2010 RESTRAINTS

Seat Belts - Camaro

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Application	Specification	
	Metric	English
Child Tether Anchor Bolt	30 N.m	22 lb ft
Front Seat Belt Buckle Assembly	40 N.m	30 lb ft
Rear Seat Center Belt Retractor Bolt	30 N.m	22 lb ft
Rear Seat Center Shoulder Belt Anchor Plate Bolt	36 N.m	27 lb ft
Seat Belt Buckle Nut	36 N.m	27 lb ft
Seat Belt Retractor Bolt	45 N.m	33 lb ft
Seat Shoulder Belt Anchor Plate Bolt	45 N.m	33 lb ft
Shoulder Belt Guide Bolt	47 N.m	35 lb ft

SCHEMATIC AND ROUTING DIAGRAMS

SEAT BELT SCHEMATICS

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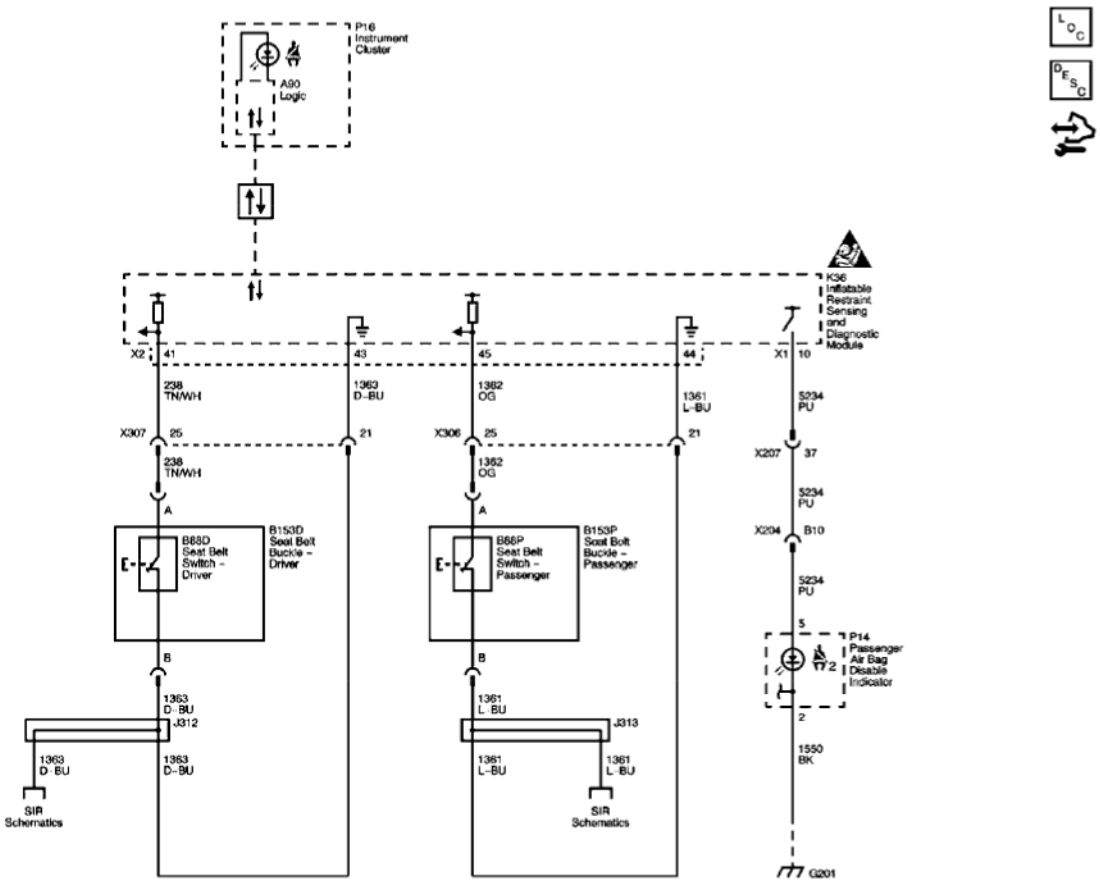


Fig. 1: Seat Belt
Courtesy of GENERAL MOTORS CORP.

DIAGNOSTIC INFORMATION AND PROCEDURES

SYMPTOMS - SEAT BELTS

NOTE: **Review the seat belt system description and operation in order to familiarize yourself with the system and how it functions. Refer to Seat Belt System Description and Operation.**

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the seat belt 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

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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 the following symptom diagnostic procedure in order to diagnose the symptom:

- **Seat Belt Indicator Circuit Malfunction - Driver**
- **Seat Belt Indicator Circuit Malfunction - Passenger**

SEAT BELT DOES NOT RETRACT

1. Grab the seat belt webbing and slowly and firmly extract 15-25 mm (5/8-1 in) of webbing from the seat belt.
2. Release the seat belt and allow the webbing to slowly retract back into the retractor.
3. Check to see if the seat belt is released. If the seat belt is not released, repeat steps 1 and 2, two times more.
4. If the retractor does not release after repeating the steps, replace with a new retractor.

SEAT BELT INDICATOR CIRCUIT MALFUNCTION - DRIVER

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Driver Seat Belt Switch Signal	1	2	2	2	-
Driver Seat Belt Switch Low Reference	-	2	2	2	-
1. Indicator will remain ON with seat belt buckled. 2. Indicator will illuminate only for the bulb check.					

Circuit/System Description

The driver seat belt switch is a 2-wire switch wired to the inflatable restraint sensing and diagnostic module (SDM) using a signal circuit and a low reference circuit. When the seat belt is unbuckled the switch is closed, and when the seat belt is buckled the switch is open. The SDM sends the status of the driver seat belt via serial data to the instrument panel cluster. After receiving the message, the instrument panel cluster controls the illumination of the driver seat belt indicator.

Reference Information

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Schematic Reference

Seat Belt Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Seat Belt 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, with a scan tool turn on all indicators using the Instrument Cluster Output Controls and verify the driver seat belt indicator is illuminated for 5 seconds.
   - If the indicator does not illuminate, replace the P16 instrument panel cluster.
2. With the scan tool, monitor the Driver Seat Belt Status parameter while buckling and unbuckling the seat belt. The parameter should display Buckled and Unbuckled when buckling and unbuckling the seat belt.

Circuit/System Testing

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

- **B88 Seat belt switch**
- **Seat belt switch harness connector**
- **K36 SDM**
- **SDM wiring harness connector**

1. Ignition OFF, disconnect the harness connector at the B88 seat belt switch.
2. Test for less than 5 ohms between the ground circuit terminal B and ground.

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- If greater than the specified range, test the ground circuit for an open/high resistance. If the circuit tests normal replace the K36 SDM.

3. Ignition ON, verify the scan tool Driver Seat Belt Status parameter displays Buckled.
   - If not the specified value, test the signal circuit terminal A for a short to ground. If the circuit tests normal replace the K36 SDM.
4. Install a 3 A fused jumper wire between the circuit terminal A and the ground circuit terminal B. Verify the scan tool Driver Seat Belt Status parameter displays Unbuckled.
   - If not the specified value, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K36 SDM.
5. If all circuits test normal, test or replace the B88 seat belt switch. Refer to **Driver or Passenger Seat Belt Buckle Replacement**.

Component Testing

1. Ignition OFF, disconnect the harness connector at the B88 seat belt switch.
2. Test for infinite resistance between the signal circuit terminal A and the ground terminal B, at the switch, with the switch in the open position.
   - If not the specified value, replace the B88 seat belt switch. Refer to **Driver or Passenger Seat Belt Buckle Replacement**.
3. Test for less than 5 ohms between the signal circuit terminal A and the ground terminal B, at the switch, with the switch in the closed position.
   - If greater than the specified range, replace the B88 seat belt switch. Refer to **Driver or Passenger Seat Belt Buckle Replacement**.

Repair Procedures

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

Control Module References for SDM and instrument panel cluster replacement, setup, and programming

SEAT BELT INDICATOR CIRCUIT MALFUNCTION - PASSENGER

Diagnostic Instructions

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

Diagnostic Fault Information

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Passenger Seat Belt Switch Signal	1	2	2	2	-
Passenger Seat Belt Switch Low	-	2	2	2	-

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Reference					
1. Indicator will remain ON with seat belt buckled. 2. Indicator will illuminate only for the bulb check.					

Circuit/System Description

When an individual is sitting in the passenger seat the passenger presence sensor detects the individual. A signal to the SDM indicates a person is in the passenger seat. The SDM will turn the passenger seat belt indicator on. The passenger seat belt switch is a 2-wire switch wired to the inflatable restraint sensing and diagnostic module (SDM) using a signal circuit and a low reference circuit. When the seat belt is unbuckled the switch is closed, and when the seat belt is buckled the switch is open. The SDM sends the status of the passenger seat belt via a hard wire to the passenger air bag disable switch. After receiving the message, the passenger air bag disable switch controls the illumination of the passenger seat belt indicator.

Reference Information

Schematic Reference

Seat Belt Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Seat Belt 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, have someone sit in the passenger seat. With a scan tool verify the Automatic Occupant Sensing Current Front Occupancy Status indicates Occupied.
    - If the scan tool does not indicate Occupied, test the passenger presence sensor signal circuit and the low reference circuit for an open or short. If the circuits test normal, replace the passenger presence sensor. Refer to **Front Seat Cushion Cover and Pad Replacement** .

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2. Ignition ON, with a scan tool perform the Passenger Seat Belt Reminder Indicator On/Off Control Function and verify the passenger seat belt indicator turns on and off.
    - If the indicator is always ON or always OFF, refer to Seat Belt Inidicator Malfunction.
3. With the scan tool monitor the Passenger Seat Belt Status parameter while buckling and unbuckling the seat belt. The parameter should display Buckled and Unbuckled when buckling and unbuckling the seat belt.
    - If the values do not change, refer to Seat Belt Switch Malfunction.

Circuit/System Testing

Seat Belt Switch Malfunction

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

- **B88 Seat belt switch**
- **Seat belt switch harness connector**
- **K36 SDM**
- **SDM harness connector**

1. Ignition OFF, disconnect the harness connector at the B88 passenger seat belt switch.
2. Ignition OFF, test for less than 1 ohms between the low reference circuit terminal B and ground.
    - If greater than the specified range, test the low reference circuit for an open/high resistance. If the circuit tests normal, replace the K36 SDM.
3. Ignition ON, verify the scan tool Passenger Seat Belt Status parameter displays Buckled.
    - If not the specified value, test the signal circuit for a short to ground. If the circuit tests normal replace the K36 SDM.
4. Install a 3 A fused jumper wire between the signal circuit terminal A and the low reference circuit terminal B. Verify the scan tool Passenger Seat Belt Status parameter displays Unbuckled.
    - If not the specified value, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K36 SDM.
5. If all circuits test normal, replace the B88 seat belt switch. Refer to **Driver or Passenger Seat Belt Buckle Replacement**

Seat Belt Indicator Malfunction

1. Ignition OFF, disconnect the harness connector at the P14 passeneger air bag disable indicator.
2. Test for less than 1 ohms between the ground circuit terminal 2 and ground.
    - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Connect a test lamp between the control circuit terminal 5 and ground.
4. Ignition ON, command the Passenger Seat Belt Reminder Indicator ON and OFF with a scan tool, the test lamp should turn ON and OFF while changing between the commanded states.

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- If the test lamp is always ON, test the control circuit for a short to voltage. If the circuit tests normal, replace the K36 SDM.
- If the test lamp is always OFF, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the K36 SDM.

5. If all circuit test normal, test or replace the P14 passeneger air bag disable indicator. Refer to **Inflatable Restraint Instrument Panel Module Indicator Replacement** .

Component Testing

1. Ignition OFF, disconnect the harness connector at the B88 seat belt switch.
2. Test for infinite resistance between the signal circuit terminal A and the low reference terminal B, at the switch, with the switch in the open position.
   - If less than the specified value, replace the B88 seat belt switch. Refer to **Driver or Passenger Seat Belt Buckle Replacement**
3. Test for less than 1 ohms between the signal circuit terminal A and the low reference terminal B, at the switch, with the switch in the closed position.
   - If greater than the specified range, replace the B88 seat belt switch. Refer to **Driver or Passenger Seat Belt Buckle Replacement**

Repair Procedures

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

Control Module References for SDM and instrument panel cluster replacement, setup, and programming.

REPAIR INSTRUCTIONS

REPAIRS AND INSPECTIONS REQUIRED AFTER A COLLISION

WARNING: Restraint systems can be damaged in a collision. To help avoid injury and ensure that all parts in need of replacement are replaced:

- **Replace any seat belt system that was in use during the collision serious enough to deploy any automatic restraint device such as air bags and seat belt pretensioners. This not only includes seat belt systems in use by people of adult size, but seat belt systems used to secure child restraints, infant carriers and booster seats, including LATCH system and top tether anchorages.**
- **Replace any seat belt system that has torn, worn, or damaged components. This not only includes adult seat belt systems, but built-in child restraints and LATCH system components, if any.**
- **Replace any seat belt system if you observe the words "REPLACE" or "CAUTION", or if a yellow tag is visible. Do not replace a seat belt if only the child seat caution label is visible.**

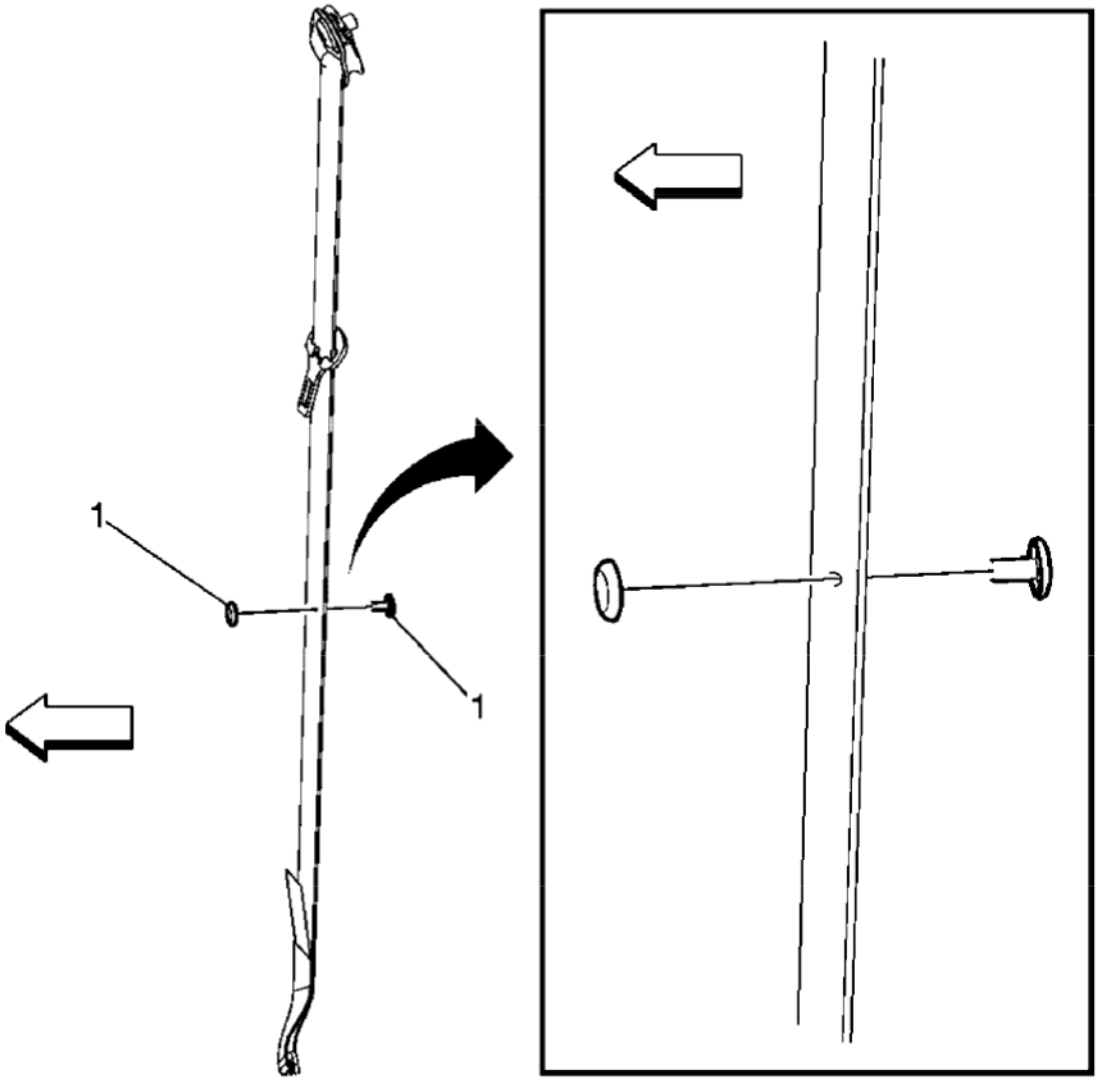
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- **Replace any seat belt system if you are doubtful about its condition. This not only includes adult seat belt systems, but built-in child restraints, LATCH system components, and any restraint system used to secure infant carriers, child restraints, and booster seats.**

  Do NOT replace single seat belt system components in vehicles that have been in a collision as described above. Always replace the entire seat belt system with the buckle, guide and retractor assembly, which includes the latch and webbing material.

After a minor collision where no automatic restraint device was deployed, seat belt system replacement may not be necessary, unless some of the parts are torn, worn, or damaged.

SEAT BELT LATCH STOP INSTALLATION



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Fig. 2: Seat Belt Latch Stop
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure 1. Locate the hole in the seat belt webbing where the original seat belt stop button was located. 2. If the original hole in the seat belt webbing is not visible, perform the following: • If either the right or left stop button is missing use the opposing seat belt as a reference. • With the opposing seat belt fully stowed, measure the distance between the seat belt lower anchor and the stop button. • Using the measurement obtained above, measure and mark the location of the missing stop button on the center of the seat belt webbing. 3. Ensure the seat belt latch plate is located above the mark or original hole.	
1	Seat Belt Stop Button **Procedure** 1. Work the male half of the stop button through the hole in the webbing or at the marked location. 2. Align the female half of the stop button with the male half of the stop button. 3. Snap the two halves together. 4. Trim off any access of the male half of the stop button flush with the female half of the stop button. **Tip:** Ensure the male half of the stop button is facing forward in the vehicle in order to ensure the stop button will not snag customers clothing.

DRIVER OR PASSENGER SEAT BELT BUCKLE REPLACEMENT

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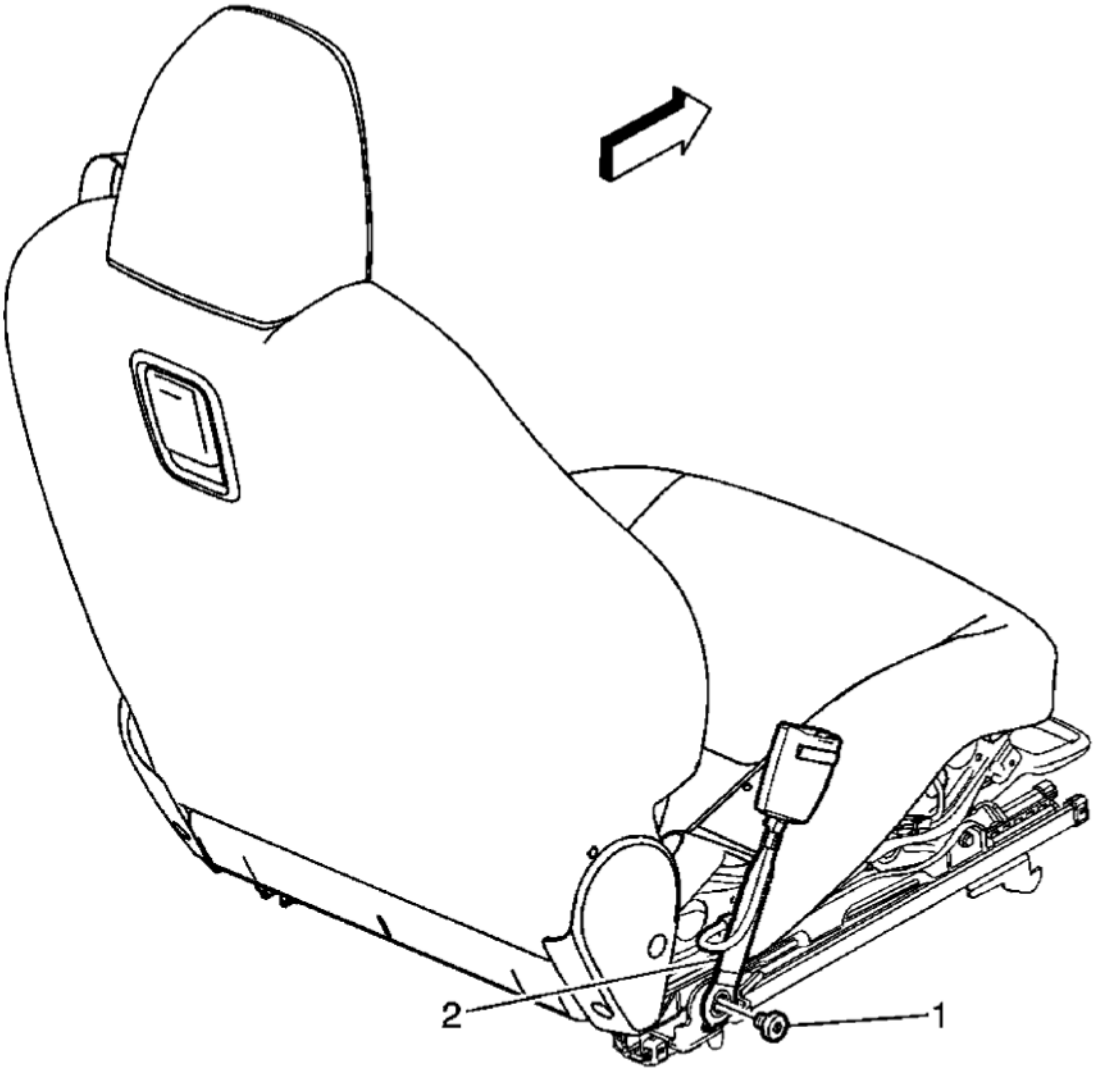


Fig. 3: Driver Or Passenger Seat Belt Buckle
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove front seat. Refer to **Driver or Passenger Seat Replacement** .	
1	Front Seat Belt Buckle Fastener **CAUTION:** **Refer to Fastener Caution .** **Tighten:** 40 N.m (30 lb ft)
2	Front Seat Belt Buckle Assembly **Tip:** Disconnect electrical connectors.

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REAR SEAT BUCKLE SIDE BELT REPLACEMENT

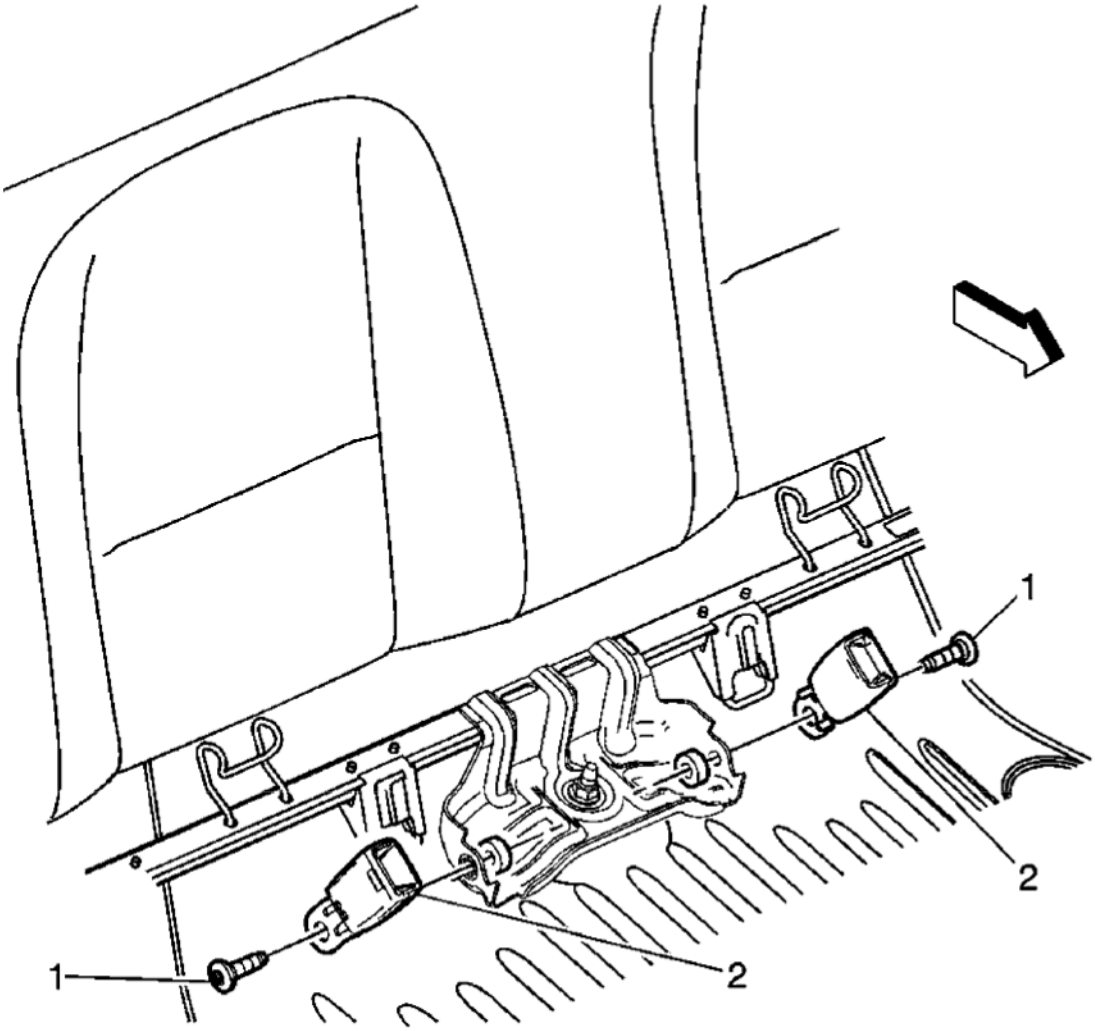


Fig. 4: Rear Seat Buckle Side Belt
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the rear seat cushion. Refer to **Rear Seat Cushion Replacement** .	
1	Rear Seat Buckle Fastener (Qty: 2) **CAUTION:** **Refer to Fastener Caution .** **Tighten:** 42 N.m (31 lb ft)
2	Rear Seat Belt Buckle Assembly

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REAR SEAT RETRACTOR SIDE BELT REPLACEMENT

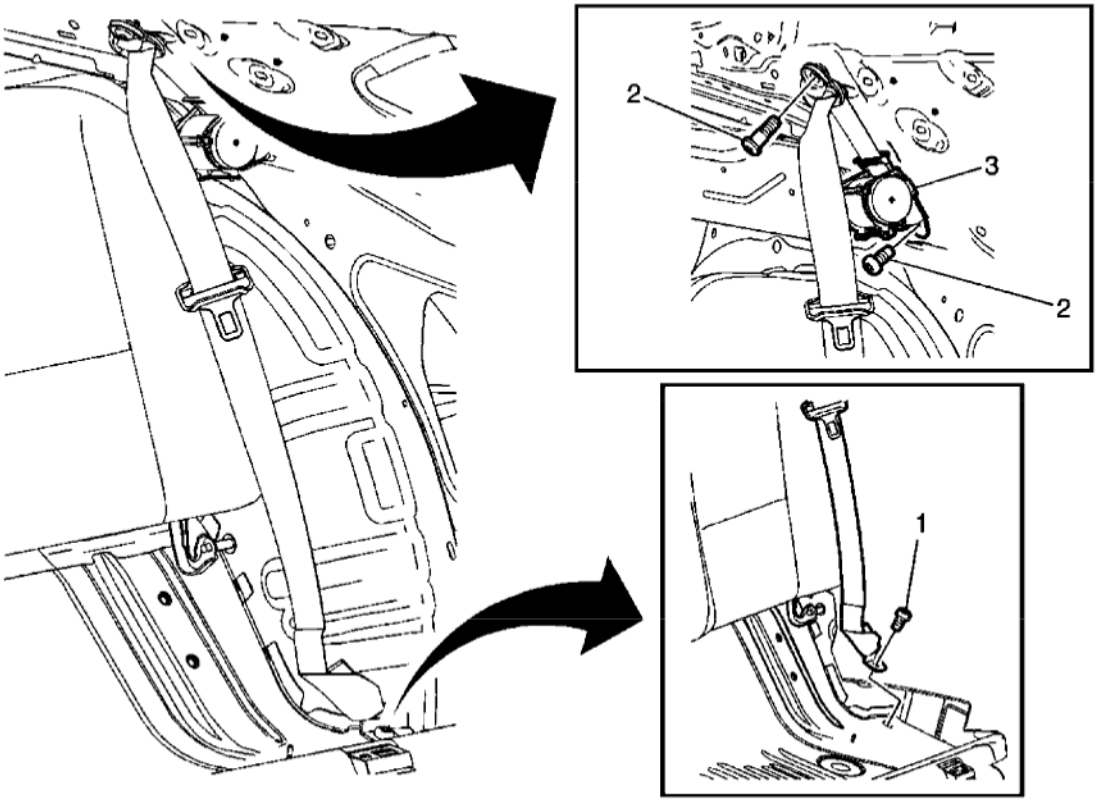


Fig. 5: Rear Seat Retractor Side Belt
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure 1. Remove the rear seat cushion. Refer to **Rear Seat Cushion Replacement** . 2. Remove the rear seat back. Refer to **Rear Seat Back Cushion Replacement** . 3. Remove the quarter upper rear trim panel. Refer to **Quarter Upper Rear Trim Panel Replacement** . 4. Remove the quarter upper trim panel. Refer to **Quarter Upper Trim Panel Replacement** .	
1	Seat Shoulder Belt Anchor Plate Fastener **CAUTION:** **Refer to Fastener Caution .** **Tighten:** 36 N.m (27 lb ft)
2	Seat Belt Retractor Fastener (Qty: 2)

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	Tighten: 30 N.m (22 lb ft)
3	Rear Shoulder Seat Belt Retractor

DESCRIPTION AND OPERATION

SEAT BELT SYSTEM DESCRIPTION AND OPERATION

Restraint System

The vehicle has front and rear seat belts that are the primary means of occupant restraint. Seat belts help to keep the occupants inside the passenger compartment and to gradually reduce the impact forces during the following events:

- Frontal impact type crashes
- Rear impact type crashes
- Side impact type crashes
- Roll-over type crashes

All seat belt retractors have emergency locks. The retractors remain unlocked during normal operation and under normal driving conditions. The retractors remain unlocked during normal conditions in order to allow free movement of the upper body of each occupant. A pendulum locks the seat belt webbing into position. The pendulum causes a locking bar to engage a cog on the spool of the retractor mechanism when the following conditions occur:

- A rapid extraction of the seat belt webbing from the retractor
- An abrupt change in vehicle speed
- An abrupt change in vehicle direction
- Operation of the vehicle on a steep upgrade
- Operation of the vehicle on a downgrade

The seat belts have an automatic locking (cinch) feature. The cinch feature is activated when the seat belt webbing is completely extended from the retractor. The cinch feature prevents the webbing from extending beyond the position from which it is allowed to retract. Use of the cinch feature is recommended for securing a child seat. The cinch feature may be cancelled by allowing the webbing to wind back completely into the retractor. After the cinch feature is cancelled, the webbing is unlocked. After the cinch feature is cancelled, the webbing will extend from the retractor. This vehicle is also equipped with a supplemental inflatable restraint (SIR) system. Refer to **SIR System Description and Operation**

Front Seat Belt System

The front seat belt system includes a driver and passenger seat belt pretensioner retractor. Both front seat belt pretensioners includes a seat belt switch in the seat buckle which controls a reminder lamp and a tone alarm.

NOTE: **The front passenger seat is equipped with a passenger presence detection sensor, which detects an occupant. If the passenger presence detection sensor**

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detects an empty front passenger seat, then the passenger fasten safety belt indicator will be disabled.

- When the driver seat belt is buckled and the ignition switch is turned ON, the following events will occur:
  - The tone alarm will not operate.
  - The reminder lamp will not operate.
- When the passenger seat belt is buckled with an occupant sitting in the passenger front seat, then the ignition switch is turned ON, the following events will occur:
  - The tone alarm will not operate.
  - The reminder lamp, which is located within the Passenger Air Bag Disable Indicator, will not be turned ON.
- When the driver seat belt is not buckled and the ignition switch is in the ON position, the following events will occur:
  - The tone alarm will operate for 4-8 seconds and then go OFF.
  - The fasten safety belt indicator will turn ON for 20 seconds, until the driver seat belt is buckled.
- When the passenger seat belt is not buckled with an occupant sitting in the passenger front seat, then the ignition switch is turned ON, the following events will occur:
  - The tone alarm will operate for 4-8 seconds and then go OFF.
  - The reminder lamp, which is located within the Passenger Air Bag Disable Indicator, will be turned ON.

Rear Seat Belt System

The Rear Seat Belt System includes the following components:

- The rear seat belt retractor is located at the wheelhouse panel and attached to the floor panel by the rear seat shoulder belt retractor bracket.
- The rear seat belt buckles and the center seat belt buckle are attached to each seat.

Child Seat Restraint System

WARNING: A child in a rear-facing child restraint can be seriously injured if the right-front passengers air bag inflates. This is because the back of a rear-facing child restraint would be very close to the inflating air bag. NEVER use a rear-facing child restraint in this vehicle. If a forward-facing child restraint is suitable for your child, ALWAYS move the front passenger seat as far back as it will go and then install the child restraint. Be sure the child restraint position does not conflict with any additional requirements provided by the manufacturer. For more information, refer to the vehicle owners manual and the instruction that came with the child restraint.

A child in a rear-facing child restraint can be seriously injured if the right-front passengers air bag inflates. This is because the back of a rear-facing child restraint would be very close to the inflating air bag. NEVER use a rear-facing child restraint in this vehicle. If a forward-facing child restraint is suitable for your child, ALWAYS

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move the front passenger seat as far back as it will go and then install the child restraint. Be sure the child restraint position does not conflict with any additional requirements provided by the manufacturer. For more information, refer to the vehicle owners manual and the instruction that came with the child restraint.

The child seat may only be used in a forward facing seating location. The child seat should be installed and secured according to the manufacturer's directions. If the child seat has a top strap, the seat will need to be anchored. Passengers should not be allowed to sit at locations where the seat belts are being used to secure the child seat.

All vehicles are equipped with a dual-mode type retractor with emergency and automatic locking features. The automatic locking feature is for restraint of a child seat. The child seat can be secured by pulling the seat belt all the way out to lock it. Then tighten the seat belt around the child seat.

If a child seat is to be used in the second seat position, a special dealer-installed anchor must be used in order to anchor the child seat top strap. This only applies to the seats designed with the top strap provision and for the vehicles sold in Canada. In order to ensure the correct top strap angle, the child seat is only to be used at the seating position for which the top strap anchor is installed.

Fasten Safety Belt Indicators

There are two fasten safety belt indicators for this vehicle. The driver fasten safety belt reminder is displayed in the instrument cluster, and the passenger fasten safety belt reminder is displayed in the passenger air bag disable indicator. The fasten safety belt indicator may only be ON during RUN. The fasten safety belt indicator illuminates under the following conditions:

- During the bulb check
- The inflatable restraint sensing and diagnostic module (SDM) sends the status of the driver seat belt to the instrument cluster via serial data. The passenger seat belt status is sent to the passenger air bag disable indicator via a hardwire. If any of the seat belts are unfastened, the instrument cluster will send a message requesting a chime sound to be turned ON after a bulb check.

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2010 RESTRAINTS

Supplemental Inflatable Restraints - Camaro

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Application	Specification	
	Metric	English
Inflatable Restraint Front End Sensor Mounting Bolt	11 N.m	97 lb in
Inflatable Restraint Front Passenger Presence Module Bolt	4 N.m	35 lb in
Inflatable Restraint Front Seat Side Module Nut	3.5 N.m	31 lb in
Inflatable Restraint Sensing and Diagnostic Module Nut	7 N.m	56 lb in
Inflatable Restraint Side Impact Sensor Assembly Bolt	8 N.m	70 lb in
Inflatable Restraint Steering Wheel Module Coil Bolt	0.9 N.m	7.8 lb in
Roof Side Rail Inflatable Restraint Module Electrical Harness Bolt	9 N.m	80 lb in
Roof Side Rail Inflatable Restraint Module Integral Bolts	9 N.m	80 lb in
Seat Shoulder Belt Guide Bolt	47 N.m	35 lb ft
Seat Shoulder Belt Retractor Screw	47 N.m	35 lb ft
Seat Belt Retractor Anchor Plate Nut	47 N.m	35 lb ft

SCHEMATIC AND ROUTING DIAGRAMS

SIR SCHEMATICS

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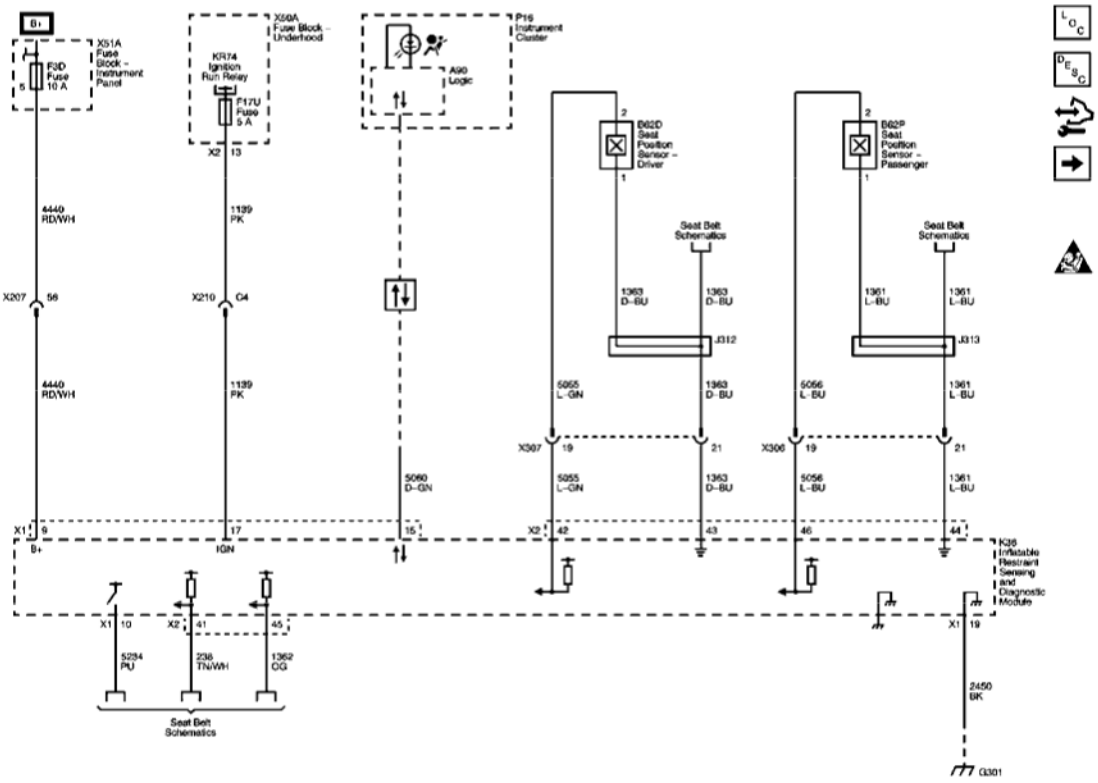


Fig. 1: Power, Ground, DLC, and Seat Position Sensors
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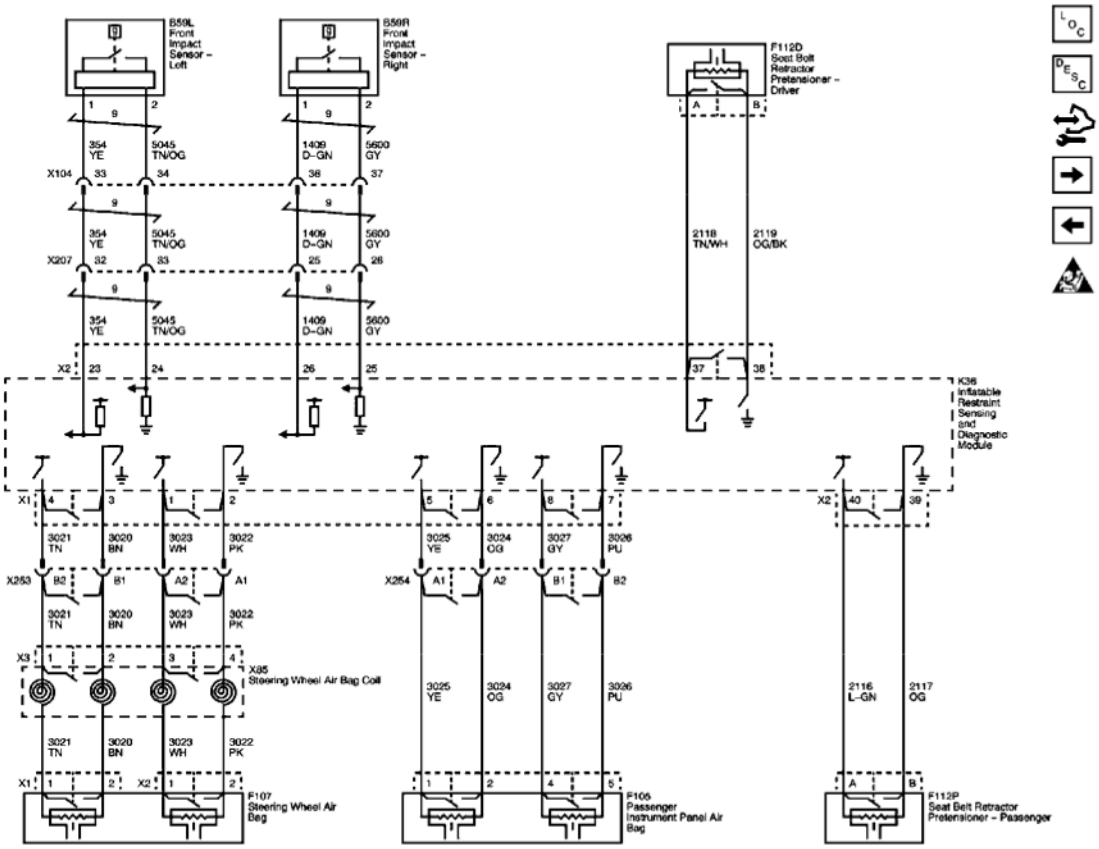


Fig. 2: Front End Sensors, Seat Belt Retractor Pretensioners, Steering Wheel Module and I/P Module
Courtesy of GENERAL MOTORS CORP.

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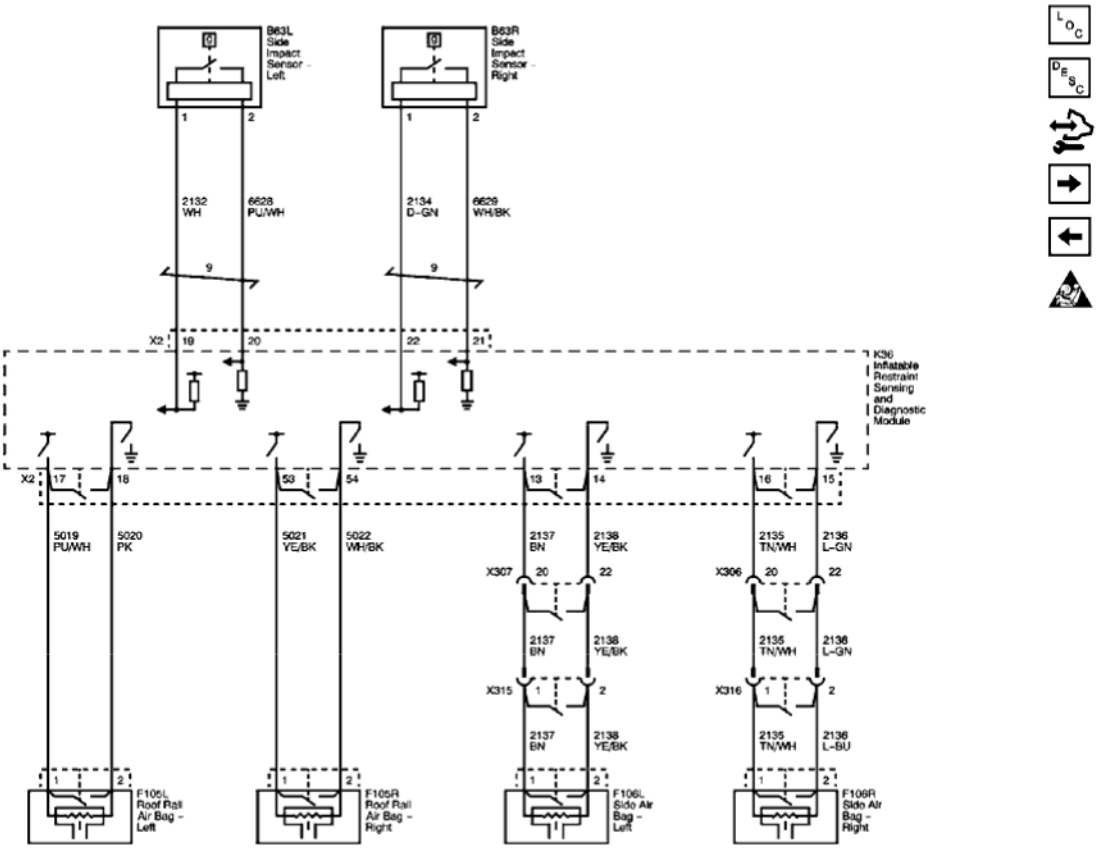


Fig. 3: Side Impact Sensors and Modules
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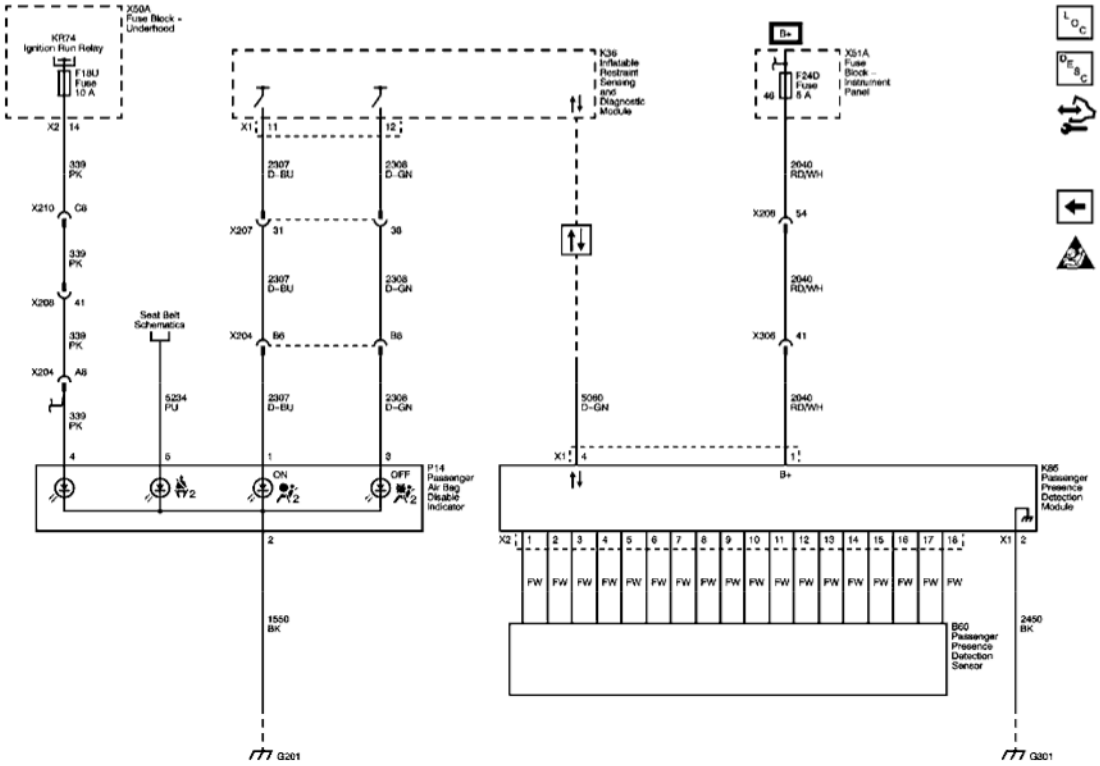


Fig. 4: Passenger Presence System
Courtesy of GENERAL MOTORS CORP.

COMPONENT LOCATOR

SIR IDENTIFICATION VIEWS

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

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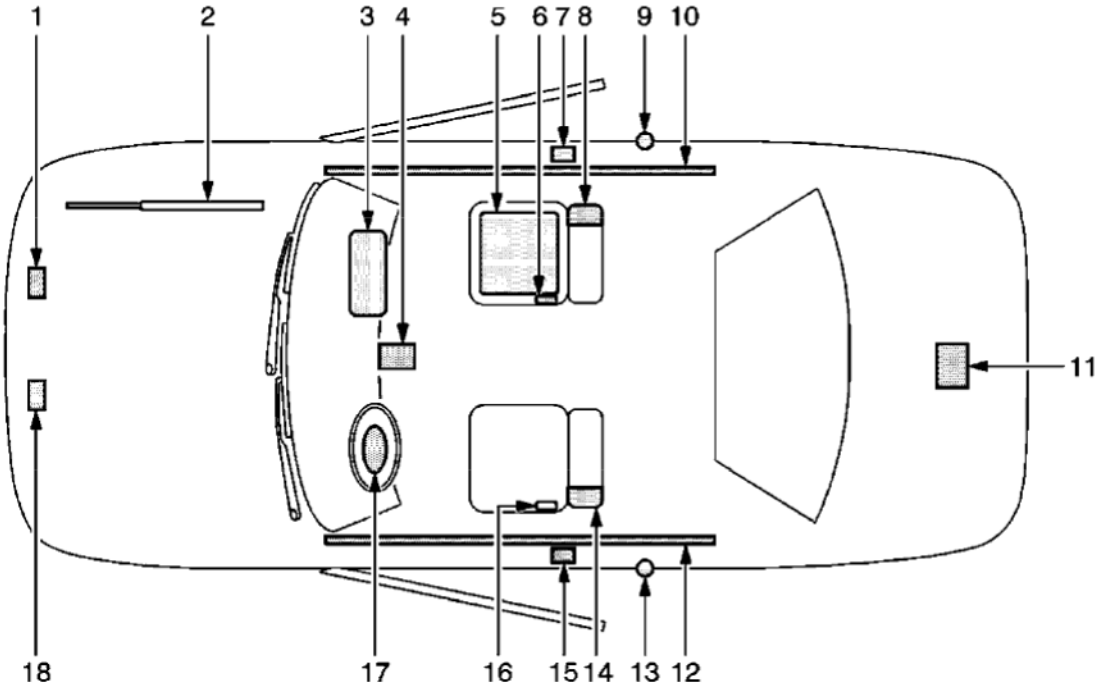


Fig. 5: SIR Identification Views
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Right Front End Sensor-Located on the front of the vehicle in the engine compartment
2	Front Hood Assist Rod-A gas shock located under the front hood on the passenger side
3	Instrument Panel Air Bag-Located at the top right under the instrument panel
4	Inflatable Restraints Sensing and Diagnostic Module (SDM)-Located underneath the vehicle center console in front of shifter
5	Passenger Presence Detection System-Located in the passenger seat under the seat trim
6	Passenger Seat Position Sensor-Located under the seat inboard side
7	Seat Belt Retractor Pretensioner-Located under the trim near the bottom of the center pillar
8	Right Front Side Impact Air Bag-Located on the seat back of passenger seat
9	Side Impact Sensor-Located in the B-pillar
10	Right Front Side Roof Rail Air Bag-Located passenger side under the headliner
11	Vehicle Battery-Located under the hood on the right side, in the trunk on the middle
12	Left Front Side Roof Rail Air Bag-Located driver side under headliner
13	Side Impact Sensor-Located in the B-pillar
14	Left Front Side Impact Air Bag-Located on the seat back of driver seat
	Seat Belt Retractor Pretensioner-Located under the trim near the bottom of the

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15	center pillar
16	Driver Seat Position Sensor-Located under seat inboard side
17	Steering Wheel Air Bag-Located on the steering wheel
18	Left Front End Sensor-Located on the front of the vehicle in the engine compartment (on the radiator tie bar)

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 B0012 0D: Driver Frontal Deployment Loop Stage 1 High Resistance B0012 0E: Driver Frontal Deployment Loop Stage 1 Low Resistance 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 B0013 0D: Driver Frontal Deployment Loop Stage 2 High Resistance B0013 0E: Driver Frontal Deployment Loop Stage 2 Low Resistance
DTC B0014-B0045	B0014 01: Driver Side Deployment Loop Short to Battery - Seat Air Bag B0014 02: Driver Side Deployment Loop Short to Ground - Seat Air Bag B0014 04: Driver Side Deployment Loop Open - Seat Air Bag B0014 0D: Driver Side Deployment Loop High Resistance - Seat Air Bag B0014 0E: Driver Side Deployment Loop Low Resistance - Seat Air Bag B0015 01: Driver Seat Belt Retractor Pretensioner Deployment Loop Short to Battery B0015 02: Driver Seat Belt Retractor Pretensioner Deployment Loop Short to Ground B0015 04: Driver Seat Belt Retractor Pretensioner Deployment Loop Open B0015 0D: Driver Seat Belt Retractor Pretensioner Deployment Loop High Resistance B0015 0E: Driver Seat Belt Retractor Pretensioner Deployment Loop Low Resistance B0016 01: Left Roof Rail Deployment Loop 1 Short to Battery B0016 02: Left Roof Rail Deployment Loop 1 Short to Ground B0016 04: Left Roof Rail Deployment Loop 1 Open B0016 0D: Left Roof Rail Deployment Loop 1 High Resistance B0016 0E: Left Roof Rail Deployment Loop 1 Low Resistance 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

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	B0019 0D: Passenger Frontal Deployment Loop Stage 1 High Resistance B0019 0E: Passenger Frontal Deployment Loop Stage 1 Low Resistance 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 B0020 0D: Passenger Frontal Deployment Loop Stage 2 High Resistance B0020 0E: Passenger Frontal Deployment Loop Stage 2 Low Resistance B0021 01: Passenger Side Deployment Loop Short to Battery - Seat Air Bag B0021 02: Passenger Side Deployment Loop Short to Ground - Seat Air Bag B0021 04: Passenger Side Deployment Loop Open - Seat Air Bag B0021 0D: Passenger Side Deployment Loop High Resistance - Seat Air Bag B0021 0E: Passenger Side Deployment Loop Low Resistance - Seat Air Bag B0022 01: Passenger Seat Belt Retractor Pretensioner Deployment Loop Short to Battery B0022 02: Passenger Seat Belt Retractor Pretensioner Deployment Loop Short to Ground B0022 08: Passenger Seat Belt Retractor Pretensioner Deployment Loop Open Circuit B0022 0D: Passenger Seat Belt Retractor Pretensioner Deployment Loop High Resistance B0022 0E: Passenger Seat Belt Retractor Pretensioner Deployment Loop Low Resistance B0023 01: Right Roof Rail Deployment Loop 1 Short to Battery B0023 02: Right Roof Rail Deployment Loop 1 Short to Ground B0023 04: Right Roof Rail Deployment Loop 1 Open B0023 0D: Right Roof Rail Deployment Loop 1 High Resistance B0023 0E: Right Roof Rail Deployment Loop 1 Low Resistance
DTC B0052	B0052 00: Deployment Commanded Malfunction B0052 56: Deployment Commanded Too Many Transitions
DTC B0074	B0074 00: Passenger Occupant Classification Sensor Circuit Malfunction B0074 04: Passenger Occupant Classification Sensor Open
DTC B0079 or B0080	B0079 01: Driver Seat Position Sensor Circuit Short to Battery B0079 02: Driver Seat Position Sensor Circuit Short to Ground B0079 04: Driver Seat Position Sensor Circuit Open B0079 05: Driver Seat Position Sensor Circuit High Voltage or Open B0079 06: Driver Seat Position Sensor Circuit Low Voltage or Open B0079 08: Driver Seat Position Sensor Circuit Performance-Signal Invalid B0079 0C: Driver Seat Position Sensor Circuit Low Current B0080 01: Passenger Seat Position Sensor Circuit Short to Battery B0080 02: Passenger Seat Position Sensor Circuit Short to Ground B0080 04: Passenger Seat Position Sensor Circuit Open

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	B0080 05: Passenger Seat Position Sensor Circuit High Voltage or Open B0080 06: Passenger Seat Position Sensor Circuit Low Voltage or Open B0080 08: Passenger Seat Position Sensor Circuit Performance-Signal Invalid B0080 0C: Passenger Seat Position Sensor Circuit Low Current
DTC B0081 (SDM)	B0081 00: Passenger Presence Detection Module Malfunction B0081 3A: Passenger Presence Detection Module Incorrect Component Installed
DTC B0081 (Passenger Presence Detection Module)	B0081 11: Passenger Presence Detection Module High Input B0081 42: Passenger Presence Detection Module Calibration Not Programmed
DTC B0083-B0088	B0083 01: Front Impact Sensor 1 Short to Battery (Driver) B0083 02: Front Impact Sensor 1 Short to Ground (Driver) B0083 04: Front Impact Sensor 1 Open (Driver) B0083 39: Front Impact Sensor 1 Internal Electronic Failure (Driver) B0083 3A: Front Impact Sensor 1 Incorrect Component Installed (Driver) B0083 71: Front Impact Sensor 1 Invalid Serial Data Received (Driver) B0084 01: Front Impact Sensor 2 Short to Battery (Passenger) B0084 02: Front Impact Sensor 2 Short to Ground (Passenger) B0084 04: Front Impact Sensor 2 Open (Passenger) B0084 39: Front Impact Sensor 2 Internal Electronic Failure (Passenger) B0084 3A: Front Impact Sensor 2 Incorrect Component Installed (Passenger) B0084 71: Front Impact Sensor 2 Invalid Serial Data Received (Passenger) B0085 01: Left Front Side Impact Sensor Short to Battery B0085 02: Left Front Side Impact Sensor Short to Ground B0085 04: Left Front Side Impact Sensor Open B0085 39: Left Front Side Impact Sensor Internal Malfunction B0085 3A: Left Front Side Impact Sensor Incorrect Component Installed B0085 71: Left Front Side Impact Sensor Invalid Serial Data Received B0086 01: Right Front Side Impact Sensor Short to Battery B0086 02: Right Front Side Impact Sensor Short to Ground B0086 04: Right Front Side Impact Sensor Open B0086 39: Right Front Side Impact Sensor Internal Malfunction B0086 3A: Right Front Side Impact Sensor Incorrect Component Installed B0086 71: Right Front Side Impact Sensor Invalid Serial Data Received
DTC B1001	B1001 00: Option Configuration
DTC B1019	B1019 00: System Configuration Error

DTC B0012 OR B0013

Diagnostic Instructions

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

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

DTC 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

DTC B0012 0D

Driver Frontal Deployment Loop Stage 1 High Resistance

DTC B0012 0E

Driver Frontal Deployment Loop Stage 1 Low Resistance

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

DTC B0013 0D

Driver Frontal Deployment Loop Stage 2 High Resistance

DTC B0013 0E

Driver Frontal Deployment Loop Stage 2 Low Resistance

Diagnostic Fault Information

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

Circuit/System Description

During a frontal crash of sufficient force the inflatable restraint sensing and diagnostic module (SDM) will allow current to flow through the deployment loop in order to deploy the steering wheel air bag. The SDM performs continuous diagnostic tests on the deployment loops to check for proper circuit continuity and for shorts to ground or voltage. There are 2 shorting bars used within the steering wheel air bag coil connector which will short together both steering wheel air bag stage 1 high circuit and steering wheel air bag stage 1 low circuit and both steering wheel air bag stage 2 high circuit and steering wheel air bag stage 2 low circuit when the connector is disconnected. This will help to prevent unwanted deployment of the steering wheel air bag during servicing.

Conditions for Running the DTC

Ignition voltage is between 9-16 V.

Conditions for Setting the DTC

B0012 01 stage 1 or B0013 01 stage 2

The steering wheel module deployment loop is shorted to voltage for 2 seconds.

B0012 02 stage 1 or B0013 02 stage 2

The steering wheel module deployment loop is shorted to ground for 2 seconds.

B0012 04 stage 1 or B0013 04 stage 2

The steering wheel module deployment loop is open for 2 seconds.

B0012 0D stage 1 or B0013 0D stage 2

The steering wheel module deployment loop resistance is greater than 4.4 ohms for 2 seconds.

B0012 0E stage 1 or B0013 0E stage 2

The steering wheel module deployment loop resistance is less than 1.7 ohms for 2 seconds.

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Action Taken When the DTC Sets

- The SDM requests the instrument cluster to illuminate the AIR BAG indicator.
- The SDM will store a DTC, however if an event occurs the system will still attempt deployment.

Conditions for Clearing the DTC

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

Diagnostic Aid

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

A worn steering wheel air bag coil can cause a repeated history DTC to set. To verify this condition, turn the steering wheel 360 degrees in one direction then back 360 degrees in the other direction, multiple times, while viewing the scan tool Deployment Loop Resistance 1 and 2 parameters.

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

- Steering wheel air bag assembly
- Steering wheel air bag coil assembly
- Inline connectors - on the steering wheel air bag side of the harness connector
- Harness side of the SDM connector

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

If the steering wheel air bag has inflated under unexpected conditions and/or DTC with symptom byte 01 is set, check both control circuits for a short to voltage.

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

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SIR System Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

NOTE: **Refer to SIR Service Precautions.**
Inspect all terminals for damage or corrosion when disconnecting connectors. Damage or corrosion in the following requires repair or replacement of the affected component/connector.

- **Air bag**
- **Steering wheel air bag coil**
- **SDM**
- **Air bag wiring harness connector**
- **SDM wiring harness connector**

NOTE: **The connector and connector position assurance (CPA) may seat independent of each other. Both the connector and CPA should seat with an audible and/or tactile click. The CPA isolates the shorting-bars within the connector allowing the deployment circuit to operate properly.**
If the condition is intermittent or cannot be duplicated, disconnect the connectors and add Nyogel lubricant 760G. This procedure will correct the high resistance condition due to terminal fretting corrosion.

1. Observe the scan tool Deployment Loop Resistance 1 and 2 parameters while turning the steering wheel 360 degrees in one direction then back 360 degrees in the other direction. The reading should stay consistently between 2.1 and 4.0 ohms without any spikes or dropouts.
   - If the reading is erratic while turning the steering wheel, replace the X85 steering wheel air bag coil.
   - If not within the specified range, refer to Circuit/System Testing.
2. DTC B0012 or B0013 should only be set as a history DTC.
   - If the DTC is set as current, refer to Circuit/System Testing.
3. Observe the scan tool Deployment Loop Resistance 1 and 2 parameters while moving the harness near each connector listed below. The reading should stay consistently between 2.1 and 4.0 ohms without any

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drop outs or spikes.

- X85 Steering wheel air bag coil
- F107 Steering wheel air bag.
- Any harness inline
- K36 SDM

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

- Inspect each connector terminal for damage or corrosion and repair as necessary.
- Apply Nyogel lubricant 760G to each connector terminal.
- Insure each connector and CPA is correctly seated.

Circuit/System Testing

1. Ignition OFF, disconnect the scan tool and disconnect the appropriate harness connector at the F107 steering wheel air bag.
2. Wait for 120 seconds and then test for greater than 25 ohms between the control circuit terminal 1 and the control circuit terminal 2.
   - If less than the specified range, test for a short between the control circuits, check each connector and CPA to ensure the shorting bars are lifted. If the circuits and shorting bars tests normal, replace the K36 SDM.
3. Ignition ON, test for less than 11 V between the control circuit terminals listed below and ground:
   - Control circuit terminal 1
   - Control circuit terminal 2
   - If greater than the specified range, test the control circuit for a short to voltage. If the circuit tests normal, replace the K36 SDM.
4. Ignition OFF, test for greater than 25 ohms between the control circuit terminals listed below and ground:
   - Control circuit terminal 1
   - Control circuit terminal 2
   - If less than the specified range, test the steering wheel inflatable restraint module coil for a short to ground and the control circuit for a short to ground. If the circuit tests normal, replace the K36 SDM.
5. Install a 3 A fused jumper wire between the control circuit terminal 1 and the control circuit terminal 2.
6. Ignition ON, observe the scan tool Deployment Loop Resistance parameter while turning the steering wheel 360 degrees in one direction then back 360 degrees in the other direction. Verify the scan tool Deployment Loop Resistance parameter is consistently less than 2 ohms.
   - If the reading is erratic while turning the steering wheel, replace the X85 steering wheel airbag coil.
   - If greater than the specified range, test the steering wheel airbag coil and the control circuit terminals 1 and 2 for an open/high resistance. If the steering wheel airbag coil and the control circuits test normal, replace the K36 SDM.
7. If all circuits test normal, replace the F107 steering wheel air bag.

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Repair Procedures

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

- **Steering Wheel Inflatable Restraint Module Coil Replacement**
- **Steering Wheel Inflatable Restraint Module Airbag 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

DTC B0014 01

Driver Side Deployment Loop Short to Battery - Seat Air Bag

DTC B0014 02

Driver Side Deployment Loop Short to Ground - Seat Air Bag

DTC B0014 04

Driver Side Deployment Loop Open - Seat Air Bag

DTC B0014 0D

Driver Side Deployment Loop High Resistance - Seat Air Bag

DTC B0014 0E

Driver Side Deployment Loop Low Resistance - Seat Air Bag

DTC B0015 01

Driver Seat Belt Retractor Pretensioner Deployment Loop Short to Battery

DTC B0015 02

Driver Seat Belt Retractor Pretensioner Deployment Loop Short to Ground

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DTC B0015 04

Driver Seat Belt Retractor Pretensioner Deployment Loop Open

DTC B0015 0D

Driver Seat Belt Retractor Pretensioner Deployment Loop High Resistance

DTC B0015 0E

Driver Seat Belt Retractor Pretensioner Deployment Loop Low Resistance

DTC B0016 01

Left Roof Rail Deployment Loop 1 Short to Battery

DTC B0016 02

Left Roof Rail Deployment Loop 1 Short to Ground

DTC B0016 04

Left Roof Rail Deployment Loop 1 Open

DTC B0016 0D

Left Roof Rail Deployment Loop 1 High Resistance

DTC B0016 0E

Left Roof Rail Deployment Loop 1 Low Resistance

DTC B0019 01

Passenger Frontal Deployment Loop Stage 1 Short to Battery

DTC B0019 02

Passenger Frontal Deployment Loop Stage 1 Short to Ground

DTC B0019 04

Passenger Frontal Deployment Loop Stage 1 Open

DTC B0019 0D

Passenger Frontal Deployment Loop Stage 1 High Resistance

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DTC B0019 0E

Passenger Frontal Deployment Loop Stage 1 Low Resistance

DTC B0020 01

Passenger Frontal Deployment Loop Stage 2 Short to Battery

DTC B0020 02

Passenger Frontal Deployment Loop Stage 2 Short to Ground

DTC B0020 04

Passenger Frontal Deployment Loop Stage 2 Open

DTC B0020 0D

Passenger Frontal Deployment Loop Stage 2 High Resistance

DTC B0020 0E

Passenger Frontal Deployment Loop Stage 2 Low Resistance

DTC B0021 01

Passenger Side Deployment Loop Short to Battery - Seat Air Bag

DTC B0021 02

Passenger Side Deployment Loop Short to Ground - Seat Air Bag

DTC B0021 04

Passenger Side Deployment Loop Open - Seat Air Bag

DTC B0021 0D

Passenger Side Deployment Loop High Resistance - Seat Air Bag

DTC B0021 0E

Passenger Side Deployment Loop Low Resistance - Seat Air Bag

DTC B0022 01

Passenger Seat Belt Retractor Pretensioner Deployment Loop Short to Battery

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DTC B0022 02

Passenger Seat Belt Retractor Pretensioner Deployment Loop Short to Ground

DTC B0022 08

Passenger Seat Belt Retractor Pretensioner Deployment Loop Open Circuit

DTC B0022 0D

Passenger Seat Belt Retractor Pretensioner Deployment Loop High Resistance

DTC B0022 0E

Passenger Seat Belt Retractor Pretensioner Deployment Loop Low Resistance

DTC B0023 01

Right Roof Rail Deployment Loop 1 Short to Battery

DTC B0023 02

Right Roof Rail Deployment Loop 1 Short to Ground

DTC B0023 04

Right Roof Rail Deployment Loop 1 Open

DTC B0023 0D

Right Roof Rail Deployment Loop 1 High Resistance

DTC B0023 0E

Right Roof Rail Deployment Loop 1 Low Resistance

Diagnostic Fault Information

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Driver Side Impact Module - High Control	B0014 02, B0014 0E	B0014 0D	B0014 04, B0014 0D	B0014 01	-
Driver Side Impact Module - Low Control	B0014 02, B0014 0E	B0014 0D	B0014 04, B0014 0D	B0014 01	-
Driver Seat Belt Retractor Pretensioner - High Control	B0015 02, B0015 0E	B0015 0D	B0015 04, B0015 0D	B0015 01	-

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Driver Seat Belt Retractor Pretensioner - Low Control	B0015 02, B0015 0E	B0015 0D	B0015 04, B0015 0D	B0015 01	-
Left Roof Rail Module - High Control	B0016 02, B0016 0E	B0016 0D	B0016 04, B0016 0D	B0016 01	-
Left Roof Rail Module - Low Control	B0016 02, B0016 0E	B0016 0D	B0016 04, B0016 0D	B0016 01	-
Instrument Panel Module - Stage 1 - High Control	B0019 02, B0019 0E	B0019 0D	B0019 04, B0019 0D	B0019 01	-
Instrument Panel Module - Stage 1 - Low Control	B0019 02, B0019 0E	B0019 0D	B0019 04, B0019 0D	B0019 01	-
Instrument Panel Module - Stage 2 - High Control	B0020 02, B0020 0E	B0020 0D	B0020 04, B0020 0D	B0020 01	-
Instrument Panel Module - Stage 2 - Low Control	B0020 02, B0020 0E	B0020 0D	B0020 04, B0020 0D	B0020 01	-
Passenger Side Impact Module - High Control	B0021 02, B0021 0E	B0021 0D	B0021 04, B0021 0D	B0021 01	-
Passenger Side Impact Module - High Control	B0021 02, B0021 0E	B0021 0D	B0021 04, B0021 0D	B0021 01	-
Passenger Seat Belt Retractor Pretensioner - High Control	B0022 02, B0022 0E	B0022 0D	B0022 04, B0022 0D	B0022 01	-
Passenger Seat Belt Retractor Pretensioner - Low Control	B0022 02, B0022 0E	B0022 0D	B0022 04, B0022 0D	B0022 01	-
Right Roof Rail Module - High Control	B0023 02, B0023 0E, B0025 02	B0023 0D	B0023 04, B0023 0D	B0023 01	-
Right Roof Rail Module - Low Control	B0023 02, B0023 0E	B0023 0D	B0023 04, B0023 0D	B0023 01	-

Circuit/System Description

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

Conditions for Running the DTC

Ignition voltage is between 9-16 V.

Conditions for Setting the DTC

B0014 01, B0015 01, B0016 01, B0019 01, B0020 01, B0021 01, B0022 01, B0023 01

The inflatable restraint module or pretensioner control circuit is shorted to voltage for 2 seconds.

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B0014 02, B0015 02, B0016 02, B0019 02, B0020 02, B0021 02, B0022 02, B0023 02

The inflatable restraint module or pretensioner control circuit is shorted to ground for 2 seconds.

B0014 04, B0015 04, B0016 04, B0019 04, B0020 04, B0021 04, B0022 04, B0023 04

The inflatable restraint module or pretensioner control circuit is open for 2 seconds.

B0014 0D, B0015 0D, B0016 0D, B0019 0D, B0020 0D, B0021 0D, B0022 0D, B0023 0D

The inflatable restraint module or pretensioner deployment loop resistance is greater than 4.2 ohms for 2 seconds.

B0014 0E, B0015 0E, B0016 0E, B0019 0E, B0020 0E, B0021 0E, B0022 0E, B0023 0E

The inflatable restraint module or pretensioner deployment loop resistance is less than 1.4 ohms for 2 seconds.

Action Taken When the DTC Sets

- The SDM requests the instrument cluster to illuminate the AIR BAG indicator.
- The SDM will store a DTC, however if an event occurs the system will still attempt deployments.

Conditions for Clearing the DTC

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

Diagnostic Aid

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

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

- Passenger instrument panel air bag
- Driver and passenger side airbags
- Left and right roof rail airbags
- Driver and passenger pretensioners
- Inline connectors - on the side of the harness connector
- Harness side of the SDM connector

Terminal fretting or incorrectly seated connector can cause an open/high resistance condition. Check the circuit terminals for fretting or incorrectly seated connector if a DTC with symptom byte 04 or 0D is set. If DTCs of deployment loops which are in the seat DTC B0014 and B0021, can occur because of stress or damage to the

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harness due to seat movement. Move the seat to the full extend of travel while using the scan tool to observe deployment type loop parameters.

If the pretensioner, passenger instrument panel or side air bag has inflated under unexpected conditions and/or DTC with symptom byte 01 is set, check both control circuits for a short to voltage.

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**
- **Wiring Repairs**
- **Connector Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

NOTE: **Refer to SIR Service Precautions.**
Inspect all terminals for damage or corrosion when disconnecting connectors. Damage or corrosion in the following requires repair or replacement of the affected component/connector.

- **Seat belt pretensioner**
- **Passenger instrument panel airbag**
- **Side air bag**
- **Roof rail airbag**
- **SDM**
- **SDM wiring harness connector**

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NOTE: **The connector and connector position assurance (CPA) may seat independent of each other. Both the connector and CPA should seat with an audible and/or tactile click. The CPA isolates the shorting-bars within the connector allowing the deployment circuit to operate properly.**
If the condition is intermittent or cannot be duplicated, disconnect the connectors and add Nyogel lubricant 760G. This procedure will correct the high resistance condition due to terminal fretting corrosion.

Observe the scan tool Deployment Loop Resistance parameters while moving the harness near each connector listed below. The reading should stay consistently between 1.7 and 4.2 ohms without any drop outs or spikes.

- F105 Passenger instrument panel, Roof rail air bag
- F106 Side air bag
- F112 Seat belt pretensioner
- Any inline harness
- K36 SDM

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

- Inspect each connector terminal for damage or corrosion and repair as necessary.
- Apply Nyogel lubricant 760G to each connector terminal.
- Insure each connector and CPA is correctly seated.

Circuit/System Testing

DTC B0014-B0018 or B0021-B0045

1. Ignition OFF, disconnect the scan tool and disconnect the harness connector at the appropriate F105, F106 airbags or F112 seat belt pretensioner.
2. Wait for 120 seconds and then test for greater than 25 ohms between the control circuit terminals listed below.
   - F105 Left roof rail airbag terminal 1 and 2
   - F105 Right roof rail airbag terminal 1 and 2
   - F106 Left side airbag terminal 1 and 2
   - F106 Right side airbag terminal 1 and 2
   - F112 Driver seat belt retractor pretensioner terminal A and B
   - F112 Passenger seat belt retractor pretensioner terminal A and B
   - If less than the specified range, test for a short between the control circuits, check each connector and CPA to ensure that the shorting bars are lifted. If the circuits and shorting bars tests normal, replace the K36 SDM.
3. Ignition ON, test for less than 11 V between the control circuit terminals listed below and ground:
   - F105 or F106 airbag control circuit terminal 1
   - F105 or F106 airbag control circuit terminal 2

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- F112 pretensioner control circuit terminal A
- F112 pretensioner control circuit terminal B
  - If greater than the specified range, test the control circuit for a short to voltage. If the circuit tests normal, replace the K36 SDM.

4. Ignition OFF, test for greater than 25 ohms between the control circuit terminals listed below and ground:
   - F105 or F106 airbag control circuit terminal 1
   - F105 or F106 airbag control circuit terminal 2
   - F112 pretensioner control circuit terminal A
   - F112 pretensioner control circuit terminal B
     - If less than the specified range, test the control circuit for a short to ground. If the circuit tests normal, replace the K36 SDM.
5. Install a 3 A fused jumper wire between the control circuit terminals listed below.
   - F105 Left roof rail airbag terminal 1 and 2
   - F105 Right roof rail airbag terminal 1 and 2
   - F106 Left side airbag terminal 1 and 2
   - F106 Right side airbag terminal 1 and 2
   - F112 Driver seat belt retractor pretensioner terminal A and B
   - F112 Passenger seat belt retractor pretensioner terminal A and B
6. Verify the scan tool Deployment Loop Resistance parameter is less than 2 ohms.
   - If greater than the specified range, test both control circuits terminals for an open/high resistance. If the circuits test normal, replace the K36 SDM.
7. If all circuits test normal, replace the F105, F106 airbags or F112 seat belt pretensioner.

DTC B0019 - B0020

1. Ignition OFF, disconnect the scan tool and disconnect harness connector X254.
2. Wait for 120 seconds and then test for greater than 25 ohms between the appropriate control circuit terminals listed below on the SDM side of the connector:
   - F105 Passenger instrument panel airbag stage 1 terminal A1 and A2
   - F105 Passenger instrument panel airbag stage 2 terminal B1 and B2
     - If less than the specified range, test for a short between the control circuits, check each connector and CPA to ensure that the shorting bars are lifted. If the circuits and shorting bars tests normal, replace the K36 SDM.
3. Ignition ON, test for less than 11 V between the control circuit terminals listed below and ground:
   - Control circuit terminal A1
   - Control circuit terminal A2
   - Control circuit terminal B1
   - Control circuit terminal B2
     - If greater than the specified range, test the control circuit for a short to voltage. If the circuit tests normal, replace the K36 SDM.

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4. Ignition OFF, test for greater than 25 ohms between the control circuit terminals listed below and ground:
    - Control circuit terminal A1
    - Control circuit terminal A2
    - Control circuit terminal B1
    - Control circuit terminal B2
    - If less than the specified range, test the control circuit for a short to ground. If the circuit tests normal, replace the K36 SDM.
5. Install a 3 A fused jumper wire between the control circuit terminals listed below.
    - F105 Passenger instrument panel airbag stage 1 terminal A1 and A2
    - F105 Passenger instrument panel airbag stage 2 terminal B1 and B2
6. Verify the scan tool Deployment Loop Resistance parameter is less than 2 ohms.
    - If greater than the specified range, test both control circuits terminals for an open/high resistance. If the circuits test normal, replace the K36 SDM.
7. Disconnect the F105 airbag harness connector.
8. Ignition ON, test for less than 11 V between the control circuit terminals listed below and ground:
    - Control circuit terminal A1
    - Control circuit terminal A2
    - Control circuit terminal B1
    - Control circuit terminal B2
    - If greater than the specified range, test the control circuit for a short to voltage.
9. Ignition OFF, test for greater than 25 ohms between the control circuit terminals listed below and ground:
    - Control circuit terminal A1
    - Control circuit terminal A2
    - Control circuit terminal B1
    - Control circuit terminal B2
    - If less than the specified range, test the control circuit for a short to ground.
10. Ignition OFF, test for less than 5 ohms between the control circuit terminals listed below:
    - X254 control circuit terminal A1 and F105 airbag harness connector control circuit terminal 1
    - X254 control circuit terminal A2 and F105 airbag harness connector control circuit terminal 2
    - X254 control circuit terminal B1 and F105 airbag harness connector control circuit terminal 4
    - X254 control circuit terminal B2 and F105 airbag harness connector control circuit terminal 5
    - If greater than the specified range, test the control circuit for an open/high resistance.
11. If all circuits test normal, replace the F105 airbag.

Repair Procedures

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

- **Driver or Passenger Seat Side Inflatable Restraint Module Replacement**

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- **Driver or Passenger Seat Retractor Side Belt Replacement**
- **Instrument Panel Inflatable Restraint Module Airbag Replacement**
- **Roof Side Rail Inflatable Restraint Module Replacement**
- **SIR/SRS Wiring Repairs**
- **Control Module References** for SDM replacement, setup, and programming

DTC B0052

Diagnostic Instructions

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

DTC Descriptor

DTC B0052 00

Deployment Commanded Malfunction

DTC B0052 56

Deployment Commanded Too Many Transitions

Circuit/System Description

The sensing and diagnostic module (SDM) senses vehicle impacts and provides deployment signals to the airbags and pretensioners when warranted. The SDM sets DTC B0052 after each command for deployment. DTC B0052 will latch and not clear until after 3 commanded deployments by the SDM. And therefore the SDM has to be replaced using end of life disposal procedure.

Conditions for Running the DTC

Ignition voltage is between 9-16 V.

Conditions for Setting the DTC

- The SDM detects a frontal impact of sufficient force to warrant deployment of the frontal modules.
- The SDM detects a side impact or rollover (if equipped) of sufficient force to warrant deployment of a side impact module and/or roof rail module.

Action Taken When the DTC Sets

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

Conditions for Clearing the DTC

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- DTC B0052 00 is a clearable DTC and may be cleared with a scan tool without replacing the SDM.
- DTC B0052 56 is a latched DTC. The DTC cannot be cleared with the scan tool. Replacement of the SDM is required.

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

Component Connector End Views

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. Verify that DTC B0052 00 is not set.
    - If DTC is set, clear the DTC.
2. Verify that DTC B0052 56 is not set.
    - If DTC is set, replace the K36 SDM.

Repair Procedures

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

Control Module References for SDM replacement, setup, and programming

DTC B0074

Diagnostic Instructions

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

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DTC Descriptors

DTC B0074 00

Passenger Occupant Classification Sensor Circuit Malfunction

DTC B0074 04

Passenger Occupant Classification Sensor Open

Circuit/System Description

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

Conditions for Running the DTC

Ignition voltage is between 9-16 V.

Conditions for Setting the DTC

B0074 00

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

B0074 04

The passenger presence detection module has detected an open circuit.

Action Taken When the DTC Sets

The SDM will set a DTC B0081 00 after receiving a fault present message from the passenger presence detection module and requests the instrument cluster to illuminate the AIR BAG indicator.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

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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

NOTE: **This system allows you to service each component separately (module and/or sensing mat). Perform a Passenger Presence System Rezeroing procedure whenever a component is replaced. Inspect the following component connectors for damage or corrosion. Repair or replace the affected component/connector:**

- **Passenger presence detection module**
- **Passenger presence detection module harness connector**
- **Seat wiring harness to vehicle harness connector**

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

1. Observe with the scan tool if the fault changes status while moving the passenger seat forward and backward through its full range of motion. The status should stay consistent.
    - If the status changes this could be indication of a seat to vehicle harness connection issue, refer to Circuit/System Testing.
2. Observe with the scan tool if the fault changes status while moving the harness near each connector listed below. The status should stay consistent.
    - Passenger presence detection module
    - Passenger presence detection sensor
    - Any seat harness inline
    - If the reading is erratic while moving the harness, perform the following;

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3. Inspect each connector terminal for damage or corrosion and repair as necessary.
4. Insure each connector and CPA is correctly seated.

Circuit/System Testing

NOTE: This system allows you to service each component separately (module and/or sensing mat). Perform a Passenger Presence System Rezeroing whenever a component is replaced. Inspect component connectors for damage or corrosion. Repair or replace the affected component/connector:

1. Confirm that all Passenger presence detection system connectors are fully seated.
2. Verify DTC B0074 is not set.
    - If the DTC is set, replace the B60 passenger presence detection sensor.

Repair Procedures

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

Inflatable Restraint Front Passenger Mass Sensor Replacement

DTC B0079 OR B0080

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 B0079 01

Driver Seat Position Sensor Circuit Short to Battery

DTC B0079 02

Driver Seat Position Sensor Circuit Short to Ground

DTC B0079 04

Driver Seat Position Sensor Circuit Open

DTC B0079 05

Driver Seat Position Sensor Circuit High Voltage or Open

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DTC B0079 06

Driver Seat Position Sensor Circuit Low Voltage or Open

DTC B0079 08

Driver Seat Position Sensor Circuit Performance-Signal Invalid

DTC B0079 0C

Driver Seat Position Sensor Circuit Low Current

DTC B0080 01

Passenger Seat Position Sensor Circuit Short to Battery

DTC B0080 02

Passenger Seat Position Sensor Circuit Short to Ground

DTC B0080 04

Passenger Seat Position Sensor Circuit Open

DTC B0080 05

Passenger Seat Position Sensor Circuit High Voltage or Open

DTC B0080 06

Passenger Seat Position Sensor Circuit Low Voltage or Open

DTC B0080 08

Passenger Seat Position Sensor Circuit Performance-Signal Invalid

DTC B0080 0C

Passenger Seat Position Sensor Circuit Low Current

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Seat Position Sensor - Driver Signal	B0079 02, B0079 06	B0079 04, B0079 05, B0079 06,	B0079 01	B0079 08

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		B0079 0C		
Seat Position Sensor - Driver Low Reference	B0079 02, B0079 06	B0079 04, B0079 05, B0079 06, B0079 0C	B0079 01	B0079 08
Seat Position Sensor - Passenger Signal	B0080 02, B0080 06	B0080 04, B0080 05, B0080 06, B0080 0C	B0080 01	B0080 08
Seat Position Sensor - Passenger Low Reference	B0080 02, B0080 06	B0080 04, B0080 05, B0080 06, B0080 0C	B0080 01	B0080 08

Circuit/System Description

The inflatable restraint seat position sensor is used to determine the proximity of a front driver or passenger seat position with respect to the frontal air bag. There are two states of seat position, forward and rearward. The seat position sensor interfaces with the sensing and diagnostic module (SDM) and allows the SDM to disable stage 2 of the frontal air bag for a front seat that is forward of the forward/rearward point in seat track. The seat position sensor provides 2 current ranges, one range for the forward seat position and one for rearward seat position. When the SDM receives input from a seat position sensor that the seat is rearward, and the SDM will not disable stage 2 deployment. When the seat is forward, the SDM will disable stage 2 deployment. The SDM monitors the seat position sensor circuit and if a fault is detected, the SDM will set code B0079 or B0080 and disable stage 2 frontal deployment.

Conditions for Running the DTC

Ignition voltage is between 9-16 V.

Conditions for Setting the DTC

B0079 01, B0080 01

The SDM detects the seat position sensor signal circuit is shorted to voltage for 2 seconds.

B0079 02, B0080 02

The SDM detects the seat position sensor signal circuit is shorted to ground for 2 seconds.

B0079 04, B0080 04

The SDM detects the seat position sensor signal circuit is open for 2 seconds.

B0079 05, B0080 05

The SDM detects the seat position sensor signal circuit is open or has a high voltage condition for 2 seconds.

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B0079 06, B0080 06

The SDM detects the seat position sensor signal circuit is shorted to ground or an open for 2 seconds.

B0079 08, B0080 08

The SDM detects an invalid signal on the seat position sensor signal circuit.

B0079 0C, B0080 0C

The SDM detects a low current condition in the seat position sensor signal circuit for 2 seconds.

Action Taken When the DTC Sets

- The SDM defaults the seat position sensor to seat forward threshold.
- The SDM requests the instrument panel cluster to illuminate the AIR BAG indicator.

Conditions for Clearing the DTC

- The condition for setting the DTC no longer present.
- A history DTC will clear once 100 fault-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**
- **Wiring Repairs**
- **Connector Repairs**

Scan Tool Reference

Control Module References for scan tool information

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Circuit/System Verification

1. Verify that DTC B0079 08 or B0080 08 is not set.
   - If the DTC is set with the symptom byte 08, replace the appropriate B88 seat position sensor.
2. Ignition ON, observe the scan tool seat position sensor parameter. The reading should be between 2-20 m A. With the scan tool verify that the seat position sensor parameter is between 2-20 m A.
   - If not within the specified range, refer to Circuit/System Testing.
3. With the seat un-weighted, observe the scan tool while moving the seat to the full forward and then full rearward positions. The seat position sensor parameter should be continuously between 2-20 m A.
   - If not within the specified range, refer to Circuit/System Testing.
4. While sitting in the seat, observe the scan tool while moving the seat to the full forward and then full rearward positions. The seat position sensor parameter should be continuously between 2-20 m A.
   - If not within the specified range, refer to Circuit/System Testing.

Circuit/System Testing

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

- **Seat position sensor**
- **SDM module**
- **Seat position sensor wiring harness connector**
- **SDM wiring harness connector**

1. Ignition OFF, disconnect the harness connector at the appropriate B88 seat position sensor.
2. Test for less than 10 ohms between the low reference circuit terminal 1 and ground.
   - If greater than the specified range, test the low reference circuit for an open/high resistance. If the circuit tests normal, replace the K36 SDM.
3. Ignition ON, test for 4-9 V between the signal circuit terminal 2 and ground.
   - If less than the specified value, test the signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the K36 SDM.
   - If greater than the specified range, test the signal circuit for a short to voltage. If the circuit tests normal, replace the K36 SDM.
4. If all circuits test normal, replace the B88 seat position sensor.

Repair Procedures

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

- **Inflatable Restraint Driver or Passenger Seat Position Sensor Replacement**
- **SIR/SRS Wiring Repairs**
- **Control Module References** for SDM replacement, setup, and programming

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DTC B0081 (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 Descriptors

DTC B0081 00

Passenger Presence Detection Module Malfunction

DTC B0081 3A

Passenger Presence Detection Module Incorrect Component Installed

Circuit/System Description

When the ignition is turned ON, the inflatable restraint sensing and diagnostic module (SDM) and the passenger presence detection system modules perform tests to diagnose critical malfunctions. Upon a successful power-up mode the SDM will illuminate both PASSENGER AIRBAG ON/OFF indicators located in the overhead center console. If the SDM detects a fault in the passenger presence detection module, it may disable the front passenger air bag deployment loop, set DTC B0081 00 or DTC B0081 3A and illuminate the AIRBAG indicator.

Conditions for Running the DTC

Ignition voltage is between 9-16 V.

Conditions for Setting the DTC

B0081 00

The SDM has received a fault present message from the passenger presence detection module.

B0081 3A

The SDM has received a message from the passenger presence detection module indicating a vehicle and passenger presence detection module mismatch.

Action Taken When the DTC Sets

- The SDM requests the instrument cluster to illuminate the AIR BAG indicator.
- The passenger instrument panel air bag deployment loop will be disabled.

Conditions for Clearing the DTC

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- 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 Verification

NOTE: **This system allows you to service each component separately (module and/or sensing mat). Perform a passenger presence detection system rezero procedure whenever a component is replaced.**

NOTE: **Both SDM and Passenger Presence Detection Module set DTC B0081 but with different symptom bytes. Therefore it is important to identify which module has set the DTC B0081. Use the symptom bytes as a way of identify the correct module to diagnose. Use the table below in identifying specific module DTC B0081 application and symptom byte that sets with it.**

DTC	Symptom Bytes	
B0081 - SDM	00	3A
B0081- Passenger Presence Detection Module	11	42

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1. Verify that DTC B1001 is not set in the SDM.
   - If the DTC is set in the SDM, refer to **DTC B1001**.
2. Verify that DTC B0074, B101D, or B101E is not set in the passenger presence detection module.
   - If any of the DTCs are set in the passenger presence detection module, refer to **Diagnostic Trouble Code (DTC) List - Vehicle** .

NOTE: The SDM sets a redundant B0081 00 DTC when the passenger presence detection module sets a DTC B0081 11 or B0081 42.

3. Verify that DTC B0081 00 is not set in the SDM
   - If DTC B0081 00 is set in the SDM, refer to **DTC B0081 (SDM)** or **DTC B0081 (Passenger Presence Detection Module)**.

NOTE: The SDM sets a B0081 3A when an incorrect passenger presence detection module is installed.

4. Verify that DTC B0081 3A is not set in the SDM.
   - If DTC B0081 3A is set in the SDM, replace the K85 passenger presence detection module.

Repair Procedures

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

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

DTC B0081 (PASSENGER PRESENCE DETECTION MODULE)

Diagnostic Instructions

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

DTC Descriptors

DTC B0081 11

Passenger Presence Detection Module High Input

DTC B0081 42

Passenger Presence Detection Module Calibration Not Programmed

Circuit/System Description

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

Conditions for Running the DTC

Ignition voltage is between 9-16 V.

Conditions for Setting the DTC

Any of the following conditions must exist for 5 seconds.

B0081 42

The first attempt to rezero passenger presence detection module failed. Repeat the procedure.

B0081 11

The passenger presence detection module has failed rezero procedure.

Action Taken When the DTC Sets

- The SDM requests the instrument cluster to illuminate the AIR BAG indicator.
- The passenger instrument panel air bag deployment loop will be disabled.

Conditions for Clearing the DTC

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

Reference Information

Description and Operation

SIR System Description and Operation

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

NOTE: This system allows you to service each component separately (module and/or sensing mat). Perform a passenger presence detection system rezero procedure whenever a component is replaced.

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NOTE: **Both SDM and passenger presence detection module set DTC B0081 but with different symptoms bytes. Therefore it is important to identify which module has set the DTC B0081. Use the symptom bytes as a way of identify the correct module to diagnose. Use the table below in identifying specific module DTC B0081 application and symptom byte that sets with it.**

DTC	Symptom Bytes	
B0081 - SDM	00	3A
B0081 - Passenger Presence Detection Module	11	42

NOTE: **The SDM sets a B0081 3A when an incorrect passenger presence detection module is installed.**

1. Verify that DTC B0081 3A is not set in the SDM.
   - If DTC B0081 3A is set in the SDM, replace the K85 passenger presence detection module.

   NOTE: **The SDM sets a redundant B0081 00 DTC when the passenger presence detection module sets a DTC B0081 11 or B0081 42.**

2. Verify that DTC B0081 11 or DTC B0081 42 is not set in the passenger presence detection module.
   - If DTC B0081 11 or DTC B0081 42 is set in the passenger presence detection module, perform the passenger presence detection system rezero procedure. Refer to **Passenger Presence System Rezeroing**.

Repair Procedures

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

Control Module References for passenger presence detection module and SDM 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 01

Front Impact Sensor 1 Short to Battery (Driver)

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DTC B0083 02

Front Impact Sensor 1 Short to Ground (Driver)

DTC B0083 04

Front Impact Sensor 1 Open (Driver)

DTC B0083 39

Front Impact Sensor 1 Internal Electronic Failure (Driver)

DTC B0083 3A

Front Impact Sensor 1 Incorrect Component Installed (Driver)

DTC B0083 71

Front Impact Sensor 1 Invalid Serial Data Received (Driver)

DTC B0084 01

Front Impact Sensor 2 Short to Battery (Passenger)

DTC B0084 02

Front Impact Sensor 2 Short to Ground (Passenger)

DTC B0084 04

Front Impact Sensor 2 Open (Passenger)

DTC B0084 39

Front Impact Sensor 2 Internal Electronic Failure (Passenger)

DTC B0084 3A

Front Impact Sensor 2 Incorrect Component Installed (Passenger)

DTC B0084 71

Front Impact Sensor 2 Invalid Serial Data Received (Passenger)

DTC B0085 01

Left Front Side Impact Sensor Short to Battery

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DTC B0085 02

Left Front Side Impact Sensor Short to Ground

DTC B0085 04

Left Front Side Impact Sensor Open

DTC B0085 39

Left Front Side Impact Sensor Internal Malfunction

DTC B0085 3A

Left Front Side Impact Sensor Incorrect Component Installed

DTC B0085 71

Left Front Side Impact Sensor Invalid Serial Data Received

DTC B0086 01

Right Front Side Impact Sensor Short to Battery

DTC B0086 02

Right Front Side Impact Sensor Short to Ground

DTC B0086 04

Right Front Side Impact Sensor Open

DTC B0086 39

Right Front Side Impact Sensor Internal Malfunction

DTC B0086 3A

Right Front Side Impact Sensor Incorrect Component Installed

DTC B0086 71

Right Front Side Impact Sensor Invalid Serial Data Received

Diagnostic Fault Information

	Short to	**High**		**Short to**	**Signal**

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Circuit	Ground	Resistance	Open	Voltage	Performance
Front Impact Sensor 1 High Signal	B0083 02	B0083 04	B0083 04	B0083 01	B0083 3A
Front Impact Sensor 1 Low Reference	B0083 02	B0083 04	B0083 04	B0083 01	B0083 3A
Front Impact Sensor 2 High Signal	B0084 02	B0084 04	B0084 04	B0084 01	B0084 3A
Front Impact Sensor 2 Low Reference	B0084 02	B0084 04	B0084 04	B0084 01	B0084 3A
Left Front Side Impact Sensor High Signal	B0085 02	B0085 04	B0085 04	B0085 01	B0085 39
Left Front Side Impact Low Reference	B0085 02	B0085 04	B0085 04	B0085 01	B0085 39
Right Front Side Impact Sensor High Signal	B0086 02	B0086 04	B0086 04	B0086 01	B0086 39
Right Front Side Impact Sensor Low Reference	B0086 02	B0086 04	B0086 04	B0086 01	B0086 39

Circuit/System Description

The impact sensors are equipped on vehicles to supplement the Supplemental Inflatable Restraint (SIR) System performance. The impact sensors are electronic and are not part of the deployment loops, but instead provide inputs to the sensing and diagnostic module (SDM). The impact sensors can assist in determining the severity of some frontal and side collisions. The SDM uses the input from the impact sensors to assist in determining the severity of a 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.

Conditions for Running the DTC

Ignition voltage is between 9-16 V.

Conditions for Setting the DTC

Any of the following conditions exist for 10 seconds:

B0083 01, B0084 01, B0085 01, B0086 01

The sensor has been shorted to voltage.

B0083 02, B0084 02, B0085 02, B0086 02

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

B0083 04, B0084 04, B0085 04, B0086 04

- The sensor circuit is open.
- The SDM has not received a message from the sensor for greater than 375 milliseconds.

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B0083 39, B0084 39, B0085 39, B0086 39

- The SDM has received a Not OK message from the sensor.
- The SDM has not received a message.

B0083 3A, B0084 3A, B0085 3A, B0086 3A

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

B0083 71, B0084 71, B0085 71, B0086 71

The SDM has received invalid serial data from the sensor.

Action Taken When the DTC Sets

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

Conditions for Clearing the DTC

- The condition for setting the DTC no longer exists.
- A history DTC will clear once 100 malfunction-free ignition cycles have occurred.
- An ignition cycle is required for the DTC to go from current to history.

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

SIR System Description and Operation

Electrical Information Reference

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

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Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

NOTE: **Refer to SIR Service Precautions.**
Inspect all terminals for damage or corrosion when disconnecting connectors. Damage or corrosion in the following requires repair or replacement of the affected component/connector.

- **Air bag module**
- **Steering wheel inflatable restraint module coil**
- **SDM module**
- **Air bag wiring harness connector**
- **SDM wiring harness connector**

NOTE: **The connector and connector position assurance (CPA) may seat independent of each other. Both the connector and CPA should seat with an audible and/or tactile click. The CPA isolates the shorting-bars within the connector allowing the deployment circuit to operate properly. Replace any CPA that is damaged or missing.**
If the condition is intermittent or cannot be duplicated, disconnect the connectors and add Nyogel lubricant 760G. This procedure will correct the high resistance condition due to terminal fretting corrosion.

1. Verify that DTC B0083-B0086 symptom byte 39 or 71 is not set as current.
   - If symptom byte 39 or 71 is set as current, replace the appropriate B59 or B63 impact sensor.
2. Verify that the SDM calibrations match the VIN data, software part number, and calibration part number.
   - If not the correct data or part number, program the SDM.
3. Verify the correct impact sensors have the correct part numbers, matching the label part numbers with the parts book.
   - If the part numbers do not match, replace the incorrect B59 or B63 impact sensor
4. Verify that DTC B0083-B0086 symptom byte 01, 02 or 04 is not set as current.
   - If symptom byte 01, 02 or 04 is set as current, refer to Circuit/System Testing.

Circuit/System Testing

1. Ignition OFF, disconnect the scan tool and disconnect the harness connector at the appropriate B59 or B63 impact sensor.
2. Wait for 120 seconds and then test for less than 10 ohms between the low reference circuit terminal 2 and ground.
   - If greater than the specified range, test the low reference circuit for an open/high resistance. If the circuit tests normal, replace the K36 SDM.

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3. Test for greater than 50k ohms between the signal circuit terminal 1 and ground.
    - If less than the specified value, test the signal circuit for a short to ground. If the circuit tests normal, replace the K36 SDM.
4. Disconnect the harness connector at the SDM.
5. Test for less than 1 ohms between the impact sensor signal circuit terminal 1 and the SDM terminal listed below.
    - Left front side impact sensor terminal 19 X2
    - Left front impact sensor terminal 23 X2
    - Right front side impact sensor terminal 22 X2
    - Right front impact sensor terminal 26 X2
    - If greater than the specified range, test the circuit for an open/high resistance.
6. If all circuits test normal, replace the B59 or B63 sensor. The DTC should not be set as current.
    - If the DTC resets as current, replace the K36 SDM.

Repair Procedures

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

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

DTC B1001

Diagnostic Instructions

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

DTC Descriptor

DTC B1001 00

Option Configuration

Circuit/System Description

The inflatable restraint sensing and diagnostic module (SDM) stores a primary data key, which is a 4-digit number. When the ignition is turned ON, the 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

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System voltage is between 9-16 V.

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.

Action Taken When the DTC Sets

- The SDM requests the instrument cluster to illuminate the AIR BAG indicator.
- The SDM disables all deployments.

Conditions for Clearing the DTC

The last 4-digit Primary Data Key in the SDM matches the last 4 digits 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**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**
- **Connector Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

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Verify the scan tool SDM Primary Key Status is Valid in the BCM.

NOTE: Cycle the ignition after performing the Setup SDM Primary Key procedure in the BCM. This enables the BCM to read the new SDM primary Key value.

- If the SDM Primary Key Status is Invalid, perform the Setup SDM Primary Key procedure in the BCM.

DTC B1019

Diagnostic Instructions

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

DTC Descriptor

DTC B1019 00

System Configuration Error

Circuit/System Description

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

Conditions for Running the DTC

Ignition voltage is between 9-16 V.

Conditions for Setting the DTC

The setup for the SDM has not been completed and the SDM does not detect the correct number of sensors or deployment loops than is expected with this calibration.

Action Taken When the DTC Sets

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

Conditions for Clearing the DTC

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

Diagnostic Aids

The SDM scan tool deployment loop and impact sensor data will match what the SDM has been programmed to expect to see on the vehicle. The B1019 DTC will set if a deployment loop or impact sensor is added or removed from the system.

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

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

Reference Information

Schematic Reference

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

Connector End View Reference

Component Connector End Views

Description and Operation

- **Seat Belt System 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

NOTE: DTC B1019 can set after SDM has been replaced and/or reprogrammed before

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the setup procedure is completed. The setup procedure cannot be completed if DTC B1019 is set as current or history. If a short or open is detected in a deployment circuit prior to the setup procedure being performed the SDM will set DTC B1019.

1. Ignition ON, verify no other SDM DTC are set.
    - If another SDM DTC is set, diagnose those DTCs first. Refer to **Diagnostic Trouble Code (DTC) List - Vehicle**
2. With the scan tool observe the SDM impact sensor configuration scan tool data list. Verify the impact sensors called out in the scan tool data list match the number of actual impact sensors the vehicle is built with.
    - If the number of impact sensors do not match verify the correct SDM calibration file is loaded in the SDM.
    - If the SDM calibration file is correct, the vehicle contains less/more sensors than it is supposed to. Modify the vehicle to match the SDM impact sensor calibration scan tool data list.
3. With the scan tool observe the SDM enabled deployment loop configuration scan tool data list. Verify the enabled deployment loops called out in the scan tool data list match the deployment loops the vehicle is built with.
    - If the number of enabled deployment loops do not match verify the correct SDM calibration file is loaded in the SDM.
    - If the SDM calibration file is correct, modify the vehicle to match the SDM enabled deployment loop calibration scan tool data list.
4. If the SDM impacts sensor and enabled deployment loops match the vehicle build and the DTC is still current, replace the K36 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 is a calibrated system that requires rezeroing anytime the seat cushion trim attachments have been removed or the passenger presence system has been replaced. The procedures below are designed to assist in the rezeroing of the passenger presence system. Before you start, read these procedures carefully and completely. For further information regarding the passenger presence system refer to **SIR System Description and Operation**.

IMPORTANT: The following procedures must be followed:

1. Read this procedure carefully and completely.

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2. The passenger presence system will not function properly if the passenger presence system 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 Rezeroing Procedure

IMPORTANT: Before rezeroing the passenger presence system, 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 passenger presence system.

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

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

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

5. Use the scan tool in order to clear the SIR and passenger presence system DTCs.
6. With a scan tool, perform the Passenger Presence Sensor Learn procedure.
7. The passenger presence system will illuminate both PASSENGER AIR BAG ON and OFF indicators until the rezeroing procedure has been completed.
   - When the rezeroing procedure has been successfully completed, the passenger presence system will display the current system status.
   - If the rezeroing procedure was unsuccessful, both PASSENGER AIR BAG ON and OFF indicators will alternate from no illumination to full illumination in 1 second intervals for 5 seconds. The passenger presence system will treat an unsuccessful rezero attempt as a system fault.
8. If the rezeroing procedure was unsuccessful, repeat the Passenger Prsence Sensor Learn procedure. Due to the communication status between the SDM and the passenger presence system module, this procedure may have to be repeated until a successful rezero attempt has been achieved.
9. After the passenger presence system has been successfully rezeroed, perform the **Diagnostic System Check - Vehicle** .

SYMPTOMS - SIR

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

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

Air Bag Indicator Circuit Malfunction (Driver) or **Air Bag Indicator Circuit Malfunction (Passenger)** in order to diagnose the symptom.

AIR BAG INDICATOR CIRCUIT MALFUNCTION (DRIVER)

Diagnostic Instructions

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

Circuit/System Description

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

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Diagnostic Aids

A DTC B1370 may set if the ignition 1 circuit is outside the 9-16 V 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**
- **Testing for Intermittent Conditions and Poor Connections**
- **Connector Repairs**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

1. Verify SDM DTCs are not set.
    - If any DTCs are set, refer to **Diagnostic Trouble Code (DTC) List - Vehicle** .
2. Command the Instrument Cluster All Indicators ON and OFF with a scan tool. The air bag indicators should turn ON and OFF as commanded.
    - If the air bag indicator does not turn ON and OFF as expected, replace the P16 instrument cluster.
3. If all circuits test normal, replace the K36 SDM.

Repair Procedures

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

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

AIR BAG INDICATOR CIRCUIT MALFUNCTION (PASSENGER)

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Diagnostic Instructions

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

Diagnostic Fault Information

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

Circuit/System Description

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

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

SIR System Description and Operation

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

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

1. Ignition ON, with the passenger seat unoccupied, verify the scan tool Passenger Seat Occupancy Status parameter is Empty.
2. With the passenger seat unoccupied, verify the passenger air bag OFF indicator is illuminated.
3. With the passenger seat occupied, verify the scan tool Passenger Seat Occupancy Status parameter is Occupied.
4. With the passenger seat occupied, verify the passenger air bag ON indicator is illuminated.

Circuit/System Testing

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

- **Inflatable restraint passenger air bag on/off indicator.**
- **Inflatable restraint passenger air bag on/off indicator wiring harness.**

1. Ignition OFF, disconnect the harness connector at the P14 inflatable restraint instrument panel module indicator.
2. Test for less than 5 ohms between the ground circuit terminal 2 and ground.
   - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, with the passenger seat occupied, verify that a test lamp does not illuminate between the control circuit terminal 3 and ground.
   - If the test lamp is illuminated, test the control circuit for a short to voltage. If the circuit tests normal, replace the K36 SDM
4. With the passenger seat unoccupied, verify that a test lamp illuminates between the control circuit terminal 3 and ground.
   - If the test lamp does not illuminate, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal replace the K36 SDM.
5. With the passenger seat unoccupied verify that a test lamp does not illuminate between the control circuit

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terminal 1 and ground.

- If the test lamp is illuminated, test the control circuit for a short to voltage. If the circuit tests normal, replace the K36 SDM.

6. With the passenger seat occupied verify that a test lamp illuminates between the control circuit terminal 1 and ground.
   - If the test lamp does not illuminate, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal replace the K36 SDM.
7. If all circuits test normal, replace the P14 inflatable restraint instrument panel module indicator. Refer to **Inflatable Restraint Instrument Panel Module Indicator Replacement**.

Repair Procedures

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

Control Module References for SDM replacement, setup, and programming

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 moving, removing or replacing an SIR component or a component attached to an SIR component. (Anytime you remove fasteners.)	Disconnect the negative battery cable(s) *
If the vehicle is suspected of having shorted electrical wires.	Disconnect the negative battery cable(s) *
When performing electrical diagnosis on components other than the SIR system.	Remove the SIR/Airbag fuse(s) when indicated by the diagnostic procedure to disable the SIR system
* DTCs will be lost when the negative battery cable is disconnected.	

SIR Service Precautions

WARNING: When performing service on or near the SIR components or the SIR

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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 (149°F).
- Verify the correct replacement part number. Do not substitute a component from a different vehicle.
- Use only original GM replacement parts available from your authorized GM dealer. Do not use salvaged parts for repairs to the SIR system.

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

- Inflatable restraint sensing and diagnostic module (SDM)
- Any Inflatable restraint air bag module
- Inflatable restraint steering wheel module coil
- Any Inflatable restraint sensor
- Inflatable restraint seat belt pretensioners
- Inflatable restraint passenger presence detection 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.

NOTE: 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** .

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4. Wait 1 minute before working on the system.

Enabling Procedure - Air Bag Fuse

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

Disabling Procedure - Negative Battery Cable

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

Enabling Procedure - Negative Battery Cable

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

REPAIR INSTRUCTIONS

SIR SERVICE PRECAUTIONS

General Service Instructions

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

NOTE: The inflatable restraint sensing and diagnostic module (SDM) maintains a reserved energy supply. The reserved energy supply provides deployment power for the SIR modules. Deployment power may be available for up to 60 seconds after disconnecting the vehicle power. Disabling the SIR system

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prevents deployment of the SIR modules from the reserved energy supply.

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

- Do not expose inflator modules to temperatures above 65°C (149°F)
- Verify the correct replacement part number. Do not substitute a component from a different vehicle
- Use only original GM replacement parts available from your authorized GM dealer. Do not use salvaged parts for repairs to the SIR system

NOTE: Discard any of the following components if it has been dropped from a height of 962 cm (3 ft) or greater:

- SDM
- Inflatable restraint instrument panel module
- Inflatable restraint steering wheel module
- Inflatable restraint steering wheel module coil
- Inflatable restraint roof rail modules
- Side impact sensors
- Seat belt front impact sensors pretensioners
- Front seat (with side impact module)

FRONT END INFLATABLE RESTRAINT DISCRIMINATING SENSOR REPLACEMENT

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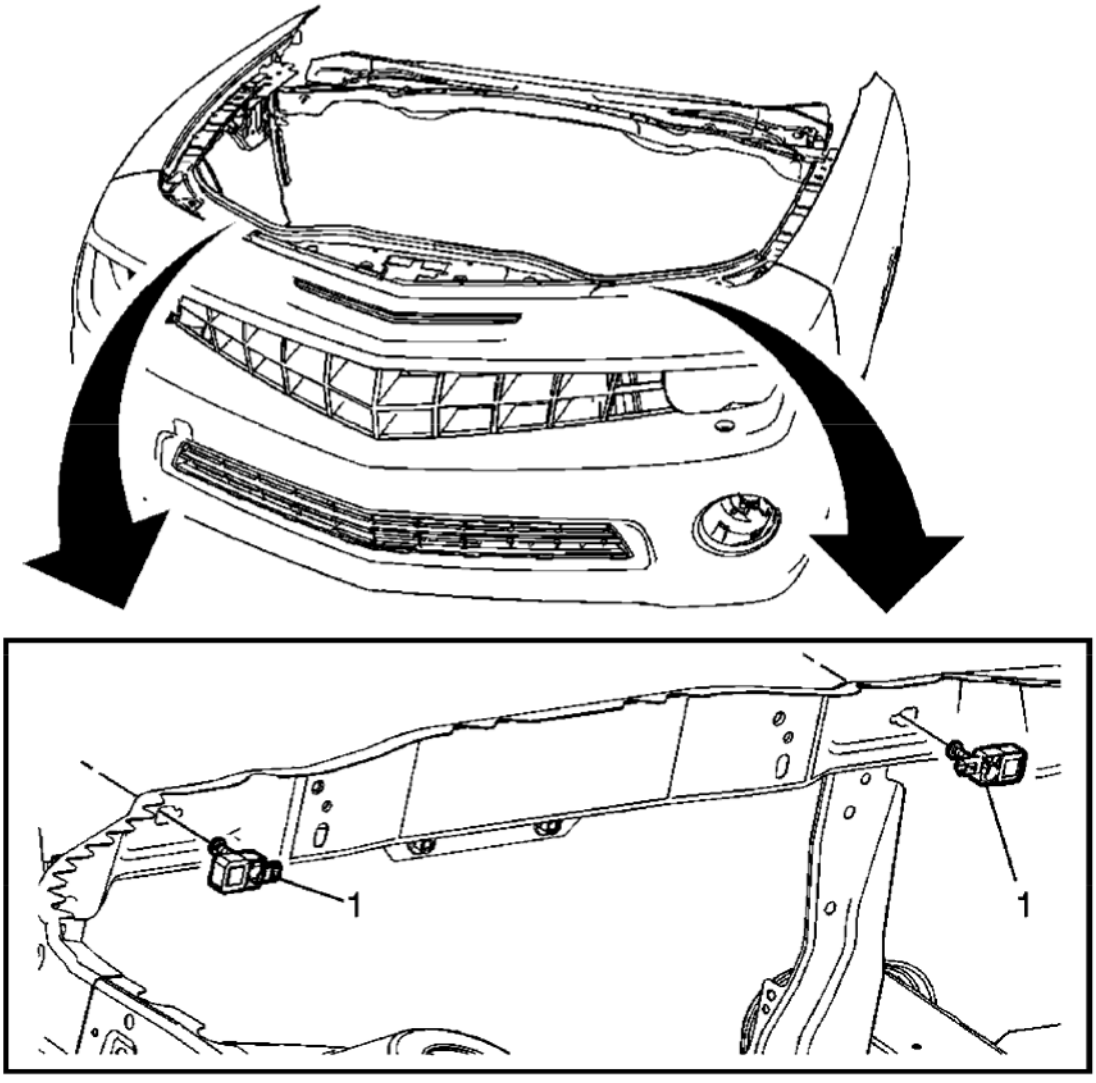


Fig. 6: Front End Inflatable Restraint Discriminating Sensor
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
WARNING: Refer to SIR Warning . **Preliminary Procedure:** Disable the supplemental inflatable restraint (SIR) system. Refer to **SIR Disabling and Enabling**.	
	Inflatable Restraint Front End Sensor Assembly **CAUTION:** Refer to Fastener Caution .

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1	**Procedure** 1. Loosen the bolts and slide the sensor out of the keyhole slots. 2. The bolts are integral to the sensor assembly and DO NOT remove separately. **Tighten:** 11 N.m (97 lb in)

INFLATABLE RESTRAINT SIDE IMPACT SENSOR REPLACEMENT

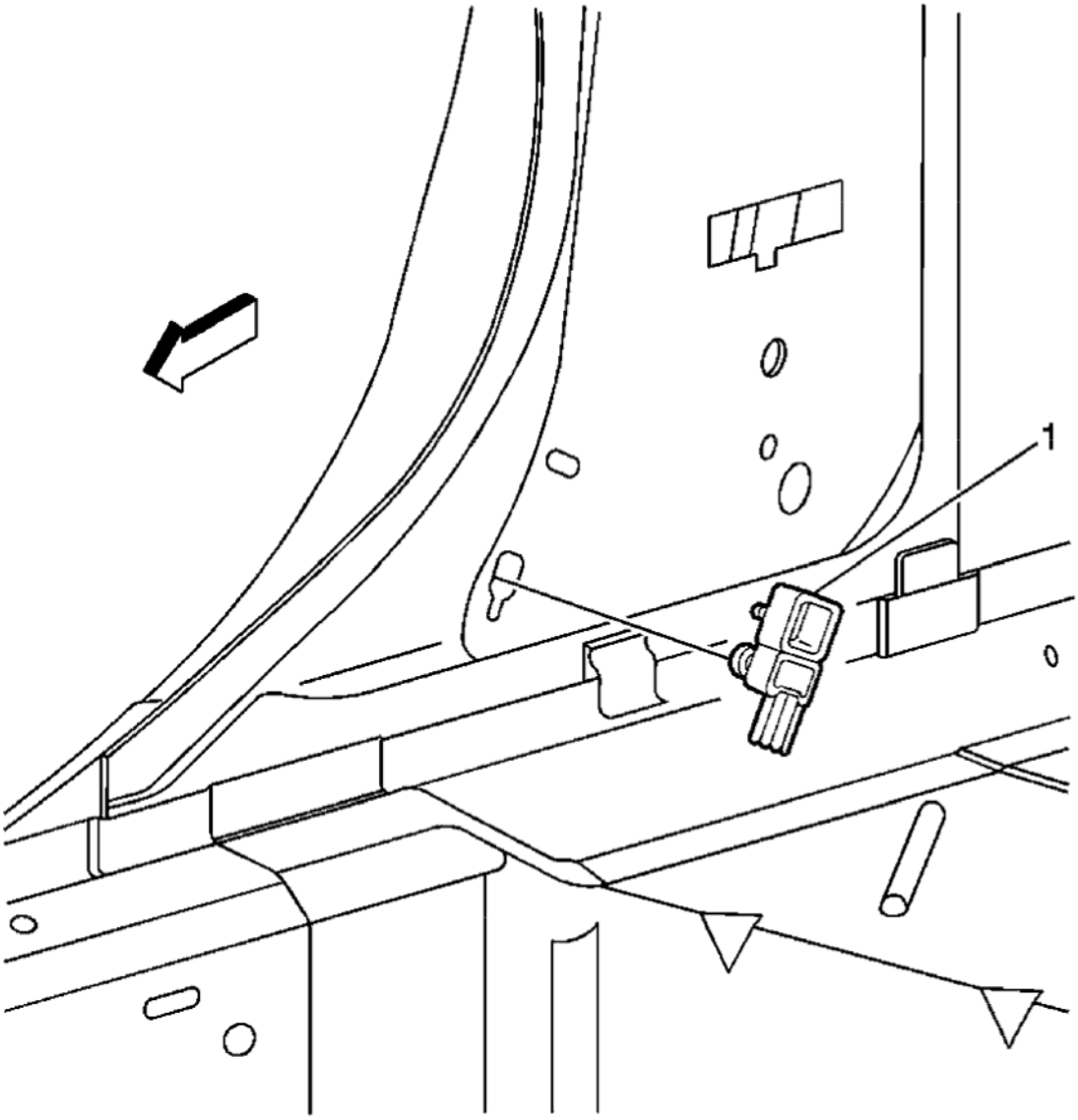


Fig. 7: Inflatable Restraint Side Impact Sensor
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name

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WARNING:

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

WARNING:

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 the quarter trim panel. Refer to **Quarter Trim Panel Replacement** .

	Inflatable Restraint Side Impact Sensor Assembly **CAUTION:** **Refer to Fastener Caution .**
1	**Procedure** 1. Loosen the bolts and slide the sensor out of the keyhole slots. 2. The bolts are integral to the sensor assembly, DO NOT remove separately. **Tighten:** 8 N.m (70 lb in)

INFLATABLE RESTRAINT SENSING AND DIAGNOSTIC MODULE REPLACEMENT

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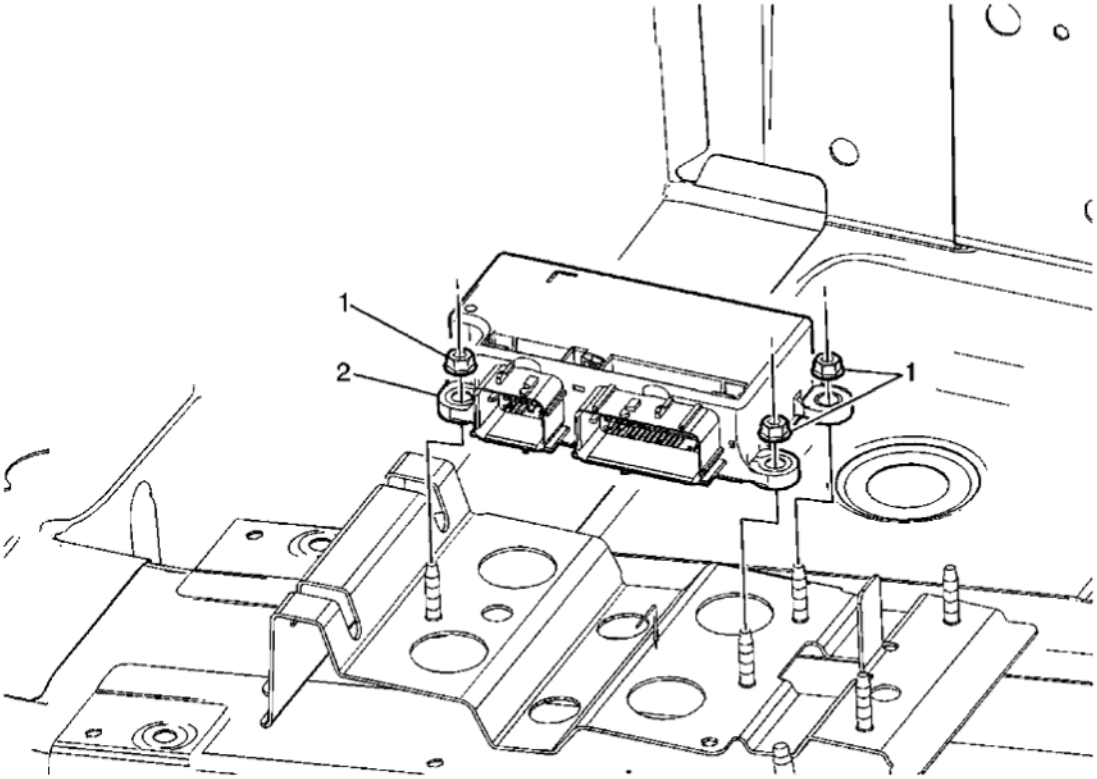


Fig. 8: Inflatable Restraint Sensing & Diagnostic Module
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
	WARNING: **Do not strike or jolt the inflatable restraint sensing and diagnostic module (SDM). Before applying power to the SDM, make sure that it is securely fastened with the arrow facing toward the front of the vehicle. Failure to observe the correct installation procedure could cause SIR deployment, personal injury, or unnecessary SIR system repairs.** **WARNING:** **Refer to SIR Warning .** **Preliminary Procedures** 1. Disable the supplemental inflatable restraint (SIR) system. Refer to **SIR Disabling and Enabling**. 2. Remove the console. Refer to **Front Floor Console Replacement** . 3. Disconnect the electrical connectors.
1	Inflatable Restraint Sensing and Diagnostic Module Fastener (Qty: 3) **CAUTION:** **Refer to Fastener Caution .**

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	Tighten: 7 N.m (56 lb in)
2	Inflatable Restraint Sensing and Diagnostic Module Assembly **Procedure** 1. When installing, ensure the arrow on the module is pointed towards the front of the vehicle. 2. Tighten down the inflatable restraint sensing and diagnostic module by all 3 fasteners. 3. Connect the electrical connectors. 4. If installing a replacement module, program the module. Refer to **Control Module References** .

STEERING WHEEL INFLATABLE RESTRAINT MODULE AIRBAG REPLACEMENT

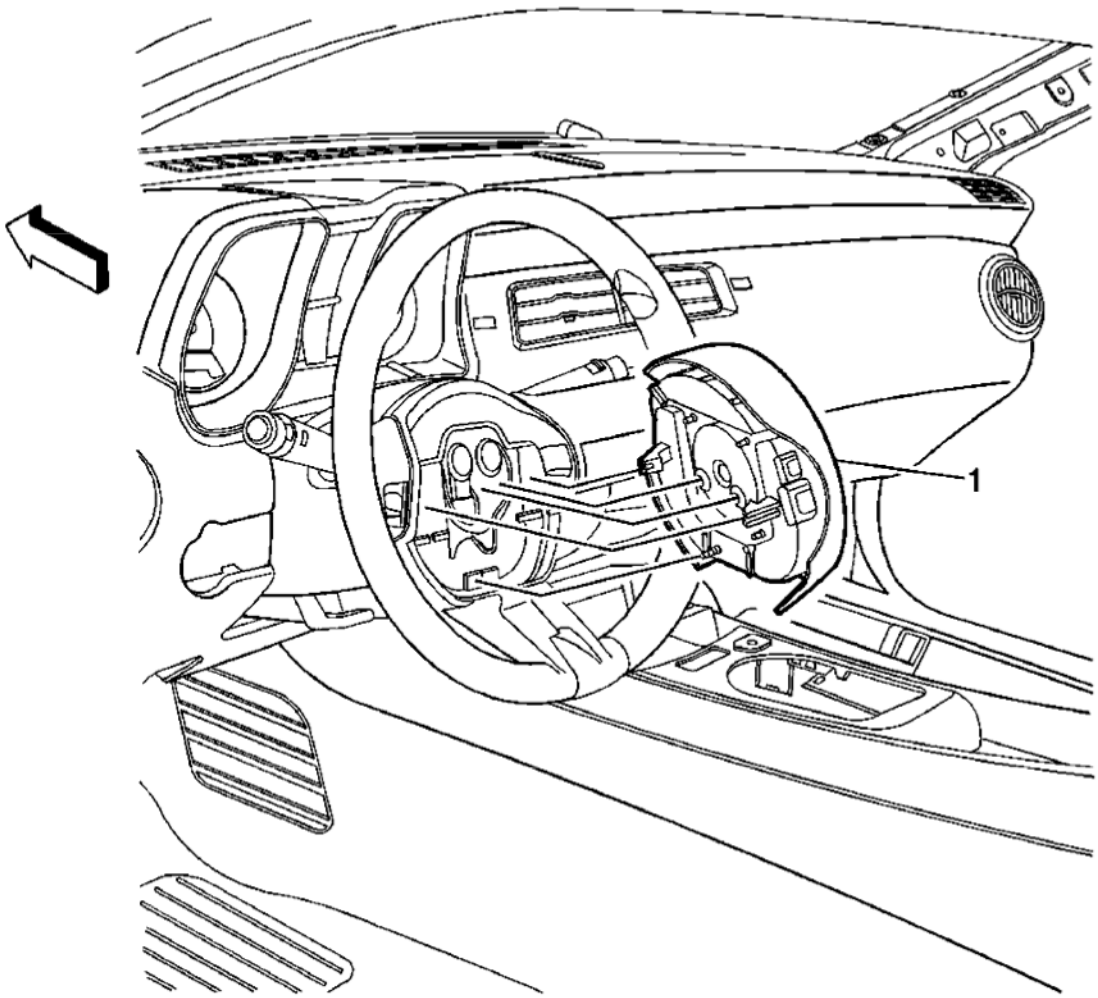


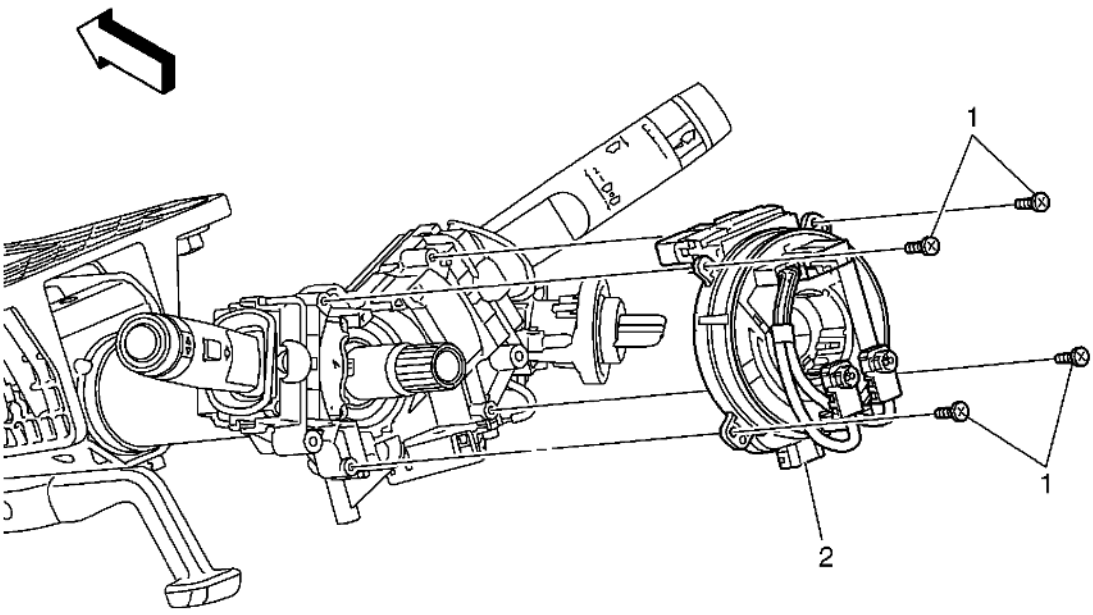
Fig. 9: Steering Wheel Inflatable Restraint Module Airbag

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Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
	WARNING: **Refer to SIR Inflator Module Handling and Storage Warning .** **WARNING:** **Refer to SIR Warning .** **Preliminary Procedures** 1. Disable the SIR system. Refer to **SIR Disabling and Enabling**. 2. Using a blunt-ended tool, push the spring fastener inward through the access hole located on the side of the steering wheel. Repeat the step for the other opening.
1	Steering Wheel Inflatable Restraint Module **Procedure** 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 **Inflatable Restraint Module Handling and Scrapping**.

STEERING WHEEL INFLATABLE RESTRAINT MODULE COIL REPLACEMENT



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Fig. 10: Steering Wheel Inflatable Restraint Module Coil
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures 1. Remove the steering wheel. Refer to **Steering Wheel Replacement** . 2. Remove the steering column shroud. Refer to **Steering Column Shroud Replacement** .	
1	Inflatable Restraint Steering Wheel Module Coil Fastener (Qty: 4) **CAUTION:** **Refer to Fastener Caution .** **Tighten:** 0.9 N.m (7.8 lb in)
2	Inflatable Restraint Steering Wheel Module Coil **Procedure** 1. Disconnect any electrical connectors as necessary. 2. Transfer the steering angle sensor. Refer to **Steering Angle Sensor Replacement** . 3. Ensure the coil is centered during installation. Refer to **Inflatable Restraint Steering Wheel Module Coil Centering**. **Tip:** If you are installing a NEW coil, remove the centering tab AFTER the coil is on the steering column.

INFLATABLE RESTRAINT STEERING WHEEL MODULE COIL CENTERING

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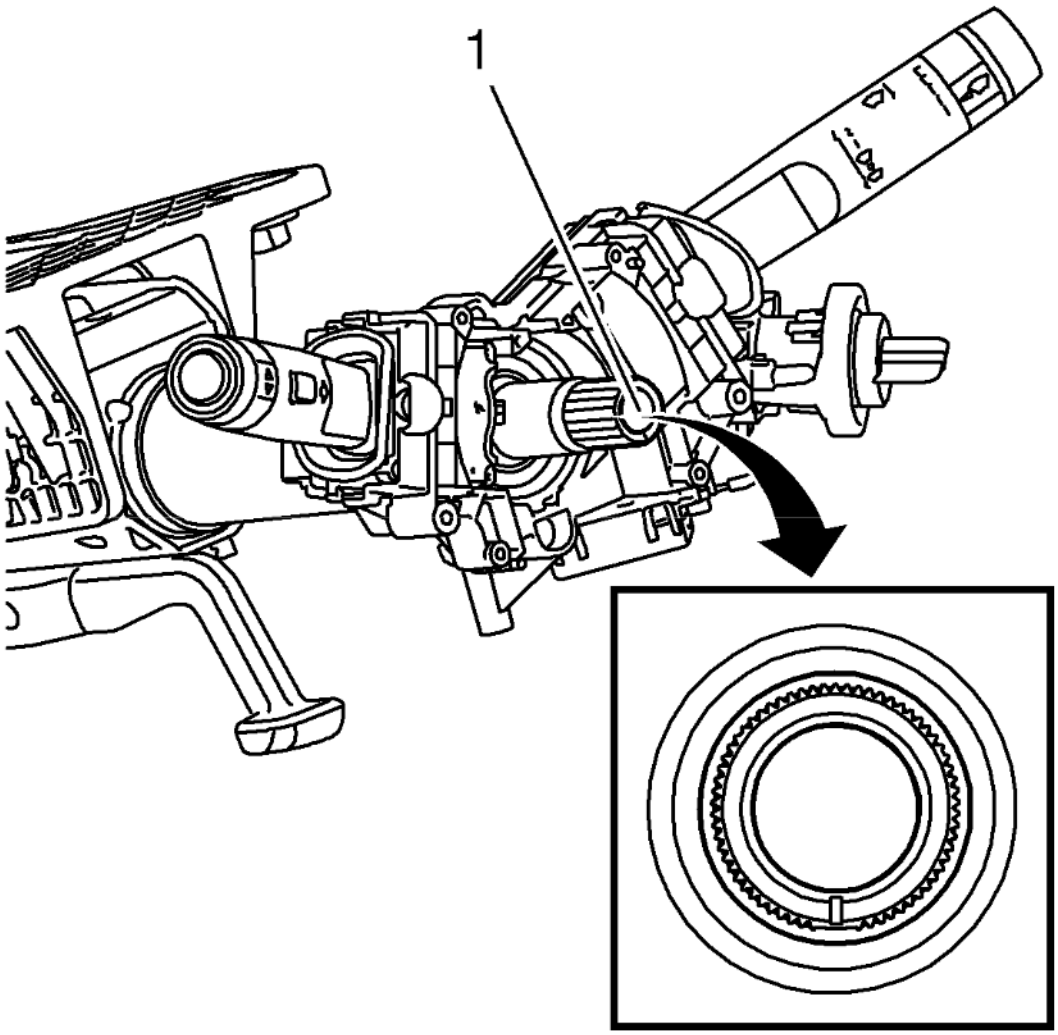


Fig. 11: Steering Shaft Centering Mark
Courtesy of GENERAL MOTORS CORP.

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

1. Verify the following conditions before centering the supplemental inflatable restraint (SIR) steering wheel module coil:
   - The wheels on the vehicle are straight ahead.
   - The centering mark (1) of the steering shaft is in the 6 o'clock position.
2. Turn the lobe of the clock spring clockwise until the coil ribbon stops. Do not force.
3. Turn the lobe of the clock spring counterclockwise approximately 3 turns to the Neutral position.

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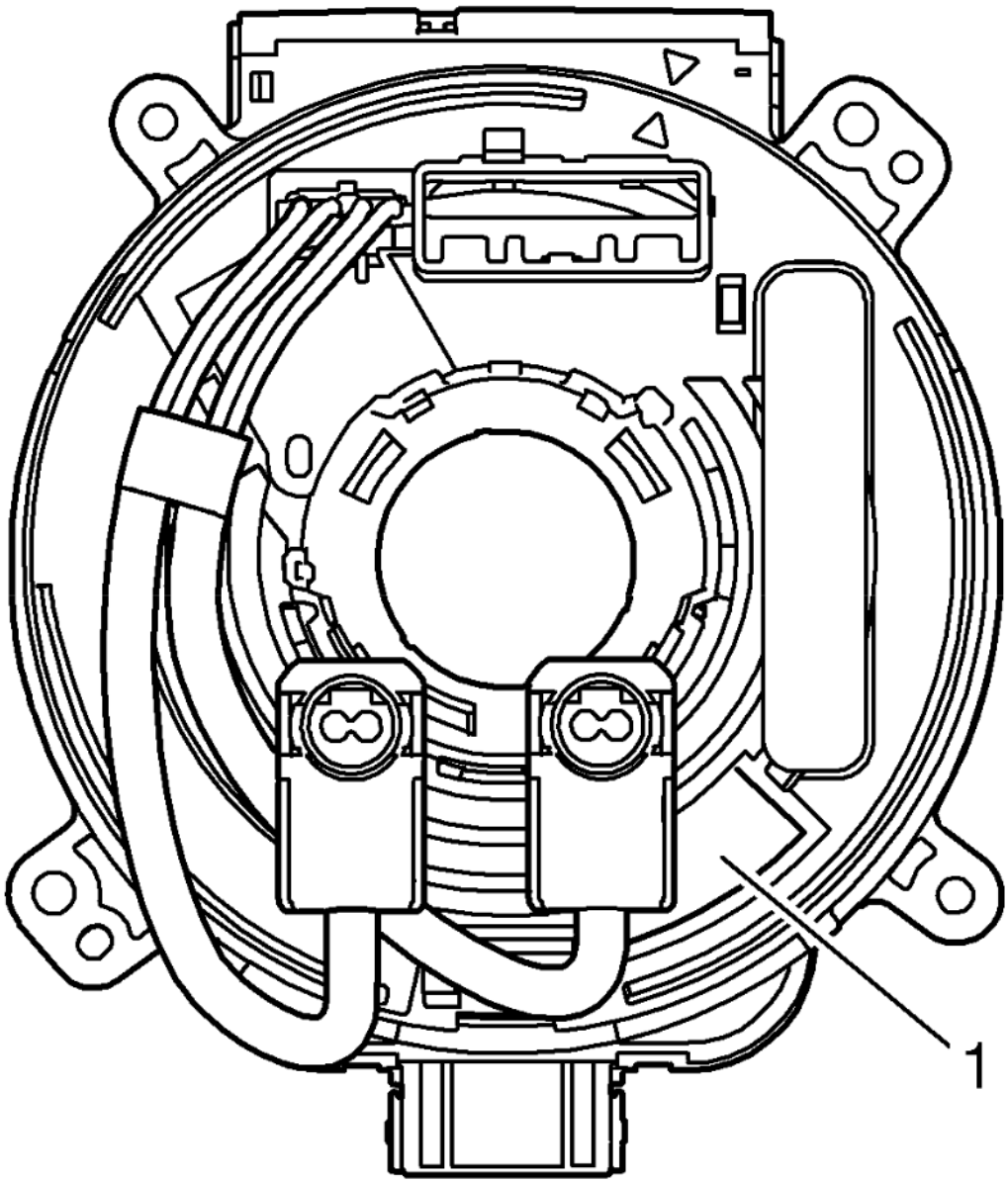


Fig. 12: Centering Window
Courtesy of GENERAL MOTORS CORP.

4. Properly align until the centering window turns yellow (1). This indicates the CENTER position.

INSTRUMENT PANEL INFLATABLE RESTRAINT MODULE AIRBAG REPLACEMENT

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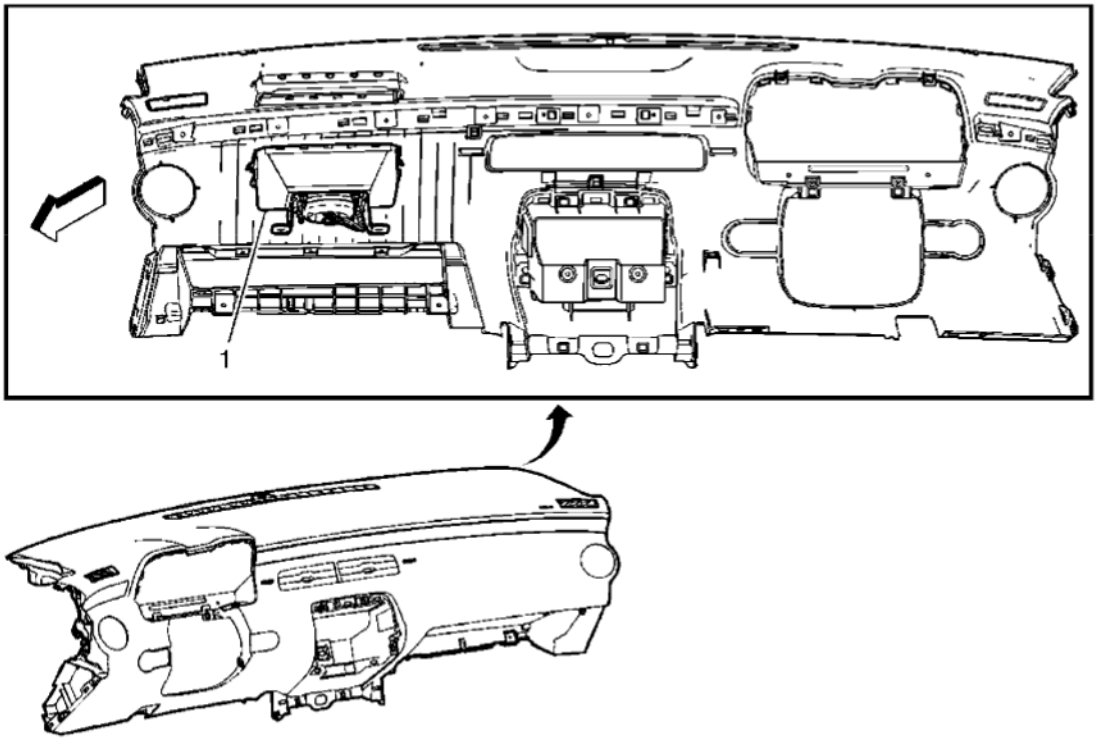


Fig. 13: Instrument Panel Inflatable Restraint Module Airbag
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
WARNING: **Refer to SIR Inflator Module Handling and Storage Warning .** **WARNING:** **Refer to SIR Warning .** **CAUTION:** **No attempt should be made to separate the instrument panel inflatable restraint module from the instrument panel trim pad. When replacing the instrument panel inflatable restraint module, the instrument panel trim pad must also be replaced.** **Preliminary Procedure** 1. Disable the SIR system. Refer to **SIR Disabling and Enabling**. 2. Remove the instrument panel trim pad. Refer to **Instrument Panel Trim Pad Replacement** .	
	Instrument Panel Inflatable Restraint Module Assembly **Procedure**

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1	1. Snap new airbag into new instrument panel trim pad. 2. Ensure that the instrument panel inflatable restraint module is fully deployed before disposal. If the module was replaced under warranty, fully deploy and dispose of the module after the required retention period. Refer to **Inflatable Restraint Module Handling and Scrapping**. 3. Enable the SIR system. Refer to **SIR Disabling and Enabling**. **Tip:** The instrument panel trim pad will be damaged when attempting to separate the instrument panel inflatable restraint. The trim pad and inflatable restraint are shipped separately and need to be attached when ready to install to vehicle.

INFLATABLE RESTRAINT FRONT PASSENGER PRESENCE MODULE REPLACEMENT

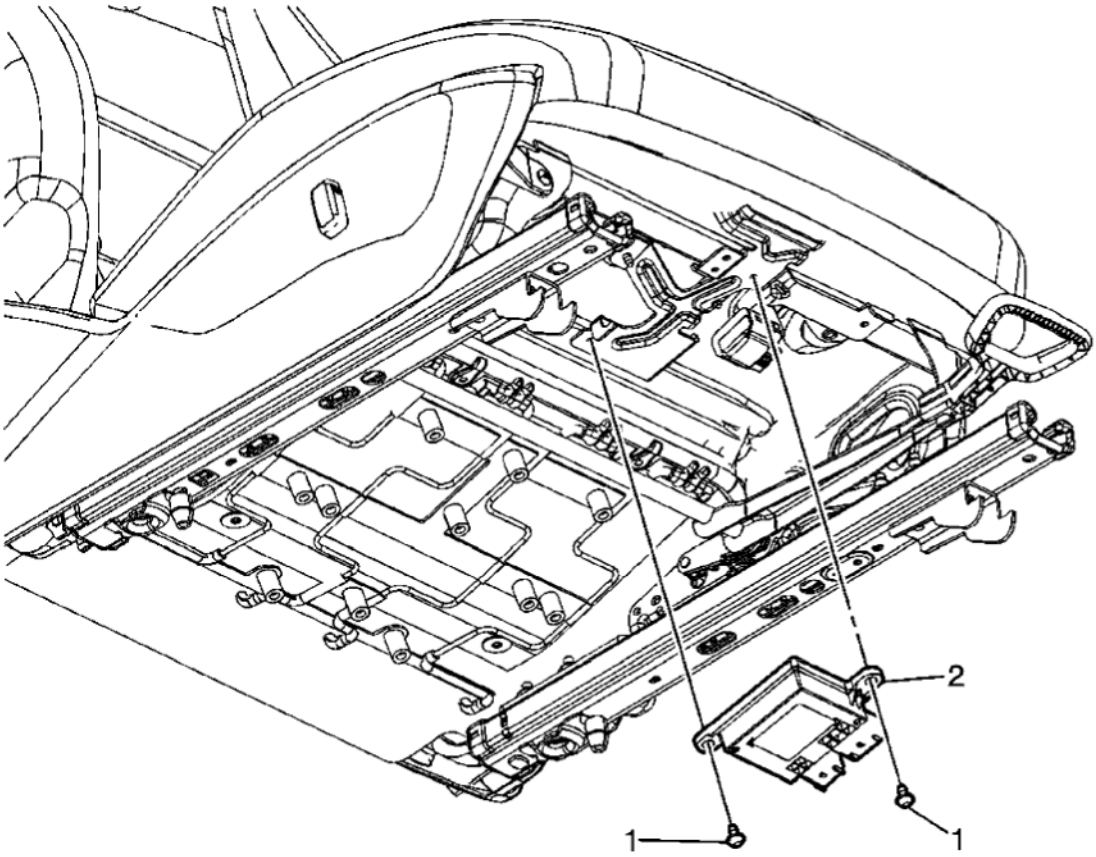


Fig. 14: Inflatable Restraint Front Passenger Presence Module
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name

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WARNING: **Refer to SIR Warning .** **Procedure:** Disable the SIR system. Refer to **SIR Disabling and Enabling**	
1	Inflatable Restraint Passenger Presence Module Screw (Qty: 2) **CAUTION:** **Refer to Fastener Caution .** **Tighten:** 4 N.m (35 lb in)
2	Inflatable Restraint Passenger Presence Module **Procedure:** Refer to **Control Module References** for replacement and setup information.

INFLATABLE RESTRAINT DRIVER OR PASSENGER SEAT POSITION SENSOR REPLACEMENT

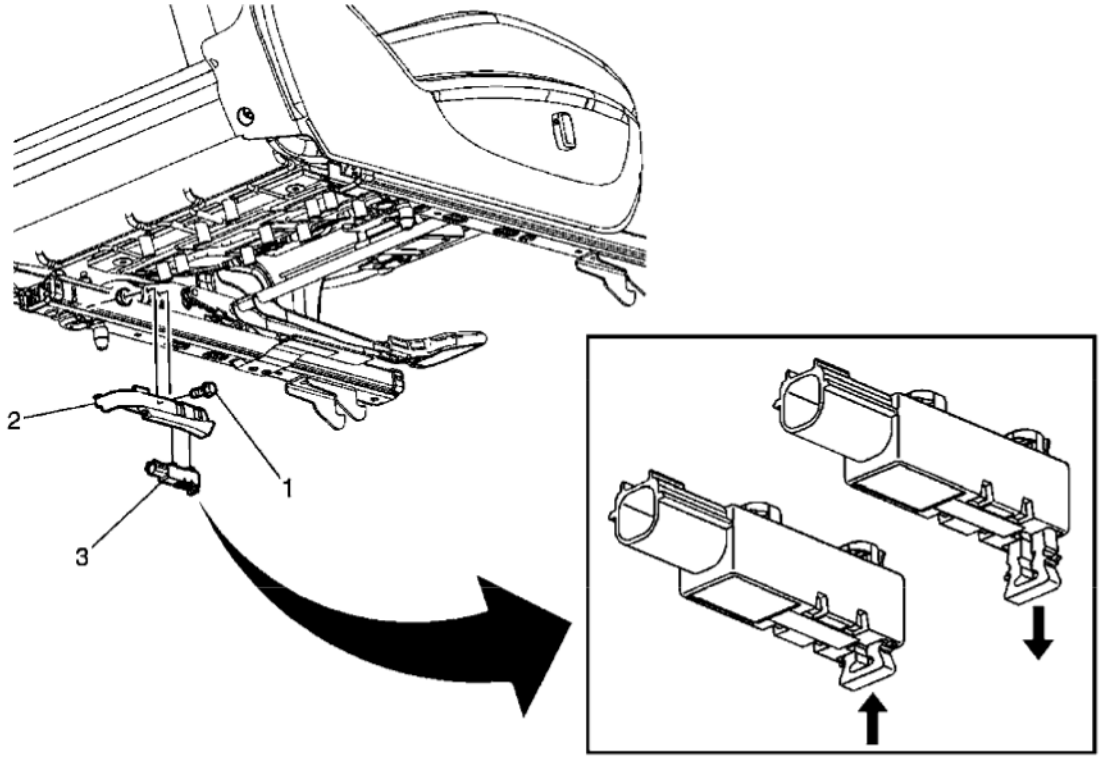


Fig. 15: Inflatable Restraint Driver Or Passenger Seat Position Sensor
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
WARNING:	

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Refer to SIR Warning .

Preliminary Procedures

1. Disable the supplemental inflatable restraint (SIR) system. Refer to **SIR Disabling and Enabling**.
2. Remove the driver or passenger seat. Refer to **Driver or Passenger Seat Replacement** .

1	Inflatable Restraint Seat Position Sensor Bolt **CAUTION:** **Refer to Fastener Caution .** **Tighten:** 3 N.m (25 lb in)
2	Inflatable Restraint Seat Position Sensor Bracket Assembly **Procedure:** Disconnect the electrical connector.
3	Inflatable Restraint Seat Position Sensor **Procedure:** Disengage the locking feature by pulling down on the locking tab.

INFLATABLE RESTRAINT FRONT PASSENGER MASS SENSOR REPLACEMENT

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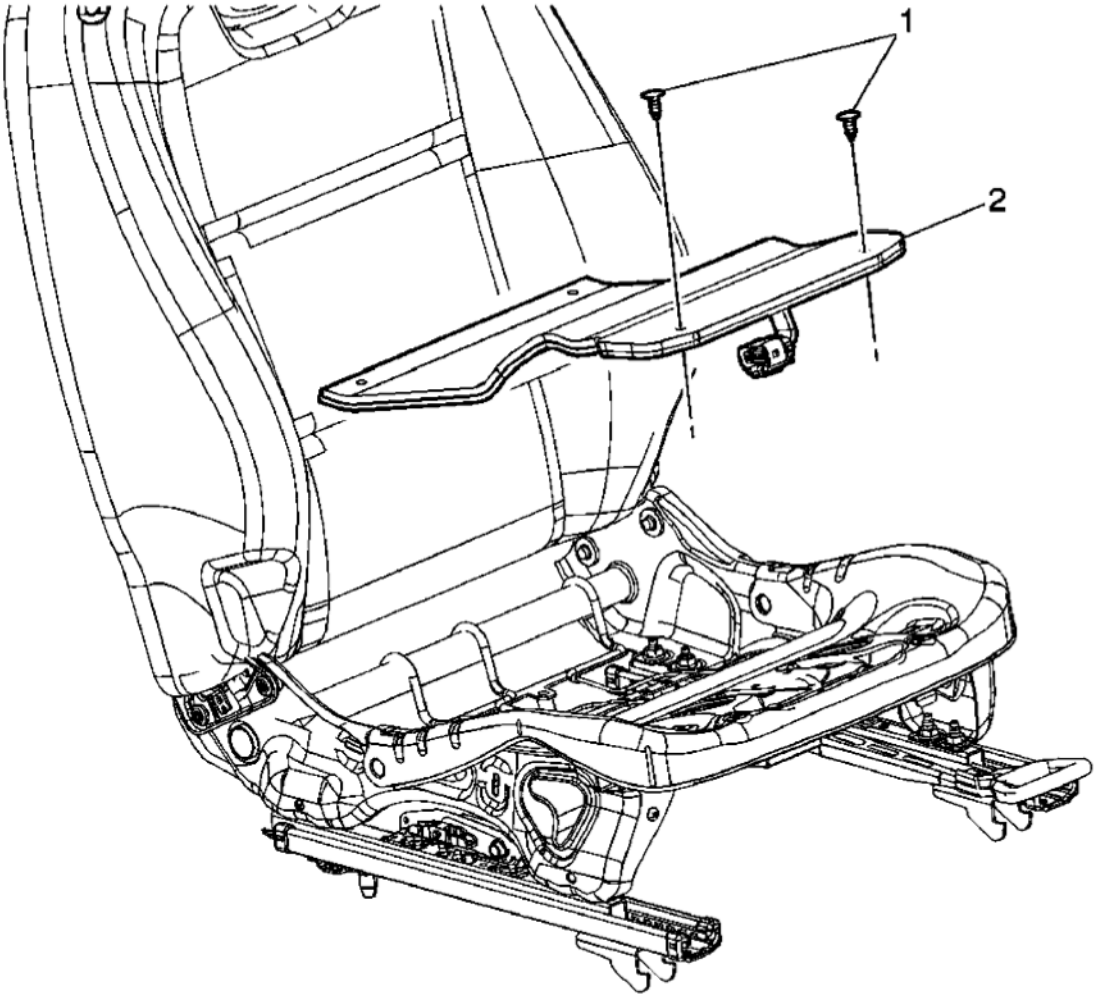


Fig. 16: Inflatable Restraint Front Passenger Mass Sensor
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name

WARNING:
Refer to SIR Warning .

WARNING:
To avoid personal injuries, re-zero the passenger presence system whenever you remove or replace the seat cushion or trim. Failure to do so may cause the system to malfunction.

Preliminary Procedure

1. Disable the SIR system. Refer to. **SIR Disabling and Enabling**
2. Remove the front seat cushion cover and pad. Refer to. **Front Seat Cushion Cover and Pad Replacement**

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3. When working with the passenger seat re-zero the inflatable restraint passenger presence system whenever the seat cushion or any component of the passenger presence system is removed. Refer to **Control Module References** .	
1	Inflatable Restraint Passenger Presence System Retainer (Qty: 2) **Tip:** Use a flat bladed tool to release retainers from the seat frame.
2	Inflatable Restraint Passenger Presence System **Procedure** 1. Disconnect the electrical connectors. 2. Remove the passenger presence system. 3. Program the inflatable restraint passenger presence system after replacement. Refer to **Control Module References** .

DRIVER OR PASSENGER SEAT SIDE INFLATABLE RESTRAINT MODULE REPLACEMENT

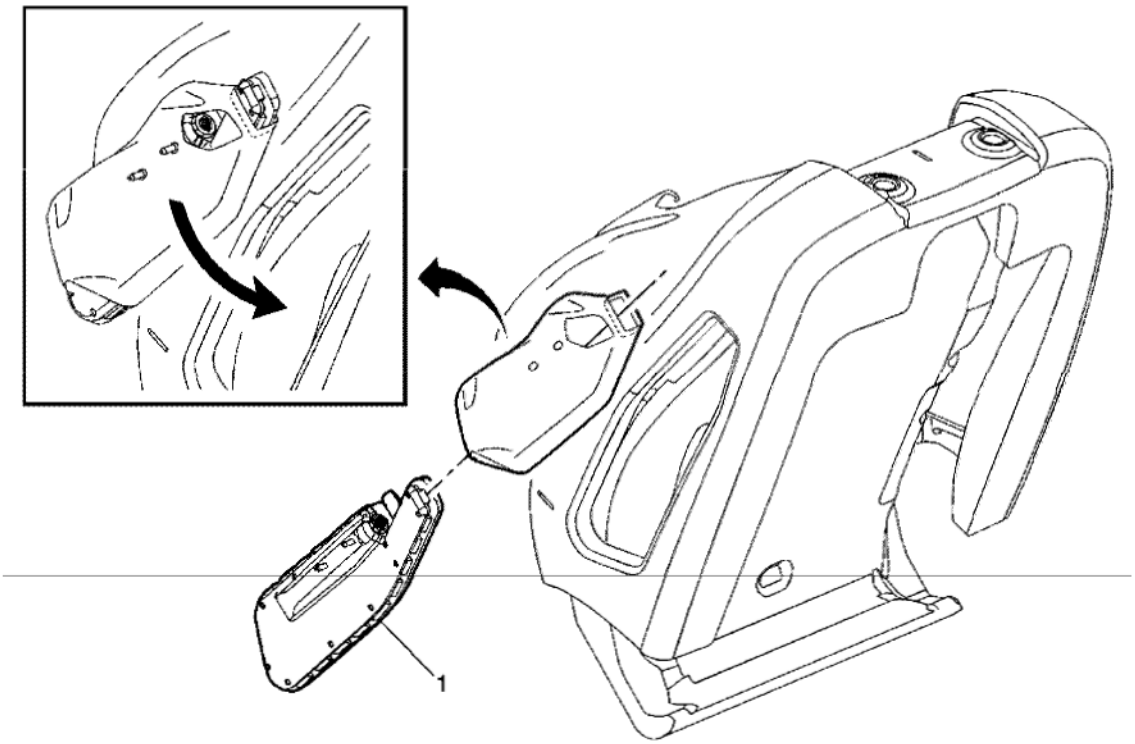


Fig. 17: Driver Or Passenger Seat Side Inflatable Restraint Module
Courtesy of GENERAL MOTORS CORP.

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

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

Failure to do so may cause future personal injury.

WARNING:

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

Preliminary Procedure

1. Disable the SIR system. Refer to **SIR Disabling and Enabling**.
2. Remove the front seat. Refer to **Driver or Passenger Seat Replacement** .
3. Remove the front seat back cushion cover and pad. Refer to **Driver or Passenger Seat Back Cushion Cover and Pad Replacement** .

1	Inflatable Restraint Front Seat Side Module **Procedure** 1. Remove the module out of the chute by removing it through the bottom opening of the chute. 2. When installing the airbag module into the seat trim cover chute, ensure there is no twisting of the chute by fitting the module studs through the chute holes for proper alignment and also make sure that the top of the module protrudes through the correct access hole. 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 **Inflatable Restraint Module Handling and Scrapping**.

INFLATABLE RESTRAINT INSTRUMENT PANEL MODULE INDICATOR REPLACEMENT

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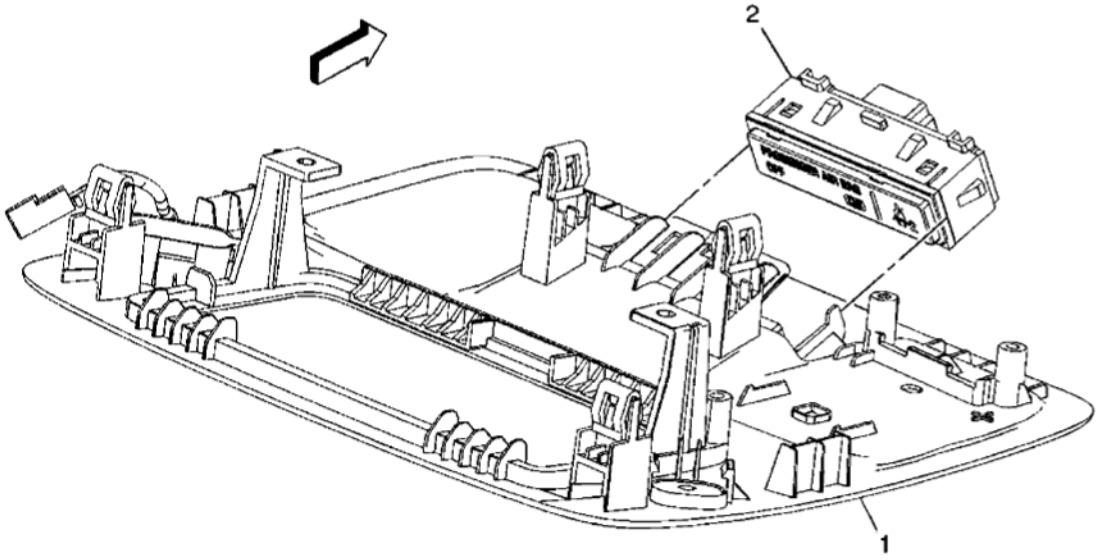


Fig. 18: Inflatable Restraint Instrument Panel Module Indicator
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Roof Console Assembly **Procedure:** Remove the roof console. Refer to **Roof Console Replacement** .
2	Inflatable Restraint Instrument Panel Module Indicator Assembly **Procedure:** Unsnap the indicator from the roof console bezel.

ROOF SIDE RAIL INFLATABLE RESTRAINT MODULE REPLACEMENT

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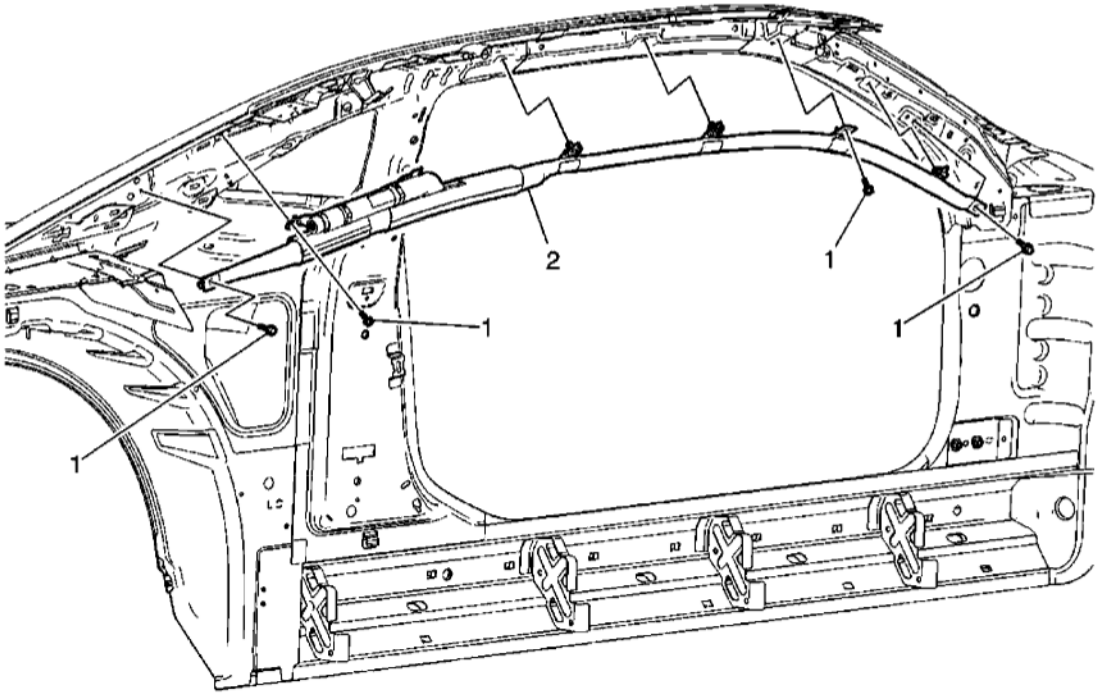


Fig. 19: Roof Side Rail Inflatable Restraint Module
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name

WARNING:
In order to prevent SIR deployment, personal injury, or unnecessary SIR system repairs, do not strike the door or the door pillar in the area of the side impact sensor (SIS). Turn OFF the ignition and remove the key when performing service in the area of the SIS.

WARNING:
When installing the roof rail airbag, do not twist or turn the airbag 360 degrees. Securing the roof rail airbag with an airbag twisted or turned 360 degrees may cause the airbag not to deploy correctly and could cause personal injury.

WARNING:
Refer to SIR Warning .

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

Preliminary Procedures

1. Disable the SIR system. Refer to **SIR Disabling and Enabling**.
2. Lower the side of the headliner. Refer to **Headlining Trim Panel Replacement** .

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3. Lower the side of the headliner, if equipped. Refer to **Sunroof Panel Trim Panel Replacement** .

1	Roof Side Rail Inflatable Restraint Module Fastener (Qty: 8) **CAUTION:** **Refer to Fastener Caution .** **Tighten:** 9 N.m (80 lb in)
2	Inflatable Restraint Roof Side Rail Module Assembly **Procedure** 1. Disconnect the electrical connector. 2. Release the integral clips. 3. Remove the roof side rail inflatable restraint module from the vehicle. 4. Fully deploy the module before disposal. Refer to **Inflatable Restraint Module Handling and Scrapping**.

DRIVER OR PASSENGER SEAT RETRACTOR SIDE BELT REPLACEMENT

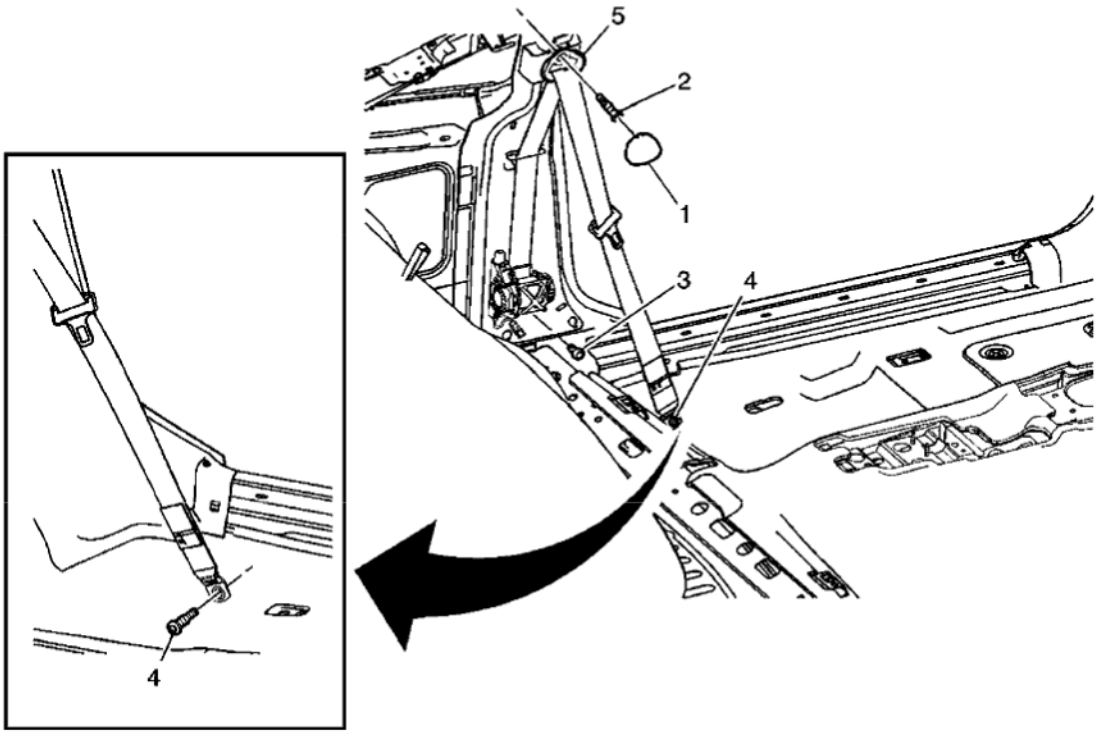


Fig. 20: Driver Or Passenger Seat Retractor Side Belt
Courtesy of GENERAL MOTORS CORP.

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Callout	Component Name
Preliminary Procedures 1. Disable the SIR system. Refer to **SIR Disabling and Enabling**. 2. Remove the quarter trim panel. Refer to **Quarter Trim Panel Replacement** .	
1	Driver Seat Shoulder Belt Guide Bracket Cover
2	Shoulder Belt Fastener **CAUTION:** **Refer to Fastener Caution .** **Tighten:** 47 N.m (35 lb ft)
3	Shoulder Belt Retractor Fastener **Tighten:** 47 N.m (35 lb ft)
4	Shoulder Belt Assembly Fastener **Tighten:** 47 N.m (35 lb ft)
5	Driver or Passenger Shoulder Belt Assembly

REPAIRS AND INSPECTIONS REQUIRED AFTER A COLLISION

Accident With or Without Air Bag Deployment - Component Inspections

WARNING: Proper operation of the Supplemental Inflatable Restraint (SIR) sensing system requires that any repairs to the vehicle structure return the vehicle structure to the original production configuration. Not properly repairing the vehicle structure could cause non-deployment of the air bag(s) in a frontal collision or deployment of the air bag(s) for conditions less severe than intended.

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

- The steering column-Inspect the steering column for bending, twisting, buckling or any type of damage.
- The instrument panel knee bolsters and mounting points-Inspect the knee bolsters for bending, twisting, buckling, or any other type of damage.
- The instrument panel brackets, braces, etc.-Inspect for bending, twisting, buckling, or any other type of damage.
- The seat belts-Perform the seat belt operational and functional checks. Refer to **Repairs and Inspections Required After a Collision** .
- The instrument panel cross car beam-Inspect for bending, twisting, buckling, or any other type of damage.

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- The instrument panel mounting points and brackets-Inspect for bending, twisting, buckling, or any other type of damage.
- The seats and seat mounting points-Inspect for bending, twisting, buckling, or any other type of damage.
- The roof and headliner mounting points.

Accident With Frontal Air Bag Deployment - Component Replacement and Inspections

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

- Inflatable restraint passenger instrument panel air bag module
- Inflatable restraint steering wheel module
- Inflatable restraint sensing and diagnostic module (SDM)
- Inflatable restraint front end sensors
- Inflatable restraint left front/right front air bag module, if deployed
- Seat back cover on internal seat side air bag module, if deployed
- Inflatable restraint 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 passenger instrument panel module, steering wheel module, SDM, side air bag module (if deployed) and seat belt pretensioners-Inspect for any damage and repair or replace each component as needed.

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

After a collision involving left/right side air bag module deployment, replace the following components.

- Left/right inflatable restraint side impact sensors on the side of the impact.
- Left/right inflatable restraint roof rail module on the side of the impact.
- Inflatable restraint sensing and diagnostic module (SDM), if SDM has DTC B0052 56.
- Inflatable restraint seat belt pretensioner.
- Driver or passenger seat back cushion cover replacement, if equipped left front/right front side air bag.

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

Perform additional inspections on the following components.

- Mounting points or mounting hardware for the side impact sensors, and left front/right front side air bag modules on the side of impact-Inspect for any damage and repair or replace each component as needed.

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- Mounting points, mounting hardware, headliner and trim pieces for the left/right roof rail air bag module 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 seat belt pretensioners-Inspect for any damage and repair or replace each component as needed.
- The seat cushion frame
- The seat recliner and cover, if equipped
- The seat adjuster
- The seat back frame
- Door trim assembly
- Impacted seat cushion side covers and switches

Inflatable Restraint Impact Sensor Replacement Guidelines

The inflatable restraint impact sensor replacement policy requires replacing sensors in the area of the accident damage. The area of accident damage is defined as the portion of the vehicle which is crushed, bent, or damaged due to a collision. An example of this would be a moderate collision where the front of the vehicle impacts a object. If the vehicle has an inflatable restraint impact sensor mounted forward of the radiator, it must be replaced.

- Replace the inflatable restraint impact sensor whether or not the air bags have deployed.
- Replace the inflatable restraint impact sensor even if it 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 inflatable restraint impact sensing system. Do not try to determine whether the sensor is undamaged, replace the inflatable restraint impact sensor. Also, if you follow a diagnostic trouble code (DTC) procedure and a malfunctioning sensor is indicated, replace the inflatable restraint impact sensor.

INFLATABLE RESTRAINT MODULE HANDLING AND SCRAPPING

Special Tools

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

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

Live and Undeployed Inflator Module

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

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

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module, to project through the air in the event of an unlikely deployment.

Dual Stage Inflator Module

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

Scrapping Procedure

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

Do not deploy the inflator module in the following situations:

- After replacement of an inflator module under warranty-the inflator module may need to be returned undeployed to the manufacturer.
- If the vehicle is the subject of a product liability claim, related to the SIR system and is subject to a preliminary investigation-do NOT alter the SIR system in any manner.
- If the vehicle is involved in a campaign affecting the 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, Instrument Panel 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.

WARNING: Refer to SIR Inflator Module Disposal Warning .

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1. Turn OFF the ignition.

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

2. Remove the inflator module.

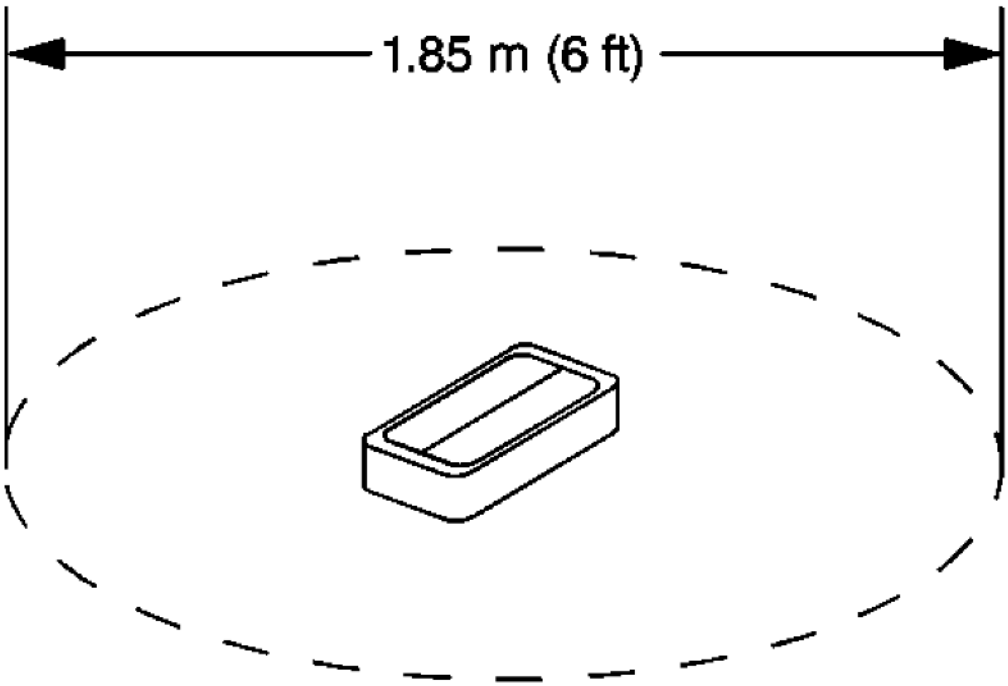


Fig. 21: Identifying Clearance For Deployment Of Inflator Module
Courtesy of GENERAL MOTORS CORP.

3. 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.
4. Clear the area of loose or flammable objects.

NOTE: Dual stage deployments are only used in steering wheel and instrument panel air bag 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.

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

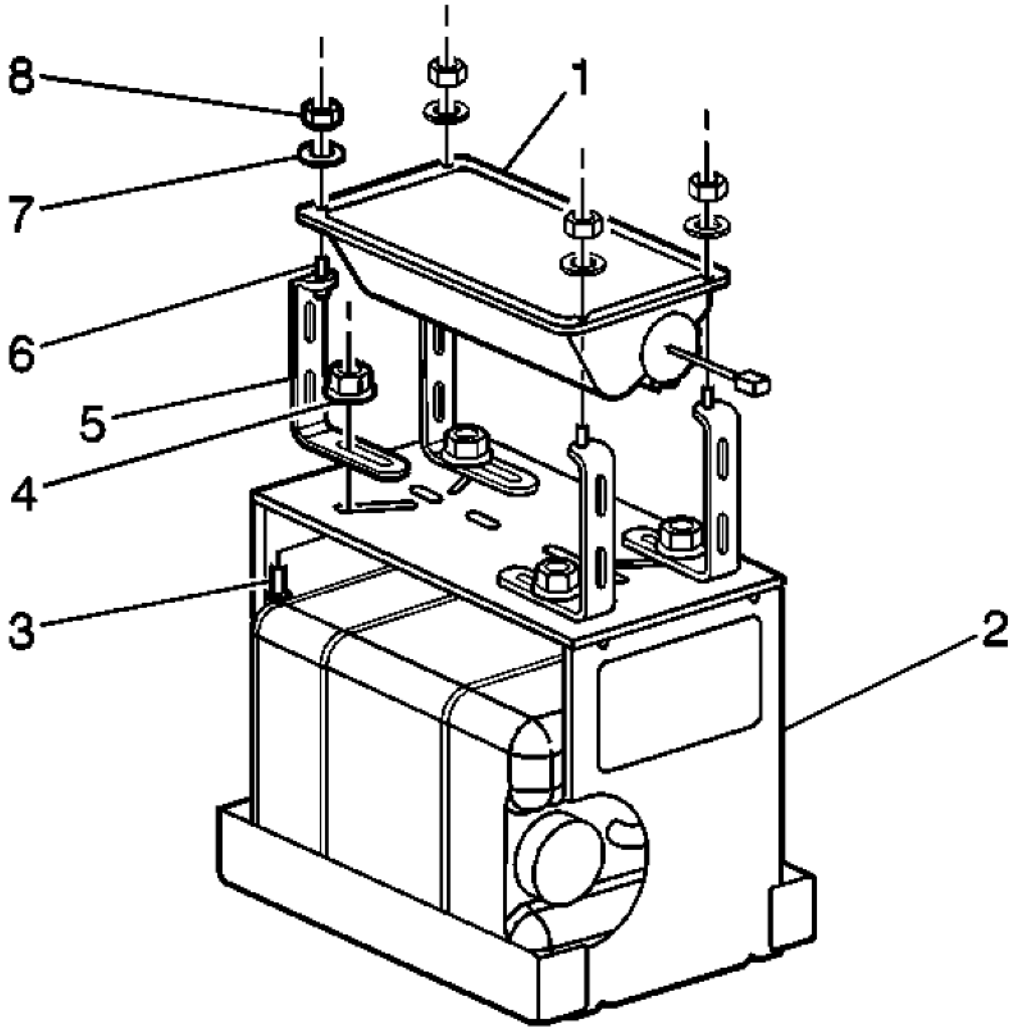


Fig. 22: Identifying I/P Module & Deployment Fixture Components
Courtesy of GENERAL MOTORS CORP.

6. When deploying an instrument panel air bag module, perform the following instructions:
    1. Place the **EL-39401-B:** fixture in the center of the cleared area.
    2. Fill the deployment fixture with water or sand.
    3. Using the proper nuts and bolts, mount the instrument panel air bag module (1) to the deployment fixture (2), with the vinyl trim facing up.

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4. Securely tighten all fasteners that hold the instrument panel air bag module (1) to the deployment fixture (2).

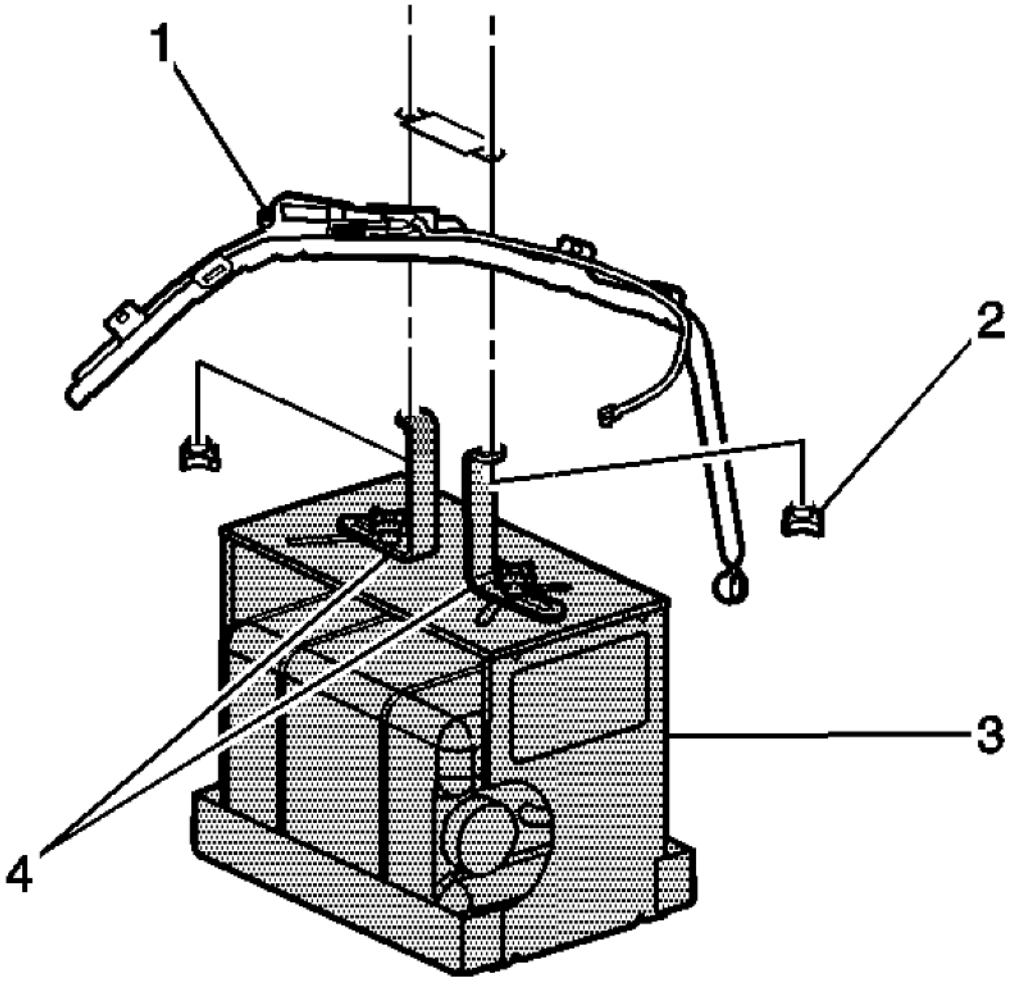


Fig. 23: Identifying Fasteners Holding Side Impact Module To Deployment Fixture
Courtesy of GENERAL MOTORS CORP.

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

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4. Attach the roof rail module in the deployment fixture and securely tighten all fasteners.

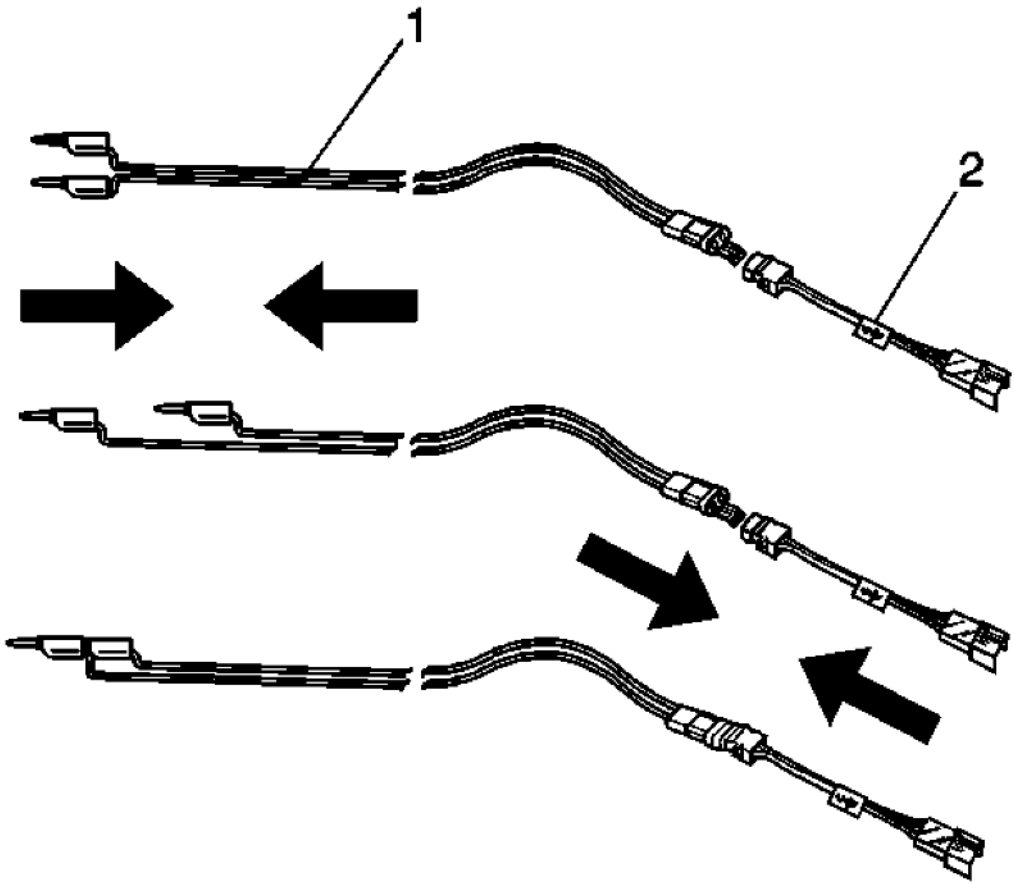


Fig. 24: Identifying SIR Deployment Harness & Adapter
Courtesy of GENERAL MOTORS CORP.

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

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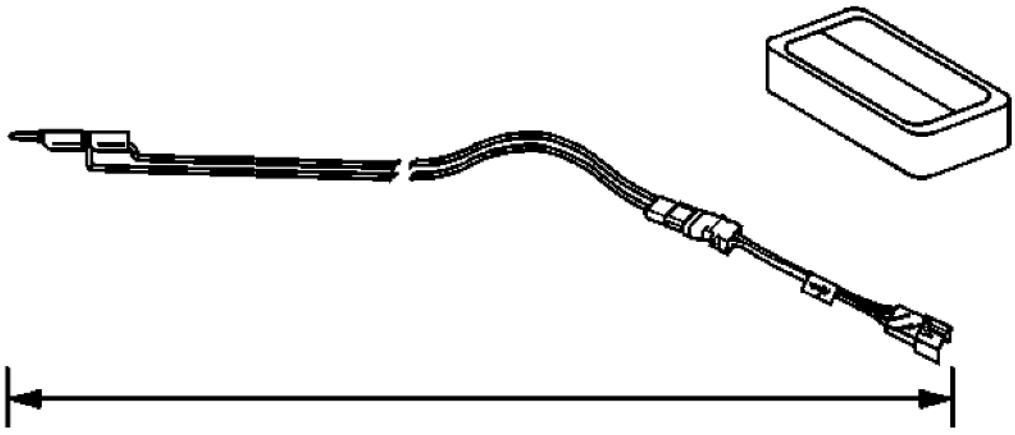


Fig. 25: Extending SIR Deployment Harness & Adapter
Courtesy of GENERAL MOTORS CORP.

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

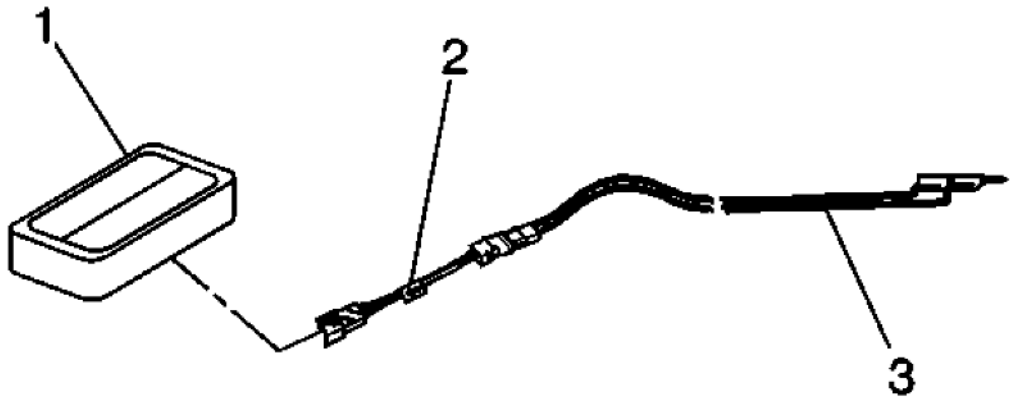


Fig. 26: Identifying Inflator Module, SIR Deployment Harness & Adapter
Courtesy of GENERAL MOTORS CORP.

NOTE: 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

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2 of the deployment loops are energized, regardless of the deployment state.

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

NOTE:

- **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.**

13. Clear the area of people.

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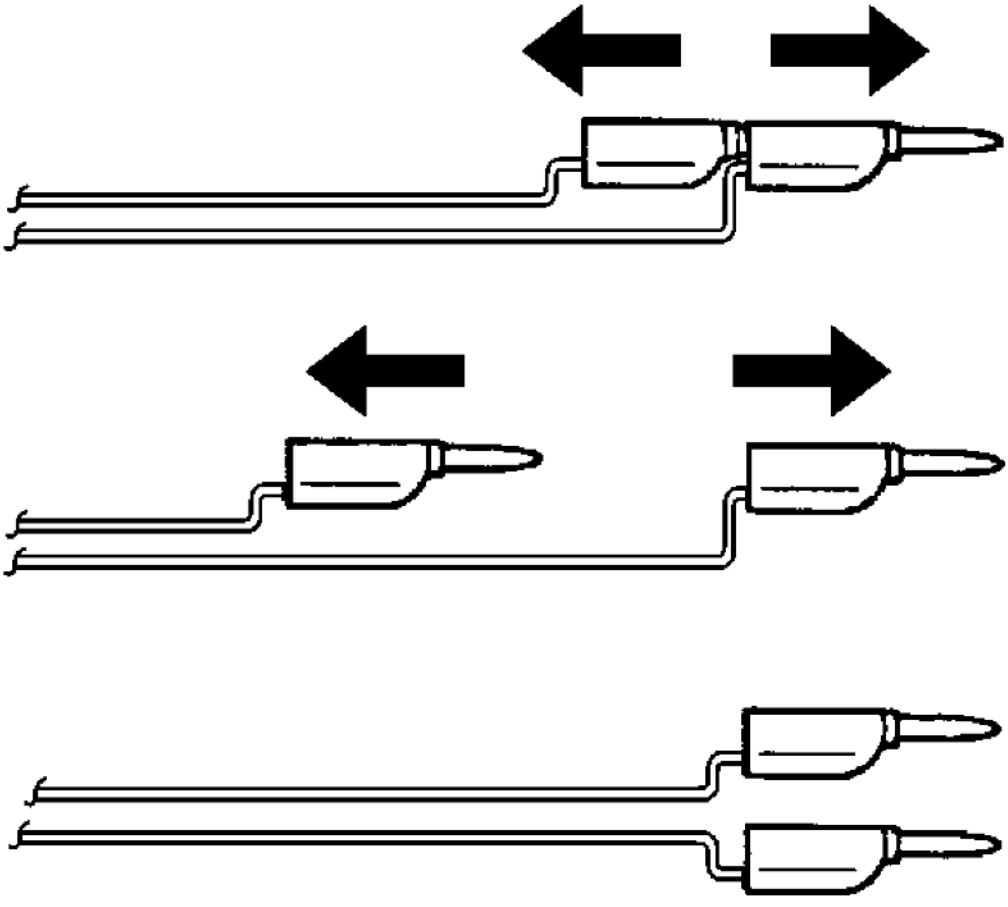


Fig. 27: Separating Banana Plugs
Courtesy of GENERAL MOTORS CORP.

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

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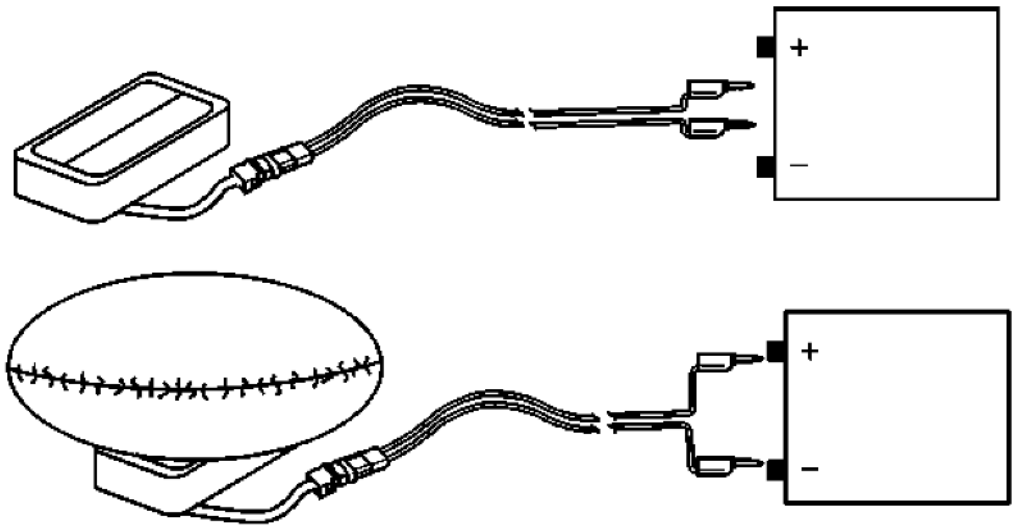


Fig. 28: Connecting SIR Deployment Harness Wires To Power Source
Courtesy of GENERAL MOTORS CORP.

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

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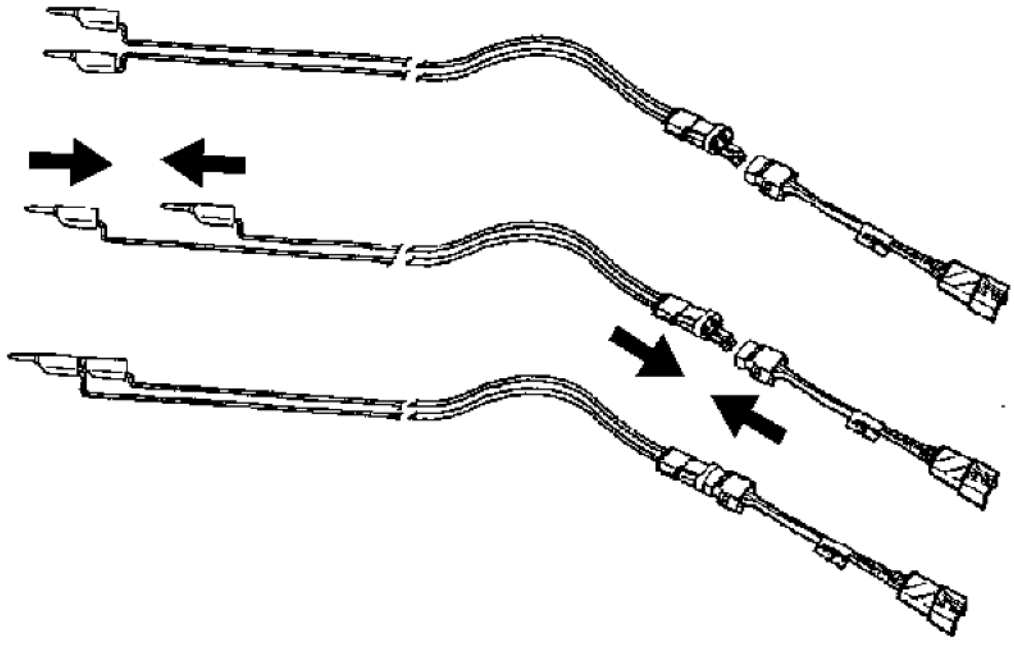


Fig. 29: View Of Deployment Harness Leads
Courtesy of GENERAL MOTORS CORP.

17. Disconnect the SIR deployment harness from the power source after the inflator module deploys.
18. 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.

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

19. Seat one banana plug into the other in order to short the deployment harness leads.
20. Put on a pair of shop gloves.
21. Disconnect the pigtail adapter from the inflator module as soon as possible.
22. Inspect the pigtail adapter and the SIR deployment harness. Replace as needed.
23. Dispose of the deployed inflator module through normal refuse channels.
24. Wash your hands with a mild soap.

Deployment Inside Vehicle - Vehicle Scrapping Procedure

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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.

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

1. Lower the driver and passenger windows.
2. Turn the ignition switch to the OFF position and remove the ignition key.
3. Check that all inflator modules which will be deployed are mounted securely.
4. Remove all loose objects from the front seats.

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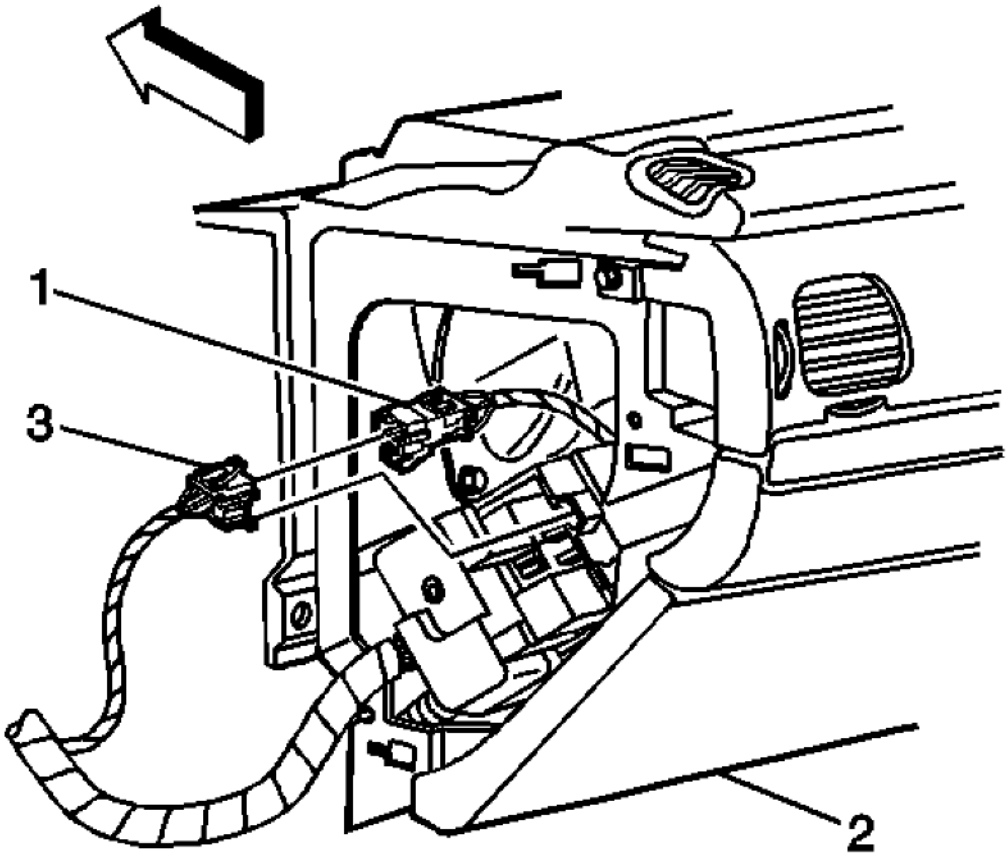


Fig. 30: Identifying Steering Wheel Module & Vehicle Harness Connectors
Courtesy of GENERAL MOTORS CORP.

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

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

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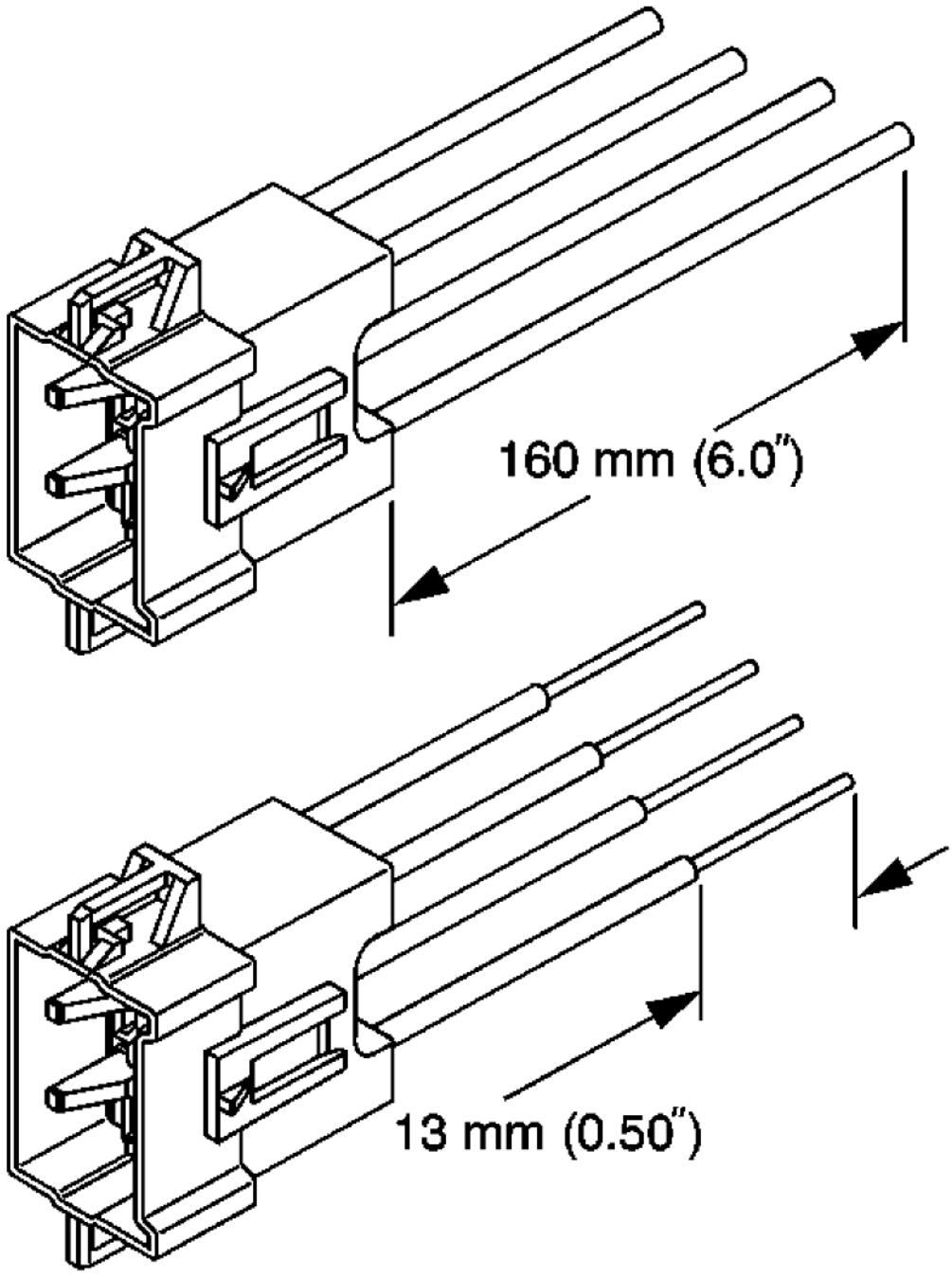


Fig. 31: Stripping SIR Wires
Courtesy of GENERAL MOTORS CORP.

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

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

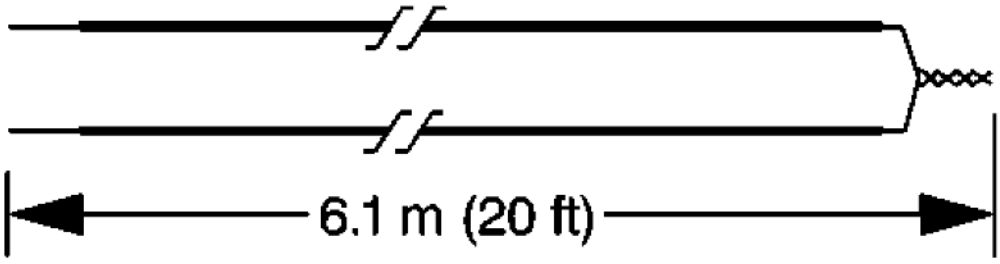


Fig. 32: Fabricating 20 Ft. Deployment Harness
Courtesy of GENERAL MOTORS CORP.

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

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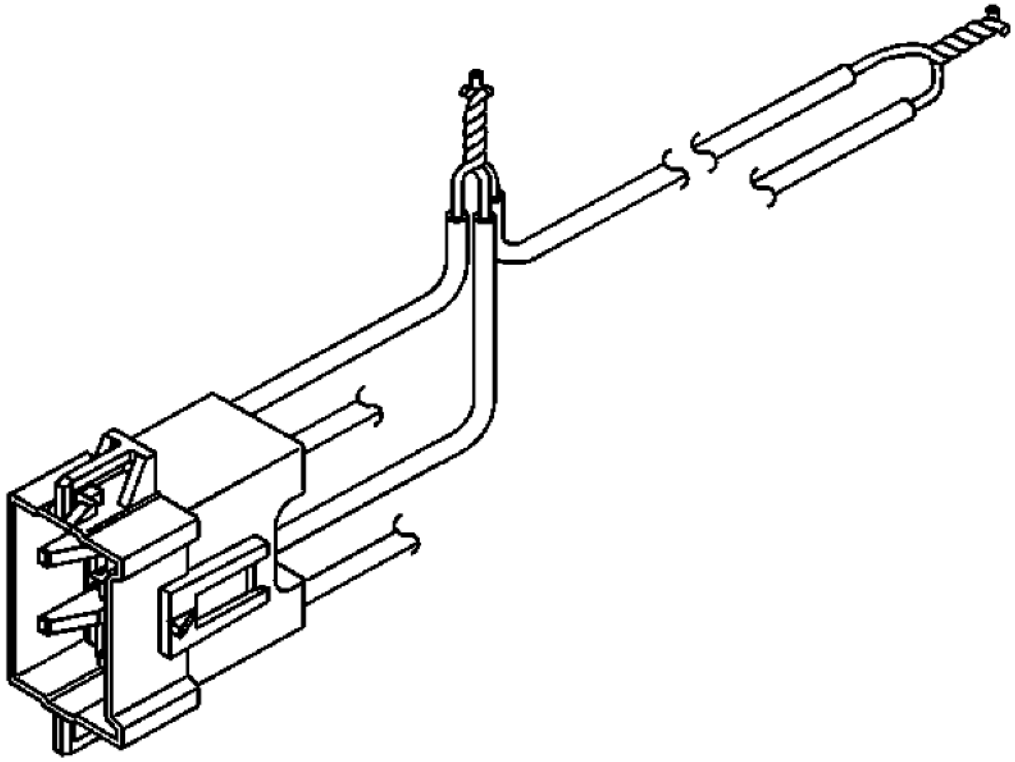


Fig. 33: Twisting Connector Wire Leads (High Circuits) To Deployment Harness Wire
Courtesy of GENERAL MOTORS CORP.

11. 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.
12. Inspect that the 3-wire connection is secure.
13. Secure and insulate the 3-wire connection to the deployment harness using electrical tape.

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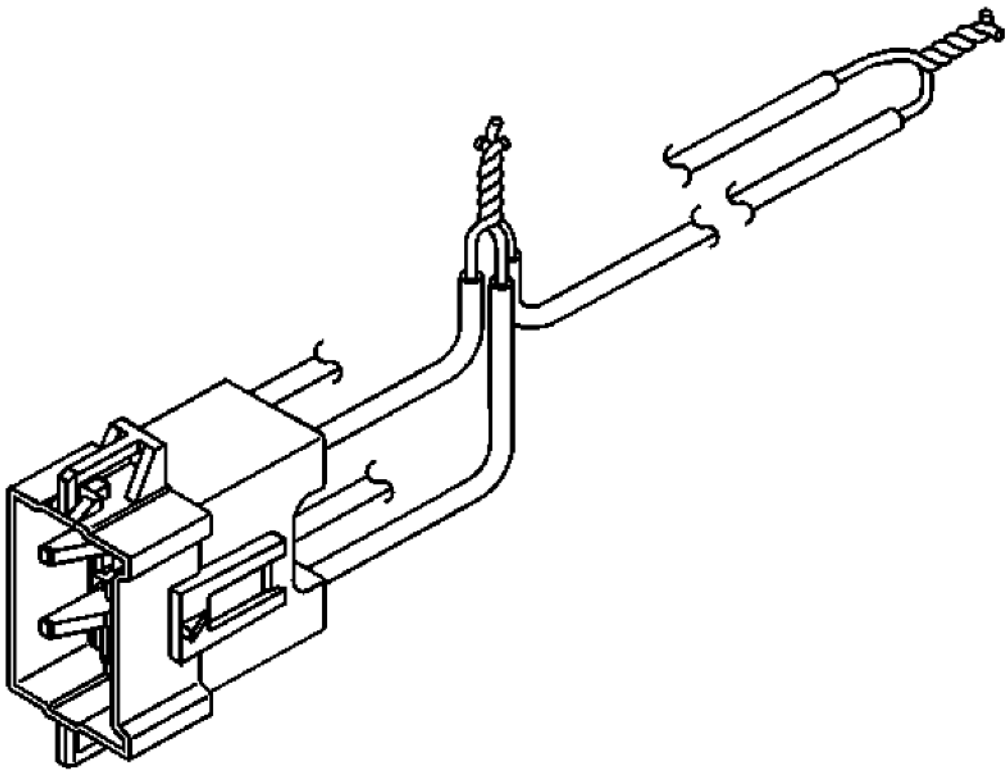


Fig. 34: Twisting Connector Wire Leads (Low Circuits) To Deployment Harness Wire
Courtesy of GENERAL MOTORS CORP.

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

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

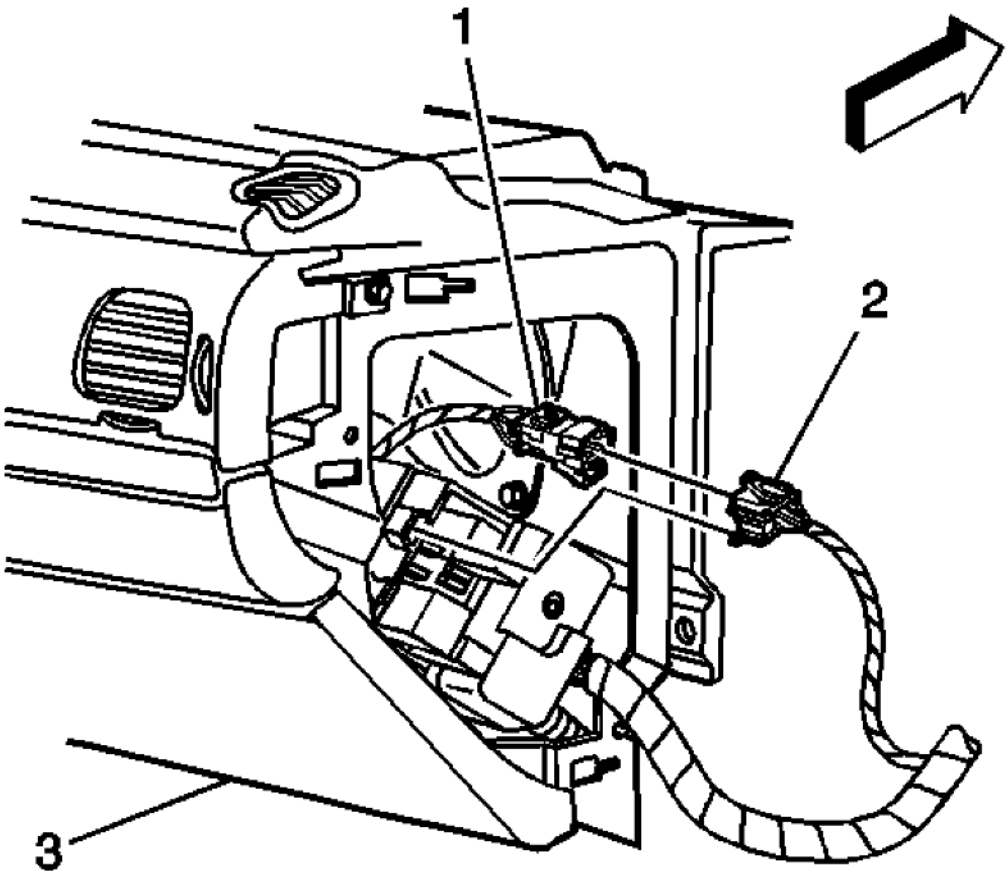


Fig. 35: Identifying I/P Module Connector To Vehicle Harness Connector
Courtesy of GENERAL MOTORS CORP.

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

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

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module and instrument panel module will each have 4 wires. Refer to Component Connector End Views for determining high and low circuits.

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

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60. Disconnect the deployment harness from the power source and twist the wire ends together.
61. Continue the same process with the remaining deployment harnesses.
62. Disconnect all harnesses from the vehicle.
63. Discard the harnesses.
64. Scrap the vehicle in the same manner as a non-SIR equipped vehicle.
65. If one or all of the inflator modules did not deploy, remove the undeployed modules from the vehicle.

PRETENSIONER HANDLING AND SCRAPPING

Scrapping Procedure

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

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

Deployment Procedures

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

Deployment Inside the Vehicle

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

Deployment Outside Vehicle for Seat Belt Pretensioners

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

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

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

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

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

Special Tools

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

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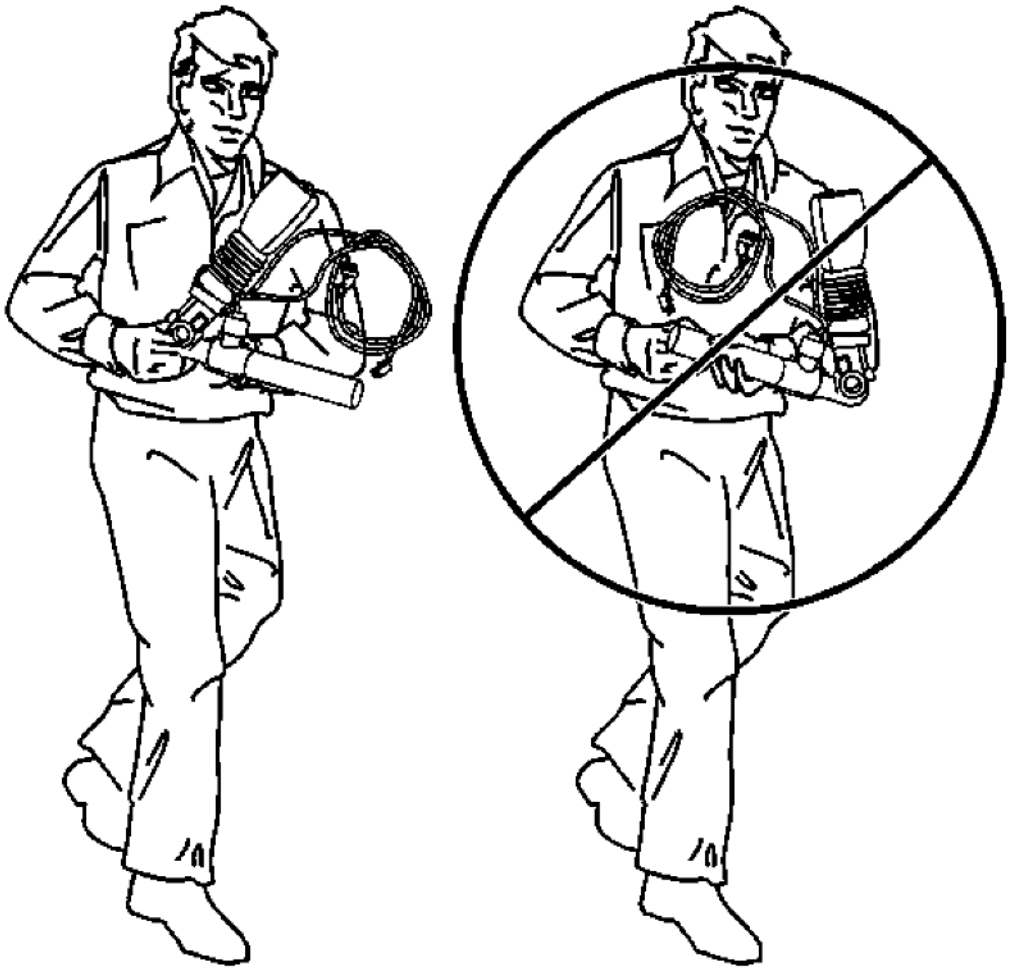


Fig. 36: Proper Pretensioner Carrying
Courtesy of GENERAL MOTORS CORP.

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

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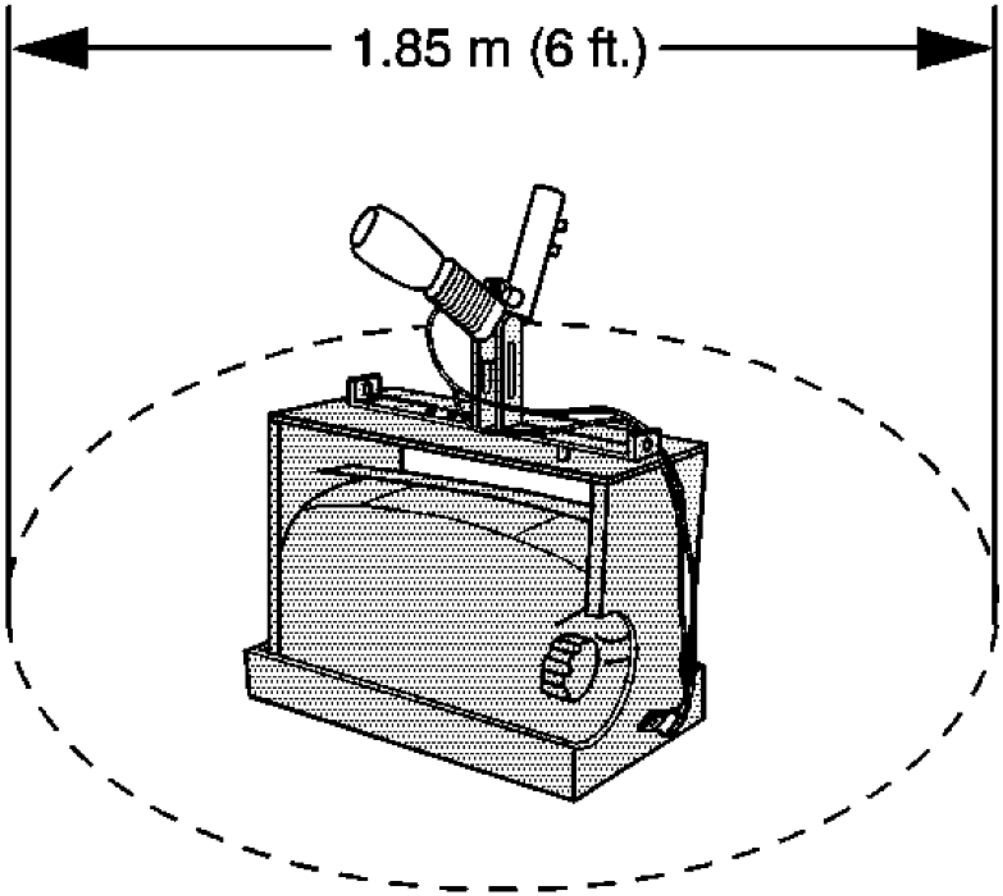


Fig. 37: Pretensioner Deployment Area
Courtesy of GENERAL MOTORS CORP.

6. Clear a space on the ground about 1.85 M (6 ft) in diameter for deployment of the pretensioner. If possible, use a paved, outdoor location free of activity. Otherwise, use a space free of activity on the shop floor. Make sure you have sufficient ventilation.
7. Make sure no loose or flammable objects are in the area.
8. Place the **J 39401-B** SIR Deployment Fixture in the center of the cleared area. See **Special Tools**.
9. Fill the fixture plastic reservoir with water or sand.

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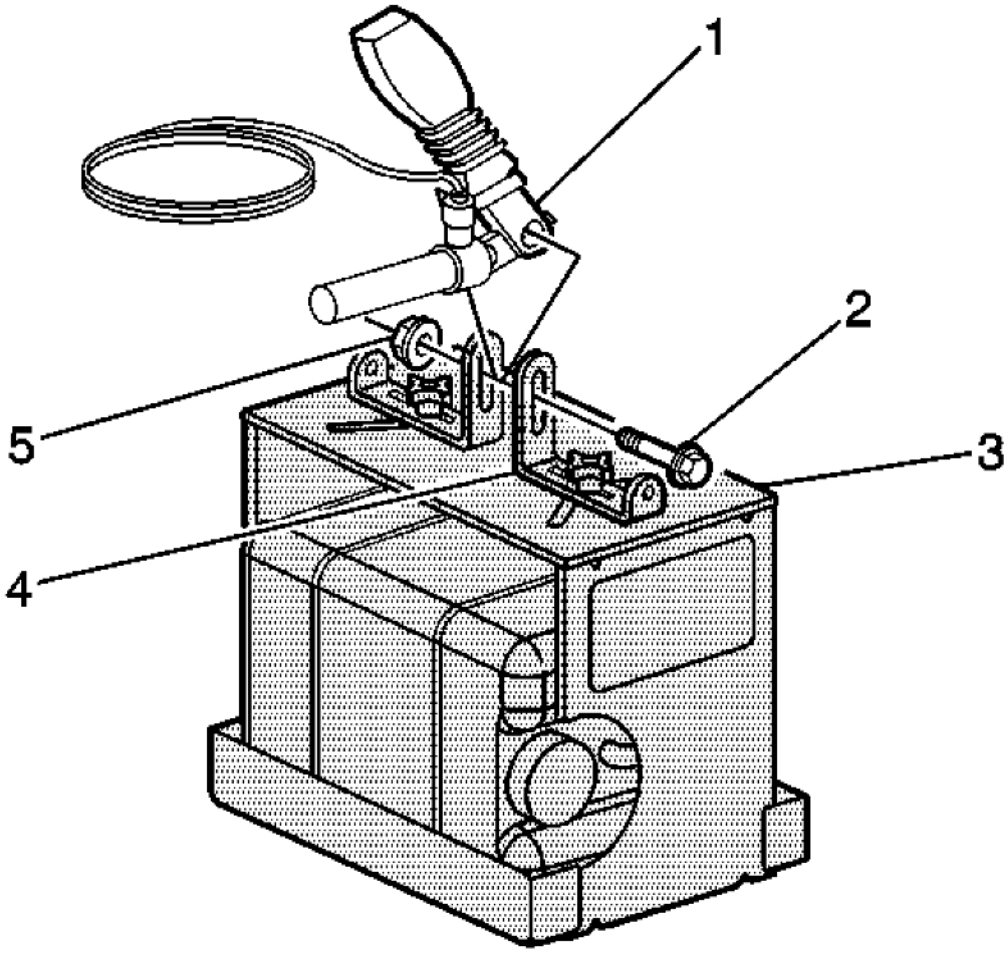


Fig. 38: Mounting Pretensioner In SIR Deployment Fixture
Courtesy of GENERAL MOTORS CORP.

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

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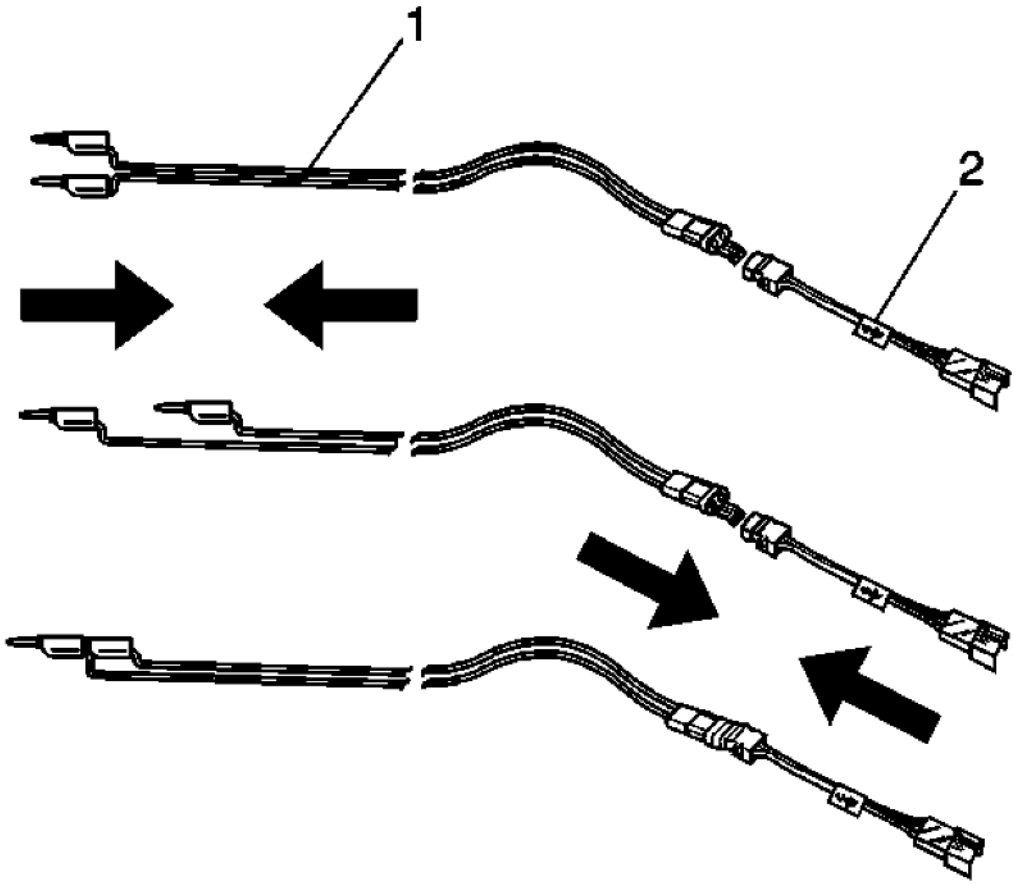


Fig. 39: Identifying SIR Deployment Harness & Adapter
Courtesy of GENERAL MOTORS CORP.

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

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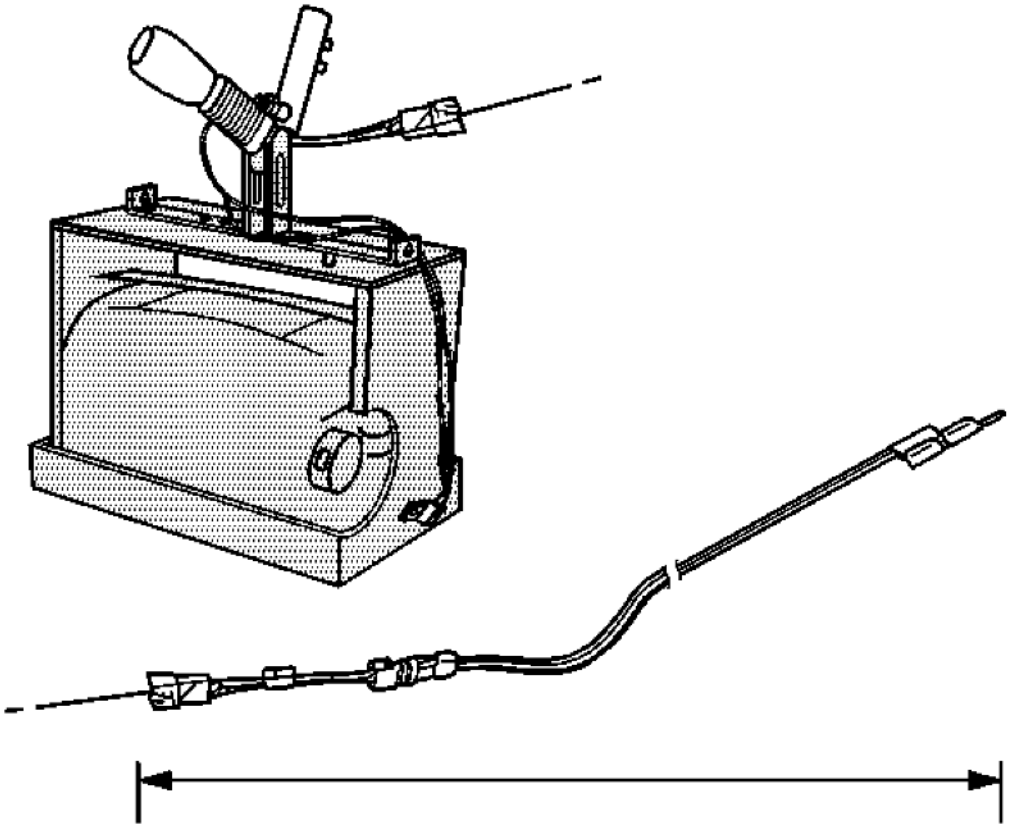


Fig. 40: Extending SIR Deployment Harness & Adapter
Courtesy of GENERAL MOTORS CORP.

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

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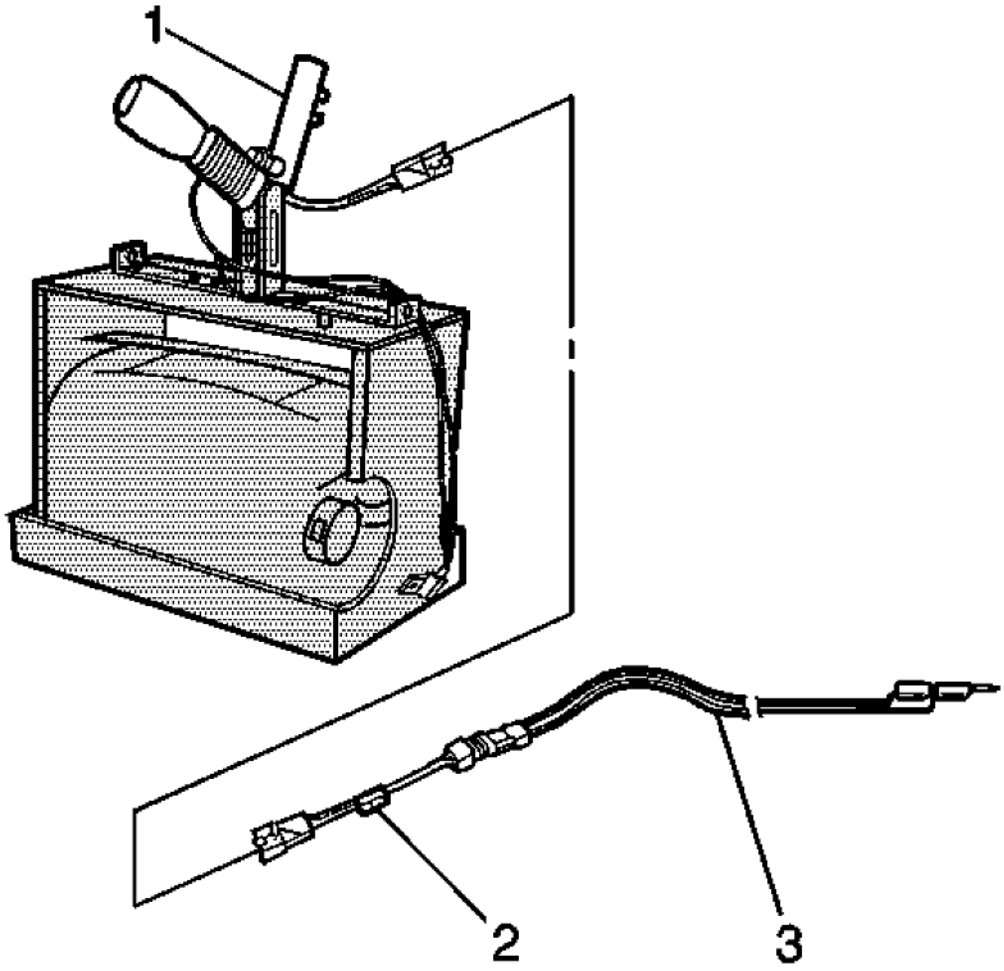


Fig. 41: Connecting Pretensioner To Adapter
Courtesy of GENERAL MOTORS CORP.

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

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

16. Clear the area of people.

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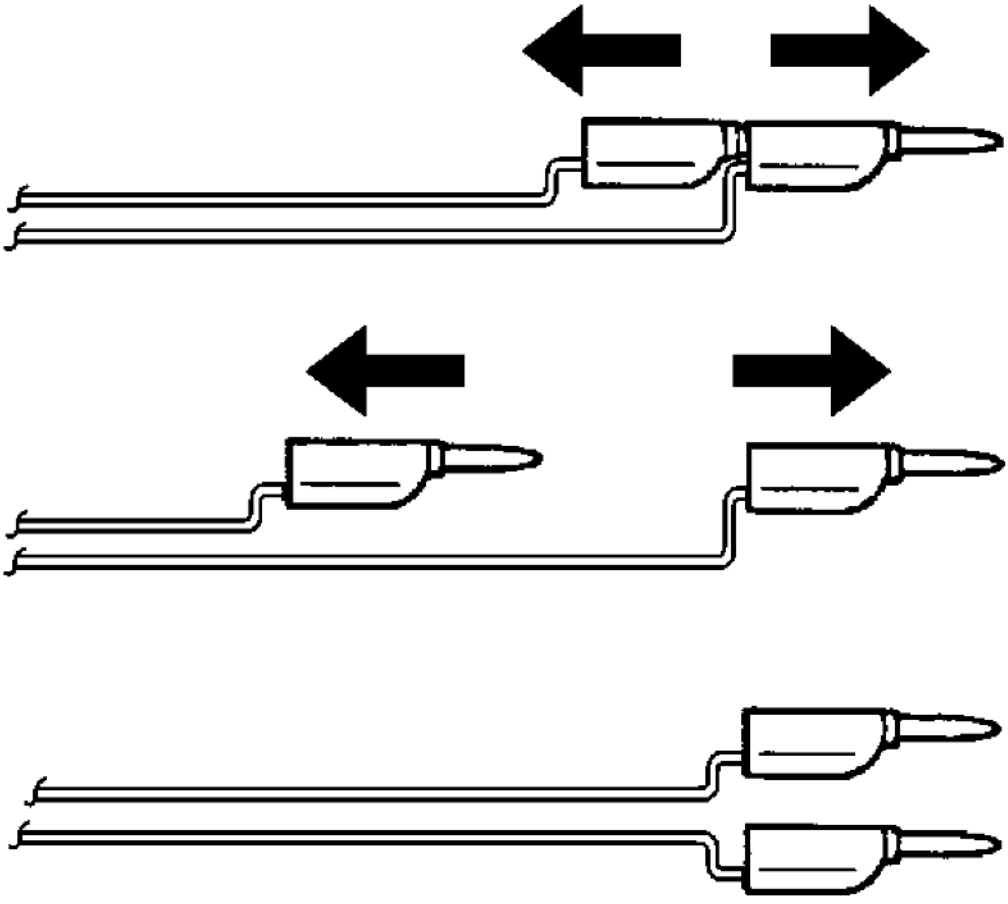


Fig. 42: Separating Banana Plugs
Courtesy of GENERAL MOTORS CORP.

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

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

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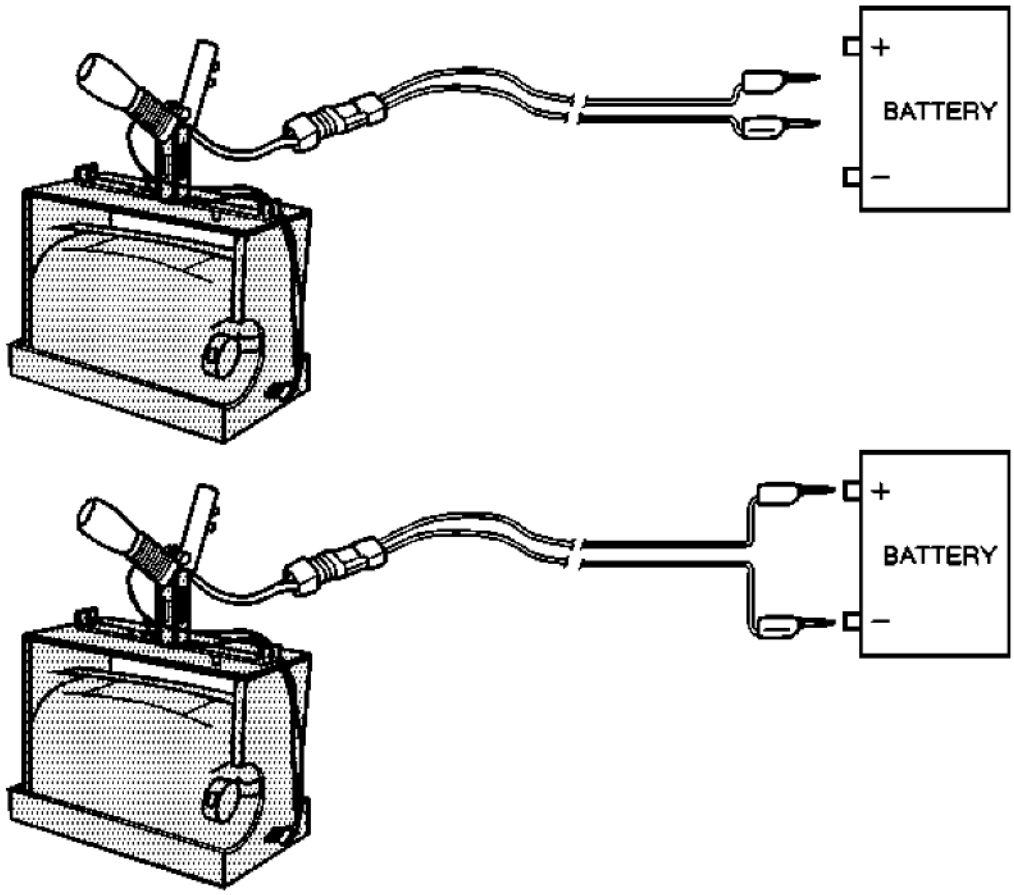


Fig. 43: Deploying Pretensioner
Courtesy of GENERAL MOTORS CORP.

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

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

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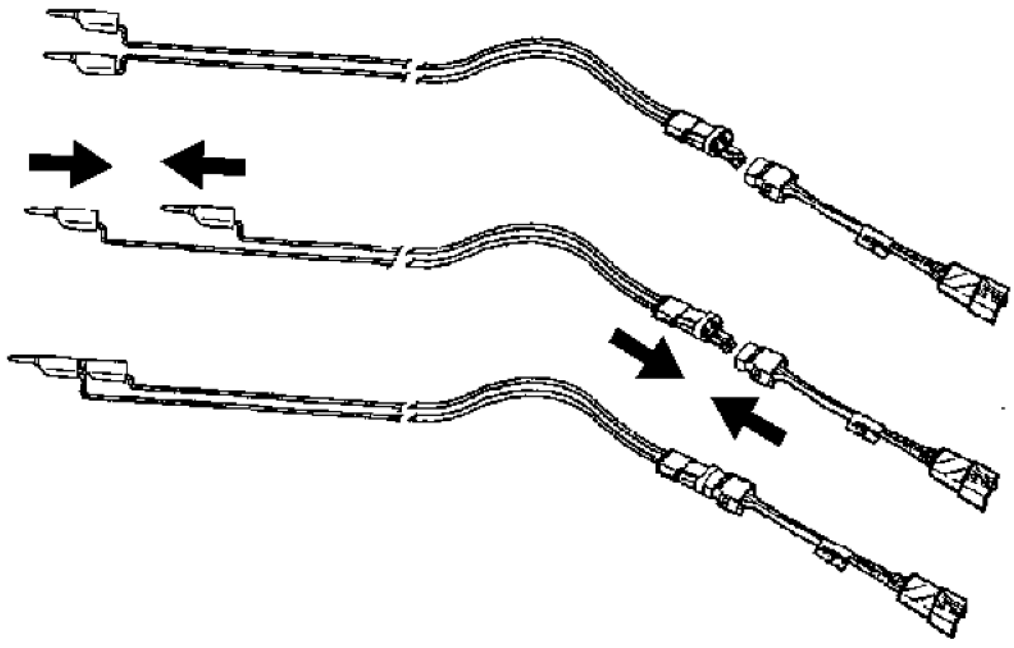


Fig. 44: View Of Deployment Harness Leads
Courtesy of GENERAL MOTORS CORP.

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

DESCRIPTION AND OPERATION

SIR SYSTEM DESCRIPTION AND OPERATION

SIR System Overview

The supplemental inflatable restraint (SIR) system supplements the protection offered by the seat belts. The SIR system contains an inflatable restraint sensing and diagnostic module (SDM), inflator modules, seat belt pretensioners (anchor and retractor), and impact sensors. The SDM determines the severity of a collision with

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the assistance of side impact sensors located at strategic points on the vehicle. When the SDM detects a collision, the SDM will process the information provided by the sensors to further support air bag or pretensioner deployment. The SDM will deploy the air bags and pretensioners if it detects a collision of sufficient force. If the force of the impact is not sufficient to warrant inflator module deployment, the SDM may still deploy the seat belt pretensioners. The SDM contains a sensing device that converts vehicle velocity changes to an electrical signal. The SDM compares these signals to values stored in memory. If the signals exceed a stored value, the SDM will determine the severity of the impact and either cause current to flow through the frontal deployment loops deploying the frontal air bags and pretensioners, or it will deploy the pretensioners only. The SDM continuously monitors the deployment loops for malfunctions and illuminates the AIR BAG indicator if a fault is detected.The SDM performs continuous diagnostic monitoring of the SIR system electrical components. Upon detection of a circuit malfunction, the SDM will set a DTC and inform the driver by illuminating the AIR BAG indicator. The steering column and knee bolsters are designed to absorb energy and compress during frontal collisions in order to limit leg movement and decrease the chance of injury to the driver and passenger.

AIR BAG Indicator

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

Inflatable Restraint Sensing and Diagnostic Module (SDM)

The inflatable restraint sensing and diagnostic module (SDM) is a microprocessor and the control center for the supplemental inflatable restraint (SIR) system. The SDM contains internal sensors along with external impact sensors, mounted at strategic locations on the vehicle. In the event of a collision, the SDM compares the signals from the internal and external impact sensors to a value stored in memory. When the generated signals exceed the stored value, the SDM will cause current to flow through the appropriate deployment loops to deploy the air bags. The SDM records the SIR system status when a deployment occurs and illuminates the AIR BAG indicator located in the instrument cluster. The SDM performs continuous diagnostic monitoring of the SIR system electrical components and circuitry when the ignition is turned ON. If the SDM detects a malfunction, a DTC will be stored and the SDM will request the instrument cluster to illuminate the AIR BAG indicator, notifying the driver that a malfunction exists. In the event that ignition positive voltage is lost during a collision, the SDM maintains a 23-volt loop reserve for deployment of the air bags. It is important when disabling the SIR system for servicing or rescue operations to allow the 23-volt loop reserve to dissipate, which could take up to 1 minute.

Inflator Modules

This vehicle contains 6 inflator modules. The 6 inflator modules are located in the steering wheel (dual

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inflators), instrument panel (passenger side) (dual inflators), driver side (B-pillar), passenger side (B-pillar), left roof rail, and right roof rail. To view the locations of the inflator modules refer to **SIR Identification Views**. Inflator modules contain a housing, inflatable air bag, two initiating devices (if dual inflator), canister of gas generating material and, in some cases, stored compressed gas. The deployment loops supply current through the inflator modules to deploy the air bags. The steering wheel and instrument panel passenger side inflator modules have two stages of deployment, which varies the amount of restraint to the occupant according to the collision severity. For moderate frontal collisions the inflator modules deploy at less than full deployment which consists of stage 1 of the inflator module. For more severe frontal collisions a full deployment is initiated which consists of stage 1 and stage 2 of the inflator module. The current passing through the inflator modules ignite the material in the canister producing a rapid generation of gas and is some cases, the release of compressed gas. The gas produced from this reaction rapidly inflates the air bag. Once the air bag is inflated it quickly deflates through the air bag vent holes and/or the bag fabric. Each inflator module is equipped with a shorting bar located in the connectors of the module. The shorting bar shorts the inflator module deployment loop circuitry to prevent unwanted deployment of the air bag when it is disconnected.

Seat Belt Pretensioners (Retractor)

The seat belt pretensioners (driver and passenger) consist of a housing, seat belt retractor (located in the B-pillar), seat belt webbing, an initiator, and a canister of gas generating materials. To view the locations of the seat belt pretentioners refer to **SIR Identification Views**. The initiator is part of the seat belt pretensioner deployment loop. When the vehicle is involved in a collision of sufficient force, the SDM causes current to flow through the seat belt deployment loops to the initiator. Current passing through the initiator ignites the material in the canister producing a rapid generation of gas. The gas produced from this reaction deploys the seat belt pretensioners which removes all of the slack in the seat belts. Depending on the severity of the collision, the seat belt pretensioners may deploy without the frontal 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.

Impact Sensors

This vehicle contains 4 impact sensors. The 4 impact sensors are located in the front of the vehicle (2, left and right), and 2 in the B-pillars (left and right). To view the locations of the impact sensors refer to **SIR Identification Views**. The impact sensors contain a sensing device which monitors vehicle acceleration and velocity changes to detect side collisions that are severe enough to warrant air bag deployment. The impact sensor arenot part of the deployment loop, but instead provide input to the SDM. The SDM contains a microprocessor that performs calculations using the measured accelerations and compares these calculations to a value stored in memory. When the generated calculations exceed the stored value, the SDM will cause current to flow through the deployment loops deploying the appropriate impact module air bags.

Seat Position Sensors

The seat position sensors are used to determine the proximity of a front driver or passenger seat position with respect to the frontal air bag. Each seat position sensor interfaces with the inflatable restraint sensing and diagnostic module (SDM). The state of the seat position sensor allows the SDM to disable stage 2 of the frontal air bag for a front seat that is forward of the forward/rearward point in the seat track travel. The seat position sensor is a hall effect sensor that is mounted on the outboard seat track of the driver and passenger seats. The

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seat track includes a metal bracket that shunts the seat position sensor magnetic circuit creating 2 states of seat position, the shunted state represents a rearward seat position and the non-shunted state represents a forward position. The seat position sensor provides 2 current ranges, one range for the shunted state and a second range for a non-shunted state which are inputs to the SDM. When the SDM receives input from a seat position sensor that state 1 threshold is reached (seat is rearward), the SDM will enable stage 2 deployment. 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 seat position sensor circuit and if a fault is detected, the SDM will set code B0079 and disable stage 2 frontal deployment.

Passenger Presence Detection System

NOTE: The passenger presence system (PPS) is a calibrated unit. When replacing the assembly all parts in the service kit must remain together. Do not mix any of the old parts with the new parts. After repairing or replacing the PPS, the preload test must be performed in order to function properly.

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

Seat Belt Indicators

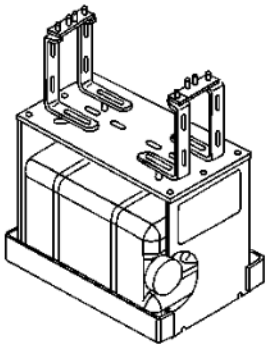
The seat belt indicators are controlled through the inflatable restraint sensing and diagnostic module (SDM). For further information on seat belt indicators refer to **Seat Belt System Description and Operation** .

SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

Illustration	Tool Number/ Description
	J 38826 SIR Deployment Harness

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	J 39401-B SIR Deployment Fixture

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