| DTC | P2121 | Throttle / Pedal Position Sensor / Switch "D" Circuit Range / Performance |
|-----|-------|--------------------------------------------------------------------------|

## DESCRIPTION

HINT:
Refer to DTC P2120 (see page ES-324).

| DTC No. | DTC Detection Condition | Trouble Area |
|---------|-------------------------|--------------|
| P2121 | Difference between VPA and VPA2 less than 0.4 V, or more than 1.2 V for 0.5 seconds (1 trip detection logic) | • Accelerator Pedal Position (APP) sensor<br>• ECM |

## MONITOR DESCRIPTION

When the difference between the output voltages of VPA and VPA2 deviates from the standard, the ECM determines that the Accelerator Pedal Position (APP) sensor is malfunctioning. The ECM turns on the MIL and the DTC is set.

## MONITOR STRATEGY

| Related DTCs | P2121: APP sensor rationality |
|--------------|-------------------------------|
| Required Sensors/Components (Main) | APP sensor |
| Required Sensors/Components (Related) | - |
| Frequency of Operation | Continuous |
| Duration | 0.5 seconds |
| MIL Operation | Immediate |
| Sequence of Operation | None |

## TYPICAL ENABLING CONDITIONS

| Monitor runs whenever following DTCs not present | None |
|--------------------------------------------------|------|
| Either of following conditions 1 or 2 met: | - |
| 1. Ignition switch | ON |
| 2. Throttle actuator power | ON |

## TYPICAL MALFUNCTION THRESHOLDS

| Difference between VPA voltage (learned value) and VPA2 voltage (learned value) | Less than 0.4 V, or more than 1.2 V |
|--------------------------------------------------------------------------------|-------------------------------------|

## FAIL-SAFE

The APP sensor has two (main and sub) sensor circuits. If a malfunction occurs in either of the sensor circuits, the ECM detects the abnormal signal voltage difference between the two sensor circuits and switches to limp mode. In limp mode, the functioning circuit is used to calculate the accelerator pedal opening angle to allow the vehicle to continue driving. If both circuits malfunction, the ECM regards the opening angle of the accelerator pedal as being fully closed. In this case, the throttle valve remains closed as if the engine is idling.
If a pass condition is detected and then the ignition switch is turned OFF, the fail-safe operation stops and the system returns to a normal condition.

## WIRING DIAGRAM

Refer to DTC P2120 (see page ES-328).

## INSPECTION PROCEDURE

HINT:
• This DTC relates to the Accelerator Pedal Position (APP) sensor.
• Read freeze frame data using the intelligent tester. Freeze frame data records the engine condition when malfunctions are detected. When troubleshooting, freeze frame data can help determine if the vehicle was moving or stationary, if the engine was warmed up or not, if the air-fuel ratio was lean or rich, and other data from the time the malfunction occurred.

| **1** | **CHECK ANY OTHER DTCS OUTPUT (IN ADDITION TO DTC P2121)** |

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch ON.
(c) Turn the tester ON.
(d) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DTC INFO / CURRENT CODES.
(e) Read DTCs.

**ES**

**Result**

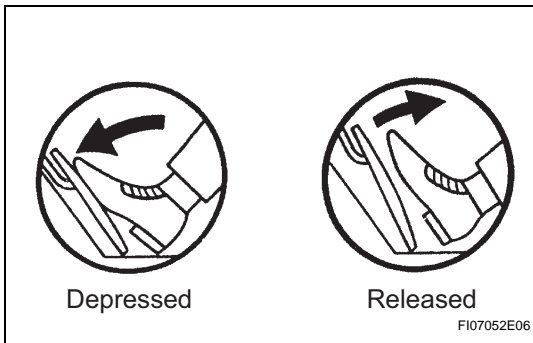| Display (DTC Output) | Proceed to |
|---|---|
| P2121 | A |
| P2121 and other DTCs | B |

HINT:
If any DTCs other than P2121 are output, troubleshoot those DTCs first.

| **B** > | **GO TO DTC CHART** |

| **A** |

| **2** | **READ VALUE USING INTELLIGENT TESTER (ACCEL POS #1 AND ACCEL POS #2)** |



Depressed    Released

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(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch ON and turn the tester ON.
(c) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DATA LIST / PRIMARY / ACCEL POS #1 and ACCEL POS #2.
(d) Read the values displayed on the tester.
**Standard voltage**

| Accelerator Pedal Operations | ACCEL POS #1 | ACCEL POS #2 |
|---|---|---|
| Released | 0.5 to 1.1 V | 1.2 to 2.0 V |
| Depressed | 2.6 to 4.5 V | 3.4 to 4.7 V |

| **OK** > | **CHECK FOR INTERMITTENT PROBLEMS** |

| **NG** |

| **3** | **REPLACE ACCELERATOR PEDAL ASSEMBLY** |

| **NEXT** |

| 4 | CHECK WHETHER DTC OUTPUT RECURS (DTC P2121) |
|---|---|

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch ON and turn the tester ON.
(c) Clear DTCs (see page ES-39).
(d) Start the engine.
(e) Allow the engine to idle for 15 seconds.
(f) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DTC INFO / CURRENT CODES.
(g) Read DTCs.

**Result**

| Display (DTC Output) | Proceed to |
|---|---|
| P2121 | A |
| No output | B |

**SYSTEM OK**

**A**

| REPLACE ECM |
|---|