

DTC	P2122/104	THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT LOW INPUT
DTC	P2123/105	THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT HIGH INPUT
DTC	P2127/107	THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT LOW INPUT
DTC	P2128/108	THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT HIGH INPUT

HINT:

This is the repair procedure for the accelerator pedal position sensor.

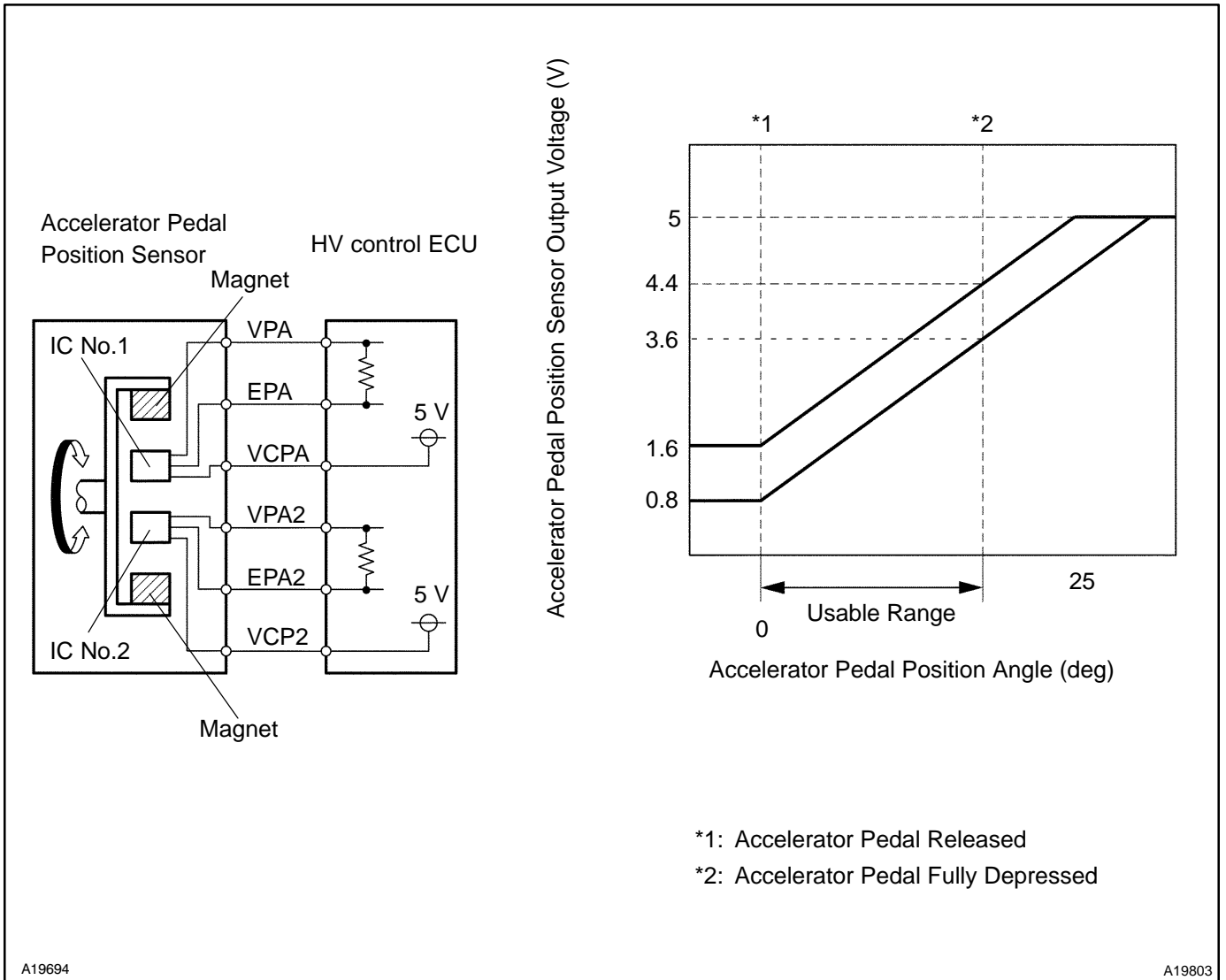
CIRCUIT DESCRIPTION**HINT:**

- This electrical throttle system does not use a throttle cable.
- This accelerator pedal position sensor is a non-contact type.

The accelerator pedal position sensor is mounted on the accelerator pedal to detect how much it is depressed. It has 2 sensor terminals (VPA and VPA2) to detect the accelerator pedal position and a malfunction of the accelerator pedal position sensor itself. Since this sensor is electronically controlled with hall elements, accurate control and reliability can be obtained.

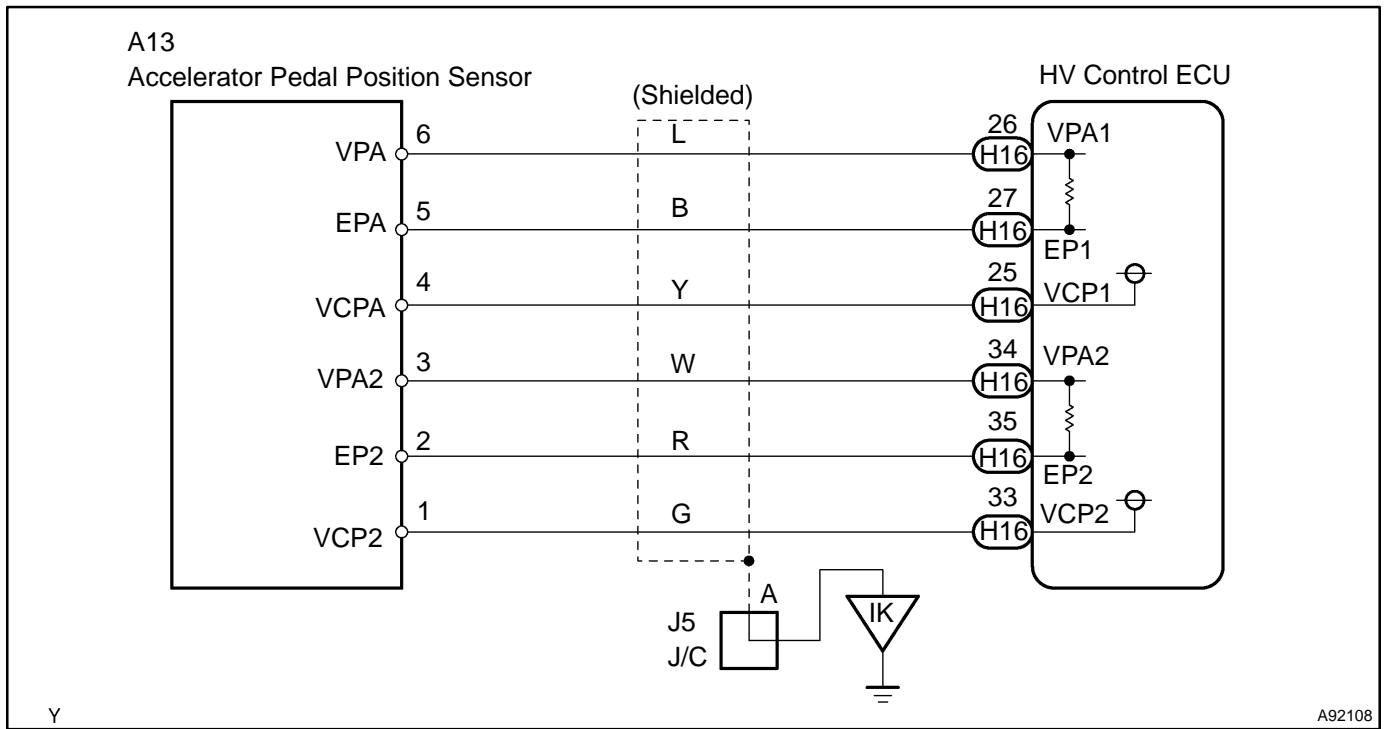
In the accelerator pedal position sensor, the voltage applied to terminals VPA and VPA2 of the HV control ECU changes between 0 V and 5 V in proportion to the degree of depressing the accelerator pedal. The VPA is a signal to indicate the actual accelerator pedal position angle which is used for the HV system control, and the VPA2 is a signal to indicate the actual accelerator pedal position angle which is used for detecting a malfunction of the sensor itself (terminal VPA).

The HV control ECU judges how much the accelerator pedal is being depressed from the VPA and VPA2 signals, and controls the HV system based on the signals.



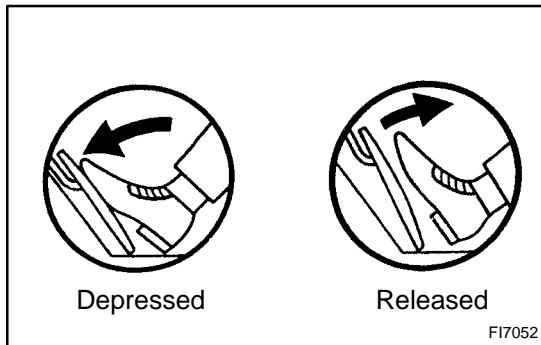
DTC No.	INF Code	DTC Detection Condition	Trouble Area
P2122	104	Open or GND short in accelerator pedal position main sensor circuit	<ul style="list-style-type: none"> • Wire harness or connector • Accelerator pedal rod assembly • HV control ECU
P2123	105	+B short in accelerator pedal position main sensor circuit	<ul style="list-style-type: none"> • Wire harness or connector • Accelerator pedal rod assembly • HV control ECU
P2127	107	Open or GND short in accelerator pedal position sub sensor circuit	<ul style="list-style-type: none"> • Wire harness or connector • Accelerator pedal rod assembly • HV control ECU
P2128	108	+B short in accelerator pedal position sub sensor circuit	<ul style="list-style-type: none"> • Wire harness or connector • Accelerator pedal rod assembly • HV control ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

1 READ VALUE OF HAND-HELD TESTER(ACCEL POS #1 AND #2)



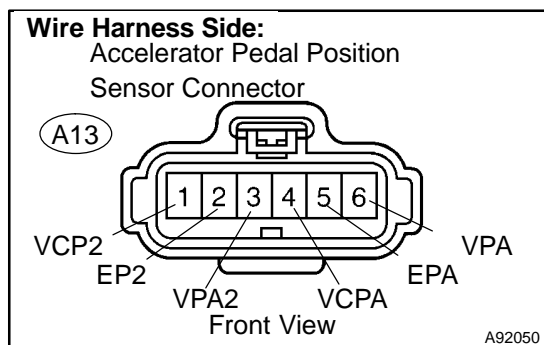
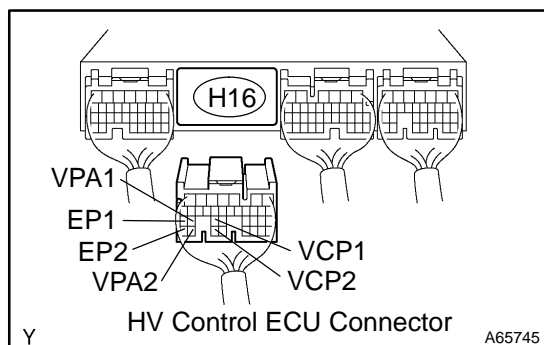
- (a) Connect the hand-held tester to the DLC3.
- (b) Turn the power switch ON (IG).
- (c) Turn the hand-held tester ON.
- (d) On the hand-held tester, enter the following menus: DIAGNOSIS / ENHANCED OBD II / HV ECU / DATA LIST.
- (e) Read the ACCEL POS #1 and #2 values on the hand-held tester with the engine stopped.

OK: Changes with accelerator pedal pressure

OK → **Go to step 5**

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2 CHECK HARNESS AND CONNECTOR(HYBRID VEHICLE CONTROL ECU – ACCELERATOR PEDAL POSITION SENSOR)



- (a) Disconnect the H16 HV control ECU connector.
- (b) Disconnect the A13 accelerator pedal position sensor connector.
- (c) Turn the power switch ON (IG).
- (d) Measure the voltage between the terminals of the HV control ECU connector and body ground.

Standard:

Tester Connection	Specified Condition
VPA1 (H16-26) – Body ground	Below 1 V
VCP1 (H16-25) – Body ground	Below 1 V
EP1 (H16-27) – Body ground	Below 1 V
VPA2 (H16-34) – Body ground	Below 1 V
VCP2 (H16-33) – Body ground	Below 1 V
EP2 (H16-35) – Body ground	Below 1 V

- (e) Turn the power switch OFF.
- (f) Check the resistance between the wire harness side connectors.

Standard (Check for open):

Tester Connection	Specified Condition
VPA1 (H16-26) – VPA (A13-6)	Below 1 Ω
VCP1 (H16-25) – VCPA (A13-4)	Below 1 Ω
EP1 (H16-27) – EPA (A13-5)	Below 1 Ω
VPA2 (H16-34) – VPA2 (A13-3)	Below 1 Ω
VCP2 (H16-33) – VCP2 (A13-1)	Below 1 Ω
EP2 (H16-35) – EP2 (A13-2)	Below 1 Ω

Standard (Check for short):

Tester Connection	Specified Condition
VPA1 (H16-26) or VPA (A13-6) – Body ground	10 k Ω or higher
VCP1 (H16-25) or VCPA (A13-4) – Body ground	10 k Ω or higher
EP1 (H16-27) or EPA (A13-5) – Body ground	10 k Ω or higher
VPA2 (H16-34) or VPA2 (A13-3) – Body ground	10 k Ω or higher
VCP2 (H16-33) or VCP2 (A13-1) – Body ground	10 k Ω or higher
EP2 (H16-35) or EP2 (A13-2) – Body ground	10 k Ω or higher

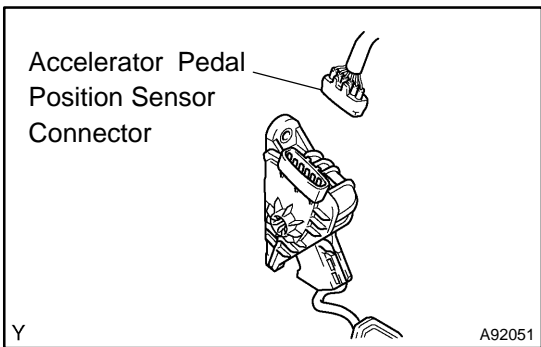
- (g) Reconnect the accelerator pedal position sensor connector.
- (h) Reconnect the HV control ECU connector.

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REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

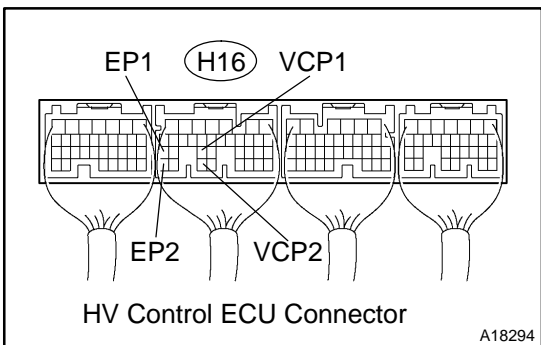
3 INSPECT HYBRID VEHICLE CONTROL ECU(VCP1 OR VCP2 VOLTAGE)



- (a) Disconnect the A13 accelerator pedal position sensor connector.
- (b) Turn the power switch ON (IG).
- (c) Measure the voltage between the terminals of the HV control ECU connector.

Standard:

Tester Connection	Specified Condition
VCP1 (H16-25) – EP1 (H16-27)	4.5 to 5.5 V
VCP2 (H16-33) – EP2 (H16-35)	4.5 to 5.5 V



- (d) Reconnect the accelerator pedal position sensor connector.

NG → **REPLACE HYBRID VEHICLE CONTROL ECU (See page 21-124)**

OK

4 REPLACE ACCELERATOR PEDAL ROD ASSY (See page 21-128)

GO

5 CHECK IF DTC OUTPUT RECURS(DTC P2122, P2123, P2127 OR P2128)

- (a) Connect the hand-held tester to the DLC3.
- (b) Turn the power switch ON (IG).
- (c) Turn the hand-held tester ON.
- (d) On the hand-held tester, enter the following menus: DIAGNOSIS / ENHANCED OBD II / HV ECU / DTC INFO / TROUBLE CODES.
- (e) Perform a simulation test.
- (f) Read DTCs.

Result: DTC P2122, P2123, P2127 or P2128 is not output again

YES → **SYSTEM OK**

NO

REPLACE HYBRID VEHICLE CONTROL ECU (See page 21-124)