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Model Year Start: 2023	Model: Prius Prime	Prod Date Range: [03/2023 -]
Title: M20A-FXS (ENGINE CONTROL): SFI SYSTEM: P001700; Crankshaft Position - Camshaft Position Correlation Bank 1 Sensor B; 2023 - 2024 MY Prius Prius Prime [03/2023 -]		

DTC	P001700	Crankshaft Position - Camshaft Position Correlation Bank 1 Sensor B
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DESCRIPTION

Refer to DTC P001313.

Click here [INFO](#)

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	DTC OUTPUT FROM	PRIORITY	NOTE
P001700	Crankshaft Position - Camshaft Position Correlation Bank 1 Sensor B	Deviation in the crankshaft position sensor signal and camshaft position sensor (for exhaust camshaft) signal (2 trip detection logic).	<ul style="list-style-type: none"> Valve timing Cam timing oil control solenoid assembly Camshaft timing oil control valve assembly (exhaust camshaft timing gear bolt assembly) Camshaft timing exhaust gear assembly ECM 	Comes on	Engine	B	SAE Code: P0017

MONITOR DESCRIPTION

To monitor the correlation of the exhaust camshaft position and crankshaft position, the ECM checks the VVT learned value while the engine is idling. The VVT learned value is calibrated based on the camshaft position and crankshaft position. The exhaust valve timing is set to the most advanced angle while the engine is idling. If the VVT learned value is out of the specified range in consecutive driving cycles, the ECM stores this DTC.

MONITOR STRATEGY

Related DTCs	P0017: Camshaft timing misalignment at idling (for exhaust camshaft)
Required Sensors/Components (Main)	Camshaft timing exhaust gear assembly
Required Sensors/Components (Related)	Camshaft position sensor Crankshaft position sensor
Frequency of Operation	Continuous
Duration	Within 1 minute

MIL Operation	2 driving cycles
Sequence of Operation	None

TYPICAL ENABLING CONDITIONS

Monitor runs whenever the following DTCs are not stored	None
Engine speed	500 to 1400 rpm

TYPICAL MALFUNCTION THRESHOLDS

Either of the following conditions is met	A or B
A. VVT learned value at maximum advanced valve timing	Less than 82.7°CA (Crankshaft Angle)
B. VVT learned value at maximum advanced valve timing	More than 105°CA (Crankshaft Angle)

CONFIRMATION DRIVING PATTERN

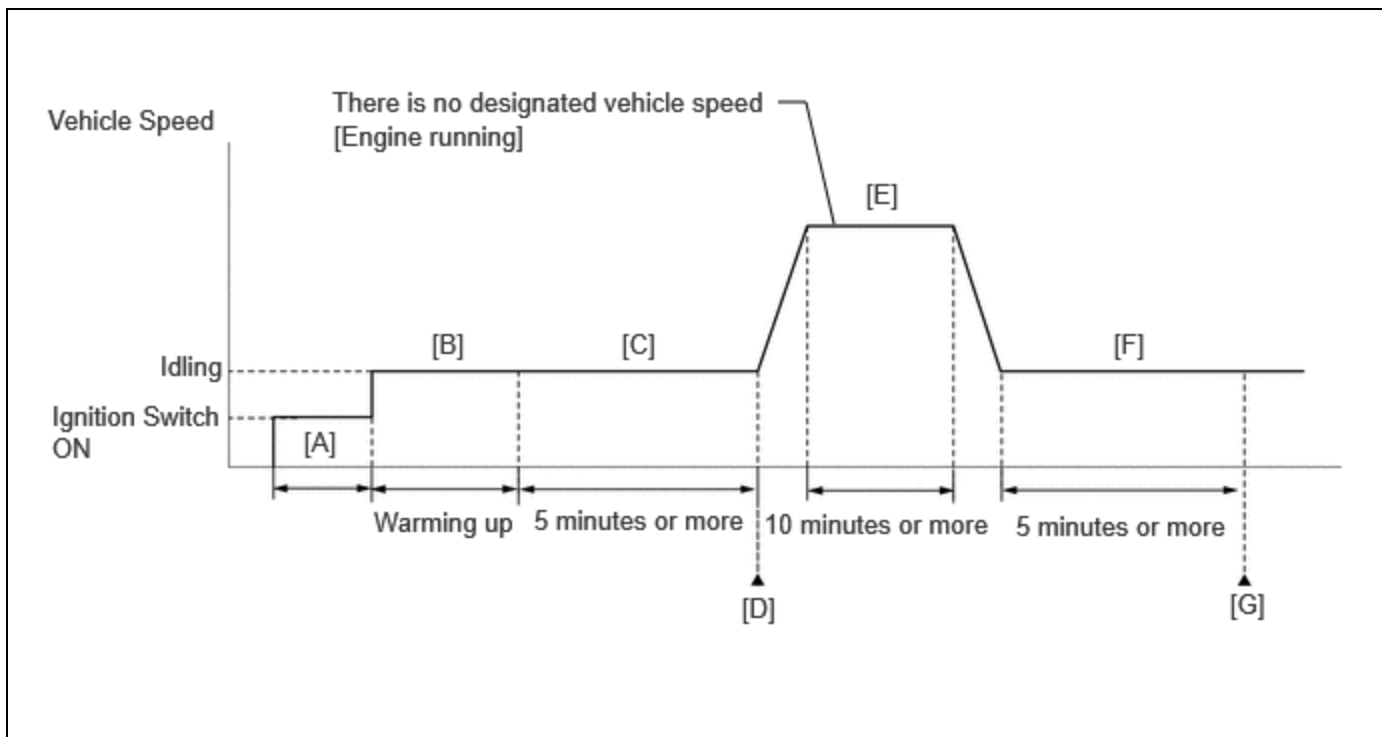
HINT:

- 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 warm it up until the engine coolant temperature reaches 75°C (167°F) or higher [B].
6. Idle the engine for 5 minutes or more [C].
7. Enter the following menus: Powertrain / Engine / Trouble Codes [D].
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 / Utility / All Readiness.
10. Input the DTC: P001700.
11. Check the DTC judgment result.

HINT:

- If the judgment result is NORMAL, the system is normal.
- If the judgment result is ABNORMAL, the system has a malfunction.
- If the judgment result is INCOMPLETE, perform steps [E] through [G].
- [A] to [D]: 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.
12. Press the EV/HV mode selection switch to select HV mode. (for PHEV Model)
 13. With the engine running, drive the vehicle for 10 minutes or more [E].

CAUTION:

When performing the confirmation driving pattern, obey all speed limits and traffic laws.

HINT:

If the engine stops, further depress the accelerator pedal to restart the engine.

14. Idle the engine for 5 minutes or more [F].
15. Enter the following menus: Powertrain / Engine / Trouble Codes [G].
16. 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.

17. Check the DTC judgment result.

HINT:

- If the judgment result is NORMAL, the system is normal.
- If the judgment result is ABNORMAL, the system has a malfunction.
- [A] to [G]: 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](#)

HINT:

The monitor for this DTC detects when the timing chain is shifted by one tooth or more.

PROCEDURE

1.	CHECK ANY OTHER DTCS OUTPUT (IN ADDITION TO DTC P001700)
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(a) Read the DTCs.

Powertrain > Engine > Trouble Codes

RESULT	PROCEED TO
P001700 and other DTCs are output	A
P001700 is output	B

HINT:

If any DTCs other than P001700 are output, troubleshoot those DTCs first.

A **GO TO DTC CHART**

B

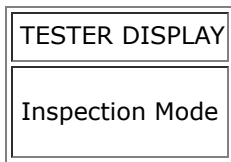
2.	PERFORM ACTIVE TEST USING GTS (CONTROL THE EXHAUST VVT OCV DUTY RATIO BANK 1)
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HINT:

If the VVT system can be operated through the Active Test, it can be assumed that the VVT system is operating normally.

Pre-procedure1

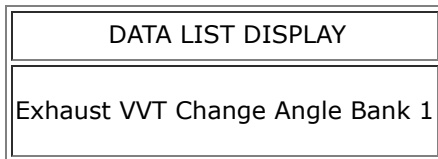
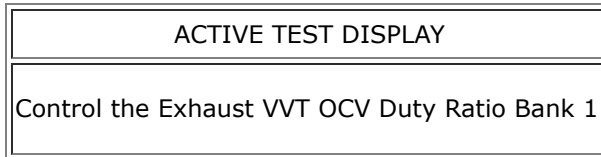
(a) Put the engine in Inspection Mode (Maintenance Mode).

Powertrain > Hybrid Control > Utility

(b) Start the engine.

Procedure1

(c) Perform the Active Test. Check that the displacement angle varies.

Powertrain > Engine > Active Test

OK:

Displacement angle varies.

HINT:

- Test not possible with the shift lever in P during charge control. Move the shift lever to N to perform test.
- If the DTCs are stored after the Active Test, clear the DTCs.

Post-procedure1

(d) None

NG ► **GO TO STEP 4**

OK



(a) Check for mechanical malfunctions that affect the valve timing, such as a jumped tooth or stretching of the timing chain.

HINT:

Perform "Inspection After Repair" after repairing or replacing the engine mechanical system.

Click here [INFO](#)

OK ► **GO TO STEP 7**

NG ▶ **REPAIR OR REPLACE MALFUNCTIONING PARTS, COMPONENT AND AREA**

4. INSPECT CAM TIMING OIL CONTROL SOLENOID ASSEMBLY

Click here [INFO](#)

NG ▶ **REPLACE CAM TIMING OIL CONTROL SOLENOID ASSEMBLY**

OK



5. INSPECT CAMSHAFT TIMING OIL CONTROL VALVE ASSEMBLY (EXHAUST CAMSHAFT TIMING GEAR BOLT ASSEMBLY)

Click here [INFO](#)

NG ▶ **REPLACE CAMSHAFT TIMING OIL CONTROL VALVE ASSEMBLY (EXHAUST CAMSHAFT TIMING GEAR BOLT ASSEMBLY)**

OK



6. INSPECT CAMSHAFT TIMING EXHAUST GEAR ASSEMBLY

for HEV Model: Click here [INFO](#)

for PHEV Model: Click here [INFO](#)

NG ▶ **REPLACE CAMSHAFT TIMING EXHAUST GEAR ASSEMBLY**

for HEV Model: Click here [INFO](#)

for PHEV Model: Click here [INFO](#)

OK



7.	CLEAR DTC
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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 P001700)
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Pre-procedure1

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

Procedure1

(b) Read the pending DTCs.

Powertrain > Engine > Trouble Codes

RESULT	PROCEED TO
DTCs are not output	A
P001700 is output	B

Post-procedure1

(c) None

A **CHECK FOR INTERMITTENT PROBLEMS**

B **REPLACE ECM**

