DI9G8–02

| DTC | 19 (1) | Accelerator Pedal Position Sensor Circuit Malfunction (Open/Short) |
|---|---|---|

## CIRCUIT DESCRIPTION

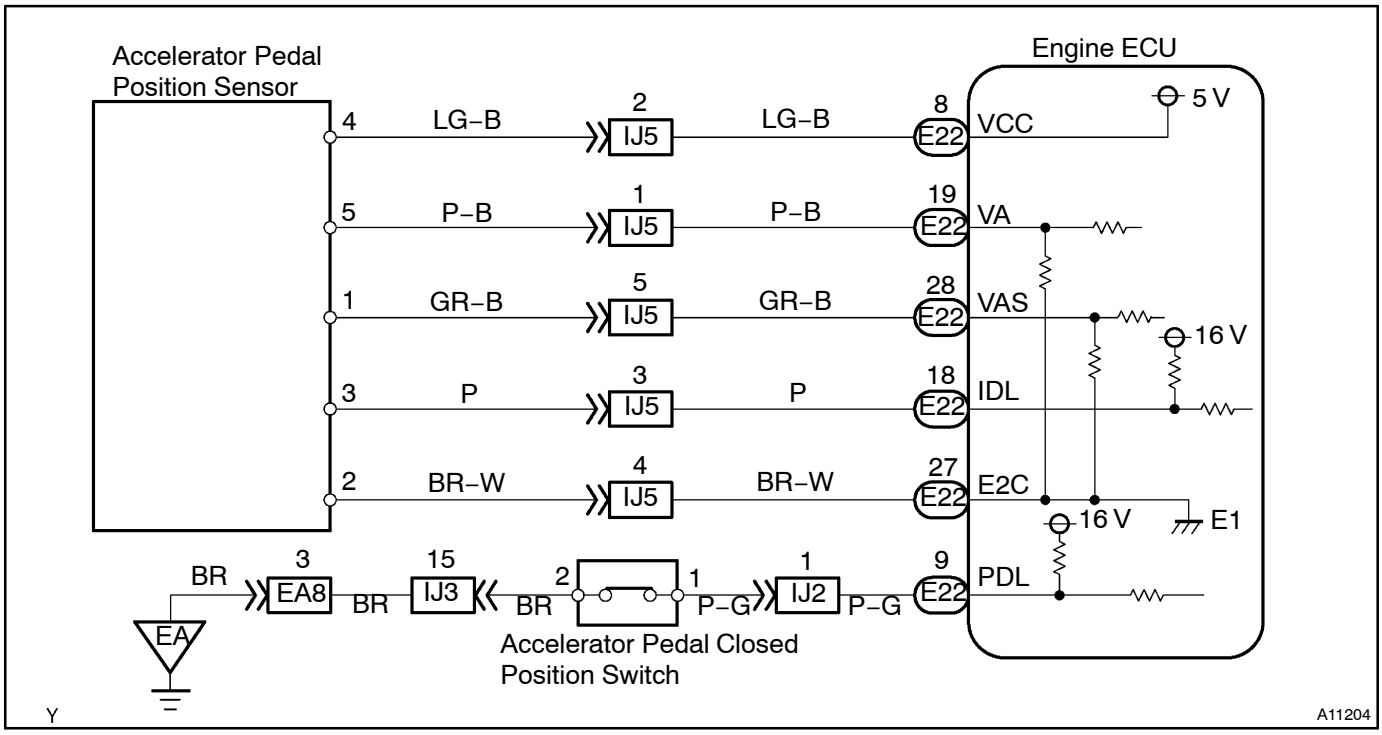
The accelerator pedal position sensor is mounted at the accelerator pedal and detects the accelerator pedal opening angle. When the accelerator pedal is fully closed, a voltage of approximately 0.9 V is applied to terminals VA, VAS of the engine ECU. The voltage applied to terminals VA, VAS of the engine 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 accelerator pedal is fully closed.
This system has 2 way accelerator pedal position sensor and accelerator pedal closed position switch for fail safe.

| DTC No. | DTC Detecting 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<br>• Accelerator pedal position sensor<br>• 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<br>• VA, VAS circuit open or short |
| Approx. 100 % | Approx. 100 % | • E2C circuit open |

## WIRING DIAGRAM

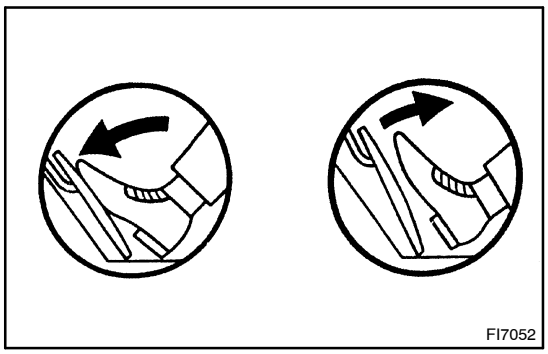


## INSPECTION PROCEDURE

HINT:
Read freeze frame data using the 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, and 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.

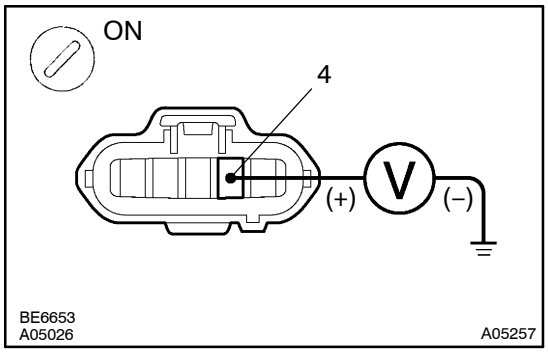
**OK:**

| Accelerator Pedal | Accelerator pedal opening position expressed as percentage |
|---|---|
| Fully open | Approx. 65 % |
| Fully closed | Approx. 18 % |

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

NG

| | |
|---|---|
| 2 | **Check voltage between terminal 4 of accelerator pedal position sensor connector and body ground.** |




**PREPARATION:**
(a) Disconnect the accelerator pedal position sensor connector.
(b) Turn the ignition switch ON.

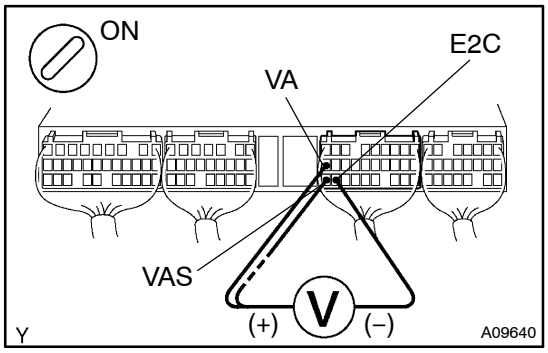
**CHECK:**
Measure the voltage between terminal 4 of the accelerator pedal position sensor connector and body ground.

**OK:**
**Voltage: 4.5 – 5.5 V**

NG → **Go to step 5.**

OK

| 3 | Check voltage between terminals VA and E2C, and VAS and E2C of engine ECU connector. |
|---|---|




**PREPARATION:**

(a) Disconnect the engine ECU from the body bracket (See page ED–30).

(b) Turn the ignition switch ON.

**CHECK:**

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

**OK:**

| Accelerator Pedal | Voltage |
|---|---|
| Fully closed | 0.6 – 1.3 V |
| Fully open | 3.0 – 4.5 V |

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

NG

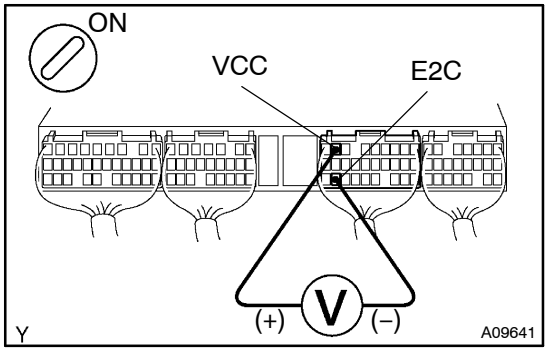
| 4 | Check for open and short in harness and connector in VA and VAS circuits between engine ECU and accelerator pedal position sensor (See page IN–20). |
|---|---|

| 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) Disconnect the engine ECU from the body bracket (See page ED–30).

(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**

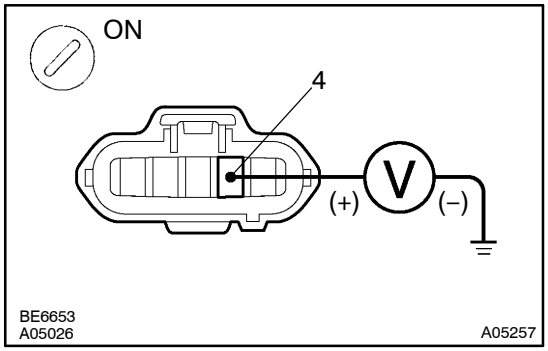
| NG | Check and replace engine ECU (See page IN–20). |
|---|---|

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 accelerator pedal position sensor 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 accelerator pedal position sensor connector and body ground.

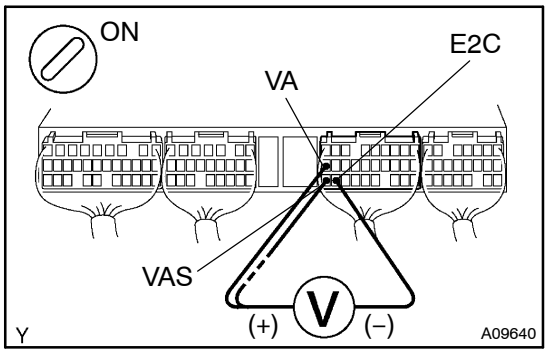
**OK:**

**Voltage: 4.5 – 5.5 V**

| NG | Go to step 4. |
|---|---|

OK

| 2 | Check voltage between terminals VA and E2C, and VAS and E2C of engine ECU connector. |
|---|---|




**PREPARATION:**

(a) Disconnect the engine ECU from the body bracket (See page ED–30).

(b) Turn the ignition switch ON.

**CHECK:**

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

**OK:**

| Accelerator Pedal | Voltage |
|---|---|
| Fully closed | 0.6 – 1.3 V |
| Fully open | 3.0 – 4.5 V |

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

NG

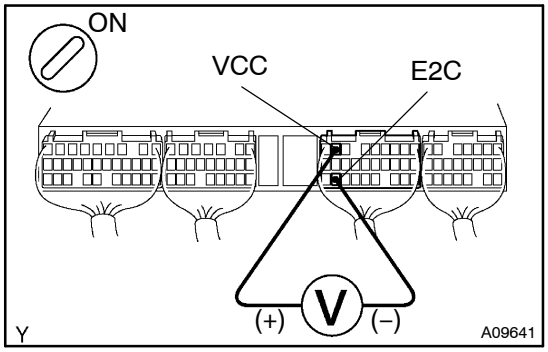
| | |
|---|---|
| 3 | Check for open and short in harness and connector in VA and VAS circuits between engine ECU and accelerator pedal position sensor (See page IN–20). |

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) Disconnect the engine ECU from the body bracket (See page ED–30).

(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).