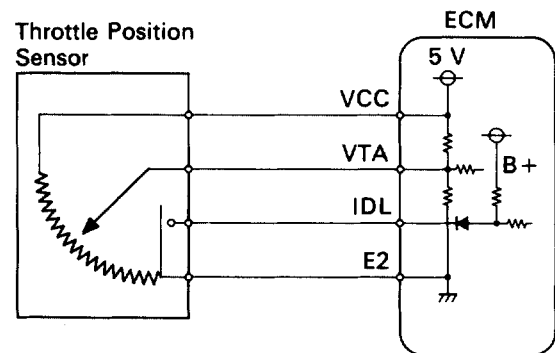


DTC	41, 47	Throttle Position Sensor(s) Circuit
------------	---------------	--

— CIRCUIT DESCRIPTION —

The throttle position sensor is mounted in the throttle body and detects the throttle position. 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 ECM become 0 V. At this time, a voltage of approximately 0.7 V is applied to the terminal VTA of the ECM. When the throttle valve is opened, the IDL contacts go off and thus the power source voltage of approximately 12 V in the ECM is applied to the terminal IDL of the ECM. The voltage applied to the terminal VTA 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 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.



FI6480

DTC No.	DTC 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 •ECM
47	(1) Open or short in sub-throttle position sensor circuit (VTA2) for 0.5 sec. or more.	•Open or short in throttle position sensor circuit
	(2) IDL2 contact is ON and VTA2 output exceeds 1.5 V for 0.5 sec. or more	•Throttle position sensor •ECM

HINT:

Diagnostic trouble code 41 is for the throttle position sensor circuit.

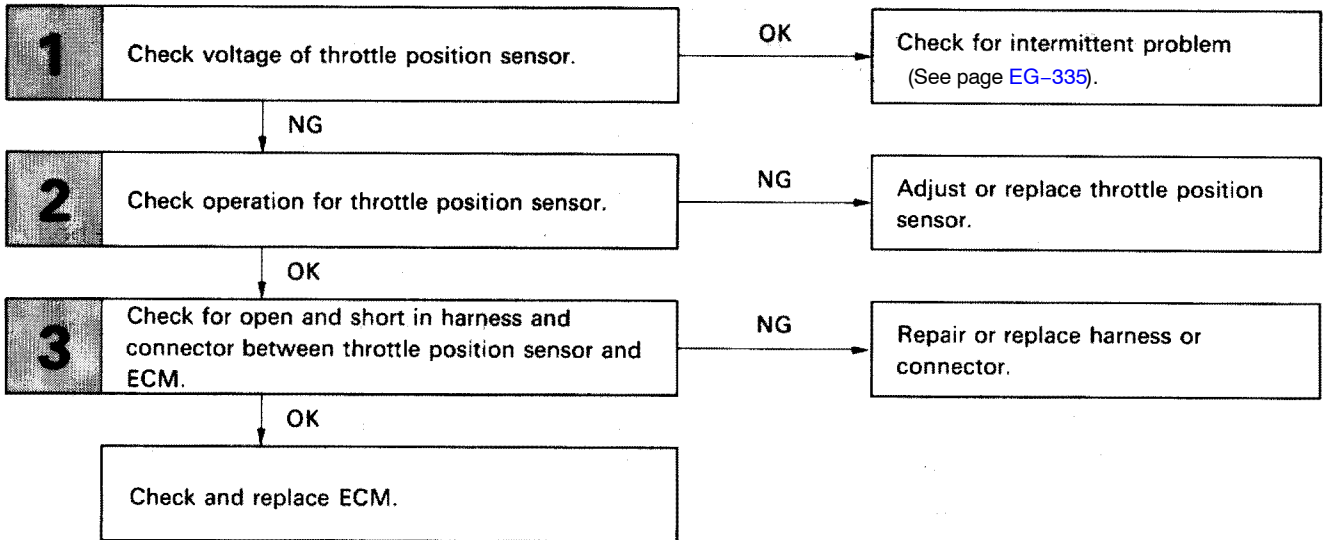
Diagnostic trouble code 47 is for the sub-throttle position sensor circuit.

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

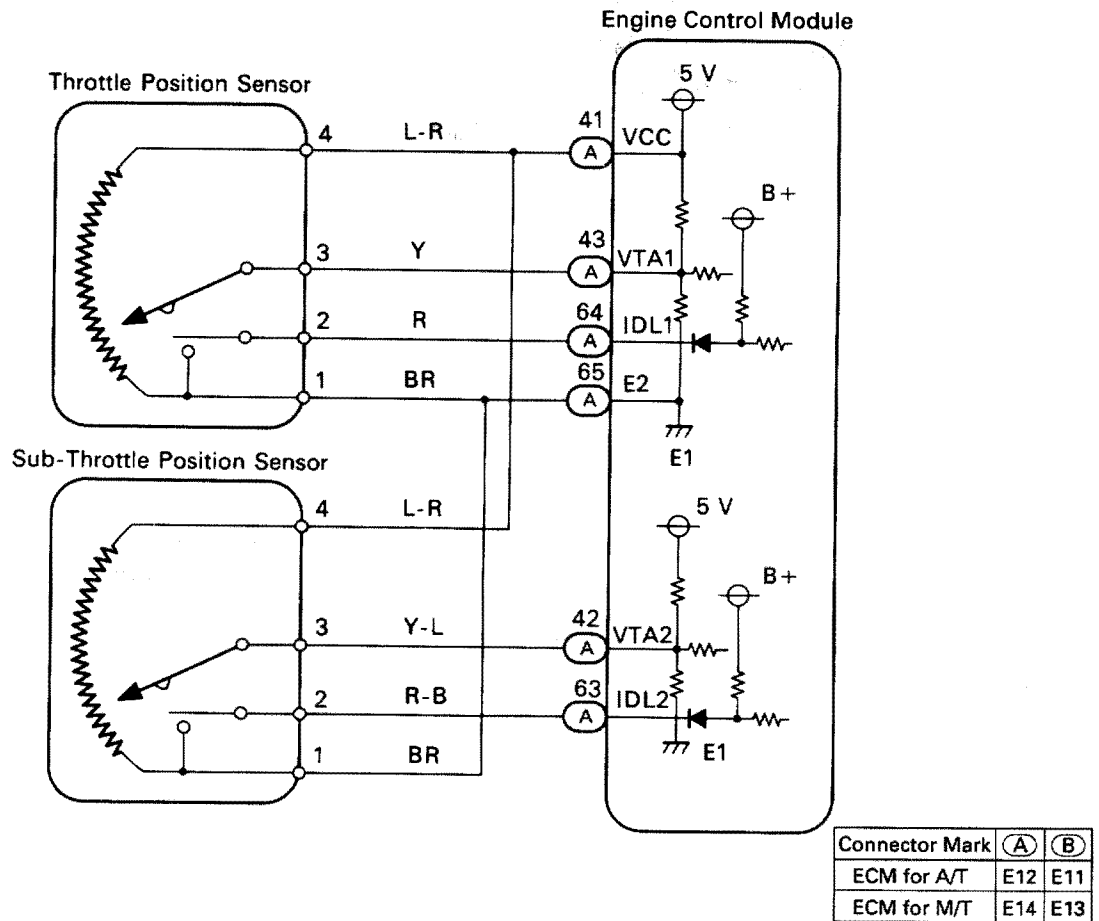
DIAGNOSTIC CHART

HINT:

- If diagnostic trouble code 41 is displayed, check throttle position sensor circuit; if diagnostic trouble code 47 is displayed, check sub-throttle position sensor circuit.
- If diagnostic trouble codes "22" (engine coolant 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

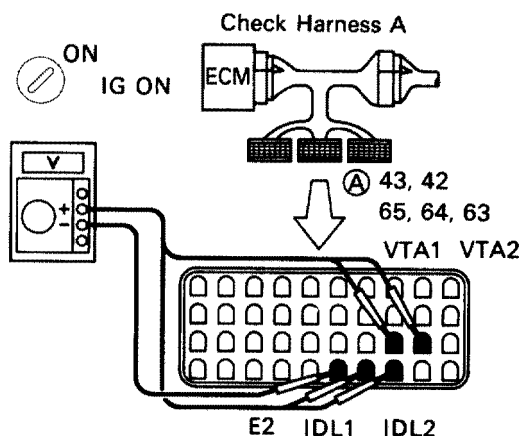


INSPECTION PROCEDURE

HINT:

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

1 Check voltage between terminals VTA1, 2, IDL1, 2 and E2 of engine control module connector.



P (1). Connect Check Harness A.
(see page [EG-342](#))

(2) Turn ignition switch ON.

C (3) Disconnect vacuum hose from throttle body then apply vacuum to throttle opener (See page [EG-203](#)).

(4) Disconnect sub-throttle actuator connector.

Measure voltage between terminals VTA1, 1, IDL1, 2 and E2 of engine control module connector when the (sub-) throttle valve is opened gradually from closed condition.

OK

Terminal	VTA1, 2 - E2	IDL1, 2 - E2
Throttle valve		
Fully closed	0.3 - 0.8 V	0 - 3.0 V
Fully open	3.2 - 4.9 V	9 - 14 V

HINT: The voltage should increase steadily in proportion to the throttle position.

BE6653 F16507

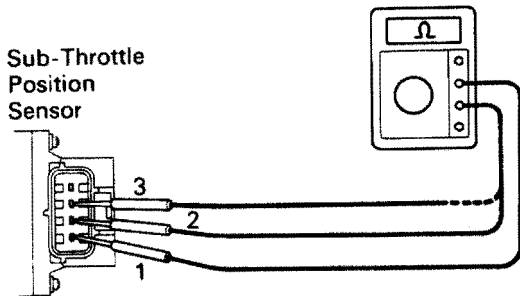
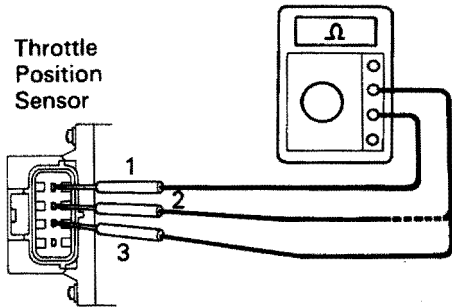
NG

OK

Check for intermittent problem (See page [EG-335](#)).

Go to step 2.

2 Check throttle position sensor(s).



FI6650
FI6651

- P** (1) Disconnect throttle position sensor(s) connector.
(2) Disconnect vacuum hose from throttle body then apply vacuum to throttle opener (See page EG-203).

C Measure voltage between terminals 3 (VTA1,2) 2 (IDL1,2) and 1 (E2) of throttle position sensor(s) connectors when throttle valve is opened gradually from closed condition.

OK

Terminal	3 (VTA1, 2) - 1 (E2)	2 (IDL1, 2) - 1 (E2)
Throttle valve		
Fully closed	0.3 - 6.3 kΩ	Less than 0.5 kΩ
Fully open	2.4 - 11.2 kΩ	1MΩ or higher

Hint Resistance between terminals 3 (VTA1,2) and 1 (E2) should increase gradually in accordance with the throttle position.

OK

NG

Adjust or replace throttle position sensor(s) (See page EG-209).

3 Check for open and short in harness and connector between engine control module and throttle position sensor(s) (See page IN-33).

OK

NG

Repair or replace harness or connector.

Check and replace engine control module.