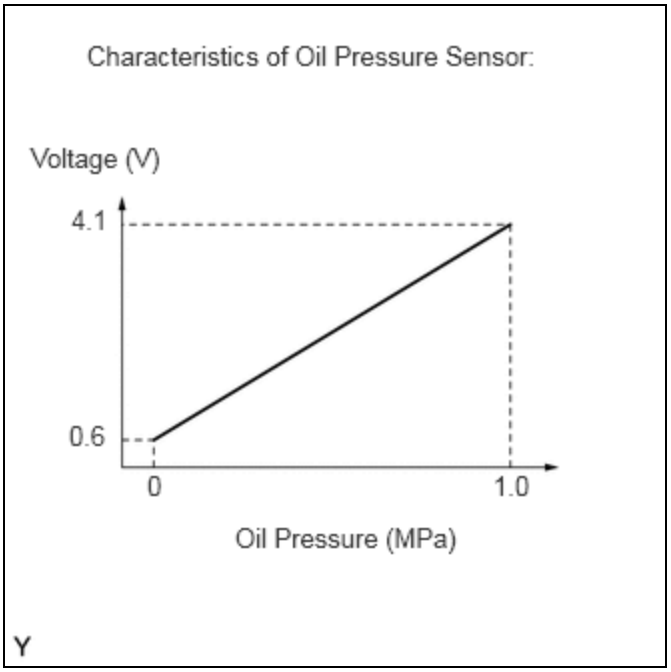
Last Modified: 12-04-2024	6.11:8.1.0	**Doc ID:** RM100000002BLXO
Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [03/2023 -]
Title: M20A-FXS (ENGINE CONTROL): SFI SYSTEM: P052012,P052014; Engine Oil Pressure Sensor/Switch "A" Circuit Short to Battery; 2023 - 2024 MY Prius Prius Prime [03/2023 -]		

DTC	**P052012**	**Engine Oil Pressure Sensor/Switch "A" Circuit Short to Battery**

DTC	**P052014**	**Engine Oil Pressure Sensor/Switch "A" Circuit Short to Ground or Open**

DESCRIPTION



Variable oil pump control uses the oil pressure control valve assembly, oil pressure and temperature sensor and ECM to optimize the oil pressure and oil volume required by each component to reduce friction by monitoring the engine temperature and engine speed. The oil pressure and temperature sensor utilizes a semiconductor type pressure sensor that changes resistance in accordance with changes in pressure. An internal electrical signal that varies with the change in resistance is amplified and sent to the ECM as the engine oil pressure signal.

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	DTC OUTPUT FROM	PRIORITY	NOTE
P052012	Engine Oil Pressure Sensor/Switch "A" Circuit Short to Battery	The oil pressure and temperature sensor output voltage is higher than 4.495 V for 5 seconds or more (1 trip detection logic).	• Open or short in oil pressure and temperature sensor circuit • Oil pressure and	Comes on	Engine	A	SAE Code: P0523

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	DTC OUTPUT FROM	PRIORITY	NOTE
			temperature sensor • ECM				
P052014	Engine Oil Pressure Sensor/Switch "A" Circuit Short to Ground or Open	The oil pressure and temperature sensor output voltage is less than 0.159 V for 5 seconds or more (1 trip detection logic).	• Open or short in oil pressure and temperature sensor circuit • Oil pressure and temperature sensor • ECM	Comes on	Engine	A	SAE Code: P0522

Related Data List

DTC NO.	DATA LIST
P052012	Engine Oil Pressure
P052014	

MONITOR DESCRIPTION

The ECM calculates the oil pressure based on the output voltage of the oil pressure and temperature sensor. If the signal output from the oil pressure and temperature sensor is outside of the specified range, the MIL is illuminated and a DTC is stored.

MONITOR STRATEGY

Related DTCs	P0522: Engine oil pressure sensor range check (low voltage) P0523: Engine oil pressure sensor range check (high voltage)
Required Sensors/Components (Main)	Oil pressure sensor
Required Sensors/Components (Related)	-
Frequency of Operation	Continuous
Duration	5 seconds
MIL Operation	Immediate
Sequence of Operation	None

TYPICAL ENABLING CONDITIONS

Monitor runs whenever the following DTCs are not stored	None
Both of the following conditions are met	-
Auxiliary battery voltage	8 V or higher

Ignition switch	ON

TYPICAL MALFUNCTION THRESHOLDS

P0522: Range Check (Low Voltage)

Engine oil pressure sensor voltage	Less than 0.159 V

P0523: Range Check (High Voltage)

Engine oil pressure sensor voltage	Higher than 4.495 V

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. Wait 10 seconds or more [B].
5. Enter the following menus: Powertrain / Engine / Trouble Codes [C].
6. Read the pending DTCs.

   HINT:

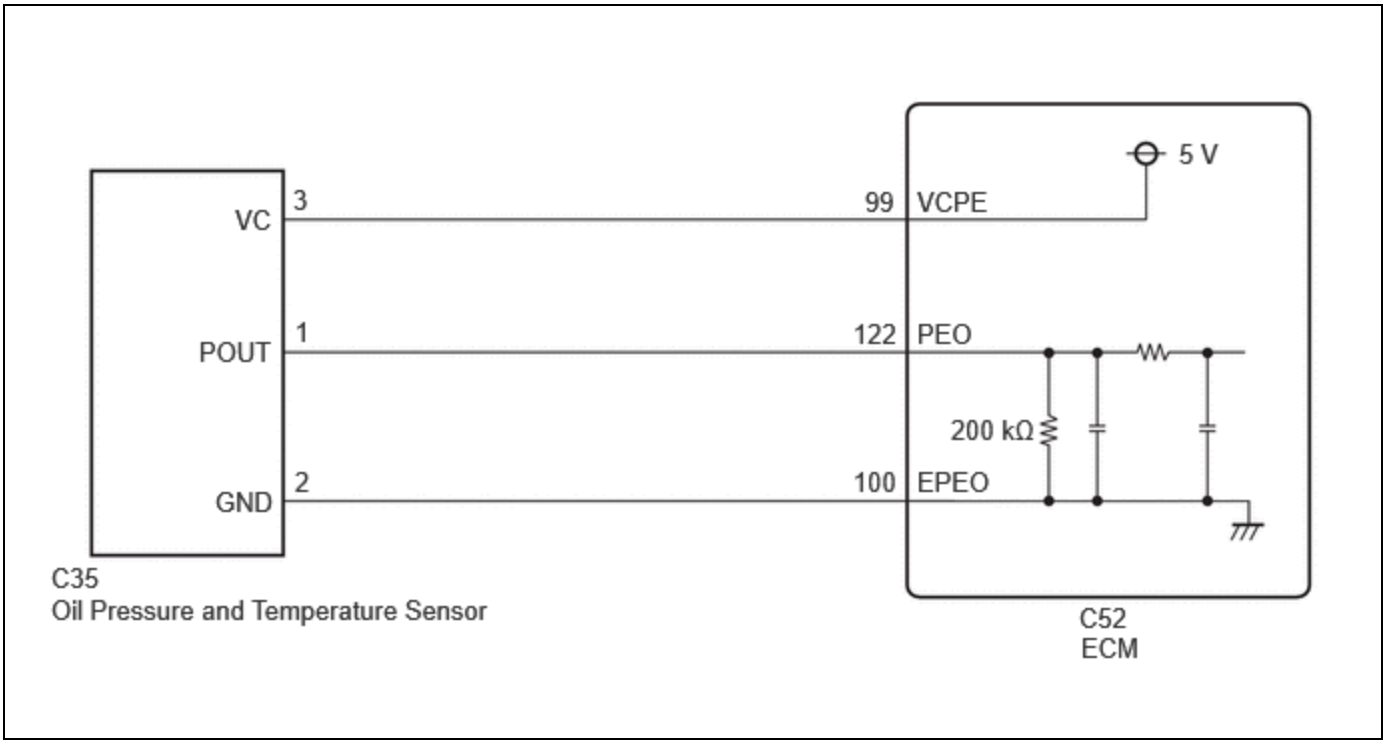
   - If a pending DTC is output, the system is malfunctioning.
   - If a pending DTC is not output, perform the following procedure.
7. Enter the following menus: Powertrain / Engine / Utility / All Readiness.
8. Input the DTC: P052012 or P052014.
9. Check the DTC judgment result.

HINT:

- If the judgment result is NORMAL, the system is normal.
- If the judgment result is ABNORMAL, the system is malfunctioning.
- 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.

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 oil pressure and temperature 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(C35)
Click Connector(C35)

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION	RESULT
C35-3 (VC) - Body ground	Ignition switch ON	4.5 to 5.5 V	V
C35-1 (POUT) - Body ground	Ignition switch ON	Below 0.1 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(C35)
Click Connector(C35)

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION	RESULT
C35-1 (POUT) - C35-2 (GND)	Ignition switch off	190 to 210 kΩ	kΩ
C35-2 (GND) - Body ground	Ignition switch off	Below 1 Ω	Ω

Post-procedure2

(g) None.

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

NG
▼

2.	**CHECK HARNESS AND CONNECTOR (OIL PRESSURE AND TEMPERATURE SENSOR - ECM)**

Pre-procedure1

(a) Disconnect the oil pressure and temperature 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(C35,C52)
Click Connector(C35)
Click Connector(C52)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
C35-2 (GND) - C52-100 (EPEO)	Always	Below 1 Ω	Ω
C35-1 (POUT) - C52-122 (PEO)	Always	Below 1 Ω	Ω
C35-3 (VC) - C52-99 (VCPE)	Always	Below 1 Ω	Ω
C35-2 (GND) or C52-100 (EPEO) - Body ground and other terminals	Always	10 kΩ or higher	kΩ
C35-1 (POUT) or C52-122 (PEO) - Body ground and other terminals	Always	10 kΩ or higher	kΩ
C35-3 (VC) or C52-99 (VCPE) - 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**