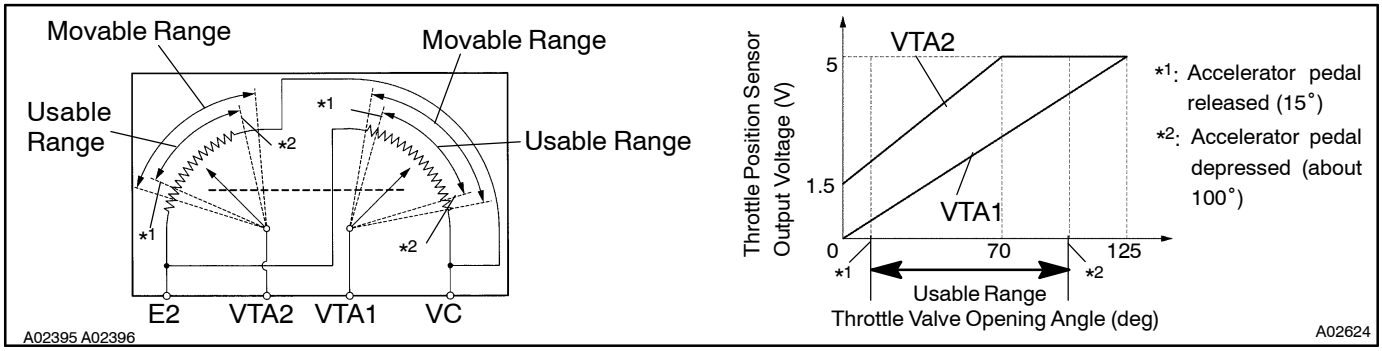
DTC	P0120/41	THROTTLE/PEDAL POSITION SENSOR/SWITCH"A"CIRCUIT MALTANCION

CIRCUIT DESCRIPTION

Throttle position sensor is mounted on the throttle body and it has 2 sensors to detect the throttle opening angle and the malfunction of the throttle position sensor's own.
The voltage applied to terminals VTA1 and VTA2 of the ECM changes between 0 V and 5 V in proportion to the opening angle of the throttle valve.
The ECM judges the current opening angle of the throttle valve from these signals input from terminals VTA1 and VTA2, and the ECM controls the throttle motor to make the throttle valve angle properly in response to the driving condition.
If this DTC is stored, the ECM cuts the power down for the throttle motor, and the throttle valve is fully closed by the return spring.

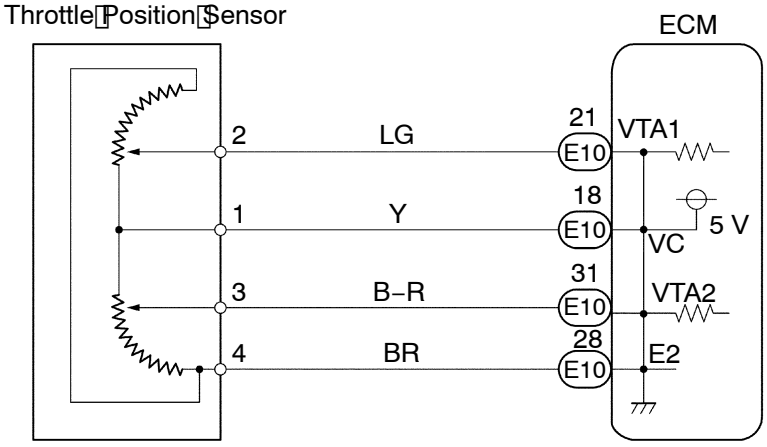


DTC No.	DTC Detection Condition	Trouble Area
P0120/41	Condition (a), (b), (c), (d) or (e) continues for 2.0 seconds: (IDL ON: 10 seconds) (a) VTA1 ≦ 0.2 V (b) VTA2 ≦ 0.5 V (c) VTA1 ≧ 4.8 V (d) When VTA1 ≧ 0.2 V and ≦ 1.8 V, and VTA2 ≧ 4.97 V (e) VTA1–VTA2 ≦ 0.02 V (f) IDL is OFF	• Open or short in throttle position sensor circuit • Throttle body assy (Throttle position sensor) • ECM
	Condition (a) continues for 0.4 seconds: (a) VTA1 ≦ 0.2 V and VTA2 ≦ 0.5 V	

HINT:
After confirming DTC P0120, use the hand–held tester to confirm the throttle valve opening percentage and closed throttle position switch condition.

Accelerator pedal position expressed as percentage and voltage				Trouble area
Accelerator pedal released		Accelerator pedal depressed		
THROTTLE POS	THROTTLE POS #2	THROTTLE POS	THROTTLE POS #2	
0 %	0 V	0 %	0 V	VC circuit open
0 %	2.0 – 2.9 V	0 %	4.6 – 5.0 V	VTA1 circuit open or ground short
8 – 20 %	0 V	64 – 96 %	0 V	VTA2 circuit open or ground short
100 %	5 V	100 %	5 V	E2 circuit open

WIRING DIAGRAM



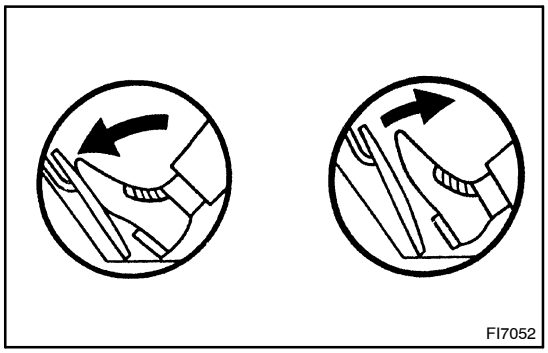
INSPECTION PROCEDURE

HINT:

Read freeze frame data using hand–held tester, as freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

Start the inspection from step 1 in case of using the hand–held tester and start from step 2 in case of not using the hand–held tester.

1	**READ VALUE OF HAND–HELD TESTER (THROTTLE VALVE OPENING PERCENTAGE)**



(a) Read the throttle valve opening percentage for the VTA1 circuit and read the voltage for the VTA2 circuit.

Accelerator pedal	Throttle valve opening position expressed as percentage (VTA1)	Voltage (VTA2)
Released	8 – 20 %	2.0 – 2.9 V
Depressed	64 – 96 %	4.6 – 5.0 V

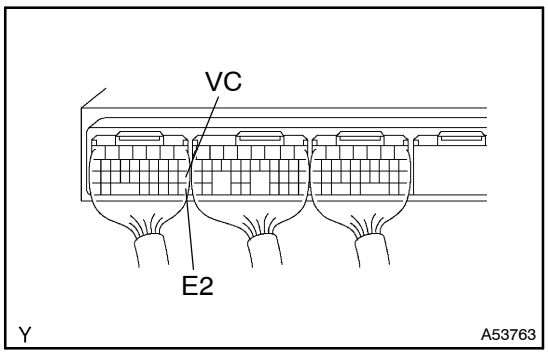
HINT:

- If the throttle position is 100 % when releasing throttle pedal, VTA1 circuit is open.
- If the throttle position is 0 % when depressing accelerator pedal, VC or VTA1 circuit is open.
- If the throttle position is not 0 % when releasing accelerator pedal or throttle position is not 100 % when depressing throttle pedal, VTA2 circuit is open or short.

OK	**CHECK FOR INTERMITTENT PROBLEMS (See page 05–290)**

NG

2 INSPECT ECM(VC – E2)

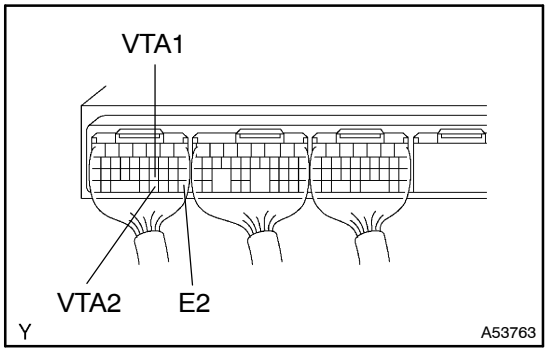


(a) Measure the voltage between terminals VC and E2 of the ECM connector.
Voltage: 4.5 – 5.5 V

NG → **CHECK AND REPLACE ECM**

OK

3 INSPECT ECM(VTA1 – E2, VTA2 – E2)



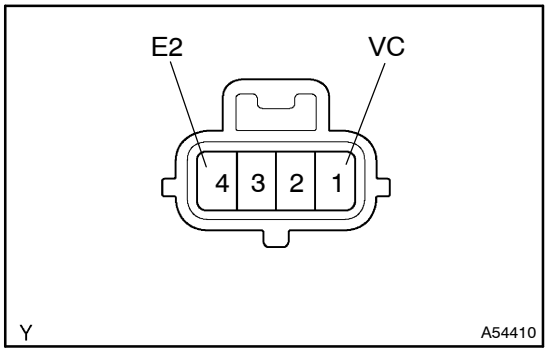
(a) Measure the voltage between terminals VTA1 and E2, and VTA2 and E2 of the ECM connector.

Accelerator pedal	Voltage	
	VTA1 – E2	VTA2 – E2
Released	0.4 – 1.0 V	2.0 – 2.9 V
Depressed	3.2 – 4.8 V	4.6 – 5.0 V

OK → **CHECK AND REPLACE ECM**

NG

4 INSPECT E.F.I. THROTTLE POSITION SENSOR

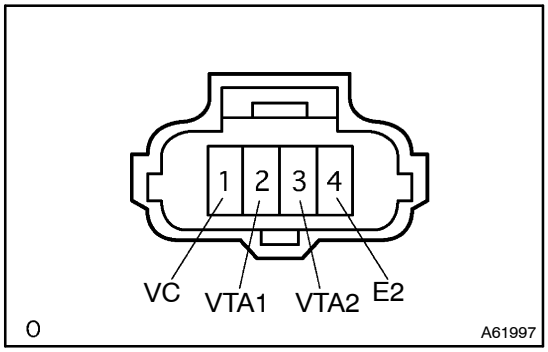


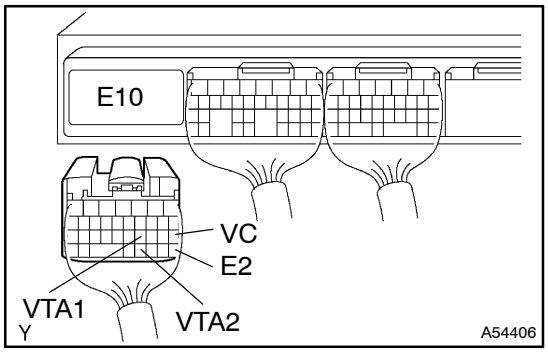
(a) Disconnect the throttle position sensor connector.
(b) Using an ohmmeter, measure the resistance between terminals VC and E2.
Resistance: 1.2 – 3.2 kΩ at 20°C (68°F)

NG → **REPLACE E.F.I. THROTTLE POSITION SENSOR**

OK

5 CHECK HARNESS AND CONNECTOR(ECM – THROTTLE BODY)





(a) Disconnect the throttle position sensor connector.
(b) Disconnect the E10 ECM connector.
(c) Check the continuity between terminals in the chart below.

Standard: Check for open

Throttle position sensor connector terminal	ECM connector terminal	Continuity
VC	VC	Continuity
VTA1	VTA1	Continuity
VTA2	VAT2	Continuity
E2	E2	Continuity

Standard: Check for open

Throttle position sensor connector terminal	ECM terminal	Continuity
VC	E2	No continuity
VTA1		No continuity
VTA2		No continuity
E2		No continuity

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

OK

CHECK AND REPLACE ECM