

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

2006 RESTRAINTS

SIR - HHR

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Forward Discriminating Sensor Bolt	8 N.m	71 lb in
Inflatable Restraint Roof Side Rail Module Bolt	9 N.m	80 lb in
Inflatable Restraint Sensing and Diagnostic Module Nut	10 N.m	89 lb in
Inflatable Restraint Side Impact Sensor Bolt	9 N.m	80 lb in
Instrument Panel Compartment Dampener Screw	3 N.m	25 lb in
Instrument Panel Inflatable Restraint Module Nut	10 N.m	89 lb in
Seat Belt Adjuster Bolt	45 N.m	33 lb ft
Seat Belt Anchor Bolt	45 N.m	33 lb ft
Seat Belt Retractor Bolt	45 N.m	33 lb ft

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.

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR



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)

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

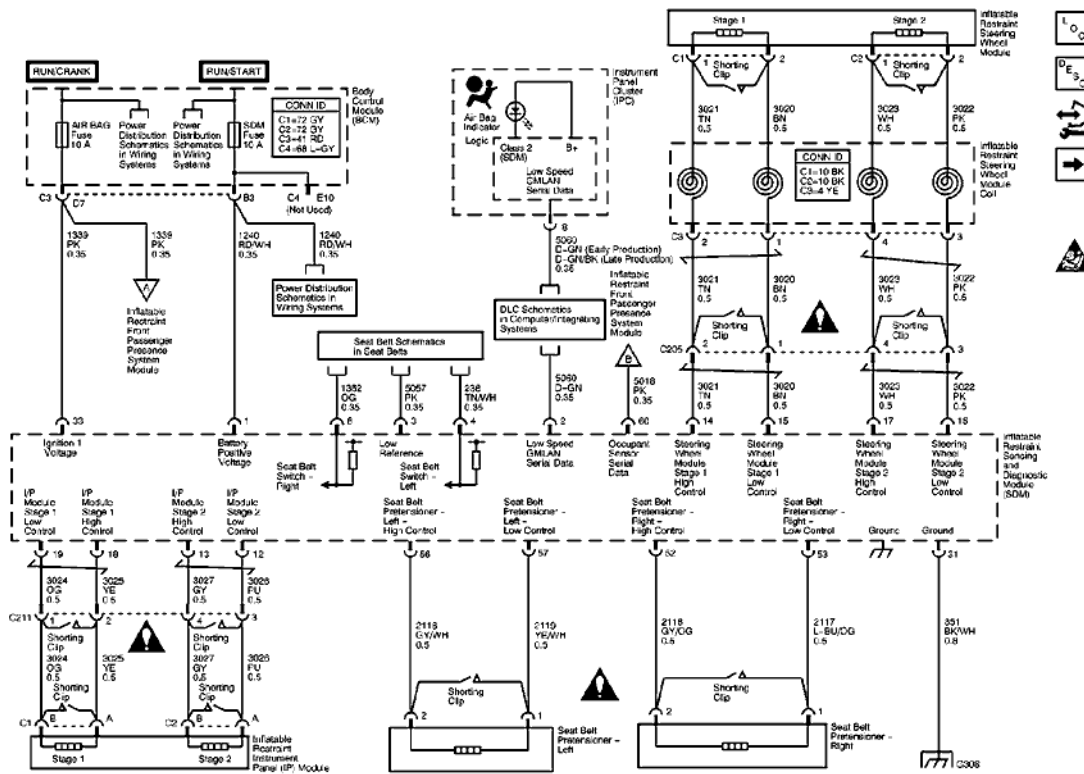


Fig. 1: SIR Indicators, Power, Ground, Pretensioners, and Front Air Bag Modules
 Courtesy of GENERAL MOTORS CORP.

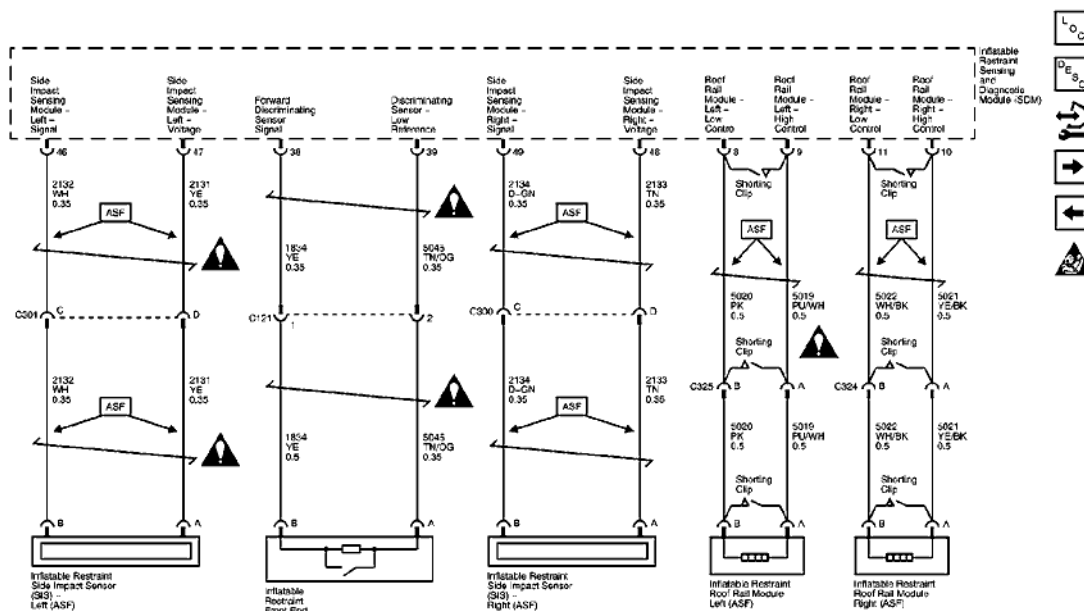


Fig. 2: Side Impact (ASF), Roof Rail Module, and Front End Sensor
 Courtesy of GENERAL MOTORS CORP.

2006 RESTRAINTS SIR - HHR

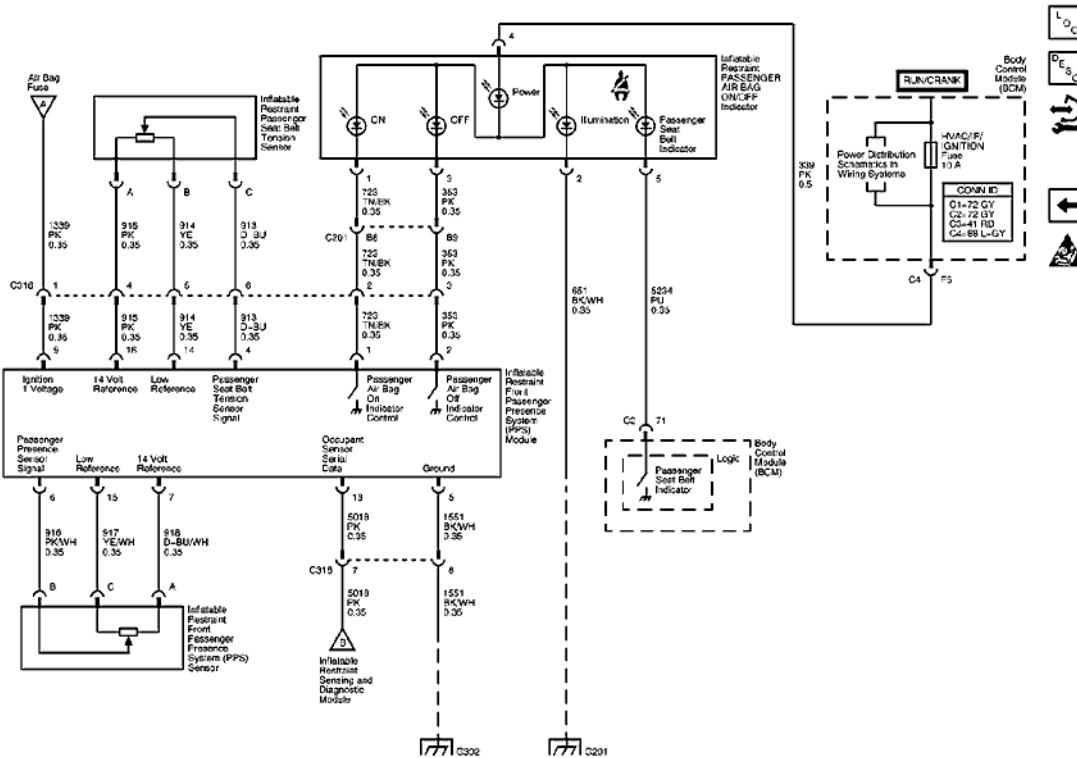


Fig. 3: Passenger Presence System
Courtesy of GENERAL MOTORS CORP.

COMPONENT LOCATOR

SIR COMPONENT VIEWS

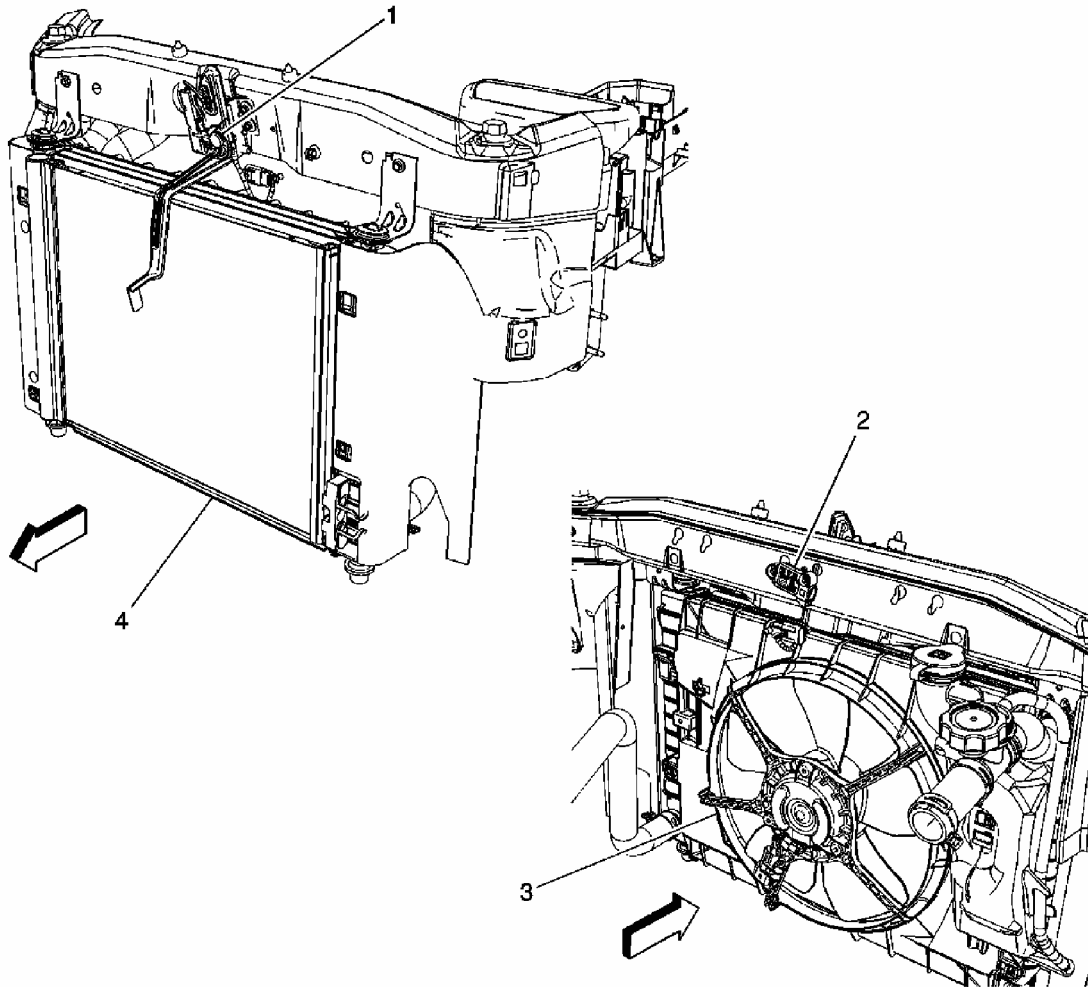
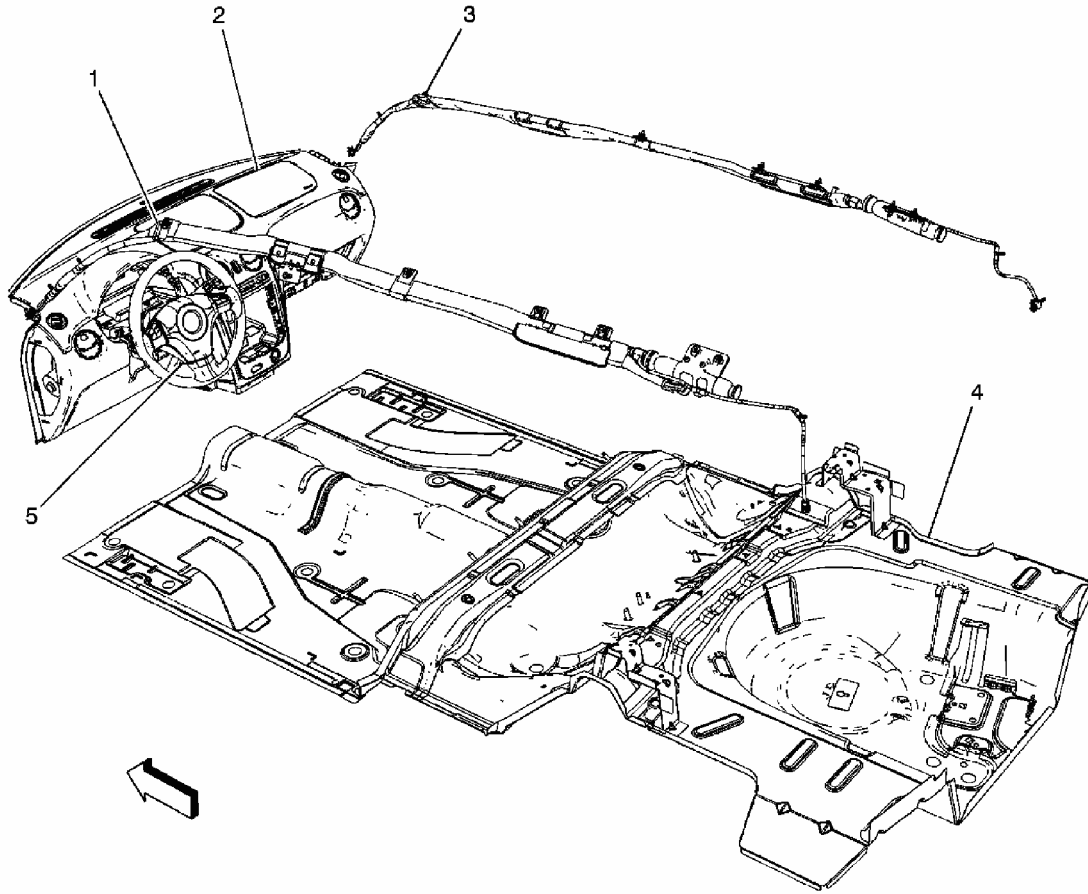


Fig. 4: Front of the Engine Compartment
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 4

Callout	Component Name
1	Hood Ajar Switch (AP3)
2	Inflatable Restraint Front End Sensor
3	Engine Cooling Fan
4	Radiator

**Fig. 5: Air Bags**

Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 5

Callout	Component Name
1	Inflatable Restraint Roof Rail Module - Left (ASF)
2	Inflatable Restraint Instrument Panel (I/P) Module
3	Inflatable Restraint Roof Rail Module - Right (ASF)
4	Floor Pan
5	Inflatable Restraint Steering Wheel Module

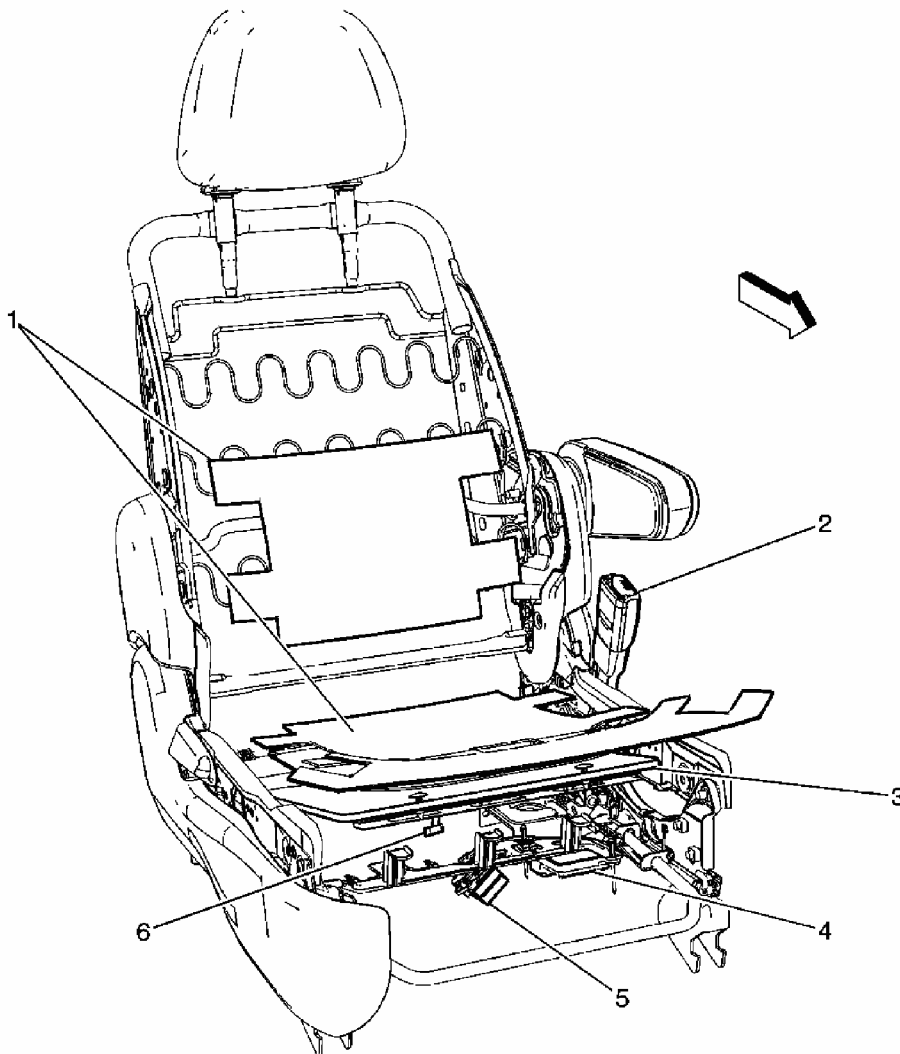
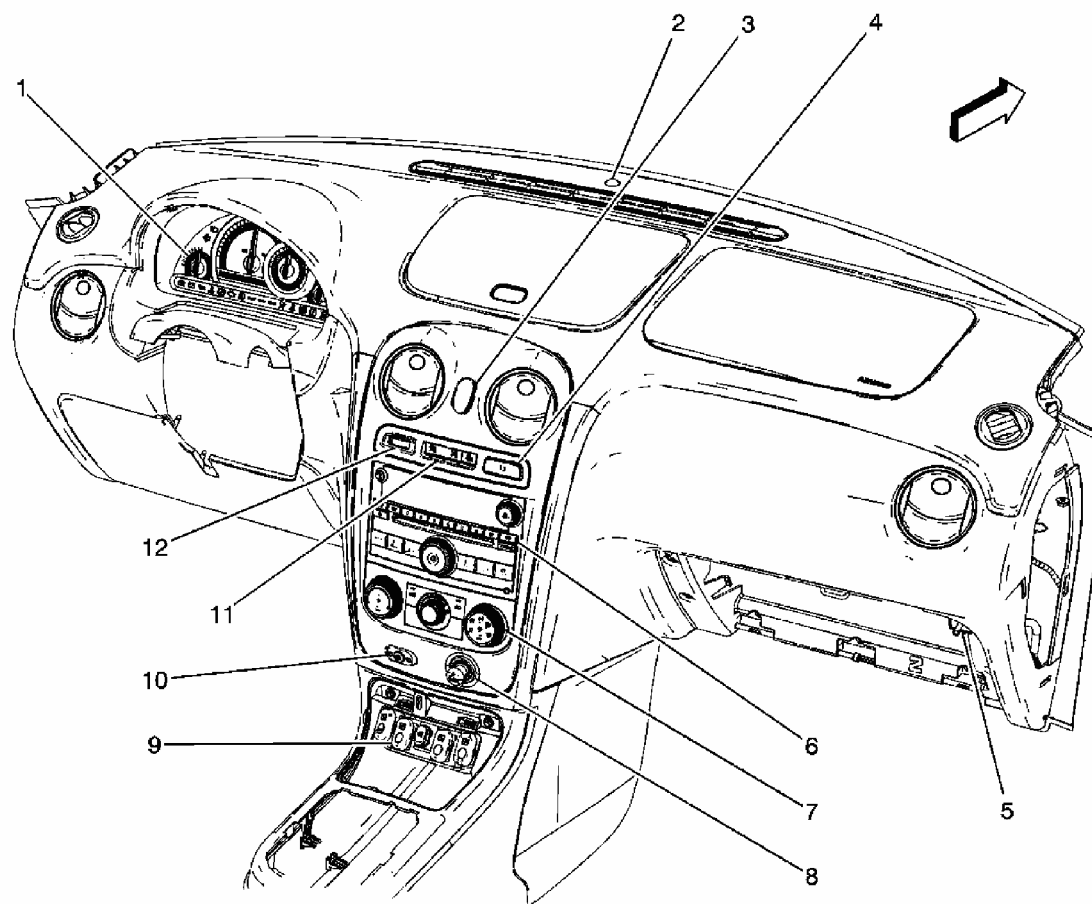


Fig. 6: Passenger Seat Components
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 6

Callout	Component Name
1	Heated Seat Element - Passenger (KA1)
2	Seat Belt Switch - Right
3	Inflatable Restraint Front Passenger Presence System (PPS) Sensor Pad
4	Inflatable Restraint Front Passenger Presence System (PPS) Module
5	Heated Seat Control Module Passenger (KA1)
6	Inflatable Restraint Front Passenger Presence System (PPS) Sensor

**Fig. 7: I/P Components**

Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 7

Callout	Component Name
1	Instrument Panel Cluster (IPC)
2	Ambient Light Sensor
3	Hazard Switch
4	Fog Lamp Switch (T37)
5	I/P Compartment
6	Radio
7	HVAC Control Assembly
8	Cigar Lighter (DT4)
9	Master Window Switch
10	Rear Wiper / Washer Switch
11	Inflatable Restraint Passenger Air Bag ON / OFF Indicator
12	Instrument Panel (I/P) Dimmer Switch

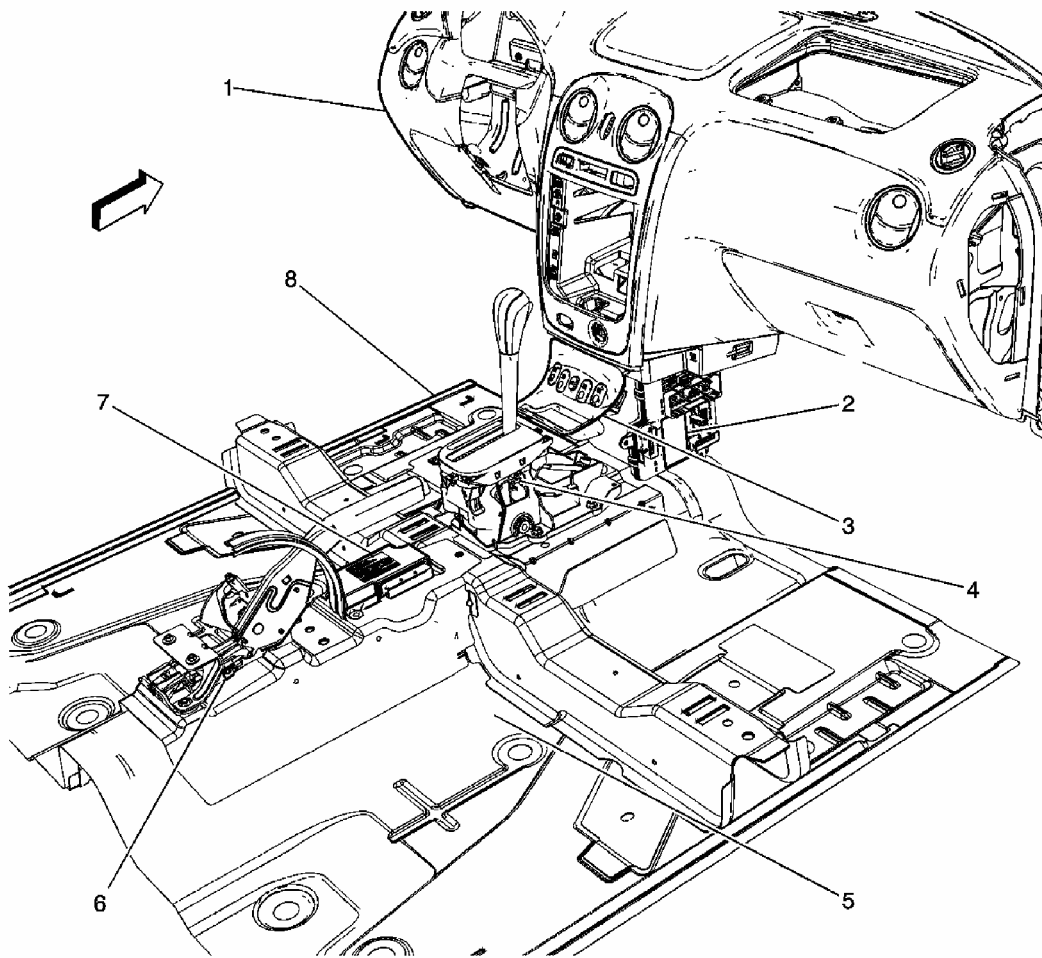


Fig. 8: Center Console Components
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 8

Callout	Component Name
1	I/P Trim
2	Body Control Module (BCM)
3	Master Window Switch
4	A/T Shift Lock Control Solenoid (MN5)
5	Floor Panel
6	Park Brake Switch
7	Inflatable Restraint Sensing and Diagnostic Module (SDM)
8	Floor Panel

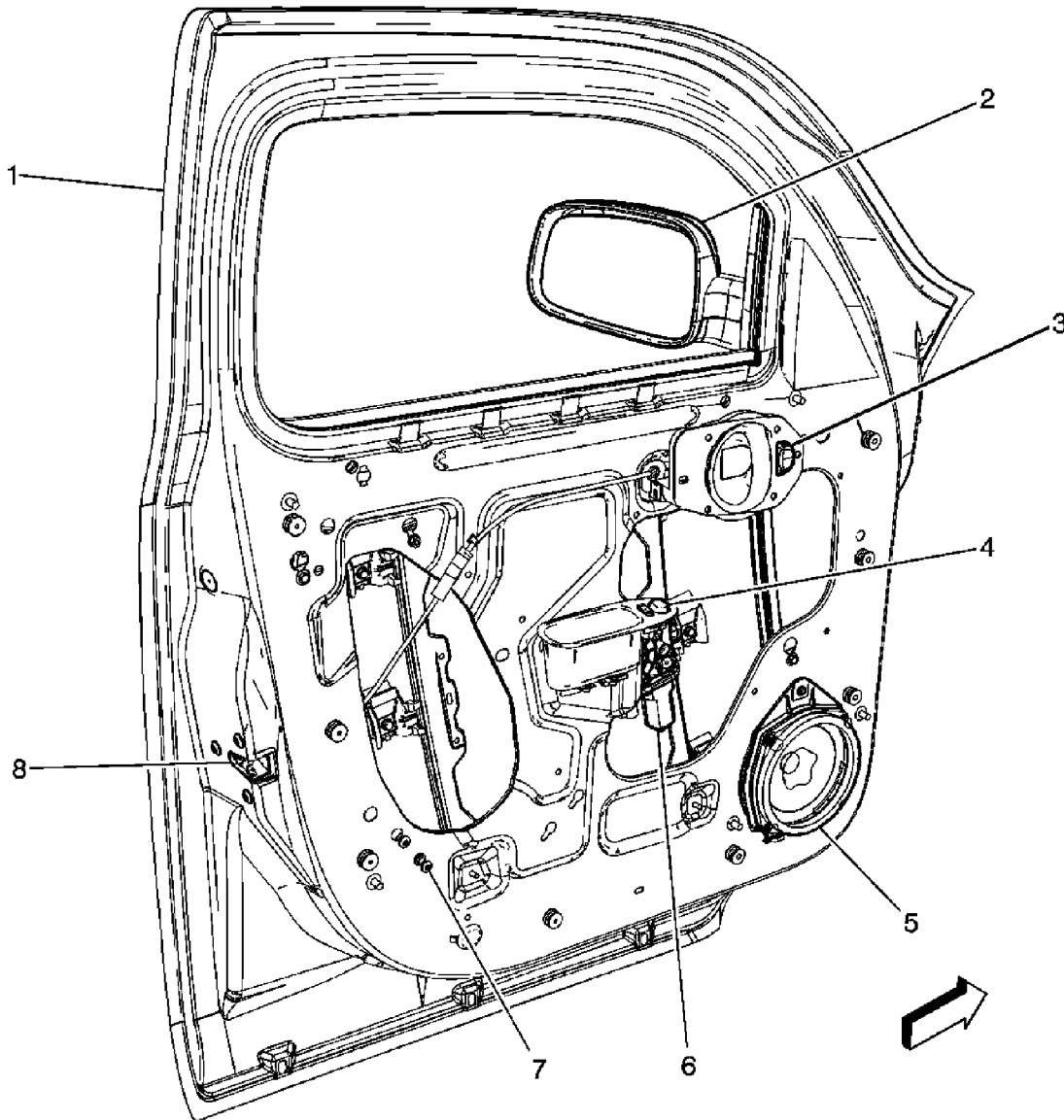


Fig. 9: Driver Door Components
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 9

Callout	Component Name
1	Door Frame
2	Outside Rearview Mirror Motor - Driver
3	Door Lock Switch - Driver
4	Outside Rearview Mirror Switch
5	Speaker - LF Door
6	Window Motor - Driver
7	Inflatable Restraint Side Impact Sensor (SIS) Left (ASF)
8	Door Latch - Driver

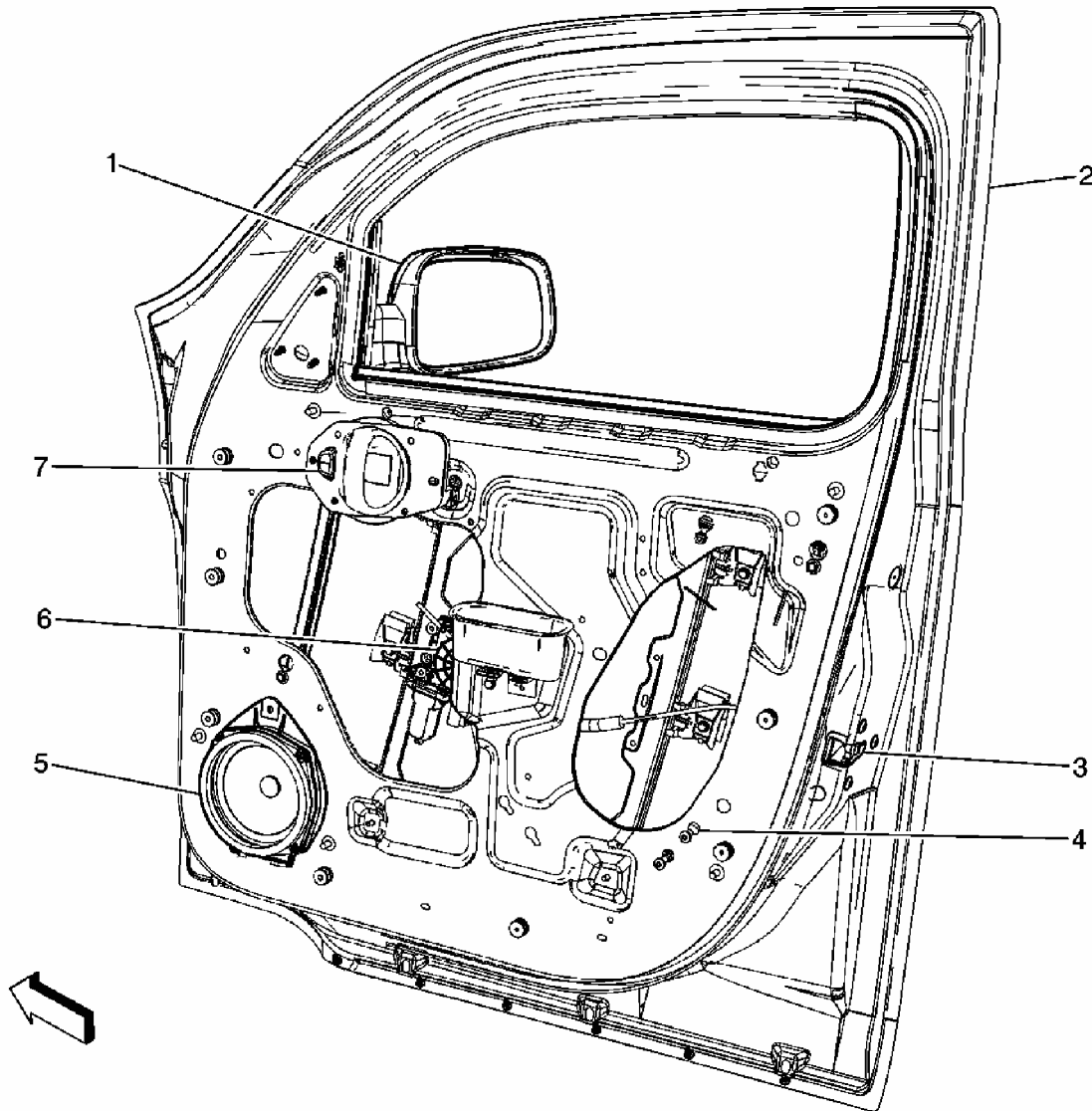


Fig. 10: Passenger Door Components
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 10

Callout	Component Name
1	Outside Rearview Mirror Motor - Passenger
2	Door Frame
3	Door Latch - Passenger
4	Inflatable Restraint Side Impact Sensor (SIS) Right (ASF)
5	Speaker - RF Door
6	Window Motor - Passenger
7	Door Lock Switch - Passenger

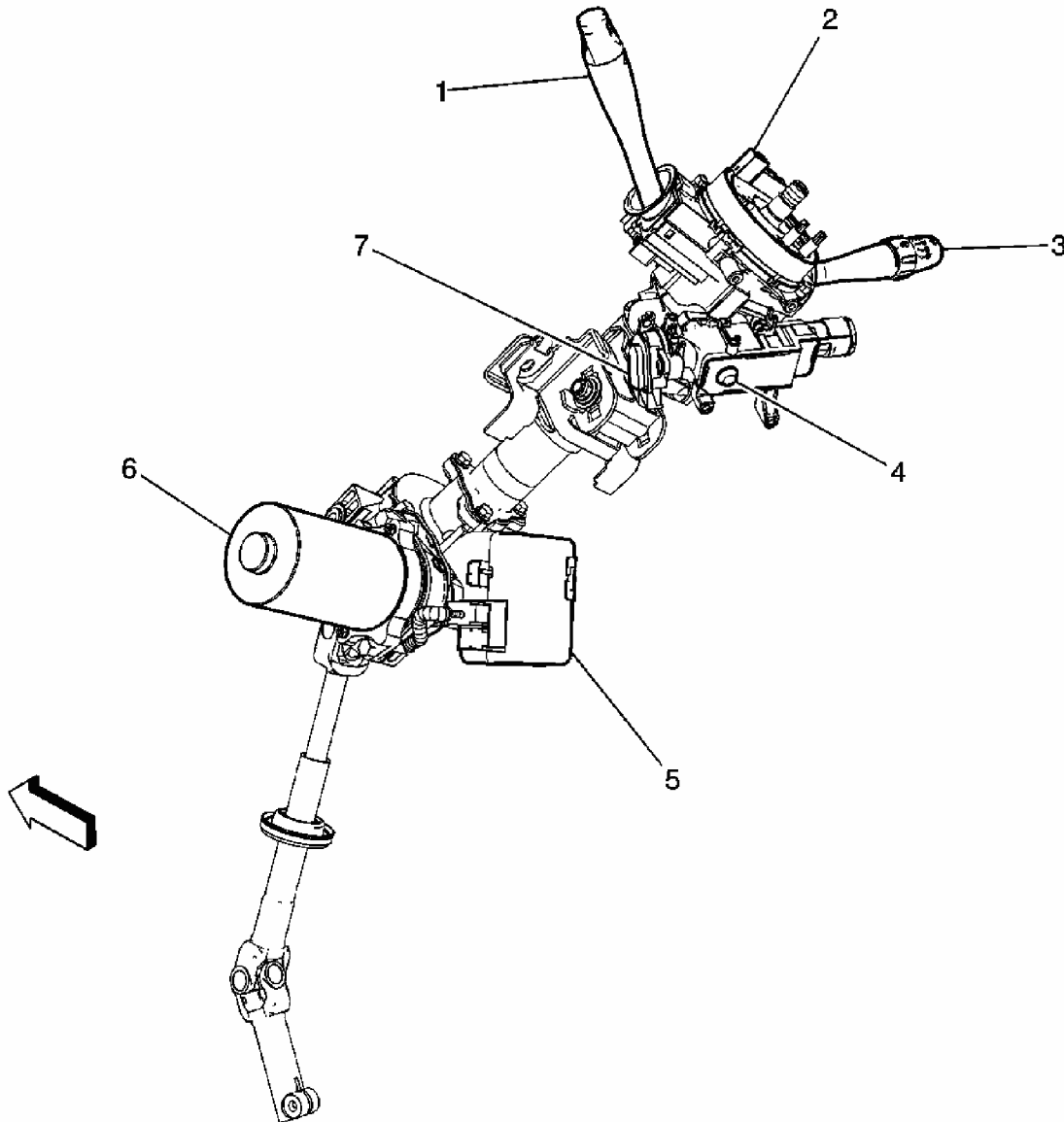


Fig. 11: Steering Column Components
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 11

Callout	Component Name
1	Turn Signal / Multifunction Switch
2	Inflatable Restraint Steering Wheel Module Coil
3	Windshield Wiper / Washer Switch
4	Power Steering Control Module (PSCM)
5	Electronic Power Steering (EPS) Motor
6	Ignition Lock Cylinder Control Actuator (MN5)

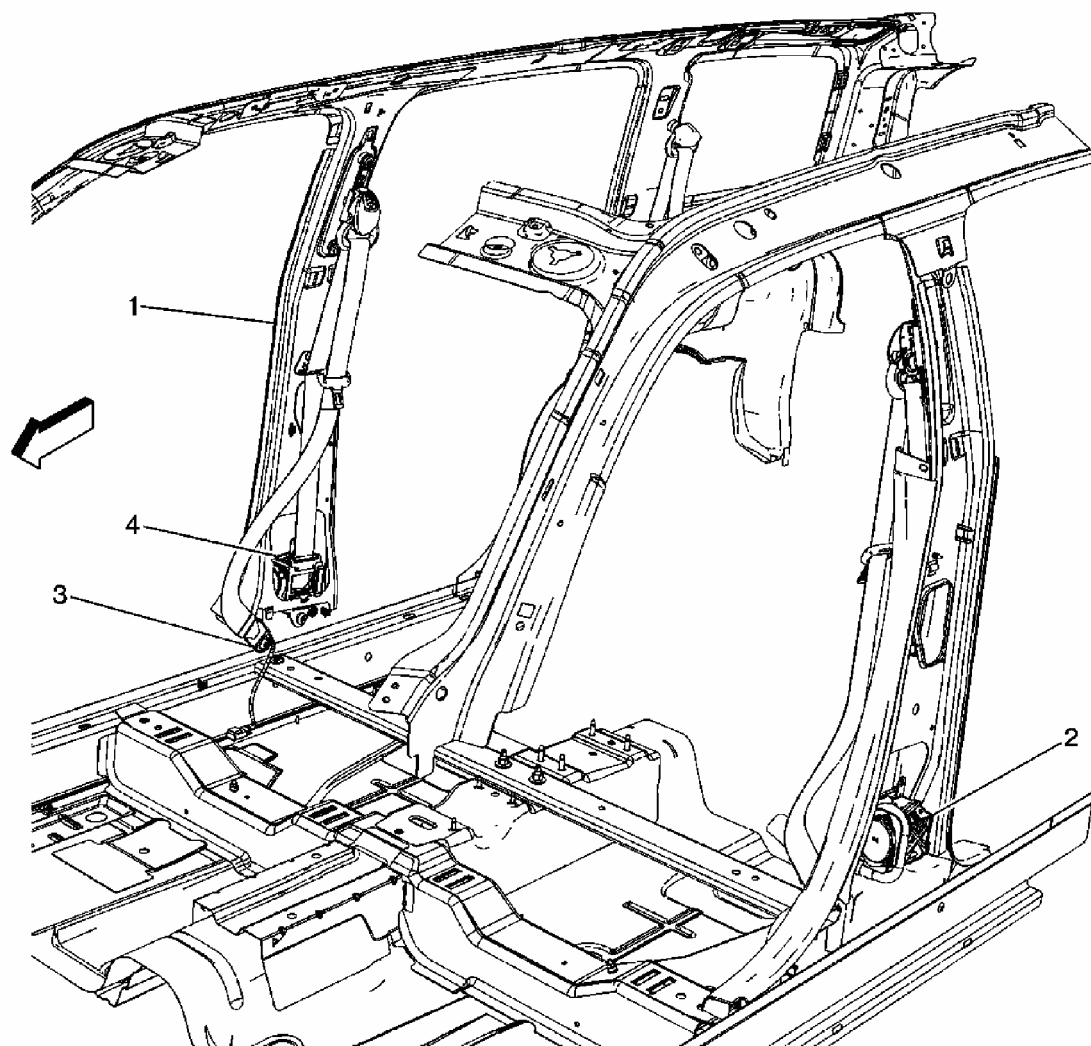


Fig. 12: Seat Belt Tensioner Components
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 12

Callout	Component Name
1	Passenger B Pillar
2	Seat Belt Pretensioner - Left
3	Inflatable Restraint Passenger Seat Belt Tension Sensor
4	Seat Belt Pretensioner - Right

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**.

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

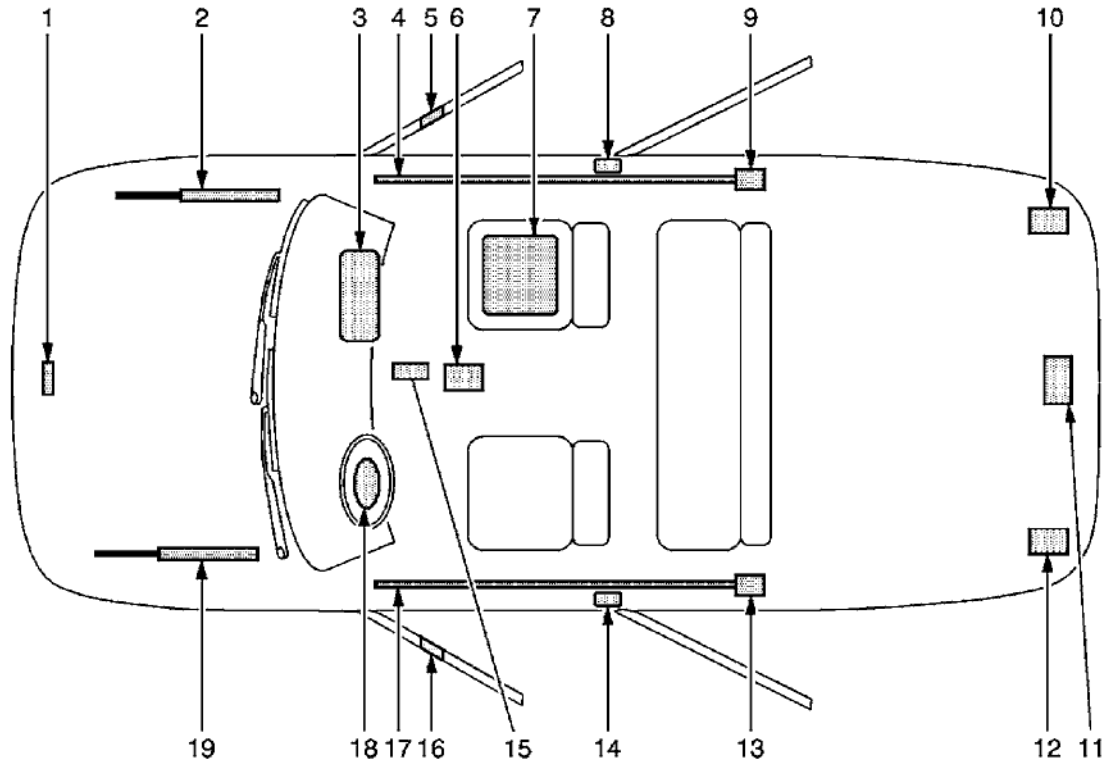


Fig. 13: SIR Zone Identification Views
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 13

Callout	Component Name
1	Front End Sensor-Located under the hood at the front of the vehicle
2	Front Hood Assist Rod-A gas shock located under the front hood on the passenger side
3	I/P Air Bag-Located at the top right under the instrument panel
4	Roof Rail Air Bag-Located under the headliner, extending from the passenger front windshield pillar to the passenger rear windshield pillar
5	Side Impact Sensor (SIS)-Located behind door panel on the passenger front door
6	Sensing and Diagnostic Module (SDM)-Located underneath the vehicle carpet under the center console
7	Passenger Presence System-Located on the front passenger seat under the seat bottom trim
8	Seat Belt Retractor Pretensioner-Located under the trim near the bottom of the center pillar on the passenger side of vehicle
9	Inflator Module for Roof Rail Air Bag-Located behind the garnish molding on the upper rear pillar

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

10	Rear Hood Assist Rod-A gas shock located under the rear truck lid on the passenger side
11	Vehicle Battery-Located in the trunk under the carpet
12	Rear Hood Assist Rod-A gas shock located under the rear truck lid on the driver side
13	Inflator Module for Roof Rail Air Bag-Located behind garnish molding on the upper rear pillar
14	Seat Belt Retractor Pretensioner-Located under the trim near the bottom of the center pillar on the driver side of vehicle
15	Body Control Module/Fuse Block-Air Bag and SDM Fuse-Located on RH side of the center console
16	Side Impact Sensor (SIS)-Located behind door panel on the driver front door
17	Roof Rail Air Bag-Located under the headliner, extending from the driver front windshield pillar to the driver rear windshield pillar
18	Steering Wheel Air Bag-Located on the steering wheel
19	Front Hood Assist Rod-A gas shock located under the front hood on the driver side

SIR CONNECTOR END VIEWS**Inflatable Restraint Front End Sensor**

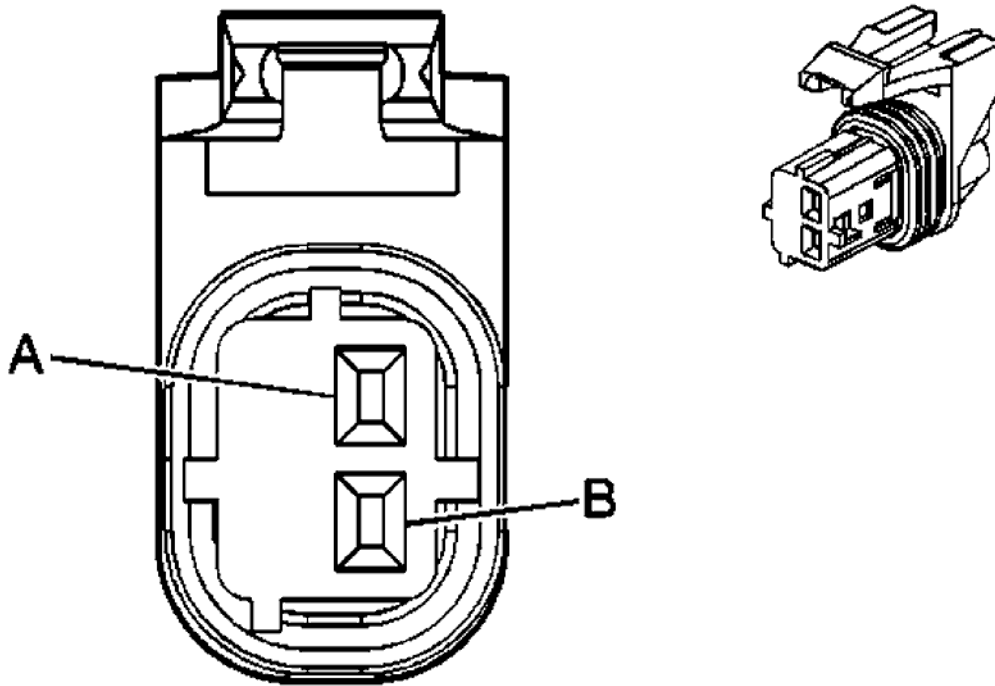


Fig. 14: Inflatable Restraint Front End Sensor Connector
 Courtesy of GENERAL MOTORS CORP.

SIR Connector End Views

Connector Part Information

- OEM: 15356722
- Service: 15306405
- Description: 2-Way F GT 150 Series Sealed 4.0 (YE)

Terminal Part Information

- Pins:
- Terminal:
- Core/Insulation Crimp:
- Release Tool/Test Probe:

Inflatable Restraint Front End Sensor

Pin	Wire Color	Circuit No.	Function
A	TN/OG	5045	Left Front Discriminating Sensor

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

			Low Reference
B	YE	1834	SIR Forward Sensor Signal (1)

Inflatable Restraint Front Passenger Presence System (PPS) Module

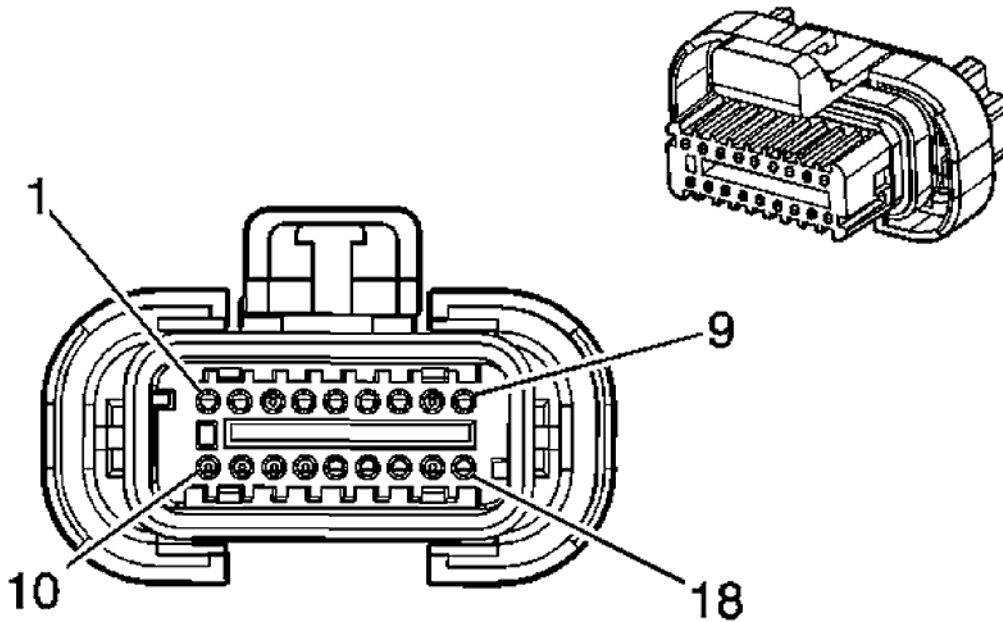


Fig. 15: Inflatable Restraint Front Passenger Presence System (PPS) Module Connector

Courtesy of GENERAL MOTORS CORP.

SIR Connector End Views

Connector Part Information

- OEM: 15431682
- Service: Service by Complete Seat Harness
- Description: 18-Way F Micro-Pack 100W Series Sealed (BK)

Terminal Part Information

- Pins:
- Terminal:
- Core/Insulation Crimp:
- Release Tool/Test Probe:

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

Inflatable Restraint Front Passenger Presence System (PPS) Module

Pin	Wire Color	Circuit No.	Function
1	TN/BK	723	Passenger I/P Module Enable Signal
2	PK	353	Passenger I/P Module Suppression Indicator Control
3	-	-	Not Used
4	BU	913	Belt Tension Sensor
5	BK/WH	1551	Signal Ground
6	PK/WH	916	Seat Pressure Sensor Signal
7	D-BU/WH	918	Seat Pressure Sensor Supply
8	-	-	Not Used
9	PK	1339	Run/Crank Ignition 1 Voltage
10-13	-	-	Not Used
14	YE	914	Belt Tension Sensor
15	YE/WH	917	Seat Pressure Sensor Ground
16	PK	915	Belt Tension Sensor
17	-	-	Not Used
18	PK	5018	Occupant Sensor Serial Data

Inflatable Restraint Front Passenger Presence System (PPS) Sensor

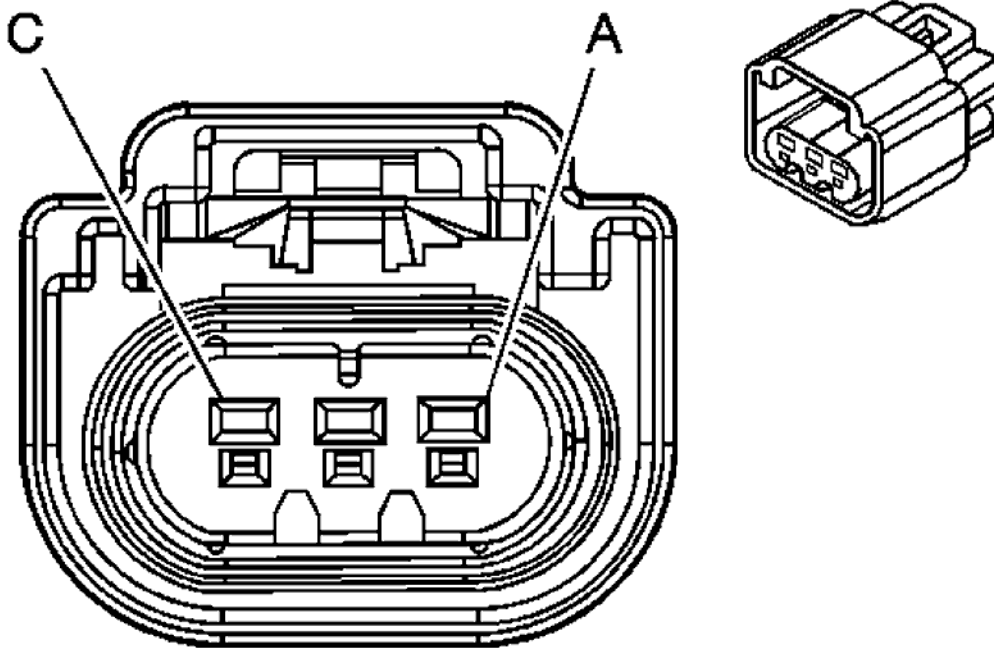


Fig. 16: Inflatable Restraint Front Passenger Presence System (PPS) Sensor Connector
Courtesy of GENERAL MOTORS CORP.

SIR Connector End Views

Connector Part Information

- OEM: 15422250
- Service: Service by Complete Seat Harness
- Description: 3-Way F GT 150 Series (D-GY)

Terminal Part Information

- Pins:
- Terminal:
- Core/Insulation Crimp:
- Release Tool/Test Probe:

Inflatable Restraint Front Passenger Presence System (PPS) Sensor

Pin	Wire Color	Circuit No.	Function
A	D-BU/WH	918	Seat Pressure Sensor Supply
B	PK/WH	916	Seat Pressure Sensor Signal

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

C

YE/WH

917

Seat Pressure Sensor Ground

Inflatable Restraint I/P Module C1

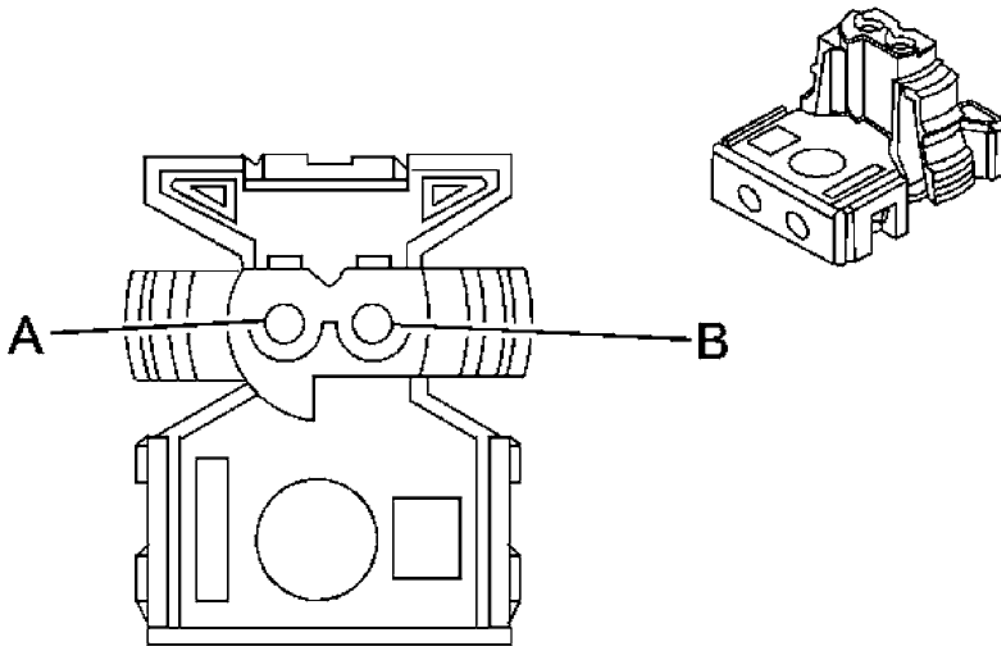


Fig. 17: Inflatable Restraint Steering Wheel Module C1 Connector End View
Courtesy of GENERAL MOTORS CORP.

SIR Connector End Views

Connector Part Information

- OEM: 15359118
- Service: Service By Complete Passenger Air Bag Jumper Harness
- Description: 2-Way F Micro-Pack 100 Series (GY) With (YE) Case

Inflatable Restraint I/P Module C1

Pin	Wire Color	Circuit No.	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

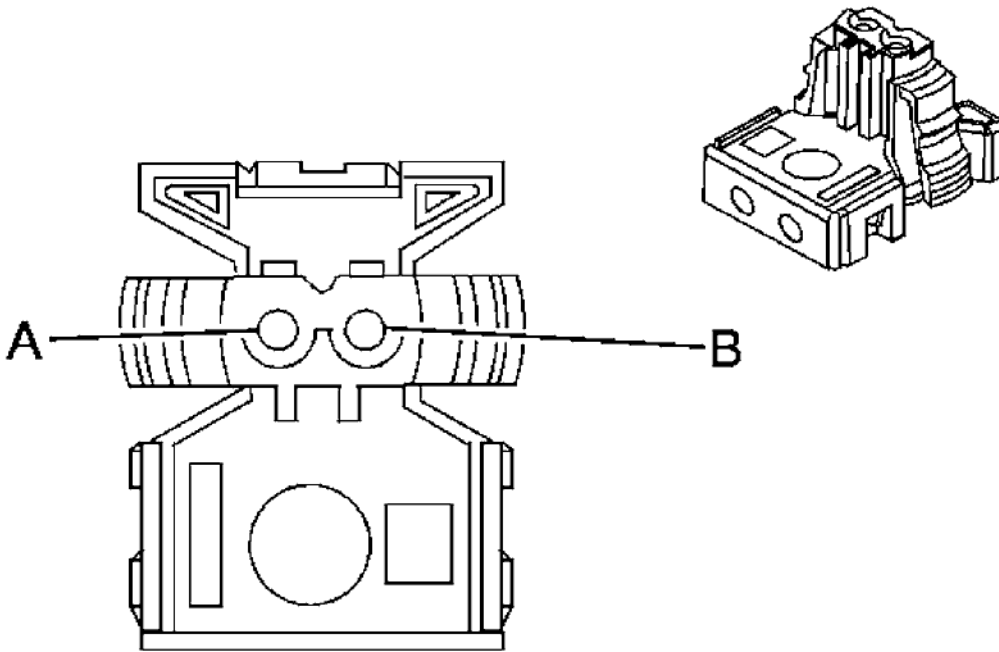


Fig. 18: Inflatable Restraint Steering Wheel Module C2 Connector End View
 Courtesy of GENERAL MOTORS CORP.

SIR Connector End Views

Connector Part Information

- OEM: 15359119
- Service: Service By Complete Passenger Air Bag Jumper Harness
- Description: 2-Way F Micro-Pack 100 Series (PU) With (YE) Case

Inflatable Restraint I/P Module C2

Pin	Wire Color	Circuit No.	Function
A	PU	3026	I/P Module - Stage 2 - Low Control
B	GY	3027	I/P Module - Stage 2 - High Control

Inflatable Restraint PASSENGER AIR BAG ON/OFF Indicator

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

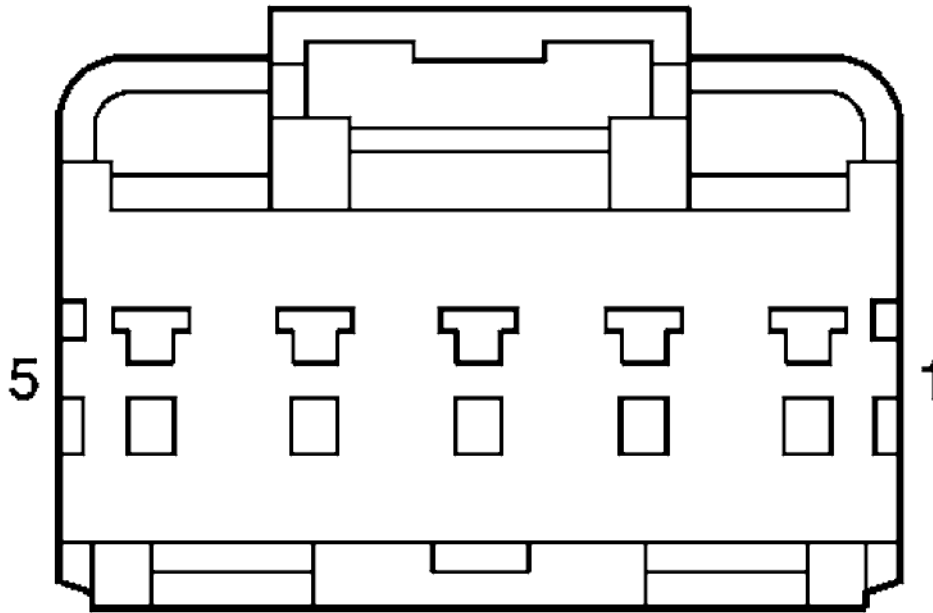


Fig. 19: Inflatable Restraint PASSENGER AIR BAG ON/OFF Indicator Connector
Courtesy of GENERAL MOTORS CORP.

SIR Connector End Views

Connector Part Information

- OEM: HCMPB-05-S
- Service: 88953369
- Description: 5-Way F

Terminal Part Information

- Pins:
- Terminal:
- Core/Insulation Crimp:
- Release Tool/Test Probe:

Inflatable Restraint PASSENGER AIR BAG ON/OFF Indicator

Pin	Wire Color	Circuit No.	Function
1	TN/BK	723	Passenger I/P Module Enable Signal
2	BK/WH	651	Signal Ground

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

3	PK	353	Passenger I/P Module Suppression Indicator Control
4	PK	339	Run/Crank Ignition 1 Voltage
5	PU	5234	Passenger Seat Belt Indicator

Inflatable Restraint Passenger Seat Belt Tension Sensor

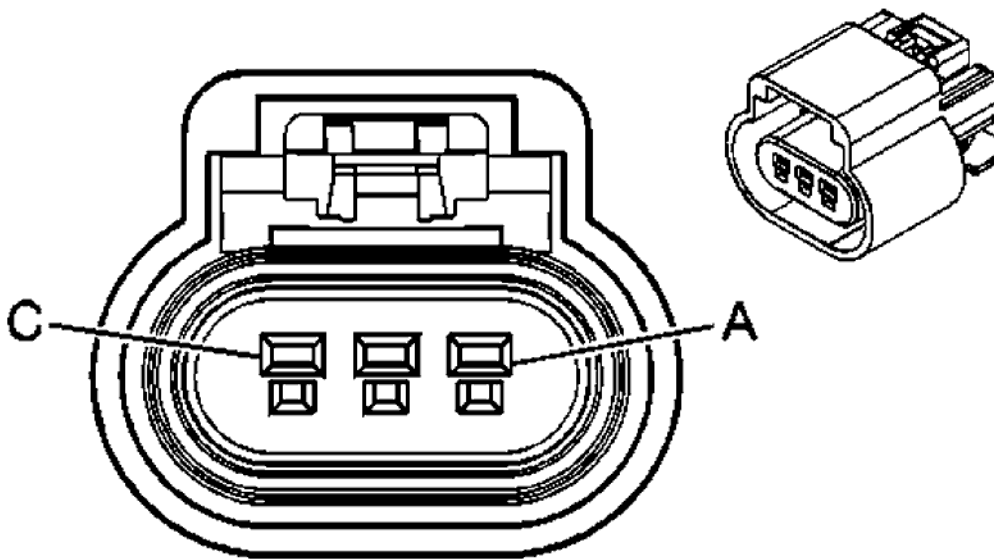


Fig. 20: Inflatable Restraint Passenger Seat Belt Tension Sensor Connector
Courtesy of GENERAL MOTORS CORP.

SIR Connector End Views

Connector Part Information

- OEM: 15326808
- Service: 15306388
- Description: 3-Way F GT 150 Series Sealed (BK)

Terminal Part Information

- Pins:
- Terminal:
- Core/Insulation Crimp:
- Release Tool/Test Probe:

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

Inflatable Restraint Passenger Seat Belt Tension Sensor

Pin	Wire Color	Circuit No.	Function
A	PK	915	Belt Tension Sensor
B	YE	914	Belt Tension Sensor
C	D-BU	913	Belt Tension Sensor

Inflatable Restraint Roof Rail Module - Left (ASF)

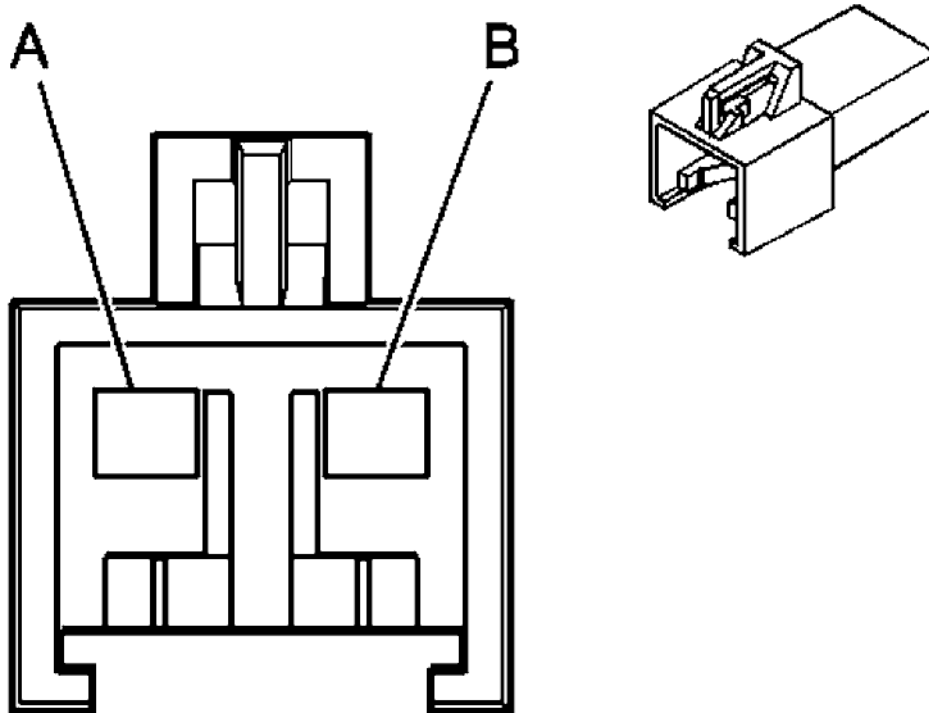


Fig. 21: Inflatable Restraint Roof Rail Module - Left (ASF) Connector
Courtesy of GENERAL MOTORS CORP.

SIR Connector End Views

Connector Part Information

- OEM: 12186799
- Service: 15306012
- Description: 2-Way M Metri-Pack 280 Series (YE)

Terminal Part Information

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

- Pins:
- Terminal:
- Core/Insulation Crimp:
- Release Tool/Test Probe:

Inflatable Restraint Roof Rail Module - Left (ASF)

Pin	Wire Color	Circuit No.	Function
A	PU/WH	5019	Left Front Head Curtain Module High Control (ASF)
B	PK	5020	Left Front Head Curtain Module Low Control (ASF)

Inflatable Restraint Roof Rail Module - Right (ASF)

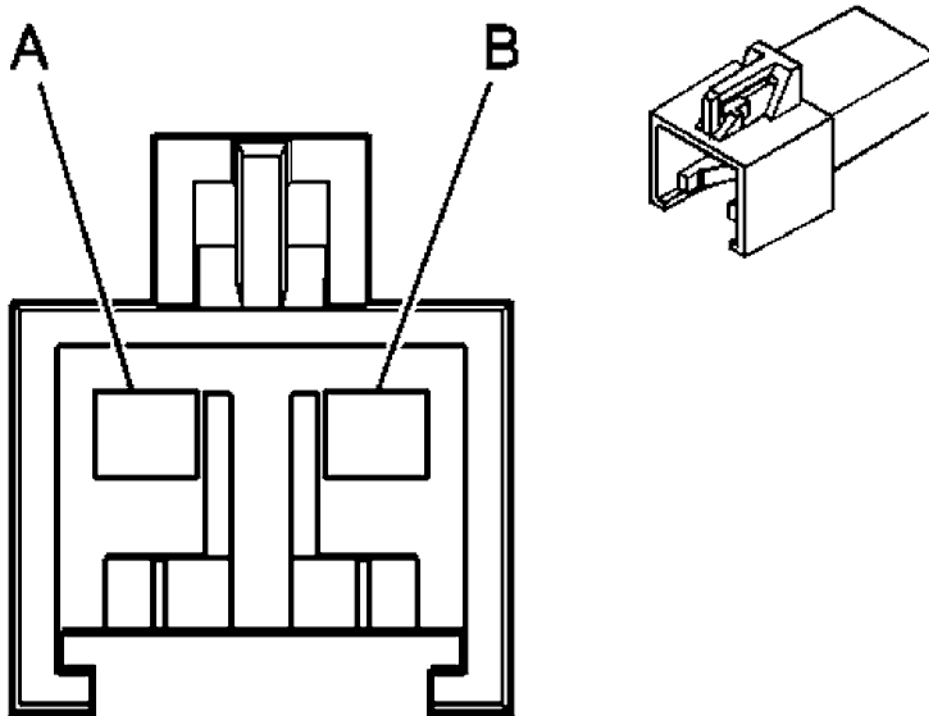


Fig. 22: Inflatable Restraint Roof Rail Module - Right (ASF) Connector
Courtesy of GENERAL MOTORS CORP.

SIR Connector End Views

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

Connector Part Information

- OEM: 12186799
- Service: 15306012
- Description: 2-Way M Metri-Pack 280 Series (YE)

Terminal Part Information

- Pins:
- Terminal:
- Core/Insulation Crimp:
- Release Tool/Test Probe:

Inflatable Restraint Roof Rail Module - Right (ASF)

Pin	Wire Color	Circuit No.	Function
A	YE/BK	5021	Right Front Head Curtain Module High Control (ASF)
B	WH/BK	5022	Right Front Head Curtain Module Low Control (ASF)

Inflatable Restraint Sensing and Diagnostic Module (SDM)

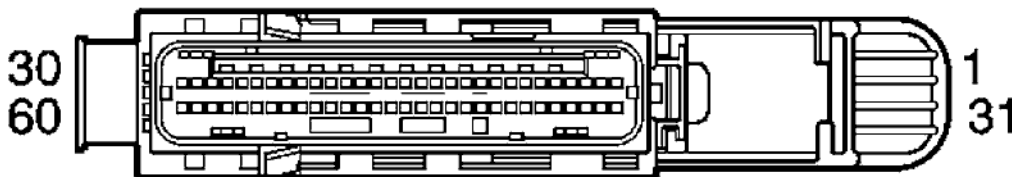


Fig. 23: Inflatable Restraint Sensing and Diagnostic Module (SDM) Connector
Courtesy of GENERAL MOTORS CORP.

SIR Connector End Views

Connector Part Information

- OEM: 3-638595-3
- Service: 88988368
- Description: 60-Way F

Terminal Part Information

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

- Pins:
- Terminal:
- Core/Insulation Crimp:
- Release Tool/Test Probe:

Inflatable Restraint Sensing and Diagnostic Module (SDM)

Pin	Wire Color	Circuit No.	Function
1	RD/WH	1240	Battery Positive Voltage
2	D-GN	5060	Low Speed GMLAN Serial Data
3	PK	5057	Seat Position Switch Low Reference
4	TN/WH	238	Left Seat Belt Switch Signal
5	-	-	Not Used
6	OG	1362	Right Seat Belt Switch Signal
7	-	-	Not Used
8	PK	5020	Left Front Head Curtain Module Low Control (ASF)
9	PU/WH	5019	Left Front Head Curtain Module High Control (ASF)
10	YE/BK	5021	Right Front Head Curtain Module High Control (ASF)
11	WH/BK	5022	Right Front Head Curtain Module Low Control (ASF)
12	PU	3026	Passenger I/P Module Stage 2 Low Control
13	GY	3027	Passenger I/P Module Stage 2 High Control
14	TN	3021	Steering Wheel Module Stage 1 High Control
15	BN	3020	Steering Wheel Module Stage 1 Low Control
16	PK	3022	Steering Wheel Module Stage 2 Low Control
17	WH	3023	Steering Wheel Module Stage 2 High Control
18	YE	3025	Passenger I/P Module Stage 1 High Control
19	OG	3024	Passenger I/P Module Stage 1 Low Control
20-30	-	-	Not Used
31	BK/WH	351	Signal Ground

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

32	-	-	Not Used
33	PK	1339	Run/Crank Ignition 1 Voltage
34-37	-	-	Not Used
38	YE	1834	SIR Forward Sensor Signal (1)
39	TN/OG	5045	Left Front Discriminating Sensor Low Reference
40-45	-	-	Not Used
46	WH	2132	Left Front Side Impact Sensing Module Signal (ASF)
47	YE	2131	Left Front Side Impact Sensing Module Supply Voltage (ASF)
48	TN	2133	Right Front Side Impact Sensing Module Supply Voltage (ASF)
49	D-GN	2134	Right Front Side Impact Sensing Module Signal (ASF)
50-51	-	-	Not Used
52	GY/OG	2116	Right Seat Belt Pretensioner High Control
53	L-BU/OG	2117	Right Seat Belt Pretensioner Low Control
54-55	-	-	Not Used
56	GY/WH	2118	Left Seat Belt Pretensioner High Control
57	YE/WH	2119	Left Seat Belt Pretensioner Low Control
58-59	-	-	Not Used
60	PK	5018	Occupant Sensor Serial Data

Inflatable Restraint Side Impact Sensor (SIS) - Left (ASF)

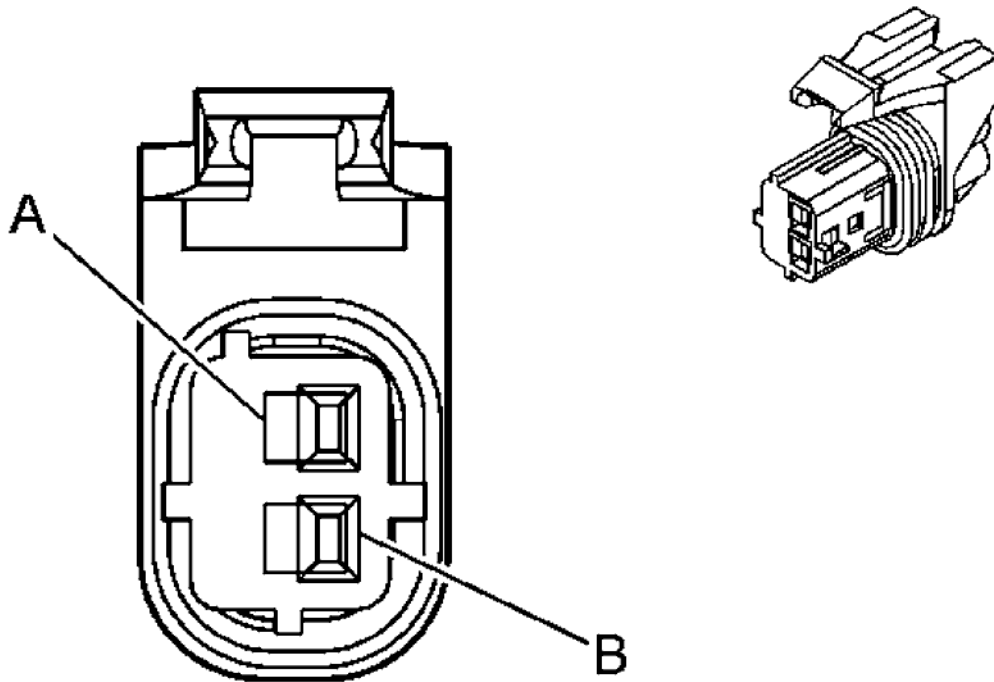


Fig. 24: Inflatable Restraint Side Impact Sensor (SIS) - Left (ASF) Connector
Courtesy of GENERAL MOTORS CORP.

SIR Connector End Views

Connector Part Information

- OEM: 15356724
- Service: 15306418
- Description: 2-Way F GT 150 Series (PU)

Terminal Part Information

- Pins:
- Terminal:
- Core/Insulation Crimp:
- Release Tool/Test Probe:

Inflatable Restraint Side Impact Sensor (SIS) - Left (ASF)

Pin	Wire Color	Circuit No.	Function
A	YE	2131	Left Front Side Impact Sensing

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

			Module Supply Voltage
B	WH	2132	Left Front Side Impact Sensing Module Signal

Inflatable Restraint Side Impact Sensor (SIS) - Right (ASF)

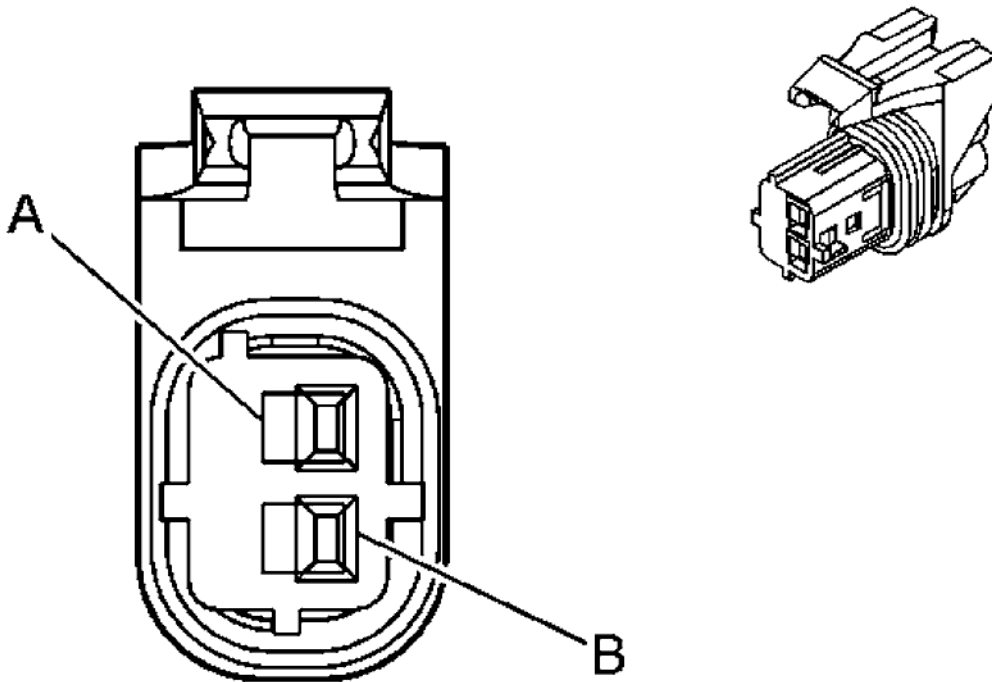


Fig. 25: Inflatable Restraint Side Impact Sensor (SIS) - Right (ASF) Connector
Courtesy of GENERAL MOTORS CORP.

SIR Connector End Views

Connector Part Information

- OEM: 15356724
- Service: 15306418
- Description: 2-Way F GT 150 Series (PU)

Terminal Part Information

- Pins:
- Terminal:
- Core/Insulation Crimp:

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

- Release Tool/Test Probe:

Inflatable Restraint Side Impact Sensor (SIS) - Right (ASF)

Pin	Wire Color	Circuit No.	Function
A	TN	2133	Right Front Side Impact Sensing Module Supply Voltage
B	D-GN	2134	Right Front Side Impact Sensing Module Signal

Inflatable Restraint Steering Wheel Module C1

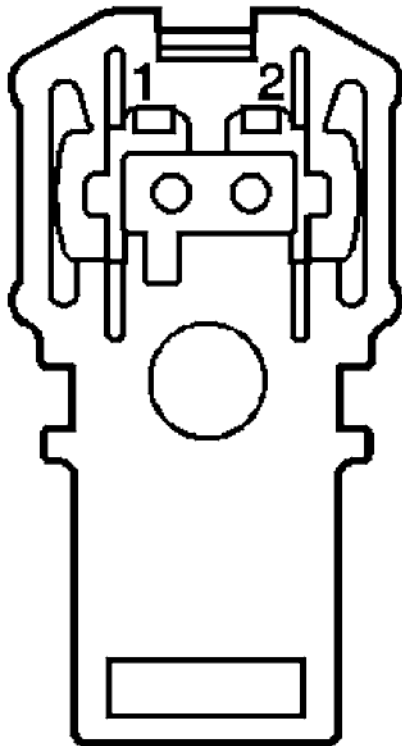


Fig. 26: Inflatable Restraint Steering Wheel Module C1 Connector
Courtesy of GENERAL MOTORS CORP.

SIR Connector End Views

Connector Part Information

- OEM: CA-252-92-4 R

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

- Service:
- Description: 2-Way F AMP (GY) With (YE) Case

Inflatable Restraint Steering Wheel Module C1

Pin	Wire Color	Circuit No.	Function
1	TN	3021	Steering Wheel Module - Stage 1 - High Control
2	BN	3020	Steering Wheel Module - Stage 1 - Low Control

Inflatable Restraint Steering Wheel Module C2

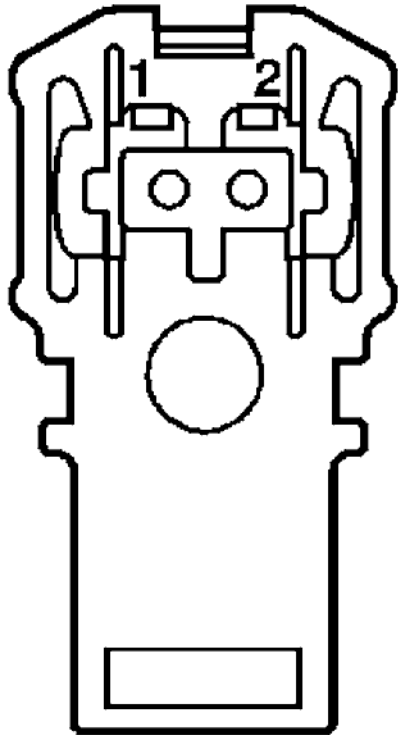


Fig. 27: Inflatable Restraint Steering Wheel Module C2 Connector
Courtesy of GENERAL MOTORS CORP.

SIR Connector End Views

Connector Part Information

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

- OEM: CA-252-92-4 R
- Service:
- Description: 2-Way F AMP (PU) With (YE) Case

Inflatable Restraint Steering Wheel Module C2

Pin	Wire Color	Circuit No.	Function
1	WH	3023	Steering Wheel Module - Stage 2 - High Control
2	PK	3022	Steering Wheel Module - Stage 2 - Low Control

Inflatable Restraint Steering Wheel Module Coil C1

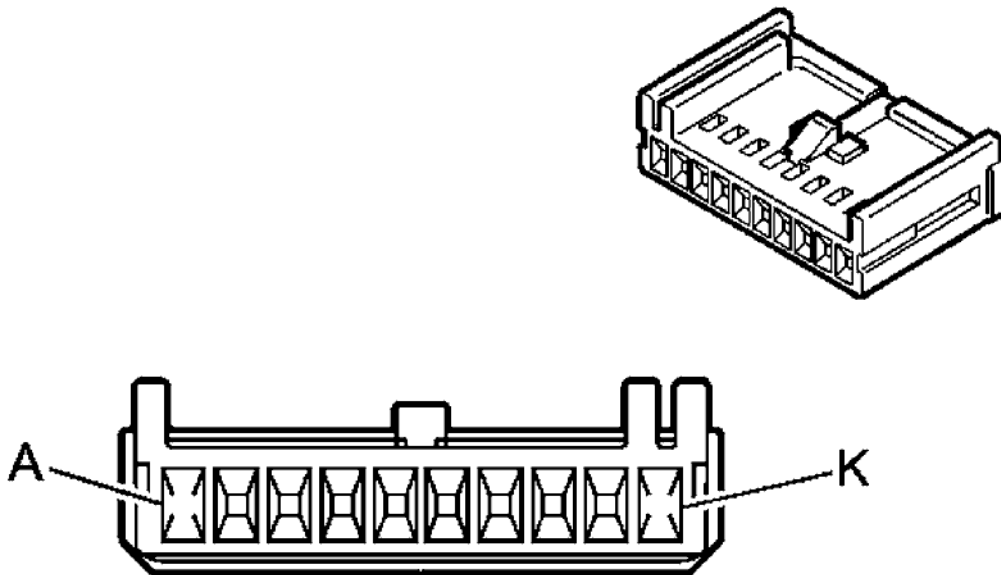


Fig. 28: Inflatable Restraint Steering Wheel Module Coil C1 Connector
Courtesy of GENERAL MOTORS CORP.

SIR Connector End Views

Connector Part Information

- OEM: 15393433
- Service: 22710638
- Description: 10-Way F Micro-Pack 64 Series (BK)

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

Terminal Part Information

- Pins:
- Terminal:
- Core/Insulation Crimp:
- Release Tool/Test Probe:

Inflatable Restraint Steering Wheel Module Coil C1

Pin	Wire Color	Circuit No.	Function
A-B	-	-	Not Used
C	PK	339	Run/Crank Ignition 1 Voltage
D	GY/BK	1884	Cruise Control Set/Coast/Resume/Accelerate Switch Signal
E	D-BU	1796	Steering Column Radio Control Signal (UK3)
F	WH/BK	644	10-Volt Reference (UK3)
G	GY	8	Instrument Panel Lamp Supply Voltage (1)
H	D-GN/WH	1358	Driver Information Center Switch Signal
J	TN	28	Horn Relay Control
K	BK/WH	151	Signal Ground

Inflatable Restraint Steering Wheel Module Coil C2

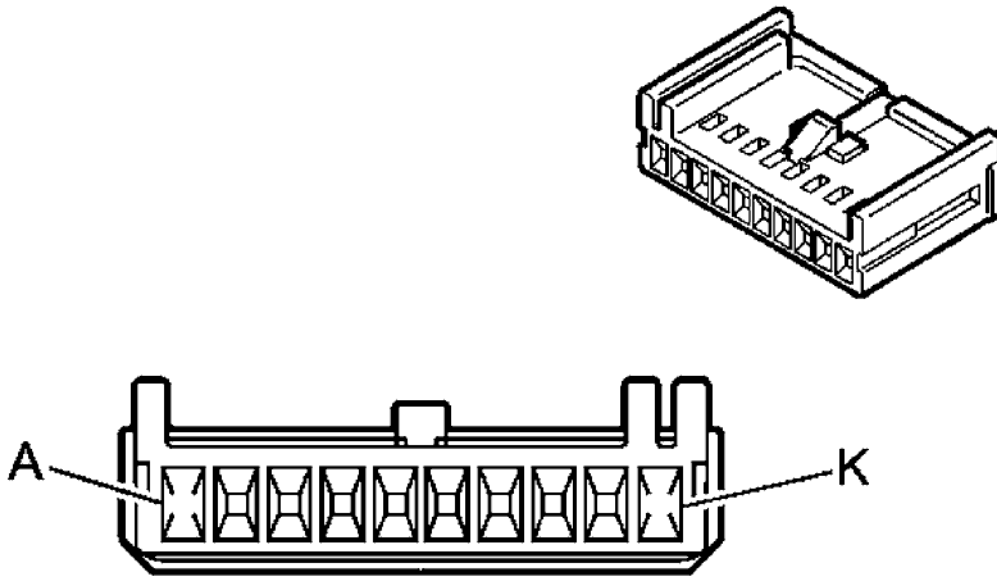


Fig. 29: Inflatable Restraint Steering Wheel Module Coil C2 Connector
 Courtesy of GENERAL MOTORS CORP.

SIR Connector End Views

Connector Part Information

- OEM: 15393433
- Service: 22710638
- Description: 10-Way F Micro-Pack 64 Series (BK)

Terminal Part Information

- Pins:
- Terminal:
- Core/Insulation Crimp:
- Release Tool/Test Probe:

Inflatable Restraint Steering Wheel Module Coil C2

Pin	Wire Color	Circuit No.	Function
A-B	-	-	Not Used
C	PK	1539	Run/Crank Ignition 1 Voltage
			Cruise Control Set/Coast/Resume/Accelerate

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

D	GY	1884	Switch Signal
E	D-BU	1796	Steering Column Radio Control Signal (UK3)
F	WH/BK	644	10-Volt Reference (UK3)
G	GY	8	Instrument Panel Lamp Supply Voltage (1)
H	D-GN/WH	1358	Driver Information Center Switch Signal
J	TN	28	Horn Relay Control
K	BK/WH	651	Signal Ground

Inflatable Restraint Steering Wheel Module Coil C3

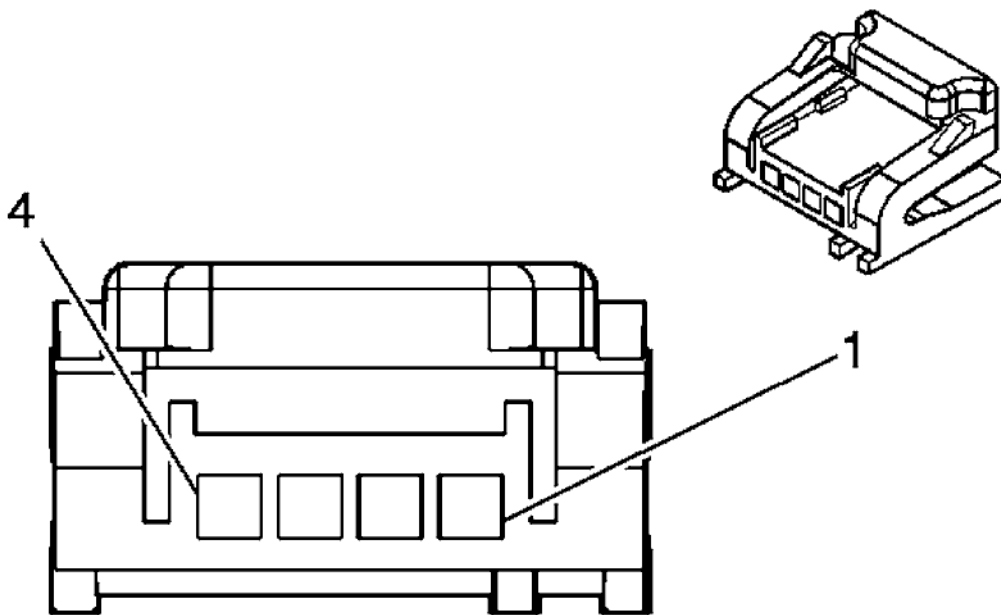


Fig. 30: Inflatable Restraint Steering Wheel Module Coil C3 Connector
Courtesy of GENERAL MOTORS CORP.

SIR Connector End Views

Connector Part Information

- OEM: 15393421
- Service: 88987853
- Description: 4-Way F Micro-Pack 064 (YE)

Terminal Part Information

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

- Pins:
- Terminal:
- Core/Insulation Crimp:
- Release Tool/Test Probe:

Inflatable Restraint Steering Wheel Module Coil C3

Pin	Wire Color	Circuit No.	Function
1	PK	3022	Steering Wheel Module Stage 2 Low Control
2	WH	3023	Steering Wheel Module Stage 2 High Control
3	BN	3020	Steering Wheel Module Stage 1 Low Control
4	TN	3021	Steering Wheel Module Stage 1 High Control

Seat Belt Pretensioner - Left

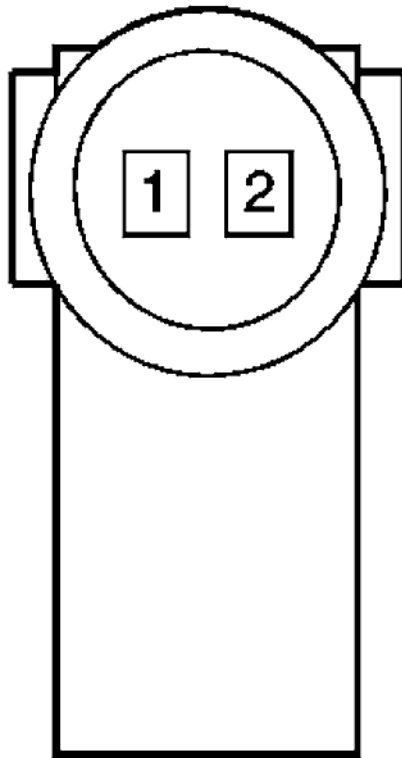


Fig. 31: Seat Belt Pretensioner - Left Connector
Courtesy of GENERAL MOTORS CORP.

SIR Connector End Views

Connector Part Information

- OEM: 1642628-1
- Service: 88988308
- Description: 2-Way F

Terminal Part Information

- Pins:
- Terminal:
- Core/Insulation Crimp:
- Release Tool/Test Probe:

Seat Belt Pretensioner - Left

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

Pin	Wire Color	Circuit No.	Function
1	YE/WH	2119	Left Seat Belt Pretensioner Low Control
2	GY/WH	2118	Left Seat Belt Pretensioner High Control

Seat Belt Pretensioner - Right

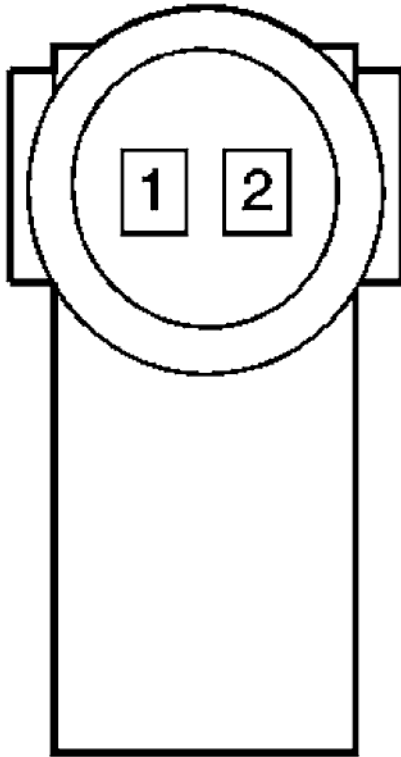


Fig. 32: Seat Belt Pretensioner - Right Connector
Courtesy of GENERAL MOTORS CORP.

SIR Connector End Views

Connector Part Information

- OEM: 1642627-1
- Service: 88988308
- Description: 2-Way F

Terminal Part Information

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

- Pins:
- Terminal:
- Core/Insulation Crimp:
- Release Tool/Test Probe:

Seat Belt Pretensioner - Right

Pin	Wire Color	Circuit No.	Function
1	L-BU/OG	2117	Right Seat Belt Pretensioner Low Control
2	GY/OG	2116	Right Seat Belt Pretensioner High Control

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>DTC B0012 or B0013</u>	** MULTIPLE VALUES **
<u>DTC B0015</u>	**DESCRIPTION NOT COLLECTED **
<u>DTC B0016</u>	**DESCRIPTION NOT COLLECTED **
<u>DTC B0019 or B0020</u>	** MULTIPLE VALUES **
<u>DTC B0022</u>	**DESCRIPTION NOT COLLECTED **
<u>DTC B0023</u>	**DESCRIPTION NOT COLLECTED **
<u>DTC B0052 or B0053</u>	** MULTIPLE VALUES **
<u>DTC B0081</u>	**DESCRIPTION NOT COLLECTED **
<u>DTC B0083</u>	**DESCRIPTION NOT COLLECTED **
<u>DTC B0085 or B0086</u>	** MULTIPLE VALUES **
<u>DTC B1001</u>	**DESCRIPTION NOT COLLECTED **
<u>DTC B1019</u>	**DESCRIPTION NOT COLLECTED **
<u>DTC B1370</u>	**DESCRIPTION NOT COLLECTED **

DIAGNOSTIC STARTING POINT - SIR

Begin the system diagnosis with the **Diagnostic System Check - Vehicle** in Vehicle DTC Information. The Diagnostic System Check 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 - Vehicle** in Vehicle DTC Information, will identify the correct procedure for diagnosing the system and where the procedure is located.

PASSENGER PRESENCE SYSTEM FLASH CODE PROCEDURES

Introduction

When the ignition is turned ON, the inflatable restraint sensing and diagnostic module (SDM) performs tests to diagnose critical malfunctions within itself. When the SDM has completed the power-up mode the SDM will establish communication with the Passenger Presence System (PPS). The PPS will respond by performing diagnostic tests to check for proper circuit continuity and for shorts to ground and voltage within the PPS. If the PPS detects a malfunction, the PPS will set a DTC, then communicate through a non GMLAN communications circuit to the SDM that a malfunction has occurred, while turning the passenger air bag status indicator to OFF. The SDM will respond by disabling the instrument panel (I/P) module deployment loop, setting DTC B0081 and commanding the AIR BAG indicator ON. The SDM notify the driver of a PPS or SIR malfunction by turning ON the AIR BAG indicator on the cluster. The DTCs that the PPS set are non GMLAN and have to be flashed through the PASSENGER AIR BAG ON/OFF indicators located in the center of instrument panel cluster (IPC). The procedures below are designed to assist in the flashing of these codes. Before you start, read these procedures carefully and completely. For further information regarding the PPS refer to **SIR System Description and Operation**.

Passenger Presence System (PPS) Flash Code Procedure

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

1. Empty the front outboard passenger seat.
2. Install a scan tool.
3. Turn ON the ignition, with the engine OFF.
4. With a scan tool, request the PPS to flash DTCs.
5. When the PPS receives a valid request to flash DTCs, the PPS will perform the following:
 1. Illuminate both PASSENGER AIR BAG ON and OFF indicators located on the center of IPC for 1 second.
 2. Turn OFF both PASSENGER AIR BAG ON and OFF indicators for 1 second.
 3. Flash the first number of the DTC using the OFF indicator. This will be an ODD number. Count the number of times the OFF indicator flashes to obtain the first number of the DTC.
 4. Flash the second number of the DTC using the ON indicator. This will be an Even

number. Count the number of times the ON indicator flashes to obtain the second number of the DTC.

5. When the flashing procedure is initiated, to determine if a code is current or history, the PPS will flash current DTCs two times consecutively and flash history DTCs once.
6. If the flashing procedure was unsuccessful repeat this procedure. Due to the communication status between the SDM and the PPS module, this procedure may have to be repeated until a successful flashing attempt has been achieved.
7. Refer to the **Diagnostic Trouble Code (DTC) List - Vehicle** to diagnose the DTCs you have obtained.

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 - Vehicle. Use the SIR Scan Tool Data List after the following is determined:

- There is no published diagnostic trouble code (DTC) procedure nor published symptom procedure for the customer concern.
- The DTC or symptom diagnostic procedure indicated by the diagnostic system check 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.

SIR 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 2 Information	8-digit number	16XXXXXX
Battery Voltage	Data	Volts	12 Volts
Calibration ID	Module 1 Information	4-digit number	Varies
Driver Seat Belt Status	Inputs	Buckled/Unbuckled	Buckled
Driver Side Impact Sensor	Module 1		

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

ID	Information	2-digit number	Varies
Front End Sensor ID	Module 1 Information	2-digit number	Varies
Julian Date of Build	Module 1 Information	3-digit number	Varies
Passenger Side Impact Sensor ID	Module 1 Information	2-digit number	Varies
Passenger Seat Belt Status	Inputs	Buckled/Unbuckled	Buckled
ROM ID	Module 1 Information	4-digit number	Varies
Year Module Built	Module 1 Information	4-digit 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 an 8-digit part number. This number is the GM part number that is stored within the sensing and diagnostic module (SDM) memory.

Battery Voltage

The scan tool displays 0-20 volts. The Ignition represents the system voltage measured by the SDM at its ignition feed.

Calibration ID

The scan tool displays a 4-digit number. This calibration ID is the check sum of the SDM read only memory contents.

Driver Seat Belt Status

The scan tool displays Buckled or Unbuckled. The signal from the drivers seat belt switch indicates whether the driver seat is buckled or unbuckled.

Driver Side Impact Sensor ID

The scan tool displays a 2-digit ID number. The ID signal is sent to the SDM from the Driver SIS.

Electronic Front End Sensor ID

The scan tool displays a 2-digit ID number. The ID signal is sent to the SDM from the front end sensor.

Battery Voltage

The scan tool displays 0-20 volts. The Ignition represents the system voltage measured by the SDM at its ignition feed.

Julian Date of Build

This displays the day of the year the module was built.

Passenger Side Impact Sensor ID

The scan tool displays a 2-digit ID number. The ID signal is sent to the SDM from the Passenger SIS.

Passenger Seat Belt Status

The scan tool displays Buckled or Unbuckled. The signal from the passengers seat belt switch indicates whether the passenger seat is buckled or unbuckled.

ROM ID

The scan tool displays a 4-digit number. This number is the read-only memory (ROM) ID.

Year Module Built

The scan tool displays what year the module was built.

DTC 023**DTC Descriptor****DTC 023**

Seat Belt Tension Sensor Circuit Out of Range

Diagnostic Fault Information

IMPORTANT: Always perform the Diagnostic System Check - Vehicle prior to using this diagnostic procedure.

Circuit/System Description

The inflatable restraint seat belt tension sensor is a 3-wire potentiometer mounted on the retractor or buckle side of the seat belt and provides an input to the passenger presence system (PPS). When an infant car seat is properly restrained on the front passenger seat, the seat belt is tightly secured through the car seat. The seat belt pulls on the tension sensor and changes the voltage signal to the PPS module. The PPS monitors the seat belt tension sensor circuit and if a fault is detected, DTC 023 will be set. When the PPS detects this DTC within the PPS, it will notify the customer of the enable/disable status by turning ON the OFF indicator on the PASSENGER AIR BAG ON/OFF indicators. Then the PPS will communicate to the sensing and diagnostic module (SDM) through a non GMLAN communications circuit that a PPS fault is present. The SDM will then set DTC B0081 indicating a problem within the PPS and will suppress the deployment of the instrument panel (I/P) module and then turn the AIR BAG indicator ON.

Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

Conditions for Setting the DTC

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

Action Taken When the DTC Sets

- The PPS will set a DTC, and then communicate with the SDM via non GMLAN circuit.
- The SDM will set DTC B0081.
- The SDM disables the I/P module deployment loop.
- The PPS will turn ON the passenger air bag status OFF indicator.
- The SDM commands the AIR BAG indicator ON via GMLAN 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

Inspect the passenger seat belt tension retractor sensor signal, 5-volt reference, and low reference circuits carefully for cutting and/or chafing.

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

SIR Connector End Views

Electrical Information Reference

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

Circuit/System Testing

IMPORTANT: The seat belt tension retractor sensor is not service separately. The Seat Belt Retractor Pretensioner Replacement - Right Front with the seat belt tension retractor sensor must be serviced as a complete unit.

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

- The seat belt retractor pretensioner - RF
 - The PPS module
 - The SDM module
 - The seat belt retractor pretensioner - RF wiring harness connector
 - The PPS wiring harness connector
 - The SDM wiring harness connector
1. Ignition OFF, disconnect the seat belt tension retractor sensor. Refer to seat belt retractor replacement - right front in Repair Instructions for location of connector.
 2. Disconnect the PPS module connector. Refer to PPS replacement in Repair Instructions for connector location.
 3. Test the seat belt tension retractor sensor signal circuit for a short to ground, a high resistance, or an open. Verify that a short to ground, a high resistance, or an open does

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

not exist.

- If any of the above conditions are found make the appropriate repair.
- 4. Test the seat belt tension retractor sensor 5-volt reference circuit for a short to ground, a short to voltage, a high resistance, or an open. Verify that a short to ground, a short to voltage, a high resistance, or an open does not exist.
 - If any of the above conditions are found make the appropriate repair.
- 5. Test the seat belt tension retractor sensor low reference circuit for a short to ground, a short to voltage, a high resistance, or an open. Verify that a short to ground, a short to voltage, a high resistance, or an open does not exist.
 - If any of the above conditions are found make the appropriate repair.
- 6. Ignition ON, engine OFF test the seat belt tension retractor sensor circuit with a DMM. Measure the voltage of the seat belt tension retractor sensor circuit harness side and ground. The voltage should read 0.05-4.5 volts.
 - If the voltage is more than 5.0 volts test the seat belt tension retractor sensor circuit for a short to voltage. If the circuit tests good replace the PPS.
- 7. Reconnect all PPS components. Use the scan tool to clear all PPS DTCs. Refer to **Passenger Presence System Flash Code Procedures**. Rezero the PPS, refer to **Passenger Presence System Rezeroing Procedure**. Verify DTC 023 does not exist.
 - If DTC 023 reset replaced the PPS.

Repair Instructions

IMPORTANT: Always perform the Diagnostic Repair Verification after completing the diagnostic procedure.

- **Seat Belt Retractor Pretensioner Replacement - Front**
- **Control Module References** for PPS replacement, setup, and programming.

DTC 024

DTC Descriptor

DTC 024

PPS Ignition 1 Voltage Performance

Diagnostic Fault Information

IMPORTANT: Always perform the Diagnostic System Check - Vehicle prior to using this diagnostic procedure.

Circuit/System Description

The passenger presence system (PPS) module has an ignition 1 voltage input. The PPS continually monitors itself for faults. If the voltage on this circuit falls below a certain threshold, the PPS will set DTC 024. When the PPS detects this DTC within the PPS it will notify the customer of the enable/disable status by turning ON the OFF indicator on the PASSENGER AIR BAG ON/OFF indicators. Then the PPS will communicate to the sensing and diagnostic module (SDM) through a non GMLAN communications circuit that a PPS fault is present. The SDM will then set DTC B0081 indicating a problem within the PPS and will suppress the deployment of the instrument panel (I/P) module and then turn the AIR BAG indicator ON.

Conditions for Running the DTC

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

Conditions for Setting the DTC

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

Action Taken When the DTC Sets

- The PPS will set a DTC, and then communicate with the SDM via non GMLAN circuit.
- The SDM will set DTC B0081.
- The SDM disables the I/P module deployment loop.
- The PPS will turn ON the passenger air bag status OFF indicator.
- The SDM commands the AIR BAG indicator ON via GMLAN 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 PPS will set DTC 024 as a history code only, when the ignition voltage has fallen below 8 volts. This is a normal condition for DTC 024 and it should be diagnosed as a current DTC.

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

SIR Connector End Views

Electrical Information Reference

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

Circuit/System Testing

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

- The PPS module
 - The PPS wiring harness connector
1. Ignition OFF, disconnect the PPS module connector. Refer to PPS replacement in Repairs Instructions for connector location.
 2. Test the PPS ground circuit for an open or high resistance. Verify that an open or high resistance does not exist.
 - If any of the above conditions are found make the appropriate repair.
 3. Test the PPS ignition 1 voltage circuit for a short to ground, an open, or high resistance. Verify that a short to ground, an open, or high resistance does not exist.
 - If any of the above conditions are found make the appropriate repair.
 4. Reconnect all PPS components. Use the scan tool to clear all PPS DTCs. Refer to **Passenger Presence System Flash Code Procedures**. Rezero the PPS, refer to **Passenger Presence System Rezeroing Procedure**. Verify DTC 024 does not exist.
 - If DTC 024 reset replaced the PPS.

Repair Instructions

IMPORTANT: Always perform the Diagnostic Repair Verification after completing the diagnostic procedure.

Control Module References for PPS replacement, setup, and programming**DTC 063****DTC Descriptor****DTC 063**

PPS Out of Calibration

Diagnostic Fault Information

IMPORTANT: Always perform the Diagnostic System Check - Vehicle prior to using this diagnostic procedure.

Circuit/System Description

The passenger presence system (PPS) is used to monitor the weight of an occupant in the front passenger seat. The PPS is calibrated at the seat assembly plant and cannot be recalibrated at a service center and must be replaced. The PPS continuously monitors itself and if the system becomes out of calibration, DTC 063 will be set. When the PPS detects this DTC within the PPS, it will notify the customer of the enable/disable status by turning ON the OFF indicator on the PASSENGER AIR BAG ON/OFF indicators. Then the PPS will communicate to the sensing and diagnostic module (SDM) through a non GMLAN communications circuit that a PPS fault is present. The SDM will then set DTC B0081 indicating a problem within the PPS and will suppress the deployment of the instrument panel (I/P) module and then turn the AIR BAG indicator ON.

Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

Action Taken When the DTC Sets

- The PPS will set a DTC, and then communicate with the SDM via non GMLAN circuit.
- The SDM will set DTC B0081.
- The SDM disables the I/P module deployment loop.
- The PPS will turn ON the passenger air bag status OFF indicator.
- The SDM commands the AIR BAG indicator ON via GMLAN serial data.

Conditions for Clearing the DTC

DTC 063 is an indication that the PPS is out of calibration. You cannot recalibrate the PPS. Replace the PPS after following the instructions in the Circuit/System Testing.

Diagnostic Aids

The presence of current or history DTCs while attempting to rezero the PPS will cause the PPS module to set DTC 063. Verify that all supplemental inflatable restraint (SIR) and PPS DTCs have been cleared before rezeroing the PPS.

Reference Information**Schematic Reference****SIR Schematics****Connector End View Reference****SIR Connector End Views****Electrical Information Reference**

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

Circuit/System Testing

1. Ignition ON, use the scan tool. Use the scan tool to clear all SIR and PPS DTCs. Refer to **Passenger Presence System Flash Code Procedures**. Rezero the PPS, refer to **Passenger Presence System Rezeroing Procedure**. Verify DTC 063 exist.
2. Replace the PPS if DTC 063 reset.

Repair Instructions

IMPORTANT: Always perform the Diagnostic Repair Verification after completing the diagnostic procedure.

Control Module References for PPS replacement, setup, and programming

DTC 064**DTC Descriptor****DTC 064**

Communication/ID Performance

Diagnostic Fault Information

IMPORTANT: Always perform the Diagnostic System Check - Vehicle prior to using this diagnostic procedure.

Circuit/System Description

The passenger presence system (PPS) communicates over a non GMLAN communication circuit to the inflatable restraint sensing and diagnostic module (SDM). When the ignition is turned ON, the PPS module will check to make sure the PPS verification ID matches that stored in the SDM. If the SDM cannot communicate with the PPS, the SDM will set a DTC and request the instrument panel cluster (IPC) to turn the AIR BAG indicator ON. If the SDM can communicate to the PPS but the verification ID does not match, the PPS will set DTC 033 and notify the SDM that a fault has occurred. The SDM will then set DTC B0081 indicating a problem within the PPS and will suppress the deployment of the instrument panel (I/P) module and then turn the AIR BAG indicator ON.

Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

Conditions for Setting the DTC

- The PPS has lost communications with the SDM.
- The PPS verification ID does not match the ID that is stored in the SDM.

Action Taken When the DTC Sets

- The PPS will set a DTC, and then communicate with the SDM via non GMLAN circuit.
- The SDM will set DTC B0081.
- The SDM disables the I/P module deployment loop.
- The PPS will turn ON the passenger air bag status OFF indicator.
- The SDM commands the AIR BAG indicator ON via GMLAN 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 SDM has received an incorrect PPS verification ID. The SDM will continue to request the verification ID from the PPS for 5 seconds. If the SDM does not communicate or receive the correct verification ID from the PPS within 5 seconds, the SDM will set DTC B0081 as current.

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

SIR Connector End Views

Electrical Information Reference

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

Circuit/System Testing

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

- The PPS module
 - The SDM module
 - The PPS wiring harness connector
 - The SDM wiring harness connector
1. Ignition ON, use the scan tool. Go to the PPS menu, then retrieve the DTCs. Refer to **Passenger Presence System Flash Code Procedures**. Verify DTC 064 is set.
 2. Ignition OFF, disconnect the PPS module connector. Refer to PPS replacement in Repair Instructions for connector location.
 3. Remove the SDM connector, refer to SDM replacement in Repair Instructions for connector location.
 4. Test the PPS communication circuit between the SDM and the PPS for a short to ground, a high resistance, or an open. Verify short to ground, a high resistance, or an open exist.
 - If any of the above conditions are found make the appropriate repair.
 5. Replace the PPS.
 6. Use the scan tool to clear all PPS DTCs. Refer to **Passenger Presence System Flash Code Procedures**. Rezero the PPS, refer to **Passenger Presence System Rezeroing Procedure**. Verify DTC 064 does not exist.

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

- If DTC 064 reset replaced the SDM.

Repair Instructions

IMPORTANT: Always perform the Diagnostic Repair Verification after completing the diagnostic procedure.

Control Module References for PPS or SDM replacement, setup, and programming

DTC 065

DTC Descriptor

DTC 065

Sensor Circuit Out of Range

Diagnostic Fault Information

IMPORTANT: Always perform the Diagnostic System Check - Vehicle prior to using this diagnostic procedure.

Circuit/System Description

The passenger presence system (PPS) uses a silicone filled sensor pad located underneath the passenger seat foam cushion and is connected by a hose clamp to a pressure sensor. The weight of the occupant sitting in the front passenger seat is measured as a pressure change within the bladder by the pressure sensor. The pressure sensor is a 3-wire sensor consisting of a power, ground, and signal circuit. The PPS continually monitors itself and if a fault in this circuit occurs, DTC 065 will set. When the PPS detects this DTC within the PPS, it will notify the customer of the enable/disable status by turning ON the OFF indicator on the PASSENGER AIR BAG ON/OFF indicators.

Then the PPS will communicate to the sensing and diagnostic module (SDM) through a non GMLAN communications circuit that a PPS fault is present. The SDM will then set DTC B0081 indicating a problem within the PPS and will suppress the deployment of the instrument panel (I/P) module and then turn the AIR BAG indicator ON.

Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

Conditions for Setting the DTC

- The PPS detects the voltage at the PPS sensor signal is less than 0.05 volt or greater than 4.5 volts for 500 milliseconds.

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

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

Action Taken When the DTC Sets

- The PPS will set a DTC, and then communicate with the SDM via non GMLAN circuit.
- The SDM will set DTC B0081.
- The SDM disables the I/P module deployment loop.
- The PPS will turn ON the passenger air bag status OFF indicator.
- The SDM commands the AIR BAG indicator ON via GMLAN serial data.

Conditions for Clearing the DTC

DTC 063 is an indication that the PPS is out of calibration. You cannot recalibrate the PPS. Replace the PPS after following the instructions in the Circuit/System Testing.

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

SIR Connector End Views

Electrical Information Reference

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

Circuit/System Testing

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

- The PPS module

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

1. Ignition OFF, disconnect the PPS module connector.
2. Test the PPS sensor signal circuit for a short to ground, a high resistance, or an open. Verify that a short to ground, a high resistance, or an open does not exist.
 - If any of the above conditions are found make the appropriate repair.
3. Test the PPS sensor low reference circuit for a short to ground, a short to voltage, a high resistance, or an open. Verify that a short to ground, a short to voltage, a high resistance, or an open does not exist.
 - If any of the above conditions are found make the appropriate repair.
4. Test the PPS sensor 5-volt reference circuit for a short to ground, a short to voltage, a high resistance, or an open. Verify that a short to ground, a short to voltage, a high resistance, or an open does not exist.
 - If any of the above conditions are found make the appropriate repair
5. Ignition ON, engine OFF test the PPS sensor signal circuit with a DMM. Measure the voltage of the PPS sensor circuit harness side and ground. The voltage should read 0.05-4.5 volts.
 - If the voltage is more than 5 volts test the PPS sensor signal circuit for a short to voltage. If the circuit tests good replace the PPS.
6. Reconnect all PPS components. Use the scan tool to clear all PPS DTCs. Refer to **Passenger Presence System Flash Code Procedures**. Rezero the PPS, refer to **Passenger Presence System Rezeroing Procedure**. Verify DTC 065 does not exist.
 - If DTC 065 reset replaced the PPS.

Repair Instructions

IMPORTANT: Always perform the Diagnostic Repair Verification after completing the diagnostic procedure.

Control Module References for PPS replacement, setup, and programming

DTC B0012 OR B0013

DTC Descriptor

DTC B0012 01

Driver Frontal Deployment Loop Stage 1 Short to Battery

DTC B0012 02

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

Driver Frontal Deployment Loop Stage 1 Short to Ground

DTC B0012 04

Driver Frontal Deployment Loop Stage 1 Open Circuit

DTC B0012 0D

Driver Frontal Deployment Loop Stage 1 Resistance Above Threshold

DTC B0012 0E

Driver Frontal Deployment Loop Stage 1 Resistance Below Threshold

DTC B0013 01

Driver Frontal Deployment Loop Stage 2 Short to Battery

DTC B0013 02

Driver Frontal Deployment Loop Stage 2 Short to Ground

DTC B0013 04

Driver Frontal Deployment Loop Stage 2 Open Circuit

DTC B0013 0D

Driver Frontal Deployment Loop Stage 2 Resistance Above Threshold

DTC B0013 0E

Driver Frontal Deployment Loop Stage 2 Resistance Below Threshold

Diagnostic Fault Information

IMPORTANT: Always perform the Diagnostic System Check - Vehicle prior to using this diagnostic procedure.

DTC B0012 or B0013

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Steering Wheel Module Stage 1 High Circuit	B0012 02	B0012 0D	B0012 04	B0012 01	B0012 0E
Steering Wheel Module	B0012 02	B0012 0D	B0012 04	B0012 01	B0012 0E

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

Stage 1 Low Circuit					
Steering Wheel Module Stage 2 High Circuit	B0013 02	B0013 0D	B0013 04	B0013 01	B0013 0E
Steering Wheel Module Stage 2 Low Circuit	B0013 02	B0013 0D	B0013 04	B0013 01	B0013 0E

Circuit/System Description

During a frontal crash of sufficient force the inflatable restraint sensing and diagnostic module (SDM) will allow current to flow through the deployment loop in order to deploy the steering wheel module. The SDM performs continuous diagnostic tests on the deployment loops to check for proper circuit continuity and for shorts to ground or voltage.

There are 2 shorting bars used within the steering wheel module coil connector which will short together both steering wheel module stage 1 high circuit and steering wheel module stage 1 low circuit and both steering wheel module stage 2 high circuit and steering wheel module stage 2 low circuit when the connector is disconnected. This will help to prevent unwanted deployment of the inflator module during servicing.

Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

Conditions for Setting the DTC**B0012 01 Stage 1 or B0013 01 Stage 2**

The steering wheel module high and/or low circuit is short to voltage for 120 milliseconds.

B0012 02 Stage 1 or B0013 02 Stage 2

The steering wheel module high and/or low circuit is short to ground for 120 milliseconds.

B0012 04 Stage 1 or B0013 04 Stage 2

The steering wheel module high and/or low circuit is open for 120 milliseconds.

B0012 0D Stage 1 or B0013 0D Stage 2

The steering wheel module deployment loop resistance is more than 5.1 ohms for 120 milliseconds.

B0012 0E Stage 1 or B0013 0E Stage 2

The steering wheel module deployment loop resistance is less than 1.3 ohms for 120 milliseconds.

Action Taken When the DTC Sets

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

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

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

SIR Connector End Views

Electrical Information Reference

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

Special Tools Required

- **J 38715-A** SIR Driver/Passenger Load Tool. See Special Tools.
- J38715-80 Driver/Passenger Load Tool Adapter
- J38715-120 SIR Load Tool Adapter (Top of Column)
- J38715-140 SIR Load Tool Adapter (Back of Steering Wheel Coil)

Circuit/System Testing

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

- The steering wheel coil module
- The SDM module
- The steering wheel coil module wiring harness connector

• The SDM wiring harness connector

1. Ignition OFF, disconnect steering wheel module. Then use J 38715-120 adapter to connect the **J 38715-A** to the upper steering wheel coil module in-line wiring harness connectors. See **Special Tools**. Use the PASSENGER INFLATOR and STEERING COLUMN connectors located on the load tool.
2. Ignition ON, use a scan tool to observe the SIR DTC display. Verify DTC B0012 or B0013 are set current.
 - If DTC B0012 or B0013 is history replace the steering wheel module.
3. Ignition OFF, remove the steering column trim covers and disconnect the steering wheel coil inline connector located behind the steering wheel module coil. Refer to **Steering Column Trim Covers Replacement**.
4. Use the J 38715-140 adapter to connect the **J 38715-A** to the harness side of the steering wheel module coil connector. See **Special Tools**. Use BASE OF COLUMN and PASSENGER INFLATOR connectors located on the load tool.
5. Ignition ON, use a scan tool to observe the SIR DTC display. Verify DTC B0012 or B0013 are set current.
 - If DTC B0012 or B0013 is history replace the steering wheel coil module.
6. Ignition OFF, disconnect and remove the **J 38715-A** and adapter. See **Special Tools**. Then remove the SDM connector, refer to SDM replacement in Repair Instructions for connector location.
7. Test the high and low circuits between the SDM and steering wheel coil module for a short to voltage, short to ground, or open/low resistance. Verify that a short to voltage, short to ground, or open/low resistance does not exist.
 - If any of the above conditions are found make the appropriate repair.
8. If all circuits test normal then replace the SDM.

Repair Instructions

IMPORTANT: Always perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Inflatable Restraint Steering Wheel Module Coil Replacement**
- **Inflatable Restraint Steering Wheel Module Replacement**
- **Control Module References** for SDM replacement, setup, and programming

DTC B0015

DTC Descriptor

DTC B0015 01

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

Left Front Seat Belt Pretensioner Deployment Loop Short to Battery

DTC B0015 02

Left Front Seat Belt Pretensioner Deployment Loop Short to Ground

DTC B0015 04

Left Front Seat Belt Pretensioner Deployment Loop Open Circuit

DTC B0015 0D

Left Front Seat Belt Pretensioner Deployment Loop Resistance Above Threshold

DTC B0015 0E

Left Front Seat Belt Pretensioner Deployment Loop Resistance Below Threshold

Diagnostic Fault Information

IMPORTANT: Always perform the Diagnostic System Check - Vehicle prior to using this diagnostic procedure.

DTC B0015

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Seat Belt Pretensioner - LF High Circuit	B0015 02	B0015 0D	B0015 04	B0015 01	B0015 0E
Seat Belt Pretensioner - LF Low Circuit	B0015 02	B0015 0D	B0015 04	B0015 01	B0015 0E

Circuit/System Description

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

Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

Conditions for Setting the DTC

B0015 01

The seat belt pretensioner - LF high and/or low circuit is short to voltage for 120 milliseconds.

B0015 02

The seat belt pretensioner - LF high and/or low circuit is short to ground for 120 milliseconds.

B0015 04

The seat belt pretensioner - LF high and/or low circuit is open for 120 milliseconds.

B0015 0D

The seat belt pretensioner - LF deployment loop resistance is more than 3.9 ohms for 120 milliseconds.

B0015 0E

The seat belt pretensioner - LF deployment loop resistance is less than 1.1 ohms for 120 milliseconds.

Action Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Diagnostic Aids

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

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

SIR Connector End Views

Electrical Information Reference

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

Special Tools Required

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

Circuit/System Testing

1. Ignition OFF, disconnect the seat belt retractor pretensioner - LF connector. Then inspect the component and wiring harness sides of the in-line connector for the steering wheel coil module for damage or corrosion. Verify there is no damage or corrosion found.
 - If the connector for the seat belt retractor pretensioner - LF is damaged, the seat belt retractor pretensioner - LF must be replaced.
 - If the seat belt retractor pretensioner - LF wiring harness side connector is damaged, replace the harness side of the connector.
2. Use J 38715-30A adapter to connect the **J 38715-A** SIR Driver/Passenger Load Tool to the harness side of the seat belt retractor pretensioner - LF wiring harness connector. See Special Tools. Use the PASSENGER INFLATOR connector located on the load tool.
3. With the ignition ON, use a scan tool to observe the SIR DTC display. Verify DTC B0015 is set current.
 - If DTC B0015 is history replace the seat belt retractor pretensioner - LF.
4. With the ignition OFF, disconnect and remove both the **J 38715-A** and adapter. See Special Tools. Then remove the SDM connector and inspect the SDM connector for corrosion or damage. Verify there is no damage or corrosion found. Note: Refer to SDM replacement in Control Module References within Computer/Integrating Systems for connector location.
 - If the connector for the SDM is damaged, the SDM must be replaced.
 - If the wiring harness side of the SDM connector is damaged, replace the harness side of the connector.
5. Test the high and low circuits between the SDM and seat belt retractor pretensioner - LF for a short to voltage, short to ground, an open, or low resistance. Verify that a short to voltage, short to ground, or open/low resistance does not exist.

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

- If any of the above conditions are found make the appropriate repair.
- 6. If circuits test good then replace the SDM.

Repair Instructions

IMPORTANT: Always perform the Diagnostic Repair Verification after completing the diagnostic procedure.

- Seat Belt Retractor Pretensioner Replacement - Front
- Control Module References for SDM replacement, setup, and programming.

DTC B0016

DTC Descriptor

DTC B0016 01

Left Roof Rail Deployment Loop Short to Battery

DTC B0016 02

Left Roof Rail Deployment Loop Short to Ground

DTC B0016 04

Left Roof Rail Deployment Loop Open Circuit

DTC B0016 0D

Left Roof Rail Deployment Loop Resistance Above Threshold

DTC B0016 0E

Left Roof Rail Deployment Loop Resistance Below Threshold

Diagnostic Fault Information

IMPORTANT: Always perform the Diagnostic System Check - Vehicle prior to using this diagnostic procedure.

DTC B0016

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Roof Rail Module - Left High Circuit	B0016 02	B0016 0D	B0016 04	B0016 01	B0016 0E

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

Roof Rail Module - Left Low Circuit	B0016 02	B0016 0D	B0016 04	B0016 01	B0016 0E
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Circuit/System Description

During a side or frontal crash of sufficient force the inflatable restraint sensing and diagnostic module (SDM) will allow current to flow through the deployment loop in order to deploy the roof side 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.

A shorting bar used within the roof rail module connector which will short 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.

Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

Conditions for Setting the DTC

B0016 01

The roof rail module - left high and/or low circuit is short to voltage for 120 milliseconds.

B0016 02

The roof rail module - left high and/or low circuit is short to ground for 120 milliseconds.

B0016 04

The roof rail module - left high and/or low circuit is open for 120 milliseconds.

B0016 0D

The roof rail module - left deployment loop resistance is more than 3.9 ohms for 120 milliseconds.

B0016 0E

The roof rail module - left deployment loop resistance is less than 1.1 ohms for 120 milliseconds.

Action Taken When the DTC Sets

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

Conditions for Clearing the DTC

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

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

Diagnostic Aids

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

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

SIR Connector End Views

Electrical Information Reference

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

Special Tools Required

- **J 38715-A** SIR Driver/Passenger Load Tool. See Special Tools.
- J 38715-5 SIR Load Tool Adapter

Circuit/System Testing

1. Ignition OFF, disconnect the roof rail module - left in-line connector. Then inspect the component and wiring harness sides of the in-line connector for the roof rail module - left for damage or corrosion. Verify there is no damage or corrosion found.
 - If the connector for the roof rail module - left is damaged, the roof rail module - left must be replaced.
 - If the wiring harness side of the roof rail module - left connector is damaged, replace the harness side of the connector.
2. Use the J 38715-5 adapter to connect the **J 38715-A** to the harness side of the roof rail module - left in-line connector. See Special Tools. Use the PASSENGER INFLATOR connector located on the load tool.
3. With the ignition ON, use a scan tool to observe the SIR DTC display. Verify DTC B0016 is set in history.

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

- If DTC B0016 is history replace the roof rail module - left.
- 4. With the ignition OFF, disconnect and remove both the **J 38715-A** and adapter. See **Special Tools**. Then remove the SDM connector and inspect the SDM connector for corrosion or damage. Verify there is no damage or corrosion found. Verify there is no damage or corrosion found.

Note: Refer to SDM replacement in Control Module References within Computer/Integrating Systems for connector location.

- If damage or corrosion is found make the appropriate repair.
- 5. Test the high and low circuits between the SDM and roof rail module - left for a short to voltage, short to ground, or open/low resistance.
- 6. If circuits test good then replace the SDM.

Repair Instructions

IMPORTANT: Always perform the Diagnostic Repair Verification after completing the diagnostic procedure.

- **Inflatable Restraint Roof Rail Module Replacement - Front**
- **Control Module References** for SDM replacement, setup, and programming.

DTC B0019 OR B0020

DTC Descriptor

DTC B0019 01

Passenger Frontal Deployment Loop Stage 1 Short to Battery

DTC B0019 02

Passenger Frontal Deployment Loop Stage 1 Short to Ground

DTC B0019 04

Passenger Frontal Deployment Loop Stage 1 Open Circuit

DTC B0019 0D

Passenger Frontal Deployment Loop Stage 1 Resistance Above Threshold

DTC B0019 0E

Passenger Frontal Deployment Loop Stage 1 Resistance Below Threshold

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

DTC B0020 01

Passenger Frontal Deployment Loop Stage 2 Short to Battery

DTC B0020 02

Passenger Frontal Deployment Loop Stage 2 Short to Ground

DTC B0020 04

Passenger Frontal Deployment Loop Stage 2 Open Circuit

DTC B0020 0D

Passenger Frontal Deployment Loop Stage 2 Resistance Above Threshold

DTC B0020 0E

Passenger Frontal Deployment Loop Stage 2 Resistance Below Threshold

Diagnostic Fault Information

IMPORTANT: Always perform the Diagnostic System Check - Vehicle prior to using this diagnostic procedure.

DTC B0019 or B0020

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
I/P Module Stage 1 High Circuit	B0019 02	B001 0D	B0019 04	B0019 01	B0019 0E
I/P Module Stage 1 Low Circuit	B0019 02	B001 0D	B0019 04	B0019 01	B0019 0E
I/P Module Stage 2 High Circuit	B0020 02	B002 0D	B0020 04	B0020 01	B0020 0E
I/P Module Stage 2 Low Circuit	B0020 02	B002 0D	B0020 04	B0020 01	B0020 0E

Circuit/System Description

If a malfunction is detected, a DTC will be stored in non-volatile memory. 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 I/P module. The SDM performs continuous diagnostic tests on the deployment loops to check for proper circuit continuity and for shorts to ground or voltage.

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

There are 2 shorting bars used within the instrument panel (I/P) module connector which will short together both I/P module stage 1 high and low circuits, and both I/P module stage 2 high and low circuits, when the connector is disconnected. This will help to prevent unwanted deployment of the inflator module during servicing.

Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

Conditions for Setting the DTC

B0019 01 Stage 1 or B0020 01 Stage 2

The I/P module high and/or low circuit is short to voltage for 120 milliseconds.

B0019 02 Stage 1 or B0020 02 Stage 2

The I/P module high and/or low circuit is short to ground for 120 milliseconds.

B0019 04 Stage 1 or B0020 04 Stage 2

The I/P module high and/or low circuit is open for 120 milliseconds.

B0019 0D Stage 1 or B0020 0D Stage 2

The I/P module deployment loop resistance is more than 5.1 ohms for 120 milliseconds.

B0019 0E Stage 1 or B0020 0E Stage 2

The I/P module deployment loop resistance is less than 1.3 ohms for 120 milliseconds.

Action Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Diagnostic Aids

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

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

SIR Connector End Views

Electrical Information Reference

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

Special Tools Required

- **J 38715-A** SIR Driver/Passenger Load Tool. See Special Tools.
- EL 38715-160 Driver/Passenger Load Tool Adapter

Circuit/System Testing

1. Ignition OFF, inspect the component and wiring harness sides of the in-line connector for the I/P module for damage or corrosion located above the passenger hinge pillar trim. Verify there is no damage or corrosion found.
 - If the in-line connector for the I/P module is damaged, the I/P module must be replaced.
 - If the I/P module wiring harness side connector is damaged, replace the harness side of the connector.
2. Use EL 38715-160 adapter to connect the **J 38715-A** to the harness side of the I/P module in-line wiring harness connector. See Special Tools. Use the PASSENGER INFLATOR and BASE of COLUMN connectors located on the load tool.
3. With the ignition ON, use a scan tool to observe the SIR DTC display. Verify DTC B0019 or B0020 are set current.
 - If DTC B0019 or B0020 is history replace the I/P module.
4. With the ignition OFF, disconnect and remove the **J 38715-A** and adapter. See Special Tools. Then remove the SDM connector and inspect the SDM connector for corrosion or damage. Verify there is no damage or corrosion found.

Note: Refer to SDM replacement in Control Module References within Computer/Integrating Systems for connector location.

- If the connector for the SDM is damaged, the SDM must be replaced.
- If the wiring harness side of the SDM connector is damaged, replace the harness side of the connector.

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

5. Test the high and low circuits between the SDM and I/P module for a short to voltage, short to ground, an open, or low resistance. Verify that a short to voltage, short to ground, or open/low resistance does not exist.
 - o If any of the above conditions are found make the appropriate repair.
6. If circuits test good then replace the SDM.

Repair Instructions

IMPORTANT: Always perform the Diagnostic Repair Verification after completing the diagnostic procedure.

- **Inflatable Restraint Instrument Panel Module Replacement**
- **Control Module References** for SDM replacement, setup, and programming.

DTC B0022

DTC Descriptor

DTC B0022 01

Right Front Seat Belt Pretensioner Deployment Loop Short to Battery

DTC B0022 02

Right Front Seat Belt Pretensioner Deployment Loop Short to Ground

DTC B0022 04

Right Front Seat Belt Pretensioner Deployment Loop Open Circuit

DTC B0022 0D

Right Front Seat Belt Pretensioner Deployment Loop Resistance Above Threshold

DTC B0022 0E

Right Front Seat Belt Pretensioner Deployment Loop Resistance Below Threshold

Diagnostic Fault Information

IMPORTANT: Always perform the Diagnostic System Check - Vehicle prior to using this diagnostic procedure.

DTC B0022

	Short to	High		Short to	Signal
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2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

Circuit	Ground	Resistance	Open	Voltage	Performance
Seat Belt Pretensioner - RF High Circuit	B0022 02	B0022 0D	B0022 04	B0022 01	B0022 0E
Seat Belt Pretensioner - RF Low Circuit	B0022 02	B0022 0D	B0022 04	B0022 01	B0022 0E

Circuit/System Description

During a side or frontal crash of sufficient force the inflatable restraint sensing and diagnostic module (SDM) will allow current to flow through the deployment loop in order to deploy the seat belt pretensioner - RF. The SDM performs continuous diagnostic tests on the deployment loops to check for proper circuit continuity and for shorts to ground or voltage.

A shorting bar used within the seat belt pretensioner - RF connector which will short together both seat belt pretensioner - RF high and low circuits when the connector is disconnected, this will help to prevent unwanted deployment of the inflator module during servicing.

Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

Conditions for Setting the DTC**B0022 01**

The seat belt pretensioner - RF high and/or low circuit is short to voltage for 120 milliseconds.

B0022 02

The seat belt pretensioner - RF high and/or low circuit is short to ground for 120 milliseconds.

B0022 04

The seat belt pretensioner - RF high and/or low circuit is open for 120 milliseconds.

B0022 0D

The seat belt pretensioner - RF deployment loop resistance is more than 3.9 ohms for 120 milliseconds.

B0022 0E

The seat belt pretensioner - RF deployment loop resistance is less than 1.1 ohms for 120 milliseconds.

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

Action Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Diagnostic Aids

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

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

SIR Connector End Views

Electrical Information Reference

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

Special Tools Required

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

Circuit/System Testing

1. Ignition OFF, disconnect the seat belt retractor pretensioner - RF connector. Then inspect the component and wiring harness sides of the in-line connector for the steering wheel coil module for damage or corrosion. Verify there is no damage or corrosion found.
 - If the connector for the seat belt retractor pretensioner - RF is damaged, the seat belt retractor pretensioner - RF must be replaced.
 - If the seat belt retractor pretensioner - RF wiring harness side connector is

damaged, replace the harness side of the connector.

2. Use the J 38715-30A to connect the **J 38715-A** to the harness side of the seat belt retractor pretensioner - RF wiring harness connector. See **Special Tools**. Use the PASSENGER INFLATOR connector located on the load tool.
3. With the ignition ON, use a scan tool to observe the SIR DTC display. Verify DTC B0022 is set current.
 - If DTC B0022 is history replace the seat belt retractor pretensioner - RF.
4. With the ignition OFF, disconnect and remove both the **J 38715-A** and adapter. See **Special Tools**. Then remove the SDM connector and inspect the SDM connector for corrosion or damage. Verify there is no damage or corrosion found. Note: Refer to SDM replacement in Control Module References within Computer/Integrating Systems for connector location.
 - If the connector for the SDM is damaged, the SDM must be replaced.
 - If the wiring harness side of the SDM connector is damaged, replace the harness side of the connector.
5. Test the high and low circuits between the SDM and seat belt retractor pretensioner - RF for a short to voltage, short to ground, an open, or low resistance. Verify that a short to voltage, short to ground, or open/low resistance does not exist.
 - If any of the above conditions are found make the appropriate repair.
6. If circuits test good then replace the SDM.

Repair Instructions

IMPORTANT: Always perform the Diagnostic Repair Verification after completing the diagnostic procedure.

- Seat Belt Retractor Pretensioner Replacement - Front
- Control Module References for SDM replacement, setup, and programming.

DTC B0023

DTC Descriptor

DTC B0023 01

Right Roof Rail Deployment Loop Short to Battery

DTC B0023 02

Right Roof Rail Deployment Loop Short to Ground

DTC B0023 04

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

Right Roof Rail Deployment Loop Open Circuit

DTC B0023 0D

Right Roof Rail Deployment Loop Resistance Above Threshold

DTC B0023 0E

Right Roof Rail Deployment Loop Resistance Below Threshold

Diagnostic Fault Information

IMPORTANT: Always perform the Diagnostic System Check - Vehicle prior to using this diagnostic procedure.

DTC B0023

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Roof Rail Module - Right High Circuit	B0023 02	B0023 0D	B0023 04	B0023 01	B0023 0E
Roof Rail Module - Right Low Circuit	B0023 02	B0023 0D	B0023 04	B0023 01	B0023 0E

Circuit/System Description

During a side or frontal crash of sufficient force the inflatable restraint sensing and diagnostic module (SDM) will allow current to flow through the deployment loop in order to deploy the roof side 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. A shorting bar used within the roof rail module connector which will short together both 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.

Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

Conditions for Setting the DTC

B0023 01

The roof rail module - right high and/or low circuit is short to voltage for 120 milliseconds.

B0023 02

The roof rail module - right high and/or low circuit is short to ground for 120 milliseconds.

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

B0023 04

The roof rail module - right high and/or low circuit is open for 120 milliseconds.

B0023 0D

The roof rail module - right deployment loop resistance is more than 3.9 ohms for 120 milliseconds.

B0023 0E

The roof rail module - right deployment loop resistance is less than 1.1 ohms for 120 milliseconds.

Action Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Diagnostic Aids

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

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

SIR Connector End Views

Electrical Information Reference

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

Special Tools Required

- **J 38715-A** SIR Driver/Passenger Load tool. See **Special Tools**.
- J 38715-5 SIR Load Tool Adapter

Circuit/System Testing

1. Ignition OFF, disconnect the roof rail module - right in-line connector. Then inspect the component and wiring harness sides of the in-line connector for the roof rail module - right for damage or corrosion. Verify there is no damage or corrosion found.
 - If the connector for the roof rail module - right is damaged, the roof rail module - right must be replaced.
 - If the wiring harness side of the roof rail module - right connector is damaged, replace the harness side of the connector.
2. Use the J 38715-5 adapter to connect the **J 38715-A** to the harness side of the roof rail module - right in-line connector. See **Special Tools**. Use the PASSENGER INFLATOR connector located on the load tool.
3. With the ignition ON, use a scan tool to observe the SIR DTC display. Verify DTC B0023 is set in history.
 - If DTC B0023 is history replace the roof rail module - right.
4. With the ignition OFF, disconnect and remove both the **J 38715-A** and adapter. See **Special Tools**. Then remove the SDM connector and inspect the SDM connector for corrosion or damage. Verify there is no damage or corrosion found. Verify there is no damage or corrosion found.

Note: Refer to SDM replacement in Control Module References within Computer/Integrating Systems for connector location.

- If damage or corrosion is found make the appropriate repair.
5. Test the high and low circuits between the SDM and roof rail module - right for a short to voltage, short to ground, or open/low resistance.
 6. If circuits test good then replace the SDM.

Repair Instructions

IMPORTANT: Always perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Inflatable Restraint Roof Rail Module Replacement - Front**
- **Control Module References** for SDM replacement, setup and programming.

DTC B0052 OR B0053

DTC Descriptors

DTC B0052

Deployment Commanded

DTC B0053

Deployment Commanded with Loop DTCs Present

Diagnostic Fault Information

IMPORTANT: Always perform the Diagnostic System Check - Vehicle prior to using this diagnostic procedure.

Circuit/System 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 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 causing DTC B0052 to set.

Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

Conditions for Setting the DTC

B0052

- The SDM detects a frontal impact of sufficient force to warrant deployment of the frontal modules.
- The SDM detects a side impact of sufficient force to warrant deployment of a side impact module and/or roof rail module.
- The SDM has deployed the seat belt pretensioner for 3 separate deployments.

B0053

SDM commands inflators deployment with loop faults present.

Action Taken When the DTC Sets

- The SDM will only set DTC B0052 or the SDM sets DTC B0053 along with DTC B0052.
- The SDM commands the AIR BAG warning lamp ON via serial data communications.

- The SDM records crash data.

Conditions for Clearing the DTC

DTC B0052 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.

DTC B0052 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.

Diagnostic Aids

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 one frontal or side deployment event. After the maximum number of deployments has occurred, DTC B0052 sets and becomes a latched code, which cannot be cleared.

When DTC B0053 is accompanied by additional DTCs, other than B0052, repair the malfunction causing the other DTCs before replacing SDM.

Reference Information

Electrical Information Reference

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

Circuit/System Testing

1. Ignition OFF, inspect the vehicle for signs of inflator module or pretensioner deployment. Verify that the vehicle does not show any signs of inflator deployment.
 - If the vehicle displays any signs of inflator deployment, refer to **Repairs and Inspections Required After a Collision**.
2. Use a scan tool and observe the SIR DTC display. Refer to **Diagnostic Trouble Code (DTC) List - Vehicle**. The scan tool should indicate DTC B0052 is not set.
 - If DTC B0052 is set, use the scan tool and clear all DTCs. Then recheck for any DTCs. If DTC B0052 does not clear or resets, replace the SDM.

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

Repair Instructions

IMPORTANT: Always perform the Diagnostic Repair Verification after completing the diagnostic procedure.

Control Module References for SDM replacement, setup, and programming

DTC B0081

DTC Descriptors

DTC B0081 3A

Passenger Presence System Incorrect Component Installed

DTC B0081 39

Passenger Presence System Internal Electronic Failure

DTC B0081 71

Passenger Presence System Invalid Serial Data Received

Diagnostic Fault Information

IMPORTANT: Always perform the Diagnostic System Check - Vehicle prior to using this diagnostic procedure.

Circuit/System Description

When the ignition is turned ON, the inflatable restraint sensing and diagnostic module (SDM) performs tests to diagnose critical malfunctions within itself. When the SDM has completed the power-up mode, the SDM will establish communication with the Passenger Presence System (PPS). The PPS will respond by commanding both of the PASSENGER AIR BAG ON/OFF indicators ON for 5 seconds. The SDM will then transmit a request message to the PPS to receive the PPS verification ID. The PPS will transmit the verification ID to the SDM, and the SDM will compare the ID received to data stored in memory. If the data stored in memory does not match the information transmitted by the PPS or the SDM has detects that the PPS has set a current DTC the SDM will then disable the instrument panel (I/P) module deployment loop, set DTC B0081 and command the AIR BAG indicator ON.

Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

Conditions for Setting the DTC

All of the following conditions must exist for 5 seconds:

B0081 3A

- The SDM has received an ID message from the PPS which does not match the ID stored in the SDM memory.
- The SDM has reset the PPS twice without detecting the correct ID message.

B0081 39

- The SDM has received a NOK message from the PPS.
- The SDM has not received a message.

B0081 71

The SDM has received invalid serial data from the PPS.

Action Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Diagnostic Aids

If either the SDM or PPS were replaced verify that the correct part numbers were used for the vehicle application.

Reference Information**Schematic Reference****SIR Schematics****Connector End View Reference****SIR Connector End Views****Electrical Information Reference**

- **Circuit Testing**
- **Connector Repairs**

- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs

Circuit/System Testing

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

- The PPS module
 - The SDM module
 - The PPS wiring harness connector
 - The SDM wiring harness connector
1. Ignition ON, the PPS should turn ON the PPS ON/OFF indicators. Verify the PPS illuminates the PPS ON/OFF indicators.
 - If the Passenger Air Bag ON/OFF status indicator does not illuminate refer to **Passenger Presence System Indicator Circuit Malfunction**.
 2. Ignition ON, use the scan tool. Go to the passenger presence system (PPS) menu, then retrieve the DTCs. Refer to **Diagnostic Trouble Code (DTC) List - Vehicle** . Verify no PPS DTCs are set.
 - If the PPS has any current or history DTCs stored, you must address the PPS DTCs first. Refer to the **Diagnostic Trouble Code (DTC) List - Vehicle** .
 3. Check to see if the PPS was replaced. Verify that the correct PPS was installed into the vehicle.
 - If the wrong PPS was installed then replace the correct PPS.
 4. Ignition OFF, disconnect the PPS module connector. Refer to PPS replacement in Repair Instructions for connector location.
 5. Remove the SDM connector. Refer to SDM replacement in Repair Instructions for connector location.
 6. Test the occupant sensor serial data circuit for an open or high resistance between the PPS and SDM connector. Verify no open or high resistance exists.
 - If any of the above conditions are found make the appropriate repair.
 7. Test the PPS ignition 1 voltage circuit for a short to ground, a high resistance, or an open. Verify no short to ground, a high resistance, or an open exists.
 - If any of the above conditions are found make the appropriate repair.
 8. Replace the PPS.
 9. Ignition ON, use the scan tool to clear the DTCs then recheck for DTC B0081. Verify that the DTC does not reset.

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

- If DTC B0081 resets, then replace the SDM.

Repair Instructions

IMPORTANT: Always perform the Diagnostic Repair Verification after completing the diagnostic procedure.

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

DTC B0083

DTC Descriptor

DTC B0083 01

Front End Sensor 1 Short to Battery

DTC B0083 02

Front End Sensor 1 Short to Ground

DTC B0083 04

Front End Sensor 1 Open Circuit

DTC B0083 39

Front End Sensor 1 Internal Electronic Failure

DTC B0083 0F

Front End Sensor 1 Incorrect Component Installed

DTC B0083 3A

Front End Sensor 1 Invalid Serial Data Received

Diagnostic Fault Information

IMPORTANT: Always perform the Diagnostic System Check - Vehicle prior to using this diagnostic procedure.

DTC B0083

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Front End Sensor 1 Signal					

2006 Chevrolet HHR LT**2006 RESTRAINTS SIR - HHR**

Circuit	-	-	B0083 04	-	-
Front End Sensor 1 Voltage Circuit	B0083 02	B0083 02	B0083 04	B0083 01	B0083 02

Circuit/System Description

The inflatable restraint front end sensor utilizes a unidirectional 2-wire circuit. The front end sensor 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 front end sensor. When the ignition is turned on and input power from the SDM is first detected, the front end sensor 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 front end sensor continually communicates status messages to the SDM, which determines if a fault is present in the front end sensor circuit. When a fault is detected, the SDM may reset the front end sensor up to two times 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 voltage is between 9-16 volts.

Conditions for Setting the DTC

All of the following conditions exist for 2.5 seconds:

B0083 01

- The front end sensor has been shorted to voltage.
- The SDM has not received a message from the front end sensor for more than 375 milliseconds.

B0083 02

- The front end sensor has been shorted to ground.
- The front end sensor current has been above 23 mA for longer than 5 milliseconds.

B0083 04

The front end sensor circuit is open.

B0083 39

- The SDM has received a NOK message from the front end sensor.
- The SDM has not received a message.

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

B0083 71

The SDM has received invalid serial data from the front end sensor.

B0083 0F

The SDM has received erratic messages from the front end sensor.

B0083 3A

- The SDM has received an ID message from the front end sensor, which does not match the ID stored in the SDM memory.
- The SDM has reset the front end sensor twice without detecting the correct ID message.

Action Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

SIR Connector End Views

Electrical Information Reference

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

Circuit/System Testing

IMPORTANT: When removing connectors inspect for damage or corrosion. Damage or corrosion in the following requires

repair or replacement of the affected component/connector.

- **The front end sensor**
- **The SDM module**
- **The front end sensor wiring harness connector**
- **The SDM wiring harness connector**

1. Ignition OFF, disconnect the front end sensor connector. Refer to front end sensor replacement in Repair Instructions for location of connector.
2. Remove the SDM connector. Refer to SDM replacement in Repair Instructions for connector location.
3. Test the signal and voltage circuits between the SDM and front end sensor for a short to voltage, short to ground, or open/low resistance. Verify that a short to voltage, short to ground, or open/low resistance does not exist.
 - If any of the above conditions are found make the appropriate repair.
4. Reconnect all SIR components. Ignition ON, use the scan tool to clear the DTCs then recheck for DTCs to be set in history.
 - If DTC B0083 was current replace the front end sensor. After replacement refer to Repair Verification.

Repair Instructions

IMPORTANT: Always perform the Diagnostic Repair Verification after completing the diagnostic procedure.

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

Repair Verification

Ignition ON, use the scan tool to clear the DTCs then recheck for DTCs to be cleared.

- If DTC B0083 appear current replace the SDM.

DTC B0085 OR B0086

DTC Descriptors

DTC B0085 01

Left Front Side Impact Sensor Short to Battery

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

DTC B0085 02

Left Front Side Impact Sensor Short to Ground

DTC B0085 04

Left Front Side Impact Sensor Open Circuit

DTC B0085 39

Left Front Side Impact Sensor Internal Electronic Failure

DTC B0085 0F

Left Front Side Impact Sensor Incorrect Component Installed

DTC B0085 3A

Left Front Side Impact Sensor Invalid Serial Data Received

DTC B0086 01

Right Front Side Impact Sensor Short to Battery

DTC B0086 02

Right Front Side Impact Sensor Short to Ground

DTC B0086 04

Right Front Side Impact Sensor Open Circuit

DTC B0086 39

Right Front Side Impact Sensor Internal Electronic Failure

DTC B0086 0F

Right Front Side Impact Sensor Incorrect Component Installed

DTC B0086 3A

Right Front Side Impact Sensor Invalid Serial Data Received

Diagnostic Fault Information

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

IMPORTANT: Always perform the Diagnostic System Check - Vehicle prior to using this diagnostic procedure.

DTC B0085 or B0086

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Side Impact Sensor LF Signal Circuit	-	-	B0085 04	-	-
Side Impact Sensor LF Voltage Circuit	B0085 02	B0085 02	B0085 04	B0085 01	B0085 02
Side Impact Sensor RF Signal Circuit	-	-	B0086 04	-	-
Side Impact Sensor RF Voltage Circuit	B0086 02	B0086 02	B0086 04	B0086 01	B0086 02

Circuit/System 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 DTC.

Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

Conditions for Setting the DTC

All of the following conditions exist for 2.5 seconds:

B0085 01 or B0086 01

- The SIS has been shorted to voltage.
- The SDM has not received a message from the SIS for more than 375 milliseconds.

B0085 02 or B0086 02

- The SIS has been shorted to ground.

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

- The SIS current has been above 23 mA for longer than 5 milliseconds.

B0085 04 or B0086 04

The SIS circuit is open.

B0085 39 or B0086 39

- The SDM has received a NOK message from the SIS.
- The SDM has not received a message.

B0085 71 or B0086 71

The SDM has received invalid serial data from the SIS.

B0085 0F or B0086 0F

The SDM has received erratic messages from the SIS.

B0085 3A or B0086 3A

- 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 the correct ID message.

Action Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

SIR Connector End Views

Electrical Information Reference

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

Circuit/System Testing

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

- The SIS
 - The SDM module
 - The SIS wiring harness connector
 - The SDM wiring harness connector
1. Ignition OFF, if DTC B0085 is current, disconnect the LF SIS connector. If DTC B0086 is current, disconnect the RF SIS connector. Refer to SIS replacement in Repair Instructions for location of connector.
 2. Remove the SDM connector. Refer to SDM replacement in Repair Instructions for location of connector.
 3. Test the signal and voltage circuits between the SDM and SIS for a short to voltage, short to ground, or open/low resistance. Verify that a short to voltage, short to ground, or open/low resistance does not exist.
 - If any of the above conditions are found, make the appropriate repair.
 4. Reconnect all SIR components, then ignition ON use the scan tool to clear the DTCs then recheck for DTCs.
 - If DTC B0085 was current, replace the LF SIS. If DTC B0086 was current, replace the RF SIS. After replacement, refer to Repair Verification.

Repair Instructions

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

Repair Verification

Ignition ON, use the scan tool to clear the DTCs then recheck for DTCs.

- If DTC B0085 or B0086 was current, replace the SDM.

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

DTC B1001

DTC Descriptor

DTC B1001 00

SDM Option Configuration Error

Diagnostic Fault Information

IMPORTANT: Always perform the Diagnostic System Check - Vehicle prior to using this diagnostic procedure.

Circuit/System Description

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

Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

Conditions for Setting the DTC

B1001 00

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

Action Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Diagnostic Aids

This DTC is an indication that an incorrect SDM is installed in the vehicle, or that the SDM

and/or the BCM was replaced without reprogramming the BCM with the new information.

Reference Information

Electrical Information Reference

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

Circuit/System Testing

1. Ignition ON, use the scan tool to request SIR DTCs. Verify that DTC B1001 is set as current.
 - If DTC B1001 is history, clear codes and recheck.
2. Using the scan tool check the BCM that is programmed with the VIN. Verify that the BCM is programmed with the correct VIN number with the vehicle VIN plate.
 - If the BCM has the wrong VIN number refer to BCM in Repairs Instructions for programming.
3. Using the scan tool perform the Setup SDM Part Number into BCM procedure. Refer to SDM in Repairs Instructions for programming.
4. Ignition ON use the scan tool to clear the DTCs. Verify that DTC B1001 is cleared.
 - If DTC B1001 was current replace the SDM.

Repair Instructions

IMPORTANT: Always perform the Diagnostic Repair Verification after completing the diagnostic procedure.

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

DTC B1019

DTC Descriptor

DTC B1019 00

System Configuration Error

Diagnostic Fault Information

IMPORTANT: Always perform the Diagnostic System Check - Vehicle prior to using this diagnostic procedure.

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

Circuit/System Description

The inflatable restraint sensing and diagnostic module (SDM) runs continuous diagnostic tests on the restraints system. When the ignition is turned ON, the SDM will check to see if the correct components are installed for the vehicle configuration. If the SDM detects that there are too few or too many components on the system, DTC B1019 will set.

Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

Conditions for Setting the DTC

- The SDM was programmed with the wrong options for the vehicle.
- The wrong SDM was installed for the content of the vehicle.

Action Taken When the DTC Sets

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

Conditions for Clearing the DTC

- The correct SDM must be installed.
- The correct components must be installed.

Diagnostic Aids

If the SDM has been replaced, make sure that the correct part number was installed for this vehicle.

Reference Information

Electrical Information Reference

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

Circuit/System Testing

1. Ignition ON, use the scan tool to request SIR DTCs. Verify that DTC B1019 is set as current.
 - If DTC B1019 is history, clear codes and recheck.
2. Using the scan tool, check the BCM that is programmed with the VIN. Verify that the

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

BCM is programmed with the correct VIN number with the vehicle VIN plate.

- If the BCM has the wrong VIN number, refer to BCM in Repairs Instructions for programming.
- 3. Using the scan tool, perform the Setup SDM Part Number into BCM procedure. Refer to SDM in Repairs Instructions for programming.
- 4. Ignition ON, use the scan tool to clear the DTCs then cycle the ignition OFF then back ON. Verify that DTC B1019 is cleared.
 - If DTC B1019 was current, replace the SDM.

Repair Instructions

IMPORTANT: Always perform the Diagnostic Repair Verification after completing the diagnostic procedure.

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

DTC B1370

DTC Descriptor

DTC B1370 01

Device Ignition 1 Circuit Short to Battery

DTC B1370 06

Device Ignition 1 Circuit Short to Ground or Open

Diagnostic Fault Information

IMPORTANT: Always perform the Diagnostic System Check - Vehicle prior to using this diagnostic procedure.

DTC B1370

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Ignition 1 Circuit	B1370 06	-	B1370 06	B1370 01	B1370 06

Circuit/System Description

The inflatable restraint sensing and diagnostic module (SDM) monitors the ignition 1 signal from the ignition switch. When the vehicle ignition switch is placed in the RUN or CRANK position the switch supplies voltage to the SDM ignition 1 input terminal. If an open, short to voltage, or short to ground in this SDM ignition 1 circuit is detected then DTC B1370 will set.

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

Conditions for Setting the DTC

The following conditions exist for at least 10 seconds:

B1370 01

The SDM detects a short to battery in the ignition 1 voltage circuit when the switch is in the OFF position.

B1370 06

The SDM detects a short to ground or an open in the ignition 1 voltage circuit when the ignition switch is in RUN or CRANK.

Action Taken When the DTC Sets

- The SDM commands the AIR BAG indicator ON via GMLAN serial data.
- The SDM stores DTC to memory.
- The SDM determines its power mode only from the GMLAN power mode messages and discards the ignition 1 input for the remainder of the ignition cycle.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the module ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Diagnostic Aids

A history DTC may be caused by an intermittent short or open in the ignition 1 circuit.

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

SIR Connector End Views

Electrical Information Reference

- Circuit Testing

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

Circuit/System Testing

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

- The SDM module
 - The SDM wiring harness connector
1. Ignition ON, use the scan tool checks for DTCs. Verify that DTC P2535 in the BCM does not set.
 - If DTC P2535 is current go to **DTC P2535**.
 2. Ignition OFF, remove the Air Bag fuse from the BCM fuse center. Ignition ON, engine OFF test the voltage side of the Air Bag fuse with a DMM. Measure the voltage of the Air Bag fuse voltage side and ground. The voltage should read 9.0-16.0 volts.
 - If the voltage is less than 9.0-16.0 volts refer to **DTC B1370**.
 3. Remove the SDM connector. Refer to SDM replacement in Repair Instructions for connector location.
 4. With the Air Bag fuse removed, test the ignition 1 voltage circuit between the BCM fuse center and the SDM for a short to voltage or an open. Verify that a short to voltage or an open does not exist.
 - If any of the above conditions are found make the appropriate repair.
 5. If all circuits test normal then replace the SDM.

Repair Instructions

IMPORTANT: Always perform the Diagnostic Repair Verification after completing the diagnostic procedure.

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

PASSENGER PRESENCE SYSTEM REZEROING PROCEDURE

Introduction

The Inflatable Restraints Passenger Presence System (PPS) is a calibrated system that requires rezeroing anytime the seat cushion trim attachments have been removed or the PPS has been replaced. The procedures below are designed to assist in the rezeroing of the PPS.

Before you start, read these procedures carefully and completely. For further information regarding the PPS refer to **SIR System Description and Operation**.

IMPORTANT: The following procedures must be followed:

1. Read this procedure carefully and completely.
2. The PPS will not function properly if the PPS rezeroing procedure is not performed.
3. Perform the **Diagnostic System Check - Vehicle** after successfully completing the rezeroing procedure to ensure the system is functioning properly.

Passenger Presence System (PPS) Rezeroing Procedure

IMPORTANT: Before rezeroing the PPS, the front passenger seat must be completely empty of all items. The presence of any items on the front passenger seat will affect the calibration and operation of the PPS.

IMPORTANT: When rezeroing the PPS, the instrument panel cluster (IPC), and Passenger Air Bag ON/OFF indicator will begin dimming ON and OFF. This is normal operation during the rezeroing procedure and does not indicate additional system faults.

1. Empty the front outboard passenger seat.
2. Verify that all SIR and PPS components, connectors, and connector position assurances (CPAs) are properly connected and mounted.
3. Install a scan tool.
4. Turn ON the ignition, with the engine OFF.

IMPORTANT: All SIR and PPS DTCs must be cleared before rezeroing the PPS. The presence of current or history DTCs will prevent the PPS from rezeroing and may set additional DTCs.

5. Use the scan tool in order to clear the SIR and PPS DTCs.
6. With a scan tool, request the PPS rezeroing procedure.
7. Initiate the PPS rezeroing procedure. The PPS will illuminate both PASSENGER AIR BAG ON and OFF indicators until the rezeroing procedure has been completed.
 - When the rezeroing procedure has been successfully completed, the PPS will display the current system status.
 - If the rezeroing procedure was unsuccessful, both PASSENGER AIR BAG ON and OFF indicators will alternate from no illumination to full illumination in 1

second intervals for 5 seconds. The PPS will treat an unsuccessful rezero attempt as a system fault.

8. If the rezeroing procedure was unsuccessful, repeat this procedure. Due to the communication status between the SDM and the PPS module, this procedure may have to be repeated until a successful rezero attempt has been achieved.
9. After the PPS has been successfully rezeroed, perform the **Diagnostic System Check - Vehicle**.

SYMPTOMS - SIR

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

1. Perform **Diagnostic System Check - Vehicle** in Vehicle DTC Information, before using the symptom tables in order to verify that all of the following are true:
 - There are no DTCs set.
 - The inflatable restraint sensing and diagnostic module (SDM) can communicate via the serial data link.
2. Review the SIR system description and operation in order to familiarize yourself with the system functions. Refer to **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.
- Refer to **Passenger Presence System Indicator Circuit Malfunction** in order to diagnose the symptom.

AIR BAG INDICATOR CIRCUIT MALFUNCTION

Diagnostic Fault Information

IMPORTANT: Always perform the Diagnostic System Check - Vehicle prior to

using this diagnostic procedure.

Circuit/System Description

When the ignition is turned ON, the instrument panel cluster (IPC) flashes the AIR BAG indicator 7 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 serial data communications. If the ignition 1 voltage is outside of the normal operating voltage range 9-16 volts, the SDM will command the IPC to turn the AIR BAG indicator ON with no DTCs present then disables all deployment loops.

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

SIR Connector End Views

Diagnostic Aids

A DTC B1370 may set if the ignition 1 circuit is outside the 9-16 volts range.

Circuit/System Testing

1. Ignition ON, use the scan tool to request the SIR data list display. Observe the Battery Voltage Parameter. The battery voltage on the scan tool should read 9-16 volts.
 - o If the voltage is less than 9 volts, refer to **Diagnostic System Check - Vehicle**.
2. Ignition ON, monitor the IPC. The SIR warning indicator should flash then turn OFF. Verify that the SIR warning indicator flash and then turn OFF.
 - o If the SIR warning indicator continually flash then replace the SDM.
3. Using the scan tool, go to Body and Accessories, then go onward to Special Functions to Instrument Panel Cluster, and then go to Display Test. In the Display Test mode you can turn ON or OFF all the instrument panel indicators when commanded ON. Commanded the IPC indicators ON. The Air Bag indicator should turn ON.
 - o If the Air Bag indicator does not turn ON, replace the IPC.

Note: The AIR BAG warning indicator is not serviceable separately. The IPC must be serviced/replaced as a complete unit.

4. If the scan tool commands the Air Bag indicator ON and OFF, replace the SDM.

Repair Instructions

IMPORTANT: Always perform the Diagnostic Repair Verification after completing the diagnostic procedure.

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

PASSENGER PRESENCE SYSTEM INDICATOR CIRCUIT MALFUNCTION

Diagnostic Fault Information

IMPORTANT: Always perform the Diagnostic System Check - Vehicle prior to using this diagnostic procedure.

Circuit/System Description

The PASSENGER AIR BAG ON/OFF indicators are used to notify the driver when the Passenger Presence System (PPS) has enabled or disabled the instrument panel (I/P) inflator module. When the ignition is turned ON, the PPS module is supplied with voltage and commands both PASSENGER AIR BAG ON/OFF indicators ON for 5 seconds; then the PPS module conducts tests on the PPS components and circuits while both PASSENGER AIR BAG ON/OFF indicators are ON. If no malfunctions are detected, the PPS module will turn the PASSENGER AIR BAG indicator ON or OFF, depending on the status of the PPS. If a malfunction is detected, the PPS module will store a diagnostic trouble code (DTC), default the PPS to the OFF state, and communicate with the SDM that a DTC has been set. The SDM will request the instrument panel cluster (IPC) to turn the AIR BAG indicator ON to notify the driver of a PPS malfunction.

Diagnostic Aids

A history DTC maybe caused by an intermittent short or open in the ignition 1 circuit for the passenger AIR BAG ON/OFF indicator.

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

SIR Connector End Views

Electrical Information Reference

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

- **Wiring Repairs**

Circuit/System Testing

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

- The Passenger AIR BAG ON/OFF indicator
 - The PPS module
 - The Passenger AIR BAG ON/OFF indicator wiring harness connector
 - The PPS wiring harness connector
1. Ignition OFF, disconnect the PPS module connector located under the passenger seat.
 2. Disconnect the Passenger AIR BAG ON/OFF Indicator connector.
 3. Test the Passenger AIR BAG ON/OFF indicator ignition 1 voltage circuit for a short to ground, a high resistance, or an open. Verify that a short to ground, a high resistance, or an open does not exist.
 - If any of the above conditions are found make the appropriate repair.
 4. Test both ON and OFF indicator control circuits between the Passenger AIR BAG ON/OFF indicator and the PPS for a short to voltage, high resistance, or an open. Verify that a short to voltage, a high resistance, or an open does not exist.
 - If any of the above conditions are found make the appropriate repair.
 5. Reconnect the PPS connector then turn the ignition ON, engine OFF. Then connect a test lamp between the ignition 1 voltage circuit and Passenger Air Bag OFF indicator control circuit on the Passenger AIR BAG ON/OFF indicator connector. With the passenger front seat empty verify the test lamp illuminate.
 - If test lamp does not illuminate replace the PPS.
 - If test lamp illuminate replace the Passenger AIR BAG ON/OFF Indicator.

Repair Instructions

IMPORTANT: Always perform the Diagnostic Repair Verification after completing the diagnostic procedure.

- **Indicator Replacement - Inflatable Restraint IP Module**
- **Control Module References** for PPS replacement, setup, and programming

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.

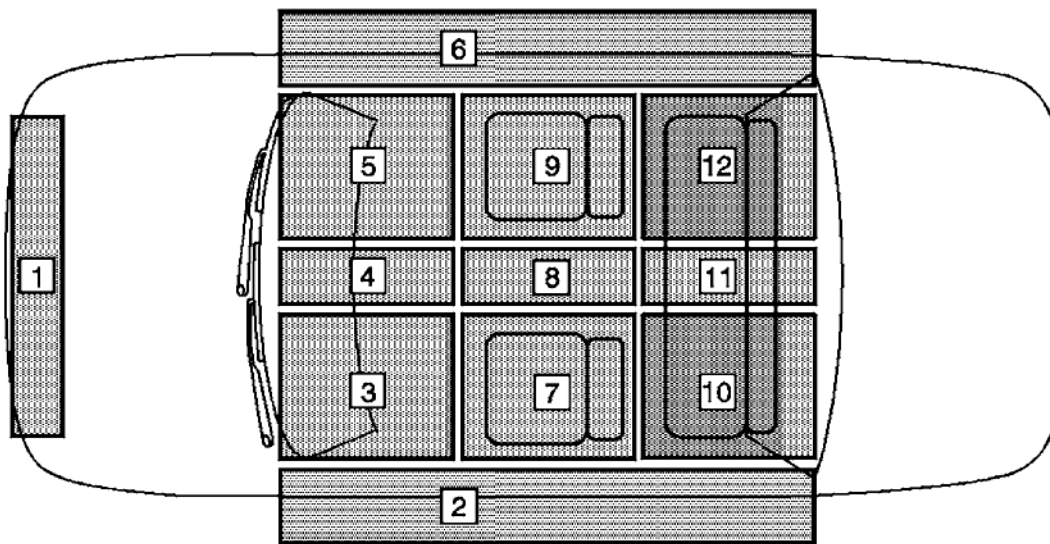


Fig. 33: Identifying SIR Disabling and Enabling Zones
Courtesy of GENERAL MOTORS CORP.

SIR Disabling and Enabling Zones

Zone	Description
1	Inflatable Restraint Front End Sensor-Refer to <u>SIR Disabling and Enabling Zone 1</u> .
2	Inflatable Restraint Roof Rail Module - Left, Seat Belt Retractor Pretensioner - LF, and the Side Impact Sensor (SIS) - Left- Refer to <u>SIR Disabling and Enabling Zone 2</u> .
3	Inflatable Restraint Steering Wheel Module and Coil-Refer to <u>SIR Disabling and Enabling Zone 3</u> .
4	Not Used

5	Inflatable Restraint I/P Module-Refer to <u>SIR Disabling and Enabling Zone 5.</u>
6	Inflatable Restraint Roof Rail Module - Right, Seat Belt Retractor Pretensioner - RF, and Side Impact Sensor (SIS) - Right- Refer to <u>SIR Disabling and Enabling Zone 6.</u>
7	Not Used
8	Inflatable Restraint Sensing and Diagnostic Module (SDM)-Refer to <u>SIR Disabling and Enabling Zone 8.</u>
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 handle the inflatable restraint vehicle rollover sensor when connected to vehicle power.
- Do not expose inflator modules to temperatures above 65°C (150°F).
- Verify the correct replacement part number. Do not substitute a component from a different vehicle.
- Use only original GM replacement parts available from your authorized GM dealer. Do not use salvaged parts for repairs to the SIR system.

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

or greater:

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

SIR DISABLING AND ENABLING ZONE 1

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 (BCM) fuse center then remove fuse center cover.

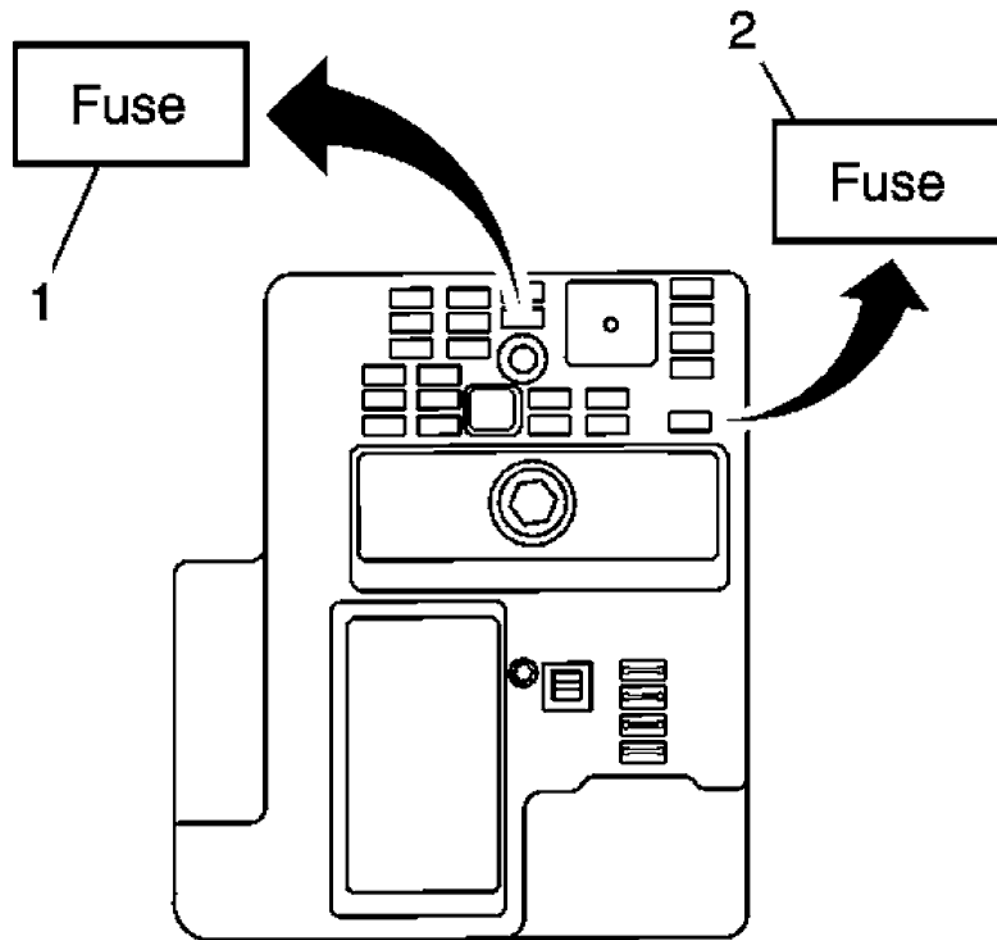


Fig. 34: BCM Fuse Center

Courtesy of GENERAL MOTORS CORP.

IMPORTANT: This inflatable restraint sensing and diagnostic module (SDM) has 2 fused power inputs. To ensure there is no unwanted SIR deployment, personal injury, or unnecessary SIR system repairs, remove both AIR BAG and SDM fuses from the BCM fuse center. With the AIR BAG fuses 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 (1) and SDM (2) fuses from the BCM fuse center.

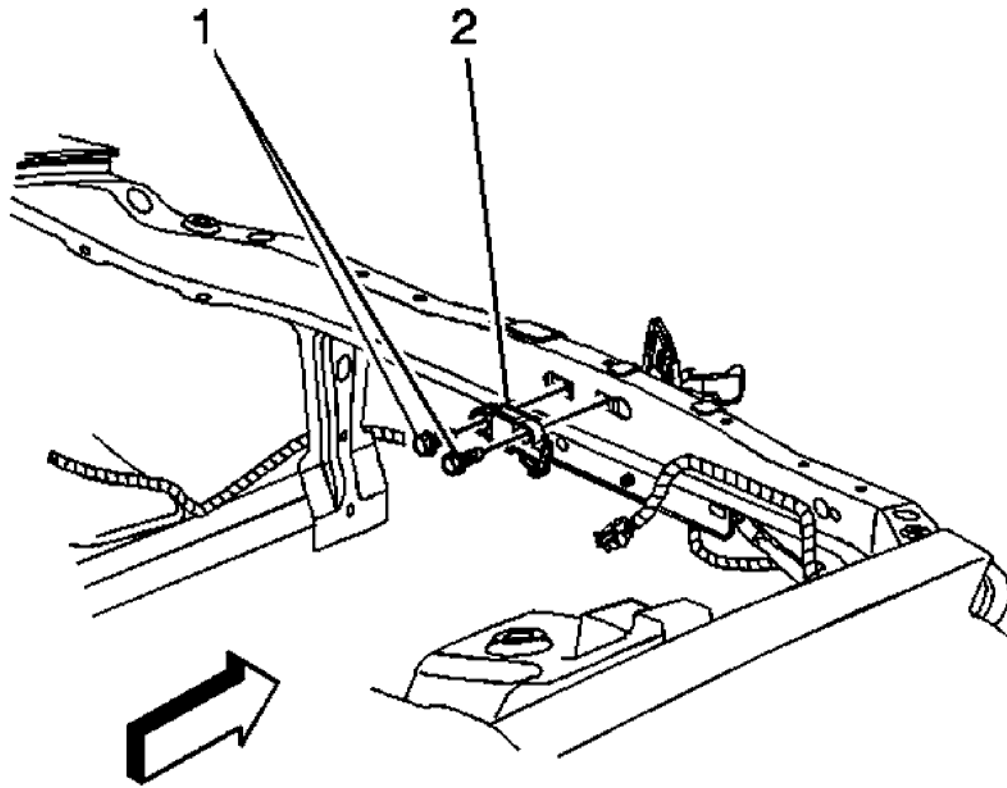


Fig. 35: EFS & Connector
Courtesy of GENERAL MOTORS CORP.

6. Open front hood, and locate the front end sensor (2).
7. Remove the connector position assurance (CPA) from the front end sensor connector.
8. Remove the front end sensor connector from the front end sensor (2).

Enabling Procedure

1. Remove the key from the ignition switch.

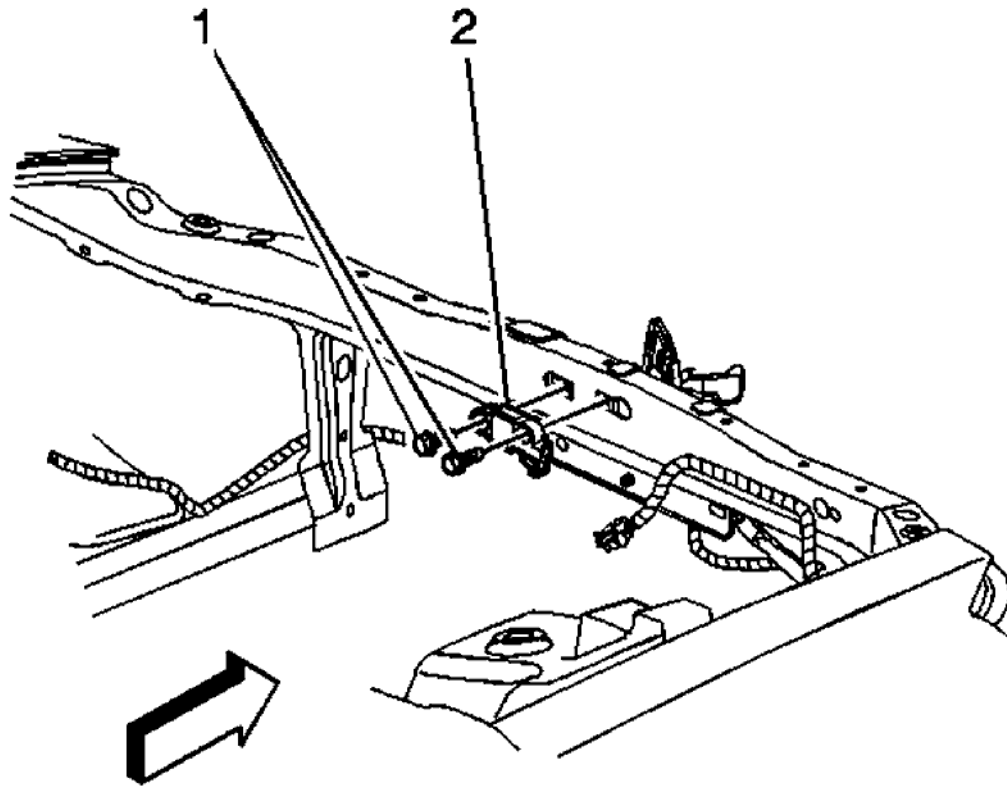


Fig. 36: EFS & Connector

Courtesy of GENERAL MOTORS CORP.

2. Connect the front end sensor connector to the front end sensor (2).
3. Connect the CPA to the front end sensor connector.

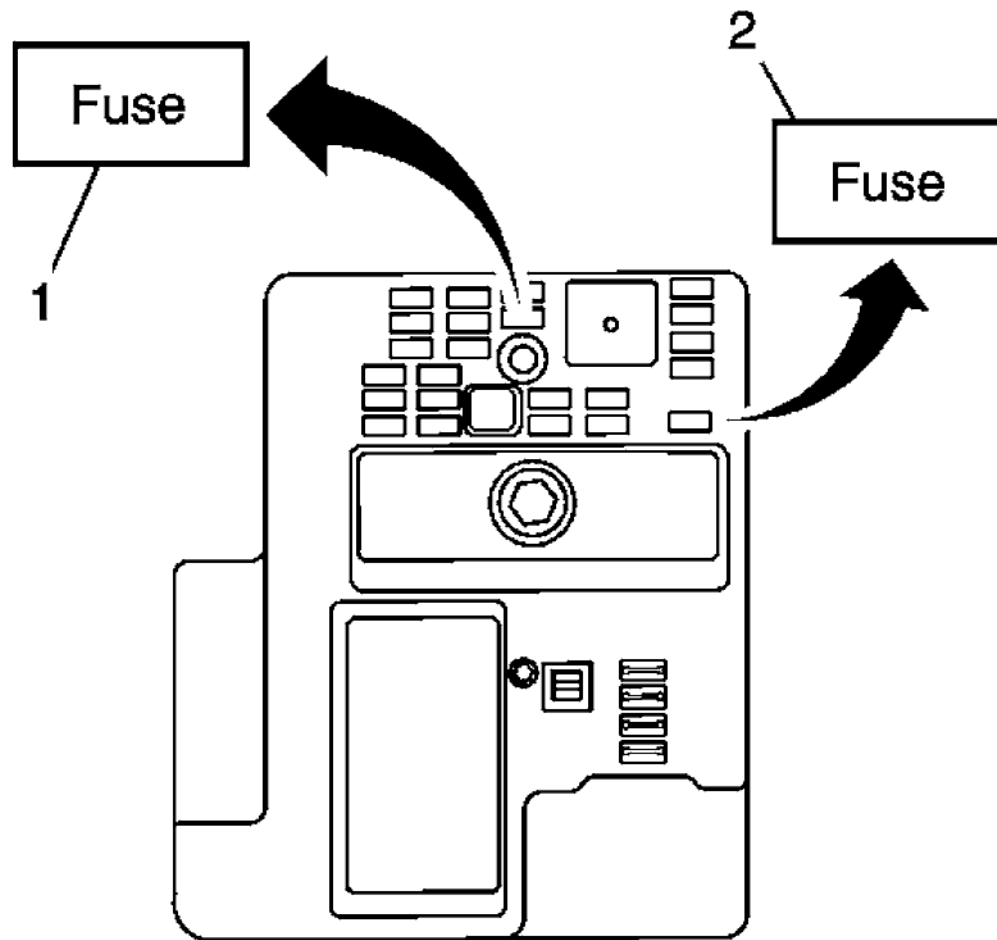


Fig. 37: BCM Fuse Center

Courtesy of GENERAL MOTORS CORP.

4. Install the AIR BAG (1) and SDM (2) fuses into the BCM fuse center.
5. Install the BCM 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 Diagnostic System Check - Vehicle if the AIR BAG warning indicator does not operate as described. Refer to **Diagnostic System Check - Vehicle**.

SIR DISABLING AND ENABLING ZONE 2

Disabling Procedure

IMPORTANT: Refer to SIR Disabling and Enabling Zones before disabling the SIR system.

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 (BCM) fuse center then remove fuse center cover.

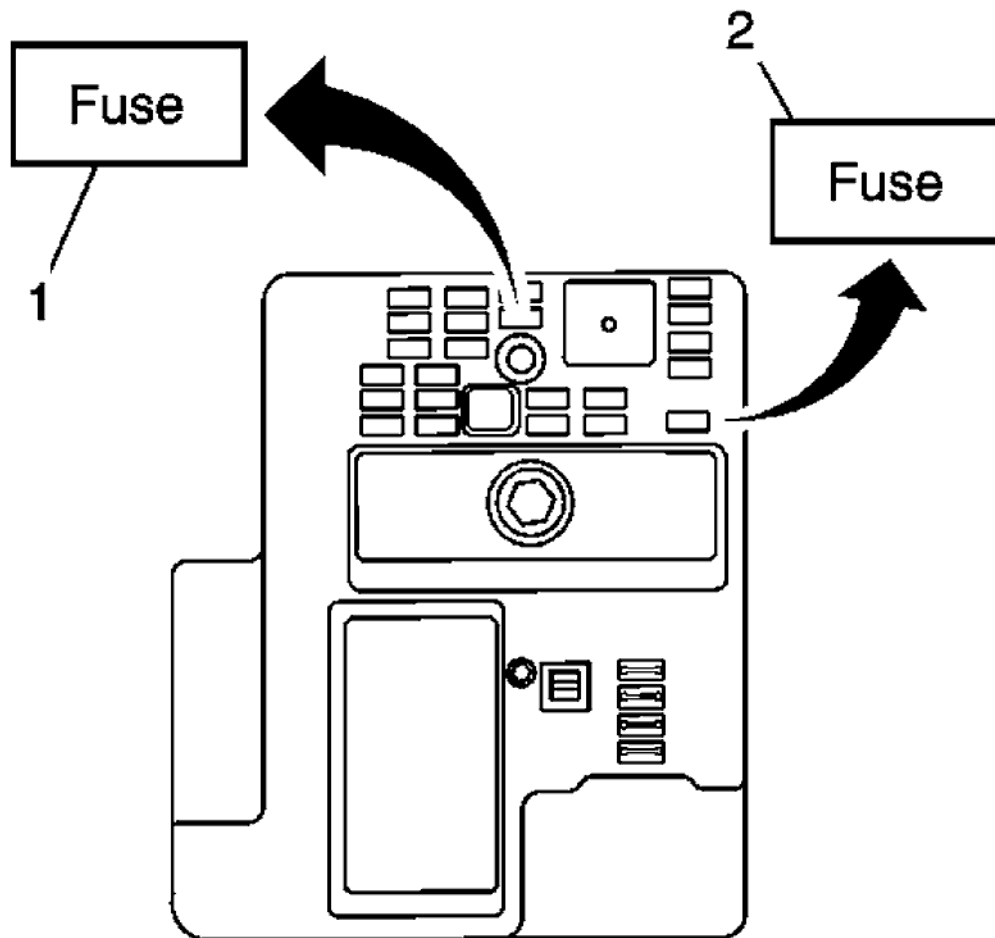


Fig. 38: BCM Fuse Center
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: This inflatable restraint sensing and diagnostic module (SDM) has 2 fused power inputs. To ensure there is no unwanted SIR deployment, personal injury, or

unnecessary SIR system repairs, remove both AIR BAG and SDM fuses from the BCM fuse center. With the AIR BAG fuses 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 AIRBAG (1) and SDM (2) fuses from the BCM fuse center.

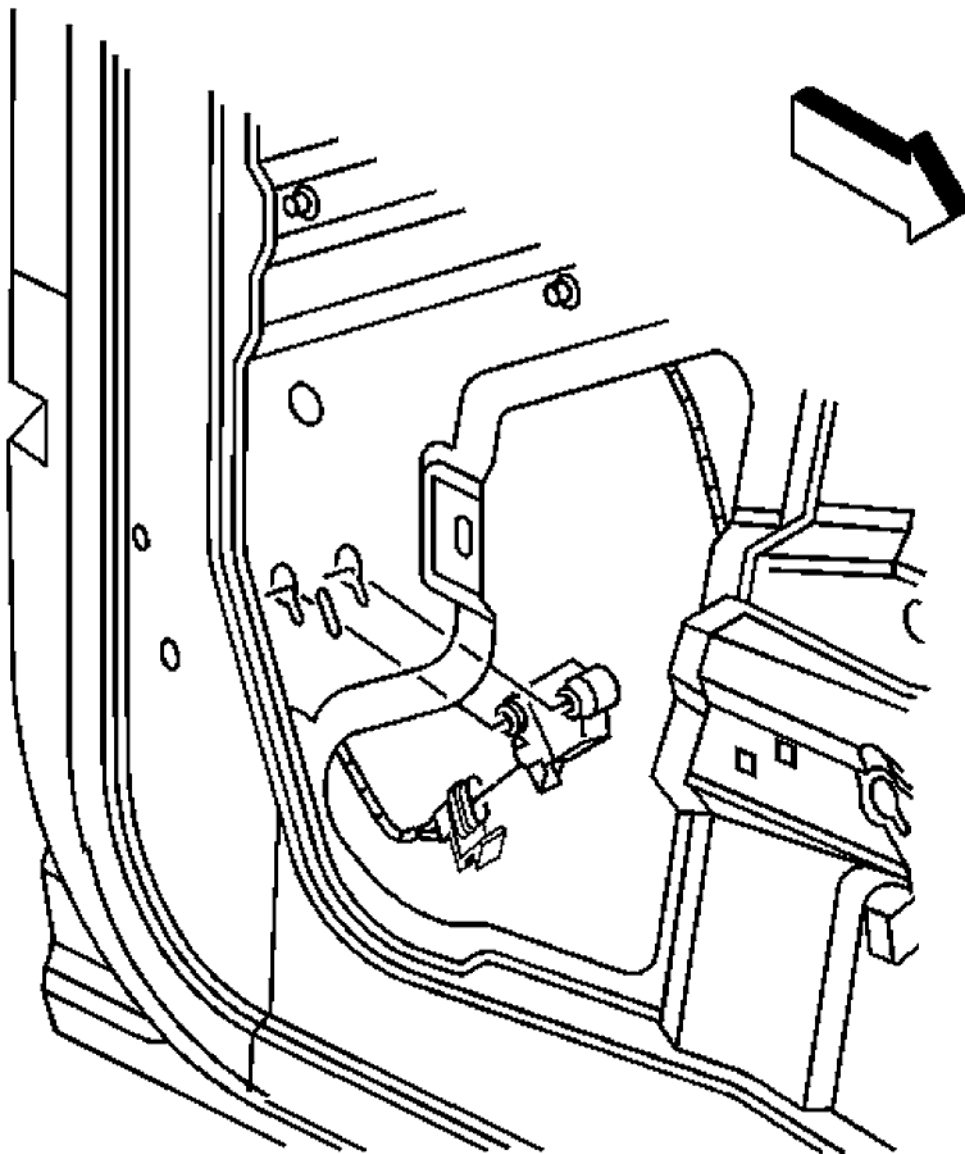


Fig. 39: View Of Inflatable Restraint Side Impact Sensor Electrical Connector
Courtesy of GENERAL MOTORS CORP.

6. Remove the LH door trim panel. Refer to Trim Panel Replacement - Side Front Door.
7. Peel back the door water deflector far enough to access the side impact sensor (SIS).
8. Remove the connector position assurance (CPA) from the SIS connector.
9. Disconnect the SIS connector from the SIS.

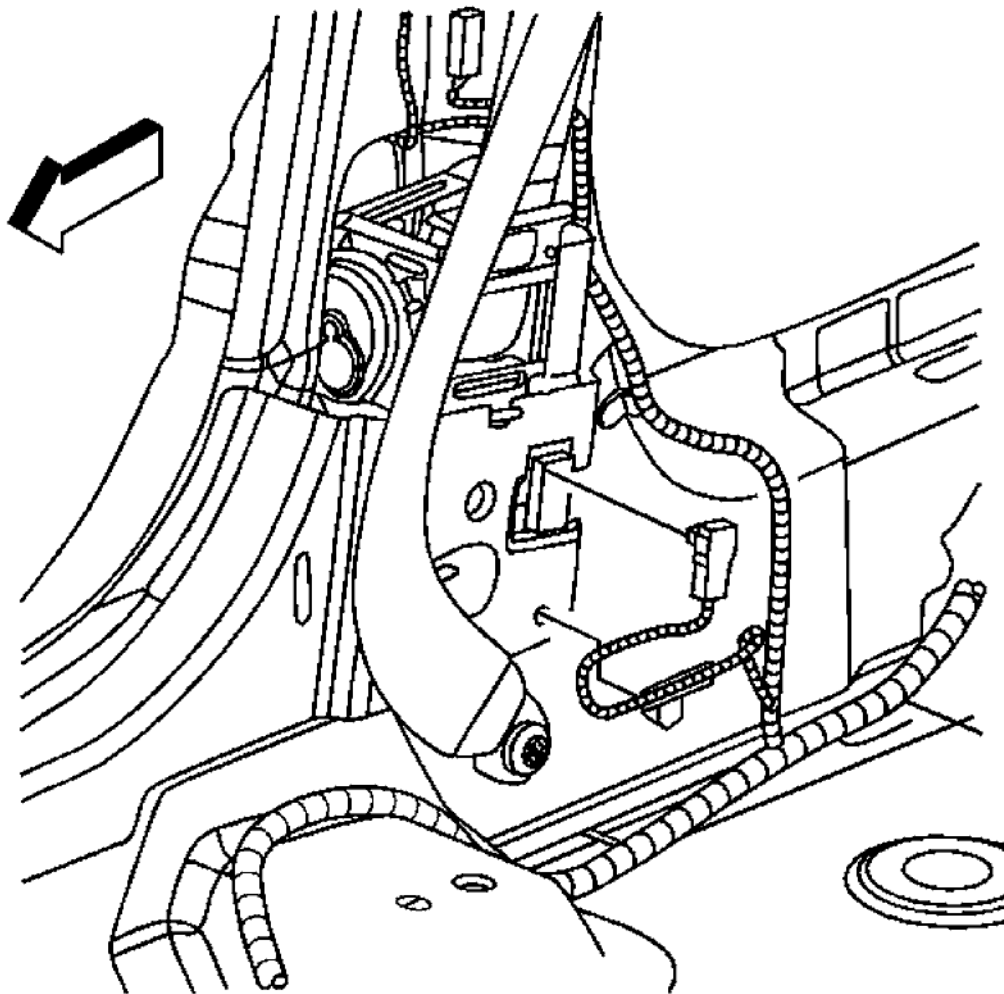


Fig. 40: View Of Seat Belt Pretensioner Connector And Wiring Harness Routing
Courtesy of GENERAL MOTORS CORP.

10. Remove the lower center pillar trim. Refer to Trim Panel Replacement - Lower

Center Pillar .

11. Remove the CPA from the seat belt retractor pretensioner - left connector.
12. Disconnect the seat belt retractor pretensioner - left connector from the vehicle harness connector.

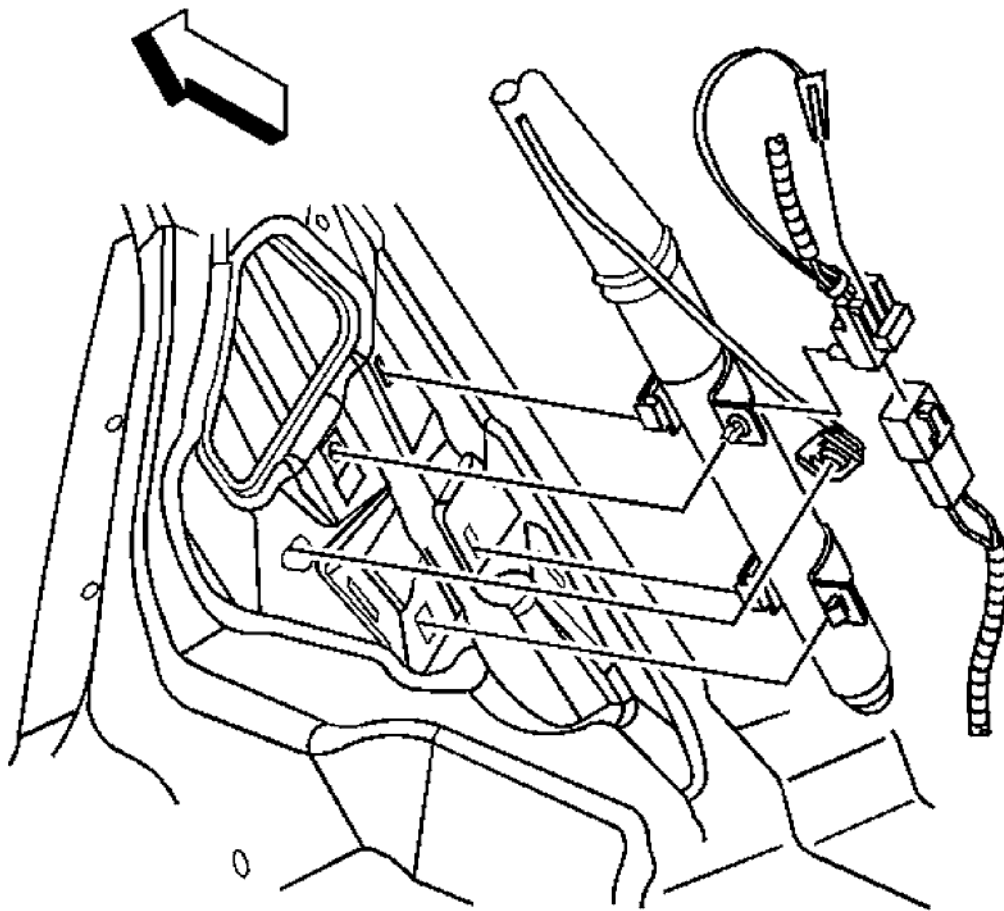


Fig. 41: Locating Roof Rail Module Connector
Courtesy of GENERAL MOTORS CORP.

13. Remove the trim panel. Refer to **Trim Panel Replacement - Rear Quarter Upper .**
14. Remove the CPA from the roof rail module - left connector.
15. Disconnect the roof rail module - left connector from the vehicle harness connector.

Enabling Procedure

1. Remove the key from the ignition switch.

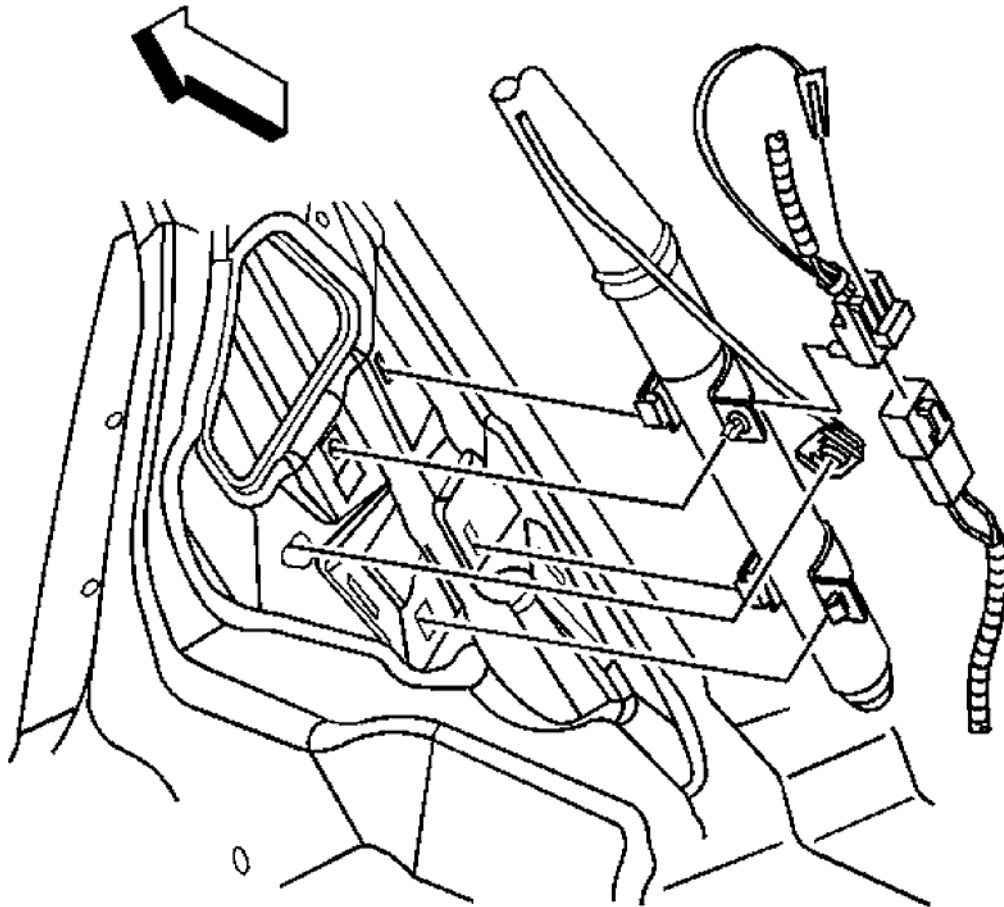


Fig. 42: Locating Roof Rail Module Connector
Courtesy of GENERAL MOTORS CORP.

2. Connect the roof rail module - left connector to the vehicle harness connector.
3. Install the CPA to the roof rail module - left connector.
4. Install the trim panel. Refer to **Trim Panel Replacement - Rear Quarter Upper** .

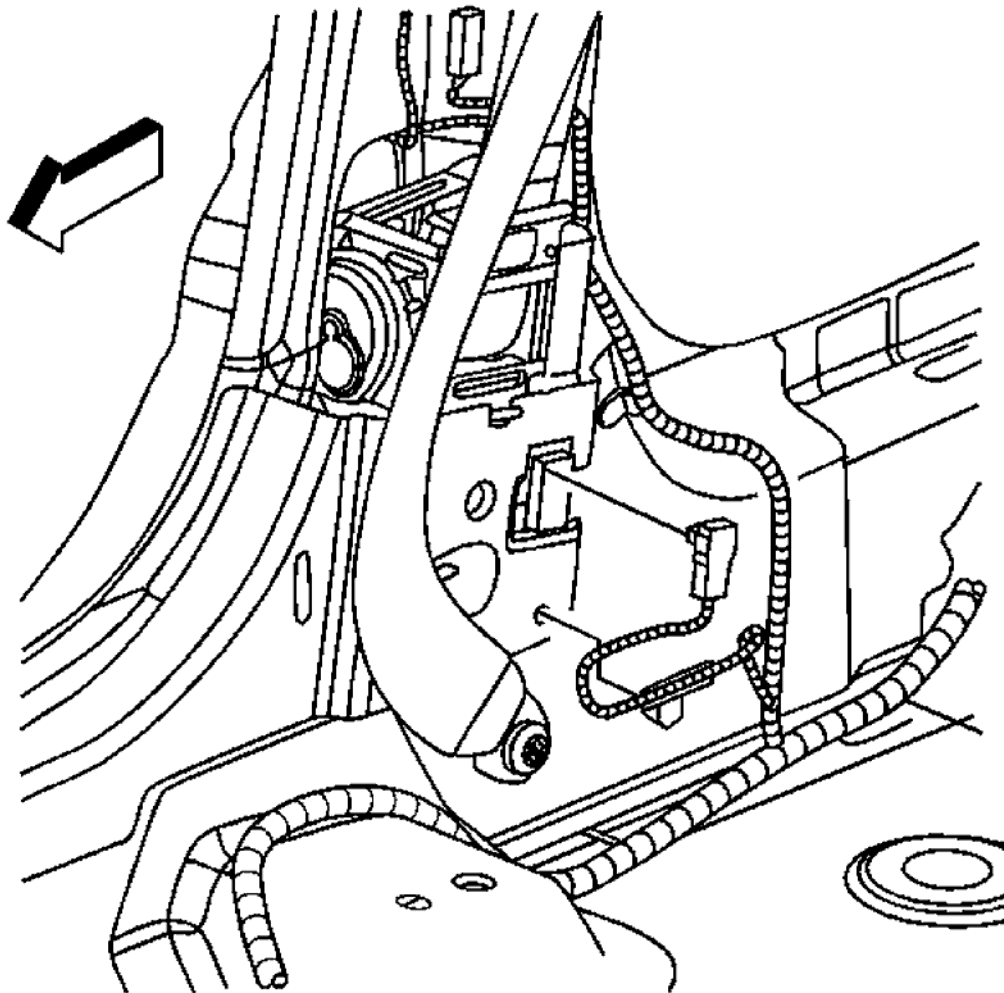


Fig. 43: View Of Seat Belt Pretensioner Connector And Wiring Harness Routing
Courtesy of GENERAL MOTORS CORP.

5. Connect the seat belt retractor pretensioner - left connector.
6. Install the CPA to the seat belt retractor pretensioner - left connector.
7. Install the lower center pillar. Refer to **Trim Panel Replacement - Lower Center Pillar** .

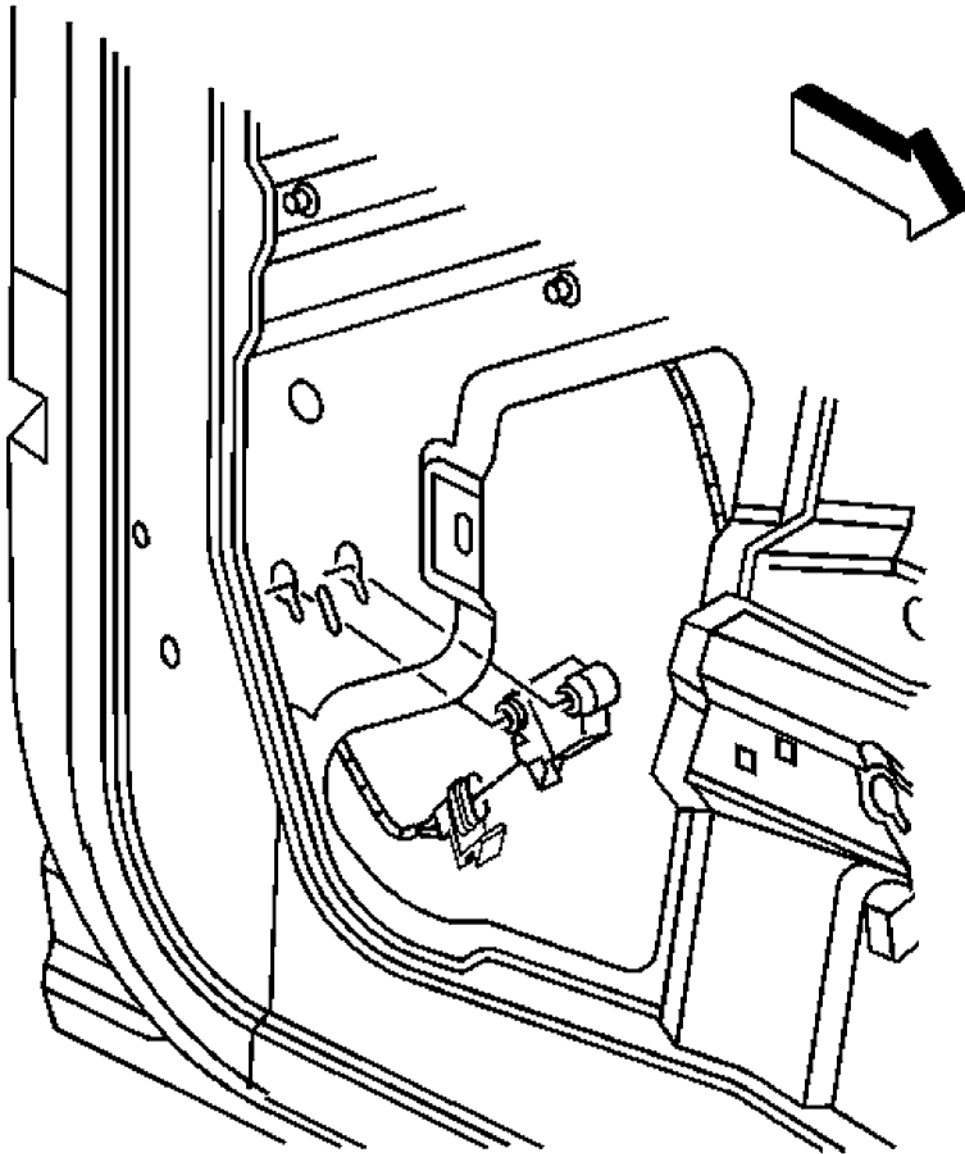


Fig. 44: View Of Inflatable Restraint Side Impact Sensor Electrical Connector
Courtesy of GENERAL MOTORS CORP.

8. Install the SIS - left connector to the SIS.
9. Install the CPA to the SIS connector.
10. Reinstall door water deflector.
11. Install the LH door trim panel. Refer to **Trim Panel Replacement - Side Front Door** .

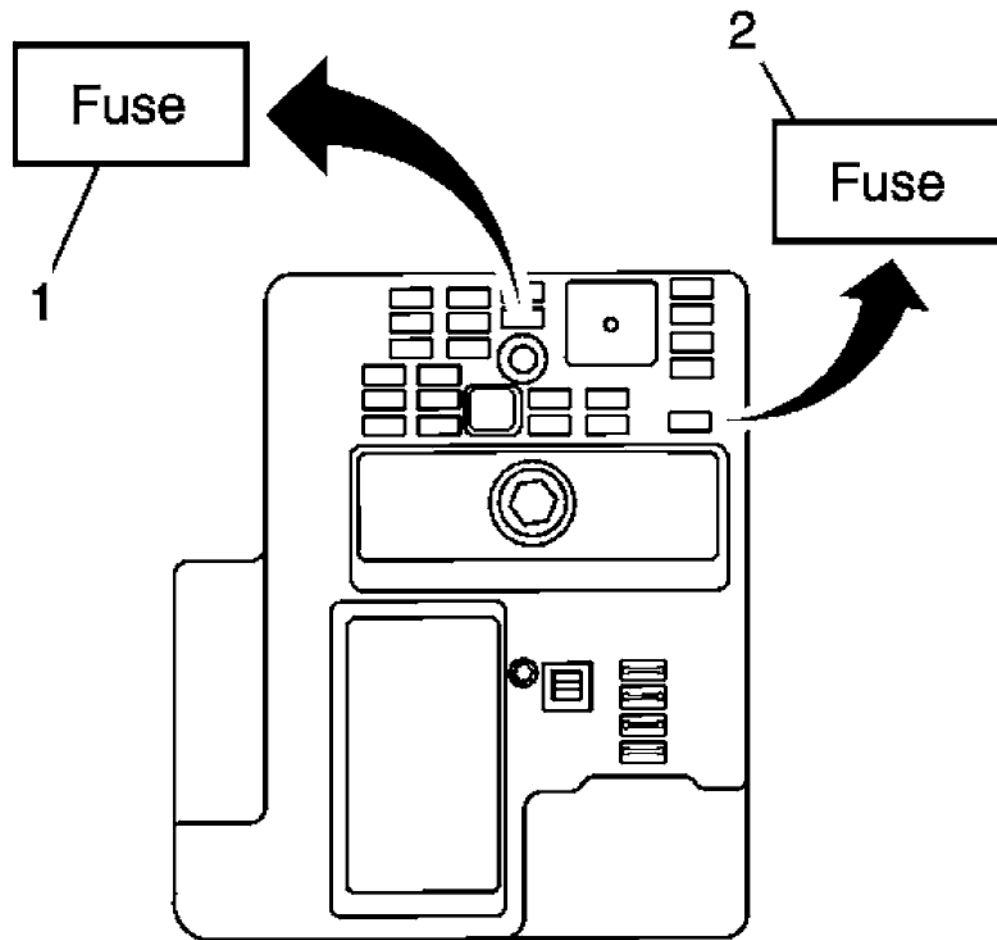


Fig. 45: BCM Fuse Center

Courtesy of GENERAL MOTORS CORP.

12. Install the AIRBAG (1) and SDM (2) fuses into the BCM fuse center.
13. Install the BCM fuse center cover.
14. Use caution while reaching in and turn the ignition switch to the ON position. The AIR BAG indicator will flash then turn OFF.
15. Perform the Diagnostic System Check - Vehicle if the AIR BAG warning indicator does not operate as described. Refer to **Diagnostic System Check - Vehicle** .

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 (BCM) fuse center then remove the fuse center cover.

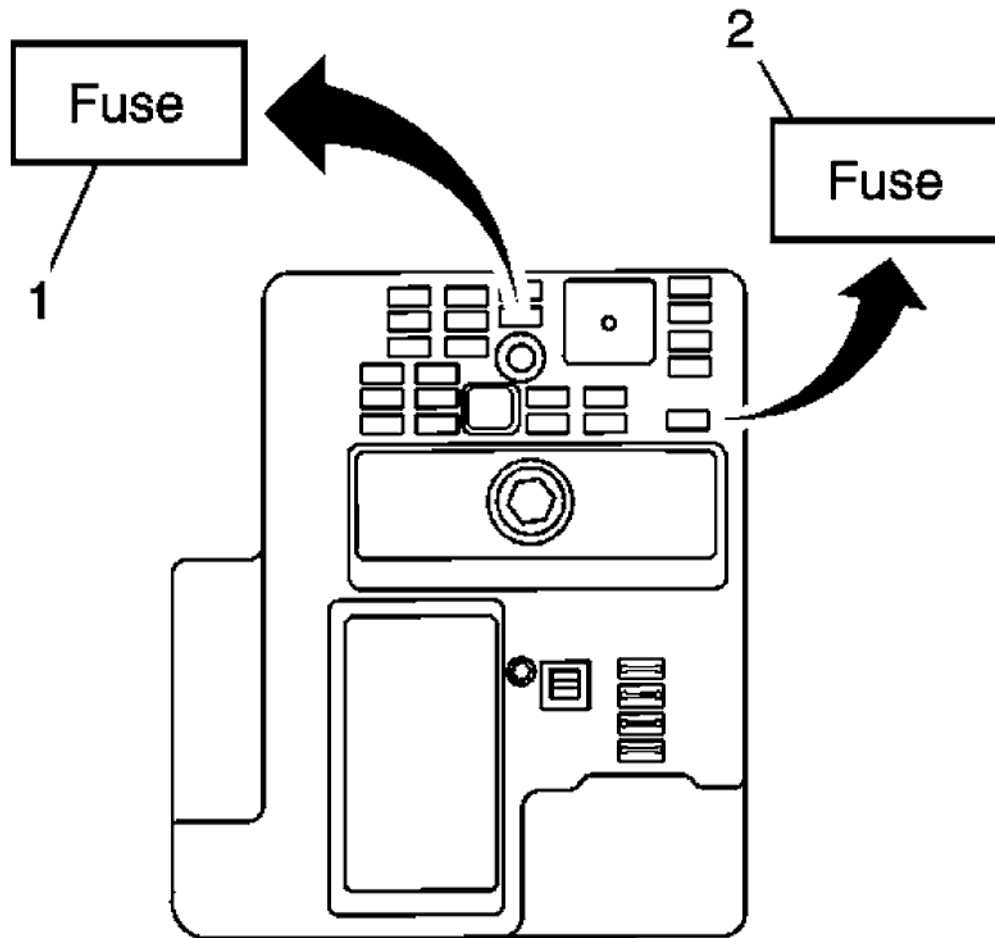


Fig. 46: BCM Fuse Center

Courtesy of GENERAL MOTORS CORP.

IMPORTANT: This inflatable restraint sensing and diagnostic module (SDM) has 2 fused power inputs. To ensure there is no unwanted SIR deployment, personal injury, or unnecessary SIR system repairs, remove both AIR BAG and SDM fuses from the BCM fuse center. With the AIR BAG fuses 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 (1) and SDM (2) fuses from the BCM fuse center.

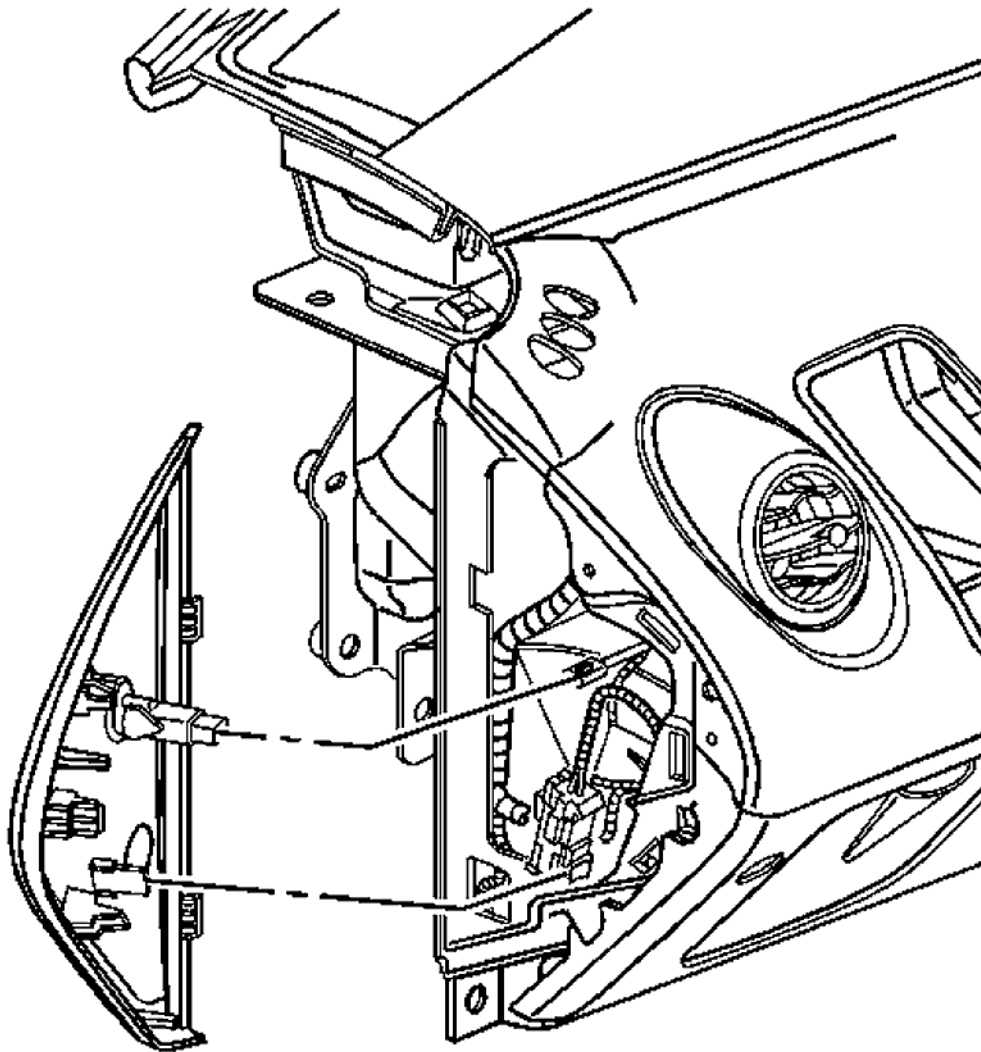


Fig. 47: View Of Door Switch & Air Bag Electrical Connectors Behind Left Trim Panel

Courtesy of GENERAL MOTORS CORP.

6. Remove the left/driver outer trim cover from the instrument panel (I/P). Refer to **Instrument Panel (I/P) Outer Trim Cover Replacement**.

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

Enabling Procedure

1. Remove the key from the ignition switch.

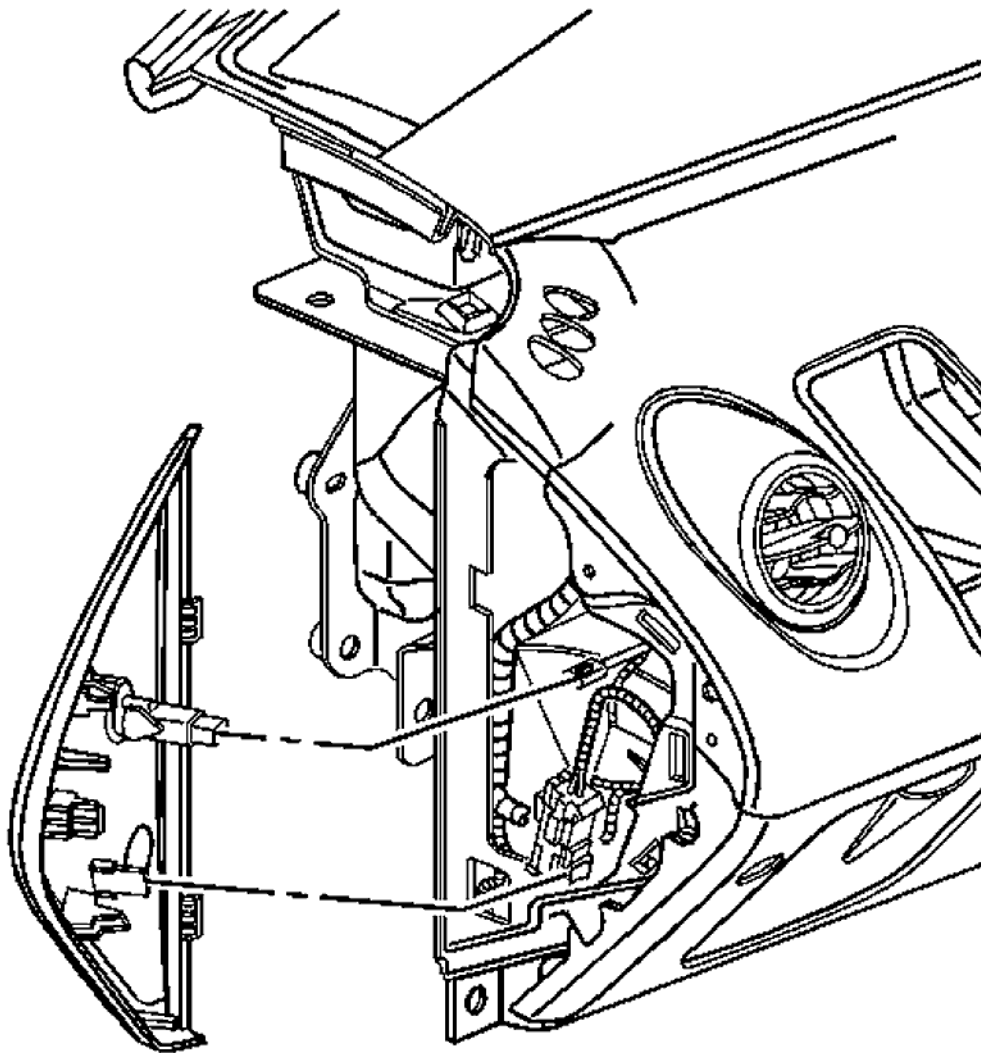


Fig. 48: View Of Door Switch & Air Bag Electrical Connectors Behind Left Trim Panel

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 left outer trim cover to the I/P. Refer to **Instrument Panel (I/P) Outer Trim Cover Replacement**.

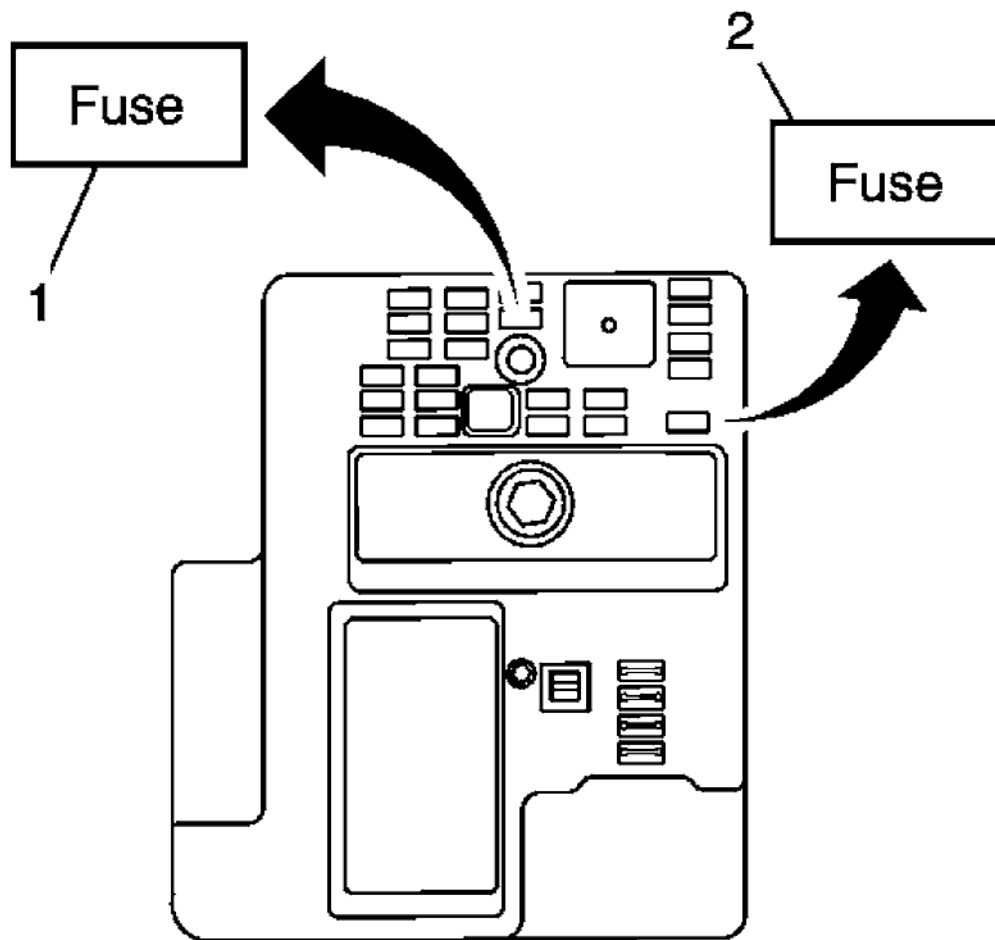


Fig. 49: BCM Fuse Center
Courtesy of GENERAL MOTORS CORP.

5. Install the AIR BAG (1) and SDM (2) fuses into the BCM fuse center.
6. Install the BCM fuse center cover.
7. Use caution while reaching in and turn the ignition switch to the ON position.

The AIR BAG indicator will flash then turn OFF.

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

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 (BCM) fuse center, then remove the fuse center cover.

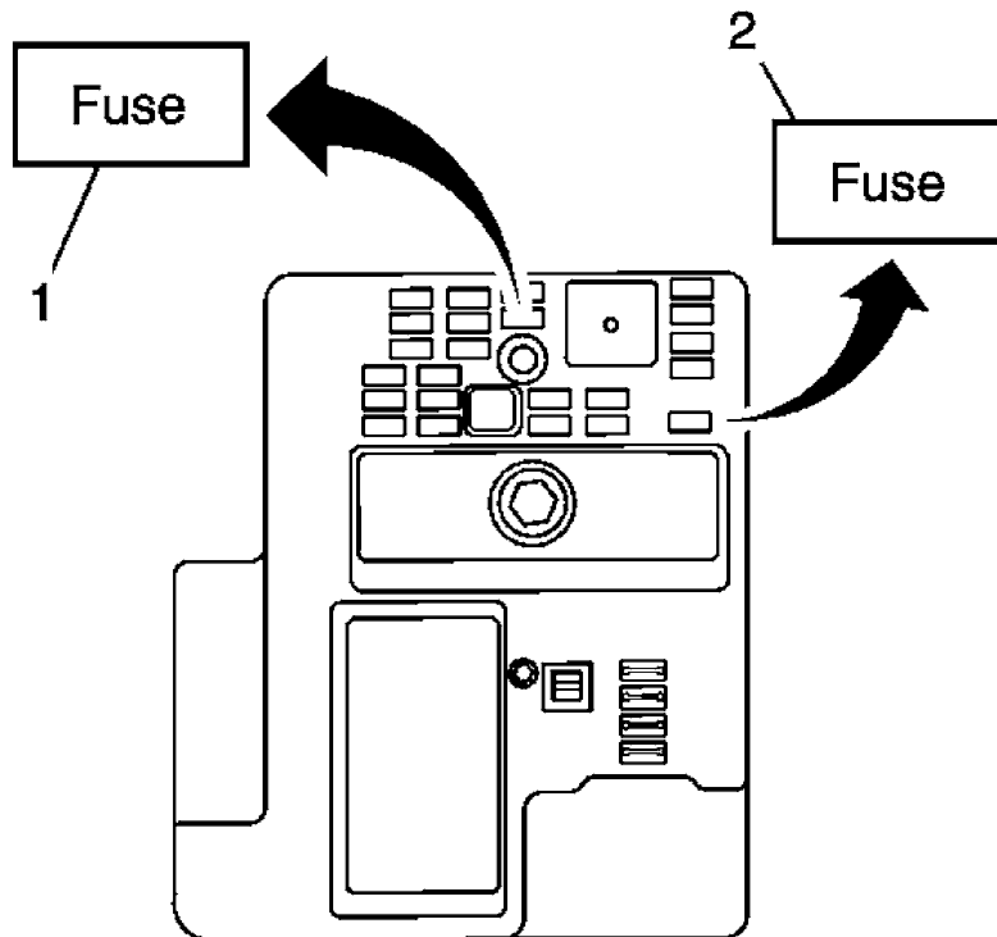


Fig. 50: BCM Fuse Center
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: This inflatable restraint sensing and diagnostic module (SDM) has 2 fused power inputs. To ensure there is no unwanted SIR deployment, personal injury, or unnecessary SIR system repairs, remove both AIR BAG and SDM fuses from the BCM fuse center. With the AIR BAG fuses 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 (1) and SDM (2) fuses from the BCM fuse center.
6. The instrument panel (I/P) module connector is located above the right hinge pillar trim panel.
7. Slide the connector position assurance (CPA) of the I/P module connector to the released position.
8. Disconnect the I/P module connector from the vehicle harness connector.

Enabling Procedure

1. Remove the key from the ignition switch.
2. Connect the I/P module connector to the vehicle harness connector.
3. Engage the CPA of the I/P module connector.

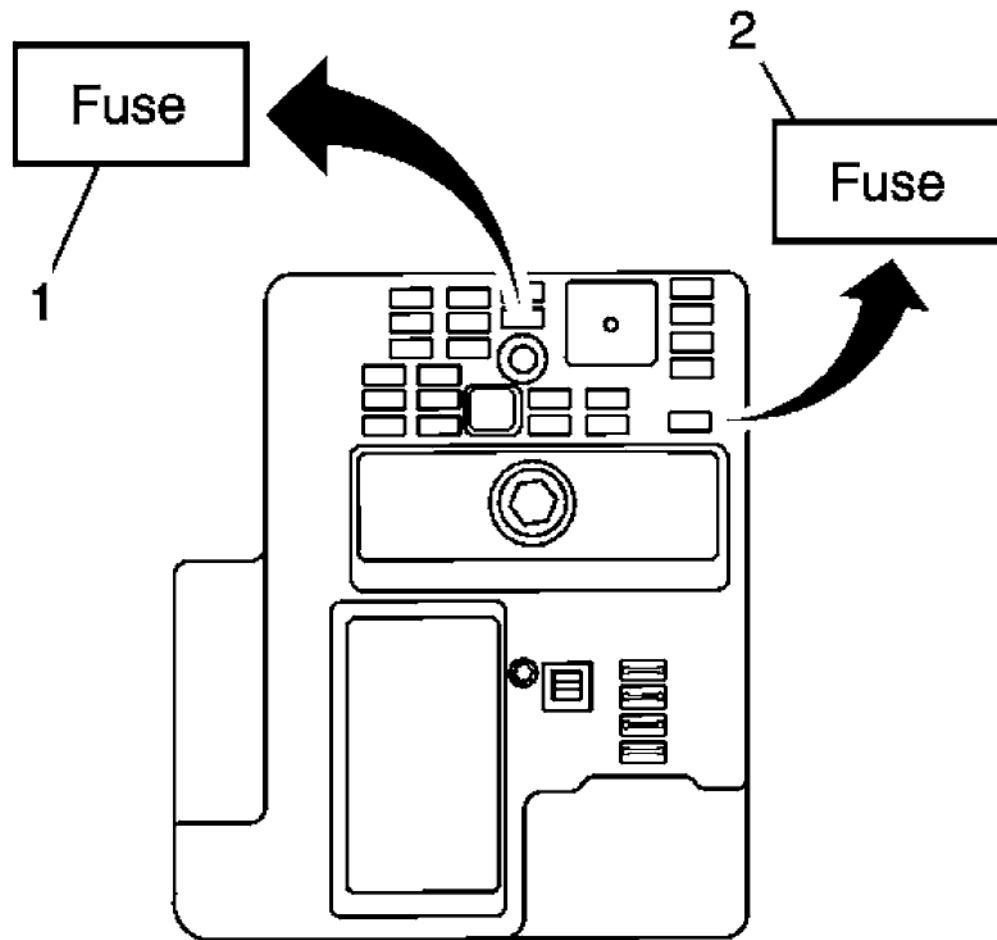


Fig. 51: BCM Fuse Center

Courtesy of GENERAL MOTORS CORP.

4. Install the AIR BAG (1) and SDM (2) fuses into the BCM fuse center.
5. Install the BCM 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 Diagnostic System Check - Vehicle if the AIR BAG warning indicator does not operate as described. Refer to **Diagnostic System Check - Vehicle**.

SIR DISABLING AND ENABLING ZONE 6

Disabling Procedure

IMPORTANT: Refer to SIR Disabling and Enabling Zones before disabling the SIR system.

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 (BCM) fuse center then remove fuse center cover.

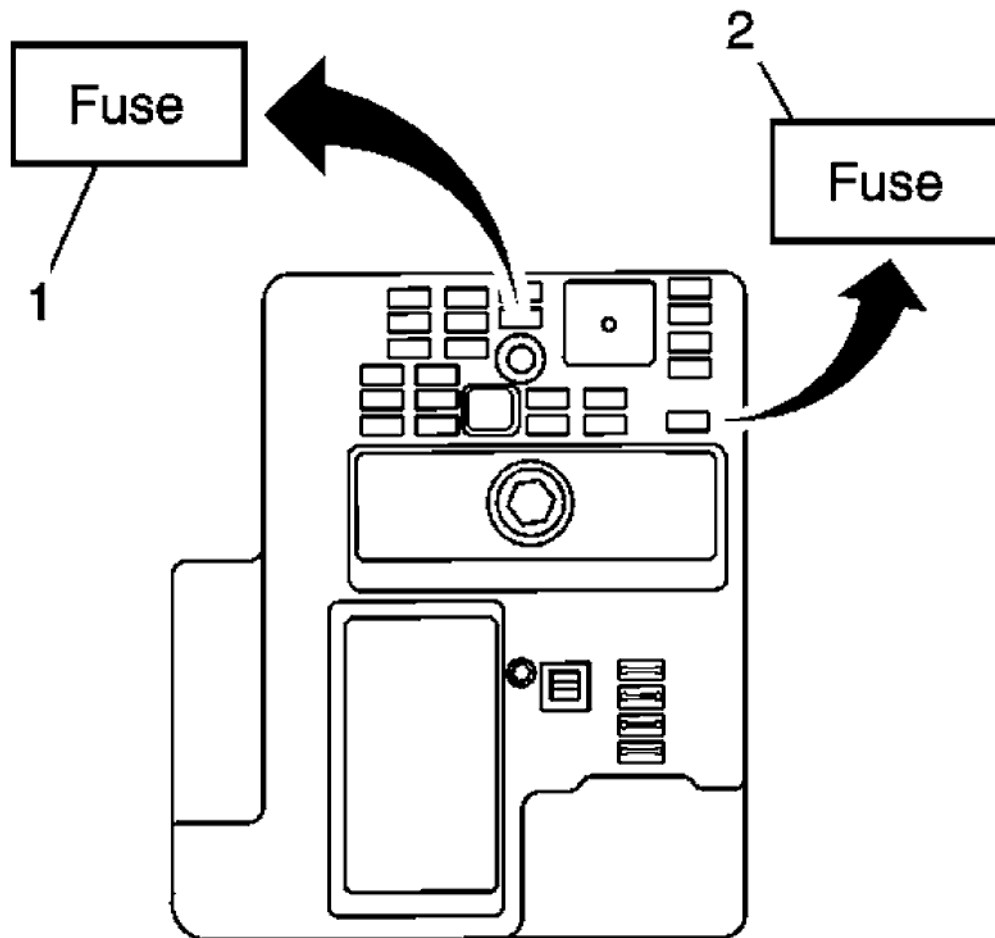


Fig. 52: BCM Fuse Center
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: This inflatable restraint sensing and diagnostic module (SDM) has 2 fused power inputs. To ensure there is no unwanted SIR deployment, personal injury, or

unnecessary SIR system repairs, remove both AIR BAG and SDM fuses from the BCM fuse center. With the AIR BAG fuses 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 AIRBAG (1) and SDM (2) fuses from the BCM fuse center.

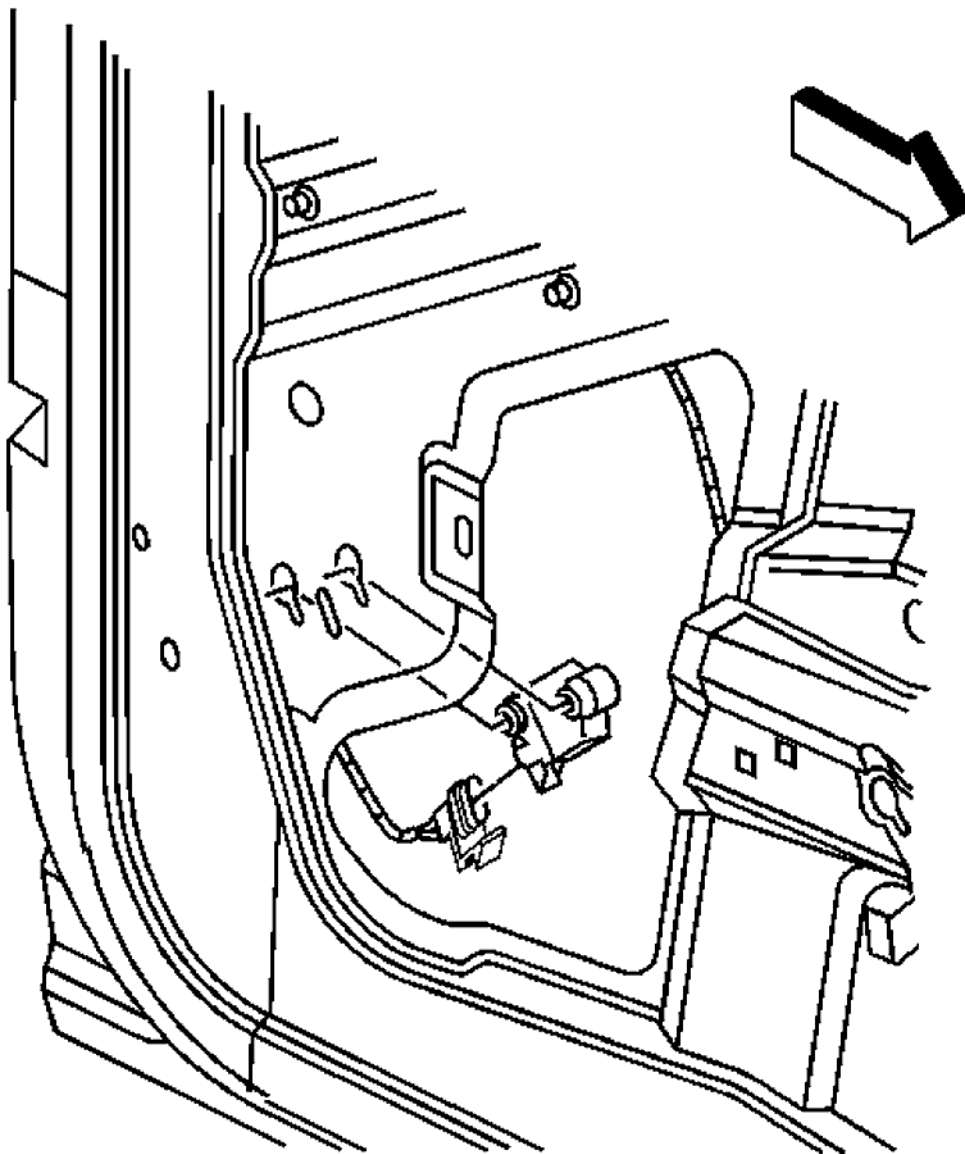


Fig. 53: View Of Inflatable Restraint Side Impact Sensor Electrical Connector
Courtesy of GENERAL MOTORS CORP.

6. Remove the RH door trim panel. Refer to Trim Panel Replacement - Side Front Door.
7. Peel back the door water deflector far enough to access the side impact sensor (SIS).
8. Remove the connector position assurance (CPA) from the SIS connector.
9. Disconnect the SIS connector from the SIS.

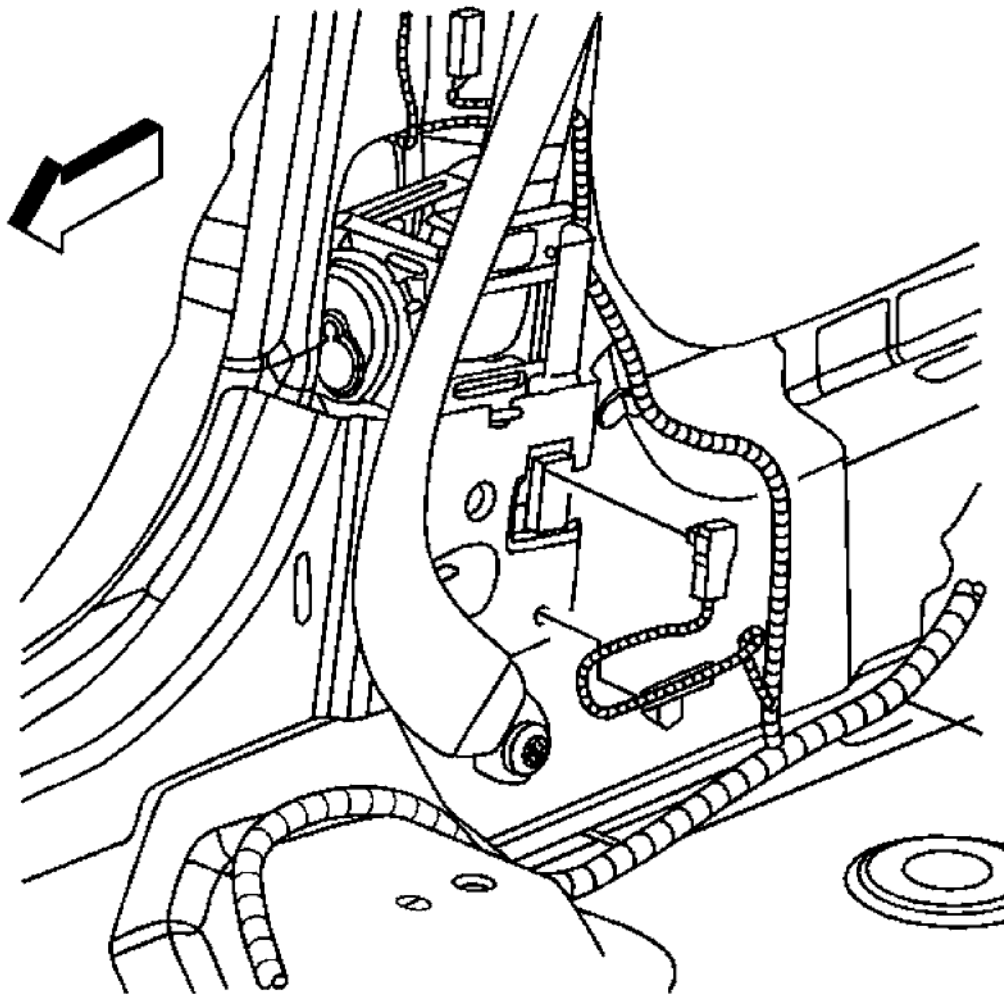


Fig. 54: View Of Seat Belt Pretensioner Connector And Wiring Harness Routing
Courtesy of GENERAL MOTORS CORP.

10. Remove the lower center pillar trim. Refer to Trim Panel Replacement - Lower

Center Pillar .

11. Remove the CPA from the seat belt retractor pretensioner - right connector.
12. Disconnect the seat belt retractor pretensioner - right connector from the vehicle harness connector.

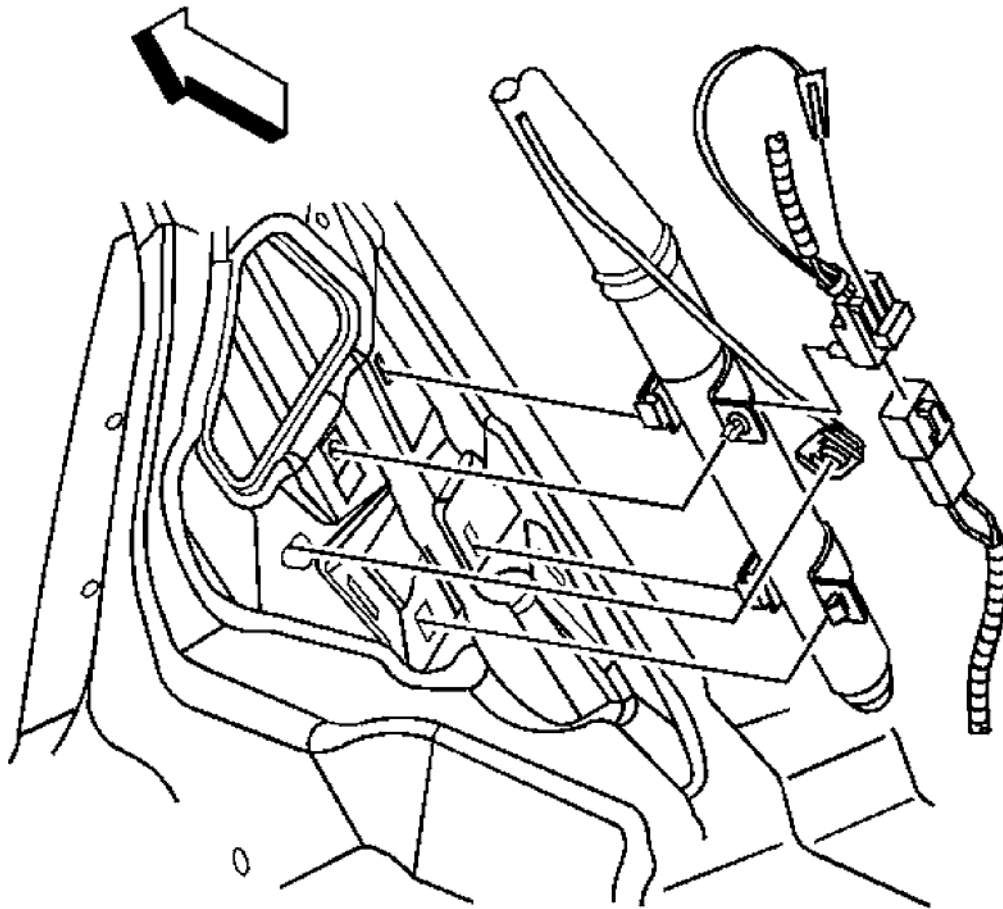


Fig. 55: Locating Roof Rail Module Connector
Courtesy of GENERAL MOTORS CORP.

13. Remove the trim panel. Refer to **Trim Panel Replacement - Rear Quarter Upper .**
14. Remove the CPA from the roof rail module - right connector.
15. Disconnect the roof rail module - right connector from the vehicle harness connector.

Enabling Procedure

1. Remove the key from the ignition switch.

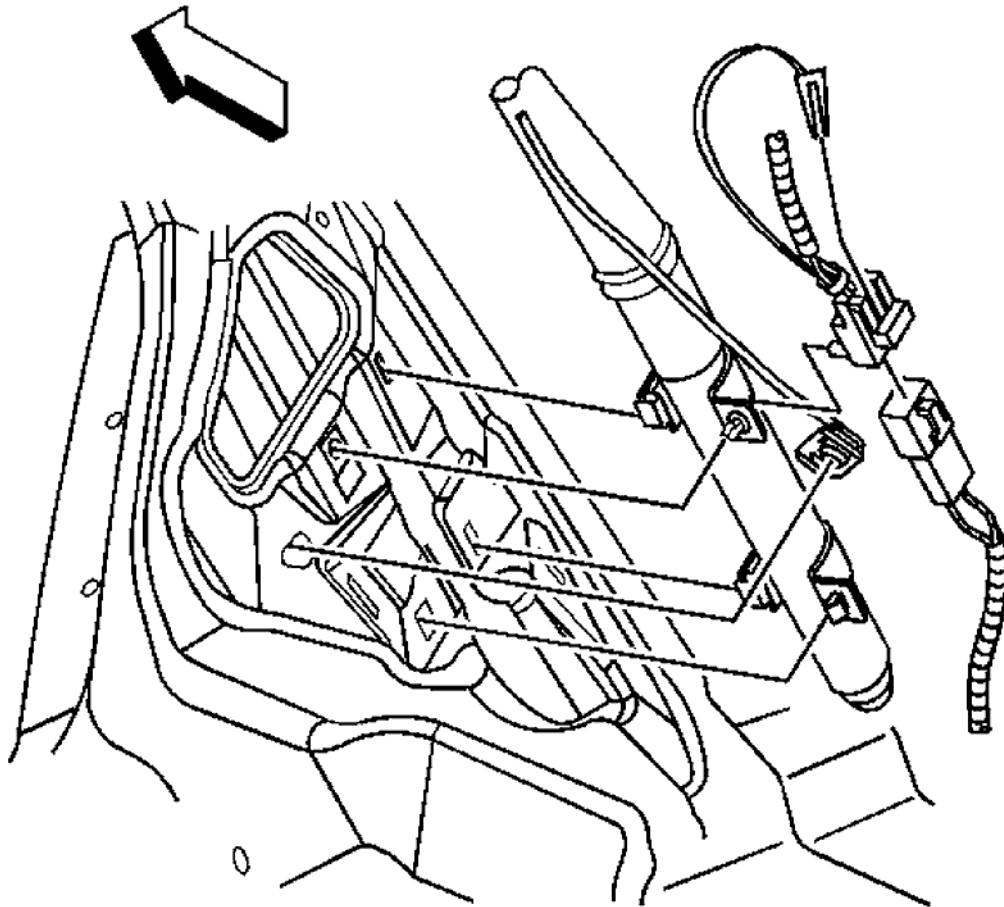


Fig. 56: Locating Roof Rail Module Connector
Courtesy of GENERAL MOTORS CORP.

2. Connect the roof rail module - right connector to the vehicle harness connector.
3. Install the CPA to the roof rail module - right connector.
4. Install the trim panel. Refer to **Trim Panel Replacement - Rear Quarter Upper** .

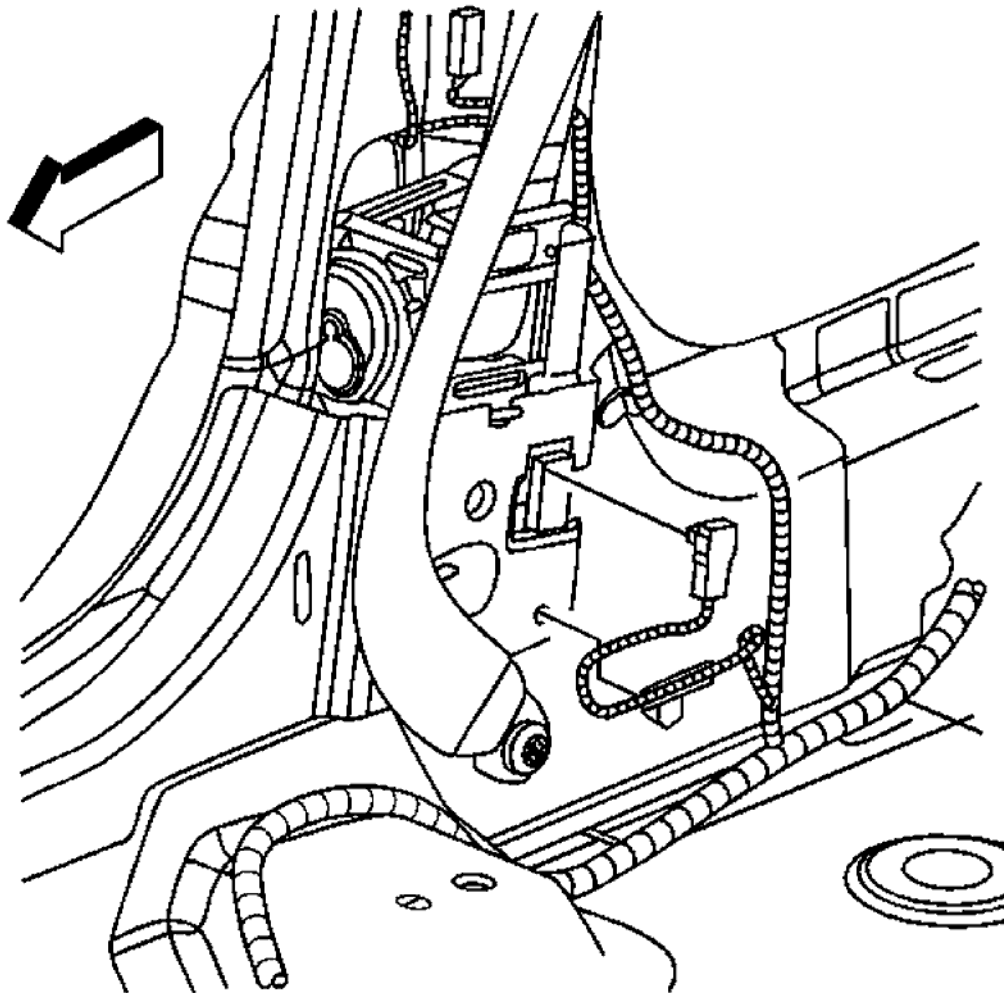


Fig. 57: View Of Seat Belt Pretensioner Connector And Wiring Harness Routing
Courtesy of GENERAL MOTORS CORP.

5. Connect the seat belt retractor pretensioner - right connector.
6. Install the CPA to the seat belt retractor pretensioner - right connector.
7. Install the lower center pillar. Refer to **Trim Panel Replacement - Lower Center Pillar** .

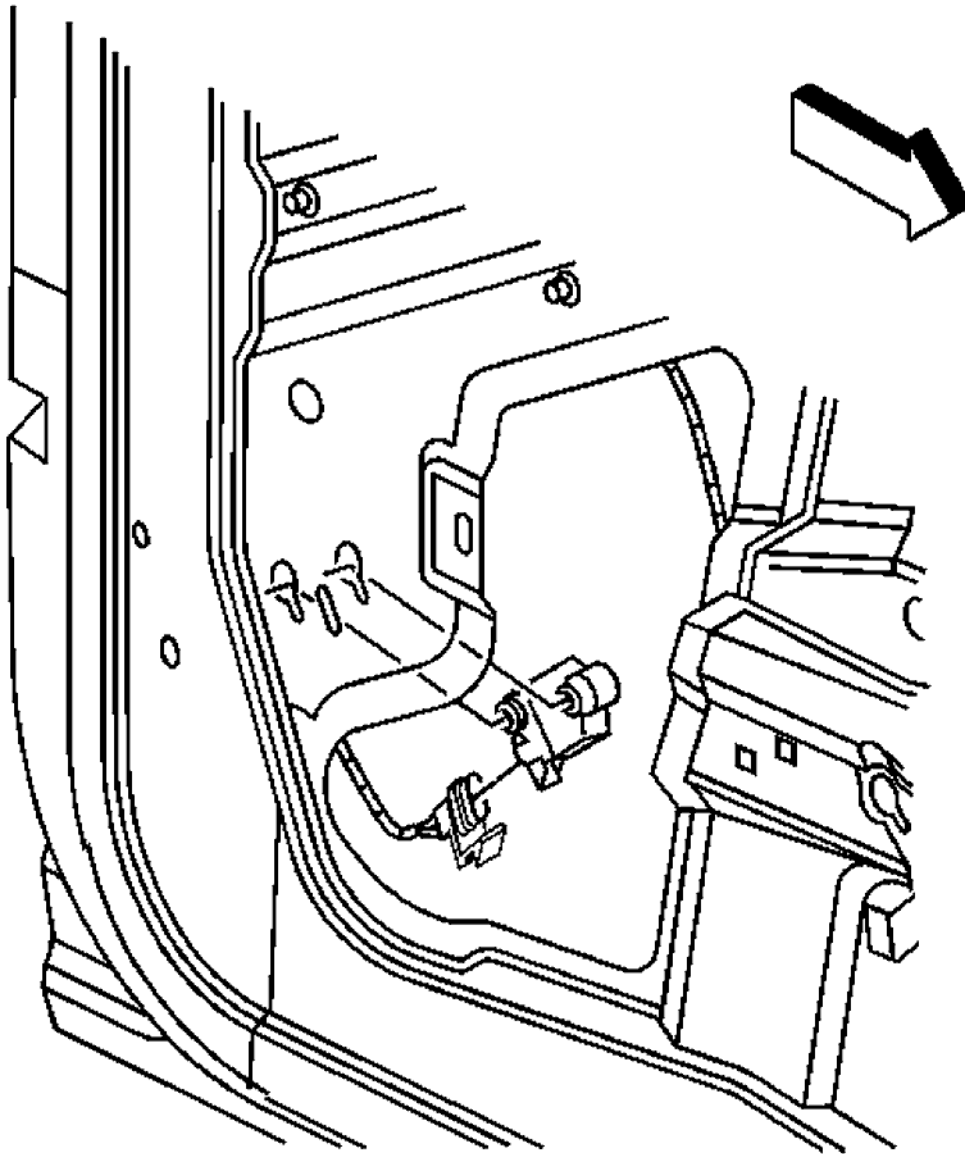


Fig. 58: View Of Inflatable Restraint Side Impact Sensor Electrical Connector
Courtesy of GENERAL MOTORS CORP.

8. Install the SIS - right connector to the SIS.
9. Install the CPA to the SIS connector.
10. Reinstall door water deflector.
11. Install the RH door trim panel. Refer to **Trim Panel Replacement - Side Front Door** .

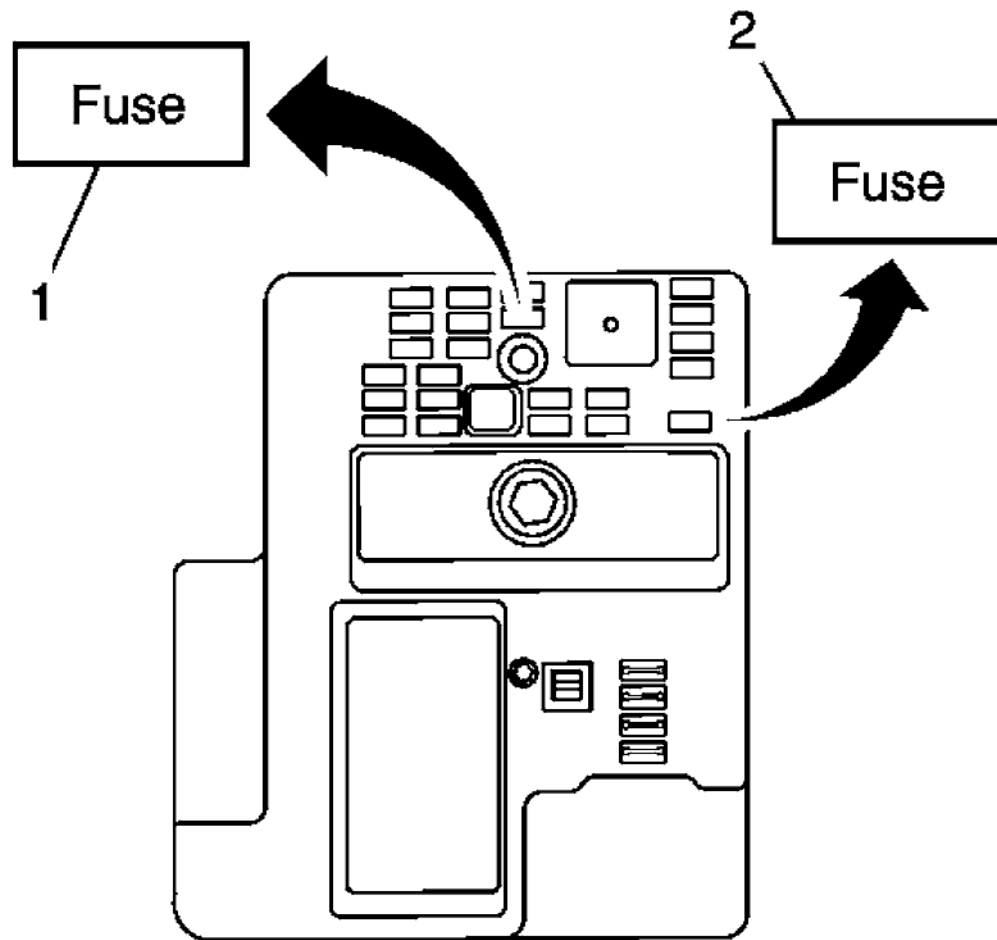


Fig. 59: BCM Fuse Center

Courtesy of GENERAL MOTORS CORP.

12. Install the AIRBAG (1) and SDM (2) fuses into the BCM fuse center.
13. Install the BCM fuse center cover.
14. Use caution while reaching in and turn the ignition switch to the ON position. The AIR BAG indicator will flash then turn OFF.
15. Perform the Diagnostic System Check - Vehicle if the AIR BAG warning indicator does not operate as described. Refer to **Diagnostic System Check - Vehicle** .

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 (BCM) fuse center then remove fuse center cover.

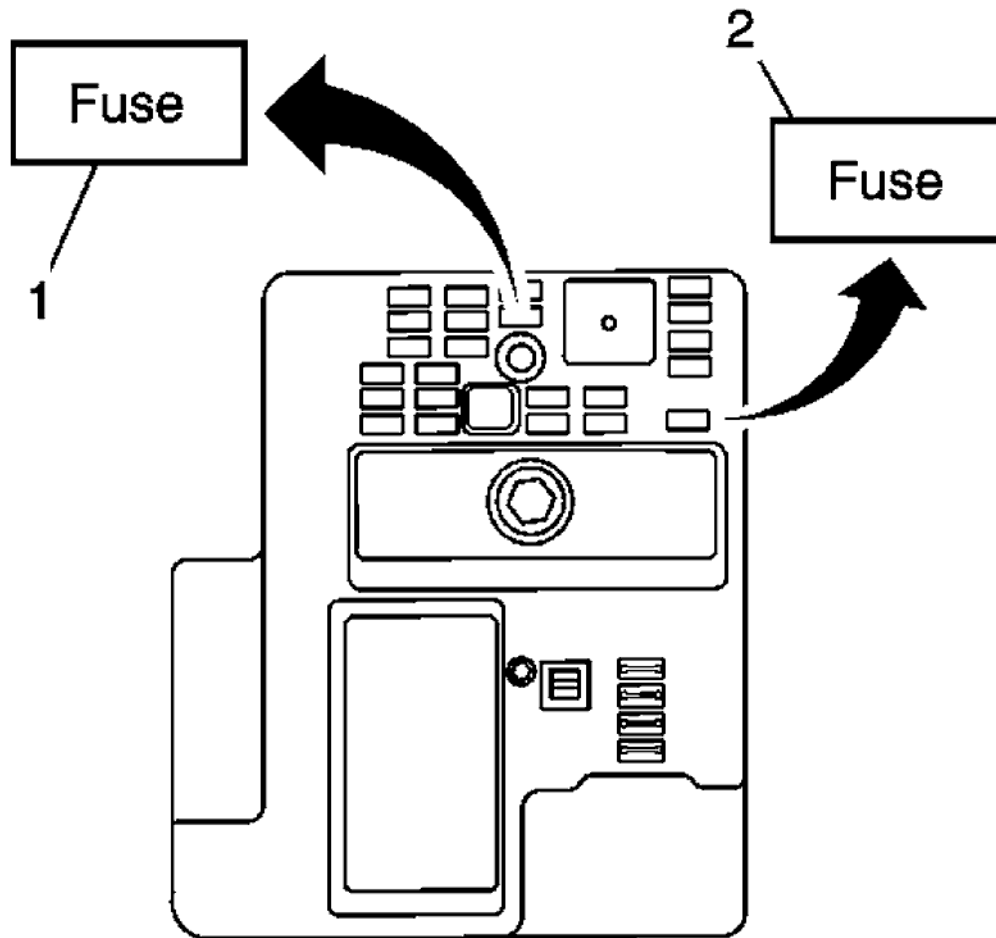


Fig. 60: BCM Fuse Center

Courtesy of GENERAL MOTORS CORP.

IMPORTANT: This inflatable restraint sensing and diagnostic module (SDM) has 2 fused power inputs. To ensure there is no unwanted SIR deployment, personal injury, or unnecessary SIR system repairs, remove both AIR BAG and SDM fuses from the BCM fuse center. With the AIR BAG fuses 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 AIRBAG (1) and SDM (2) fuses from the BCM fuse center.

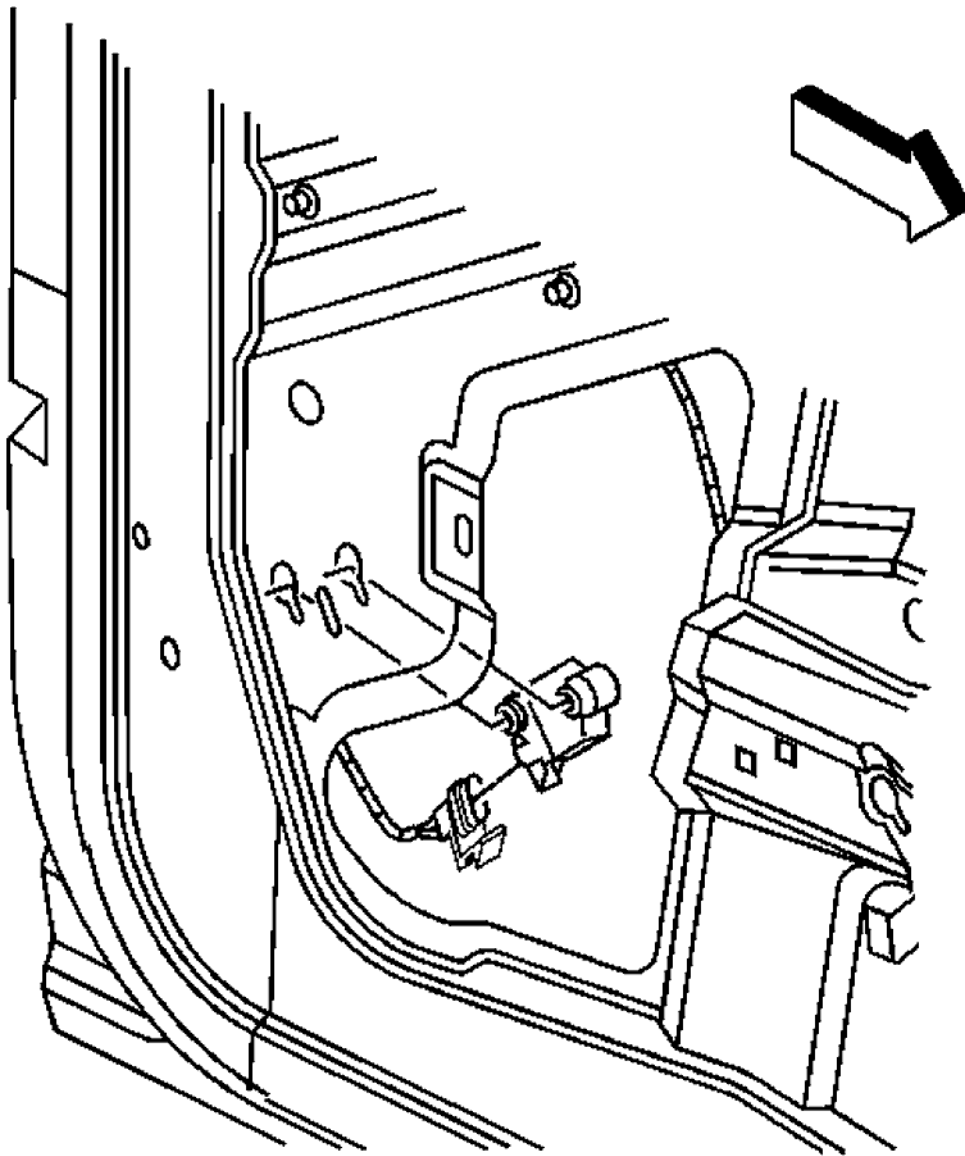


Fig. 61: View Of Inflatable Restraint Side Impact Sensor Electrical Connector
Courtesy of GENERAL MOTORS CORP.

6. Remove the RH door trim panel. Refer to **Trim Panel Replacement - Side Front**

Door .

7. Peel back the door water deflector far enough to access the side impact sensor (SIS).
8. Remove the connector position assurance (CPA) from the SIS connector.
9. Disconnect the SIS connector from the SIS.
10. The I/P module connector is located above the right hinge pillar trim.
11. Slide the CPA of the I/P module connector to the released position.
12. Disconnect the I/P module connector from the vehicle harness connector.

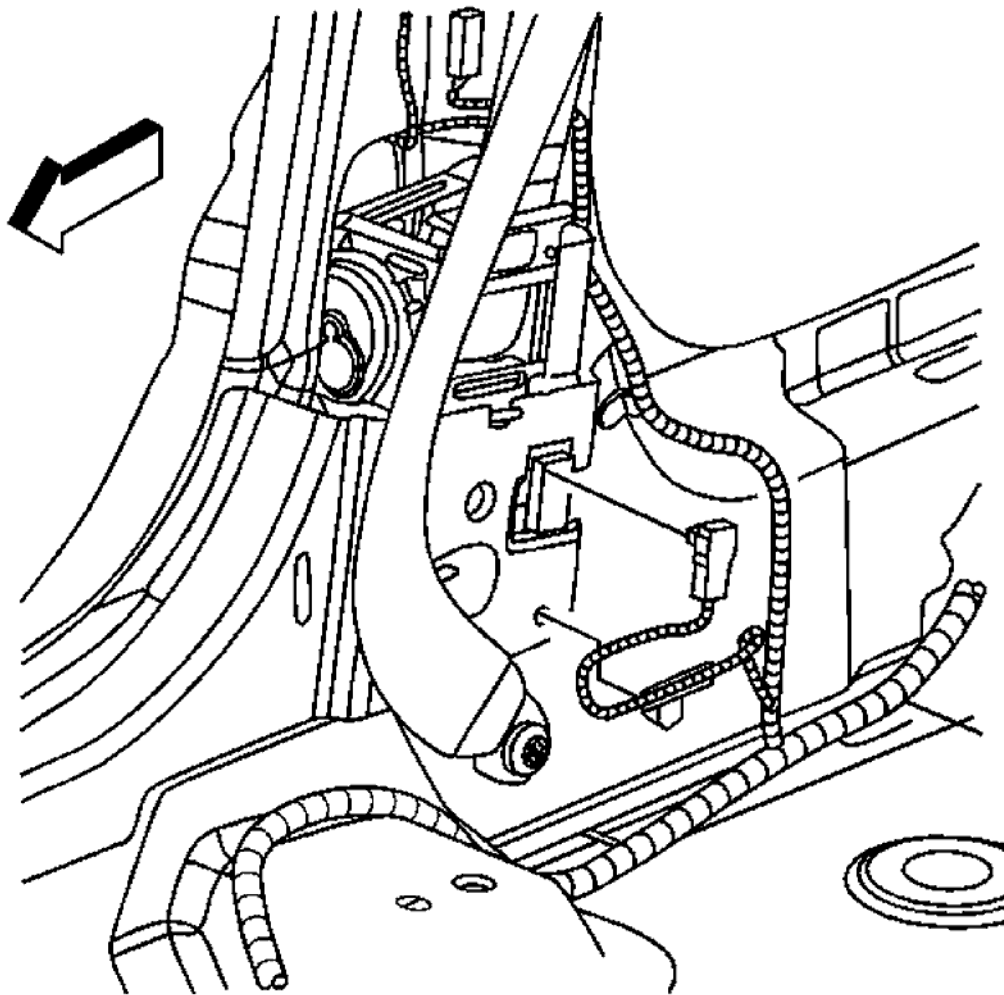


Fig. 62: View Of Seat Belt Pretensioner Connector And Wiring Harness Routing
Courtesy of GENERAL MOTORS CORP.

13. Remove the lower right center pillar trim. Refer to **Trim Panel Replacement - Lower Center Pillar** .

14. Remove the CPA from the seat belt retractor pretensioner - RF connector.
15. Disconnect the seat belt retractor pretensioner - RF connector from the vehicle harness connector.

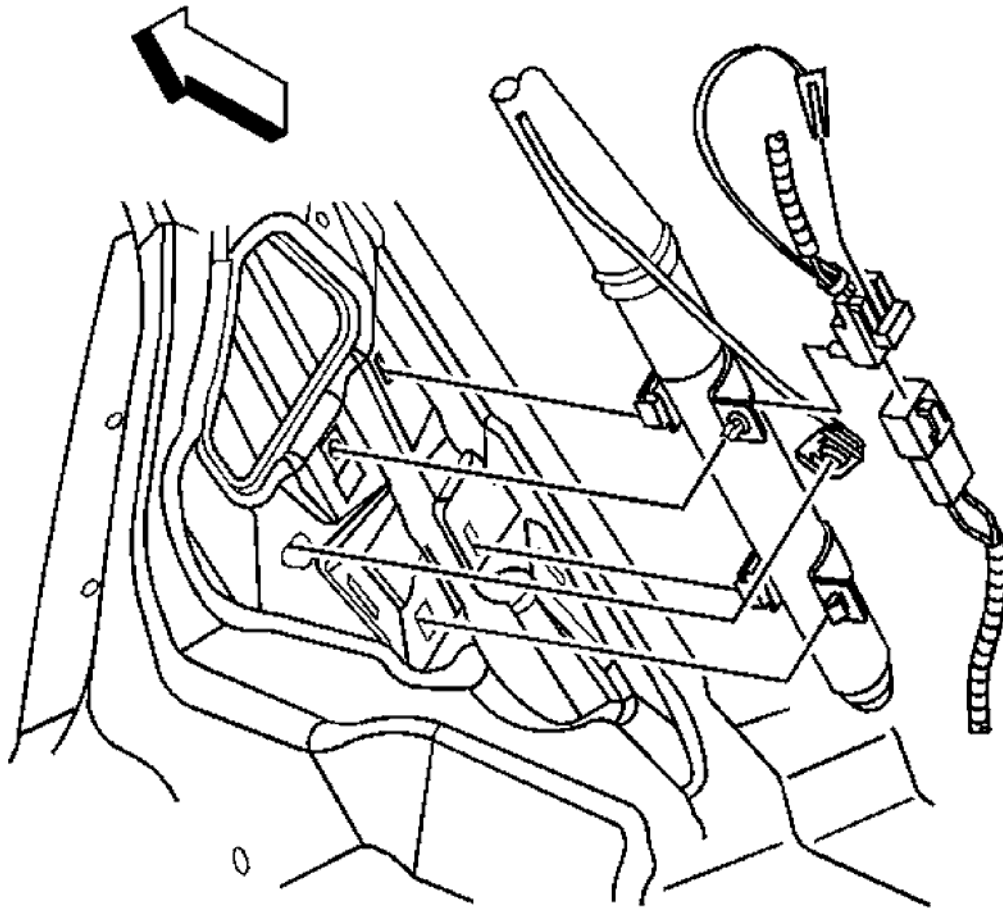


Fig. 63: Locating Roof Rail Module Connector
Courtesy of GENERAL MOTORS CORP.

16. Remove the garnish molding from the right upper lock pillar. Refer to **Trim Panel Replacement - Rear Quarter Upper** .
17. Remove the CPA from the roof rail module - right connector.
18. Disconnect the roof rail module - right connector from the vehicle harness connector.

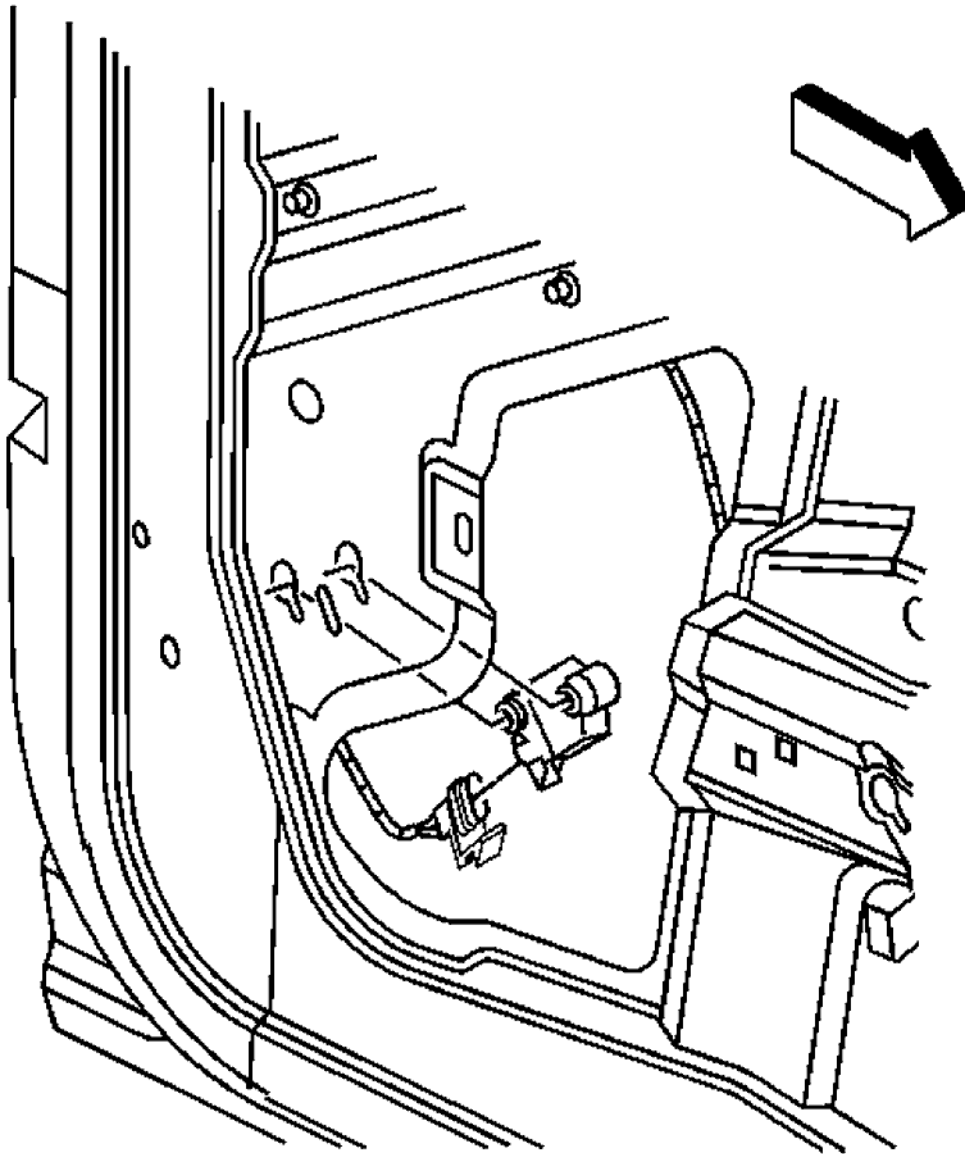


Fig. 64: View Of Inflatable Restraint Side Impact Sensor Electrical Connector
Courtesy of GENERAL MOTORS CORP.

19. Remove the LH door trim panel. Refer to **Trim Panel Replacement - Side Front Door** .
20. Peel back the door water deflector far enough to access the SIS.
21. Remove the CPA from the SIS connector.
22. Disconnect the SIS connector from the SIS.

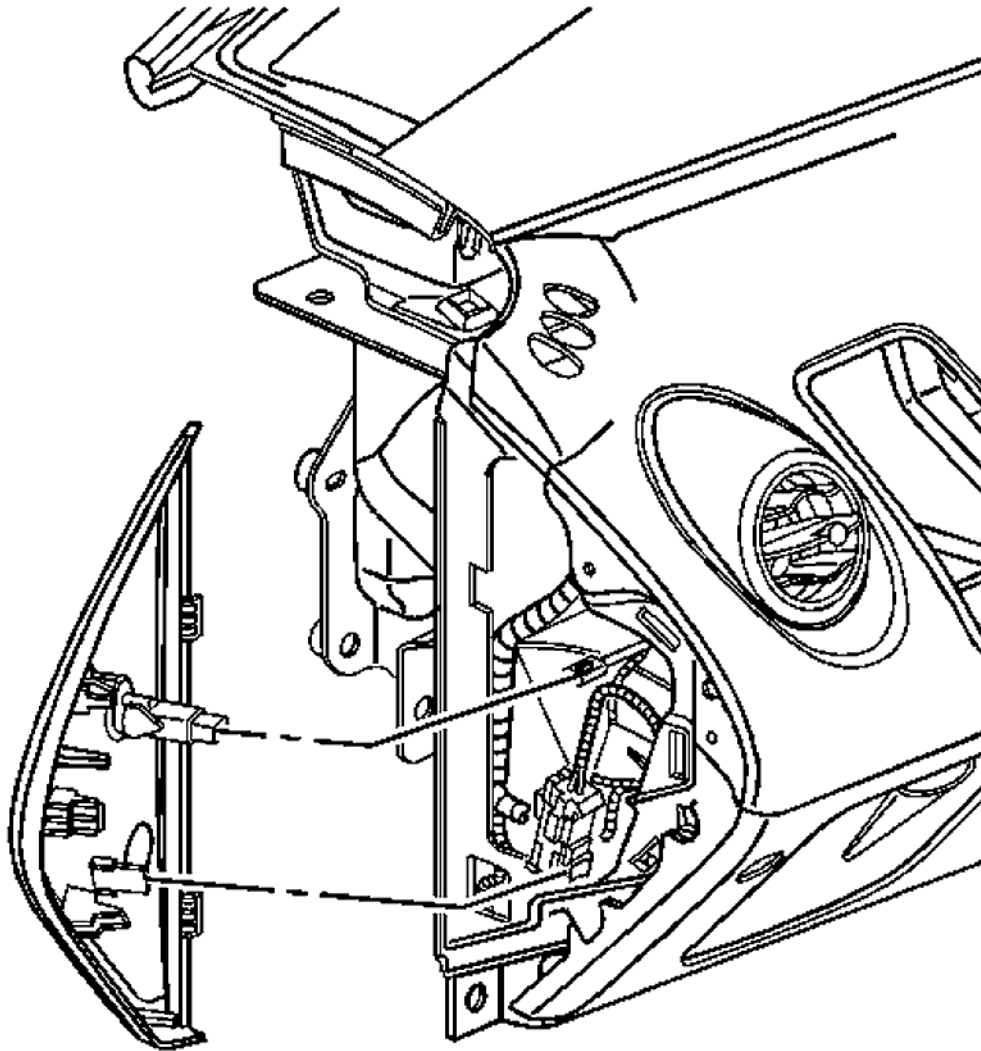


Fig. 65: View Of Door Switch & Air Bag Electrical Connectors Behind Left Trim Panel

Courtesy of GENERAL MOTORS CORP.

23. Remove the driver/left outer trim cover from the I/P. Refer to **Instrument Panel (I/P) Outer Trim Cover Replacement** .
24. Remove the CPA from the steering wheel module coil connector.
25. Disconnect the steering wheel module coil connector from the vehicle harness connector.

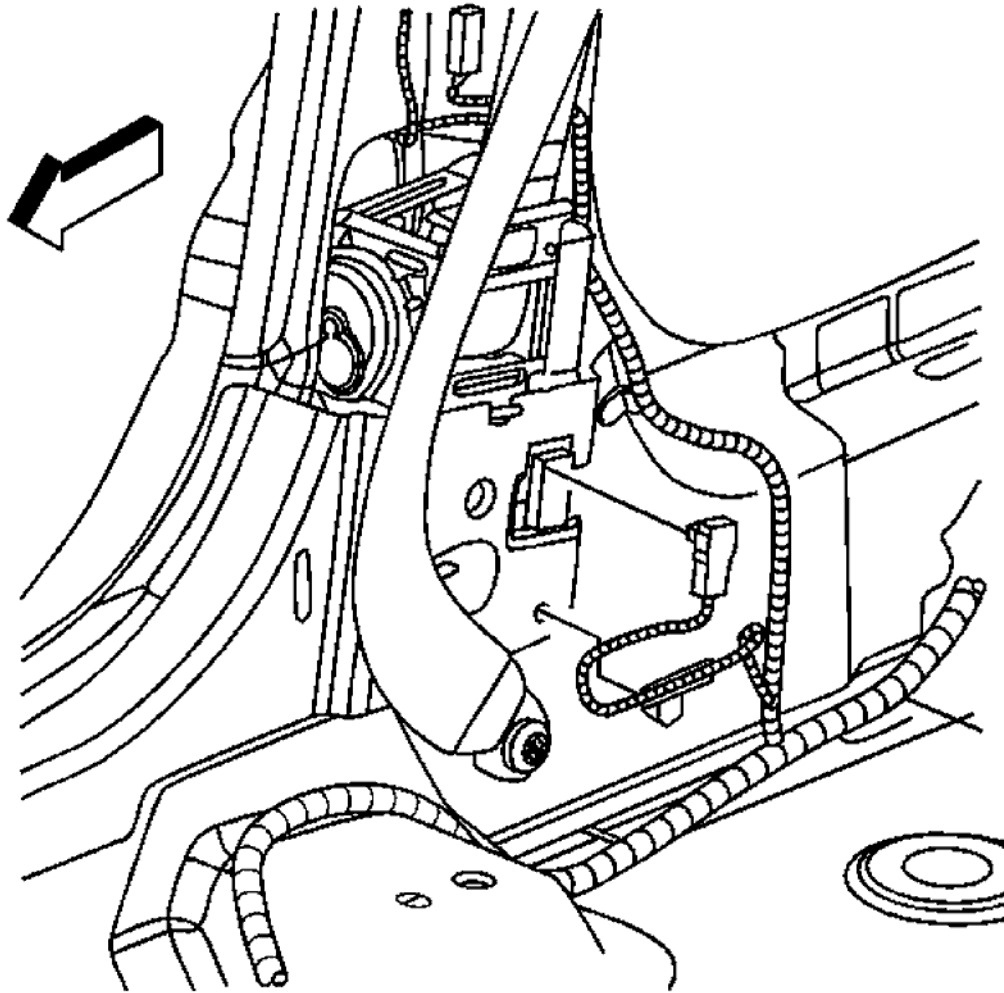


Fig. 66: View Of Seat Belt Pretensioner Connector And Wiring Harness Routing
Courtesy of GENERAL MOTORS CORP.

26. Remove the lower left center pillar trim. Refer to **Trim Panel Replacement - Lower Center Pillar** .
27. Remove the CPA from seat belt retractor pretensioner - LF connector.
28. Disconnect the seat belt retractor pretensioner - LF connector from the vehicle harness connector.

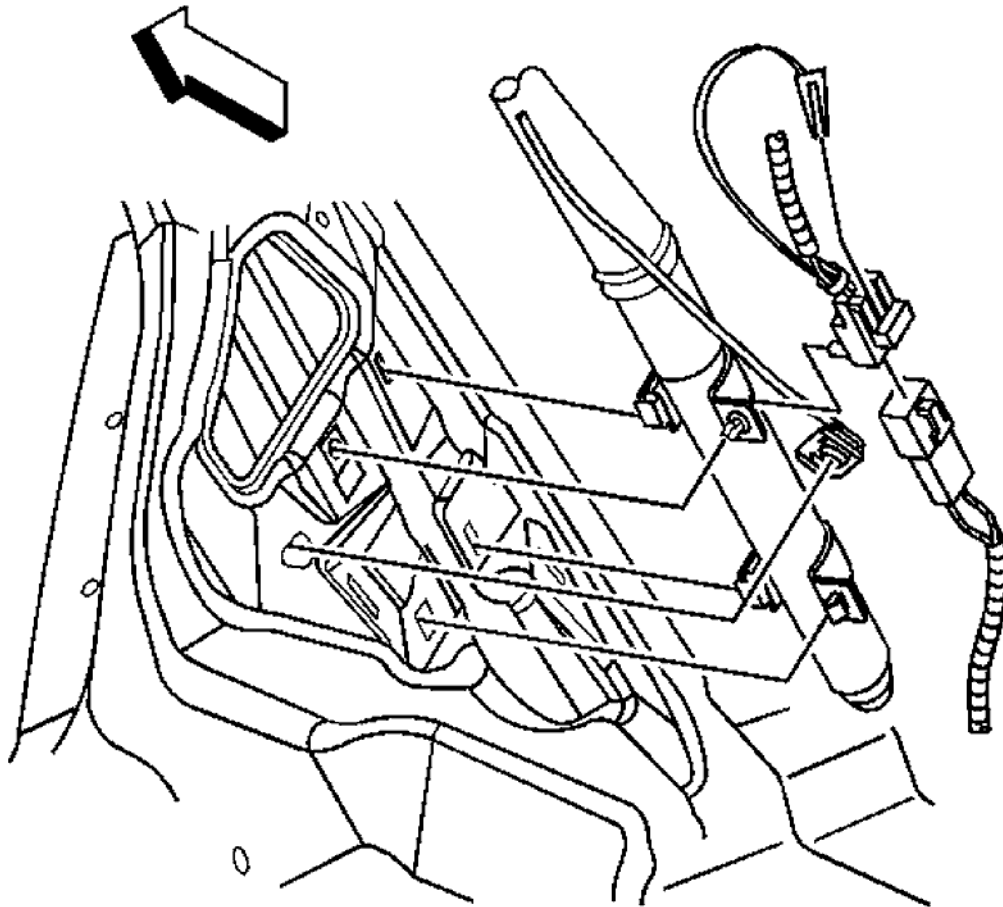


Fig. 67: Locating Roof Rail Module Connector
Courtesy of GENERAL MOTORS CORP.

29. Remove the garnish molding from the upper lock pillar. Refer to **Trim Panel Replacement - Rear Quarter Upper** .
30. Remove the CPA from the roof rail module - left connector.
31. Disconnect the roof rail module - left connector from the vehicle harness connector.

Enabling Procedure

1. Remove the key from the ignition switch.

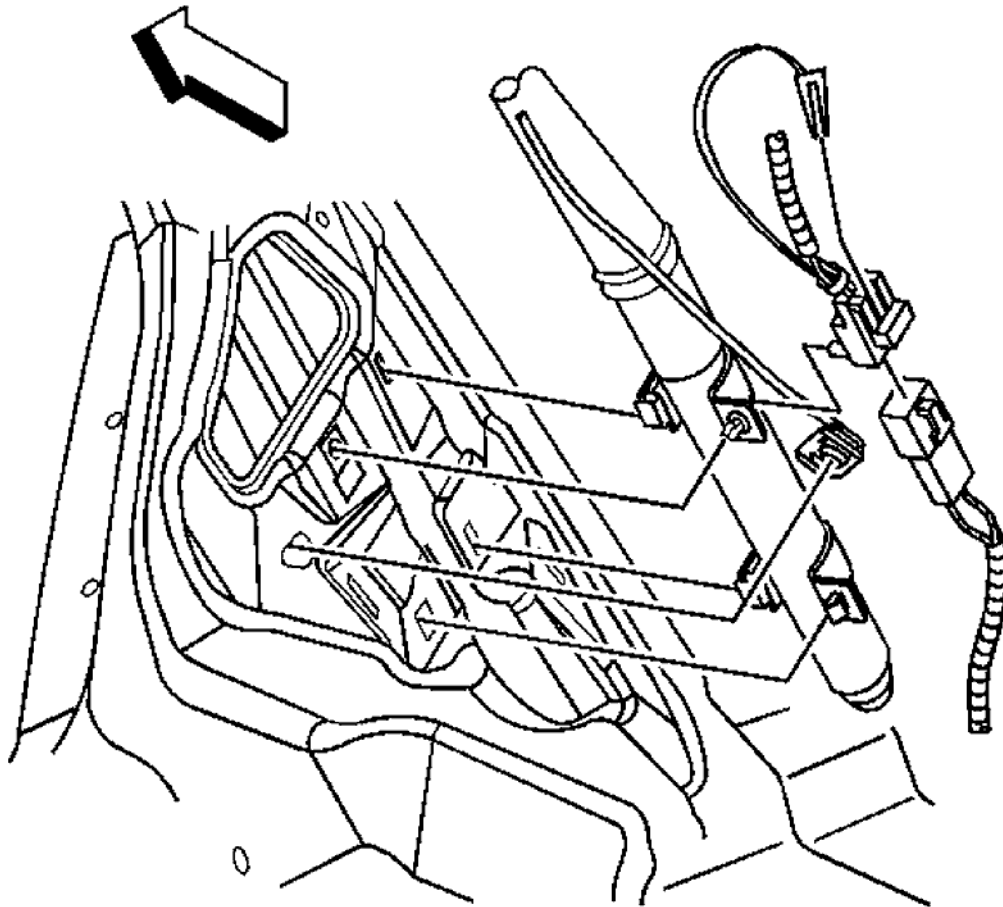


Fig. 68: Locating Roof Rail Module Connector
Courtesy of GENERAL MOTORS CORP.

2. Connect the roof rail module - left connector to the vehicle harness connector.
3. Install the CPA to the roof rail module - left connector.
4. Install the garnish molding to the left upper lock pillar. Refer to **Trim Panel Replacement - Rear Quarter Upper** .

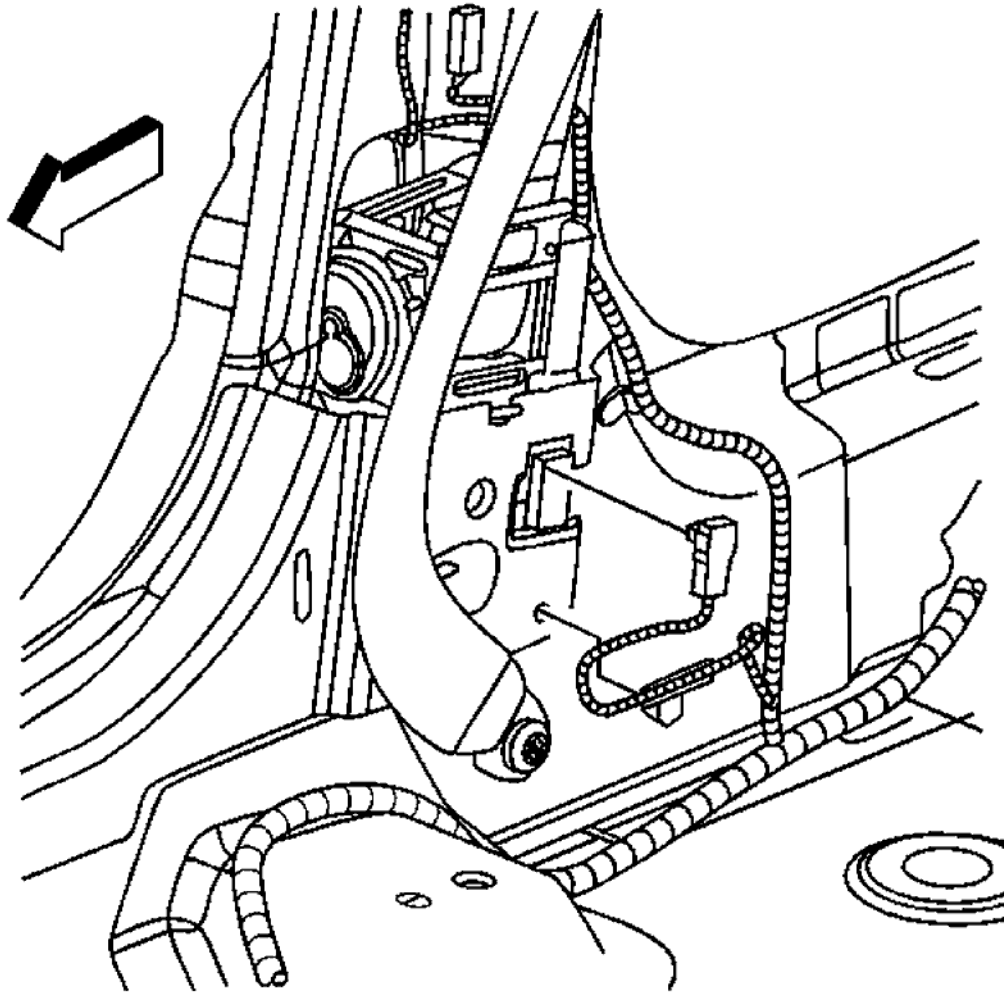


Fig. 69: View Of Seat Belt Pretensioner Connector And Wiring Harness Routing
Courtesy of GENERAL MOTORS CORP.

5. Connect the seat belt retractor pretensioner - LF connector.
6. Install the CPA to the seat belt retractor pretensioner - LF connector.
7. Install the left/driver lower center pillar trim. Refer to **Trim Panel Replacement - Lower Center Pillar** .

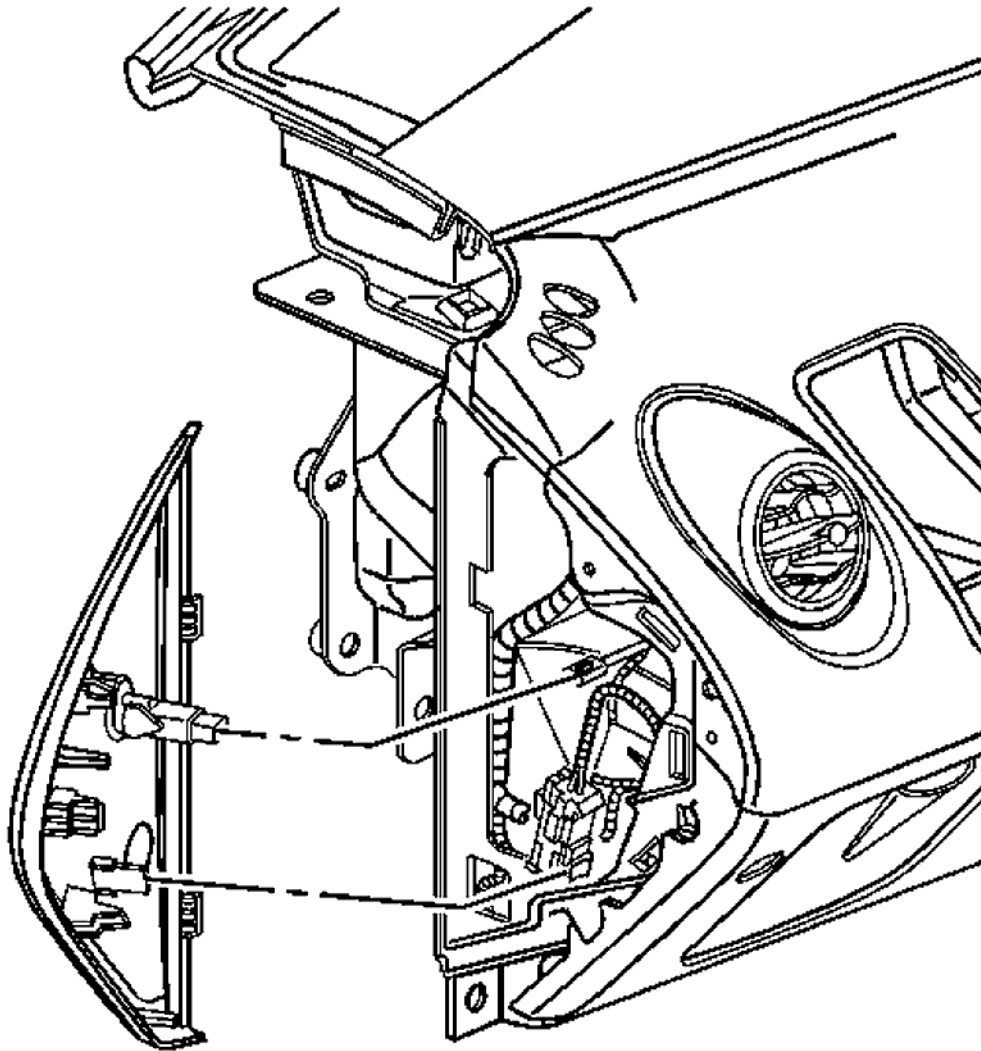


Fig. 70: View Of Door Switch & Air Bag Electrical Connectors Behind Left Trim Panel

Courtesy of GENERAL MOTORS CORP.

8. Connect the steering wheel module coil connector to the vehicle harness connector.
9. Install the CPA to the steering wheel module coil connector.
10. Install the driver/left outer trim cover to the I/P. Refer to **Instrument Panel (I/P) Outer Trim Cover Replacement** .

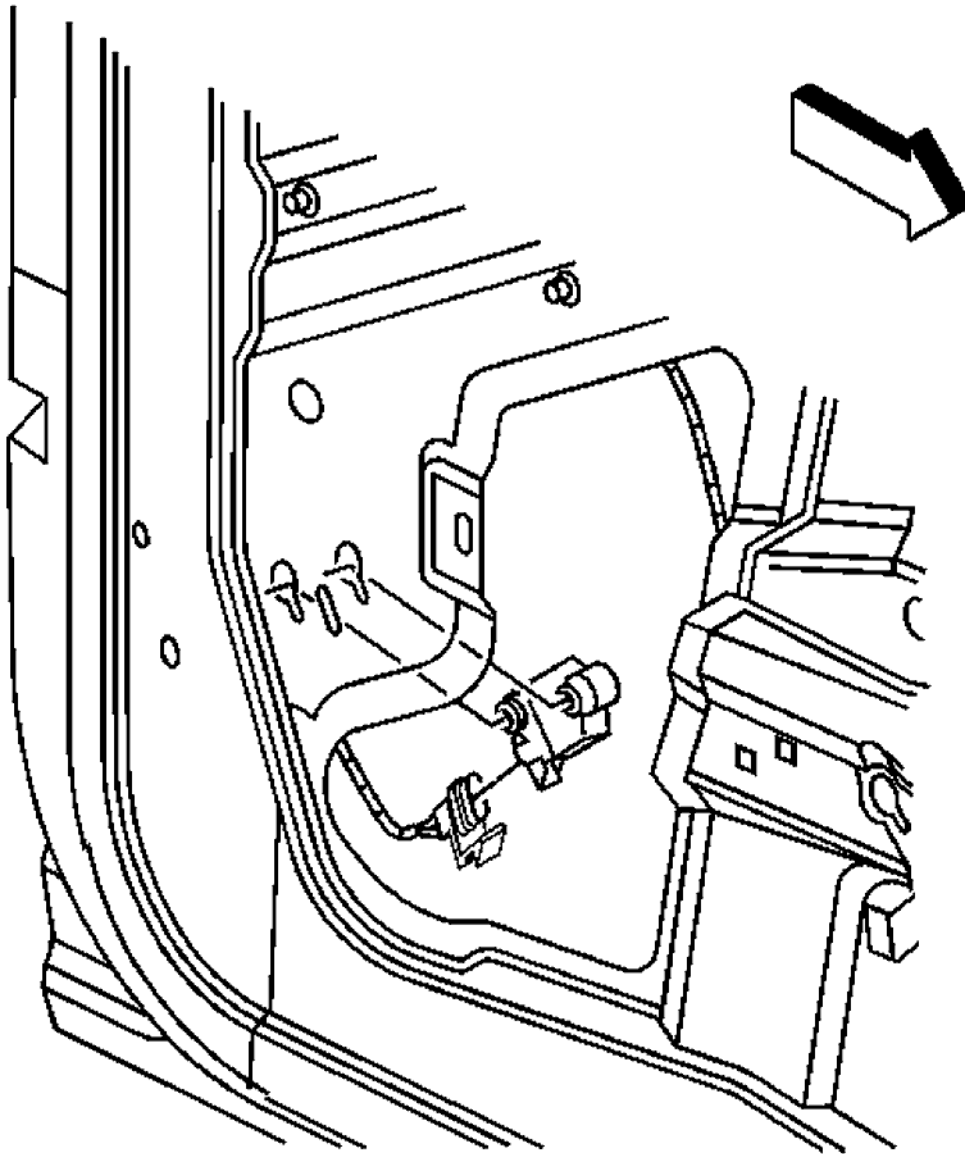


Fig. 71: View Of Inflatable Restraint Side Impact Sensor Electrical Connector
Courtesy of GENERAL MOTORS CORP.

11. Install the SIS - left connector to the SIS.
12. Install the CPA to the SIS connector.
13. Reinstall door water deflector.
14. Install the LH door trim panel. Refer to **Trim Panel Replacement - Side Front Door** .
15. Connect the I/P module connector to the vehicle harness connector.

16. Engage the CPA of the I/P module connector.

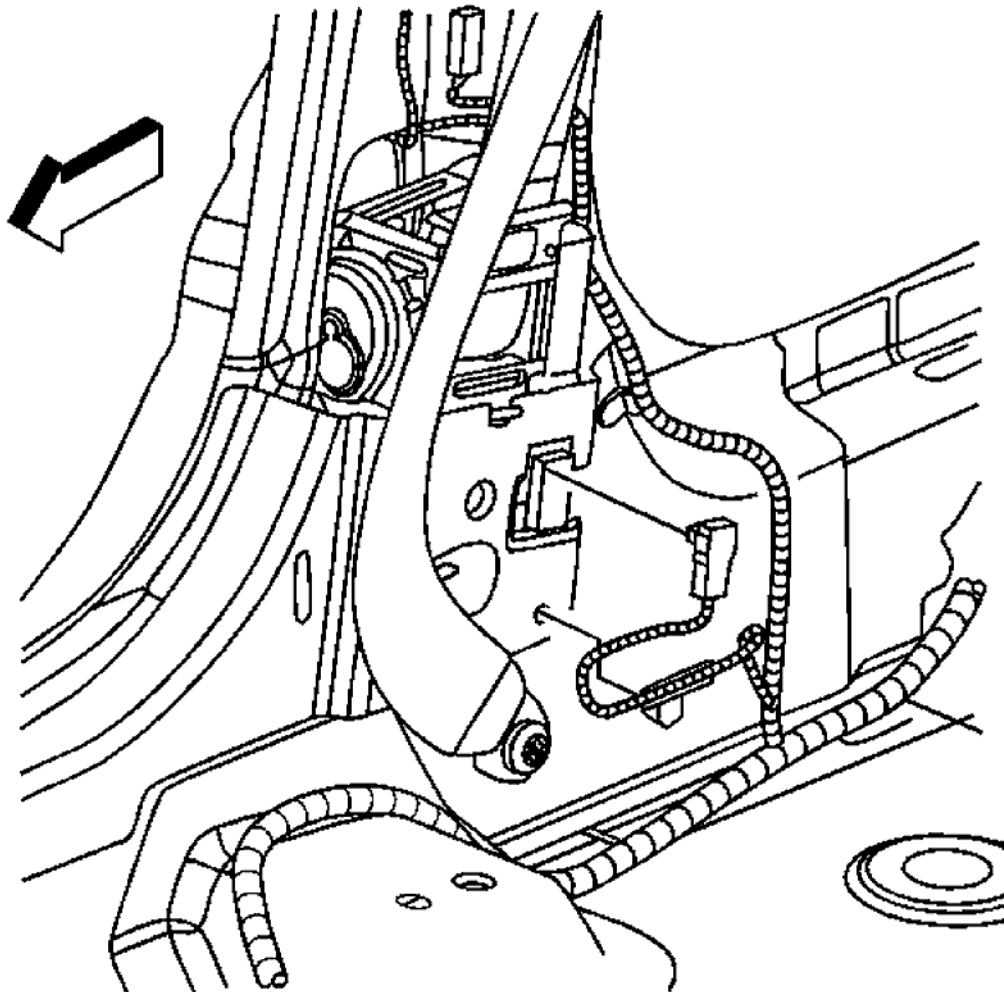


Fig. 72: View Of Seat Belt Pretensioner Connector And Wiring Harness Routing
Courtesy of GENERAL MOTORS CORP.

17. Connect the seat belt retractor pretensioner - RF connector.
18. Install the CPA to the seat belt retractor pretensioner - RF connector.
19. Install the right lower center pillar trim. Refer to **Trim Panel Replacement - Lower Center Pillar** .

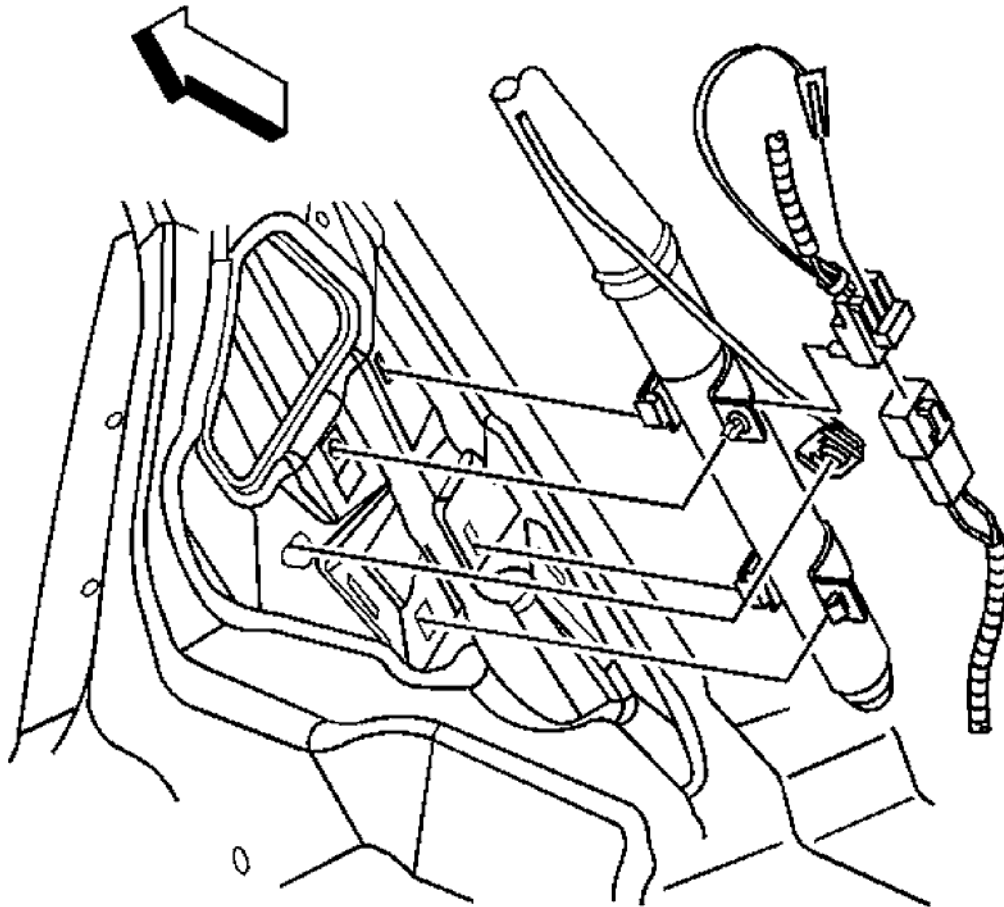


Fig. 73: Locating Roof Rail Module Connector
Courtesy of GENERAL MOTORS CORP.

20. Connect the roof rail module - right connector to the vehicle harness connector.
21. Install the CPA to the roof rail module - right connector.
22. Install the garnish molding to the right upper lock pillar. Refer to **Trim Panel Replacement - Rear Quarter Upper** .

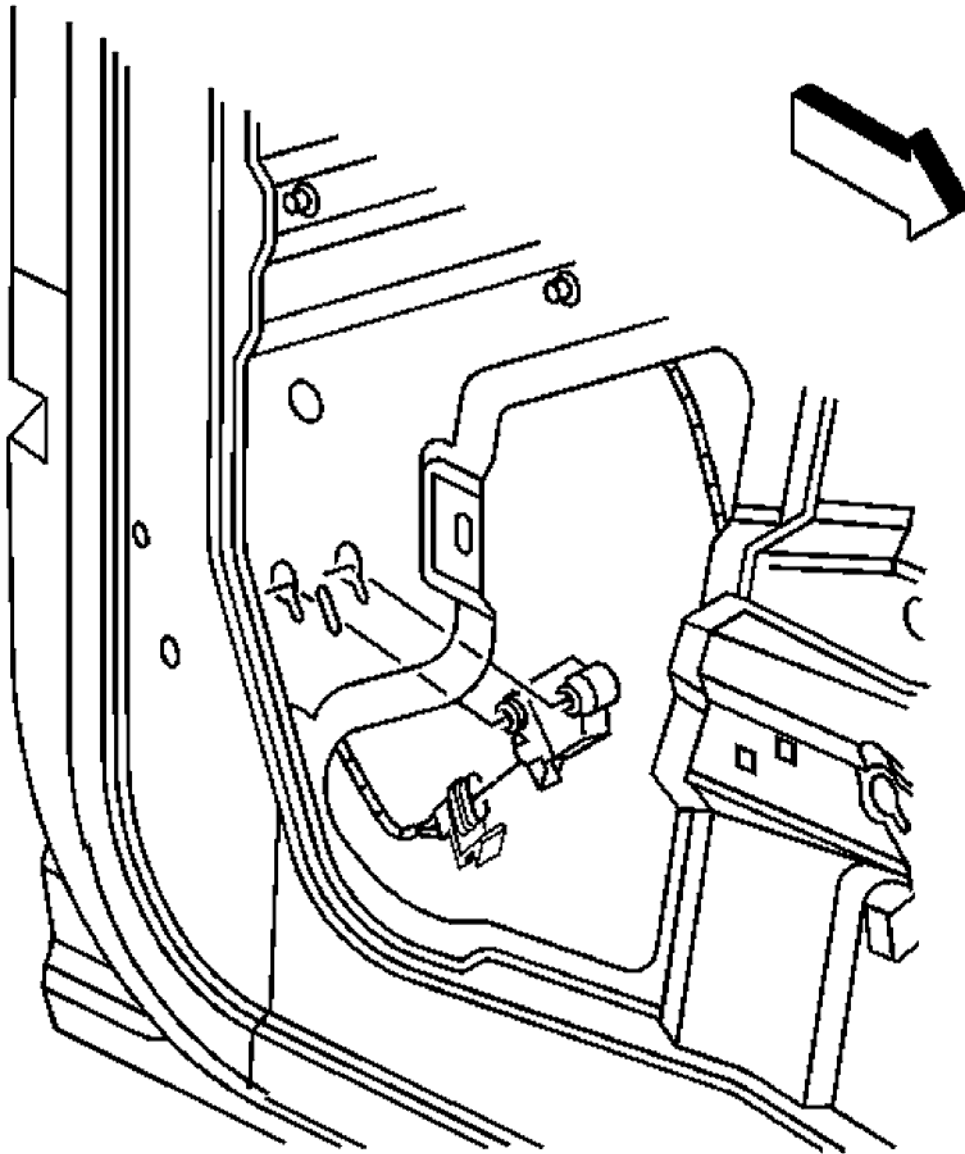


Fig. 74: View Of Inflatable Restraint Side Impact Sensor Electrical Connector
Courtesy of GENERAL MOTORS CORP.

23. Install the SIS - right connector to the SIS.
24. Install the CPA to the SIS connector.
25. Reinstall door water deflector.
26. Install the RH door trim panel. Refer to **Trim Panel Replacement - Side Front Door** .

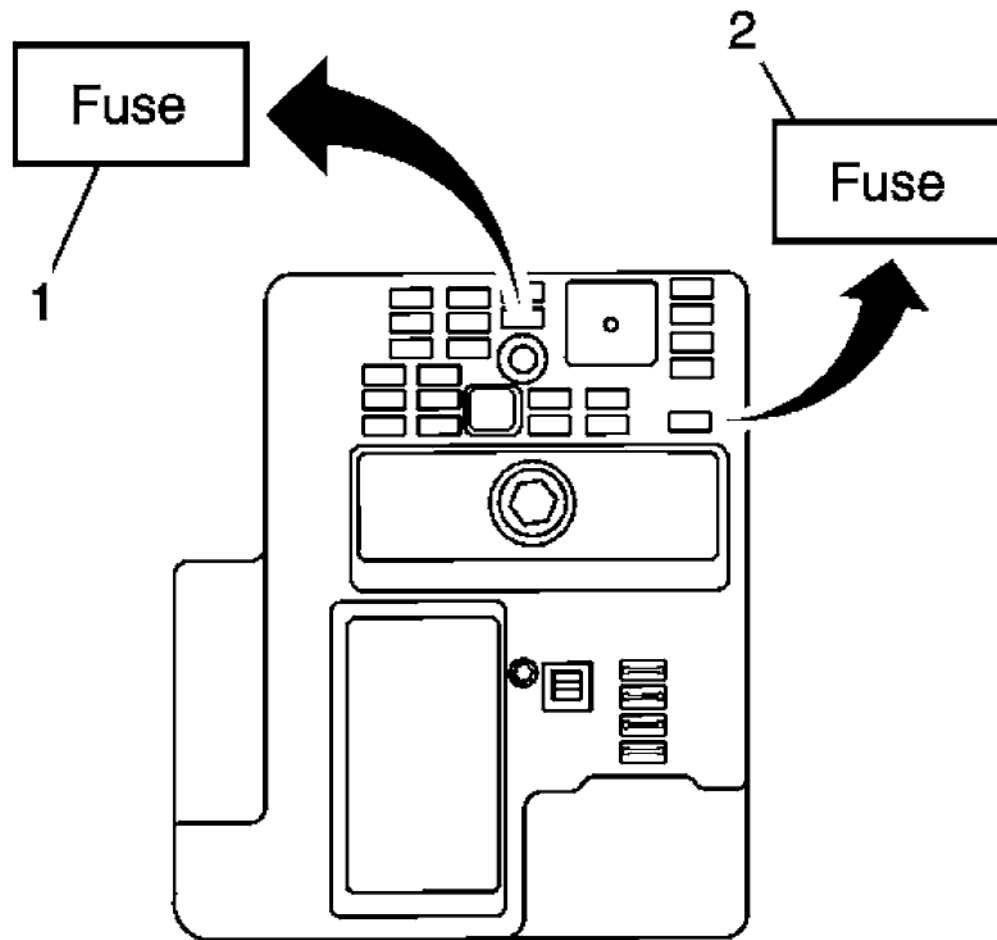


Fig. 75: BCM Fuse Center

Courtesy of GENERAL MOTORS CORP.

27. Install the AIR BAG (1) and SDM (2) fuses into the BCM fuse center.
28. Install the BCM fuse center cover.
29. Use caution while reaching in and turn the ignition switch to the ON position. The AIR BAG indicator will flash then turn OFF.
30. Perform the Diagnostic System Check - Vehicle if the AIR BAG warning indicator does not operate as described. Refer to **Diagnostic System Check - Vehicle** .

INFLATABLE RESTRAINT FRONT END SENSOR REPLACEMENT

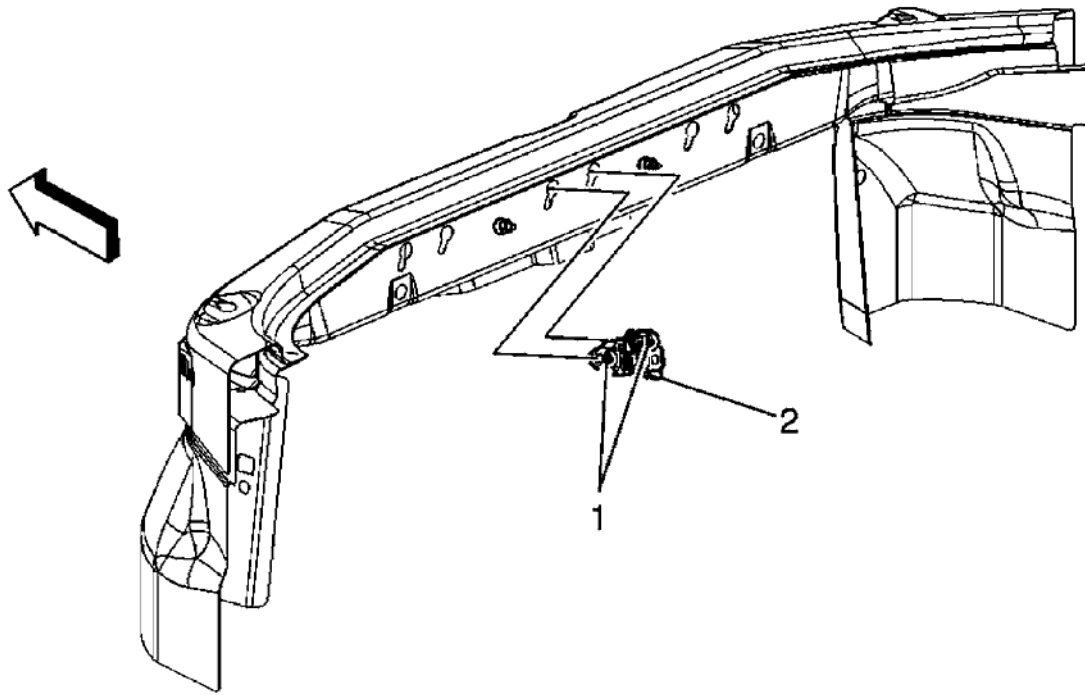


Fig. 76: Inlatable Restraint Front End Sensor Replacement
 Courtesy of GENERAL MOTORS CORP.

Inlatable Restraint Front End Sensor Replacement

Callout	Component Name
CAUTION: Do not strike or jolt the inflatable restraint front end sensor. Before applying power to the front end sensor make sure that it is securely fastened. Failure to observe the correct installation procedure could cause SIR deployment, personal injury, or unnecessary SIR system repairs.	
NOTE: Refer to <u>Fastener Notice</u> .	
Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u> . Preliminary Procedure: Disable the supplemental inflatable restraint (SIR) system. Refer to <u>SIR Disabling and Enabling Zone 1</u> .	
1	Bolt, Forward Discriminating Sensor (Qty: 2) Tip: Loosen the bolts in order to remove the sensor. Tighten: 8 N.m (71 lb in)
2	Sensor, Forward Discriminating Tip: 1. Remove the connector position assurance (CPA) retainer. 2. Disconnect the electrical connector.

INFLATABLE RESTRAINT SIDE IMPACT SENSOR REPLACEMENT

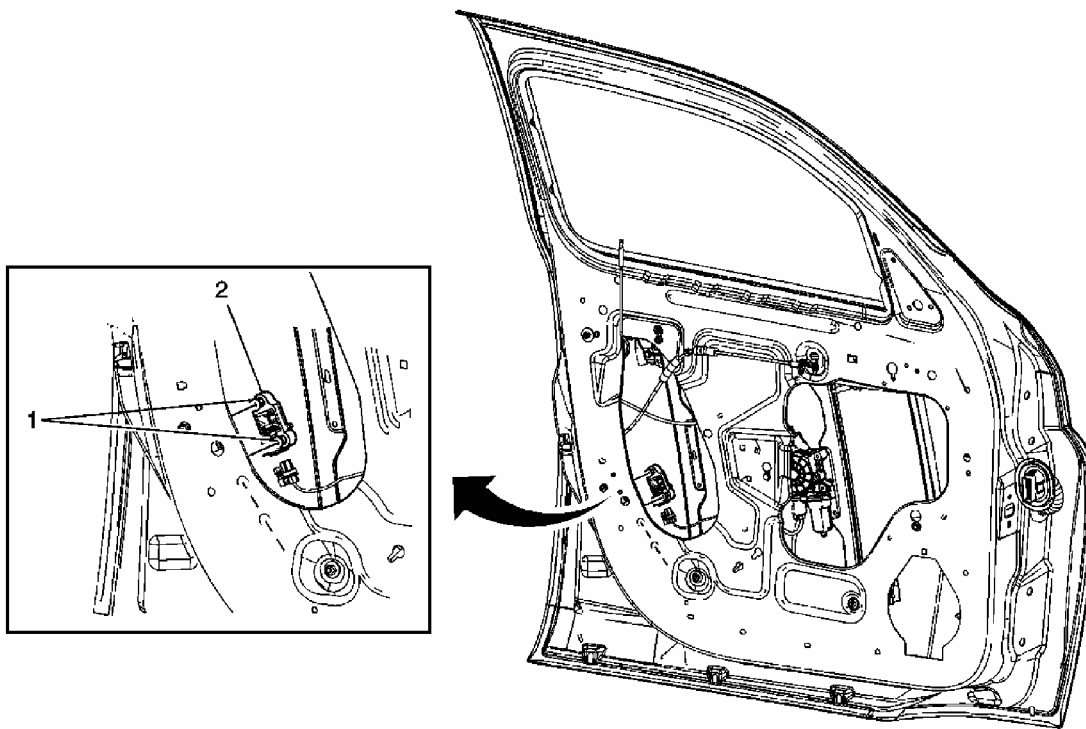


Fig. 77: Inflatable Restraint Side Impact Sensor Replacement
 Courtesy of GENERAL MOTORS CORP.

Inflatable Restraint Side Impact Sensor Replacement

Callout	Component Name
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. NOTE: Refer to <u>Fastener Notice</u> . Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u>. Preliminary Procedure	

1. Disable the SIR. Refer to **SIR Disabling and Enabling Zone 2** or **SIR Disabling and Enabling Zone 6**.
2. Remove the door trim panel. Refer to **Trim Panel Replacement - Side Front Door**.

1	Bolt, Inflatable Restraint Side Impact Sensor Assembly (Qty: 2) Tip: Loosen the bolts and slide the sensor out of the key hole slots. Tighten: 9 N.m (80 lb in)
2	Sensor Assembly, Inflatable Restraint Side Impact

INFLATABLE RESTRAINT SENSING AND DIAGNOSTIC MODULE REPLACEMENT

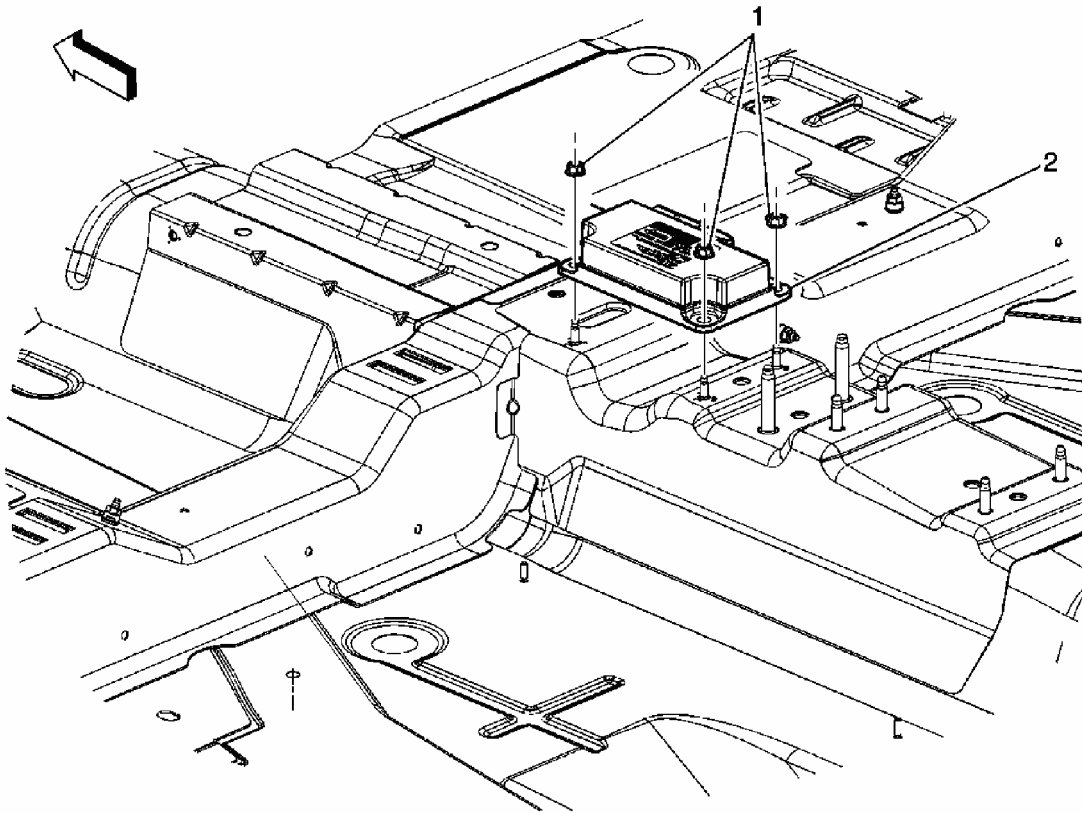


Fig. 78: Inflatable Restraint Sensing and Diagnostic Module Replacement
Courtesy of GENERAL MOTORS CORP.

Inflatable Restraint Sensing and Diagnostic Module Replacement

Callout	Component Name
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.	

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

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.

NOTE:

Refer to Fastener Notice .

Fastener Tightening Specifications: Refer to Fastener Tightening Specifications.

Preliminary Procedure

1. Disable the SIR. Refer to SIR Disabling and Enabling Zone 8.
2. Remove the center console. Refer to Console Replacement .

1	Nut, Inflatable Restraint Sensing and Diagnostic Module (Qty: 3) Tighten: 10 N.m (89 lb in)
2	Module, Inflatable Restraint Sensing and Diagnostic Tip: Reprogram the Inflatable Restraint Sensing and Diagnostic Module after installation. Refer to <u>Control Module References</u> .

INFLATABLE RESTRAINT STEERING WHEEL MODULE REPLACEMENT

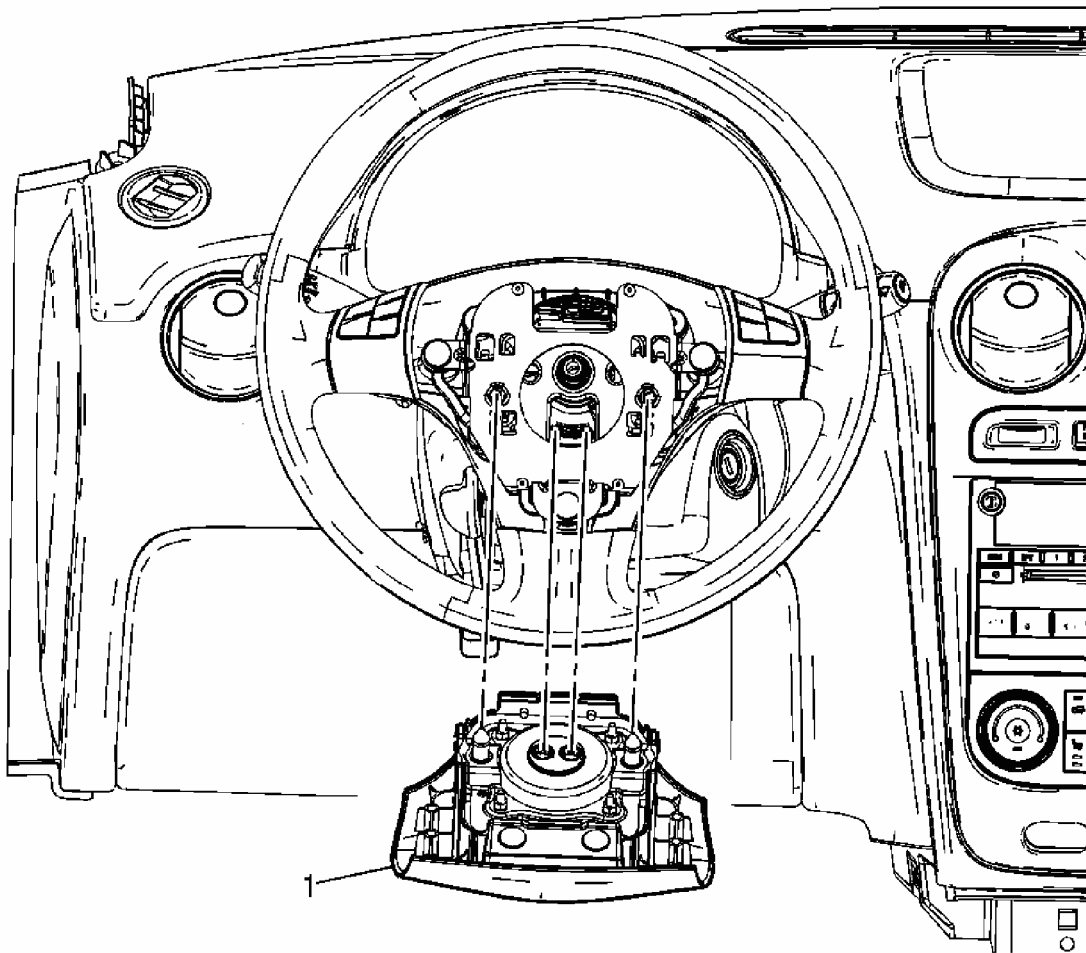


Fig. 79: Inflatable Restraint Steering Wheel Module Replacement
Courtesy of GENERAL MOTORS CORP.

Inflatable Restraint Steering Wheel Module Replacement

Callout	Component Name
CAUTION: Refer to <u>SIR Inflator Module Handling and Storage Caution</u> .	
CAUTION: Refer to <u>SIR Caution</u> .	
Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u> .	
Preliminary Procedures	
1. Disable the supplemental inflatable restraint (SIR) system. Refer to <u>SIR Disabling and Enabling Zone 3</u> .	
2. On the back side of the steering wheel are 2 openings, place the wheel so that one	

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

opening is on top.

3. Using a blunt-ended tool, push the spring fastener inward through the access hole. Repeat the step for the other opening.

Module, Steering Wheel Inflatable Restraint

Tip:

1

1. Remove the connector position assurance (CPA) retainer.
2. Disconnect the electrical connectors.
3. Fully deploy the module before disposal. If the module was replaced under warranty, fully deploy and dispose of the module after the required retention period. Refer to **Inflator Module Handling and Scrapping**.

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**.
5. Remove the steering column covers. Refer to **Steering Column Trim Covers Replacement**.

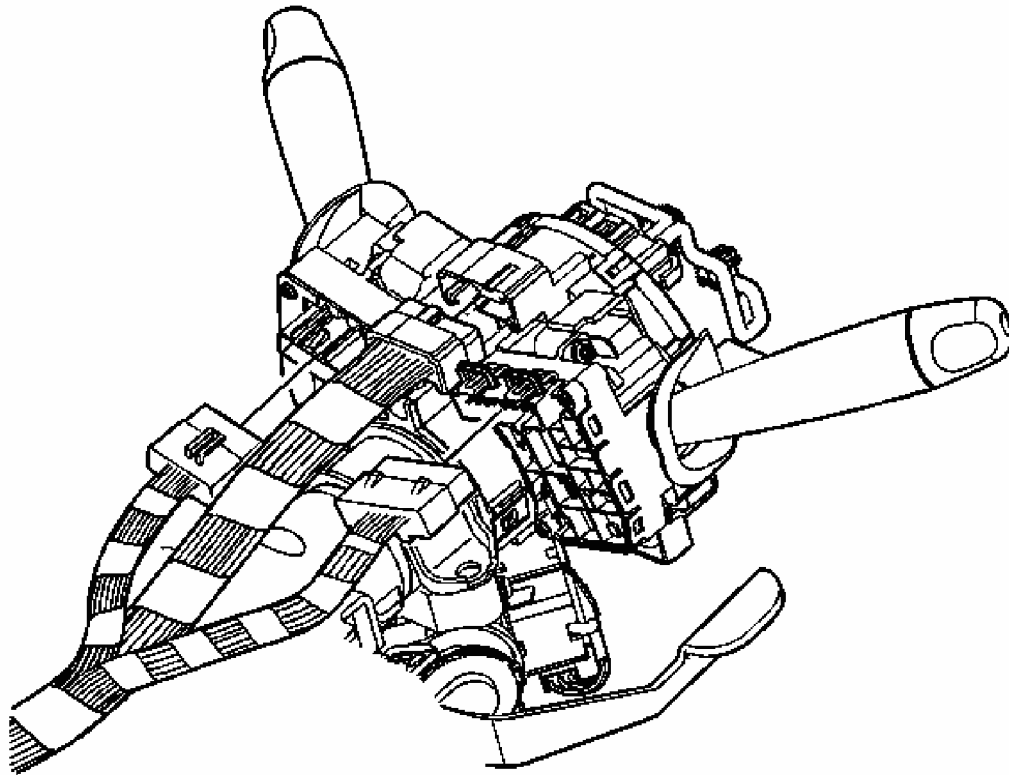


Fig. 80: View Of SIR Coil Module Assembly Harness Connectors
Courtesy of GENERAL MOTORS CORP.

6. Disconnect the SIR coil harness connector from the SIR coil module assembly.
7. Disconnect the headlamp/turn signal harness connector from the SIR coil module assembly.
8. Disconnect the wiper/washer harness connector for the SIR coil module assembly.

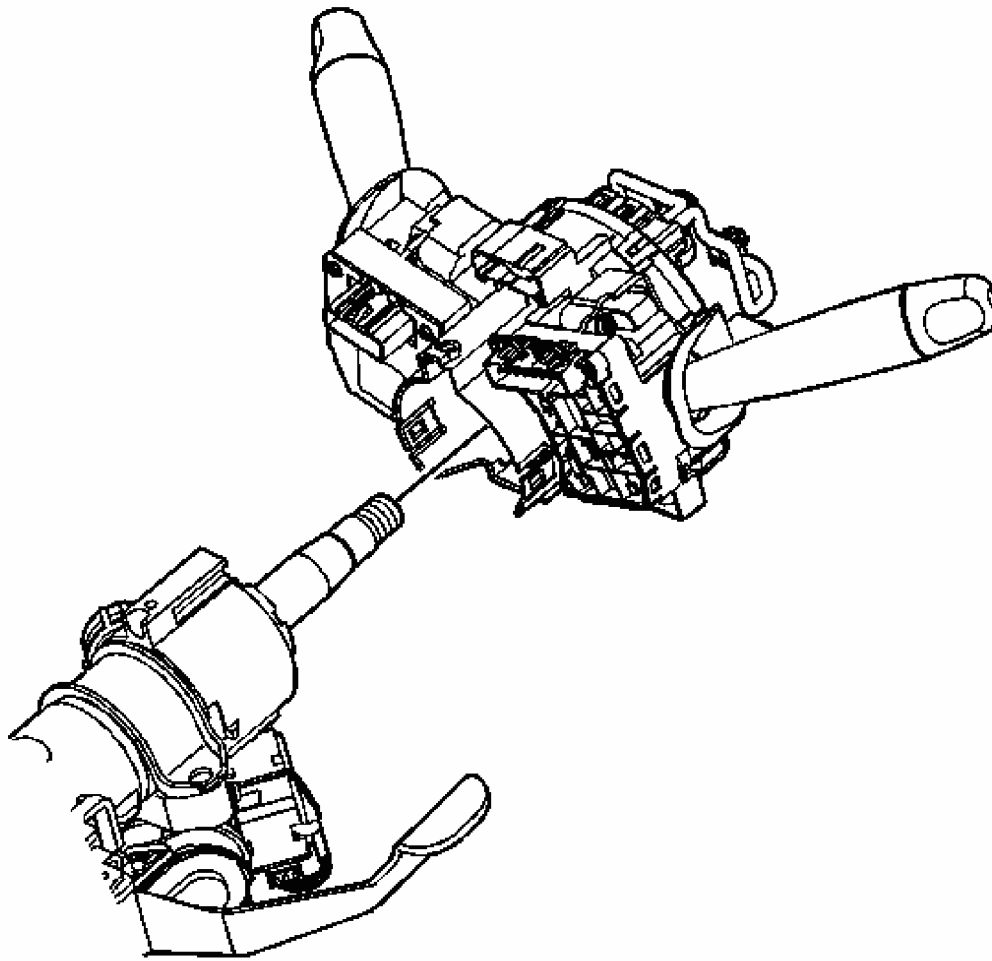


Fig. 81: Steering Wheel Module
Courtesy of GENERAL MOTORS CORP.

9. Using a small flat-bladed tool, carefully pry the 2 retaining tabs away at the base of the SIR coil assembly and slide the SIR coil assembly off of the steering column.

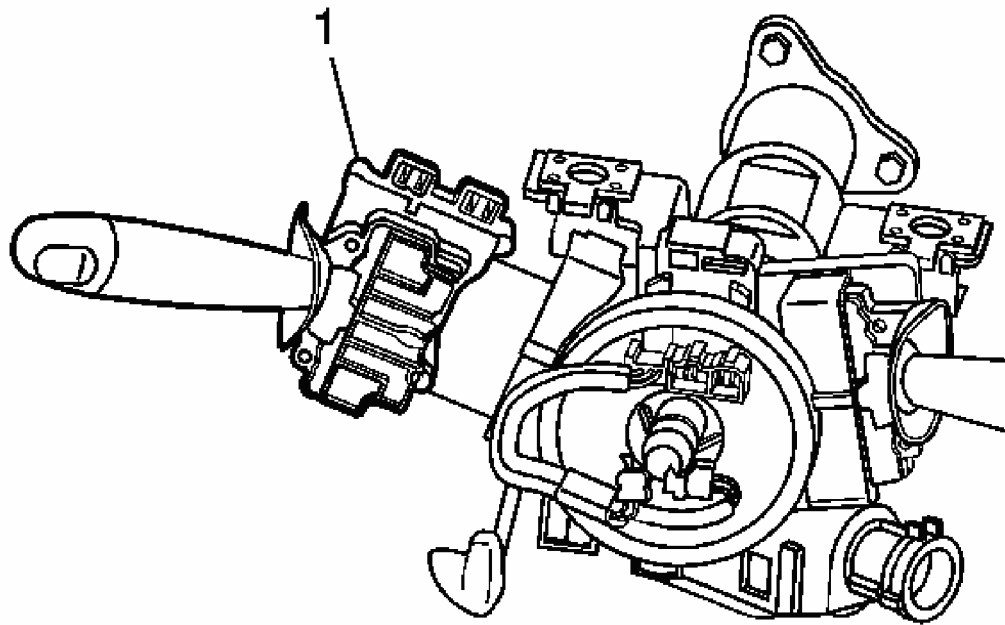


Fig. 82: Headlamp/Turn Signal Switch
Courtesy of GENERAL MOTORS CORP.

10. Remove the headlamp/turn signal switch from the SIR coil module assembly. Refer to **Multifunction, Turn Signal Switch Replacement** .
11. Remove the wiper washer switch from the SIR coil module assembly. Refer to **Wipers/Washer Switch Replacement** .

Installation Procedure

1. Install the wiper washer switch from the SIR coil module assembly. Refer to **Wipers/Washer Switch Replacement** .
2. Install the headlamp/turn signal switch to the SIR coil module assembly. Refer to **Multifunction, Turn Signal Switch Replacement** .
3. Install the headlamp/turn signal switch screws.
4. Verify the SIR coil is in the center position. Refer to **Inflatable Restraint Steering Wheel Module Coil Centering** .
5. Slide the SIR coil assembly on the steering column and snap into place.

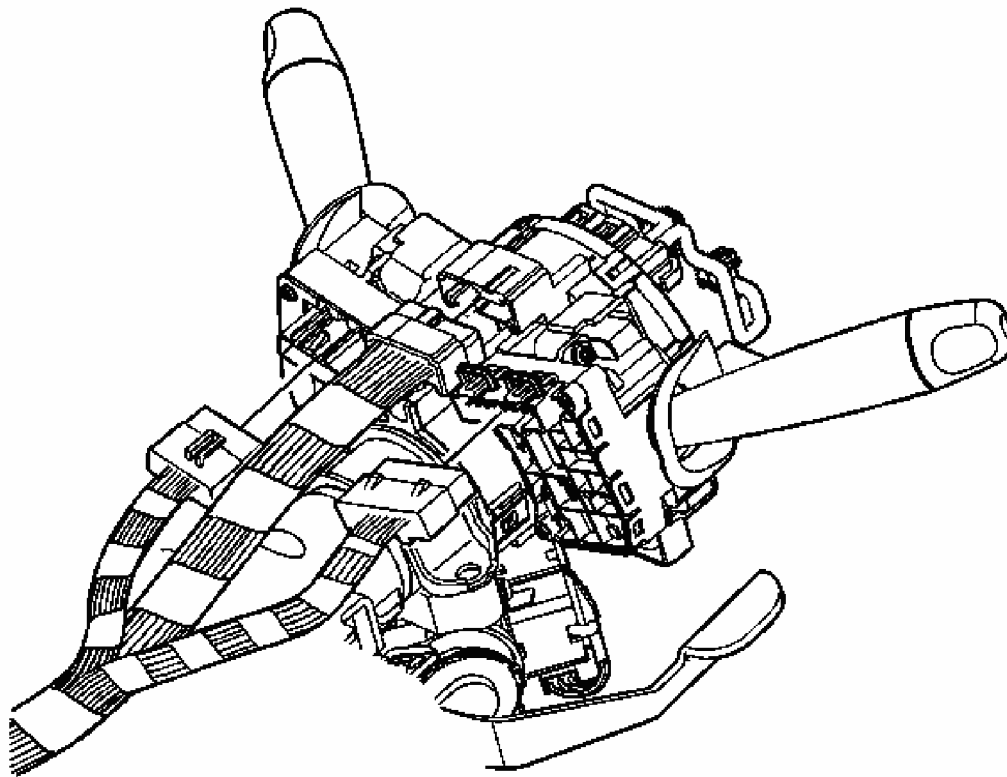


Fig. 83: View Of SIR Coil Module Assembly Harness Connectors
Courtesy of GENERAL MOTORS CORP.

6. Connect the wiper/washer harness connector to the SIR coil module assembly.
7. Connect the headlamp/turn signal harness connector to the SIR coil module assembly.
8. Connect the SIR coil harness connector to the SIR coil module assembly.
9. Install the steering column covers. Refer to **Steering Column Trim Covers Replacement** .
10. Install the steering wheel. Refer to **Steering Wheel Replacement** .
11. Install the inflatable restraint steering wheel module. Refer to **Inflatable Restraint Steering Wheel Module Replacement**.
12. Enable the SIR system. Refer to **SIR Disabling and Enabling Zone 3**.

INFLATABLE RESTRAINT INSTRUMENT PANEL MODULE REPLACEMENT

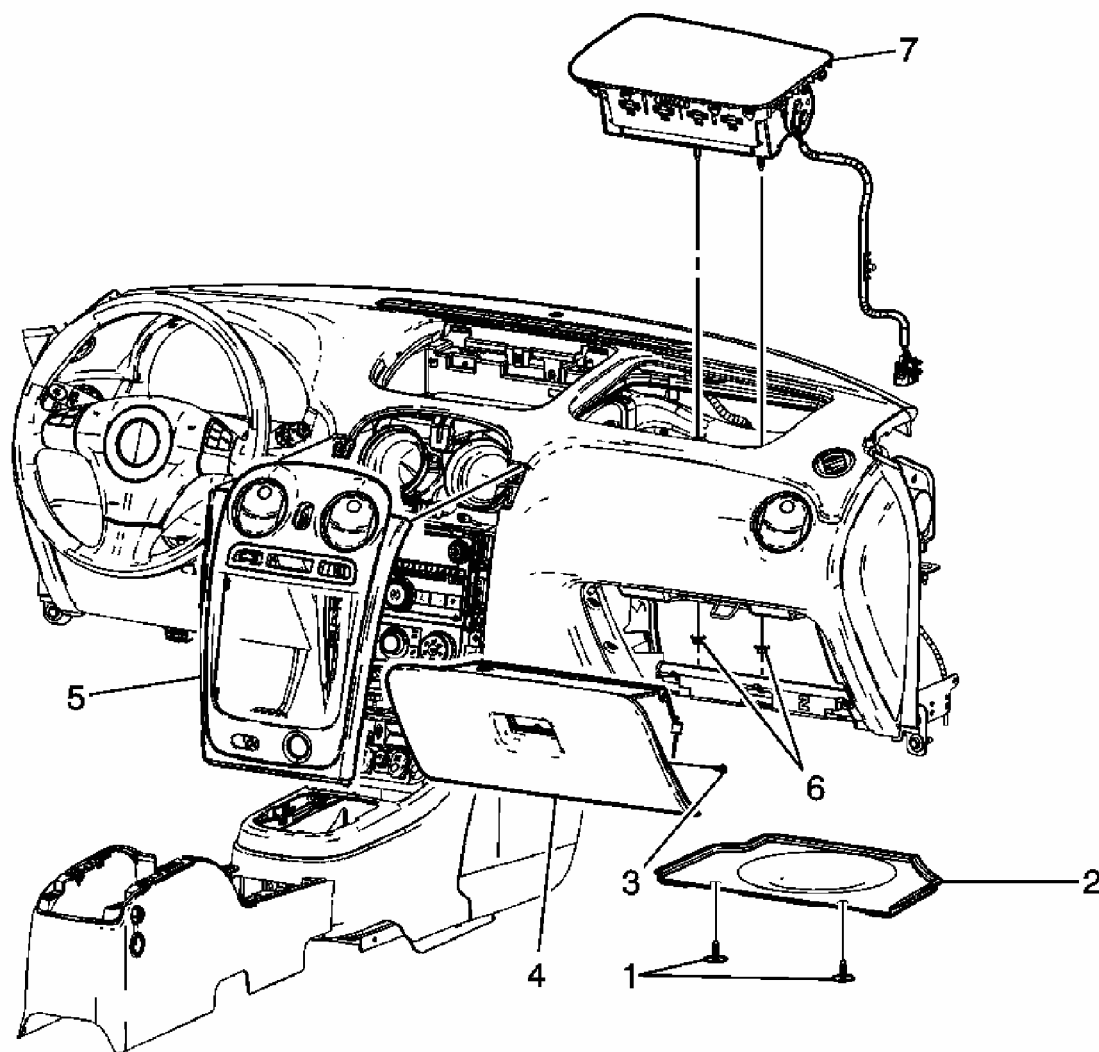


Fig. 84: Inflatable Restraint Instrument Panel Module Replacement
 Courtesy of GENERAL MOTORS CORP.

Inflatable Restraint Instrument Panel Module Replacement

Callout	Component Name
CAUTION: Refer to SIR Inflator Module Handling and Storage Caution . CAUTION: Refer to SIR Caution . NOTE: Refer to Fastener Notice .	

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

Fastener Tightening Specifications: Refer to **Fastener Tightening Specifications**.

Preliminary Procedure

1. Disable the supplemental inflatable restraint (SIR) system. Refer to **SIR Disabling and Enabling Zone 5**.
2. Remove the right windshield pillar garnish molding. Refer to **Windshield Garnish Molding Replacement**.
3. Loosen the front passenger side of the instrument panel upper trim panel. Refer to **Trim Pad Replacement - Instrument Panel (I/P) Upper**.

1	Retainer, Insulator/Closeout Panel (Qty: 2)
2	Panel Assembly, Insulator/Closeout
3	Screw, Instrument Panel Compartment Dampener Tighten: 3 N.m (25 lb in)
4	Compartment Assembly, Instrument Panel
5	Trim Plate, Instrument Panel Accessory Tip: Disconnect the electrical connector.
6	Nut, Instrument Panel Inflatable Restraint Module (Qty: 2) Tighten: 10 N.m (89 lb in)
7	Module, Instrument Panel Inflatable Restraint Tip: 1. To release the instrument panel inflatable restraint door from the upper trim panel, push in on the tabs to separate the module door from the trim panel. 2. Remove the connector position assurance (CPA) retainer. 3. Disconnect the electrical connector. 4. Fully deploy the module before disposal. If the module was replaced under warranty, fully deploy and dispose of the module after the required period. Refer to Inflator Module Handling and Scrapping.

INFLATABLE RESTRAINT PASSENGER PRESENCE SYSTEM REPLACEMENT - FRONT

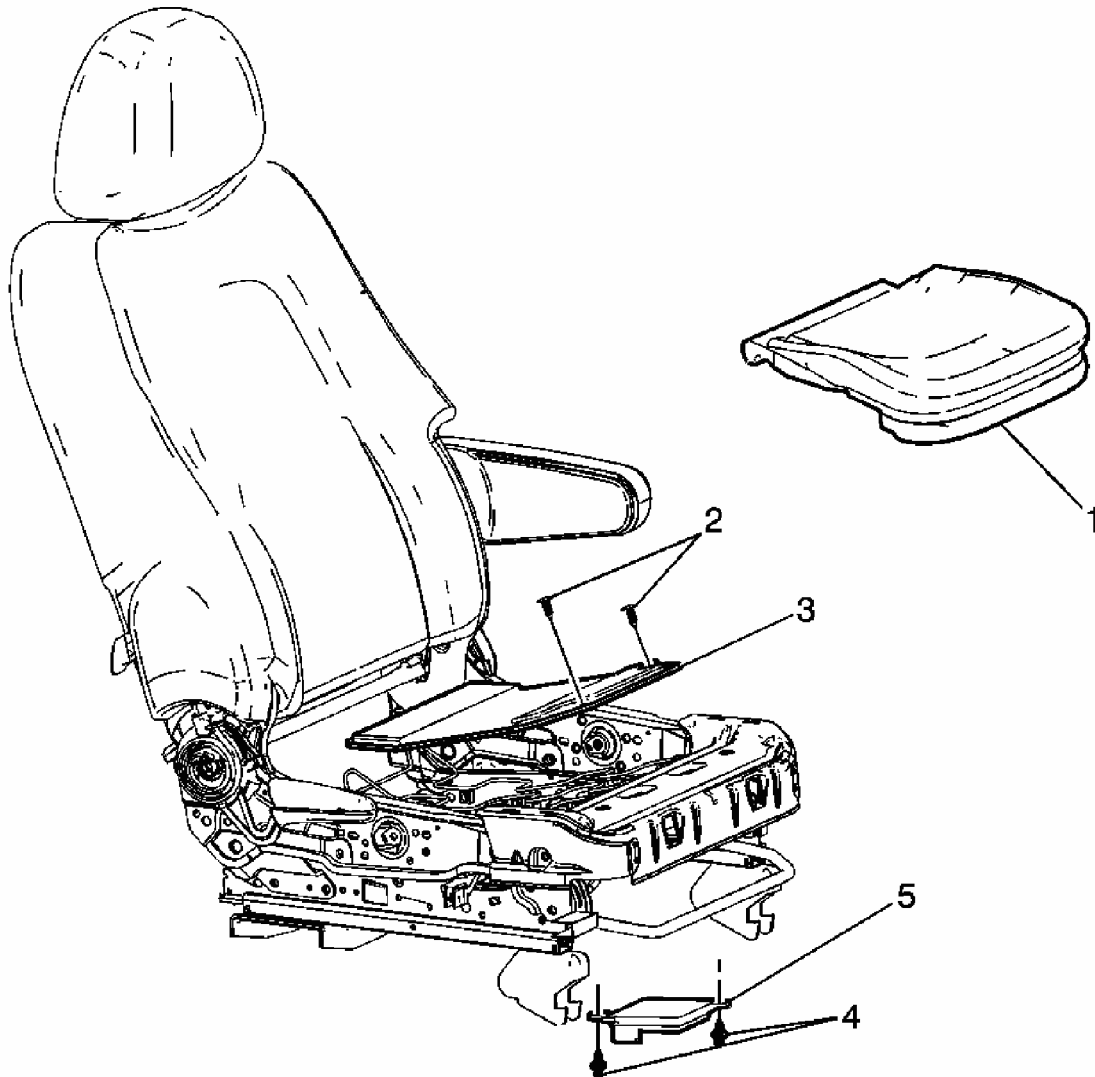


Fig. 85: Inflatable Restraint Passenger Presence System Replacement - Front
 Courtesy of GENERAL MOTORS CORP.

Inflatable Restraint Passenger Presence System Replacement - Front

Callout	Component Name
CAUTION: Replace the passenger presence system as a complete assembly to prevent possible injury to the occupant. All the components in the service kit are assembled and calibrated as a unit. Using only some of the components in the service kit will cause the passenger presence system to operate improperly. Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u> . Preliminary Procedure 1. Remove the front seat. Refer to Seat Replacement - Front Bucket .	

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

2. Re-zero the inflatable restraint passenger presence system whenever the seat cushion or any component of the passenger presence system is removed. Refer to **Passenger Presence System Programming and Setup** .

1	Pad, Passenger Seat Cushion Cover Refer to Seat Cushion Cover and Pad Replacement - Front .
2	Retainer, Inflatable Restraint Front Passenger Presence Sensor (Qty: 2)
3	Sensor, Inflatable Restraint Front Passenger Presence Tip: • Disconnect the electrical connector. • The passenger presence system is an integral part of the pad on the passenger seat cushion. • The sensor, module and seat cushion pad must be replaced as a unit.
4	Rivet, Inflatable Restraint Front Passenger Presence Module (Qty: 2) Tip: Drill out the rivets to remove.
5	Module, Inflatable Restraint Front Passenger Presence Tip: The sensor, module and seat cushion pad must be replaced as a unit.

INDICATOR REPLACEMENT - INFLATABLE RESTRAINT IP MODULE

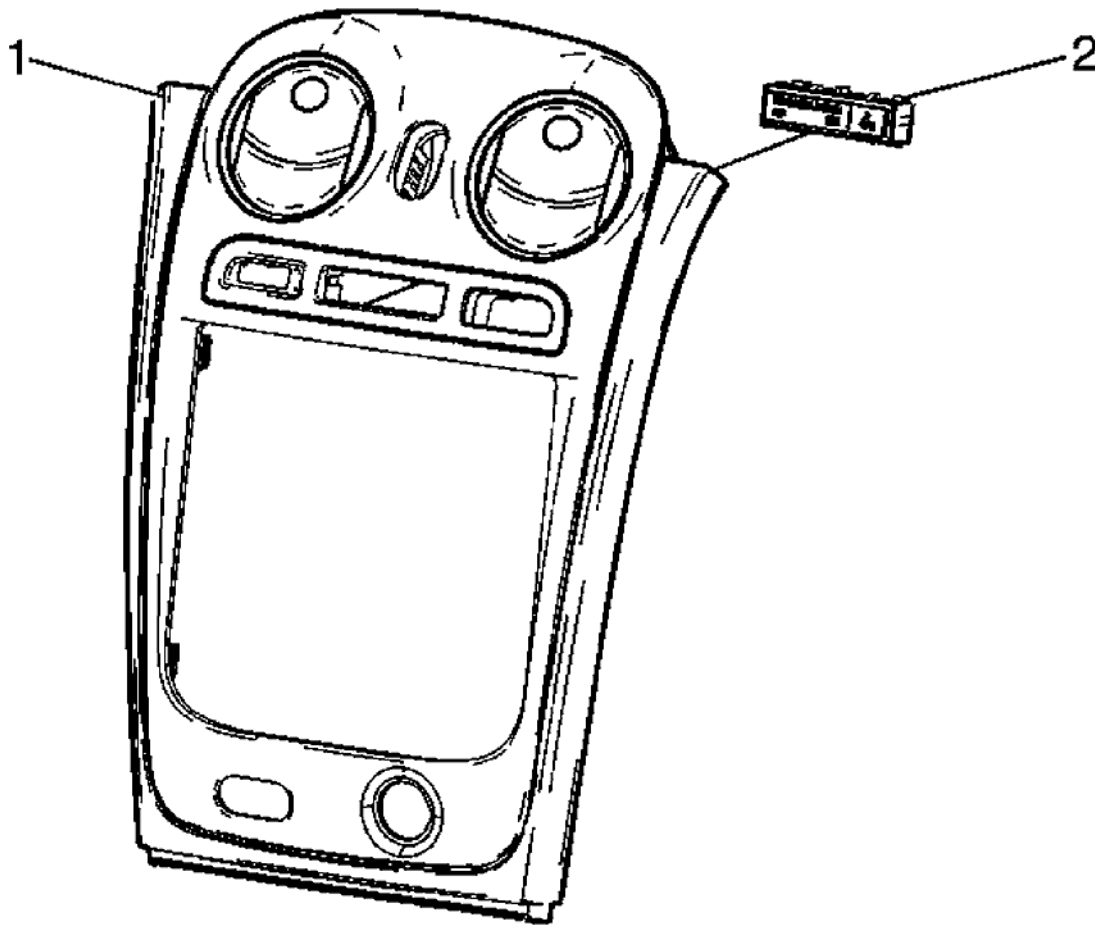


Fig. 86: Indicator Replacement - Inflatable Restraint IP Module
Courtesy of GENERAL MOTORS CORP.

Indicator Replacement - Inflatable Restraint IP Module

Callout	Component Name
Fastener Tightening Specifications: Refer to Fastener Tightening Specifications .	
1	Trim Plate, Instrument Panel Accessory Tip: Disconnect the electrical connector.
2	Indicator, Instrument Panel Inflatable Restraint Tip: Disconnect the electrical connector.

INFLATABLE RESTRAINT ROOF RAIL MODULE REPLACEMENT - FRONT

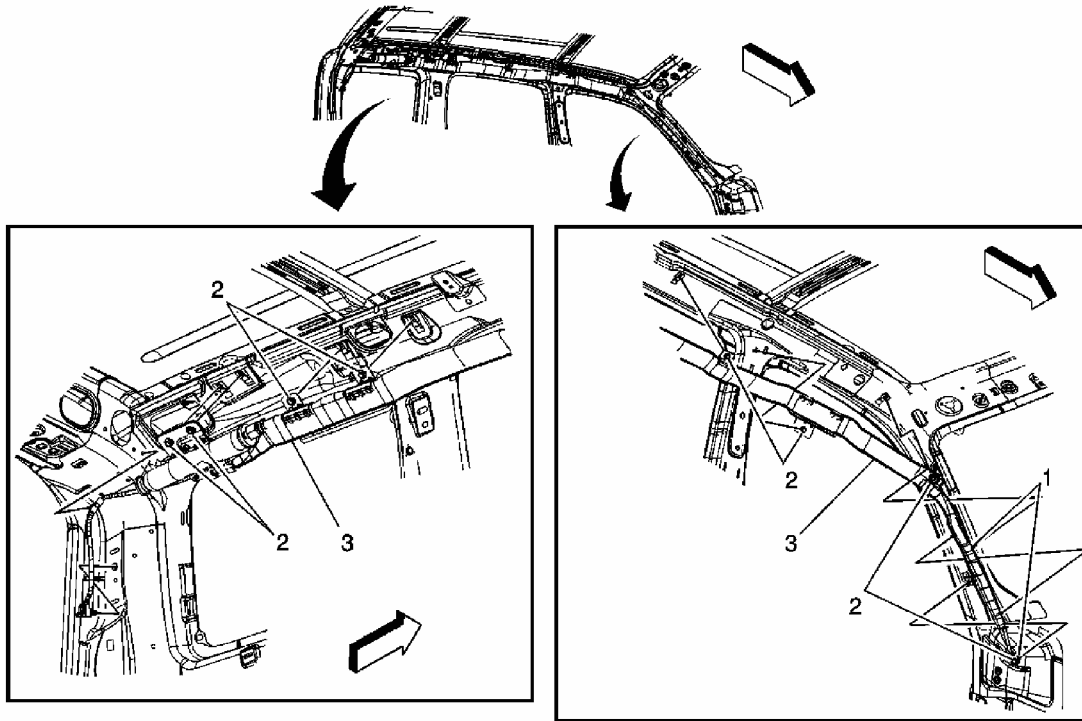


Fig. 87: Inflation Restraint Roof Rail Module Replacement - Front
 Courtesy of GENERAL MOTORS CORP.

Inflation Restraint Roof Rail Module Replacement - Front

Callout	Component Name
CAUTION: In order to prevent SIR deployment, personal injury, or unnecessary SIR system repairs, do not strike the door or the door pillar in the area of the side impact sensor (SIS). Turn OFF the ignition and remove the key when performing service in the area of the SIS. CAUTION: Refer to <u>SIR Caution</u> . CAUTION: Refer to <u>SIR Inflator Module Handling and Storage Caution</u> . NOTE: Refer to <u>Fastener Notice</u> Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u>. Preliminary Procedure	

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

1. Disable the SIR system. Refer to **SIR Disabling and Enabling Zone 2** for the left side or **SIR Disabling and Enabling Zone 6**.
2. Remove the windshield pillar garnish molding. Refer to **Windshield Garnish Molding Replacement**.
3. Remove the upper center pillar trim panel. Refer to **Trim Panel Replacement - Upper Center Pillar**.
4. Remove the rear quarter upper trim panel. Refer to **Trim Panel Replacement - Rear Quarter Upper**.
5. Remove the coat hooks. Refer to **Coat Hook Replacement**.
6. Lower the side of the headliner. Refer to **Headliner Replacement**.

1	Retainer, Push Pin (Qty: 4)
2	Bolt, Inflatable Restraint Roof Side Rail (Qty: 8) Tighten: 9 N.m (80 lb in)
3	Module Assembly, Inflatable Restraint Roof Side Rail Tip: 1. Remove the connector position assurance (CPA) retainer. 2. Disconnect the electrical connector. 3. Ensure the roof rail inflator has been fully deployed before disposal. Refer to Inflator Module Handling and Scrapping.

SEAT BELT RETRACTOR PRETENSIONER REPLACEMENT - FRONT

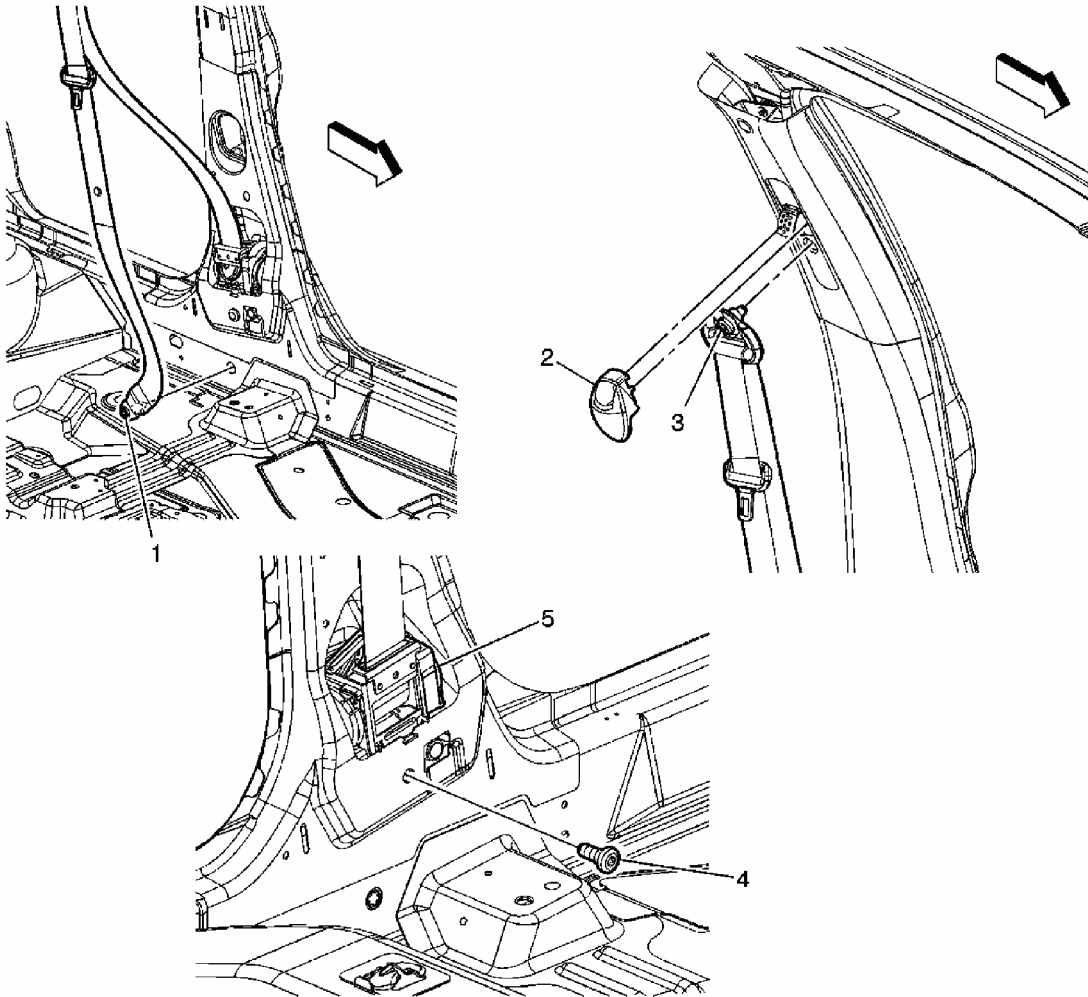


Fig. 88: Seat Belt Retractor Pretensioner Replacement - Front
 Courtesy of GENERAL MOTORS CORP.

Seat Belt Retractor Pretensioner Replacement - Front

Callout	Component Name
NOTE: Refer to <u>Fastener Notice</u> in Cautions and Notices.	
Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u> . Preliminary Procedure: Disable the SIR in Zones 2 or 6. Refer to <u>SIR Disabling and Enabling Zone 2</u> or <u>SIR Disabling and Enabling Zone 6</u> .	
1	Bolt, Seat Belt Anchor Tighten: 45 N.m (33 lb ft) Tip: Move the seat to the full forward position to gain access to the bolt.

2	Cover, Seat Belt Adjuster
3	Bolt, Seat Belt Adjuster Tighten: 45 N.m (33 lb ft)
4	Bolt, Seat Belt Retractor Tighten: 45 N.m (33 lb ft) Tip: Remove the center pillar lower trim panel to gain access to the bolt. Refer to Trim Panel Replacement - Lower Center Pillar .
5	Retractor Assembly, Front Seat Belt Tip: Disconnect the belt tension sensor electrical connector.

REPAIRS AND INSPECTIONS REQUIRED AFTER A COLLISION

Accident With or Without Inflator Module Deployment - Component Inspections

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

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

- The steering column-Perform the steering column accident damage checking procedures. Refer to **Steering Column Accident Damage Inspection** in Steering Wheel and Column.
- The instrument panel (I/P) knee bolsters and mounting points-Inspect the knee bolsters for bending, twisting, buckling, or any other type of damage.
- The I/P brackets, braces, etc.-Inspect for bending, twisting, buckling, or any other type of damage.
- The seat belts-Perform the seat belt operational and functional checks. Refer to **Operational and Functional Checks** in Seat Belts.
- The I/P mounting points and brackets-Inspect for bending, twisting, buckling, or any other type of damage.
- The roof rail and roof rail module mounting points-Inspect for bending, twisting, buckling, or any other type of damage.
- The seats and seat mounting points-Inspect for bending, twisting, buckling, or any other

type of damage.

- Passenger seat bottom equipped with Passenger Presence System (PPS)-Check for any DTCs or problems that may cause the PPS not to function properly.

Accident With Frontal Air Bag Deployment - Component Replacement and Inspections

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

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

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

Perform additional inspections on the following components:

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

Accident With Side Air Bag Deployment - Component Replacement and Inspections

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

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

- Inflatable restraint SDM
- Seat belt pretensioner, on the side of impact.

Perform additional inspections on the following components:

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

Sensor Replacement Guidelines

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

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

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

INFLATOR MODULE HANDLING AND SCRAPPING

Live and Undeployed Inflator Module

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

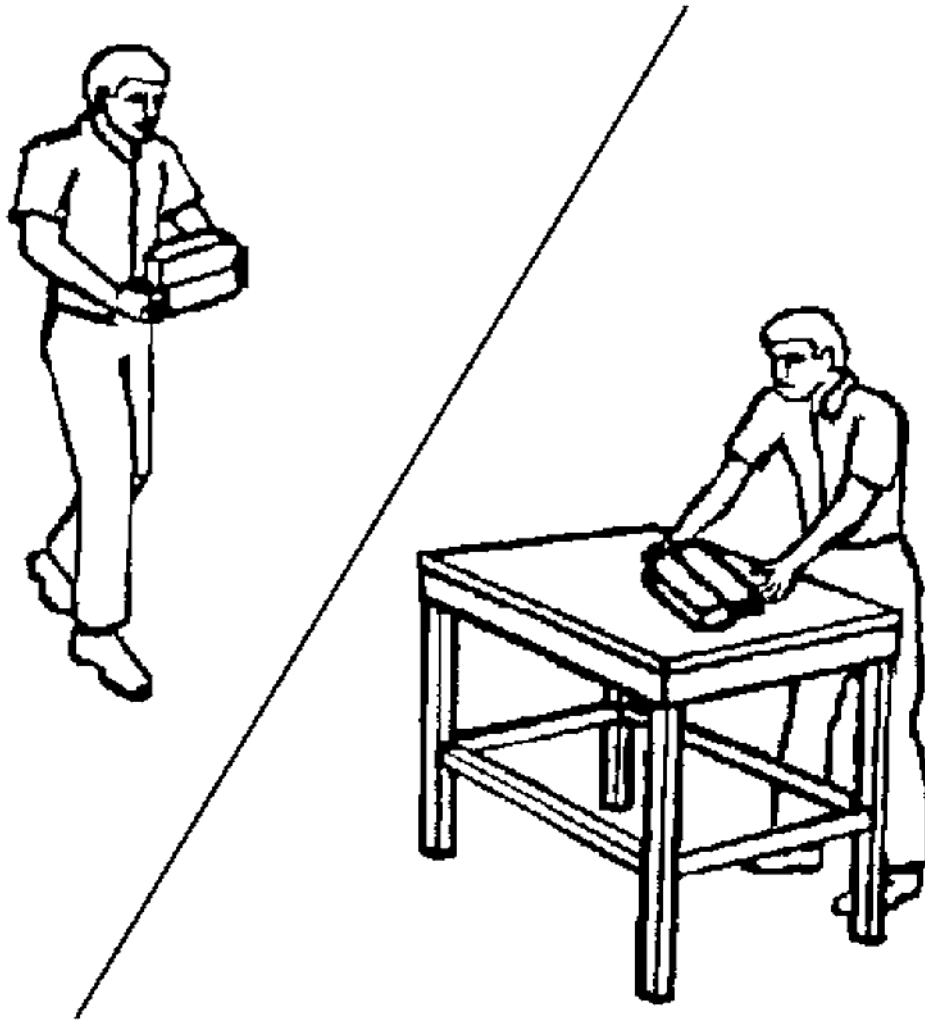


Fig. 89: View Of Proper Handling Of Undeployed Inflator Module
Courtesy of GENERAL MOTORS CORP.

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

Do not deploy the inflator module in the following situations:

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

Deployment Procedures

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

Deployment Outside Vehicle - Steering Wheel Module, I/P Module, 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: In order to prevent accidental deployment and the risk of personal injury, do not dispose of an undeployed inflator module as normal shop waste. Undeployed inflator modules contain substances that could cause severe illness or personal injury if their sealed containers are

damaged during disposal. Use the following deployment procedures to safely dispose of an undeployed inflator module. Failure to observe the following disposal methods may be a violation of federal, state, or local laws.

Tools Required

- **J 39401-B** SIR Deployment Fixture. See **Special Tools**.
- **J 38826** SIR Deployment Harness. See **Special Tools**.
- 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.

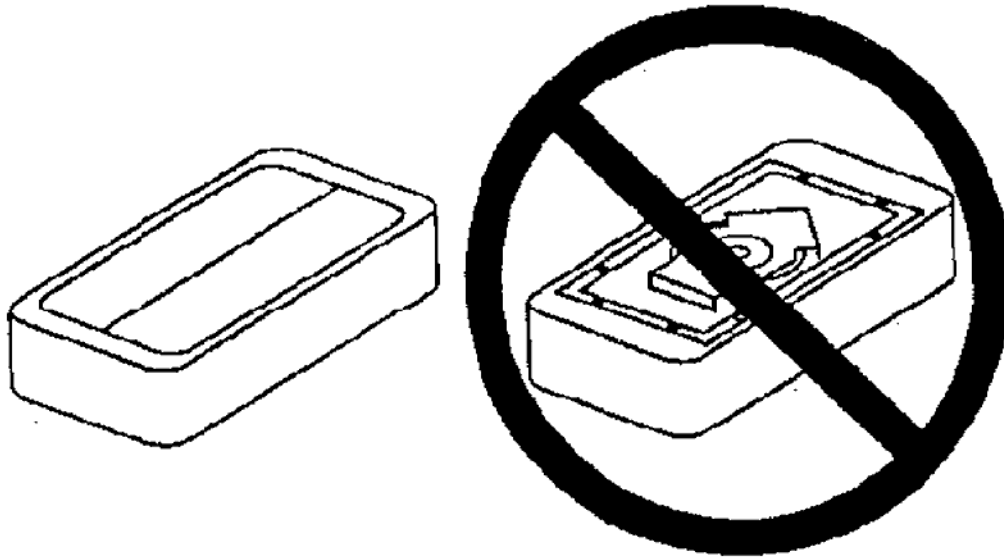


Fig. 90: Illustrating Proper Storage Of Inflator Module
Courtesy of GENERAL MOTORS CORP.

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

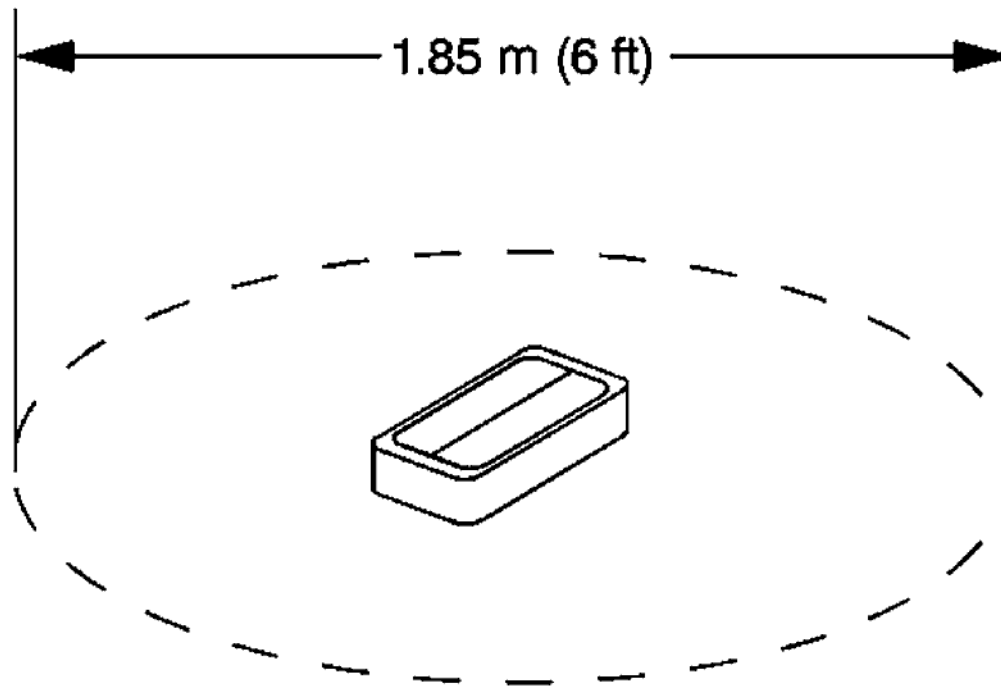


Fig. 91: Clearance For Deployment Of Inflator Module
Courtesy of GENERAL MOTORS CORP.

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

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

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

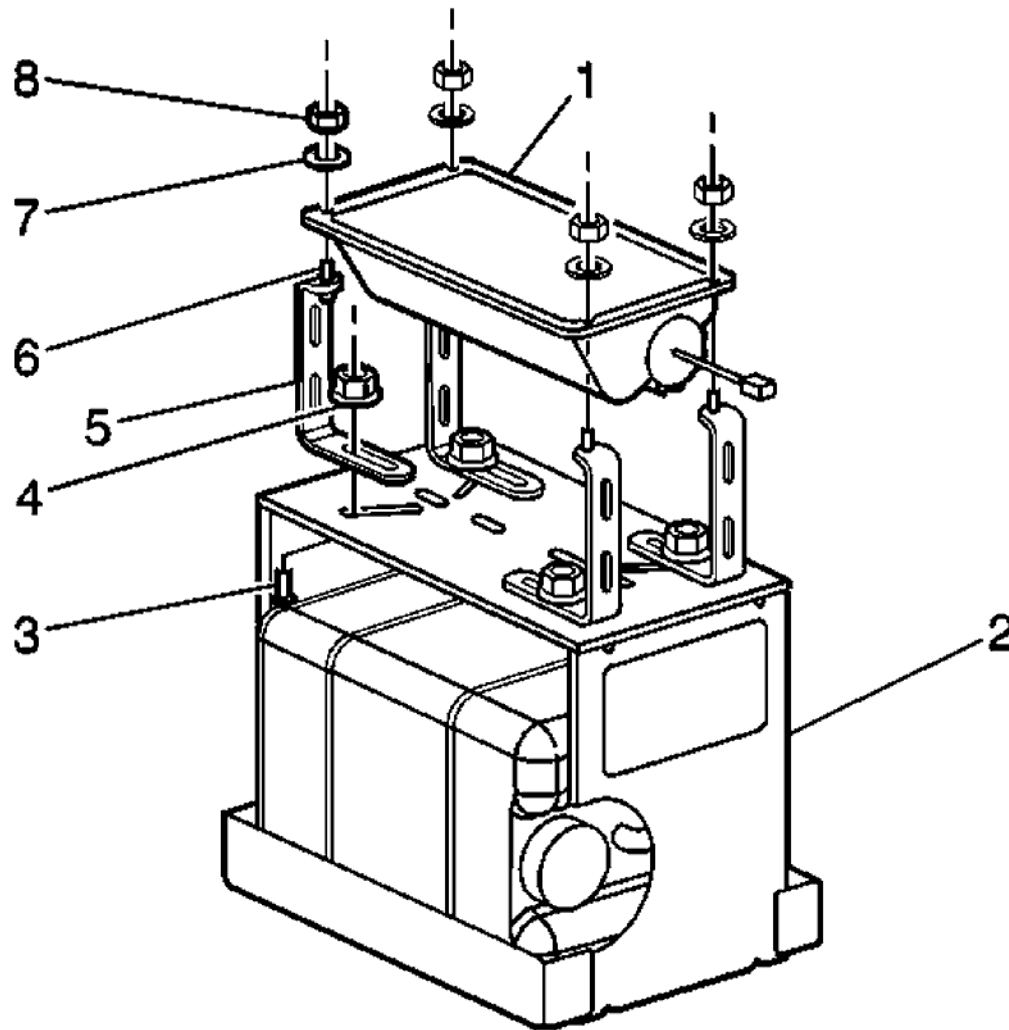


Fig. 92: Identifying I/P Module Components
Courtesy of GENERAL MOTORS CORP.

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

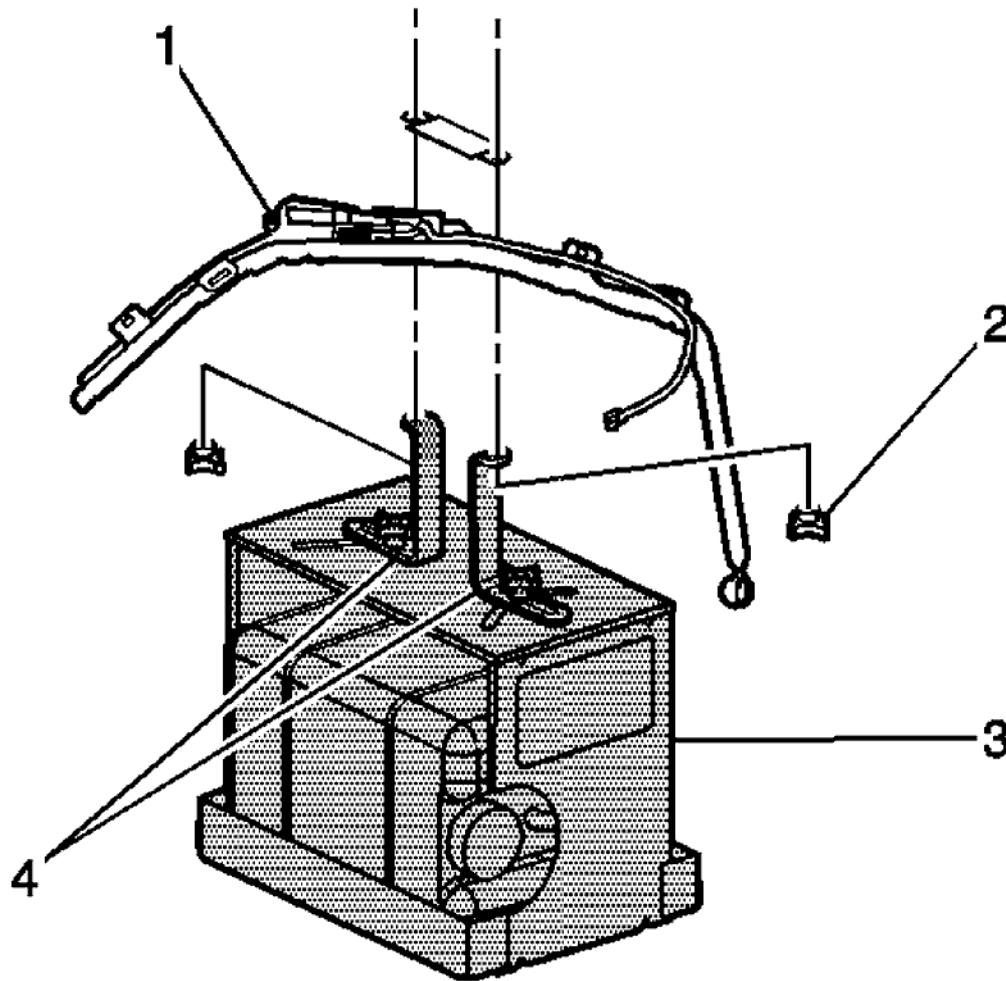


Fig. 93: Identifying Fasteners Holding Side Impact Module To Deployment Fixture

Courtesy of GENERAL MOTORS CORP.

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

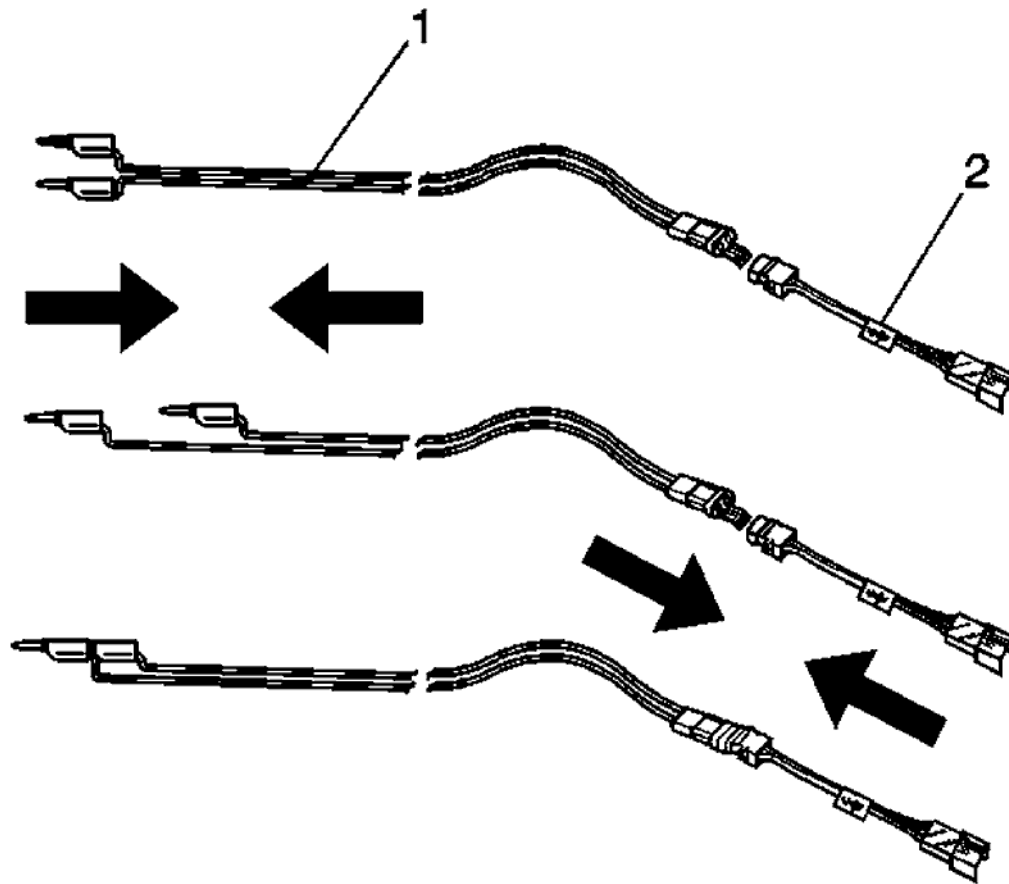


Fig. 94: Identifying SIR Deployment Harness & Adapter
Courtesy of GENERAL MOTORS CORP.

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

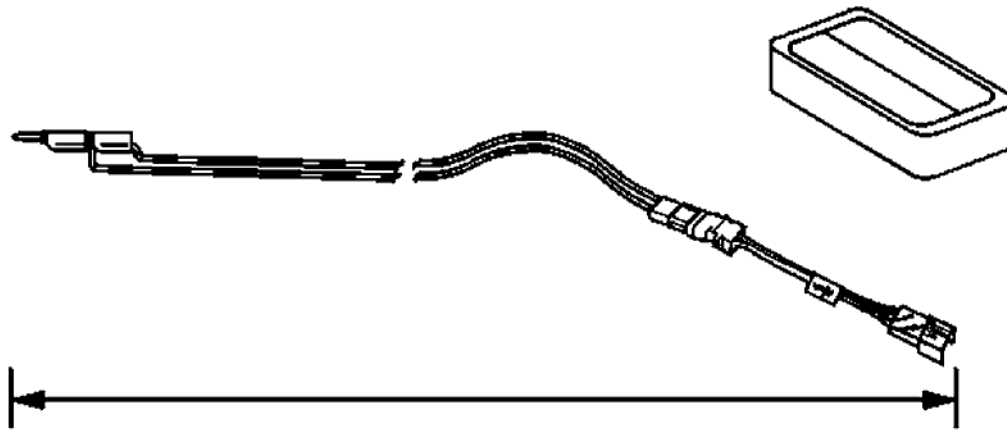


Fig. 95: Extending SIR Deployment Harness & Adapter
Courtesy of GENERAL MOTORS CORP.

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.

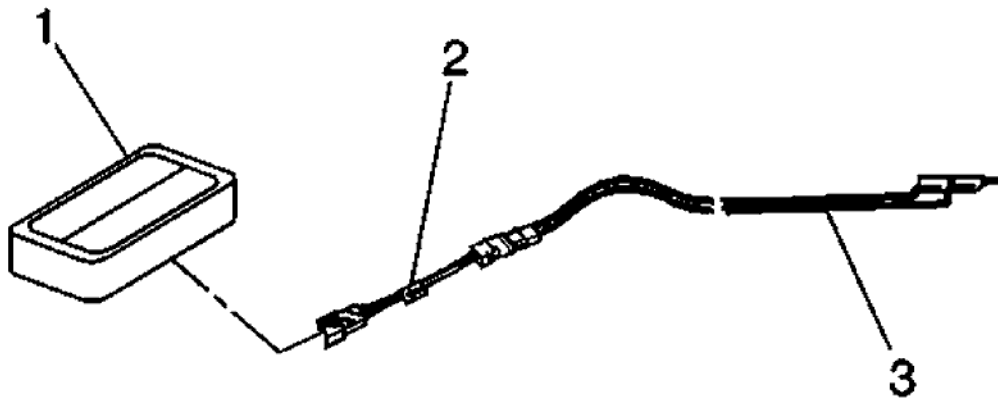


Fig. 96: Inflator Module & SIR Deployment Harness Adapter

Courtesy of GENERAL MOTORS CORP.

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

IMPORTANT:

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

16. Clear the area of people.

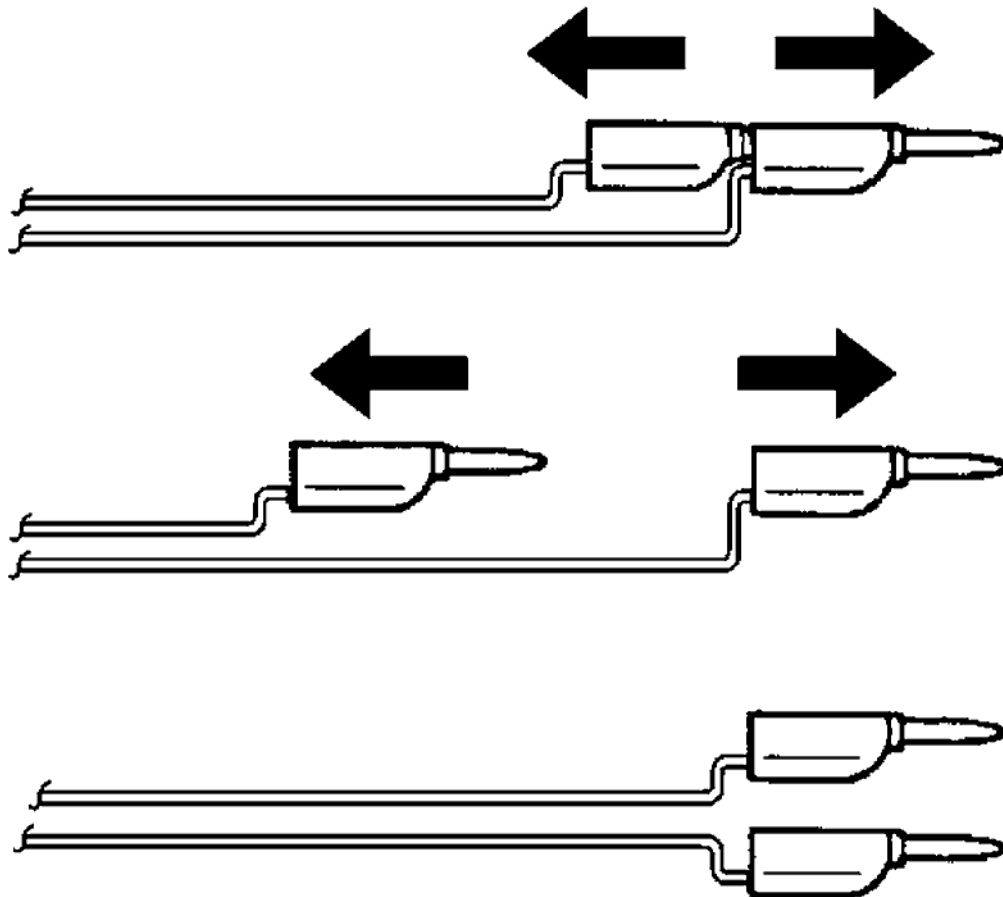


Fig. 97: Separating Banana Plugs
Courtesy of GENERAL MOTORS CORP.

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

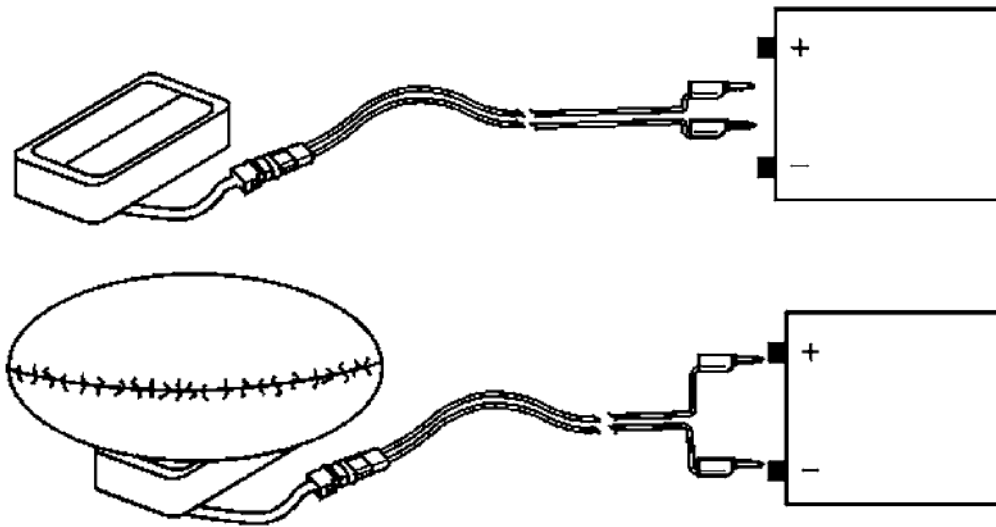


Fig. 98: Connecting SIR Deployment Harness Wires To Power Source
Courtesy of GENERAL MOTORS CORP.

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

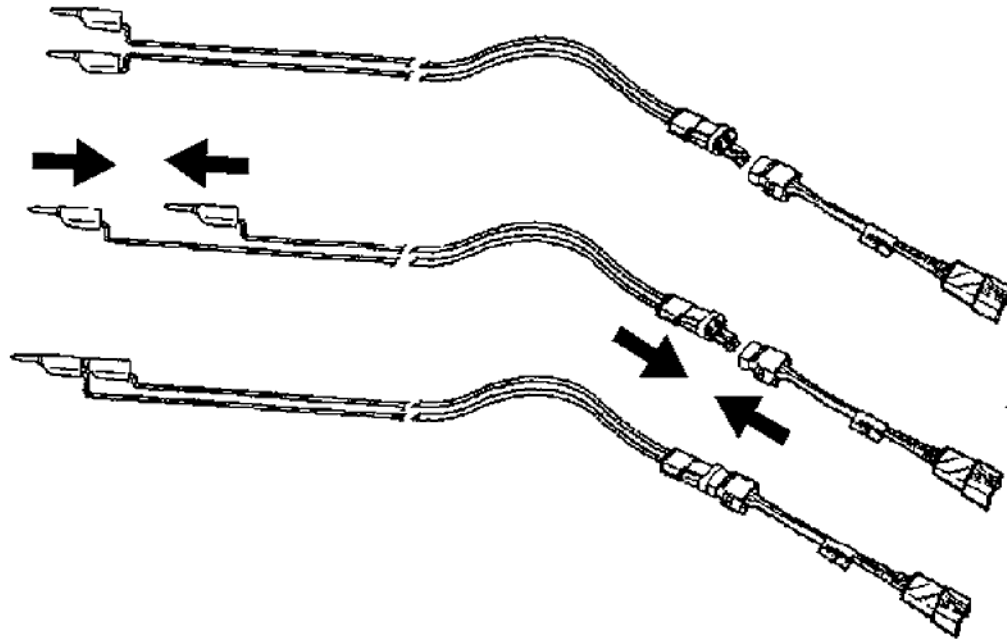


Fig. 99: View Of Deployment Harness Leads
Courtesy of GENERAL MOTORS CORP.

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

If deployment was successful, proceed to the following steps.

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

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

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

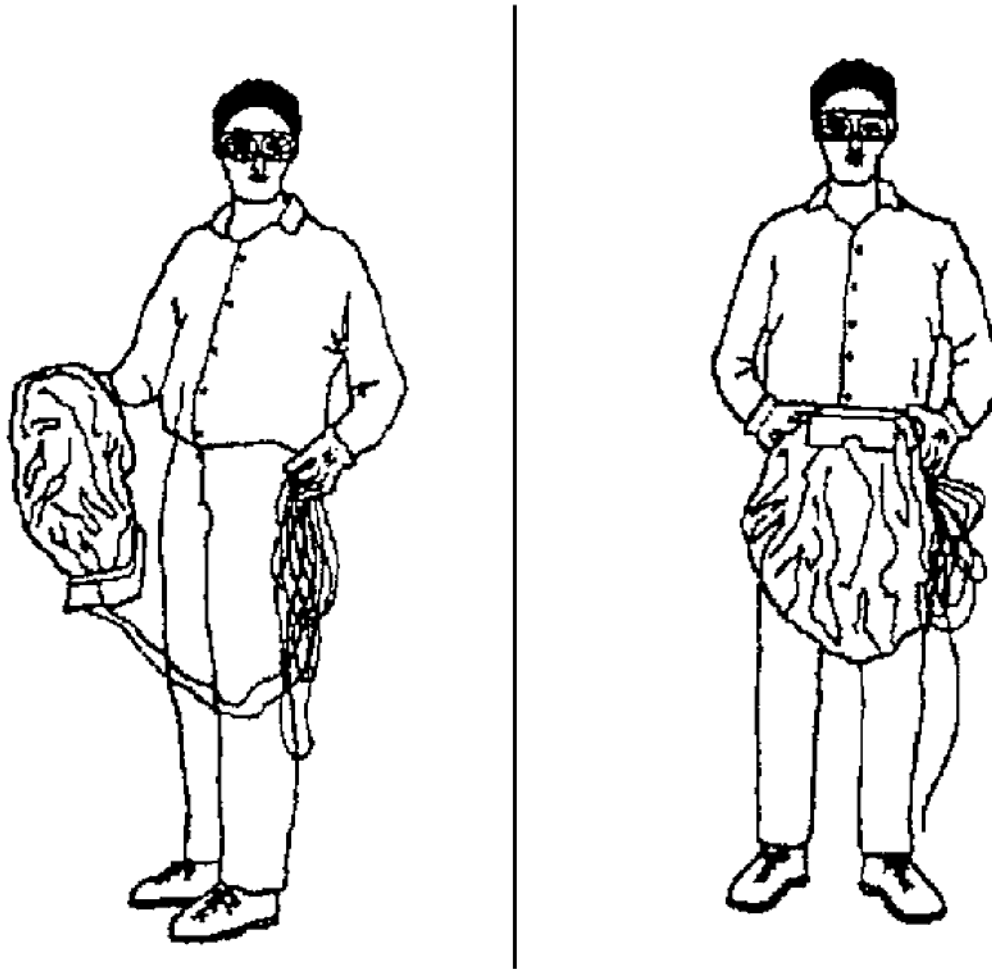


Fig. 100: Disposing Of Deployed Inflator Module
Courtesy of GENERAL MOTORS CORP.

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:

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

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

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

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

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

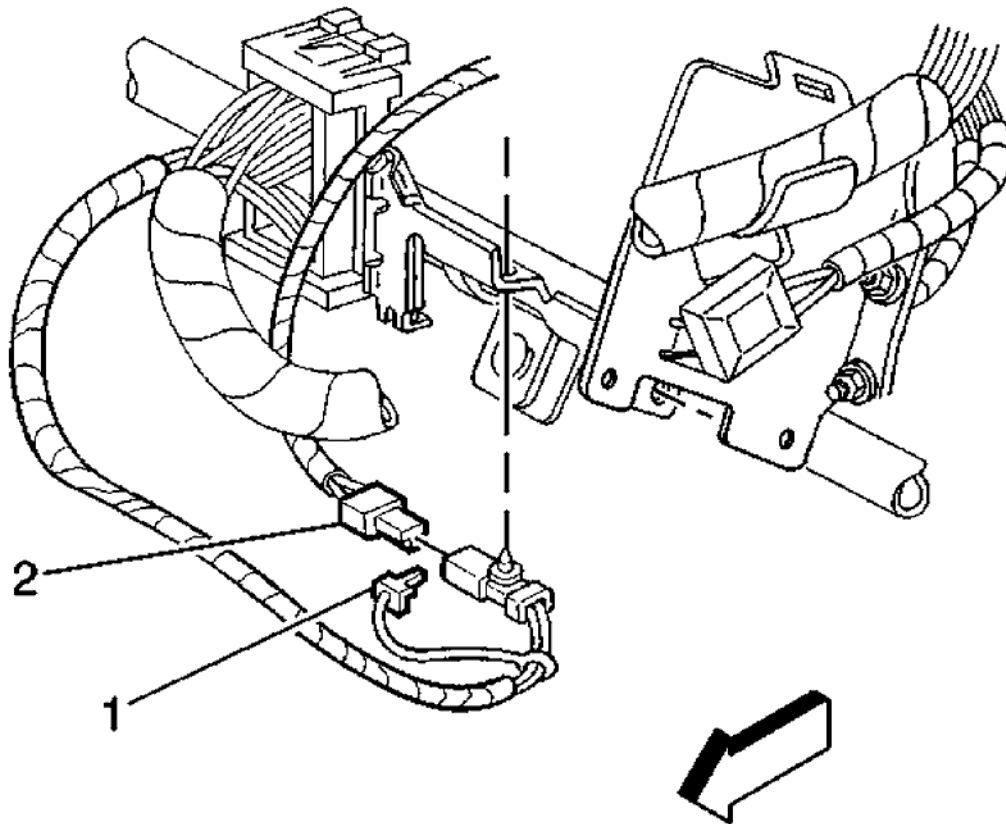


Fig. 101: Locating Inflatable Restraint Steering Wheel Module Connector
Courtesy of GENERAL MOTORS CORP.

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

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

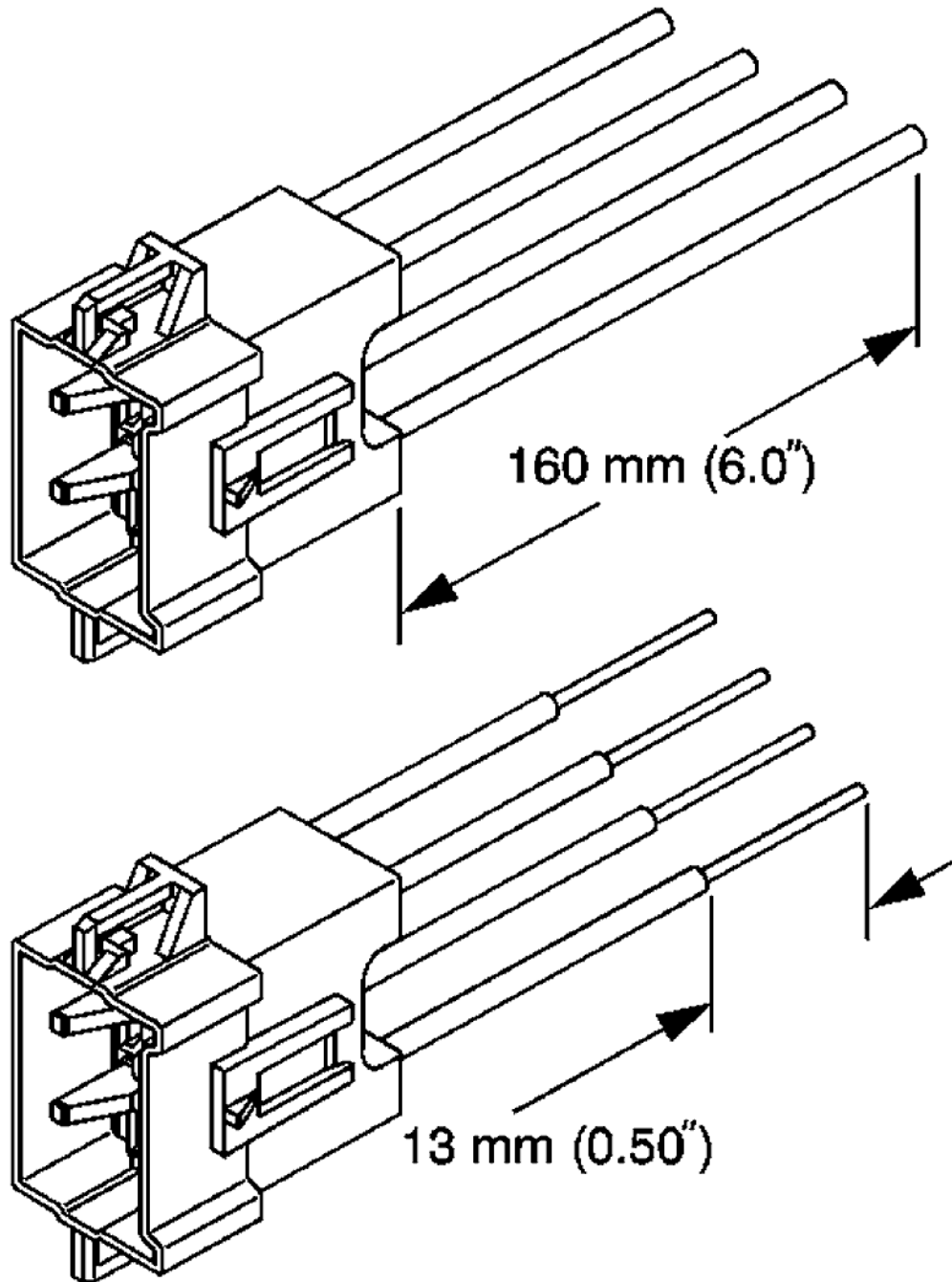


Fig. 102: Stripping SIR Wires

Courtesy of GENERAL MOTORS CORP.

IMPORTANT: If the vehicle is equipped with dual stage air bags the steering wheel module and I/P module will each have 4

wires. Refer to 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.

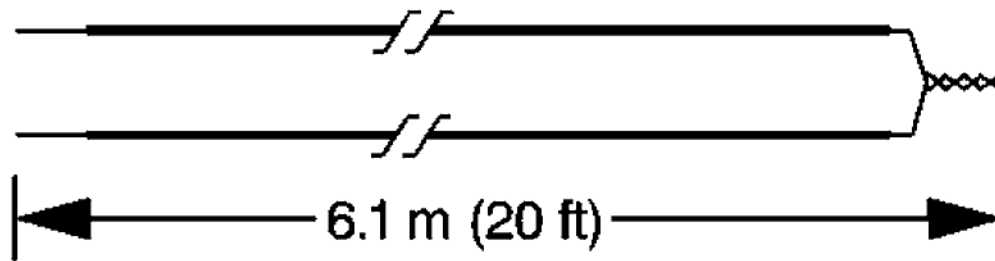


Fig. 103: Fabricating 20 Ft. Deployment Harness
Courtesy of GENERAL MOTORS CORP.

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.

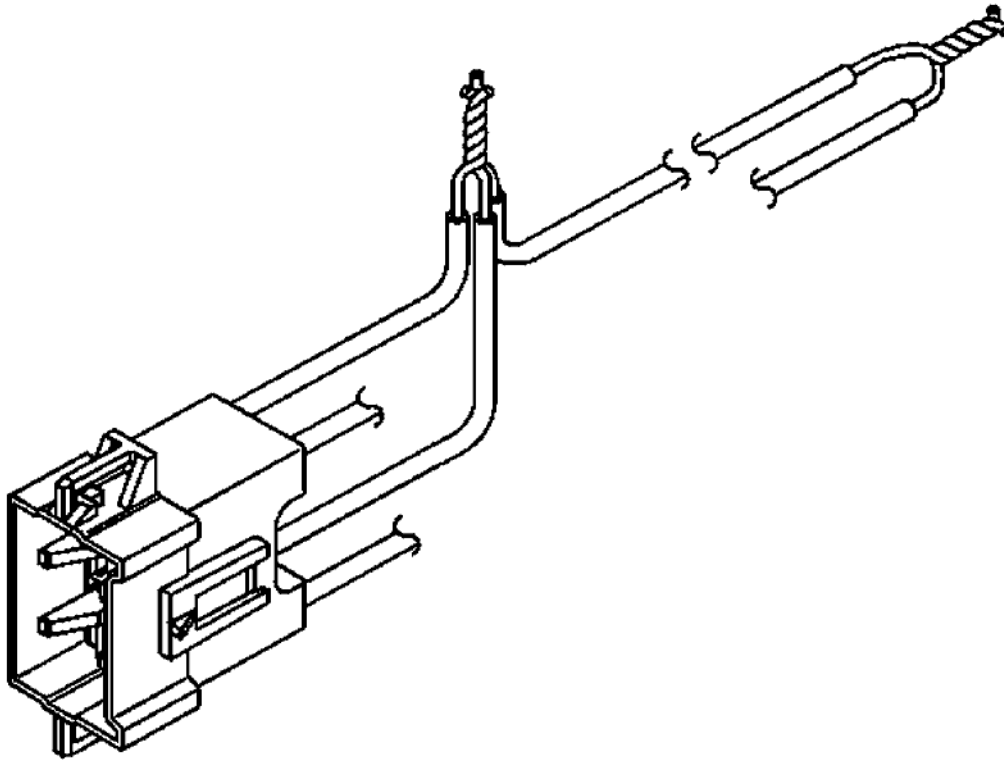


Fig. 104: Twisting Connector Wire Leads (High Circuits) To Deployment Harness Wire

Courtesy of GENERAL MOTORS CORP.

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

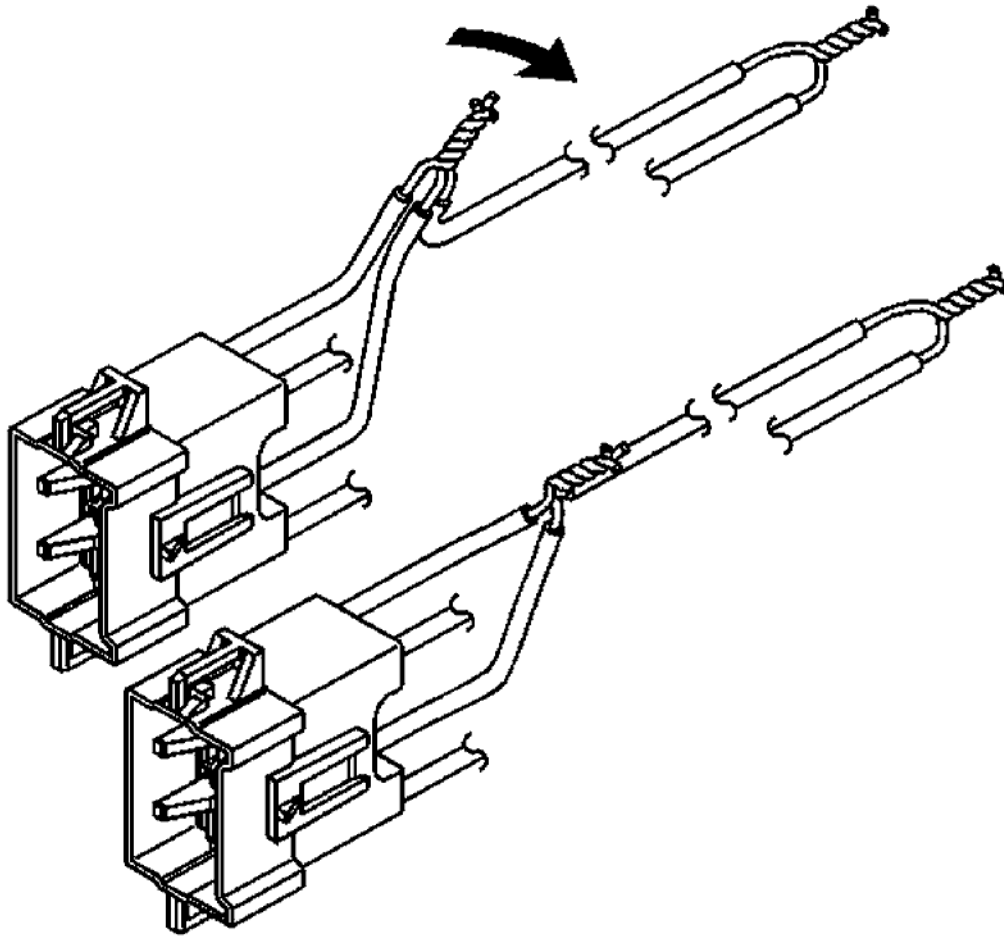


Fig. 105: Bending Twisted Connection Flat
Courtesy of GENERAL MOTORS CORP.

14. Bend flat the twisted connection.

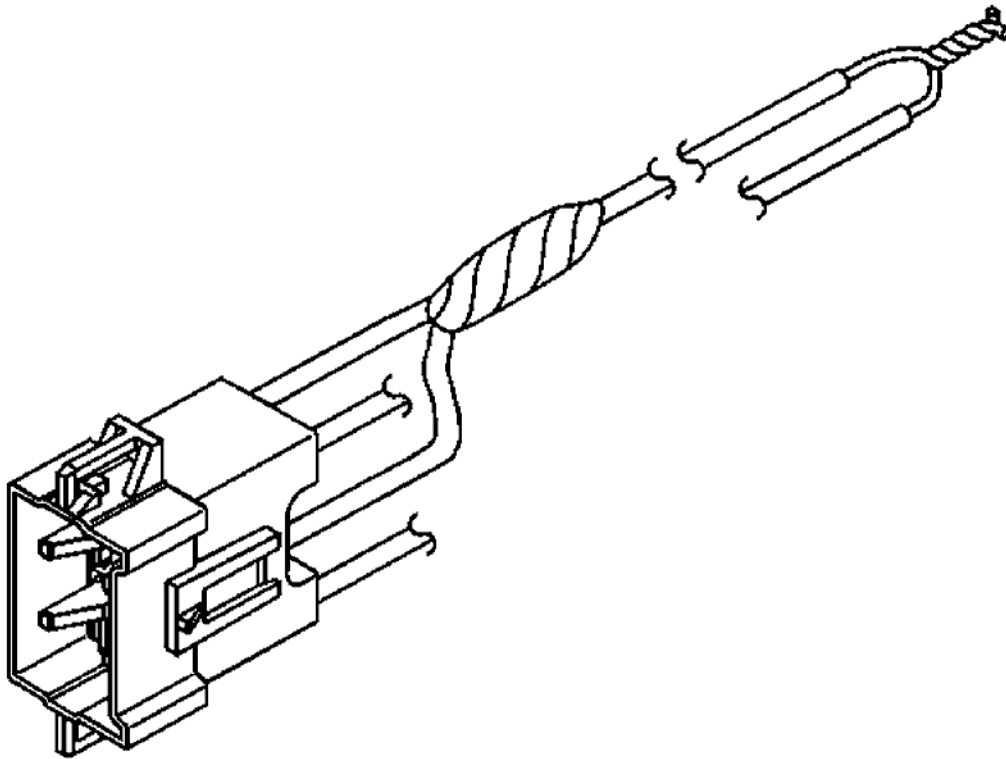


Fig. 106: Insulating Connection With Electrical Tape
Courtesy of GENERAL MOTORS CORP.

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

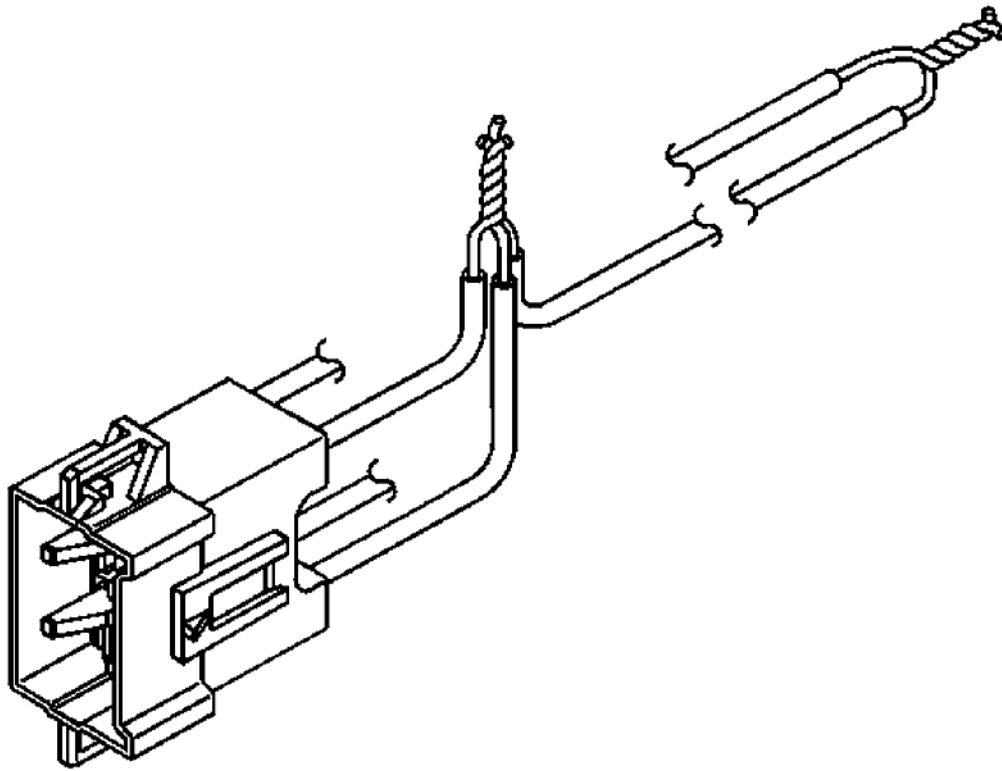


Fig. 107: Twisting Connector Wire Leads (Low Circuits) To Deployment Harness Wire

Courtesy of GENERAL MOTORS CORP.

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

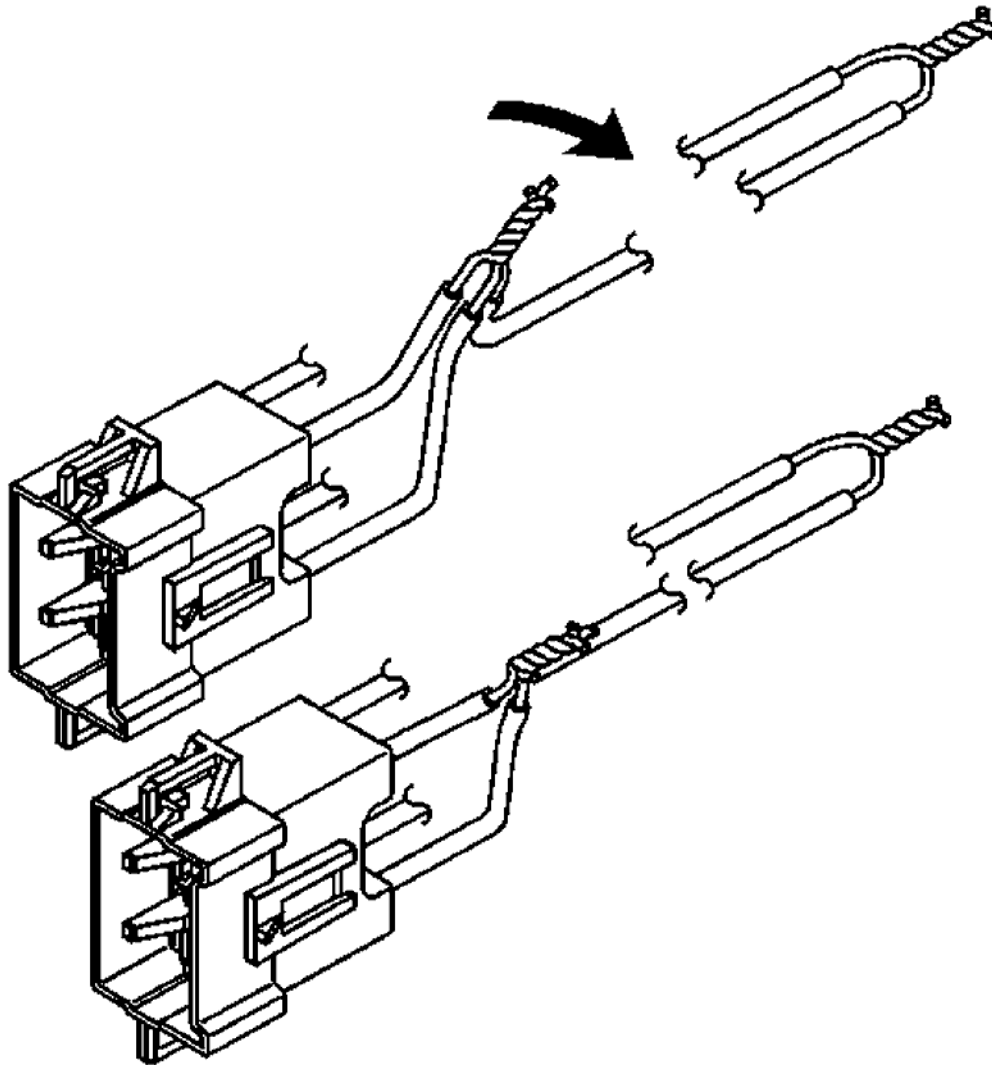


Fig. 108: Bending Twisted Connection Flat
Courtesy of GENERAL MOTORS CORP.

18. Bend flat the twisted connection.

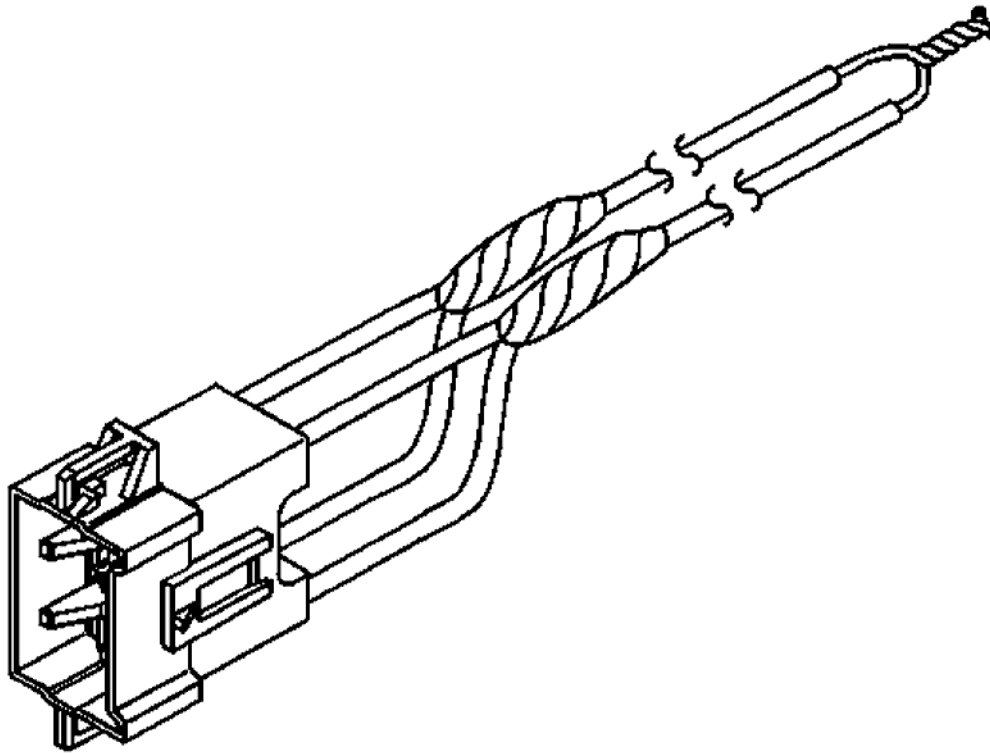


Fig. 109: Insulating Connection With Electrical Tape
Courtesy of GENERAL MOTORS CORP.

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

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

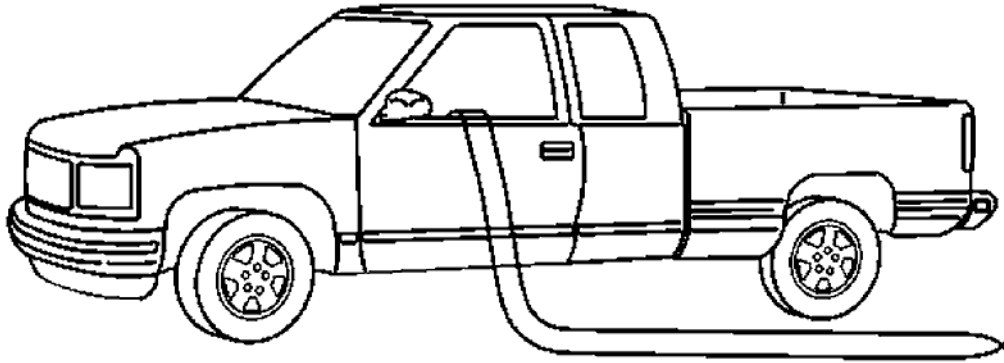


Fig. 110: Routing The Deployment Harness Out Of The Vehicle's Driver Side
Courtesy of GENERAL MOTORS CORP.

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

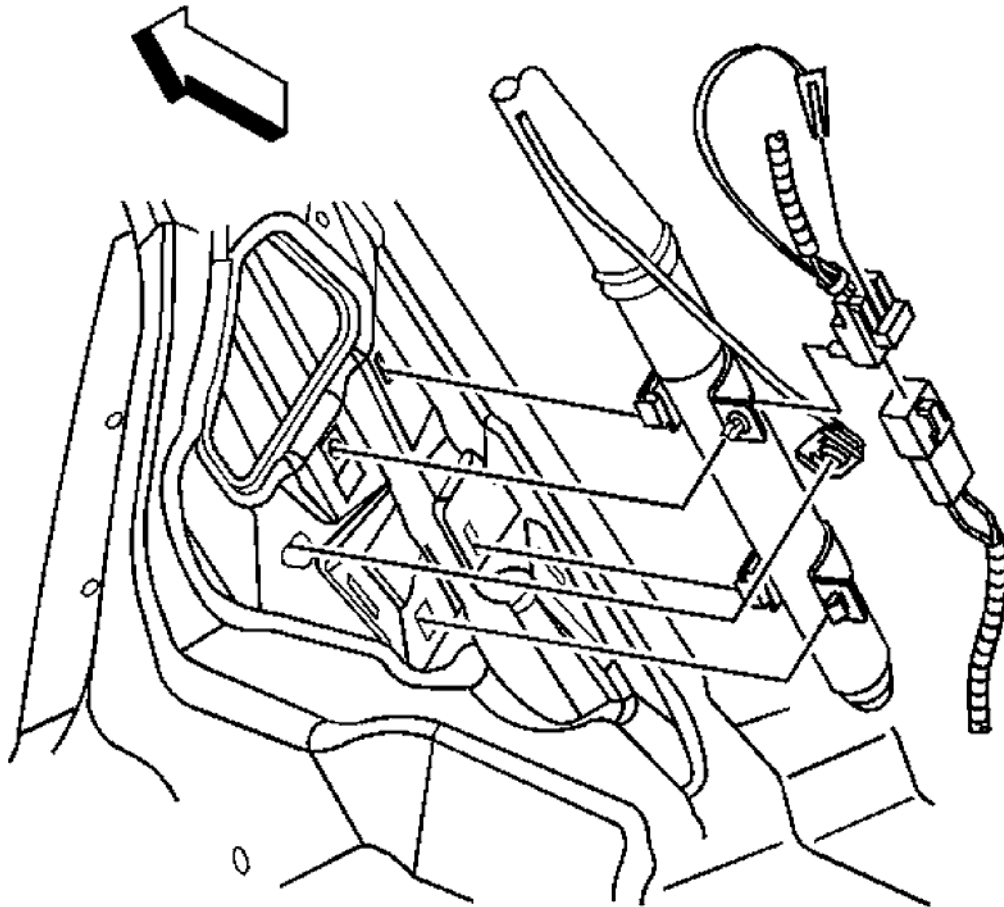


Fig. 111: Locating Roof Rail Module Connector
Courtesy of GENERAL MOTORS CORP.

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

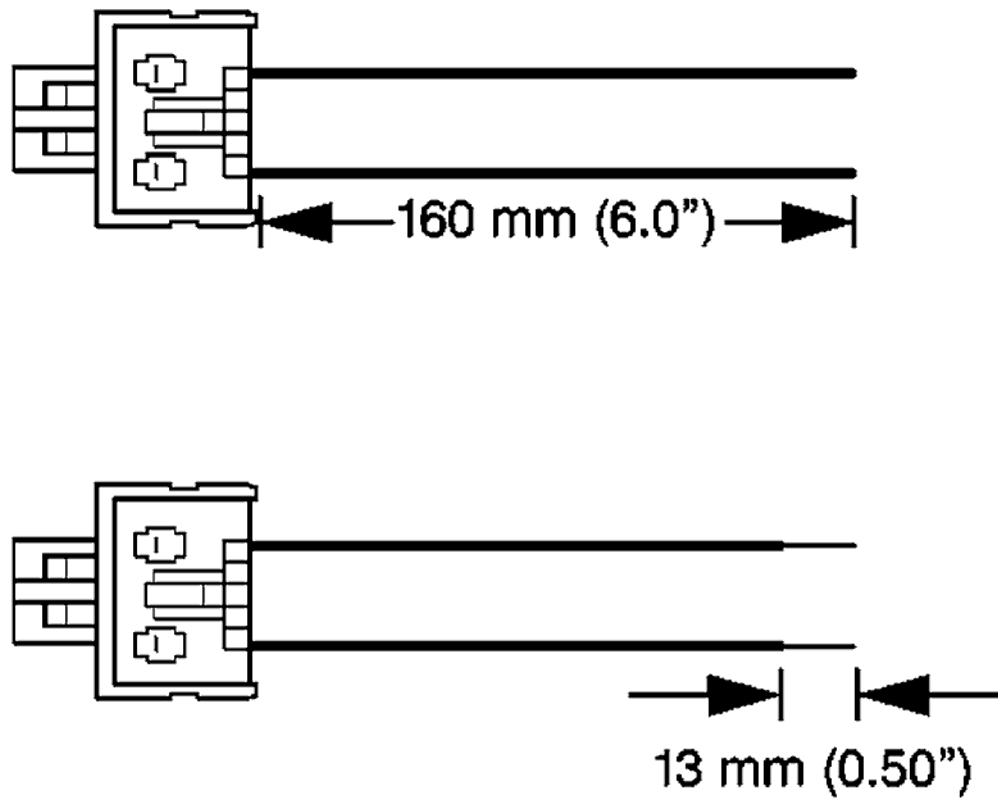


Fig. 112: Identifying Proper Stripping Of Connection Wire Leads
Courtesy of GENERAL MOTORS CORP.

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

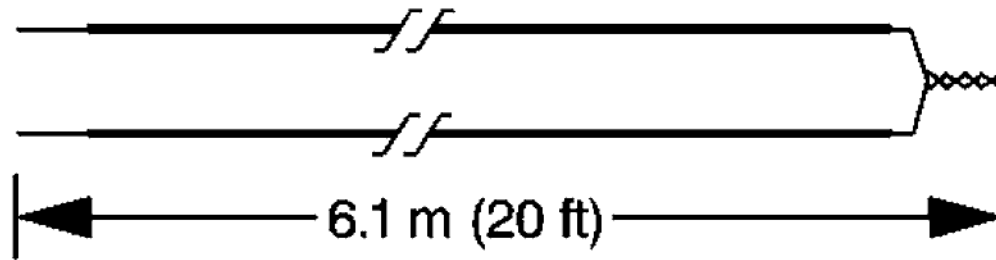


Fig. 113: Fabricating 20 Ft. Deployment Harness
Courtesy of GENERAL MOTORS CORP.

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.

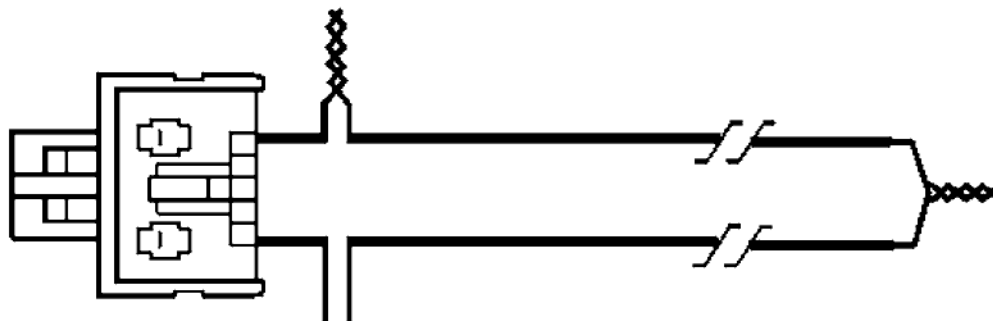


Fig. 114: View Of Proper Twisting Of Connector Wire Lead To Deployment Wire
Courtesy of GENERAL MOTORS CORP.

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

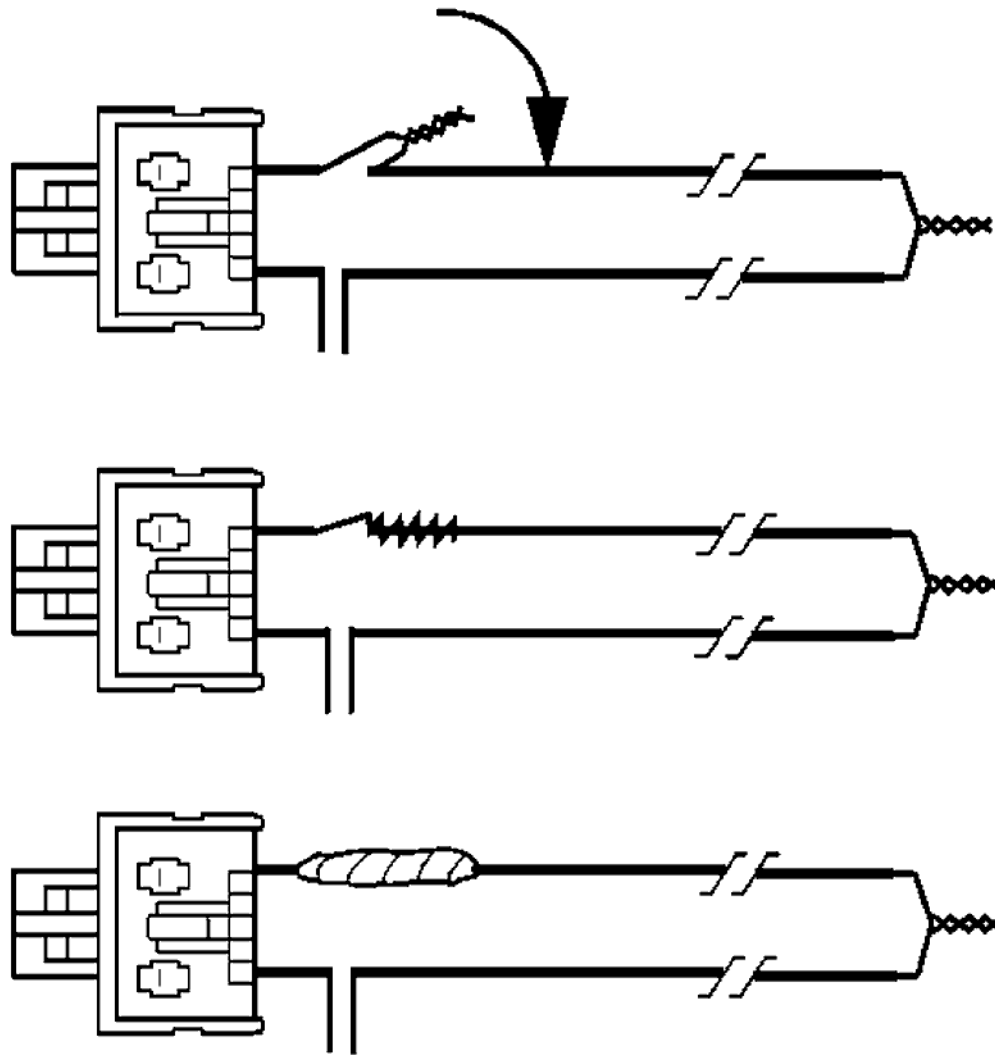


Fig. 115: Bending Twisted Connection Flat & Insulating With Tape
Courtesy of GENERAL MOTORS CORP.

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

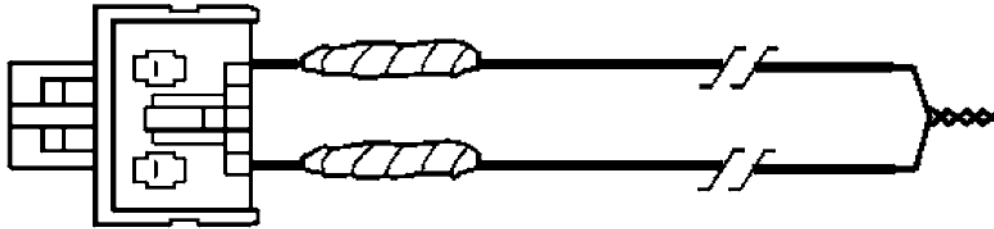


Fig. 116: Taping Remaining Connector Wire Lead To Remaining Deployment Wire

Courtesy of GENERAL MOTORS CORP.

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

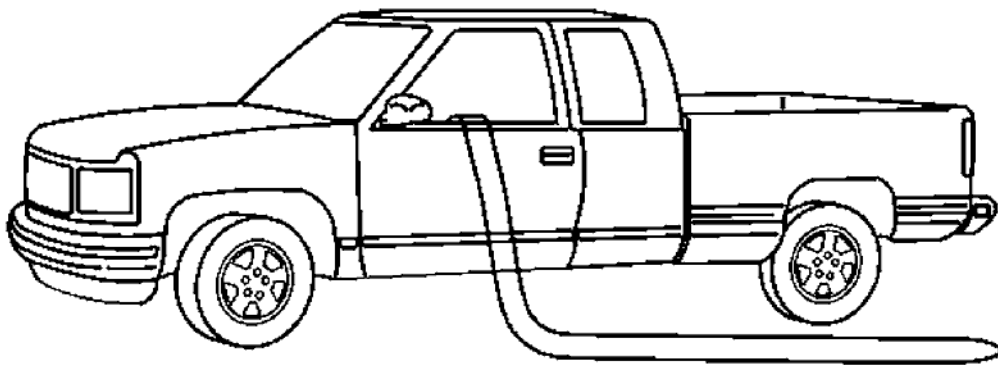


Fig. 117: Routing The Deployment Harness Out Of The Vehicle's Driver Side
Courtesy of GENERAL MOTORS CORP.

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

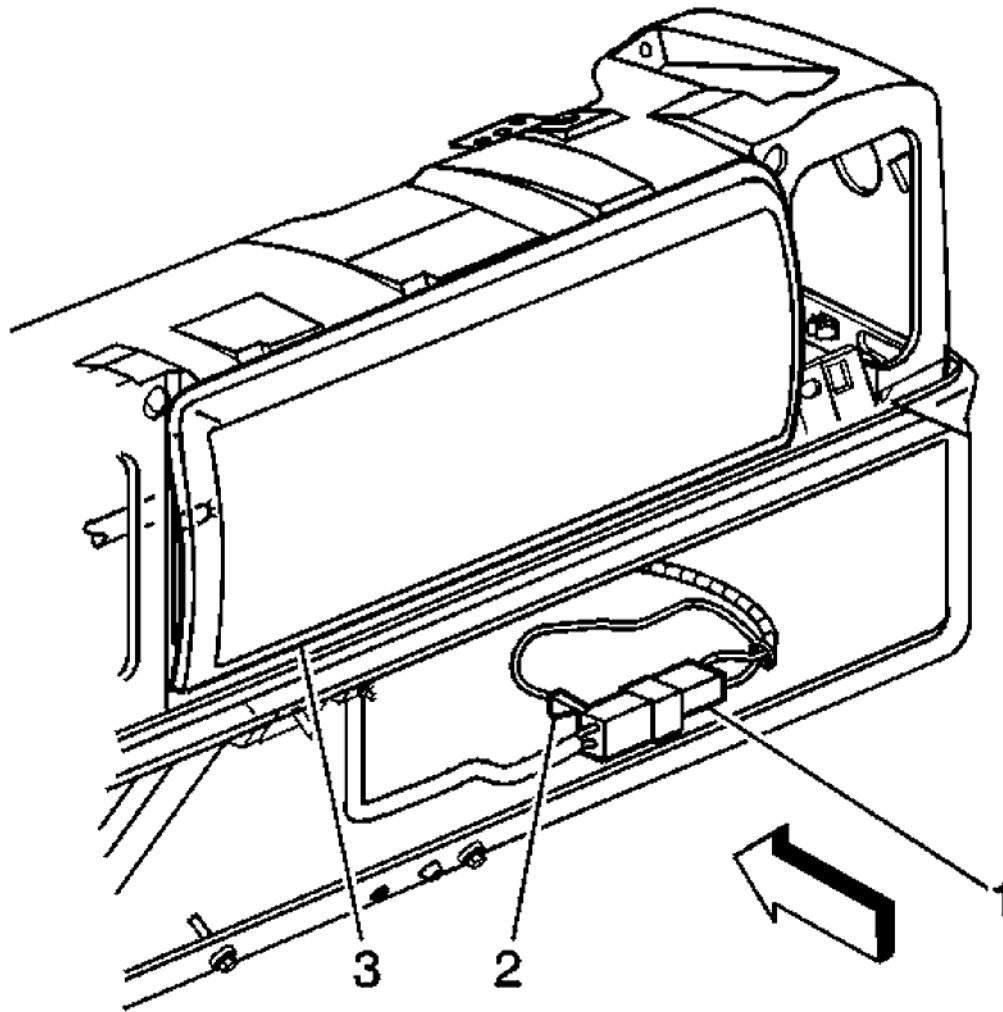


Fig. 118: View Of I/P Module Yellow Harness Connector & Vehicle Harness Connector

Courtesy of GENERAL MOTORS CORP.

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

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

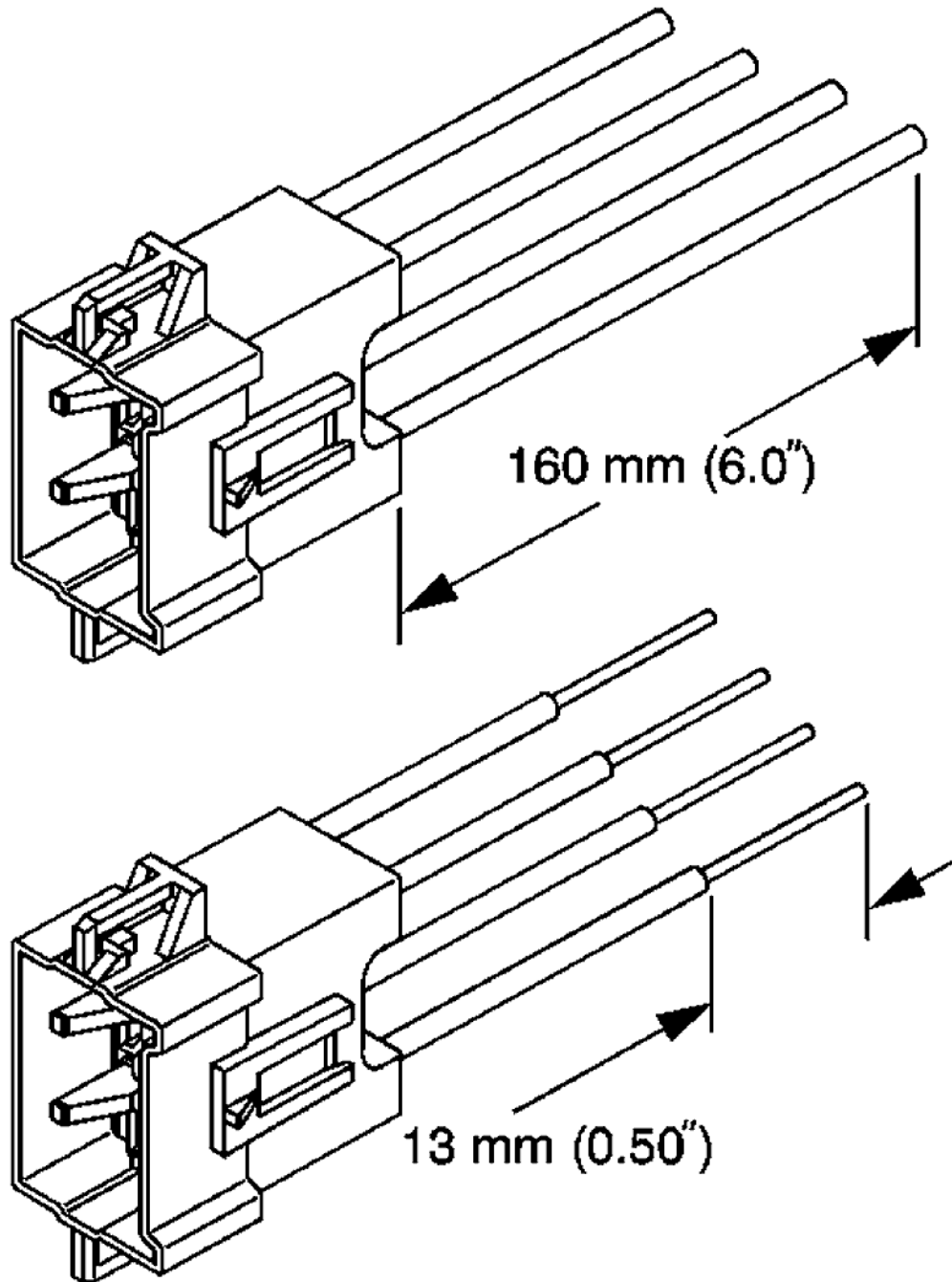


Fig. 119: Stripping SIR Wires
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: If the vehicle is equipped with dual stage air bags the steering wheel module and I/P module will each have 4

wires. Refer to 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.

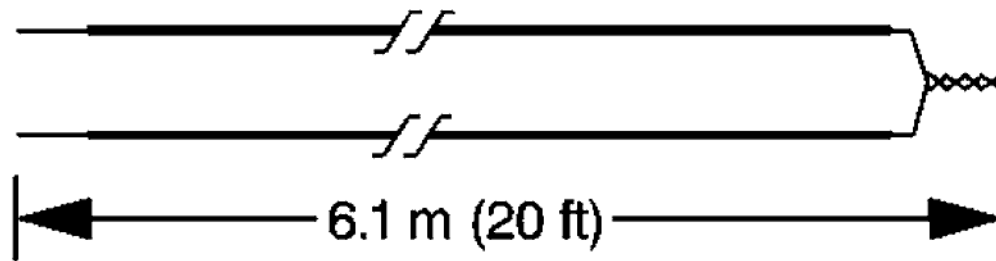


Fig. 120: Fabricating 20 Ft. Deployment Harness
Courtesy of GENERAL MOTORS CORP.

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.

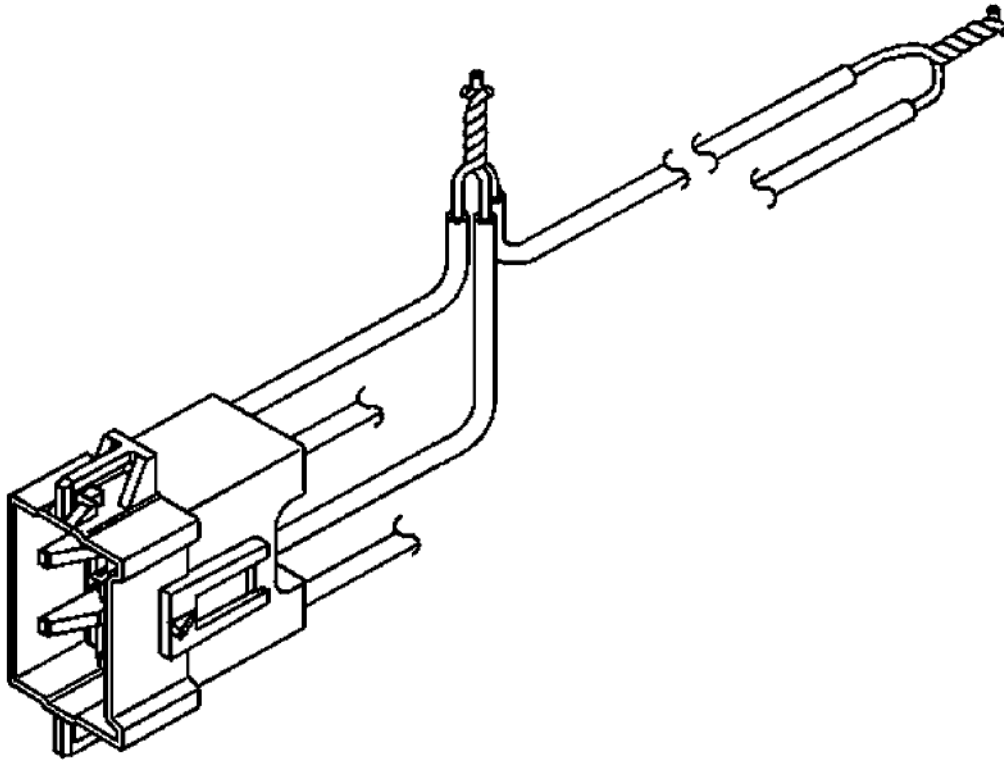


Fig. 121: Twisting Connector Wire Leads (High Circuits) To Deployment Harness Wire

Courtesy of GENERAL MOTORS CORP.

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

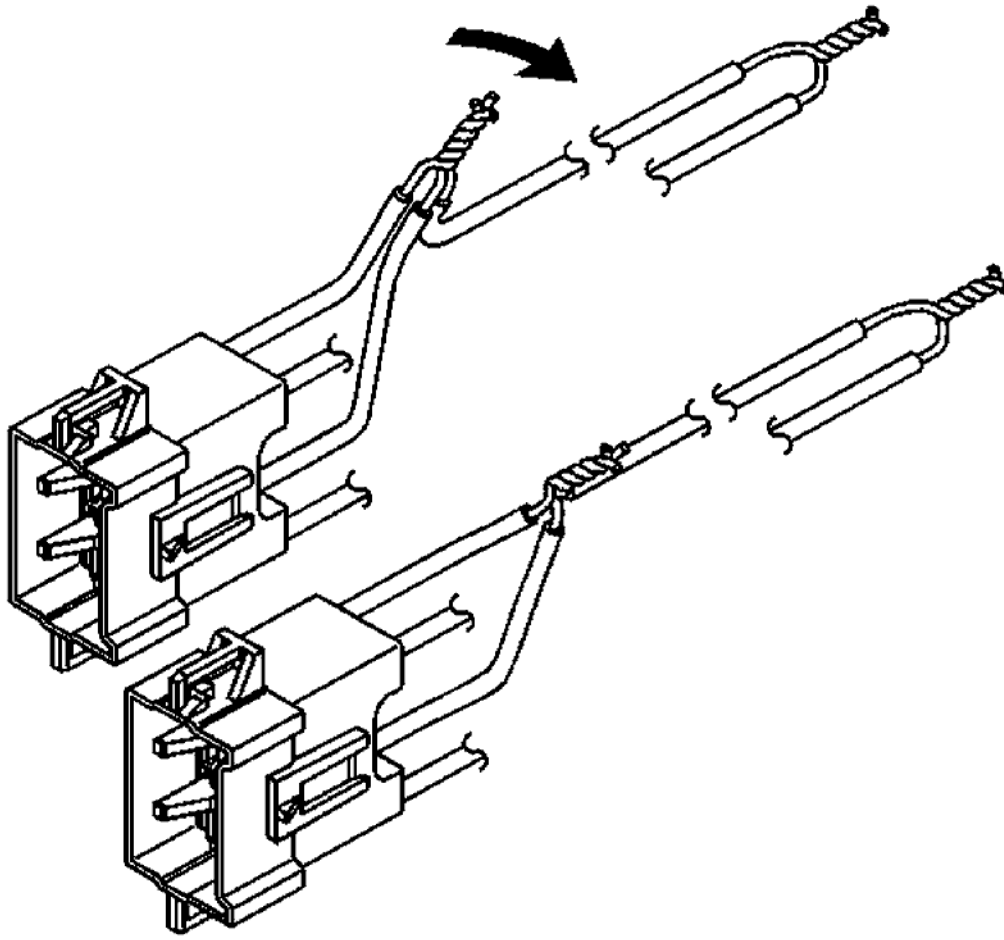


Fig. 122: Bending Twisted Connection Flat
Courtesy of GENERAL MOTORS CORP.

42. Bend flat the twisted connection.

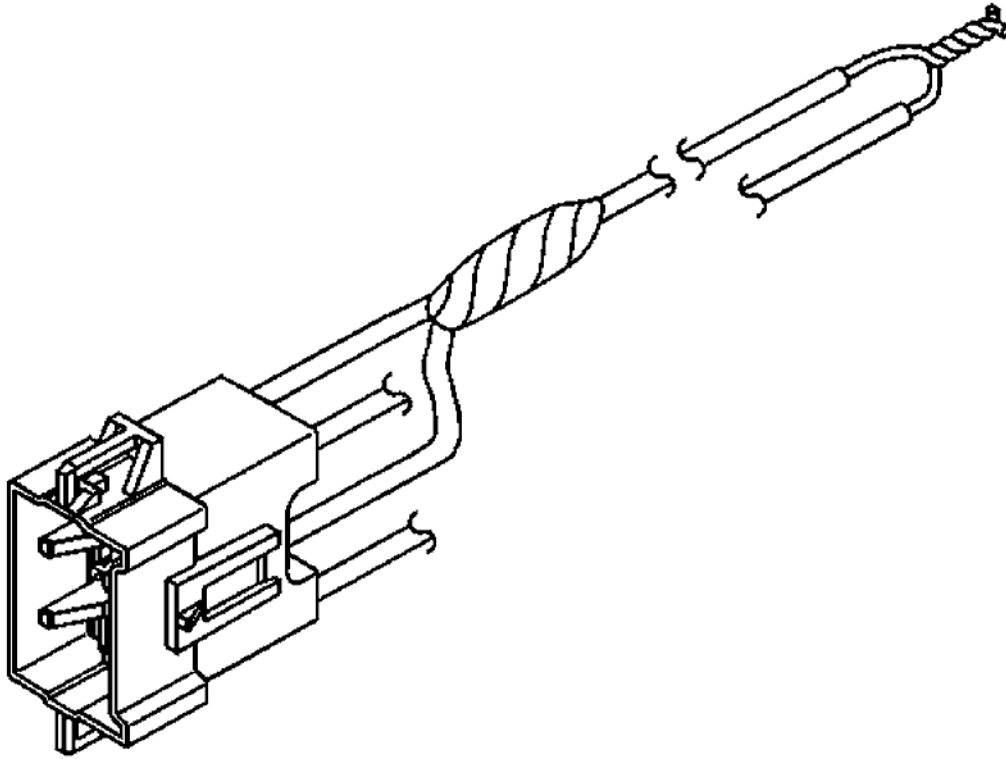


Fig. 123: Insulating Connection With Electrical Tape
Courtesy of GENERAL MOTORS CORP.

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

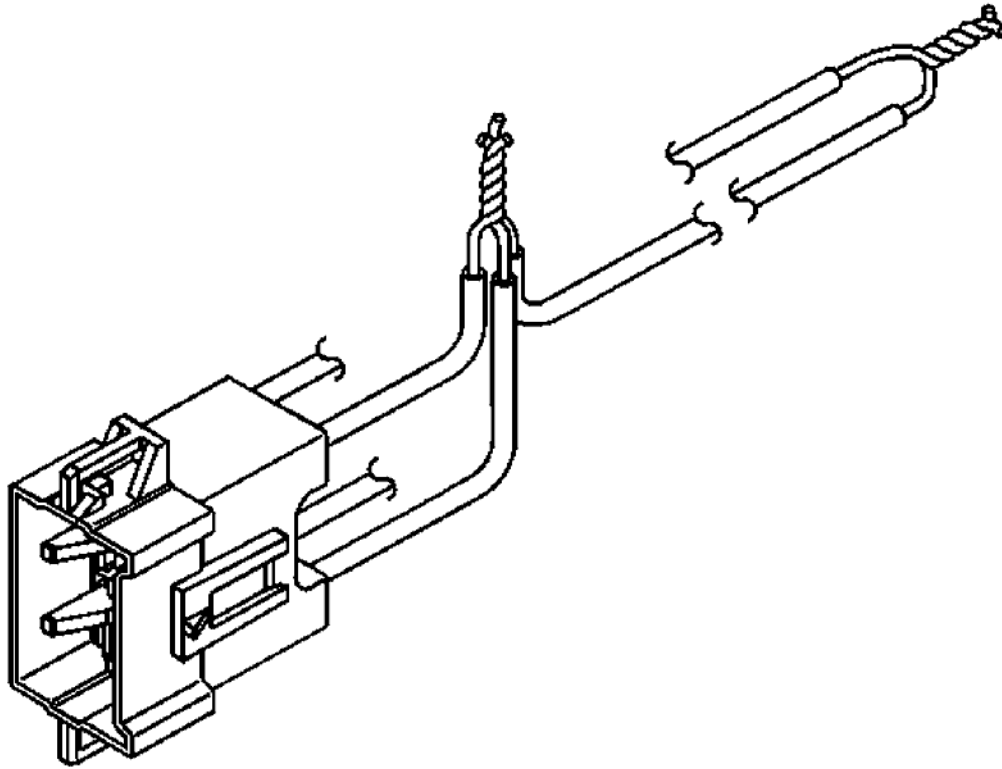


Fig. 124: Twisting Connector Wire Leads (Low Circuits) To Deployment Harness Wire

Courtesy of GENERAL MOTORS CORP.

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

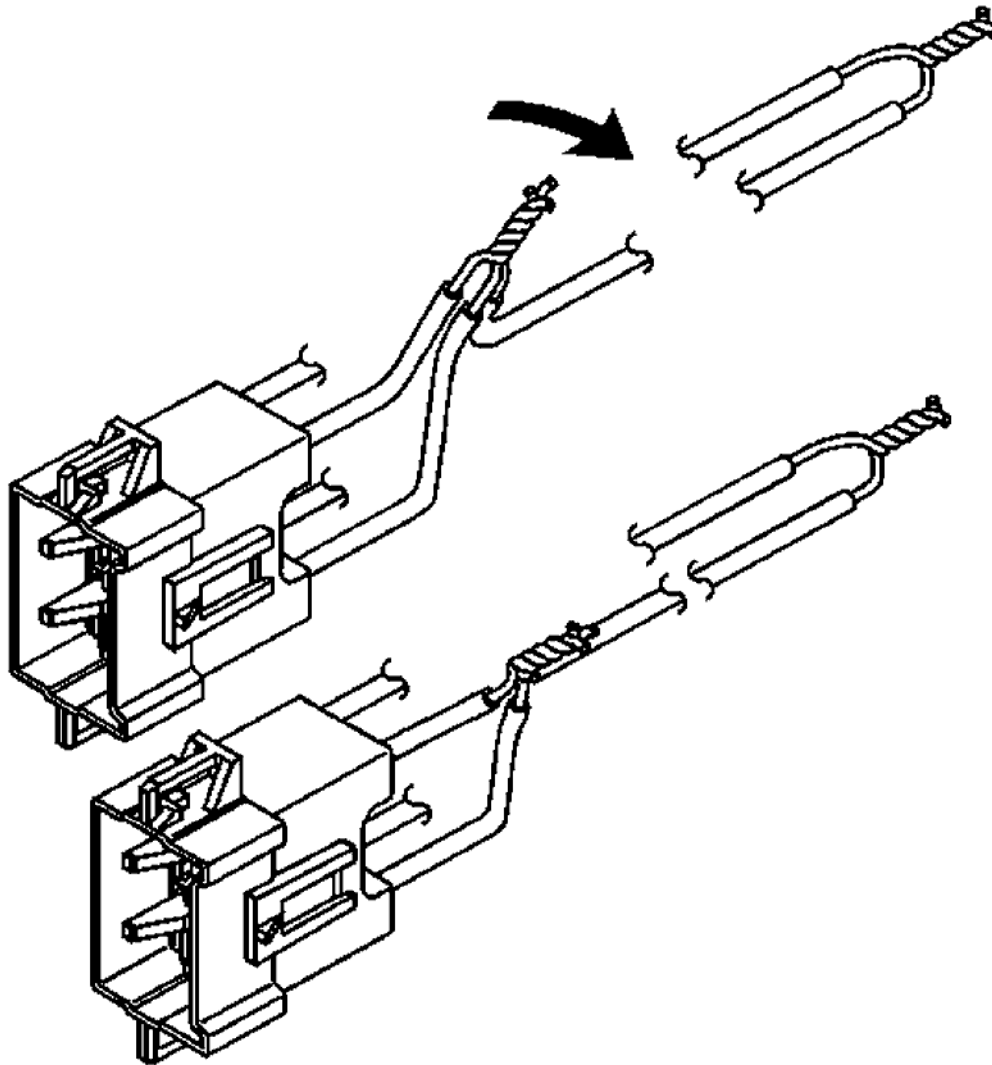


Fig. 125: Bending Twisted Connection Flat
Courtesy of GENERAL MOTORS CORP.

46. Bend flat the twisted connection.

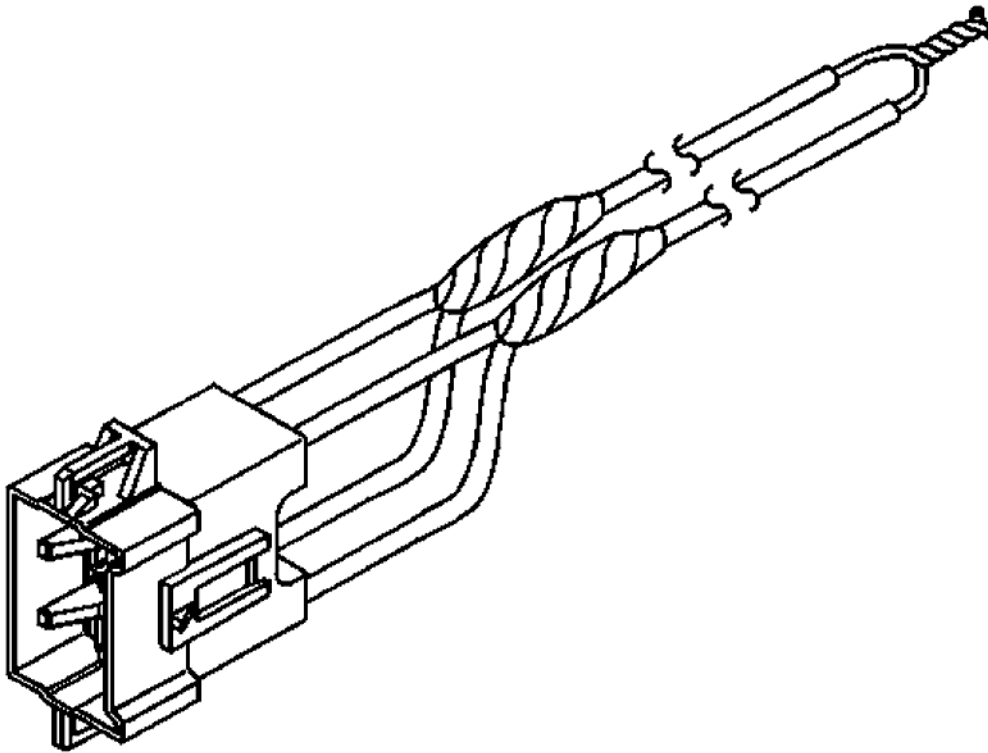


Fig. 126: Insulating Connection With Electrical Tape
Courtesy of GENERAL MOTORS CORP.

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

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

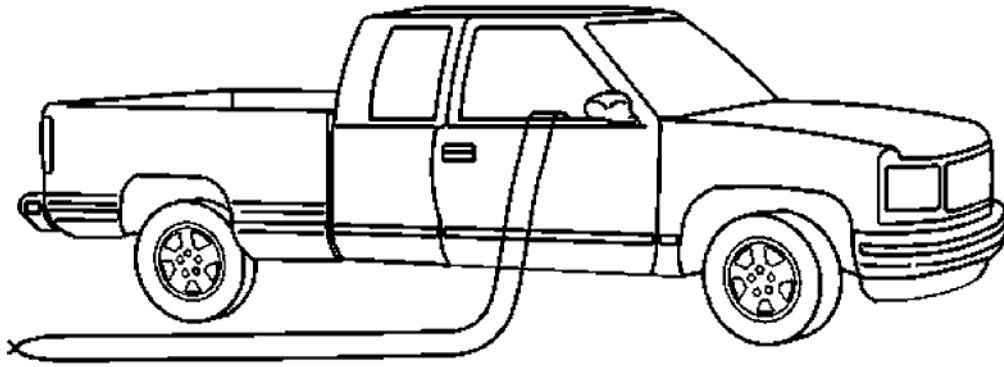


Fig. 127: Routing The Deployment Harness Out Of The Vehicle's Passenger Side
Courtesy of GENERAL MOTORS CORP.

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

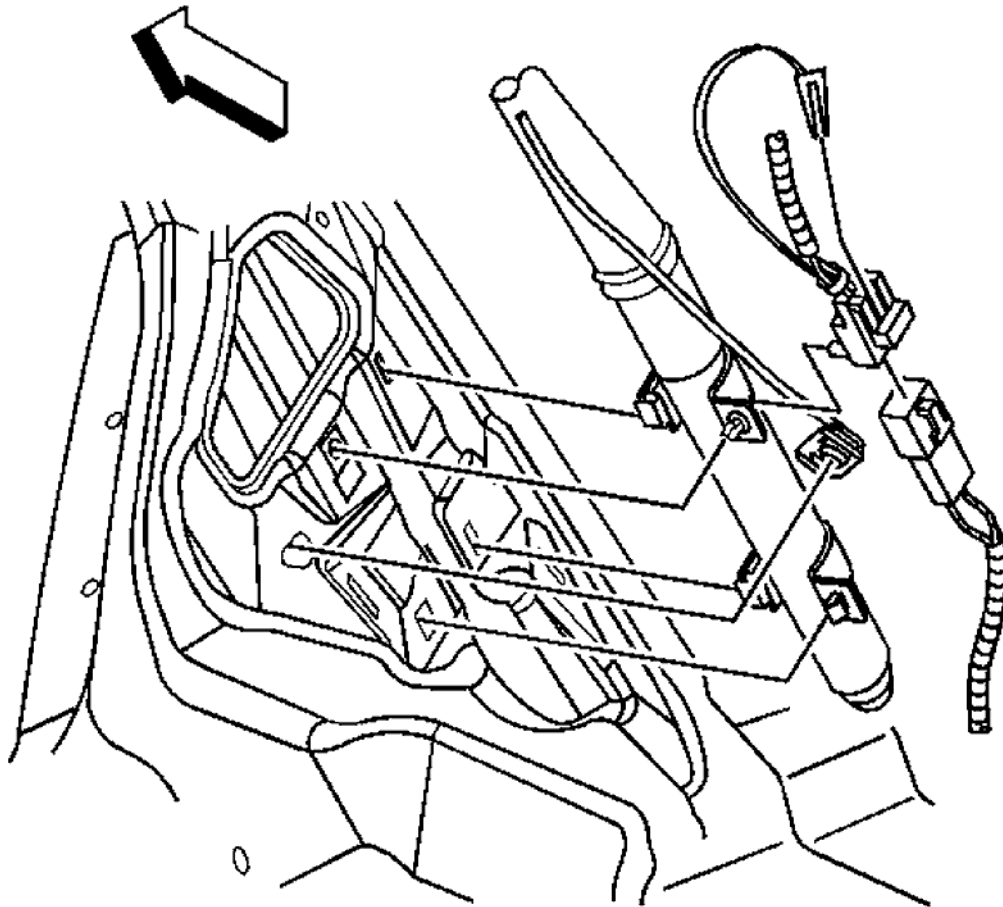


Fig. 128: Locating Roof Rail Module Connector
Courtesy of GENERAL MOTORS CORP.

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

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

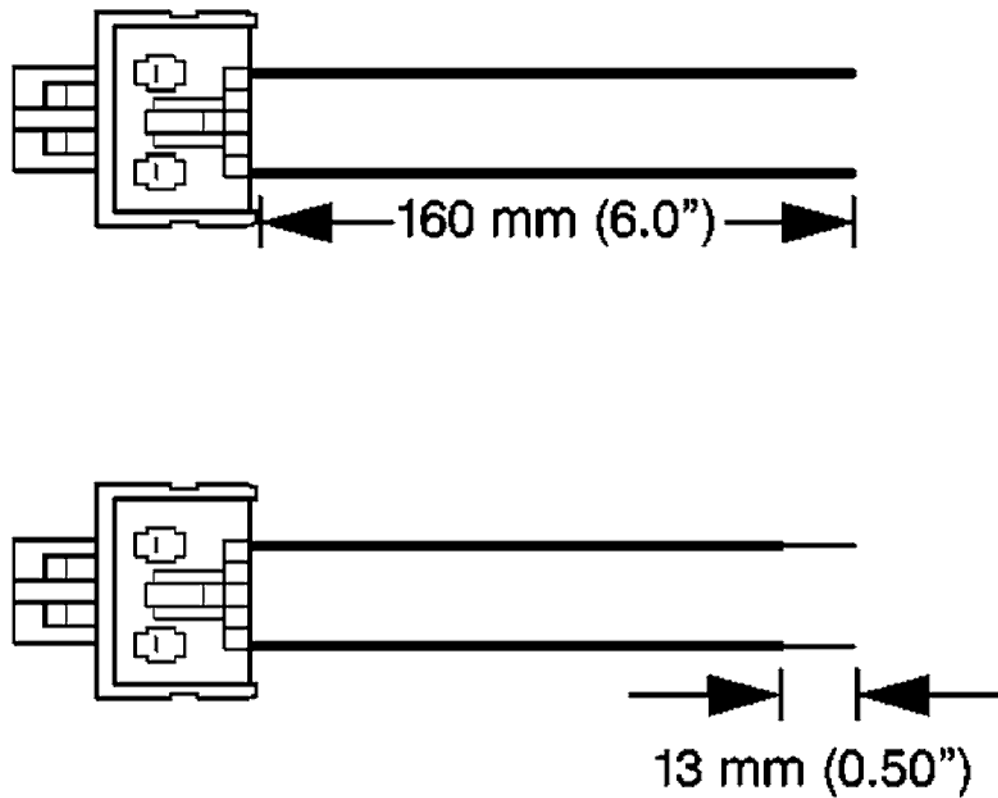


Fig. 129: Identifying Proper Stripping Of Connection Wire Leads
Courtesy of GENERAL MOTORS CORP.

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

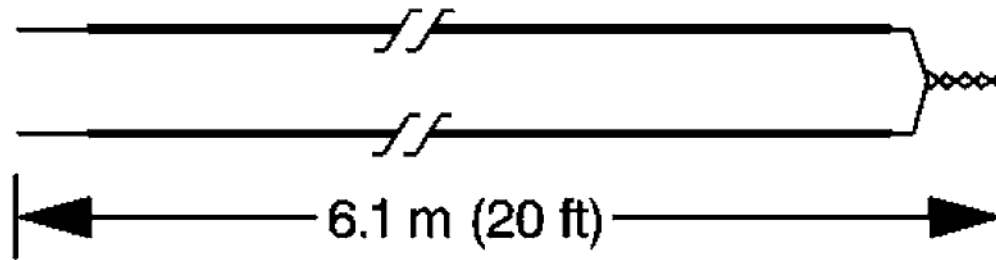


Fig. 130: Fabricating 20 Ft. Deployment Harness
Courtesy of GENERAL MOTORS CORP.

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

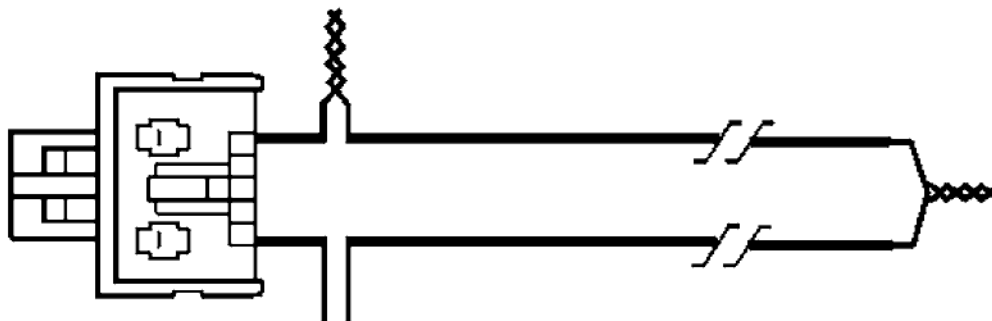


Fig. 131: View Of Proper Twisting Of Connector Wire Lead To Deployment Wire
Courtesy of GENERAL MOTORS CORP.

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

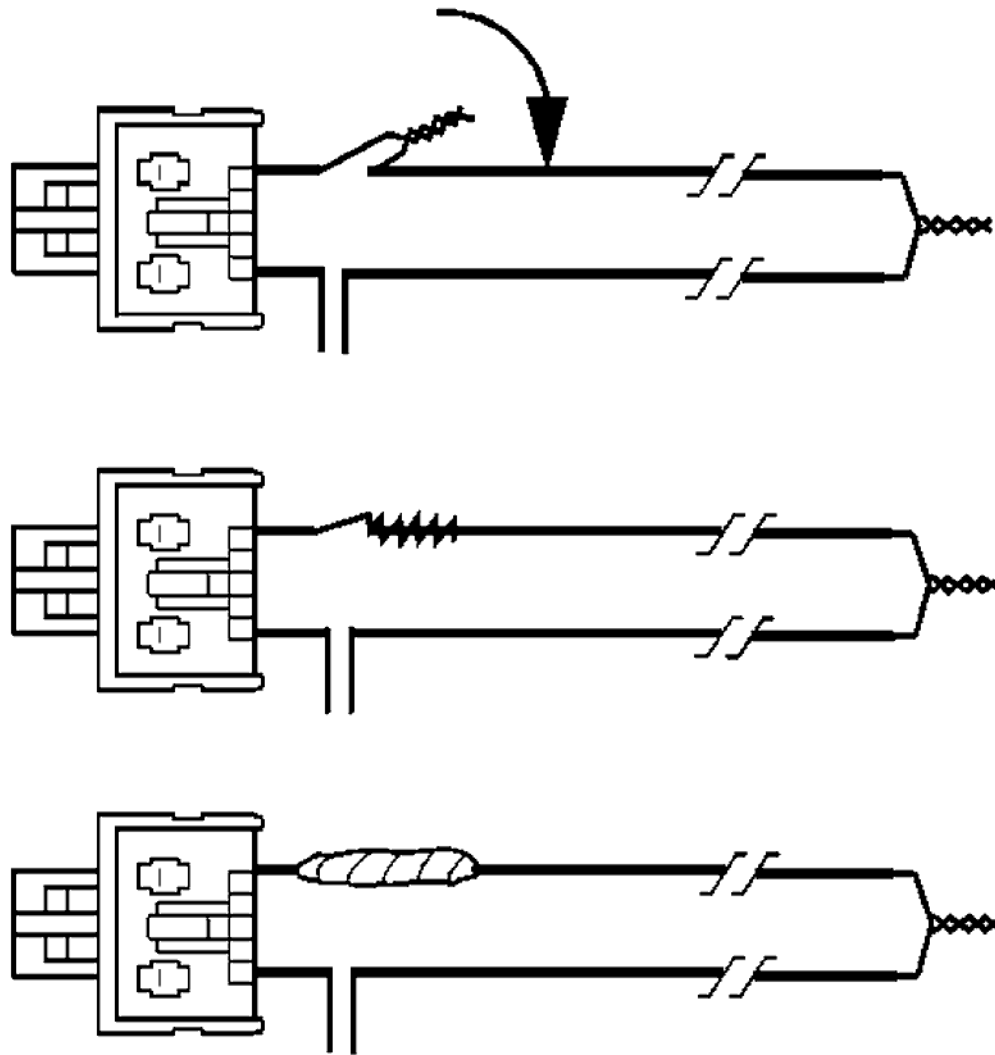


Fig. 132: Bending Twisted Connection Flat & Insulating With Tape
Courtesy of GENERAL MOTORS CORP.

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

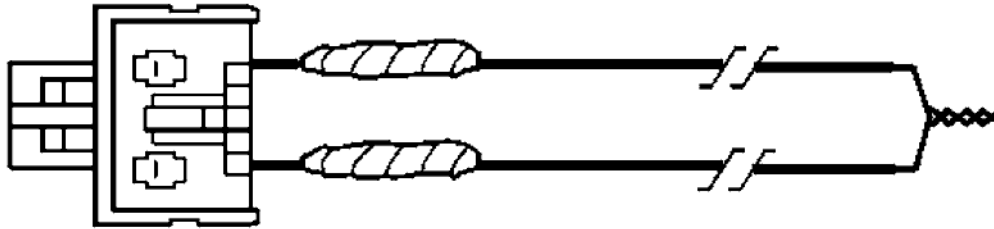


Fig. 133: Taping Remaining Connector Wire Lead To Remaining Deployment Wire

Courtesy of GENERAL MOTORS CORP.

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

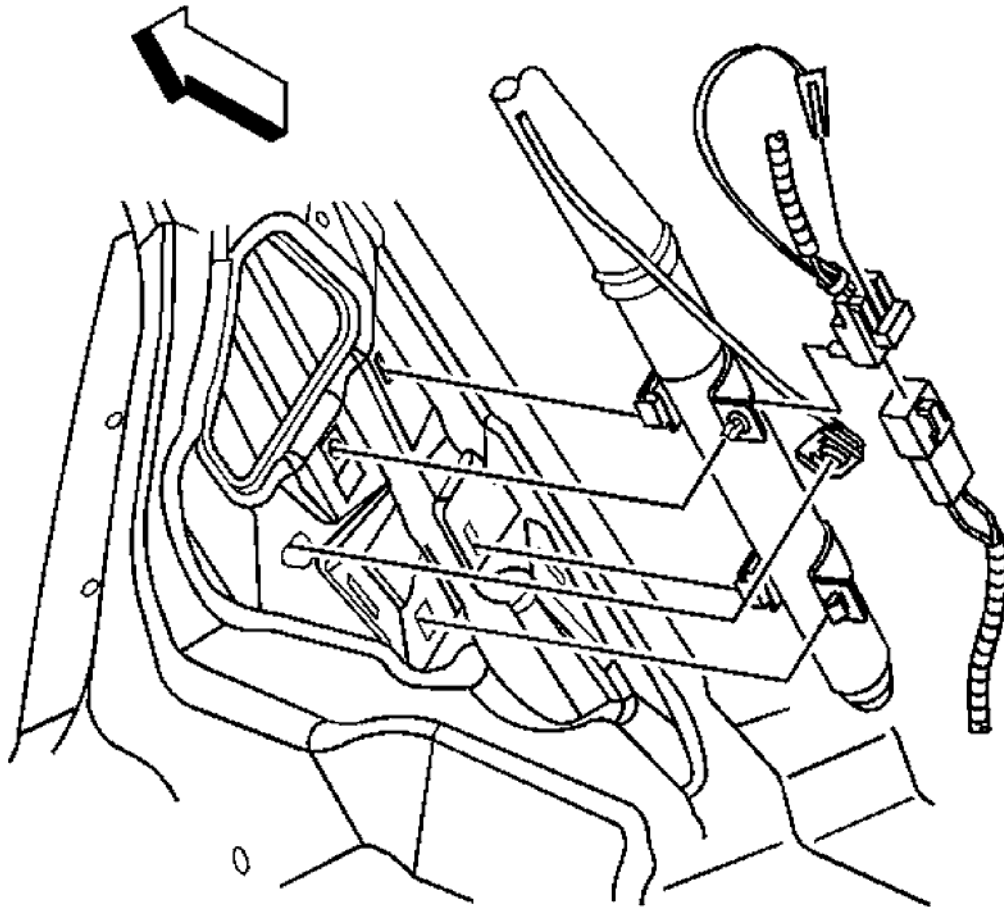


Fig. 134: Locating Roof Rail Module Connector
Courtesy of GENERAL MOTORS CORP.

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

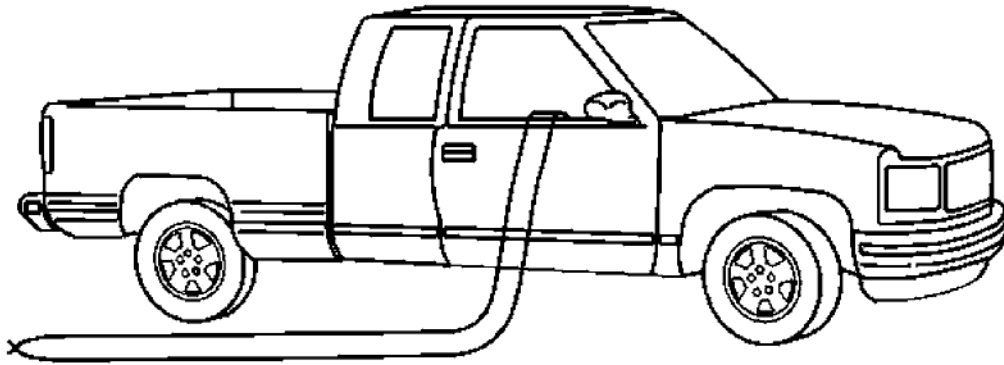


Fig. 135: Routing The Deployment Harness Out Of The Vehicle's Passenger Side
Courtesy of GENERAL MOTORS CORP.

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

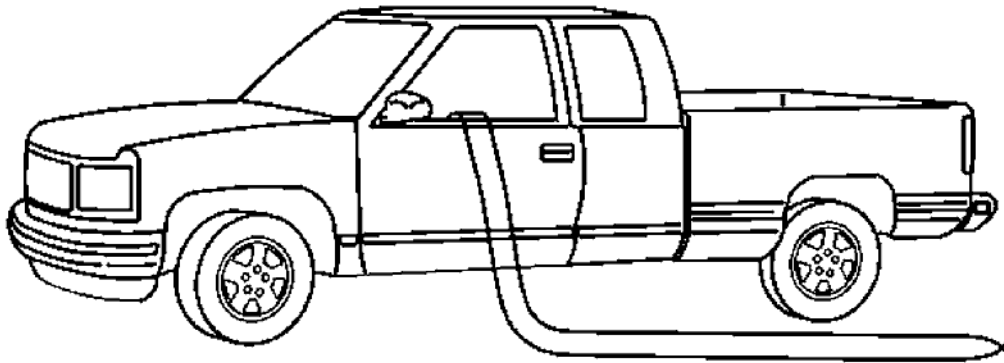


Fig. 136: Routing The Deployment Harness Out Of The Vehicle's Driver Side
Courtesy of GENERAL MOTORS CORP.

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

PRETENSIONER HANDLING AND SCRAPPING

CAUTION: Refer to SIR Seatbelt Pretensioner Handling Caution in

Cautions and Notices.

Scrapping Procedure

During the course of a vehicle's useful life, certain situations may arise which will require the disposal of a live and undeployed 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

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

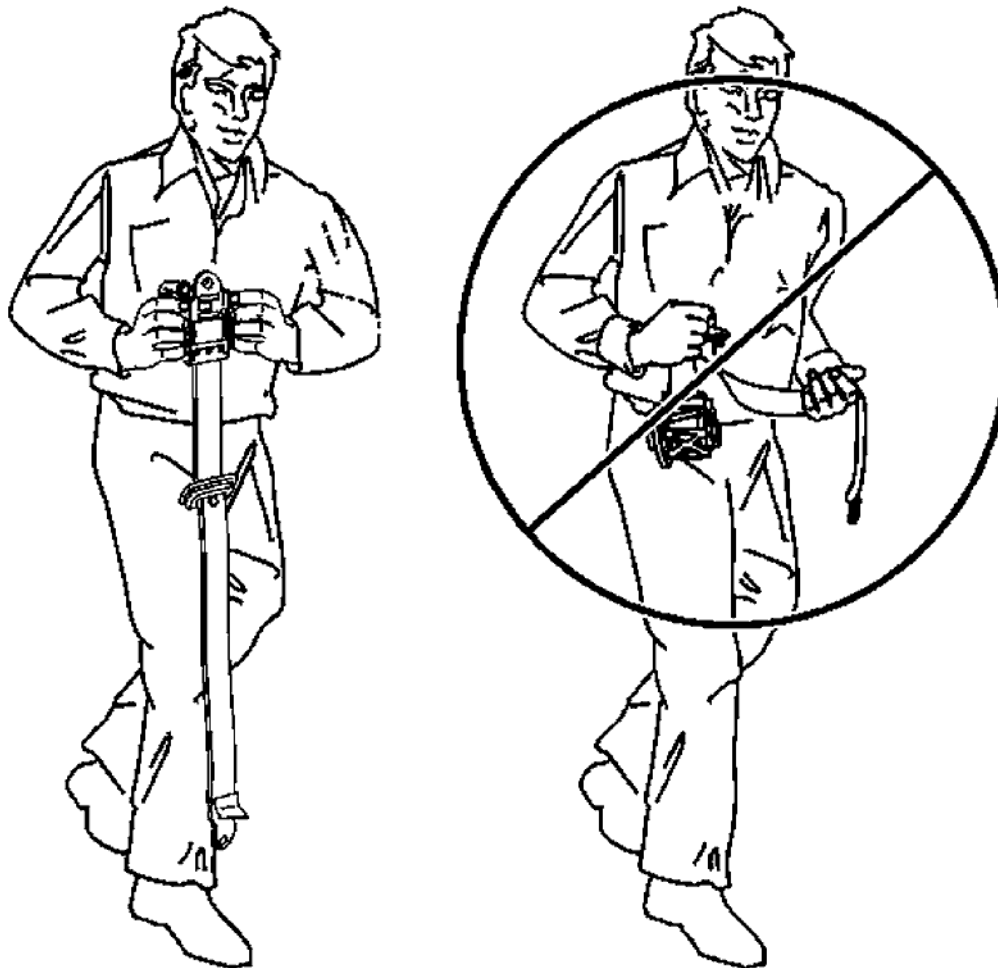


Fig. 137: Proper Transportation of Seat Belt Pretensioner
Courtesy of GENERAL MOTORS CORP.

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

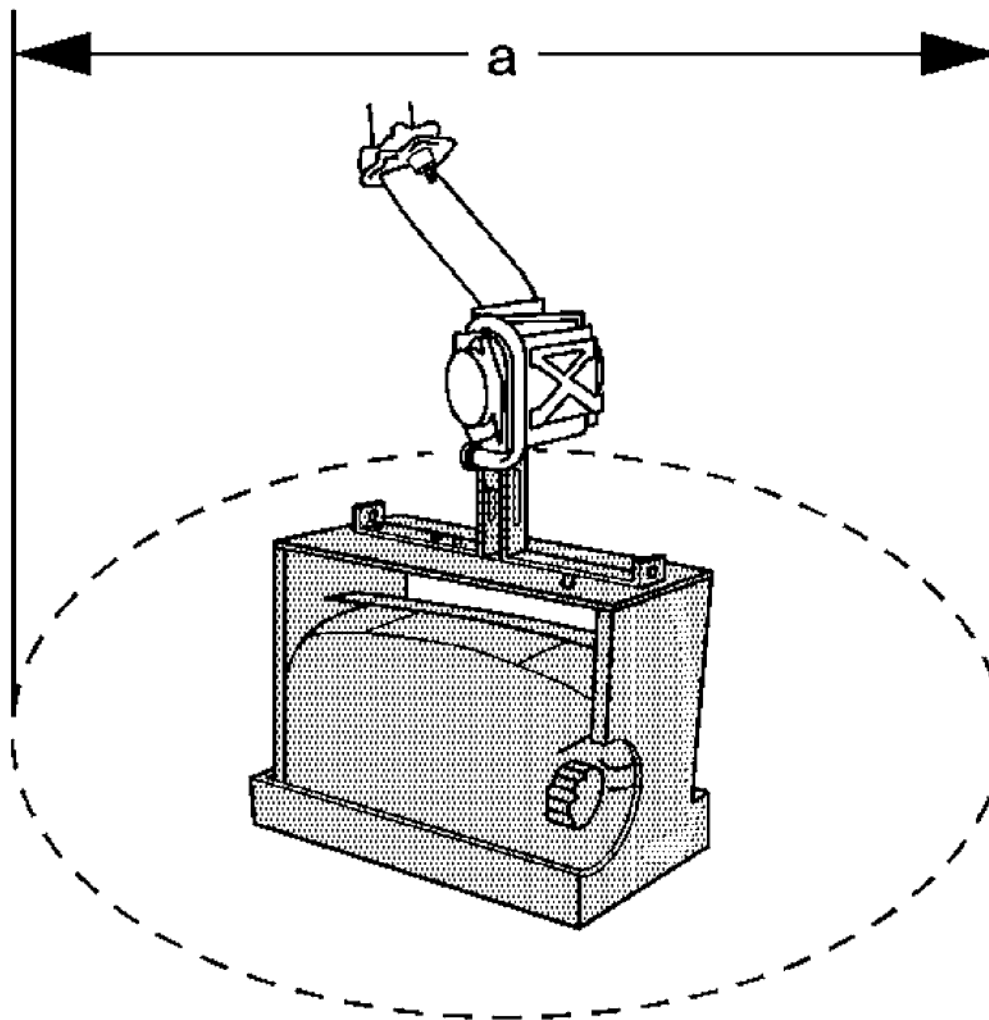


Fig. 138: Illustrating Proper Space For Deployment Of Pretensioner
Courtesy of GENERAL MOTORS CORP.

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

belt pretensioner. If possible, use a paved, outdoor location free of activity. Otherwise, use a space free of activity on the shop floor. Make sure you have sufficient ventilation.

7. Make sure no loose or flammable objects are in the area.
8. Place the **J 39401-B** in the center of the cleared area. See **Special Tools**.
9. Fill the fixture plastic reservoir with water or sand.

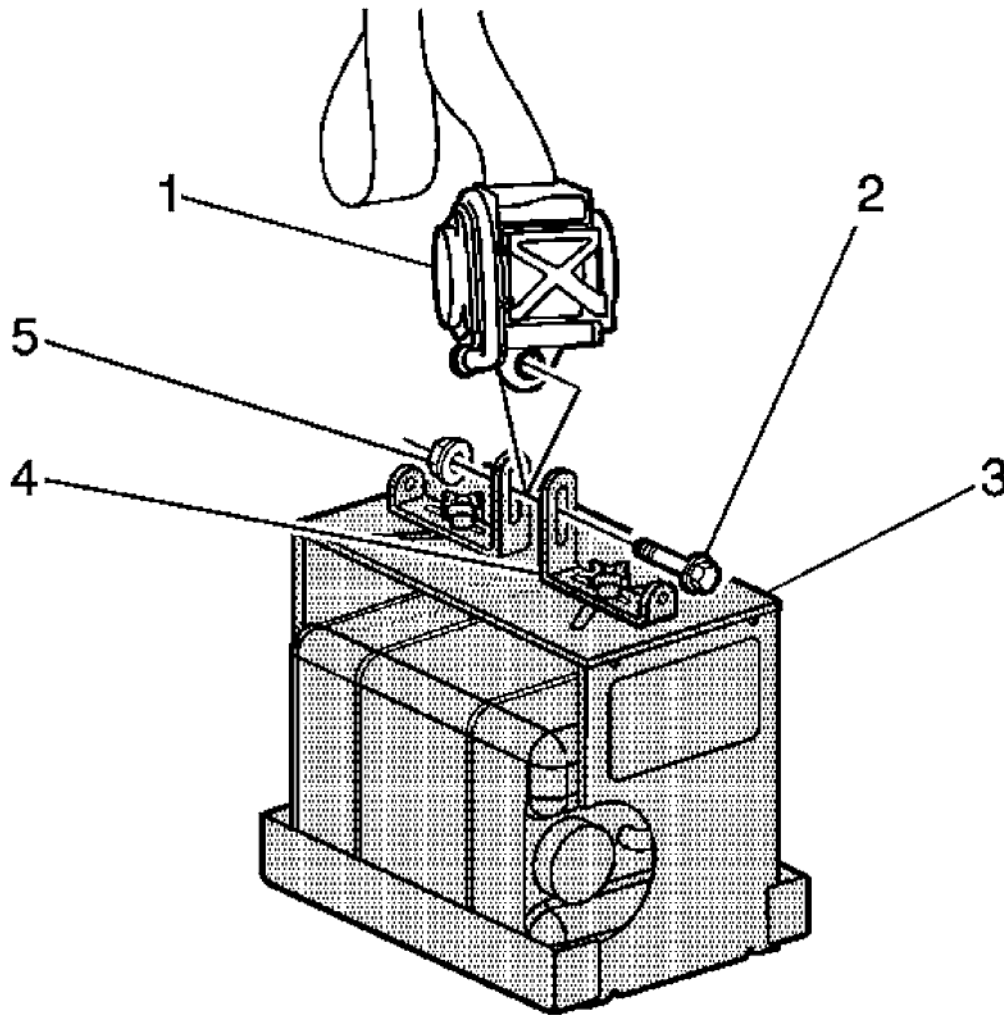


Fig. 139: Seat Belt Pretensioner And SIR Deployment Fixture
Courtesy of GENERAL MOTORS CORP.

10. Mount the seat belt pretensioner (1) in the SIR deployment fixture (3) with the open end facing up using the following mounting method.
 - Adjust and secure the **J 39401-B** arms (4) to the deployment fixture. See **Special**

Tools.

- To mount, use the proper size bolt (2) and nut (5) with washers in order to secure the seat belt pretensioner (1) to the deployment fixture brackets.
- Securely tighten all fasteners prior to deployment.

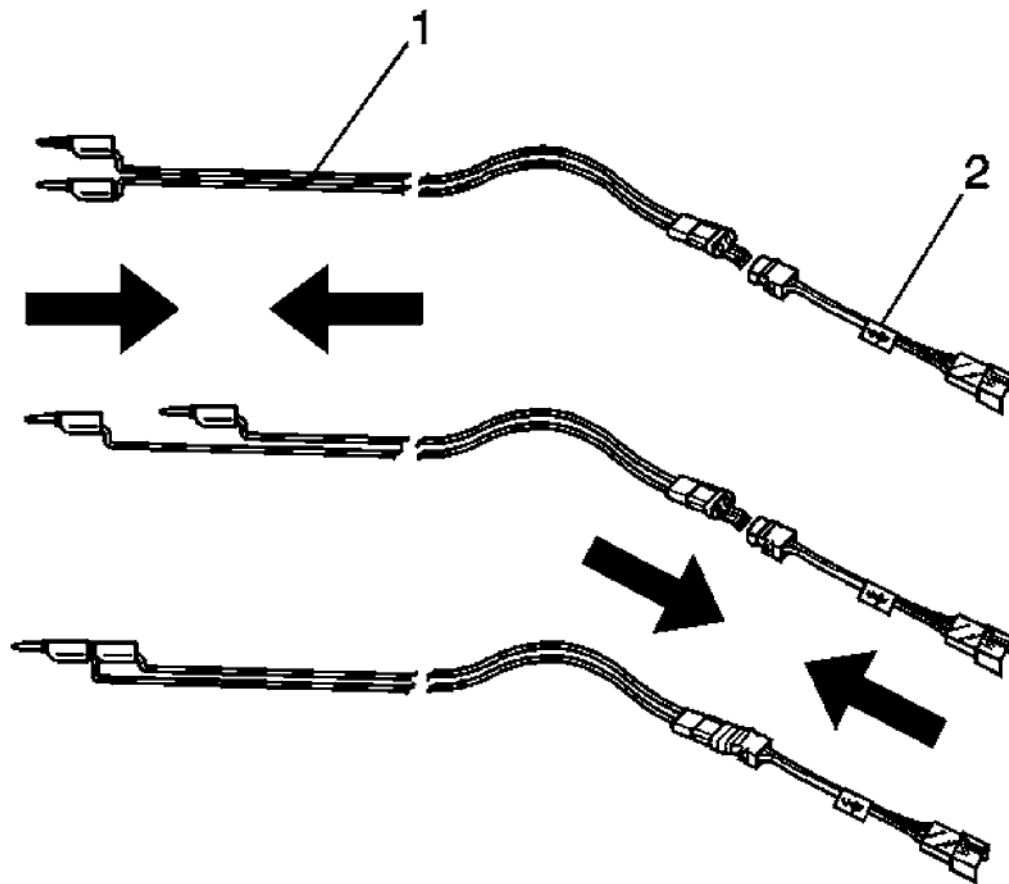


Fig. 140: Identifying SIR Deployment Harness & Adapter
Courtesy of GENERAL MOTORS CORP.

11. Inspect the **J 38826** and the appropriate pigtail adapter for damage. See **Special Tools**. Replace as needed.
12. Short the 2 SIR deployment harness (1) leads together using 1 banana plug seated into the other.
13. Connect the appropriate pigtail adapter (2) to the SIR deployment harness.

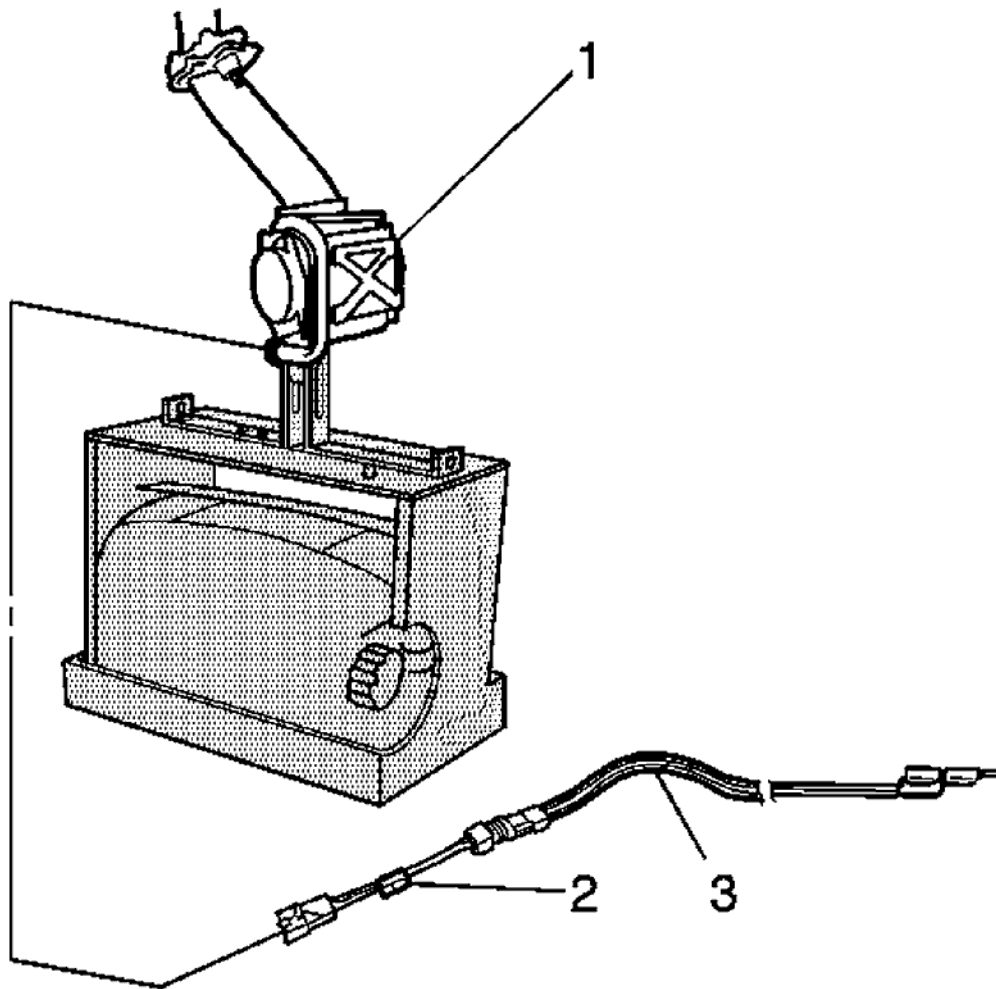


Fig. 141: Identifying Seat Belt Pretensioner Connector, Adapter & Deployment Harness

Courtesy of GENERAL MOTORS CORP.

14. Extend the SIR deployment harness and adapter to full length from the deployment fixture.
15. Connect the seat belt pretensioner connector (1) to the adapter (2) on the deployment harness (3).

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

16. Clear the area of people.

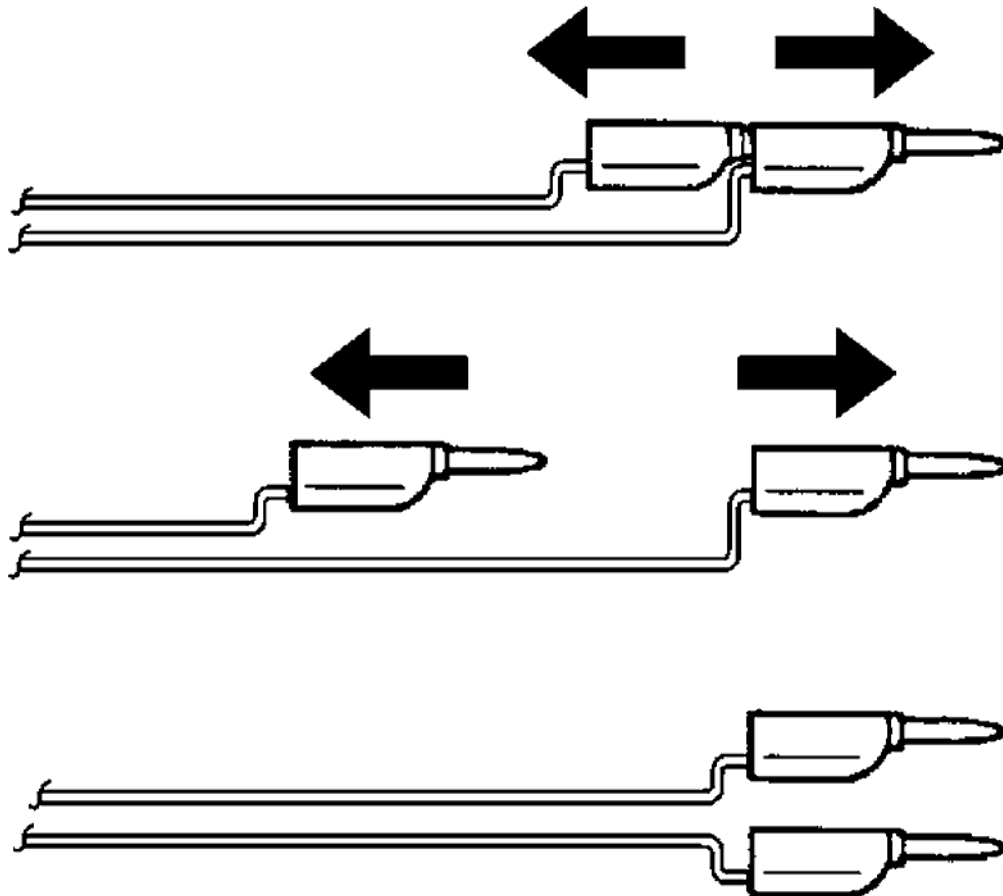


Fig. 142: Separating Banana Plugs
Courtesy of GENERAL MOTORS CORP.

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

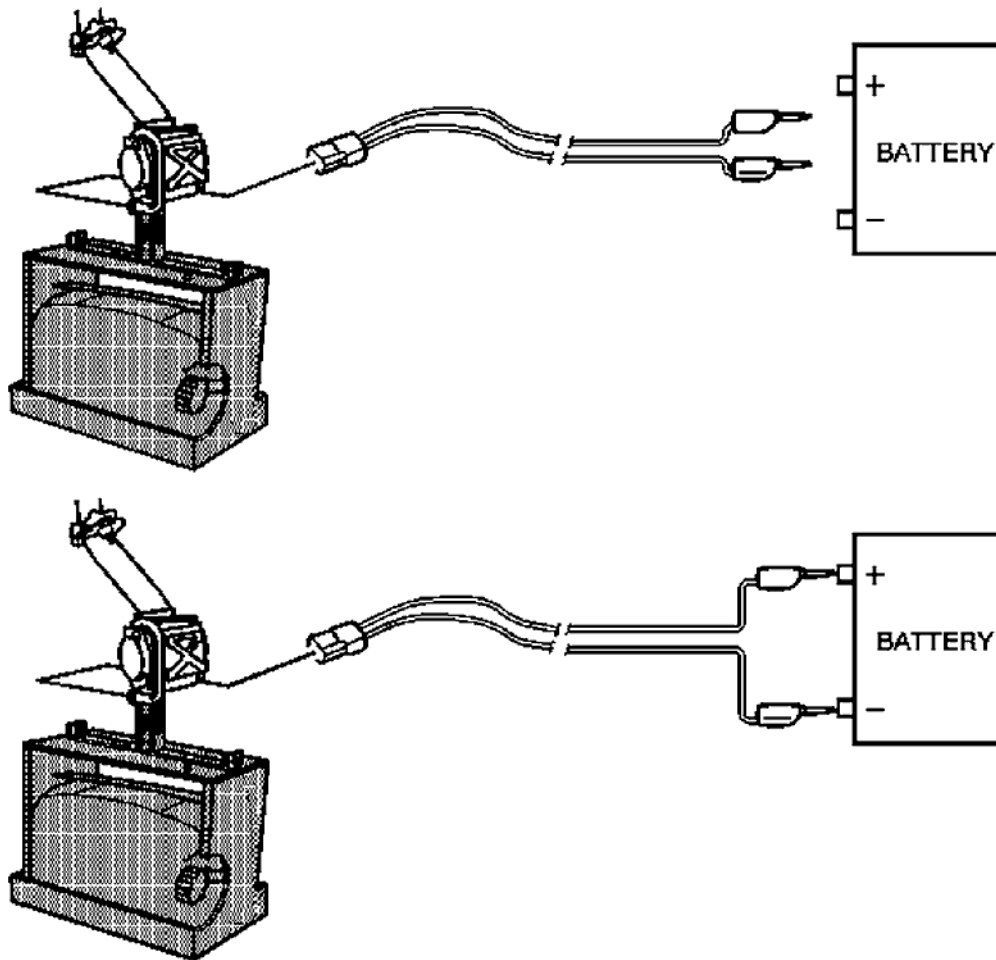


Fig. 143: Deploying Seat Belt Pretensioner
Courtesy of GENERAL MOTORS CORP.

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

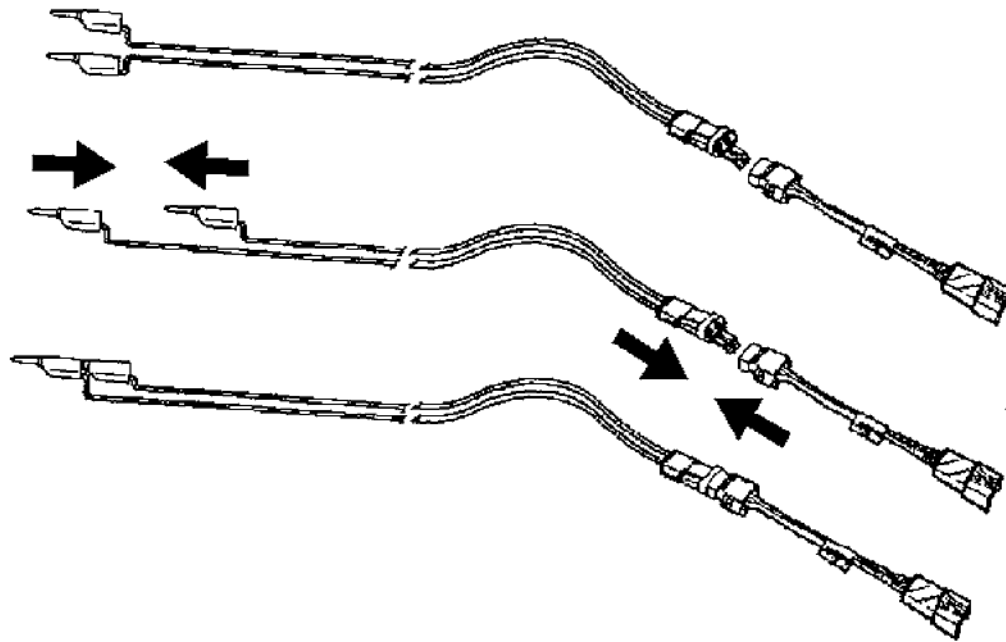


Fig. 144: View Of Deployment Harness Leads
Courtesy of GENERAL MOTORS CORP.

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

Deployment Inside Vehicle - Vehicle Scrapping Procedure

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

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

opposed to rebuilding as the same VIN.

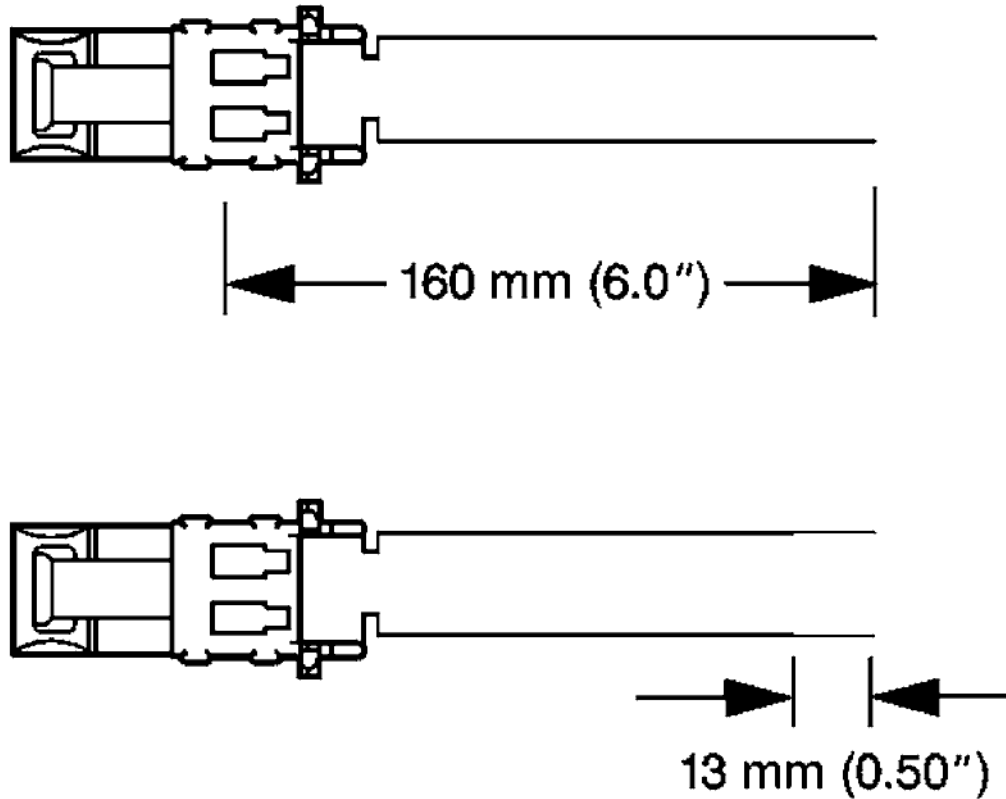


Fig. 145: Stripping Connector Wire Lead
Courtesy of GENERAL MOTORS CORP.

1. Turn OFF the ignition.
2. Remove the ignition key.
3. Put on safety glasses.
4. Remove all loose objects from the front seats.
5. Disconnect the seat belt pretensioner connector. Refer to **Seat Belt Retractor Pretensioner Replacement - Front**.
6. Cut the seat belt pretensioner harness connector out of the vehicle, leaving at least 16 cm (6 in) of wire at the connector.
7. Strip 13 mm (0.5 in) of insulation from each of the connector wire leads.

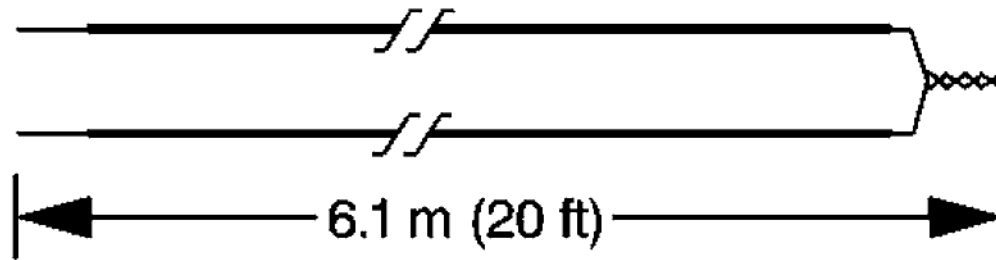


Fig. 146: Fabricating 20 Ft. Deployment Harness
Courtesy of GENERAL MOTORS CORP.

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.

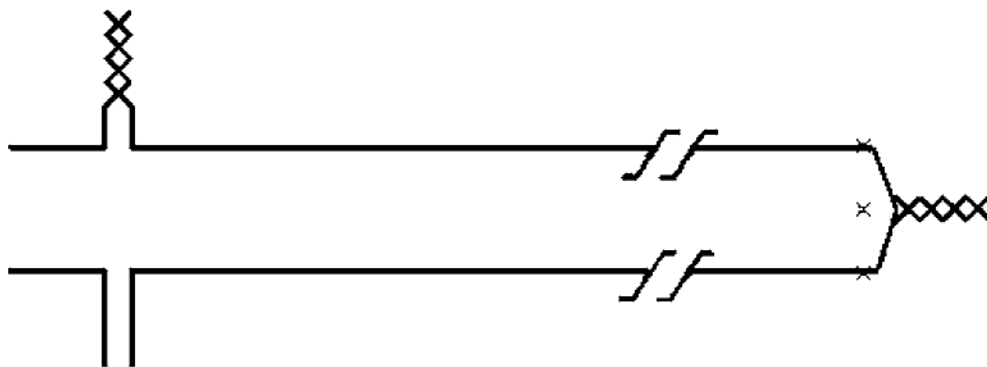


Fig. 147: Twisting Together Connector Wire Lead To Deployment Wire
Courtesy of GENERAL MOTORS CORP.

11. Twist together one connector wire lead to one deployment wire.
12. Inspect that the previous connections is secure.

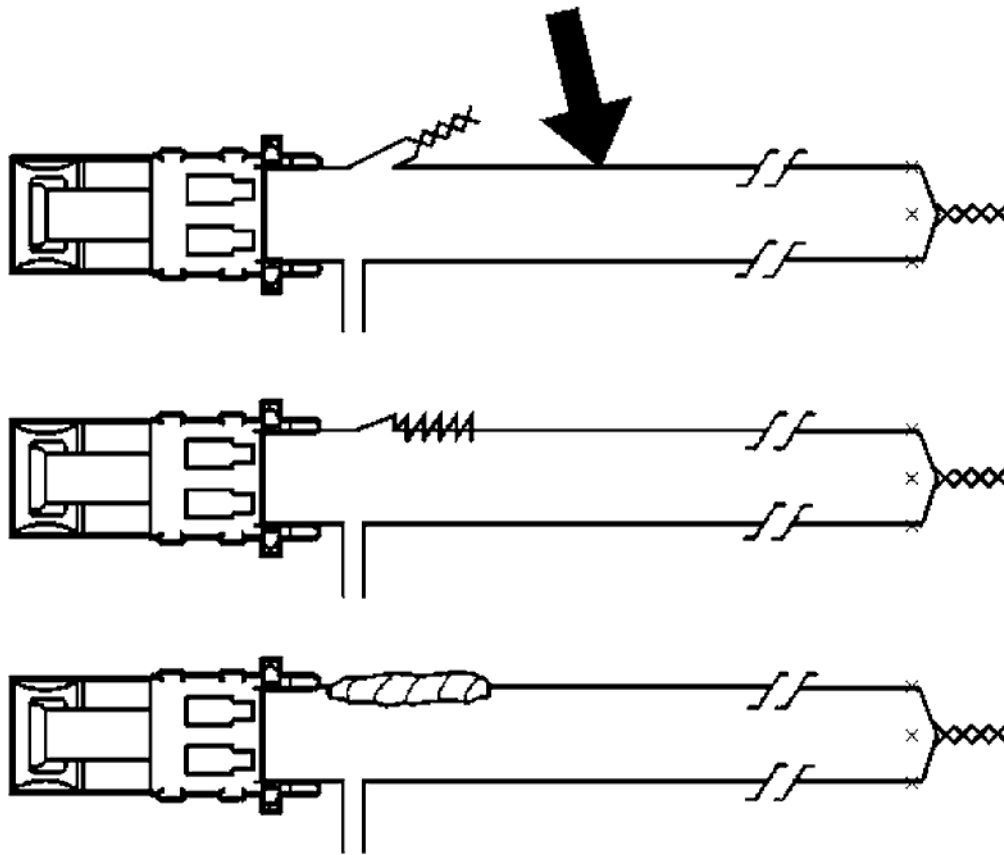


Fig. 148: Identifying I/P Module Twisted Connection
Courtesy of GENERAL MOTORS CORP.

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

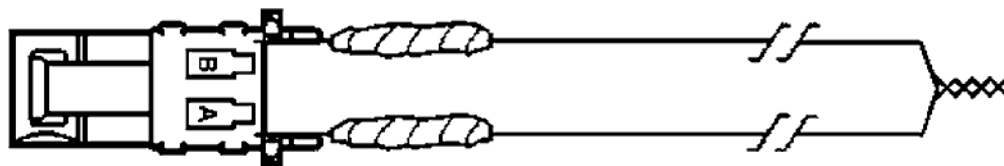


Fig. 149: View Of Dual Insulated Connector Wires

Courtesy of GENERAL MOTORS CORP.

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

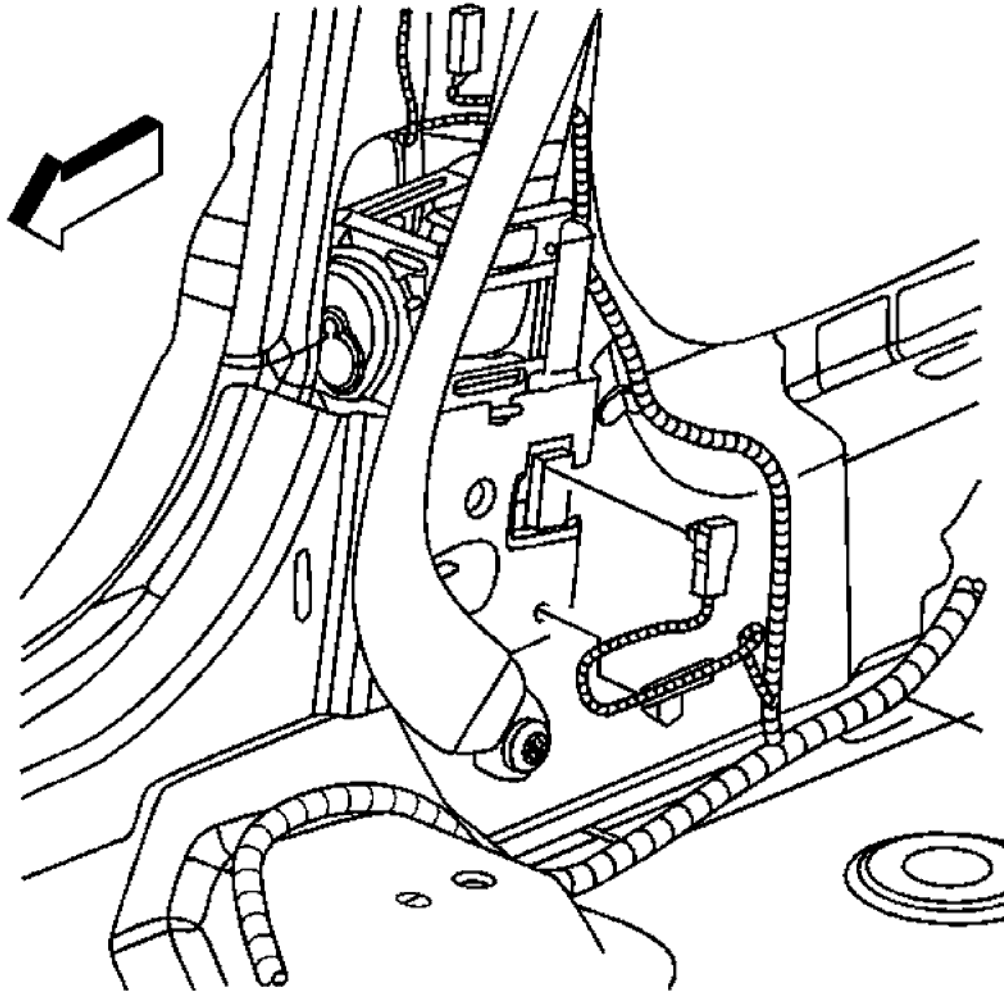


Fig. 150: View Of Seat Belt Pretensioner Connector And Wiring Harness Routing
Courtesy of GENERAL MOTORS CORP.

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

2006 Chevrolet HHR LT

2006 RESTRAINTS SIR - HHR

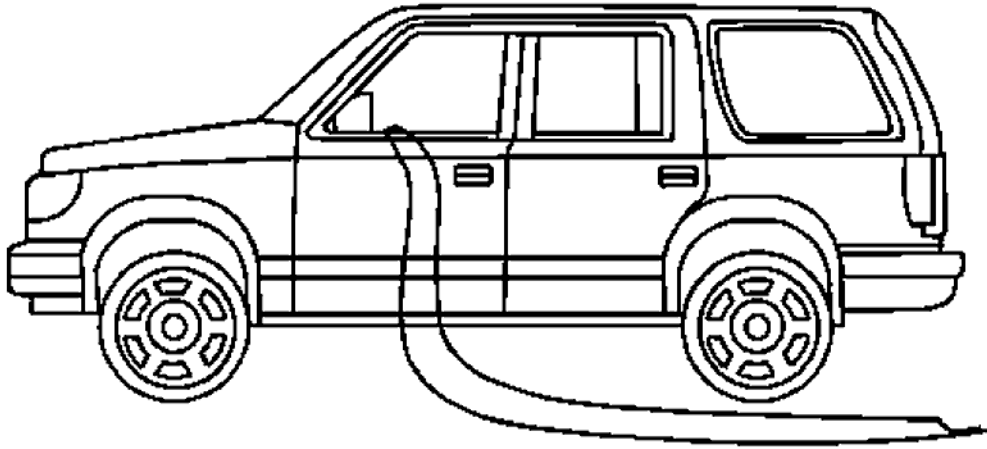


Fig. 151: Routing Wires To Apply Power For Controlled Bag Deployment (Left)
Courtesy of GENERAL MOTORS CORP.

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

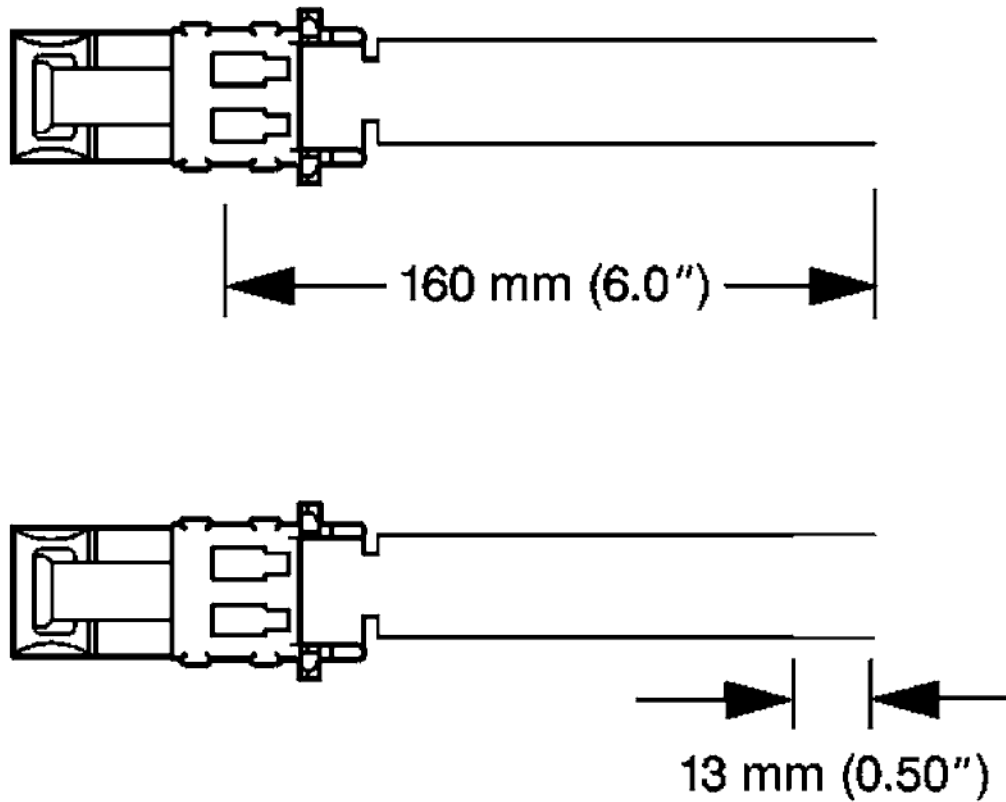


Fig. 152: Stripping Connector Wire Lead
Courtesy of GENERAL MOTORS CORP.

18. Disconnect the seat belt pretensioner connector. Refer to **Seat Belt Retractor Pretensioner Replacement - Front**.
19. Cut the seat belt pretensioner connector out of the vehicle, leaving at least 16 cm (6 in) of wire at the connector.
20. Strip 13 mm (0.5 in) of insulation from each of the connector wire leads.

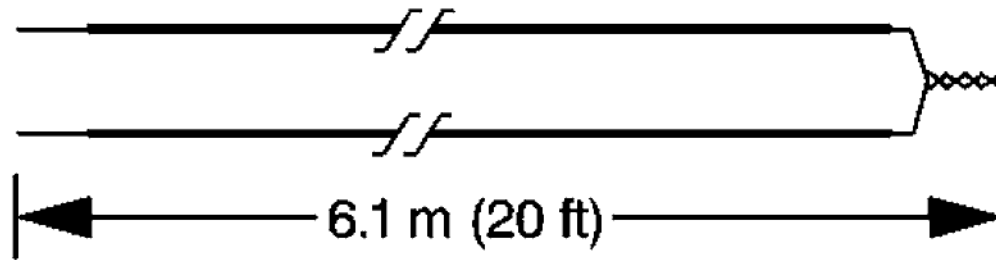


Fig. 153: Fabricating 20 Ft. Deployment Harness
Courtesy of GENERAL MOTORS CORP.

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.

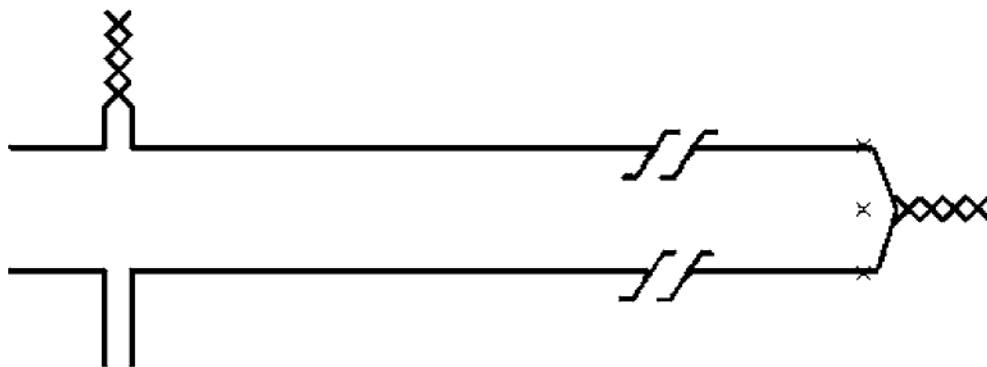


Fig. 154: Twisting Together Connector Wire Lead To Deployment Wire
Courtesy of GENERAL MOTORS CORP.

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

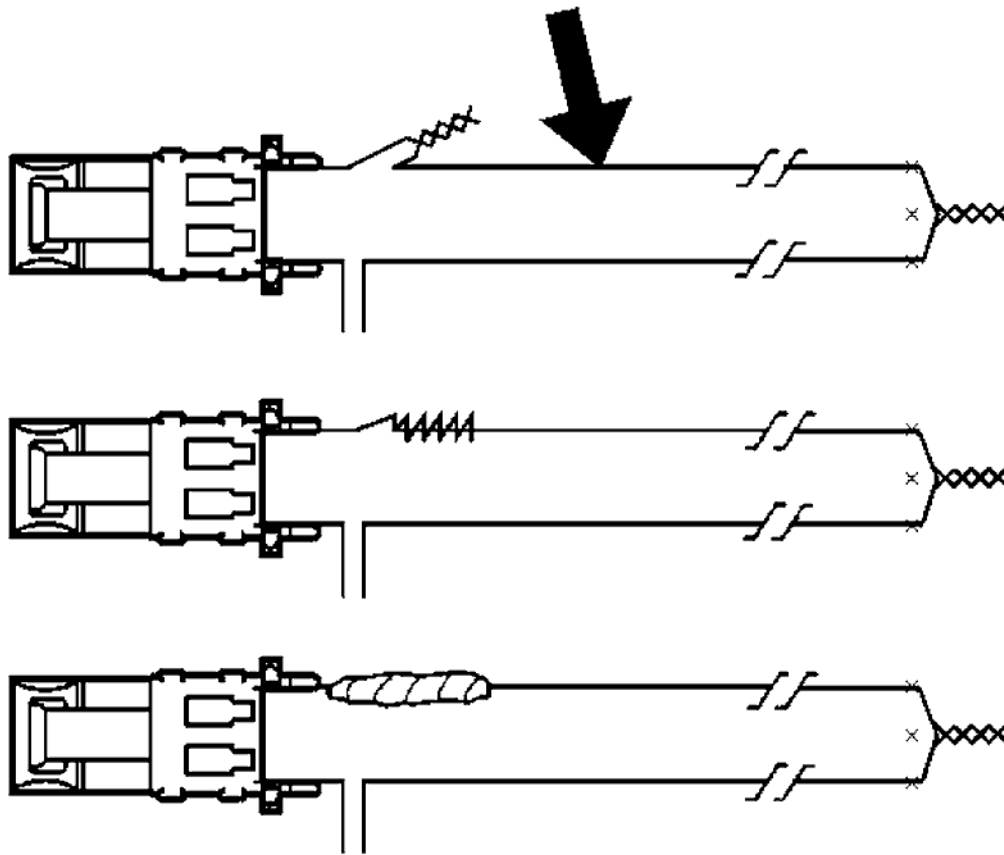


Fig. 155: Identifying I/P Module Twisted Connection
Courtesy of GENERAL MOTORS CORP.

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

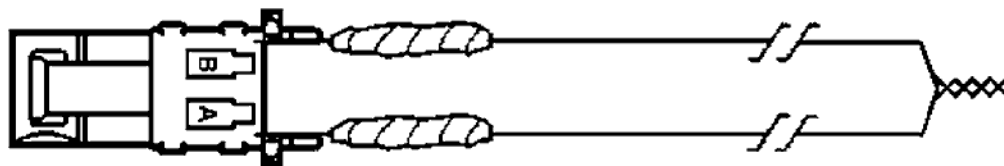


Fig. 156: View Of Dual Insulated Connector Wires

Courtesy of GENERAL MOTORS CORP.

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

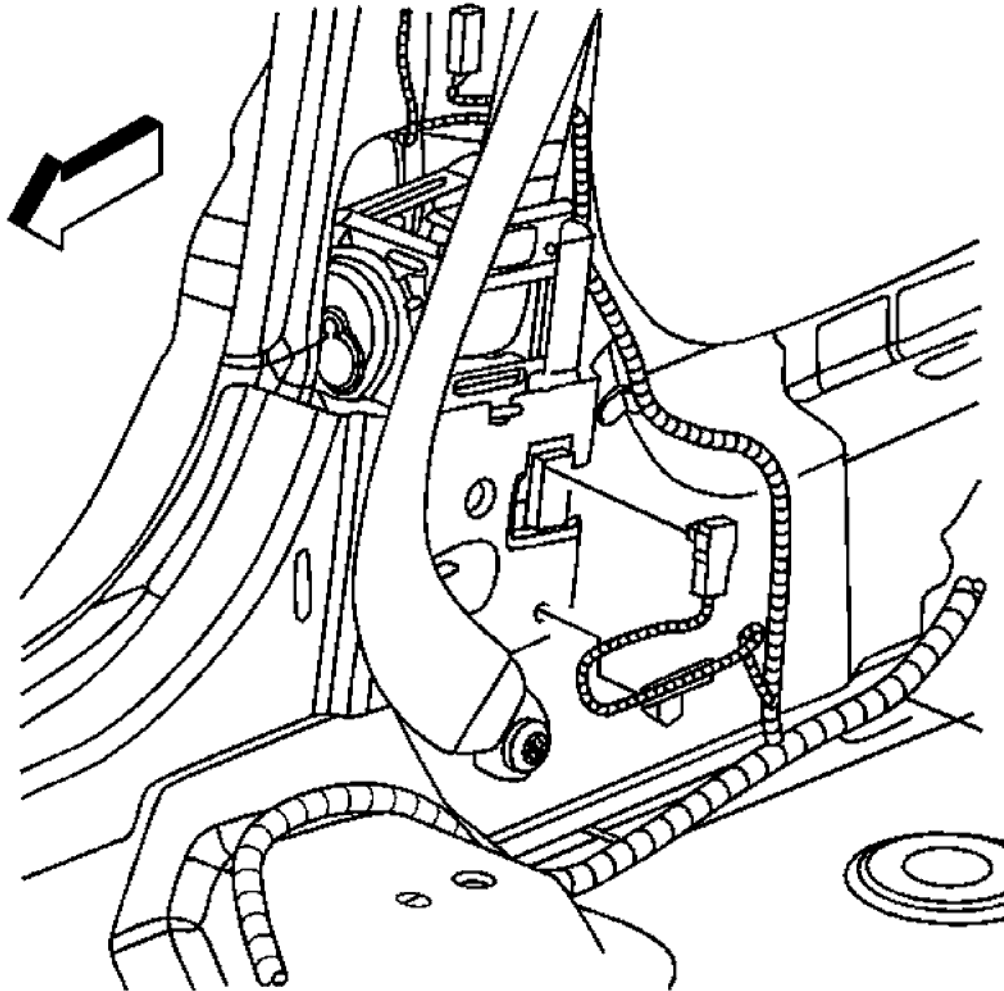


Fig. 157: View Of Seat Belt Pretensioner Connector And Wiring Harness Routing
Courtesy of GENERAL MOTORS CORP.

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

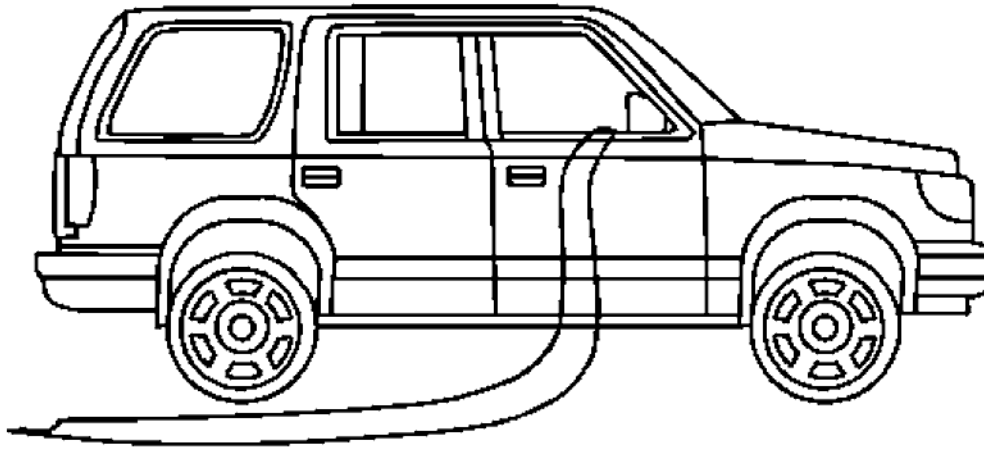


Fig. 158: Routing Wires To Apply Power For Controlled Bag Deployment (Right)
Courtesy of GENERAL MOTORS CORP.

30. Route the deployment harness out of the passenger's side of the vehicle.
31. Completely cover the windshield and the front door openings with a drop cloth.
32. Deploy each deployment loop one at a time.
33. Stretch out all of the deployment harness wires on the left and right side of the vehicle to their full length.
34. Place a power source, 12 volt minimum/2 amp minimum, such as a vehicle battery, near the shorted end of the harnesses.
35. Separate one set of wires and touch the wire ends to the power source in order to deploy the seat belt pretensioners.
36. Disconnect the deployment harness from the power source and twist the wire ends together.
37. Continue the same process with the remaining deployment harnesses that are available.
38. Remove the drop cloth from the vehicle.
39. Disconnect all harnesses from the vehicle.
40. Discard the harnesses.
41. Scrap the vehicle in the same manner as a non-SIR equipped vehicle.
42. If one or more of the seat belt pretensioners did not deploy, perform the following steps to remove the undeployed seat belt pretensioner from the vehicle, refer to **Seat Belt Retractor Pretensioner Replacement - Front**.
43. Call the Technical Assistance Group for further assistance.

DESCRIPTION AND OPERATION

SIR SYSTEM DESCRIPTION AND OPERATION

SIR System Overview

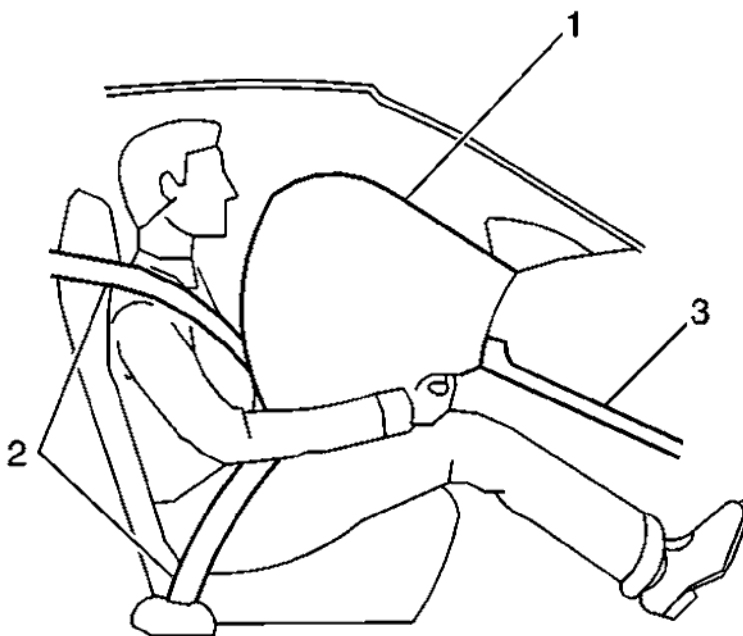
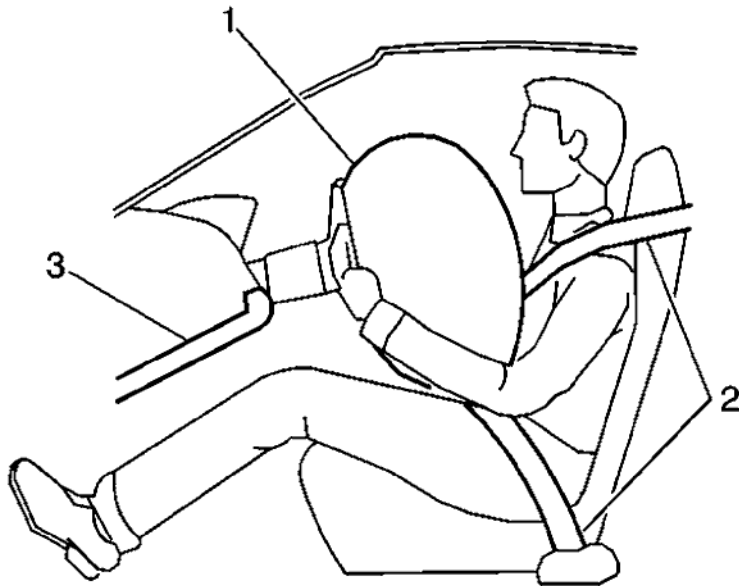


Fig. 159: Illustrating Deployed Inflatable Restraint

Courtesy of GENERAL MOTORS CORP.

The SIR System supplements the protection offered by the occupant seat belt system (2). The SIR System contains various inflator modules located throughout the vehicle, i.e. inflatable restraint steering wheel module (1) and the inflatable restraint instrument panel (I/P) module (1). Each inflator module has a deployment loop that is controlled by the inflatable restraint sensing and diagnostic module (SDM), which is mounted inside of the vehicle. The SDM determines the severity of a collision and commands deployment of each inflator module. The SDM performs continuous diagnostic monitoring of the SIR System electrical components. Upon detection of a circuit malfunction, the SDM will set a diagnostic trouble (DTC) and inform the driver by commanding the instrument panel cluster (IPC) to turn the AIR BAG indicator ON. The steering column and knee bolsters (3) are designed to absorb energy and compress during frontal collisions in order to limit leg movement and decrease the chance on injury to the driver and front passenger.

Frontal SIR System Description

The frontal Supplemental Inflatable Restraint (SIR) System consists of the following components:

- AIR BAG indicator located in the instrument panel cluster (IPC)
- Inflatable restraint instrument panel (I/P) module
- Inflatable restraint sensing and diagnostic module (SDM)
- Inflatable Restraint Passenger Presence System (PPS)
- Inflatable restraint Passenger AIR BAG ON/OFF indicator
- Inflatable restraint steering wheel module
- Inflatable restraint steering wheel module coil
- Steering wheel and column
- Inflatable restraint front end sensor
- Inflatable restraint seat belt retractor pretensioners
- Inflatable restraint wiring harnesses
- Driver and passenger knee bolsters

A frontal collision of sufficient force will deploy the frontal air bags. The SDM contains a sensing device that converts vehicle velocity changes to an electrical signal. In the event of a frontal collision, the SDM receives a signal from the electronic frontal sensor which assists the SDM in determining the severity of the collision. The SDM compares these signals to a value stored in memory. When the generated signals exceed the stored value, the SDM will cause current to flow through the frontal deployment loops simultaneously deploying the frontal air bags. The SDM, I/P module, steering wheel module, steering wheel module coil, seat belt pretensioner and the connecting wires makeup 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.

Inflatable Restraint Sensing and Diagnostic Module (SDM)

The sensing and diagnostic module (SDM) is a microprocessor and the control center for the Supplemental Inflatable Restraint (SIR) System. This SDM has 2 fused power inputs; one fuse is for the battery voltage and the other fuse is for the ignition voltage. The SDM uses vehicle battery voltage as its main power input. The SDM then uses the vehicles GMLAN Serial Data Communication line and the ignition voltage logic input for enabling or disabling the SIR deployment loops. The SDM contains internal sensors along with several 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 the stored value, the SDM will cause current to flow through the appropriate deployment loops to deploy the air bags or seat belt pretensioners. 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 records the SIR system status when a deployment occurs and turns the AIR BAG indicator located in the IPC ON. As soon as 3 distinct deployment commands (representing different events) have been issued to any belt pretensioner, or the SDM commands any front and side air bag to deploy once, the SDM shall be considered to not be reusable. 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 Passenger Presence System (PPS)

IMPORTANT: The Passenger Presence System (PPS) is a calibrated unit. When replacing the assembly, all parts in the service kit must remain together. Do not mix any of the old parts with the new parts. After repairing or replacing the PPS, the system must be rezeroed in order to function properly.

The PPS is used to monitor the weight of an occupant on the front outboard passenger seat and communicate the status to the sensing and diagnostic module (SDM) whether to enable or suppress the deployment of the instrument panel (I/P) module. The PPS consist of an electronic control module, silicone filled sensor pad, pressure sensor, seat belt tension retractor sensor, wiring harness, and PASSENGER AIR BAG ON/OFF indicators. The silicone filled sensor pad is located under the passenger seat foam cushion and is connected by a hose clamped to the pressure sensor. The weight of the occupant sitting in the front passenger seat is measured as a pressure change within the bladder by the pressure sensor. The pressure sensor sends a voltage signal to the PPS module. If the pressure from the

occupants weight is less than a specified value, the PPS module will send a suppress signal to the SDM to disable the I/P module. If the pressure from the occupants weight is higher than a specified value, the PPS module will send an enable signal to the SDM to enable the I/P module. The PPS module will notify the customer of the enable/disable status by turning ON one of the PASSENGER AIR BAG ON/OFF indicators located in the center of I/P. The PPS monitors itself for faults and will set DTCs if a fault is detected. The PPS will also notify the SDM of a fault and the SDM will request the instrument panel cluster (IPC) to turn ON the AIR BAG indicator located on the IPC. To determine what DTCs have been set by the PPS, the scan tool is used to command the SDM to request the PPS to flash the DTCs using the PASSENGER AIR BAG ON/OFF indicators located in the center of I/P.

Inflatable Restraint PASSENGER AIR BAG ON/OFF Indicator

The PASSENGER AIR BAG ON/OFF indicators located in the center of the instrument panel cluster (IPC), is used to notify the driver and passenger when the instrument panel (I/P) air bag is enable or disable. The PASSENGER AIR BAG ON/OFF indicators are also used to display any faults/DTCs, when the sensing and diagnostic module (SDM) sends a command to the Passenger Presence System (PPS), the PPS will flash the ON/OFF indicators. The PPS will flash the first number of the DTC using the OFF indicator. This will be an ODD number, then flash the second number of the DTC using the ON indicator. For more information on this flash procedure refer to **Passenger Presence System Flash Code Procedures**.

AIR BAG Indicator

The AIR BAG indicator, located in the instrument panel cluster (IPC), is used to notify the driver of Supplemental Inflatable Restraint (SIR) System malfunctions and to verify that the sensing and diagnostic module (SDM) is communicating with the IPC. When the ignition is turned ON, the SDM is supplied with ignition positive voltage. The SDM requests the IPC to flash the AIR BAG indicator seven times. While flashing the indicator, the SDM conducts tests on all SIR system components and circuits. If no malfunctions are detected, the SDM will communicate with the IPC through the GMLAN 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 GMLAN 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, 2 initiating devices, canister of gas generating material and, in some cases, stored compressed gas. The 2 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 2 stages of deployment, which varies the amount of restraint to the occupant according to the collision severity. For moderate frontal collisions the inflator modules deploy at less than full deployment (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 in some cases, the release of compressed gas. The gas produced from this reaction rapidly inflates the air bag. Once the air bag is inflated, it quickly deflates through the air bag vent holes and/or the bag fabric.

Each dual stage inflator module 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 Steering Wheel Module Coil

The steering wheel module coil is attached to the steering column and is located under the steering wheel. The steering wheel module coil consists of 2 or more current-carrying coils. The coils allow the rotation of the steering wheel while maintaining continuous electrical contact between the steering wheel module deployment loop and the steering wheel module. Two coil wires are used for the steering wheel module deployment loop. Additional coil wires are used for accessories that are 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 steering wheel module when the connector is disconnected.

Steering Wheel and Column

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

Inflatable Restraint Front End Sensor

The front end sensor is equipped on vehicles to supplement the SIR System performance. The front end sensor is an electronic sensor and is not part of the deployment loops, but instead provides an input to the sensing and diagnostic module (SDM). The front end sensor can assist in determining the severity of some frontal collisions. The SDM contains a microprocessor which 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 frontal deployment loops

deploying the frontal air bags.

Inflatable Restraint Seat Belt Retractor Pretensioner

The seat belt pretensioner modules contain a housing, a seat belt retractor, the seat belt webbing, an initiating device, and a canister of gas generating material. The initiator is part of the seat belt pretensioner deployment loop. When the vehicle is involved in a collision of sufficient force, the sensing and diagnostic module (SDM) will cause current to flow through the deployment loops to the initiator. Current passing through the initiator ignites the material in the canister producing a rapid generation of gas and the release of compressed gas, if present. The gas produced from this reaction deploys the seat belt pretensioner and retracts the seat belt webbing, which removes slack in the seat belt.

Depending on the severity of the collision, the seat belt pretension may deploy without the frontal inflator modules deploying, or they will deploy immediately before the frontal inflator modules deploy. As soon as 3 distinct deployment commands, representing different events, have been issued to any belt pretensioner, the SDM shall be considered to not be reusable.

Each seat belt pretensioner is equipped with a shorting bar located on the connector of the pretensioner. The shorting bar shorts the seat belt pretensioner deployment loop circuitry to prevent unwanted deployment of the pretensioner when servicing the seat belt pretensioner.

Inflatable Restraint Wiring Harness

The inflatable restraint wiring harness connects the inflator modules, the sensing and diagnostic module (SDM), the deployment loops, and the serial data circuit together using weather-packed connectors. SIR System connectors are yellow for easy identification. When repairing SIR wiring harnesses, follow the proper testing and repair procedures listed in the service 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 occupants upper legs. In a collision, the front seat occupants legs may come in contact with the knee bolsters. The knee bolsters are designed to crush and deform, absorbing some of the impact and helping 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.

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 seat belt retractor pretensioners (left/right)
- 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 side impact sensor (SIS) detects the impact and sends a signal to the sensing and diagnostic module (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 makeup 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 modules 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 sensing and diagnostic module (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 side air bags.

SPECIAL TOOLS AND EQUIPMENT

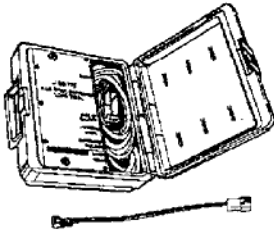
SPECIAL TOOLS

Special Tools

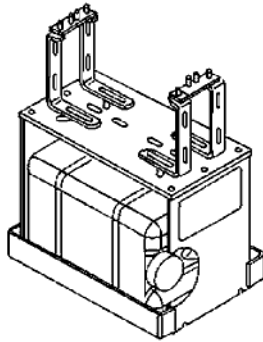
Illustration	Tool Number/Description
	J 38715-A Driver/Passenger SIR Load Tool

2006 Chevrolet HHR LT

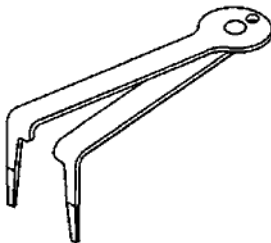
2006 RESTRAINTS SIR - HHR



J 38826
SIR Deployment Harness



J 39401-B
SIR Deployment Fixture



J 44298
Driver Air Bag Removal Tool