Last Modified: 12-04-2024	6.11:8.1.0	**Doc ID:** RM100000002BM2D
Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [03/2023 -]
Title: M20A-FXS (ENGINE CONTROL): SFI SYSTEM: P111C62; Control Module Internal Temperature Sensor/Intake Air Temperature Sensor Signal Compare Failure; 2023 - 2024 MY Prius Prius Prime [03/2023 -]		

DTC	**P111C62**	**Control Module Internal Temperature Sensor/Intake Air Temperature Sensor Signal Compare Failure**

DESCRIPTION

The engine has an ECM internal temperature sensor and intake air temperature sensor.

The resistance of a thermistor within the ECM internal temperature sensor and intake air temperature sensor increases as the temperature decreases and decreases as the temperature increases.

The voltage monitored by the ECM changes in accordance with the change in the resistance of the thermistor.

The ECM performs control based on these voltages.

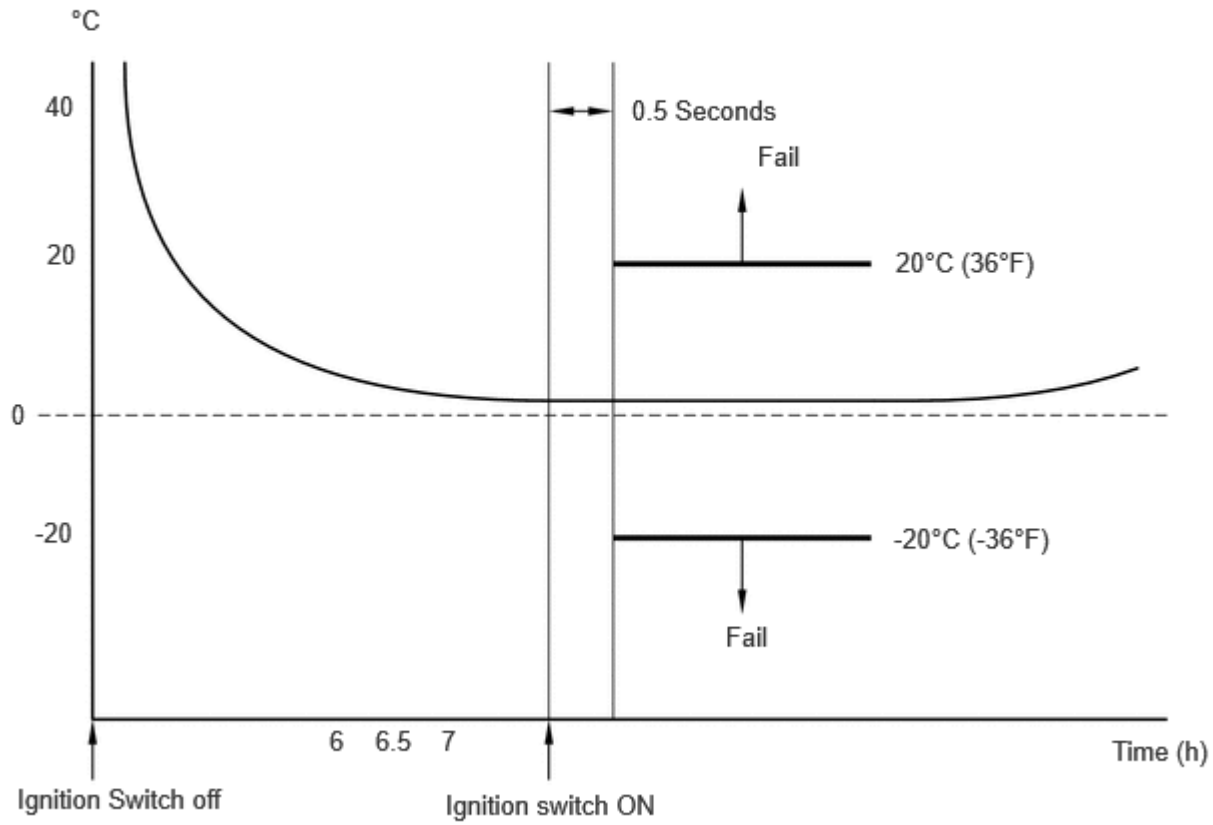
DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	DTC OUTPUT FROM	PRIORITY	NOTE
P111C62	Control Module Internal Temperature Sensor/Intake Air Temperature Sensor Signal Compare Failure	All of the following conditions are met (2 trip detection logic): 1. The auxiliary battery voltage is 8 V or higher. 2. 7 hours or more have elapsed since the engine stopped on the previous trip. 3. 0.5 seconds or more after the ignition switch is turned to ON. 4. Either of the following conditions is met: a. The minimum ECM internal temperature is -10°C (14°F) or higher. b. The minimum intake air temperature is -10°C	• Intake air temperature sensor (mass air flow meter sub-assembly) • ECM (ECM internal temperature sensor)	Comes on	Engine	B	SAE Code: P111C

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	DTC OUTPUT FROM	PRIORITY	NOTE
		(14°F) or higher. 5. The difference between the readings of the ECM internal temperature and intake air temperature is higher than 20°C (36°F).					

Related Data List

DTC NO.	DATA LIST
P111C62	Intake Air Temperature
	Ambient Temperature

Difference Between ECM Internal Temperature and Intake Air Temperature
(for mass air flow meter sub-assembly)



HINT:

- Waiting is required to prevent the temperature of the engine from affecting the readings. If the engine has been operated recently, it is not possible to accurately compare the readings.
- For diagnosis, in order to duplicate the detection conditions of the DTC, it is necessary to park the vehicle for 7 hours. Parking the vehicle for 7 hours ensures that the actual temperature of the ECM internal temperature and intake air temperature (for mass airflow meter sub-assembly) are very similar. When the vehicle has been parked for less than 7 hours, differences in the readings may exist, but this does not necessarily indicate a fault.

MONITOR DESCRIPTION

6, 6.5 and 7 hours after the engine has stopped, the ECM monitors the voltage of the ECM internal temperature sensor and intake air temperature sensor.

If the difference between the readings of the ECM internal temperature and intake air temperature is more than 20°C (36°F), the ECM determines that there is a malfunction in the ECM internal temperature sensor circuit or intake air temperature sensor circuit and stores a DTC and illuminates the MIL.

MONITOR STRATEGY

Related DTCs	P111C: Intake air temperature / engine control module internal temperature sensor correlation
Required Sensors/Components (Main)	Intake air temperature sensor Engine control module internal temperature sensor
Required Sensors/Components (Related)	-
Frequency of Operation	Once per driving cycle
Duration	-
MIL Operation	2 driving cycles
Sequence of Operation	None

TYPICAL ENABLING CONDITIONS

All of the following conditions are met	-
Ignition switch	Off
Engine	Stall
Soak time	6, 6.5 and 7 hours
Time after ECM power on	0.5 seconds or more
One of the following conditions is met	(a) or (b)
(a) Engine control module internal temperature	-10°C (14°F) or higher
(b) Intake air temperature	-10°C (14°F) or higher
Engine control module internal temperature sensor circuit fail (P06AD, P06AE)	Not detected
Intake air temperature sensor circuit fail (P0112, P0113)	Not detected
Soak timer fail (P2610)	Not detected
Auxiliary battery voltage	8 V or higher

TYPICAL MALFUNCTION THRESHOLDS

Deviated engine control module internal temperature and intake air temperature	Less than -20°C (-36°F), or higher than 20°C (36°F)

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.
3. With the engine stopped, leave the vehicle as is for 7.5 hours or more [A].
4. Turn the ignition switch to ON.
5. Wait 1 second [B].
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: P111C62.
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.
    - If the judgment result is INCOMPLETE, perform steps [A] through [C] again.
    - [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.

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

PROCEDURE

1.	**CHECK ANY OTHER DTCS OUTPUT (IN ADDITION TO DTC P111C62)**

(a) Read the DTCs and record the Freeze Frame Data.

Powertrain > Engine > Trouble Codes

RESULT	PROCEED TO
P111C62 and other DTCs are output	A
P111C62 is output	B

HINT:

If any DTCs other than P111C62 are output, troubleshoot those DTCs first.

A ▶ **GO TO DTC CHART**

B ▼

2.	**CHECK FREEZE FRAME DATA (INTAKE AIR TEMPERATURE AND AMBIENT TEMPERATURE)**

Pre-procedure1

(a) Using the GTS, read the values displayed in the Freeze Frame Data recorded in step 1.

Powertrain > Engine > DTC(P111C62) > Freeze Frame Data

TESTER DISPLAY
Intake Air Temperature
Ambient Temperature

Procedure1

(b) Read the value displayed on the GTS.

Standard:

GTS DISPLAY	SPECIFIED CONDITION
Difference between the Intake Air Temperature and the Ambient Temperature	Within 15°C (27°F)

HINT:

When the engine is cold, the value of the intake air temperature, ECM internal temperature and ambient temperature should be approximately the same.

Post-procedure1

(c) None.

OK ▶ **REPLACE ECM**

NG ▶ **REPLACE MASS AIR FLOW METER SUB-ASSEMBLY**