DTC P2111 THROTTLE ACTUATOR CONTROL MODULE PERFORMANCE / THROTTLE ACTUATOR CONTROL SYSTEM-STUCK OPEN

COMPONENT LOCATION

GENERAL DESCRIPTION
The ETSCM (Electronic Throttle System Control Module) is integrated with PCM (Powertrain Control Module). Therefore, Make sure that location of ETS Module is changed. The ETS (Electronic Throttle System) is the throttle body whose throttle angle is controlled by control module. It consists of ETS-motor, Accelerator Position Sensor (APS), Throttle Position Sensor (TPS) and Limp home valve. After calculating throttle valve target opening value from signals such as APS and other input values, the PCM controls ETS motor to meet the throttle valve target opening value. TPS is mounted on throttle body assembly and detects the opening angle of the throttle valve. The TPS is a variable resistor (potentiometer) whose characteristic is that the resistance changes according to throttle position angle. TPS 1 and TPS 2 signals are used to monitor PCM's throttle valve target opening value's activation. TPS1's output signal is the main signal to calculate the target value for opening throttle valve and to decide whether TPS2 is normal or not. TPS2's output signal is the sub signal to decide whether TPS1 is normal or not. And if TPS1's signal is abnormal, TPS2's output signal is used as the main signal.

DTC DESCRIPTION
DTC P2110/P2111 is set if the difference between actual TPS opening angle and TPS target angle is higher than 0.5 V.

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<th>Possible Cause</th>
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<td>Valve Open Stuck</td>
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<td>Enable Conditions</td>
<td>Ignition Switch : On</td>
<td>Poor connector</td>
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<td>Motor Relay : On</td>
<td>Faulty Throttle valve</td>
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<td>Threshold Value</td>
<td>Actual Position • Target Position &gt; 0.5V</td>
<td>Faulty ETS motor</td>
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<td>Diagnostic Time</td>
<td>Continuous</td>
<td>Faulty PCM</td>
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<td>MIL on condition</td>
<td>1 driving cycle</td>
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DTC DETECTING CONDITION

Test Condition | TPS1 (TPS ETS) | TPS2 (TPS ENS) |
---------------|----------------|----------------|
C.T. (Throttle valve fully closed) | 0.3~0.9V | 4.5~5.0V |
W.O.T. (Throttle valve fully open) | 4.5~5.0V | 0.3~0.9V |

SPECIFICATION
1. Connect scantool to Data Link Connector (DLC).
2. Warm up the engine to normal operating temperature.
3. Monitor the “TPS1” and “TPS2” parameter on the scantool.

Specification:
- Approx. 0.3 - 0.9 V at idle & No load (TPS1 or TPS ETS)
- Approx. 4.5 - 5.0 V at idle & No load (TPS2 or TPS EMS)
4. Is Current data displayed correctly?

**YES:** Fault is intermittent caused by poor contact in the sensor's and/or PCM's connector or was repaired and PCM memory was not cleared. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and go to "Verification of Vehicle Repair" procedure.

**NO:** Go to "W/Harness Inspection" procedure

**TERMINAL AND CONNECTOR INSPECTION**

1. Many malfunctions in the electrical system are caused by poor harness and terminals.
   Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.

2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.

3. Has a problem been found?

   **YES:** Repair as necessary and go to "Verification of Vehicle Repair" procedure.

   **NO:** Go to "Component Inspection" procedure

**COMPONENT INSPECTION**

1. Visually check ETS System
   1. Ignition "OFF"

2. Visually check the overall ETS system (Throttle valve, ETS motor, APS, and TPS). (Especially check the throttle valve for open stuck)

3. Has a problem been found?

   **YES:** Repair or replace as necessary and go to "Verification of Vehicle Repair" procedure.

   **NO:** Go to "Check ETS motor" as below.

2. Check ETS motor
   1. Ignition "OFF"
   2. Disconnect ETS motor connector
   3. Measure resistance between terminals "1" and "2" of the ETS motor connector.
   4. Measure resistance between terminals "1" and "3" of the ETS motor connector.
   5. Measure resistance between terminals "2" and "3" of the ETS motor connector.

   **Specification:** Approx. 0.6 - 1.5 Ohm ("1" --> "2")
   Approx. 0.6 - 1.5 Ohm ("1" --> "3")
   Approx. 0.6 - 1.5 Ohm ("2" --> "3")

   **NOTE:** Difference between each resistance should be less than 0.5 Ohm.

6. Is the measured resistance within specifications?

   **YES:** Substitute with a known-good PCM and check for proper operation. If the problem is corrected, replace PCM and then go to "Verification of Vehicle Repair" procedure.
NOTE: If PCM needs to be replaced, do "ETS Initialization" after it is replaced.

NO: Check ETS motor for contamination, deterioration, or damage. Substitute with a known-good ETS motor and check for proper operation. If the problem is corrected, replace ETS motor and then do "ETS Initialization" And go to "Verification of Vehicle Repair" procedure.

NOTE:
Procedure of ETS Initialization
1. Erase the trouble codes on PCM
2. Turn the ignition key on less than 1 second and turn it off (Do not start the engine)
3. Turn the ignition key off and keep this condition until the main relay is turned off (It will takes 10 seconds)
4. Turn ignition key on more than 1 second to record the throttle motor position on the EEPROM

VERIFICATION OF VEHICLE REPAIR
After a repair, it is essential to verify that the fault has been corrected.
1. Monitor and record the Freeze Frame Data for the Diagnostic Trouble Code (DTC) which has been diagnosed.
2. Using a Scantool, Clear the DTCs.
3. Operate the vehicle within conditions noted in the freeze frame data or enable conditions.
4. Monitor that all readiness test have been verified as "Complete"
5. Are any DTCs present?

YES: Go to the applicable troubleshooting procedure.

NO: System is performing to specification at this time.