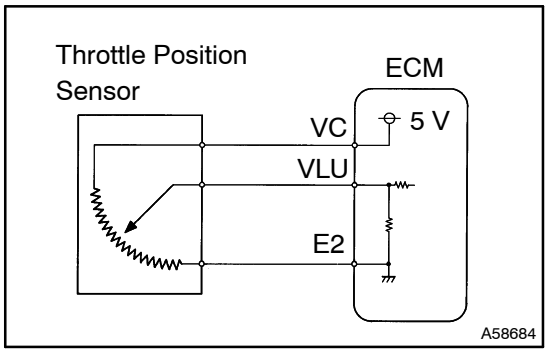
DTC	P0120/41	THROTTLE/PEDAL POSITION SENSOR/SWITCH ”A” CIRCUIT

DTC	P0122/41	THROTTLE/PEDAL POSITION SENSOR/SWITCH ”A” CIRCUIT LOW INPUT

DTC	P0123/41	THROTTLE/PEDAL POSITION SENSOR/SWITCH ”A” CIRCUIT HIGH INPUT

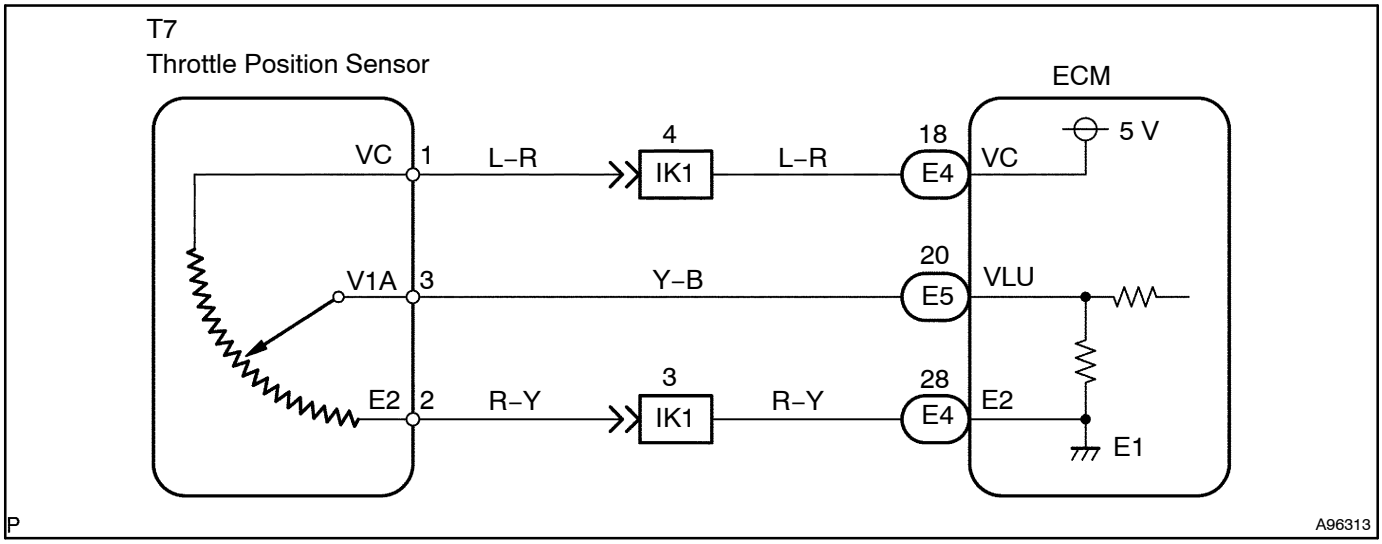
CIRCUIT DESCRIPTION



The throttle position sensor is mounted in the throttle body and detects the throttle valve (intake shutter) opening angle.
When the throttle valve is fully closed, a voltage of approximately 0.7 V is applied to terminal VLU of the ECM. The voltage applied to terminal VLU of the ECM increases in proportion to the opening angle of the throttle valve and becomes approximately 3.5 to 5.0 V when the throttle valve is fully opened. The ECM judges the vehicles driving conditions from these signals input from terminal VLU, and uses them as one of the conditions for deciding the air–fuel ratio correction, power increase correction and fuel–cut control etc.

DTC No.	DTC Detection Condition	Trouble Area
Condition (a) of DTC P0120/41, P0122/41 or P0123/41 continues for 1 second (open or short in throttle position sensor circuit)		
P0120/41	Detection conditions for DTC P0122/41 and P0123/41 are not satisfied but condition (a) is satisfied. (a) VLU less than 0.2 V or VLU greater than 4.8 V	• Open or short in throttle position sensor circuit • Throttle position sensor • ECM
P0122/41	VLU less than 0.2 V	
P0123/41	VLU greater than 4.8 V	

WIRING DIAGRAM



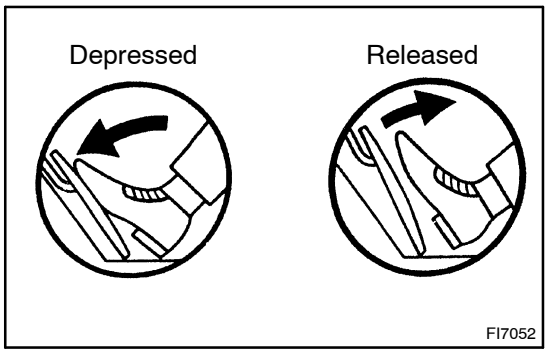
INSPECTION PROCEDURE

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.
- Read freeze frame data using the hand–held tester. 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 using hand–held tester:

1	READ VALUE OF DATA LIST (THROTTLE VALVE OPENING PERCENTAGE)



(a) Connect the hand–held tester (with 24 V VIM) to the DLC3.
(b) Turn the ignition switch ON.
(c) On the hand–held tester, enter the following menus: DIAGNOSIS / OBD/MOBD / DATA LIST / ALL / THROTTLE POS. Read the values.

HINT:
The shift position should be neutral and the A/C switch should be turned OFF.

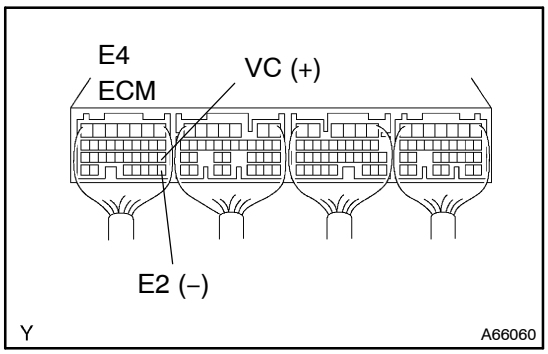
Standard:

Engine Connection	Throttle valve opening position expressed as percentage
Idling	Approx. 60 % to Approx. 80 %
2,000 rpm	Approx. 0 % to Approx. 5 %

OK	CHECK FOR INTERMITTENT PROBLEMS (See page 05–10)

NG

2 CHECK ECM (VC VOLTAGE)



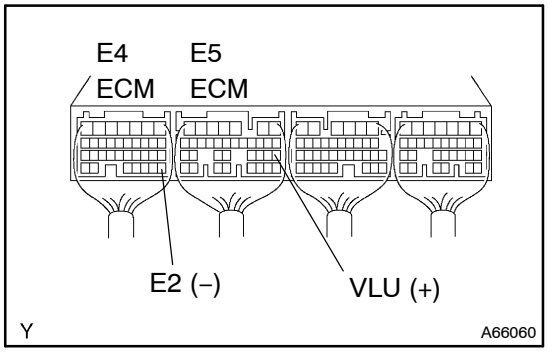
(a) Turn the ignition switch ON.
(b) Measure the voltage of the ECM connector.
Standard:

Tester Connection	Specified Condition
E4–18 (VC) – E4–28 (E2)	4.5 to 5.5 V

NG → **REPLACE ECM (See page 10–10)**

OK

3 CHECK ECM (VLU VOLTAGE)



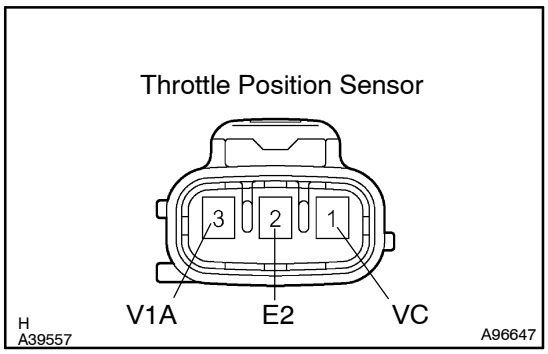
(a) Turn the ignition switch ON.
(b) Measure the voltage of the E4 and E5 ECM connectors.
Standard:

Tester Connection	Accelerator Pedal Condition	Specified Condition
E5–20 (VLU) – E4–28 (E2)	Released	3.5 to 4.0 V
E5–20 (VLU) – E4–28 (E2)	Depressed	0.5 to 0.8 V
E5–20 (VLU) – E4–28 (E2)	Released → Depressed	Voltage changes constantly

OK → **REPLACE ECM (See page 10–10)**

NG

4 INSPECT THROTTLE POSITION SENSOR



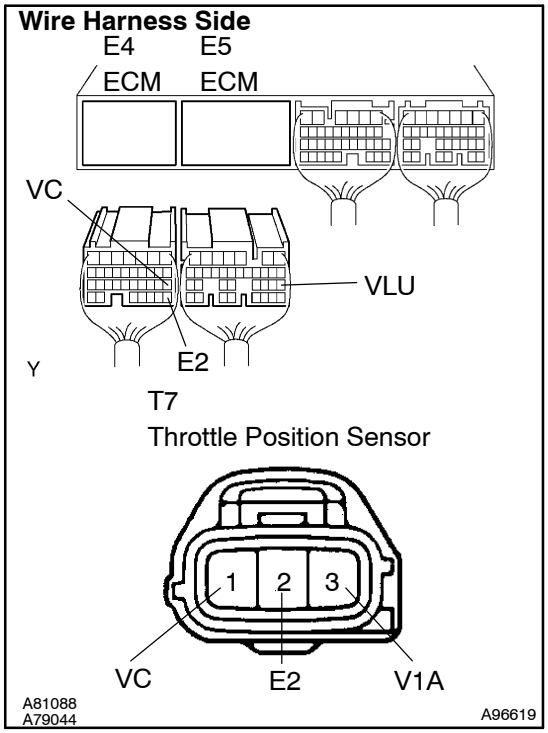
(a) Disconnect the T7 sensor connector.
(b) Measure the resistance of the sensor.
Standard:

Tester Connection	Throttle Valve Condition	Specified Condition
T7–3 (V1A) – T7–2 (E2)	Fully closed	0.2 to 5.7 kΩ
T7–3 (V1A) – T7–2 (E2)	Fully open	2.0 to 10.2 kΩ

NG → **REPLACE THROTTLE POSITION SENSOR**

OK

5	CHECK WIRE HARNESS (ECM – THROTTLE POSITION SENSOR)



(a) Disconnect the E4 and E5 ECM connectors.
(b) Disconnect the T7 throttle position sensor connector.
(c) Measure the resistance of the wire harness side connectors.

Standard:

Tester Connection	Specified Condition
T7–1 (VC) – VC (E4–18) T7–3 (V1A) – E5–20 (VLU) T7–2 (E2) – E4–28 (E2)	Below 1 Ω
T7–1 (VC) or E4–18 (VC) – Body ground T7–3 (V1A) or E5–20 (VLU) – Body ground	10 kΩ or higher

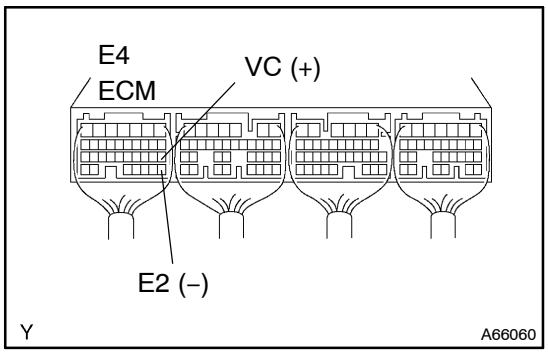
NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

REPLACE ECM (See page 10–10)

When not using hand–held tester:

1	CHECK ECM (VC VOLTAGE)



(a) Turn the ignition switch ON.
(b) Measure the voltage of the ECM connector.

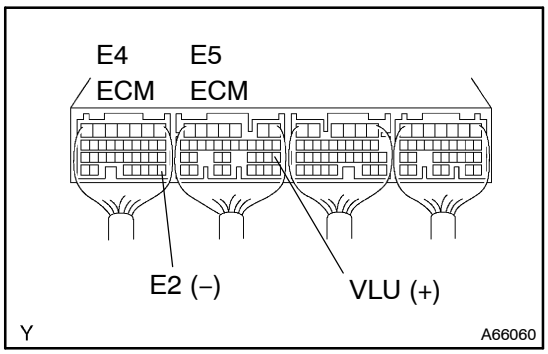
Standard:

Tester Connection	Specified Condition
E4–18 (VC) – E4–28 (E2)	4.5 to 5.5 V

NG → **REPLACE ECM (See page 10–10)**

OK

2 CHECK ECM (VLU VOLTAGE)



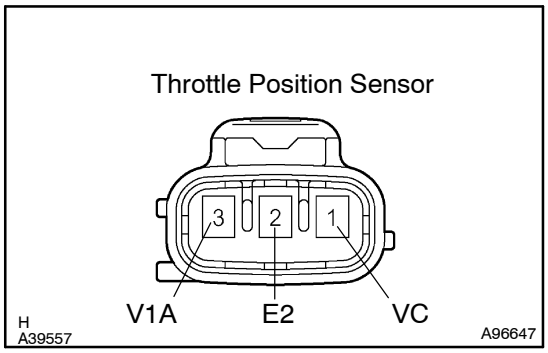
(a) Turn the ignition switch ON.
(b) Measure the voltage of the ECM connectors.
Standard:

Tester Connection	Accelerator Pedal Condition	Specified Condition
E5–20 (VLU) – E4–28 (E2)	Released	3.5 to 4.0 V
E5–20 (VLU) – E4–28 (E2)	Depressed	0.5 to 0.8 V
E5–20 (VLU) – E4–28 (E2)	Released → Depressed	Voltage changes constantly

OK → **REPLACE ECM (See page 10–10)**

NG

3 INSPECT THROTTLE POSITION SENSOR



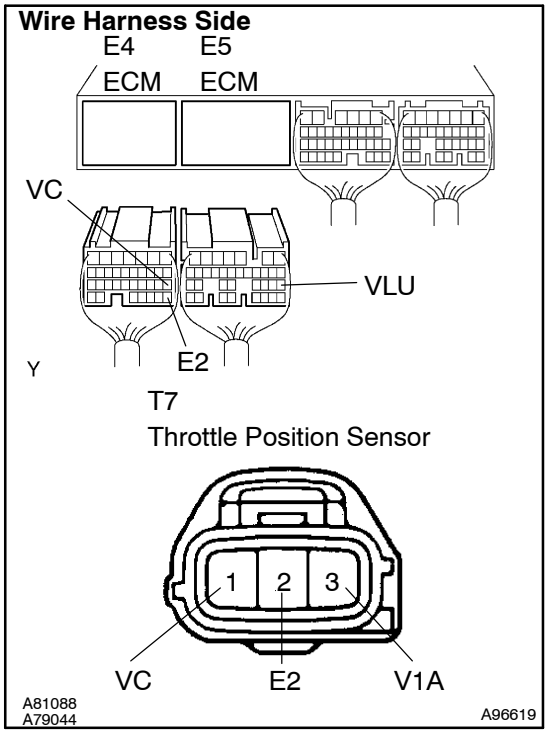
(a) Disconnect the T7 sensor connector.
(b) Measure the resistance of the sensor.
Standard:

Tester Connection	Throttle Valve Condition	Specified Condition
T7–3 (V1A) – T7–2 (E2)	Fully closed	0.2 to 5.7 kΩ
T7–3 (V1A) – T7–2 (E2)	Fully open	2.0 to 10.2 kΩ

NG → **REPLACE THROTTLE POSITION SENSOR**

OK

4 CHECK WIRE HARNESS (ECM – THROTTLE POSITION SENSOR)



(a) Disconnect the E4 and E5 ECM connectors.
(b) Disconnect the T7 throttle position sensor connector.
(c) Measure the resistance of the wire harness side connectors.

Standard:

Tester Connection	Specified Condition
T7–1 (VC) – VC (E4–18) T7–3 (V1A) – E5–20 (VLU) T7–2 (E2) – E4–28 (E2)	Below 1 Ω
T7–1 (VC) or E4–18 (VC) – Body ground T7–3 (V1A) or E5–20 (VLU) – Body ground	10 kΩ or higher

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

OK

REPLACE ECM (See page 10–10)