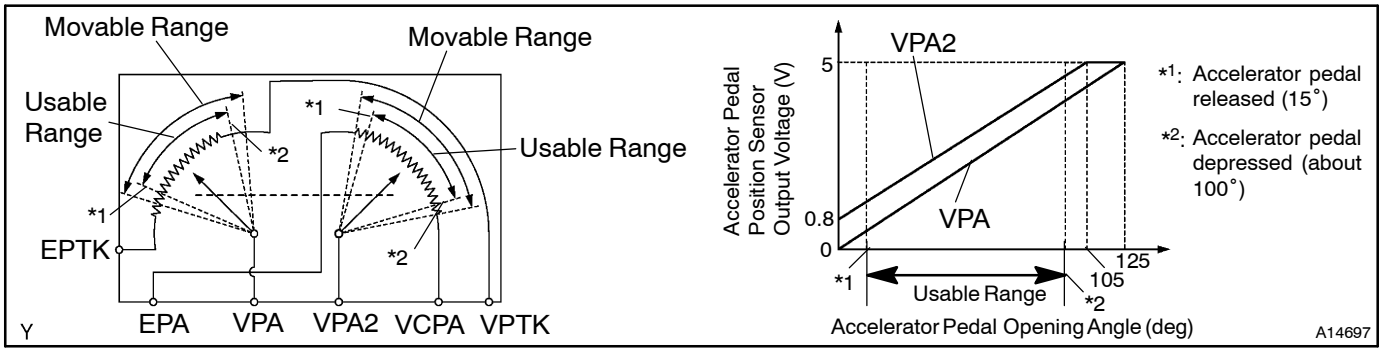
DI646–02

DTC	P1120	Accelerator Pedal Position Sensor Circuit Malfunction

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 VPA and VPA2 of the ECU changes between 0 V and 5 V in proportion to the opening angle of the accelerator pedal.
The engine ECU judges the current opening angle of the accelerator pedal from these signals input from terminals VPA and VPA2 and the engine ECU controls the throttle motor based on these signals.
If this DTC is stored, the engine ECU shuts down the power for the throttle motor, and the throttle valve is fully closed by the return spring.

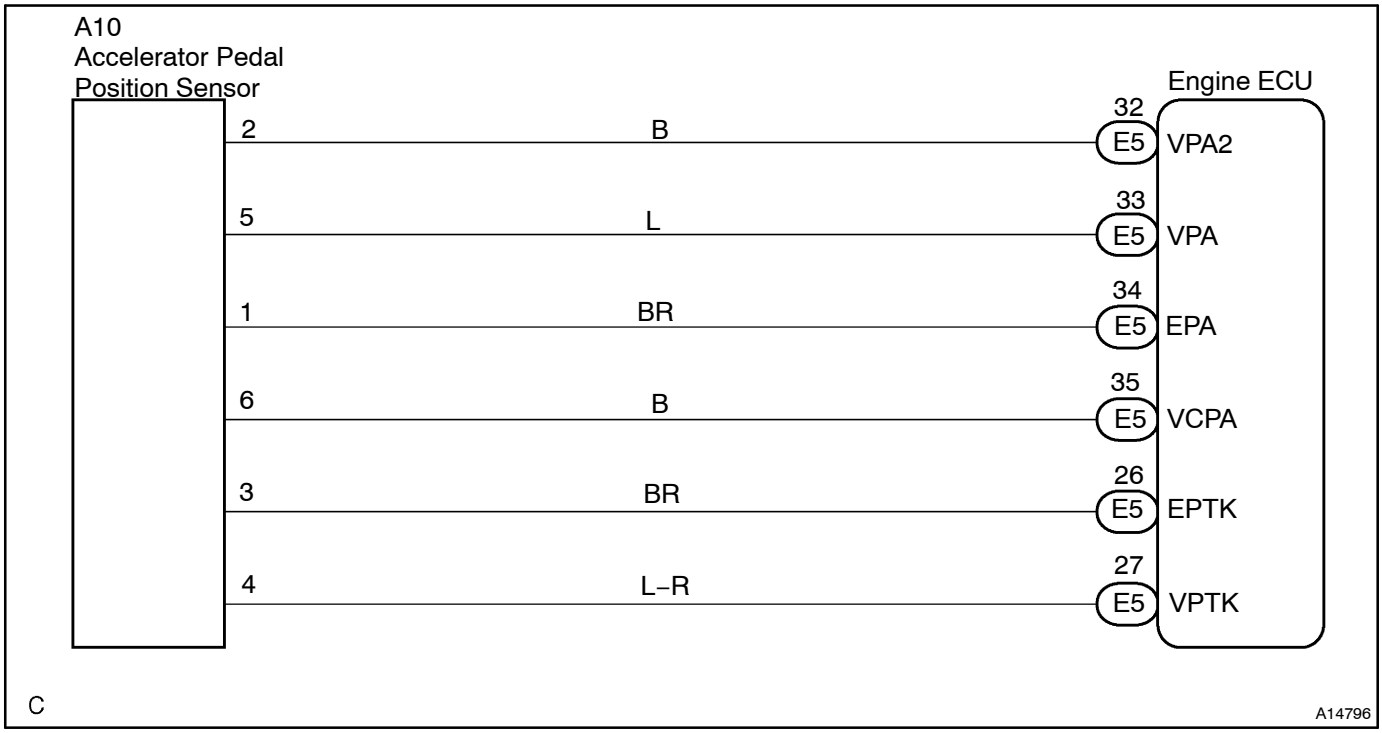


DTC No.	DTC Detecting Condition	Trouble Area
P1120	Condition (a), (b), (c) or (d) continues for 2.0 seconds: (a) VPA ≦ 0.2 V (b) VPA2 ≦ 0.5 V (c) VPA ≧ 4.8 V (d) When VPA ≧ 0.2 V and ≦ 3.4 V, and VPA2 ≧ 4.8 V (e) VPA–VPA2 ≦ 0.02 V	• Open or short in accelerator pedal position sensor circuit • Accelerator pedal position sensor • Engine ECU
	Condition (a) or (b) continues for 0.4 seconds: (a) VPA ≦ 0.2 V and VPA2 ≦ 0.5 V	

HINT:
After confirming DTC P1120, use the OBD scan tool or hand–held tester to confirm the accelerator pedal opening percentage.

Throttle valve position expressed as voltage				Trouble area
Accelerator pedal released		Accelerator pedal depressed		
ACCEL POS #1	ACCEL POS #2	ACCEL POS #1	ACCEL POS #2	
0 V	0 V	0 V	0 V	VC line open
0 V	0.9 – 2.3 V	0 V	3.3 – 5.0 V	VPA line open or grand short
0.5 – 1.1 V	0 V	3.0 – 4.6 V	0 V	VPA2 line open or grand short
5 V	5 V	5 V	5 V	E2 line open

WIRING DIAGRAM



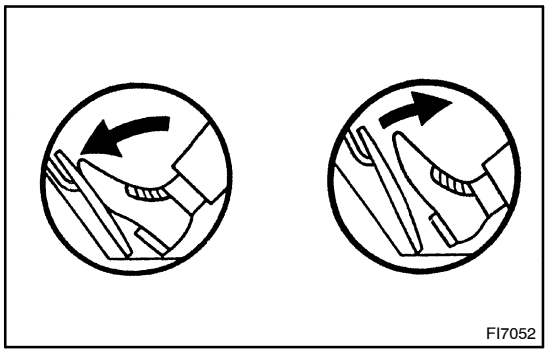
INSPECTION PROCEDURE

HINT:

Read freeze frame data using OBD scan tool or 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	**Connect hand–held tester, read voltage for accelerator pedal position sensor data.**



PREPARATION:

(a) Connect the hand–held tester to the DLC3.

(b) Turn the ignition switch ON and push the hand–held tester main switch ON.

CHECK:

Read the voltage for the accelerator pedal position sensor data.

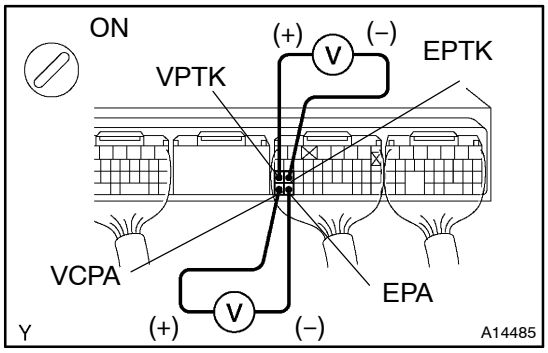
OK:

Accelerator Pedal	VPA	VPA2
Released	0.5 – 1.1 V	0.9 – 2.3 V
Depressed	3.0 – 4.6 V	3.3 – 5.0 V

OK	**Check and replace engine ECU (See page IN–30).**

NG

2	Check voltage between terminals VCPA and EPA, VPTK and EPTK of engine ECU connector.



PREPARATION:

(a) Remove the engine ECU hood and cover (See page FI–74).

(b) Turn the ignition switch ON.

CHECK:

Measure the voltage between terminals VCPA and EPA, VPTK and EPTK of the engine ECU connector.

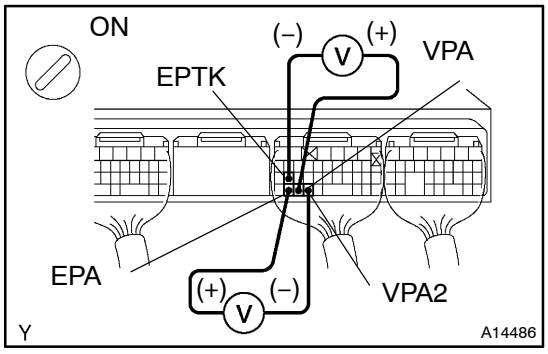
OK:

Voltage: 4.5 – 5.5 V

NG	Check and replace engine ECU (See page IN–30).

OK

3	Check voltage between terminals VPA and EPTK, VPA2 and EPA of engine ECU connector.



PREPARATION:

(a) Remove the engine ECU hood and cover (See page FI–74).

(b) Turn the ignition switch ON.

CHECK:

Measure the voltage between terminals VPA and EPTK, VPA2 and EPA of the engine ECU connector.

OK:

Accelerator pedal	Voltage	
	VPA – EPTK	VPA2 – EPA
Released	0.5 – 1.1 V	0.9 – 2.3 V
Depressed	3.0 – 4.6 V	3.3 – 5.0 V

OK	Check and replace engine ECU (See page IN–30).

NG

4	Check accelerator pedal position sensor (See page FI–35).

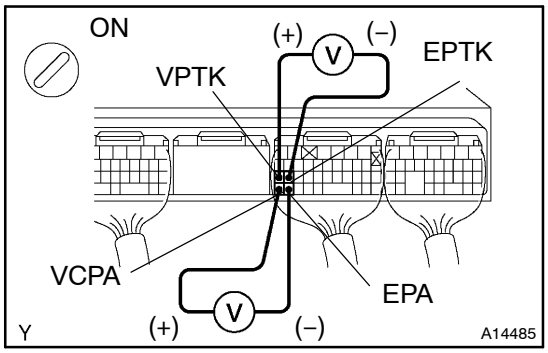
NG → Replace accelerator pedal assembly.

OK →

Check for open and short in harness and connector in VCPA, VPTK, VPA, VPA2, EPTK and EPA circuits between engine ECU and accelerator pedal position sensor (See page IN–30).

When using OBD scan tool:

1	Check voltage between terminals VCPA and EPA, VPTK and EPTK of engine ECU connector.



PREPARATION:

(a) Remove the engine ECU hood and cover (See page FI–74).

(b) Turn the ignition switch ON.

CHECK:

Measure the voltage between terminals VCPA and EPA, VPTK and EPTK of the engine ECU connector.

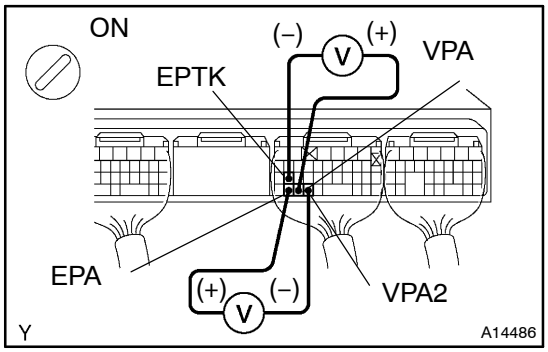
OK:

Voltage: 4.5 – 5.5 V

NG → Check and replace engine ECU (See page IN–30).

OK →

2	**Check voltage between terminals VPA and EPTK, VP2 and EPA of engine ECU connector.**



PREPARATION:

(a) Remove the engine ECU hood and cover (See page FI–74).

(b) Turn the ignition switch ON.

CHECK:

Measure the voltage between terminals VPA and EPTK, VPA2 and EPA of the engine ECU connector.

OK:

Accelerator pedal	Voltage	
	VPA – EPTK	VPA2 – EPA
Released	0.5 – 1.1 V	0.9 – 2.3 V
Depressed	3.0 – 4.6 V	3.3 – 5.0 V

OK → **Check and replace engine ECU (See page IN–30).**

NG

3	**Check accelerator pedal position sensor (See page FI–35).**

NG → **Replace accelerator pedal assembly.**

OK

Check for open and short in harness and connector in VCPA, VPTK, VPA, VPA2, EPA and EPTK circuits between engine ECU and accelerator pedal position sensor (See page IN–30).