

P0117 Cylinder Head Temperature Sensor Circuit Low Vol...

P0117 Cylinder Head Temperature Sensor Circuit Low Voltage - Manual and Automatic Transmission

Possible Causes

ECT/CHT sensor has failed
ECT/CHT sensor connector is damaged (check pins for damage, and moisture)
ECT/CHT sensor signal circuit is shorted to ground
PCM has failed

Setting Conditions

Key on or engine running; and the PCM detected the Cylinder Head Temperature (CHT) sensor signal or Engine Coolant Temperature (ECT) sensor signal was less than 0.20v (a parameter above 250°F). This is a thermistor-type sensor with a variable resistance that changes when exposed to different temperatures.

Malfunction Indicator Lamp (Manual and Automatic Transmission)

Malfunction Indicator Lamp

The Malfunction Indicator Lamp (MIL) alerts the driver that the Powertrain Control Module (PCM) or Transmission Control Module (TCM) has detected an OBD II emission-related component or system fault. When this type of malfunction occurs, an OBD Diagnostic Trouble Code (DTC) will be set. The MIL is located on the instrument cluster and is labeled CHECK ENGINE, SERVICE ENGINE SOON, or it is identified with the ISO standard engine symbol (which is a picture of an engine).

Prove-Out Test

The instrument cluster (IC) and other vehicle modules carry out a display prove-out to verify that all module controlled warning/indicator lamps and monitored systems are functioning correctly within the instrument cluster (IC). The instrument cluster (IC) and other modules such as the Powertrain Control Module (PCM) provide a timed prove-out while other indicators illuminate until engine start up. When the ignition switch is cycled to the "on" position with the engine off, the indicators illuminate to prove-out for 3 seconds.

Instrument Cluster (Gateway) Function

The instrument cluster (IC) acts as a gateway module by receiving information in one format and transmitting it to other modules using another format. For example, the instrument cluster (IC) receives the vehicle speed data from the PCM over the HS-CAN, converts the data into a MS-CAN message and sends (gateways) the message to other network modules such as the HVAC module, the tire pressure monitoring system (TPMS), the parking aid module (PAM), and the SJB. This enables network communication between modules that do not communicate using the same network (HS-CAN or the MS-CAN).

COMPONENT MONITOR DRIVE CYCLE INSTRUCTIONS

- Do not turn off the ignition switch during the test procedure.
- All Onboard System Readiness (OSR) codes are cleared when the battery is disconnected or when the Powertrain Control Module (PCM) is cleared with the Scan Tool.
- This drive cycle can be used to determine if the Readiness code for this Monitor will run and complete, and if the MIL will remain off after the vehicle is driven.
- Operating Ranges: Whenever a range of values is provided, try to operate the vehicle in the middle of the range. For example, if the vehicle speed range calls for 45-55 mph, operate the vehicle at as close as possible to 50 mph. Or if the engine speed should be 1,000-2,000 rpm, try to operate the engine at 1,500 rpm.
- Scan Tool Data: There are certain Parameter Identification (PID) values that must be within range before this Monitor will "run". It can be helpful to pull up those PID items on the Scan Tool so an assistant can view them during testing.
- The Readiness code for this Monitor defaults to "continuous" or "monitoring" because this Monitor runs continuously when the engine is cranking or running.

COMPONENT MONITOR PRETEST CONDITIONS

- MIL off with no emission related trouble codes present
- IAT sensor signal between 40-100°F
- Drive vehicle as outlined below

TEST PROCEDURE

1. Connect the Scan Tool to the data link connector (DLC). Turn the key on and bring up the ECT PID and IAT PID on the Scan Tool. Verify that the IAT PID is between 40-100°F.

2. Use the Scan Tool to clear any stored DTC's and to reset the OSR Monitors. Note that DTC P1000 will appear once all of the trouble codes are cleared. Start the engine without turning off the ignition key. Allow the engine to run at idle speed for 15 seconds.
3. Accelerate at part-throttle to 40 mph and maintain that speed until the ECT PID reaches 170°F (77°C). Bring the vehicle to a stop, and then allow the engine to idle with the transmission in Drive (in Neutral for M/T) for 2 minutes.
4. Then accelerate at moderate throttle in Overdrive (if equipped with O/D) to 50 mph (80 km/h) and maintain that speed for 15 seconds. Bring the vehicle to a stop, change out of Overdrive, and then accelerate to 40 mph (64 km/h) and maintain that speed for 15 seconds. Bring the vehicle to a stop and allow the engine to idle for 15 seconds. Repeat this step at least 5 times.
5. Check for any Pending codes in the Generic OBD II section of the Scan Tool. If no Pending codes are set, the Component Monitor test is complete. If any Pending codes are set, refer to the appropriate trouble code repair information to make the repair.

COMPONENT MONITOR DRIVE CYCLE INSTRUCTIONS

Pre-Test Conditions

Clear Codes. Bring up ECT PID on the Scan Tool. Start the engine w/o turning off the key.

Driving Instructions

Drive at 40 mph until ECT is 170°F. Then at various speeds while in different gear positions.

Check Monitor Status

At the end of the drive cycle, review the status of the Component Monitor on Scan Tool.

