Last Modified: 12-04-2024	6.11:8.1.0	**Doc ID:** RM100000002BLXP
Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [03/2023 -]
Title: M20A-FXS (ENGINE CONTROL): SFI SYSTEM: P052024,P05202A; Engine Oil Pressure Sensor/Switch "A" Signal Stuck High; 2023 - 2024 MY Prius Prius Prime [03/2023 -]		

DTC	**P052024**	**Engine Oil Pressure Sensor/Switch "A" Signal Stuck High**

DTC	**P05202A**	**Engine Oil Pressure Sensor/Switch "A" Signal Stuck in Range**

DESCRIPTION

Refer to DTC P052012.

Click here INFO

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	DTC OUTPUT FROM	PRIORITY	NOTE
P052024	Engine Oil Pressure Sensor/Switch "A" Signal Stuck High	The oil pressure and temperature sensor output voltage is higher than the threshold value (1 trip detection logic).	• Open or short in oil pressure and temperature sensor circuit • Oil pressure and temperature sensor • ECM	Comes on	Engine	B	SAE Code: P0521
P05202A	Engine Oil Pressure Sensor/Switch "A" Signal Stuck in Range	The oil pressure and temperature sensor output voltage is the same value for a certain period of time (1 trip detection logic).	• Open or short in oil pressure and temperature sensor circuit • Oil pressure and temperature sensor • ECM	Comes on	Engine	B	SAE Code: P0521

Related Data List

DTC NO.	DATA LIST
P052024	• Engine Oil Temperature Sensor • Engine Oil Pressure
P05202A	

MONITOR DESCRIPTION

The ECM calculates the engine oil pressure based on the output voltage of the oil pressure sensor. If any of the following are detected, the ECM will illuminate the MIL and store a DTC.

- The oil pressure and temperature sensor output value differs from the specified value for a given engine speed (P052024).
- The oil pressure and temperature sensor output voltage does not change for a certain period of time (P05202A).

MONITOR STRATEGY

Related DTCs	P0521: Engine oil pressure sensor rationality (high) P0521: Engine oil pressure sensor rationality (stuck)
Required Sensors/Components (Main)	Oil pressure sensor
Required Sensors/Components (Related)	-
Frequency of Operation	Continuous
Duration	3 seconds: High pressure monitor 5 seconds: Stuck monitor
MIL Operation	Immediate
Sequence of Operation	None

TYPICAL ENABLING CONDITIONS

High Pressure Monitor

Both of the following conditions are met	-
Engine coolant temperature	70°C (158°F) or higher
Engine coolant temperature sensor malfunction (P0117, P0118)	Not detected

Stuck Monitor

All of the following conditions are met	-
Engine speed	Higher than 400 rpm, and 3500 rpm or less
Engine oil pressure sensor malfunction (P0521, P0522, P0523)	Not detected
Engine coolant temperature	40°C (104°F) or higher
Engine coolant temperature sensor malfunction (P0117, P0118)	Not detected

TYPICAL MALFUNCTION THRESHOLDS

High Pressure Monitor

Engine oil pressure at engine speed 1000 rpm	560 kPa (81 psi) or higher (vary with engine speed)

Stuck Monitor

Difference between oil pressure (smoothed) and oil pressure (not smoothed)	1.0 kPa (0.15 psi) or less (vary with engine speed)

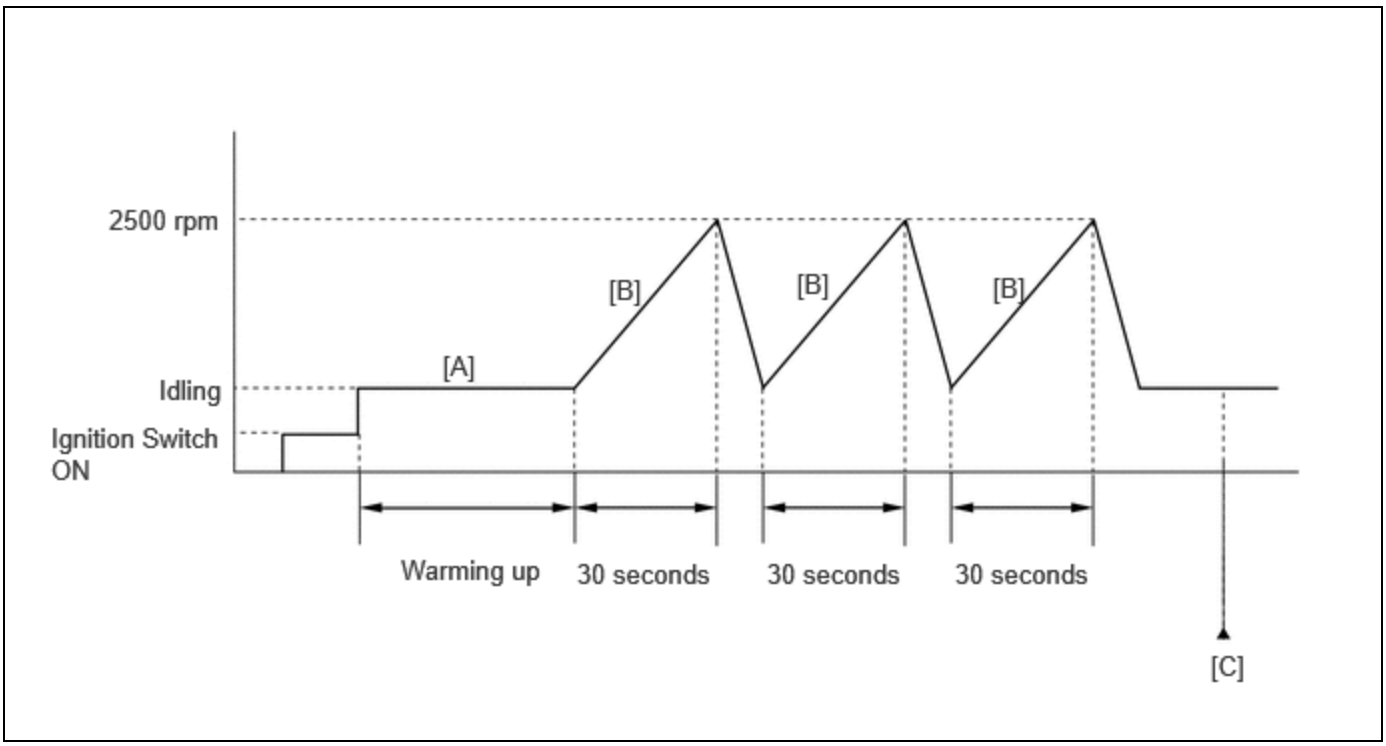
CONFIRMATION DRIVING PATTERN

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 warm it up until the engine coolant temperature is 75°C (167°F) or higher with all the accessories switched off [A].
5. When the vehicle is stationery, gently depress the accelerator pedal until the engine speed increases to 2500 rpm for 30 seconds, then release the accelerator pedal to return to the idling speed [B].
6. Repeat step [B] 3 times or more.
7. Enter the following menus: Powertrain / Engine / Trouble Codes [C].
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: P052024 or P05202A.
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 is malfunctioning.
    - If the judgment result is INCOMPLETE, perform steps [B] 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 P052024 OR P05202A)**

(a) Read the DTCs.

Powertrain > Engine > Trouble Codes

RESULT	PROCEED TO
P052024 or P05202A and other DTCs are output	A
P052024 or P05202A is output	B

HINT:

If any DTCs other than P052024 or P05202A are output, troubleshoot those DTCs first.

A ▶ GO TO DTC CHART

B

▼

2.	**INSPECT OIL PRESSURE SENSOR (OIL PRESSURE AND TEMPERATURE SENSOR)**

Pre-procedure1

(a) Read the value displayed on the GTS.

(1) Disconnect the oil pressure control valve assembly connector.

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

Powertrain > Hybrid Control > Utility

TESTER DISPLAY
Inspection Mode

(3) Start the engine.

(4) With the engine oil temperature at 75 to 85°C (167 to 185°F), read the "Engine Oil Pressure" with the engine speed at 2500 rpm.

Powertrain > Engine > Data List

TESTER DISPLAY
Engine Speed
Engine Oil Temperature Sensor
Engine Oil Pressure

(b) Read the oil pressure using an oil pressure gauge with adapter.

(1) Install the oil pressure gauge.

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

Powertrain > Hybrid Control > Utility

TESTER DISPLAY
Inspection Mode

(3) Start the engine.

(4) Maintain "Coolant Temperature" at 90 to 95°C (194 to 203°F) for 3 minutes, and then read the oil pressure gauge value at 2500 rpm.

Powertrain > Engine > Data List

TESTER DISPLAY
Engine Speed
Coolant Temperature

HINT:

- When the oil pressure and temperature sensor is removed, the engine oil temperature cannot be checked, so refer to "Coolant Temperature".
- Race the engine as necessary to maintain "Coolant Temperature" at 90 to 95°C (194 to 203°F).
- If maintained for 3 minutes or more, the engine oil temperature may exceed 85°C (185°F).

Procedure1

(c) Compare the Data List value and the oil pressure gauge reading.

OK:

Data List value and gauge reading are within +/-50 kPa (7.3 psi) of each other

HINT:

Be sure to clear the DTCs after reinstalling the oil pressure sensor (oil pressure and temperature sensor) or reconnecting the oil pressure sensor (oil pressure and temperature sensor) or oil pressure control valve assembly connector, as DTCs may be stored.

Post-procedure1

(d) None.

OK ▶ **REPLACE ECM**

NG ▶ **REPLACE OIL PRESSURE AND TEMPERATURE SENSOR**