

DTC	P0450	EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR/SWITCH
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DTC	P0451	EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR RANGE/PERFORMANCE
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DTC	P0452	EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR/SWITCH LOW INPUT
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DTC	P0453	EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR/SWITCH HIGH INPUT
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DTC SUMMARY

DTC	Monitoring Items	Malfunction Detection Conditions	Trouble Areas	Detection Timings	Detection Logic
P0450	Pressure sensor voltage abnormal fluctuation	Sensor output voltage rapidly fluctuates beyond upper and lower malfunction thresholds for 0.5 seconds.	<ul style="list-style-type: none"> Pump module Connector/Wire harness (Pump module - ECM) ECM 	<ul style="list-style-type: none"> EVAP monitoring (ignition OFF) Ignition ON 	1 trip
P0451	Pressure sensor noising	Sensor output voltage fluctuates frequently in certain time period.	<ul style="list-style-type: none"> Pump module Connector/Wire harness (Pump module - ECM) ECM 	<ul style="list-style-type: none"> EVAP monitoring (ignition OFF) Engine running 	2 trip
P0451	Pressure sensor stuck	Sensor output voltage does vary in certain time period.	<ul style="list-style-type: none"> Pump module Connector/Wire harness (Pump module - ECM) ECM 	<ul style="list-style-type: none"> EVAP monitoring (ignition OFF) 	2 trip
P0452	Pressure sensor voltage low	Sensor output voltage is less than 0.45 V for 0.5 seconds.	<ul style="list-style-type: none"> Pump module Connector/Wire harness (Pump module - ECM) ECM 	<ul style="list-style-type: none"> Ignition ON EVAP monitoring (ignition OFF) 	1 trip
P0453	Pressure sensor voltage high	Sensor output voltage is more than 4.9 V for 0.5 seconds.	<ul style="list-style-type: none"> Pump module Connector/Wire harness (Pump module - ECM) ECM 	<ul style="list-style-type: none"> Ignition ON EVAP monitoring (ignition OFF) 	1 trip

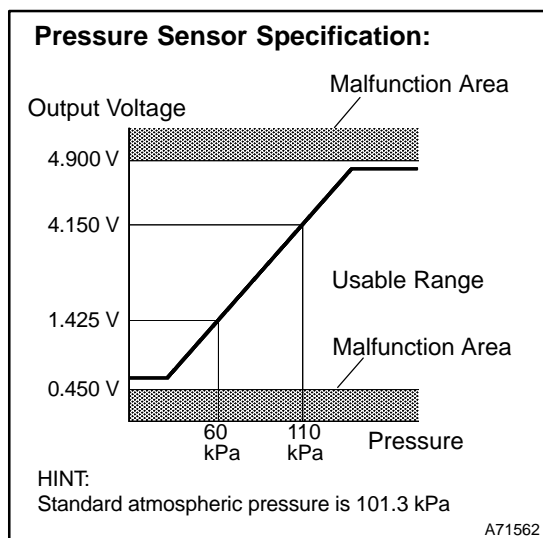
HINT:

The pressure sensor is built into the pump module.

CIRCUIT DESCRIPTION

The circuit description can be found in the EVAP (Evaporative Emission) Inspection Procedure (see page [05-317](#)).

MONITOR DESCRIPTION



- (a) **DTC P0450: Pressure sensor voltage abnormal fluctuation.**
If the pressure sensor voltage output rapidly fluctuates between less than 0.45 V and more than 4.9 V, the ECM interprets this as an open or short circuit malfunction in the pressure sensor or its circuit, and stops the EVAP (Evaporative Emission) system monitor. The ECM then illuminates the MIL and sets the DTC (1 trip detection logic).
- (b) **DTC P0451: Pressure sensor noising or stuck**
If the pressure sensor voltage output fluctuates rapidly for 10 seconds, the ECM stops the EVAP system monitor. The ECM interprets this as noise from the pressure sensor, and stops the EVAP system monitor. The ECM then illuminates the MIL and sets the DTC.
Alternatively, if the sensor voltage output does not change for 10 seconds, the ECM interprets this as the sensor being stuck, and stops the monitor. The ECM then illuminates the MIL and sets the DTC.
(Both the malfunctions are detected by 2 trip detection logic)
- (c) **DTC P0452: Pressure sensor voltage low**
If the pressure sensor voltage output is below 0.45 V, the ECM interprets this as an open or short circuit malfunction in the pressure sensor or its circuit, and stops the EVAP system monitor. The ECM then illuminates the MIL and sets the DTC (1 trip detection logic).
- (d) **DTC P0453: Pressure sensor voltage high**
If the pressure sensor voltage output is 4.9 V or more, the ECM interprets this as an open or short circuit malfunction in the pressure sensor or its circuit, and stops the EVAP system monitor. The ECM then illuminates the MIL and sets the DTC (1 trip detection logic).

OBD II MONITOR SPECIFICATIONS

Monitor Strategy

Required Sensors/Components	Pump module
Frequency of Operation	Once per driving cycle: P0451 FTP sensor output "Stuck" Continuous: P0451 FTP sensor "Noise", P0450, P0452 and P0453
Duration	0.5 sec.: P0450, P0452 and P0453 10 sec.: P0451
MIL Operation	Immediate: P0450, P0452 and P0453 2 driving cycles: P0451
Sequence of Operation	None

Typical Enabling Conditions

P0451: FTP sensor "Noise"

Monitor runs whenever these DTCs are not present	See page 05-16
Atmospheric pressure (absolute pressure)	70 kPa (525 mmHg) or more, less than 110 kPa (825 mmHg)
Battery voltage	10.5 V or more
Intake air temperature	4.4° to 35°C (40° to 95°F)
FTP sensor malfunction (P0450, P0452, P0453)	Not detected
Either of following conditions is met:	Condition 1 or 2
1. Engine	Running
2. Time after engine stopped	5 hours

Example of re-start time

First time	7 hours
Second time	9 hours and 30 min.

P0451: FTP sensor output "Stuck"

Monitor runs whenever these DTCs are not present	See page 05-16
Battery voltage	10.5 V or more
Intake air temperature	4.4° to 35°C (40° to 95°F)
FTP sensor malfunction (P0450, P0452, P0453)	Not detected
Atmospheric pressure (absolute pressure)	Less than 70 kPa (525 mmHg), or 110 kPa (825 mmHg) or more
Time after engine stopped	5 hours

Example of re-start time

First time	7 hours
Second time	9 hours and 30 min.

P0450, P0452 and P0453:

Monitor runs whenever these DTCs are not present	See page 05-16
Ignition switch	ON
Battery voltage	8 V or more
Starter	OFF

Typical Malfunction Thresholds

P0450: Pressure sensor chattering

Pressure sensor voltage	Less than 0.45 V, or more than 4.9 V
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P0451: FTP sensor "Noise"

Frequency that FTP change is 2.25 mmHg (0.3 kPa) or more	10 times or more in 10 sec.
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P0451: FTP sensor output "Stuck"

FTP change for 10 sec. during EVAP monitor (Reference pressure)	Less than 4.88 mmHg (0.65 kPa)
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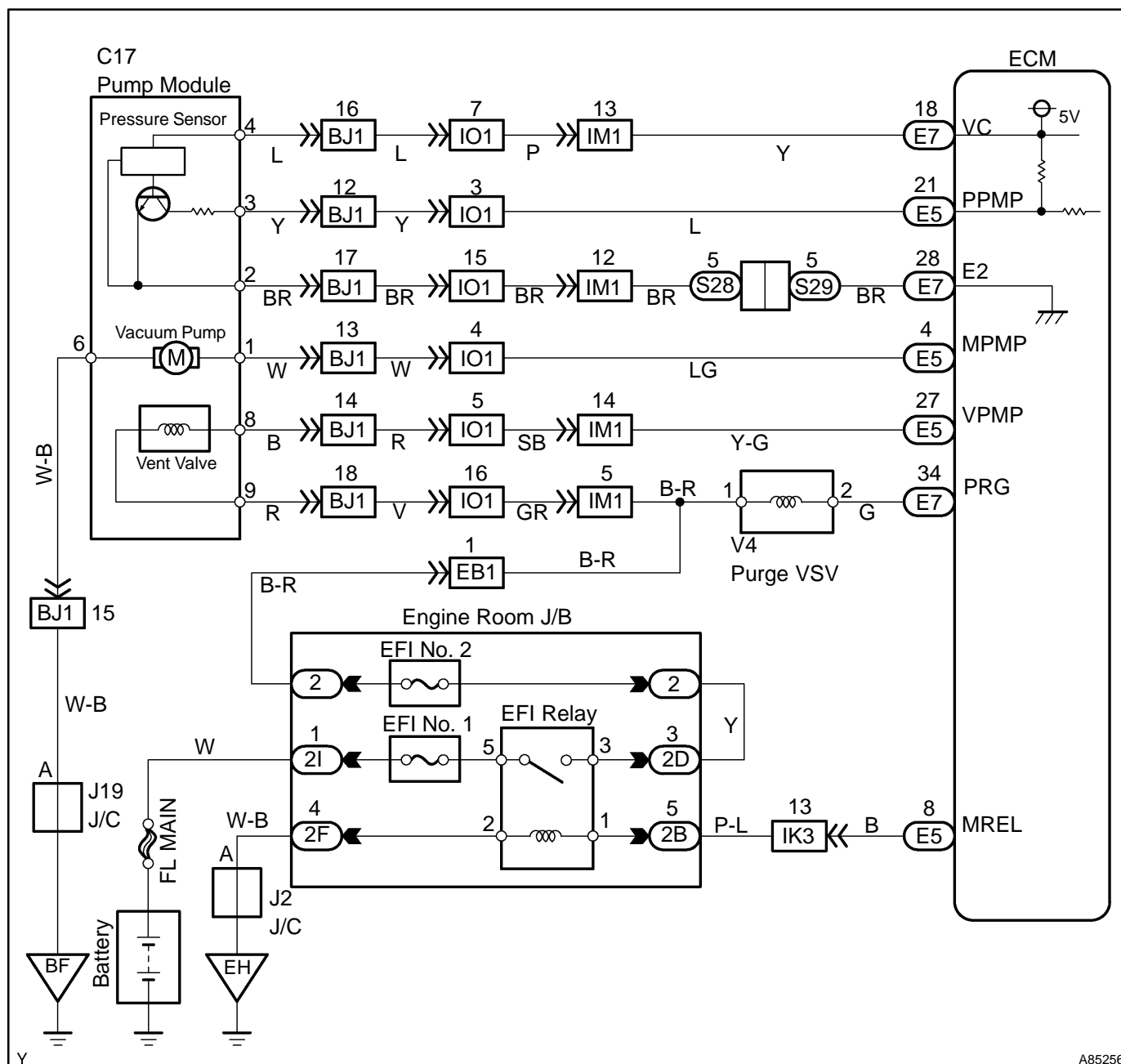
P0452: Pressure sensor low voltage

Pressure sensor voltage	Less than 0.45 V
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P0453: Pressure sensor high voltage

Pressure sensor voltage

More than 4.9 V

WIRING DIAGRAM

A85256

INSPECTION PROCEDURE

NOTICE:

- When a vehicle is brought into the workshop, leave it as it is. Do not change the vehicle condition. For example, do not tighten the fuel tank cap.
- Do not disassemble the pump module.
- A hand-held tester is required to conduct the following diagnostic troubleshooting procedure.

1 CONFIRM DTC AND EVAP PRESSURE

- Connect a hand-held tester to the DLC3.
- Turn the ignition switch to ON (do not start the engine).
- Turn the tester ON.
- Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DTC INFO / CURRENT CODES.
- Read DTCs.
- Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DATA LIST / ALL / VAPOR PRESS.
- Read the EVAP (Evaporative Emission) pressure displayed on the tester.

Result:

Display (DTC Output)	Test Results	Suspected Trouble Areas	Proceed To
P0451	—	• Pressure sensor	C
P0452	Less than 45 kpa (430 mmHg)	• Wire harness/connector (ECM - pressure sensor) • Pressure sensor • Short in ECM circuit	A
P0453	More than 120 kPa (900 mmHg)	• Wire harness/connector (ECM - pressure sensor) • Pressure sensor • Open in ECM circuit	B

B

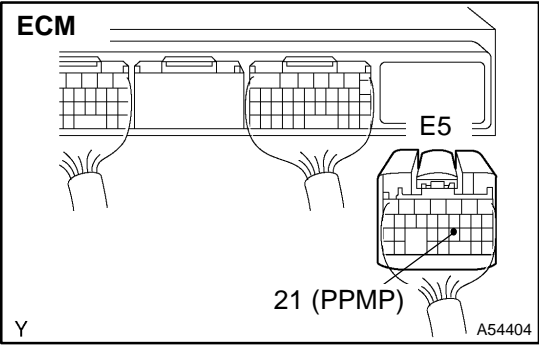
Go to step 4

C

Go to EVAP INSPECTION PROCEDURE
(See page 05-317)

A

2	CHECK HARNESS AND CONNECTOR(PUMP MODULE - ECM)
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- (a) Turn the ignition switch to OFF.
- (b) Disconnect the E5 ECM connector.
- (c) Measure the resistance between PPMP terminal of the ECM connector and the body ground.

Result:

Test Results	Suspected Trouble Areas	Proceed To
10 Ω or less	<ul style="list-style-type: none">• Wire harness/connector (ECM - pressure sensor)• Short in pressure sensor circuit	A
10 kΩ or more	<ul style="list-style-type: none">• Wire harness/connector (ECM - pressure sensor)• Short in ECM circuit	B

- (d) Reconnect the ECM connector.

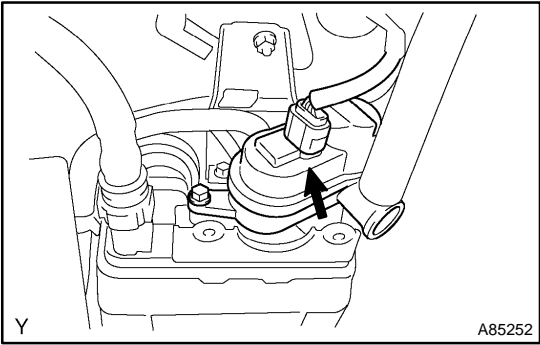
B

Go to step 7

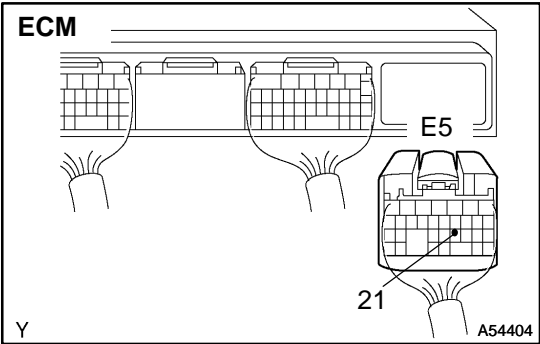
A

3

CHECK HARNESS AND CONNECTOR(PUMP MODULE - ECM)



- (a) Remove the exhaust tail pipe.
- (b) Remove the heat insulator under the canister.
- (c) Disconnect the canister connector.
- (d) Disconnect the E5 ECM connector.
- (e) Check the resistance between PPMP terminal of the ECM connector and the body ground.



Result:

Test Results	Suspected Trouble Areas	Proceed To
10 kΩ or more	• Short in pressure sensor circuit	A
10 Ω or less	• Short in wire harness/connector (ECM - pressure sensor)	B

- (f) Reconnect the canister connector.
- (g) Reconnect the ECM connector.

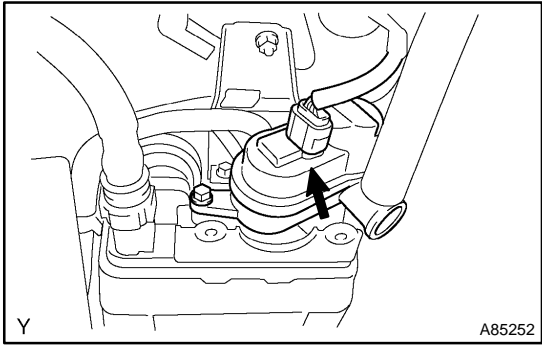
A

Go to step 5

B

Go to step 6

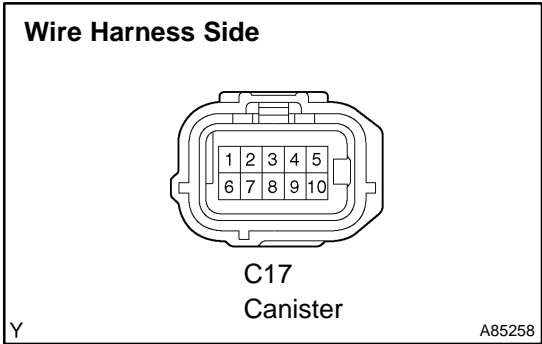
4 CHECK HARNESS AND CONNECTOR(PUMP MODULE - ECM)



- (a) Turn the ignition switch to OFF.
- (b) Remove the exhaust tail pipe.
- (c) Remove the heat insulator under the canister.
- (d) Disconnect the canister connector.
- (e) Turn the ignition switch to ON.
- (f) Measure the voltage and resistance of the C17 connector.

Standard:

Terminal No.	Specified Condition
C17-4 - Body ground	Between 4.5 V and 5.5 V
C17-3 - Body ground	Between 4.5 V and 5.5 V
C17-2 - Body ground	Below 1 Ω



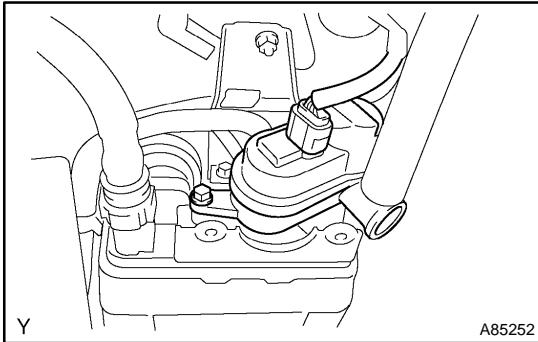
Result:

Test Results	Suspected Trouble Areas	Proceed To
Voltage and resistance within standard ranges	• Open in pressure sensor circuit	A
Voltage and resistance outside standard ranges	• Open in wire harness/connector (ECM - pressure sensor)	B

- (g) Reconnect the canister connector.

A Go to step 5

B Go to step 6

5 REPLACE PUMP MODULE

- (a) Remove the exhaust tail pipe.
- (b) Remove the heat insulator under the canister.
- (c) Disconnect the hoses and the connector.
- (d) Remove the 3 bolts and the pump module with the O-ring.
- (e) Install a new pump module with a new O-ring.
- (f) Install the 3 bolts.
- (g) Connect the hoses and the connector.
- (h) Go to the next step before installing the exhaust tail pipe.

NEXT ➤**Go to step 8****6 REPAIR OR REPLACE WIRE HARNESS AND CONNECTOR****HINT:**

If the exhaust tail pipe has been removed, go to the next step before reinstalling it.

NEXT ➤**Go to step 8****7 REPLACE ECM (see page 10-9)****NEXT** ➤**Go to step 8****8 CONFIRM DTC (AFTER REPAIR)**

- (a) Connect the hand-held tester to the DLC3.
- (b) Turn the ignition switch to ON and turn the tester ON.
- (c) Wait for at least 60 seconds.
- (d) On the tester, select the following menu items: DIAGNOSIS /ENHANCED OBD II /DTC INFO /PENDING CODES.

HINT:

If no pending DTC is displayed on the tester, the repair has been successfully completed.

NEXT ➤**COMPLETED**