

2013 RESTRAINTS

Seat Belts - Malibu

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Front Seat Belt Buckle Fastener	40 N.m	30 lb ft
Rear Seat Belt Buckle Fastener	45 N.m	33 lb ft
Rear Seat Retractor Anchor Bracket Fastener	45 N.m	33 lb ft
Rear Seat Belt Retractor Fastener	45 N.m	33 lb ft
Rear Seat Center Retractor Side Belt Fastener	45 N.m	33 lb ft

SCHEMATIC WIRING DIAGRAMS

SEAT BELT WIRING SCHEMATICS

Seat Belts Wiring Schematics

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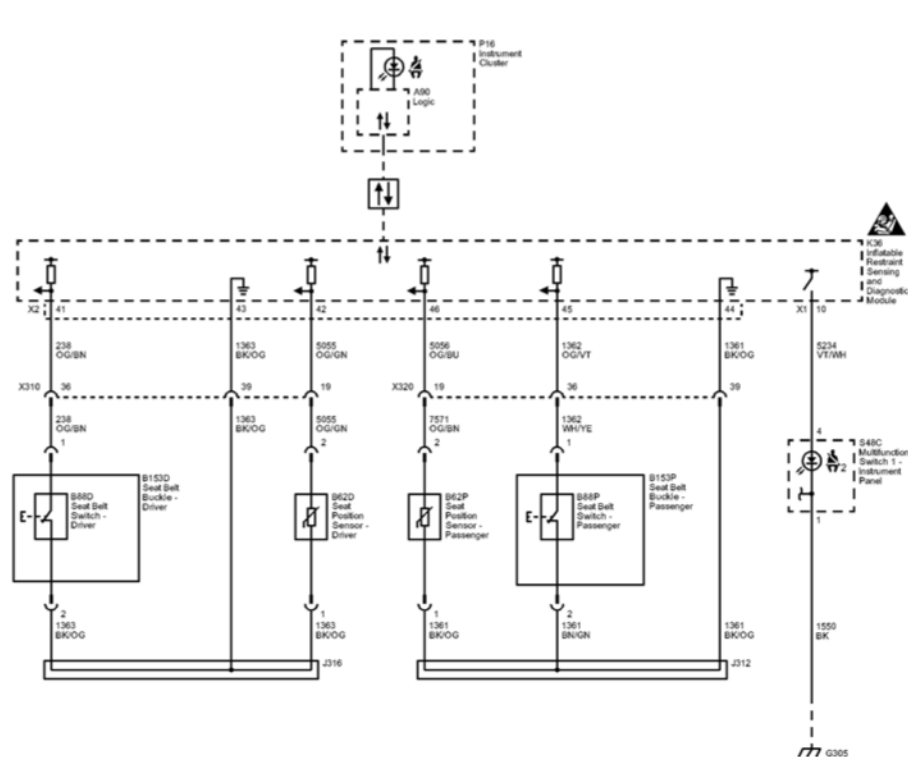


Fig. 1: Seat Belts Wiring Schematics
Courtesy of GENERAL MOTORS COMPANY

DIAGNOSTIC INFORMATION AND PROCEDURES

SEAT BELT SYSTEM OPERATIONAL AND FUNCTIONAL CHECKS

NOTE: If the vehicle has been in a collision, refer to Repairs and Inspections Required After a Collision for additional information.

Perform the following inspection from the driver seat:

1. Turn the ignition switch to the ON position. Verify proper operation of the seat belt reminder lamp with the belt buckled and with the belt unbuckled.
2. Inspect the shoulder belt guide in order to ensure that the following conditions are met:
 - The shoulder belt guide swivels freely.
 - The seat belt webbing is seated flat in the guide slot.
 - The seat belt webbing does not bind.
3. Verify that the seat belt buckle faces inboard and is accessible.
4. Verify that the seat belt retractor units are securely attached.
5. Verify that the seat belt anchor bolts are secure.

6. Fully extend the seat belt webbing. Verify that the seat belt webbing does not have any twists or tears.
7. Allow the seat belt webbing to retract. Verify that the seat belt webbing returns freely and completely back into the retractor. If the seat belt webbing will not retract, refer to **Seat Belt Does Not Retract**.
8. Snap the seat belt latch plate into the buckle.
9. Sharply tug on the seat belt latch plate and the buckle. Verify that the seat belt latch plate and the buckle remain locked when tugged.
10. Push the button on the buckle:
 - Verify that the seat belt latch plate releases easily from the buckle.
 - Verify that the button returns to its original position.

Perform the following inspection procedure from the passenger seat.

1. Verify the automatic locking retractor (ALR) feature operates properly by performing the following checks:
 1. Pull the seat belt all the way out of the retractor until it stops.
 2. Slowly allow the belt to retract partially, while listening for a ratcheting sound.
 3. Sharply tug on the belt ensuring that the retractor lock sets and does not allow the belt to be pulled from the retractor.
 4. After performing steps 1.1 through 1.3 ensure the belt fully retracts.
2. Repeat the inspection procedure steps 2 through 10 from the passengers seat.

Perform the following steps in order to inspect the left and right rear seat belts:

1. Inspect the shoulder belt guide in order to ensure that the following conditions are met:
 - The seat belt webbing is seated flat in the guide slot.
 - The seat belt webbing does not bind.
2. Verify that the seat belt buckle is accessible.
3. Verify that the seat belt retractor units are securely attached.
4. Verify that the seat belt anchor bolts are secure.
5. Fully extend the seat belt webbing. Verify that the seat belt webbing does not have any twists or tears.
6. Allow the seat belt webbing to retract. Verify that the seat belt webbing returns freely and completely back into the retractor.
7. Snap the seat belt latch plate into the buckle.
8. Sharply tug on the seat belt latch plate and the buckle. Verify that the seat belt latch plate and the buckle remain locked when tugged.
9. Push the button on the buckle:
 - Verify that the seat belt latch plate releases easily from the buckle.
 - Verify that the button returns to its original position.

Emergency Locking Retractors

WARNING: Perform this test in an area clear of other vehicles or obstructions. Do not conduct this test on the open road. A large, empty parking lot is suitable. Failure to observe this precaution may result in damage to the vehicle and possible personal injury.

1. Fasten the seat belts, an assistant is needed when the retractor under test is not part of the driver seat belt.
2. Accelerate the vehicle slowly to 16 km/h (10 mph) and apply the brakes firmly.
3. Verify that the seat belt locks when braking firmly.

NOTE: When performing this check, note the position that the retractors are mounted. Some retractors are not mounted at a zero degree inclination.

4. If the belt does not lock, proceed with the following steps:
 1. Remove the seat belt retractor assembly.
 2. Tilt the seat belt retractor slowly.

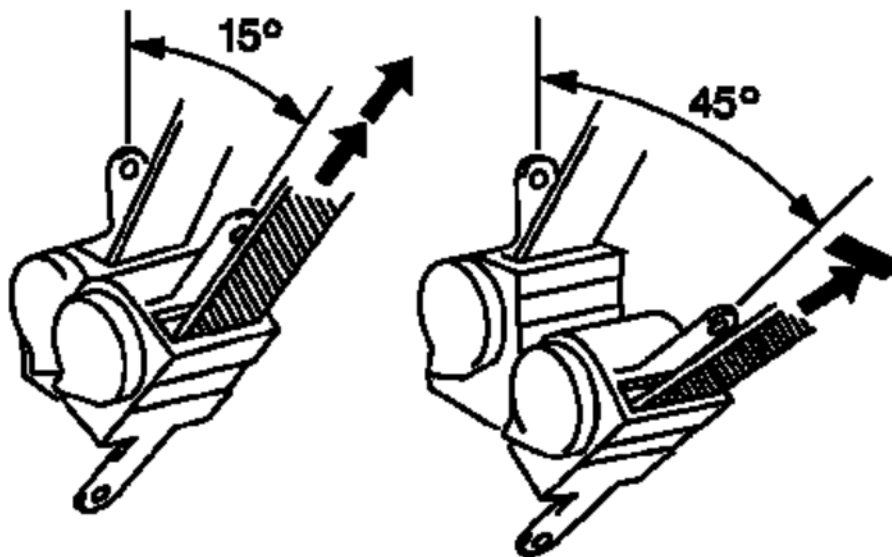


Fig. 2: Checking Seat Belt Retractor Inclination
Courtesy of GENERAL MOTORS COMPANY

3. Ensure that the seat belt webbing can be pulled from the retractor at an inclination of 15 degrees forward or less, from the retractors mounted position.
4. Ensure the retractor cannot be pulled from the retractor at an inclination of 45 degrees forward or more.
5. If a seat belt retractor does not operate as described, replace the retractor assembly.

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>DTC B0072 or B0073</u>	DTC B0072 Driver Seat Belt Switch Circuit DTC B0073 Passenger Seat Belt Switch Circuit
<u>DTC B059A</u>	DTC B059A 01 Passenger Seat Belt Indicator Circuit Short to Battery DTC B059A 02 Passenger Seat Belt Indicator Circuit Short to Ground DTC B059A 04 Passenger Seat Belt Indicator Circuit Open

DTC B0072 OR B0073

Diagnostic Instructions

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

DTC Descriptors

DTC B0072

Driver Seat Belt Switch Circuit

DTC B0073

Passenger Seat Belt Switch Circuit

For symptom byte information refer to **Symptom Byte List** .

Diagnostic Fault Information

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Driver Seat Belt Switch Signal	B0072 02, B0072 0B	B0072 04, B0072 06, B0072 0C	B0072 04, B0072 06	B0072 01, B0072 05	B0072 08

Passenger Seat Belt Switch Signal	B0073 02, B0073 0B	B0073 04, B0073 06, B0073 0C	B0073 04, B0073 06	B0073 01, B0073 05	B0073 08
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Circuit/System Description

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

Conditions for Running the DTC

Ignition voltage is between 9-16 V.

Conditions for Setting the DTC

B0072 01 or B0073 01

The seat belt switch circuit is shorted to voltage.

B0072 02 or B0073 02

The seat belt switch circuit is shorted to ground.

B0072 04 or B0073 03

The seat belt switch circuit is open.

B0072 05 or B0073 05

The seat belt switch circuit is shorted to voltage or open.

B0072 06 or B0073 06

The seat belt switch circuit is shorted to ground or open.

B0072 08 or B0073 08

The seat belt switch signal is invalid.

B0072 0B or B0073 0B

The seat belt switch signal is above threshold.

B0072 0C or B0073 0C

The seat belt switch signal is below threshold.

Action Taken When the DTC Sets

The inflatable restraint sensing and diagnostic module will store a DTC and illuminate the air bag indicator in the instrument cluster.

Conditions for Clearing the DTC

The condition for setting the DTC no longer exists.

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Supplemental Inflatable Restraint 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

1. Ignition ON.
2. Verify the appropriate scan tool Seat Belt Status parameter changes between Buckled and Unbuckled when the seat belt is buckled and unbuckled.
 - **If the parameter does not change**

Refer to Circuit/System Testing below.
 - **If the parameter changes**

3. All OK.

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.

- B153D Seat Belt Buckle-Driver
- B153P Seat Belt Buckle-Passenger
- K36 Inflatable Restraint Sensing and Diagnostic Module

1. Ignition OFF. Scan tool disconnected. Disconnect the harness connector at the appropriate B153 Seat Belt Buckle. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 5 ohms between the low reference circuit terminal 2 and ground.
 - **If 5 ohms or greater**
 1. Ignition OFF, disconnect the harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module.
 2. Test for less than 2 ohms in the low reference circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.
 - **If less than 5 ohms**
3. Ignition ON.
4. Verify the appropriate scan tool Seat Belt Status parameter is Buckled.
 - **If not Buckled**
 1. Ignition OFF, disconnect the harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module.
 2. Test for infinite resistance between the signal circuit terminal 1 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.
 - **If Buckled**
5. Install a 3 A fused jumper wire between the signal circuit terminal 1 and the low reference circuit terminal 2.
6. Verify the appropriate scan tool Seat Belt Status parameter is Unbuckled.
 - **If not Unbuckled**
 1. Ignition OFF, disconnect the harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module, ignition ON.
 2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V

3. Test for less than 2 ohms in the signal circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.

- **If Unbuckled**

7. Test or replace the B153 Seat Belt Buckle.

Component Testing

1. Ignition OFF. Scan tool disconnected. Disconnect the harness connector at the appropriate B153 Seat Belt Buckle. It may take up to 2 min for all vehicle systems to power down.
2. Test for infinite resistance between the signal terminal 1 and the low reference terminal 2.

- **If less than infinite resistance**

Replace the B153 Seat Belt Buckle.

- **If infinite resistance**

3. Insert the seat belt into the buckle.
4. Test for less than 5 ohms between the signal terminal 1 and the low reference terminal 2.

- **If 5 ohms or greater**

Replace the B153 Seat Belt Buckle.

- **If less than 5 ohms**

5. All OK.

Repair Instructions

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

- **Front Seat Belt Buckle Replacement**
- **SIR/SRS Wiring Repairs**
- **Control Module References** for inflatable restraint sensing and diagnostic module replacement, programming, and setup.

DTC B059A

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 B059A 01

Passenger Seat Belt Indicator Circuit Short to Battery

DTC B059A 02

Passenger Seat Belt Indicator Circuit Short to Ground

DTC B059A 04

Passenger Seat Belt Indicator Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Passenger Seat Belt Indicator Control	B059A 02	B059A 04	B059A 01	-

Circuit/System Description

The Inflatable Restraint Sensing and Diagnostic Module (SDM) monitors the passenger seat status and the passenger seat belt buckle switch and provides an output to the passenger seat belt indicator. When the Inflatable Restraint Sensing and Diagnostic Module detects the passenger seat is occupied and the seat belt is not fastened, the Inflatable Restraint Sensing and Diagnostic Module supplies a pulse width modulated signal to control the passenger seat belt indicator circuit. The Inflatable Restraint Sensing and Diagnostic Module monitors the passenger seat belt indicator circuits and if a fault is detected a DTC will be set.

Conditions for Running the DTC

Ignition voltage is between 9-16 V.

Conditions for Setting the DTC

B059A 01

The passenger seat belt indicator circuit is shorted to voltage.

B059A 02

The passenger seat belt indicator circuit is shorted to ground.

B059A 04

The passenger seat belt indicator circuit is open.

Action Taken When the DTC Sets

The Inflatable Restraint Sensing and Diagnostic Module will store the DTC.

Conditions for Clearing the DTC

The condition for setting the DTC no longer exists.

Reference Information

Schematic Reference

SIR Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Supplemental Inflatable Restraint 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 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.

- **S48C Multifunction Switch 1 - Instrument Panel**
- **K36 Inflatable Restraint Sensing and Diagnostic Module**

1. Ignition OFF.
2. Disconnect the harness connector at the S48C Multifunction Switch 1 - Instrument Panel.
3. Test for less than 10 ohms between the ground circuit terminal 1 and ground.
 - **If 10 ohms or greater**
 1. Ignition OFF.

2. Test for less than 2 ohms in the ground circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, repair the open/high resistance in the ground connection.
 - **If less than 10 ohms**
4. Connect a test lamp between the control circuit terminal 4 and ground.
5. Ignition ON.
6. Occupy the passenger seat, buckle and unbuckle the passenger seat belt, the test lamp should turn OFF and ON while changing between buckled and unbuckled.
 - **If the test lamp is always on**
 1. Ignition OFF, disconnect the harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module, ignition ON.
 2. Test for less than 1 V between the signal circuit and ground.
 - If 1V or greater, repair the short to voltage on the circuit.
 - If less than 1V, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.
 - **If the test lamp is always off**
 1. Disconnect the harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module.
 2. Test for infinite resistance between the seat belt switch signal circuit terminal 45 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 ohms in each control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.
 - **If test lamp turns on and off while changing between the commanded states**
7. Replace the S48C Multifunction Switch 1 - Instrument Panel.

Repair Instructions

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

- **Hazard Warning and Accessory Switch Replacement** for Multifunction Switch 1 - Instrument Panel replacement
- **Control Module References** for Inflatable Restraint Sensing and Diagnostic Module replacement, setup, and programming

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

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 Malfunction - Driver**
- **Seat Belt Indicator 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 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	Open/High Resistance	Short to Voltage	Signal Performance
Driver Seat Belt Switch Signal	1	2	2	-
Driver Seat Belt Switch Low Reference	-	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 Inflatable Restraint Sensing and Diagnostic Module sends the status of the driver seat belt via serial data to the instrument cluster. After receiving the message, the instrument cluster controls the illumination of the driver seat belt indicator.

Reference Information

Schematic Reference

Seat Belt Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

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. Verify the driver seat belt indicator turns ON and OFF when commanding the instrument cluster all indicators ON and OFF with a scan tool.
 - **If the driver seat belt indicator does not turn ON and OFF as commanded .**

Replace the P16 Instrument Cluster.
 - **If the driver seat belt indicator does turn ON and OFF as commanded**
2. Verify the scan tool Driver Seat Belt Switch parameter changes between Buckled and Unbuckled when buckling and unbuckling the driver seat belt.
 - **If the parameter does not change**

Refer to Circuit/System Testing below.

- **If the parameter changes**

3. All OK.

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.

- **B153D Seat Belt Buckle-Driver**
- **Seat belt switch harness connector**
- **K36 Inflatable Restraint Sensing and Diagnostic Module**
- **Inflatable Restraint Sensing and Diagnostic Module wiring harness connector**

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the B153D Seat Belt Buckle-Driver. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 5 ohms between the low reference circuit terminal 2 and ground.
 - **If 5 ohms or greater**
 1. Disconnect the X2 harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module.
 2. Test for less than 2 ohms in each low reference circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.
 - **If less than 5 ohms**
3. Ignition ON.
4. Verify the scan tool Driver Seat Belt Status parameter is Buckled.
 - **If not Buckled**
 1. Ignition OFF, disconnect the X2 harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module.
 2. Test for infinite resistance between the seat belt switch signal circuit terminal 1 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.
 - **If Buckled**
5. Install a 3 A fused jumper wire between the signal circuit terminal 1 and the low reference circuit terminal 2.
6. Verify the scan tool Driver Seat Belt Status parameter is Unbuckled.
 - **If Unbuckled**
 1. Ignition OFF, disconnect the X2 harness connector at the K36 Inflatable Restraint Sensing and

Diagnostic Module, ignition ON.

2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V
3. Test for less than 2 ohms in each circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.
- **If Unbuckled**
7. Test or replace the B153D Seat Belt Buckle-Driver.

Component Testing

1. Ignition OFF, disconnect the harness connector at the B153D Seat Belt Buckle-Driver, buckle the driver seat belt.
2. Test for infinite resistance between the signal circuit terminal 1 and the low reference terminal 2.
 - **If not infinite resistance**

Replace the B153D Seat Belt Buckle-Driver.
 - **If infinite resistance**
3. Unbuckle the driver seat belt.
4. Test for less than 1 ohms between the signal circuit terminal 1 and the low reference terminal 2.
 - **If 1 ohms or greater**

Replace the B153D Seat Belt Buckle-Driver.
 - **If less than 1 ohms**
5. All OK.

Repair Instructions

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

- **Front Seat Belt Buckle Replacement**
- **Control Module References** for Inflatable Restraint Sensing and Diagnostic Module or instrument cluster replacement, programming and setup

SEAT BELT INDICATOR 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	Open/High Resistance	Short to Voltage	Signal Performance
Passenger Seat Belt Switch Signal	1	2	2	-
Low Reference	-	2	-	-
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 inflatable restraint sensing and diagnostic module indicates a person is in the passenger seat. The inflatable restraint sensing and diagnostic module will turn the passenger seat belt indicator. The passenger seat belt switch is a 2-wire switch wired to the inflatable restraint sensing and diagnostic module 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 inflatable restraint sensing and diagnostic module sends the status of the passenger seat belt via a hard wire to the passenger air bag disable indicator. After receiving the message, the passenger air bag disable indicator controls the illumination of the passenger seat belt indicator.

Reference Information

Schematic Reference

Seat Belt Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

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.
2. With a scan tool, Command the Passenger Seat Belt Reminder Indicator ON and OFF.
 - If the passenger seat belt reminder indicator turns ON and OFF as commanded, refer to Passenger Seat Belt Switch Malfunction below.
 - If the passenger seat belt reminder indicator does not turn ON and OFF as commanded, refer to Passenger Seat Belt Indicator Malfunction below.

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.

- **B153P Seat Belt Buckle - Passenger**
- **B153P Seat Belt Buckle - Passenger harness connector**
- **K36 Inflatable Restraint Sensing and Diagnostic Module**
- **K36 Inflatable Restraint Sensing and Diagnostic Module harness connector**

Passenger Seat Belt Switch Malfunction

1. Ignition OFF. Disconnect the harness connector at the B153P Seat Belt Buckle - Passenger.
2. Test for less than 5 ohms between the low reference circuit terminal 2 and ground.
 - **If 5 ohms or greater**
 1. Disconnect the X2 harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module.
 2. Test for less than 2 ohms in each control circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.
 - **If less than 5 ohms**
3. Ignition ON.
4. Verify the scan tool Passenger Seat Belt Status parameter listed below is Buckled.
 - **If the scan tool Passenger Seat Belt Status parameter does not display Buckled**
 1. Disconnect the X2 harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module.
 2. Test for infinite resistance between the seat belt switch signal circuit terminal 1 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If less than 2 ohms, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.

- **If the scan tool Passenger Seat Belt Status parameter does display Buckled**
- 5. Install a 3 A fused jumper wire between the signal circuit terminal 1 and the low reference circuit terminal 2.
- 6. Verify the scan tool Passenger Seat Belt Status parameter is Unbuckled.
 - **If the scan tool Passenger Seat Belt Status parameter does not display Unbuckled**
 1. Ignition OFF. Disconnect the X2 harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module. Ignition ON.
 2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 3. Test for less than 2 ohms in each circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.
 - **If the scan tool Passenger Seat Belt Status parameter does display Unbuckled**
- 7. Ignition OFF, reconnect all harness connectors. Ignition ON.
- 8. With a 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 Passenger Seat Belt Status parameter does not display Buckled and Unbuckled**

Test or replace the B153P Seat Belt Buckle - Passenger.
 - **If the Passenger Seat Belt Status parameter does display Buckled and Unbuckled**
- 9. All OK.

Passenger Seat Belt Indicator Malfunction

1. Ignition OFF. Disconnect the harness connector at the S48C Multifunction Switch 1 - Instrument Panel.
2. Test for less than 10 ohms between the ground circuit terminal 1 and ground.
 - **If 10 ohms or greater**

Repair the open/high resistance in the circuit.
 - **If less than 10 ohms**
3. Ignition ON. With a scan tool, command the Passenger Seat Belt Reminder Indicator OFF.
4. Test for less than 11 V between the control circuit terminal 4 and ground.
 - **If 11 V or greater**
 1. Ignition OFF. Disconnect the X1 harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module. Ignition ON.
 2. Test for less than 1 V between the control circuit terminal 4 and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K36 Inflatable Restraint Sensing and Diagnostic Module.

- **If less than 11 V**

5. With a scan tool, command the Passenger Seat Belt Reminder Indicator ON.
6. Test for greater than 4 V between the control circuit terminal 4 and ground.

- **If 4 V or less**

1. Ignition OFF. Disconnect the X 1 harness connector at the K36 Inflatable Restraint Sensing and Diagnostic Module.
2. Test for infinite resistance between the control circuit terminal 4 and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
3. Test for less than 2 ohms between the control circuit terminal 4 and ground.
 - If 2 ohms or greater repair the open/high resistance in the circuit.
 - If less than 2 ohms replace the K36 Inflatable Restraint Sensing and Diagnostic Module.

- **If greater than 4 V**

7. Ignition OFF, reconnect all harness connectors. Ignition ON.
8. With a scan tool, Command the Passenger Seat Belt Reminder Indicator ON and OFF.
 - **If the passenger seat belt reminder indicator does not turn ON and OFF as commanded**

Replace the S48C Multifunction Switch 1 - Instrument Panel.

- **If the passenger seat belt reminder indicator turns ON and OFF as commanded**

9. All OK.

Component Testing

1. Ignition OFF. Disconnect the harness connector at the B153P Seat Belt Buckle - Passenger. Buckle the B153P Seat Belt Buckle - Passenger.
2. Test for infinite resistance between the signal circuit terminal 1 and the low reference terminal 2 at the B153P Seat Belt Buckle - Passenger.

- **If there is not infinite resistance**

Replace the B153P Seat Belt Buckle - Passenger.

- **If there is infinite resistance**

3. Unbuckle the B153P Seat Belt Buckle - Passenger.
4. Test for less than 1 ohms between the signal circuit terminal 1 and the low reference terminal 2 at the B153P Seat Belt Buckle - Passenger.

- **If 1 ohms or greater**

Replace the B153P Seat Belt Buckle - Passenger.

- **If less than 1 ohms**

5. All OK.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair.

- Front Seat Belt Buckle Replacement
- Hazard Warning and Accessory Switch Replacement for multifunction switch 1 - instrument panel replacement
- Control Module References for inflatable restraint sensing and diagnostic module Passenger Presence System, and Instrument Panel Cluster replacement, programming and setup

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.
- 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

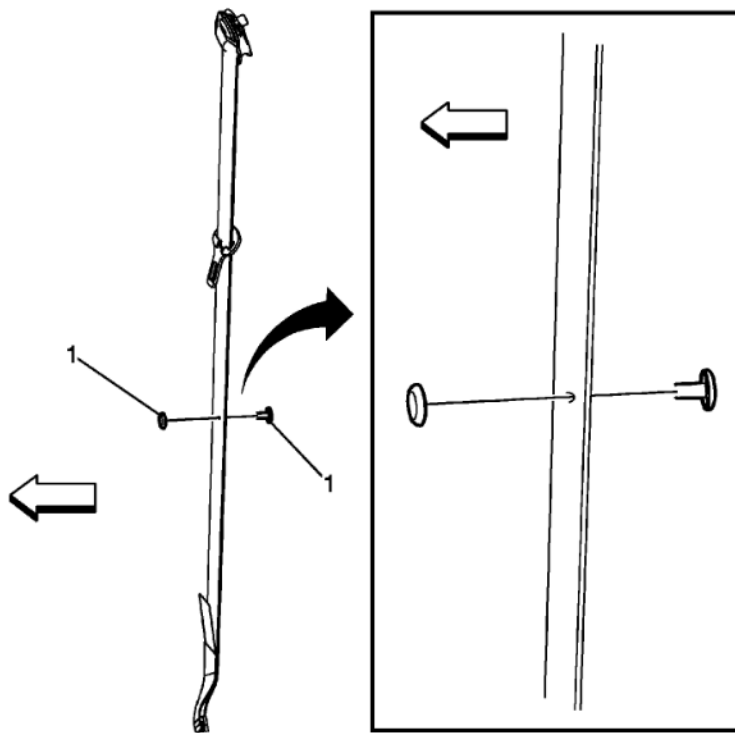


Fig. 3: View Of Seat Belt Latch Stop Components
 Courtesy of GENERAL MOTORS COMPANY

Seat Belt Latch Stop Installation

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 Latch 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 excess 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.

FRONT SEAT BELT BUCKLE REPLACEMENT



Fig. 4: Front Seat Belt Buckle
Courtesy of GENERAL MOTORS COMPANY

Front Seat Belt Buckle Replacement

Callout	Component Name
Preliminary Procedure Remove driver or passenger seat. Refer to <u>Driver or Passenger Seat Removal and Installation</u>	
1	Front Seat Belt Buckle Fastener CAUTION: Refer to <u>Fastener Caution</u> . Tighten 40 N.m (30 lb ft)

REAR SEAT BELT BUCKLE REPLACEMENT

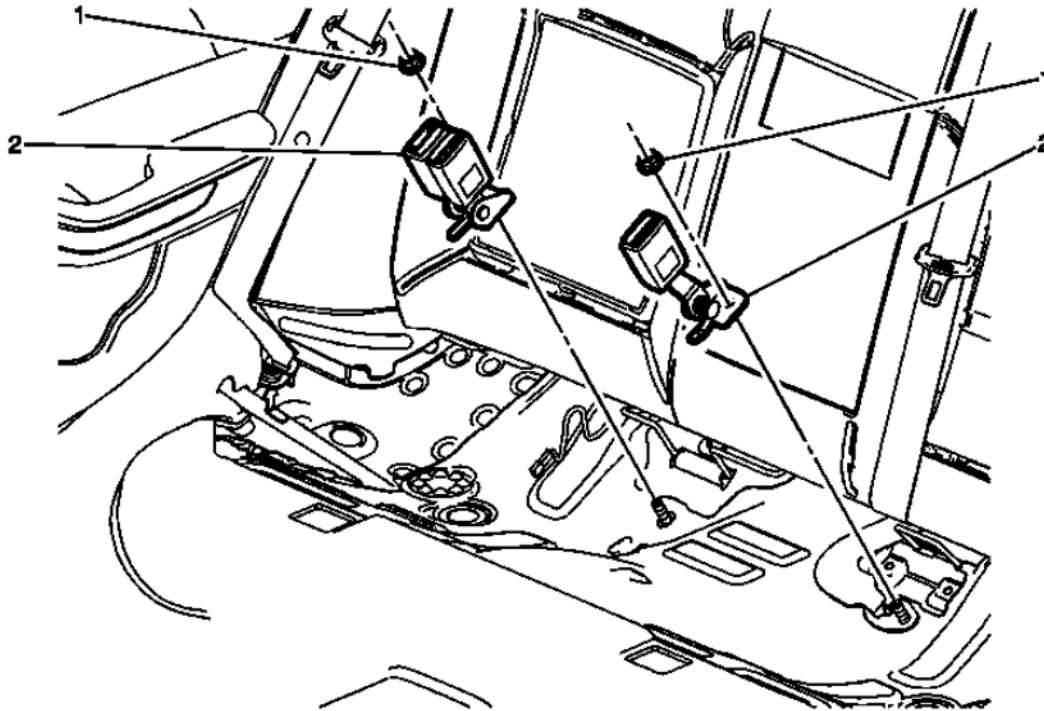


Fig. 5: Rear Seat Belt Buckle
 Courtesy of GENERAL MOTORS COMPANY

Rear Seat Belt Buckle Replacement

Callout	Component Name
Preliminary Procedure Remove the rear seat cushion. Refer to Rear Seat Cushion Removal and Installation .	
1	Rear Seat Belt Buckle Fastener (Qty: 2) CAUTION: Refer to Fastener Caution . Tighten 45 N.m (33 lb ft)
2	Rear Seat Belt Buckle Assembly (Qty: 2)

REAR SEAT RETRACTOR SIDE BELT REPLACEMENT

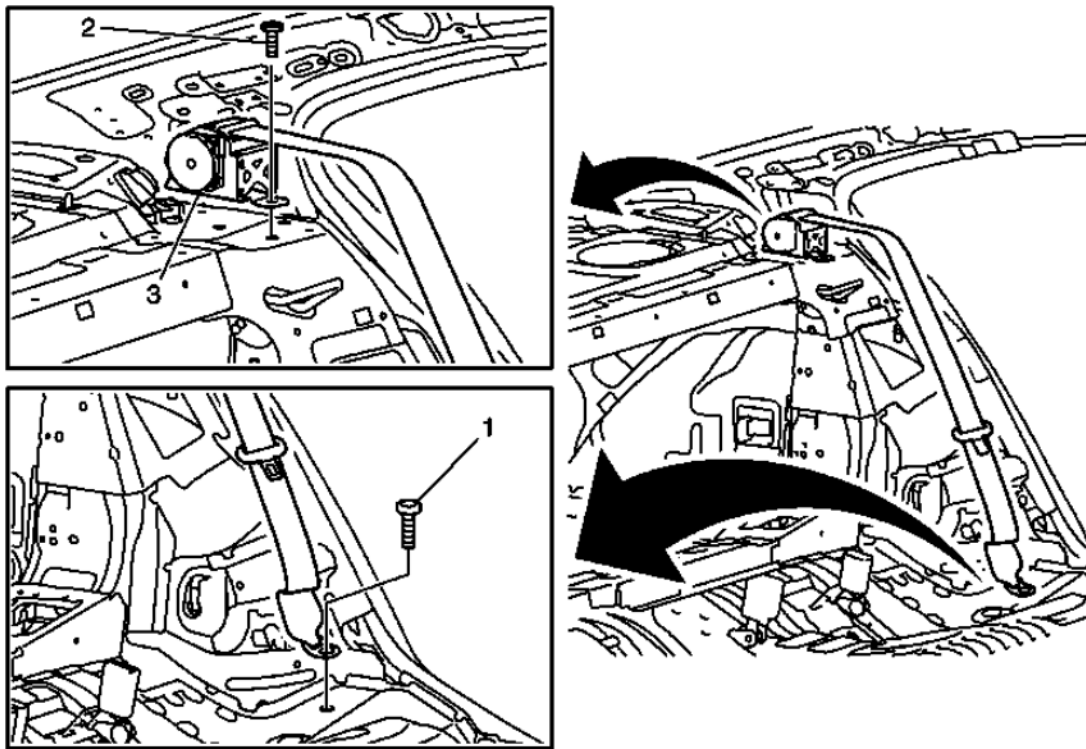


Fig. 6: Rear Seat Retractor Side Belt & Fasteners
Courtesy of GENERAL MOTORS COMPANY

Rear Seat Retractor Side Belt Replacement

Callout	Component Name
Preliminary Procedures	
1. Remove the rear seat cushion. Refer to Rear Seat Cushion Removal and Installation . 2. Remove the rear seat back cushion bolster. Refer to Rear Seat Back Bolster Replacement . 3. Remove the quarter trim panel. Refer to Quarter Trim Panel Replacement .	
1	Rear Seat Belt Retractor Anchor Bracket Fastener CAUTION: Refer to Fastener Caution . Tighten 45 N.m (33 lb ft)
2	Rear Seat Belt Retractor Fastener Tighten 45 N.m (33 lb ft)
3	Rear Seat Belt Retractor Side Belt

REAR SEAT CENTER RETRACTOR SIDE BELT REPLACEMENT

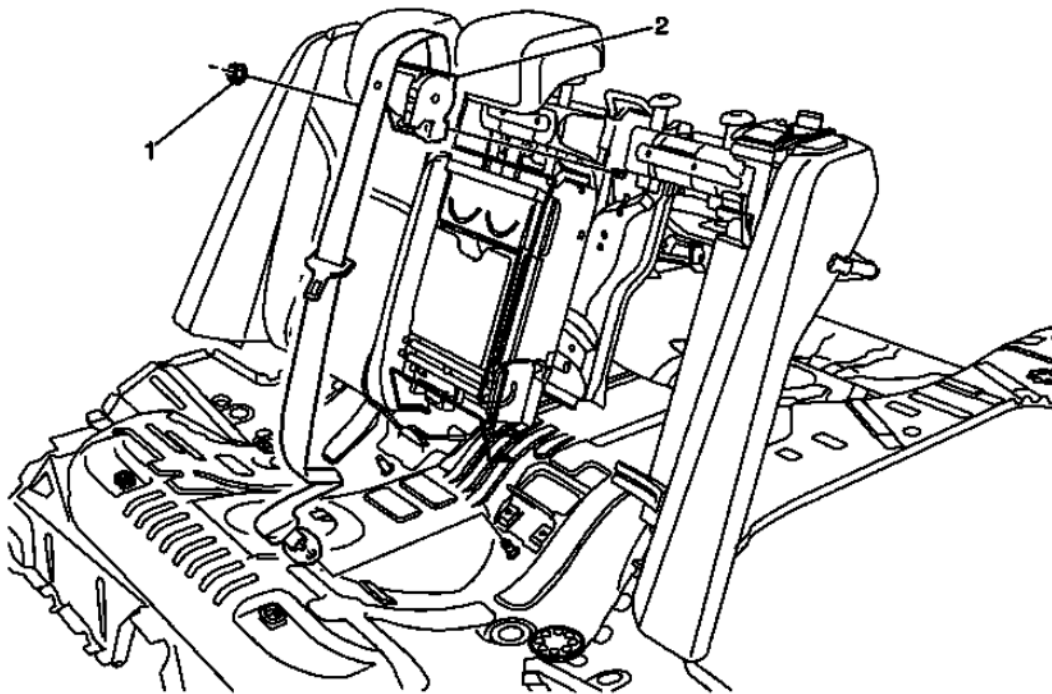


Fig. 7: Rear Seat Center Retractor Side Belt & Fasteners
 Courtesy of GENERAL MOTORS COMPANY

Rear Seat Center Retractor Side Belt Replacement

Callout	Component Name
Preliminary Procedures 1. Remove the rear seat belt buckle. Refer to <u>Rear Seat Belt Buckle Replacement</u>. 2. Remove the rear seat cushion. Refer to <u>Rear Seat Cushion Removal and Installation</u>. 3. Release the rear seat center shoulder belt retractor bracket.	
1	Rear Seat Center Retractor Side Belt Fastener (Qty: 2) CAUTION: Refer to <u>Fastener Caution</u> . Tighten 45 N.m (33 lb ft)
2	Rear Seat Center Retractor Side Belt

DESCRIPTION AND OPERATION

SEAT BELT SYSTEM DESCRIPTION AND OPERATION

Seat Belts

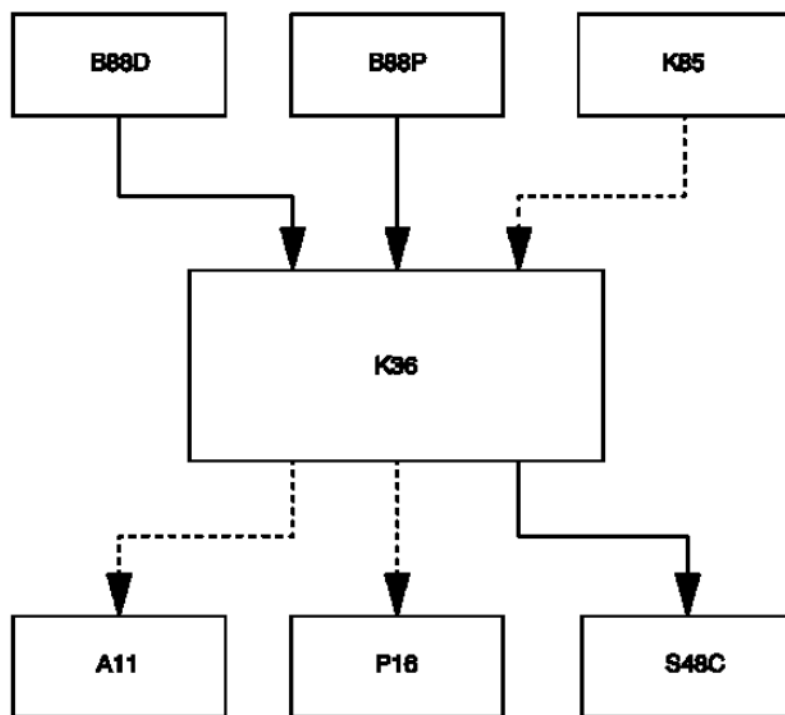


Fig. 8: Seat Belt System Operation Graph
Courtesy of GENERAL MOTORS COMPANY

Solid Line - Hard Wire I/O	
Dash Line - Serial Data	
A11	Radio
B88D	Seat Belt Switch - Driver
B88P	Seat Belt Switch - Passenger
K36	Inflatable Restraint Sensing and Diagnostic Module
K85	Passenger Presence Detection Module
P16	Instrument Cluster
S48C	Multifunction Switch 1 - Instrument Panel

Restraint System

NOTE: If the vehicle has been in a collision, refer to Repairs and Inspections Required After a Collision

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 **Supplemental Inflatable Restraint System Description and Operation**

Front Seat Belt System

The front seat belt system includes a driver and passenger seat belt retractor pretensioner. 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 sensor, which detects an occupant. If the passenger presence sensor 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 Instrument Panel Multifunction Switch, 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 Instrument Panel Multifunction Switch, 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 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 Instrument Panel Multifunction Switch. 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 Instrument Panel Multifunction Switch via a hard wire. 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.