

2017 Transmission

Shift Lock Control - Sierra, Silverado

SCHEMATIC WIRING DIAGRAMS

SHIFT LOCK CONTROL WIRING SCHEMATICS

Shift Lock Control (M5U, MW7, MYC or MYD)

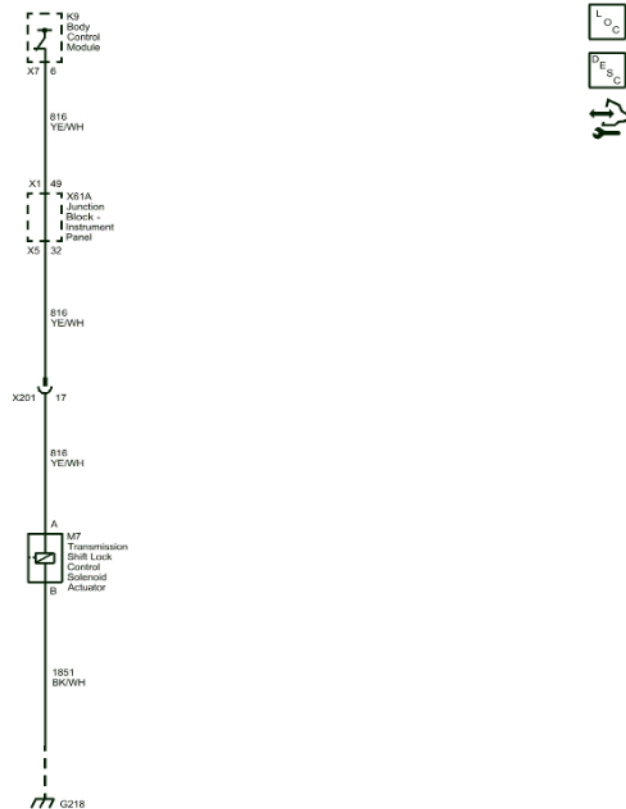


Fig. 1: Shift Lock Control (M5U, MW7, MYC or MYD)

Courtesy of GENERAL MOTORS COMPANY

DIAGNOSTIC INFORMATION AND PROCEDURES

SYMPTOMS - AUTOMATIC TRANSMISSION SHIFT LOCK CONTROL

NOTE: The following steps must be completed before using the symptom tables.

1. Perform the **Diagnostic System Check - Vehicle** before using the Symptom Tables in order to verify that all of the following are true:
 - There are no DTCs set.
 - The control modules can communicate via the serial data link.
2. Review the system operation in order to familiarize yourself with the system functions. Refer to **Automatic Transmission Shift Lock Control Description and Operation (Without T4Z)Automatic**

Transmission Shift Lock Control Description and Operation (With T4Z).

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the automatic transmission shift lock control. Refer to [Checking Aftermarket Accessories](#).
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.

Intermittent

Faulty electrical connections or wiring may be the cause of intermittent conditions. Refer to [Testing for Intermittent Conditions and Poor Connections](#)

Symptom List

Refer to a symptom diagnostic procedure in order to diagnose the symptom:

Transmission Control Lever Malfunction (Without T4Z)Transmission Control Lever Malfunction (With T4Z)

TRANSMISSION CONTROL LEVER MALFUNCTION (WITHOUT T4Z)

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
Fuse B+	1	1	-	-
Control	1	1	2	-
Ground	-	1	-	-
1. Shift lever will not move from PARK with the brake pedal applied. 2. Shift lever will move from PARK without the brake pedal applied.				

Circuit/System Description

The body control module controls the shift lock solenoid by providing battery voltage to the shift lock control solenoid. The body control module utilizes a smart driver to control the voltage supplied to the shift lock solenoid. The smart driver monitors the voltage and current flow of the control circuit.

Reference Information

Schematic Reference

- [Body Control System Schematics](#)
- [Shift Lock Control Schematics](#)

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Automatic Transmission Shift Lock Control Description and Operation (Without T4Z)

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. Verify the scan tool Brake Transmission Shift Interlock Solenoid Actuator Command parameter changes from Inactive to Active when the brake pedal is applied.
 - **If the parameter does not change**
Refer to [Stop Lamps Malfunction](#)
 - **If the parameter changes**
3. Verify the transmission shift lever moves out of the PARK position when the brake pedal is applied.
 - **If the transmission shift lever does not move out of the PARK position**
Refer to Circuit/System Testing.
 - **If the transmission shift lever does move out of the PARK position**
All OK.

Circuit/System Testing

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the M7 Transmission Shift Lock Control Solenoid Actuator. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between the ground circuit terminal B and ground.
 - **If greater than 10 Ω**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **If less than 10 Ω**

3. Install a test lamp between the control circuit terminal A and the ground circuit terminal B, ignition ON.
4. Verify the test lamp turns ON and OFF when commanding the Brake Transmission Shift Interlock Solenoid Actuator Command parameter with the scan tool.

- **If test lamp is always OFF**

1. Ignition OFF, disconnect the harness connector at the K9 Body Control Module.
2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - if infinite resistance.
3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω
4. Ignition ON.
5. Verify a test lamp illuminates between each B+ and ignition circuit terminal at the control module harness connector.
 - If the test lamp does not illuminate, repair the circuit or fuse as necessary.
 - If the test lamp does illuminate at each B+ and ignition circuit, replace the K9 Body Control Module.

- **If test lamp is always ON**

1. Ignition OFF, disconnect the harness connector at K9 Body Control Module, ignition on.
2. Test for less than 1 V between the control circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K9 Body Control Module.

- **If the test lamp turns ON and OFF**

5. Test or replace the M7 Transmission Shift Lock Control Solenoid Actuator.

Component Testing

1. Ignition OFF, disconnect the harness connector at M7 Transmission Shift Lock Control Solenoid Actuator.
2. Install a 10 A fused jumper wire between the control terminal A and 12 V. Momentarily install a jumper wire between the ground terminal B and ground.
3. Verify the M7 Transmission Shift Lock Control Solenoid Actuator turns on and off/clicks, etc.
 - **If the M7 Transmission Shift Lock Control Solenoid Actuator does not turn on and off/clicks, etc**

Replace the M7 Transmission Shift Lock Control Solenoid Actuator.

- **If the M7 Transmission Shift Lock Control Solenoid Actuator does turn on and off/clicks, etc**

4. All OK.

Repair Instructions

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

- **Automatic Transmission Shift Lock Control Actuator Replacement**

- [Control Module References](#) for control module replacement, programming, and setup

TRANSMISSION CONTROL LEVER MALFUNCTION (WITH T4Z)

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
Fuse B+	1	1	-	-
Control	1	1	2	-
Ground	-	1	-	-
1. Shift lever will not move from PARK with the brake pedal applied. 2. Shift lever will move from PARK without the brake pedal applied.				

Circuit/System Description

The body control module controls the shift lock solenoid by providing battery voltage to the shift lock control solenoid. The body control module utilizes a smart driver to control the voltage supplied to the shift lock solenoid. The smart driver monitors the voltage and current flow of the control circuit.

Reference Information

Schematic Reference

- [Body Control System Schematics](#)
- [Shift Lock Control Schematics](#)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Automatic Transmission Shift Lock Control Description and Operation (With T4Z)

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. Verify the scan tool Brake Transmission Shift Interlock Solenoid Actuator Command parameter changes from Inactive to Active when the brake pedal is applied.
 - **If the parameter does not change**
Refer to [Stop Lamps Malfunction](#)
 - **If the parameter changes**
3. Verify the scan tool Driver Seat Belt Status and Passenger Seat Belt Status parameter changes between Buckled and Unbuckled when the seat belt is buckled and unbuckled.
 - **If the Driver Seat Belt Status and Passenger Seat Belt Status parameter does not change**
Refer to [Symptoms - Seat Belts](#)
 - **If the Driver Seat Belt Status and Passenger Seat Belt Status parameter changes**
4. Verify the transmission shift lever moves out of the PARK position when the brake pedal is applied.

NOTE: Vehicles with the Safety Belt Assurance System, will not allow the vehicle to shift out of PARK if the driver and front outboard passenger, if present, do not have safety belt(s) buckled. Buckle the safety belt(s) to unlock the shifter. This system may not allow the vehicle to shift out of PARK if an object such as a briefcase, handbag, grocery bag, laptop, or other electronic devices is on the front outboard passenger seat. If this happens, remove the object from the seat or buckle the safety belt.

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- **If the transmission shift lever does not move out of the PARK position**

Refer to Circuit/System Testing.

- **If the transmission shift lever does move out of the PARK position**

All OK.

Circuit/System Testing

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the M7 Transmission Shift Lock Control Solenoid Actuator. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between the ground circuit terminal B and ground.
 - **If greater than 10 Ω**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **If less than 10 Ω**
3. Install a test lamp between the control circuit terminal A and the ground circuit terminal B, ignition ON.

4. Verify the test lamp turns ON and OFF when commanding the Brake Transmission Shift Interlock Solenoid Actuator Command parameter with the scan tool.

- **If test lamp is always OFF**

1. Ignition OFF, disconnect the harness connector at the K9 Body Control Module.
2. Test for infinite resistance between the control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - if infinite resistance.
3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω
4. Ignition ON.
5. Verify a test lamp illuminates between each B+ and ignition circuit terminal at the control module harness connector.
 - If the test lamp does not illuminate, repair the circuit or fuse as necessary.
 - If the test lamp does illuminate at each B+ and ignition circuit, replace the K9 Body Control Module.

- **If test lamp is always ON**

1. Ignition OFF, disconnect the harness connector at K9 Body Control Module, ignition on.
2. Test for less than 1 V between the control circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K9 Body Control Module.

- **If the test lamp turns ON and OFF**

5. Test or replace the M7 Transmission Shift Lock Control Solenoid Actuator.

Component Testing

1. Ignition OFF, disconnect the harness connector at M7 Transmission Shift Lock Control Solenoid Actuator.
2. Install a 10 A fused jumper wire between the control terminal A and 12 V. Momentarily install a jumper wire between the ground terminal B and ground.
3. Verify the M7 Transmission Shift Lock Control Solenoid Actuator turns on and off/clicks, etc.
 - **If the M7 Transmission Shift Lock Control Solenoid Actuator does not turn on and off/clicks, etc**

Replace the M7 Transmission Shift Lock Control Solenoid Actuator.
 - **If the M7 Transmission Shift Lock Control Solenoid Actuator does turn on and off/clicks, etc**
4. All OK.

Repair Instructions

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

- **Automatic Transmission Shift Lock Control Actuator Replacement**
- **Control Module References** for control module replacement, programming, and setup

REPAIR INSTRUCTIONS

AUTOMATIC TRANSMISSION SHIFT LOCK CONTROL ACTUATOR REPLACEMENT

Removal Procedure

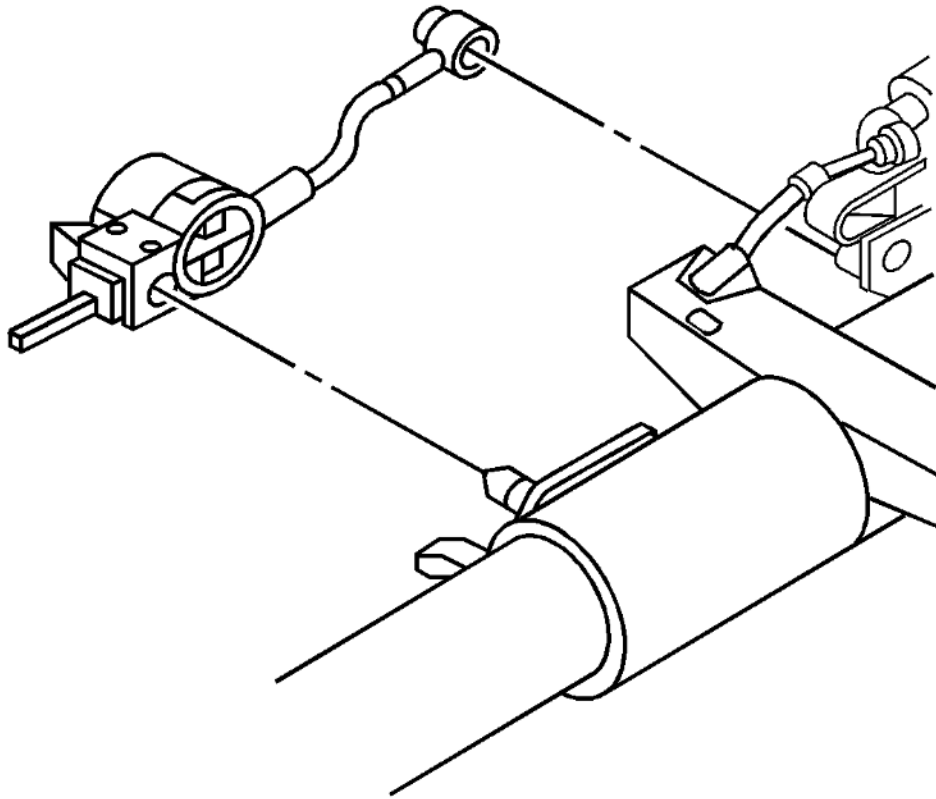


Fig. 2: View Of Automatic Transmission Shift Lock Control Actuator

Courtesy of GENERAL MOTORS COMPANY

1. Disable the SIR system. Refer to [SIR Disabling and Enabling](#) .
2. Remove the knee bolster. Refer to [Instrument Panel Knee Bolster Replacement](#) .
3. Put the shift lever clevis into the neutral position.
4. Disconnect the electrical connector.
5. Using a small screwdriver, pry the automatic transmission shift lock control actuator away from the steering column jacket and the cable shift cam.
6. Remove the shift lock control actuator.

Installation Procedure

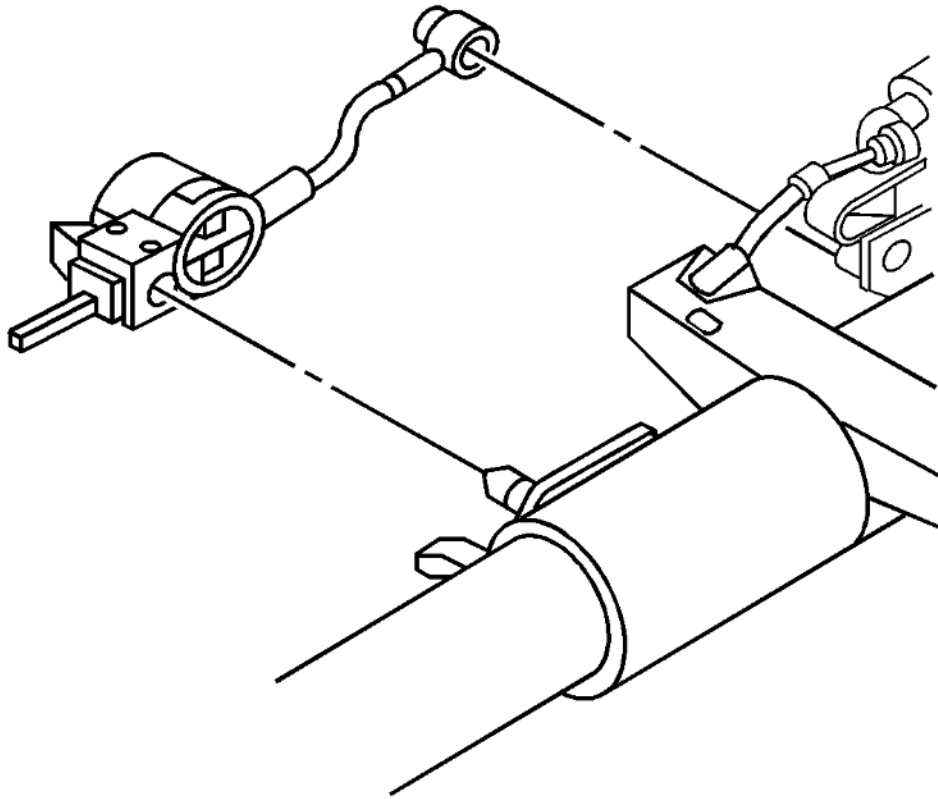


Fig. 3: View Of Automatic Transmission Shift Lock Control Actuator
Courtesy of GENERAL MOTORS COMPANY

1. Firmly install the shift lock control actuator onto the steering column jacket and the cable shift cam.
2. Connect the electrical connector.
3. Place the shift lever clevis into the neutral position.

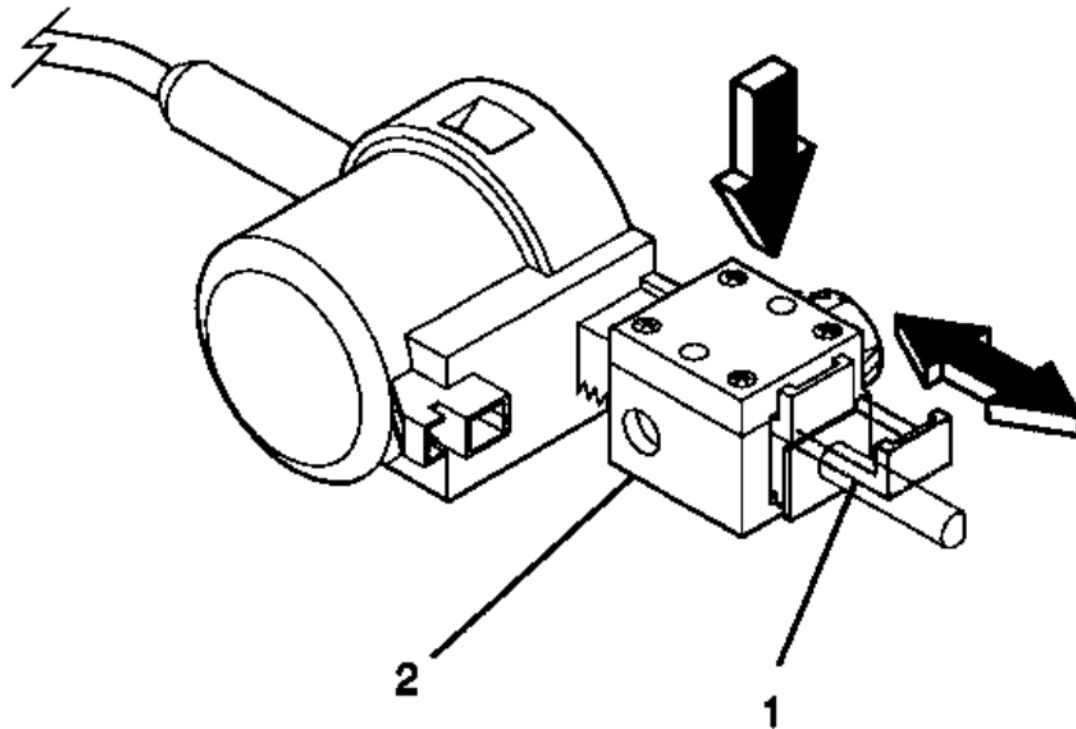


Fig. 4: Adjusting Automatic Transmission Shift Lock Control Actuator

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4. Adjust the shift lock control actuator (with the shift lever clevis in the neutral position) in the following way:
 1. Pull out the tab (1) on the adjuster block side (2) of the shift lock control actuator.
 2. Press on the adjuster block (2) to compress the internal adjuster spring which disengages the adjuster teeth. Slide the adjuster block (2) as far away from the actuator as possible.
5. Place the shift lever into the park position.
6. Lock the adjuster block (2) in place by pushing in on the tab (1).
7. Inspect the shift lock control actuator for the following items:
 1. The shift lock control actuator must lock the shift lever clevis when the shift lever clevis is put into the park position.
 2. Depress the brake pedal to move the shift lever out of the park position.
 3. The actuator will be energized.
 4. Readjust the shift lock control actuator if needed.
8. Install the knee bolster. Refer to [**Instrument Panel Knee Bolster Replacement**](#) .

9. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .

DESCRIPTION AND OPERATION

AUTOMATIC TRANSMISSION SHIFT LOCK CONTROL DESCRIPTION AND OPERATION (WITHOUT T4Z)

The Automatic Transmission Shift Lock Control System is a safety device that prevents an inadvertent shift out of PARK when the engine is running. The driver must press the brake pedal before moving the shift lever out of the PARK position. The system consists of the following components:

- The Automatic Transmission Shift Lock Solenoid (serviced as the Automatic Transmission Shift Lock Actuator)
- The Body Control Module (BCM)
- The Engine Control Module (ECM)

The BCM controls the voltage to the shift lock control solenoid through the shift lock control solenoid controlled voltage circuit. The following conditions must be met before the BCM will supply voltage to the shift lock control solenoid:

- The ignition is in the ON position.
- The ECM sends an input via GMLAN serial data to the BCM when the Transmission Control Module (TCM) indicates the transmission is in the PARK position.
- The BCM receives a brake applied input from the stop lamp switch.

Since the shift lock control solenoid is permanently grounded, the BCM supplies voltage to the automatic transmission shift lock control solenoid, releasing the mechanical lock on the shift lever as the solenoid energizes. The energized solenoid allows the driver to move the shift lever out of the PARK position. When the brake pedal is not applied, the BCM turns the control voltage output of the shift lock control solenoid OFF, de-energizing the shift lock control solenoid. When the transmission is in the PARK position, the de-energized shift lock control solenoid will prevent shifting as the lever is mechanically locked in the PARK position.

During remote start operation the BCM will de-energize the automatic transmission shift lock control circuit, locking the shift lever in the PARK position.

AUTOMATIC TRANSMISSION SHIFT LOCK CONTROL DESCRIPTION AND OPERATION (WITH T4Z)

The Automatic Transmission Shift Lock Control System is a safety device that prevents an inadvertent shift out of PARK when the engine is running. Vehicles equipped with the Safety Belt Assurance System (RPO T4Z), the driver must press the brake pedal and have the driver and if present, the front outboard passenger safety belt(s) buckled before moving the park lever out of the PARK position. The system consists of the following components:

- The Automatic Transmission Shift Lock Solenoid (serviced as the Automatic Transmission Shift Lock Actuator)
- The Body Control Module (BCM)
- The Engine Control Module (ECM)
- The Inflatable Restraint Sensing and Diagnostic Module (SDM).

The BCM controls the voltage to the shift lock control solenoid through the shift lock control solenoid controlled voltage circuit. The following conditions must be met before the BCM will supply voltage to the shift lock control solenoid:

- The ignition is in the ON position.
- The ECM sends an input via GMLAN serial data to the BCM when the Transmission Control Module (TCM) indicates the transmission is in the PARK position.
- The BCM receives a brake applied input from the stop lamp switch.
- The SDM determines if the occupied driver and front outboard passenger, if present, have their safety belt(s) buckled.

Since the shift lock control solenoid is permanently grounded, the BCM supplies voltage to the automatic transmission shift lock control solenoid, releasing the mechanical lock on the shift lever as the solenoid energizes. The energized solenoid allows the driver to move the shift lever out of the PARK position. When the brake pedal is not applied, the BCM turns the control voltage output of the shift lock control solenoid OFF, de-energizing the shift lock control solenoid. When the transmission is in the PARK position, the de-energized shift lock control solenoid will prevent shifting as the lever is mechanically locked in the PARK position.

During remote start operation, the BCM will energize the shift lock control circuit, locking the shift lever in the PARK position.

Vehicles with the Safety Belt Assurance System, will display the following message "Shift Locked, Buckle Seatbelt" if the driver or front outboard passenger, if present, and safety belt(s) are not buckled. The vehicle will not shift out of PARK. Buckle the safety belt(s) to unlock the shifter.

This system may not allow the vehicle to shift out of PARK if an object such as a briefcase, handbag, grocery bag, laptop, or other electronic devices is on the front outboard passenger seat. If this happens, remove the object from the seat or buckle the safety belt.

Vehicles with the Safety Belt Assurance System, will display the following message "Shift Unlocked, Brake To Shift" if the system times out and allows the vehicle to be shifted out of PARK after 30 s following brake applied.

The Safety Belt Assurance System can be disabled with a calibration file update in the K36 Inflatable Restraint Sensing and Diagnostic Module using SPS. This procedure should only be done to help resolve a customer dissatisfaction issue.

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