

C0577 C0579 C0582 C0584 C0587 C0589 C0592 or C0594 The preset PWM command can be either an OFF or ON state duty cycle

Circuit Description

The strut actuator is controlled by the electronic suspension control (ESC) module with a pulse-width modulation (PWM) signal. Switching the voltage ON and OFF at a high frequency (2.0 kHz), or pulse width modulating, controls the amount of current delivered to the actuator. By controlling the amount of current to the actuator the ESC module controls the damping force in the strut. A higher level of damping force is achieved by providing correspondingly higher current levels, relating to higher percentages of PWM duty cycle. The default damper state, which is no battery voltage, is one that provides a minimum damping force. The ESC module periodically commands each strut actuator to a preset PWM duty cycle in order to override the normal PWM command. During this preset PWM duty cycle, the ESC module is able to perform a diagnostic test on each strut actuator to determine if a malfunction is present. The preset PWM command can be either an OFF or ON state duty cycle.

C0577, C0582, C0587, or C0592

DTC C0577, C0582, C0587, or C0592 the following must be present:
The ESC module must first command the strut actuator ON. If the voltage detected in the damper control circuit during the ON state is less than a preset value, the DTC will be set immediately.

C0579, C0584, C0589, or C0594

In order to test for the conditions that set the DTC C0579, C0584, C0589, or C0594 the following must be present:
The ESC module must first command the solenoid ON. If the voltage detected in the damper control circuit during the ON state is between 2 preset values, the test is repeated. If the ESC module again detects voltage between two preset values, a DTC will be set.

C0579, C0584, C0589, or C0594

The following conditions must be present to run the DTC:

- The ignition is ON.
- The ESC module is in command ON state.

C0577, C0582, C0587, or C0592

The following conditions must be present to run the DTC:

- The SERVICE SUSPENSION SYS and SPEED LIMITED TO XXX messages will be displayed.
- ALL the strut actuators will be disabled by commanding 0 percent PWM duty cycle.
- The damper relay control switch will be opened and the damper relay de-energized.
- The vehicle speed will be limited.
- The vehicle ride will be soft.

DTC C0579, C0584, C0589, or C0594

The following conditions must be present to set the DTC:

- The ESC module detects voltage between two preset values during two consecutive ON state tests.
- The fault is detected during three consecutive ignition cycles, or during the same ignition cycle after clearing the DTC with a scan tool.

Action Taken When the DTC Sets

DTC C0579, C0584, C0589, or C0594

- The SERVICE SUSPENSION SYS message will be displayed.
- ALL the strut actuators will be disabled by commanding 0 percent PWM duty cycle.
- The vehicle ride will be soft.

DTC C0577, C0582, C0587, or C0592

The following conditions must be present to run the DTC:

- The SERVICE SUSPENSION SYS and SPEED LIMITED TO XXX messages will be displayed.
- ALL the strut actuators will be disabled by commanding 0 percent PWM duty cycle.
- The damper relay control switch will be opened and the damper relay de-energized.
- The vehicle speed will be limited.
- The vehicle ride will be soft.

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 detects the fault during two consecutive diagnostic tests. The DTC will clear if the fault does not return after 50 consecutive ignition cycles.

Diagnostic Aids

If the DTC is a history DTC, the fault may be intermittent. 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.

3. Tests for short to ground and short to B+ on the control circuit.

4. Tests for continuity from the ESC module on the control circuit and the low reference circuit.

DTC C0577, C0579, C0582, C0584, C0587, C0589, C0592, or C0594

Step	Action	Value(s)	Yes	No
Schematic Reference: Suspension Controls Schematics on page 3-133 Connector End View Reference: Suspension Controls Connector End Views on page 3-139				
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
2	1. Disconnect the strut actuator connector. 2. Measure the resistance of the strut actuator. Does the resistance measure within the specified value?	0.5–2.0 W	Go to Step 3	Go to Step 7
3	Test the damper control circuit of the actuator for a short to ground and short to battery. Refer to Circuit Testing on page 8-1184 and Wiring Repairs on page 8-1189 in Wiring Systems. Did you find and correct the condition?	—	Go to Step 9	Go to Step 4

Step	Action	Value(s)	Yes	No
4	<p>1. Disconnect the ESC module. 2. Check continuity from the ESC module to the damper actuator connector on both the control circuit and the reference low circuit. Refer to Circuit Testing on Wiring Systems.</p> <p>Did you find and correct the condition?</p>	—	Go to Step 9	Go to Step 5
5	<p>Inspect for poor connections at the actuator. Refer to Testing for Intermittent and Poor Connections on page 8-1187 and Connector Repairs on page 8-1198 in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	—	Go to Step 9	Go to Step 6
6	<p>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.</p> <p>Did you find and correct the condition?</p>	—	Go to Step 9	Go to Step 8
7	<p>Replace the strut/shock absorber. Refer to Shock, Shock Component, and/or Spring Replacement on page 3-42 in Front Suspension or Shock Absorber Replacement on page 3-63 in Rear Suspension.</p> <p>Did you complete the replacement?</p>	—	Go to Step 9	—

Step	Action	Value(s)	Yes	No
8	Replace the ESC module. Refer to Electronic Suspension Control Module Replacement on page 3-167. Did you complete the replacement?	—	Go to Step 9	—
9	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

LAUNCH