DL: Vehicle Speed Sensor (VSS)

DL: Introduction

DL1 DTC P0500: CHECK CONTINUITY OF VSS HARNESS CIRCUITS

Diagnostic Trouble Code (DTC) P0500 indicates that a VSS malfunction has been detected.

Note: Delayed engagement or no vehicle movement may be caused by a transmission concern. Harsh shifts and/or erratic speedometer may be caused by a failed speedometer or an open or intermittent ground within the instrument panel on vehicles with electronic readout.

Possible causes:

- Open in VSS (+)/VSS (-) harness circuit
- Short to GND or SIG RTN in VSS (+)/VSS (-) harness circuit
- Short to PWR in VSS (+)/VSS (-) harness circuit
- Damaged VSS
- Damaged PCM

- Key off.
- Disconnect PCM. Inspect for damaged or pushed out pins, corrosion, loose wires, etc. Service as necessary.
- Install breakout box, PCM disconnected.
- Disconnect VSS.
- Measure resistance between Test Pin 58 [VSS (+)] at the breakout box and VSS (+) circuit at the VSS vehicle harness connector.
- Measure resistance between Test Pin 33 [VSS (-)] at the breakout box and VSS (-) circuit at the VSS vehicle harness connector.

Is each resistance less than 5.0 ohms?

Yes	No
GO to DL2 .	SERVICE open in harness circuit. REMOVE breakout box. RECONNECT all components. RESTORE vehicle. CLEAR DTCs and RETEST.

DL2 CHECK VSS HARNESS CIRCUITS FOR SHORTS TO GROUND, SIG RTN AND POWER

- Key off.
- VSS disconnected.
- Breakout box installed, PCM disconnected.
- Measure resistance between Test Pin 58 [VSS (+)] and Test Pins 24, 61, 76 and 103 (PWR GND).
- Measure resistance between Test Pin 58 [VSS (+)] and Test Pin 33 [VSS (-)].
- Measure resistance between Test Pin 58 [VSS (+)] and Test Pin 91 (SIG RTN).
- Measure resistance between Test Pin 58 [VSS (+)] and Test Pin 71 (VPWR).
- Measure resistance between Test Pins 33 [VSS (-)] and 71 (VPWR) at the breakout box.

Is each resistance greater than 10,000 ohms?

Yes	No
	SERVICE short circuit. REMOVE the breakout box.

GO to DL3 .	RECONNECT all components. RESTORE vehicle. CLEAR DTCs and RETEST.

DL3 CHECK VSS RESISTANCE

- Key off.
- VSS disconnected.
- Measure the resistance of the VSS.

Is resistance between 190 and 250 ohms?

Yes	No
GO to DL4 .	REPLACE the VSS. REMOVE breakout box. RECONNECT the PCM. RESTORE vehicle. CLEAR DTCs and RETEST.

DL4 CHECK VSS SIGNAL OUTPUT

- VSS connected.
- Breakout box installed, PCM connected.
- Install scan tool and set to frequency count with an amplitude of 2 volts.
- Measure the frequency between PCM Test Pin 33 and PCM Test Pin 58.
- Road test the vehicle while monitoring the VSS signal frequency.

Does the change in VSS frequency correspond to the change in vehicle speed?

Yes	No
REMOVE the breakout box. RECONNECT all components. CLEAR DTCs and RETEST. If DTC P0500 is present again, REPLACE PCM.	REPLACE the VSS. REMOVE breakout box. RECONNECT the PCM. RESTORE vehicle. CLEAR DTCs and RETEST.

DL5 DTC P0500: CHECK THE SPEEDOMETER OPERATION

Note: For F-Superduty/Excursion the vehicle speed signal is provided by the anti-lock brake system (ABS) module.

Possible causes:

- vehicle speed circuit (VSC) open
- PCM

- Check the vehicle speedometer for correct operation.

Does the speedometer operate correctly?

Yes	No
GO to DL6 .	REFER to Workshop Manual Section 413.

DL6 CHECK FOR CONTINUITY OF THE SPEED SIGNAL CIRCUIT

- Key off.
- Disconnect PCM.
- Disconnect the ABS module.
- Measure resistance between the PCM pin 58, harness side and the ABS module pin 16 (Early Build) or pin 11 (Late Build), harness side.

Is the resistance less than 5.0 ohms?

Yes	No
RECONNECT all components. CLEAR DTCs and RETEST. If DTC P0500 is present again, REPLACE PCM.	SERVICE open in harness circuit. RECONNECT all components. RESTORE vehicle. CLEAR DTCs and RETEST.

DL10 KOER DTC P1501: CHECK PCM VSS PID FOR INPUT SIGNAL

Diagnostic Trouble Code (DTC) P1501 indicates the VSS input signal is out of Self Test range.

Note: When the PCM detects a VSS input signal any time during KOER testing, a DTC P1501 will be set and the testing will abort.

Possible causes:

- Noisy VSS input signal from RFI/EMI external sources such as ignition wires or charging circuit as examples.

- Start the engine and idle in neutral.
- Access the VSS PID with a scan tool and observe for vehicle speed input to the PCM.
- Increase the engine speed, not greater than 2000 rpm, several times while observing the VSS PID.

Is the reading on the VSS PID less than 5 km/h (3 mph)?

Yes	No
Unable to duplicate or identify a fault at this time. RESTORE vehicle. CLEAR DTCs and RETEST.	GO to DL13 .

DL11 DTC P0503: INSPECT VSS AND CIRCUIT FOR AN INTERMITTENT

Continuous Memory DTC P0503 indicates poor VSS performance.

Possible causes:

- Noisy VSS input signal from RFI/EMI external sources such as ignition wires or charging circuit as examples.
- Damaged VSS or driven gears.
- Damaged wiring harness or connectors.

- Check for harness intermittents.
  - Pins properly seated in connector shell; wiring properly crimped; no corrosion; sensor securely mounted.

Are there any indications of harness intermittents?

Yes	No
SERVICE as necessary. RESTORE vehicle. CLEAR DTCs and RETEST.	GO to DL12 .

DL12 CHECK PCM VSS PID FOR INPUT SIGNAL

- Access the VSS PID with a scan tool.
- Drive the vehicle at several steady state speeds above and below 50 km/h (30 mph).
- During each steady state speed observe the VSS PID for variations of (+) or (-) 8 km/h (5 mph) for greater than 10 seconds.

  Note: For scan tools which have Data Record feature, recording data for playback may help in identifying variations easier.

Were there any indications of a noisy or intermittent signal with the VSS PID?

Yes	No
GO to DL13 .	Unable to duplicate or identify a fault at this time. DTC P0503 may have been set from sources external to the vehicle. SERVICE any other DTCs. RESTORE vehicle. CLEAR DTCs and RETEST.

DL13 CHECK VSS HARNESS ROUTING

- Check VSS harness routing.
  - Verify that the harness is not routed adjacent to high current wires, i.e., ignition wires or alternator wiring.
  - Verify VSS harness is shielded and grounded, if applicable.
  - Check continuity of the VSS harness; GO to DL1 .

Are any problems evident?

Yes	No
SERVICE as necessary. RESTORE vehicle. CLEAR DTCs and RETEST.	Unable to duplicate or identify a fault at this time. RERUN Quick Test.