

C0635, C0638, C0640, C0643, C0249, or C0250 The EBCM uses this information to provide improved rough-road braking performance

Circuit Description

The electronic suspension control (ESC) module estimates the road surface and communicates that information to the electronic brake control module (EBCM). The ESC module provides a pulse width modulation (PWM) signal to the EBCM through the left and right normal force signal circuits. The ESC module sends each normal force value twice to the EBCM. The possible values of the PWM duty cycle are 20 percent, 40 percent, 60 percent and 80 percent, with the valid range from 10–90 percent. The EBCM uses this information to provide improved rough-road braking performance.

Conditions for Running the DTC

The ignition is ON.

Conditions for Setting the DTC

DTC C0635 or C0640

The DTC is set when the ESC module measures a feedback voltage less than a preset value during five consecutive normal force signal output OFF state tests.

DTC C0638 or C0643

The DTC is set when the ESC module measures a feedback voltage greater than a preset value during five consecutive normal force signal output ON state tests.

DTC C0249 or C0250

The DTC is set if one of the following conditions is present for 5 seconds of any 10 second period:

- The PWM duty cycle is outside the valid range of 10–90 percent.

- The PWM duty cycle value does not match either the previous or the next PWM duty cycle value.

Action Taken When the DTC Sets

- Both the left and right normal force outputs are set to default output states.
- The EBCM disables the rough road detection function for the duration of the ignition cycle.

Conditions for Clearing the MIL/DTC

- The scan tool can be used to clear the DTC.
- The DTC is saved as history when the ESC module no longer sees an out of range feedback voltage during five consecutive normal force OFF states. The DTC will clear if the fault does not return after 50 consecutive ignition cycles.

Diagnostic Aids

- The DTC may be caused by an open or a short in the normal force signal circuit. Refer to Circuit Testing on page 8-1184 in Wiring Systems.
- The DTC may be caused by a poor connection at the EBCM or ESC module connectors. Refer to Testing for Intermittent and Poor Connections on page 8-1187 in Wiring Systems.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

2. This step tests for a valid duty cycle in the normal force signal circuit.
3. This step tests for normal voltage in the normal force signal circuit.

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Step	Action	Value(s)	Yes	No
Schematic Reference: Suspension Controls Schematics on page 3-133				
1	Did you perform the Electronic Suspension Control (ESC) Diagnostic System Check?	—	Go to Step 2	Go to Diagnostic System Check - Electronic Suspension Control on page 3-143

Step	Action	Value(s)	Yes	No
2	<p>1. Install a scan tool.</p> <p>2. Start the engine. 3. Observe the Front Normal Force parameter in the VSES/ESC data list.</p> <p>Does the scan tool display within the specified range?</p>	10–90%	Go to Testing for Intermittent and Poor Connections on page 8-1187 in Wiring Systems	Go to Step 3
3	<p>1. Turn OFF the ignition.</p> <p>2. Disconnect the ESC module connector.</p> <p>3. Turn ON the ignition, with the engine OFF.</p> <p>4. Measure the voltage from the normal force signal circuit to a good ground.</p> <p>Does the voltage measure greater than the specified value?</p>	B+	Go to Step 5	Go to Step 4
4	<p>Test the normal force signal circuit for high resistance, a short to ground, or an open. Refer to Circuit Testing on page 8-1184 and Wiring Repairs on page 8-1189 in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	—	Go to Step 10	Go to Step 6
5	<p>Test the normal force signal circuit for a short to voltage. Refer to Circuit Testing on page 8-1184 and Wiring Repairs on page 8-1189 in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	—	Go to Step 10	Go to Step 7

Step	Action	Value(s)	Yes	No
6	Inspect for poor connections at the harness connector of the electronic brake control module (EBCM). Refer to Testing for Intermittent and Poor Connections on page 8-1187 and Connector Repairs on page 8-1198 in Wiring Systems. Did you find and correct the condition?	—	Go to Step 10	Go to Step 9
7	Inspect for poor connections at the harness connector of the ESC module. Refer to Testing for Intermittent and Poor Connections on page 8-1187 and Connector Repairs on page 8-1198 in Wiring Systems. Did you find and correct the condition?	—	Go to Step 10	Go to Step 8
8	Replace the EBCM. Refer to Electronic Brake Control Module (EBCM) Replacement on page 5-254 in Antilock Brake System. Did you complete the replacement?	—	Go to Step 10	—
9	Replace the ESC module. Refer to Electronic Suspension Control Module Replacement on page 3-167. Did you complete the replacement?	—	Go to Step 10	—
10	1. Use the scan tool in order to clear the DTCs. 2. Operate the vehicle within the Conditions for Running the DTC as specified in the supporting text. Does the DTC reset?	—	Go to Step 2	System OK