Last Modified: 12-04-2024	6.11:8.1.0	**Doc ID:** RM100000002BM1H
Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [03/2023 -]
Title: M20A-FXS (ENGINE CONTROL): SFI SYSTEM: P24507E,P24517F; Evaporative Emission System Switching Valve Actuator Stuck On; 2023 - 2024 MY Prius Prius Prime [03/2023 -]		

DTC	**P24507E**	**Evaporative Emission System Switching Valve Actuator Stuck On**

DTC	**P24517F**	**Evaporative Emission System Switching Valve Actuator Stuck Off**

DTC SUMMARY

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	DTC OUTPUT FROM	PRIORITY	NOTE
P24507E	Evaporative Emission System Switching Valve Actuator Stuck On	Either of the following conditions is met when the fuel tank pressure is higher than -2.5 kPa(gauge) [-0.36 psi(gauge)], and less than 3 kPa(gauge) [0.4 psi(gauge)]. • Fuel tank pressure change when vacuum introduction for canister is higher than 0.5 kPa [0.07 psi] • EVAP pressure when vacuum introduction for canister was complete is higher than (third reference pressure x 0.2)	• Fuel vapor-containment valve • Connector/wire harness (fuel vapor-containment valve - ECM) • ECM	Comes on	Engine	B	SAE Code: P2450
P24517F	Evaporative Emission System Switching Valve Actuator Stuck Off	Either of the following conditions is met: • Fuel tank pressure change when vacuum introduction for	• Fuel vapor-containment valve • Connector/wire harness (fuel vapor-containment valve - ECM)	Comes on	Engine	B	SAE Code: P2451

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	DTC OUTPUT FROM	PRIORITY	NOTE
		canister is less than 0.5 kPa [0.07 psi] • EVAP pressure change when fuel vapor-containment valve is open is less than 0.3 kPa [0.04 psi]	• ECM				

DTC NO.	MONITORING ITEM	DETECTION TIMING	DETECTION LOGIC	SAE CODE
P24507E	Fuel vapor-containment valve stuck open	EVAP monitoring (ignition switch off)	2 trip	P2450
P24517F	Fuel vapor-containment valve stuck close			P2451

DESCRIPTION

Refer to EVAP (Evaporative Emission) System.

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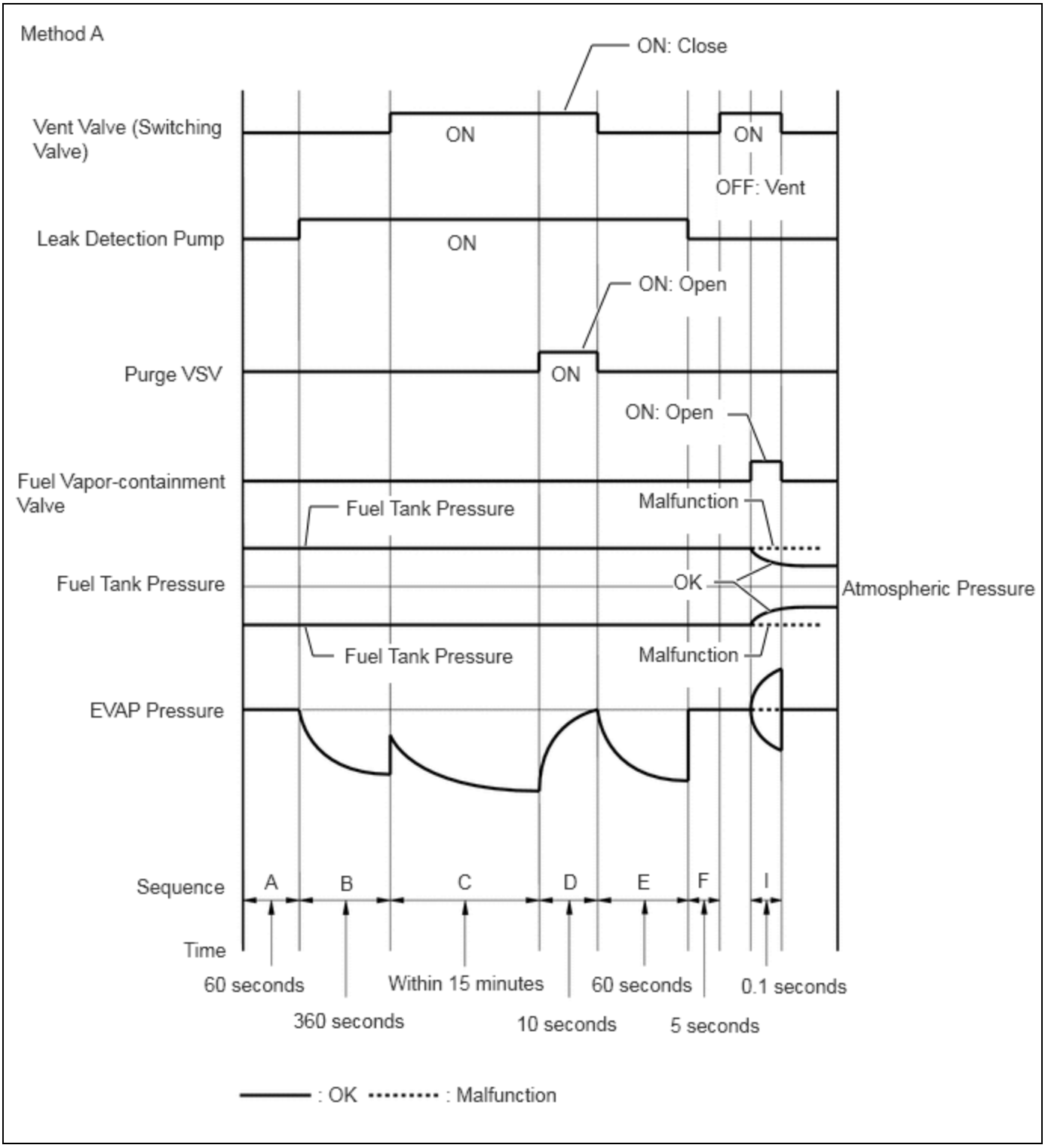
MONITOR DESCRIPTION

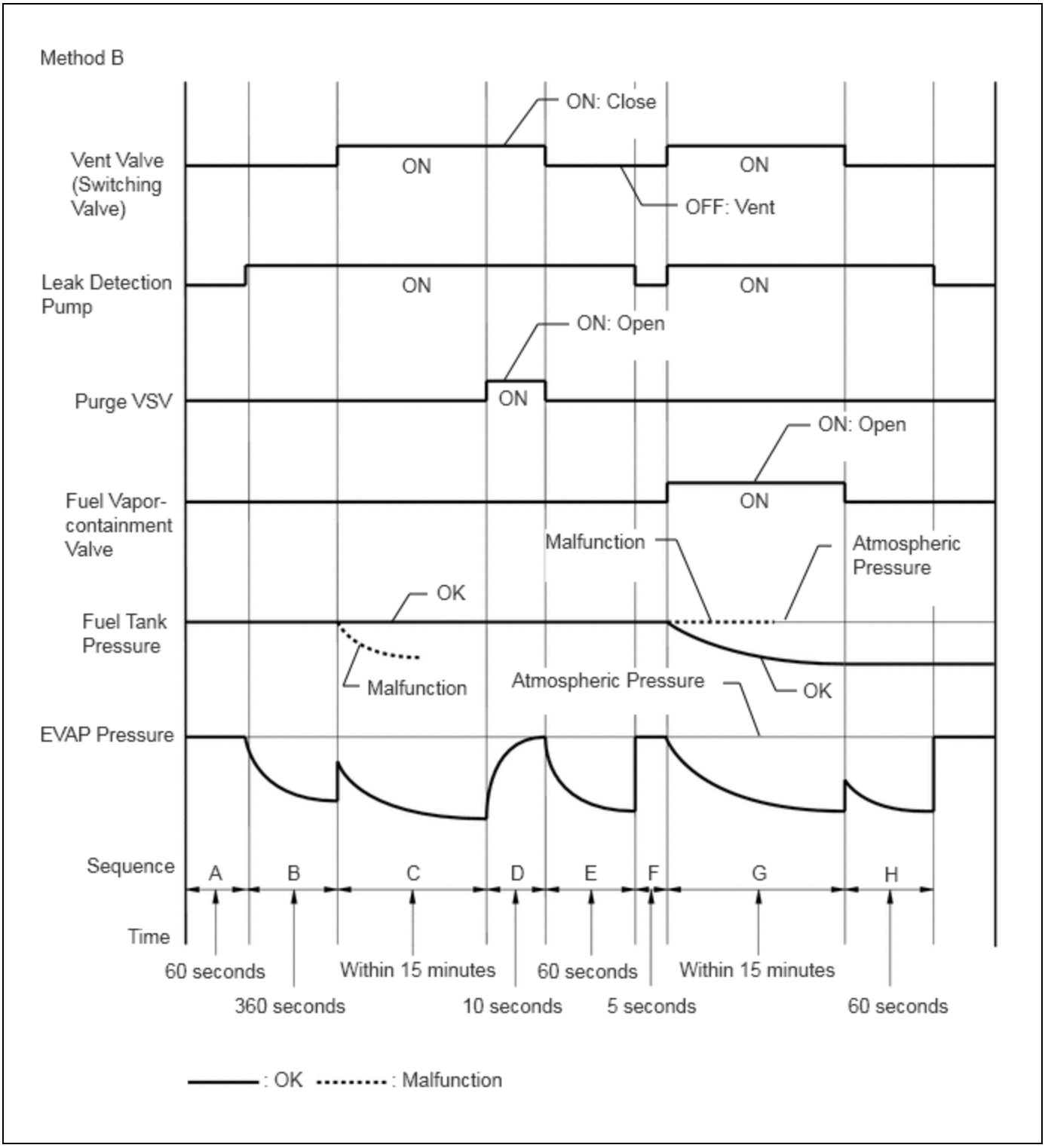
1. P24507E: Fuel vapor-containment valve stuck open

   During sequence C, the leak detection pump creates vacuum in the EVAP system. If the pressure in the fuel tank drops, the ECM determines that the fuel vapor-containment valve is stuck open, illuminates the MIL and stores the DTC (2 trip detection logic).
2. P24517F: Fuel vapor-containment valve stuck closed (vent)

   During sequence I, the fuel vapor-containment valve opens to allow atmospheric pressure into the fuel tank. If there is no change in the fuel tank pressure, the ECM determines that the fuel vapor-containment valve is stuck closed, illuminates the MIL and stores the DTC (2 trip detection logic).

   During sequence G, the fuel vapor-containment valve opens to allow vacuum pressure generated by the leak detection pump into the fuel tank. If the pressure in the fuel tank does not drop, the ECM determines that the fuel vapor-containment valve is stuck closed, illuminates the MIL and stores the DTC (2 trip detection logic).


Method A
ON: Close
Vent Valve (Switching Valve)
ON
ON
OFF: Vent
Leak Detection Pump
ON
ON: Open
Purge VSV
ON
ON: Open
Fuel Vapor-containment Valve
Fuel Tank Pressure
Malfunction
Fuel Tank Pressure
OK
Atmospheric Pressure
Fuel Tank Pressure
Malfunction
EVAP Pressure
Sequence
A
B
C
D
E
F
I
Time
60 seconds
360 seconds
Within 15 minutes
10 seconds
60 seconds
5 seconds
0.1 seconds
: OK
: Malfunction



MONITOR STRATEGY

Required Sensors/Components (Main)	Fuel vapor-containment valve Fuel tank pressure sensor Canister pump module
Required Sensors/Components (Related)	-
Frequency of Operation	Once per driving cycle
Duration	Within 20 minutes

MIL Operation	2 driving cycles
Sequence of Operation	None

TYPICAL ENABLING CONDITIONS

Key-off monitor runs when all of the following conditions are met	-
Atmospheric pressure	70 kPa(abs) [10.2 psi(abs)] or higher, and less than 110 kPa(abs) [16 psi(abs)]
Auxiliary battery voltage	10.5 V or higher
Vehicle speed	Less than 4 km/h (2.5 mph)
Ignition switch	Off
Engine condition	Not running
Key-OFF duration	5, 7 or 9.5 hours
Pressure sensor of canister pump module malfunction (P0451, P0452, P0453)	Not detected
Fuel tank pressure sensor malfunction (P1451, P1452, P1453)	Not detected
Purge VSV	Not operated by scan tool
Vent valve	Not operated by scan tool
Fuel vapor-containment valve	Not operated by scan tool
Leak detection pump	Not operated by scan tool
Purge flow before key-OFF	Performed
Engine coolant temperature	4.4°C (39.9°F) or higher, and less than 35°C (95°F)
Intake air temperature	4.4°C (39.9°F) or higher, and less than 35°C (95°F)

TYPICAL MALFUNCTION THRESHOLDS

P2450: Fuel Vapor-containment Valve Stuck Open

Either of the following conditions is met when the fuel tank pressure is higher than -2.5 kPa(gauge) [-0.4 psi(gauge)], and less than 3 kPa(gauge) [0.4 psi(gauge)]	Condition 1 or 2
1. Fuel tank pressure change when vacuum introduction for canister	Higher than 0.5 kPa [0.07 psi]
2. EVAP pressure when vacuum introduction for canister was complete	Higher than [third reference pressure x 0.2]

P2451: Fuel Vapor-containment Valve Stuck Close

Either of the following conditions is met	Condition 1 or 2
1. Both of the following conditions are met	Condition (a) and (b)
(a) Fuel tank pressure	Higher than -2.5 kPa(gauge) [-0.36 psi(gauge)], and less than 3 kPa(gauge) [0.4 psi(gauge)]

(b) Fuel tank pressure change when vacuum introduction for fuel tank	Less than 0.5 kPa [0.07 psi]
2. Both of the following conditions are met	Condition (a) and (b)
(a) Fuel tank pressure	-2.5 kPa(gauge) [-0.36 psi(gauge)] or less, or 3 kPa(gauge) [0.4 psi(gauge)] or higher
(b) EVAP pressure change when fuel vapor-containment valve is open	Less than 0.3 kPa [0.04 psi]

MONITOR RESULT

Refer to EVAP System.

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CONFIRMATION DRIVING PATTERN

NOTICE:

- The Evaporative System Check (Automatic Mode) consists of 9 steps performed automatically by the GTS. It takes a maximum of approximately 40 minutes.
- Do not perform the Evaporative System Check when the fuel tank is more than 90% full because the cut-off valve may be closed, making the fuel tank leak check unavailable.
- Do not start the engine during this operation.
- When the temperature of the fuel is 35°C (95°F) or higher, a large amount of vapor will form and any check result will be inaccurate. When performing the Evaporative System Check, keep the fuel temperature less than 35°C (95°F).

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.

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- 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. Enter the following menus: Powertrain / Engine / Utility / Evaporative System Check / Automatic Mode [B].
5. After the "Evaporative System Check" is completed, check for All Readiness by entering the following menus: Powertrain / Engine / Utility / All Readiness.
6. Input the DTC: P24507E or P24517F.
7. 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.

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.	**GO TO EVAP SYSTEM**

HINT:

Click here INFO

NEXT ▶ END