Last Modified: 12-04-2024	6.11:8.1.0	**Doc ID:** RM100000002BM2A
Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [03/2023 -]
Title: M20A-FXS (ENGINE CONTROL): SFI SYSTEM: P043E00,P043F00,P044672,P24007E,P24007F; Evaporative Emission System Leak Detection Reference Orifice Low Flow; 2023 - 2024 MY Prius Prius Prime [03/2023 -]		

DTC	**P043E00**	**Evaporative Emission System Leak Detection Reference Orifice Low Flow**

DTC	**P043F00**	**Evaporative Emission System Leak Detection Reference Orifice High Flow**

DTC	**P044672**	**EVAP System Vent Valve Stuck Open Actuator Stuck Open**

DTC	**P24007E**	**Evaporative Emission System Leak Detection Pump Control Circuit Actuator Stuck On**

DTC	**P24007F**	**Evaporative Emission System Leak Detection Pump Control Circuit Actuator Stuck Off**

DTC SUMMARY

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	DTC OUTPUT FROM	PRIORITY	NOTE
P043E00	Evaporative Emission System Leak Detection Reference Orifice Low Flow	Reference orifice detected as clogged during key-off EVAP monitor.	• Canister pump module • Connector/wire harness (Canister pump module - ECM) • EVAP system hose (pipe from air inlet port to canister pump module, canister filter, fuel tank vent hose) • ECM	Comes on	Engine	B	SAE Code: P043E
P043F00	Evaporative Emission System Leak Detection Reference Orifice High Flow	Reference orifice flow high during key-off EVAP monitor.	• Canister pump module • Connector/wire harness (Canister pump module - ECM) • EVAP system hose (pipe from air inlet	Comes on	Engine	B	SAE Code: P043F

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	DTC OUTPUT FROM	PRIORITY	NOTE
			port to canister pump module, canister filter, fuel tank vent hose) • ECM				
P044672	EVAP System Vent Valve Stuck Open Actuator Stuck Open	Vent valve on (closed) malfunction detected during key-off EVAP monitor.	• Canister pump module • Connector/wire harness (Canister pump module - ECM) • EVAP system hose (pipe from air inlet port to canister pump module, canister filter, fuel tank vent hose) • ECM	Comes on	Engine	B	SAE Code: P2421
P24007E	Evaporative Emission System Leak Detection Pump Control Circuit Actuator Stuck On	Leak detection pump on malfunction detected during key-off EVAP monitor.	• Canister pump module • Connector/wire harness (Canister pump module - ECM) • EVAP system hose (pipe from air inlet port to canister pump module, canister filter, fuel tank vent hose) • ECM	Comes on	Engine	B	SAE Code: P2402
P24007F	Evaporative Emission System Leak Detection Pump Control Circuit Actuator Stuck Off	Leak detection pump off malfunction detected during key-off EVAP monitor.	• Canister pump module • Connector/wire harness (Canister pump module - ECM) • EVAP system hose (pipe from air inlet port to canister pump module, canister filter, fuel tank vent hose) • ECM	Comes on	Engine	B	SAE Code: P2401

HINT:

The reference orifice is located inside the canister pump module.

DTC NO.	MONITORING ITEM	DETECTION TIMING	DETECTION LOGIC	SAE CODE
P043E00	Reference orifice low flow	EVAP monitoring (Ignition switch off)	2 trip	P043E
P043F00	Reference orifice high flow			P043F
P044672	Vent valve (built into canister pump module) stuck open			P2421
P24007E	Leak detection pump stuck ON			P2402
P24007F	Leak detection pump stuck OFF			P2401

DESCRIPTION

Refer to EVAP (Evaporative Emission) System.

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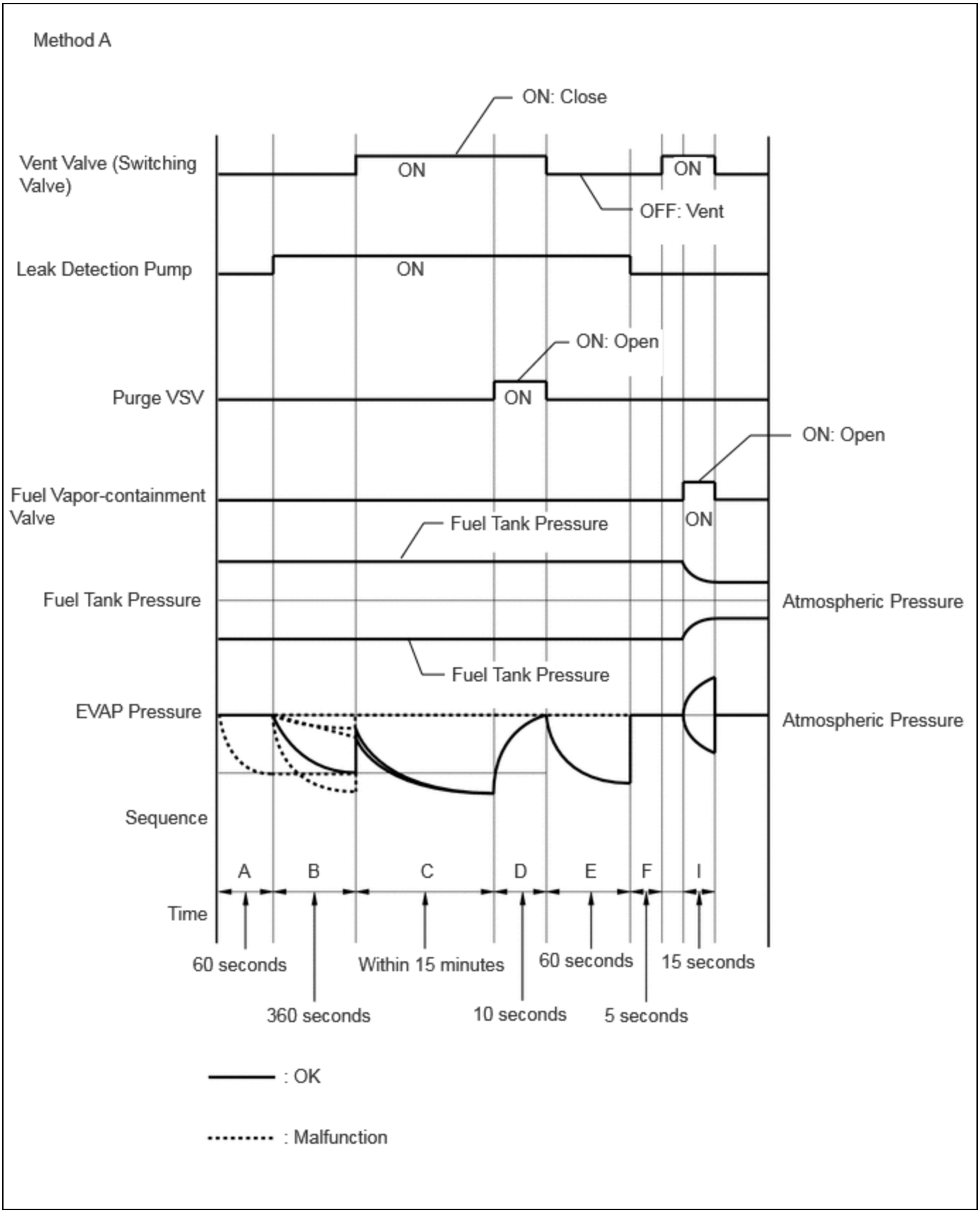
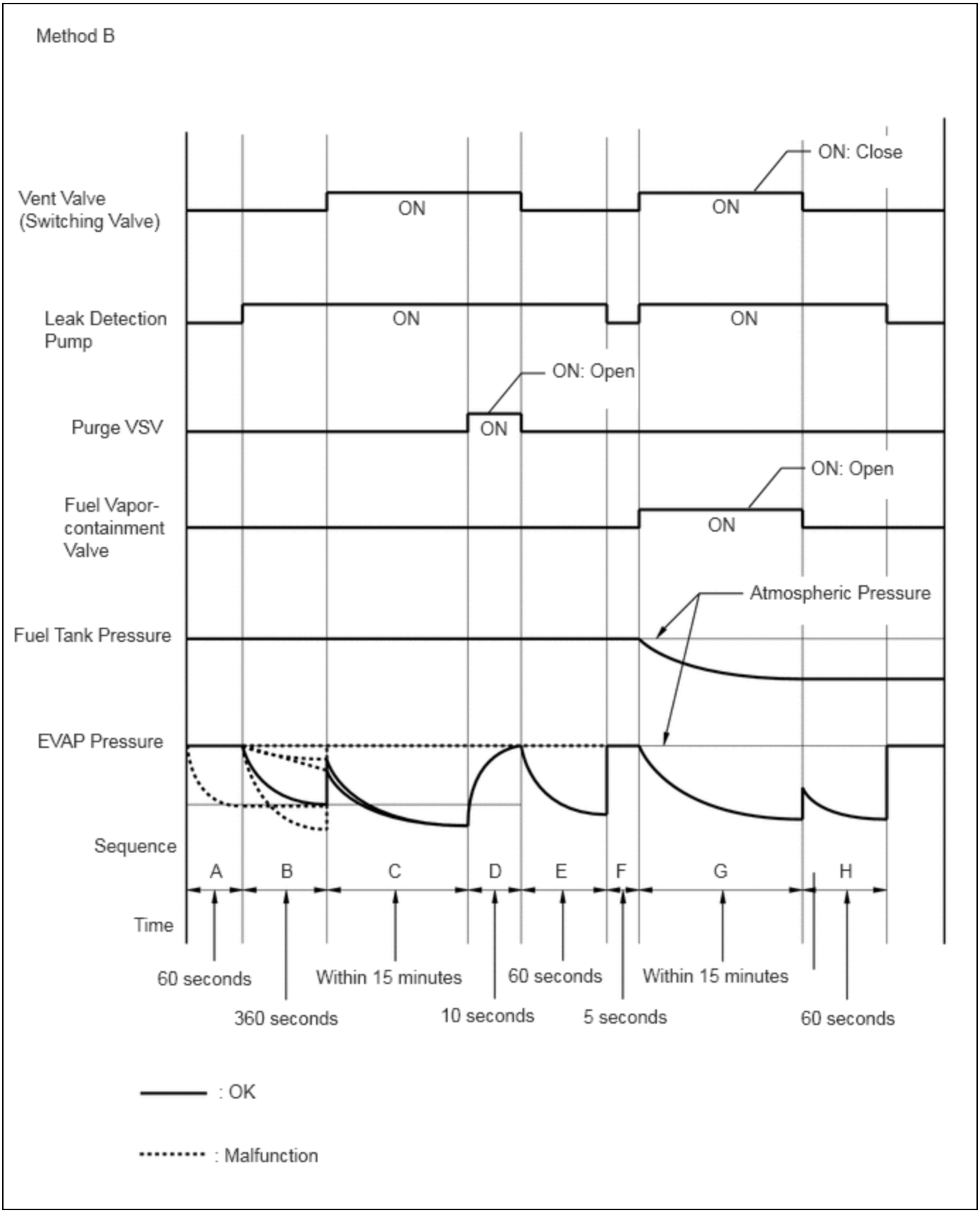
MONITOR DESCRIPTION

In sequence B and E, the leak detection pump creates negative pressure (vacuum) through the reference orifice. The EVAP system pressure is then measured by the ECM, using the canister pressure sensor, to determine the reference pressure. If the pressure detected meets one of the following conditions, the ECM will illuminated the MIL and store a DTC (2 trip detection logic).

- EVAP pressure is lower than the malfunction criterion.
- EVAP pressure is higher than the malfunction criterion.
- EVAP pressure is not saturated within 60 seconds.
- EVAP pressure difference between sequence B and E is large.


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
ON
Fuel Tank Pressure
Fuel Tank Pressure
Atmospheric Pressure
Fuel Tank Pressure
EVAP Pressure
Atmospheric Pressure
Sequence
A
B
C
D
E
F
I
Time
60 seconds
360 seconds
Within 15 minutes
10 seconds
60 seconds
5 seconds
15 seconds
: OK
: Malfunction



MONITOR STRATEGY

Required Sensors/Components (Main)	Canister pump module
Required Sensors/Components (Related)	-

Frequency of Operation	Once per driving cycle
Duration	Within 7 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

One of following conditions met	-
EVAP pressure when 1.9 seconds after reference pressure measurement began	Higher than -0.242 kPa(gauge) [-0.0351 psi(gauge)]
Reference pressure (vary with atmospheric pressure)	Less than -4.85 kPa(gauge) [-0.7 psi(gauge)]
Reference pressure (vary with atmospheric pressure)	-1.068 kPa(gauge) [-0.155 psi(gauge)] or higher
Reference pressure (vary with atmospheric pressure)	Not saturated
Reference pressure difference between the first and second	0.9 kPa(gauge) [0.1 psi(gauge)] or higher

MONITOR RESULT

Refer to EVAP System.

Click here INFO

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 higher 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 from 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.

  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. 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: P043E00, P043F00, P044672, P24007E or P24007F.
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

HINT:

If the cable is disconnected from the Auxiliary battery terminal, the fuel vapor containment valve cannot close completely and an EVAP SYSTEM DTC will be stored. If the DTC is output, drive the vehicle at a speed of 10 km/h (6 mph) or more and then leave the vehicle for 30 seconds or more. Then perform the Evaporative System Check again.

PROCEDURE

1.	**GO TO EVAP SYSTEM**

HINT:

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NEXT ▶ **END**