90 ENGINE SENSOR HARNESS

90.1 DESCRIPTION OF ENGINE SENSOR HARNESS

Referral to this section indicates a fault within the Engine Sensor Harness affecting signals of various sensors used by the DDEC system.

90.2 TROUBLESHOOTING ENGINE SENSOR HARNESS

The following procedure will troubleshoot the engine sensor harness.

90.2.1 Check for Low Battery Voltage

Perform the following steps to check for low battery voltage.

1. Plug in the diagnostic data reader (DDR).
   [a] If flash code 168/1 is logged, refer to section 46.3.
   [b] If flash codes 168/1 is not logged, refer to section 90.2.2.

90.2.2 Check for +5 Volts

Perform the following steps to check for +5 volts.

1. Turn vehicle ignition switch OFF.
2. Disconnect the Oil Pressure Sensor (OPS) and Turbo Boost Sensor (TBS) connectors.
3. If applicable, disconnect the Fuel Pressure Sensor (FPS).
4. Turn vehicle ignition switch ON.
5. At each sensor harness connector, measure voltage between socket C (red lead) and socket A (black lead).
   [a] If the voltage measurement is between 4.7 and 5.2 volts, the voltage reading is correct. Check voltage at the next connector. If all connector voltage readings are correct, refer to section 90.2.3.
   [b] If the voltage measurement is less than 4.7 volts at any or all connectors, refer to section 90.2.4.
   [c] If the voltage measurement is greater than 5.2 volts at all connectors, refer to section 90.2.6.

90.2.3 Check ECM Connectors

Perform the following steps to check the ECM connectors.

1. Check terminals at the ECM engine harness connector (both the ECM and harness side) for damaged, bent, corroded and unseated pins or sockets.
   [a] If the terminals and connectors are not damaged, check all sensors, especially OPS, TBS, and TPS (on vehicle system), this indicates that there is no problem on the engine sensor harness. Refer to section 91.1.
   [b] If the terminals and connectors are damaged, repair them. Refer to section 90.2.7.

90.2.4 Check for +5 volts or Return Open

Perform the following steps to check for +5 volts or return open.

1. Turn vehicle ignition switch OFF.
2. Disconnect the engine harness connector at the ECM.
3. Install a jumper wire between sockets A and C of any sensor connector that reads less than 4.7 volts. Refer to section 90.2.2.
4. Measure resistance between sockets W1 and Y2 of the engine harness connector.
   [a] If the resistance measurement is less than or equal to 5 Ω, refer to section 90.2.5.
   [b] If the resistance measurement is greater than 5 Ω or open, either the engine +5 volt line (#416), or the return line (#452) is open. Repair the open and refer to section 90.2.7.

90.2.5 Check for Short to Ground

Perform the following steps to check for short to ground.

1. Turn vehicle ignition switch OFF.
2. Remove jumper wire.
3. Measure resistance between sockets A and C of the sensor connector.
4. Measure resistance between socket C of the sensor connector and a good ground.
   [a] If the resistance measurement for both readings is greater than 1,000 Ω, or open, refer to section 90.2.3.
   [b] If either resistance measurement is less than or equal to 1,000 Ω, the engine +5 volt line (#416) is shorted to either the sensor return line (#452) or to chassis ground. Repair the short and refer to section 90.2.7.

90.2.6 Check for Short to Battery

Perform the following steps to check for a short to battery.

1. Turn vehicle ignition switch OFF.
2. Remove both fuses to the ECM.
3. Disconnect all five connectors at the ECM.
4. Measure resistance between socket W1 on the engine harness connector and B3 on the vehicle harness connector.
5. Measure resistance between socket W1 on the engine harness connector and the battery (+).
   [a] If the resistance measurement for both readings is greater than 1,000 Ω, or open, refer to section 90.2.3.
   [b] If either resistance measurement is less than or equal to 1,000 Ω, a short exists between sockets where reading was taken. Repair the short and refer to section 90.2.7.

90.2.7 Verify Repairs

Perform the following steps to verify repairs.

1. Turn vehicle ignition switch OFF.
2. Reconnect all connectors.
3. Reconnect fuses (or circuit breakers) if previously disconnected.
4. Turn ignition ON.
5. Clear codes.
6. If Check Engine Light (CEL) does not stay on, start engine and run for one minute
7. Stop engine.
8. Read inactive codes with the DDR.
   [a] If no codes are logged, troubleshooting is complete.
   [b] If codes that brought you to this section are still logged, all system diagnostics are complete. Review this section from the first step to find the error. Refer to section 90.2.1.
   [c] If codes except those which brought you to this section are logged, refer to section 9.1.