

2013 RESTRAINTS

Supplemental Inflatable Restraints - Malibu

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Driver or Passenger Seat Belt Tensioner Cover Fastener	7.5 N.m	66 lb in
Driver or Passenger Seat Belt Tensioner Fastener	45 N.m	33 lb ft
Driver or Passenger Seat Shoulder Belt Fastener	45 N.m	33 lb ft
Driver or Passenger Seat Side Inflatable Restraint Module Fastener	3.25 N.m	29 lb in
Driver or Passenger Shoulder Belt Retractor Fastener	45 N.m	33 lb ft
Inflatable Restraint Front End Discriminating Sensor	7.5 N.m	66 lb in
Inflatable Restraint Roof Side Rail Fastener	9.5 N.m	84 lb in
Inflatable Restraint Sensing and Diagnostic Module Fastener	10 N.m	89 lb in
Inflatable Restraint Side Impact Sensor	7.5 Y	66 lb in
Instrument Panel Airbag Fastener	5 Y	44 lb in
Instrument Panel Lower Airbag Nut	9 N.m	80 lb in

SCHEMATIC WIRING DIAGRAMS

SIR WIRING SCHEMATICS

Power, Ground, Serial Data, Indicator and Passenger Presence Wiring Schematics

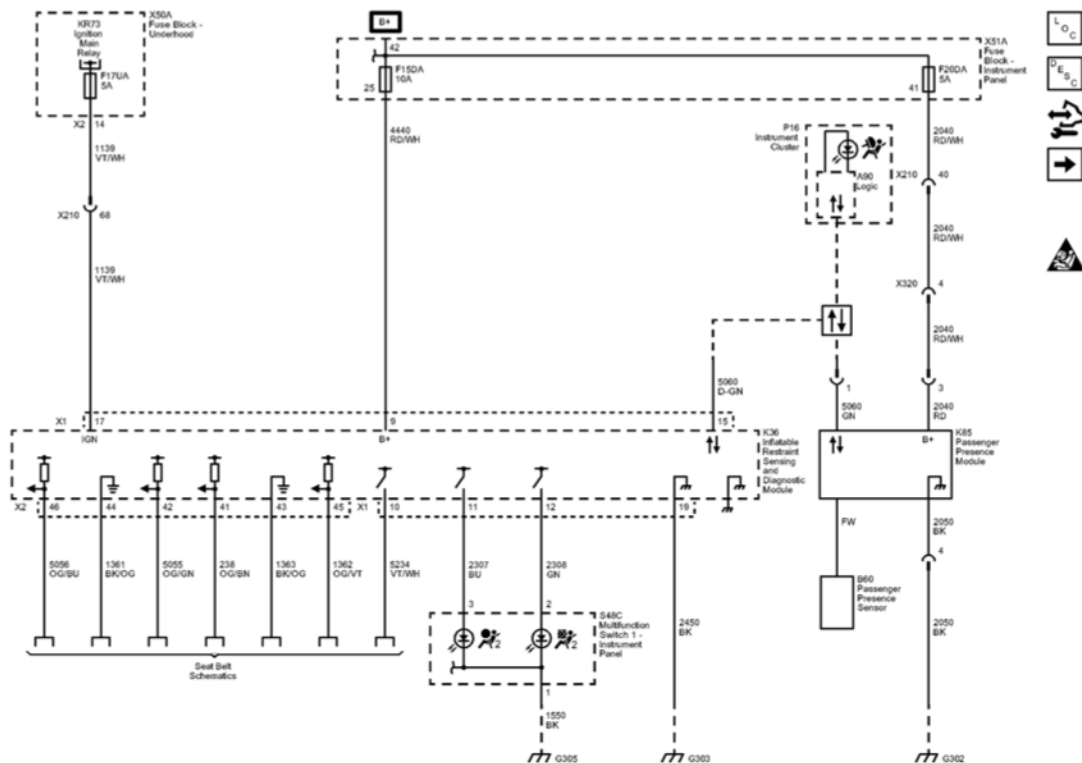


Fig. 1: Power, Ground, Serial Data, Indicator and Passenger Presence Wiring Schematics
 Courtesy of GENERAL MOTORS COMPANY

Frontal Impact Sensing and Deployment Wiring Schematics

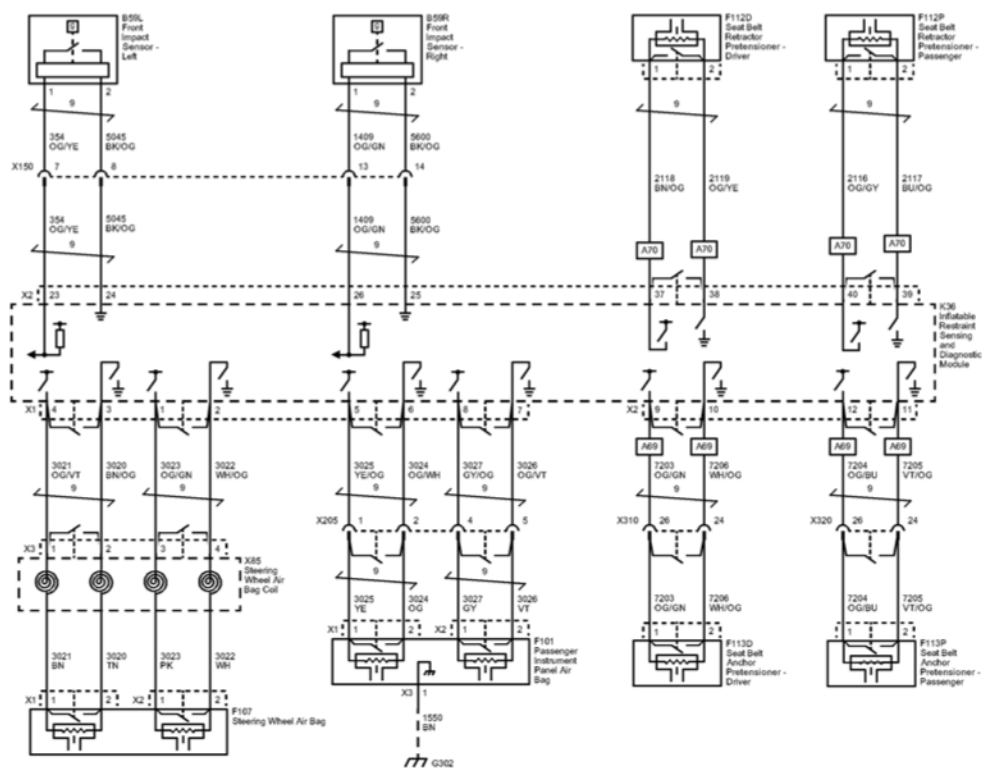


Fig. 2: Frontal Impact Sensing and Deployment Wiring Schematics
 Courtesy of GENERAL MOTORS COMPANY

Side Impact Sensing and Deployment Wiring Schematics

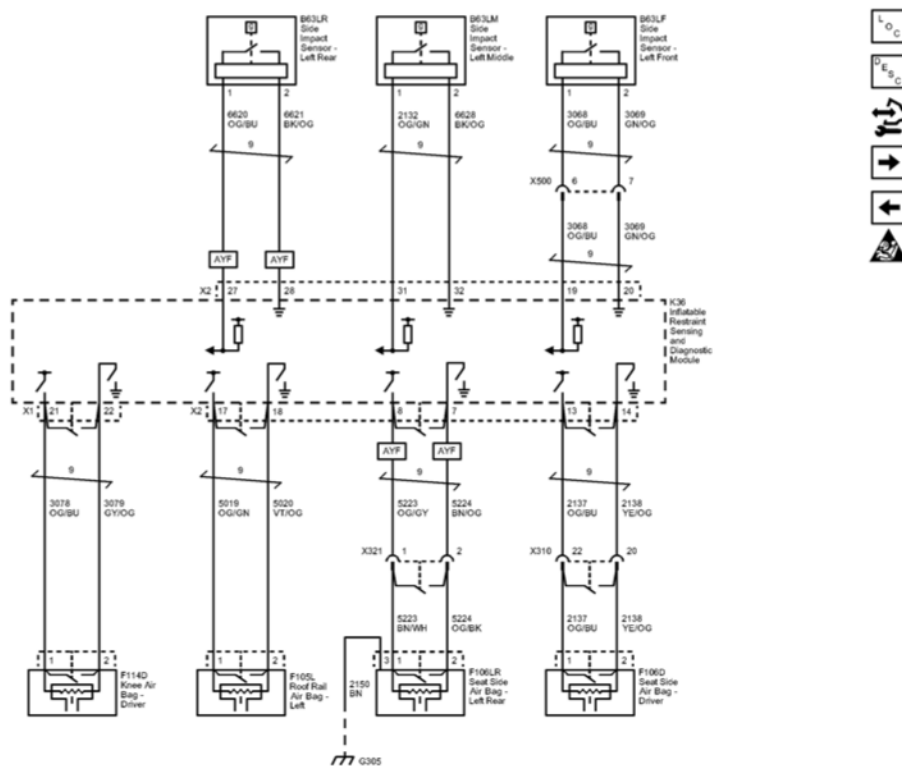


Fig. 3: Side Impact Sensing and Deployment Wiring Schematics
 Courtesy of GENERAL MOTORS COMPANY

Side Impact Sensing and Deployment Wiring Schematics

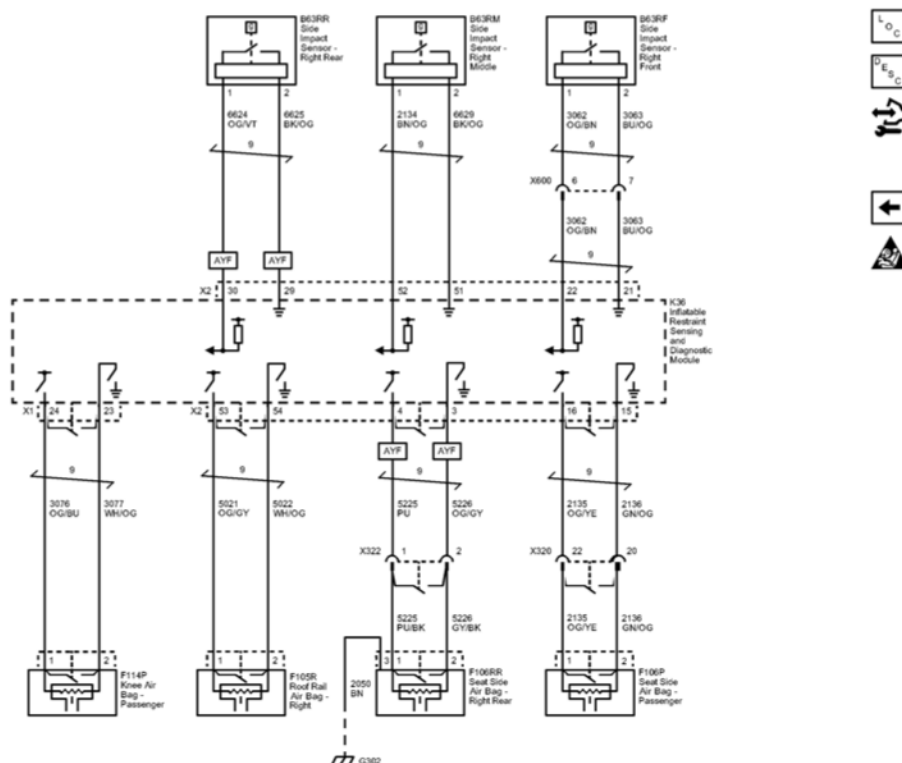


Fig. 4: Side Impact Sensing and Deployment Wiring Schematics
 Courtesy of GENERAL MOTORS COMPANY

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**.

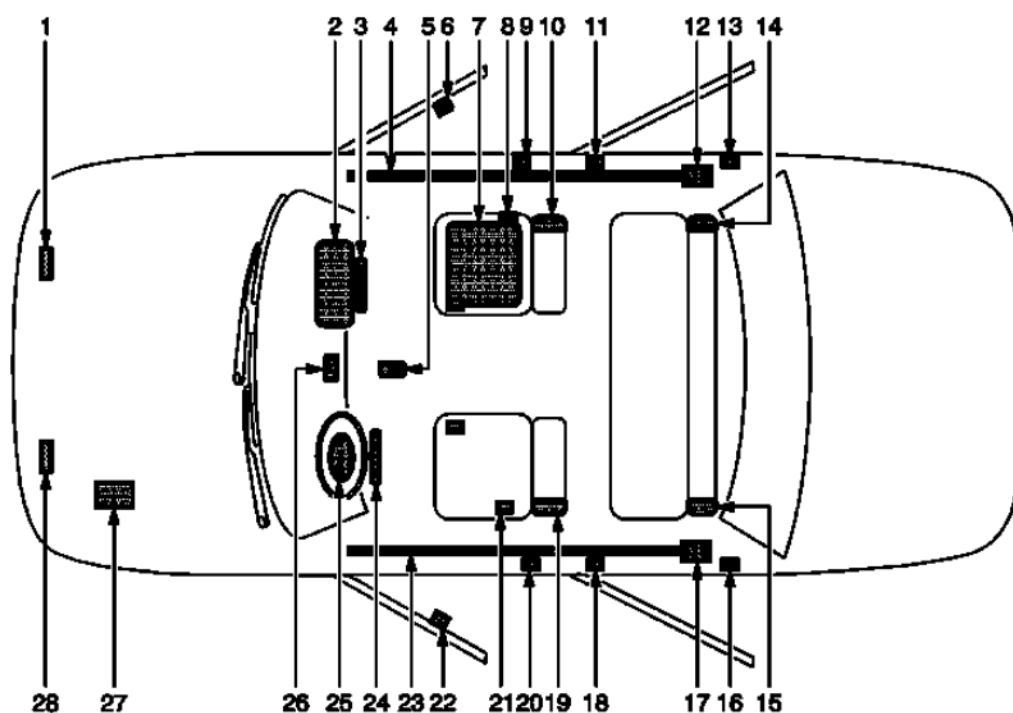


Fig. 5: SIR Component Locations

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	B59R Front Impact Sensor - Right - Located at the front of the engine compartment, on the right side of the radiator support
2	F101 Passenger Instrument Panel Air Bag - Located at the top right, under the instrument panel
3	F114P Knee Air Bag - Passenger - Located below the glove box in the instrument panel
4	F105R Roof Rail Air Bag - Right - Located in the passenger compartment, along the right roof rail
5	K36 Inflatable Restraint Sensing and Diagnostic Module - Located underneath the center console
6	B63RF Side Impact Sensor - Right Front - Located inside the right front door
7	B60 Passenger Presence Sensor - Located on the passenger front seat underneath the seat bottom trim
8	F109P Seat Belt Buckle Pretensioner - Passenger - Located in the passenger compartment, passenger side forward of middle, mounted to outboard side of passenger seat cushion frame, at rear
9	F112P Seat Belt Retractor Pretensioner - Passenger - Located in the passenger compartment, right side middle, mounted to base of B-pillar

10	F106P Seat Side Air Bag - Passenger - Located on the seat back of passenger seat
11	B63RM Side Impact Sensor - Right Middle - Located in the passenger compartment, right side under the trim, mounted to base of B-pillar
12	F105R Roof Rail Air Bag - Right - Located in the passenger compartment, along the right roof rail
13	B63RR Side Impact Sensor - Right Rear - Located in the passenger compartment, right side under the trim, mounted to base of C-pillar
14	F106RR Seat Side Air Bag - Right Rear - Located on the seat back bolster of the rear passenger seat
15	F106LR Seat Side Air Bag- Left Rear - Located on the seat back bolster of the rear passenger seat
16	B63LR Side Impact Sensor - Left Rear - Located in the passenger compartment, right side under the trim, mounted to base of C-pillar
17	F105L Roof Rail Air Bag - Left - Located in the passenger compartment, along the left roof rail
18	B63LM Side Impact Sensor - Left Middle - Located in the passenger compartment, left side under the trim, mounted to base of B-pillar
19	F106D Seat Side Air Bag - Driver - Located on the seat back of driver seat
20	F112D Seat Belt Retractor Pretensioner - Driver - Located in the driver compartment, left side middle, mounted to base of B-pillar
21	F109D Seat Belt Buckle Pretensioner - Driver - Located in the passenger compartment, driver side forward of middle, mounted to outboard side of driver seat cushion frame, at rear
22	B63LF Side Impact Sensor - Left Front - Located inside the left front door
23	F105L Roof Rail Air Bag - Left - Located in the passenger compartment, along the left roof rail
24	F114D Knee Air Bag - Driver - Located below the steering wheel in the instrument panel
25	F107 Steering Wheel Air Bag - Located on the steering wheel
26	P14 Passenger Air Bag Disable Indicator - Located in the passenger compartment, in the center of the instrument panel
27	C1 Battery - Located In the engine compartment, on the left side, near the underhood fuse block
28	B59L Front Impact Sensor - Left - Located at the front of the engine compartment, on the left side of the radiator support

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>DTC B0012 or B0013</u>	DTC B0012 Driver Steering Wheel Air Bag Deployment Loop Stage 1 DTC B0013 Driver Steering Wheel Air Bag Deployment Loop Stage 2
<u>DTC B0014, B0021, B0031, or B0038</u>	DTC B0014 01 Driver Seat Side Air Bag Deployment Loop Short to Battery DTC B0014 02 Driver Seat Side Air Bag Deployment Loop Short to Ground DTC B0014 04 Driver Seat Side Air Bag Deployment Loop Open DTC B0014 0D Driver Seat Side Air Bag Deployment Loop High Resistance DTC B0014 0E Driver Seat Side Air Bag Deployment Loop Low Resistance DTC B0021 01 Passenger Seat Side Air Bag Deployment Loop Short to Battery DTC B0021 02 Passenger Seat Side Air Bag Deployment Loop Short to Ground DTC B0021 04 Passenger Seat Side Air Bag Deployment Loop Open DTC B0021 0D Passenger Seat Side Air Bag Deployment Loop High Resistance DTC B0021 0E Passenger Seat Side Air Bag Deployment Loop Low Resistance DTC B0031 01 Left Rear Seat Side Air Bag Deployment Loop Short to Battery DTC B0031 02 Left Rear Seat Side Air Bag Deployment Loop Short to Ground DTC B0031 04 Left Rear Seat Side Air Bag Deployment Loop Open DTC B0031 0D Left Rear Seat Side Air Bag Deployment Loop High Resistance DTC B0031 0E Left Rear Seat Side Air Bag Deployment Loop Low Resistance DTC B0038 01 Right Rear Seat Side Air Bag Deployment Loop Short to Battery DTC B0038 02 Right Rear Seat Side Air Bag Deployment Loop Short to Ground DTC B0038 04 Right Rear Seat Side Air Bag Deployment Loop Open DTC B0038 0D Right Rear Seat Side Air Bag Deployment Loop High Resistance DTC B0038 0E Right Rear Seat Side Air Bag Deployment Loop Low Resistance
	DTC B0015 Driver Seat Belt Retractor Pretensioner

<u>DTC B0015, B001A, B001B, or B0022</u>	Deployment Loop DTC B001A Driver Seat Belt Anchor Pretensioner Deployment Loop DTC B001B Passenger Seat Belt Anchor Pretensioner Deployment Loop DTC B0022 Passenger Seat Belt Retractor Pretensioner Deployment Loop
<u>DTC B0016, B0018, B0023, or B0025</u>	DTC B0016 01 Left Roof Rail Air Bag Deployment Loop Short to Battery DTC B0016 02 Left Roof Rail Air Bag Deployment Loop Short to Ground DTC B0016 04 Left Roof Rail Air Bag Deployment Loop Open DTC B0016 0D Left Roof Rail Air Bag Deployment Loop High Resistance DTC B0016 0E Left Roof Rail Air Bag Deployment Loop Low Resistance DTC B0023 01 Right Roof Rail Air Bag Deployment Loop Short to Battery DTC B0023 02 Right Roof Rail Air Bag Deployment Loop Short to Ground DTC B0023 04 Right Roof Rail Air Bag Deployment Loop Open DTC B0023 0D Right Roof Rail Air Bag Deployment Loop High Resistance DTC B0023 0E Right Roof Rail Air Bag Deployment Loop Low Resistance
<u>DTC B0017 or B0024</u>	DTC B0017 01 Driver Knee Air Bag Deployment Loop Short to Battery DTC B0017 02 Driver Knee Air Bag Deployment Loop Short to Ground DTC B0017 04 Driver Knee Air Bag Deployment Loop Open DTC B0017 0D Driver Knee Air Bag Deployment Loop High Resistance DTC B0017 0E Driver Knee Air Bag Deployment Loop Low Resistance DTC B0024 01 Passenger Knee Air Bag Deployment Loop Short to Battery DTC B0024 02 Passenger Knee Air Bag Deployment Loop Short to Battery DTC B0024 04 Passenger Knee Air Bag Deployment Loop Open DTC B0024 0D Passenger Knee Air Bag Deployment Loop High Resistance DTC B0024 0E Passenger Knee Air Bag Deployment Loop Low Resistance

<u>DTC B0019 or B0020</u>	DTC B0019 Passenger Instrument Panel Air Bag Deployment Loop Stage 1 DTC B0020 Passenger Instrument Panel Air Bag Deployment Loop Stage 2
<u>DTC B0052</u>	DTC B0052 00 Deployment Commanded DTC B0052 56 Deployment Commanded Too Many Transitions
<u>DTC B0074</u>	DTC B0074 00 Passenger Presence Sensor Circuit Malfunction DTC B0074 0D Passenger Presence Sensor Resistance Above Threshold DTC B0074 0E Passenger Presence Sensor Resistance Below Threshold DTC B0074 0F Passenger Presence Sensor Erratic (Wet Seat)
<u>DTC B0081 (Inflatable Restraint Sensing and Diagnostic Module)</u>	DTC B0081 00 Passenger Presence Module Malfunction DTC B0081 3A Passenger Presence Module Incorrect Component Installed DTC B0081 71 Passenger Presence Module Invalid Data
<u>DTC B0081 (Passenger Presence System)</u>	DTC B0081 11 Passenger Presence Module High Input DTC B0081 4B Passenger Presence Module Calibration Not Learned DTC B0081 5A Passenger Presence Module Not Plausible
	DTC B0083 01 Left Front Impact Sensor Short to Battery DTC B0083 02 Left Front Impact Sensor Short to Ground DTC B0083 04 Left Front Impact Sensor Open DTC B0083 39 Left Front Impact Sensor Internal Malfunction DTC B0083 3A Left Front Impact Sensor Incorrect Component Installed DTC B0083 71 Left Front Impact Sensor Invalid Data DTC B0084 01 Right Front Impact Sensor Short to Battery DTC B0084 02 Right Front Impact Sensor Short to Ground DTC B0084 04 Right Front Impact Sensor Open DTC B0084 39 Right Front Impact Sensor Internal Malfunction DTC B0084 3A Right Front Impact Sensor Incorrect Component Installed

DTC B0083-B0088

DTC B0084 71 Right Front Impact Sensor Invalid Data
DTC B0085 01 Left Front Side Impact Sensor Short to Battery
DTC B0085 02 Left Front Side Impact Sensor Short to Ground
DTC B0085 04 Left Front Side Impact Sensor Open
DTC B0085 39 Left Front Side Impact Sensor Internal Malfunction
DTC B0085 3A Left Front Side Impact Sensor Incorrect Component Installed
DTC B0085 71 Left Front Side Impact Sensor Invalid Data
DTC B0086 01 Right Front Side Impact Sensor Short to Battery
DTC B0086 02 Right Front Side Impact Sensor Short to Ground
DTC B0086 04 Right Front side Impact Sensor Open
DTC B0086 39 Right Front Side Impact Sensor Internal Malfunction
DTC B0086 3A Right Front Side Impact Sensor Incorrect Component Installed
DTC B0086 71 Right Front Side Impact Sensor Invalid Data
DTC B0087 01 Left Rear Side Impact Sensor Short to Battery
DTC B0087 02 Left Rear Side Impact Sensor Short to Ground
DTC B0087 04 Left Rear Side Impact Sensor Open
DTC B0087 39 Left Rear Side Impact Sensor Internal Malfunction
DTC B0087 3A Left Rear Side Impact Sensor Incorrect Component Installed
DTC B0087 71 Left Rear Side Impact Sensor Invalid Data
DTC B0088 01 Right Rear Side Impact Sensor Short to Battery
DTC B0088 02 Right Rear Side Impact Sensor Short to Ground
DTC B0088 04 Right Rear Side Impact Sensor Open
DTC B0088 39 Right Rear Side Impact Sensor Internal Malfunction
DTC B0088 3A Right Rear Side Impact Sensor Incorrect Component Installed
DTC B0088 71 Right Rear Side Impact Sensor Invalid Data

<u>DTC B0092 or B0093</u>	DTC B0092 01 Left Center Side Impact Sensor Short to Battery
	DTC B0092 02 Left Center Side Impact Sensor Short to Ground
	DTC B0092 04 Left Center Side Impact Sensor Open
	DTC B0092 39 Left Center Side Impact Sensor Internal Malfunction
	DTC B0092 3A Left Center Side Impact Sensor Incorrect Component Installed
	DTC B0092 71 Left Center Side Impact Sensor Invalid Data
	DTC B0093 01 Right Center Side Impact Sensor Short to Battery
	DTC B0093 02 Right Center Side Impact Sensor Short to Ground
	DTC B0093 04 Right Center Side Impact Sensor Open
	DTC B0093 39 Right Center Side Impact Sensor Internal Malfunction
<u>DTC B1001</u>	DTC B1001 00 Option Configuration
	DTC B1019 00 System Configuration Error

DTC B0012 OR B0013

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

Driver Steering Wheel Air Bag Deployment Loop Stage 1

DTC B0013

Driver Steering Wheel Air Bag Deployment Loop Stage 2

For symptom byte information refer to **Symptom Byte List** .

Diagnostic Fault Information

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Steering Wheel Air Bag Stage 1 High Control	B0012 02, B0012 0E	B0012 0D	B0012 04, B0012 0D	B0012 01	-
Steering Wheel Air Bag Stage 1 Low Control	B0012 02, B0012 0E	B0012 0D	B0012 04, B0012 0D	B0012 01	-
Steering Wheel Air Bag Stage 2 High Control	B0013 02, B0013 0E	B0013 0D	B0013 04, B0013 0D	B0013 01	-
Steering Wheel Air Bag Stage 2 Low Control	B0013 02, B0013 0E	B0013 0D	B0013 04, B0013 0D	B0013 01	-

Circuit/System Description

During a 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 steering wheel air bag. The SDM performs continuous diagnostic tests on the deployment loops to check for proper circuit continuity and for shorts to ground or voltage. There are 2 shorting bars used within the steering wheel air bag coil connector which will short together both steering wheel air bag stage 1 high control circuit and steering wheel air bag stage 1 low control circuit and both steering wheel air bag stage 2 high control circuit and steering wheel air bag stage 2 low control circuit when the connector is disconnected. This will help to prevent unwanted deployment of the steering wheel air bag during servicing.

Conditions for Running the DTC

Ignition voltage is between 9-16 V.

Conditions for Setting the DTC

B0012 01 stage 1 or B0013 01 stage 2

The Steering Wheel Air Bag deployment loop is shorted to voltage for 2 seconds.

B0012 02 stage 1 or B0013 02 stage 2

The Steering Wheel Air Bag deployment loop is shorted to ground for 2 seconds.

B0012 04 stage 1 or B0013 04 stage 2

The Steering Wheel Air Bag deployment loop is open for 2 seconds.

B0012 0D stage 1 or B0013 0D stage 2

The Steering Wheel Air Bag deployment loop resistance is greater than 4.4 ohms for 2 seconds.

B0012 0E stage 1 or B0013 0E stage 2

The Steering Wheel Air bag deployment loop resistance is less than 1.7 ohms for 2 seconds.

Action Taken When the DTC Sets

- The Inflatable Restraint Sensing and Diagnostic Module requests the instrument cluster to illuminate the AIR BAG indicator.
- The Inflatable Restraint Sensing and Diagnostic Module will store a DTC, however if an event occurs the system will still attempt deployment.

Conditions for Clearing the DTC

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

Diagnostic Aid

NOTE: The following diagnostic aids apply for both current and history DTCs.

A worn steering wheel air bag coil can cause a repeated history DTC to set. To verify this condition, turn the steering wheel 360 degrees in one direction then back 360 degrees in the other direction, multiple times, while viewing the scan tool Deployment Loop Resistance parameters.

An incorrectly installed connector position assurance (CPA) or incorrectly seated connector can cause a shorting bar to short both control circuits together. Check the connectors and CPAs if a DTC with symptom byte 02 or 0E is set, to ensure the shorting bars are not causing the circuits to be shorted together. Shorting bars are used in the locations listed below:

- Steering Wheel Air Bag assembly
- Steering Wheel Air Bag Coil assembly
- Inline harness connectors
- Harness side of the Inflatable Restraint Sensing and Diagnostic Module connector

Terminal fretting or incorrectly seated connector can cause an open/high resistance condition. Check the circuit terminals for fretting or incorrectly seated connector if a DTC with symptom byte 04 or 0D is set.

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Supplemental Inflatable Restraint System Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Special Tools

EL-38125-580 Terminal Release Tool Kit

Circuit/System Verification

NOTE:

- Refer to SIR Service Precautions.
 - Inspect all terminals for damage or corrosion when disconnecting connectors. Damage or corrosion in the following requires repair or replacement of the affected component/connector.
 - Steering wheel air bag
 - Steering wheel air bag coil
 - Inflatable Restraint Sensing and Diagnostic Module
 - Air bag wiring harness connector
 - Inflatable Restraint Sensing and Diagnostic Module wiring harness connector
 - The connector and connector position assurance (CPA) may seat independent of each other. Both the connector and CPA should seat with an audible and/or tactile click. The CPA isolates the shorting-bars within the connector allowing the deployment circuit to operate properly. Replace any CPA that is damaged or missing.
 - If the condition is intermittent or cannot be duplicated, disconnect the connectors and add dielectric grease / lubricant (Nyogel 760G or equivalent, meeting GM specification 9986087). This procedure will correct the high resistance condition due to terminal fretting corrosion.
1. Verify the appropriate scan tool Deployment Loop Resistance parameters stay consistently between 2.1-4.0 ohms without any spikes or dropouts while turning the steering wheel 360 degrees in one direction then back 360 degrees in the other direction.
 - If less than 2.1 ohms or greater than 4.0 ohms

Refer to Circuit/System Testing below.

- **If there are spikes or dropouts**

Replace the X85 Steering Wheel Air Bag Coil.

- **If between 2.1-4.0 ohms without any spikes or dropouts**

2. Verify DTC B0012 or B0013 is only set as a history DTC.

- **If the DTC is set as current**

Refer to Circuit/System Testing below.

- **If the DTC is set as history**

3. Verify the scan tool Deployment Loop Resistance parameters stay consistently between 2.1-4.0 ohms without any drop outs or spikes while moving the harness near each connector listed below.

- X85 Steering Wheel Air Bag Coil
- F107 Steering Wheel Air Bag
- Any inline harness connector
- K36 Inflatable Restraint Sensing and Diagnostic Module

- **If the reading is erratic while moving the harness, perform the following**

- Inspect each connector terminal for damage or corrosion and repair as necessary.
- Apply dielectric grease / lubricant (Nyogel 760G or equivalent, meeting GM specification 9986087) to each connector terminal.
- Ensure each connector and CPA is correctly seated.

- **If between 2.1-4.0 ohms without any spikes or dropouts**

4. All OK.

Circuit/System Testing

1. Ignition OFF, disconnect the scan tool and disconnect the appropriate harness connector listed below at the F107 Steering Wheel Air Bag.

- DTC B0012 connector X1
- DTC B0013 connector X2

2. Test for greater than 25 ohms between the control circuit terminal 1 and the control circuit terminal 2 at the harness connector.

- **If 25 ohms or less**

1. Disconnect the X1 harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module.

NOTE: Some connectors may be equipped with shorting bars as a safety component to prevent accidental deployment. When testing on a connector with shorting bars, the shorting bars must be disabled to ensure accurate test results. Insert an appropriate pick from EL-

38125-580 and depress the shorting bars above the appropriate terminals. This will lift the shorting bar from the terminal and allow accurate test results. Take care not to damage the connector, shorting bar, or terminal when depressing the shorting bar.

2. Test for infinite resistance between the two control circuits.
 - If less than infinite resistance, repair the short between the two circuits.
 - If infinite resistance, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.
 - **If greater than 25 ohms**
3. Ignition ON.
4. Test for less than 11 V between each control circuit terminal listed below and ground:
 - Control circuit terminal 1
 - Control circuit terminal 2
 - **If 11 V or greater**
 1. Ignition OFF, disconnect the X1 harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module, ignition ON.
 2. Test for less than 1 V between the control circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.
 - **If less than 11 V**
5. Ignition OFF.
6. Test for greater than 25 ohms between each control circuit terminal listed below and ground:
 - Control circuit terminal 1
 - Control circuit terminal 2
 - **If 25 ohms or less**
 1. Disconnect the X1 harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module.

NOTE: Some connectors may be equipped with shorting bars as a safety component to prevent accidental deployment. When testing on a connector with shorting bars, the shorting bars must be disabled to ensure accurate test results. Insert an appropriate pick from EL-38125-580 and depress the shorting bars above the appropriate terminals. This will lift the shorting bar from the terminal and allow accurate test results. Take care not to damage the connector, shorting bar, or terminal when depressing the shorting bar.

2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.
 - **If greater than 25 ohms**

7. Install a 3 A fused jumper wire between the control circuit terminal 1 and the control circuit terminal 2, ignition ON.
8. Verify the appropriate scan tool Deployment Loop Resistance parameter is consistently less than 2 ohms while turning the steering wheel 360 degrees in one direction then back 360 degrees in the other direction.

- **If the reading is erratic while turning the steering wheel**

Replace the X85 Steering Wheel Air Bag Coil.

- **If 2 ohms or greater**

1. Ignition OFF, disconnect the X1 harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module.
2. Test for less than 2 ohms in the X85 Steering Wheel Air Bag Coil and each control circuit end to end.

- If 2 ohms or greater, replace the X85 Steering Wheel Air Bag Coil or repair the open/high resistance in the circuit.

- If less than 2 ohms, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.

- **If less than 2 ohms**

9. Ignition OFF, connect the harness connector at the F107 Steering Wheel Air Bag, press in the CPA (if equipped) until an audible and/or tactile click is heard.
10. Ignition ON, clear DTCs. Operate the vehicle within the Conditions for Running the DTC.
11. Verify DTC B0012 or B0013 is not set.

- **If DTC B0012 or B0013 is set**

Replace the F107 Steering Wheel Air Bag.

- **If DTC B0012 or B0013 is not set**

12. All OK.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Steering Wheel Airbag Coil Replacement**

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- **SIR/SRS Wiring Repairs**

- **Control Module References** for Inflatable Restraint Sensing and Diagnostic Module replacement, programming and setup

DTC B0014, B0021, B0031, OR B0038

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 B0014 01

Driver Seat Side Air Bag Deployment Loop Short to Battery

DTC B0014 02

Driver Seat Side Air Bag Deployment Loop Short to Ground

DTC B0014 04

Driver Seat Side Air Bag Deployment Loop Open

DTC B0014 0D

Driver Seat Side Air Bag Deployment Loop High Resistance

DTC B0014 0E

Driver Seat Side Air Bag Deployment Loop Low Resistance

DTC B0021 01

Passenger Seat Side Air Bag Deployment Loop Short to Battery

DTC B0021 02

Passenger Seat Side Air Bag Deployment Loop Short to Ground

DTC B0021 04

Passenger Seat Side Air Bag Deployment Loop Open

DTC B0021 0D

Passenger Seat Side Air Bag Deployment Loop High Resistance

DTC B0021 0E

Passenger Seat Side Air Bag Deployment Loop Low Resistance

DTC B0031 01

Left Rear Seat Side Air Bag Deployment Loop Short to Battery

DTC B0031 02

Left Rear Seat Side Air Bag Deployment Loop Short to Ground

DTC B0031 04

Left Rear Seat Side Air Bag Deployment Loop Open

DTC B0031 0D

Left Rear Seat Side Air Bag Deployment Loop High Resistance

DTC B0031 0E

Left Rear Seat Side Air Bag Deployment Loop Low Resistance

DTC B0038 01

Right Rear Seat Side Air Bag Deployment Loop Short to Battery

DTC B0038 02

Right Rear Seat Side Air Bag Deployment Loop Short to Ground

DTC B0038 04

Right Rear Seat Side Air Bag Deployment Loop Open

DTC B0038 0D

Right Rear Seat Side Air Bag Deployment Loop High Resistance

DTC B0038 0E

Right Rear Seat Side Air Bag Deployment Loop Low Resistance

Diagnostic Fault Information

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Left Front Seat Side Air Bag High Control	B0014 02, B0014 0E	B0014 0D	B0014 04, B0014 0D	B0014 01	-
Left Front Seat Side Air Bag Low Control	B0014 02, B0014 0E	B0014 0D	B0014 04, B0014 0D	B0014 01	-

Right Front Seat Side Air Bag High Control	B0021 02, B0021 0E	B0021 0D	B0021 04, B0021 0D	B0021 01	-
Right Front Seat Side Air Bag Low Control	B0021 02, B0021 0E	B0021 0D	B0021 04, B0021 0D	B0021 01	-
Left Rear Seat Side Air Bag High Control	B0031 02, B0031 0E	B0031 0D	B0031 04, B0031 0D	B0031 01	-
Left Rear Seat Side Air Bag Low Control	B0031 02, B0031 0E	B0031 0D	B0031 04, B0031 0D	B0031 01	-
Right Rear Seat Side Air Bag High Control	B0038 02, B0038 0E	B0038 0D	B0038 04, B0038 0D	B0038 01	-
Right Rear Seat Side Air Bag Low Control	B0038 02, B0038 0E	B0038 0D	B0038 04, B0038 0D	B0038 01	-

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 air bag. There are 2 shorting bars used within the connector that will short the control circuits together when the connector is disconnected. This will help to prevent unwanted deployment of the air bag or retractor pretensioner during servicing.

Conditions for Running the DTC

Ignition voltage is between 9-16 V.

Conditions for Setting the DTC

B0014 01, B0021 01, B0031 01, B0038 01

The air bag control circuit is shorted to voltage for 2 seconds.

B0014 02, B0021 02, B0031 02, B0038 02

The air bag control circuit is shorted to ground for 2 seconds.

B0014 04, B0021 04, B0031 04, B0038 04

The air bag control circuit is open for 2 seconds.

B0014 0D, B0021 0D, B0031 0D, B0038 0D

The air bag deployment loop resistance is greater than 4.2 ohms for 2 seconds.

B0014 0E, B0021 0E, B0031 0E, B0038 0E

The air bag deployment loop resistance is less than 1.4 ohms for 2 seconds.

Action Taken When the DTC Sets

- The inflatable restraint sensing and diagnostic module requests the instrument cluster to illuminate the AIR BAG indicator.
- The inflatable restraint sensing and diagnostic module will store a DTC, however if an event occurs the system will still attempt deployments.

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.

Diagnostic Aid

NOTE: **The following diagnostic aids apply for both current and history DTCs.**

An incorrectly installed connector position assurance (CPA) or incorrectly seated connector can cause a shorting bar to short both control circuits together. Check the connectors and CPAs if a DTC with symptom byte 02 or 0E is set, to ensure the shorting bars are not causing the circuits to be shorted together. Shorting bars are used in the locations listed below:

- Front and rear seat side air bags
- Left and right roof rail air bags
- Inline harness connectors
- Harness side of the inflatable restraint sensing and diagnostic module connector

Terminal fretting or incorrectly seated connector can cause an open/high resistance condition. Check the circuit terminals for fretting or incorrectly seated connector if a DTC with symptom byte 04 or 0D is set. DTCs of deployment loops which are in the seat can occur because of stress or damage to the harness due to seat movement. Move the seat to the full extent of travel while using the scan tool to observe deployment type loop parameters.

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- Wiring Repairs
- Connector Repairs

Scan Tool Reference

Control Module References for scan tool information

Special Tools

EL-38125-580 Terminal Release Tool Kit

Circuit/System Verification

NOTE:

- Refer to SIR Service Precautions.
- Inspect all terminals for damage or corrosion when disconnecting connectors. Damage or corrosion in the following requires repair or replacement of the affected component/connector.
 - Seat side air bag
 - Inflatable restraint sensing and diagnostic module
 - All wiring harness connectors
 - Inflatable restraint sensing and diagnostic module wiring harness connector
- The connector and connector position assurance (CPA) may seat independent of each other. Both the connector and CPA should seat with an audible and/or tactile click. The CPA isolates the shorting-bars within the connector allowing the deployment circuit to operate properly.
- If the condition is intermittent or cannot be duplicated, disconnect the connectors and add dielectric grease/lubricant (Nyogel 760G or equivalent, meeting GM specification 9986087). This procedure will correct the high resistance condition due to terminal fretting corrosion.

1. Verify the appropriate scan tool Deployment Loop Resistance parameters stay consistently between 2.1-4.0 ohms without any spikes or dropouts while moving the harness near each connector.
 - F106 Seat Side Air Bag
 - Any inline harness connector
 - K36 Inflatable Restraint Sensing and Diagnostic Module
 - If less than 2.1 ohms or greater than 4.0 ohms

Refer to Circuit/System Testing below.

- If there are spikes or dropouts, perform the following:

- Inspect each connector terminal and harness for damage or corrosion and repair as necessary.
- Apply dielectric grease/lubricant (Nyogel 760G or equivalent, meeting GM specification 9986087) to each connector terminal.
- Ensure each connector and CPA is correctly seated.
 - **If between 2.1-4.0 ohms without any spikes or dropouts**

2. All OK

Circuit/System Testing

1. Ignition OFF, scan tool disconnected, disconnect the harness connector at the appropriate F106 Seat Side Air Bag.
2. Test for greater than 25 ohms between the control circuit terminals 1 and 2.

- **If 25 ohms or less**

1. Disconnect the X2 harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module.

NOTE: Some connectors may be equipped with shorting bars as a safety component to prevent accidental deployment. When testing on a connector with shorting bars, the shorting bars must be disabled to ensure accurate test results. Insert an appropriate pick from EL-38125-580 and depress the shorting bars above the appropriate terminals. This will lift the shorting bar from the terminal and allow accurate test results. Take care not to damage the connector, shorting bar, or terminal when depressing the shorting bar.

2. Test for infinite resistance between the 2 control circuits.
 - If less than infinite resistance, repair the short between the 2 circuits.
 - If infinite resistance, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.

- **If greater than 25 ohms**

3. Ignition ON.
4. Test for less than 11 V between each control circuit terminal listed below and ground:
 - Control circuit terminal 1
 - Control circuit terminal 2
 - **If 11 V or greater**
 1. Ignition OFF, disconnect the X2 harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module, ignition ON.
 2. Test for less than 1 V between the control circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.
 - **If less than 11 V**
5. Ignition OFF.

6. Test for greater than 25 ohms between each control circuit terminal listed below and ground:
 - Control circuit terminal 1
 - Control circuit terminal 2
 - **If 25 ohms or less**
 1. Disconnect the X2 harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.
 - **If greater than 25 ohms**
7. Install a 3 A fused jumper wire between the control circuit terminals 1 and 2, ignition ON.
8. Verify the appropriate scan tool Deployment Loop Resistance parameter is less than 2 ohms.
 - **If 2 ohms or greater**
 1. Ignition OFF, disconnect the X2 harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module.
 2. Test for less than 2 ohms in each control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.
 - **If less than 2 ohms**
9. Ignition OFF, connect the harness connector at the F106 Seat Side Air Bag, press in the CPA (if equipped) until an audible and/or tactile click is heard.
10. Ignition ON, clear DTCs. Operate the vehicle within the Conditions for Running the DTC.
11. Verify DTC B0014, B0021, B0031, or B0038 is not set.
 - **If DTC B0014, B0021, B0031, or B0038 is set**

Test or replace the F106 Seat Side Air Bag.
 - **If DTC B0014, B0021, B0031, or B0038 is not set**
12. All OK.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Front Seat Outboard Seat Back Airbag Replacement**
- **Rear Seat Outboard Seat Back Airbag Replacement**
- **Control Module References** for inflatable restraint sensing and diagnostic module replacement, programming, and setup

DTC B0015, B001A, B001B, OR B0022

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 B0015

Driver Seat Belt Retractor Pretensioner Deployment Loop

DTC B001A

Driver Seat Belt Anchor Pretensioner Deployment Loop

DTC B001B

Passenger Seat Belt Anchor Pretensioner Deployment Loop

DTC B0022

Passenger Seat Belt Retractor Pretensioner Deployment Loop

For symptom byte information refer to **Symptom Byte List**.

Diagnostic Fault Information

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Driver Seat Belt Retractor Pretensioner High Control	B0015 02, B0015 0E	B0015 0D	B0015 04, B0015 0D	B0015 01	-
Driver Seat Belt Retractor Pretensioner Low Control	B0015 02, B0015 0E	B0015 0D	B0015 04, B0015 0D	B0015 01	-
Driver Seat Belt Anchor Pretensioner Low Control	B001A 02, B001A 0E	B001A 0D	B001A 04	B001A 01	-
Driver Seat Belt Anchor Pretensioner High Control	B001A 02, B001A 0E	B001A 0D	B001A 04	B001A 01	-
Passenger Seat Belt Anchor Pretensioner Low Control	B001B 02, B001B 0E	B001B 0D	B001B 04	B001B 01	-
Passenger Seat Belt	B001B 02,				

Anchor Pretensioner High Control	B001B 0E	B001B 0D	B001B 04	B001B 01	-
Passenger Seat Belt Retractor Pretensioner High Control	B0022 02, B0022 0E	B0022 0D	B0022 04, B0022 0D	B0022 01	-
Passenger Seat Belt Retractor Pretensioner Low Control	B0022 02, B0022 0E	B0022 0D	B0022 04, B0022 0D	B0022 01	-

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 air bag or pretensioner. There are 2 shorting bars which will short together control circuits, when the connector is disconnected. This will help to prevent unwanted deployment of the air bag or pretensioner during servicing.

Conditions for Running the DTC

Ignition voltage is between 9-16 V.

Conditions for Setting the DTC

B0015 01, B001A 01, B001B 01, B0022 01

The pretensioner control circuit is shorted to voltage for 2 seconds.

B0015 02, B001A 02, B001B 02, B0022 02

The pretensioner control circuit is shorted to ground for 2 seconds.

B0015 04, B001A 04, B001B 04, B0022 04

The pretensioner control circuit is open for 2 seconds.

B0015 0D, B001A 0D, B001B 0D, B0022 0D

The pretensioner deployment loop resistance is greater than 4.2 ohms for 2 seconds.

B0015 0E, B001A 0E, B001B 0E, B0022 0E

The pretensioner deployment loop resistance is less than 1.4 ohms for 2 seconds.

Action Taken When the DTC Sets

- The inflatable restraint sensing and diagnostic module requests the instrument cluster to illuminate the AIR BAG indicator.
- The inflatable restraint sensing and diagnostic module will store a DTC, however if an event occurs the

system will still attempt deployments.

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.

Diagnostic Aid

NOTE: **The following diagnostic aids apply for both current and history DTCs.**

An incorrectly installed connector position assurance (CPA) or incorrectly seated connector can cause a shorting bar to short both control circuits together. Check the connectors and CPAs if a DTC with symptom byte 02 or 0E is set, to ensure the shorting bars are not causing the circuits to be shorted together. Shorting bars are used in the locations listed below:

- Driver and passenger anchor or retractor pretensioners
- Inline harness connectors
- Harness side of the inflatable restraint sensing and diagnostic module connector

Terminal fretting or incorrectly seated connectors can cause an open/high resistance condition. Check the circuit terminals for fretting or incorrectly seated connector if a DTC with symptom byte 04 or 0D is set. DTCs of deployment loops which are in the seat can occur because of stress or damage to the harness due to seat movement. Move the seat to the full extent of travel while using the scan tool to observe deployment type loop parameters.

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

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Description and Operation

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Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Special Tools

EL-38125-580 Terminal Release Tool Kit

Circuit/System Verification

NOTE: Refer to **SIR Service Precautions**.

- **Inspect all terminals for damage or corrosion when disconnecting connectors. Damage or corrosion in the following requires repair or replacement of the affected component/connector.**
 - **Seat belt retractor pretensioner**
 - **Seat belt anchor pretensioner**
 - **Inflatable restraint sensing and diagnostic module**
 - **Seat belt retractor pretensioner wiring harness connector**
 - **Seat belt anchor pretensioner wiring harness connector**
 - **Inflatable restraint sensing and diagnostic module wiring harness connector**
- **The connector and connector position assurance (CPA) may seat independent of each other. Both the connector and CPA should seat with an audible and/or tactile click. The CPA isolates the shorting-bars within the connector allowing the deployment circuit to operate properly.**
- **If the condition is intermittent or cannot be duplicated, disconnect the connectors and add dielectric grease / lubricant (Nyogel 760G or equivalent, meeting GM specification 9986087). This procedure will correct the high resistance condition due to terminal fretting corrosion.**

1. Verify the appropriate scan tool Deployment Loop Resistance parameters stay consistently between 2.1 and 4.0 ohms without any spikes or dropouts while moving the harness near each connector listed below:
 - **F112 Seat Belt Retractor Pretensioner**
 - **F113 Seat Belt Anchor Pretensioner**
 - **Any inline harness connector**
 - **K36 Inflatable Restraint Sensing and Diagnostic Module**
 - **If less than 2.1 or greater than 4.0 ohms**

Refer to Circuit/System Testing below.

- **If there are spikes or dropouts, perform the following**
 - **Inspect each connector terminal and harness for damage or corrosion and repair as necessary**

- Apply dielectric grease / lubricant (Nyogel 760G or equivalent, meeting GM specification 9986087) to each connector terminal
- Insure each connector and CPA is correctly seated.
 - **If within 2.1 and 4.0 ohms without any spikes or dropouts**

2. All OK

Circuit/System Testing

1. Ignition OFF. Scan tool disconnected. Disconnect the appropriate harness connector listed below:
 - F112 Seat Belt Retractor Pretensioner
 - F113 Seat Belt Anchor Pretensioner
2. Test for greater than 25 ohms between the control circuit terminals 1 and 2.
 - **If 25 ohms or less**

1. Disconnect the X2 harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module.

NOTE: Some connectors may be equipped with shorting bars as a safety component to prevent accidental deployment. When testing on a connector with shorting bars, the shorting bars must be disabled to ensure accurate test results. Insert an appropriate pick from EL-38125-580 and depress the shorting bars above the appropriate terminals. This will lift the shorting bar from the terminal and allow accurate test results. Take care not to damage the connector, shorting bar, or terminal when depressing the shorting bar.

2. Test for infinite resistance between the two control circuits.
 - If less than infinite resistance, repair the short between the two circuits.
 - If infinite resistance, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.
 - **If greater than 25 ohms**
3. Ignition ON.
4. Test for less than 11 V between the control circuit terminals listed below and ground:
 - Control circuit terminal 1
 - Control circuit terminal 2
 - **If 11 V or greater**
 1. Ignition OFF. Disconnect the X2 harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module. Ignition ON
 2. Test for less than 1 V between the control circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.
 - **If less than 11 V**
5. Ignition OFF.

6. Test for greater than 25 ohms between the control circuit terminals listed below and ground:
 - Control circuit terminal 1
 - Control circuit terminal 2
 - **If 25 ohms or less**
 1. Disconnect the X2 harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.
 - **If greater than 25 ohms**
7. Install a 3 A fused jumper wire between the control circuit terminals 1 and 2. Ignition ON.
8. Verify the appropriate scan tool Deployment Loop Resistance parameter is less than 2 ohms.
 - **If 2 ohms or greater**
 1. Ignition OFF. Disconnect the X2 harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module.
 2. Test for less than 2 ohms in each control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.
 - **If less than 2 ohms**
9. Ignition OFF, connect the harness connector at the F112 Seat Belt Retractor Pretensioner or F113 Seat Belt Anchor Pretensioner, press in the CPA (if equipped) until an audible and/or tactile click is heard.
10. Ignition ON, clear DTCs. Operate the vehicle within the Conditions for Running the DTC.
11. Verify DTC B0015, B001A, B001B, or B0022 is not set.
 - **If DTC B0015, B001A, B001B, or B0022 is set**

Replace the appropriate F112 Seat Belt Retractor Pretensioner or F113 Seat Belt Anchor Pretensioner.
 - **If DTC B0015, B001A, B001B, or B0022 is not set**
12. All OK.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Front Seat Belt Anchor Plate Tensioner Replacement**
-
- **SIR/SRS Wiring Repairs**
- **Control Module References** for inflatable restraint sensing and diagnostic module replacement, programming and setup

DTC B0016, B0018, B0023, OR B0025

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 B0016 01

Left Roof Rail Air Bag Deployment Loop Short to Battery

DTC B0016 02

Left Roof Rail Air Bag Deployment Loop Short to Ground

DTC B0016 04

Left Roof Rail Air Bag Deployment Loop Open

DTC B0016 0D

Left Roof Rail Air Bag Deployment Loop High Resistance

DTC B0016 0E

Left Roof Rail Air Bag Deployment Loop Low Resistance

DTC B0023 01

Right Roof Rail Air Bag Deployment Loop Short to Battery

DTC B0023 02

Right Roof Rail Air Bag Deployment Loop Short to Ground

DTC B0023 04

Right Roof Rail Air Bag Deployment Loop Open

DTC B0023 0D

Right Roof Rail Air Bag Deployment Loop High Resistance

DTC B0023 0E

Right Roof Rail Air Bag Deployment Loop Low Resistance

Diagnostic Fault Information

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Left Roof Rail Air Bag High Control	B0016 02, B0016 0E	B0016 0D	B0016 04, B0016 0D	B0016 01	-
Left Roof Rail Air Bag Low Control	B0016 02, B0016 0E	B0016 0D	B0016 04, B0016 0D	B0016 01	-
Right Roof Rail Air Bag High Control	B0023 02, B0023 0E	B0023 0D	B0023 04, B0023 0D	B0023 01	-
Right Roof Rail Air Bag Low Control	B0023 02, B0023 0E	B0023 0D	B0023 04, B0023 0D	B0023 01	-

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 air bag or pretensioner. There are 2 shorting bars which will short together control circuits, when the connector is disconnected. This will help to prevent unwanted deployment of the air bag or pretensioner during servicing.

Conditions for Running the DTC

Ignition voltage is between 9-16 V.

Conditions for Setting the DTC

B0016 01, B0023 01

The air bag control circuit is shorted to voltage for 2 seconds.

B0016 02, B0023 02

The air bag control circuit is shorted to ground for 2 seconds.

B0016 04, B0023 04

The air bag control circuit is open for 2 seconds.

B0016 0D, B0023 0D

The air bag deployment loop resistance is greater than 4.2 ohms for 2 seconds.

B0016 0E, B0023 0E

The air bag deployment loop resistance is less than 1.4 ohms for 2 seconds.

Action Taken When the DTC Sets

- The inflatable restraint sensing and diagnostic module requests the instrument cluster to illuminate the AIR BAG indicator.
- The inflatable restraint sensing and diagnostic module will store a DTC, however if an event occurs the system will still attempt deployments.

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.

Diagnostic Aid

NOTE: The following diagnostic aids apply for both current and history DTCs.

An incorrectly installed connector position assurance (CPA) or incorrectly seated connector can cause a shorting bar to short both control circuits together. Check the connectors and CPAs if a DTC with symptom byte 02 or 0E is set, to ensure the shorting bars are not causing the circuits to be shorted together. Shorting bars are used in the locations listed below:

- Left and right roof rail air bags
- Inline harness connectors
- Harness side of the inflatable restraint sensing and diagnostic module connector

Terminal fretting or incorrectly seated connectors can cause an open/high resistance condition. Check the circuit terminals for fretting or incorrectly seated connector if a DTC with symptom byte 04 or 0D is set. DTCs of deployment loops which are in the seat DTC can occur because of stress or damage to the harness due to seat movement. Move the seat to the full extent of travel while using the scan tool to observe deployment type loop parameters.

Reference Information

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- Wiring Repairs
- Connector Repairs

Scan Tool Reference

Control Module References for scan tool information

Special Tools

EL-38125-580 Terminal Release Tool Kit

Circuit/System Verification

NOTE:

- Refer to SIR Service Precautions.
- Inspect all terminals for damage or corrosion when disconnecting connectors. Damage or corrosion in the following requires repair or replacement of the affected component/connector.
 - Roof rail air bag
 - Roof rail air bag wiring harness connector
 - Inflatable restraint sensing and diagnostic module
 - Inflatable restraint sensing and diagnostic module wiring harness connector
- The connector and connector position assurance (CPA) may seat independent of each other. Both the connector and CPA should seat with an audible and/or tactile click. The CPA isolates the shorting-bars within the connector allowing the deployment circuit to operate properly.
- If the condition is intermittent or cannot be duplicated, disconnect the connectors and add dielectric grease / lubricant (Nyogel 760G or equivalent, meeting GM specification 9986087). This procedure will correct the high resistance condition due to terminal fretting corrosion.

1. Verify the appropriate scan tool Deployment Loop Resistance parameter stays consistently between 2.1 and 4.0 ohms without any spikes or dropouts while moving the harness near each connector listed below:
 - F105L Roof Rail Air Bag - Left
 - F105R Roof Rail Air Bag - Right
 - Any inline harness connector
 - K36 inflatable restraint sensing and diagnostic module
 - **If less than 2.1 or greater than 4.0 ohms**

Refer to Circuit/System Testing below.

- **If there are spikes or dropouts, perform the following**
 - Inspect each connector terminal and harness for damage or corrosion and repair as necessary
 - Ensure each connector and CPA is correctly seated.
- **If within 2.1 and 4.0 ohms without any spikes or dropouts**

2. All OK

Circuit/System Testing

1. Ignition OFF. Scan tool disconnected. Disconnect the harness connector at the appropriate F105 Roof Rail Air Bag. It may take up to 2 min for all vehicle systems to power down.
2. Test for greater than 25 ohms between the control circuit terminals 1 and 2.
 - **If 25 ohms or less**
 1. Disconnect the X2 harness connector at the K36 inflatable restraint sensing and diagnostic module.

NOTE: Some connectors may be equipped with shorting bars as a safety component to prevent accidental inflator deployment. When testing on a connector with shorting bars, the shorting bars must be disabled to ensure accurate test results. Insert an appropriate pick from EL-38125-580 and depress the shorting bars above the appropriate terminals. This will lift the shorting bar from the terminal and allow accurate test results. Take care not to damage the connector, shorting bar, or terminal when depressing the shorting bar.

2. Test for infinite resistance between the two control circuits.
 - If less than infinite resistance, repair the short between the two circuits.
 - If infinite resistance, replace the K36 inflatable restraint sensing and diagnostic module.
 - **If greater than 25 ohms**
3. Ignition ON.
4. Test for less than 11 V between the control circuit terminals listed below and ground:
 - Control circuit terminal 1
 - Control circuit terminal 2
 - **If 11 V or greater**
 1. Ignition OFF. Disconnect the X2 harness connector at the K36 inflatable restraint sensing and diagnostic module. Ignition ON.
 2. Test for less than 1 V between the control circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K36 inflatable restraint sensing and diagnostic module.
 - **If less than 11 V**
5. Ignition OFF.
6. Test for greater than 25 ohms between the control circuit terminals listed below and ground:

- Control circuit terminal 1
- Control circuit terminal 2
- **If 25 ohms or less**
 1. Disconnect the X2 harness connector at the K36 inflatable restraint sensing and diagnostic module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K36 inflatable restraint sensing and diagnostic module.
- **If greater than 25 ohms**
- 7. Ignition OFF. Install a 3 A fused jumper wire between the control circuit terminals 1 and 2. Ignition ON.
- 8. Verify the scan tool Deployment Loop Resistance parameter is less than 2 ohms.
 - **If 2 ohms or greater**
 1. Ignition OFF. Disconnect the X2 harness connector at the K36 inflatable restraint sensing and diagnostic module.
 2. Test for less than 2 ohms in each control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K36 inflatable restraint sensing and diagnostic module.
 - **If less than 2 ohms**
- 9. Ignition OFF, connect the harness connector at the F105 Roof Rail Air Bag, press in the CPA (if equipped) until an audible and/or tactile click is heard.
- 10. Ignition ON, clear DTCs. Operate the vehicle within the Conditions for Running the DTC.
- 11. Verify DTC B0016 or B0023 is not set.
 - **If DTC B0016 or B0023 is set**

Test or replace the F105 Roof Rail Air Bag.
 - **If DTC B0016 or B0023 is not set**
- 12. All OK.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Airbag Roof Side Rail Module Replacement**
- **SIR/SRS Wiring Repairs**
- **Control Module References** for inflatable restraint sensing and diagnostic module replacement, programming and setup

DTC B0017 OR B0024

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 B0017 01

Driver Knee Air Bag Deployment Loop Short to Battery

DTC B0017 02

Driver Knee Air Bag Deployment Loop Short to Ground

DTC B0017 04

Driver Knee Air Bag Deployment Loop Open

DTC B0017 0D

Driver Knee Air Bag Deployment Loop High Resistance

DTC B0017 0E

Driver Knee Air Bag Deployment Loop Low Resistance

DTC B0024 01

Passenger Knee Air Bag Deployment Loop Short to Battery

DTC B0024 02

Passenger Knee Air Bag Deployment Loop Short to Battery

DTC B0024 04

Passenger Knee Air Bag Deployment Loop Open

DTC B0024 0D

Passenger Knee Air Bag Deployment Loop High Resistance

DTC B0024 0E

Passenger Knee Air Bag Deployment Loop Low Resistance

Diagnostic Fault Information

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Driver Knee Air Bag High Control	B0017 02, B0017 0E	B0017 0D	B0017 04, B0017 0D	B0017 01	-
Driver Knee Air Bag Low Control	B0017 02, B0017 0E	B0017 0D	B0017 04, B0017 0D	B0017 01	-
Passenger Knee Air Bag High Control	B0024 02, B0024 0E	B0024 0D	B0024 04, B0024 0D	B0024 01	-
Passenger Knee Air Bag Low Control	B0024 02, B0024 0E	B0024 0D	B0024 04, B0024 0D	B0024 01	-

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 air bag. There are 2 shorting bars used within the connector that will short together the control circuits, when the connector is disconnected. This will help to prevent unwanted deployment of the air bag or retractor pretensioner during servicing.

Conditions for Running the DTC

Ignition voltage is between 9-16 V.

Conditions for Setting the DTC

B0017 01, B0024 01

The air bag control circuit is shorted to voltage for 2 seconds.

B0017 02, B0024 02

The air bag control circuit is shorted to ground for 2 seconds.

B0017 04, B0024 04

The air bag control circuit is open for 2 seconds.

B0017 0D, B0024 0D

The air bag deployment loop resistance is greater than 4.2 ohms for 2 seconds.

B0017 0E, B0024 0E

The air bag deployment loop resistance is less than 1.4 ohms for 2 seconds.

Action Taken When the DTC Sets

- The inflatable restraint sensing and diagnostic module requests the instrument cluster to illuminate the

AIR BAG indicator.

- The inflatable restraint sensing and diagnostic module will store a DTC, however if an event occurs the system will still attempt deployments.

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.

Diagnostic Aid

NOTE: **The following diagnostic aids apply for both current and history DTCs.**

An incorrectly installed connector position assurance (CPA) or incorrectly seated connector can cause a shorting bar to short both control circuits together. Check the connectors and CPAs if a DTC with symptom byte 02 or 0E is set, to ensure the shorting bars are not causing the circuits to be shorted together. Shorting bars are used in the locations listed below:

- Driver and passenger knee air bags
- Inline harness connectors
- Harness side of the inflatable restraint sensing and diagnostic module connector

Terminal fretting or incorrectly seated connector can cause an open/high resistance condition. Check the circuit terminals for fretting or incorrectly seated connector if a DTC with symptom byte 04 or 0D is set. Deployment loop DTCs of air bags in the seats can set because of stress or damage to the harness due to seat movement. Move the seat to the full extent of travel while using the scan tool to observe deployment loop resistance parameters.

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

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Description and Operation

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Electrical Information Reference

- **Circuit Testing**
- **Testing for Intermittent Conditions and Poor Connections**

- Wiring Repairs
- Connector Repairs

Scan Tool Reference

Control Module References for scan tool information

Special Tools

EL-38125-580 Terminal Release Tool Kit

Circuit/System Verification

NOTE:

- Refer to SIR Service Precautions.
- Inspect all terminals for damage or corrosion when disconnecting connectors. Damage or corrosion in the following requires repair or replacement of the affected component/connector.
 - Knee air bag
 - Inflatable restraint sensing and diagnostic module
 - All wiring harness connectors
 - Inflatable restraint sensing and diagnostic module wiring harness connector
- The connector and connector position assurance (CPA) may seat independent of each other. Both the connector and CPA should seat with an audible and/or tactile click. The CPA isolates the shorting-bars within the connector allowing the deployment circuit to operate properly.
- If the condition is intermittent or cannot be duplicated, disconnect the connectors and add dielectric grease/lubricant (Nyogel 760G or equivalent, meeting GM specification 9986087). This procedure will correct the high resistance condition due to terminal fretting corrosion.

1. Verify the scan tool Deployment Loop Resistance parameters stay consistently between 2.1 and 4.0 ohms without any spikes or dropouts while moving the harness near each connector listed below:

- F114D Knee Air Bag - Driver
- F114P Knee Air Bag - Passenger
- Any inline harness connector
- K36 Inflatable Restraint Sensing and Diagnostic Module
- If less than 2.1 or greater than 4.0 ohms

Refer to Circuit/System Testing below.

- If there are spikes or dropouts, perform the following:
 - Inspect each connector terminal and harness for damage or corrosion and repair as necessary.

- Apply dielectric grease/lubricant (Nyogel 760G or equivalent, meeting GM specification 9986087) to each connector terminal
- Ensure each connector and CPA is correctly seated
 - **If within 2.1 and 4.0 ohms without any spikes or dropouts**

2. All OK

Circuit/System Testing

1. Ignition OFF, disconnect the scan tool and disconnect the harness connector at the appropriate F114 Knee Air Bag.
2. At the harness connector, test for greater than 25 ohms between the control circuit terminals 1 and 2.

- **If 25 ohms or less**

1. Disconnect the X1 harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module.

NOTE: Some connectors may be equipped with shorting bars as a safety component to prevent accidental inflator deployment. When testing on a connector with shorting bars, the shorting bars must be disabled to ensure accurate test results. Insert an appropriate pick from EL-38125-580 and depress the shorting bars above the appropriate terminals. This will lift the shorting bar from the terminal and allow accurate test results. Take care not to damage the connector, shorting bar, or terminal when depressing the shorting bar.

2. Test for infinite resistance between the 2 control circuits.
 - If less than infinite resistance, repair the short between the 2 circuits.
 - If infinite resistance, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.

- **If greater than 25 ohms**

3. Ignition ON.
4. Test for less than 11 V between the control circuit terminals listed below and ground:

- Control circuit terminal 1
- Control circuit terminal 2

- **If 11 V or greater**

1. Ignition OFF, disconnect the X1 harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module, ignition ON.
2. Test for less than 1 V between the control circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.

- **If less than 11 V**

5. Ignition OFF.
6. Test for greater than 25 ohms between the control circuit terminals listed below and ground:

- Control circuit terminal 1
- Control circuit terminal 2
- **If 25 ohms or less**
- 1. Disconnect the X1 harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module.
- 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.
- **If greater than 25 ohms**
- 7. Install a 3 A fused jumper wire between the control circuit terminals 1 and 2, ignition ON.
- 8. Verify the scan tool Deployment Loop Resistance parameter is less than 2 ohms.
 - **If 2 ohms or greater**
 - 1. Ignition OFF, disconnect the X1 harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module.
 - 2. Test for less than 2 ohms in each control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.
 - **If less than 2 ohms**
 - 9. Ignition OFF, disconnect the 3 A fused jumper wire. Connect the harness connector at the F114 Knee Air Bag, press in the CPA (if equipped) until an audible and/or tactile click is heard.
 - 10. Ignition ON, clear DTCs. Operate the vehicle within the Conditions for Running the DTC.
 - 11. Verify DTC B0017 or B0024 is not set.
 - **If DTC B0017 or B0024 is set**
 - Test or replace the appropriate F114 Knee Air Bag.
 - **If DTC B0017 or B0024 is not set**
- 12. All OK.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Instrument Panel Lower Airbag Replacement (Driver Side), Instrument Panel Lower Airbag Replacement (Passenger Side)**
- **Control Module References** for K36 Inflatable Restraint Sensing and Diagnostic Module replacement, programming, and setup

DTC B0019 OR B0020

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 B0019

Passenger Instrument Panel Air Bag Deployment Loop Stage 1

DTC B0020

Passenger Instrument Panel Air Bag Deployment Loop Stage 2

For symptom byte information refer to **Symptom Byte List** .

Diagnostic Fault Information

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Passenger Instrument Panel Air Bag Stage 1 High Control	B0019 02, B0019 0E	B0019 0D	B0019 04, B0019 0D	B0019 01	-
Passenger Instrument Panel Air Bag Stage 1 Low Control	B0019 02, B0019 0E	B0019 0D	B0019 04, B0019 0D	B0019 01	-
Passenger Instrument Panel Air Bag Stage 2 High Control	B0020 02, B0020 0E	B0020 0D	B0020 04, B0020 0D	B0020 01	-
Passenger Instrument Panel Air Bag Stage 2 Low Control	B0020 02, B0020 0E	B0020 0D	B0020 04, B0020 0D	B0020 01	-

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 air bag or pretensioner. There are 2 shorting bars which will short the control circuits together when the connector is disconnected. This will help to prevent unwanted deployment of the air bag or pretensioner during servicing.

Conditions for Running the DTC

Ignition voltage is between 9-16 V.

Conditions for Setting the DTC

B0019 01, B0020 01

The air bag control circuit is shorted to voltage for 2 seconds.

B0019 02, B0020 02

The air bag control circuit is shorted to ground for 2 seconds.

B0019 04, B0020 04

The air bag control circuit is open for 2 seconds.

B0019 0D, B0020 0D

The air bag deployment loop resistance is greater than 4.2 ohms for 2 seconds.

B0019 0E, B0020 0E

The air bag deployment loop resistance is less than 1.4 ohms for 2 seconds.

Action Taken When the DTC Sets

- The inflatable restraint sensing and diagnostic module requests the instrument cluster to illuminate the AIR BAG indicator.
- The inflatable restraint sensing and diagnostic module will store a DTC, however if an event occurs the system will still attempt deployments.

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.

Diagnostic Aid

NOTE: The following diagnostic aids apply for both current and history DTCs.

An incorrectly installed connector position assurance (CPA) or incorrectly seated connector can cause a shorting bar to short both control circuits together. Check the connectors and CPAs if a DTC with symptom byte 02 or 0E is set, to ensure the shorting bars are not causing the circuits to be shorted together. Shorting bars are used in the locations listed below:

- Passenger instrument panel air bag
- Inline harness connectors
- Harness side of the inflatable restraint sensing and diagnostic module connector

Terminal fretting or incorrectly seated connectors can cause an open/high resistance condition. Check the circuit

terminals for fretting or incorrectly seated connector if a DTC with symptom byte 04 or 0D is set.

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

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Scan Tool Reference

Control Module References for scan tool information

Special Tools

EL-38125-580 Terminal Release Tool Kit

Circuit/System Verification

NOTE:

- **Refer to SIR Service Precautions.**
- **Inspect all terminals for damage or corrosion when disconnecting connectors. Damage or corrosion in the following requires repair or replacement of the affected component/connector.**
 - **Passenger instrument panel air bag**
 - **inflatable restraint sensing and diagnostic module**
 - **Passenger instrument panel air bag wiring harness connector**
 - **inflatable restraint sensing and diagnostic module wiring harness connector**
- **The connector and connector position assurance (CPA) may seat independent of each other. Both the connector and CPA should seat with**

an audible and/or tactile click. The CPA isolates the shorting-bars within the connector allowing the deployment circuit to operate properly.

- If the condition is intermittent or cannot be duplicated, disconnect the connectors and add dielectric grease / lubricant (Nyogel 760G or equivalent, meeting GM specification 9986087). This procedure will correct the high resistance condition due to terminal fretting corrosion.

1. Verify the scan tool Deployment Loop Resistance parameters stay consistently between 2.1-4.0 ohms without any spikes or dropouts while moving the harness near each connector listed below:

- F101 Passenger Instrument Panel Air Bag
- Any inline harness connector
- K36 inflatable restraint sensing and diagnostic module
- If less than 2.1 ohms or greater than 4.0 ohms

Refer to Circuit/System Testing below.

- If there are spikes or dropouts, perform the following
- Inspect each connector terminal and harness for damage or corrosion and repair as necessary
- Apply dielectric grease / lubricant (Nyogel 760G or equivalent, meeting GM specification 9986087) to each connector terminal
- Insure each connector and CPA is correctly seated.
- If between 2.1-4.0 ohms without any spikes or dropouts

2. All OK.

Circuit/System Testing

1. Ignition OFF, scan tool disconnected, disconnect the X205 inline harness connector for the F101 Passenger Instrument Panel Air Bag. It may take up to 2 min for all vehicle systems to power down.
2. Test for greater than 25 ohms between the appropriate control circuit terminals listed below on the K36 inflatable restraint sensing and diagnostic module side of the connector:
 - F101 Passenger Instrument Panel Air Bag stage 1 X205 terminal 1 and 2
 - F101 Passenger Instrument Panel Air Bag stage 2 X205 terminal 4 and 5
 - If 25 ohms or less
1. Disconnect the X1 harness connector at the K36 inflatable restraint sensing and diagnostic module.

NOTE: Some connectors may be equipped with shorting bars as a safety component to prevent accidental deployment. When testing on a connector with shorting bars, the shorting bars must be disabled to ensure accurate test results. Insert an appropriate pick from EL-38125-580 and depress the shorting bars above the appropriate terminals. This will lift the shorting bar from the terminal and allow accurate test results. Take care not to damage the connector, shorting bar, or terminal when depressing the shorting bar.

2. Test for infinite resistance between the two control circuits.
 - If less than infinite resistance, repair the short between the two circuits.
 - If infinite resistance, replace the K36 inflatable restraint sensing and diagnostic module.
 - **If greater than 25 ohms**
3. Ignition ON.
4. Test for less than 11 V between each control circuit terminal listed below on the instrument panel harness side of the connector and ground:
 - X205 control circuit terminal 1
 - X205 control circuit terminal 2
 - X205 control circuit terminal 4
 - X205 control circuit terminal 5
 - **If 11 V or greater**
 1. Ignition OFF, disconnect the X1 harness connector at the K36 inflatable restraint sensing and diagnostic module, ignition ON.
 2. Test for less than 1 V between each control circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K36 inflatable restraint sensing and diagnostic module.
 - **If less than 11 V**
5. Ignition OFF.
6. Test for greater than 25 ohms between each control circuit terminal listed below on the instrument panel harness side of the connector and ground:
 - X205 control circuit terminal 1
 - X205 control circuit terminal 2
 - X205 control circuit terminal 4
 - X205 control circuit terminal 5
 - **If 25 ohms or less**
 1. Disconnect the X1 harness connector at the K36 inflatable restraint sensing and diagnostic module.
 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K36 inflatable restraint sensing and diagnostic module.
 - **If greater than 25 ohms**
7. Install a 3 A fused jumper wire between the control circuit terminals listed below on the instrument panel harness side of the connector:
 - F101 Passenger Instrument Panel Air Bag stage 1 X205 terminal 1 and 2
 - F101 Passenger Instrument Panel Air Bag stage 2 X205 terminal 4 and 5
8. Ignition ON.
9. Verify the scan tool Deployment Loop Resistance parameter is less than 2 ohms.
 - **If 2 ohms or greater**

1. Ignition OFF, disconnect the X1 harness connector at the K36 inflatable restraint sensing and diagnostic module.
2. Test for less than 2 ohms in each control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.
 - **If less than 2 ohms**
10. Ignition OFF, connect the X205 inline harness connector and disconnect the appropriate X1 (DTC B0019) or X2 (DTC B0020) harness connector at the F101 Passenger instrument panel air bag, ignition ON.
11. Test for less than 11 V between each control circuit terminals listed below and ground:
 - F101 Passenger Instrument Panel Air Bag control circuit terminal 1 X1
 - F101 Passenger Instrument Panel Air Bag control circuit terminal 2 X1
 - F101 Passenger Instrument Panel Air Bag control circuit terminal 1 X2
 - F101 Passenger Instrument Panel Air Bag control circuit terminal 2 X2
 - **If 11 V or greater**

Repair the short to voltage on the circuit.

 - **If less than 11 V**
12. Ignition OFF.
13. Test for greater than 25 ohms between each control circuit terminals listed below and ground:
 - F101 Passenger Instrument Panel Air Bag control circuit terminal 1 X1
 - F101 Passenger Instrument Panel Air Bag control circuit terminal 2 X1
 - F101 Passenger Instrument Panel Air Bag control circuit terminal 1 X2
 - F101 Passenger Instrument Panel Air Bag control circuit terminal 2 X2
 - **If 25 ohms or less**

Repair the short to ground on the circuit.

 - **If greater than 25 ohms**
14. Install a 3 A fused jumper wire between the control circuit terminals listed below:
 - F101 Passenger Instrument Panel Air Bag stage 1 control circuit terminal 1 X1 and 2 X1
 - F101 Passenger Instrument Panel Air Bag stage 2 control circuit terminal 1 X2 and 2 X2
15. Ignition ON.
16. Verify the scan tool Deployment Loop Resistance parameter is less than 2 ohms.
 - **If 2 ohms or greater**
 1. Ignition OFF, disconnect the X1 harness connector at the K36 inflatable restraint sensing and diagnostic module.
 2. Test for less than 2 ohms in each control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit between the F101 Passenger

Instrument Panel Air Bag connector and the X205 inline harness connector.

- If less than 2 ohms, replace the K36 inflatable restraint sensing and diagnostic module.

- **If less than 2 ohms**

17. Ignition OFF, connect the harness connector at the F101 Passenger Instrument Panel Air Bag, press in the CPA (if equipped) until an audible and/or tactile click is heard.
18. Ignition ON, clear DTCs. Operate the vehicle within the Conditions for Running the DTC.
19. Verify DTC B0019 or B0020 is not set.
 - **If DTC B0019 or B0020 is set**

Test or replace the F101 Passenger Instrument Panel Air Bag.

- **If DTC B0019 or B0020 is not set**

20. All OK.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Instrument Panel Airbag Replacement**
- **SIR/SRS Wiring Repairs**
- **Control Module References** for inflatable restraint sensing and diagnostic module control module replacement, programming and setup

DTC B0052

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using the 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 B0052 00

Deployment Commanded

DTC B0052 56

Deployment Commanded Too Many Transitions

Circuit/System Description

The inflatable restraint sensing and diagnostic module (SDM) senses vehicle impacts and provides deployment signals to the air bags and anchor and/or retractor pretensioners when warranted. The inflatable restraint sensing

and diagnostic module sets DTC B0052 after each command for deployment. DTC B0052 will latch and not clear after 3 commanded deployments by the inflatable restraint sensing and diagnostic module. Therefore the inflatable restraint sensing and diagnostic module has to be replaced.

Conditions for Running the DTC

Ignition voltage is between 9-16 V.

Conditions for Setting the DTC

- The inflatable restraint sensing and diagnostic module detects a frontal impact of sufficient force to warrant deployment of the frontal air bags.
- The inflatable restraint sensing and diagnostic module detects a side impact or rollover (if equipped) of sufficient force to warrant deployment of a seat air bag and/or roof rail air bag.

Action Taken When the DTC Sets

The inflatable restraint sensing and diagnostic module requests the instrument cluster to illuminate the AIR BAG indicator.

Conditions for Clearing the DTC

- DTC B0052 00 is a DTC that may be cleared with a scan tool without replacing the inflatable restraint sensing and diagnostic module. This DTC will not clear if deployment has been commanded more than two times, and the inflatable restraint sensing and diagnostic module would have to be replaced.
- DTC B0052 56 is a latched DTC. The DTC cannot be cleared with the scan tool. Replacement of the inflatable restraint sensing and diagnostic module is required.

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

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Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Verify that DTC B0052 00 is not set.

- **If DTC B0052 00 is set**

Clear the DTC. If the DTC will not clear, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.

- **If DTC B0052 00 is not set**

2. Verify that DTC B0052 56 is not set.

- **If DTC B0052 56 is set**

Replace the K36 Inflatable Restraint Sensing and Diagnostic Module.

- **If DTC B0052 56 is not set**

3. All OK.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

Control Module References for inflatable restraint sensing and diagnostic module replacement, programming and setup

DTC B0074

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 B0074 00

Passenger Presence Sensor Circuit Malfunction

DTC B0074 0D

Passenger Presence Sensor Resistance Above Threshold

DTC B0074 0E

Passenger Presence Sensor Resistance Below Threshold

DTC B0074 0F

Passenger Presence Sensor Erratic (Wet Seat)

Circuit/System Description

The passenger presence module monitors the sensor status continually. Whenever the sensor mat has an internal malfunction, the passenger presence module will set DTC B0074.

Conditions for Running the DTC

Ignition voltage is between 9-16 V.

Conditions for Setting the DTC

B0074 00

The passenger presence module has detected a disconnection from the sensor mat.

B0074 0D

The passenger presence module has detected a resistance above threshold.

B0074 0E

The passenger presence module has detected a resistance below threshold.

B0074 0F

The passenger presence module has detected a wet seat fault.

Action Taken When the DTC Sets

The inflatable restraint sensing and diagnostic module requests the instrument panel cluster to illuminate the AIR BAG indicator.

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.

Diagnostic Aids

- If either the inflatable restraint sensing and diagnostic module or Passenger Presence Module were replaced verify that the correct part numbers were used for the vehicle application.
- If this DTC is set as either current or history it may have been caused by an electronic device. If an electronic device (Computers, MP3 Players, Cell Phones, Diagnostic Scan Tool, Power Inverter, etc.) was placed on the passenger seat the passenger presence module may command the passenger air bag indicator to turn on and/or command the passenger seat belt indicator to turn on. Make sure there are no objects on the passenger seat and clear the DTCs. If this DTC resets then perform this diagnostic. If the DTC does not reset there is no further work needed on the passenger presence system.
- If this DTC is set as either current or history it may have been caused by an aftermarket seat heater. The aftermarket seat heater may command the passenger air bag indicator to turn on and/or command the passenger seat belt indicator to turn on. Remove the aftermarket seat heater from the passenger seat and clear the DTCs. If this DTC resets then perform this diagnostic. If the DTC does not reset there is no further work needed on the passenger presence system.

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

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Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

NOTE: This system is serviced as a kit (seat foam, module and/or sensing mat). Perform a Passenger Presence System Preload whenever a component is replaced, refer to Passenger Presence System Programming and Setup . Inspect component connectors for damage or corrosion. Repair or replace the affected component/connector:

- Passenger Presence Module
- Passenger Presence Module harness connector
- Seat wiring harness to vehicle harness connector

The connector and connector position assurance (CPA) may seat independent of each other. Both the connector and CPA should seat with an audible and/or tactile click.

1. Verify with the scan tool, the DTC remains Current while moving the passenger seat forward and backward through its full range of motion. The status should stay consistent.

- **The DTC changes to History**

If the status changes this could be indication of a seat to vehicle harness connection issue, refer to Circuit/System Testing below.

- **The DTC remains Current**

2. Verify with the scan tool, if the fault changes status while moving the harness near each connector listed below. The status should stay consistent.

- K85 Passenger Presence Module
- B60 Passenger Presence Sensor
- Any seat harness inline

- **The status changes**

If the reading is erratic while moving the harness, perform the following:

- Inspect each connector terminal for damage or corrosion and repair as necessary.
- Ensure each connector and CPA is correctly seated.

- **The status does not change**

3. All OK.

Circuit/System Testing

NOTE: This system is serviced as a kit (seat foam, module and/or sensing mat). Perform a Passenger Presence System Preload whenever a component is replaced, refer to Passenger Presence System Programming and Setup . Inspect component connectors for damage or corrosion. Repair or replace the affected component/connector:

1. Confirm that all passenger presence system connectors are fully seated.
 2. Verify that DTC B0074 0F is not set.
- **DTC B0074 0F is set.**

Verify there are no electronic devices on the passenger seat. If not, then verify the seat is dry by

removing the trim from the seat bottom frame. If the seat is wet, allow 24-48 hours dry time with trim completely off. If the DTC is history, do not replace B60 Passenger Presence Sensor. Clear passenger presence module DTCs.

1. Verify there are no electronic devices on the passenger seat.
 - Empty the passenger seat
 - If the seat is empty
2. Verify the seat is dry by removing the trim from the seat bottom frame.
 - If the seat is wet, allow 24-48 hours dry time with trim completely off.
 - If the seat is dry
3. If the DTC is history, do not replace B60 Passenger Presence Sensor, and clear passenger presence module DTCs.
 - **DTC B0074 0F does not set.**
3. Verify DTC B0074 00, B0074 0D or B0074 0E is not set.
 - **DTC B0074 00, B0074 0D or B0074 0E is set.**

Replace the K85 Passenger Presence Module.

 - **DTC B0074 00, B0074 0D or B0074 0E do not set.**
4. All OK.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

Control Module References for passenger presence module replacement, programming and setup

DTC B0081 (INFLATABLE RESTRAINT SENSING AND DIAGNOSTIC MODULE)

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 B0081 00

Passenger Presence Module Malfunction

DTC B0081 3A

Passenger Presence Module Incorrect Component Installed

DTC B0081 71

Passenger Presence Module Invalid Data

Circuit/System Description

When the ignition is turned ON, the inflatable restraint sensing and diagnostic module and the passenger presence module perform tests to diagnose critical malfunctions. Upon a successful power-up mode the inflatable restraint sensing and diagnostic module will illuminate both PASSENGER AIRBAG ON/OFF indicators. If the inflatable restraint sensing and diagnostic module detects a fault in the passenger presence module, it may disable the Passenger Instrument Panel Air Bag deployment loop and/or illuminate the AIRBAG indicator.

Conditions for Running the DTC

Ignition voltage is between 9-16 V.

Conditions for Setting the DTC

B0081 00

The inflatable restraint sensing and diagnostic module has received a fault present message from the passenger presence module.

B0081 3A

The inflatable restraint sensing and diagnostic module has received a message from the passenger presence module indicating a vehicle and passenger presence module mismatch.

B0081 71

The inflatable restraint sensing and diagnostic module has received invalid data from the passenger presence module.

Action Taken When the DTC Sets

- The inflatable restraint sensing and diagnostic module requests the instrument cluster to illuminate the AIR BAG indicator.
- The passenger instrument panel air bag deployment loop will be disabled.

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.

Diagnostic Aids

If either the inflatable restraint sensing and diagnostic module or passenger presence module were replaced verify that the correct part numbers were used for the vehicle application.

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

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Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

NOTE: Both K36 inflatable restraint sensing and diagnostic module and K85 Passenger Presence Module set DTC B0081 but with different symptom bytes. Therefore it is important to identify which module has set the DTC B0081. Use the symptom bytes as a way of identify the correct module to diagnose.

1. Verify that DTC B1001 is not set in the K36 inflatable restraint sensing and diagnostic module.
 - If DTC B1001 is set in the K36 inflatable restraint sensing and diagnostic module

Refer to DTC B1001.

- If DTC B1001 is not set in the K36 inflatable restraint sensing and diagnostic module

2. Verify that DTC B0074, B0081, B101D, or B101E is not set in the K85 Passenger Presence Module.
 - If any of these DTCs are set in the K85 Passenger Presence Module

Refer to Diagnostic Trouble Code (DTC) List - Vehicle .

- If none of these DTCs are set in the K85 Passenger Presence Module

3. Verify that DTC B0081 symptom byte 3A or 71 is not set in the K36 inflatable restraint sensing and diagnostic module.

NOTE: The K36 inflatable restraint sensing and diagnostic module sets a DTC B0081 3A when an incorrect K85 Passenger Presence Module is installed.

- If DTC B0081 symptom byte 3A or 71 is set in the K36 inflatable restraint sensing and diagnostic module

Replace the K85 Passenger Presence Module.

- If DTC B0081 symptom byte 3A or 71 is not set in the K36 inflatable restraint sensing and diagnostic module

4. All OK.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair.

Control Module References for passenger presence module and inflatable restraint sensing and diagnostic module replacement, programming and setup

DTC B0081 (PASSENGER PRESENCE SYSTEM)

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 B0081 11

Passenger Presence Module High Input

DTC B0081 4B

Passenger Presence Module Calibration Not Learned

DTC B0081 5A

Passenger Presence Module Not Plausible

Circuit/System Description

When the ignition is turned ON, the inflatable restraint sensing and diagnostic module and the passenger presence module perform tests to diagnose critical malfunctions. Upon a successful power-up mode the inflatable restraint sensing and diagnostic module will illuminate both PASSENGER AIRBAG ON/OFF indicators. If the inflatable restraint sensing and diagnostic module detects a fault in the passenger presence module, it may disable the passenger instrument panel air bag deployment loop, set DTC B0081 and illuminate the air bag indicator.

Conditions for Running the DTC

Ignition voltage is between 9-16 V.

Conditions for Setting the DTC

Any of the following conditions must exist for 5 seconds.

B0081 11

The passenger presence module has failed the rezero procedure.

B0081 4B

The passenger presence module is not calibrated.

B0081 5A

The passenger presence module sets this code when the passenger presence module has lost communication with the inflatable restraint sensing and diagnostic module.

Action Taken When the DTC Sets

- The inflatable restraint sensing and diagnostic module requests the instrument cluster to illuminate the AIR BAG indicator.
- The passenger instrument panel air bag deployment loop will be disabled.

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.

Diagnostic Aids

- If either the inflatable restraint sensing and diagnostic module or passenger presence module were replaced verify that the correct part numbers were used for the vehicle application.
- If this DTC is set as either current or history it may have been caused by an electronic device. If an electronic device (Computers, MP3 Players, Cell Phones, Diagnostic Scan Tool, Power Inverter, etc.) was placed on the passenger seat the passenger presence module may command the passenger air bag indicator to turn on and/or command the passenger seat belt indicator to turn on. Make sure there are no

objects on the passenger seat and clear the DTCs. If this DTC resets then perform this diagnostic. If the DTC does not reset there is no further work needed on the passenger presence system.

- If this DTC is set as either current or history it may have been caused by an aftermarket seat heater. The aftermarket seat heater may command the passenger air bag indicator to turn on and/or command the passenger seat belt indicator to turn on. Remove the aftermarket seat heater from the passenger seat and clear the DTCs. If this DTC resets then perform this diagnostic. If the DTC does not reset there is no further work needed on the passenger presence system.

Reference Information

Description and Operation

Supplemental Inflatable Restraint System Description and Operation

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

NOTE:

- This system is serviced as a kit (seat foam, module and sensing mat). Perform a passenger presence system rezero procedure whenever a component is replaced. Refer to Passenger Presence System Programming and Setup.
- Both K36 inflatable restraint sensing and diagnostic module and K85 Passenger Presence Module set DTC B0081 but with different symptom bytes. Therefore it is important to identify which module has set the DTC B0081. Use the symptom bytes as a way of identify the correct module to diagnose.
- The K36 inflatable restraint sensing and diagnostic module sets a B0081 3A when an incorrect K85 Passenger Presence Module is installed.

1. Verify that the seat is free of any objects or an aftermarket seat heater.
 - **If objects and/or an aftermarket seat heater is present**
 1. Remove objects and/or aftermarket seat heater.
 2. Ignition ON, clear the DTC.
 3. Verify that DTC B0081 is not set
 - If the DTC B0081 is set, replace the B60 Passenger Presence Sensor
 - If the DTC B0081 is not set
 4. All OK.
 - **If the seat is empty and does not have an aftermarket seat heater**
2. Verify that DTC B0081 3A is not set in the K36 inflatable restraint sensing and diagnostic module.
 - **If DTC B0081 3A is set in the K36 inflatable restraint sensing and diagnostic module**

Replace the K85 Passenger Presence Module.

- If DTC B0081 3A is not set in the K36 inflatable restraint sensing and diagnostic module
- 3. Verify that DTC B0081 11 or DTC B0081 4B is not set in the K85 Passenger Presence Module.

NOTE: The K36 inflatable restraint sensing and diagnostic module sets a redundant B0081 00 DTC when the K85 Passenger Presence Module sets a DTC B0081 11 or B0081 4B.

- If DTC B0081 11 or DTC B0081 4B is set in the K85 Passenger Presence Module

Perform the passenger presence system rezero procedure. Refer to Passenger Presence System Programming and Setup.

- If neither of these DTCs are set in the K85 Passenger Presence Module
4. Verify DTC B0081 5A is not set in the K85 Passenger Presence Module.
- If DTC B0081 5A is set in the K85 Passenger Presence Module
1. Verify the connections at the K36 inflatable restraint sensing and diagnostic module and K85 Passenger Presence Module, for terminal corrosion, properly seated connectors, and the connector position assurance is installed.
 2. Clear the DTC.
 3. Verify DTC B0081 5A does not set in the K85 Passenger Presence Module.
 - If DTC B0081 5A sets, replace the K85 Passenger Presence Module.
 - If DTC B0081 5A does not set
 4. All OK.
 - If DTC B0081 5A is not set in the K85 Passenger Presence Module
5. All OK.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair.

Control Module References for passenger presence module or inflatable restraint sensing and diagnostic module replacement, programming and setup

DTC B0083-B0088

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 01

Left Front Impact Sensor Short to Battery

DTC B0083 02

Left Front Impact Sensor Short to Ground

DTC B0083 04

Left Front Impact Sensor Open

DTC B0083 39

Left Front Impact Sensor Internal Malfunction

DTC B0083 3A

Left Front Impact Sensor Incorrect Component Installed

DTC B0083 71

Left Front Impact Sensor Invalid Data

DTC B0084 01

Right Front Impact Sensor Short to Battery

DTC B0084 02

Right Front Impact Sensor Short to Ground

DTC B0084 04

Right Front Impact Sensor Open

DTC B0084 39

Right Front Impact Sensor Internal Malfunction

DTC B0084 3A

Right Front Impact Sensor Incorrect Component Installed

DTC B0084 71

Right Front Impact Sensor Invalid Data

DTC B0085 01

Left Front Side Impact Sensor Short to Battery

DTC B0085 02

Left Front Side Impact Sensor Short to Ground

DTC B0085 04

Left Front Side Impact Sensor Open

DTC B0085 39

Left Front Side Impact Sensor Internal Malfunction

DTC B0085 3A

Left Front Side Impact Sensor Incorrect Component Installed

DTC B0085 71

Left Front Side Impact Sensor Invalid Data

DTC B0086 01

Right Front Side Impact Sensor Short to Battery

DTC B0086 02

Right Front Side Impact Sensor Short to Ground

DTC B0086 04

Right Front side Impact Sensor Open

DTC B0086 39

Right Front Side Impact Sensor Internal Malfunction

DTC B0086 3A

Right Front Side Impact Sensor Incorrect Component Installed

DTC B0086 71

Right Front Side Impact Sensor Invalid Data

DTC B0087 01

Left Rear Side Impact Sensor Short to Battery

DTC B0087 02

Left Rear Side Impact Sensor Short to Ground

DTC B0087 04

Left Rear Side Impact Sensor Open

DTC B0087 39

Left Rear Side Impact Sensor Internal Malfunction

DTC B0087 3A

Left Rear Side Impact Sensor Incorrect Component Installed

DTC B0087 71

Left Rear Side Impact Sensor Invalid Data

DTC B0088 01

Right Rear Side Impact Sensor Short to Battery

DTC B0088 02

Right Rear Side Impact Sensor Short to Ground

DTC B0088 04

Right Rear Side Impact Sensor Open

DTC B0088 39

Right Rear Side Impact Sensor Internal Malfunction

DTC B0088 3A

Right Rear Side Impact Sensor Incorrect Component Installed

DTC B0088 71

Right Rear Side Impact Sensor Invalid Data

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Left Front Impact Sensor High Signal	B0083 02	B0083 04	B0083 01	B0083 3A
Left Front Impact Sensor Low Reference	B0083 02	B0083 04	B0083 01	B0083 3A
Right Front Impact Sensor High Signal	B0084 02	B0084 04	B0084 01	B0084 3A
Right Front Impact Sensor Low Reference	B0084 02	B0084 04	B0084 01	B0084 3A
Left Front Side Impact Sensor High Signal	B0085 02	B0085 04	B0085 01	B0085 39
Left Front Side Impact sensor Low Reference	B0085 02	B0085 04	B0085 01	B0085 39
Right Front Side Impact Sensor High Signal	B0086 02	B0086 04	B0086 01	B0086 39
Right Front Side Impact Sensor Low Reference	B0086 02	B0086 04	B0086 01	B0086 39
Left Rear Side Impact Sensor High Signal	B0087 02	B0087 04	B0087 01	B0087 39
Left Rear Side Impact Sensor Low Reference	B0087 02	B0087 04	B0087 01	B0087 39
Right Rear Side Impact Sensor High Signal	B0088 02	B0088 04	B0088 01	B0088 39
Right Rear Side Impact Sensor Low Reference	B0088 02	B0088 04	B0088 01	B0088 39

Circuit/System Description

The impact sensors are equipped on vehicles to supplement the Supplemental Inflatable Restraint (SIR) System performance. The impact sensors are electronic and are not part of the deployment loops, but instead provide inputs to the Inflatable Restraint Sensing and Diagnostic Module. The impact sensors can assist in determining the severity of some frontal and side collisions. The Inflatable Restraint Sensing and Diagnostic Module uses the input from the impact sensors to assist in determining the severity of a collision further supporting air bag deployment. If the Inflatable Restraint Sensing and Diagnostic Module determines a deployment is warranted, the Inflatable Restraint Sensing and Diagnostic Module will cause current to flow through the deployment loops deploying the air bags.

Conditions for Running the DTC

Ignition voltage is between 9-16 V.

Conditions for Setting the DTC

Any of the following conditions exist for 10 seconds:

B0083 01, B0084 01, B0085 01, B0086 01, B0087 01, B0088 01

The impact sensor has been shorted to voltage.

B0083 02, B0084 02, B0085 02, B0086 02, B0087 02, B0088 02

- The impact sensor has been shorted to ground.
- The impact sensor current is greater than 23 mA for greater than 5 milliseconds.

B0083 04, B0084 04, B0085 04, B0086 04, B0087 04, B0088 04

The impact sensor has an open or high resistance.

B0083 39, B0084 39, B0085 39, B0086 39, B0087 39, B0088 39

- The Inflatable Restraint Sensing and Diagnostic Module has received a Not OK message from the impact sensor.
- The Inflatable Restraint Sensing and Diagnostic Module has not received a message.

B0083 3A, B0084 3A, B0085 3A, B0086 3A, B0087 3A, B0088 3A

- The Inflatable Restraint Sensing and Diagnostic Module has received identification message from the impact sensor, which does not match the identification stored in the Inflatable Restraint Sensing and Diagnostic Module memory.
- The Inflatable Restraint Sensing and Diagnostic Module has reset the impact sensor twice without detecting the correct identification message.

B0083 71, B0084 71, B0085 71, B0086 71, B0087 71, B0088 71

The Inflatable Restraint Sensing and Diagnostic Module has received invalid data from the sensor.

Action Taken When the DTC Sets

The Inflatable Restraint Sensing and Diagnostic Module requests the instrument panel cluster to illuminate the AIR BAG indicator.

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.
- An ignition cycle is required for the DTC to go from current to history.

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Supplemental Inflatable Restraint System Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

NOTE:

- **Refer to SIR Service Precautions.**
- **Inspect all terminals for damage or corrosion when disconnecting connectors. Damage or corrosion in the following requires repair or replacement of the affected component/connector.**
 - **Impact Sensor**
 - **Inflatable Restraint Sensing and Diagnostic Module**
 - **Impact sensor wiring harness connector**
 - **Inflatable Restraint Sensing and Diagnostic Module wiring harness connector**
- **The connector and connector position assurance (CPA) may seat independent of each other. Both the connector and CPA should seat with an audible and/or tactile click. The CPA isolates the shorting-bars within the connector allowing the deployment circuit to operate properly. Replace any CPA that is damaged or missing.**
- **If the condition is intermittent or cannot be duplicated, disconnect the connectors and add dielectric grease / lubricant (Nyogel 760G or equivalent, meeting GM specification 9986087). This procedure will correct the high resistance condition due to terminal fretting corrosion.**

1. Verify that DTC B0083-B0088 symptom byte 3A, 39, or 71 is not set as current.

- **If DTC B0083-B0088 symptom byte 3A, 39 or 71 is set as current**

Replace the appropriate B59 or B63 impact sensor.

- **If DTC B0083-B0088 symptom byte 3A, 39 or 71 is not set as current**

2. Verify that DTC B0083-B0088 symptom byte 01, 02, or 04 is not set as current.

- **If DTC B0083-B0088 symptom byte 01, 02, or 04 is set as current**

Refer to Circuit/System Testing below.

- **If DTC B0083-B0088 symptom byte 01, 02, or 04 is not set as current**

3. All OK.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the appropriate B59 or B63 Impact Sensor.

2. Test for less than 10 ohms between the low reference circuit terminal 2 and ground.

- **If 10 ohms or greater**

1. Ignition OFF, disconnect the harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module.

2. Test for less than 2 ohms in the low reference circuit end to end.

- If 2 ohms or greater, repair the open/high resistance in the circuit.

- If less than 2 ohms, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.

- **If less than 10 ohms**

3. Test for greater than 50k ohms between the signal circuit terminal 1 and ground.

- **If 50k ohms or less**

1. Disconnect the harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module.

2. Test for infinite resistance between the signal circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.

- If infinite resistance, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.

- **If greater than 50k ohms**

4. Ignition ON.

5. Test for less than 1 V between the signal circuit terminal 1 and ground.

- **If 1 V or greater**

1. Ignition OFF, disconnect the harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module, ignition ON.

2. Test for less than 1 V between the signal circuit and ground.

- If greater than 1 V, repair the short to voltage on the circuit.

- If less than 1 V, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.

○ **If less than 1 V**

6. Ignition OFF, disconnect the harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module.
7. Test for less than 2 ohms between each harness connector terminal listed below end to end:
 - B59L Front Impact Sensor - Left - terminal 1 and K36 Inflatable Restraint Sensing and Diagnostic Module 23 X2
 - B59R Front Impact Sensor - Right - terminal 1 and K36 Inflatable Restraint Sensing and Diagnostic Module 26 X2
 - B63LF Side Impact Sensor - Left Front - terminal 1 and K36 Inflatable Restraint Sensing and Diagnostic Module 19 X2
 - B63RF Side Impact Sensor - Right Front - terminal 1 and K36 Inflatable Restraint Sensing and Diagnostic Module 22 X2
 - B63LR Side Impact Sensor - Left Rear - terminal 1 and K36 Inflatable Restraint Sensing and Diagnostic Module 27 X2
 - B63RR Side Impact Sensor - Right Rear - terminal 1 and K36 Inflatable Restraint Sensing and Diagnostic Module 30 X2

○ **If 2 ohms or greater**

Repair the open/high resistance in the circuit.

○ **If less than 2 ohms**

8. Ignition OFF, reconnect all harness connectors, press in the CPA (if equipped) until an audible and/or tactile click is heard.
9. Ignition ON, clear DTCs. Operate the vehicle within the Conditions for Running the DTC.
10. Verify the DTC B0083-B0088 does not set.

○ **If the DTC is set**

Replace the B59 or B63 Impact Sensor.

○ **If the DTC is not set**

11. All OK.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Front End Inflatable Restraint Discriminating Sensor Replacement** for B59 Front Impact Sensor replacement
- **Airbag Side Impact Sensor Replacement** for B63LF Side Impact Sensor - Left Front and B63RF Side Impact Sensor - Right Front replacement
- **Airbag Rear Side Door Side Impact Sensor Replacement** for B63LR Side Impact Sensor - Left Rear and B63RR Side Impact Sensor - Right Rear replacement
- **Control Module References** for Inflatable Restraint Sensing and Diagnostic Module replacement,

programming and setup

DTC B0092 OR B0093

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 B0092 01

Left Center Side Impact Sensor Short to Battery

DTC B0092 02

Left Center Side Impact Sensor Short to Ground

DTC B0092 04

Left Center Side Impact Sensor Open

DTC B0092 39

Left Center Side Impact Sensor Internal Malfunction

DTC B0092 3A

Left Center Side Impact Sensor Incorrect Component Installed

DTC B0092 71

Left Center Side Impact Sensor Invalid Data

DTC B0093 01

Right Center Side Impact Sensor Short to Battery

DTC B0093 02

Right Center Side Impact Sensor Short to Ground

DTC B0093 04

Right Center Side Impact Sensor Open

DTC B0093 39

Right Center Side Impact Sensor Internal Malfunction

DTC B0093 3A

Right Center Side Impact Sensor Incorrect Component Installed

DTC B0093 71

Right Center Side Impact Sensor Invalid Data

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Left Center Side Impact Sensor High Signal	B0092 02	B0092 04	B0092 01	B0092 3A
Left Center Side Impact Sensor Low Reference	B0092 02	B0092 04	B0092 01	B0092 3A
Right Center Side Impact Sensor High Signal	B0093 02	B0093 04	B0093 01	B0093 3A
Right Center Side Impact Sensor Low Reference	B0093 02	B0093 04	B0093 01	B0093 3A

Circuit/System Description

The impact sensors are equipped on vehicles to supplement the Supplemental Inflatable Restraint (SIR) System performance. The impact sensors are electronic and are not part of the deployment loops, but instead provide inputs to the inflatable restraint sensing and diagnostic module. The impact sensors can assist in determining the severity of some frontal and side collisions. The inflatable restraint sensing and diagnostic module uses the input from the impact sensors to assist in determining the severity of a collision further supporting air bag deployment. If the inflatable restraint sensing and diagnostic module determines a deployment is warranted, the inflatable restraint sensing and diagnostic module will cause current to flow through the deployment loops deploying the air bags.

Conditions for Running the DTC

Ignition voltage is between 9-16 V.

Conditions for Setting the DTC

Any of the following conditions exist for 10 seconds:

B0092 01, B0093 01

The impact sensor has been shorted to voltage.

B0092 02, B0093 02

- The impact sensor has been shorted to ground.
- The impact sensor current is greater than 23 mA for greater than 5 milliseconds.

B0092 04, B0093 04

The impact sensor has an open or high resistance.

B0092 39, B0093 39

- The inflatable restraint sensing and diagnostic module has received a Not OK message from the impact sensor.
- The inflatable restraint sensing and diagnostic module has not received a message.

B0092 3A, B0093 3A

- The inflatable restraint sensing and diagnostic module has received identification message from the impact sensor, which does not match the identification stored in the SDM memory.
- The inflatable restraint sensing and diagnostic module has reset the impact sensor twice without detecting the correct identification message.

B0092 71, B0093 71

The SDM has received invalid data from the sensor.

Action Taken When the DTC Sets

The SDM requests the instrument panel cluster to illuminate the AIR BAG indicator.

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.
- An ignition cycle is required for the DTC to go from current to history.

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Supplemental Inflatable Restraint System Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

NOTE:

- Refer to SIR Service Precautions.
- Inspect all terminals for damage or corrosion when disconnecting connectors. Damage or corrosion in the following requires repair or replacement of the affected component/connector.
 - Impact sensor
 - Inflatable restraint sensing and diagnostic module
 - Impact sensor wiring harness connector
 - Inflatable restraint sensing and diagnostic module wiring harness connector
- The connector and connector position assurance (CPA) may seat independent of each other. Both the connector and CPA should seat with an audible and/or tactile click. The CPA isolates the shorting-bars within the connector allowing the deployment circuit to operate properly. Replace any CPA that is damaged or missing.
- If the condition is intermittent or cannot be duplicated, disconnect the connectors and add dielectric grease / lubricant (Nyogel 760G or equivalent, meeting GM specification 9986087). This procedure will correct the high resistance condition due to terminal fretting corrosion.

1. Verify that DTC B0092 or B0093 symptom byte 3A, 39, or 71 is not set as current.
 - If DTC B0092 or B0093 symptom byte 3A, 39 or 71 is set as current

Replace the appropriate B63 Side Impact Sensor.

- If DTC B0092 or B0093 symptom byte 3A, 39 or 71 is not set as current
2. Verify that DTC B0092 or B0093 symptom byte 01, 02, or 04 is not set as current.

- **If DTC B0092 or B0093 symptom byte 01, 02, or 04 is set as current**

Refer to Circuit/System Testing below.

- **If DTC B0092 or B0093 symptom byte 01, 02, or 04 is not set as current**

3. All OK.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the appropriate B63 Side Impact Sensor. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 ohms between the low reference circuit terminal 2 and ground.
 - **If 10 ohms or greater**
 1. Ignition OFF, disconnect the harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module.
 2. Test for less than 2 ohms in the low reference circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.
 - **If less than 10 ohms**
3. Test for greater than 50k ohms between the signal circuit terminal 1 and ground.
 - **If 50k ohms or less**
 1. Disconnect the harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.
 - **If greater than 50k ohms**
4. Ignition ON.
5. Test for less than 1 V between the signal circuit terminal 1 and ground.
 - **If 1 V or greater**
 1. Ignition OFF, disconnect the harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module, ignition ON.
 2. Test for less than 1 V between the signal circuit and ground.
 - If greater than 1 V, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.
 - **If less than 1 V**
6. Ignition OFF, disconnect the harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module.
7. Test for less than 2 ohms between the signal circuit end to end from the impact sensor terminal 1 and the K36 Inflatable Restraint Sensing and Diagnostic Module terminal listed below:
 - Left Center Side Impact Sensor terminal 31 X2

- Right Center Side Impact Sensor terminal 52 X2
 - **If 2 ohms or greater**

Repair the open/high resistance in the circuit.

- **If less than 2 ohms**

8. Connect all harness connectors. Ignition ON, clear the DTC.

9. Verify the DTC does not set.

- **If the DTC sets**

Replace the B63 Side Impact Sensor.

- **If the DTC does not set**

10. All OK.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Airbag Side Impact Sensor Replacement**
- **Control Module References** for inflatable restraint sensing and diagnostic module replacement, programming and setup

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 00

Option Configuration

Circuit/System Description

The inflatable restraint sensing and diagnostic module (SDM) stores a primary data key, which is a 4-digit number. When the ignition is turned ON, the inflatable restraint sensing and diagnostic module compares this information to the information stored in the Body Control Module (BCM) via serial data. If there is a mismatch between the information stored in the inflatable restraint sensing and diagnostic module and Body Control Module, DTC B1001 will set.

Conditions for Running the DTC

System voltage is between 9-16 V.

Conditions for Setting the DTC

The 4-digit Primary Data Key stored in the inflatable restraint sensing and diagnostic module does not match the 4 digits stored in the Body Control Module.

Action Taken When the DTC Sets

- The inflatable restraint sensing and diagnostic module requests the instrument cluster to illuminate the AIR BAG indicator.
- The inflatable restraint sensing and diagnostic module disables all deployments.

Conditions for Clearing the DTC

The last 4-digit Primary Data Key in the inflatable restraint sensing and diagnostic module matches the last 4 digits stored in the Body Control Module.

Diagnostic Aids

- This DTC is an indication that an incorrect inflatable restraint sensing and diagnostic module is installed in the vehicle, or that the inflatable restraint sensing and diagnostic module and/or the Body Control Module was replaced without reprogramming the Body Control Module with the new information.
- If the inflatable restraint sensing and diagnostic module was previously programmed and DTC B1001 is now set, the setup portion of program was not completed. Proceed to the inflatable restraint sensing and diagnostic module Setup portion of the **Inflatable Restraint Sensing and Diagnostic Module Programming and Setup**

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Supplemental Inflatable Restraint System Description and Operation

Electrical Information Reference

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

- **Connector Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Verify the scan tool K36 Inflatable Restraint Sensing and Diagnostic Module Primary Key Status parameter is Valid.

- **If the K36 Inflatable Restraint Sensing and Diagnostic Module Primary Key Status parameter is Invalid**

Perform the K36 Inflatable Restraint Sensing and Diagnostic Module setup. Refer to **Inflatable Restraint Sensing and Diagnostic Module Programming and Setup** .

- **If the K36 Inflatable Restraint Sensing and Diagnostic Module Primary Key Status parameter is Valid**

2. All OK.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- **SIR/SRS Wiring Repairs**
- **Control Module References** for K36 Inflatable Restraint Sensing and Diagnostic Module replacement, programming and setup

DTC B1019

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 B1019 00

System Configuration Error

Circuit/System Description

The inflatable restraint sensing and diagnostic module monitors the number of safety components installed on the vehicle. When the ignition is turned ON, the inflatable restraint sensing and diagnostic module evaluates the

number of safety components installed and compares it to the number of components the inflatable restraint sensing and diagnostic module expects to see on the vehicle with its current calibration. If there is a mismatch between detected components and the components programmed with the inflatable restraint sensing and diagnostic module calibration, DTC B1019 will set. The components (if equipped) that the inflatable restraint sensing and diagnostic module will detect include inflatable restraint deployment loops, impact sensors, passenger presence system components, seat position sensors, disable switches, and seat belt switches.

Conditions for Running the DTC

Ignition voltage is between 9-16 V.

Conditions for Setting the DTC

The setup for the inflatable restraint sensing and diagnostic module has not been completed and the inflatable restraint sensing and diagnostic module does not detect the passenger presence system (if equipped), the correct number of sensors, or deployment loops, that is expected with this calibration.

Action Taken When the DTC Sets

- The inflatable restraint sensing and diagnostic module requests the instrument cluster to illuminate the AIR BAG warning indicator.
- The DTC must be cleared before running the setup inflatable restraint sensing and diagnostic module.
- Air bag indicator will continue to flash until inflatable restraint sensing and diagnostic module setup procedure is complete.

Conditions for Clearing the DTC

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

Diagnostic Aids

The inflatable restraint sensing and diagnostic module scan tool deployment loop, impact sensor, and passenger presence (if equipped) data will match what the inflatable restraint sensing and diagnostic module has been programmed to expect to see on the vehicle. B1019 DTC will set if a deployment loop or impact sensor is added or removed from the system, or if the passenger presence is not detected.

DTC B1019 will set when an open/high resistance DTC sets for a deployment loop or impact sensor. This causes mismatch between the learned and actual components connected to the inflatable restraint sensing and diagnostic module.

DTC B1019 can set with no other DTCs if an unused deployment loop or impact sensor circuit is shorted to ground. This causes a mismatch between the learned and actual components connected to the inflatable restraint sensing and diagnostic module.

Reference Information

Schematic Reference

- **Seat Belt Schematics**
- **SIR Schematics**

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

- **Seat Belt System Description and Operation**
- **Supplemental Inflatable Restraint System Description and Operation**

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

NOTE: DTC B1019 can set after the inflatable restraint sensing and diagnostic module has been replaced and/or reprogrammed before the setup procedure is completed. The setup procedure cannot be completed if DTC B1019 is set as current or history. If a short or open is detected in a deployment circuit prior to the setup procedure being performed, the inflatable restraint sensing and diagnostic module will set DTC B1019.

1. Ignition ON.
2. Verify no other K36 Inflatable Restraint Sensing and Diagnostic Module DTCs are set.
 - **If other K36 Inflatable Restraint Sensing and Diagnostic Module DTCs are set**

Diagnose those DTCs first. Refer to **Diagnostic Trouble Code (DTC) List - Vehicle**
 - **If no other K36 Inflatable Restraint Sensing and Diagnostic Module DTCs are set**
3. Verify the enabled impact sensors identified in the scan tool data list match the number of actual impact sensors installed on the vehicle.
 - **If the number of enabled impact sensors do not match**

1. Verify the correct K36 Inflatable Restraint Sensing and Diagnostic Module calibration file is loaded in the K36 Inflatable Restraint Sensing and Diagnostic Module.
 - If the K36 Inflatable Restraint Sensing and Diagnostic Module calibration file is correct and the vehicle contains an incorrect number of sensors, identify which sensors are missing to make the vehicle match the K36 Inflatable Restraint Sensing and Diagnostic Module impact sensor calibration scan tool data list.
 - If the calibration file is incorrect
2. Reprogram the K36 Inflatable Restraint Sensing and Diagnostic Module. Refer to **Inflatable Restraint Sensing and Diagnostic Module Programming and Setup**
 - **If the number of enabled impact sensors match**
4. Verify the enabled deployment loops identified in the scan tool data list match the deployment loops installed on the vehicle.
 - **If the number of enabled deployment loops do not match**
 1. Verify the correct K36 Inflatable Restraint Sensing and Diagnostic Module calibration file is loaded in the K36 Inflatable Restraint Sensing and Diagnostic Module.
 - If the K36 Inflatable Restraint Sensing and Diagnostic Module calibration file is correct and the vehicle contains an incorrect number of loops, identify which deployment loops are missing to make the vehicle match the K36 Inflatable Restraint Sensing and Diagnostic Module impact sensor calibration scan tool data list.
 - If the calibration file is incorrect
 2. Program the K36 Inflatable Restraint Sensing and Diagnostic Module. Refer to **Inflatable Restraint Sensing and Diagnostic Module Programming and Setup**
 - **If the number of enabled deployment loops match**
5. Verify a passenger presence system is equipped on the vehicle.
 - **If a passenger presence system is not equipped on the vehicle**

Replace the K36 Inflatable Restraint Sensing and Diagnostic Module.
 - **If a passenger presence system is equipped on the vehicle**
6. Verify the Passenger Presence System Enable Status parameter identified in the scan tool data list is Enabled.
 - **If the Passenger Presence System Enable Status parameter is not Enabled**

Refer to **Inflatable Restraint Sensing and Diagnostic Module Programming and Setup**
 - **If the Passenger Presence System parameter is Enabled**
7. Verify the Passenger Presence System Learn Status parameter identified in the scan tool data list is Learned.
 - **If the Passenger Presence System Learn Status parameter is not Learned**
 1. Verify the scan tool can communicate with the passenger presence system.
 - If the scan tool will not communicate with the passenger presence system, refer to **Scan Tool Does Not Communicate with Low Speed GMLAN Device**

- If the scan tool communicates
- 2. Ignition OFF, disconnect the scan tool, wait 2 min.
- 3. Ignition ON, connect the scan tool, verify DTC B1019 is not set as current.
 - If the DTC is set as current, refer to **Inflatable Restraint Sensing and Diagnostic Module Programming and Setup**
 - If the DTC is not set as current
- 4. All OK.
 - **If the Passenger Presence System Learn status is Learned**
- 8. Replace the K36 Inflatable Restraint Sensing and Diagnostic Module.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- **SIR/SRS Wiring Repairs**
- **Control Module References** for inflatable restraint sensing and diagnostic module replacement, programming and setup

PASSENGER PRESENCE SYSTEM REZEROING

Introduction

The inflatable restraints passenger presence system is a calibrated system that requires re-zeroing or a zero check anytime the seat cushion trim attachments have been removed or the passenger presence system has been replaced. The procedures below are designed to assist in the re-zeroing of the passenger presence system. Before you start, read these procedures carefully and completely. For further information regarding the passenger presence system refer to **Supplemental Inflatable Restraint System Description and Operation**.

NOTE: The following procedures must be followed:

1. Read this procedure carefully and completely.
2. The passenger presence system will not function properly if the passenger presence system re-zeroing procedure is not performed.
3. Perform the **Diagnostic Repair Verification** after successfully completing the re-zeroing procedure to ensure the system is functioning properly.

Passenger Presence System Re-zeroing Procedure

- NOTE:**
- Before the passenger presence system can be re-zeroed the front passenger seat must be completely empty of all items. The presence of any liquid or items on the front passenger seat will affect the calibration and operation of the passenger presence system.
 - DTC B0081 will set if the re-zero system test is performed with:

- An aftermarket seat heater located too close to the sensor mat
- A scan tool, laptop, or other electronic device is in the seat
- The seat is damp or wet
- An object or person is in the seat

1. Verify that the temperature is between 32°F to 100°F before running a re-zero procedure.
2. Verify the seat is completely dry.
3. Empty the front outboard passenger seat.
4. Verify that all SIR and passenger presence system components, connectors, and connector position assurances are properly connected and mounted.
5. Install a scan tool.
6. Turn ON the ignition, with the engine OFF.

NOTE: The presence of current DTCs, except DTC B0081 11 or B0081 4B, will prevent the passenger presence system from re-zeroing and may set additional DTCs.

7. With a scan tool, perform the Passenger Presence Sensor Learn procedure.
8. If the test fails, confirm that the seat is empty and completely dry. Perform the Passenger Presence Sensor Learn test again. If the test fails again, verify DTC B0081 is not set as current, if the DTC is set refer to Diagnostic Trouble Code (DTC) List - Vehicle . If the test successfully completed, cycle the ignition OFF.
9. After the passenger presence system has been successfully re-zeroed, perform the Diagnostic Repair Verification .

SYMPTOMS - SIR

NOTE: Complete the following steps before using the symptom tables:

1. Perform 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 inflatable restraint sensing and diagnostic module (SDM) can communicate via the serial data link.
2. Review the SIR system description and operation in order to familiarize yourself with the system functions. Refer to Supplemental Inflatable Restraint 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 (Driver)**, **Air Bag Indicator Circuit Malfunction (Passenger)** in order to diagnose the symptom.

AIR BAG INDICATOR CIRCUIT MALFUNCTION (DRIVER)

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 driver air bag indicator will illuminate, and then turn OFF after the bulb check is complete. The inflatable restraint sensing and diagnostic module (SDM) performs diagnostic tests on the SIR system during the bulb check. If any malfunction exists the inflatable restraint sensing and diagnostic module will request the instrument cluster to illuminate the air bag indicator steady, via serial data. If a preexisting malfunction exists, the air bag indicator will illuminate steady immediately after the ignition is turned ON. If the ignition 1 voltage is outside of the normal operating voltage range of 9-16 V, the inflatable restraint sensing and diagnostic module will command the instrument cluster to illuminate the air bag indicator ON, even with no DTCs present, and then disable all deployment loops.

Diagnostic Aids

- A DTC B1370 may set if the ignition 1 circuit is outside the 9-16 V range.
- A flashing driver air bag indicator is displayed if the inflatable restraint sensing and diagnostic module was programmed but did not fully complete the programming. For a flashing driver airbag indicator, refer to **Inflatable Restraint Sensing and Diagnostic Module Programming and Setup** .

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Supplemental Inflatable Restraint System Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Verify the test lamp turns ON and OFF when commanding the Passenger Seat Belt Reminder Indicator ON and OFF with a scan tool.
 - **If the air bag indicator does not turn ON or OFF**

Replace the P16 Instrument Cluster.
 - **If the air bag indicator does turn ON or OFF**
2. Replace the K36 inflatable restraint sensing and diagnostic module.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair.

- SIR/SRS Wiring Repairs
- Control Module References for Instrument Cluster or inflatable restraint sensing and diagnostic module replacement, programming and setup

AIR BAG INDICATOR CIRCUIT MALFUNCTION (PASSENGER)

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

	Short to	Open/High	Short to	
--	----------	-----------	----------	--

Circuit	Ground	Resistance	Voltage	Signal Performance
Passenger Air Bag OFF Indicator Control	2	2*	4	-
Passenger Air Bag ON Indicator Control	3	3*	5	-
Passenger Air Bag Disable Indicator Ground	-	1	1	-
1. Both indicators always OFF 2. The OFF indicator will not illuminate 3. The ON indicator will not illuminate 4. The OFF indicator always ON 5. The ON indicator always ON * High resistance may cause the appropriate indicator to illuminate less bright than normal				

Circuit/System Description

The passenger air bag ON/OFF indicators are used to notify the driver when the passenger presence system has enabled or disabled the passenger instrument panel air bag. When the ignition is turned ON, the ignition voltage is supplied to the passenger presence module. When the Inflatable Restraint Sensing and Diagnostic Module (SDM) receives the appropriate serial data message from the passenger presence module the SDM will then provide voltage to the appropriate indicator.

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Supplemental Inflatable Restraint 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

NOTE: The passenger air bag ON and OFF indicators may not operate as expected if there are supplemental inflatable restraint (SIR) DTCs. Repair all SIR DTCs before proceeding with this diagnostic.

1. Ignition ON.
2. Verify the passenger air bag ON indicator turns ON and OFF when commanding the Passenger Air Bag ON Indicator ON and OFF with a scan tool.

- **If the air bag ON indicator does not turn ON or OFF**

Refer to Circuit/System Testing below.

- **If the air bag ON indicator turns ON or OFF**

3. Verify the passenger air bag OFF indicator turns ON and OFF when commanding the Passenger Air Bag OFF Indicator ON and OFF with a scan tool.

- **If the air bag OFF indicator does not turn ON or OFF**

Refer to Circuit/System Testing below.

- **If the air bag OFF indicator turns ON or OFF**

4. All OK.

Circuit/System Testing

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

- **Multifunction Switch 1 - Instrument Panel.**
- **Multifunction Switch 1 - Instrument Panel on/off indicator wiring harness.**

1. Ignition OFF, disconnect the harness connector at the S48C Multifunction Switch 1 - Instrument Panel. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 10 ohms between the ground circuit terminal 1 and ground.

- **If 10 ohms or greater**

1. Ignition OFF.

2. Test for less than 2 ohms in the ground circuit end to end.

- If 2 ohms or greater, repair the open/high resistance in the circuit.

- If less than 2 ohms, repair the open/high resistance in the ground connection.

- **If less than 10 ohms**

3. Ignition ON, command the passenger air bag OFF indicator OFF with a scan tool.

4. Test for less than 11 V between the control circuit terminal 2 and ground.

- **If 11 V or greater**

1. Ignition OFF, disconnect the X1 harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module, ignition ON.
2. Test for less than 1 V between the control circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.
- **If less than 11 V**
5. Command the passenger air bag OFF indicator ON with a scan tool.
6. Test for 1 V or greater between the control circuit terminal 2 and ground.
 - **If less than 1 V**
 - 1. Disconnect the X1 harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module.
 - 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 - 3. Test for less than 2 ohms in the control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.
 - **If 1 V or greater**
 - 7. Command the passenger air bag ON indicator OFF with a scan tool.
 - 8. Test for less than 11 V between the control circuit terminal 3 and ground.
 - **If 11 V or greater**
 - 1. Ignition OFF, disconnect the X1 harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module, ignition ON.
 - 2. Test for less than 1 V between the control circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.
 - **If less than 11 V**
 - 9. Command the passenger air bag ON indicator ON with a scan tool.
 - 10. Test for 1 V or greater between the control circuit terminal 3 and ground.
 - **If less than 1 V**
 - 1. Disconnect the X1 harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module.
 - 2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 - 3. Test for less than 2 ohms in the control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.

- If 1 V or greater

11. Test or replace the S48C Multifunction Switch 1 - Instrument Panel.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Hazard Warning and Accessory Switch Replacement**
- **Control Module References** for Inflatable Restraint Sensing and Diagnostic Module replacement, programming and setup

SIR DISABLING AND 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 **Supplemental Inflatable Restraint System Description and Operation**.

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 <u>Repairs and Inspections Required After a Collision</u> .
When performing SIR diagnostics.	Follow the appropriate SIR service manual diagnostic procedure(s) *
When moving, removing or replacing an SIR component or a component attached to an SIR component. (Anytime you remove fasteners.)	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

WARNING: 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 Inflatable Restraint Sensing and Diagnostic Module loses battery power during a collision. Deployment power is available for as much as 2 minutes after disconnecting the vehicle power. Waiting 2 minutes 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 air bags to temperatures above 65°C (149°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 92 cm (3 feet) or greater:

- Inflatable Restraint Sensing and Diagnostic Module (SDM)
- Any air bag
- Driver steering wheel air bag coil
- Any impact sensor
- Seat belt anchor and/or retractor pretensioners
- Passenger presence module and/or occupant 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.

WARNING: 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 Inflatable Restraint Sensing and Diagnostic Module. Refer to [SIR Schematics](#), or [Electrical Center Identification Views](#).
4. Wait 2 minutes 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 Inflatable Restraint Sensing and Diagnostic Module. Refer to **SIR Schematics**, or **Electrical Center Identification Views**.
3. Turn the ignition switch to the ON position. The AIR BAG indicator will illuminate or 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 2 minutes 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 illuminate or 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

General Service Instructions

WARNING: 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.

NOTE: The Inflatable Restraint Sensing and Diagnostic Module (SDM) maintains a reserved energy supply. The reserved energy supply provides deployment power for the SIR air bags. Deployment power may be available for up to 2 minutes after disconnecting the vehicle power. Disabling the SIR system prevents deployment of the SIR air bags from the reserved energy supply.

NOTE: 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 air bags to temperatures above 65°C (149°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

NOTE: Discard any of the following components if it has been dropped from a height of 92 cm (3 ft) or greater:

- Inflatable Restraint Sensing and Diagnostic Module
- Passenger instrument panel air bag
- Driver steering wheel air bag
- Driver steering wheel air bag coil
- Roof rail air bags
- Front and /or side impact sensors
- Seat belt anchor and/or retractor pretensioners
- Front seat side air bag

INSTRUMENT PANEL LOWER AIRBAG REPLACEMENT (DRIVER SIDE)

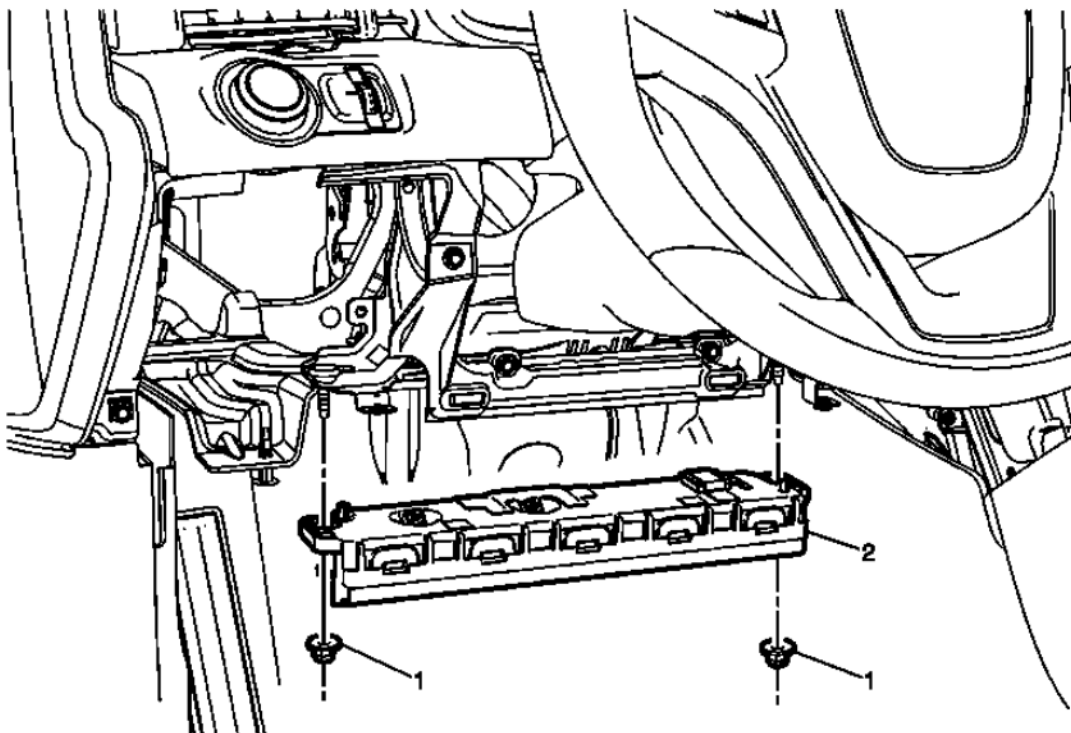


Fig. 6: Instrument Panel Lower Airbag Assembly & Nuts (Driver Side)
Courtesy of GENERAL MOTORS COMPANY

Instrument Panel Lower Airbag Replacement (Driver Side)

Callout	Component Name
WARNING: Refer to <u>SIR Inflator Module Handling and Storage Warning</u> .	
WARNING: Refer to <u>SIR Warning</u> .	
Preliminary Procedure 1. Disable the SIR system. Refer to <u>SIR Disabling and Enabling</u> . 2. Remove the steering column opening lower filler. Refer to <u>Steering Column Opening Lower Filler Replacement</u> .	
1	Instrument Panel Lower Airbag Nut (Qty: 2) CAUTION: Refer to <u>Fastener Caution</u> . Tighten 9 (80 lb in)
2	Instrument Panel Lower Airbag Assembly Procedure 1. Refer to <u>Inflatable Restraint Module Handling and Scrapping</u> . 2. Enable the SIR system. Refer to <u>SIR Disabling and Enabling</u> .

INSTRUMENT PANEL LOWER AIRBAG REPLACEMENT (PASSENGER SIDE)

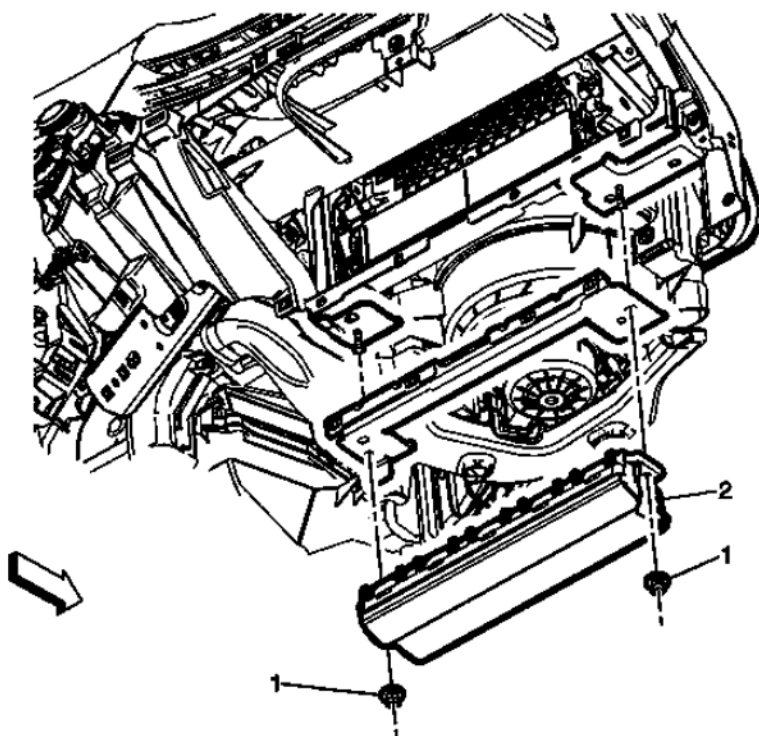


Fig. 7: Instrument Panel Lower Airbag (Passenger Side)

Courtesy of GENERAL MOTORS COMPANY

Instrument Panel Lower Airbag Replacement (Passenger Side)

Callout	Component Name
WARNING: Refer to <u>SIR Inflator Module Handling and Storage Warning</u> . WARNING: Refer to <u>SIR Warning</u> . Preliminary Procedure Disable the SIR system. Refer to <u>SIR Disabling and Enabling</u> .	
1	Instrument Panel Lower Airbag Nut (Qty: 2) CAUTION: Refer to <u>Fastener Caution</u> . Tighten 9 (80 lb in)
2	Instrument Panel Lower Airbag Assembly Procedure

1. Refer to Inflatable Restraint Module Handling and Scrapping.
2. Enable the SIR system. Refer to SIR Disabling and Enabling.

FRONT END INFLATABLE RESTRAINT DISCRIMINATING SENSOR REPLACEMENT

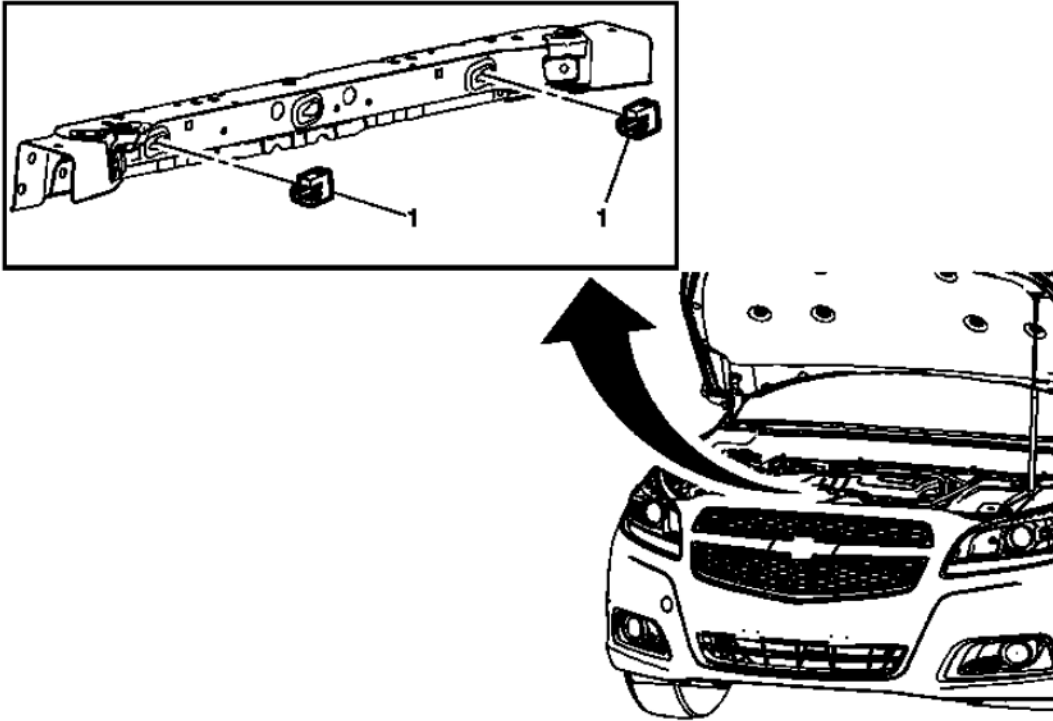


Fig. 8: Front End Inflatable Restraint Discriminating Sensor
Courtesy of GENERAL MOTORS COMPANY

Front End Inflatable Restraint Discriminating Sensor Replacement

Callout	Component Name
WARNING: Refer to <u>SIR Warning</u> .	
WARNING: Refer to <u>SIR Inflator Module Handling and Storage Warning</u> .	
WARNING: Following the deployment of a side impact air bag, inspect the following parts for damage. Replace these parts if necessary: • The seat cushion frame • The seat recliner, if equipped • The seat adjuster • The seat back frame	

Failure to do so may cause future personal injury.

Preliminary Procedure Disable the supplemental inflatable restraint (SIR) system. Refer to **SIR Disabling and Enabling**.

1	Inflatable Restraint Front End Discriminating Sensor Assembly (Qty: 2) CAUTION: Refer to <u>Fastener Caution</u> . Procedure 1. Disconnect electrical connector. 2. Loosen the bolts and slide the sensor out of the keyhole slots. 3. The bolts are integral to the sensor assembly and DO NOT remove separately. Tighten 7.5 N.m (66 lb in)
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AIRBAG SIDE IMPACT SENSOR REPLACEMENT

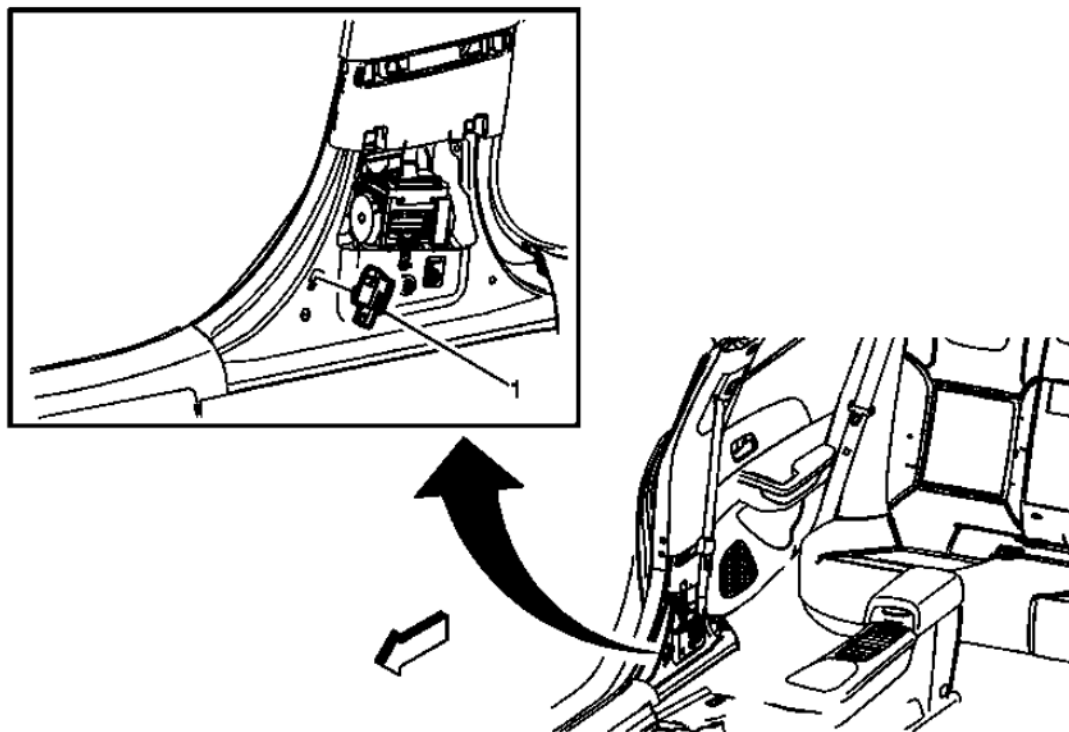


Fig. 9: Airbag Side Impact Sensor

Courtesy of GENERAL MOTORS COMPANY

Airbag Side Impact Sensor Replacement

Callout	Component Name
WARNING: Refer to <u>SIR Warning</u> . WARNING: Refer to <u>SIR Inflator Module Handling and Storage Warning</u> . WARNING: Following the deployment of a side impact air bag, inspect the following parts for damage. Replace these parts if necessary: • The seat cushion frame • The seat recliner, if equipped • The seat adjuster • The seat back frame Failure to do so may cause future personal injury. Preliminary Procedures 1. Disable the SIR system. Refer to <u>SIR Disabling and Enabling</u>. 2. Remove the center pillar lower trim panel. Refer to <u>Center Pillar Lower Trim Panel Replacement</u> .	
1	Inflatable Restraint Side Impact Sensor Assembly CAUTION: Refer to <u>Fastener Caution</u> . Procedure 1. Disconnect electrical connector. 2. Loosen the fasteners and slide the sensor out of the keyhole slots. 3. The bolts are integral to the sensor assembly, DO NOT remove separately. Tighten 7.5 N.m (66 lb in)

AIRBAG SENSING AND DIAGNOSTIC MODULE REPLACEMENT

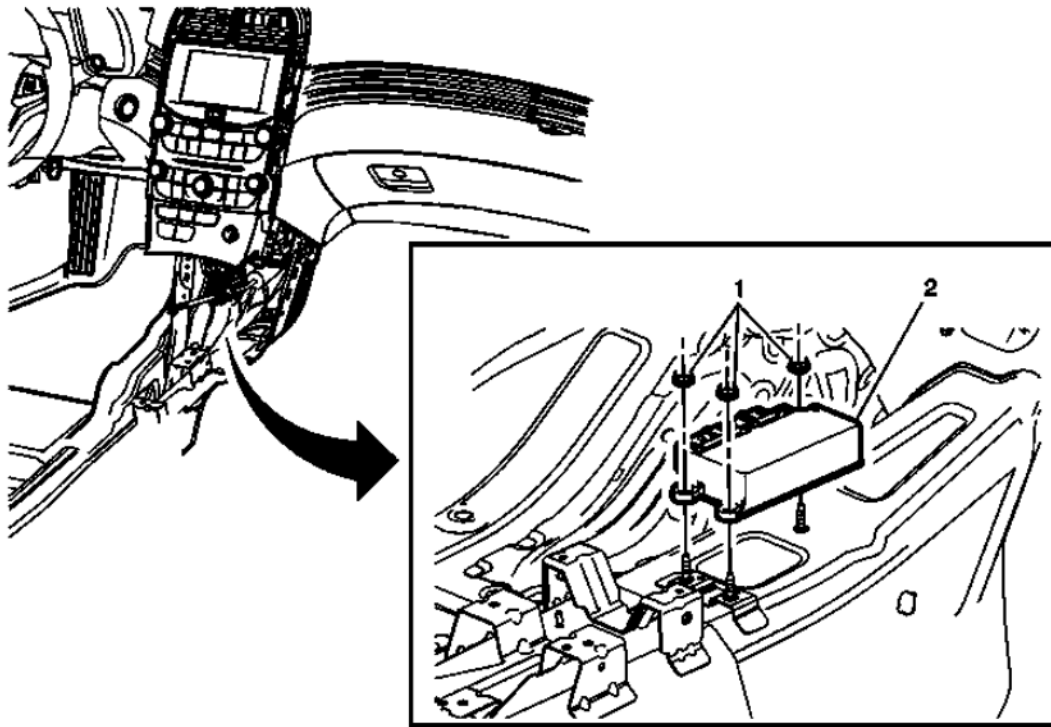


Fig. 10: Airbag Sensing and Diagnostic Module
Courtesy of GENERAL MOTORS COMPANY

Airbag Sensing and Diagnostic Module Replacement

Callout	Component Name
WARNING: Refer to <u>SIR Warning</u> . WARNING: 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. Preliminary Procedures 1. Disable the supplemental inflatable restraint (SIR) system. Refer to <u>SIR Disabling and Enabling</u>. 2. Remove the transmission control. Refer to <u>Transmission Control Replacement</u> . 3. Disconnect the electrical connector.	
1	Inflatable Restraint Sensing and Diagnostic Module Fastener (Qty: 3) CAUTION: Refer to <u>Fastener Caution</u> .

	Tighten 10 N.m (89 lb in)
2	Inflatable Restraint Sensing and Diagnostic Module Assembly • When installing, ensure the arrow on the module is pointed towards the front of the vehicle. • If installing a replacement module, program the module. Refer to <u>Control Module References</u> .

STEERING WHEEL AIRBAG REPLACEMENT

Removal Procedure

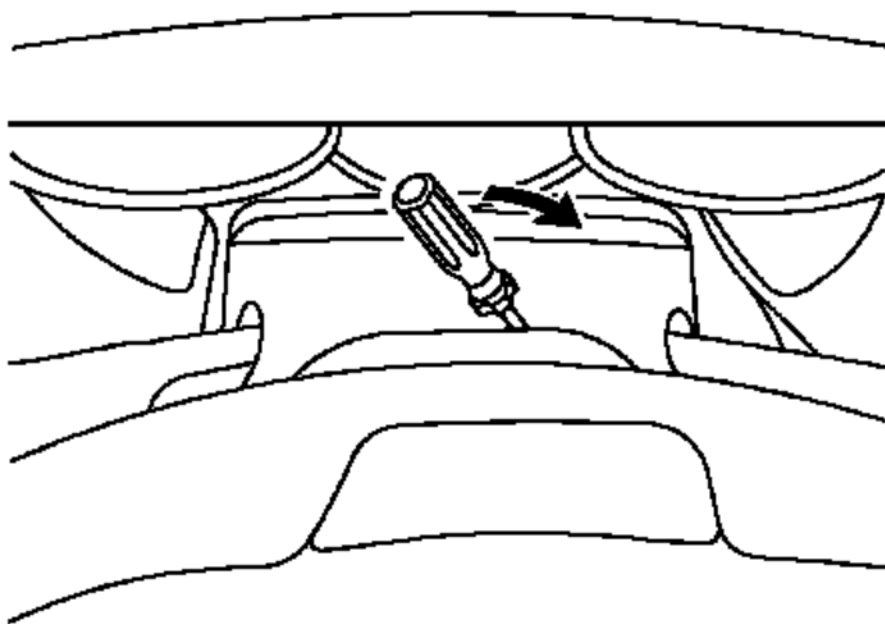


Fig. 11: Disabling SIR System

Courtesy of GENERAL MOTORS COMPANY

WARNING: Refer to **SIR Inflator Module Handling and Storage Warning** .

WARNING: Refer to SIR Warning .

1. Disable the SIR system. Refer to SIR Disabling and Enabling.
2. Rotate the steering wheel 180 degrees.

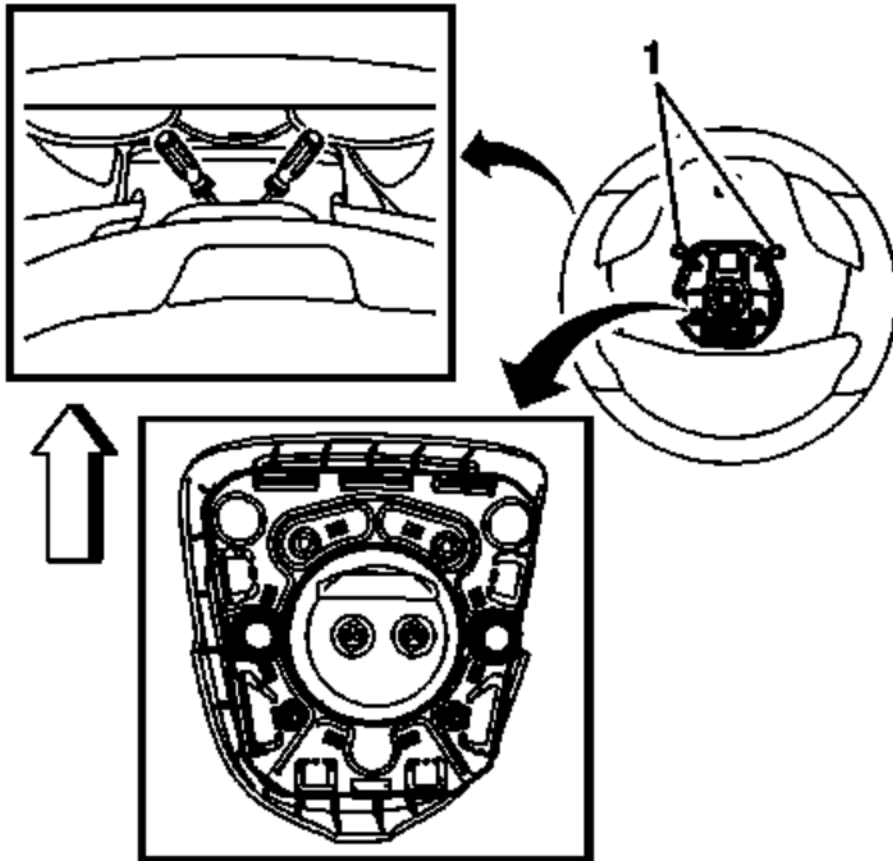


Fig. 12: Spring Fastener Inward Through Access Hole
Courtesy of GENERAL MOTORS COMPANY

3. Using a blunt-ended tool, push the spring fastener inward through the access hole (1) located on the rear of the steering wheel by pulling the tool outwards.
4. Keeping the tool inserted, repeat the step for other opening.
5. Keeping the upper step pull the steering wheel airbag out of the steering wheel.
6. Disconnect the electrical connectors.
7. Remove the steering wheel airbag.

Installation Procedure

1. Connect the electrical connectors.

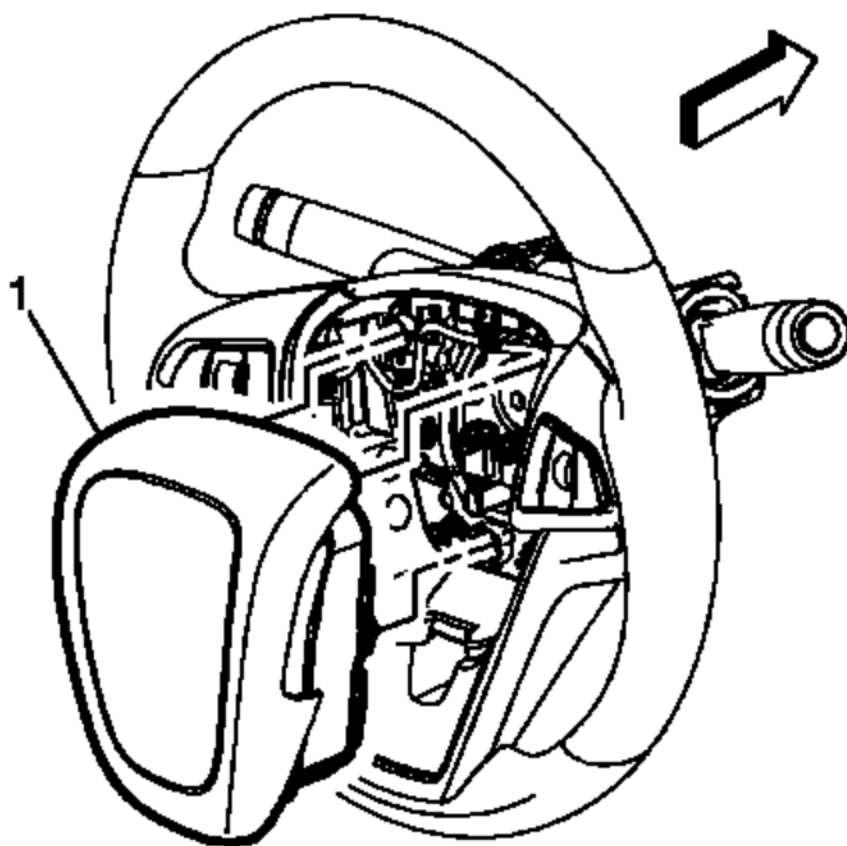


Fig. 13: Steering Wheel Airbag

Courtesy of GENERAL MOTORS COMPANY

2. Align the steering wheel airbag fasteners to the steering column fastener holes.
3. Push the steering wheel airbag (1) firmly into the steering column in order to engage the fasteners.
4. Enable the SIR system. Refer to **SIR Disabling and Enabling**.
5. Refer to **Inflatable Restraint Module Handling and Scrapping**.

STEERING WHEEL AIRBAG COIL REPLACEMENT

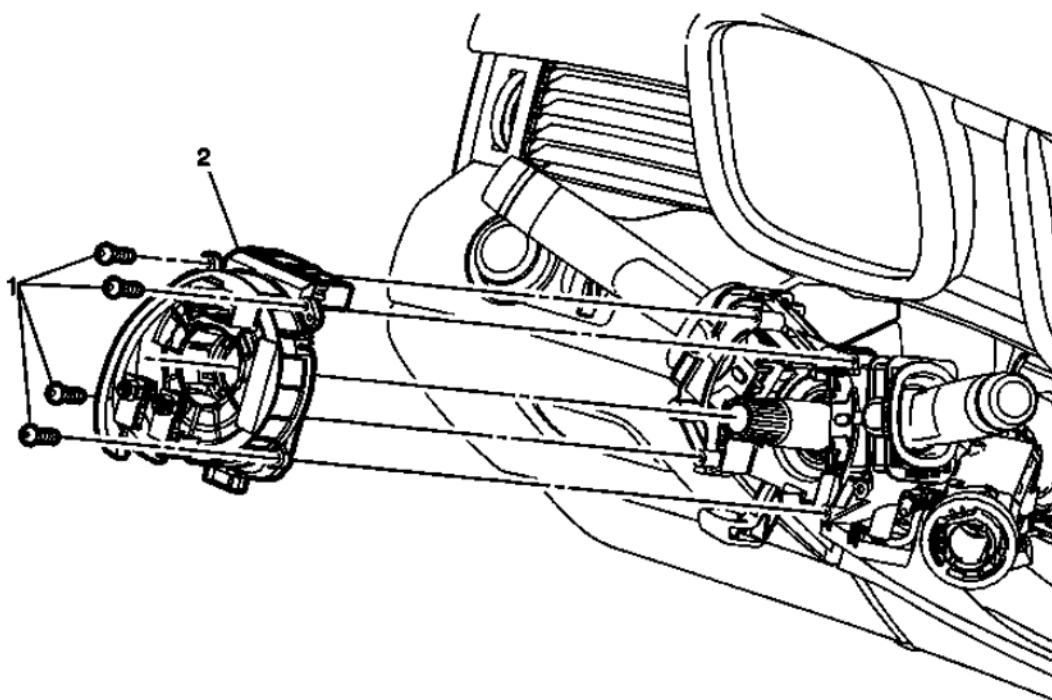


Fig. 14: Steering Wheel Airbag Coil
 Courtesy of GENERAL MOTORS COMPANY

Steering Wheel Airbag Coil Replacement

Callout	Component Name
Preliminary Procedures 1. Remove the steering wheel. Refer to <u>Steering Wheel Replacement</u> . 2. Remove the steering column upper trim cover. Refer to <u>Steering Column Upper Trim Cover Replacement</u> . 3. If equipped with BTM, remove the steering column lower trim cover. Refer to <u>Steering Column Lower Trim Cover Replacement</u> . 4. If not equipped with BTM, remove the ignition lock cylinder bezel. Refer to <u>Ignition Lock Cylinder Bezel Replacement (Without BTM)</u> .	
1	Steering Wheel Airbag Coil Fastener (Qty: 4) CAUTION: Refer to <u>Fastener Caution</u> .
2	Steering Wheel Airbag Coil Procedure 1. Disconnect any electrical connectors. 2. Transfer the steering angle sensor. Refer to <u>Steering Angle Sensor</u>

Replacement .

3. Ensure the coil is centered during installation. If installing a NEW coil, remove the centering tab AFTER the coil is on the steering column. Refer to Airbag Steering Wheel Module Coil Centering.

AIRBAG STEERING WHEEL MODULE COIL CENTERING

NOTE: If a double wire harness strap is installed onto the wire harness assembly and steering column, the original holder for the wire strap(s) **MUST** be reused during installation.

1. Remove the wire harness strap(s) where necessary.

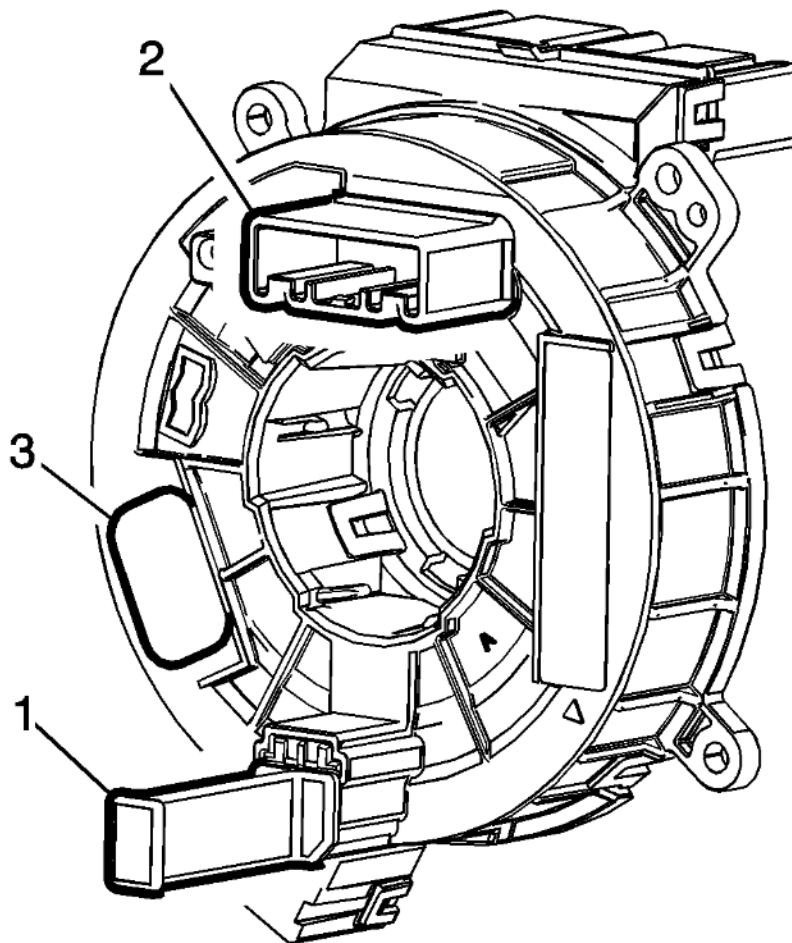


Fig. 15: Airbag Steering Wheel Module Coil Centering Components
Courtesy of GENERAL MOTORS COMPANY

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

restraint malfunction.

2. Inspect the inflatable restraint steering wheel module coil. If the yellow lock pin (1) is present, the uplead post (2) is at the 12:00 position and the loop (u-turn) appears in the centering window (3) then the coil is already in the centered position and no further action is required.

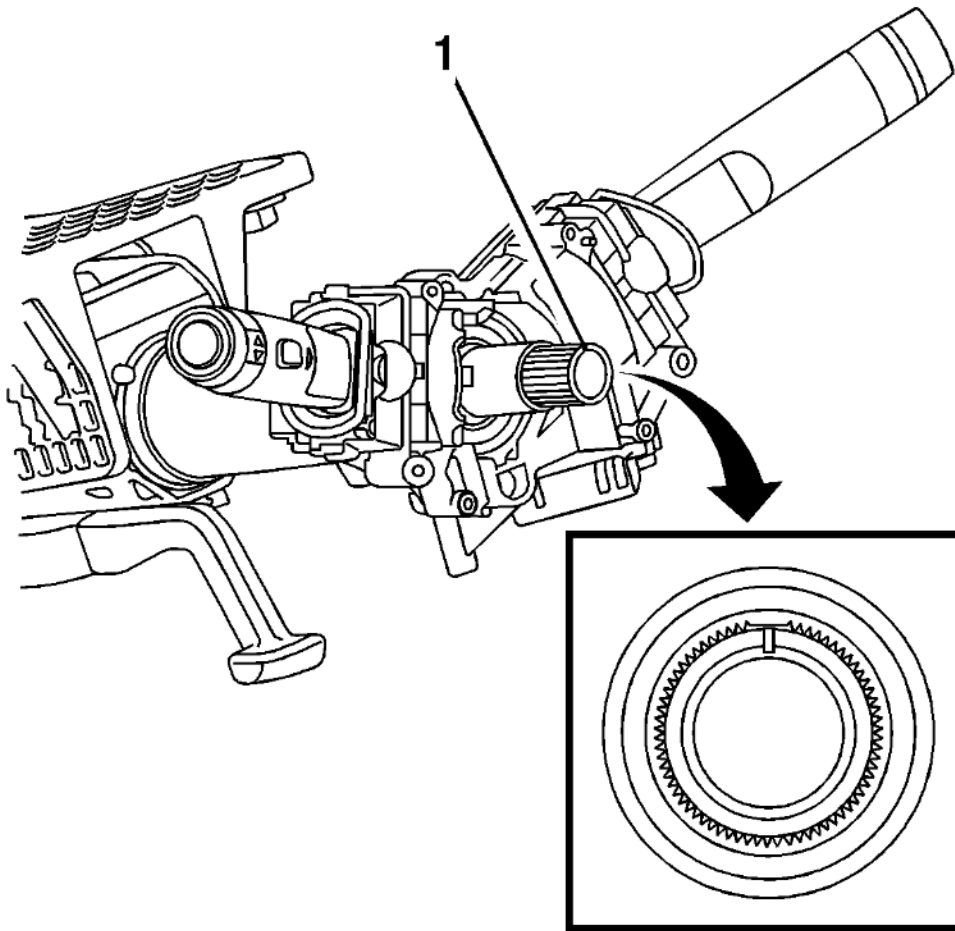


Fig. 16: Steering Shaft Block Tooth
Courtesy of GENERAL MOTORS COMPANY

3. If the coil needs to be centered, perform the following preliminary steps:
 - The wheels on the vehicle are straight ahead.
 - The block tooth (1) on the steering shaft is in the 12 o'clock position.
 - The ignition switch is in the LOCK position.

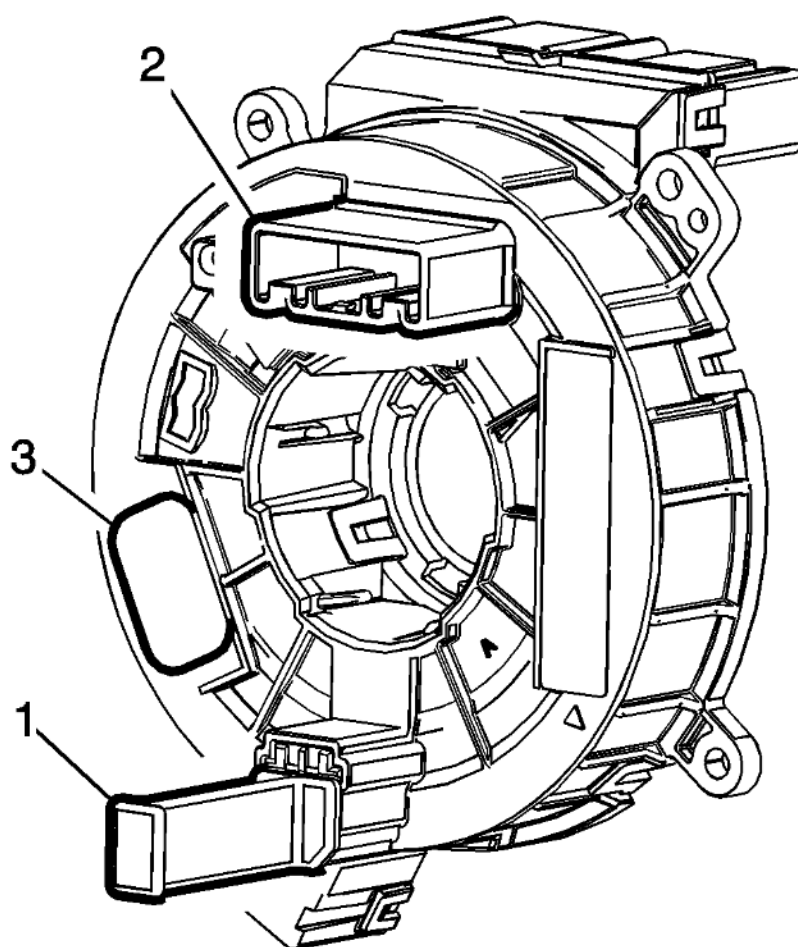


Fig. 17: Airbag Steering Wheel Module Coil Centering Components
Courtesy of GENERAL MOTORS COMPANY

4. To center the coil, perform the following steps:
 - Hold the coil with the face up.
 - Slowly rotate the coil hub clockwise until the coil ribbon stops.
 - Slowly rotate the coil hub counterclockwise approximately 2.5 turns until the uplead post (2) is at the 12:00 position.
 - View the centering window (3) and ensure the loop (u-turn) is visible. If the loop is visible then the coil is in the CENTER position.
 - While holding the coil hub in the CENTER position, align the coil with the steering column components and slide onto the steering shaft.
5. If a double wire harness strap is installed onto the wire harness assembly and steering column, the wires must be routed up against the column. One wire harness strap will surround one lead from the coil to the steering column. The other wire harness strap will surround all other leads to the steering column.

INSTRUMENT PANEL AIRBAG REPLACEMENT

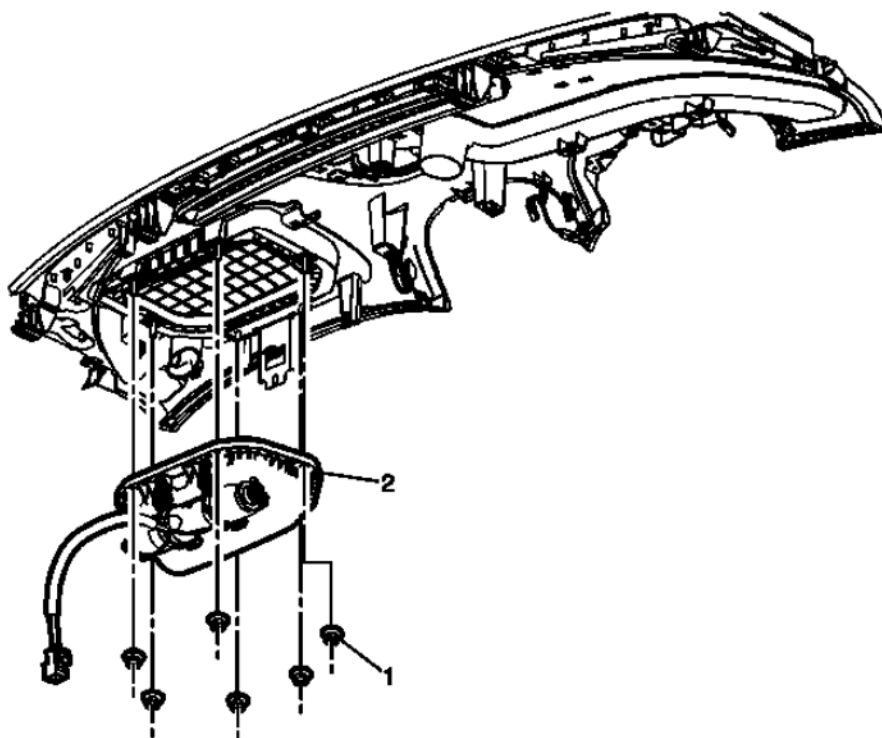


Fig. 18: Instrument Panel Airbag
 Courtesy of GENERAL MOTORS COMPANY

Instrument Panel Airbag Replacement

Callout	Component Name
WARNING: Refer to <u>SIR Inflator Module Handling and Storage Warning</u> . WARNING: Refer to <u>SIR Warning</u> . Preliminary Procedures 1. Disable the SIR system. Refer to <u>SIR Disabling and Enabling</u> . 2. Remove the instrument panel center air outlet duct. Refer to <u>Instrument Panel Center Air Outlet Duct Replacement</u> .	
1	Instrument Panel Airbag Fastener (Qty: 6) CAUTION: Refer to <u>Fastener Caution</u> . Tighten 5 (44 lb in)

2	Instrument Panel Airbag Assembly Procedure 1. Refer to <u>Inflatable Restraint Module Handling and Scrapping</u> . 2. Enable the SIR system. Refer to <u>SIR Disabling and Enabling</u> . NOTE: Replace the accessory wiring harness retainer (passenger airbag retainer), if necessary.
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AIRBAG FRONT PASSENGER PRESENCE SENSOR REPLACEMENT

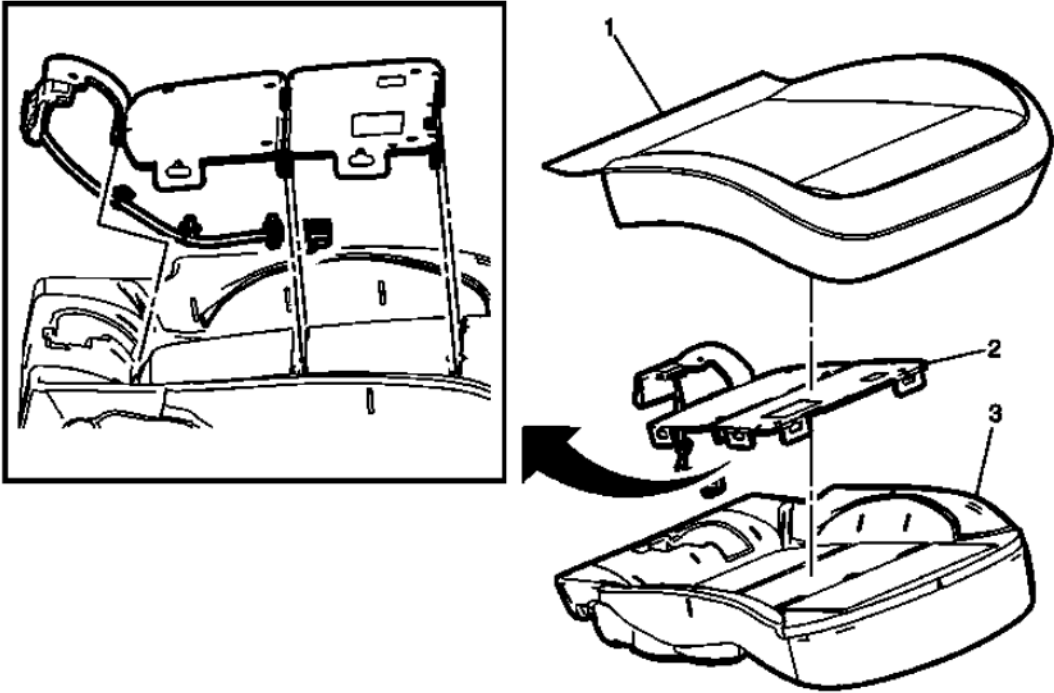


Fig. 19: Inflatable Restraint Front Passenger Presence Sensor
Courtesy of GENERAL MOTORS COMPANY

Airbag Front Passenger Presence Sensor Replacement

Callout	Component Name
WARNING: Refer to <u>SIR Warning</u> . WARNING: To avoid personal injuries, re-zero the passenger presence system whenever you remove or replace the seat cushion or trim. Failure to do so may cause the system to malfunction.	

Preliminary Procedure

1. Remove the driver or passenger seat. Refer to **Driver or Passenger Seat Removal and Installation** .
2. Remove the front seat cushion cover. Refer to **Front Seat Cushion Cover and Pad Replacement** .

1	Front Seat Cushion Cover
2	Inflatable Restraint Front Passenger Presence Sensor Assembly Procedures 1. Remove the hog rings that attach the passenger presence system to the foam cushion pad. 2. Remove the passenger presence system from the foam cushion pad and heater assembly, if equipped. 3. When installing the passenger presence system. Refer to <u>Control Module References</u> . 4. Tuck the passenger presence system into the cushion pad trench at the proper locations. 5. Transfer components as necessary. 6. Note the routing of the wiring harness and connector location for installation.
3	Front Seat Cushion Pad

FRONT SEAT OUTBOARD SEAT BACK AIRBAG REPLACEMENT

Removal Procedures

WARNING: Refer to **SIR Warning** .

1. Disable the SIR system. Refer to **SIR Disabling and Enabling**.
2. Remove driver or passenger seat. Refer to **Driver or Passenger Seat Removal and Installation** .
3. Remove the driver or passenger seat outer recliner finish cover. Refer to **Driver or Passenger Seat Outer Recliner Finish Cover Replacement (Power)** , **Driver or Passenger Seat Outer Recliner Finish Cover Replacement (Manual)** .
4. Remove the driver or passenger seat inner recliner finish cover. Refer to **Driver or Passenger Seat Inner Recliner Finish Cover Replacement** .
5. Remove the driver or passenger seat head restraint. Refer to **Driver or Passenger Seat Head Restraint Replacement** .

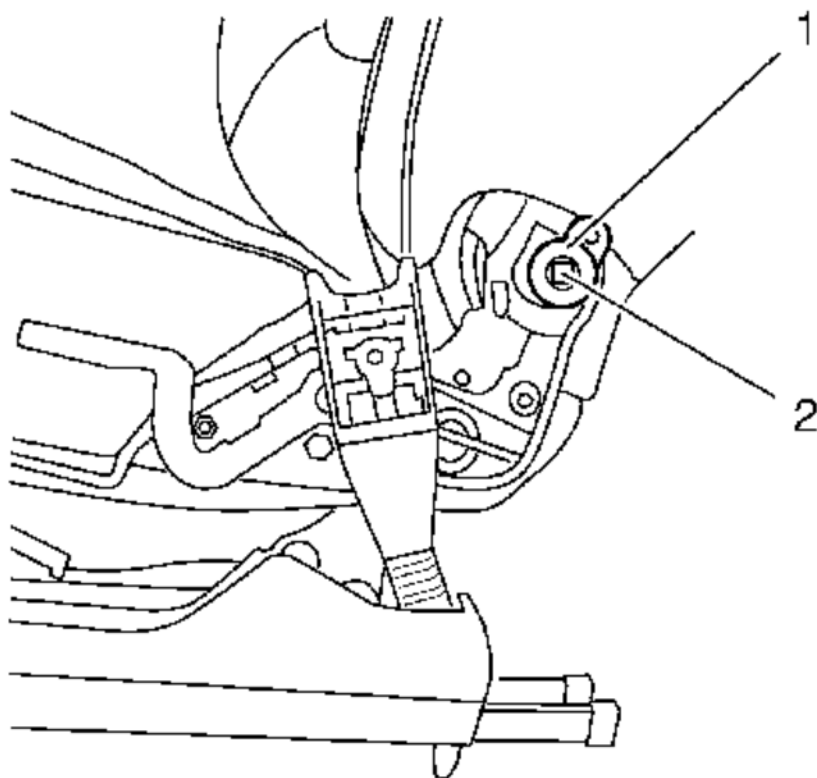


Fig. 20: Recliner Control Shaft And Securing Clip
Courtesy of GENERAL MOTORS COMPANY

6. Clip out securing (1) of recliner control shaft (2), if equipped.

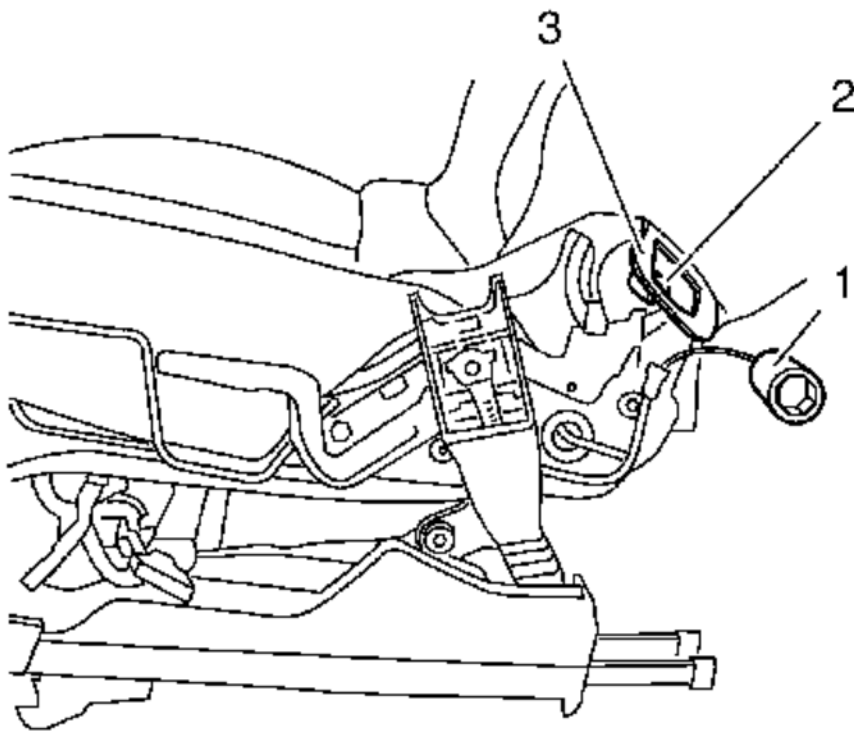


Fig. 21: Recliner Control, Shaft And Cushion Strap
Courtesy of GENERAL MOTORS COMPANY

7. Remove recliner control (1) from recliner shaft (2), if equipped. Unhinge the cushion strap (3) at seat frame.

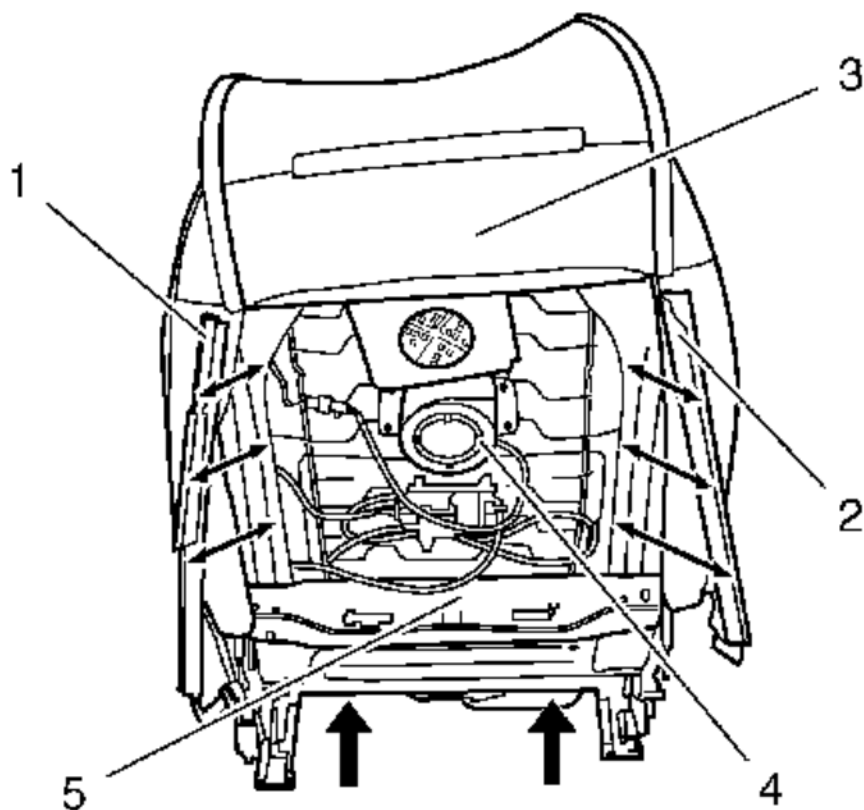


Fig. 22: Front Seat Back Cushion And Backrest Frame
Courtesy of GENERAL MOTORS COMPANY

NOTE: For loosening move the cushion upper and pull from backrest frame.

8. Loose the front seat back cushion at backrest left side (1) and right side (2).
9. Loose the front seat back cushion at backrest lower.
10. Remove hog rings at front seat back cushion to backrest wire.
11. Clip out the front seat back cushion vent fan mat (3) of vent fan (4), if equipped. Pull the cushion (5) in front to surface.

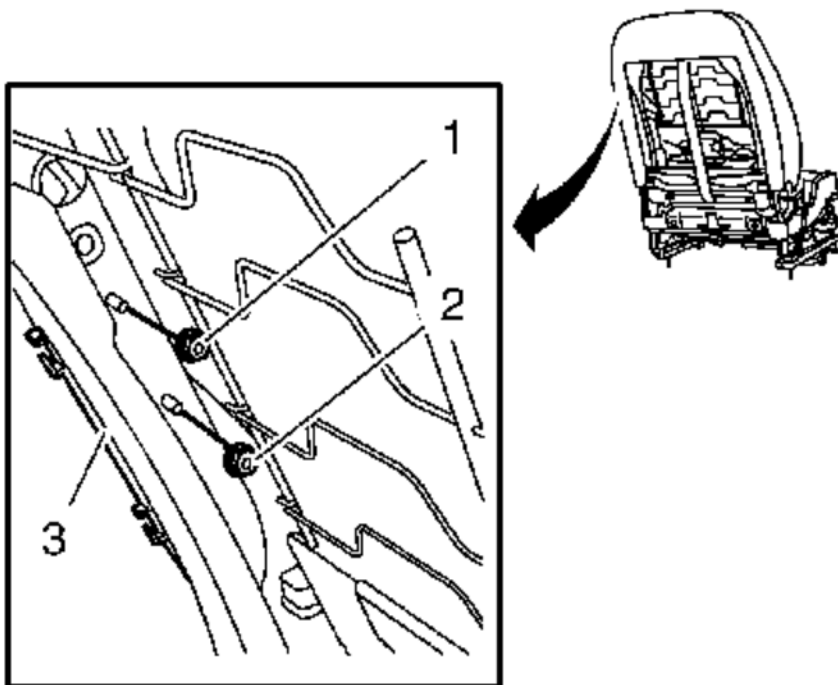


Fig. 23: Seat Side Inflatable Restraint Module And Nuts
Courtesy of GENERAL MOTORS COMPANY

12. Loosen both nuts (1, 2) from seat side inflatable restraint module (3).

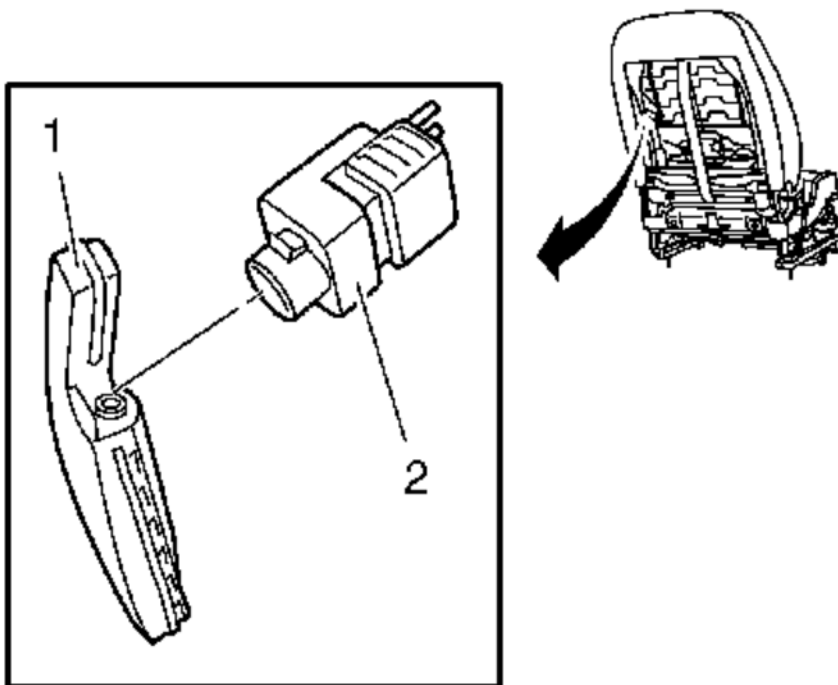


Fig. 24: Wiring Harness Connector And From Seat Side Inflatable Restraint Module
Courtesy of GENERAL MOTORS COMPANY

13. Disconnect the wiring harness connector (2) from seat side inflatable restraint module (1).

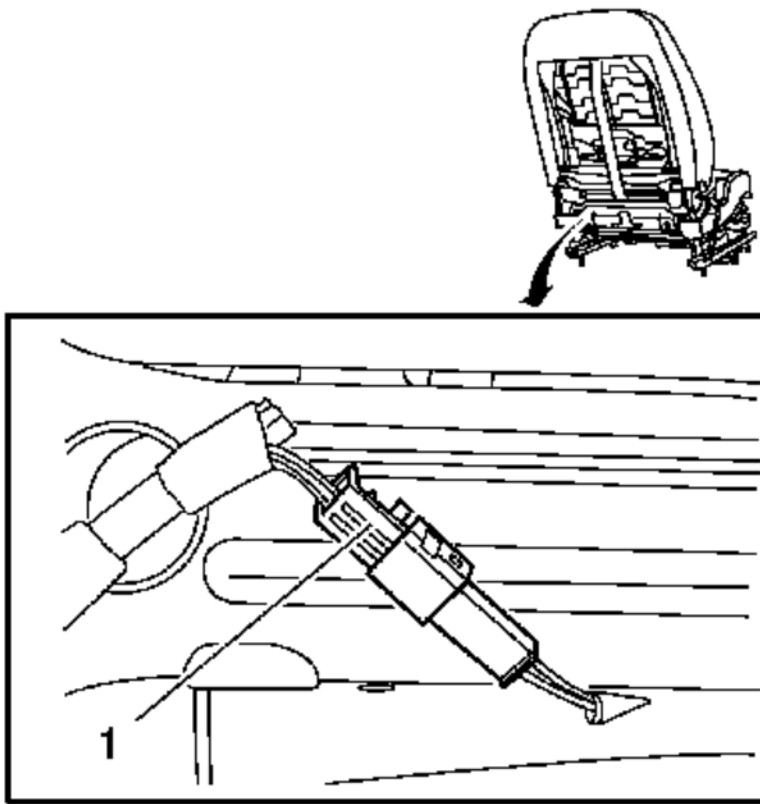


Fig. 25: Wiring Harness Connector And Seat Back Cushion Heater
Courtesy of GENERAL MOTORS COMPANY

14. Disconnect wiring harness connector (1) of the seat back cushion heater, if equipped.

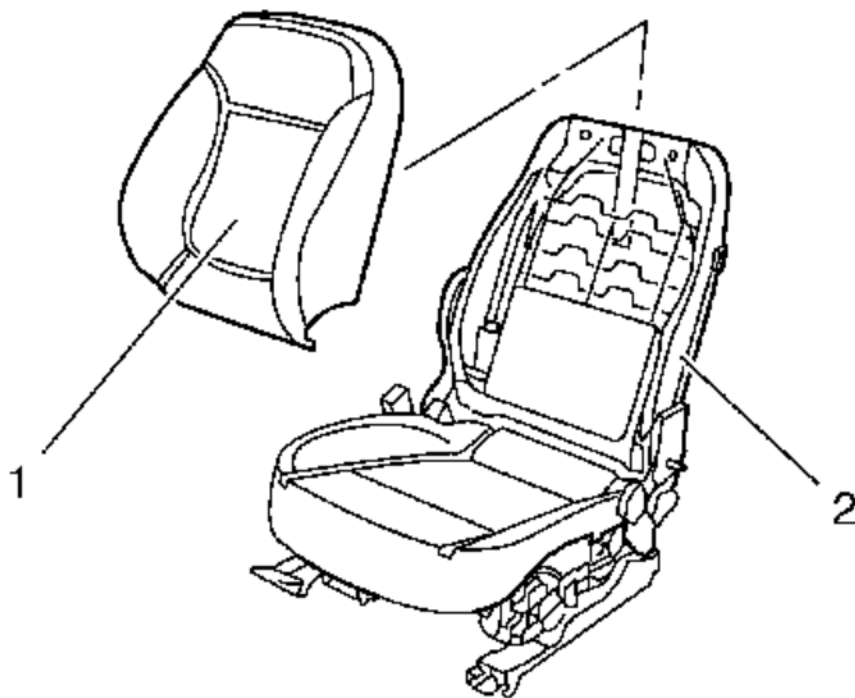


Fig. 26: Front Seat Back Cushion With Cushion Pad And Backrest Frame
Courtesy of GENERAL MOTORS COMPANY

15. Remove front seat back cushion with cushion Pad (1) from backrest frame (2).

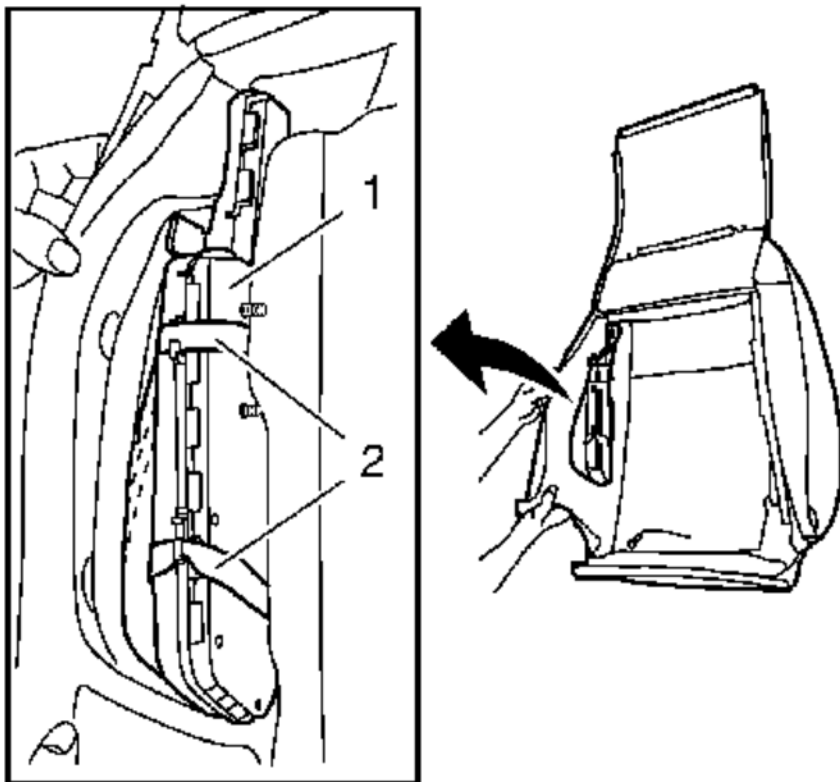


Fig. 27: Seat Side Inflatable Restraint Module And Textile Straps
Courtesy of GENERAL MOTORS COMPANY

16. Remove seat side inflatable restraint module (1) out of the textile bag (2).

Installation Procedures

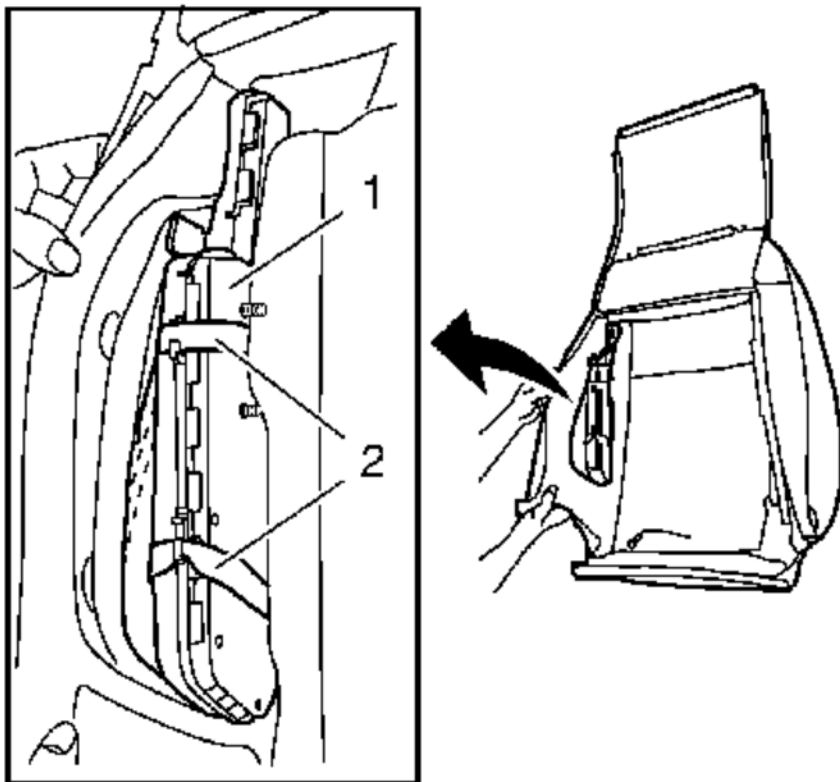


Fig. 28: Seat Side Inflatable Restraint Module And Textile Straps
Courtesy of GENERAL MOTORS COMPANY

1. Install seat side inflatable restraint module (1) to textile bag (2).

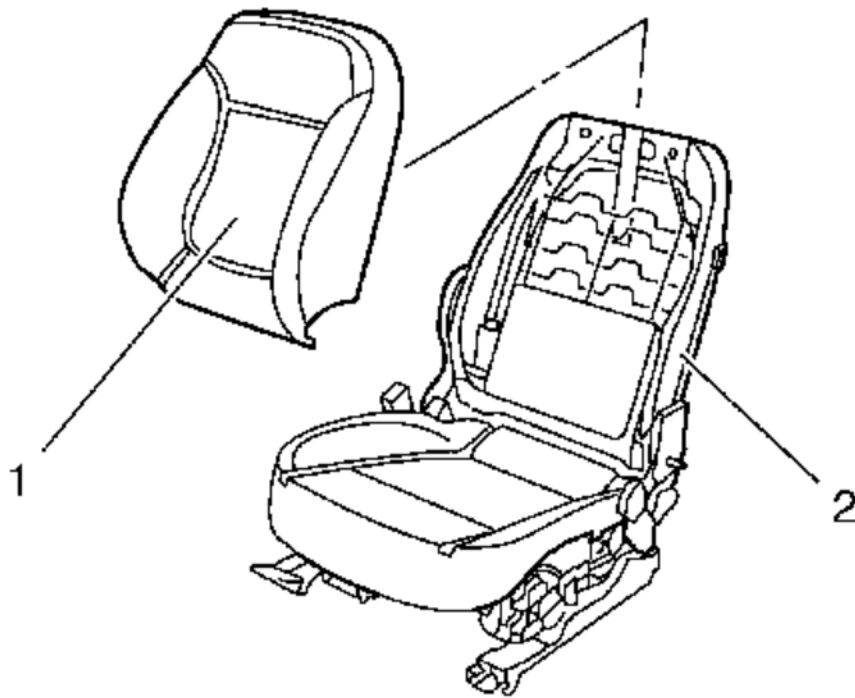


Fig. 29: Front Seat Back Cushion With Cushion Pad And Backrest Frame
Courtesy of GENERAL MOTORS COMPANY

2. Install front seat back cushion with cushion pad (1) at the backrest frame (2).

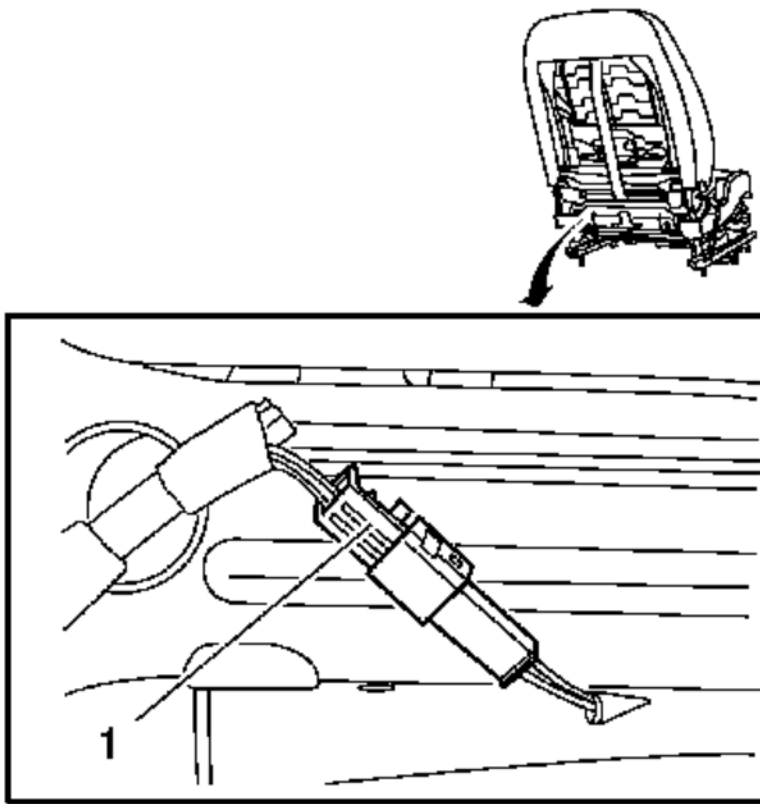


Fig. 30: Wiring Harness Connector And Seat Back Cushion Heater
Courtesy of GENERAL MOTORS COMPANY

3. Connect the wiring harness connector (1) of the seat back cushion heater, if equipped.

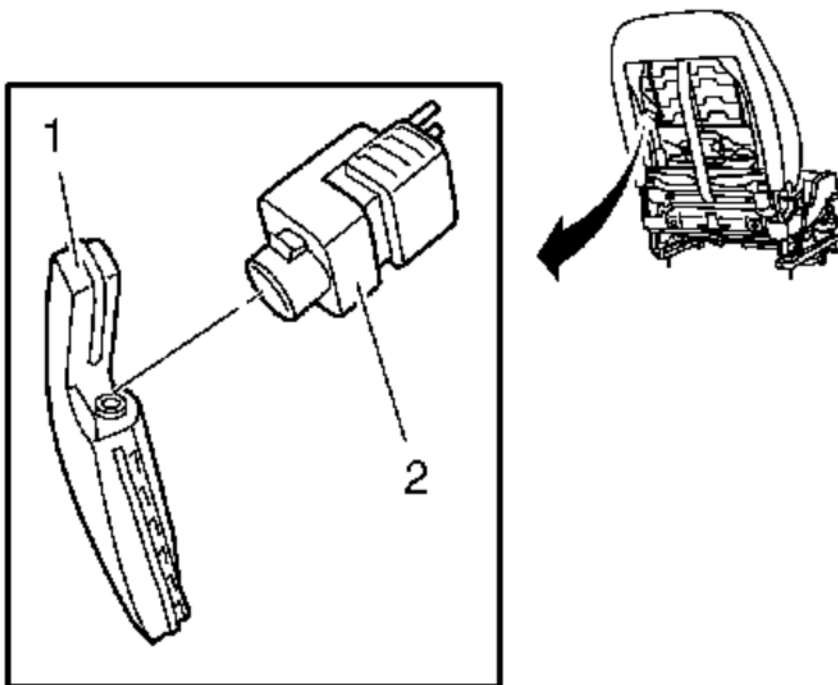


Fig. 31: Wiring Harness Connector And From Seat Side Inflatable Restraint Module
Courtesy of GENERAL MOTORS COMPANY

NOTE: **Proof the correct locking of wiring harness connector (2).**

4. Connect the wiring harness connector (2) from seat side inflatable restraint module (1).

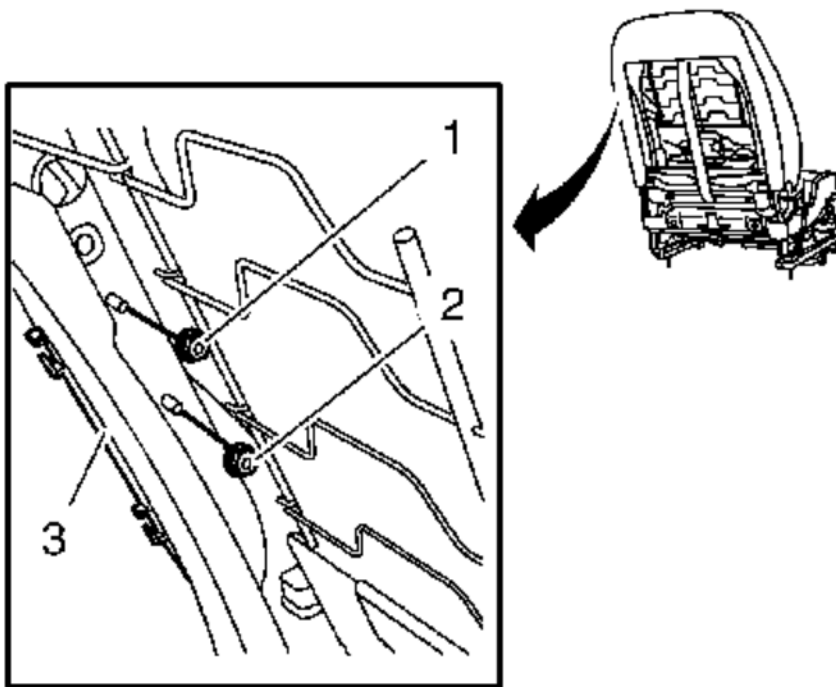


Fig. 32: Seat Side Inflatable Restraint Module And Nuts
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

5. Position seat side inflatable restraint module (3) the backrest frame. Screw both nuts (1, 2) from seat side inflatable restraint module (3) and tighten to 3.25 N.m (29 lb in).

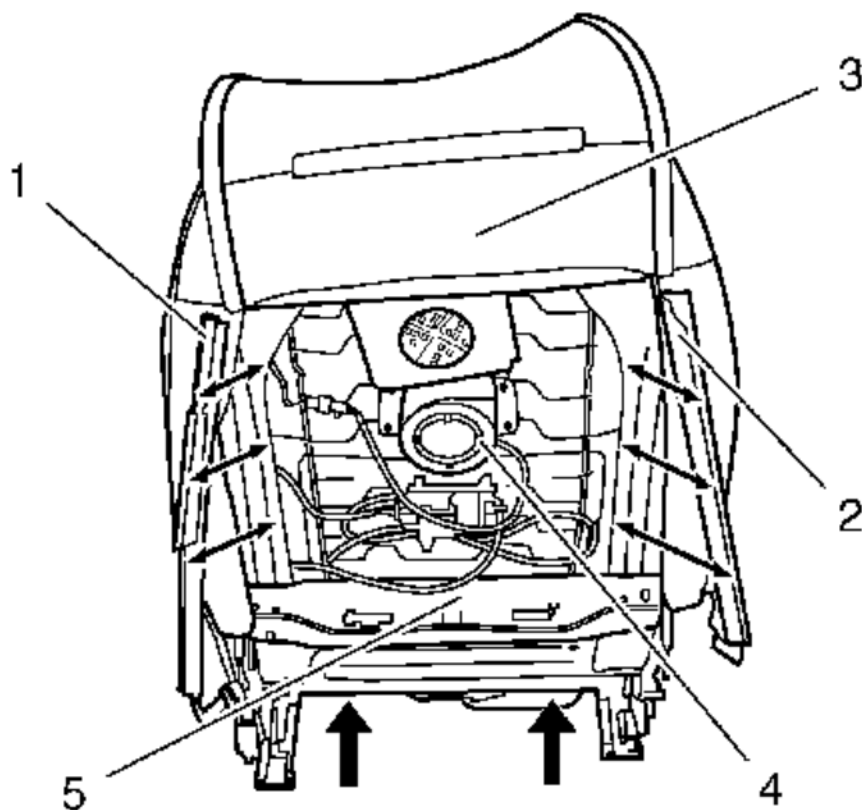


Fig. 33: Front Seat Back Cushion And Backrest Frame
Courtesy of GENERAL MOTORS COMPANY

6. Clip in the front seat back cushion vent fan mat (3) at the vent fan (4), if equipped. Position the cushion (5).
7. Install new hog rings at front seat back cushion to backrest wire.
8. Install the front seat back cushion at backrest lower.
9. Install front seat back cushion at backrest left side (1) and right side (2).
10. Install the driver or passenger seat head restraint. Refer to **Driver or Passenger Seat Head Restraint Replacement** .
11. Close the cushion at backrest rear side.
12. Install the driver or passenger seat inner recliner finish cover. Refer to **Driver or Passenger Seat Inner Recliner Finish Cover Replacement** .
13. Install the driver or passenger seat outer recliner finish cover. Refer to **Driver or Passenger Seat Outer Recliner Finish Cover Replacement (Power)** , **Driver or Passenger Seat Outer Recliner Finish Cover Replacement (Manual)** .
14. Install the driver or passenger seat. Refer to **Driver or Passenger Seat Removal and Installation** .

REAR SEAT OUTBOARD SEAT BACK AIRBAG REPLACEMENT

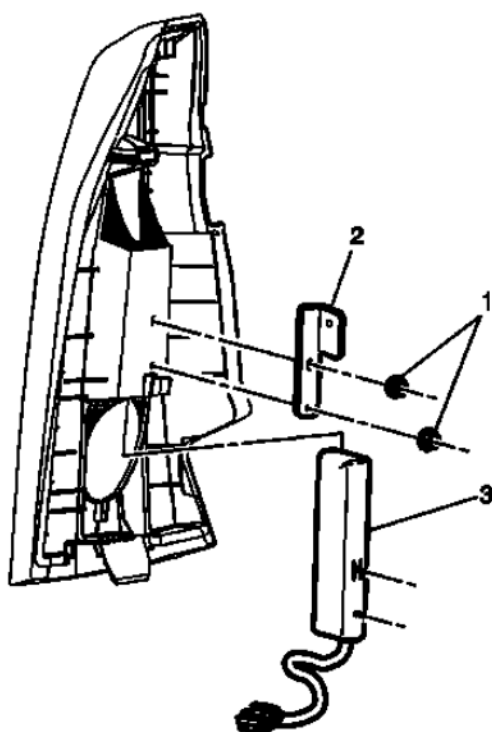


Fig. 34: Rear Seat Side Inflatable Restraint Module
 Courtesy of GENERAL MOTORS COMPANY

Rear Seat Outboard Seat Back Airbag Replacement

Callout	Component Name
WARNING: Following the deployment of a rear seat side air bag, inspect the following parts for damage. Replace these parts if necessary: • The rear seat side bolster, attachments, brackets and wiring • The rear seat back frame, cushion and cover • The rear seat cushion frame, cushion and cover Failure to do so may cause future personal injury.	
Preliminary Procedure 1. Disable the SIR system, if equipped. Refer to SIR Disabling and Enabling. 2. Remove the rear seat back cushion bolster. Refer to Rear Seat Back Bolster Replacement.	
1	Rear Seat Side Inflatable Restraint Module Nut (Qty: 2) CAUTION: Refer to Fastener Caution .

	Tighten 3.5 (31 lb in)
2	Rear Seat Side Inflatable Restraint Module Bracket
3	Rear Seat Side Inflatable Restraint Module Procedure 1. Remove the connector position assurance (CPA) from the module electrical connector. 2. Disconnect the electrical connector. 3. Slide airbag out of airbag chute. 4. Install seat side airbag into airbag chute with connector facing down. Airbag mounting studs must fit through airbag chute holes and then into the module bracket. 5. Refer to Inflatable Restraint Module Handling and Scrapping.

AIRBAG REAR SIDE DOOR SIDE IMPACT SENSOR REPLACEMENT

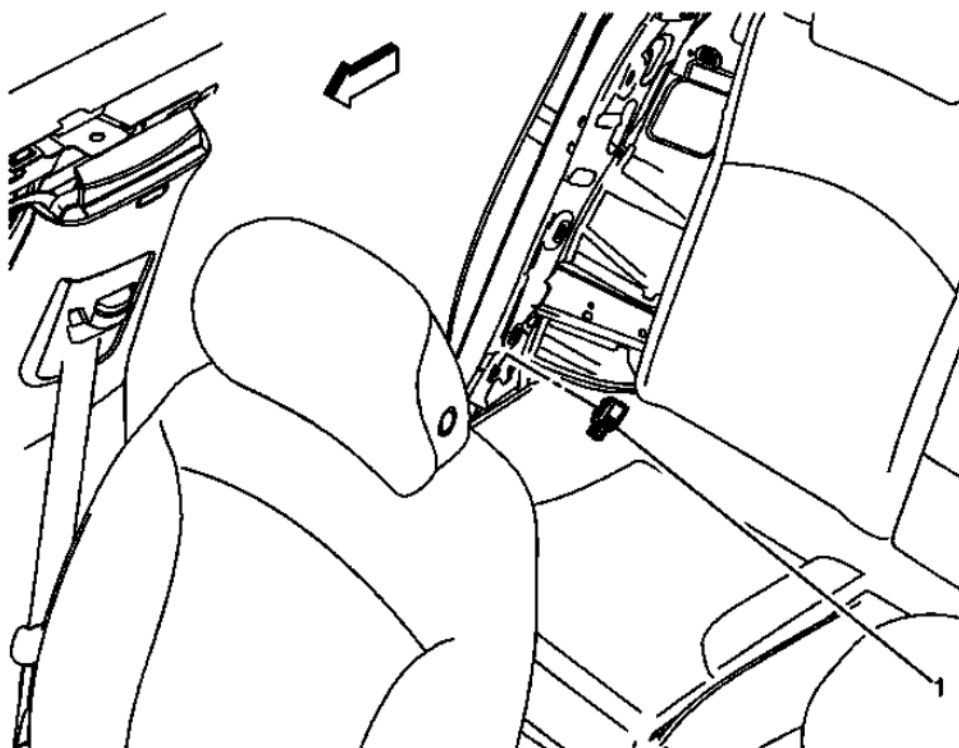


Fig. 35: Inflatable Restraint Rear Side Door Side Impact Sensor
Courtesy of GENERAL MOTORS COMPANY

Airbag Rear Side Door Side Impact Sensor Replacement

Callout	Component Name
WARNING:	

Refer to SIR Warning .

WARNING:

Refer to SIR Inflator Module Handling and Storage Warning .

WARNING:

Following the deployment of a side impact air bag, inspect the following parts for damage. Replace these parts if necessary:

- The seat cushion frame
- The seat recliner, if equipped
- The seat adjuster
- The seat back frame

Failure to do so may cause future personal injury.

Preliminary Procedures

1. Disable the SIR system. Refer to SIR Disabling and Enabling.
2. Remove the rear seat back cushion bolster. Refer to Rear Seat Back Bolster Replacement .

1	Inflatable Restraint Rear Side Door Side Impact Sensor Assembly CAUTION: Refer to <u>Fastener Caution</u> . Procedure 1. Disconnect electrical connector. 2. Loosen the fastener and slide the sensor out of the keyhole slot. 3. The bolt is integral to the sensor assembly, DO NOT remove separately. Tighten 7.5 N.m (66 lb in)
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AIRBAG ROOF SIDE RAIL MODULE REPLACEMENT

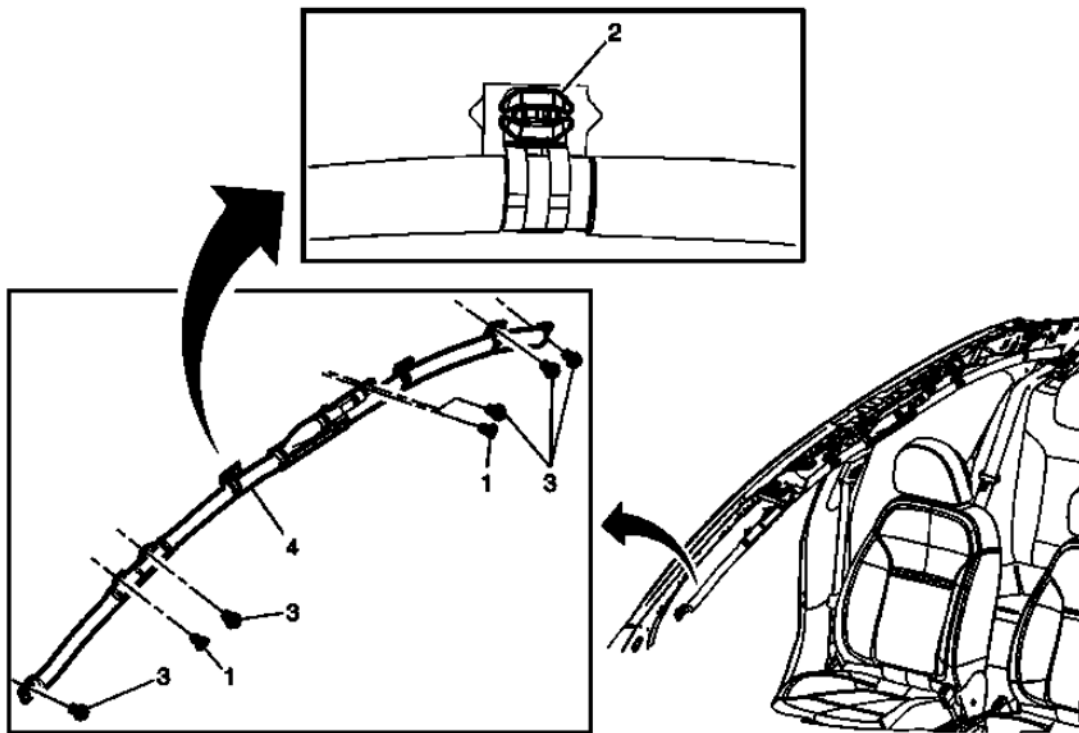


Fig. 36: Roof Side Rail Inflatable Restraint Module
 Courtesy of GENERAL MOTORS COMPANY

Airbag Roof Side Rail Module Replacement

Callout	Component Name
WARNING: In order to prevent SIR deployment, personal injury, or unnecessary SIR system repairs, do not strike the door or the door pillar in the area of the side impact sensor (SIS). Turn OFF the ignition and remove the key when performing service in the area of the SIS. WARNING: When installing the roof rail airbag, do not twist or turn the airbag 360 degrees. Securing the roof rail airbag with an airbag twisted or turned 360 degrees may cause the airbag not to deploy correctly and could cause personal injury. WARNING: Refer to <u>SIR Warning</u> . WARNING: Refer to <u>SIR Inflator Module Handling and Storage Warning</u> . Preliminary Procedures 1. Disable the SIR system. Refer to <u>SIR Disabling and Enabling</u> 2. It is only necessary to lower the headliner. Only do those steps in headliner replacement that will	

lower the headliner enough to gain access to the part. Refer to **Headlining Trim Panel Replacement (Without Sunroof)** , **Headlining Trim Panel Replacement (With Sunroof)**

1	Roof Side Rail Inflatable Restraint Module Retainer (Qty: 2)
2	Roof Side Rail Inflatable Restraint Module Retainer (Qty: 2) Procedure Use an appropriate tool to disengage spring clips.
3	Roof Side Rail Inflatable Restraint Module Fastener (Qty: 5) CAUTION: Refer to <u>Fastener Caution</u> . Tighten 9.5 (84 lb in)
4	Roof Side Rail Inflatable Restraint Module Assembly Procedure 1. Disconnect the electrical connector. 2. Remove the roof side rail inflatable restraint module from the vehicle. 3. Refer to <u>Inflatable Restraint Module Handling and Scrapping.</u>

FRONT SEAT BELT ANCHOR PLATE TENSIONER REPLACEMENT

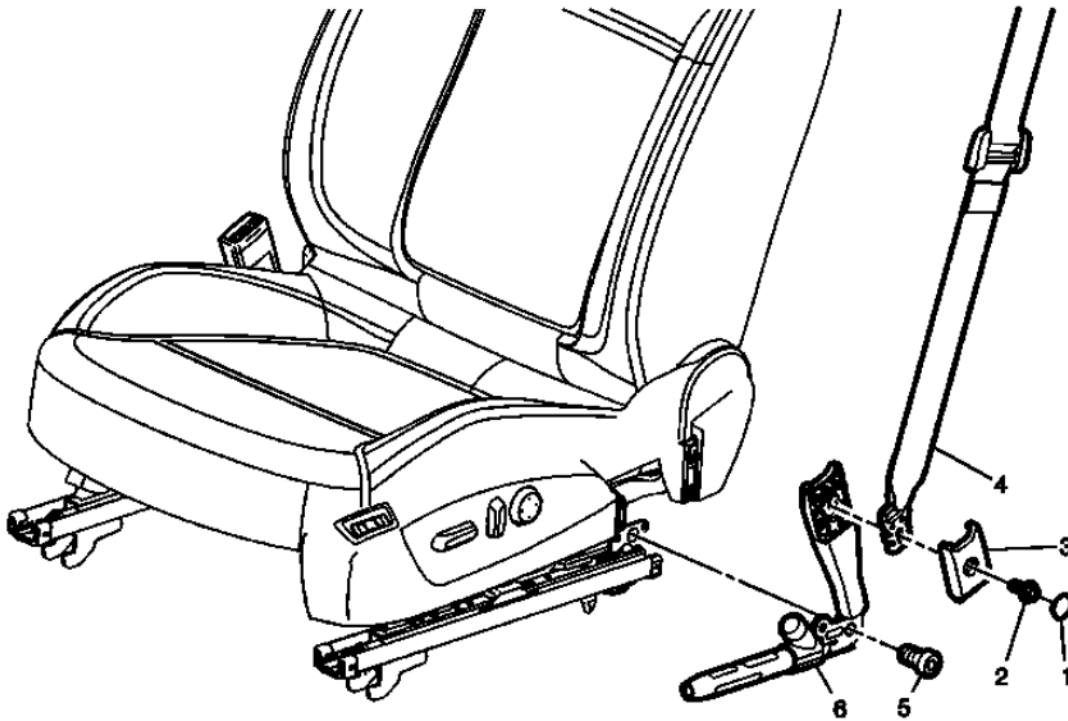


Fig. 37: Front Seat Belt Anchor Plate Tensioner
 Courtesy of GENERAL MOTORS COMPANY

Front Seat Belt Anchor Plate Tensioner Replacement

Callout	Component Name
WARNING: Refer to <u>SIR Warning</u> . WARNING: 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. Preliminary Procedures 1. Move the front seat to the full forward and full up position. 2. Disable the SIR. Refer to <u>SIR Disabling and Enabling</u>. 3. Remove the front seat adjuster track finish cover. Refer to <u>Front Seat Adjuster Track Finish Cover Replacement</u> . 4. Remove the driver or passenger seat belt anchor plate tensioner cover. Refer to <u>Front Seat Belt Anchor Plate Tensioner Cover Replacement</u> . 5. For pretensioner handling and scrapping. Refer to <u>Pretensioner Handling and Scrapping</u>.	

1	Driver or Passenger Seat Belt Tensioner Cover
2	Driver or Passenger Seat Belt Tensioner Cover Fastener CAUTION: Refer to <u>Fastener Caution</u> Tighten 7.5 N.m (66 lb in)
3	Driver or Passenger Seat Belt Tensioner Cover
4	Driver or Passenger Seat Belt Tensioner Seat Belt Latch Procedure Remove the seat belt with latch from front seat belt tensioner.
5	Driver or Passenger Seat Belt Tensioner Fastener Tighten 45 N.m (33 lb ft)
6	Driver or Passenger Seat Belt Tensioner Assembly Procedure Disconnect the electrical connector.

DRIVER OR PASSENGER SEAT RETRACTOR SIDE BELT REPLACEMENT

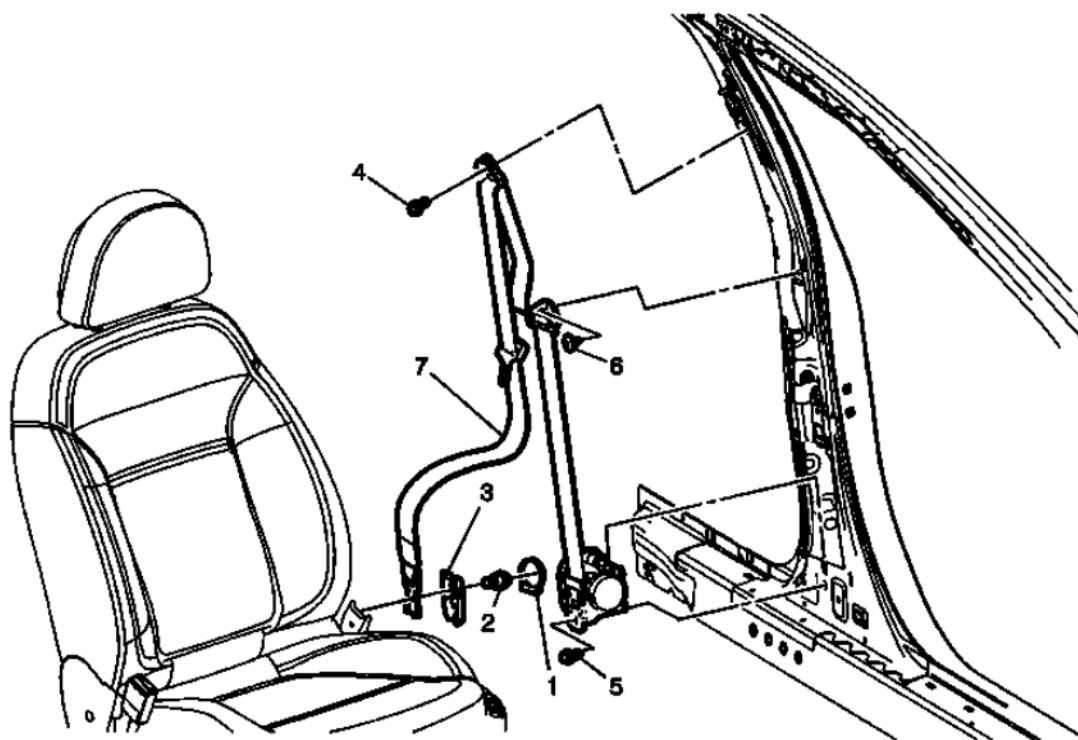


Fig. 38: Driver or Passenger Seat Retractor Side Belt
Courtesy of GENERAL MOTORS COMPANY

Driver or Passenger Seat Retractor Side Belt Replacement

Callout	Component Name
WARNING: Refer to <u>SIR Warning</u> . WARNING: Refer to <u>SIR Inflator Module Handling and Storage Warning</u> . WARNING: 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. Preliminary Procedures 1. Move the front seat to a full forward and full up position. 2. Disable the SIR. Refer to <u>SIR Disabling and Enabling</u>. 3. Remove the center pillar upper trim panel. Refer to <u>Center Pillar Upper Trim Panel Replacement</u> .	
1	Driver or Passenger Seat Belt Tensioner Cover
2	Driver or Passenger Seat Belt Tensioner Cover Fastener CAUTION: Refer to <u>Fastener Caution</u> . Tighten 7.5 N.m (66 lb in)
3	Driver or Passenger Seat Belt Tensioner Cover
4	Driver or Passenger Seat Retractor Side Belt Fastener (Upper) Tighten 45 (33 lb ft)
5	Driver or Passenger Seat Retractor Side Belt Fastener (Lower) Tighten 45 (33 lb ft)
6	Driver or Passenger Seat Retractor Side Belt Push On Retainer Procedure Use a flat-bladed tool to remove locking pin in retainer.
7	Driver or Passenger Seat Retractor Side Belt Assembly Procedure

- | | |
|--|---|
| | <ol style="list-style-type: none">1. Disconnect the electrical connector.2. Refer to Pretensioner Handling and Scrapping. |
|--|---|

REPAIRS AND INSPECTIONS REQUIRED AFTER A COLLISION

Accident With or Without Air Bag Deployment - Component Inspections

WARNING: Proper operation of the Supplemental Inflatable Restraint (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 of the air bag(s) in a frontal collision or deployment of the air bag(s) 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 the component or replace the hardware as needed.

- The steering column-Inspect the steering column for bending, twisting, buckling or any type of damage.
- The instrument panel knee bolsters and mounting points-Inspect the knee bolsters for bending, twisting, buckling, or any other type of damage.
- The instrument panel 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 **Repairs and Inspections Required After a Collision**.
- The instrument panel cross car beam-Inspect for bending, twisting, buckling, or any other type of damage.
- The instrument panel mounting points and brackets-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.
- The roof and headliner mounting points.
- The brake pedal --Inspect the brake pedal for bending, twisting, buckling or any type of damage.

Accident With Frontal Air Bag Deployment - Component Replacement and Inspections

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

- Driver Steering Wheel Air Bag
- Passenger instrument panel air bag, if deployed
- Inflatable Restraint Sensing and Diagnostic Module (SDM), if the Inflatable Restraint Sensing and Diagnostic Module has set DTC B0052 and will not clear
- Front and/or Side Impact Sensors
- Driver/Passenger Seat Side Air Bag, if deployed

- Seat back cover if Side Seat Air Bag is deployed
- Driver/Passenger Seat Belt Anchor and/or Retractor Pretensioners

Perform additional inspections on the following components.

- Steering wheel air bag coil and the coil wiring pigtail-Inspect for melting, scorching, or other damage due to excessive heat.
- Mounting points or mounting hardware for the passenger instrument panel air bag, steering wheel air bag, Inflatable Restraint Sensing and Diagnostic Module, seat side air bag (if deployed) and seat belt anchor and/or retractor pretensioners-Inspect for any damage and repair or replace each component as needed.

Accident With Side Seat Air Bag Deployment - Component Replacement and Inspections

After a collision involving driver/passenger side seat air bag deployment, replace the following components.

- Left/right side impact sensors on the side of the impact.
- Left/right roof rail air bag on the side of the impact.
- Inflatable Restraint Sensing and Diagnostic Module (SDM), if the Inflatable Restraint Sensing and Diagnostic Module has set DTC B0052 and will not clear.
- Inflatable Restraint Seat Belt Anchor and/or Retractor Pretensioner.
- Driver or passenger seat back cushion cover replacement.

WARNING: Do not repair or replace the seat stitching or seams in the seat back trim cover with an internal mounted seat side airbag module. Replace the complete seat back trim cover from the OEM. Non-OEM seat stitching may cause improper airbag deployment which could result in personal injury.

Perform additional inspections on the following components.

- Mounting points or mounting hardware for the side impact sensors, and driver/passenger side seat air bags on the side of impact-Inspect for any damage and repair or replace each component as needed.
- Mounting points, mounting hardware, headliner and trim pieces for the left/right roof rail air bag on the side of impact-Inspect for any damage and repair or replace each component as needed.
- Mounting points or mounting hardware for the Inflatable Restraint Sensing and Diagnostic Module and seat belt anchor and/or retractor pretensioners-Inspect for any damage and repair or replace each component as needed.
- The seat cushion frame
- The seat recliner and cover, if equipped
- The seat adjuster
- The seat back frame
- Door trim assembly
- Impacted seat cushion side covers and switches

Accident With Seat Belt Pretensioner Deployment Only - Component Replacement and Inspections

After a collision involving driver/passenger Seat Belt Retractor or Anchor Pretensioner deployment, replace the following components.

- Driver and Passenger Inflatable restraint seat belt anchor pretensioner and/or retractor pretensioner
- Inflatable Restraint Sensing and Diagnostic Module (SDM), if the Inflatable Restraint Sensing and Diagnostic Module has set DTC B0052 and will not clear

Perform additional inspections for any damage and repair or replace each component as needed on the following components.

- Mounting points or mounting hardware for the Inflatable Restraint Sensing and Diagnostic Module
- Mounting points or mounting hardware for the Seat Belt Anchor Pretensioners
- Mounting points or mounting hardware for the Seat Belt Retractor Pretensioners

Impact Sensor Replacement Guidelines

The impact sensor replacement policy requires replacing sensors in the area of the 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 object. If the vehicle has an impact sensor mounted forward of the radiator, it must be replaced.

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

Impact 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 system. Do not try to determine whether the impact sensor is undamaged, replace the impact sensor. Also, if you follow a diagnostic trouble code (DTC) procedure and a malfunctioning impact sensor is indicated, replace the impact sensor.

INFLATABLE RESTRAINT MODULE HANDLING AND SCRAPPING

Special Tools

- **EL-38826** SIR Deployment Harness
- **EL-39401-B** SIR Deployment Fixture

For equivalent regional tools, refer to **Special Tools**.

Live and Undeployed Air Bag

WARNING: Refer to SIR Inflator Module Handling and Storage Warning .

Take special care when handling or storing an undeployed air bag. An air bag deployment produces a rapid

generation of gas. This may cause the air bag, or an object in front of the air bag, to project through the air in the event of an unlikely deployment.

Dual Stage Air Bags

Dual stage air bags have two deployment stages. If stage 1 was used to deploy a dual stage air bag, stage 2 may still be active. Therefore, a deployed dual stage air bag must be treated as an active air bag. If disposal of a dual stage air bag 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 air bag. Do NOT dispose a live and undeployed air bag through normal disposal channels until the air bag has been deployed.

Do not deploy the air bag in the following situations:

- After replacement of an air bag under warranty-the air bag may need to be returned undeployed to the manufacturer.
- If the vehicle is the subject of a product liability claim, 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 air bags - follow the instructions in the campaign service bulletin for proper SIR handling procedures.

Deployment Procedures

NOTE: Some countries, states or localities may not allow service deployment of air bags without special permission or training. Local laws regarding deploying and scrapping of air bags/devices with pyrotechnics must be followed.

You can deploy the air bag 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 Air Bag, Instrument Panel Air Bag, and Roof Rail Air Bag

Deploy the air bag 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 air bag is malfunctioning.
- The air bag is cosmetically damaged, scratched, or ripped.
- The air bag pigtail is damaged.
- The air bag connector is damaged.
- The air bag connector terminals are damaged.

Deployment and disposal of a malfunctioning air bag is subject to any required retention period.

WARNING: Refer to SIR Inflator Module Disposal Warning .

1. Turn OFF the ignition.

WARNING: Refer to SIR Inflator Module Handling and Storage Warning .

2. Remove the air bag.

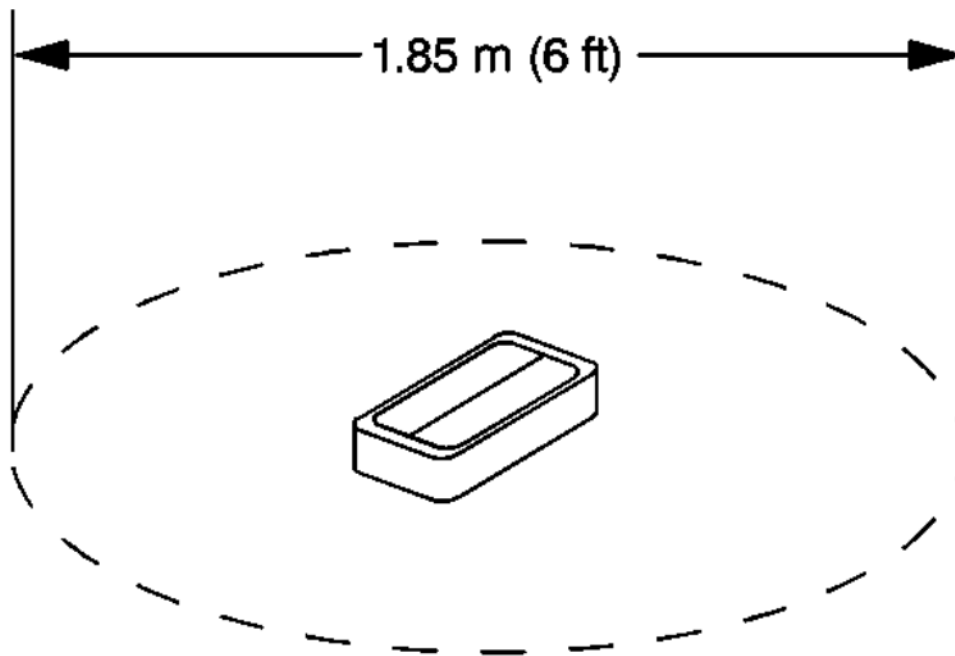


Fig. 39: Identifying Clearance For Deployment Of Inflator Module
Courtesy of GENERAL MOTORS COMPANY

3. Clear a space on the ground about 1.85 m (6 ft) in diameter for deployment of the air bag 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.

4. Clear the area of loose or flammable objects.

NOTE: Dual stage deployments are only used in steering wheel and instrument panel air bags. If stage 1 was used to deploy a dual stage air bag, stage 2 may still be active. If disposal of a dual stage air bag is required, both deployment loops must be energized to deploy the air bag.

5. If you are deploying a steering wheel air bag, place the air bag in the center of the space with the vinyl trim cover facing up and away from the surface.

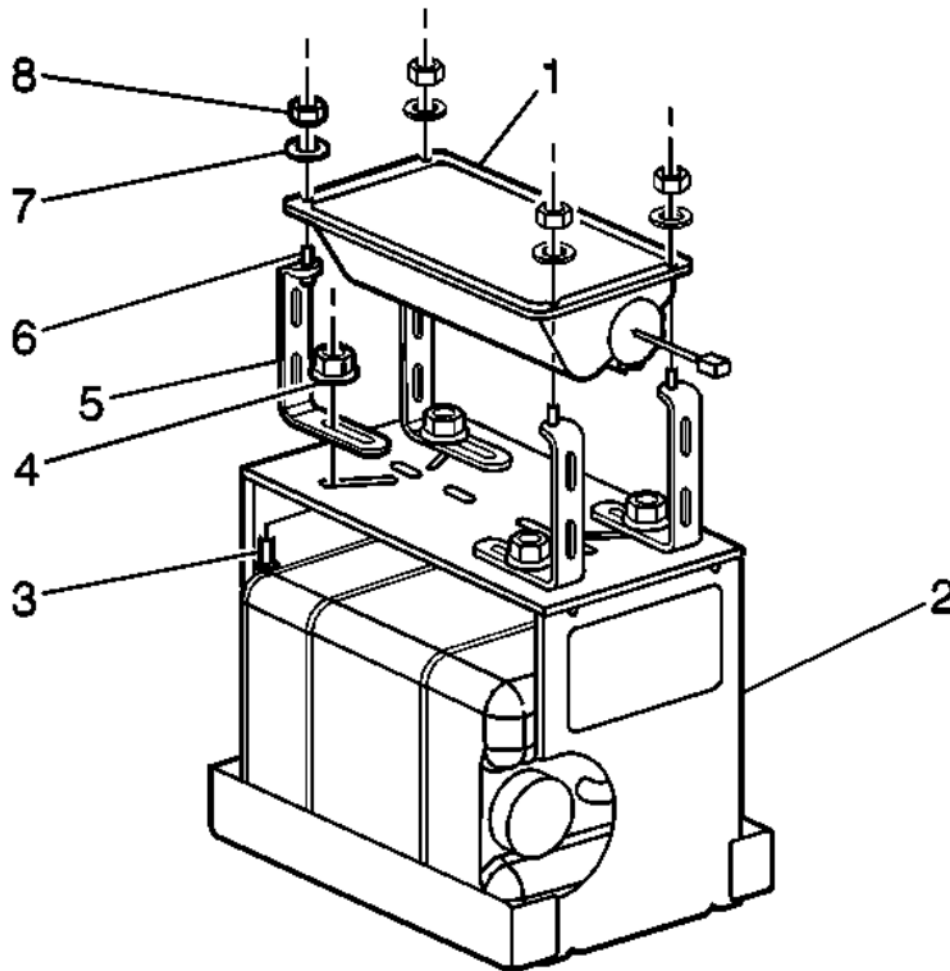


Fig. 40: Identifying I/P Module Components
Courtesy of GENERAL MOTORS COMPANY

6. When deploying an instrument panel air bag, perform the following instructions:
 1. Place the **EL-39401-B** fixture in the center of the cleared area.
 2. Fill the deployment fixture with water or sand.

3. Using the proper nuts and bolts, mount the instrument panel air bag (1) to the deployment fixture (2), with the vinyl trim facing up.
4. Securely tighten all fasteners that hold the instrument panel air bag (1) to the deployment fixture (2).

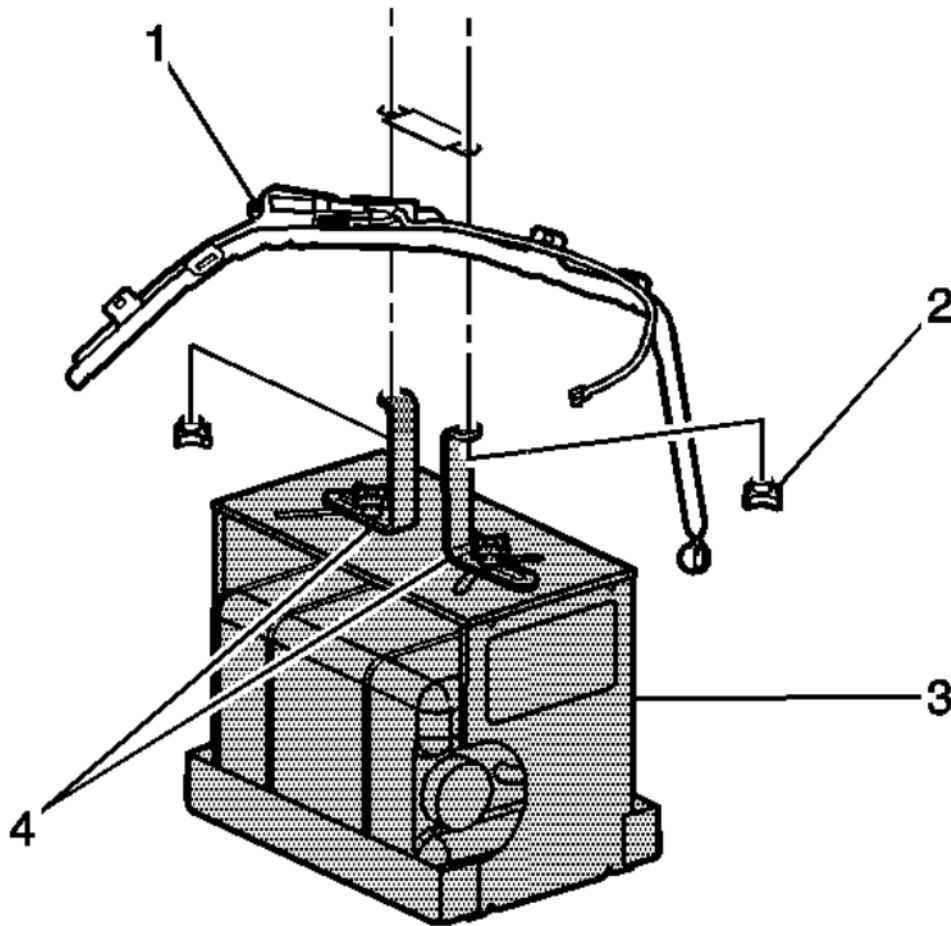


Fig. 41: Identifying Fasteners Holding Side Impact Module To Deployment Fixture
Courtesy of GENERAL MOTORS COMPANY

7. When deploying a roof rail air bag, perform the following instructions:
 1. Place the **EL-39401-B** fixture (3) in the center of the cleared area.
 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 air bag in the deployment fixture and securely tighten all fasteners.

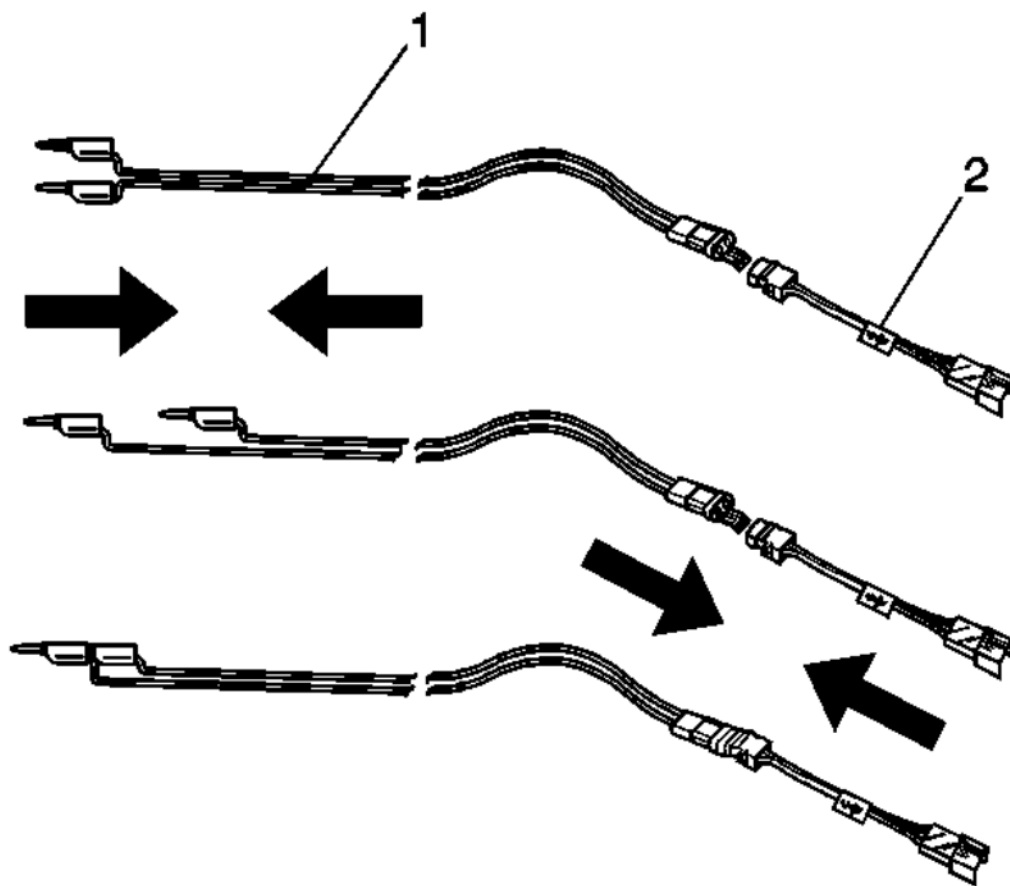


Fig. 42: Identifying SIR Deployment Harness & Adapter
Courtesy of GENERAL MOTORS COMPANY

8. Inspect the **EL-38826** harness and the appropriate pigtail adapter (2) for damage. Replace as needed.
9. Short the 2 SIR deployment harness leads (1) together using one banana plug seated into the other.
10. Connect the appropriate pigtail adapter (2) to the SIR deployment harness (1).

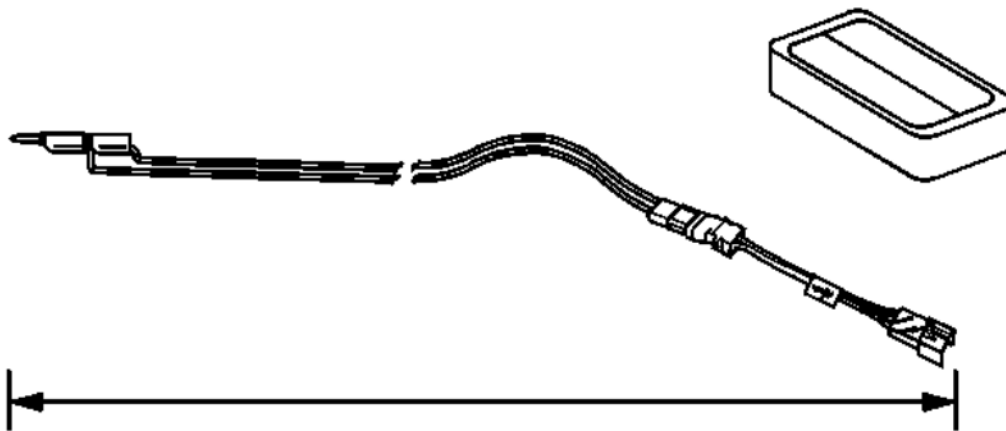


Fig. 43: Extending SIR Deployment Harness & Adapter
Courtesy of GENERAL MOTORS COMPANY

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

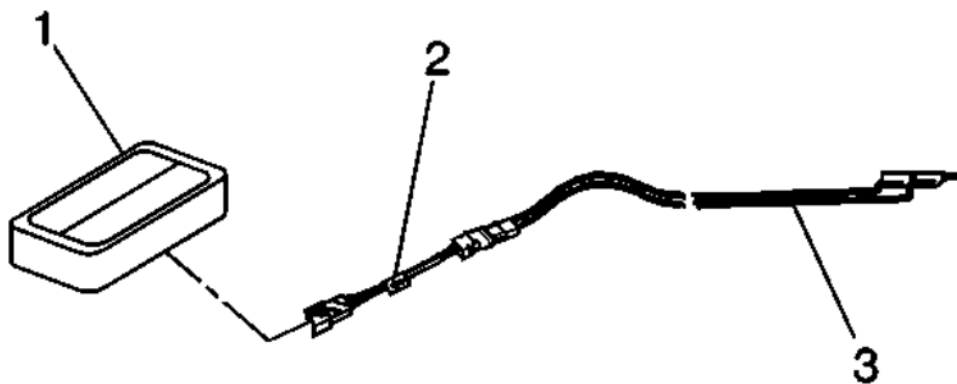


Fig. 44: Identifying Inflator Module, SIR Deployment Harness & Adapter
Courtesy of GENERAL MOTORS COMPANY

NOTE: On a dual stage air bag, 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.

12. Connect the air bag (1) to the adapter (2) on the SIR deployment harness (3).

NOTE:

- The rapid expansion of gas involved with deploying an air bag is very loud. Notify all the people in the immediate area that you intend to deploy the air bag.
- When the air bag deploys, the deployment fixture may jump about 30 cm (1 ft) vertically. This is a normal reaction of the air bag due to the force of the rapid expansion of gas inside the air bag.

- If you are deploying a dual stage air bag with stage 1 already deployed, the fixture may not move and the noise may have been reduced.

13. Clear the area of people.

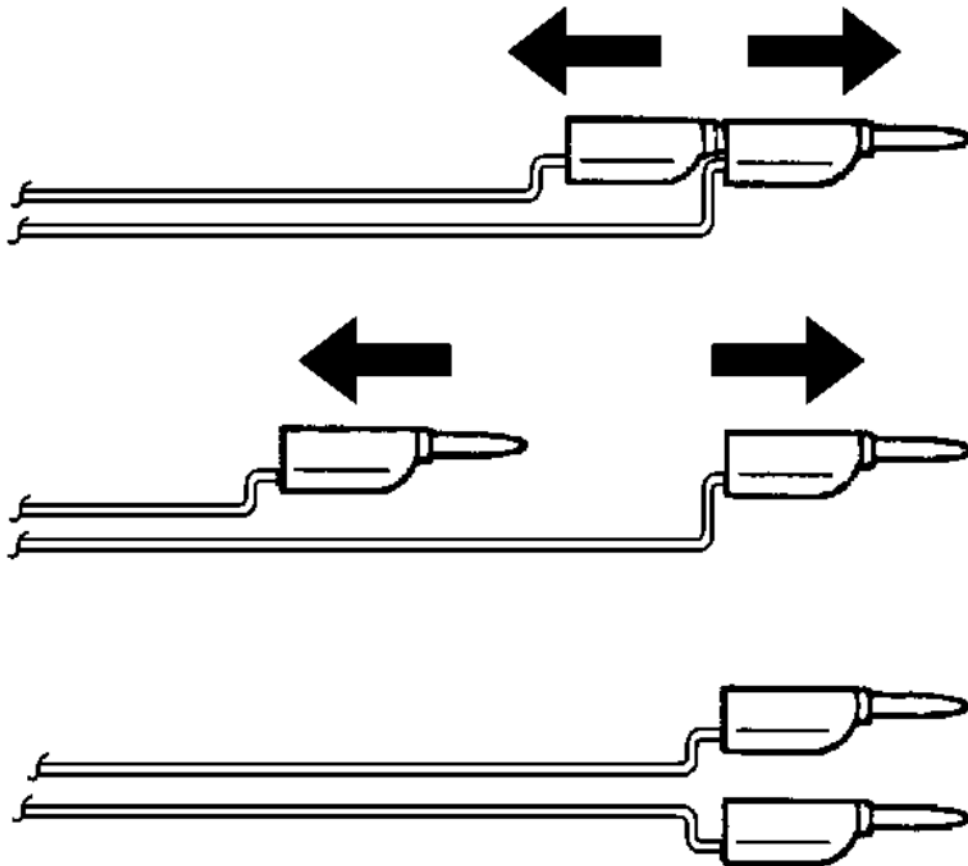


Fig. 45: View Of Banana Plugs

Courtesy of GENERAL MOTORS COMPANY

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

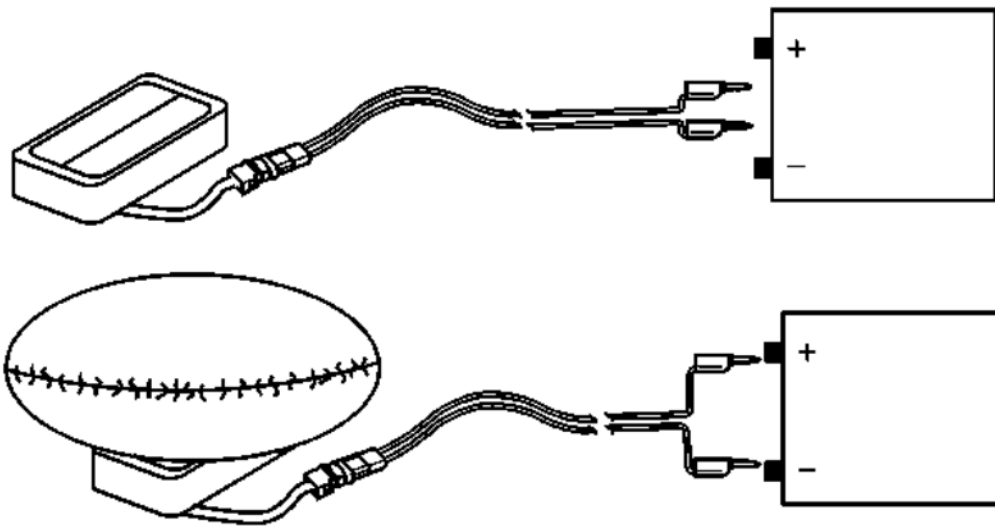


Fig. 46: Identifying SIR Deployment Harness Wires And Power Source
Courtesy of GENERAL MOTORS COMPANY

15. Place a 12 V minimum/2A minimum power source, such as a vehicle battery, near the shorted end of the harness.
16. Connect the SIR deployment harness wires to the power source. Deployment of the air bag will occur when contact is made.

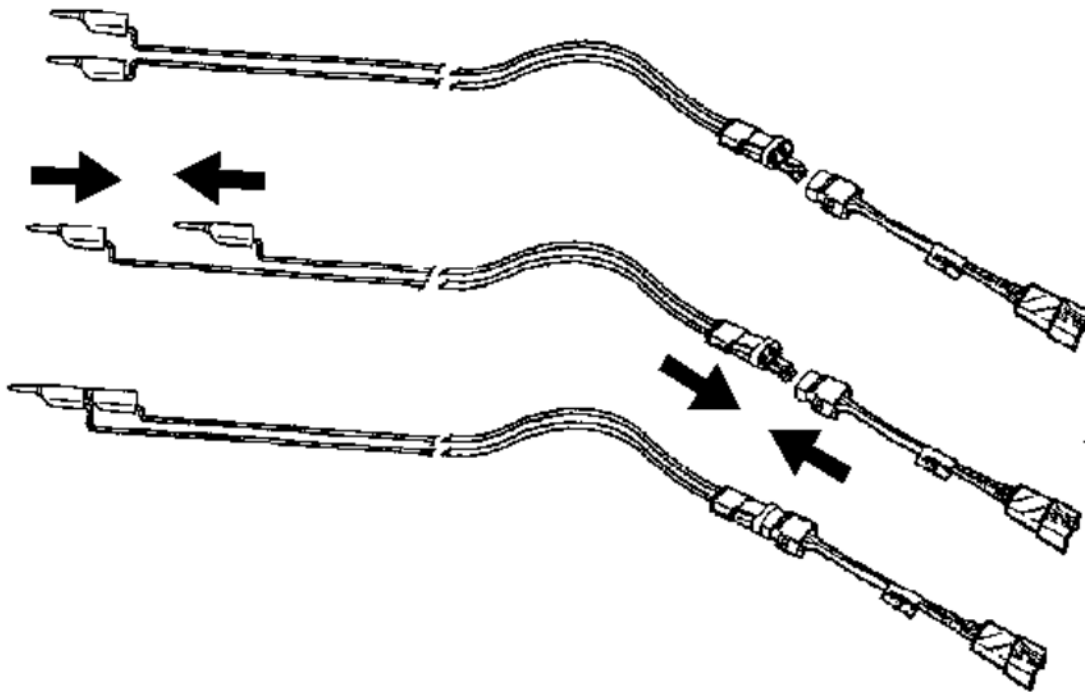


Fig. 47: View Of Deployment Harness Leads
Courtesy of GENERAL MOTORS COMPANY

17. Disconnect the SIR deployment harness from the power source after the air bag deploys.
18. If the air bag 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.

WARNING: Refer to SIR Deployed Inflator Modules Are Hot Warning .

19. Seat one banana plug into the other in order to short the deployment harness leads.
20. Put on a pair of shop gloves.

21. Disconnect the pigtail adapter from the air bag as soon as possible.
22. Inspect the pigtail adapter and the SIR deployment harness. Replace as needed.
23. Dispose of the deployed air bag through normal refuse channels.
24. Wash your hands with a mild soap.

Deployment Inside Vehicle - Vehicle Scrapping Procedure

Deploy the air bags 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 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.

WARNING: Refer to SIR Inflatable Module Deployment Outside Vehicle Warning .

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 air bags which will be deployed are mounted securely.
4. Remove all loose objects from the front seats.

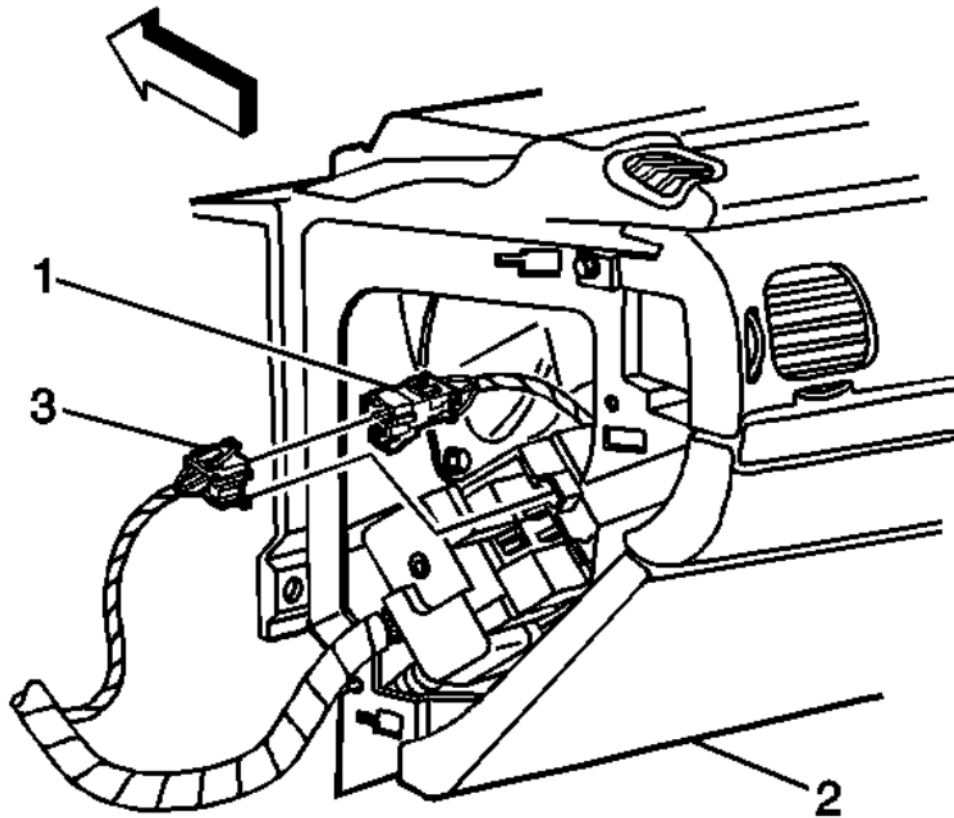


Fig. 48: Identifying I/P Module Connector To Vehicle Harness Connector (LH Side I/P)
Courtesy of GENERAL MOTORS COMPANY

WARNING: 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.

5. Disconnect the steering wheel air bag yellow connector (1) from vehicle harness yellow connector (3).

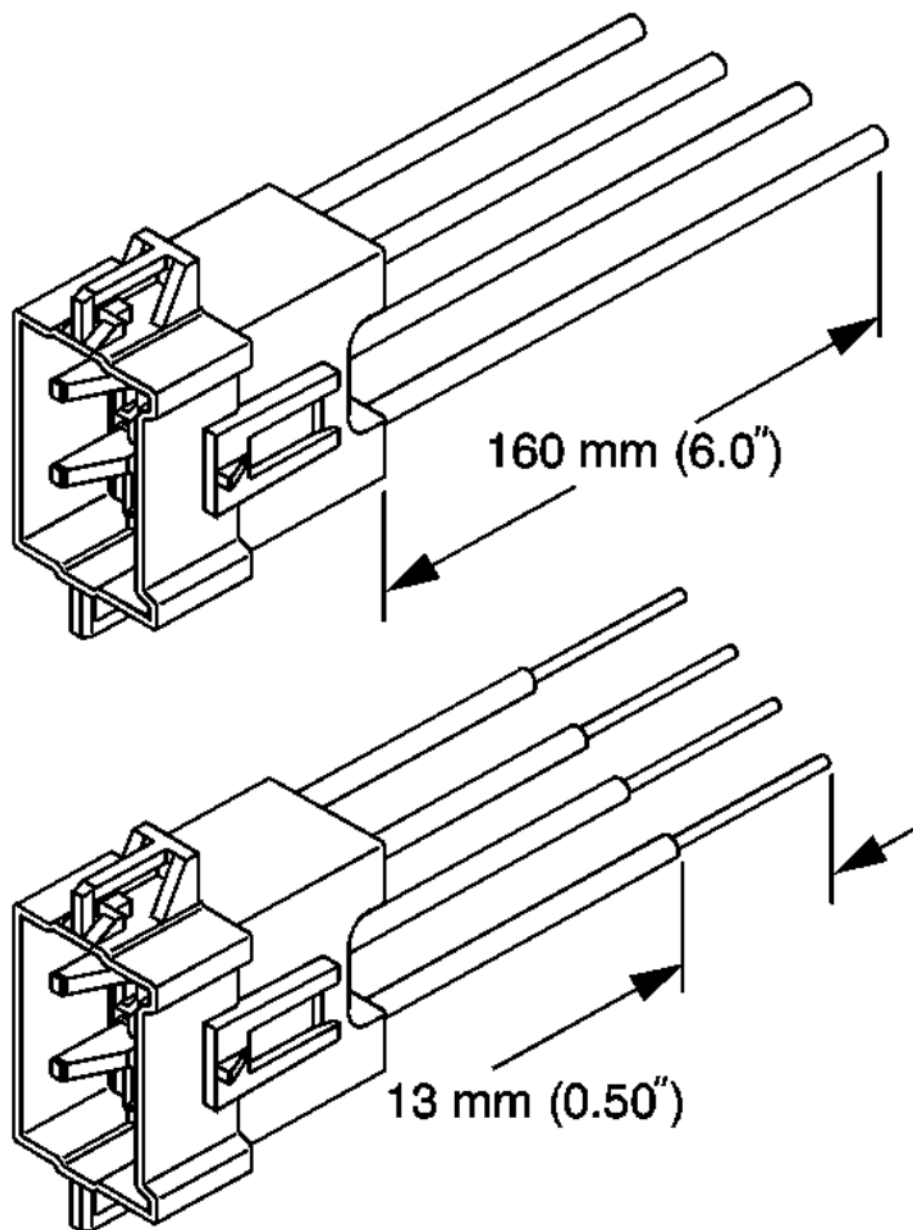


Fig. 49: Identifying Striped Wires
Courtesy of GENERAL MOTORS COMPANY

NOTE: If the vehicle is equipped with dual stage air bags the steering wheel air

bag and instrument panel air bag will each have 4 wires. Refer to **COMPONENT CONNECTOR END VIEWS - INDEX** for determining high and low circuits.

6. Cut the yellow 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.

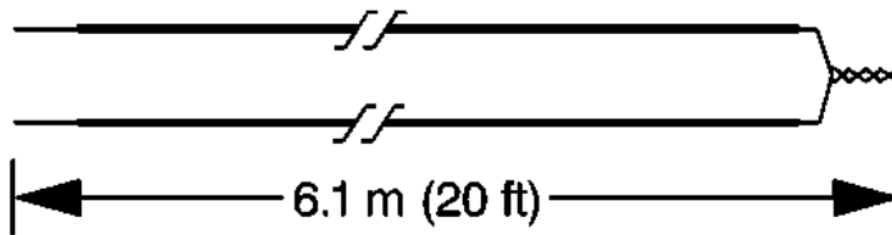


Fig. 50: View Of Deployment Harness
Courtesy of GENERAL MOTORS COMPANY

8. Cut two 6.1 m (20 ft) deployment wires from a 0.8 mm (18 gauge) or thicker multi-strand wire. Use these wires to fabricate the driver deployment harness.
9. Strip 13 mm (0.5 in) of insulation from both ends of the wires.
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 air bag.

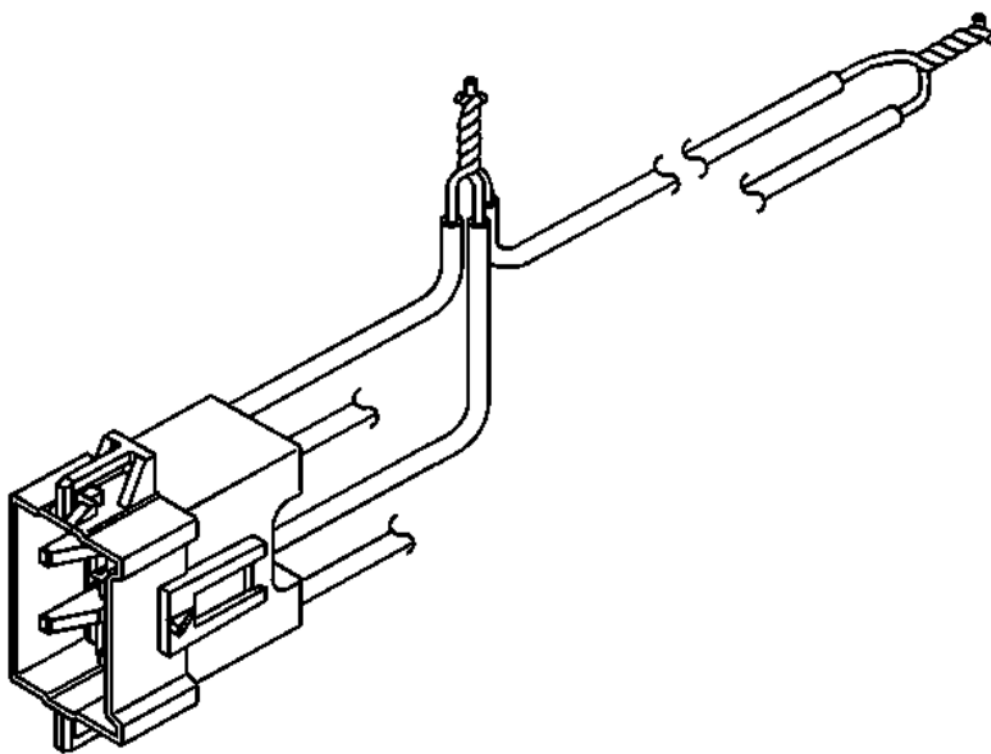


Fig. 51: Connector Wire Leads (High Circuits) And Deployment Harness Wire
Courtesy of GENERAL MOTORS COMPANY

11. Twist together the 2 connector wire leads from the high circuits from both stages of the steering wheel air bag, to one set of deployment wires. Refer to **COMPONENT CONNECTOR END VIEWS - INDEX** in order to determine the correct circuits.
12. Inspect that the 3-wire connection is secure.
13. Secure and insulate the 3-wire connection to the deployment harness using electrical tape.

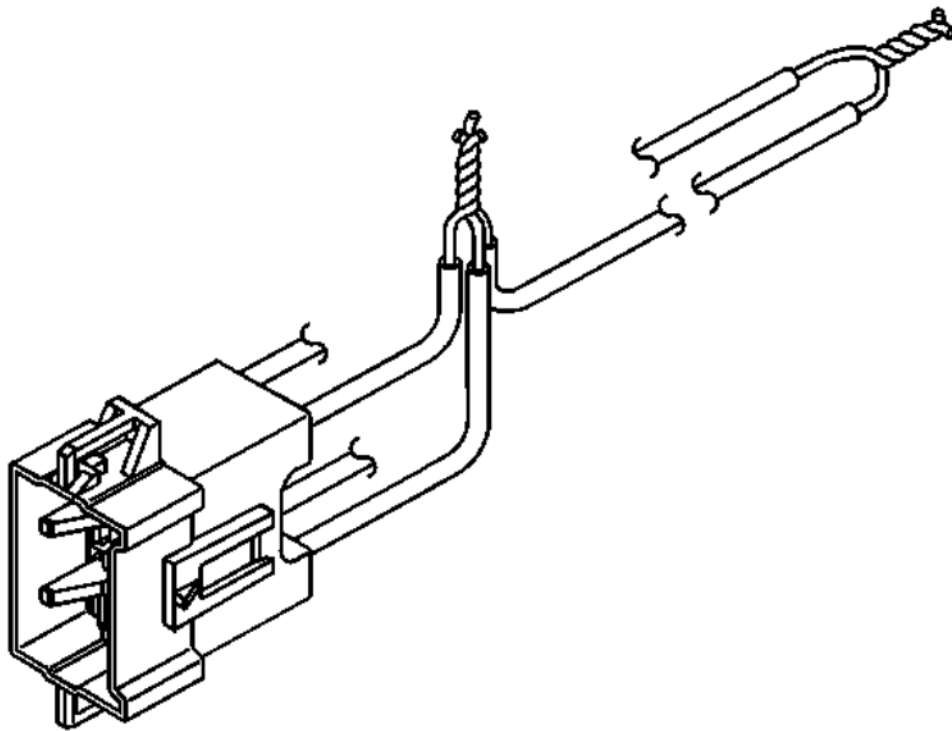


Fig. 52: Connector Wire Leads (Low Circuits) And Deployment Harness Wire
 Courtesy of GENERAL MOTORS COMPANY

14. Twist together the 2 connector wire leads from the low circuits from both stages of the steering wheel air bag, to one set of deployment wires. Refer to **COMPONENT CONNECTOR END VIEWS - INDEX** in order to determine the correct circuits.
15. Inspect that the 3-wire connection is secure.
16. Secure and insulate the 3-wire connection to the deployment harness using electrical tape.
17. Connect the deployment harness to the connector on the steering wheel air bag.
18. Route the deployment harness out of the driver side of the vehicle.
19. Disconnect the yellow left roof rail harness connector from the vehicle harness connector.
20. Cut the harness connector out of the vehicle, leaving at least 16 cm (6 in) of wire at the connector.
21. Strip 13 mm (0.5 in) of insulation from each of the connector wire leads.
22. Cut two 6.1 m (20 ft) deployment wires from a 0.8 mm (18 gauge) or thicker multi-strand wire. These wires will be used to fabricate the roof rail air bag deployment harness.
23. Strip 13 mm (0.5 in) of insulation from both ends of the wires.

24. Twist together one end from each of the wires in order to short the wires.
25. Twist together one connector wire lead to one deployment wire.
26. Secure and insulate the connection using electrical tape.
27. Twist together and tape the remaining connector wire lead to the remaining deployment wire.
28. Connect the deployment harness to the yellow connector of the roof rail air bag.
29. Route the deployment harness out of the driver side of the vehicle.

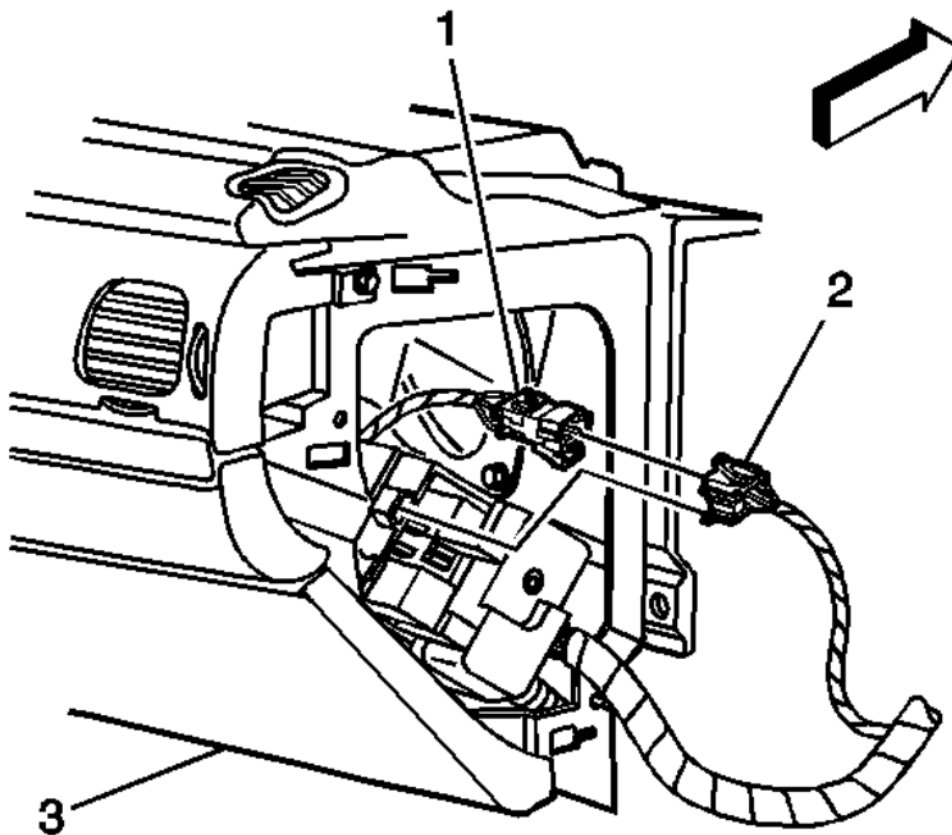


Fig. 53: Identifying I/P Module Connector And Vehicle Harness Connector
Courtesy of GENERAL MOTORS COMPANY

30. Disconnect the instrument panel air bag yellow harness connector (1) from the vehicle harness connector (2).

NOTE: If the vehicle is equipped with dual stage air bags the steering wheel air bag and instrument panel air bag will each have 4 wires. Refer to COMPONENT CONNECTOR END VIEWS - INDEX for determining high and low circuits.

31. Cut the yellow harness connector out of the vehicle, leaving at least 16 cm (6 in) of wire at the connector.
32. Strip 13 mm (0.5 in) of insulation from each of the connector wire leads.
33. Cut two 6.1 m (20 ft) deployment wires from a 0.8 mm (18 gauge) or thicker multi-strand wire. These wires will be used to fabricate the passenger deployment harness.
34. Strip 13 mm (0.5 in) of insulation from both ends of the wires.
35. Twist together one end from each of the wires in order to short the wires.
36. Twist together the 2 connector wire leads from the high circuits from both stages of the instrument panel air bag to one set of deployment wires. Refer to **COMPONENT CONNECTOR END VIEWS - INDEX** in order to determine the correct circuits.
37. Inspect that the 3-wire connection is secure.
38. Secure and insulate the 3-wire connection to the deployment harness using electrical tape.
39. Twist together the 2 connector wire leads from the low circuits from both stages of the instrument panel air bag to one set of deployment wires. Refer to **COMPONENT CONNECTOR END VIEWS - INDEX** in order to determine the correct circuits.
40. Inspect that the 3-wire connection is secure.
41. Secure and insulate the 3-wire connection to the deployment harness using electrical tape.
42. Connect the deployment harness to the instrument panel air bag in-line connector.
43. Route the deployment harness out of the passenger side of the vehicle.
44. Disconnect the yellow harness connector to the right roof rail air bag from the vehicle harness connector.
45. Cut the harness connector out of the vehicle, leaving at least 16 cm (6 in) of wire at the connector.
46. Strip 13 mm (0.5 in) of insulation from each of the connector wire leads.
47. Cut two 6.1 m (20 ft) deployment wires from a 0.8 mm (18 gauge) or thicker multi-strand wire. These wires will be used to fabricate the roof rail air bag deployment harness.
48. Strip 13 mm (0.5 in) of insulation from both ends of the wires.
49. Twist together one end from each of the wires in order to short the wires.
50. Twist together one connector wire lead to one deployment wire.
51. Secure and insulate the connection using electrical tape.
52. Twist together and tape the remaining connector wire lead to the remaining deployment wire.
53. Connect the deployment harness to the roof rail air bag yellow connector.
54. Route the deployment harness out of the passenger side of the vehicle.
55. Completely cover the windshield and the front door window openings with a drop cloth.
56. Stretch to the full length all of the deployment harness wires on the right side of the vehicle.
57. Deploy each deployment loop one at a time.
58. Place a power source, 12 V minimum/2A minimum, such as a vehicle battery, near the shorted end of the harnesses.
59. Separate one set of wires and touch the wire ends to the power source in order to deploy the selected air bag.
60. Disconnect the deployment harness from the power source and twist the wire ends together.
61. Continue the same process with the remaining deployment harnesses.

62. Disconnect all harnesses from the vehicle.
63. Discard the harnesses.
64. Scrap the vehicle in the same manner as a non-SIR equipped vehicle.
65. If one or all of the air bags did not deploy, remove the undeployed air bags from the vehicle.

PRETENSIONER HANDLING AND SCRAPPING

Scrapping Procedure

During the course of a vehicle's useful life, certain situations may arise which will necessitate the disposal of a live (undeployed) pretensioner. The following information covers the proper procedures for the disposing of a live (undeployed) pretensioner. Deploy the pretensioner before disposal. Do not dispose of a live (undeployed) pretensioner through normal disposal channels until the pretensioner has been deployed. The following information covers the proper procedures for the disposing of a live (undeployed) pretensioner.

- After replacement of a pretensioner under warranty. The pretensioner may need to be returned undeployed to the original manufacturer of pretensioner.
- If the vehicle is the subject of a Product Liability report related to the SIR system and is subject to a Preliminary Investigation (GM-1241). Do not alter the SIR system in any manner.
- If the vehicle is involved in a campaign affecting the pretensioners. Follow the instructions in the Campaign Service Bulletin for proper SIR handling procedures.

Deployment Procedures

NOTE: Some countries, states or localities may not allow service deployment of air bags without special permission or training. Local laws regarding deploying and scrapping of air bags/devices with pyrotechnics must be followed.

The 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 Inside the Vehicle

Refer to **Inflatable Restraint Module Handling and Scrapping** for deploying the pretensioner inside vehicle under Vehicle Scrapping Procedure.

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, you determine that the seat belt pretensioner is malfunctioning.
- The pretensioner pigtail (if equipped) is damaged.
- The pretensioner connector is damaged.

- The pretensioner connector terminal is damaged.

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

WARNING: In order to prevent accidental deployment of the pretensioner which could cause personal injury, do not dispose of an undeployed pretensioner as normal shop waste. The undeployed pretensioner contains substances that could cause severe illness or personal injury if the sealed container is damaged during disposal. Use the following deployment procedures to safely dispose of an undeployed pretensioner. Failure to dispose of a pretensioner as instructed may be a violation of federal, state, or local laws.

WARNING: When you are deploying a pretensioner for disposal, perform the deployment procedures in the order listed. Failure to follow the procedures in the order listed may result in personal injury.

Special Tools

- **EL-39401-B** SIR Deployment Fixture
- **EL-38826** SIR Deployment Harness

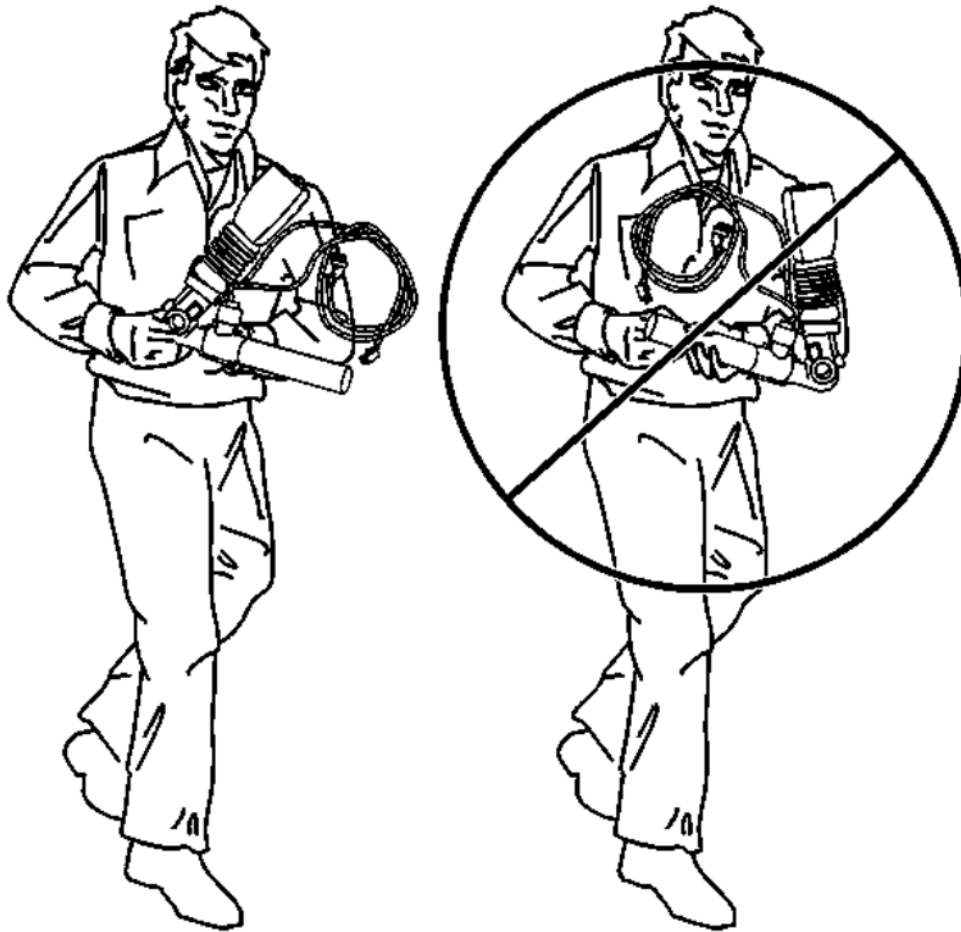


Fig. 54: Proper Pretensioner Carrying
Courtesy of GENERAL MOTORS COMPANY

1. Turn the ignition switch to the OFF position.
2. Remove the ignition key.
3. Put on safety glasses.
4. Remove the seat belt pretensioner from the vehicle.
5. When carrying a pretensioner to the deployment area keep the open end of pretensioner pointed away from the body.

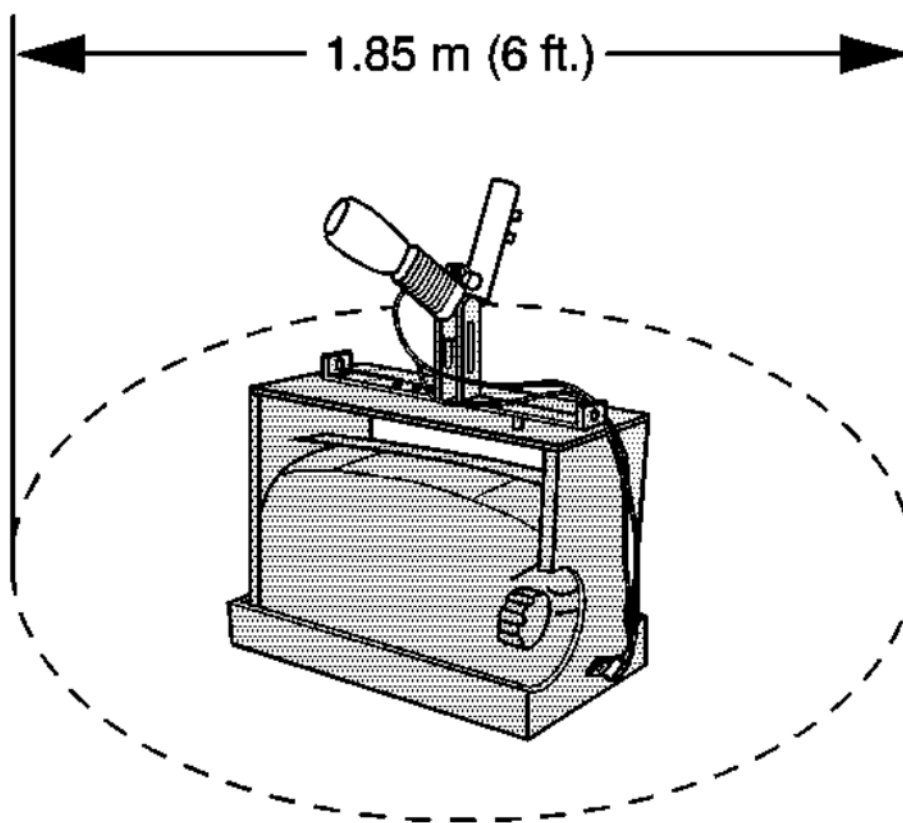


Fig. 55: Pretensioner Deployment Area
Courtesy of GENERAL MOTORS COMPANY

6. Clear a space on the ground about 1.85 M (6 ft) in diameter for deployment of the 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 **EL-39401-B** SIR deployment fixture in the center of the cleared area.
9. Fill the fixture plastic reservoir with water or sand.

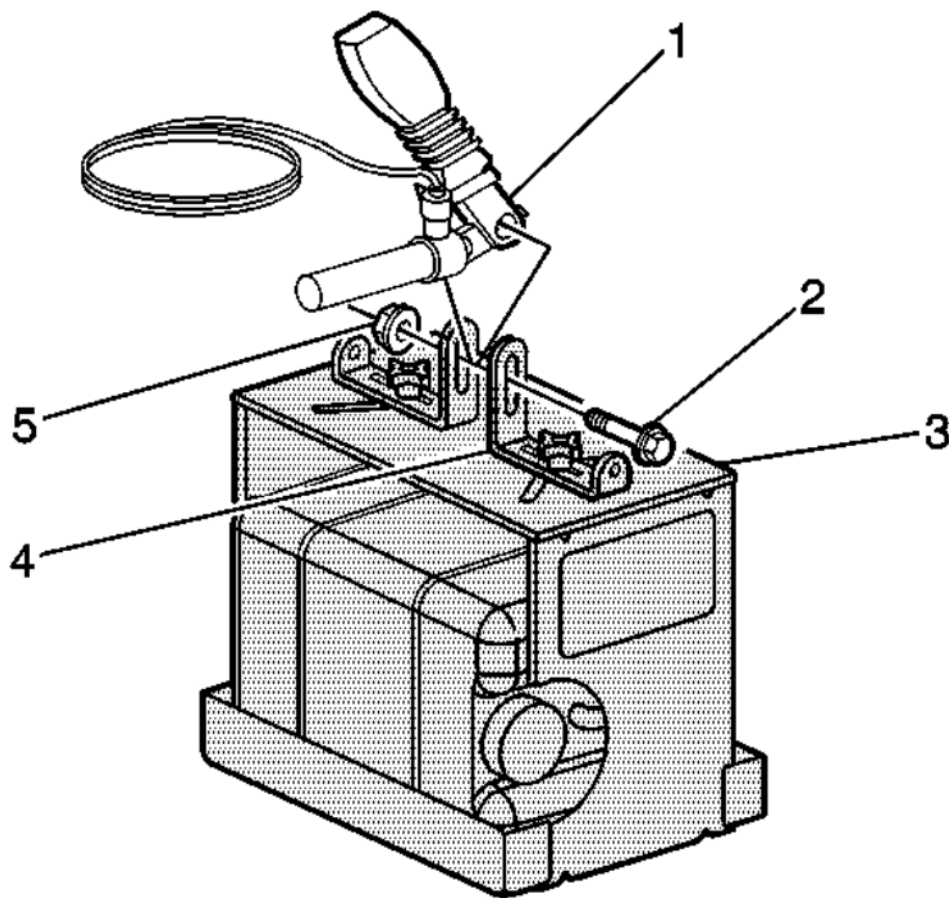


Fig. 56: Mounting Pretensioner In SIR Deployment Fixture
Courtesy of GENERAL MOTORS COMPANY

10. Mount the pretensioner (1) in the SIR deployment fixture (3) with the open end facing up using the following mounting method.
 1. Adjust and secure the EL-39401-B arms (4) to the deployment fixture (3).
 2. To mount, use the proper size bolt (2) and nut (5) with washers in order to secure the pretensioner (1) to the deployment fixture brackets (4).
 3. Securely tighten all fasteners prior to deployment.

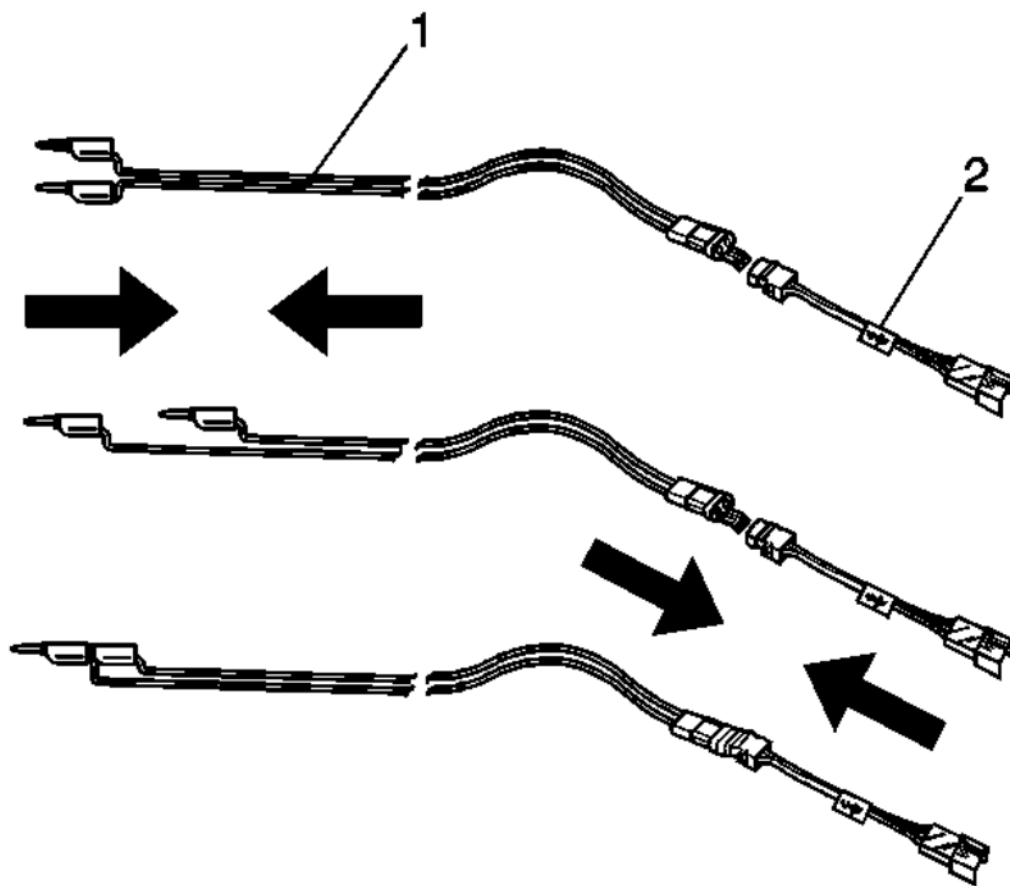


Fig. 57: Identifying SIR Deployment Harness & Adapter
Courtesy of GENERAL MOTORS COMPANY

11. Inspect the **EL-38826** SIR deployment harness and the appropriate pigtail adapter for damage. 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 (1).

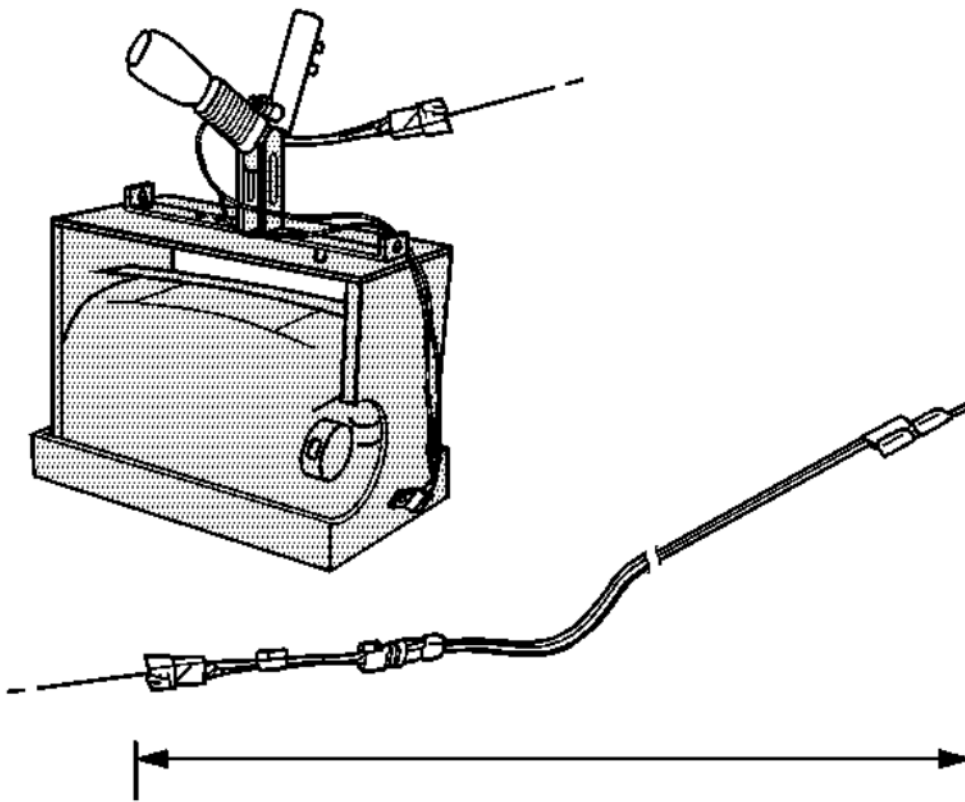


Fig. 58: SIR Deployment Harness & Adapter
Courtesy of GENERAL MOTORS COMPANY

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

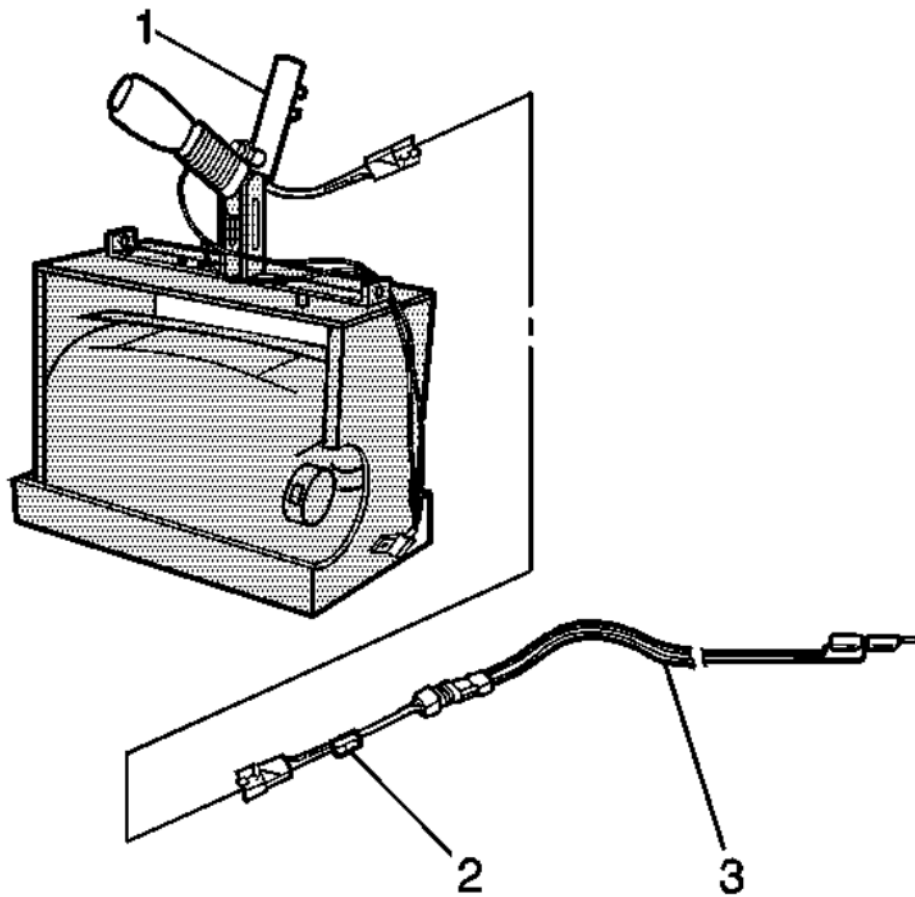


Fig. 59: View Of Pretensioner, Adapter & Deployment Harness
Courtesy of GENERAL MOTORS COMPANY

15. Connect the pretensioner (1) to the adapter (2) on the deployment harness (3).

NOTE: The rapid gas expansion involved with deploying a pretensioner is very loud. Notify all the people in the immediate area that you intend to deploy the seat belt pretensioner.

16. Clear the area of people.

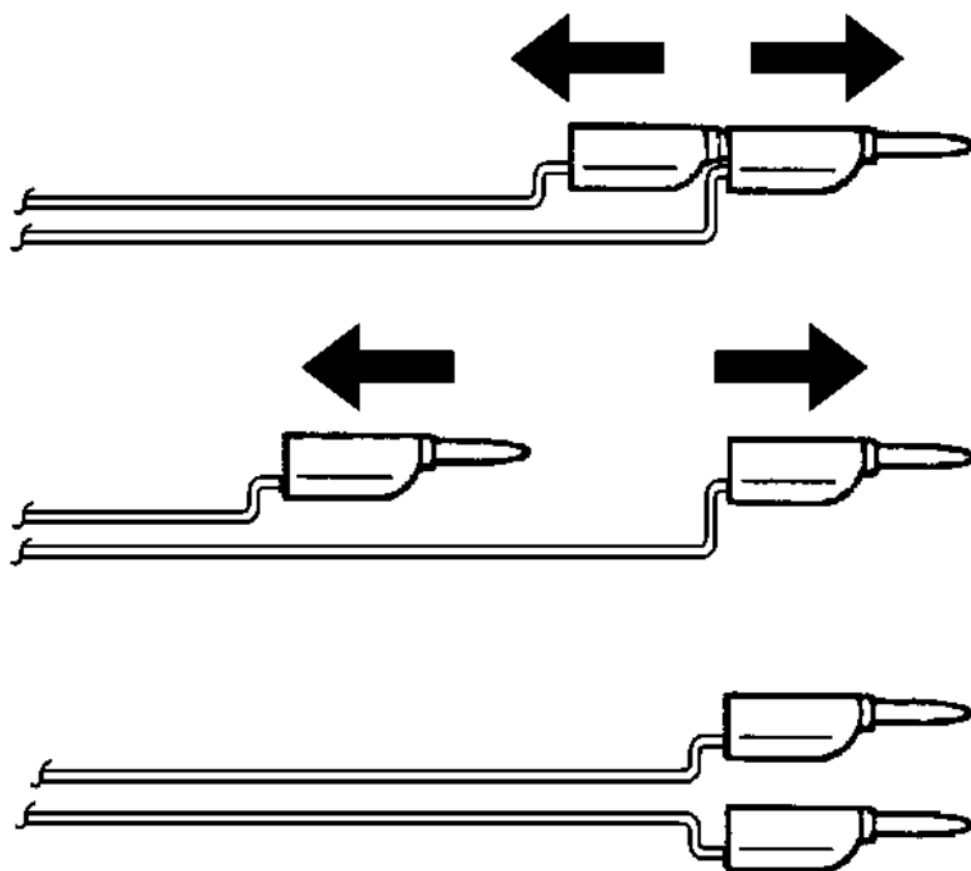


Fig. 60: View Of Banana Plugs

Courtesy of GENERAL MOTORS COMPANY

WARNING: When you are deploying a pretensioner for disposal, perform the deployment procedures in the order listed. Failure to follow the procedures in the order listed may result in personal injury.

17. Separate the 2 banana plugs on the SIR deployment harness.

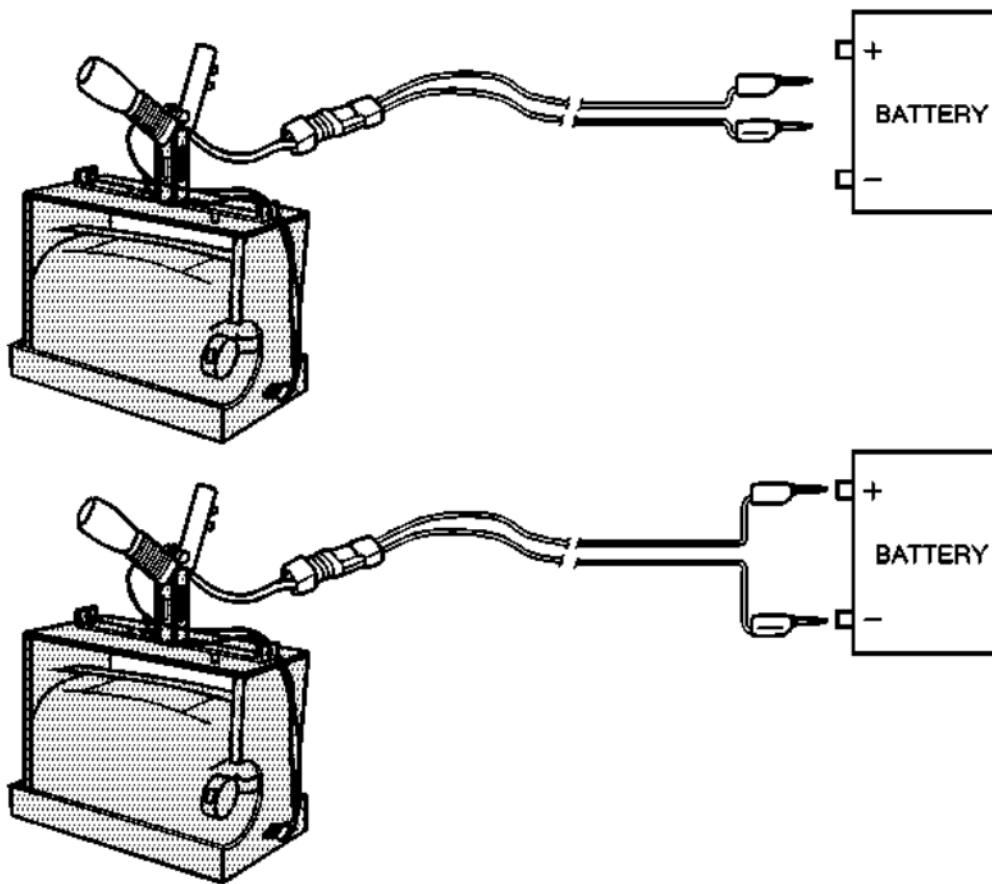


Fig. 61: Pretensioner & Power Source
Courtesy of GENERAL MOTORS COMPANY

NOTE: When the seat belt pretensioner deploys, the deployment fixture may jump about 30 cm (1 ft) vertically. This is a normal reaction of the seat belt pretensioner due to the force of the rapid expansion of gas inside the pretensioner.

18. Place a 12 V minimum/2 A minimum power source (i.e., vehicle battery) near the shorted end of the harness.
19. Connect the SIR deployment harness wires to the power source. Pretensioner deployment will occur when contact is made.
20. Disconnect the SIR deployment harness from the power source after the pretensioner deploys.

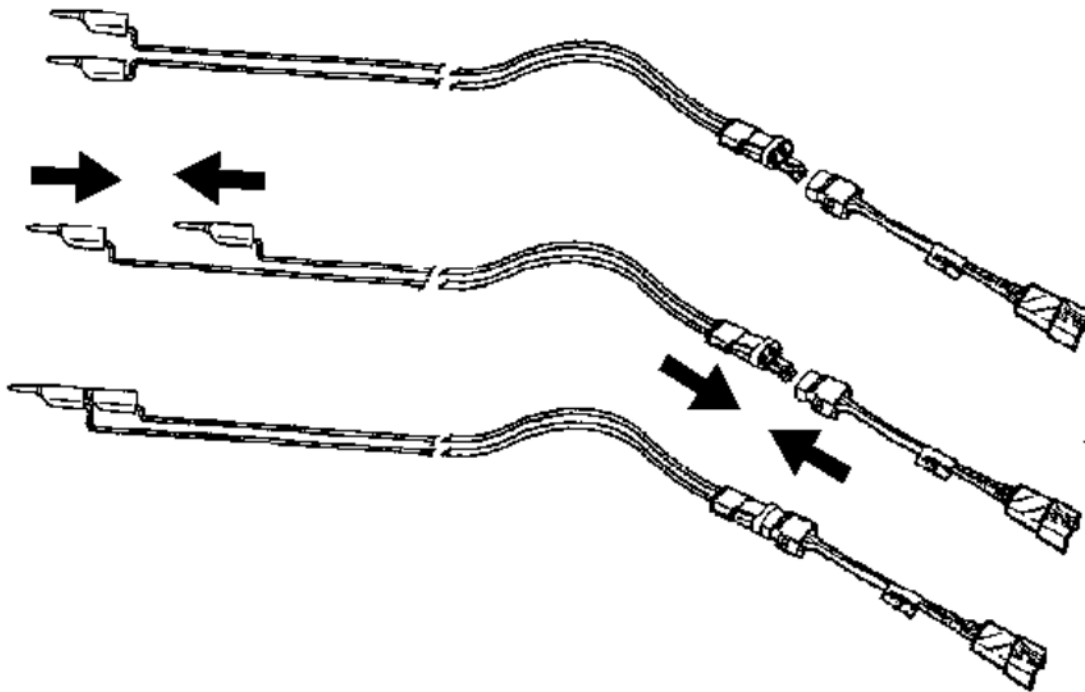


Fig. 62: View Of Deployment Harness Leads
Courtesy of GENERAL MOTORS COMPANY

21. Seat one banana plug into the other in order to short the deployment harness leads.
22. If the 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 pretensioner as soon as possible.
25. Inspect the pigtail adapter and the SIR deployment harness. Replace as needed.
26. Dispose of the deployed pretensioner through normal refuse channels.
27. Wash hands with a mild soap.

DESCRIPTION AND OPERATION

SUPPLEMENTAL INFLATABLE RESTRAINT SYSTEM DESCRIPTION AND OPERATION

SIR System Overview

The supplemental inflatable restraint (SIR) system supplements the protection offered by the seat belts. The SIR system contains an inflatable restraint sensing and diagnostic module (SDM), air bags, seat belt pretensioners (anchor and retractor), and impact sensors. The SDM determines the severity of a collision with the assistance of impact sensors located at strategic points on the vehicle. When the SDM detects a collision, the SDM will process the information provided by the sensors to further support air bag or pretensioner deployment. The SDM will deploy the air bags and pretensioners if it detects a collision of sufficient force. If the force of the impact is not sufficient to warrant air bag deployment, the SDM may still deploy the seat belt pretensioners. The SDM contains a sensing device that converts vehicle velocity changes to an electrical signal. The SDM compares these signals to values stored in memory. If the signals exceed a stored value, the SDM will determine the severity of the impact and either cause current to flow through the frontal deployment loops deploying the frontal air bags and pretensioners, or it will deploy the pretensioners only. The SDM continuously monitors the deployment loops for malfunctions and illuminates the SIR system AIR BAG indicator if a fault is detected. 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 illuminating the SIR system AIR BAG indicator. The steering column and knee bolsters 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.

SIR System AIR BAG Indicator

The SIR system AIR BAG indicator, located in the instrument cluster, is used to notify the driver of SIR system malfunctions and to verify that the inflatable restraint sensing and diagnostic module (SDM) is communicating with the instrument cluster. When the ignition is turned ON, the SDM is supplied with ignition positive voltage. The instrument cluster will momentarily turn on the SIR system AIR BAG indicator. While the indicator is on, the SDM conducts tests on all SIR system components and circuits. If no malfunctions are detected the SDM will communicate with the instrument cluster through the serial data circuit and command the SIR system 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 command the instrument cluster to illuminate the SIR system AIR BAG indicator via serial data. The presence of a SIR system malfunction could result in non-deployment of the air bags or deployment in conditions less severe than intended. The SIR system AIR BAG indicator will remain ON until the malfunction has been repaired.

Inflatable Restraint Sensing and Diagnostic Module (SDM)

The inflatable restraint 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 external impact sensors, mounted at strategic locations on the vehicle. In the event of a collision, the SDM compares the signals from the internal and external impact sensors to a value stored in memory. When the generated signals 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 illuminates the SIR system AIR BAG indicator located in the instrument cluster. 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 instrument cluster to illuminate the SIR system AIR BAG indicator, notifying the driver that a malfunction exists. In the event that ignition positive voltage is lost during a collision, the SDM maintains a 23-volt loop reserve for deployment of the air bags. It is important

when disabling the SIR system for servicing or rescue operations to allow the 23-volt loop reserve to dissipate, which could take up to 1 minute.

Air Bags

This vehicle contains 10 air bags. The 10 air bags are located in the steering wheel (dual inflators), instrument panel (passenger side) (dual inflators), driver side (B-pillar), passenger side (B-pillar), driver side (C-pillar), passenger side (C-pillar), driver side knee, passenger side knee, left roof rail, and right roof rail. To view the locations of the air bags refer to **SIR Identification Views**. Air bags contain a housing, inflatable air bag, two initiating devices (if dual air bags), canister of gas generating material and, in some cases, stored compressed gas. The deployment loops supply current to deploy the air bags. The driver steering wheel and passenger instrument panel air bags have two stages of deployment, which varies the amount of restraint to the occupant according to the collision severity. For moderate frontal collisions the air bags deploy at less than full deployment which consists of stage 1 of the air bag. For more severe frontal collisions a full deployment is initiated which consists of stage 1 and stage 2 of the air bag. The current passing through the air bags ignites the material in the canister producing a rapid generation of gas and in some cases, the release of compressed gas. 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 and/or the bag fabric. A shorting bar (if equipped) is located in the connector.

Seat Belt Pretensioners (Anchor and Retractor)

The seat belt pretensioners (driver and passenger) consist of a housing, seat belt retractor (located in the B-pillar), seat belt anchor (located on the floor), seat belt webbing, an initiator, and a canister of gas generating materials. To view the locations of the seat belt pretensioners refer to **SIR Identification Views**. The initiator is part of the seat belt pretensioner deployment loop. When the vehicle is involved in a collision of sufficient force, the 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 pretensioners which removes all of the slack in the seat belts. Depending on the severity of the collision, the seat belt pretensioners may deploy without the frontal air bags deploying, or they will deploy immediately before the frontal air bags deploy. A shorting bar (if equipped) is located in the connector.

Impact Sensors

This vehicle contains 8 impact sensors. There are 8 impact sensors which are located in the front of the vehicle (2, left and right), in the front doors (2, left and right), on the B-pillar (2, left and right), and on the C-pillar (2, left and right). To view the locations of the impact sensors refer to **SIR Identification Views**. The impact sensors contain a sensing device which monitors vehicle acceleration and velocity changes to detect side collisions that are severe enough to warrant air bag deployment. The impact sensors are not part of the deployment loop, but instead provide input to the SDM. The SDM contains a microprocessor that performs calculations using the measured accelerations and 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 deployment loops deploying the appropriate air bags.

Passenger Presence Detection System and Passenger Air Bag Indicator

NOTE: 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 Preload test must be performed in order to function properly.

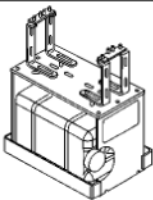
The passenger presence system (PPS) is used to monitor the type of occupant that is sitting in the front passenger seat and communicate the status to the inflatable restraint sensing and diagnostic module (SDM). The SDM then uses this information to determine whether to enable or suppress the deployment of the passenger instrument panel air bag. PPS consists of an electronic control module, a sensor mat in the seat, a harness, and PASSENGER AIR BAG ON/OFF indicators. PPS transmits and receives a low-level electric field. The measured capacitance value of this field is used to determine the type of occupant sitting in the front passenger seat. If the measured capacitance is less than a calibrated value, then the passenger presence module will send a serial data signal to the SDM to disable the passenger instrument panel air bag. If the measured capacitance is greater than a calibrated value, then the passenger presence module will send a serial data signal to the SDM to enable the passenger instrument panel air bag. The SDM will notify the customer of the enable/disable status by illuminating one of the PASSENGER AIR BAG ON/OFF indicator. The PPS monitors itself for faults and will displays diagnostic trouble codes (DTCs) on the scan tool. When a fault is detected, the passenger presence module sends out a message to the SDM. The SDM responds by sending a command message to the IPC to illuminate the SIR system AIR BAG indicator.

Seat Belt Indicators

The seat belt indicators are controlled through the inflatable restraint sensing and diagnostic module (SDM). For further information on seat belt indicators refer to **Seat Belt System Description and Operation** .

SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

Illustration	Tool Number/ Description
	EL 38826 J 38826 KM 799-3 SIR Deployment Harness
	EL 39401-B J 39401-B SIR Deployment Fixture