DTC P2111 Throttle Actuator Control System - Stuck Open

DTC P2112 Throttle Actuator Control System - Stuck Closed

for Preparation Click here

DESCRIPTION

The throttle actuator is operated by the ECM, and opens and closes the throttle valve using gears. The opening angle of the throttle valve is detected by the throttle position sensor, which is mounted on the throttle body. The throttle position sensor provides feedback to the ECM so that the ECM can control the throttle actuator (throttle valve) appropriately in response to driver inputs.

HINT:

This ETCS (Electronic Throttle Control System) does not use a throttle cable.

DTC No.	DTC Detection Condition	Trouble Area
P2111	Throttle actuator does not close even when the ECM commands it to close (1 trip detection logic).	• Throttle actuator • Throttle body assembly • Throttle valve • Wire harness or connector
P2112	Throttle actuator does not open even when the ECM commands it to open (1 trip detection logic).	• Throttle actuator • Throttle body assembly • Throttle valve • Wire harness or connector

MONITOR DESCRIPTION

The ECM determines that there is a malfunction in the ETCS when the throttle valve remains at a fixed angle despite a high drive current from the ECM. The ECM illuminates the MIL and stores a DTC.
If the malfunction is not repaired successfully, a DTC is stored when the accelerator pedal is fully depressed and released quickly (to fully open and close the throttle valve) after the engine is next started.

MONITOR STRATEGY

Required Sensors/Components	Throttle actuator
Frequency of Operation	Continuous

TYPICAL ENABLING CONDITIONS

All

Throttle actuator	ON
Throttle actuator duty calculation	Executing
Throttle position sensor fail	Not detected
Throttle actuator current-cut operation	Not executing
Throttle actuator power supply	4 V or higher
Throttle actuator fail	Not detected

P2111 (Throttle Actuator Stuck Open)

All of following conditions met	-
Throttle actuator current	2 A or higher
Duty cycle to close throttle	80% or more

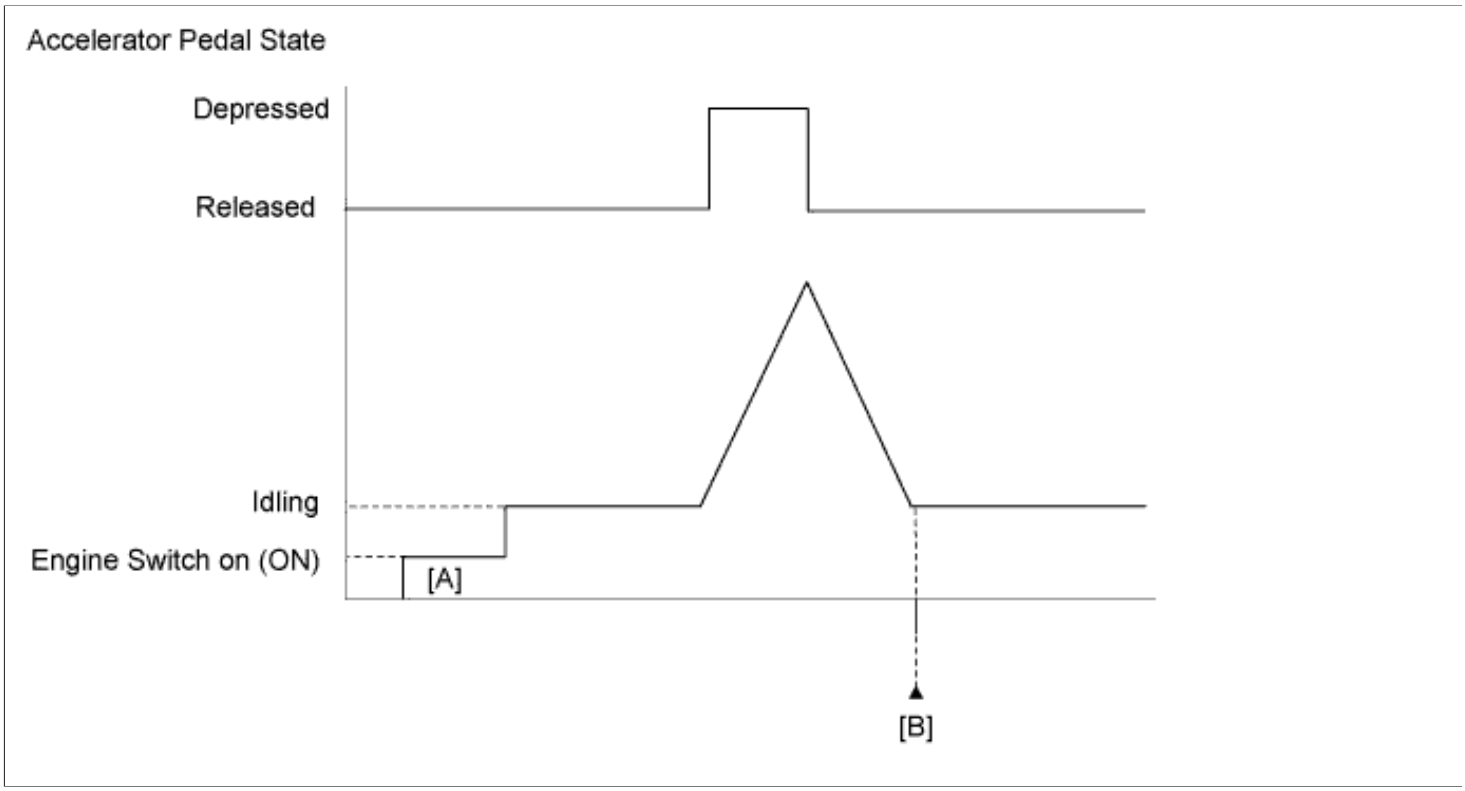
P2112 (Throttle Actuator Stuck Closed)

All of following conditions met	-
Throttle actuator current	2 A or higher
Duty cycle to open throttle	80% or more

TYPICAL MALFUNCTION THRESHOLDS

Throttle position sensor voltage	No change

CONFIRMATION DRIVING PATTERN



1. Connect the intelligent tester to the DLC3.
2. Turn the engine switch on (IG) and turn the tester on.
3. Clear DTCs (even if no DTCs are stored, perform the clear DTC operation).
4. Turn the engine switch off and wait for at least 30 seconds.
5. Turn the engine switch on (IG) and turn the tester on [A].
6. Start the engine and fully depress and release the accelerator pedal quickly (to fully open and close the throttle valve).
7. Enter the following menus: Powertrain / Engine and ECT / DTC [B].
8. Read the pending DTCs.

HINT:

- **If a pending DTC is output, the system is malfunctioning.**
- **If a pending DTC is not output, perform the following procedure.**

9. Enter the following menus: Powertrain / Engine and ECT / Utility / All Readiness.
10. Input the DTC: P2111 or P2112.
11. Check the DTC judgment result.

Tester Display	Description
NORMAL	• DTC judgment completed • System normal
ABNORMAL	• DTC judgment completed • System abnormal
INCOMPLETE	• DTC judgment not completed • Perform driving pattern after confirming DTC enabling conditions
UNKNOWN	• Unable to perform DTC judgment • Number of DTCs which do not fulfill DTC preconditions has reached ECU memory limit

HINT:

- **If the judgment result shows NORMAL, the system is normal.**
- **If the judgment result shows ABNORMAL, the system has a malfunction.**

12. If the judgment result shows INCOMPLETE or UNKNOWN, perform steps [A] through [B] again and, if necessary, drive the vehicle for a period of time.

FAIL-SAFE

When either of these DTCs or other DTCs relating to ETCS (Electronic Throttle Control System) malfunctions are stored, the ECM enters fail-safe mode. During fail-safe mode, the ECM cuts the current to the throttle actuator and the throttle valve is returned to a 7° throttle angle by the return spring. The ECM then adjusts the engine output by controlling the fuel injection (intermittent fuel-cut) and ignition timing in accordance with the accelerator pedal position to allow the vehicle to continue at a minimal speed. If the accelerator pedal is depressed firmly and gently, the vehicle can be driven slowly. The ECM continues operating in fail-safe mode until a pass condition is detected, and the engine switch is then turned off.

WIRING DIAGRAM

Refer to DTC P2102 (Click here).

INSPECTION PROCEDURE

HINT:

- **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.**
- **Refer to "Data List / Active Test" [Throttle Position Command, Throttle Position No. 1, Throttle Motor Current, Throttle Motor Duty (Open), Throttle Motor Duty (Close)] (Click here).**

1.CHECK ANY OTHER DTCS OUTPUT (IN ADDITION TO DTC P2111 OR P2112)

a. Connect the intelligent tester to the DLC3.

b. Turn the engine switch on (IG).

c. Turn the tester on.

d. Enter the following menus: Powertrain / Engine and ECT / DTC.

e. Read DTCs.

Result

Result	Proceed to
P2111 or P2112 is output	A
P2111 or P2112 and other DTCs are output	B

HINT:

If any DTCs other than P2111 or P2112 are output, troubleshoot those DTCs first.

B → **GO TO DTC CHART**

A

2.INSPECT THROTTLE BODY ASSEMBLY (VISUALLY CHECK THROTTLE VALVE)

a. Check for contamination between the throttle valve and housing. If necessary, clean the throttle body. Also, check that the throttle valve moves smoothly.

OK:
Throttle valve is not contaminated with foreign objects and moves smoothly.

NG → **Go to step 4**

OK

3.READ VALUE USING INTELLIGENT TESTER (THROTTLE POSITION)

a. Connect the intelligent tester to the DLC3.

b. Turn the engine switch on (IG).

c. Turn the tester on.

d. Clear DTCs (Click here).

e. Turn the engine switch off and wait for at least 30 seconds.

f. Turn the engine switch on (IG).

g. Enter the following menus: Powertrain / Engine and ECT / Data List / All Data / Throttle Position No. 1, Throttle Position No. 2 and Throttle Position Command.

h. Check the values displayed on the tester while wiggling the ECM wire harness.

i. Enter the following menus: Powertrain / Engine and ECT / DTC.

j. Check for DTCs.

Result

Result	Proceed to
Value in Data List changes when wire harness is wiggled, or DTC is output*	A
Other than above	B

*: As the DTC was stored due to a change in the contact resistance of the connector, repair or replace the wire harness or connector (Click here).

B → Go to step 5

A

REPAIR OR REPLACE HARNESS OR CONNECTOR

4.REPLACE THROTTLE BODY ASSEMBLY

a. Replace the throttle body assembly (Click here).

NEXT

5.CHECK WHETHER DTC OUTPUT RECURS (DTC P2111 OR P2112)

a. Connect the intelligent tester to the DLC3.

b. Turn the engine switch on (IG).

c. Turn the tester on.

d. Clear DTCs (Click here).

e. Start the engine, and then fully depress and release the accelerator pedal quickly to fully open and close the throttle valve.

f. Enter the following menus: Powertrain / Engine and ECT / DTC.

g. Read DTCs.

Result

Result	Proceed to
No DTC is output	A
P2111 or P2112 is output	B

B → REPLACE ECM (Click here)

A

END