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Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [03/2023 -]
Title: M20A-FXS (ENGINE CONTROL): SFI SYSTEM: P211172,P211173; Throttle Actuator "A" Control System Actuator Stuck Open; 2023 - 2024 MY Prius Prius Prime [03/2023 -]		

DTC	**P211172**	**Throttle Actuator "A" Control System Actuator Stuck Open**

DTC	**P211173**	**Throttle Actuator "A" Control System Actuator Stuck Closed**

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 built into the throttle body with motor assembly. The throttle position sensor provides feedback to the ECM. This feedback allows the ECM to appropriately control the throttle actuator and monitor the throttle opening angle as the ECM responds to a request from the hybrid system.

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	DTC OUTPUT FROM	PRIORITY	NOTE
P211172	Throttle Actuator "A" Control System Actuator Stuck Open	The ECM signals the throttle actuator to close, but the actuator is stuck (1 trip detection logic).	• Throttle actuator • Throttle body with motor assembly • Throttle valve • Wire harness or connector • ECM	Comes on	Engine	B	SAE Code: P2111
P211173	Throttle Actuator "A" Control System Actuator Stuck Closed	The ECM signals the throttle actuator to open, but the actuator is stuck (1 trip detection logic).	• Throttle actuator • Throttle body with motor assembly • Throttle valve • Wire harness or connector • ECM	Comes on	Engine	B	SAE Code: P2112

MONITOR DESCRIPTION

If the throttle valve remains at a certain angle despite a high drive current from the ECM, the ECM determines that there is a malfunction in the Electronic Throttle Control System (ETCS), illuminates the MIL and stores a DTC.

MONITOR STRATEGY

Related DTCs	P2111: Throttle actuator stuck open P2112: Throttle actuator stuck closed
Required Sensors/Components (Main)	Throttle actuator (throttle body with motor assembly)
Required Sensors/Components (Related)	-
Frequency of Operation	Continuous
Duration	0.5 seconds
MIL Operation	Immediate
Sequence of Operation	None

TYPICAL ENABLING CONDITIONS

P2111: Throttle Actuator Stuck Open

All of the following conditions are met	-
System guard* judge condition	On
Throttle actuator current	2 A or higher
Duty-cycle to close throttle	80% or higher

P2112: Throttle Actuator Stuck Closed

All of the following conditions are met	-
System guard* judge condition	On
Throttle actuator current	2 A or higher
Duty-cycle to open throttle	80% or higher

*: System guard set when following conditions are met	-
Throttle actuator	On
Throttle actuator duty calculation	Executing
Throttle position sensor fail (P0121, P0122, P0123, P0222, P0223, P2135)	Not detected
Throttle actuator current-cut operation	Not executing
Throttle actuator power supply	4 V or higher
Throttle actuator fail (P2102)	Not detected

TYPICAL MALFUNCTION THRESHOLDS

P2111: Throttle Actuator Stuck Open

Throttle position sensor voltage	No change

P2112: Throttle Actuator Stuck Closed

Throttle position sensor voltage	No change

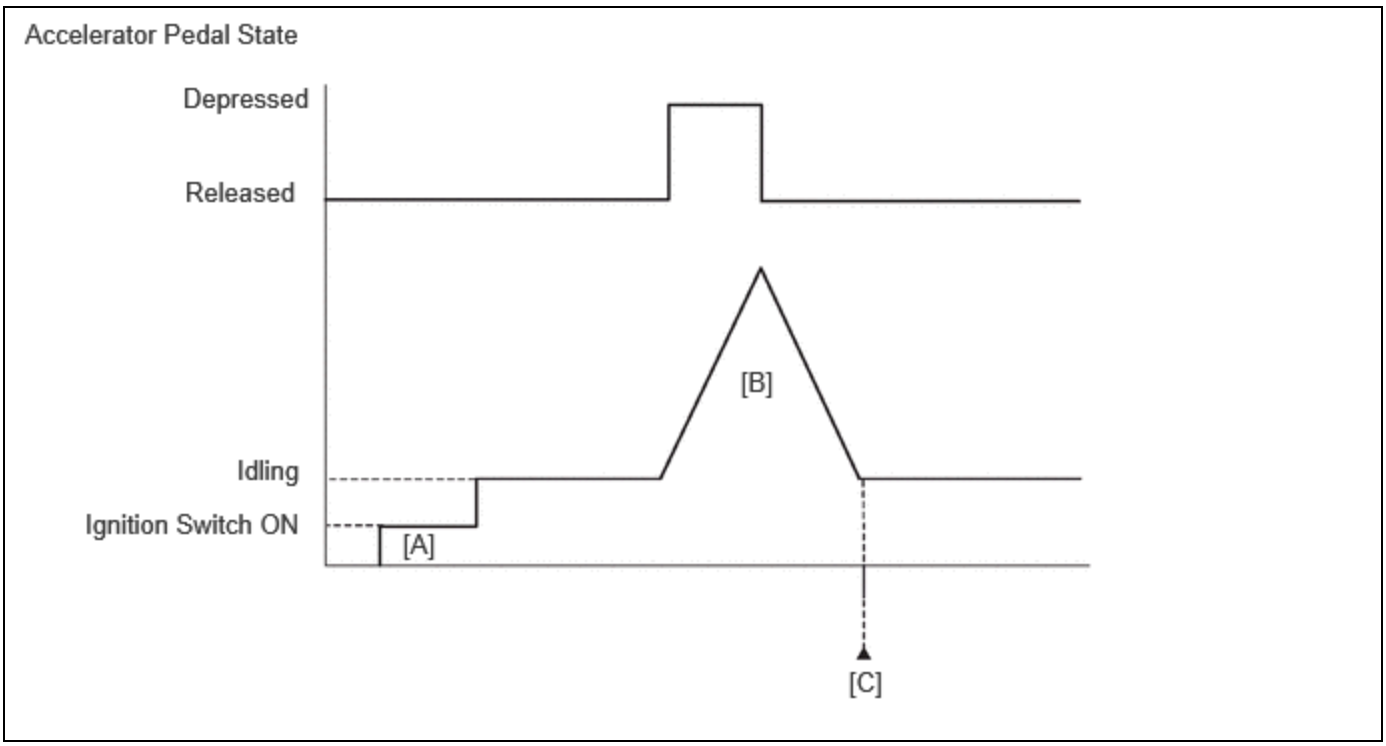
CONFIRMATION DRIVING PATTERN

HINT:

- After repair has been completed, clear the DTC and then check that the vehicle has returned to normal by performing the following All Readiness check procedure.

  Click here INFO
- When clearing the permanent DTCs, refer to the "CLEAR PERMANENT DTC" procedure.

  Click here INFO



1. Clear the DTCs (even if no DTCs are stored, perform the clear DTC procedure).
2. Turn the ignition switch off and wait for at least 30 seconds.
3. Turn the ignition switch to ON [A].
4. Put the engine in Inspection Mode (Maintenance Mode).

   Click here INFO
5. Start the engine and fully depress and release the accelerator pedal quickly (to open and close the throttle valve) [B].

   HINT:

   During charge control, the engine speed is set at idle. Therefore, the engine speed will not increase when the accelerator pedal is depressed. In this case, perform step [B] after charge control has completed.
6. Enter the following menus: Powertrain / Engine / Trouble Codes [C].
7. 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.

8. Enter the following menus: Powertrain / Engine / Utility / All Readiness.
9. Input the DTC: P211172 or P211173.
10. Check the DTC judgment result.

HINT:

- If the judgment result is NORMAL, the system is normal.
- If the judgment result is ABNORMAL, the system is malfunctioning.
- [A] to [C]: Normal judgment procedure.

  The normal judgment procedure is used to complete DTC judgment and also used when clearing permanent DTCs.
- When clearing the permanent DTCs, do not disconnect the cable from the auxiliary battery terminal or attempt to clear the DTCs during this procedure, as doing so will clear the universal trip and normal judgment histories.

FAIL-SAFE

When these DTCs 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 7.5° throttle valve opening angle by the return spring. The ECM stops the engine and the vehicle can be driven using solely the hybrid system. If the accelerator pedal is depressed firmly and gently, the vehicle can be driven slowly.

Fail-safe mode continues until a pass condition is detected, and the ignition switch is then turned off.

WIRING DIAGRAM

Refer to DTC P210018.

Click here INFO

CAUTION / NOTICE / HINT

NOTICE:

- Vehicle Control History may be stored in the hybrid vehicle control ECU if the engine is malfunctioning. Certain vehicle condition information is recorded when Vehicle Control History is stored. Reading the vehicle conditions recorded in both the freeze frame data and Vehicle Control History can be useful for troubleshooting.

  for HEV Model: Click here INFO

  for PHEV Model: Click here INFO

  (Select Powertrain in Health Check and then check the time stamp data.)
- If any "Engine Malfunction" Vehicle Control History item has been stored in the hybrid vehicle control ECU, make sure to clear it. However, as all Vehicle Control History items are cleared simultaneously, if any Vehicle Control History items other than "Engine Malfunction" are stored, make sure to perform any troubleshooting for them before clearing Vehicle Control History.

  for HEV Model: Click here INFO

  for PHEV Model: Click here INFO

HINT:

Refer to "Data List / Active Test" [Throttle Position Sensor No.1 Voltage, Throttle Position Sensor No.2 Voltage, Throttle Position Command, Throttle Motor Current, Throttle Motor Duty Ratio (Open) and Throttle Motor Duty Ratio (Close)].

Click here INFO

PROCEDURE

1.	**CHECK ANY OTHER DTCS OUTPUT (IN ADDITION TO DTC P211172 OR P211173)**

(a) Read the DTCs.

Powertrain > Engine > Trouble Codes

RESULT	PROCEED TO
P211172 or P211173 and other DTCs are output	A
P211172 or P211173 is output	B

HINT:

If any DTCs other than P211172 or P211173 are output, troubleshoot those DTCs first.

A ▶ **GO TO DTC CHART**

B ▼

2.	**INSPECT THROTTLE BODY WITH MOTOR ASSEMBLY (VISUALLY CHECK THROTTLE VALVE)**

(a) Check for foreign matter between the throttle valve and housing. If necessary, clean the throttle body with motor assembly. Also check that the throttle valve moves smoothly.

OK:

Throttle valve is not contaminated with foreign matter and moves smoothly.

HINT:

Perform "Inspection After Repair" after cleaning the throttle body with motor assembly.

Click here INFO

NG ▶ **GO TO STEP 6**

OK ▼

3.	**CLEAR DTC**

Pre-procedure1

(a) None.

Procedure1

(b) Clear the DTCs.

Powertrain > Engine > Clear DTCs

Post-procedure1

(c) Turn the ignition switch off and wait for at least 30 seconds.

NEXT

4.	**READ VALUE USING GTS (THROTTLE POSITION)**

(a) Read the values displayed on the GTS while wiggling the ECM wire harness.

Powertrain > Engine > Data List

TESTER DISPLAY
Throttle Position Sensor No.1 Voltage
Throttle Position Sensor No.2 Voltage
Throttle Position Command

(b) Read the DTCs.

Powertrain > Engine > Trouble Codes

RESULT	PROCEED TO
Value in Data List changes when wire harness is wiggled, or DTC is output	A
Other than above	B

B **GO TO STEP 7**

A

5.	**REPAIR OR REPLACE HARNESS OR CONNECTOR (THROTTLE BODY WITH MOTOR ASSEMBLY - ECM)**

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

HINT:

Click here INFO

NEXT END

6.	**REPLACE THROTTLE BODY WITH MOTOR ASSEMBLY**

HINT:

Click here INFO

NEXT

7.	**CLEAR DTC**

Pre-procedure1

(a) None.

Procedure1

(b) Clear the DTCs.

Powertrain > Engine > Clear DTCs

Post-procedure1

(c) Turn the ignition switch off and wait for at least 30 seconds.

NEXT

8.	**CHECK WHETHER DTC OUTPUT RECURS (DTC P211172 OR P211173)**

Pre-procedure1

(a) Drive the vehicle in accordance with the driving pattern described in Confirmation Driving Pattern.

Procedure1

(b) Read the DTCs.

Powertrain > Engine > Trouble Codes

RESULT	PROCEED TO
DTCs are not output	A
P211172 or P211173 is output	B

Post-procedure1

(c) None.

A ▶ **END**

B ▶ **REPLACE ECM**