DTC	P0451	EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR RANGE/PERFORMANCE

DTC	P0452	EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR/SWITCH LOW INPUT

DTC	P0453	EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR/SWITCH HIGH INPUT

MONITOR DESCRIPTION

DTC P0451, P0452 or P0453 is recorded by the ECM when the vapor pressure sensor malfunctions.

P0451

The ECM monitors the vapor pressure sensor in two ways:

(a) The ECM monitors the fluctuation of electrical signals while the engine is idling. If the pressure signal varies beyond a specified range more than 7 times, the ECM interprets this as a fault in the vapor pressure sensor.

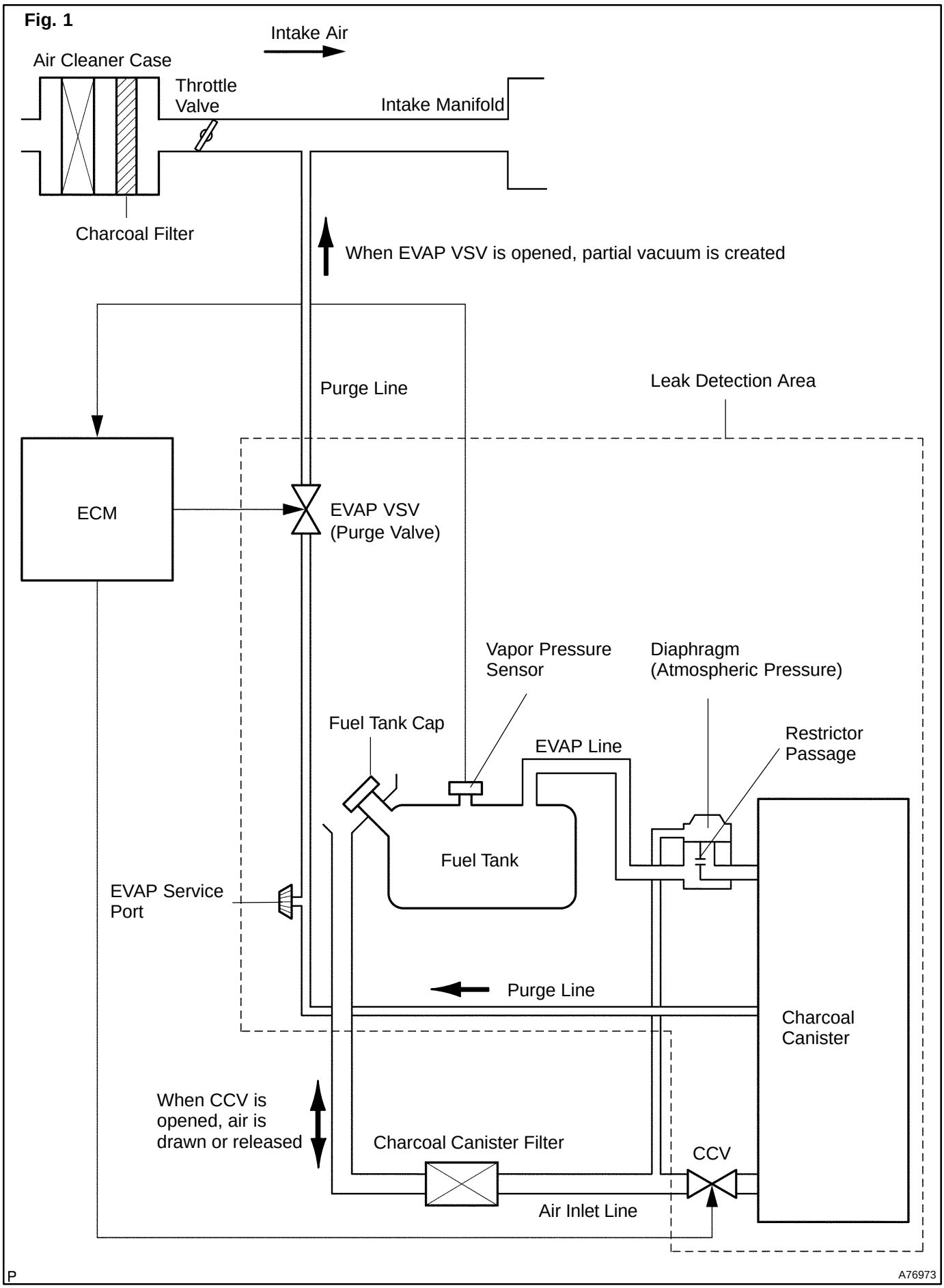
(b) The ECM checks if the pressure signal fluctuates. If the output of the sensor does not vary for 5 minutes while the intake air amount is changing, the ECM interprets this as a fault in the vapor pressure sensor.

Either fault will set DTC P0451 and the ECM will turn on the MIL.

P0452 and P0453

When the pressure indicated by the vapor pressure sensor deviates below −3.999 kPa (−30 mmHg) or above 1.999 kPa (15 mmHg), the ECM interprets this as a malfunction in the vapor pressure sensor. The ECM will turn on the MIL and a DTC will be set.

Fig. 1


Intake Air
Air Cleaner Case
Throttle Valve
Intake Manifold
Charcoal Filter
When EVAP VSV is opened, partial vacuum is created
Purge Line
Leak Detection Area
ECM
EVAP VSV (Purge Valve)
Vapor Pressure Sensor
Diaphragm (Atmospheric Pressure)
Fuel Tank Cap
EVAP Line
Restrictor Passage
Fuel Tank
EVAP Service Port
Purge Line
Charcoal Canister
When CCV is opened, air is drawn or released
Charcoal Canister Filter
CCV
Air Inlet Line
P
A76973

DTC No.	DTC Detection Condition	Trouble Area
P0451	Vapor pressure sensor output changes extremely under conditions: • Vapor pressure sensor output changes often while vehicle speed is 0 mph (0 km/h) and the engine is idling 5 seconds to 10 seconds (2 trip detection logic) • Vapor pressure sensor output is stuck 5 minutes (2 trip detection logic)	• Open or short in vapor pressure sensor circuit • Vapor pressure sensor • ECM
P0452	Vapor pressure sensor output remains less −30 mmHg (2 trip detection logic)	• Same as DTC No. P0451
P0453	Vapor pressure sensor output remains more than 15 mmHg (2 trip detection logic)	• Same as DTC No. P0451

MONITOR STRATEGY

Related DTCs	P0451: FTP Sensor Noise P0451: FTP Sensor Stuck P0452: FTP Sensor Range Check (Low voltage) P0453: FTP Sensor Range Check (High voltage)
Required sensors/components (Main)	FTP sensor
Required sensors/components (Related)	ECT sensor, IAT sensor
Frequency of operation	Once per driving cycle
Duration	7 seconds: FTP Sensor Range Check 10 seconds: FTP Sensor Noise 20 minutes: FTP Sensor Stuck
MIL operation	2 driving cycles
Sequence operation	None

TYPICAL ENABLING CONDITIONS

All:

The monitor will run whenever these DTCs are not present	See page 05−16

FTP Sensor Noise Monitor P0451:

Altitude	7,874 ft. (2,400m) or less
Battery voltage	11 V or more
Throttle position learning	Not detected
FTP sensor malfunction (P0450, P0452, P0453)	Not detected
IAT at engine start − ECT at engine start	−7 to 11.1°C (−12.6 to 20°F)
EVAP VSV, CCV	Not operated by scan tool
ECT at engine start	4.4 to 35°C (39.92 to 95°F)
IAT at engine start	4.4 to 35°C (39.92 to 95°F)
Time after vehicle stop and idling	5 to 15 seconds

FTP Sensor Stuck Monitor P0451:

Altitude	7,874 ft. (2,400m) or less
Battery voltage	11 V or more
Throttle position learning	Not detected
FTP sensor malfunction (P0450, P0452, P0453)	Not detected
IAT at engine start − ECT at engine start	−7 to 11.1°C (−12.6 to 20°F)
EVAP VSV, CCV	Not operated by scan tool
ECT at engine start	4.4 to 35°C (39.92 to 95°F)
IAT at engine start	4.4 to 35°C (39.92 to 95°F)
Time after engine start	5 seconds or more
0.02 inch leak	Not detected
0.04 inch leak	Not detected
CCV malfunction	Not detected

FTP Sensor Range Check P0452, P0453:

ECT at engine start	10°C (50°F) or more, and less than 35°C (95°F)
IAT at engine start	10°C (50°F) or more, and less than 35°C (95°F)
Difference between engine start ECT and engine start IAT	Less than 12°C (21.6 °F)
Engine condition	Running

TYPICAL MALFUNCTION THRESHOLDS

FTP Sensor Noise P0451:

Frequency that FTP change is 5 mmHg or more	6 times or more for 10 seconds

FTP Sensor Stuck P0451:

FTP change	No change for 5 minutes

FTP Sensor Range Check (Low voltage) P0452:

FTP	Less than −30 mmHg (−3.999 kPa)

FTP Sensor Range Check (High voltage) P0453:

FTP	15 mmHg (1.999 kPa) or more

COMPONENT OPERATING RANGE

FTP	−26 to 11 mmHg (−3.5 to 1.5 kPa)

WIRING DIAGRAM

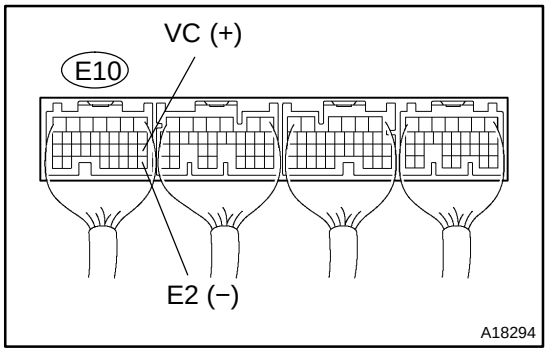
Refer to DTC P0441 on page 05−195.

INSPECTION PROCEDURE

HINT:

- If DTCs that are related to different systems are output simultaneously while terminal E2 is used as a ground terminal, terminal E2 may have an open circuit.
- Always troubleshoot DTCs P0441 (purge flow), P0446 (CCV), P0451, P0452 and P0453 (evaporative pressure sensor) before troubleshooting DTCs P0442, P0455 or P0456.
- Read freeze frame data using the hand−held tester or the OBD II scan tool. Freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting, freeze frame data can help determine if the vehicle was running or stopped, if the engine was warmed up or not, if the air−fuel ratio was lean or rich, and other data from the time the malfunction occurred.
- When the ENGINE RUN TIME in the freeze frame data is less than 200 seconds, carefully check the vapor pressure sensor.

1	INSPECT ECM (VC VOLTAGE)



(a) Turn the ignition switch ON.

(b) Check the voltage of the E10 ECM connector.

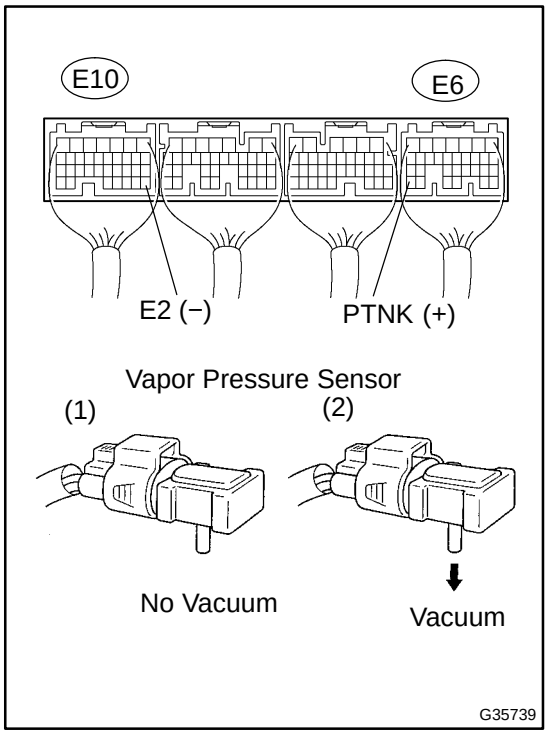
Standard:

Tester Connection	Specified Condition
E10−18 (VC) − E10−28 (E2)	4.5 to 5.5 V

NG → **REPLACE ECM (See page 10−9)**

OK

2 INSPECT ECM (PTNK VOLTAGE)



(a) Turn the ignition switch ON.
(b) Check the voltage of the E10 and E6 ECM connectors.
(1) Disconnect the vacuum hose from the vapor pressure sensor.

Standard (1):

Tester Connection	Specified Condition
E6−31 (PTNK) − E10−28 (E2)	2.9 to 3.7 V

(2) Using a MITYVAC (Hand−held Vacuum Pump), apply a vacuum of 4.0 kPa (30 mmHg, 1.18 in.Hg) to the vapor pressure sensor.

NOTICE:
The vacuum applied to the vapor pressure sensor must be less than 66.7 kPa (500 mmHg, 19.7 in.Hg).

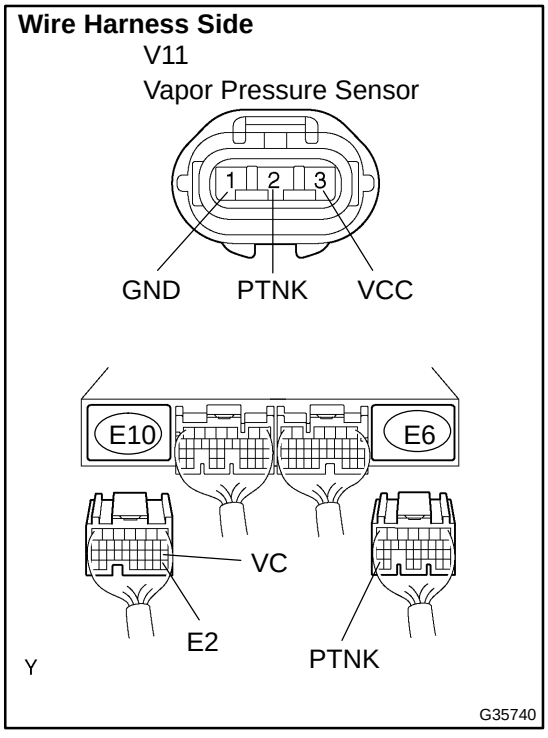
Standard (2):

Tester Connection	Specified Condition
E6−31 (PTNK) − E10−28 (E2)	0.5 V or less

OK → **REPLACE ECM (See page 10−9)**

NG

3 CHECK WIRE HARNESS (VAPOR PRESSURE SENSOR − ECM)



(a) Disconnect the V11 vapor pressure sensor connector.
(b) Disconnect the E10 and E6 ECM connectors.
(c) Check the resistance of the wire harness side connectors.

Standard:

Tester Connection	Specified Condition
V11−2 (PTNK) − E6−31 (PTNK) V11−1 (GND) − E10−28 (E2) V11−3 (VCC) − E10−18 (VC)	Below 1 Ω
V11−2 (PTNK) or E6−31 (PTNK) − Body ground V11−3 (VCC) or E10−18 (VC) − Body ground	10 kΩ or higher

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

REPLACE VAPOR PRESSURE SENSOR ASSY