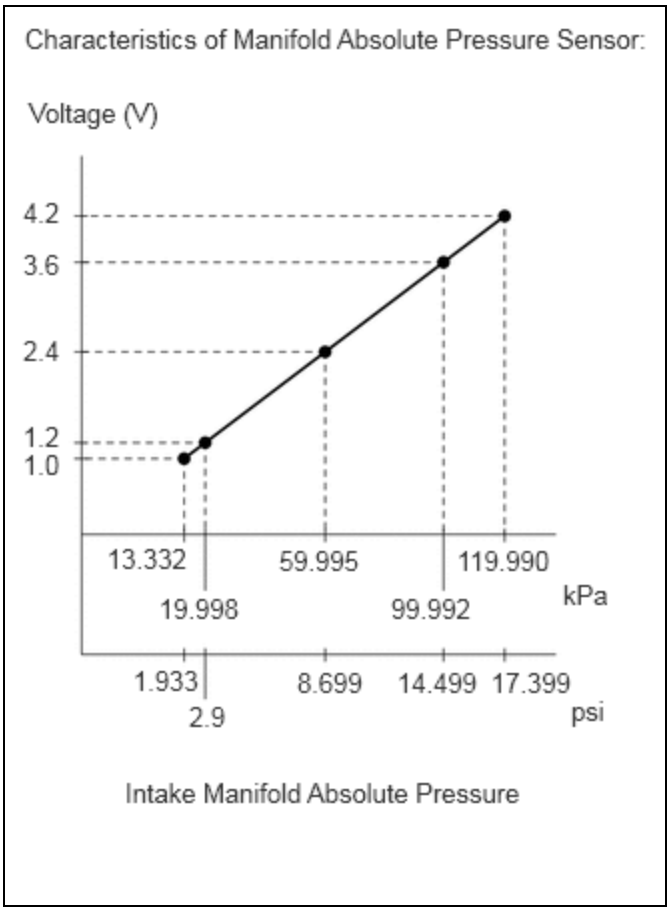
Last Modified: 12-04-2024	6.11:8.1.0	**Doc ID:** RM100000002BLUO
Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [03/2023 -]
Title: M20A-FXS (ENGINE CONTROL): SFI SYSTEM: P010511; Manifold Absolute Pressure / Barometric Pressure Sensor Circuit Short to Ground; 2023 - 2024 MY Prius Prius Prime [03/2023 -]		

DTC	**P010511**	**Manifold Absolute Pressure / Barometric Pressure Sensor Circuit Short to Ground**

DESCRIPTION



The manifold absolute pressure sensor detects the intake manifold pressure as a change in voltage. The ECM calculates the intake manifold pressure based on this voltage. The ECM calculates the EGR valve assembly and purge VSV opening amount according to changes in the intake manifold pressure and also detects malfunctions of the manifold absolute pressure sensor using these changes in pressure.

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	DTC OUTPUT FROM	PRIORITY	NOTE
P010511	Manifold Absolute Pressure / Barometric Pressure Sensor Circuit Short to Ground	The manifold absolute pressure sensor output voltage is less than 0.5 V for 0.5 seconds or more (1 trip detection logic).	• Open or short in manifold absolute pressure sensor circuit	Comes on	Engine	A	SAE Code: P0107

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	DTC OUTPUT FROM	PRIORITY	NOTE
			• Manifold absolute pressure sensor • ECM				

HINT:

When a DTC is output, check the Data List item "Intake Manifold Absolute Pressure" using the GTS.

Click here INFO

DTC NO.	INTAKE MANIFOLD ABSOLUTE PRESSURE	MALFUNCTION
P010511	Approximately 0 kPa (0 psi)	• Short to ground in PIM circuit • Short in PIM to EPIM circuit • Open in VCPM circuit

If the Data List displays a normal value, the normal value may be due to a temporary recovery from the malfunction condition. Check for intermittent problems.

MONITOR DESCRIPTION

The ECM monitors the manifold absolute pressure sensor voltage and uses this value to calculate the intake manifold pressure. When the manifold absolute pressure sensor output voltage deviates from the normal operating range, the ECM interprets this as a malfunction in the manifold absolute pressure sensor circuit, illuminates the MIL and stores a DTC.

Example:

If the manifold absolute pressure sensor output voltage is less than 0.5 V for 0.5 seconds or more, the ECM stores this DTC.

MONITOR STRATEGY

Related DTCs	P0107: Manifold absolute pressure sensor range check (low voltage)
Required Sensors/Components (Main)	Manifold absolute pressure 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 the following DTCs are not stored	None
All of the following conditions are met	-
Auxiliary battery voltage	8 V or higher

Ignition switch	ON
Time after ignition switch off to ON	0.5 seconds or more
Time after starter on to off	More than 2 seconds

TYPICAL MALFUNCTION THRESHOLDS

Manifold absolute pressure sensor voltage (Manifold absolute pressure)	Less than 0.5 V (Less than 0 kPa(abs) [0 psi(abs)])

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. Put the engine in Inspection Mode (Maintenance Mode).

   Click here INFO
4. Start the engine and wait 5 seconds or more [A].
5. Enter the following menus: Powertrain / Engine / Trouble Codes [B].
6. Read the pending DTCs.

   HINT:

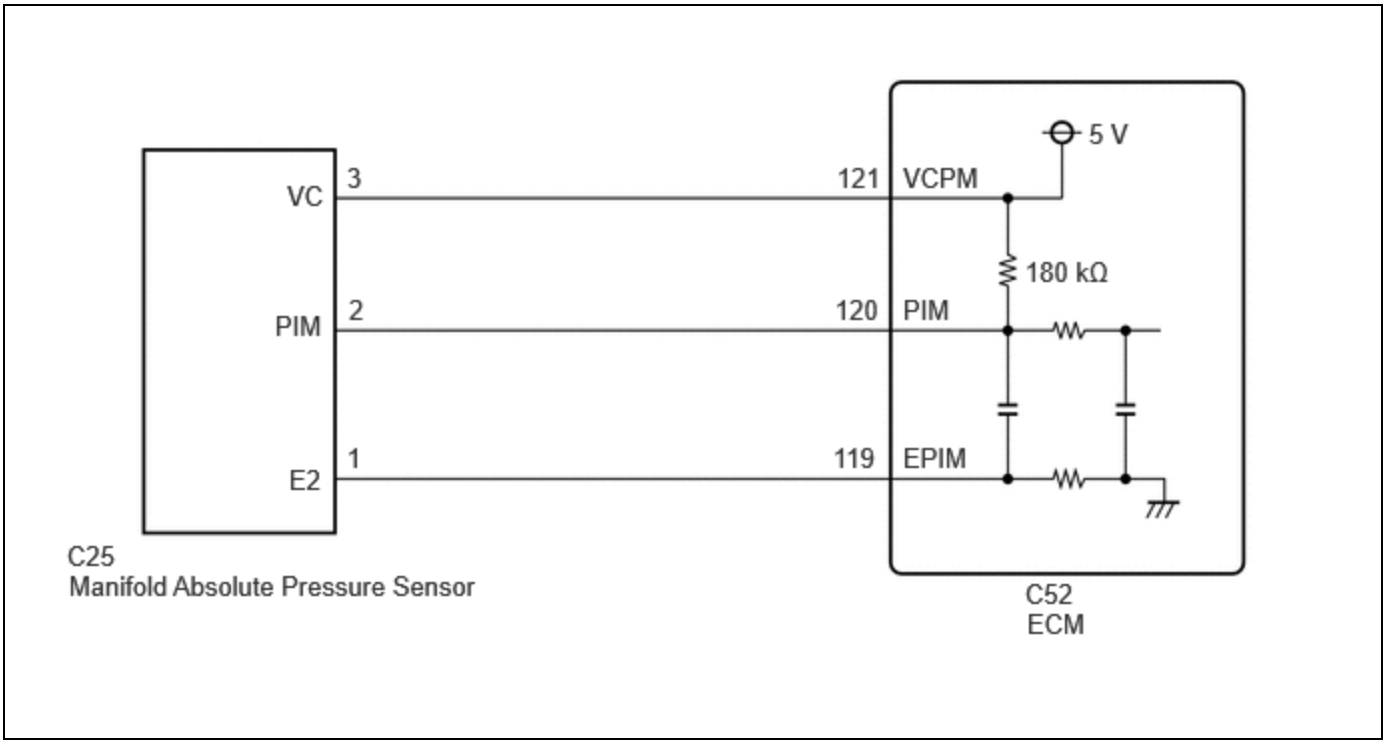
   - If a pending DTC is output, the system is malfunctioning.
   - If a pending DTC is not output, perform the following procedure.
7. Enter the following menus: Powertrain / Engine / Utility / All Readiness.
8. Input the DTC: P010511.
9. Check the DTC judgment result.

   HINT:

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

WIRING DIAGRAM



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 HARNESS AND CONNECTOR**

HINT:

Make sure that the connector is properly connected. If it is not, securely connect it and check for DTCs again.

Pre-procedure1

(a) Disconnect the manifold absolute pressure sensor connector.

(b) Turn the ignition switch to ON.

Procedure1

(c) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

EWD INFO

Click Location & Routing(C25)
Click Connector(C25)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
C25-3 (VC) - C25-1 (E2)	Ignition switch ON	4.75 to 5.25 V	V
C25-2 (PIM) - C25-1 (E2)	Ignition switch ON	1.2 to 5.25 V	V

Post-procedure1

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

Pre-procedure2

(e) None

Procedure2

(f) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

EWD INFO

Click Location & Routing(C25)
Click Connector(C25)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
C25-3 (VC) - C25-2 (PIM)	Ignition switch off	171 to 189 kΩ	kΩ

Post-procedure2

(g) None

OK ▶ **REPLACE MANIFOLD ABSOLUTE PRESSURE SENSOR**

NG ▼

2.	**CHECK HARNESS AND CONNECTOR (MANIFOLD ABSOLUTE PRESSURE SENSOR - ECM)**

Pre-procedure1

(a) Disconnect the manifold absolute pressure sensor connector.

(b) Disconnect the ECM connector.

Procedure1

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

EWD INFO

Click Location & Routing(C25,C52)
Click Connector(C25)
Click Connector(C52)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
C25-3 (VC) - C52-121 (VCPM)	Always	Below 1 Ω	Ω
C25-2 (PIM) or C52-120 (PIM) - Body ground and other terminals	Always	10 kΩ or higher	kΩ

Post-procedure1

(d) None

OK ▶ **REPLACE ECM**

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**