

C0186 or C0187 The brake pedal pulsates at a higher frequency during VSES activation

Circuit Description

The vehicle stability enhancement system (VSES) is activated by the EBCM calculating the desired yaw rate and comparing it to the actual yaw rate input. The desired yaw rate is calculated from measured steering wheel position, vehicle speed, and lateral acceleration. The difference between the desired yaw rate and actual yaw rate is the yaw rate error, which is a measurement of oversteer or understeer. If the yaw rate error becomes too large, the EBCM will attempt to correct the vehicle's yaw motion by applying differential braking to the left or right front wheel. The amount of differential braking applied to the left or right front wheel is based on both the yaw rate error and side slip rate error. The side slip rate error is a function of the lateral acceleration minus the product of the yaw rate and vehicle speed. The yaw rate error and side slip rate error are combined to produce the total delta velocity error. When the delta velocity error becomes too large and the VSES system activates, the drivers steering inputs combined with the differential braking will attempt to bring the delta velocity error toward zero. The VSES activations generally occur during aggressive driving, in the turns or bumpy roads without much use of the accelerator pedal. When braking during VSES activation, the brake pedal will feel different than the ABS pedal pulsation. The brake pedal pulsates at a higher frequency during VSES activation.

Conditions for Running the DTC

C0186 00, 09, and 1A

- The ignition is ON.
- The ignition voltage is greater than 8 volts.

C0186 08

- The ignition is ON.
- The ignition voltage is greater than 8 volts.
- The vehicle speed is greater than 0 km/h (0 mph).

C0186 19

- The ignition is ON.

- The ignition voltage is greater than 8 volts.
- The vehicle is stopped.

C0186 52

- The ignition is ON.
- The ignition voltage is greater than 8 volts.
- DTC C0196 is not set.
- The yaw rate is less than 8 degrees per second.

Conditions for Setting the DTC

C0186 00

One of the following conditions exist:

- The lateral accelerometer sensor input voltage is less than 0.15 volts.
- The lateral accelerometer sensor input voltage is greater than 4.85 volts for 0.03 seconds.

C0186 08

The lateral accelerometer voltage does not increase at least 0.5 volts during the lateral accelerometer sensor self test.

C0186 09

The lateral jerk exceeds 11 g per second twice within 0.2 seconds.

C0186 19

The lateral acceleration is greater than 0.5 g for more than 1 second.

C0186 1A

Both of the following conditions exist:

- The compensated bias value of the lateral accelerometer sensor is greater than 0.3 g.
- The yaw rate is centered.

C0186 52

The slip rate error exceeds 0.5 g 60 times within one drive cycle.

Action Taken When the DTC Sets

- The EBCM disables the VSES for the duration of the ignition cycle.
- The DIC displays the Service Stability System message.
- The ABS/TCS remains functional.

Conditions for Clearing the DTC

- The condition for the DTC is no longer present and the DTC is cleared with a scan tool.
- The EBCM automatically clears the history DTC when a current DTC is not detected in 100 consecutive drive cycles.

Diagnostic Aids

The following conditions can cause this concern:

- Improper steering alignment.
- Open, short to ground, or short to voltage.
- Internal lateral accelerometer failure.
- EBCM internal failure.

Test Description

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

3. Tests for the proper operation of the circuit in the low voltage range.
4. Tests for the proper operation of the circuit in the high voltage range. If the fuse in the jumper opens when you perform this test, the signal circuit is shorted to ground.
5. Tests for a short to voltage in the 5 volt reference circuit.
6. Tests the bias voltage of the lateral accelerometer sensor.

Step	Action	Values	Yes	No
Schematic Reference: ABS Schematics on page 5-155 Connector End View Reference: ABS Connector End Views on page 5-167				
1	Did you perform the ABS Diagnostic System Check?	—	Go to Step 2	Go to Diagnostic System Check -ABS

Step	Action	Values	Yes	No
2	<ol style="list-style-type: none"> 1. Install a scan tool. 2. Turn ON the ignition, with the engine OFF. 3. With a scan tool, observe the Lateral Accelerometer Input parameter in the VSES data list. <p>Does the scan tool display that the Lateral Accelerometer Input parameter is within the specified range?</p>	0.15–4.85 V	Go to Step 6	Go to Step 3
3	<ol style="list-style-type: none"> 1. Turn OFF the ignition. 2. Disconnect the lateral accelerometer sensor connector. 3. Turn ON the ignition, with the engine OFF. 4. With the scan tool, observe the Lateral Accelerometer Input parameter. <p>Does the scan tool display that the Lateral Accelerometer Input parameter is less than the specified value?</p>	0.15 V	Go to Step 4	Go to Step 10
4	<ol style="list-style-type: none"> 1. Turn OFF the ignition. 2. Connect a 3 amp fused jumper wire between the 5 volt reference circuit of the lateral accelerometer sensor and the signal circuit of the lateral accelerometer sensor. 3. Turn ON the ignition, with the engine OFF. 4. With the scan tool, observe the Lateral Accelerometer Input parameter. <p>Does the scan tool display that the Lateral Accelerometer Input parameter is greater than the specified value?</p>	4.85 V	Go to Step 5	Go to Step 8

Step	Action	Values	Yes	No
5	<p>1. Disconnect the fused jumper wire.</p> <p>2. Measure the voltage between the 5 volt reference circuit of the lateral accelerometer sensor and the low reference circuit of the lateral accelerometer.</p> <p>Does the voltage measure less the specified value?</p>	5V	Go to Step 12	Go to Step 7
6	<p>Does the scan tool display that the Lateral Accelerometer Input parameter is within the specified range?</p>	2.3–2.7 V	Go to Diagnostic Aids	Go to Step 11
7	<p>Test the 5 volt reference circuit of the lateral accelerometer sensor for a short to voltage. Refer to Circuit Testing on page 8-1184 and Wiring Repairs in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	—	Go to Step 16	Go to Step 13
8	<p>Test the 5 volt reference circuit of the lateral accelerometer sensor for the following conditions:</p> <ul style="list-style-type: none"> • An open • A short to ground • A high resistance Refer to Circuit Testing and Wiring Repairs in Wiring Systems. <p>Did you find and correct the condition?</p> 	—	Go to Step 16	Go to Step 9
9	<p>Test the signal circuit of the lateral accelerometer sensor for the following conditions:</p> <ul style="list-style-type: none"> • An open • A short to ground • A high resistance Refer to Circuit Testing and Wiring Repairs in Wiring Systems. <p>Did you find and correct the condition?</p> 	—	Go to Step 16	Go to Step 13

Step	Action	Values	Yes	No
10	<p>Test the signal circuit of the lateral accelerometer sensor for a short to voltage. Refer to Circuit Testing and Wiring Repairs in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	—	Go to Step 16	Go to Step 13
11	<ol style="list-style-type: none"> 1. Disconnect the EBCM harness connector. 2. Install the J 39700 universal pinout box using the J 39700-300 cable adapter to the EBCM harness connector only. 3. Test the low reference circuit of the lateral accelerometer sensor for a high resistance or an open. Refer to Circuit Testing and Wiring Repairs in Wiring Systems. <p>Did you find and correct the condition?</p>	—	Go to Step 16	Go to Step 12
12	<p>Inspect for poor connections at the harness connector of the lateral accelerometer sensor. Refer to Testing for Intermittent and Poor Connections and Connector Repairs in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	—	Go to Step 16	Go to Step 14
13	<p>Inspect for poor connections at the harness connector of the EBCM. Refer to Testing for Intermittent and Poor Connections and Connector Repairs in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	—	Go to Step 16	Go to Step 15

Step	Action	Values	Yes	No
14	Replace the yaw rate/lateral accelerometer sensor. Refer to Yaw Rate Sensor/Lateral Accelerometer Replacement. Did you complete the repair?	—	Go to Step 16	—
15	Replace the EBCM. Refer to Electronic Brake Control Module (EBCM) Replacement Did you complete the repair?	—	Go to Step 16	—
16	1. Clear the DTCs using the scan tool. 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