

ENGINE SECTION 1

This service manual has been prepared to provide SUBARU service personnel with the necessary information and data for the correct maintenance and repair of SUBARU vehicles.

This manual includes the procedures for maintenance, disassembling, reassembling, inspection and adjustment of components and diagnostics for guidance of experienced mechanics.

Please peruse and utilize this manual fully to ensure complete repair work for satisfying our customers by keeping their vehicle in optimum condition. When replacement of parts during repair work is needed, be sure to use SUBARU genuine parts.

All information, illustration and specifications contained in this manual are based on the latest product information available at the time of publication approval.

FUEL INJECTION (FUEL SYSTEMS) FU(H4SO 2.0)

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES) EC(H4SO 2.0)

INTAKE (INDUCTION) IN(H4SO 2.0)

MECHANICAL ME(H4SO 2.0)

EXHAUST EX(H4SO 2.0)

COOLING CO(H4SO 2.0)

LUBRICATION LU(H4SO 2.0)

SPEED CONTROL SYSTEMS SP(H4SO 2.0)

IGNITION IG(H4SO 2.0)

STARTING/CHARGING SYSTEMS SC(H4SO 2.0)

**ENGINE (DIAGNOSTICS) EN(H4SO 2.0)
(diag)**

FUEL INJECTION (FUEL SYSTEMS) FU(H4SO 2.5)

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES) EC(H4SO 2.5)

INTAKE (INDUCTION) IN(H4SO 2.5)

MECHANICAL ME(H4SO 2.5)

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ENGINE SECTION 1

LUBRICATION LU(H4SO 2.5)

SPEED CONTROL SYSTEMS SP(H4SO 2.5)

IGNITION IG(H4SO 2.5)

STARTING/CHARGING SYSTEMS SC(H4SO 2.5)

ENGINE (DIAGNOSTICS) EN(H4SO 2.5)
(diag)

ENGINE (DIAGNOSTICS)

EN(H4SO 2.5)(diag)

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Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

18. Diagnostic Procedure with Diagnostic Trouble Code (DTC)

A: DTC P0030 HO2S HEATER CONTROL CIRCUIT (BANK 1 SENSOR 1)

DTC DETECTING CONDITION:

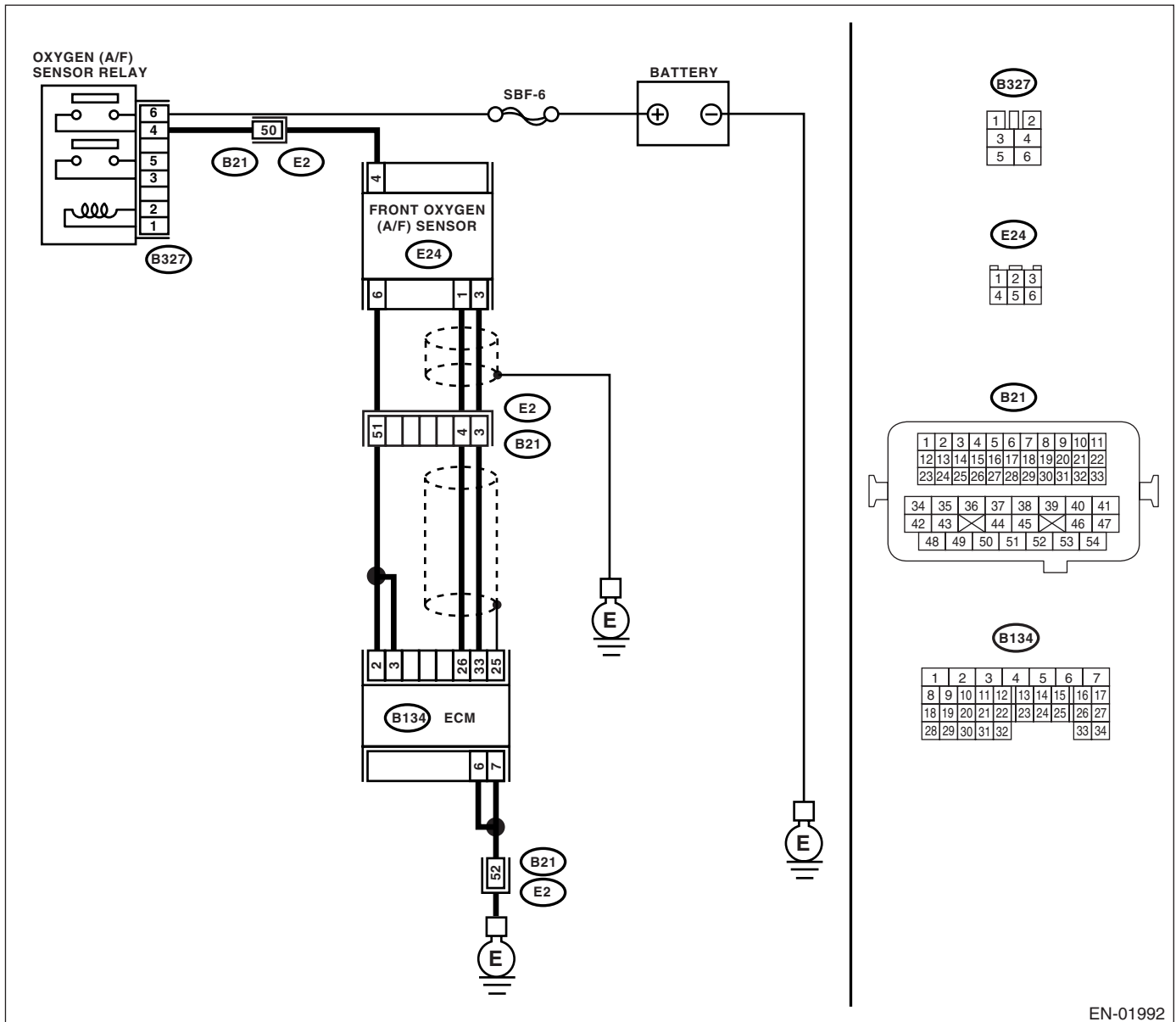
Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



EN-01992

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1	CHECK OPTION CODE. Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2	CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR. 1) Start and warm-up the engine. 2) Turn the ignition switch to OFF. 3) Disconnect the connectors from ECM and front oxygen (A/F) sensor. 4) Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector. Connector & terminal (B134) No. 2 — (E24) No. 6: (B134) No. 3 — (E24) No. 6:	Go to step 3.	Repair the open circuit in harness between ECM and front oxygen (A/F) sensor connector.
3	CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR. Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector. Connector & terminal (B134) No. 26 — (E24) No. 1: (B134) No. 33 — (E24) No. 3:	Go to step 4.	Repair the open circuit in harness between ECM and front oxygen (A/F) sensor connector.
4	CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR. Measure the resistance of harness between main relay and front oxygen (A/F) sensor connector. Connector & terminal (B327) No. 4 — (E24) No. 4:	Go to step 5.	Repair the open circuit in harness between ECM and front oxygen (A/F) sensor connector.
5	CHECK FRONT OXYGEN (A/F) SENSOR. Measure the resistance between front oxygen (A/F) sensor connector terminals. Terminals No. 4 — No. 6:	Go to step 6.	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4SO 2.5)-34, Front Oxygen (A/F) Sensor.>
6	CHECK POOR CONTACT. Check the poor contact in ECM and front oxygen (A/F) sensor connector.	Repair the poor contact in ECM or front oxygen (A/F) sensor connector.	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4SO 2.5)-34, Front Oxygen (A/F) Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

B: DTC P0031 HO2S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 1)

DTC DETECTING CONDITION:

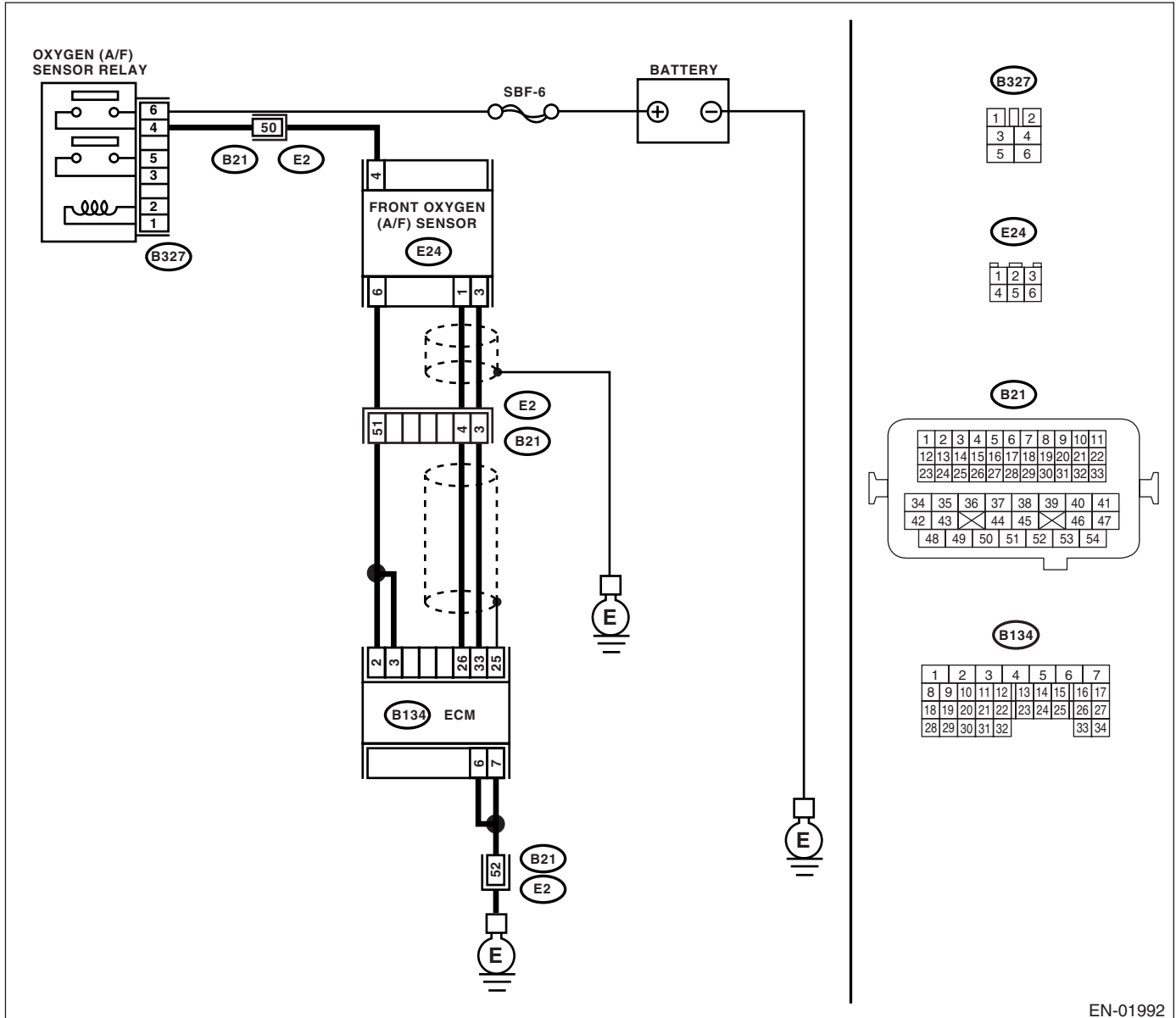
Immediately at fault recognition.

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1	CHECK OPTION CODE. Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2	CHECK ANY OTHER DTC ON DISPLAY. Do DTC P0031 and P0037 appear at the same time on the Subaru Select Monitor?	Go to step 3.	Go to step 6.
3	CHECK POWER SUPPLY TO FRONT OXYGEN (A/F) SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from front oxygen (A/F) sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between front oxygen (A/F) sensor connector and engine ground. Connector & terminal (E24) No. 4 (+) — Engine ground (-):	Go to step 4.	Repair the power supply line. NOTE: In this case, repair the following: <ul style="list-style-type: none"> • Open circuit in harness between main relay and front oxygen (A/F) sensor connector • Poor contact in front oxygen (A/F) sensor connector • Poor contact in main relay connector
4	CHECK GROUND CIRCUIT FOR ECM. Measure the resistance of harness between ECM connector and chassis ground. Connector & terminal (B134) No. 6 — Chassis ground: (B134) No. 7 — Chassis ground:	Go to step 5.	Repair the harness and connector. NOTE: In this case, repair the following: <ul style="list-style-type: none"> • Open circuit in harness between ECM and engine ground terminal • Poor contact in ECM connector. • Poor contact in coupling connector
5	CHECK CURRENT DATA. 1) Start the engine. 2) Read the data of front oxygen (A/F) sensor heater current using Subaru Select Monitor. NOTE: For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO 2.5)(diag)-26, Subaru Select Monitor.>	Repair the poor contact connector. NOTE: In this case, repair the following: <ul style="list-style-type: none"> • Poor contact in front oxygen (A/F) sensor connector • Poor contact in ECM connector. 	Go to step 6.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
6 CHECK INPUT SIGNAL FROM ECM. 1) Start and idle the engine. 2) Measure the voltage between ECM connector and chassis ground. Connector & terminal (B134) No. 2 (+) — Chassis ground (-): (B134) No. 3 (+) — Chassis ground (-):	Is the voltage less than 1 V?	Go to step 8.	Go to step 7.
7 CHECK OUTPUT SIGNAL FROM ECM. Measure the voltage between ECM connector and chassis ground. Connector & terminal (B134) No. 2 (+) — Chassis ground (-): (B134) No. 3 (+) — Chassis ground (-):	Does the voltage change by shaking the ECM harness and connector while monitoring the value of voltage meter?	Repair the poor contact in ECM connector.	Go to step 8.
8 CHECK FRONT OXYGEN (A/F) SENSOR. 1) Turn the ignition switch to OFF. 2) Measure the resistance between front oxygen (A/F) sensor connector terminals. Terminals No. 4 — No. 6:	Is the resistance less than 10 Ω ?	Repair the harness and connector. NOTE: In this case, repair the following: <ul style="list-style-type: none"> • Open or ground short circuit in harness between front oxygen (A/F) sensor and ECM connector • Poor contact in front oxygen (A/F) sensor connector • Poor contact in ECM connector 	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4SO 2.5)-34, Front Oxygen (A/F) Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

C: DTC P0032 HO2S HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 1)

DTC DETECTING CONDITION:

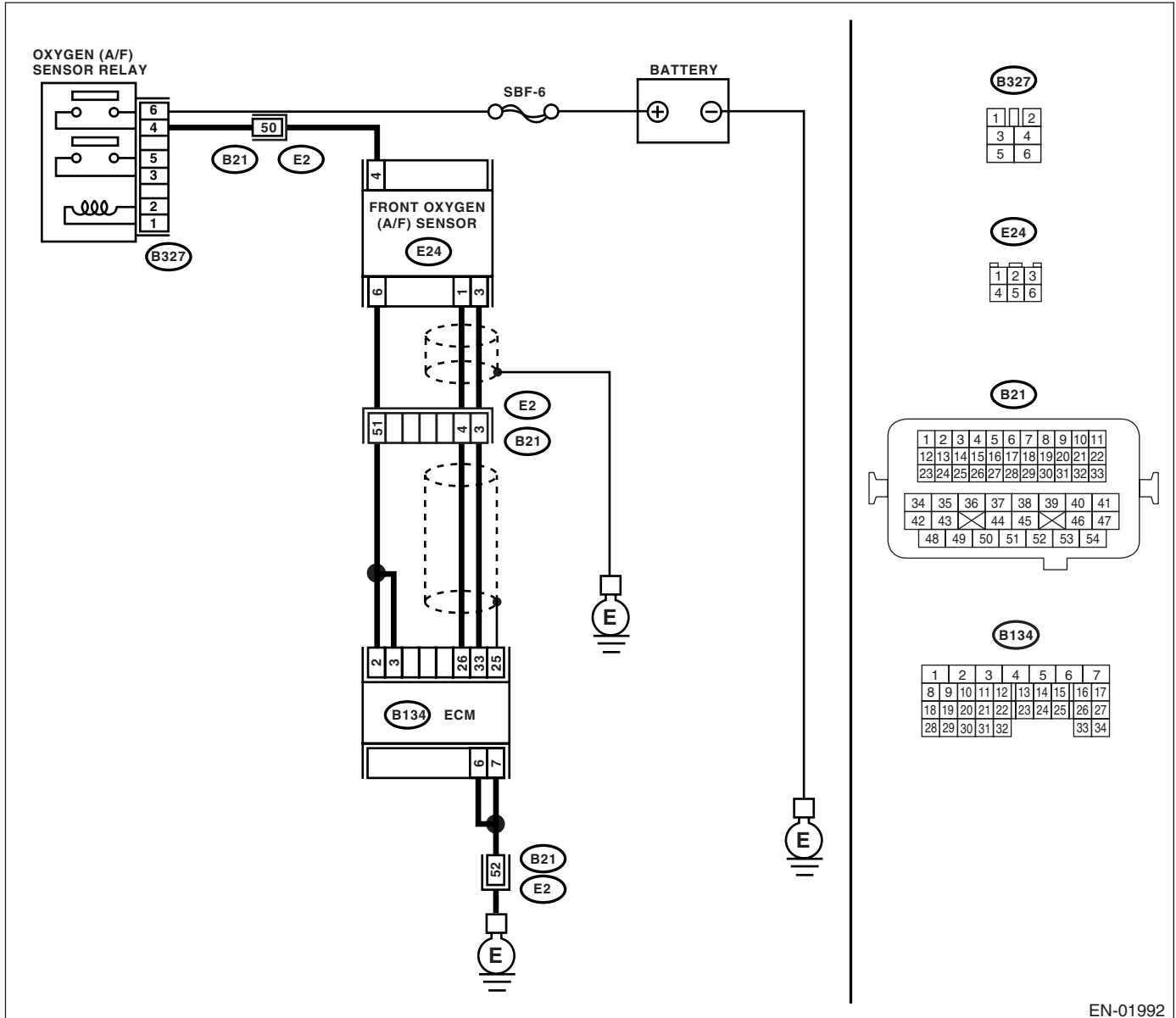
Immediately at fault recognition.

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK OUTPUT SIGNAL FROM ECM. 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM connector and chassis ground. Connector & terminal (B134) No. 2 (+) — Chassis ground (-): (B134) No. 3 (+) — Chassis ground (-):	Is the voltage more than 8 V?	Go to step 3.	Go to step 4.
3 CHECK FRONT OXYGEN (A/F) SENSOR HEATER CURRENT. 1) Turn the ignition switch to OFF. 2) Repair the battery short circuit in harness between ECM and front oxygen (A/F) sensor connector. 3) Turn the ignition switch to ON. 4) Read the data of front oxygen (A/F) sensor heater current using Subaru Select Monitor. NOTE: For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO 2.5)(diag)-26, Subaru Select Monitor.>	Is the current more than 2.3 A?	Replace the ECM. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>	END.
4 CHECK OUTPUT SIGNAL FROM ECM. Measure the voltage between ECM connector and chassis ground. Connector & terminal (B134) No. 2 (+) — Chassis ground (-): (B134) No. 3 (+) — Chassis ground (-):	Does the voltage change by shaking the ECM harness and connector?	Repair the battery short circuit in harness between ECM and front oxygen (A/F) sensor connector.	END.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

D: DTC P0037 HO2S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 2)

DTC DETECTING CONDITION:

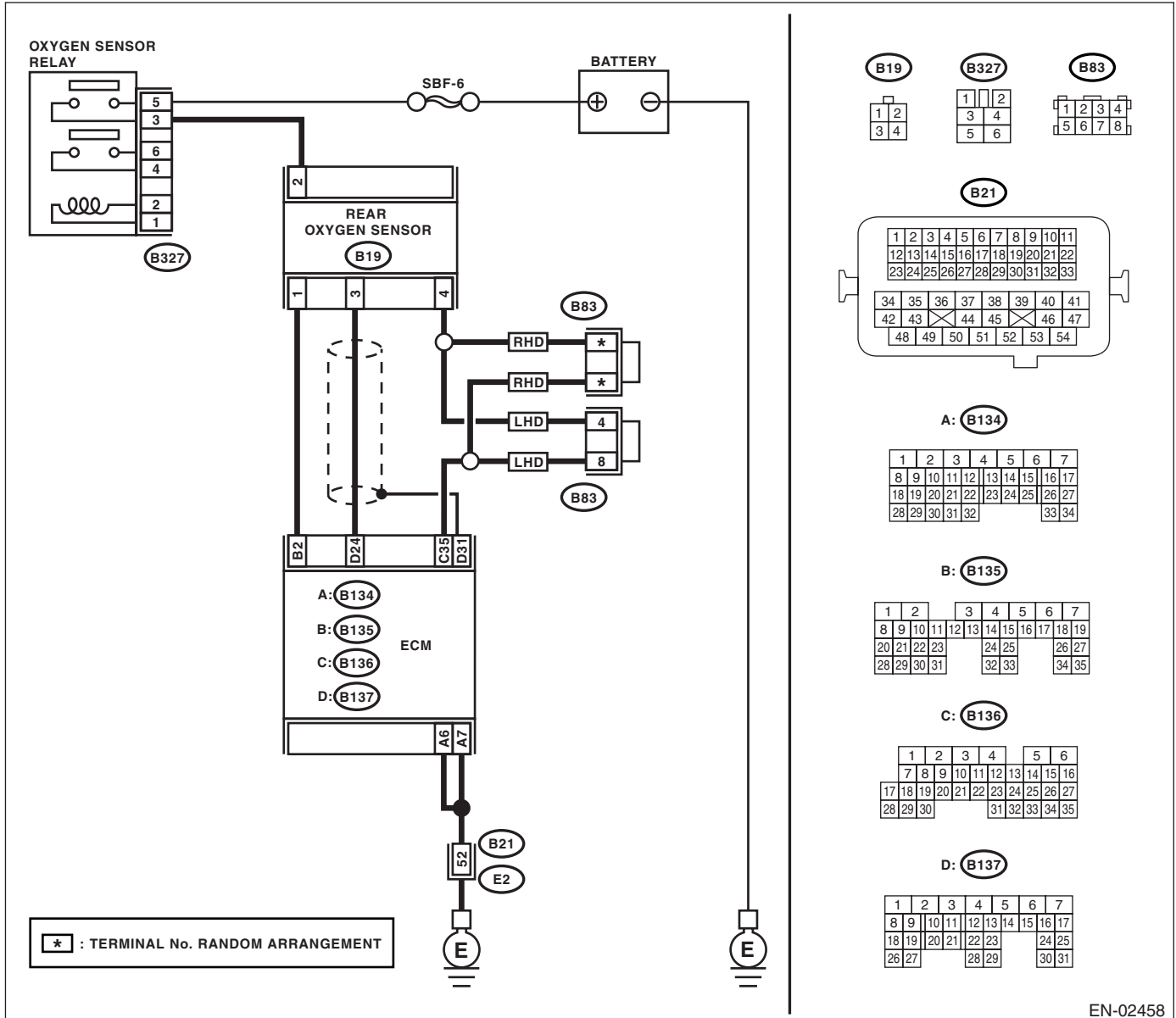
Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK GROUND CIRCUIT OF ECM. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance of harness between ECM connector and chassis ground. Connector & terminal (B134) No. 6 — Chassis ground: (B134) No. 7 — Chassis ground:	Is the resistance less than 5 Ω ?	Go to step 3.	Repair the harness and connector. NOTE: In this case, repair the following: <ul style="list-style-type: none"> • Open circuit in harness between ECM and engine ground terminal • Poor contact in ECM connector • Poor contact in coupling connector
3 CHECK CURRENT DATA. 1) Start the engine. 2) Read the data of rear oxygen sensor heater current using Subaru Select Monitor. NOTE: For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO 2.5)(diag)-26, Subaru Select Monitor.>	Is the current more than 0.2 A?	Repair the connector. NOTE: In this case, repair the following: <ul style="list-style-type: none"> • Poor contact in rear oxygen sensor connector • Poor contact in rear oxygen sensor connecting harness connector • Poor contact in ECM connector 	Go to step 4.
4 CHECK OUTPUT SIGNAL FROM ECM. 1) Start and idle the engine. 2) Measure the voltage between ECM connector and chassis ground. Connector & terminal (B135) No. 2 (+) — Chassis ground (-):	Is the voltage less than 1 V?	Go to step 7.	Go to step 5.
5 CHECK OUTPUT SIGNAL FROM ECM. Measure the voltage between ECM connector and chassis ground. Connector & terminal (B135) No. 2 (+) — Chassis ground (-):	Does the voltage change by shaking the ECM harness and connector while monitoring the value of voltage meter?	Repair the poor contact in ECM connector.	Go to step 6.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>6 CHECK OUTPUT SIGNAL FROM ECM. 1) Disconnect the connector from rear oxygen sensor. 2) Measure the voltage between ECM connector and chassis ground. Connector & terminal (B135) No. 2 (+) — Chassis ground (-):</p>	Is the voltage less than 1 V?	Replace the ECM. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>	Repair the battery short circuit in harness between ECM and rear oxygen sensor connector. After repair, replace the ECM. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>
<p>7 CHECK POWER SUPPLY TO REAR OXYGEN SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from rear oxygen sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between rear oxygen sensor connector and chassis ground. Connector & terminal (B19) No. 2 (+) — Chassis ground (-):</p>	Is the voltage more than 10 V?	Go to step 8.	Repair the power supply line. NOTE: In this case, repair the following: <ul style="list-style-type: none"> • Open circuit in harness between main relay and rear oxygen sensor connector • Poor contact in rear oxygen sensor connector • Poor contact in coupling connector
<p>8 CHECK REAR OXYGEN SENSOR. 1) Turn the ignition switch to OFF. 2) Measure the resistance between rear oxygen (A/F) sensor connector terminals. Terminals No. 1 — No. 2:</p>	Is the resistance less than 30 Ω?	Repair the harness and connector. NOTE: In this case, repair the following: <ul style="list-style-type: none"> • Open circuit in harness between rear oxygen sensor and ECM connector • Poor contact in rear oxygen sensor connector • Poor contact in ECM connector • Poor contact in coupling connector 	Replace the rear oxygen sensor. <Ref. to FU(H4SO 2.5)-35, Rear Oxygen Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

E: DTC P0038 HO2S HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 2)

DTC DETECTING CONDITION:

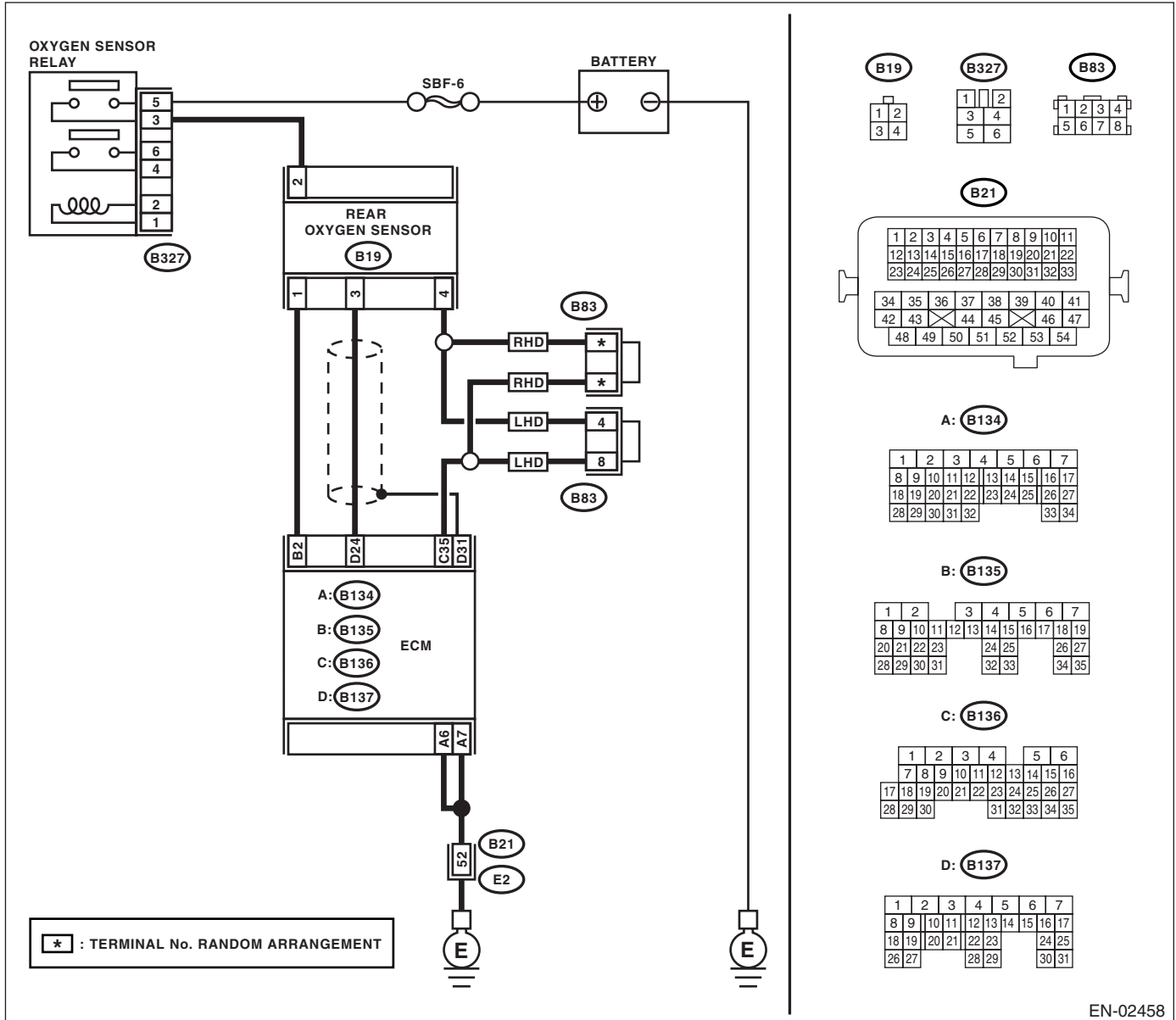
Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK INPUT SIGNAL FROM ECM. Measure the voltage between ECM connector and chassis ground. Connector & terminal (B135) No. 2 (+) — Chassis ground (-):	Is the voltage more than 8 V?	Go to step 3.	Go to step 4.
3 CHECK CURRENT DATA. 1) Turn the ignition switch to OFF. 2) Repair the battery short circuit in harness between ECM and rear oxygen sensor connector. 3) Turn the ignition switch to ON. 4) Read the data of rear oxygen sensor heater current using Subaru Select Monitor. NOTE: For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO 2.5)(diag)-26, Subaru Select Monitor.>	Is the current more than 7 A?	Replace the ECM. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>	END.
4 CHECK POOR CONTACT. Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	END.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

F: DTC P0102 MASS OR VOLUME AIR FLOW CIRCUIT LOW INPUT

DTC DETECTING CONDITION:

Immediately at fault recognition.

TROUBLE SYMPTOM:

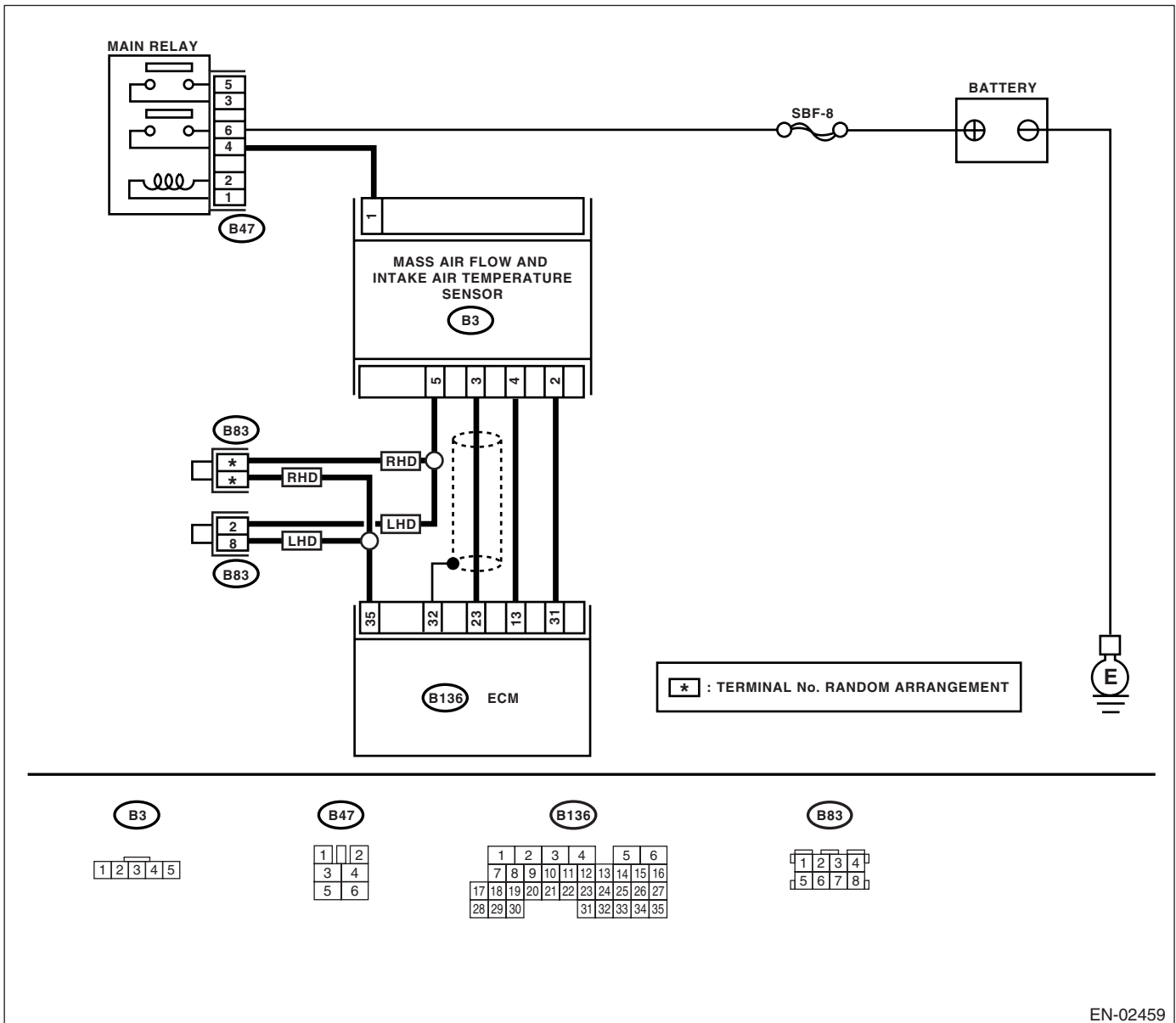
- Erroneous idling
- Engine stalls.
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



EN-02459

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 READ THE DATA CONNECTING SUBARU SELECT MONITOR. 1) Turn the ignition switch to OFF. 2) Connect the Subaru Select Monitor to data link connector. 3) Turn the ignition switch to ON, and the Subaru Select Monitor switch to ON. 4) Start the engine. 5) Read the voltage of mass air flow sensor using Subaru Select Monitor. NOTE: For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to EN(H4SO 2.5)(diag)-26, Subaru Select Monitor.>	Is the voltage 0.2 — 4.7 V?	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the mass air flow sensor. NOTE: In this case, repair the following: <ul style="list-style-type: none"> • Open or ground short circuit in harness between mass air flow sensor and ECM connector • Poor contact in mass air flow sensor or ECM connector 	Go to step 3.
3 CHECK INPUT SIGNAL OF ECM. Measure the voltage between ECM connector and chassis ground while engine is idling. <i>Connector & terminal</i> <i>(B136) No. 23 (+) — Chassis ground (-):</i>	Is the voltage more than 0.2 V?	Go to step 5.	Go to step 4.
4 CHECK INPUT SIGNAL FOR ECM (USING SUBARU SELECT MONITOR). Measure the voltage between ECM connector and chassis ground while engine is idling.	Does the voltage change by shaking the harness and connector of ECM while monitoring the value with Subaru Select Monitor?	Repair the poor contact in ECM connector.	Replace the ECM. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>
5 CHECK POWER SUPPLY TO MASS AIR FLOW SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from mass air flow sensor. 3) Turn the ignition switch to ON. 4) Measure voltage between mass air flow sensor connector and chassis ground. <i>Connector & terminal</i> <i>(B3) No. 1 (+) — Chassis ground (-):</i>	Is the voltage more than 5 V?	Go to step 6.	Repair the open circuit between mass air flow sensor and main relay

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
6 CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance of harness between ECM and mass air flow sensor connector. <i>Connector & terminal</i> (B136) No. 23 — (B3) No. 3: (B136) No. 31 — (B3) No. 2: (B136) No. 35 — (B3) No. 5:	Is the resistance less than 1 Ω ?	Go to step 7.	Repair the open circuit between ECM and mass air flow sensor connector.
7 CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW SENSOR CONNECTOR. Measure the resistance of harness between ECM and chassis ground. <i>Connector & terminal</i> (B136) No. 23 — Chassis ground: (B136) No. 31 — Chassis ground: (B136) No. 35 — Chassis ground:	Is the resistance more than 1 M Ω ?	Go to step 8.	Repair the ground short circuit between ECM and mass air flow sensor connector.
8 CHECK POOR CONTACT. Check poor contact in mass air flow sensor connector.	Is there poor contact in mass air flow sensor connector?	Repair the poor contact in mass air flow sensor connector.	Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4SO 2.5)-26, Mass Air Flow and Intake Air Temperature Sensor.>

G: DTC P0103 MASS OR VOLUME AIR FLOW CIRCUIT HIGH INPUT

DTC DETECTING CONDITION:

Immediately at fault recognition.

TROUBLE SYMPTOM:

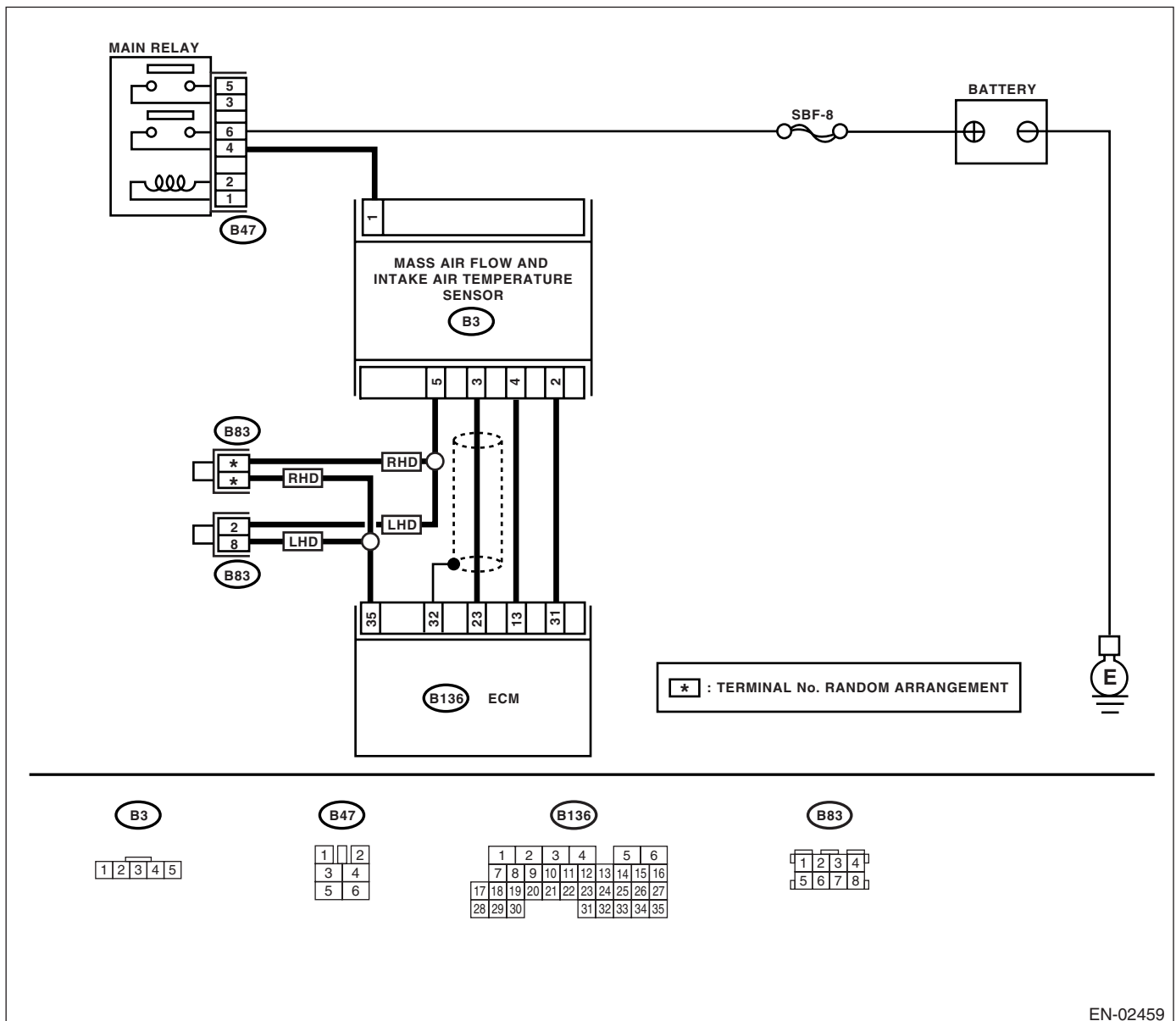
- Erroneous idling
- Engine stalls.
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 READ THE DATA CONNECTING SUBARU SELECT MONITOR. 1) Turn the ignition switch to OFF. 2) Connect the Subaru Select Monitor to data link connector. 3) Turn the ignition switch to ON, and the Subaru Select Monitor switch to ON. 4) Start the engine. 5) Read the voltage of mass air flow sensor using Subaru Select Monitor. NOTE: For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO 2.5)(diag)-26, Subaru Select Monitor.>	Is the voltage 0.2 — 4.7 V?	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time.	Go to step 3.
3 CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from mass air flow sensor. 3) Turn the ignition switch to ON. 4) Measure voltage between mass air flow sensor connector and chassis ground. Connector & terminal (B3) No. 3 (+) — Chassis ground (-):	Is the voltage more than 5 V?	Repair the battery short circuit in harness between mass air flow sensor connector and ECM connector.	Go to step 4.
4 CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance of harness between ECM connector and mass air flow sensor connector. Connector & terminal (B3) No. 2 — (B136) No. 31:	Is the resistance less than 1 Ω ?	Replace the mass air flow sensor. <Ref. to FU(H4SO 2.5)-26, Mass Air Flow and Intake Air Temperature Sensor.>	Repair the open circuit in harness between mass air flow sensor connector and ECM connector.

H: DTC P0107 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT LOW INPUT

DTC DETECTING CONDITION:

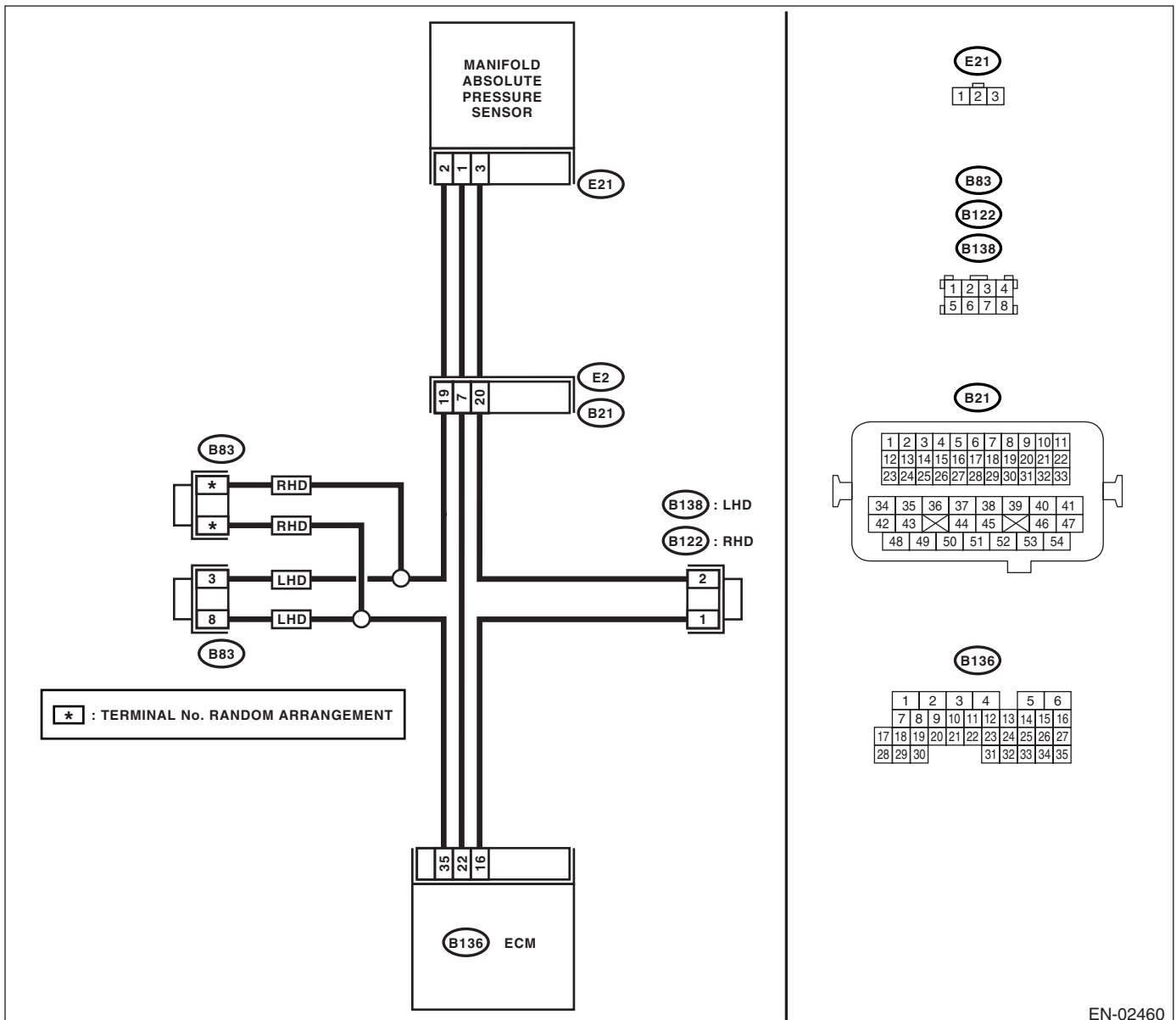
Immediately at fault recognition.

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



EN-02460

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK CURRENT DATA. 1) Start the engine. 2) Read the data of intake manifold absolute pressure signal using Subaru Select Monitor. NOTE: For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO 2.5)(diag)-26, Subaru Select Monitor.>	Is the value less than 13.3 kPa (100 mmHg, 3.94 inHg)?	Go to step 4.	Go to step 3.
3 CHECK POOR CONTACT. Check the poor contact in ECM and manifold pressure sensor connector.	Is there poor contact in ECM or manifold pressure sensor connector?	Repair the poor contact in ECM or manifold pressure sensor connector.	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time.
4 CHECK OUTPUT SIGNAL FROM ECM. Measure the voltage between ECM connector and chassis ground. <i>Connector & terminal</i> <i>(B136) No. 16 (+) — Chassis ground (-):</i>	Is the voltage more than 4.5 V?	Go to step 6.	Go to step 5.
5 CHECK OUTPUT SIGNAL FROM ECM. Measure the voltage between ECM connector and chassis ground. <i>Connector & terminal</i> <i>(B136) No. 16 (+) — Chassis ground (-):</i>	Does the voltage change when shaking the ECM harness and connector?	Repair the poor contact in ECM connector.	Replace the ECM. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>
6 CHECK INPUT SIGNAL TO ECM. Measure the voltage between ECM and chassis ground. <i>Connector & terminal</i> <i>(B136) No. 22 (+) — Chassis ground (-):</i>	Is the voltage less than 0.2 V?	Go to step 8.	Go to step 7.
7 CHECK INPUT SIGNAL TO ECM (USING SUBARU SELECT MONITOR). Read the data of atmospheric absolute pressure signal using Subaru Select Monitor. NOTE: For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO 2.5)(diag)-26, Subaru Select Monitor.>	Is the value more than 13.3 kPa (100 mmHg, 3.94 inHg) when shaking the ECM harness and connector?	Repair the poor contact in ECM connector.	Go to step 8.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
8 CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from manifold absolute pressure sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between manifold absolute pressure sensor connector and engine ground. <i>Connector & terminal</i> <i>(E21) No. 3 (+) — Engine ground (-):</i>	Is the voltage more than 4.5 V?	Go to step 9.	Repair the open circuit in harness between ECM and manifold absolute pressure sensor connector.
9 CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance of harness between ECM and manifold absolute pressure sensor connector. <i>Connector & terminal</i> <i>(B136) No. 35 — (E21) No. 2:</i>	Is the resistance less than 1 Ω ?	Go to step 10.	Repair the open circuit in harness between ECM and manifold absolute pressure sensor connector.
10 CHECK POOR CONTACT. Check poor contact in manifold absolute pressure sensor connector.	Is there poor contact in manifold absolute pressure sensor connector?	Repair the poor contact in manifold absolute pressure sensor connector.	Replace the manifold absolute pressure sensor. <Ref. to FU(H4SO 2.5)-25, Manifold Absolute Pressure Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

I: DTC P0108 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT HIGH INPUT

DTC DETECTING CONDITION:

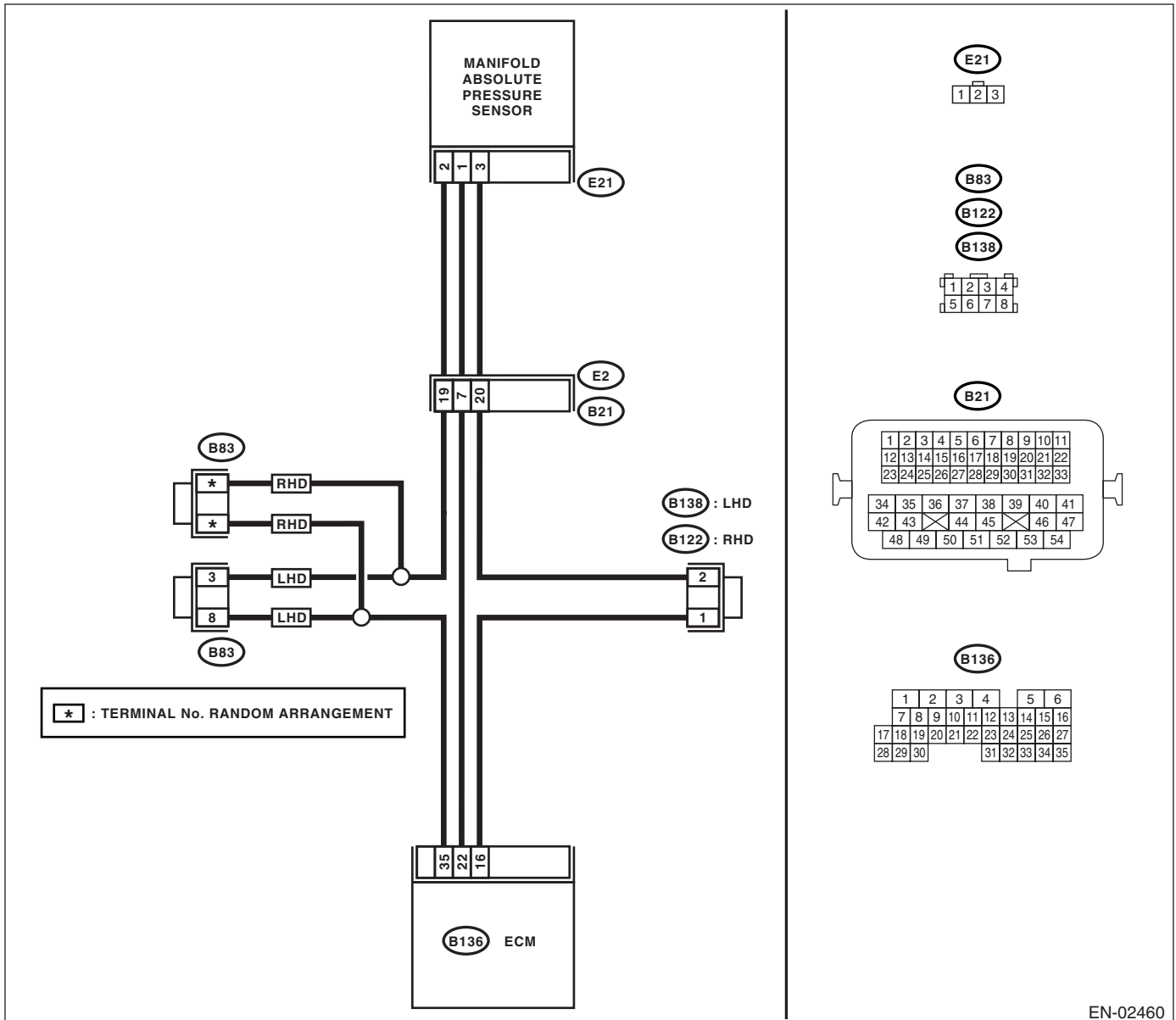
Immediately at fault recognition.

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



EN-02460

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2 .	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK CURRENT DATA. 1) Start the engine. 2) Read the data of intake manifold absolute pressure signal using Subaru Select Monitor. NOTE: For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO 2.5)(diag)-26, Subaru Select Monitor.>	Is the value more than 119.5 kPa (896.5 mmHg, 35.29 inHg)?	Go to step 11 .	Go to step 3 .
3 CHECK OUTPUT SIGNAL FROM ECM. Measure the voltage between ECM connector and chassis ground. Connector & terminal (B136) No. 16 (+) — Chassis ground (-):	Is the voltage more than 4.5 V?	Go to step 5 .	Go to step 4 .
4 CHECK OUTPUT SIGNAL FROM ECM. Measure the voltage between ECM connector and chassis ground. Connector & terminal (B136) No. 16 (+) — Chassis ground (-):	Does the voltage change when shaking the ECM harness and connector?	Repair the poor contact in ECM connector.	Replace the ECM. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>
5 CHECK INPUT SIGNAL TO ECM. Measure the voltage between ECM connector and chassis ground. Connector & terminal (B136) No. 22 (+) — Chassis ground (-):	Is the voltage less than 0.2 V?	Go to step 7 .	Go to step 6 .
6 CHECK INPUT SIGNAL TO ECM (USING SUBARU SELECT MONITOR). Read the data of atmospheric absolute pressure signal using Subaru Select Monitor. NOTE: For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO 2.5)(diag)-26, Subaru Select Monitor.>	Is the value more than 13.3 kPa (100 mmHg, 3.94 inHg) when shaking the ECM harness and connector?	Repair the poor contact in ECM connector.	Go to step 7 .
7 CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from manifold absolute pressure sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between manifold absolute pressure sensor connector and engine ground. Connector & terminal (E21) No. 3 (+) — Engine ground (-):	Is the voltage more than 4.5 V?	Go to step 8 .	Repair the open circuit in harness between ECM and manifold absolute pressure sensor connector.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
8 CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance of harness between ECM and manifold absolute pressure sensor connector. <i>Connector & terminal (B136) No. 22 — (E21) No. 1:</i>	Is the resistance less than 1 Ω ?	Go to step 9.	Repair the open circuit in harness between ECM and manifold absolute pressure sensor connector.
9 CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR. Measure the resistance of harness between ECM and manifold absolute pressure sensor connector. <i>Connector & terminal (B136) No. 35 — (E21) No. 2:</i>	Is the resistance less than 1 Ω ?	Go to step 10.	Repair the open circuit in harness between ECM and manifold absolute pressure sensor connector.
10 CHECK POOR CONTACT. Check poor contact in manifold absolute pressure sensor connector.	Is there poor contact in manifold absolute pressure sensor connector?	Repair the poor contact in manifold absolute pressure sensor connector.	Replace the manifold absolute pressure sensor. <Ref. to FU(H4SO 2.5)-25, Manifold Absolute Pressure Sensor.>
11 CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR. 1) Turn the ignition switch to OFF, and the Subaru Select Monitor switch to OFF. 2) Disconnect the connector from manifold absolute pressure sensor. 3) Turn the ignition switch to ON, and the Subaru Select Monitor switch to ON. 4) Read the data of intake manifold absolute pressure signal using Subaru Select Monitor. NOTE: For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO 2.5)(diag)-26, Subaru Select Monitor.>	Is the value more than 119.5 kPa (896.5 mmHg, 35.29 inHg)?	Repair battery short in harness between ECM and manifold absolute pressure sensor connector.	Replace the manifold absolute pressure sensor. <Ref. to FU(H4SO 2.5)-25, Manifold Absolute Pressure Sensor.>

J: DTC P0112 INTAKE AIR TEMPERATURE CIRCUIT LOW INPUT

DTC DETECTING CONDITION:

Immediately at fault recognition.

TROUBLE SYMPTOM:

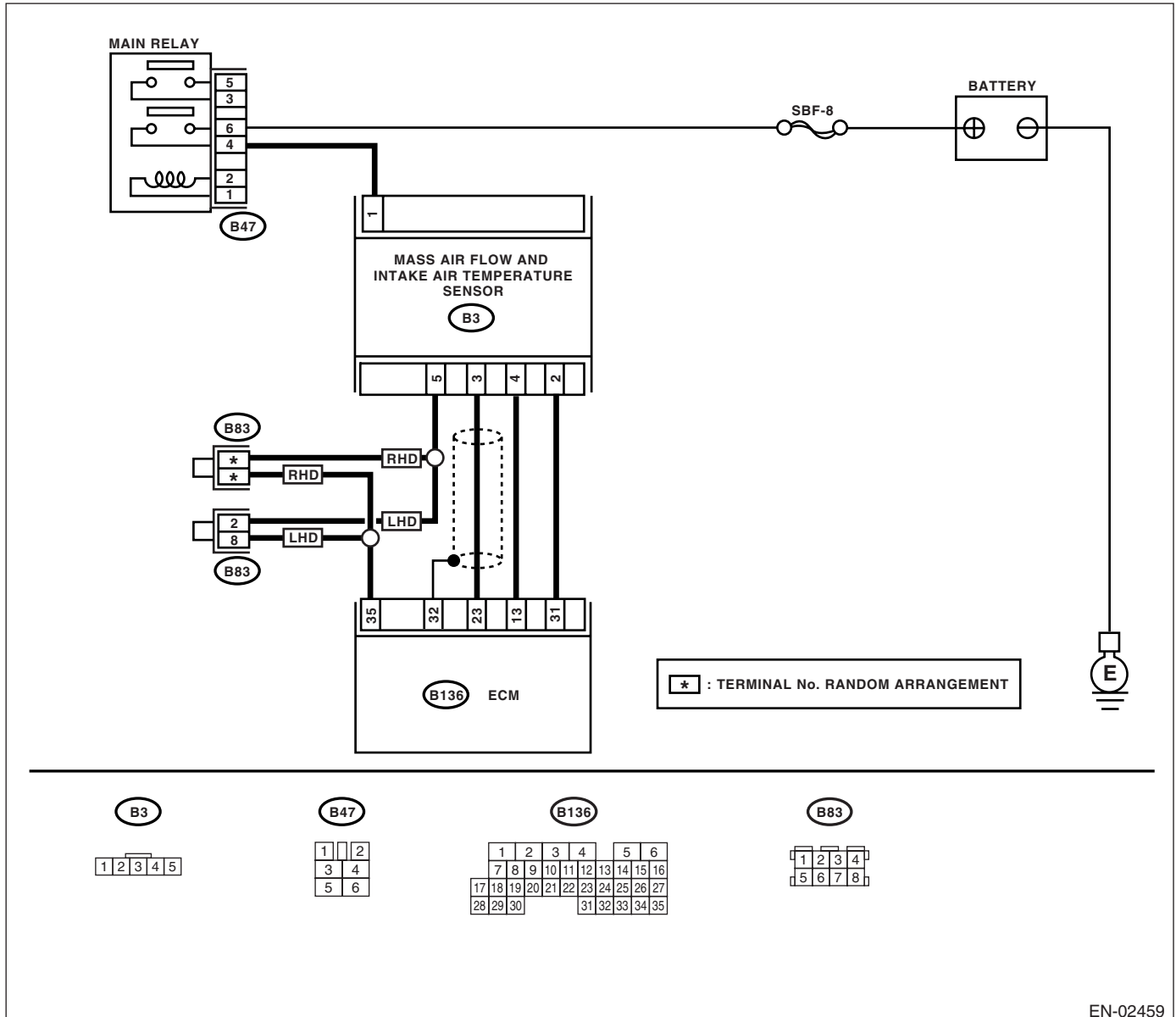
- Erroneous idling
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



EN-02459

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK CURRENT DATA. 1) Start the engine. 2) Read the data of mass air flow and intake air temperature sensor signal using Subaru Select Monitor. NOTE: For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO 2.5)(diag)-26, Subaru Select Monitor.>	Is the intake air temperature more than 120°C (248°F)?	Go to step 3.	Repair the poor contact. NOTE: In this case, repair the following: <ul style="list-style-type: none"> • Poor contact in mass air flow and intake air temperature sensor • Poor contact in ECM • Poor contact in coupling connector • Poor contact in joint connector
3 CHECK HARNESS BETWEEN MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR AND ECM CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from mass air flow and intake air temperature sensor. 3) Turn the ignition switch to ON. 4) Read the data of mass air flow and intake air temperature sensor signal using Subaru Select Monitor. NOTE: For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO 2.5)(diag)-26, Subaru Select Monitor.>	Is the intake air temperature less than -40°C (-40°F)?	Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4SO 2.5)-26, Mass Air Flow and Intake Air Temperature Sensor.>	Repair the ground short circuit in harness between mass air flow and intake air temperature sensor and ECM connector.

K: DTC P0113 INTAKE AIR TEMPERATURE CIRCUIT HIGH INPUT

DTC DETECTING CONDITION:

Immediately at fault recognition.

TROUBLE SYMPTOM:

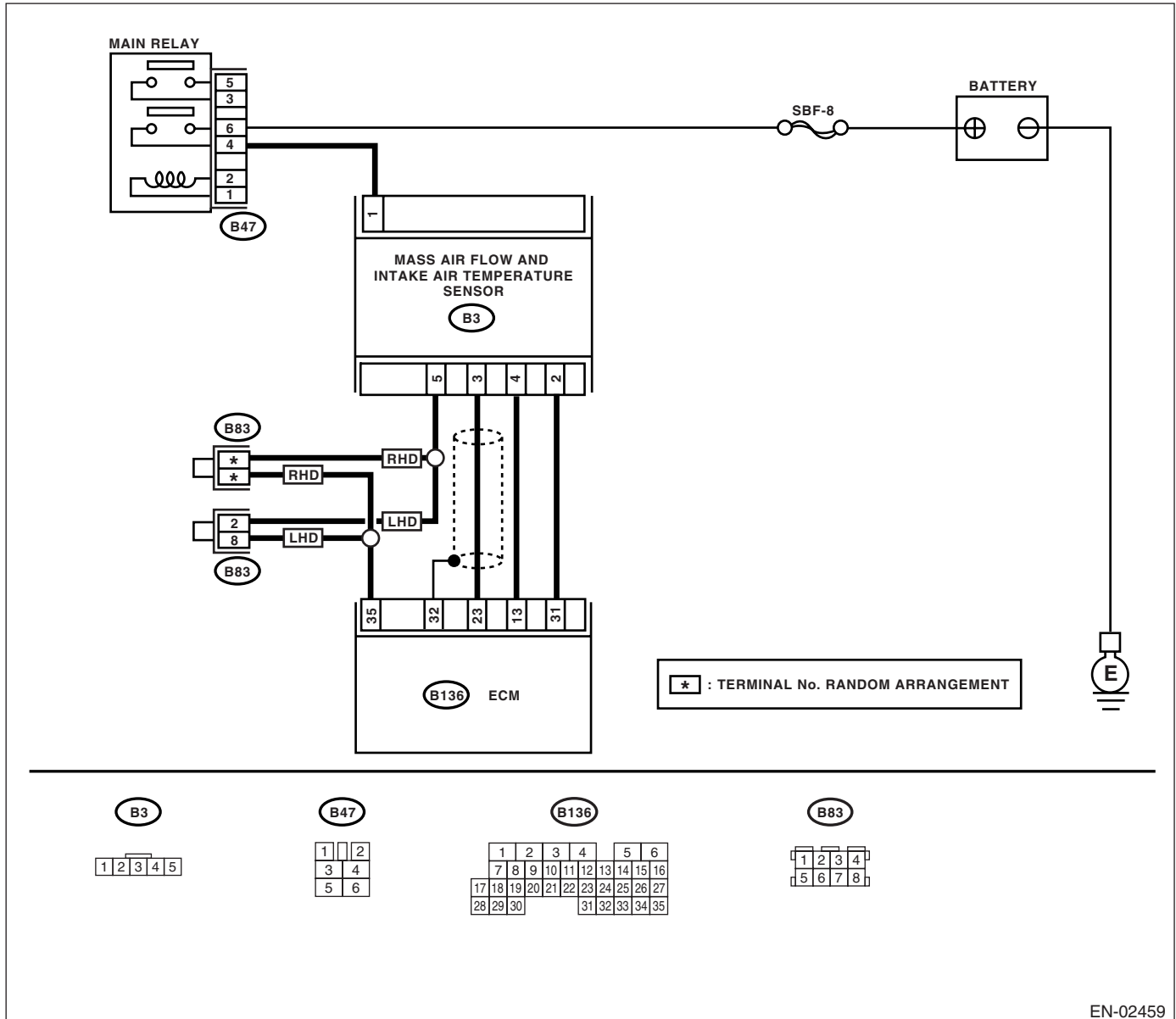
- Erroneous idling
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK CURRENT DATA. 1) Start the engine. 2) Read the data of air flow and intake air temperature sensor signal using Subaru Select Monitor. NOTE: For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO 2.5)(diag)-26, Subaru Select Monitor.>	Is the intake air temperature less than -40°C (-40°F)?	Go to step 3.	Repair the poor contact. NOTE: In this case, repair the following: <ul style="list-style-type: none"> • Poor contact in mass air flow and intake air temperature sensor • Poor contact in ECM • Poor contact in coupling connector • Poor contact in joint connector
3 CHECK HARNESS BETWEEN MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR AND ECM CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from mass air flow and intake air temperature sensor. 3) Measure the voltage between mass air flow and intake air temperature sensor connector and engine ground. Connector & terminal (B3) No. 4 (+) — Engine ground (-):	Is the voltage more than 10 V?	Repair the battery short circuit in harness between mass air flow and intake air temperature sensor and ECM connector.	Go to step 4.
4 CHECK HARNESS BETWEEN MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR AND ECM CONNECTOR. 1) Turn the ignition switch to ON. 2) Measure the voltage between mass air flow and intake air temperature sensor connector and engine ground. Connector & terminal (B3) No. 4 (+) — Engine ground (-):	Is the voltage more than 10 V?	Repair the battery short circuit in harness between mass air flow and intake air temperature sensor and ECM connector.	Go to step 5.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>5</p> <p>CHECK HARNESS BETWEEN MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR AND ECM CONNECTOR. Measure the voltage between mass air flow and intake air temperature sensor connector and engine ground. <i>Connector & terminal</i> (B3) No. 4 (+) — Engine ground (-):</p>	<p>Is the voltage more than 3 V?</p>	<p>Go to step 6.</p>	<p>Repair the harness and connector. NOTE: In this case, repair the following:</p> <ul style="list-style-type: none"> • Open circuit in harness between mass air flow and intake air temperature sensor and ECM connector • Poor contact in mass air flow and intake air temperature sensor • Poor contact in ECM • Poor contact in coupling connector • Poor contact in joint connector
<p>6</p> <p>CHECK HARNESS BETWEEN MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR AND ECM CONNECTOR. 1) Turn the ignition switch to OFF. 2) Measure the resistance of harness between mass air flow and intake air temperature sensor connector and engine ground. <i>Connector & terminal</i> (B3) No. 5 — Engine ground:</p>	<p>Is the resistance less than 5 Ω?</p>	<p>Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4SO 2.5)-26, Mass Air Flow and Intake Air Temperature Sensor.></p>	<p>Repair the harness and connector. NOTE: In this case, repair the following:</p> <ul style="list-style-type: none"> • Open circuit in harness between mass air flow and intake air temperature sensor and ECM connector • Poor contact in mass air flow and intake air temperature sensor • Poor contact in ECM • Poor contact in joint connector

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

L: DTC P0117 ENGINE COOLANT TEMPERATURE CIRCUIT LOW INPUT

DTC DETECTING CONDITION:

Immediately at fault recognition.

TROUBLE SYMPTOM:

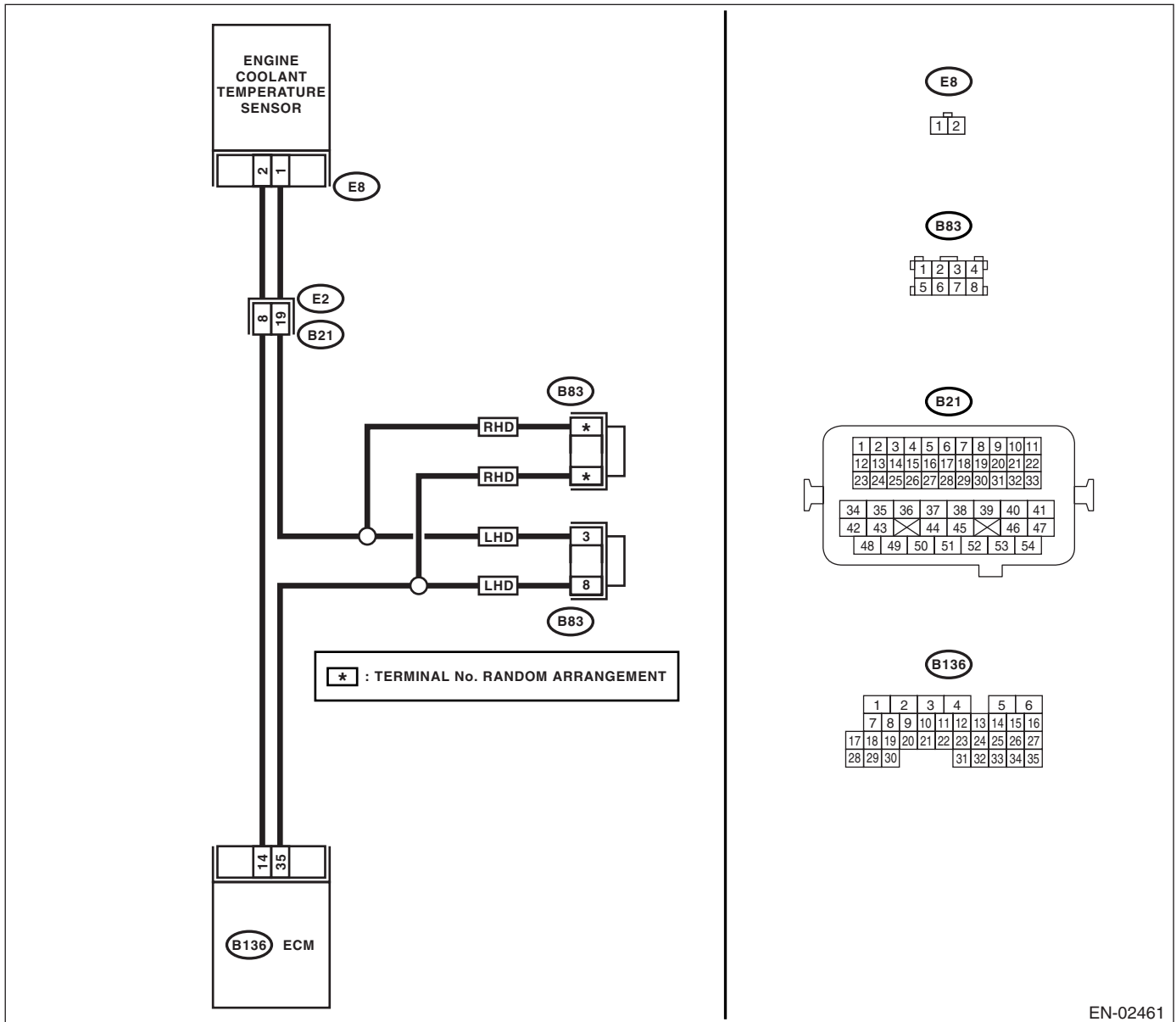
- Hard to start
- Erroneous idling
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



EN-02461

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK CURRENT DATA. 1) Start the engine. 2) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor. NOTE: For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO 2.5)(diag)-26, Subaru Select Monitor.>	Is the engine coolant temperature more than 150°C (302°F)?	Go to step 3.	Repair the poor contact. NOTE: In this case, repair the following: <ul style="list-style-type: none"> • Poor contact in engine coolant temperature sensor • Poor contact in ECM • Poor contact in coupling connector • Poor contact in joint connector
3 CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the engine coolant temperature sensor. 3) Turn the ignition switch to ON. 4) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor. NOTE: For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO 2.5)(diag)-26, Subaru Select Monitor.>	Is the engine coolant temperature less than -40°C (-40°F)?	Replace the engine coolant temperature sensor. <Ref. to FU(H4SO 2.5)-20, Engine Coolant Temperature Sensor.>	Repair the ground short circuit in harness between engine coolant temperature sensor and ECM connector.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

M: DTC P0118 ENGINE COOLANT TEMPERATURE CIRCUIT HIGH INPUT

DTC DETECTING CONDITION:

Immediately at fault recognition.

TROUBLE SYMPTOM:

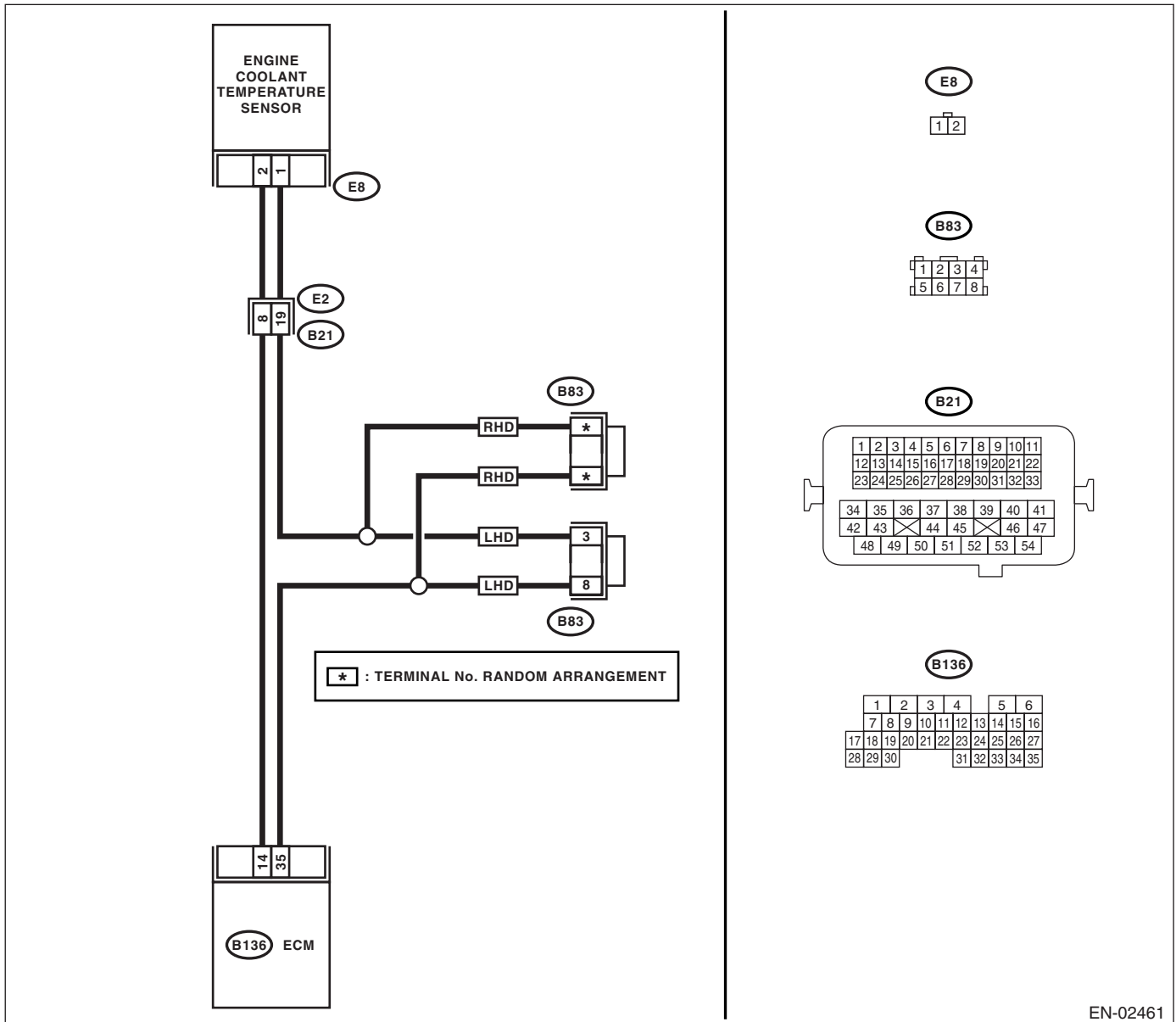
- Hard to start
- Erroneous idling
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



EN-02461

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK CURRENT DATA. 1) Start the engine. 2) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor. NOTE: For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO 2.5)(diag)-26, Subaru Select Monitor.>	Is the engine coolant temperature less than -40°C (-40°F)?	Go to step 3.	Repair the poor contact. NOTE: In this case, repair the following: <ul style="list-style-type: none"> • Poor contact in engine coolant temperature sensor • Poor contact in ECM • Poor contact in coupling connector • Poor contact in joint connector
3 CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from engine coolant temperature sensor. 3) Measure the voltage between engine coolant temperature sensor connector and engine ground. <i>Connector & terminal</i> <i>(E8) No. 2 (+) — Engine ground (-):</i>	Is the voltage more than 10 V?	Repair the battery short circuit in harness between ECM and engine coolant temperature sensor connector.	Go to step 4.
4 CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR. 1) Turn the ignition switch to ON. 2) Measure the voltage between engine coolant temperature sensor connector and engine ground. <i>Connector & terminal</i> <i>(E8) No. 2 (+) — Engine ground (-):</i>	Is the voltage more than 10 V?	Repair the battery short circuit in harness between ECM and engine coolant temperature sensor connector.	Go to step 5.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>5</p> <p>CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.</p> <p>Measure the voltage between engine coolant temperature sensor connector and engine ground.</p> <p>Connector & terminal (E8) No. 2 (+) — Engine ground (-):</p>	<p>Is the voltage more than 4 V?</p>	<p>Go to step 6.</p>	<p>Repair the harness and connector.</p> <p>NOTE: In this case, repair the following:</p> <ul style="list-style-type: none"> • Open circuit in harness between ECM and engine coolant temperature sensor connector • Poor contact in engine coolant temperature sensor connector • Poor contact in ECM connector • Poor contact in coupling connector • Poor contact in joint connector
<p>6</p> <p>CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.</p> <p>1) Turn the ignition switch to OFF. 2) Measure the resistance of harness between engine coolant temperature sensor connector and engine ground.</p> <p>Connector & terminal (E8) No. 1 — Engine ground:</p>	<p>Is the resistance less than 5 Ω?</p>	<p>Replace the engine coolant temperature sensor. <Ref. to FU(H4SO 2.5)-20, Engine Coolant Temperature Sensor.></p>	<p>Repair the harness and connector.</p> <p>NOTE: In this case, repair the following:</p> <ul style="list-style-type: none"> • Open circuit in harness between ECM and engine coolant temperature sensor connector • Poor contact in engine coolant temperature sensor connector • Poor contact in ECM connector • Poor contact in coupling connector • Poor contact in joint connector

N: DTC P0122 THROTTLE/PEDAL POSITION SENSOR/SWITCH “A” CIRCUIT LOW INPUT

DTC DETECTING CONDITION:

Immediately at fault recognition.

TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

CAUTION:

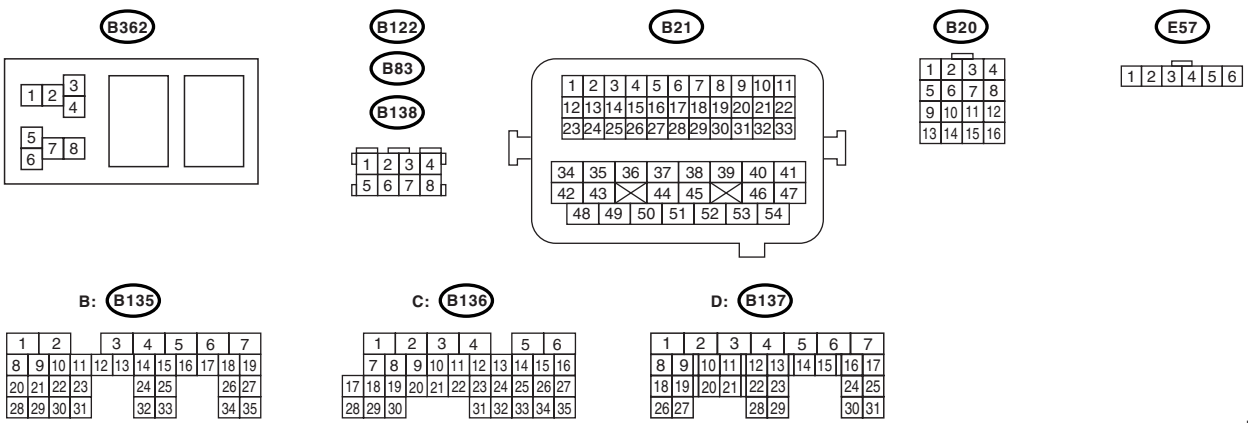
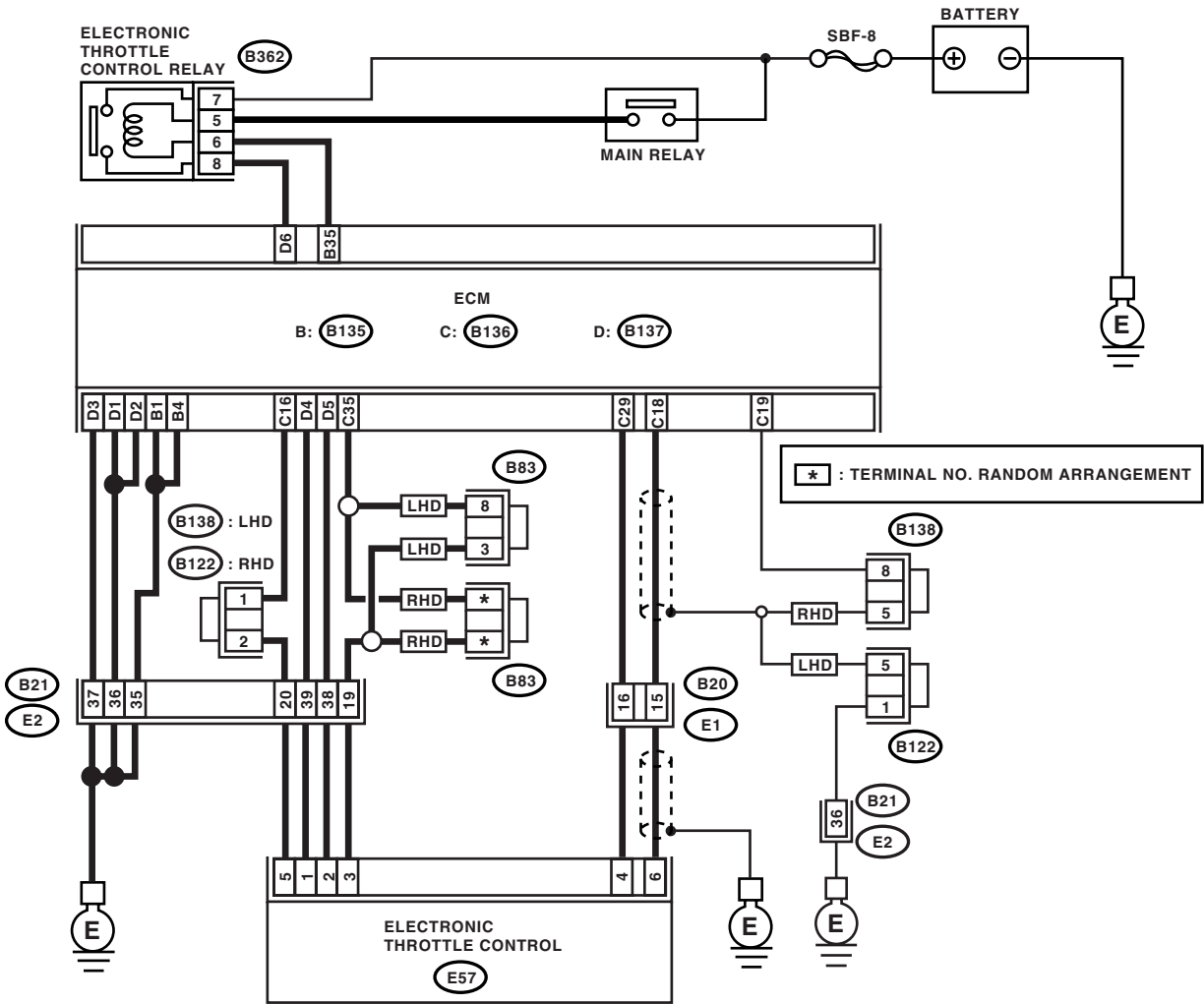
After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

WIRING DIAGRAM:

- EC, EK and K4 model



EN-02462

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1	CHECK OPTION CODE.	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2	CHECK SENSOR OUTPUT. 1) Turn the ignition switch to ON. 2) Read the data of main throttle sensor signal using Subaru Select Monitor.	Go to step 3.	Go to step 4.
3	CHECK POOR CONTACT. Check poor contact in connector between ECM and electronic throttle control.	Repair the poor contact.	Temporary poor contact occurred, but it is normal at present.
4	CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connectors from electronic throttle control. 4) Measure the resistance between ECM connector and electronic throttle control connector. Connector & terminal (B136) No. 18 — (E57) No. 6: (B136) No. 16 — (E57) No. 5:	Go to step 5.	Repair the open circuit of harness connector.
5	CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. Measure the resistance between ECM connector and chassis ground. Connector & terminal (B136) No. 18 — Chassis ground: (B136) No. 16 — Chassis ground:	Go to step 6.	Repair the chassis short circuit of harness.
6	CHECK POWER SUPPLY OF ELECTRONIC THROTTLE CONTROL. 1) Connect the ECM connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between electronic throttle control terminal and engine ground. Connector & terminal (E57) No. 5 (+) — Engine ground (-):	Go to step 7.	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>
7	CHECK SHORT CIRCUIT INSIDE THE ECM. 1) Turn the ignition switch to OFF. 2) Measure the resistance between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 6 — Engine ground:	Repair the poor contact of electronic throttle control connector. Replace the accelerator position sensor if defective.	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

O: DTC P0123 THROTTLE/PEDAL POSITION SENSOR/SWITCH “A” CIRCUIT HIGH INPUT

DTC DETECTING CONDITION:

Immediately at fault recognition.

TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

CAUTION:

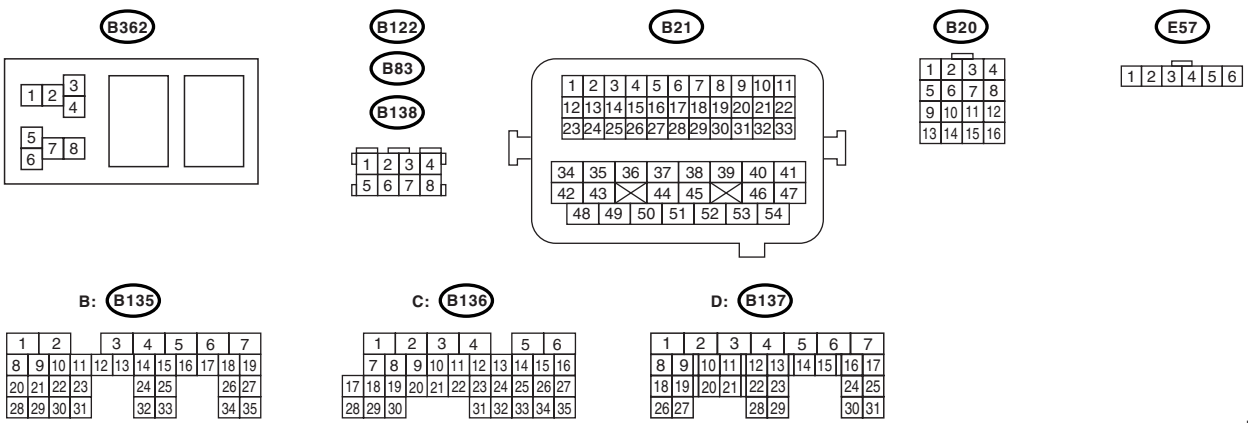
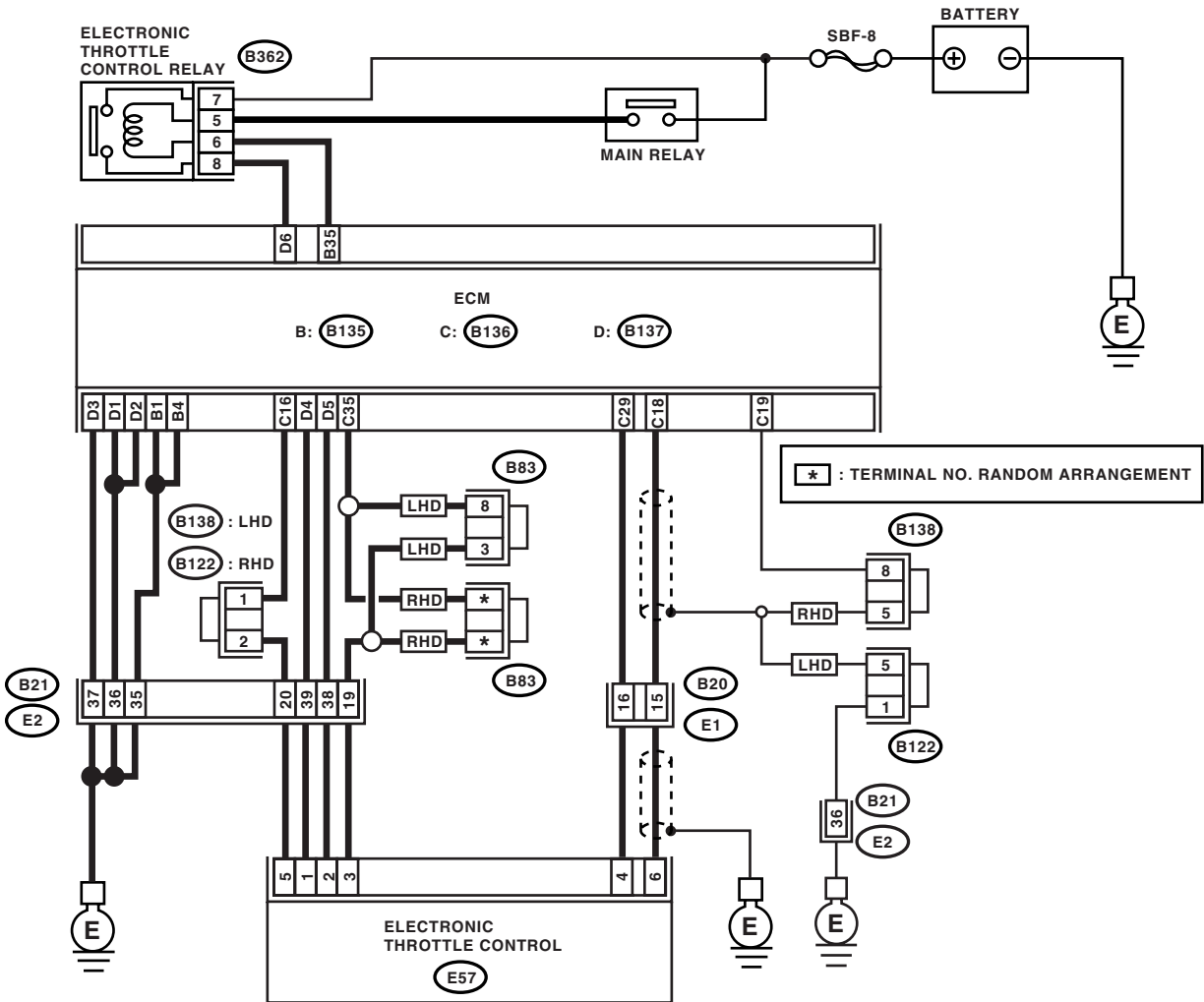
After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

WIRING DIAGRAM:

- EC, EK and K4 model



EN-02462

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1	CHECK OPTION CODE.		
	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2	CHECK SENSOR OUTPUT. 1) Turn the ignition switch to ON. 2) Read the data of main throttle sensor signal using Subaru Select Monitor.		
	Is the voltage less than 4.63 V?	Go to step 3.	Go to step 4.
3	CHECK POOR CONTACT. Check poor contact in connector between ECM and electronic throttle control.		
	Is there poor contact in connector between ECM and electronic throttle control?	Repair the poor contact.	Temporary poor contact occurred, but it is normal at present.
4	CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connectors from electronic throttle control. 4) Measure the resistance between ECM connector and electronic throttle control connector. Connector & terminal (B136) No. 18 — (E57) No. 6: (B136) No. 35 — (E57) No. 3:		
	Is the resistance less than 1 Ω ?	Go to step 5.	Repair the open circuit of harness connector.
5	CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Connect the ECM connector. 2) Measure the resistance between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 3 — Engine ground:		
	Is the resistance less than 1 Ω ?	Go to step 6.	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>
6	CHECK SENSOR OUTPUT POWER SUPPLY. Measure the voltage between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 6 (+) — Engine ground (-):		
	Is the voltage less than 10 V?	Go to step 7.	Repair the battery short circuit in harness between ECM connector and electronic throttle control connector.
7	CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance between ECM connectors. Connector & terminal (B136) No. 18 — (B136) No. 16:		
	Is the resistance more than 1 M Ω ?	Repair the poor contact in harness. Replace the electronic throttle control.	Repair the short circuit to sensor power supply.

P: DTC P0125 INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL

DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

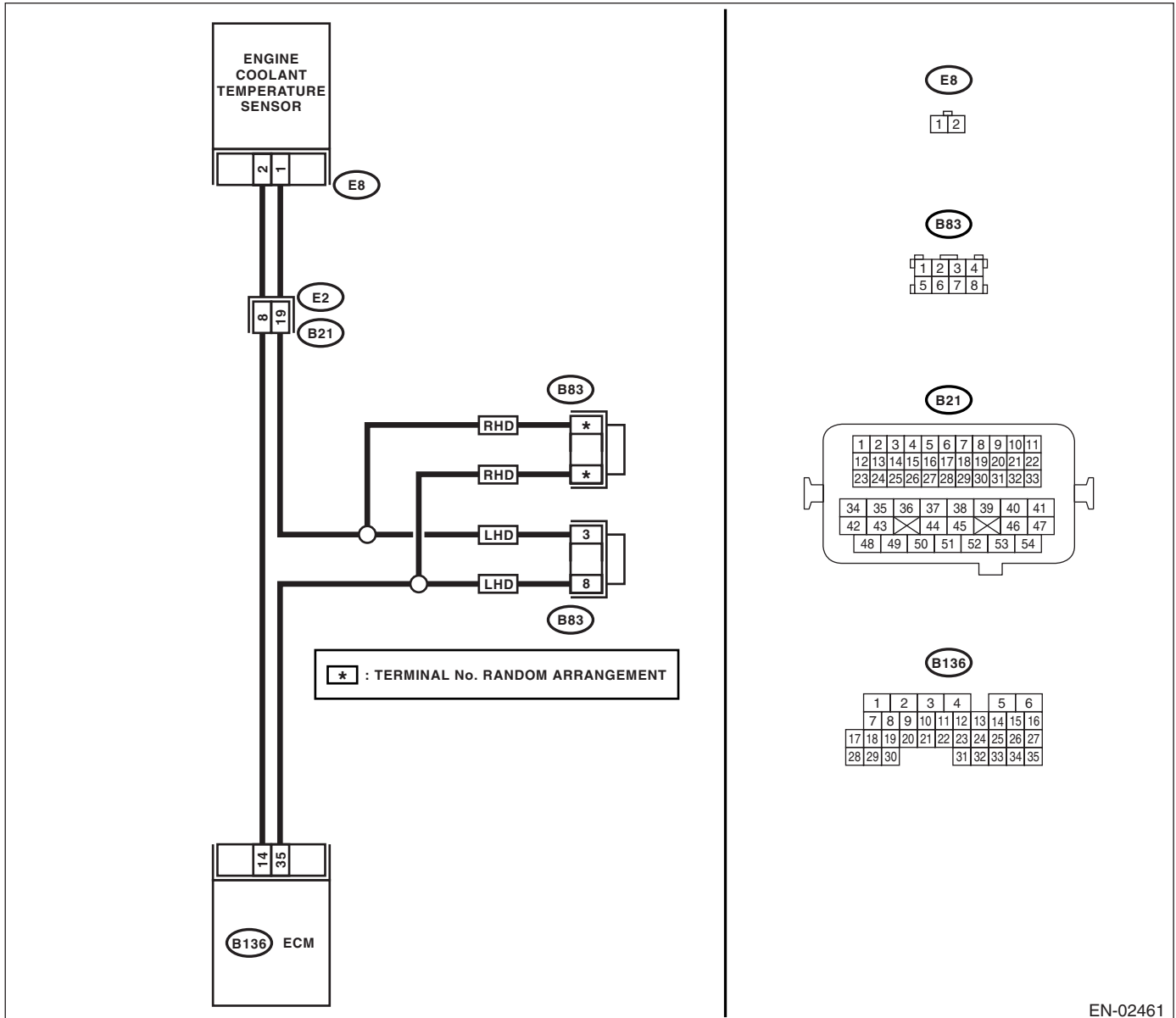
Engine will not return to idling.

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



EN-02461

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO 2.5)(diag)-70, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P0125.	Go to step 3.
3 CHECK ENGINE COOLING SYSTEM. NOTE: Check the following items. <ul style="list-style-type: none"> • Thermostat open stuck • Coolant level • Coolant freeze • Tire diameter 	Is there any fault in engine cooling system?	Replace the thermostat. <Ref. to CO(H4SO 2.0)-18, Thermostat.>	Replace the engine coolant temperature sensor. <Ref. to FU(H4SO 2.5)-20, Engine Coolant Temperature Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Q: DTC P0131 O2 SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 1)

DTC DETECTING CONDITION:

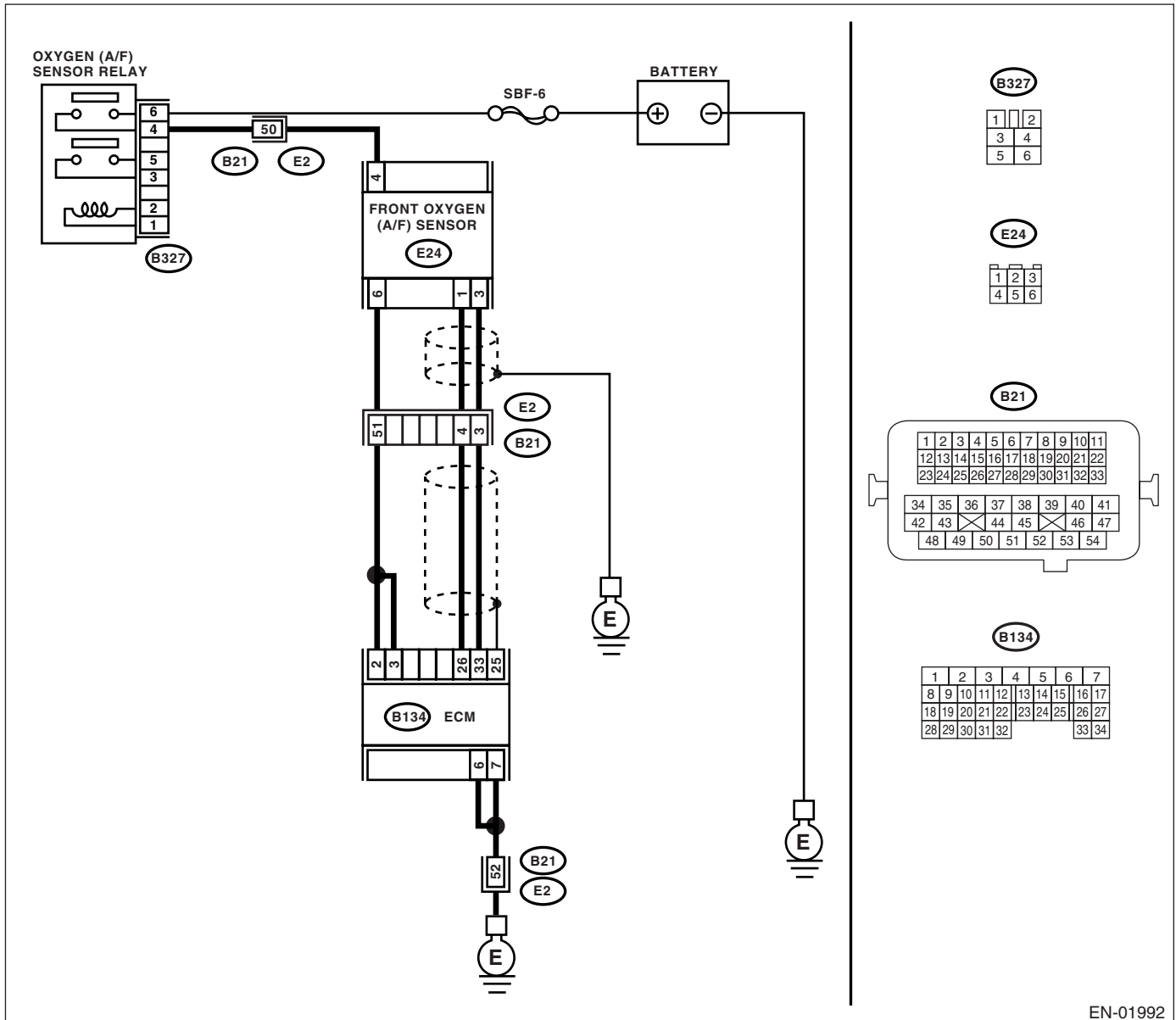
Immediately at fault recognition.

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and front oxygen (A/F) sensor connector. 3) Measure the resistance of harness between ECM and chassis ground. Connector & terminal (B134) No. 26 — Chassis ground: (B134) No. 33 — Chassis ground:	Is the resistance more than 1 MΩ?	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4SO 2.5)-34, Front Oxygen (A/F) Sensor.>	Repair the ground short circuit in harness between ECM and front oxygen (A/F) sensor connector.

R: DTC P0132 O2 SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 1)

DTC DETECTING CONDITION:

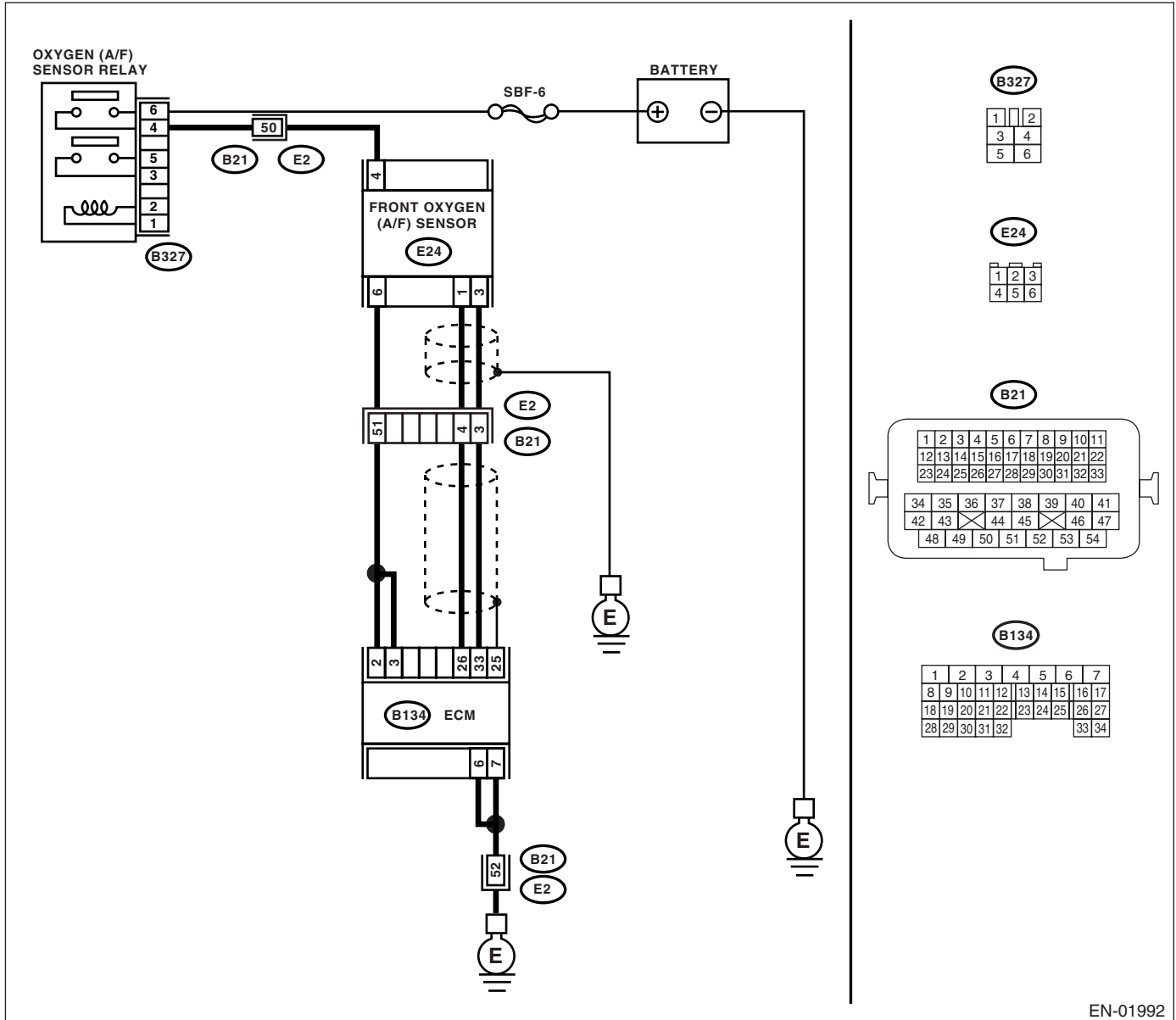
Immediately at fault recognition.

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



EN-01992

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR. 1) Turn the ignition switch to ON. 2) Disconnect the connector from front oxygen (A/F) sensor. 3) Measure the voltage of harness between ECM connector and chassis ground. Connector & terminal <i>(B134) No. 26 (+) — Chassis ground (-):</i> <i>(B134) No. 33 (+) — Chassis ground (-):</i>	Is the voltage more than 8 V?	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4SO 2.5)-34, Front Oxygen (A/F) Sensor.>	Repair the battery short circuit in harness between ECM and front oxygen (A/F) sensor connector.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

S: DTC P0133 O2 SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 1)

DTC DETECTING CONDITION:

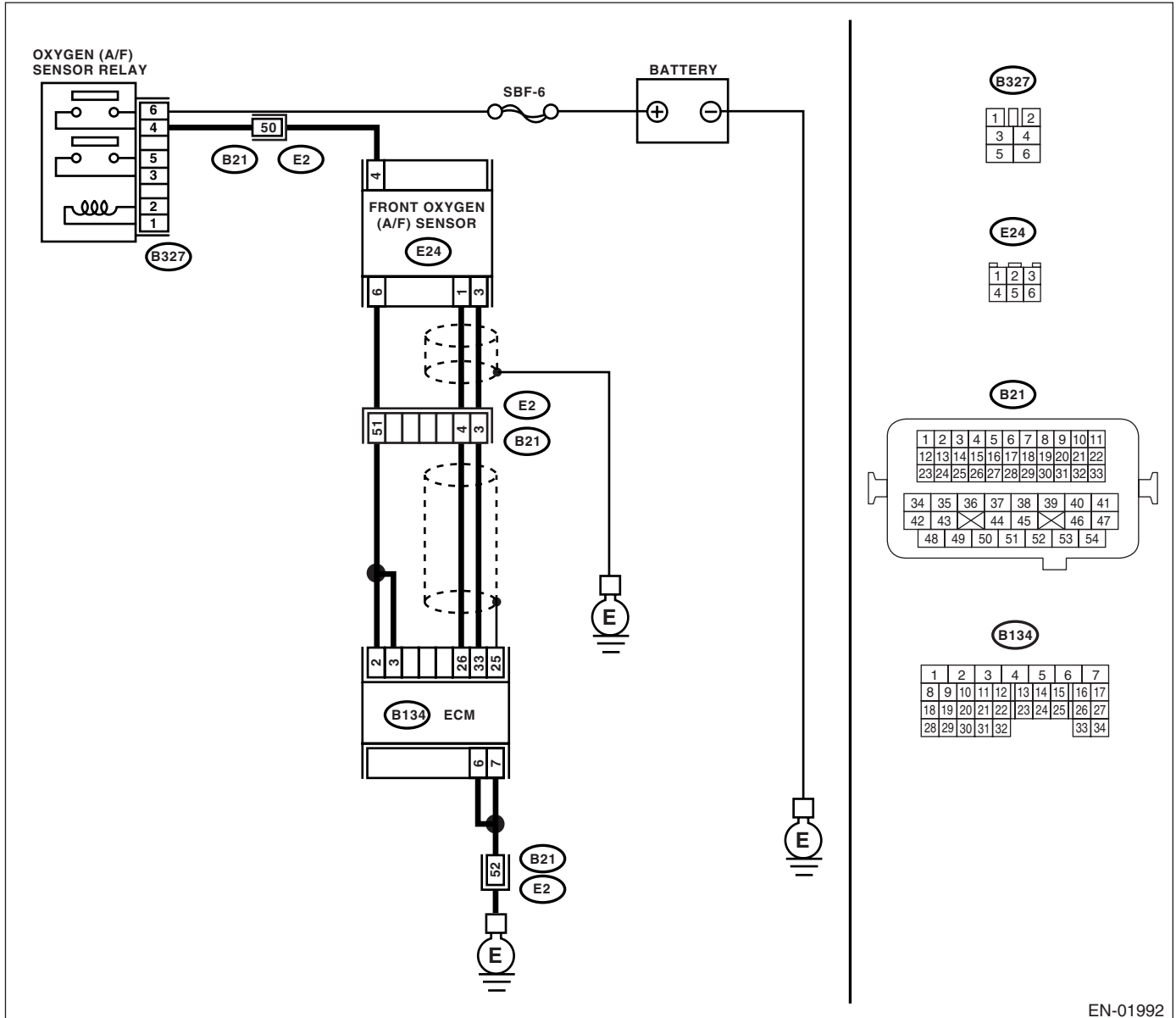
Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO 2.5)(diag)-70, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P0133.	Go to step 3.
3 CHECK EXHAUST SYSTEM. NOTE: Check the following items. <ul style="list-style-type: none"> • Loose installation of front portion of exhaust pipe onto cylinder heads • Loose connection between front exhaust pipe and front catalytic converter • Damage of exhaust pipe resulting in a hole 	Is there any fault in exhaust system?	Repair the exhaust system.	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4SO 2.5)-34, Front Oxygen (A/F) Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

T: DTC P0134 O2 SENSOR CIRCUIT NO ACTIVITY DETECTED (BANK 1 SENSOR 1)

DTC DETECTING CONDITION:

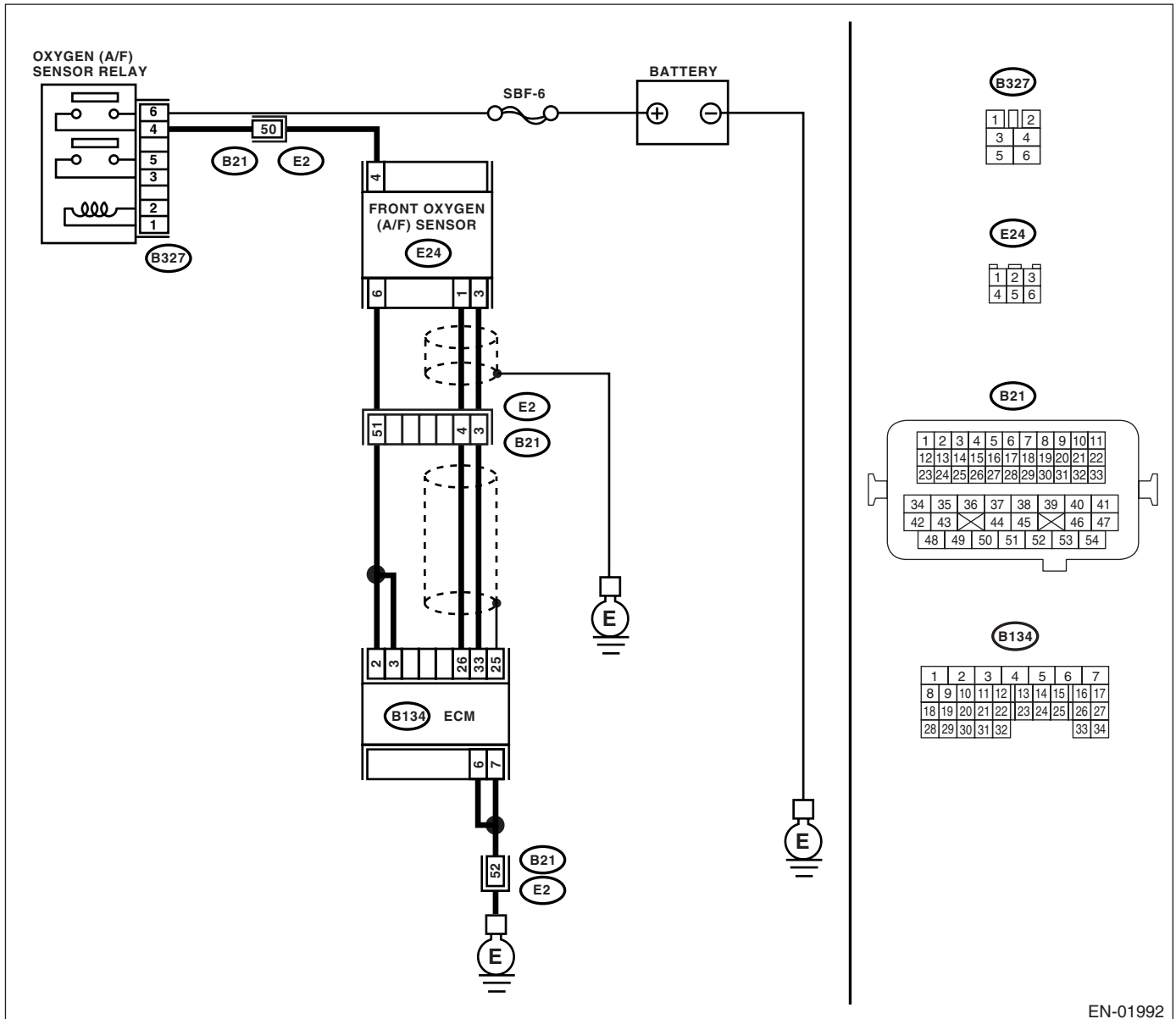
Immediately at fault recognition.

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



EN-01992

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and front oxygen (A/F) sensor connector. 3) Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector. Connector & terminal (B134) No. 26 — (E24) No. 1: (B134) No. 33 — (E24) No. 3:	Is the resistance less than 1 Ω?	Go to step 3.	Repair the harness and connector. NOTE: In this case, repair the following: <ul style="list-style-type: none"> • Open circuit in harness between ECM and front oxygen (A/F) sensor connector • Poor contact in front oxygen (A/F) sensor connector • Poor contact in ECM connector
3 CHECK POOR CONTACT. Check poor contact in front oxygen (A/F) sensor connector.	Is there poor contact in front oxygen (A/F) sensor connector?	Repair the poor contact in front oxygen (A/F) sensor connector.	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4SO 2.5)-34, Front Oxygen (A/F) Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

U: DTC P0137 O2 SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 2)

DTC DETECTING CONDITION:

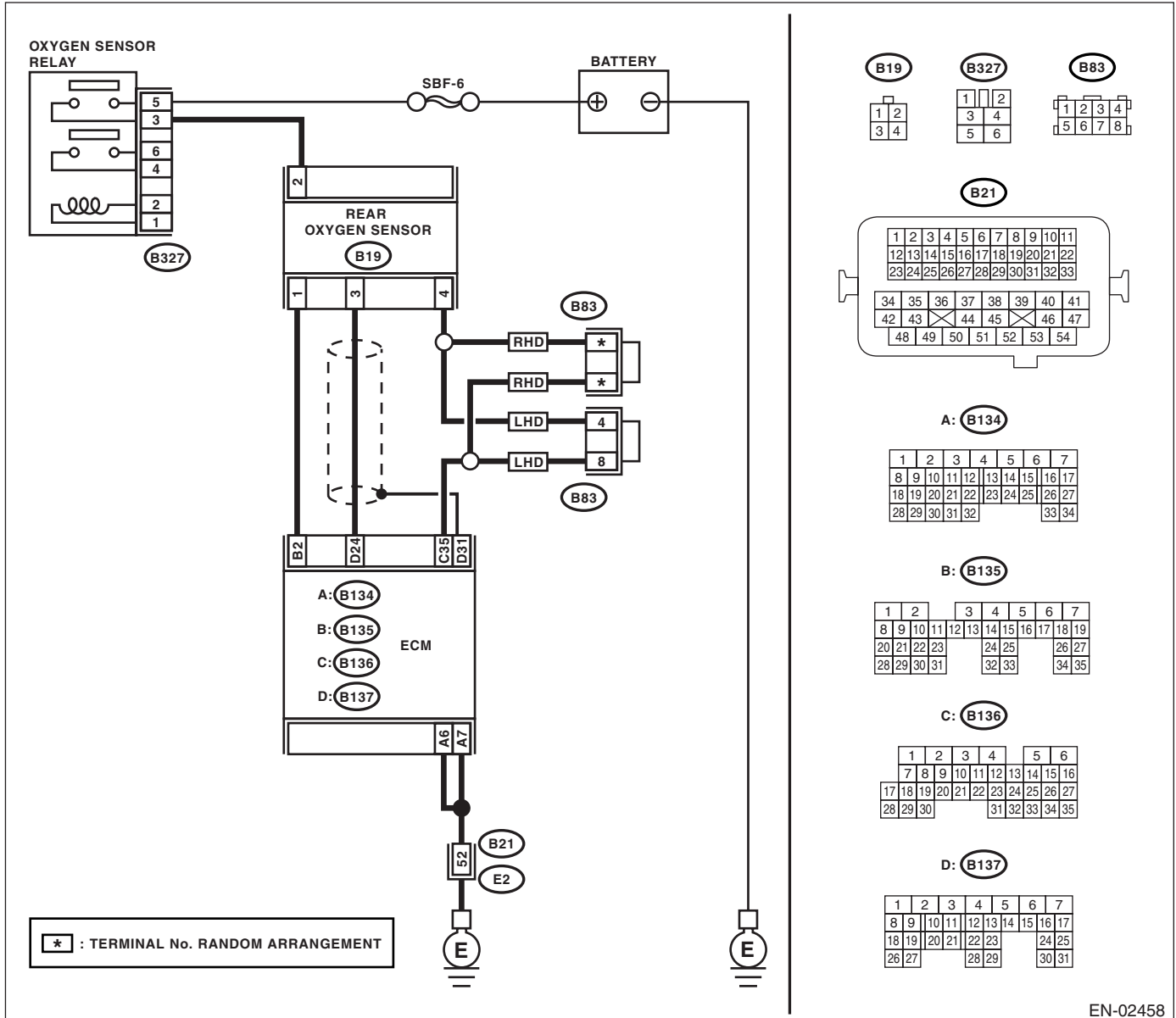
Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



EN-02458

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO 2.5)(diag)-70, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P0137.	Go to step 3.
3 CHECK REAR OXYGEN SENSOR DATA. 1) Warm-up the engine until engine coolant temperature is above 70°C (158°F), and keep the engine speed at 5,000 rpm. 2) Read the data of rear oxygen sensor signal using Subaru Select Monitor. NOTE: For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO 2.5)(diag)-26, Subaru Select Monitor.>	Is the voltage more than 490 mV?	Go to step 6.	Go to step 4.
4 CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and rear oxygen sensor. 3) Measure the resistance in harness between ECM and rear oxygen sensor connector. Connector & terminal (B137) No. 24 — (B19) No. 3: (B136) No. 35 — (B19) No. 4:	Is the resistance more than 3 Ω?	Repair the open circuit in harness between ECM and rear oxygen sensor connector.	Go to step 5.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>5</p> <p>CHECK HARNESS BETWEEN REAR OXYGEN SENSOR AND ECM CONNECTOR.</p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from rear oxygen sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between rear oxygen sensor harness connector and chassis ground.</p> <p>Connector & terminal (B19) No. 3 (+) — Chassis ground (-):</p>	<p>Is the voltage 0.2 — 0.5 V?</p>	<p>Replace the rear oxygen sensor. <Ref. to FU(H4SO 2.5)-35, Rear Oxygen Sensor.></p>	<p>Repair the harness and connector.</p> <p>NOTE: In this case, repair the following:</p> <ul style="list-style-type: none"> • Open circuit in harness between rear oxygen sensor and ECM connector • Poor contact in rear oxygen sensor connector • Poor contact in ECM connector
<p>6</p> <p>CHECK EXHAUST SYSTEM.</p> <p>Check exhaust system parts.</p> <p>NOTE: Check the following items:</p> <ul style="list-style-type: none"> • Loose part of exhaust system and incomplete installation • Damage (crack, hole etc.) of parts • Looseness and ill fitting of parts between front oxygen (A/F) sensor and rear oxygen sensor 	<p>Is there any fault in exhaust system?</p>	<p>Repair or replace the faulty part.</p>	<p>Replace the rear oxygen sensor. <Ref. to FU(H4SO 2.5)-35, Rear Oxygen Sensor.></p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

V: DTC P0138 O2 SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 2)

DTC DETECTING CONDITION:

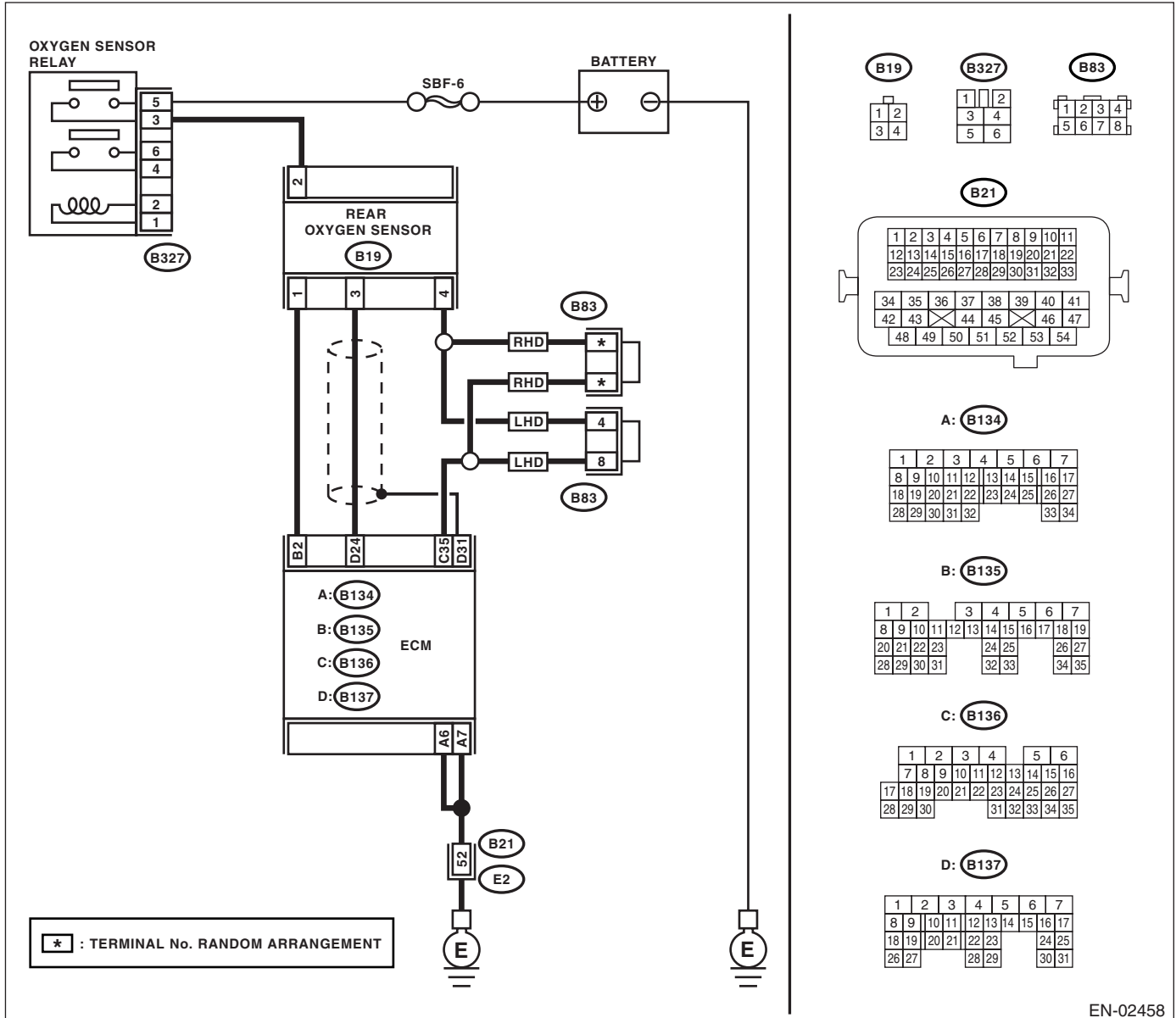
Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No	
1	CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO 2.5)(diag)-70, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P0138.	Go to step 3.
3	CHECK REAR OXYGEN SENSOR DATA. 1) Warm-up the engine until engine coolant temperature is above 70°C (158°F), and lower the engine speed rapidly from 5,000 rpm. 2) Read the data of rear oxygen sensor signal using Subaru Select Monitor. NOTE: For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO 2.5)(diag)-26, Subaru Select Monitor.>	Is the voltage more than 250 mV?	Go to step 6.	Go to step 4.
4	CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and rear oxygen sensor. 3) Measure the resistance in harness between ECM and rear oxygen sensor connector. Connector & terminal (B137) No. 24 — (B19) No. 3: (B136) No. 35 — (B19) No. 4:	Is the resistance more than 3 Ω?	Repair the open circuit in harness between ECM and rear oxygen sensor connector.	Go to step 5.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>5</p> <p>CHECK HARNESS BETWEEN REAR OXYGEN SENSOR AND ECM CONNECTOR.</p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from rear oxygen sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between rear oxygen sensor harness connector and chassis ground.</p> <p>Connector & terminal (B19) No. 3 (+) — Chassis ground (-):</p>	<p>Is the voltage 0.2 — 0.5 V?</p>	<p>Replace the rear oxygen sensor. <Ref. to FU(H4SO 2.5)-35, Rear Oxygen Sensor.></p>	<p>Repair the harness and connector.</p> <p>NOTE: In this case, repair the following:</p> <ul style="list-style-type: none"> • Open circuit in harness between rear oxygen sensor and ECM connector • Poor contact in rear oxygen sensor connector • Poor contact in ECM connector
<p>6</p> <p>CHECK EXHAUST SYSTEM.</p> <p>Check exhaust system parts.</p> <p>NOTE: Check the following items:</p> <ul style="list-style-type: none"> • Loose part of exhaust system and incomplete installation • Damage (crack, hole etc.) of parts • Looseness and ill fitting of parts between front oxygen (A/F) sensor and rear oxygen sensor 	<p>Is there any fault in exhaust system?</p>	<p>Repair or replace the faulty part.</p>	<p>Replace the rear oxygen sensor. <Ref. to FU(H4SO 2.5)-35, Rear Oxygen Sensor.></p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

W: DTC P0139 O2 SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 2)

DTC DETECTING CONDITION:

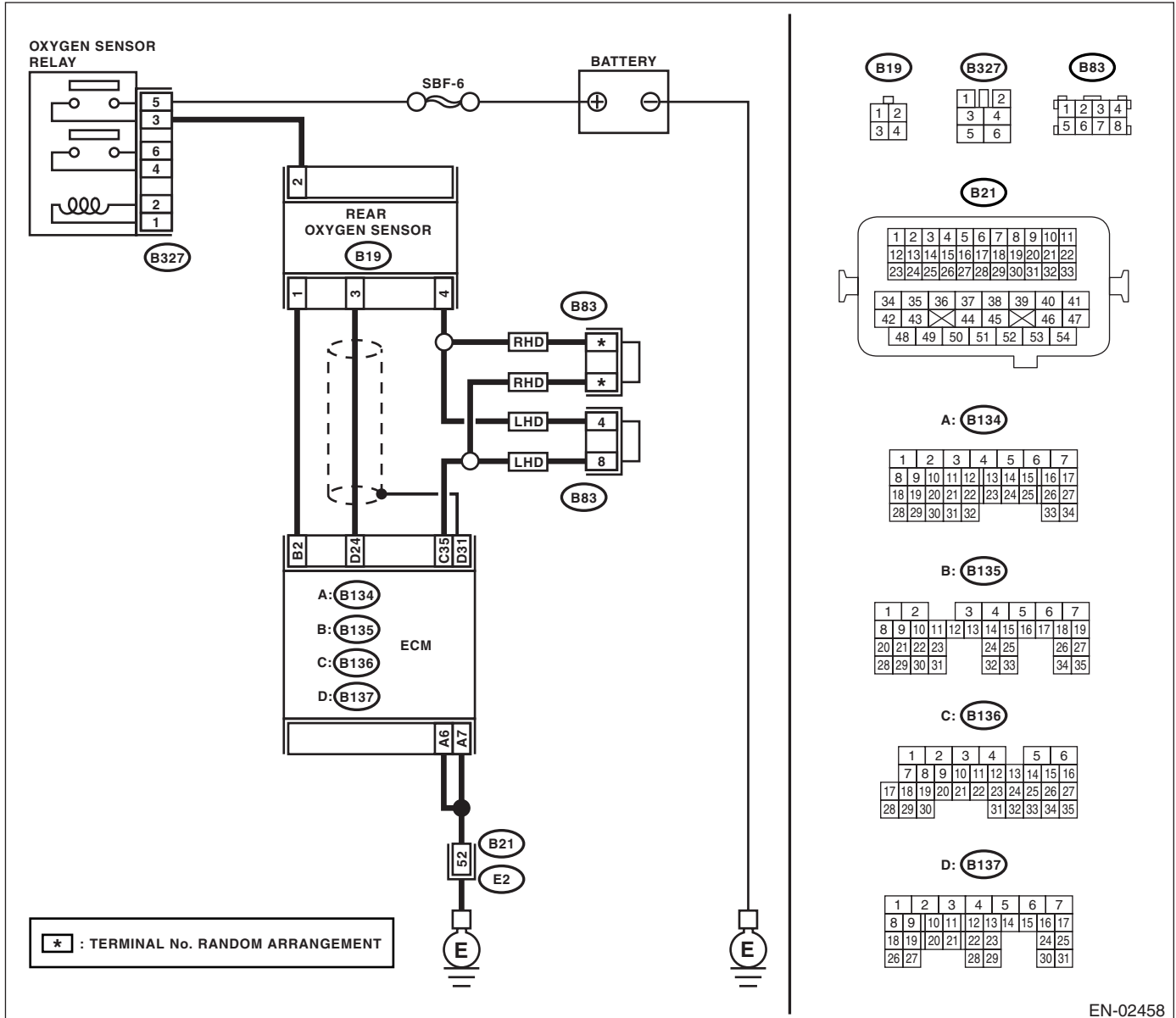
Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1	CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2. Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO 2.5)(diag)-70, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P0139. Replace the rear oxygen sensor. <Ref. to FU(H4SO 2.5)-35, Rear Oxygen Sensor.>

X: DTC P0171 SYSTEM TOO LEAN (BANK 1)

Refer to DTC P0172 for diagnostic procedure. <Ref. to EN(H4SO 2.5)(diag)-137, DTC P0172 SYSTEM TOO RICH (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Y: DTC P0172 SYSTEM TOO RICH (BANK 1)

DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK EXHAUST SYSTEM.	Are there holes or loose bolts on exhaust system?	Repair exhaust system.	Go to step 3.
3 CHECK AIR INTAKE SYSTEM.	Are there holes, loose bolts or disconnection of hose on air intake system?	Repair air intake system.	Go to step 4.
4 CHECK EGR VALVE.	Is the EGR valve stuck?	Replace the EGR valve.	Go to step 5.
5 CHECK PURGE CONTROL SOLENOID VALVE.	Is the purge control solenoid valve stuck?	Replace the purge control solenoid valve.	Go to step 6.
6 CHECK PCV VALVE.	Is the PCV valve stuck?	Replace the PCV valve.	Go to step 7.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>7 CHECK FUEL PRESSURE.</p> <p>Warning:</p> <ul style="list-style-type: none"> • Place “NO FIRE” signs near the working area. • Be careful not to spill fuel. <ol style="list-style-type: none"> 1) Release the fuel pressure. <ol style="list-style-type: none"> (1) Disconnect the connector from fuel pump relay. (2) Start the engine and run it until it stalls. (3) After the engine stalls, crank it for five more seconds. (4) Turn the ignition switch to OFF. 2) Connect the connector to fuel pump relay. 3) Disconnect the fuel delivery hose, and connect the fuel pressure gauge. 4) Install the fuel filler cap. 5) Start the engine and idle while gear position is neutral. 6) Measure the fuel pressure while disconnecting pressure regulator vacuum hose from intake manifold. <p>Warning: Release fuel pressure before removing the fuel pressure gauge.</p> <p>NOTE: If fuel pressure does not increase, squeeze fuel return hose 2 to 3 times, then measure fuel pressure again.</p>	<p>Is fuel pressure 284 — 314 kPa (2.9 — 3.2 kg/cm², 41 — 46 psi)?</p>	Go to step 8.	<p>Repair the following items.</p> <p>Fuel pressure is too high:</p> <ul style="list-style-type: none"> • Clogged fuel return line or bent hose <p>Fuel pressure is too low:</p> <ul style="list-style-type: none"> • Improper fuel pump discharge • Clogged fuel supply line
<p>8 CHECK FUEL PRESSURE.</p> <p>After connecting the pressure regulator vacuum hose, measure fuel pressure.</p> <p>Warning: Release fuel pressure before removing the fuel pressure gauge.</p> <p>NOTE:</p> <ul style="list-style-type: none"> • If fuel pressure does not increase, squeeze fuel return hose 2 to 3 times, then measure fuel pressure again. • If the measured value at this step is out of specification, check or replace pressure regulator and pressure regulator vacuum hose. 	<p>Is measured value 206 — 235 kPa (2.1 — 2.4 kg/cm², 30 — 34 psi)?</p>	Go to step 9.	<p>Repair the following items.</p> <p>Fuel pressure is too high:</p> <ul style="list-style-type: none"> • Faulty pressure regulator • Clogged fuel return line or bent hose <p>Fuel pressure is too low:</p> <ul style="list-style-type: none"> • Faulty pressure regulator • Improper fuel pump discharge • Clogged fuel supply line
<p>9 CHECK ENGINE COOLANT TEMPERATURE SENSOR.</p> <ol style="list-style-type: none"> 1) Start the engine and warm-up completely. 2) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor. <p>NOTE: For detailed operation procedure, refer to the “READ CURRENT DATA FOR ENGINE”. <Ref. to EN(H4SO 2.5)(diag)-26, Subaru Select Monitor.></p>	<p>Is the engine coolant temperature between 70°C (158°F) and 100°C (212°F)?</p>	Go to step 10.	<p>Replace the engine coolant temperature sensor. <Ref. to FU(H4SO 2.5)-20, Engine Coolant Temperature Sensor.></p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No	
10	CHECK MANIFOLD PRESSURE SENSOR SIGNAL. 1) Start and warm-up the engine until engine coolant temperature is above 60°C (140°F). 2) Place the select lever in "N" or "P" position. 3) Turn the A/C switch to OFF. 4) Turn all accessory switches to OFF. 5) Read the data of manifold pressure sensor signal using Subaru Select Monitor. NOTE: For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO 2.5)(diag)-26, Subaru Select Monitor.>	Is the measurement value 24.0 — 41.3 kPa (180 — 310 mmHg, 7.09 — 12.20 inHg) when idling and 73.3 — 106.6 kPa (550 — 800 mmHg, 21.65 — 31.50 inHg) when the ignition turns to ON?	Replace the ECM. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>	Replace the manifold pressure sensor. <Ref. to FU(H4SO 2.5)-25, Manifold Absolute Pressure Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Z: DTC P0222 THROTTLE/PEDAL POSITION SENSOR/SWITCH “B” CIRCUIT LOW INPUT

DTC DETECTING CONDITION:

Immediately at fault recognition.

TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance
- Engine stalls.

CAUTION:

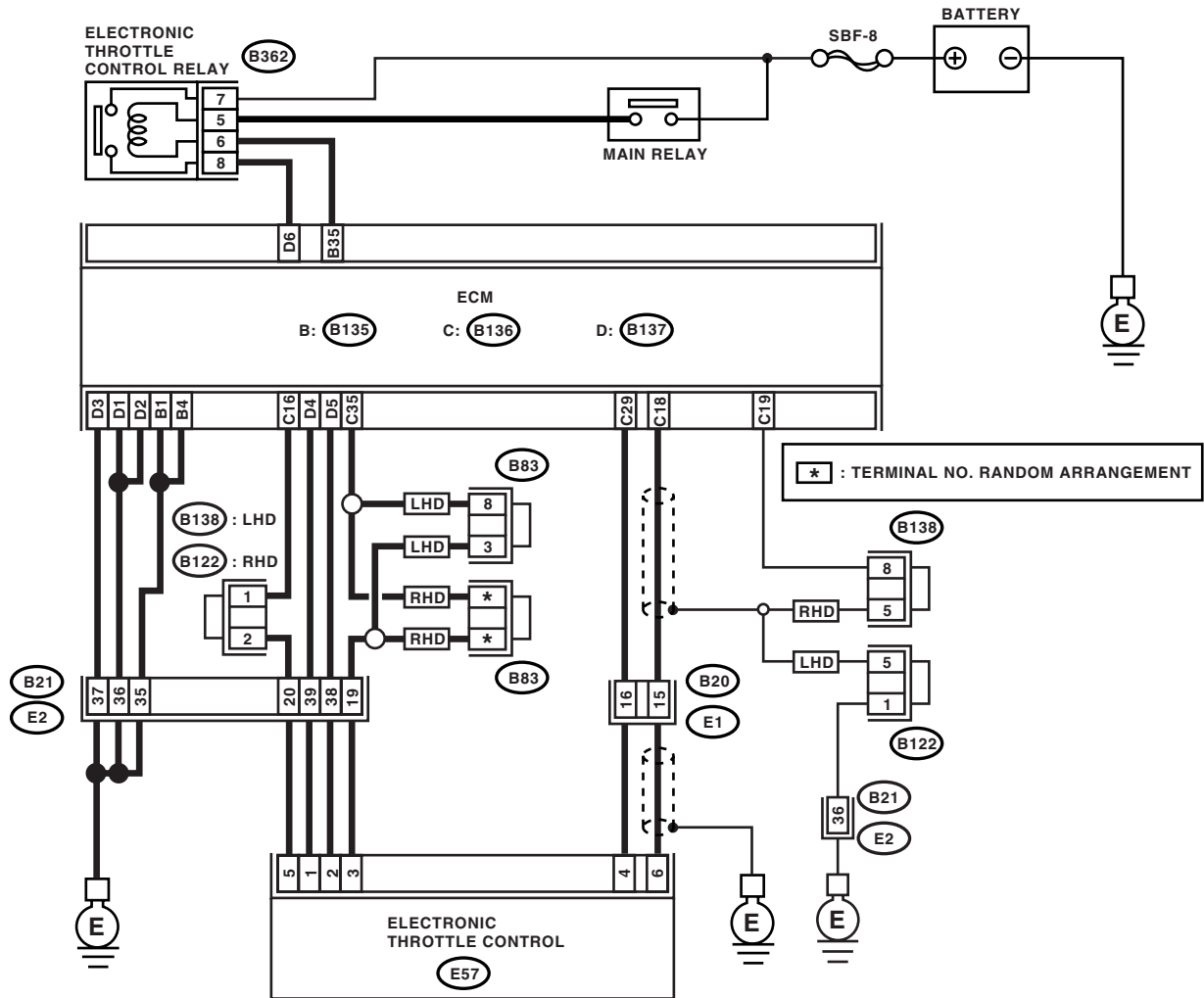
After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

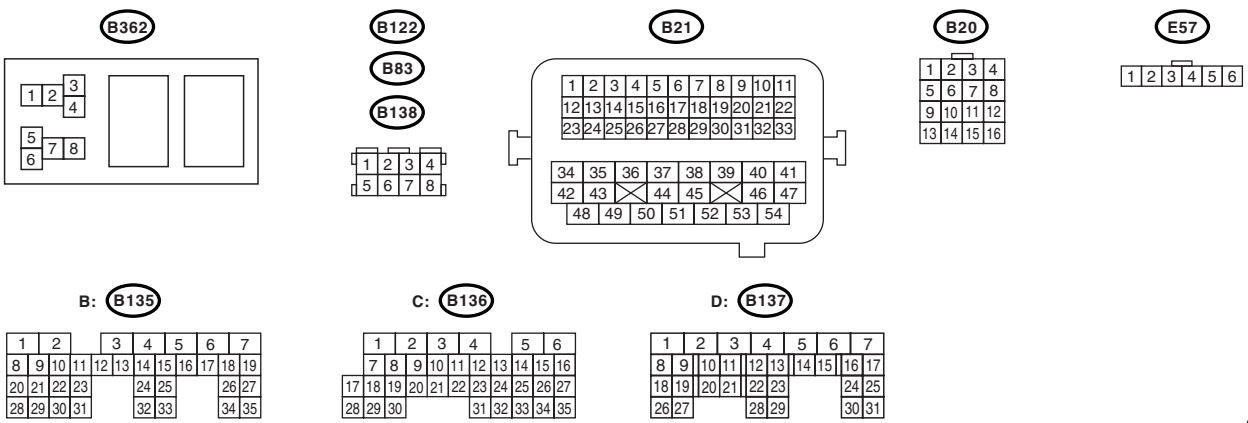
ENGINE (DIAGNOSTICS)

WIRING DIAGRAM:

- EC, EK and K4 model



* : TERMINAL NO. RANDOM ARRANGEMENT



EN-02462

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1	CHECK OPTION CODE.	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2	CHECK SENSOR OUTPUT. 1) Turn the ignition switch to ON. 2) Read the data of sub throttle sensor signal using Subaru Select Monitor.	Go to step 3.	Go to step 4.
3	CHECK POOR CONTACT. Check poor contact in connector between ECM and electronic throttle control.	Repair the poor contact.	Temporary poor contact occurred, but it is normal at present.
4	CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connectors from electronic throttle control. 4) Measure the resistance between ECM connector and electronic throttle control connector. Connector & terminal (B136) No. 29 — (E57) No. 4: (B136) No. 16 — (E57) No. 5:	Go to step 5.	Repair the open circuit of harness connector.
5	CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. Measure the resistance between ECM connector and chassis ground. Connector & terminal (B136) No. 29 — Chassis ground: (B136) No. 16 — Chassis ground:	Go to step 6.	Repair the chassis short circuit of harness.
6	CHECK SENSOR POWER SUPPLY. 1) Connect the ECM connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 5 (+) — Engine ground (-):	Go to step 7.	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>
7	CHECK SHORT CIRCUIT INSIDE THE ECM. 1) Turn the ignition switch to OFF. 2) Measure the resistance between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 4 — Engine ground:	Repair the poor contact of electronic throttle control connector. Replace the electronic throttle control if defective.	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>

AA:DTC P0223 THROTTLE/PEDAL POSITION SENSOR/SWITCH “B” CIRCUIT HIGH INPUT

DTC DETECTING CONDITION:

Immediately at fault recognition.

TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance
- Engine stalls.

CAUTION:

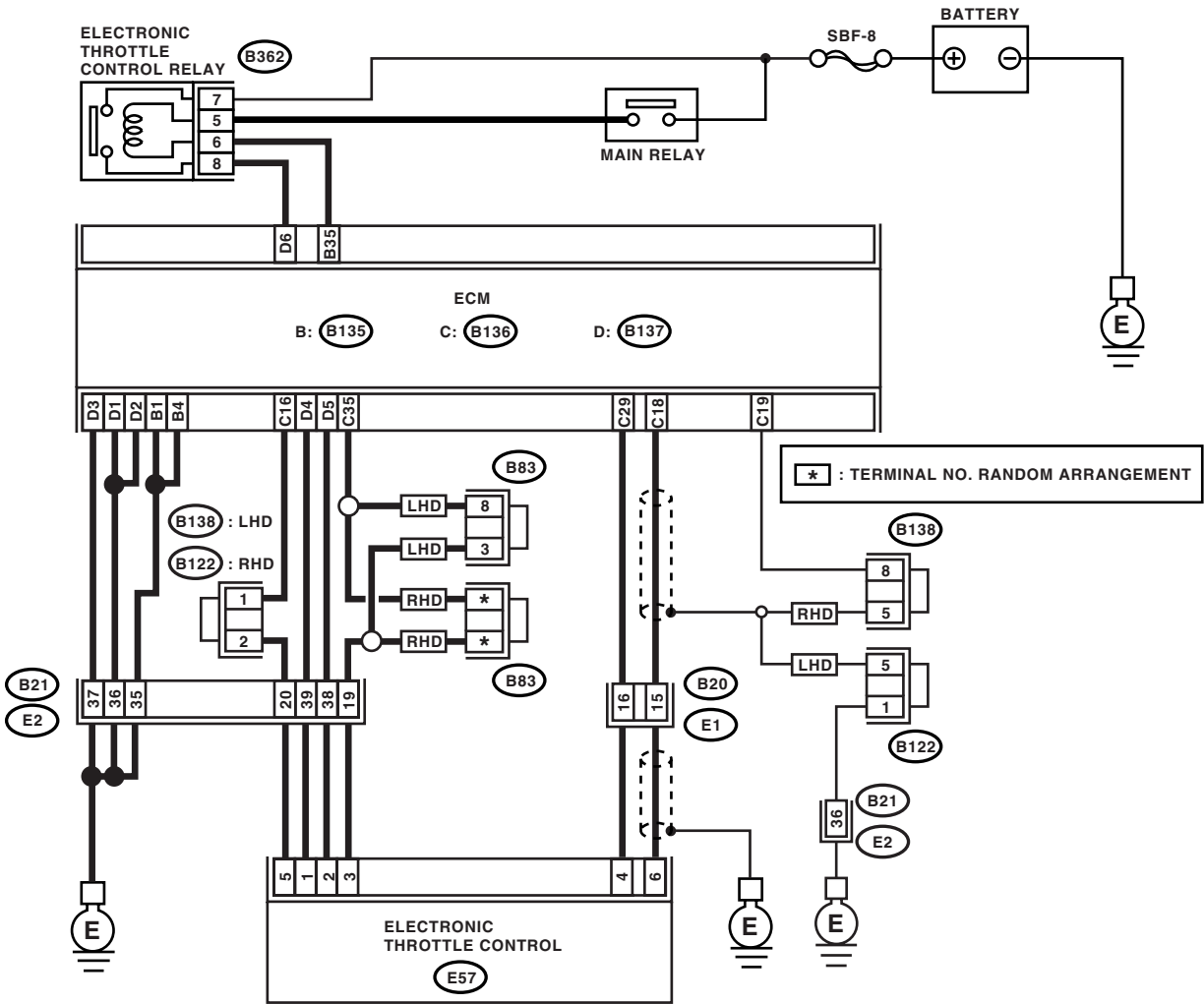
After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

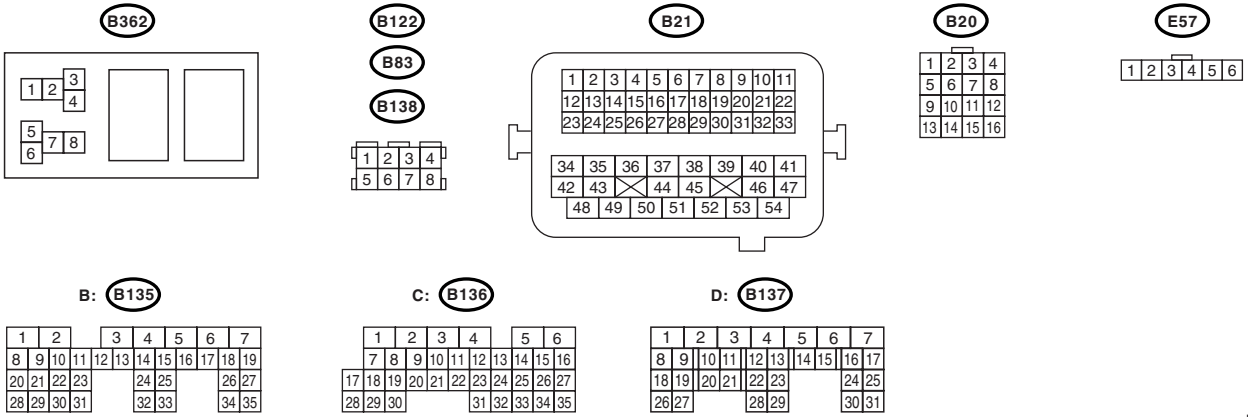
ENGINE (DIAGNOSTICS)

WIRING DIAGRAM:

- EC, EK and K4 model



* : TERMINAL NO. RANDOM ARRANGEMENT



EN-02462

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1	CHECK OPTION CODE.	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2	CHECK SENSOR OUTPUT. 1) Turn the ignition switch to ON. 2) Read the data of sub throttle sensor signal using Subaru Select Monitor.	Go to step 3.	Go to step 4.
3	CHECK POOR CONTACT. Check poor contact in connector between ECM and electronic throttle control.	Repair the poor contact.	Temporary poor contact occurred, but it is normal at present.
4	CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connectors from electronic throttle control. 4) Measure the resistance between ECM connector and electronic throttle control connector. Connector & terminal (B136) No. 35 — (E57) No. 3: (B136) No. 29 — (E57) No. 4:	Go to step 5.	Repair the open circuit of harness connector.
5	CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Connect the ECM connector. 2) Measure the resistance between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 3 — Engine ground:	Go to step 6.	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>
6	CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. Measure the voltage between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 4 (+) — Engine ground (-):	Go to step 7.	Repair the battery short circuit in harness between ECM connector and electronic throttle control connector.
7	CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance between connector terminals. Connector & terminal (B136) No. 29 — (B136) No. 16:	Repair the poor contact. Replace the electronic throttle control.	Sensor power supply circuit may be shorted.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AB:DTC P0301 CYLINDER 1 MISFIRE DETECTED

NOTE:

For the diagnostic procedure, refer to DTC P0304. <Ref. to EN(H4SO 2.5)(diag)-147, DTC P0304 CYLINDER 4 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

AC:DTC P0302 CYLINDER 2 MISFIRE DETECTED

NOTE:

For the diagnostic procedure, refer to DTC P0304. <Ref. to EN(H4SO 2.5)(diag)-147, DTC P0304 CYLINDER 4 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

AD:DTC P0303 CYLINDER 3 MISFIRE DETECTED

NOTE:

For the diagnostic procedure, refer to DTC P0304. <Ref. to EN(H4SO 2.5)(diag)-147, DTC P0304 CYLINDER 4 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AE:DTC P0304 CYLINDER 4 MISFIRE DETECTED

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- Immediately at fault recognition (A misfire which could damage catalyst occurs.)

TROUBLE SYMPTOM:

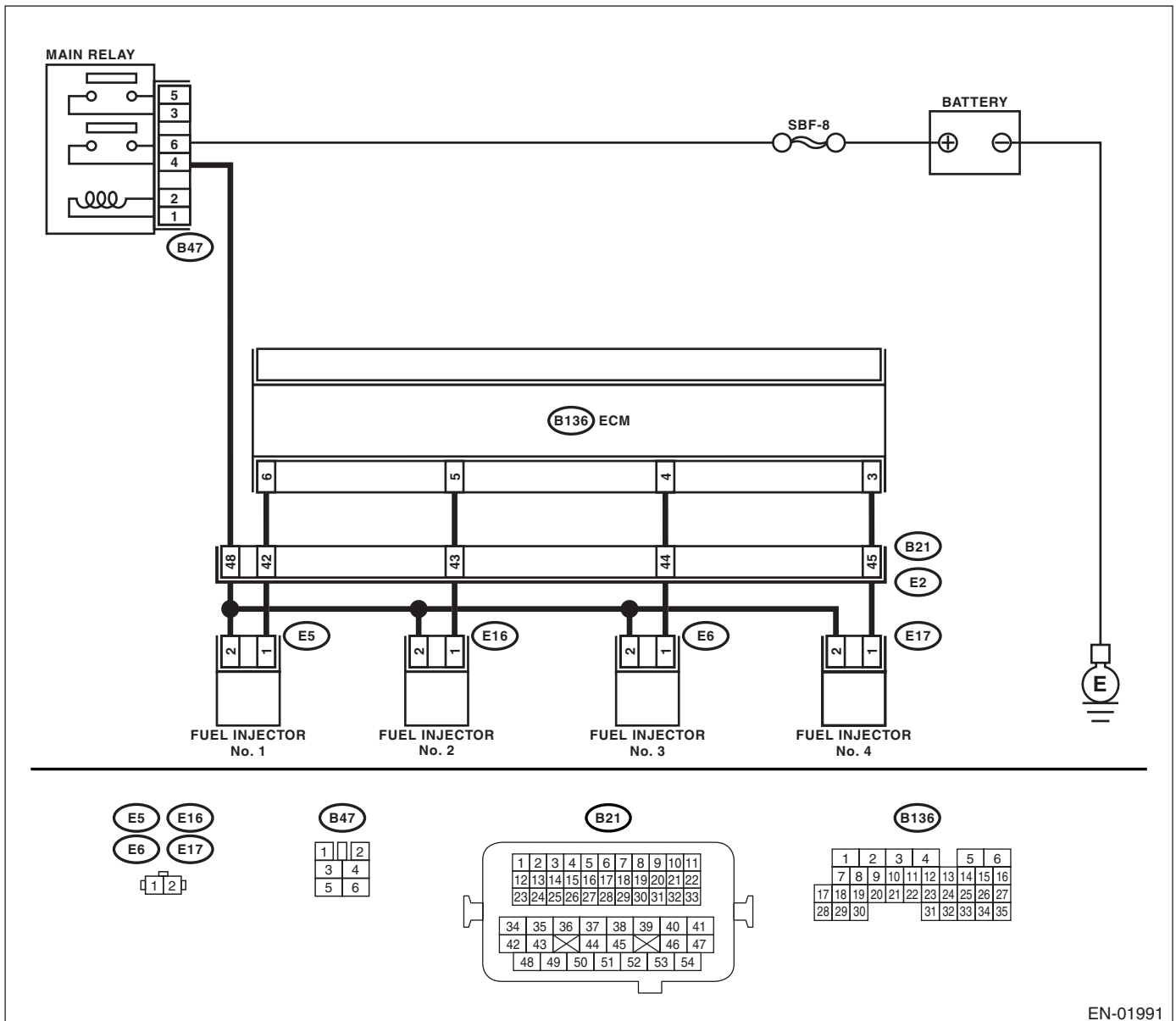
- Engine stalls.
- Erroneous idling
- Rough driving

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



EN-01991

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO 2.5)(diag)-70, List of Diagnostic Trouble Code (DTC).>	Go to step 3.
3 CHECK OUTPUT SIGNAL FROM ECM. 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM connector and chassis ground on faulty cylinders. Connector & terminal #1 (B136) No. 6 (+) — Chassis ground (-): #2 (B136) No. 5 (+) — Chassis ground (-): #3 (B136) No. 4 (+) — Chassis ground (-): #4 (B136) No. 3 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Go to step 8.	Go to step 4.
4 CHECK HARNESS BETWEEN FUEL INJECTOR AND ECM CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from fuel injector on faulty cylinders. 3) Disconnect the connector from ECM. 4) Measure the resistance between ECM connector and engine ground on faulty cylinders. Connector & terminal #1 (E5) No. 1 — Engine ground: #2 (E16) No. 1 — Engine ground: #3 (E6) No. 1 — Engine ground: #4 (E17) No. 1 — Engine ground:	Is the resistance more than 1 MΩ?	Go to step 5.	Repair the ground short circuit in harness between fuel injector and ECM connector.
5 CHECK HARNESS BETWEEN FUEL INJECTOR AND ECM CONNECTOR. Measure the resistance of harness connector between ECM connector and fuel injector on faulty cylinders. Connector & terminal #1 (B136) No. 6 — (E5) No. 1: #2 (B136) No. 5 — (E16) No. 1: #3 (B136) No. 4 — (E6) No. 1: #4 (B136) No. 3 — (E17) No. 1:	Is the resistance less than 1 Ω?	Go to step 6.	Repair the harness and connector. NOTE: In this case, repair the following: <ul style="list-style-type: none"> • Open circuit in harness between ECM and fuel injector connector • Poor contact in coupling connector
6 CHECK FUEL INJECTOR. Measure the resistance between fuel injector terminals on faulty cylinder. Terminals No. 1 — No. 2:	Is the resistance 5 — 20 Ω?	Go to step 7.	Replace the faulty fuel injector. <Ref. to FU(H4SO 2.5)-31, Fuel Injector.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>7</p> <p>CHECK POWER SUPPLY LINE. 1) Turn the ignition switch to ON. 2) Measure the voltage between fuel injector and engine ground on faulty cylinders. Connector & terminal #1 (E5) No. 2 (+) — Engine ground (-): #2 (E16) No. 2 (+) — Engine ground (-): #3 (E6) No. 2 (+) — Engine ground (-): #4 (E17) No. 2 (+) — Engine ground (-):</p>	Is the voltage more than 10 V?	Repair the poor contact in all connectors in fuel injector circuit.	Repair the harness and connector. NOTE: In this case, repair the following: • Open circuit in harness between main relay and fuel injector connector on faulty cylinders • Poor contact in coupling connector • Poor contact in main relay connector • Poor contact in fuel injector connector on faulty cylinders
<p>8</p> <p>CHECK HARNESS BETWEEN FUEL INJECTOR AND ECM CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from fuel injector on faulty cylinder. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM connector and chassis ground on faulty cylinders. Connector & terminal #1 (B136) No. 6 (+) — Chassis ground (-): #2 (B136) No. 5 (+) — Chassis ground (-): #3 (B136) No. 4 (+) — Chassis ground (-): #4 (B136) No. 3 (+) — Chassis ground (-):</p>	Is the voltage more than 10 V?	Repair the battery short circuit in harness between ECM and fuel injector. After repair, replace the ECM. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>	Go to step 9.
<p>9</p> <p>CHECK FUEL INJECTOR. 1) Turn the ignition switch to OFF. 2) Measure the resistance between fuel injector terminals on faulty cylinder. Terminals No. 1 — No. 2:</p>	Is the resistance less than 1 Ω?	Replace the faulty fuel injector <Ref. to FU(H4SO 2.5)-31, Fuel Injector.> and ECM <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>	Go to step 10.
<p>10</p> <p>CHECK INSTALLATION OF CAMSHAFT POSITION SENSOR/CRANKSHAFT POSITION SENSOR.</p>	Is the camshaft position sensor or crankshaft position sensor loosely installed?	Tighten the camshaft position sensor or crankshaft position sensor.	Go to step 11.
<p>11</p> <p>CHECK CRANK SPROCKET. Remove the timing belt cover.</p>	Is the crank sprocket rusted or does it have broken teeth?	Replace the crank sprocket. <Ref. to ME(H4SO 2.0)-50, Crank Sprocket.>	Go to step 12.
<p>12</p> <p>CHECK INSTALLATION CONDITION OF TIMING BELT. Turn the crankshaft, and align alignment mark on crank sprocket with alignment mark on cylinder block.</p>	Is the timing belt dislocated from its proper position?	Repair the installation condition of timing belt. <Ref. to ME(H4SO 2.0)-43, Timing Belt.>	Go to step 13.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
13 CHECK FUEL LEVEL.	Is the fuel meter indication higher than the "Lower" level?	Go to step 14 .	Replenish the fuel so fuel meter indication is higher than the "Lower" level. After replenishing fuel, go to step 14 .
14 CHECK STATUS OF MALFUNCTION INDICATOR LIGHT. 1) Clear the memory using Subaru Select Monitor. <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> 2) Start the engine, and drive the vehicle more than 10 minutes.	Does the malfunction indicator light come on or blink?	Go to step 16 .	Go to step 15 .
15 CHECK CAUSE OF MISFIRE DIAGNOSED.	Was the cause of misfire diagnosed when the engine is running?	Finish the diagnostics operation, if the engine has no abnormality.	Repair the poor contact. NOTE: In this case, repair the following: • Poor contact in ignition coil connector • Poor contact in fuel injector connector on faulty cylinders • Poor contact in ECM connector • Poor contact in coupling connector
16 CHECK AIR INTAKE SYSTEM.	Is there any fault in air intake system?	Repair the air intake system. NOTE: Check the following items: • Are there air leaks or air suction caused by loose or dislocated nuts and bolts? • Are there cracks or any disconnection of hoses?	Go to step 17 .
17 CHECK CYLINDER.	Is there any fault in that cylinder?	Repair or replace the faulty parts. NOTE: Check the following items. • Spark plug • Fuel injector • Compression pressure	Go to DTC P0171 and P0172. <Ref. to EN(H4SO 2.5)(diag)-136, DTC P0171 SYSTEM TOO LEAN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

AF:DTC P0327 KNOCK SENSOR 1 CIRCUIT LOW INPUT (BANK 1 OR SINGLE SENSOR)

DTC DETECTING CONDITION:

Immediately at fault recognition.

TROUBLE SYMPTOM:

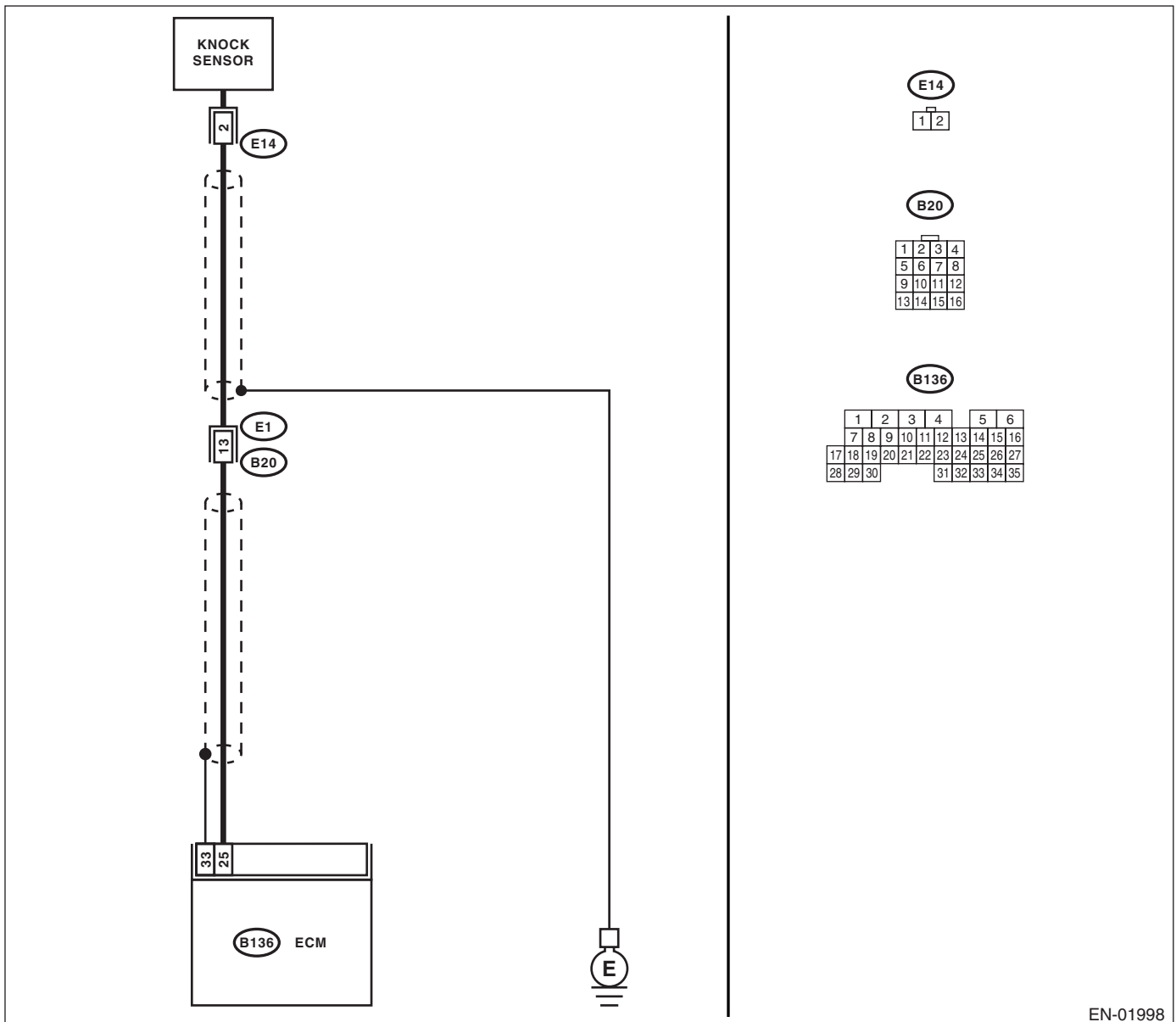
- Poor driving performance
- Knocking occurs.

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



EN-01998

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK HARNESS BETWEEN KNOCK SENSOR AND ECM CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance between ECM harness connector and chassis ground. Connector & terminal (B136) No. 25 — Chassis ground:	Is the resistance more than 700 k Ω ?	Go to step 3.	Repair the harness and connector. NOTE: In this case, repair the following: <ul style="list-style-type: none"> • Open circuit in harness between knock sensor and ECM connector • Poor contact in knock sensor connector • Poor contact in coupling connector
3 CHECK KNOCK SENSOR. 1) Disconnect the connector from knock sensor. 2) Measure the resistance between knock sensor connector terminal and engine ground. Terminals No. 2 — Engine ground:	Is the resistance more than 700 k Ω ?	Go to step 4.	Repair the harness and connector. NOTE: In this case, repair the following: <ul style="list-style-type: none"> • Poor contact in knock sensor connector
4 CHECK CONDITION OF KNOCK SENSOR INSTALLATION.	Is the knock sensor installation bolt tightened securely?	Replace the knock sensor. <Ref. to FU(H4SO 2.5)-23, Knock Sensor.>	Tighten knock sensor installation bolt securely.

AG:DTC P0328 KNOCK SENSOR 1 CIRCUIT HIGH INPUT (BANK 1 OR SINGLE SENSOR)

DTC DETECTING CONDITION:

Immediately at fault recognition.

TROUBLE SYMPTOM:

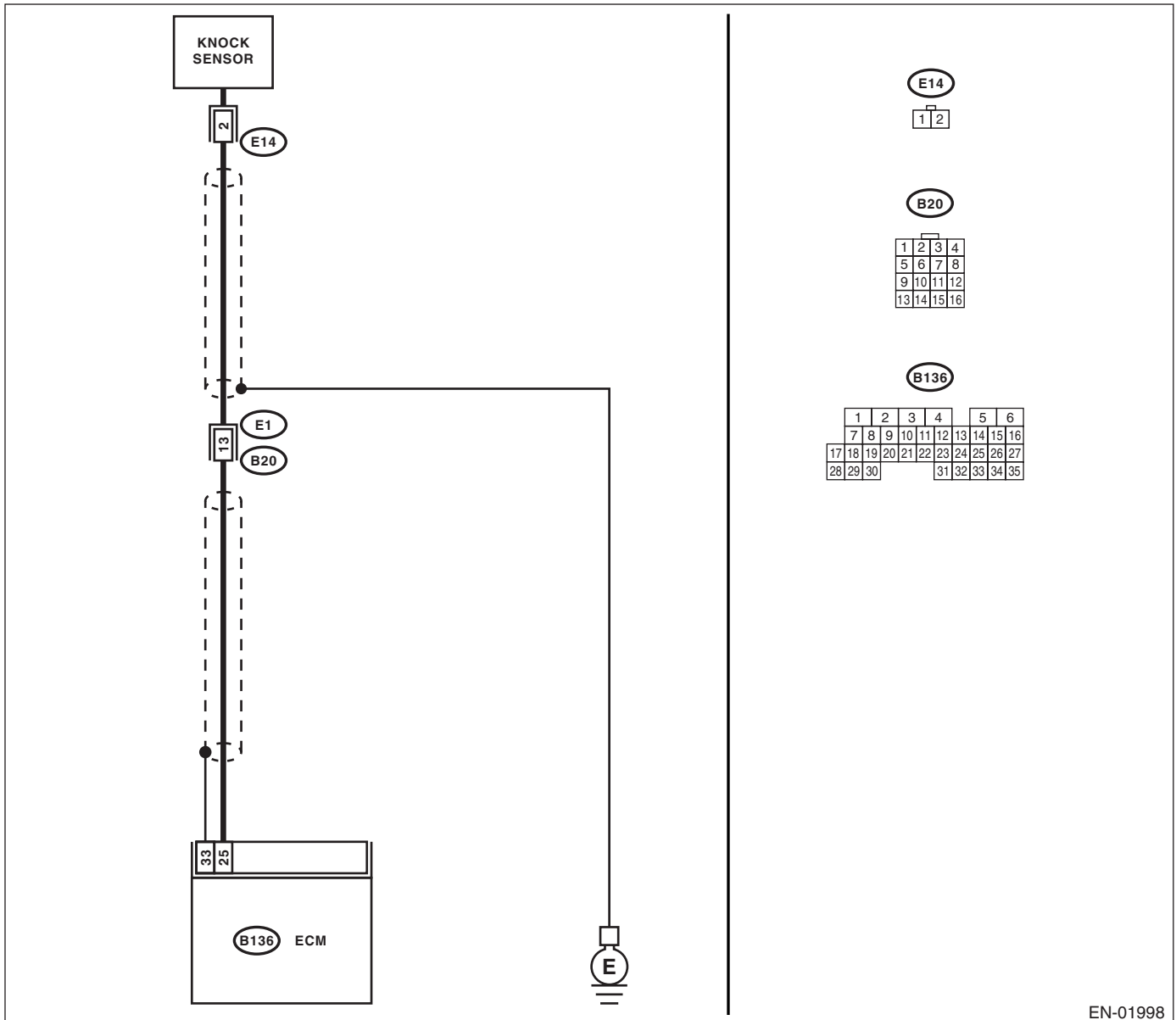
- Poor driving performance
- Knocking occurs.

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



EN-01998

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK HARNESS BETWEEN KNOCK SENSOR AND ECM CONNECTOR. Measure the resistance of harness between ECM connector and chassis ground. Connector & terminal (B136) No. 25 — Chassis ground:	Is the resistance less than 400 kΩ?	Go to step 3.	Go to step 4.
3 CHECK KNOCK SENSOR. 1) Disconnect the connector from knock sensor. 2) Measure the resistance between knock sensor connector terminal and engine ground. Terminals No. 2 — Engine ground:	Is the resistance less than 400 kΩ?	Replace the knock sensor. <Ref. to FU(H4SO 2.5)-23, Knock Sensor.>	Repair the ground short circuit in harness between knock sensor connector and ECM connector. NOTE: The harness between both connectors are shielded. Repair the short circuit in harness covered with shield.
4 CHECK INPUT SIGNAL FROM ECM. 1) Connect the connectors to ECM and knock sensor. 2) Turn the ignition switch to ON. 3) Measure the voltage between ECM and chassis ground. Connector & terminal (B136) No. 25 (+) — Chassis ground (-):	Is the voltage more than 2 V?	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. (However, the possibility of poor contact still remains.) NOTE: In this case, repair the following: <ul style="list-style-type: none"> • Poor contact in knock sensor connector • Poor contact in ECM connector • Poor contact in coupling connector 	Repair the poor contact in ECM connector.

AH:DTC P0335 CRANKSHAFT POSITION SENSOR "A" CIRCUIT

DTC DETECTING CONDITION:

Immediately at fault recognition.

TROUBLE SYMPTOM:

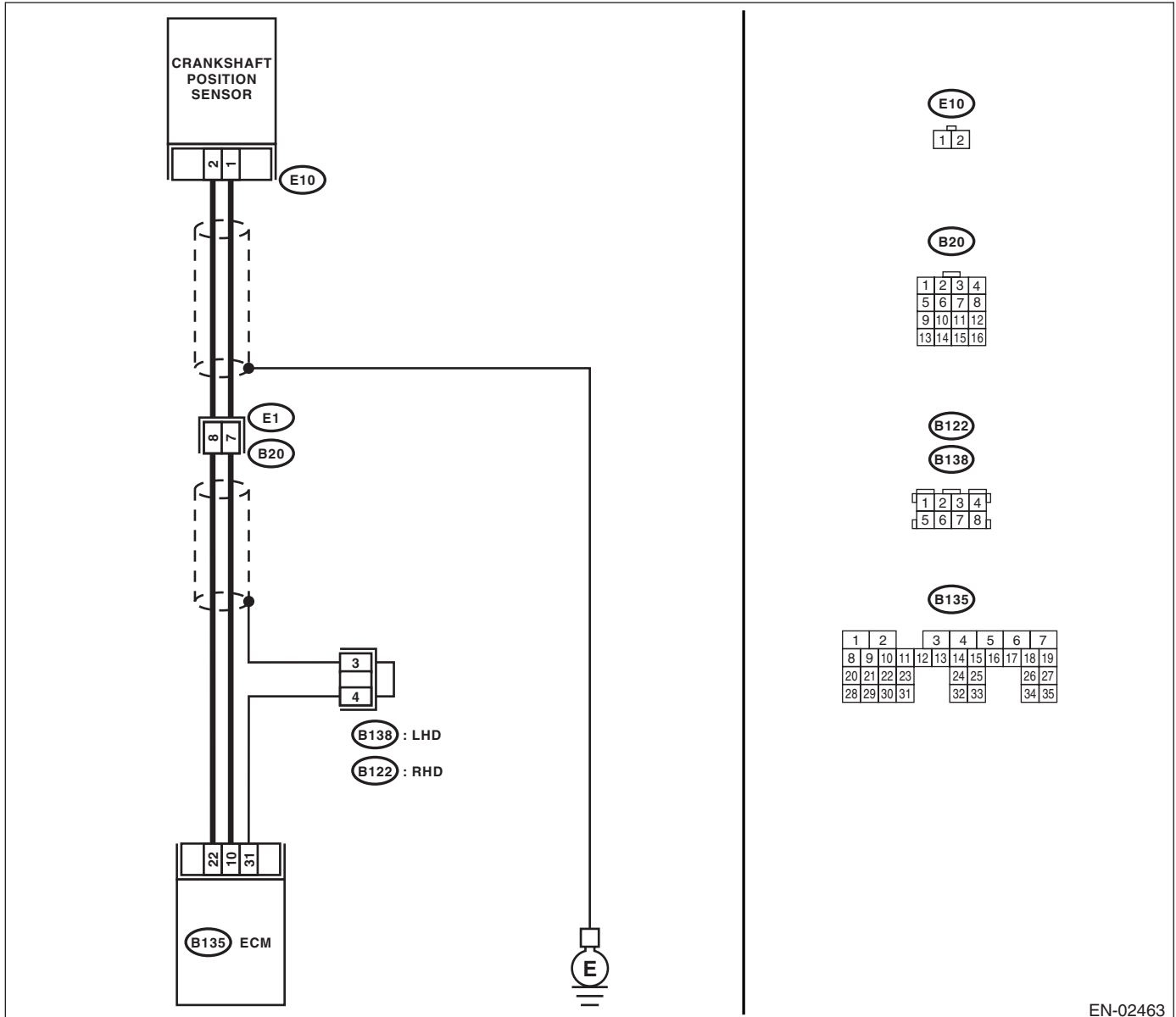
- Engine stalls.
- Failure of engine to start

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>1</p> <p>CHECK OPTION CODE.</p>	<p>Is the option code EC, EK or K4?</p>	<p>Go to step 2.</p>	<p>Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).></p> <p>NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.</p>
<p>2</p> <p>CHECK HARNESS BETWEEN CRANKSHAFT POSITION SENSOR AND ECM CONNECTOR.</p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from crankshaft position sensor. 3) Measure the resistance of harness between crankshaft position sensor connector and engine ground.</p> <p>Connector & terminal (E10) No. 1 — Engine ground:</p>	<p>Is the resistance more than 100 kΩ?</p>	<p>Repair the harness and connector.</p> <p>NOTE: In this case, repair the following:</p> <ul style="list-style-type: none"> • Open circuit in harness between crankshaft position sensor and ECM connector • Poor contact in ECM connector • Poor contact in coupling connector 	<p>Go to step 3.</p>
<p>3</p> <p>CHECK HARNESS BETWEEN CRANKSHAFT POSITION SENSOR AND ECM CONNECTOR.</p> <p>Measure the resistance of harness between crankshaft position sensor connector and engine ground.</p> <p>Connector & terminal (E10) No. 1 — Engine ground:</p>	<p>Is the resistance less than 10 Ω?</p>	<p>Repair the ground short circuitrepair the ground short circuit in harness between crankshaft position sensor and ECM connector.</p> <p>NOTE: The harness between both connectors are shielded. Repair the ground short circuit in harness with shield.</p>	<p>Go to step 4.</p>
<p>4</p> <p>CHECK HARNESS BETWEEN CRANKSHAFT POSITION SENSOR AND ECM CONNECTOR.</p> <p>Measure the resistance of harness between crankshaft position sensor connector and engine ground.</p> <p>Connector & terminal (E10) No. 2 — Engine ground:</p>	<p>Is the resistance less than 5 Ω?</p>	<p>Go to step 5.</p>	<p>Repair the harness and connector.</p> <p>NOTE: In this case, repair the following:</p> <ul style="list-style-type: none"> • Open circuit in harness between crankshaft position sensor and ECM connector • Poor contact in ECM connector • Poor contact in coupling connector

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
5 CHECK CONDITION OF CRANKSHAFT POSITION SENSOR.	Is the crankshaft position sensor installation bolt tightened securely?	Go to step 6.	Tighten the crankshaft position sensor installation bolt securely.
6 CHECK CRANKSHAFT POSITION SENSOR. 1) Remove the crankshaft position sensor. 2) Measure the resistance between connector terminals of crankshaft position sensor. Terminals No. 1 — No. 2:	Is the resistance 1 — 4 k Ω ?	Repair the poor contact in crankshaft position sensor connector.	Replace the crankshaft position sensor. <Ref. to FU(H4SO 2.5)-21, Crankshaft Position Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AI: DTC P0340 CAMSHAFT POSITION SENSOR "A" CIRCUIT (BANK 1 OR SINGLE SENSOR)

DTC DETECTING CONDITION:

Immediately at fault recognition.

TROUBLE SYMPTOM:

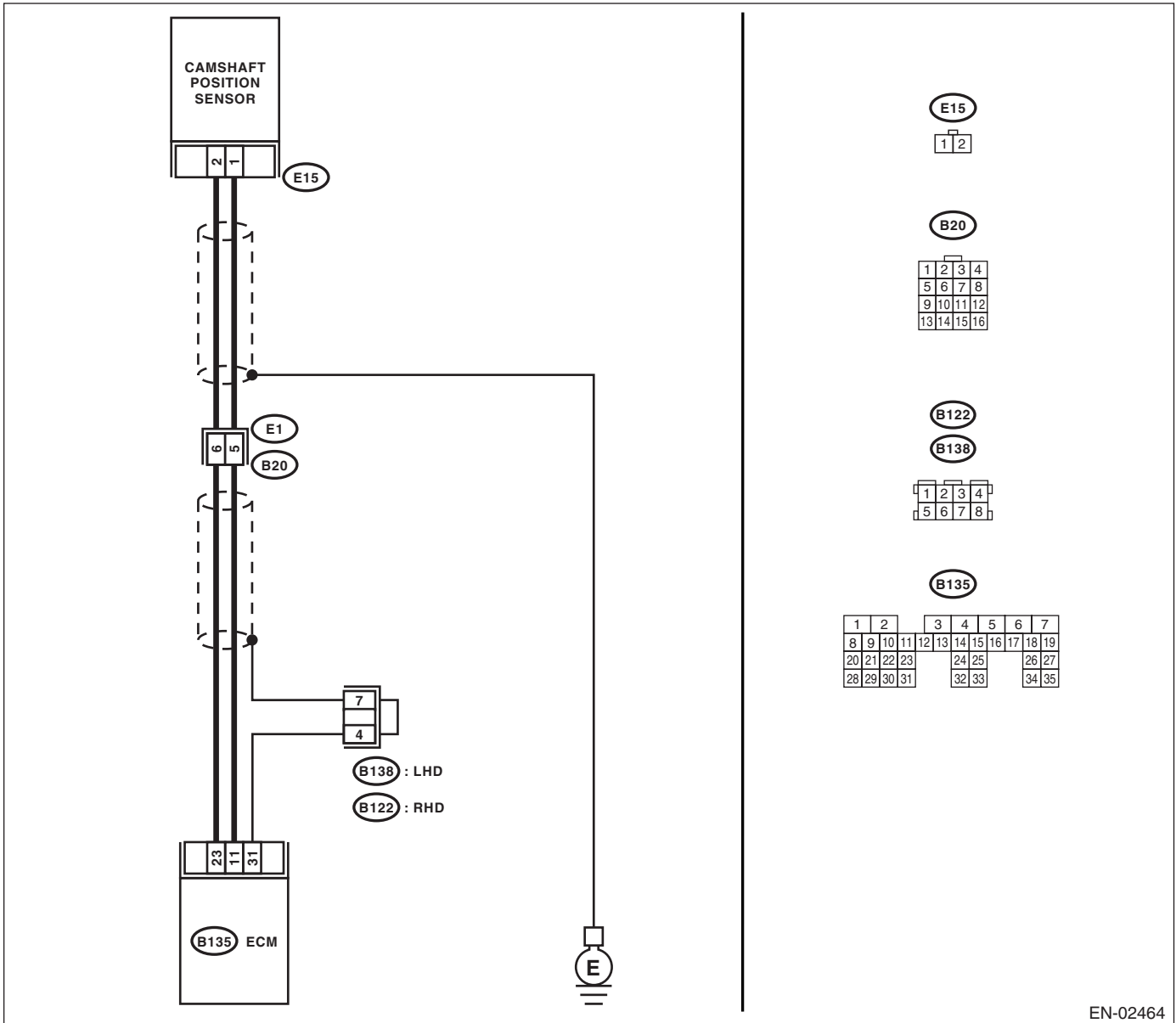
- Engine stalls.
- Failure of engine to start

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1	CHECK OPTION CODE. Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2	CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from camshaft position sensor. 3) Measure the resistance of harness between camshaft position sensor connector and engine ground. Connector & terminal (E15) No. 1 — Engine ground:	Repair the harness and connector. NOTE: In this case, repair the following: <ul style="list-style-type: none"> • Open circuit in harness between camshaft position sensor and ECM connector • Poor contact in ECM connector • Poor contact in coupling connector 	Go to step 3.
3	CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM CONNECTOR. Measure the resistance of harness between camshaft position sensor connector and engine ground. Connector & terminal (E15) No. 1 — Engine ground:	Repair the ground short circuit in harness between camshaft position sensor and ECM connector. NOTE: The harness between both connectors are shielded. Repair the ground short circuit in harness with shield.	Go to step 4.
4	CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM CONNECTOR. Measure the resistance of harness between camshaft position sensor connector and engine ground. Connector & terminal (E15) No. 2 — Engine ground:	Go to step 5.	Repair the harness and connector. NOTE: In this case, repair the following: <ul style="list-style-type: none"> • Open circuit in harness between camshaft position sensor and ECM connector • Poor contact in ECM connector • Poor contact in coupling connector
5	CHECK CONDITION OF CAMSHAFT POSITION SENSOR. Is the camshaft position sensor installation bolt tightened securely?	Go to step 6.	Tighten the camshaft position sensor installation bolt securely.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
6 CHECK CAMSHAFT POSITION SENSOR. 1) Remove the camshaft position sensor. 2) Measure the resistance between connector terminals of camshaft position sensor. Terminals No. 1 — No. 2:	Is the resistance 1 — 4 kΩ?	Repair the poor contact in camshaft position sensor connector.	Replace the camshaft position sensor. <Ref. to FU(H4SO 2.5)-22, Camshaft Position Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AJ:DTC P0400 EXHAUST GAS RECIRCULATION FLOW

DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

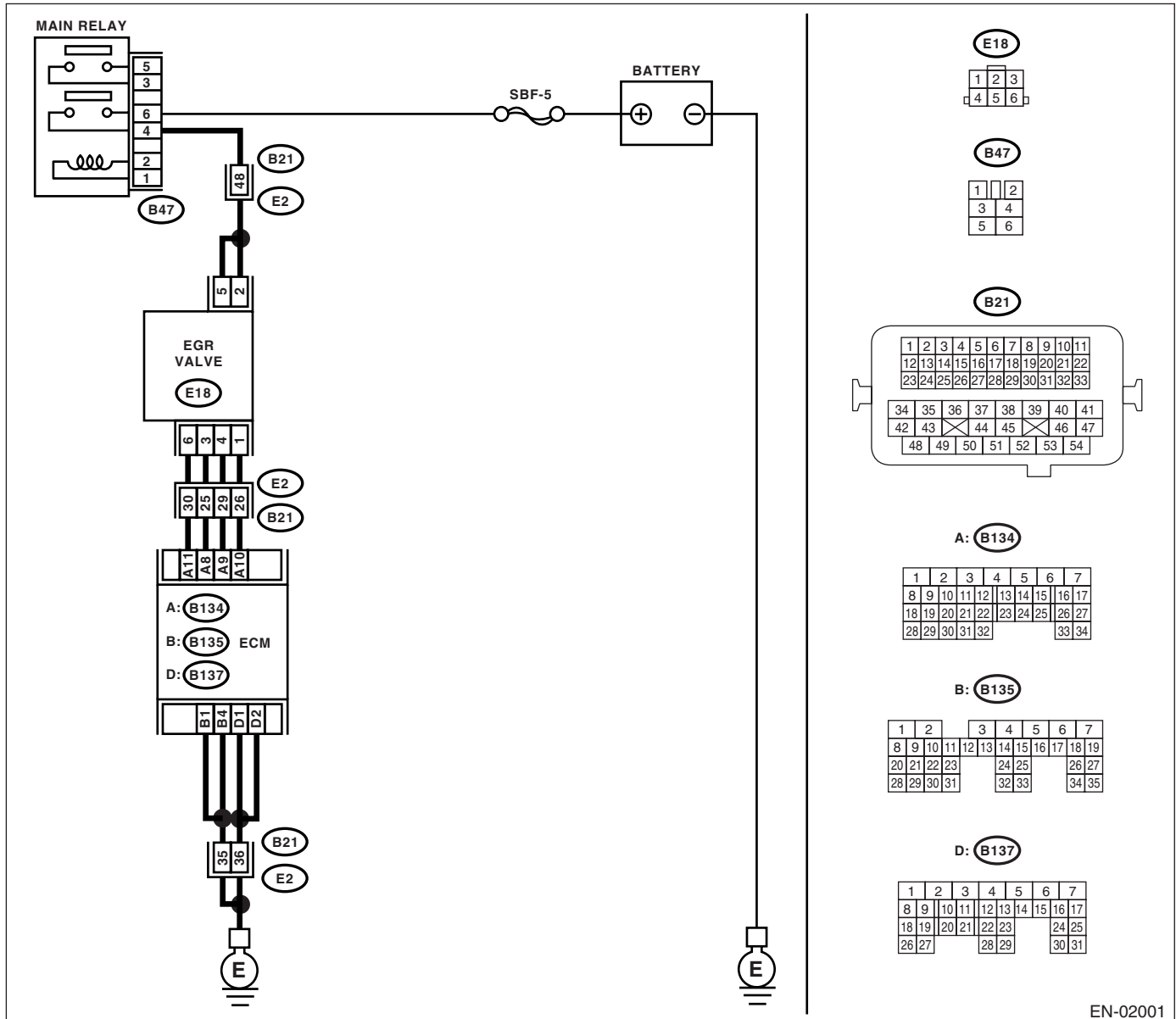
TROUBLE SYMPTOM:

- Movement performance problem when engine is low speed.
- Erroneous idling
- Movement performance problem

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:



EN-02001

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO 2.5)(diag)-70, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2 CHECK CURRENT DATA. 1) Start the engine. 2) Read the data of intake manifold absolute pressure signal using Subaru Select Monitor. NOTE: For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO 2.5)(diag)-26, Subaru Select Monitor.>	Is the value more than 53.3 kPa (400 mmHg, 15.75 inHg)?	Make sure that the EGR valve, manifold absolute pressure sensor and throttle body are installed securely.	Go to step 3.
3 CHECK THE POWER SUPPLY OF EGR SOLENOID VALVE. 1) Detach the connector from EGR solenoid valve. 2) Turn the ignition switch to ON. 3) Measure the voltage between EGR solenoid valve and engine ground. Connector & terminal (E18) No. 2 (+) — Engine ground (-): (E18) No. 5 (+) — Engine ground (-):	Is the voltage more than 10 V?	Go to step 4.	Repair the open circuit in harness between main relay and EGR solenoid valve connector.
4 CHECK EGR SOLENOID VALVE. Measure the resistance between EGR solenoid valve terminals. NOTE: Make sure there is no foreign material between EGR solenoid valve and valve seat. Terminals No. 1 — No. 2: No. 3 — No. 2: No. 4 — No. 5: No. 6 — No. 5:	Is the resistance 20 — 30 Ω?	Go to step 5.	Replace the EGR solenoid valve. <Ref. to FU(H4SO 2.5)-30, EGR Valve.>
5 CHECK OUTPUT SIGNAL FROM ECM. 1) Turn the ignition switch to OFF. 2) Connect the connector to ECM and EGR solenoid valve. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM and chassis ground. Connector & terminal (B134) No. 8 (+) — Chassis ground (-): (B134) No. 9 (+) — Chassis ground (-): (B134) No. 10 (+) — Chassis ground (-): (B134) No. 11 (+) — Chassis ground (-):	Is the voltage 0 — 10 V?	Repair the poor contact portion in ECM connector.	Go to step 6.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>6 CHECK HARNESS BETWEEN EGR SOLENOID VALVE AND ECM CONNECTOR. 1) Turn the ignition switch to OFF. 2) Detach the connector from EGR solenoid valve and ECM. 3) Measure the resistance of harness between EGR solenoid valve and ECM connector.</p> <p>Connector & terminal (B134) No. 8 — (E18) No. 6: (B134) No. 10 — (E18) No. 1: (B134) No. 9 — (E18) No. 4: (B134) No. 11 — (E18) No. 3:</p>	Is the resistance less than 1 Ω ?	Go to step 7.	Repair the open circuit in harness between ECM and EGR solenoid valve connector.
<p>7 CHECK HARNESS BETWEEN EGR SOLENOID VALVE AND ECM CONNECTOR. Measure the resistance of harness between EGR solenoid valve and chassis ground.</p> <p>Connector & terminal (B134) No. 8 — Chassis ground: (B134) No. 9 — Chassis ground: (B134) No. 10 — Chassis ground: (B134) No. 11 — Chassis ground:</p>	Is the resistance more than 1 $M\Omega$?	Go to step 8.	Repair the short circuit in harness between main relay and EGR solenoid valve connector.
<p>8 CHECK POOR CONTACT. Check poor contact for ECM and EGR solenoid valve connector.</p>	Is there poor contact for ECM and EGR solenoid valve connector?	Repair the poor contact of ECM and EGR solenoid valve connector.	Even if the malfunction indicator light illuminates, the circuit has returned to the specified condition at this time.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AK:DTC P0420 CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD (BANK 1)

DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

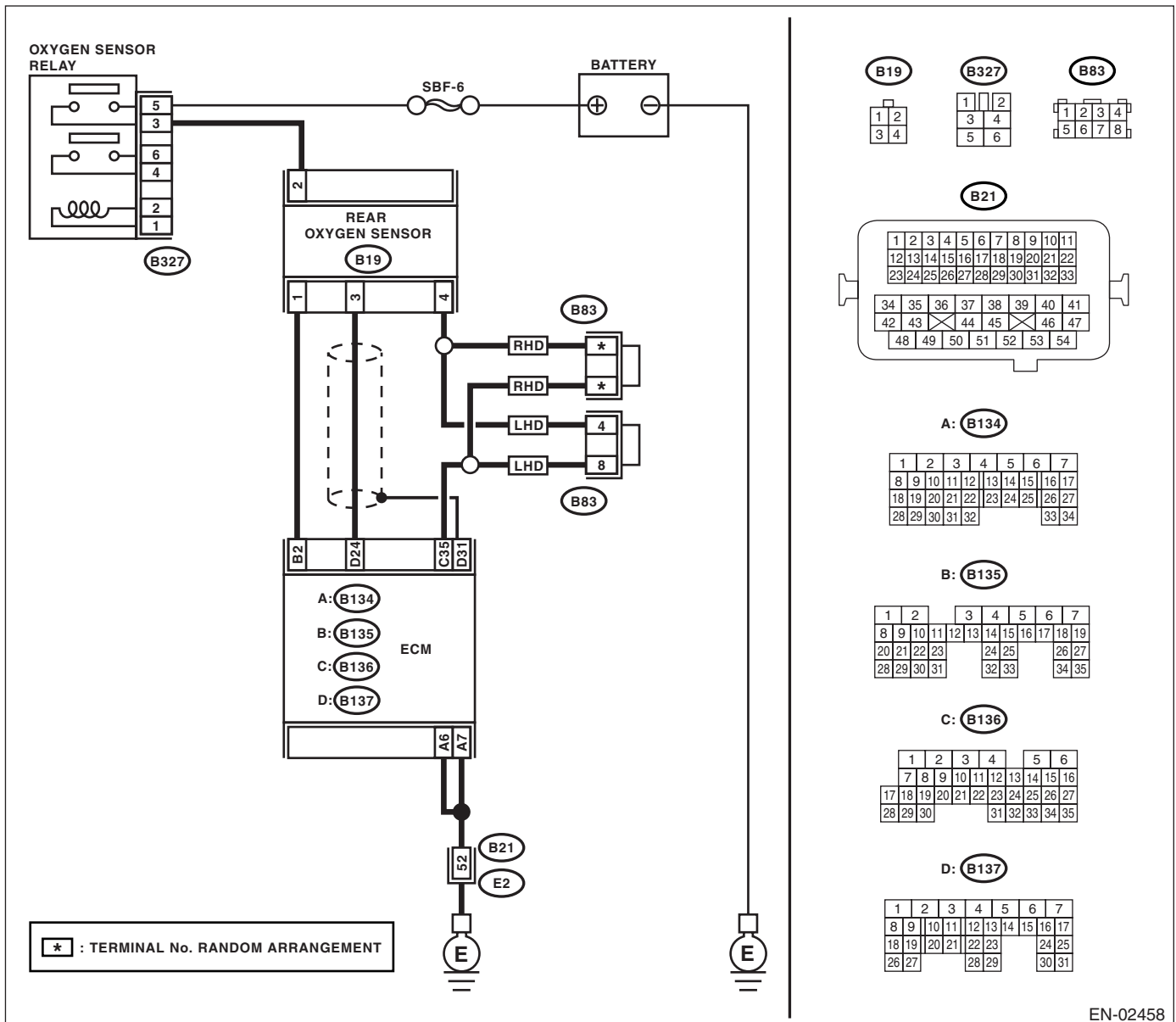
- Engine stalls.
- Idle mixture is out of specifications.

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



EN-02458

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1	CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.
			Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO 2.5)(diag)-70, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P0420.
3	CHECK EXHAUST SYSTEM. Check for gas leaks or air suction caused by loose or dislocated nuts and bolts, and open hole at exhaust pipes. NOTE: Check the following positions. • Between cylinder head and front exhaust pipe • Between front exhaust pipe and front catalytic converter • Between front catalytic converter and rear catalytic converter	Is there any fault in exhaust system?	Repair or replace the exhaust system. <Ref. to EX(H4SO 2.0)-2, General Description.>
4	CHECK REAR CATALYTIC CONVERTER. Separate the rear catalytic converter from rear exhaust pipe.	Is there damage at rear face of rear catalyst?	Replace the front catalytic converter. <Ref. to EC(H4SO 2.0)-3, Front Catalytic Converter.> and rear catalytic converter <Ref. to EC(H4SO 2.0)-4, Rear Catalytic Converter.>
5	CHECK FRONT CATALYTIC CONVERTER. Remove the front catalytic converter.	Is there damage at rear face or front face of front catalyst?	Replace the front catalytic converter. <Ref. to EC(H4SO 2.0)-3, Front Catalytic Converter.> Contact Subaru distributor service. NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AL:DTC P0458 EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT LOW

DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

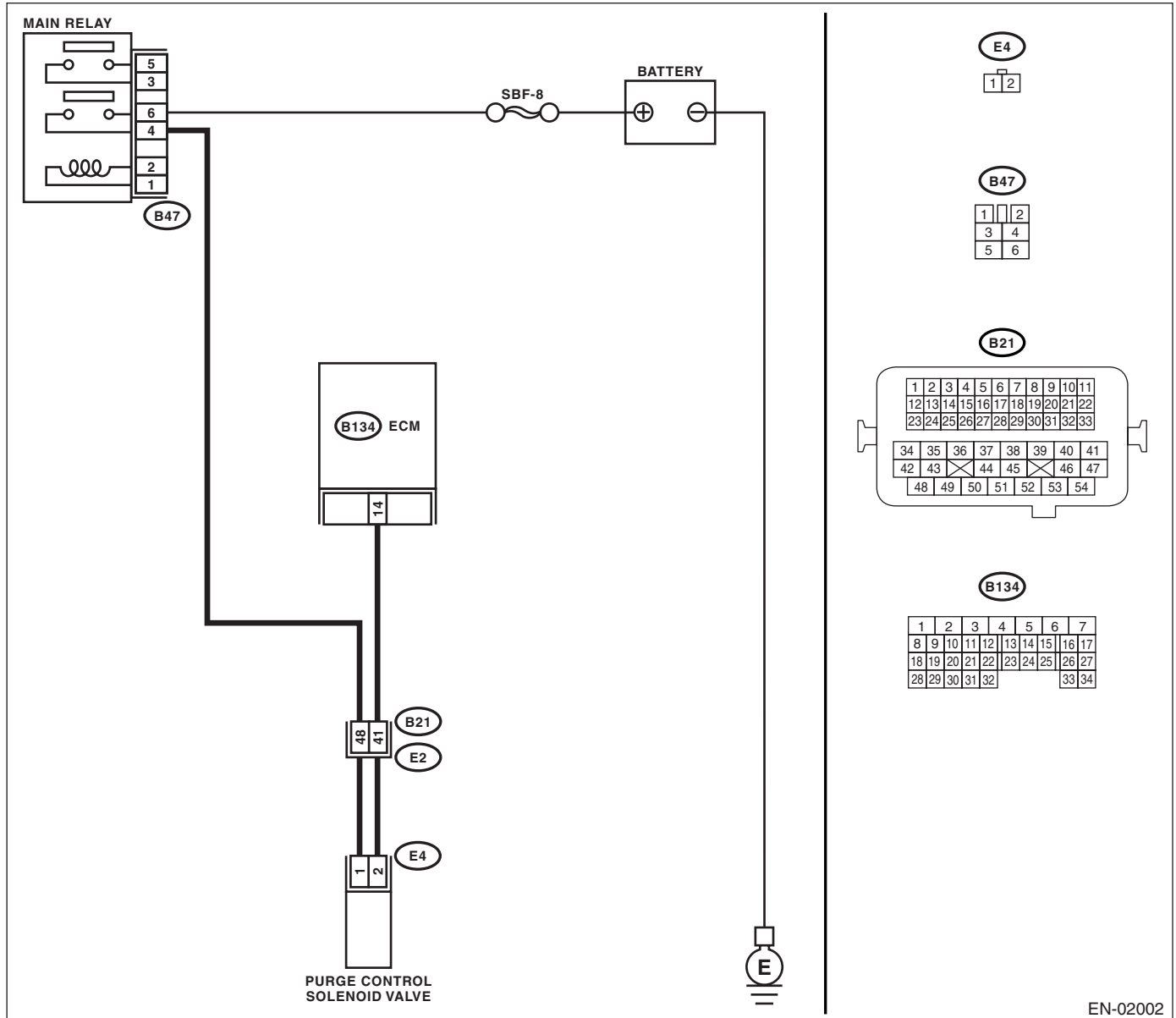
Erroneous idling

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



EN-02002

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1	CHECK OPTION CODE. Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2	CHECK OUTPUT SIGNAL FROM ECM. 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground. Connector & terminal (B134) No. 14 (+) — Chassis ground (-):	Is the voltage more than 10 V? Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time.	Go to step 3.
3	CHECK HARNESS BETWEEN PURGE CONTROL SOLENOID VALVE AND ECM CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from purge control solenoid valve and ECM. 3) Measure the resistance of harness between purge control solenoid valve connector and engine ground. Connector & terminal (E4) No. 2 — Engine ground:	Is the resistance more than 1 M Ω ?	Go to step 4. Repair the ground short circuit in harness between ECM and purge control solenoid valve connector.
4	CHECK HARNESS BETWEEN PURGE CONTROL SOLENOID VALVE AND ECM CONNECTOR. Measure the resistance of harness between ECM and purge control solenoid valve. Connector & terminal (B134) No. 14 — (E4) No. 2:	Is the resistance less than 1 Ω ?	Go to step 5. Repair the open circuit in harness between ECM and purge control solenoid valve connector. NOTE: In this case, repair the following: <ul style="list-style-type: none"> • Open circuit in harness between ECM and purge control solenoid valve connector • Poor contact in coupling connector
5	CHECK PURGE CONTROL SOLENOID VALVE. 1) Remove the purge control solenoid valve. 2) Measure the resistance between purge control solenoid valve terminals. Terminals No. 1 — No. 2:	Is the resistance 10 — 100 Ω ?	Go to step 6. Replace the purge control solenoid valve. <Ref. to EC(H4SO 2.0)-7, Purge Control Solenoid Valve.>
6	CHECK POWER SUPPLY TO PURGE CONTROL SOLENOID VALVE. 1) Turn the ignition switch to ON. 2) Measure the voltage between purge control solenoid valve and engine ground. Connector & terminal (E4) No. 1 (+) — Engine ground (-):	Is the voltage more than 10 V?	Go to step 7. Repair the open circuit in harness between main relay and purge control solenoid valve connector.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
7	CHECK POOR CONTACT. Check poor contact in purge control solenoid valve connector.	Is there poor contact in purge control solenoid valve connector?	Repair the poor contact in purge control solenoid valve connector.	Replace the ECM. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>

AM:DTC P0459 EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT HIGH

DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

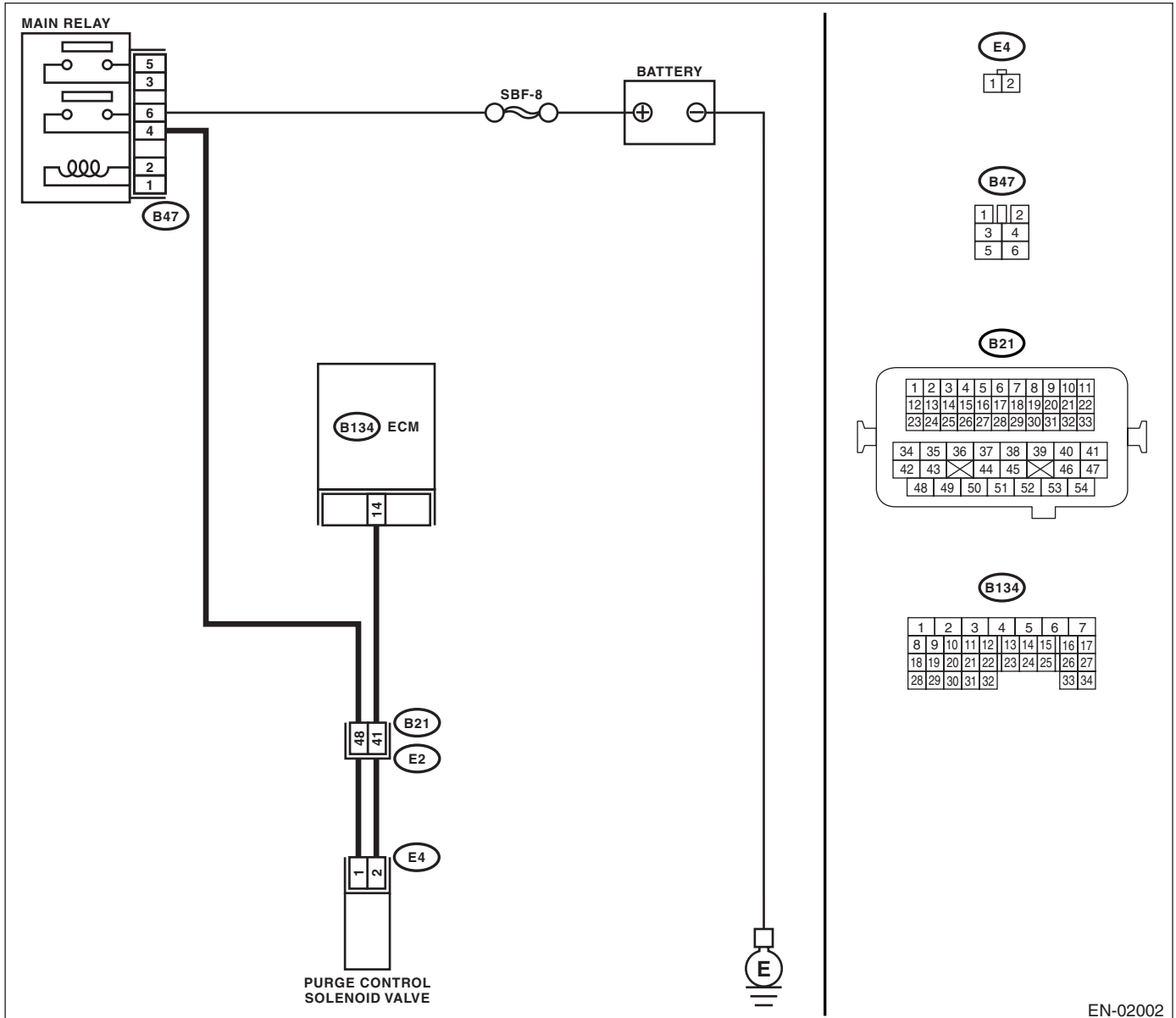
Erroneous idling

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



EN-02002

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OPTION CODE. 	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK OUTPUT SIGNAL FROM ECM. 1) Turn the ignition switch to OFF. 2) Connect the test mode connector at the lower portion of glove box. 3) Turn the ignition switch to ON. 4) While operating the purge control solenoid valve, measure voltage between ECM and chassis ground. NOTE: Purge control solenoid valve operation can be executed using Subaru Select Monitor. Refer to "Compulsory Valve Operation Check Mode" for procedures. <Ref. to EN(H4SO 2.5)(diag)-42, Compulsory Valve Operation Check Mode.> Connector & terminal (B134) No. 14 (+) — Chassis ground (-):	Is the voltage 0 — 10 V?	Go to step 3.	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. In this case, repair the poor contact in ECM connector.
3 CHECK OUTPUT SIGNAL FROM ECM. 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground. Connector & terminal (B134) No. 14 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Go to step 5.	Go to step 4.
4 CHECK POOR CONTACT. Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Replace the ECM. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>
5 CHECK HARNESS BETWEEN PURGE CONTROL SOLENOID VALVE AND ECM CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from purge control solenoid valve. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM and chassis ground. Connector & terminal (B134) No. 14 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Repair the battery short circuit in harness between ECM and purge control solenoid valve connector. After repair, replace the ECM. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>	Go to step 6.
6 CHECK PURGE CONTROL SOLENOID VALVE. 1) Turn the ignition switch to OFF. 2) Measure the resistance between purge control solenoid valve terminals. Terminals No. 1 — No. 2:	Is the resistance less than 1 Ω ?	Replace the purge control solenoid valve <Ref. to EC(H4SO 2.0)-7, Purge Control Solenoid Valve.> and ECM. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>	Go to step 7.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
7	CHECK POOR CONTACT. Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Replace the ECM. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AN:DTC P0462 FUEL LEVEL SENSOR CIRCUIT LOW INPUT

DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK ANY OTHER DTC ON DISPLAY.	Is DTC P0462 displayed on the Subaru Select Monitor?	Check the combination meter system. <Ref. to IDI-3, Combination Meter System.>	Temporary poor contact occurs.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AO:DTC P0463 FUEL LEVEL SENSOR CIRCUIT HIGH INPUT

DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK ANY OTHER DTC ON DISPLAY.	Is DTC P0463 displayed on the Subaru Select Monitor?	Check the combination meter system. <Ref. to IDI-3, Combination Meter System.>	Temporary poor contact occurs.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AP:DTC P0500 VEHICLE SPEED SENSOR

DTC DETECTING CONDITION:

Immediately at fault recognition.

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK DTC OF ABS. Check DTC of ABS.	Is DTC of ABS displayed?	Perform the diagnosis according to DTC. <Ref. to ABS(diag)-39, List of Diagnostic Trouble Code (DTC).>	Repair the poor contact in ECM.

AQ:DTC P0512 STARTER REQUEST CIRCUIT

DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

Failure of engine to start

CAUTION:

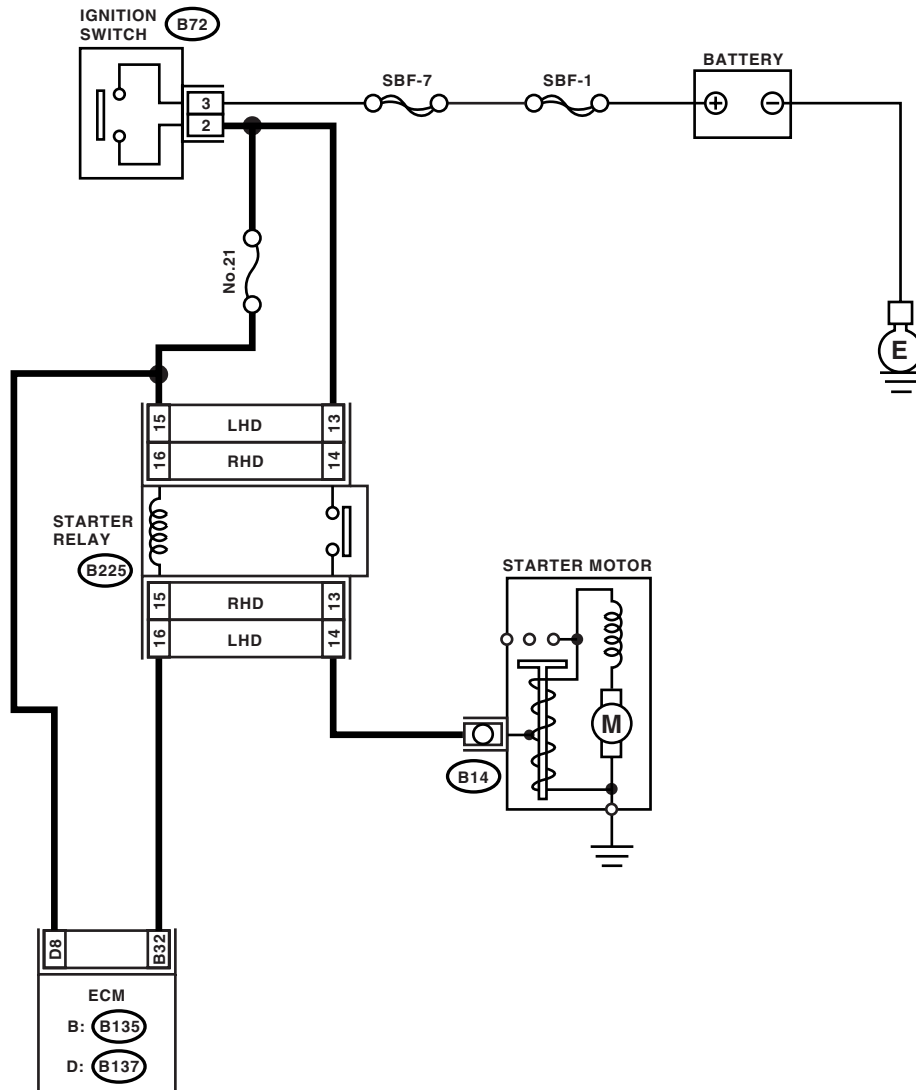
After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

WIRING DIAGRAM:

- EC, EK and K4 model



B72

1	2	3
4	5	6

B225

1	2	9	13	17	21
3	4	10	14	18	22
5	6	11	15	19	23
7	8	12	16	20	24
		25	29	33	37
		26	30	34	38
		27	31	35	39
		28	32	36	40

B: B135

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	32	33	34	35

D: B137

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	32	33	34	35

EN-02455

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK OPERATION OF STARTER MOTOR. Turn the ignition switch to ON. NOTE: Place the inhibitor switch in each position.	Does the starter motor operate?	Repair the battery short circuit in starter motor circuit.	Check starter motor circuit. <Ref. to EN(H4SO 2.5)(diag)-55, STARTER MOTOR CIRCUIT, Diagnostics for Engine Starting Failure.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AR:DTC P0519 IDLE CONTROL SYSTEM MALFUNCTION (FAIL-SAFE)

DTC DETECTING CONDITION:

Immediately at fault recognition.

TROUBLE SYMPTOM:

Engine keeps running at higher revolution than specified idling revolution.

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO 2.5)(diag)-70, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P0519.	Go to step 3.
3 CHECK AIR INTAKE SYSTEM. 1) Turn the ignition switch to ON. 2) Start and idle the engine. 3) Check the following items: <ul style="list-style-type: none"> • Loose installation of intake manifold and throttle body • Cracks of intake manifold gasket and throttle body gasket • Disconnections of vacuum hoses 	Is there any fault in air intake system?	Repair air suction and leaks.	Go to step 4.
4 CHECK ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Remove the electronic throttle control. 3) Check the electronic throttle control.	Are foreign matters found inside the electronic throttle control?	Remove foreign matters from the electronic throttle control.	Perform the diagnosis of DTC P2101.

AS:DTC P0558 GENERATOR CIRCUIT LOW INPUT

CAUTION:

For diagnostic procedure, refer to DTC P0559. <Ref. to EN(H4SO 2.5)(diag)-179, DTC P0559 GENERATOR CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>.

AT:DTC P0559 GENERATOR CIRCUIT HIGH

DTC DETECTING CONDITION:

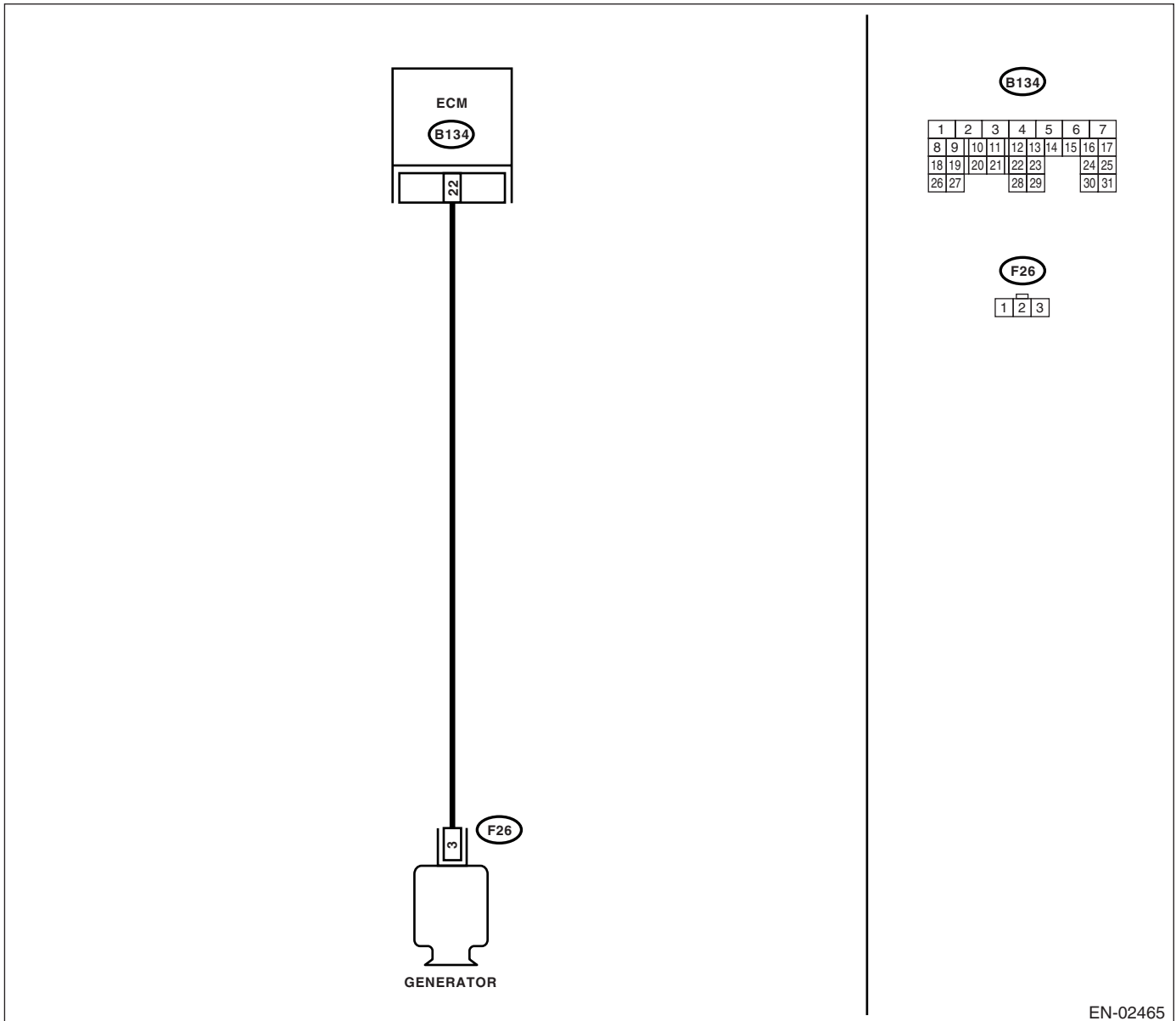
Immediately at fault recognition

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK HARNESS BETWEEN GENERATOR AND ECM CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from generator and ECM. 3) Measure the resistance of harness between generator connector and engine ground. <i>Connector & terminal</i> <i>(F26) No. 3 — Engine ground:</i>	Is the resistance more than 1 M Ω ?	Go to step 3.	Repair the ground short circuit in harness between ECM and purge control solenoid valve connector.
3 CHECK HARNESS BETWEEN GENERATOR AND ECM CONNECTOR. Measure the resistance of harness between ECM and generator of harness connector. <i>Connector & terminal</i> <i>(B134) No. 22 — (F26) No. 3:</i>	Is the resistance less than 1 Ω ?	Repair the poor contact in connector.	Repair the open circuit in harness between ECM and generator connector. NOTE: In this case, repair the following: <ul style="list-style-type: none"> • Open circuit in harness between ECM and generator connector • Poor contact in coupling connector

AU:DTC P0600 SERIAL COMMUNICATION LINK

NOTE:

For the diagnostic procedure, refer to LAN section. <Ref. to LAN(diag)-2, Basic Diagnostic Procedure.>

AV:DTC P0604 INTERNAL CONTROL MODULE READ ACCESS MEMORY (RAM) ERROR

DTC DETECTING CONDITION:

Immediately at fault recognition.

TROUBLE SYMPTOM:

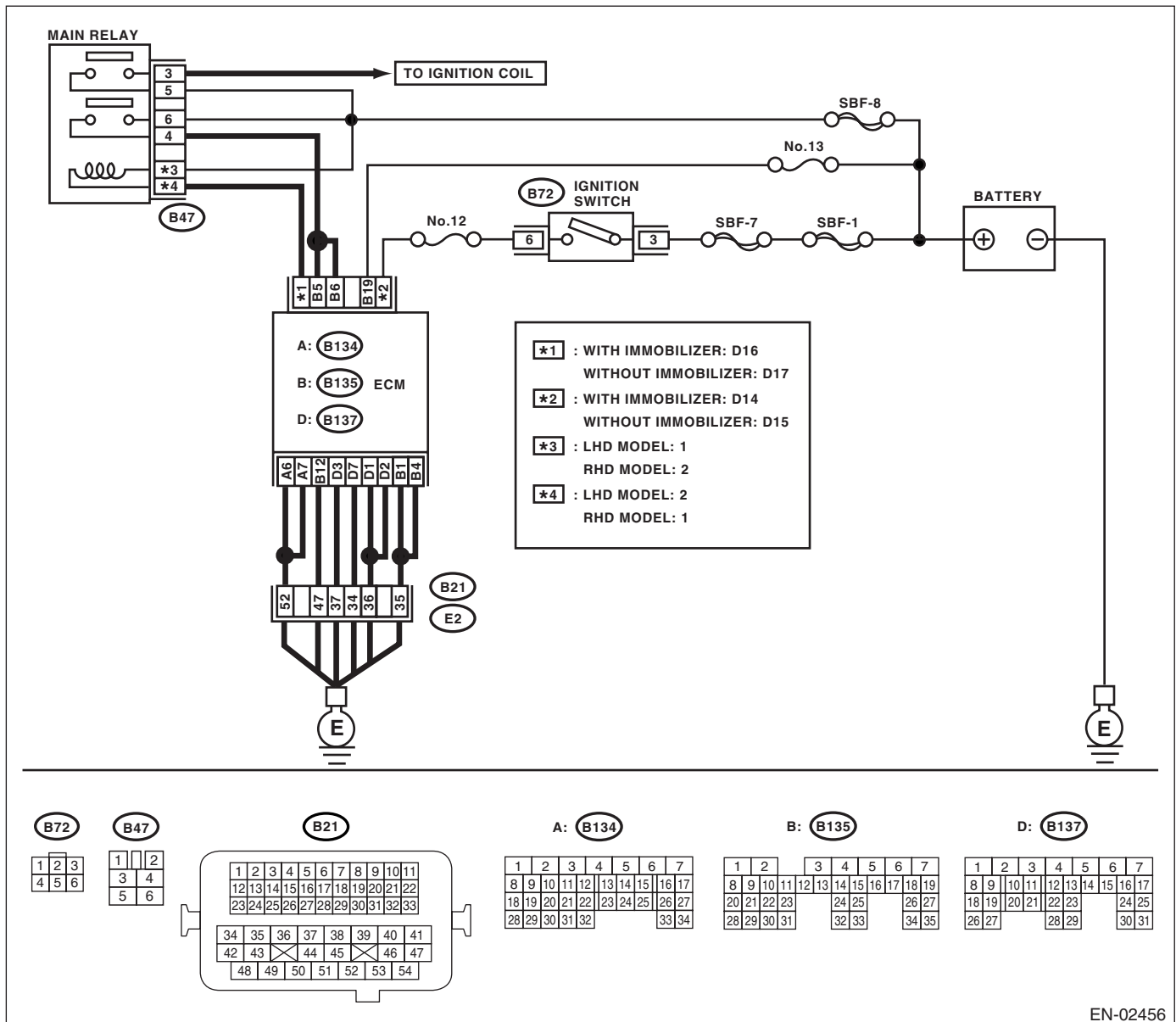
- Engine does not start.
- Engine stalls.

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



EN-02456

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO 2.5)(diag)-70, List of Diagnostic Trouble Code (DTC).>	Temporary poor contact occurs.

AW:DTC P0605 INTERNAL CONTROL MODULE READ ONLY MEMORY (ROM) ERROR

NOTE:

For the diagnostic procedure, refer to DTC P0607. <Ref. to EN(H4SO 2.5)(diag)-183, DTC P0607 CONTROL MODULE PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

AX:DTC P0607 CONTROL MODULE PERFORMANCE

DTC DETECTING CONDITION:

Immediately at fault recognition.

TROUBLE SYMPTOM:

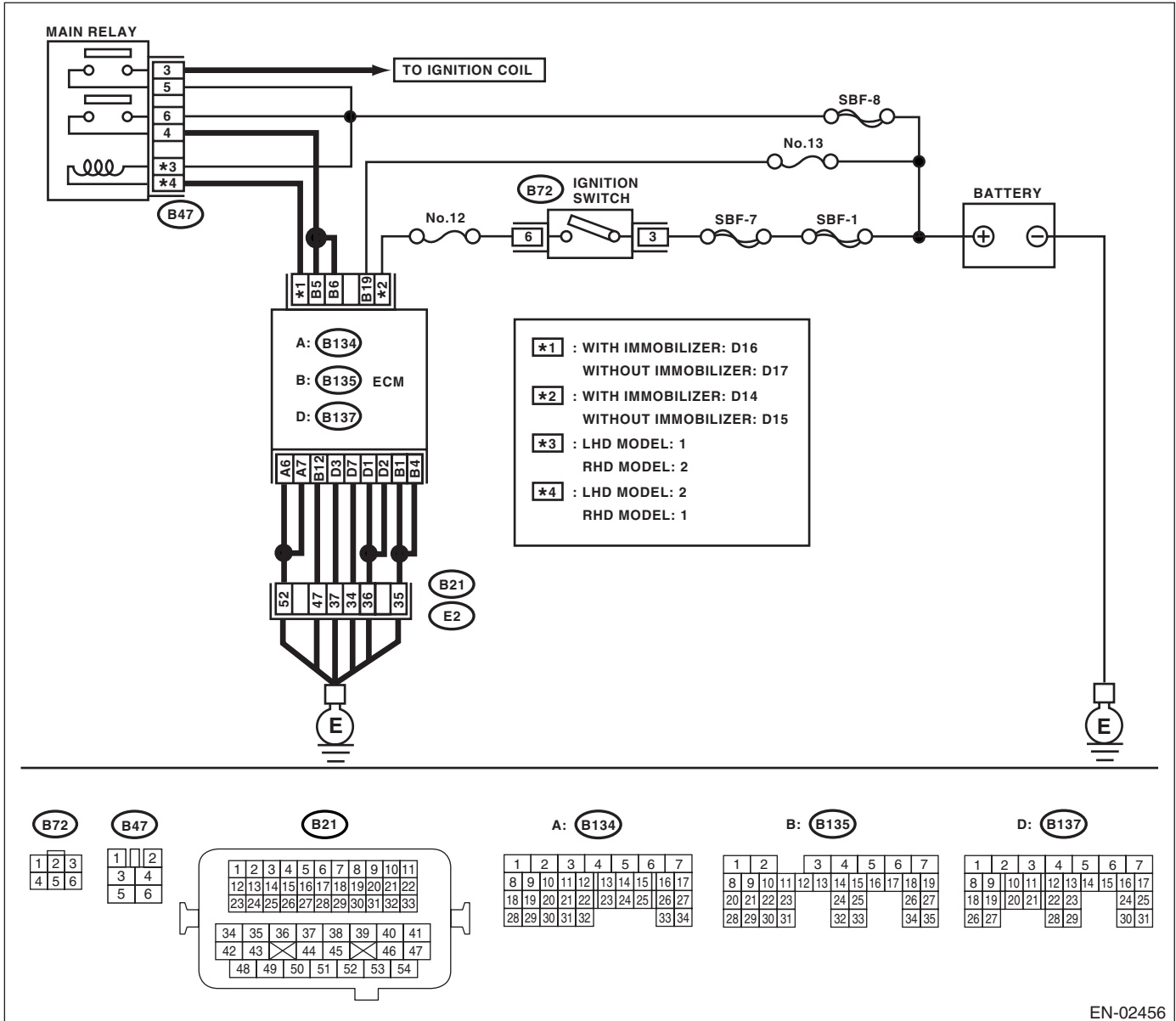
- Erroneous idling
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK INPUT VOLTAGE OF ECM. 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM connector and chassis ground. Connector & terminal (B135) No. 5 (+) — Chassis ground (-): (B135) No. 6 (+) — Chassis ground (-):	Is the voltage 10 — 13 V?	Go to step 3.	Repair the open or ground short circuit of power supply circuit.
3 CHECK INPUT VOLTAGE OF ECM. 1) Start the engine. 2) Measure the voltage between ECM connector and chassis ground. Connector & terminal (B135) No. 5 (+) — Chassis ground (-): (B135) No. 6 (+) — Chassis ground (-):	Is the voltage 13 — 15 V?	Go to step 4.	Repair the open or ground short circuit of power supply circuit.
4 CHECK ECM GROUND HARNESS. Measure the voltage between ECM connector and chassis ground. Connector & terminal (B137) No. 1 (+) — Chassis ground (-): (B137) No. 2 (+) — Chassis ground (-): (B137) No. 3 (+) — Chassis ground (-):	Is the voltage less than 1 V?	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>	Further tighten the engine ground terminal.

AY:DTC P0638 THROTTLE ACTUATOR CONTROL RANGE/PERFORMANCE (BANK 1)

NOTE:

For diagnostic procedure, refer to DTC P2101. <Ref. to EN(H4SO 2.5)(diag)-231, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AZ:DTC P0691 COOLING FAN 1 CONTROL CIRCUIT LOW

DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Radiator fan does not operate properly.
- Overheating

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK ANY OTHER DTC ON DISPLAY.	Is DTC P0691 displayed on the Subaru Select Monitor?	Check the radiator fan system. <Ref. to CO(H4SO 2.0)-7, Radiator Fan System.>	Temporary poor contact occurs.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BA:DTC P0692 COOLING FAN 1 CONTROL CIRCUIT HIGH

DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Radiator fan does not operate properly.
- Overheating

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK ANY OTHER DTC ON DISPLAY.	Is DTC P0692 displayed on the Subaru Select Monitor?	Check the radiator fan system. <Ref. to CO(H4SO 2.0)-7, Radiator Fan System.>	Temporary poor contact occurs.

BB:DTC P0700 TRANSMISSION CONTROL SYSTEM (MIL REQUEST)

NOTE:

For the diagnostic procedure, refer to AT section. <Ref. to 4AT(diag)-2, Basic Diagnostic Procedure.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BC:DTC P0851 NEUTRAL SWITCH INPUT CIRCUIT LOW

DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

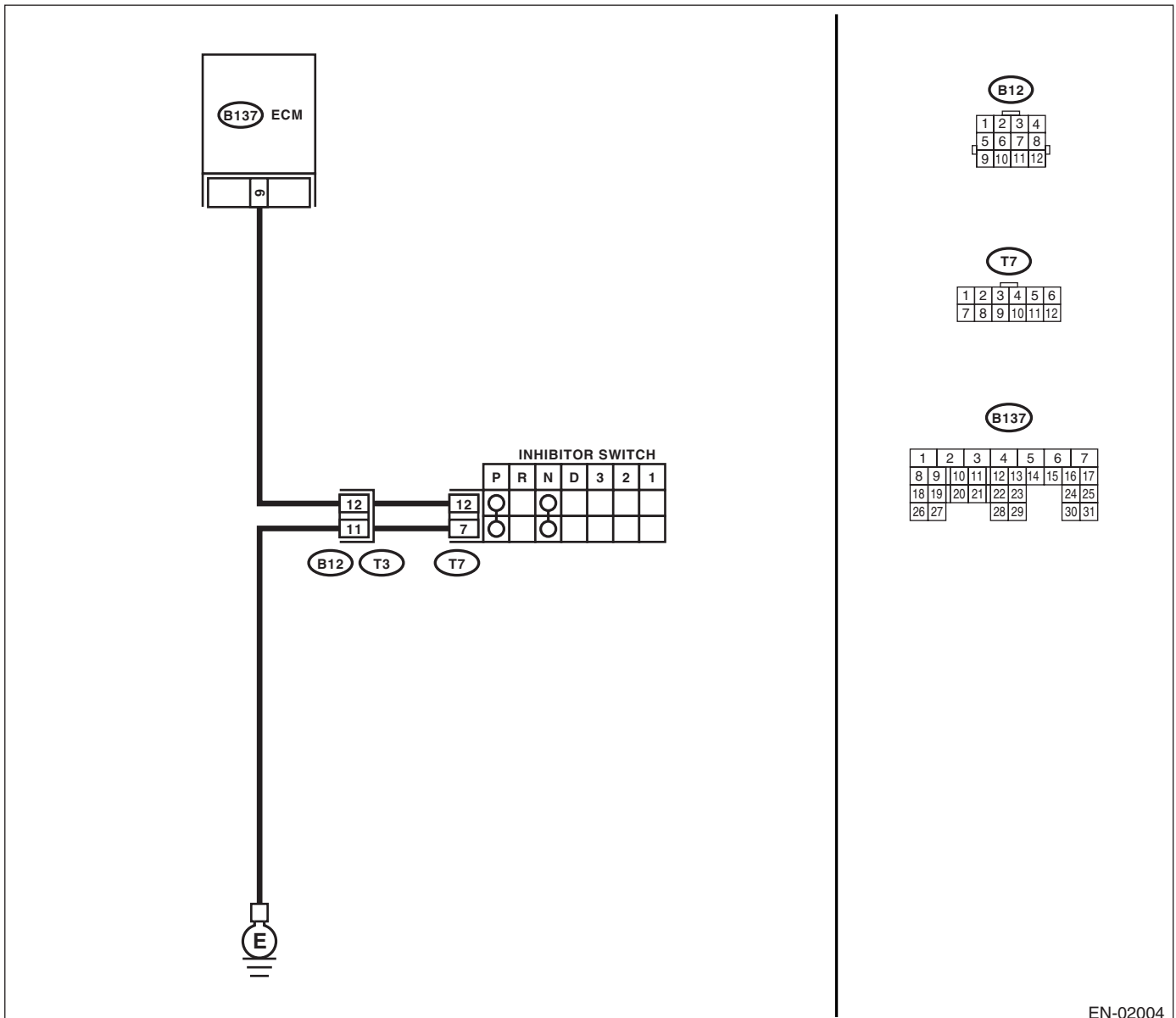
Erroneous idling

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



EN-02004

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1	CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.
			Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO 2.5)(diag)-70, List of Diagnostic Trouble Code (DTC).>
			Go to step 3.
3	CHECK INPUT SIGNAL FROM ECM. 1) Turn the ignition switch to ON. 2) Shift the select lever except for "N" and "P" range. 3) Measure the voltage between ECM and chassis ground. Connector & terminal (B137) No. 9 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time.
			Go to step 4.
4	CHECK HARNESS BETWEEN ECM AND TRANSMISSION HARNESS CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and transmission harness connector (T3). 3) Measure the resistance of harness between ECM connector and chassis ground. Connector & terminal (B137) No. 9 — Chassis ground:	Is the resistance more than 1 MΩ?	Go to step 5.
			Repair the ground short circuit in harness between ECM and transmission harness connector.
5	CHECK TRANSMISSION HARNESS CONNECTOR. 1) Disconnect the connector from inhibitor switch. 2) Measure the resistance of harness between transmission harness connector and engine ground. Connector & terminal (T3) No. 12 — Engine ground:	Is the resistance more than 1 MΩ?	Go to step 6.
			Repair the ground short circuit in harness between transmission harness connector and inhibitor switch connector.
6	CHECK INHIBITOR SWITCH. Measure the resistance between inhibitor switch connector receptacle's terminals with select lever at other than "N" and "P" range. Terminals No. 7 — No. 12:	Is the resistance more than 1 MΩ?	Go to step 7.
			Replace the inhibitor switch. <Ref. to 4AT-52, Inhibitor Switch.>
7	CHECK SELECT CABLE CONNECTION.	Is there any fault in select cable connection to inhibitor switch?	Repair the select cable connection. <Ref. to CS-14, INSPECTION, Select Cable.>
			Replace the ECM. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BD:DTC P0852 NEUTRAL SWITCH INPUT CIRCUIT HIGH

DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

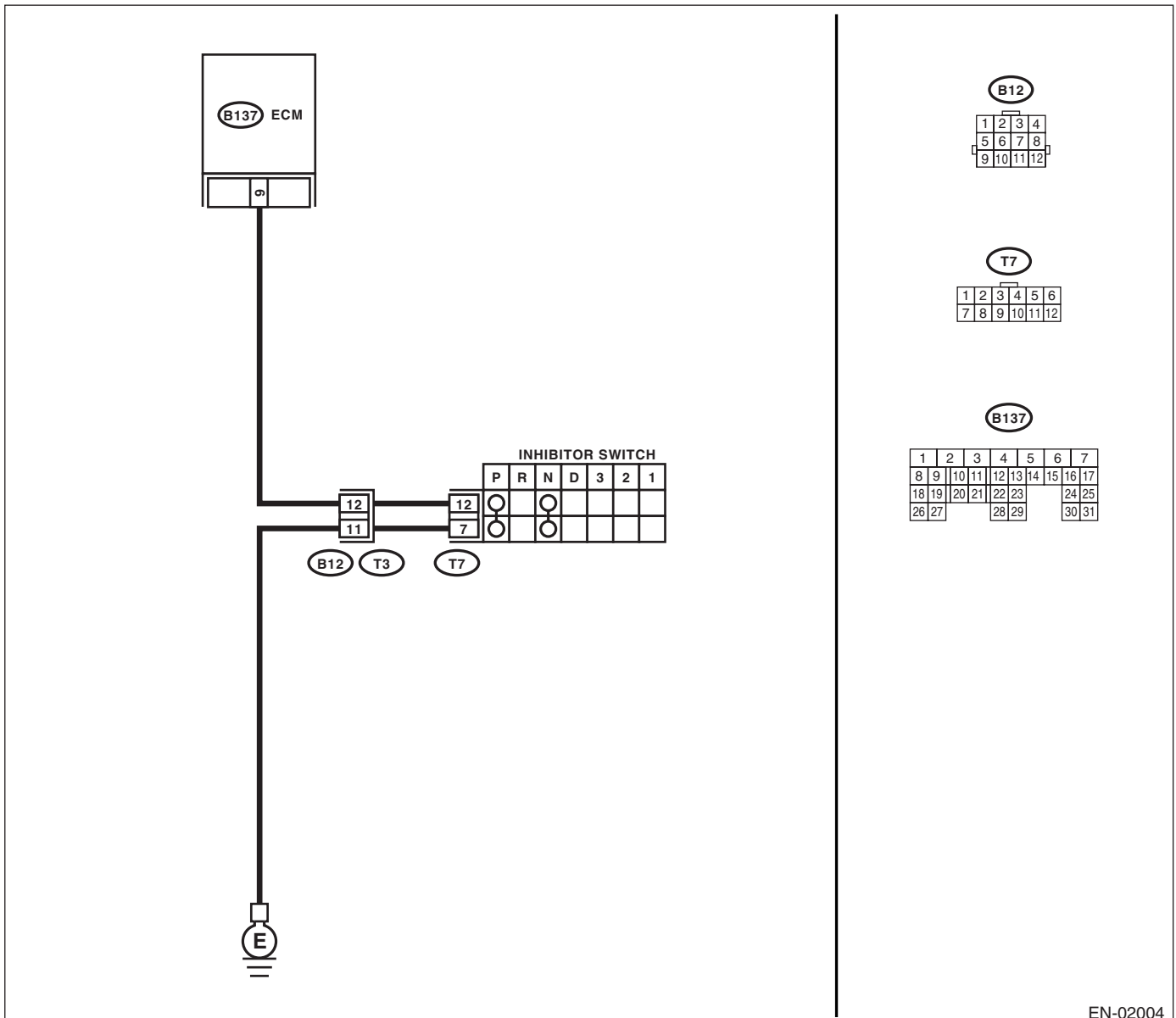
Erroneous idling

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



EN-02004

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1	CHECK OPTION CODE.	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2	CHECK ANY OTHER DTC ON DISPLAY.	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO 2.5)(diag)-70, List of Diagnostic Trouble Code (DTC).>	Go to step 3.
3	CHECK INPUT SIGNAL FROM ECM. 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground with select lever at "N" and "P" range. Connector & terminal (B136) No. 21 (+) — Chassis ground (-):	Is the voltage less than 1 V?	Go to step 4.
4	CHECK INPUT SIGNAL FROM ECM. Measure the voltage between ECM and chassis ground with select lever at other than "N" and "P" range. Connector & terminal (B137) No. 9 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Go to step 5.
5	CHECK POOR CONTACT. Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector. Replace the ECM. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>
6	CHECK INPUT SIGNAL FROM ECM. Measure the voltage between ECM and chassis ground. Connector & terminal (B137) No. 9 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Repair the battery short circuit in harness between ECM and inhibitor switch connector. Go to step 7.
7	CHECK HARNESS BETWEEN ECM AND INHIBITOR SWITCH CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and inhibitor switch. 3) Measure the resistance of harness between ECM and inhibitor switch connector. Connector & terminal (B137) No. 9 — (T7) No. 12:	Is the resistance less than 1 Ω ?	Go to step 8. Repair the harness and connector. NOTE: In this case, repair the following: • Open circuit in harness between ECM and inhibitor switch connector • Poor contact in coupling connector • Poor contact in inhibitor switch connector • Poor contact in ECM connector

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
8 CHECK INHIBITOR SWITCH GROUND LINE. Measure the resistance of harness between inhibitor switch connector and engine ground. <i>Connector & terminal</i> <i>(T7) No. 12 — Engine ground:</i>	Is the resistance less than 5 Ω ?	Go to step 9 .	Repair the open circuit in harness between inhibitor switch connector and ground line. NOTE: In this case, repair the following: <ul style="list-style-type: none"> • Open circuit in harness between inhibitor switch connector and ground line
9 CHECK INHIBITOR SWITCH. Measure the resistance between inhibitor switch connector receptacle's terminals with select lever at "N" and "P" range. <i>Terminals</i> <i>No. 7 — No. 12:</i>	Is the resistance less than 1 Ω ?	Go to step 10 .	Replace the inhibitor switch. <Ref. to 4AT-52, Inhibitor Switch.>
10 CHECK SELECT CABLE CONNECTION.	Is there any fault in select cable connection to inhibitor switch?	Repair the select cable connection. <Ref. to CS-14, INSPECTION, Select Cable.>	Replace the ECM. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BE:DTC P1086 TUMBLE GENERATED VALVE POSITION SENSOR 2 CIRCUIT LOW

DTC DETECTING CONDITION:

Immediately at fault recognition

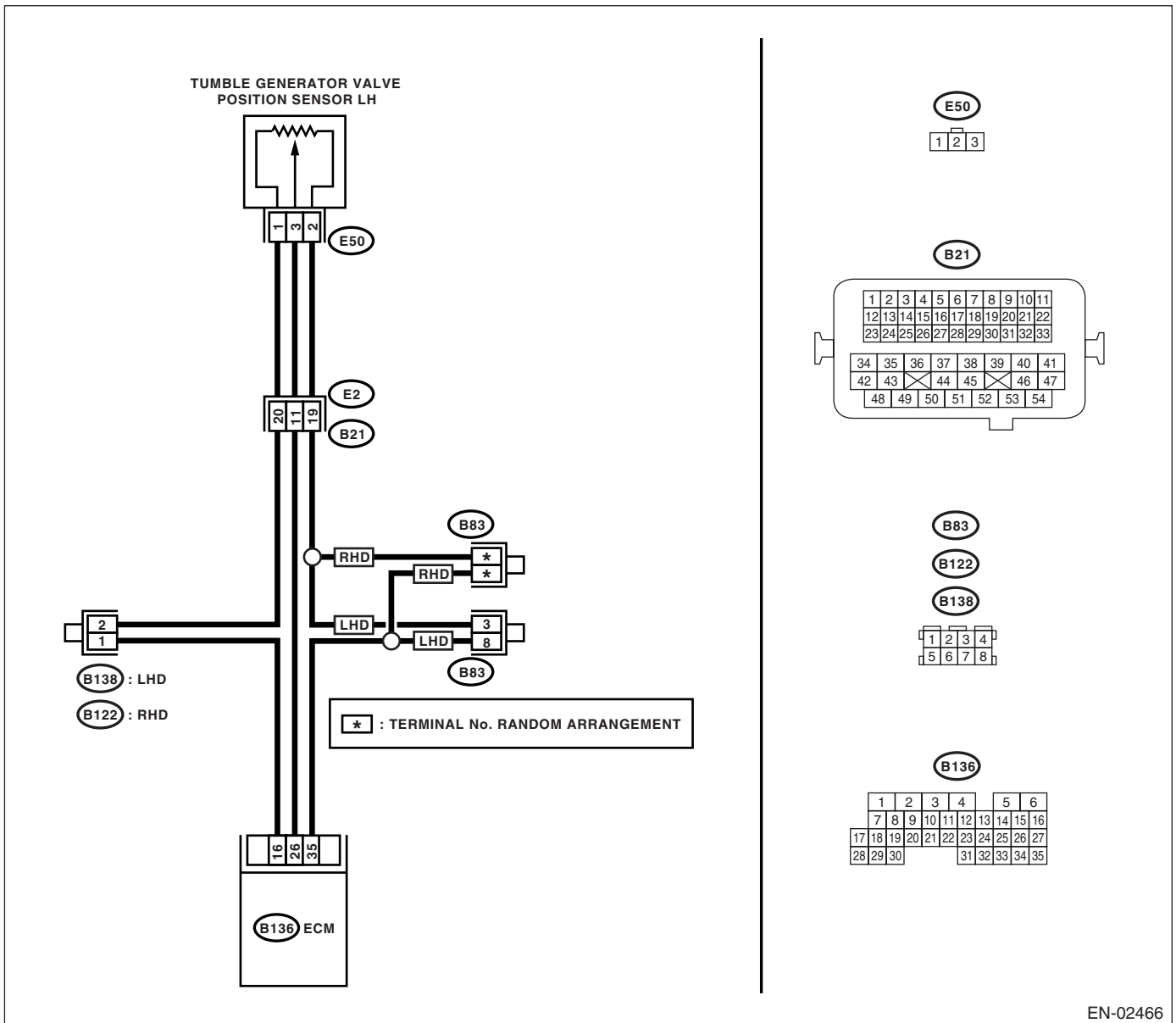
TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:



EN-02466

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK CURRENT DATA. 1) Start the engine. 2) Read the data of throttle position sensor signal using Subaru Select Monitor or OBD-II general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO 2.5)(diag)-26, Subaru Select Monitor.> • OBD-II general scan tool For detailed operation procedures, refer to the operation manual of OBD-II general scan tool.	Is the voltage less than 0.1 V?	Go to step 2.	Even if malfunction indicator light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause. NOTE: In this case, repair the following: • Poor contact in throttle position sensor connector • Poor contact in ECM connector • Poor contact in coupling connector
2 CHECK INPUT SIGNAL FOR ECM. Measure the voltage between ECM connector and chassis ground while tumble generator valve is fully closed. <i>Connector & terminal</i> (B136) No. 16 (+) — Chassis ground (-):	Is the voltage more than 4.5 V?	Go to step 4.	Go to step 3.
3 CHECK INPUT SIGNAL FOR ECM. Measure the voltage between ECM connector and chassis ground. <i>Connector & terminal</i> (B136) No. 16 (+) — Chassis ground (-):	Shake the ECM harness and connector, while monitoring value of voltage meter. Does the voltage change?	Repair the poor contact in ECM connector.	Contact your Subaru distributor service. NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.
4 CHECK INPUT SIGNAL FOR ECM. Measure the voltage between ECM connector and chassis ground. <i>Connector & terminal</i> (B136) No. 26 (+) — Chassis ground (-):	Is the voltage less than 0.1 V?	Go to step 6.	Go to step 5.
5 CHECK INPUT SIGNAL FOR ECM. (USING SUBARU SELECT MONITOR) Measure the voltage between ECM connector and chassis ground.	Shake the ECM harness and connector, while monitoring value of Subaru Select Monitor. Does the voltage change?	Repair the poor contact in ECM connector.	Go to step 6.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>6</p> <p>CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR.</p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connectors from tumble generator valve position sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between tumble generator valve position sensor connector and engine ground.</p> <p>Connector & terminal (E50) No. 1 (+) — Engine ground (-):</p>	Is the voltage more than 4.5 V?	Go to step 7.	Repair the harness and connector. NOTE: In this case, repair the following: <ul style="list-style-type: none"> • Open circuit in harness between tumble generator valve position sensor and ECM connector • Poor contact in tumble generator valve position sensor connector • Poor contact in ECM connector • Poor contact in coupling connector • Poor contact in joint connector
<p>7</p> <p>CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR.</p> <p>1) Turn the ignition switch to OFF. 2) Measure the resistance of harness between ECM connector and tumble generator valve position sensor connector.</p> <p>Connector & terminal (B136) No. 26 — (E50) No. 3:</p>	Is the resistance less than 1 Ω ?	Go to step 8.	Repair the harness and connector. NOTE: In this case, repair the following: <ul style="list-style-type: none"> • Open circuit in harness between tumble generator valve position sensor and ECM connector • Poor contact in ECM connector • Poor contact in tumble generator valve position sensor connector • Poor contact in coupling connector
<p>8</p> <p>CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR.</p> <p>Measure the resistance of harness between tumble generator valve position sensor connector and engine ground.</p> <p>Connector & terminal (E50) No. 3 — Engine ground:</p>	Is the resistance more than 1 M Ω ?	Go to step 9.	Repair the ground short circuit in harness between tumble generator valve position sensor and ECM connector.
<p>9</p> <p>CHECK POOR CONTACT.</p> <p>Check poor contact in tumble generator valve position sensor connector.</p>	Is there poor contact in tumble generator valve position sensor connector?	Repair the poor contact in tumble generator valve position sensor connector.	Replace the tumble generator valve assembly. <Ref. to FU(H4SO 2.5)-28, Tumble Generator Valve Assembly.>

BF:DTC P1087 TUMBLE GENERATED VALVE POSITION SENSOR 2 CIRCUIT HIGH

DTC DETECTING CONDITION:

Immediately at fault recognition

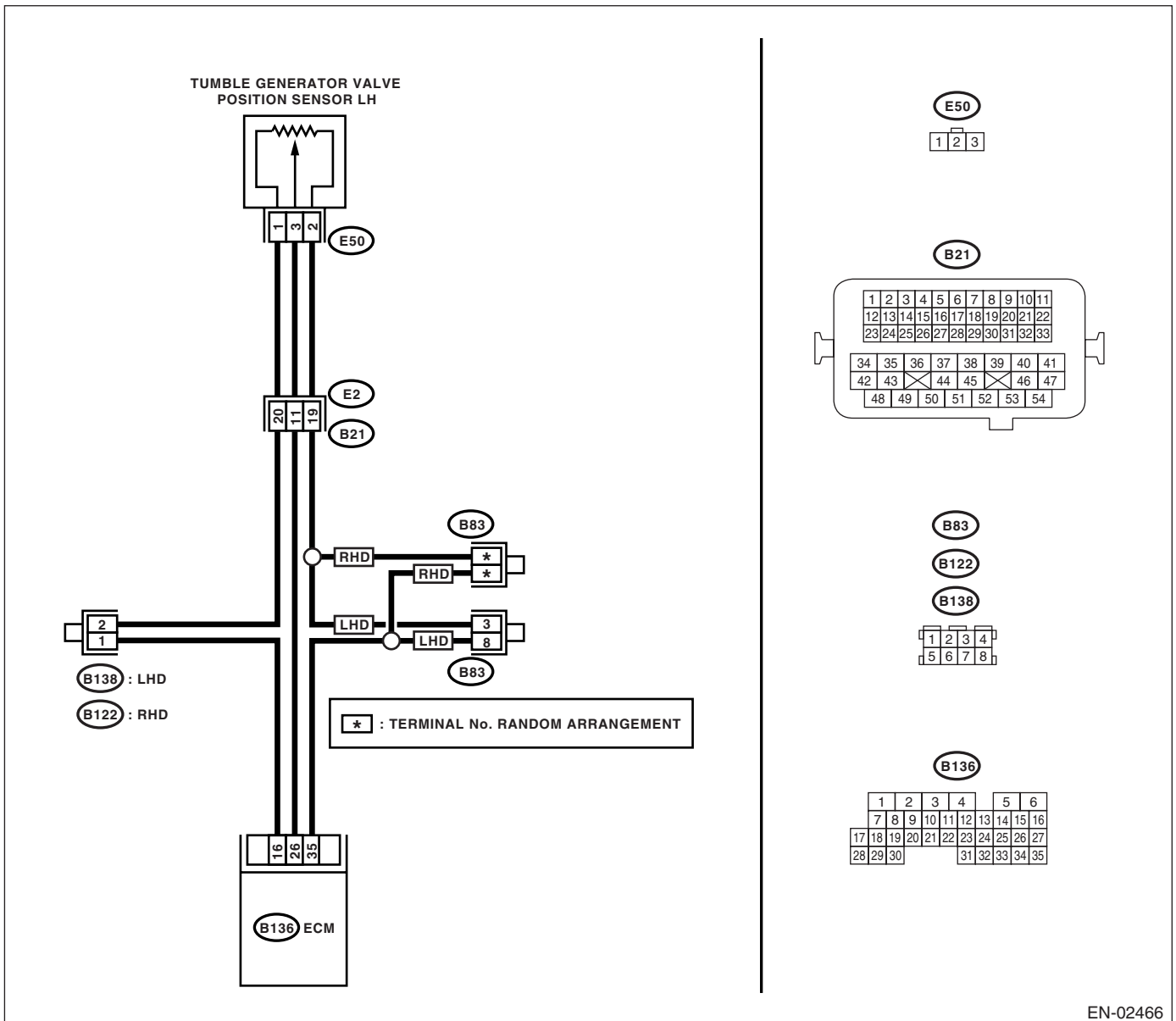
TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:



EN-02466

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>1 CHECK CURRENT DATA.</p> <p>1) Start the engine.</p> <p>2) Read the data of throttle position sensor signal using Subaru Select Monitor or OBD-II general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> • Subaru Select Monitor <p>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO 2.5)(diag)-26, Subaru Select Monitor.></p> <ul style="list-style-type: none"> • OBD-II general scan tool <p>For detailed operation procedures, refer to the operation manual of OBD-II general scan tool.</p>	Is the voltage more than 4.9 V?	Go to step 2.	<p>Even if malfunction indicator light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.</p> <p>NOTE:</p> <p>In this case, repair the following:</p> <ul style="list-style-type: none"> • Poor contact in tumble generator valve position sensor connector • Poor contact in ECM connector • Poor contact in coupling connector
<p>2 CHECK HARNESS BETWEEN TUMBLE GENERATOR VALVE POSITION SENSOR AND ECM CONNECTOR.</p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connector from throttle position sensor.</p> <p>3) Measure the resistance of harness between throttle position sensor connector and engine ground.</p> <p>Connector & terminal (E50) No. 2 — Engine ground:</p>	Is the resistance less than 5 Ω ?	Go to step 3.	<p>Repair the harness and connector.</p> <p>NOTE:</p> <p>In this case, repair the following:</p> <ul style="list-style-type: none"> • Open circuit in harness between tumble generator valve position sensor and ECM connector • Poor contact in coupling connector • Poor contact in joint connector
<p>3 CHECK HARNESS BETWEEN THROTTLE POSITION SENSOR AND ECM CONNECTOR.</p> <p>1) Turn the ignition switch to ON.</p> <p>2) Measure the voltage between throttle position sensor connector and engine ground.</p> <p>Connector & terminal (E50) No. 3 (+) — Engine ground (-):</p>	Is the voltage more than 4.9 V?	Repair the battery short circuit in harness between tumble generator valve position sensor and ECM connector. After repair, replace the ECM. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>	Replace the tumble generator valve assembly. <Ref. to FU(H4SO 2.5)-28, Tumble Generator Valve Assembly.>

BG:DTC P1088 TUMBLE GENERATED VALVE POSITION SENSOR 1 CIRCUIT LOW

DTC DETECTING CONDITION:

Immediately at fault recognition

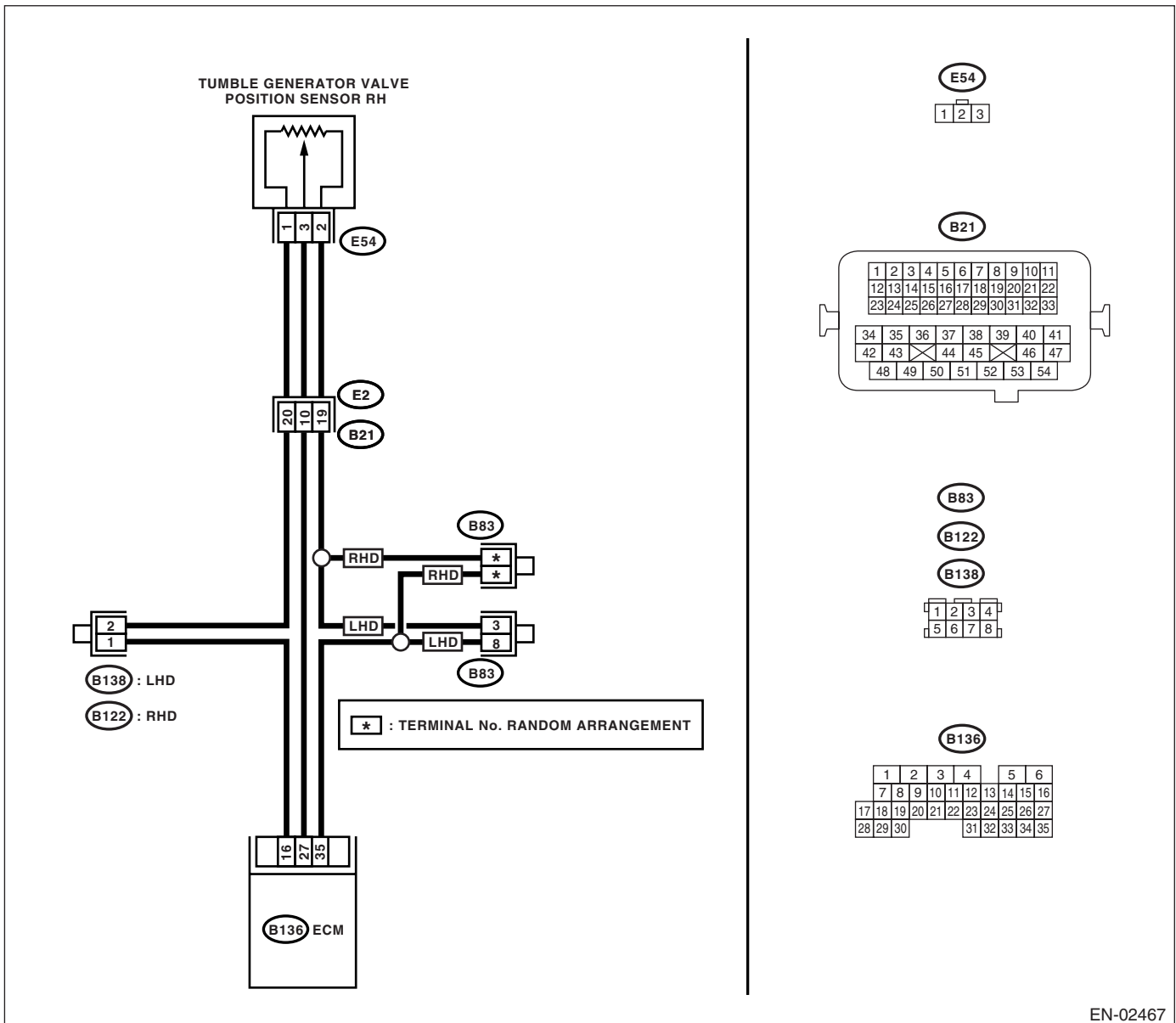
TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:



EN-02467

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK CURRENT DATA. 1) Start the engine. 2) Read the data of tumble generator valve position sensor signal using Subaru Select Monitor or OBD-II general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO 2.5)(diag)-26, Subaru Select Monitor.> • OBD-II general scan tool For detailed operation procedures, refer to the operation manual of OBD-II general scan tool.	Is the voltage less than 0.1 V?	Go to step 2.	Even if malfunction indicator light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause. NOTE: In this case, repair the following: • Poor contact in tumble generator valve position sensor connector • Poor contact in ECM connector • Poor contact in coupling connector
2 CHECK INPUT SIGNAL FOR ECM. Measure the voltage between ECM connector and chassis ground while throttle valve is fully closed. Connector & terminal (B136) No. 16 (+) — Chassis ground (-):	Is the voltage more than 4.5 V?	Go to step 4.	Go to step 3.
3 CHECK INPUT SIGNAL FOR ECM. Measure the voltage between ECM connector and chassis ground. Connector & terminal (B136) No. 16 (+) — Chassis ground (-):	Shake the ECM harness and connector, while monitoring value of voltage meter. Does the voltage change?	Repair the poor contact in ECM connector.	Contact your Subaru distributor service. NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.
4 CHECK INPUT SIGNAL FOR ECM. Measure the voltage between ECM connector and chassis ground. Connector & terminal (B136) No. 27 (+) — Chassis ground (-):	Is the voltage less than 0.1 V?	Go to step 6.	Go to step 5.
5 CHECK INPUT SIGNAL FOR ECM. (USING SUBARU SELECT MONITOR) Measure the voltage between ECM connector and chassis ground.	Shake the ECM harness and connector, while monitoring value of Subaru Select Monitor. Does the voltage change?	Repair the poor contact in ECM connector.	Go to step 6.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>6</p> <p>CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR.</p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connectors from throttle position sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between throttle position sensor connector and engine ground.</p> <p>Connector & terminal (E54) No. 1 (+) — Engine ground (-):</p>	<p>Is the voltage more than 4.5 V?</p>	<p>Go to step 7.</p>	<p>Repair the harness and connector.</p> <p>NOTE: In this case, repair the following:</p> <ul style="list-style-type: none"> • Open circuit in harness between tumble generator valve position sensor and ECM connector • Poor contact in throttle position sensor connector • Poor contact in ECM connector • Poor contact in coupling connector • Poor contact in joint connector
<p>7</p> <p>CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR.</p> <p>1) Turn the ignition switch to OFF. 2) Measure the resistance of harness between ECM connector and throttle position sensor connector.</p> <p>Connector & terminal (B136) No. 27 — (E54) No. 3:</p>	<p>Is the resistance less than 1 Ω?</p>	<p>Go to step 8.</p>	<p>Repair the harness and connector.</p> <p>NOTE: In this case, repair the following:</p> <ul style="list-style-type: none"> • Open circuit in harness between tumble generator valve position sensor and ECM connector • Poor contact in ECM connector • Poor contact in tumble generator valve position sensor connector • Poor contact in coupling connector
<p>8</p> <p>CHECK HARNESS BETWEEN ECM AND THROTTLE POSITION SENSOR CONNECTOR.</p> <p>Measure the resistance of harness between tumble generator valve position sensor connector and engine ground.</p> <p>Connector & terminal (E54) No. 3 — Engine ground:</p>	<p>Is the resistance more than 1 MΩ?</p>	<p>Go to step 9.</p>	<p>Repair the ground short circuit in harness between tumble generator valve position sensor and ECM connector.</p>
<p>9</p> <p>CHECK POOR CONTACT.</p> <p>Check poor contact in tumble generator valve position sensor connector.</p>	<p>Is there poor contact in tumble generator valve position sensor connector?</p>	<p>Repair the poor contact in tumble generator valve position sensor connector.</p>	<p>Replace the tumble generator valve assembly. <Ref. to FU(H4SO 2.5)-28, Tumble Generator Valve Assembly.></p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BH:DTC P1089 TUMBLE GENERATED VALVE POSITION SENSOR 1 CIRCUIT HIGH

DTC DETECTING CONDITION:

Immediately at fault recognition

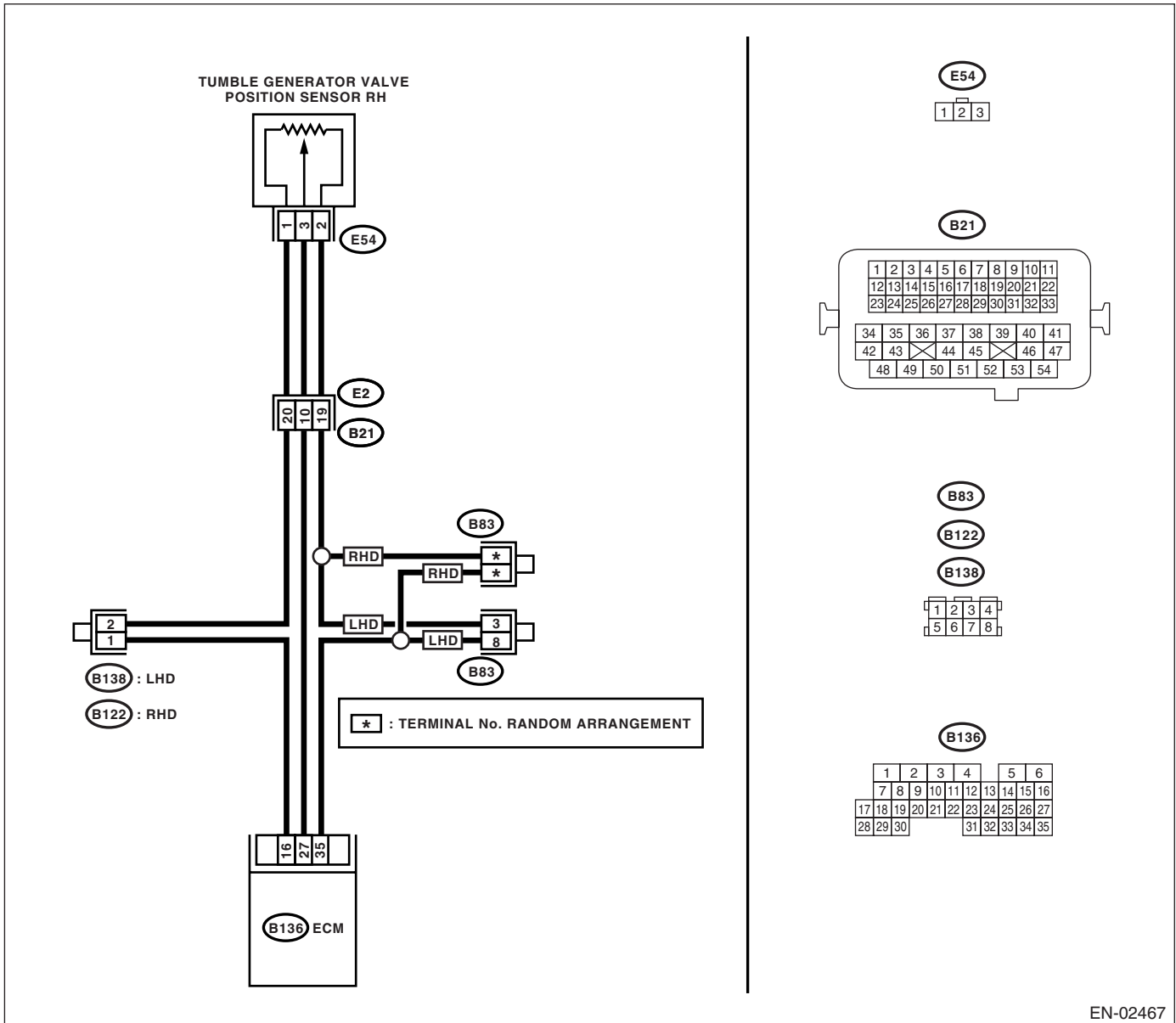
TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:



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Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>1</p> <p>CHECK CURRENT DATA.</p> <p>1) Start the engine.</p> <p>2) Read the data of tumble generator valve position sensor signal using Subaru Select Monitor or OBD-II general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> • Subaru Select Monitor <p>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO 2.5)(diag)-26, Subaru Select Monitor.></p> <ul style="list-style-type: none"> • OBD-II general scan tool <p>For detailed operation procedures, refer to the operation manual of OBD-II general scan tool.</p>	<p>Is the voltage more than 4.9 V?</p>	<p>Go to step 2.</p>	<p>Even if malfunction indicator light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.</p> <p>NOTE:</p> <p>In this case, repair the following:</p> <ul style="list-style-type: none"> • Poor contact in tumble generator valve position sensor connector • Poor contact in ECM connector • Poor contact in coupling connector
<p>2</p> <p>CHECK HARNESS BETWEEN TUMBLE GENERATOR VALVE POSITION SENSOR AND ECM CONNECTOR.</p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connector from throttle position sensor.</p> <p>3) Measure the resistance of harness between tumble generator valve position sensor connector and engine ground.</p> <p>Connector & terminal (E54) No. 2 — Engine ground:</p>	<p>Is the resistance less than 5 Ω?</p>	<p>Go to step 3.</p>	<p>Repair the harness and connector.</p> <p>NOTE:</p> <p>In this case, repair the following:</p> <ul style="list-style-type: none"> • Open circuit in harness between tumble generator valve position sensor and ECM connector • Poor contact in coupling connector • Poor contact in joint connector
<p>3</p> <p>CHECK HARNESS BETWEEN TUMBLE GENERATOR VALVE POSITION SENSOR AND ECM CONNECTOR.</p> <p>1) Turn the ignition switch to ON.</p> <p>2) Measure the voltage between throttle position sensor connector and engine ground.</p> <p>Connector & terminal (E54) No. 3 (+) — Engine ground (-):</p>	<p>Is the voltage more than 4.9 V?</p>	<p>Repair the battery short circuit in harness between tumble generator valve position sensor and ECM connector. After repair, replace the ECM. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).></p>	<p>Replace the tumble generator valve assembly. <Ref. to FU(H4SO 2.5)-28, Tumble Generator Valve Assembly.></p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BI: DTC P1090 TUMBLE GENERATED VALVE SYSTEM 1 (VALVE OPEN)

DTC DETECTING CONDITION:

Immediately at fault recognition

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO 2.5)(diag)-70, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2 CHECK TUMBLE GENERATOR VALVE RH. 1) Remove the tumble generator valve assembly. 2) Check the tumble generator valve body.	Does the tumble generator valve move smoothly? (No dirt or foreign materials clogged)	Replace the tumble generator valve assembly. <Ref. to FU(H4SO 2.5)-28, Tumble Generator Valve Assembly.>	Clean the tumble generator valve.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BJ:DTC P1091 TUMBLE GENERATED VALVE SYSTEM 1 (VALVE CLOSE)

DTC DETECTING CONDITION:

Immediately at fault recognition

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)" <Ref. to EN(H4SO 2.5)(diag)-70, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2 CHECK TUMBLE GENERATOR VALVE RH. 1) Remove the tumble generator valve assembly. 2) Check the tumble generator valve body.	Does the tumble generator valve move smoothly? (No dirt or foreign materials clogged)	Replace the tumble generator valve assembly. <Ref. to FU(H4SO 2.5)-28, Tumble Generator Valve Assembly.>	Clean the tumble generator valve.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BK:DTC P1092 TUMBLE GENERATED VALVE SYSTEM 2 (VALVE OPEN)

DTC DETECTING CONDITION:

Immediately at fault recognition

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO 2.5)(diag)-70, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2 CHECK TUMBLE GENERATOR VALVE RH. 1) Remove the tumble generator valve assembly. 2) Check the tumble generator valve body.	Does the tumble generator valve move smoothly? (No dirt or foreign materials clogged)	Replace the tumble generator valve assembly. <Ref. to FU(H4SO 2.5)-28, Tumble Generator Valve Assembly.>	Clean the tumble generator valve.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BL:DTC P1093 TUMBLE GENERATED VALVE SYSTEM 2 (VALVE CLOSE)

DTC DETECTING CONDITION:

Immediately at fault recognition

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO 2.5)(diag)-70, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2 CHECK TUMBLE GENERATOR VALVE RH. 1) Remove the tumble generator valve assembly. 2) Check the tumble generator valve body.	Does the tumble generator valve move smoothly? (No dirt or foreign materials clogged)	Replace the tumble generator valve assembly. <Ref. to FU(H4SO 2.5)-28, Tumble Generator Valve Assembly.>	Clean the tumble generator valve.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BM:DTC P1094 TUMBLE GENERATED VALVE SIGNAL 1 CIRCUIT MALFUNCTION (OPEN)

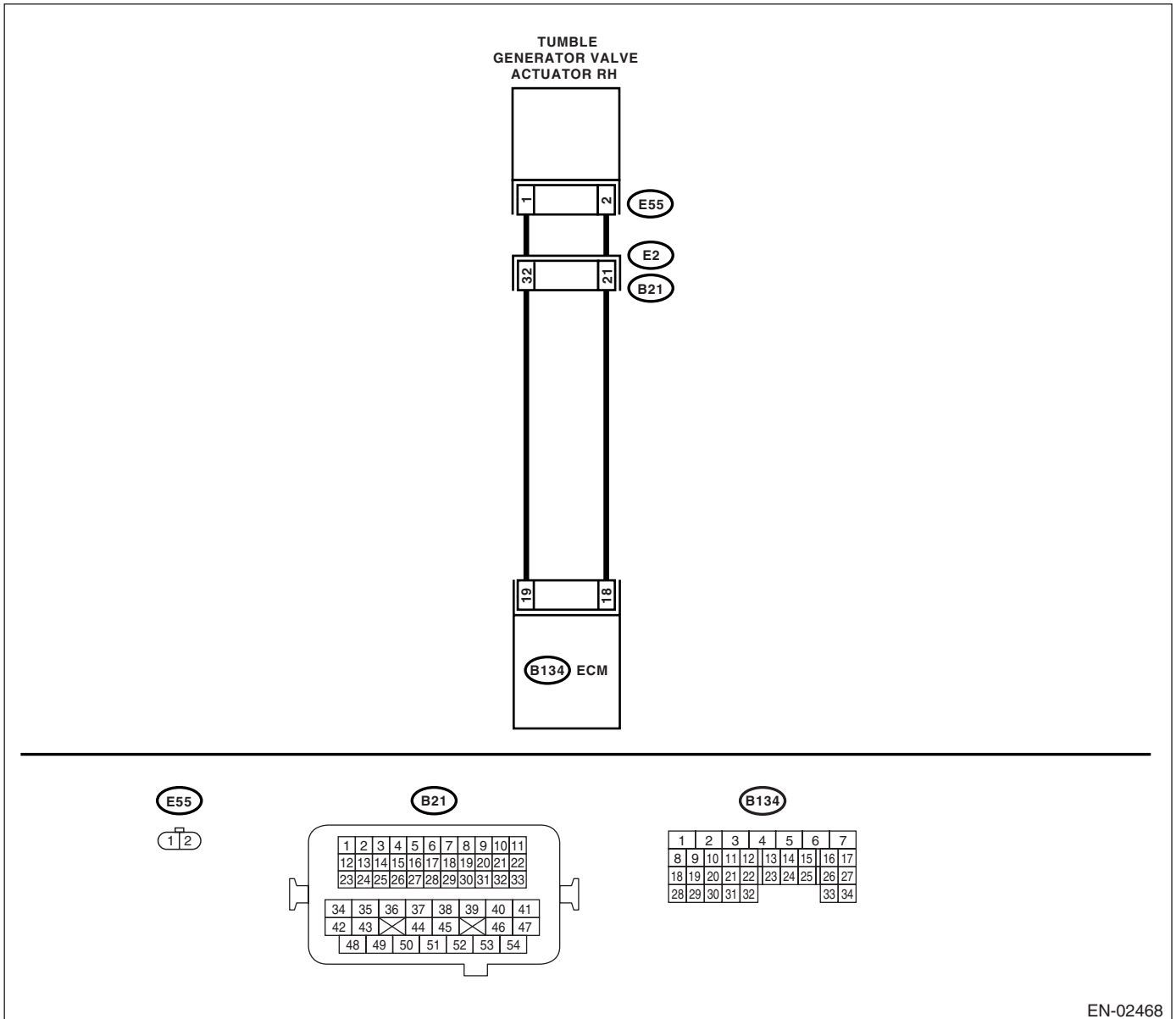
DTC DETECTING CONDITION:

Immediately at fault recognition.

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:



EN-02468

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>1</p> <p>CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR CONNECTOR.</p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from tumble generator valve and ECM connector. 3) Measure the resistance between tumble generator valve actuator and ECM connector.</p> <p>Connector & terminal (E55) No. 1 — (B134) No. 19: (E55) No. 2 — (B134) No. 18:</p>	<p>Is the resistance less than 1 Ω?</p>	<p>Go to step 2.</p>	<p>Repair the open circuit between ECM and tumble generator valve connector.</p> <p>NOTE: In this case, repair the following:</p> <ul style="list-style-type: none"> • Open circuit in harness between ECM and tumble generator valve actuator connector • Poor contact in coupling connector
<p>2</p> <p>CHECK POOR CONTACT. Check poor contact in tumble generator valve actuator connector.</p>	<p>Is there poor contact in tumble generator valve actuator connector?</p>	<p>Repair the poor contact in tumble generator valve actuator connector.</p>	<p>Replace the tumble generator valve assembly. <Ref. to FU(H4SO 2.5)-28, Tumble Generator Valve Assembly.></p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BN:DTC P1095 TUMBLE GENERATED VALVE SIGNAL 1 CIRCUIT MALFUNCTION (SHORT)

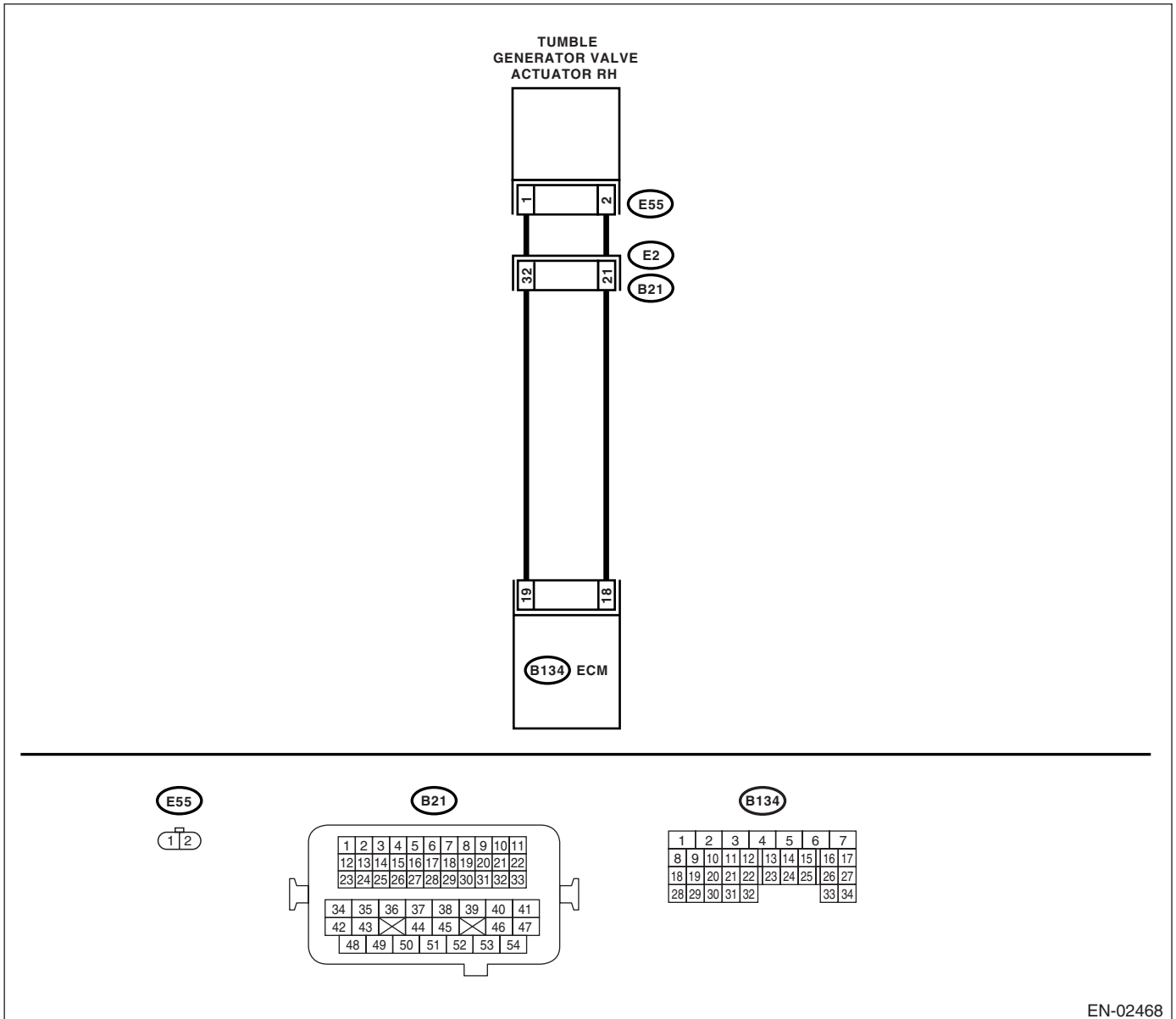
DTC DETECTING CONDITION:

Immediately at fault recognition.

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:



EN-02468

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>1</p> <p>CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR CONNECTOR.</p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from tumble generator valve connector. 3) Measure the voltage between tumble generator valve actuator and chassis ground.</p> <p>Connector & terminal (E55) No. 1 (+) — Chassis ground (-): (E55) No. 2 (+) — Chassis ground (-):</p>	<p>Is the voltage less than 5 V?</p>	<p>Replace the tumble generator valve assembly. <Ref. to FU(H4SO 2.5)-28, Tumble Generator Valve Assembly.></p>	<p>Repair the battery short circuit between ECM and tumble generator valve actuator.</p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>1</p> <p>CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR CONNECTOR.</p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from tumble generator valve and ECM connector. 3) Measure the resistance between tumble generator valve actuator and ECM connector.</p> <p>Connector & terminal (E51) No. 1 — (B134) No. 29: (E51) No. 2 — (B134) No. 28:</p>	<p>Is the resistance less than 1 Ω?</p>	<p>Go to step 2.</p>	<p>Repair the open circuit between ECM and tumble generator valve connector.</p> <p>NOTE: In this case, repair the following:</p> <ul style="list-style-type: none"> • Open circuit in harness between ECM and tumble generator valve actuator connector • Poor contact in coupling connector
<p>2</p> <p>CHECK POOR CONTACT. Check poor contact in tumble generator valve actuator connector.</p>	<p>Is there poor contact in tumble generator valve actuator connector?</p>	<p>Repair the poor contact in tumble generator valve actuator connector.</p>	<p>Replace the tumble generator valve assembly. <Ref. to FU(H4SO 2.5)-28, Tumble Generator Valve Assembly.></p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BP:DTC P1097 TUMBLE GENERATED VALVE SIGNAL 2 CIRCUIT MALFUNCTION (SHORT)

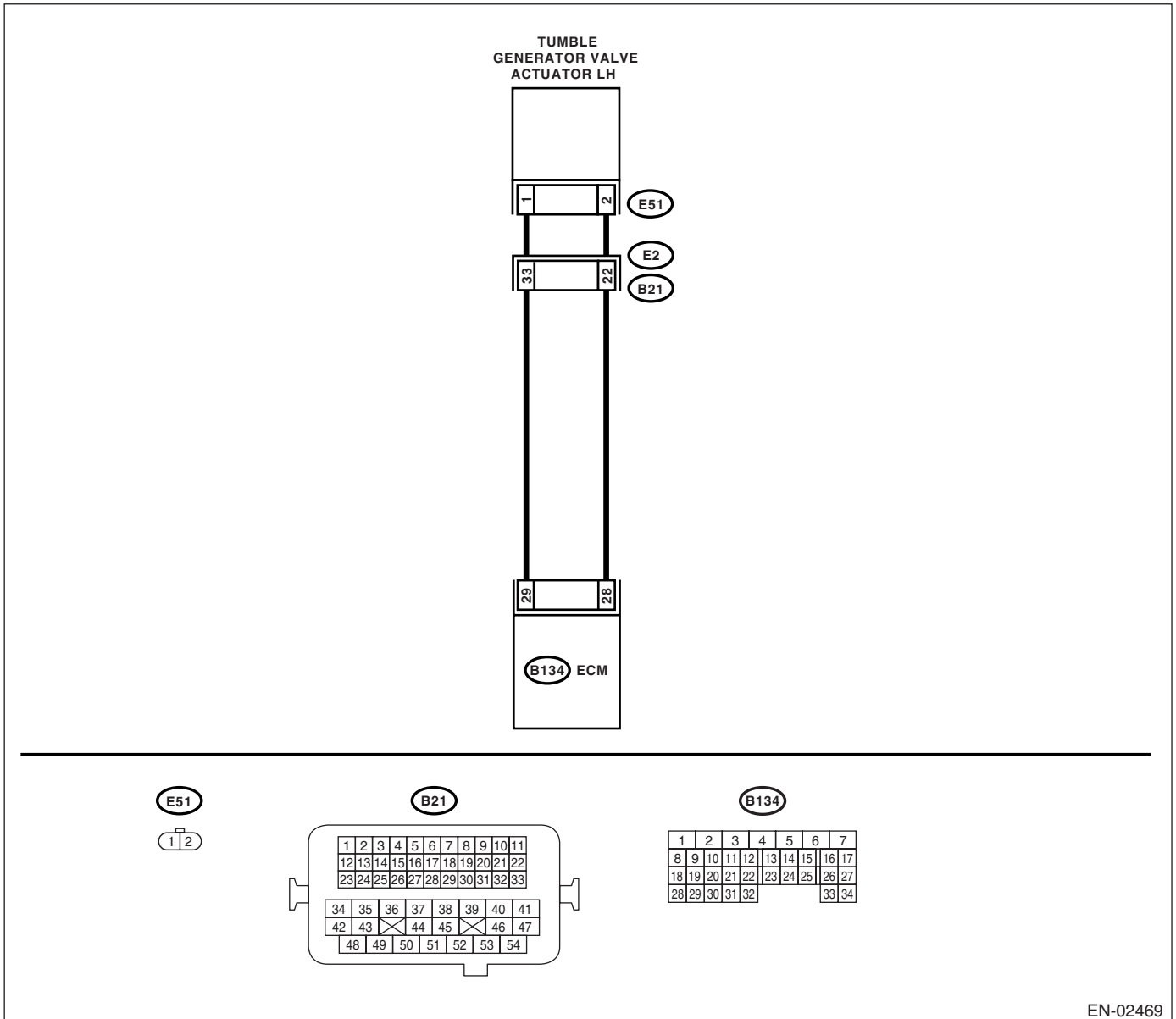
DTC DETECTING CONDITION:

Immediately at fault recognition.

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:



EN-02469

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>1</p> <p>CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR CONNECTOR.</p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connector from tumble generator valve connector.</p> <p>3) Measure the voltage between tumble generator valve actuator and chassis ground.</p> <p>Connector & terminal</p> <p>(E51) No. 1 (+) — Chassis ground (-):</p> <p>(E51) No. 2 (+) — Chassis ground (-):</p>	<p>Is the voltage less than 5 V?</p>	<p>Replace the tumble generator valve assembly. <Ref. to FU(H4SO 2.5)-28, Tumble Generator Valve Assembly.></p>	<p>Repair the battery short circuit between ECM and tumble generator valve actuator.</p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BQ:DTC P1110 ATMOSPHERIC PRESSURE SENSOR CIRCUIT MALFUNCTION (LOW INPUT)

DTC DETECTING CONDITION:

Immediately at fault recognition.

TROUBLE SYMPTOM:

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO 2.5)(diag)-70, List of Diagnostic Trouble Code (DTC).> NOTE: It is not necessary to inspect DTC P1110.	Replace the ECM. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BR:DTC P1111 ATMOSPHERIC PRESSURE SENSOR CIRCUIT MALFUNCTION (HIGH INPUT)

DTC DETECTING CONDITION:

Immediately at fault recognition.

TROUBLE SYMPTOM:

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

Step	Check	Yes	No
1	CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.
			Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO 2.5)(diag)-70, List of Diagnostic Trouble Code (DTC).> NOTE: It is not necessary to inspect DTC P1111.
			Replace the ECM. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BS:DTC P1152 O2 SENSOR CIRCUIT RANGE/PERFORMANCE (LOW) (BANK1 SENSOR1)

DTC DETECTING CONDITION:

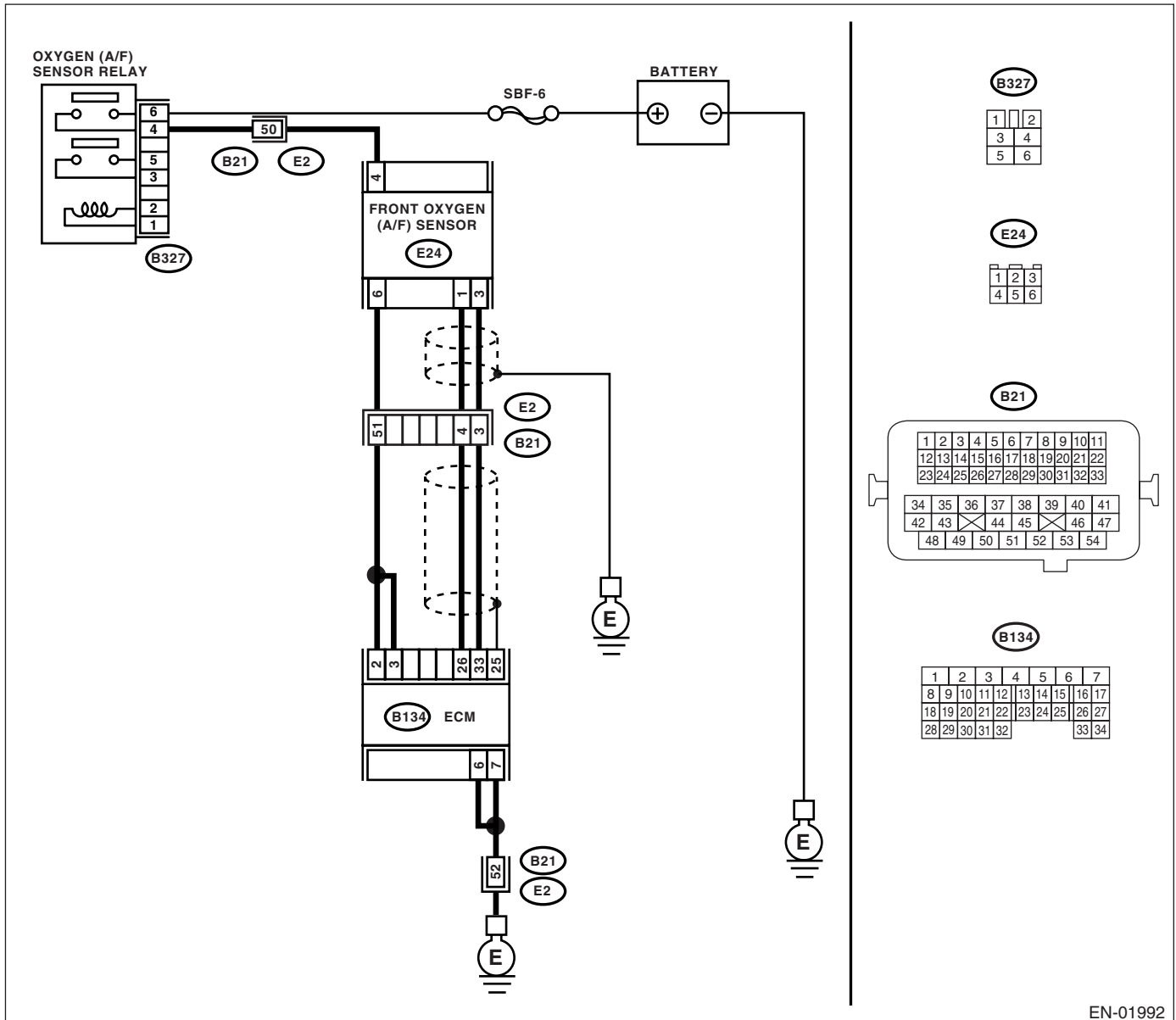
Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>

WIRING DIAGRAM:

- EC, EK and K4 model



EN-01992

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and front oxygen (A/F) sensor connector. 3) Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector. Connector & terminal (B134) No. 26 — (E24) No. 1: (B134) No. 33 — (E24) No. 3:	Is the resistance less than 1 Ω ?	Go to step 3.	Repair the harness and connector. NOTE: In this case, repair the following: <ul style="list-style-type: none"> • Open circuit in harness between ECM and front oxygen (A/F) sensor connector • Poor contact in front oxygen (A/F) sensor connector • Poor contact in ECM connector
3 CHECK POOR CONTACT. Check poor contact in front oxygen (A/F) sensor connector.	Is there poor contact in front oxygen (A/F) sensor connector?	Repair the poor contact in front oxygen (A/F) sensor connector.	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4SO 2.5)-34, Front Oxygen (A/F) Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BT:DTC P1153 O2 SENSOR CIRCUIT RANGE/PERFORMANCE (HIGH) (BANK1 SENSOR1)

DTC DETECTING CONDITION:

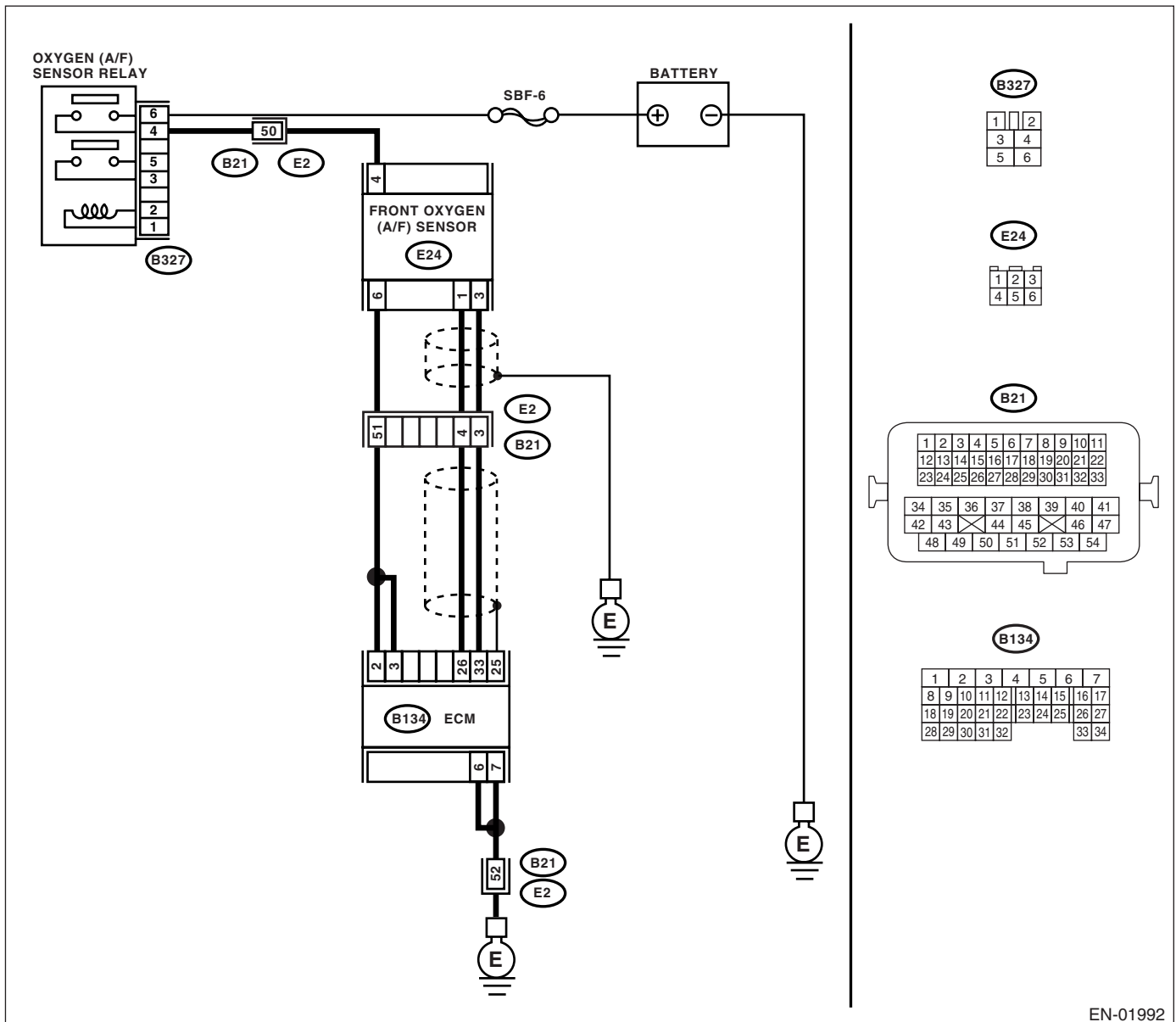
Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



EN-01992

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1	CHECK OPTION CODE. Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2	CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and front oxygen (A/F) sensor. 3) Measure the resistance of harness between ECM connector and chassis ground. Connector & terminal (B134) No. 26 — Chassis ground:	Go to step 3.	Repair the ground short circuit in harness between ECM and front oxygen (A/F) sensor connector.
3	CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR. Measure the resistance of harness between ECM connector and chassis ground. Connector & terminal (B134) No. 33 — Chassis ground:	Go to step 4.	Repair the ground short circuit in harness between ECM and front oxygen (A/F) sensor connector.
4	CHECK OUTPUT SIGNAL FOR ECM. 1) Connect the connector to ECM and front oxygen (A/F) sensor. 2) Turn the ignition switch to ON. 3) Measure the voltage between ECM connector and chassis ground. Connector & terminal (B134) No. 26 (+) — Chassis ground (-):	Go to step 5.	Go to step 6.
5	CHECK OUTPUT SIGNAL FOR ECM. Measure the voltage between ECM connector and chassis ground. Connector & terminal (B134) No. 26 (+) — Chassis ground (-):	Is the voltage more than 10 V? Repair the battery short circuit in harness between ECM and front oxygen (A/F) sensor connector. After repair, replace the ECM. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>	Repair the poor contact in ECM connector.
6	CHECK OUTPUT SIGNAL FOR ECM. Measure the voltage between ECM connector and chassis ground. Connector & terminal (B134) No. 33 (+) — Chassis ground (-):	Is the voltage more than 4.95 V? Go to step 7.	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4SO 2.5)-34, Front Oxygen (A/F) Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
7 CHECK OUTPUT SIGNAL FOR ECM. Measure the voltage between ECM connector and chassis ground. Connector & terminal (B134) No. 33 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Repair the battery short circuit in harness between ECM and front oxygen (A/F) sensor connector. After repair, replace the ECM. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>	Repair the poor contact in ECM connector.

BU:DTC P1160 RETURN SPRING FAILURE

NOTE:

For diagnostic procedure, refer to DTC P2101. <Ref. to EN(H4SO 2.5)(diag)-231, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

BV:DTC P1492 EGR SOLENOID VALVE SIGNAL #1 CIRCUIT MALFUNCTION (LOW INPUT)

NOTE:

For the diagnostic procedure, refer to DTC P1498. <Ref. to EN(H4SO 2.5)(diag)-222, DTC P1498 EGR SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

BW:DTC P1493 EGR SOLENOID VALVE SIGNAL #1 CIRCUIT MALFUNCTION (HIGH INPUT)

NOTE:

For the diagnostic procedure, refer to DTC P1499. <Ref. to EN(H4SO 2.5)(diag)-224, DTC P1499 EGR SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

BX:DTC P1494 EGR SOLENOID VALVE SIGNAL #2 CIRCUIT MALFUNCTION (LOW INPUT)

NOTE:

For the diagnostic procedure, refer to DTC P1498. <Ref. to EN(H4SO 2.5)(diag)-222, DTC P1498 EGR SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

BY:DTC P1495 EGR SOLENOID VALVE SIGNAL #2 CIRCUIT MALFUNCTION (HIGH INPUT)

NOTE:

For the diagnostic procedure, refer to DTC P1499. <Ref. to EN(H4SO 2.5)(diag)-224, DTC P1499 EGR SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

BZ:DTC P1496 EGR SOLENOID VALVE SIGNAL #3 CIRCUIT MALFUNCTION (LOW INPUT)

NOTE:

For the diagnostic procedure, refer to DTC P1498. <Ref. to EN(H4SO 2.5)(diag)-222, DTC P1498 EGR SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

CA:DTC P1497 EGR SOLENOID VALVE SIGNAL #3 CIRCUIT MALFUNCTION (HIGH INPUT)

NOTE:

For the diagnostic procedure, refer to DTC P1499. <Ref. to EN(H4SO 2.5)(diag)-224, DTC P1499 EGR SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

CB:DTC P1498 EGR SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (LOW INPUT)

DTC DETECTING CONDITION:

Immediately at fault recognition.

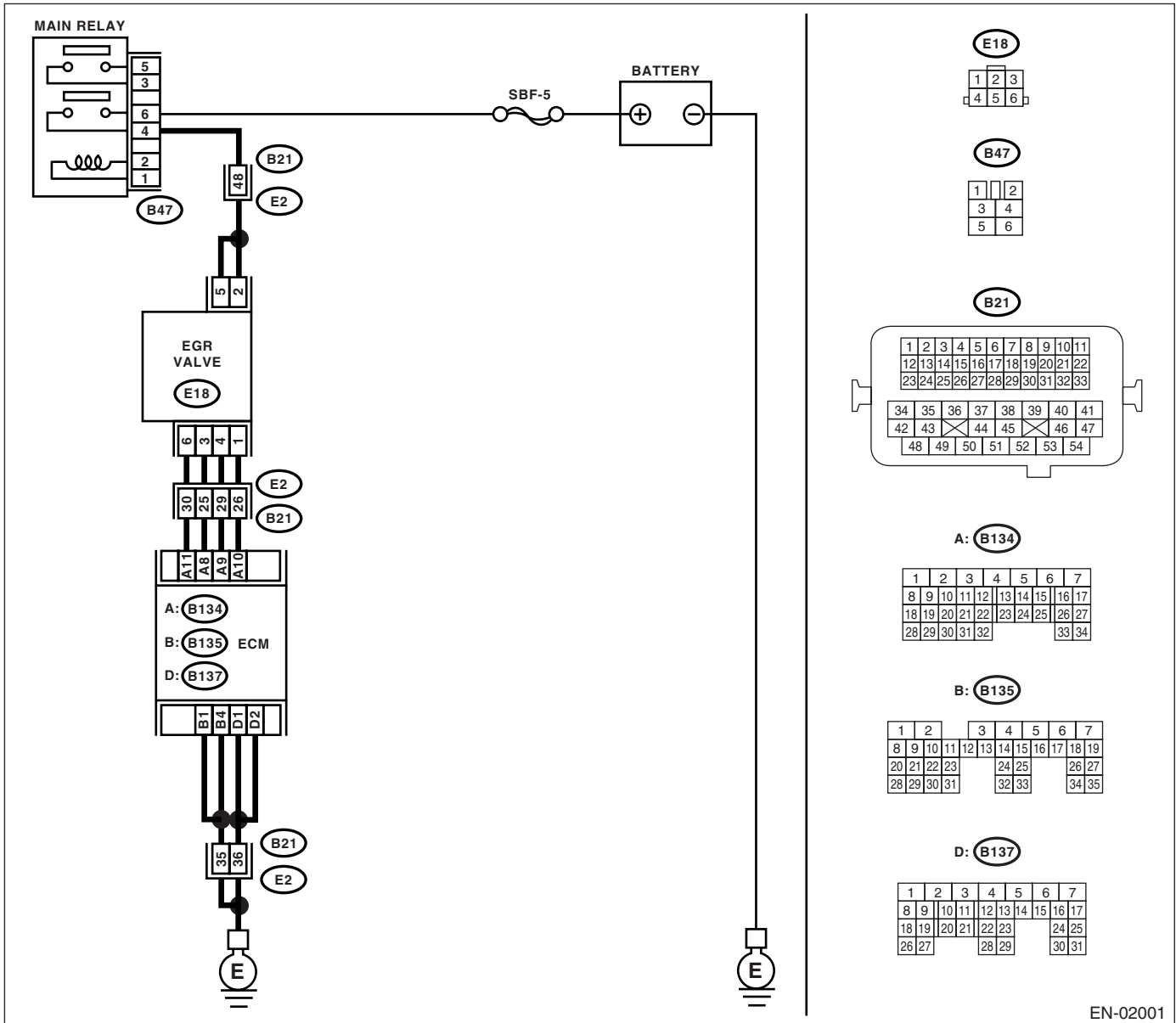
TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance
- Engine breathing

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:



EN-02001

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>1 CHECK POWER SUPPLY TO EGR SOLENOID VALVE.</p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from EGR solenoid valve. 3) Turn the ignition switch to ON. 4) Measure the voltage between EGR solenoid valve connector and engine ground.</p> <p>Connector & terminal (E18) No. 2 (+) — Engine ground (-): (E18) No. 5 (+) — Engine ground (-):</p>	Is the voltage more than 10 V?	Go to step 2.	Repair the harness and connector. NOTE: In this case, repair the following: • Open circuit in harness between EGR solenoid valve and main relay connector • Poor contact in coupling connector
<p>2 CHECK HARNESS BETWEEN ECM AND EGR SOLENOID VALVE CONNECTOR.</p> <p>1) Turn the ignition switch to OFF. 2) Measure the voltage between ECM and EGR solenoid valve connector.</p> <p>Connector & terminal DTC P1492; (B134) No. 11 — (E18) No. 3: DTC P1494; (B134) No. 10 — (E18) No. 1: DTC P1496; (B134) No. 9 — (E18) No. 4: DTC P1498; (B134) No. 8 — (E18) No. 6:</p>	Is the resistance less than 1 Ω?	Go to step 3.	Repair the harness and connector. NOTE: In this case, repair the following: • Open circuit in harness between ECM and EGR solenoid valve connector • Poor contact in coupling connector
<p>3 CHECK HARNESS BETWEEN ECM AND EGR SOLENOID VALVE CONNECTOR.</p> <p>1) Disconnect the connector from ECM. 2) Measure the resistance between ECM connector and chassis ground.</p> <p>Connector & terminal DTC P1492; (B134) No. 11 — Chassis ground: DTC P1494; (B134) No. 10 — Chassis ground: DTC P1496; (B134) No. 9 — Chassis ground: DTC P1498; (B134) No. 8 — Chassis ground:</p>	Is the resistance more than 1 MΩ?	Go to step 4.	Repair the ground short in harness between ECM and EGR solenoid valve connector.
<p>4 CHECK POOR CONTACT.</p> <p>Check poor contact in ECM connector and EGR solenoid valve connector.</p>	Is there poor contact in ECM connector or EGR solenoid valve connector?	Repair the poor contact in ECM connector or EGR solenoid valve connector.	Replace the EGR solenoid valve. <Ref. to FU(H4SO 2.5)-30, EGR Valve.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

CC:DTC P1499 EGR SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (HIGH INPUT)

DTC DETECTING CONDITION:

Immediately at fault recognition.

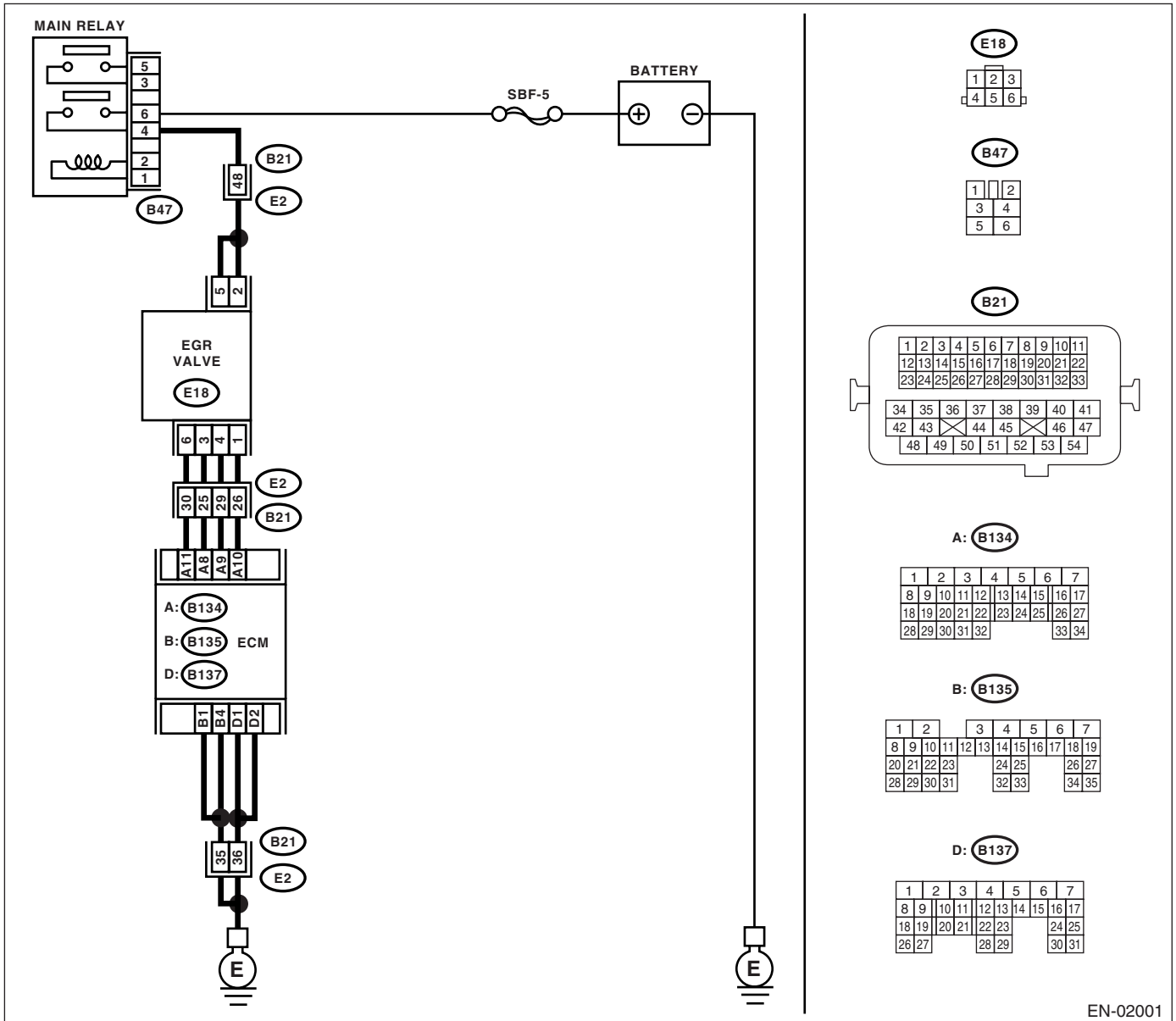
TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance
- Engine breathing

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:



EN-02001

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO 2.5)(diag)-70, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2 CHECK GROUND CIRCUIT FOR ECM. 1) Turn the ignition switch to OFF. 2) Measure the resistance between ECM connector and chassis ground. Connector & terminal <i>(B135) No. 1 — Chassis ground:</i> <i>(B135) No. 4 — Chassis ground:</i> <i>(B137) No. 1 — Chassis ground:</i> <i>(B137) No. 2 — Chassis ground:</i>	Is the resistance less than 5 Ω?	Go to step 3.	Repair the harness and connector. NOTE: In this case, repair the following: <ul style="list-style-type: none"> • Open circuit in harness between ECM connector and engine ground terminal • Poor contact in ECM connector • Poor contact in coupling connector
3 CHECK HARNESS BETWEEN ECM AND EGR SOLENOID VALVE CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from EGR solenoid valve. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM connector and chassis ground. Connector & terminal <i>DTC P1493; (B134) No. 11 (+) — Chassis ground (-):</i> <i>DTC P1495; (B134) No. 10 (+) — Chassis ground (-):</i> <i>DTC P1497; (B134) No. 9 (+) — Chassis ground (-):</i> <i>DTC P1499; (B134) No. 8 (+) — Chassis ground (-):</i>	Is the voltage more than 10 V?	Repair battery short in harness between ECM and EGR solenoid valve connector. After repairing, replace the ECM. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>	Replace the ECM. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

CD:DTC P1518 STARTER SWITCH CIRCUIT LOW INPUT

DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

Failure of engine to start

CAUTION:

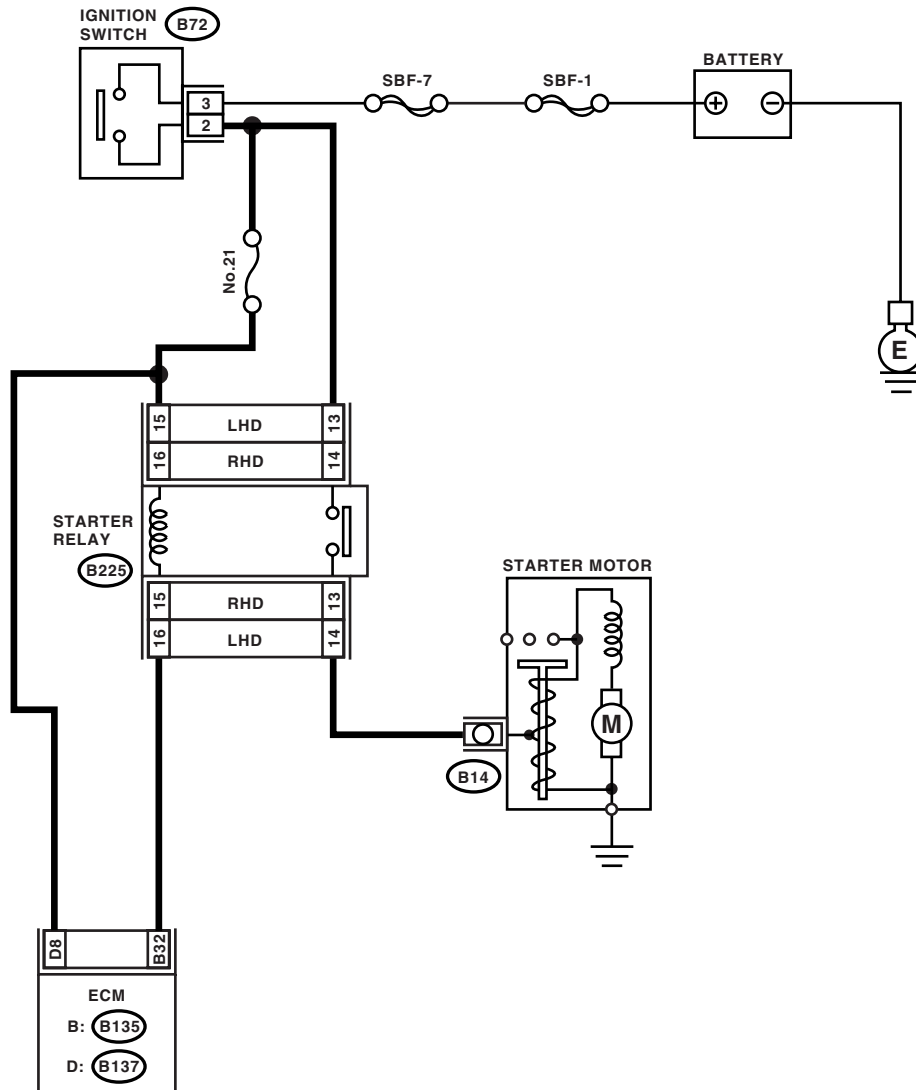
After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

WIRING DIAGRAM:

- EC, EK and K4 model



B72

1	2	3
4	5	6

B225

1	2	9	13	17	21
3	4	10	14	18	22
5	6	11	15	19	23
7	8	12	16	20	24
		25	29	33	37
		26	30	34	38
		27	31	35	39
		28	32	36	40

B: B135

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	32	33	34	35

D: B137

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	32	33	34	35

EN-02455

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK OPERATION OF STARTER MOTOR. Place the inhibitor switch in the "P" or "N" range.	Does the starter motor operate when ignition switch to START?	Repair the harness and connector. NOTE: In this case, repair the following: <ul style="list-style-type: none"> • Open or ground short circuit in harness between ECM and starter motor connector • Poor contact in ECM connector 	Check starter motor circuit. <Ref. to EN(H4SO 2.5)(diag)-55, STARTER MOTOR CIRCUIT, Diagnostics for Engine Starting Failure.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK INPUT SIGNAL FROM ECM. 1) Turn the ignition switch to OFF. 2) Measure the voltage between ECM and chassis ground. Connector & terminal (B135) No. 19 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Repair the poor contact in ECM connector.	Go to step 3.
3 CHECK HARNESS BETWEEN ECM AND MAIN FUSE BOX CONNECTOR. 1) Disconnect the connector from ECM. 2) Measure the resistance of harness between ECM and chassis ground. Connector & terminal (B135) No. 19 — Chassis ground:	Is the resistance less than 10 Ω ?	Repair the ground short circuit in harness between ECM connector and battery terminal.	Go to step 4.
4 CHECK FUSE No. 13.	Is the fuse blown out?	Replace the fuse.	Repair the harness and connector. NOTE: In this case, repair the following: <ul style="list-style-type: none"> • Open circuit in harness between ECM and battery • Poor contact in ECM connector • Poor contact in battery terminal

CF:DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/ PERFORMANCE

DTC DETECTING CONDITION:

Immediately at fault recognition.

TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance
- Engine stalls.

CAUTION:

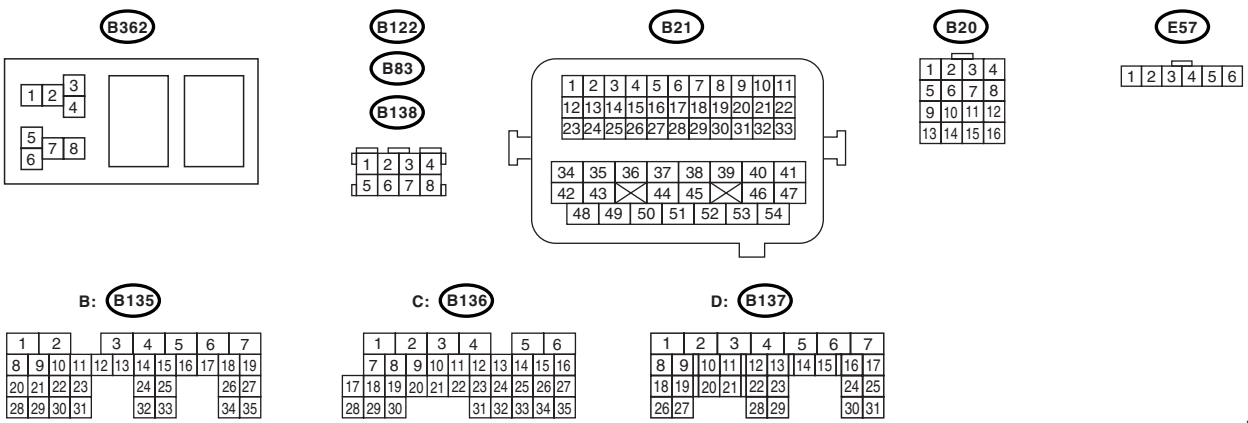
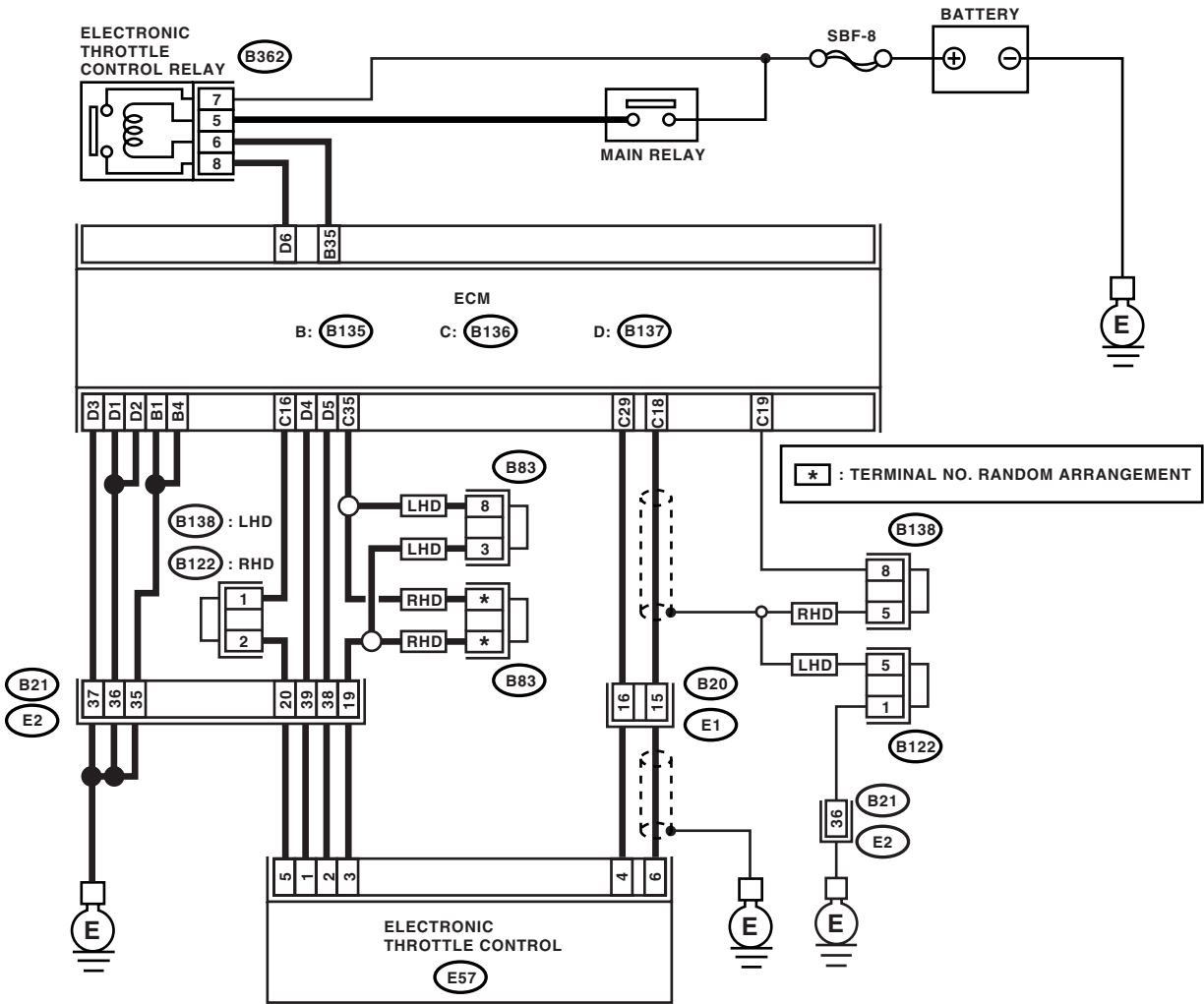
After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

WIRING DIAGRAM:

- EC, EK and K4 model



EN-02462

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1	CHECK OPTION CODE. Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2	CHECK ELECTRONIC THROTTLE CONTROL RELAY. 1) Turn the ignition switch to OFF. 2) Remove the electronic throttle control relay. 3) Connect the battery to electronic throttle control relay terminals No. 5 and No. 6. 4) Measure the resistance between electronic throttle control relay terminals. Terminals No. 7 — No. 8:	Go to step 3.	Replace the electronic throttle control relay.
3	CHECK POWER SUPPLY OF ELECTRONIC THROTTLE CONTROL RELAY. Measure the voltage between electronic throttle control relay connector and chassis ground. Connector & terminal (B362) No. 7 (+) — Chassis ground (-): (B362) No. 5 (+) — Chassis ground (-):	Go to step 4.	Repair the open or ground short circuit of power supply circuit.
4	CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY. 1) Disconnect the connector from ECM. 2) Turn the ignition switch to ON. 3) Measure the voltage between electronic throttle control relay connector and chassis ground. Connector & terminal (B362) No. 6 (+) — Chassis ground (-):	Go to step 5.	Repair power supply short circuit in harness between ECM and electronic throttle control.
5	CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY. 1) Turn the ignition switch to OFF. 2) Measure the resistance between electronic throttle control relay connector and chassis ground. Connector & terminal (B362) No. 6 — Chassis ground: (B362) No. 8 — Chassis ground:	Go to step 6.	Repair the ground short circuit in harness between ECM and electronic throttle control relay.
6	CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY. Measure the resistance between ECM connector and electronic throttle control relay connector. Connector & terminal (B135) No. 35 — (B362) No. 6: (B137) No. 6 — (B362) No. 8:	Go to step 7.	Repair the open circuit in harness between ECM and electronic throttle control relay.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
7 CHECK SENSOR OUTPUT. 1) Connect all the connectors. 2) Turn the ignition switch to ON. 3) Read the data of main throttle sensor signal using Subaru Select Monitor.	Is the voltage more than 0.4 V?	Go to step 8.	Go to step 10.
8 CHECK SENSOR OUTPUT. Read the data of sub throttle sensor signal using Subaru Select Monitor.	Is the voltage more than 0.8 V?	Go to step 9.	Go to step 10.
9 CHECK POOR CONTACT. Check poor contact in connector between ECM and electronic throttle control.	Is there poor contact?	Repair the poor contact.	Go to step 14.
10 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connectors from electronic throttle control. 4) Measure the resistance between ECM connector and electronic throttle control connector. Connector & terminal (B136) No. 18 — (E57) No. 6: (B136) No. 29 — (E57) No. 4: (B136) No. 16 — (E57) No. 5:	Is the resistance less than 1 Ω ?	Go to step 11.	Repair the open circuit of harness connector.
11 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. Measure the resistance between ECM connector and chassis ground. Connector & terminal (B136) No. 16 — Chassis ground: (B136) No. 18 — Chassis ground: (B136) No. 29 — Chassis ground:	Is the resistance more than 1 M Ω ?	Go to step 12.	Repair the ground short circuit of harness.
12 CHECK SENSOR POWER SUPPLY. 1) Connect the ECM connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 5 (+) — Engine ground (-):	Is the voltage 4.5 — 5.5 V?	Go to step 13.	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>
13 CHECK SHORT CIRCUIT IN ECM. 1) Turn the ignition switch to OFF. 2) Measure the resistance between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 6 — Engine ground: (E57) No. 4 — Engine ground:	Is the resistance more than 10 Ω ?	Go to step 14.	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>
14 CHECK SENSOR OUTPUT. 1) Connect all the connectors. 2) Turn the ignition switch to ON. 3) Read the data of main throttle sensor signal using Subaru Select Monitor.	Is the voltage 4.63 V?	Go to step 15.	Go to step 17.
15 CHECK SENSOR OUTPUT. Read the data of sub throttle sensor signal using Subaru Select Monitor.	Is the voltage 4.73 V?	Go to step 16.	Go to step 17.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
16 CHECK POOR CONTACT. Check poor contact in connector between ECM and electronic throttle control.	Is there poor contact?	Repair the poor contact.	Go to step 22 .
17 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connectors from electronic throttle control. 4) Measure the resistance between ECM connector and electronic throttle control connector. Connector & terminal (B136) No. 35 — (E57) No. 3: (B136) No. 18 — (E57) No. 6: (B136) No. 29 — (E57) No. 4:	Is the resistance less than 1 Ω ?	Go to step 18 .	Repair the open circuit of harness connector.
18 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Connect the ECM connector. 2) Measure the resistance between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 3 — Engine ground:	Is the resistance less than 5 Ω ?	Go to step 19 .	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>
19 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to ON. 2) Measure the voltage between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 5 (+) — Engine ground (-):	Is the voltage less than 10 V?	Go to step 20 .	Repair the battery short circuit in harness between ECM connector and electronic throttle control connector.
20 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. Measure the voltage between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 6 (+) — Engine ground (-): (E57) No. 4 (+) — Engine ground (-):	Is the voltage less than 10 V?	Go to step 21 .	Repair the short circuit in harness between ECM connector and electronic throttle control connector.
21 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Remove the ECM. 3) Measure the resistance between ECM connectors. Connector & terminal (B136) No. 18 — (B136) No. 16: (B136) No. 29 — (B136) No. 16:	Is the resistance more than 1 M Ω ?	Go to step 22 .	Repair the short circuit to sensor power supply.
22 CHECK SENSOR OUTPUT. 1) Turn the ignition switch to OFF. 2) Connect the connectors except for the electric control throttle relay. 3) Turn the ignition switch to ON. 4) Read the data of main throttle sensor signal using Subaru Select Monitor.	Is the voltage 0.81 — 0.87 V?	Go to step 23 .	Repair the poor contact of electronic throttle control connector. Replace the electronic throttle control if defective.
23 CHECK SENSOR OUTPUT. Read the data of sub throttle sensor signal using Subaru Select Monitor.	Is the voltage 1.64 — 1.70 V?	Go to step 24 .	Repair the poor contact in ECM connector. Replace the electronic throttle control if defective.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
24 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connectors from electronic throttle control. 4) Measure the resistance between ECM connector and electronic throttle control connector. <i>Connector & terminal</i> <i>(B137) No. 5 — (E57) No. 2:</i> <i>(B137) No. 4 — (E57) No. 1:</i>	Is the resistance less than 1 Ω ?	Go to step 25.	Repair the open circuit of harness connector.
25 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR. 1) Connect the connector to ECM. 2) Turn the ignition switch to ON. 3) Measure the voltage between electronic throttle control connector and engine ground. <i>Connector & terminal</i> <i>(E57) No. 2 (+) — Engine ground (-):</i> <i>(E57) No. 1 (+) — Engine ground (-):</i>	Is the voltage less than 5 V?	Go to step 26.	Repair power supply short circuit in harness between ECM and electronic throttle control.
26 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance between electronic throttle control connector and engine ground. <i>Connector & terminal</i> <i>(E57) No. 2 — Engine ground:</i> <i>(E57) No. 1 — Engine ground:</i>	Is the resistance more than 1 M Ω ?	Go to step 27.	Repair the short circuit of harness.
27 CHECK ELECTRONIC THROTTLE CONTROL MOTOR HARNESS. Measure the resistance between electronic throttle control connector terminals. <i>Connector & terminal</i> <i>(E57) No. 2 — (E57) No. 1:</i>	Is the resistance more than 1 M Ω ?	Go to step 28.	Repair the short circuit of harness.
28 CHECK ELECTRONIC THROTTLE CONTROL GROUND CIRCUIT. Measure the resistance between ECM connector and chassis ground. <i>Connector & terminal</i> <i>(B137) No. 3 — Chassis ground:</i>	Is the resistance less than 10 Ω ?	Go to step 29.	Repair the open circuit of harness.
29 CHECK ELECTRONIC THROTTLE CONTROL. Measure the resistance between electronic throttle control terminals. <i>Terminals</i> <i>No. 1 — No. 2:</i>	Is the resistance less than 5 Ω ?	Go to step 30.	Replace the electronic throttle control.
30 CHECK ELECTRONIC THROTTLE CONTROL. Move the throttle valve to the fully open and fully closed positions with fingers. Check that the valve returns to the specified position when releasing fingers.	Does the valve return to the specified position? Standard value: 3 mm (0.12 in) from fully closed position	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>	Replace the electronic throttle control.

CG:DTC P2102 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT LOW

DTC DETECTING CONDITION:

Immediately at fault recognition.

TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance
- Engine stalls.

CAUTION:

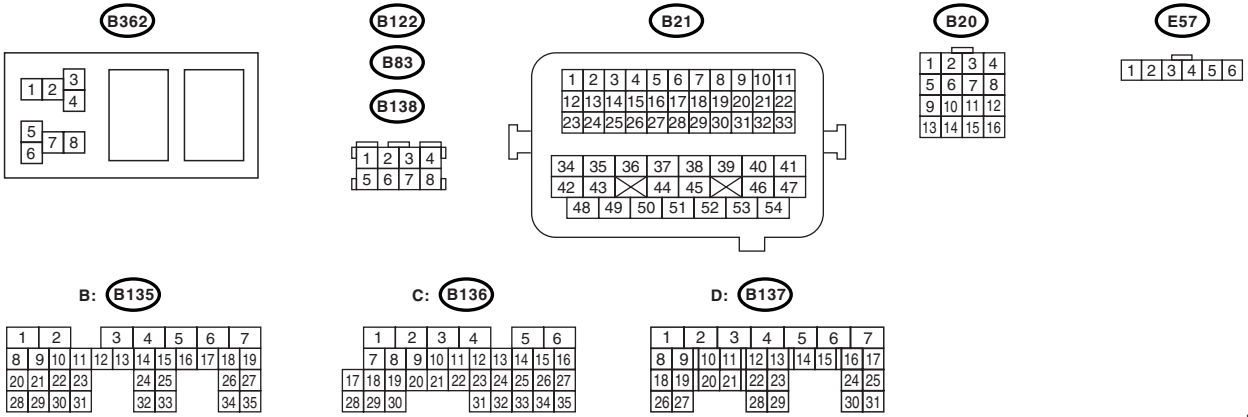
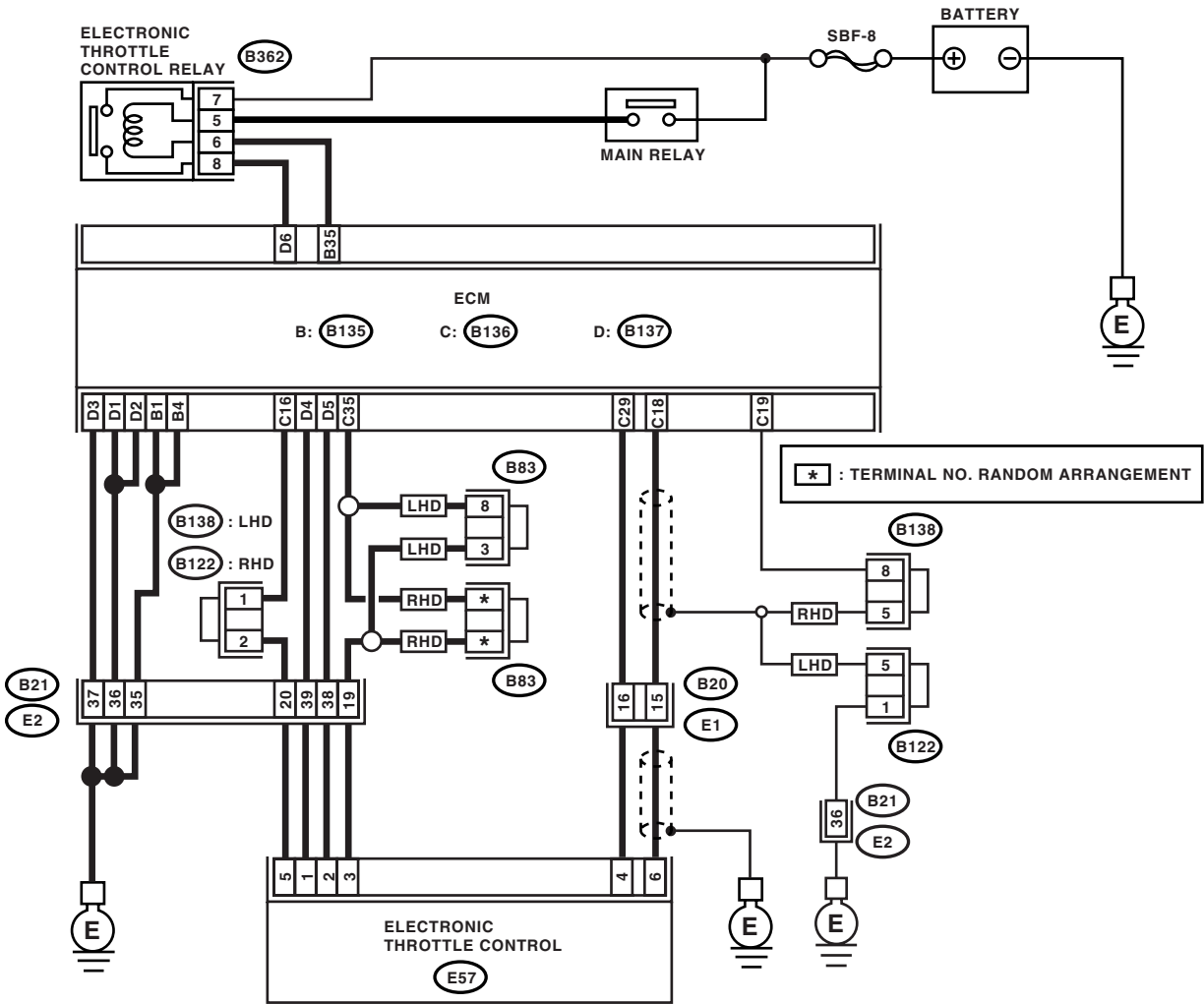
After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

WIRING DIAGRAM:

- EC, EK and K4 model



EN-02462

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1	CHECK OPTION CODE. Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2	CHECK ELECTRONIC THROTTLE CONTROL RELAY. 1) Turn the ignition switch to OFF. 2) Remove the electronic throttle control relay. 3) Connect the battery to electronic throttle control relay terminals No. 5 and No. 6. 4) Measure the resistance between electronic throttle control relay terminals. <i>Terminals</i> No. 7 — No. 8:	Go to step 3.	Replace the electronic throttle control relay.
3	CHECK POWER SUPPLY OF ELECTRONIC THROTTLE CONTROL RELAY. Measure the voltage between electronic throttle control relay connector and chassis ground. <i>Connector & terminal</i> (B362) No. 7 (+) — Chassis ground (-): (B362) No. 5 (+) — Chassis ground (-):	Go to step 4.	Repair the open or ground short circuit of power supply circuit.
4	CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY. 1) Disconnect the connector from ECM. 2) Turn the ignition switch to ON. 3) Measure the voltage between electronic throttle control relay connector and chassis ground. <i>Connector & terminal</i> (B362) No. 6 (+) — Chassis ground (-):	Go to step 5.	Repair power supply short circuit in harness between ECM and electronic throttle control relay.
5	CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY. 1) Turn the ignition switch to OFF. 2) Measure the resistance between electronic throttle control relay connector and chassis ground. <i>Connector & terminal</i> (B362) No. 6 — Chassis ground: (B362) No. 8 — Chassis ground:	Go to step 6.	Repair the ground short circuit in harness between ECM and electronic throttle control relay.
6	CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY. Measure the resistance between ECM connector and electronic throttle control relay connector. <i>Connector & terminal</i> (B135) No. 35 — (B362) No. 6: (B137) No. 6 — (B362) No. 8:	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>	Repair the open circuit in harness between ECM and electronic throttle control relay.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Step	Check	Yes	No
1 CHECK OPTION CODE.	Is the option code EC, EK or K4?	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2 CHECK ELECTRONIC THROTTLE CONTROL RELAY. 1) Turn the ignition switch to OFF. 2) Remove the electronic throttle control relay. 3) Measure the resistance between electronic throttle control relay terminals. Terminals No. 7 — No. 8:	Is the resistance more than 1 MΩ?	Go to step 3.	Replace the electronic throttle control relay.
3 CHECK POWER SUPPLY SHORT CIRCUIT OF ELECTRONIC THROTTLE CONTROL RELAY. 1) Turn the ignition switch to ON. 2) Measure the voltage between electronic throttle control relay connector and chassis ground. Connector & terminal (B362) No. 8 (+) — Chassis ground (-):	Is the voltage more than 5 V?	Go to step 4.	Repair power supply short circuit in harness between ECM and electronic throttle control relay.
4 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance between ECM connector and chassis ground. Connector & terminal (B135) No. 35 — Chassis ground:	Is the resistance more than 1 MΩ?	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>	Repair the ground short circuit in harness between ECM and electronic throttle control relay.

CI: DTC P2109 THROTTLE ANGLE CLOSED POSITION ERROR

NOTE:

For diagnostic procedure, refer to DTC P2101. <Ref. to EN(H4SO 2.5)(diag)-231, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

CJ:DTC P2122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT LOW INPUT

DTC DETECTING CONDITION:

Immediately at fault recognition.

TROUBLE SYMPTOM:

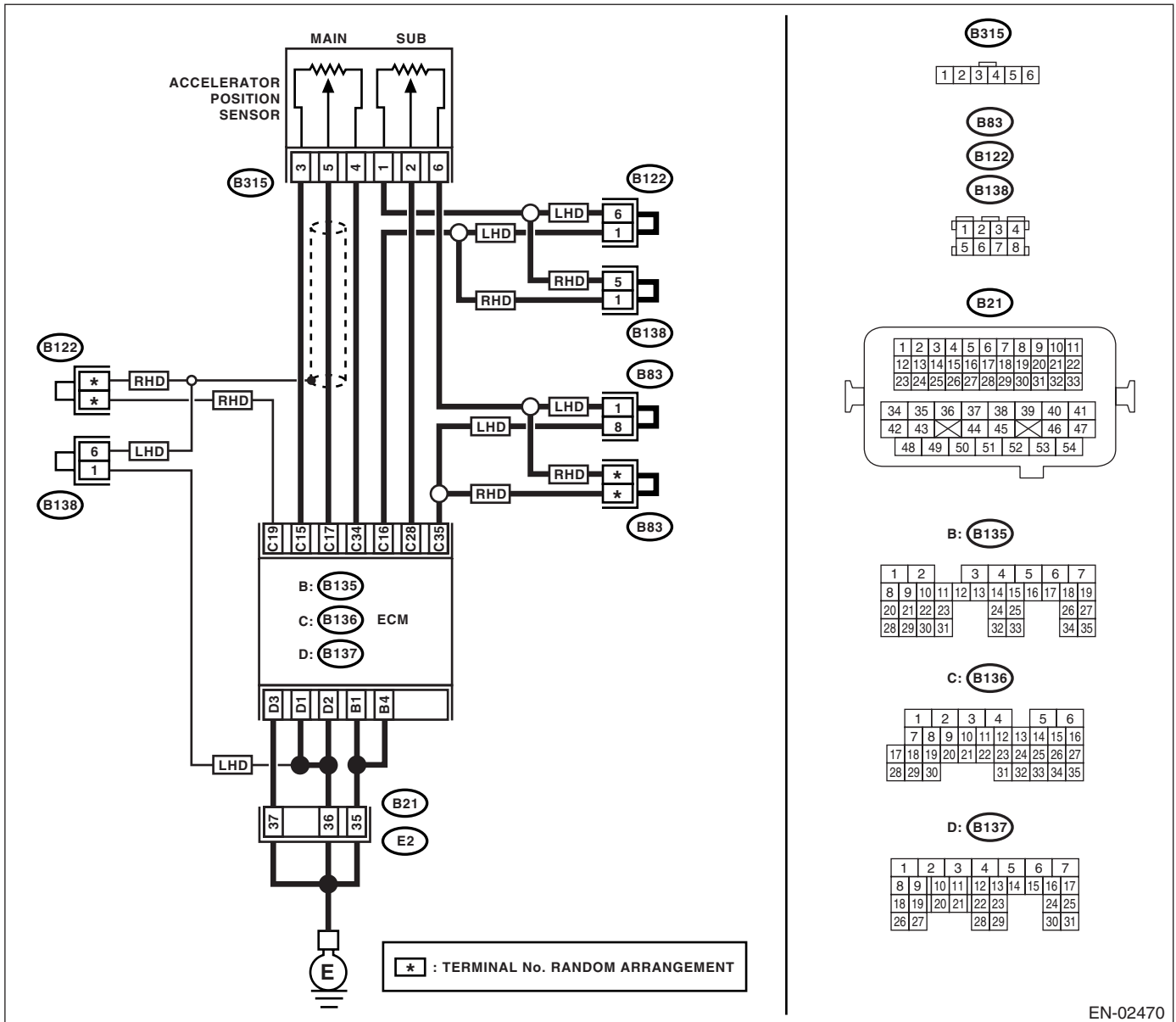
- Erroneous idling
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1	CHECK OPTION CODE.	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2	CHECK ACCELERATOR POSITION SENSOR OUTPUT. 1) Turn the ignition switch to ON. 2) Read the data of main accelerator position sensor signal using Subaru Select Monitor.	Go to step 3.	Go to step 4.
3	CHECK POOR CONTACT. Check poor contact in connector between ECM and accelerator position sensor.	Repair the poor contact.	Temporary poor contact occurred, but it is normal at present.
4	CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connector from accelerator position sensor. 4) Measure the resistance between ECM connector and accelerator position sensor connector. Connector & terminal (B136) No. 17 — (B315) No. 5: (B136) No. 15 — (B315) No. 3:	Go to step 5.	Repair the open circuit of harness connector.
5	CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR. Measure the resistance between ECM connector and chassis ground. Connector & terminal (B136) No. 17 — Chassis ground: (B136) No. 15 — Chassis ground:	Go to step 6.	Repair the chassis short circuit of harness.
6	CHECK POWER SUPPLY OF ACCELERATOR POSITION SENSOR. 1) Connect the ECM connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between accelerator position sensor connector and engine ground. Connector & terminal (B315) No. 3 (+) — Engine ground (-):	Go to step 7.	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>
7	CHECK ACCELERATOR POSITION SENSOR. Measure the resistance of accelerator position sensor. Terminals No. 3 — No. 4:	Go to step 8.	Replace the accelerator position sensor.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
8 CHECK ACCELERATOR POSITION SENSOR. Measure the resistance of accelerator position sensor. <i>Terminals</i> No. 5 — No. 4: Check the measured value is within the specification without depressing the accelerator pedal.	Is the resistance 0.2 — 1.0 kΩ?	Go to step 9 .	Replace the accelerator position sensor.
9 CHECK ACCELERATOR POSITION SENSOR. Measure the resistance of accelerator position sensor. <i>Terminals</i> No. 5 — No. 4: Check the measured value is within the specification with the accelerator pedal depressed.	Is the resistance 0.5 — 2.5 kΩ?	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>	Replace the accelerator position sensor.

CK:DTC P2123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT HIGH INPUT

DTC DETECTING CONDITION:

Immediately at fault recognition.

TROUBLE SYMPTOM:

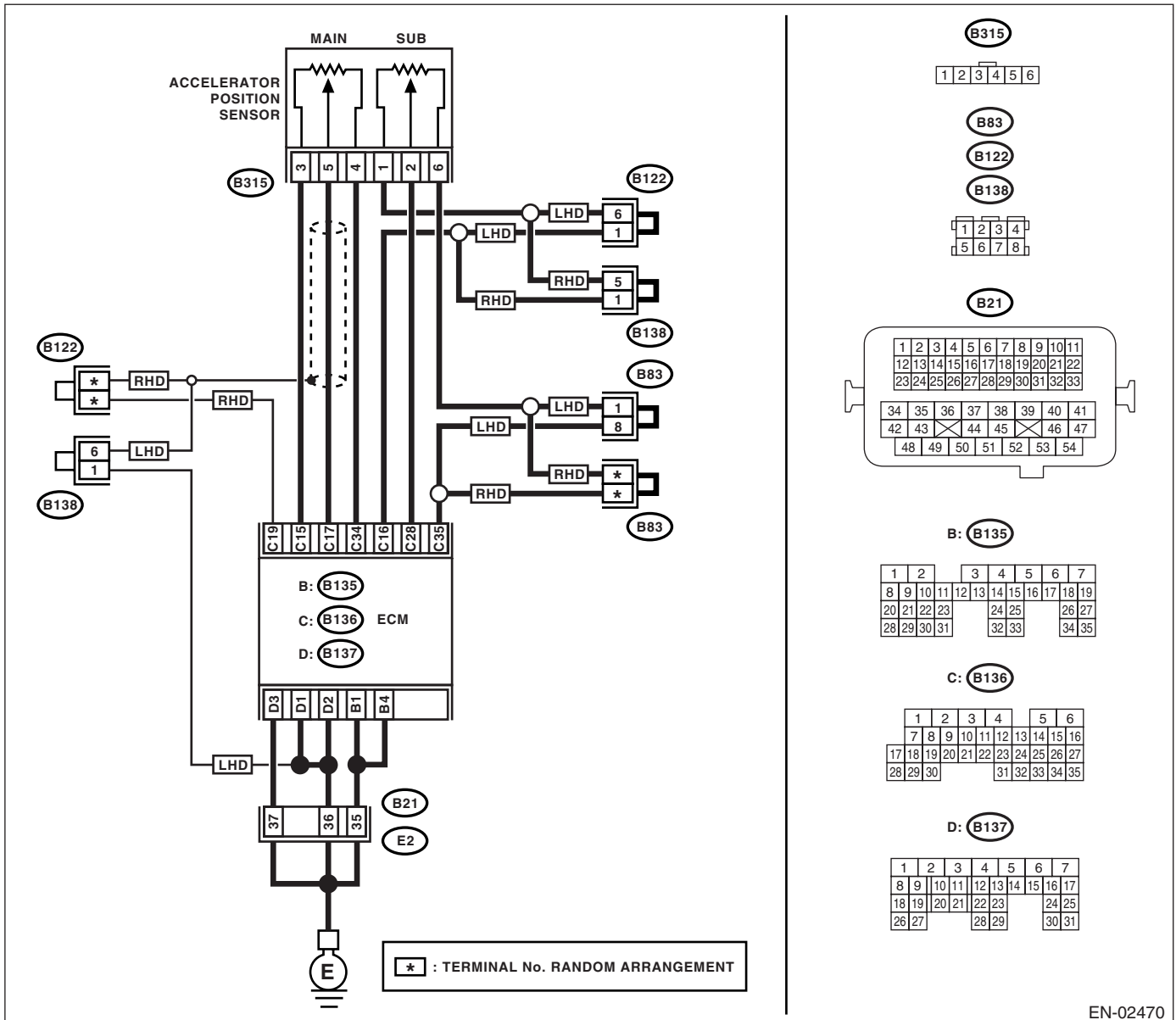
- Erroneous idling
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1	CHECK OPTION CODE.	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2	CHECK ACCELERATOR POSITION SENSOR OUTPUT. 1) Turn the ignition switch to ON. 2) Read the data of main accelerator position sensor signal using Subaru Select Monitor.	Go to step 3.	Go to step 4.
3	CHECK POOR CONTACT. Check poor contact in connector between ECM and accelerator position sensor.	Repair the poor contact.	Temporary poor contact occurred, but it is normal at present.
4	CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connector from accelerator position sensor. 4) Measure the resistance between ECM connector and accelerator position sensor connector. Connector & terminal (B136) No. 34 — (B315) No. 4:	Go to step 5.	Repair the open circuit of harness connector.
5	CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR. 1) Connect the ECM connector. 2) Measure the resistance between accelerator position sensor connector and engine ground. Connector & terminal (B315) No. 4 — Engine ground:	Go to step 6.	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>
6	CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR. 1) Connect the ECM connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between accelerator position sensor connector and engine ground. Connector & terminal (B315) No. 5 (+) — Engine ground (-):	Go to step 7.	Repair the battery short circuit in harness between ECM connector and accelerator position sensor connector.
7	CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance between ECM connectors. Connector & terminal (B136) No. 17 — (B136) No. 15: (B136) No. 17 — (B136) No. 16:	Repair the poor contact in accelerator position sensor connector. Replace the accelerator position sensor if defective.	Repair the short circuit to sensor power supply.

CL:DTC P2127 THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT LOW INPUT

DTC DETECTING CONDITION:

Immediately at fault recognition.

TROUBLE SYMPTOM:

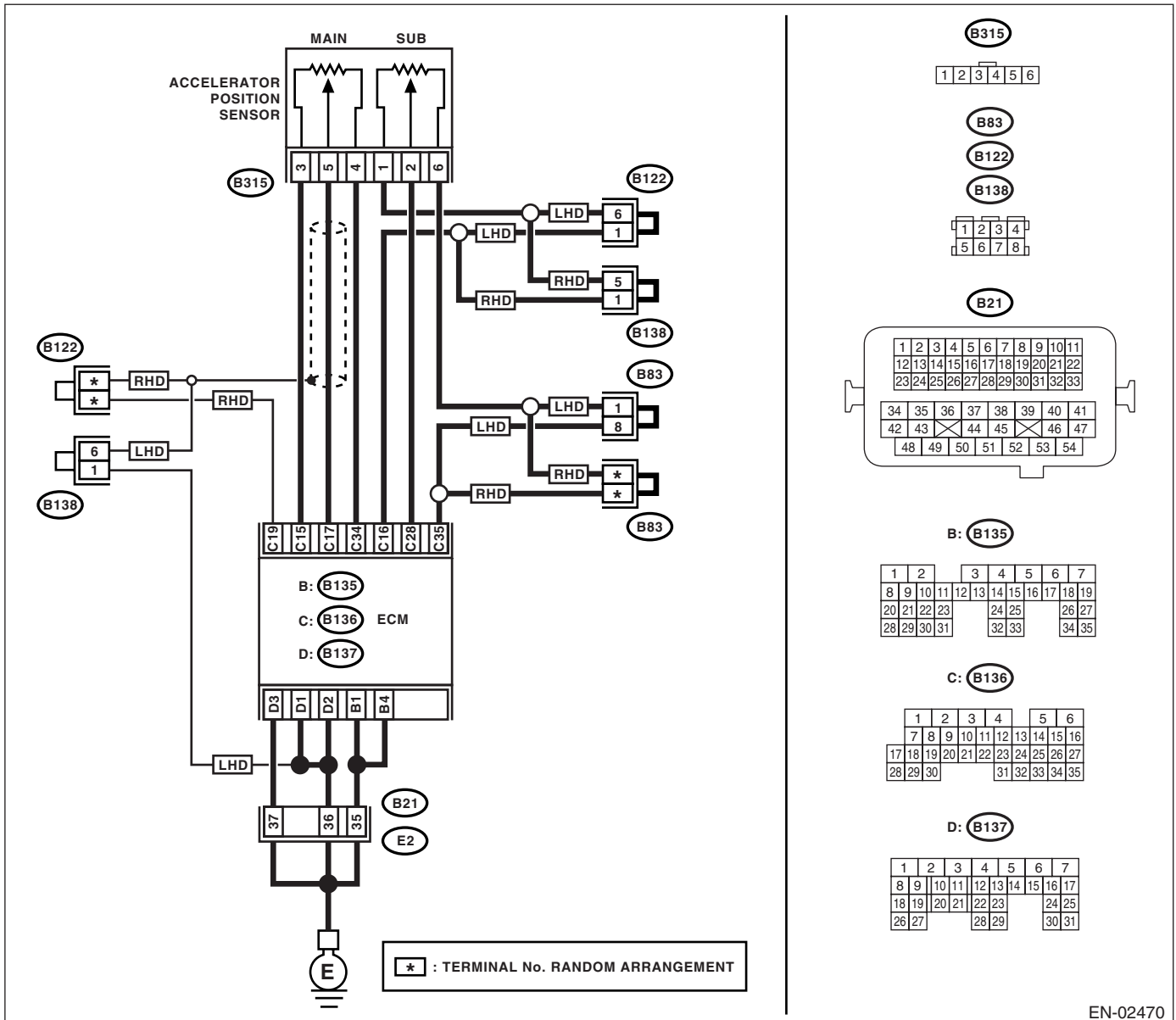
- Erroneous idling
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1	CHECK OPTION CODE.	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2	CHECK ACCELERATOR POSITION SENSOR OUTPUT. 1) Turn the ignition switch to ON. 2) Read the data of sub accelerator position sensor signal using Subaru Select Monitor.	Go to step 3.	Go to step 4.
3	CHECK POOR CONTACT. Check poor contact in connector between ECM and accelerator position sensor.	Repair the poor contact.	Temporary poor contact occurred, but it is normal at present.
4	CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connector from accelerator position sensor. 4) Measure the resistance between ECM connector and accelerator position sensor connector. Connector & terminal (B136) No. 28 — (B315) No. 2: (B136) No. 16 — (B315) No. 1:	Go to step 5.	Repair the open circuit of harness connector.
5	CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR. Measure the resistance between ECM connector and chassis ground. Connector & terminal (B136) No. 28 — Chassis ground: (B136) No. 16 — Chassis ground:	Go to step 6.	Repair the chassis short circuit of harness.
6	CHECK POWER SUPPLY OF ACCELERATOR POSITION SENSOR. 1) Connect the ECM connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between accelerator position sensor connector and engine ground. Connector & terminal (B315) No. 1 (+) — Engine ground (-):	Go to step 7.	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>
7	CHECK ACCELERATOR POSITION SENSOR. Measure the resistance of accelerator position sensor. Terminals No. 1 — No. 6:	Go to step 8.	Replace the accelerator position sensor.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
8 CHECK ACCELERATOR POSITION SENSOR. 1) Measure the resistance of accelerator position sensor. Terminals No. 2 — No. 6: 2) Check the measured value is within the specification without depressing the accelerator pedal.	Is the resistance 0.15 — 0.63 kΩ?	Go to step 9 .	Replace the accelerator position sensor.
9 CHECK ACCELERATOR POSITION SENSOR. 1) Measure the resistance of accelerator position sensor. Terminals No. 2 — No. 6: 2) Check the measured value is within the specification with the accelerator pedal depressed.	Is the resistance 0.28 — 1.68 kΩ?	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>	Replace the accelerator position sensor.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

CM:DTC P2128 THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT HIGH INPUT

DTC DETECTING CONDITION:

Immediately at fault recognition.

TROUBLE SYMPTOM:

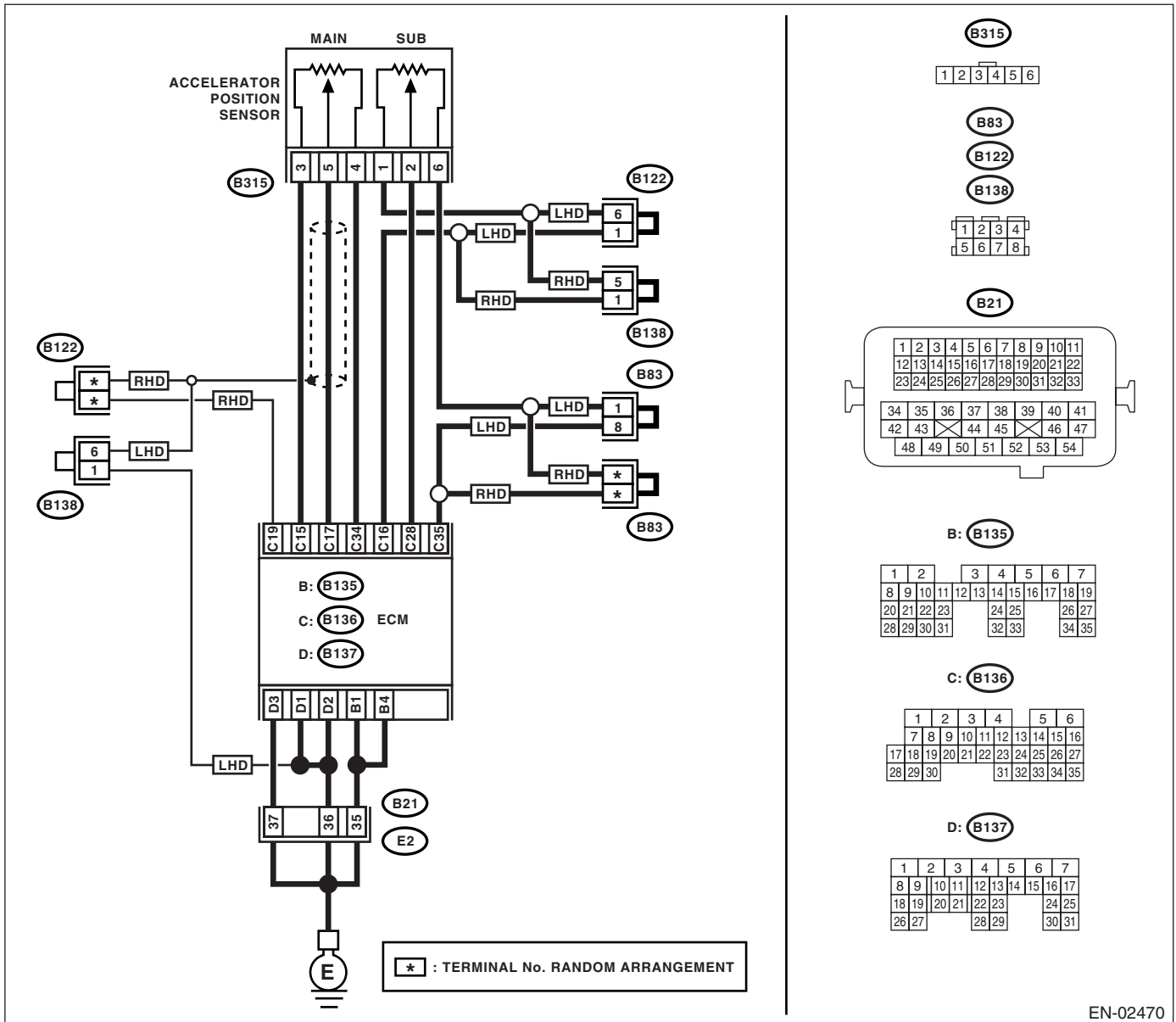
- Erroneous idling
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1	CHECK OPTION CODE.	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2	CHECK ACCELERATOR POSITION SENSOR OUTPUT. 1) Turn the ignition switch to ON. 2) Read the data of sub accelerator position sensor signal using Subaru Select Monitor.	Go to step 3.	Go to step 4.
3	CHECK POOR CONTACT. Check poor contact in connector between ECM and accelerator position sensor.	Repair the poor contact.	Temporary poor contact occurred, but it is normal at present.
4	CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connector from accelerator position sensor. 4) Measure the resistance between ECM connector and accelerator position sensor connector. Connector & terminal (B136) No. 35 — (B315) No. 6:	Go to step 5.	Repair the open circuit of harness connector.
5	CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR. 1) Connect the ECM connector. 2) Measure the resistance between accelerator position sensor connector and engine ground. Connector & terminal (B315) No. 6 — Engine ground:	Go to step 6.	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>
6	CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR. 1) Connect the ECM connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between accelerator position sensor connector and engine ground. Connector & terminal (B315) No. 2 (+) — Engine ground (-):	Go to step 7.	Repair the battery short circuit in harness between ECM connector and accelerator position sensor connector.
7	CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance between ECM connectors. Connector & terminal (B136) No. 28 — (B136) No. 15: (B136) No. 28 — (B136) No. 16:	Repair the poor contact in accelerator position sensor connector. Replace the accelerator position sensor if defective.	Repair the short circuit to sensor power supply.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

CN:DTC P2135 THROTTLE/PEDAL POSITION SENSOR/SWITCH “A” / “B” VOLTAGE RATIONALITY

DTC DETECTING CONDITION:

Immediately at fault recognition.

TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance

CAUTION:

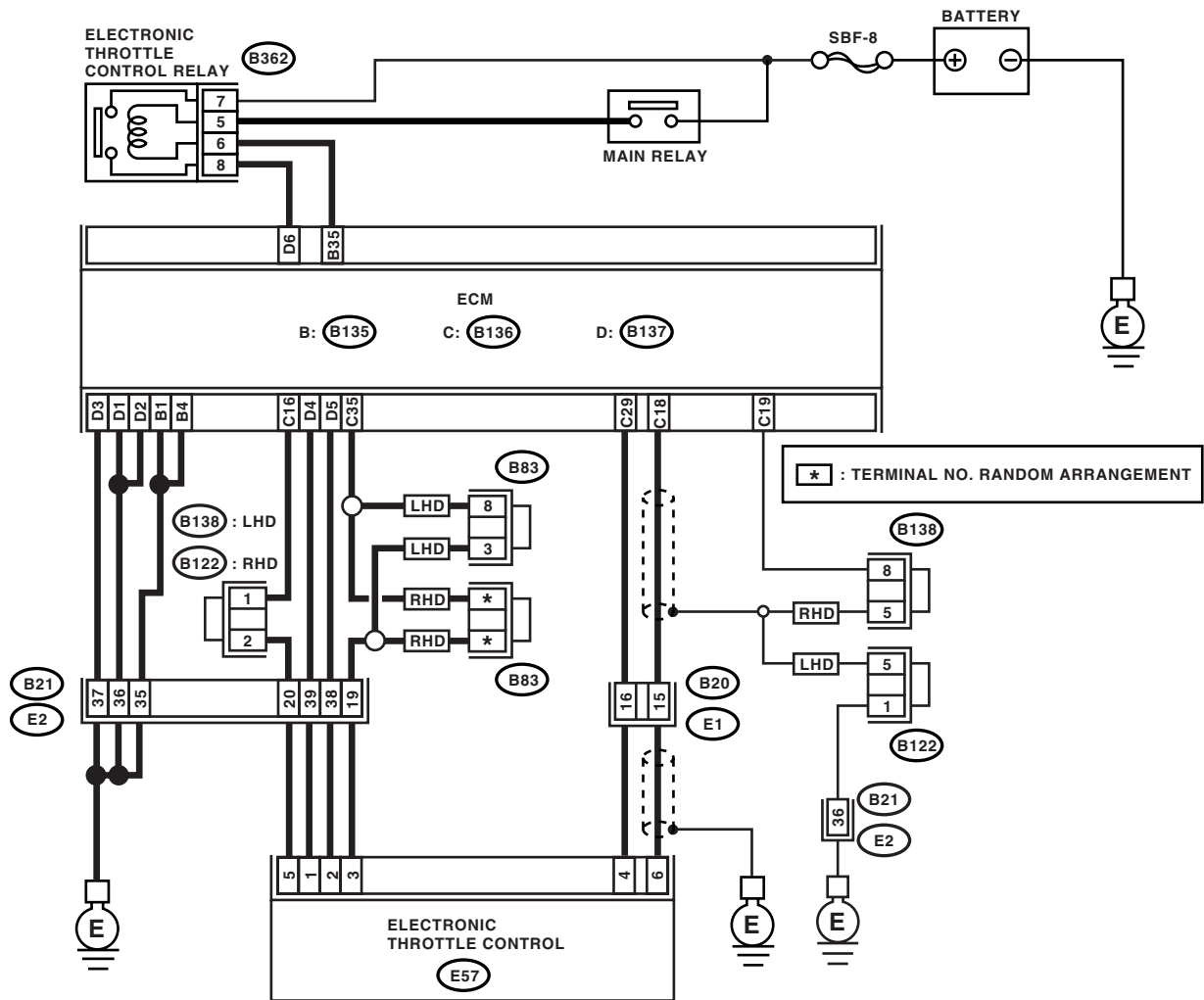
After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

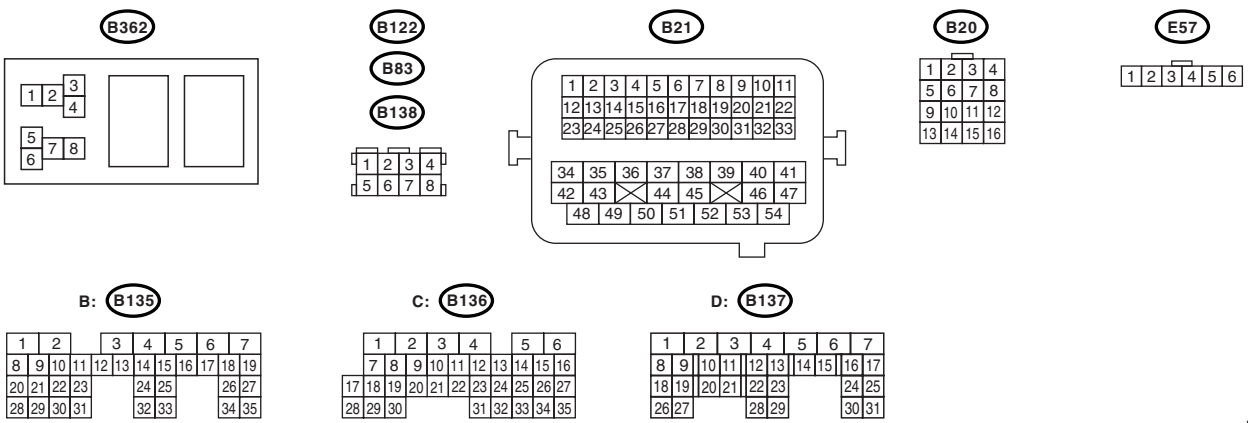
ENGINE (DIAGNOSTICS)

WIRING DIAGRAM:

- EC, EK and K4 model



* : TERMINAL NO. RANDOM ARRANGEMENT



EN-02462

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Step	Check	Yes	No
1	CHECK OPTION CODE.	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2	CHECK SENSOR OUTPUT. 1) Turn the ignition switch to ON. 2) Read the data of main throttle sensor signal using Subaru Select Monitor.	Go to step 3.	Go to step 5.
3	CHECK SENSOR OUTPUT. Read the data of sub throttle sensor signal using Subaru Select Monitor.	Go to step 4.	Go to step 5.
4	CHECK POOR CONTACT. Check poor contact in connector between ECM and electronic throttle control.	Repair the poor contact.	Go to step 15.
5	CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connectors from the electronic throttle control. 4) Measure the resistance between ECM connector and electronic throttle control connector. Connector & terminal (B136) No. 18 — (E57) No. 6: (B136) No. 29 — (E57) No. 4: (B136) No. 16 — (E57) No. 5:	Go to step 6.	Repair the open circuit of harness connector.
6	CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. Measure the resistance between ECM connector and chassis ground. Connector & terminal (B136) No. 18 — Chassis ground: (B136) No. 29 — Chassis ground: (B136) No. 16 — Chassis ground:	Go to step 7.	Repair the ground short circuit of harness.
7	CHECK SENSOR POWER SUPPLY. 1) Connect the ECM connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 5 (+) — Engine ground (-):	Go to step 8.	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
8 CHECK SHORT CIRCUIT IN ECM. 1) Turn the ignition switch to OFF. 2) Measure the resistance between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 6 — Engine ground: (E57) No. 4 — Engine ground:	Is the resistance more than 10 Ω ?	Go to step 9.	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>
9 CHECK SENSOR OUTPUT. 1) Connect all the connectors. 2) Turn the ignition switch to ON. 3) Read the data of main throttle sensor signal using Subaru Select Monitor.	Is the voltage less than 4.63 V?	Go to step 10.	Go to step 12.
10 CHECK SENSOR OUTPUT. Read the data of sub throttle sensor signal using Subaru Select Monitor.	Is the voltage less than 4.73 V?	Go to step 11.	Go to step 12.
11 CHECK POOR CONTACT. Check poor contact in connector between ECM and electronic throttle control.	Is there poor contact?	Repair the poor contact.	Temporary poor contact occurred, but it is normal at present.
12 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connectors from electronic throttle control. 4) Measure the resistance between ECM connector and electronic throttle control connector. Connector & terminal (B136) No. 35 — (E57) No. 3: (B136) No. 18 — (E57) No. 6: (B136) No. 29 — (E57) No. 4:	Is the resistance less than 1 Ω ?	Go to step 13.	Repair the open circuit of harness connector.
13 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Connect the ECM connector. 2) Measure the resistance between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 3 — Engine ground:	Is the resistance less than 5 Ω ?	Go to step 14.	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>
14 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Connect the ECM connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 5 (+) — Engine ground (-):	Is the voltage less than 10 V?	Go to step 15.	Repair the battery short circuit in harness between ECM connector and electronic throttle control connector.
15 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. Measure the voltage between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 6 (+) — Engine ground (-): (E57) No. 4 (+) — Engine ground (-):	Is the voltage less than 10 V?	Go to step 16.	Repair the short circuit in harness between ECM connector and electronic throttle control connector.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
16 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance between ECM connectors. <i>Connector & terminal</i> (B136) No. 18 — (B136) No. 16: (B136) No. 29 — (B136) No. 16:	Is the resistance more than 1 MΩ?	Go to step 17.	Repair the short circuit to sensor power supply.
17 CHECK ELECTRONIC THROTTLE CONTROL HARNESS. 1) Disconnect the connector from ECM. 2) Disconnect the connectors from the electronic throttle control. 3) Measure the resistance between electronic throttle control connector terminals. <i>Connector & terminal</i> (E57) No. 6 — (E57) No. 4:	Is the resistance more than 1 MΩ?	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>	Repair the short circuit of harness.

CO:DTC P2138 THROTTLE/PEDAL POSITION SENSOR/SWITCH “D” / “E” VOLTAGE RATIONALITY

DTC DETECTING CONDITION:

Immediately at fault recognition.

TROUBLE SYMPTOM:

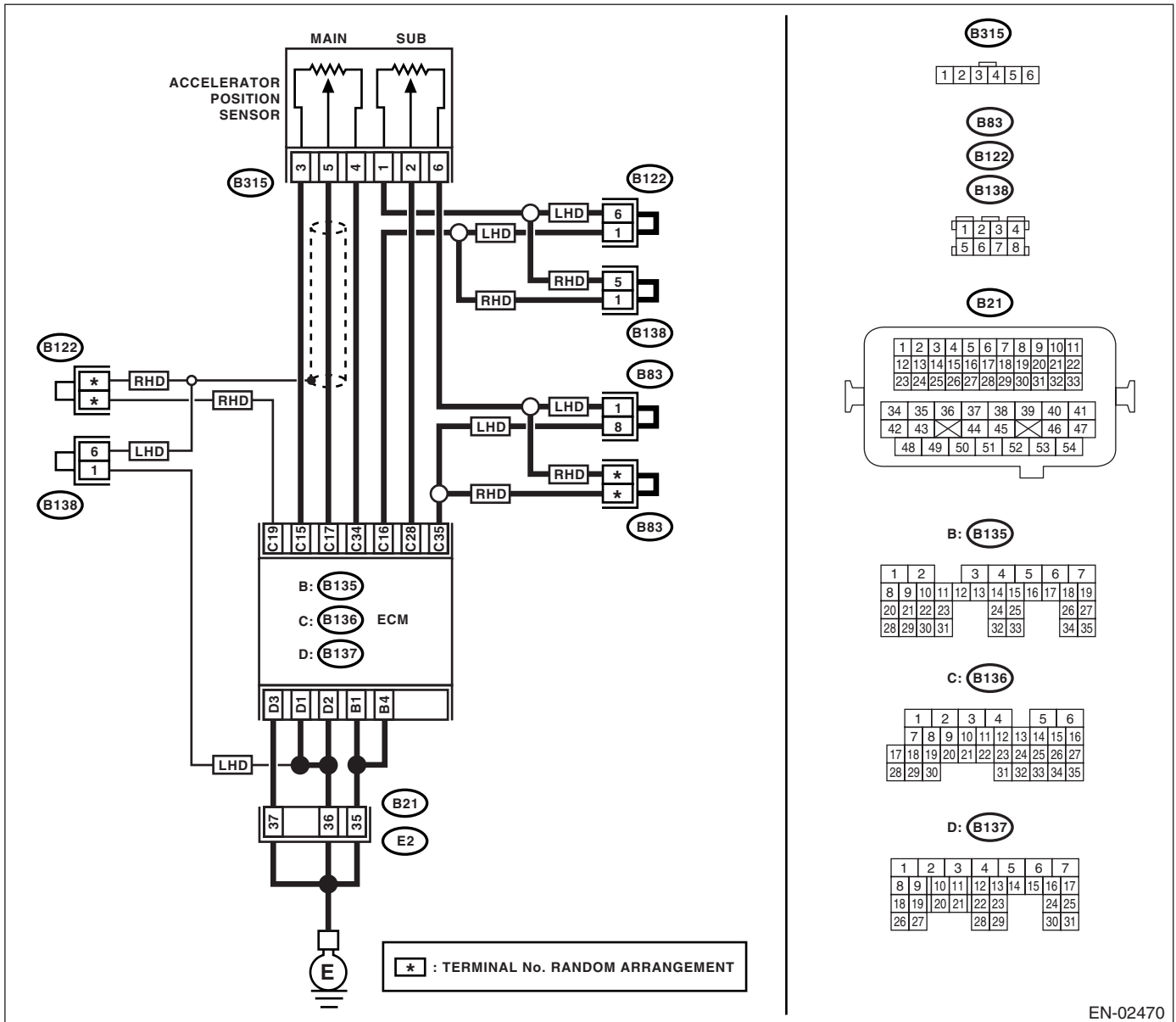
- Erroneous idling
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO 2.5)(diag)-41, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO 2.5)(diag)-34, Inspection Mode.>.

WIRING DIAGRAM:

- EC, EK and K4 model



- KA and KS model

NOTE:

Fuel injection system for KA and KS model is the same as 2.0 L model. Refer to EN(H4SO 2.0) section.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1	CHECK OPTION CODE.	Go to step 2.	Refer to EN(H4SO 2.0) section. <Ref. to EN(H4SO 2.0)(diag)-66, List of Diagnostic Trouble Code (DTC).> NOTE: Fuel injection system for KA and KS model is the same as 2.0 L model.
2	CHECK ACCELERATOR POSITION SENSOR OUTPUT. 1) Turn the ignition switch to ON. 2) Read the data of main accelerator position sensor signal and sub accelerator position sensor signal using Subaru Select Monitor.	Go to step 3.	Go to step 4.
3	CHECK POOR CONTACT. Check poor contact in connector between ECM and accelerator position sensor.	Repair the poor contact.	Go to step 13.
4	CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connector from accelerator position sensor. 4) Measure the resistance between ECM connector and accelerator position sensor connector. Connector & terminal (B136) No. 17 — (B315) No. 5: (B136) No. 15 — (B315) No. 3: (B136) No. 28 — (B315) No. 2: (B136) No. 16 — (B315) No. 1:	Go to step 5.	Repair the open circuit of harness connector.
5	CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR. Measure the resistance between ECM connector and chassis ground. Connector & terminal (B136) No. 17 — Chassis ground: (B136) No. 15 — Chassis ground: (B136) No. 28 — Chassis ground: (B136) No. 16 — Chassis ground:	Go to step 6.	Repair the ground short circuit of harness.
6	CHECK POWER SUPPLY OF ACCELERATOR POSITION SENSOR. 1) Connect the ECM connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between accelerator position sensor connector and engine ground. Connector & terminal (B315) No. 3 (+) — Engine ground (-): (B315) No. 1 (+) — Engine ground (-):	Go to step 7.	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>
7	CHECK ACCELERATOR POSITION SENSOR. Measure the resistance of accelerator position sensor. Terminals No. 3 — No. 4:	Go to step 8.	Replace the accelerator position sensor.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
8 CHECK ACCELERATOR POSITION SENSOR. Measure the resistance of accelerator position sensor. <i>Terminals</i> <i>No. 1 — No. 6:</i>	Is the resistance 0.75 — 3.15 k Ω ?	Go to step 9.	Replace the accelerator position sensor.
9 CHECK ACCELERATOR POSITION SENSOR. Measure the resistance of accelerator position sensor without depressing the accelerator pedal. <i>Terminals</i> <i>No. 5 — No. 4:</i>	Is the resistance 0.2 — 0.8 k Ω ?	Go to step 10.	Replace the accelerator position sensor.
10 CHECK ACCELERATOR POSITION SENSOR. Measure the resistance of accelerator position sensor without depressing the accelerator pedal. <i>Terminals</i> <i>No. 2 — No. 6:</i>	Is the resistance 0.15 — 0.63 k Ω ?	Go to step 11.	Replace the accelerator position sensor.
11 CHECK ACCELERATOR POSITION SENSOR. Measure the resistance of accelerator position sensor with the accelerator pedal depressed. <i>Terminals</i> <i>No. 5 — No. 4:</i>	Is the resistance 0.5 — 2.5 k Ω ?	Go to step 12.	Replace the accelerator position sensor.
12 CHECK ACCELERATOR POSITION SENSOR. Measure the resistance of accelerator position sensor with the accelerator pedal depressed. <i>Terminals</i> <i>No. 2 — No. 6:</i>	Is the resistance 0.28 — 1.68 k Ω ?	Go to step 13.	Replace the accelerator position sensor.
13 CHECK ACCELERATOR POSITION SENSOR OUTPUT. 1) Turn the ignition switch to OFF. 2) Connect all the connectors. 3) Turn the ignition switch to ON. 4) Read the data of main throttle sensor signal and sub accelerator position sensor signal using Subaru Select Monitor.	Is the voltage less than 4.8 V?	Go to step 14.	Go to step 15.
14 CHECK POOR CONTACT. Check poor contact in connector between ECM and accelerator position sensor.	Is there poor contact?	Repair the poor contact.	Go to step 19.
15 CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connector from accelerator position sensor. 4) Measure the resistance between ECM connector and accelerator position sensor connector. <i>Connector & terminal</i> <i>(B136) No. 34 — (B315) No. 4:</i> <i>(B136) No. 35 — (B315) No. 6:</i>	Is the resistance less than 1 Ω ?	Go to step 16.	Repair the open circuit of harness connector.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
16 CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR. 1) Connect the ECM connector. 2) Measure the resistance between accelerator position sensor connector and engine ground. Connector & terminal (B315) No. 4 — Engine ground: (B315) No. 6 — Engine ground:	Is the resistance less than 5 Ω ?	Go to step 17.	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>
17 CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR. 1) Connect the ECM connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between accelerator position sensor connector and engine ground. Connector & terminal (B315) No. 5 (+) — Engine ground (-): (B315) No. 2 (+) — Engine ground (-):	Is the voltage less than 6 V?	Go to step 18.	Repair the battery short circuit in harness between ECM connector and accelerator position sensor connector.
18 CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance between ECM connectors. Connector & terminal (B136) No. 17 — (B136) No. 15: (B136) No. 17 — (B136) No. 16: (B136) No. 28 — (B136) No. 15: (B136) No. 28 — (B136) No. 16:	Is the resistance more than 1 $M\Omega$?	Go to step 19.	Repair the short circuit to sensor power supply.
19 CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connector from the accelerator position sensor. 4) Measure the resistance between connector terminals of accelerator position sensor. Connector & terminal (B315) No. 5 — (B315) No. 2:	Is the resistance more than 1 $M\Omega$?	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4SO 2.5)-36, Engine Control Module (ECM).>	Repair the short circuit in harness between ECM connector and accelerator position sensor connector.

19. General Diagnostic Table

A: INSPECTION

1. ENGINE

NOTE:

Malfunction of parts other than those listed is also possible. <Ref. to ME(H4SO 2.0)-83, Engine Trouble in General.>

Symptom	Problem parts
1. Engine stalls during idling.	1) Manifold absolute pressure sensor 2) Mass air flow and intake air temperature sensor 3) Ignition parts (*1) 4) Engine coolant temperature sensor (*2) 5) Crankshaft position sensor (*3) 6) Camshaft position sensor (*3) 7) Fuel injection parts (*4)
2. Rough idling	1) Manifold absolute pressure sensor 2) Mass air flow and intake air temperature sensor 3) Engine coolant temperature sensor (*2) 4) Ignition parts (*1) 5) Air intake system (*5) 6) Fuel injection parts (*4) 7) Electronic throttle control 8) Crankshaft position sensor (*3) 9) Camshaft position sensor (*3) 10) Oxygen sensor 11) Fuel pump and fuel pump relay 12) EGR valve
3. Engine does not return to idle.	1) Engine coolant temperature sensor 2) Electronic throttle control 3) Manifold absolute pressure sensor 4) Mass air flow and intake air temperature sensor 5) EGR valve
4. Poor acceleration	1) Manifold absolute pressure sensor 2) Mass air flow and intake air temperature sensor 3) Electronic throttle control 4) Fuel injection parts (*4) 5) Fuel pump and fuel pump relay 6) Engine coolant temperature sensor (*2) 7) Crankshaft position sensor (*3) 8) Camshaft position sensor (*3) 9) A/C switch and A/C cut relay 10) Engine torque control signal circuit 11) Ignition parts (*1) 12) EGR valve 13) Tumble generator valve
5. Engine stalls, engine sags or hesitates at acceleration.	1) Manifold absolute pressure sensor 2) Mass air flow and intake air temperature sensor 3) Engine coolant temperature sensor (*2) 4) Crankshaft position sensor (*3) 5) Camshaft position sensor (*3) 6) Purge control solenoid valve 7) Fuel injection parts (*4) 8) Electronic throttle control 9) Fuel pump and fuel pump relay 10) EGR valve 11) Tumble generator valve

General Diagnostic Table

ENGINE (DIAGNOSTICS)

Symptom	Problem parts
6. Surge	1) Mass air flow and intake air temperature sensor 2) Manifold absolute pressure sensor 3) Engine coolant temperature sensor (*2) 4) Crankshaft position sensor (*3) 5) Camshaft position sensor (*3) 6) Fuel injection parts (*4) 7) Electronic throttle control 8) Fuel pump and fuel pump relay 9) EGR valve 10) Tumble generator valve
7. Spark knock	1) Mass air flow and intake air temperature sensor 2) Manifold absolute pressure sensor 3) Engine coolant temperature sensor 4) Knock sensor 5) Fuel injection parts (*4) 6) Fuel pump and fuel pump relay 7) EGR valve 8) Tumble generator valve
8. After burning in exhaust system	1) Mass air flow and intake air temperature sensor 2) Manifold absolute pressure sensor 3) Engine coolant temperature sensor (*2) 4) Fuel injection parts (*4) 5) Fuel pump and fuel pump relay

*1: Check ignition coil & ignitor ASSY and spark plug.

*2: Indicate the symptom occurring only in cold temperatures.

*3: Ensure the secure installation.

*4: Check the fuel injector and fuel pressure regulator.

*5: Inspect air leak in air intake system.