DI8FI–01

DTC	19 (1)	Accelerator Pedal Position Sensor circuit Malfunction (Open/Short)

CIRCUIT DESCRIPTION

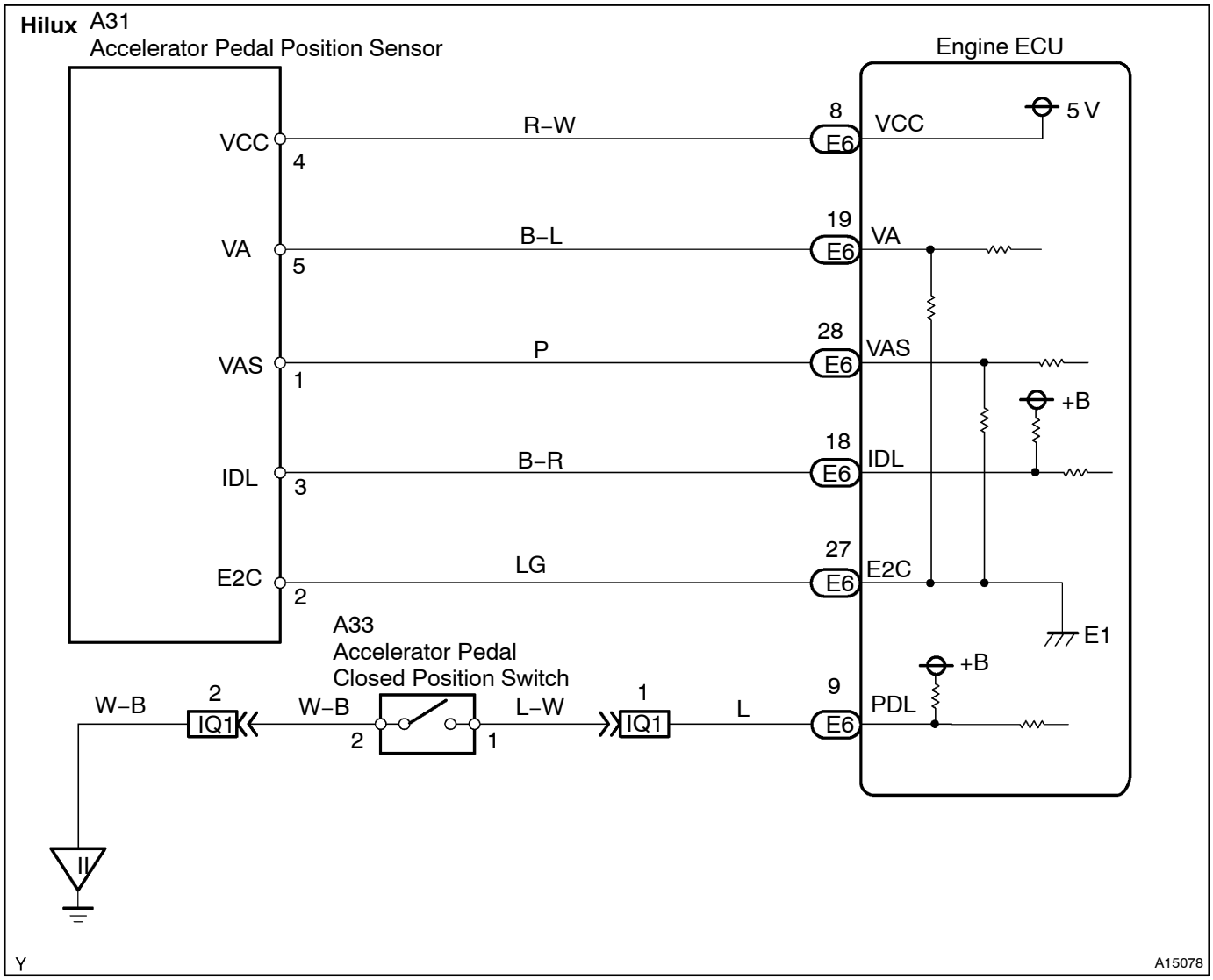
The accelerator pedal position sensor is mounted in the accelerator pedal and detects the accelerator pedal opening angle. When the accelerator pedal is fully closed, a voltage of approximately 1.0 V is applied to terminals VA, VAS of the engine ECU. The voltage applied to the terminals VA, VAS of the engine ECU increases in proportion to the opening angle of the accelerator pedal and becomes approximately 3.8 V when the accelerator pedal is fully opened. The engine ECU judges the vehicle driving conditions from these signals input from terminals VA, VAS and uses them as one of the conditions to control the injection volume and diesel throttle valve position. The idle switch is mounted in the accelerator pedal position sensor and sends the IDL signal to the engine ECU when the accelerator pedal is fully closed.
This system has the 2 ways accelerator pedal position sensor and accelerator pedal closed position switch for the fail safe.

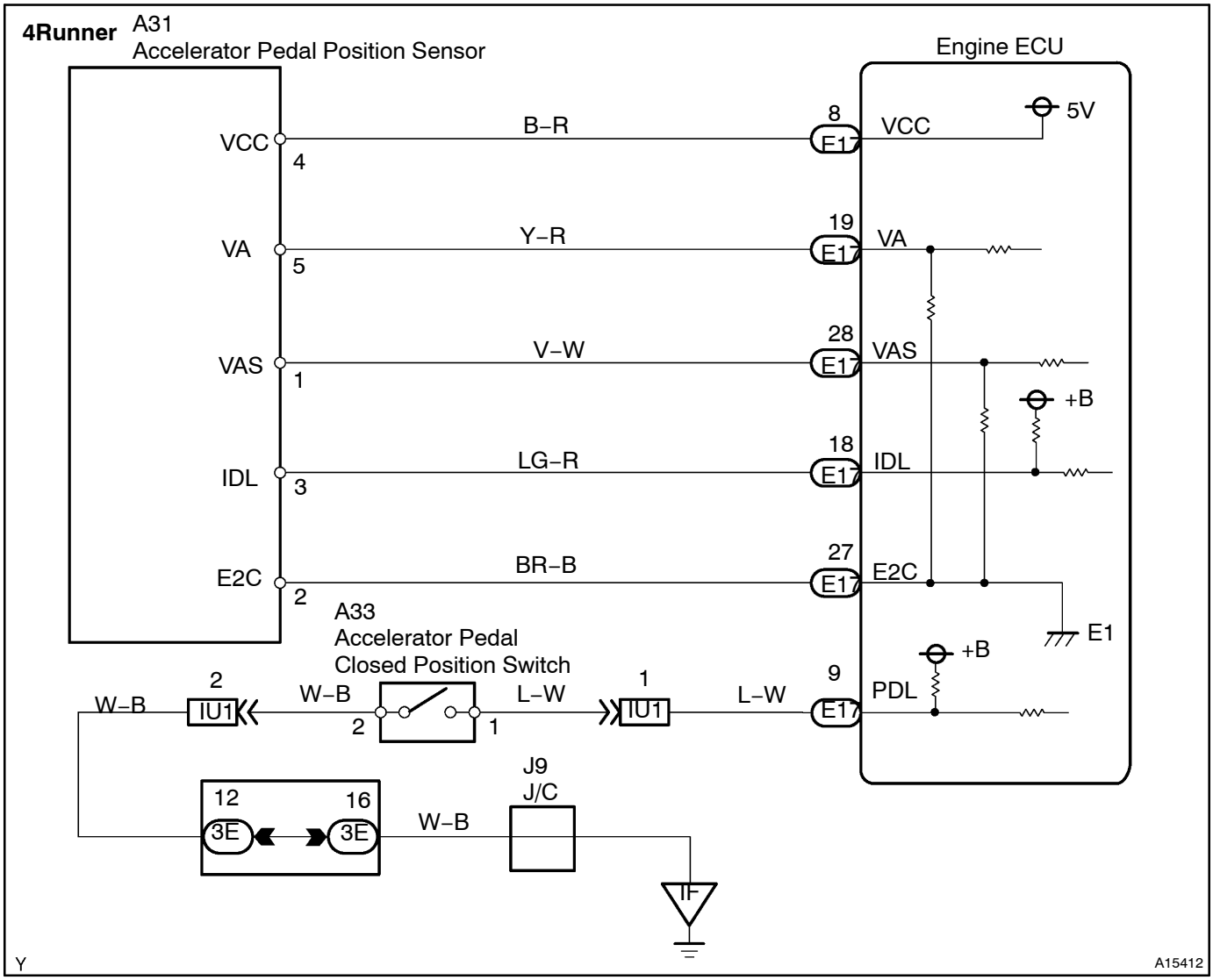
DTC No.	DTC Detection Condition	Trouble Area
19 (1)	Open or short in accelerator pedal position sensor circuit for 0.05 sec. or more	• Open or short in accelerator pedal position sensor circuit • Accelerator pedal position sensor • Engine ECU

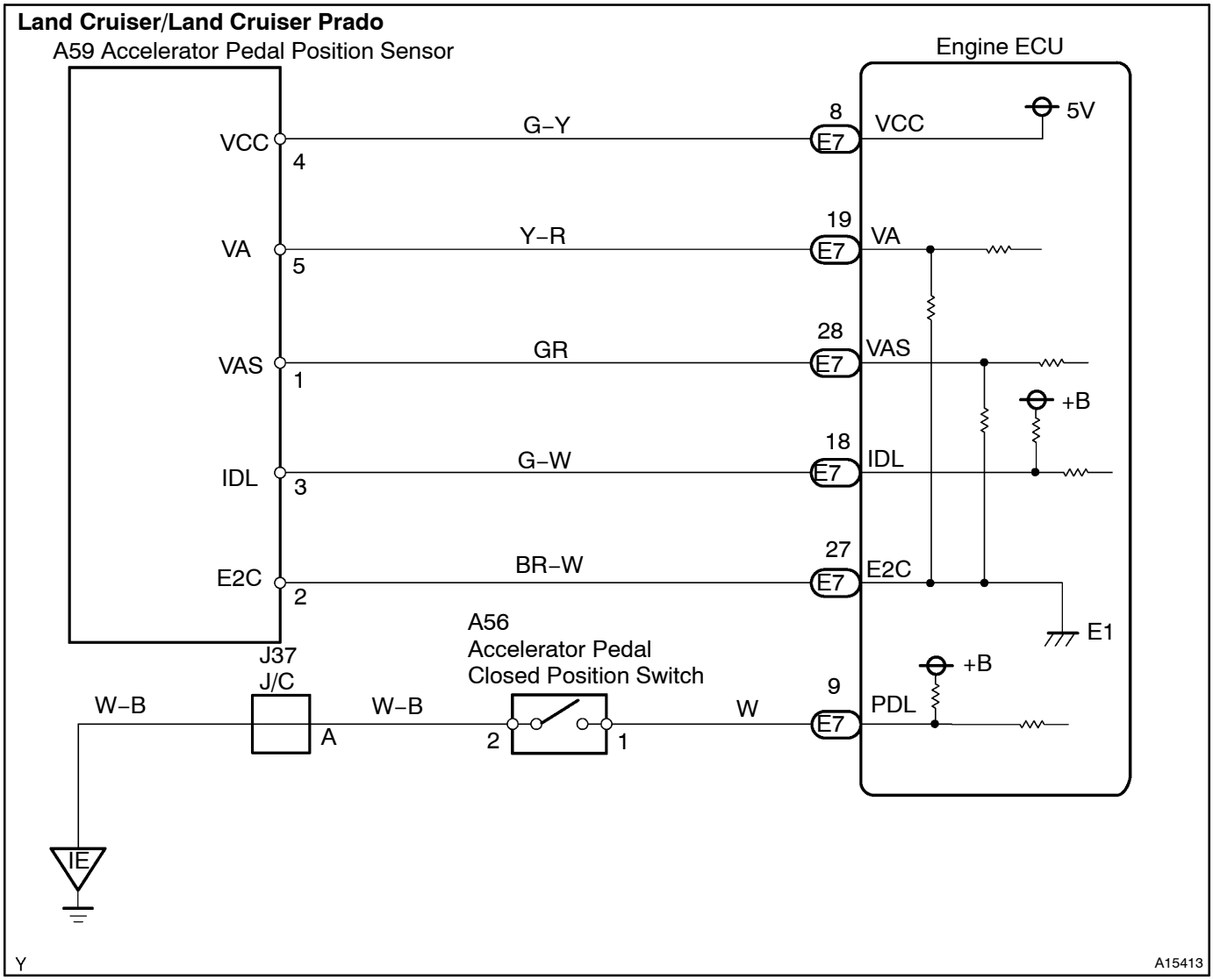
HINT:
After confirming DTC 19 (1), use the hand–held tester to confirm the accelerator pedal opening percentage and accelerator pedal close position switch condition.

Accelerator pedal opening position expressed as percentage		Trouble Area
Accelerator pedal fully closed	Accelerator pedal fully open	
0 %	0 %	VCC circuit open VA, VAS circuit open or short
Approx. 100 %	Approx. 100 %	E2C circuit open

WIRING DIAGRAM




4Runner
A31
Accelerator Pedal Position Sensor
Engine ECU
VCC
4
B–R
8
E17
VCC
5V
VA
5
Y–R
19
E17
VA
VAS
1
V–W
28
E17
VAS
+B
IDL
3
LG–R
18
E17
IDL
E2C
2
BR–B
27
E17
E2C
E1
A33
Accelerator Pedal
Closed Position Switch
2
IU1
W–B
W–B
2
1
L–W
1
IU1
L–W
9
E17
PDL
+B
J9
J/C
12
3E
16
3E
W–B
IF
Y
A15412



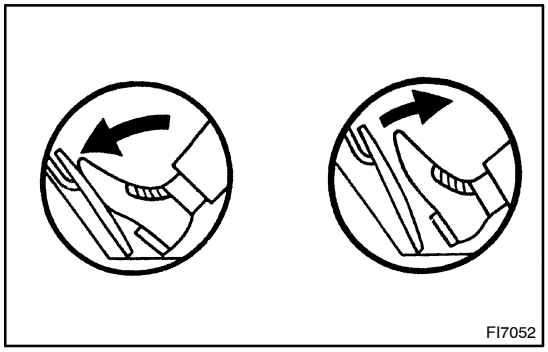
INSPECTION PROCEDURE

When using hand–held tester:

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.

1	**Connect hand–held tester, read accelerator pedal opening percentage.**



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 accelerator pedal opening percentage.

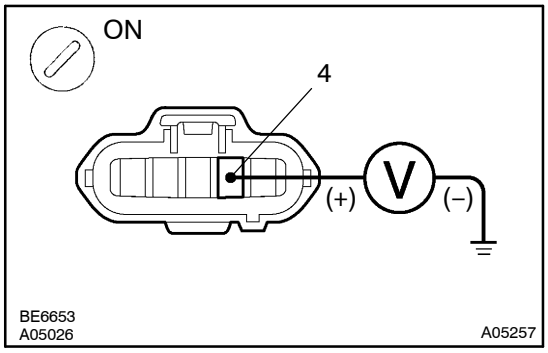
OK:

Accelerator pedal	Accelerator pedal opening position expressed as percentage
Fully released	Approx. 65 %
Fully depressed	Approx. 18 %

OK	**Check for intermittent problems (See page DI–4).**

NG

2	**Check voltage between terminal 4 of wire harness side connector and body ground.**



PREPARATION:

(a) Disconnect the accelerator pedal position sensor connector.

(b) Turn the ignition switch ON.

CHECK:

Measure the voltage between terminal 4 of the wire harness side connector and the body ground.

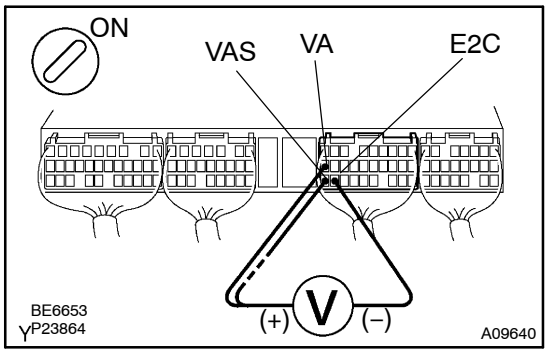
OK:

Voltage: 4.5 – 5.5 V

NG	**Go to step 5.**

OK

3	**Check voltage between terminals VA/VAS and E2C of engine ECU connector.**



PREPARATION:

(a) Remove the glove compartment door.

(b) Turn the ignition switch ON.

CHECK:

Measure the voltage between terminals VA/VAS and E2C of the engine ECU connector.

OK:

Accelerator Pedal	Voltage
Fully released	0.6 – 1.3 V
Fully depressed	2.8 – 4.5 V

OK	**Check and replace engine ECU (See page IN–20).**

NG

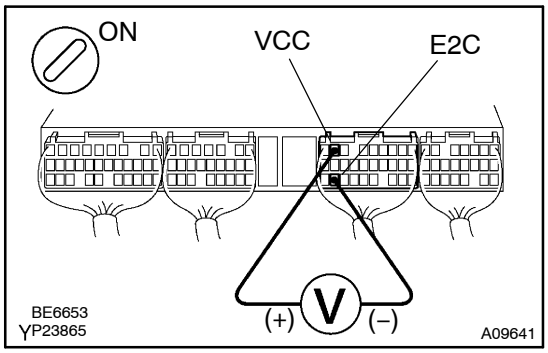
4	**Check for open and short in harness and connector in VA or VAS between engine ECU and accelerator pedal position sensor (See page IN–20).**

NG → **Repair or replace harness or connector.**

OK

Replace accelerator pedal.

5	**Check voltage between terminals VCC and E2C of engine ECU connector.**



PREPARATION:

(a) Remove the glove compartment door.

(b) Turn the ignition switch ON.

CHECK:

Measure the voltage between terminals VCC and E2C of the engine ECU connector.

OK:

Voltage: 4.5 – 5.5 V

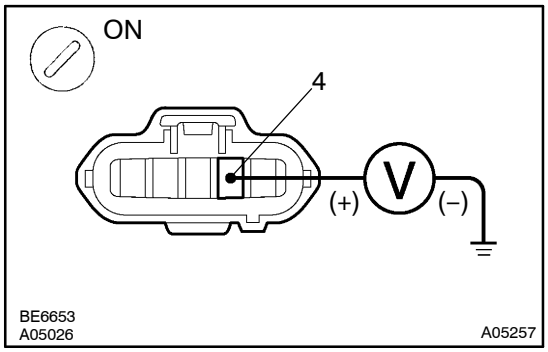
NG → **Check and replace engine ECU (See page IN–20).**

OK

Check for open in harness and connector in VCC circuit between engine ECU and accelerator pedal position sensor (See page IN–20).

When not using hand–held tester:

1	**Check voltage between terminal 4 of wire harness side connector and body ground.**



PREPARATION:

(a) Disconnect the accelerator pedal position sensor connector.

(b) Turn the ignition switch ON.

CHECK:

Measure the voltage between terminal 4 of the wire harness side connector and the body ground.

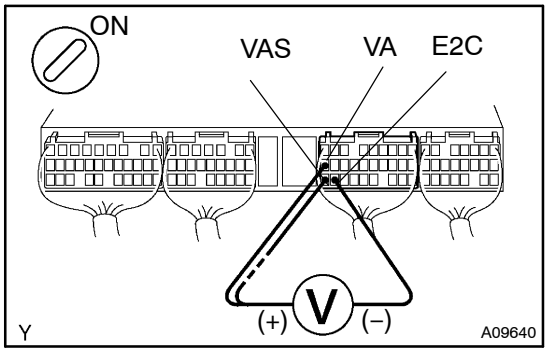
OK:

Voltage: 4.5 – 5.5 V

NG	**Go to step 4.**

OK

2	**Check voltage between terminals VA/VAS and E2C of engine ECU connector.**



PREPARATION:

(a) Remove the glove compartment door.

(b) Turn the ignition switch ON.

CHECK:

Measure the voltage between terminals VA/VAS and E2C of the engine ECU connector.

OK:

Accelerator pedal	Voltage
Fully released	0.6 – 1.3 V
Fully depressed	2.8 – 4.5 V

OK	**Check and replace engine ECU (See page IN–20).**

NG

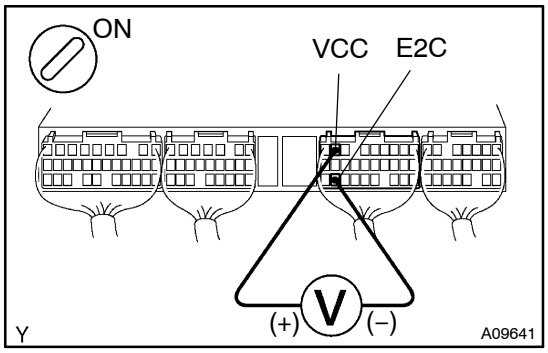
3	**Check for open and short in harness and connector inVA or VAS circuit between engine ECU and accelerator pedal position sensor (See page IN–20).**

NG	**Repair or replace harness or connector.**

OK

Replace accelerator pedal.

4	**Check voltage between terminals VCC and E2C of engine ECU connector.**



PREPARATION:

(a) Remove the glove compartment door.

(b) Turn the ignition switch ON.

CHECK:

Measure the voltage between terminals VCC and E2C of the engine ECU connector.

OK:

Voltage: 4.5 – 5.5 V

NG

Check and replace engine ECU (See page IN–20).

OK

Check for open in harness and connector in VCC circuit between engine ECU and accelerator pedal position sensor (See page IN–20).