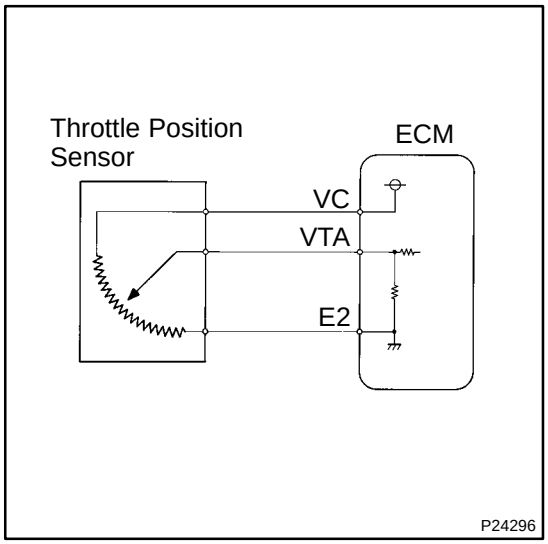
DI6V0-02

DTC	P0120	Throttle Position Sensor/Switch "A" Circuit Malfunction

CIRCUIT DESCRIPTION



The throttle position sensor is mounted in the throttle body and detects the throttle valve opening angle. When the throttle valve is fully closed, a voltage of approximately 0.3 - 0.8 V is applied to terminal VTA of the ECM. The voltage applied to the terminals VTA of the ECM increases in proportion to the opening angle of the throttle valve and becomes approximately 3.2 - 4.9 V when the throttle valve is fully opened. The ECM judges the vehicle driving conditions from this signal input from terminal VTA, and uses it as one of the conditions for deciding the air-fuel ratio correction, power increase correction and fuel-cut control etc.

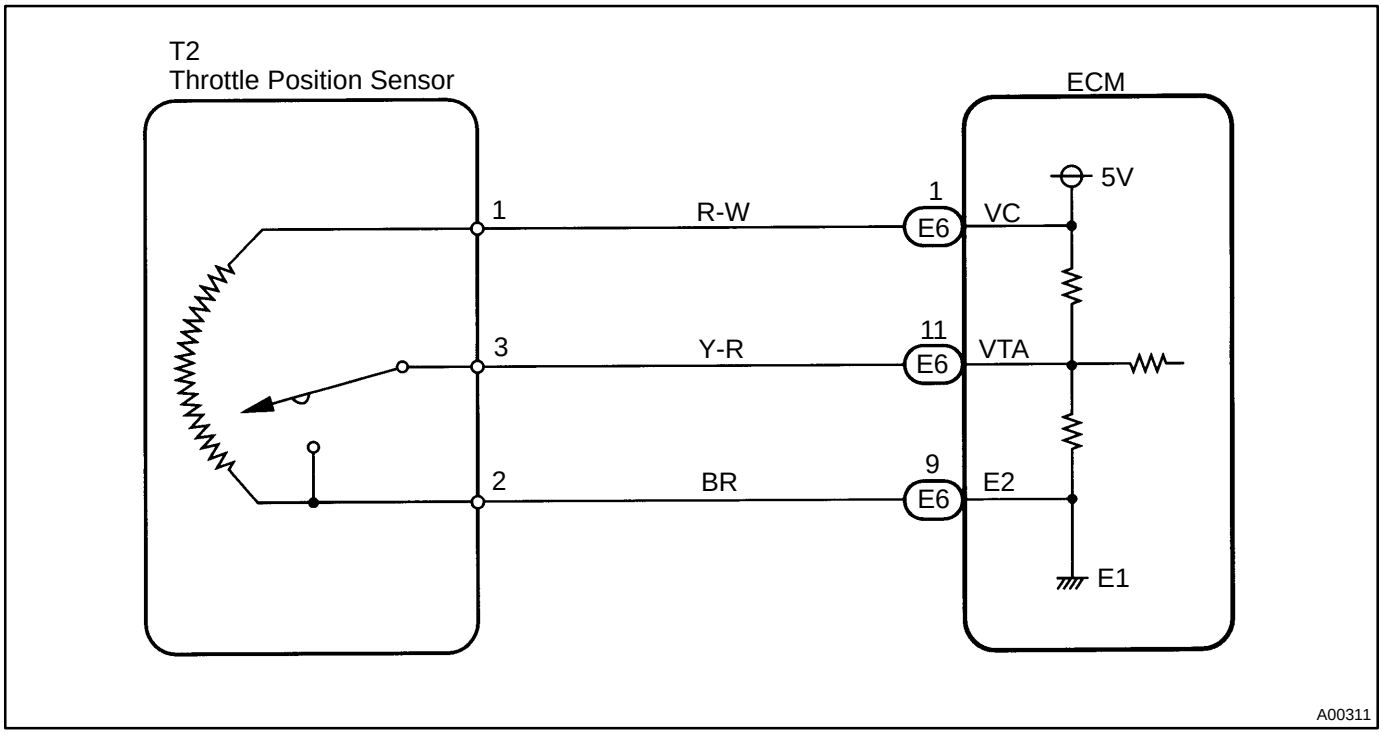
DTC No.	DTC Detecting Condition	Trouble Area
P0120	Condition (a) or (b) continues with more than 5 sec.: (a) VTA < 0.1 V (b) VTA > 4.9 V	• Open or short in throttle position sensor circuit • Throttle position sensor • ECM

HINT:

After confirming DTC P0120, use the OBD II scan tool or TOYOTA hand-held tester to confirm the throttle valve opening percentage.

Throttle valve opening position expressed as percentage		Trouble Area
Throttle valve fully closed	Throttle valve fully open	
0 %	0 %	VC line open VTA line open or short
Approx. 100 %	Approx. 100 %	E2 line open

WIRING DIAGRAM

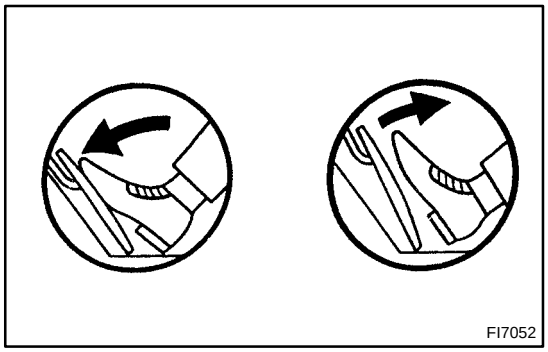


INSPECTION PROCEDURE

HINT:

- If DTC P0110 (Intake Air Temp. Circuit Malfunction), P0115 (Engine Coolant Temp. Circuit Malfunction), P0120 (Throttle/Pedal Position Sensor/Switch ”A” Circuit Malfunction) are output simultaneously, E2 (sensor ground) may be open.
- Read freeze frame data using TOYOTA hand-held tester or OBD II scan tool. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

1	**Connect the OBD II scan tool or TOYOTA hand-held tester, read the throttle valve opening percentage.**



PREPARATION:

(a) Connect the OBD II scan tool or TOYOTA hand-held tester to DLC3.

(b) Turn the ignition switch ON and push the OBD II scan tool or TOYOTA hand-held tester main switch ON.

CHECK:

Read the throttle valve opening percentage.

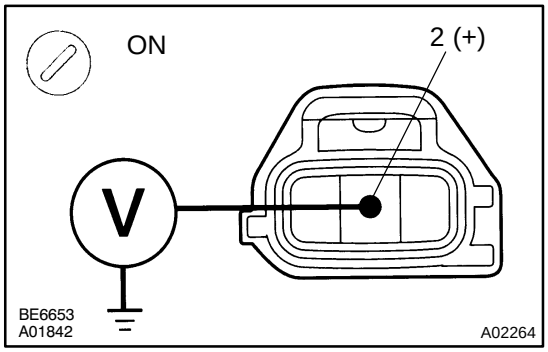
OK:

Throttle valve	Throttle valve opening position expressed as percentage
Fully open	Approx. 70 %
Fully closed	Approx. 10 %

OK → **Check for intermittent problems (See page DI-3).**

NG

2	**Check voltage between terminal VC of throttle position sensor connector and body ground.**



PREPARATION:

(a) Disconnect the throttle position sensor connector.

(b) Turn the ignition switch ON.

CHECK:

Measure voltage between terminal 2 of the throttle position connector and body ground.

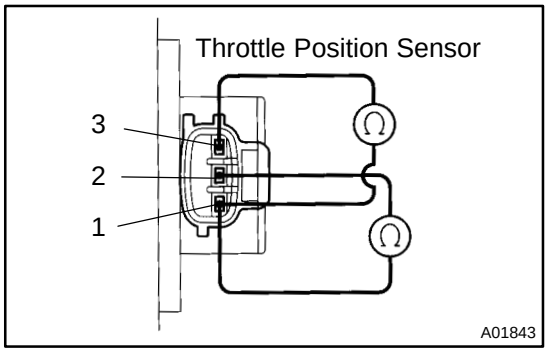
OK:

Voltage: 4.5 - 5.5 V

NG → **Go to step 5.**

OK

3	Check throttle position sensor (See page SF-32).



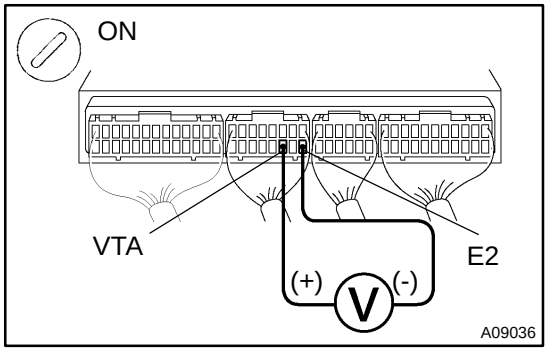
PREPARATION:
Disconnect the throttle position sensor connector.
CHECK:
Measure resistance between terminals 1, 3 and 2 of the throttle position sensor.
OK:

Terminals	Throttle valve	Resistance kΩ
1 - 2	—	2.5 - 5.9
1 - 3	Fully closed	0.2 - 5.7
	Fully open	2.0 - 10.2

NG → **Replace throttle position sensor.**

OK

4	Check voltage between terminals VTA and E2 of ECM connector.



PREPARATION:
(a) Remove the connector cover from the ECM.
(b) Turn the ignition switch ON.
CHECK:
Measure voltage between terminals VTA and E2 of the ECM connector.
OK:

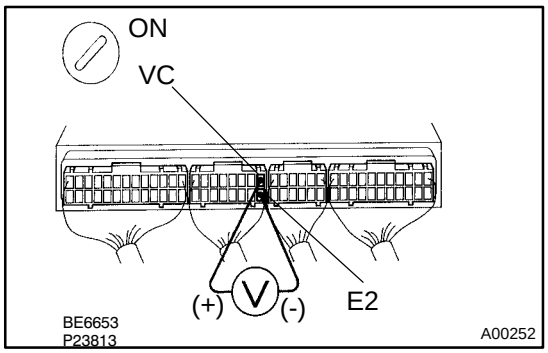
Throttle valve	Voltage
Fully closed	0.3 - 1.0 V
Fully open	3.2 - 4.9 V

NG → **Check for open and short in harness and connector between ECM and throttle position sensor (VTA or E2 line) (See page IN-29).**

OK

Check and replace ECM (See page IN-29).

5	Check voltage between terminals VC and E2 of ECM connector.



PREPARATION:

(a) Remove the connector cover from the ECM.

(b) Turn ignition switch ON.

CHECK:

Measure voltage between terminals VC and E2 of the ECM connector.

OK:

Voltage: 4.5 - 5.5 V

NG → **Check and replace ECM (See page IN-29).**

OK

Check for open in harness and connector between ECM and sensor (VC line) (See page IN-29).