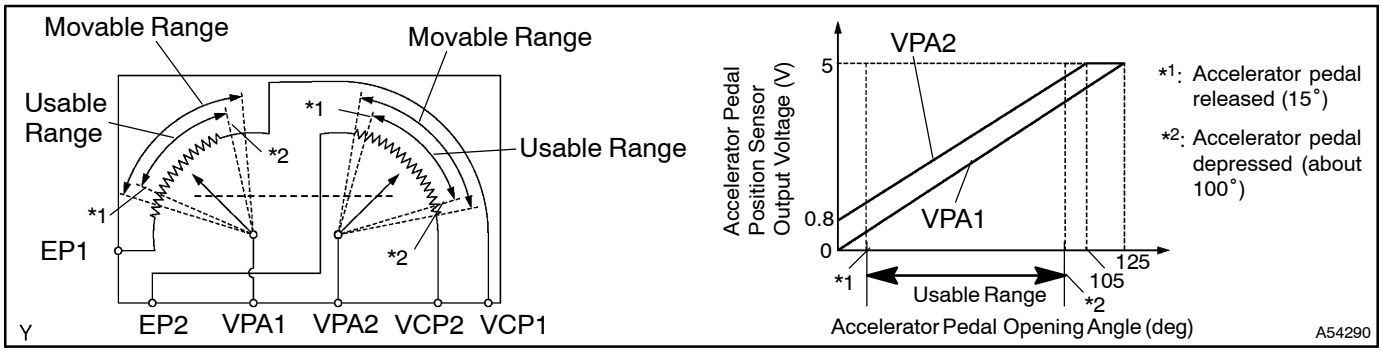
DTC	P1120/19	ACCELERATOR PEDAL POSITION SENSOR CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION

Accelerator pedal position sensor is mounted on the accelerator pedal bracket and it has 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 VPA1 and VPA2 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 VPA1 and VPA2 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.

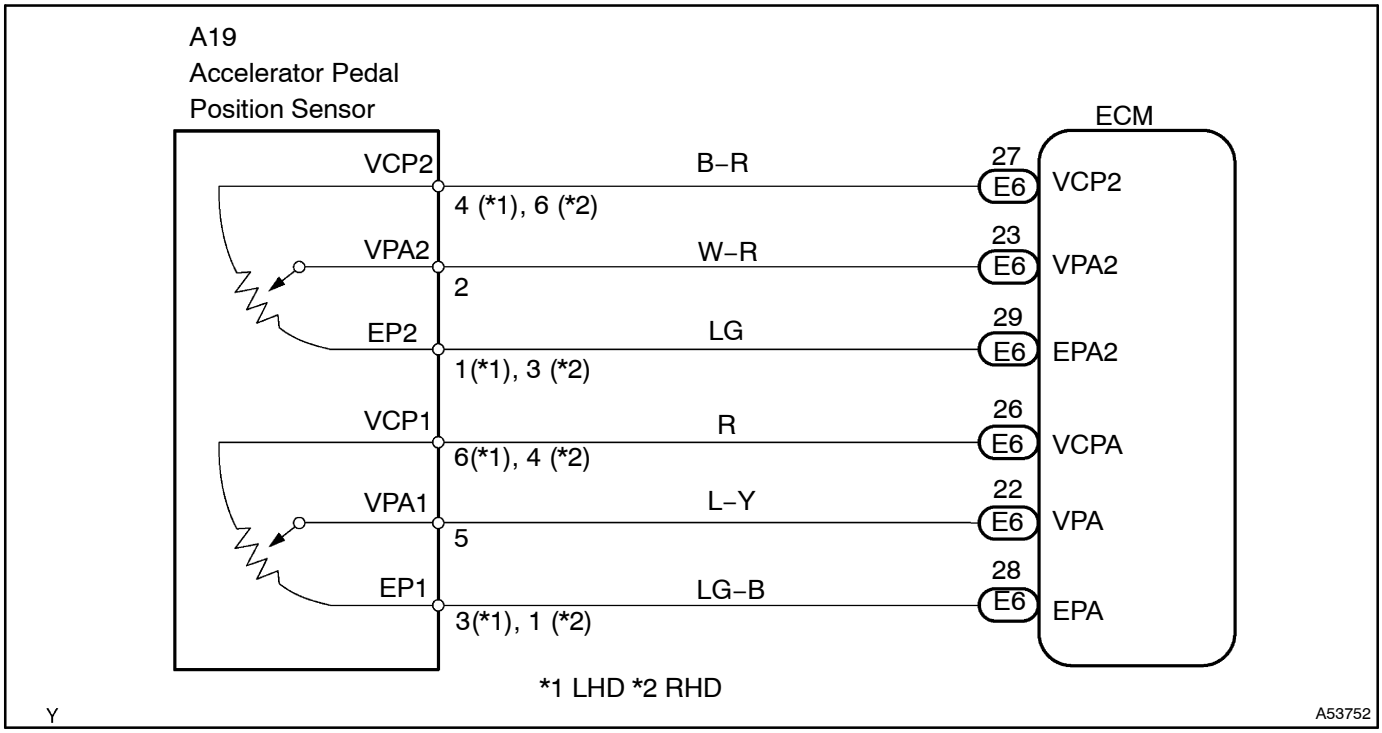


DTC No.	DTC Detecting Condition	Trouble Area
P1120/19	Condition (a), (b), (c), (d) or (e) continues for 0.5 seconds: (a) VPA1 ≦ 0.2 V (b) VPA2 ≦ 0.5 V (c) VPA1 ≧ 4.8 V (d) When VPA1 ≧ 0.2 V and ≦ 3.45 V, and VPA2 ≧ 4.8 V (e) VPA1–VPA2 ≦ 0.02 V (f) IDL is OFF	• Open or short in accelerator pedal position sensor circuit • Accelerator pedal position sensor • ECM
	Condition (a) or (b) continues for 2.0 seconds: (a) VPA1 ≦ 0.2 V and VPA2 ≦ 0.5 V	

After confirming DTC P1120, use the hand–held tester to confirm the throttle valve opening percentage.

Accelerator pedal position expressed as voltage				Trouble area
Accelerator pedal released		Accelerator pedal depressed		
ACCEL POS #1	ACCEL POS #2	ACCEL POS #1	ACCEL POS #2	
0V	0V	0V	0V	VCcircuit open
0V	0.9–2.3V	0V	3.4–5.0V	VPA1 circuit open or ground short
0.5–1.1V	0V	3.0–4.6V	0V	VPA2 circuit open or ground short
5V	5V	5V	5V	E2 circuit open

WIRING DIAGRAM



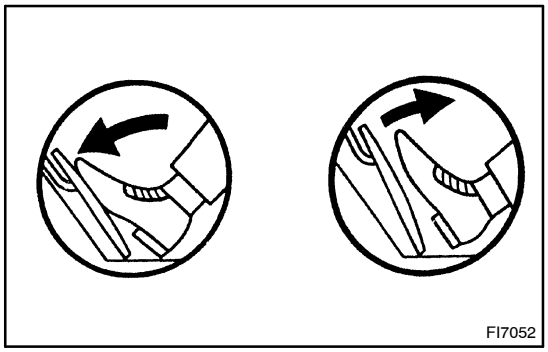
INSPECTION PROCEDURE

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



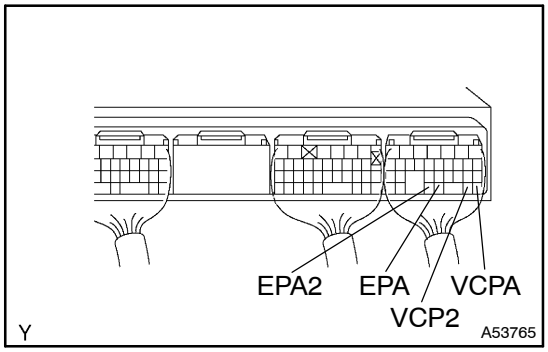
Read the voltage for the accelerator pedal position sensor data.

Accelerator pedal	VPA	VPA2
Released	0.5 – 1.1 V	0.9 – 2.3 V
Depressed	3.0 – 4.6 V	3.4 – 5.0 V

OK → CHECK AND REPLACE ECM

NG

2 INSPECT ECM(VCPA – EPA, VCP2 – EPA2)

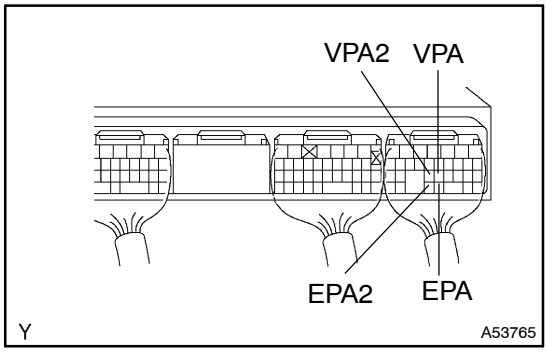


(a) Measure the voltage between terminals VCPA and EPA, VCP2 and EPE2 of the ECM connector.
Voltage: 4.5 – 5.5 V

NG → **CHECK AND REPLACE ECM**

OK

3 INSPECT ECM(VPA – EPA, VPA2 – EPA2)



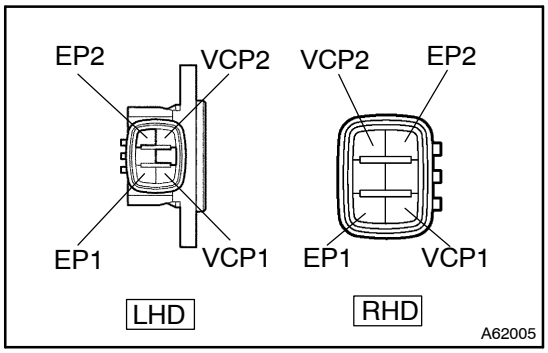
(a) Measure the voltage between terminals VPA and EPA, and VPA2 and EPA2 of the ECM connector.

Accelerator pedal	Voltage	
	VPA – EPA	VPA2 – EPA2
Released	0.5 – 1.1 V	0.9 – 2.3 V
Depressed	3.0 – 4.6 V	3.4 – 5.0 V

OK → **CHECK AND REPLACE ECM**

NG

4 INSPECT ACCELERATOR PEDAL ASSY(POSITION SENSOR)



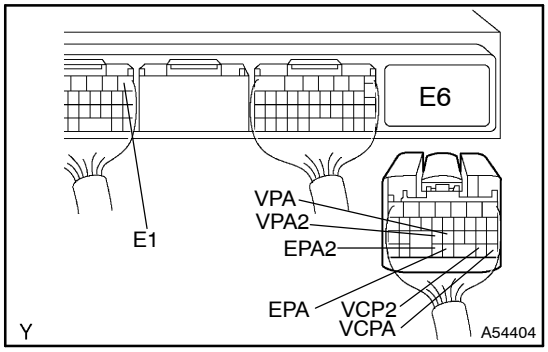
(a) Disconnect the accelerator pedal position sensor connector.
(b) Using an ohmmeter, measure the resistance between each terminals.
Resistance: at 20°C (68°F)

Terminals	Resistance
VCP1 – EP1 VCP2 – EP2	2.25 – 4.75 kΩ

NG → **REPLACE ACCELERATOR PEDAL ASSY**

OK

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

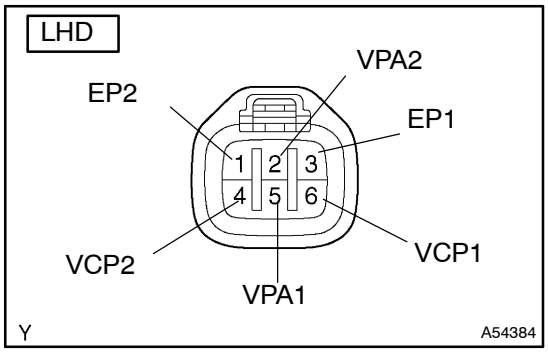


(a) Disconnect the E6 ECM connector.
(b) Disconnect the accelerator position sensor connector.
(c) Check the continuity between the terminal E6 ECM connector and accelerator position sensor connector.

Standard (LHD):

(Check for open)

ECM connector terminal	Accelerator pedal position sensor connector	Continuity
VCP2	VCP2	Continuity
VPA2	VPA2	Continuity
EPA2	EP2	Continuity
VCPA	VCP1	Continuity
VPA	VPA1	Continuity
EPA	EP1	Continuity



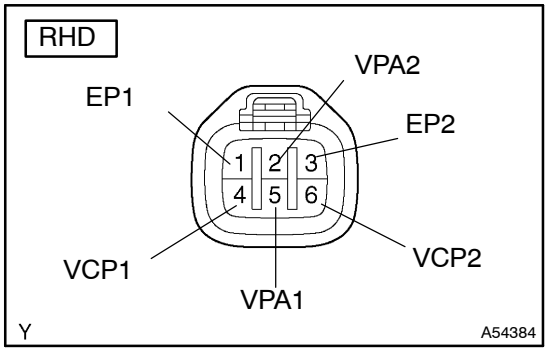
(Check for short)

Accelerator pedal position sensor connector	ECM connector	Continuity
VCP2	E1	No continuity
VPA2		No continuity
EP2		No continuity
VCP1		No continuity
VPA1		No continuity
EP1		No continuity

Standard (RHD):

(Check for open)

ECM connector terminal	Accelerator pedal position sensor connector	Continuity
VCP2	VCP2	Continuity
VPA2	VPA2	Continuity
EPA2	EP2	Continuity
VCPA	VCP1	Continuity
VPA	VPA1	Continuity
EPA	EP1	Continuity



(Check for short)

Accelerator pedal position sensor connector	ECM connector	Continuity
VCP2	E1	No continuity
VPA2		No continuity
EP2		No continuity
VCP1		No continuity
VPA1		No continuity
EP1		No continuity

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

OK

CHECK AND REPLACE ECM