Component Procedures: Seat Belt Systems

Table of Contents

Component Procedures: Seat Belt Systems

Parts and Labor (itype_189)

Labor

Operation	Qualifier Path	Skill	Std Hrs	Wty Hrs
Remove & Replace	Seat Belt > Lap & Shoulder Belt, R&R > Front ?	B	1.3	0.0
Remove & Replace	Seat Belt > Lap & Shoulder Belt, R&R > Front ?	B	1.3	0.0
Remove & Replace	Seat Belt > Lap & Shoulder Belt, R&R > Second?	B	1.4	0.0
Remove & Replace	Seat Belt > Lap & Shoulder Belt, R&R > Second?	B	1.4	0.0
Remove & Replace	Seat Belt > Latch, R&R > Front > Left	B	0.7	0.0
Remove & Replace	Seat Belt > Latch, R&R > Front > Right	B	0.7	0.0
Remove & Replace	Seat Belt > Latch, R&R > Second Row > Left	B	0.4	0.0
Remove & Replace	Seat Belt > Latch, R&R > Second Row > Right	B	0.4	0.0
Reset	Seat Belt > Warning System, Reset	B	0.3	0.0
Inspect	Seat Belt > System, Inspect	B	0.4	0.0
Diagnosis	Seat Belt > System, Diagnosis	B	0.7	0.0

Seat Belt System (Article 13255)

Figure 1: Seat Belt with P14 Block Diagram

Restraint System

The vehicle has front and rear seat belt s 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 retractor s 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 pretensioner retractor. Both front seat belt pretensioners includes a seat belt switch in the seat buckle which controls a reminder lamp and a tone alarm.

- 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 reminder lamp, which is located within the Passenger Air Bag Disable Indicator, will not be turned ON.
- When the driver seat belt is not buckled and the ignition switch is in the ON position, the following events will occur:
- The tone alarm will operate for 4–8 seconds and then go OFF.

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

Rear Seat Belt System

The Rear Seat Belt System includes the following components:
- The rear seat belt retractor is located at the wheelhouse panel and attached to the floor panel by the rear seat shoulder belt retractor bracket.
- The rear seat belt buckle s and the center seat belt buckle are attached to each seat.

Child Seat Restraint System

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

Seat Belt Schematics (Article 13269)

Figure 1: Seat Belt and Passenger Air Bag Disable Indicator

Seat Belts - Fastener Specifications (Article 13270)

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

All New Technical Service Bulletins (itype_432)

Tsbs
- Seat Belt Extender Availability (99-09-40-005J, 2026/01/28)

All Technical Service Bulletins (itype_100)

Tsbs
- Restraints - Seat Belt Latching Issues, Warning Lamp ON (09-09-40-001C, 2015/08/03)
- Restraints - Normal Seat Belt Operating Characteristics (05-09-40-002G, 2013/06/18)
- Seat Belt Extender Availability (99-09-40-005J, 2026/01/28)

Customer Interest Bulletins (itype_109)

Tsbs
- Restraints - Seat Belt Latching Issues, Warning Lamp ON (09-09-40-001C, 2015/08/03)

Repair Tips (itype_110)

Tsbs
- Restraints - Normal Seat Belt Operating Characteristics (05-09-40-002G, 2013/06/18)

Symptoms - Seat Belts (Article 13263)

Visual/Physical Inspection
- Inspect for aftermarket devices which could affect the operation of the seat belt system.
- 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 (Article 13256)

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

Seat Belt Indicator Malfunction - Driver (Article 13258)

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
Signal 1 2 2 —
Low Reference — 2 — —
1. Indicator will remain ON with seat belt buckle d. 2. Indicator will illuminate only for the bulb check.

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

Reference Information
Schematic Reference
Seat Belt Schematics
Connector End View Reference
Master Electrical Component List
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

Refer to SIR Service Precautions .

- Command the instrument cluster all indicators ON and OFF with a scan tool. The driver seat belt indicator should turn ON and OFF as commanded.
- 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
- Monitor the scan tool Driver Seat Belt Switch parameter while buckling and unbuckling the seat belt. The parameter should display Buckled and Unbuckled when changing seat belt states.
- If the scan tool Driver Seat Belt Switch parameter does not display Buckled and Unbuckled when changing seat belt states Refer to Circuit/System Testing.
- If the scan tool Driver Seat Belt Switch parameter does display Buckled and Unbuckled when changing seat belt states
- The condition is not currently present and may be an intermittent fault.

Circuit/System Testing

- Refer to SIR Service Precautions .
- Refer to SIR Disabling and Enabling .
- B88D seat belt switch-driver
- Seat belt switch harness connector
- K36 inflatable restraint sensing and diagnostic module
- SDM wiring harness connector
- Ignition OFF. Disconnect the harness connector at the B88D seat belt switch-driver.
- Test for less than 5 Ω between the low reference circuit terminal B and ground.
- If 5 Ω or greater
- Verify the SIR system is disabled.
- Disconnect the X2 harness connector at the K36 inflatable restraint sensing and diagnostic module .
- Test for less than 2 Ω in each control circuit end to end.
- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω, replace the K36 inflatable restraint sensing and diagnostic module.
- If less than 5 Ω
- Ignition ON.
- Verify the scan tool Driver Seat Belt Status parameter displays Buckled.
- If the scan tool Driver Seat Belt Status parameter does not display Buckled
- Ignition OFF.
- Disconnect the X2 harness connector at the K36 inflatable restraint sensing and diagnostic module.
- Test for infinite resistance between the seat belt switch signal circuit terminal A and ground.
- If less than infinite resistance, repair the short to ground on the circuit.
- If the scan tool Driver Seat Belt Status parameter does display Buckled
- Install a 3 A fused jumper wire between the signal circuit terminal A and the low reference circuit terminal B.
- Verify the scan tool Driver Seat Belt Status parameter displays Unbuckled.
- If the scan tool Driver Seat Belt Status parameter does not display Unbuckled
- Ignition ON, vehicle in service mode.
- 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.
- Test for less than 2 Ω in each circuit end to end.
- If the scan tool Driver Seat Belt Status parameter does display Unbuckled
- Test or replace the B88D seat belt switch-driver.

Component Testing

- Ignition OFF. Disconnect the harness connector at the B88D seat belt switch-driver. The B88D seat belt switch-driver in the open position.
- Test for infinite resistance between the signal circuit terminal A and the low reference terminal B at the B88D seat belt switch-driver.
- If there is not infinite resistance Replace the B88D seat belt switch-driver.
- If there is infinite resistance
- The B88D seat belt switch-driver in the closed position.

- Test for less than 1 Ω between the signal circuit terminal A and the low reference terminal B at the B88D seat belt switch-driver.
- If 1 Ω or greater Replace the B88D seat belt switch-driver.
- If less than 1 Ω
- All OK.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair .
- Front Seat Belt Buckle Replacement
- Control Module References for SDM or instrument panel cluster replacement, programming and setup

Seat Belt Indicator Malfunction - Driver (Article 13260)

Diagnostic Instructions
- Perform the Diagnostic System Check prior to using this diagnostic procedure: Diagnostic System Check - Vehicle
- Review the description of Strategy Based Diagnosis: Strategy Based Diagnosis
- An overview of each diagnostic category can be found here: Diagnostic Procedure Instructions

Diagnostic Fault Information

Circuit Short to Ground Open/High Resistance Short to Voltage Signal Performance
Signal — Terminal 2 @ B153D Seat Belt Buckle - Driver 1 2 2 —
Low Reference — Terminal 1 @ B153D Seat Belt Buckle - Driver — 2 — —
Seat Belt Reminder Indicator = Always On Seat Belt Reminder Indicator = Always Off
- Seat Belt Reminder Indicator = Always On
- Seat Belt Reminder Indicator = Always Off

Circuit/System Description

For an overview of the component/system, refer to: Seat Belt System Description and Operation
Circuit Description
Signal The control module input circuit has an internal resistance connected to 12 V.
Low Reference Grounded through the control module.
Component Description
B88D Seat Belt Switch - Driver When the seat belt is unbuckled the switch is closed, and when the seat belt is buckled the switch is open.
K36 Inflatable Restraint Sensing and Diagnostic Module The control module monitors several sensors that can detect a collision. When a collision is detected, the control module will trigger certain air bag s and seat belt pretensioner s, depending on the angle and severity of the impact.

Reference Information

Schematic Reference
Seat Belt Schematics
Connector End View Reference
Component Connector End Views
Electrical Information Reference
- Circuit Testing
- Connector Repairs
- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs
- Electrical Relay Replacement

Scan Tool Reference
Control Module References

Circuit/System Verification
- Ignition » On / Vehicle » In Service Mode
- Perform the appropriate scan tool control function: All Indicators @ P16 Instrument Cluster » On and Off
Verify the component turns On and Off: Seat Belt Reminder Indicator
- If the component does not turn On and Off Replace the appropriate component: P16 Instrument Cluster
- If the component turns On and Off
- Operate the component: B153D Seat Belt Buckle - Driver » Buckled Verify the scan tool parameter: Driver Seat Belt Status = Buckled
- If not the specified state Refer to: Circuit/System Testing
- If the specified state
- Operate the component: B153D Seat Belt Buckle - Driver » Unbuckled Verify the scan tool parameter: Driver Seat Belt Status = Unbuckled
- All OK.

Circuit/System Testing
- Ignition/Vehicle » Off — For greater than 10 min
- Disconnect the electrical connector: B153D Seat Belt Buckle - Driver
- Test for less than 5 Ω between the test points: Low Reference terminal 1 & Ground
- If 5 Ω or greater
- Disconnect the electrical connector: K36 Inflatable Restraint Sensing and Diagnostic Module
- Test for less than 2 Ω between the test points: Low Reference circuit terminal 1 @ B153D Seat Belt Buckle - Driver & The other end of the circuit
- If 2 Ω or greater » Repair the open/high resistance in the circuit.
- If less than 2 Ω » Replace the component: K36 Inflatable Restraint Sensing and Diagnostic Module
- If less than 5 Ω
- Verify the scan tool parameter: Driver Seat Belt Status = Buckled
- If not the specified state
- Ignition/Vehicle » Off
- Test for infinite resistance between the test points: Signal circuit terminal 2 @ Component harness & Ground
- If less than infinite resistance » Repair the short to ground on the circuit.
- If infinite resistance » Replace the component: K36 Inflatable Restraint Sensing and Diagnostic Module
- Connect a 3 A fused jumper wire between the test points: Signal circuit terminal 2 & Low Reference circuit terminal 1
- Verify the scan tool parameter: Driver Seat Belt Status = Unbuckled
- Ignition/Vehicle » Off & Remove » Jumper wire(s)
- Test for less than 1 V between the test points: Signal circuit terminal 2 @ Component harness & Ground
- If 1 V or greater » Repair the short to voltage on the circuit.
- If less than 1 V
- Test for less than 2 Ω between the test points: Signal circuit terminal 2 @ Component harness & The other end of the circuit
- Test or replace the component: B153D Seat Belt Buckle - Driver

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair: Diagnostic Repair Verification
- Front Seat Belt Buckle Replacement
- For control module replacement, programming, and setup refer to: Control Module References

Seat Belt Indicator Malfunction - Passenger (Article 13262)

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
Signal 1 2 2 —
Low Reference — 2 — —
1. Indicator will remain ON with seat belt buckle d. 2. Indicator will illuminate only for the bulb check.

Circuit/System Description

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

Diagnostic Aids

Objects on the passenger seat can cause the passenger seat belt reminder to be commanded on. Depending on the sensing technology used, a conductive object (computers, MP3 players, cell phones, diagnostic scan tool, wires, a hand, etc.) placed on the passenger seat may cause the Passenger Presence Detection Module to command the passenger air bag indicator ON and/or command the passenger seat belt indicator ON. The fasten seat belt chime will also sound.

Reference Information

Schematic Reference
Seat Belt Schematics
Connector End View Reference

Component Connector End Views
Description and Operation
Seat Belt System Description and Operation
Electrical Information Reference
- Circuit Testing
- Connector Repairs
- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs
Scan Tool Reference
Control Module References for scan tool information
Circuit/System Verification
- Command the instrument cluster all indicators ON and OFF with a scan tool. The passenger seat belt indicator should turn ON and OFF as commanded.
- If the passenger seat belt indicator does not turn ON and OFF as commanded Replace the P16 instrument cluster.
- If the passenger seat belt indicator does turn ON and OFF as commanded
- Monitor the scan tool Passenger Seat Belt Switch parameter while buckling and unbuckling the seat belt. The parameter should display Buckled and Unbuckled when changing seat belt states.
- If the scan tool Passenger Seat Belt Switch parameter does not display Buckled and Unbuckled when changing seat belt states Refer to Circuit/System Testing.
- If the scan tool Passenger Seat Belt Switch parameter does display Buckled and Unbuckled when changing seat belt states
- All OK.
Circuit/System Testing
Passenger Seat Belt Switch Malfunction
- Ignition OFF. Disconnect the harness connector at the B88P seat belt switch-passenger.
- Test for less than 5 Ω between the low reference circuit terminal B and ground.
- If 5 Ω or greater
- Disconnect the X2 harness connector at the K36 inflatable restraint sensing and diagnostic module .
- Test for less than 2 Ω in each control circuit end to end.
- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω, replace the K36 inflatable restraint sensing and diagnostic module .
- If less than 5 Ω
- Ignition ON, 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
- Disconnect the X2 harness connector at the K36 inflatable restraint sensing and diagnostic module.
- Test for infinite resistance between the seat belt switch signal circuit terminal A and ground.
- If less than infinite resistance, repair the short to ground on the circuit.
- If less than 2 Ω, replace the K36 inflatable restraint sensing and diagnostic module.
- If the scan tool Passenger Seat Belt Status parameter does display Buckled
- Install a 3 A fused jumper wire between the signal circuit terminal A and the low reference circuit terminal B.
- Verify the scan tool Passenger Seat Belt Status parameter is Unbuckled.
- If the scan tool Passenger Seat Belt Status parameter does not display Unbuckled
- Ignition OFF. Disconnect the X2 harness connector at the K36 inflatable restraint sensing and diagnostic module. Ignition ON.
- 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.
- Test for less than 2 Ω in each circuit end to end.
- If the scan tool Passenger Seat Belt Status parameter does display Unbuckled
- Test or replace the B88P seat belt switch-passenger.
Passenger Seat Belt Indicator Malfunction
- Ignition OFF. Disconnect the harness connector at the P14 passenger air bag disable indicator.
- Test for less than 10 Ω between the ground circuit terminal 2 and ground.
- If 10 Ω or greater Repair the open/high resistance in the circuit.
- If less than 10 Ω
- Ignition ON. With a scan tool, command the Passenger Seat Belt Reminder Indicator OFF.
- Test for less than 11 V between the control circuit terminal 5 and ground.
- If 11 V or greater
- Ignition OFF. Disconnect the X1 harness connector at the K36 inflatable restraint sensing and diagnostic

module. Ignition ON.
- Test for less than 1 V between the control circuit terminal 5 and ground.
- If less than 1 V, replace the K36 inflatable restraint sensing and diagnostic module.
- If less than 11 V
- With a scan tool, command the Passenger Seat Belt Reminder Indicator ON.
- Test for greater than 4 V between the control circuit terminal 5 and ground.
- If 4 V or less
- Ignition OFF. Disconnect the X 1 harness connector at the K36 inflatable restraint sensing and diagnostic module.
- Test for infinite resistance between the control circuit terminal 5 and ground.
- Test for less than 2 Ω between the control circuit terminal 5 and ground.
- If 2 Ω or greater repair the open/high resistance in the circuit.
- If less than 2 Ω replace the K36 inflatable restraint sensing and diagnostic module.
- If greater than 4 V
- Replace the P14 passenger air bag disable indicator.

Component Testing

- Ignition OFF. Disconnect the harness connector at the B88P seat belt switch-passenger. Buckle the B88P seat belt switch-passenger.
- Test for infinite resistance between the signal circuit terminal A and the low reference terminal B at the B88P seat belt switch-passenger.
- If there is not infinite resistance Replace the B88P seat belt switch-passenger.
- If there is infinite resistance
- Unbuckle the B88P seat belt switch-passenger.
- Test for less than 1 Ω between the signal circuit terminal A and the low reference terminal B at the B88P seat belt switch-passenger.
- If 1 Ω or greater Replace the B88P seat belt switch-passenger.
- If less than 1 Ω

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair.
- Instrument Panel Airbag Arming Status Display Replacement
- Front Seat Belt Buckle Replacement
- Front Seat Cushion Cover and Pad Replacement
- Control Module References for SDM Passenger Presence System, and Instrument Panel Cluster replacement, programming and setup