

DTC P0500: VEHICLE SPEED SENSOR (VSS) MALFUNCTION (ES 300 & HIGHLANDER)

CAUTION: If ECM replacement is instructed in following testing, always ensure ECM harness connector and ground circuit are okay. If either are suspect, repair and repeat testing to confirm ECM malfunction. If ECM is replaced, ECM must be programmed with proper ignition key code for engine immobilizer system. For programming procedures, see **COMPUTER RELEARN PROCEDURES** article in **GENERAL INFORMATION**.

NOTE: For circuit reference, see **CONNECTOR IDENTIFICATION** and/or **WIRING DIAGRAMS**.

Circuit Description

Anti-Lock Brake System (ABS) wheel speed sensors detect wheel speed and sends signals to ABS ECU. The ABS ECU converts signals into a 4-pulse signal and outputs signal to instrument cluster. Instrument cluster converts signal to a more precise waveform and outputs signal to ECM. ECM determines vehicle speed based on frequency of these pulse signals. DTC is set when ECM does not detect any VSS signal while vehicle is in motion. Possible causes are:

- Faulty wheel speed sensors.
- Open or short in VSS circuit.
- Faulty instrument cluster.
- Faulty ECM.

Diagnosis & Repair

1. Test drive vehicle and check operation of speedometer. If speedometer is not operating correctly, repair speedometer as necessary. See appropriate **INSTRUMENT PANELS** article in **ACCESSORIES & EQUIPMENT**. If speedometer is operating correctly, go to next step.
2. Raise and support front of vehicle. Shift transmission into Neutral. Access ECM behind glove box. Using DVOM, backprobe terminal No. 22 at appropriate ECM connector. Turn ignition on. Slowly rotate a drive wheel while observing voltage on DVOM. Voltage should fluctuate from zero volts to 4.5-5.5 volts as wheel is turned. If voltage is not as specified, locate and repair open/short circuit between terminal No. 22 at ECM harness connector and appropriate instrument cluster connector. If voltage is as specified, go to next step.
3. Check for loose or poor connection at ECM connector E8. Repair as necessary. If connection is okay, replace ECM and retest system. See appropriate **REMOVAL, OVERHAUL & INSTALLATION** article in **ENGINE PERFORMANCE**.

Diagnostic Aids

Using scan tool, read freeze frame data. Freeze frame records will indicate engine conditions when malfunction is detected.