

DTC	P2419	Evaporative Emission System Switching Valve Control Circuit Low
DTC	P2420	Evaporative Emission System Switching Valve Control Circuit High

DTC SUMMARY

DTCs	Monitoring Items	Malfunction Detection Conditions	Trouble Areas	Detection Timings	Detection Logic
P2419	Vent valve stuck closed	Leak detection pump creates negative pressure through reference orifice and EVAP system pressure measured to determine leak criterion. If system pressure higher than -1.06 kPa (-7.95 mmHg)* 4 seconds after leak detection pump turned ON, ECM determines that vent valve stuck closed.	<ul style="list-style-type: none"> Canister pump module Connector/wire harness (Canister pump module - ECM) ECM 	While ignition switch OFF	2 trip
P2420	Vent valve stuck open (vent)	leak detection pump creates negative pressure through reference orifice and EVAP system pressure measured to determine leak criterion. 0.02 inch leak criterion measured at start and at end of leak check. If system pressure does not increase by more than 0.3 kPa (2.25 mmHg) within 10 seconds when vent valve turned ON, ECM determines that vent valve stuck close.	<ul style="list-style-type: none"> Canister pump module Connector/wire harness (Canister pump module - ECM) ECM Leakage from EVAP system 	While ignition switch OFF	2 trip

*: The threshold value varies according to the atmospheric pressure measured in operation A. The value described above is based on an atmospheric pressure of 100 kPa (750.1 mmHg): absolute pressure.

HINT:

The vent valve is built into the canister pump module.

DESCRIPTION

The circuit description can be found in the EVAP (Evaporative Emission) System (see page [ES-392](#)).

Refer to the EVAP System (see page [ES-397](#)).

MONITOR DESCRIPTION

5 hours* after the ignition switch is turned to OFF, the electric leak detection pump creates negative pressure (vacuum) in the EVAP (Evaporative Emission) system. The ECM monitors for leaks and actuator malfunctions based on the EVAP pressure.

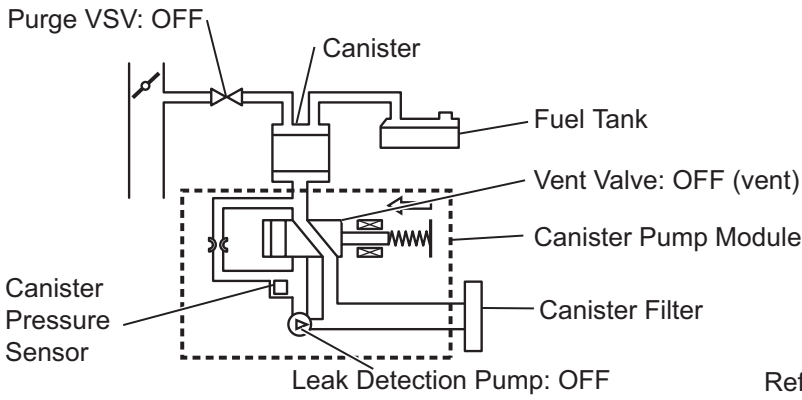
HINT:

*: If the engine coolant temperature is not below 35°C (95°F) 5 hours after the ignition switch is turned off, the monitor check starts 2 hours later. If it is still not below 35°C (95°F) 7 hours after the ignition switch is turned off, the monitor check starts 2.5 hours later.

Sequence	Operations	Descriptions	Duration
-	ECM activation	Activated by soak timer, 5 hours (7 or 9.5 hours) after ignition switch turned to OFF.	-
A	Atmospheric pressure measurement	Vent valve turned OFF (vent) and EVAP system pressure measured by ECM in order to register atmospheric pressure. If pressure in EVAP system not between 70 kPa and 110 kPa (525 mmHg and 825 mmHg), ECM cancels EVAP system monitor.	10 seconds
B	First 0.02 inch leak criterion (reference pressure) measurement	In order to determine 0.02 inch leak criterion, leak detection pump creates negative pressure (vacuum) through reference orifice and then ECM checks if leak detection pump and vent valve operate normally.	60 seconds
C	EVAP system pressure measurement	Vent valve turned ON (closed) to shut EVAP system. Negative pressure (vacuum) created in EVAP system, and EVAP system pressure then measured. Write down measured value as they will be used in leak check. If EVAP pressure does not stabilize within 15 minutes, ECM cancels EVAP system monitor.	15 minutes*
D	Purge VSV monitor	Purge VSV opened and then EVAP system pressure measured by ECM. Large increase indicates normal.	10 seconds
E	Second 0.02 inch leak criterion (reference pressure) measurement	After second 0.02 inch leak criterion measurement, leak check performed by comparing first and second 0.02 inch leak criterion. If stabilized system pressure higher than second 0.02 inch leak criterion, ECM determines that EVAP system leaking.	60 seconds
F	Final check	Atmospheric pressure measured and then monitoring result recorded by ECM.	-

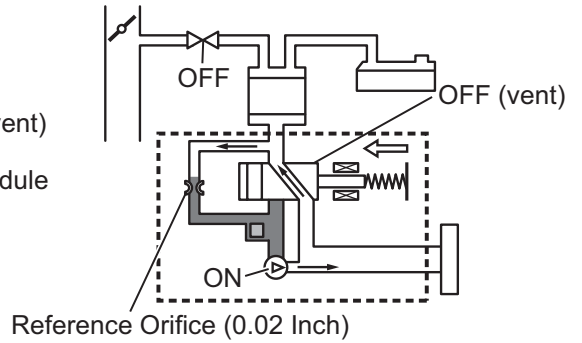
* If only a small amount of fuel is in the fuel tank, it takes longer for the EVAP pressure to stabilize.

Operation A: Atmospheric Pressure Measurement

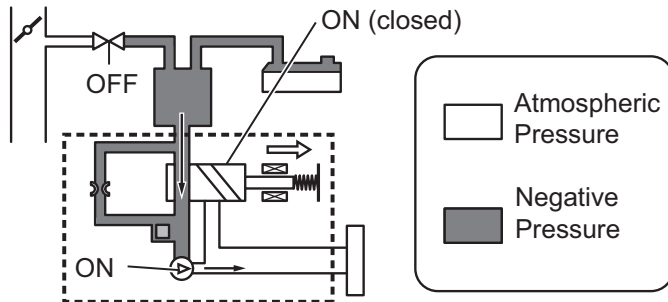


Operation B, E:

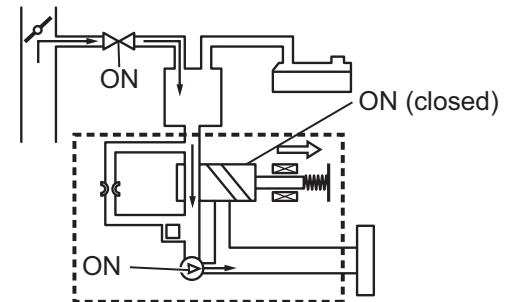
0.02 Inch Leak Criterion Measurement



Operation C: EVAP System Pressure Measurement



Operation D: Purge VSV Monitor



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1. P2419: Vent valve stuck closed

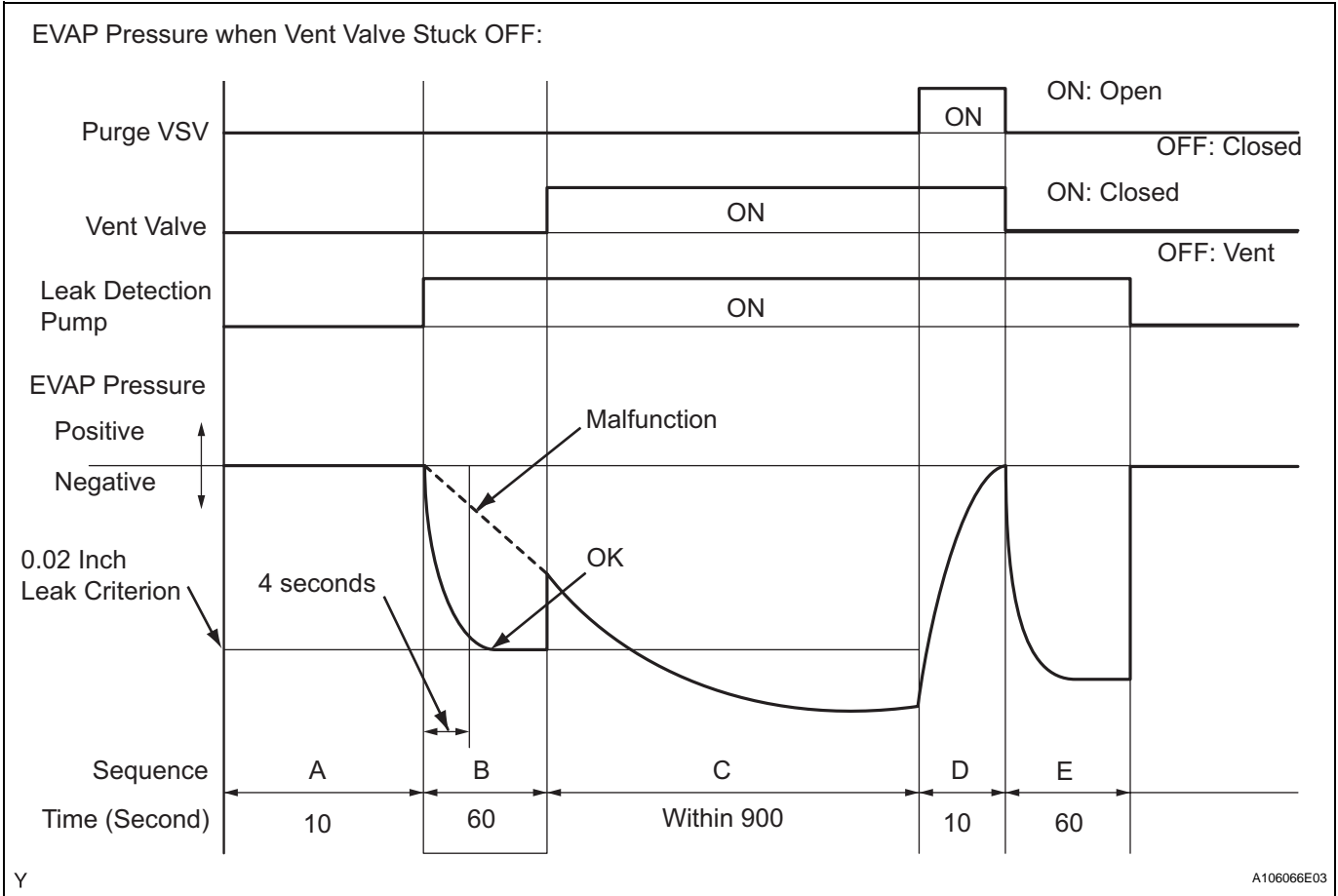
In operation B, the leak detection pump creates negative pressure (a vacuum) through the reference orifice. The EVAP (Evaporative Emission) system pressure is then measured by the ECM, using the canister pressure sensor, to determine the 0.02 inch leak criterion. If the pressure exceeds -1.06 kPa (-7.95 mmHg) * 4 seconds after the leak detection pump is turned ON, the ECM interprets this as the vent valve being stuck closed.

The ECM illuminates the MIL and sets the DTC (2 trip detection logic).

*: The threshold varies according to the atmospheric pressure measured in operation A. The value described above is based on an atmospheric pressure of 100 kPa (750.1 mmHg): absolute pressure.

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EVAP Pressure when Vent Valve Stuck OFF:

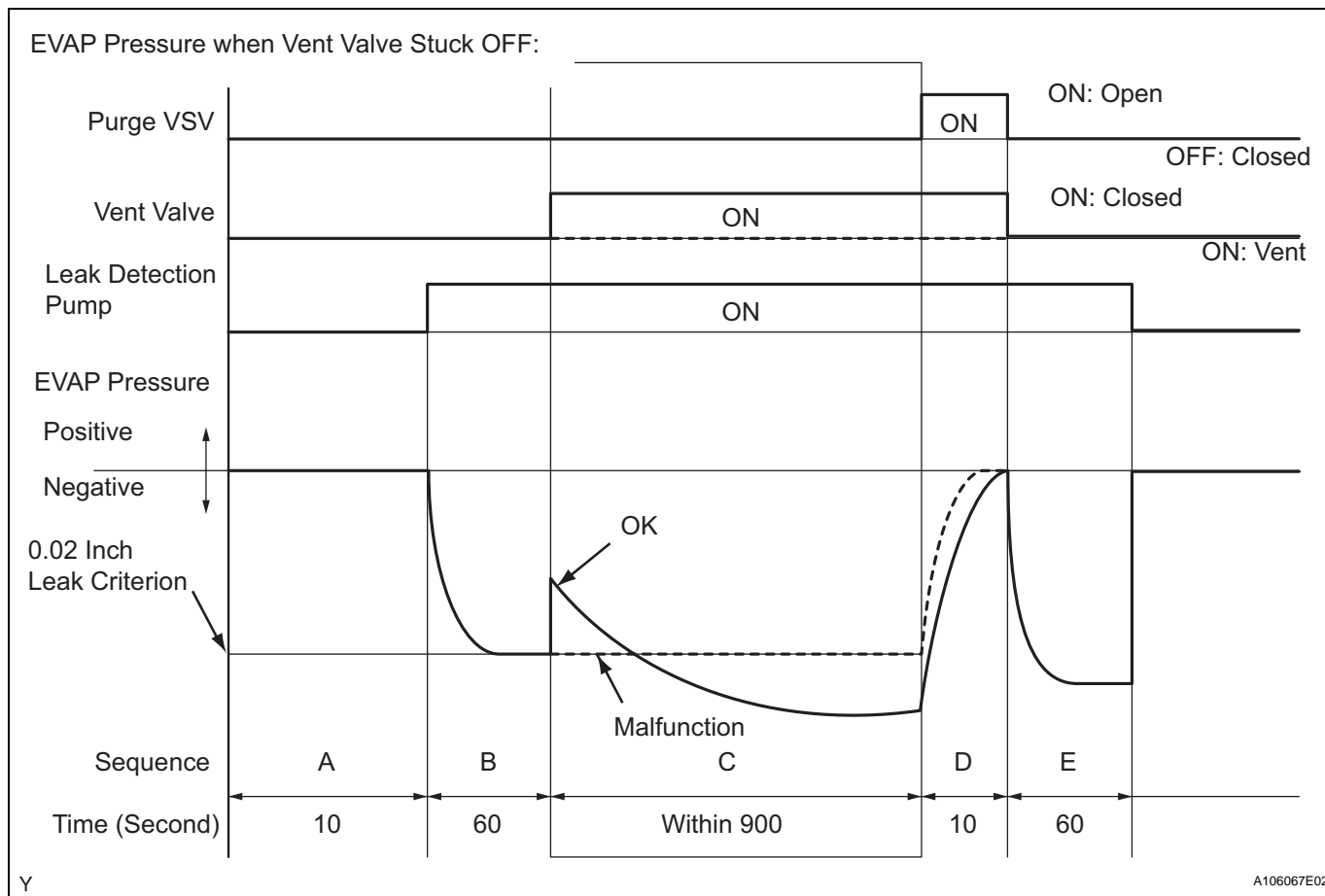


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2. P2420: Vent valve stuck open (vent)

In operation C, the vent valve turns ON (closes) and the EVAP (Evaporative Emission) system pressure is then measured by the ECM, using the canister pressure sensor, to conduct an EVAP leak check. If the pressure does not increase when the vent valve is open, the ECM interprets this as the vent valve being stuck open. The ECM illuminates the MIL and sets the DTC.



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OBD II MONITOR SPECIFICATIONS

MONITOR STRATEGY

Required Sensors/Components	Purge VSV and Canister pump module
Frequency of Operation	Once per driving cycle
Duration	Within 15 minutes (varies with amount of fuel in tank)
MIL Operation	2 driving cycles
Sequence of Operation	None

TYPICAL ENABLING CONDITIONS

Monitor runs whenever following DTCs not present	None
EVAP key-off monitor runs when all of following conditions met	-
Atmospheric pressure	70 to 110 kPa (525 to 825 mmHg)
Battery voltage	10.5 V or more
Vehicle speed	Below 2.5 mph (4 km/h)
Ignition switch	OFF
FTP sensor malfunction (P0450, P0451, P0452 and P0453)	Not detected
Purge VSV	Not operated by scan tool

Vent valve	Not operated by scan tool
Leak detection pump	Not operated by scan tool
Both of following conditions met before IG switch OFF	Conditions 1 and 2
1. Duration that vehicle driven	5 minutes or more
2. Purge flow	Executed
ECT	4.4° to 35°C (40° to 95°F)
IAT	4.4° to 35°C (40° to 95°F)
Time after engine stopped	5 hours

Example of restart time

First time	7 hours
Second time	9 hours and 30 minutes

1. Key-off monitor sequence 1 to 8**1. Atmospheric pressure**

Next sequence is run if following condition set	-
Atmospheric pressure change for 10 second	Less than 0.3 kPa (2.25 mmHg) for 1 second

2. First reference pressure

Next sequence is run if all of following conditions set	Condition 1, 2 and 3
1. FTP when 4 seconds after reference pressure measurement	-1 kPa (-7.5 mmHg) or less
2. Reference pressure	-4.85 to -1.057 kPa (-33.38 to -7.93 mmHg)
3. Reference pressure	Saturated within 60 seconds

3. Vent valve stuck closed check

Next sequence is run if following condition set	-
FTP change for 10 seconds after vent valve ON (closed)	0.3 kPa (2.25 mmHg) or more

4. Vacuum introduction and leak

Next sequence is run if both of following conditions set	Condition 1 and 2
1. Vacuum introduction time	12 minutes or less
2. FTP	Saturated within 12 minutes

5. Purge VSV stuck closed check

Next sequence is run if following condition set	-
FTP change for 10 seconds after purge VSV ON (open)	0.3 kPa (2.25 mmHg) or more

6. Second reference pressure measurement

Next sequence is run if all of following conditions set	Condition 1, 2, 3 and 4
1. FTP when 4 seconds after reference pressure measurement	-1 kPa (-7.5 mmHg) or less
2. Reference pressure	-4.85 to -1.057 kPa (-36.4 to -7.92 mmHg)
3. Reference pressure	Saturated within 60 seconds
4. Reference pressure difference between first and second	0.7 kPa (5.25 mmHg) or less

7. Leak check

Next sequence is run if following condition set	-
FTP when vacuum introduction was complete	Second reference pressure or less

8. Atmospheric pressure

Monitor is complete if following	-
Atmospheric pressure difference between sequence 1 and 8	0.3 kPa (2.25 mmHg) or less

TYPICAL MALFUNCTION THRESHOLDS**P2419: Vent valve stuck closed**

One of the following conditions set	-
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EVAP pressure just after reference pressure measurement start	-1 kPa (-7.5 mmHg) or more
Reference pressure	Less than -4.85 kPa (-36.4 mmHg)
Reference pressure	-1.057 kPa (-7.9 mmHg) or more
0.02 inch leak criterion	Not saturated within 60 seconds
Difference between first reference pressure and second reference pressure	More than 0.7 kPa (5.25 mmHg)

P2420: Vent valve stuck open (vent)

EVAP pressure change in 10 seconds when vent valve turned ON after measurement of 0.02 inch leak criterion	Less than 0.3 kPa (2.25 mmHg)
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"Saturated" indicates that the EVAP pressure change is less than 0.286 kPa (2.14 mmHg) in 60 seconds.

MONITOR RESULT

Refer to Checking Monitor Status (See page [ES-21](#)) or (See page [ES-422](#)).