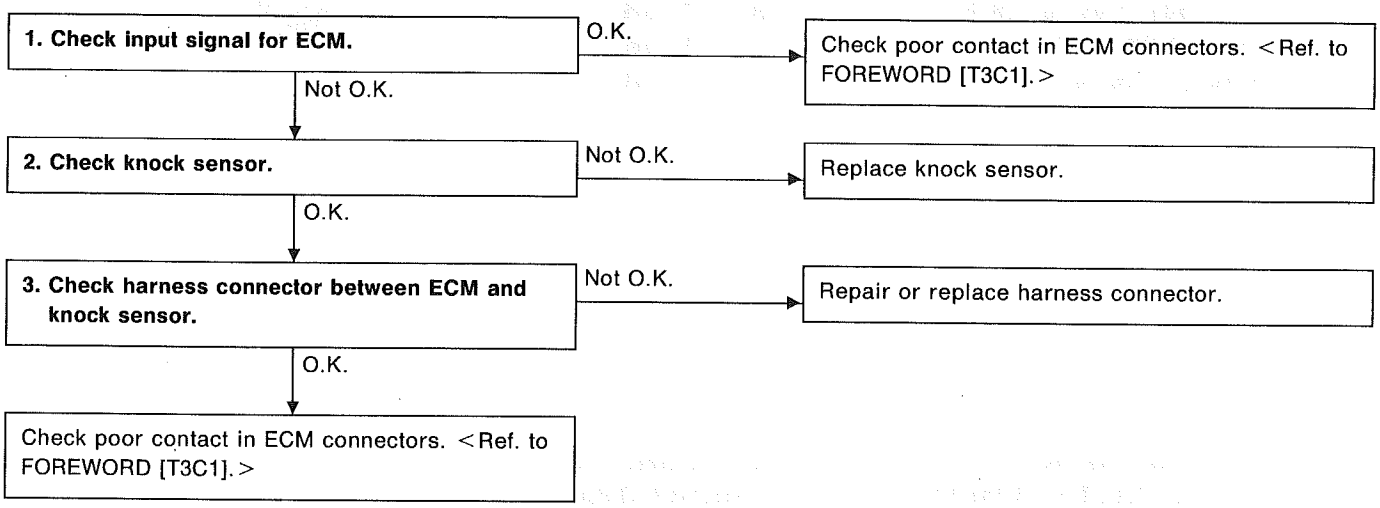
F: TROUBLE CODE (22)
— KNOCK SENSOR —

DIAGNOSIS:

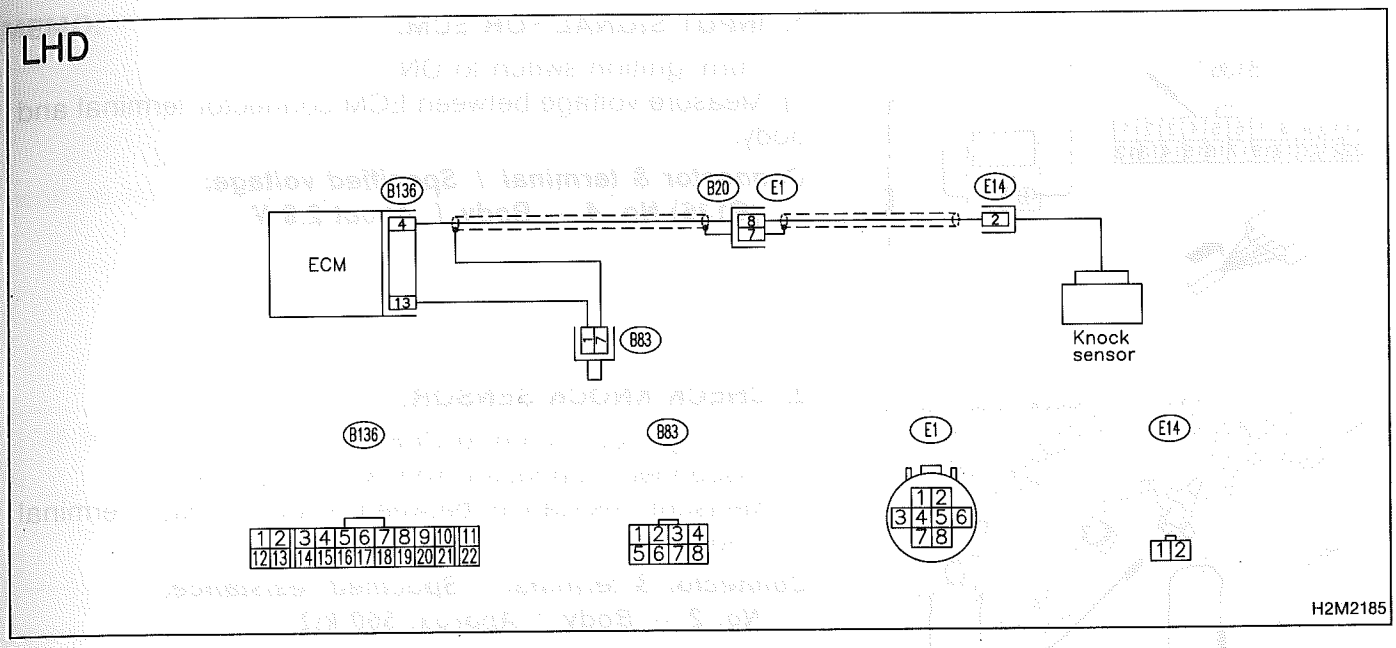
- The knock sensor signal is abnormal.
- The harness connector between ECM and knock sensor is in short or open.

TROUBLE SYMPTOM:

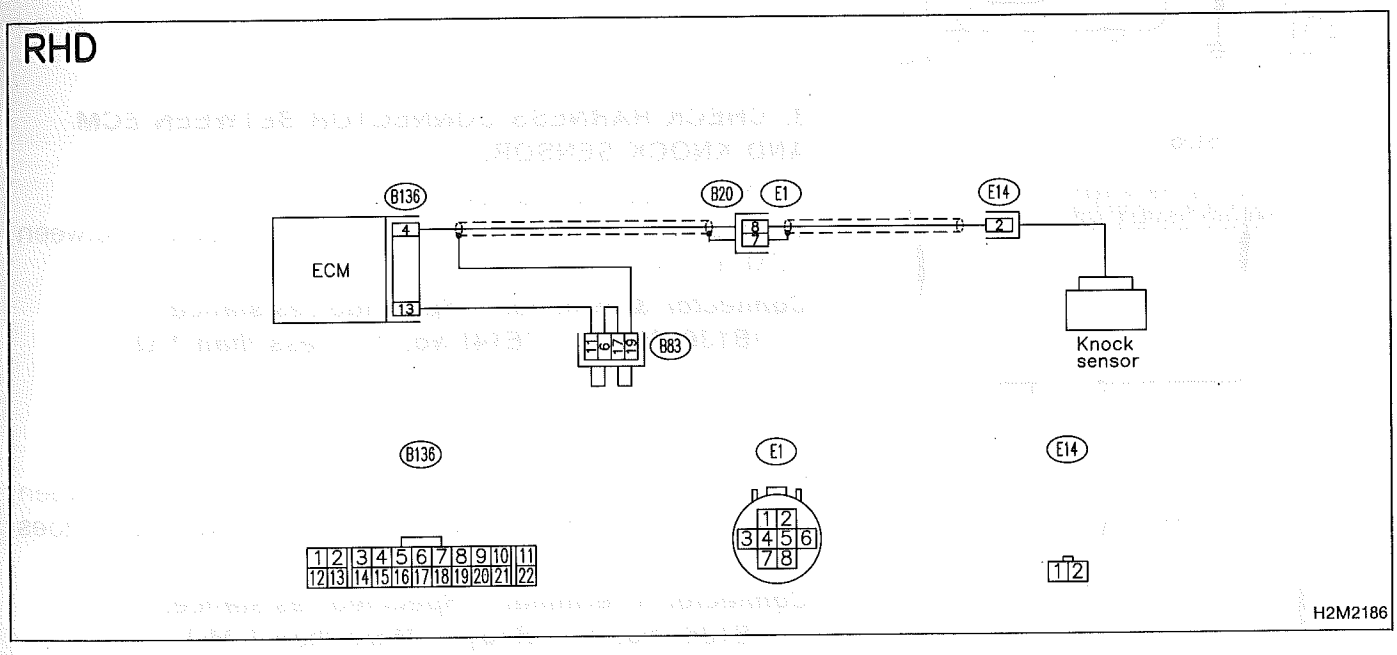
- Poor driving performance

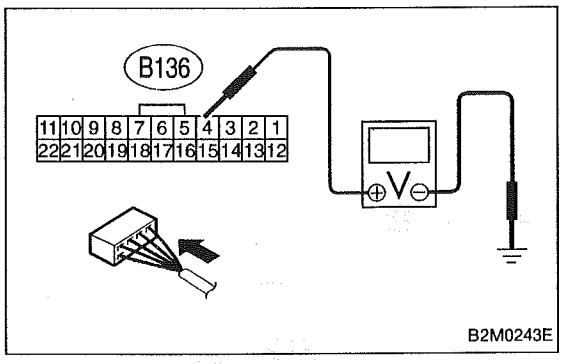


LHD


B136
B20
E1
E14
ECM
4
13
8
7
2
B83
Knock sensor
B136
B83
E1
E14
1 2 3 4 5 6 7 8 9 10 11
12 13 14 15 16 17 18 19 20 21 22
1 2 3 4
5 6 7 8
1 2
3 4 5 6
7 8
1 2
H2M2185

RHD

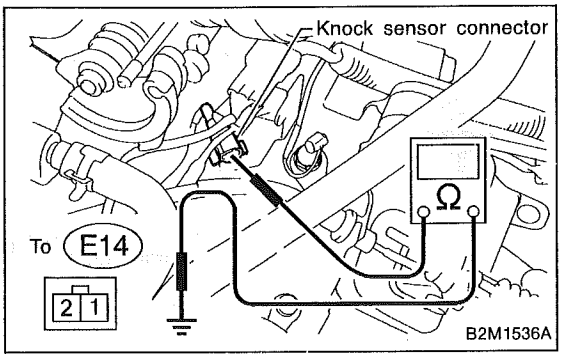

B136
B20
E1
E14
ECM
4
13
8
7
2
B83
Knock sensor
B136
E1
E14
1 2 3 4 5 6 7 8 9 10 11
12 13 14 15 16 17 18 19 20 21 22
1 2
3 4 5 6
7 8
1 2
H2M2186



1. INPUT SIGNAL FOR ECM.

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

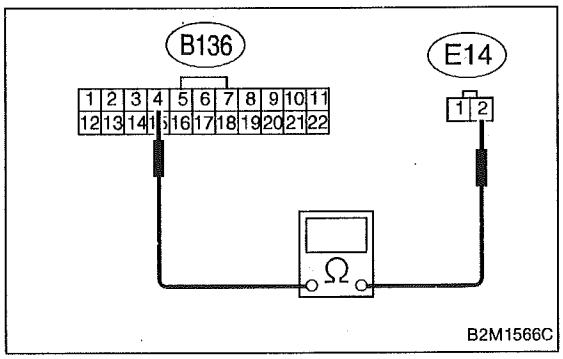
Connector & terminal / Specified voltage:
(B136) No. 4 — Body / About 2.8 V



2. CHECK KNOCK SENSOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from knock sensor.
3) Measure resistance between knock sensor terminal and body.

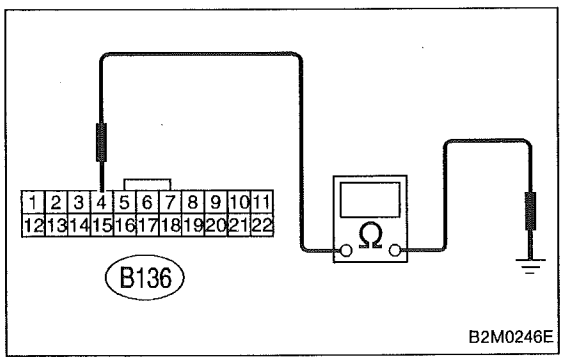
Connector & terminal / Specified resistance:
No. 2 — Body / Approx. 560 kΩ



3. CHECK HARNESS CONNECTOR BETWEEN ECM AND KNOCK SENSOR.

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

Connector & terminal / Specified resistance:
(B136) No. 4 — (E14) No. 2 / Less than 1 Ω



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

Connector & terminal / Specified resistance:
(B136) No. 4 — Body / More than 1 MΩ

MEMO:

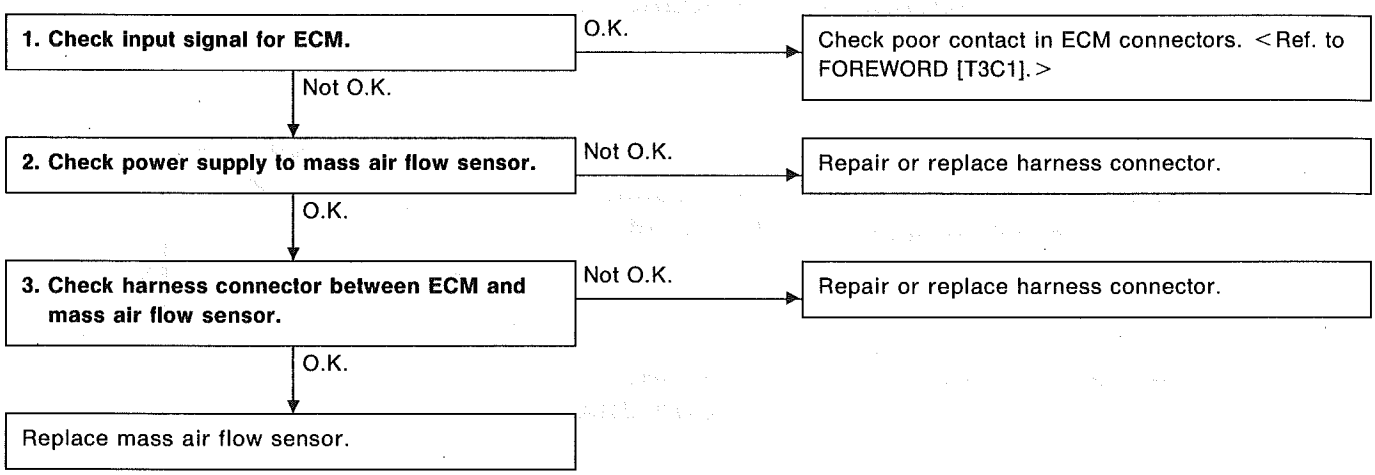
G: TROUBLE CODE (23)
— MASS AIR FLOW SENSOR —

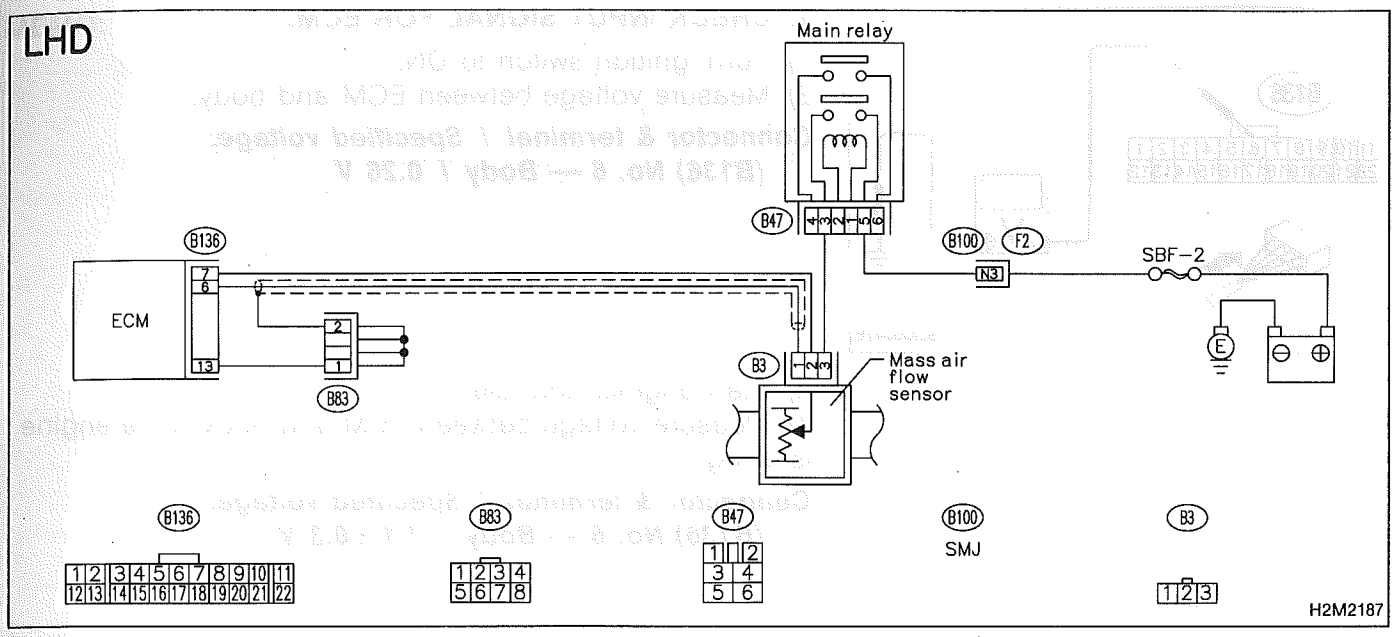
DIAGNOSIS:

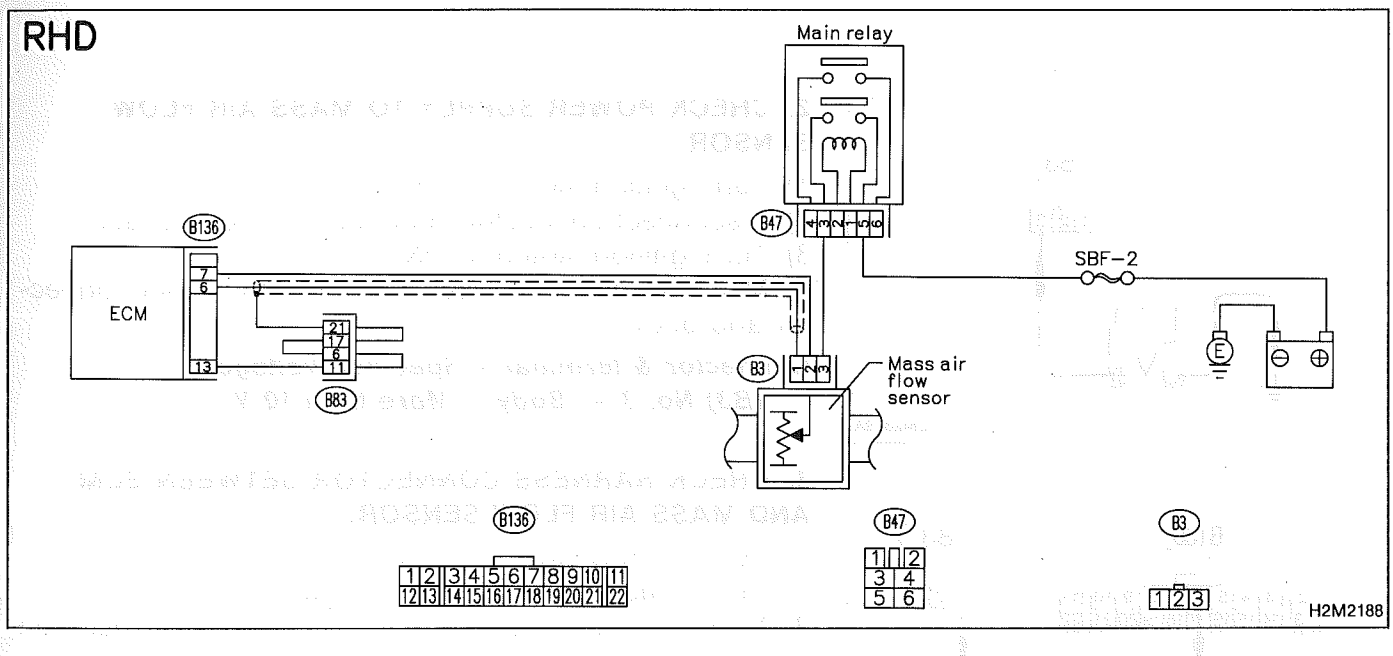
- The mass air flow sensor signal is abnormal.
- The harness connector between ECM and mass air flow sensor is in short or open.

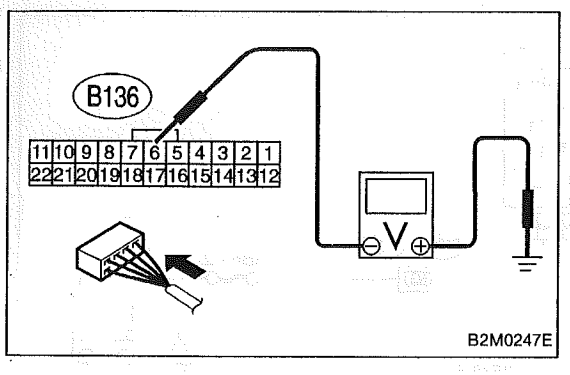
TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance




LHD
Main relay
B47
B136
ECM
B83
B3
Mass air flow sensor
B100
F2
N3
SBF−2
E
B136
B83
B47
B100
SMJ
B3
H2M2187


RHD
Main relay
B47
B136
ECM
B83
B3
Mass air flow sensor
SBF−2
E
B136
B47
B3
H2M2188



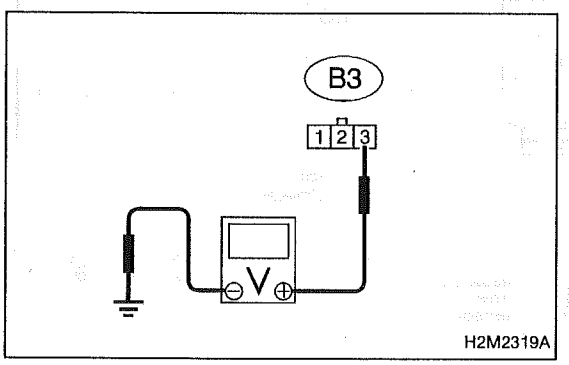
1. CHECK INPUT SIGNAL FOR ECM.

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

Connector & terminal / Specified voltage:
(B136) No. 6 — Body / 0.26 V

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

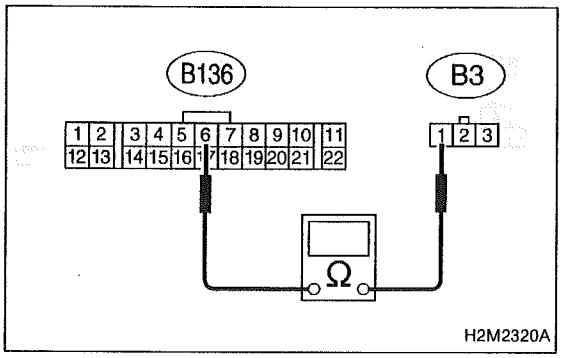
Connector & terminal / Specified voltage:
(B136) No. 6 — Body / 1.1 ± 0.3 V



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.

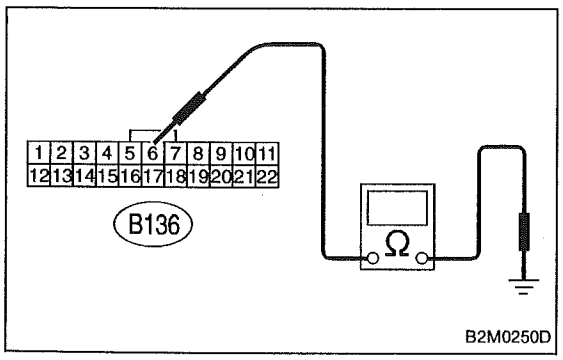
Connector & terminal / Specified voltage:
(B3) No. 3 — Body / More than 10 V



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

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

Connector & terminal / Specified resistance:
(B136) No. 6 — (B3) No. 1 / Less than 1 Ω



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

Connector & terminal / Specified resistance:
(B136) No. 6 — Body / More than 1 MΩ

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:

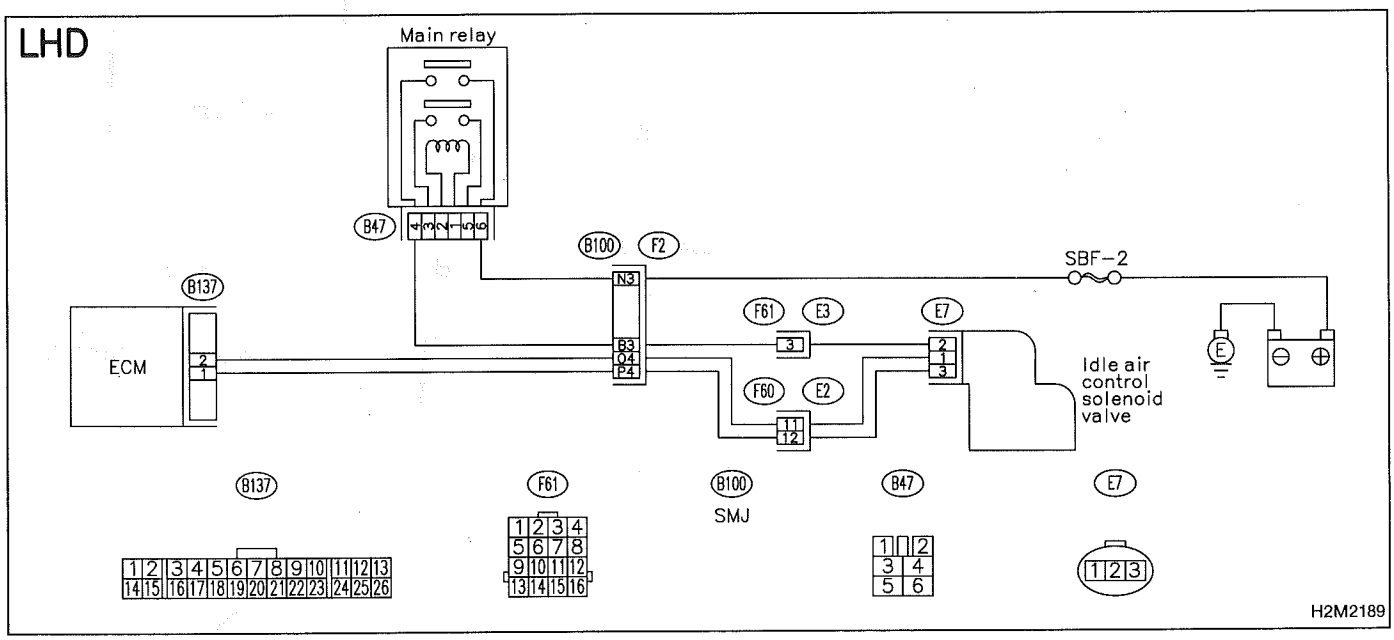
- Erroneous idling
- Engine stalls.
- Engine breathing

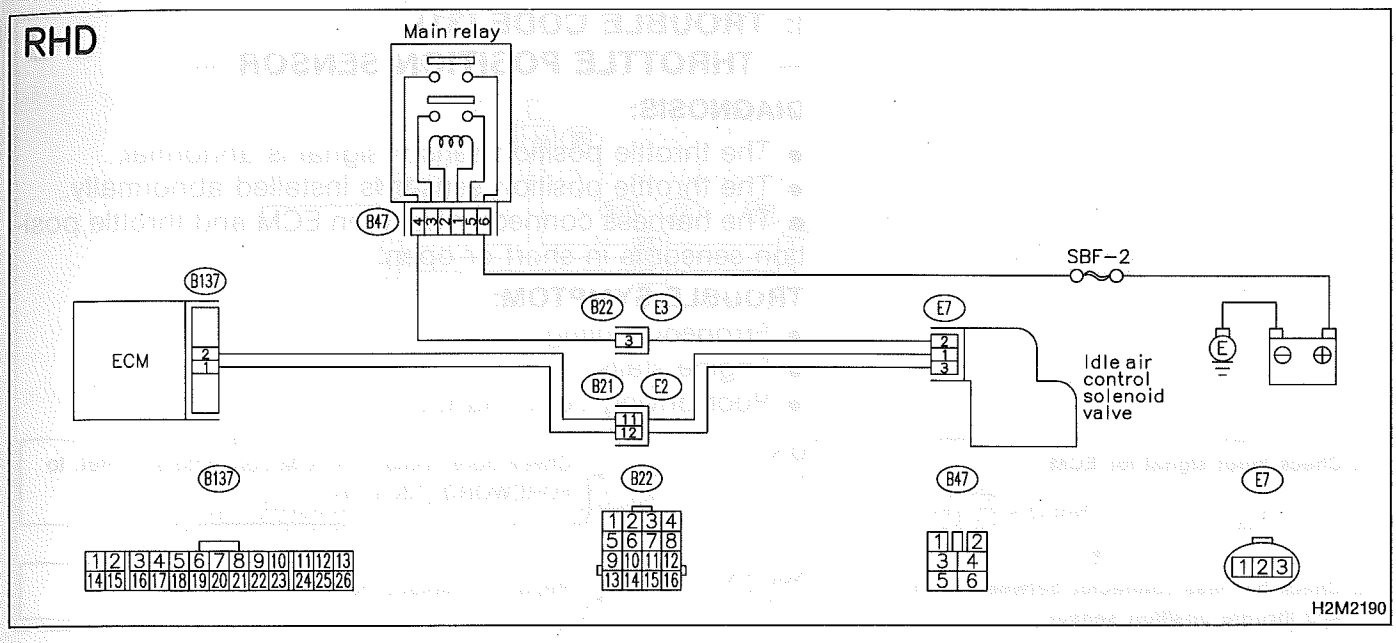
1. Check input signal for ECM.
- O.K. → Check poor contact in ECM connectors. <Ref. to FOREWORD [T3C1].>
- Not O.K. ↓

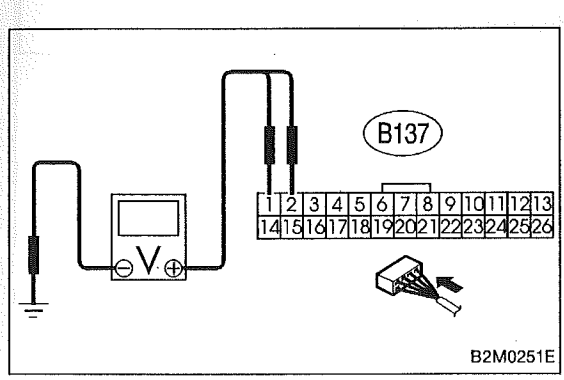
2. Check idle air control solenoid valve.
- Not O.K. → Replace idle air control solenoid valve.
- O.K. ↓

3. Check power supply line to idle air control solenoid valve.
- Not O.K. → Repair or replace harness connector.
- O.K. ↓

Repair or replace harness connector between ECM and idle air control solenoid valve.



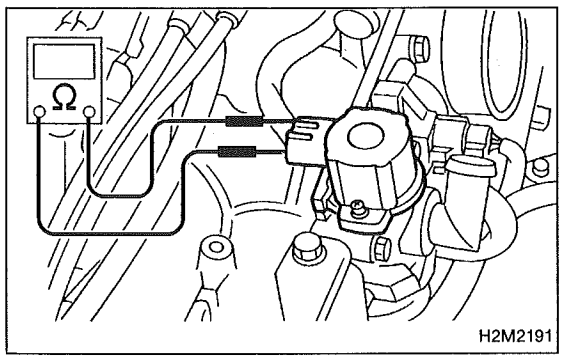




1. CHECK INPUT SIGNAL FOR ECM.

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

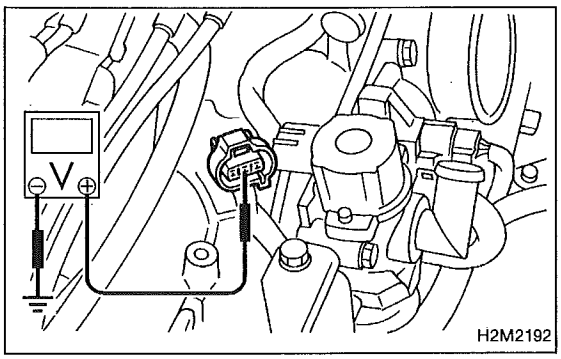
Connector & terminal / Specified voltage:
(B137) No. 1 — Body / More than 10 V
(B137) No. 2 — Body / More than 10 V



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 / 9.5±1.5 Ω
No. 3 — No. 2 / 9.5±1.5 Ω



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

1) Turn ignition switch to ON.
2) Measure power supply voltage idle air control solenoid valve.

Connector & terminal / Specified voltage:
(E7) No. 2 — Body / More than 10 V

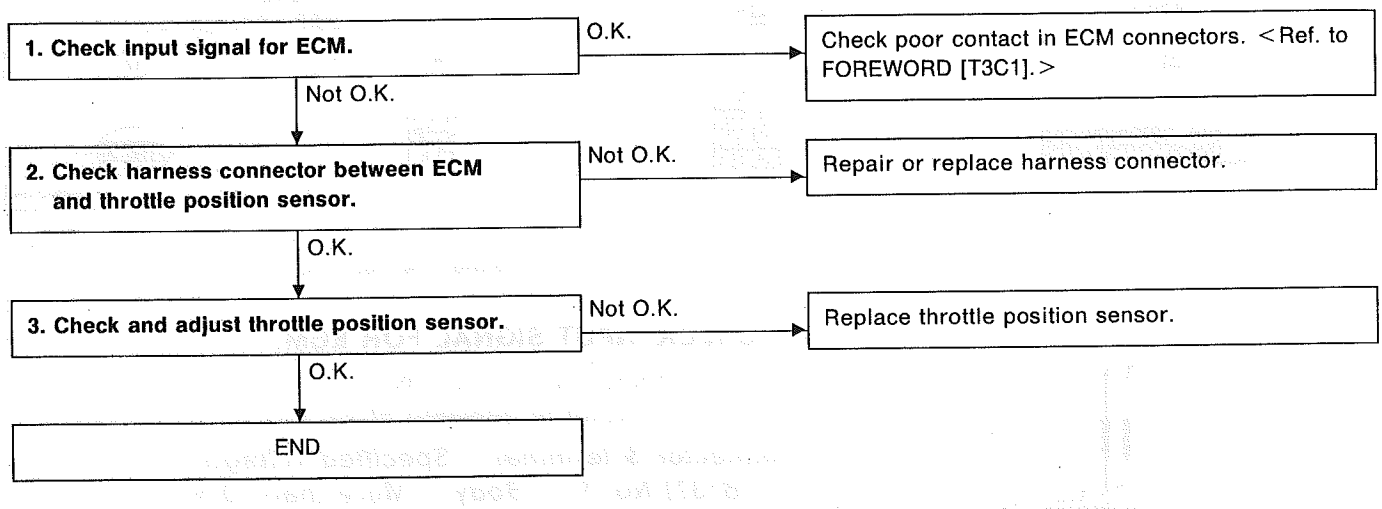
I: TROUBLE CODE (31)
— THROTTLE POSITION SENSOR —

DIAGNOSIS:

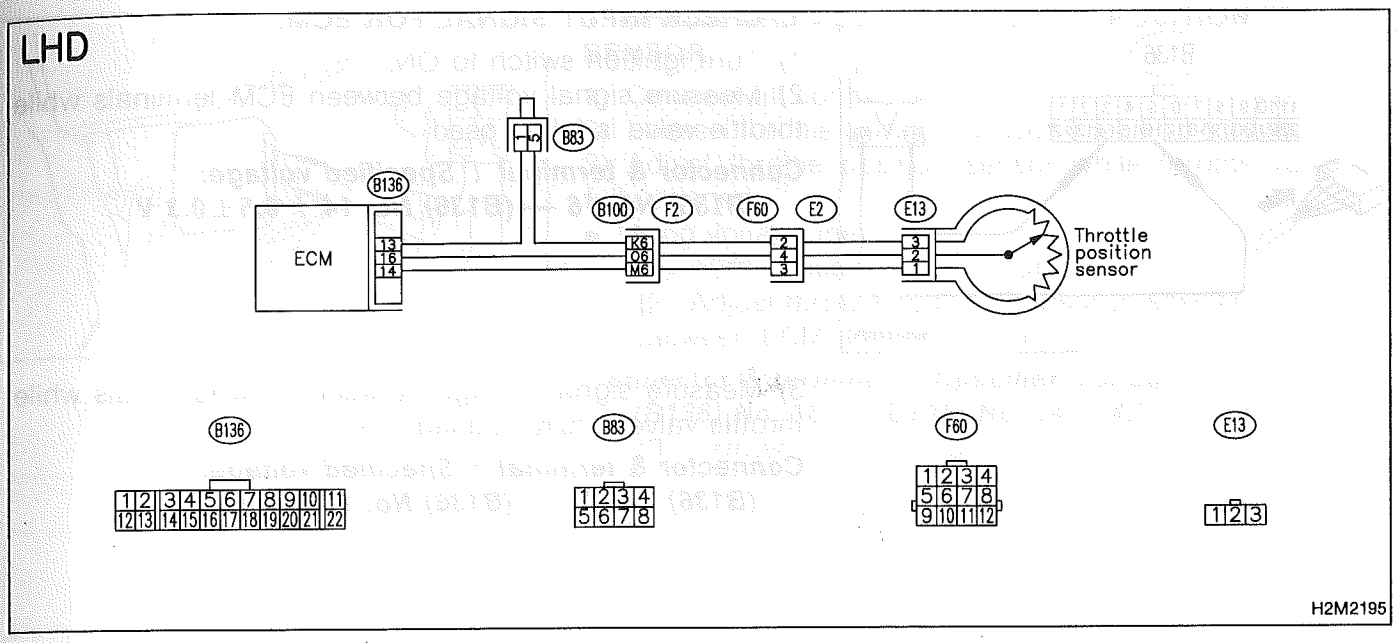
- The throttle position sensor signal is abnormal.
- The throttle position sensor is installed abnormally.
- The harness connector between ECM and throttle position sensor is in short or open.

TROUBLE SYMPTOM:

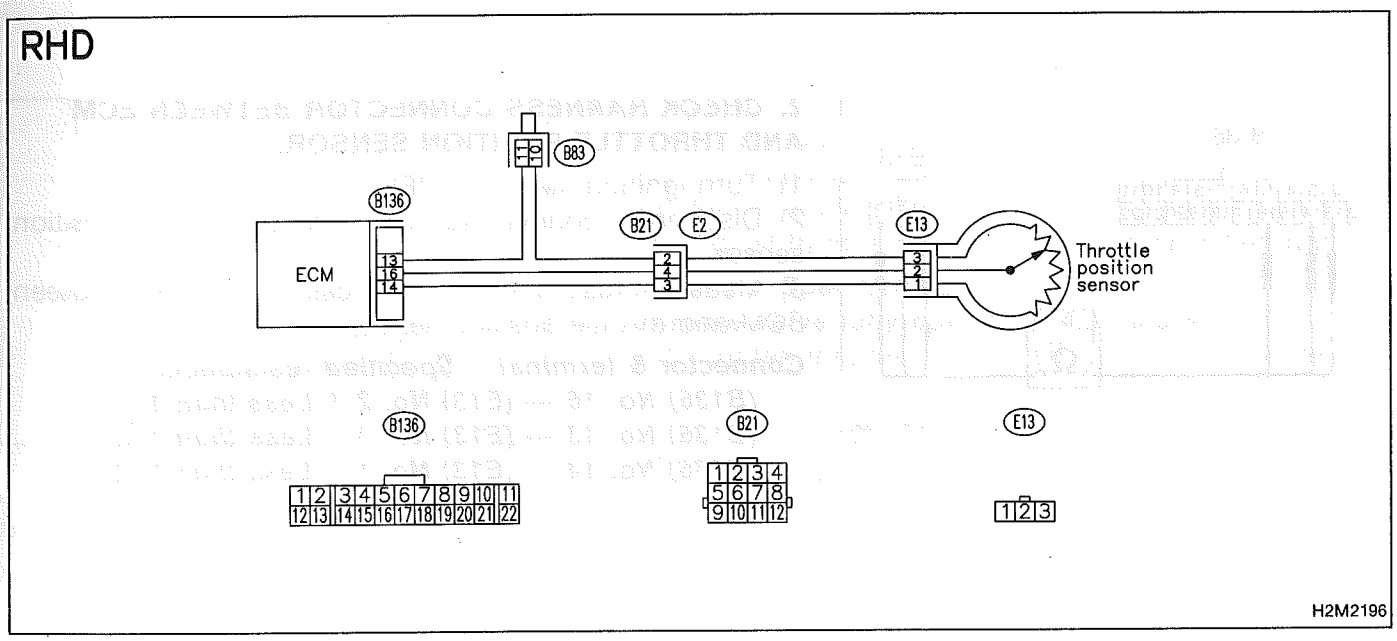
- Erroneous idling
- Engine stalls.
- Poor driving performance

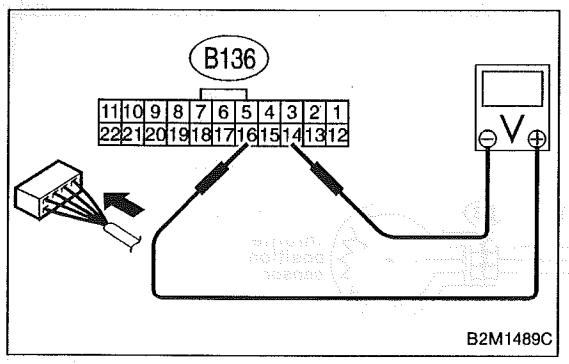


LHD


B83
B136
ECM
13
16
14
B100
F2
K6
O6
M6
F60
E2
2
4
3
E13
3
2
1
Throttle position sensor
B136
1 2 3 4 5 6 7 8 9 10 11
12 13 14 15 16 17 18 19 20 21 22
B83
1 2 3 4
5 6 7 8
F60
1 2 3 4
5 6 7 8
9 10 11 12
E13
1 2 3
H2M2195

RHD


B83
B136
ECM
13
16
14
B21
E2
2
4
3
E13
3
2
1
Throttle position sensor
B136
1 2 3 4 5 6 7 8 9 10 11
12 13 14 15 16 17 18 19 20 21 22
B21
1 2 3 4
5 6 7 8
9 10 11 12
E13
1 2 3
H2M2196



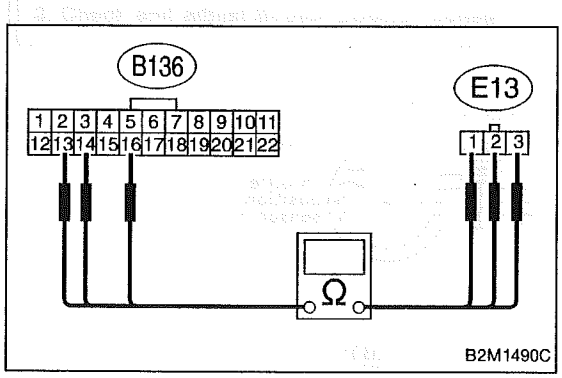
1. CHECK INPUT SIGNAL FOR ECM.

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

Connector & terminal / Specified voltage:
(B136) No. 16 — (B136) No. 14 / 0.5±0.3 V

3) Measure signal voltage between ECM terminals while throttle valve is fully opened.

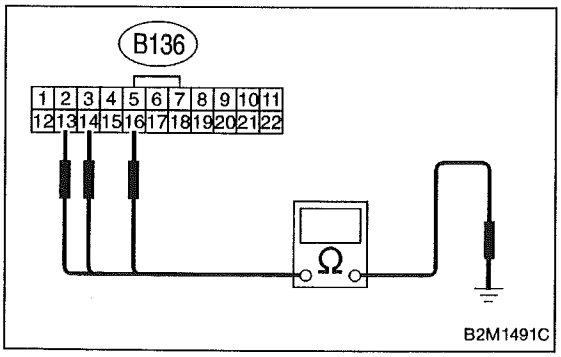
Connector & terminal / Specified voltage:
(B136) No. 16 — (B136) No. 14 / 4.3±0.3 V



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

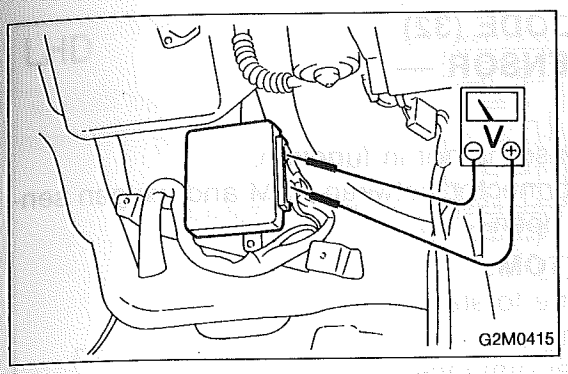
1) Turn ignition switch to OFF.
2) Disconnect connectors from ECM and throttle position sensor.
3) Measure resistance of harness connector between ECM and throttle position sensor.

Connector & terminal / Specified resistance:
(B136) No. 16 — (E13) No. 2 / Less than 1 Ω
(B136) No. 13 — (E13) No. 3 / Less than 1 Ω
(B136) No. 14 — (E13) No. 1 / Less than 1 Ω



4) Disconnect connectors from TCM. (AT vehicle only)
5) Measure resistance of harness connector between ECM and body to make sure that circuit does not short.

Connector & terminal / Specified resistance:
(B136) No. 16 — Body / More than 1 MΩ
(B136) No. 13 — Body / More than 1 MΩ
(B136) No. 14 — Body / More than 1 MΩ

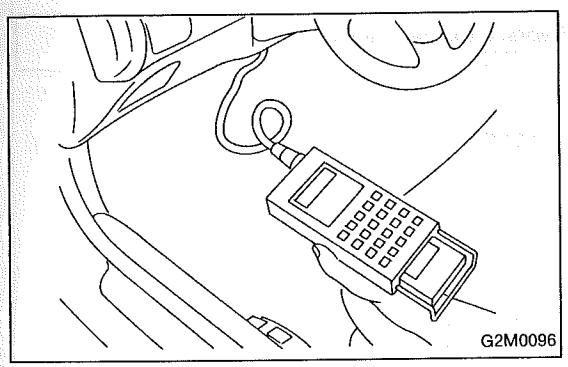


3. CHECK AND ADJUST THROTTLE POSITION SENSOR.

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

- 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:
(B136) No. 16 — (B136) No. 14 / 4.3±0.3 V
(3) Tighten throttle position sensor installing screws.



- Using select monitor:
  (1) Attach select monitor.
  (2) Turn ignition switch to ON.
  (3) Select mode "F07".
  (4) Adjust throttle position sensor to specified data.

Conditions / Specified data:
Throttle valve fully opened / 4.3±0.3 V
(5) Tighten throttle position sensor installing screws.

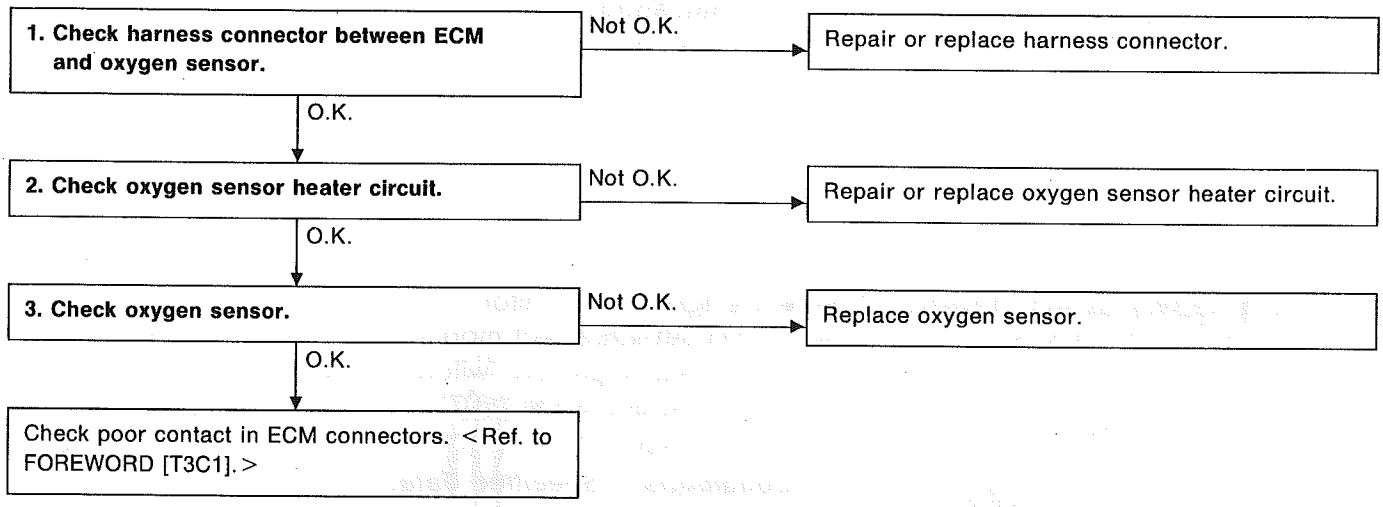
J: TROUBLE CODE (32)
— OXYGEN SENSOR —

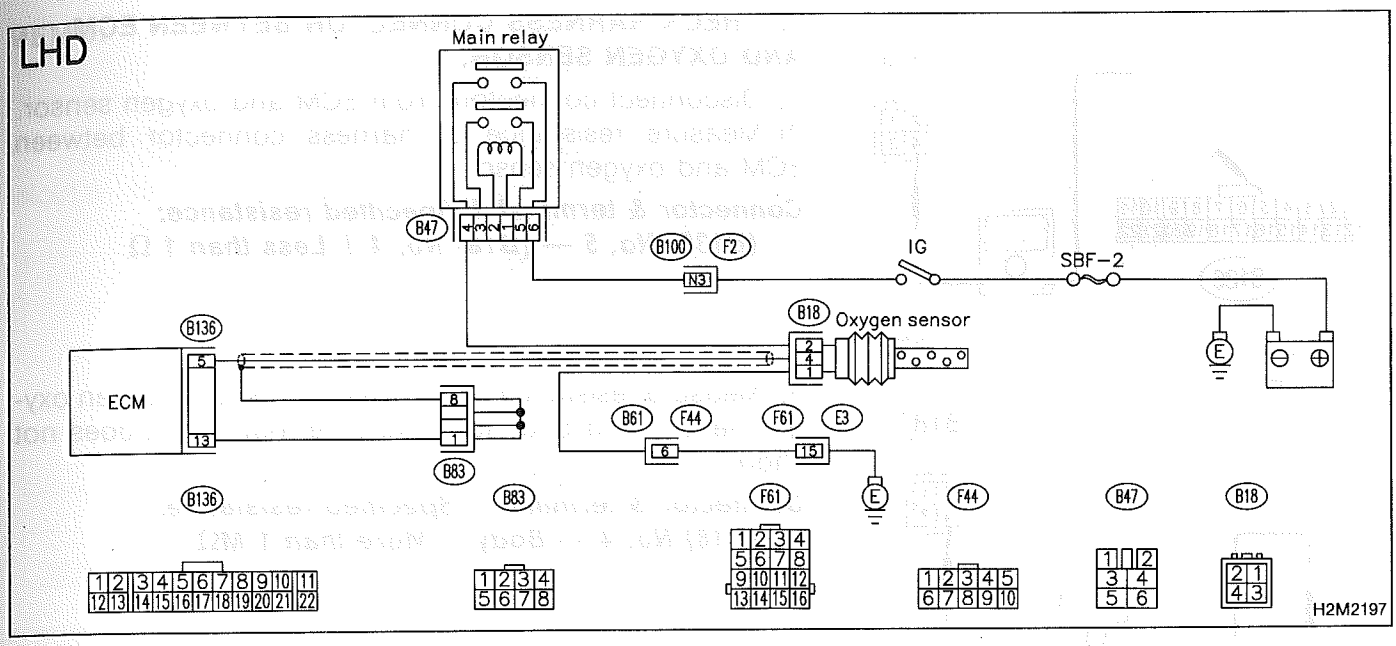
DIAGNOSIS:

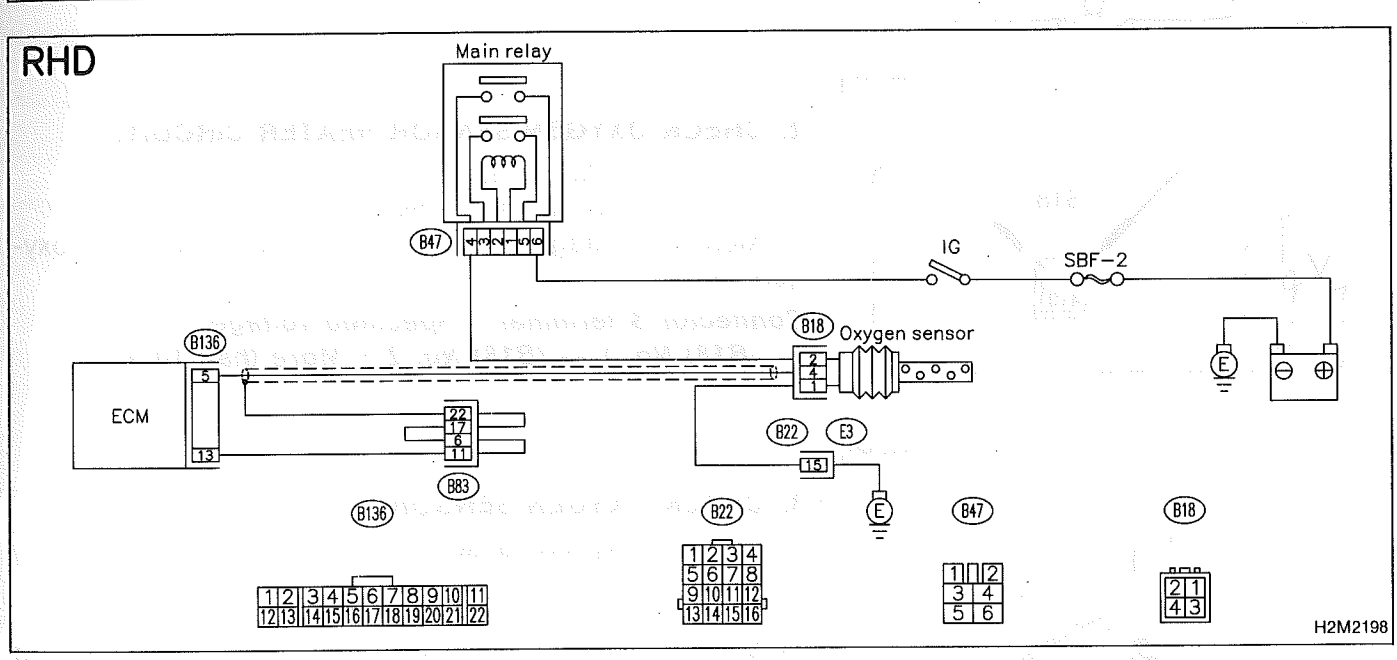
- The oxygen sensor is not in function.
- The harness connector between ECM and oxygen sensor is in short or open.

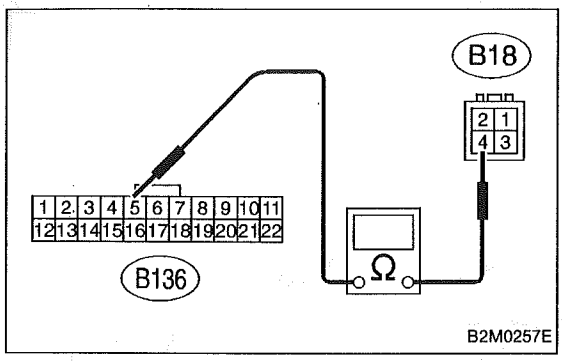
TROUBLE SYMPTOM:

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




LHD
Main relay
B47
B100
F2
N3
IG
SBF−2
B18
Oxygen sensor
B136
ECM
B61
F44
F61
E3
B83
H2M2197

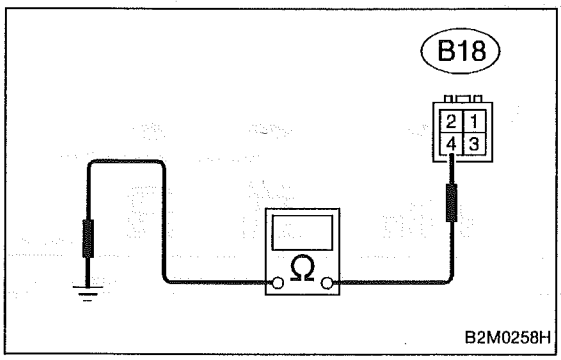

RHD
Main relay
B47
IG
SBF−2
B18
Oxygen sensor
B136
ECM
B22
E3
B83
H2M2198



1. CHECK HARNESS CONNECTOR BETWEEN ECM AND OXYGEN SENSOR.

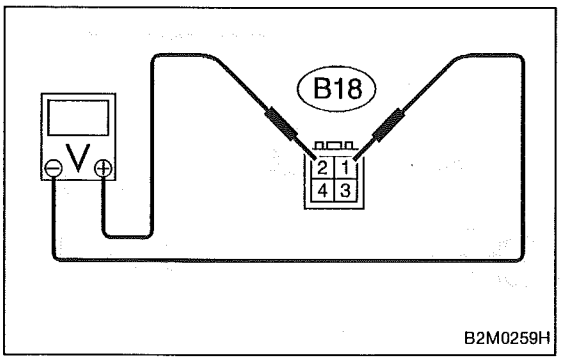
1) Disconnect connectors from ECM and oxygen sensor.
2) Measure resistance of harness connector between ECM and oxygen sensor.

Connector & terminal / Specified resistance:
(B136) No. 5 — (B18) No. 4 / Less than 1 Ω



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

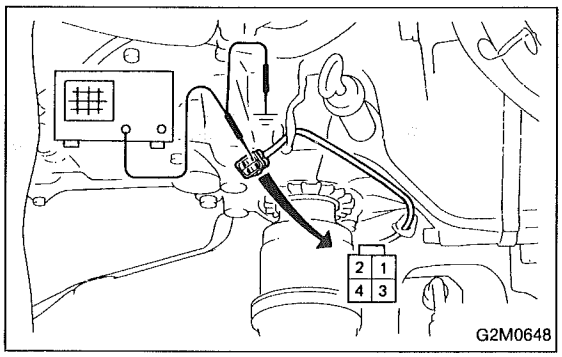
Connector & terminal / Specified resistance:
(B18) No. 4 — Body / More than 1 MΩ



2. CHECK OXYGEN SENSOR HEATER CIRCUIT.

1) Connect ECM connectors.
2) Turn ignition switch to ON.
3) Measure voltage between connector terminals of oxygen sensor.

Connector & terminal / Specified voltage:
(B18) No. 1 — (B18) No. 2 / More than 10 V



3. CHECK OXYGEN SENSOR.

1) Connect oxygen sensor.
2) Idle engine.
3) Disconnect oxygen sensor connector.
4) Measure voltage between oxygen sensor terminal and body by using oscilloscope.

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