



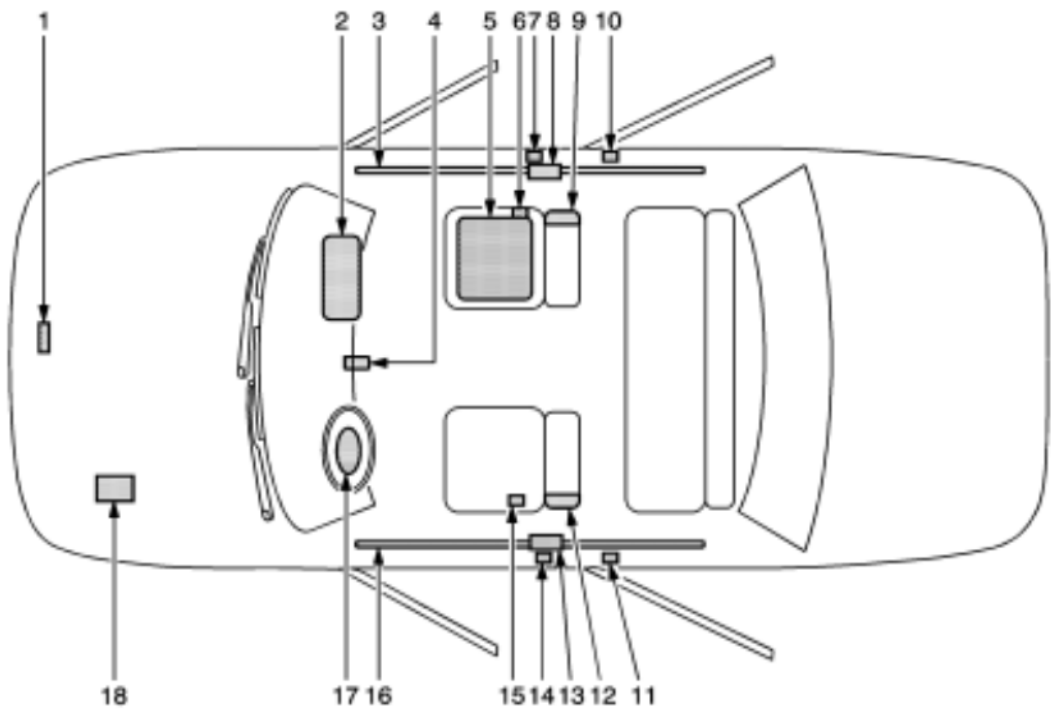
Index	RESTRAINTS	0-8
Specifications	Driver or Passenger Seat Side Inflatable Restraint Module Replacement	
Component Locator	Inflatable Restraint Instrument Panel Compartment Module Disable Switch Replacement	
SIR Disabling and Enabling	Roof Side Rail Inflatable Restraint Module Replacement (AYC)	
SIR Service Precautions	Front Seat Belt Anchor Plate Tensioner Replacement	
Front End Inflatable Restraint Discriminating Sensor Replacement	Driver or Passenger Seat Shoulder Belt Replacement (with A69)	
Inflatable Restraint Side Impact Sensor Replacement	Driver or Passenger Seat Shoulder Belt Replacement (without A69)	
Inflatable Restraint Sensing and Diagnostic Module Replacement	Repairs and Inspections Required After a Collision	
Steering Wheel Inflatable Restraint Module Replacement	Inflatable Restraint Module Handling and Scrapping	
Steering Wheel Airbag Coil Replacement	Pretensioner Handling and Scrapping	
Inflatable Restraint Steering Wheel Module Coil Centering	Description and Operation	
Instrument Panel Inflatable Restraint Module Replacement	Special Tools	



Fastener Tightening Specifications

Application	Specification	
	Metric	English
Driver or Passenger Seat Belt Tensioner Cover Fastener	7.5 N·m	66 lb in
Driver or Passenger Seat Belt Tensioner Fastener	45 N·m	33 lb ft
Driver or Passenger Seat Shoulder Belt Fastener	45 N·m	33 lb ft
Driver or Passenger Seat Side Inflatable Restraint Module Fastener	4 N·m	35 lb in
Driver or Passenger Shoulder Belt Retractor Fastener	45 N·m	33 lb ft
Inflatable Restraint Front End Discriminating Sensor	7.5 N·m	66 lb in
Front Seat Belt Anchor Plate Fastener	8 N·m	70 lb in
Front Seat Belt Retractor D Ring Fastener	45 N·m	33 lb ft
Front Seat Shoulder Belt Retractor Fastener	45 N·m	33 lb ft
Inflatable Restraint Roof Side Rail Fastener	9.5 N·m	84 lb in
Inflatable Restraint Sensing and Diagnostic Module Fastener	10 N·m	89 lb in
Inflatable Restraint Side Impact Sensor	7.5 N·m	66 lb in

Component Locator



- (1) Center Front Impact Sensor—Located under the hood at the center of the vehicle
- (2) Passenger Instrument Panel Air Bag—Located at the top right under the instrument panel
- Right Roof Rail Air Bag—Located under the headliner, extending from the passenger front windshield pillar to the passenger rear windshield pillar
- (3)
- Inflatable Restraint Sensing and Diagnostic Module (SDM)—Located underneath the center stack
- (4)
- Passenger Presence System (PPS)—Located on the passenger front seat underneath the seat bottom trim
- (5)
- Passenger Seat Belt Anchor Pretensioner—
- (6) Located on the outboard side of the passengers seat
- (7) Right Front Side Impact Sensor—Located at the B-pillar underneath the door sill
- (8) Inflator Module for Right Roof Rail Air Bag— Located behind headliner at the upper B-pillar
- (9) Passenger Seat Side Air Bag—Located on the seat back of passenger seat
- Passenger Seat Belt Retractor Pretensioner—
- (10) Located under the trim near the bottom of the center pillar on the passenger side of vehicle
- Driver Seat Belt Retractor Pretensioner—
- (11) Located under the trim near the bottom of the center pillar on the driver side of vehicle
- (12) Driver Seat Side Air Bag—Located on the seat back of driver seat
- (13) Inflator Module for Left Roof Rail Air Bag— Located behind headliner at the upper B-pillar
- (14) Left Front Side Impact Sensor—Located at the B-pillar underneath the door sill
- (15) Driver Seat Belt Anchor Pretensioner—Located on the outboard side of the drivers seat
- Left Roof Rail Air Bag—Located under the headliner, extending from the driver front windshield pillar to the driver rear windshield pillar
- (16)
- (17) Driver Steering Wheel Air Bag—Located on the steering wheel
- (18) Vehicle Battery—Located under the hood on the left side

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

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

- Inflatable restraint sensing and diagnostic module (SDM)
- Any air bag
- Driver steering wheel air bag coil
- Any impact sensor
- Seat belt anchor and/or retractor pretensioners

- Passenger presence module and/or occupant sensor

Disabling Procedure – Air Bag Fuse

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

Warning: The SDM may have more than one fused power input. To ensure there is no unwanted SIR deployment, personal injury, or unnecessary SIR system repairs, remove all fuses supplying power to the SDM. With all SDM fuses removed and the ignition switch in the ON position, the AIR BAG warning indicator illuminates. This is normal operation, and does not indicate a SIR system malfunction.

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

Enabling Procedure – Air Bag Fuse

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

Disabling Procedure – Negative Battery Cable

1. Turn the steering wheel so that the vehicles wheels are pointing straight ahead.
2. Place the ignition in the OFF position.
3. Disconnect the negative battery cable from the battery. Refer to [Battery Negative Cable Disconnection and Connection](#) .
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](#) .

SIR Service Precautions

General Service Instructions

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

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

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

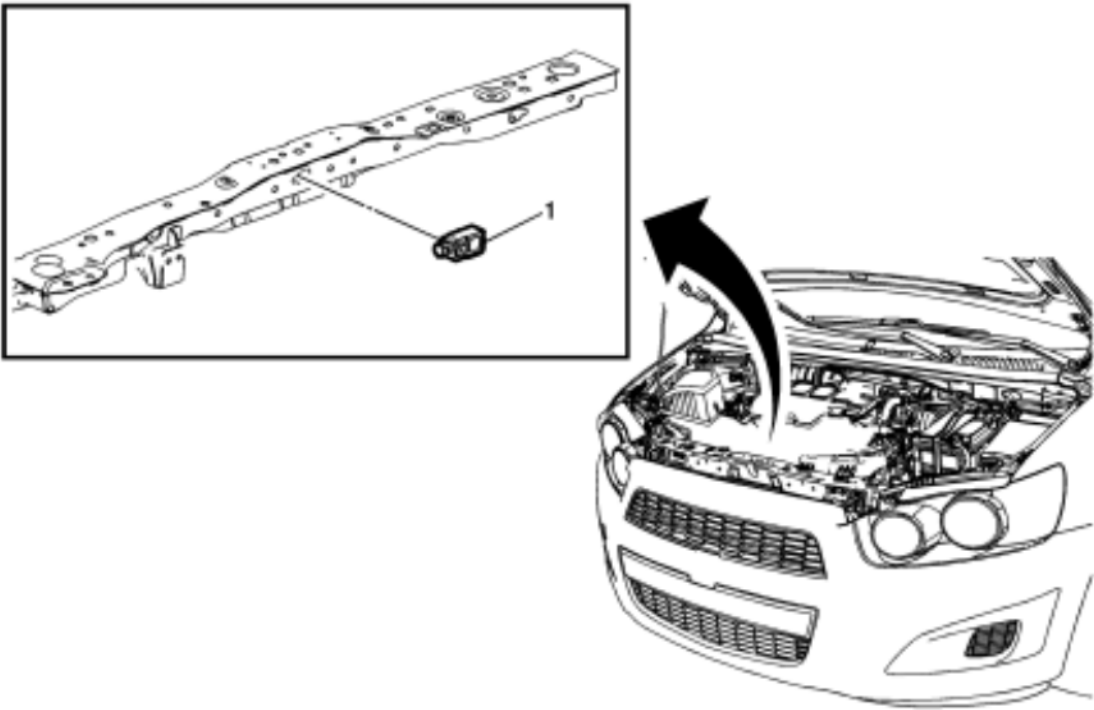
- Do not expose air bags to temperatures above 65°C (149°F)
- Verify the correct replacement part number. Do not substitute a component from a different vehicle
- Use only original GM replacement parts available from your authorized GM dealer. Do not use salvaged parts for repairs to the SIR system

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

- SDM
- Passenger instrument panel air bag
- Driver steering wheel air bag
- Driver steering wheel air bag coil
- Roof rail air bags
- Front and /or side impact sensors
- Seat belt achor and/or retractor pretensioners
- Front seat side air bag

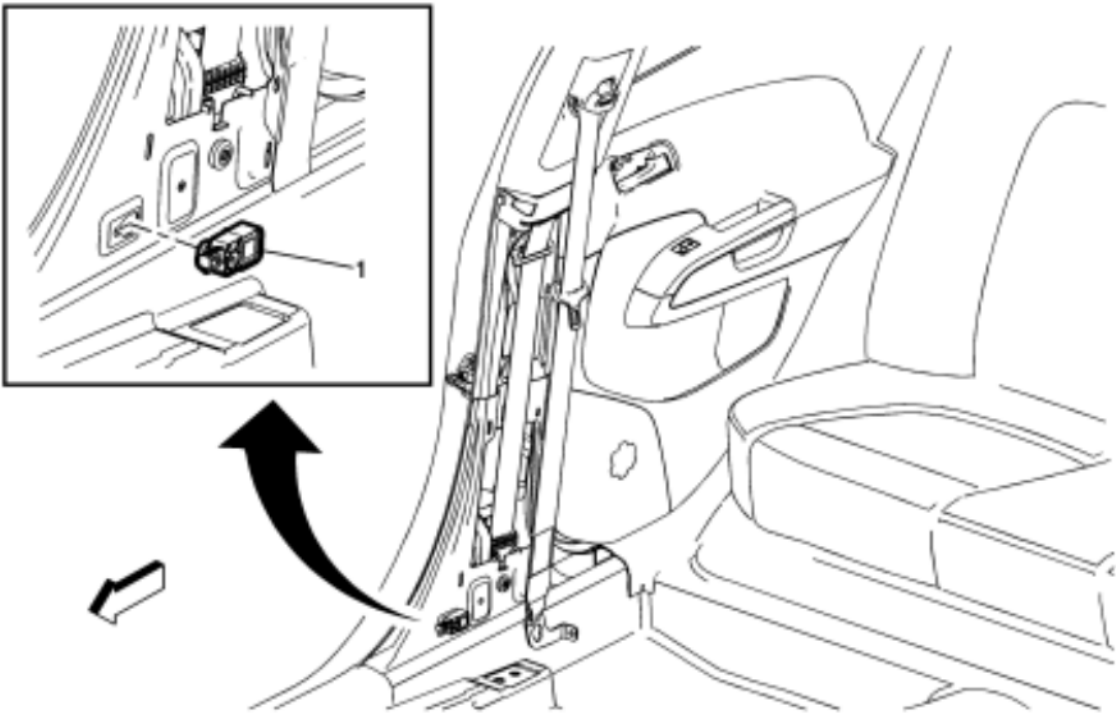
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Front End Inflatable Restraint Discriminating Sensor Replacement



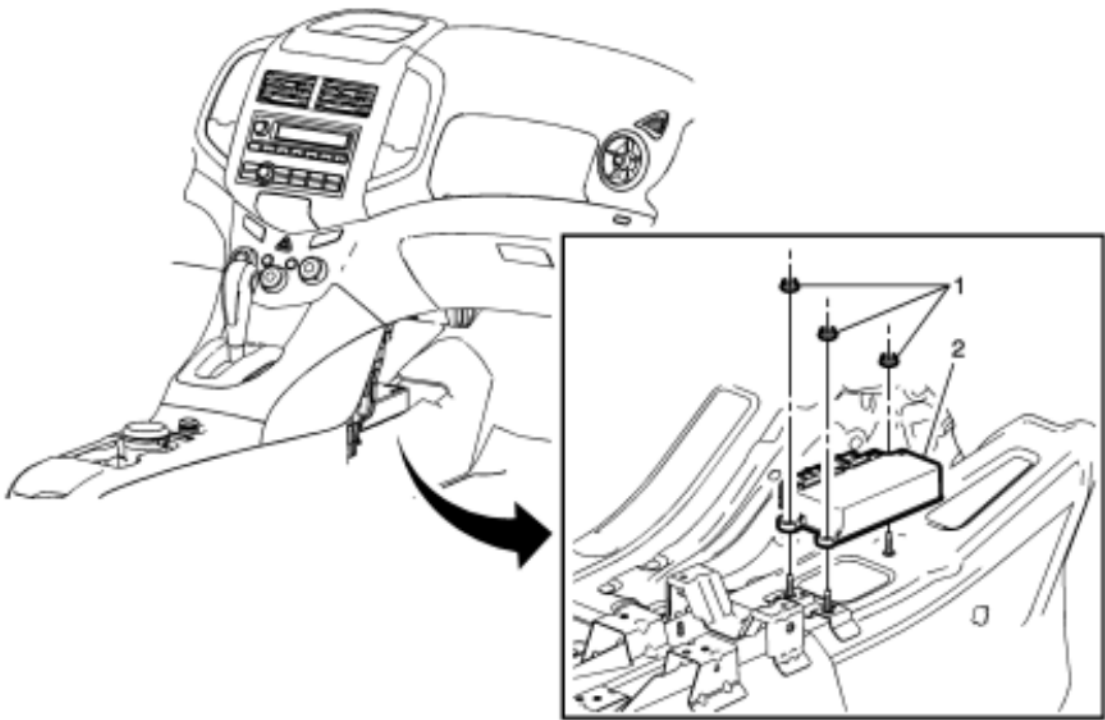
Callout	Component Name
Warning: Refer to SIR Warning . Warning: Refer to SIR Inflator Module Handling and Storage Warning . Warning: Following the deployment of a side impact air bag, inspect the following parts for damage. Replace these parts if necessary: • The seat cushion frame • The seat recliner, if equipped • The seat adjuster • The seat back frame Failure to do so may cause future personal injury. Preliminary Procedures 1. Disable the supplemental inflatable restraint (SIR) system. Refer to SIR Disabling and Enabling . 2. Remove the radiator opening upper cover. Refer to Radiator Opening Upper Cover Replacement .	
1	Inflatable Restraint Front End Discriminating Sensor Assembly Caution: Refer to Fastener Caution . Procedure 1. Disconnect electrical connector. 2. Loosen the bolts and slide the sensor out of the keyhole slots. 3. The bolts are integral to the sensor assembly and DO NOT remove separately. Tighten 7.5 N·m (66 lb in)

Inflatable Restraint Side Impact Sensor Replacement



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

Inflatable Restraint Sensing and Diagnostic Module Replacement



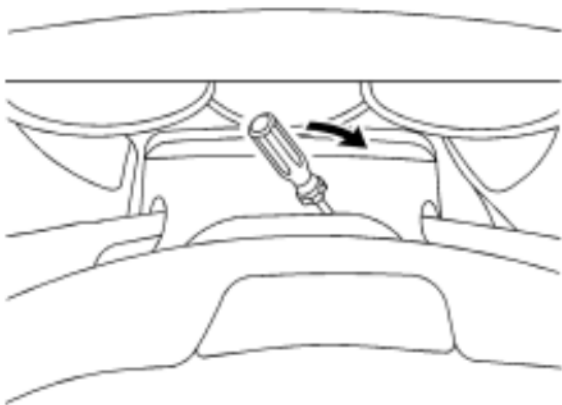
Callout	Component Name
Warning: Refer to SIR Warning . Warning: Do not strike or jolt the inflatable restraint sensing and diagnostic module (SDM). Before applying power to the SDM, make sure that it is securely fastened with the arrow facing toward the front of the vehicle. Failure to observe the correct installation procedure could cause SIR deployment, personal injury, or unnecessary SIR system repairs. Preliminary Procedures 1. Disable the supplemental inflatable restraint (SIR) system. Refer to SIR Disabling and Enabling . 2. Remove the front floor console extension. Refer to Front Floor Console Extension Replacement - Left Side or Front Floor Console Extension Replacement - Right Side . 3. Disconnect the electrical connector.	
1	Inflatable Restraint Sensing and Diagnostic Module Fastener (Qty: 3) Caution: Refer to Fastener Caution . Tighten 10 N·m (89 lbin)
2	Inflatable Restraint Sensing and Diagnostic Module Assembly Tip • When installing, ensure the arrow on the module is pointed towards the front of the vehicle. • If installing a replacement module, program the module. Refer to Control Module References .

Steering Wheel Inflatable Restraint Module Replacement

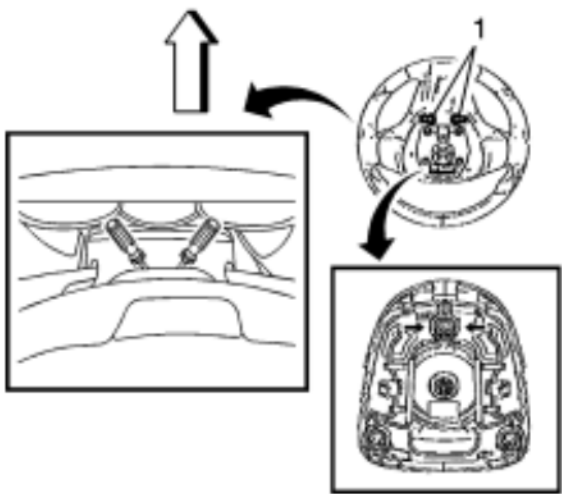
Removal Procedure

Warning: Refer to [SIR Inflator Module Handling and Storage Warning](#) .

Warning: Refer to [SIR Warning](#) .



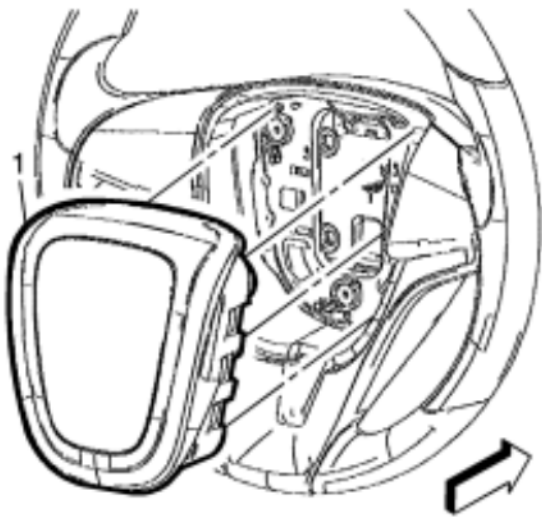
1. Disable the SIR system. Refer to [SIR Disabling and Enabling](#) .
2. Rotate the steering wheel 180 degrees.



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

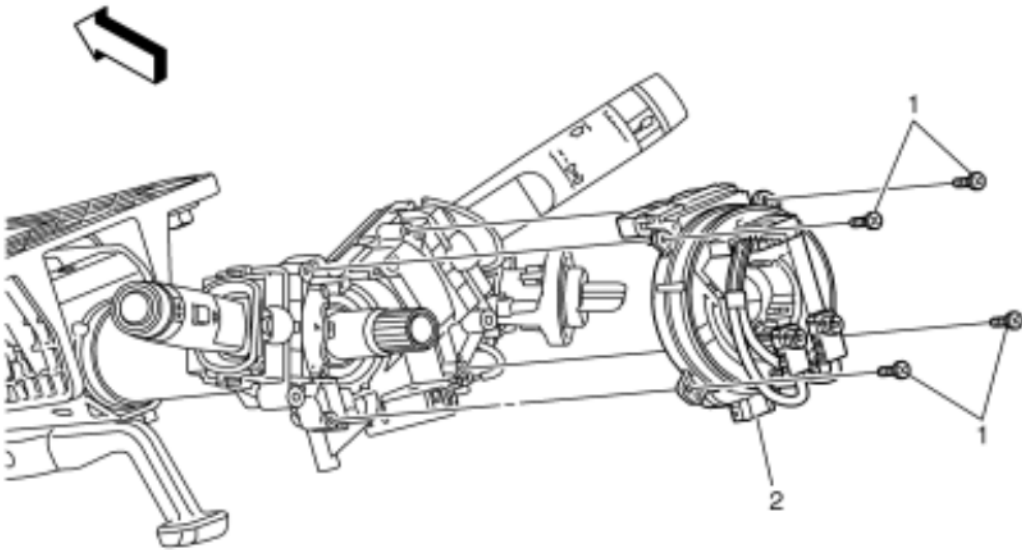
Installation Procedure

1. Connect the electrical connectors.



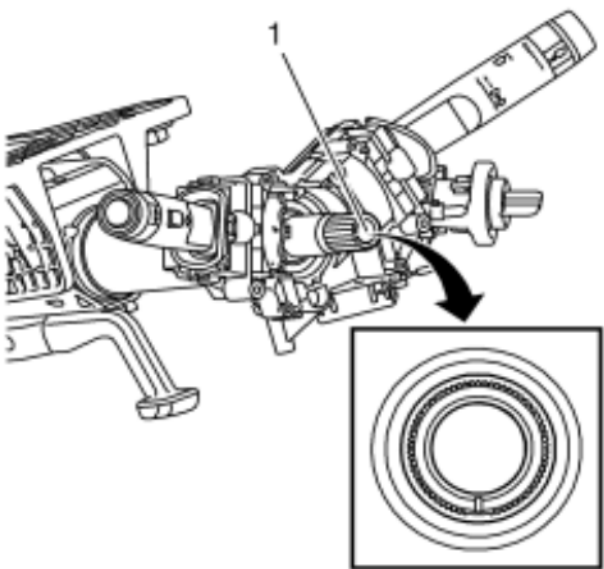
- 2. Align the steering wheel module fasteners to the steering column fastener holes.
- 3. Push the steering wheel module(1) firmly into the steering column in order to engage the fasteners.
- 4. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .
- 5. After replacing the module, fully 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 Airbag Coil Replacement



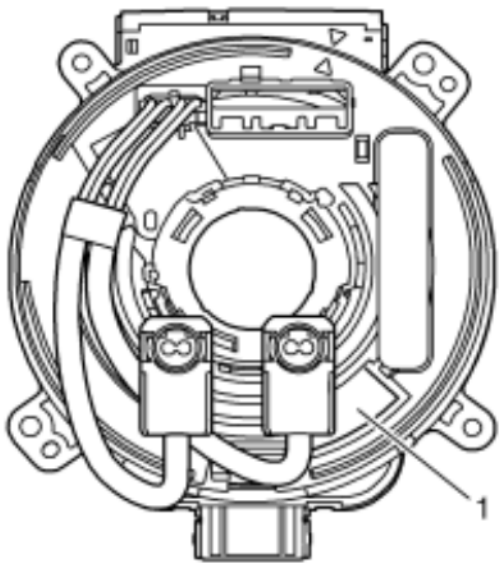
Callout	Component Name
Preliminary Procedures 1. Remove the steering wheel. Refer to Steering Wheel Replacement . 2. Remove the steering column upper trim cover. Refer to Steering Column Upper Trim Cover Replacement . 3. Remove the steering column lower trim cover. Refer to Steering Column Lower Trim Cover Replacement .	
1	Steering Wheel Inflatable Restraint Module Coil Bolt(Qty:4) Caution: Refer to Fastener Caution .
2	Steering Wheel Inflatable Restraint Module Coil Procedure 1. Disconnect any electrical connectors as necessary. 2. Use tape in order to secure the old coil in the center position. 3. Remove the old coil from the steering column. 4. Transfer the steering angle sensor. Refer to Steering Angle Sensor Replacement . 5. Ensure the coil is centered during installation. If you are installing a NEW coil, ensure the centering tab is on the coil. If the coil is not centered, refer to Inflatable Restraint Steering Wheel Module Coil Centering .

Inflatable Restraint Steering Wheel Module Coil Centering



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.

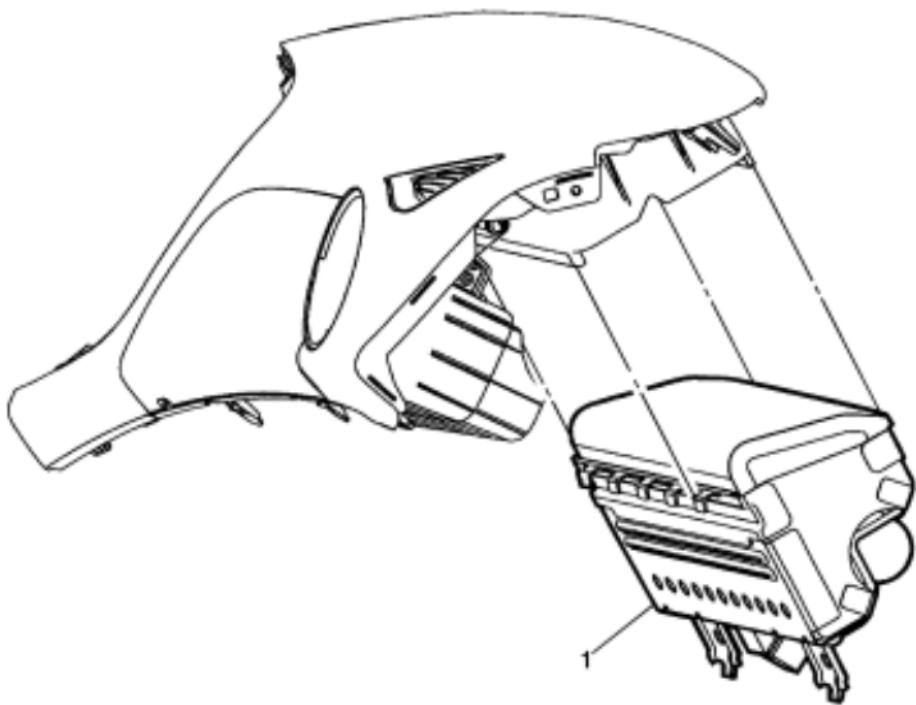
1. Verify the following conditions before centering the supplemental inflatable restraint (SIR) steering wheel module coil:
 - The wheels on the vehicle are straight ahead.
 - The centering mark (1) of the steering shaft is in the 6 o'clock position.
2. Turn the lobe of the coil clockwise until the coil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



Note: The quantity of electrical connectors may vary depending upon the content of the vehicle.

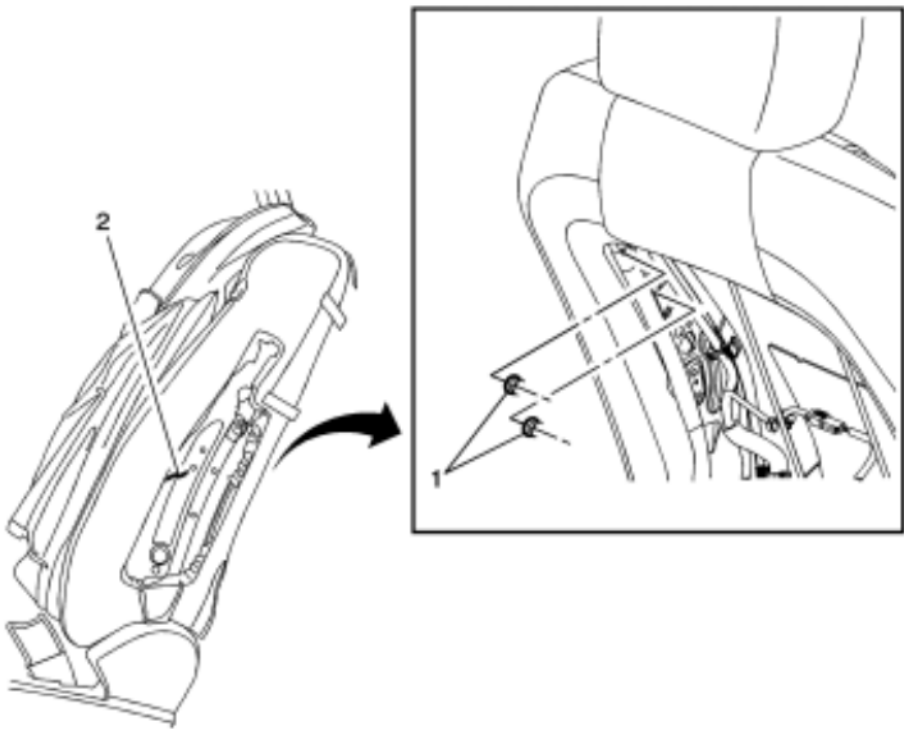
4. Properly align the coil until the centering window turns yellow (1). This indicates the CENTER position of the coil.

Instrument Panel Inflatable Restraint Module Replacement



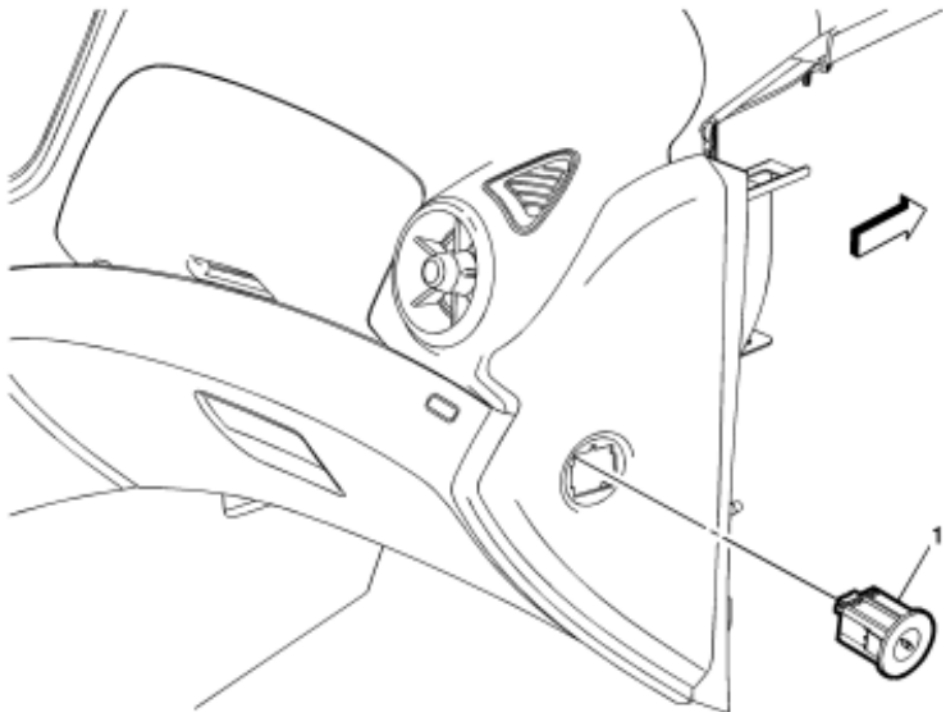
Callout	Component Name
Warning: Refer to SIR Inflator Module Handling and Storage Warning . Warning: Refer to SIR Warning . Preliminary Procedure 1. Disable the SIR system. Refer to SIR Disabling and Enabling . 2. Remove the instrument panel upper trim panel assembly – right side. Refer to Instrument Panel Upper Trim Panel Replacement - Right Side .	
1	Instrument Panel Inflatable Restraint Module Assembly Procedure 1. 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 . 2. Enable the SIR system. Refer to SIR Disabling and Enabling .

Driver or Passenger Seat Side Inflatable Restraint Module Replacement



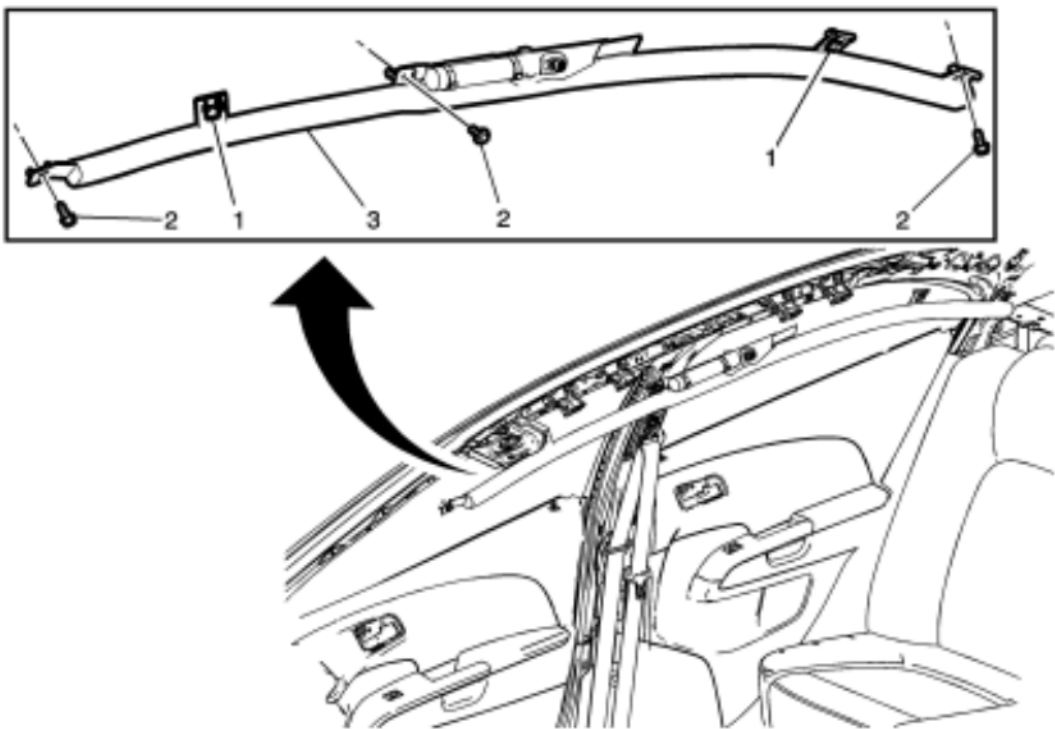
Callout	Component Name
Warning: Following the deployment of a side impact air bag, inspect the following parts for damage. Replace these parts if necessary: • The seat cushion frame • The seat recliner, if equipped • The seat adjuster • The seat back frame Failure to do so may cause future personal injury. 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 driver or passenger seat. Refer to Driver or Passenger Seat Replacement . 3. Remove the driver or passenger seat back cushion cover and pad. Refer to Driver or Passenger Seat Back Cushion Cover and Pad Replacement .	
1	Seat Side Inflatable Restraint Module Nut (Qty: 2) Caution: Refer to Fastener Caution Tighten 4N·m (35lbin)
2	Driver or Passenger Seat Side Inflatable Restraint Module Procedure 1. Disconnect the electrical connector. 2. Remove the seat side inflatable restraint module. 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 Compartment Module Disable Switch Replacement



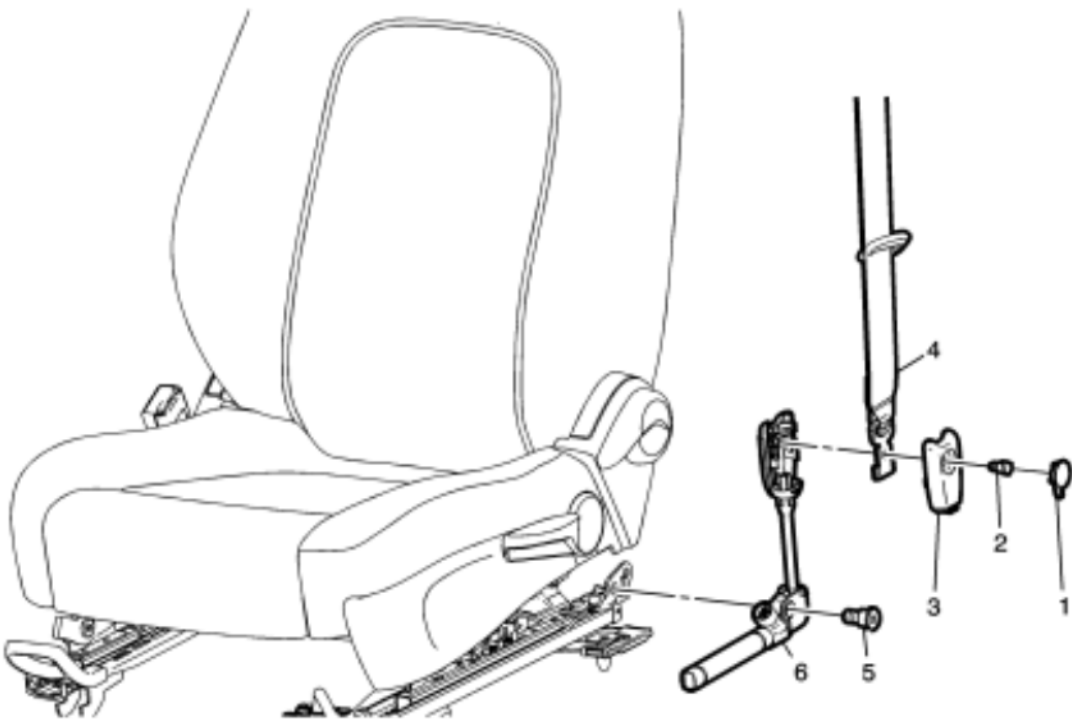
Callout	Component Name
Warning: Refer to SIR Warning . Preliminary Procedure 1. Disable the supplemental inflatable restraint (SIR) system. Refer to SIR Disabling and Enabling . 2. Remove the instrument panel outer trim cover. Refer to Instrument Panel Outer Trim Cover Replacement .	
1	Inflatable Restraint Instrument Panel Module Disable Switch Assembly Procedure 1. Use a small flat bladed tool to aid in the removal of the switch from the instrument panel side trim panel. 2. Disconnect the electrical connector.

Roof Side Rail Inflatable Restraint Module Replacement (AYC)



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 360degrees. Securing the roof rail airbag with an airbag twisted or turned 360degrees 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. It is only necessary to lower the headliner. Only do those steps in headliner replacement that will lower the headliner enough to gain access to the part. Refer to Headlining Trim Panel Replacement	
1	Roof Side Rail Inflatable Restraint Module Retainer(Qty: 2)
2	Roof Side Rail Inflatable Restraint Module Fastener(Qty: 3) Caution: Refer to Fastener Caution . Tighten 9.5N·m (84lbin)
3	Roof Side Rail Inflatable Restraint Module Assembly Procedure 1. Disconnect the electrical connector. 2. Remove the roof side rail inflatable restraint module from the vehicle. 3. 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 .

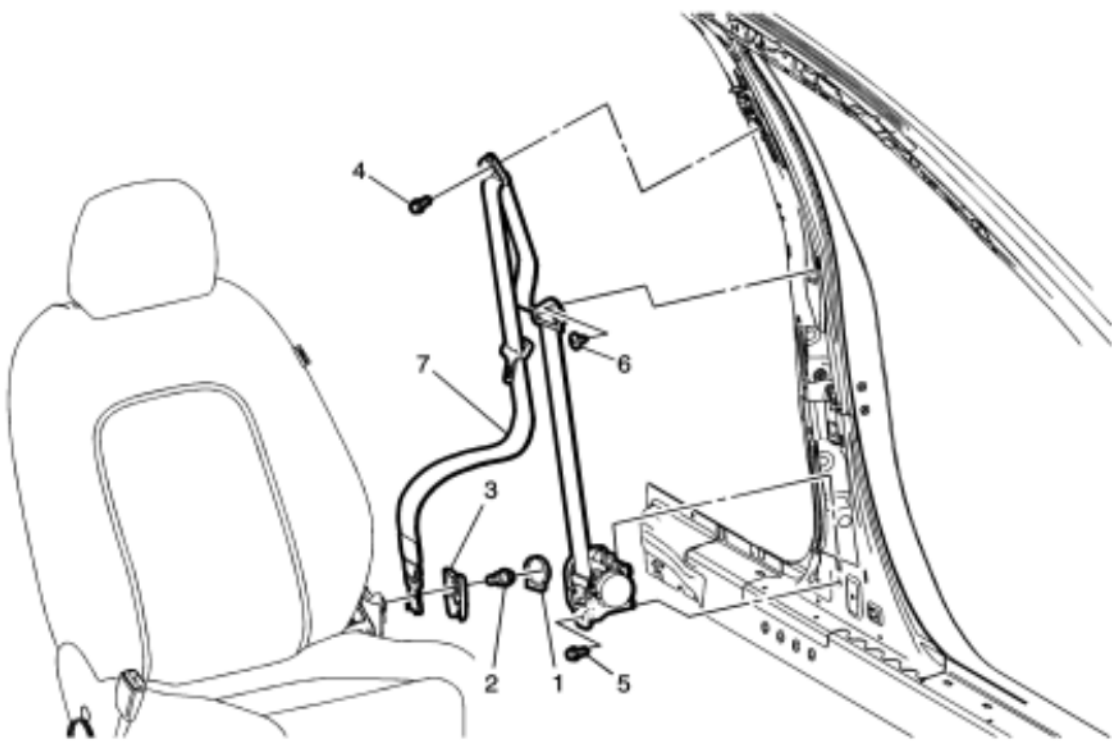
Front Seat Belt Anchor Plate Tensioner Replacement



Callout	Component Name
Warning: Refer to SIR Warning . Warning: In order to prevent accidental deployment and the risk of personal injury, do not dispose of an undeployed inflatable restraint seat belt pretensioner as normal shop waste. Undeployed seat belt pretensioners contain substances that could cause severe illness or personal injury if their sealed containers are damaged during disposal. Use the following deployment procedures to safely dispose of an undeployed seat belt pretensioner. Failure to observe the following disposal methods may be a violation of federal, state, or local laws. Preliminary Procedures 1. Move the front seat to the full forward and full up position. 2. Disable the SIR. Refer to SIR Disabling and Enabling . 3. Remove the driver or passenger seat belt tensioner cover. Refer to Front Seat Belt Anchor Plate Tensioner Cover Replacement . 4. For pretensioner handling and scrapping. Refer to Pretensioner Handling and Scrapping .	
1	Driver or Passenger Seat Belt Tensioner Cover
2	Driver or Passenger Seat Belt Tensioner Cover Fastener Caution: Refer to Fastener Caution Tighten 7.5 N·m (66 lbin)
3	Driver or Passenger Seat Belt Tensioner Cover
4	Driver or Passenger Seat Belt Tensioner Seat Belt Latch

	Procedure Remove the seat belt with latch from front seat belt tensioner.
5	Driver or Passenger Seat Belt Tensioner Fastener Tighten 45 N·m (33 lb ft)
6	Driver or Passenger Seat Belt Tensioner Assembly Procedure Disconnect the electrical connector.

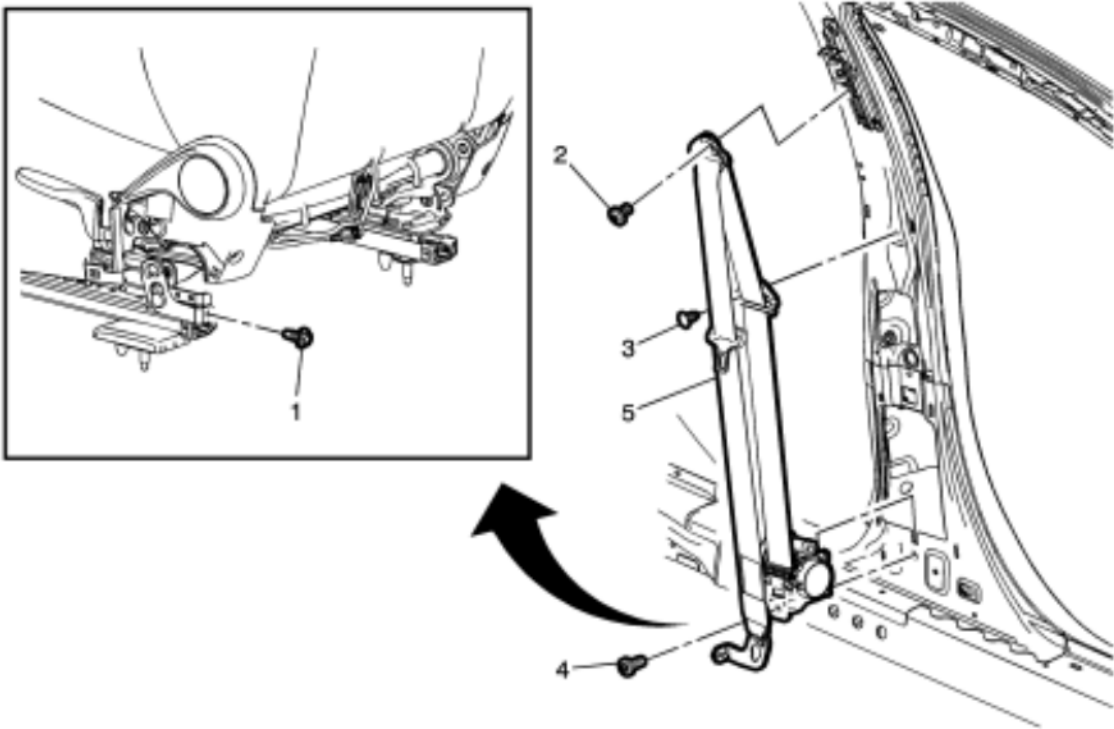
Driver or Passenger Seat Shoulder Belt Replacement (with A69)



Callout	Component Name
Warning: Refer to SIR Warning . Warning: Refer to SIR Inflator Module Handling and Storage Warning . Warning: Refer to SIR Seatbelt Pretensioner Handling Warning . Warning: In order to prevent accidental deployment and the risk of personal injury, do not dispose of an undeployed inflatable restraint seat belt pretensioner as normal shop waste. Undeployed seat belt pretensioners contain substances that could cause severe illness or personal injury if their sealed containers are damaged during disposal. Use the following deployment procedures to safely dispose of an undeployed seat belt pretensioner. Failure to observe the following disposal methods may be a violation of federal, state, or local laws. Preliminary Procedures 1. Move the front seat to a full forward and full up position. 2. Disable the SIR. Refer to SIR Disabling and Enabling . 3. Remove the center pillar upper trim panel. Refer to Center Pillar Upper Trim Panel Replacement .	
1	Driver or Passenger Seat Belt Tensioner Cover
2	Driver or Passenger Seat Belt Tensioner Cover Fastener Caution: Refer to Fastener Caution . Tighten 7.5N·m (66lbin)
3	Driver or Passenger Seat Belt Tensioner Cover
4	Driver or Passenger Seat Shoulder Belt Fastener Tighten 45N·m (33lbft)

5	Driver or Passenger Shoulder Belt Retractor Fastener Tighten 45N·m (33lbft)
6	Driver or Passenger Seat Belt Push On Retainer Procedure Use a flat-bladed tool to remove locking pin in retainer.
7	Driver or Passenger Seat Shoulder Belt Retractor Assembly Procedure 1. Disconnect the electrical connector. 2. Full deploy the module before disposal. If the module was replaced under warranty, full deploy and dispose of the module after the required retention period. Refer to Pretensioner Handling and Scrapping .

Driver or Passenger Seat Shoulder Belt Replacement (without A69)



Callout	Component Name
Warning: Refer to SIR Warning . Warning: Refer to SIR Seatbelt Pretensioner Handling Warning . Warning: In order to prevent accidental deployment and the risk of personal injury, do not dispose of an undeployed inflatable restraint seat belt pretensioner as normal shop waste. Undeployed seat belt pretensioners contain substances that could cause severe illness or personal injury if their sealed containers are damaged during disposal. Use the following deployment procedures to safely dispose of an undeployed seat belt pretensioner. Failure to observe the following disposal methods may be a violation of federal, state, or local laws. Preliminary Procedures 1. Remove the center pillar upper trim panel. Refer to Center Pillar Upper Trim Panel Replacement . 2. Remove the front seat lower finish cover. Refer to Front Seat Belt Anchor Plate Tensioner Cover Replacement .	
1	Front Seat Belt Anchor Plate Fastener Caution: Refer to Fastener Caution . Tighten 8N·m (70lbin)
2	Front Seat Belt Retractor D Ring Fastener Tighten 45N·m (33lbft)
3	Front Seat Shoulder Belt Guide Retainer
4	Front Seat Shoulder Belt Retractor Fastener Tighten 45N·m (33lbft)
5	Front Seat 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.
- The instrument panel mounting points and brackets—Inspect for bending, twisting, buckling, or any other type of damage.
- The seats and seat mounting points—Inspect for bending, twisting, buckling, or any other type of damage.
- The roof and headliner mounting points.
- The brake pedal --Inspect the brake pedal for bending, twisting, buckling or any type of damage.

Accident With Frontal Air Bag Deployment – Component Replacement and Inspections

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

- Driver steering wheel air bag
- Passenger instrument panel air bag, if deployed
- Inflatable restraint sensing and diagnostic module (SDM), if SDM has DTCB0052 56
- Front and/or side impact sensors
- Driver/Passenger seat side air bag, if deployed
- Seat back cover if side seat air bag is deployed
- Driver/Passenger seat belt anchor and/or retractor pretensioners

Perform additional inspections on the following components.

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

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

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

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

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

Perform additional inspections on the following components.

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

Impact Sensor Replacement Guidelines

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

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

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

Inflatable Restraint Module Handling and Scrapping

Air Bag Module Deployment – Inside of Vehicle

Warning: When deploying an airbag inside the vehicle, make sure the vehicle doors are closed and the side windows are fully open. Wear safety glasses throughout the entire procedure. Make sure the deployment area in the vehicle is clear of people, or loose objects. Failure to follow these guidelines could result in personal injury or vehicle damage.

Deploy the air bags before disposing them. If a vehicle is to be scrapped, the air bag may be deployed inside the vehicle.

Warning: When you are deploying an inflator module for disposal, perform the deployment procedures in the order listed. Failure to follow the procedures in the order listed may result in personal injury.

- Before deploying the air bags, remove all loose objects from the air bags expansion area.
- Deploy the air bags with the vehicles doors closed and the side windows open.
- Deploy the air bags only in an evacuated area. Service personnel who must be present during the deployment should be at least 10m (33ft) in front of the vehicle.
- Do not connect the voltage source until after having completed all other preparations for the deployment of air bags.
- Allow a deployed air bag module or pretensioner cool for 30minutes before handling.
- Wear gloves and eye protection during the disposal procedure.
- If the deployment fails, disconnect the voltage source and wait 5 minutes before approaching the vehicle.

Deployment Procedure

Warning: Refer to [Sensing and Diagnostic Module Voltage after Ignition is Turned Off Warning](#) .

Warning: Refer to [Battery Disconnect Warning](#) .

1. Disconnect both battery cables and place the battery at least 10m (33ft) from the vehicle.
2. Remove the driver side knee bolster or instrument panel lower cover from the steering column.
3. At the lower steering column, cut the 2wires leading from the supplemental inflatable restraints(SIR) harness to the steering wheel module coil.
4. Strip 13mm (0.5in) of the insulation from the end of the wires leading to the steering wheel module coil.
5. Use 2additional wires, each at least 10m (33ft) long, to reach from the deployment battery to the inflator module.
6. Strip 13mm (0.5in) of the insulation from the end of these 2additional wires.
7. Twist the 2wires together at oneend.
8. Place the twisted ends of the 2wires near the deployment battery. Do not connect the wires to the battery at this time.
9. Using the free ends of the 10m (33ft) wires leading to the steering wheel module coil, make 2splices, oneat each wire from the air bag modules.
10. Wrap the wires with insulation tape.
11. Now that the free ends of the 10m (33ft) wires are spliced to the air bag module wires, and the ends that are twisted together are near the deployment battery, clear the area.
12. Untwist the wires that near the deployment battery.
13. Touch onewire to the positive battery terminal and touch the other wire to the negative battery terminal. The air bag will deploy.
14. Repeat this procedure for the passenger air bag, side air bags, and pretensioners.
15. Using proper precautions, dispose of the deployed air bags/pretensioners. Refer to Deployed Air Bag Module Disposal Procedure.

Air Bag Module Deployment – Outside of Vehicle

If the vehicle is within the warranty period, contact the General Motors regional service manager for approval or special instructions before deploying the air bag modules.

Deploy air bag modules in following situations:

- The vehicle is to be scrapped—Refer to [Inflatable Restraint Module Handling and Scrapping](#) .
- If an air bag module is damaged during transit, storage, or service

Warning: When you are deploying an inflator module for disposal, perform the deployment procedures in the order listed. Failure to follow the procedures in the order listed may result in personal injury.

- Deploy the air bags only in an evacuated area. Service personnel who must be present during the deployment should be at least 10m (33ft) in front of the vehicle.
 - Do not connect the voltage source until after having completed all other preparations for the deployment of air bags.
 - Allow a deployed air bag module or pretensioner cool for 30minutes before handling.
 - Wear gloves and eye protection during the disposal procedure.
 - If the deployment fails, disconnect the voltage source and wait 5 minutes before approaching the vehicle.
1. Position the air bag module face up, on flat ground outdoors, at least 10m (33ft) from any obstacles or people.
 2. Place a vehicle battery at least 10m (33ft) away from the air bag module.

3. Deploy the air bag module.
4. Perform the Air Bag Module Deployment procedure as follows.
5. Cut the yellow wires to the air bag module/pretensioner.
6. Strip 13 mm (0.5 in) of the insulation from the end of the wires leading to the air bag module/pretensioner.
7. Use 2 additional wires, each at least 10 m (33 ft) long, to reach from the deployment battery to the air bag module/pretensioner.
8. Strip 13 mm (0.5 in) of the insulation from the ends of these 2 additional wires.
9. Twist the 2 wires together at one end.
10. Place the twisted ends of the 2 wires near the deployment battery. Do not connect the wires to the battery at this time.
11. Using the free ends of the 10 m (33 ft) wires leading to the air bag module/pretensioner, make 2 splices, one at each wire from the air bag module/pretensioner.
12. Wrap the splices with insulating tape.
13. Now that the free ends of the 10 m (33 ft) wires are spliced to the air bag module/pretensioner wires, and the ends that are twisted together are near the deployment battery, clear the area.
14. Untwist the wires that are near the deployment battery.
15. Touch one wire to the positive battery terminal and touch the other wire to the negative battery terminal. The air bag will deploy.
16. Using proper precautions, dispose of the deployed air bags/pretensioners. Refer to the Deployed Air Bag Module Disposal Procedure.

Deployed Air Bag Module Disposal Procedure

Warning: Safety precautions must be followed when handling a deployed inflator module (air bag). After deployment, the inflator module (air bag) surface may contain a small amount of sodium hydroxide, a by-product of the deployment reaction, that is irritating to the skin and eyes. Most of the powder on the inflator module (air bag) is harmless. as a precaution, wear gloves and safety glasses when handling a deployed inflator module (air bag), and wash your hands with mild soap and water afterwards.

Warning: Approved safety glasses and gloves should be worn when performing this procedure to reduce the chance of personal injury.

Warning: Immediately following the deployment of an air bag, the metal surfaces of the inflator module are very hot. Do not place the deployed inflator module near any flammable objects. Wait for about ten minutes before touching any metal surface of the inflator module. Disregarding these precautions may cause fire or personal injury.

Deploy an air bag or pretensioner before disposing of it.

This includes those in a whole vehicle being scrapped. If the vehicle is still within the warranty period contact the General Motors regional service manager for approval or special instructions before deploying an air bag module or a pretensioner. Deployed air bag module or pretensioner should be disposed of in the same manner as other scrap parts, with the addition of the following steps:

1. Place the deployed air bag or pretensioner in a sturdy plastic bag.
2. Seal the plastic bag securely.
3. Wash your hands and rinse them with water after handling a deployed air bag.

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

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

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

Deployment Inside the Vehicle

Refer to [Inflatable Restraint Module Handling and Scrapping](#) for deploying the pretensioner inside vehicle under Vehicle Scrapping Procedure.

Deployment Outside Vehicle for Seat Belt Pretensioners

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

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

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

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

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

Special Tools

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



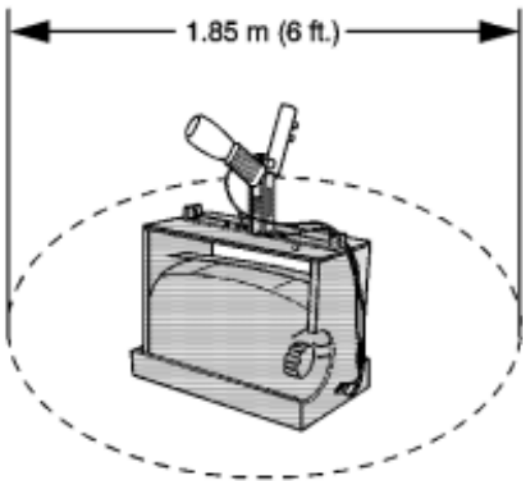
1. Turn the ignition switch to the OFF position.

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.

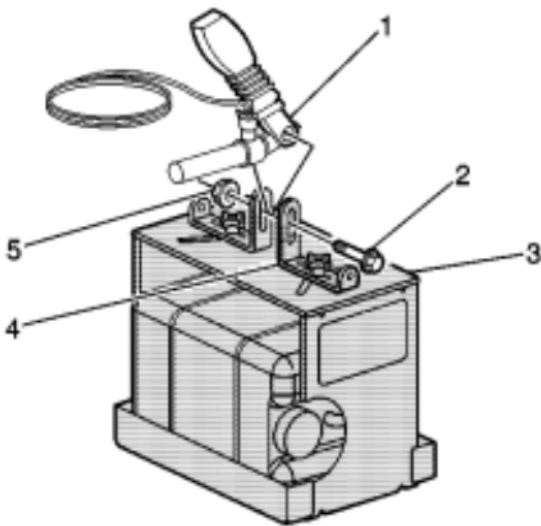


6. Clear a space on the ground about 1.85M (6ft) in diameter for deployment of the pretensioner. If possible, use a paved, outdoor location free of activity. Otherwise, use a space free of activity on the shop floor. Make sure you have sufficient ventilation.

7. Make sure no loose or flammable objects are in the area.

8. Place the *EL-39401-B* SIR deployment fixture in the center of the cleared area.

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



10. Mount the pretensioner(1) in the SIR deployment fixture(3) with the open end facing up using the following mounting method.

10.1 Adjust and secure the EL-39401-B arms(4) to the deployment fixture(3).

10.2 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).

10.3 Securely tighten all fasteners prior to deployment.

✖

Object Number: 68645

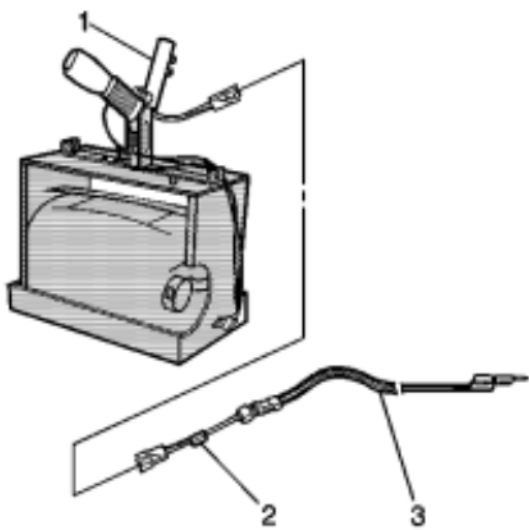
11. Inspect the *EL-38826* SIR deployment harness and the appropriate pigtail adapter for damage. Replace as needed.

12. Short the 2 SIR deployment harness(1) leads together using one banana plug seated into the other.

13. Connect the appropriate pigtail adapter(2) to the SIR deployment harness(1).



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



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

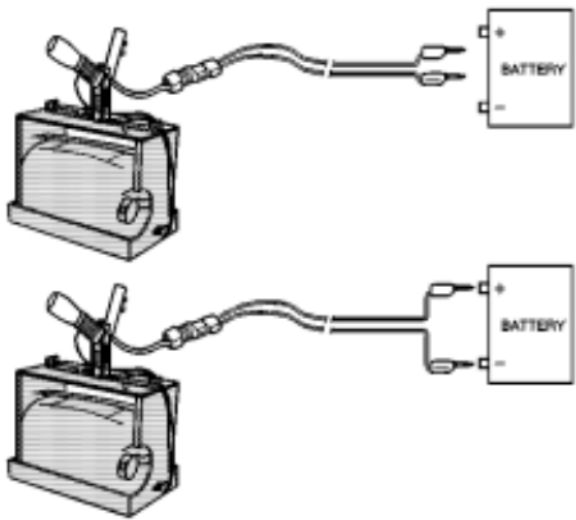
Note: The rapid gas expansion involved with deploying a pretensioner is very loud. Notify all the people in the immediate area that you intend to deploy the seat belt pretensioner.

16. Clear the area of people.



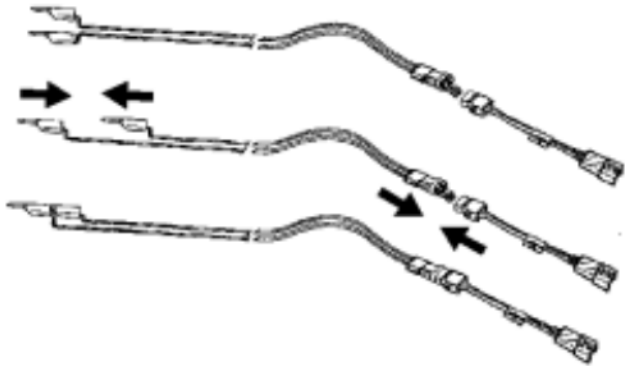
Warning: When you are deploying a pretensioner for disposal, perform the deployment procedures in the order listed. Failure to follow the procedures in the order listed may result in personal injury.

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



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 12V minimum/2A 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.



- 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.

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), air bags, seat belt pretensioners (anchor and retractor), and impact sensors. The SDM determines the severity of a collision with 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 air bag deployment, the SDM may still deploy the seat belt pretensioners. The SDM contains a sensing device that converts vehicle velocity changes to an electrical signal. The SDM compares these signals to values stored in memory. If the signals exceed a stored value, the SDM will determine the severity of the impact and either cause current to flow through the frontal deployment loops deploying the frontal air bags and pretensioners, or it will deploy the pretensioners only. The SDM continuously monitors the deployment loops for malfunctions and illuminates the 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 (Driver)

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 23V loop reserve for deployment of the air bags. It is important when disabling the SIR system for servicing or rescue operations to allow the 23V loop reserve to dissipate, which could take up to 1 minute.

Air Bags

This vehicle contains 6 air bags. The 6 air bags are located in the steering wheel, instrument panel (passenger side), driver side (B-pillar), passenger side (B-pillar), left roof rail, and right roof rail. To view the locations of the air bags refer to [SIR Identification Views](#) . Air bags contain a housing, inflatable air bag, two initiating devices (if dual 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 air bags have two stages of deployment, which varies the amount of restraint to the occupant according to the collision severity. The current passing through the air bag, ignites the material in the canister producing a rapid generation of gas and is some cases, the release of compressed gas. The gas produced from this reaction rapidly inflates the air bag. Once the air bag is inflated it quickly deflates through the air bag vent holes and/or the bag fabric. Each air bag is equipped with a shorting bar located in the connectors of the module. The shorting bar shorts the air bag deployment loop circuitry to prevent unwanted deployment of the air bag when it is disconnected.

Seat Belt Pretensioners (Anchor and Retractor)

The seat belt pretensioners (driver and passenger) consist of a housing, seat belt retractor (located in the B-pillar), seat belt anchor (located on the floor), seat belt webbing, an initiator, and a canister of gas generating materials. To view the locations of the seat belt pretensioners refer to [SIR Identification Views](#) . The initiator is part of the seat belt pretensioner deployment loop. When the vehicle is involved in a collision of sufficient force, the SDM causes current to flow through the seat belt deployment loops to the initiator. Current passing through the initiator ignites the material in the canister producing a rapid generation of gas. The gas produced from this reaction deploys the seat belt pretensioners which removes all of the slack in the seat belts. Depending on the severity of the collision, the seat belt pretensioners may deploy without the frontal air bags deploying, or they will deploy immediately before the frontal air bags deploy. 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 3 impact sensors. The 3 impact sensors are located in the front of the vehicle 1 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 sensors are not part of the deployment loop, but instead provide input to the SDM. The SDM contains a microprocessor that performs calculations using the measured accelerations and compares these calculations to a value stored in memory. When the generated calculations exceed the stored value, the SDM will cause current to flow through the deployment loops deploying the appropriate impact module air bags.

Passenger Air Bag Disable Switch

The passenger air bag disable switch is used to turn the passenger frontal air bag on or off. The customer can decide to disable the passenger air bag by turning this switch on. When the SDM sees a ground circuit from this switch the passenger air bag is turned



off. The vehicle has a PASSENGER AIR BAG ON/OFF indicator to tell the customer when the passenger air bag is on or off based on the disable switch position.

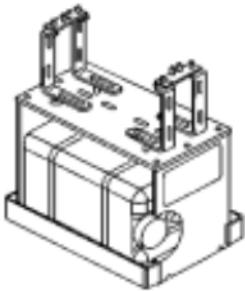
Seat Belt Indicators

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](#) .

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Special Tools

Illustration	Tool Number/ Description
	EL 38826 J38826 KM799-3 SIR Deployment Harness
	EL39401-B J39401-B SIR Deployment Fixture