

DTC	19(1)	ACCELERATOR PEDAL POSITION SENSOR CIRCUIT MALFUNCTION(OPEN/SHORT)
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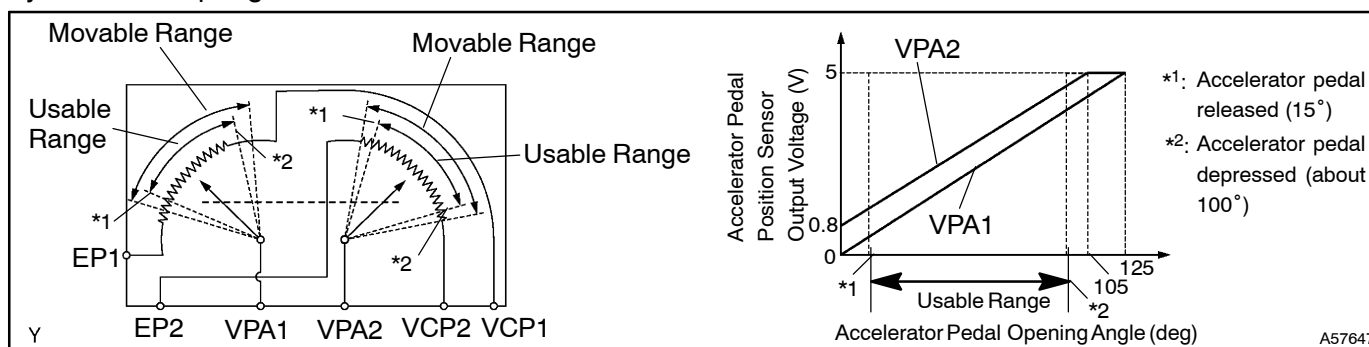
CIRCUIT DESCRIPTION

Accelerator pedal position sensor is mounted on the accelerator pedal bracket and it have the 2 sensors to detects the accelerator position and a malfunction of the accelerator position's own.

The accelerator pedal position sensor is the voltage applied to the terminals VA and VAS of the ECM changes between 0 V and 5 V in proportion to the opening angle of the accelerator pedal.

The ECM judges the current opening angle of the accelerator pedal from these signals input from terminals VA and VAS and the ECM controls the throttle motor based on these signals.

If this DTC is stored, the ECM shuts down the power for the throttle motor, and the throttle valve is fully closed by the return spring.



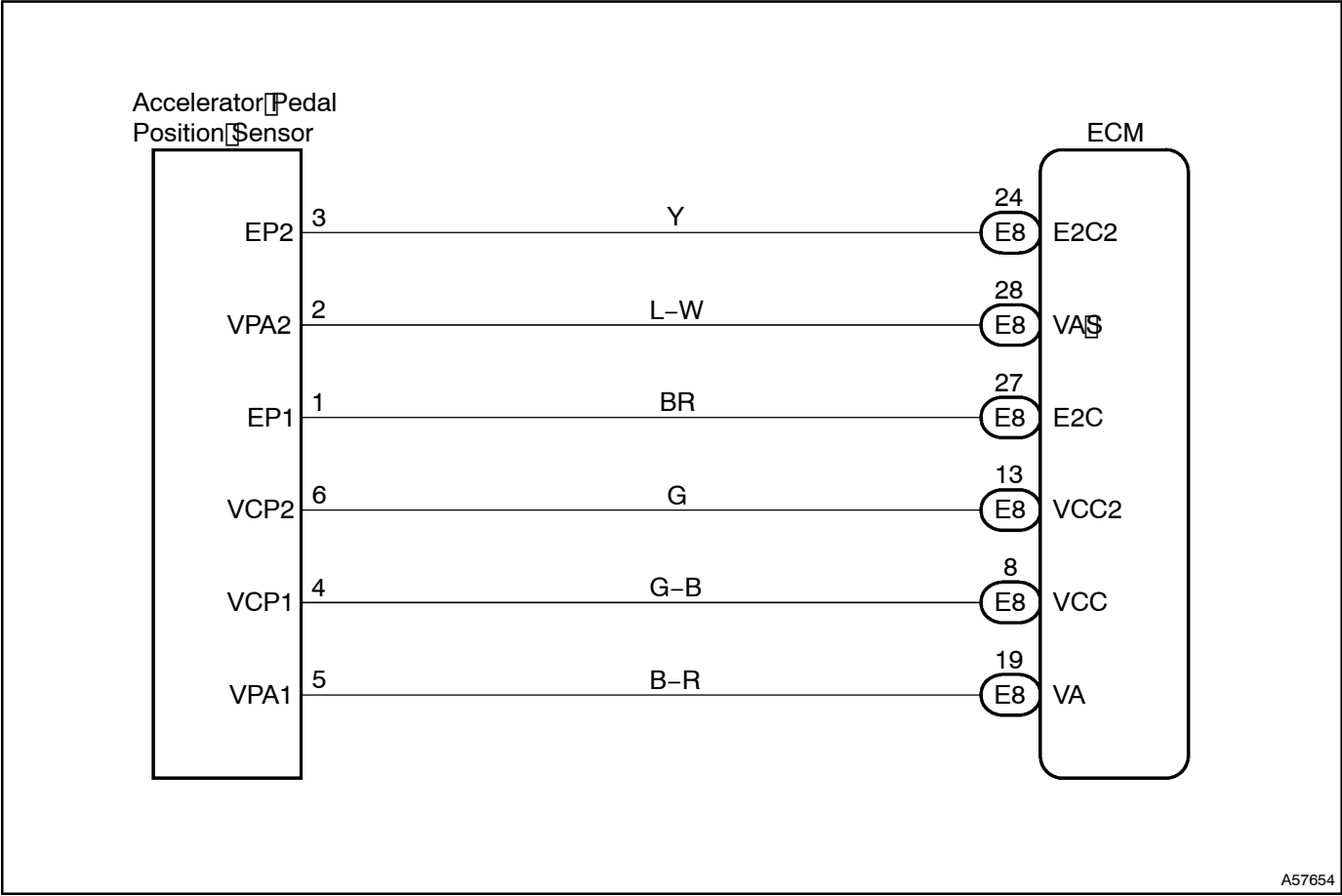
DTC No.	DTC Detecting Condition	Trouble Area
19(1)	Condition (a), (b), (c) or (d) continues for 2.0 seconds: (a) $VPA1 \leq 0.2 \text{ V}$ and $VPA2 \leq 0.5 \text{ V}$ (b) $VPA1 \geq 4.8 \text{ V}$ (c) When $3.45 \text{ V} \geq VPA1 \leq 0.2 \text{ V}$, and $VPA2 \geq 4.8 \text{ V}$ (d) $VPA1 - VPA2 \leq 0.02 \text{ V}$	<ul style="list-style-type: none"> • Open or short in accelerator pedal position sensor circuit • Accelerator pedal position sensor • ECM
	Condition (a) continues for 0.5 seconds: (a) $VPA1 \leq 0.2 \text{ V}$ or $VPA2 \leq 0.5 \text{ V}$	

HINT:

After confirming DTC 19 (1), use the hand-held tester to confirm the accelerator pedal opening percentage and accelerator pedal close position switch condition.

Accelerator pedal opening position expressed as percentage		Trouble area
Accelerator pedal fully closed	Accelerator pedal fully open	
0 %	0 %	<ul style="list-style-type: none"> • VCC circuit open • VA, VAS circuit open or short
Approx. 100 %	Approx. 100 %	<ul style="list-style-type: none"> • E2C circuit open

WIRING DIAGRAM



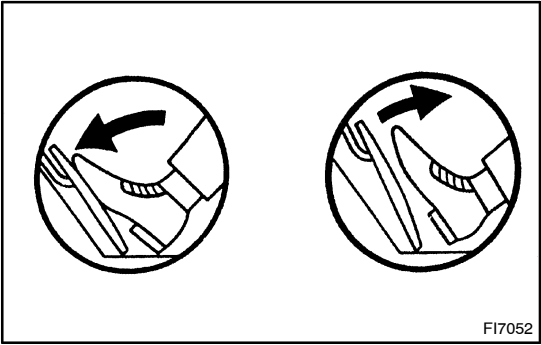
INSPECTION PROCEDURE

HINT:
Read freeze frame data using hand-held tester. 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 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
(ACCELERATOR PEDAL OPENING PERCENTAGE)



(a) Read the accelerator pedal opening percentage.
Result:

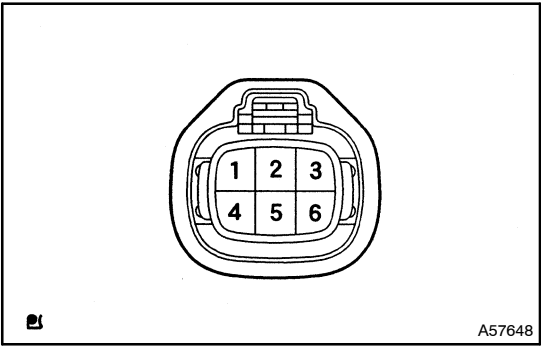
Accelerator pedal	Accelerator pedal opening position expressed as percentage
Fully depressed	Approx. 75 %
Fully released	Approx. 16 %

OK

CHECK FOR INTERMITTENT PROBLEMS
(See page 05-156)

2

CHECK HARNESS AND CONNECTOR



- (a) Disconnect the accelerator pedal position sensor connector.
- (b) Turn the ignition switch ON.
- (c) Measure the voltage between terminal 1, 4, and 3, 6 of the wire harness side connector.
Voltage: 4.5 – 5.5 V

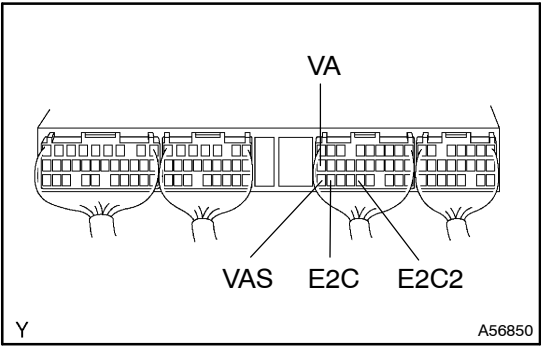
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Go to step 5

OK

3

INSPECT ECM



- (a) Turn the ignition switch ON.
- (b) Measure the voltage between terminals VA and E2C, VAS and E2C2 of the ECM connector.
Voltage:

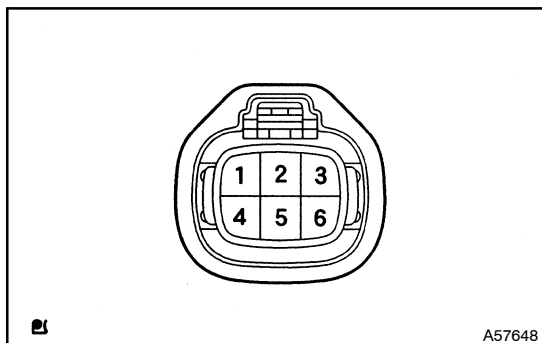
Accelerator pedal	Voltage
Fully closed	VA: 0.5 – 1.1 V VAS: 0.9 – 2.3 V
Fully open	VA: 3.0 – 4.6 V VAS: 3.4 – 5.0 V

OK

CHECK AND REPLACE ECM

NG

4 CHECK HARNESS AND CONNECTOR (ECM-ACCELERATOR PEDAL POSITION SENSER)



- (a) Disconnect the accelerator pedal position sensor connector.
- (b) Disconnect the ECM E8 connector.
- (c) Check for open between the terminals VA of the ECM E8 connector and 5 of the accelerator pedal position sensor harness side connector.

Resistance: 1 Ω or less

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

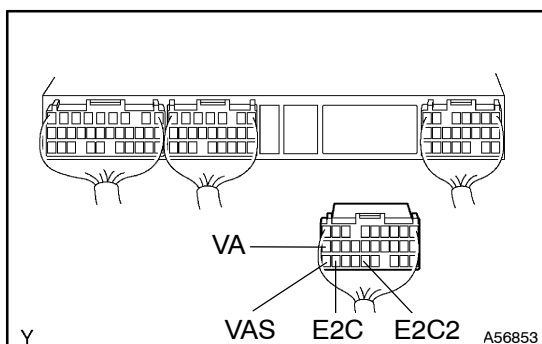
Resistance: 1 M Ω or more

- (e) Check for open between the terminals VAS of the ECM E8 connector and 2 of the accelerator pedal position sensor harness side connector.

Resistance: 1 Ω or less

- (f) Check for short between the terminals VA and E2C, VAS and E2C2 of the ECM E8 connector.

Resistance: 1 M Ω or more



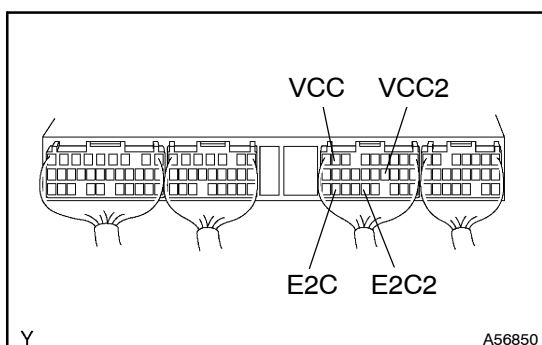
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**REPAIR OR REPLACE
HARNESS AND CONNECTOR**

OK

REPLACE ACCELERATOR PEDAL ASSY

5 INSPECT ECM



- (a) Turn the ignition switch ON.
- (b) Measure the voltage between terminals VCC and E2C, VCC2 and E2C2 of the ECM connector.

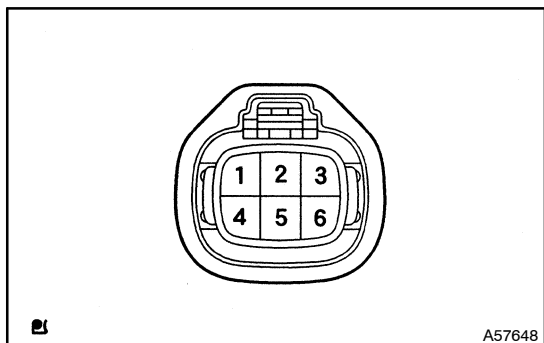
Voltage: 4.5 - 5.5 V

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CHECK AND REPLACE ECM

OK

6 CHECK HARNESS AND CONNECTOR (ECM-ACCELERATOR PEDAL POSITION SENSOR)

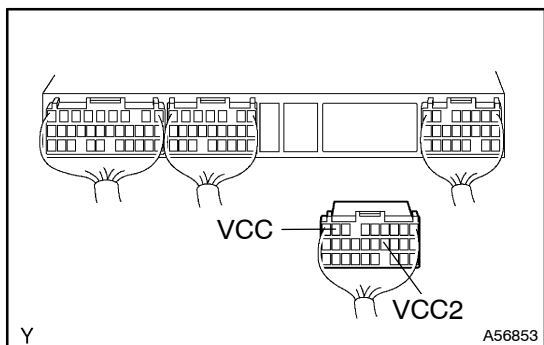


- (a) Disconnect the accelerator pedal position sensor connector.
- (b) Disconnect the ECM E8 connector.
- (c) Check for open between the terminals VCC of the ECM E8 connector and 4 of the accelerator pedal position sensor harness side connector.

Resistance: 1 Ω or less

- (d) Check for open between the terminals VCC2 of the ECM E8 connector and 6 of the accelerator pedal position sensor harness side connector.

Resistance: 1 Ω or less



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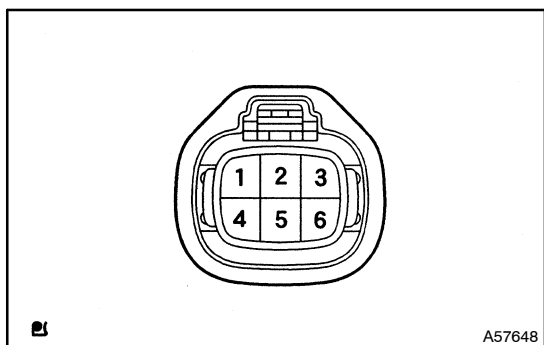
**REPAIR OR REPLACE
HARNESS AND CONNECTOR**

OK

CHECK AND REPLACE ECM

When not using hand-held tester:

1 CHECK HARNESS AND CONNECTOR



- (a) Disconnect the accelerator pedal position sensor connector.
- (b) Turn the ignition switch ON.
- (c) Measure the voltage between terminal 1, 4 and 3, 6 of the wire harness side connector.

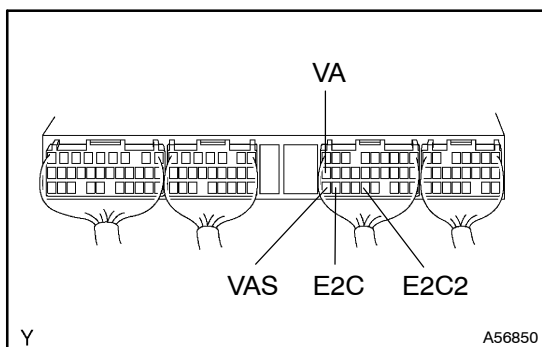
Voltage: 4.5 – 5.5 V

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Go to step 4

OK

2 INSPECT ECM



- (a) Turn the ignition switch ON.
- (b) Measure the voltage between terminals VA and E2C, VAS and E2C2 of the ECM connector.

Result:

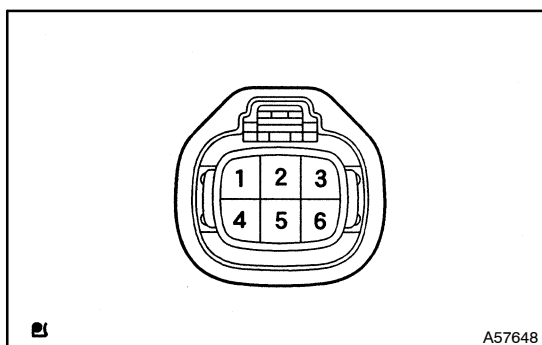
Accelerator pedal	Voltage
Fully closed	VA: 0.5 – 1.1 V VAS: 0.9 – 2.3 V
Fully open	VA: 3.0 – 4.6 V VAS: 3.4 – 5.0 V

OK

CHECK AND REPLACE ECM

NG

3 CHECK HARNESS AND CONNECTOR (ECM-ACCELERATOR PEDAL POSITION SENSOR)



- (a) Disconnect the accelerator pedal position sensor connector.
- (b) Disconnect the ECM E8 connector.
- (c) Check for open between the terminals VA of the ECM E8 connector and 5 of the accelerator pedal position sensor harness side connector.

Resistance: 1 Ω or less

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

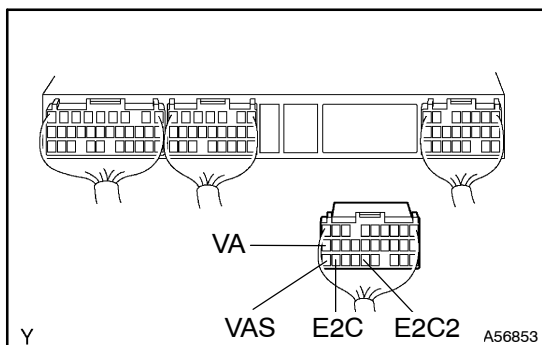
Resistance: 1 M Ω or more

- (e) Check for open between the terminals VAS of the ECM E8 connector and 2 of the accelerator pedal position sensor harness side connector.

Resistance: 1 Ω or less

- (f) Check for short between the terminals VA and E2C, VAS and E2C2 of the ECM E8 connector.

Resistance: 1 M Ω or more



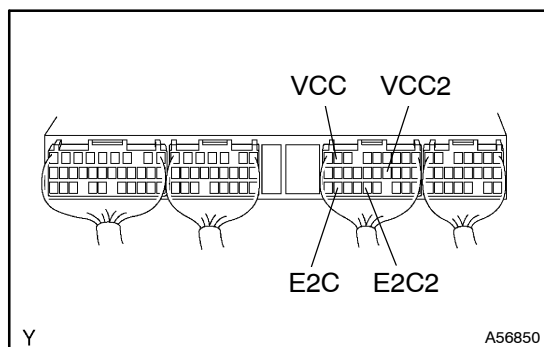
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REPAIR OR REPLACE
HARNESS AND CONNECTOR

OK

REPLACE ACCELERATOR PEDAL ASSY

4 INSPECT ECM



- (a) Turn the ignition switch ON.
- (b) Measure the voltage between terminals VCC and E2C, VCC2 and E2C2 of the ECM connector.

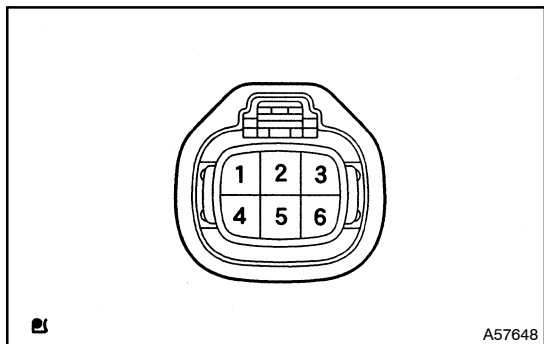
Voltage: 4.5 – 5.5 V

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CHECK AND REPLACE ECM

OK

5 CHECK HARNESS AND CONNECTOR (ECM-ACCELERATOR PEDAL POSITION SENSOR)

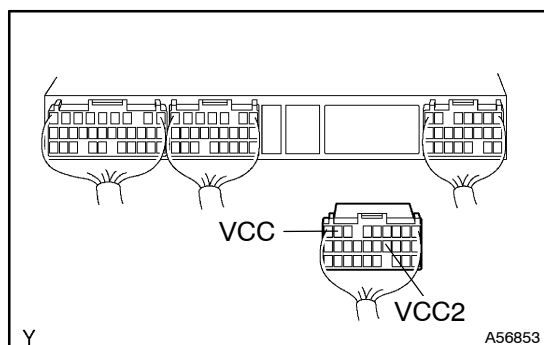


- (a) Disconnect the accelerator pedal position sensor connector.
- (b) Disconnect the ECM E8 connector.
- (c) Check for open between the terminals VCC of the ECM E8 connector and 4 of the accelerator pedal position sensor harness side connector.

Resistance: 1 Ω or less

- (d) Check for open between the terminals VCC2 of the ECM E8 connector and 6 of the accelerator pedal position sensor harness side connector.

Resistance: 1 Ω or less



NG

**REPAIR OR REPLACE
HARNESS AND CONNECTOR**

OK

CHECK AND REPLACE ECM