2008 RESTRAINTS

Supplemental Inflatable Restraints - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Application	Specification	
	Metric	English
Inflatable Restraint Front Passenger Position Sensor Screws	3 N.m	25 lb in
Inflatable Restraint Rollover Sensor Nuts	10 N.m	89 lb in
Inflatable Restraint Roof Rail Bolts	9 N.m	80 lb in
Inflatable Restraint SDM Nuts	7 N.m	56 lb in
Inflatable Restraint Side Impact Sensor Module Bolts	9 N.m	80 lb in
Instrument Panel Inflatable Restraint Module Bolts	10 N.m	89 lb in
SIR Front End Discriminating Sensor Bolts	8 N.m	71 lb in

SCHEMATIC AND ROUTING DIAGRAMS

SIR SCHEMATICS

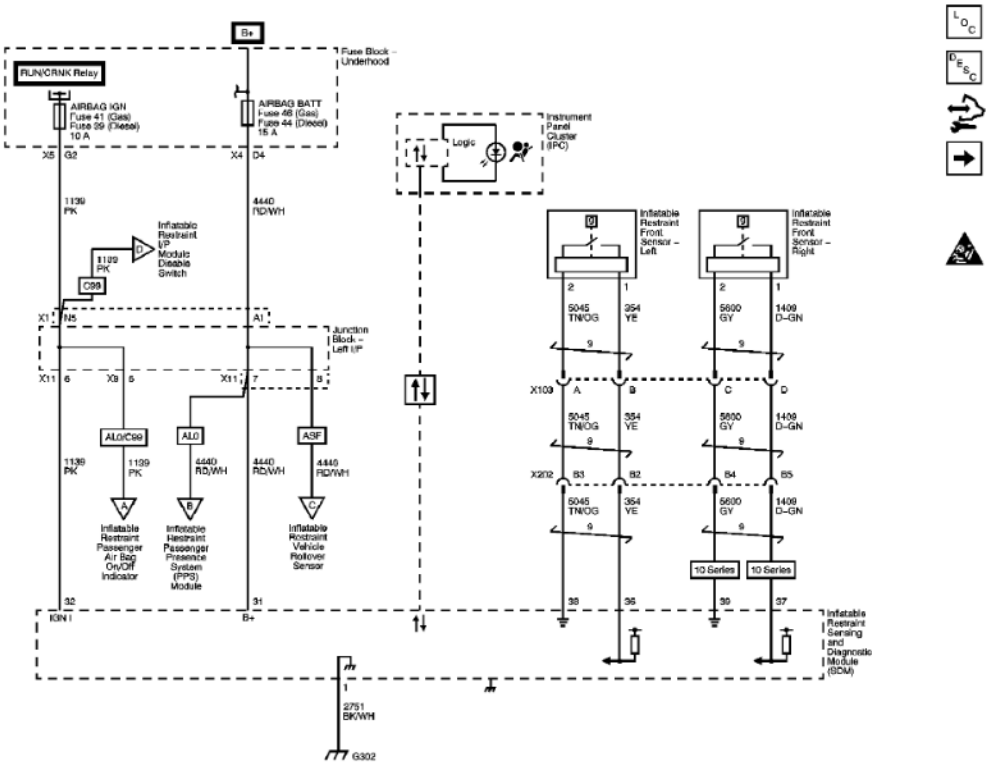


Fig. 1: Module Power, Ground, Serial Data and Front Sensors
Courtesy of GENERAL MOTORS CORP.

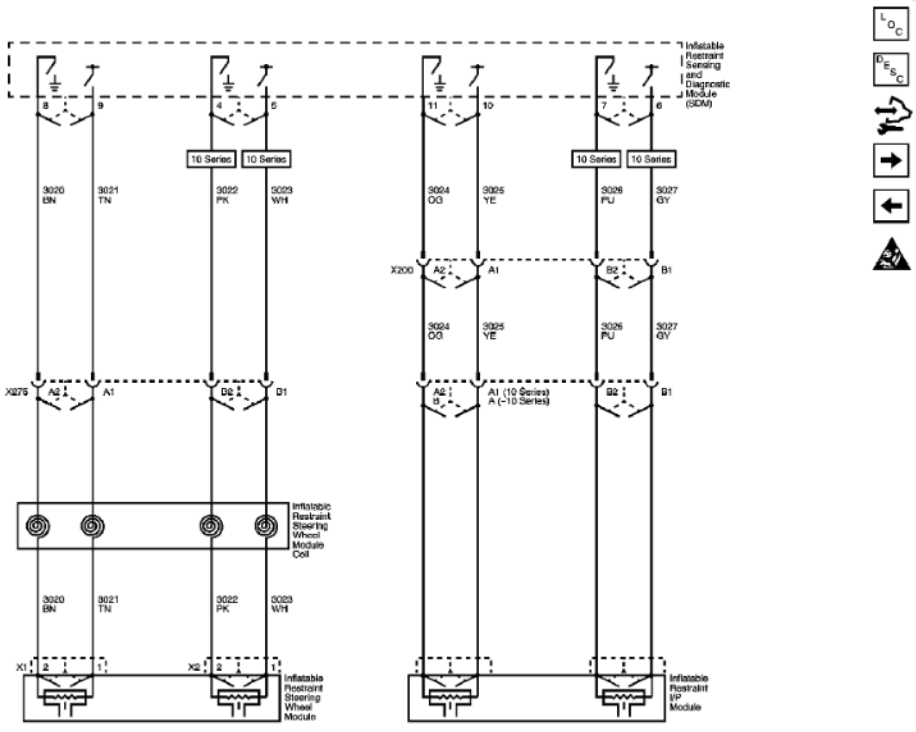


Fig. 2: Steering Wheel and I/P Module
Courtesy of GENERAL MOTORS CORP.

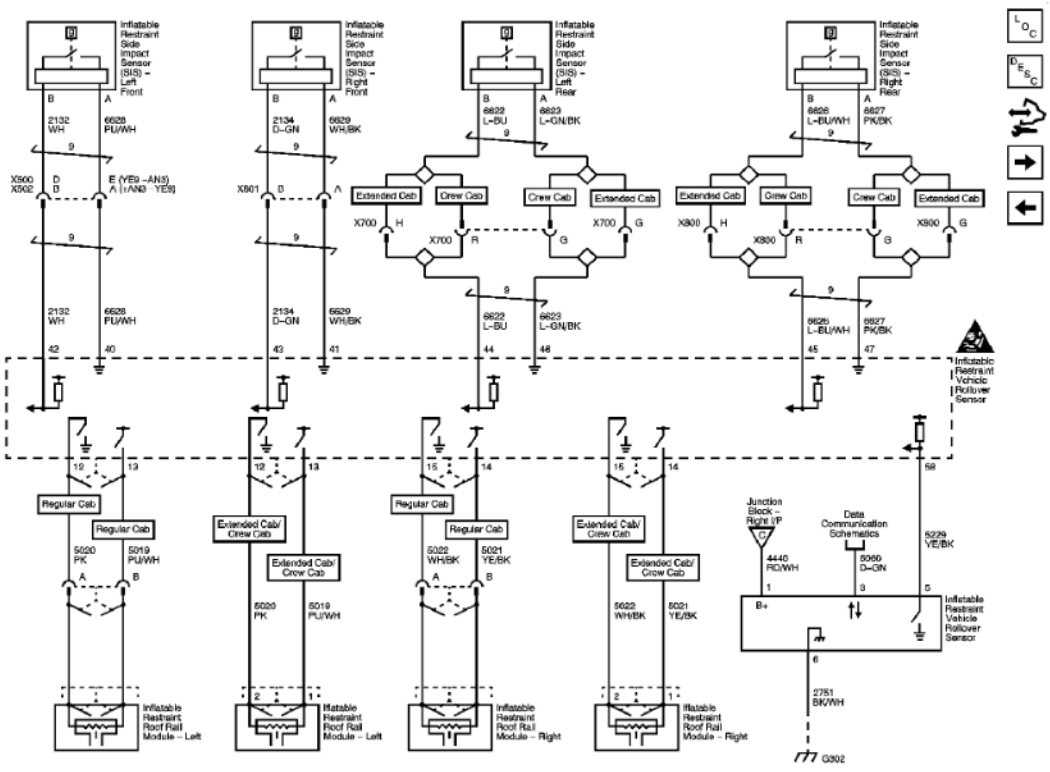


Fig. 3: Side Impact Modules and Sensors (ASF)
Courtesy of GENERAL MOTORS CORP.

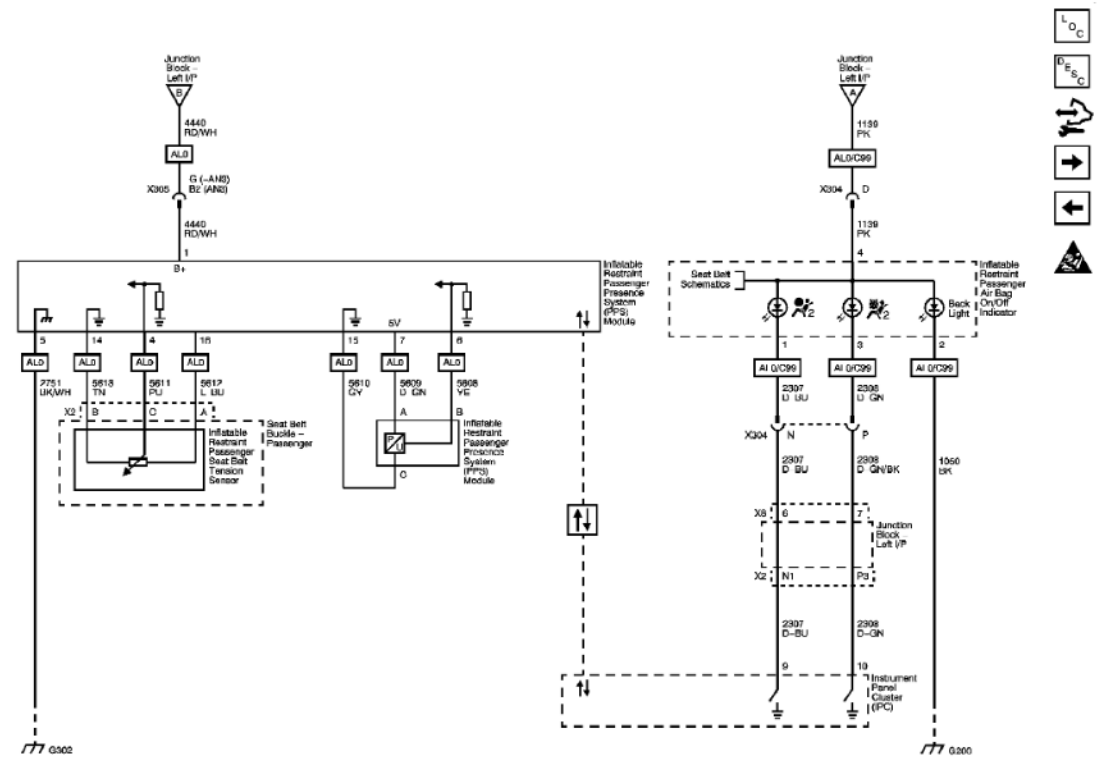


Fig. 4: Passenger Presence System 1 of 2
Courtesy of GENERAL MOTORS CORP.

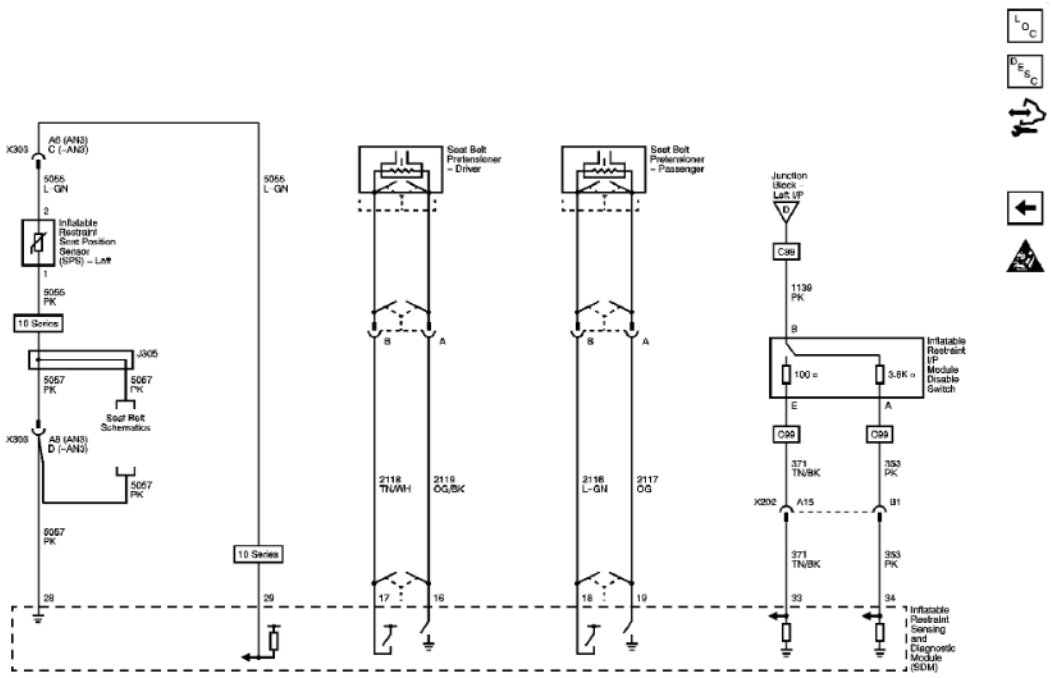


Fig. 5: Passenger Presence System 2 of 2
Courtesy of GENERAL MOTORS CORP.

COMPONENT LOCATOR

SIR IDENTIFICATION VIEWS

The SIR Identification Views shown below illustrate the approximate location of all SIR components available for the vehicle. This will assist in disabling and enabling the SIR system, refer to **SIR Disabling and Enabling**.

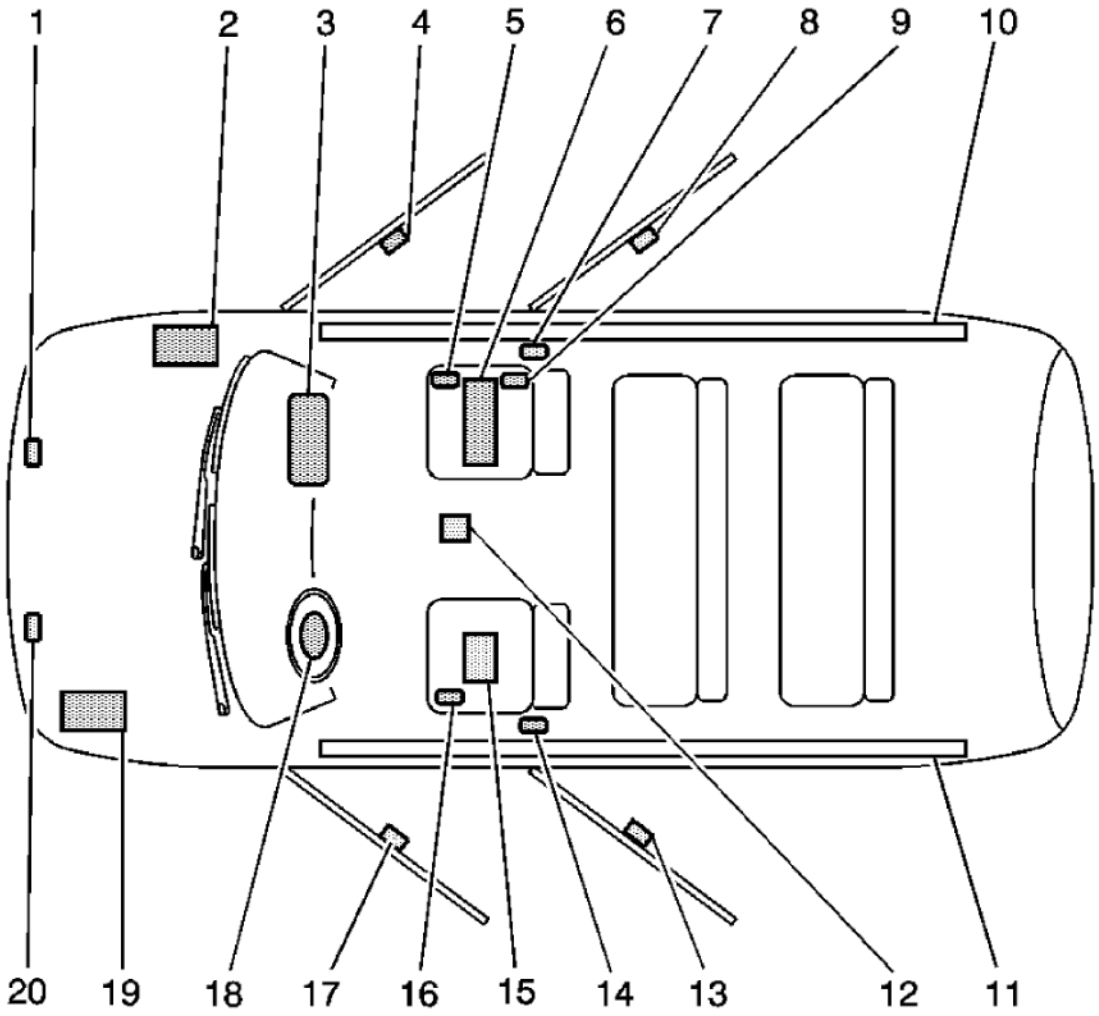


Fig. 6: Sierra/Siverado
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Inflatable Restraint Front End Sensor-Right-Located on the front frame crossmember
2	Battery-Located under the hood on the right side
3	Inflatable Restraint I/P Module-Located at the right front of the instrument panel cluster (IPC)
4	Inflatable Restraint Side Impact Sensor (SIS)-RF-Located under the right front door trim near the lower rear of the door frame
5	Inflatable Restraint Seat Position Sensor (SPS)-Right-Located on the right front outboard seat track

6	Inflatable Restraint Passenger Presence System (PPS)-Located under the right front seat mounted to the seat frame
7	Inflatable Restraint Seat Belt Pretensioner-Right-Located on the right front B Piller
8	Inflatable Restraint Side Impact Sensor (SIS)-RR-Located under the right rear door trim near the lower rear of the door frame
9	Inflatable Restraint Seat Belt Tension Retractor Sensor-Located on the outboard lower seat belt anchor
10	Inflatable Restraint Roof Rail Module-Right-Located in the headliner
11	Inflatable Restraint Roof Rail Module-Left-Located in the headliner
12	Inflatable Restraint Vehicle Rollover Sensor-Located under the center console
13	Inflatable Restraint Side Impact Sensor (SIS)-LR-Located under the left rear door trim near the lower rear of the door frame
14	Inflatable Restraint Seat Belt Pretensioner-Left-Located on the left front B Piller
15	Inflatable Restraint Sensing and Diagnostic Module (SDM)-Located under the left front seat under the carpet
16	Inflatable Restraint Seat Position Sensor (SPS)-Left-Located on the left front outboard seat track
17	Inflatable Restraint Side Impact Sensor (SIS)-LF-Located under the left front door trim near the lower rear of the door frame
18	Inflatable Restraint Steering Wheel Module-Located on the steering wheel
19	Underhood Fuse Block and Auxiliary Battery-Located under the hood on the left side
20	Inflatable Restraint Front End Sensor-Left-Located on the front frame crossmember

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
DTC B0012 or B0013	B0012 01: Driver Frontal Deployment Loop Stage 1 Short to Battery B0012 02: Driver Frontal Deployment Loop Stage 1 Short to

	Ground B0012 04: Driver Frontal Deployment Loop Stage 1 Open Circuit B0012 0D: Driver Frontal Deployment Loop Stage 1 Resistance Above Threshold B0012 0E: Driver Frontal Deployment Loop Stage 1 Resistance Below Threshold B0013 01: Driver Frontal Deployment Loop Stage 2 Short to Battery B0013 02: Driver Frontal Deployment Loop Stage 2 Short to Ground B0013 04: Driver Frontal Deployment Loop Stage 2 Open Circuit B0013 0D: Driver Frontal Deployment Loop Stage 2 Resistance Above Threshold B0013 0E: Driver Frontal Deployment Loop Stage 2 Resistance Below Threshold
DTC B0014-B0045	Pretensioner/Initiator Errors
DTC B0052 or B0053	B0052 00: Deployment Commanded B0053 00: Deployment Commanded With Loop DTCs Present
DTC B0071	B0071 03: Passenger Seat Belt Tension Sensor Circuit Voltage Below Threshold B0071 07: Passenger Seat Belt Tension Sensor Circuit Voltage Above Threshold
DTC B0072 or B0073	B0072 01: LF Seat Belt Sensor Circuit Short to Battery B0072 02: LF Seat Belt Sensor Circuit Short to Ground B0072 04: LF Seat Belt Sensor Circuit Open Circuit B0072 06: LF Seat Belt Sensor Circuit Short To Ground or Open Circuit B0072 08: LF Seat Belt Sensor Circuit Signal Invalid B0073 01: RF Seat Belt Sensor Circuit Short to Battery B0073 02: RF Seat Belt Sensor Circuit Short to Ground B0073 04: RF Seat Belt Sensor Circuit Open Circuit B0073 06: RF Seat Belt Sensor Circuit Short To Ground or Open Circuit B0073 08: RF Seat Belt Sensor Circuit Signal Invalid
DTC B0074	B0074 03: Passenger Occupant Classification Sensor Circuit Voltage Below Threshold B0074 07: Passenger Occupant Classification Circuit Voltage

	Above Threshold B0074 08: Passenger Occupant Classification Circuit Signal Invalid
DTC B0079	B0079 01: LF Seat Position Sensor Circuit Short to Battery B0079 02: LF Seat Position Sensor Circuit Short to Ground B0079 04: LF Seat Position Sensor Circuit Open B0079 06: LF Seat Position Sensor Circuit Short to Ground or Open Circuit B0079 08: LF Seat Position Sensor Circuit Signal Invalid
DTC B0081	B0081 0F: Passenger Presence System Erratic B0081 39: Passenger Presence System Internal Electronic Failure B0081 3A: Passenger Presence System Incorrect Component Installed B0081 71: Passenger Presence System Invalid Serial Data Received
DTC B0083-B0088	B0083 00: Electronic Front End Sensor 1 No Additional Information (Left) B0083 0F: Electronic Front End Sensor 1 Erratic (Left) B0083 39: Electronic Front End Sensor 1 Internal Electronic Failure (Left) B0083 3A: Electronic Front End Sensor 1 Incorrect Component Installed (Left) B0083 71: Electronic Front End Sensor 1 Invalid Serial Data Received (Left) B0084 00: Electronic Front End Sensor 2 No Additional Information (Right) B0084 0F: Electronic Front End Sensor 2 Erratic (Right) B0084 39: Electronic Front End Sensor 2 Internal Electronic Failure (Right) B0084 3A: Electronic Front End Sensor 2 Incorrect Component Installed (Right) B0084 71: Electronic Front End Sensor 2 Invalid Serial Data Received (Right) B0085 00: LF Side Impact Sensor No Additional Information B0085 0F: LF Side Impact Sensor Erratic B0085 39: LF Side Impact Sensor Internal Electronic Failure B0085 3A: LF Side Impact Sensor Incorrect Component Installed

	B0085 71: LF Side Impact Sensor Invalid Serial Data Received B0086 00: RF Side Impact Sensor No Additional Information B0086 0F: RF Side Impact Sensor Erratic B0086 39: RF Side Impact Sensor Internal Electronic Failure B0086 3A: RF Side Impact Sensor Incorrect Component Installed B0086 71: RF Side Impact Sensor Invalid Serial Data Received B0087 00: LR Side Impact Sensor No Additional Information B0087 0F: LR Side Impact Sensor Erratic B0087 39: LR Side Impact Sensor Internal Electronic Failure B0087 3A: LR Side Impact Sensor Incorrect Component Installed B0087 71: LR Side Impact Sensor Invalid Serial Data Received B0088 00: RR Side Impact Sensor No Additional Information B0088 0F: RR Side Impact Sensor Erratic B0088 39: RR Side Impact Sensor Internal Electronic Failure B0088 3A: RR Side Impact Sensor Incorrect Component Installed B0088 71: RR Side Impact Sensor Invalid Serial Data Received
DTC B0090	B0090 00: Rollover Sensor No Additional Information B0090 0F: Rollover Sensor Erratic B0090 3A: Rollover Sensor Incorrect Component Installed B0090 39: Rollover Sensor Internal Electronic Failure B0090 71: Rollover Sensor Invalid Serial Data Received
DTC B0098	B0098 52: Manual Cutoff Switch Circuit Compare Failure
DTC B1000	B1000 00: Electronic Control Unit (ECU) Performance No Additional Information Available
DTC B1001 (ROS)	B1001 00: Option Configuration Error
DTC B1001 (SDM)	B1001 00: SDM Option Configuration Error
DTC B1011	B1011 71: System Disabled Information Stored Invalid Serial Data Received
DTC B1019	B1019 00: SDM System Configuration Error B1019 3A: SDM System Configuration Error Incorrect Component Installed
DTC B1370	B1370 01: Device Ignition 1 Circuit Short to Battery B1370 06: Device Ignition 1 Circuit Short to Ground or Open

DIAGNOSTIC STARTING POINT - SIR

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

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

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

DTC B0012 OR B0013

Diagnostic Instructions

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

DTC Descriptors

DTC B0012 01

Driver Frontal Deployment Loop Stage 1 Short to Battery

DTC B0012 02

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

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 Stage 1 Low Circuit	B0012 02	B0012 0D	B0012 04	B0012 01	B0012 0E
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

If a malfunction is detected, a DTC will be stored in non-volatile memory. 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 each 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 greater 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

- The SDM commands the AIR BAG indicator ON.
- The SDM will store a DTC, if an event occurs the system will still attempt deployments.

Conditions for Clearing the DTC

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

Diagnostic Aids

- When a harness connector is disconnected, the high control and low control circuits are shorted together by the integral shorting bar. This should be taken into account when testing for faults on these circuits.
- This DTC usually indicates a poor connection or a wiring malfunction between the SDM and the deployment loop.

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

SIR System Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Special Tools Required

J 38715-A SIR Driver/Passenger Load Tool

Circuit/System Testing

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

- **The pretensioner**
- **The air bag module**
- **The SDM module**
- **The air bag wiring harness connector**
- **The SDM wiring harness connector**

1. Verify that the steering wheel module connector and the connector position assurance (CPA) are engaged.

IMPORTANT: The connector and CPA may seat independent of each other. Both the connector and CPA should seat with an audible and/or tactile click. The CPA isolates the shorting-bars within the connector allowing the deployment circuit to operate properly.

   - If the above condition is found, make the appropriate repair.
2. Ignition OFF, disconnect the steering wheel module.
3. With the appropriate adaptor, connect special tool **J 38715-A** .
4. Ignition ON, with a scan tool, verify DTC is set as current.
   - If DTC is not set or is set as history, replace the steering wheel module.
5. Ignition OFF, disconnect special tool **J 38715-A** .
6. Disconnect the steering wheel module coil in-line connector.
7. With the appropriate adaptor, connect special tool **J 38715-A** .
8. Ignition ON, with a scan tool, verify DTC is set as current.
   - If DTC is not set or is set as history, replace the steering wheel module coil.
9. Ignition OFF, disconnect special tool **J 38715-A** and the appropriate adaptor.
10. Disconnect the harness connector at the SDM.
11. Ignition ON, test for less than 1 volt between the appropriate high circuit and ground.
    - Steering wheel module coil connector Stage 1 terminal A (X1)
    - Steering wheel module coil connector Stage 2 terminal A (X2)
    - If not the specified range, test the circuit for a short to voltage.
12. Test for less than 1 volt between the appropriate low circuit and ground.
    - Steering wheel module coil connector Stage 1 terminal B (X1)
    - Steering wheel module coil connector Stage 2 terminal B (X2)

- If not the specified range, test the circuit for a short to voltage.

13. Ignition OFF, test for infinite resistance between the appropriate high circuit and ground.
    - Steering wheel module coil connector Stage 1 terminal A (X1)
    - Steering wheel module coil connector Stage 2 terminal A (X2)
    - If not the specified range, test the circuit for a short to ground.
14. Test for infinite resistance between the appropriate low circuit and ground.
    - Steering wheel module coil connector Stage 1 terminal B (X1)
    - Steering wheel module coil connector Stage 2 terminal B (X2)
    - If not the specified range, test the circuit for a short to ground.
15. Test for less then 1 ohm between the SDM connector and the air bag module connector high circuit.
    - Steering wheel module coil connector Stage 1 terminal A (X1) and SDM terminal 9
    - Steering wheel module coil connector Stage 2 terminal A (X2) and SDM terminal 5
    - If not the specified range, test the circuit for an open/high resistance.
16. Test for less then 1 ohm between the SDM connector and the air bag module connector low circuit.
    - Steering wheel module coil connector Stage 1 terminal B (X1) and SDM terminal 8
    - Steering wheel module coil connector Stage 2 terminal B (X2) and SDM terminal 4
    - If not the specified range, test the circuit for an open/high resistance.
17. If all circuits test normal, replace the SDM.

Repair Procedures

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

- **Inflatable Restraint Steering Wheel Module Coil Replacement**
- **Inflatable Restraint Steering Wheel Module Replacement**
- **SIR/SRS Wiring Repairs**
- **Control Module References** for SDM replacement, setup, and programming

DTC B0014-B0045

Diagnostic Instructions

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

- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptors

B0015 01

Driver Pretensioner Deployment Loop Short to Battery

B0015 02

Driver Pretensioner Deployment Loop Short to Ground

B0015 04

Driver Pretensioner Deployment Loop Open Circuit

B0015 0D

Driver Pretensioner Deployment Loop Resistance Above Threshold

B0015 0E

Driver Pretensioner Deployment Loop Resistance Below Threshold

B0016 01

Left Roof Rail Initiator 1 Deployment Loop Short to Battery

B0016 02

Left Roof Rail Initiator 1 Deployment Loop Short to Ground

B0016 04

Left Roof Rail Initiator 1 Deployment Loop Open Circuit

B0016 0D

Left Roof Rail Initiator 1 Deployment Loop Resistance Above Threshold

B0016 0E

Left Roof Rail Initiator 1 Deployment Loop Resistance Below Threshold

B0019 01

Passenger Frontal Deployment Loop Stage 1 Short to Battery

B0019 02

Passenger Frontal Deployment Loop Stage 1 Short to Ground

B0019 04

Passenger Frontal Deployment Loop Stage 1 Open Circuit

B0019 0D

Passenger Frontal Deployment Loop Stage 1 Resistance Above Threshold

B0019 0E

Passenger Frontal Deployment Loop Stage 1 Resistance Below Threshold

B0020 01

Passenger Frontal Deployment Loop Stage 2 Short to Battery

B0020 02

Passenger Frontal Deployment Loop Stage 2 Short to Ground

B0020 04

Passenger Frontal Deployment Loop Stage 2 Open Circuit

B0020 0D

Passenger Frontal Deployment Loop Stage 2 Resistance Above Threshold

B0020 0E

Passenger Frontal Deployment Loop Stage 2 Resistance Below Threshold

B0022 01

Passenger Pretensioner Deployment Loop Short to Battery

B0022 02

Passenger Pretensioner Deployment Loop Short to Ground

B0022 04

Passenger Pretensioner Deployment Loop Open Circuit

B0022 0D

Passenger Pretensioner Deployment Loop Resistance Above Threshold

B0022 0E

Passenger Pretensioner Deployment Loop Resistance Below Threshold

B0023 01

Right Roof Rail Initiator 1 Deployment Loop Short to Battery

B0023 02

Right Roof Rail Initiator 1 Deployment Loop Short to Ground

B0023 04

Right Roof Rail Initiator 1 Deployment Loop Open Circuit

B0023 0D

Right Roof Rail Initiator 1 Deployment Loop Resistance Above Threshold

B0023 0E

Right Roof Rail Initiator 1 Deployment Loop Resistance Below Threshold

Diagnostic Fault Information

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Seat Belt Pretensioner - Driver - Low Control	B0015 02	B0015 0E	B0015 0D	B0015 04	B0015 01
Seat Belt Pretensioner - Driver - High Control	B0015 02	B0015 0E	B0015 0D	B0015 04	B0015 01
Left Front Roof Rail Module Low Control	B0016 02	B0016 0E	B0016 0D	B0016 04	B0016 01
Left Front Roof Rail Module High Control	B0016 02	B0016 0E	B0016 0D	B0016 04	B0016 01
I/P Module - Stage 1 - Low Control	B0019 02	B0019 0E	B0019 0D	B0019 04	B0019 01
I/P Module - Stage 1 - High Control	B0019 02	B0019 0E	B0019 0D	B0019 04	B0019 01
I/P Module - Stage 2 - Low Control	B0020 02	B0020 0E	B0020 0D	B0020 04	B0020 01
I/P Module - Stage 2 - High Control	B0020 02	B0020 0E	B0020 0D	B0020 04	B0020 01
Seat Belt Pretensioner - Passenger - Low Control	B0022 02	B0022 0E	B0022 0D	B0022 04	B0022 01
Seat Belt Pretensioner - Passenger - High Control	B0022 02	B0022 0E	B0022 0D	B0022 04	B0022 01
Right Front Roof Rail Module Low Control	B0023 02	B0023 0E	B0023 0D	B0023 04	B0023 01
Right Front Roof Rail Module High Control	B0023 02	B0023 0E	B0023 0D	B0023 04	B0023 01

Circuit/System Description

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

Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

Conditions for Setting the DTC

B0015 01, B0016 01, B0019 01, B0020 01, B0022 01, B0023 01

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

B0015 02, B0016 02, B0019 02, B0020 02, B0022 02, B0023 02

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

B0015 04, B0016 04, B0019 04, B0020 04, B0022 04, B0023 04

The air bag module high and/or low circuit is open for 120 milliseconds.

B0015 0D, B0016 0D, B0019 0D, B0020 0D, B0022 0D, B0023 0D

The air bag module deployment loop resistance is greater than 3.9 ohms for 120 milliseconds.

B0015 0E, B0016 0E, B0019 0E, B0020 0E, B0022 0E, B0023 0E

The air bag module 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.
- The SDM will store a DTC, if event occurs system will still attempt deployments.

Conditions for Clearing the DTC

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

Diagnostic Aids

- When a harness connector is disconnected, the high control and low control circuits are shorted together by the integral shorting bar. This should be taken into account when testing for faults on these circuits.
- This DTC usually indicates a poor connection or a wiring malfunction between the SDM and the deployment loop.

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

SIR System Description and Operation

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

Scan Tool Reference

Control Module References for scan tool information

Special Tools Required

J 38715-A Driver and Passenger SIR Load Tool

Circuit/System Testing

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

- **The pretensioner**
- **The air bag module**
- **The SDM module**
- **The air bag wiring harness connector**
- **The SDM wiring harness connector**

1. Ignition OFF, disconnect the harness connector at the appropriate air bag module. Refer to the appropriate air bag module replacement procedure.

2. Ignition ON, test for less than 1 volt between the appropriate high control circuit terminal and ground.
    - I/P Module - Stage 1 terminal A1 (with 10 series)
    - I/P Module - Stage 1 terminal A (without 10 series)
    - I/P Module - Stage 2 terminal B1
    - Left Front Roof Rail Module terminal B (regular cab)
    - Left Front Roof Rail Module terminal 1 (extended cab)
    - Right Front Roof Rail Module terminal B (regular cab)
    - Right Front Roof Rail Module terminal 1 (extended cab)
    - Seat Belt Pretensioner - Left terminal B
    - Seat Belt Pretensioner - Right terminal B
    - If greater than the specified range, test the circuit for a short to voltage. If the circuit tests normal, replace the SDM.
3. Test for less than 1 volt between the appropriate low control circuit terminal and ground.
    - I/P Module - Stage 1 terminal A2 (with 10 series)
    - I/P Module - Stage 1 terminal B (without 10 series)
    - I/P Module - Stage 2 terminal B2
    - Left Front Roof Rail Module terminal A (regular cab)
    - Left Front Roof Rail Module terminal 2 (extended cab)
    - Right Front Roof Rail Module terminal A (regular cab)
    - Right Front Roof Rail Module terminal 2 (extended cab)
    - Seat Belt Pretensioner - Left terminal A
    - Seat Belt Pretensioner - Right terminal A
    - If greater than the specified range, test the circuit for a short to voltage. If the circuit tests normal, replace the SDM.
4. Ignition OFF, test for infinite resistance between the appropriate high control circuit terminal and ground.
    - I/P Module - Stage 1 terminal A1 (with 10 series)
    - I/P Module - Stage 1 terminal A (without 10 series)
    - I/P Module - Stage 2 terminal B1
    - Left Front Roof Rail Module terminal B (regular cab)
    - Left Front Roof Rail Module terminal 1 (extended cab)
    - Right Front Roof Rail Module terminal B (regular cab)

- Right Front Roof Rail Module terminal 1 (extended cab)
- Seat Belt Pretensioner - Left terminal B
- Seat Belt Pretensioner - Right terminal B
  - If not the specified value, test the circuit for a short to ground. If the circuit tests normal, replace the SDM.

5. Test for infinite resistance between the appropriate low control circuit terminal and ground.
   - I/P Module - Stage 1 terminal A2 (with 10 series)
   - I/P Module - Stage 1 terminal B (without 10 series)
   - I/P Module - Stage 2 terminal B2
   - Left Front Roof Rail Module terminal A (regular cab)
   - Left Front Roof Rail Module terminal 2 (extended cab)
   - Right Front Roof Rail Module terminal A (regular cab)
   - Right Front Roof Rail Module terminal 2 (extended cab)
   - Seat Belt Pretensioner - Left terminal A
   - Seat Belt Pretensioner - Right terminal A
     - If not the specified value, test the circuit for a short to ground. If the circuit tests normal, replace the SDM.
6. With the appropriate adaptor, connect **J 38715-A** in place of the air bag module.
7. Ignition ON, verify the DTC is set as current.
   - If DTC is not set or is set as history, replace the appropriate air bag module.
8. Ignition OFF, disconnect **J 38715-A** and the appropriate adaptor.
9. Disconnect the harness connector at the SDM.
10. Test for less then 1 ohm between the following high control circuit terminals.
    - I/P Module - Stage 1 terminal A1 and SDM terminal 10 (with 10 series)
    - I/P Module - Stage 1 terminal A and SDM terminal 10 (without 10 series)
    - I/P Module - Stage 2 terminal B1 and SDM terminal 6
    - Left Front Roof Rail Module terminal B and SDM terminal 13 (regular cab)
    - Left Front Roof Rail Module terminal 1 and SDM terminal 13 (extended cab)
    - Right Front Roof Rail Module terminal B and SDM terminal 14 (regular cab)
    - Right Front Roof Rail Module terminal 1 and SDM terminal 14 (extended cab)
    - Seat Belt Pretensioner - Left terminal B and SDM terminal 16
    - Seat Belt Pretensioner - Right terminal B and SDM terminal 19
      - If not within the specified range, test the circuit for an open/high resistance.

11. Test for less then 1 ohm between the following low control circuit terminals.
    - I/P Module - Stage 1 terminal A2 and SDM terminal 11 (with 10 series)
    - I/P Module - Stage 1 terminal B and SDM terminal 11 (without 10 series)
    - I/P Module - Stage 2 terminal B2 and SDM terminal 7
    - Left Front Roof Rail Module terminal A and SDM terminal 12 (regular cab)
    - Left Front Roof Rail Module terminal 2 and SDM terminal 12 (extended cab)
    - Right Front Roof Rail Module terminal A and SDM terminal 15 (regular cab)
    - Right Front Roof Rail Module terminal 2 and SDM terminal 15 (extended cab)
    - Seat Belt Pretensioner - Left terminal A and SDM terminal 17
    - Seat Belt Pretensioner - Right terminal A and SDM terminal 18
    - If not within the specified range, test the circuit for an open/high resistance.
12. If all circuits test normal, replace the SDM.

Repair Procedures

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

- **SIR/SRS Wiring Repairs**
- **Inflatable Restraint Instrument Panel Module Replacement**
- **Inflatable Restraint Steering Wheel Module Replacement**
- **Inflatable Restraint Steering Wheel Module Coil Replacement**
- **Inflatable Restraint Side Impact Sensor Replacement (Extended Cab)** or **Inflatable Restraint Side Impact Sensor Replacement (Crew Cab)** or **Inflatable Restraint Side Impact Sensor Replacement (Crew Cab/Extended Cab/Regular Cab)**
- **Inflatable Restraint Roof Side Rail Module Replacement (Crew Cab)** or **Inflatable Restraint Roof Side Rail Module Replacement (Extended Cab)** or **Inflatable Restraint Roof Side Rail Module Replacement (Regular Cab)**
- **Seat Belt Retractor Pretensioner Replacement - Front (Regular Cab)** or **Seat Belt Retractor Pretensioner Replacement - Front (Extended Cab)** or **Seat Belt Retractor Pretensioner Replacement - Front (Crew Cab)**
- **Control Module References** for SDM replacement, programming, and setup

DTC B0052 OR B0053

Diagnostic Instructions

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

DTC Descriptors

DTC B0052 00

Deployment Commanded

DTC B0053 00

Deployment Commanded With Loop DTCs Present

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 or B0053 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.

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 indicator ON.
- The SDM records crash data.

Conditions for Clearing the DTC

After an air bag deployment or 3 separate pretensioner deployments the DTC becomes latched and cannot be cleared.

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

SIR System Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

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.**

1. Ignition OFF, verify no signs of inflator module or pretensioner deployment exist.
   - If any signs of deployment exist, refer to **Repairs and Inspections Required After a Collision**.
2. Ignition ON, verify DTC B0052 or DTC B0053 is not set.
   - If the DTC is set, clear DTCs. If DTC resets, replace the SDM.

Repair Procedures

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

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

DTC B0071

Diagnostic Instructions

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

DTC Descriptors

DTC B0071 03

Passenger Seat Belt Tension Sensor Circuit Voltage Below Threshold

DTC B0071 07

Passenger Seat Belt Tension Sensor Circuit Voltage Above Threshold

Diagnostic Fault Information

Circuit	Short to Ground	High Resistance	Open	Short to Voltage
Belt Tension Sensor Voltage Reference	B0071 03	B0071 03	B0071 03	-
Belt Tension Sensor Low Reference	-	B0071 07	B0071 07	-
Belt Tension Sensor Signal	B0071 03	B0071 03, 07	B0071 03, 07	B0071 07

Circuit/System Description

The inflatable restraint seat belt tension sensor is a 3-wire potentiometer mounted on the buckle side of the passenger 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 belt tension sensor signal circuit and if a fault is detected, DTC will be set. When the PPS detects this DTC it will send out a serial data message and the SDM will notify the customer of the enable/disable status by turning on the OFF indicator on the PASSENGER AIR BAG ON/OFF indicators. The SDM will then suppress the deployment of the instrument panel (I/P) module and 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 belt tension sensor signal circuit is less than 0.5 volt or greater than 4.5 volts for 500 milliseconds.
- The PPS detects the voltage at the belt tension sensor voltage reference circuit is less than 4.5 volts or greater than 9.1 volts for 500 milliseconds.
- The PPS detects the amperage at the belt tension sensor low reference circuit 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.
- 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.

Conditions for Clearing the DTC

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

Diagnostic Aids

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

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

SIR System Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

IMPORTANT: The seat belt tension sensor is not serviced separately. The seat belt buckle replacement with the seat belt tension sensor must be serviced as a complete unit.
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 tension sensor**
- **The PPS module**
- **The seat belt tension sensor wiring harness connector**
- **The PPS module wiring harness connector**

1. Ignition OFF, disconnect the harness connector at the seat belt tension sensor and inspect the component and harness sides for damage or corrosion.
    - If damage or corrosion is found, repair or replace as necessary.
2. Ignition ON, test for 4.5-5.5 volts between the voltage reference circuit terminal B and ground.
    - If less that the specified range, test the voltage reference circuit for open/high resistance or a short to ground. If the circuit tests normal, replace the PPS.
    - If greater that the specified range, test the voltage reference circuit for a short to voltage. If the circuit tests normal, replace the PPS.

IMPORTANT: The AIR BAG BATT Fuse must be removed to ensure the PPS module is inactive. An active PPS module may cause inaccurate resistance readings.

3. Ignition OFF, remove the AIR BAG BATT Fuse in the underhood fuse block. Test for less than 2.0 ohms between low reference terminal A and ground.
    - If greater than specified, test the low reference circuit for open/high resistance. If the circuit tests normal, replace the PPS.
4. Ignition OFF, disconnect the harness connector at the PPS module.
5. Ignition ON, test for infinite resistance between the signal circuit terminal C and ground.
    - If less than the specified range, test the signal circuit for a short to ground.
6. Ignition ON, test for less than 1 volt between the signal circuit terminal C and ground.
    - If greater than the specified range, test the circuit for a short to voltage
7. Test for less than 1 ohm in the signal circuit between the PPS module terminal 4 and the belt tension sensor terminal C
    - If greater than specified, test the signal circuit for open/high resistance. If the circuit tests normal, replace the PPS.
8. If all circuits test normal, replace the passenger seat belt buckle which includes the seat belt

tension sensor.

Repair Procedures

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

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

DTC B0072 OR B0073

Diagnostic Instructions

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

DTC Descriptors

DTC B0072 01

LF Seat Belt Sensor Circuit Short to Battery

DTC B0072 02

LF Seat Belt Sensor Circuit Short to Ground

DTC B0072 04

LF Seat Belt Sensor Circuit Open Circuit

DTC B0072 06

LF Seat Belt Sensor Circuit Short To Ground or Open Circuit

DTC B0072 08

LF Seat Belt Sensor Circuit Signal Invalid

DTC B0073 01

RF Seat Belt Sensor Circuit Short to Battery

DTC B0073 02

RF Seat Belt Sensor Circuit Short to Ground

DTC B0073 04

RF Seat Belt Sensor Circuit Open Circuit

DTC B0073 06

RF Seat Belt Sensor Circuit Short To Ground or Open Circuit

DTC B0073 08

RF Seat Belt Sensor Circuit Signal Invalid

Diagnostic Fault Information

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Seat Position Sensor Low Reference	-	B0072 04, B0073 04	B0072 04	B0079 01	B0072 08
Seat Belt Switch Left Signal	B0073 02, 06	B0072 04	B0072 04	B0072 01	B0072 08
Seat Belt Switch Right Signal	B0073 02, 06	B0073 04	B0073 04	B0073 01	B0073 08

Circuit/System Description

The inflatable restraint seat belt switch is within the seat belt retractor and provides an input to the inflatable restraint sensing and diagnostic module (SDM). The SDM supplies a low reference circuit and a seat belt switch signal circuit to determine a buckled or unbuckled condition. The SDM monitors the seat belt switch circuits, and if a fault is detected a DTC will be set.

Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

Conditions for Setting the DTC

B0072 01, B0073 01

The SDM detects the seat switch signal circuit or low reference circuit is shorted to voltage for 500 milliseconds.

B0072 02, B0073 02

The SDM detects the seat switch signal circuit or low reference circuit is shorted to ground for 500 milliseconds.

B0072 04, B0073 04

The SDM detects the seat switch signal circuit or low reference circuit is open for 500 milliseconds.

B0072 06, B0073 06

The SDM detects the seat switch signal circuit or low reference circuit is shorted to ground or an open for 500 milliseconds.

B0072 08, B0073 08

The SDM detects an invalid signal in the seat switch signal circuit.

Action Taken When the DTC Sets

- The SDM commands the AIR BAG indicator ON.
- The SDM will store a DTC.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Seat Belt Schematics

Connector End View Reference

Component Connector End Views

Electrical Information Reference

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

Circuit/System Testing

IMPORTANT:

- **The seat belt switch is not serviced separately. The seat belt retractor with the seat belt switch must be serviced as a complete unit.**
- **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 seat belt switch wiring harness connector**
  - **The seat belt switch**
  - **The SDM wiring harness connector**

1. Ignition OFF, disconnect the seat belt switch connector.
2. Test for less than 1.0 ohm between low reference terminal B and ground.
   - If greater than specified, test the low reference circuit for open/high resistance. If the circuit tests normal, replace the SDM.
3. Ignition ON. Test for 1.0 - 1.6 volts between the signal circuit terminal A and ground.
   - If less that the specified range, test the signal circuit for open/high resistance or a short to ground. If the circuit tests normal, replace the SDM.
   - If greater that the specified range, test the signal circuit for a short to voltage.
4. If the circuits test normal, replace the seat belt retractor.

Repair Procedures

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

- **Seat Belt Retractor Pretensioner Replacement - Front (Regular Cab)** or **Seat Belt Retractor Pretensioner Replacement - Front (Extended Cab)** or **Seat Belt Retractor Pretensioner Replacement - Front (Crew Cab)**

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

DTC B0074

Diagnostic Instructions

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

DTC Descriptors

DTC B0074 03

Passenger Occupant Classification Sensor Circuit Voltage Below Threshold

DTC B0074 07

Passenger Occupant Classification Circuit Voltage Above Threshold

DTC B0074 08

Passenger Occupant Classification Circuit Signal Invalid

Diagnostic Fault Information

Circuit	Short to Ground	High Resistance	Open	Short to Voltage
Pressure Sensor Low Reference	-	B0074 03	B0074 03	-
Pressure Sensor Signal	B0074 07	B0074 03, 07	B0074 03, 07	B0074 03
Pressure Sensor Voltage Reference	B0074 07	B0074 07	B0074 07	B0074 03

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,

a DTC will set. When the sensing and diagnostic module (SDM) 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 SDM through serial data communications that a PPS fault is present. The SDM will then 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 0.5 volt or greater than 4.5 volts for 500 milliseconds.
- 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.
- 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.

Conditions for Clearing the DTC

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

Reference Information

Electrical Information Reference

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

Circuit/System Testing

IMPORTANT:

- **The PPS pressure sensor is not serviced separately. The PPS replacement with the PPS pressure sensor must be serviced as a complete unit.**
- **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 pressure sensor**
- **The PPS module**
- **The PPS pressure sensor wiring harness connector**
- **The PPS module wiring harness connector**

1. Ignition OFF, disconnect the harness connector at the PPS pressure sensor and inspect the component and harness sides for damage or corrosion.
    - If damage or corrosion is found, repair or replace as necessary.
2. Ignition ON, test for 4.5-5.5 volts between the voltage reference circuit terminal A and ground.
    - If less that the specified range, test the voltage reference circuit for open/high resistance or a short to ground. If the circuit tests normal, replace the PPS.
    - If greater that the specified range, test the voltage reference circuit for a short to voltage. If the circuit tests normal, replace the PPS.

IMPORTANT: The AIR BAG BATT Fuse that supplies B+ voltage must be removed to ensure the PPS module is inactive. An active PPS module may cause inaccurate resistance readings.

3. Ignition OFF, remove the AIR BAG BATT Fuse. Test for less than 2.0 ohms between low reference terminal C and ground.
    - If greater than the specified range, test the low reference circuit for open/high resistance. If the circuit tests normal, replace the PPS.
4. Ignition OFF, disconnect the harness connector at the PPS module.
5. Test for infinite resistance between the signal circuit terminal B and ground.
    - If less than the specified value, test the signal circuit for a short to ground.
6. Ignition ON, test for less than 1 volt between the signal circuit terminal B and ground.
    - If greater than the specified range, test the signal circuit for a short to voltage.

7. Test for less than 1 ohm in the signal circuit between PPS module terminal 6 and PPS sensor terminal B.
    - If greater than the specified range, test the signal circuit for open/high resistance. If the circuit tests normal, replace the PPS.
8. If all circuits test normal, replace the PPS which includes the pressure sensor.

Repair Procedures

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

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

DTC B0079

Diagnostic Instructions

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

DTC Descriptors

DTC B0079 01

LF Seat Position Sensor Circuit Short to Battery

DTC B0079 02

LF Seat Position Sensor Circuit Short to Ground

DTC B0079 04

LF Seat Position Sensor Circuit Open

DTC B0079 06

LF Seat Position Sensor Circuit Short to Ground or Open Circuit

DTC B0079 08

LF Seat Position Sensor Circuit Signal Invalid

Diagnostic Fault Information

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Seat Position Sensor Left Low Reference	B0079 02, 06	B0079 04	B0079 04	B0079 01	B0079 08
Seat Position Sensor Left Signal	B0079 02, 06	B0079 04	B0079 04	B0079 01	B0079 08

Circuit/System Description

The inflatable restraint seat position sensor (SPS) is used to determine the proximity of a front driver or passenger seat position with respect to the frontal air bag. The SPS interfaces with the sensing and diagnostic module (SDM). The state of the SPS allows the SDM to disable stage 2 of the frontal air bag for a front seat that is forward of a forward/rearward point in seat track travel. The SPS is a hall effect sensor that is mounted on the inboard seat track of the driver and passenger seats. The seat track includes a metal bracket that shunts the SPS magnetic circuit creating 2 states of seat position. The shunted state represents a rearward seat position. The non-shunted state represents a forward position. The SPS provides 2 current ranges, one range for the shunted state and a second range for a non-shunted state. These 2 states are inputs to the SDM, state 1 (shunted) being the rearward threshold and state 2 (non-shunted) being the forward threshold. When the SDM receives input from a SPS that state 1 threshold is reached (seat is rearward), the SDM will not disable stage 2 deployment, if required by the deployment sensors. When state 2 threshold is reached (seat is forward), the SDM will disable stage 2 deployment on the side the seat is forward. The SDM monitors the SPS circuit and if a fault is detected, the SDM will set codes B0079 and defaults to disabling stage 2 frontal deployment.

Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

Conditions for Setting the DTC

B0079 01

The SDM detects the SPS circuit is shorted to voltage for 500 milliseconds.

B0079 06

The SDM detects the SPS circuit is shorted to ground or an open occur for 500 milliseconds.

B0079 08

The SDM detects the SPS signal circuit is invalid for 500 milliseconds.

Action Taken When the DTC Sets

- The SDM sets a DTC B0079.
- The SDM defaults the SPS to seat rearward threshold.
- The SDM commands the AIR BAG indicator ON.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

SIR System Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

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

- **The Seat Position Sensor (SPS)**
- **The Sensing and Diagnostic Module (SDM) module**
- **The seat position sensor wiring harness connector**
- **The SDM wiring harness connector**

1. Ignition OFF, disconnect the harness connector at the SPS.
2. Disconnect the harness connector at the SDM.
3. Ignition ON, test for less than 1 volt between the SPS signal circuit terminal 29 and ground.
    - If greater than the specified range, test the circuit for a short to voltage.
4. Ignition ON, test for less than 1 volt between the SPS low reference circuit terminal 28 and ground.
    - If greater than the specified range, test the circuit for a short to voltage.
5. Test for infinite resistance between the SPS signal circuit terminal 29 and ground.
    - If less than infinite resistance, test the circuit for a short to ground.
6. Test for less than 1 ohm of the SPS signal circuit between the SDM harness connector terminal 29 and the SPS harness connector terminal 2.
    - If greater than the specified range, test the circuit for an open/high resistance.
7. Test for less than 1 ohm of the SPS low reference circuit between the SDM harness connector terminal 28 and the SPS harness connector terminal 1.
    - If greater than the specified range, test the circuit for an open/high resistance.
8. If all circuits test normal, replace the SPS.
9. Reconnect all SIR components. Ignition ON, with a scan tool clear and recheck for DTCs.
    - If the front end sensor DTC returns and is current, replace the SDM. After replacement, refer to Repair Verification.

Repair Procedures

- **Inflatable Restraint Front Passenger Position Sensor Replacement**
- **SIR/SRS Wiring Repairs**
- **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. Verify no DTCs are set.

- If DTC B0079 was current, replace the SDM.

DTC B0081

Diagnostic Instructions

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

DTC Descriptors

DTC B0081 0F

Passenger Presence System Erratic

DTC B0081 39

Passenger Presence System Internal Electronic Failure

DTC B0081 3A

Passenger Presence System Incorrect Component Installed

DTC B0081 71

Passenger Presence System Invalid Serial Data Received

Circuit/System Description

When the ignition is turned ON, the passenger presence system (PPS) and the inflatable restraint sensing and diagnostic module (SDM) performs tests to diagnose critical malfunctions. When the SDM has completed the power-up mode, the SDM will establish communication with the PPS. The SDM will also request the instrument panel cluster (IPC) to command both of the PASSENGER AIR BAG ON/OFF indicators ON for 5 seconds. If the SDM determines the correct PPS is installed and functioning normally, the SDM will turn the passenger side airbags ON or OFF based on messages from the PPS. The SDM will also send a message to the IPC to turn the appropriate PASSENGER AIR BAG ON/OFF 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 0F

- The SDM has received a fault present message from the PPS.
- The PPS is in assembly plant mode and the SDM is in production mode.

B0081 39

The SDM has received a critical malfunction message from the PPS.

B0081 3A

The SDM has received a message from the PPS which indicates a vehicle and PPS mismatch.

B0081 71

The SDM has received invalid or no serial data from the PPS.

Action Taken When the DTC Sets

- The SDM commands the AIR BAG indicator ON, and the passenger air bag indicator to display OFF.
- The I/P module deployment loop will be disabled.

Conditions for Clearing the DTC

- The condition for setting the DTC no longer exists and there is no activity on the low speed serial data circuits.
- A history DTC will clear once 100 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

Component Connector End Views

Description and Operation

SIR System Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

IMPORTANT:

- **A DTC B0081 set in history may not clear until the PPS module enters the sleep mode.**
- **When removing connectors inspect for damage, corrosion or poor connection. Damage or corrosion in the following requires repair or replacement of the affected component/connector.**
  - **The PPS module**
  - **The SDM module**
  - **The PPS module harness connector**
  - **The SDM wiring harness connector**

1. Ignition ON, verify no PPS DTCs are set in the PPS or SDM.
   - If any PPS DTCs are set, refer to **Diagnostic Trouble Code (DTC) List - Vehicle** .
2. Verify DTC B1000, B1001, or U0170 is not set as current.

- If any of the DTCs are set as current, refer to **Diagnostic Trouble Code (DTC) List - Vehicle** .

3. Verify DTC B0081 3A is not set as current.
   - If DTC B0081 3A is set as current, replace the PPS with the correct part number.
4. Verify DTC B0081 39 is not set as current.
   - If DTC B0081 39 is set as current, replace the PPS.
5. Verfiy DTC B0081 71 or B0081 0F is not set.
   - If DTC B0081 71 or B0081 0F is set, clear the DTCs. No other repairs are necessary.

Clearing DTC B0081

1. To enter the sleep mode, remove the scan tool, turn the ignition OFF, and open and close the driver door.
2. Ignition OFF and all doors closed, wait 30 seconds.
3. With a scan tool, clear DTC B0081. The DTC should clear.

Repair Procedures

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

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

DTC B0083-B0088

Diagnostic Instructions

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

DTC Descriptors

DTC B0083 00

Electronic Front End Sensor 1 No Additional Information (Left)

DTC B0083 0F

Electronic Front End Sensor 1 Erratic (Left)

DTC B0083 39

Electronic Front End Sensor 1 Internal Electronic Failure (Left)

DTC B0083 3A

Electronic Front End Sensor 1 Incorrect Component Installed (Left)

DTC B0083 71

Electronic Front End Sensor 1 Invalid Serial Data Received (Left)

DTC B0084 00

Electronic Front End Sensor 2 No Additional Information (Right)

DTC B0084 0F

Electronic Front End Sensor 2 Erratic (Right)

DTC B0084 39

Electronic Front End Sensor 2 Internal Electronic Failure (Right)

DTC B0084 3A

Electronic Front End Sensor 2 Incorrect Component Installed (Right)

DTC B0084 71

Electronic Front End Sensor 2 Invalid Serial Data Received (Right)

DTC B0085 00

LF Side Impact Sensor No Additional Information

DTC B0085 0F

LF Side Impact Sensor Erratic

DTC B0085 39

LF Side Impact Sensor Internal Electronic Failure

DTC B0085 3A

LF Side Impact Sensor Incorrect Component Installed

DTC B0085 71

LF Side Impact Sensor Invalid Serial Data Received

DTC B0086 00

RF Side Impact Sensor No Additional Information

DTC B0086 0F

RF Side Impact Sensor Erratic

DTC B0086 39

RF Side Impact Sensor Internal Electronic Failure

DTC B0086 3A

RF Side Impact Sensor Incorrect Component Installed

DTC B0086 71

RF Side Impact Sensor Invalid Serial Data Received

DTC B0087 00

LR Side Impact Sensor No Additional Information

DTC B0087 0F

LR Side Impact Sensor Erratic

DTC B0087 39

LR Side Impact Sensor Internal Electronic Failure

DTC B0087 3A

LR Side Impact Sensor Incorrect Component Installed

DTC B0087 71

LR Side Impact Sensor Invalid Serial Data Received

DTC B0088 00

RR Side Impact Sensor No Additional Information

DTC B0088 0F

RR Side Impact Sensor Erratic

DTC B0088 39

RR Side Impact Sensor Internal Electronic Failure

DTC B0088 3A

RR Side Impact Sensor Incorrect Component Installed

DTC B0088 71

RR Side Impact Sensor Invalid Serial Data Received

Diagnostic Fault Information

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Front End Sensor 1 High Circuit	B0083 00	B0083 0F	B0083 00	B0083 00	B0083 0F
Front End Sensor 1 Low Circuit	B0083 00	B0083 0F	B0083 00	B0083 00	B0083 0F
Front End Sensor 2 High Circuit	B0084 00	B0084 0F	B0084 00	B0084 00	B0084 0F
Front End Sensor 2 Low	B0084 00	B0084 0F	B0084 00	B0084 00	B0084 0F

Circuit					
Left Front Side Impact Sensor High Circuit	B0085 00	B0085 0F	B0085 00	B0085 00	B0085 0F
Left Front Side Impact Low Circuit	B0085 00	B0085 0F	B0085 00	B0085 00	B0085 0F
Right Front Side Impact Sensor High Circuit	B0086 00	B0086 0F	B0086 00	B0086 00	B0086 0F
Right Front Side Impact Low Circuit	B0086 00	B0086 0F	B0086 00	B0086 00	B0086 0F
Left Rear Side Impact Sensor High Circuit	B0087 00	B0087 0F	B0087 00	B0087 00	B0087 0F
Left Rear Side Impact Low Circuit	B0087 00	B0087 0F	B0087 00	B0087 00	B0087 0F
Right Rear Side Impact Sensor High Circuit	B0088 00	B0088 0F	B0088 00	B0088 00	B0088 0F
Right Rear Side Impact Low Circuit	B0088 00	B0088 0F	B0088 00	B0088 00	B0088 0F

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 2 times 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

Any of the following conditions exist for 2.5 seconds:

B0083 00, B0084 00, B0085 00, B0086 00, B0087 00, B0088 00

- The front end sensor has been shorted to voltage, open, or shorted to ground.
- The front end sensor current has been above 23 mA for longer than 5 milliseconds.
- The SDM has not received a message from the front end sensor for more than 375 milliseconds.

B0083 0F, B0084 0F, B0085 0F, B0086 0F, B0087 0F, B0088 0F

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

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

- The SDM has received a Not Ok (NOK) message from the front end sensor.
- The SDM has not received a message.
- The SDM has received invalid serial data from the front end sensor.

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

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

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

Action Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

SIR System Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information.

Circuit/System Testing

IMPORTANT: Refer to SIR Service Precautions.
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 harness connector at the appropriate sensor.
2. Disconnect the harness connector at the SDM.
3. Ignition ON, test for less than 1 volt between the following signal circuit and ground.
   - Right front end sensor terminal 1
   - Left front end sensor terminal 1
   - Right front side impact sensor terminal B
   - Left front side impact sensor terminal B

- Right rear side impact sensor terminal B
- Left rear side impact sensor terminal B
  - If greater than the specified range, test the circuit for a short to voltage.

4. Ignition ON, test for less than 1 volt between the low reference circuit and ground.
   - Right front end sensor terminal 2
   - Left front end sensor terminal 2
   - Right front side impact sensor terminal A
   - Left front side impact sensor terminal A
   - Right rear side impact sensor terminal A
   - Left rear side impact sensor terminal A
     - If greater than the specified range, test the circuit for a short to voltage.
5. Test for infinite resistance between the signal circuit and ground.
   - Right front end sensor terminal 1
   - Left front end sensor terminal 1
   - Right front side impact sensor terminal B
   - Left front side impact sensor terminal B
   - Right rear side impact sensor terminal B
   - Left rear side impact sensor terminal B
     - If less than infinite resistance, test the circuit for a short to ground.
6. Test for less than 1 ohm between the following signal circuit terminals.
   - Right front end sensor terminal 1 and SDM harness connector terminal 37.
   - Left front end sensor terminal 1 and SDM harness connector terminal 36.
   - Right front side impact sensor terminal B and the SDM harness connector terminal 43.
   - Left front side impact sensor terminal B and the SDM harness connector terminal 42.
   - Right rear side impact sensor terminal B and the SDM harness connector terminal 45.
   - Left rear side impact sensor terminal B and the SDM harness connector terminal 44.
     - If greater than the specified range, test the circuit for an open/high resistance.
7. Test for less then 1 ohm between the following front end sensor low reference circuit terminals.
   - Right front end sensor terminal 2 and SDM harness connector terminal 39.
   - Left front end sensor terminal 2 and SDM harness connector terminal 38.
   - Right front side impact sensor terminal A and the SDM harness connector terminal 41.

- Left front side impact sensor terminal A and the SDM harness connector terminal 40.
- Right rear side impact sensor terminal A and the SDM harness connector terminal 47.
- Left rear side impact sensor terminal A and the SDM harness connector terminal 46.
  - If greater than the specified range, test the circuit for an open/high resistance.

8. If all circuits test normal, replace the appropriate sensor.
9. Reconnect all SIR components. Ignition ON, with a scan tool clear and check for DTCs.
   - If the DTC returns and is current, replace the SDM.

Repair Procedures

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

- **Inflatable Restraint Front End Sensor Replacement (2500, 3500)** or **Inflatable Restraint Front End Sensor Replacement (1500)**
- **Inflatable Restraint Side Impact Sensor Replacement (Extended Cab)** or **Inflatable Restraint Side Impact Sensor Replacement (Crew Cab)** or **Inflatable Restraint Side Impact Sensor Replacement (Crew Cab/Extended Cab/Regular Cab)**
- **SIR/SRS Wiring Repairs**
- **Control Module References** for SDM replacement, setup, and programming

DTC B0090

Diagnostic Instructions

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

DTC Descriptors

DTC B0090 00

Rollover Sensor No Additional Information

DTC B0090 0F

Rollover Sensor Erratic

DTC B0090 3A

Rollover Sensor Incorrect Component Installed

DTC B0090 39

Rollover Sensor Internal Electronic Failure

DTC B0090 71

Rollover Sensor Invalid Serial Data Received

Diagnostic Fault Information

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Battery Positive Voltage	B0090 0F	B0090 0F	B0090 0F	-	B0090 0F
Roll Over Sensor Ground	-	B0090 0F	B0090 0F	-	B0090 0F
Roll Over Sensor High Signal	B0090 0F	B0090 0F	B0090 0F	B0090 0F	B0090 0F

Circuit/System Description

The inflatable restraint vehicle rollover sensor (ROS) utilizes battery power supply and a bidirectional interface circuit. The ROS modulates current on the interface to send ID, State of Health, and deployment commands to the inflatable restraint sensing and diagnostic module (SDM). When the ignition is turned on the ROS responds by performing internal diagnostics and sending an ID to the SDM. The ROS continually communicates status messages to the SDM, which determines if a fault is present in the ROS circuit. If the fault is 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 must exist for 5 seconds:

B0090 0F

- The SDM received a fault present message from the ROS.
- The ROS is in assembly plant mode and the SDM is in production mode.

- The SDM has not received any data from the ROS.

B0090 3A

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

B0090 39

- The SDM has received a Not Ok (NOK) message from the vehicle rollover sensor.
- The SDM has not received a message.

B0090 71

The SDM has received invalid serial data from the vehicle rollover sensor.

Action Taken When the DTC Sets

- The SDM commands the AIR BAG indicator ON.
- The side air bag deployment loops will be disabled for rollover events only. For side impact events the side air bags are still enabled.

Conditions for Clearing the DTC

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

Diagnostic Aids

If either the SDM or vehicle rollover sensor were replaced verify that the correct part numbers were used for the vehicle application and the components were properly configured. Refer to **Control Module References** for SDM and ROS setup and programming.

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

SIR System Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

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 vehicle rollover sensor**
- **The SDM module**
- **The vehicle rollover sensor harness connector**
- **The SDM wiring harness connector**

1. Verify DTC B0090 39 is not set.
   - If DTC is set, replace the rollover sensor.
2. Ignition OFF, disconnect the harness connector at the rollover sensor and the SDM.
3. Test for less than 5 ohms between the rollover sensor ground circuit terminal 6 and ground.
   - If greater then the specified range, test the circuit for an open/high resistance.
4. Test for less than 5 ohms between the serial data circuit terminal 5 and the SDM occupant sensor serial data circuit terminal 58.
   - If greater then the specified range, test the circuit for a short to ground or an open/high resistance.
5. Ignition ON, test for less than 1 volt between the serial data circuit terminal 5 and ground.

- If greater then the specified range, test the circuit for a short to voltage.

6. Verify a test lamp illuminates between the B+ circuit terminal 1 and ground.
   - If the test lamp does not illuminate, test the circuit for an open/high resistance. If the circuit fuse is open, test the circuit for a short to ground, if the circuit tests normal, replace the rollover sensor.
7. With a scan tool, clear DTCs. Verify DTC B0090 is not set.
   - If DTC is set, replace the SDM.

Repair Procedures

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

- Inflatable Restraint Vehicle Rollover Sensor Replacement
- **SIR/SRS Wiring Repairs**
- **Control Module References** for SDM and ROS replacement, setup, and programming.

DTC B0098

Diagnostic Instructions

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

DTC Descriptors

DTC B0098 52

Manual Cutoff Switch Circuit Compare Failure

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
I/P Module Disable Switch Signal	-	B0098 52	B0098 52	-
I/P Module Enable Switch Signal	B0098 52	B0098 52	B0098 52	-
Ignition 1 Voltage	B1370 06	B0098 52	-	-

Circuit/System Description

The inflatable restraint I/P module disable switch is ignition key operated to manually enable or disable the inflatable restraint I/P module. When the ignition is turned ON, ignition 1 voltage is supplied to the inflatable restraint I/P module disable switch and based on the position of the switch either the I/P module disable switch signal circuit (ON) or the I/P module suppression indicator control (OFF) circuit will be active to the inflatable restraint sensing and diagnostic module (SDM). The SDM will communicate to the instrument panel cluster (IPC) to illuminate the appropriate the ON/OFF indicator as well as enable or disable the deployment of the I/P module. If a malfunction is detected, a DTC will be stored.

Conditions for Running the DTC

Ignition 1 voltage is between 9-16 volts.

Conditions for Setting the DTC

The SDM detects both the I/P module disable switch signal circuit (ON) and the I/P module suppression indicator control (OFF) circuit active or inactive for 500 milliseconds.

Action Taken When the DTC Sets

The SDM commands the AIRBAG indicator ON.

Conditions for Clearing the DTC

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

Reference Information

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 inflatable restraint I/P module disable switch**
- **The SDM**
- **The inflatable restraint I/P module wiring harness connector**
- **The SDM wiring harness connector**

1. Ignition OFF, disconnect the harness connector at the inflatable restraint I/P module disable switch.
2. Ignition ON, verify that a test lamp illuminates between the ignition circuit terminal B and ground.
    - If the test lamp does not illuminate, test the ignition circuit for a short to ground or an open/high resistance, if the circuit tests normal and the ignition fuse is open, test or replace the inflatable restraint I/P module disable switch.
3. Verify that a test lamp illuminates between the I/P module disable switch signal control circuit terminal E and B+.
    - If the test lamp does not illuminate, test the control circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the SDM.
4. Verify that a test lamp illuminates between the I/P module suppression indicator control (OFF) circuit terminal A and B+.
5. If all circuits test normal, test or replace the inflatable restraint I/P module disable switch.

Component Testing

1. Ignition OFF, disconnect the harness connector at the inflatable restraint I/P module disable switch.
2. Test for infinite resistance between the signal circuit terminal A and the signal circuit terminal E.
    - If not the specified value, inflatable restraint I/P module disable switch.
3. With the inflatable restraint I/P module disable switch select the OFF position.
4. Test for 90-110 ohms between the ignition circuit terminal B and signal circuit terminal E.
    - If not the specified range, replace the inflatable restraint I/P module disable switch.
5. With the inflatable restraint I/P module disable switch select the ON position.
6. Test for 3.9K-3.2K ohms between the ignition circuit terminal B and signal circuit terminal A.

- If not the specified range, replace the inflatable restraint I/P module disable switch.

Repair Procedures

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

- **SIR/SRS Wiring Repairs**
- **Inflatable Restraint Instrument Panel Module Disable Switch Replacement**
- **Control Module References** for SDM replacement, setup, and programming

DTC B1000

Diagnostic Instructions

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

DTC Descriptors

DTC B1000 00

Electronic Control Unit (ECU) Performance No Additional Information Available

Circuit/System Description

This diagnostic is specific to the passenger presence system (PPS) module. The internal fault detection is typically handled inside the control module, however the PPS module may set DTC B1000 due to other system malfunctions.

Conditions for Running the DTC

The module runs the program to detect an internal fault when power up is commanded. The only requirements are voltage and ground. This program runs even if the voltage is out of the valid operating range.

Conditions for Setting the DTC

The module has detected an internal malfunction or a specific sensor circuit may be shorted.

Action Taken When the DTC Sets

The module refuses all additional inputs.

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 of 100, without a repeat of the malfunction.

Diagnostic Aids

- DTC B1000 may set in the PPS module due to shorted circuits of the PPS pressure sensor or the seat belt tension sensor.
- This DTC may be stored as a history DTC without affecting the operation of the module.
- If stored only as a history DTC and not retrieved as a current DTC, do not replace the module.

Circuit/System Verification

Ignition ON, with a scan tool, clear DTC. Verify DTC B1000 is not set as current in the PPS.

- If DTC is set as a current DTC, replace the PPS.

Repair Procedures

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

Control Module References for PPS replacement, setup, and programming

DTC B1001 (ROS)

Diagnostic Instructions

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

DTC Descriptor

DTC B1001 00

Option Configuration Error

Circuit/System Description

The inflatable restraint sensing and diagnostic module (SDM) stores a 4-digit primary key for the inflatable restraint vehicle rollover sensor (ROS). The SDM sends the ROS the primary key. If the ROS determines that it is the wrong primary key, the ROS will set DTC B1001 and send the SDM a vehicle mismatch message. The SDM then will set DTC B0090 3A and turn the SIR Warning Indicator ON. The ROS does not use a secondary key.

Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

Conditions for Setting the DTC

The 4-digit primary key stored in the SDM does not match the 4-digit key stored in the ROS.

Action Taken When the DTC Sets

- The SDM commands the AIR BAG indicator ON.
- The SDM disables all rollover related deployments.

Conditions for Clearing the DTC

The 4-digit Primary Key in the SDM and in the ROS match.

Diagnostic Aids

This DTC is an indication that the ROS was not set-up correctly, is not the correct part number or that the ROS is defective.

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

SIR System Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

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

- **ROS**
- **ROS wiring harness**

1. Verify the correct ROS part number has been installed
   - If the wrong ROS part number was installed, replace with the correct ROS.
2. Verify that DTC B1001 is not set in the ROS.
   - If DTC is set, perform the Setup New ROS procedure. If DTC resets replace the ROS.

Repair Procedures

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

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

DTC B1001 (SDM)

Diagnostic Instructions

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

DTC Descriptor

DTC B1001 00

SDM Option Configuration Error

Circuit/System Description

The inflatable restraint sensing and diagnostic module (SDM) stores a primary data key, which is a 4-digit number, and a secondary data key, which is a portion of the vehicle identification number (VIN). When the ignition is turned ON, the SDM compares this information to the information stored in the body control module (BCM) over the serial data communication circuit. If there is a mismatch between the information stored in the SDM and BCM, DTC B1001 will set.

Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

Conditions for Setting the DTC

- The 4-digit primary data key stored in the SDM does not match the 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 the AIR BAG indicator ON.
- The SDM disables all deployments.

Conditions for Clearing the DTC

- The last 4-digit Primary Data Key in the SDM match the last 4 digits stored in the BCM.
- The VIN that is stored in the SDM matches the VIN 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

Schematic Reference

SIR Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

SIR System Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information.

Circuit/System Testing

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

- **SDM**
- **SDM wiring harness**

1. Ignition ON, verify the scan tool Secondary Key Status displays Valid.
   - If not the specified value, verify the scan tool Received VIN Digits 2-7 match the vehicle VIN, if the VIN does not match, reprogram the BCM. If the VIN matches, reprogram the SDM.
2. Ignition ON, verify the scan tool Primary Key Status displays Valid.
   - If not the specified value, verify the scan tool SDM Primary Key matches the Received Primary Key, if the key does not match, perform the Setup SDM Primary Key in BCM procedure.

3. With a scan tool, verify DTC B1001 is not set as current.
    - If DTC is set as current, replace the SDM.

Repair Procedures

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

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

DTC B1011

Diagnostic Instructions

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

DTC Descriptor

DTC B1011 71

System Disabled Information Stored Invalid Serial Data Received

Circuit/System Description

The vehicle rollover sensor (ROS) monitors the vehicle speed signal (VSS) on the GMLAN serial data circuit. If the VSS is marked as invalid or is missing, the ROS will set a diagnostic trouble code (DTC).

Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

Conditions for Setting the DTC

If the VSS is marked as invalid or is missing.

Conditions for Clearing the DTC

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

Diagnostic Aids

DTC B1011 does not indicate a ROS system malfunction and will not cause any warning indicators to illuminate. Factors such as a long engine crank or a delay in serial data communications will cause B1011 to set.

Reference Information

Electrical Information Reference

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

Repair Procedures

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

SIR/SRS Wiring Repairs

DTC B1019

Diagnostic Instructions

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

DTC Descriptors

DTC B1019 00

SDM System Configuration Error

DTC B1019 3A

SDM System Configuration Error Incorrect Component Installed

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 I/P inflator module. When the ignition is turned ON, the ignition voltage is supplied to the passenger air bag ON/OFF indicators and to the

PPS module. The instrument panel cluster (IPC) grounds all indicator control circuits to the passenger air bag ON/OFF indicators for illumination. The IPC receives serial data messages from the supplemental inflatable restraints system to turn ON the indicators as necessary.

After the SDM is programmed, the SDM setup procedure is required. During this set up procedure, the SDM will compare the content that was just programmed to the actual components that are installed on the vehicle. If the SDM detects that there are too few or too many components on the system, DTC B1019 00 will set and not allow the setup procedure to complete.

Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

Conditions for Setting the DTC

B1019 00

- The SDM was programmed with the wrong options for the vehicle.
- The wrong components were installed for the content of the vehicle.
- SDM connector may have bent pins or shorting bars causing the SDM to learn deployment loops that are not actually present.

B1019 3A

- The vehicle was configured for passenger presence system (PPS) but the SDM does not detect that the PPS indicator is present due to loss of power at indicator.
- The vehicle is not configured for PPS and the SDM detects that the PPS indicator is present.

Action Taken When the DTC Sets

- The SDM commands the AIR BAG warning lamp ON.
- The SDM disables all deployments when B1019 00 DTC is set as current.

Conditions for Clearing the DTC

- The correct SDM must be installed.
- The correct components must be installed.
- The PPS indicator operates as indicated in the **SIR System Description and Operation**.

Diagnostic Aids

If the SDM has been replaced, make sure that the correct part number was installed for this vehicle. If after programming the SDM DTC B1019 00 sets as current, check for bent pins or shorting bars at the SDM connector.

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

SIR System Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

B1019 3A

1. With a scan tool, verify DTC B1370 is not set as current in the SDM.
   - If DTC is current refer to **DTC B1370**.
2. If equipped with PPS, verify the appropriate PPS indicator segments illuminate by occupying and un-occupying the passenger seat.
   - If the PPS indicator segments do not illuminate properly, refer to **Passenger Presence System Indicator Circuit Malfunction**.

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.

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

B1019 00

1. Ignition ON, verify the scan tool End Model Part Number is correct for the vehicle.
   - If the part number is incorrect, reprogram the SDM.

IMPORTANT:

- **If not equipped with PPS, the scan tool parameter should display Not Present and the PPS indicator should not be present on the vehicle**
- **If equipped with PPS, the scan tool parameter should display Auto, Manual, or Auto + Man and the PPS indicator should be present on the vehicle**

2. Observe the scan tool PPS Options parameter to determine how the vehicle PPS is currently configured in the SDM. Verify the actual vehicle equipment and the current configuration indicated by the scan tool parameter are the same.
   - If the original configuration does not match the actual vehicle equipment, reprogram the SDM with the correct configuration.
3. Ignition OFF, disconnect the harness connectors at the SDM and verify the connector is in good condition and has no bent pins, terminals or shorting bars
   - If damage is found, repair the bent pins, terminals or shorting bars as needed and perform the Setup New SDM procedure.
4. Connect the harness connector at the SDM.
5. Ignition ON, verify the scan tool System Configuration matches the actual components installed on the vehicle.
   - If the System Configuration does not match the actual components installed, reprogram the SDM with the correct components.

6. Ignition ON, clear all PPS and SDM DTCs.
7. Verify DTC B1019 does not set.
    - If DTC sets, replace the SDM.

Repair Procedures

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

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

DTC B1370

Diagnostic Instructions

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

DTC Descriptors

DTC B1370 01

Device Ignition 1 Circuit Short to Battery

DTC B1370 06

Device Ignition 1 Circuit Short to Ground or Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Ignition 1 Voltage	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.

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.
- 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

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

Diagnostic Aids

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

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

SIR System Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References

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.

- **SDM**
- **SDM wiring harness**

1. Ignition OFF, remove the underhood AIR BAG IGN fuse 39.
2. Ignition ON, test for 9-16 V between the voltage supply side and ground.
   - If not within the specified range, refer to **DTC B1370** .
3. Ignition OFF, remove the SDM harness connector.
4. Ignition OFF, test for less then 1 ohm between the ignition 1 voltage circuit terminal 32 and the underhood fuse block terminal G2 (X5).
   - If greater then the specified range, test the circuit for an open/high resistance.
5. Ignition ON, test for less then 1 volt between the SDM harness connector ignition 1 voltage circuit terminal 32 and the underhood fuse block terminal G2 (X5).
   - If greater then the specified value, test the circuit for a short to voltage.
6. If all circuits test normal, reconnect all connectors, replace fuse, clear all DTCs. If DTC B1370 stays current, replace the SDM.

Repair Procedures

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

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

PASSENGER PRESENCE SYSTEM REZEROING

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.

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: DTC B0081 4B may be set prior to rezeroing the system if the system was replaced with a service kit. All other 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.
8. When the rezeroing procedure has been successfully completed, the PPS will display the current system status.
9. 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.
10. After the PPS has been successfully rezeroed, perform the **Diagnostic System Check - Vehicle** .

SYMPTOMS - SIR

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

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

Visual/Physical Inspection

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

Intermittent

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

Symptom List

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

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

AIR BAG INDICATOR CIRCUIT MALFUNCTION

Diagnostic Instructions

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

Circuit/System Description

When the ignition is turned ON, the instrument panel cluster (IPC) flashes the AIR BAG indicator 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.

Diagnostic Aids

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

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

SIR System Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

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.
   - 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 flashes and then turns OFF.
   - If the SIR warning indicator continually flashes then reprogrammed 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.
   - If the AIR BAG indicator does not turn ON, replace the IPC.
4. If the scan tool commands the AIR BAG indicator ON and OFF, replace the SDM.

Repair Procedures

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

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

PASSENGER PRESENCE SYSTEM INDICATOR CIRCUIT MALFUNCTION

Diagnostic Instructions

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

- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

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 will commands both PASSENGER AIR BAG ON/OFF indicators ON for 5 seconds. The PPS module conducts tests on the PPS components and circuits while both PASSENGER AIR BAG ON/OFF indicators are ON. If no malfunctions are detected, the PPS module will turn the PASSENGER AIR BAG indicator ON or OFF, depending on the status of the PPS. If a malfunction is detected, the PPS module will store a DTC, default the PPS to the OFF state, and communicate with the sensing and diagnostic module (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 malfunction.

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

SIR System Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References

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.

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

1. Ignition OFF, disconnect the harness connector at the inflatable restraint passenger air bag On/Off indicator.
2. Ignition OFF, test for less then 1 ohm between the ground circuit terminal 2 and ground.
   - If greater then the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify a test lamp illuminates between the ignition circuit terminal 4 and ground.
   - If the test lamp does not illuminate, test the ignition circuit for a short to ground or an open/high resistance. If the circuit tests normal and the ignition circuit fuse is open, test or replace the inflatable restraint passenger air bag On/Off indicator.
4. Connect a test lamp between the control circuit terminal 3 and the ignition circuit terminal 4. With the passenger seat unoccupied, then occupied the test lamp should switch states within 5 seconds.
   - If the test lamp is always on, test the control circuit for a short to ground. If all circuits test normal replace the IPC.
   - If the test lamp is always off, test the control circuit for a short to voltage or an open/high resistance. If all circuits test normal replace the IPC.
5. Connect a test lamp between the control circuit terminal 1 and the ignition circuit terminal 4. With the passenger seat unoccupied, then occupied the test lamp should switch states within 5 seconds.
   - If the test lamp is always on, test the control circuit for a short to ground. If all circuits test normal replace the IPC.
   - If the test lamp is always off, test the control circuit for a short to voltage or an open/high resistance. If all circuits test normal replace the IPC.

6. If all circuits test normal, replace the inflatable restraint passenger air bag on/off indicator.

Repair Procedures

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

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

SIR DISABLING AND ENABLING

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

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

Condition	Action
If the vehicle was involved in an accident with an air bag deployment.	Disconnect the negative battery cable(s) *. Refer to **Repairs and Inspections Required After a Collision**.
When performing SIR diagnostics.	Follow the appropriate SIR service manual diagnostic procedure(s) *
When removing or replacing an SIR component or a component attached to an SIR component.	Disconnect the negative battery cable(s) *
If the vehicle is suspected of having shorted electrical wires.	Disconnect the negative battery cable(s) *
When performing electrical diagnosis on components other than the SIR system.	Remove the SIR/Airbag fuse(s) when indicated by the diagnostic procedure to disable the SIR system
* DTCs will be lost when the negative battery cable is disconnected.	

SIR Service Precautions

CAUTION: When performing service on or near the SIR components or the SIR wiring, the SIR system must be disabled. Failure to

observe the correct procedure could cause deployment of the SIR components. Serious injury can occur. Failure to observe the correct procedure could also result in unnecessary SIR system repairs.

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

General Service Instructions

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

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

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

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

Disabling Procedure - Air Bag Fuse

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

IMPORTANT: The SDM may have more than one fused power input. To ensure there is no unwanted SIR deployment, personal injury,

or unnecessary SIR system repairs, remove all fuses supplying power to the SDM. With all SDM fuses removed and the ignition switch in the ON position, the AIR BAG warning indicator illuminates. This is normal operation, and does not indicate a SIR system malfunction.

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

Enabling Procedure - Air Bag Fuse

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

Disabling Procedure - Negative Battery Cable

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

Enabling Procedure - Negative Battery Cable

1. Place the ignition in the OFF position.
2. Connect the negative battery cable to the battery. Refer to **Battery Negative Cable Disconnection and Connection (w/Single Battery)** or **Battery Negative Cable Disconnection and Connection (w/Auxiliary Battery)** or **Battery Negative Cable Disconnection and Connection (w/Dual Batteries)** .
3. Turn the ignition switch to the ON position. The AIR BAG indicator will flash then turn

OFF.

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

REPAIR INSTRUCTIONS

SIR SERVICE PRECAUTIONS

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

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

General Service Instructions

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

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

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

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

- Inflatable restraint seat belt retractor pretensioners
- Inflatable restraint front end sensors

INFLATABLE RESTRAINT FRONT END SENSOR REPLACEMENT (2500, 3500)

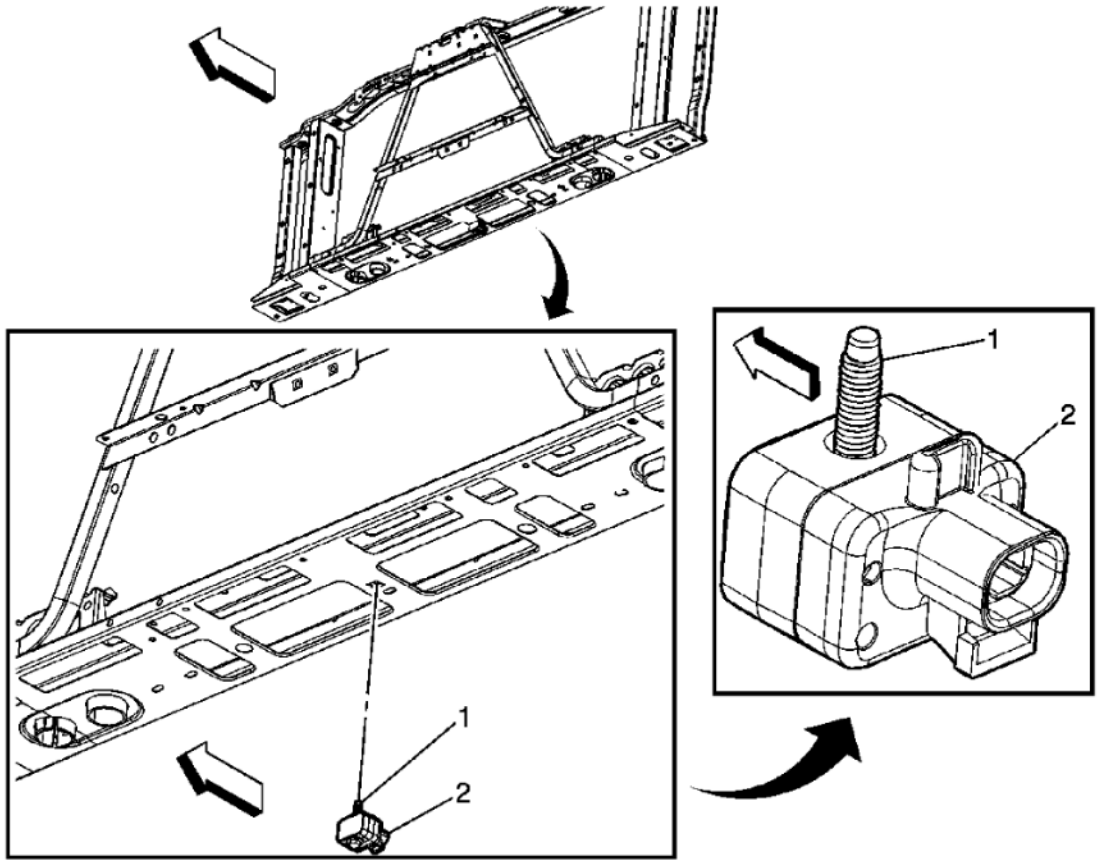


Fig. 7: Inflatable Restraint Front End Sensor Replacement (2500, 3500)
Courtesy of GENERAL MOTORS CORP.

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.** **Preliminary Procedure:** Disable the supplemental inflatable restraint (SIR) system. Refer to **SIR Disabling and Enabling**.	
	Supplemental Inflatable Restraint Front End Discriminating Sensor Bolt (Qty:

1	1) **NOTE:** **Refer to Fastener Notice .** **Tip:** Loosen bolt in order to remove sensor. **Tighten:** 8 N.m (71 lb in)
2	Supplemental Inflatable Restraint Front End Discriminating Sensor Assembly **Tip:** 1. Remove connector position assurance (CPA) retainer. 2. Disconnect electrical connector.

INFLATABLE RESTRAINT FRONT END SENSOR REPLACEMENT (1500)

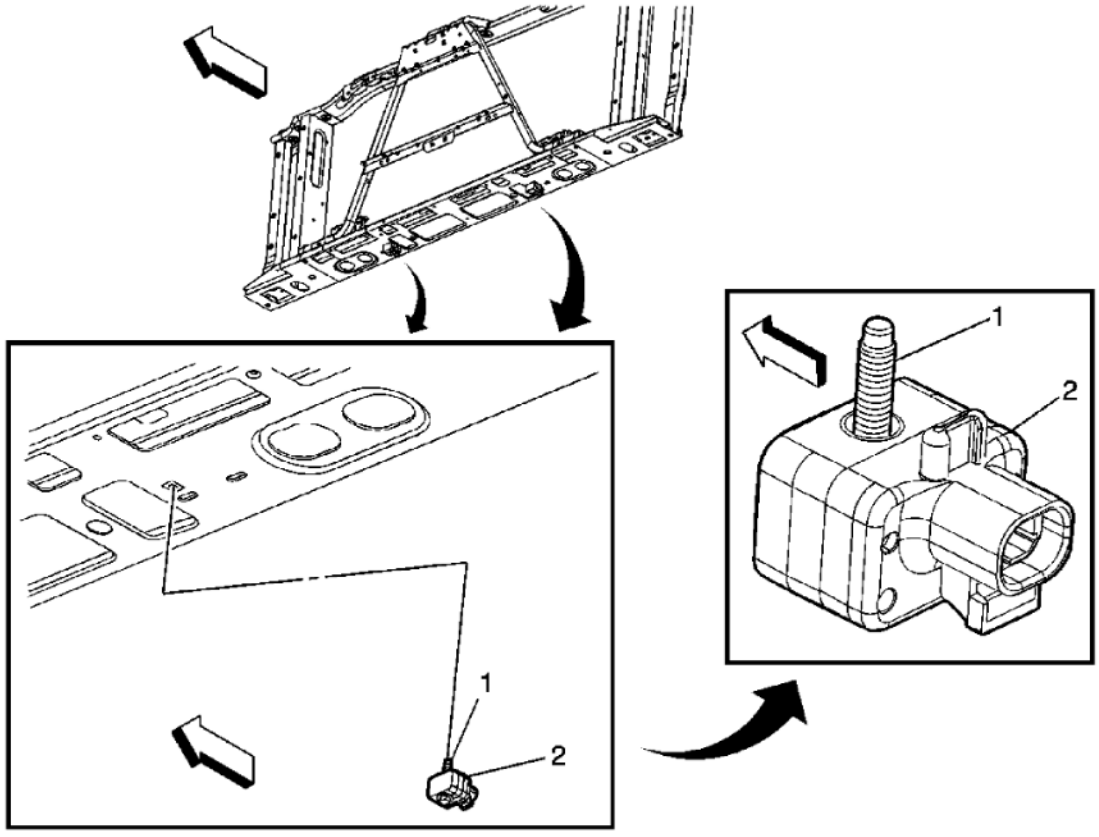


Fig. 8: Inflatable Restraint Front End Sensor Replacement (1500)

Courtesy of GENERAL MOTORS CORP.

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.** **Preliminary Procedure:** Disable the supplemental inflatable restraint (SIR) system. Refer to **SIR Disabling and Enabling**.	
1	Supplemental Inflatable Restraint Front End Discriminating Sensor Bolt (Qty: 2) **NOTE:** **Refer to Fastener Notice .** **Tip:** Loosen the bolt in order to remove the sensor. **Tighten:** 8 N.m (71 lb in)
2	Supplemental Inflatable Restraint Front End Discriminating Sensor (Qty: 2) **Procedure** 1. Remove connector position assurance (CPA) retainer. 2. Disconnect electrical connector.

INFLATABLE RESTRAINT SIDE IMPACT SENSOR REPLACEMENT (EXTENDED CAB)

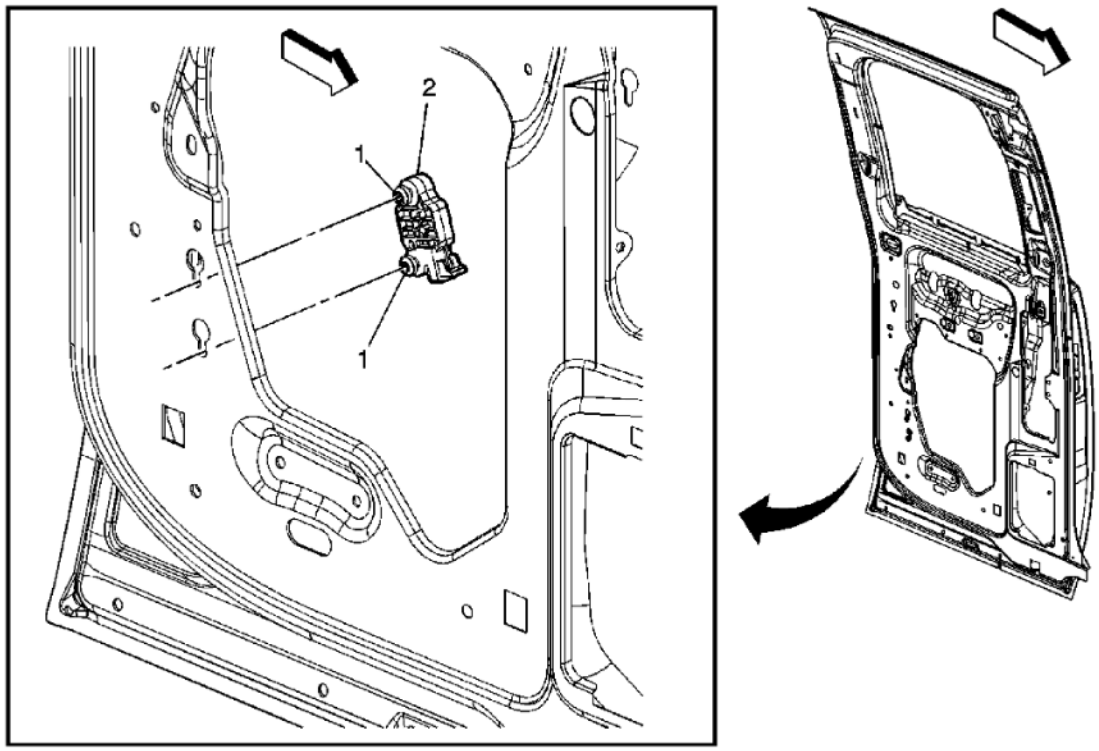


Fig. 9: Inflatable Restraint Side Impact Sensor Replacement (Extended Cab)
Courtesy of GENERAL MOTORS CORP.

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. 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.

Preliminary Procedures

1. Disable the supplemental inflatable restraint (SIR) system. Refer to **SIR Disabling and Enabling**.
2. Remove rear side door trim panel. Refer to **Rear Side Door Trim Panel Replacement (YE9)** or **Rear Side Door Trim Panel Replacement (SLT)** .

3. Remove rear side door water deflector. Refer to **Rear Side Door Water Deflector Replacement** .	
1	Inflatable Restraint Side Impact Sensor Module Bolt (Qty: 2) **NOTE:** **Refer to Fastener Notice .** **Procedure:** Loosen the bolts and slide sensor out of key hole slots. **Tip:** • When removing the bolts from the inboard side, the bolts are removed as having right hand threads. • When removing the bolts from the outboard side, the bolts are removed as having left hand threads. **Tighten:** 9 N.m (80 lb ft)
2	Inflatable Restraint Side Impact Sensor Module Assembly

INFLATABLE RESTRAINT SIDE IMPACT SENSOR REPLACEMENT (CREW CAB)

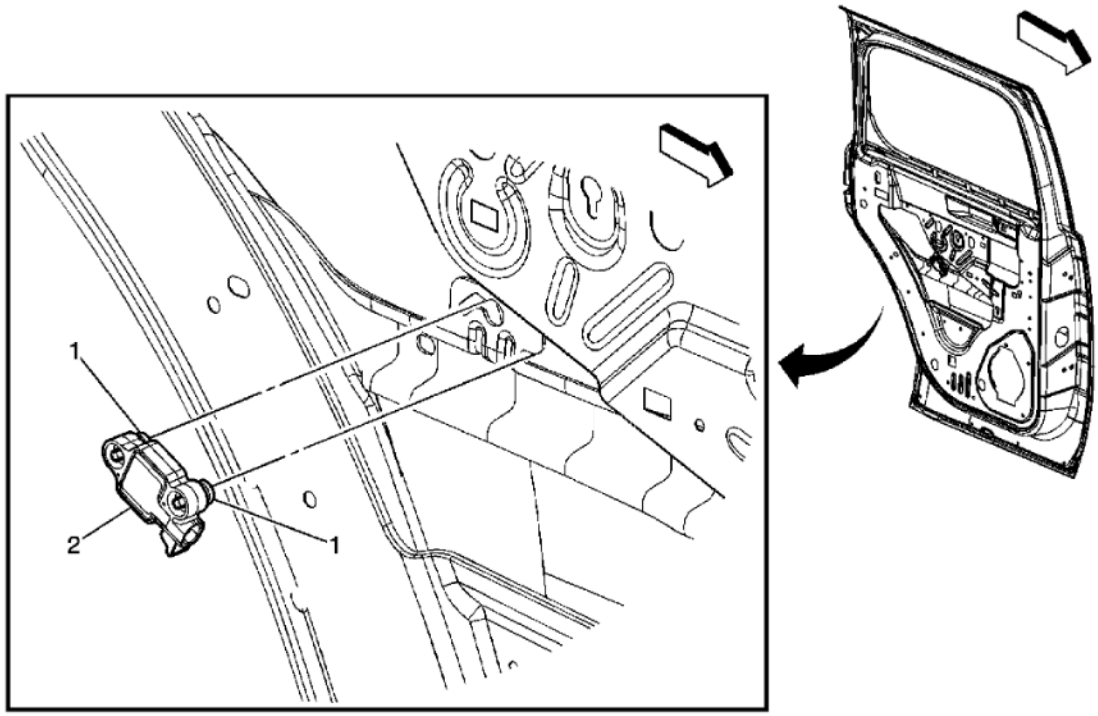


Fig. 10: Inflatable Restraint Side Impact Sensor Replacement (Crew Cab)
Courtesy of GENERAL MOTORS CORP.

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. 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.

Preliminary Procedures

1. Disable the supplemental inflatable restraint (SIR) system. Refer to **SIR Disabling and Enabling**.
2. Remove rear side door trim panel. Refer to **Rear Side Door Trim Panel Replacement (YE9)** or **Rear Side Door Trim Panel Replacement (SLT)** .
3. Remove rear side door water deflector. Refer to **Rear Side Door Water Deflector**

Replacement .

1	Inflatable Restraint Side Impact Sensor Module Bolt (Qty: 2) **NOTE:** **Refer to Fastener Notice .** **Procedure:** Loosen the bolts and slide sensor out of key hole slots. **Tip:** • When removing the bolts from the inboard side, the bolts are removed as having right hand threads. • When removing the bolts from the outboard side, the bolts are removed as having left hand threads. **Tighten:** 9 N.m (80 lb ft)
2	Inflatable Restraint Side Impact Sensor Module Assembly

INFLATABLE RESTRAINT SIDE IMPACT SENSOR REPLACEMENT (CREW CAB/E CAB/EXTENDED CAB/REGULAR CAB)

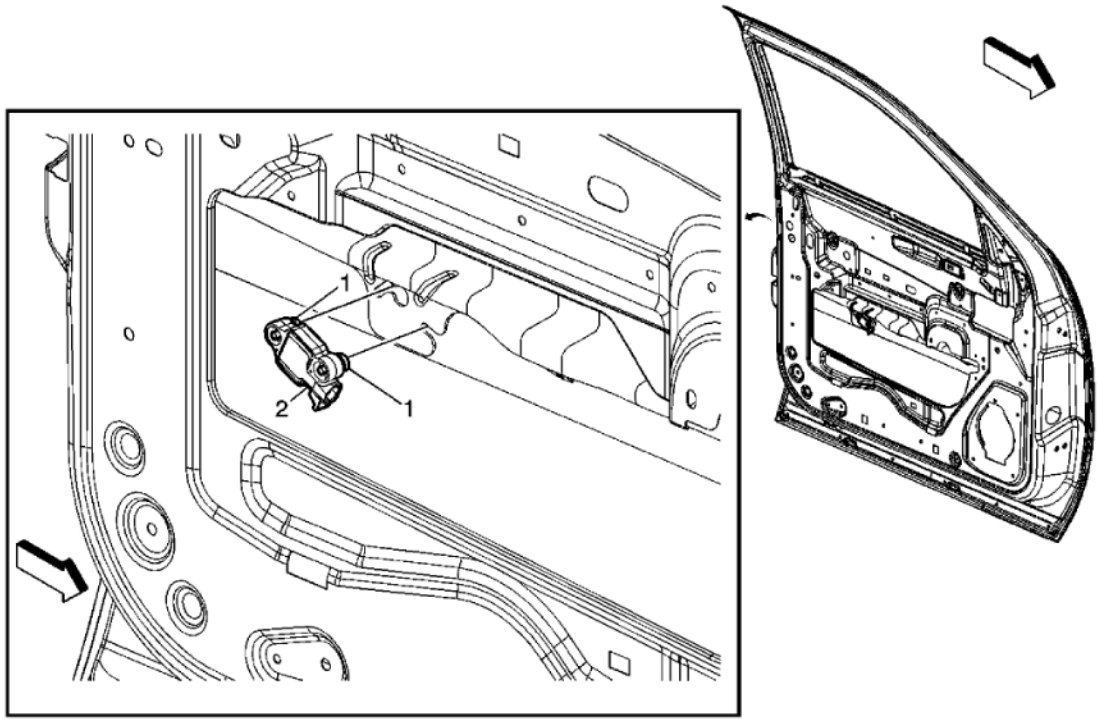


Fig. 11: Inflatable Restraint Side Impact Sensor Replacement (Crew Cab/Extended Cab/Regular Cab)
Courtesy of GENERAL MOTORS CORP.

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. 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.

Preliminary Procedures

1. Disable the supplemental inflatable restraint (SIR) system. Refer to **SIR Disabling and Enabling**.
2. Remove upper front side door trim panel. Refer to **Upper Extension Trim Panel Replacement** .

	3. Remove front side door trim panel. Refer to **Front Side Door Trim Panel Replacement (YE9)** or **Front Side Door Trim Panel Replacement (SLT)** . 4. Remove front side door water deflector. Refer to **Front Side Door Water Deflector Replacement** .
1	Inflatable Restraint Side Impact Sensor Module Bolt (Qty: 2) **NOTE:** **Refer to Fastener Notice .** **Procedure:** Loosen the bolts and slide sensor out of key hole slots. **Tip:** • When removing the bolts from the inboard side, the bolts are removed as having right hand threads. • When removing the bolts from the outboard side, the bolts are removed as having left hand threads. **Tighten:** 9 N.m (80 lb ft)
2	Inflatable Restraint Side Impact Sensor Module Assembly

INFLATABLE RESTRAINT SENSING AND DIAGNOSTIC MODULE REPLACEMENT

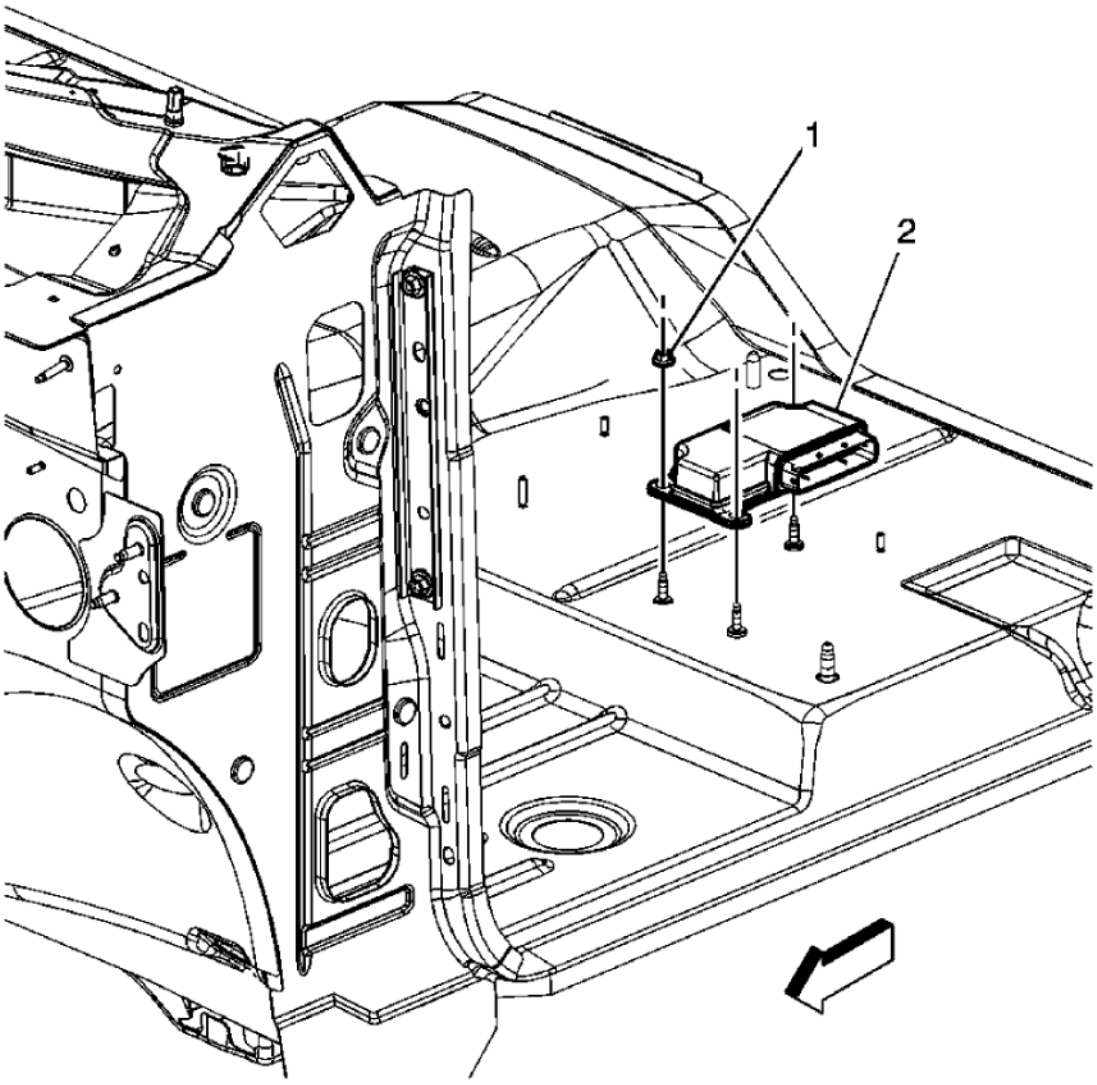


Fig. 12: Inflatable Restraint Sensing and Diagnostic Module Replacement
Courtesy of GENERAL MOTORS CORP.

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

Preliminary Procedures

1. Disable the supplemental inflatable restraint (SIR) system. Refer to **SIR Disabling and Enabling**.
2. Remove driver front bucket seat. Refer to **Front Seat Replacement - Bucket** .

1	Inflatable Restraint Sensing and Diagnostic Module Nuts (Qty: 3) **NOTE:** **Refer to Fastener Notice .** **Tighten:** 7 N.m (56 lb in)
2	Inflatable Restraint Sensing and Diagnostic Module Assembly **Tip:** 1. Position the carpet in order to access the module. 2. Disconnect the electrical connectors. 3. When installing, ensure the arrow on the module is pointed towards the front of the vehicle. 4. If installing a replacement module, program the module. Refer to **Control Module References** .

INFLATABLE RESTRAINT STEERING WHEEL MODULE REPLACEMENT

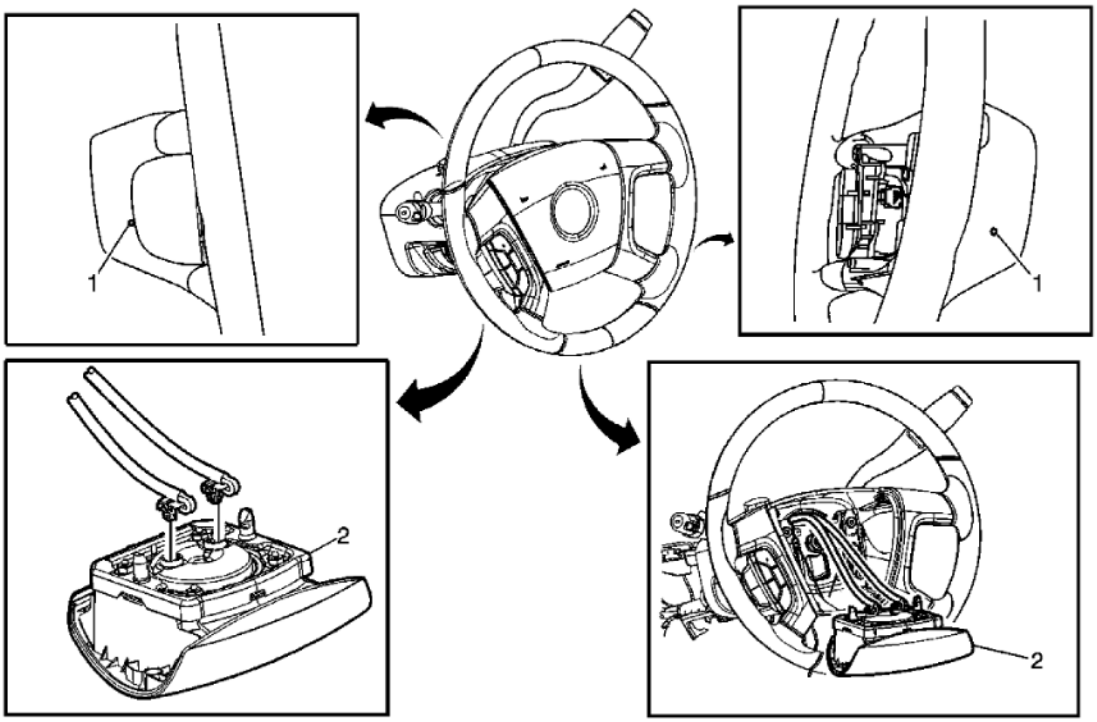


Fig. 13: Inflatable Restraint Steering Wheel Module Replacement
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
CAUTION: Refer to SIR Inflator Module Handling and Storage Caution . **CAUTION:** Refer to SIR Caution . **Preliminary Procedure:** Disable the supplemental inflatable restraint (SIR) system. Refer to **SIR Disabling and Enabling**.	
1	Retainer **Procedure:** On the back side of the steering wheel, there are 2 access holes which directs the tool to the release retainer. Using a 3-4 mm wire or 4 mm allen type wrench, push the retainer inward and slightly upward through the access hole. Repeat the step for the other access hole.
	Steering Wheel Inflatable Restraint Module **Procedure**

2	1. Release 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

Special Tools

J 42640 Steering Column Anti-rotation Pin

Removal Procedure

NOTE: The wheels of the vehicle must be straight ahead and the steering column in the LOCK position before disconnecting the steering column or intermediate shaft from the steering gear. Failure to do so will cause the SIR coil assembly to become uncentered, which may cause damage to the coil assembly.

1. Verify the following before removing the inflatable restraint steering wheel module coil:
   - The wheels on the vehicle are straight ahead.
   - That anti-rotation pin **J 42640** is installed or the ignition and start switch is in the LOCK position.
2. Remove the steering wheel. Refer to **Steering Wheel Replacement** .
3. Remove the steering column shroud. Refer to **Steering Column Shroud Replacement** .
4. Disconnect any electrical connectors as needed.

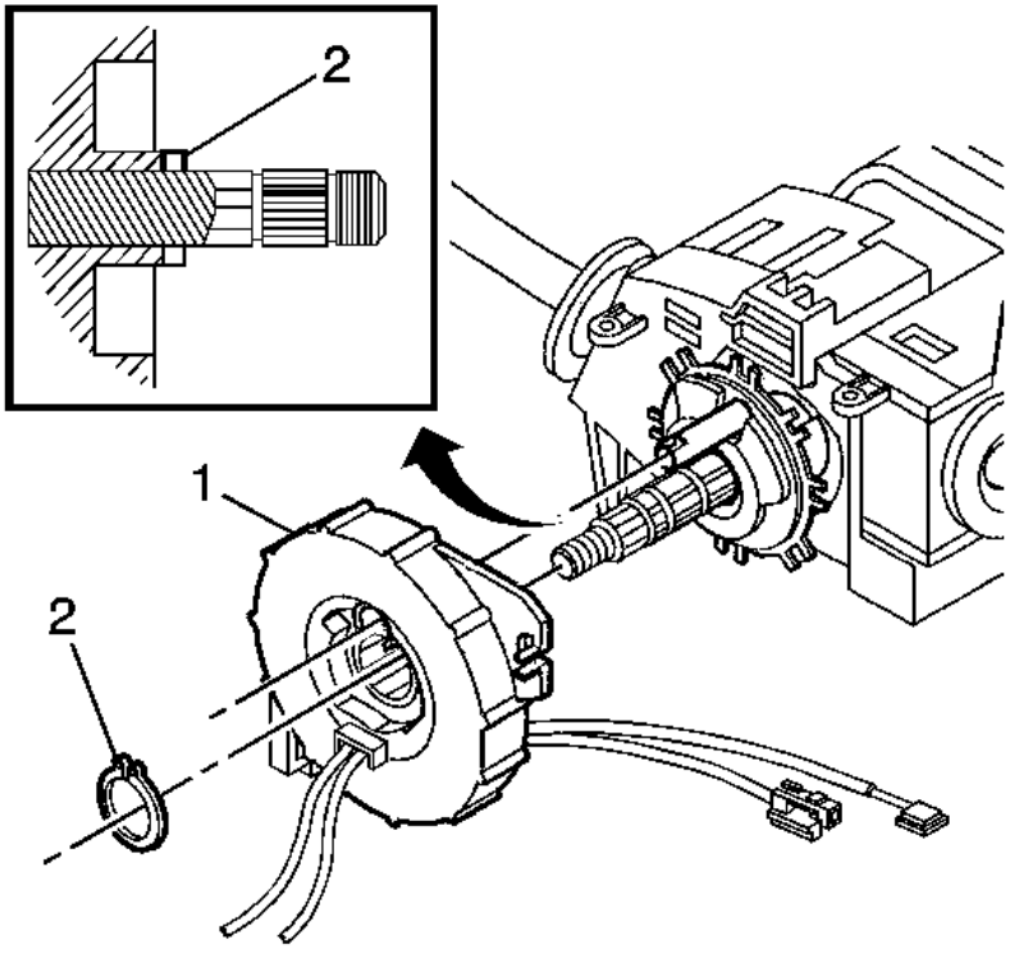


Fig. 14: View Of SIR Coil & Retaining Ring
Courtesy of GENERAL MOTORS CORP.

5. Remove the inflatable restraint steering wheel module coil retaining ring (2) and discard it. DO NOT reuse the ring.
6. Remove the inflatable restraint steering wheel module coil (1) from the steering shaft.
7. If replacing, discard the old inflatable restraint steering wheel module coil.

Installation 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.

IMPORTANT: Do not remove the centering tab from the new inflatable restraint steering wheel module coil until the installation is complete. If the centering tab is missing then re-center the assembly.

1. If reusing the existing inflatable restraint steering wheel module coil it MUST be centered. Refer to **Inflatable Restraint Steering Wheel Module Coil Centering**.

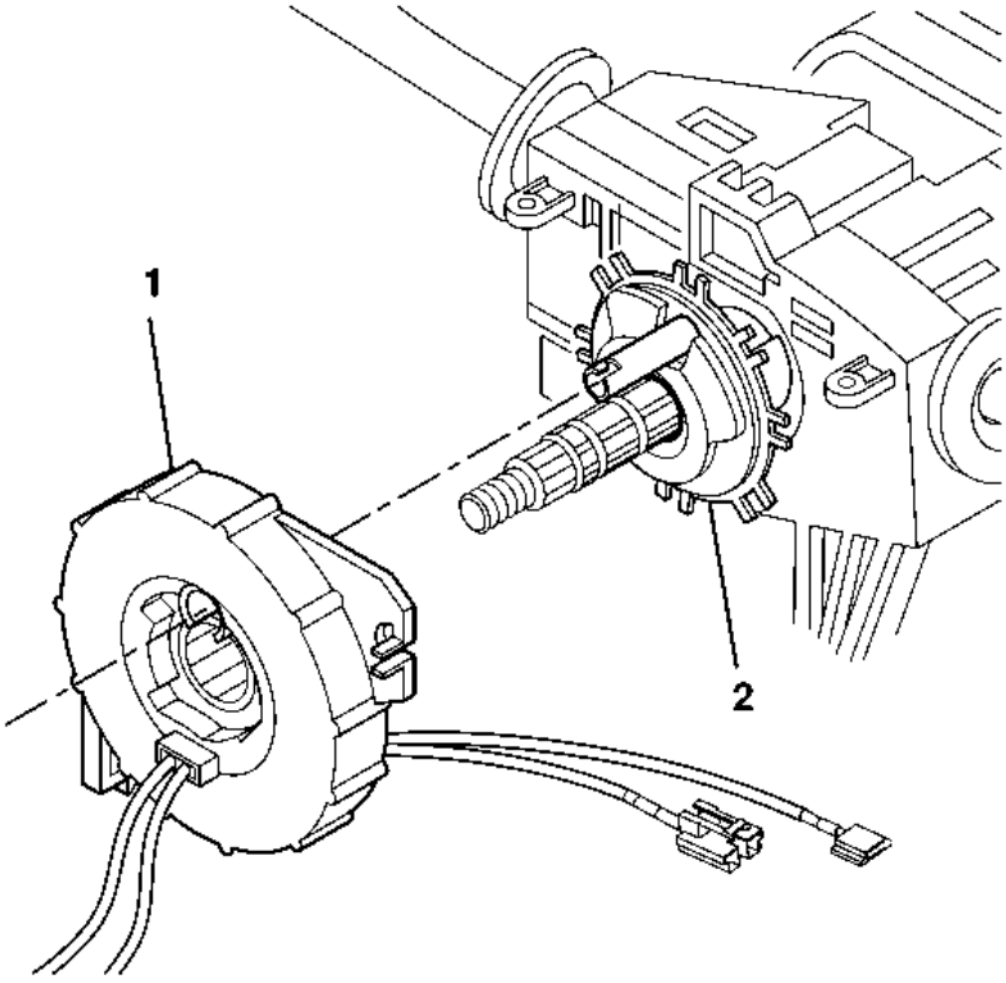


Fig. 15: Aligning SIR Coil Assembly With Horn Tower
Courtesy of GENERAL MOTORS CORP.

2. Align the inflatable restraint steering wheel module coil (1) with the horn tower on the turn signal switch cancel cam (2).

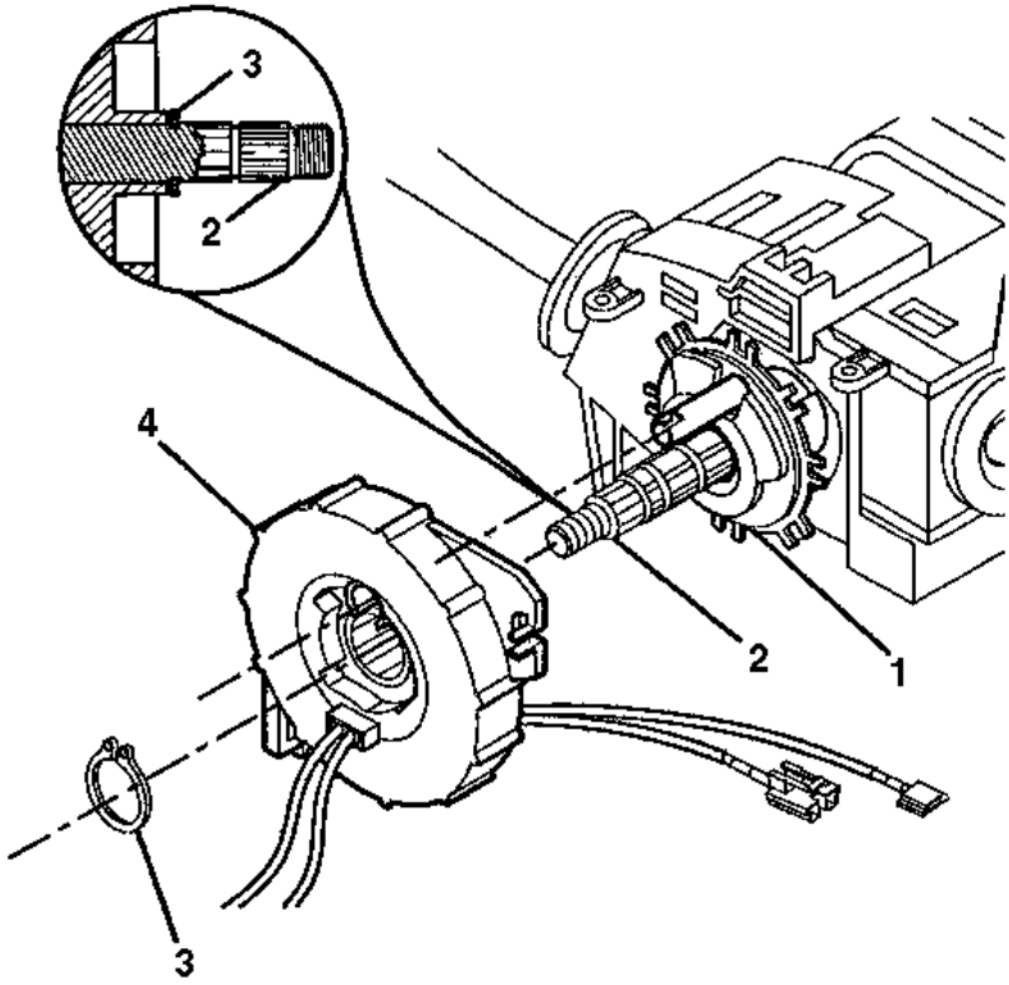


Fig. 16: Identifying SIR Coil, Steering Shaft Assembly & Retaining Ring
Courtesy of GENERAL MOTORS CORP.

3. Slide the inflatable restraint steering wheel module coil (4) onto the steering shaft (2).
4. Firmly seat the new inflatable restraint steering wheel module coil retaining ring (3) into the appropriate groove on the steering shaft (2).
5. Remove and discard the centering tab from the new inflatable restraint steering wheel module coil (4).
6. Connect any electrical connectors as needed.
7. Install the steering column shroud. Refer to **Steering Column Shroud Replacement** .

8. Install the steering wheel. Refer to **Steering Wheel Replacement** .
9. Remove anti-rotation pin **J 42640** .

INFLATABLE RESTRAINT STEERING WHEEL MODULE COIL CENTERING

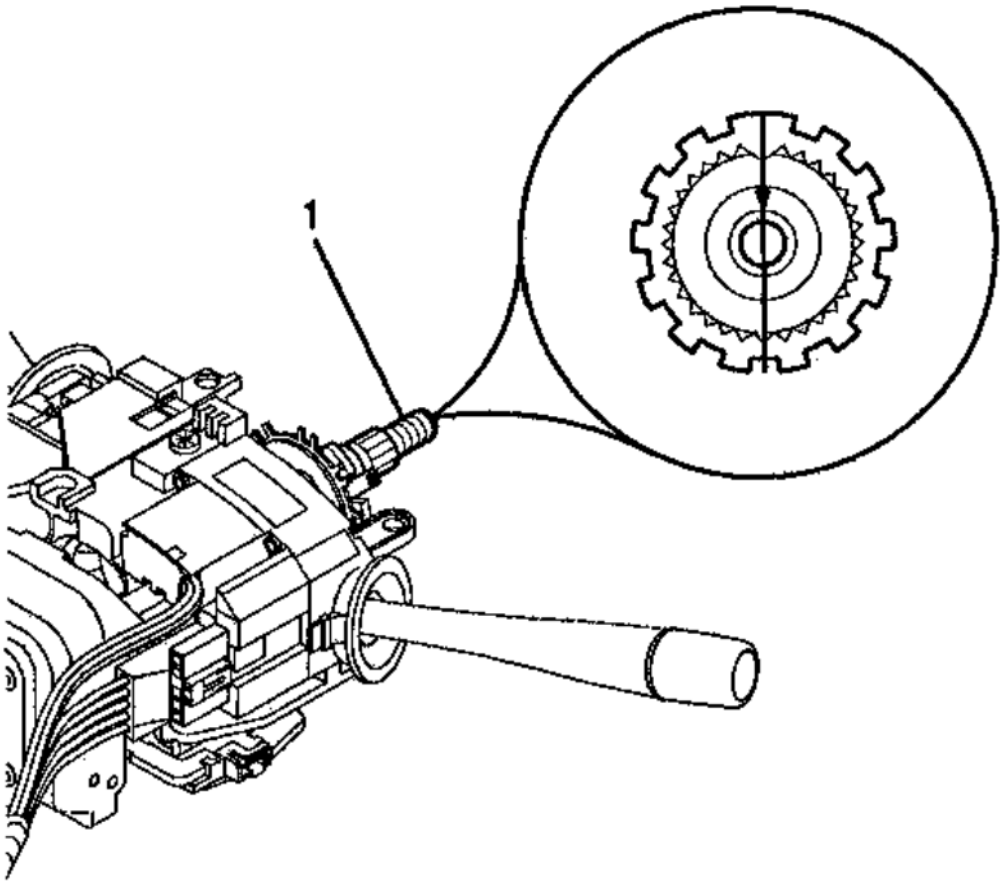


Fig. 17: View Of Block Tooth Of Steering Shaft Assembly In 12 O'clock Position
Courtesy of GENERAL MOTORS CORP.

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

IMPORTANT: If double wire harness strap is installed onto the wire harness assembly and column, you must reuse the holder for the wire straps during installation.
Remove the wire harness strap(s) where necessary.

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

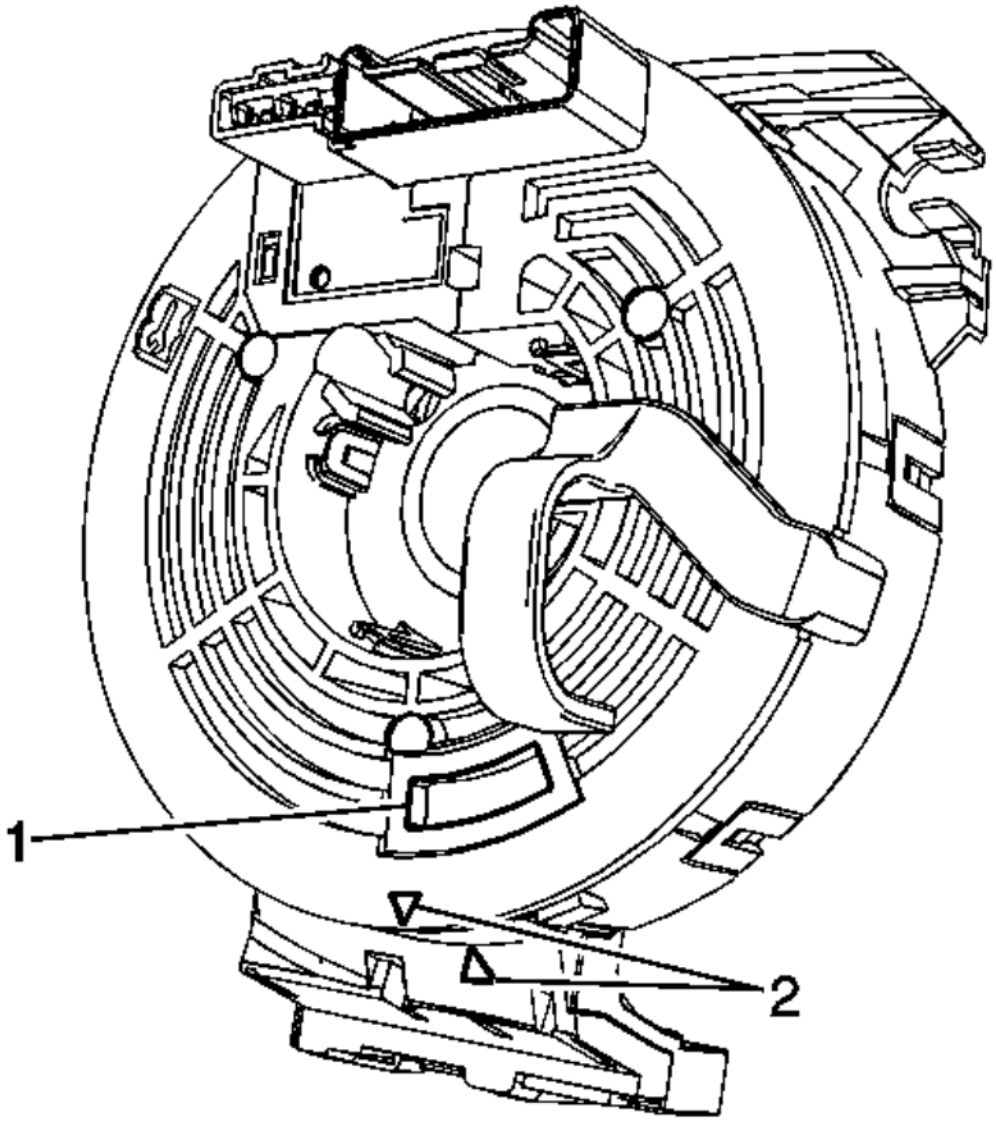


Fig. 18: View Of Coil Hub Centering Window & Arrows
Courtesy of GENERAL MOTORS CORP.

2. The front of the SIR coil has a centering window (1). To center the SIR coil perform the following steps:
    1. Hold the SIR coil with the face up.

2. Rotate the coil hub clockwise until the coil ribbon stops.
3. Rotate the coil hub slowly, counterclockwise until the centering window appears yellow (1) and both arrows (2) line up. This is the CENTER position.
4. While holding the coil hub in the CENTER position, align the SIR coil with the horn tower and slide onto the steering shaft assembly.

3. If a double wire harness strap is installed onto the wire harness assembly and column, you must route the wires up against the steering column. One wire harness strap will surround one lead from the coil to the steering column. The other wire harness strap will surround all other leads to the steering column.

INFLATABLE RESTRAINT INSTRUMENT PANEL MODULE REPLACEMENT

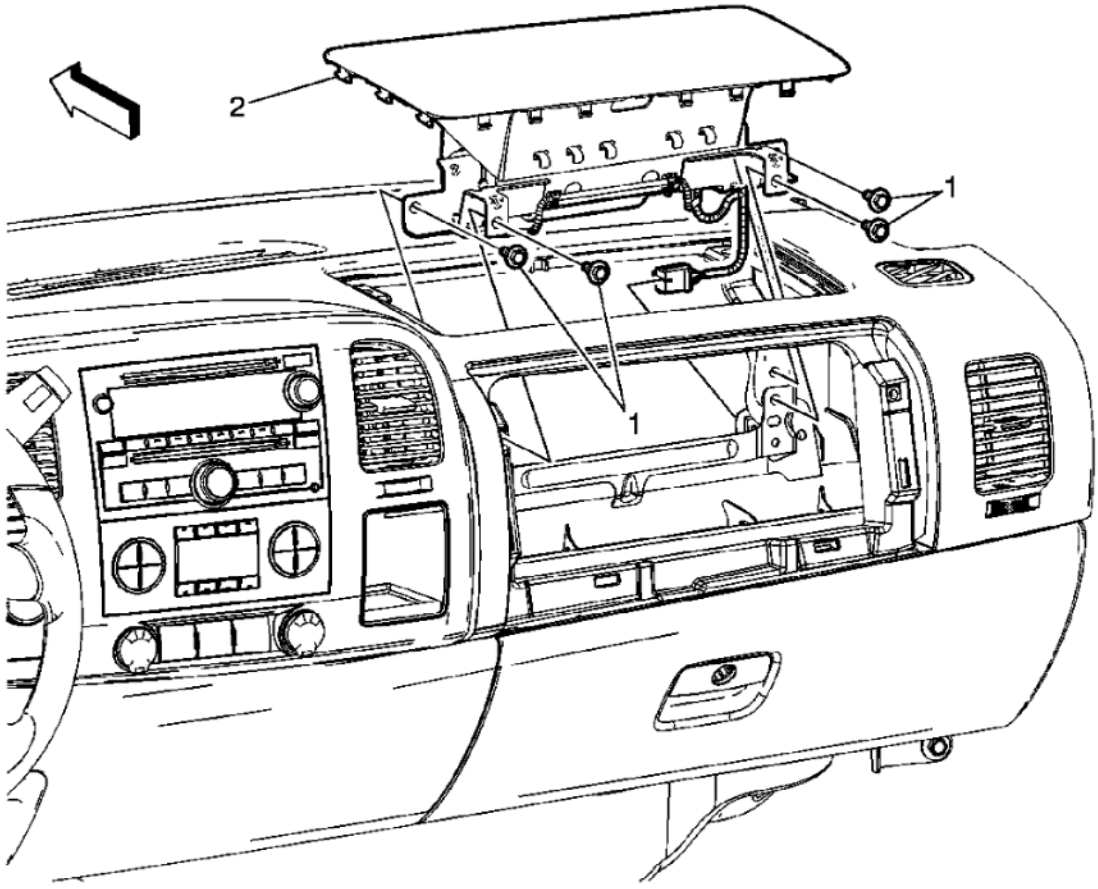


Fig. 19: Inflatable Restraint Instrument Panel Module Replacement
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name

CAUTION:
Refer to SIR Caution .

Preliminary Procedures

1. Disable the supplemental inflatable restraint (SIR) system. Refer to **SIR Disabling and Enabling**.
2. Remove instrument panel upper compartment assembly. Refer to **Instrument Panel Upper Compartment Replacement** .

1	Instrument Panel Inflatable Restraint Module Bolt (Qty: 4) **NOTE:** **Refer to Fastener Notice .** **Tighten:** 10 N.m (89 lb in)
2	Instrument Panel Inflatable Restraint Module **Tip:** 1. Using a plastic flat-bladed tool, pull up on module to disengage retainers. 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 FRONT PASSENGER POSITION SENSOR REPLACEMENT

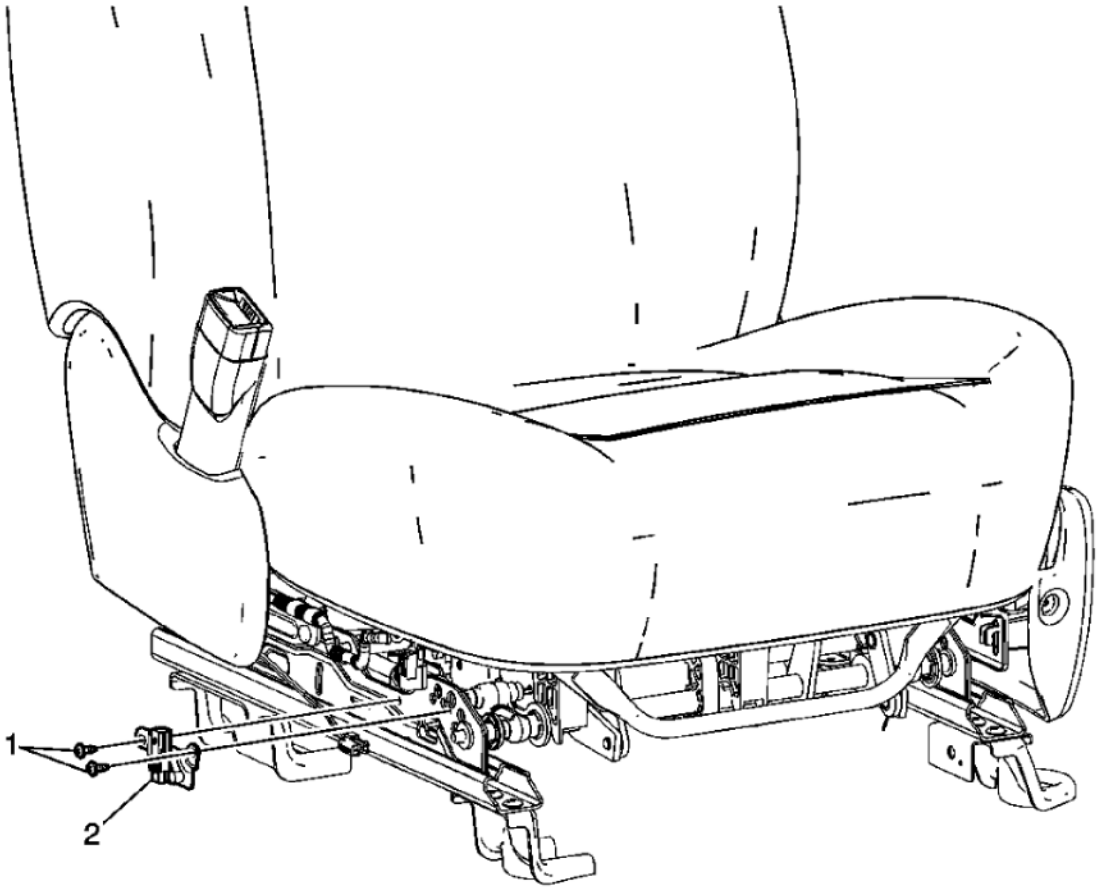


Fig. 20: Inflatable Restraint Front Passenger Position Sensor Replacement
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
CAUTION: **Refer to SIR Caution .** **Preliminary Procedures** 1. Disable the supplemental inflatable restraint (SIR) system. Refer to **SIR Disabling and Enabling**. 2. Remove the drivers seat. Refer to **Front Seat Replacement - Bucket** .	
1	Inflatable Restraint Seat Position Sensor Screw (Qty: 2) **NOTE:** **Refer to Fastener Notice .**

	Tighten: 3 N.m (25 lb in)
2	Inflatable Restraint Position Sensor Assembly **Tip:** Disconnect the electrical connector.

INFLATABLE RESTRAINT PASSENGER PRESENCE SYSTEM REPLACEMENT - FRONT

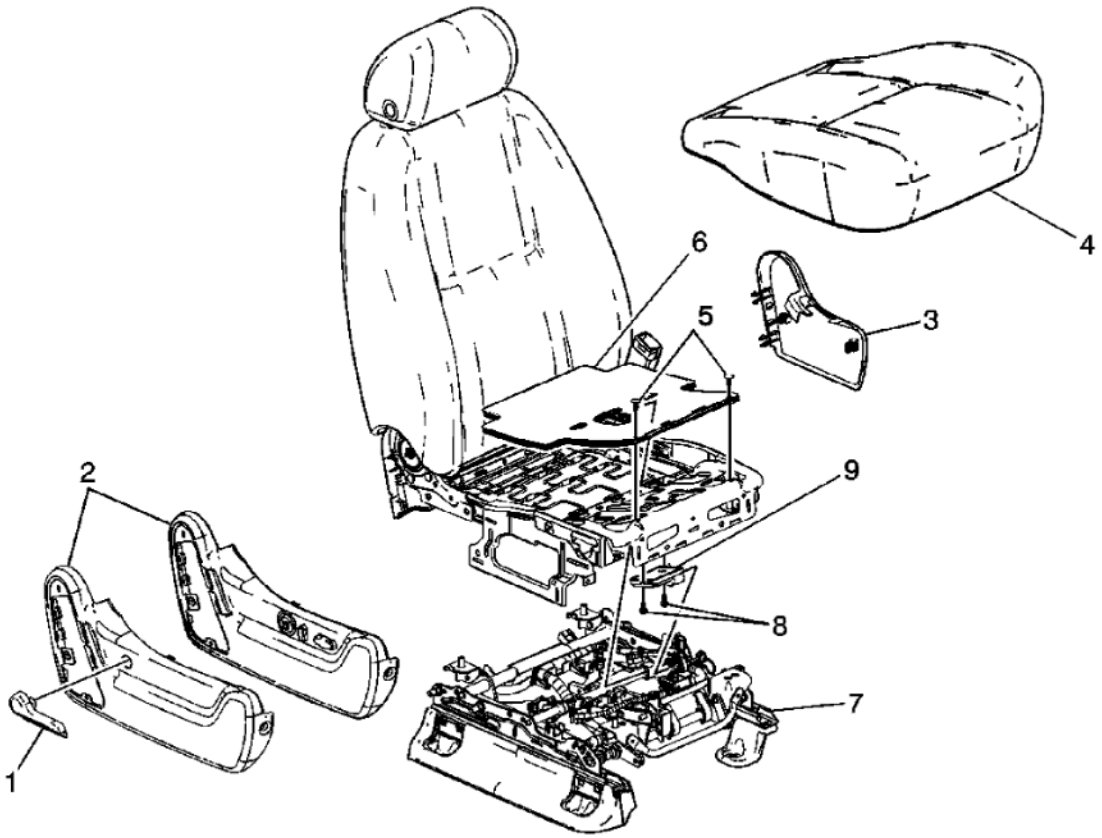


Fig. 21: Inflatable Restraint Passenger Presence System Replacement - Front
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name

CAUTION:
Refer to SIR Caution .

Preliminary Procedure

1. Remove the front seat. Refer to **Front Seat Replacement - Bucket** .
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 Rezeroing.
1	Front Seat Recliner Lever (If Equipped) **Tip:** Using a flat-bladed tool, push the retainer clip downward and pull outward to release the knob.
2	Front Seat Adjuster Outer Finish Cover Refer to **Front Seat Cushion Outer Trim Panel Replacement (Manual)** or **Front Seat Cushion Outer Trim Panel Replacement (Power)** .
3	Front Seat Adjuster Inner Finish Cover Refer to **Front Seat Cushion Inner Trim Panel Replacement** .
4	Front Seat Cushion Cover and Pad **Tip:** 1. Disengage the j-channel retainers from the seat cushion frame. 2. Remove the seat cushion cover and pad from the seat cushion frame as an assembly.
5	Inflatable Restraint Front Passenger Presence Sensor Retainer (Qty: 2)
6	Inflatable Restraint Front Passenger Presence Sensor **Tip:** 1. Lay the seat on it's side. 2. Unhook connector from retainer on seat frame and push up through seat pan. 3. Disconnect and remove sensor.
7	Front Seat Adjuster Assembly Refer to **Front Seat Adjuster Replacement (Manual)** or **Front Seat Adjuster Replacement (Power)** .
8	Inflatable Restraint Front Passenger Presence Module Rivets (Qty: 2) **Tip:** Drill out the rivets to remove and install using new rivets.
9	Inflatable Restraint Front Passenger Presence Module

INFLATABLE RESTRAINT INSTRUMENT PANEL MODULE DISABLE SWITCH REPLA REPLACEMENT

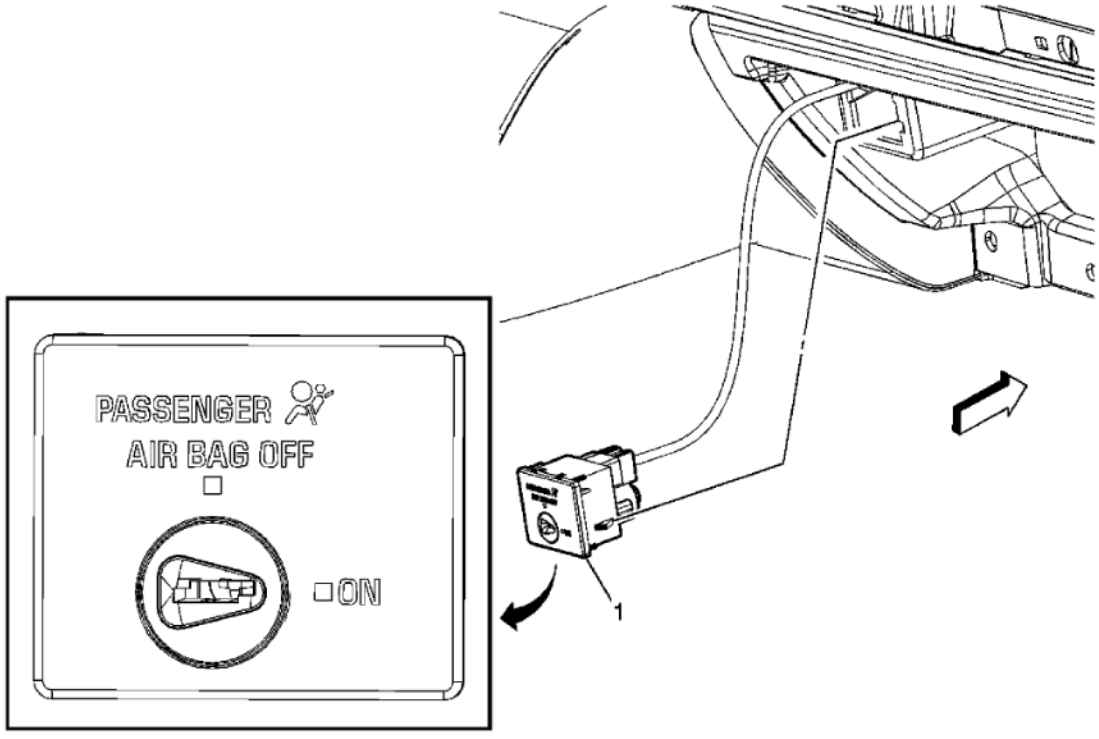


Fig. 22: Inflatable Restraint Instrument Panel Module Disable Switch Replacement
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
CAUTION: **Refer to SIR Caution .** **Preliminary Procedure:** Disable the supplemental inflatable restraint (SIR) system. Refer to **SIR Disabling and Enabling**.	
1	Supplemental Inflatable Restraint Instrument Panel Module Disable Switch Assembly **Tip:** 1. Remove connector position assurance (CPA) retainer. 2. Disconnect electrical connector.

INFLATABLE RESTRAINT ROOF SIDE RAIL MODULE REPLACEMENT (CREW CAB)

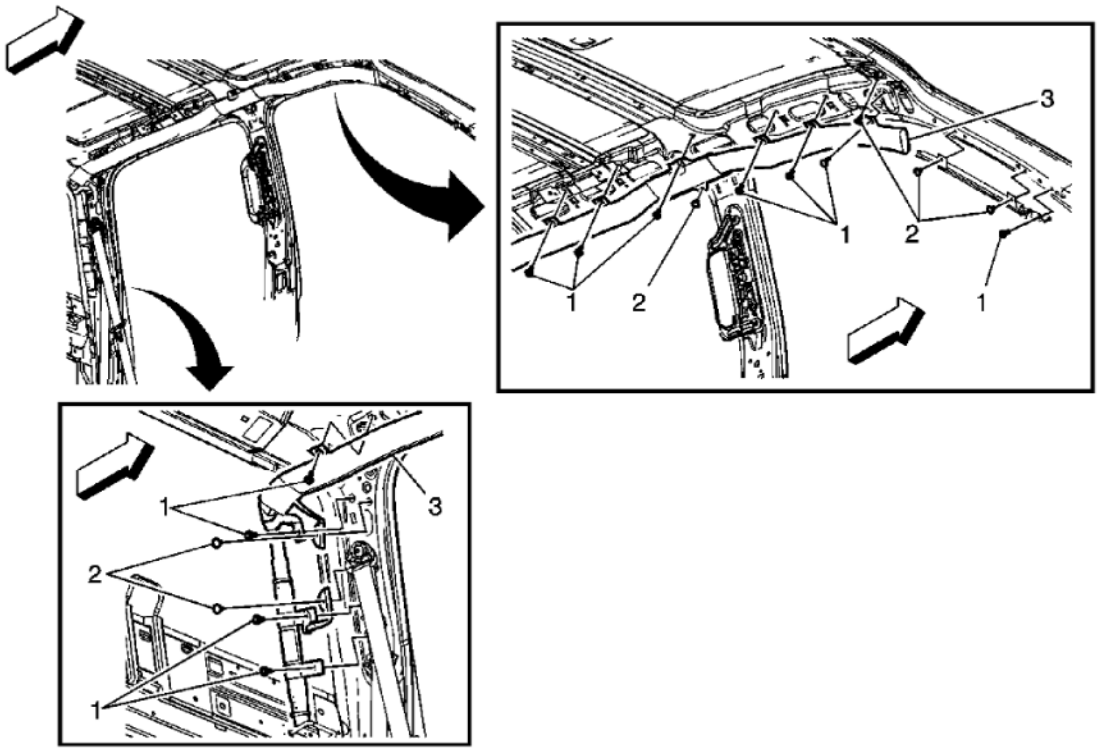


Fig. 23: Inflatable Restraint Roof Side Rail Module Replacement (Crew Cab)
Courtesy of GENERAL MOTORS CORP.

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 SIR Caution .

Preliminary Procedures

1. Disable the SIR system. Refer to **SIR Disabling and Enabling**.
2. Remove the front and rear door sill plate. Refer to **Front Side Door Sill Plate Replacement (Regular Cab/Crew Cab)** or **Front Side Door Sill Plate Replacement (Extended Cab)** and **Rear Side Door Sill Plate Replacement (Extended Cab)** or **Rear Side Door Sill Plate Replacement (Crew Cab)** .
3. Remove the center pillar lower molding. Refer to **Center Pillar Lower Garnish**

Molding Replacement .

4. Remove the center pillar upper molding. Refer to **Center Pillar Upper Garnish Molding Replacement** .
5. Remove the rear window lower trim panel. Refer to **Rear Window Lower Garnish Molding Replacement (Regular Cab)** or **Rear Window Lower Garnish Molding Replacement (Ext Cab/Crew Cab w/A48)** or **Rear Window Lower Garnish Molding Replacement (Ext Cab/Crew Cab w/o A48)** .
6. Remove body lock pillar garnish molding. Refer to **Body Lock Pillar Trim Replacement (Crew Cab)** or **Body Lock Pillar Trim Replacement (Regular Cab)** or **Body Lock Pillar Trim Replacement (Extended Cab)** .
7. Remove the rear assist handle. Refer to **Roof Rail Rear Assist Handle Replacement** .
8. Remove the front assist handle (passenger side only). Refer to **Front Assist Handle Replacement** .
9. Remove the windshield garnish molding. Refer to **Windshield Pillar Garnish Molding Replacement** .
10. Lower the side of headliner. Refer to **Headlining Trim Panel Replacement (Regular Cab)** or **Headlining Trim Panel Replacement (Crew Cab)** or **Headlining Trim Panel Replacement (Extended Cab)** .

1	Inflatable Restraint Roof Rail Module Bolt (Qty: 10) **NOTE:** **Refer to Fastener Notice .** **Procedure** 1. The following repair procedure should be used if an inflatable restraint roof rail module M-6 nut is stripped: 1. Remove the current M-6 bolt. 2. Retain the module out of the way if necessary. Ensure that the module does not get damaged. Remove any other module bolts if installed, to help retain the module out of the way if necessary. 2. If location is at second row roof rail assist handle bracket attachments: • Remove the roof rail assist handle bracket if installed. • Drill out the slot at the location on roof rail assist handle bracket at the stripped weld-nut location to 8 mm (0.31 in) diameter.

	• Hand tap (thread) stripped weld-nut to M7 X 1.00 thread for M-7 replacement bolt. 3. If location is at second row roof rail assist handle bracket attachments, reinstall the roof rail assist handle bracket. 4. If present, remove the M-6 bolt and plastic prefixation bracket from the module assembly. 5. Reinstall the module. Ensure the module does not get damaged. 6. Hand start the replacement M-7 bolt P/N 11609538. For cushion attachments, ensure the bolt goes through both layers of the attachment webbing. 7. Hand start any other bolts that were removed. 8. Tighten the bolts to original specification. **Tighten:** 9 N.m (80 lb ft)
2	Inflatable Restraint Roof Rail Module Retainer (Qty: 5)
3	Inflatable Restraint Roof Rail Module Assembly **Procedure** 1. Release the connector position assurance (CPA) retainer. 2. Disconnect the electrical connectors. 3. Ensure roof rail inflator has been fully deployed before disposal. Refer to **Inflator Module Handling and Scrapping**.

INFLATABLE RESTRAINT ROOF SIDE RAIL MODULE REPLACEMENT (EXTENDED CAB) CAB)

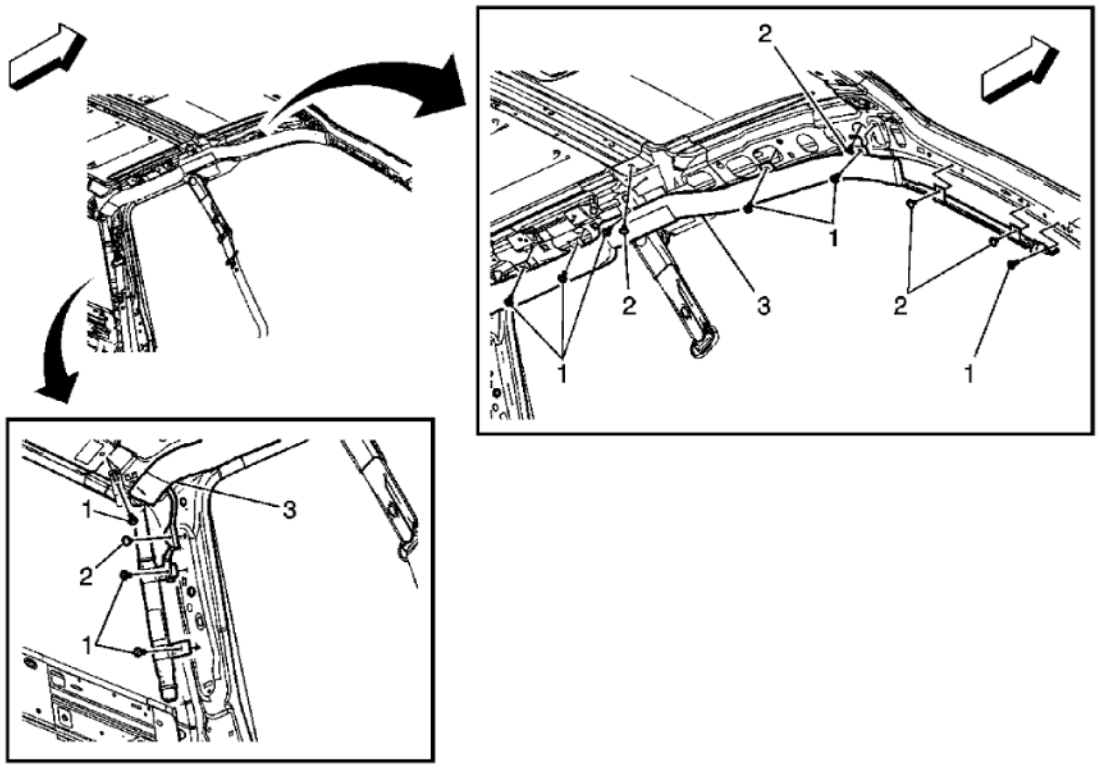


Fig. 24: Inflatable Restraint Roof Side Rail Module Replacement (Extended Cab)
Courtesy of GENERAL MOTORS CORP.

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 SIR Caution .

Preliminary Procedures

1. Disable the SIR system. Refer to **SIR Disabling and Enabling**.
2. Remove the rear door sill plate. Refer to **Rear Side Door Sill Plate Replacement (Extended Cab)** or **Rear Side Door Sill Plate Replacement (Crew Cab)** .
3. Remove the rear window lower trim panel. Refer to **Rear Window Lower Garnish Molding Replacement (Regular Cab)** or **Rear Window Lower Garnish Molding Replacement (Ext Cab/Crew Cab w/A48)** or **Rear Window Lower Garnish**

Molding Replacement (Ext Cab/Crew Cab w/o A48) .

4. Remove body lock pillar garnish molding. Refer to **Body Lock Pillar Trim Replacement (Crew Cab)** or **Body Lock Pillar Trim Replacement (Regular Cab)** or **Body Lock Pillar Trim Replacement (Extended Cab)** .
5. Remove the rear assist handle. Refer to **Roof Rail Rear Assist Handle Replacement** .
6. Remove the front assist handle (passenger side only). Refer to **Front Assist Handle Replacement** .
7. Remove the windshield garnish molding. Refer to **Windshield Pillar Garnish Molding Replacement** .
8. Lower the side of headliner. Refer to **Headlining Trim Panel Replacement (Regular Cab)** or **Headlining Trim Panel Replacement (Crew Cab)** or **Headlining Trim Panel Replacement (Extended Cab)** .

1	Inflatable Restraint Roof Rail Module Bolt (Qty: 9) **NOTE:** **Refer to Fastener Notice .** **Procedure** 1. The following repair procedure should be used if an inflatable restraint roof rail module M-6 nut is stripped: 1. Remove the current M-6 bolt. 2. Retain the module out of the way if necessary. Ensure that the module does not get damaged. Remove any other module bolts if installed, to help retain the module out of the way if necessary. 2. If location is at second row roof rail assist handle bracket attachments: • Remove the roof rail assist handle bracket if installed. • Drill out the slot at the location on roof rail assist handle bracket at the stripped weld-nut location to 8 mm (0.31 in) diameter. • Hand tap (thread) stripped weld-nut to M7 X 1.00 thread for M-7 replacement bolt. 3. If location is at second row roof rail assist handle bracket attachments, reinstall the roof rail assist handle bracket. 4. If present, remove the M-6 bolt and plastic prefixation bracket from the module assembly.

	5. Reinstall the module. Ensure the module does not get damaged. 6. Hand start the replacement M-7 bolt P/N 11609538. For cushion attachments, ensure the bolt goes through both layers of the attachment webbing. 7. Hand start any other bolts that were removed. 8. Tighten the bolts to original specification. **Tighten:** 9 N.m (80 lb ft)
2	Inflatable Restraint Roof Rail Module Retainer (Qty: 5)
3	Inflatable Restraint Roof Rail Module Assembly **Procedure** 1. Release the connector position assurance (CPA) retainer. 2. Disconnect the electrical connectors. 3. Ensure roof rail inflator has been fully deployed before disposal. Refer to **Inflator Module Handling and Scrapping**.

INFLATABLE RESTRAINT ROOF SIDE RAIL MODULE REPLACEMENT (REGULAR CAB)

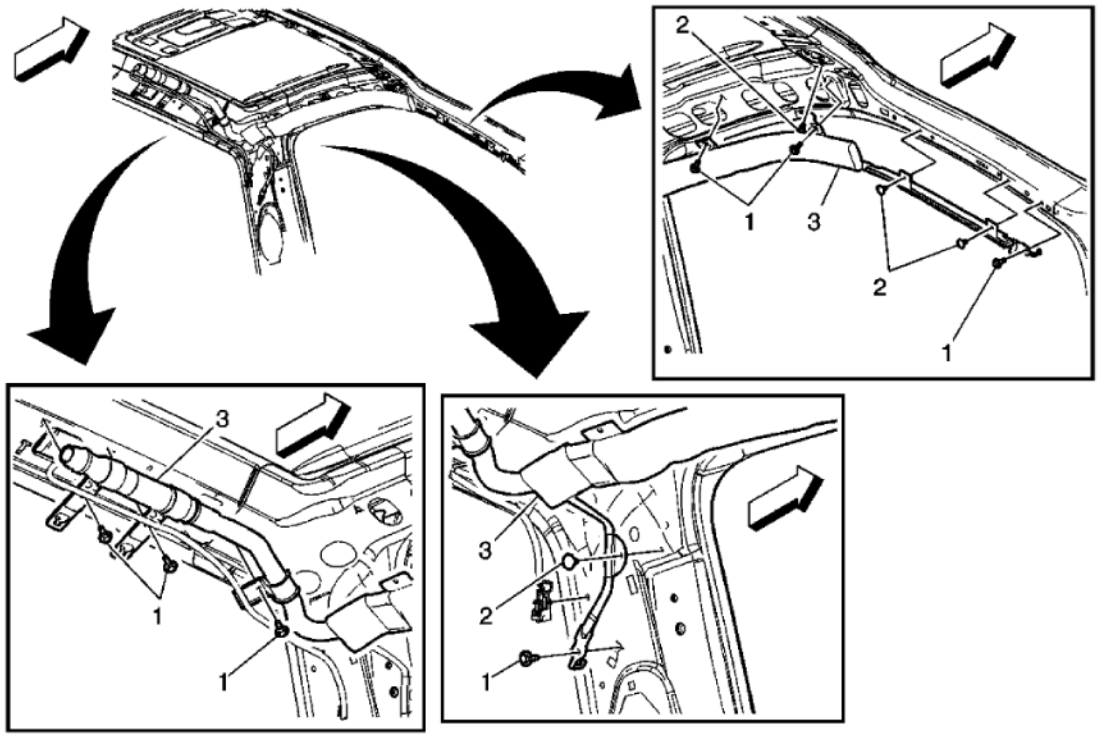


Fig. 25: Inflatable Restraint Roof Side Rail Module Replacement (Regular Cab)
Courtesy of GENERAL MOTORS CORP.

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 SIR Caution .

Preliminary Procedures

1. Disable the SIR system. Refer to **SIR Disabling and Enabling**.
2. Remove the front door sill plate. Refer to **Front Side Door Sill Plate Replacement (Regular Cab/Crew Cab)** or **Front Side Door Sill Plate Replacement (Extended Cab)** .
3. Remove the rear window lower trim panel. Refer to **Rear Window Lower Garnish Molding Replacement (Regular Cab)** or **Rear Window Lower Garnish Molding**

Replacement (Ext Cab/Crew Cab w/A48) or **Rear Window Lower Garnish Molding Replacement (Ext Cab/Crew Cab w/o A48)** .

4. Remove body lock pillar garnish molding. Refer to **Body Lock Pillar Trim Replacement (Crew Cab)** or **Body Lock Pillar Trim Replacement (Regular Cab)** or **Body Lock Pillar Trim Replacement (Extended Cab)** .
5. Remove the front assist handle (passenger side only). Refer to **Front Assist Handle Replacement** .
6. Remove windshield garnish molding. Refer to **Windshield Pillar Garnish Molding Replacement** .
7. Lower side of headliner. Refer to **Headlining Trim Panel Replacement (Regular Cab)** or **Headlining Trim Panel Replacement (Crew Cab)** or **Headlining Trim Panel Replacement (Extended Cab)** .

1	Inflatable Restraint Roof Rail Module Bolt (Qty: 7) **NOTE:** **Refer to Fastener Notice .** **Procedure** 1. The following repair procedure should be used if an inflatable restraint roof rail module M-6 nut is stripped: 1. Remove the current M-6 bolt. 2. Retain the module out of the way if necessary. Ensure that the module does not get damaged. Remove any other module bolts if installed, to help retain the module out of the way if necessary. 2. If location is at second row roof rail assist handle bracket attachments: • Remove the roof rail assist handle bracket if installed. • Drill out the slot at the location on roof rail assist handle bracket at the stripped weld-nut location to 8 mm (0.31 in) diameter. • Hand tap (thread) stripped weld-nut to M7 X 1.00 thread for M-7 replacement bolt. 3. If location is at second row roof rail assist handle bracket attachments, reinstall the roof rail assist handle bracket. 4. If present, remove the M-6 bolt and plastic prefixation bracket from the module assembly. 5. Reinstall the module. Ensure the module does not get damaged.

	6. Hand start the replacement M-7 bolt P/N 11609538. For cushion attachments, ensure the bolt goes through both layers of the attachment webbing. 7. Hand start any other bolts that were removed. 8. Tighten the bolts to original specification. **Tighten:** 9 N.m (80 lb ft)
2	Inflatable Restraint Roof Rail Module Retainer (Qty: 4)
3	Inflatable Restraint Roof Rail Module Assembly **Procedure** 1. Release the connector position assurance (CPA) retainer. 2. Disconnect the electrical connectors. 3. Ensure roof rail inflator has been fully deployed before disposal. Refer to **Inflator Module Handling and Scrapping**.

SEAT BELT RETRACTOR PRETENSIONER REPLACEMENT - FRONT (REGULAR CAB)

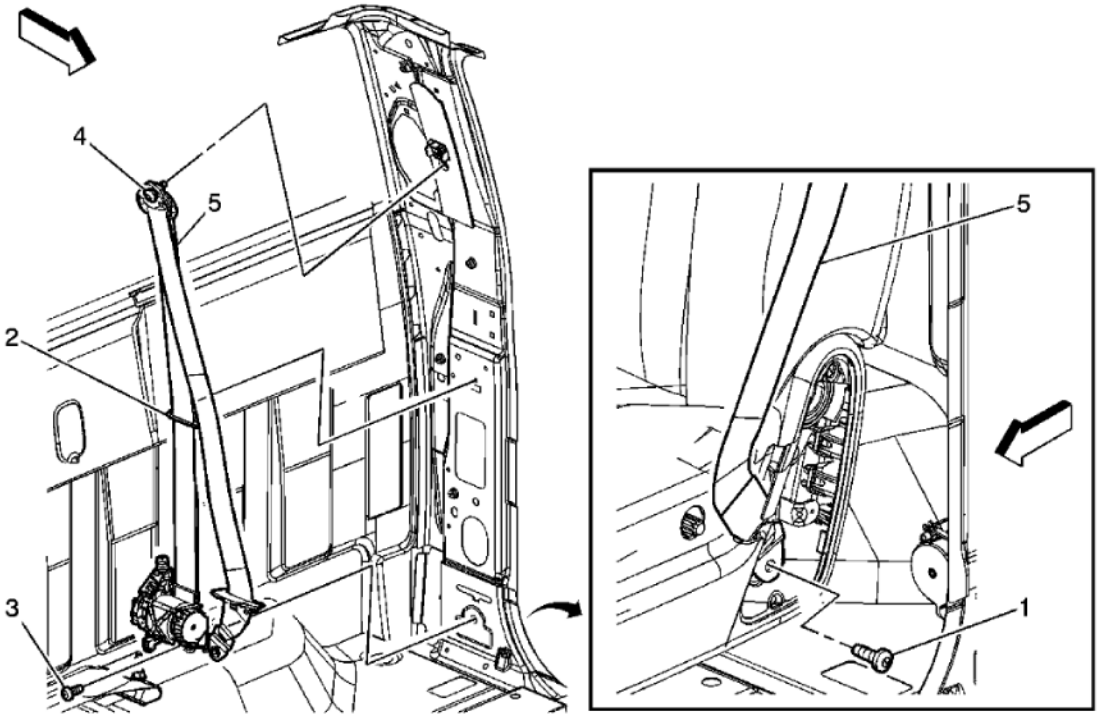


Fig. 26: Seat Belt Retractor Pretensioner Replacement - Front (Regular Cab)

Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
CAUTION: **Refer to SIR Caution .** **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.** **Preliminary Procedures** 1. Disable the SIR. Refer to **SIR Disabling and Enabling**. 2. Remove the front seats. Refer to **Front Seat Replacement - Bucket** . 3. Remove the rear window lower molding. Refer to **Rear Window Lower Garnish Molding Replacement (Regular Cab)** or **Rear Window Lower Garnish Molding Replacement (Ext Cab/Crew Cab w/A48)** or **Rear Window Lower Garnish Molding Replacement (Ext Cab/Crew Cab w/o A48)** . 4. Remove rear door sill plate. Refer to **Rear Side Door Sill Plate Replacement (Extended Cab)** or **Rear Side Door Sill Plate Replacement (Crew Cab)** . 5. Remove the body lock pillar trim panel. Refer to **Body Lock Pillar Trim Replacement (Crew Cab)** or **Body Lock Pillar Trim Replacement (Regular Cab)** or **Body Lock Pillar Trim Replacement (Extended Cab)** .	
1	Front Seat Belt Anchor Plate Bolt **NOTE:** **Refer to Fastener Notice .** **Tighten:** 45 N.m (33 lb ft)
2	Front Seat Belt Guide
3	Front Seat Belt Retractor Bolt **Tip:** Disconnect electrical connector. **Tighten:** 45 N.m (33 lb ft)
	Front Seat Belt Adjuster Bolt

4	**Tighten:** 45 N.m (33 lb ft)
5	Front Seat Belt Retractor Assembly **Tip:** Route seat belt through slot in body lock pillar trim panel.

SEAT BELT RETRACTOR PRETENSIONER REPLACEMENT - FRONT (EXTENDED CAB)

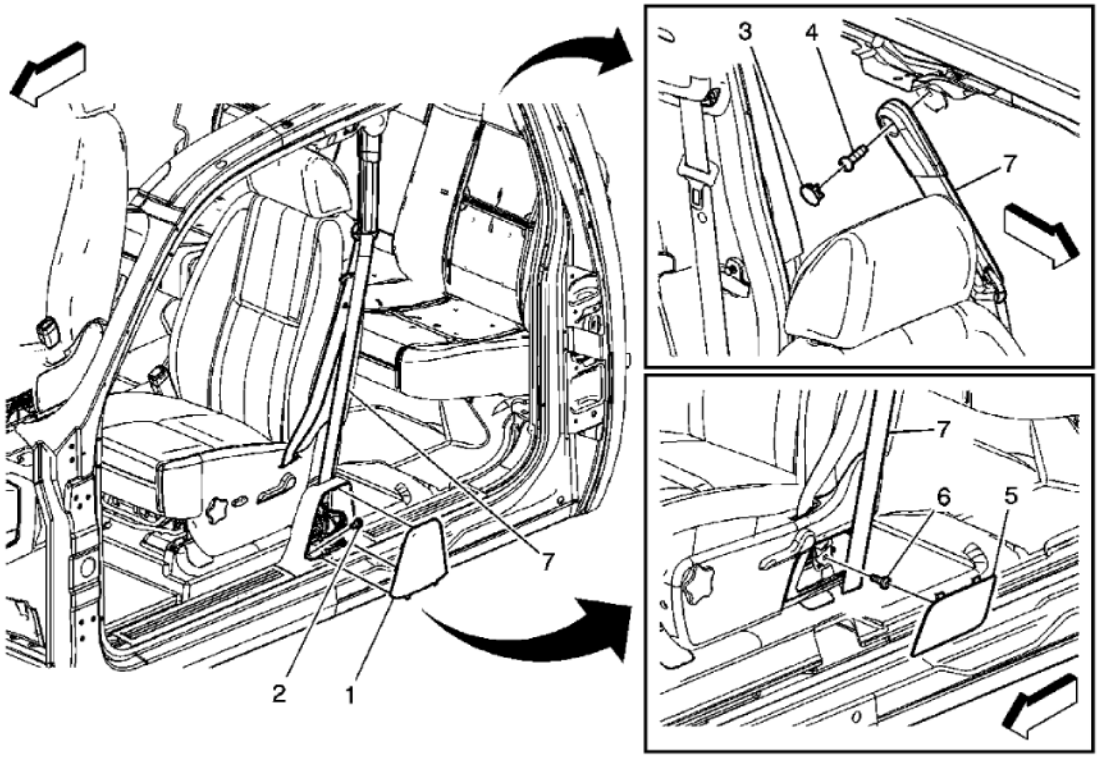


Fig. 27: Seat Belt Retractor Pretensioner Replacement - Front (Extended Cab)
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
CAUTION: **Refer to SIR Caution .** **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.**	

Preliminary Procedures

1. Disable the SIR. Refer to **SIR Disabling and Enabling**.
2. Remove front door sill plate. Refer to **Front Side Door Sill Plate Replacement (Regular Cab/Crew Cab)** or **Front Side Door Sill Plate Replacement (Extended Cab)** .
3. Remove rear door sill plate. Refer to **Rear Side Door Sill Plate Replacement (Extended Cab)** or **Rear Side Door Sill Plate Replacement (Crew Cab)** .

1	Front Seat Belt Retractor Trim Cover
2	Front Seat Belt Retractor Bolt **NOTE:** **Refer to Fastener Notice .** **Tip:** Disconnect electrical connector. **Tighten:** 45 N.m (33 lb ft)
3	Front Seat Shoulder Belt Guide Plug
4	Front Seat Shoulder Belt Guide Bolt **Tighten:** 45 N.m (33 lb ft)
5	Front Seat Adjuster Finish Cover
6	Front Seat Shoulder Belt Anchor Plate Bolt **Tighten:** 45 N.m (33 lb ft)
7	Front Seat Shoulder Belt Retractor Assembly

SEAT BELT RETRACTOR PRETENSIONER REPLACEMENT - FRONT (CREW CAB)

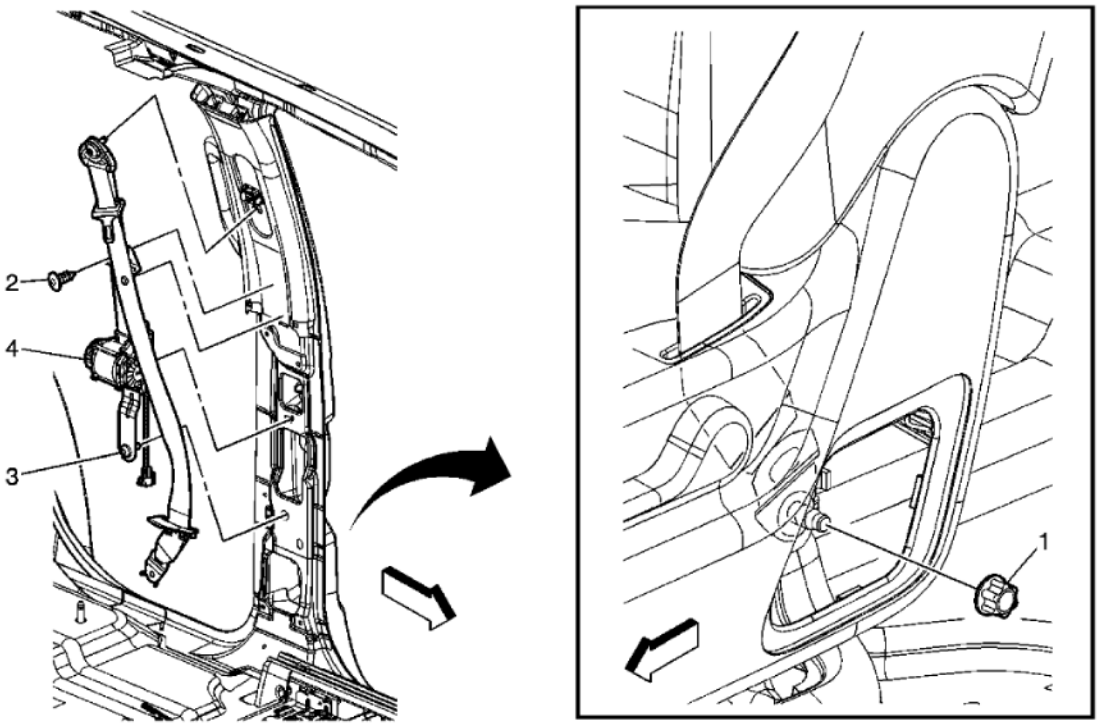


Fig. 28: Seat Belt Retractor Pretensioner Replacement - Front (Crew Cab)
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name

CAUTION:
Refer to SIR Caution .

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.

Preliminary Procedures

1. Disable the SIR. Refer to **SIR Disabling and Enabling**.
2. Remove front seat shoulder belt adjuster cover. Refer to **Seat Belt Height Adjuster Knob Replacement - Front** .
3. Remove front door sill plate. Refer to **Front Side Door Sill Plate Replacement**

(Regular Cab/Crew Cab) or **Front Side Door Sill Plate Replacement (Extended Cab)** .

4. Remove rear door sill plate. Refer to **Rear Side Door Sill Plate Replacement (Extended Cab)** or **Rear Side Door Sill Plate Replacement (Crew Cab)** .
5. Remove center pillar lower garnish molding. Refer to **Center Pillar Lower Garnish Molding Replacement** .

1	Front Seat Shoulder Belt Anchor Plate Nut **NOTE:** Refer to Fastener Notice . **Tighten:** 45 N.m (33 lb ft)
2	Front Seat Shoulder Belt Guide Retainer
3	Front Seat Shoulder Belt Retractor Bolt **Tip:** Disconnect electrical connector. **Tighten:** 45 N.m (33 lb ft)
4	Front Seat Shoulder Belt Retractor Assembly

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** .
- The instrument panel (I/P) knee bolsters and mounting points-Inspect the knee bolsters for bending, twisting, buckling, or any other type of damage.
- The I/P brackets, braces, etc.-Inspect for bending, twisting, buckling, or any other type of

damage.

- The seat belts-Perform the seat belt operational and functional checks. Refer to **Operational and Functional Checks** .
- The I/P mounting points and brackets-Inspect for bending, twisting, buckling, or any other type of damage.
- The roof rail and roof rail module mounting points-Inspect for bending, twisting, buckling, or any other type of damage.
- The seats and seat mounting points-Inspect for bending, twisting, buckling, or any other type of damage.
- Passenger seat bottom equipped with Passenger Presence System (PPS)-Check for any DTCs or problems that may cause the PPS not to function properly.

Accident With Frontal Air Bag Deployment - Component Replacement and Inspections

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

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

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

Perform additional inspections on the following components:

- 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) (front/rear), 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 .

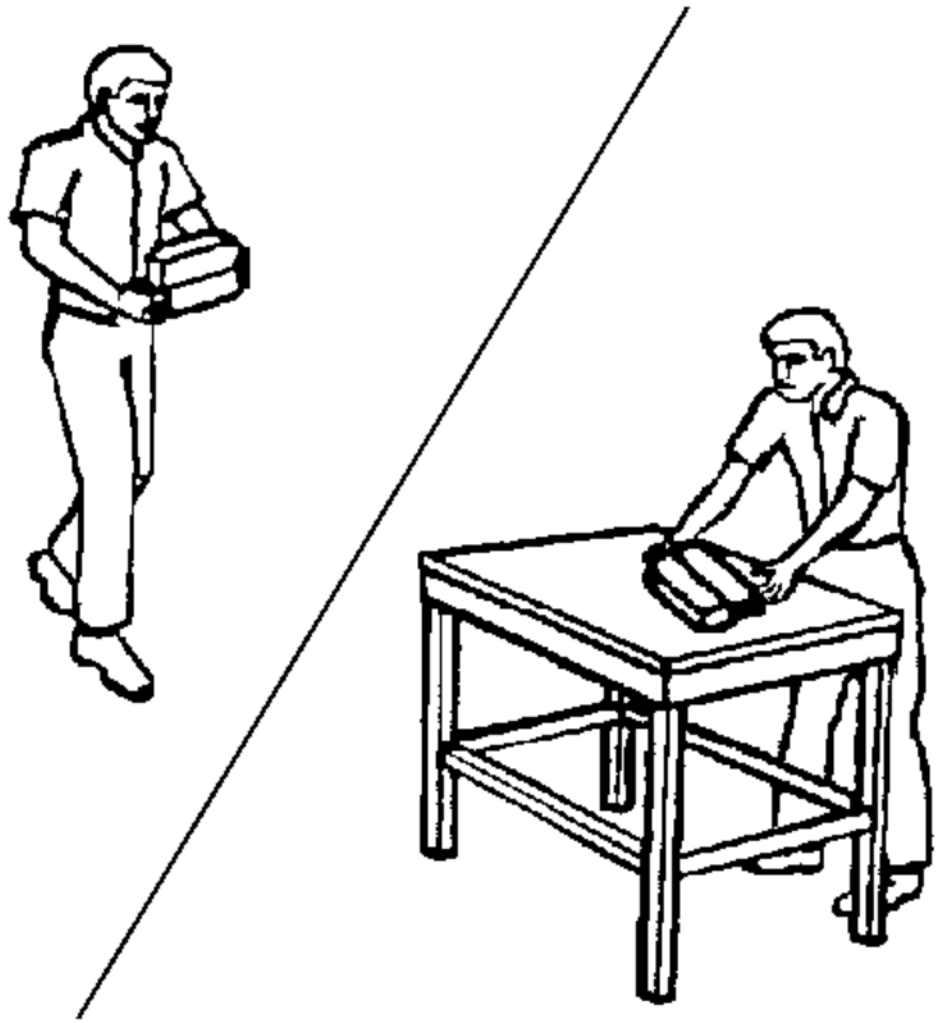


Fig. 29: View Of Proper Handling Of Undeployed Inflator Module
Courtesy of GENERAL MOTORS CORP.

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

Scrapping Procedure

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

Do not deploy the inflator module in the following situations:

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

Deployment Procedures

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

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

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

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

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

period.

CAUTION: 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.

Special Tools

- **J 39401-B** SIR Deployment Fixture
- **J 38826** SIR Deployment Harness
- 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 Side Rail Module Replacement (Crew Cab)** or **Inflatable Restraint Roof Side Rail Module Replacement (Extended Cab)** or **Inflatable Restraint Roof Side Rail Module Replacement (Regular Cab)**.

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

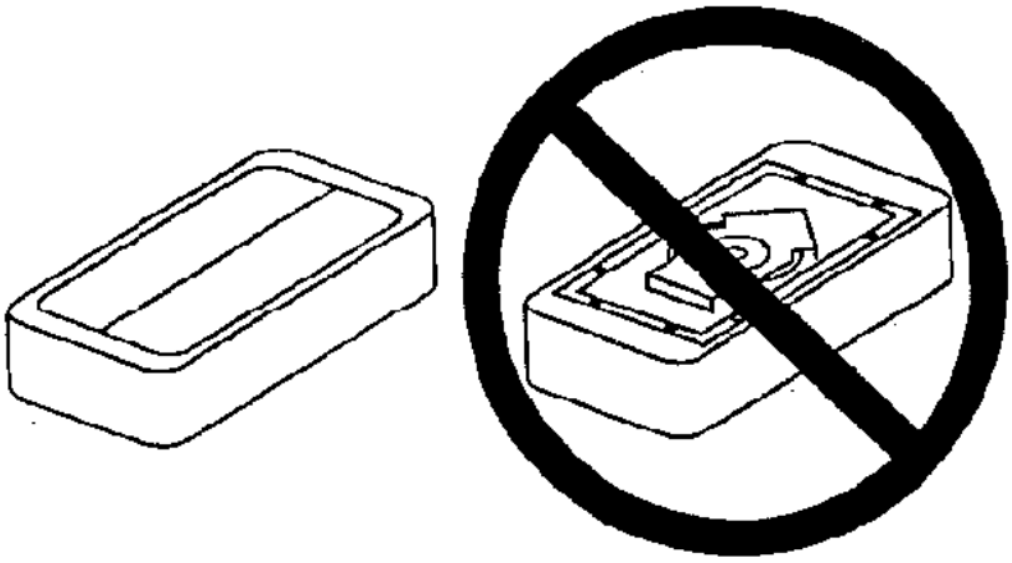


Fig. 30: Illustrating Proper Storage Of Inflator Module
Courtesy of GENERAL MOTORS CORP.

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

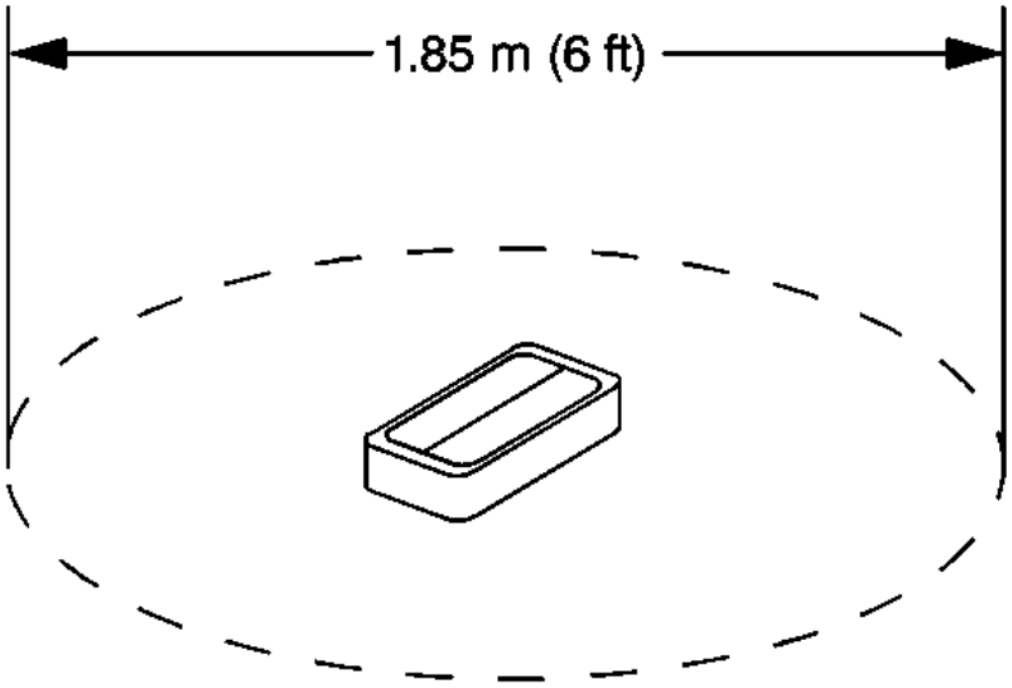


Fig. 31: Clearance For Deployment Of Inflator Module
Courtesy of GENERAL MOTORS CORP.

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.

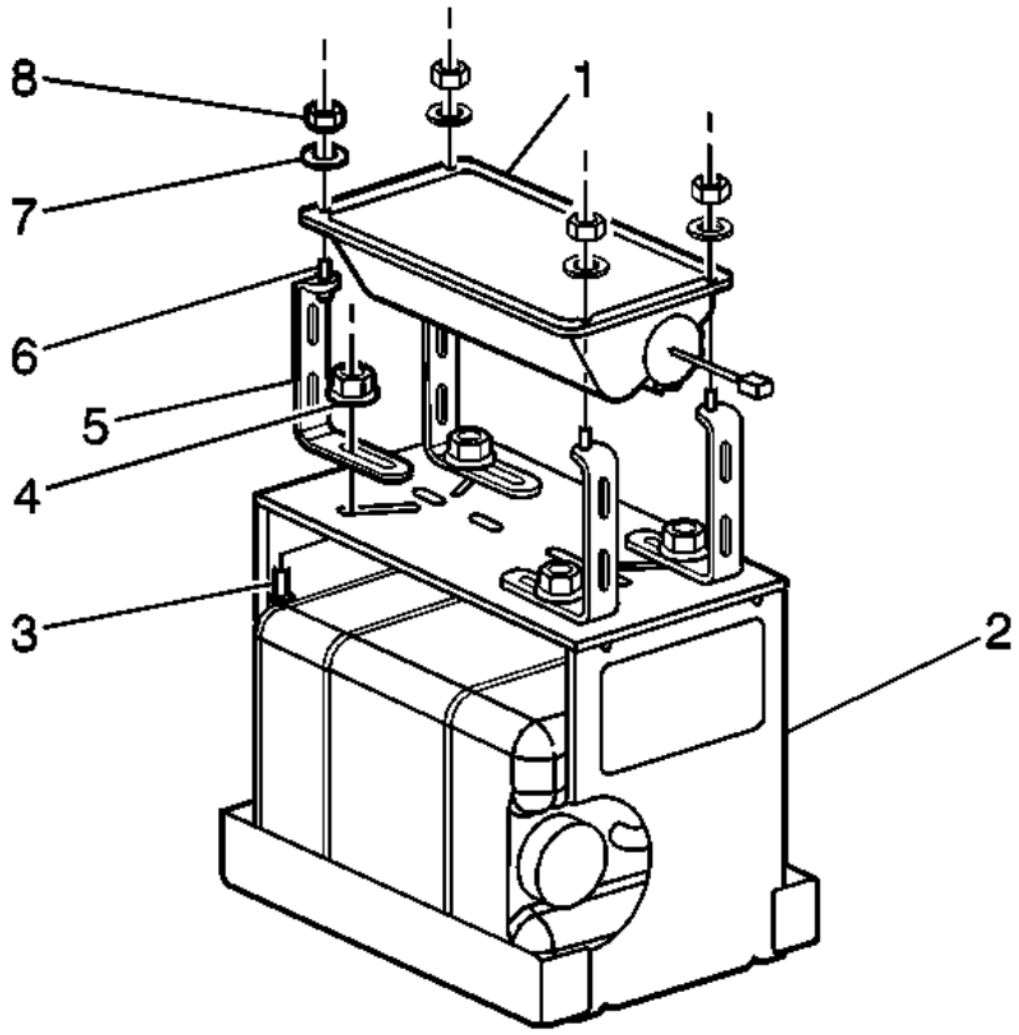


Fig. 32: Identifying I/P Module Components
Courtesy of GENERAL MOTORS CORP.

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.
    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).

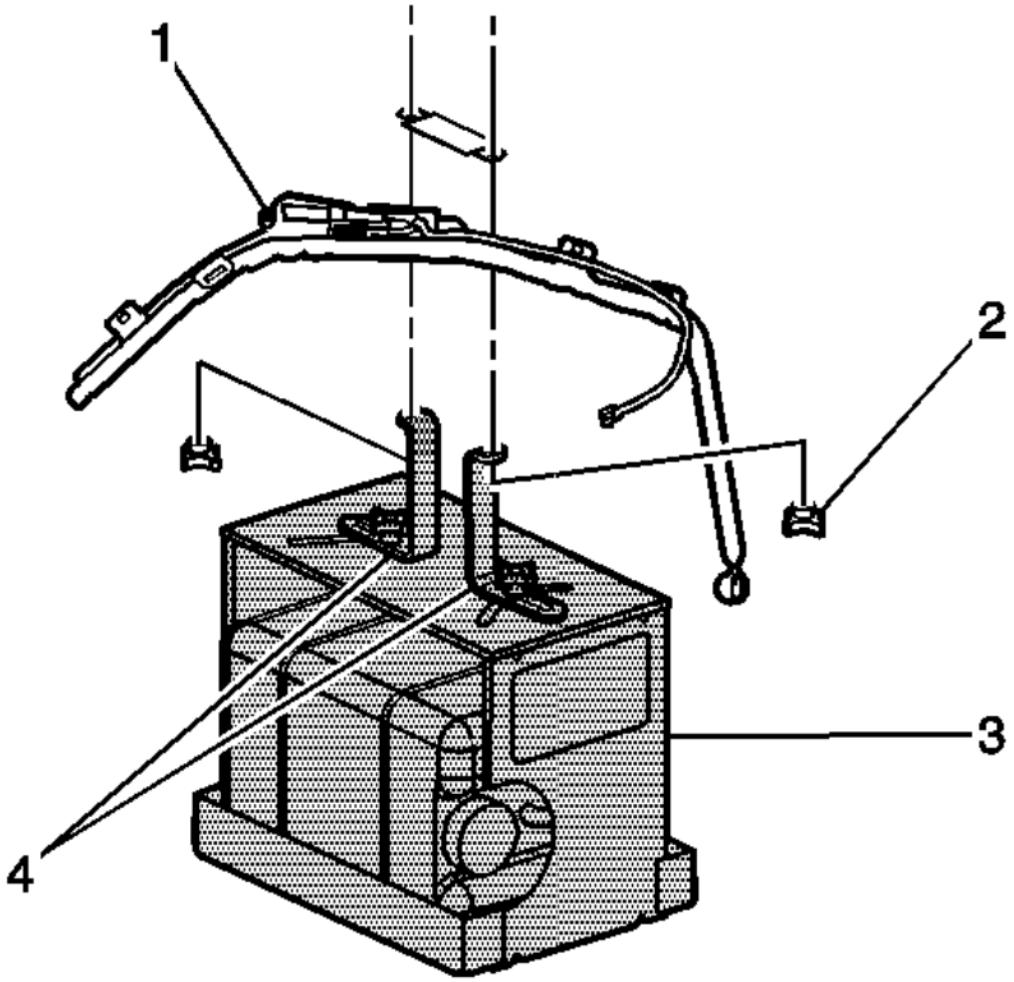


Fig. 33: Identifying Fasteners Holding Side Impact Module To Deployment Fixture
Courtesy of GENERAL MOTORS CORP.

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.
    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.

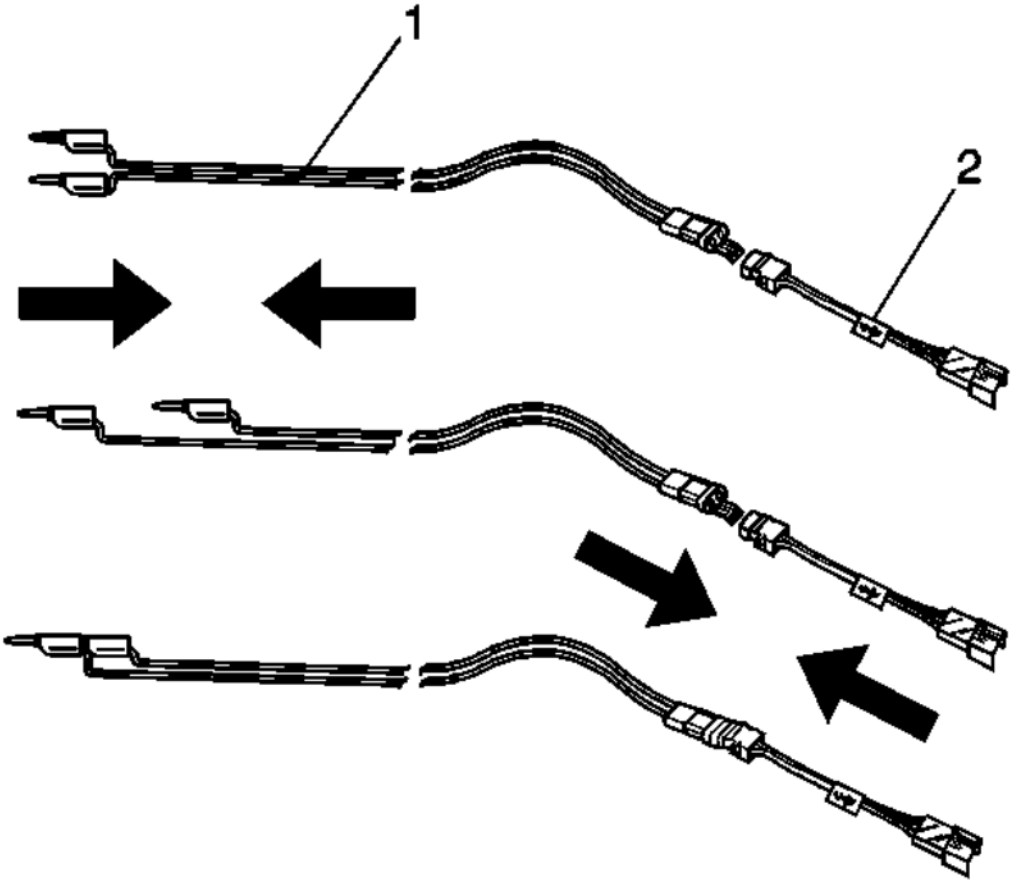


Fig. 34: Identifying SIR Deployment Harness & Adapter
Courtesy of GENERAL MOTORS CORP.

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).

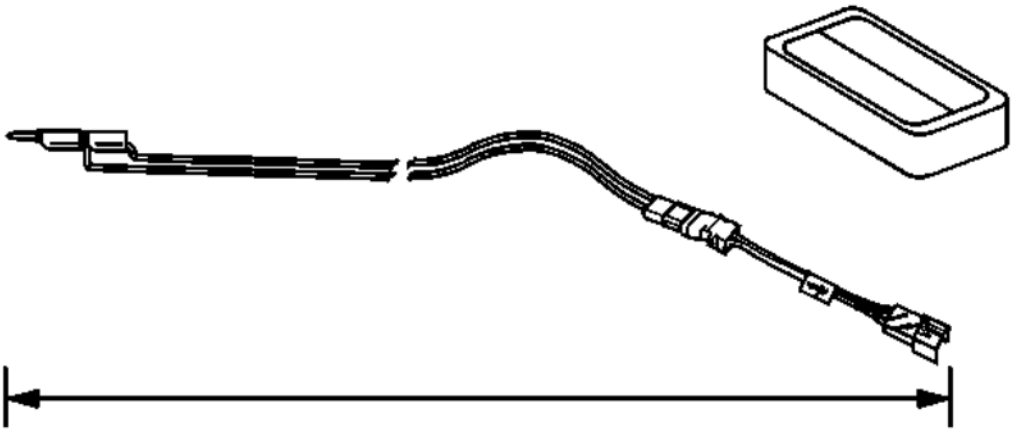


Fig. 35: Extending SIR Deployment Harness & Adapter
Courtesy of GENERAL MOTORS CORP.

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.

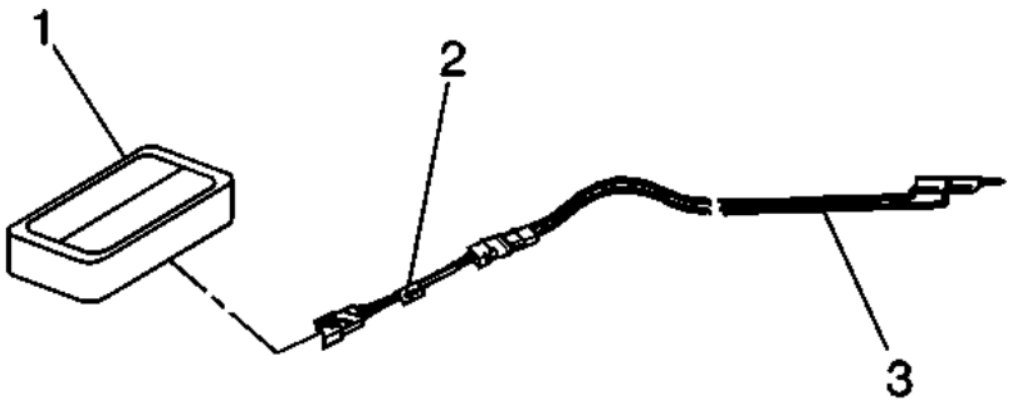


Fig. 36: Inflator Module & SIR Deployment Harness Adapter
Courtesy of GENERAL MOTORS CORP.

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.

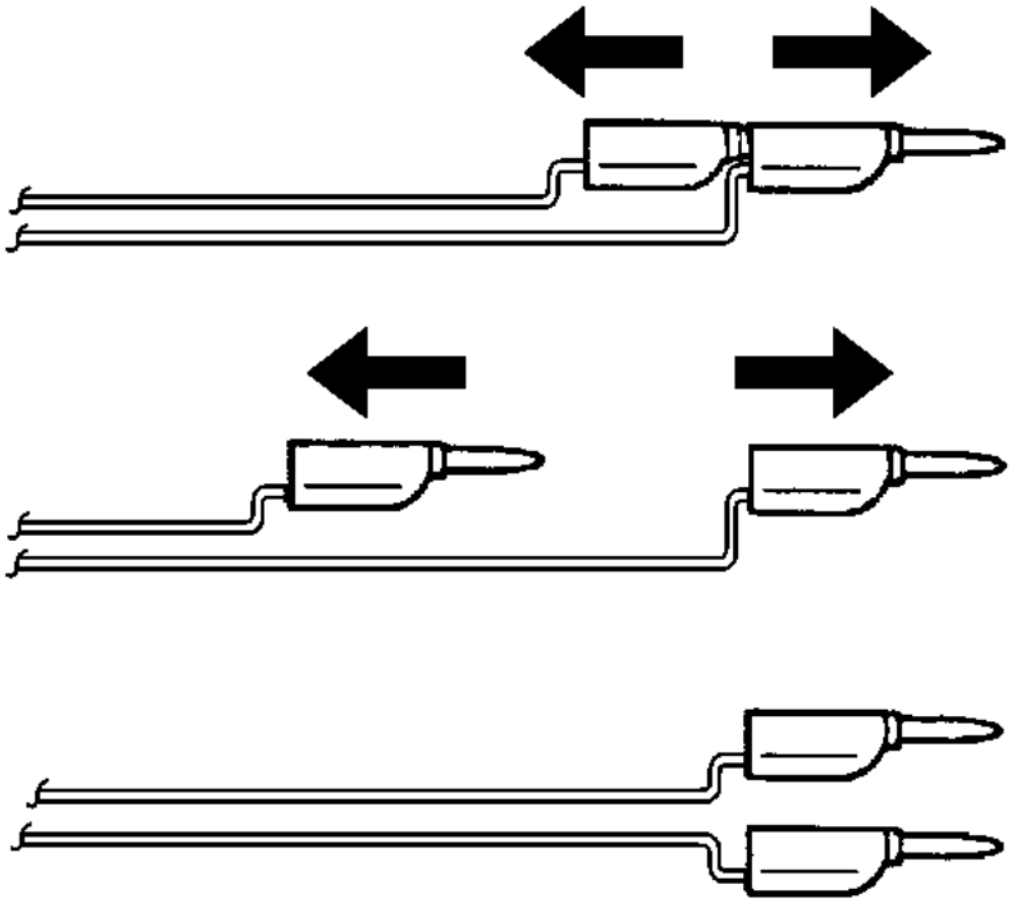


Fig. 37: Separating Banana Plugs
Courtesy of GENERAL MOTORS CORP.

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

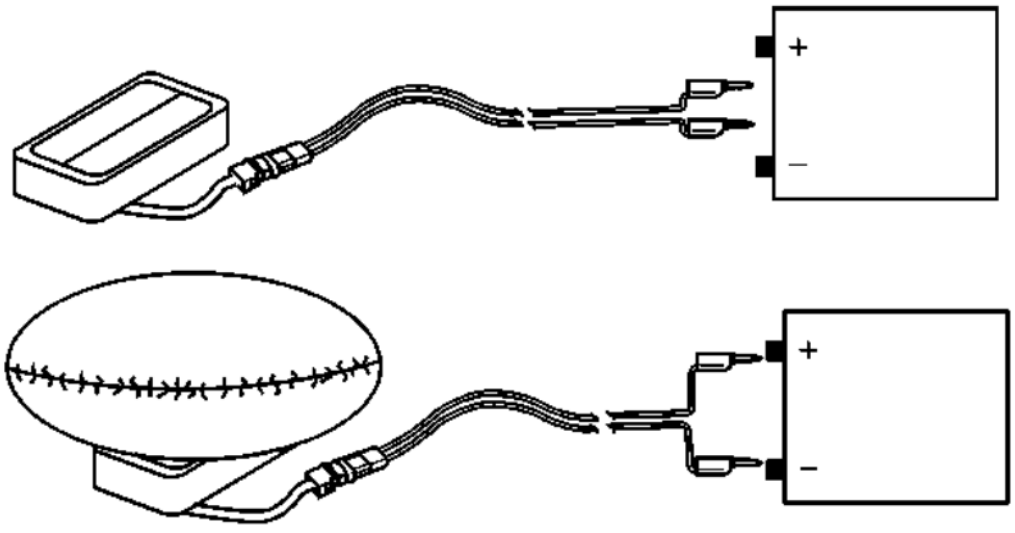


Fig. 38: Connecting SIR Deployment Harness Wires To Power Source
Courtesy of GENERAL MOTORS CORP.

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.

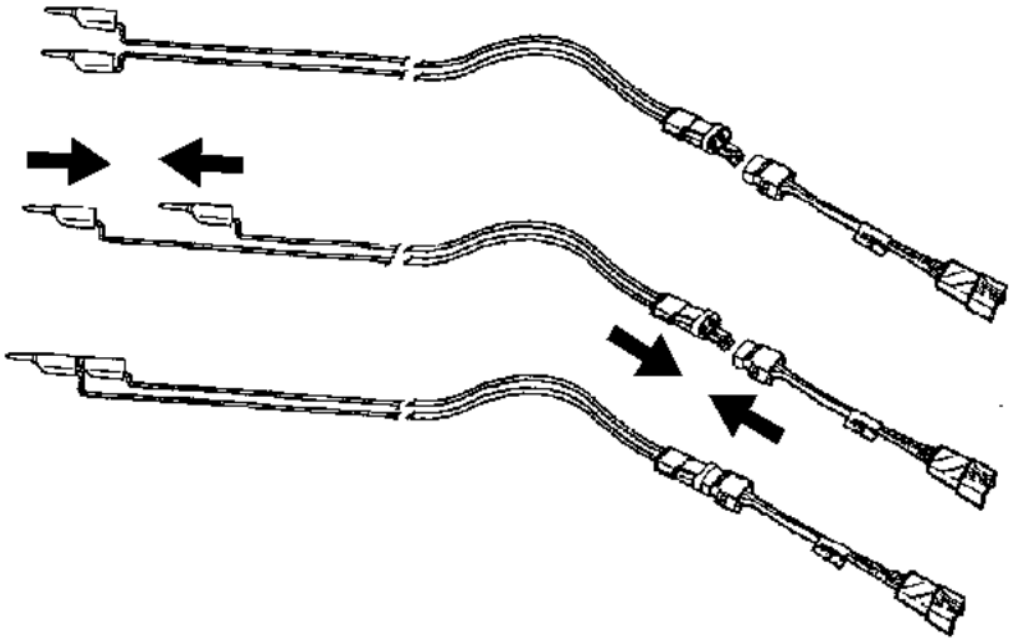


Fig. 39: View Of Deployment Harness Leads
Courtesy of GENERAL MOTORS CORP.

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

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

Deployment Inside Vehicle - Vehicle Scrapping Procedure

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

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

CAUTION: 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.

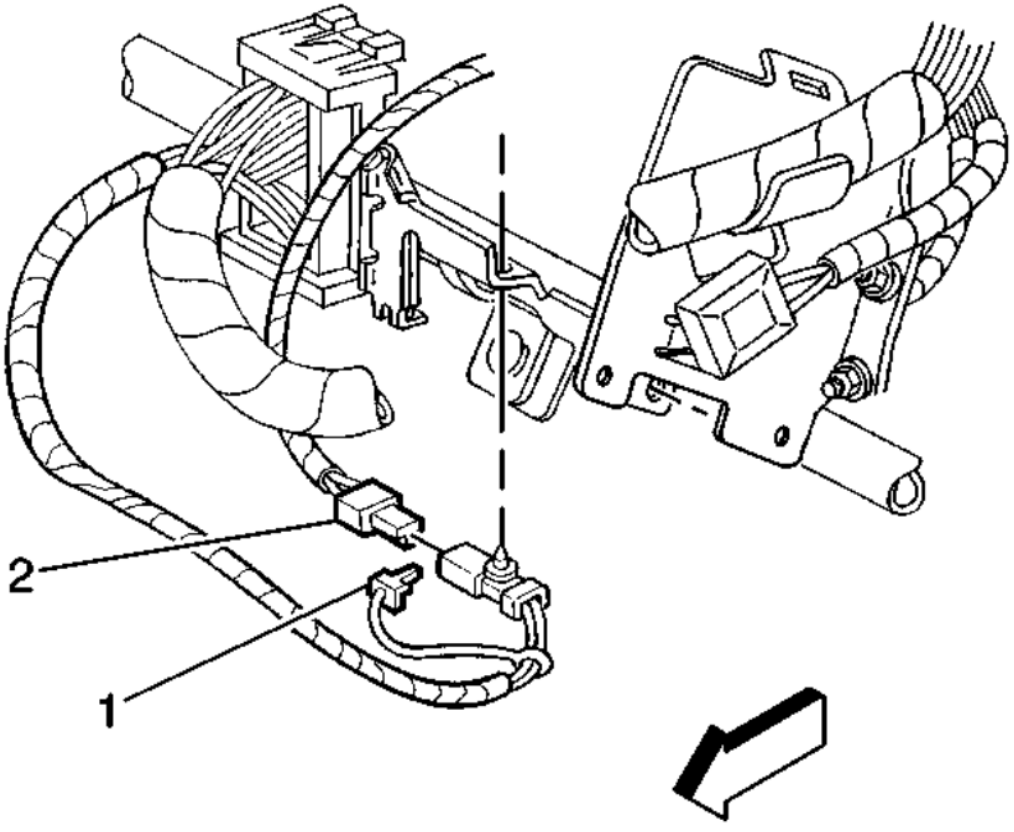


Fig. 41: Locating Inflatable Restraint Steering Wheel Module Connector
Courtesy of GENERAL MOTORS CORP.

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

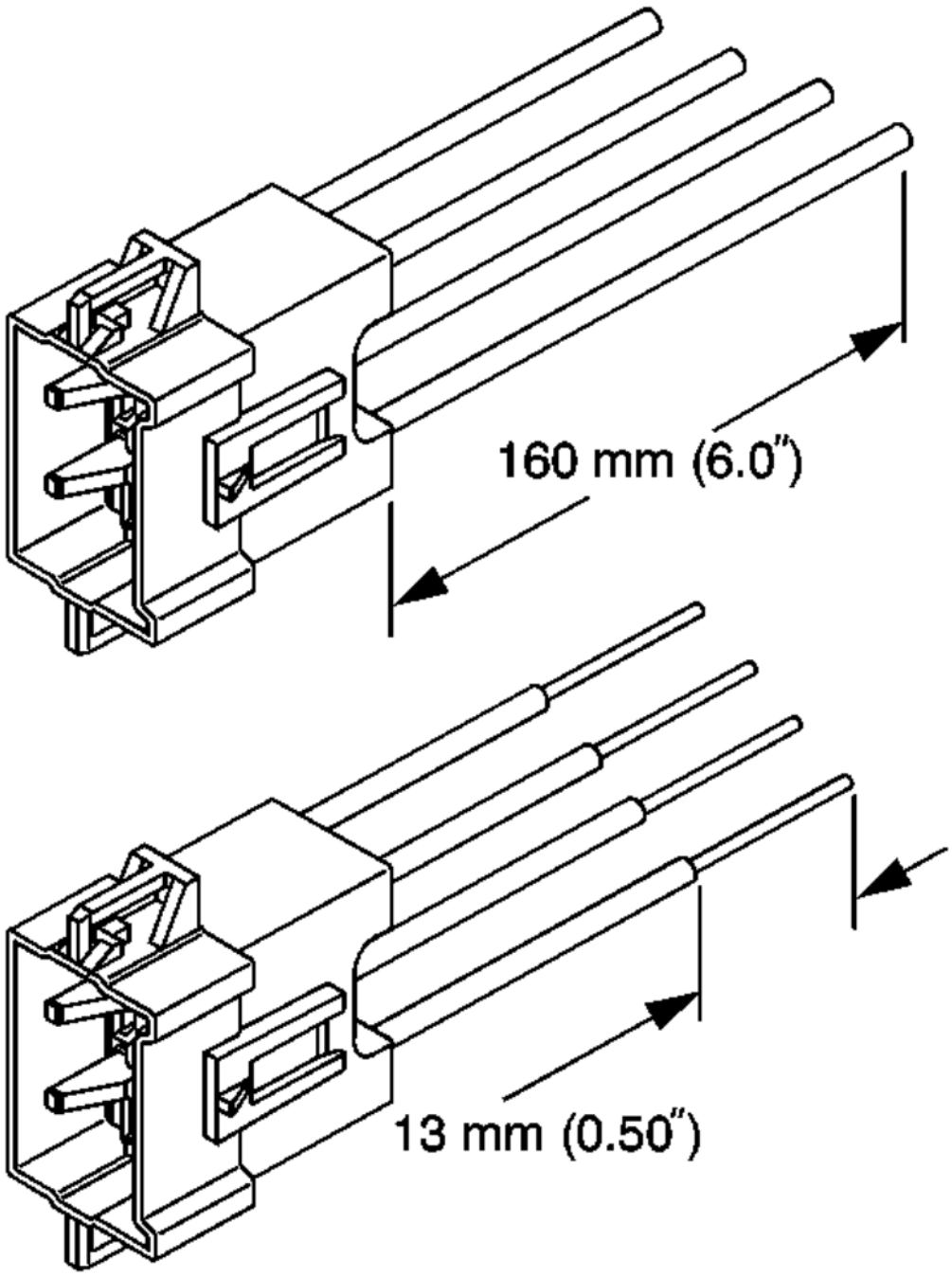


Fig. 42: Stripping SIR Wires
Courtesy of GENERAL MOTORS CORP.

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 Component Connector End Views for determining high and low circuits.

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

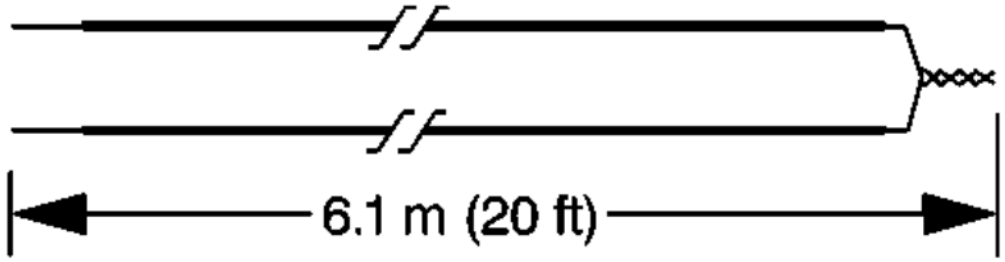


Fig. 43: Fabricating 20 Ft. Deployment Harness
Courtesy of GENERAL MOTORS CORP.

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.

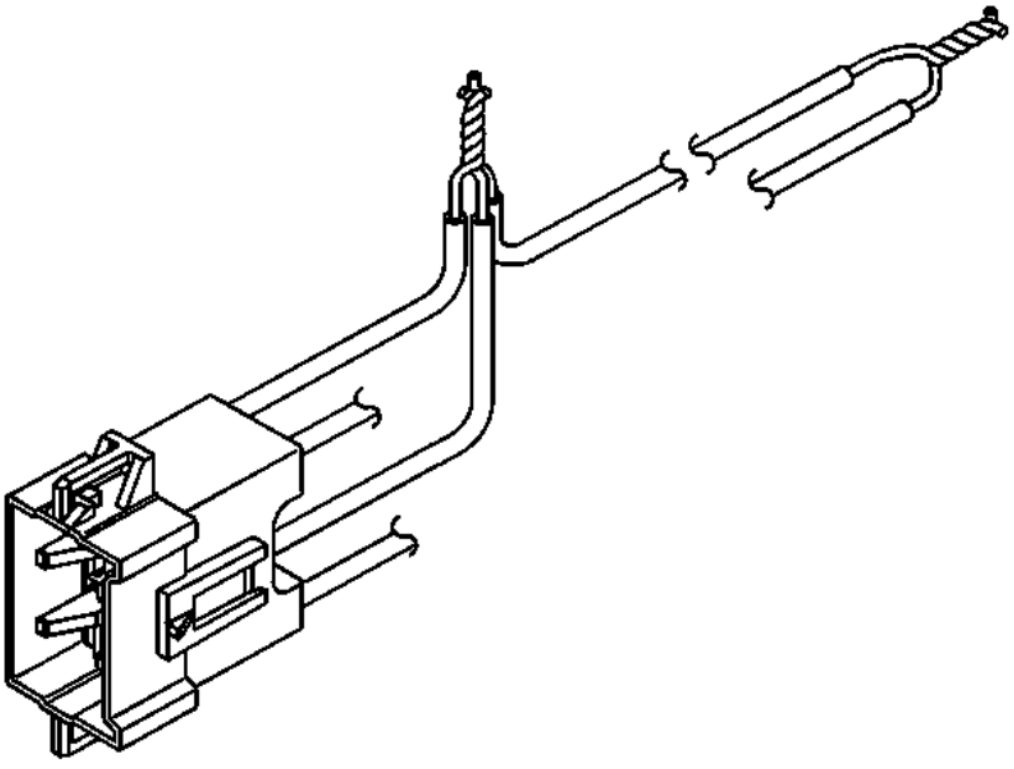


Fig. 44: Twisting Connector Wire Leads (High Circuits) To Deployment Harness Wire
Courtesy of GENERAL MOTORS CORP.

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

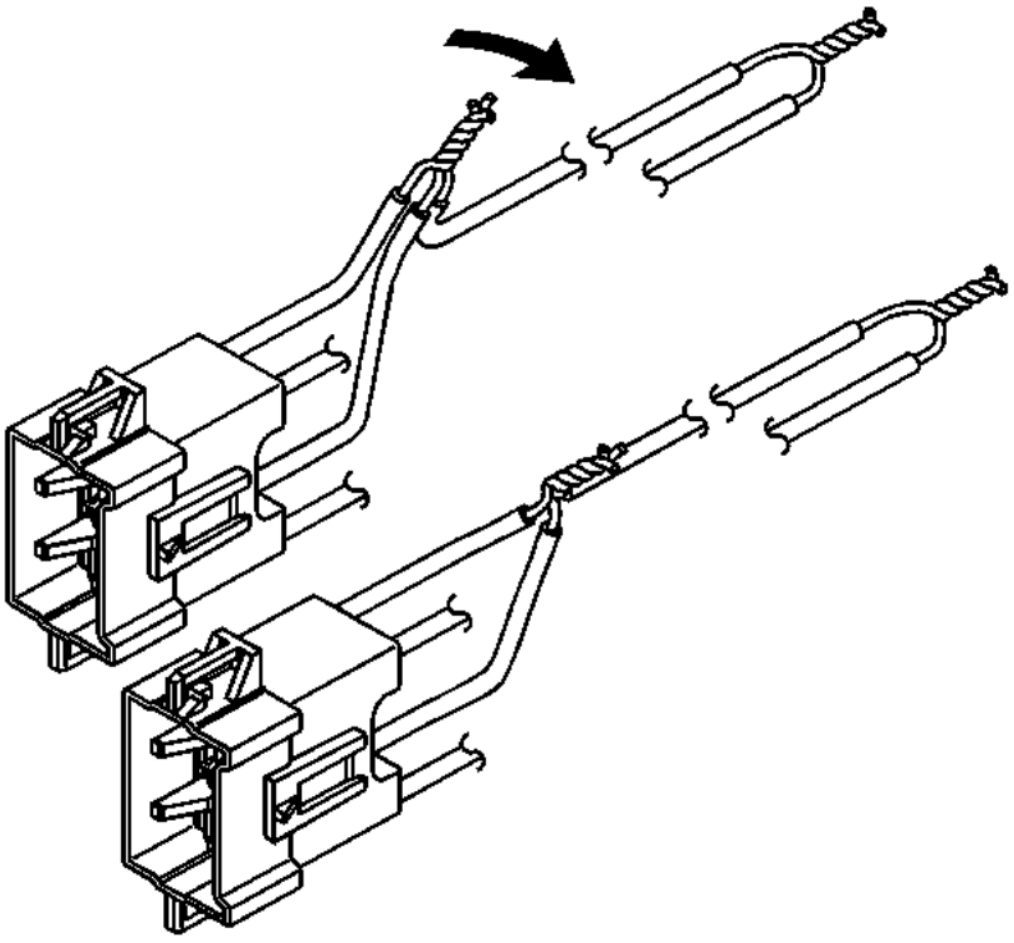


Fig. 45: Bending Twisted Connection Flat
Courtesy of GENERAL MOTORS CORP.

14. Bend flat the twisted connection.

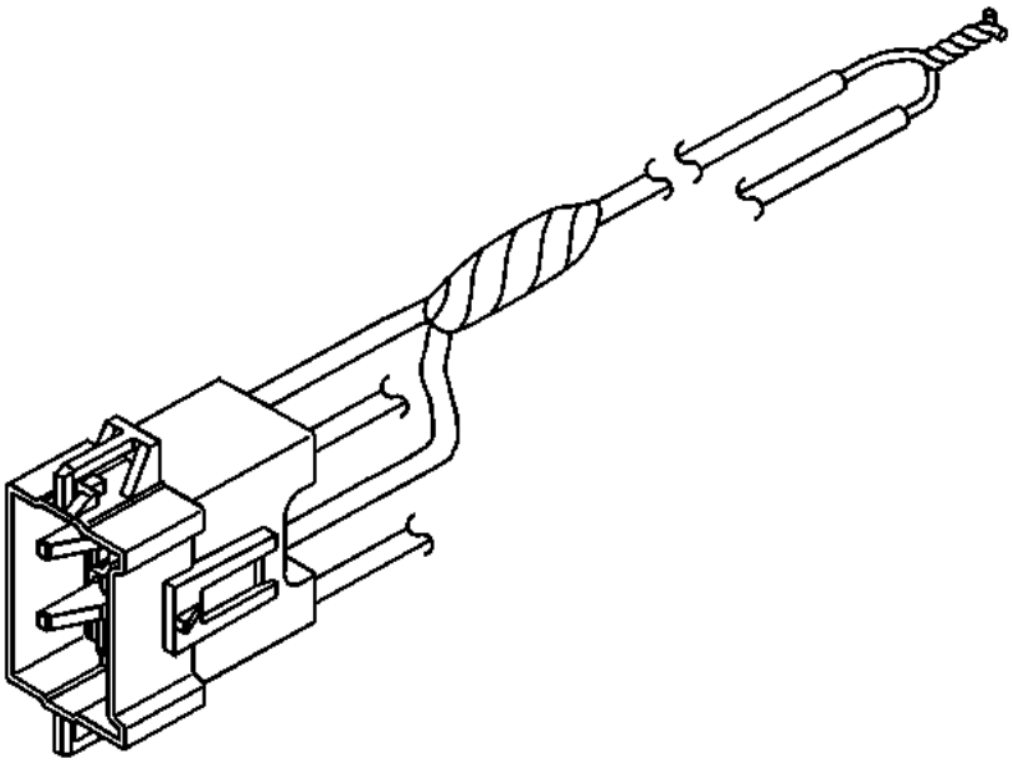


Fig. 46: Insulating Connection With Electrical Tape
Courtesy of GENERAL MOTORS CORP.

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

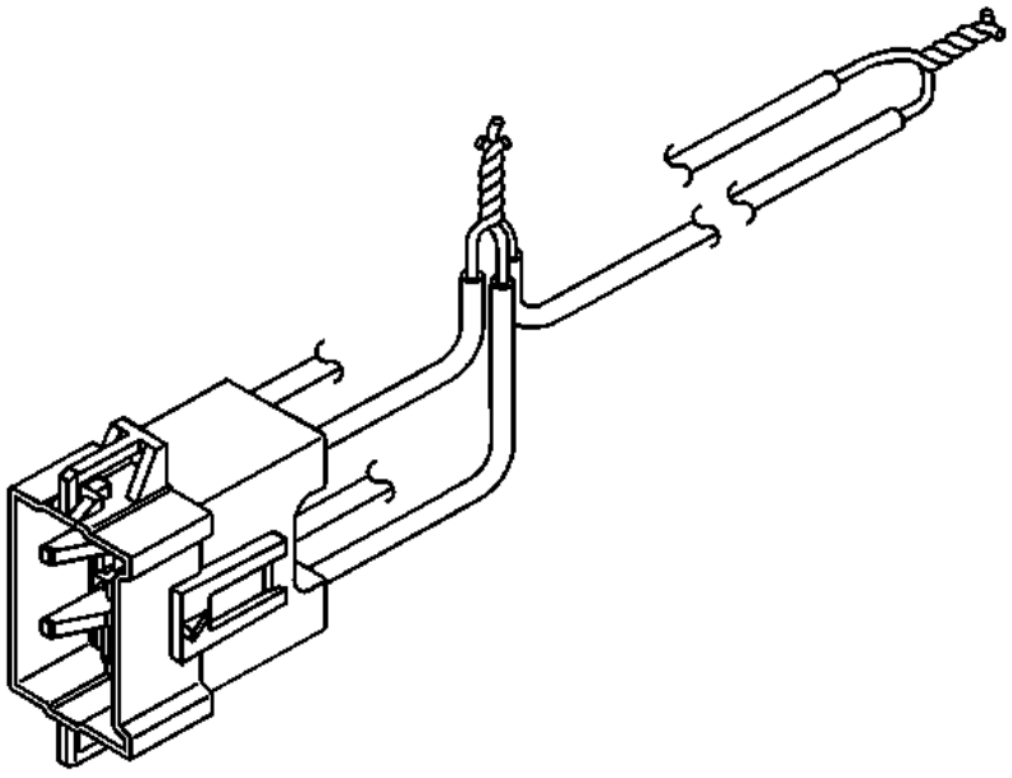


Fig. 47: Twisting Connector Wire Leads (Low Circuits) To Deployment Harness Wire
Courtesy of GENERAL MOTORS CORP.

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

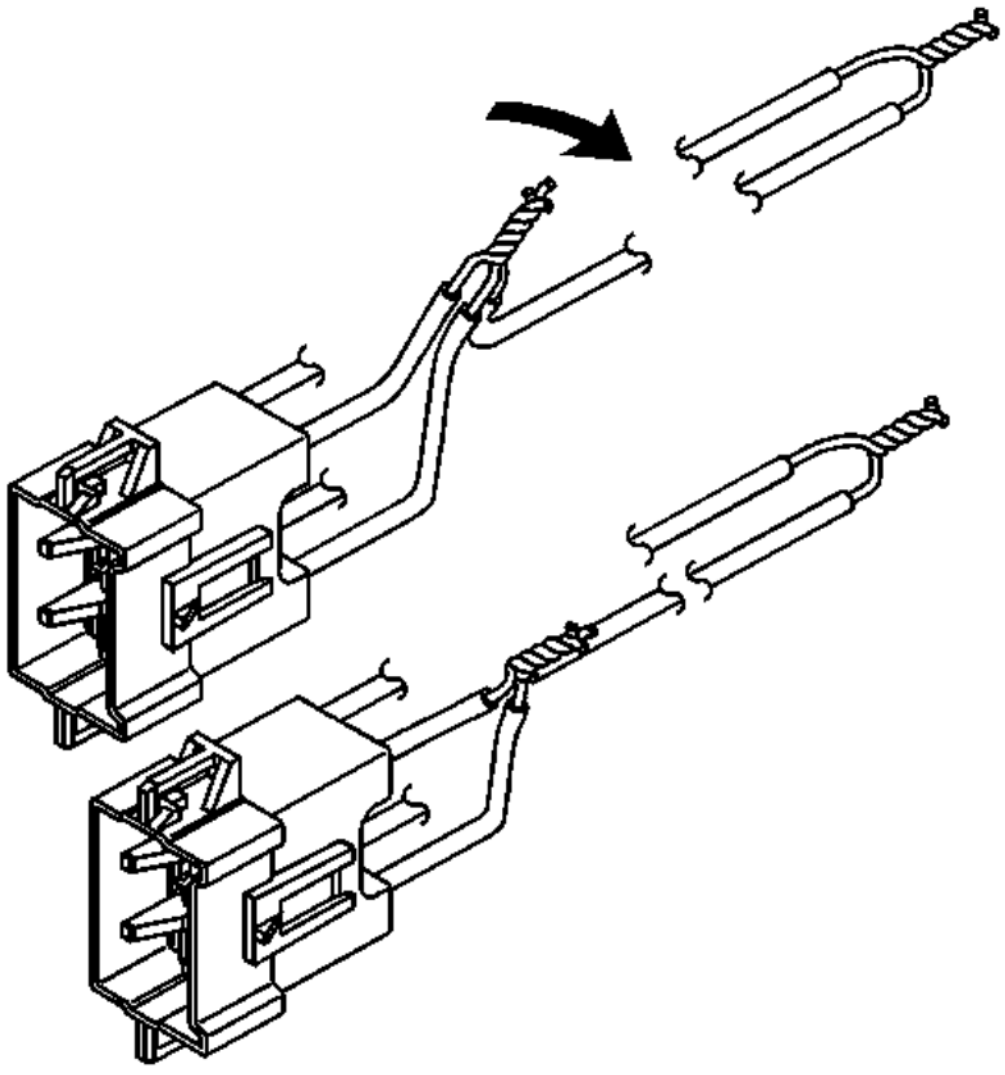


Fig. 48: Bending Twisted Connection Flat
Courtesy of GENERAL MOTORS CORP.

18. Bend flat the twisted connection.

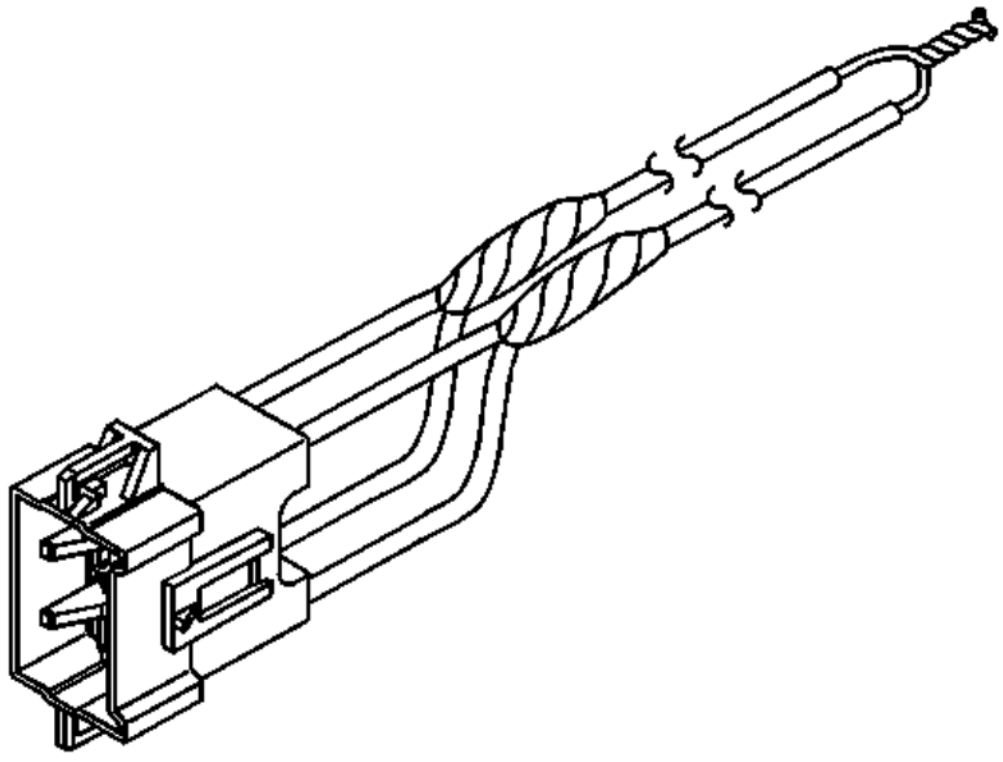


Fig. 49: Insulating Connection With Electrical Tape
Courtesy of GENERAL MOTORS CORP.

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.

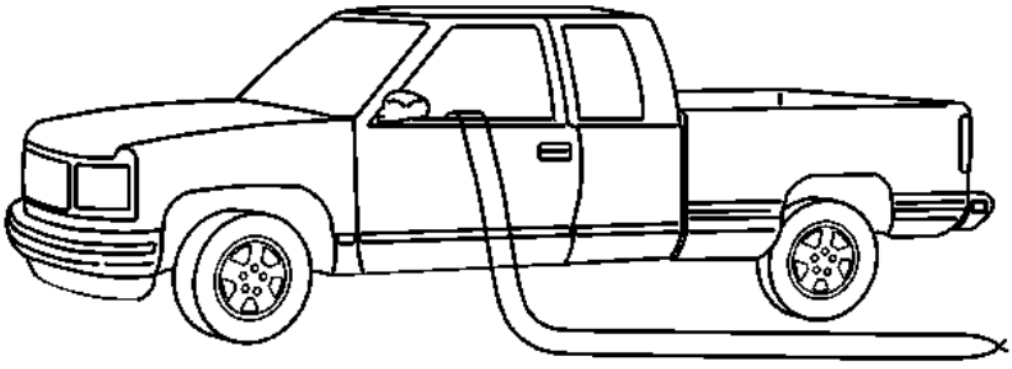


Fig. 50: Routing The Deployment Harness Out Of The Vehicle's Driver Side
Courtesy of GENERAL MOTORS CORP.

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

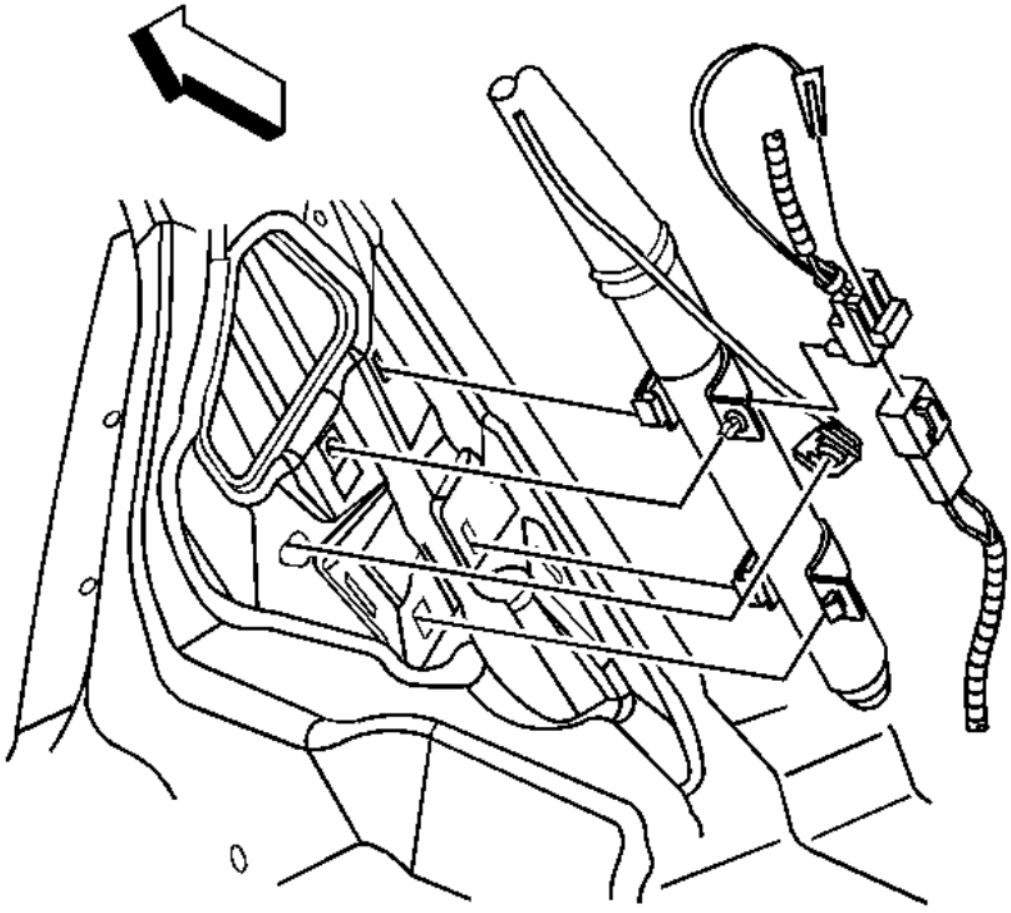


Fig. 51: Locating Roof Rail Module Connector
Courtesy of GENERAL MOTORS CORP.

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

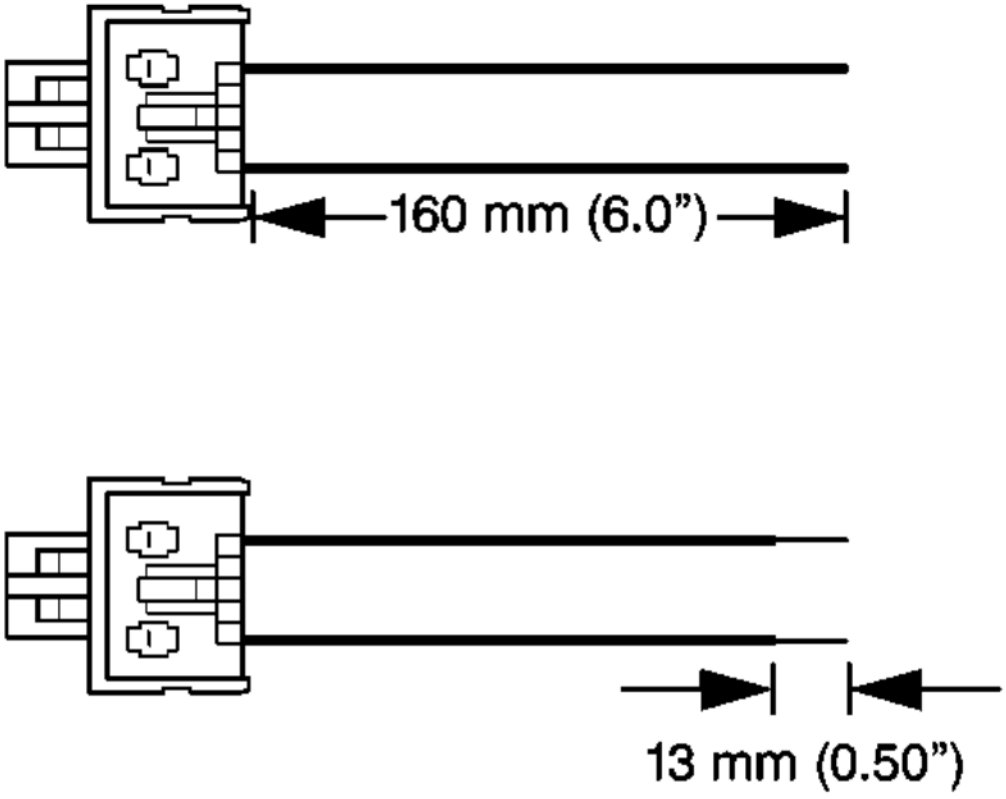


Fig. 52: Identifying Proper Stripping Of Connection Wire Leads
Courtesy of GENERAL MOTORS CORP.

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.

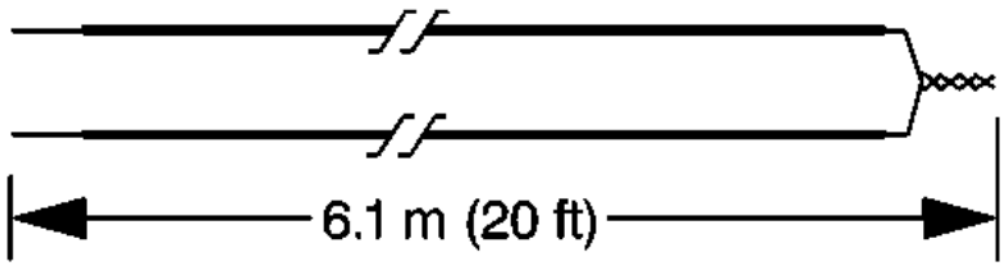


Fig. 53: Fabricating 20 Ft. Deployment Harness
Courtesy of GENERAL MOTORS CORP.

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.

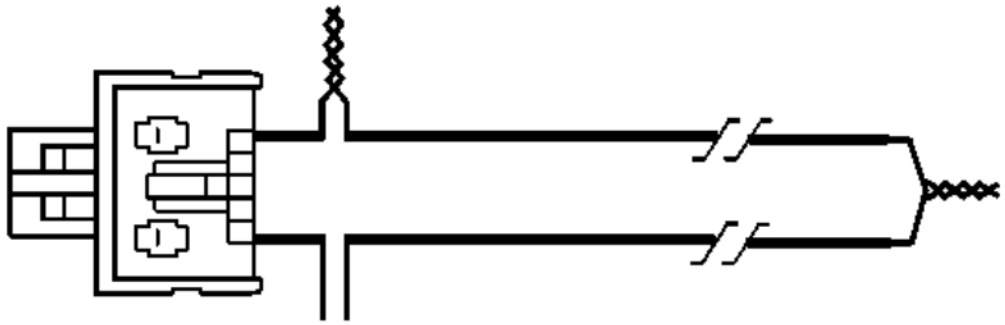


Fig. 54: View Of Proper Twisting Of Connector Wire Lead To Deployment Wire
Courtesy of GENERAL MOTORS CORP.

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

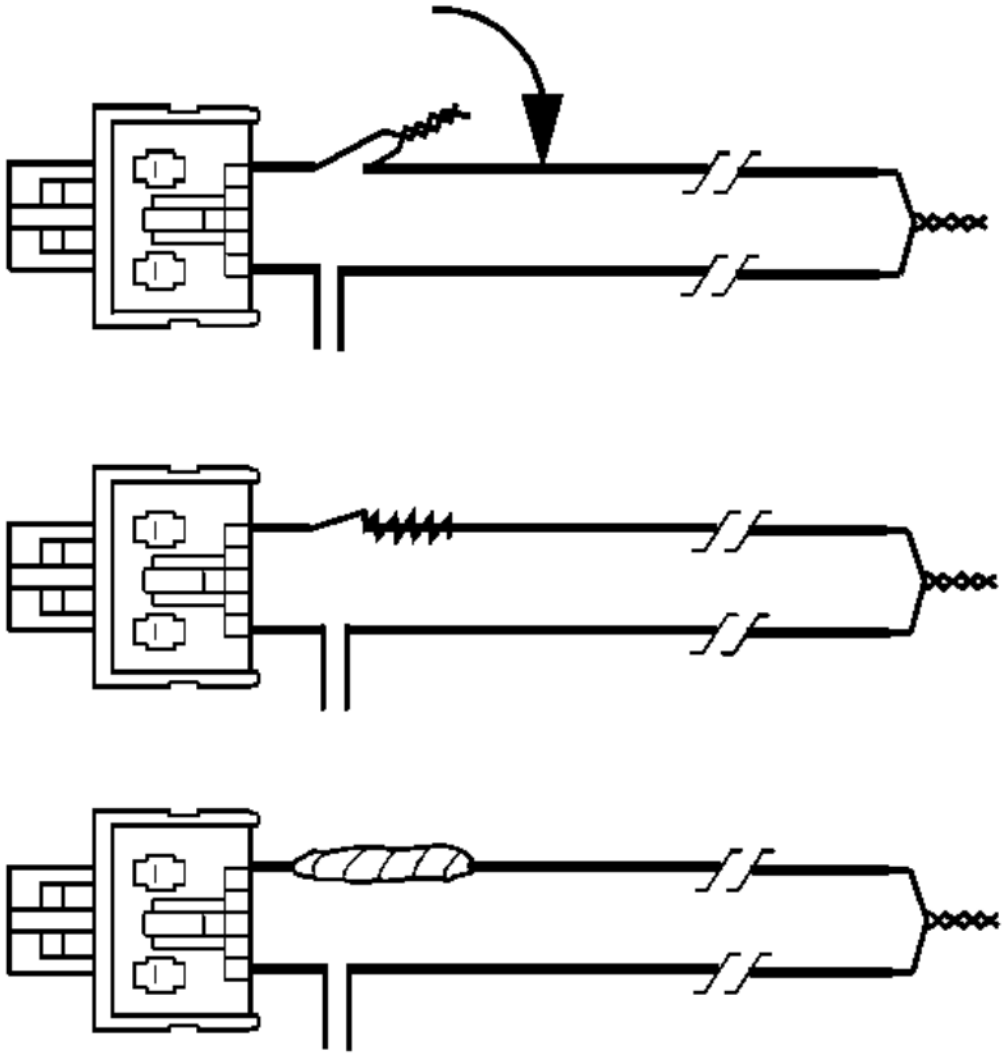


Fig. 55: Bending Twisted Connection Flat & Insulating With Tape
Courtesy of GENERAL MOTORS CORP.

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

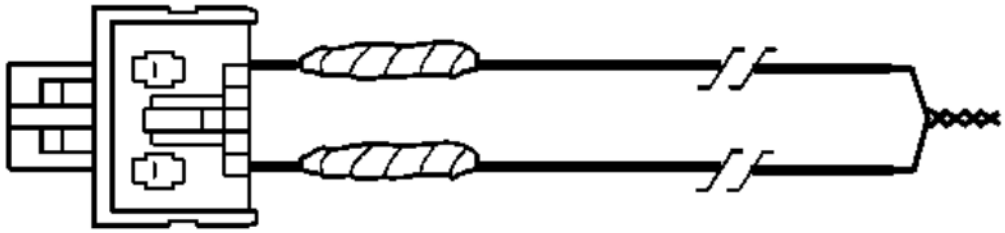


Fig. 56: Taping Remaining Connector Wire Lead To Remaining Deployment Wire
Courtesy of GENERAL MOTORS CORP.

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.

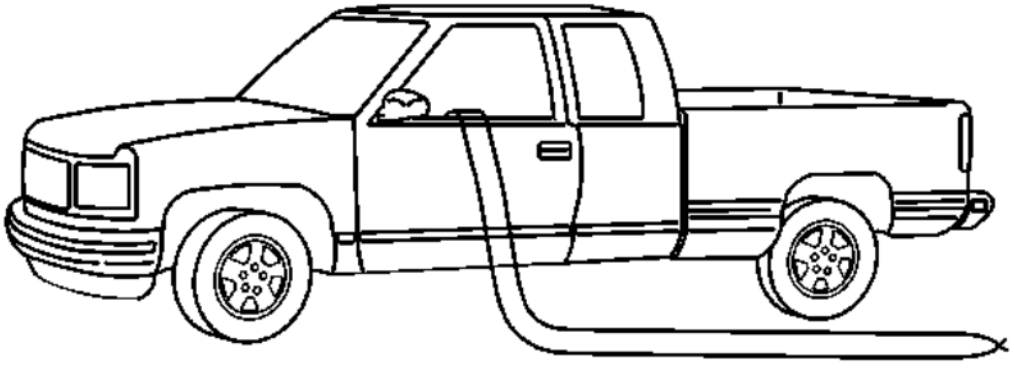


Fig. 57: Routing The Deployment Harness Out Of The Vehicle's Driver Side
Courtesy of GENERAL MOTORS CORP.

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

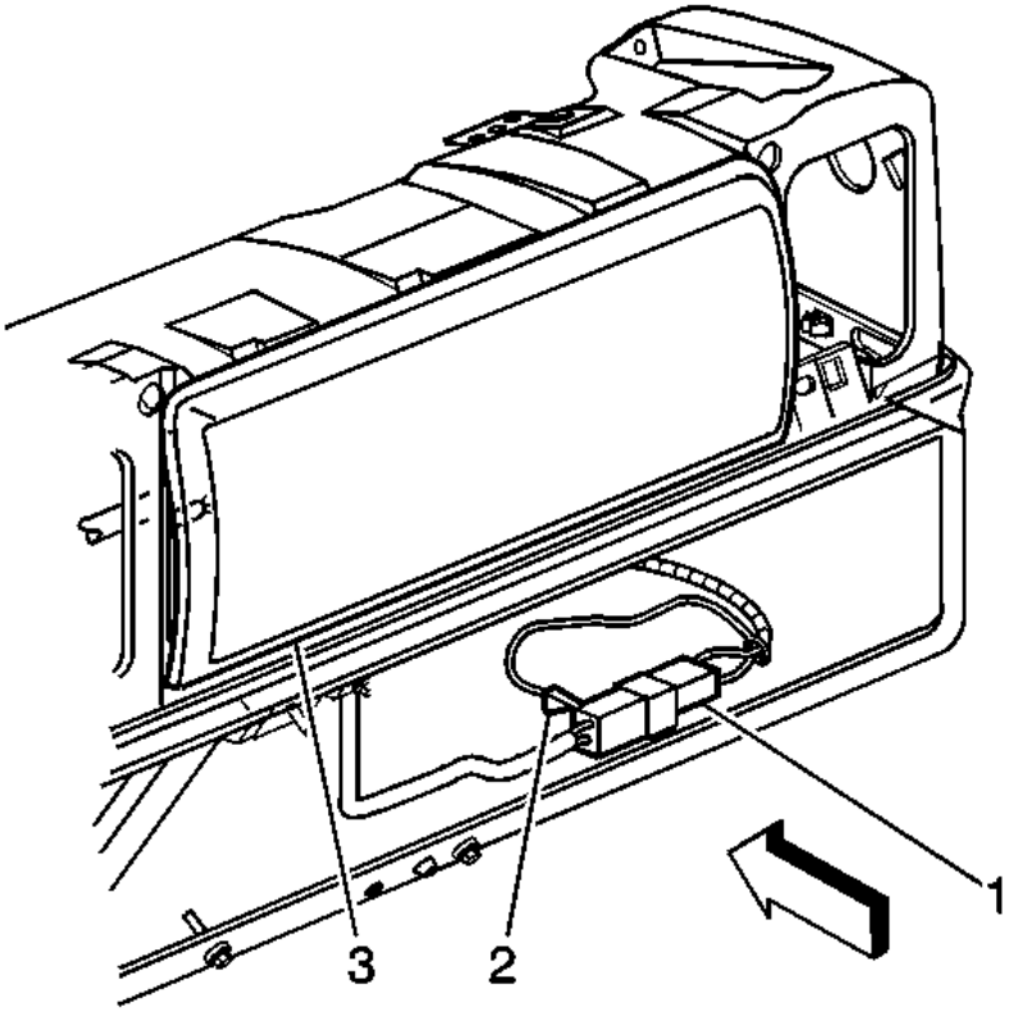


Fig. 58: View Of I/P Module Yellow Harness Connector & Vehicle Harness Connector
Courtesy of GENERAL MOTORS CORP.

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

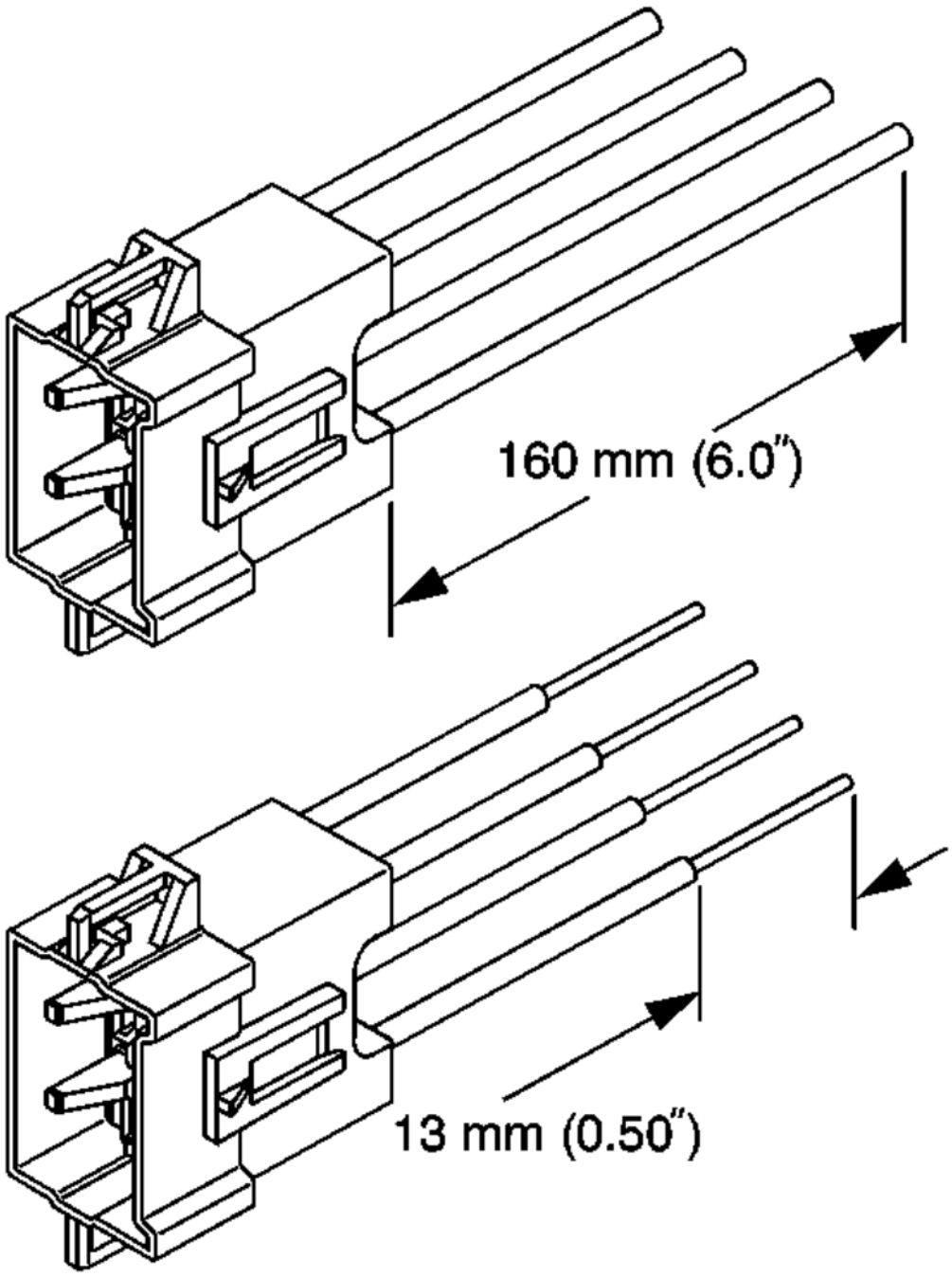


Fig. 59: Stripping SIR Wires
Courtesy of GENERAL MOTORS CORP.

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 Component Connector End Views for determining high and low circuits.

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

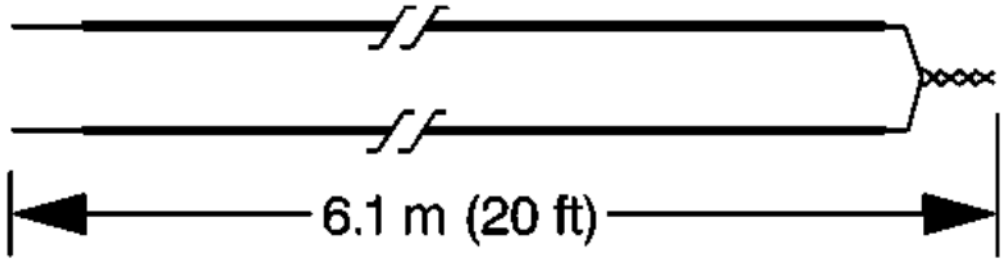


Fig. 60: Fabricating 20 Ft. Deployment Harness
Courtesy of GENERAL MOTORS CORP.

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.

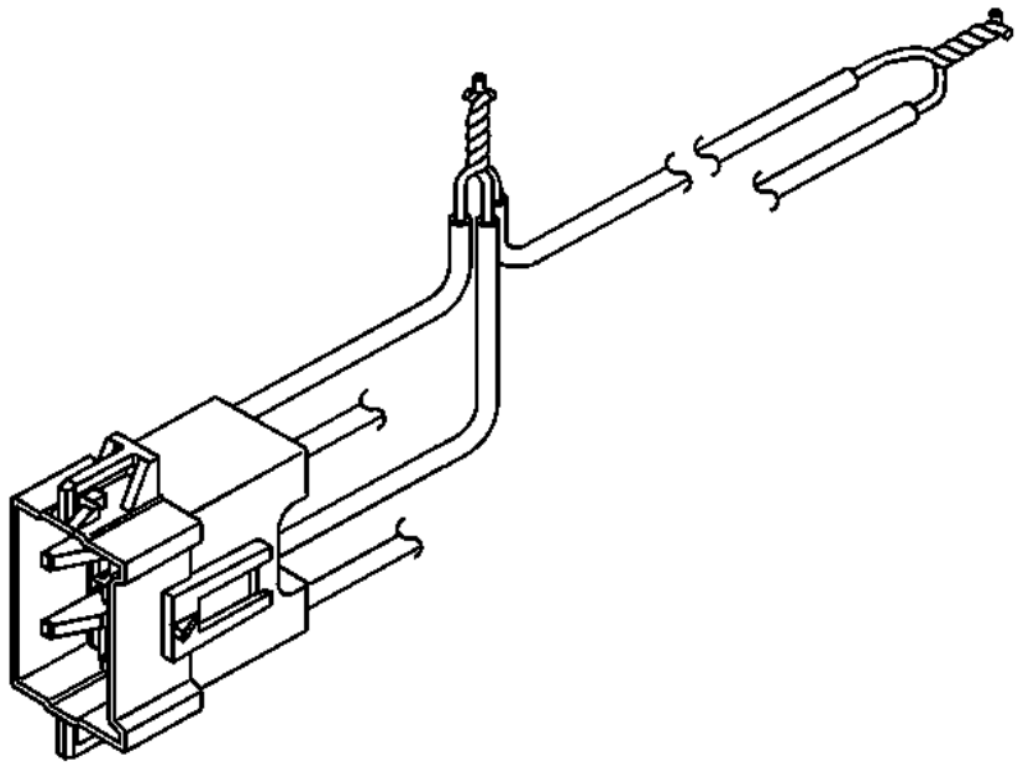


Fig. 61: Twisting Connector Wire Leads (High Circuits) To Deployment Harness Wire
Courtesy of GENERAL MOTORS CORP.

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

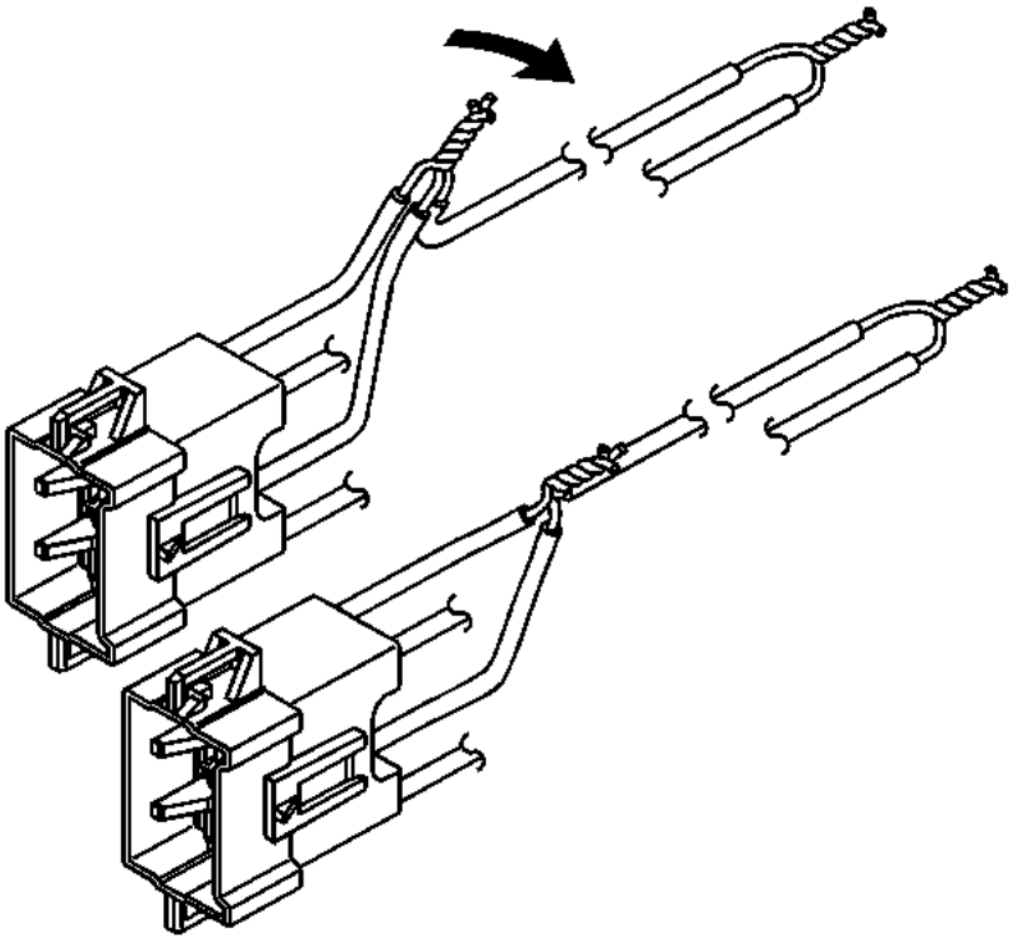


Fig. 62: Bending Twisted Connection Flat
Courtesy of GENERAL MOTORS CORP.

42. Bend flat the twisted connection.

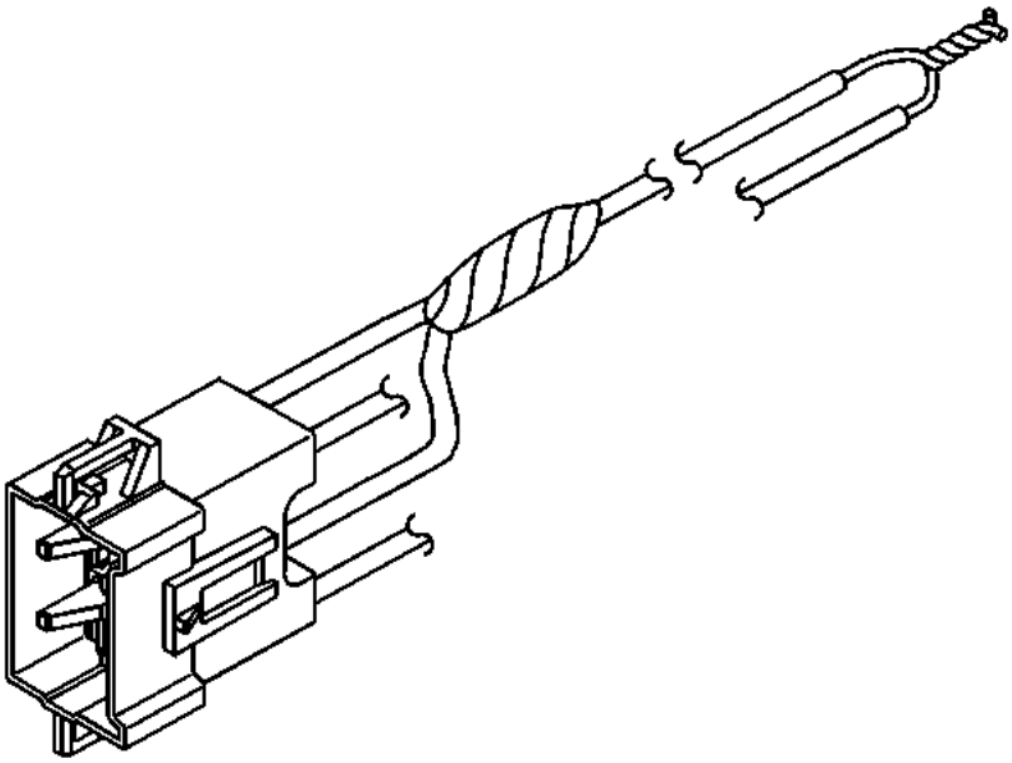


Fig. 63: Insulating Connection With Electrical Tape
Courtesy of GENERAL MOTORS CORP.

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

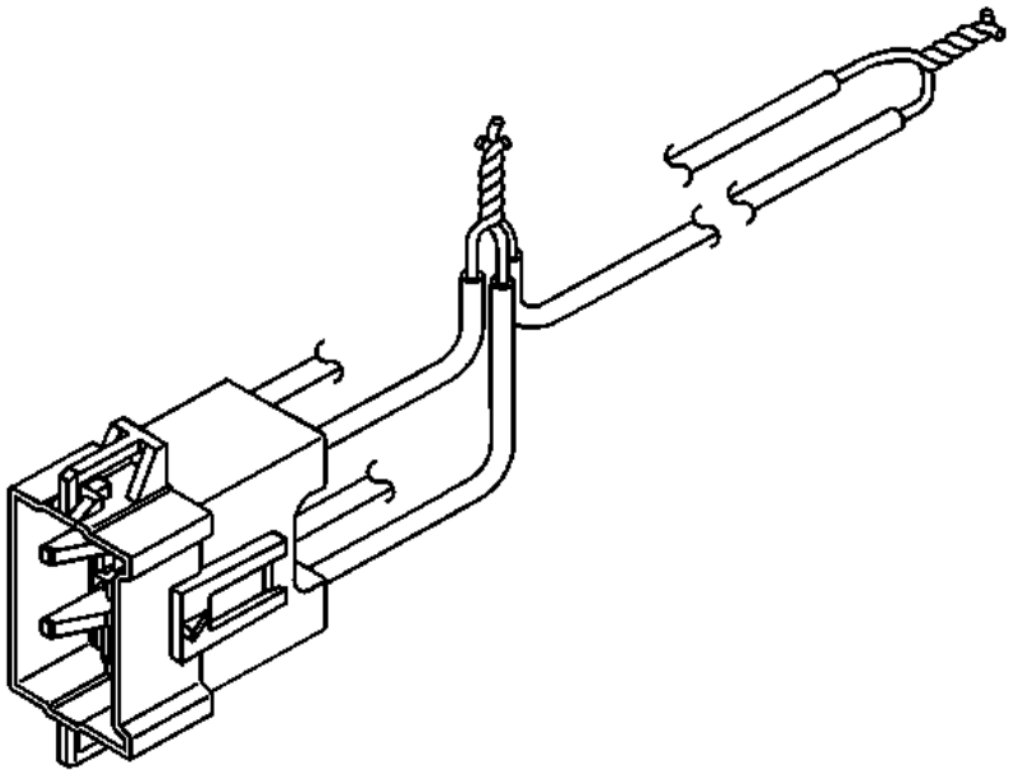


Fig. 64: Twisting Connector Wire Leads (Low Circuits) To Deployment Harness Wire
Courtesy of GENERAL MOTORS CORP.

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

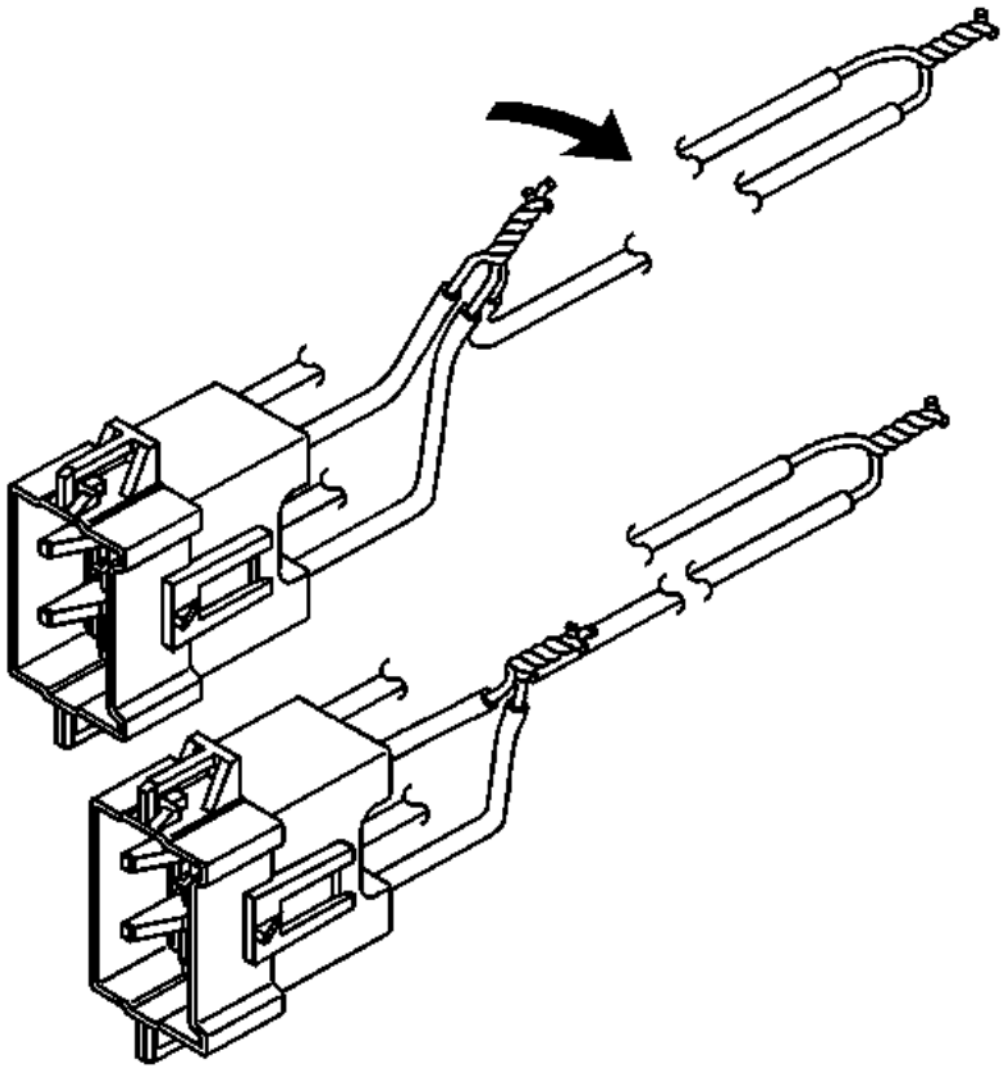


Fig. 65: Bending Twisted Connection Flat
Courtesy of GENERAL MOTORS CORP.

46. Bend flat the twisted connection.

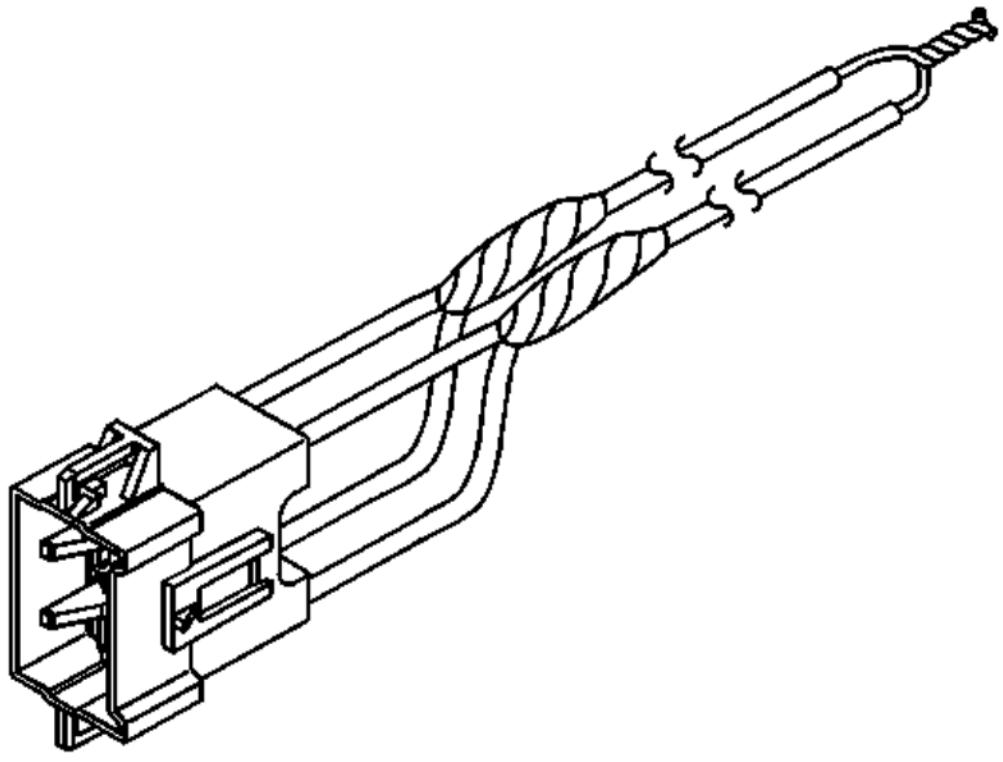


Fig. 66: Insulating Connection With Electrical Tape
Courtesy of GENERAL MOTORS CORP.

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.

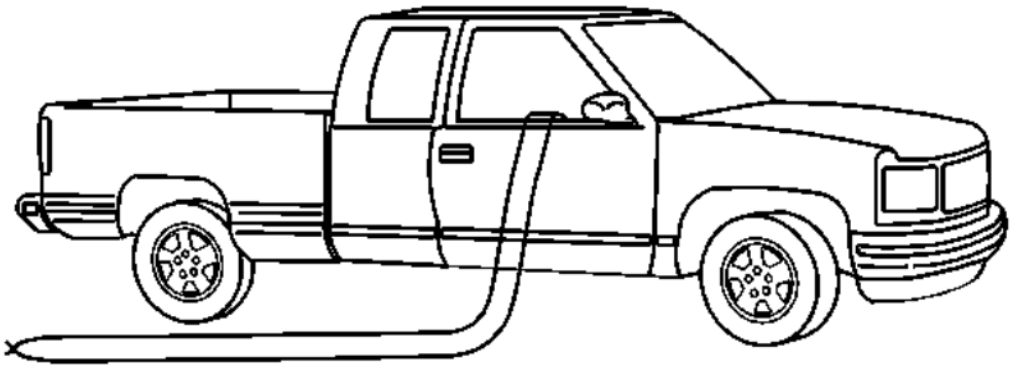


Fig. 67: Routing The Deployment Harness Out Of The Vehicle's Passenger Side
Courtesy of GENERAL MOTORS CORP.

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

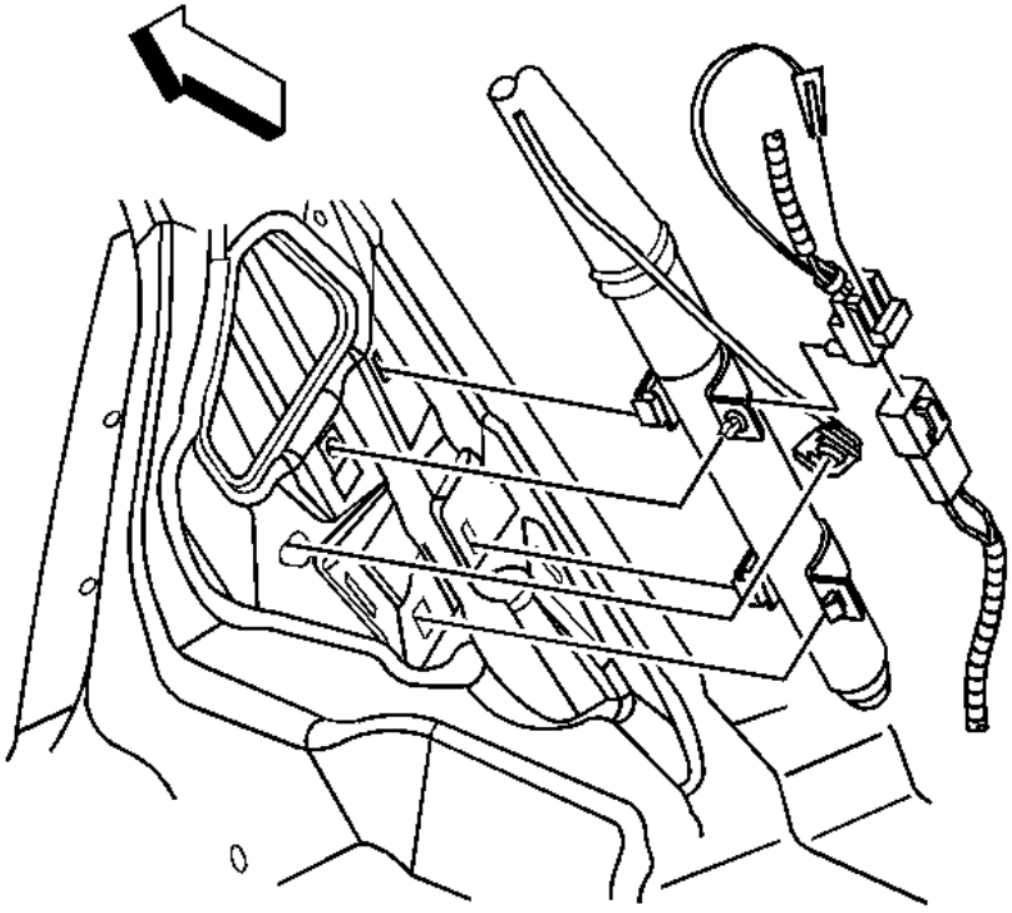


Fig. 68: Locating Roof Rail Module Connector
Courtesy of GENERAL MOTORS CORP.

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

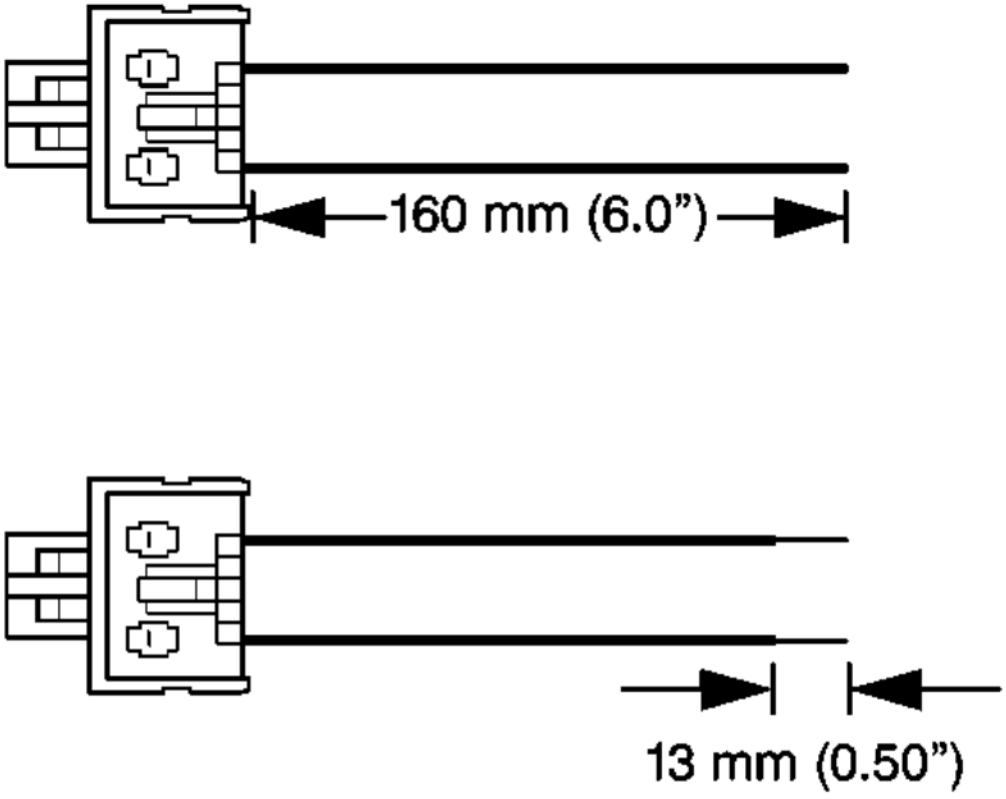


Fig. 69: Identifying Proper Stripping Of Connection Wire Leads
Courtesy of GENERAL MOTORS CORP.

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.

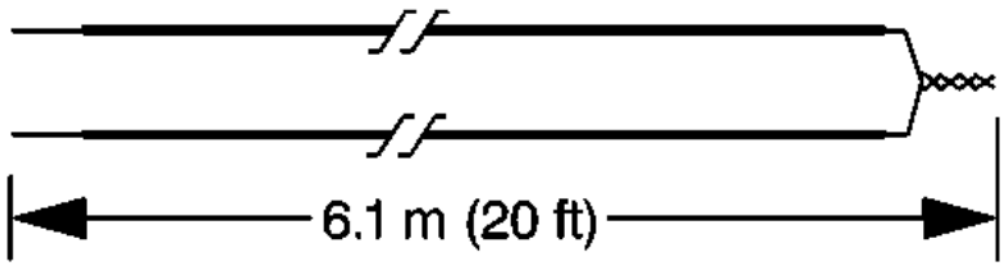


Fig. 70: Fabricating 20 Ft. Deployment Harness
Courtesy of GENERAL MOTORS CORP.

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.

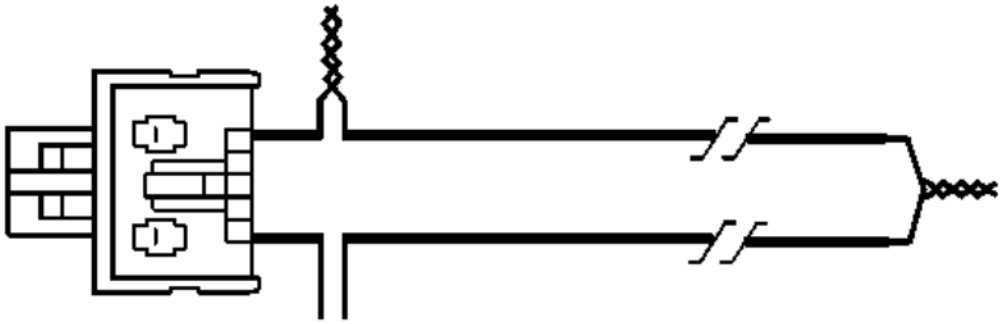


Fig. 71: View Of Proper Twisting Of Connector Wire Lead To Deployment Wire
Courtesy of GENERAL MOTORS CORP.

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

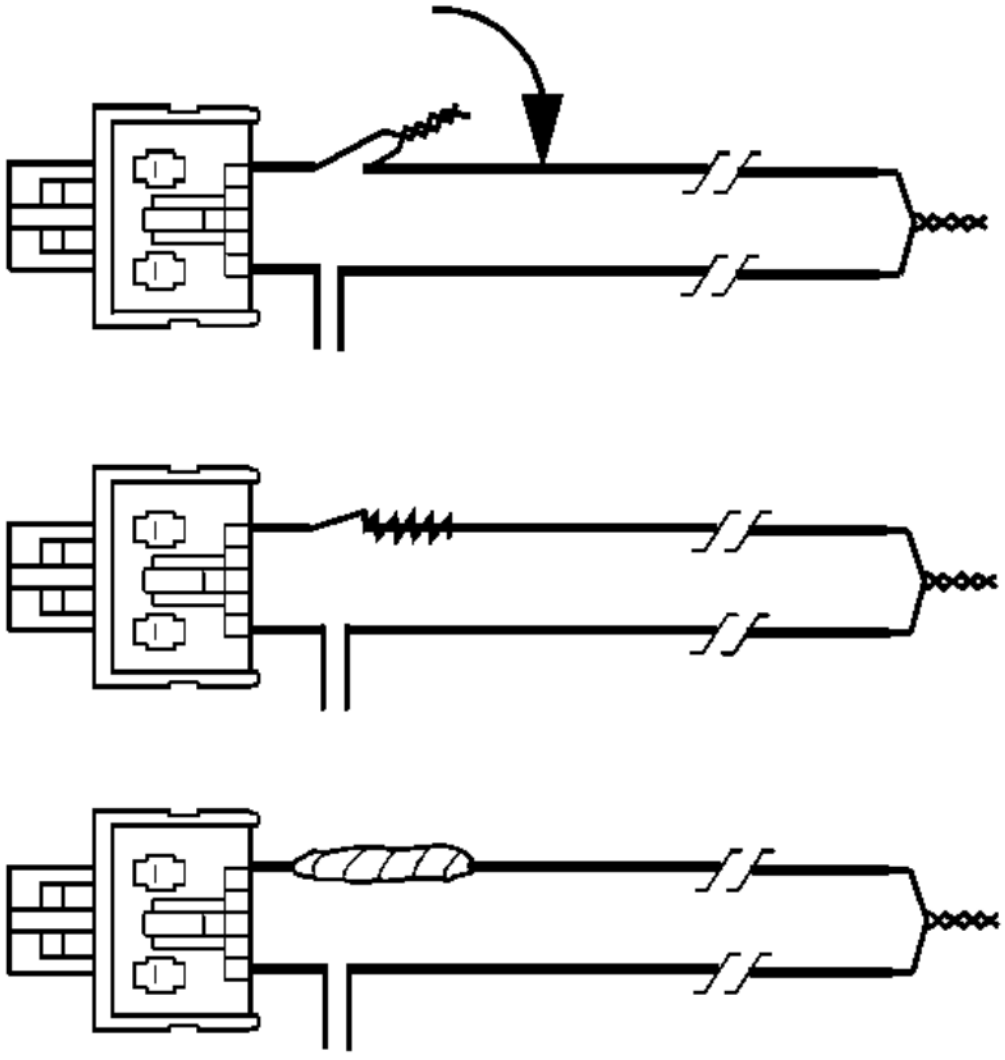


Fig. 72: Bending Twisted Connection Flat & Insulating With Tape
Courtesy of GENERAL MOTORS CORP.

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

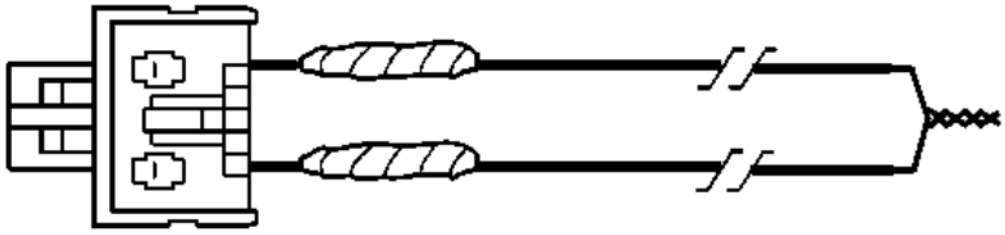


Fig. 73: Taping Remaining Connector Wire Lead To Remaining Deployment Wire
Courtesy of GENERAL MOTORS CORP.

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

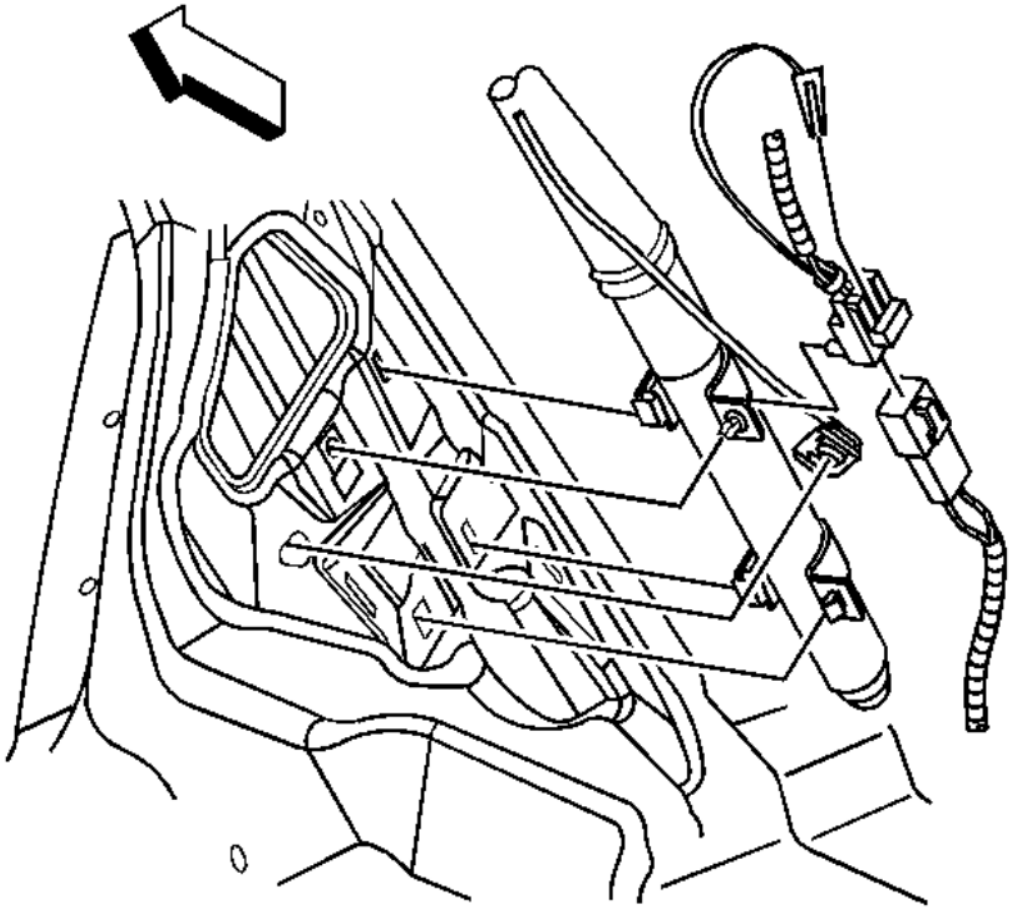


Fig. 74: Locating Roof Rail Module Connector
Courtesy of GENERAL MOTORS CORP.

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

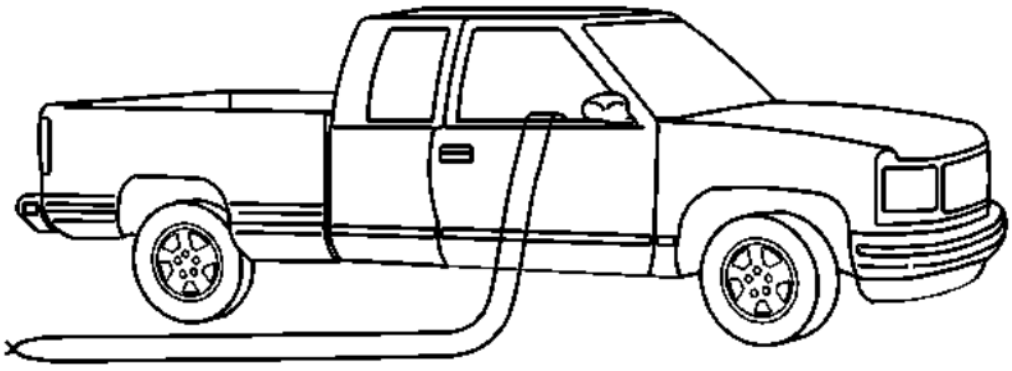


Fig. 75: Routing The Deployment Harness Out Of The Vehicle's Passenger Side
Courtesy of GENERAL MOTORS CORP.

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.

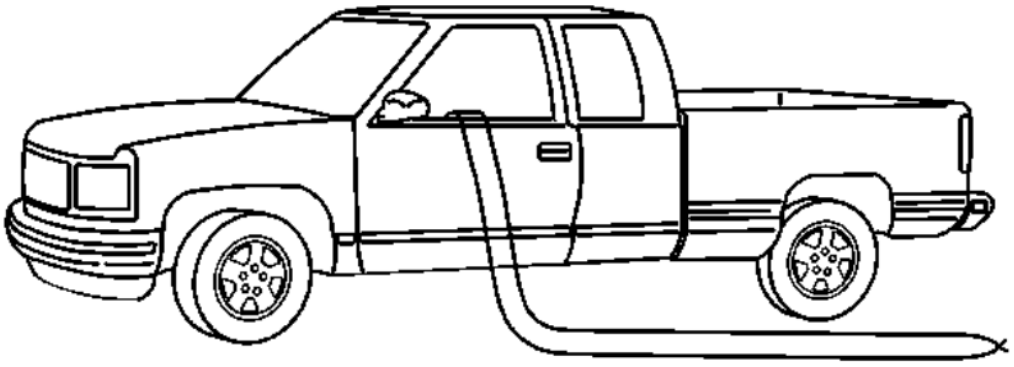


Fig. 76: Routing The Deployment Harness Out Of The Vehicle's Driver Side
Courtesy of GENERAL MOTORS CORP.

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 Side Rail Module Replacement (Crew Cab)** or **Inflatable Restraint Roof Side Rail Module Replacement (Extended Cab)** or **Inflatable Restraint Roof Side Rail Module Replacement (Regular Cab)**

PRETENSIONER HANDLING AND SCRAPPING

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

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

Failure to observe these guidelines may result in personal injury.

Scrapping Procedure

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

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

Deployment Procedures

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

Deployment Outside Vehicle for Seat Belt Pretensioners

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

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

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

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

Tools Required

- **J 39401-B** SIR Deployment Fixture
- **J 38826** SIR Deployment Harness
- An appropriate pigtail adaptor

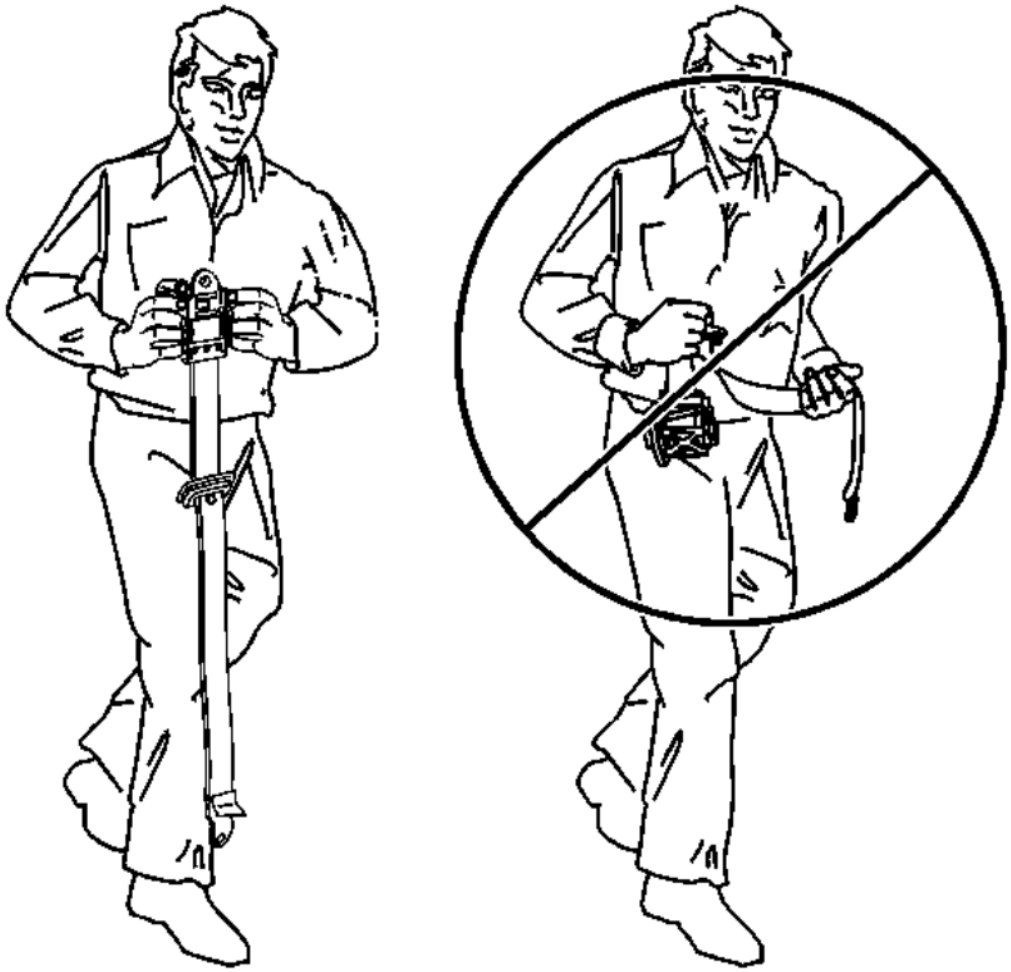


Fig. 77: Proper Transportation of Seat Belt Pretensioner
Courtesy of GENERAL MOTORS CORP.

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 (Regular Cab)** or **Seat Belt Retractor Pretensioner Replacement - Front (Extended Cab)** or **Seat Belt Retractor Pretensioner Replacement - Front (Crew Cab)**.

5. When carrying a seat belt pretensioner to the deployment area, keep fingers clear of the seat belt webbing.

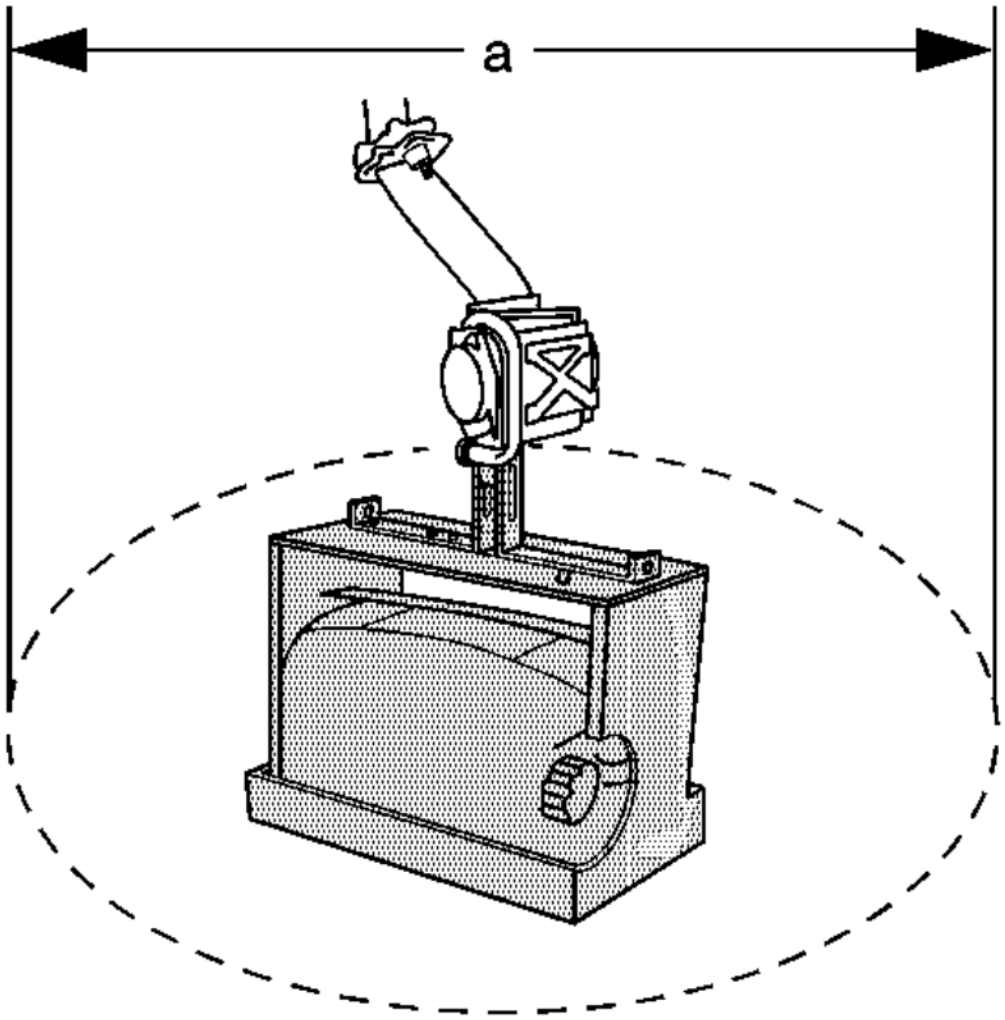


Fig. 78: Illustrating Proper Space For Deployment Of Pretensioner
Courtesy of GENERAL MOTORS CORP.

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.
9. Fill the fixture plastic reservoir with water or sand.

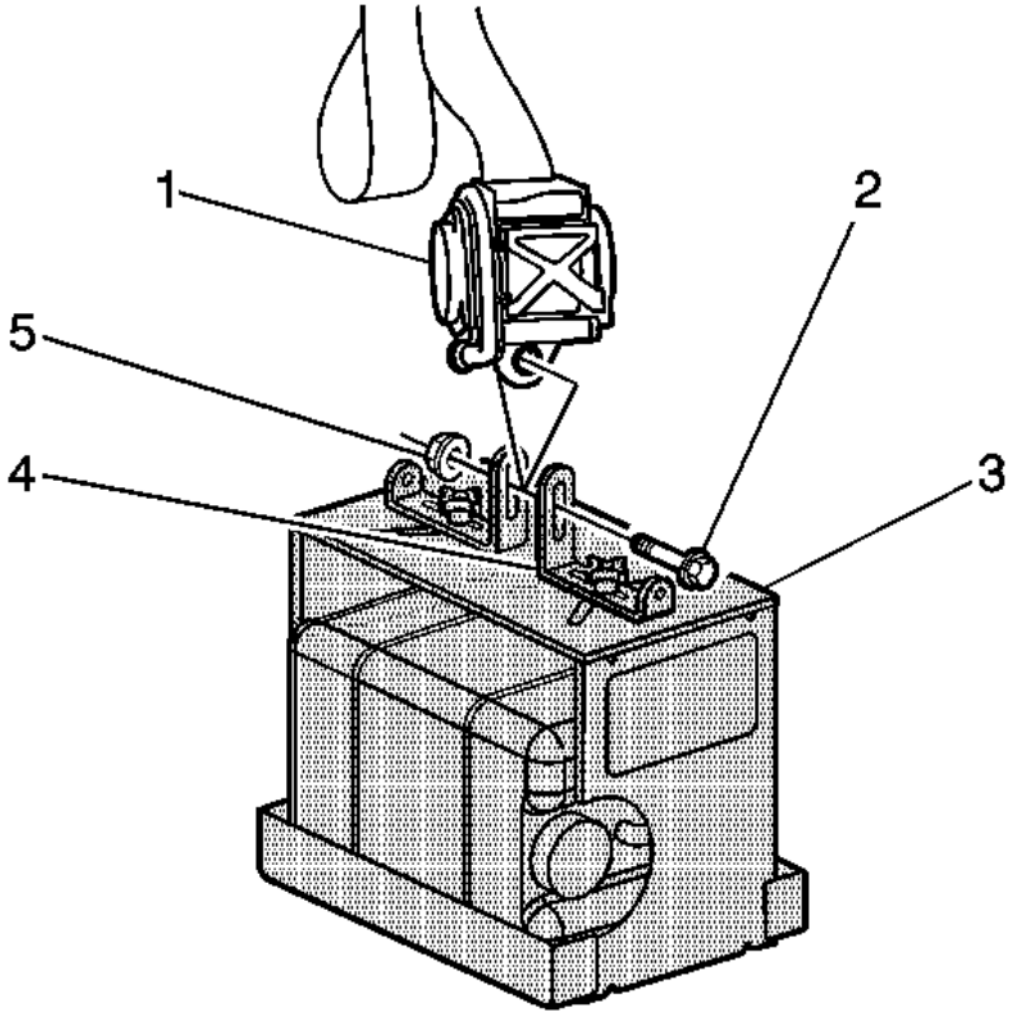


Fig. 79: Seat Belt Pretensioner And SIR Deployment Fixture
Courtesy of GENERAL MOTORS CORP.

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.
- 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.

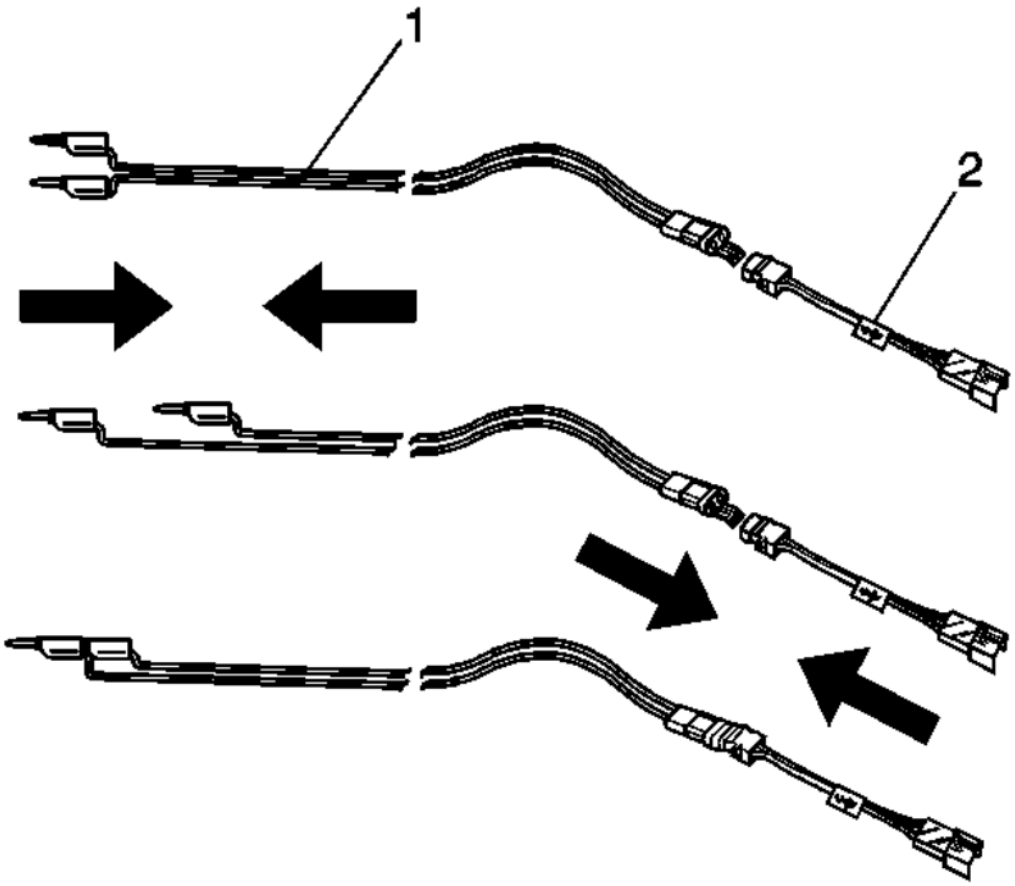


Fig. 80: Identifying SIR Deployment Harness & Adapter
Courtesy of GENERAL MOTORS CORP.

11. Inspect the **J 38826** and the appropriate pigtail adapter for damage. 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.

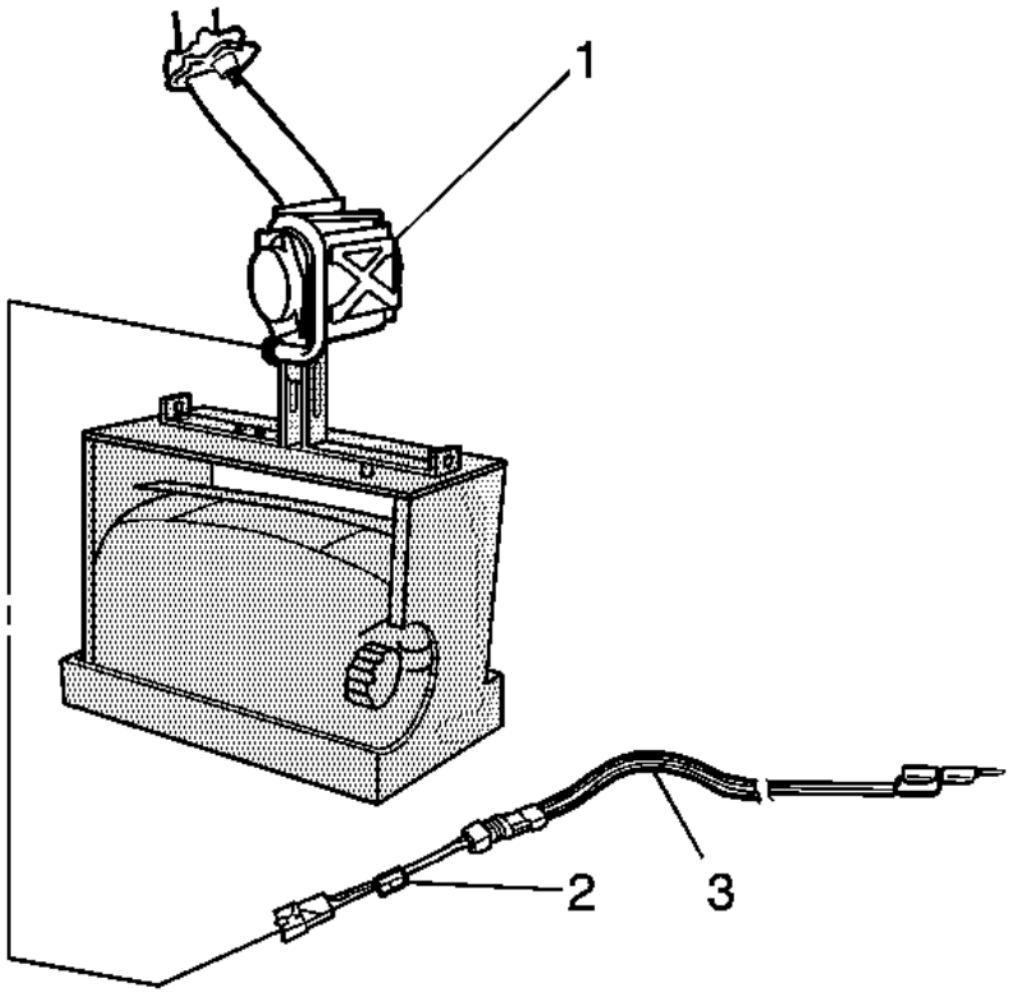


Fig. 81: Identifying Seat Belt Pretensioner Connector, Adapter & Deployment Harness
Courtesy of GENERAL MOTORS CORP.

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.

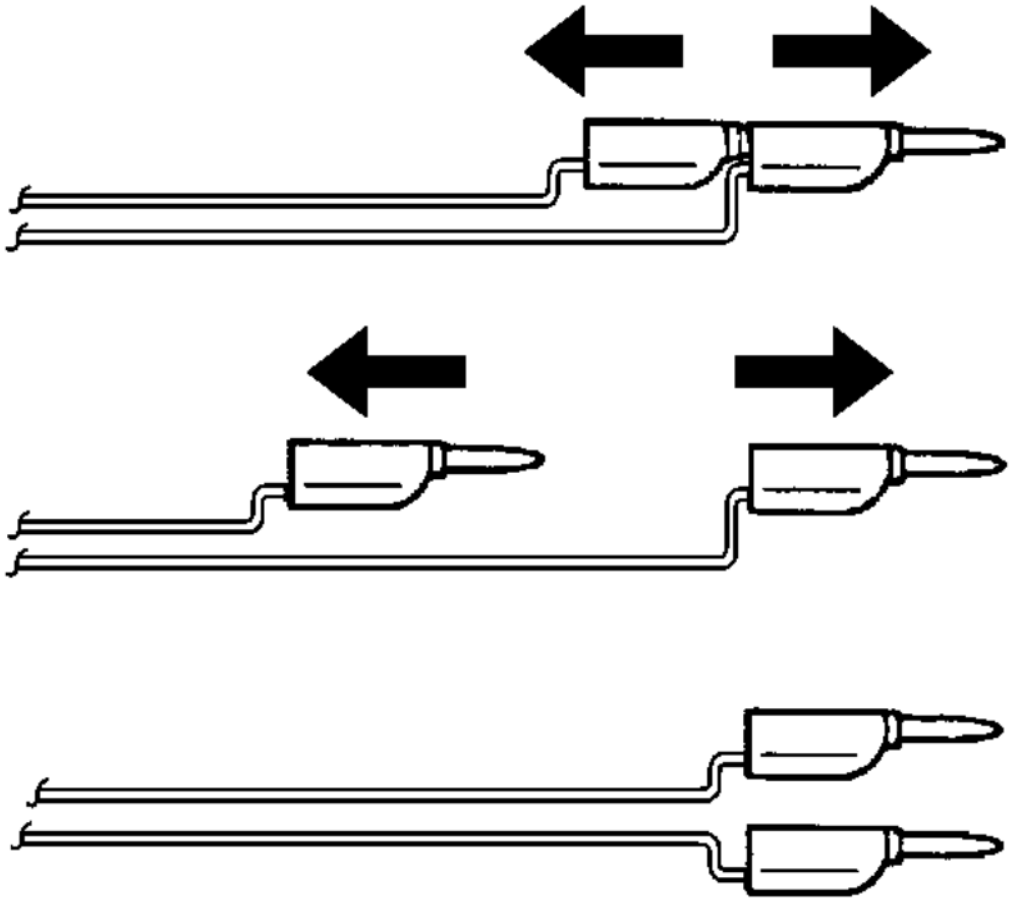


Fig. 82: Separating Banana Plugs
Courtesy of GENERAL MOTORS CORP.

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

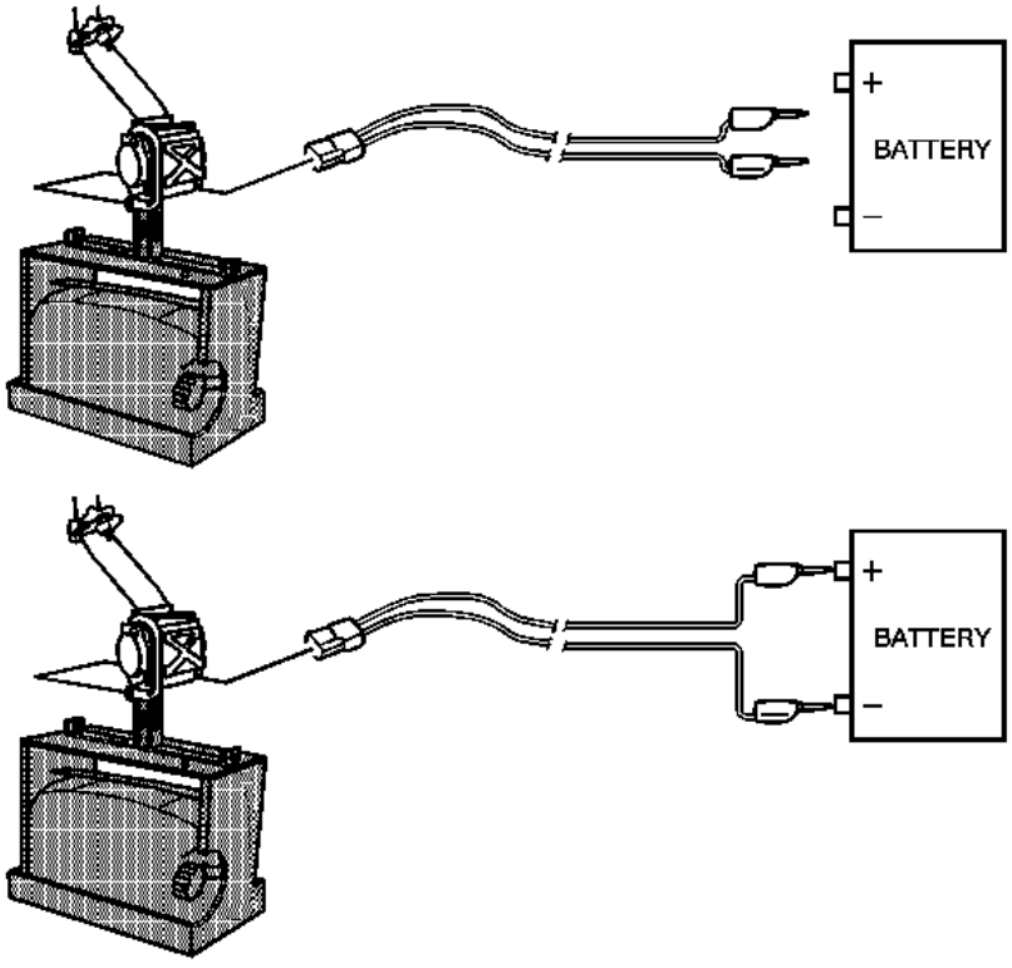


Fig. 83: Deploying Seat Belt Pretensioner
Courtesy of GENERAL MOTORS CORP.

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.

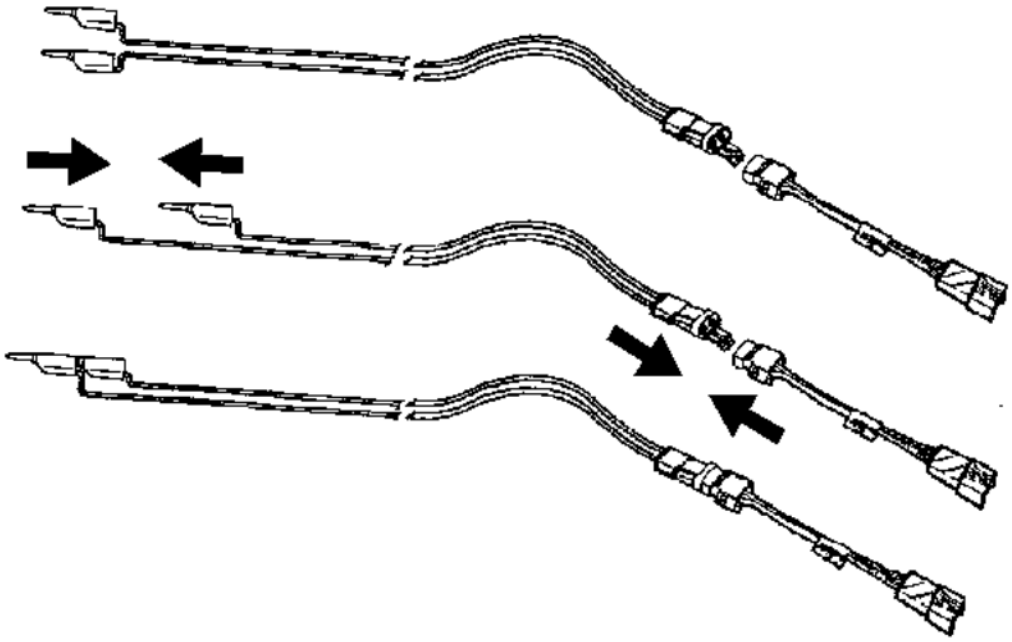


Fig. 84: View Of Deployment Harness Leads
Courtesy of GENERAL MOTORS CORP.

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.

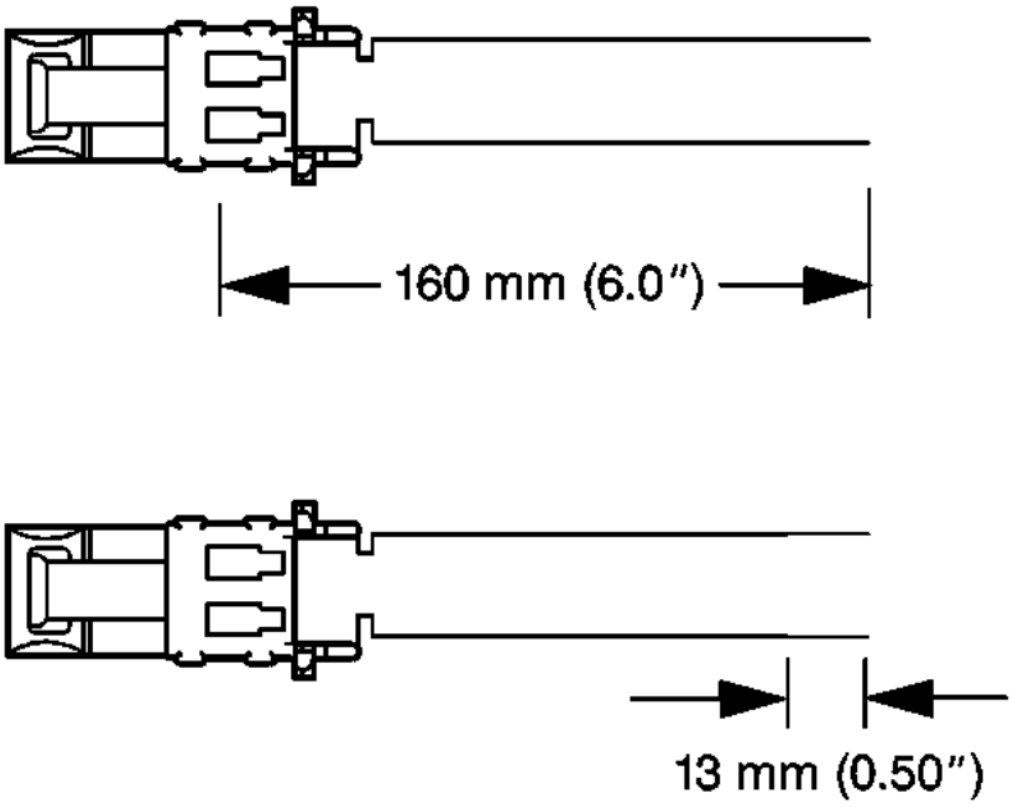


Fig. 85: Stripping Connector Wire Lead
Courtesy of GENERAL MOTORS CORP.

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 (Regular Cab)** or **Seat Belt Retractor Pretensioner**

Replacement - Front (Extended Cab) or **Seat Belt Retractor Pretensioner Replacement - Front (Crew Cab)**.

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.

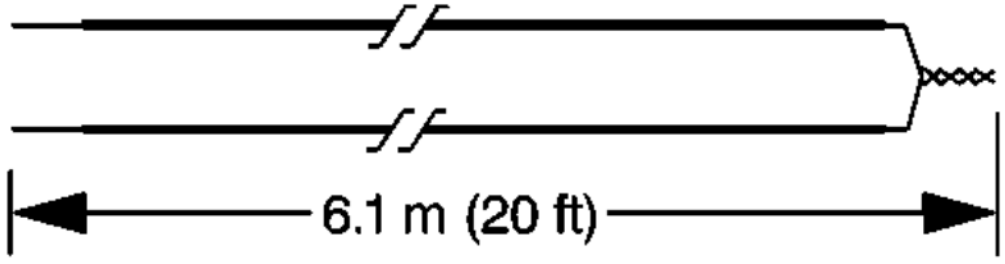


Fig. 86: Fabricating 20 Ft. Deployment Harness
Courtesy of GENERAL MOTORS CORP.

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.

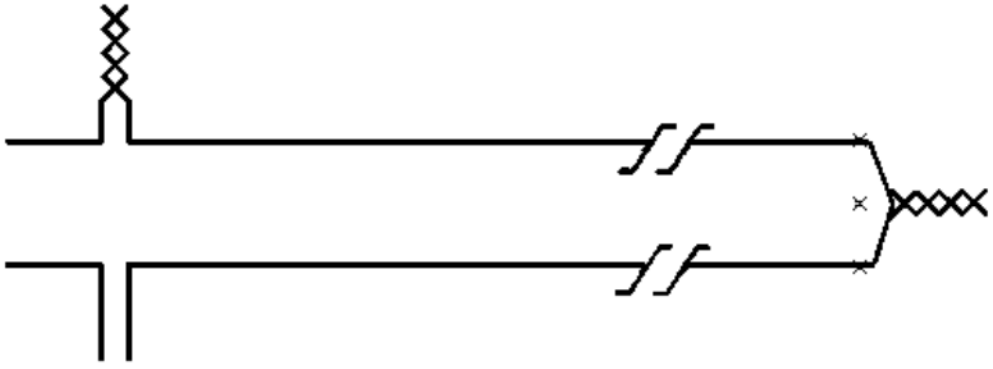


Fig. 87: Twisting Together Connector Wire Lead To Deployment Wire
Courtesy of GENERAL MOTORS CORP.

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

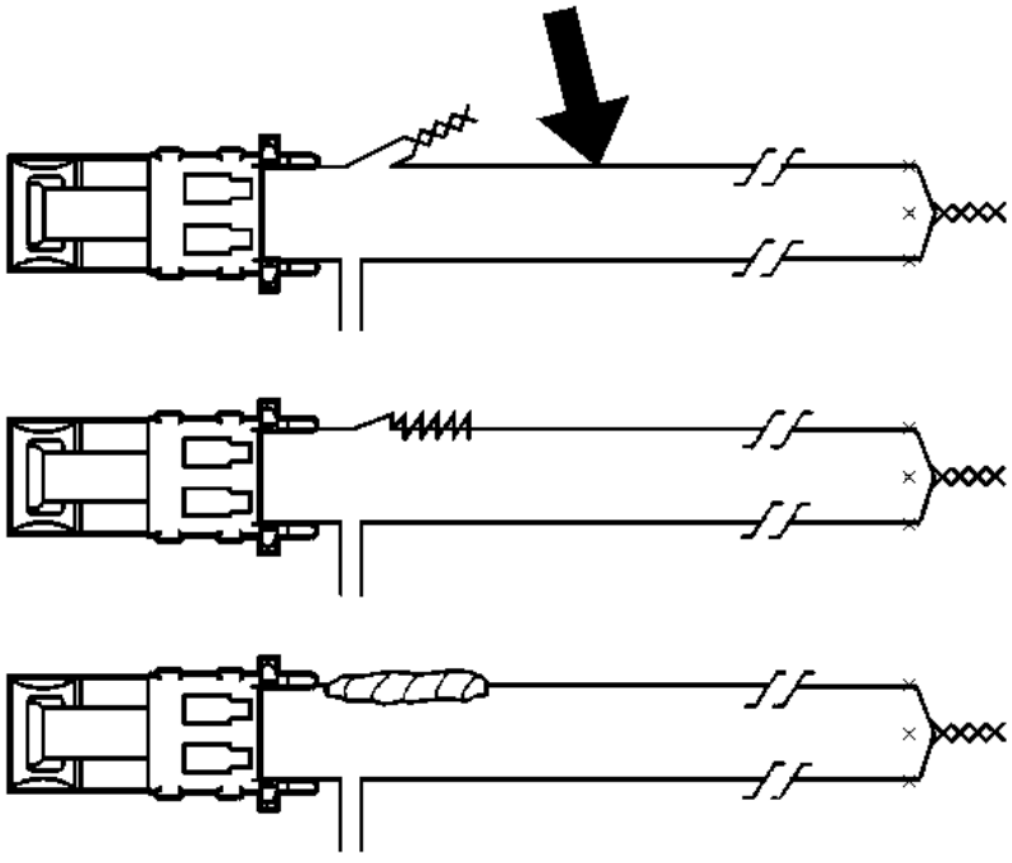


Fig. 88: Identifying I/P Module Twisted Connection
Courtesy of GENERAL MOTORS CORP.

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

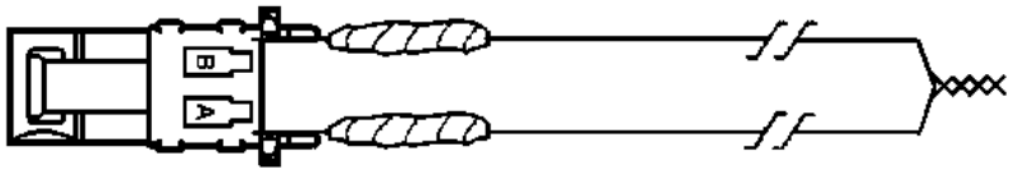


Fig. 89: View Of Dual Insulated Connector Wires
Courtesy of GENERAL MOTORS CORP.

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

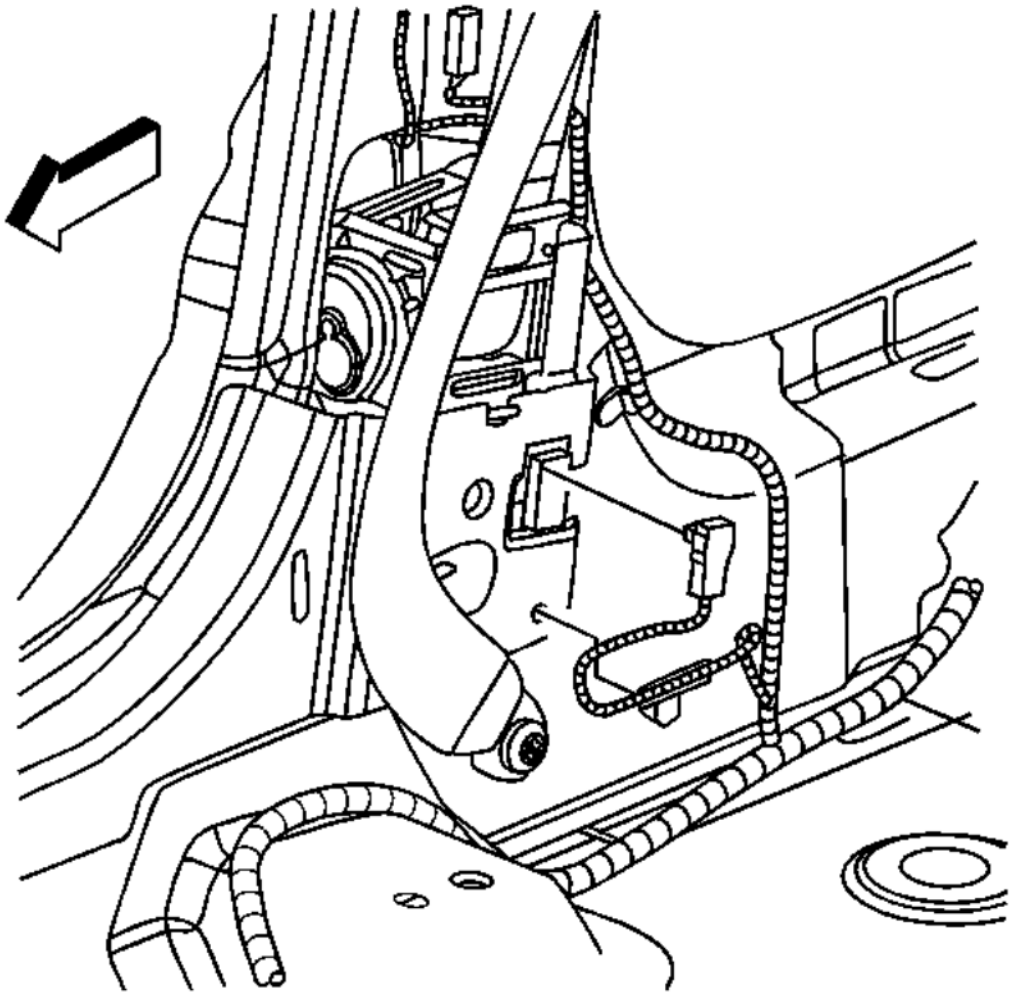


Fig. 90: View Of Seat Belt Pretensioner Connector And Wiring Harness Routing
Courtesy of GENERAL MOTORS CORP.

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

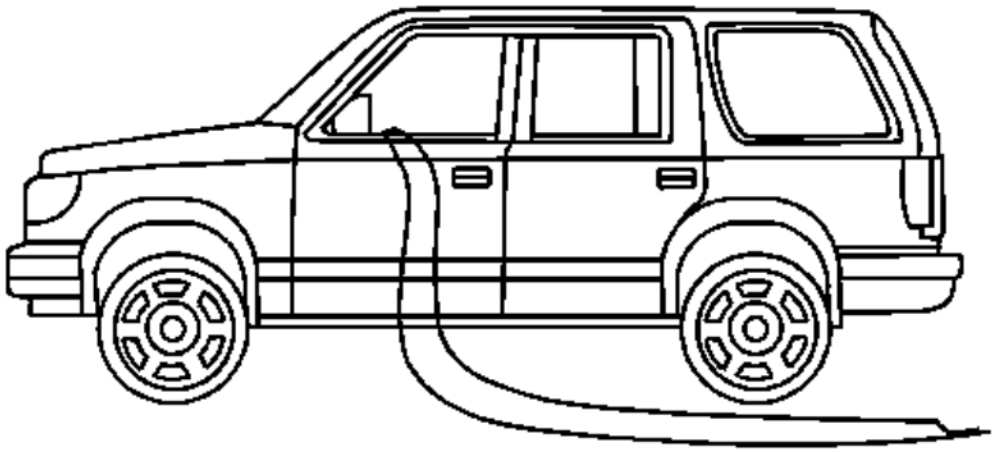


Fig. 91: Routing Wires To Apply Power For Controlled Bag Deployment (Left)
Courtesy of GENERAL MOTORS CORP.

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

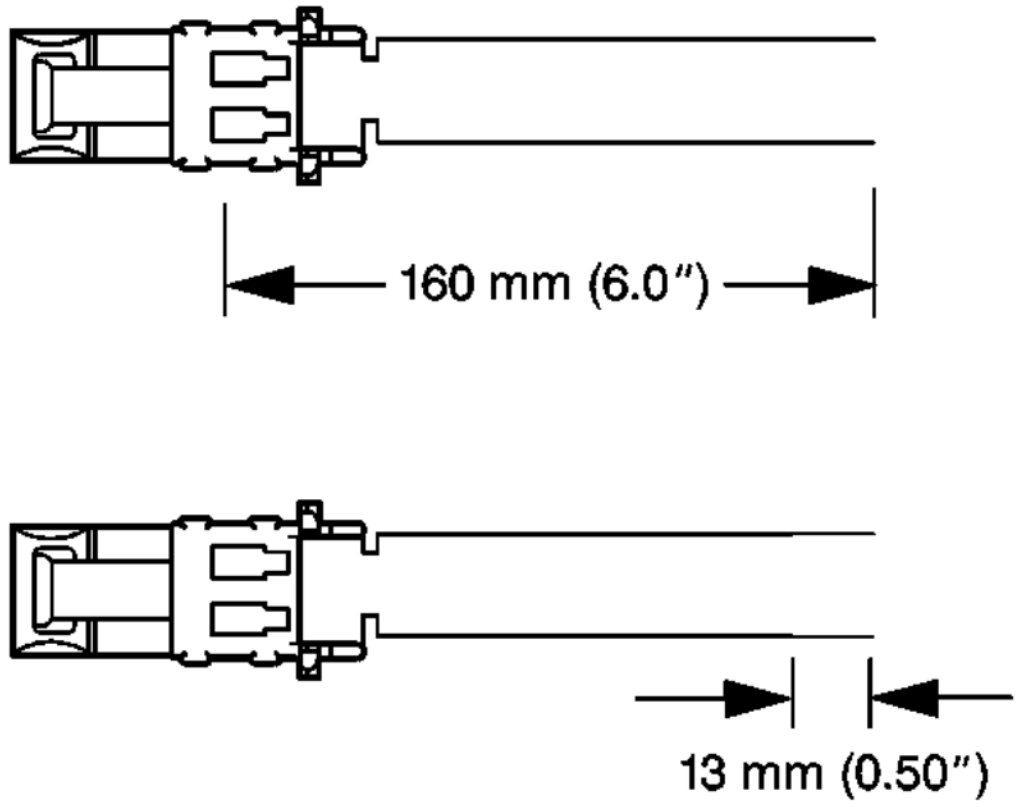


Fig. 92: Stripping Connector Wire Lead
Courtesy of GENERAL MOTORS CORP.

18. Disconnect the seat belt pretensioner connector. Refer to **Seat Belt Retractor Pretensioner Replacement - Front (Regular Cab)** or **Seat Belt Retractor Pretensioner Replacement - Front (Extended Cab)** or **Seat Belt Retractor Pretensioner Replacement - Front (Crew Cab)**.
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.

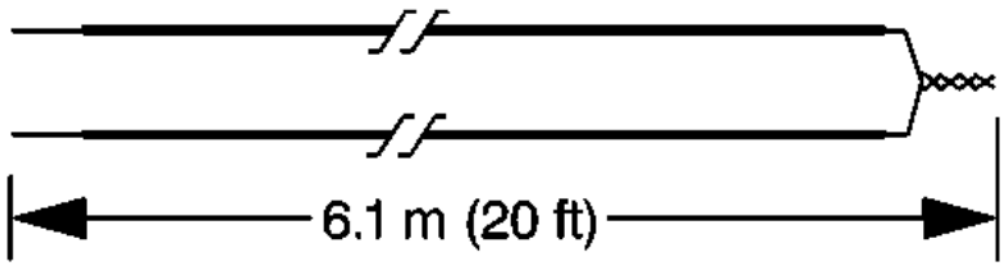


Fig. 93: Fabricating 20 Ft. Deployment Harness
Courtesy of GENERAL MOTORS CORP.

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.

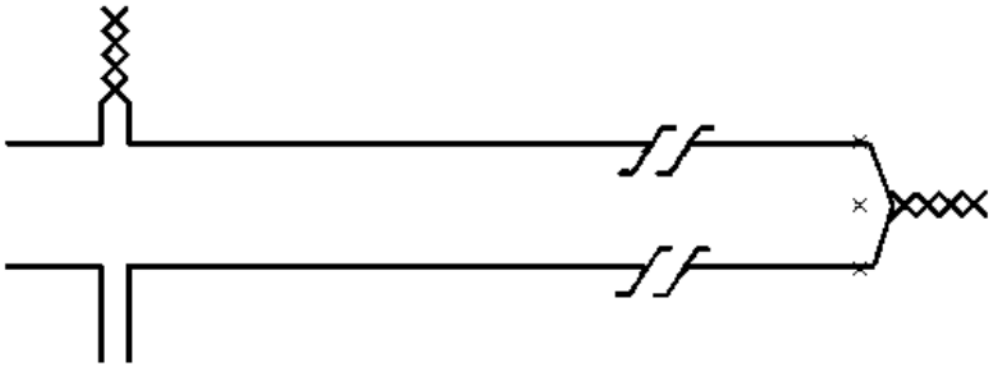


Fig. 94: Twisting Together Connector Wire Lead To Deployment Wire

Courtesy of GENERAL MOTORS CORP.

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

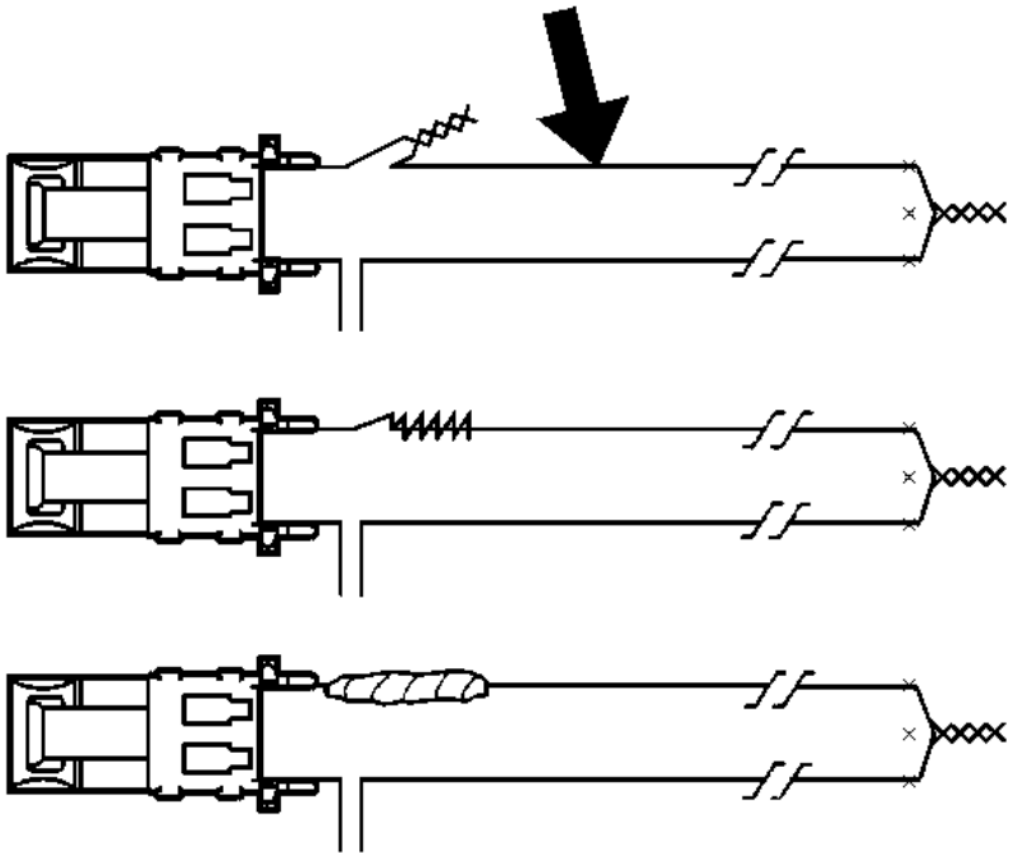


Fig. 95: Identifying I/P Module Twisted Connection
Courtesy of GENERAL MOTORS CORP.

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

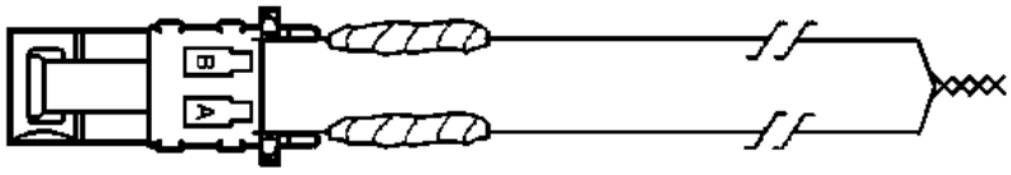


Fig. 96: View Of Dual Insulated Connector Wires
Courtesy of GENERAL MOTORS CORP.

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

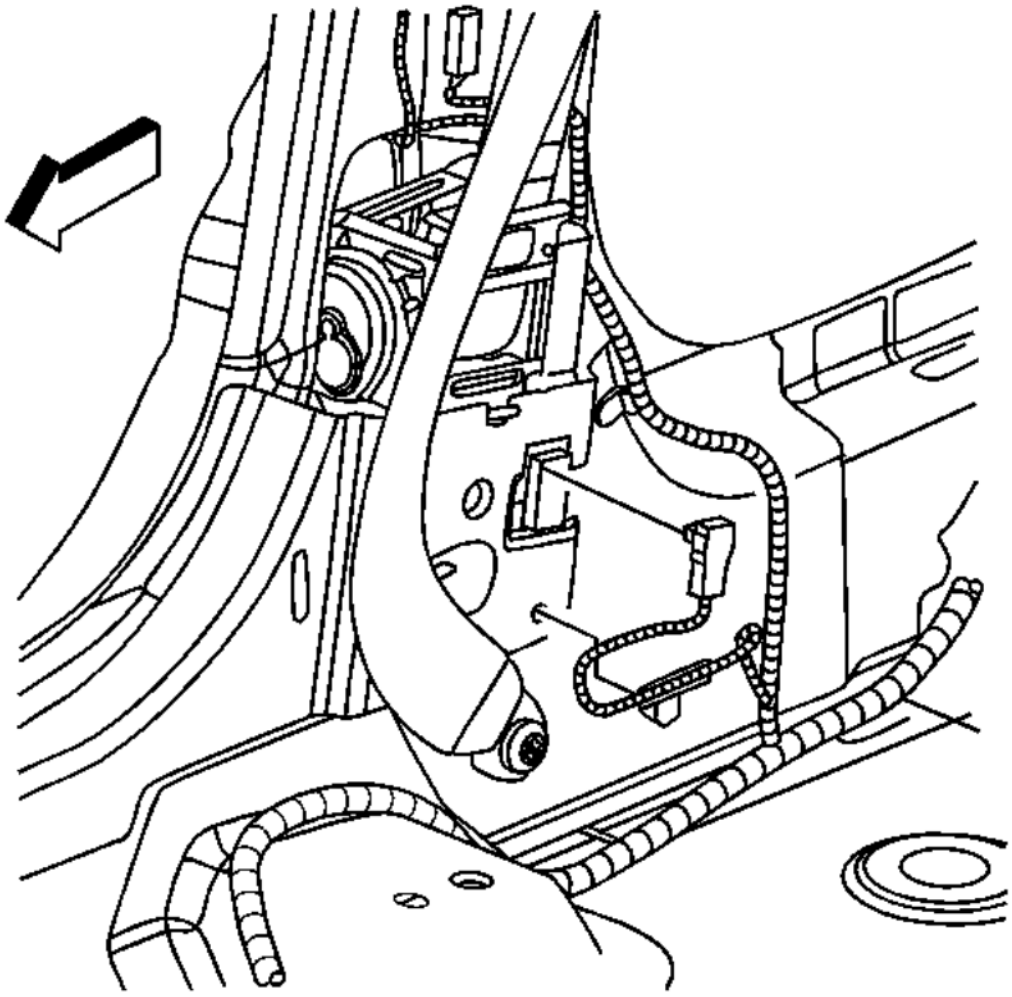


Fig. 97: View Of Seat Belt Pretensioner Connector And Wiring Harness Routing
Courtesy of GENERAL MOTORS CORP.

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

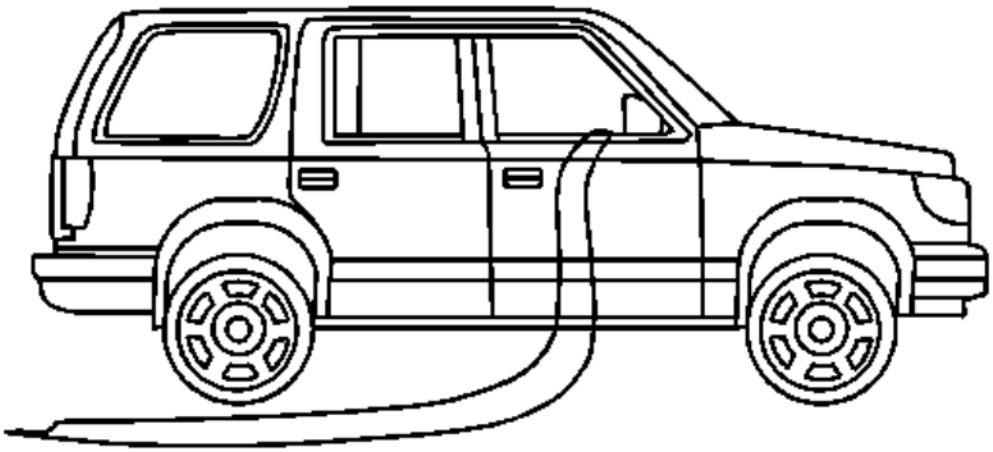


Fig. 98: Routing Wires To Apply Power For Controlled Bag Deployment (Right)
Courtesy of GENERAL MOTORS CORP.

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 (Regular Cab) or **Seat Belt Retractor Pretensioner Replacement - Front (Extended Cab)** or **Seat Belt Retractor Pretensioner Replacement - Front (Crew Cab)**.

43. Call the Technical Assistance Group for further assistance.

DESCRIPTION AND OPERATION

SIR SYSTEM DESCRIPTION AND OPERATION

SIR System Overview

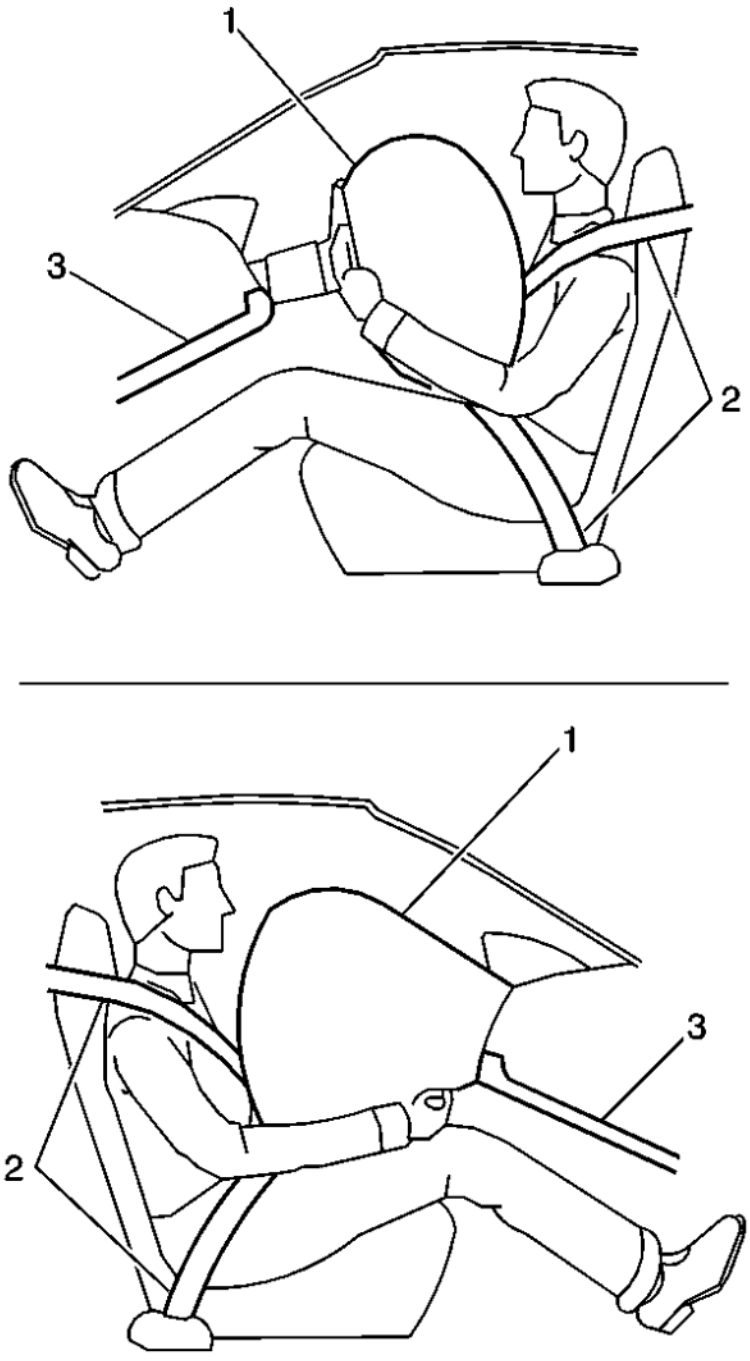


Fig. 99: Illustrating Deployed Inflatable Restraint
Courtesy of GENERAL MOTORS CORP.

The Supplemental Inflatable Restraint (SIR) System supplements the protection offered by the

occupants Seat Belt System (2). The SIR system may contain several inflator modules located throughout the vehicle, i.e. steering wheel module (1) and instrument panel (I/P) module (1). In addition to inflator modules, the vehicle contains an inflatable restraint Passenger Presence System (PPS) that measures the weight of an occupant sitting in the front passenger seat. The PPS uses the weight of the occupant to determine if the I/P inflator module will be enabled or disabled. Each inflator module has a deployment loop that is controlled by the sensing and diagnostic module (SDM) mounted inside the vehicle. The SDM determines the severity of a collision with the assistance of various sensor inputs. When the SDM detects a collision of sufficient force it will process the information provided by the sensors to further support air bag deployment. The SDM performs continuous diagnostic monitoring of the SIR system electrical components. Upon detection of a circuit malfunction, the SDM will set a DTC and inform the driver by requesting the instrument panel cluster (IPC) to turn the AIR BAG indicator ON. The steering column (1) and knee bolsters (3) are designed to absorb energy and compress during frontal collisions in order to limit leg movement and decrease the chance of injury to the driver and passenger.

Frontal SIR System Description

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

- AIR BAG indicator located on the instrument panel cluster (IPC)
- Driver and passenger knee bolsters
- Inflatable restraint front end sensors (left/right)
- Inflatable restraint PASSENGER AIR BAG ON/OFF indicator
- Inflatable restraint Passenger Presence System (PPS)
- Inflatable restraint passenger seat belt tension sensor
- Inflatable restraint seat position sensor (SPS) (left)
- Inflatable restraint sensing and diagnostic module (SDM)
- Inflatable restraint steering wheel module
- Inflatable restraint steering wheel module coil
- Inflatable restraint wiring harnesses
- Seat belt pretensioners (left/right)
- Steering wheel and column

A frontal collision of sufficient force will deploy the frontal air bags. The SDM contains a sensing device that converts vehicle velocity changes to an electrical signal. In the event of a frontal collision, the SDM receives a signal from the front end sensors which assists the SDM in determining the severity of some frontal collisions. The SDM contains a microprocessor that

performs calculations using the measured accelerations. The SDM compares these calculations to a value stored in memory. When the generated calculations exceed the stored value, the SDM will cause current to flow through the frontal deployment loops deploying the frontal air bags. Once the air bags are inflated they quickly deflate through the air bag vent holes. After the air bags have deployed, the SDM sets a diagnostic trouble code (DTC) and requests the IPC to turn the AIR BAG indicator ON. The SDM, instrument panel (I/P) module, steering wheel module, steering wheel module coil and the connecting wires makeup the frontal deployment loops. The SDM continuously monitors the deployment loops for malfunctions and requests the IPC to turn the AIR BAG indicator ON if a fault is detected.

Side SIR System Description (Front)

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

- AIR BAG indicator located in the instrument panel cluster (IPC)
- Inflatable restraint roof rail modules front/rear, (left/right)
- Inflatable restraint sensing and diagnostic module (SDM)
- Inflatable restraint side impact sensors (SIS) (left/right)
- Inflatable restraint vehicle rollover sensor
- Inflatable restraint wiring harnesses
- Seat belt pretensioners (left/right)

The roof rail modules (front/rear) are located in the headliner along the roof rails. The roof rail modules contain a housing, inflatable air bag, initiating device, and a canister of gas generating material. The initiator is part of the roof rail module deployment loop. When a side impact of sufficient force occurs the SIS detects the impact and sends a signal to the SDM. The SDM compares the signal received from the SIS to a value stored in memory. When the generated signal exceeds the stored value, the SDM will cause current to flow through the side deployment loop deploying the roof rail air bag. The SDM, roof rail modules (front) and the connecting wires 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 module deployment loop circuitry to prevent unwanted deployment of the air bag when servicing the inflator module.

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. The SDM contains internal sensors along with

several external sensors, if equipped, mounted at various locations on the vehicle. In the event of a collision, the SDM performs calculations using the signals received from the internal and external sensors. The SDM compares the results of the calculations to values stored in memory. When these calculations exceed the stored value, the SDM will cause current to flow through the appropriate deployment loops to deploy the air bags. The SDM records the SIR System status when a deployment occurs and requests the instrument panel cluster (IPC) to turn the AIR BAG indicator ON. The SDM performs continuous diagnostic monitoring of the SIR System electrical components and circuitry when the ignition is turned ON. If the SDM detects a malfunction, a DTC will be stored and the SDM will request the IPC to turn the AIR BAG indicator ON. In the event that battery voltage is lost during a collision, the SDM maintains a 23-volt loop reserve (23 VLR) for deployment of the air bags. It is important to note, when disabling the SIR System for servicing or rescue operations to allow the 23 VLR to dissipate, which could take up to 1 minute.

Inflatable Restraint Passenger Presence System (PPS)

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

The PPS is used to monitor the weight of an occupant on the front outboard passenger seat and communicate the status to the sensing and diagnostic module (SDM) whether to enable or suppress the deployment of the instrument panel (I/P) module. The PPS consist of an electronic control module, silicone filled sensor pad, pressure sensor, seat belt tension sensor, wiring harness, and PASSENGER AIR BAG ON/OFF indicator. 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 indicator located on the overhead console. The PPS monitors itself for faults and will set diagnostic trouble codes (DTC) if a fault is detected. The PPS will also notify the SDM of a fault and the SDM will set DTC B0081 and request the instrument panel cluster (IPC) to turn ON the AIR BAG indicator located on the IPC.

Inflatable Restraint Seat Position Sensors (SPS)

The seat position sensor (SPS) is used to determine the proximity of a front driver position with respect to the frontal air bag. The SPS interfaces with the sensing and diagnostic module (SDM). The state of the SPS allows the SDM to disable stage 2 of the frontal air bag for a front seat that is forward of a forward/rearward point in seat track travel. The SPS is a Hall effect sensor that is mounted on the outboard seat track of the driver seat. The seat track includes a metal bracket that shunts the SPS magnetic circuit creating two states of seat position. The shunted state represents a rearward seat position. The non-shunted state represents a forward position. The SPS provides 2 current ranges, one range for the shunted state and a second range for a non-shunted state. These 2 states are inputs to the SDM. State 1 (shunted) being the rearward threshold and state 2 (non-shunted) being the forward threshold. When the SDM receives input from a SPS that state 1 threshold is reached (seat is rearward) the SDM will not disable stage 2 deployment, if required by the deployment sensors. When state 2 threshold is reached (seat is forward) the SDM will disable stage 2 deployment on the side the seat is forward. The SDM monitors the SPS circuit and if a fault is detected the SDM will set code B0079 and defaults to disabling stage 2 frontal deployment.

Inflatable Restraint Passenger Seat Belt Tension Sensor

The seat belt tension sensor is used to enhance the Passenger Presence System (PPS) when an infant car seat is properly restrained on the front outboard passenger seat. The seat belt tension sensor is a 3-wire potentiometer mounted on the lower seat belt anchor and provides an input to the PPS module. When an infant car seat is properly restrained on the front passenger seat, the seat belt is tightly secured through the infant car seat. The seat belt pulls on the tension sensor and changes the voltage signal to the PPS module. The PPS module uses the voltage signal to help determine if a tightly belted infant car seat is installed. The PPS uses the inputs from the seat belt tension sensor and the PPS pressure sensor to determine if the instrument panel (I/P) module should be suppressed or enabled. The PPS monitors the seat belt tension sensor circuits and sets DTC B0071 if a fault is detected.

Inflatable Restraint Vehicle Rollover Sensor

The vehicle rollover sensor is used to supplement the side Supplemental Inflatable Restraint (SIR) System. The sensing and diagnostic module (SDM) uses the input from the vehicle rollover sensor to assist in determining the severity of a vehicle rollover or near rollover condition. If the SDM determines a deployment is warranted, the SDM will cause current to flow through the deployment loops deploying the inflatable restraint roof rail modules.

AIR BAG Indicator

The AIR BAG indicator, located on the instrument panel cluster (IPC) is used to notify the driver of Supplemental Inflatable Restraint (SIR) System malfunctions and to verify that the sensing and

diagnostic module (SDM) is communicating with the IPC. When the ignition is turned ON, the SDM is supplied with battery voltage and requests the IPC to flash the AIR BAG indicator 7 times. While flashing the indicator, the SDM conducts test on all SIR system components and circuits. If no malfunctions are detected the SDM will communicate with the IPC through the serial data circuit and request the IPC to turn the AIR BAG indicator OFF. The SDM provides continuous monitoring of the air bag circuits by conducting a sequence of checks. If a malfunction is detected the SDM will store a diagnostic trouble code (DTC) and request the IPC to turn the AIR BAG indicator ON. The presence of a SIR system malfunction could result in non-deployment of the air bags. The AIR BAG indicator will remain ON until the malfunction has been repaired.

Inflatable Restraint PASSENGER AIR BAG ON/OFF Indicator

The PASSENGER AIR BAG ON/OFF indicator located on the overhead console is used to notify the driver when the Passenger Presence System (PPS) has enabled or disabled the instrument panel (I/P) inflator module. The PPS air bag indicators will also inform the driver of any PPS malfunctions. When the ignition is turned on, the SDM is supplied with battery voltage and commands both PASSENGER AIR BAG ON/OFF indicators ON for 5 seconds. The PPS module conducts tests on the PPS components and circuits while both ON/OFF indicators are ON. If no malfunctions are detected the PPS module will turn the PASSENGER AIR BAG indicator ON or OFF depending on the status of the PPS. If a malfunction is detected, the PPS module will store a diagnostic trouble code (DTC), default the PPS to the OFF state and communicate with the sensing and diagnostic module (SDM) that a DTC has been set. When the SDM detects that the PPS has set a DTC, the SDM will set either DTC B0056 or B0081 and request the instrument panel cluster (IPC) to turn the AIR BAG indicator located on the IPC ON. This is done to notify the driver of any PPS malfunctions. The presence of a Supplemental Inflatable Restraint (SIR) System malfunction could result in non-deployment of the air bags. The AIR BAG indicator will remain ON until the malfunction has been repaired.

Dual Stage Inflator Modules

Dual stage inflator modules contain a housing, inflatable air bag, 2 initiating devices, canister of gas generating material and, in some cases, stored compressed gas. The 2 initiators are part of the inflator module deployment loop. The inflator modules have 2 stages of deployment, which varies the amount of restraint to the occupant according to the collision severity. For moderate frontal collisions the inflator modules deploy at less than full deployment which consists of stage 1 of the inflator module. For more severe frontal collisions a full deployment is initiated which consists of stage 1 and stage 2 of the inflator module. When the vehicle is involved in a collision of sufficient force, the sensing and diagnostic module (SDM) will cause current to flow through the deployment loops to the initiator. Current passing through the initiator ignites the material in the canister producing a rapid generation of gas and the release of compressed gas, if present. The gas

produced from this reaction rapidly inflates the air bag. Once the air bag is inflated it quickly deflates through the air bag vent holes.

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

Inflatable Restraint Steering Wheel Module Coil

The steering wheel module coil is attached to the steering column and is located under the steering wheel. The steering wheel module coil consists of 2 or more current-carrying coils. The coils allow the rotation of the steering wheel while maintaining continuous electrical contact between the driver deployment loop and the steering wheel module. Four coil wires are used for the steering wheel module deployment loop. Additional coil wires are used for accessories attached to the steering wheel depending on the vehicle model. The steering wheel module coil connector is located near the base of the steering column. The connector contains a shorting bar that shorts the steering wheel module coil deployment loop circuitry to prevent unwanted deployment of the air bag when it is disconnected.

Inflatable Restraint Front End Sensors

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

Inflatable Restraint 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 sever enough to warrant side SIR deployment. The SIS is not part of the deployment loop, but instead provides an input to the SDM. The SDM contains a microprocessor that performs calculations using the measured accelerations and compares these calculations to a value stored in memory.

Inflatable Restraint Wiring Harnesses

The wiring harnesses connect the sensing and diagnostic module (SDM), inflator modules, Passenger Presence System (PPS), front end sensors, seat position sensors (SPS), passenger seat belt tension retractor sensor, rollover sensor, side impact sensors and the serial data circuit

together using connectors. SIR deployment loop connectors are yellow in color for easy identification. When repairing Supplemental Inflatable Restraint (SIR) System wiring harnesses, follow the proper testing and wiring repair procedures outlined in this manual.

Seat Belt Pretensioner

The seat belt pretensioner consist of a housing, a seat belt retractor, the seat belt webbing, an initiator, and a canister of gas generating materials. The initiator is part of the seat belt pretensioner deployment loop. When the vehicle is involved in a collision of sufficient force, the sensing and diagnostic module (SDM) causes current to flow through the seat belt deployment loops to the initiator. Current passing through the initiator ignites the material in the canister producing a rapid generation of gas. The gas produced from this reaction deploys the seat belt pretensioner and retracts the seat belt webbing, which removes all of the slack in the seat belts. Depending on the severity of the collision, the seat belt pretensioner may deploy without the frontal inflator modules deploying, or they will deploy immediately before the frontal inflator modules deploy. Each seat belt pretensioner is equipped with a shorting bar that is located in the connector of the seat belt pretensioner. The shorting bar shorts the seat belt pretensioner circuitry to prevent unwanted deployment of the seat belt pretensioner when the connector is disconnected.

Steering Wheel and Column

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

Driver and Passenger Knee Bolsters

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