JA: Vehicle Speed Sensor

JA: Introduction

JA1 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 JA2 .	SERVICE open in harness circuit. REMOVE breakout box. RECONNECT all components. RESTORE vehicle. CLEAR DTCs and RETEST.

JA2 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 Pins 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 500 ohms?

Yes	No
GO to JA3	SERVICE short circuit. REMOVE the breakout box. RECONNECT all components. RESTORE vehicle. CLEAR DTCs and RETEST.

JA3 CHECK VSS RESISTANCE

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

Is resistance between 190 and 250 ohms?

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

JA4 DTC P0500: CHECK VSS SIGNAL OUTPUT TO POWERTRAIN CONTROL MODULE (PCM)

- 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, VPWR, PWR GND harness circuit.
  - Short to GND in VSS harness circuit.
  - Short to PWR in VSS harness circuit.
  - Damaged VSS.
  - Damaged PCM.
- Key off.
- Disconnect Powertrain Control Module (PCM). Inspect for damaged or pushed out pins, corrosion, loose wires, etc. Service as necessary.
- Install scan tool and set to frequency count with an amplitude of 2 volts.
- From a stop, accelerate to 48 km/h (30 mph).
- The frequency reading should increase to a reading between 45-85 HTZ.

Is the VSS output within specification?

Yes	No
GO to JA5 .	REPLACE the VSS. RESTORE vehicle. CLEAR DTCs and RETEST.

JA5 CHECK THE BATTERY VOLTAGE TO VSS

- Key off.
- Disconnect VSS.
- Key on.
- Measure voltage at VPWR pin to GND pin at the VSS vehicle harness connector.

Is the voltage greater than 10.5 volts?

Yes	No

GO to JA6 .	GO to JA9 .

JA6 CHECK VSS CIRCUIT SHORT TO POWER

- VSS disconnected.
- Key on, PCM disconnected.
- Measure voltage between Test Pin 58 and Test Pin 103 at the breakout box.

Is the voltage less than 1.0 volt?

Yes	No
GO to JA7 .	SERVICE short to power. REMOVE breakout box. RECONNECT all components. RESTORE vehicle. CLEAR DTCs and RETEST.

JA7 CHECK VSS CIRCUIT SHORT TO GROUND

- Key off.
- VSS disconnected.
- Measure resistance between Test Pin 58 and Test Pin 103 at breakout box.

Is resistance greater than 3,000 ohms?

Yes	No
GO to JA8 .	SERVICE short to ground. REMOVE breakout box. RECONNECT all components. RESTORE vehicle. CLEAR DTCs and RETEST.

JA8 CHECK CONTINUITY OF VSS HARNESS CIRCUIT

- Key off, VSS disconnected.
- PCM disconnected.
- Measure resistance between Test Pin 58 at the breakout box and the VSS circuit at the VSS vehicle harness connector.

Is resistance less than 5.0 ohms?

Yes	No
REPLACE VSS. REMOVE the breakout box. RECONNECT all components. RESTORE vehicle. CLEAR DTCs and RETEST.	SERVICE open circuit. REMOVE the breakout box. RECONNECT all components. RESTORE vehicle. CLEAR DTCs and RETEST.

JA9 CHECK CONTINUITY OF VSS GROUND HARNESS CIRCUIT

- Key off, VSS disconnected.
- PCM disconnected.
- Measure resistance between GND Pin at the VSS vehicle harness connector and chassis ground.

Is resistance less than 5.0 ohms?

Yes	No
SERVICE open VPWR to VSS. REMOVE breakout box. RECONNECT all components. RESTORE vehicle. CLEAR DTCs and RETEST.	SERVICE open VSS GND circuit. REMOVE breakout box. RECONNECT all components. RESTORE vehicle. CLEAR DTCs and RETEST.

JA10 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 3 mph (5 km/h)?

Yes	No
Unable to duplicate or identify a fault at this time. RESTORE vehicle. CLEAR DTCs and RETEST.	GO to JA13 .

JA11 DTC P0502: INSPECT VSS AND CIRCUIT FOR AN INTERMITTENT

- Continuous Memory DTC P0502 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 JA12 .

JA12 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 JA13 .	Unable to duplicate or identify a fault at this time. DTC P0502 may have been set from sources external to the vehicle. SERVICE any other DTCs. RESTORE vehicle. CLEAR DTCs and RETEST.

JA13 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 JA1 .

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.