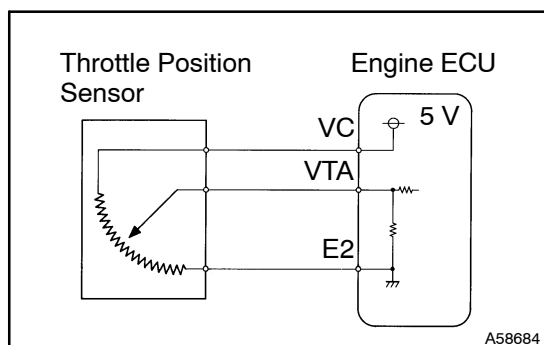


DTC	P0120/41	THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT MALTANCION
------------	-----------------	---

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 – 1.0 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 by this signal output from terminal VTA, and uses it as one of the conditions to decide the air-fuel ratio correction, power increase correction and fuel-cut control etc.

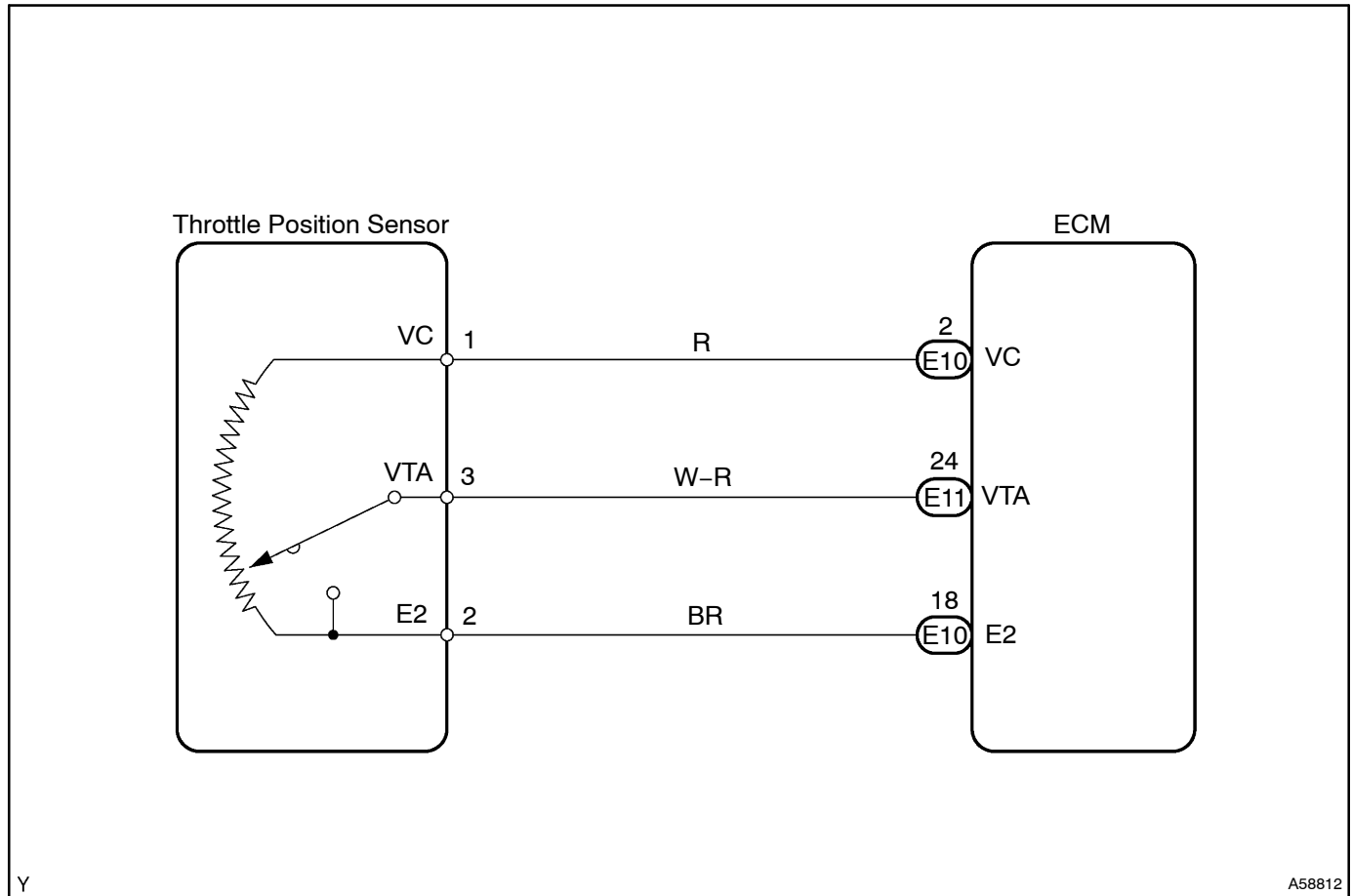
DTC No.	DTC Detecting Condition	Trouble Area
P0120/41	Condition (1) or (2) continues with more than 5 sec.: 1. VTA < 0.1 V 2. VTA > 4.9 V	<ul style="list-style-type: none"> • Open or short in throttle position sensor • Throttle position sensor • ECM

HINT:

After confirming DTC P0120/41, use the 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 circuit open VTA circuit open or short
Approx. 100 %	Approx. 100 %	E2 circuit open

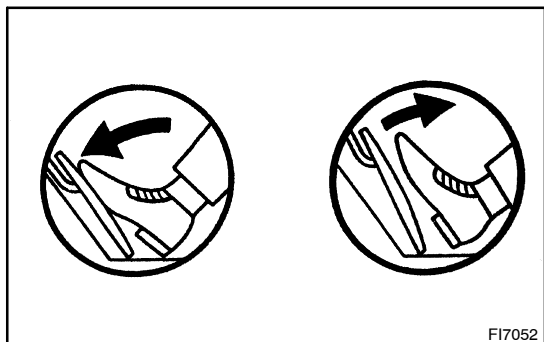
WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

- If DTCs P0110/24, P0115/22, P0116/22, P0120/41 and P0121/41 are output simultaneously, E2 (sensor ground) may be open.
- Read freeze frame data using the hand-held tester, as freeze frame data 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 was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

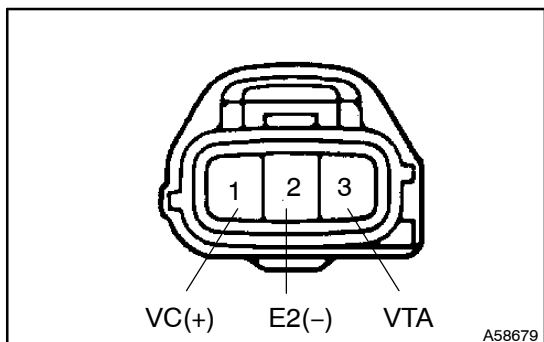
When using hand-held tester:**1 READ VALUE OF HAND-HELD TESTER(THROTTLE VALVE OPENING PERCENTAGE)**

F17052

- (a) Read the throttle valve opening percentage.

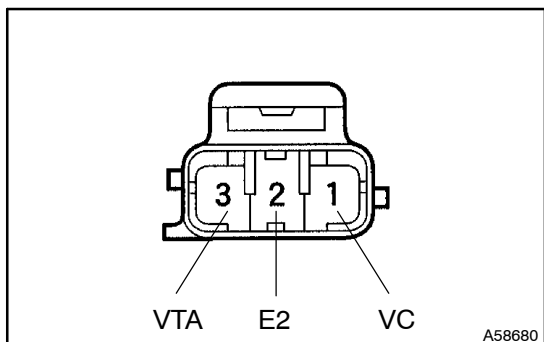
Result:

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

OK**CHECK FOR INTERMITTENT PROBLEMS****NG****2 CHECK WIRE HARNESS OR CONNECTOR(CHECK VOLTAGE)**

A58679

- (a) Disconnect the throttle position sensor connector.
 (b) Turn the ignition switch ON.
 (c) Measure voltage between terminals VC and E2 of the throttle position sensor connector.

Voltage: 4.5 – 5.5 V**NG****Go to step 6****OK****3 INSPECT E.F.I. THROTTLE POSITION SENSOR**

A58680

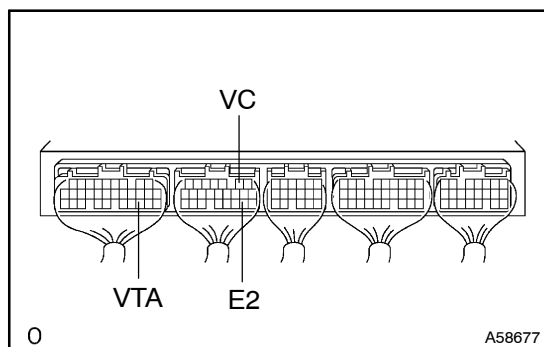
- (a) Disconnect the throttle position sensor connector.
 (b) Measure resistance between the terminals VC and E2 of the throttle position sensor.
 (c) Measure resistance between the terminals E2 and VTA of the throttle position sensor.

Resistance:

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

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

4 INSPECT ECM(CHECK VOLTAGE)



- (a) Turn the ignition switch ON.
- (b) Measure voltage between the terminals VTA of the ECM connector and E2 of the ECM connector.

Voltage:

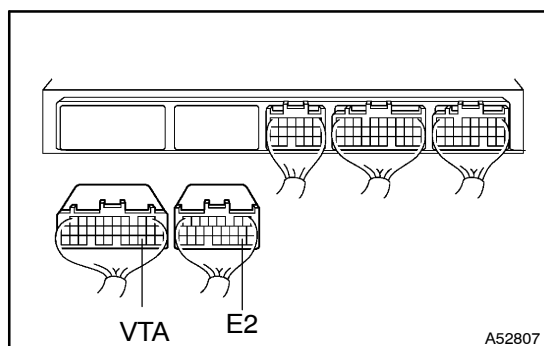
Throttle valve	Voltage V
Fully closed	0.3 - 1.0
Fully open	3.2 - 4.9

OK

CHECK AND REPLACE ECM

NG

5 CHECK WIRE HARNESS OR CONNECTOR(ECM-THROTTLEPOSITION SENSOR)

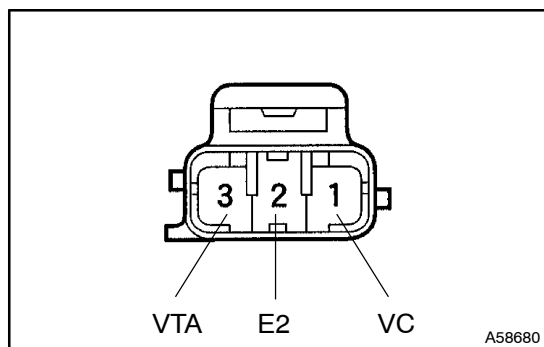


- (a) Disconnect the throttle position sensor connector.
- (b) Disconnect the ECM E11 and E10 connector.
- (c) Check continuity between the terminals VTA of the ECM connector and VTA of the throttle position sensor connector.

Resistance: 1 Ω or less

- (d) Check for short between the terminals VTA and E2 of the ECM E8 connector.

Resistance: 1 M Ω or more



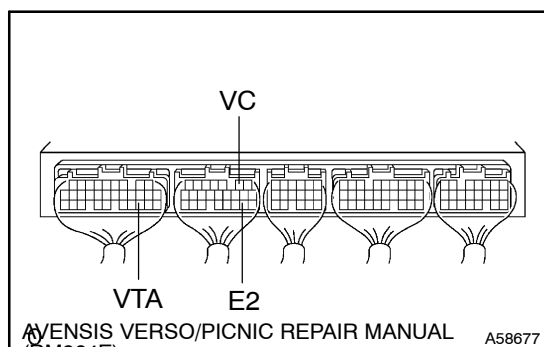
NG

REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR

OK

CHECK AND REPLACE ECM

6 INSPECT ECM(CHECK VOLTAGE)



- (a) Turn the ignition switch ON.
- (b) Measure voltage between terminals VC and E2 of ECM connector.

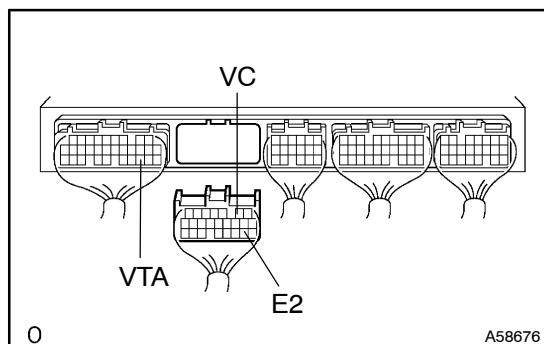
Voltage: 4.5 - 5.5 V

OK

CHECK AND REPLACE ECM

NG

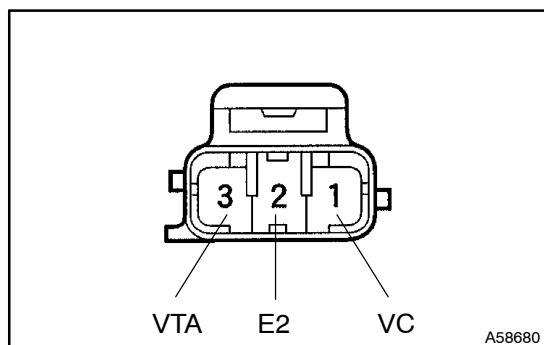
7 CHECK WIRE HARNESS OR CONNECTOR(ECM-THROTTLE POSITION SENSOR)



- (a) Disconnect the throttle position sensor connector.
- (b) Disconnect the ECM E10 connector.
- (c) Check continuity between the terminals VC of the ECM connector and VC of the throttle position sensor connector.

Resistance: 1 Ω or less

- (d) Check for short between the terminals VC and E2 of the ECM connector.

Resistance: 1 M Ω or more

NG

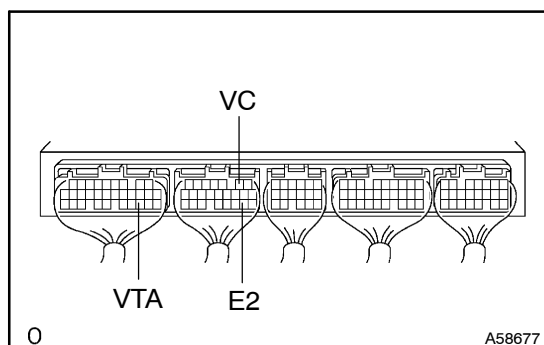
REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR

OK

CHECK AND REPLACE ECM

When not not using hand-held tester:

1 INSPECT ECM



- (a) Turn the ignition switch ON.
- (b) Measure voltage between the terminals VTA of the ECM connector and E2 of the ECM connector.

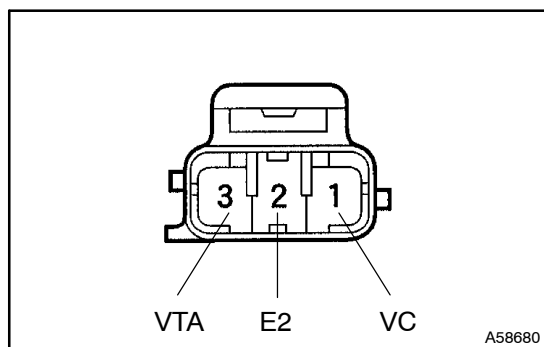
Voltage:

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

OK

CHECK CHECK FOR INTERMITTENT PROBLEMS

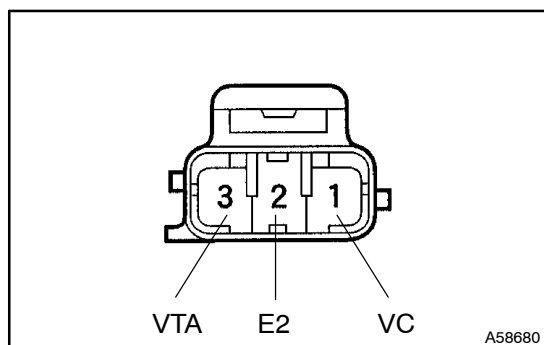
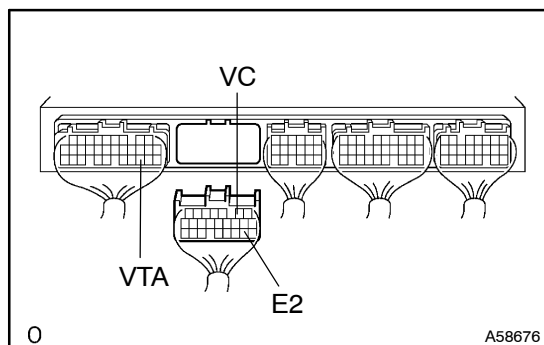
NG

2 CHECK E.F.I. THROTTLE POSITION SENSOR

- (a) Disconnect the throttle position sensor connector.
- (b) Measure resistance between the terminals VC and E2 of the throttle position sensor.
- (c) Measure resistance between the terminals E2 and VTA of the throttle position sensor.

Resistance:

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

NG**REPLACE E.F.I. THROTTLE POSITION SENSOR****OK****3 CHECK WIRE HARNESS OR CONNECTOR(ECM-THROTTLE POSITION SENSOR)**

- (a) Disconnect the throttle position sensor connector.
- (b) Disconnect the ECM E10 connector.
- (c) Check continuity between the terminals VTA of the ECM connector and VTA of the throttle position sensor connector.

Resistance: 1 Ω or less

- (d) Check for short between the terminals VTA and E2 of the ECM connector.

Resistance: 1 MΩ or more

- (e) Check continuity between the terminals VC of the ECM connector and VC of the throttle position sensor connector.

Resistance: 1 Ω or less

- (f) Check for short between the terminals VC and E2 of the ECM connector.

Resistance: 1 MΩ or more**NG****REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR****OK****CHECK AND REPLACE ECM**