

2010 Transmission

Shift Lock Control - Equinox & Terrain

SCHEMATIC AND ROUTING DIAGRAMS

SHIFT LOCK CONTROL SCHEMATICS

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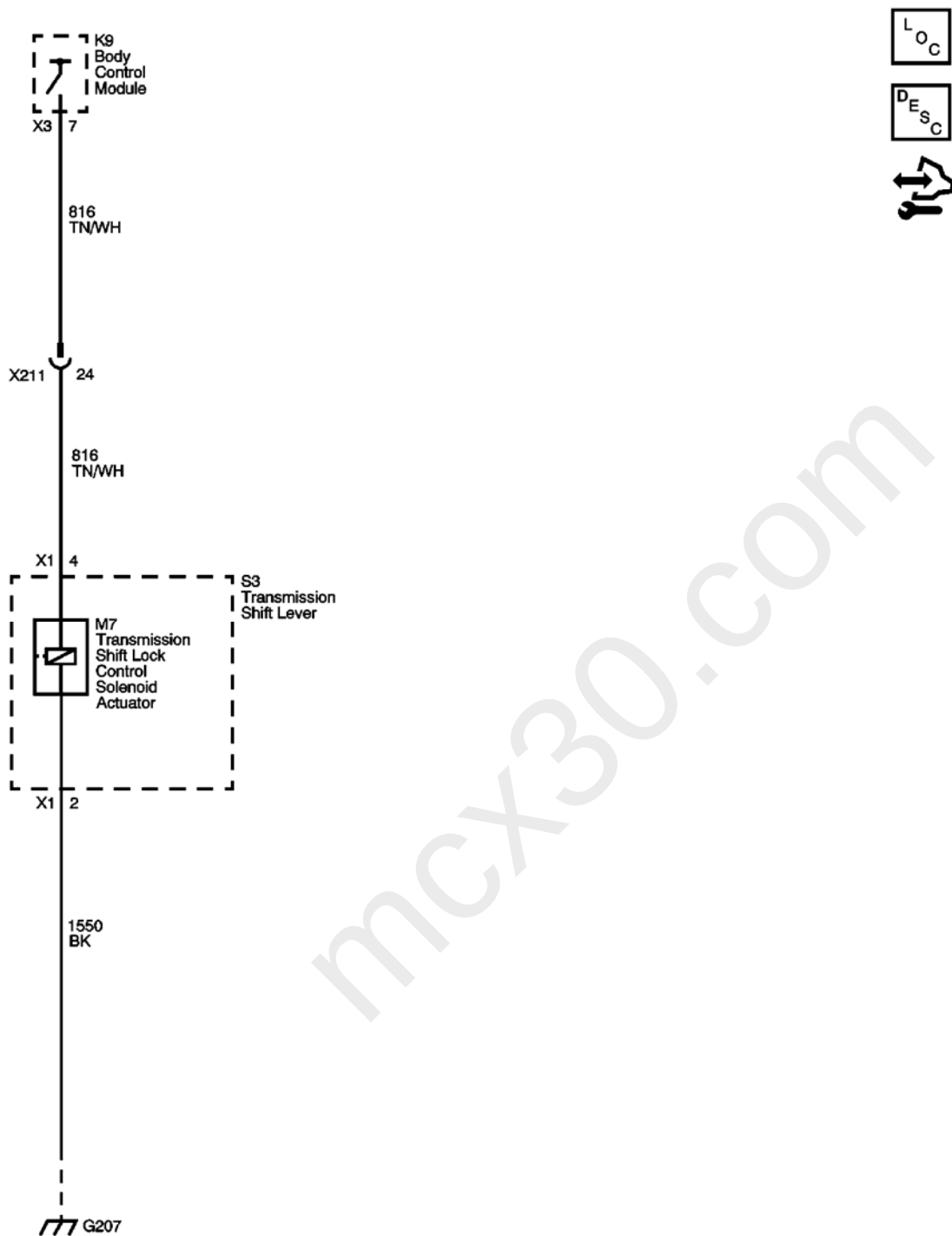


Fig. 1: Shift Lock Control

Courtesy of GENERAL MOTORS CORP.

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
DTC B270A	B270A 01: Park Lock Solenoid Control Circuit Short to Voltage B270A 02: Park Lock Solenoid Control Circuit Short to Ground B270A 04: Park Lock Solenoid Control Circuit Open

DTC B270A

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 B270A 01

Park Lock Solenoid Control Circuit Short to Voltage

DTC B270A 02

Park Lock Solenoid Control Circuit Short to Ground

DTC B270A 04

Park Lock Solenoid Control Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Control	B270A 02, 1	B270A 04, 1	B270A 01, 2	-
Ground	-	B270A 04, 1	-	-
1. Transmission shift control lever will not move from PARK with the brake pedal pressed. 2. Transmission shift control lever will move from PARK without the brake pedal pressed.				

Circuit/System Description

The body control module controls the automatic transmission park lock control solenoid by providing a battery positive voltage to the solenoid. The body control module controls the voltage supply circuit to the automatic transmission park lock control solenoid. The BCM monitors the voltage and current flow of the control circuit.

Conditions for Running the DTC

- The ignition switch is in the ON position.

- The brake pedal is pressed.
- The transmission is in the PARK position.
- The DTC runs continuously once the above conditions are met.

Conditions for Setting the DTC

B270A 01

The body control module detects a short to voltage in the automatic transmission park lock control solenoid control circuit for 1 second.

B270A 02

The body control module detects a short to ground in the automatic transmission park lock control solenoid control circuit for 1 second.

B270A 04

The body control module detects an open in the automatic transmission park lock control solenoid control circuit for 1 second.

Action Taken When the DTC Sets

The body control module will not attempt to enable the voltage supply circuit of the automatic transmission park lock control solenoid until the next key cycle.

Conditions for Clearing the DTC

- A current DTC B270A will clear when the malfunction is no longer present and the ignition switch is cycled.
- A history DTC will clear after 100 ignition cycles with no current DTC active during the 100 ignition cycles.

Reference Information

Schematic Reference

Shift Lock Control Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Automatic Transmission Shift Lock Control 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, observe the scan tool Brake Applied Output Signal parameter while pressing and releasing the brake pedal. The parameter should change from ON to OFF when the brake pedal is depressed.
 - If the parameter does not change, refer to **Stop Lamps Malfunction** .
2. While pressing the brake pedal, the vehicle operator should be able to move the shifter lever out of the park position.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the S3 shift lock actuator.
2. Ignition OFF, test for less than 1.0 ohms between the ground circuit terminal 2 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Install a test lamp between the ground circuit terminal 2 and the control circuit terminal 4.
4. Ignition ON, command the scan tool Shift Lock Solenoid Actuator ON and OFF. The test lamp should turn ON and OFF when changing between the commanded states.
 - If the test lamp is always ON, test the control circuit for short to voltage. If the circuit tests normal, replace the K9 body control module.
 - If the test lamp is always OFF, test the control circuit for short to ground or an open/high resistance. If the circuit tests normal, replace the K9 body control module.
5. If all circuits test normal, test or replace the S3 shift lock actuator.

Repair Procedures

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

- **Transmission Control Replacement**
- **Control Module References** for ECM replacement, setup, and programming

SYMPTOMS - AUTOMATIC TRANSMISSION SHIFT LOCK CONTROL

IMPORTANT: 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**.

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

TRANSMISSION CONTROL LEVER MALFUNCTION

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
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Ground	-	B270A 04, 1	-	-
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positive voltage to the solenoid. The body control module controls the voltage supply circuit to the automatic transmission park lock control solenoid. The BCM monitors the voltage and current flow of the control circuit.

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Shift Lock Control Schematics

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- **Wiring Repairs**

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Control Module References for scan tool information

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1. Ignition ON, observe the scan tool Brake Applied Output Signal parameter while pressing and releasing the brake pedal. The parameter should change from ON to OFF when the brake pedal is depressed.
 - If the parameter does not change, refer to **Stop Lamps Malfunction** .
2. While pressing the brake pedal, the vehicle operator should be able to move the shifter lever out of the park position.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the S3 shift lock actuator.
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 - If the test lamp is always ON, test the control circuit for short to voltage. If the circuit tests normal,

replace the K9 body control module.

- If the test lamp is always OFF, test the control circuit for short to ground or an open/high resistance. If the circuit tests normal, replace the K9 body control module.

5. If all circuits test normal, test or replace the S3 shift lock actuator.

Repair Procedures

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

- **Transmission Control Replacement**
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DESCRIPTION AND OPERATION

AUTOMATIC TRANSMISSION SHIFT LOCK CONTROL DESCRIPTION AND OPERATION

The automatic transmission park lock control system is a safety device that prevents an inadvertent shift out of PARK. The driver must press the brake pedal before moving the park lever out of the PARK position. The system consists of the following components:

- The automatic transmission park lock solenoid (serviced as the automatic transmission shift lock actuator), is located within the floor shift control assembly.
- The body control module, which controls the voltage supply circuit of the park lock control solenoid.
- The engine control module.

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

- The ignition is in the ON position.
- The engine control module sends an input via GMLAN serial data to the body control module indicating the transmission is in the PARK position.
- The body control module determines the brake pedal is applied according the brake pedal position.

Since the park lock control solenoid is permanently grounded, the body control module supplies voltage to the automatic transmission park lock control solenoid, unlocking the park lever allowing the driver to move the park lever out of the PARK position as the solenoid energizes. When the brake pedal is not applied, the body control module turns the control voltage output of the park lock control solenoid OFF, de-energizing the park lock control solenoid. The de-energized solenoid mechanically locks the park lever in the PARK position.