

8. Diagnostics Chart with Trouble Code

A: TROUBLE CODE

Trouble code	Item	Contents of diagnosis	Page
11	Crankshaft position sensor	<ul style="list-style-type: none"> No signal entered from crankshaft position sensor, but signal entered from camshaft position sensor. The harness connector between ECM and crankshaft position sensor is in short or open. 	33
12	Starter switch	<ul style="list-style-type: none"> The starter switch signal is abnormal. The harness connector between ECM and starter switch is in short or open. 	35
13	Camshaft position sensor	<ul style="list-style-type: none"> No signal entered from camshaft position sensor, but signal entered from crankshaft position sensor. The harness connector between ECM and camshaft position sensor is in short or open. 	37
14	Fuel injector #1	<ul style="list-style-type: none"> The fuel injector is not in function. The harness connector between ECM and each fuel injector is in short or open. 	39
15	Fuel injector #2		
16	Fuel injector #3		
17	Fuel injector #4		
21	Engine coolant temperature sensor	<ul style="list-style-type: none"> The engine coolant temperature sensor signal is abnormal. The harness connector between ECM and engine coolant temperature sensor is in short or open. 	41
23	Mass air flow sensor	<ul style="list-style-type: none"> The mass air flow sensor signal is abnormal. The harness connector between ECM and mass air flow sensor is in short or open. 	43
24	Idle air control solenoid valve	<ul style="list-style-type: none"> The idle air control solenoid valve is not in function. The harness connector between ECM and idle air control solenoid valve is in short or open. 	45
31	Throttle position sensor	<ul style="list-style-type: none"> The throttle position sensor signal is abnormal. The throttle position sensor is installed abnormally. The harness connector between ECM and throttle position sensor is in short or open. 	47
32	Oxygen sensor	<ul style="list-style-type: none"> The oxygen sensor is not in function. The harness connector between ECM and oxygen sensor is in short or open. 	50
33	Vehicle speed sensor 2	<ul style="list-style-type: none"> The vehicle speed sensor 2 is not in function. The harness connector between ECM and vehicle speed sensor 2 is in short or open. 	52
34	EGR solenoid valve	<ul style="list-style-type: none"> The EGR solenoid valve is not in function. The harness connector between ECM and EGR solenoid valve is in short or open. 	54
35	Purge control solenoid valve	<ul style="list-style-type: none"> The purge control solenoid valve is not in function. The harness connector between ECM and purge control solenoid valve is in short or open. 	56
36	Air suction solenoid valve	<ul style="list-style-type: none"> The air suction solenoid valve is not in function. The harness connector between ECM and air suction solenoid valve is in short or open. 	58
41	A/F (air/fuel) learning control	<ul style="list-style-type: none"> Faulty leaning control function 	60
51	Neutral position switch (MT)	<ul style="list-style-type: none"> The neutral position switch signal is abnormal. The harness connector between ECM and neutral position switch is in short or open. 	61
	Inhibitor switch (AT)	<ul style="list-style-type: none"> The park/neutral position signal is abnormal. The shift cable is connected abnormally. The harness connector between ECM and inhibitor switch is in short or open. 	63
55	Recirculation gas temperature sensor	<ul style="list-style-type: none"> The recirculation gas temperature sensor is not in function. The harness connector between ECM and recirculation gas temperature sensor is in short or open. 	65
56	EGR system	<ul style="list-style-type: none"> Faulty EGR system function 	66
61	Fuel tank pressure control solenoid valve (California FWD model only)	<ul style="list-style-type: none"> The fuel tank pressure control solenoid valve is not in function. The harness connector between ECM and fuel tank pressure control solenoid valve is in short or open. 	67

Trouble code	Item	Contents of diagnosis	Page
62	Fuel temperature sensor (California FWD model only)	<ul style="list-style-type: none">• The fuel temperature sensor signal is abnormal.• The harness connector between ECM and fuel temperature sensor is in short or open.	71
63	Fuel tank pressure sensor (California FWD model only)	<ul style="list-style-type: none">• The fuel tank pressure sensor signal is abnormal.• The harness connector between ECM and fuel tank pressure sensor is in short or open.	75

B: TROUBLE CODE (11)

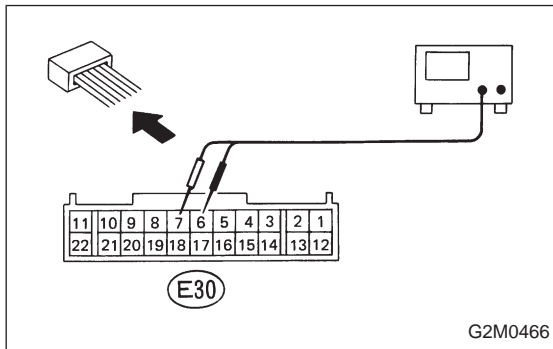
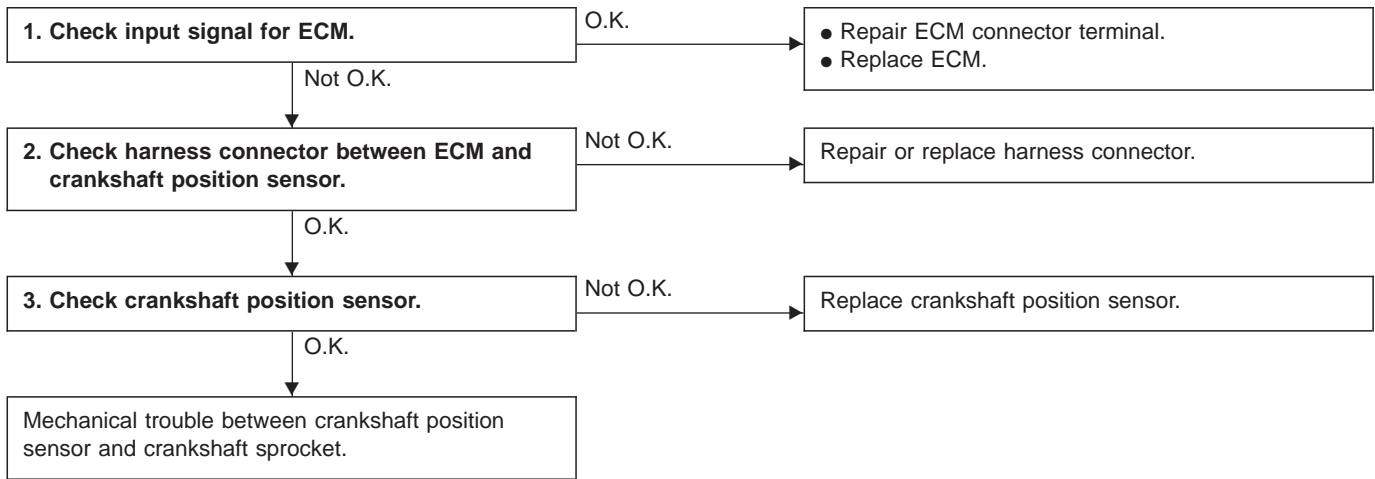
— CRANKSHAFT POSITION SENSOR —

DIAGNOSIS:

- No signal entered from crankshaft position sensor, but signal entered from camshaft position sensor.
- The harness connector between ECM and crankshaft position sensor is in short or open.

TROUBLE SYMPTOM:

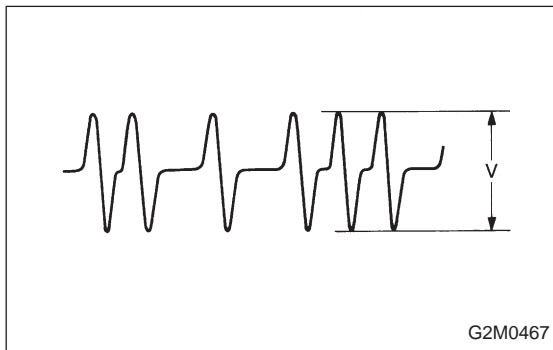
- Engine stalls.
- Restarting impossible



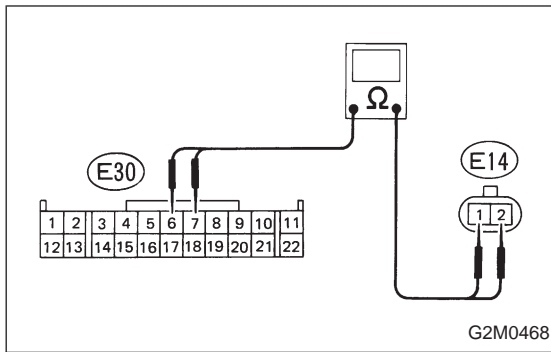
1. CHECK INPUT SIGNAL FOR ECM.

1) Set the positive (+) probe and earth lead of oscilloscope at ECM connector terminals.

Connector & terminal / (E30) No. 6 — (E30) No. 7



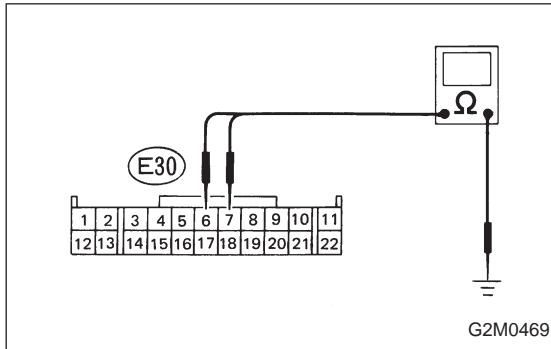
2) Measure signal voltage indicated on oscilloscope while cranking the engine.



2. CHECK HARNESS CONNECTOR BETWEEN ECM AND CRANKSHAFT POSITION SENSOR.

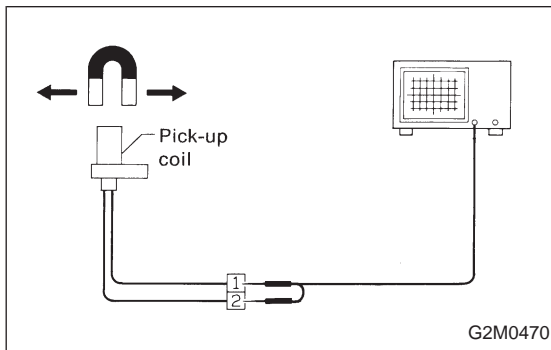
- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from ECM and crankshaft position sensor.
- 3) Measure resistance of harness connector between ECM and crankshaft position sensor.

Connector & terminal /Specified resistance:
 (E30) No. 6 — (E14) No. 1 /10 Ω, max.
 (E30) No. 7 — (E14) No. 2 /10 Ω, max.



- 4) Measure resistance of harness connector between ECM and body to make sure that circuit does not short.

Connector & terminal /Specified resistance:
 (E30) No. 6 — Body /1 MΩ, min.
 (E30) No. 7 — Body /1 MΩ, min.
 (E30) No. 11 — Body /1 MΩ, min.



3. CHECK CRANKSHAFT POSITION SENSOR.

- 1) Remove crankshaft position sensor.
- 2) Set the position (+) probe at sensor connector terminal No. 1, and set earth lead at terminal No. 2.
- 3) Check that a wave profile appears crossing a magnet near the pick-up coil of crankshaft position sensor.

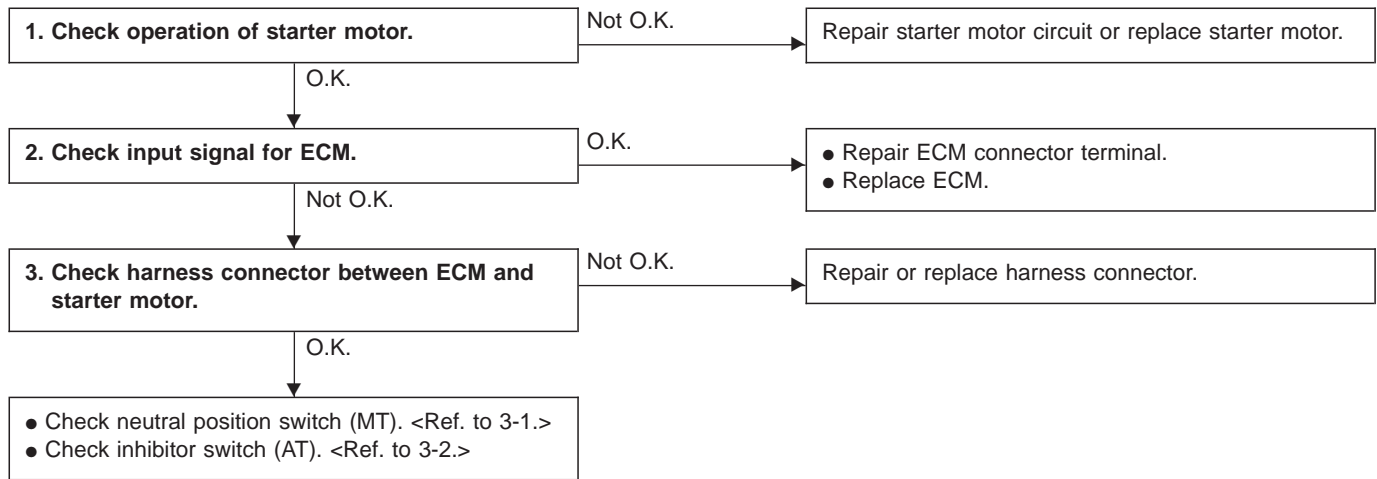
C: TROUBLE CODE (12)
— STARTER SWITCH —

DIAGNOSIS:

- The starter switch signal is abnormal.
- The harness connector between ECM and starter switch is in short or open.

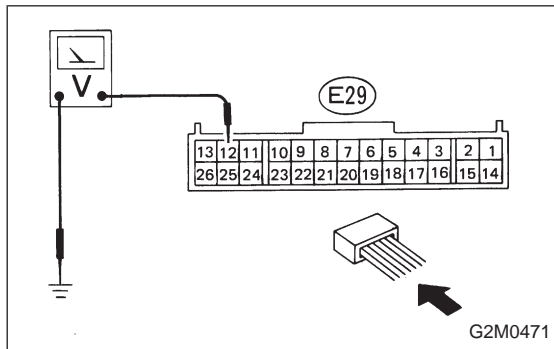
TROUBLE SYMPTOM:

- Failure of engine to start



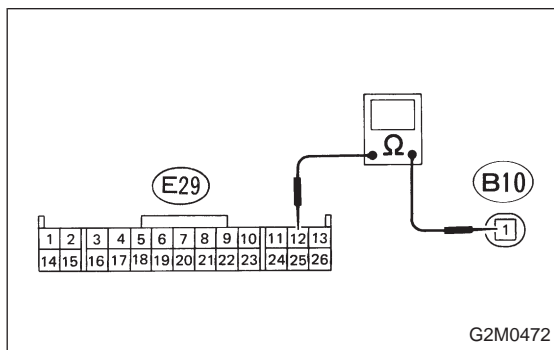
1. CHECK OPERATION OF STARTER MOTOR.

Turn ignition switch to "ST" to ensure that starter motor functions.

**2. CHECK INPUT SIGNAL FOR ECM.**

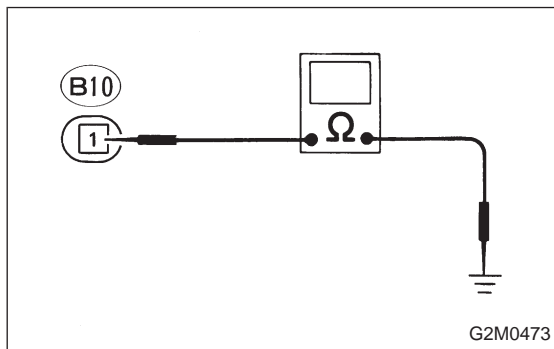
Measure voltage between ECM and body while cranking the engine.

Connector & terminal /Specified voltage:
(E29) No. 12 — Body/13 — 14 V

**3. CHECK HARNESS CONNECTOR BETWEEN ECM AND STARTER MOTOR.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from ECM and starter motor.
- 3) Measure resistance of harness connector between ECM and starter motor.

Connector & terminal /Specified resistance:
(E29) No. 12 — (B10) No. 1/0 Ω



- 4) Measure resistance of harness connector between starter motor and body to make sure that circuit does not short.

Connector & terminal /Specified resistance:
(B10) No. 1 — Body/1 MΩ, min.

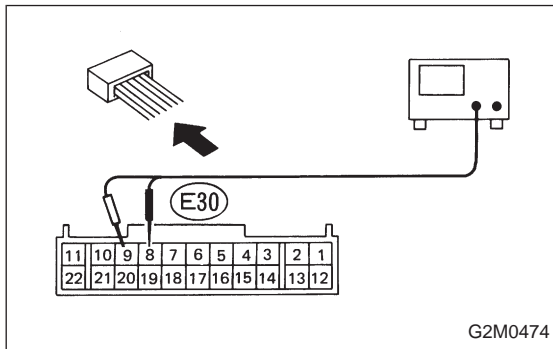
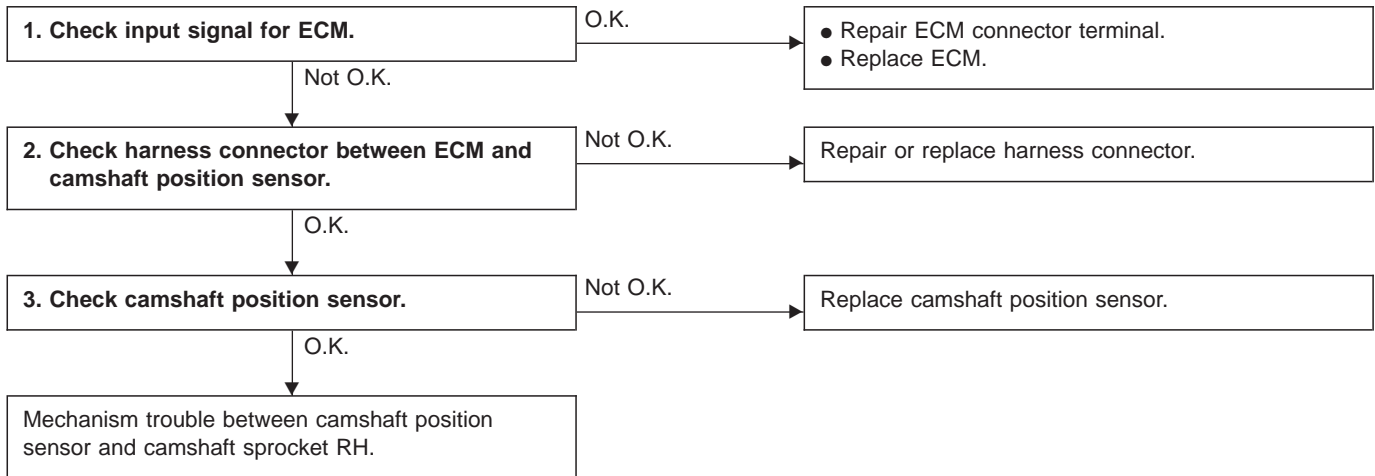
**D: TROUBLE CODE (13)
— CAMSHAFT POSITION SENSOR —**

DIAGNOSIS:

- No signal entered from camshaft position sensor, but signal entered from crankshaft position sensor.
- The harness connector between ECM and camshaft position sensor is short or open.

TROUBLE SYMPTOM:

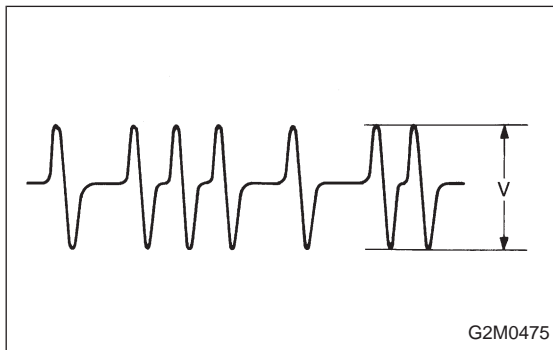
- Engine stalls
- Failure of engine to start



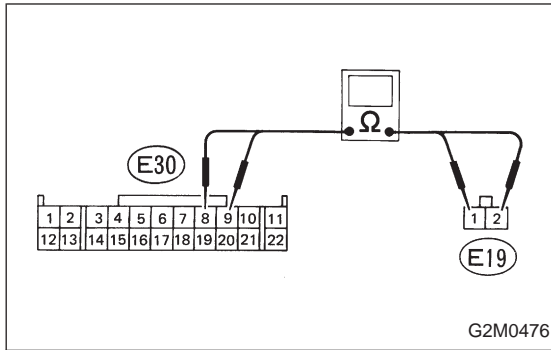
1. CHECK INPUT SIGNAL FOR ECM.

1) Set the positive (+) probe and earth lead of oscilloscope at ECM connector terminals.

Connector & terminal / (E30) No. 8 — (E30) No. 9



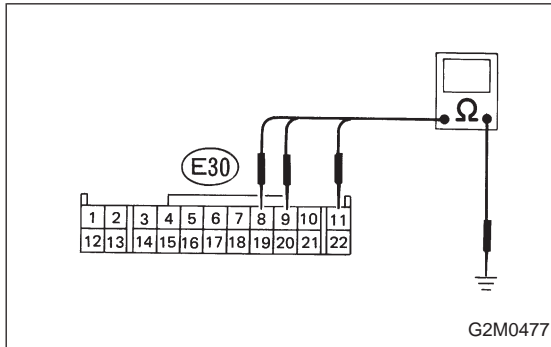
2) Measure signal voltage indicated on oscilloscope, while cranking the engine.



2. CHECK HARNESS CONNECTOR BETWEEN ECM AND CAMSHAFT POSITION SENSOR.

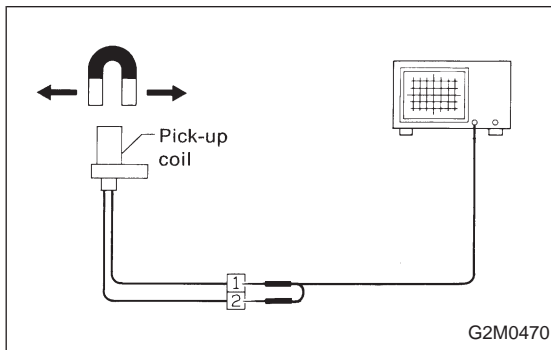
- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from ECM and camshaft position sensor.
- 3) Measure resistance of harness connector between ECM and camshaft position sensor.

Connector & terminal /Specified resistance:
 (E30) No. 8 — (E19) No. 1 /10 Ω, max.
 (E30) No. 9 — (E19) No. 2 /10 Ω, max.



- 4) Measure resistance of harness connector between ECM and body to make sure that circuit does not short.

Connector & terminal /Specified resistance:
 (E30) No. 8 — Body /1 MΩ, min.
 (E30) No. 9 — Body /1 MΩ, min.
 (E30) No. 11 — Body /1 MΩ, min.



3. CHECK CAMSHAFT POSITION SENSOR.

- 1) Remove camshaft position sensor.
- 2) Set the position (+) probe at sensor connector terminal No. 1, and set earth lead at terminal No. 2.
- 3) Check that a wave profile appears crossing a magnet near the pick-up coil of crankshaft position sensor.

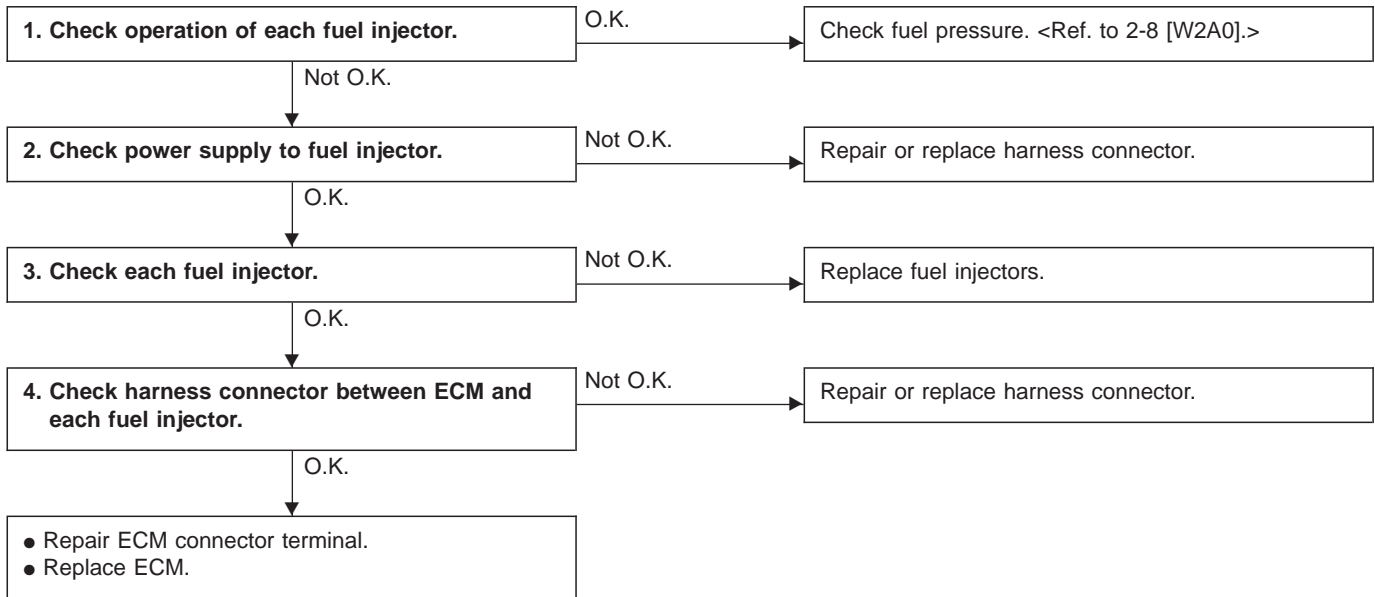
**E: TROUBLE CODE 14, 15, 16, 17
— FUEL INJECTOR —**

DIAGNOSIS:

- The fuel injector is not in function.
- The harness connector between ECM and each fuel injection is in short or open.

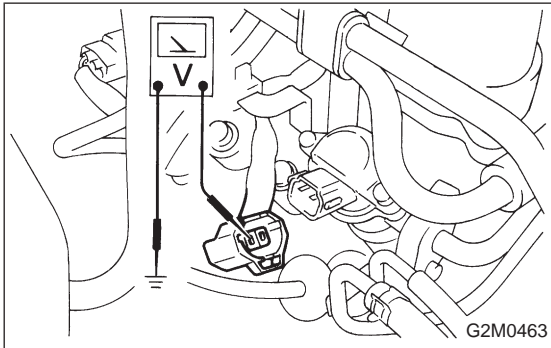
TROUBLE SYMPTOM:

- Engine stalls.
- Erroneous idling
- Rough driving



1. CHECK OPERATION OF EACH FUEL INJECTOR.

While cranking the engine, check that each fuel injector emits "operating" sound. Use a sound scope or attach a screwdriver to injector for this check.

**2. CHECK POWER SUPPLY TO FUEL INJECTOR.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from each injector.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between each injector connector terminal and body.

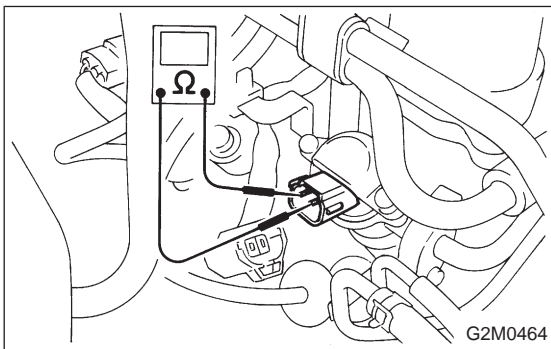
Connector & terminal /Specified voltage:

#1 (E7) No. 2 — Body /10 V, min.

#2 (E17) No. 2 — Body/10 V, min.

#3 (E8) No. 2 — Body /10 V, min.

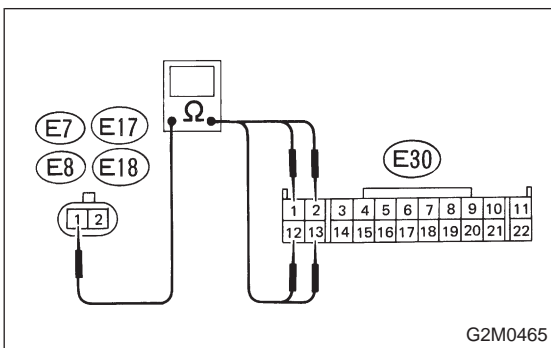
#4 (E18) No. 2 — Body/10 V, min.

**3. CHECK EACH FUEL INJECTOR.**

Measure resistance between fuel injector terminals.

Terminals /Specified resistance:

No. 1 — No. 2/11 — 12 Ω

**4. CHECK HARNESS CONNECTOR BETWEEN ECM AND EACH FUEL INJECTOR.**

- 1) Disconnect connector from ECM.
- 2) Measure resistance of harness connector between ECM connector and each fuel injector.

Connector & terminal /Specified resistance:

(E30) No. 2 — (E7) No. 1 /10 Ω, max.

(E30) No. 1 — (E17) No. 1 /10 Ω, max.

(E30) No. 13 — (E8) No. 1 /10 Ω, max.

(E30) No. 12 — (E18) No. 1/10 Ω, max.

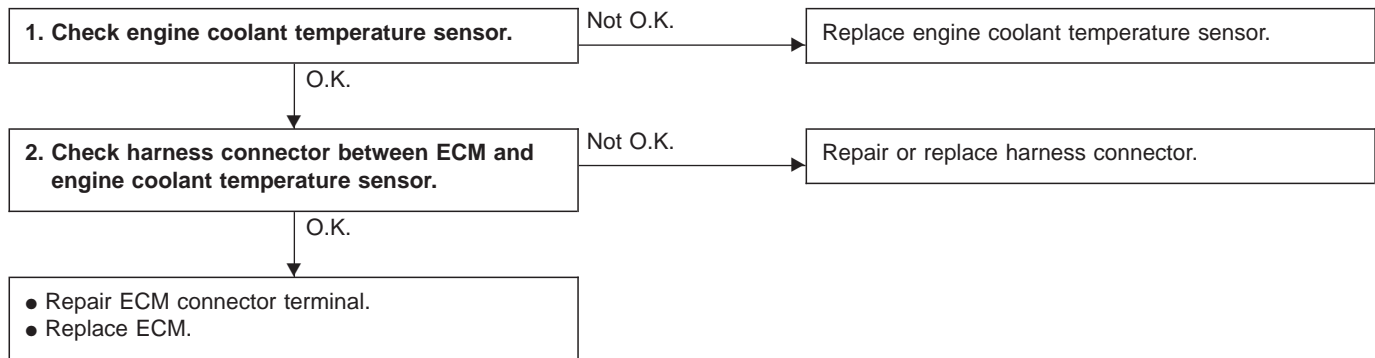
**F: TROUBLE CODE (21)
— ENGINE COOLANT TEMPERATURE
SENSOR —**

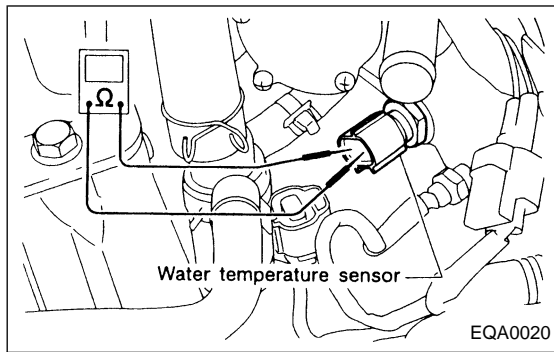
DIAGNOSIS:

- The engine coolant temperature sensor signal is abnormal.
- The harness connector between ECM and engine coolant temperature sensor is in short or open.

TROUBLE SYMPTOM:

- Hard to start
- Erroneous idling
- Poor driving performance

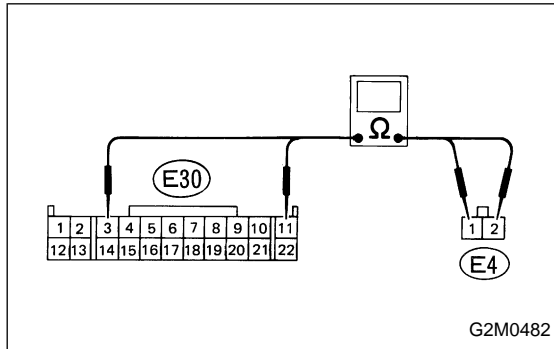




1. CHECK ENGINE COOLANT TEMPERATURE SENSOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from engine coolant temperature sensor.
- 3) Measure resistance between engine coolant temperature sensor terminals.

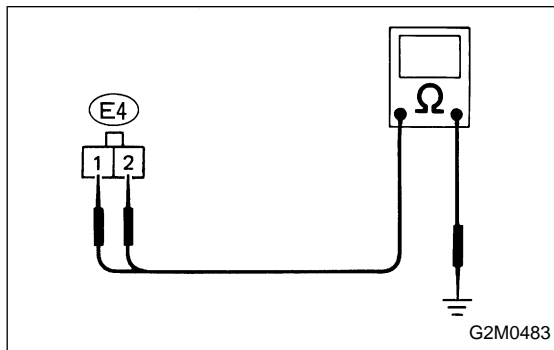
Terminals /Specified resistance:
No. 1 — No. 2/2.0 — 3.0 k Ω at 20°C (68°F)
No. 1 — No. 2/270 — 370 Ω at 80°C (176°F)



2. CHECK HARNESS CONNECTOR BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR.

- 1) Disconnect connector from ECM.
- 2) Measure resistance of harness connector between ECM and engine coolant temperature connector.

Connector & terminal /Specified resistance:
(E30) No. 3 — (E4) No. 1 /10 Ω , max.
(E30) No. 11 — (E4) No. 2/10 Ω , max.



- 3) Measure resistance of harness connector between engine coolant temperature sensor and body to make sure that circuit does not short.

Connector & terminal /Specified resistance:
(E4) No. 1 — Body/1 M Ω , min.
(E4) No. 2 — Body/1 M Ω , min.

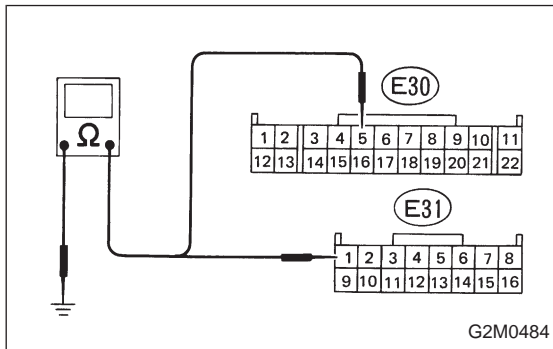
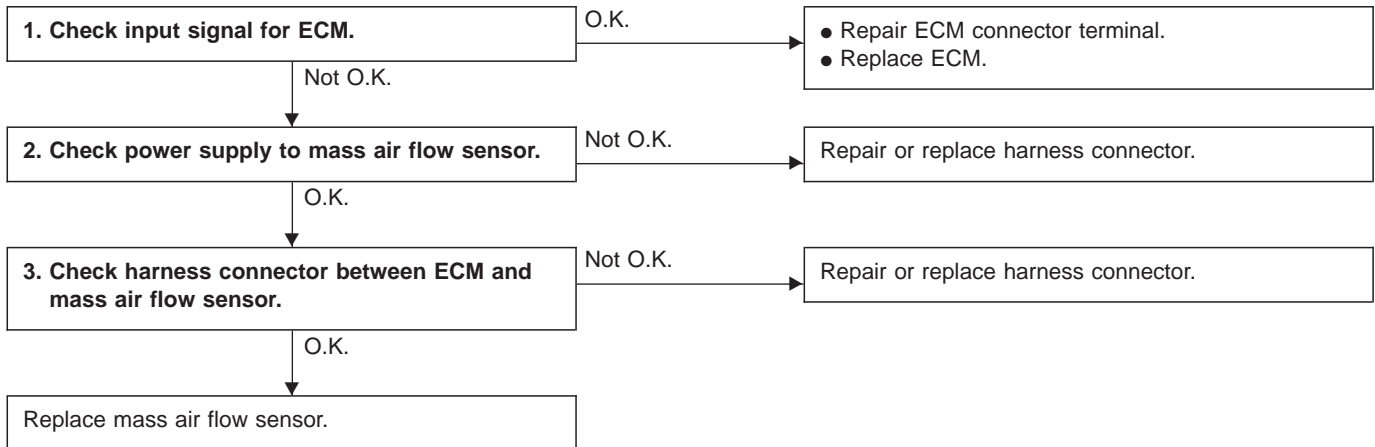
G: TROUBLE CODE (23)
— MASS AIR FLOW SENSOR —

DIAGNOSIS:

- The mass air flow sensor signal is abnormal.
- The harness connector between ECM and mass air flow sensor is in short or open.

TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance



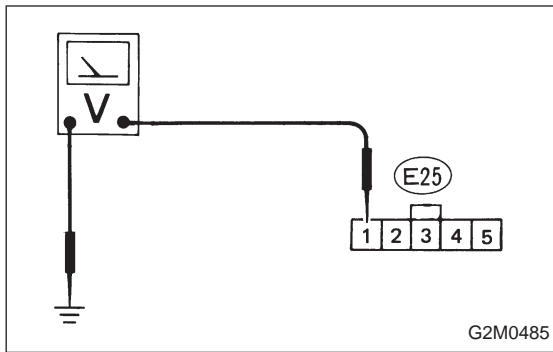
1. CHECK INPUT SIGNAL FOR ECM.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between ECM and body.

Connector & terminal /Specified voltage:
 (E30) No. 5 — Body/0 — 0.3 V
 (E31) No. 1 — Body/0 V

- 3) Start engine, and idle it.
- 4) Measure voltage between ECM and body while engine is idling.

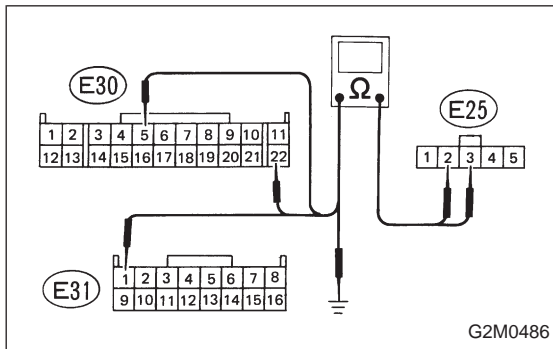
Connector & terminal /Specified voltage:
 (E30) No. 5 — Body/0.8 — 1.2 V
 (E31) No. 1 — Body/0 V



2. CHECK POWER SUPPLY TO MASS AIR FLOW SENSOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from mass air flow sensor.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between mass air flow sensor connector and body.

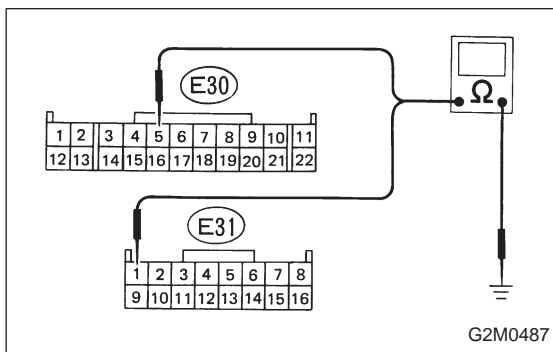
Connector & terminal /Specified voltage:
(E25) No. 1 — Body/10 — 13 V



3. CHECK HARNESS CONNECTOR BETWEEN ECM AND MASS AIR FLOW SENSOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ECM.
- 3) Measure resistance of harness connector between ECM and mass air flow sensor.

Connector & terminal /Specified resistance:
(E30) No. 5 — (E25) No. 2 /10 Ω, max.
(E30) No. 22 — (E25) No. 3 /10 Ω, max.
(E25) No. 3 — Body /10 Ω, max.



- 4) Measure resistance of harness connector between ECM and body to make sure that circuit does not short.

Connector & terminal /Specified resistance:
(E30) No. 5 — Body/1 MΩ, min.
(E31) No. 1 — Body/1 MΩ, min.

H: TROUBLE CODE (24)

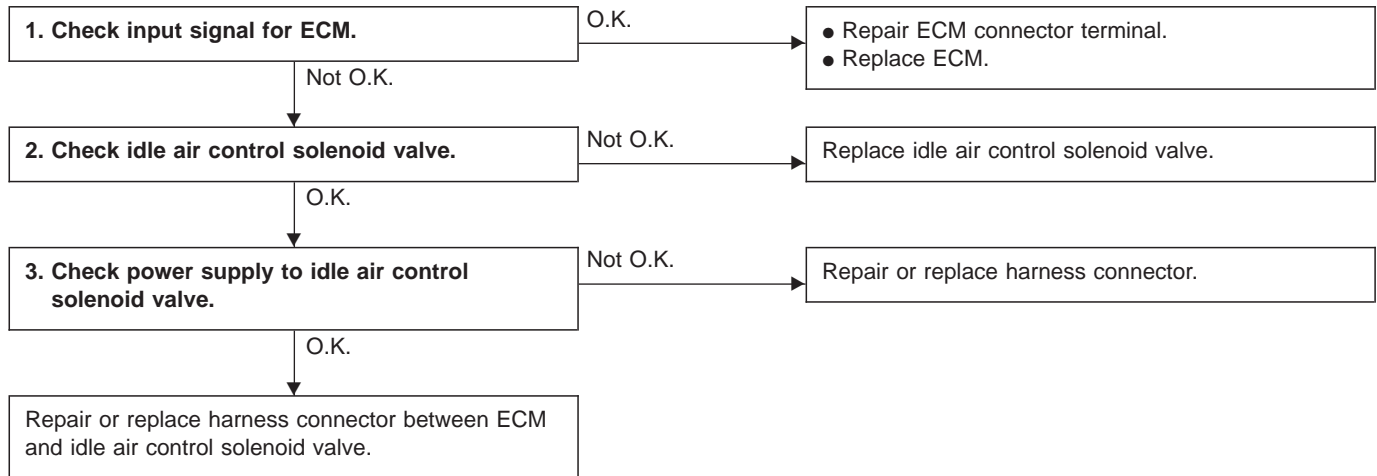
— IDLE AIR CONTROL SOLENOID VALVE —

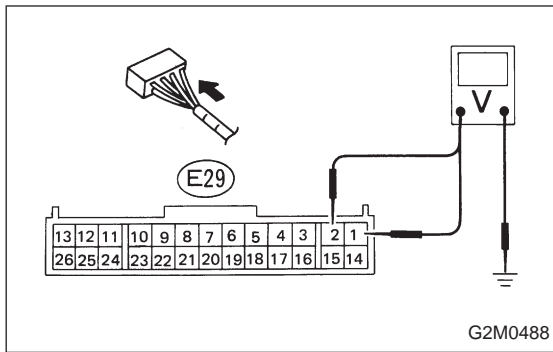
DIAGNOSIS:

- The idle air control solenoid valve is not in function.
- The harness connector between ECM and idle air control solenoid valve is in short or open.

TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Engine breathing

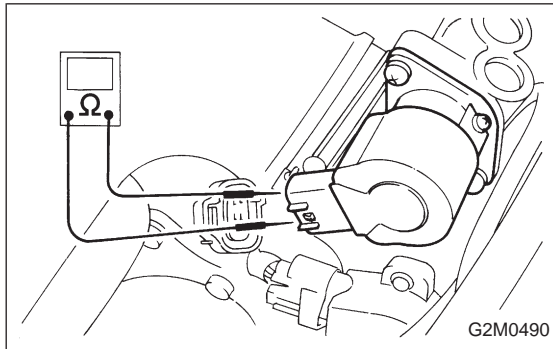


**1. CHECK INPUT SIGNAL FOR ECM.**

- 1) Turn ignition switch to ON.
- 2) Measure voltage between ECM and body.

Connector & terminal /Specified voltage:

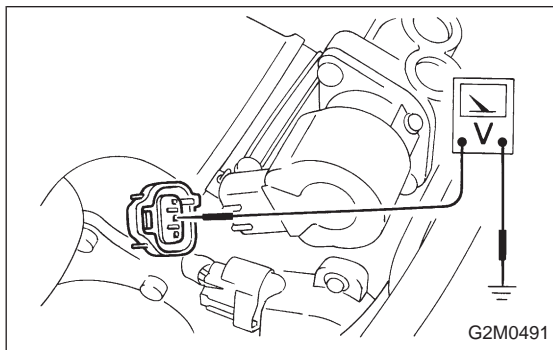
- (E29) No. 2 — Body/0 V → 13 V
 (E29) No. 1 — Body/13 V → 0 V

**2. CHECK IDLE AIR CONTROL SOLENOID VALVE.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from idle air control solenoid valve.
- 3) Measure resistance between solenoid valve terminals.

Terminals /Specified resistance:

- No. 1 — No. 2/32 Ω
 No. 2 — No. 3/32 Ω

**3. CHECK POWER SUPPLY TO IDLE AIR CONTROL SOLENOID VALVE.**

- 1) Turn ignition switch to ON.
- 2) Measure voltage between idle air control solenoid valve and body.

Connector & terminal /Specified voltage:

- (E11) No. 2 — Body/10 V, min.

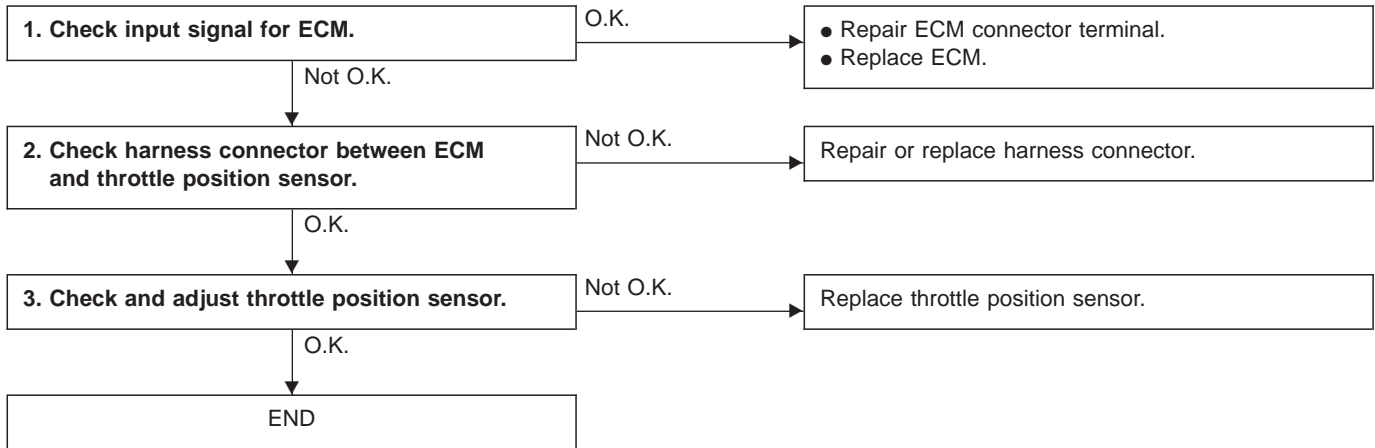
**I: TROUBLE CODE (31)
— THROTTLE POSITION SENSOR —**

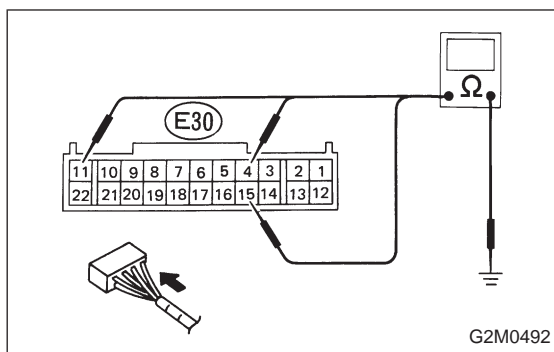
DIAGNOSIS:

- The throttle position sensor signal is abnormal.
- The throttle position sensor is installed abnormally.
- The harness connector between ECM and throttle position sensor is in short or open.

TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

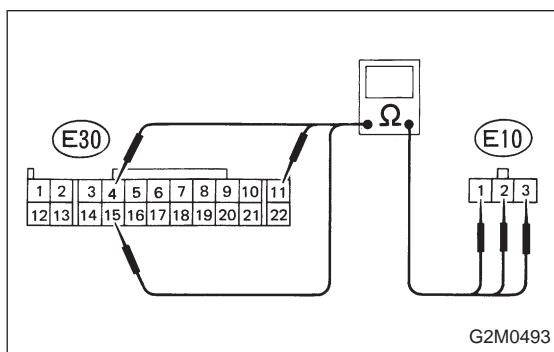


**1. CHECK INPUT SIGNAL FOR ECM.**

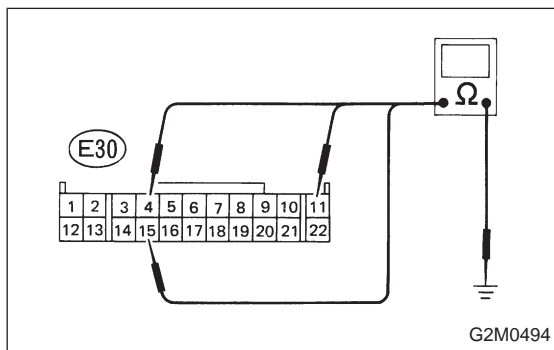
- 1) Turn ignition switch to ON.
- 2) Measure signal voltage between ECM and body while throttle valve is fully closed.

Connector & terminal /Specified voltage:**(E30) No. 15 — Body/4.4 — 5.5 V****(E30) No. 4 — Body /0.4 — 0.5 V****(E30) No. 11 — Body/0 V**

- 3) Measure signal voltage between ECM and body while throttle valve is fully opened.

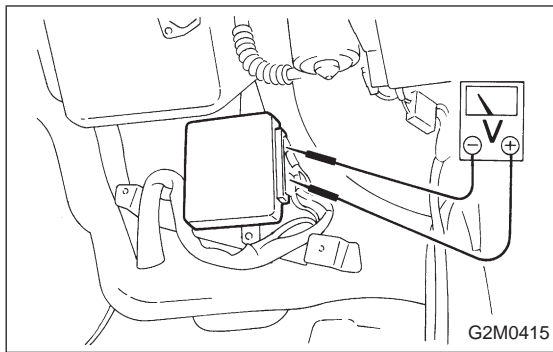
Connector & terminal /Specified voltage:**(E30) No. 15 — Body/4.4 — 5.5 V****(E30) No. 4 — Body /3.5 — 4.3 V****(E30) No. 11 — Body/0 V****2. CHECK HARNESS CONNECTOR BETWEEN ECM AND THROTTLE POSITION SENSOR.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from ECM and throttle position sensor.
- 3) Measure resistance of harness connector between ECM and throttle position sensor.

Connector & terminal /Specified resistance:**(E30) No. 15 — (E10) No. 1/10 Ω, max.****(E30) No. 4 — (E10) No. 2 /10 Ω, max.****(E30) No. 11 — (E10) No. 3/10 Ω, max.**

- 4) Measure resistance of harness connector between ECM and body to make sure that circuit does not short.

Connector & terminal /Specified resistance:**(E30) No. 15 — Body/1 MΩ, min.****(E30) No. 4 — Body /1 MΩ, min.****(E30) No. 11 — Body/1 MΩ, min.**



3. CHECK AND ADJUST THROTTLE POSITION SENSOR.

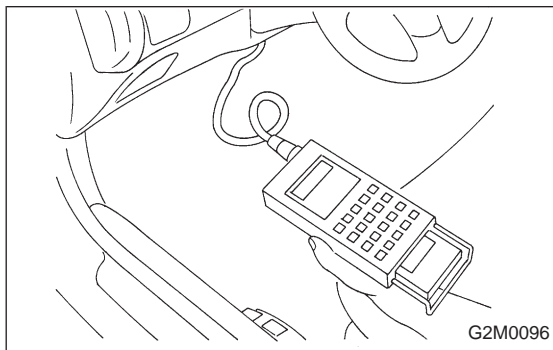
- 1) Connect all connectors.
- 2) Loosen throttle position sensor installing screws.
- 3) Adjust throttle position sensor while throttle valve is fully closed.

● Using voltage meter:

- (1) Turn ignition switch to ON.
- (2) Adjust throttle position sensor to specified voltage between ECM connector terminals.

Connector & terminal /Specified voltage:
(E30) No. 15 — (E30) No. 4/0.45 — 0.55 V

- (3) Tighten throttle position sensor installing screws.



● Using select monitor:

- (1) Attach select monitor.
- (2) Turn ignition switch to ON.
- (3) Select mode "F10".
- (4) Adjust throttle position sensor to specified data.

Conditions /Specified data:
Throttle valve fully closed/0.50 V

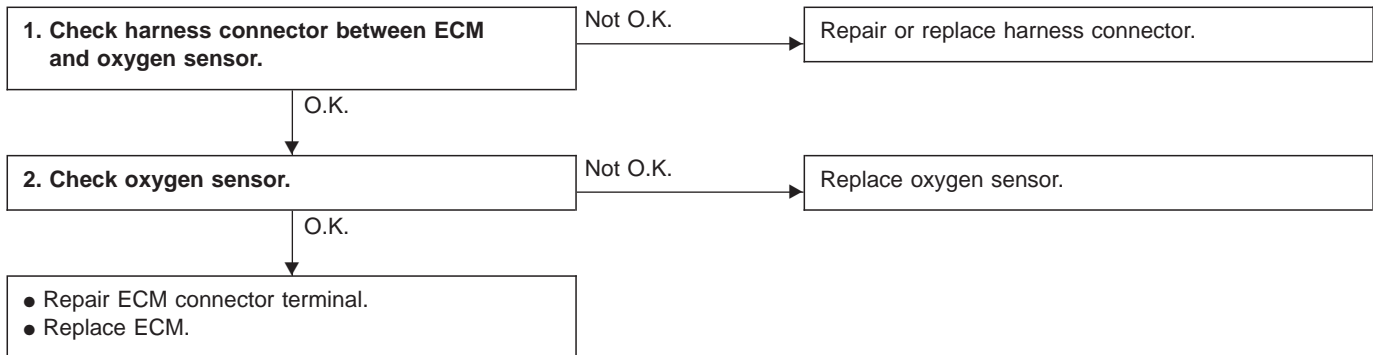
- (5) Tighten throttle position sensor installing screws.

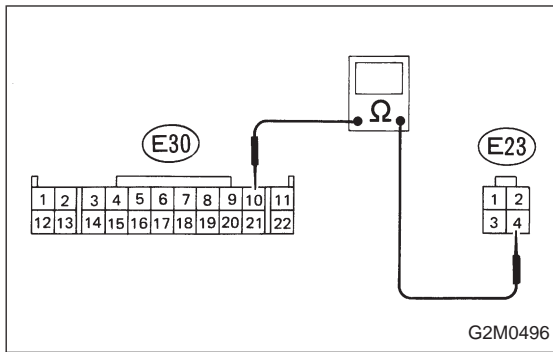
J: TROUBLE CODE (32)**— OXYGEN SENSOR —****DIAGNOSIS:**

- The oxygen sensor is not in function.
- The harness connector between ECM and oxygen sensor is in short or open.

TROUBLE SYMPTOM:

- Failure of engine to start
- Erroneous idling
- Poor driving performance
- Engine stalls.
- Idle mixture is out of specifications.

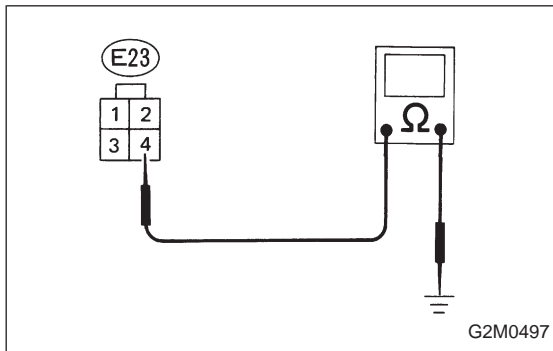




1. CHECK HARNESS CONNECTOR BETWEEN ECM AND OXYGEN SENSOR.

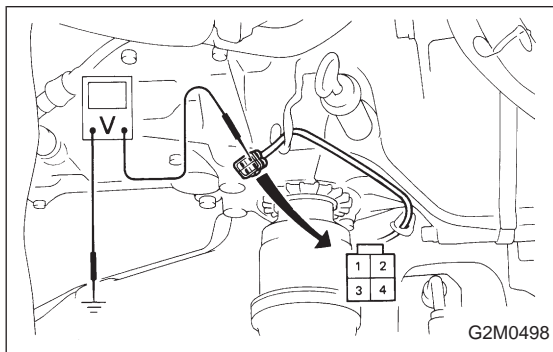
- 1) Disconnect connectors from ECM and oxygen sensor.
- 2) Measure resistance of harness connector between ECM and oxygen sensor.

Connector & terminal /Specified resistance:
(E30) No. 10 — (E23) No. 4/0 Ω



- 3) Measure resistance of harness connector between oxygen sensor and body to make sure that circuit does not short.

Connector & terminal /Specified resistance:
(E23) No. 4 — Body /1 MΩ, min.



2. CHECK OXYGEN SENSOR.

- 1) Idle engine.
- 2) Disconnect oxygen sensor connector.
- 3) Measure voltage between oxygen sensor terminal and body.

Connector & terminal/Specified voltage:
No. 4 — Body /0.1 — 1.0 V

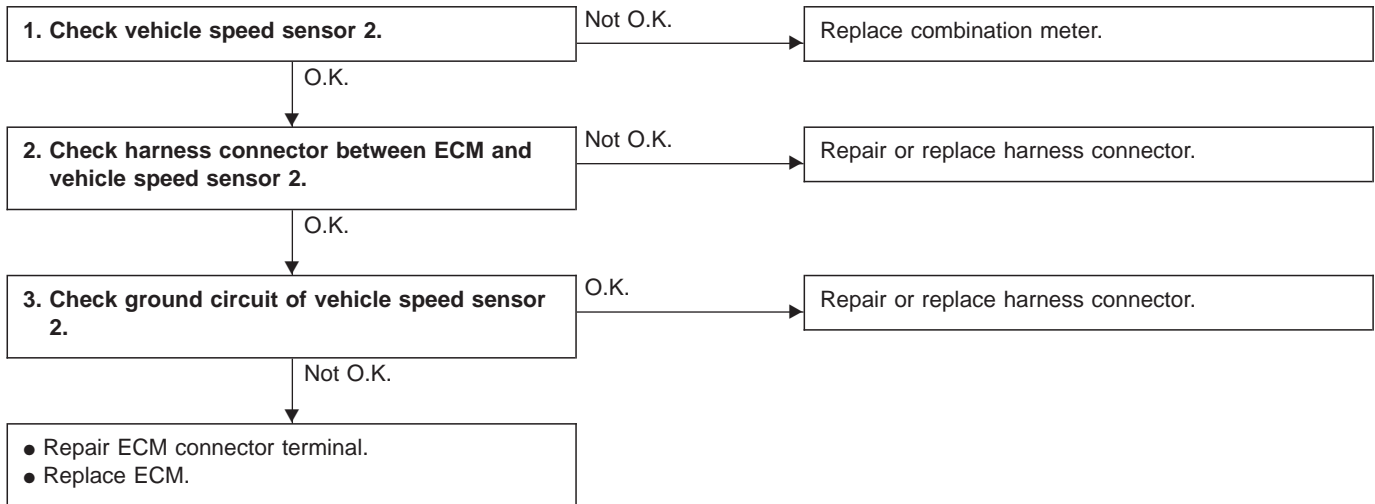
K: TROUBLE CODE (33) — VEHICLE SPEED SENSOR 2 —

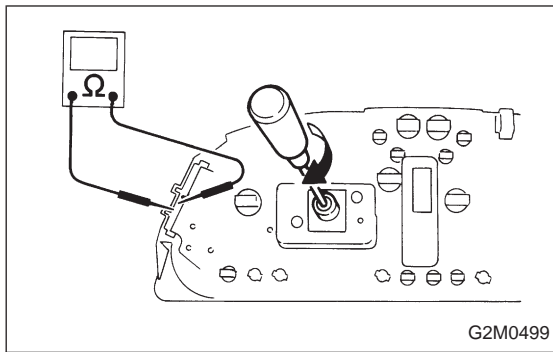
DIAGNOSIS:

- The vehicle speed sensor 2 is not in function.
- The harness connector between ECM and vehicle speed sensor 2 is in short or open.

TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

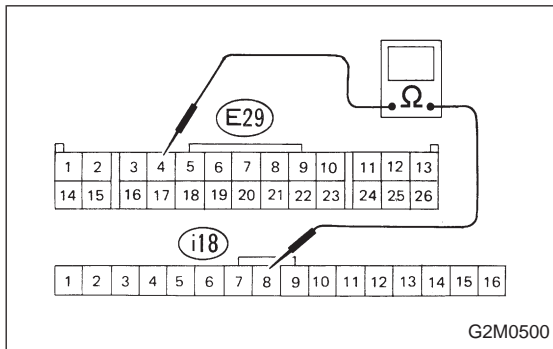




1. CHECK VEHICLE SPEED SENSOR 2.

- 1) Remove combination meter.
- 2) Measure resistance between connector terminals of combination meter by rotating rotor of speedometer cable hole with screwdriver.

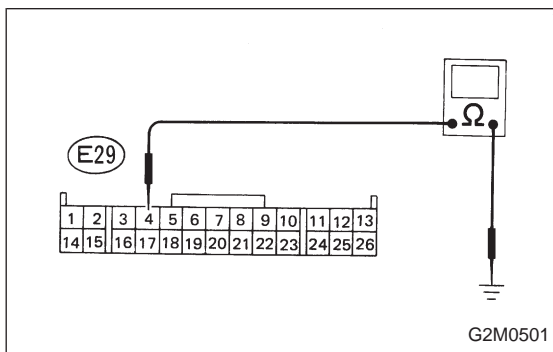
Terminals /Specified resistance:
No. 11 — No. 8/10 Ω , max. \leftrightarrow 1 M Ω , min.
(Four times per rotation)



2. CHECK HARNESS CONNECTOR BETWEEN ECM AND VEHICLE SPEED SENSOR 2.

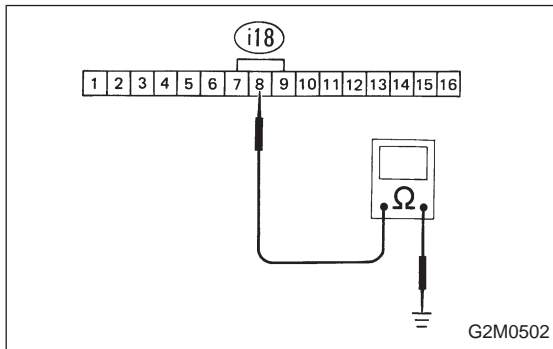
- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ECM.
- 3) Measure resistance of harness connector between ECM and combination meter.

Connector & terminal /Specified resistance:
(E29) No. 4 — (i18) No. 8/10 Ω , max.



- 4) Measure resistance of harness connector between ECM and body to make sure that circuit does not short.

Connector & terminal /Specified resistance:
(E29) No. 4 — Body / 1 M Ω , min.



3. CHECK GROUND CIRCUIT OF VEHICLE SPEED SENSOR 2.

Measure resistance between combination meter and body.

Connector & terminal /Specified resistance:
(i18) No. 8 — Body / 1 M Ω , min.

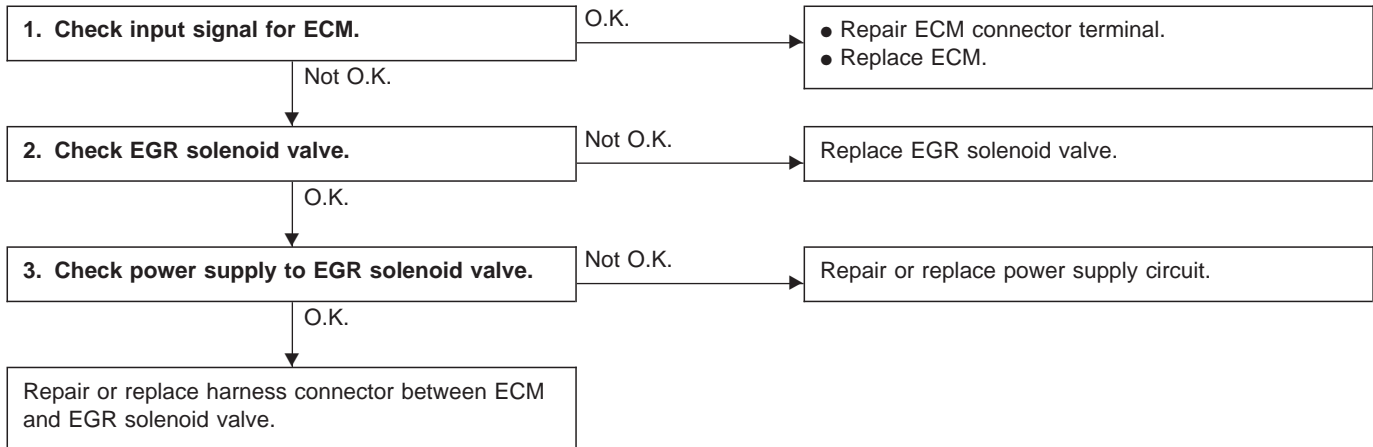
L: TROUBLE CODE (34) — EGR SOLENOID VALVE —

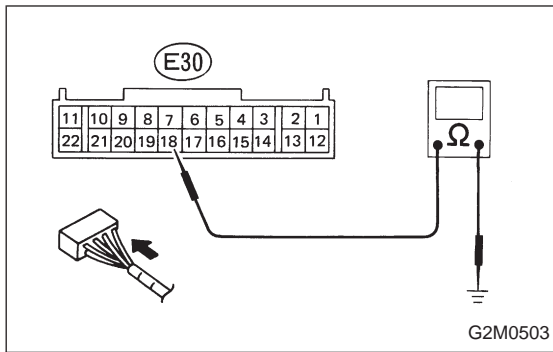
DIAGNOSIS:

- The EGR solenoid valve is not in function.
- The harness connector between ECM and EGR solenoid valve is in short or open.

TROUBLE SYMPTOM:

- Poor driving performance on low engine speed





1. CHECK INPUT SIGNAL FOR ECM.

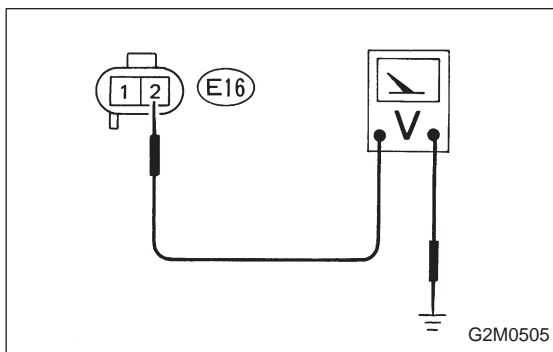
- 1) Turn ignition switch to ON.
- 2) Measure signal voltage between ECM and body.

Connector & terminal /Specified voltage:
(E30) No. 18 — Body/10 V, max.

2. CHECK EGR SOLENOID VALVE.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from EGR solenoid valve.
- 3) Measure resistance between connector terminals of EGR solenoid valve.

Terminals /Specified resistance:
No. 1 — No. 2/36 Ω at 20°C (68°F)



3. CHECK POWER SUPPLY TO EGR SOLENOID VALVE.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between EGR solenoid valve connector and body.

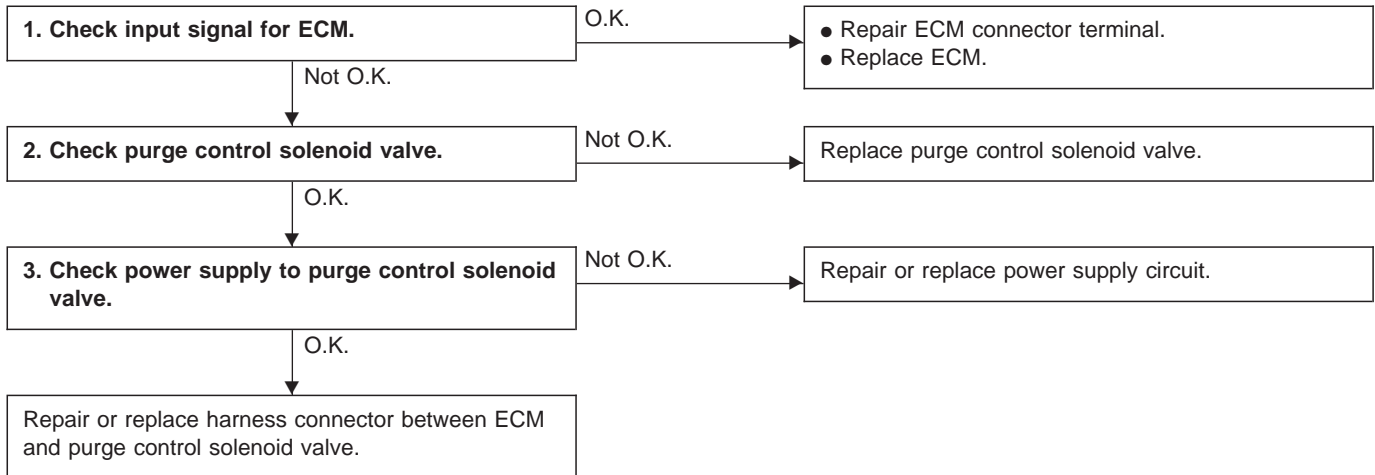
Connector & terminal /Specified voltage:
(E16) No. 2 — Body/10 V, max.

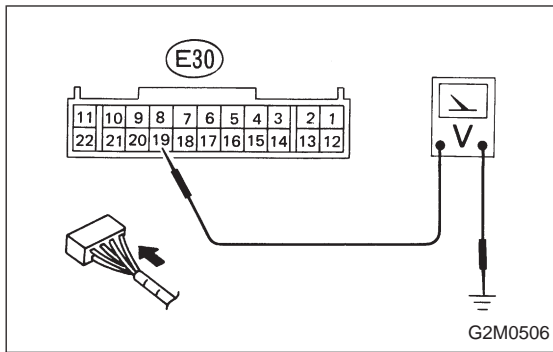
M: TROUBLE CODE (35)**— PURGE CONTROL SOLENOID VALVE —****DIAGNOSIS:**

- The purge control solenoid valve is not in function.
- The harness connector between ECM and purge control solenoid valve is in short or open.

TROUBLE SYMPTOM:

- Erroneous idling





1. CHECK INPUT SIGNAL FOR ECM.

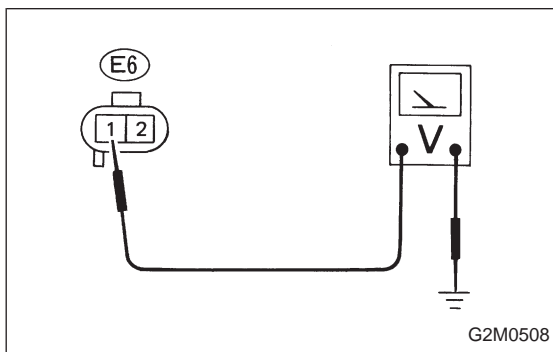
- 1) Turn ignition switch to ON.
- 2) Measure voltage between ECM connector terminal and body.

Connector & terminal /Specified voltage:
(E30) No. 19 — Body/10 — 13 V

2. CHECK PURGE CONTROL SOLENOID VALVE.

- 1) Turn ignition switch to OFF.
- 2) Remove purge control solenoid valve.
- 3) Measure resistance between solenoid valve terminals.

Terminals/Specified resistance:
No. 1 — No. 2/36 Ω [at 20°C (68°F)]



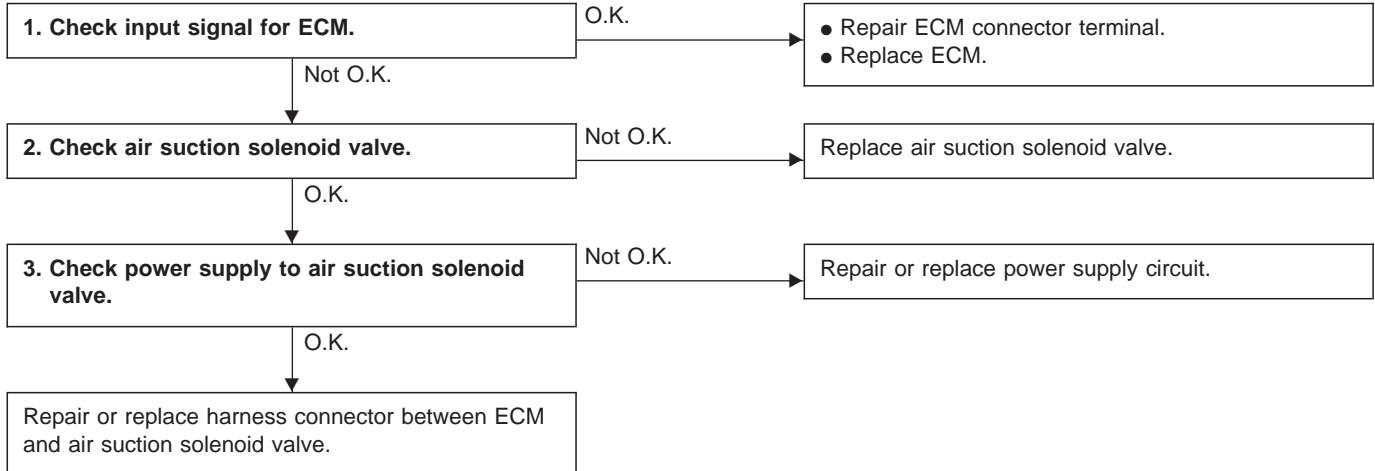
3. CHECK POWER SUPPLY TO PURGE CONTROL SOLENOID VALVE.

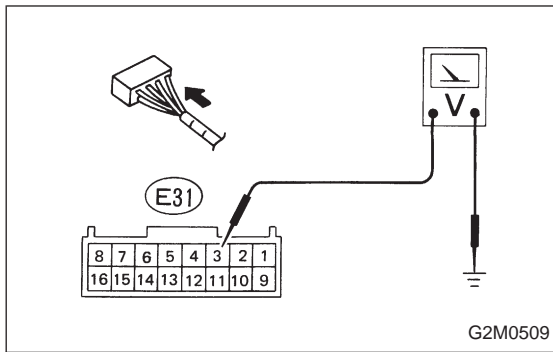
- 1) Turn ignition switch to ON.
- 2) Measure voltage between purge control solenoid valve connector and body.

Connector & terminal /Specified voltage:
(E6) No. 1 — Body/10 V, min.

N: TROUBLE CODE (36)
— AIR SUCTION SOLENOID VALVE —**DIAGNOSIS:**

- The air suction solenoid valve is not in function.
- The harness connector between ECM and air suction solenoid valve is in short or open.

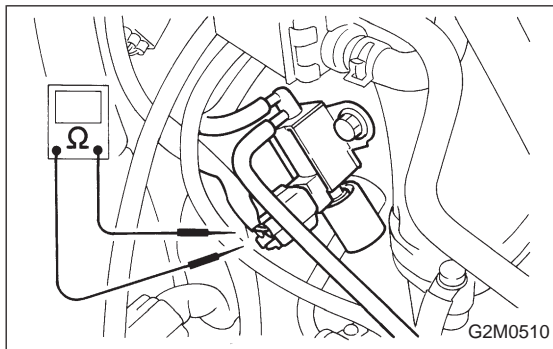




1. CHECK INPUT SIGNAL FOR ECM.

- 1) Turn ignition switch to ON.
- 2) Measure signal voltage between ECM and body.

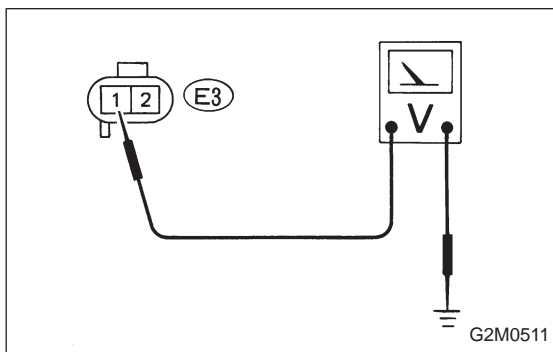
Connector & terminal /Specified voltage:
(E31) No. 3 — Body/10 V, max.



2. CHECK AIR SUCTION SOLENOID VALVE.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from air suction solenoid valve.
- 3) Measure resistance between connector terminals of air suction solenoid valve.

Terminals /Specified resistance:
No. 1 — No. 2/36 Ω at 20°C (68°F)



3. CHECK POWER SUPPLY TO AIR SUCTION SOLENOID VALVE.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between air suction solenoid valve connector and body.

Connector & terminal /Specified voltage:
(E3) No. 1 — Body/10 V, max.

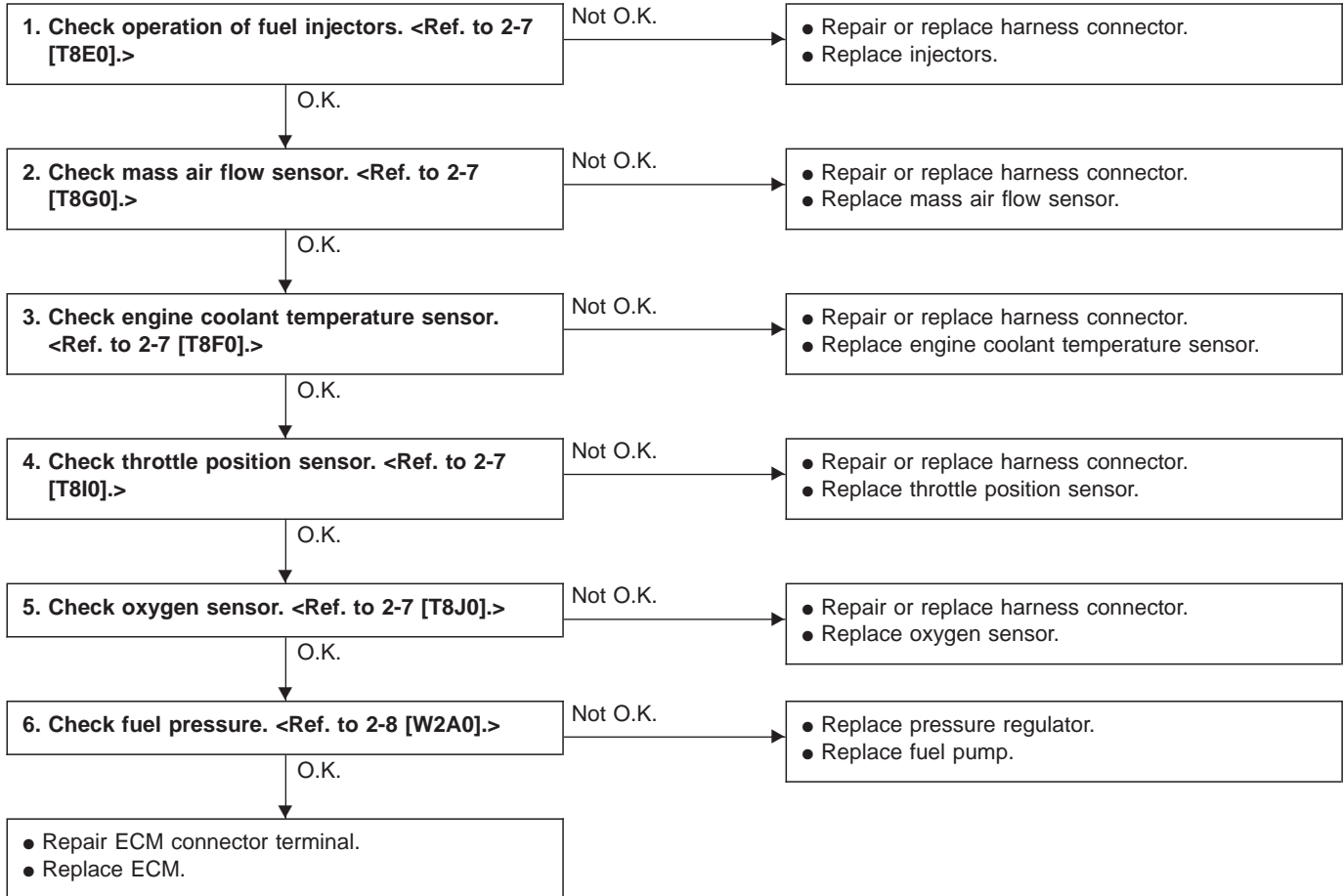
O: TROUBLE CODE (41) — A/F (AIR/FUEL) LEARNING CONTROL —

DIAGNOSIS:

- Faulty learning control function

TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.



P: TROUBLE CODE (51)

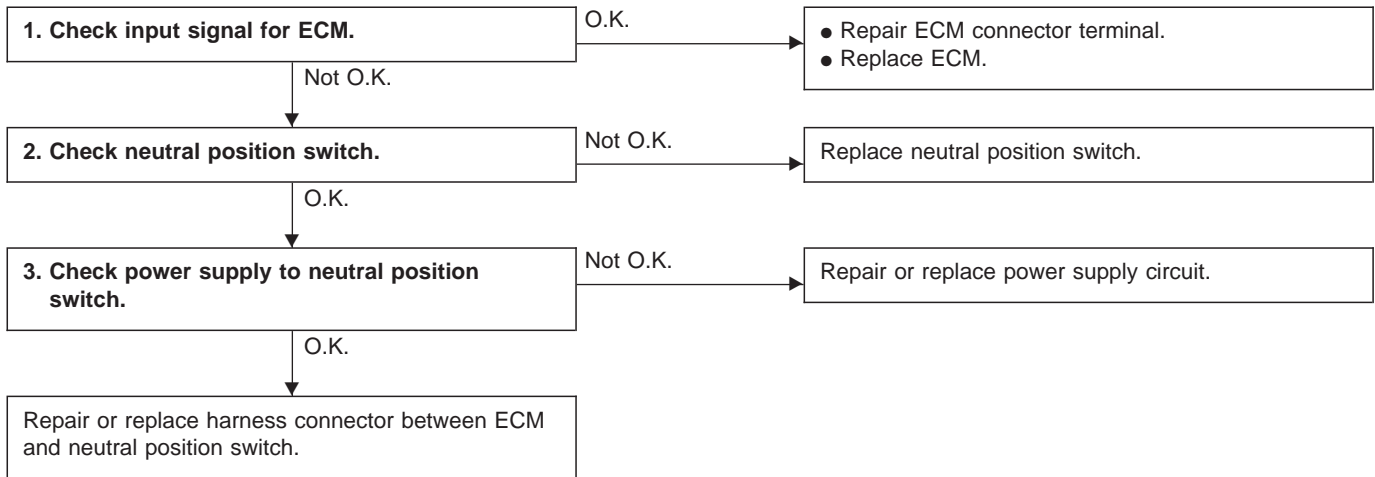
— NEUTRAL POSITION SWITCH (MT) —

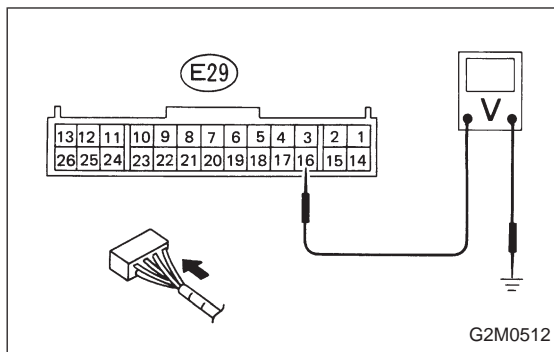
DIAGNOSIS:

- The neutral position switch signal is abnormal.
- The harness connector between ECM and neutral position switch is in short or open.

TROUBLE SYMPTOM:

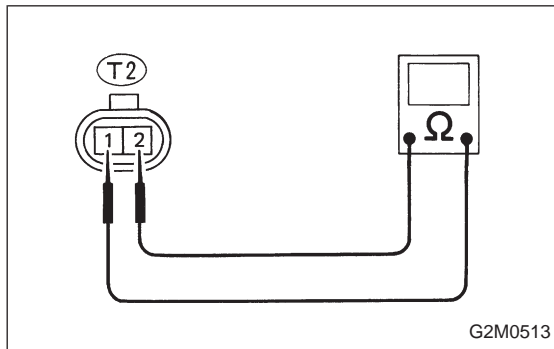
- Erroneous idling



**1. CHECK INPUT SIGNAL FOR ECM.**

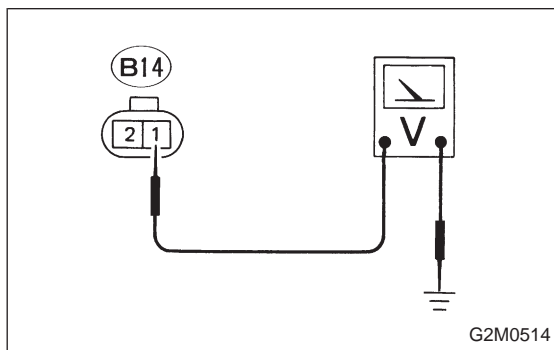
- 1) Turn ignition switch to ON.
- 2) Measure voltage between ECM and body.

Connector & terminal /Specified voltage:
(E29) No. 16 — Body/10 — 14 V (Neutral position)
0 V (Other positions)

**2. CHECK NEUTRAL POSITION SWITCH.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from transmission harness.
- 3) Measure resistance between connector terminals of transmission harness.

Connector & terminal /Specified resistance:
(T2) No. 1 — (T2) No. 2 /1 MΩ, min.
(Neutral position)
10 Ω, max.
(Other positions)

**3. CHECK POWER SUPPLY TO NEUTRAL POSITION SWITCH.**

- 1) Turn ignition switch to ON.
- 2) Measure voltage between neutral position switch connector and body.

Connector & terminal /Specified voltage:
(B14) No. 1 — Body/10 V, min.

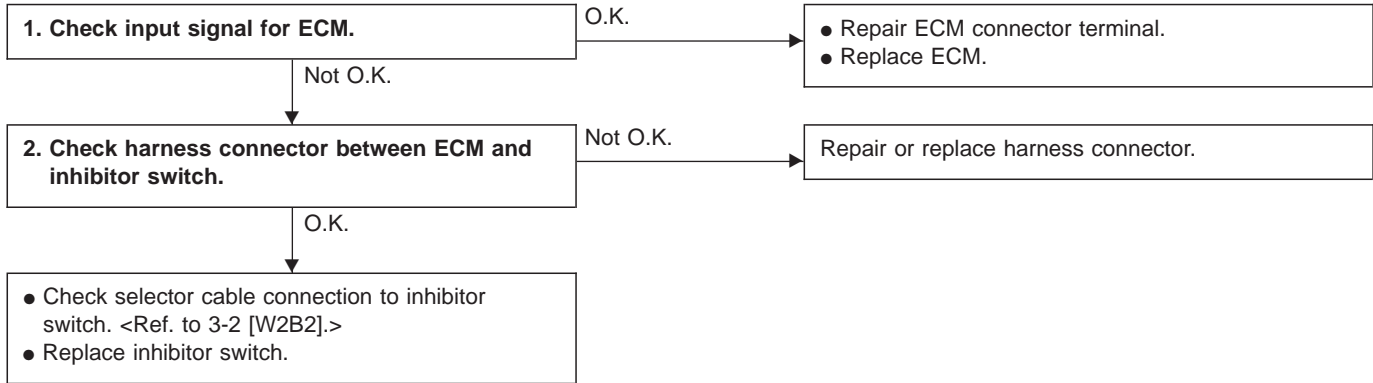
**Q: TROUBLE CODE (51)
— INHIBITOR SWITCH (AT) —**

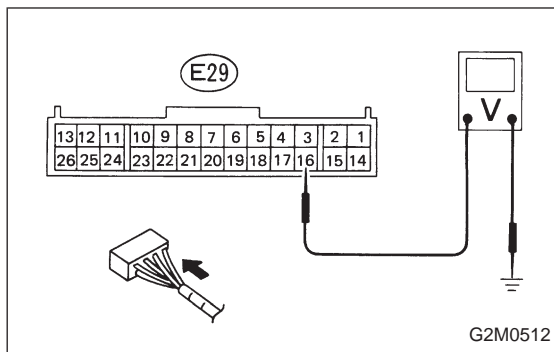
DIAGNOSIS:

- The park/neutral position switch signal is abnormal.
- The shift cable is connected abnormally.
- The harness connector between ECM and inhibitor switch is in short or open.

TROUBLE SYMPTOM:

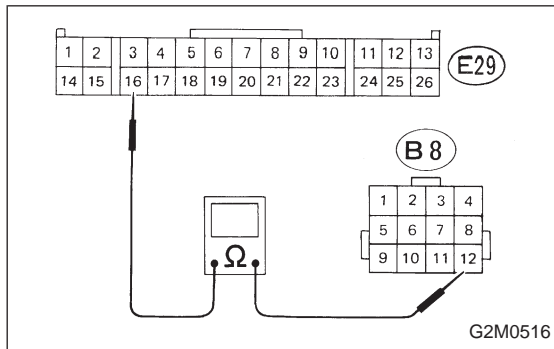
- Erroneous idling



**1. CHECK INPUT SIGNAL FOR ECM.**

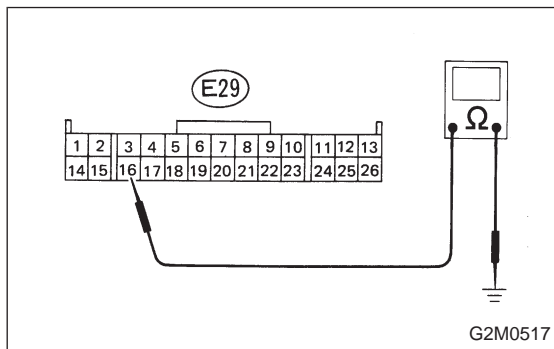
- 1) Turn ignition switch to ON.
- 2) Measure voltage between ECM and body.

Connector & terminal /Specified voltage:
(E29) No. 16 — Body/10 — 14 V
(“P” or “N” position)
0 V (Other positions)

**2. CHECK HARNESS CONNECTOR BETWEEN ECM AND INHIBITOR SWITCH.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from ECM and transmission harness.
- 3) Measure resistance of harness connector between ECM and transmission harness.

Connector & terminal /Specified resistance:
(E29) No. 16 — (B8) No. 1/10 Ω , max.
(E29) No. 16 — (B8) No. 3/10 Ω , max.



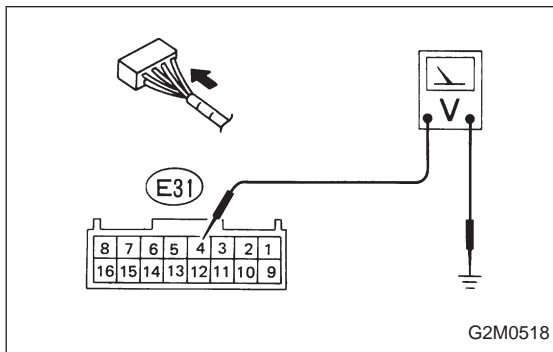
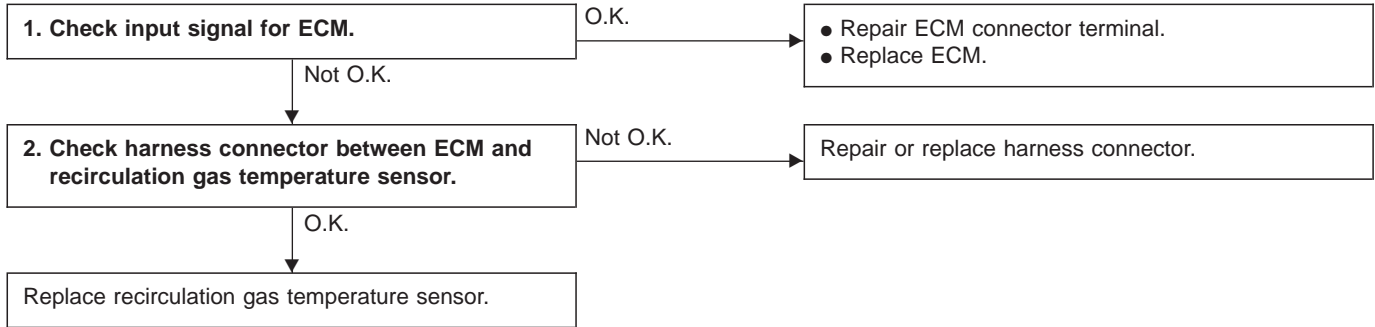
- 4) Measure resistance harness connector between ECM and body to make sure that circuit does not short.

Connector & terminal /Specified resistance:
(E29) No. 16 — Body/1 $M\Omega$, min.

**R: TROUBLE CODE (55)
— RECIRCULATION GAS TEMPERATURE
SENSOR —**

DIAGNOSIS:

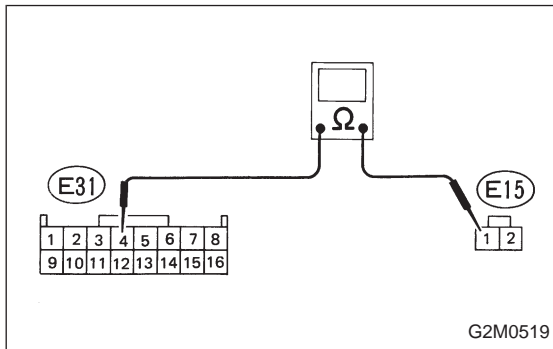
- The recirculation gas temperature sensor is not in function.
- The harness connector between ECM and recirculation gas temperature sensor is in short or open.



1. CHECK INPUT SIGNAL FOR ECM.

- 1) Turn ignition switch to ON.
- 2) Measure signal voltage between ECM and body.

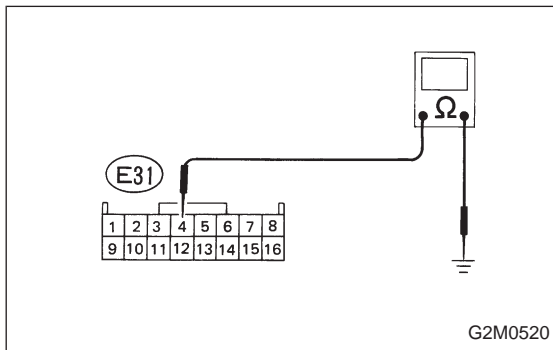
Connector & terminal /Specified voltage:
 (E31) No. 4 — Body/4 — 4.8 V at 20°C (68°F)
 (E31) No. 4 — Body/0.4 — 1.2 V at 100°C (212°F)



2. CHECK HARNESS CONNECTOR BETWEEN ECM AND RECIRCULATION GAS TEMPERATURE SENSOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from recirculation gas temperature sensor.
- 3) Measure resistance of harness connector between ECM and recirculation gas temperature sensor.

Connector & terminal /Specified resistance:
 (E31) No. 4 — (E15) No. 1/10 Ω, max.



- 4) Measure resistance of harness connector between ECM and body to make sure that circuit does not short.

Connector & terminal /Specified resistance:
 (E31) No. 4 — Body/1 MΩ, max.

S: TROUBLE CODE (56)

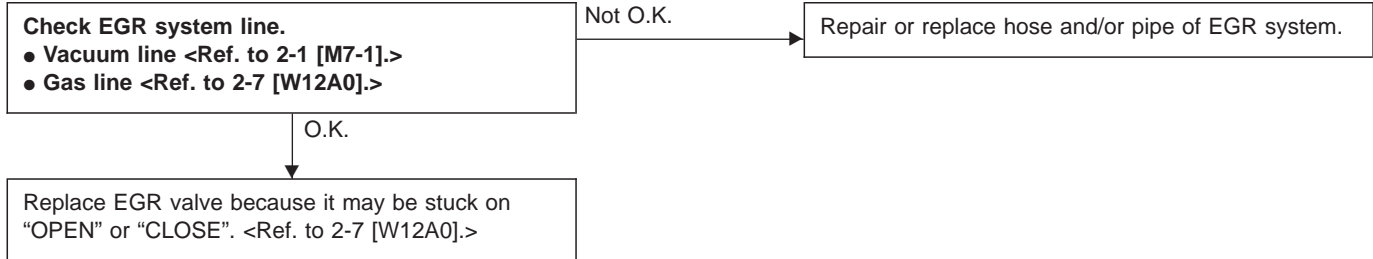
— EGR SYSTEM —

DIAGNOSIS:

- Faulty EGR system function

TROUBLE SYMPTOM:

- Poor driving performance on low engine speed

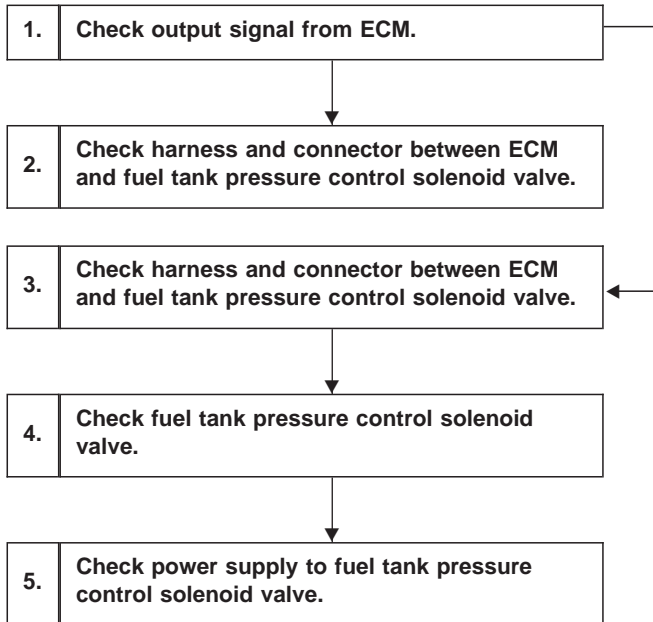


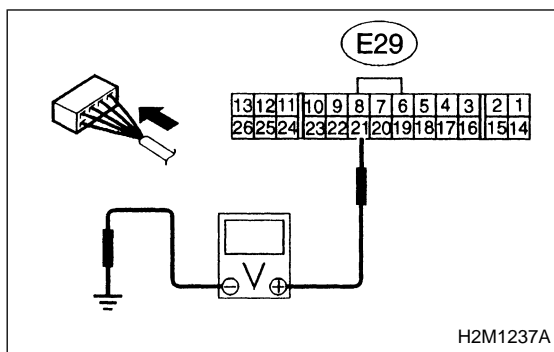
T: TROUBLE CODE (61)

— FUEL TANK PRESSURE CONTROL SOLENOID VALVE —

DIAGNOSIS:

- The fuel tank pressure control solenoid valve is not in function.
- The harness connector between ECM and fuel tank pressure control solenoid valve is in short or open.



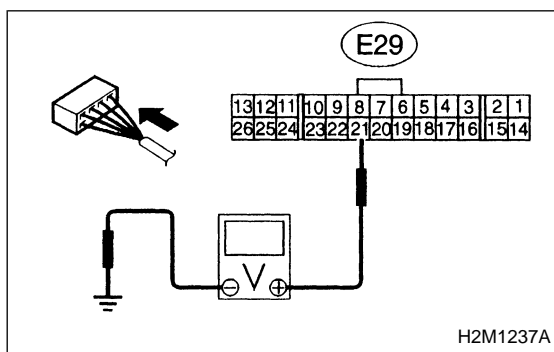
**1. CHECK OUTPUT SIGNAL FROM ECM.**

- 1) Turn ignition switch to ON.
- 2) Measure voltage between ECM connector and body.

CHECK : **Connector & terminal**
(E29) No. 21 — Body/10 V, or more

YES : Go to step 2.

NO : Go to step 3.

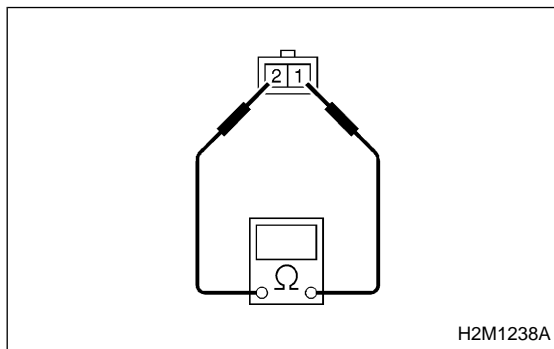
**2. CHECK HARNESS AND CONNECTOR BETWEEN ECM AND FUEL TANK PRESSURE CONTROL SOLENOID VALVE.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from fuel tank pressure control solenoid valve.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between ECM and body.

CHECK : **Connector & terminal**
(E29) No. 21 — Body/10 V, or more

YES : Repair short circuit of harness between ECM and fuel tank pressure control solenoid valve connector. After repair, replace ECM with a new one.

NO : Go to next step.



- 5) Turn ignition switch to OFF.
- 6) Measure resistance between fuel tank pressure control solenoid valve terminals.

CHECK : **Connector & terminal**
No. 1 — No. 2/1 Ω, or less

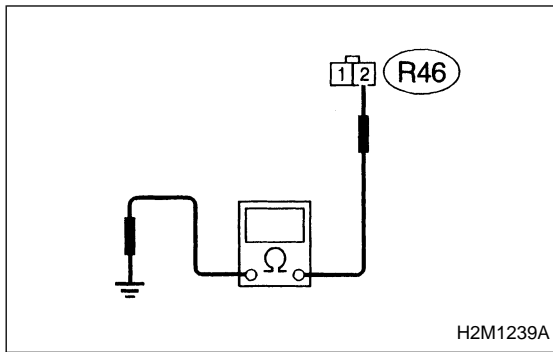
YES : Replace fuel tank pressure control solenoid valve and ECM.

NO : Go to next **CHECK** .

CHECK : **Is there poor contact in ECM connector?**

YES : Repair poor contact in ECM connector.

NO : Replace ECM with a new one.



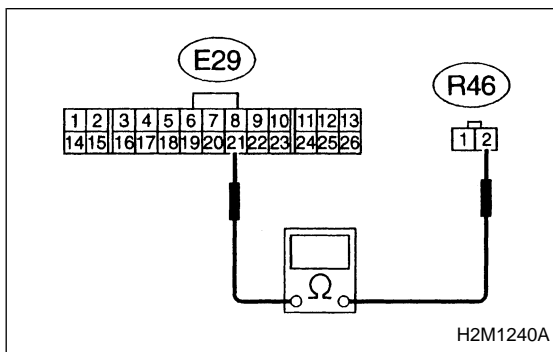
3. CHECK HARNESS AND CONNECTOR BETWEEN ECM AND FUEL TANK PRESSURE CONTROL SOLENOID VALVE.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from fuel tank pressure control solenoid valve and ECM.
- 3) Measure resistance between fuel tank pressure control solenoid valve connector and body.

CHECK : **Connector & terminal (R46) No. 2 — Body/10 Ω, or less**

YES : Repair short circuit of harness between ECM and fuel tank pressure control solenoid valve connector.

NO : Go to next step.



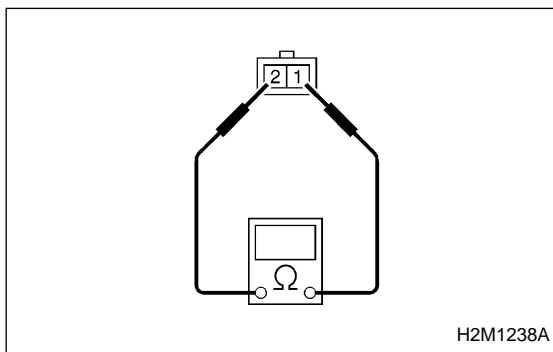
- 4) Measure resistance of harness between ECM and fuel tank pressure control solenoid valve connector.

CHECK : **Connector & terminal (E29) No. 21 — (R46) No. 2/1 Ω, or less**

YES : Go to step 4.

NO : In this case, repair the following items.

- Open circuit of harness between ECM and fuel tank pressure control solenoid valve connector
- Poor contact in ECM connector
- Poor contact in fuel tank pressure control solenoid valve connector
- Poor contact in coupling connectors (B74, B85 and R45)



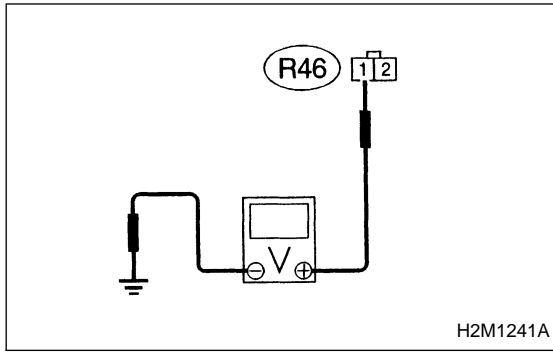
4. CHECK FUEL TANK PRESSURE CONTROL SOLENOID VALVE.

Measure resistance between fuel tank pressure control solenoid valve terminals.

CHECK : **Terminals No. 1 — No. 2/10 — 100 Ω**

YES : Go to step 5.

NO : Replace fuel tank pressure control solenoid valve with a new one.



5. CHECK POWER SUPPLY TO FUEL TANK PRESSURE CONTROL SOLENOID VALVE.

- 1) Connect connector to ECM.
- 2) Turn ignition switch to ON.
- 3) Measure voltage between fuel tank pressure control solenoid valve connector and body.

CHECK : **Connector & terminal (R46) No. 1 — Body/10 V, or more**

YES : Go to next **CHECK** .

NO : In this case, repair the following items.

- Open circuit of harness between main relay and fuel tank pressure control solenoid valve connector
- Poor contact in main relay connector
- Poor contact in coupling connectors (B85 and R39)

CHECK : **Is there poor contact in fuel tank pressure control solenoid valve connector?**

YES : Repair poor contact in fuel tank pressure control solenoid valve connector.

NO : Contact with SOA service.

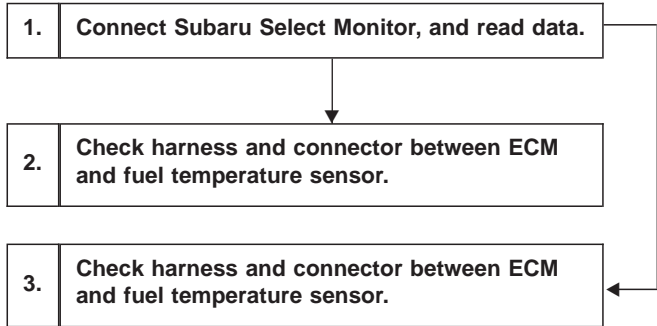
NOTE:

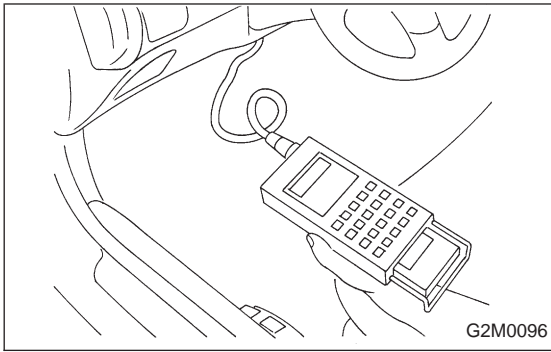
Inspection by DTM is required.

U: TROUBLE CODE (62)
— FUEL TEMPERATURE SENSOR —

DIAGNOSIS:

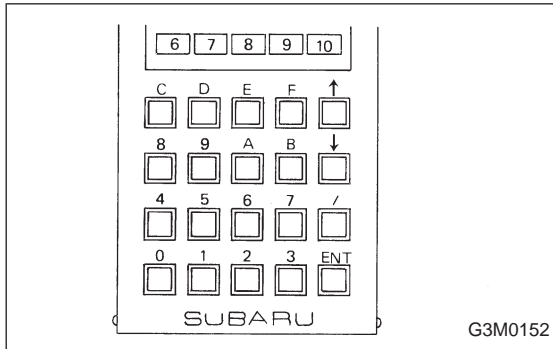
- The fuel temperature sensor signal is abnormal.
- The harness connector between ECM and fuel temperature sensor is in short or open.





1. CONNECT SUBARU SELECT MONITOR, AND READ DATA.

- 1) Turn ignition switch to OFF.
- 2) Connect Subaru Select Monitor to data link connector.



- 3) Turn ignition switch to ON and Subaru Select Monitor switch to ON.

4) Start engine.

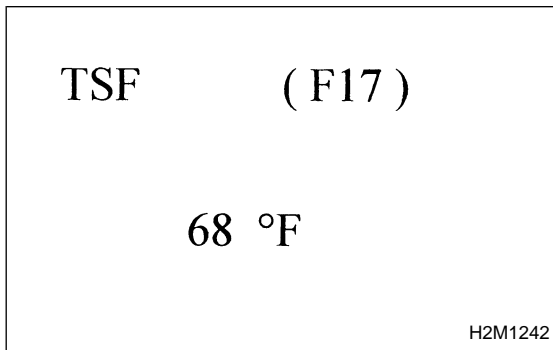
5) Read data on Subaru Select Monitor.

● Subaru Select Monitor

Designate mode using function key.

Function mode: F17

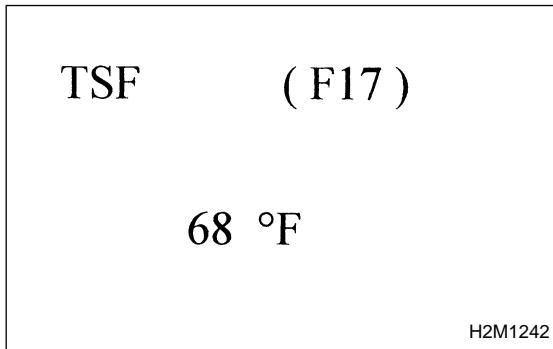
● F17: Fuel temperature is indicated in "°F".



CHECK : *Is the value greater than 300°F with function mode F17?*

YES : Go to step 2.

NO : Go to next **CHECK** .

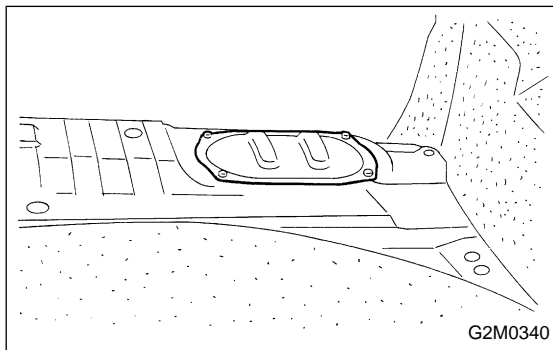


CHECK : *Is the value less than -40°F with function mode F17?*

YES : Go to step 3.

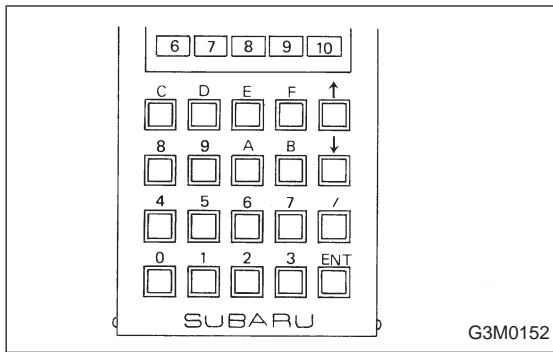
NO : In this case, repair the following items.

- Poor contact in ECM connector
- Poor contact in fuel pump connector
- Poor contact in coupling connectors (B74, B84, B85 and R45)



2. CHECK HARNESS AND CONNECTOR BETWEEN ECM AND FUEL TEMPERATURE SENSOR.

- 1) Turn ignition switch to OFF.
- 2) Remove access hole lid.

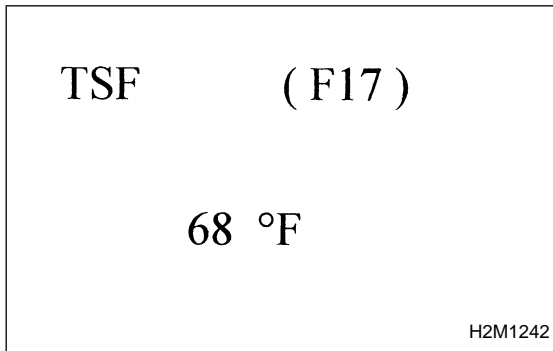


G3M0152

- 3) Disconnect connector from fuel pump.
- 4) Turn ignition switch to ON and Subaru Select Monitor switch to ON.
- 5) Read data on Subaru Select Monitor.
 - Subaru Select Monitor Designate mode using function key.

Function mode: F17

- F17: Fuel temperature is indicated in “°F”.

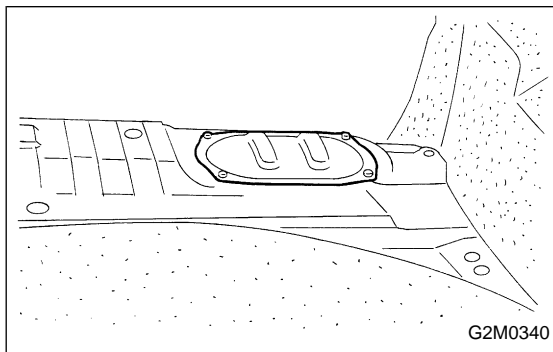


H2M1242

CHECK : *Is the value less than -40°F with function mode F17?*

YES : Replace fuel temperature sensor.

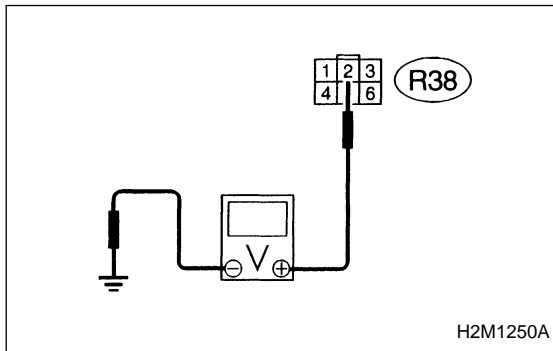
NO : Repair short circuit of harness between ECM and fuel pump connector.



G2M0340

3. CHECK HARNESS AND CONNECTOR BETWEEN ECM AND FUEL TEMPERATURE SENSOR.

- 1) Turn ignition switch to OFF.
- 2) Remove access hole lid.



H2M1250A

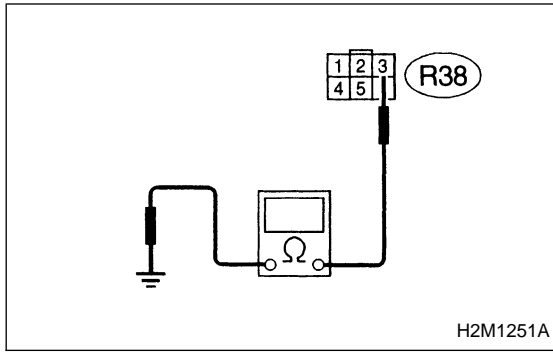
- 3) Disconnect connector from fuel pump.
- 4) Turn ignition switch to ON.
- 5) Measure voltage between fuel pump connector and body.

CHECK : **Connector & terminal (R38) No. 2 — Body/4 V, or more**

YES : Go to next step.

NO : In this case, repair the following items.

- Repair open circuit of harness between ECM and fuel pump connector.
- Poor contact in ECM connector
- Poor contact in fuel pump connector
- Poor contact in coupling connectors (B74, B85 and R45)



6) Turn ignition switch to OFF.

7) Measure resistance of harness between fuel pump connector and body.

CHECK : **Connector & terminal**
(R38) No. 3 — Body/5 Ω, or less

YES : Replace fuel temperature sensor.

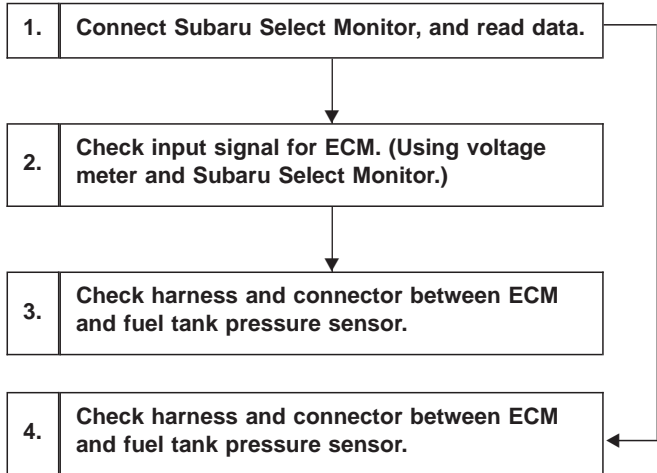
NO : In this case, repair the following items.

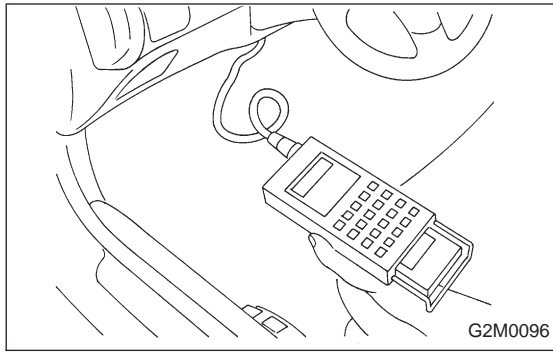
- Repair open circuit of harness between ECM and fuel pump connector.
- Poor contact in ECM connector
- Poor contact in fuel pump connector
- Poor contact in coupling connectors (B74, B84 and R45)

V: TROUBLE CODE (63)
— FUEL TANK PRESSURE SENSOR —

DIAGNOSIS:

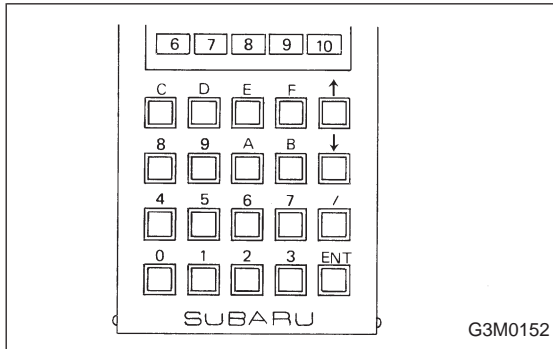
- The fuel tank pressure sensor signal is abnormal.
- The harness connector between ECM and fuel tank pressure sensor is in short or open.





1. CONNECT SUBARU SELECT MONITOR, AND READ DATA.

- 1) Turn ignition switch to OFF.
- 2) Remove fuel filler cap.
- 3) Install fuel filler cap.
- 4) Connect Subaru Select Monitor to data link connector.



- 5) Turn ignition switch to ON and Subaru Select Monitor switch to ON.
- 6) Read data on Subaru Select Monitor.

● Subaru Select Monitor

Designate mode using function key.

Function mode: F18

- F18: Fuel tank pressure sensor output signal is indicated.

VFTP (F18)

0.10 kpa

H2M1252

CHECK : *Is the value less than -7.2 kPa?*

YES : Go to step 2.

NO : Go to next **CHECK** .

VFTP (F18)

0.10 kpa

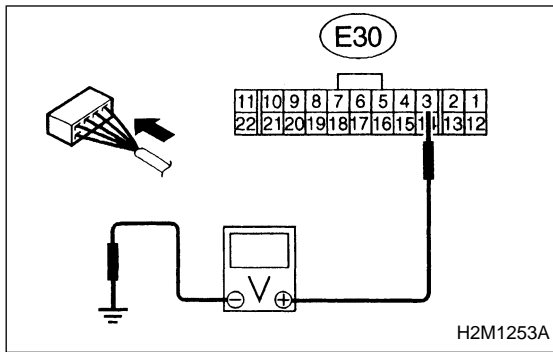
H2M1252

CHECK : *Is the value more than 7.2 kPa?*

YES : Go to step 4.

NO : In this case, repair the following items.

- Open circuit of harness between ECM and fuel tank pressure sensor connector
- Poor contact in ECM connector
- Poor contact in fuel tank pressure sensor connector
- Poor contact in coupling connectors (B74, B84 and B85)



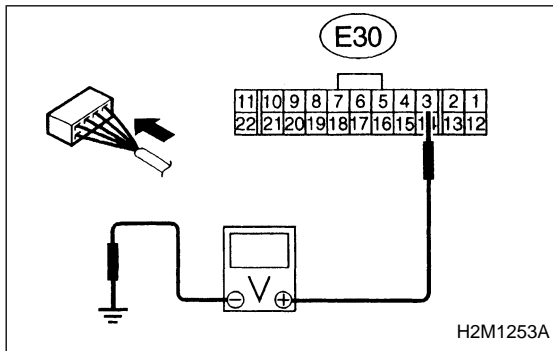
2. CHECK INPUT SIGNAL FOR ECM. (USING VOLTAGE METER AND SUBARU SELECT MONITOR.)

1) Measure voltage between ECM connector and body.

CHECK : **Connector & terminal (E30) No. 3 — Body/4.5 V, or more**

YES : Go to next step.

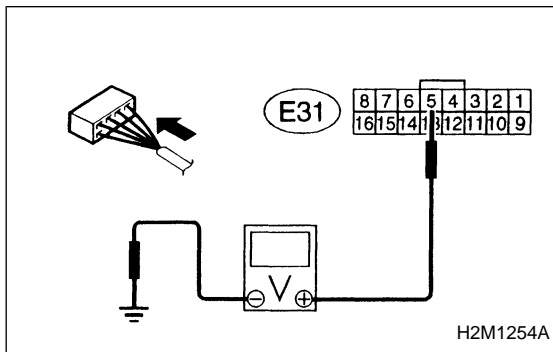
NO : Go to next **CHECK** .



CHECK : **Does the voltage change more than 4.5 V by shaking harness and connector of ECM while monitoring the value with voltage meter?**

YES : Repair poor contact in ECM connector.

NO : Replace ECM with a new one.

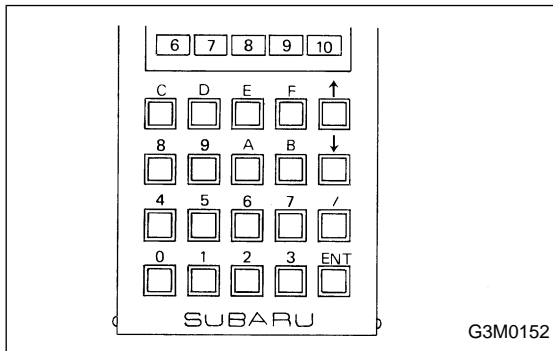


2) Measure voltage between ECM connector and body.

CHECK : **Connector & terminal (E31) No. 5 — Body/0.2 V, or less**

YES : Go to step 3.

NO : Go to next step.



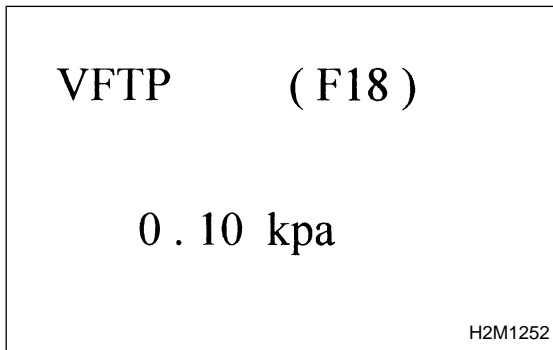
3) Read data on Subaru Select Monitor.

● Subaru Select Monitor

Designate mode using function key.

Function mode: F18

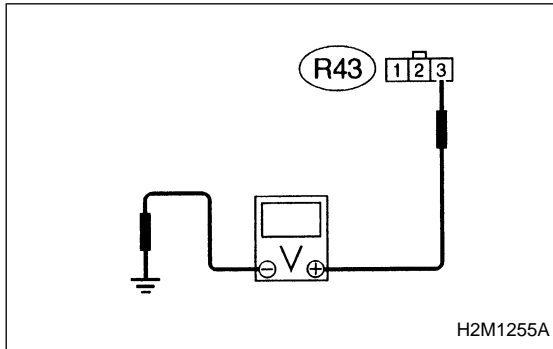
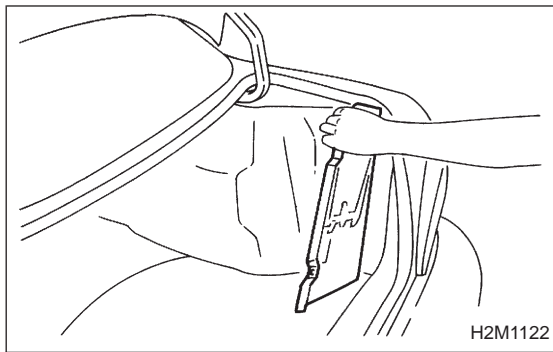
● F18: Fuel tank pressure sensor output signal is indicated.



CHECK : **Does the value change more than -7.2 kPa by shaking harness and connector of ECM while monitoring the value with Subaru Select Monitor?**

YES : Repair poor contact in ECM connector.

NO : Go to step 3.



3. CHECK HARNESS AND CONNECTOR BETWEEN ECM AND FUEL TANK PRESSURE SENSOR.

- 1) Turn ignition switch to OFF.
- 2) Remove right side rear quarter trim.

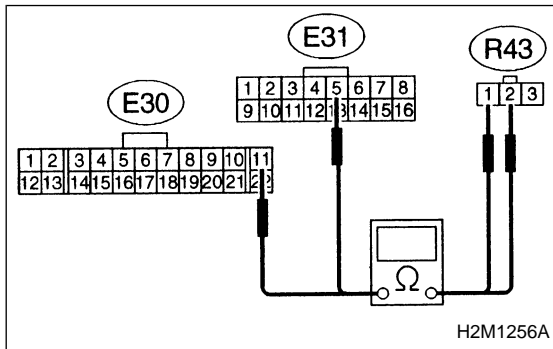
- 3) Disconnect connector from fuel tank pressure sensor.
- 4) Turn ignition switch to ON.
- 5) Measure voltage between fuel tank pressure sensor connector and body.

CHECK : **Connector & terminal (R43) No. 3 — Body/4.5 V, or more**

YES : Go to next **CHECK** .

NO : In this case, repair the following items.

- Open circuit of harness between ECM and fuel tank pressure sensor connector
- Poor contact in ECM connector
- Poor contact in fuel tank pressure sensor connector
- Poor contact in coupling connectors (B74 and B85)



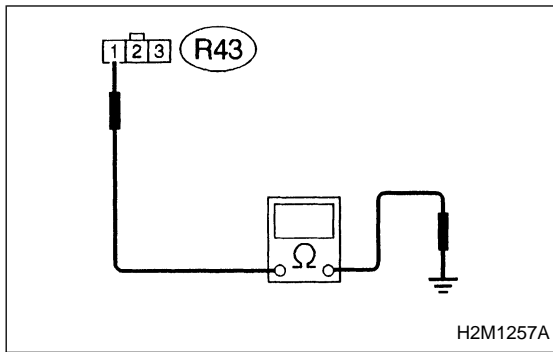
- 6) Turn ignition switch to OFF.
- 7) Disconnect connector from ECM.
- 8) Measure resistance of harness between ECM and fuel tank pressure sensor connector.

CHECK : **Connector & terminal (E31) No.5 — (R43) No. 1/1 Ω, or less (E30) No. 11 — (R43) No. 2/1 Ω, or less**

YES : Go to next step.

NO : In this case, repair the following items.

- Open circuit of harness between ECM and fuel tank pressure sensor connector
- Poor contact in ECM connector
- Poor contact in fuel tank pressure sensor connector
- Poor contact in coupling connectors (B74 and B84)



9) Measure resistance between fuel tank pressure sensor connector and body.

CHECK : **Connector & terminal (R43) No. 1 — Body/500 kΩ, or more**

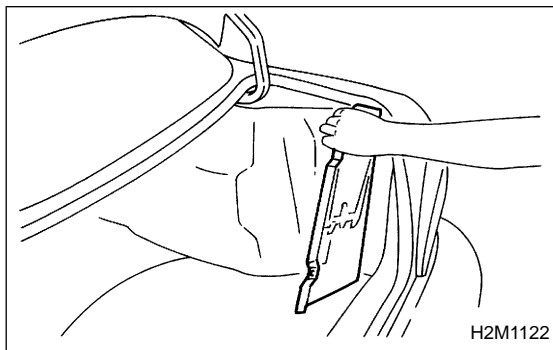
YES : Go to next **CHECK** .

NO : Repair short circuit of harness between ECM and fuel tank pressure sensor connector.

CHECK : **Is there poor contact in fuel tank pressure sensor connector?**

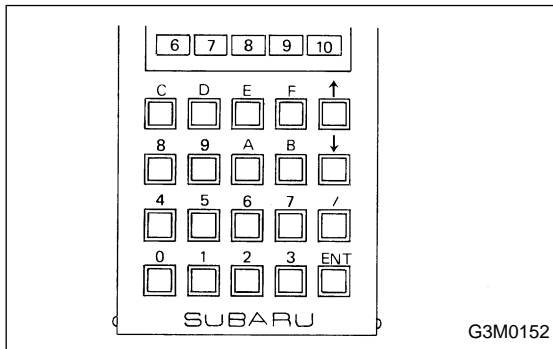
YES : Repair poor contact in fuel tank pressure sensor connector.

NO : Replace fuel tank pressure sensor with a new one.



4. CHECK HARNESS AND CONNECTOR BETWEEN ECM AND FUEL TANK PRESSURE SENSOR.

- 1) Turn ignition switch to OFF.
- 2) Remove right side rear quarter trim.

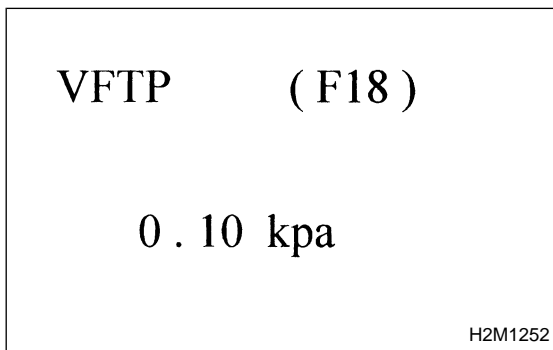


- 3) Disconnect connector from fuel tank pressure sensor.
- 4) Turn ignition switch to ON.
- 5) Read data on Subaru Select Monitor.

● Subaru Select Monitor
Designate mode using function key.

Function mode: F18

● F18: Fuel tank pressure sensor output signal is indicated.



CHECK : **Is the value more than 7.2 kPa with function mode F18?**

YES : Repair short circuit of harness between ECM and fuel tank pressure sensor connector.

NO : Replace fuel tank pressure sensor with a new one.