SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

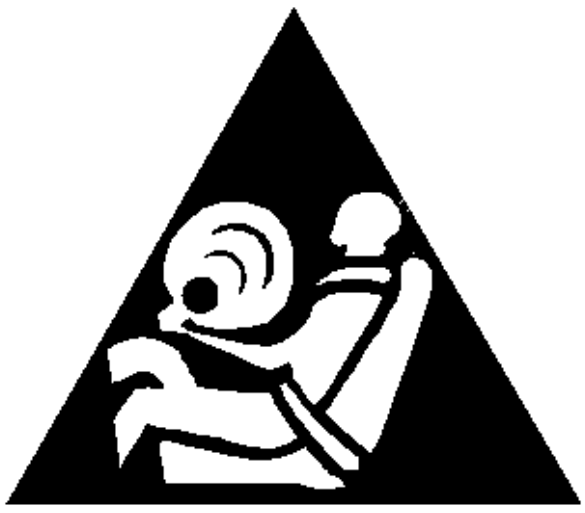
Fastener Tightening Specifications

Application	Specification	
	Metric	English
Instrument Panel Inflator Module-to-I/P Screws	10 N.m	89 lb in
Roof Rail Inflator Module-to-Roof Screws	5 N.m	44 lb in
Sensing and Diagnostic Module-to-Floor Nuts	10 N.m	89 lb in
Side Impact Sensor-to-Lock Pillar Screw	10 N.m	89 lb in

SCHEMATIC AND ROUTING DIAGRAMS

SIR SCHEMATIC ICONS

SIR Schematic Icons

Icon	Icon Definition
	**CAUTION:** **When performing service on or near the SIR components or the SIR wiring, the SIR system must be disabled. Refer to SIR Disabling and Enabling Zones. Failure to observe the correct procedure could cause deployment of the SIR components, personal injury, or unnecessary SIR system repairs.**

o
g

IMPORTANT:

- **In order to prevent accidental deployment, the shorting bars close in order to short the connectors when the connectors are separated.**
- **Twisted-pair wires provide an effective shield that helps protect sensitive electronic components from electrical interference. If the wires were covered with shielding, install new shielding.**

  In order to prevent electrical interference from degrading the performance of the connected components, you must maintain the proper specification when making any repairs to the twisted-pair wires shown :

  - **The wires must be twisted a minimum of 9 turns per 31 cm (12 in) as measured anywhere along the length of the wires**
  - **The outside diameter of the twisted wires must not exceed 6.0 mm (0.25 in)**

SIR SCHEMATICS

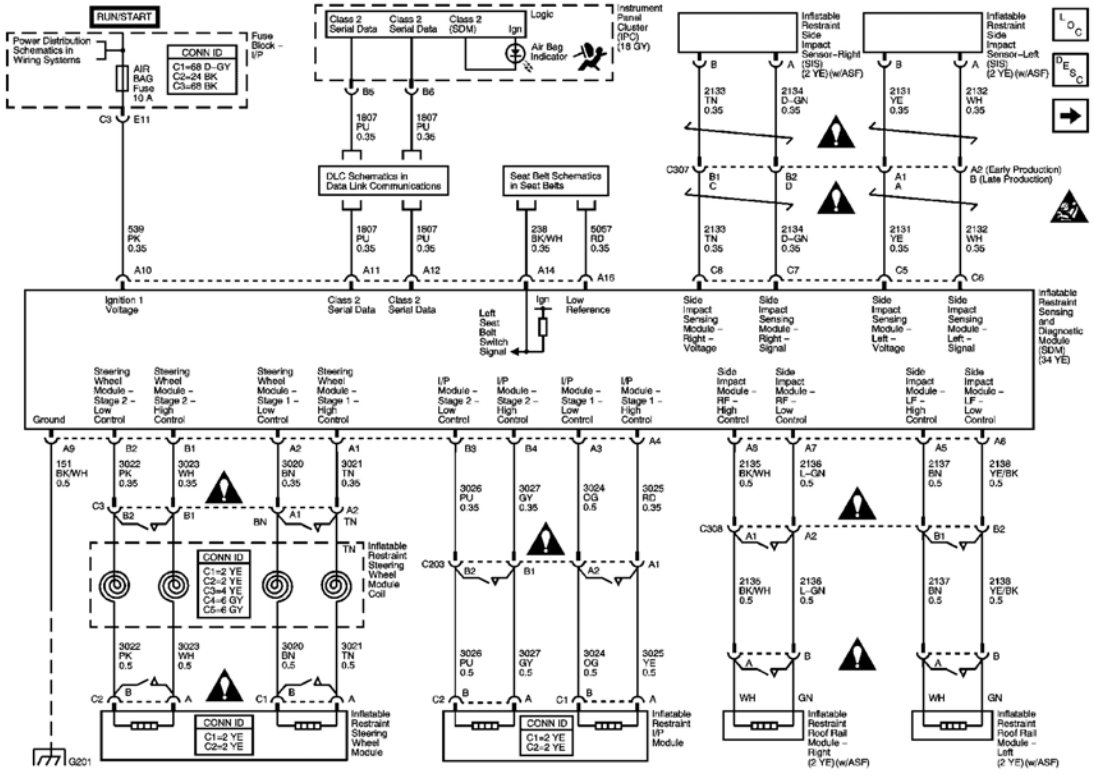


Fig. 1: Modules And Sensors Schematics
Courtesy of GENERAL MOTORS CORP.

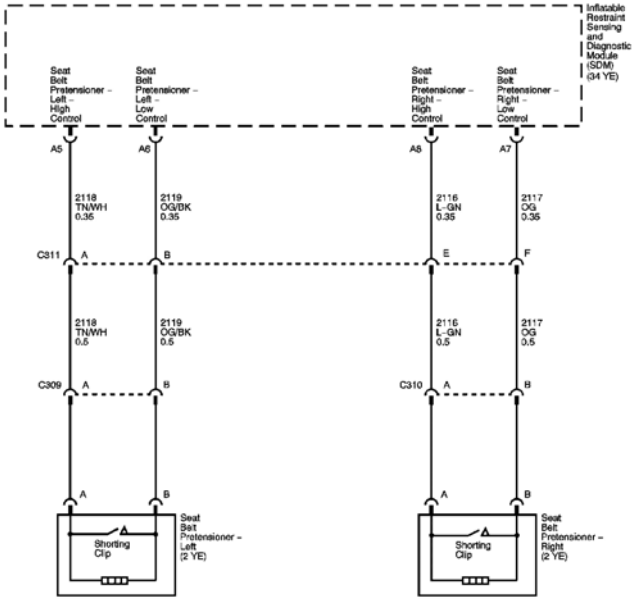


Fig. 2: Pretensioners Schematics
Courtesy of GENERAL MOTORS CORP.

COMPONENT LOCATOR

SIR COMPONENT VIEWS

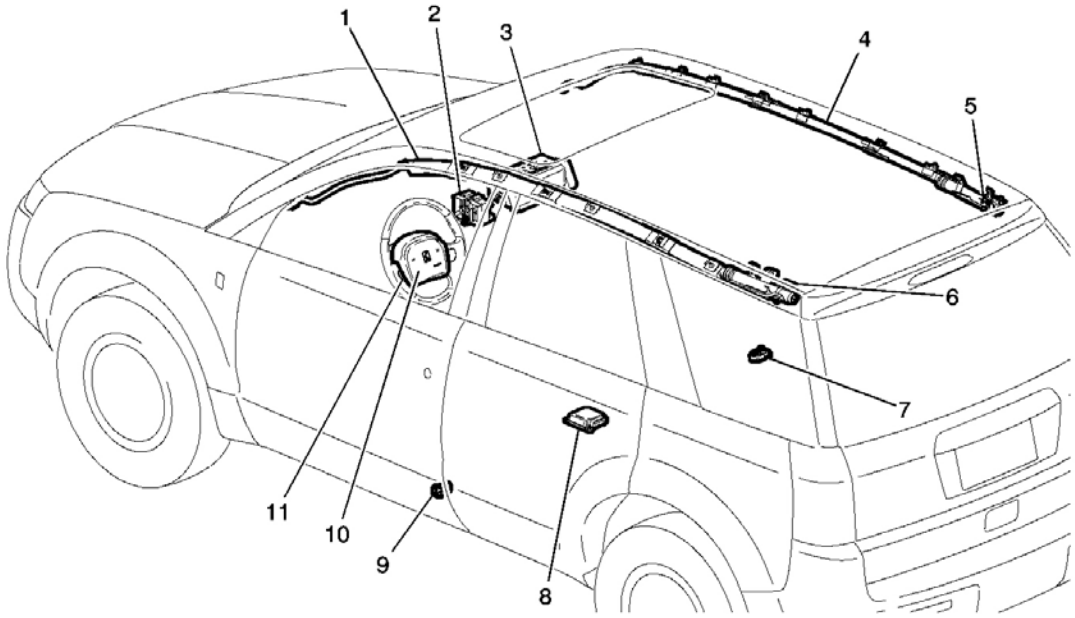


Fig. 3: SIR Components View
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 3

Callout	Component Name
1	Inflatable Restraint Roof Rail Module - Left (w/ASF)
2	Fuse Block - I/P
3	Inflatable Restraint I/P Module
4	Inflatable Restraint Roof Rail Module - Right (w/ASF)
5	Inflatable Restraint Roof Rail Module - Right Disable Connector (w/ASF)
6	Inflatable Restraint Roof Rail Module - Left Disable Connector (w/ASF)
7	Inflatable Restraint Side Impact Sensor (SIS) - Right
8	Inflatable Restraint Sensing and Diagnostic Module (SDM)
9	Inflatable Restraint Side Impact Sensor (SIS) - Left
10	Inflatable Restraint Steering Wheel Module Coil (Hidden Beneath Module)
11	Inflatable Restraint Steering Wheel Module

SIR ZONE IDENTIFICATION VIEWS

The SIR Zone 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 Zones for a given service procedure, refer to **SIR Disabling and Enabling Zones** .

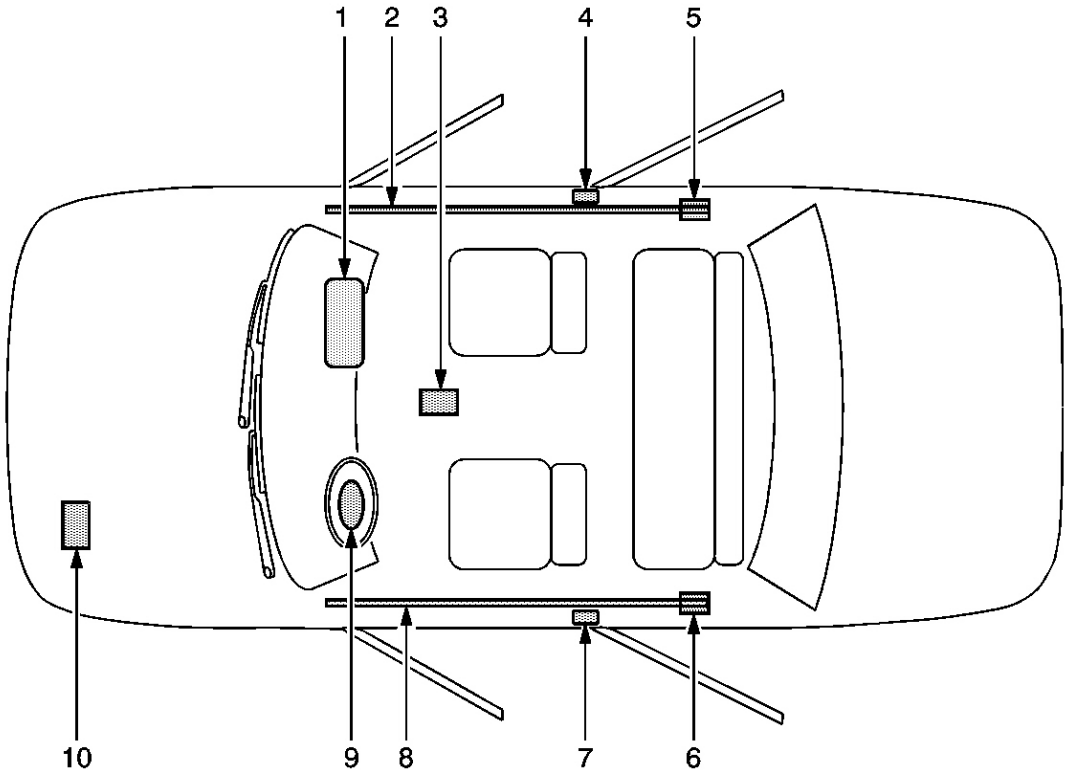


Fig. 4: Saturn VUE View
Courtesy of GENERAL MOTORS CORP.

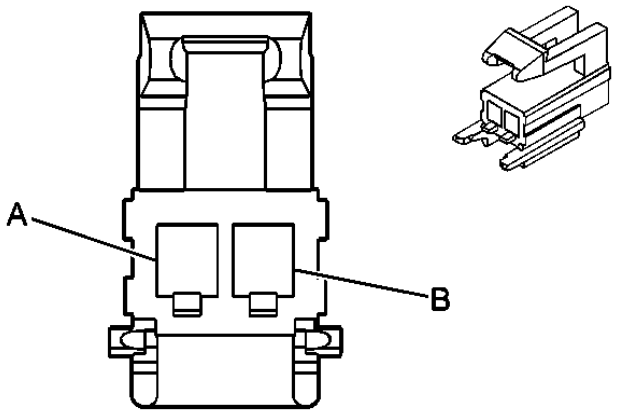
Callouts For Fig. 4

Callout	Component Name
1	I/P Air Bag-Located at the top right under the instrument panel
2	Right Roof Rail Air Bag-Located under the headliner, extending from the passenger front windshield pillar to the passenger rear windshield pillar
3	Sensing and Diagnostic Module (SDM)-Located underneath the vehicle carpet under the center console
4	Passenger/Right Side Impact Sensor (SIS) and Seat Belt Pretensioner-Located under the trim near the bottom of the center pillar
5	Inflator Module for Right Roof Rail Module-Located behind the garnish molding on the upper rear pillar
6	Inflator Module for Left Roof Rail Module-Located behind garnish molding on the upper rear pillar
7	Driver/Left Side Impact Sensor (SIS) and Seat Belt Pretensioner-Located under the trim near the bottom of the center pillar
8	Left Roof Rail Air Bag-Located under the headliner, extending from the driver front windshield pillar to the driver rear windshield pillar

9	Steering Wheel Air Bag-Located on the steering wheel
10	Vehicle Battery-Located at the front left of the engine compartment.

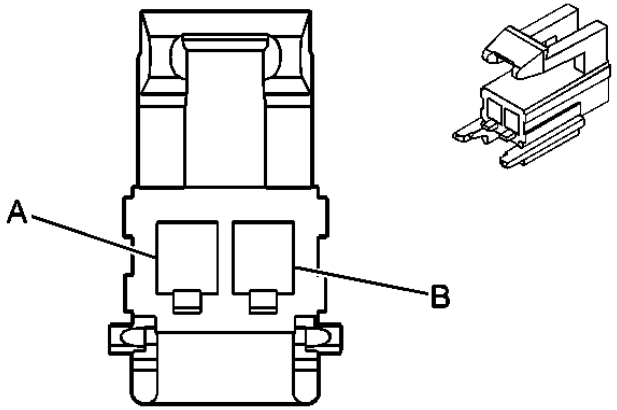
SIR CONNECTOR END VIEWS

Inflatable Restraint I/P Module C1 Terminal Identification



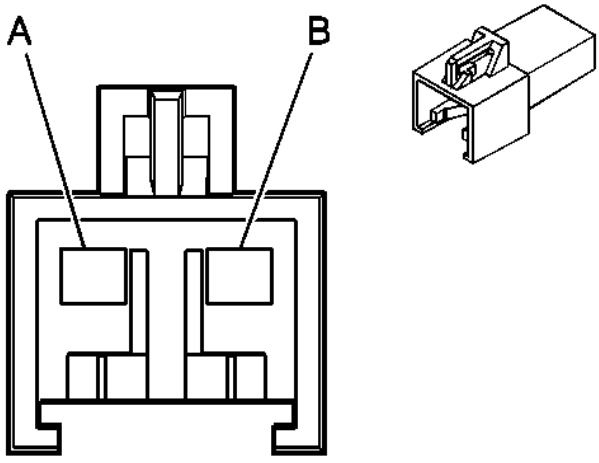
Connector Part Information		• **12110505** • **2-Way F Metri-Pack 150 Series (YE)**	
Pin	**Wire Color**	**Circuit Number**	**Function**
A	YE	3025	I/P Module - Stage 1 - High Control
B	OG	3024	I/P Module - Stage 1 - Low Control

Inflatable Restraint I/P Module C2 Terminal Identification



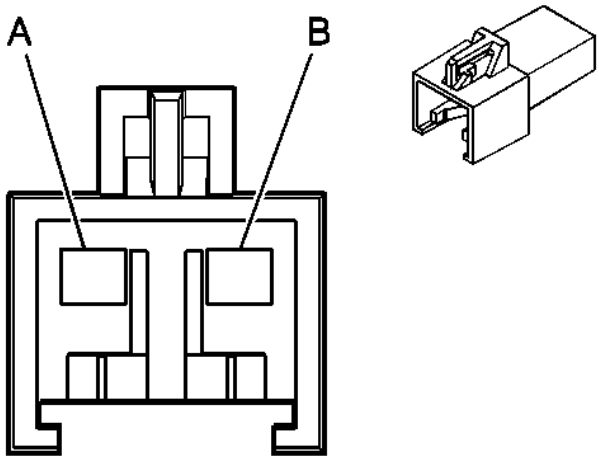
Connector Part Information		• 12110505 • 2-Way F Metri-Pack 150 Series (YE)	
Pin	**Wire Color**	**Circuit Number**	**Function**
A	GY	3027	I/P Module - Stage 2 - High Control
B	PU	3026	I/P Module - Stage 2 - Low Control

Inflatable Restraint Roof Rail Module - Left (w/ASF) Terminal Identification



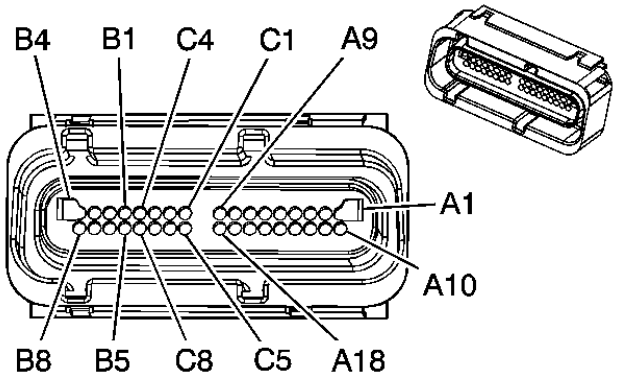
Connector Part Information		• 12186799 • 2-Way M 280 Series (YE)	
Pin	**Wire Color**	**Circuit Number**	**Function**
A	BN	2137	Side Impact Module - LF - High Control
B	YE/BK	2138	Side Impact Module - LF - High Control

Inflatable Restraint Roof Rail Module - Right (w/ASF) Terminal Identification



Connector Part Information		• 12186799 • 2-Way M 280 Series (YE)	
Pin	**Wire Color**	**Circuit Number**	**Function**
A	BK/WH	2135	Side Impact Module - RF - High Control
B	L-GN	2136	Side Impact Module - RF - Low Control

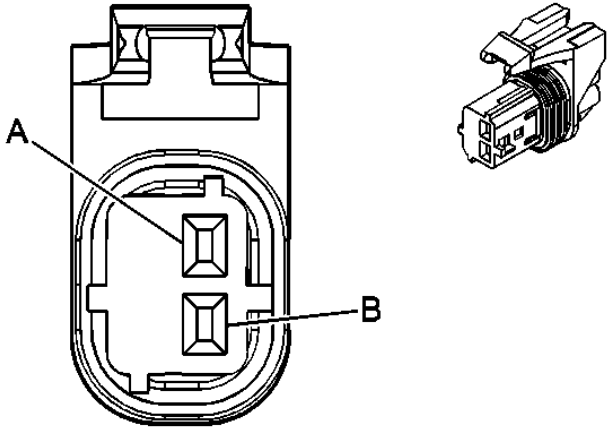
Inflatable Restraint Sensing and Diagnostic Module (SDM) Terminal Identification



Connector Part Information		• 15357038 • 34-Way F Micro-Pack 100 W 2.5 CL (GY Connector w/ YE Case)	
Pin	**Wire Color**	**Circuit Number**	**Function**
A1	WH	347	Steering Wheel Module - High Control

A2	D-GN	348	Steering Wheel Module - Low Control
A3	D-GN/WH	1404	I/P Module - Low Control
A4	WH/BK	1403	I/P Module - High Control
A5	BN	2137	Side Impact Module - LF - High Control (w/ASF)
A6	YE/BK	2138	Side Impact Module - LF - Low Control (w/ASF)
A7	L-GN	2136	Side Impact Module - RF - Low Control (w/ASF)
A8	BK/WH	2135	Side Impact Module - RF - High Control (w/ASF)
A9	BK/WH	151	Ground
A10	PK	539	Ignition 1 Voltage
A11	PU	1807	Class 2 Serial Data
A12	PU	1807	Class 2 Serial Data
A13	-	-	Not Used
A14	BK/WH	238	Left Seat Belt Switch Signal
A15	-	-	Not Used
A16	D-BU	1363	Left Seat Belt Switch Low Reference
A17-A18	-	-	Not Used
B1-B8	-	-	Not Used
C1-C4	-	-	Not Used
C5	YE	2131	Side Impact Sensing Module Voltage - Left (w/ASF)
C6	WH	2132	Side Impact Sensing Module Signal - Left (w/ASF)
C7	D-GN	2134	Side Impact Sensing Module Signal - Right (w/ASF)
C8	TN	2133	Side Impact Sensing Module Voltage - Right (w/ASF)

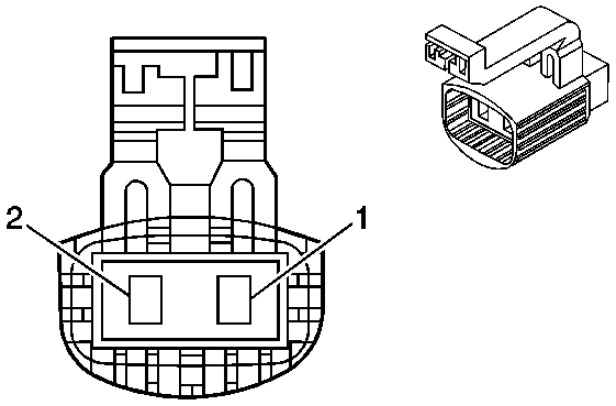
Inflatable Restraint Side Impact Sensor (SIS) - Left (w/ASF) Terminal Identification



Connector Part Information	• **15356723** • **2-Way F GT 150 Sealed 4.0 (YE)**

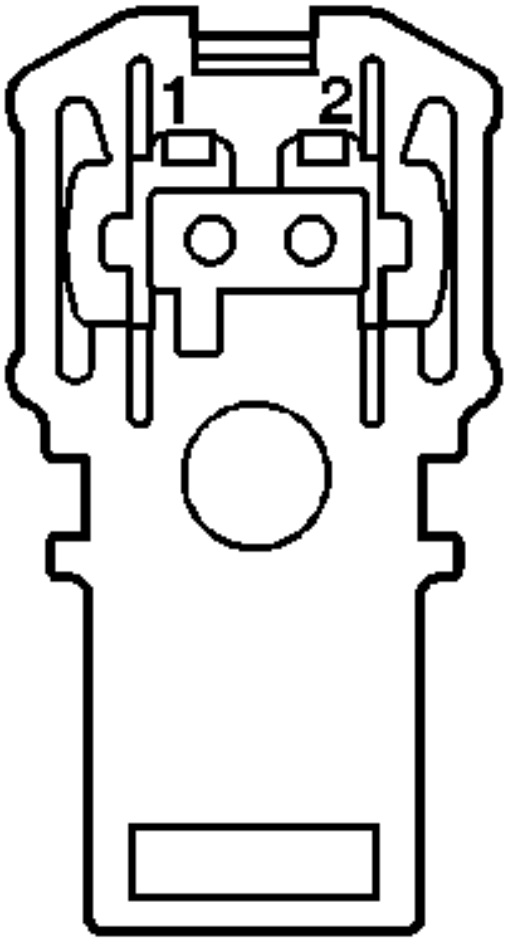
Pin	Wire Color	Circuit Number	Function
A	WH	2132	Side Impact Sensing Module Signal - Left
B	YE	2131	Side Impact Sensing Module Voltage - Left

Inflatable Restraint Side Impact Sensor (SIS) - Right (w/ASF) Terminal Identification



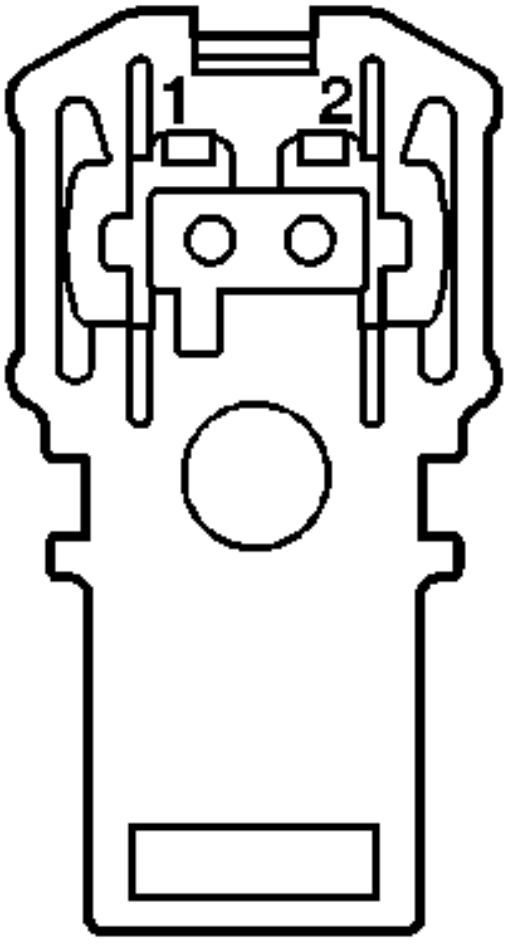
Connector Part Information		• 15356724 • 2-Way F GT 150 Sealed 4.0 (YE)	
Pin	**Wire Color**	**Circuit Number**	**Function**
A	D-GN	2134	Side Impact Sensing Module Signal - Right
B	TN	2133	Side Impact Sensing Module Voltage - Right

Inflatable Restraint Steering Wheel Module Coil C1 (Inflatable Restraint Steering Wheel Module) Terminal Identification



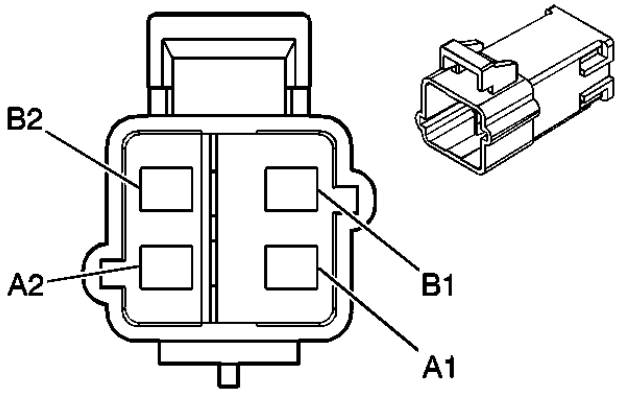
Connector Part Information		• 97U-1001 • 2-Way F (BK Connector w/ YE Case) • Coil Pigtail	
Pin	**Wire Color**	**Circuit Number**	**Function**
A (1)	TN	3021	Steering Wheel Module - Stage 1 - High Control
B (2)	BN	3020	Steering Wheel Module - Stage 1 - Low Control

Inflatable Restraint Steering Wheel Module Coil C2 (Inflatable Restraint Steering Wheel Module) Terminal Identification



Connector Part Information		• 97U-1001 • 2-Way F (BK Connector w/ YE Case) • Coil Pigtail	
Pin	**Wire Color**	**Circuit Number**	**Function**
A (1)	WH	3023	Steering Wheel Module - Stage 2 - High Control
B (2)	PK	3022	Steering Wheel Module - Stage 2 - Low Control

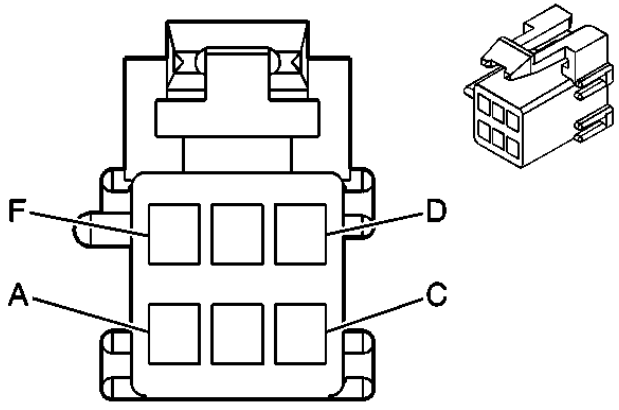
Inflatable Restraint Steering Wheel Module Coil C3 Terminal Identification



Connector Part Information	• 15336476 • 4-Way M Metri-Pack 280 Series (YE) • I/P Harness Side

Pin	Wire Color	Circuit Number	Function
A1	BN	3020	Steering Wheel Module - Stage 1 - Low Control
A2	TN	3021	Steering Wheel Module - Stage 1 - High Control
B1	WH	3023	Steering Wheel Module - Stage 2 - High Control
B2	PK	3022	Steering Wheel Module - Stage 2 - Low Control

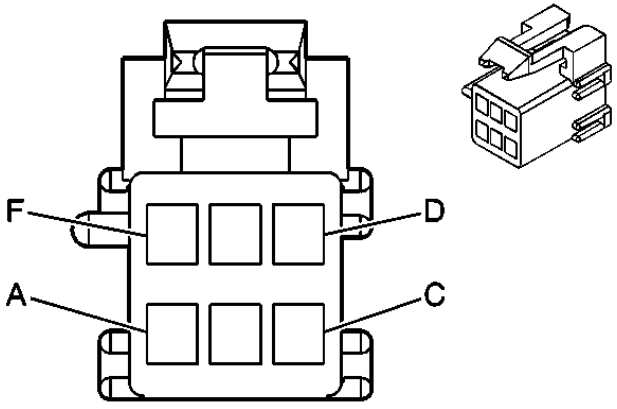
Inflatable Restraint Steering Wheel Module Coil C4 Terminal Identification



Connector Part Information	• 12064762 • 6-Way F Metri-Pack 150 Series (GY) • Coil Pigtail to Cruise Switches

Pin	Wire Color	Circuit Number	Function
A	PK	1339	Ignition 1 Voltage
B	D-BU	84	Cruise Set/Coast Switch Signal
C	GY/BK	87	Cruise Resume/Accel Switch Signal
D	GY	397	Cruise On/Off Signal
	GY	397	Cruise On/Off Signal
E	BK	151	Ground
	BK	151	Ground
F	BK	28	Horn Relay Control

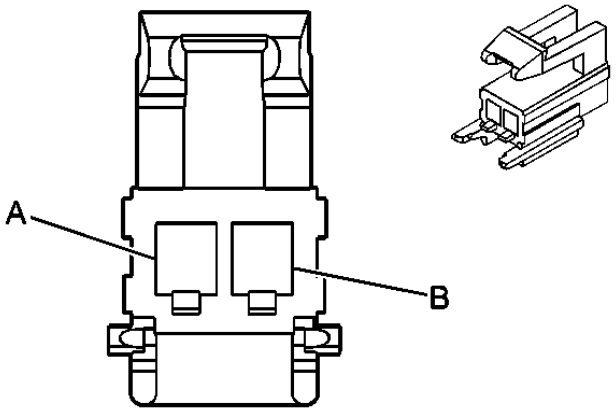
Inflatable Restraint Steering Wheel Module Coil C5 Terminal Identification



Connector Part Information	• **12064762** • **6-Way F Metri-Pack 150 Series (GY)** • **I/P Harness Side**

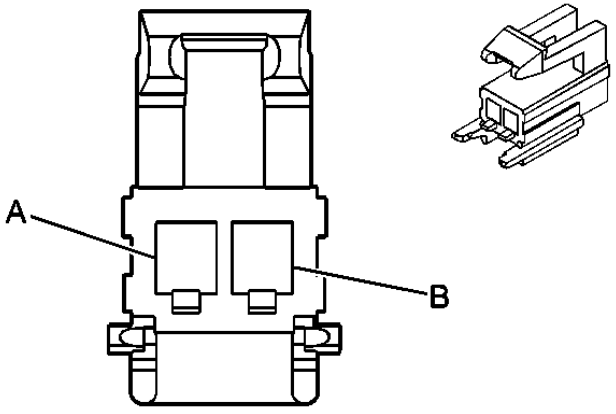
Pin	Wire Color	Circuit Number	Function
A	PK	1339	Ignition 1 Voltage
B	D-BU	84	Cruise Set/Coast Switch Signal
C	GY/BK	87	Cruise Resume/Accel Switch Signal
D	GY	397	Cruise On/Off Signal
E	BK/WH	151	Ground
F	BK	28	Horn Relay Control

Seat Belt Pretensioner - Left Terminal Identification



Connector Part Information		• H21246 • 2-Way F (YE)	
Pin	**Wire Color**	**Circuit Number**	**Function**
A	BK/WH	2118	Seat Belt Pretensioner - Left - High Control
B	OG/BK	2119	Seat Belt Pretensioner - Left - Low Control

Seat Belt Pretensioner - Right Terminal Identification



Connector Part Information		• H21246 • 2-Way F (YE)	
Pin	**Wire Color**	**Circuit Number**	**Function**
A	L-GN	2116	Seat Belt Pretensioner - Right - High Control
B	OG	2117	Seat Belt Pretensioner - Right - Low Control

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC STARTING POINT - SIR

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

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

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

DIAGNOSTIC SYSTEM CHECK - SIR

CAUTION: Refer to SIR Special Tool Caution in Cautions and Notices.

These diagnostic procedures will help you to find and repair SIR system malfunctions. For best results, use the diagnostic tables and follow the sequence listed below:

1. Refer to the diagnostic table as directed by a diagnostic system check - SIR. The diagnostic tables will help you to diagnose any SIR system malfunction. Bypassing these procedures may result in the following:
    - Extended diagnostic time
    - Incorrect diagnosis
    - Incorrect parts replacement
2. Repeat the diagnostic system check - SIR after you perform any repair or diagnostic procedures. This will verify that you correctly performed the repair. This will also ensure that no other malfunctions exist.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

1: Tests to see if the AIR BAG indicator flashes 7 times when the ignition is turned ON.

2: Tests to see if the scan tool powers up.

3: Tests to see if the scan tool can communicate with the inflatable restraint sensing and diagnostic module (SDM).

4: Tests to see if there are current or history diagnostic trouble codes (DTCs) present.

5: Tests to see if there are communication DTCs (U-codes) present.

6: Tests to see if DTC B1000 (ECU Malfunction) is present.

Diagnostic System Check - SIR

Step	Action	Yes	No
1	Note the AIR BAG indicator while turning ON the ignition. Does the AIR BAG indicator flash 7 times?	Go to **Step 2**	Go to **Symptoms - SIR**
2	Install a scan tool. Does the scan tool power up?	Go to **Step 3**	Go to **Scan Tool Does Not Power Up** in Data Link Communications
3	Attempt to establish communication with the SDM. Does the scan tool communicate with the SDM?	Go to **Step 4**	Go to **Scan Tool Does Not Communicate with Class 2 Device** in Data Link Communications
4	1. Use the scan tool to request the SIR diagnostic trouble code (DTC) display. 2. Record the displayed DTC(s) on the repair order, specifying as current or history. Does the scan tool display any current or history DTCs?	Go to **Step 5**	System OK
5	Does the scan tool display any DTCs which begin with a "U"?	Go to **Scan Tool Does Not Communicate with Class 2 Device** in Data Link Communications	Go to **Step 6**
6	Does the scan tool display DTC B1000?	Go to **DTC B1000** in Body Control System	Go to **Diagnostic Trouble Code (DTC) List**

SCAN TOOL DATA LIST

The SIR scan tool data list contains all the restraint system related parameters that are available on the scan tool. The parameters in the list are arranged in alphabetical order. The column, Data List, indicates the location of the parameter within the scan tool menu selections.

Use the SIR scan tool data list as directed by a diagnostic table or in order to supplement the diagnostic procedures. Begin all of the diagnostic procedures with the Diagnostic System Check - SIR. Use the SIR scan tool data list after the following is determined:

- There is no published Diagnostic Trouble Code (DTC) procedure, nor a published symptom procedure for the customer concern.
- The DTC or symptom diagnostic procedure indicated by the Diagnostic System Check - SIR does not resolve the customer concern.

The typical data values are obtained from a properly operating vehicle under the conditions specified in the second row of the scan tool data list table. Comparison of the parameter values from the suspect vehicle with the typical data values may reveal the source of the customer concern.

Scan Tool Data List

Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
Ignition ON/Engine OFF/Driver Seat Belt Buckled			
8-Digit GM Part Number	Module Information 1	8-digit number	Varies
Calibration ID	Module Information 2	4-digit number	Varies
Component Serial Number	Module Information 1	4-digit number	Varies
Driver Side Belt Status	Data	Buckled/Unbuckled	Buckled
Ignition Voltage	Data	Volts	12 volts
Julian Date of Build	Module Information 2	3-digit number	Varies
Left SIS ID	Module Information 1	2-digit number	Varies
PROM ID	Module Information 2	4-digit number	Varies
Right SIS ID	Module Information 1	2-digit number	Varies
VIN	VIN Information	Number	Varies

SCAN TOOL DATA DEFINITIONS

The SIR scan tool data definitions contain a brief description of all SIR related parameters available on the scan tool. The parameters that are available on the scan tool are listed below in alphabetical order.

8-Digit GM Part Number

The scan tool displays the GM part number that is stored within the SDM memory.

Calibration ID

The scan tool displays the calibration ID, which is the check sum of the SDM read only memory contents.

Component Serial Number

The scan tool displays the SDM component serial number that is stored within the SDM.

Driver Side Belt Status

The scan tool displays whether the driver seat belt is buckled or unbuckled.

Ignition Voltage

The scan tool displays 0-20 volts. This is the system voltage measured by the SDM between the ignition input and ground.

Julian Date of Build

This number represents the day of the year that the module was built.

Left SIS ID

The scan tool displays the driver SIS ID that is sent to the SDM when the ignition is turned ON.

PROM ID

The scan tool displays the programmable read-only memory (PROM) ID.

Right SIS ID

The scan tool displays whether the passenger SIS ID that is sent to the SDM when ignition is turned ON.

VIN Information

The scan tool displays a list. The Body Control Module (BCM) is programmed in the assembly plant with the last four digits of the SDM part number and the VIN of the vehicle.

DIAGNOSTIC TROUBLE CODE (DTC) LIST

Diagnostic Trouble Code (DTC) List

DTC	Description	Module
B0012, B0013, B0014, B0016, B0017, or B0018	**DTC B0012, B0013, B0014, B0016, B0017, or B0018**	SDM
B0022, B0024, B0026, B0042, B0043, or B0044	**DTC B0022, B0024, B0026, B0042, B0043, or B0044**	SDM
B0028, B0029, or B0030	**DTC B0028, B0029, or B0030**	SDM
B0040, B0041, or B0045	**DTC B0040, B0041, or B0045**	SDM
B0051	**DTC B0051**	SDM
B0053	**DTC B0053**	SDM
B0057, B0058, or B0059	**DTC B0057, B0058, or B0059**	SDM
B0064, B0065, or B0066	**DTC B0064, B0065, or B0066**	SDM
B0077, B0078, B0079, B0080, B0081, or B0082	**DTC B0077, B0078, B0079, B0080, B0081, or B0082**	SDM
B1000	**DTC B1000** in Body Control System	BCM, SDM
B1001	**DTC B1001**	SDM
U1000	**DTC U1000** in Data Link Communication	BCM, SDM
U1016, U1064, or U1096	**DTC U1001-U1254** in Data Link Communication	BCM, SDM

U1300 or U1301	**DTC U1300, U1301, or U1305** in Data Link Communication	BCM, SDM

DTC B0012, B0013, B0014, B0016, B0017, OR B0018

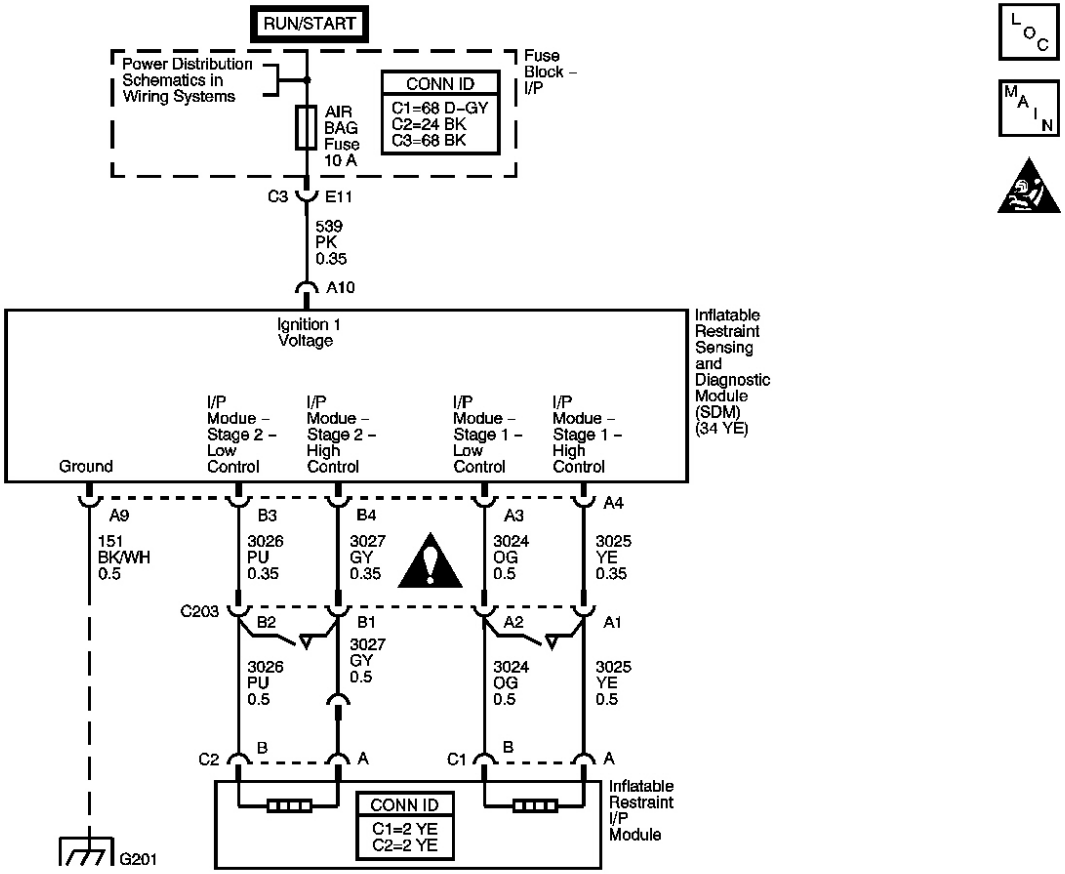


Fig. 5: DTC B0012, B0013, B0014, B0016, B0017, Or B0018 Schematics
Courtesy of GENERAL MOTORS CORP.

Circuit Description

The dual stage inflatable restraint I/P module deployment loop consists of the dual stage inflatable restraint I/P module, and the I/P module high and low circuits for both stages 1 and 2. Two shorting bars used within the I/P module connector short together both the I/P module stage 1 high and low circuits, and the I/P module stage 2 high and low circuits when the connector is disconnected. This helps to prevent unwanted deployment of the inflator module during servicing. During a frontal crash of sufficient force the inflatable restraint sensing and diagnostic module (SDM) allows current to flow through the deployment loop in order to deploy the I/P module. When the ignition is turned ON, the SDM performs continuous diagnostic tests on the deployment loops to check for proper circuit continuity and for shorts to ground or voltage. If a malfunction is detected, a

diagnostic trouble code (DTC) will be stored in memory.

Conditions for Running the DTC

Ignition 1 voltage is within the normal operating voltage range.

Conditions for Setting the DTC

- DTC B0012 in stage 2 or B0016 in stage 1 will set when the I/P module deployment loop resistance is less than 1.3 ohms for 500 milliseconds.
- DTC B0013 stage 2 or B0017 in stage 1 will set when one of the following conditions occurs:
  - I/P module high circuit is less than 2.4 volts and the I/P module deployment loop is more than 6 ohms for 500 milliseconds.
  - I/P module deployment loop resistance is more than 4.8 ohms for 500 milliseconds.
- DTC B0014 in stage 2 or B0018 in stage 1 will set when one of the following conditions occur:
  - I/P module high and/or low circuits is short to ground or short to voltage for 500 milliseconds.
  - I/P module high circuit is less than 2.4 volts and I/P module deployment loop resistance is less than 6 ohms for 500 milliseconds.

Action Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Diagnostic Aids

The following are possible causes of the malfunction:

- A short between the I/P module stage 1 or stage 2, high and low circuits
- An open or a high resistance in the I/P module stage 1 or stage 2, high or low circuits
- A short to ground or a short to voltage in the I/P module stage 1 or stage 2, high or low circuits
- The I/P module connector
- The SDM connector
- A malfunctioning I/P module
- A malfunctioning SDM

Thoroughly inspect the wiring and the connectors. An incomplete inspection of the wiring and the connectors may result in a misdiagnosis, causing a part replacement with the reappearance of the malfunction. If an intermittent malfunction exists, refer to **Testing for Intermittent Conditions and Poor Connections** in Wiring

Systems.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

4: Tests to see if the malfunction is caused by the I/P module.

6: Tests to see what DTCs are present. If DTC B0012 or B0016 is present, test for a short between the I/P module high and low circuits in stage 1 or stage 2. If DTC B0013 or B0017 is present, test the I/P module high and low circuits for an open and for high resistance in stage 1 or stage 2. If DTC B0014 or B0018 is present, test the I/P module high and low circuits for a short to ground and for a short to voltage in stage 1 or stage 2.

DTC B0012, B0013, B0014, B0016, B0017, or B0018

Step	Action	Yes	No
Connector End View Reference:SIR Connector End Views			
1	Did you perform the Diagnostic System Check - SIR?	Go to **Step 2**	Go to **Diagnostic System Check - SIR**
2	1. Turn OFF the ignition. 2. Disconnect the I/P module connector. Refer to **Inflatable Restraint Instrument Panel Module Replacement** . 3. Inspect the component and harness sides of the connector for the I/P module for damage or corrosion that may cause the malfunction. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Does the connector exhibit any signs of damage or corrosion?	Go to **Step 3**	Go to **Step 4**
3	1. If the component side of the I/P module connector is damaged, the I/P module must be replaced. Refer to **Inflatable Restraint Instrument Panel Module Replacement** . 2. If the wiring harness side of the I/P module connector is damaged, replace the harness side of the connector. Refer to **Connector Repairs** in Wiring Systems. Did you complete the repair?	Go to **Step 9**	-
	IMPORTANT: **When installing SA9409Z-A SIR Driver/Passenger Load Tool for testing the dual stage I/P module, the correct 4-way load tool adapter connector must be used. See Special Tools and Equipment . Failure to use the correct 4-way load tool connector will set additional codes when testing.** 1. Use J 38715-80 adapter to connect the **SA9409Z-A** to the harness		

4	side of the I/P module connector. See **Special Tools and Equipment** . Use BASE OF COLUMN and PASSENGER INFLATOR connectors. 2. Turn ON the ignition, with the engine OFF. 3. With the scan tool, request the SIR DTC display. Does the scan tool indicate that DTC B0012, B0013, B0014, B0016, B0017, or B0018 are current?	Go to **Step 5**	Go to **Step 7**
5	1. Turn OFF the ignition. 2. Disconnect and remove both the **SA9409Z-A** and adapter. See **Special Tools and Equipment** . 3. Disconnect the inflatable restraint sensing and diagnostic module (SDM) connector. Refer to **Inflatable Restraint Sensing and Diagnostic Module Replacement** . 4. Inspect the SDM connector for damage or corrosion that may cause a malfunction in the I/P module stage 1 or stage 2 high and/or low circuits. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 9**	Go to **Step 6**
6	**IMPORTANT:** **If scan tool displays multiple codes diagnose the open code first.** 1. If DTC B0012 or B0016 is present, test for a short between the I/P module high and low circuits in stage 1 or stage 2. 2. If DTC B0013 or B0017 is present, test the I/P module high and low circuits for an open and for high resistance in stage 1 or stage 2. 3. If DTC B0014 or B0018 is present, test the I/P module high and low circuits for a short to ground and for a short to voltage in stage 1 or stage 2. 4. All the above conditions refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 9**	Go to **Step 8**
7	1. Turn OFF the ignition. 2. Replace the I/P module. Refer to **Inflatable Restraint Instrument Panel Module Replacement** . Did you complete the replacement?	Go to **Step 9**	-
8	1. Turn OFF the ignition. 2. Replace the SDM. Refer to **Inflatable Restraint Sensing and Diagnostic Module Replacement** .	Go to	

	Did you complete the replacement?	**Step 9**	-
9	1. Connect all SIR components. 2. Turn ON the ignition, with the engine OFF. 3. Use the scan tool in order to clear the DTCs. 4. Operate the vehicle within the Conditions for Running the DTC as specified in the supporting text. Does the DTC reset?	Go to **Step 2**	System OK

DTC B0022, B0024, B0026, B0042, B0043, OR B0044

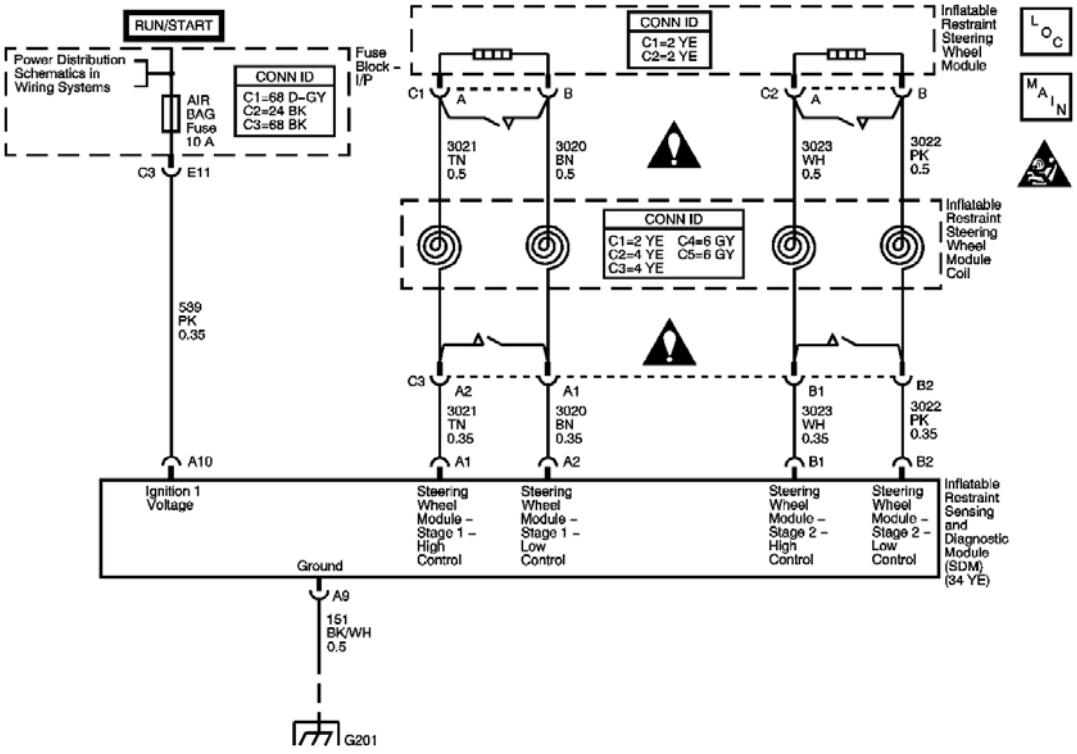


Fig. 6: DTC B0022, B0024, B0026, B0042, B0043, Or B0044 Schematics
Courtesy of GENERAL MOTORS CORP.

Circuit Description

The dual stage inflatable restraint steering wheel module deployment loop consists of the dual stage inflatable restraint steering wheel module, the inflatable restraint steering wheel module coil, and the steering wheel module high and low circuits for both stages 1 and 2. Two shorting bars used within the steering wheel module coil connector short together both the steering wheel module stage 1 high and low circuits, and the steering

wheel module stage 2 high and low circuits when the connector is disconnected. This helps to prevent unwanted deployment of the inflator module during servicing. During a frontal crash of sufficient force the inflatable restraint sensing and diagnostic module (SDM) allows current to flow through the deployment loop in order to deploy the steering wheel module. When the ignition is turned ON, the SDM performs continuous diagnostic tests on the deployment loops to check for proper circuit continuity and for shorts to ground or voltage. If a malfunction is detected, a diagnostic trouble code (DTC) will be stored in memory.

Conditions for Running the DTC

Ignition 1 voltage is within the normal operating voltage range.

Conditions for Setting the DTC

- DTC B0022 in stage 1 or B0042 in stage 2 will set when the steering wheel module deployment loop resistance is less than 1.3 ohms for 500 milliseconds.
- DTC B0024 in stage 1 or B0043 in stage 2 will set when one of the following conditions occur:
  - Steering wheel module high and/or low circuits is short to ground or short to voltage for 500 milliseconds.
  - Steering wheel module high circuit is less than 2.4 volts and steering wheel module deployment loop resistance is less than 6 ohms for 500 milliseconds.
- DTC B0026 in stage 1 or B0044 in stage 2 will set when one of the following conditions occurs:
  - Steering wheel module high circuit is less than 2.4 volts and the steering wheel module deployment loop is more than 6 ohms for 500 milliseconds.
  - Steering wheel module deployment loop resistance is more than 4.8 ohms for 500 milliseconds.

Action Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Diagnostic Aids

The following are possible causes of the malfunction:

- A short between the steering wheel module stage 1 or stage 2, high and low circuits.
- An open or a high resistance in the steering wheel module stage 1 or stage 2, high or low circuits.
- A short to ground or a short to voltage in the steering wheel module stage 1 or stage 2, high or low circuits.
- The steering wheel module coil connector

- The SDM connector
- A malfunctioning steering wheel module
- A malfunctioning steering wheel module coil
- A malfunctioning SDM

Thoroughly inspect the wiring and the connectors. An incomplete inspection of the wiring and the connectors may result in a misdiagnosis, causing a part replacement with the reappearance of the malfunction. If an intermittent malfunction exists, refer to **Testing for Intermittent Conditions and Poor Connections** in Wiring Systems.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

5: Tests to see if the malfunction is caused by the steering wheel module or by the steering wheel module coil.

7: Tests to see what DTCs are present. If DTC B0022 or B0042 is present, test for a short between the steering wheel module high and low circuits in stage 1 or stage 2. If DTC B0024 or B0043 is present, test the steering wheel module high and low circuits for an open and for high resistance in stage 1 or stage 2. If DTC B0026 or B0044 is present, test the steering wheel module high and low circuits for an open and for high resistance in stage 1 or stage 2.

DTC B0022, B0024, B0026, B0042, B0043, or B0044

Step	Action	Yes	No
Connector End View Reference:SIR Connector End Views			
1	Did you perform the Diagnostic System Check - SIR?	Go to **Step 2**	Go to **Diagnostic System Check - SIR**
2	1. Turn OFF the ignition. 2. Disconnect the steering wheel module coil connector. Refer to **Inflatable Restraint Steering Wheel Module Coil Replacement** . 3. Inspect the component and harness sides of the connector for the steering wheel module coil for damage or corrosion that may cause the malfunction. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Does the connector exhibit any signs of damage or corrosion?	Go to **Step 3**	Go to **Step 4**
3	1. If the component side of the steering wheel module coil connector is damaged, the steering wheel module coil must be replaced. Refer to **Inflatable Restraint Steering Wheel Module Coil Replacement** . 2. If the wiring harness side of steering wheel module coil connector is damaged, replace the harness side of the connector. Refer to **Connector Repairs** in Wiring Systems.		

	Did you complete the repair?	Go to **Step 11**	-
4	1. Use J 38715-80 adapter to connect the **SA9409Z-A** to the harness side of the steering wheel module coil connector. See **Special Tools and Equipment** . Use the BASE OF COLUMN and PASSENGER INFLATOR connectors on the load tool. 2. Turn ON the ignition, with the engine OFF. 3. Use the scan tool to request SIR DTCs displayed. Does the scan tool indicate that DTC B0022, B0024, B0026, B0042, B0043, or B0044 are current?	Go to **Step 6**	Go to **Step 5**
5	1. Turn OFF the ignition. 2. Disconnect and remove both the **SA9409Z-A** and adapter. See **Special Tools and Equipment** . 3. Connect the steering wheel module coil connector. 4. Remove the steering wheel module. Refer to **Inflatable Restraint Steering Wheel Module Replacement** . 5. Connect the **SA9409Z-A** Load Tool to the upper steering wheel module coil connectors on top of the steering column. See **Special Tools and Equipment** . Use the EL 38715-130 adapter to connect the load tool DRIVER INFLATOR connector to the stage 1 connector. Use the J 38715-30A adapter to connect the load tool PASSENGER INFLATOR connector to the stage 2 connector. 6. Turn ON the ignition, with the engine OFF. 7. Use the scan tool to request SIR DTCs displayed. Does the scan tool indicate that DTC B0022, B0024, B0026, B0042, B0043, or B0044 are current?	Go to **Step 9**	Go to **Step 8**
6	1. Turn OFF the ignition. 2. Disconnect and remove the **SA9409Z-A** Load Tool, and the adapter. See **Special Tools and Equipment** . 3. Disconnect the inflatable restraint sensing and diagnostic module (SDM) connector. Refer to **Inflatable Restraint Sensing and Diagnostic Module Replacement** . 4. Inspect the SDM connector for damage or corrosion that may cause a malfunction in the steering wheel module stage 1 or stage 2 high and/or low circuits. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 11**	Go to **Step 7**
	1. If DTC B0022 or B0042 is present, test for a short between the		

7	steering wheel module high and low circuits in stage 1 or stage 2. 2. If DTC B0024 or B0043 is present, test the steering wheel module high and low circuits for a short to ground and for a short to voltage in stage 1 or stage 2. 3. If DTC B0026 or B0044 is present, test the steering wheel module high and low circuits for an open and for high resistance in stage 1 or stage 2. 4. For all the above conditions, refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 11**	Go to **Step 10**
8	1. Turn OFF the ignition. 2. Replace the steering wheel module. Refer to **Inflatable Restraint Steering Wheel Module Replacement** . Did you complete the replacement?	Go to **Step 11**	-
9	1. Turn OFF the ignition. 2. Replace the steering wheel module coil. Refer to **Inflatable Restraint Steering Wheel Module Coil Replacement** . Did you complete the replacement?	Go to **Step 11**	-
10	1. Turn OFF the ignition. 2. Replace the SDM. Refer to **Inflatable Restraint Sensing and Diagnostic Module Replacement** . Did you complete the replacement?	Go to **Step 11**	-
11	1. Connect all SIR components. 2. Turn ON the ignition, with the engine OFF. 3. Use the scan tool in order to clear the DTCs. 4. Operate the vehicle within the Conditions for Running the DTC as specified in the supporting text. Does the DTC reset?	Go to **Step 2**	System OK

DTC B0028, B0029, OR B0030

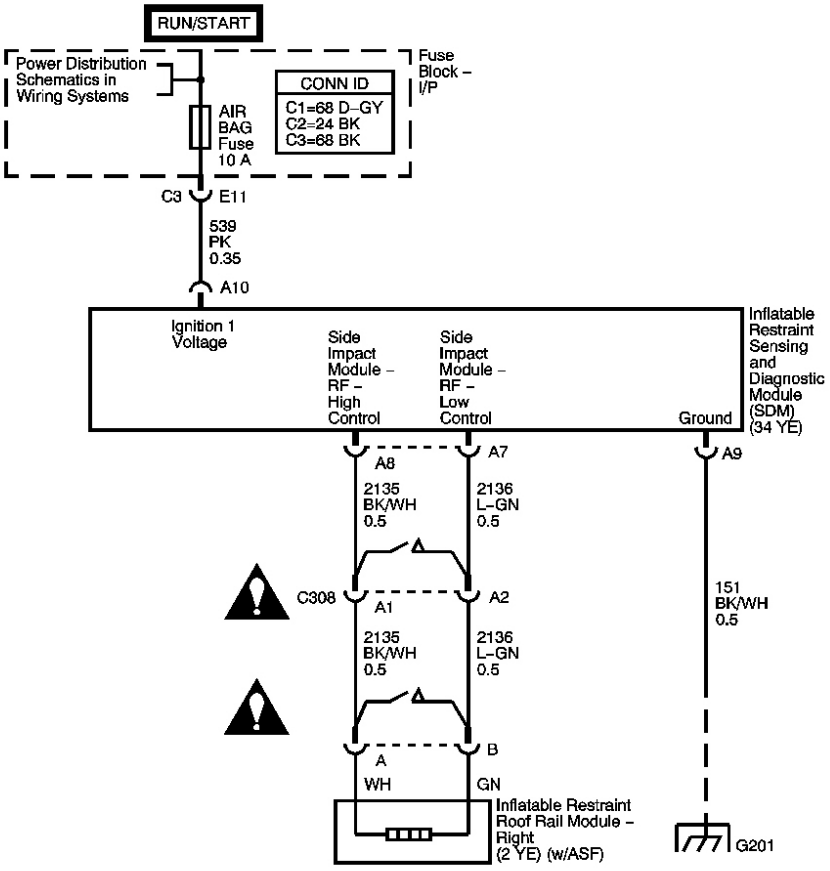


Fig. 7: DTC B0028, B0029, Or B0030 Schematics
Courtesy of GENERAL MOTORS CORP.

Circuit Description

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

Conditions for Running the DTC

The ignition 1 voltage is within the normal operating voltage range.

Conditions for Setting the DTC

- DTC B0028 will set when the roof rail module-right deployment loop resistance is less than 1.3 ohms for 500 milliseconds.
- DTC B0029 will set when one of the following conditions occurs:
  - Roof rail module-right high circuit is less than 2.4 volts and the roof rail module-right deployment loop is more than 6 ohms for 500 milliseconds.
  - Roof rail module-right deployment loop resistance is more than 4.8 ohms for 500 milliseconds.
- DTC B0030 when one of the following conditions occur:
  - Roof rail module-right high and/or low circuits is short to ground or short to voltage for 500 milliseconds.
  - Roof rail module-right high circuit is less than 2.4 volts and roof rail module-right deployment loop resistance is less than 6 ohms for 500 milliseconds.

Action Taken When the DTC Sets

The SDM commands the AIR BAG indicator ON via Class 2 serial data.

Conditions for Clearing the DTC

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

Diagnostic Aids

The following are possible causes of the malfunction:

- A short between the roof rail module-right high and low circuits.
- An open or a high resistance in the roof rail module-right high or low circuits.
- A short to ground or a short to voltage in the roof rail module-right high or low circuits.
- The roof rail module-right connector
- The SDM connector
- A malfunctioning roof rail module-right
- A malfunctioning SDM

Thoroughly inspect the wiring and the connectors. An incomplete inspection of the wiring and the connectors may result in a misdiagnosis, causing a part replacement with the reappearance of the malfunction. If an intermittent malfunction exists, refer to **Testing for Intermittent Conditions and Poor Connections** in Wiring Systems.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

4: Tests to see if the malfunction is caused by the roof rail module-right.

6: Tests to see what DTCs are present. If DTC B0028 is present, test for a short between the roof rail module-right high and low circuits. If DTC B0029 is present, test the roof rail module-right high and low circuits for an open and for high resistance. If DTC B0030 is present, test the roof rail module-right high and low circuits for a short to ground and for a short to voltage.

DTC B0028, B0029, or B0030

Step	Action	Yes	No
Connector End View Reference:SIR Connector End Views			
1	Did you perform the Diagnostic System Check - SIR?	Go to **Step 2**	Go to **Diagnostic System Check - SIR**
2	1. Turn OFF the ignition. 2. Disconnect the roof rail module-right connector. Refer to **Inflatable Restraint Roof Rail Module Replacement - Front** . 3. Inspect the component and harness sides of the connector for the roof rail module-right for damage or corrosion that may cause the malfunction. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Does the connector exhibit any signs of damage or corrosion?	Go to **Step 3**	Go to **Step 4**
3	1. If the component side of the roof rail module-right connector is damaged, the roof rail module-right must be replaced. Refer to **Inflatable Restraint Roof Rail Module Replacement - Front** . 2. If the wiring harness side of the roof rail module-right connector is damaged, replace the harness side of the connector. Refer to **Connector Repairs** in Wiring Systems. Did you complete the repair?	Go to **Step 9**	-
4	1. Connect the **SA9409Z-A** SIR Driver/Passenger Load Tool to the harness side of the roof rail module-right connector. See **Special Tools and Equipment** . Use PASSENGER INFLATOR connector. 2. Turn ON the ignition, with the engine OFF. 3. With the scan tool, request the SIR DTC display. Does the scan tool indicate that DTC B0028, B0029, or B0030 are current?	Go to **Step 5**	Go to **Step 7**
	1. Turn OFF the ignition. 2. Disconnect and remove the **SA9409Z-A** . See **Special Tools and Equipment** . 3. Disconnect the inflatable restraint sensing and diagnostic module		

5	(SDM) connector. Refer to **Inflatable Restraint Sensing and Diagnostic Module Replacement** . 4. Inspect the SDM connector for damage or corrosion that may cause a malfunction in the roof rail module-right high or low circuits. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 9**	Go to **Step 6**
6	1. If DTC B0028 is present, test for a short between the roof rail module-right high and low circuits. 2. If DTC B0029 is present, test the roof rail module-right high and low circuits for an open and for high resistance. 3. If DTC B0030 is present, test the roof rail module-right high and low circuits for a short to ground and for a short to voltage. 4. All the above conditions refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 9**	Go to **Step 8**
7	1. Turn OFF the ignition. 2. Replace the roof rail module-right. Refer to **Inflatable Restraint Roof Rail Module Replacement - Front** . Did you complete the replacement?	Go to **Step 9**	-
8	1. Turn OFF the ignition. 2. Replace the SDM. Refer to **Inflatable Restraint Sensing and Diagnostic Module Replacement** . Did you complete the replacement?	Go to **Step 9**	-
9	1. Connect all SIR components. 2. Turn ON the ignition, with the engine OFF. 3. Use the scan tool in order to clear the DTCs. 4. Operate the vehicle within the Conditions for Running the DTC as specified in the supporting text. Does the DTC reset?	Go to **Step 2**	System OK

DTC B0040, B0041, OR B0045

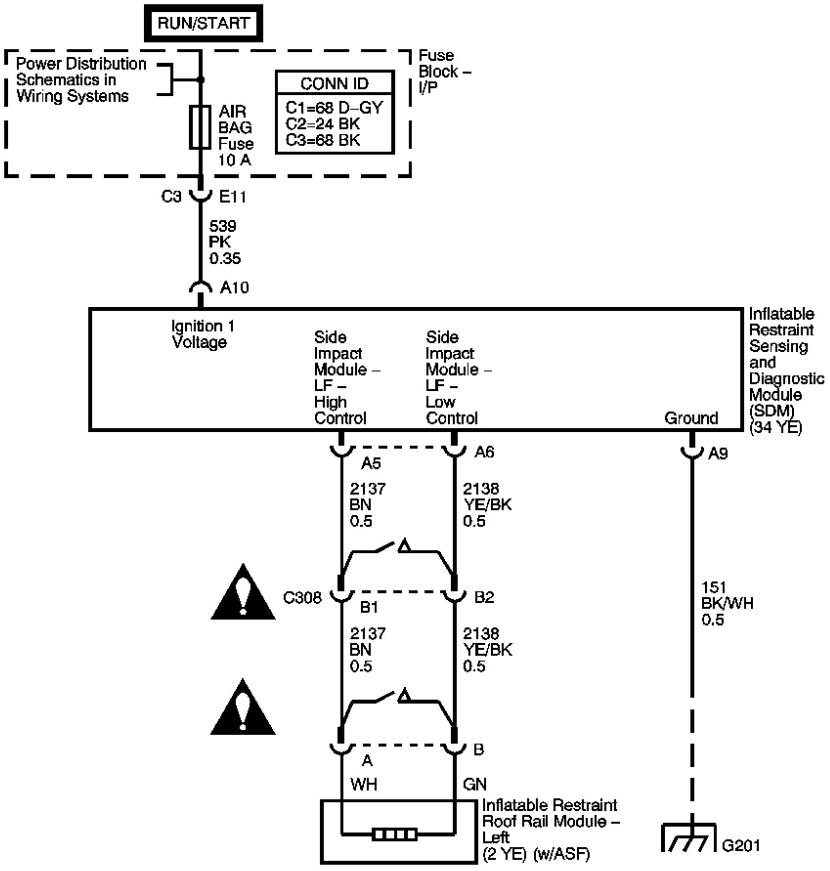


Fig. 8: DTC B0040, B0041, Or B0045 Schematics
Courtesy of GENERAL MOTORS CORP.

Circuit Description

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

Conditions for Running the DTC

Ignition 1 voltage is within the normal operating voltage range.

Conditions for Setting the DTC

- DTC B0040 will set when the roof rail module-left deployment loop resistance is less than 1.3 ohms for 500 milliseconds.
- DTC B0041 will set when one of the following conditions occurs:
  - Roof rail module-left high circuit is less than 2.4 volts and the roof rail module-left deployment loop is more than 6 ohms for 500 milliseconds.
  - Roof rail module-left deployment loop resistance is more than 4.8 ohms for 500 milliseconds.
- DTC B0045 when one of the following conditions occur:
  - Roof rail module-left high and/or low circuits is short to ground or short to voltage for 500 milliseconds.
  - Roof rail module-left high circuit is less than 2.4 volts and roof rail module-left deployment loop resistance is less than 6 ohms for 500 milliseconds.

Action Taken When the DTC Sets

The SDM commands the AIR BAG indicator ON via Class 2 serial data.

Conditions for Clearing the DTC

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

Diagnostic Aids

The following are possible causes of the malfunction:

- A short between the roof rail module-left high and low circuits.
- An open or a high resistance in the roof rail module-left high or low circuits.
- A short to ground or a short to voltage in the roof rail module-left high or low circuits.
- The roof rail module-left connector
- The SDM connector
- A malfunctioning roof rail module-left
- A malfunctioning SDM

Thoroughly inspect the wiring and the connectors. An incomplete inspection of the wiring and the connectors may result in a misdiagnosis, causing a part replacement with the reappearance of the malfunction. If an intermittent malfunction exists, refer to **Testing for Intermittent Conditions and Poor Connections** in Wiring Systems.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

4: Tests to see if the malfunction is caused by the roof rail module-left.

6: Tests to see what DTCs are present. If DTC B0040 is present, test for a short between the roof rail module-left high and low circuits. If DTC B0041 is present, test the roof rail module-left high and low circuits for an open and for high resistance. If DTC B0045 is present, test the roof rail module-left high and low circuits for a short to ground and for a short to voltage.

DTC B0040, B0041, or B0045

Step	Action	Yes	No
Connector End View Reference:SIR Connector End Views			
1	Did you perform the Diagnostic System Check - SIR?	Go to **Step 2**	Go to **Diagnostic System Check - SIR**
2	1. Turn OFF the ignition. 2. Disconnect the roof rail module connector. Refer to **Inflatable Restraint Roof Rail Module Replacement - Front** . 3. Inspect the component and harness sides of the connector for damage or corrosion that may cause the malfunction. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Does the connector exhibit any signs of damage or corrosion?	Go to **Step 3**	Go to **Step 4**
3	1. If the component side of the roof rail module connector is damaged, the roof rail module must be replaced. Refer to **Inflatable Restraint Roof Rail Module Replacement - Front** . 2. If the wiring harness side of the roof rail module connector is damaged, replace the harness side of the connector. Refer to **Connector Repairs** in Wiring Systems. Did you complete the repair?	Go to **Step 9**	-
4	1. Connect the **SA9409Z-A** SIR Driver/Passenger Load Tool to the harness side of the roof rail module connector. See **Special Tools and Equipment** . Use PASSENGER INFLATOR connector. 2. Turn ON the ignition, with the engine OFF. 3. With the scan tool, request the SIR DTC display. Does the scan tool indicate that DTC B0040, B0041, or B0045 are current?	Go to **Step 5**	Go to **Step 7**
	1. Turn OFF the ignition. 2. Disconnect and remove the **SA9409Z-A** . See **Special Tools and Equipment** . 3. Disconnect the inflatable restraint sensing and diagnostic module (SDM) connector. Refer to **Inflatable Restraint Sensing and**		

5	**Diagnostic Module Replacement** . 4. Inspect the SDM connector for damage or corrosion that may cause a malfunction in the roof rail module high and/or low circuits. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 9**	Go to **Step 6**
6	1. If DTC B0040 is present, test for a short between the roof rail module high and low circuits. 2. If DTC B0041 is present, test the roof rail module high and low circuits for an open and for high resistance. 3. If DTC B0045 is present, test the roof rail module high and low circuits for a short to ground and for a short to voltage. 4. All the above conditions refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 9**	Go to **Step 8**
7	1. Turn OFF the ignition. 2. Replace the roof rail module. Refer to **Inflatable Restraint Roof Rail Module Replacement - Front** . Did you complete the replacement?	Go to **Step 9**	-
8	1. Turn OFF the ignition. 2. Replace the SDM. Refer to **Inflatable Restraint Sensing and Diagnostic Module Replacement** . Did you complete the replacement?	Go to **Step 9**	-
9	1. Connect all SIR components. 2. Turn ON the ignition, with the engine OFF. 3. Use the scan tool in order to clear the DTCs. 4. Operate the vehicle within the Conditions for Running the DTC as specified in the supporting text. Does the DTC reset?	Go to **Step 2**	System OK

DTC B0051

Circuit Description

The inflatable restraint sensing and diagnostic module (SDM) contains a sensing device that converts vehicle velocity changes into an electrical signal. The SDM compares this electrical signal to a value stored in memory. When the generated signal exceeds the stored value, the SDM performs additional signal processing and compares the generated signals to values stored in memory. When two of the generated signals exceed the

stored values, the SDM will cause current to flow through the deployment loops, deploying the air bags and/or pretensioners causing DTC B0051 to set.

IMPORTANT: The seat belt pretensioners may deploy for impacts that are not severe enough to warrant frontal or side air bag deployment. The SDM is capable of sustaining 3 pretensioner deployment events, or 1 frontal or side deployment event. After the maximum number of deployments has occurred, DTC B0051 becomes a latched code, which cannot be cleared.

Conditions for Running the DTC

Ignition 1 voltage must be within the normal operating range.

Conditions for Setting the DTC

The DTC will set if one of the following conditions occurs.

- The SDM detects a frontal impact of sufficient force to warrant deployment of the frontal inflator modules and/or pretensioners.
- The SDM detects a side impact of sufficient force to warrant deployment of a roof rail inflator module.

Action Taken When the DTC Sets

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

Conditions for Clearing the DTC

DTC B0051 can be cleared if the following conditions are met.

- Three consecutive seat belt pretensioner deployment events have not occurred
- One frontal or side air bag deployment has not occurred.
- The condition responsible for setting the DTC no longer exists and the scan tool Clear DTCs function is used.
- A history DTC will clear once 255 malfunction free ignition cycles have occurred.

DTC B0051 becomes a latched code after 3 consecutive pretensioner deployments or 1 frontal or side air bag deployment. You cannot clear a latched code. Replace the SDM after following the instructions in the diagnostic table.

DTC B0051

Step	Action	Yes	No
Schematic Reference:SIR Schematics			
1	Did you perform the Diagnostic System Check - SIR?	Go to **Step 2**	Go to **Diagnostic System Check - SIR**

2	1. Turn OFF the ignition. 2. Inspect the vehicle for signs of inflator module or pretensioner deployment. Does the vehicle show any signs of inflator module or pretensioner deployment?	Go to **Step 4**	Go to **Step 3**
3	Inspect the front of the vehicle and undercarriage for signs of impact/collision. Does the vehicle show any signs of impact/collision?	Go to **Step 4**	Go to **Step 5**
4	1. Install a scan tool. 2. With a scan tool, observe the SIR DTC display. 3. If a history DTC exists, refer to Diagnostic Aids for that specific DTC and diagnose the problem. 4. Replace components and perform inspections as required following an accident. Refer to **Repairs and Inspections Required After a Collision** . Did you complete the action?	Go to **Step 5**	-
5	Use the scan tool to attempt to Clear DTC B0051. Has DTC B0051 been cleared successfully?	Go to **Step 7**	Go to **Step 6**
6	Replace the SDM. Refer to **Inflatable Restraint Sensing and Diagnostic Module Replacement** . Did you complete the replacement?	Go to **Step 7**	-
7	1. Reconnect all SIR components. 2. Use the scan tool in order to clear the DTCs. 3. Operate the vehicle within the Conditions for Running the DTC as specified in the supporting text. Does the DTC reset?	Go to **Step 2**	System OK

DTC B0053

Circuit Description

The inflatable restraint sensing and diagnostic module (SDM) contains sensing devices that convert vehicle velocity changes to electrical signals. The SDM processes the generated electrical signals and compares them to values stored in memory. When the generated signals exceed the stored values, the SDM performs additional signal processing and compares the generated signals to signals stored in memory. When 2 of the generated signals exceed the stored values, the SDM will cause current to flow through the deployment loops, deploying the air bags and/or pretensioners. Diagnostic trouble code (DTC) B0053 will set along with DTC B0051 when a deployment occurs while a circuit malfunction is present in any one of the deployment loops.

IMPORTANT: The seat belt pretensioners may deploy for impacts that are not severe enough

to warrant frontal or side air bag deployment. The SDM is capable of sustaining 3 pretensioner deployment events, or 1 frontal or side deployment event. After the maximum number of deployments has occurred, DTC B0051 and B0053 become latched codes, which cannot be cleared.

Conditions for Running the DTC

Ignition 1 voltage is within the normal operating voltage range.

Conditions for Setting the DTC

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

- The SDM detects a frontal impact of sufficient force to warrant deployment of the frontal inflator modules and/or pretensioners.
- The SDM detects a side impact of sufficient force to warrant deployment of a roof rail inflator module.

Action Taken When the DTC Sets

- The SDM sets DTC B0051.
- The SDM commands the AIR BAG indicator ON via class 2 serial data.
- The SDM records crash data.

Conditions for Clearing the DTC

DTC B0053 can be cleared if the following conditions are met.

- Three consecutive seat belt pretensioner deployment events have not occurred.
- One frontal or side air bag deployment has not occurred.
- The condition responsible for setting the DTC no longer exists and the scan tool Clear DTCs function is used.
- A history DTC will clear once 255 malfunction free ignition cycles have occurred.

DTC B0053 becomes a latched code after 3 consecutive pretensioner deployment events or 1 frontal or side air bag deployment. You cannot clear a latched code. Replace the SDM after following the instructions in the Diagnostic table.

Diagnostic Aids

DTC B0053 will be accompanied by another DTC, other than DTC B1000 and DTC B0051. Repair the malfunction causing the other DTCs before installing a new SDM.

DTC B0053

Step	Action	Yes	No
Schematic Reference:SIR Schematics			

1	Did you perform the Diagnostic System Check - SIR?	Go to **Step 2**	Go to **Diagnostic System Check - SIR**
2	1. Turn OFF the ignition. 2. Inspect the vehicle for signs of inflator module or pretensioner deployment. Does the vehicle show any signs of inflator module or pretensioner deployment?	Go to **Step 4**	Go to **Step 3**
3	Inspect the front of the vehicle and undercarriage for signs of impact/collision. Does the vehicle show any signs of impact/collision?	Go to **Step 4**	Go to **Step 5**
4	1. Install a scan tool. 2. With a scan tool, observe the SIR DTC display. 3. If a history DTC exists, refer to Diagnostic Aids for that specific DTC and diagnose the problem. 4. Replace components and perform inspections as required following an accident. Refer to **Repairs and Inspections Required After a Collision** . Did you complete the action?	Go to **Step 5**	-
5	Use the scan tool to attempt to Clear DTC B0053. Has DTC B0053 been cleared successfully?	Go to **Step 7**	Go to **Step 6**
6	Replace the SDM. Refer to **Inflatable Restraint Sensing and Diagnostic Module Replacement** . Did you complete the replacement?	Go to **Step 7**	-
7	1. Reconnect all SIR components. 2. Use the scan tool in order to clear the DTCs. 3. Operate the vehicle within the Conditions for Running the DTC as specified in the supporting text. Does the DTC reset?	Go to **Step 2**	System OK

DTC B0057, B0058, OR B0059

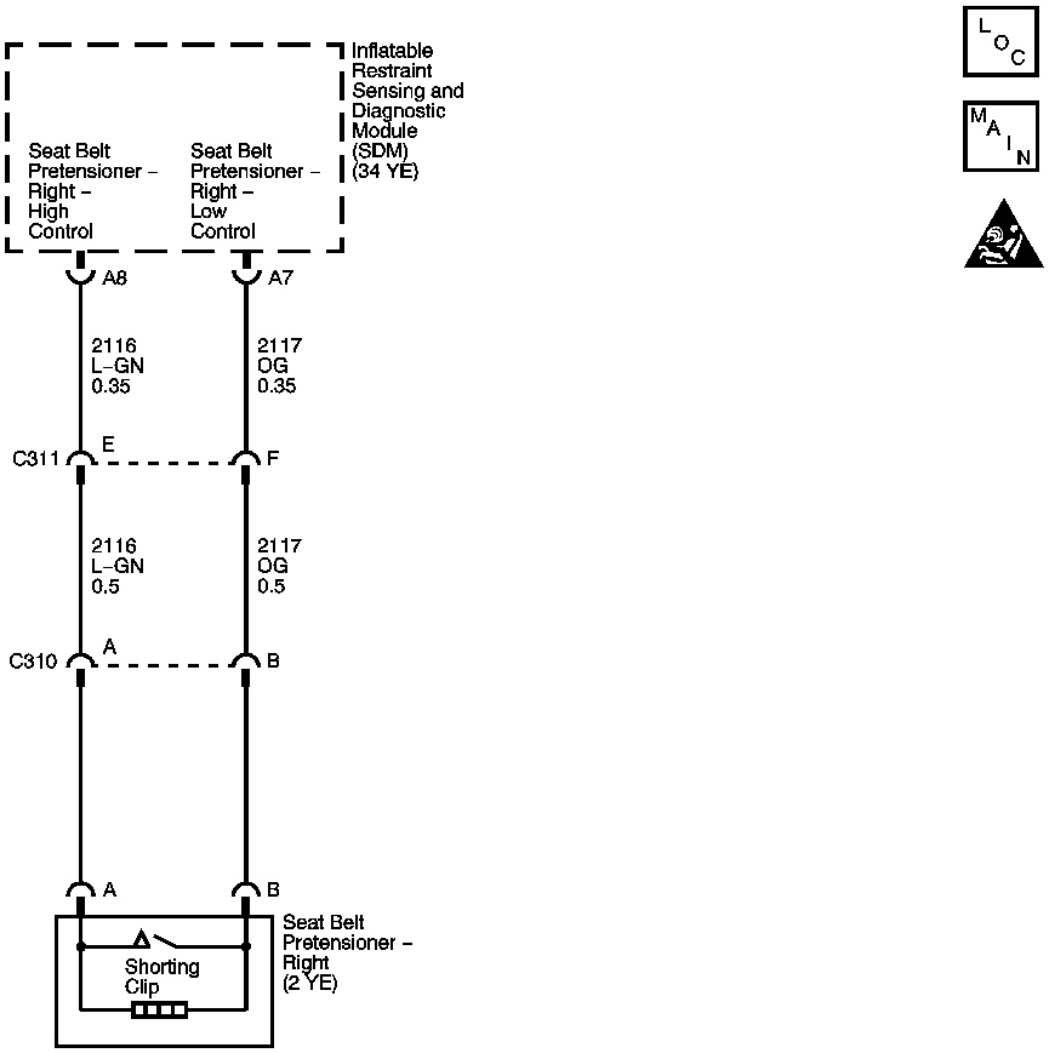


Fig. 9: DTC B0057, B0058, Or B0059 Schematics
Courtesy of GENERAL MOTORS CORP.

Circuit Description

The passenger seat belt pretensioner deployment loop consists of a seat belt pretensioner-RF and the seat belt pretensioner-RF high and low circuits. A shorting bar used within the seat belt pretensioner connector shorts together both the seat belt pretensioner high and low circuits when the connector is disconnected. This will help to prevent unwanted deployment of the pretensioner during servicing. 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 seat belt pretensioner. The SDM performs continuous diagnostic tests on the deployment loops to check for proper circuit continuity and for shorts to ground or voltage. If a malfunction is detected, a diagnostic trouble code (DTC) will be stored in memory.

Conditions for Running the DTC

Ignition 1 voltage is within the normal operating voltage range.

Conditions for Setting the DTC

- DTC B0057 will set when the seat belt pretensioner-RF deployment loop resistance is less than 1.3 ohms for 500 milliseconds.
- DTC B0058 will set when one of the following conditions occurs:
  - Seat belt pretensioner-RF high circuit is less than 2.4 volts and the seat belt pretensioner-RF deployment loop is more than 6 ohms for 500 milliseconds.
  - Seat belt pretensioner-RF deployment loop resistance is more than 4.8 ohms for 500 milliseconds.
- DTC B0059 when one of the following conditions occur:
  - Seat belt pretensioner-RF high or low circuits is short to ground or short to voltage for 500 milliseconds.
  - Seat belt pretensioner-RF high circuit is less than 2.4 volts and seat belt pretensioner-RF deployment loop resistance is less than 6 ohms for 500 milliseconds.

Action Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Diagnostic Aids

The following are possible causes of the malfunction:

- A short between the seat belt pretensioner-RF high and low circuits.
- An open or a high resistance in the seat belt pretensioner-RF high or low circuits.
- A short to ground or a short to voltage in the seat belt pretensioner-RF high or low circuits.
- The seat belt pretensioner-RF connector
- The SDM connector
- A malfunctioning seat belt pretensioner
- A malfunctioning SDM

Thoroughly inspect the wiring and the connectors. An incomplete inspection of the wiring and the connectors may result in a misdiagnosis, causing a part replacement with the reappearance of the malfunction. If an intermittent malfunction exists, refer to **Testing for Intermittent Conditions and Poor Connections** in Wiring Systems.

Test Description

The numbers below refer to the step number on the diagnostic table.

4: Tests to see if the malfunction is caused by the seat belt pretensioner-RF.

7: Tests to see what DTCs are present. If DTC B0057 is present, test for a short between the seat belt pretensioner-RF high and low circuits. If DTC B0058 is present, test the seat belt pretensioner-RF high and low circuits for an open and for high resistance. If DTC B0059 is present, test the seat belt pretensioner-RF high and low circuits for a short to ground and for a short to voltage.

DTC B0057, B0058, or B0059

Step	Action	Yes	No
Connector End View Reference:SIR Connector End Views			
1	Did you perform the Diagnostic System Check - SIR?	Go to **Step 2**	Go to **Diagnostic System Check - SIR**
2	1. Turn OFF the ignition. 2. Disconnect the seat belt pretensioner-RF wiring harness inline connector. Refer to **Seat Belt Retractor Pretensioner Replacement - Front** . 3. Inspect the component and harness sides of the inline connector for the seat belt pretensioner for damage or corrosion that may cause the malfunction. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Does the connector exhibit any signs of damage or corrosion?	Go to **Step 3**	Go to **Step 4**
3	1. If the inline connector for the seat belt pretensioner-RF wiring harness connector is damaged, the seat belt pretensioner wiring harness must be replaced. 2. If the wiring harness side of the seat belt pretensioner connector is damaged, replace the harness side of the connector. Refer to **Connector Repairs** in Wiring Systems. Did you complete the repair?	Go to **Step 11**	-
4	1. Use SA9409Z-99P adapter to connect the **SA9409Z-A** SIR Driver/Passenger Load Tool to the harness side of the seat belt pretensioner-RF connector. See **Special Tools and Equipment** . Use the PASSENGER INFLATOR connector. 2. Turn ON the ignition, with the engine OFF. 3. With the scan tool, request the SIR DTC display. Does the scan tool indicate that DTC B0057, B0058, or B0059 are current?	Go to **Step 6**	Go to **Step 5**

5	1. Turn OFF the ignition. 2. Disconnect and remove both the **SA9409Z-A** and adapter. See **Special Tools and Equipment** . 3. Connect the seat belt pretensioner - RF wiring harness inline connector. 4. Remove the seat belt pretensioner-RF connector. Refer to **Seat Belt Retractor Pretensioner Replacement - Front** . 5. Use J 38715-30A adapter to connect the **SA9409Z-A** to the seat belt pretensioner-RF connector. See **Special Tools and Equipment** . Use the PASSENGER INFLATOR connector. 6. Turn ON the ignition, with the engine OFF. 7. With the scan tool, request the SIR DTC display. Does the scan tool indicate that DTC B0057, B0058, or B0059 are current?	Go to **Step 9**	Go to **Step 8**
6	1. Turn OFF the ignition. 2. Disconnect and remove both the **SA9409Z-A** and adapter. See **Special Tools and Equipment** . 3. Disconnect the inflatable restraint sensing and diagnostic module (SDM) connector. Refer to **Inflatable Restraint Sensing and Diagnostic Module Replacement** . 4. Inspect the SDM connector for damage or corrosion that may cause a malfunction in the seat belt pretensioner-RF high and/or low circuits. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 11**	Go to **Step 7**
7	**IMPORTANT:** **If the scan tool displays multiple codes, diagnose the open code first.** 1. If DTC B0057 is present, test for a short between the seat belt pretensioner-RF high and low circuits. 2. If DTC B0058 is present, test the seat belt pretensioner-RF high and low circuits for an open and for high resistance. 3. If DTC B0059 is present, test the seat belt pretensioner-RF high and low circuits for a short to ground and for a short to voltage. 4. All the above conditions refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 11**	Go to **Step 10**
	1. Turn OFF the ignition.		

8	2. Replace the seat belt pretensioner-RF. Refer to **Seat Belt Retractor Pretensioner Replacement - Front** . Did you complete the replacement?	Go to **Step 11**	-
9	1. Turn OFF the ignition. 2. Replace the seat belt pretensioner-RF wiring harness. Did you complete the replacement?	Go to **Step 11**	-
10	1. Turn OFF the ignition. 2. Replace the SDM. Refer to **Inflatable Restraint Sensing and Diagnostic Module Replacement** . Did you complete the replacement?	Go to **Step 11**	-
11	1. Connect all SIR components. 2. Turn ON the ignition, with the engine OFF. 3. Use the scan tool in order to clear the DTCs. 4. Operate the vehicle within the Conditions for Running the DTC as specified in the supporting text. Does the DTC reset?	Go to **Step 2**	System OK

DTC B0064, B0065, OR B0066

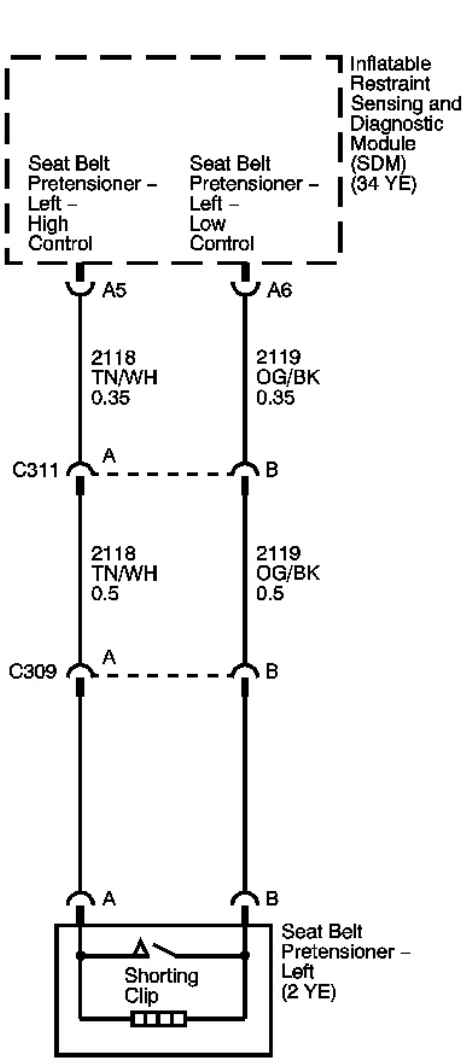


Fig. 10: DTC B0064, B0065, Or B0066 Schematics
Courtesy of GENERAL MOTORS CORP.

Circuit Description

The driver seat belt pretensioner deployment loop consists of a seat belt pretensioner-LF and the seat belt pretensioner-LF high and low circuits. A shorting bar used within the seat belt pretensioner connector shorts together both the seat belt pretensioner high and low circuits when the connector is disconnected. This will help to prevent unwanted deployment of the pretensioner during servicing. 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 seat belt pretensioner. The SDM performs continuous diagnostic tests on the deployment loops to check for proper circuit continuity and for shorts to ground or voltage. If a malfunction is detected, a diagnostic trouble code (DTC) will be stored in memory.

Conditions for Running the DTC

Ignition 1 voltage is within the normal operating voltage range.

Conditions for Setting the DTC

- DTC B0064 will set when the seat belt pretensioner-LF deployment loop resistance is less than 1.3 ohms for 500 milliseconds.
- DTC B0065 will set when one of the following conditions occurs:
  - Seat belt pretensioner-LF high circuit is less than 2.4 volts and the seat belt pretensioner-LF deployment loop is more than 6 ohms for 500 milliseconds.
  - Seat belt pretensioner-LF deployment loop resistance is more than 4.8 ohms for 500 milliseconds.
- DTC B0066 will set when one of the following conditions occur:
  - Seat belt pretensioner-LF high or low circuits is short to ground or short to voltage for 500 milliseconds.
  - Seat belt pretensioner-LF high circuit is less than 2.4 volts and seat belt pretensioner-LF deployment loop resistance is less than 6 ohms for 500 milliseconds.

Action Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Diagnostic Aids

The following are possible causes of the malfunction:

- A short between the seat belt pretensioner-LF high and low circuits.
- An open or a high resistance in the seat belt pretensioner-LF high or low circuits.
- A short to ground or a short to voltage in the seat belt pretensioner-LF high or low circuits.
- The seat belt pretensioner-LF connector
- The SDM connector
- A malfunctioning seat belt pretensioner
- A malfunctioning SDM

Thoroughly inspect the wiring and the connectors. An incomplete inspection of the wiring and the connectors may result in a misdiagnosis, causing a part replacement with the reappearance of the malfunction. If an intermittent malfunction exists, refer to **Testing for Intermittent Conditions and Poor Connections** in Wiring Systems.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

4: Tests to see if the malfunction is caused by the seat belt pretensioner-LF.

7: Tests to see what DTCs are present. If DTC B0064 is present, test for a short between the seat belt pretensioner-LF high and low circuits. If DTC B0065 is present, test the seat belt pretensioner-LF high and low circuits for an open and for high resistance. If DTC B0066 is present, test the seat belt pretensioner-LF high and low circuits for a short to ground and for a short to voltage.

DTC B0064, B0065, or B0066

Step	Action	Yes	No
Connector End View Reference:SIR Connector End Views			
1	Did you perform the Diagnostic System Check - SIR?	Go to **Step 2**	Go to **Diagnostic System Check - SIR**
2	1. Turn OFF the ignition. 2. Disconnect the seat belt pretensioner-LF wiring harness inline connector. Refer to **Seat Belt Retractor Pretensioner Replacement - Front** . 3. Inspect the component and harness sides of the inline connector for the seat belt pretensioner for damage or corrosion that may cause the malfunction. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Does the connector exhibit any signs of damage or corrosion?	Go to **Step 3**	Go to **Step 4**
3	1. If the inline connector for the seat belt pretensioner-LF wiring harness is damaged, the seat belt pretensioner wiring harness must be replaced. Refer to **Seat Belt Retractor Pretensioner Replacement - Front** . 2. If the wiring harness side of the seat belt pretensioner connector is damaged, replace the harness side of the connector. Refer to **Connector Repairs** in Wiring Systems. Did you complete the repair?	Go to **Step 11**	-
4	1. Use SA9409Z-99P adapter to connect the **SA9409Z-A** SIR Driver/Passenger Load Tool to the harness side of the seat belt pretensioner-LF connector. See **Special Tools and Equipment** . Use the PASSENGER INFLATOR connectors. 2. Turn ON the ignition, with the engine OFF. 3. With the scan tool, request the SIR DTC display. Does the scan tool indicate that DTC B0064, B0065, or B0066 are	Go to	

	current?	**Step 6**	Go to **Step 5**
5	1. Turn OFF the ignition. 2. Disconnect and remove both the **SA9409Z-A** and adapter. See **Special Tools and Equipment** . 3. Connect the seat belt pretensioner-LF wiring harness inline connector. 4. Remove the seat belt pretensioner-LF connector. Refer to **Seat Belt Retractor Pretensioner Replacement - Front** 5. Use J 38715-30A adapter to connect the **SA9409Z-A** to the seat belt pretensioner-LF connector. See **Special Tools and Equipment** . Use the PASSENGER INFLATOR connector. 6. Turn ON the ignition, with the engine OFF. 7. With the scan tool, request the SIR DTC display. Does the scan tool indicate that DTC B0064, B0065, or B0066 are current?	Go to **Step 9**	Go to **Step 8**
6	1. Turn OFF the ignition. 2. Disconnect and remove both the **SA9409Z-A** and adapter. See **Special Tools and Equipment** . 3. Disconnect the inflatable restraint sensing and diagnostic module (SDM) connector. Refer to **Inflatable Restraint Sensing and Diagnostic Module Replacement** . 4. Inspect the SDM connector for damage or corrosion that may cause a malfunction in the seat belt pretensioner-LF high and/or low circuits. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 11**	Go to **Step 7**
7	**IMPORTANT:** **If the scan tool displays multiple codes, diagnose the open code first.** 1. If DTC B0064 is present, test for a short between the seat belt pretensioner-LF high and low circuits. 2. If DTC B0065 is present, test the seat belt pretensioner-LF high and low circuits for an open and for high resistance. 3. If DTC B0066 is present, test the seat belt pretensioner-LF high and low circuits for a short to ground and for a short to voltage. 4. All the above conditions refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 11**	Go to **Step 10**
	1. Turn OFF the ignition.		

8	2. Replace the seat belt pretensioner-LF. Refer to **Seat Belt Retractor Pretensioner Replacement - Front** . Did you complete the replacement?	Go to **Step 11**	-
9	1. Turn OFF the ignition. 2. Replace the seat belt pretensioner-LF wiring harness. Did you complete the replacement?	Go to **Step 11**	-
10	1. Turn OFF the ignition. 2. Replace the SDM. Refer to **Inflatable Restraint Sensing and Diagnostic Module Replacement** . Did you complete the replacement?	Go to **Step 11**	-
11	1. Connect all SIR components. 2. Turn ON the ignition, with the engine OFF. 3. Use the scan tool in order to clear the DTCs. 4. Operate the vehicle within the Conditions for Running the DTC as specified in the supporting text. Does the DTC reset?	Go to **Step 2**	System OK

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

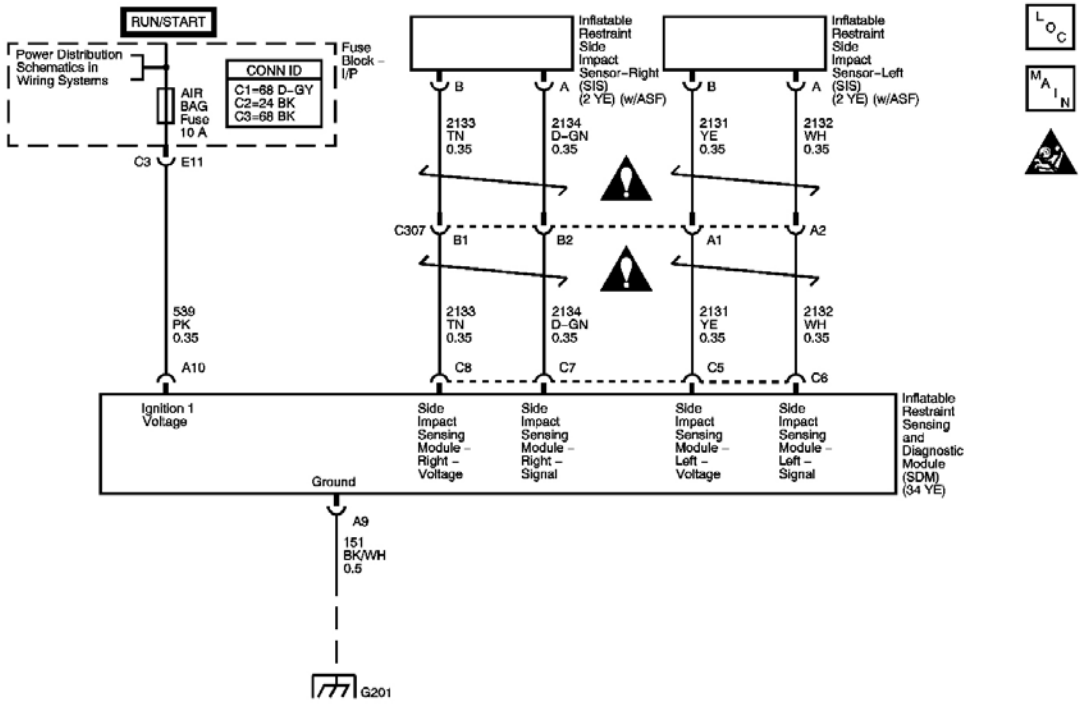


Fig. 11: DTC B0077, B0078, B0079, B0080, B0081, Or B0082 Schematics
Courtesy of GENERAL MOTORS CORP.

Circuit Description

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

Conditions for Running the DTC

Ignition 1 voltage is within the normal operating voltage range.

Conditions for Setting the DTC

- DTC B0077 for the SIS-LF or B0078 for the SIS-RF will set when one of the following conditions occur:
  - A valid ID message is not received within 5 seconds of the SIS being powered up.
  - Status message is not received.
  - The SDM has reset the SIS twice without detecting a valid ID message.

- DTC B0079 for the SIS-LF or B0081 for the SIS-RF will set when one of the following conditions occur:
  - The SDM has received an ID message from the SIS which does not match the ID stored in the SDM memory.
  - The SDM has reset the SIS twice without detecting a correct ID message.
- DTC B0080 for the SIS-LF or B0082 for the SIS-RF will set when the SDM has received a NOK message from the SIS.

Action Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Diagnostic Aids

The following are conditions that may cause the malfunction:

- A short to ground or voltage in the SIS circuit
- High or low resistance in the SIS circuit
- Improper SIS installed on vehicle

Thoroughly inspect the wiring and the connectors. An incomplete inspection of the wiring and connectors may result in misdiagnosis, causing a part replacement with the reappearance of the malfunction. If an intermittent malfunction exists, refer to **Testing for Intermittent Conditions and Poor Connections** in Wiring Systems.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

7: This step tests the SIS signal and SIS voltage circuits for an open or high resistance.

8: This step tests between the SIS signal and SIS voltage circuits for continuity.

9: This step tests the SIS signal and SIS voltage circuits for a short to voltage.

DTC B0077, B0078, B0079, B0080, B0081, or B0082

Step	Action	Yes	No
Connector End View Reference:SIR Connector End Views			
1	Did you perform the Diagnostic System Check - SIR?	Go to **Step 2**	Go to **Diagnostic System Check - SIR**
	1. Install a scan tool.		

2	2. Turn ON the ignition, with the engine OFF. 3. Use the scan tool to request SIR DTCs displayed. Does the scan tool indicate that DTC B0079, B0080, B0081, or B0082 is current?	Go to **Step 10**	Go to **Step 3**
3	1. Turn OFF the ignition. 2. If DTC B0077 is current, disconnect the inflatable restraint side impact sensor (SIS)-LF connector. If DTC B0078 is current, disconnect the SIS-RF connector. Refer to **Inflatable Restraint Side Impact Sensor Replacement** . 3. Inspect both the component and harness sides of the connector for damage or corrosion. Refer to **Testing for Intermittent Conditions and Poor Connections** in Wiring Systems. Does the connector exhibit any signs of damage or corrosion?	Go to **Step 4**	Go to **Step 5**
4	1. If the component side of the SIS connector is damaged, the SIS must be replaced. Refer to **Inflatable Restraint Side Impact Sensor Replacement** . 2. If the harness side of the SIS connector is damaged, replace the harness side of the connector. Refer to **Connector Repairs** in Wiring Systems. Did you complete the repair?	Go to **Step 11**	-
5	1. Turn OFF the ignition. 2. Disconnect the Inflatable Restraint Sensing and Diagnostic Module (SDM) connector. Refer to **Inflatable Restraint Sensing and Diagnostic Module Replacement** . 3. Inspect both the component and harness sides of the SDM connector for damage or corrosion. Refer to **Testing for Intermittent Conditions and Poor Connections** in Wiring Systems. Does the connector exhibit any signs of damage or corrosion?	Go to **Step 6**	Go to **Step 7**
6	1. If the component side of the SDM connector is damaged, the SDM must be replaced. Refer to **Inflatable Restraint Sensing and Diagnostic Module Replacement** . 2. If the harness side of the SDM connector is damaged, replace the harness side of the connector. Refer to **Connector Repairs** in Wiring Systems. Did you complete the repair?	Go to **Step 11**	-
	1. If DTC B0077 is current, disconnect the SIS-LF connector. If		

7	DTC B0078 is current, disconnect the SIS-RF connector. 2. Test both the SIS signal and SIS voltage circuits for an open or high resistance between the SDM connector and the SIS connector. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 11**	Go to **Step 8**
8	Test for continuity between the SIS signal circuit and the SIS voltage circuit on the SDM connector. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 11**	Go to **Step 9**
9	1. Turn ON the ignition, with the engine OFF. 2. Test both SIS signal and SIS voltage circuits for a short to voltage. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 11**	Go to **Step 10**
10	1. Turn OFF the ignition. 2. If DTC B0077, B0079, or B0080 was current replace the SIS-LF. If DTC B0078, B0081, or B0082 was current replace the SIS-RF. Refer to **Inflatable Restraint Side Impact Sensor Replacement** . Did you complete the replacement?	Go to **Step 11**	-
11	1. Reconnect all SIR components. 2. Use the scan tool in order to Clear the DTCs. 3. Operate the vehicle within the Conditions for Running the DTC as specified in the text. Does the DTC reset?	Go to **Step 12**	System OK
12	1. Turn OFF the ignition. 2. Replace the SDM. Refer to **Inflatable Restraint Sensing and Diagnostic Module Replacement** . Did you complete the replacement?	Go to **Step 13**	-
13	1. Turn ON the ignition, with the engine OFF 2. Use the scan tool in order to Clear the DTCs. 3. Operate the vehicle within the Conditions for Running the DTC as specified in the text. Does the DTC reset?	Go to **Step 2**	System OK

DTC B1001

Circuit Description

When the ignition is turned ON, the inflatable restraint sensing and diagnostic module (SDM) compares the restraints ID that is stored in the SDM to the restraints ID that is stored in the body control module (BCM). The restraints ID that is being compared contains the last four digits of the SDM part number. Then, the SDM compares the VIN that is stored in the SDM to the VIN that is stored in the BCM. For more detailed information concerning the Class 2 data lines, refer to **Data Link Communications Description and Operation** in Data Link Communications.

Conditions for Running the DTC

Ignition 1 voltage is within the normal operating voltage range.

Conditions for Setting the DTC

The restraints ID that is stored in the SDM does not match the restraints ID that is stored in the BCM or the VIN information that is stored in the SDM does not match the VIN information that is stored in the BCM.

Action Taken When the DTC Sets

- The SDM commands the AIR BAG indicator ON via Class 2 serial data.
- The SDM disables all deployment loops.

Conditions for Clearing the DTC

The restraints ID that is stored in the SDM matches the restraints ID that is stored in the BCM and the VIN information that is stored in the SDM matches the VIN information that is stored in the BCM.

Diagnostic Aids

DTC B1001 is an indication that the restraints IDs stored in both the BCM and SDM do not match or that the VINs stored in both the BCM and SDM do not match. If either the BCM and/or engine control module (ECM) were replaced, the replacement modules need to be reprogrammed for proper operation.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

2: Tests to see if the correct VIN is programmed in the ECM.
4: Tests to see if the BCM has been replaced.
5: Tests to see if the correct VIN is programmed in the BCM.

DTC B1001

Step	Action	Yes	No
1	Did you perform the Diagnostic System Check - SIR?	Go to	Go to **Diagnostic System Check -**

		Step 2	SIR
2	1. Install a scan tool. 2. With a scan tool, verify that the ECM is programmed with the correct VIN by comparing the VIN that is stored in the ECM to the VIN plate of the vehicle. Does the scan tool indicate that the ECM is programmed with the correct VIN?	Go to **Step 4**	Go to **Step 3**
3	Use a scan tool and/or the techline machine to program the correct VIN into the ECM. Did you complete the action?	Go to **Step 8**	-
4	Was the BCM replaced?	Go to **Step 6**	Go to **Step 5**
5	With a scan tool, verify that the BCM is programmed with the correct VIN by comparing the VIN that is stored in the BCM to the VIN that is stored in the ECM. Does the scan tool indicate that the BCM is programmed with the correct VIN?	Go to **Step 7**	Go to **Step 6**
6	Follow the instructions on the scan tool under BCM SPECIAL FUNCTIONS to properly reprogram the BCM. Refer to **Body Control Module (BCM) Programming/RPO Configuration** in Body Control System. Did you complete the action?	Go to **Step 8**	-
7	Replace the SDM. Refer to **Inflatable Restraint Sensing and Diagnostic Module Replacement** . Did you complete the replacement?	Go to **Step 8**	-
8	1. Reconnect all SIR components. 2. Use the scan tool in order to clear the DTCs. 3. Operate the vehicle within the Conditions for Running the DTC as specified in the supporting text. Does the DTC reset?	Go to **Step 2**	System OK

SYMPTOMS - SIR

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

1. Perform the**Diagnostic System Check - SIR** before using the symptom tables in order to verify that all of the following are true:
   - There are no diagnostic trouble codes (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 **SIR System Description and Operation** .

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the SIR system. Refer to **Checking Aftermarket Accessories** in Wiring Systems.
- 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** in Wiring Systems.

Symptom List

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

AIR BAG INDICATOR CIRCUIT MALFUNCTION

Circuit Description

When the ignition is turned ON, the instrument panel cluster (IPC) flashes the AIR BAG indicator seven times. The inflatable restraint sensing and diagnostic module (SDM) performs diagnostic tests on the SIR system and then commands the IPC to turn the AIR BAG indicator OFF if no SIR malfunction exists. The AIR BAG indicator is controlled by the SDM via Class 2 serial data. If the Ignition 1 voltage is outside of the normal operating voltage range of 9-16 volts, the SDM will command the IPC to turn the AIR BAG indicator ON with no diagnostic trouble codes (DTCs) present.

Diagnostic Aids

The IPC will turn the AIR BAG indicator ON if there is a loss of serial data communication between the IPC and the SDM. For more detailed information concerning the Class 2 data lines, refer to **Data Link Communications Description and Operation** in Data Link Communications.

The following are possible causes of the malfunction:

- Ignition 1 voltage out of range
- An internal IPC malfunction
- An internal SDM malfunction

Test Description

The numbers below refer to the step numbers on the diagnostic table.

5: This step tests to see if the scan tool can communicate with the IPC.

6: This step tests to see if the Ignition 1 voltage is more than 9 V.

7: This step tests to see if the Ignition 1 voltage is more than 16 V.

8: This step tests to see if the SDM connector is damaged or corroded.

9: This step tests to see if there is an open or high resistance in the Ignition 1 voltage feed circuit to the SDM.

10: This step tests to see if there is an open or a high resistance in the Ignition 1 voltage feed circuit to the AIR BAG Fuse.

11: This step tests to see if there is an open or a high resistance in the SDM ground circuit.

Air Bag Indicator Circuit Malfunction

Step	Action	Value (s)	Yes	No
Connector End View Reference:SIR Connector End Views				
1	Did you perform the Diagnostic System Check-SIR?	-	Go to **Step 2**	Go to **Diagnostic System Check - SIR**
2	1. Turn OFF the ignition. 2. Note the AIR BAG indicator while turning the ignition ON. Does the AIR BAG indicator flash seven times?	-	Go to **Step 4**	Go to **Step 3**
3	Replace the IPC. Refer to **Instrument Panel Cluster (IPC) Replacement** in Instrument Panel, Gages and Console. Did you complete the replacement?	-	Go to **Step 13**	-
4	Note the AIR BAG indicator after it has flashed seven times. Does the AIR BAG indicator turn OFF after flashing seven times?	-	Go to **Testing for Intermittent Conditions and Poor Connections** in Wiring Systems	Go to **Step 5**
5	1. Install a scan tool. 2. Attempt to communicate with the IPC. Does the scan tool communicate with the IPC?	-	Go to **Step 6**	Go to **Scan Tool Does Not Communicate with Class 2 Device** in Data Link Communications
6	With a scan tool, observe the SIR data list display. Does the scan tool indicate that the ignition voltage is greater than the specified value?	9 V	Go to **Step 7**	Go to **Step 8**
	Does the scan tool indicate that the ignition voltage is greater than the		Go to **Diagnostic System Check -**	

7	specified value?	16 V	**Engine Electrical** in Engine Electrical	Go to **Step 12**
8	1. Turn OFF the ignition. 2. Disconnect the SDM. Refer to **Inflatable Restraint Sensing and Diagnostic Module Replacement** . 3. Inspect the SDM connector for damage or corrosion that may cause the malfunction. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 13**	Go to **Step 9**
9	1. Remove the AIR BAG Fuse. 2. Test the Ignition 1 voltage feed circuit to the SDM for an open or a high resistance. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 13**	Go to **Step 10**
10	Test the Ignition 1 voltage feed circuit to the AIR BAG Fuse for an open or a high resistance. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 13**	Go to **Step 11**
11	1. Turn OFF the ignition. 2. Test the SDM ground circuit for an open or a high resistance. Did you find and correct the condition?	-	Go to **Step 13**	Go to **Step 12**
12	Replace the SDM. Refer to **Inflatable Restraint Sensing and Diagnostic Module Replacement** . Did you complete the replacement?	-	Go to **Step 13**	-
13	Operate the system in order to verify the repair. Did you correct the condition?	-	System OK	Go to **Step 2**

SIR DISABLING AND ENABLING ZONES

IMPORTANT: Refer to SIR Service Precautions before disabling the SIR system.

The SIR system has been divided into Disabling and Enabling Zones. When performing service on or near SIR components or SIR wiring, it may be necessary to disable the SIR components in that zone. It may be necessary to disable more than one zone depending on the location of other SIR components and the area being serviced, refer to **SIR Zone Identification Views** . Refer to the illustration below, to identify the specific zone or zones in which service will be performed. After identifying the zone or zones, proceed to the disabling and enabling procedures for that particular zone or zones.

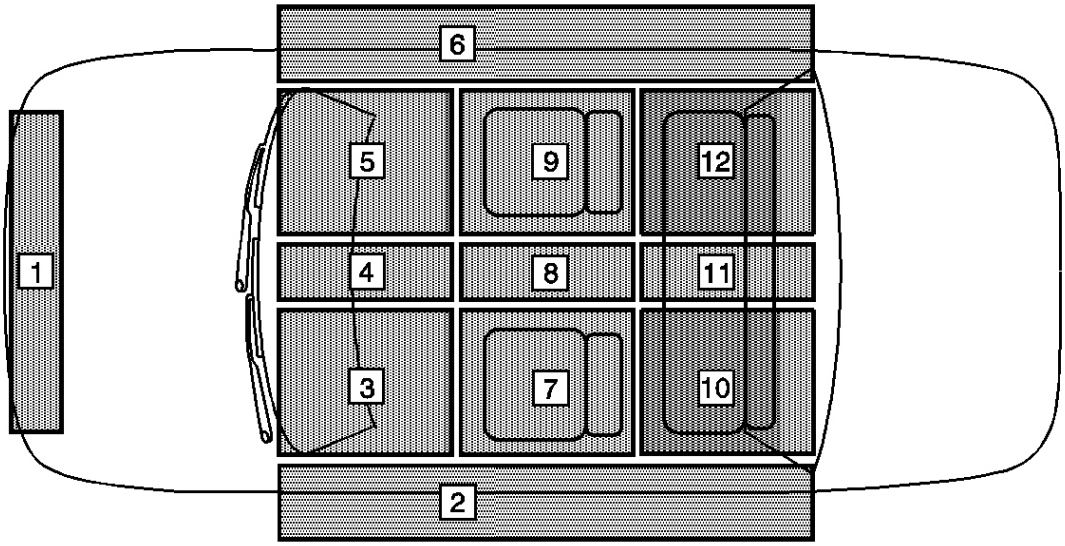


Fig. 12: SIR Disabling & Enabling Zones
Courtesy of GENERAL MOTORS CORP.

SIR Disabling and Enabling Zones

Zone	Description
1	Not Used
2	Inflatable Restraint Roof Rail Module-Left and Pretensioner-Left. Refer to **SIR Disabling and Enabling Zone 2** .
3	Inflatable Restraint Steering Wheel Module and Coil-Refer to **SIR Disabling and Enabling Zone 3** .
4	Not Used
5	Inflatable Restraint I/P Module-Refer to **SIR Disabling and Enabling Zone 5** .
6	Inflatable Restraint Roof Rail Module-Right and Pretensioner-Right. Refer to **SIR Disabling and Enabling Zone 6** .
7	Not Used
8	Inflatable Restraint Sensing and Diagnostic Module (SDM)-Refer to **SIR Disabling and Enabling Zone 8** .
9-12	Not Used

REPAIR INSTRUCTIONS

SIR SERVICE PRECAUTIONS

CAUTION: When performing service on or near the SIR components or the SIR wiring, the SIR system must be disabled. Refer to SIR Disabling and Enabling Zones. Failure to observe the correct procedure could cause deployment of the SIR components, personal injury, or unnecessary SIR system repairs.

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

General Service Instructions

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

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

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

- Inflatable restraint sensing and diagnostic module (SDM)
- Inflatable restraint I/P module
- Inflatable restraint steering wheel module
- Inflatable restraint steering wheel module coil
- Inflatable restraint roof rail modules
- Inflatable restraint side impact sensors (SIS)
- Inflatable restraint seat belt pretensioners.

SIR DISABLING AND ENABLING ZONE 2

Disabling Procedure

1. Turn the steering wheel so that the vehicles wheels are pointing straight ahead.
2. Turn the ignition switch to the OFF position.
3. Remove the key from the ignition switch.
4. Locate the body control module fuse center then remove fuse center cover.

IMPORTANT: With the AIR BAG fuse removed and the ignition switch in the ON position, the AIR BAG warning indicator illuminates. This is normal operation, and does not indicate an SIR system malfunction.

5. Locate and remove the AIR BAG fuse from the body control module fuse center.
6. To disable the roof rail module-left, perform steps 7-13. To disable both the roof rail module-left and the seat belt pretensioner-LF, continue to step 7.
7. Remove the upper rear window molding. Refer to **Molding Replacement - Rear Window Upper** .
8. Remove both the left and right rear corner garnish moldings. Refer to **Garnish Molding Replacement - Rear Corner** .
9. Remove the rear headliner push-in retainers.
10. Remove the rear coat hooks. Refer to **Coat Hook Replacement** .
11. Gently pull down the left rear corner of the headliner to access the roof rail module-left connector.

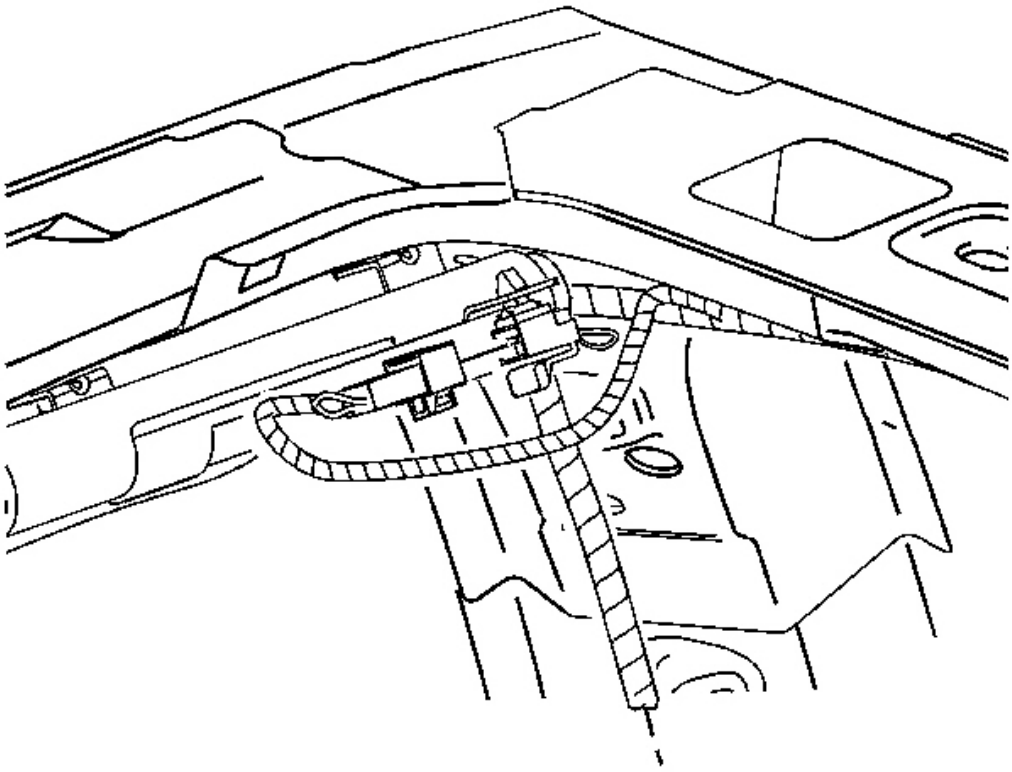


Fig. 13: CPA & Roof Rail Module Connector
Courtesy of GENERAL MOTORS CORP.

12. Remove the connector position assurance (CPA) from the roof rail module-left connector.
13. Disconnect the roof rail module-left connector from the vehicle harness connector.

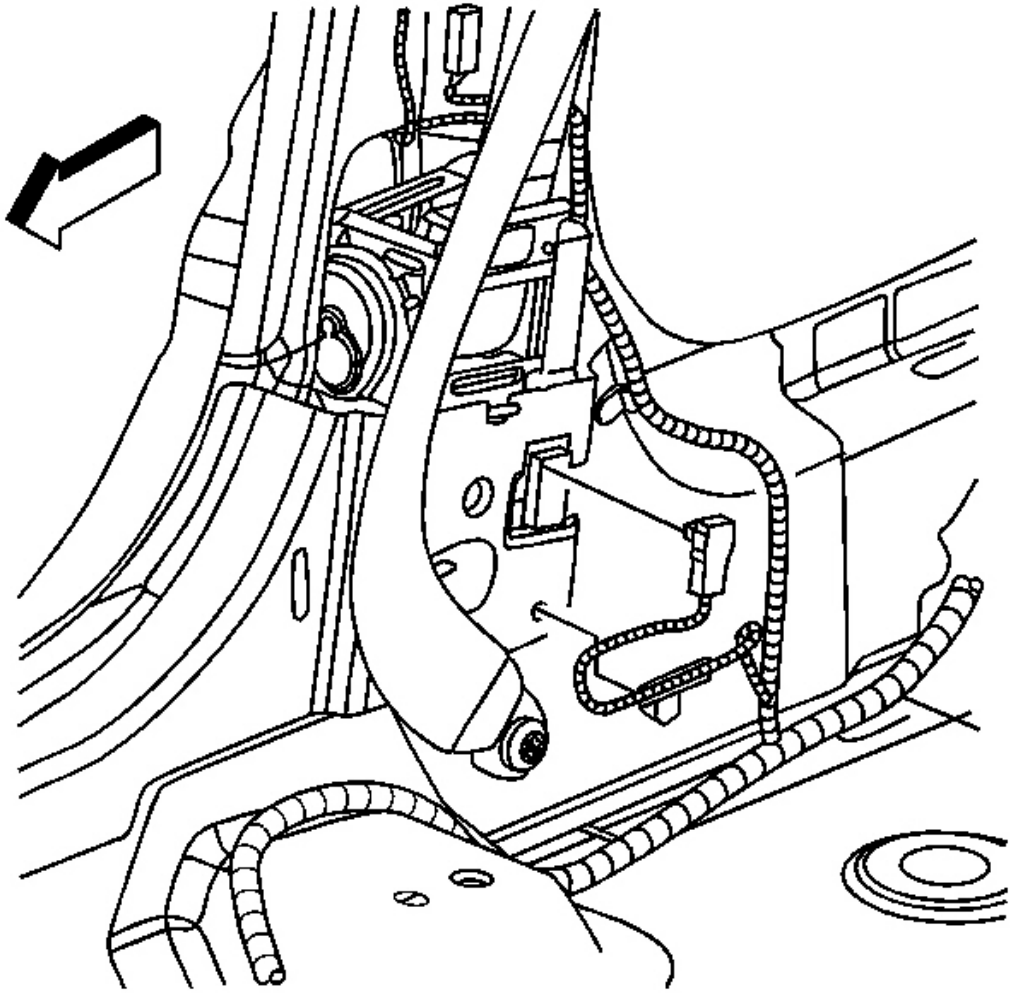


Fig. 14: View Of Seat Belt Wiring Harness Routing
Courtesy of GENERAL MOTORS CORP.

14. Remove the lower center pillar trim. Refer to **Garnish Molding Replacement - Center Pillar Lower** in Interior Trim.
15. Remove the CPA from the seat belt pretensioner-LF connector.
16. Disconnect the seat belt pretensioner-LF connector.

Enabling Procedure

1. Remove the key from the ignition switch.
2. To enable the roof rail module-left, perform steps 3-8. To enable both the roof rail module-left and the seat belt pretensioner-LF, continue to step 3.

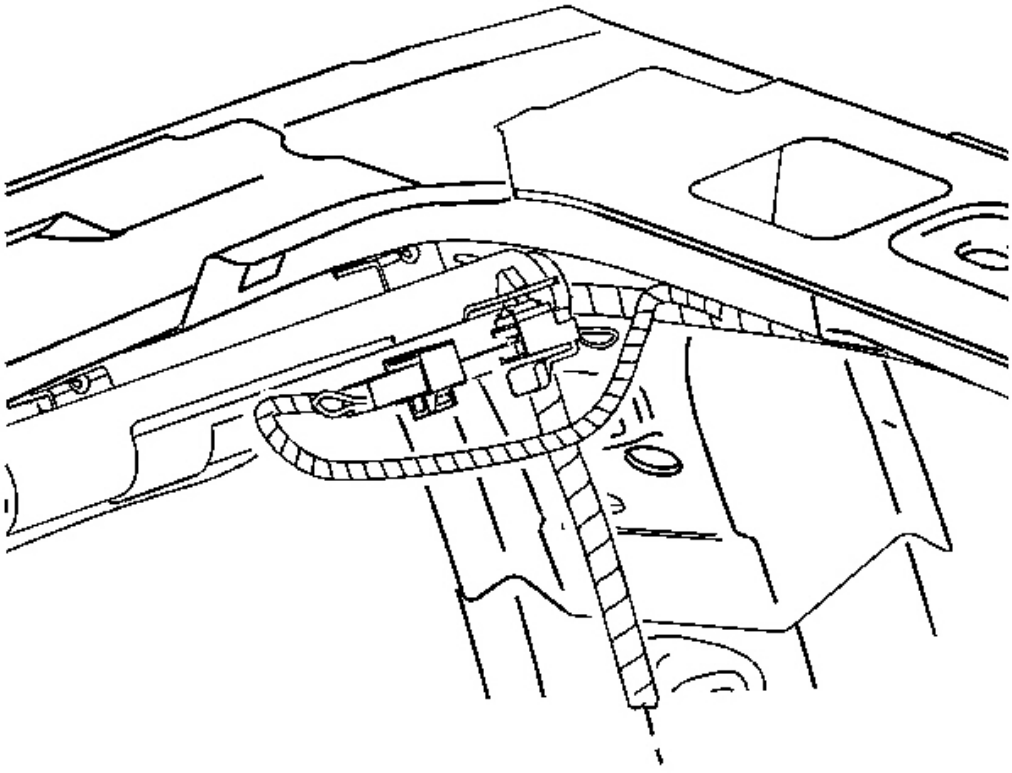


Fig. 15: CPA & Roof Rail Module Connector
Courtesy of GENERAL MOTORS CORP.

3. Connect the roof rail module-left connector to the vehicle harness connector.
4. Install the CPA to the roof rail module-left connector.
5. Install the rear coat hooks. Refer to **Coat Hook Replacement** .
6. Install the rear headliner push-in retainers.
7. Install both the left and right rear corner garnish moldings. Refer to **Garnish Molding Replacement - Rear Corner** .
8. Install the upper rear window molding. Refer to **Molding Replacement - Rear Window Upper**

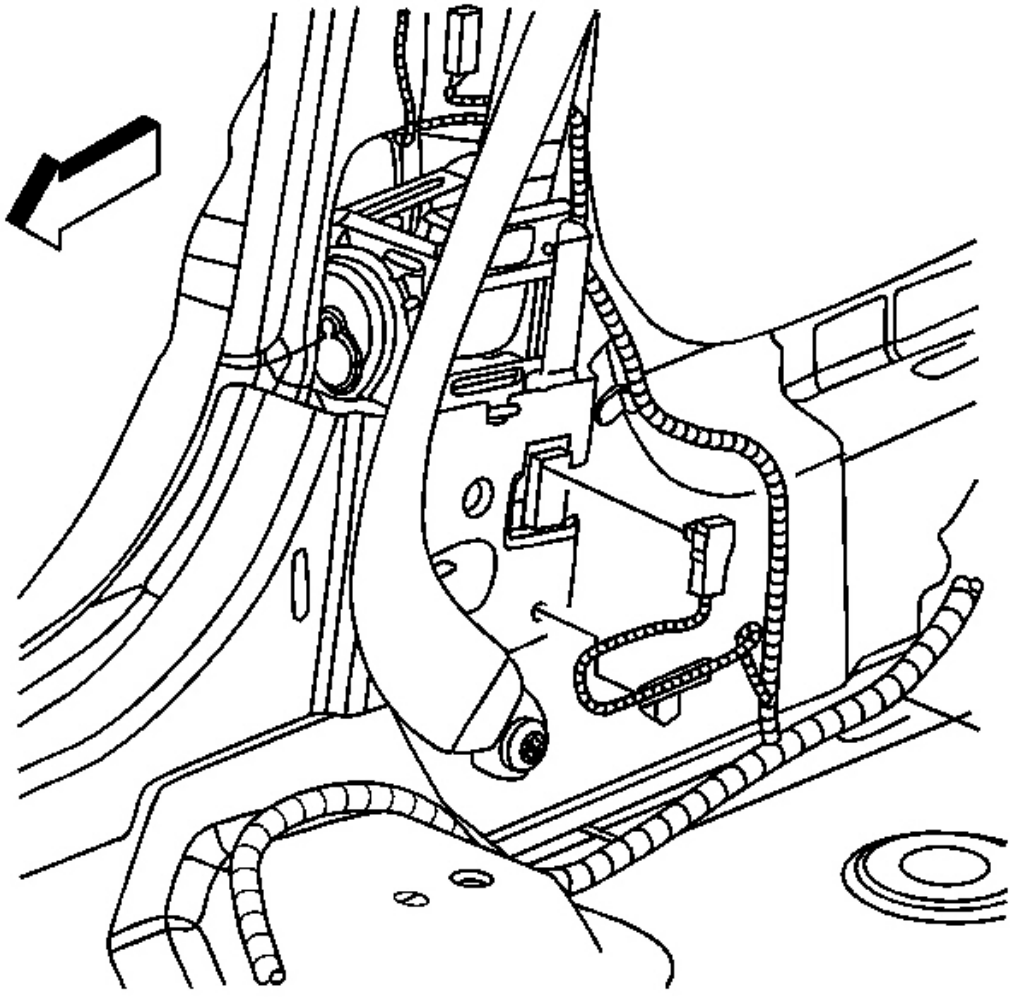


Fig. 16: View Of Seat Belt Wiring Harness Routing
Courtesy of GENERAL MOTORS CORP.

9. Connect the seat belt pretensioner-LF connector and install the CPA.
10. Install the lower center pillar trim. Refer to **Garnish Molding Replacement - Center Pillar Lower** in Interior Trim.
11. Install the AIR BAG fuse into the body control module fuse center.
12. Install the body control module fuse center cover.
13. Use caution while reaching in and turn the ignition switch to the ON position.

    The AIR BAG indicator will flash then turn OFF.

14. Perform the SIR Diagnostic System Check if the AIR BAG warning indicator does not operate as described. Refer to **Diagnostic System Check - SIR** .

SIR DISABLING AND ENABLING ZONE 3

Disabling Procedure

1. Turn the steering wheel so that the vehicles wheels are pointing straight ahead.
2. Turn the ignition switch to the OFF position.
3. Remove the key from the ignition switch.
4. Locate the body control module fuse center then remove the fuse center cover.

IMPORTANT: With the AIR BAG fuse removed and the ignition switch in the ON position, the AIR BAG warning indicator illuminates. This is normal operation, and does not indicate an SIR system malfunction.

5. Locate and remove the AIR BAG fuse from the body control module fuse center.

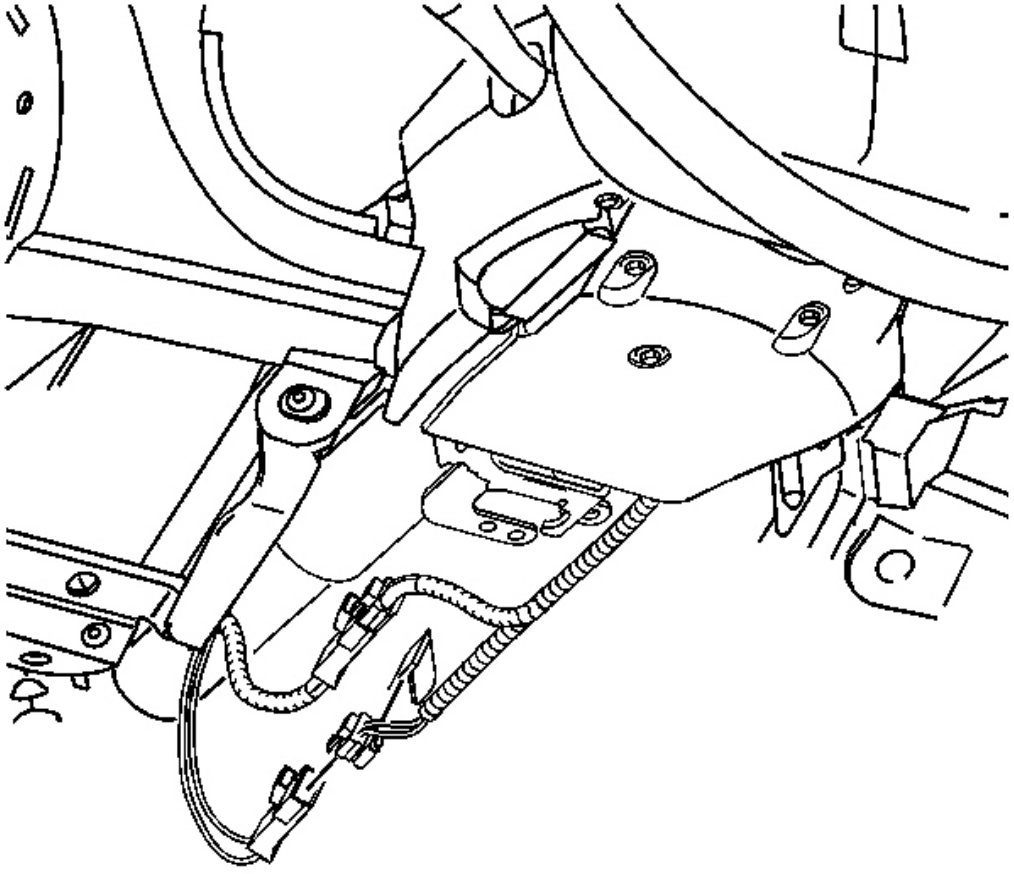


Fig. 17: CPA & Steering Wheel Module Coil Connector
Courtesy of GENERAL MOTORS CORP.

6. Remove the connector position assurance (CPA) from the steering wheel module coil connector.
7. Disconnect the steering wheel module coil connector from the vehicle harness connector.

Enabling Procedure

1. Remove the key from the ignition switch.

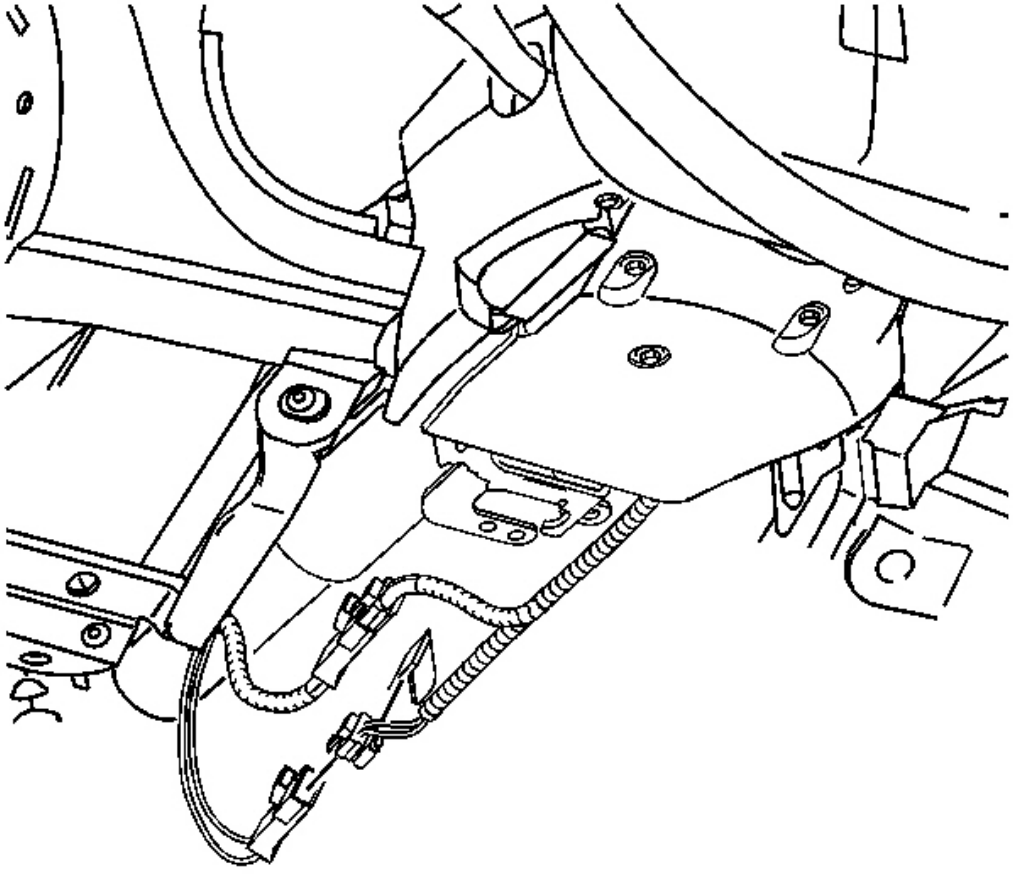


Fig. 18: CPA & Steering Wheel Module Coil Connector
Courtesy of GENERAL MOTORS CORP.

2. Connect the steering wheel module coil connector to the vehicle harness connector.
3. Install the CPA to the steering wheel module coil connector.
4. Install the AIR BAG fuse into the body control module fuse center.
5. Install the body control module fuse center cover.
6. Use caution while reaching in and turn the ignition switch to the ON position.

   The AIR BAG indicator will flash then turn OFF.

7. Perform the SIR Diagnostic System Check if the AIR BAG warning indicator does not operate as described. Refer to **Diagnostic System Check - SIR** .

SIR DISABLING AND ENABLING ZONE 5

Disabling Procedure

1. Turn the steering wheel so that the vehicles wheels are pointing straight ahead.
2. Turn the ignition switch to the OFF position.
3. Remove the key from the ignition switch.
4. Locate the body control module fuse center, then remove the fuse center cover.

IMPORTANT: With the AIR BAG fuse removed and the ignition switch in the ON position, the AIR BAG warning indicator illuminates. This is normal operation, and does not indicate an SIR system malfunction.

5. Locate and remove the AIR BAG fuse from the body control module fuse center.

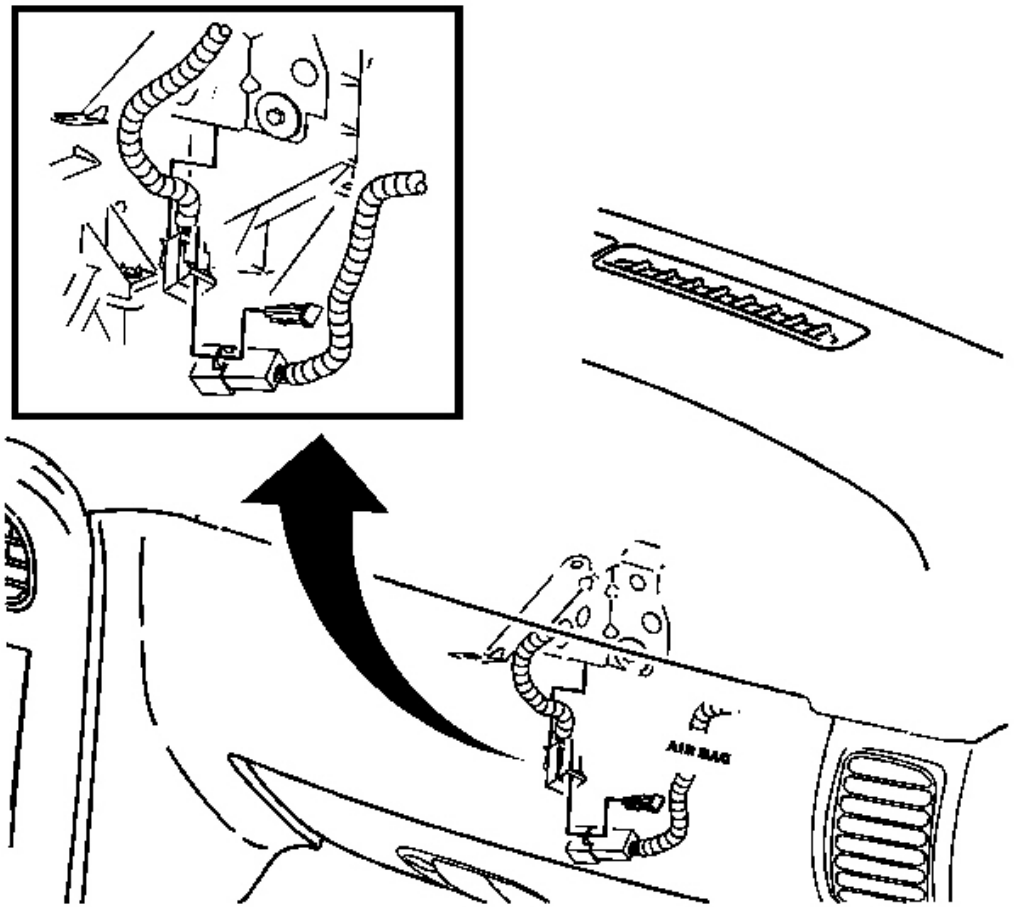


Fig. 19: CPA & I/P Module Connector

Courtesy of GENERAL MOTORS CORP.

6. Remove the connector position assurance (CPA) from the I/P module connector.
7. Disconnect the I/P module connector from the vehicle harness connector.

Enabling Procedure

1. Remove the key from the ignition switch.

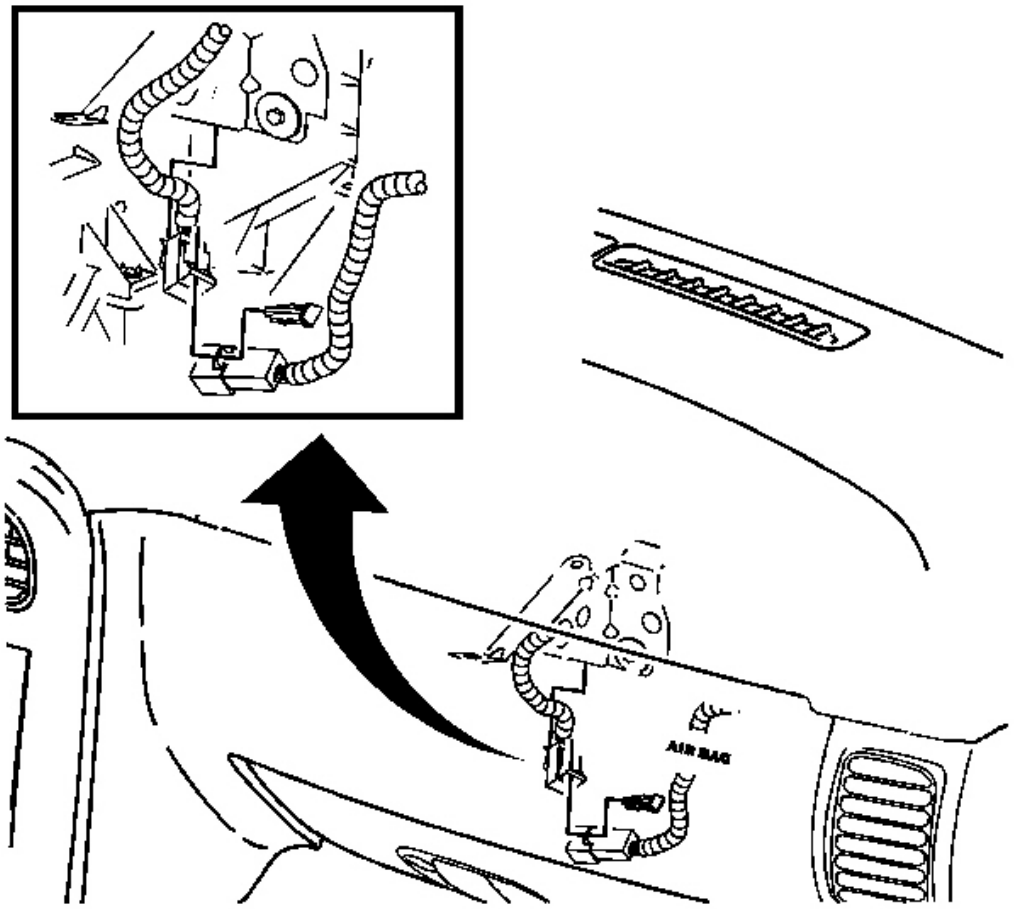


Fig. 20: CPA & I/P Module Connector
Courtesy of GENERAL MOTORS CORP.

2. Connect the I/P module connector to the vehicle harness connector.
3. Install the CPA to the I/P module connector.

4. Install the AIR BAG fuse into the body control module fuse center.
5. Install the body control module fuse center cover.
6. Use caution while reaching in and turn the ignition switch to the ON position.

   The AIR BAG indicator will flash then turn OFF.

7. Perform the SIR Diagnostic System Check if the AIR BAG warning indicator does not operate as described. Refer to **Diagnostic System Check - SIR** .

SIR DISABLING AND ENABLING ZONE 6

Disabling Procedure

1. Turn the steering wheel so that the vehicles wheels are pointing straight ahead.
2. Turn the ignition switch to the OFF position.
3. Remove the key from the ignition switch.
4. Locate the body control module fuse center, then remove the fuse center cover.

IMPORTANT: With the AIR BAG fuse removed and the ignition switch in the ON position, the AIR BAG warning indicator illuminates. This is normal operation, and does not indicate an SIR system malfunction.

5. Locate and remove the AIR BAG fuse from the body control module fuse center.
6. To disable the roof rail module-right, perform steps 7-13. To disable both the roof rail module-right and the seat belt pretensioner-RF, continue to step 7.
7. Remove the upper rear window molding. Refer to **Molding Replacement - Rear Window Upper** .
8. Remove both the left and right rear corner garnish moldings. Refer to **Garnish Molding Replacement - Rear Corner** .
9. Remove the rear headliner push-in retainers.
10. Remove the rear coat hooks. Refer to **Coat Hook Replacement** .
11. Gently pull down the right rear corner of the headliner to access the roof rail module-right connector.

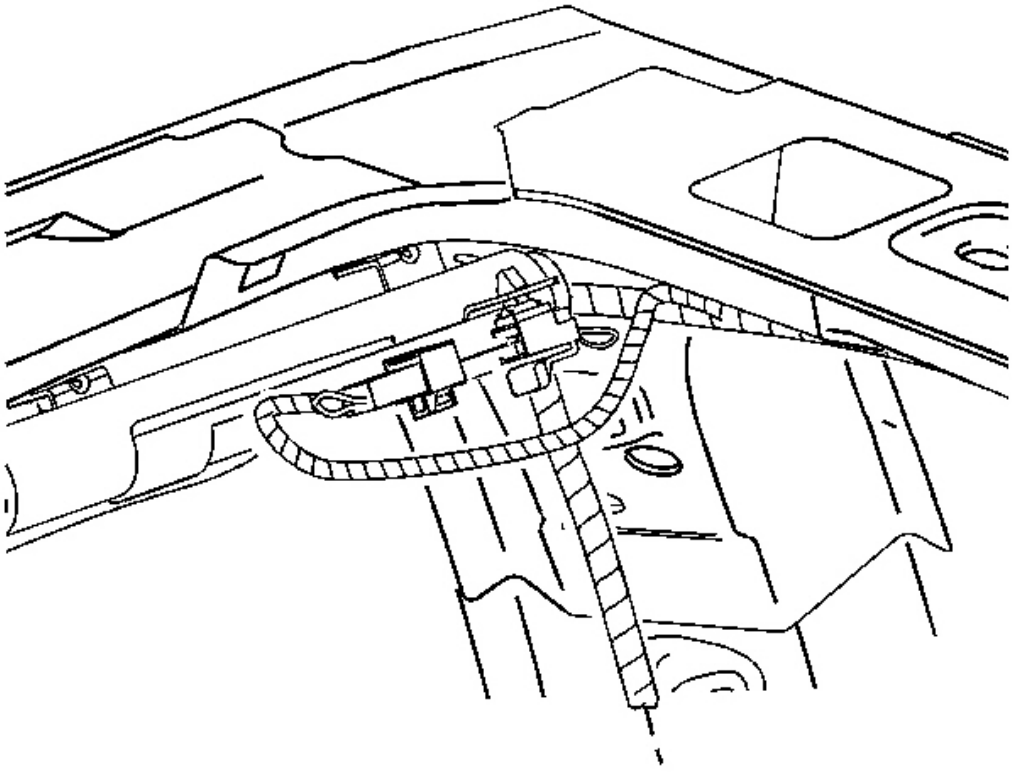


Fig. 21: CPA & Roof Rail Module Connector
Courtesy of GENERAL MOTORS CORP.

12. Remove the connector position assurance (CPA) from the roof rail module-right connector.
13. Disconnect the roof rail module-right connector from the vehicle harness connector.

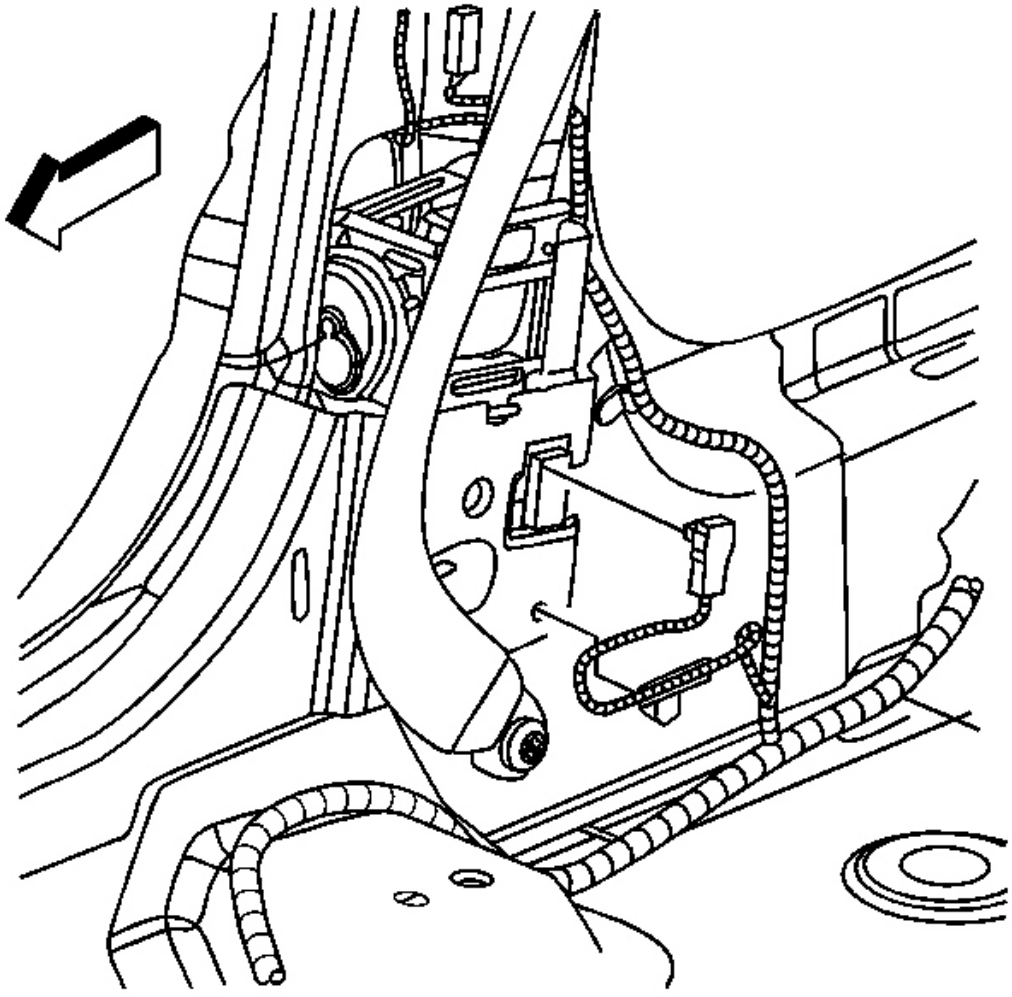


Fig. 22: View Of Seat Belt Wiring Harness Routing
Courtesy of GENERAL MOTORS CORP.

14. Remove the lower center pillar trim. Refer to **Garnish Molding Replacement - Center Pillar Lower** in Interior Trim.
15. Remove the CPA from the seat belt pretensioner-RF connector.
16. Disconnect the seat belt pretensioner-RF connector.

Enabling Procedure

1. Remove the key from the ignition switch.
2. To enable the roof rail module-right, perform steps 3-8. To enable both the roof rail module-right and the

seat belt pretensioner-RF, continue to step 3.

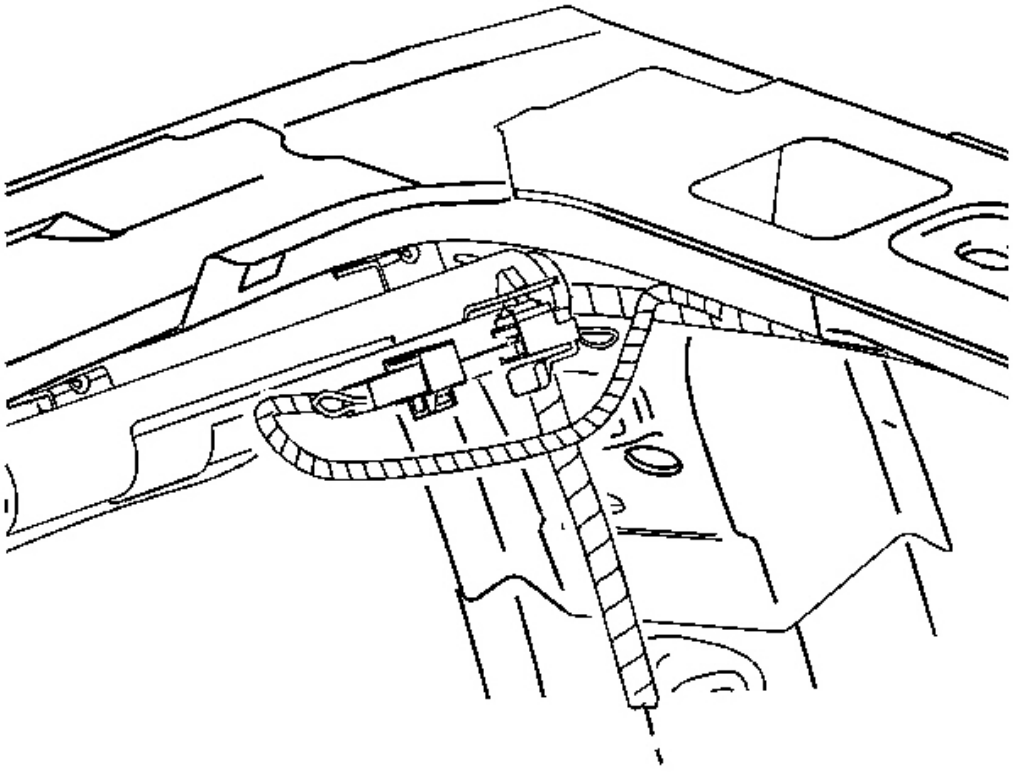


Fig. 23: CPA & Roof Rail Module Connector
Courtesy of GENERAL MOTORS CORP.

3. Connect the roof rail module-right connector to the vehicle harness connector.
4. Install the CPA to the roof rail module-right connector.
5. Install the rear coat hooks. Refer to **Coat Hook Replacement** .
6. Install the rear headliner push-in retainers.
7. Install both the left and right rear corner garnish moldings. Refer to **Garnish Molding Replacement - Rear Corner** .
8. Install the upper rear window molding. Refer to **Molding Replacement - Rear Window Upper** .

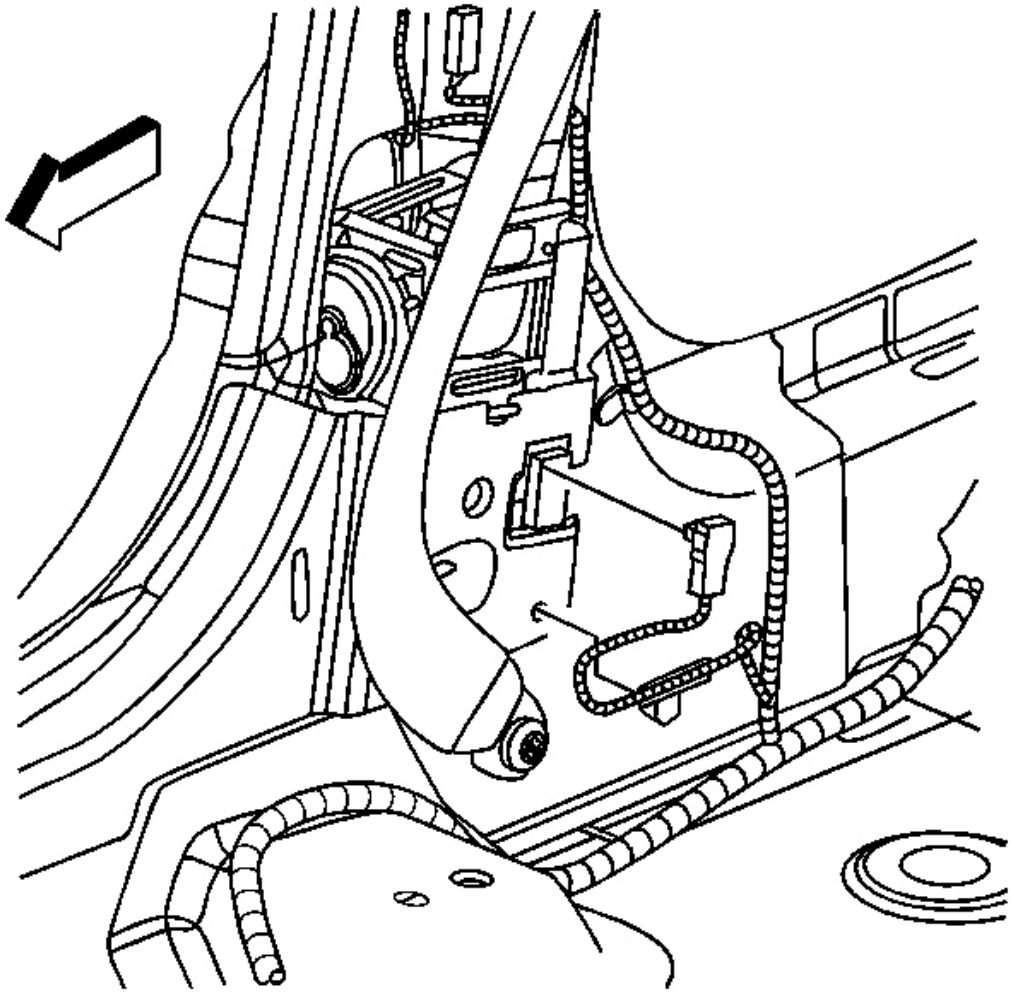


Fig. 24: View Of Seat Belt Wiring Harness Routing
Courtesy of GENERAL MOTORS CORP.

9. Connect the seat belt pretensioner-RF connector and install the CPA.
10. Install the lower center pillar trim. Refer to **Garnish Molding Replacement - Center Pillar Lower** in Interior Trim.
11. Install the AIR BAG fuse into the body control module fuse center.
12. Install the body control module fuse center cover.
13. Use caution while reaching in and turn the ignition switch to the ON position.

    The AIR BAG indicator will flash then turn OFF.

14. Perform the SIR Diagnostic System Check if the AIR BAG warning indicator does not operate as described. Refer to **Diagnostic System Check - SIR** .

SIR DISABLING AND ENABLING ZONE 8

Disabling Procedure

1. Turn the steering wheel so that the vehicles wheels are pointing straight ahead.
2. Turn the ignition switch to the OFF position.
3. Remove the key from the ignition switch.
4. Locate the body control module fuse center then remove the fuse center cover.

IMPORTANT: With the AIR BAG fuse removed and the ignition switch in the ON position, the AIR BAG warning indicator illuminates. This is normal operation, and does not indicate an SIR system malfunction.

5. Locate and remove the AIR BAG fuse from the body control module fuse center.
6. Remove the upper rear window molding. Refer to **Molding Replacement - Rear Window Upper** .
7. Remove both the left and right rear corner garnish moldings. Refer to **Garnish Molding Replacement - Rear Corner** .
8. Remove the rear headliner push-in retainers.
9. Remove the rear coat hooks. Refer to **Coat Hook Replacement** .

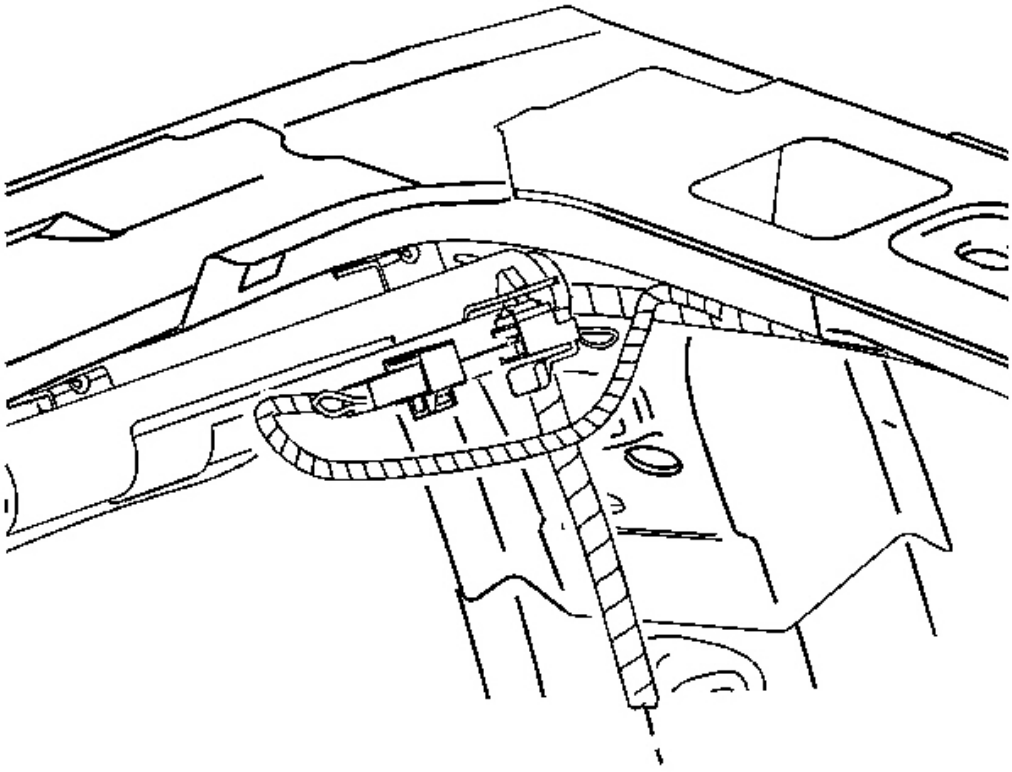


Fig. 25: CPA & Roof Rail Module Connector
Courtesy of GENERAL MOTORS CORP.

10. Gently pull down the right rear corner to access the roof rail module - right connector.
11. Remove the connector position assurance (CPA) from the roof rail module-right connector.
12. Disconnect the roof rail module-right connector from the vehicle harness connector.

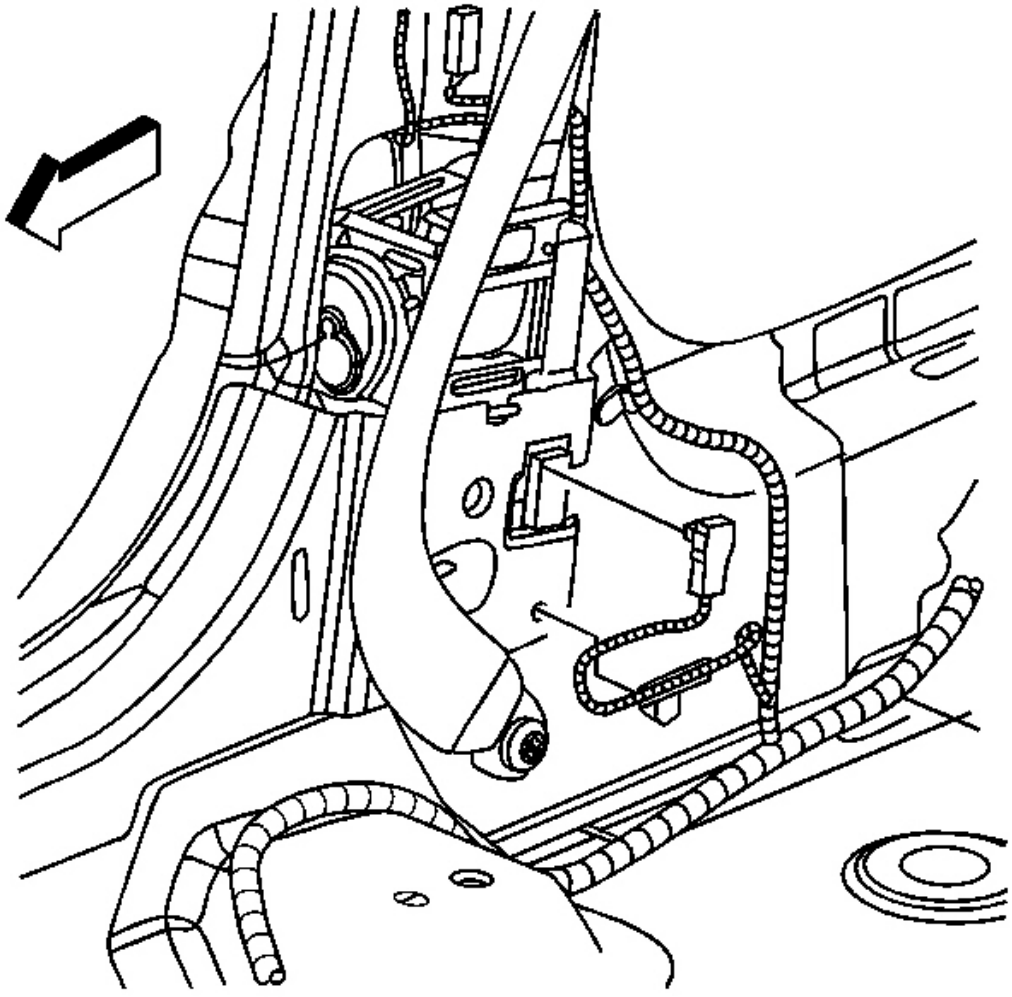


Fig. 26: View Of Seat Belt Wiring Harness Routing
Courtesy of GENERAL MOTORS CORP.

13. Remove the lower center pillar trim. Refer to **Garnish Molding Replacement - Center Pillar Lower** in Interior Trim.
14. Remove the CPA from the seat belt pretensioner - RF connector.
15. Disconnect the seat belt pretensioner - RF connector.

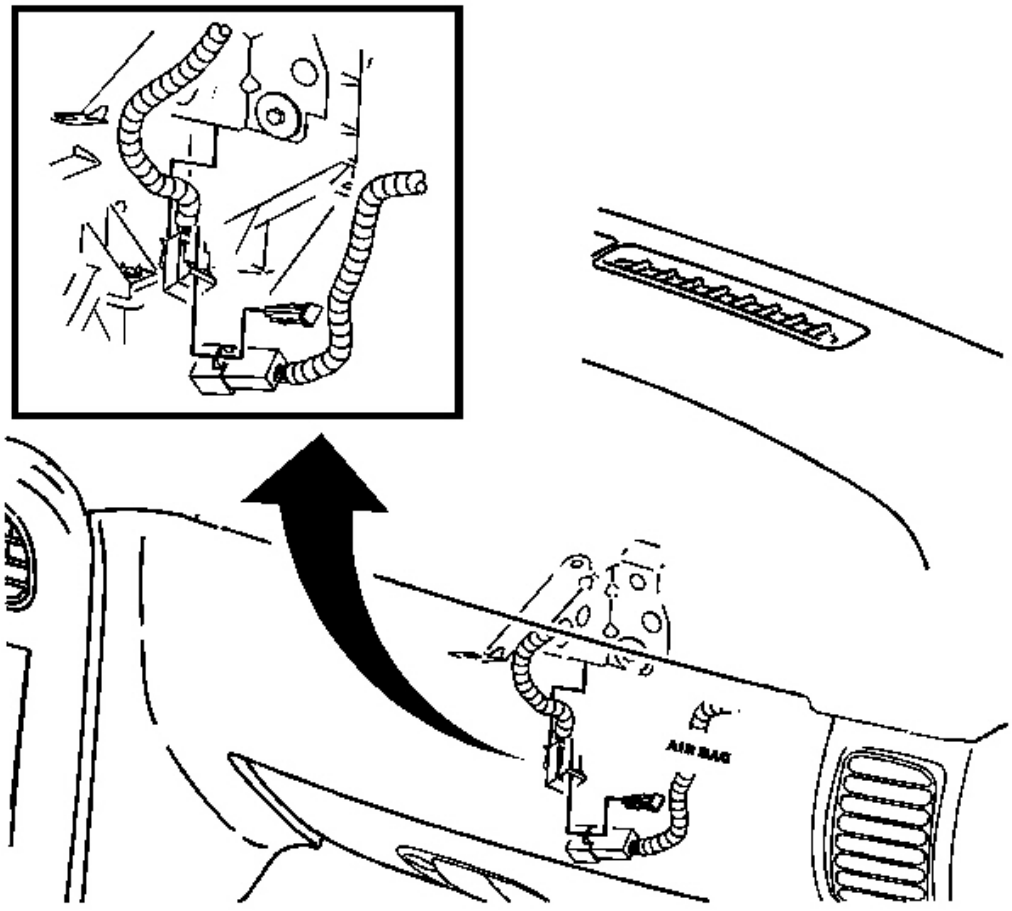


Fig. 27: CPA & I/P Module Connector
Courtesy of GENERAL MOTORS CORP.

16. Remove the CPA from the I/P module connector.
17. Disconnect the I/P module connector from the vehicle harness connector.

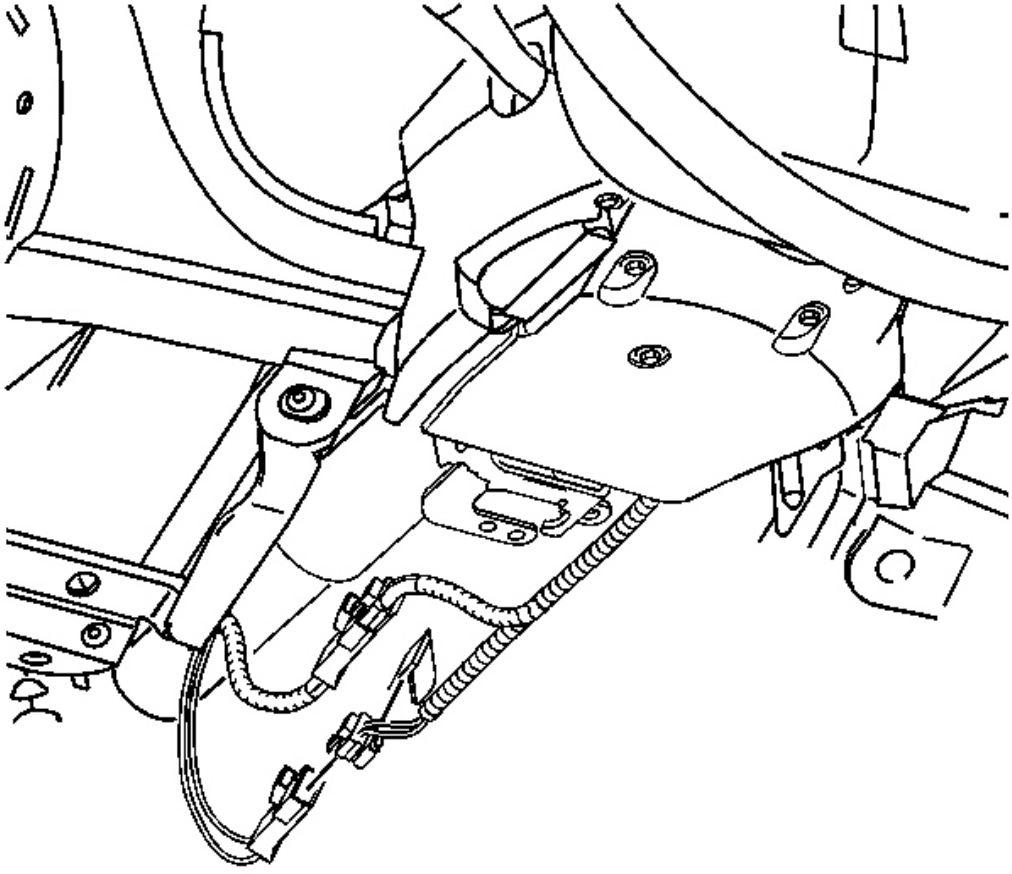


Fig. 28: CPA & Steering Wheel Module Coil Connector
Courtesy of GENERAL MOTORS CORP.

18. Remove the CPA from the steering wheel module coil connector.
19. Disconnect the steering wheel module coil connector from the vehicle harness connector.

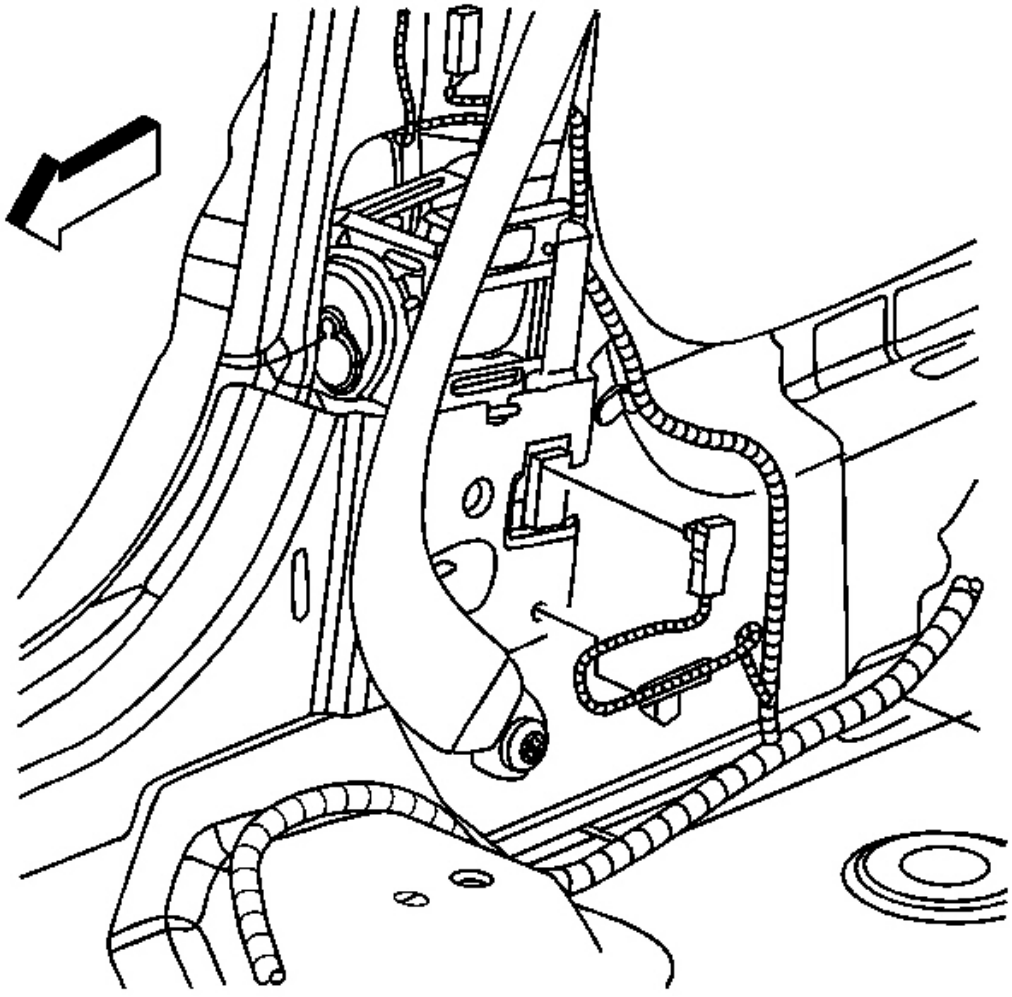


Fig. 29: View Of Seat Belt Wiring Harness Routing
Courtesy of GENERAL MOTORS CORP.

20. Remove the lower center pillar trim. Refer to **Garnish Molding Replacement - Center Pillar Lower**
21. Remove the CPA from the seat belt pretensioner - LF connector.
22. Disconnect the seat belt pretensioner - LF connector.

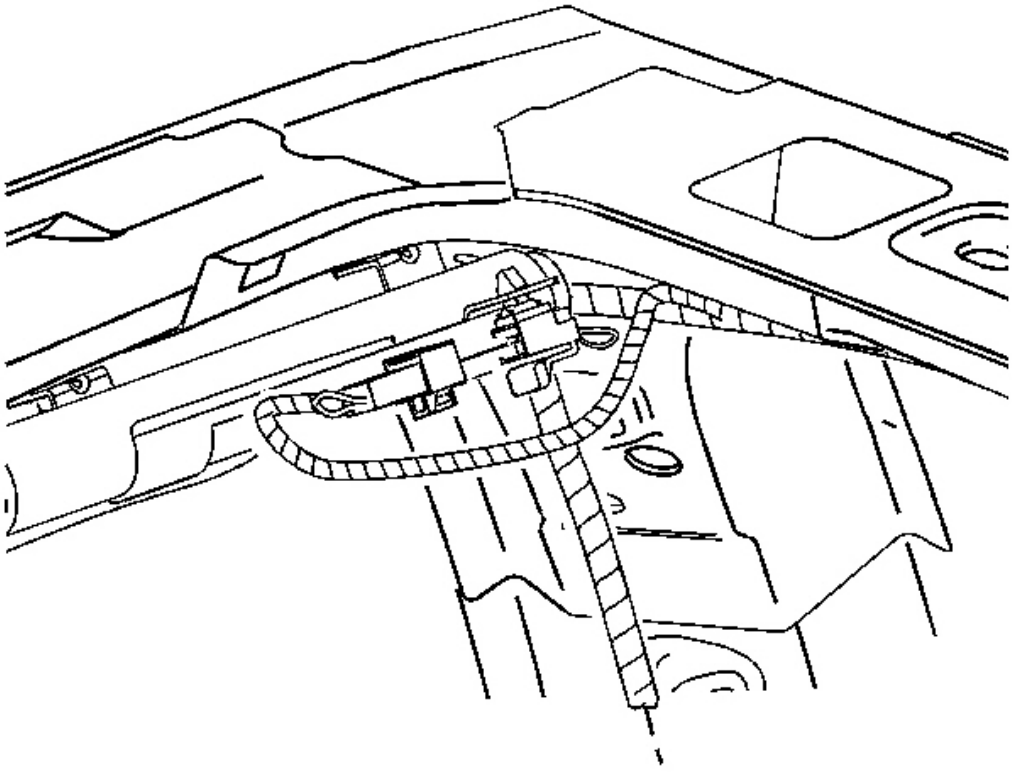


Fig. 30: CPA & Roof Rail Module Connector
Courtesy of GENERAL MOTORS CORP.

23. Gently pull down the left rear corner of the headliner to access the roof rail module - left connector.
24. Remove the CPA from the roof rail module-left connector.
25. Disconnect the roof rail module-left connector from the vehicle harness connector.

Enabling Procedure

1. Remove the key from the ignition switch.

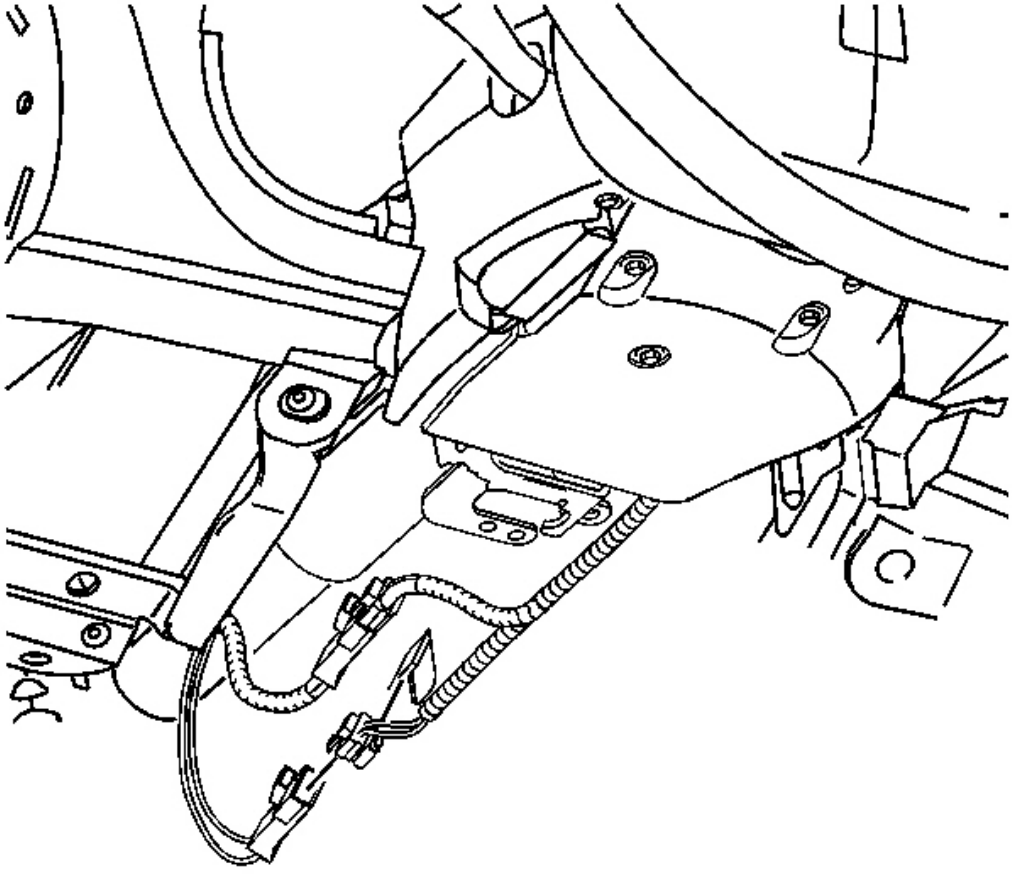


Fig. 31: CPA & Steering Wheel Module Coil Connector
Courtesy of GENERAL MOTORS CORP.

2. Connect the steering wheel module coil connector to the vehicle harness connector.
3. Install the CPA to the steering wheel module coil connector.

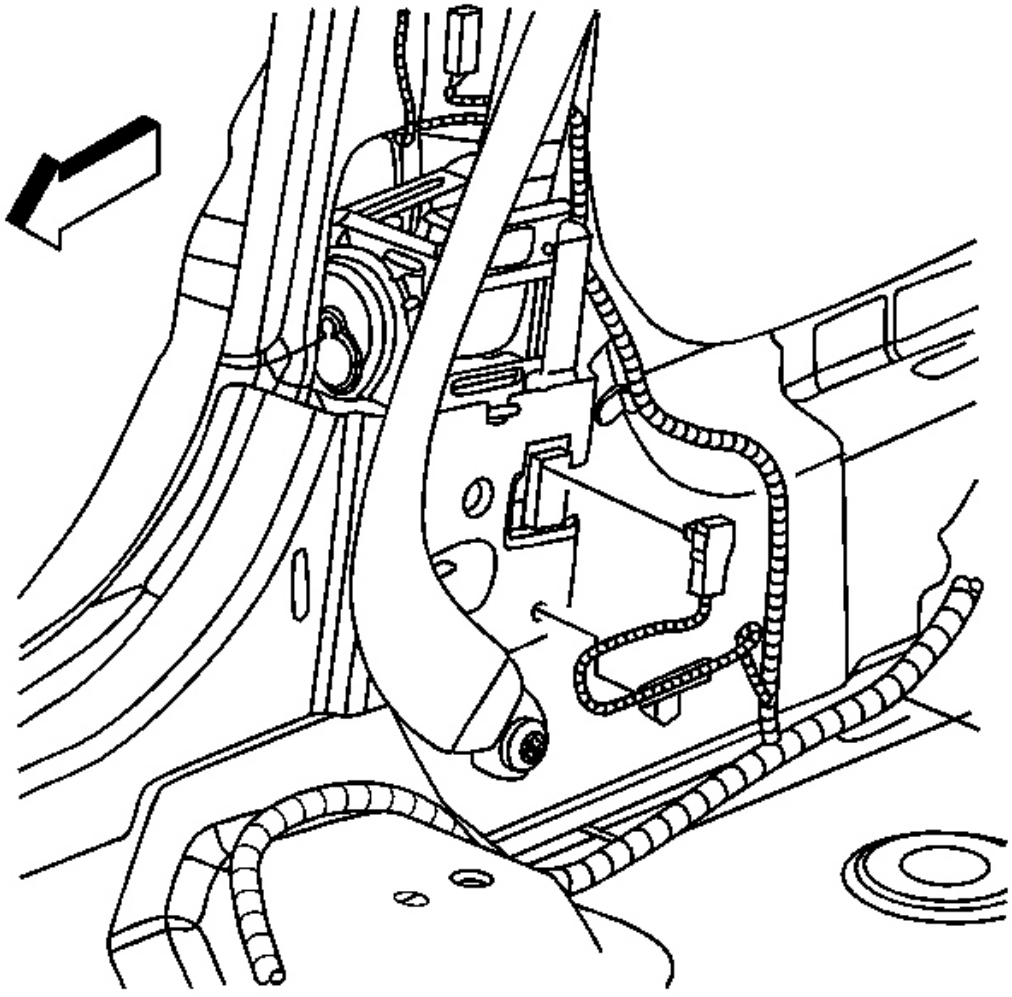


Fig. 32: View Of Seat Belt Wiring Harness Routing
Courtesy of GENERAL MOTORS CORP.

4. Connect the seat belt pretensioner - LF connector and install the CPA.
5. Install the lower center pillar trim. Refer to **Garnish Molding Replacement - Center Pillar Lower** in Interior Trim.

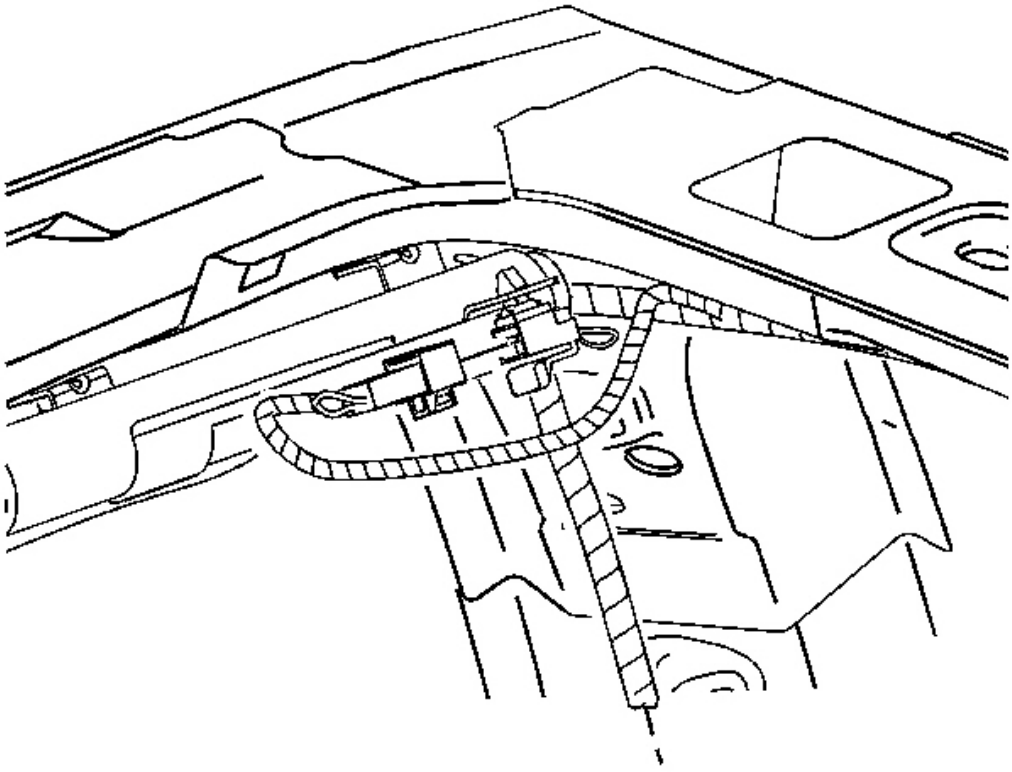


Fig. 33: CPA & Roof Rail Module Connector
Courtesy of GENERAL MOTORS CORP.

6. Connect the roof rail module-left connector to the vehicle harness connector.
7. Install the CPA to the roof rail module-left connector.

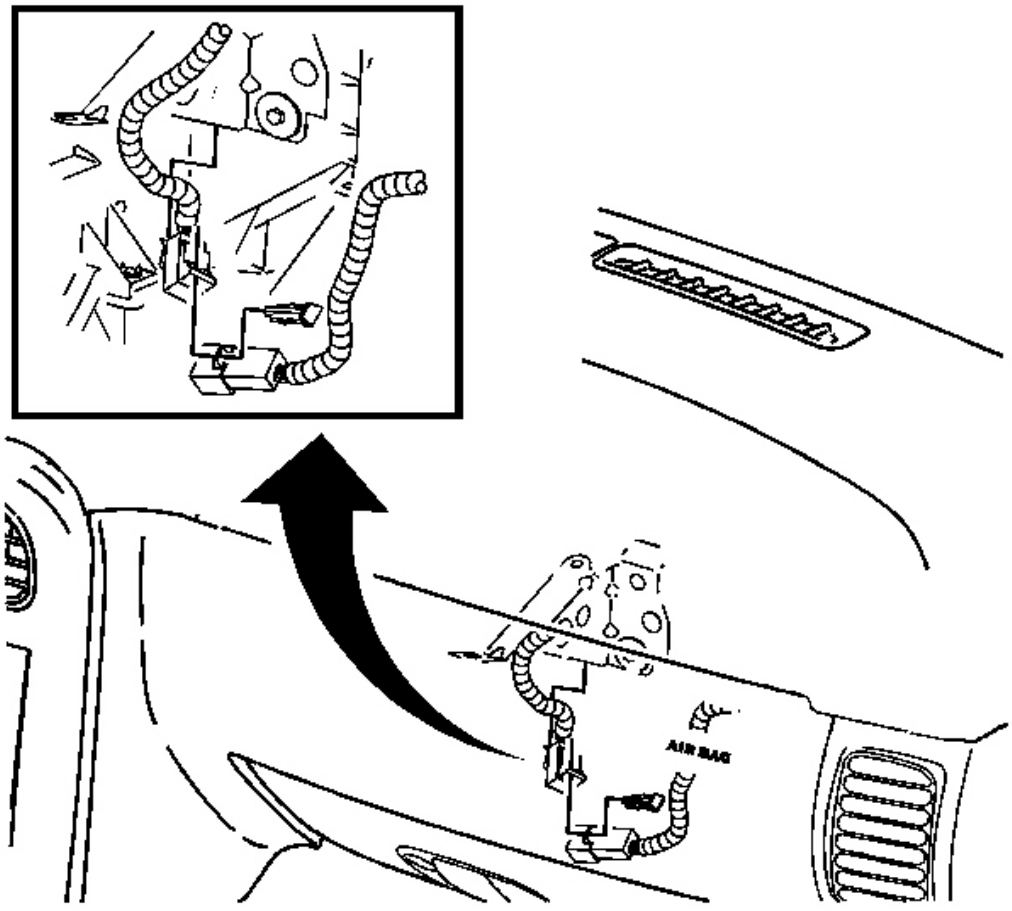


Fig. 34: CPA & I/P Module Connector
Courtesy of GENERAL MOTORS CORP.

8. Connect the I/P module connector to the vehicle harness connector.
9. Install the CPA to the I/P module connector.

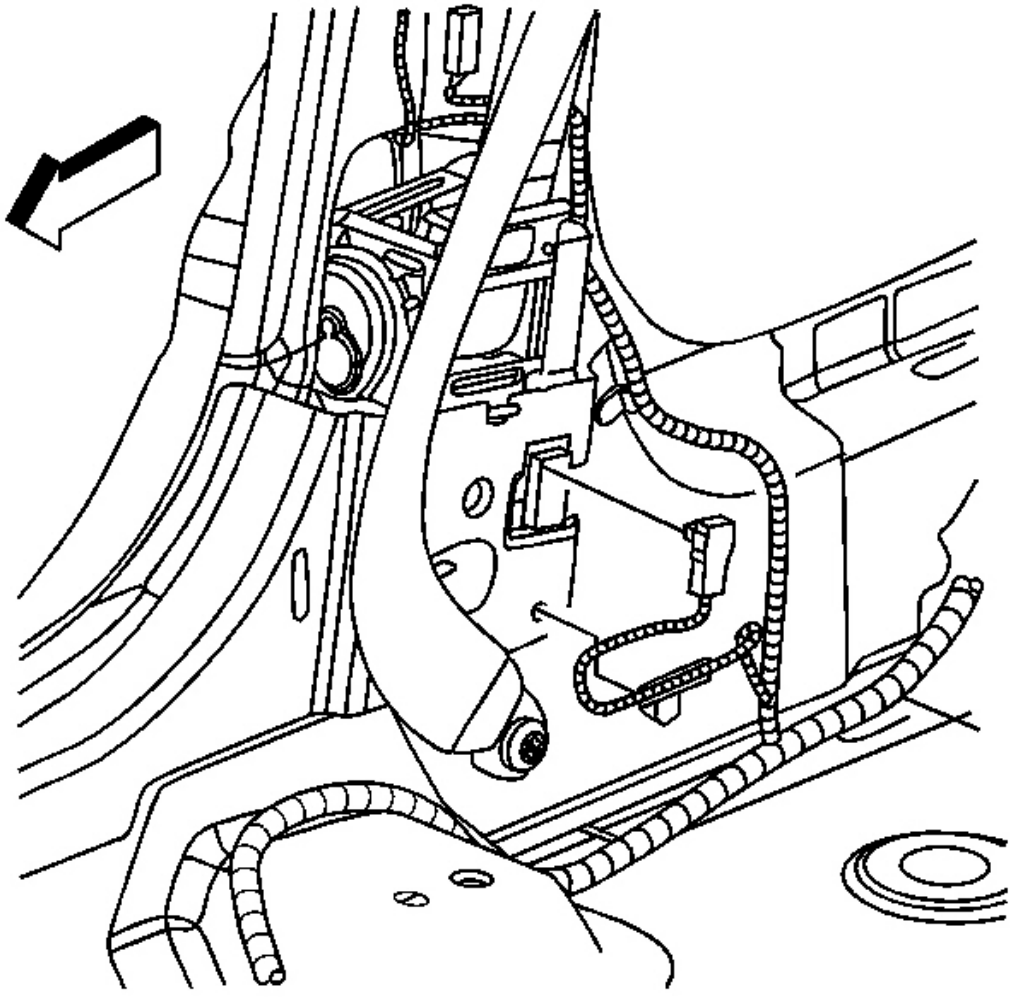


Fig. 35: View Of Seat Belt Wiring Harness Routing
Courtesy of GENERAL MOTORS CORP.

10. Connect the seat belt pretensioner - RF connector and install the CPA.
11. Install the lower center pillar trim. Refer to **Garnish Molding Replacement - Center Pillar Lower** in Interior Trim.

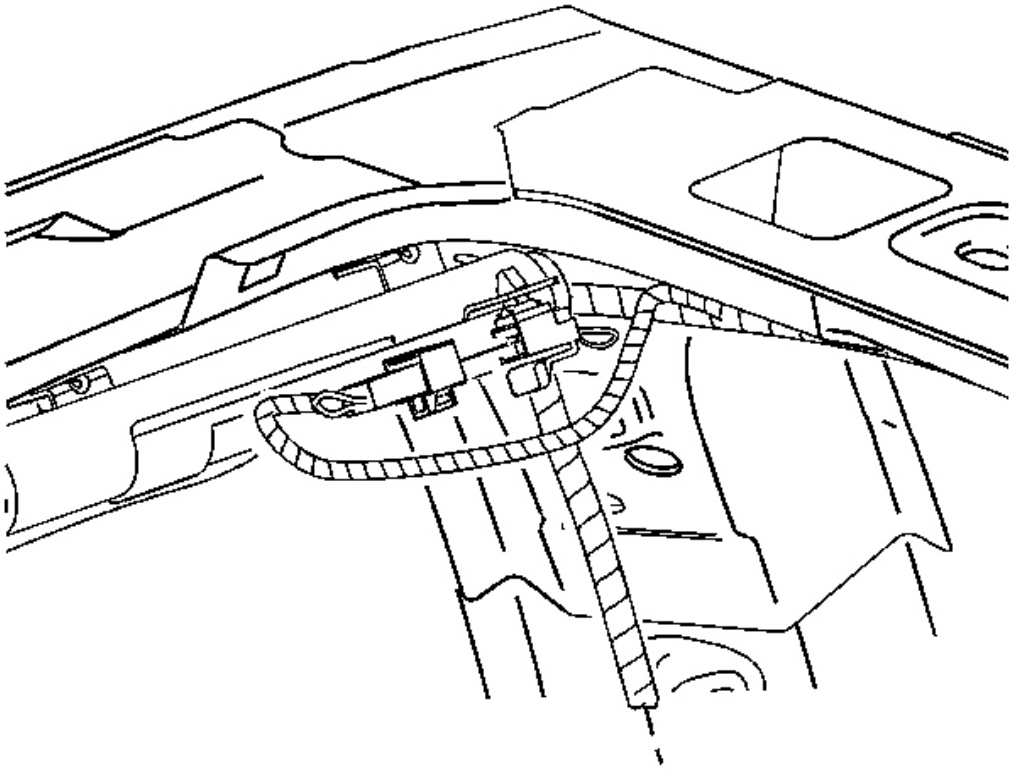


Fig. 36: CPA & Roof Rail Module Connector
Courtesy of GENERAL MOTORS CORP.

12. Connect the roof rail module-right connector to the vehicle harness connector.
13. Install the CPA to the roof rail module-right connector.
14. Install the rear coat hooks. Refer to **Coat Hook Replacement** .
15. Install the rear headliner push-in retainers.
16. Install both the left and right rear corner garnish moldings. Refer to **Garnish Molding Replacement - Rear Corner** .
17. Install the upper rear window molding. Refer to **Molding Replacement - Rear Window Upper** .
18. Install the AIR BAG fuse into the body control module fuse center.
19. Install the body control module fuse center cover.
20. Use caution while reaching in and turn the ignition switch to the ON position.

    The AIR BAG indicator will flash then turn OFF.

21. Perform the SIR Diagnostic System Check if the AIR BAG warning indicator does not operate as described. Refer to **Diagnostic System Check - SIR** .

INFLATABLE RESTRAINT SIDE IMPACT SENSOR REPLACEMENT

Removal Procedure

CAUTION: When performing service on or near the SIR components or the SIR wiring, the SIR system must be disabled. Refer to SIR Disabling and Enabling Zones. Failure to observe the correct procedure could cause deployment of the SIR components, personal injury, or unnecessary SIR system repairs.

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

1. Disable the SIR system. Refer to **SIR Disabling and Enabling Zone 2** or to **SIR Disabling and Enabling Zone 6** .
2. Remove the center pillar lower molding. Refer to **Garnish Molding Replacement - Center Pillar Lower** in Interior Trim.

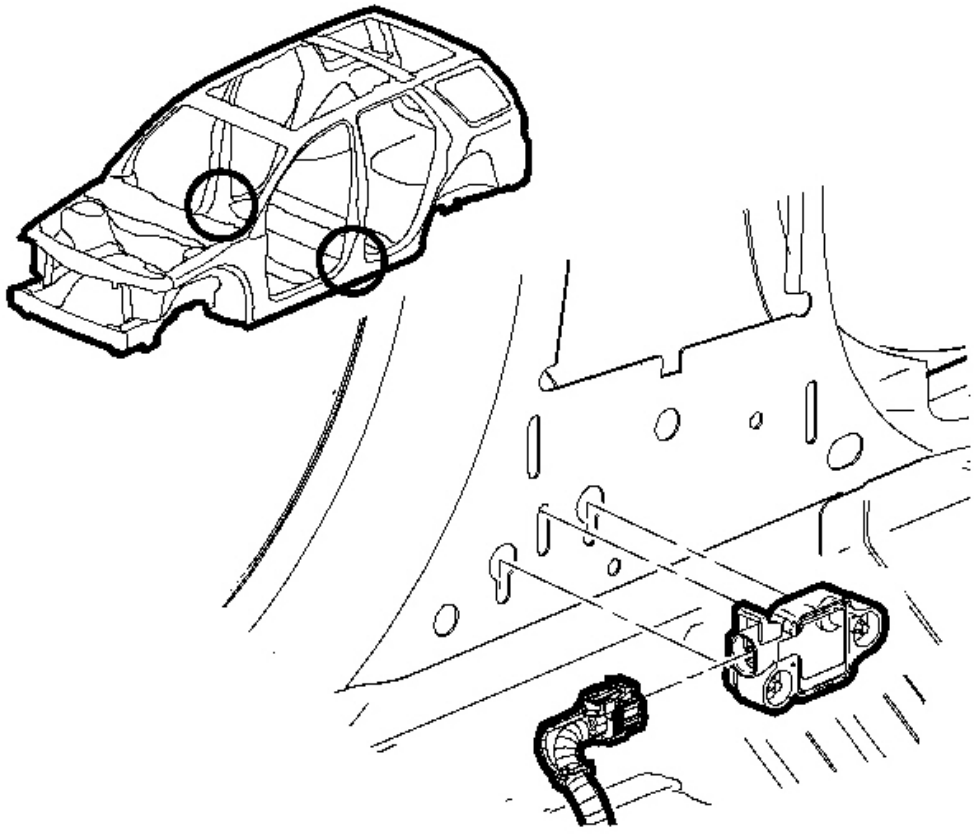


Fig. 37: SIS Electrical Connector
Courtesy of GENERAL MOTORS CORP.

3. Loosen the fasteners on the side impact sensor (SIS).
4. Remove the SIS by sliding the module up and out of the key slots in the sheet metal.
5. Disconnect the SIS electrical connector.

Installation Procedure

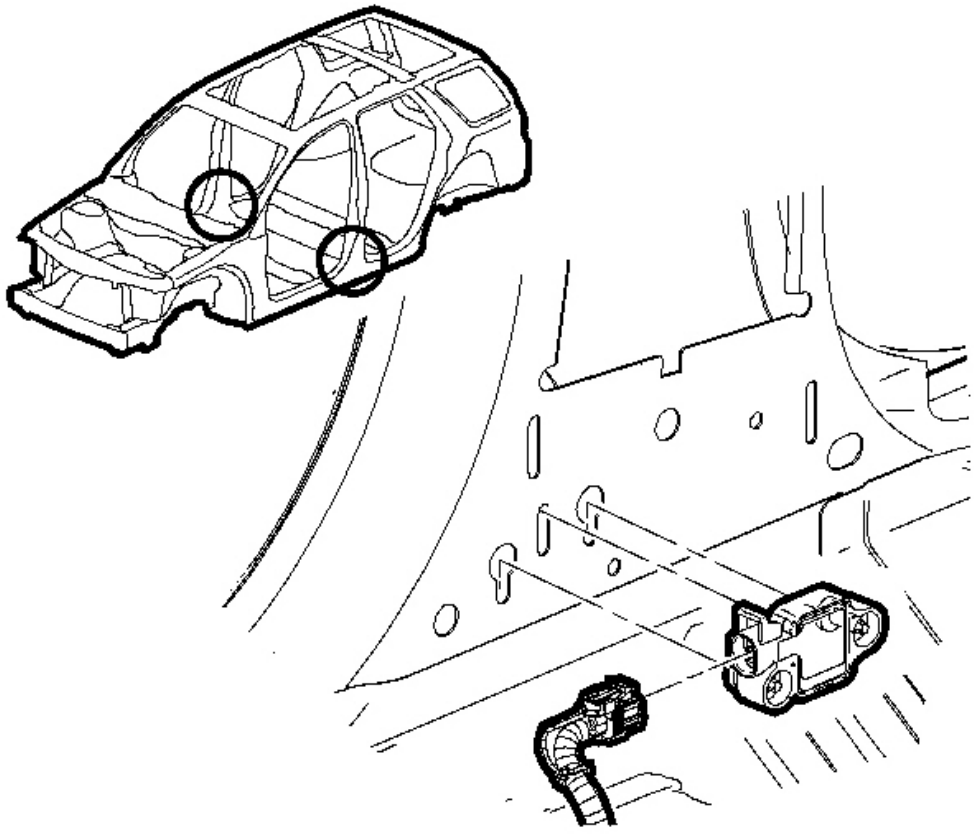


Fig. 38: SIS Electrical Connector
Courtesy of GENERAL MOTORS CORP.

1. Remove any dirt, grease, or other contaminants from the mounting surface.
2. Connect the SIS electrical connector and insert into the connector position assurance (CPA) to secure.
3. Place the SIS through the access hole in the lock pillar.

NOTE: Refer to Fastener Notice in Cautions and Notices.

4. Slide the module down and locate the captured fastener in the key slots of the lock pillar.

Tighten: Tighten the fastener to 10 N.m (89 lb in).

5. Install the center pillar lower molding. Refer to **Garnish Molding Replacement - Center Pillar Lower** in Interior Trim.
6. Enable the SIR system. Refer to **SIR Disabling and Enabling Zone 2** or to **SIR Disabling and Enabling Zone 6** .

INFLATABLE RESTRAINT SENSING AND DIAGNOSTIC MODULE REPLACEMENT

Removal Procedure

CAUTION: Do not strike or jolt the inflatable restraint sensing and diagnostic module (SDM). Before applying power to the SDM, make sure that it is securely fastened with the arrow facing toward the front of the vehicle. Failure to observe the correct installation procedure could cause SIR deployment, personal injury, or unnecessary SIR system repairs.

1. Disable the SIR system. Refer to **SIR Disabling and Enabling Zone 8** .
2. Remove the console assembly. Refer to **Console Replacement - Front Floor** in Instrument Panel, Gages, and Console.

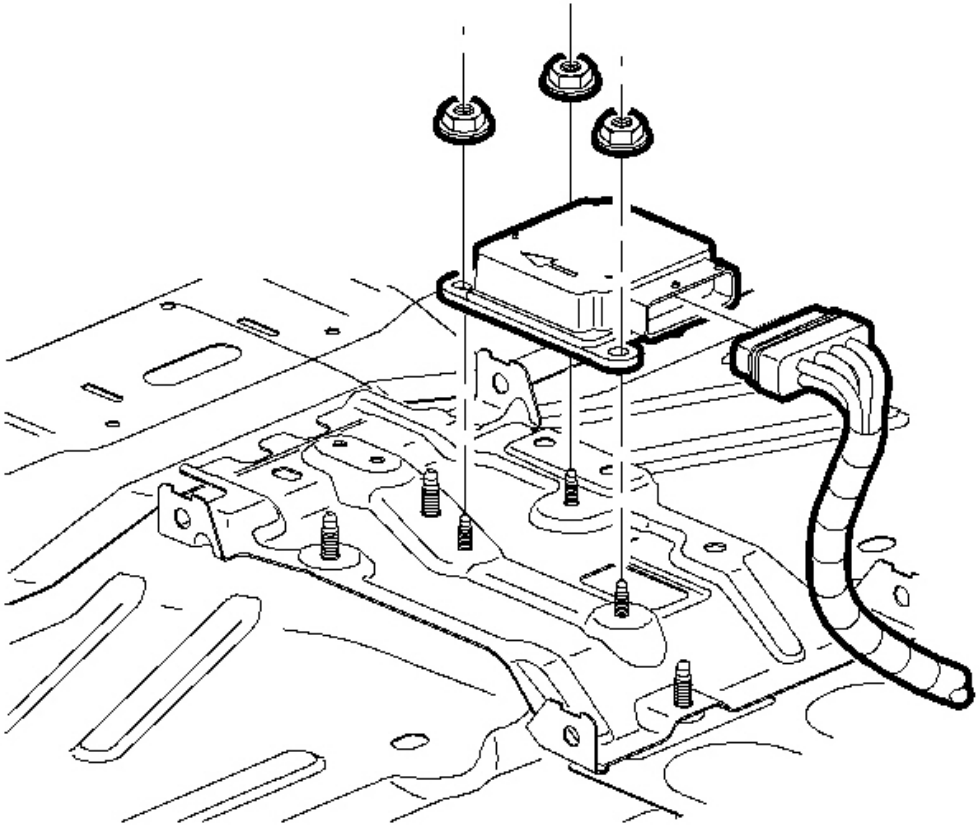


Fig. 39: CPA Electrical Connectors, Nuts & SDM
Courtesy of GENERAL MOTORS CORP.

3. Remove the retainers from the connector position assurance (CPA) and disconnect the electrical connectors.
4. Remove the nuts and remove the SDM.

Installation Procedure

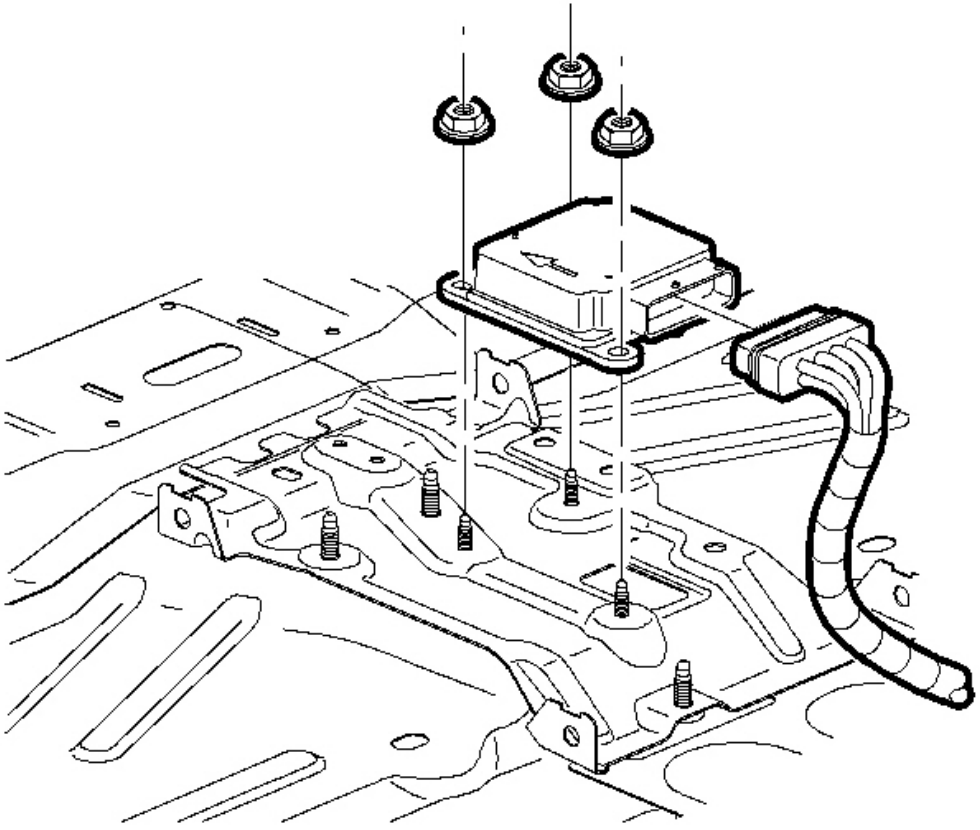


Fig. 40: CPA Electrical Connectors, Nuts & SDM
Courtesy of GENERAL MOTORS CORP.

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

NOTE: Refer to Fastener Notice in Cautions and Notices.

2. Install the SDM to the vehicle with the nuts.

   Tighten: Tighten the nuts to 10 N.m (89 lb in).

3. Install the console assembly. Refer to **Console Replacement - Front Floor** in Instrument Panel, Gages, and Console.

4. Enable the SIR system. Refer to **SIR Disabling and Enabling Zone 8** .

IMPORTANT: If you do NOT perform the BCM programming procedure, the vehicle option content information which is read by the BCM may be incorrect and a DTC B1001 Option Configuration Error will set in both the SDM and the BCM. This will illuminate the AIR BAG telltale.

5. Reprogram the BCM. Refer to **Body Control Module (BCM) Programming/RPO Configuration** in Body Control Systems.

INFLATABLE RESTRAINT STEERING WHEEL MODULE REPLACEMENT

Removal Procedure

CAUTION: Refer to SIR Inflator Module Handling and Storage Caution in Cautions and Notices.

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

CAUTION: Refer to SIR Caution in Cautions and Notices.

1. Disable the SIR system. Refer to **SIR Disabling and Enabling Zone 3** .

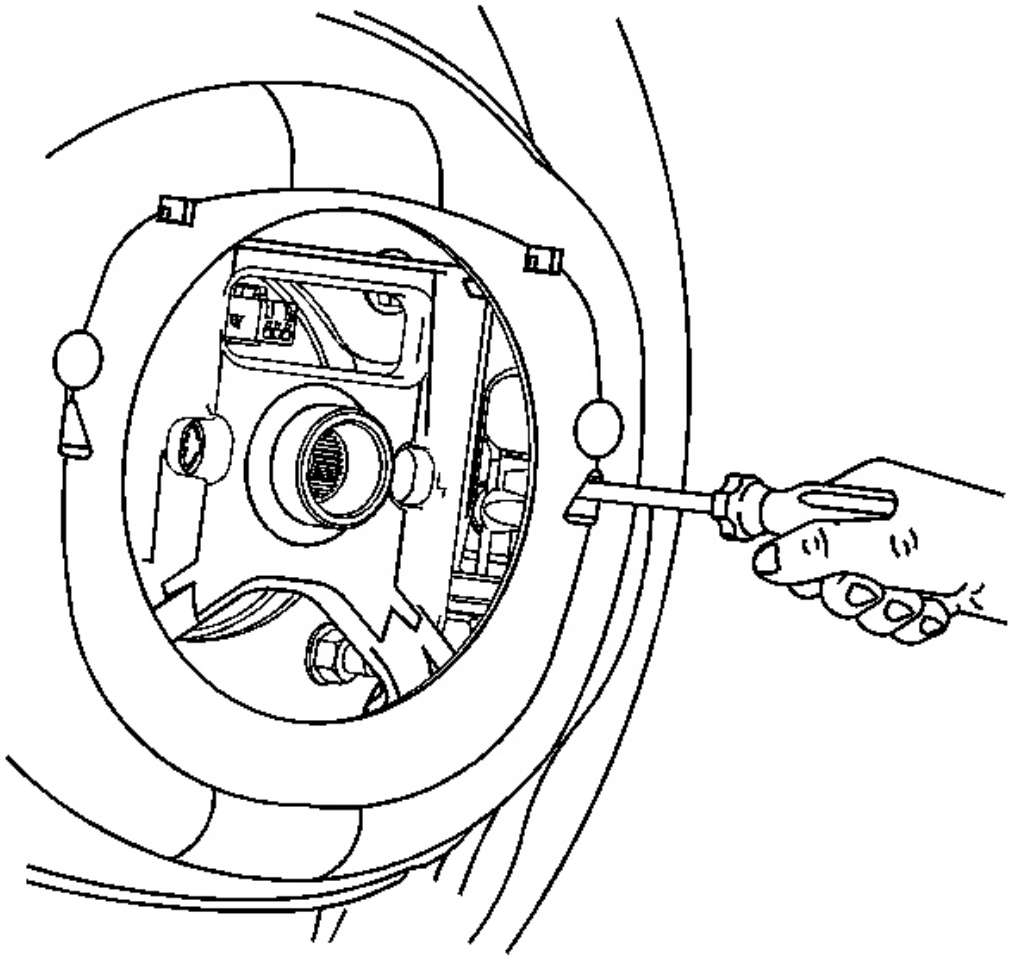


Fig. 41: Releasing The Steering Wheel Inflatable Restraint Module Using A Flat-Bladed Tool
Courtesy of GENERAL MOTORS CORP.

2. Rotate the steering wheel until one of the triangular openings is accessible with a small flat-bladed tool.
3. Insert the small flat-bladed tool into the triangular opening to release the steering wheel inflatable restraint module from the steering wheel.
4. Rotate the steering wheel 180 degrees and insert the small flat-bladed tool into the triangular opening to release the steering wheel inflatable restraint module from the steering wheel.

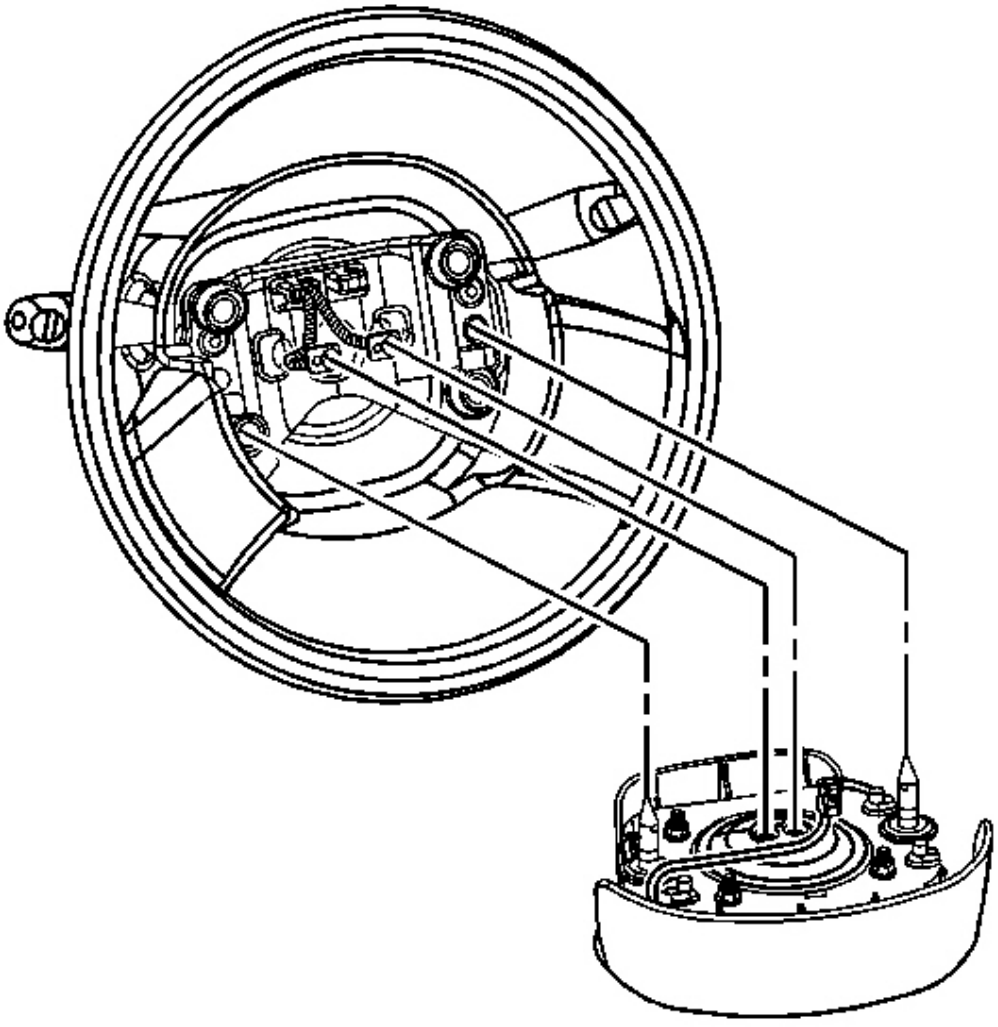


Fig. 42: Horn Switch & Inflatable Restraint Electrical Connectors
Courtesy of GENERAL MOTORS CORP.

5. Disconnect the horn switch and the inflatable restraint electrical connectors.
6. Remove the inflatable restraint steering wheel module.

Installation Procedure

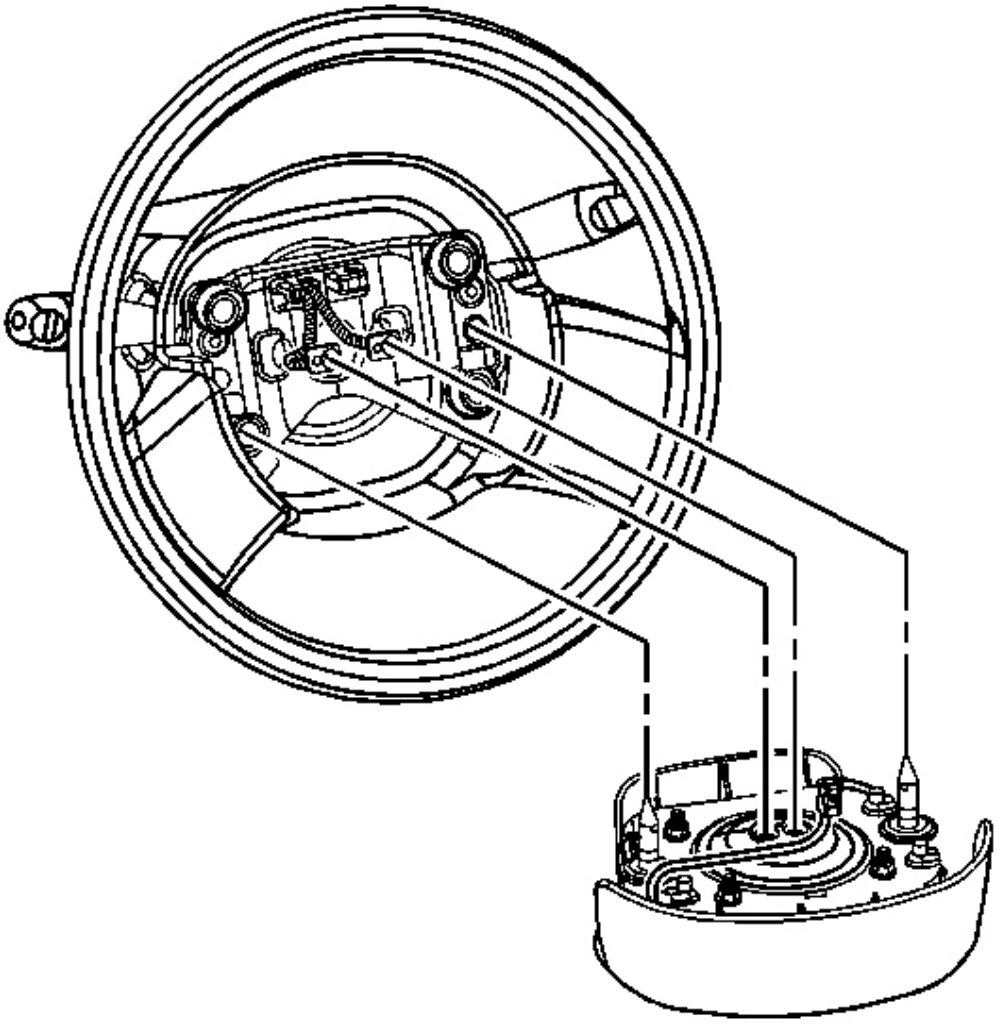


Fig. 43: Horn Switch & Inflatable Restraint Electrical Connectors
Courtesy of GENERAL MOTORS CORP.

1. Connect the horn switch connector.

IMPORTANT: This vehicle is equipped with dual stage air bags, you will find 2 connectors. Match the right color connector to the right color opening in the module.

2. Connect the inflatable restraint connectors.

3. Align the retaining pins on the inflatable restraint module with the steering wheel.
4. Push the inflatable restraint module to secure.
5. Enable the SIR system. Refer to **SIR Disabling and Enabling Zone 3** in SIR.
6. After replacing the module, deploy the old module before disposal. If the module was replaced under warranty, fully deploy and dispose of the module after the required retention period. Refer to **Inflator Module Handling and Scrapping** for proper disposal.

INFLATABLE RESTRAINT STEERING WHEEL MODULE COIL REPLACEMENT

Removal Procedure

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

1. Place the front wheels in the straight forward position with the steering wheel centered.
2. Disable the SIR system. Refer to **SIR Disabling and Enabling Zone 3** .
3. Remove the inflatable restraint steering wheel module. Refer to **Inflatable Restraint Steering Wheel Module Replacement** .
4. Remove the steering wheel. Refer to **Steering Wheel Replacement** in Steering Wheel and Column.
5. Remove the steering column covers. Refer to **Steering Column Trim Covers Replacement** in Steering Wheel and Column.

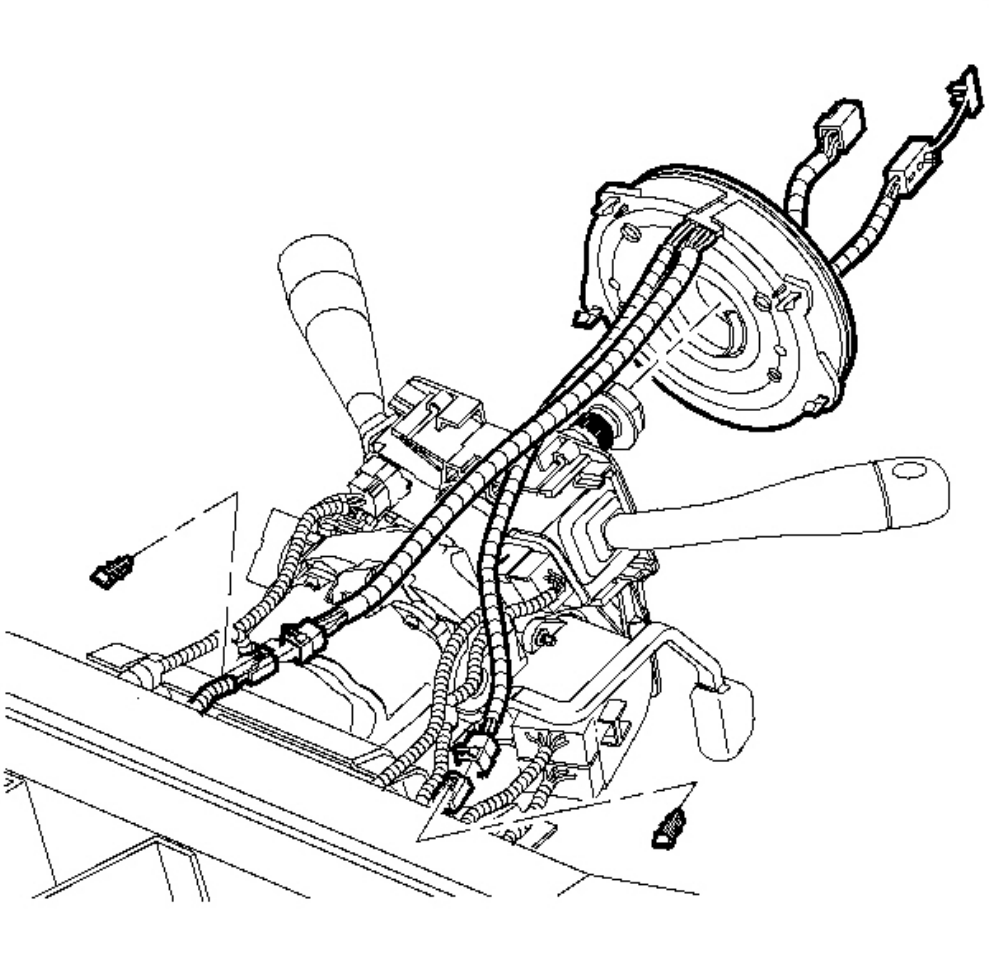


Fig. 44: SIR Coil Harness Clips, Bracket & Horn/Cruise Connectors
Courtesy of GENERAL MOTORS CORP.

6. Release the SIR coil harness clips from the bracket below the column.
7. Disconnect both the SIR coil and horn/cruise connectors.
8. Using a small flat-bladed tool, carefully pry the retaining tabs away from the SIR coil assembly and slide the SIR coil assembly off the steering column.

Installation Procedure

IMPORTANT: A new roll connector is equipped with a yellow tab that is removed after the steering wheel is installed. This tab passes through the steering

wheel.

1. Route the SIR wiring harness and horn/cruise connector down steering column.

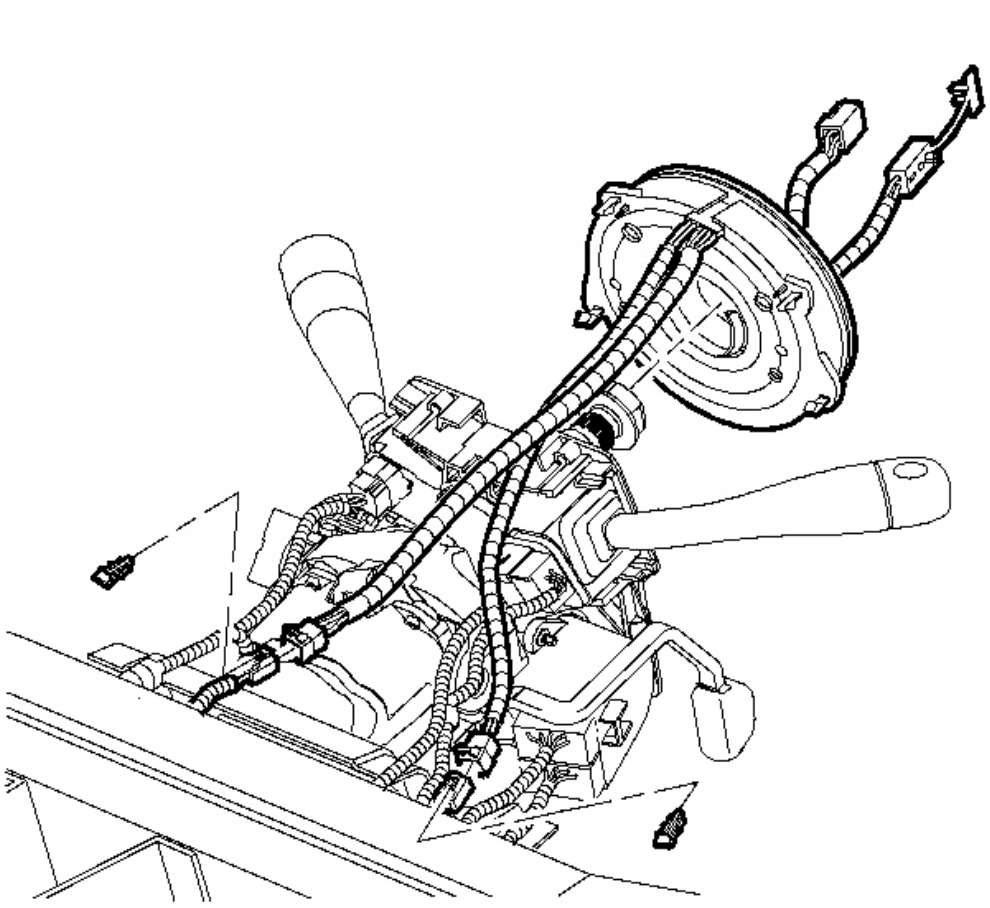


Fig. 45: SIR Coil Harness Clips, Bracket & Horn/Cruise Connectors
Courtesy of GENERAL MOTORS CORP.

2. Snap the SIR coil into position on the column.
3. Connect the SIR coil and horn/cruise electrical connectors.
4. Attach the wiring harness clips to the bracket below the column.
5. Install the steering column covers. Refer to **Steering Column Trim Covers Replacement** in Steering Wheel and Column.

6. Install the steering wheel. Refer to **Steering Wheel Replacement** in Steering Wheel and Column.
7. Install the inflatable restraint steering wheel module. Refer to **Inflatable Restraint Steering Wheel Module Replacement** .
8. Enable the SIR system. Refer to **SIR Disabling and Enabling Zone 3** .

INFLATABLE RESTRAINT INSTRUMENT PANEL MODULE REPLACEMENT

Removal Procedure

CAUTION: Refer to SIR Inflator Module Handling and Storage Caution in Cautions and Notices.

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

1. Disable the SIR system. Refer to **SIR Disabling and Enabling Zone 5** .
2. Remove the I/P top cover. Refer to **Trim Panel Replacement - Instrument Panel (I/P) Upper** in Instrument Panel, Gages, and Console.
3. Remove the radio. Refer to **Radio Replacement** in Entertainment.
4. Remove the fastener from the passenger side air outlet duct.
5. Remove the air outlet duct.

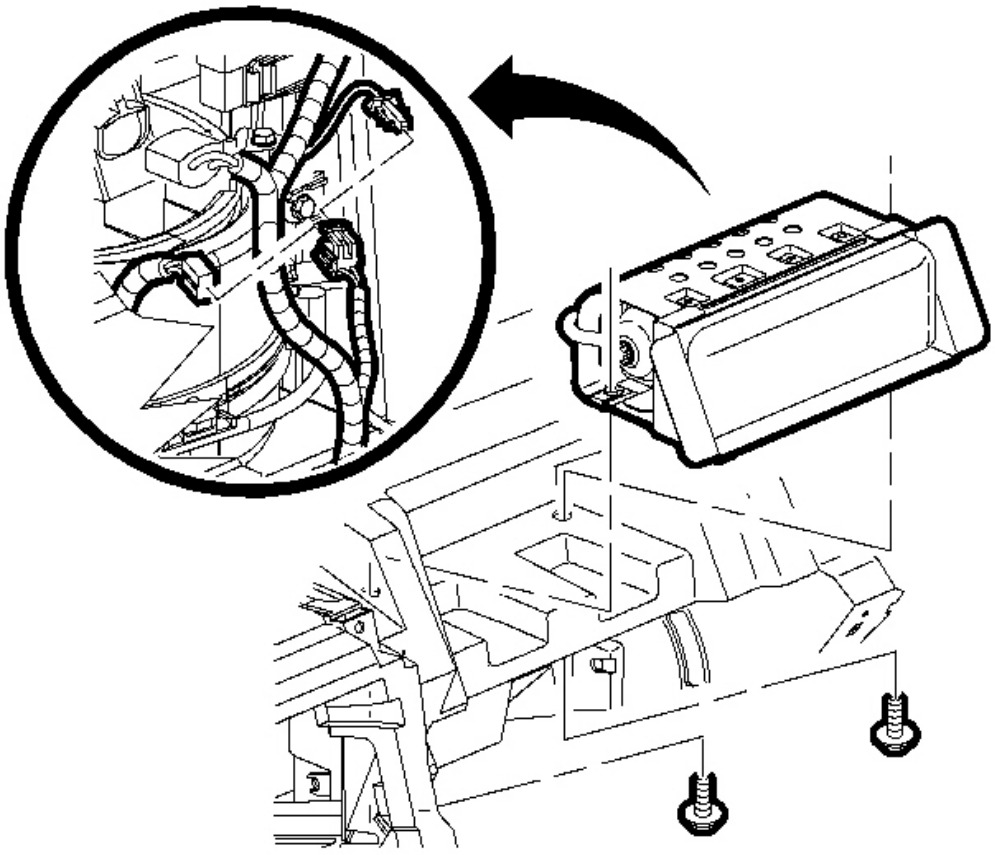


Fig. 46: Module & I/P Carrier Retainers
Courtesy of GENERAL MOTORS CORP.

6. Reach through the radio and the air outlet duct areas to access the fasteners. Remove the fasteners securing the SIR to the I/P beam.
7. Unsnap the module from the I/P carrier retainers.
8. Remove the module from the vehicle.

Installation Procedure

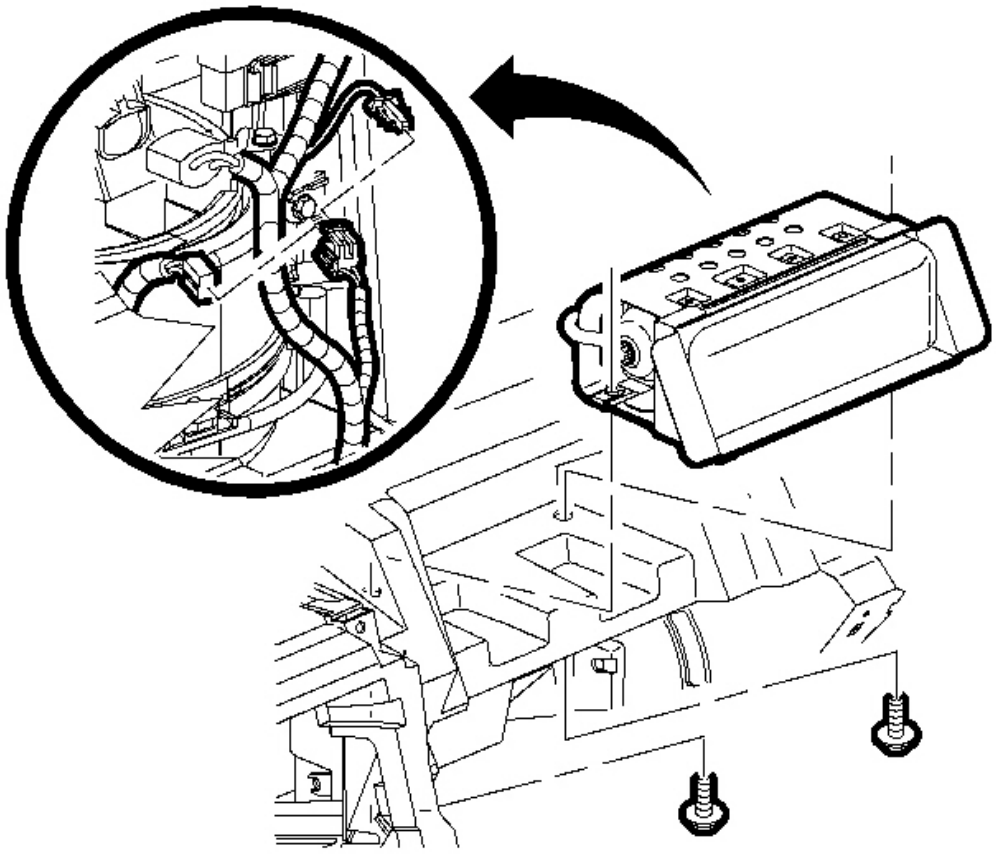


Fig. 47: Module & I/P Carrier Retainers
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: The harness exits from the module on the right side of the vehicle.

1. Insert the module into the I/P carrier. Snap the module into place with 2 retainers.

NOTE: Refer to Fastener Notice in Cautions and Notices.

IMPORTANT: Route the harness to the module between the round guide pin and the module mounting ear.

2. Install the module fasteners.

   Tighten: Tighten the fasteners to 10 N.m (89 lb in).

3. Install the passenger side air outlet duct and the fastener.

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

4. Install the radio. Refer to **Radio Replacement** in Entertainment.
5. Install the I/P top cover. Refer to **Trim Panel Replacement - Instrument Panel (I/P) Upper** in Instrument Panel, Gages, and Console.
6. Enable the SIR system. Refer to **SIR Disabling and Enabling Zone 5** .
7. After replacing the module, deploy the old module before disposal. If the module was replaced under warranty, fully deploy and dispose of the module after the required retention period. Refer to **Inflator Module Handling and Scrapping** .

INFLATABLE RESTRAINT ROOF RAIL MODULE REPLACEMENT - FRONT

Removal Procedure

CAUTION: Refer to SIR Caution in Cautions and Notices.

CAUTION: Use care when working around the roof rail inflator module because sharp objects may puncture the roof rail airbag and the airbag will not deploy correctly.
In order to avoid personal injury, if any part of the module is damaged replace the entire module

1. Disable the SIR system. Refer to **SIR Disabling and Enabling Zone 2** or to **SIR Disabling and Enabling Zone 6** .
2. Remove the headliner and the garnish moldings from the vehicle. Refer to **Headliner Replacement** in Interior Trim.

   IMPORTANT: Remove all clips and plastic guides from the structure. Clips are designed for single usage only. The new inflator assembly will contain new clips and plastic guides.

3. Unsnap the SIR tether retainer and remove the tether from the windshield pillar.

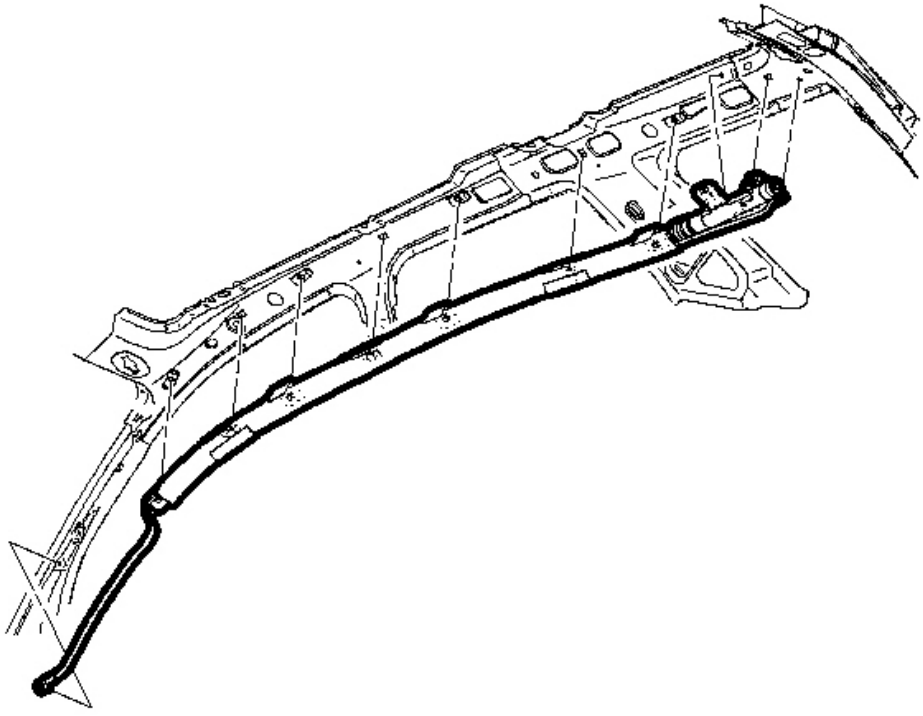


Fig. 48: SIR Module Fasteners, Inflator Retention Tabs & Clips
Courtesy of GENERAL MOTORS CORP.

4. Remove the SIR module fasteners from the inflator retention tabs and clips. Remove the SIR module from the vehicle.

Installation Procedure

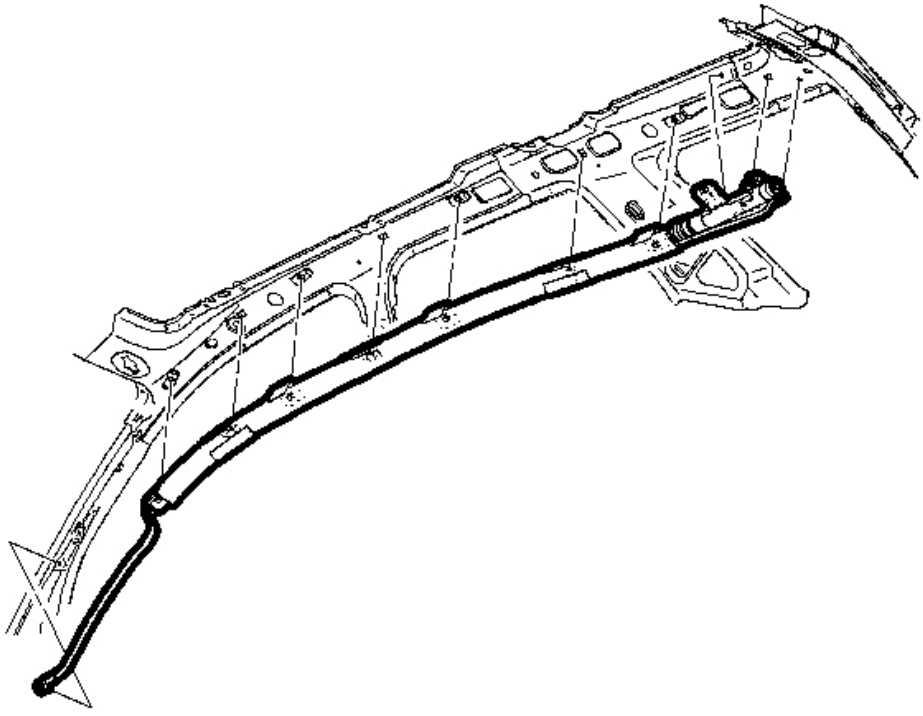


Fig. 49: SIR Module Fasteners, Inflator Retention Tabs & Clips
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Position the module tether rearward of the molding attaching clips.

1. Unpack the new inflator assembly. Start at the rear of the vehicle and install the inflator module to the structure with integral T-locator and fasteners.
2. Working from the rear of the vehicle, install the retaining tabs to the structure to hold the inflator module in place.

NOTE: Refer to Fastener Notice in Cautions and Notices.

IMPORTANT: Visually inspect the side curtain to assure that the curtain is not twisted.

3. Install the remaining side SIR module fasteners.

   Tighten: Tighten the fasteners to 5 N.m (44 lb in).

4. Install the hook on the curtain tether to the windshield pillar. Snap the hook retainer into place.
5. Install the headliner and the garnish moldings to the vehicle. Refer to **Headliner Replacement** in Interior Trim.
6. Enable the SIR system. Refer to **SIR Disabling and Enabling Zone 2** or to **SIR Disabling and Enabling Zone 6** .
7. After replacing the module, deploy the old module before disposal. If the module was replaced under warranty, fully deploy and dispose of the module after the required retention period. Refer to **Inflator Module Handling and Scrapping** .

SEAT BELT RETRACTOR PRETENSIONER REPLACEMENT - FRONT

Removal Procedure

CAUTION: Refer to SIR Caution in Cautions and Notices.

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

CAUTION: When carrying an undeployed inflatable restraint seat belt pretensioner:

- **Do not carry the seat belt pretensioner by the wires or connector.**
- **Carry the seat belt pretensioner by the piston tube, keeping hands and fingers away from the cable.**
- **Make sure the open end of the seat belt pretensioner piston tube points away from you and other people.**
- **Do not cover the seat belt pretensioner piston tube opening with your hand.**

Failure to observe these guidelines may result in personal injury.

1. Disable the SIR system. Refer to **SIR Disabling and Enabling Zone 2** or to **SIR Disabling and Enabling Zone 6** .

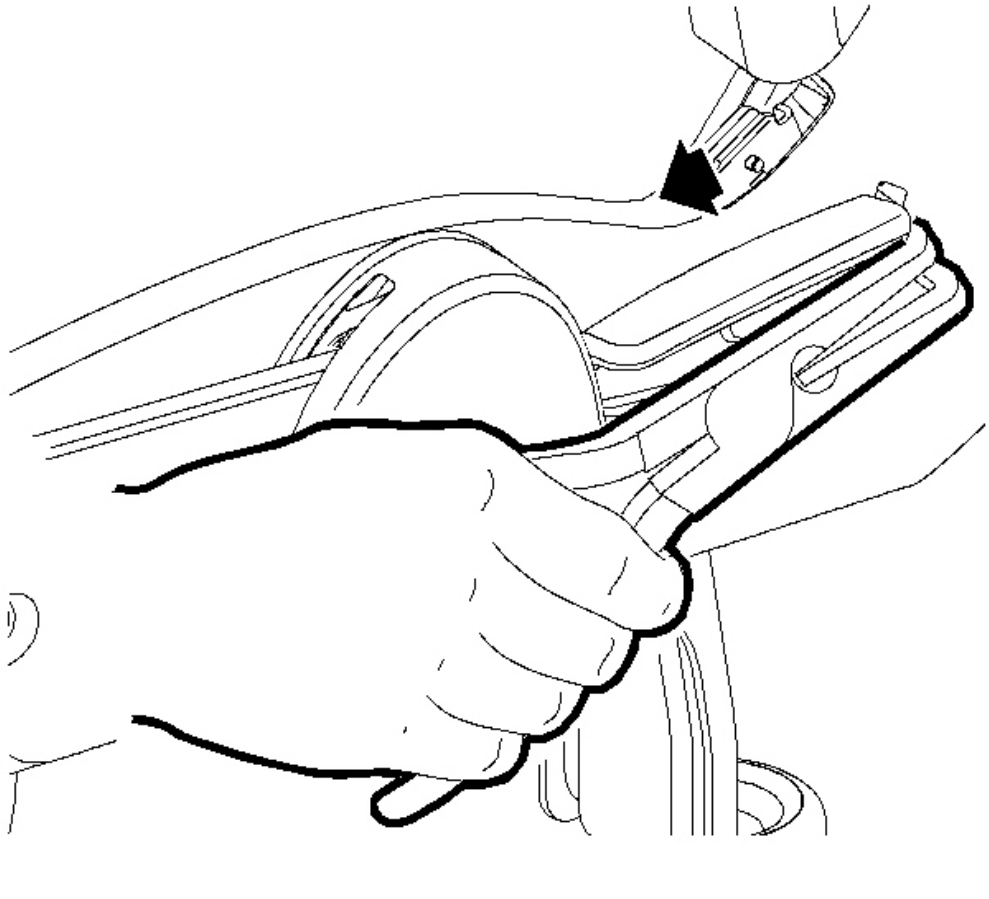


Fig. 50: Recliner Handle Trim & Side Trim Cover
Courtesy of GENERAL MOTORS CORP.

2. Remove the recliner handle trim by pulling firmly on the trim.
3. Remove the side trim cover from the front seat. Refer to **Seat Cushion Outer Trim Panel Replacement - Front Seat (4-Way)** or **Seat Cushion Outer Trim Panel Replacement - Front Seat (2-Way)** or **Seat Cushion Outer Trim Panel Replacement - Front Seat (6-Way)** in Seats.

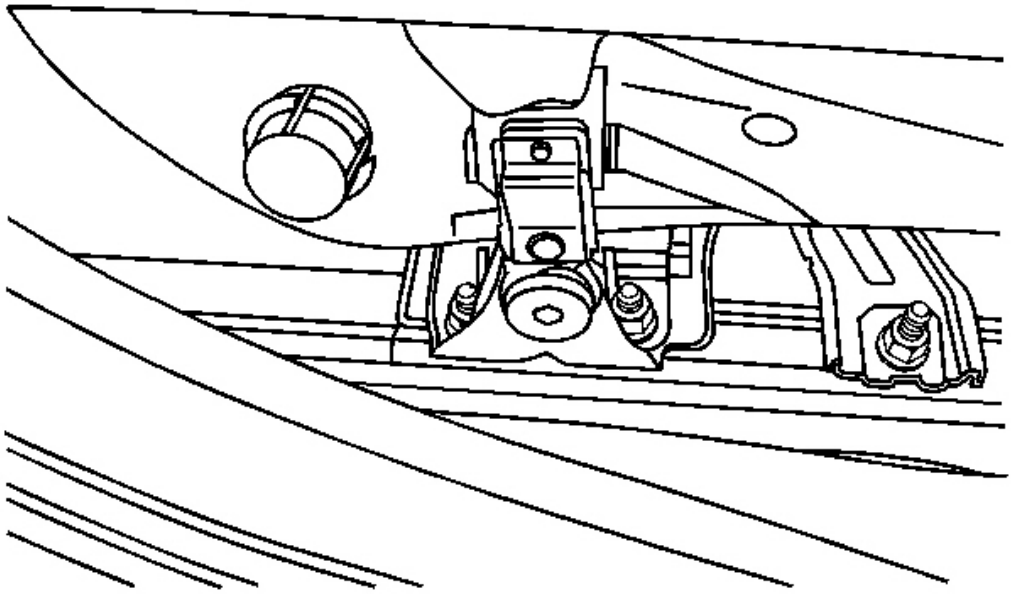


Fig. 51: Seat Belt Anchor
Courtesy of GENERAL MOTORS CORP.

4. Remove the seat belt anchor from the front seat.
5. Remove the lower garnish molding from the center pillar. Refer to **Garnish Molding Replacement - Center Pillar Lower** in Interior Trim.
6. Disconnect the electrical connector from the pretensioner retractor.

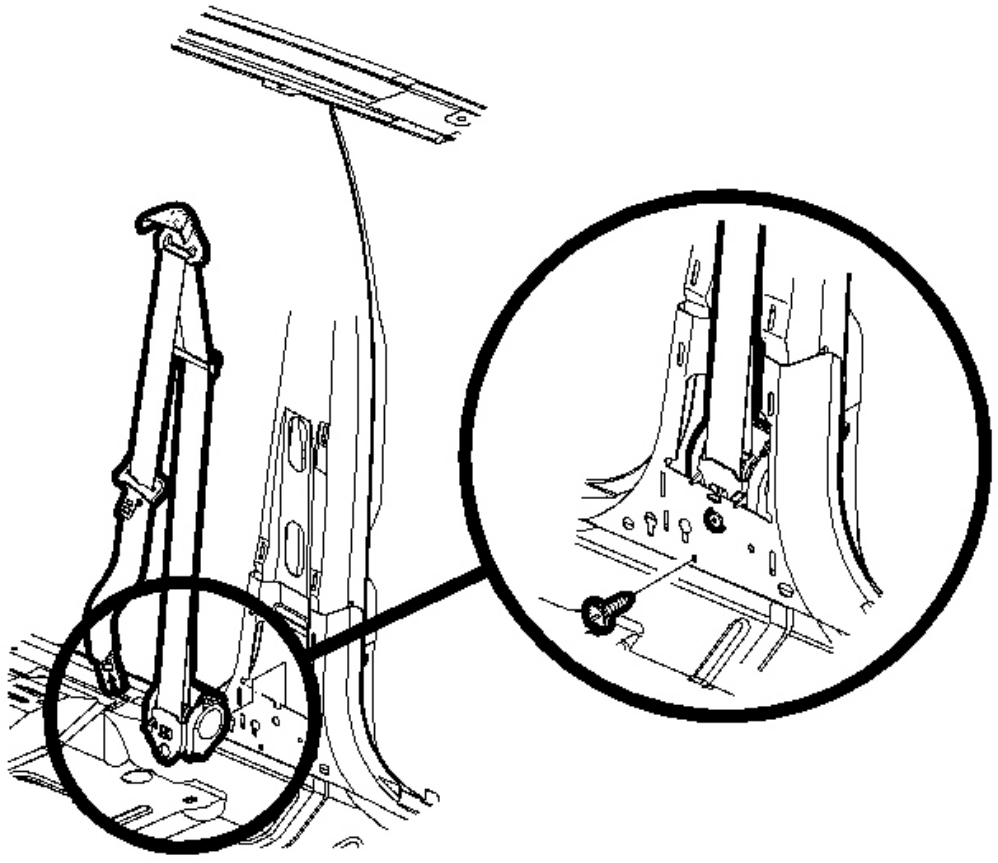


Fig. 52: Retractor Fastener
Courtesy of GENERAL MOTORS CORP.

7. Remove the retractor fastener and remove the retractor.
8. Remove the shoulder belt webbing retainer by pulling on the retainer while using a flat-bladed tool to disengage the attaching clips.
9. Remove the shoulder belt from the vehicle.

Installation Procedure

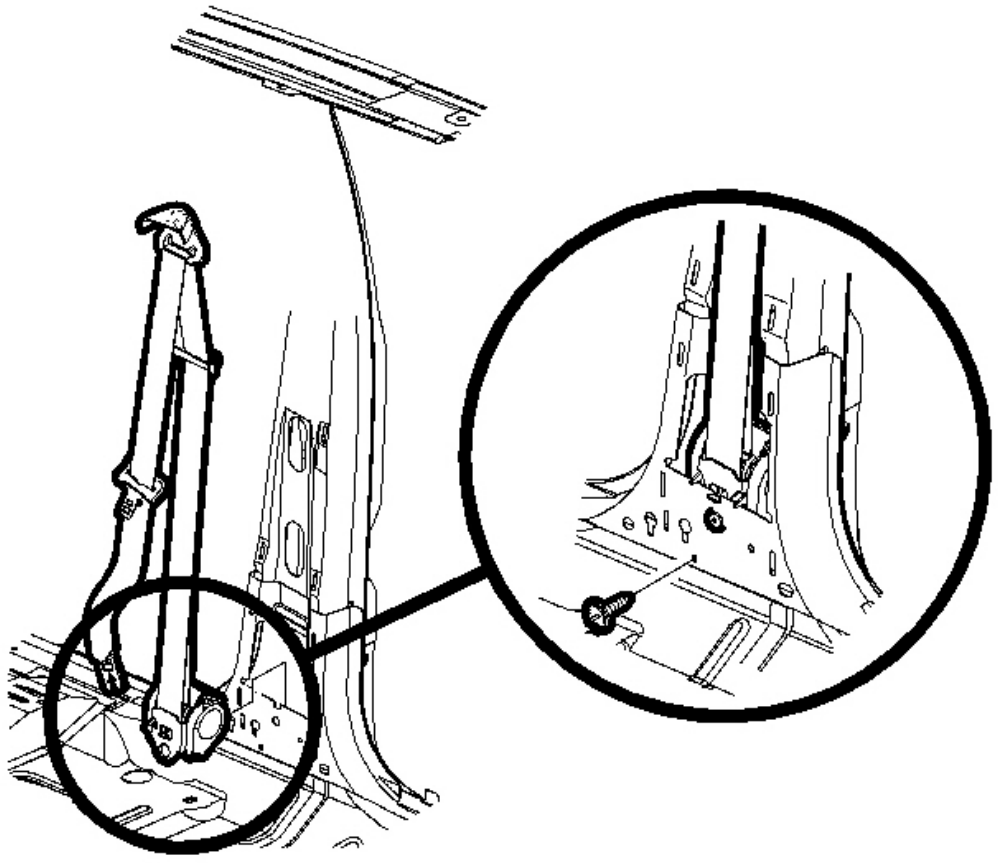


Fig. 53: Retractor Fastener
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Apply Permatex(R) 24200 on all restraint fasteners prior to installation.

1. Position the shoulder belt pretensioner retractor into the center pillar positioning unit with the locking tab in the body structure notch.

NOTE: Refer to Fastener Notice in Cautions and Notices.

2. Install the retractor fastener.

Tighten: Tighten the fastener to 45 N.m (33 lb ft).

3. Connect the electrical connector to the pretensioner retractor.
4. Snap the shoulder belt webbing retainer into the center pillar.
5. Install the lower garnish molding into the center pillar. Refer to **Garnish Molding Replacement - Center Pillar Lower** in Interior Trim.

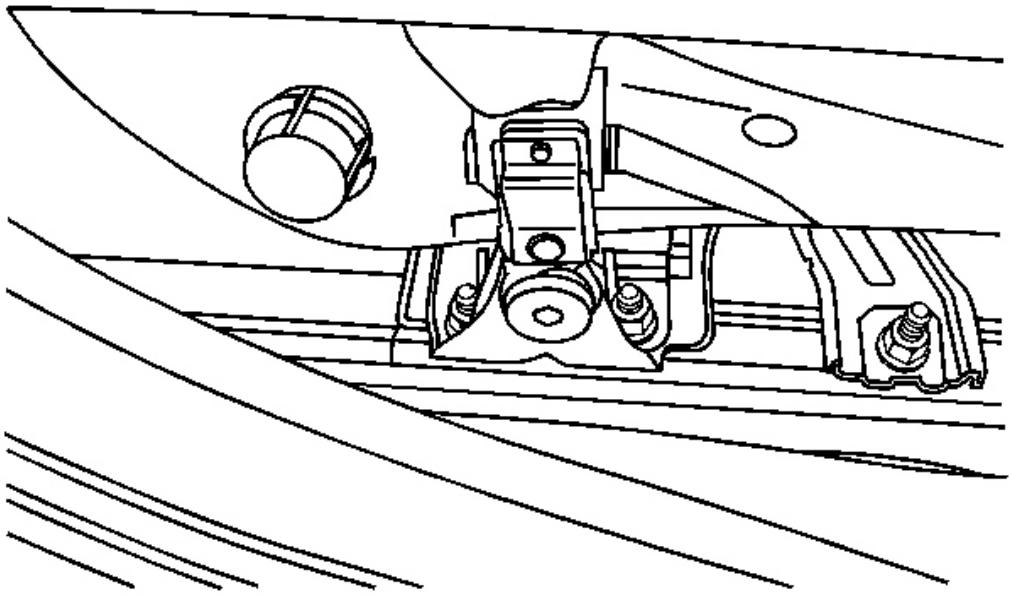


Fig. 54: Seat Belt Anchor
Courtesy of GENERAL MOTORS CORP.

6. Install the seat belt anchor to the seat assembly.
7. Install the side trim cover to the front seat. Refer to **Seat Cushion Outer Trim Panel Replacement - Front Seat (4-Way)** or **Seat Cushion Outer Trim Panel Replacement - Front Seat (2-Way)** or **Seat Cushion Outer Trim Panel Replacement - Front Seat (6-Way)** in Seats.

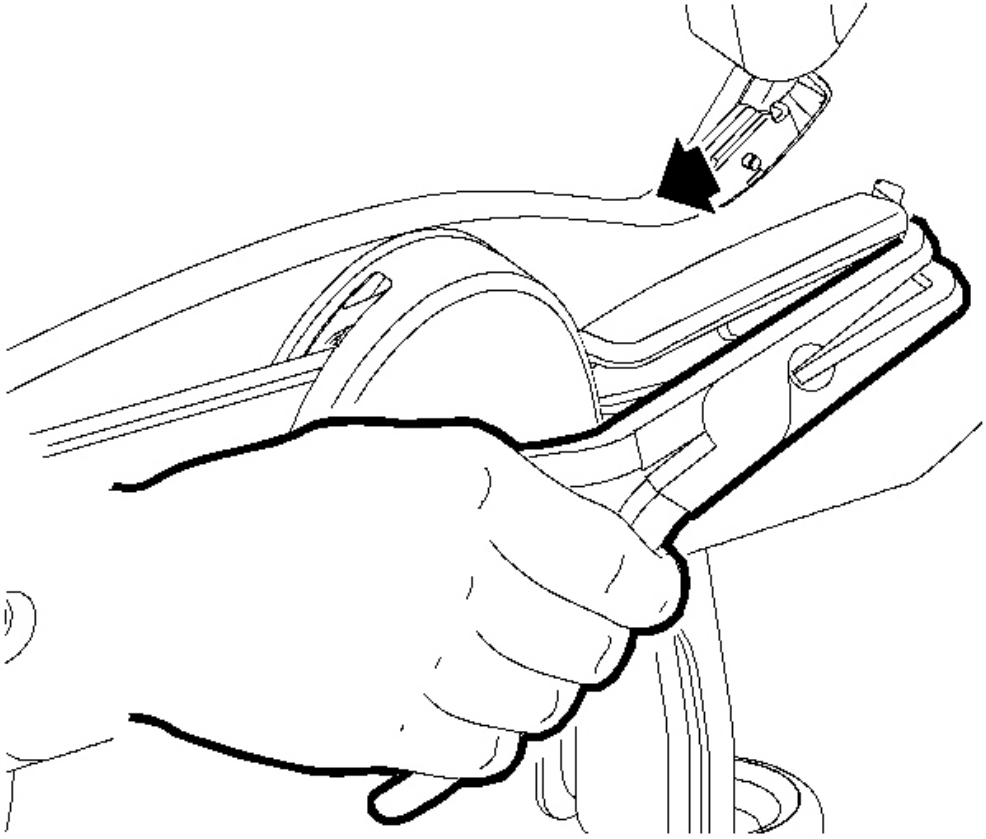


Fig. 55: Recliner Handle Trim & Side Trim Cover
Courtesy of GENERAL MOTORS CORP.

8. Install the trim by pushing firmly on to the recliner handle.
9. Enable the SIR system. Refer to **SIR Disabling and Enabling Zone 2** or to **SIR Disabling and Enabling Zone 6** .

REPAIRS AND INSPECTIONS REQUIRED AFTER A COLLISION

CAUTION: Proper operation of the SIR sensing system requires that any repairs to the vehicle structure return the vehicle structure to the original production configuration. Not properly repairing the vehicle structure could cause non-deployment in a collision or deployment for conditions less severe

than intended.

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

- Steering column - Perform the steering column accident damage inspection procedures. Refer to **Steering Column Accident Damage Inspection** in Steering Wheel and Column.
- I/P Knee Bolsters and Mounting Points - Inspect the knee bolsters for bending, twisting, buckling, or any other type of damage.
- I/P brackets, braces, etc. - Inspect for bending, twisting, buckling, or any other type of damage.
- Seat Belts - Perform the seat belt operational and functional checks. Refer to **Operational and Functional Checks** in Seat Belts.
- I/P Cross Car Beam - Inspect for bending, twisting, buckling, or any other type of damage.
- I/P Mounting Points and Brackets - Inspect for bending, twisting, buckling, or any other type of damage.
- Seats and Seat Mounting Points - Inspect for bending, twisting, buckling, or any other type of damage.

Frontal Inflator Module Deployment - Component Replacement and Inspections

After a collision involving inflator module deployment, replace the following components.

- Inflatable restraint I/P module
- Inflatable restraint sensing and diagnostic module (SDM). Replace only if DTC B0051 or DTC B0053 cannot be cleared using the scan tool. Refer to **DTC B0051** or **DTC B0053** .
- Inflatable restraint steering wheel module
- Inflatable restraint seat belt pretensioners

Perform additional inspections on the following components:

- Inflatable restraint steering wheel module coil and coil wiring pigtail - Inspect for melting, scorching, or other damage due to excessive heat.
- Mounting point or mounting hardware for the I/P module, steering wheel module, and SDM - Inspect for any damage and repair or replace each component as needed.

Roof Rail Inflator Module Deployment - Component Replacement and Inspections

After a collision involving a roof rail inflator module deployment, replace the following components on the side of the impact.

- Inflatable restraint seat belt pretensioners
- Inflatable restraint roof rail modules, Left/Right, on the side of the impact
- Inflatable restraint sensing and diagnostic module (SDM)
- Inflatable restraint side impact sensor (SIS), Left/Right, on the side of the impact

Perform additional inspections on the following components.

- Mounting points or mounting hardware for the inflatable restraint SIS on the side of the impact - Inspect for any damage and repair or replace each component as needed.
- Mounting points or mounting hardware for the inflatable restraint SDM and seat belt pretensioners - Inspect for any damage and repair or replace each component as needed.

Sensor Replacement Guidelines

The SIS replacement policy requires replacing sensors in the area of accident damage. The area of accident damage is defined as the portion of the vehicle which is crushed, bent, or damaged due to a collision.

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

Sensor damage which is not visible, such as a slight bending of the mounting bracket or cuts in the wire insulation, can cause improper operation of the sensor. Do not try to determine whether the sensor is undamaged. Replace the sensor.

INFLATOR MODULE HANDLING AND SCRAPPING

Live and Undeployed Inflator Module

CAUTION: Refer to SIR Inflator Module Handling and Storage Caution in Cautions and Notices.

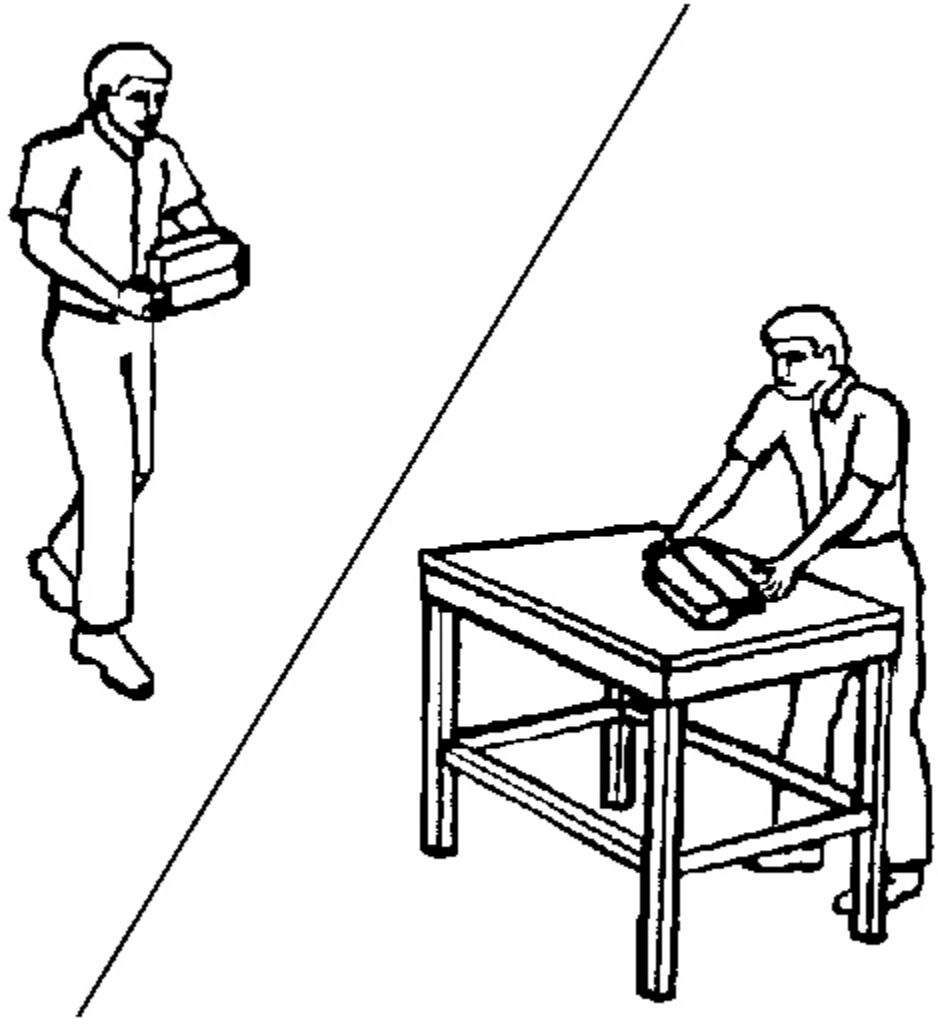


Fig. 56: Handling Undeployed Inflator Module
Courtesy of GENERAL MOTORS CORP.

Take special care when handling or storing an undeployed inflator module. An inflator module deployment produces a rapid generation of gas. This may cause the inflator module, or an object in front of the inflator module, to project through the air in the event of an unlikely deployment.

Dual Stage Inflator Module

Dual stage inflator modules have two deployment stages. If stage 1 was used to deploy a dual stage inflator

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

Scrapping Procedure

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

Do not deploy the inflator module in the following situations:

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

Deployment Procedures

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

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

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

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

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

CAUTION: Refer to SIR Inflator Module Disposal Caution in Cautions and Notices.

Tools Required

- **SA9207Z-A** SIR Deployment Harness. See **Special Tools and Equipment** .

- **SA9413NE** SIR Deployment Fixture. See **Special Tools and Equipment** .
- An appropriate pigtail adapter

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

CAUTION: Refer to SIR Inflator Module Handling and Storage Caution in Cautions and Notices.

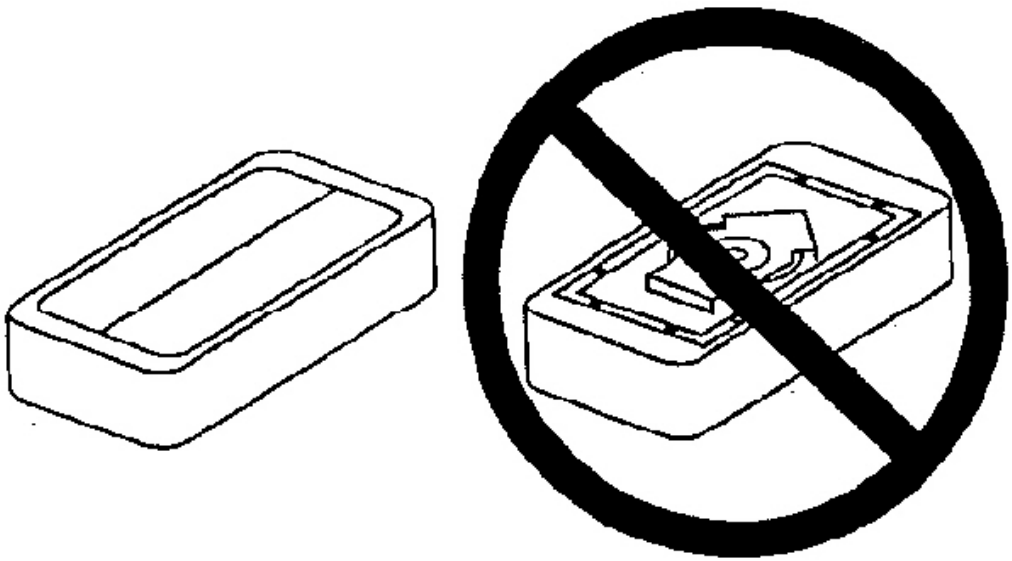


Fig. 57: Proper Storage Of Inflator Module
Courtesy of GENERAL MOTORS CORP.

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

surface.

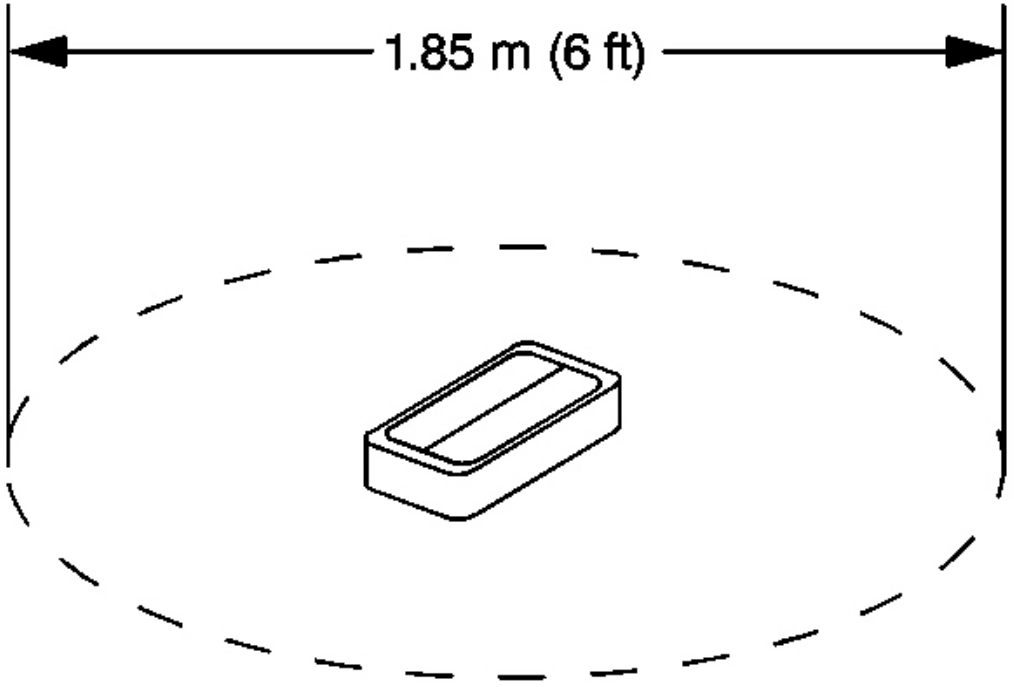


Fig. 58: Clearing Space For Deployment Of Inflator Module
Courtesy of GENERAL MOTORS CORP.

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

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

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

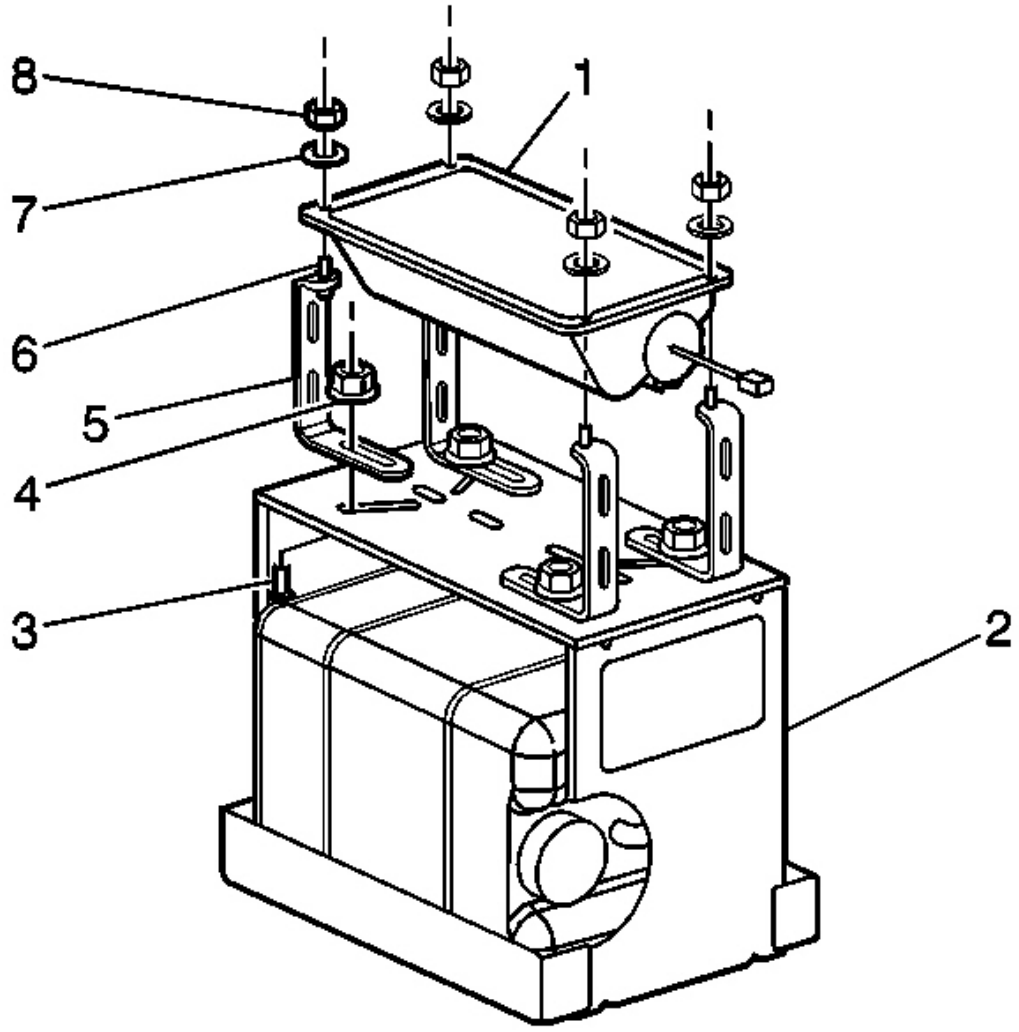


Fig. 59: I/P Module Components
Courtesy of GENERAL MOTORS CORP.

9. When deploying an I/P inflator module, perform the following instructions:
    1. Place the **SA9413NE** SIR Deployment Fixture (2) in the center of the cleared area. See **Special Tools and Equipment** .
    2. Fill the deployment fixture with water or sand.
    3. Using the proper nuts and bolts, mount the I/P module (1) to the deployment fixture (2), with the vinyl trim facing up.
    4. Securely tighten all fasteners that hold the I/P module (1) to the deployment fixture (2).

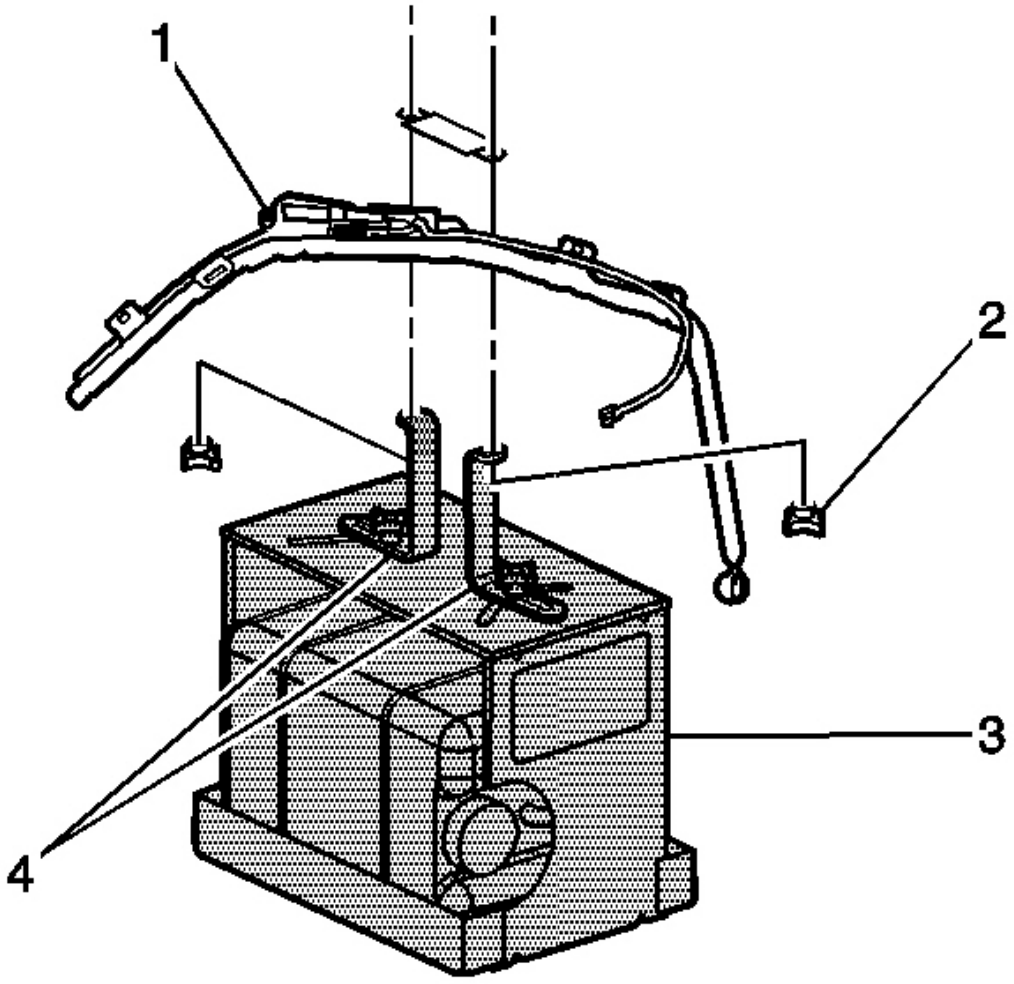


Fig. 60: Roof Rail Module & SA9413NE
Courtesy of GENERAL MOTORS CORP.

10. When deploying a roof rail module, perform the following instructions:
    1. Place the **SA9413NE** SIR Deployment Fixture (3) in the center of the cleared area. See **Special Tools and Equipment** .
    2. Fill the deployment fixture with water or sand to provide sufficient stabilization of fixture during deployment.
    3. Adjust and secure the fixture arms (4) to the deployment fixture (3), using the proper nuts and bolts.
    4. Attach the roof rail module in the deployment fixture and securely tighten all fasteners.

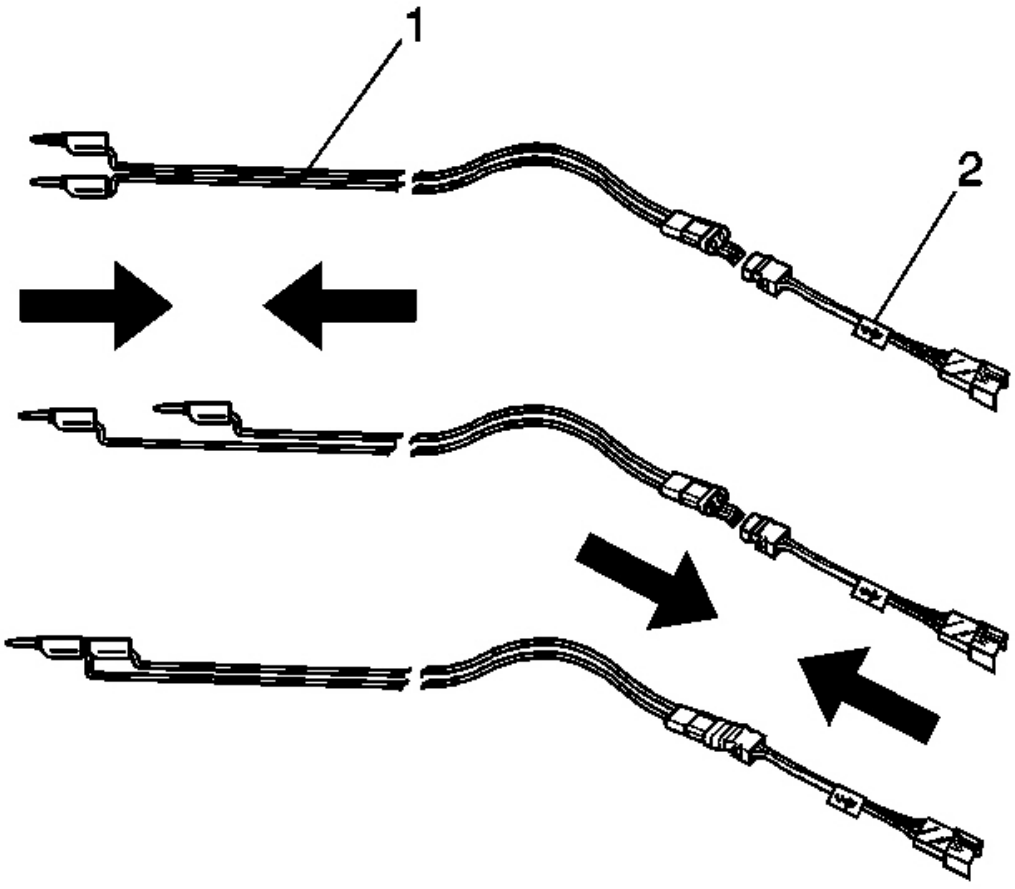


Fig. 61: SIR Deployment Harness & Adapter
Courtesy of GENERAL MOTORS CORP.

11. Inspect the **SA9207Z-A** and the appropriate pigtail adapter (2) for damage. See **Special Tools and Equipment** . Replace as needed.
12. Short the 2 SIR deployment harness leads (1) together using one banana plug seated into the other.
13. Connect the appropriate pigtail adapter (2) to the SIR deployment harness (1).

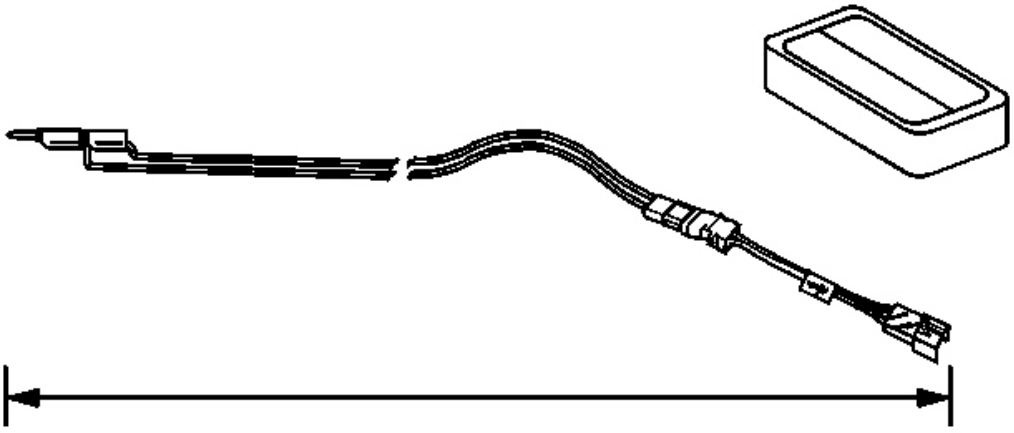


Fig. 62: Extending SIR Deployment Harness & Adapter
Courtesy of GENERAL MOTORS CORP.

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

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

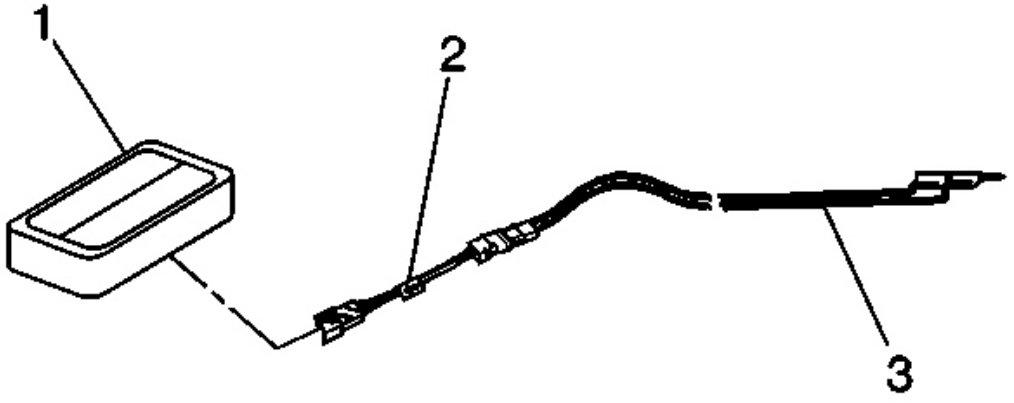


Fig. 63: Connecting Inflator Module To SIR Deployment Harness Adapter
Courtesy of GENERAL MOTORS CORP.

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

IMPORTANT:

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

16. Clear the area of people.

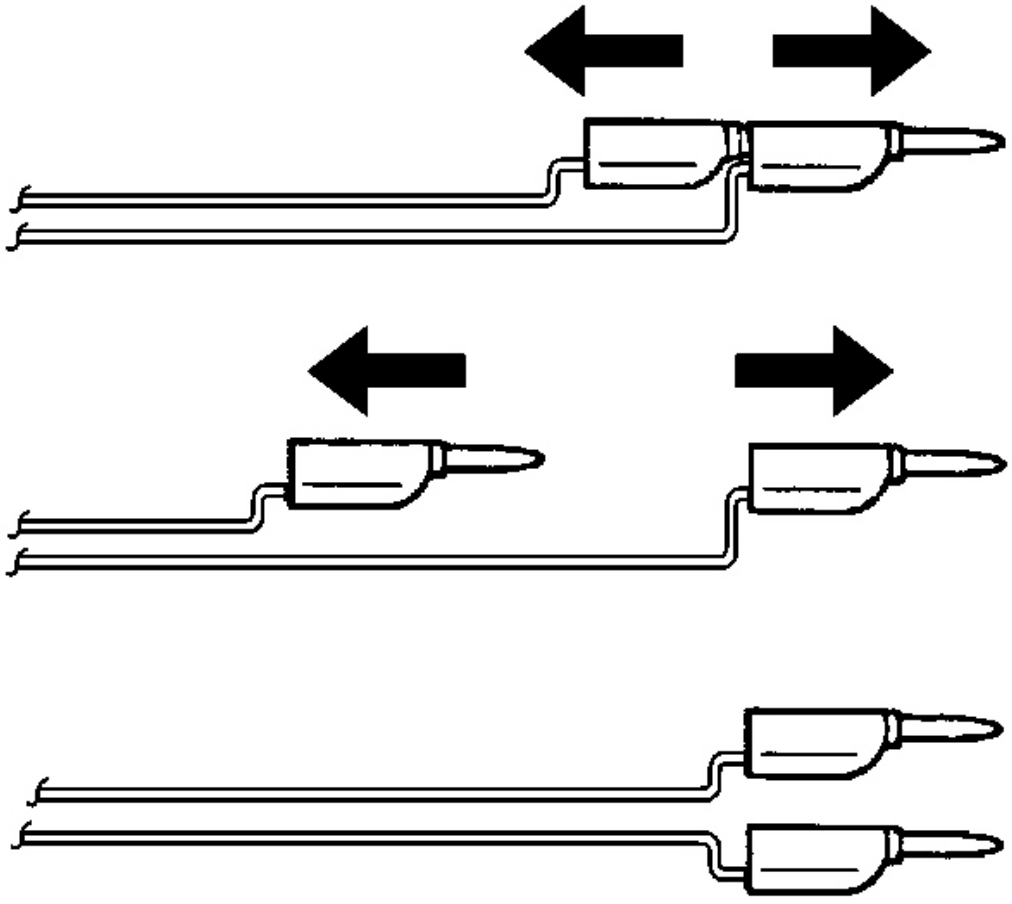


Fig. 64: Separating Banana Plugs
Courtesy of GENERAL MOTORS CORP.

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

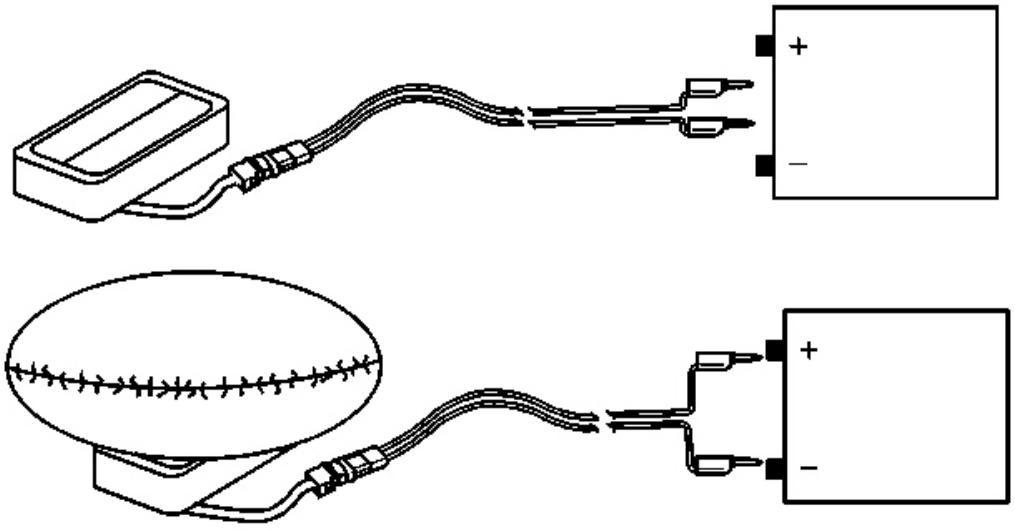


Fig. 65: Connecting SIR Deployment Harness Wires To Power Source
Courtesy of GENERAL MOTORS CORP.

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

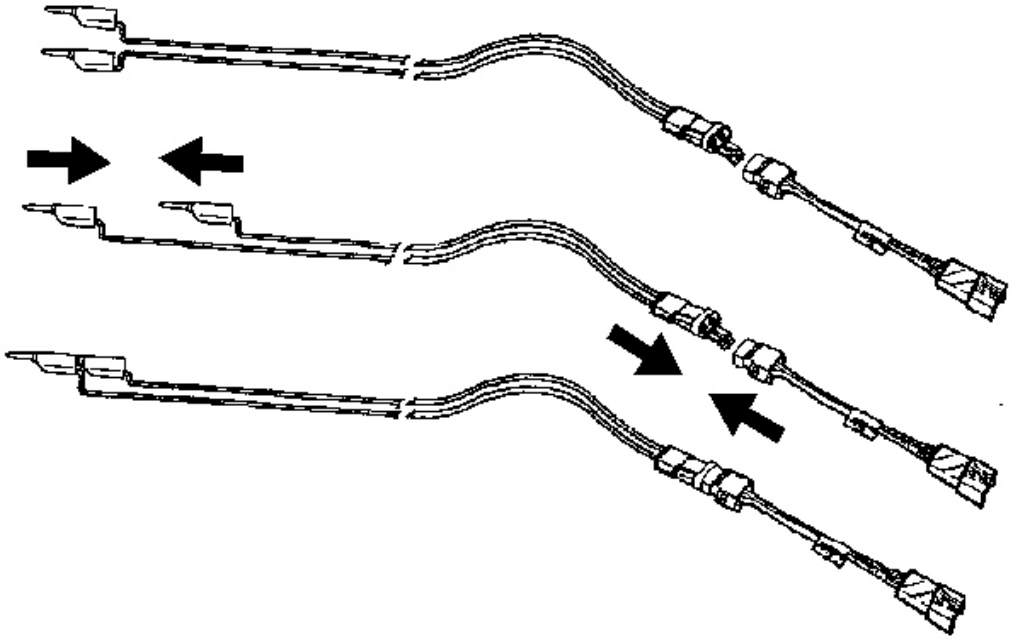


Fig. 66: Shorting Deployment Harness Leads
Courtesy of GENERAL MOTORS CORP.

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

    If deployment was successful, proceed to the following steps.

CAUTION: Refer to SIR Deployed Inflator Modules Are Hot Caution in Cautions and Notices.

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

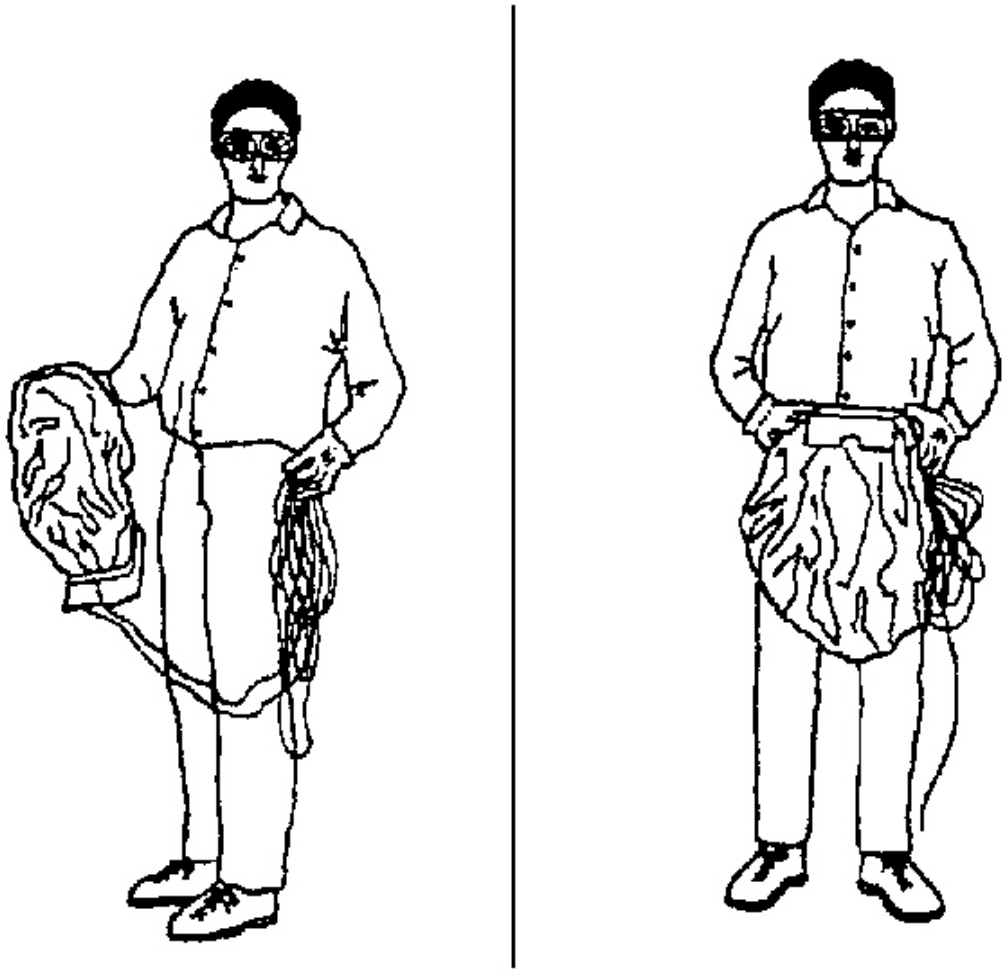


Fig. 67: Disposing Of Deployed Inflator Module
Courtesy of GENERAL MOTORS CORP.

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

Deployment Inside Vehicle - Vehicle Scrapping Procedure

Deploy the inflator modules inside of the vehicle when destroying the vehicle or when salvaging the vehicle for parts. This includes, but is not limited to, the following situations:

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

CAUTION: Refer to SIR Inflatable Module Deployment Outside Vehicle Caution in Cautions and Notices.

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

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

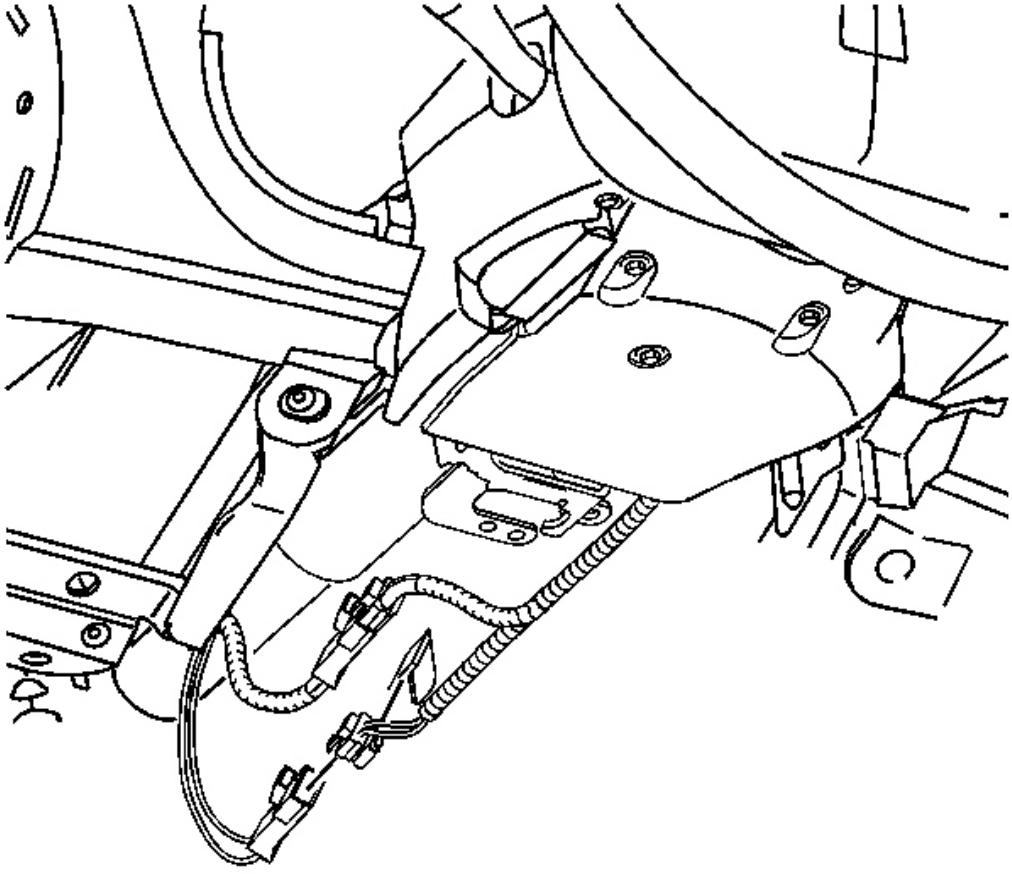


Fig. 68: CPA & Steering Wheel Module Coil Connector
Courtesy of GENERAL MOTORS CORP.

6. Disconnect the steering wheel module yellow connector from vehicle harness yellow connector.

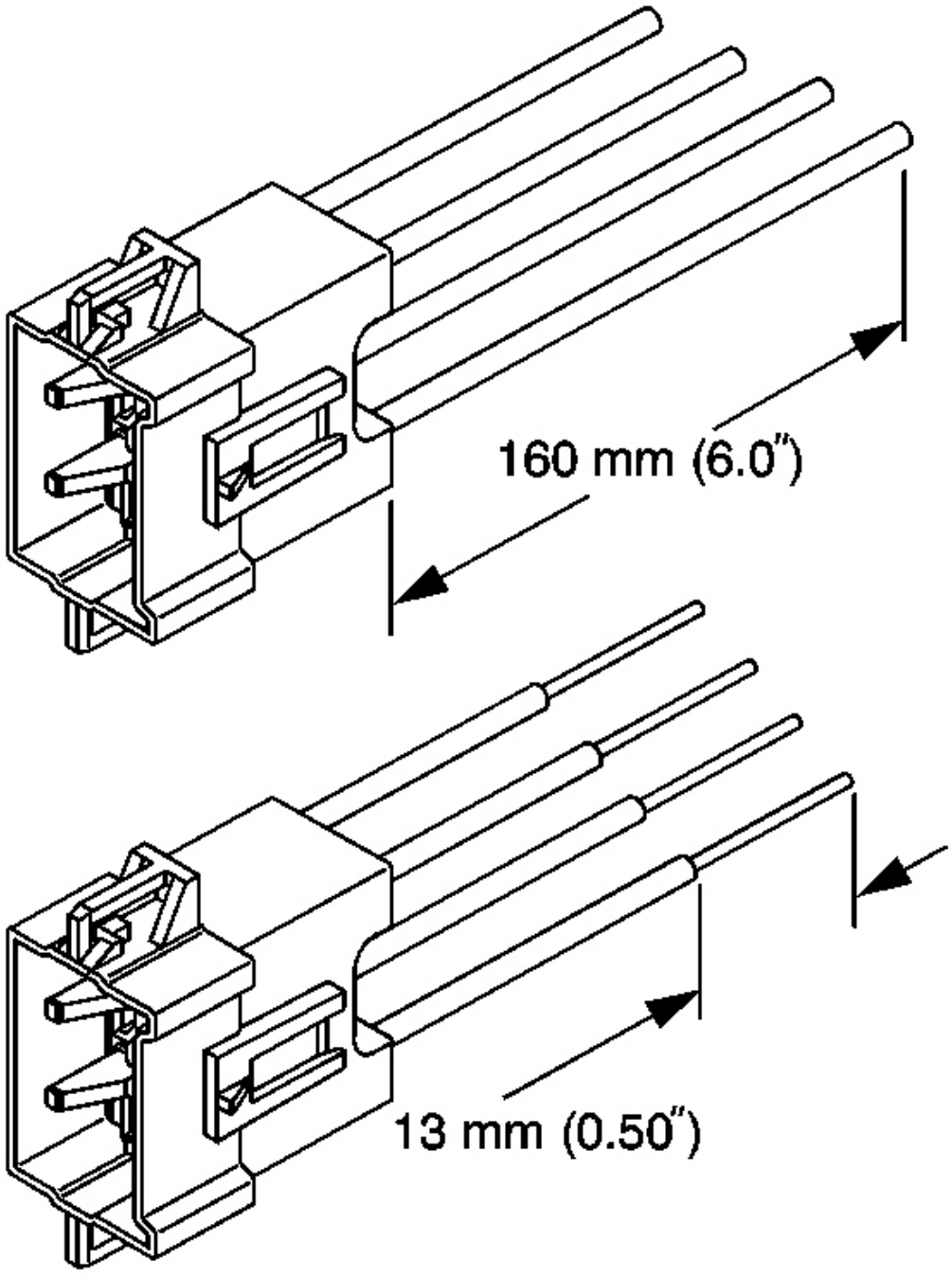


Fig. 69: Measuring SIR Wire To Connector
Courtesy of GENERAL MOTORS CORP.

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

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

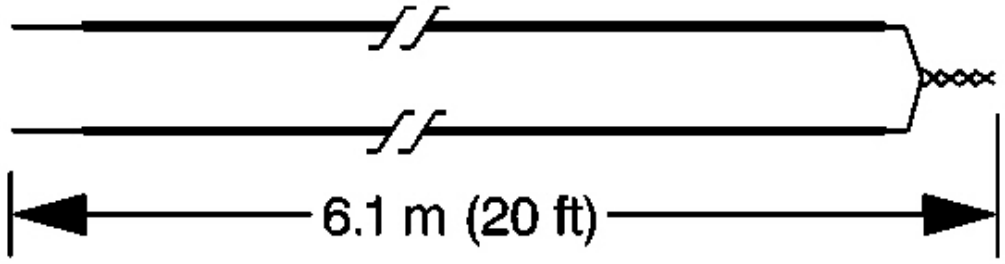


Fig. 70: Fabricating 20 Ft. Deployment Harness
Courtesy of GENERAL MOTORS CORP.

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

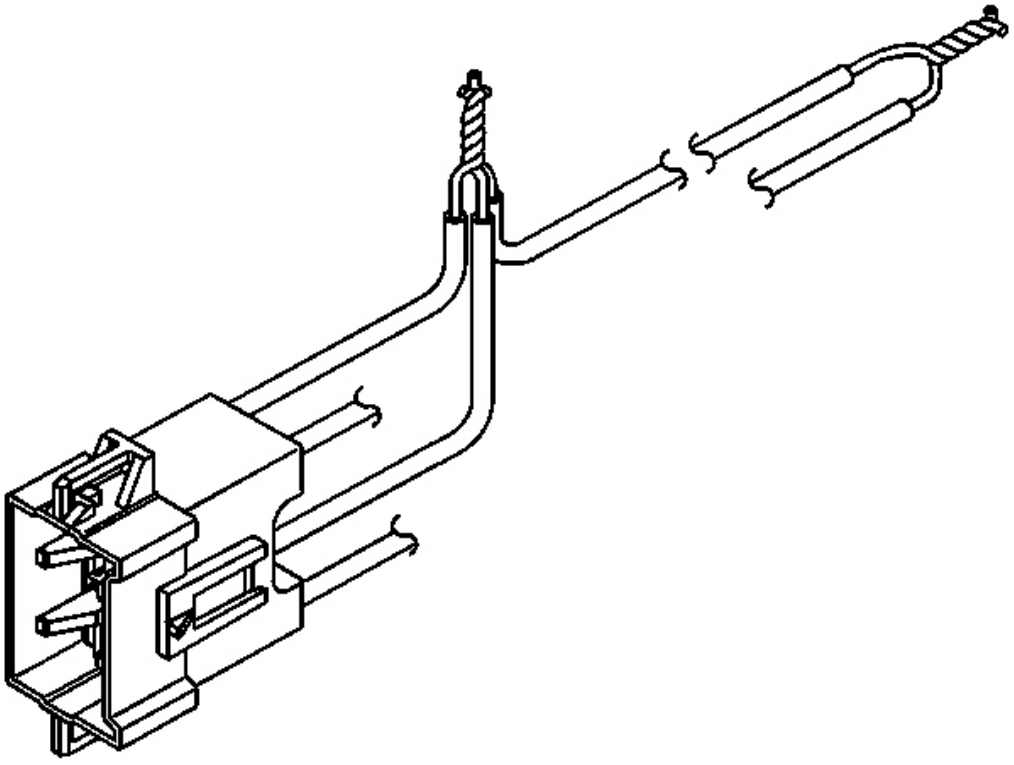


Fig. 71: Twisting Connector Wire Leads (High) To Deployment Harness Wire
Courtesy of GENERAL MOTORS CORP.

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

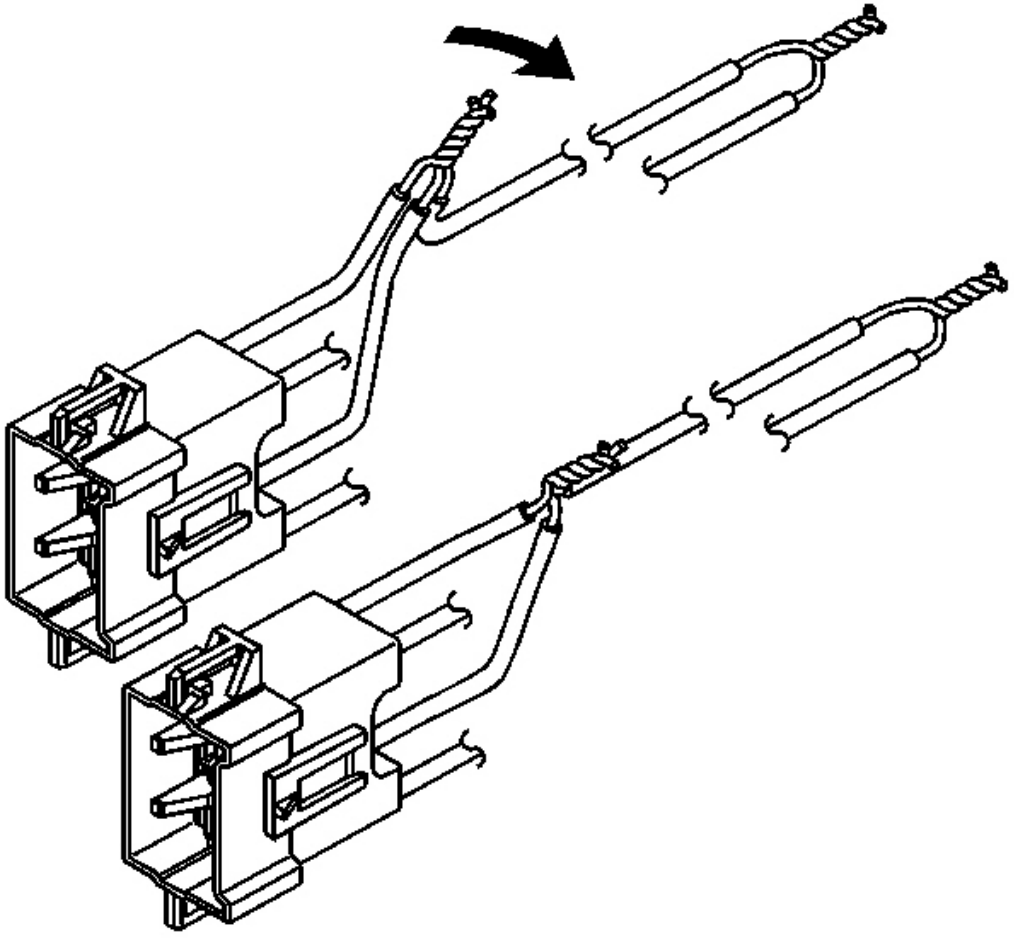


Fig. 72: Bending Twisted Connection Flat
Courtesy of GENERAL MOTORS CORP.

14. Bend flat the twisted connection.

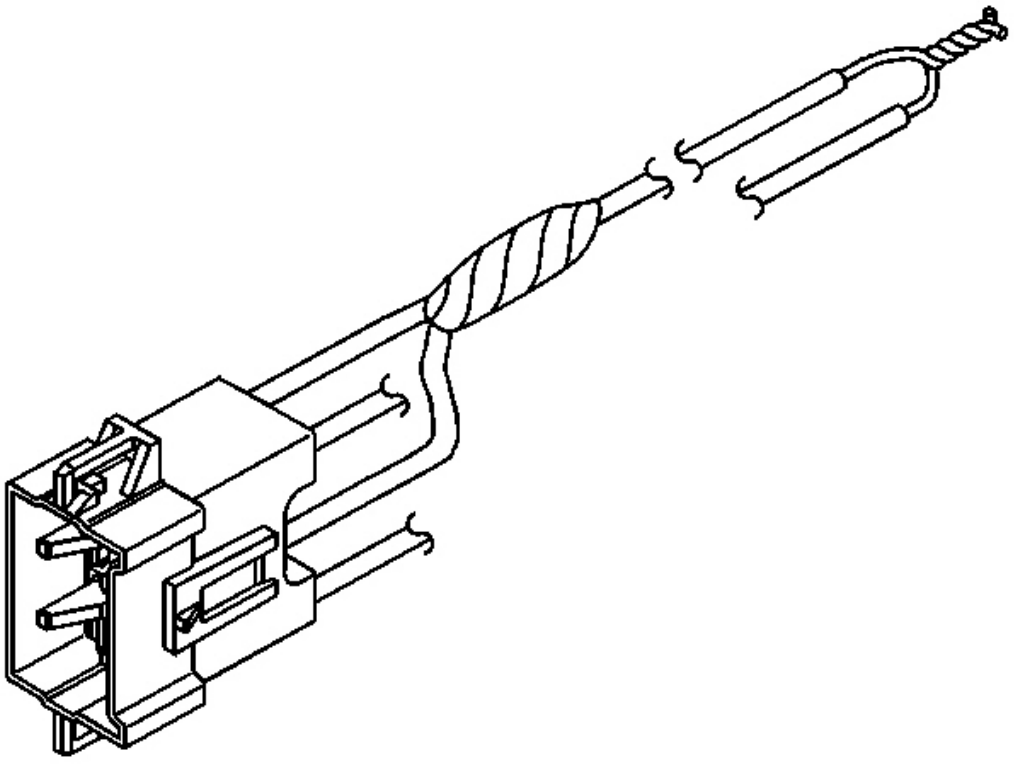


Fig. 73: Insulating Connection With Electrical Tape
Courtesy of GENERAL MOTORS CORP.

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

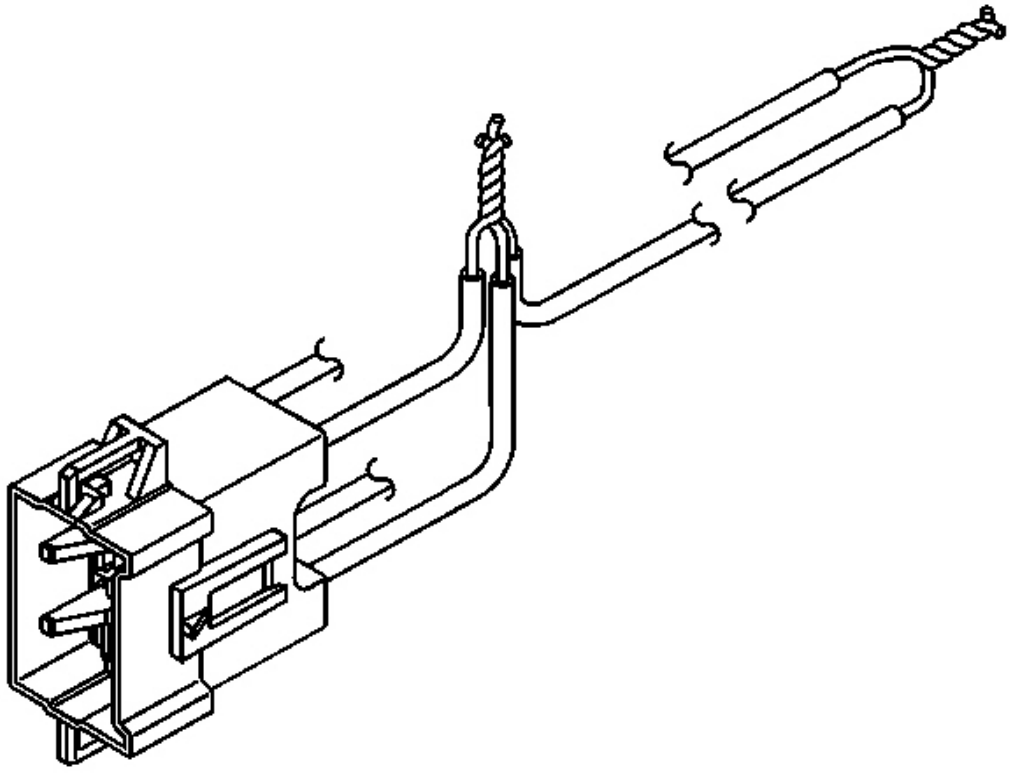


Fig. 74: Twisting Connector Wire Leads (Low) To Deployment Harness Wire
Courtesy of GENERAL MOTORS CORP.

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

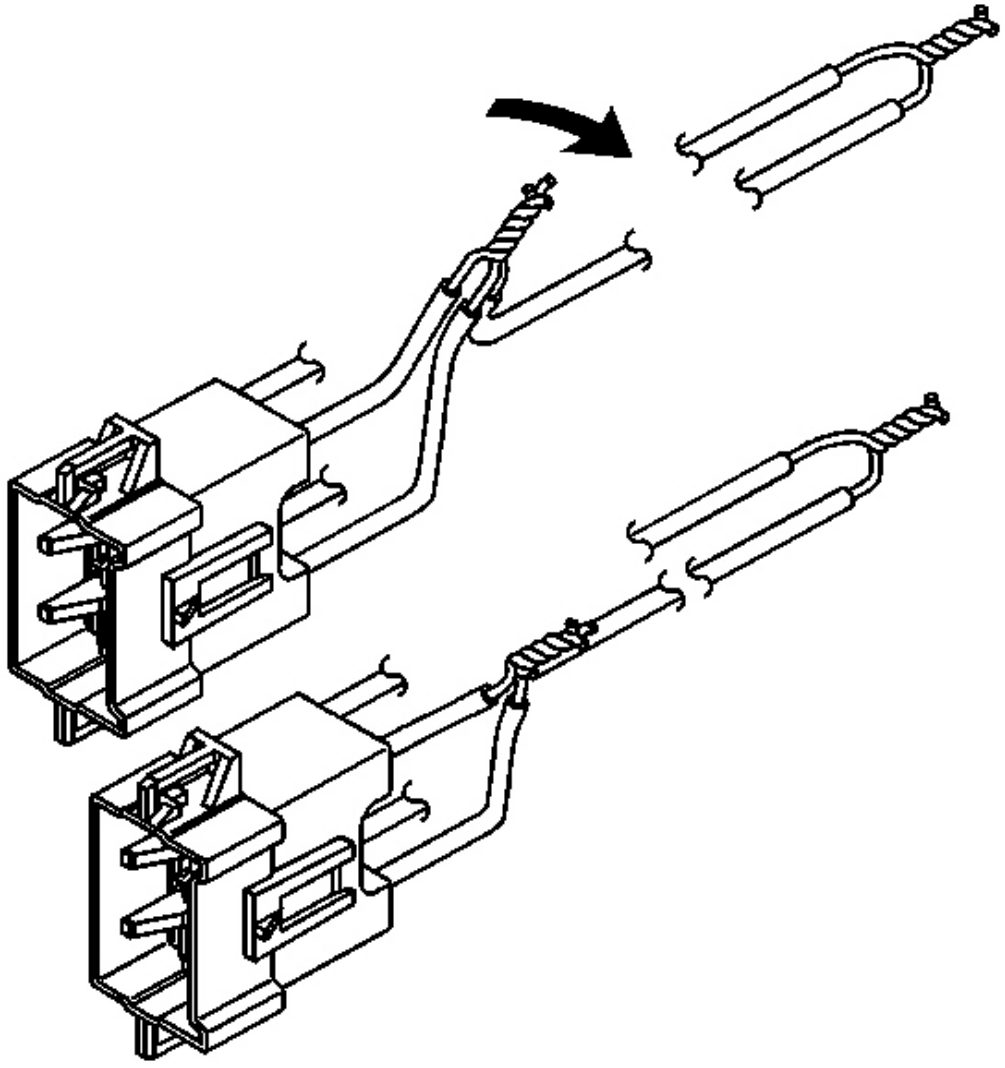


Fig. 75: Bending Twisted Connection Flat
Courtesy of GENERAL MOTORS CORP.

18. Bend flat the twisted connection.

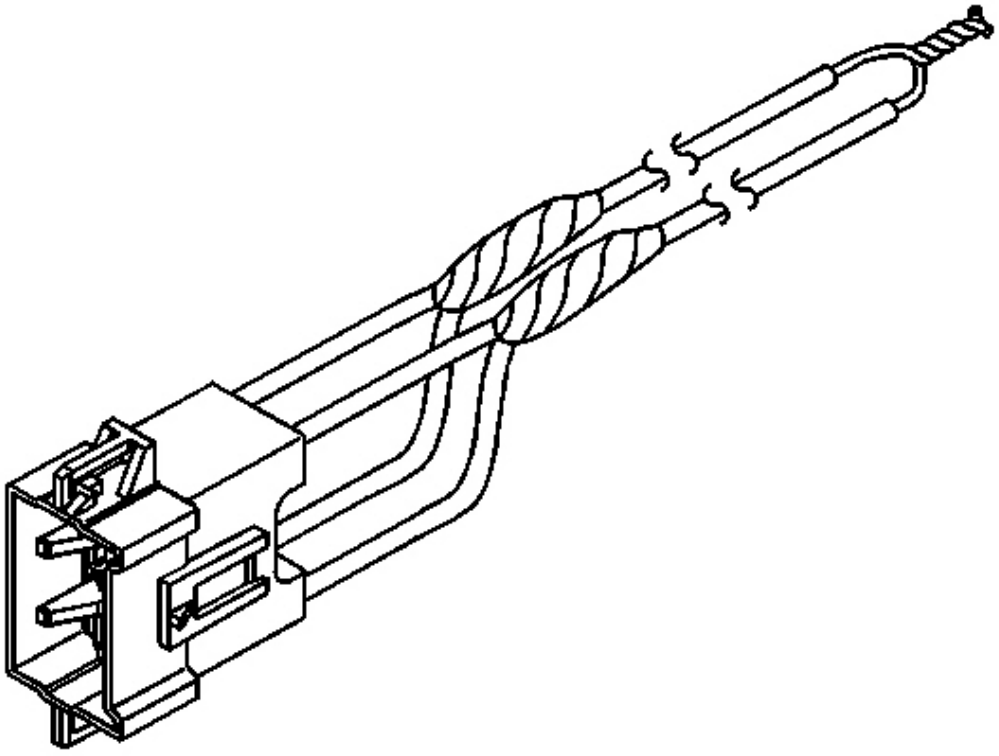


Fig. 76: Insulating Connection With Electrical Tape
Courtesy of GENERAL MOTORS CORP.

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

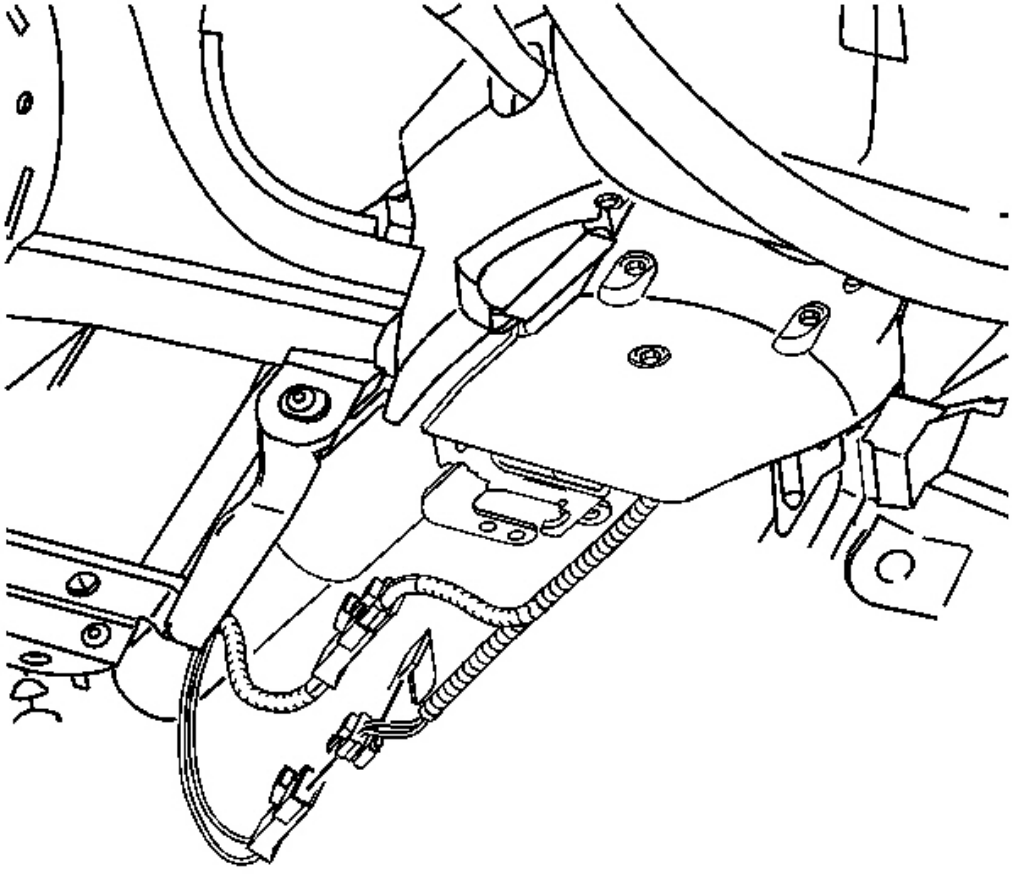


Fig. 77: CPA & Steering Wheel Module Coil Connector
Courtesy of GENERAL MOTORS CORP.

20. Connect the deployment harness to the connector on the steering wheel module.

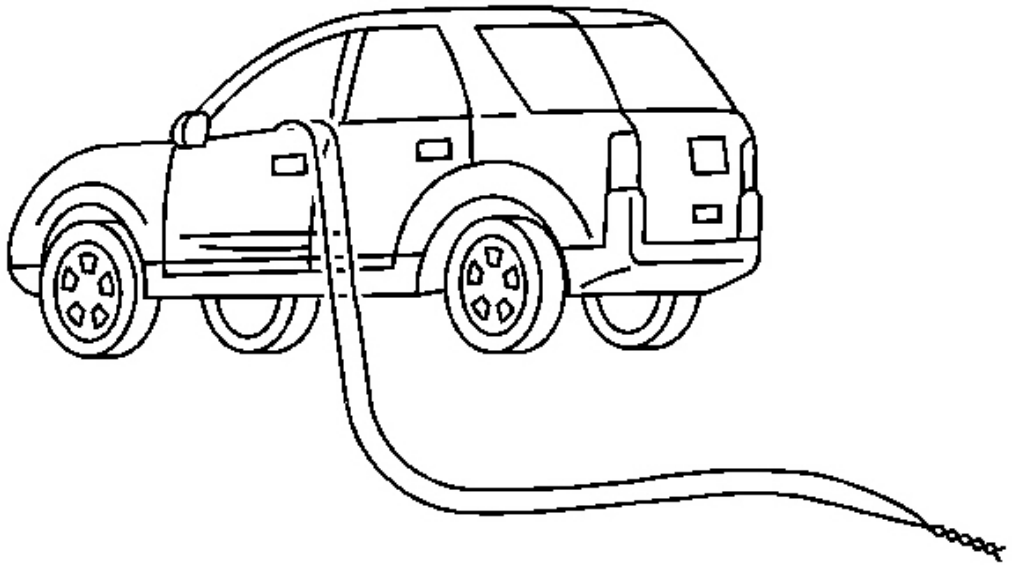


Fig. 78: Steering Wheel Module Deployment Harness Routed Out Of Driver Side Of Vehicle
Courtesy of GENERAL MOTORS CORP.

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

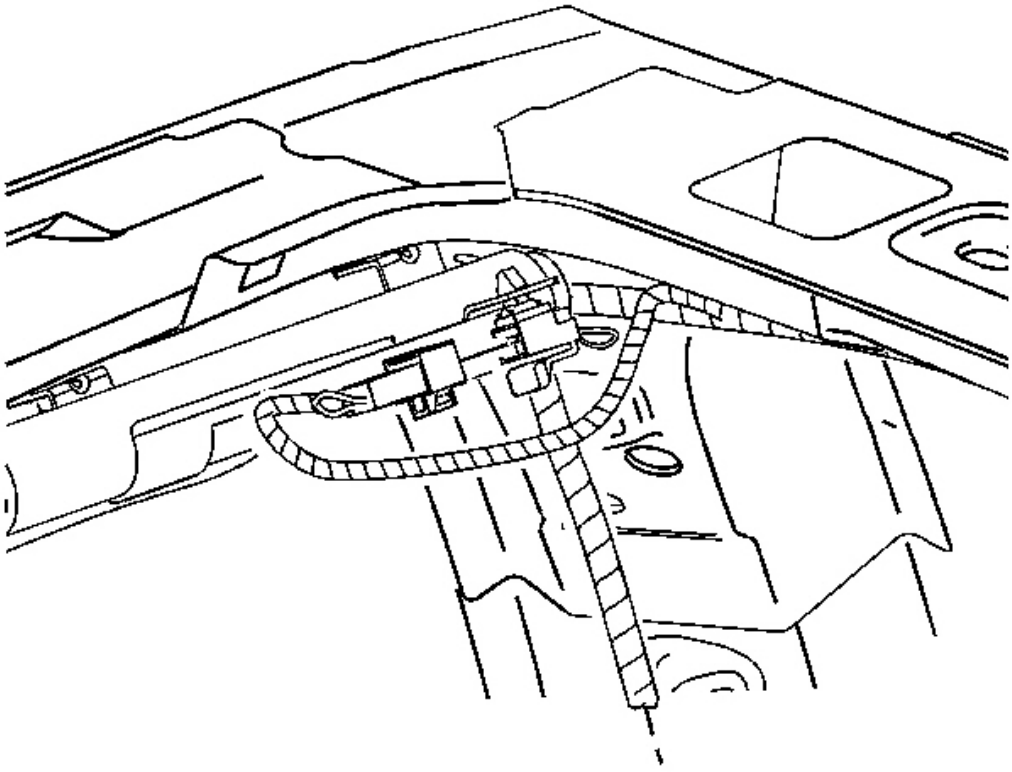


Fig. 79: CPA & Roof Rail Module Connector
Courtesy of GENERAL MOTORS CORP.

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

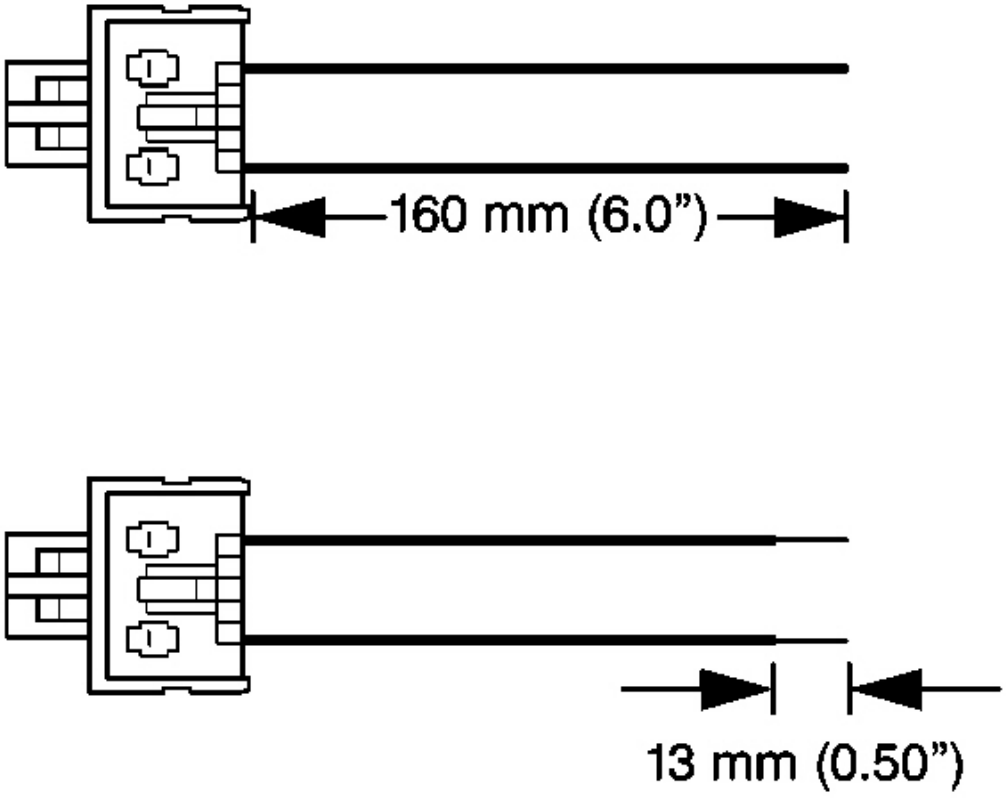


Fig. 80: Stripping Connection Wire Leads
Courtesy of GENERAL MOTORS CORP.

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

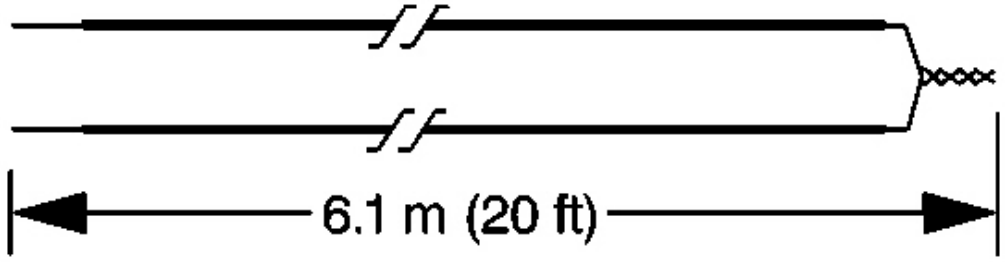


Fig. 81: Fabricating 20 Ft. Deployment Harness
Courtesy of GENERAL MOTORS CORP.

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

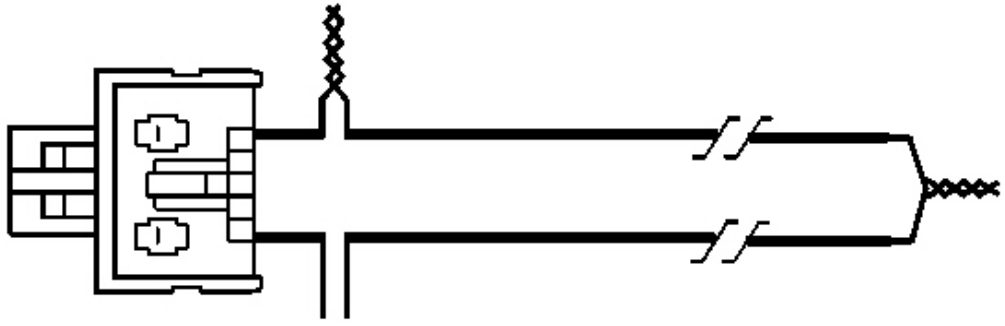


Fig. 82: Twisting Connector Wire Lead To Deployment Wire
Courtesy of GENERAL MOTORS CORP.

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

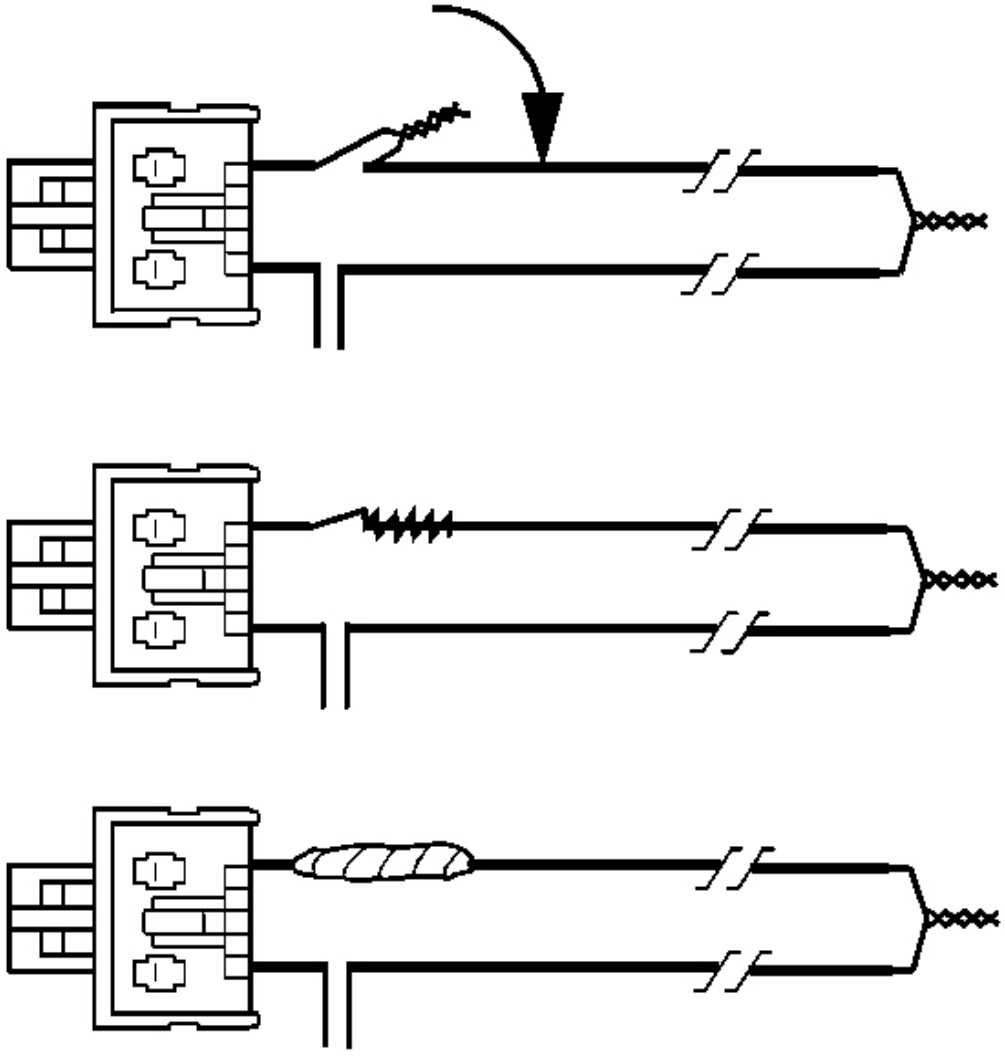


Fig. 83: Insulating Connection With Electrical Tape
Courtesy of GENERAL MOTORS CORP.

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

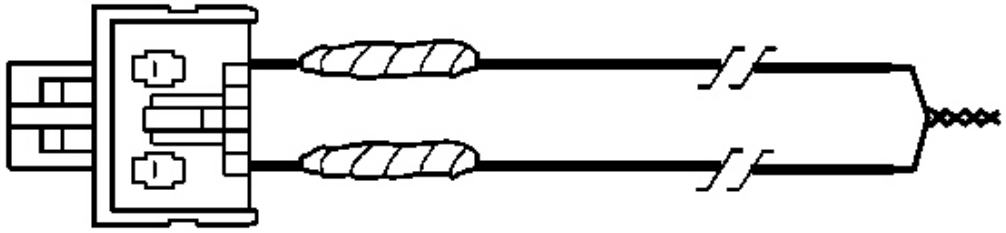


Fig. 84: Taping Remaining Connector Wire Lead To Remaining Deployment Wire
Courtesy of GENERAL MOTORS CORP.

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

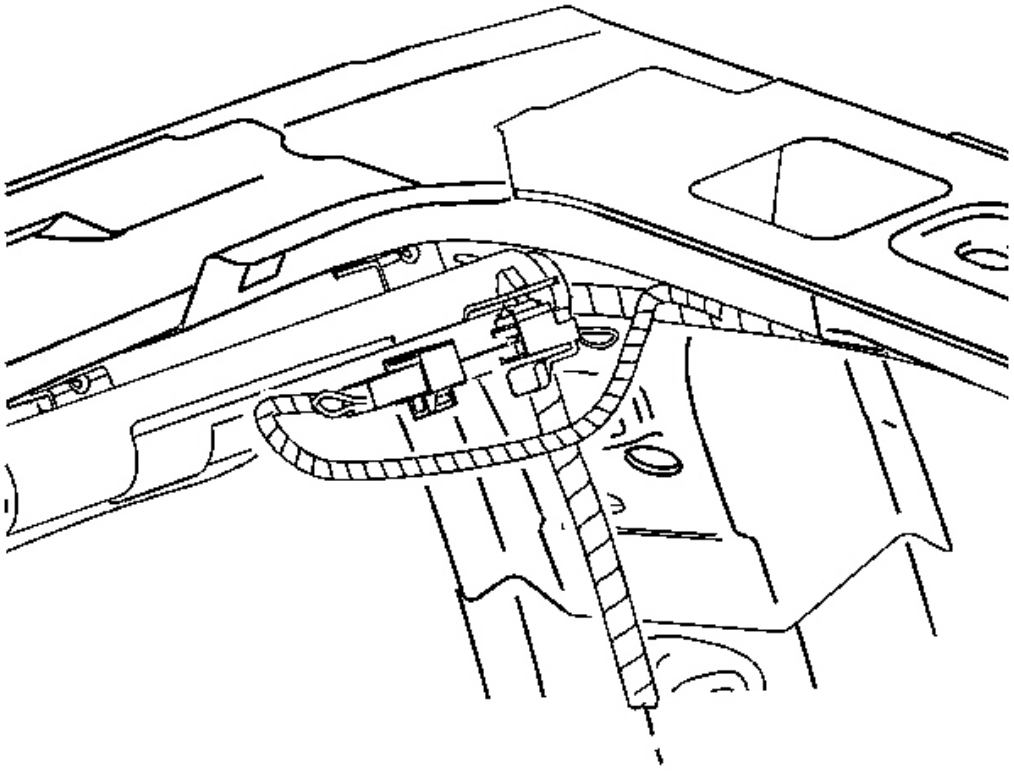


Fig. 85: CPA & Roof Rail Module Connector
Courtesy of GENERAL MOTORS CORP.

32. Connect the deployment harness to the yellow connector of the roof rail module.

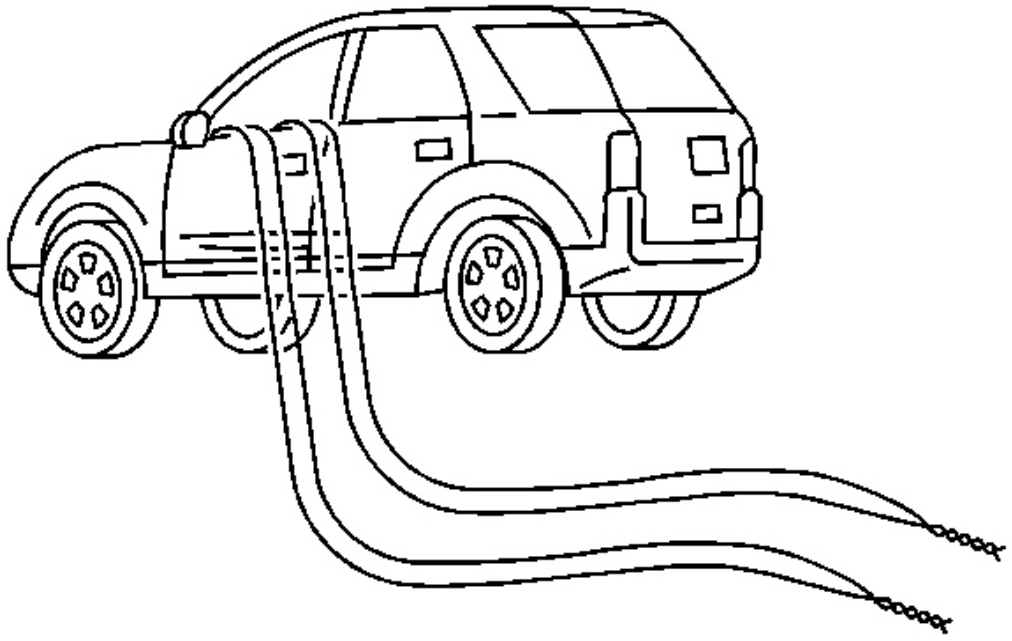


Fig. 86: Roof Rail Module Deployment Harness Routed Out Of Driver Side Of Vehicle
Courtesy of GENERAL MOTORS CORP.

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

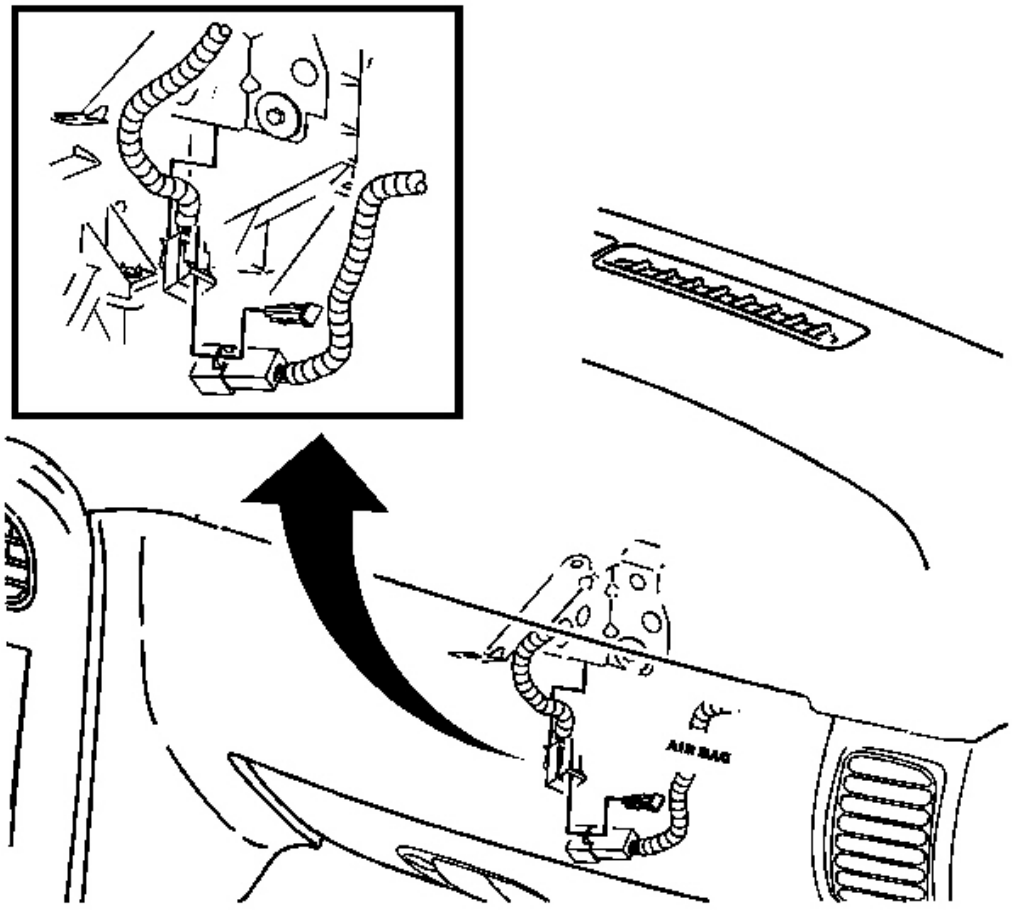


Fig. 87: CPA & I/P Module Connector
Courtesy of GENERAL MOTORS CORP.

34. Disconnect the I/P module yellow harness connector from the vehicle harness connector.

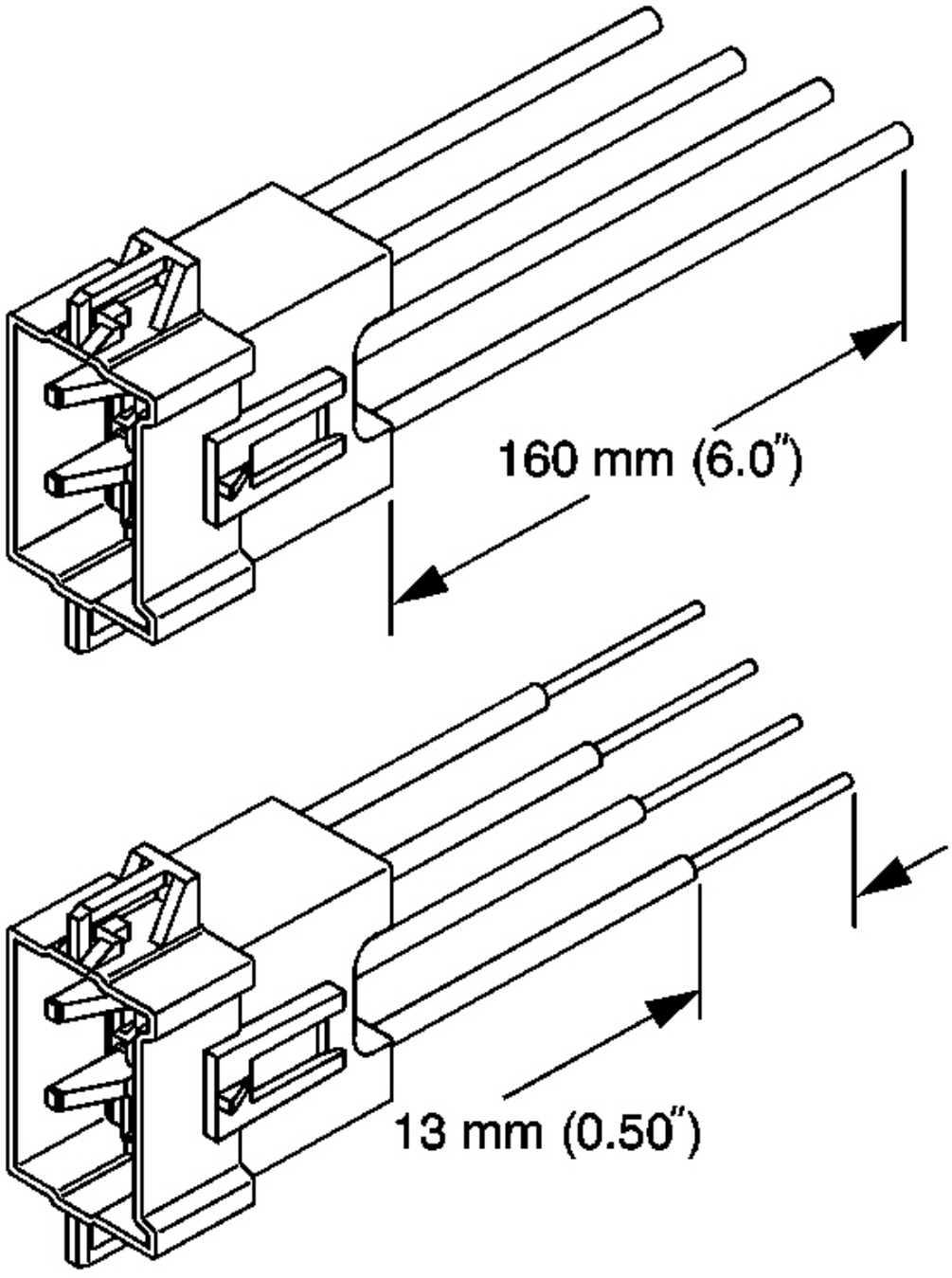


Fig. 88: Measuring SIR Wire To Connector
Courtesy of GENERAL MOTORS CORP.

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

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

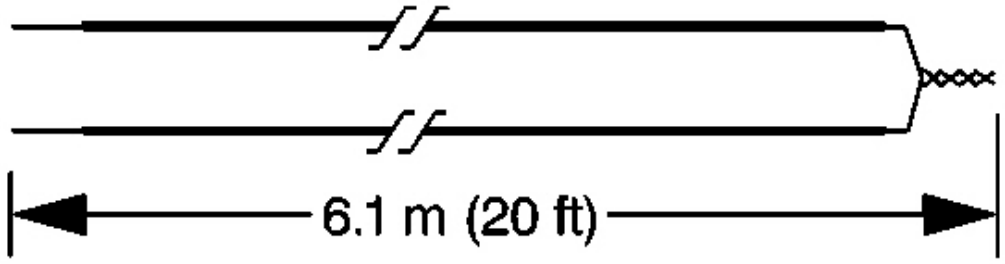


Fig. 89: Fabricating 20 Ft. Deployment Harness
Courtesy of GENERAL MOTORS CORP.

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

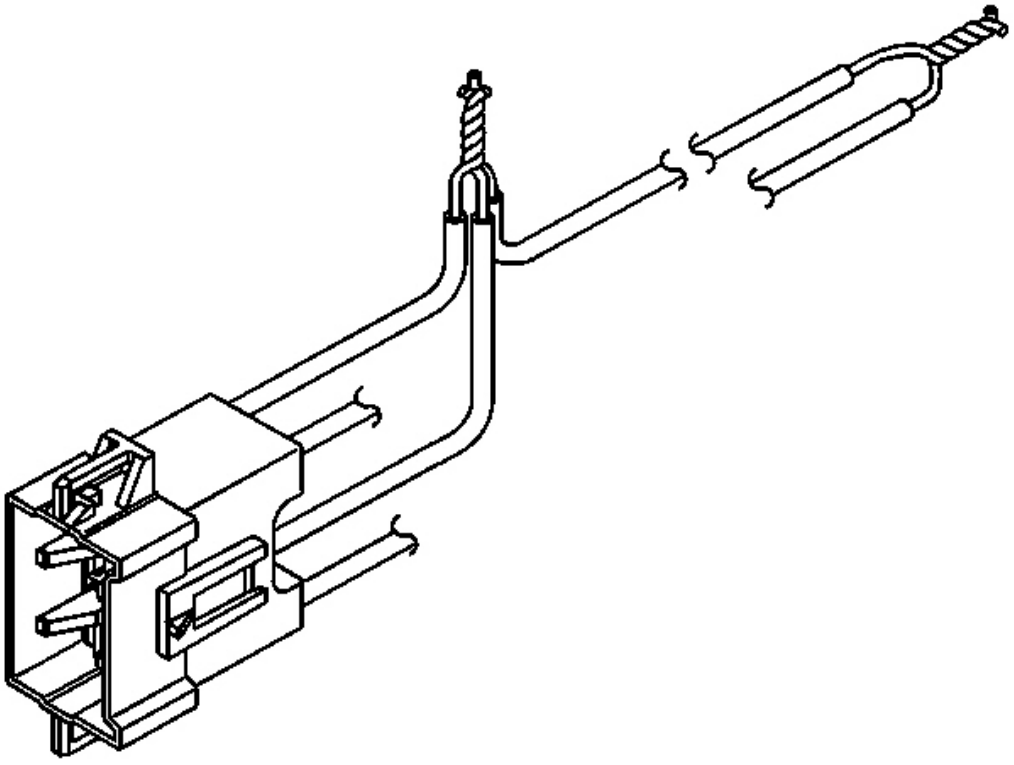


Fig. 90: Twisting Connector Wire Leads (High) To Deployment Harness Wire
Courtesy of GENERAL MOTORS CORP.

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

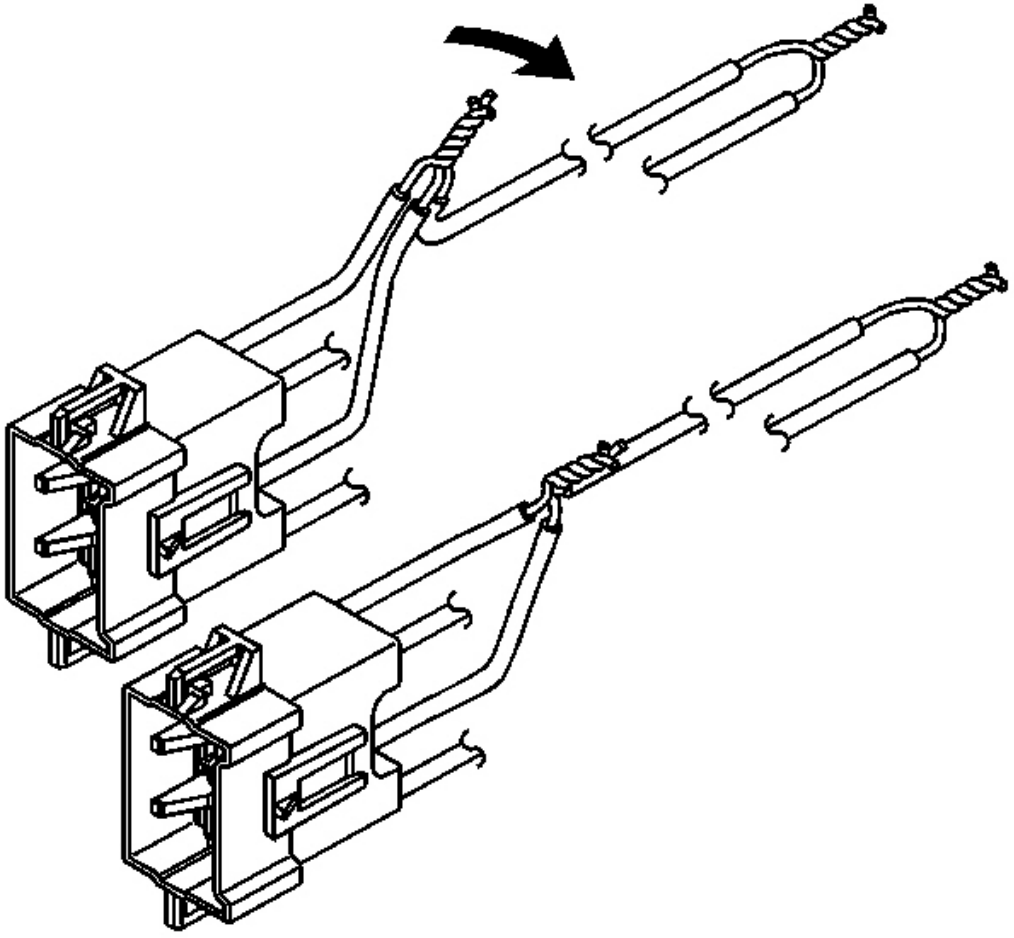


Fig. 91: Bending Twisted Connection Flat
Courtesy of GENERAL MOTORS CORP.

42. Bend flat the twisted connection.

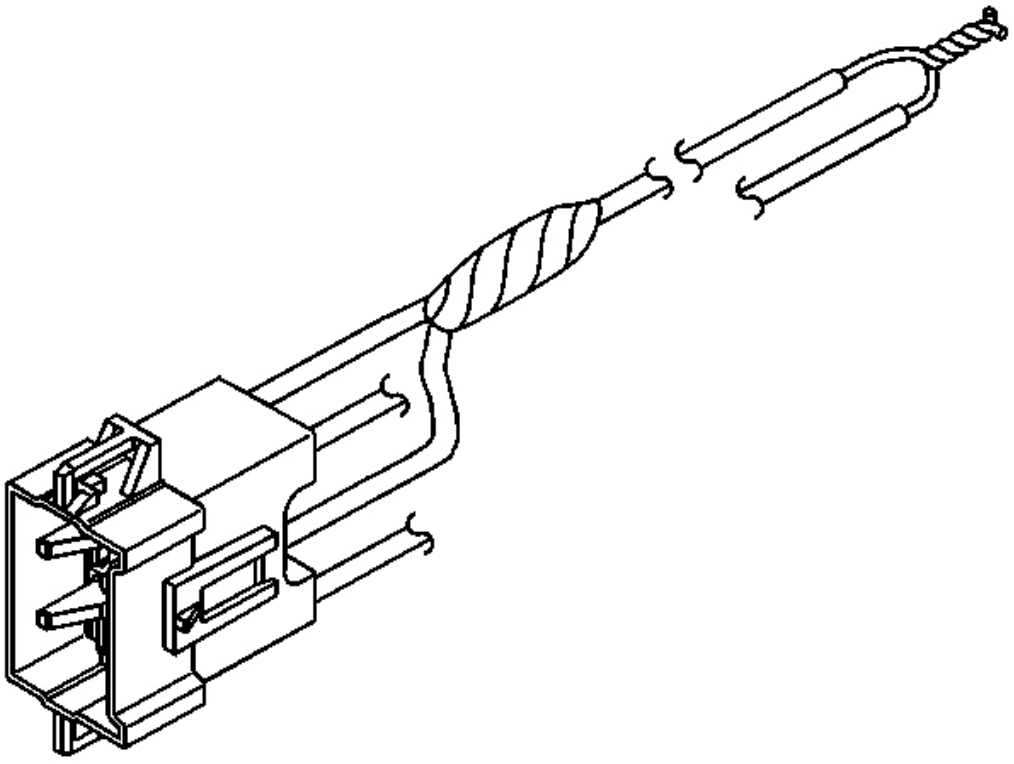


Fig. 92: Insulating Connection With Electrical Tape
Courtesy of GENERAL MOTORS CORP.

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

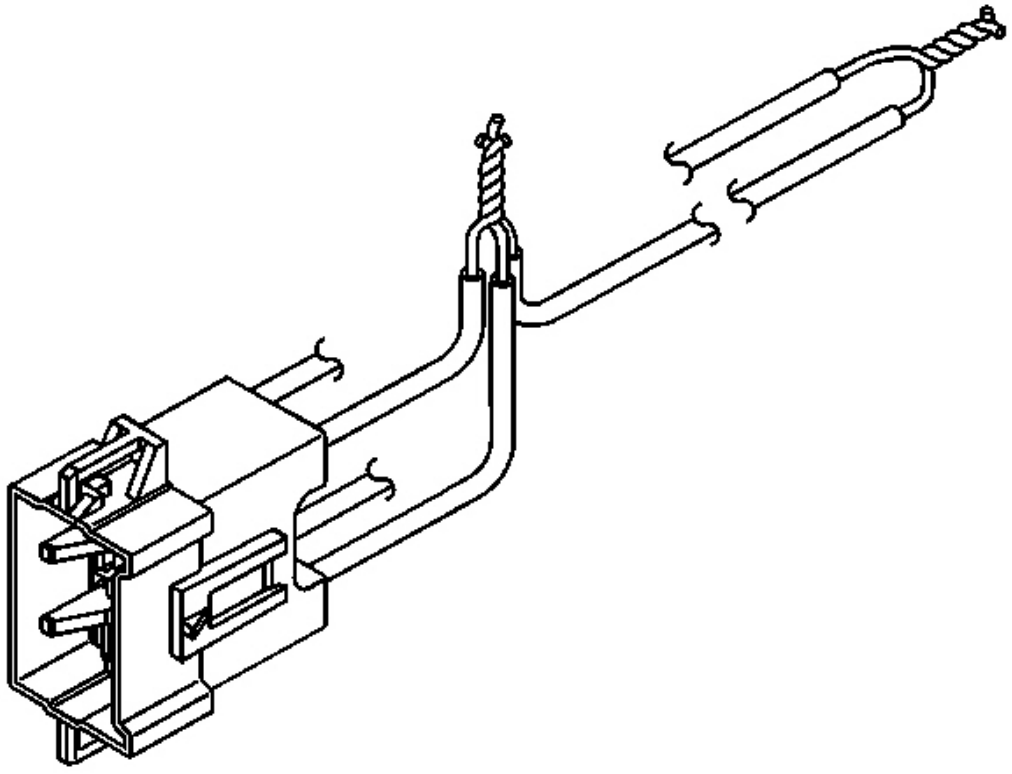


Fig. 93: Twisting Connector Wire Leads (Low) To Deployment Harness Wire
Courtesy of GENERAL MOTORS CORP.

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

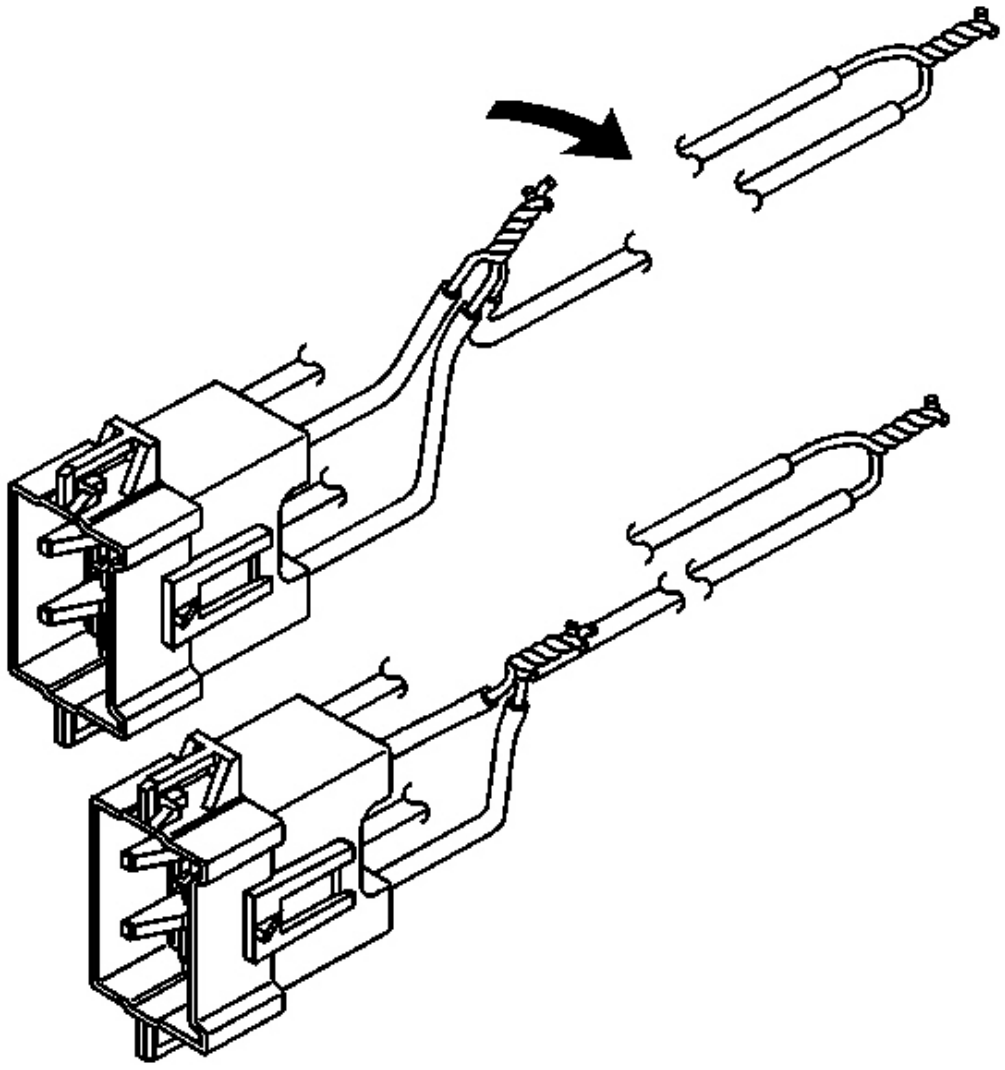


Fig. 94: Bending Twisted Connection Flat
Courtesy of GENERAL MOTORS CORP.

46. Bend flat the twisted connection.

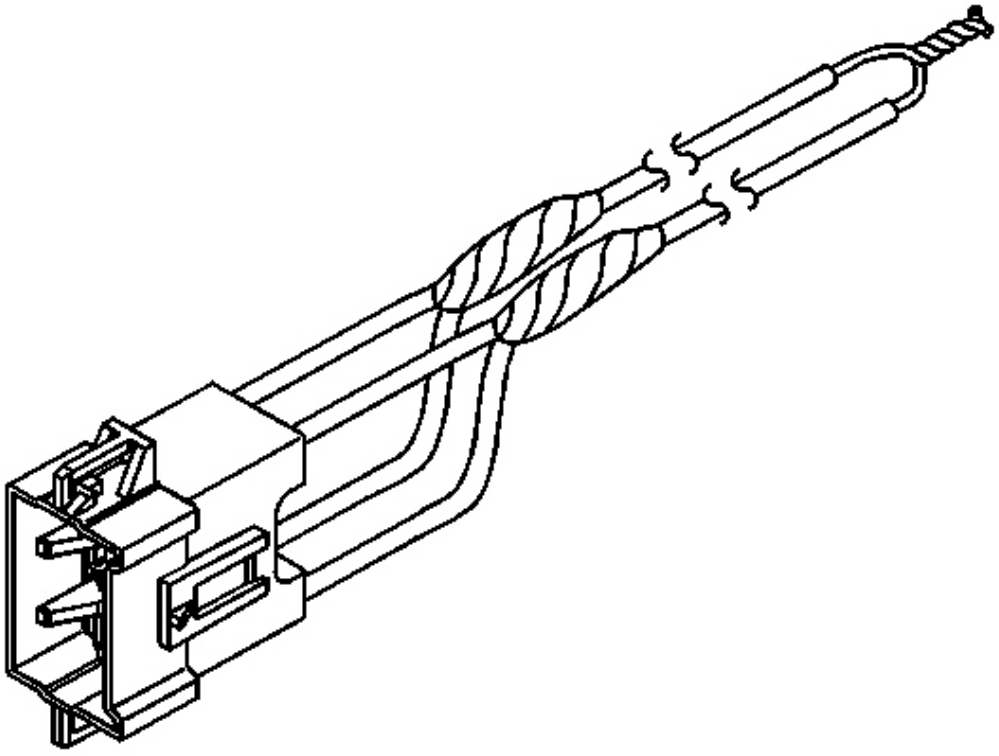


Fig. 95: Insulating Connection With Electrical Tape
Courtesy of GENERAL MOTORS CORP.

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

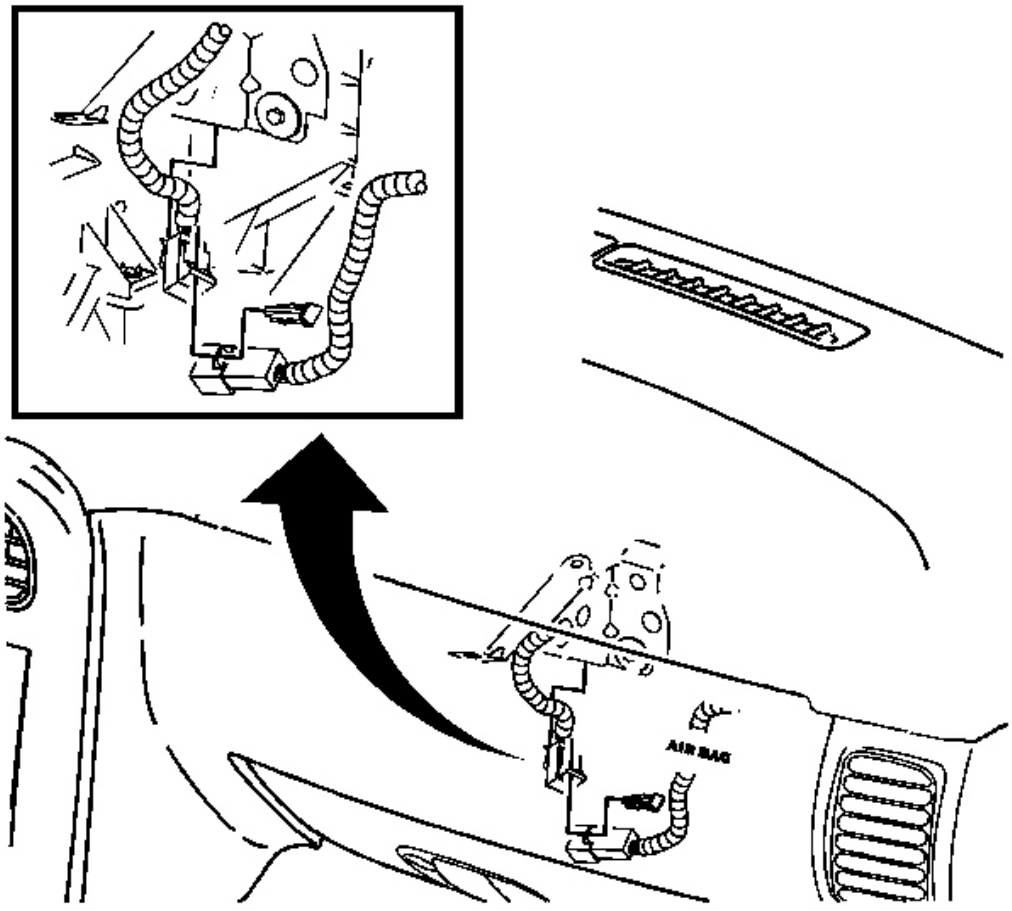


Fig. 96: CPA & I/P Module Connector
Courtesy of GENERAL MOTORS CORP.

48. Connect the deployment harness to the I/P module in-line connector.

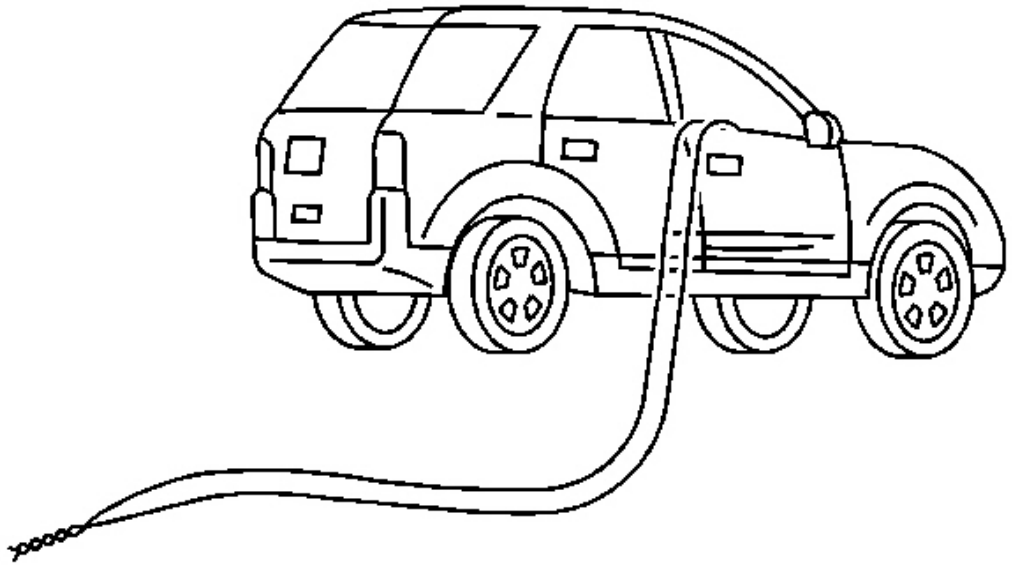


Fig. 97: I/P Module In-Line Connector Deployment Harness Routed Out Of Passenger Side Of Vehicle
Courtesy of GENERAL MOTORS CORP.

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

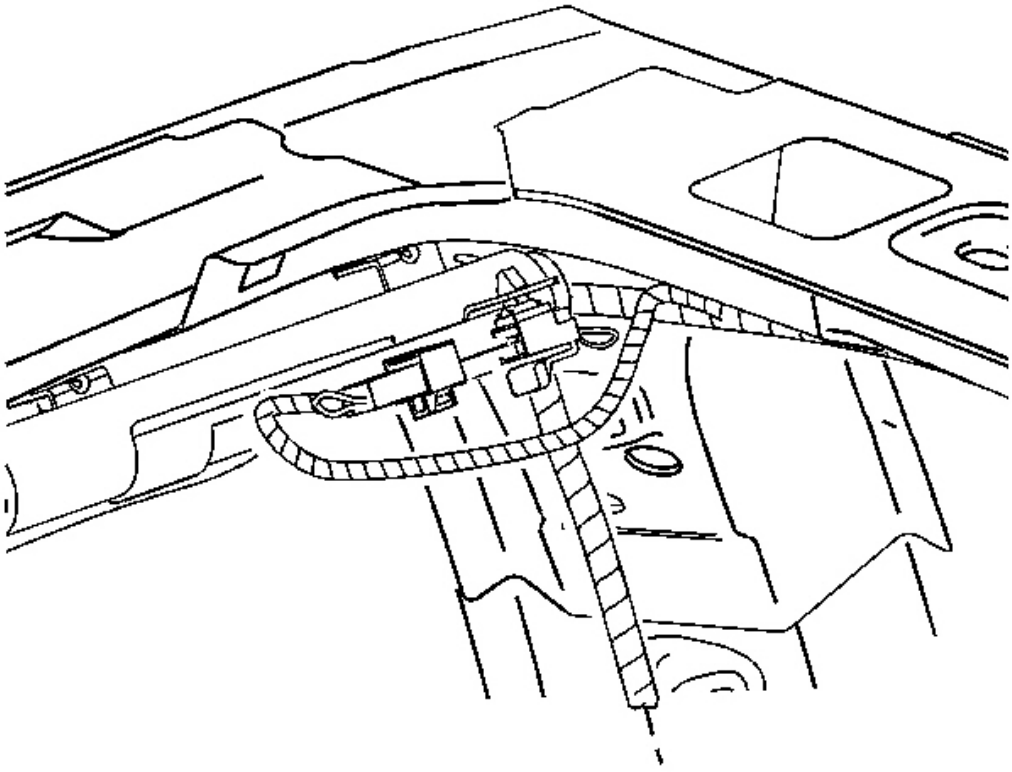


Fig. 98: CPA & Roof Rail Module Connector
Courtesy of GENERAL MOTORS CORP.

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

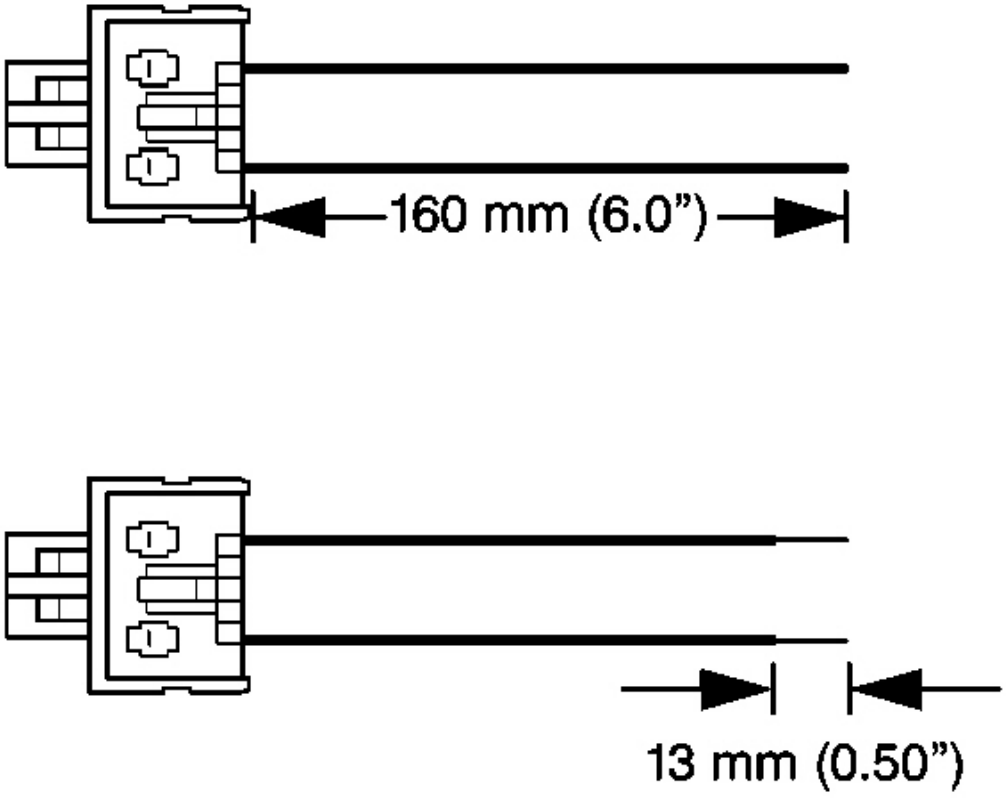


Fig. 99: Stripping Connection Wire Leads
Courtesy of GENERAL MOTORS CORP.

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

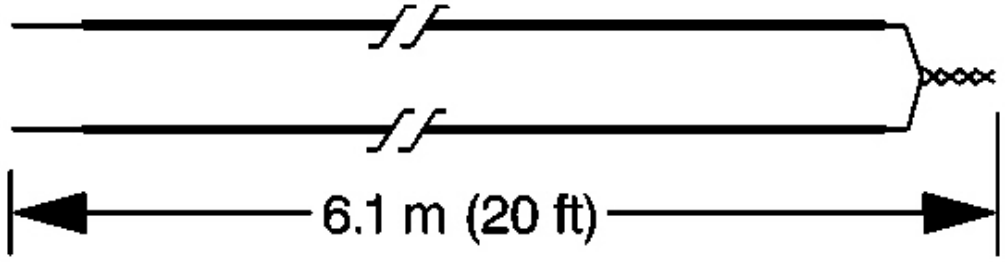


Fig. 100: Fabricating 20 Ft. Deployment Harness
Courtesy of GENERAL MOTORS CORP.

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

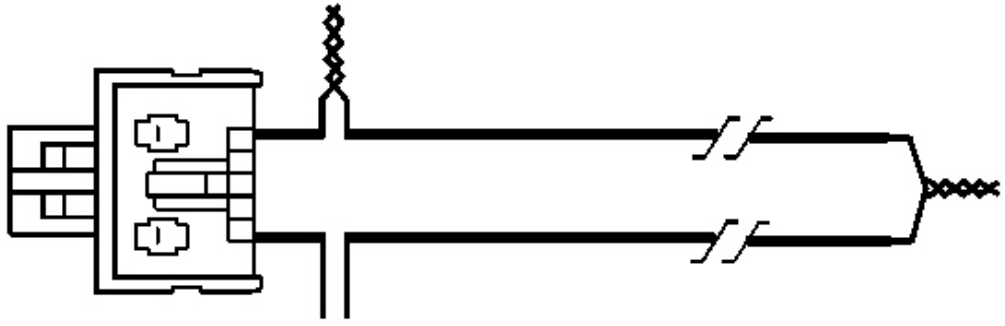


Fig. 101: Twisting Connector Wire Lead To Deployment Wire
Courtesy of GENERAL MOTORS CORP.

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

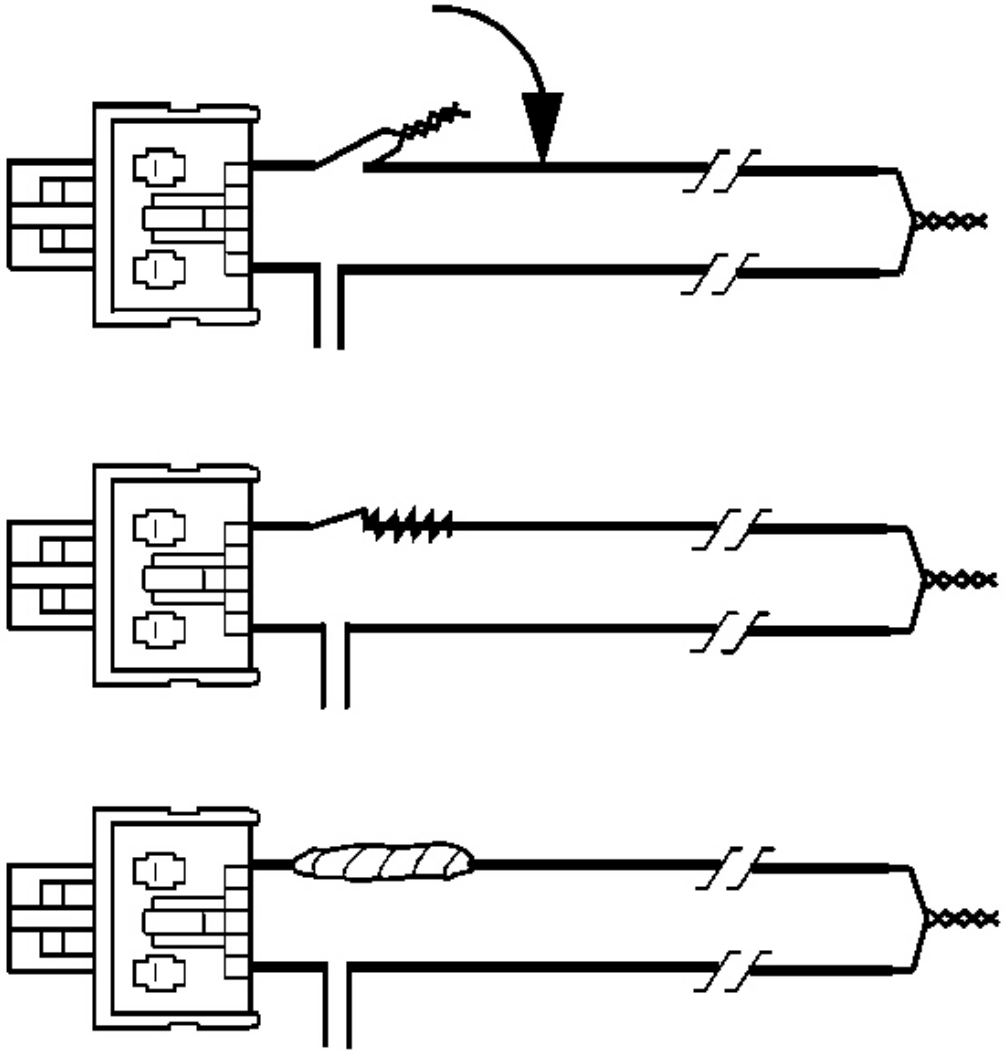


Fig. 102: Insulating Connection With Electrical Tape
Courtesy of GENERAL MOTORS CORP.

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

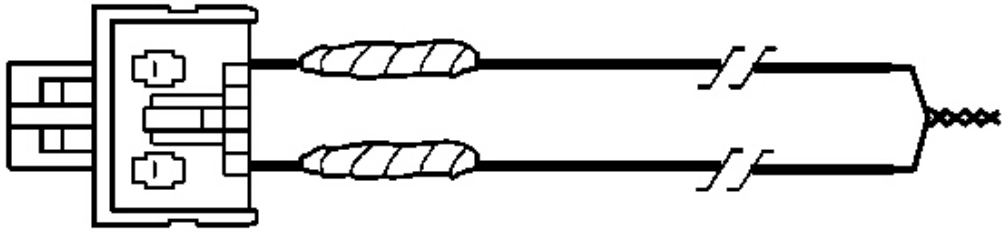


Fig. 103: Taping Remaining Connector Wire Lead To Remaining Deployment Wire
Courtesy of GENERAL MOTORS CORP.

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

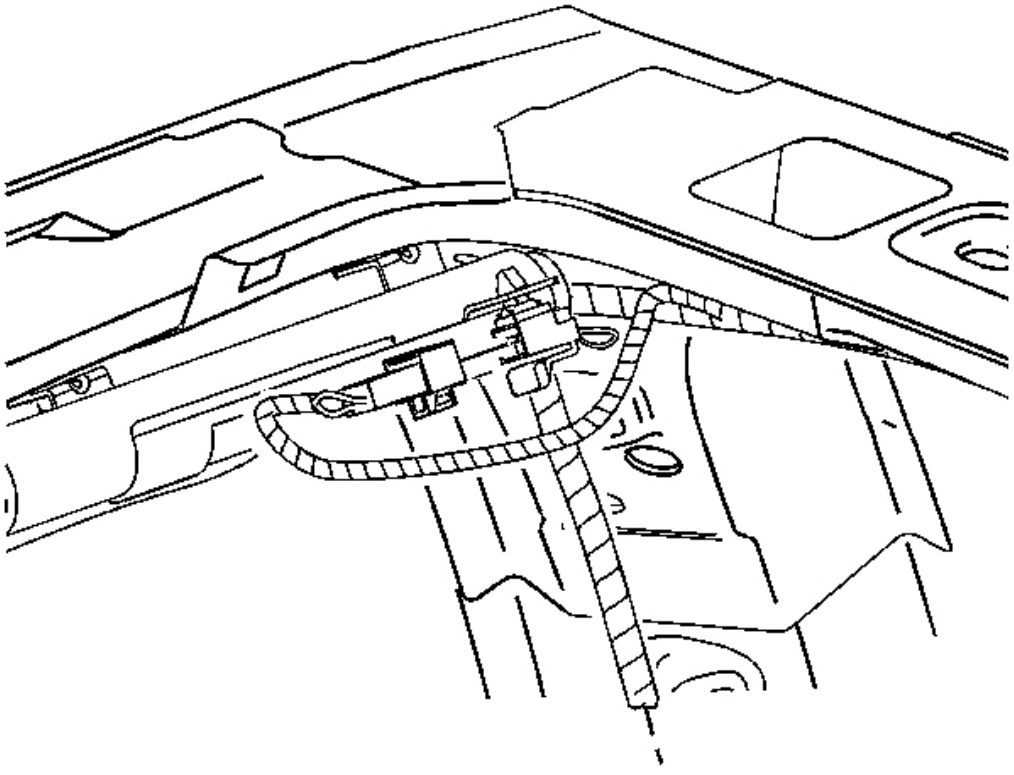


Fig. 104: CPA & Roof Rail Module Connector
Courtesy of GENERAL MOTORS CORP.

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

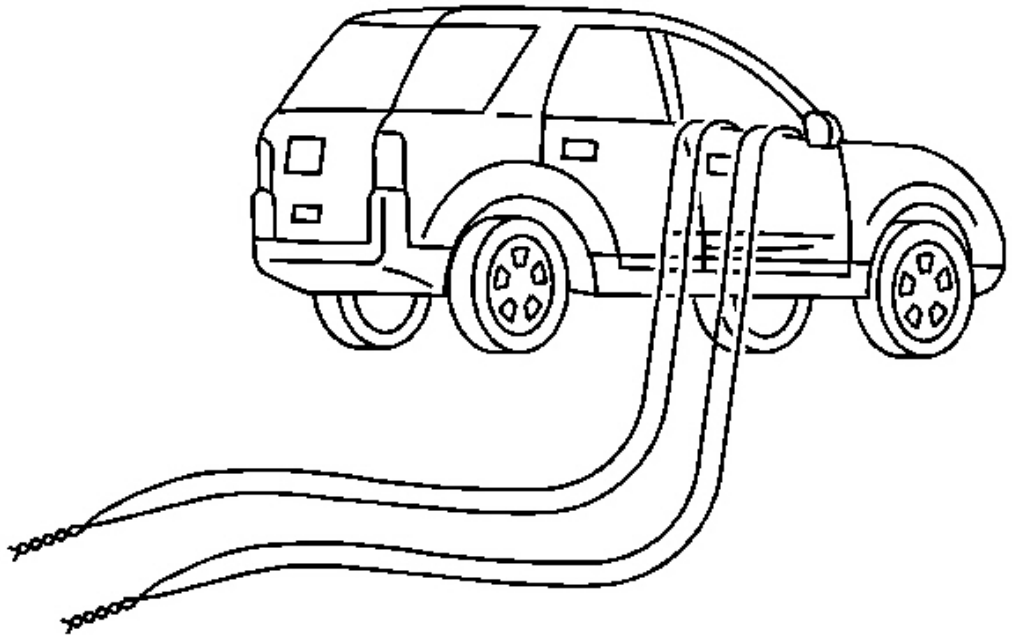


Fig. 105: Roof Rail Module Yellow Connector Deployment Harness Routed Out Of Passenger Side Of Vehicle
Courtesy of GENERAL MOTORS CORP.

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

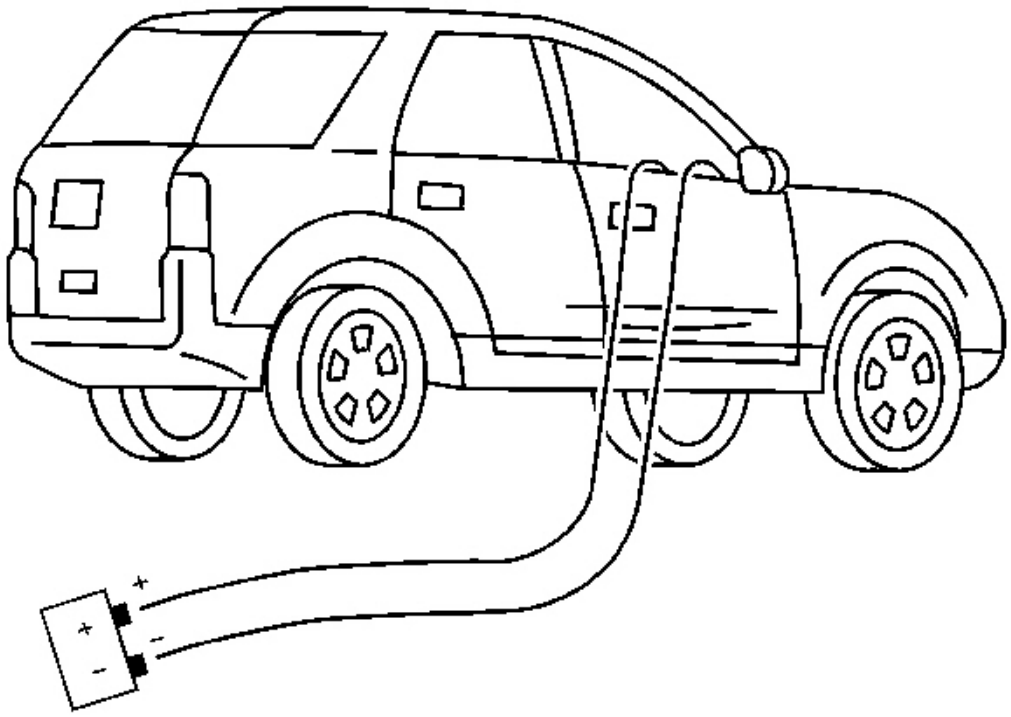


Fig. 106: Passenger Side Deployment Harness & Power Source
Courtesy of GENERAL MOTORS CORP.

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

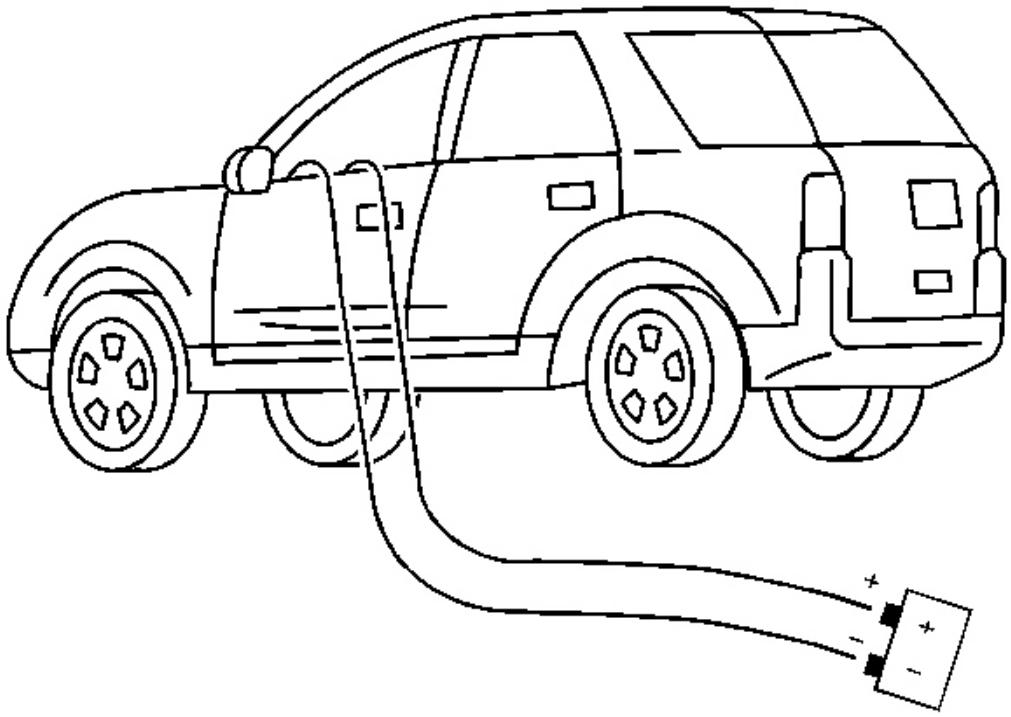


Fig. 107: Driver Side Deployment Harness & Power Source
Courtesy of GENERAL MOTORS CORP.

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

- **Inflatable Restraint Steering Wheel Module Replacement**
- **Inflatable Restraint Instrument Panel Module Replacement**
- **Inflatable Restraint Roof Rail Module Replacement - Front**

PRETENSIONER HANDLING AND SCRAPPING

CAUTION: When carrying an undeployed inflatable restraint seat belt retractor pretensioner:

- **Do not carry the seat belt pretensioner by the seat belt webbing or pigtail connector, if equipped.**
- **Carry the seat belt pretensioner by the housing, keeping hands and fingers away from the seat belt webbing.**
- **Make sure the opening, from which the seat belt webbing extends, faces downward and the seat belt webbing hangs freely.**

Failure to observe these guidelines may result in personal injury.

Scrapping Procedure

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

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

Deployment Procedures

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

Deployment Outside Vehicle for Seat Belt Pretensioners

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

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

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

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

Tools Required

- **SA9413NE** SIR Deployment Fixture. See **Special Tools and Equipment** .
- **SA9207Z-A** SIR Deployment Harness. See **Special Tools and Equipment** .
- An appropriate pigtail adaptor

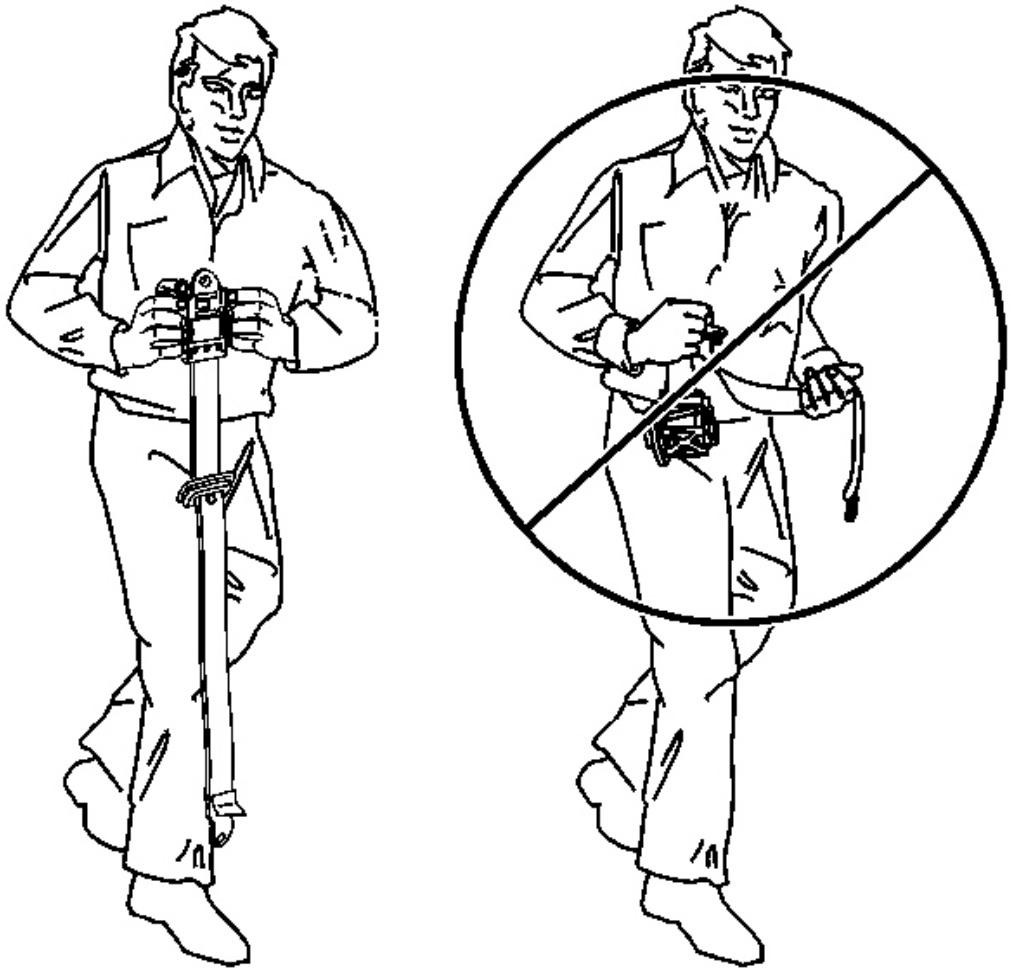


Fig. 108: Carrying Seat Belt Pretensioner
Courtesy of GENERAL MOTORS CORP.

1. Turn OFF the ignition.
2. Remove the ignition key.
3. Put on safety glasses.
4. Remove the seat belt pretensioner from the vehicle. Refer to **Seat Belt Retractor Pretensioner Replacement - Front** .
5. When carrying a seat belt pretensioner to the deployment area, keep fingers clear of the seat belt webbing.

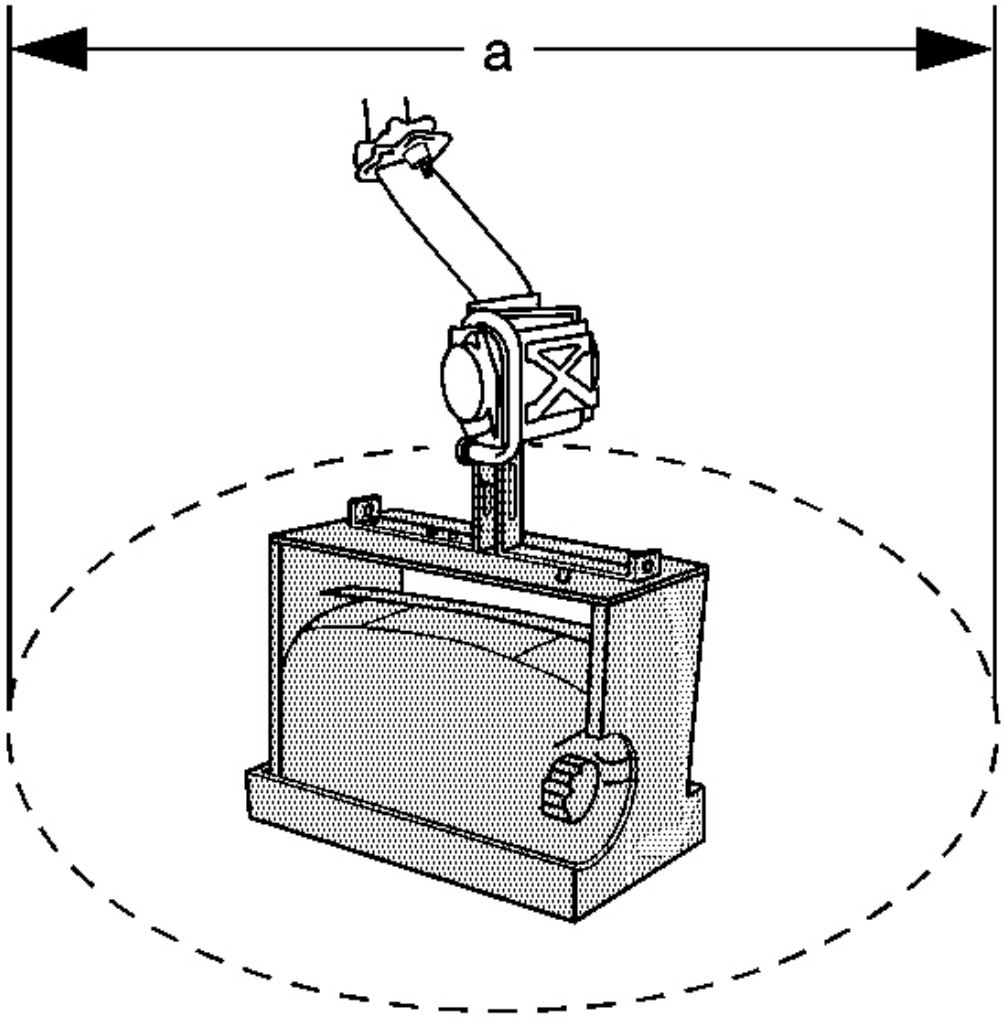


Fig. 109: Clearing Space On Ground For Deployment Of Seat Belt Pretensioner
Courtesy of GENERAL MOTORS CORP.

6. Clear a space on the ground about 1.85 m (6 ft) in diameter for deployment of the seat belt pretensioner. If possible, use a paved, outdoor location free of activity. Otherwise, use a space free of activity on the shop floor. Make sure you have sufficient ventilation.
7. Make sure no loose or flammable objects are in the area.
8. Place the **SA9413NE** in the center of the cleared area. See **Special Tools and Equipment** .
9. Fill the fixture plastic reservoir with water or sand.

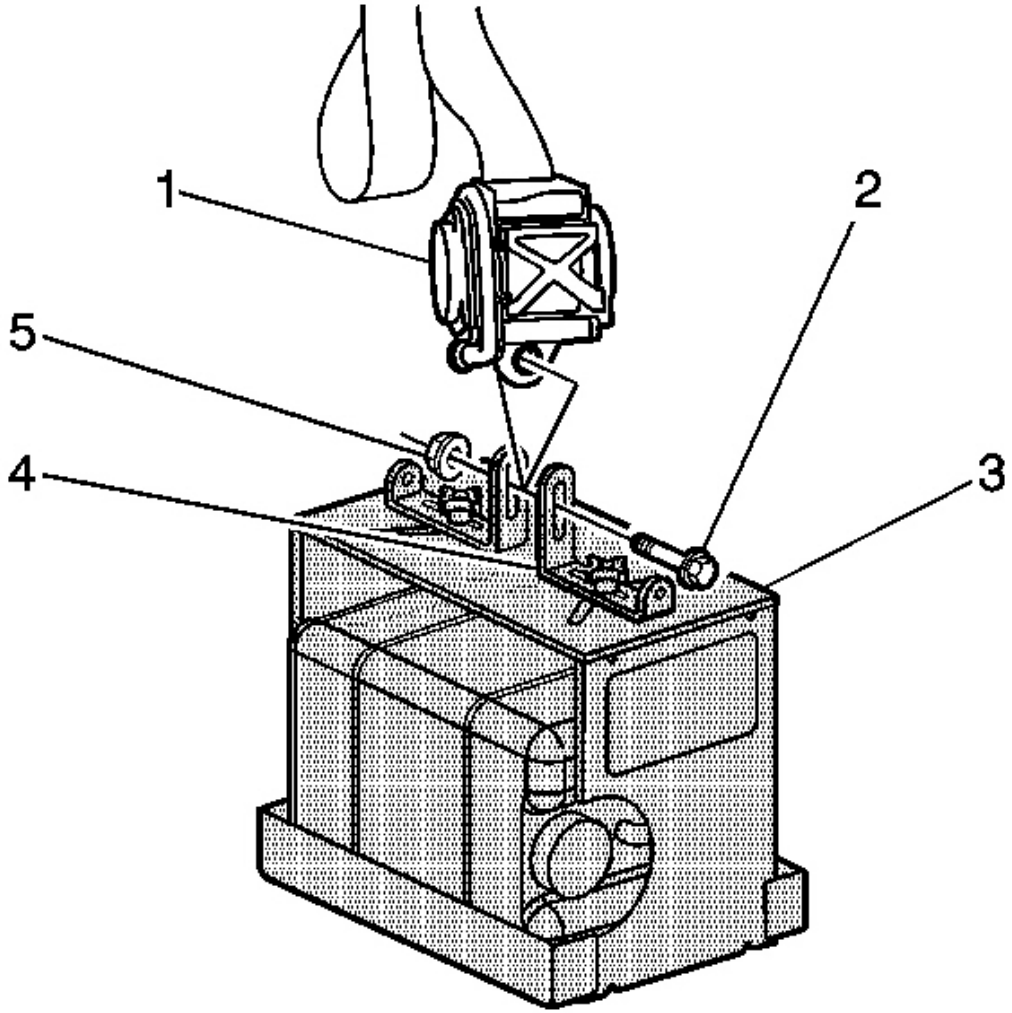


Fig. 110: Deployment Fixture & SA9413NE
Courtesy of GENERAL MOTORS CORP.

10. Mount the seat belt pretensioner in the SIR deployment fixture with the seat belt webbing exiting through the top of the pretensioner. Use the following mounting method.
    - Adjust and secure two of the **SA9413NE** arms to the deployment fixture, with the short slotted portions of the arms standing vertically and facing toward the center of the deployment fixture. See **Special Tools and Equipment** .
    - To mount, use the proper size bolt and nut with washers in order to secure the seat belt pretensioner mounting hole between the two deployment fixture brackets.
    - Securely tighten all fasteners prior to deployment.

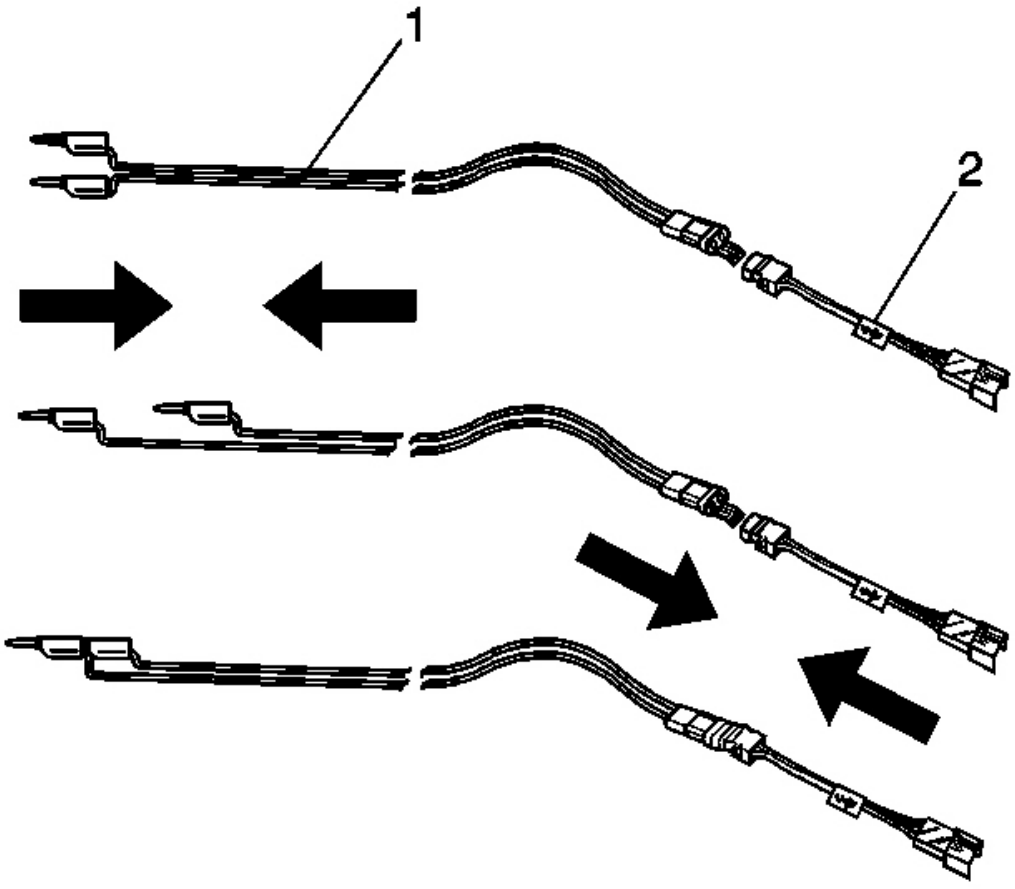


Fig. 111: SIR Deployment Harness & Adapter
Courtesy of GENERAL MOTORS CORP.

11. Inspect the **SA9207Z-A** and the appropriate pigtail adapter for damage. See **Special Tools and Equipment** . Replace as needed.
12. Short the 2 SIR deployment harness (1) leads together using 1 banana plug seated into the other.

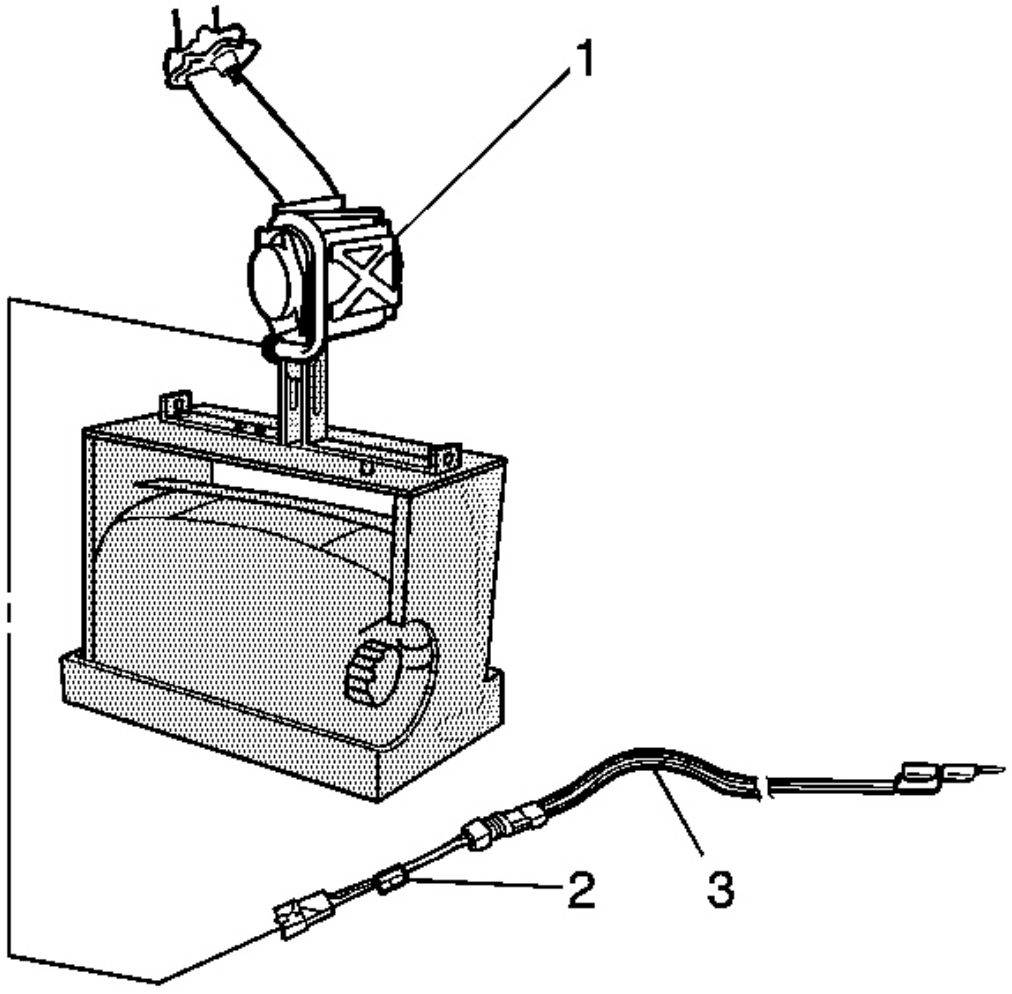


Fig. 112: SIR Deployment Harness & Pigtail Adapter
Courtesy of GENERAL MOTORS CORP.

13. Connect the appropriate pigtail adapter (2) to the SIR deployment harness (1).
14. Extend the SIR deployment harness and adapter to full length from the deployment fixture.
15. Connect the seat belt pretensioner connector to the adapter on the deployment harness.

IMPORTANT: When deploying a seat belt pretensioner, the rapid expansion of gas is very loud. Notify the people in the immediate area that a seat belt pretensioner will be deployed.

16. Clear the area of people.

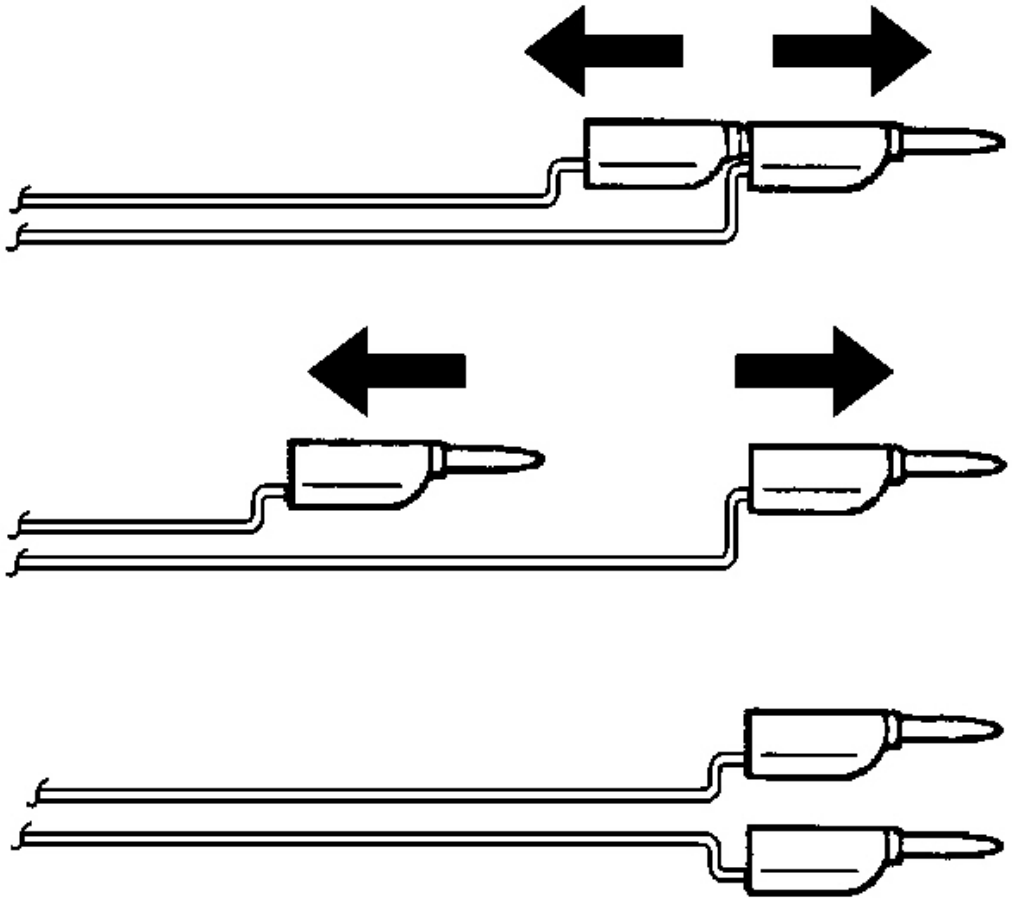


Fig. 113: Separating Banana Plugs
Courtesy of GENERAL MOTORS CORP.

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

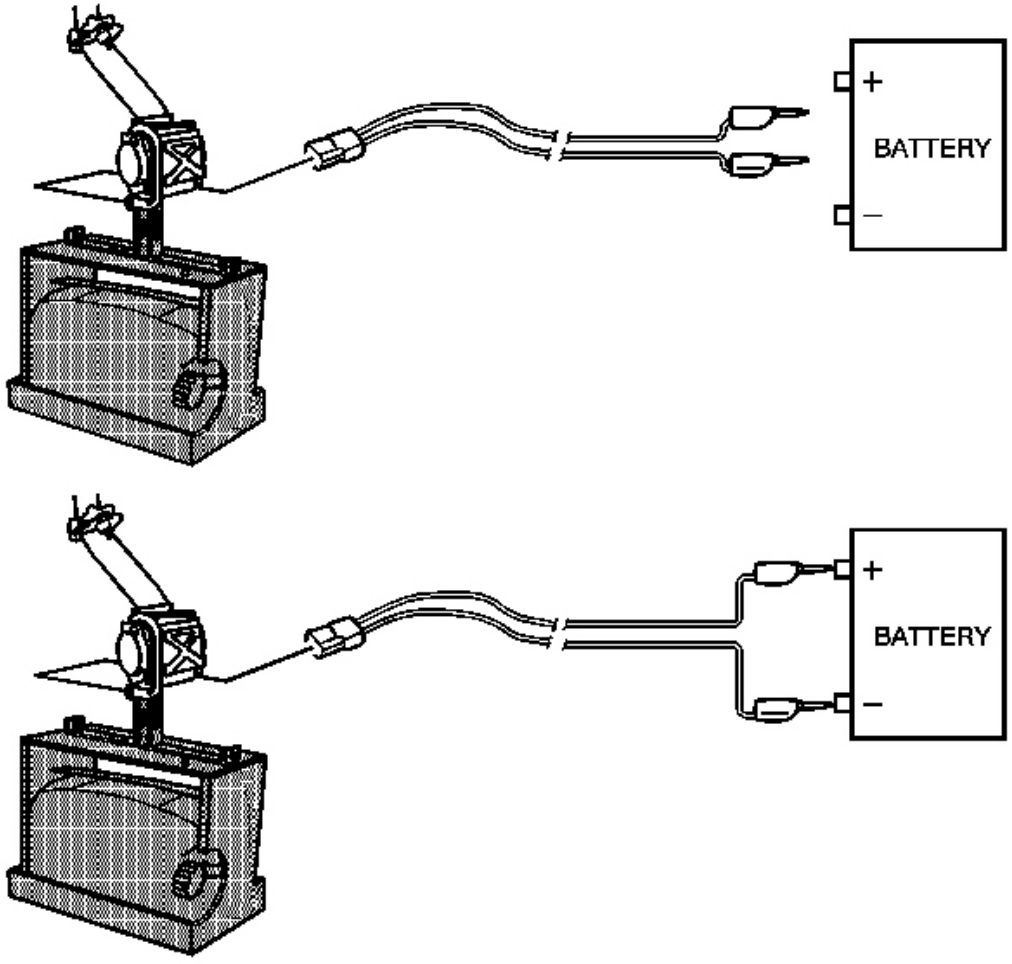


Fig. 114: SIR Deployment Harness Wires & Power Source
Courtesy of GENERAL MOTORS CORP.

18. Place a 12 V minimum/2 A minimum power source, such as a vehicle battery, near the shorted end of the harness.
19. Connect the SIR deployment harness wires to the power source. Seat belt pretensioner deployment will occur when contact is made.
20. Disconnect the SIR deployment harness from the power source after the seat belt pretensioner deploys.

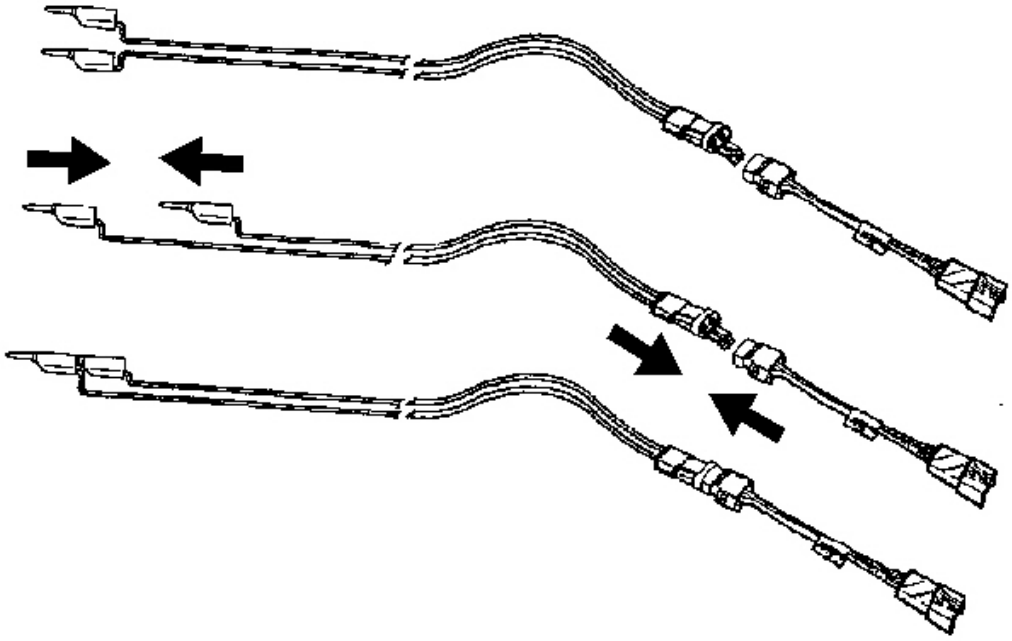


Fig. 115: Shorting Deployment Harness Leads
Courtesy of GENERAL MOTORS CORP.

21. Seat one banana plug into the other in order to short the deployment harness leads.
22. If the seat pretensioner did not deploy, disconnect the adapter and discontinue the procedure. Contact the Technical Assistance Group. Otherwise, proceed to the following steps.
23. Put on a pair of shop gloves.
24. Disconnect the pigtail adapter from the seat belt pretensioner as soon as possible.
25. Dispose of the deployed seat belt pretensioner through normal refuse channels.
26. Wash hands with a mild soap.

Deployment Inside Vehicle - Vehicle Scrapping Procedure

Deploy the seat belt pretensioners inside of the vehicle when destroying the vehicle or when salvaging the vehicle for parts. This includes but is not limited to the following situations:

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

rebuilding as the same VIN.

1. Turn OFF the ignition.
2. Remove the ignition key.
3. Put on safety glasses.
4. Remove all loose objects from the front seats.

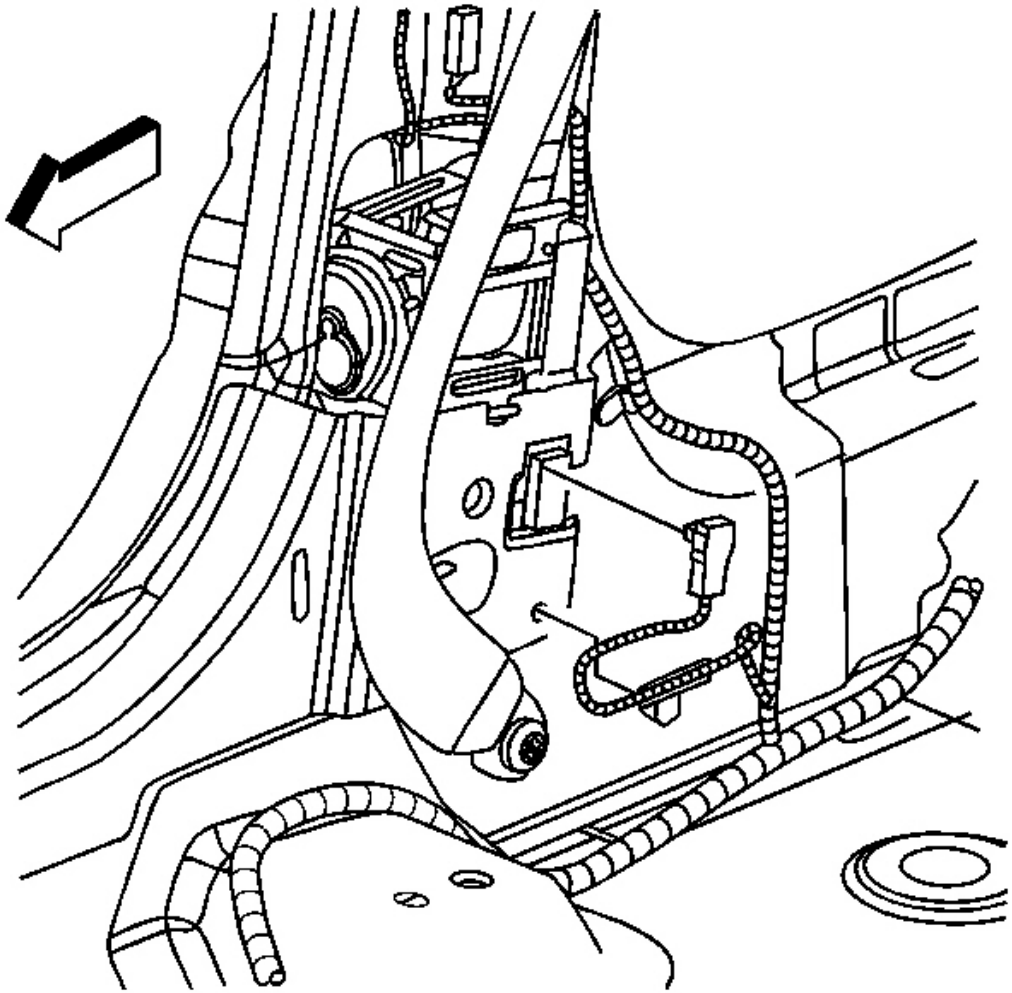


Fig. 116: View Of Seat Belt Wiring Harness Routing
Courtesy of GENERAL MOTORS CORP.

5. Disconnect the seat belt pretensioner-LF connector. Refer to **Seat Belt Retractor Pretensioner**

Replacement - Front .

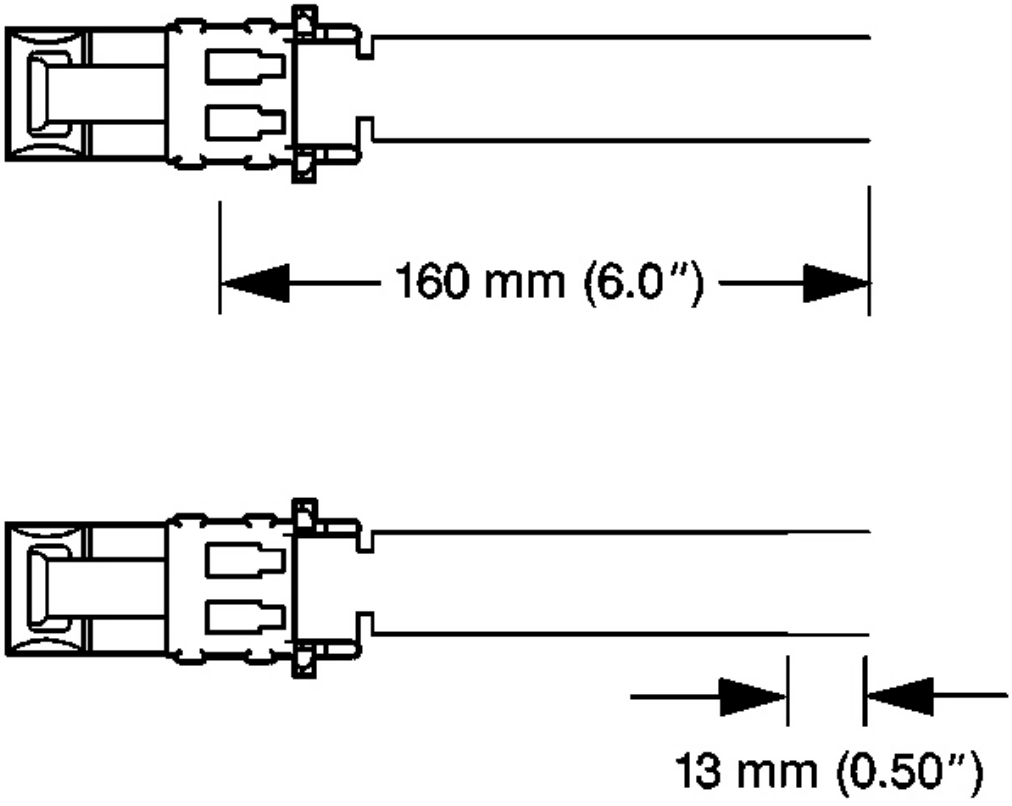


Fig. 117: Stripping Connector Wire Lead
Courtesy of GENERAL MOTORS CORP.

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

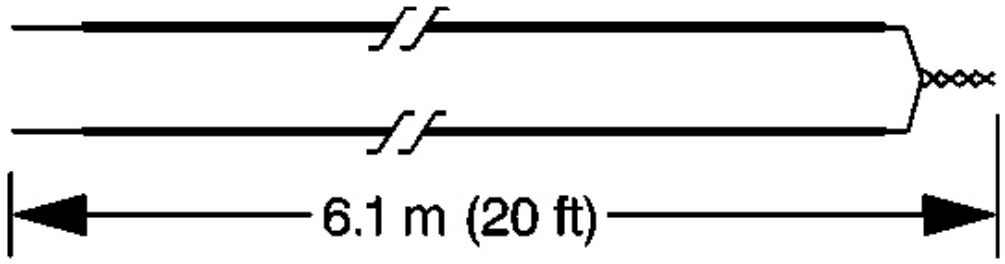


Fig. 118: Fabricating 20 Ft. Deployment Harness
Courtesy of GENERAL MOTORS CORP.

8. Cut two 6.1 m (20 ft) deployment wires from a 0.8 mm (18 gage) or thicker multi-strand wire. These wires will be used for the seat belt pretensioner deployment harness.
9. Strip 13 mm (0.5 in) of insulation from both ends of the wires cut in the previous step.
10. Twist together one end from each of the wires in order to short the wires. Deployment wires shall remain shorted, and not connected to a power source until you are ready to deploy the seat belt pretensioner.

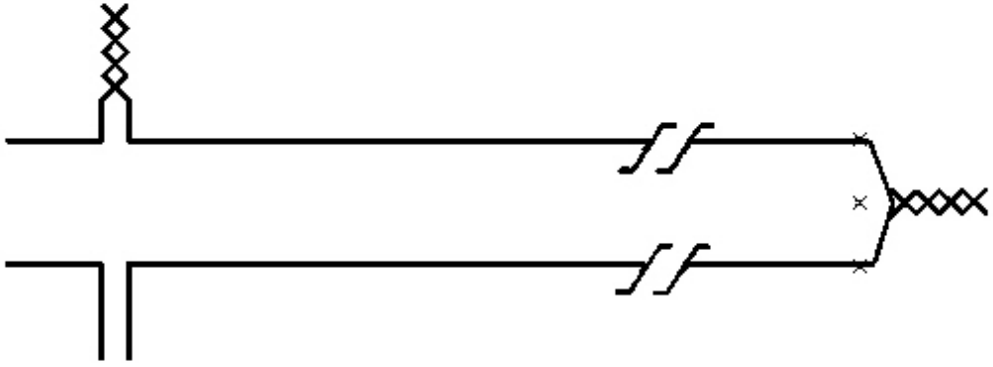


Fig. 119: Attaching Connector Wire To Deployment Wire
Courtesy of GENERAL MOTORS CORP.

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

12. Inspect that the previous connections is secure.

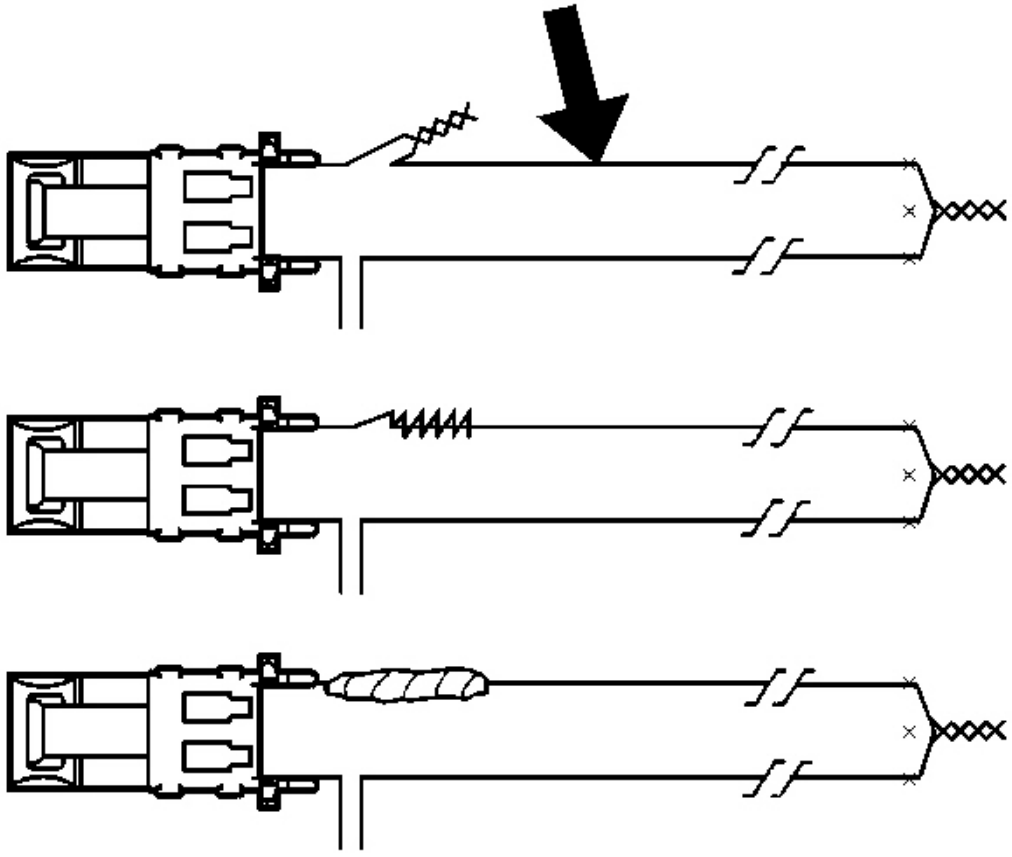


Fig. 120: Identifying Twisted Connection
Courtesy of GENERAL MOTORS CORP.

13. Bend flat the twisted connection.
14. Secure and insulate the connection using electrical tape.

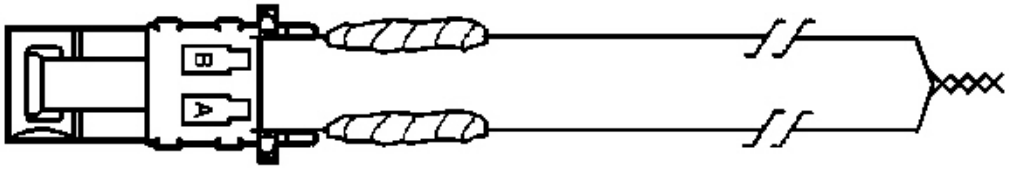


Fig. 121: View Of Dual Insulated Connector Wires
Courtesy of GENERAL MOTORS CORP.

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

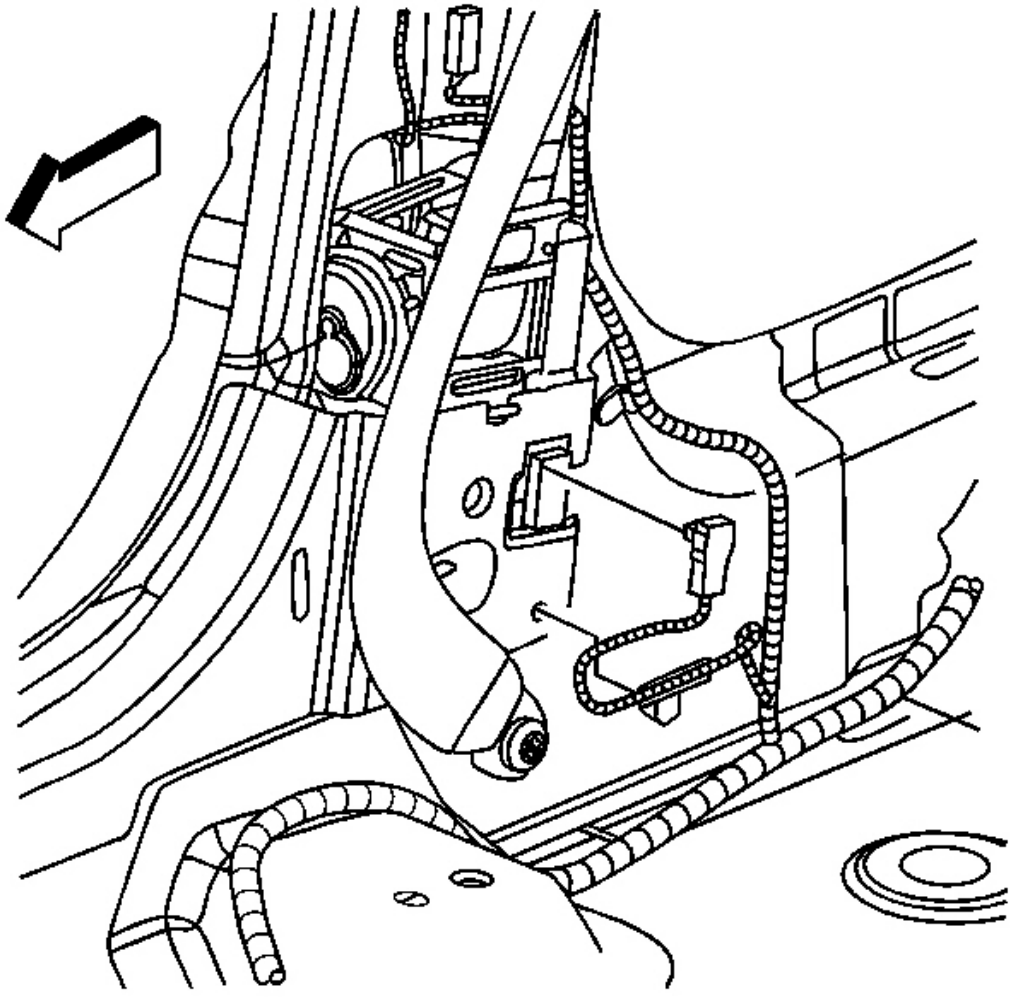


Fig. 122: View Of Seat Belt Wiring Harness Routing
Courtesy of GENERAL MOTORS CORP.

16. Connect the deployment harness to the seat belt pretensioner connector.

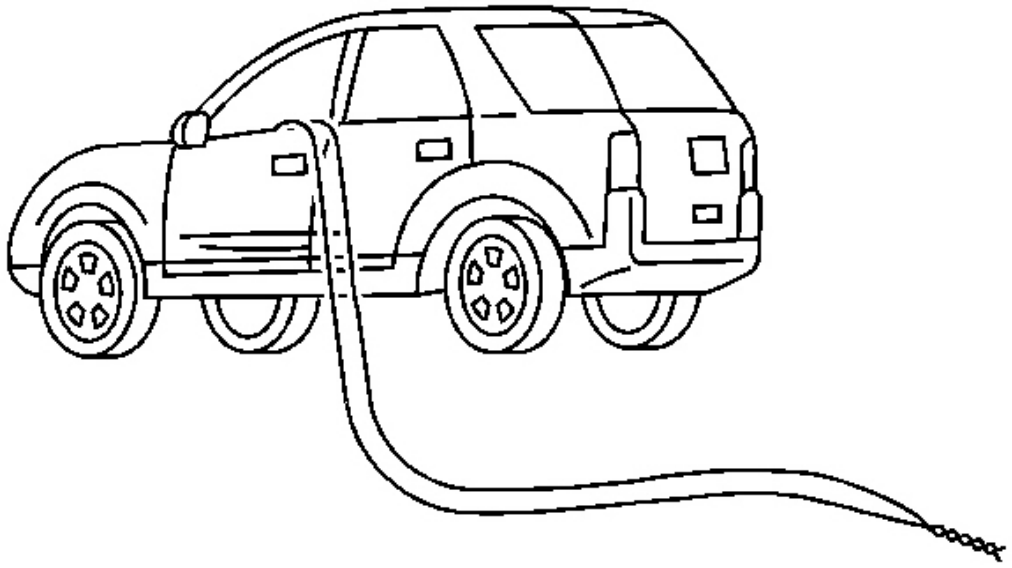


Fig. 123: Steering Wheel Module Deployment Harness Routed Out Of Driver Side Of Vehicle
Courtesy of GENERAL MOTORS CORP.

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

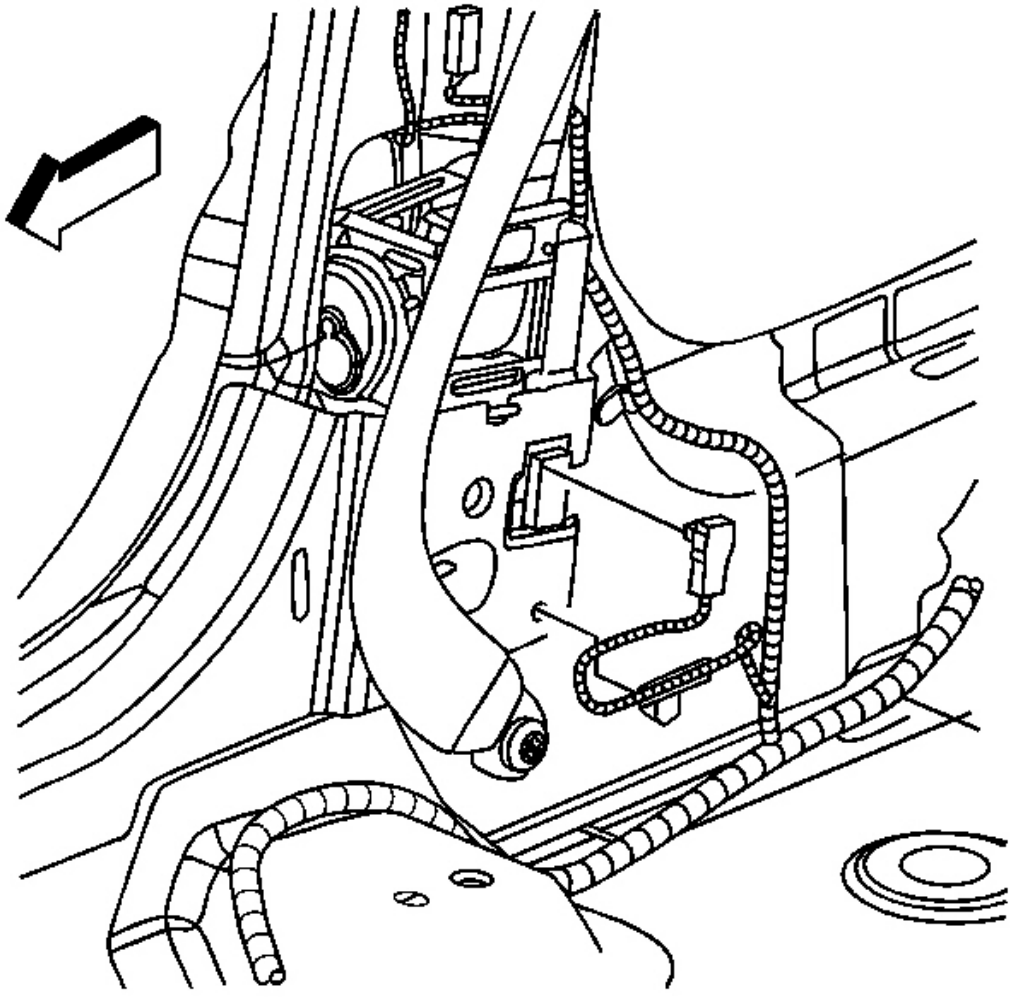


Fig. 124: View Of Seat Belt Wiring Harness Routing
Courtesy of GENERAL MOTORS CORP.

18. Disconnect the seat belt pretensioner-RF connector. Refer to **Seat Belt Retractor Pretensioner Replacement - Front** .

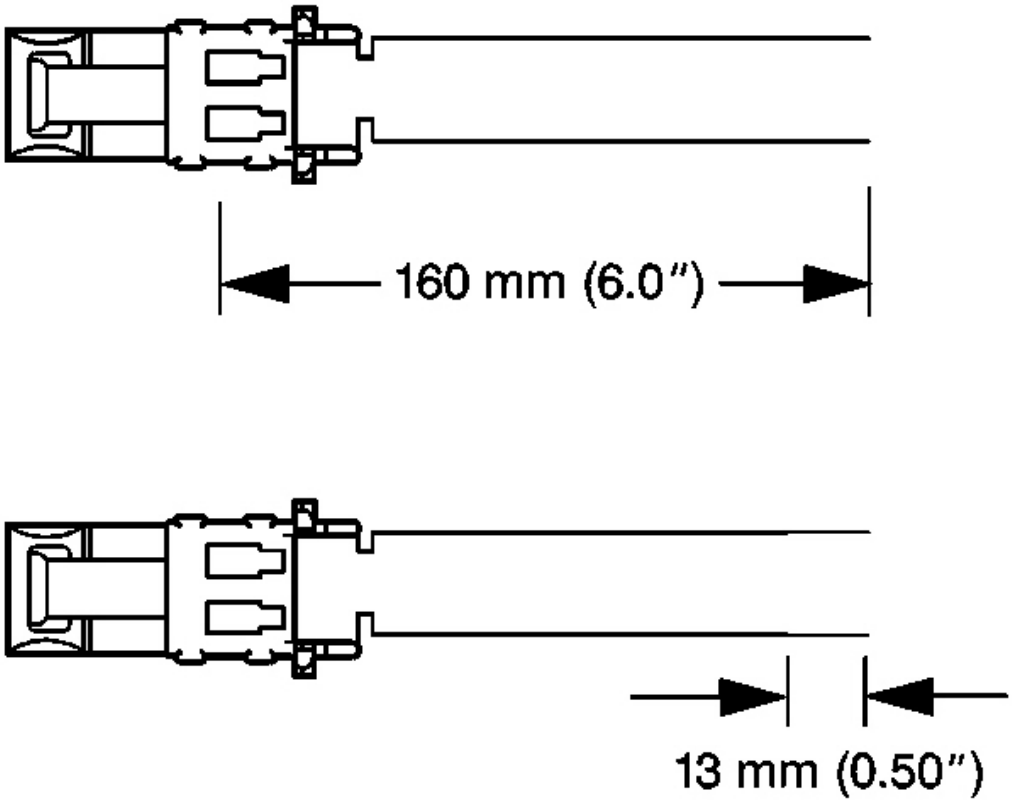


Fig. 125: Stripping Connector Wire Lead
Courtesy of GENERAL MOTORS CORP.

19. Cut the seat belt pretensioner connector out of the vehicle, leaving at least 16 cm (6 in) of wire at the connector.
20. Strip 13 mm (0.5 in) of insulation from each of the connector wire leads.

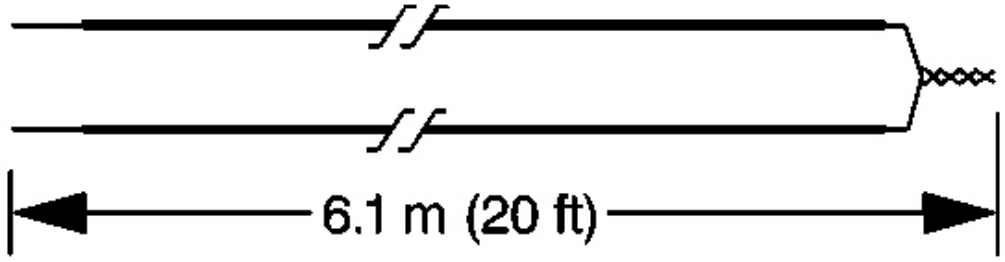


Fig. 126: Fabricating 20 Ft. Deployment Harness
Courtesy of GENERAL MOTORS CORP.

21. Cut two 6.1 m (20 ft) deployment wires from a 0.8 mm (18 gage) or thicker multi-strand wire. These wires will be used for the seat belt pretensioner deployment harness.
22. Strip 13 mm (0.5 in) of insulation from both ends of the wires cut in the previous step.
23. Twist together one end from each of the wires in order to short the wires. The deployment wires are to remain shorted, and not connected to a power source until you are ready to deploy the seat belt pretensioner.

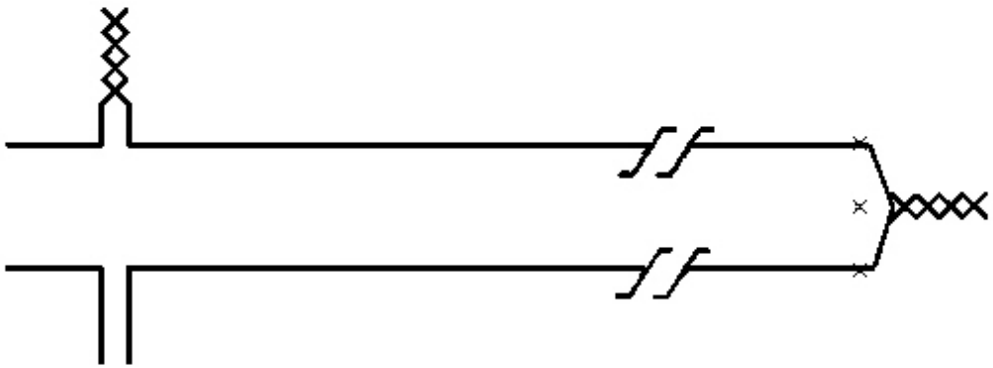


Fig. 127: Attaching Connector Wire To Deployment Wire
Courtesy of GENERAL MOTORS CORP.

24. Twist together one connector wire lead to one deployment wire.
25. Inspect that the previous connection is secure.

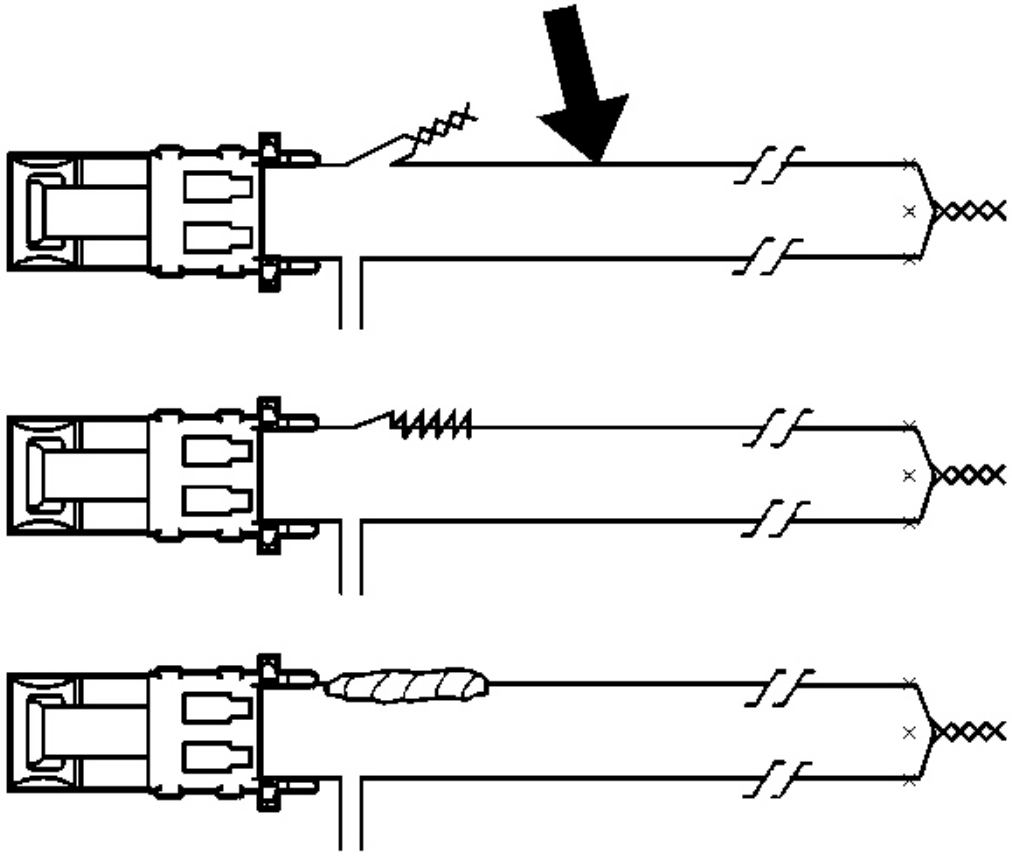


Fig. 128: Identifying Twisted Connection
Courtesy of GENERAL MOTORS CORP.

26. Bend flat the twisted connection.
27. Secure and insulate the connection using electrical tape.

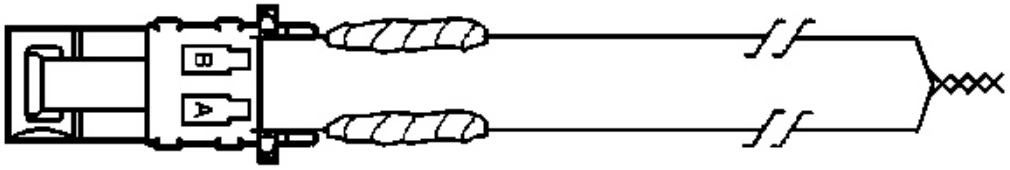


Fig. 129: View Of Dual Insulated Connector Wires
Courtesy of GENERAL MOTORS CORP.

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

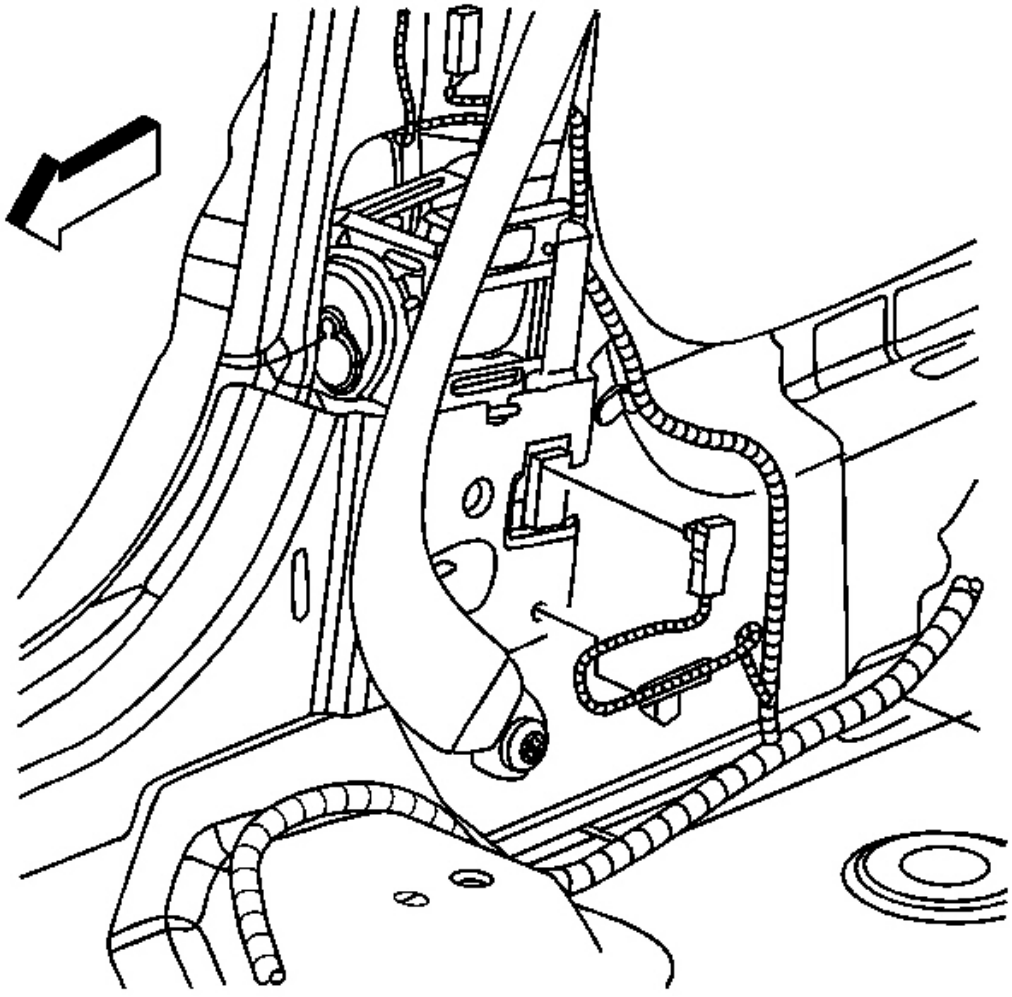


Fig. 130: View Of Seat Belt Wiring Harness Routing
Courtesy of GENERAL MOTORS CORP.

29. Connect the deployment harness to the seat belt pretensioner connector.

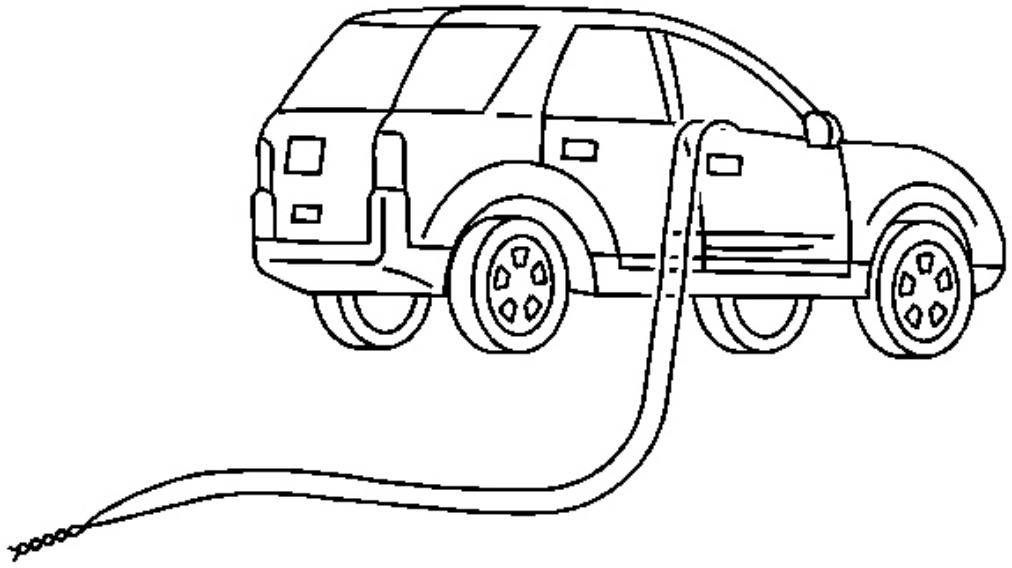


Fig. 131: I/P Module In-Line Connector Deployment Harness Routed Out Of Passenger Side Of Vehicle
Courtesy of GENERAL MOTORS CORP.

30. Route the deployment harness out of the passenger's side of the vehicle.

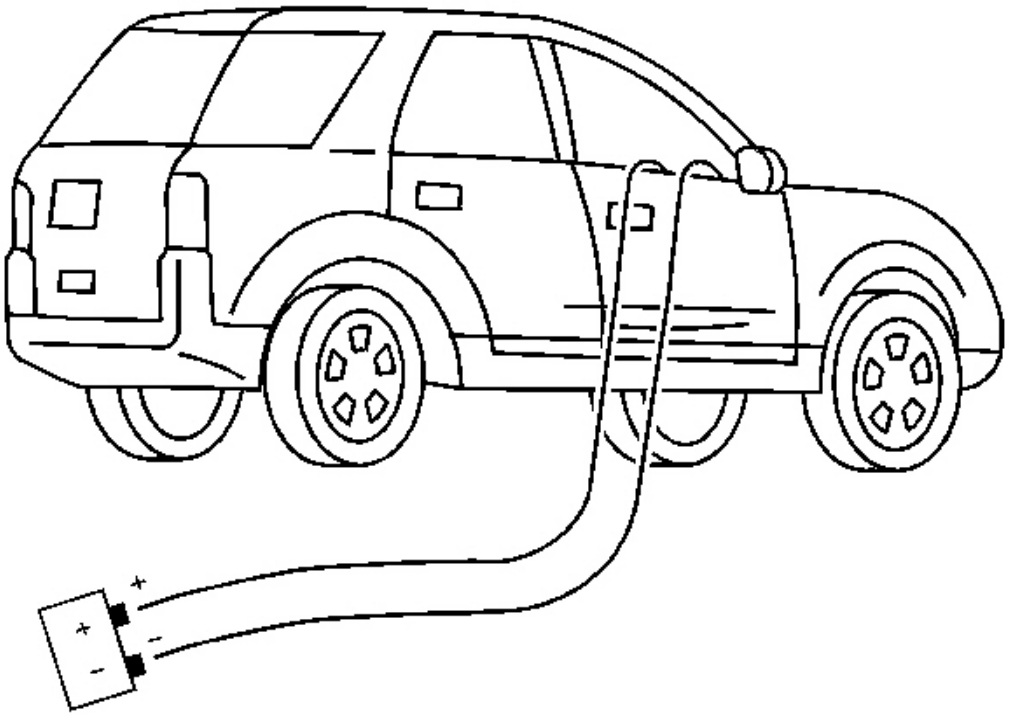


Fig. 132: Deployment Harness & Power Source
Courtesy of GENERAL MOTORS CORP.

31. Completely cover the windshield and the front door openings with a drop cloth.
32. Stretch out all of the deployment harness wires on the passenger side of the vehicle to their full length.
33. Deploy each deployment loop one at a time.
34. Place a power source, 12 V minimum/2 A minimum, such as a vehicle battery, near the shorted end of the harnesses.
35. Separate one set of wires and touch the wire ends to the power source in order to deploy the seat belt pretensioners.
36. Disconnect the deployment harness from the power source and twist the wire ends together.
37. Continue the same process with the remaining deployment harnesses that are available.

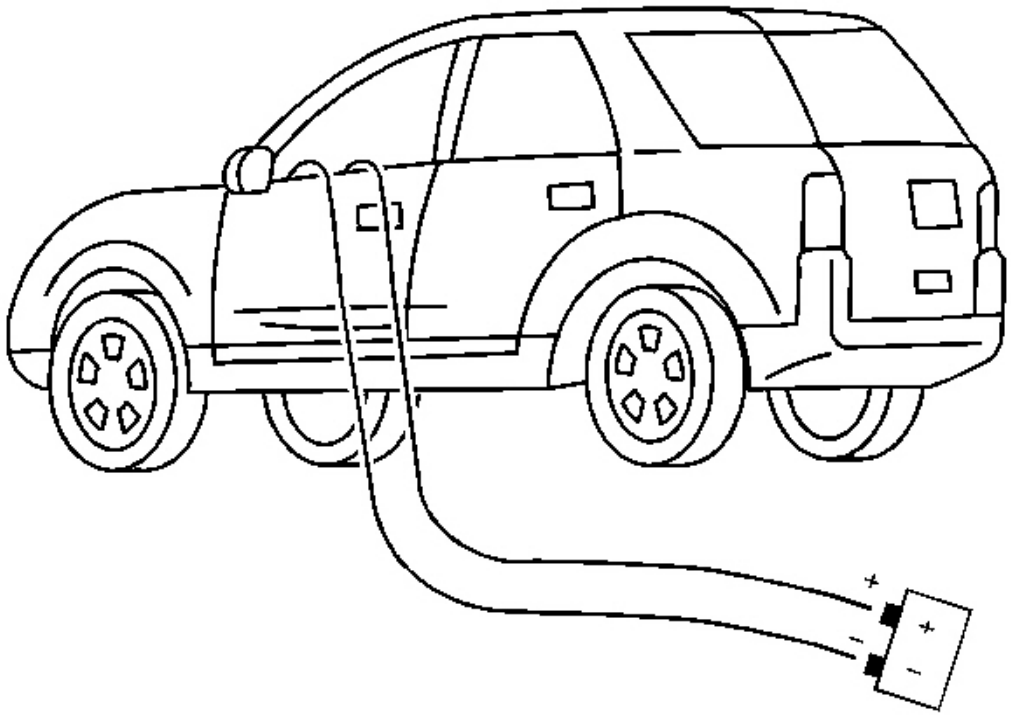


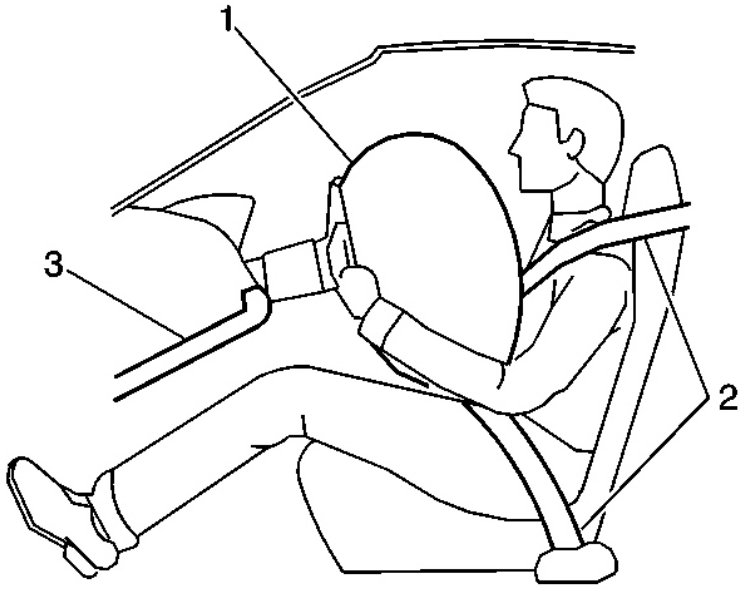
Fig. 133: Driver Side Deployment Harness & Power Source
Courtesy of GENERAL MOTORS CORP.

38. Stretch out all the deployment harness wires on the driver side of the vehicle to their full length.
39. Place a power source, 12 V minimum/2 A minimum, such as a vehicle battery, near the shorted end of harness.
40. Separate one set of wires and touch the wire ends to the power source in order to delay the seat belt pretensioner.
41. Remove the drop cloth from the vehicle.
42. Disconnect all harnesses from the vehicle.
43. Discard the harnesses.
44. Scrap the vehicle in the same manner as a non - SIR equipped vehicle.
45. If one or more of the seat belt pretensioners did not deploy, perform the following steps to remove the undeployed seat belt pretensioner from the vehicle, refer to **Seat Belt Retractor Pretensioner Replacement - Front** .
46. Call the Technical Assistance Group for further assistance.

DESCRIPTION AND OPERATION

SIR SYSTEM DESCRIPTION AND OPERATION

SIR System Overview



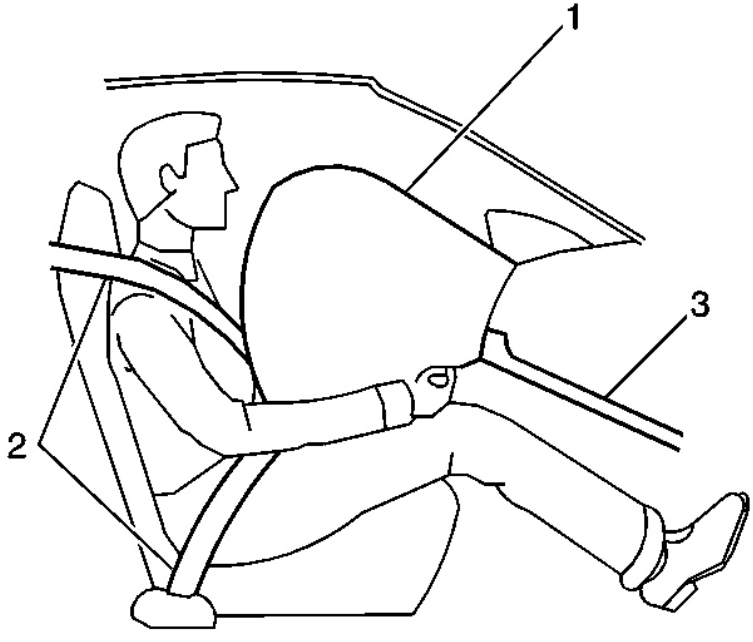


Fig. 134: Deployed Inflatable Restraint
Courtesy of GENERAL MOTORS CORP.

The supplemental inflatable restraint (SIR) system supplements the protection offered by the occupant's seat belt system (2). The SIR system may contain several inflator modules located throughout the vehicle, i.e. steering wheel module (1), instrument panel (I/P) module (1), or roof rail modules. In addition to inflator modules, the vehicle may contain seat belt pretensioners that tighten the seat belt in the event of a collision, thus reducing the distance between the occupant and the seat belt when an inflator module is deployed. Each inflator module has a deployment loop that is controlled by the sensing and diagnostic module (SDM) mounted inside the vehicle. The SDM determines the severity of a collision with the assistance of various sensor inputs located at strategic points on the vehicle. When the SDM detects a collision, it will process the information provided by the sensors to further support air bag or pretensioner deployment. The SDM will deploy the frontal air bags and pretensioners if it detects a collision of sufficient force. If the force of the impact is not sufficient to warrant inflator module deployment, the SDM may still deploy the seat belt pretensioners. 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 turning the AIR BAG indicator ON. The steering column (1) and knee bolsters (3) are designed to absorb energy and compress during frontal collisions in order to limit leg movement and decrease the chance of injury to the driver and passenger.

Frontal SIR System Description

The frontal SIR system consists of the following components:

- AIR BAG indicator located in the instrument panel cluster (IPC)
- Driver and front passenger knee bolsters
- Inflatable restraint I/P module
- Inflatable restraint seat belt pretensioner-LF
- Inflatable restraint seat belt pretensioner-RF
- Inflatable restraint sensing and diagnostic module (SDM)
- Inflatable restraint steering wheel module
- Inflatable restraint steering wheel module coil
- Inflatable restraint wiring harnesses
- Steering wheel and column

A frontal collision of sufficient force will deploy the frontal air bags and/or 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, IP module, steering wheel module, steering wheel module coil, seat belt pretensioners, and the connecting wires make up the frontal deployment loops. The SDM continuously monitors the deployment loops for malfunctions and turns the AIR BAG indicator ON if a fault is detected.

AIR BAG Indicator

The AIR BAG indicator, located in the IPC is used to notify the driver of SIR system malfunctions and to verify that the SDM is communicating with the IPC. When the ignition is turned ON, the SDM is supplied with ignition positive voltage. The SDM requests the IPC to flash the AIR BAG indicator seven times. While flashing the indicator, the SDM conducts test on all SIR system components and circuits. If no malfunctions are detected the SDM will communicate with the IPC through the class 2 serial data circuit and command the AIR BAG indicator OFF. The SDM provides continuous monitoring of the air bag circuits by conducting a sequence of checks. If a malfunction is detected the SDM will store a diagnostic trouble code (DTC) and command the IPC to turn the AIR BAG indicator ON via class 2 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 AIR BAG indicator will remain ON until the malfunction has been repaired.

Dual Stage Inflator Modules

Dual stage inflator modules contain a housing, inflatable air bag, two initiating devices, canister of gas generating material and, in some cases, stored compressed gas. The two initiators are part of the frontal deployment loop. The function of the frontal deployment loops are to supply current through the steering wheel and instrument panel (I/P) inflator modules to deploy the air bags. The inflator modules have two stages of deployment, which varies the amount of restraint to the occupant according to the collision severity. For moderate frontal collisions the inflator modules deploy at less than full deployment (low deployment) which consists of stage 1 of the inflator module. For more severe frontal collisions a full deployment is initiated which consists of stage 1 and stage 2 of the inflator module. The current passing through the initiators ignites the material in the canister producing a rapid generation of gas and is 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.

Each dual stage inflator modules is equipped with a shorting bar located in the connectors of the module. The shorting bar shorts the inflator module deployment loop circuitry to prevent unwanted deployment of the air bag when it is disconnected.

Inflatable Restraint Seat Belt Pretensioners

The seat belt pretensioners consist of a housing, a seat belt retractor, the seat belt webbing, an initiator, and a canister of gas generating materials. The initiator is part of the seat belt pretensioner deployment loop. When the vehicle is involved in a collision of sufficient force, the 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 and retracts the seat belt webbing, which removes all of the slack in the seat belts. Depending on the severity of the collision, the seat belt pretensioners may deploy without the frontal inflator modules deploying, or they will deploy immediately before the frontal inflator modules deploy. Each seat belt pretensioner is equipped with a shorting bar that is located in the connector of the seat belt pretensioner. The shorting bar shorts the seat belt pretensioner circuitry to prevent unwanted deployment of the seat belt pretensioner when the connector is disconnected.

Inflatable Restraint Sensing and Diagnostic Module (SDM)

The sensing and diagnostic module (SDM) is a microprocessor and the control center for the SIR system. The SDM contains internal sensors along with external sensors, if equipped, mounted at strategic locations on the vehicle. In the event of a collision, the SDM compares the signals from the internal and external sensors to a

value stored in memory. When the generated signals exceed a stored value, the SDM will cause current to flow through the appropriate deployment loops to deploy the air bags or pretensioners. The SDM records the SIR system status when a deployment occurs and turns the AIR BAG indicator located in the IPC ON. The SDM performs continuous diagnostic monitoring of the SIR system electrical components and circuitry when the ignition is turned ON. If the SDM detects a malfunction, a DTC will be stored and the SDM will command the AIR BAG indicator ON, notifying the driver that a malfunction exist. In the event that ignition positive voltage is lost during a collision, the SDM maintains a 23-volt loop reserve (23 VLR) for deployment of the air bags. It is important when disabling the SIR system for servicing or rescue operations to allow the 23 VLR to dissipate, which could take up to 1 minute.

Inflatable Restraint Steering Wheel Module Coil

The steering wheel module coil is attached to the steering column and is located under the steering wheel. The steering wheel module coil consists of two or more current-carrying coils. The coils allow the rotation of the steering wheel while maintaining continuous electrical contact between the driver deployment loop and the steering wheel module. Two or four, if equipped with dual stage air bags, coil wires are used for the steering wheel module deployment loop. Additional coil wires are used for accessories attached to the steering wheel depending on the vehicle model. The steering wheel module coil connector is located near the base of the steering column. The connector contains a shorting bar that shorts the steering wheel module coil deployment loop circuitry to prevent unwanted deployment of the air bag when servicing the inflator module.

Inflatable Restraint Wiring Harness

The inflatable restraint wiring harnesses connect the inflators modules, SDM, deployment loops, and class 2 serial data together using weather pack connectors. SIR system connectors are yellow in color for easy identification. When repairing the SIR wiring harnesses follow the proper testing and wiring repair procedures listed in this manual.

Knee Bolster

The Knee Bolsters are designed to help restrain the lower torso of front seat occupants by absorbing the energy through the front seat occupant's upper legs. In a frontal collision the front seat occupant legs may come in contact with the knee bolsters. The knee bolsters are designed to crush or deform, absorbing some of the impact, which helps to reduce bodily injuries. The driver and passenger knee bolsters are located in the lower part of the instrument panel and must be inspected for damages after a collision.

Steering Column and Wheel

The Steering wheel and columns are designed to absorb energy when driver contact is made with the steering wheel or inflated air bag. In a frontal collision the driver may come in contact with the steering wheel directly or load the steering wheel and column through the inflated air bag. When the driver applies load to the air bag or the steering wheel the column will compress downward absorbing some of the impact, helping to reduce bodily injuries to the driver. The steering wheel and column must be inspected for damages after a collision.

Side SIR System Description

The side SIR system consists of the following components:

- AIR BAG indicator located in the instrument panel cluster (IPC)
- Inflatable restraint sensing and diagnostic module (SDM)
- Inflatable restraint side impact sensors (SIS) (left/right)
- Inflatable restraint roof rail modules (left/right)
- Inflatable restraint wiring harnesses

Inflatable Restraint Roof Rail Modules

The roof rail modules are located under the headliner extending from the front windshield pillar to the rear window pillar. The roof rail modules contain a housing, inflatable air bag, initiating device, and a canister of gas generating material. The initiator is part of the roof rail module deployment loop. When a side impact of sufficient force occurs the SIS detects the impact and sends a signal to the SDM. The SDM compares the signal received from the SIS to a value stored in memory. When the generated signal exceeds the stored value, the SDM will cause current to flow through the side deployment loop deploying the roof rail air bags. The SDM, roof rail modules, and the connecting wires make up the side deployment loops. The SDM continuously monitors the deployment loops for malfunctions and turns the AIR BAG indicator ON if a fault is present.

Each roof rail module is equipped with a shorting bar located on the connector of the module. The shorting bar shorts the roof rail module deployment loop circuitry to prevent unwanted deployment of the air bag when servicing the inflator module.

Inflatable Restraint Side Impact Sensor (SIS)

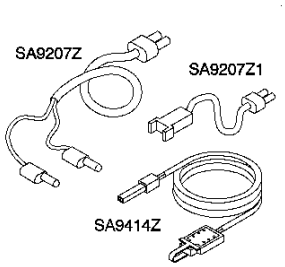
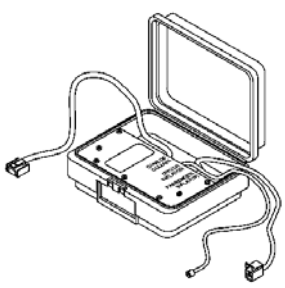
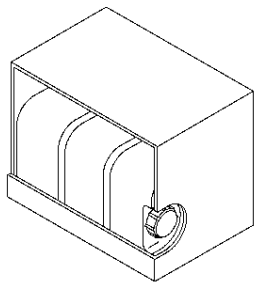
The side impact sensor (SIS) contains a sensing device which monitors vehicle acceleration and velocity changes to detect side collisions that are severe enough to warrant air bag deployment. The SIS is not part of the deployment loop, but instead provides an input to the SDM. The SDM contains a microprocessor 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 roof rail module air bags.

SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

Special Tools

Illustration	Tool Number/ Description
	SA9207Z-A Universal SIR Deployment Harness

	
	SA9409Z-A SIR Load Tool (Driver/Passenger/Roof Rail)
	SA9413NE SIR Deployment Fixture