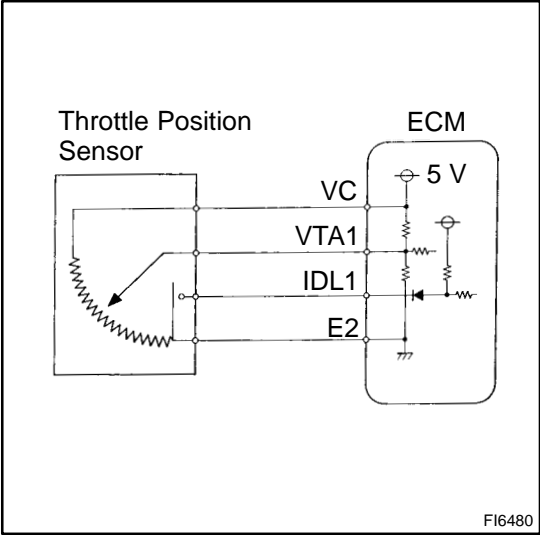


|     |       |   |
|-----|-------|---|
| DTC | P0120 | Throttle/Pedal Position Sensor/Switch "A" Circuit Malfunction |
|-----|-------|---|

CIRCUIT DESCRIPTION



The throttle position sensor is mounted in the throttle body and detects the throttle valve opening angle. When the throttle valve is fully closed, the IDL1 contacts in the throttle position sensor are on, so the voltage at the terminal IDL1 of the ECM becomes 0 V. At this time, a voltage of approximately 0.7 V is applied to terminal VTA1 of the ECM. When the throttle valve is opened, the IDL1 contacts go off and thus the power source voltage of approximately 12 V in the ECM is applied to the terminal IDL1 of the ECM. The voltage applied to the terminal VTA1 of the ECM increases in proportion to the opening angle of the throttle valve and becomes approximately 3.2 ~ 4.9 V when the throttle valve is fully opened. The ECM judges the vehicle driving conditions from these signals input from terminals VTA1 and IDL1, and uses them as one of the conditions for deciding the air–fuel ratio correction, power increases correction and fuel–cut control etc.

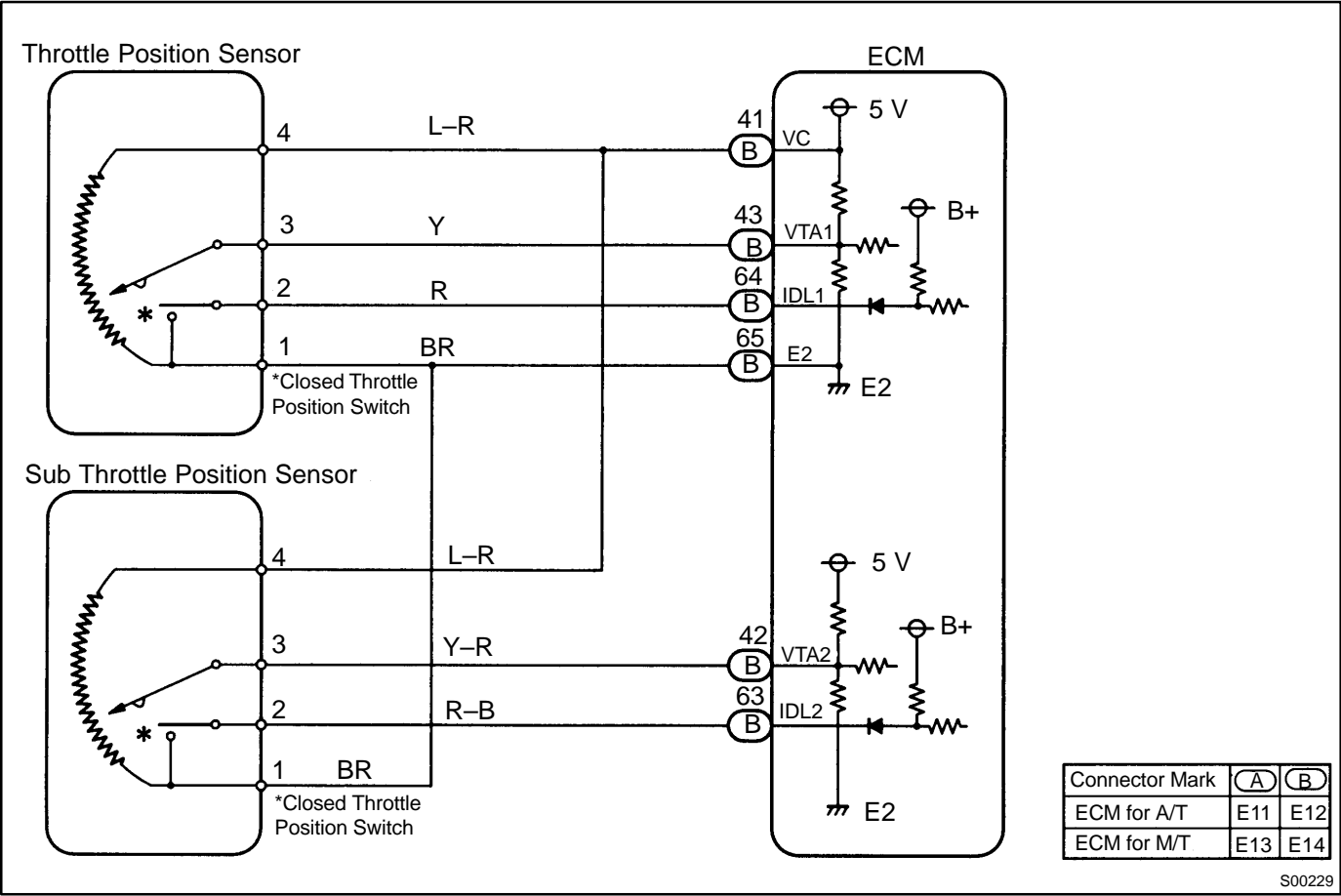
| DTC No. | DTC Detecting Condition  | Trouble Area   |
|---------|--|--|
| P0120   | Condition (a) or (b) continues:<br>(a) VTA1 < 0.1 V, and closed throttle position switch is OFF<br>(b) VTA > 4.9 V | • Open or short in throttle position sensor circuit<br>• Throttle position sensor<br>• ECM |

HINT:

- If there is open circuit in IDL1 line, DTC P0120 does not indicate.
- After confirming DTC P0120 use the OBD II scan tool or LEXUS hand–held tester to confirm the throttle valve opening percentage and closed throttle position switch condition.

| Throttle valve opening position expressed as percentage |                           | Trouble Area                            |
|---|---------------------------|---|
| Throttle valve fully closed                             | Throttle valve fully open |   |
| 0 %   | 0 %                       | VC line open<br>VTA1 line open or short |
| Approx. 100 %   | Approx. 100 %             | E2 line open                            |

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

If DTC P0110, P0115 and P0120 are output simultaneously, E2 (sensor ground) may be open.

1

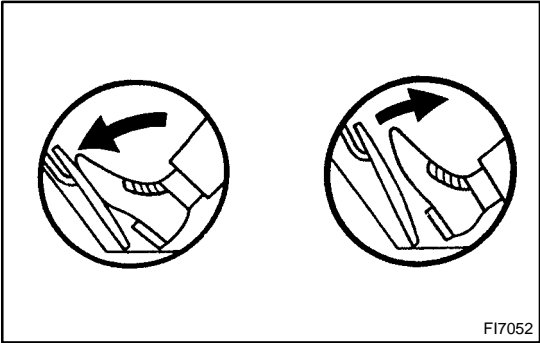
Connect the OBD II scan tool or LEXUS hand-held tester and read the throttle valve opening percentage.

PREPARATION:

- (a) Connect the OBD II scan tool or LEXUS hand-held tester to the DLC 3.
- (b) Turn ignition switch ON and OBD II scan tool or LEXUS hand-held tester main switch ON.

CHECK:

Read the throttle valve opening percentage.



OK:

| Throttle valve | Throttle valve opening position expressed as percentage |
|----------------|---|
| Fully open     | Approx. 70 %  |
| Fully closed   | Approx. 10 %  |

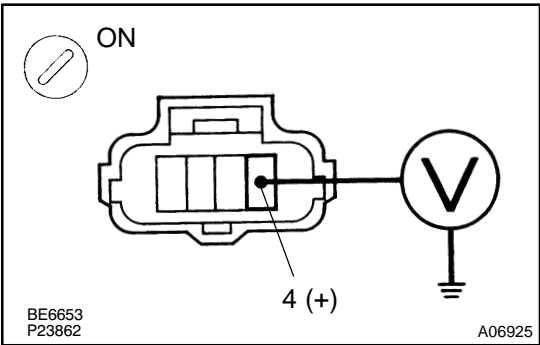
OK

Check for intermittent problems (See page DI-3).

NG

2

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



PREPARATION:

- (a) Disconnect the throttle position sensor connector.
- (b) Turn ignition switch ON.

CHECK:

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

OK:

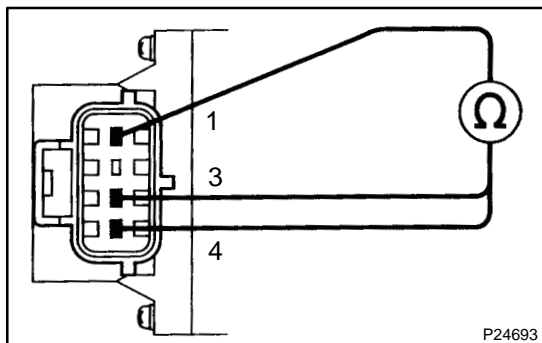
Voltage: 4.5 – 5.5 V

NG

Go to step 5.

OK

### 3 Check throttle position sensor.

**PREPARATION:**

Disconnect the throttle position sensor connector.

**CHECK:**

Measure resistance between terminals 4, 3 and 1 of throttle position sensor.

**OK:**

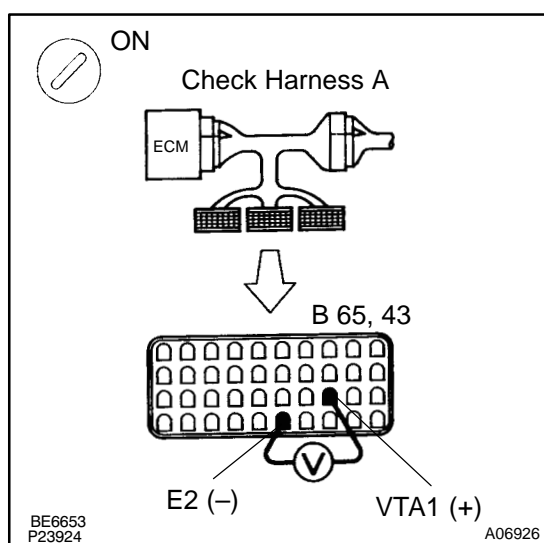
| Terminals | Throttle valves | Resistance    |
|-----------|-----------------|---------------|
| 1 – 4     | –               | 3.1 – 7.2 kΩ  |
| 1 – 3     | Fully closed    | 0.34 – 6.3 kΩ |
| 1 – 3     | Fully open      | 2.4 – 11.2 kΩ |

**NG**

Replace throttle position sensor.

**OK**

### 4 Check voltage between terminals VTA1 and E2 of ECM.

**PREPARATION:**

- Connect Check Harness A (See page [DI-18](#)).
- Turn ignition switch ON.

**CHECK:**

Measure voltage between terminals VTA1 and E2 of ECM.

**OK:**

| Throttle Valve | Voltage     |
|----------------|-------------|
| Fully closed   | 0.3 – 0.8 V |
| Fully open     | 3.2 – 4.9 V |

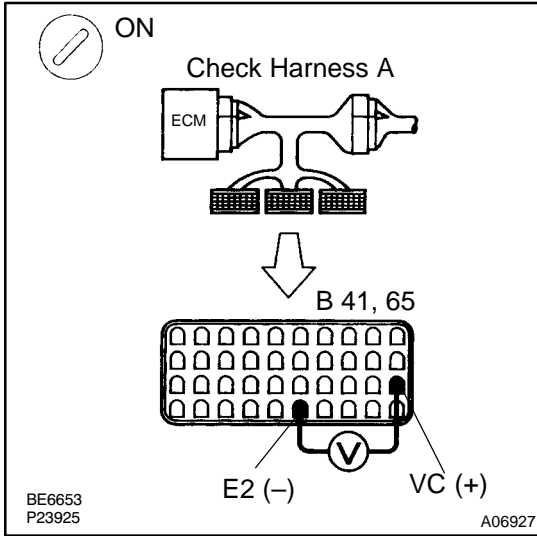
**NG**

Check for open and short in harness and connector between ECM and throttle position sensor (VTA1 line) (See page [IN-29](#)).

**OK**

Check and replace ECM (See page [IN-29](#)).

# 5 Check voltage between terminals VC and E2 of ECM.



## PREPARATION:

- Connect Check Harness A (See page [DI-18](#)).
- Turn ignition switch ON.

## CHECK:

Measure voltage between terminals VC and E2 of ECM connector.

## OK:

**Voltage 4.5 – 5.5 V**

**NG**

**Check and replace ECM (See page [IN-29](#)).**

**OK**

**Check for open in harness and connector between ECM and sensor (VC line) (See page [IN-29](#)).**