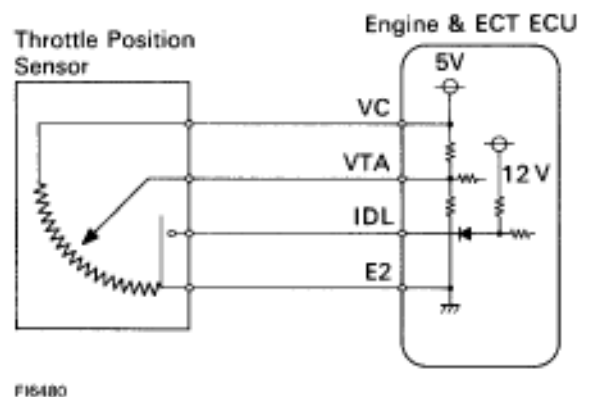


Diag. Code 41, 47 (Sub-) Throttle Position Sensor Circuit

— 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 IDL contacts in the throttle position sensor are on, so the voltage at the terminal IDL of the ECU become 0 V. At this time, a voltage of approximately 0.7 V is applied to the terminal VTA of the ECU. When the throttle valve is opened, the IDL contacts go off and thus the power source voltage of approximately 12 V in the ECU is applied to the terminal IDL of the ECU. The voltage applied to the terminal VTA of the ECU increases in proportion to the opening angle of the throttle valve and becomes approximately 3.5–5.0 V when the throttle valve is fully opened. The ECU judges the vehicle driving conditions from these signals input from the terminals VTA and IDL, and uses them as one of the conditions for deciding the air–fuel ratio correction, power increase correction and fuel–cut control etc. The sub–throttle position sensor is built and operates in the same way as the main throttle position sensor. This sensor is used for traction control. The sub–throttle valve is opened and closed by the sub–throttle actuator according to signals from the TRAC ECU to control the engine output.



Code No.	Diagnostic Code Detecting Condition	Trouble Area
41	(1) Open or short in throttle position sensor circuit (VTA1) for 0.5 sec. or more.	•Open or short in throttle position sensor circuit.
	(2) IDL1 contact is ON and VTA1 output exceeds 1.5 V for 0.5 sec. or more.	•Throttle position sensor •ECU
47	(1) Open or short in sub–throttle position sensor circuit (VTA2) for 0.5 sec. or more.	•Open or short in sub–throttle position sensor circuit.
	(2) IDL2 contact is ON and VTA2 output exceeds 1.5 V for 0.5 sec. or more.	•Sub–throttle position sensor •ECU

HINT:

Diag. code 41 is for the throttle position sensor circuit.

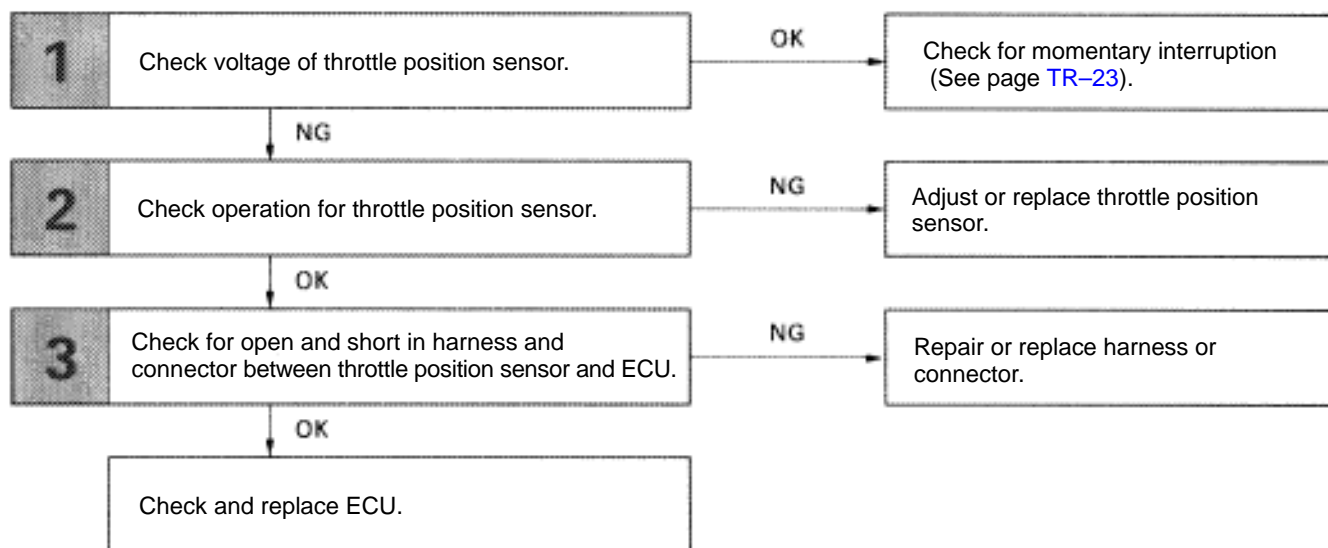
Diag. code 47 is for the sub–throttle position sensor circuit.

- When the connector for the (sub-) throttle position sensor is disconnected, diagnostic code 41 or 47 is not displayed. Diagnostic code 41 or 47 is displayed only when there is an open or short in the VTA signal circuit of the (sub-) throttle position sensor.
- Signals from the (sub-) throttle position sensor are also input to the TRAC ECU, So when a malfunction occurs on the TRAC side, code 41 or 47 may be displayed.

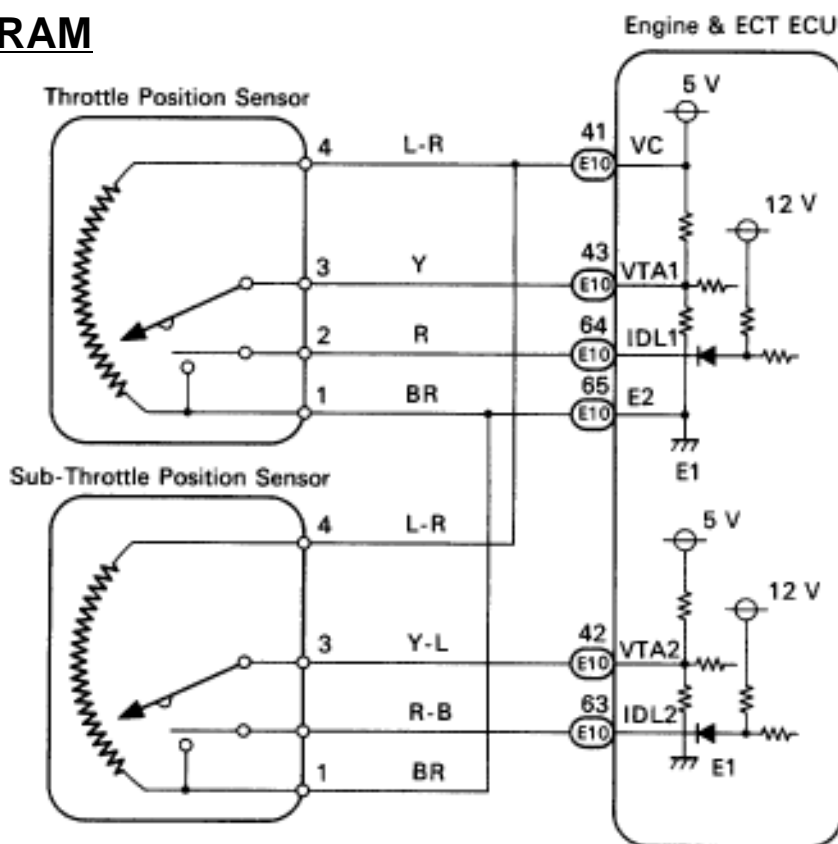
DIAGNOSTIC CHART

HINT:

- If diag. code 41 is displayed, check throttle position sensor circuit; if diag. code 47 is displayed, check sub-throttle position sensor circuit.
- If diag. codes "22" (water temperature sensor circuit), "24" (intake air temperature sensor circuit) and "41" (throttle position sensor circuit) are output simultaneously, E2 (sensor ground) may be open.





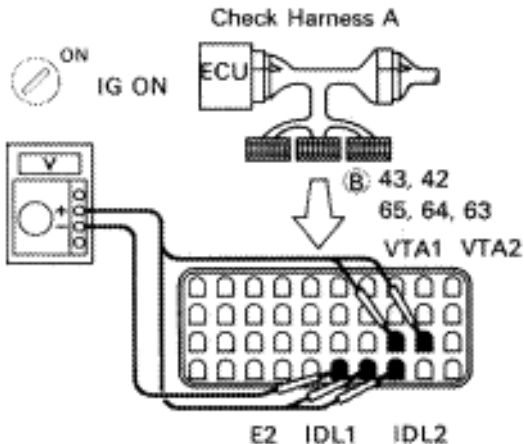
WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

- If diag. code 41 is displayed, check throttle position sensor circuit. If diag. code 47 is displayed, check sub-throttle position sensor circuit.
- If diag. codes "22" (water temperature sensor circuit), "24" (intake air temperature sensor circuit) and "41" (throttle position sensor circuit) are output simultaneously, E2 (sensor ground) may be open.

#	Check voltage between terminals VTA1, 2, IDL1, 2 and E2 of engine & ECT ECU connector.												
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Throttle valve</p> <p>(Operation of throttle linkage)</p>  </div> <div style="text-align: center;"> <p>Sub-throttle valve</p> <p>(Operation of sub-throttle valve)</p>  </div> </div> <div style="text-align: center; margin-top: 20px;"> <p>Check Harness A</p>  </div> <p style="font-size: small; margin-top: 10px;">BR3721 BR3723 RE0663 FM607</p>	<p>P (2) Connect the Check Harness A. (See page TR-30).</p> <p>(2) Turn ignition switch on.</p> <p>(2) For sub-throttle position sensor, remove intake air duct and disconnect sub-throttle valve step motor connector.</p> <p>C Measure voltage between terminals VTA1, 2, IDL1, 2 and E2 of engine & ECT ECU connector when the (sub-) throttle valve is opened gradually from the closed condition.</p> <p>OK</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Terminal</th> <th>VTA1, 2</th> <th>IDL1, 2</th> </tr> </thead> <tbody> <tr> <td>Throttle Valve</td> <td></td> <td></td> </tr> <tr> <td>Fully Closed</td> <td>0.1 – 1.0 V</td> <td>Below 1.0 V</td> </tr> <tr> <td>Fully Open</td> <td>3 – 5 V</td> <td>10 – 14 V</td> </tr> </tbody> </table> <p>Hint The voltage should increase steadily in proportion to the throttle valve opening angle.</p>	Terminal	VTA1, 2	IDL1, 2	Throttle Valve			Fully Closed	0.1 – 1.0 V	Below 1.0 V	Fully Open	3 – 5 V	10 – 14 V
Terminal	VTA1, 2	IDL1, 2											
Throttle Valve													
Fully Closed	0.1 – 1.0 V	Below 1.0 V											
Fully Open	3 – 5 V	10 – 14 V											

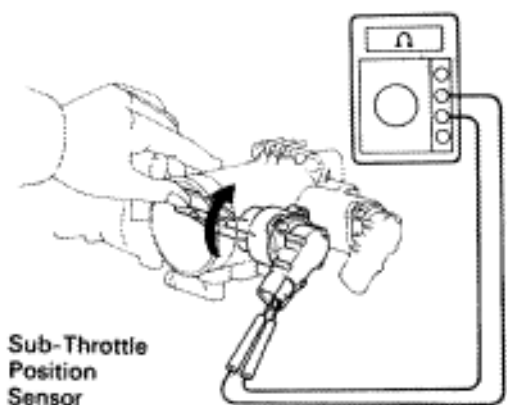
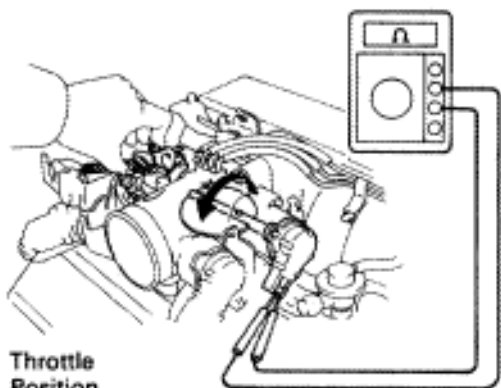
NG

OK

Check for Momentary interruption
(See page TR-23).

Go to step [2].

2 Check (sub-) throttle position sensor.



- P** (2) Remove intake air duct.
(2) Disconnect (sub-) throttle position sensor connector.

- C** Measure resistance between terminals 3, 2, and 1 of (sub-) throttle position sensor connector when the throttle valve is opened gradually from the closed condition.

OK

Terminal Throttle Valve	3 – 1	2 – 1
Fully Closed	0.2 – 0.8 kΩ	Less than 0.5 kΩ
Fully Open	2.8 – 8.0 kΩ	1MΩ or higher

- Hint** Resistance between terminals 3 and 1 should increase gradually in accordance with the throttle valve opening angle.

OK

NG

Adjust or replace (sub-) throttle position sensor
(See page [FI-73](#)).

3

Check for open and short in harness and connector between engine & ECT ECU and (sub-) throttle position sensor (See page [IN-27](#)).

OK

NG

Repair or replace harness or connector.

Check and replace engine & ECT ECU.