

Intermittent Diagnostic Techniques

Intermittent diagnostic techniques help find and isolate the root cause of intermittent concerns associated with the PCM. The material is organized to help find the concern and carry out the repair. There are examples illustrating the diagnostic techniques. The process of finding and isolating an intermittent concern starts with recreating a concern symptom, accumulating PCM data, comparing that data to typical values, and analyzing the results.

Before proceeding, make sure that:

- Customary mechanical system tests and inspections do not reveal a problem. Mechanical component problems can make a PCM system react abnormally.
- Review the Technical Service Bulletins (TSBs) and OASIS messages, if available.
- The Quick Test and associated pinpoint tests have been completed without finding a concern, and the symptom is still occurring.

Recreating The Fault

Recreating the fault is the first step in isolating the cause of the intermittent symptom. If freeze frame data is available, it may help in recreating the conditions at the time of a malfunction indicator lamp (MIL) DTC. Listed below are some of the conditions for recreating the fault.

Conditions To Recreate The Fault

Engine Type Conditions	Non-Engine Type Conditions
Engine Temperature	Ambient Temperature
Engine RPM	Moisture Conditions
Engine Load Engine Idle/Accel/Decel	Road Conditions (Smooth, Bumpy)

Accumulating Powertrain Control Module (PCM) Data

The PCM data can be accumulated in a number of ways. Gather as much data as possible when the concern is occurring to prevent misdiagnosis. Accumulate data during different operating conditions and based on the customer description of the intermittent concern. Reference the known good data values, Refer to Section 6, [Typical Diagnostic Reference Values](#). This requires recording data in 4 conditions for comparison: 1) Key On Engine Off (KOEO), 2) Hot Idle, 3) 48 km/h (30 mph), and 4) 89 km/h (55 mph). Acquisition of PCM PID data using a scan tool is one of the easiest ways to gather information.

For information on the functions of your scan tool, refer to the scan tool manufacturers manual for instructions.

Below is a list of the functions available:

- selecting and viewing PIDs
- storing PIDs
- recording measurements along with PIDs
- playback of stored PIDs
- peripheral inputs

Analyzing PCM Data

Look for abnormal events or values that are clearly incorrect. Inspect the signals for abrupt or unexpected changes. For example, during a steady cruise most of the sensor values should be relatively stable. Sensors such as mass air flow (MAF) and RPM that change abruptly when the vehicle is traveling at a constant speed are clues to a possible concern area.

Look for an agreement in related signals. For example, if the APP1, or APP2, changes during acceleration, a corresponding change should occur in RPM, fuel volume regulator (F_VCV) and fuel rate (FUELRATE) PIDs.

Scroll through the PID data while analyzing the information. Look for sudden drops or spikes in the values.

Circuit Load Testing

Some module power and ground input circuits may be very sensitive to voltage drop due to increased internal circuit resistance. Make sure to follow the tool manufacturers instructions of a resistor load testing tool to identify high resistance circuit concerns that may prevent unnecessary replacement of parts.

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