

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## 18. Diagnostic Procedure with Diagnostic Trouble Code (DTC)

### A: DTC P0011 INTAKE CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE (BANK 1)

#### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-10, DTC P0011 INTAKE CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### TROUBLE SYMPTOM:

- Engine stalls.
- Improper idling

#### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

Step	Check	Yes	No
1 <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check the appropriate DTC using the List of Diagnostic Trouble Code (DTC). <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2 <b>CHECK CURRENT DATA.</b> 1) Start the engine and let it idle. 2) Using the Subaru Select Monitor or general scan tool, inspect the AVCS advance angle amount and oil flow control solenoid valve duty output. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.	Is AVCS advance approximately 0 degrees, and the oil flow control solenoid valve duty output approx. 10%?	Check the following item and repair or replace if necessary. • Oil pipe (clog) • Oil flow control solenoid valve (clog or dirt of oil routing, setting of spring, clog of valve) • Intake camshaft (dirt, damage of camshaft) • Timing belt (matching of timing mark)	A temporary malfunction. Perform the following, and clean the oil routing. Replace the engine oil and idle the engine for 5 minutes, and then replace the oil filter and engine oil.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## B: DTC P0016 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION (BANK1)

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-13, DTC P0016 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION (BANK1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

### TROUBLE SYMPTOM:

- Engine stalls.
- Improper idling

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

Step	Check	Yes	No
1 <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check the appropriate DTC using the List of Diagnostic Trouble Code (DTC). <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2 <b>CHECK CURRENT DATA.</b> 1) Start the engine and let it idle. 2) Using the Subaru Select Monitor or general scan tool, inspect the AVCS advance angle amount and oil flow control solenoid valve duty output. <b>NOTE:</b> • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.	Is AVCS advance approximately 0 degrees, and the oil flow control solenoid valve duty output approx. 10%?	Check the following item and repair or replace if necessary. • Oil pipe (clog) • Oil flow control solenoid valve (clog or dirt of oil routing, setting of spring, clog of valve) • Intake camshaft (dirt, damage of camshaft) • Timing belt (matching of timing mark)	A temporary malfunction. Perform the following, and clean the oil routing. Replace the engine oil and idle the engine for 5 minutes, and then replace the oil filter and engine oil.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## C: DTC P0018 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION (BANK2)

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-13, DTC P0018 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION (BANK2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

### TROUBLE SYMPTOM:

- Engine stalls.
- Improper idling

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

Step	Check	Yes	No
1 <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check the appropriate DTC using the List of Diagnostic Trouble Code (DTC). <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2 <b>CHECK CURRENT DATA.</b> 1) Start the engine and let it idle. 2) Using the Subaru Select Monitor or general scan tool, inspect the AVCS advance angle amount and oil flow control solenoid valve duty output. <b>NOTE:</b> • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.	Is AVCS advance approximately 0 degrees, and the oil flow control solenoid valve duty output approx. 10%?	Check the following item and repair or replace if necessary. • Oil pipe (clog) • Oil flow control solenoid valve (clog or dirt of oil routing, setting of spring, clog of valve) • Intake camshaft (dirt, damage of camshaft) • Timing belt (matching of timing mark)	A temporary malfunction. Perform the following, and clean the oil routing. Replace the engine oil and idle the engine for 5 minutes, and then replace the oil filter and engine oil.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## D: DTC P0021 INTAKE CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE (BANK 2)

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-13, DTC P0021 INTAKE CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

### TROUBLE SYMPTOM:

- Engine stalls.
- Improper idling

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

Step	Check	Yes	No
1 <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2 <b>CHECK CURRENT DATA.</b> 1) Start the engine and let it idle. 2) Using the Subaru Select Monitor or general scan tool, inspect the AVCS advance angle amount and oil flow control solenoid valve duty output. <b>NOTE:</b> • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.	Is AVCS advance approximately 0 degrees, and the oil flow control solenoid valve duty output approx. 10%?	Check the following item and repair or replace if necessary. • Oil pipe (clog) • Oil flow control solenoid valve (clog or dirt of oil routing, setting of spring, clog of valve) • Intake camshaft (dirt, damage of camshaft) • Timing belt (matching of timing mark)	A temporary malfunction. Perform the following, and clean the oil routing. Replace the engine oil and idle the engine for 5 minutes, and then replace the oil filter and engine oil.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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

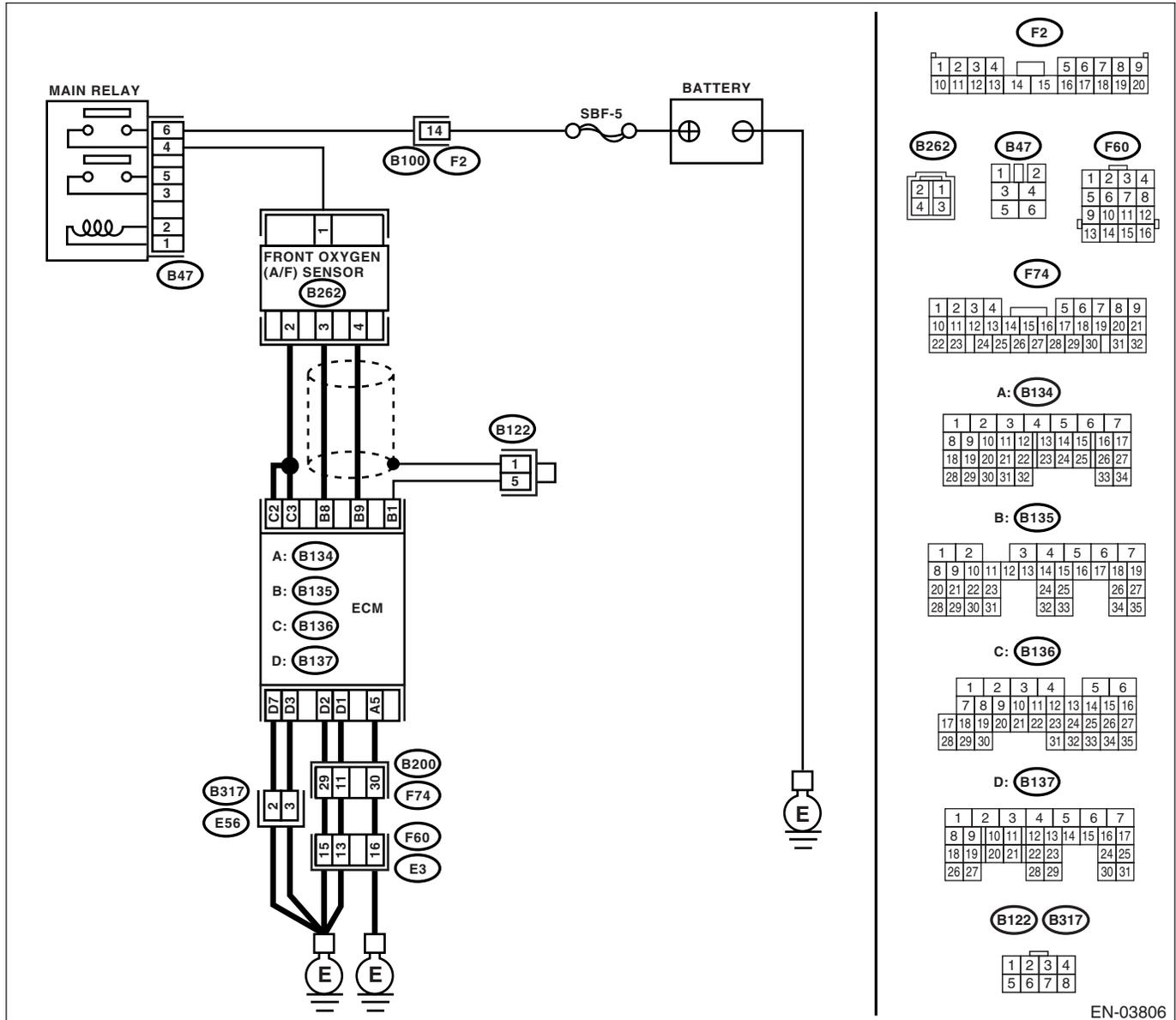
### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-14, DTC P0030 HO2S HEATER CONTROL CIRCUIT (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03806

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.</b> 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.  <i>Connector &amp; terminal</i> (B136) No. 2 — (B262) No. 2: (B136) No. 3 — (B262) No. 2:	Is the resistance less than 1 $\Omega$ ?	Go to step 2.	Repair the open circuit of the harness between ECM and front oxygen (A/F) sensor connector.
<b>2 CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.</b> Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector.  <i>Connector &amp; terminal</i> (B135) No. 8 — (B262) No. 3: (B135) No. 9 — (B262) No. 4:	Is the resistance less than 1 $\Omega$ ?	Go to step 3.	Repair the open circuit of the harness between ECM and front oxygen (A/F) sensor connector.
<b>3 CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.</b> Measure the resistance of the harness between the main relay and front oxygen (A/F) sensor connector.  <i>Connector &amp; terminal</i> (B47) No. 4 — (B262) No. 1:	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open circuit of the harness between ECM and front oxygen (A/F) sensor connector.
<b>4 CHECK FRONT OXYGEN (A/F) SENSOR.</b> Measure the resistance between front oxygen (A/F) sensor connector terminals.  <i>Terminals</i> No. 1 — No. 2:	Is the resistance less than 5 $\Omega$ ?	Go to step 5.	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4DOTC)-41, Front Oxygen (A/F) Sensor.>
<b>5 CHECK POOR CONTACT.</b> Check poor contact of ECM and front oxygen (A/F) sensor connector.	Is there poor contact in the ECM or front oxygen (A/F) sensor connector?	Repair poor contact of the ECM or front oxygen (A/F) sensor.	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4DOTC)-41, Front Oxygen (A/F) Sensor.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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

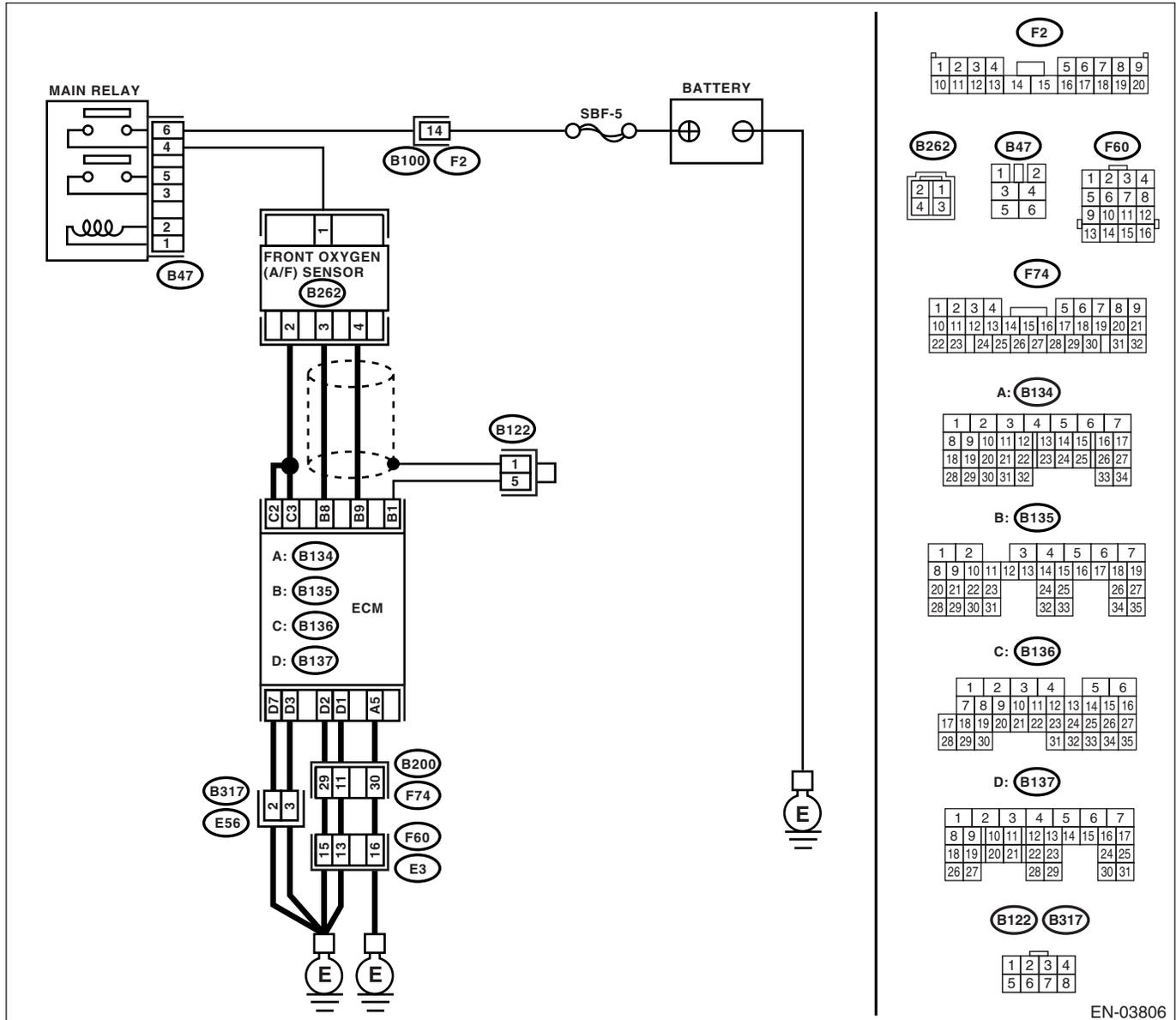
### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-16, DTC P0031 HO2S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>

### WIRING DIAGRAM:



EN-03806

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1</b>      <b>CHECK POWER SUPPLY TO FRONT OXYGEN (A/F) SENSOR.</b>                      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.  <i><b>Connector &amp; terminal</b></i>  <i><b>(B262) No. 1 (+) — Engine ground (-):</b></i></p>	Is the voltage more than 10 V?	Go to step 2.	Repair the power supply line. NOTE: In this case, repair the following item: <ul style="list-style-type: none"> <li>• Open circuit of harness between main relay and front oxygen (A/F) sensor connector</li> <li>• Poor contact of main relay connector</li> <li>• Malfunction in main relay</li> </ul>
<p><b>2</b>      <b>CHECK GROUND CIRCUIT FOR ECM.</b>                      Measure the resistance of harness between ECM connector and chassis ground.  <i><b>Connector &amp; terminal</b></i>  <i><b>(B134) No. 5 — Chassis ground:</b></i>  <i><b>(B137) No. 1 — Chassis ground:</b></i>  <i><b>(B137) No. 2 — Chassis ground:</b></i>  <i><b>(B137) No. 3 — Chassis ground:</b></i>  <i><b>(B137) No. 7 — Chassis ground:</b></i></p>	Is the resistance less than 5 $\Omega$ ?	Go to step 3.	Repair the harness and connector. NOTE: In this case, repair the following item: <ul style="list-style-type: none"> <li>• Open circuit of harness between ECM and engine ground cable</li> <li>• Poor contact in ECM connector</li> <li>• Poor contact of coupling connector</li> </ul>
<p><b>3</b>      <b>CHECK CURRENT DATA.</b>                      1) Start the engine.                      2) Read the data of the front oxygen (A/F) sensor heater current using the Subaru Select Monitor or general scan tool.                      NOTE:                      • Subaru Select Monitor                      For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;                      • General scan tool                      For detailed operation procedure, refer to the general scan tool operation manual.</p>	Is the current more than 0.2 A?	Repair the poor contact of connector. NOTE: In this case, repair the following item: <ul style="list-style-type: none"> <li>• Poor contact in front oxygen (A/F) sensor connector</li> <li>• Poor contact in ECM connector</li> </ul>	Go to step 4.
<p><b>4</b>      <b>CHECK OUTPUT SIGNAL OF ECM.</b>                      1) Start and idle the engine.                      2) Measure the voltage between ECM connector and chassis ground.  <i><b>Connector &amp; terminal</b></i>  <i><b>(B136) No. 2 (+) — Chassis ground (-):</b></i>  <i><b>(B136) No. 3 (+) — Chassis ground (-):</b></i></p>	Is the voltage less than 1 V?	Go to step 6.	Go to step 5.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>5</b>     <b>CHECK OUTPUT SIGNAL OF ECM.</b>                      Measure the voltage between ECM connector and chassis ground.  <b>Connector &amp; terminal</b>  <i>(B136) No. 2 (+) — Chassis ground (-):</i>  <i>(B136) No. 3 (+) — Chassis ground (-):</i></p>	Does the voltage change when shaking the harness and connector of the ECM while monitoring the value with a voltage meter?	Repair poor contact in ECM connector.	Go to step 6.
<p><b>6</b>     <b>CHECK FRONT OXYGEN (A/F) SENSOR.</b>                      1) Turn the ignition switch to OFF.                      2) Measure the resistance between front oxygen (A/F) sensor connector terminals.  <b>Terminals</b>  <i>No. 1 — No. 2:</i></p>	Is the resistance less than 10 Ω?	Repair the harness and connector. NOTE: In this case, repair the following item: <ul style="list-style-type: none"> <li>• Open or ground short circuit of harness between front oxygen (A/F) sensor and ECM connector</li> <li>• Poor contact in front oxygen (A/F) sensor connector</li> <li>• Poor contact in ECM connector</li> </ul>	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4DOTC)-41, Front Oxygen (A/F) Sensor.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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

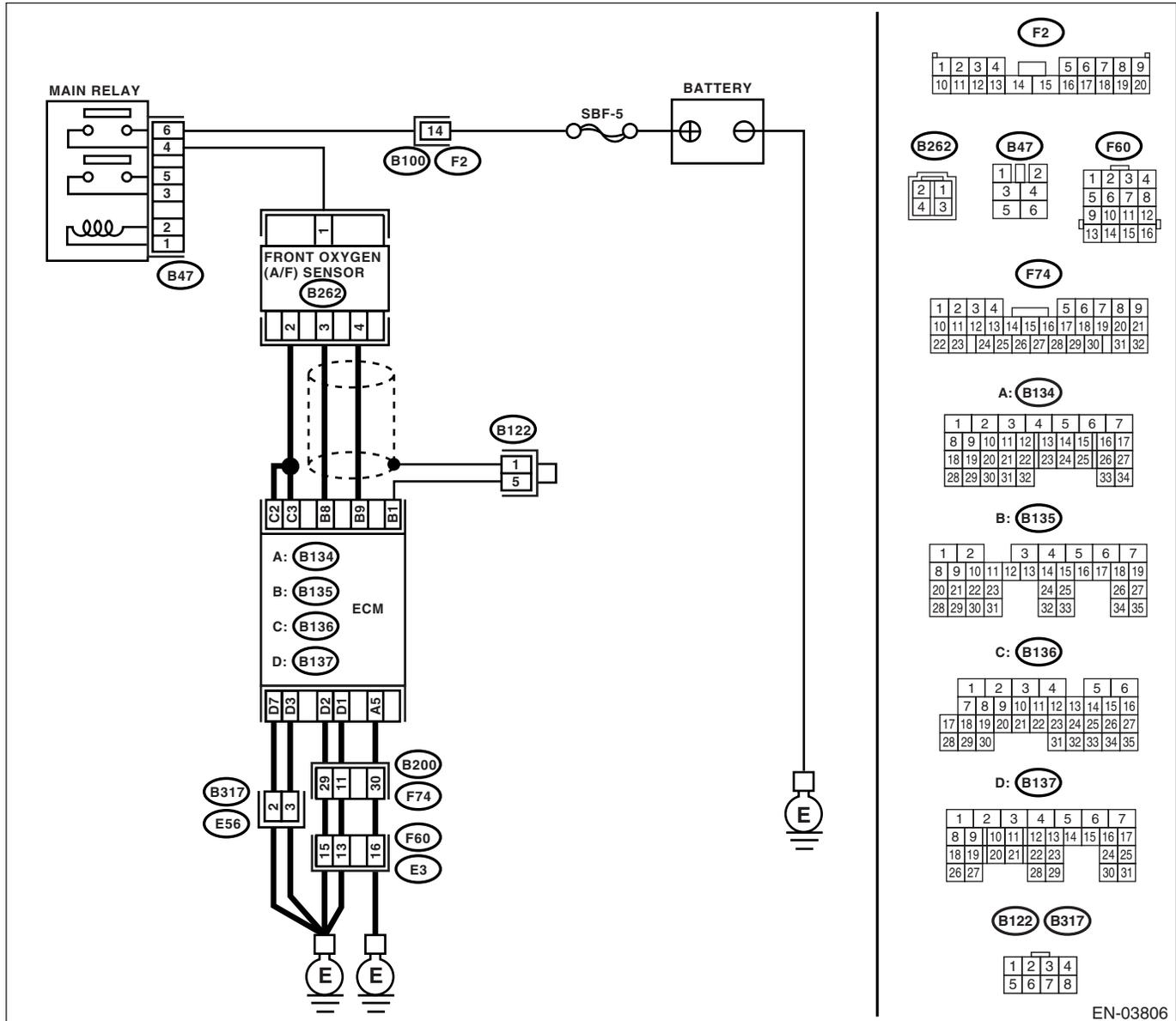
### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-18, DTC P0032 HO2S HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03806

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1</b> <b>CHECK OUTPUT SIGNAL OF ECM.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 2 (+) — Chassis ground (-):</b> <b>(B136) No. 3 (+) — Chassis ground (-):</b>	Is the voltage more than 8 V?	Go to step 3.	Go to step 2.
<b>2</b> <b>CHECK FRONT OXYGEN (A/F) SENSOR HEATER CURRENT.</b> 1) Turn the ignition switch to OFF. 2) Repair the battery short circuit of harness between ECM and front oxygen (A/F) sensor connector. 3) Turn the ignition switch to ON. 4) Read the data of the front oxygen (A/F) sensor heater current using the Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.	Is the current more than 2.3 A?	Replace the ECM. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>	END.
<b>3</b> <b>CHECK OUTPUT SIGNAL OF ECM.</b> Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 2 (+) — Chassis ground (-):</b> <b>(B136) No. 3 (+) — Chassis ground (-):</b>	Does the voltage change when shaking the harness and connector of the ECM while monitoring the value with a voltage meter?	Repair the battery short circuit of harness between ECM and front oxygen (A/F) sensor connector.	END.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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

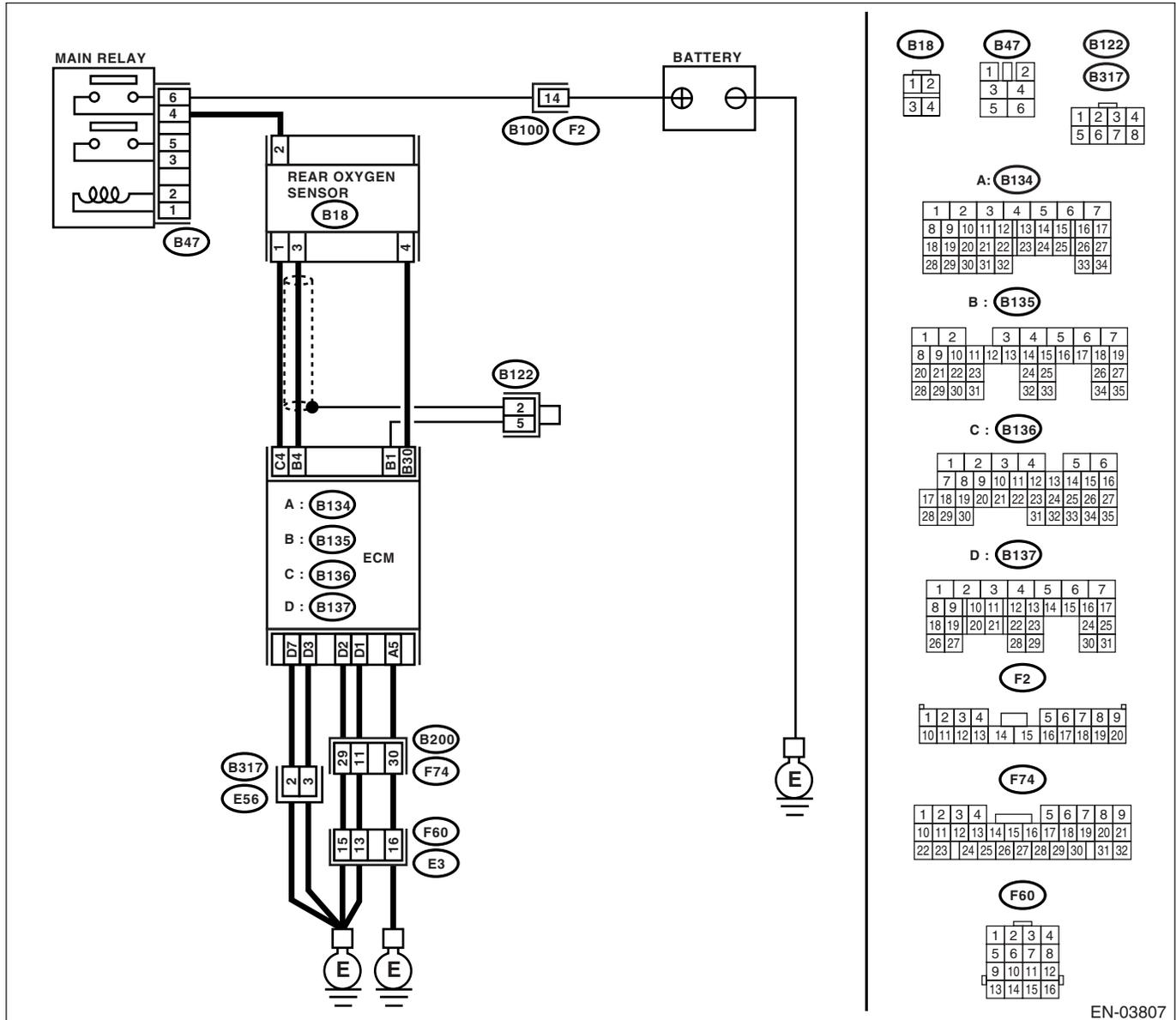
### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-20, DTC P0037 HO2S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>

### WIRING DIAGRAM:



EN-03807

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK GROUND CIRCUIT FOR ECM.</b>                      1) Turn the ignition switch to OFF.                      2) Disconnect the connectors from ECM.                      3) Measure the resistance of harness between ECM connector and chassis ground.</p> <p><b>Connector &amp; terminal</b>  <i>(B134) No. 5 — Chassis ground:</i>  <i>(B137) No. 1 — Chassis ground:</i>  <i>(B137) No. 2 — Chassis ground:</i>  <i>(B137) No. 3 — Chassis ground:</i>  <i>(B137) No. 7 — Chassis ground:</i></p>	<p>Is the resistance less than 5 <math>\Omega</math>?</p>	<p>Go to step 2.</p>	<p>Repair the harness and connector.</p> <p>NOTE:                      In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Open circuit of harness between ECM and engine ground cable</li> <li>• Poor contact in ECM connector</li> <li>• Poor contact of coupling connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK CURRENT DATA.</b>                      1) Start the engine.                      2) Read the data of rear oxygen sensor heater current using the Subaru Select Monitor or general scan tool.</p> <p>NOTE:                      • Subaru Select Monitor                      For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;                      • General scan tool                      For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the current more than 0.2 A?</p>	<p>Repair the connector.</p> <p>NOTE:                      In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Poor contact of the rear oxygen sensor connector</li> <li>• Poor contact in rear oxygen sensor connecting harness connector</li> <li>• Poor contact in ECM connector</li> </ul>	<p>Go to step 3.</p>
<p><b>3</b></p> <p><b>CHECK OUTPUT SIGNAL OF ECM.</b>                      1) Start and idle the engine.                      2) Measure the voltage between ECM connector and chassis ground.</p> <p><b>Connector &amp; terminal</b>  <i>(B136) No. 4 (+) — Chassis ground (-):</i></p>	<p>Is the voltage less than 1 V?</p>	<p>Go to step 6.</p>	<p>Go to step 4.</p>
<p><b>4</b></p> <p><b>CHECK OUTPUT SIGNAL OF ECM.</b>                      Measure the voltage between ECM connector and chassis ground.</p> <p><b>Connector &amp; terminal</b>  <i>(B136) No. 4 (+) — Chassis ground (-):</i></p>	<p>Does the voltage change when shaking the harness and connector of the ECM while monitoring the value with a voltage meter?</p>	<p>Repair poor contact in ECM connector.</p>	<p>Go to step 5.</p>
<p><b>5</b></p> <p><b>CHECK OUTPUT SIGNAL OF ECM.</b>                      1) Turn the ignition switch to OFF.                      2) Disconnect the connector from the rear oxygen sensor.                      3) Measure the voltage between ECM connector and chassis ground.</p> <p><b>Connector &amp; terminal</b>  <i>(B136) No. 4 (+) — Chassis ground (-):</i></p>	<p>Is the voltage less than 1 V?</p>	<p>Replace the ECM.                      &lt;Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).&gt;</p>	<p>Repair the battery short circuit of harness between ECM and rear oxygen sensor connector. After repair, replace the ECM. &lt;Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>6</b></p> <p><b>CHECK POWER SUPPLY TO REAR OXYGEN SENSOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connector from the rear oxygen sensor.                      3) Turn the ignition switch to ON.                      4) Measure the voltage between rear oxygen sensor connector and engine ground or chassis ground.</p> <p><b>Connector &amp; terminal</b>  <b>(B18) No. 2 (+) — Chassis ground (-):</b></p>	<p>Is the voltage more than 10 V?</p>	<p>Go to step 7.</p>	<p>Repair the power supply line.</p> <p><b>NOTE:</b>                      In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Open circuit of harness between main relay and rear oxygen sensor connector</li> <li>• Poor contact in main relay connector</li> <li>• Poor contact of coupling connector</li> <li>• Malfunction in main relay</li> </ul>
<p><b>7</b></p> <p><b>CHECK REAR OXYGEN SENSOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Measure the resistance between the rear oxygen sensor connector terminals.</p> <p><b>Terminals</b>  <b>No. 1 — No. 2:</b></p>	<p>Is the resistance less than 30 <math>\Omega</math>?</p>	<p>Repair the harness and connector.</p> <p><b>NOTE:</b>                      In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Open circuit of harness between the rear oxygen sensor and ECM connector</li> <li>• Poor contact of the rear oxygen sensor connector</li> <li>• Poor contact in ECM connector</li> <li>• Poor contact of coupling connector</li> </ul>	<p>Replace the rear oxygen sensor.</p> <p>&lt;Ref. to FU(H4DOTC)-43, Rear Oxygen Sensor.&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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

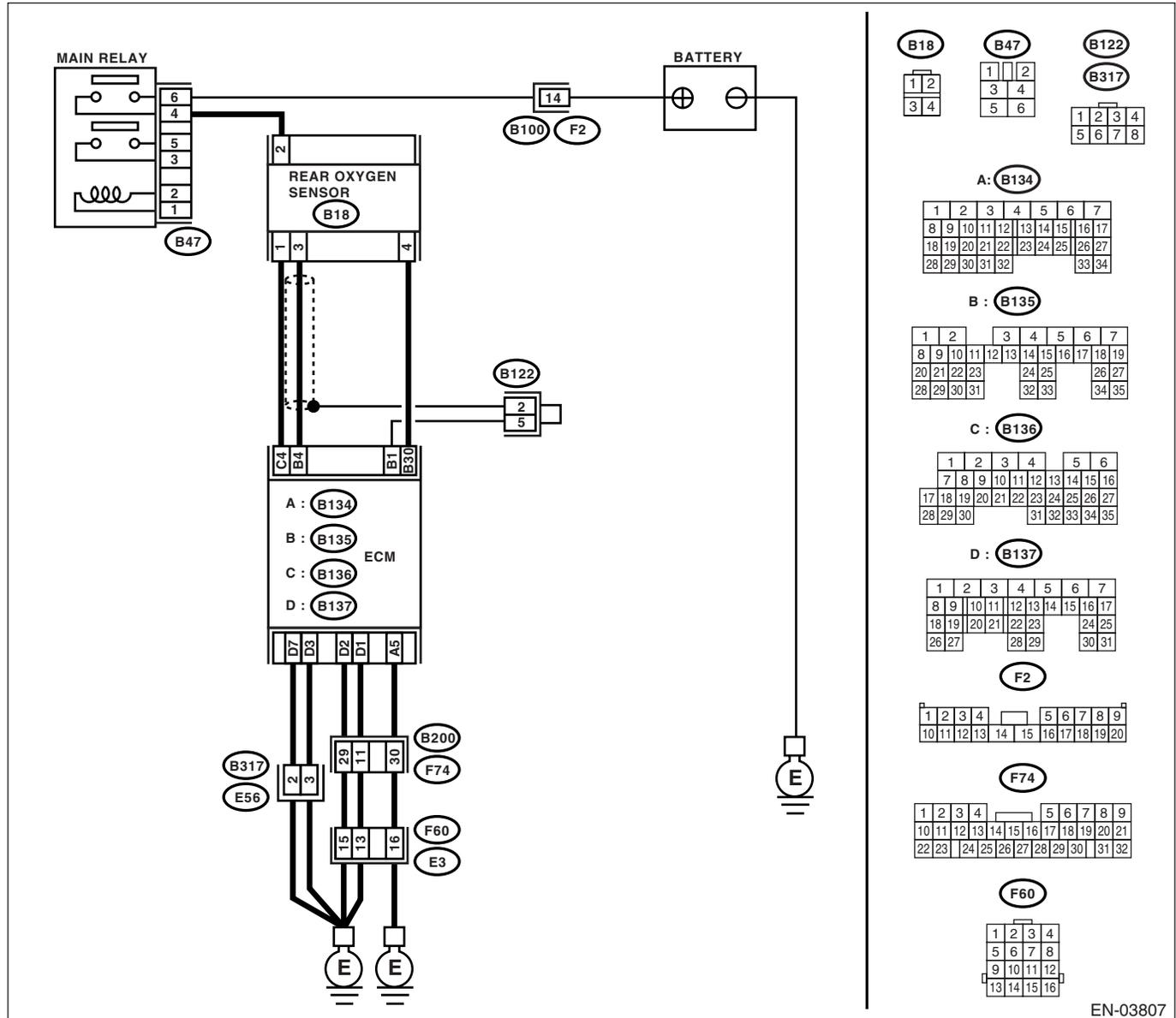
### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-22, DTC P0038 HO2S HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03807

Step	Check	Yes	No	
1	<p><b>CHECK INPUT SIGNAL OF ECM.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Measure the voltage between ECM connector and chassis ground.</p> <p><b>Connector &amp; terminal</b> (B136) No. 4 (+) — Chassis ground (-):</p>	Is the voltage more than 8 V?	Go to step 2.	Go to step 3.

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

### ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>2</b> <b>CHECK CURRENT DATA.</b> 1) Repair the battery short circuit of harness between ECM and rear oxygen sensor connector. 2) Turn the ignition switch to ON. 3) Read the data of rear oxygen sensor heater current using the Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.	Is the current more than 7 A?	Replace the ECM. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>	END.
<b>3</b> <b>CHECK POOR CONTACT.</b> Check poor contact of ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	END.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## J: DTC P0068 MAP/MAF - THROTTLE POSITION CORRELATION

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-24, DTC P0068 MAP/MAF - THROTTLE POSITION CORRELATION, Diagnostic Trouble Code (DTC) Detecting Criteria.>

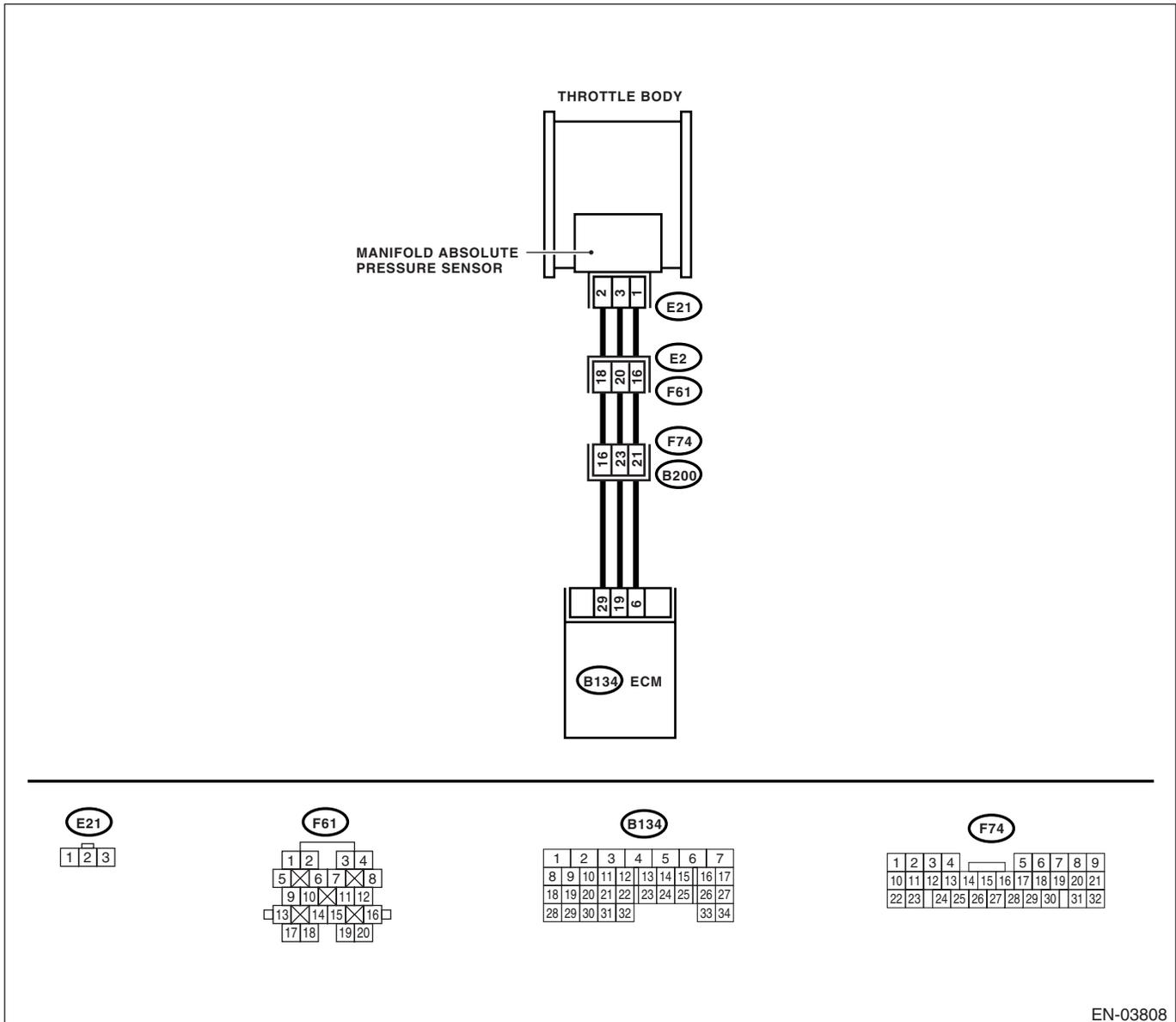
### TROUBLE SYMPTOM:

Failure of engine to start

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03808

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1</b> <b>CHECK IDLE SWITCH SIGNAL.</b> 1) Turn the ignition switch to ON. 2) Operate the LED operation mode for engine using Subaru Select Monitor. NOTE: Subaru Select Monitor For detailed operation procedure, refer to the "LED OPERATION MODE FOR ENGINE." <Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.>	Does the LED of {Idle Switch Signal} come on?	Go to step 2.	Check the throttle position sensor circuit. <Ref. to EN(H4DOTC)(diag)-358, DTC P2135 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A"/"B" VOLTAGE CORRELATION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P0106.
<b>2</b> <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check the relative DTC. "List of Diagnostic Trouble Code (DTC)" <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P0106.	Go to step 3.
<b>3</b> <b>CHECK CONDITION OF MANIFOLD ABSOLUTE PRESSURE SENSOR.</b>	Is the manifold absolute pressure sensor installation bolt tightened securely?	Go to step 4.	Securely tighten the manifold absolute pressure sensor installation bolt.
<b>4</b> <b>CHECK CONDITION OF THROTTLE BODY.</b>	Is the throttle body installation bolt tightened securely?	Replace the manifold absolute pressure sensor. <Ref. to FU(H4DOTC)-32, Manifold Absolute Pressure Sensor.>	Tighten the throttle body installation bolt securely.

## K: DTC P0101 MASS OR VOLUME AIR FLOW CIRCUIT RANGE/PERFORMANCE

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-26, DTC P0101 MASS OR VOLUME AIR FLOW CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

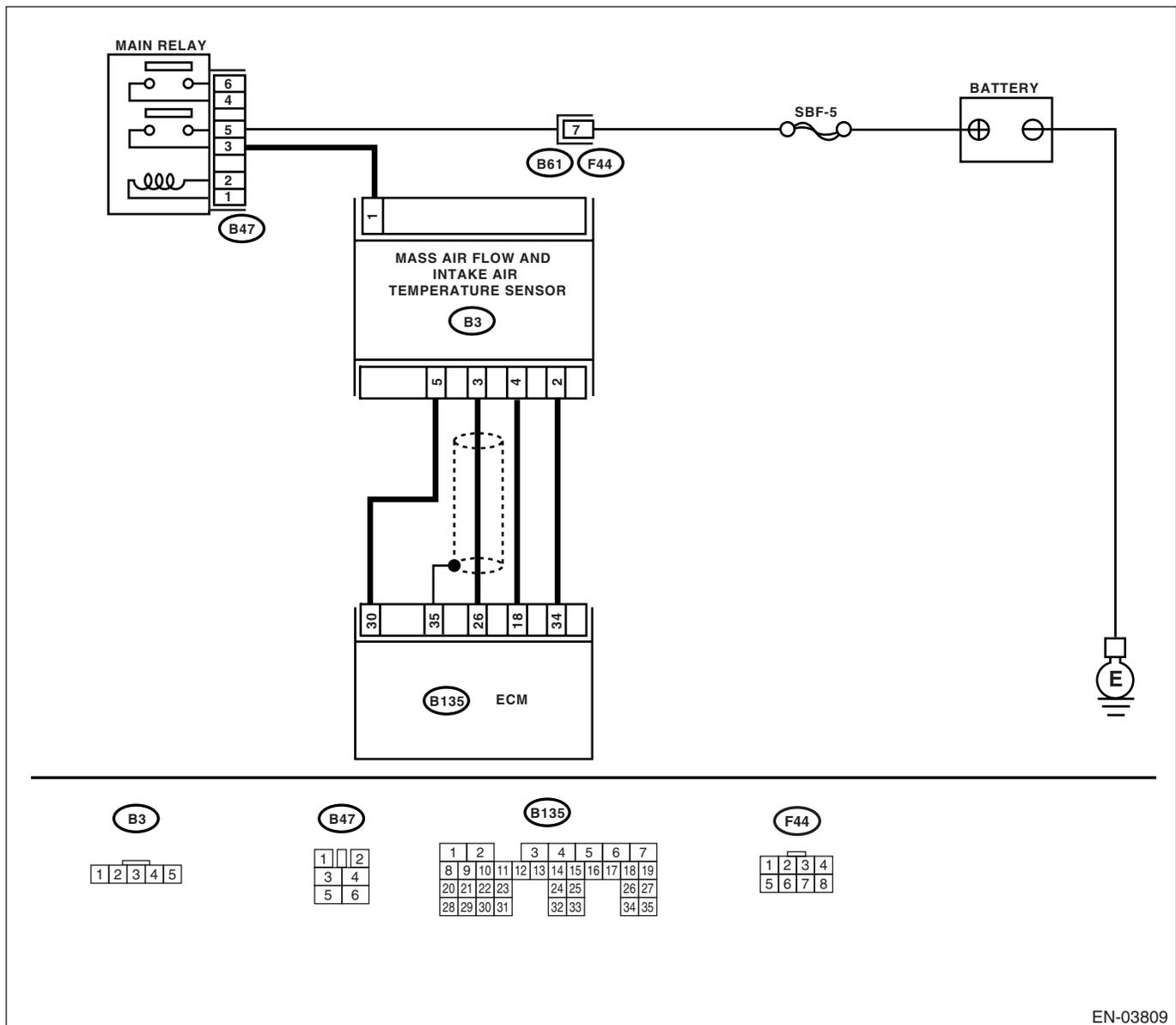
### TROUBLE SYMPTOM:

- Improper idling
- Engine stalls.
- Poor driving performance

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>  NOTE: In this case, it is not necessary to inspect DTC P0101.	Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4DOTC)-31, Mass Air Flow and Intake Air Temperature Sensor.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## L: DTC P0102 MASS OR VOLUME AIR FLOW CIRCUIT LOW INPUT

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-29, DTC P0102 MASS OR VOLUME AIR FLOW CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

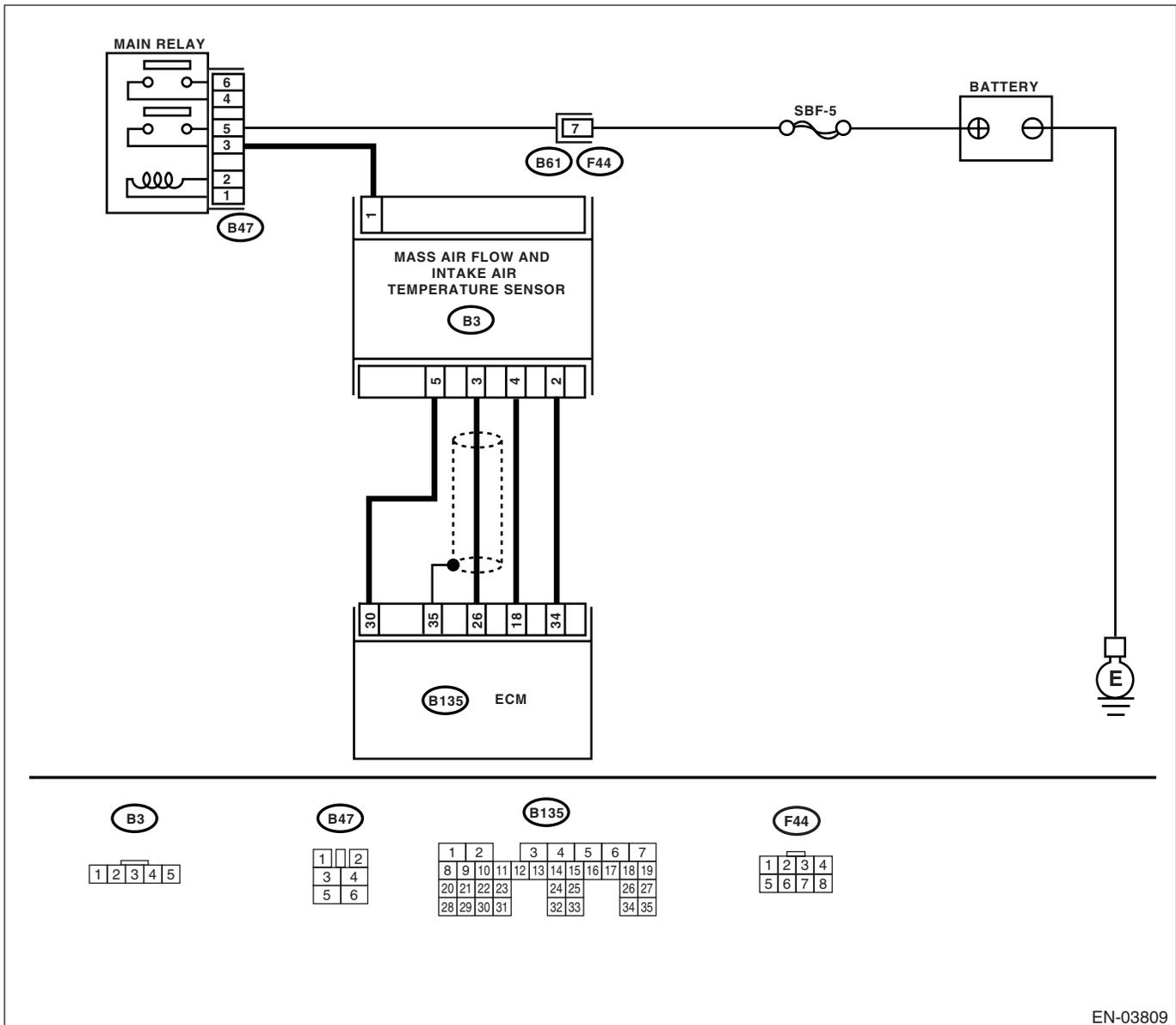
### TROUBLE SYMPTOM:

- Improper idling
- Engine stalls.
- Poor driving performance

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03809

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1 CONNECT SUBARU SELECT MONITOR OR THE GENERAL SCAN TOOL, AND READ DATA.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Connect the Subaru Select Monitor or general scan tool to data link connector.                      3) Turn the ignition switch to ON, and the Subaru Select Monitor power switch to ON.                      4) Start the engine.                      5) Read the voltage of mass air flow sensor using Subaru Select Monitor or general scan tool.</p> <p>NOTE:                      • Subaru Select Monitor                      For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;                      • General scan tool                      For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the voltage 0.2 — 4.7 V?</p>	<p>Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Temporary poor contact of connector or harness may be the cause. Repair the harness or connector in mass air flow sensor.</p> <p>NOTE:                      In this case, repair the following item:                      • Open or ground short circuit of harness between mass air flow sensor and ECM connector                      • Poor contact of mass air flow sensor or ECM connector</p>	<p>Go to step 2.</p>
<p><b>2 CHECK INPUT SIGNAL OF ECM.</b>                      Measure the voltage between ECM connector and chassis ground while engine is idling.  <b>Connector &amp; terminal</b>  <b>(B135) No. 26 (+) — Chassis ground (-):</b></p>	<p>Is the voltage more than 0.2 V?</p>	<p>Go to step 4.</p>	<p>Go to step 3.</p>
<p><b>3 CHECK INPUT SIGNAL FOR ECM (USING SUBARU SELECT MONITOR).</b>                      Measure the voltage between ECM connector and chassis ground while engine is idling.</p>	<p>Does the voltage change when shaking the harness and connector of ECM while monitoring the voltage with the Subaru Select Monitor?</p>	<p>Repair poor contact in ECM connector.</p>	<p>Contact with SOA Service Center.                      NOTE:                      The deterioration of multiple parts can be thought as the cause.</p>
<p><b>4 CHECK POWER SUPPLY TO MASS AIR FLOW SENSOR.</b></p> <p>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 the voltage between mass air flow sensor connector and chassis ground.  <b>Connector &amp; terminal</b>  <b>(B3) No. 1 (+) — Chassis ground (-):</b></p>	<p>Is the voltage more than 5 V?</p>	<p>Go to step 5.</p>	<p>Repair the open circuit between mass air flow sensor and main relay.</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>5</b> <b>CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW SENSOR CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM. 3) Measure the resistance of harness between ECM and mass air flow sensor connector.  <i>Connector &amp; terminal</i> (B135) No. 26 — (B3) No. 3: (B135) No. 34 — (B3) No. 2: (B135) No. 30 — (B3) No. 5:	Is the resistance less than 1 $\Omega$ ?	Go to step 6.	Repair the open circuit between ECM and mass air flow sensor connector.
<b>6</b> <b>CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW SENSOR CONNECTOR.</b> Measure the resistance of harness between ECM and chassis ground.  <i>Connector &amp; terminal</i> (B135) No. 26 — Chassis ground: (B135) No. 34 — Chassis ground: (B135) No. 30 — Chassis ground:	Is the resistance more than 1 M $\Omega$ ?	Go to step 7.	Repair the ground short circuit between ECM and mass air flow sensor connector.
<b>7</b> <b>CHECK POOR CONTACT.</b> Check poor contact of mass air flow sensor connector.	Is there poor contact in mass air flow sensor connector?	Repair the poor contact of mass air flow sensor connector.	Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4DOTC)-31, Mass Air Flow and Intake Air Temperature Sensor.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## M: DTC P0103 MASS OR VOLUME AIR FLOW CIRCUIT HIGH INPUT

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-31, DTC P0103 MASS OR VOLUME AIR FLOW CIRCUIT HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

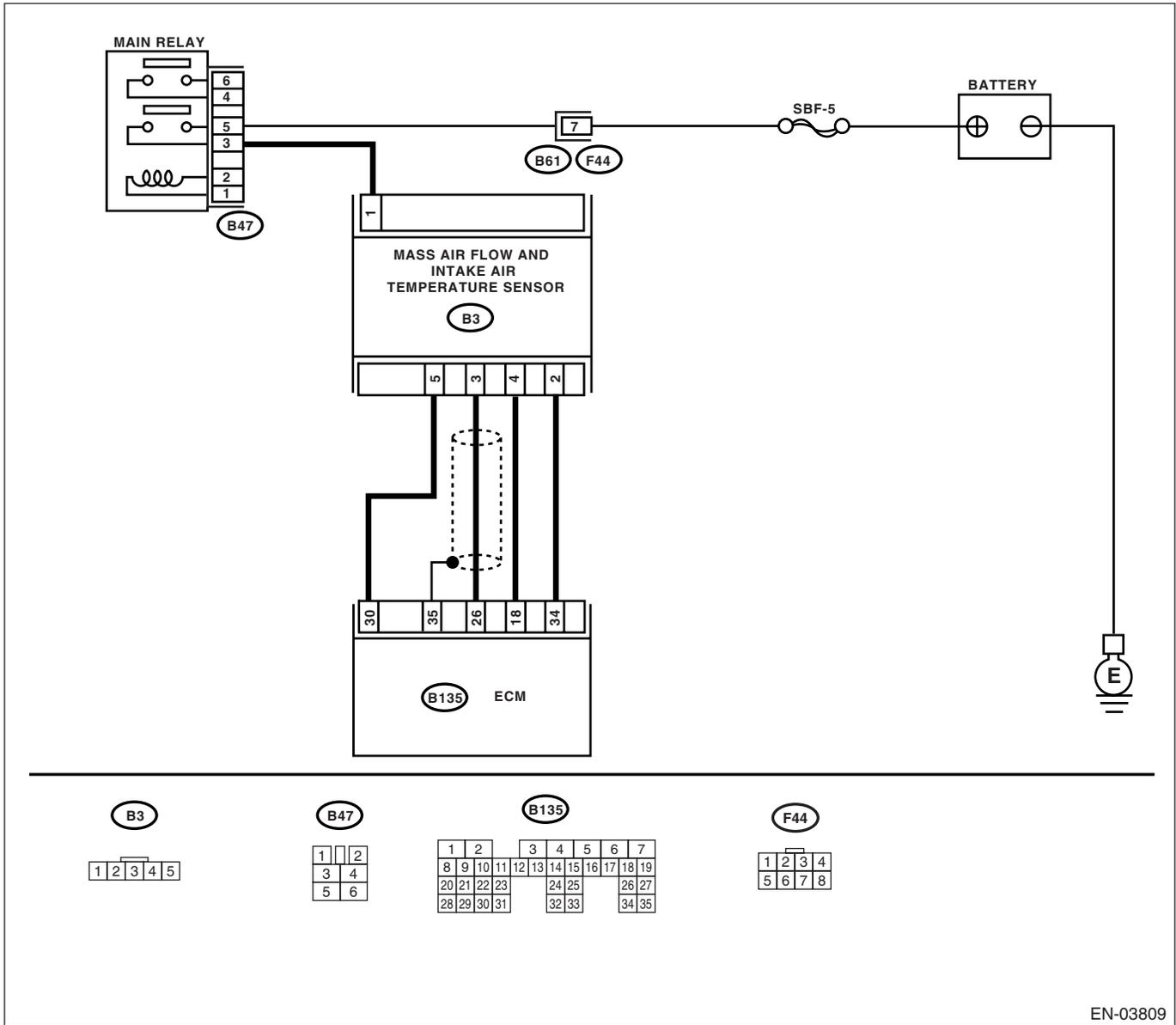
### TROUBLE SYMPTOM:

- Improper idling
- Engine stalls.
- Poor driving performance

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03809

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1 CONNECT SUBARU SELECT MONITOR OR THE GENERAL SCAN TOOL, AND READ DATA.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Connect the Subaru Select Monitor or general scan tool to data link connector.                      3) Turn the ignition switch to ON, and the Subaru Select Monitor power switch to ON.                      4) Start the engine.                      5) Read the voltage of mass air flow sensor using Subaru Select Monitor or general scan tool.</p> <p>NOTE:                      • Subaru Select Monitor                      For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;                      • General scan tool                      For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the voltage 0.2 — 4.7 V?</p>	<p>Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time.</p>	<p>Go to step 2.</p>
<p><b>2 CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW SENSOR CONNECTOR.</b></p> <p>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 the voltage between mass air flow sensor connector and chassis ground.</p> <p><b>Connector &amp; terminal</b>  <b>(B3) No. 3 (+) — Chassis ground (-):</b></p>	<p>Is the voltage more than 5 V?</p>	<p>Repair the battery short circuit of harness between mass air flow sensor connector and ECM connector.</p>	<p>Go to step 3.</p>
<p><b>3 CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW SENSOR CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connectors from ECM.                      3) Measure the resistance of harness between ECM connector and mass air flow sensor connector.</p> <p><b>Connector &amp; terminal</b>  <b>(B3) No. 2 — (B135) No. 34:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Replace the mass air flow and intake air temperature sensor. &lt;Ref. to FU(H4DOTC)-31, Mass Air Flow and Intake Air Temperature Sensor.&gt;</p>	<p>Repair the open circuit of harness between mass air flow sensor connector and ECM connector.</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## N: DTC P0107 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT LOW INPUT

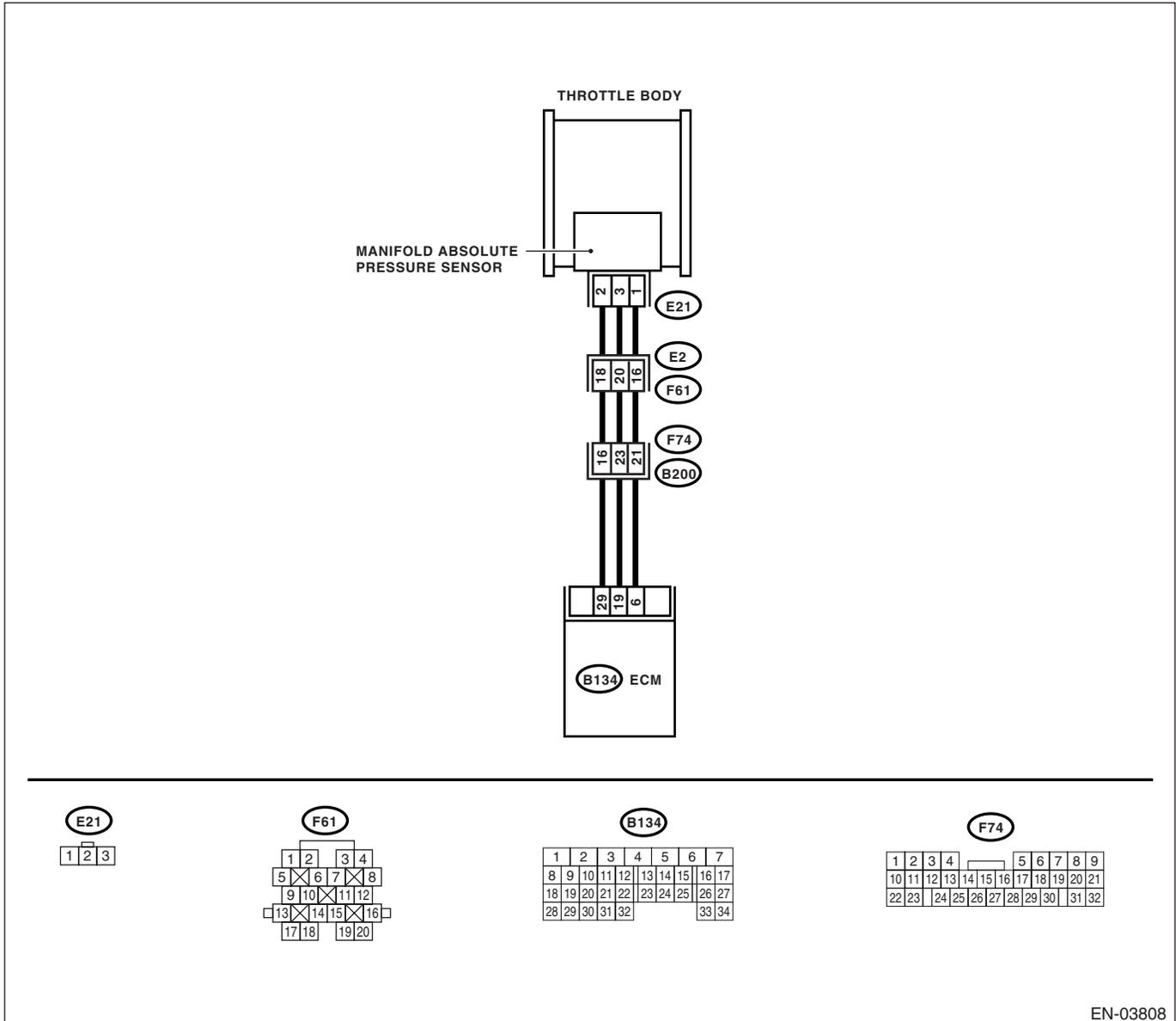
### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-33, DTC P0107 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03808

Step	Check	Yes	No
1	<p><b>CHECK INPUT SIGNAL OF ECM.</b> Measure the voltage between ECM connector and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(B134) No. 19 (+) — Chassis ground (-):</b></p>	Is the voltage more than 4.5 V? Go to step 3.	Go to step 2.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>2</b> <b>CHECK INPUT SIGNAL OF ECM.</b> Measure the voltage between ECM connector and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B134) No. 19 (+) — Chassis ground (-):</b></i>	Does the voltage change when shaking the harness and connector of the ECM while monitoring the value with a voltage meter?	Repair poor contact in ECM connector.	Contact with SOA Service Center. NOTE: The deterioration of multiple parts can be thought as the cause.
<b>3</b> <b>CHECK INPUT SIGNAL OF ECM.</b> Measure the voltage between ECM and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B134) No. 6 (+) — Chassis ground (-):</b></i>	Is the voltage less than 0.7 V?	Go to step 4.	Contact with SOA Service Center. NOTE: The deterioration of multiple parts can be thought as the cause.
<b>4</b> <b>CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.</b> 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><b>Connector &amp; terminal</b></i> <i><b>(E21) No. 3 (+) — Engine ground (-):</b></i>	Is the voltage more than 4.5 V?	Go to step 5.	Repair the open circuit of harness between ECM and manifold absolute pressure sensor connector.
<b>5</b> <b>CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM. 3) Measure the resistance of harness between ECM and manifold absolute pressure sensor connector. <i><b>Connector &amp; terminal</b></i> <i><b>(B134) No. 29 — (E21) No. 2:</b></i>	Is the resistance less than 1 $\Omega$ ?	Go to step 6.	Repair the open circuit of harness between ECM and manifold absolute pressure sensor connector.
<b>6</b> <b>CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.</b> Measure the resistance of harness between manifold absolute pressure sensor connector and engine ground. <i><b>Connector &amp; terminal</b></i> <i><b>(E21) No. 1 — Engine ground:</b></i>	Is the resistance more than 1 M $\Omega$ ?	Go to step 7.	Repair ground short circuit of harness between ECM and manifold absolute pressure sensor connector.
<b>7</b> <b>CHECK POOR CONTACT.</b> Check poor contact of manifold absolute pressure sensor connector.	Is there poor contact in manifold absolute pressure sensor connector?	Repair the poor contact of manifold absolute pressure sensor connector.	Replace the manifold absolute pressure sensor. <Ref. to FU(H4DOTC)-32, Manifold Absolute Pressure Sensor.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## O: DTC P0108 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT HIGH INPUT

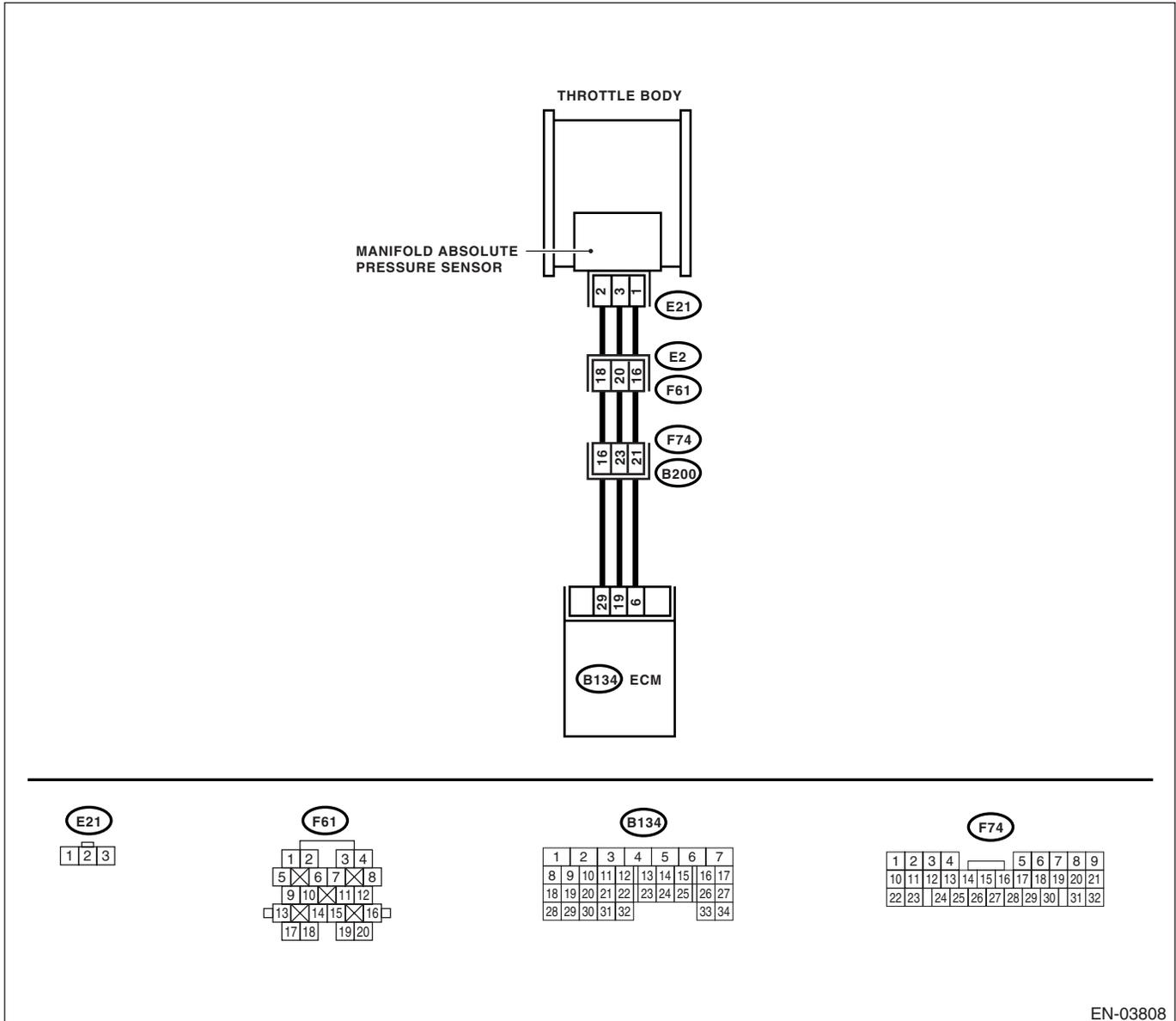
### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-35, DTC P0108 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03808

Step	Check	Yes	No
1	<p><b>CHECK INPUT SIGNAL OF ECM.</b> Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B134) No. 19 (+) — Chassis ground (-):</b></p>	Is the voltage more than 4.5 V? Go to step 3.	Go to step 2.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>2</b> <b>CHECK INPUT SIGNAL OF ECM.</b> Measure the voltage between ECM connector and chassis ground. <i>Connector &amp; terminal</i> <i>(B134) No. 19 (+) — Chassis ground (-):</i>	Does the voltage change when shaking the harness and connector of the ECM while monitoring the value with a voltage meter?	Repair poor contact in ECM connector.	Contact with SOA Service Center. NOTE: The deterioration of multiple parts can be thought as the cause.
<b>3</b> <b>CHECK INPUT SIGNAL OF ECM.</b> Measure the voltage between ECM connector and chassis ground. <i>Connector &amp; terminal</i> <i>(B134) No. 6 (+) — Chassis ground (-):</i>	Is the voltage more than 4.5 V?	Go to step 4.	Contact with SOA Service Center. NOTE: The deterioration of multiple parts can be thought as the cause.
<b>4</b> <b>CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.</b> 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 &amp; terminal</i> <i>(E21) No. 3 (+) — Engine ground (-):</i>	Is the voltage more than 4.5 V?	Go to step 5.	Repair the open circuit of harness between ECM and manifold absolute pressure sensor connector.
<b>5</b> <b>CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM. 3) Measure the resistance of harness between ECM and manifold absolute pressure sensor connector. <i>Connector &amp; terminal</i> <i>(B134) No. 6 — (E21) No. 1:</i>	Is the resistance less than 1 $\Omega$ ?	Go to step 6.	Repair the open circuit of harness between ECM and manifold absolute pressure sensor connector.
<b>6</b> <b>CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.</b> Measure the resistance of harness between ECM and manifold absolute pressure sensor connector. <i>Connector &amp; terminal</i> <i>(B134) No. 29 — (E21) No. 2:</i>	Is the resistance less than 1 $\Omega$ ?	Go to step 7.	Repair the open circuit of harness between ECM and manifold absolute pressure sensor connector.
<b>7</b> <b>CHECK POOR CONTACT.</b> Check poor contact of manifold absolute pressure sensor connector.	Is there poor contact in manifold absolute pressure sensor connector?	Repair the poor contact of manifold absolute pressure sensor connector.	Replace the manifold absolute pressure sensor. <Ref. to FU(H4DOTC)-32, Manifold Absolute Pressure Sensor.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## P: DTC P0111 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-37, DTC P0111 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

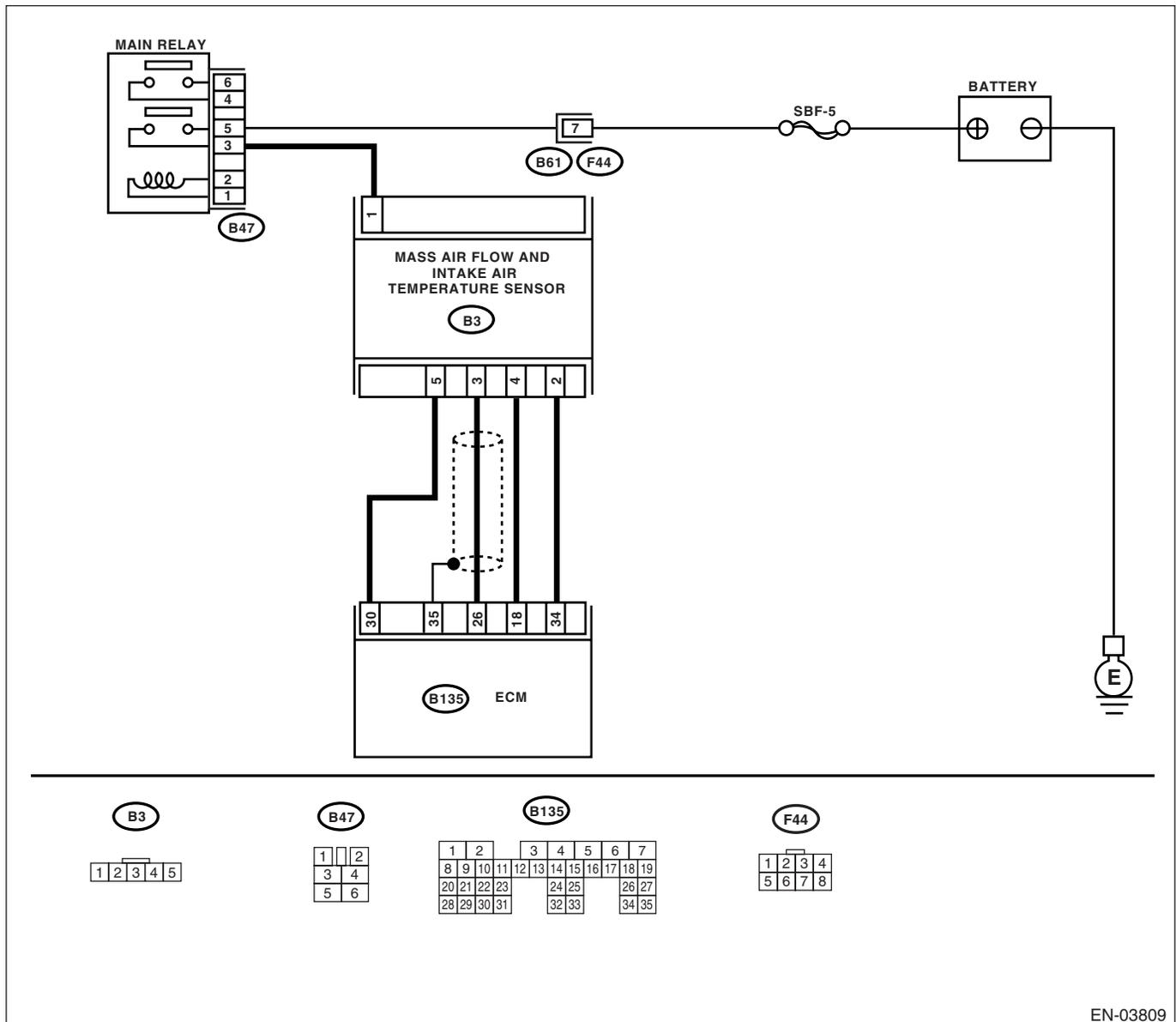
### TROUBLE SYMPTOM:

- Improper idling
- Poor driving performance

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03809

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1	<p><b>CHECK ANY OTHER DTC ON DISPLAY.</b></p>	<p>Is any other DTC displayed?</p>	<p>Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". &lt;Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).&gt;  NOTE: In this case, it is not necessary to inspect DTC P0111.</p>
2	<p><b>CHECK ENGINE COOLANT TEMPERATURE.</b></p> <p>1) Start the engine and warm-up completely. 2) Measure the engine coolant temperature using the Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• General scan tool</li> </ul> <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the engine coolant temperature 75 — 95°C (167 — 203°F) ?</p>	<p>Replace the mass air flow and intake air temperature sensor. &lt;Ref. to FU(H4DOTC)-31, Mass Air Flow and Intake Air Temperature Sensor.&gt;</p> <p>Check DTC P0125 using "List of Diagnostic Trouble Code (DTC)." &lt;Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## Q: DTC P0112 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT LOW

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-39, DTC P0112 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

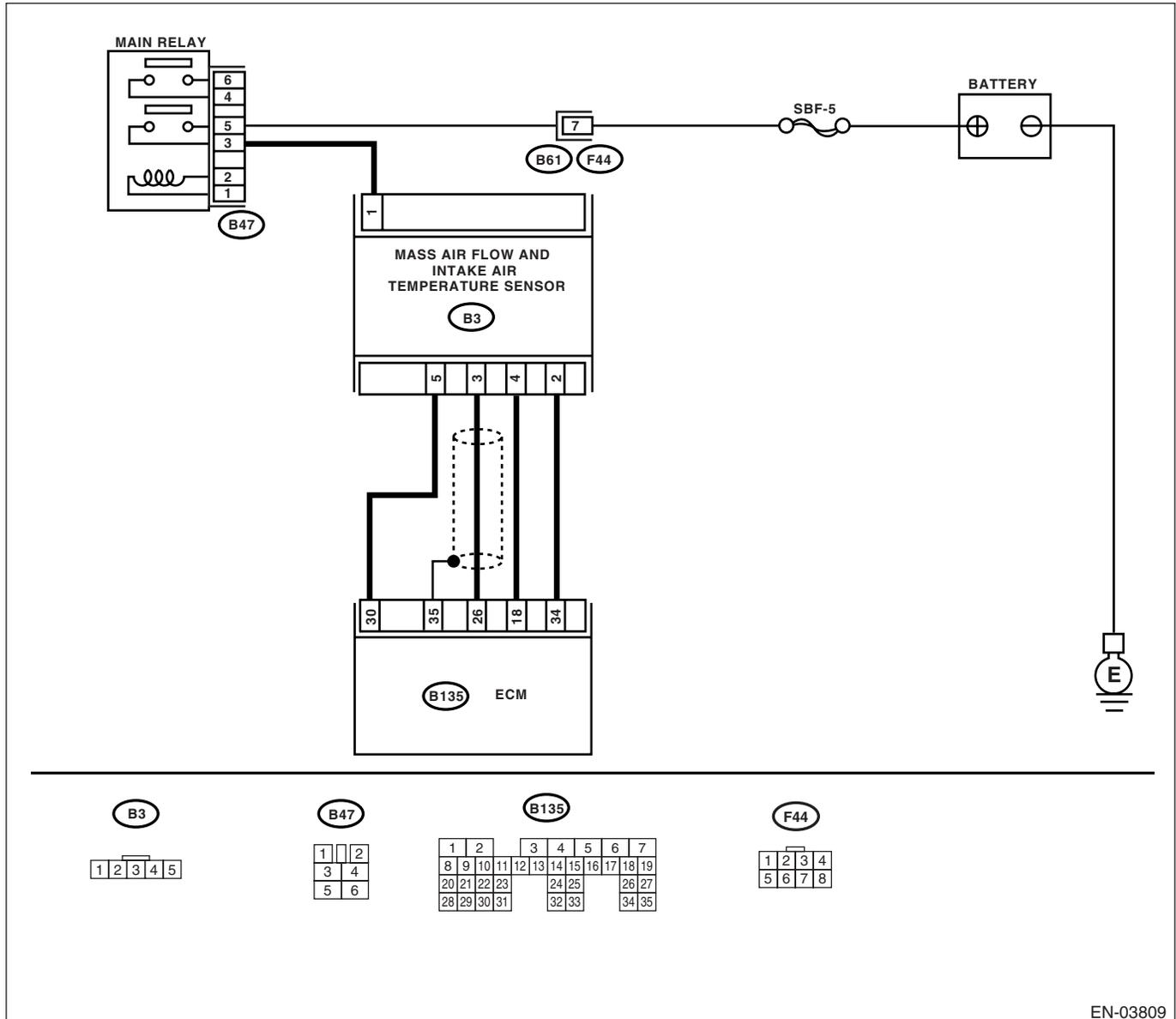
### TROUBLE SYMPTOM:

- Improper idling
- Poor driving performance

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03809

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK CURRENT DATA.</b></p> <p>1) Start the engine.</p> <p>2) Read the data of the intake air temperature sensor signal using the Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• General scan tool</li> </ul> <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the temperature above 55°C (131°F)?</p>	<p>Go to step 2.</p>	<p>Repair the poor contact.</p> <p>NOTE:</p> <p>In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Poor contact of mass air flow and intake air temperature sensor</li> <li>• Poor contact in ECM</li> <li>• Poor contact of joint connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR AND THE ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connector from the mass air flow and intake air temperature sensor.</p> <p>3) Turn the ignition switch to ON.</p> <p>4) Read the data of the intake air temperature sensor signal using the Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• General scan tool</li> </ul> <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the temperature less than –36°C (–33°F)?</p>	<p>Replace the mass air flow and intake air temperature sensor. &lt;Ref. to FU(H4DOTC)-31, Mass Air Flow and Intake Air Temperature Sensor.&gt;</p>	<p>Repair the ground short circuit of the harness between the mass air flow and intake air temperature sensor and ECM connector.</p>



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK CURRENT DATA.</b></p> <p>1) Start the engine.</p> <p>2) Read the data of the intake air temperature sensor signal using the Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• General scan tool</li> </ul> <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the temperature less than – 36°C (–33°F)?</p>	<p>Go to step 2.</p>	<p>Repair the poor contact.</p> <p>NOTE:</p> <p>In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Poor contact of mass air flow and intake air temperature sensor</li> <li>• Poor contact in ECM</li> <li>• Poor contact of joint connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR AND THE ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connector from the mass air flow and intake air temperature sensor.</p> <p>3) Measure the voltage between the mass air flow and intake air temperature sensor connectors and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(B3) No. 4 (+) — Engine ground (–):</b></p>	<p>Is the voltage more than 10 V?</p>	<p>Repair the battery short circuit of the harness between mass air flow and intake air temperature sensor, and the ECM connector.</p>	<p>Go to step 3.</p>
<p><b>3</b></p> <p><b>CHECK HARNESS BETWEEN MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR AND THE ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to ON.</p> <p>2) Measure the voltage between the mass air flow and intake air temperature sensor connectors and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(B3) No. 4 (+) — Engine ground (–):</b></p>	<p>Is the voltage more than 10 V?</p>	<p>Repair the battery short circuit of the harness between mass air flow and intake air temperature sensor, and the ECM connector.</p>	<p>Go to step 4.</p>
<p><b>4</b></p> <p><b>CHECK HARNESS BETWEEN MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR AND THE ECM CONNECTOR.</b></p> <p>Measure the voltage between the mass air flow and intake air temperature sensor, manifold absolute pressure sensor connector, and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(B3) No. 4 (+) — Engine ground (–):</b></p>	<p>Is the voltage more than 4 V?</p>	<p>Go to step 5.</p>	<p>Repair the harness and connector.</p> <p>NOTE:</p> <p>In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Open circuit between mass air flow and intake air temperature sensor and ECM connector.</li> <li>• Poor contact of mass air flow and intake air temperature sensor</li> <li>• Poor contact in ECM</li> <li>• Poor contact of joint connector</li> </ul>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>5</b></p> <p><b>CHECK HARNESS BETWEEN MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR AND THE ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF. 2) Measure the resistance of harness between mass air flow and intake air temperature sensor and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(B3) No. 5 — Engine ground:</b></p>	<p>Is the resistance less than 5 <math>\Omega</math>?</p>	<p>Replace the mass air flow and intake air temperature sensor. &lt;Ref. to FU(H4DOTC)-31, Mass Air Flow and Intake Air Temperature Sensor.&gt;</p>	<p>Repair the harness and connector.</p> <p><b>NOTE:</b> In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Open circuit between mass air flow and intake air temperature sensor and ECM connector.</li> <li>• Poor contact of mass air flow and intake air temperature sensor</li> <li>• Poor contact in ECM</li> <li>• Poor contact of joint connector</li> </ul>

## S: DTC P0117 ENGINE COOLANT TEMPERATURE CIRCUIT LOW

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-43, DTC P0117 ENGINE COOLANT TEMPERATURE CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

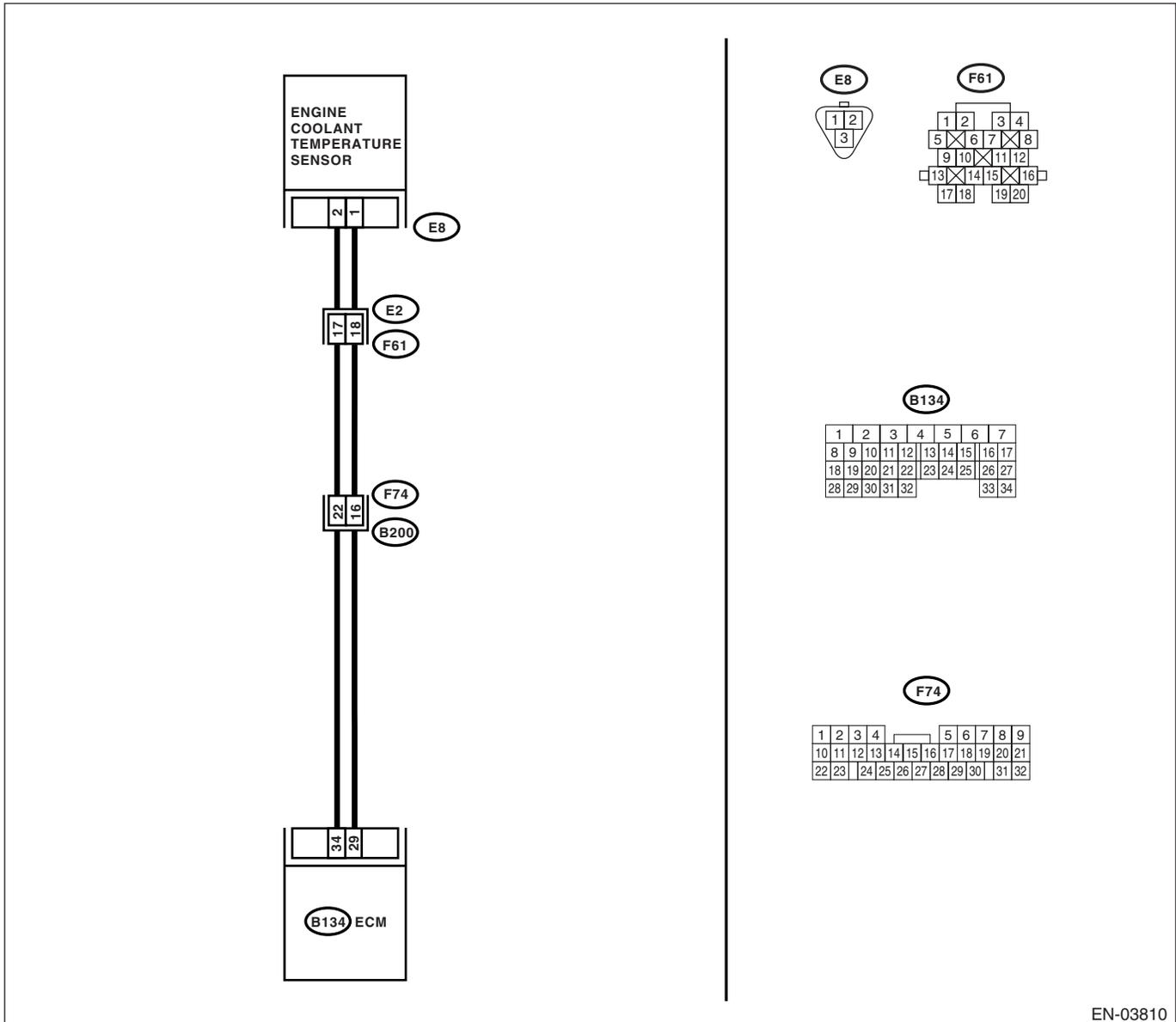
### TROUBLE SYMPTOM:

- Hard to start
- Improper idling
- Poor driving performance

### CAUTION:

**After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

### WIRING DIAGRAM:



EN-03810

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK CURRENT DATA.</b></p> <p>1) Start the engine.</p> <p>2) Read the data of the engine coolant temperature sensor signal using the Subaru Select Monitor or the general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• General scan tool</li> </ul> <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the temperature above 120°C (248°F)?</p>	<p>Go to step 2.</p>	<p>Repair the poor contact.</p> <p>NOTE:</p> <p>In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Poor contact of engine coolant temperature sensor</li> <li>• Poor contact in ECM</li> <li>• Poor contact of coupling connector</li> <li>• Poor contact of joint connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connectors from the engine coolant temperature sensor.</p> <p>3) Turn the ignition switch to ON.</p> <p>4) Read the data of the engine coolant temperature sensor signal using the Subaru Select Monitor or the general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• General scan tool</li> </ul> <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the temperature more than 40°C (40°F)?</p>	<p>Replace the engine coolant temperature sensor. &lt;Ref. to FU(H4DOTC)-27, Engine Coolant Temperature Sensor.&gt;</p>	<p>Repair the ground short circuit of harness between engine coolant temperature sensor and ECM connector.</p>

## T: DTC P0118 ENGINE COOLANT TEMPERATURE CIRCUIT HIGH

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-45, DTC P0118 ENGINE COOLANT TEMPERATURE CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

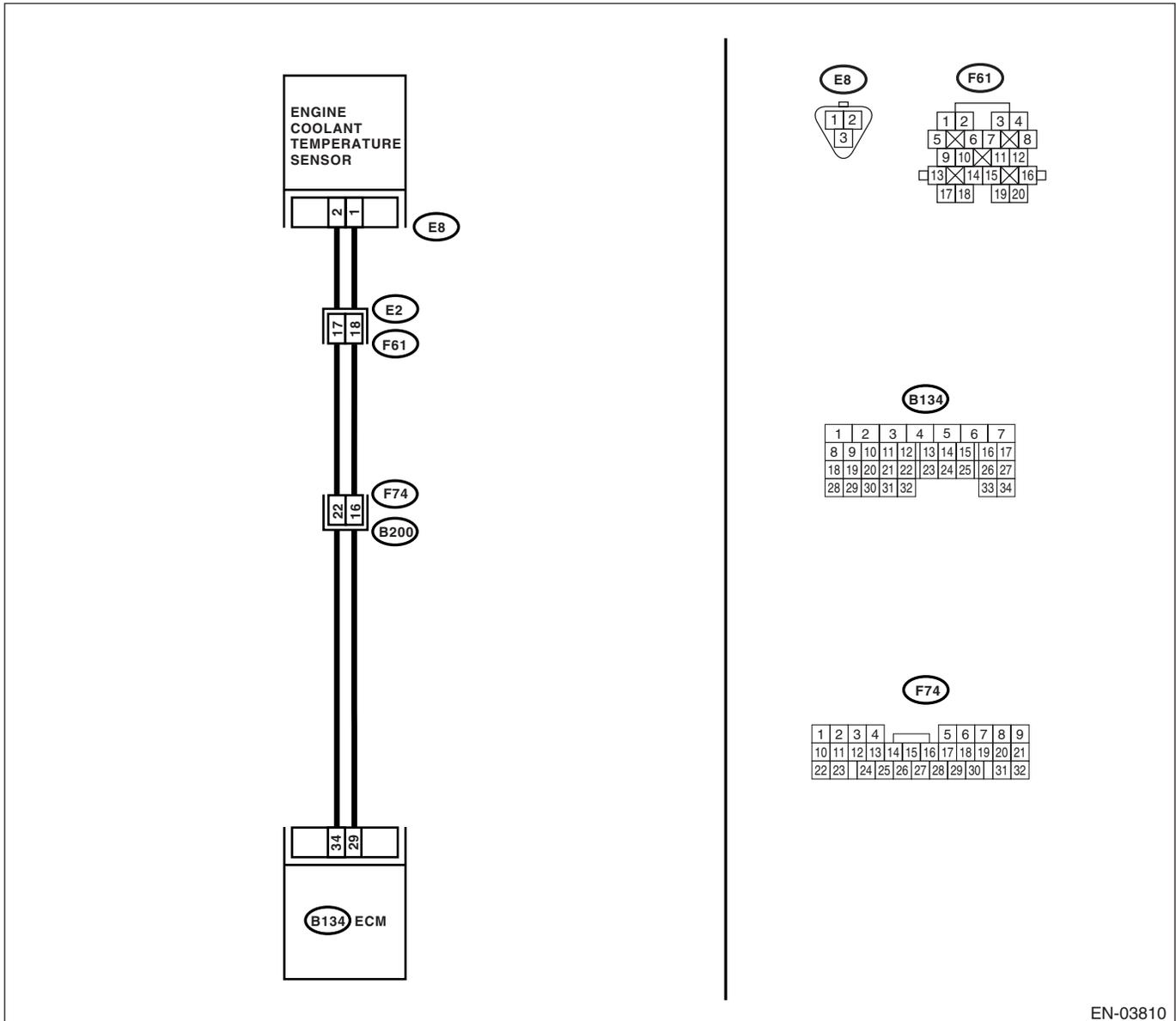
### TROUBLE SYMPTOM:

- Hard to start
- Improper idling
- Poor driving performance

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03810

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK CURRENT DATA.</b></p> <p>1) Start the engine.</p> <p>2) Read the data of the engine coolant temperature sensor signal using the Subaru Select Monitor or the general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• General scan tool</li> </ul> <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the temperature less than 40°C (40°F)?</p>	<p>Go to step 2.</p>	<p>Repair the poor contact.</p> <p>NOTE:</p> <p>In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Poor contact of engine coolant temperature sensor</li> <li>• Poor contact in ECM</li> <li>• Poor contact of coupling connector</li> <li>• Poor contact of joint connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connectors from the engine coolant temperature sensor.</p> <p>3) Measure the voltage between engine coolant temperature sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E8) No. 2 (+) — Engine ground (-):</b></p>	<p>Is the voltage more than 10 V?</p>	<p>Repair the battery short circuit of harness between ECM and engine coolant temperature sensor connector.</p>	<p>Go to step 3.</p>
<p><b>3</b></p> <p><b>CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to ON.</p> <p>2) Measure the voltage between engine coolant temperature sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E8) No. 2 (+) — Engine ground (-):</b></p>	<p>Is the voltage more than 10 V?</p>	<p>Repair the battery short circuit of harness between ECM and engine coolant temperature sensor connector.</p>	<p>Go to step 4.</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>4</b></p> <p><b>CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>Measure the voltage between engine coolant temperature sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E8) No. 2 (+) — Engine ground (-):</b></p>	<p>Is the voltage more than 4 V?</p>	<p>Go to step 5.</p>	<p>Repair the harness and connector.</p> <p><b>NOTE:</b> In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Open circuit of harness between ECM and engine coolant temperature sensor connector</li> <li>• Poor contact of engine coolant temperature sensor connector</li> <li>• Poor contact in ECM connector</li> <li>• Poor contact of coupling connector</li> <li>• Poor contact of joint connector</li> </ul>
<p><b>5</b></p> <p><b>CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.</b></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><b>Connector &amp; terminal</b> <b>(E8) No. 1 — Engine ground:</b></p>	<p>Is the resistance less than 5 <math>\Omega</math>?</p>	<p>Replace the engine coolant temperature sensor. &lt;Ref. to FU(H4DOTC)-27, Engine Coolant Temperature Sensor.&gt;</p>	<p>Repair the harness and connector.</p> <p><b>NOTE:</b> In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Open circuit of harness between ECM and engine coolant temperature sensor connector</li> <li>• Poor contact of engine coolant temperature sensor connector</li> <li>• Poor contact in ECM connector</li> <li>• Poor contact of coupling connector</li> <li>• Poor contact of joint connector</li> </ul>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## U: DTC P0122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT LOW

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-47, DTC P0122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

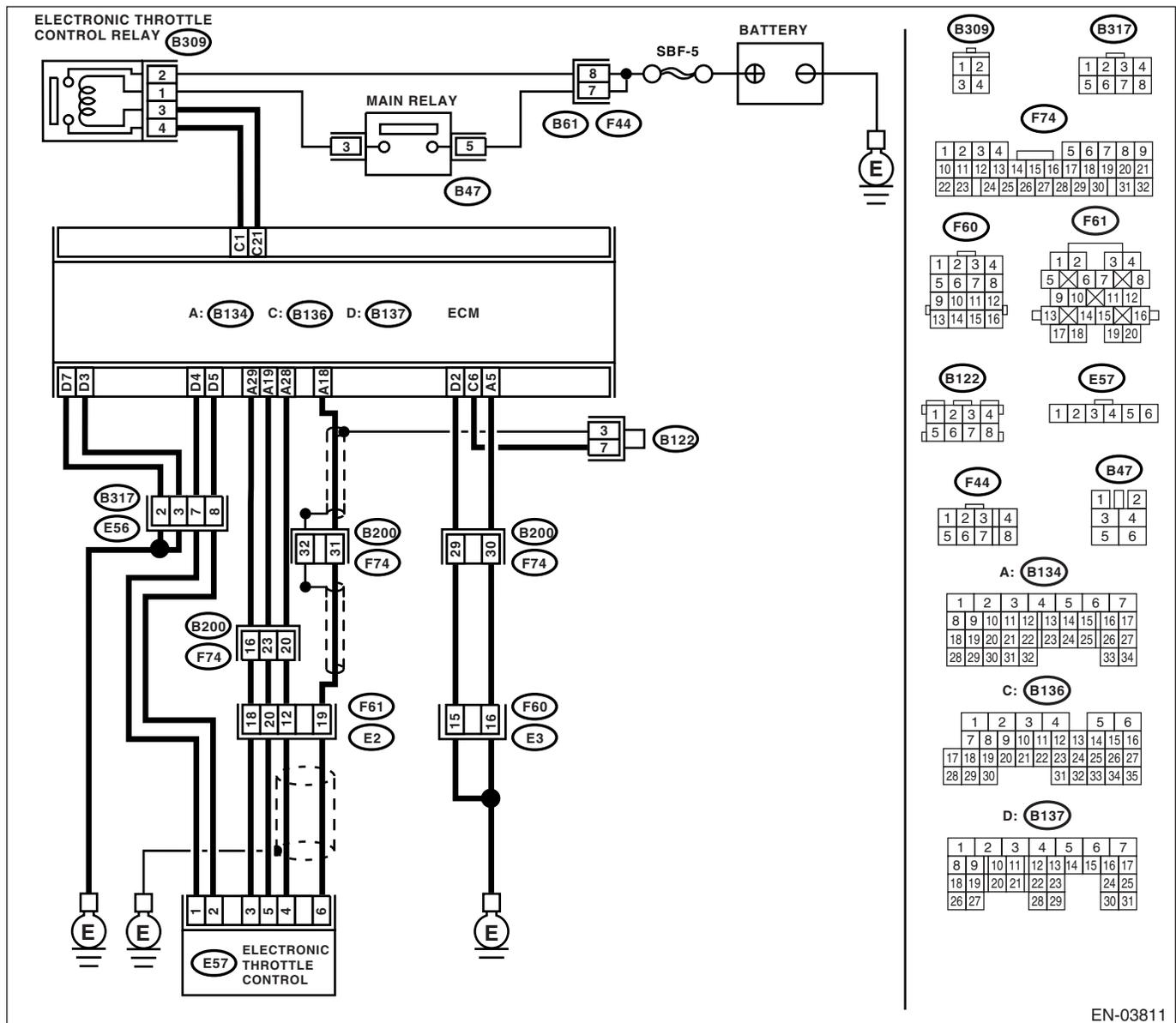
### TROUBLE SYMPTOM:

- Improper idling
- Engine stalls.
- Poor driving performance

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK SENSOR OUTPUT.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM connector and terminal. <i>Connector &amp; terminal</i> <i>(B134) No. 28 (+) — (B134) No. 29 (-):</i> 3) Check the voltage change while shaking the ECM harness and connector, engine harness connector, and electronic control throttle connector harness.	Is the voltage more than 0.4 V?	Go to step 2.	Go to step 3.
<b>2 CHECK POOR CONTACT.</b> 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.
<b>3 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM. 3) Disconnect the connectors from electronic throttle control. 4) Measure the resistance between ECM connector and electronic throttle control connector. <i>Connector &amp; terminal</i> <i>(B134) No. 19 — (E57) No. 5:</i>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open circuit of harness connector.
<b>4 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> Measure the resistance between ECM connector and chassis ground. <i>Connector &amp; terminal</i> <i>(B134) No. 18 — Chassis ground:</i> <i>(B134) No. 19 — Chassis ground:</i>	Is the resistance more than 1 M $\Omega$ ?	Go to step 5.	Repair the chassis short circuit of harness.
<b>5 CHECK POWER SUPPLY OF ELECTRONIC THROTTLE CONTROL.</b> 1) Connect the ECM connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between electronic throttle control connector and engine ground. <i>Connector &amp; terminal</i> <i>(E57) No. 5 (+) — Engine ground (-):</i> 4) Check the voltage change by shaking the harness and connector of ECM, and engine harness connector, while monitoring the value with voltage meter.	Is the voltage 4.5 — 5.5 V?	Go to step 6.	Repair poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>
<b>6 CHECK SHORT CIRCUIT INSIDE THE ECM.</b> 1) Turn the ignition switch to OFF. 2) Measure the resistance between electronic throttle control connector and engine ground. <i>Connector &amp; terminal</i> <i>(E57) No. 6 — Engine ground:</i>	Is the resistance more than 10 $\Omega$ ?	Repair the poor contact of electronic throttle control connector. Replace the accelerator pedal position sensor if defective.	Repair poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## V: DTC P0123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT HIGH

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-49, DTC P0123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

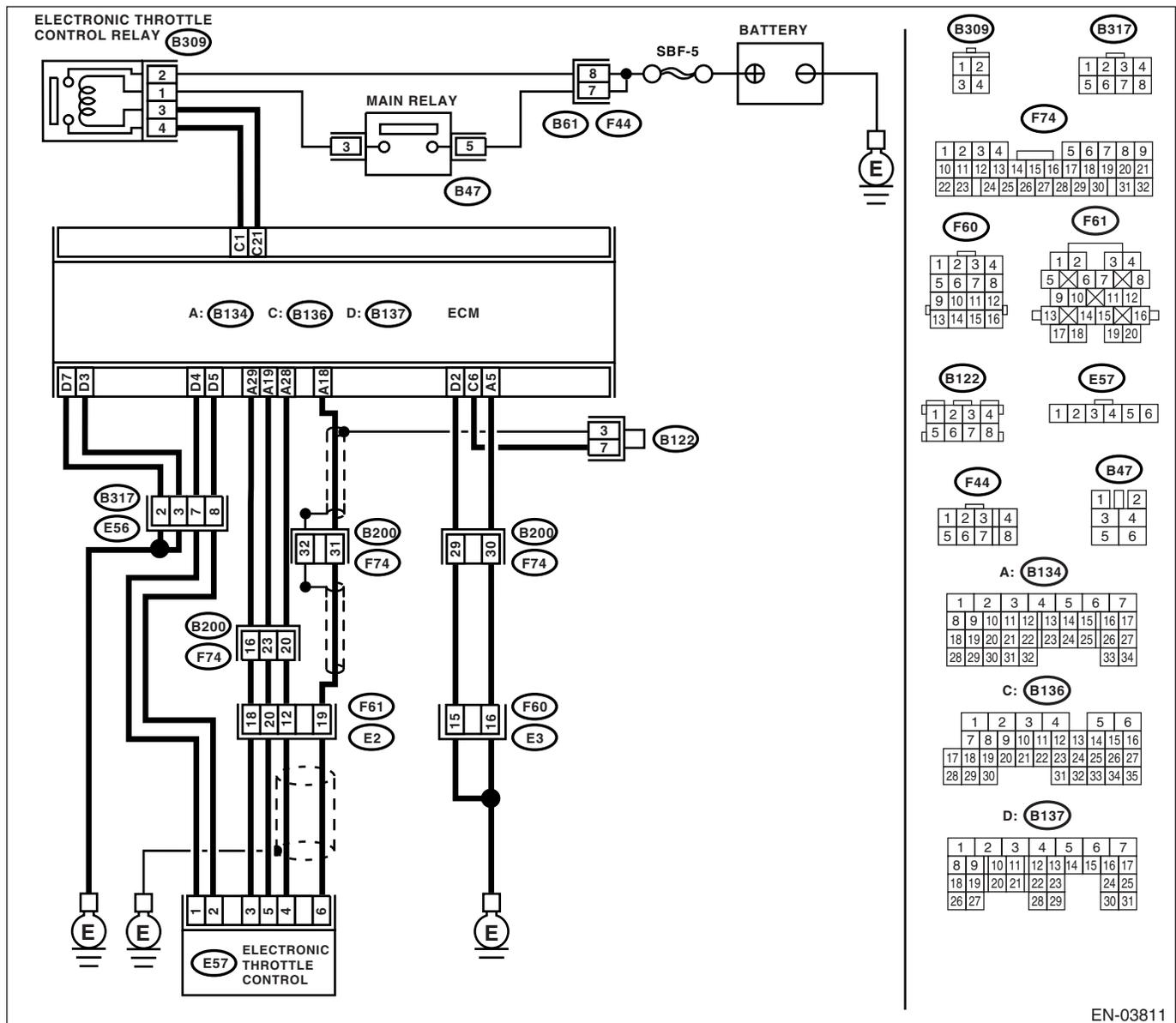
### TROUBLE SYMPTOM:

- Improper idling
- Engine stalls.
- Poor driving performance

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>

### WIRING DIAGRAM:



EN-03811

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1</b> <b>CHECK SENSOR OUTPUT.</b> 1) Turn the ignition switch to ON. 2) Read the data of main throttle sensor signal using Subaru Select Monitor. 3) Check the voltage change while shaking the ECM harness and connector, engine harness connector, and electronic control throttle connector harness.	Is the voltage less than 4.63 V?	Go to step 2.	Go to step 3.
<b>2</b> <b>CHECK POOR CONTACT.</b> 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.
<b>3</b> <b>CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM. 3) Disconnect the connectors from electronic throttle control. 4) Measure the resistance between ECM connector and electronic throttle control connector. <b>Connector &amp; terminal</b> <b>(B134) No. 18 — (E57) No. 6:</b> <b>(B134) No. 29 — (E57) No. 3:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open circuit of harness connector.
<b>4</b> <b>CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Connect the ECM connector. 2) Measure the voltage between electronic throttle control connector and engine ground. <b>Connector &amp; terminal</b> <b>(E57) No. 3 — Engine ground:</b>	Is the resistance less than 5 $\Omega$ ?	Go to step 5.	Repair poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>
<b>5</b> <b>CHECK SENSOR OUTPUT POWER SUPPLY.</b> Measure the voltage between electronic throttle control connector and engine ground. <b>Connector &amp; terminal</b> <b>(E57) No. 6 (+) — Engine ground (-):</b>	Is the voltage less than 10 V?	Replace the electronic throttle control.	Repair the battery short circuit of harness between ECM connector and electronic throttle control connector.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## W: DTC P0125 INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-51, DTC P0125 INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL, Diagnostic Trouble Code (DTC) Detecting Criteria.>

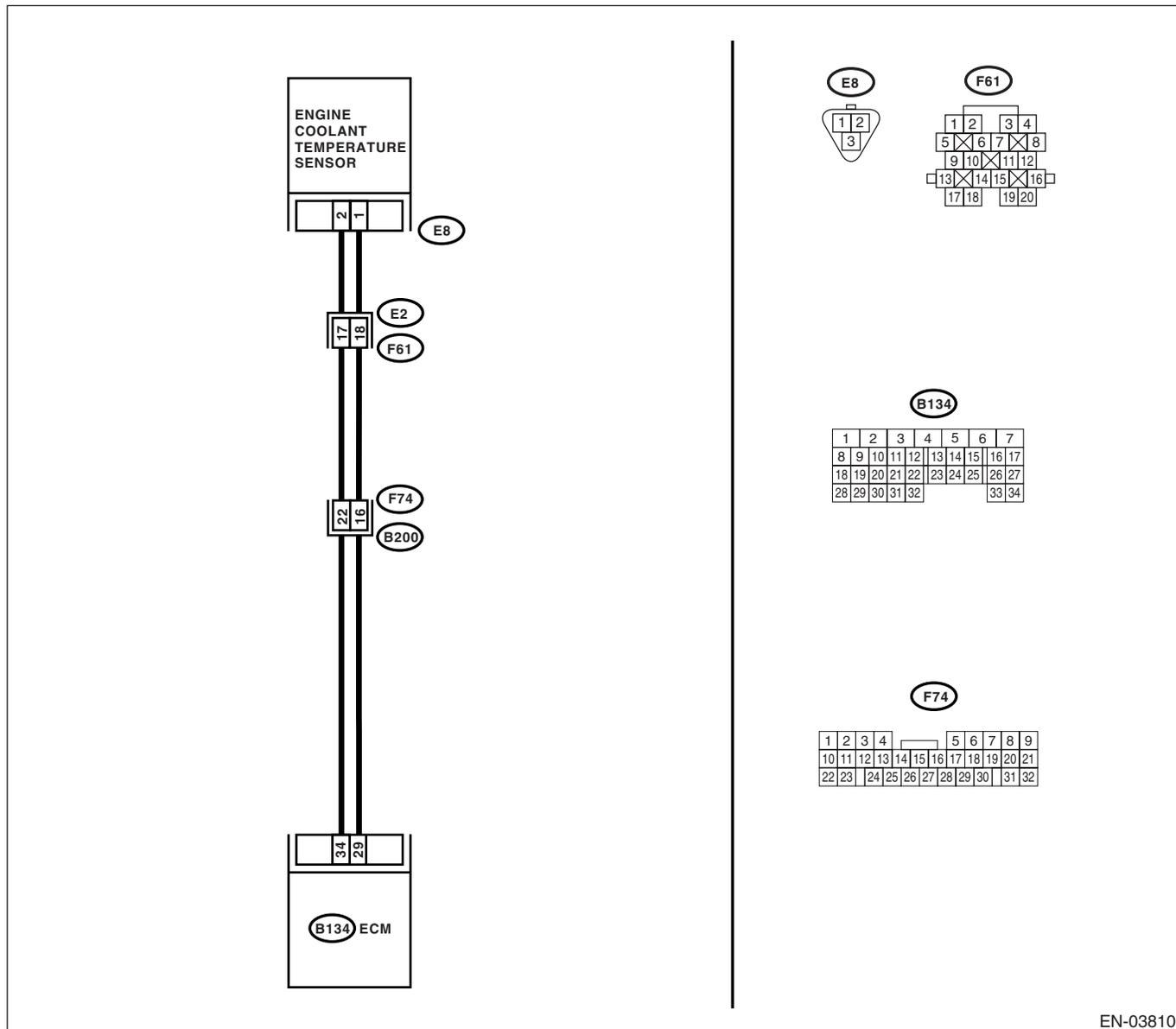
### TROUBLE SYMPTOM:

Engine would not return to idling.

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03810

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No	
1	<b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>  NOTE: In this case, it is not necessary to inspect DTC P0125.	Go to step 2.
2	<b>CHECK ENGINE COOLING SYSTEM.</b> NOTE: Check the following item. <ul style="list-style-type: none"><li>• Thermostat open stuck</li><li>• Coolant level</li><li>• Engine coolant freeze</li><li>• Tire diameter</li></ul>	Is there any fault in engine cooling system?	Replace the thermostat. <Ref. to CO(H4SO)-23, Thermostat.>	Replace the engine coolant temperature sensor. <Ref. to FU(H4DOTC)-27, Engine Coolant Temperature Sensor.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## X: DTC P0126 INSUFFICIENT ENGINE COOLANT TEMPERATURE FOR STABLE OPERATION

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-54, DTC P0126 INSUFFICIENT ENGINE COOLANT TEMPERATURE FOR STABLE OPERATION, Diagnostic Trouble Code (DTC) Detecting Criteria.>

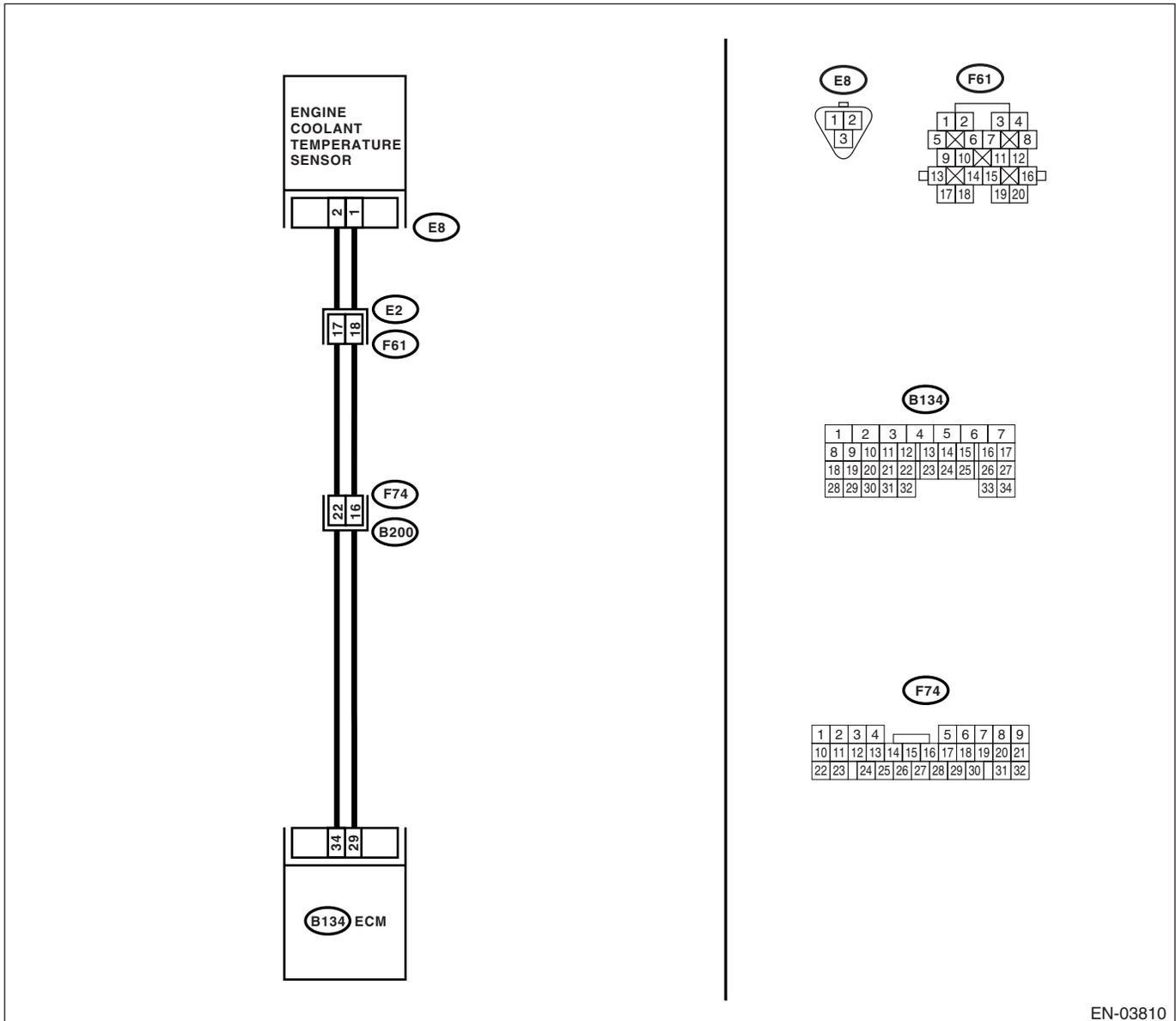
### TROUBLE SYMPTOM:

Engine would not return to idling.

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03810

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1</b> <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
<b>2</b> <b>CHECK ENGINE COOLANT TEMPERATURE SENSOR.</b> Measure the resistance between the engine coolant temperature sensor terminals when the engine coolant is cold and after warmed-up. <b>Terminals</b> <b>No. 1 — No. 2:</b>	Is there a change in resistance between the cold condition and after warm up?	Contact with SOA Service Center.	Replace the engine coolant temperature sensor. <Ref. to FU(H4SO)-22, Engine Coolant Temperature Sensor.>

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

### Y: DTC P0128 COOLANT THERMOSTAT (ENGINE COOLANT TEMPERATURE BELOW THERMOSTAT REGULATING TEMPERATURE)

#### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-56, DTC P0128 COOLANT THERMOSTAT (ENGINE COOLANT TEMPERATURE BELOW THERMOSTAT REGULATING TEMPERATURE), Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### TROUBLE SYMPTOM:

Thermostat remains open.

#### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

Step	Check	Yes	No	
1	<b>CHECK VEHICLE</b>	Has the vehicle driven or idled with the engine partially submerged under water?	In this case, it is not necessary to inspect DTC P0128.	Go to step 2.
2	<b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>	Go to step 3.
3	<b>CHECK ENGINE COOLANT.</b>	Are the coolant level and mixture ratio of engine coolant to anti-freeze solution correct?	Go to step 4.	Replace engine coolant. <Ref. to CO(H4SO)-16, REPLACEMENT, Engine Coolant.>
4	<b>CHECK RADIATOR FAN.</b> 1) Start the engine. 2) Check radiator fan operation.	Does the radiator fan continuously rotate for more than 3 minutes during idling?	Repair radiator fan circuit. <Ref. to CO(H4SO)-32, Radiator Main Fan and Fan Motor.> and <Ref. to CO(H4SO)-39, Radiator Sub Fan and Fan Motor.>	Replace the thermostat. <Ref. to CO(H4SO)-23, Thermostat.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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

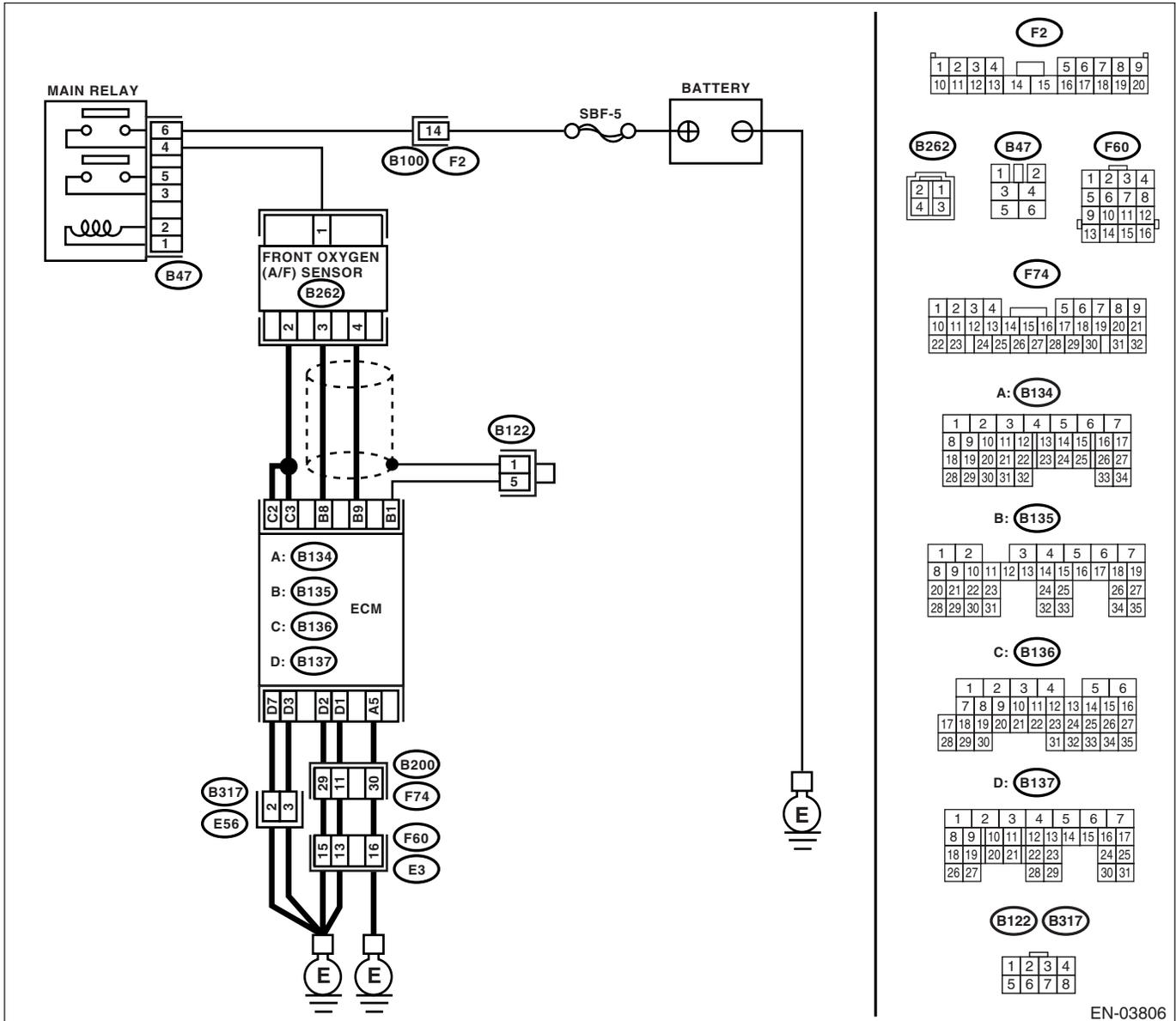
### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-58, DTC P0131 O2 SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03806

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1</b> <b>CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.</b>	Does water enter the connector?	Dry the water thoroughly.	Go to step 2.
<b>2</b> <b>CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.</b> 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. <i>Connector &amp; terminal</i> <i>(B135) No. 8 — Chassis ground:</i> <i>(B135) No. 9 — Chassis ground:</i>	Is the resistance more than 1 MΩ?	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4DOTC)-41, Front Oxygen (A/F) Sensor.>	Repair the ground short circuit of harness between ECM and front oxygen (A/F) sensor connector.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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

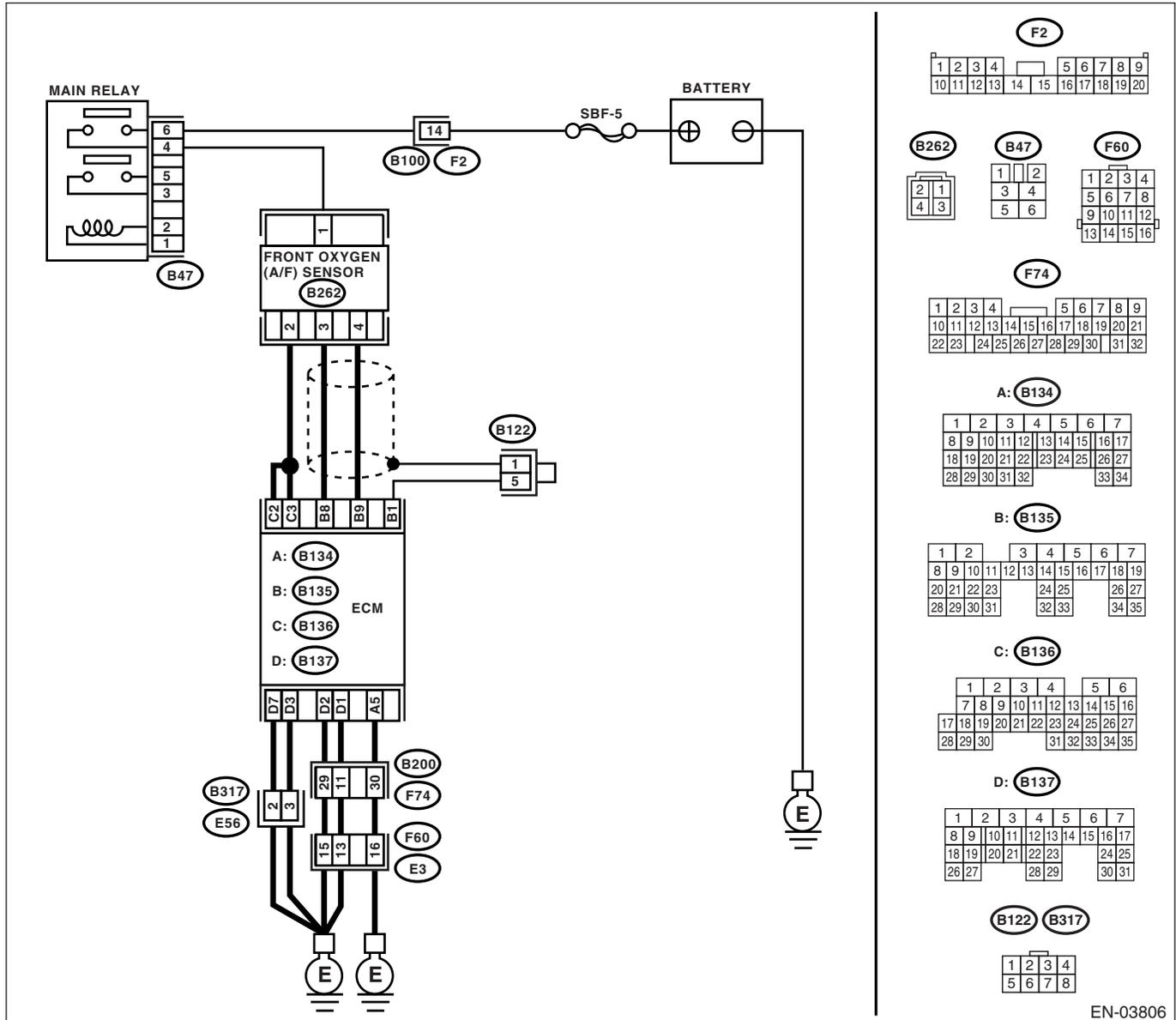
### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-60, DTC P0132 O2 SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03806

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1</b> <b>CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.</b>	Does water enter the connector?	Dry the water thoroughly.	Go to step 2.
<b>2</b> <b>CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.</b> 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. <b>Connector &amp; terminal</b> <i>(B135) No. 8 (+) — Chassis ground (-):</i> <i>(B135) No. 9 (+) — Chassis ground (-):</i>	Is the voltage more than 8 V?	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4DOTC)-41, Front Oxygen (A/F) Sensor.>	Repair the battery short circuit of harness between ECM and front oxygen (A/F) sensor connector.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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

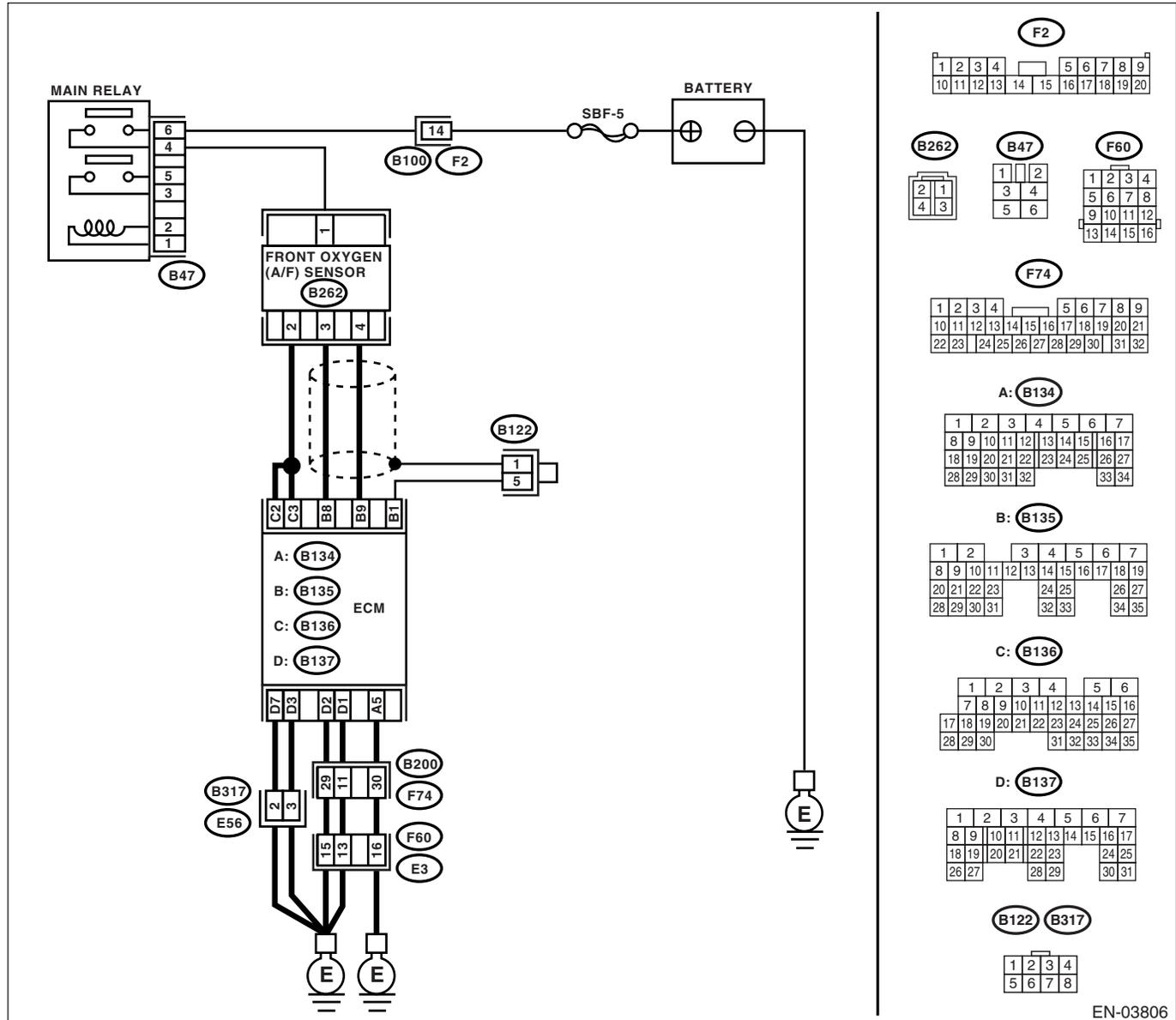
### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-62, DTC P0133 O2 SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03806

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1</b> <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>  NOTE: In this case, it is not necessary to inspect DTC P0133.	Go to step 2.
<b>2</b> <b>CHECK EXHAUST SYSTEM.</b> NOTE: Check the following item. <ul style="list-style-type: none"> <li>• Loose installation of front portion of exhaust pipe onto cylinder heads</li> <li>• Loose connection between front exhaust pipe and front catalytic converter</li> <li>• Damage of exhaust pipe resulting in a hole</li> </ul>	Is there any fault in exhaust system?	Repair the exhaust system.	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4DOTC)-41, Front Oxygen (A/F) Sensor.>

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

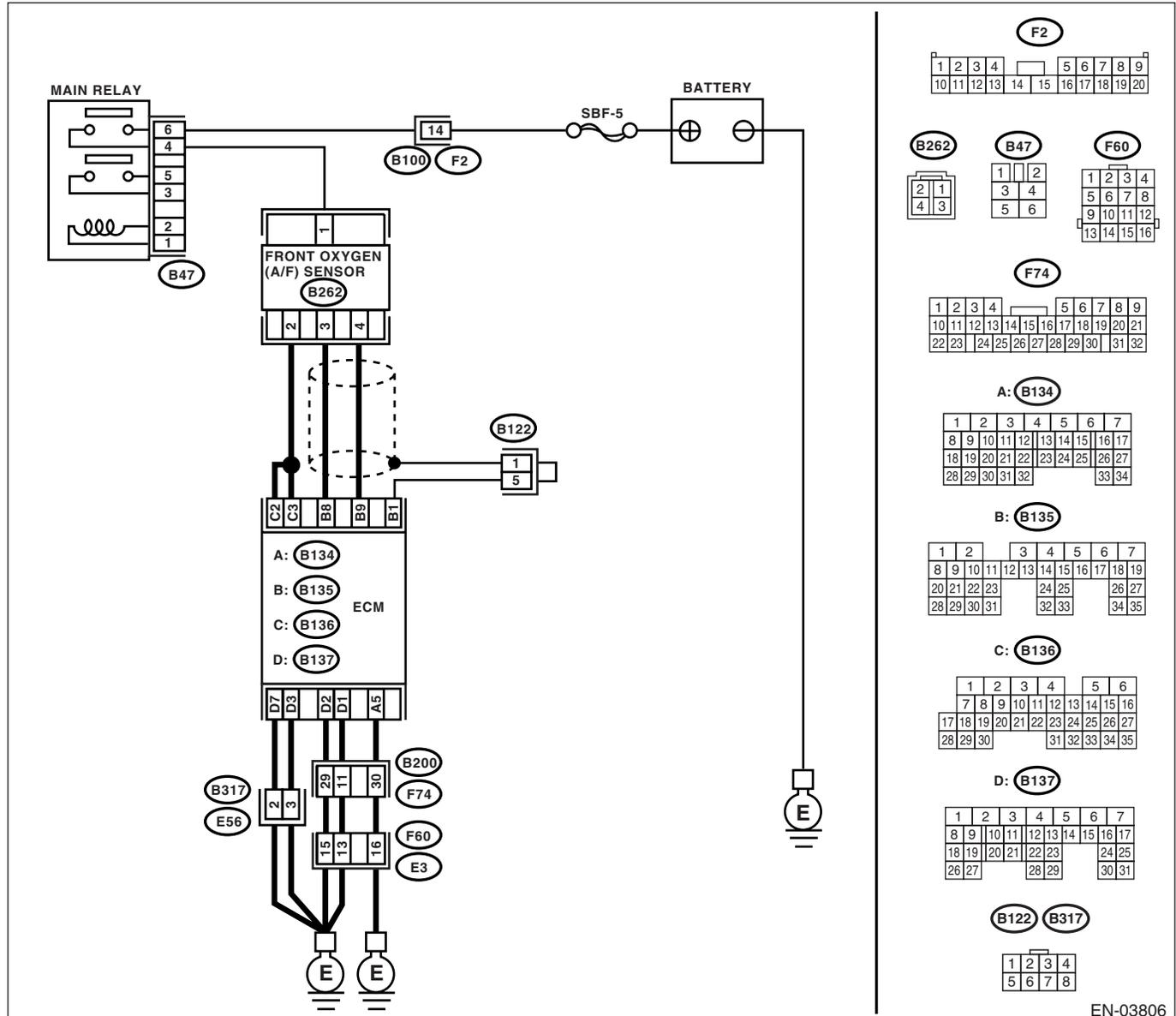
### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-65, DTC P0134 O2 SENSOR CIRCUIT NO ACTIVITY DETECTED (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03806

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1</b>    <b>CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.</b></p> <p>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.</p> <p><b>Connector &amp; terminal</b> <b>(B135) No. 8 — (B262) No. 3:</b> <b>(B135) No. 9 — (B262) No. 4:</b></p>	Is the resistance less than 1 $\Omega$ ?	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4DOTC)-41, Front Oxygen (A/F) Sensor.>	Repair the open circuit of the harness between ECM and front oxygen (A/F) sensor connector.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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

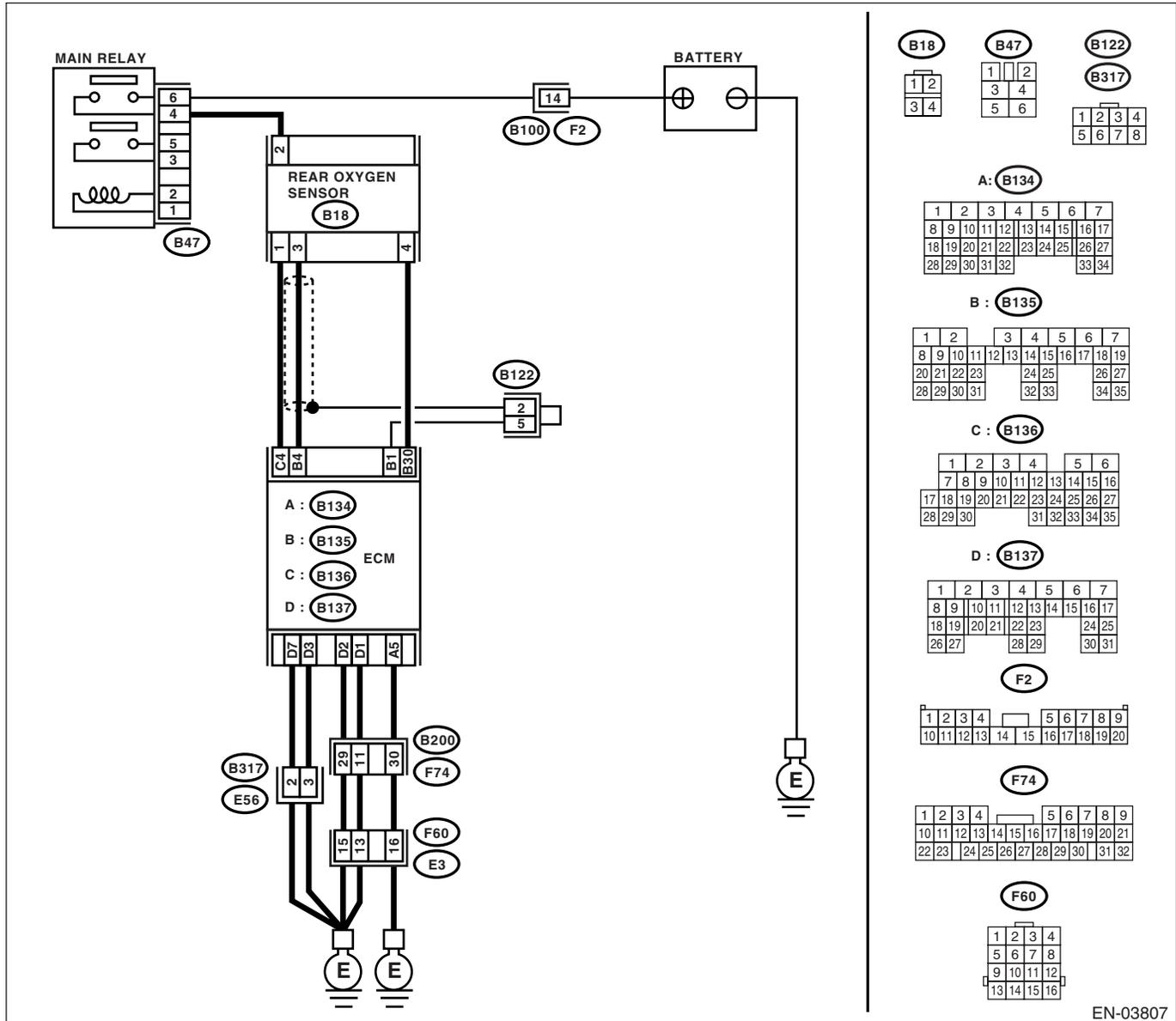
### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-67, DTC P0137 O2 SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03807

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1	<b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).> <b>NOTE:</b> In this case, it is not necessary to inspect DTC P0137.
2	<b>CHECK REAR OXYGEN SENSOR DATA.</b> 1) Warm-up the engine until engine coolant temperature is above 70°C (158°F), and keep the engine rpm at 3,000 rpm. (Max. 2 minutes) 2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool. <b>NOTE:</b> • For MT model, depress the clutch pedal. • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.	Is the voltage more than 490 mV?	Go to step 6.
3	<b>CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.</b>	Does water enter the connector?	Dry the water thoroughly.
4	<b>CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and rear oxygen sensor. 3) Measure the resistance of harness between ECM and rear oxygen sensor connector. <b>Connector &amp; terminal</b> <b>(B135) No. 4 — (B18) No. 3:</b> <b>(B135) No. 30 — (B18) No. 4:</b>	Is the resistance more than 3 Ω?	Repair the open circuit of harness between ECM and rear oxygen sensor connector.
5	<b>CHECK HARNESS BETWEEN REAR OXYGEN SENSOR AND ECM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the rear oxygen sensor. 3) Turn the ignition switch to ON. 4) Measure the resistance between the rear oxygen sensor harness connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B18) No. 3 (+) — Chassis ground (-):</b>	Is the voltage 0.2 — 0.5 V?	Replace the rear oxygen sensor. <Ref. to FU(H4DOTC)-43, Rear Oxygen Sensor.> <b>NOTE:</b> In this case, repair the following item: • Open circuit of harness between rear oxygen sensor and ECM connector • Poor contact of the rear oxygen sensor connector • Poor contact in ECM connector

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>6</b> <b>CHECK EXHAUST SYSTEM.</b> Check exhaust system parts. NOTE: Check the following item. <ul style="list-style-type: none"><li>• Exhaust system part looseness and incomplete attachment</li><li>• Damage (crack, hole etc.) of parts</li><li>• Looseness and improper attachment of parts between front oxygen (A/F) sensor and rear oxygen sensor</li></ul>	Is there any fault in exhaust system?	Repair or replace faulty parts.	Replace the rear oxygen sensor. <Ref. to FU(H4DOTC)-43, Rear Oxygen Sensor.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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

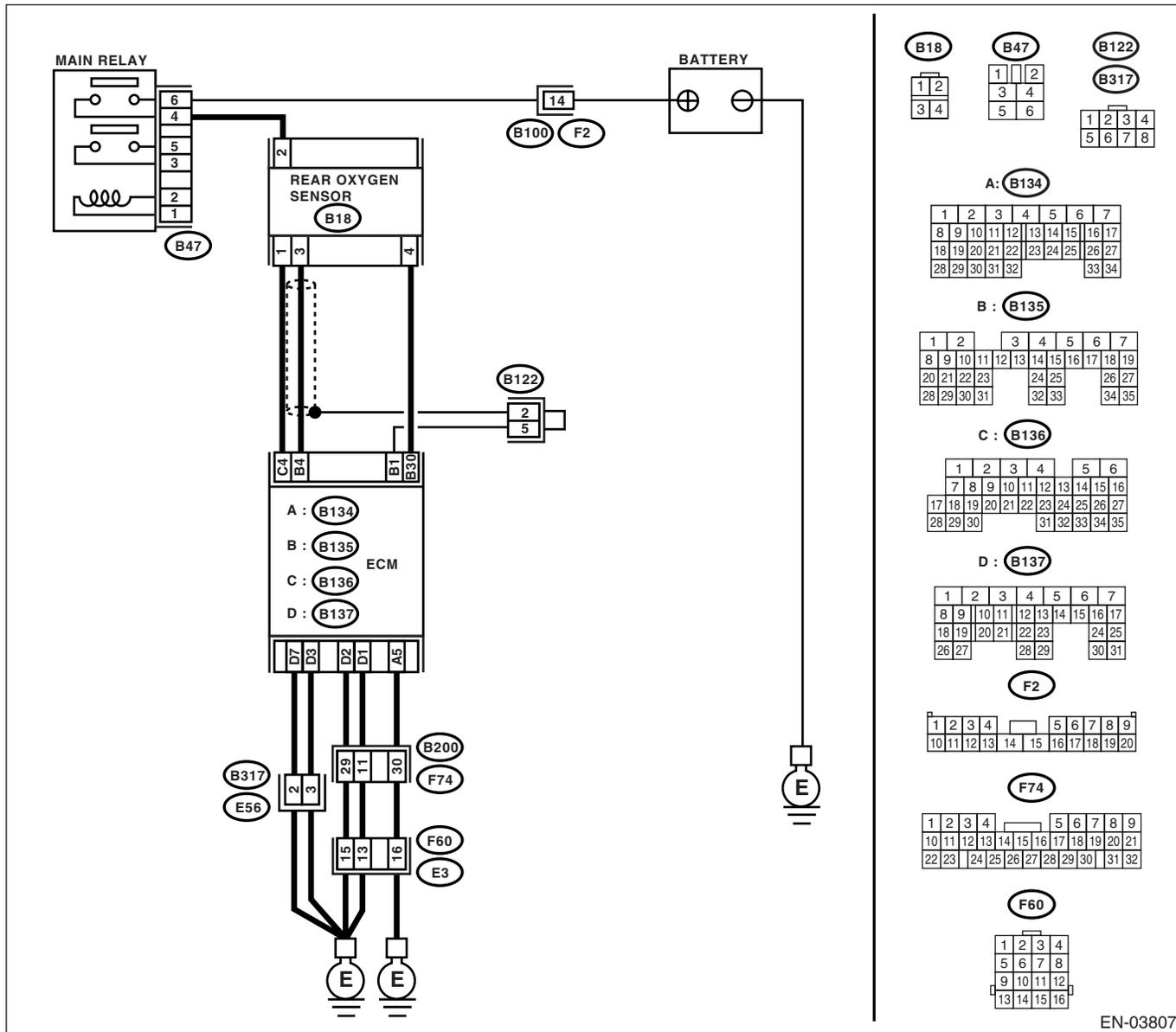
### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-70, DTC P0138 O2 SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03807

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No	
1	<b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P0138.	Go to step 2.
2	<b>CHECK REAR OXYGEN SENSOR DATA.</b> 1) Warm-up the engine until engine coolant temperature is above 70°C (158°F), and drop the engine rpm suddenly from 3,000 rpm. 2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool. NOTE: • For MT model, depress the clutch pedal. • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.	Is the voltage less than 250 mV?	Go to step 6.	Go to step 3.
3	<b>CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.</b>	Does water enter the connector?	Dry the water thoroughly.	Go to step 4.
4	<b>CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and rear oxygen sensor. 3) Measure the resistance of harness between ECM and rear oxygen sensor connector. <b>Connector &amp; terminal</b> <b>(B135) No. 4 — (B18) No. 3:</b> <b>(B135) No. 30 — (B18) No. 4:</b>	Is the resistance more than 3 Ω?	Repair the open circuit of harness between ECM and rear oxygen sensor connector.	Go to step 5.
5	<b>CHECK HARNESS BETWEEN REAR OXYGEN SENSOR AND ECM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the rear oxygen sensor. 3) Turn the ignition switch to ON. 4) Measure the resistance between the rear oxygen sensor harness connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B18) No. 3 (+) — Chassis ground (-):</b>	Is the voltage 0.2 — 0.5 V?	Replace the rear oxygen sensor. <Ref. to FU(H4DOTC)-43, Rear Oxygen Sensor.>	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between rear oxygen sensor and ECM connector • Poor contact of the rear oxygen sensor connector • Poor contact in ECM connector

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>6</b> <b>CHECK EXHAUST SYSTEM.</b> Check exhaust system parts. NOTE: Check the following item. <ul style="list-style-type: none"><li>• Exhaust system part looseness and incomplete attachment</li><li>• Damage (crack, hole etc.) of parts</li><li>• Looseness and improper attachment of parts between front oxygen (A/F) sensor and rear oxygen sensor</li></ul>	Is there any fault in exhaust system?	Repair or replace faulty parts.	Replace the rear oxygen sensor. <Ref. to FU(H4DOTC)-43, Rear Oxygen Sensor.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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

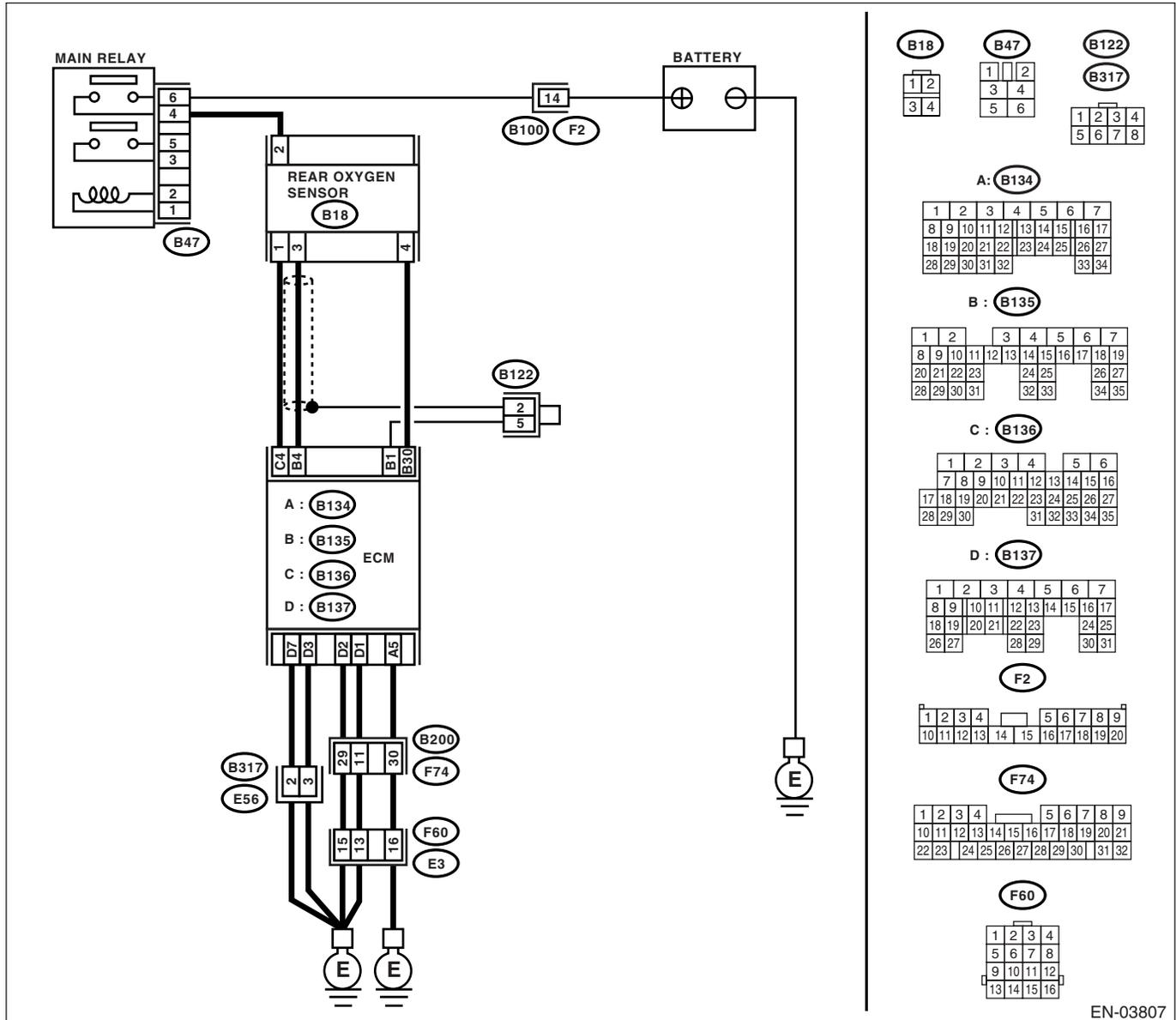
### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-71, DTC P0139 O2 SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03807

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1</b> <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>  NOTE: In this case, it is not necessary to inspect DTC P0139.	Go to step 2.
<b>2</b> <b>CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and rear oxygen sensor. 3) Measure the resistance of harness between ECM and rear oxygen sensor connector.  <i>Connector &amp; terminal</i> <i>(B135) No. 4 — (B18) No. 3:</i>	Is the resistance less than 1 $\Omega$ ?	Go to step 3.	Repair the harness and connector.  NOTE: In this case, repair the following item: <ul style="list-style-type: none"> <li>• Open circuit of harness between rear oxygen sensor and ECM connector</li> </ul>
<b>3</b> <b>CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.</b> Measure the voltage between the rear oxygen sensor harness connector and chassis ground.  <i>Connector &amp; terminal</i> <i>(B18) No. 3 — Chassis ground:</i>	Is the resistance more than 1 M $\Omega$ ?	Go to step 4.	Repair the chassis short circuit of the harness between the rear oxygen sensor and ECM connector.
<b>4</b> <b>CHECK REAR OXYGEN SENSOR.</b> Measure the resistance between the rear oxygen sensor connectors.  <i>Terminals</i> <i>No. 3 — No. 4:</i>	Is the resistance less than 1 $\Omega$ ?	Replace the rear oxygen sensor. <Ref. to FU(H4DOTC)-43, Rear Oxygen Sensor.>	Repair the poor contact in rear oxygen sensor connector.

## AG:DTC P0140 O2 SENSOR CIRCUIT NO ACTIVITY DETECTED (BANK1 SENSOR2)

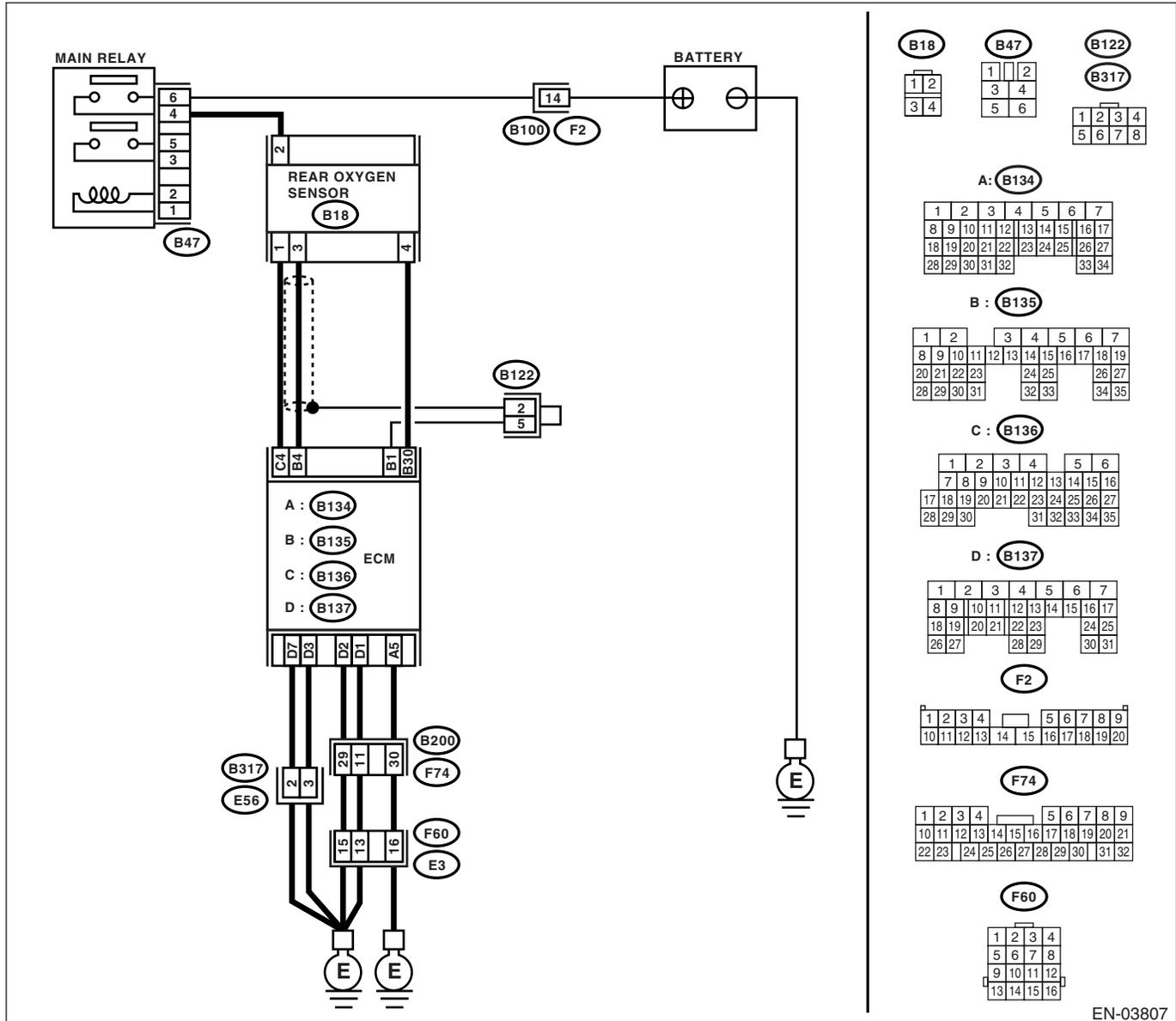
### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-77, DTC P0140 O2 SENSOR CIRCUIT NO ACTIVITY DETECTED (BANK1 SENSOR2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03807

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1</b> <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>  NOTE: In this case, it is not necessary to inspect DTC P0140.	Go to step 2.
<b>2</b> <b>CHECK REAR OXYGEN SENSOR DATA.</b> 1) Warm-up the engine until engine coolant temperature is above 70°C (158°F), and keep the engine rpm at 3,000 rpm. (Max. 2 minutes) 2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool.  NOTE: <ul style="list-style-type: none"> <li>• For MT model, depress the clutch pedal.</li> <li>• Subaru Select Monitor</li> </ul> For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.> <ul style="list-style-type: none"> <li>• General scan tool</li> </ul> For detailed operation procedure, refer to the general scan tool operation manual.	Is the voltage more than 490 mV?	Go to step 7.	Go to step 3.
<b>3</b> <b>CHECK REAR OXYGEN SENSOR DATA.</b> 1) Warm-up the engine until engine coolant temperature is above 70°C (158°F), and rapidly reduce the engine speed from 3,000 rpm. 2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool.  NOTE: <ul style="list-style-type: none"> <li>• For MT model, depress the clutch pedal.</li> <li>• Subaru Select Monitor</li> </ul> For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.> <ul style="list-style-type: none"> <li>• General scan tool</li> </ul> For detailed operation procedure, refer to the general scan tool operation manual.	Is the voltage less than 250 mV?	Go to step 7.	Go to step 4.
<b>4</b> <b>CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.</b>	Does water enter the connector?	Dry the water thoroughly.	Go to step 5.
<b>5</b> <b>CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and rear oxygen sensor. 3) Measure the resistance of harness between ECM and rear oxygen sensor connector.  <b>Connector &amp; terminal</b> <b>(B135) No. 4 — (B18) No. 3:</b> <b>(B135) No. 30 — (B18) No. 4:</b>	Is the resistance more than 3 Ω?	Repair the open circuit of harness between ECM and rear oxygen sensor connector.	Go to step 6.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>6</b>      <b>CHECK HARNESS BETWEEN REAR OXYGEN SENSOR AND ECM CONNECTOR.</b>                      1) Turn the ignition switch to OFF.                      2) Disconnect the connector from the rear oxygen sensor.                      3) Turn the ignition switch to ON.                      4) Measure the resistance between the rear oxygen sensor harness connector and chassis ground.</p> <p><b>Connector &amp; terminal</b>  <b>(B18) No. 3 (+) — Chassis ground (-):</b></p>	<p>Is the voltage 0.2 — 0.5 V?</p>	<p>Replace the rear oxygen sensor.                      &lt;Ref. to FU(H4DOTC)-43, Rear Oxygen Sensor.&gt;</p>	<p>Repair the harness and connector.</p> <p><b>NOTE:</b>                      In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Open circuit of harness between rear oxygen sensor and ECM connector</li> <li>• Poor contact of the rear oxygen sensor connector</li> <li>• Poor contact in ECM connector</li> </ul>
<p><b>7</b>      <b>CHECK EXHAUST SYSTEM.</b>                      Check exhaust system parts.</p> <p><b>NOTE:</b>                      Check the following item.</p> <ul style="list-style-type: none"> <li>• Exhaust system part looseness and incomplete attachment</li> <li>• Damage (crack, hole etc.) of parts</li> <li>• Looseness and improper attachment of parts between front oxygen (A/F) sensor and rear oxygen sensor</li> </ul>	<p>Is there any fault in exhaust system?</p>	<p>Repair or replace faulty parts.</p>	<p>Replace the rear oxygen sensor.                      &lt;Ref. to FU(H4DOTC)-43, Rear Oxygen Sensor.&gt;</p>

## AH:DTC P0171 SYSTEM TOO LEAN (BANK 1)

NOTE:

For the diagnostic procedure, refer to DTC P0172. <Ref. to EN(H4DOTC)(diag)-142, DTC P0172 SYSTEM TOO RICH (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## AI: DTC P0172 SYSTEM TOO RICH (BANK 1)

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-79, DTC P0171 SYSTEM TOO LEAN (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>and <Ref. to GD(H4DOTC)-82, DTC P0172 SYSTEM TOO RICH (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

### TROUBLE SYMPTOM:

- Improper idling
- Engine stalls.
- Poor driving performance

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

Step	Check	Yes	No
1 <b>CHECK EXHAUST SYSTEM.</b>	Are there holes or loose bolts on exhaust system?	Repair the exhaust system.	Go to step 2.
2 <b>CHECK AIR INTAKE SYSTEM.</b>	Are there holes, loose bolts or disconnection of hose on air intake system?	Repair the air intake system.	Go to step 3.
3 <b>CHECK FUEL PRESSURE</b> <b>WARNING:</b> • Place “NO FIRE” signs near the working area. • Be careful not to spill fuel. Measure the fuel pressure while disconnecting pressure regulator vacuum hose from intake manifold.<Ref. to ME(H4DOTC)-25, INSPECTION, Fuel Pressure.> <b>WARNING:</b> <b>Release fuel pressure before removing the fuel pressure gauge.</b> NOTE: If fuel pressure does not increase, squeeze the fuel return hose 2 to 3 times, then measure fuel pressure again.	Is the measured value 284 — 314 kPa (2.9 — 3.2 kgf/cm <sup>2</sup> , 41 — 46 psi)?	Go to step 4.	Repair the following item. Fuel pressure is too high: • Clogged fuel return line or bent hose Fuel pressure is too low: • Improper fuel pump discharge • Clogged fuel supply line
4 <b>CHECK FUEL PRESSURE</b> After connecting the pressure regulator vacuum hose, measure fuel pressure.<Ref. to ME(H4DOTC)-25, INSPECTION, Fuel Pressure.> <b>WARNING:</b> <b>Release fuel pressure before removing the fuel pressure gauge.</b> NOTE: • If fuel pressure does not increase, squeeze the 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.	Is the measured value 230 — 260 kPa (2.35 — 2.65 kgf/cm <sup>2</sup> , 33 — 38 psi)?	Go to step 5.	Repair the following item. Fuel pressure is too high: • Faulty pressure regulator • Clogged fuel return line or bent hose Fuel pressure is too low: • Faulty pressure regulator • Improper fuel pump discharge • Clogged fuel supply line

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>5 CHECK ENGINE COOLANT TEMPERATURE SENSOR.</b></p> <p>1) Start the engine and warm-up completely.</p> <p>2) Read the data of the engine coolant temperature sensor signal using the Subaru Select Monitor or the general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• General scan tool</li> </ul> <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the temperature above 60°C (140°F)?</p>	<p>Go to step 6.</p>	<p>Replace the engine coolant temperature sensor. &lt;Ref. to FU(H4DOTC)-27, Engine Coolant Temperature Sensor.&gt;</p>
<p><b>6 CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR</b></p> <p>1) Start the engine and warm-up engine until coolant temperature is greater than 60°C (140°F).</p> <p>2) Place the shift lever in neutral position.</p> <p>3) Turn the A/C switch to OFF.</p> <p>4) Turn all the accessory switches off.</p> <p>5) Read the data of mass air flow and intake air temperature sensor signal using the Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• General scan tool</li> </ul> <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the measured value 2.7 — 4.7 g/s (0.36 — 0.62 lb/m)</p>	<p>Go to step 7.</p>	<p>Replace the mass air flow and intake air temperature sensor. &lt;Ref. to FU(H4DOTC)-31, Mass Air Flow and Intake Air Temperature Sensor.&gt;</p>
<p><b>7 CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR</b></p> <p>1) Start the engine and warm-up engine until coolant temperature is greater than 60°C (140°F).</p> <p>2) Place the shift lever in neutral position.</p> <p>3) Turn the A/C switch to OFF.</p> <p>4) Turn all the accessory switches off.</p> <p>5) Open the front hood.</p> <p>6) Measure the ambient temperature.</p> <p>7) Read the data of mass air flow and intake air temperature sensor signal using the Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• General scan tool</li> </ul> <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Subtract ambient temperature from intake air temperature. Is the obtained value -10 — 50°C (-18 — 90°F)?</p>	<p>Replace the ECM. &lt;Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).&gt;</p>	<p>Check mass air flow and intake air temperature sensor. &lt;Ref. to FU(H4DOTC)-31, Mass Air Flow and Intake Air Temperature Sensor.&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## AJ:DTC P0181 FUEL TEMPERATURE SENSOR "A" CIRCUIT RANGE/PERFORMANCE

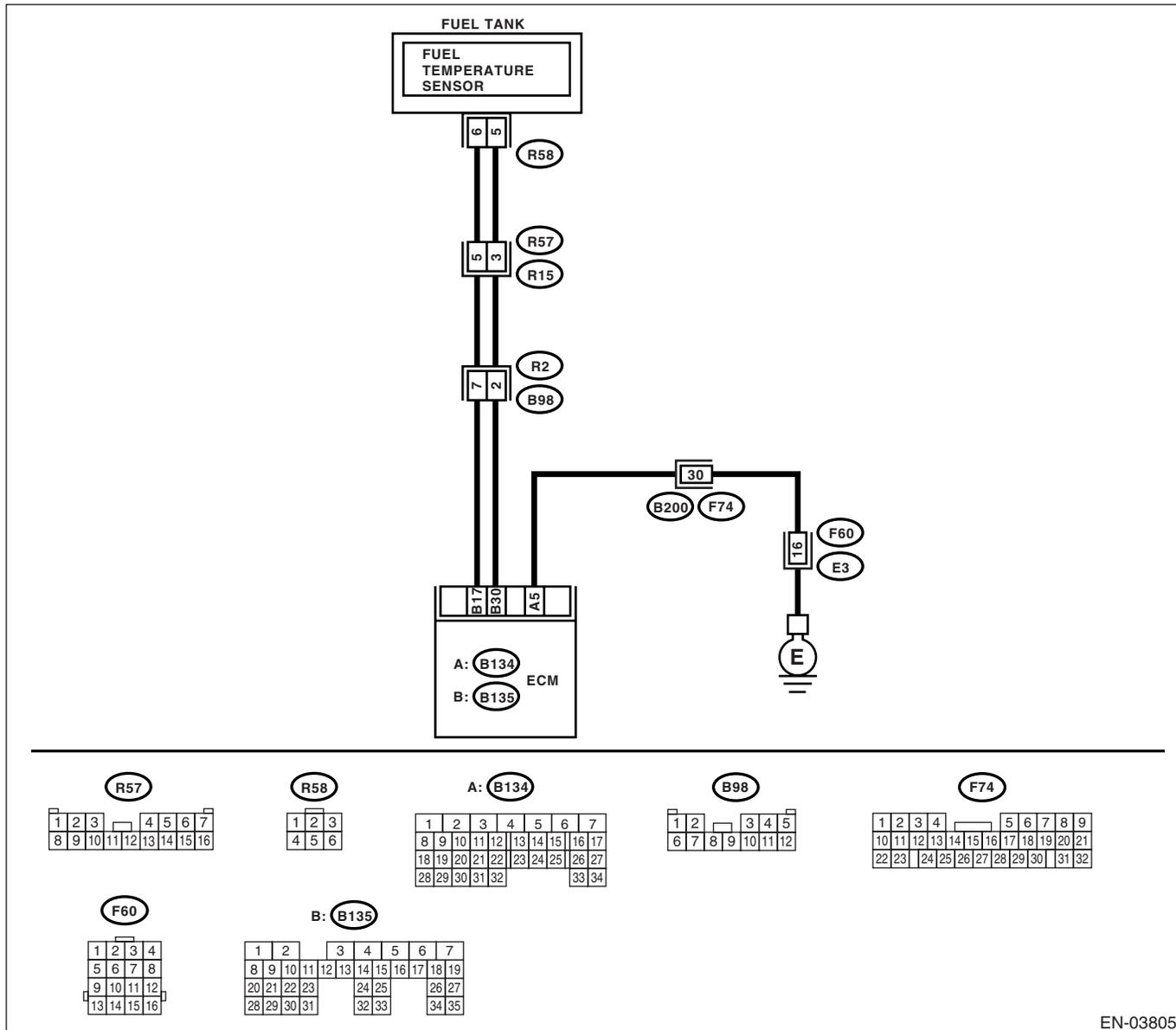
### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-85, DTC P0181 FUEL TEMPERATURE SENSOR "A" CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03805

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>  NOTE: In this case, it is not necessary to inspect DTC P0181.	Replace the fuel temperature sensor. <Ref. to EC(H4DOTC)-13, Fuel Temperature Sensor.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## AK:DTC P0182 FUEL TEMPERATURE SENSOR "A" CIRCUIT LOW INPUT

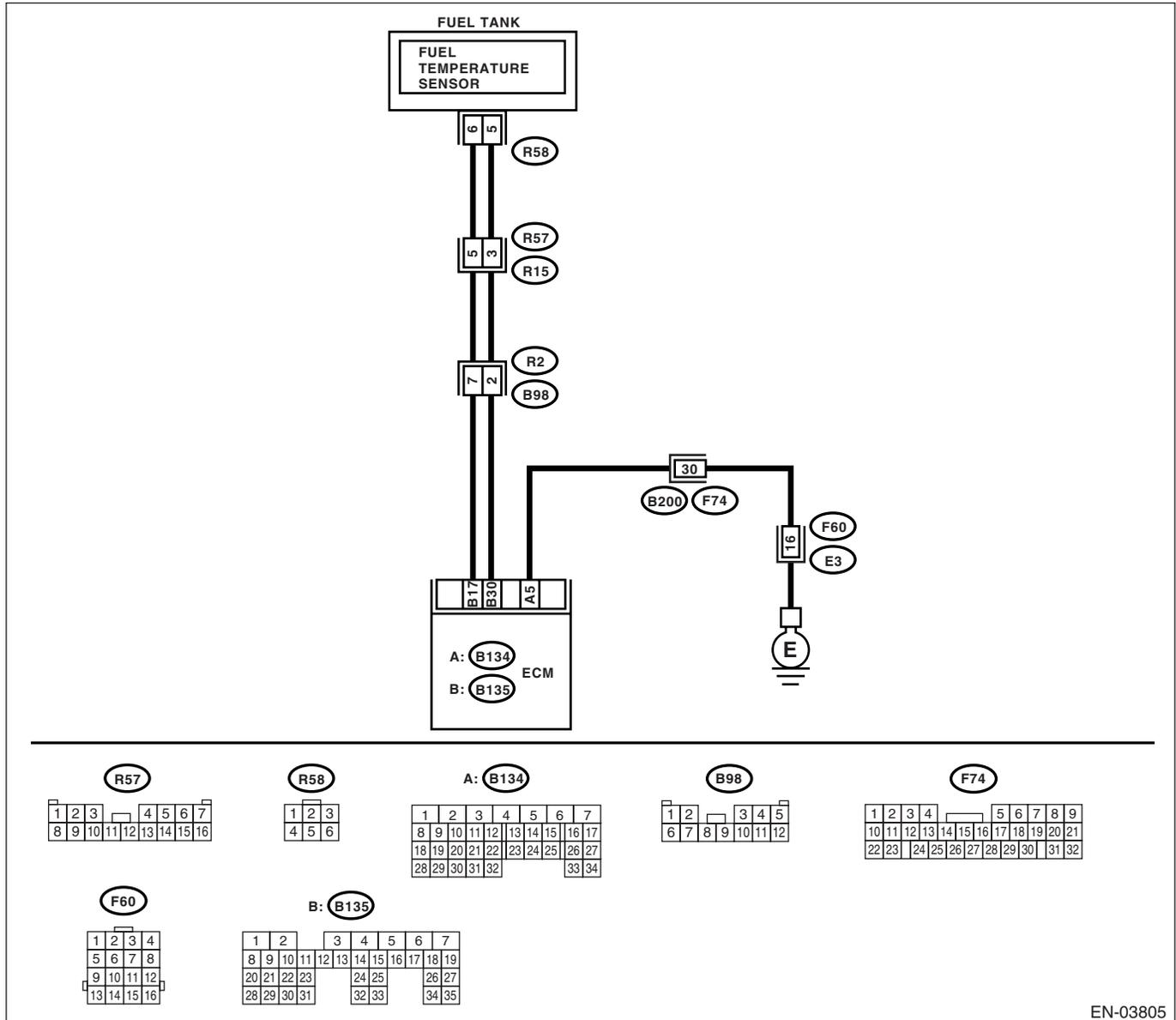
### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-88, DTC P0182 FUEL TEMPERATURE SENSOR "A" CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03805

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK CURRENT DATA.</b></p> <p>1) Start the engine.</p> <p>2) Read the data of the fuel temperature sensor signal using the Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"><li>• Subaru Select Monitor</li></ul> <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"><li>• General scan tool</li></ul> <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the temperature above 150°C (302°F)?</p>	<p>Go to step 2.</p>	<p>Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time.</p>
<p><b>2</b></p> <p><b>CHECK CURRENT DATA.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Remove the access hole lid.</p> <p>3) Disconnect the connector from fuel pump.</p> <p>4) Turn the ignition switch to ON.</p> <p>5) Read data of the fuel temperature sensor signal using the Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"><li>• Subaru Select Monitor</li></ul> <p>For detailed operation procedure, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"><li>• General scan tool</li></ul> <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the temperature less than 40°C (40°F)?</p>	<p>Replace the fuel temperature sensor. &lt;Ref. to EC(H4DOTC)-13, Fuel Temperature Sensor.&gt;</p>	<p>Repair the ground short circuit of the harness between fuel injector and ECM connector.</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## AL:DTC P0183 FUEL TEMPERATURE SENSOR "A" CIRCUIT HIGH INPUT

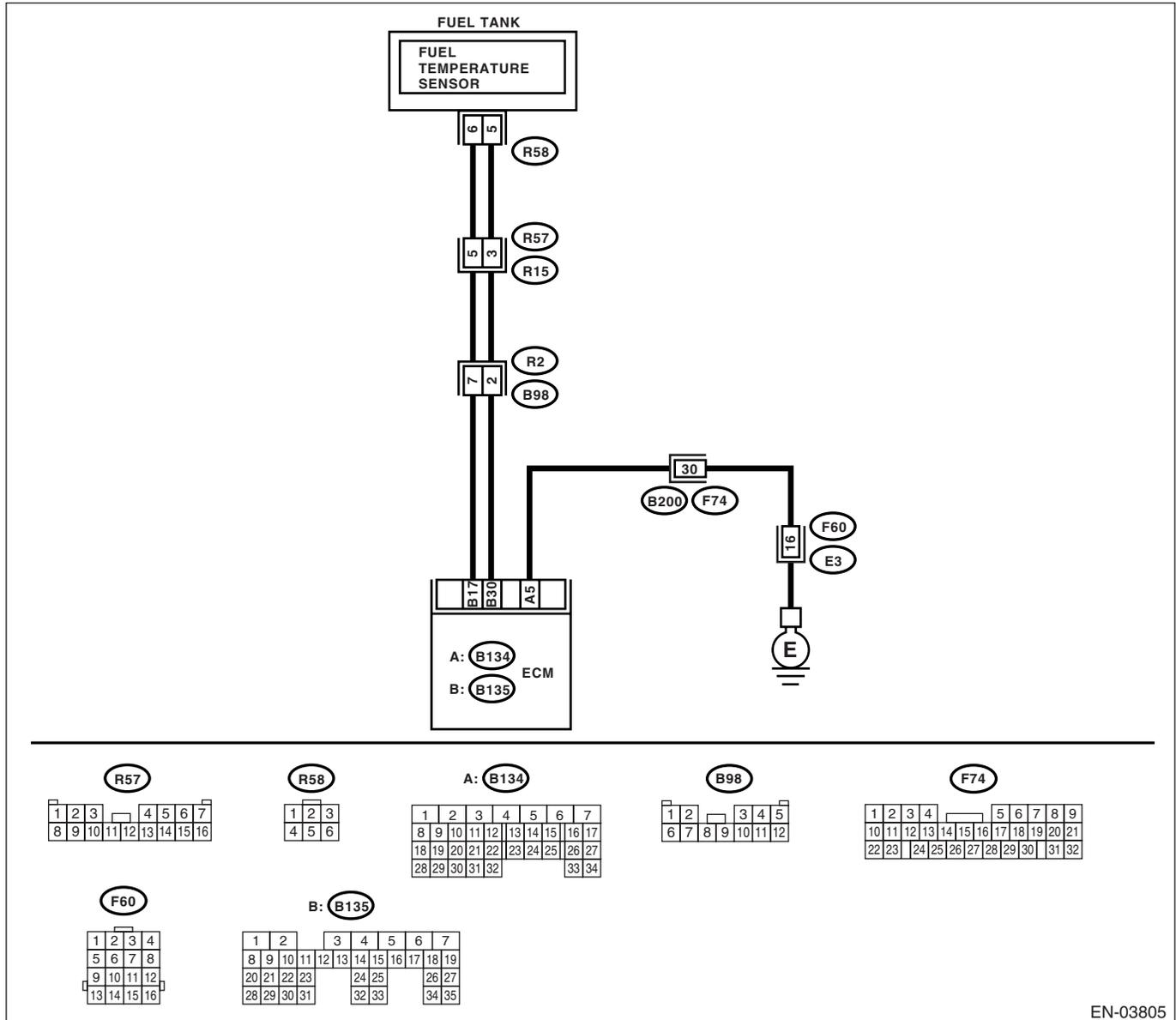
### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-90, DTC P0183 FUEL TEMPERATURE SENSOR "A" CIRCUIT HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03805

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK CURRENT DATA.</b></p> <p>1) Start the engine.</p> <p>2) Read the data of the fuel temperature sensor signal using the Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedure, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• General scan tool</li> </ul> <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the temperature less than –40°C (–40°F)?</p>	<p>Go to step 2.</p>	<p>Repair the poor contact.</p> <p>NOTE:</p> <p>In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Poor contact in fuel pump connector</li> <li>• Poor contact in ECM connector</li> <li>• Poor contact of coupling connector</li> <li>• Poor contact of joint connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Remove the access hole lid.</p> <p>3) Disconnect the connector from fuel pump.</p> <p>4) Measure the voltage between fuel pump connector and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(R58) No. 6 (+) — Chassis ground (-):</b></p>	<p>Is the voltage more than 10 V?</p>	<p>Repair the battery short circuit of harness between ECM and fuel pump connector.</p>	<p>Go to step 3.</p>
<p><b>3</b></p> <p><b>CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to ON.</p> <p>2) Measure the voltage between fuel pump connector and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(R58) No. 6 (+) — Chassis ground (-):</b></p>	<p>Is the voltage more than 10 V?</p>	<p>Repair the battery short circuit of harness between ECM and fuel pump connector.</p>	<p>Go to step 4.</p>
<p><b>4</b></p> <p><b>CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>Measure the voltage between fuel pump connector and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(R58) No. 6 (+) — Chassis ground (-):</b></p>	<p>Is the voltage more than 4 V?</p>	<p>Go to step 5.</p>	<p>Repair the harness and connector.</p> <p>NOTE:</p> <p>In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Open circuit of harness between ECM and fuel pump connector</li> <li>• Poor contact in fuel pump connector</li> <li>• Poor contact in ECM connector</li> <li>• Poor contact of coupling connector</li> </ul>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>5</b></p> <p><b>CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connectors from ECM.                      3) Measure the resistance of the harness between fuel pump connector and ECM.</p> <p><b>Connector &amp; terminal</b>  <b>(R58) No. 5 — (B135) No. 30:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Replace the fuel temperature sensor. &lt;Ref. to EC(H4DOTC)-13, Fuel Temperature Sensor.&gt;</p>	<p>Repair the harness and connector.</p> <p><b>NOTE:</b>                      In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Open circuit of harness between ECM and fuel pump connector</li> <li>• Poor contact in fuel pump connector</li> <li>• Poor contact in ECM connector</li> <li>• Poor contact of coupling connector</li> <li>• Poor contact of joint connector</li> </ul>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## AM:DTC P0222 THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT LOW

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-92, DTC P0222 THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

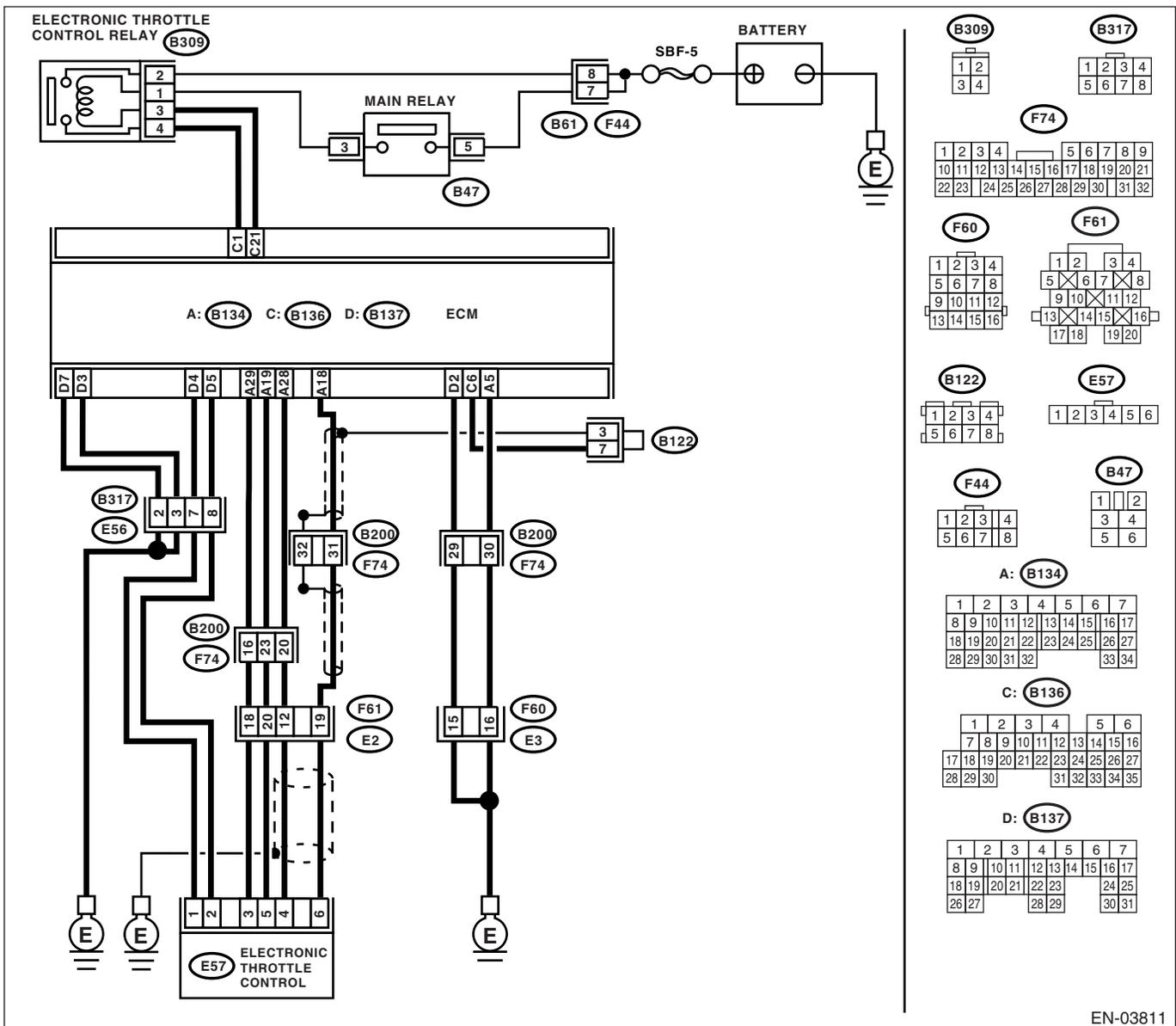
### TROUBLE SYMPTOM:

- Improper idling
- Poor driving performance
- Engine stalls.

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>

### WIRING DIAGRAM:



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK SENSOR OUTPUT.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM connector and terminal. <i><b>Connector &amp; terminal</b></i> <i><b>(B134) No. 28 (+) — (B134) No. 29 (-):</b></i> 3) Check the voltage change while shaking the ECM harness and connector, engine harness connector, and electronic control throttle connector harness.	Is the voltage more than 0.8 V?	Go to step 2.	Go to step 3.
<b>2 CHECK POOR CONTACT.</b> 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.
<b>3 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM. 3) Disconnect the connectors from electronic throttle control. 4) Measure the resistance between ECM connector and electronic throttle control connector. <i><b>Connector &amp; terminal</b></i> <i><b>(B134) No. 19 — (E57) No. 5:</b></i>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open circuit of harness connector.
<b>4 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> Measure the resistance between ECM connector and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B134) No. 19 — Chassis ground:</b></i> <i><b>(B134) No. 28 — Chassis ground:</b></i>	Is the resistance more than 1 M $\Omega$ ?	Go to step 5.	Repair the chassis short circuit of harness.
<b>5 CHECK SENSOR POWER SUPPLY.</b> 1) Connect the ECM connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between electronic throttle control connector and engine ground. <i><b>Connector &amp; terminal</b></i> <i><b>(E57) No. 5 (+) — Engine ground (-):</b></i> 4) Check the voltage change by shaking the harness and connector of ECM, and engine harness connector, while monitoring the value with voltage meter.	Is the voltage 4.5 — 5.5 V?	Go to step 6.	Repair poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>
<b>6 CHECK SHORT CIRCUIT INSIDE THE ECM.</b> 1) Turn the ignition switch to OFF. 2) Measure the resistance between electronic throttle control connector and engine ground. <i><b>Connector &amp; terminal</b></i> <i><b>(E57) No. 4 — Engine ground:</b></i>	Is the resistance more than 10 $\Omega$ ?	Repair the poor contact of electronic throttle control connector. Replace the electronic throttle control if defective.	Repair poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>

## AN:DTC P0223 THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT HIGH

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-94, DTC P0223 THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

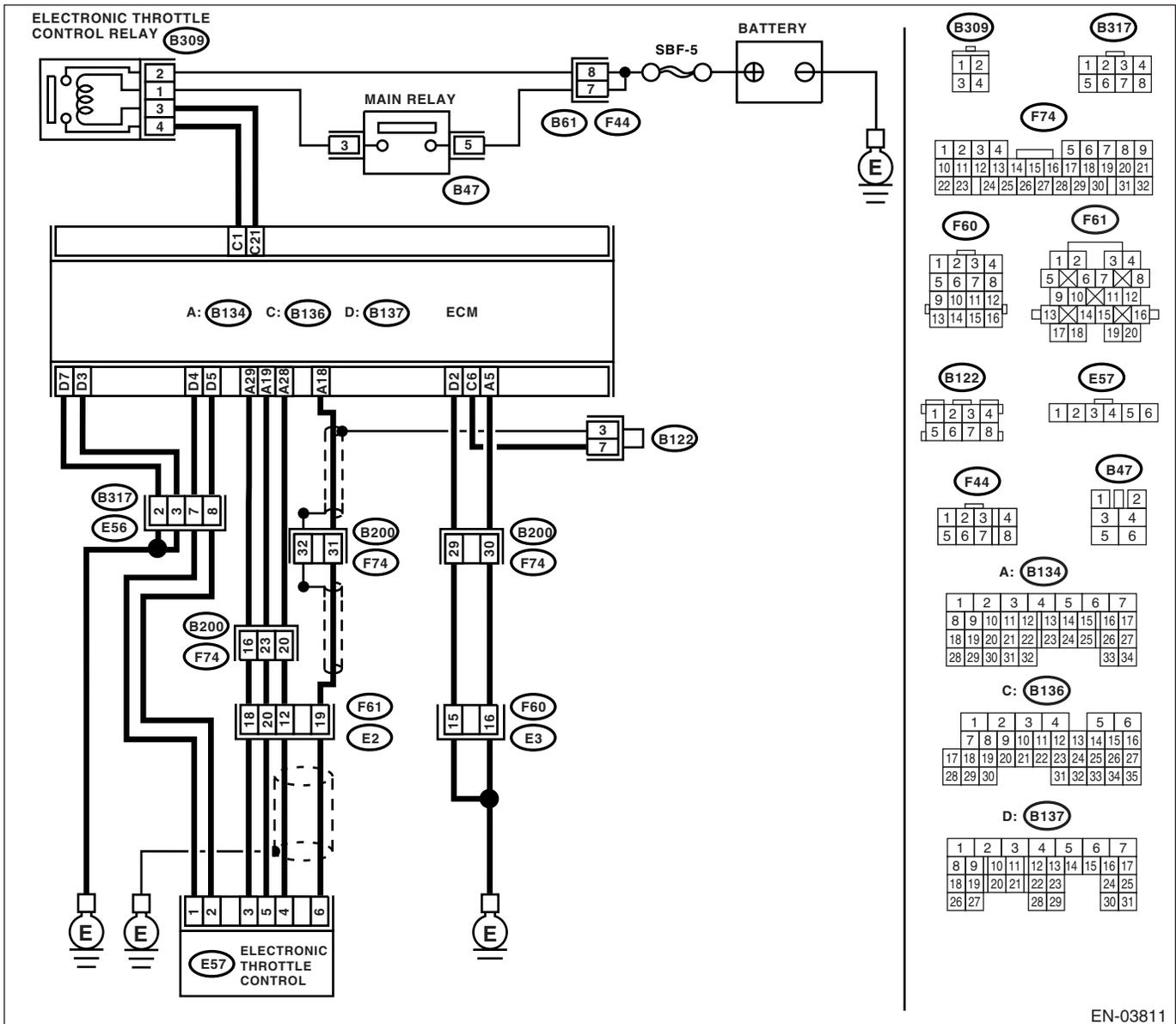
### TROUBLE SYMPTOM:

- Improper idling
- Poor driving performance
- Engine stalls.

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03811

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK SENSOR OUTPUT.</b> 1) Turn the ignition switch to ON. 2) Read the data of sub throttle sensor signal using Subaru Select Monitor. 3) Check the voltage change while shaking the ECM harness and connector, engine harness connector, and electronic control throttle connector harness.	Is the voltage less than 4.73 V?	Go to step 2.	Go to step 3.
<b>2 CHECK POOR CONTACT.</b> 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.
<b>3 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM. 3) Disconnect the connectors from electronic throttle control. 4) Measure the resistance between ECM connector and electronic throttle control connector. <i><b>Connector &amp; terminal</b></i> <i><b>(B134) No. 28 — (E57) No. 4:</b></i> <i><b>(B134) No. 29 — (E57) No. 3:</b></i>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open circuit of harness connector.
<b>4 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Connect the ECM connector. 2) Measure the resistance between electronic throttle control connector and engine ground. <i><b>Connector &amp; terminal</b></i> <i><b>(E57) No. 3 — Engine ground:</b></i>	Is the resistance less than 5 $\Omega$ ?	Go to step 5.	Repair poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>
<b>5 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Connect the ECM connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between electronic throttle control connector and engine ground. <i><b>Connector &amp; terminal</b></i> <i><b>(E57) No. 5 (+) — Engine ground (-):</b></i> 4) Check the voltage change by shaking the harness and connector of ECM, and engine harness connector, while monitoring the value with voltage meter.	Is the voltage more than 10 V?	Go to step 6.	Repair the battery short circuit of harness between ECM connector and electronic throttle control connector.
<b>6 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Measure the voltage between electronic throttle control connector and engine ground. <i><b>Connector &amp; terminal</b></i> <i><b>(E57) No. 4 (+) — Engine ground (-):</b></i> 2) Check the voltage change by shaking the harness and connector of ECM, and engine harness connector, while monitoring the value with voltage meter.	Is the voltage less than 10 V?	Go to step 7.	Repair the battery short circuit of harness between ECM connector and electronic throttle control connector.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>7</p> <p><b>CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b></p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM. 3) Measure the resistance between connector terminals.</p> <p><b>Connector &amp; terminal</b> <b>(B134) No. 28 — (B134) No. 19:</b></p>	<p>Is the resistance more than 1 M<math>\Omega</math>?</p>	<p>Repair the poor contact. Replace the electronic throttle control if defective.</p>	<p>Sensor power supply circuit may be shorted.</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## AO:DTC P0230 FUEL PUMP PRIMARY CIRCUIT

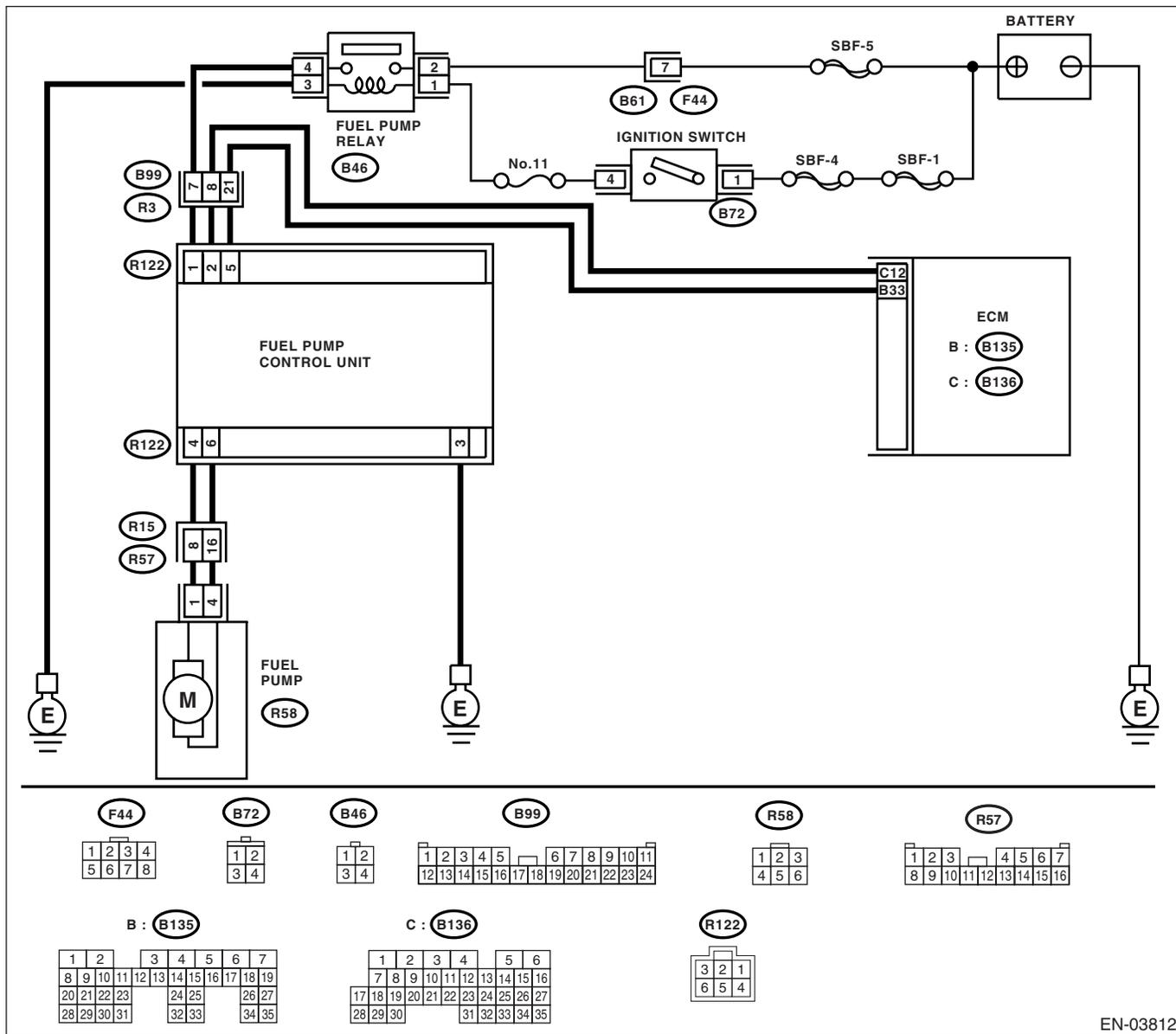
### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-96, DTC P0230 FUEL PUMP PRIMARY CIRCUIT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03812

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK POWER SUPPLY CIRCUIT TO FUEL PUMP CONTROL UNIT.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connector from fuel pump control unit.                      3) Turn the ignition switch to ON.                      4) Measure the voltage between fuel pump control unit and chassis ground.</p> <p><b>Connector &amp; terminal</b>  <b>(R122) No. 1 (+) — Chassis ground (-):</b></p>	<p>Is the voltage more than 10 V?</p>	<p>Go to step 2.</p>	<p>Repair the power supply circuit.</p> <p>NOTE:                      In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Open or ground short circuit of harness between fuel pump relay and fuel pump control unit</li> <li>• Poor contact of fuel pump control unit connector</li> <li>• Poor contact of fuel pump relay connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK GROUND CIRCUIT OF FUEL PUMP CONTROL UNIT.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Measure the resistance of harness between fuel pump control unit and chassis ground.</p> <p><b>Connector &amp; terminal</b>  <b>(R122) No. 3 — Chassis ground:</b></p>	<p>Is the resistance less than 5 <math>\Omega</math>?</p>	<p>Go to step 3.</p>	<p>Repair the harness and connector.</p> <p>NOTE:                      In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Open circuit between fuel pump control unit and chassis ground</li> <li>• Poor contact of fuel pump control unit connector</li> </ul>
<p><b>3</b></p> <p><b>CHECK HARNESS BETWEEN FUEL PUMP CONTROL UNIT AND FUEL PUMP CONNECTOR.</b></p> <p>1) Disconnect the connector from fuel pump.                      2) Measure the resistance of harness between fuel pump control unit and fuel pump connector.</p> <p><b>Connector &amp; terminal</b>  <b>(R122) No. 6 — (R58) No. 4:</b>  <b>(R122) No. 4 — (R58) No. 1:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step 4.</p>	<p>Repair the open circuit between fuel pump control unit and fuel pump.</p>
<p><b>4</b></p> <p><b>CHECK HARNESS BETWEEN FUEL PUMP CONTROL UNIT AND FUEL PUMP CONNECTOR.</b></p> <p>Measure the resistance of harness between fuel pump control unit and chassis ground.</p> <p><b>Connector &amp; terminal</b>  <b>(R122) No. 6 — Chassis ground:</b>  <b>(R122) No. 7 — Chassis ground:</b></p>	<p>Is the resistance more than 1 M<math>\Omega</math>?</p>	<p>Go to step 5.</p>	<p>Repair the ground short circuit between fuel pump control unit and fuel pump.</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>5 CHECK HARNESS BETWEEN FUEL PUMP CONTROL UNIT AND ECM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM. 3) Measure the resistance of harness between fuel pump control unit and ECM connector.  <i>Connector &amp; terminal</i> (R122) No. 2 — (B136) No. 12: (R122) No. 5 — (B135) No. 33:	Is the resistance less than 1 $\Omega$ ?	Go to step 6.	Repair the harness and connector.  NOTE: In this case, repair the following item: <ul style="list-style-type: none"> <li>• Open circuit between fuel pump control unit and ECM</li> <li>• Poor contact of fuel pump control unit and ECM connector</li> </ul>
<b>6 CHECK HARNESS BETWEEN FUEL PUMP CONTROL UNIT AND ECM CONNECTOR.</b> Measure the resistance of harness between fuel pump control unit and chassis ground.  <i>Connector &amp; terminal</i> (R122) No. 2 — Chassis ground: (R122) No. 5 — Chassis ground:	Is the resistance more than 1 M $\Omega$ ?	Go to step 7.	Repair the ground short circuit between fuel pump control unit and ECM.
<b>7 CHECK POOR CONTACT.</b> Check poor contact of ECM and fuel pump control unit connector.	Is there poor contact of ECM and fuel pump control unit connector?	Repair poor contact in ECM and fuel pump control unit.	Go to step 8.
<b>8 CHECK EXPERIENCE OF RUNNING OUT OF FUEL.</b>	Has the vehicle experienced running out of fuel?	Finish the diagnosis.  NOTE: DTC may be recorded as a result of fuel pump idling while running out of fuel.	Replace the fuel pump control unit. <Ref. to FU(H4DOTC)-49, Fuel Pump Control Unit.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## AP:DTC P0244 TURBO/SUPER CHARGER WASTEGATE SOLENOID "A" RANGE/PERFORMANCE

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-98, DTC P0244 TURBO/SUPER CHARGER WASTEGATE SOLENOID "A" RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

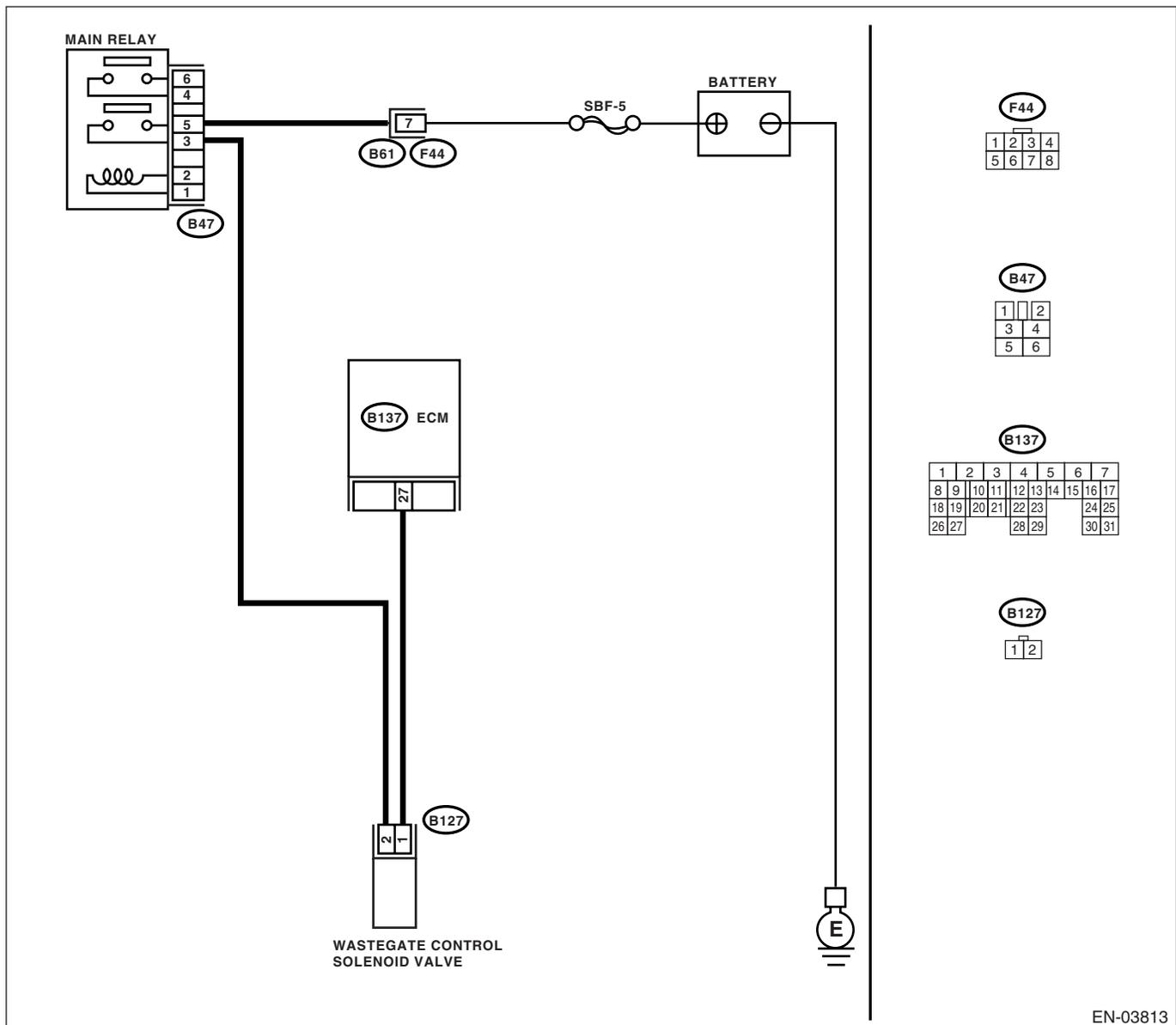
### TROUBLE SYMPTOM:

- Improper idling
- Engine stalls.
- Poor driving performance

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03813

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>  NOTE: In this case, it is not necessary to inspect DTC P0244.	Replace the wastegate control solenoid valve. <Ref. to FU(H4DOTC)-40, Wastegate Control Solenoid Valve.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## AQ:DTC P0245 TURBO/SUPER CHARGER WASTEGATE SOLENOID "A" LOW DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-100, DTC P0245 TURBO/SUPER CHARGER WASTEGATE SOLENOID "A" LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

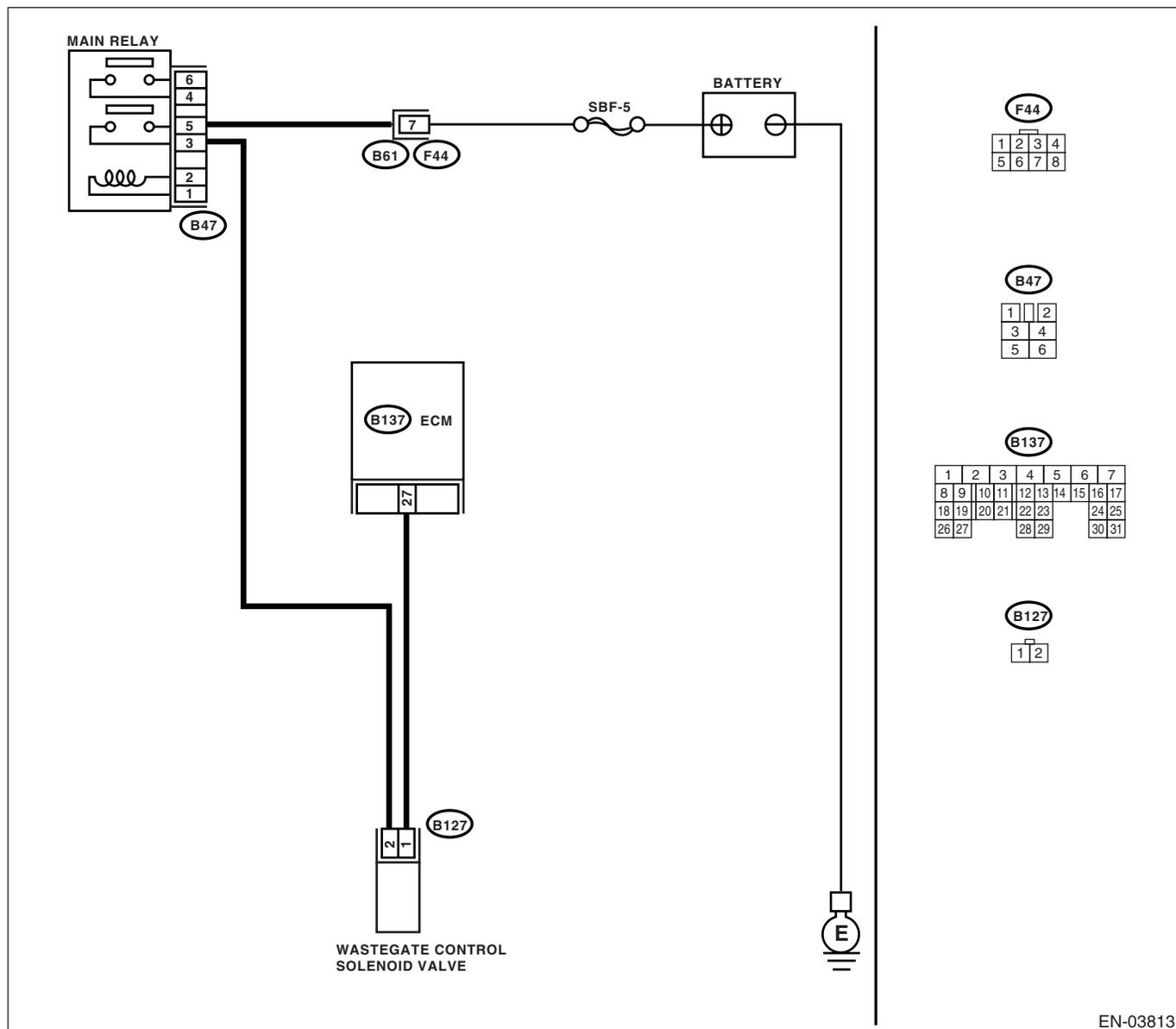
### TROUBLE SYMPTOM:

Improper idling

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK OUTPUT SIGNAL OF ECM.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B137) No. 27 (+) — Chassis ground (-):</b></i>	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 2.
<b>2 CHECK HARNESS BETWEEN WASTEGATE CONTROL SOLENOID VALVE AND ECM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from wastegate control solenoid valve and ECM. 3) Measure the resistance of harness between wastegate control solenoid valve connector and engine ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B127) No. 1 — Engine ground:</b></i>	Is the resistance less than 10 $\Omega$ ?	Repair ground short circuit of harness between ECM and wastegate control solenoid valve connector.	Go to step 3.
<b>3 CHECK HARNESS BETWEEN WASTEGATE CONTROL SOLENOID VALVE AND ECM CONNECTOR.</b> Measure the resistance of harness between wastegate control solenoid valve of harness connector and ECM. <i><b>Connector &amp; terminal</b></i> <i><b>(B137) No. 27 — (B127) No. 1:</b></i>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair open circuit of harness between ECM and wastegate control solenoid valve connector.  NOTE: In this case, repair the following item: <ul style="list-style-type: none"> <li>• Open circuit of harness between ECM and wastegate control solenoid valve connector</li> </ul>
<b>4 CHECK WASTEGATE CONTROL SOLENOID VALVE.</b> 1) Remove the wastegate control solenoid valve. 2) Measure the resistance between wastegate control solenoid valve terminals. <i><b>Terminals</b></i> <i><b>No. 1 — No. 2:</b></i>	Is the resistance between 30 and 34 $\Omega$ ?	Go to step 5.	Replace the wastegate control solenoid valve. <Ref. to FU(H4DOTC)-40, Wastegate Control Solenoid Valve.>
<b>5 CHECK POWER SUPPLY TO WASTEGATE CONTROL SOLENOID VALVE.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between wastegate control solenoid valve and engine ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B127) No. 2 (+) — Engine ground (-):</b></i>	Is the voltage more than 10 V?	Go to step 6.	Repair open circuit of harness between main relay and wastegate control solenoid valve connector.
<b>6 CHECK POOR CONTACT.</b> Check poor contact of wastegate control solenoid valve connector.	Is there poor contact of wastegate control solenoid valve connector?	Repair poor contact in wastegate control solenoid valve connector.	Contact with SOA Service Center.  NOTE: The deterioration of multiple parts can be thought as the cause.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## AR:DTC P0246 TURBO/SUPER CHARGER WASTEGATE SOLENOID "A" HIGH DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-102, DTC P0246 TURBO/SUPER CHARGER WASTEGATE SOLENOID "A" HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

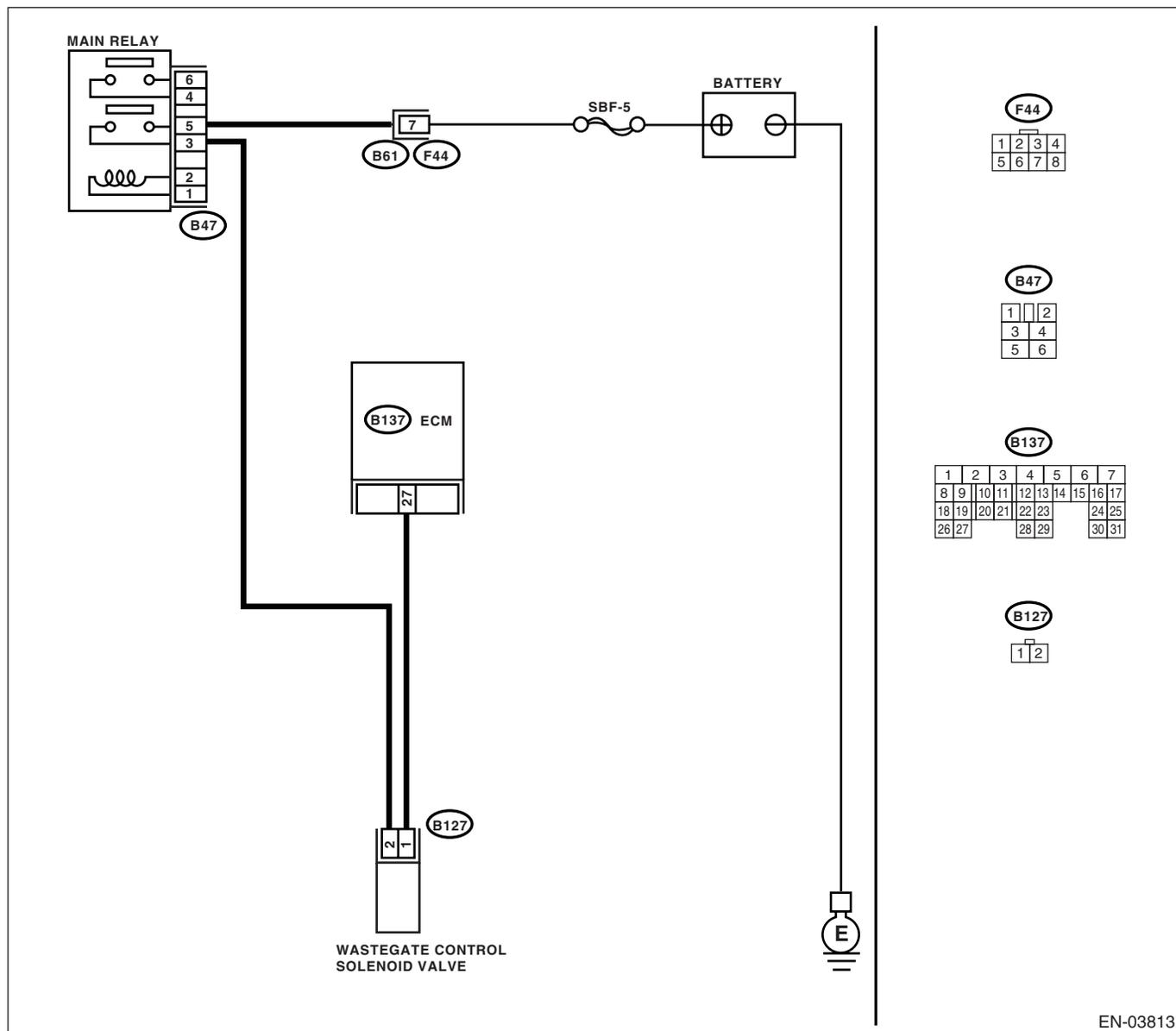
### TROUBLE SYMPTOM:

Improper idling

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03813

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK OUTPUT SIGNAL OF ECM.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B137) No. 27 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Go to step 3.	Go to step 2.
<b>2 CHECK POOR CONTACT.</b> Check poor contact of ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Replace the ECM. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>
<b>3 CHECK HARNESS BETWEEN WASTEGATE CONTROL SOLENOID VALVE AND ECM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from wastegate control solenoid valve. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B137) No. 27 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Repair battery short circuit of harness between ECM and wastegate control solenoid valve connector. After repair, replace the ECM. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>	Go to step 4.
<b>4 CHECK WASTEGATE CONTROL SOLENOID VALVE.</b> 1) Turn the ignition switch to OFF. 2) Measure the resistance between wastegate control solenoid valve terminals. <b>Terminals</b> <b>No. 1 — No. 2:</b>	Is the resistance less than 1 $\Omega$ ?	Replace the wastegate control solenoid valve and ECM. <Ref. to FU(H4DOTC)-40, Wastegate Control Solenoid Valve.> <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>	Go to step 5.
<b>5 CHECK POOR CONTACT.</b> Check poor contact of ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Replace the ECM. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>

## **AS:DTC P0301 CYLINDER 1 MISFIRE DETECTED**

**NOTE:**

For the diagnostic procedure, refer to DTC P0304. <Ref. to EN(H4DOTC)(diag)-166, DTC P0304 CYLINDER 4 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## **AT:DTC P0302 CYLINDER 2 MISFIRE DETECTED**

**NOTE:**

For the diagnostic procedure, refer to DTC P0304. <Ref. to EN(H4DOTC)(diag)-166, DTC P0304 CYLINDER 4 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## **AU:DTC P0303 CYLINDER 3 MISFIRE DETECTED**

**NOTE:**

For the diagnostic procedure, refer to DTC P0304. <Ref. to EN(H4DOTC)(diag)-166, DTC P0304 CYLINDER 4 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK ANY OTHER DTC ON DISPLAY.</b></p>	<p>Is any other DTC displayed?</p>	<p>Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". &lt;Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).&gt;</p>	<p>Go to step 2.</p>
<p><b>2</b></p> <p><b>CHECK OUTPUT SIGNAL OF ECM.</b></p> <p>1) Turn the ignition switch to ON. 2) Measure the voltage between ECM connector and chassis ground on faulty cylinders.</p> <p><b>Connector &amp; terminal</b></p> <p><b>#1 (B137) No. 8 (+) — Chassis ground (-):</b> <b>#2 (B137) No. 9 (+) — Chassis ground (-):</b> <b>#3 (B137) No. 10 (+) — Chassis ground (-):</b> <b>#4 (B137) No. 11 (+) — Chassis ground (-):</b></p>	<p>Is the voltage more than 10 V?</p>	<p>Go to step 7.</p>	<p>Go to step 3.</p>
<p><b>3</b></p> <p><b>CHECK HARNESS BETWEEN FUEL INJECTOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from fuel injector on faulty cylinders. 3) Disconnect the connectors from ECM. 4) Measure the resistance between ECM connector and engine ground on faulty cylinders.</p> <p><b>Connector &amp; terminal</b></p> <p><b>#1 (E5) No. 1 — Engine ground:</b> <b>#2 (E16) No. 1 — Engine ground:</b> <b>#3 (E6) No. 1 — Engine ground:</b> <b>#4 (E17) No. 1 — Engine ground:</b></p>	<p>Is the resistance more than 1 M<math>\Omega</math>?</p>	<p>Go to step 4.</p>	<p>Repair the ground short circuit of harness between fuel injector and ECM connector.</p>
<p><b>4</b></p> <p><b>CHECK HARNESS BETWEEN FUEL INJECTOR AND ECM CONNECTOR.</b></p> <p>Measure the resistance of harness connector between ECM connector and fuel injector on faulty cylinders.</p> <p><b>Connector &amp; terminal</b></p> <p><b>#1 (B137) No. 8 — (E5) No. 1:</b> <b>#2 (B137) No. 9 — (E16) No. 1:</b> <b>#3 (B137) No. 10 — (E6) No. 1:</b> <b>#4 (B137) No. 11 — (E17) No. 1:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step 5.</p>	<p>Repair the harness and connector.</p> <p>NOTE: In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Open circuit of harness between ECM and fuel injector connector</li> <li>• Poor contact of coupling connector</li> </ul>
<p><b>5</b></p> <p><b>CHECK FUEL INJECTOR.</b></p> <p>Measure the resistance between fuel injector terminals on faulty cylinder.</p> <p><b>Terminals</b></p> <p><b>No. 1 — No. 2:</b></p>	<p>Is the resistance between 5 and 20 <math>\Omega</math>?</p>	<p>Go to step 6.</p>	<p>Replace the faulty fuel injector. &lt;Ref. to FU(H4DOTC)-33, Fuel Injector.&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>6 CHECK POWER SUPPLY LINE.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between fuel injector and engine ground on faulty cylinders. <b>Connector &amp; terminal</b> <i>#1 (E5) No. 2 (+) — Engine ground (-):</i> <i>#2 (E16) No. 2 (+) — Engine ground (-):</i> <i>#3 (E6) No. 2 (+) — Engine ground (-):</i> <i>#4 (E17) No. 2 (+) — Engine ground (-):</i>	Is the voltage more than 10 V?	Repair the poor contact of all connectors in fuel injector circuit.	Repair the harness and connector.  NOTE: In this case, repair the following item: <ul style="list-style-type: none"> <li>• Open circuit of harness between main relay and fuel injector connector on faulty cylinders</li> <li>• Poor contact of coupling connector</li> <li>• Poor contact of main relay connector</li> <li>• Poor contact of fuel injector connector on faulty cylinders</li> </ul>
<b>7 CHECK HARNESS BETWEEN FUEL INJECTOR AND ECM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from fuel injector on faulty cylinders. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM connector and chassis ground on faulty cylinders. <b>Connector &amp; terminal</b> <i>#1 (B137) No. 8 (+) — Chassis ground (-):</i> <i>#2 (B137) No. 9 (+) — Chassis ground (-):</i> <i>#3 (B137) No. 10 (+) — Chassis ground (-):</i> <i>#4 (B137) No. 11 (+) — Chassis ground (-):</i>	Is the voltage more than 10 V?	Repair the battery short circuit of harness between ECM and fuel injector. After repair, replace the ECM. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>	Go to step 8.
<b>8 CHECK FUEL INJECTOR.</b> 1) Turn the ignition switch to OFF. 2) Measure the resistance between fuel injector terminals on faulty cylinder. <b>Terminals</b> <i>No. 1 — No. 2:</i>	Is the resistance less than 1 $\Omega$ ?	Replace the faulty fuel injector and ECM. <Ref. to FU(H4DOTC)-33, Fuel Injector.> <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>	Go to step 9.
<b>9 CHECK INSTALLATION OF CAMSHAFT POSITION SENSOR/CRANKSHAFT POSITION SENSOR.</b>	Is the camshaft position sensor or crankshaft position sensor loosely installed?	Tighten the camshaft position sensor or crankshaft position sensor.	Go to step 10.
<b>10 CHECK CRANKSHAFT SPROCKET.</b> Remove the timing belt cover.	Is the crank sprocket rusted or does it have broken teeth?	Replace the crank sprocket. <Ref. to ME(H4DOTC)-51, Crank Sprocket.>	Go to step 11.
<b>11 CHECK INSTALLATION CONDITION OF TIMING BELT.</b> Turn the crankshaft, and align alignment mark on crank sprocket with alignment mark on cylinder block.	Is the timing belt dislocated from its proper position?	Repair the installation condition of timing belt. <Ref. to ME(H4DOTC)-42, Timing Belt.>	Go to step 12.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>12</b>	<b>CHECK FUEL LEVEL.</b>	Go to step <b>13</b> .	Refill the fuel so that fuel meter indication is higher than the "Lower" level. After refueling, Go to step <b>13</b> .
<b>13</b>	<b>CHECK STATUS OF MALFUNCTION INDICATOR LIGHT.</b> 1) Clear the memory using Subaru Select Monitor. <Ref. to EN(H4DOTC)(diag)-46, Clear Memory Mode.> 2) Start the engine, and drive the vehicle more than 10 minutes.	Go to step <b>15</b> .	Go to step <b>14</b> .
<b>14</b>	<b>CHECK CAUSE OF MISFIRE.</b>	Finish diagnostics operation, if the engine has no abnormality.	Repair the poor contact. <b>NOTE:</b> In this case, repair the following item: <ul style="list-style-type: none"> <li>• Poor contact of ignition coil connector</li> <li>• Poor contact of fuel injector connector on faulty cylinders</li> <li>• Poor contact in ECM connector</li> <li>• Poor contact of coupling connector</li> </ul>
<b>15</b>	<b>CHECK AIR INTAKE SYSTEM.</b>	Repair the air intake system. <b>NOTE:</b> Check the following item. <ul style="list-style-type: none"> <li>• Are there air leaks or air suction caused by loose or dislocated nuts and bolts?</li> <li>• Are there cracks or any disconnection of hoses?</li> </ul>	Go to step <b>16</b> .
<b>16</b>	<b>CHECK CYLINDER.</b>	Repair or replace faulty parts. <b>NOTE:</b> Check the following item. <ul style="list-style-type: none"> <li>• Spark plug</li> <li>• Fuel injector</li> <li>• Compression</li> </ul>	Go to DTC P0171 and P0172. <Ref. to EN(H4DOTC)(diag)-141, DTC P0171 SYSTEM TOO LEAN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## AW:DTC P0327 KNOCK SENSOR 1 CIRCUIT LOW (BANK 1 OR SINGLE SENSOR)

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-112, DTC P0327 KNOCK SENSOR 1 CIRCUIT LOW (BANK 1 OR SINGLE SENSOR), Diagnostic Trouble Code (DTC) Detecting Criteria.>

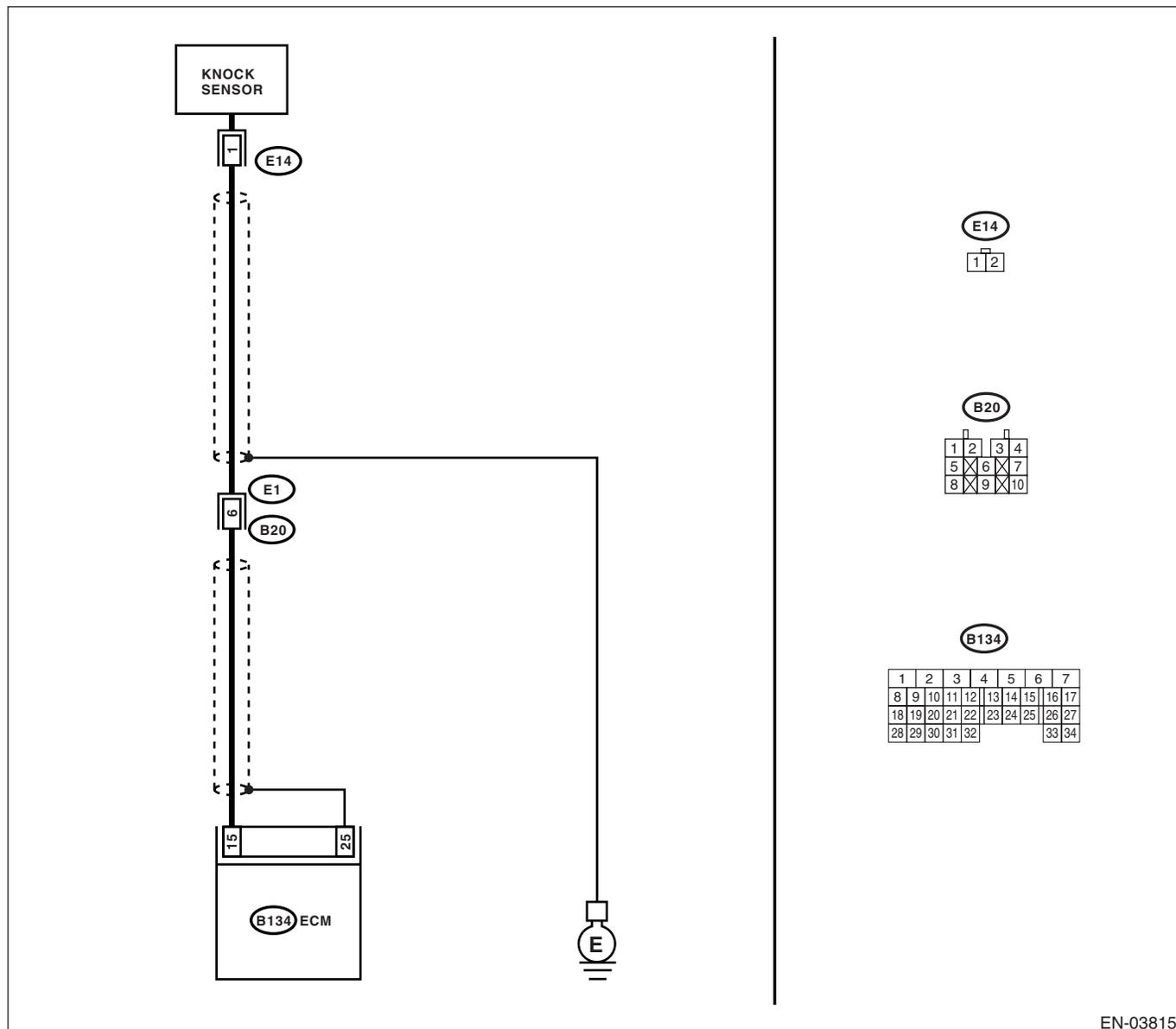
### TROUBLE SYMPTOM:

- Poor driving performance
- Knocking occurs.

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>

### WIRING DIAGRAM:



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1</b> <b>CHECK HARNESS BETWEEN KNOCK SENSOR AND ECM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM. 3) Measure the resistance between ECM harness connector and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B134) No. 15 — Chassis ground:</b></i>	Is the resistance more than 700 k $\Omega$ ?	Go to step 2.	Repair the harness and connector. NOTE: In this case, repair the following item: <ul style="list-style-type: none"> <li>• Open circuit of harness between knock sensor and ECM connector</li> <li>• Poor contact of knock sensor connector</li> <li>• Poor contact of coupling connector</li> </ul>
<b>2</b> <b>CHECK KNOCK SENSOR.</b> 1) Disconnect the connector from knock sensor. 2) Measure the resistance between knock sensor connector terminal and engine ground. <i><b>Terminals</b></i> <i><b>No. 2 — Engine ground:</b></i>	Is the resistance more than 700 k $\Omega$ ?	Go to step 3.	Repair the harness and connector. NOTE: In this case, repair the following item: <ul style="list-style-type: none"> <li>• Poor contact of knock sensor connector</li> <li>• Poor contact of coupling connector</li> </ul>
<b>3</b> <b>CHECK INSTALLATION CONDITION OF KNOCK SENSOR</b>	Is the knock sensor installation bolt tightened securely?	Replace the knock sensor. <Ref. to FU(H4DOTC)-30, Knock Sensor.>	Tighten the knock sensor installation bolt securely.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## AX:DTC P0328 KNOCK SENSOR 1 CIRCUIT HIGH (BANK 1 OR SINGLE SENSOR)

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-114, DTC P0328 KNOCK SENSOR 1 CIRCUIT HIGH (BANK 1 OR SINGLE SENSOR), Diagnostic Trouble Code (DTC) Detecting Criteria.>

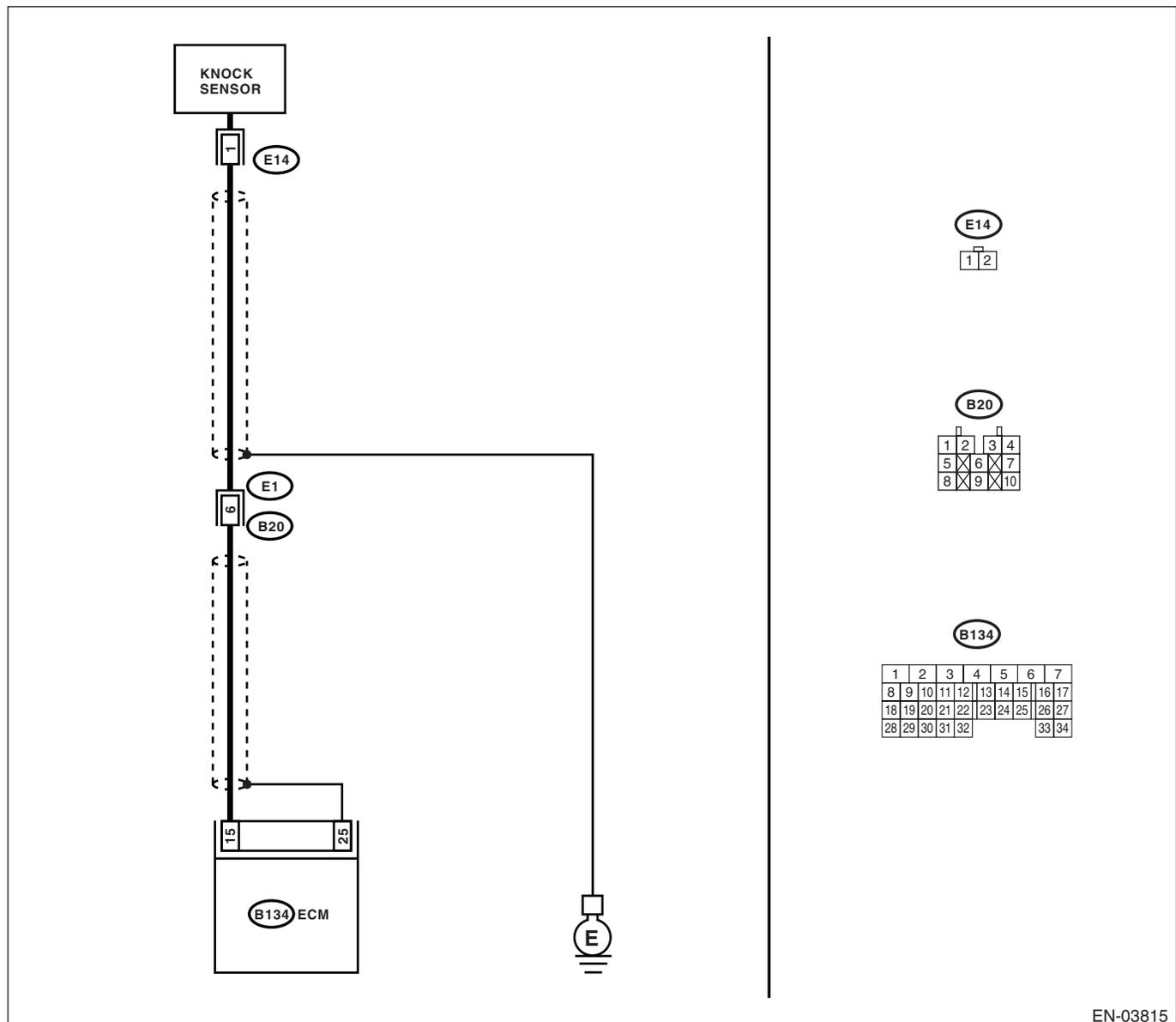
### TROUBLE SYMPTOM:

- Poor driving performance
- Knocking occurs.

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1</b> <b>CHECK HARNESS BETWEEN KNOCK SENSOR AND ECM CONNECTOR.</b> Measure the resistance of harness between ECM connector and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B134) No. 15 — Chassis ground:</b></i>	Is the resistance less than 400 k $\Omega$ ?	Go to step 2.	Go to step 3.
<b>2</b> <b>CHECK KNOCK SENSOR.</b> 1) Disconnect the connector from knock sensor. 2) Measure the resistance between knock sensor connector terminal and engine ground. <i><b>Terminals</b></i> <i><b>No. 2 — Engine ground:</b></i>	Is the resistance less than 400 k $\Omega$ ?	Replace the knock sensor. <Ref. to FU(H4DOTC)-30, Knock Sensor.>	Repair the ground short circuit of harness between knock sensor connector and ECM connector.  NOTE: The harness between both connectors is shielded. Repair the short circuit of harness covered with shield.
<b>3</b> <b>CHECK INPUT SIGNAL OF ECM.</b> 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. <i><b>Connector &amp; terminal</b></i> <i><b>(B134) No. 15 (+) — Chassis ground (-):</b></i>	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 item: <ul style="list-style-type: none"> <li>• Poor contact of knock sensor connector</li> <li>• Poor contact in ECM connector</li> <li>• Poor contact of coupling connector</li> </ul>	Repair poor contact in ECM connector.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## AY:DTC P0335 CRANKSHAFT POSITION SENSOR "A" CIRCUIT

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-116, DTC P0335 CRANKSHAFT POSITION SENSOR "A" CIRCUIT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

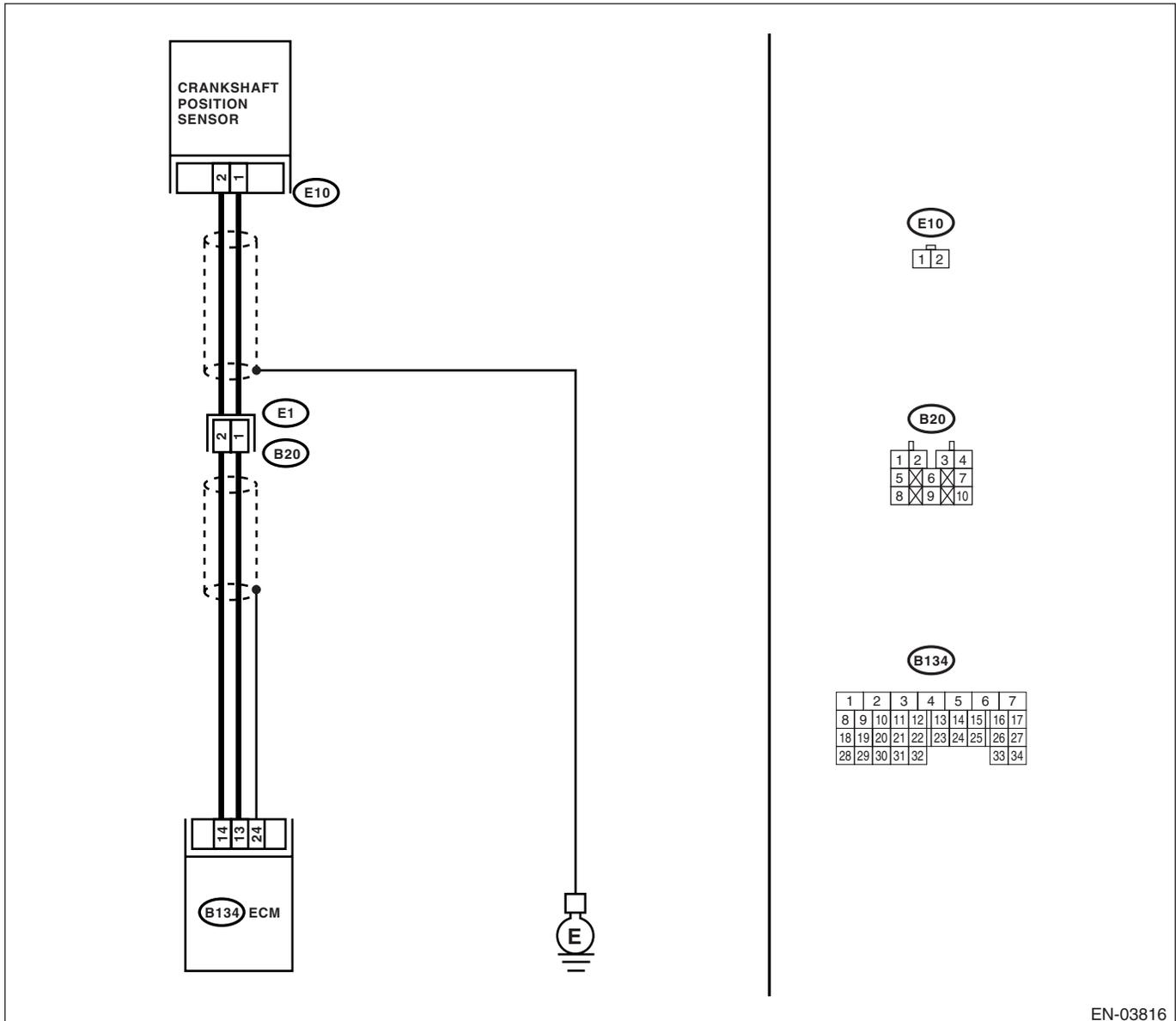
### TROUBLE SYMPTOM:

- Engine stalls.
- Failure of engine to start

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03816

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK HARNESS BETWEEN CRANKSHAFT POSITION SENSOR AND ECM CONNECTOR.</b></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><b>Connector &amp; terminal</b> <b>(E10) No. 1 — Engine ground:</b></p>	<p>Is the resistance more than 100 k<math>\Omega</math>?</p>	<p>Repair the harness and connector.</p> <p>NOTE: In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Open circuit of harness between crankshaft position sensor and ECM connector</li> <li>• Poor contact in ECM connector</li> <li>• Poor contact of coupling connector</li> </ul>	<p>Go to step 2.</p>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN CRANKSHAFT POSITION SENSOR AND ECM CONNECTOR.</b></p> <p>Measure the resistance of harness between crankshaft position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E10) No. 1 — Engine ground:</b></p>	<p>Is the resistance more than 1 M<math>\Omega</math>?</p>	<p>Go to step 3.</p>	<p>Repair the ground short circuit of harness between crankshaft position sensor and ECM connector.</p> <p>NOTE: The harness between both connectors is shielded. Repair the ground short circuit of harness with shield.</p>
<p><b>3</b></p> <p><b>CHECK HARNESS BETWEEN CRANKSHAFT POSITION SENSOR AND ECM CONNECTOR.</b></p> <p>Measure the resistance of harness between crankshaft position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E10) No. 2 — Engine ground:</b></p>	<p>Is the resistance less than 5 <math>\Omega</math>?</p>	<p>Go to step 4.</p>	<p>Repair the harness and connector.</p> <p>NOTE: In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Open circuit of harness between crankshaft position sensor and ECM connector</li> <li>• Poor contact in ECM connector</li> <li>• Poor contact of coupling connector</li> </ul>
<p><b>4</b></p> <p><b>CHECK CONDITION OF CRANKSHAFT POSITION SENSOR.</b></p>	<p>Is the crankshaft position sensor installation bolt tightened securely?</p>	<p>Go to step 5.</p>	<p>Tighten the crankshaft position sensor installation bolt securely.</p>
<p><b>5</b></p> <p><b>CHECK CRANKSHAFT POSITION SENSOR.</b></p> <p>1) Remove the crankshaft position sensor. 2) Measure the resistance between connector terminals of crankshaft position sensor.</p> <p><b>Terminals</b> <b>No. 1 — No. 2:</b></p>	<p>Is the resistance between 1 and 4 k<math>\Omega</math>?</p>	<p>Repair the poor contact of crankshaft position sensor connector.</p>	<p>Replace the crankshaft position sensor. &lt;Ref. to FU(H4DOTC)-28, Crankshaft Position Sensor.&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## AZ:DTC P0336 CRANKSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-118, DTC P0336 CRANKSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

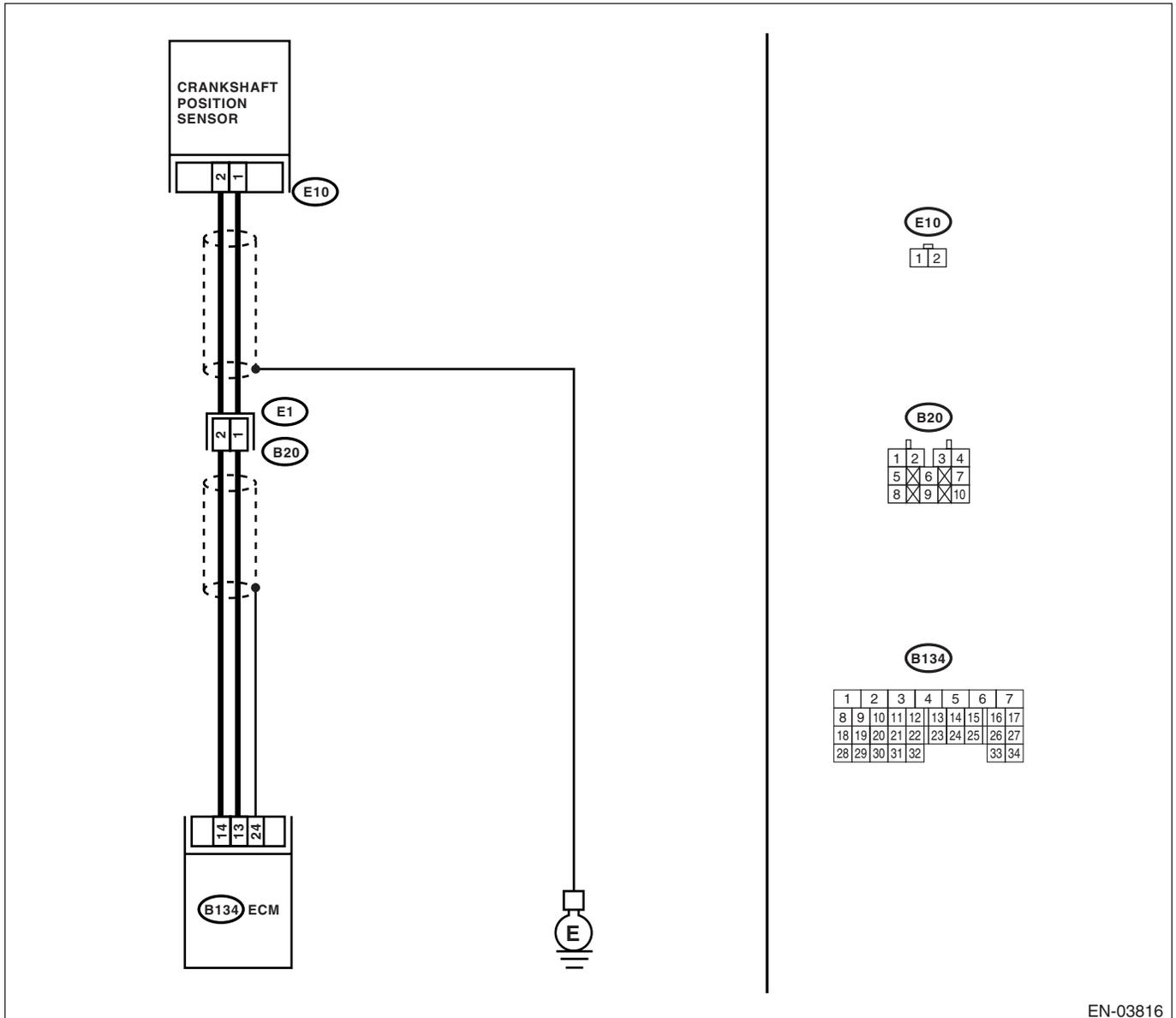
### TROUBLE SYMPTOM:

- Engine stalls.
- Failure of engine to start

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03816

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1	<b>CHECK ANY OTHER DTC ON DISPLAY.</b> Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2	<b>CHECK CONDITION OF CRANKSHAFT POSITION SENSOR.</b> Turn the ignition switch to OFF.	Is the crankshaft position sensor installation bolt tightened securely?	Go to step 3.  Tighten the crankshaft position sensor installation bolt securely.
3	<b>CHECK CRANKSHAFT SPROCKET.</b> Remove the front belt cover.	Are crank sprocket teeth cracked or damaged?	Replace the crank sprocket. <Ref. to FU(H4DOTC)-28, Crankshaft Position Sensor.>  Go to step 4.
4	<b>CHECK INSTALLATION CONDITION OF TIMING BELT.</b> Turn the crankshaft, and align alignment mark on crank sprocket with alignment mark on cylinder block.	Is the timing belt dislocated from its proper position?	Repair the installation condition of timing belt. <Ref. to ME(H4DOTC)-42, Timing Belt.>  Replace the crankshaft position sensor. <Ref. to FU(H4DOTC)-28, Crankshaft Position Sensor.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-120, DTC P0340 CAMSHAFT POSITION SENSOR "A" CIRCUIT (BANK 1 OR SINGLE SENSOR), Diagnostic Trouble Code (DTC) Detecting Criteria.>

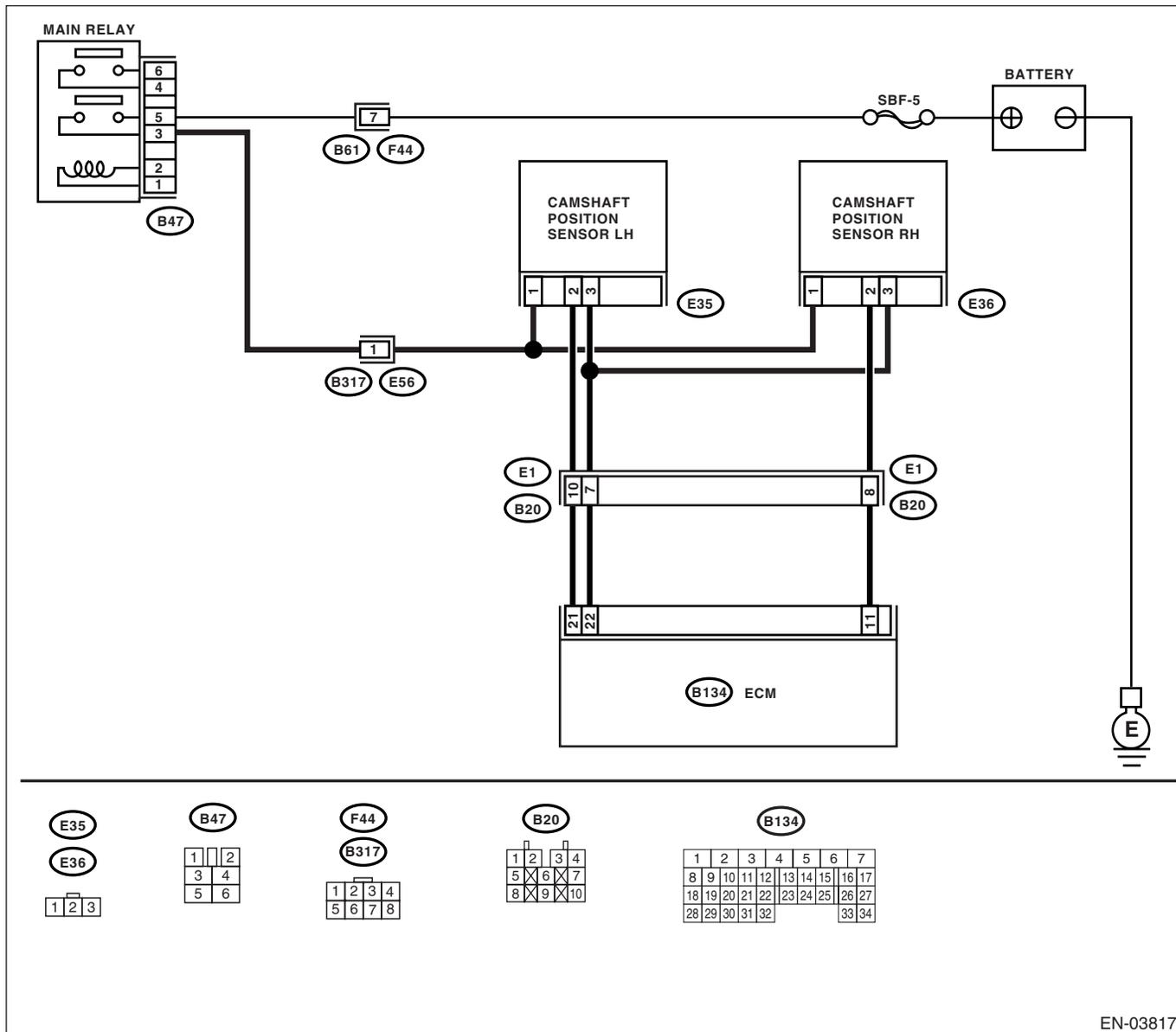
### TROUBLE SYMPTOM:

- Engine stalls.
- Failure of engine to start

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03817

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK POWER SUPPLY OF CAMSHAFT POSITION SENSOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from camshaft position sensor. 3) Measure the voltage between camshaft position sensor and engine ground. <b>Connector &amp; terminal</b> <b>(E36) No. 1 (+) — Engine ground (-):</b>	Is the voltage more than 10 V?	Repair the battery short circuit between main relay connector and camshaft position sensor connector.	Go to step 2.
<b>2 CHECK POWER SUPPLY OF CAMSHAFT POSITION SENSOR.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between camshaft position sensor and engine ground. <b>Connector &amp; terminal</b> <b>(E36) No. 1 (+) — Engine ground (-):</b>	Is the voltage more than 10 V?	Go to step 3.	Repair the open or ground short circuit between main relay connector and camshaft position sensor connector.
<b>3 CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance between camshaft position sensor and ECM. <b>Connector &amp; terminal</b> <b>(E36) No. 2 — (B134) No. 11:</b> <b>(E35) No. 3 — (B134) No. 22:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open circuit between camshaft position sensor and ECM.
<b>4 CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM.</b> Measure the resistance between camshaft position sensor and engine ground. <b>Connector &amp; terminal</b> <b>(E36) No. 2 — Engine ground</b> <b>(E35) No. 3 — Engine ground:</b>	Is the resistance more than 1 M $\Omega$ ?	Go to step 5.	Repair the ground short between the camshaft position sensor and ECM.
<b>5 CHECK CONDITION OF CAMSHAFT POSITION SENSOR.</b>	Is the camshaft position sensor installation bolt tightened securely?	Go to step 6.	Tighten the camshaft position sensor installation bolt securely.
<b>6 CHECK CAMSHAFT POSITION SENSOR.</b> Check waveform of camshaft position sensor. <Ref. to EN(H4DOTC)(diag)-18, Engine Control Module (ECM) I/O Signal.>	Is there any abnormality in waveform?	Replace the camshaft position sensor. <Ref. to FU(H4DOTC)-29, Camshaft Position Sensor.>	Go to step 7.
<b>7 CHECK POOR CONTACT.</b> Check poor contact of ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Replace the ECM. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## BB:DTC P0345 CAMSHAFT POSITION SENSOR "A" CIRCUIT (BANK 2)

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-122, DTC P0345 CAMSHAFT POSITION SENSOR "A" CIRCUIT (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

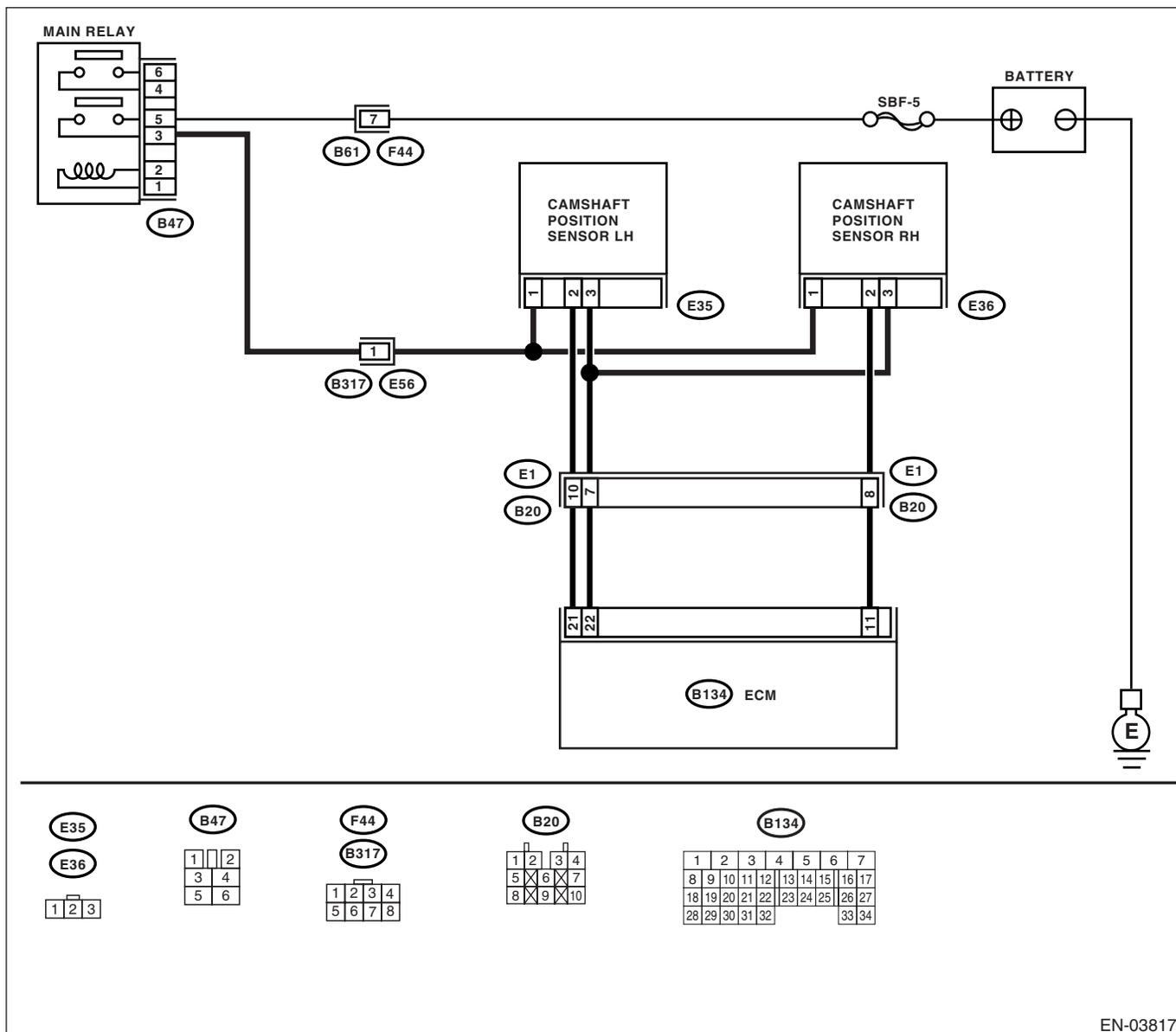
### TROUBLE SYMPTOM:

- Engine stalls.
- Failure of engine to start

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03817

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK POWER SUPPLY OF CAMSHAFT POSITION SENSOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from camshaft position sensor. 3) Measure the voltage between camshaft position sensor and engine ground. <b>Connector &amp; terminal</b> <b>(E35) No. 1 (+) — Engine ground (-):</b>	Is the voltage more than 10 V?	Repair the battery short circuit between main relay connector and camshaft position sensor connector.	Go to step 2.
<b>2 CHECK POWER SUPPLY OF CAMSHAFT POSITION SENSOR.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between camshaft position sensor and engine ground. <b>Connector &amp; terminal</b> <b>(E35) No. 1 (+) — Engine ground (-):</b>	Is the voltage more than 10 V?	Go to step 3.	Repair the open or ground short circuit between main relay connector and camshaft position sensor connector.
<b>3 CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance between camshaft position sensor and ECM. <b>Connector &amp; terminal</b> <b>(E35) No. 2 — (B134) No. 21:</b> <b>(E35) No. 3 — (B134) No. 22:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open circuit between camshaft position sensor and ECM.
<b>4 CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM.</b> Measure the resistance between camshaft position sensor and engine ground. <b>Connector &amp; terminal</b> <b>(E35) No. 2 — Engine ground:</b> <b>(E35) No. 3 — Engine ground:</b>	Is the resistance more than 1 M $\Omega$ ?	Go to step 5.	Repair the ground short between the camshaft position sensor and ECM.
<b>5 CHECK CONDITION OF CAMSHAFT POSITION SENSOR.</b>	Is the camshaft position sensor installation bolt tightened securely?	Go to step 6.	Tighten the camshaft position sensor installation bolt securely.
<b>6 CHECK CAMSHAFT POSITION SENSOR.</b> Check waveform of camshaft position sensor. <Ref. to EN(H4DOTC)(diag)-18, Engine Control Module (ECM) I/O Signal.>	Is there any abnormality in waveform?	Replace the camshaft position sensor. <Ref. to FU(H4DOTC)-29, Camshaft Position Sensor.>	Go to step 7.
<b>7 CHECK POOR CONTACT.</b> Check poor contact of ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Replace the ECM. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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## **BC:DTC P0410 SECONDARY AIR INJECTION SYSTEM**

### **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-123, DTC P0410 SECONDARY AIR INJECTION SYSTEM, Diagnostic Trouble Code (DTC) Detecting Criteria.>

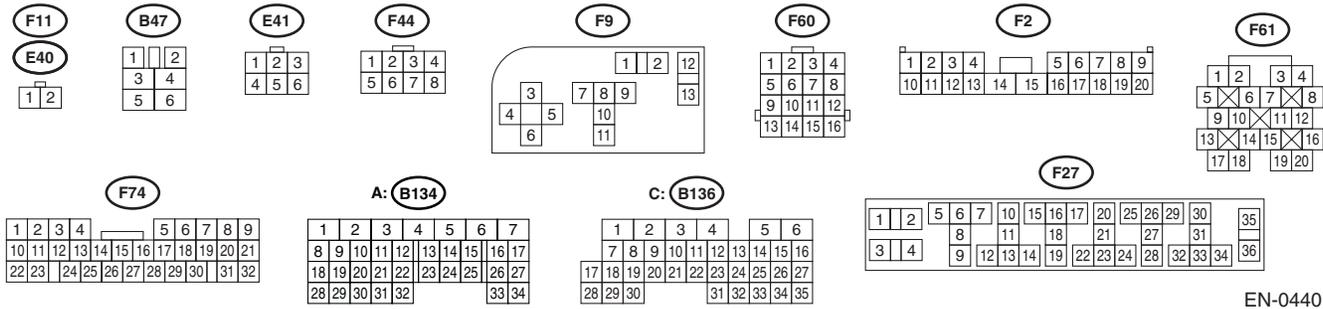
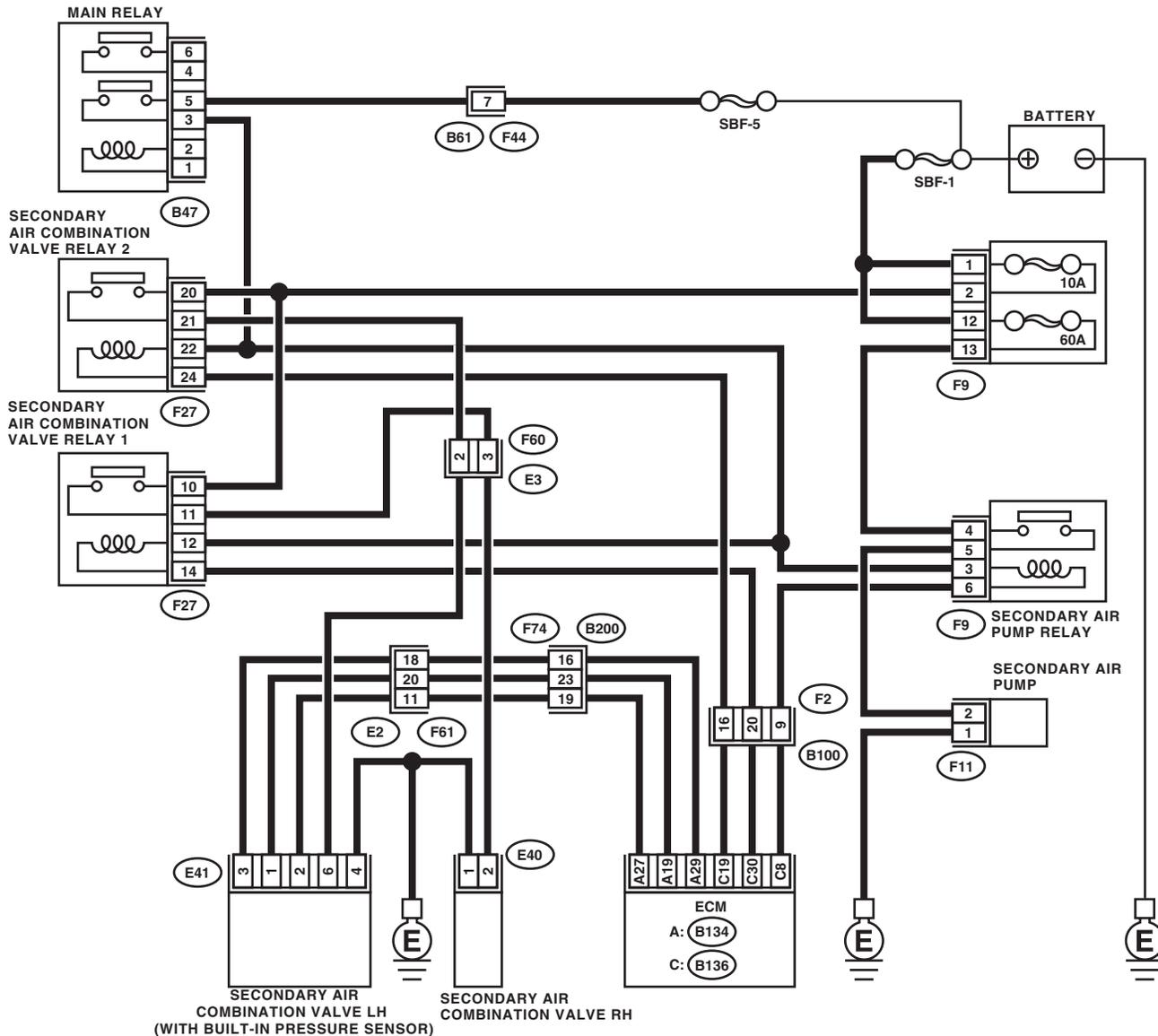
### **CAUTION:**

**After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## WIRING DIAGRAM:



EN-04401

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK SECONDARY AIR PUMP OPERATION.</b> 1) Connect the test mode connector. 2) Turn the ignition switch to ON. 3) Perform operation check for the secondary air pump using the Subaru Select Monitor. NOTE: Subaru Select Monitor Refer to "Compulsory Valve Operation Check Mode" for more operation procedure. <Ref. to EN(H4DOTC)(diag)-47, Compulsory Valve Operation Check Mode.>	Does the secondary air pump operate?	Go to step 2.	Go to step 3.
<b>2 CHECK DUCT BETWEEN SECONDARY AIR PUMP AND COMBINATION VALVE.</b> Inspection of the duct between the secondary air pump and combination valve.	Is there damage or disconnection of the duct?	Replace or connect the duct.	Temporary poor contact occurs. Check for poor contact in the connector.
<b>3 CHECK POWER SUPPLY TO SECONDARY AIR PUMP.</b> In the condition of step 1, measure the voltage between the secondary air pump and the chassis ground. <i>Connector &amp; terminal</i> <i>(F11) No. 2 (+) — Chassis ground (-):</i>	Is the voltage more than 10 V?	Replace the secondary air pump.	Go to step 4.
<b>4 CHECK HARNESS BETWEEN SECONDARY AIR PUMP RELAY AND SECONDARY AIR PUMP CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the secondary air pump relay and secondary air pump. 3) Measure resistance between the secondary air pump relay and secondary air pump connector terminal <i>Connector &amp; terminal</i> <i>(F9) No. 5 — (F11) No. 2 :</i>	Is the resistance less than 1 $\Omega$ ?	Go to step 5.	Repair the open circuit between secondary air pump relay and secondary air pump connector terminal.
<b>5 CHECK SECONDARY AIR PUMP RELAY.</b> 1) Turn the ignition switch to OFF. 2) Remove the secondary air pump relay from the relay box. 3) Connect the battery to the secondary air pump relay terminals No. 3 and 6. 4) Measure the resistance between secondary air pump relay terminals. <i>Terminals</i> <i>No. 4 — No. 5</i>	Is the resistance less than 1 $\Omega$ ?	Go to step 6.	Replace the secondary air pump relay.
<b>6 CHECK SECONDARY AIR PUMP RELAY POWER SOURCE.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between the secondary air pump relay connector and chassis ground. <i>Connector &amp; terminal</i> <i>(F9) No. 3 (+) — Chassis ground (-):</i> <i>(F9) No. 4 (+) — Chassis ground (-):</i>	Is the voltage more than 10 V?	Go to step 7.	Repair the open or ground short circuit of power supply circuit.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
7 <b>CHECK HARNESS BETWEEN ECM AND SECONDARY AIR PUMP RELAY CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector of ECM. 3) Measure the resistance of the harness between the ECM and secondary air pump relay connector terminal. <b>Connector &amp; terminal</b> <b>(B136) No. 8 — (F9) No. 6:</b>	Is the resistance less than 1 $\Omega$ ?	Replace the ECM. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>	Repair open circuit of the harness between the ECM and secondary air pump relay connector terminal.

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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### **BD:DTC P0411 SECONDARY AIR INJECTION SYSTEM INCORRECT FLOW DETECTED**

#### **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-128, DTC P0411 SECONDARY AIR INJECTION SYSTEM INCORRECT FLOW DETECTED, Diagnostic Trouble Code (DTC) Detecting Criteria.>

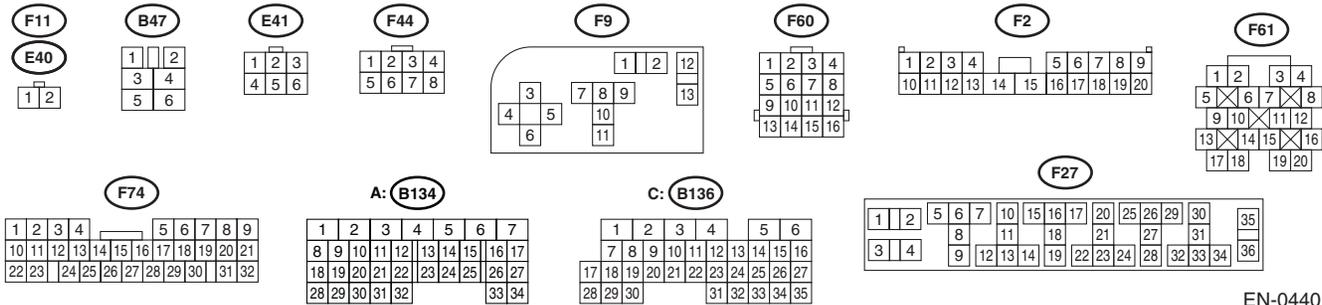
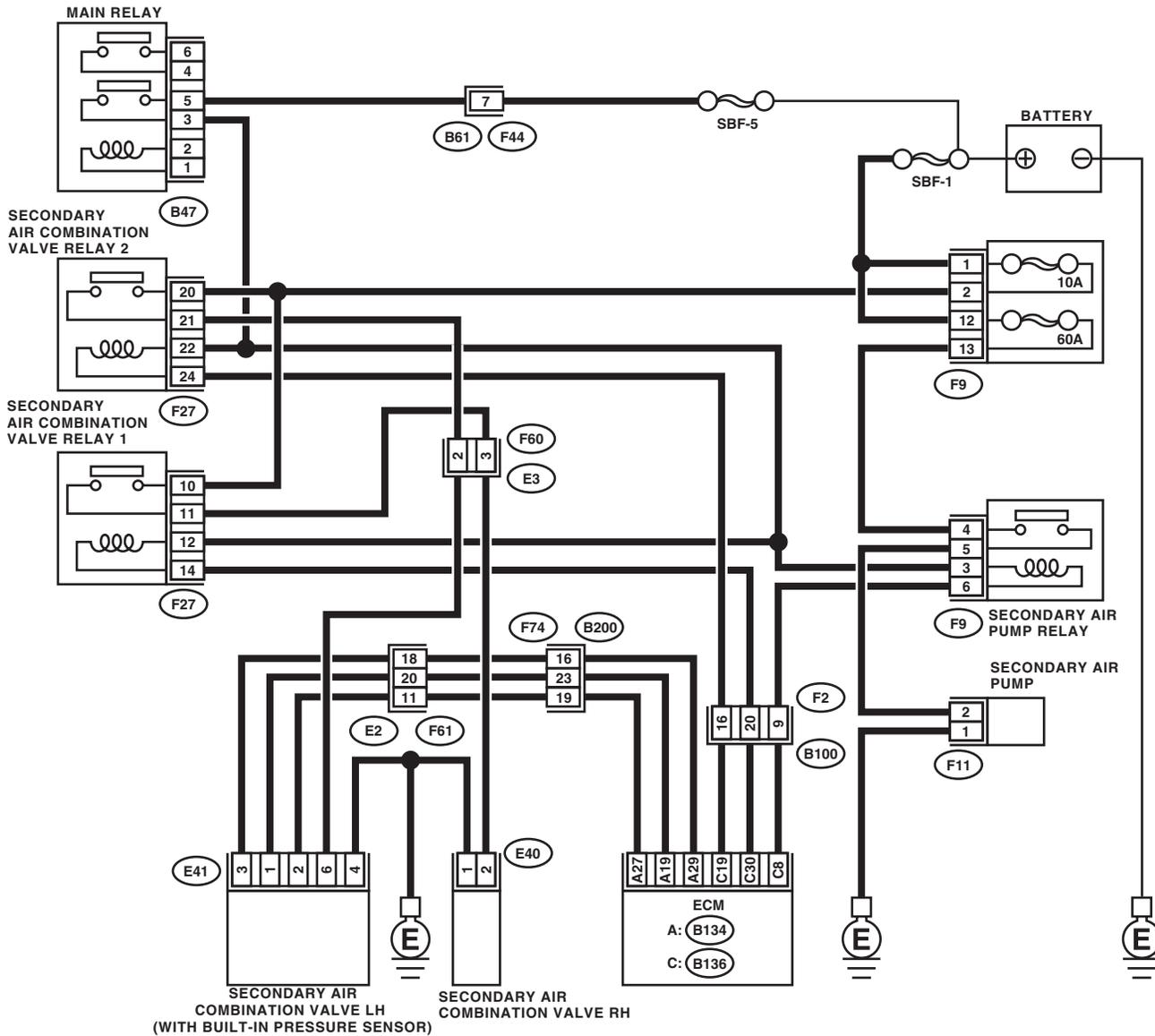
#### **CAUTION:**

**After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## WIRING DIAGRAM:



EN-04401

Step	Check	Yes	No
1	<p><b>CHECK SECONDARY AIR COMBINATION VALVE.</b></p> <p>Inspection of the pipe between the secondary air combination valve and cylinder head.</p>	Is there damage or disconnection of the pipe?	<p>Replace the pipe between the secondary air combination valve and cylinder head.</p> <p>Go to step 2.</p>

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

### ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>2</b> <b>CHECK SECONDARY AIR COMBINATION VALVE.</b> Race the engine at 2000 RPM and check whether an exhaust leak can be heard.	Is there an exhaust leaking sound?	Replace the pipe between the secondary air combination valve and cylinder head.	Contact with SOA Service Center. <b>NOTE:</b> The deterioration of multiple parts can be thought as the cause.

## **BE:DTC P0413 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE “A” CIRCUIT OPEN**

### **DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-129, DTC P0413 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE “A” CIRCUIT OPEN , Diagnostic Trouble Code (DTC) Detecting Criteria.>

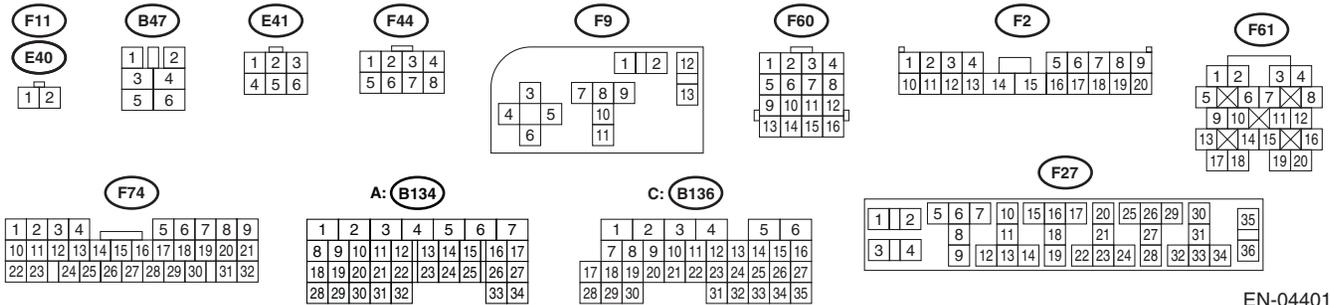
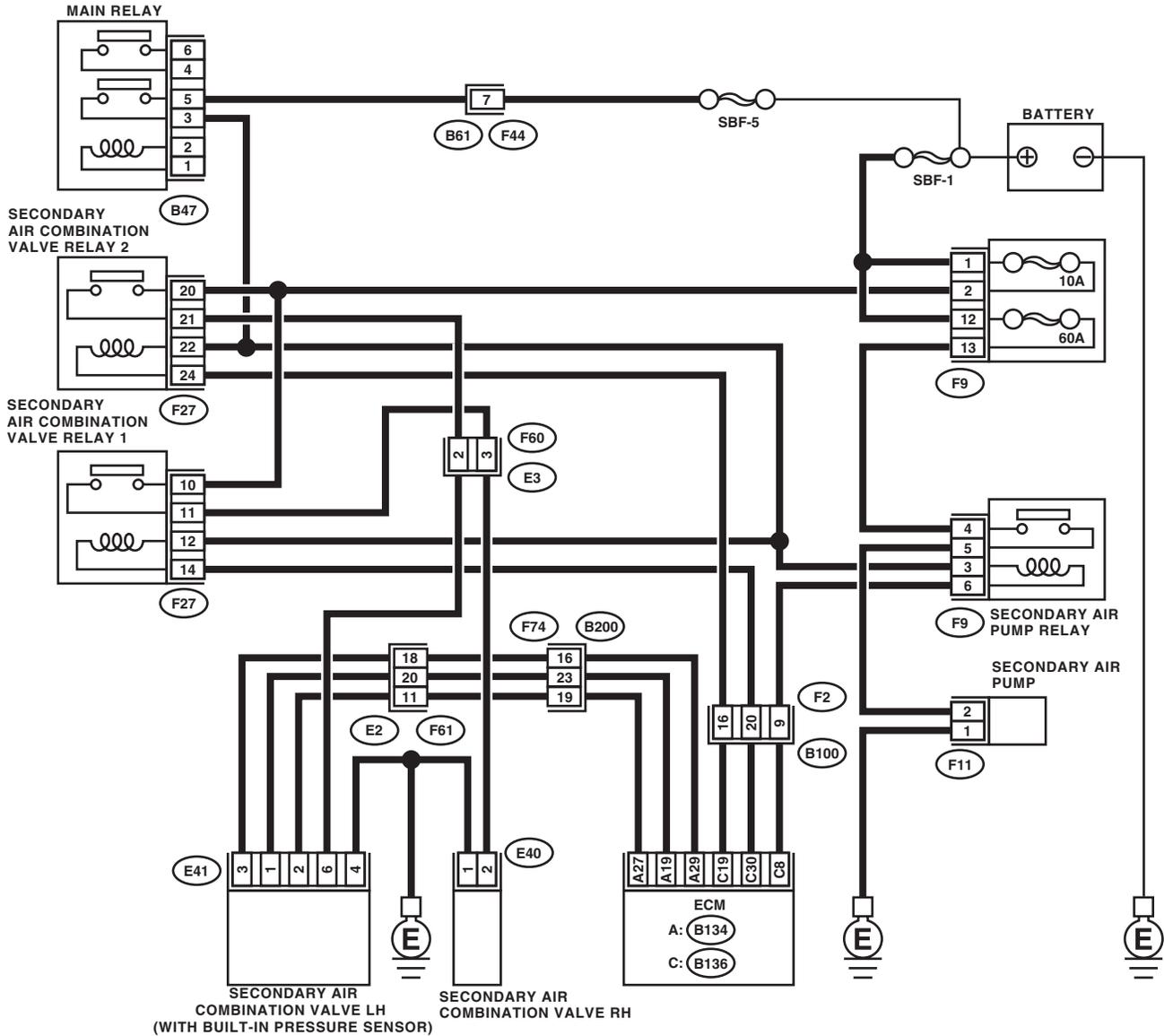
### **CAUTION:**

**After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## WIRING DIAGRAM:



EN-04401

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE RELAY 1.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connector from the ECM and secondary air combination valve relay 1.                      3) Measure the resistance of the harness between the ECM and secondary air combination valve relay 1 terminal.</p> <p><b>Connector &amp; terminal</b>  <b>(B136) No. 30 — (F27) No. 14:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step 2.</p>	<p>Repair open circuit of the harness between the ECM and secondary air combination valve relay 1 terminal.</p>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE RELAY 1.</b></p> <p>Measure the resistance of harness between ECM and chassis ground.</p> <p><b>Connector &amp; terminal</b>  <b>(B136) No. 30 — Chassis ground:</b></p>	<p>Is the resistance more than 1 <math>M\Omega</math>?</p>	<p>Temporary poor contact occurs. Check for poor contact in the connector.</p>	<p>Repair open circuit of the harness between the ECM and secondary air combination valve relay 1 terminal.</p>

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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### **BF:DTC P0414 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE “A” CIRCUIT SHORTED**

#### **DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-130, DTC P0414 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE “A” CIRCUIT SHORTED , Diagnostic Trouble Code (DTC) Detecting Criteria.>

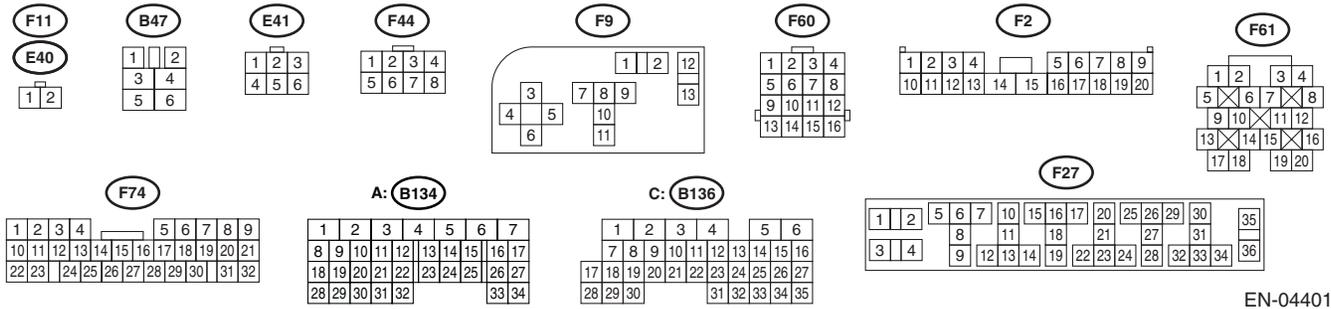
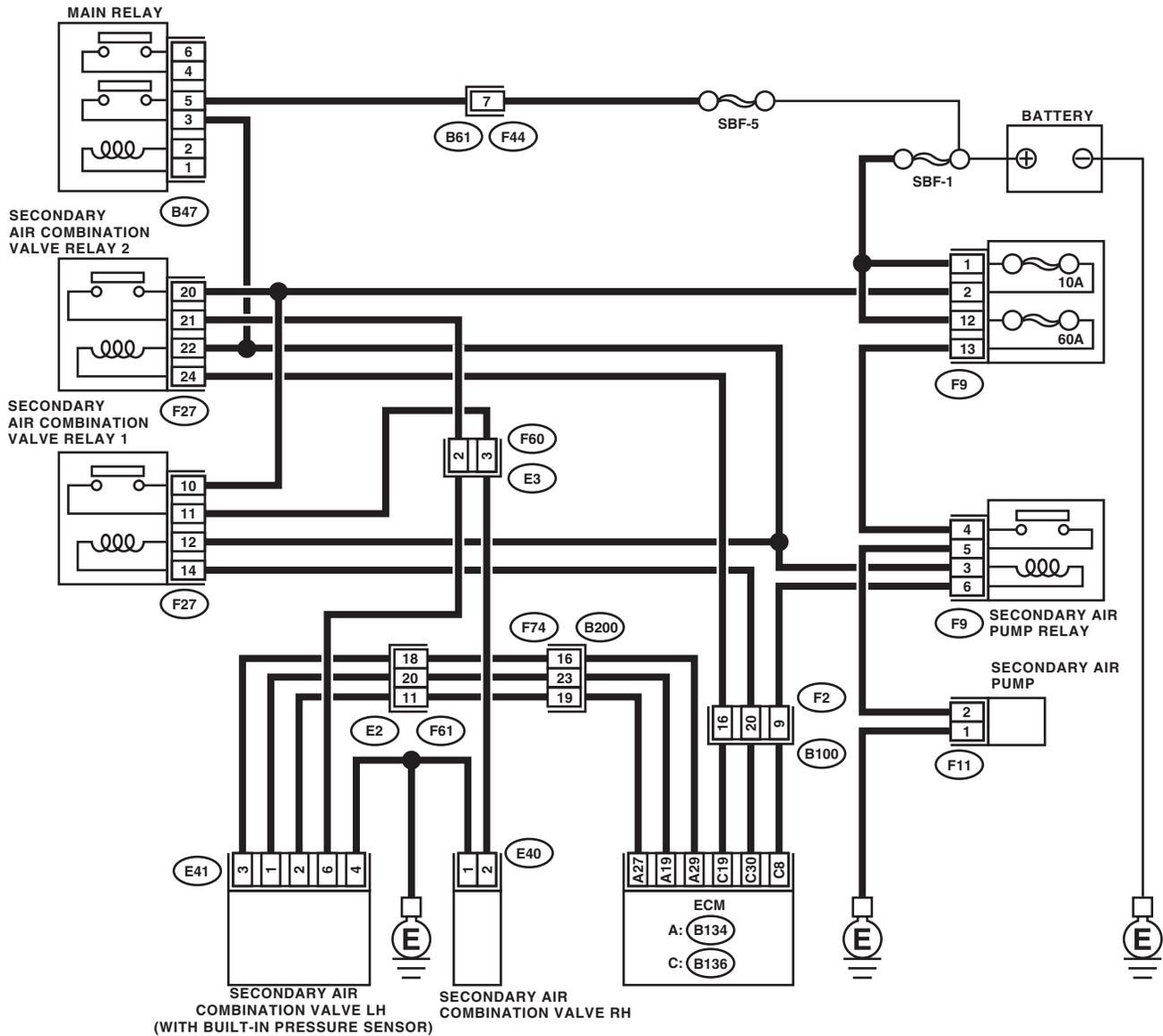
#### **CAUTION:**

**After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## WIRING DIAGRAM:



EN-04401

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE RELAY 1.</b></p> <p>1) Turn the ignition switch to OFF.            2) Disconnect the connector from the ECM and secondary air combination valve relay 1.            3) Measure the resistance of the harness between the ECM and secondary air combination valve relay 1 terminal.</p> <p><b>Connector &amp; terminal</b>  <b>(B136) No. 30 — (F27) No. 14:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step 2.</p>	<p>Repair open circuit of the harness between the ECM and secondary air combination valve relay 1 terminal.</p>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE RELAY 1.</b></p> <p>Measure the voltage between ECM and chassis ground.</p> <p><b>Connector &amp; terminal</b>  <b>(B136) No. 30 (+) — Chassis ground (-):</b></p>	<p>Is the voltage more than 10 V?</p>	<p>Repair battery short of the harness between the ECM and secondary air combination valve relay 1 terminal.</p>	<p>Temporary poor contact occurs. Check for poor contact in the connector.</p>

## **BG:DTC P0416 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE “B” CIRCUIT OPEN**

### **DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-131, DTC P0416 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE “B” CIRCUIT OPEN , Diagnostic Trouble Code (DTC) Detecting Criteria.>

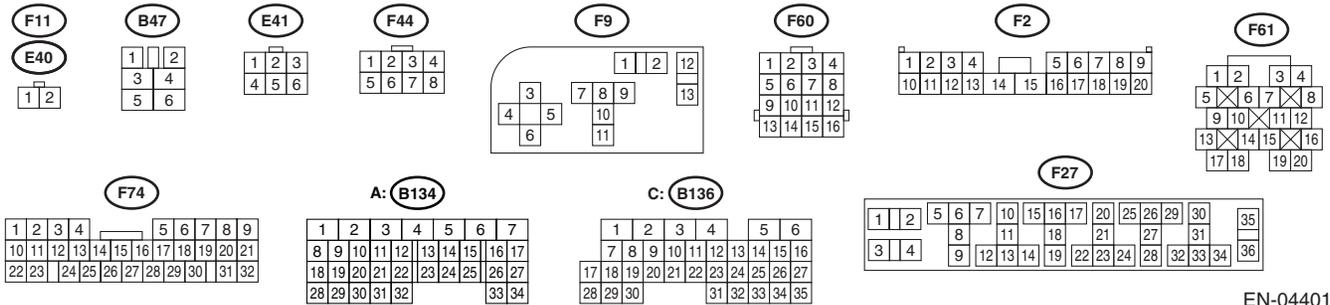
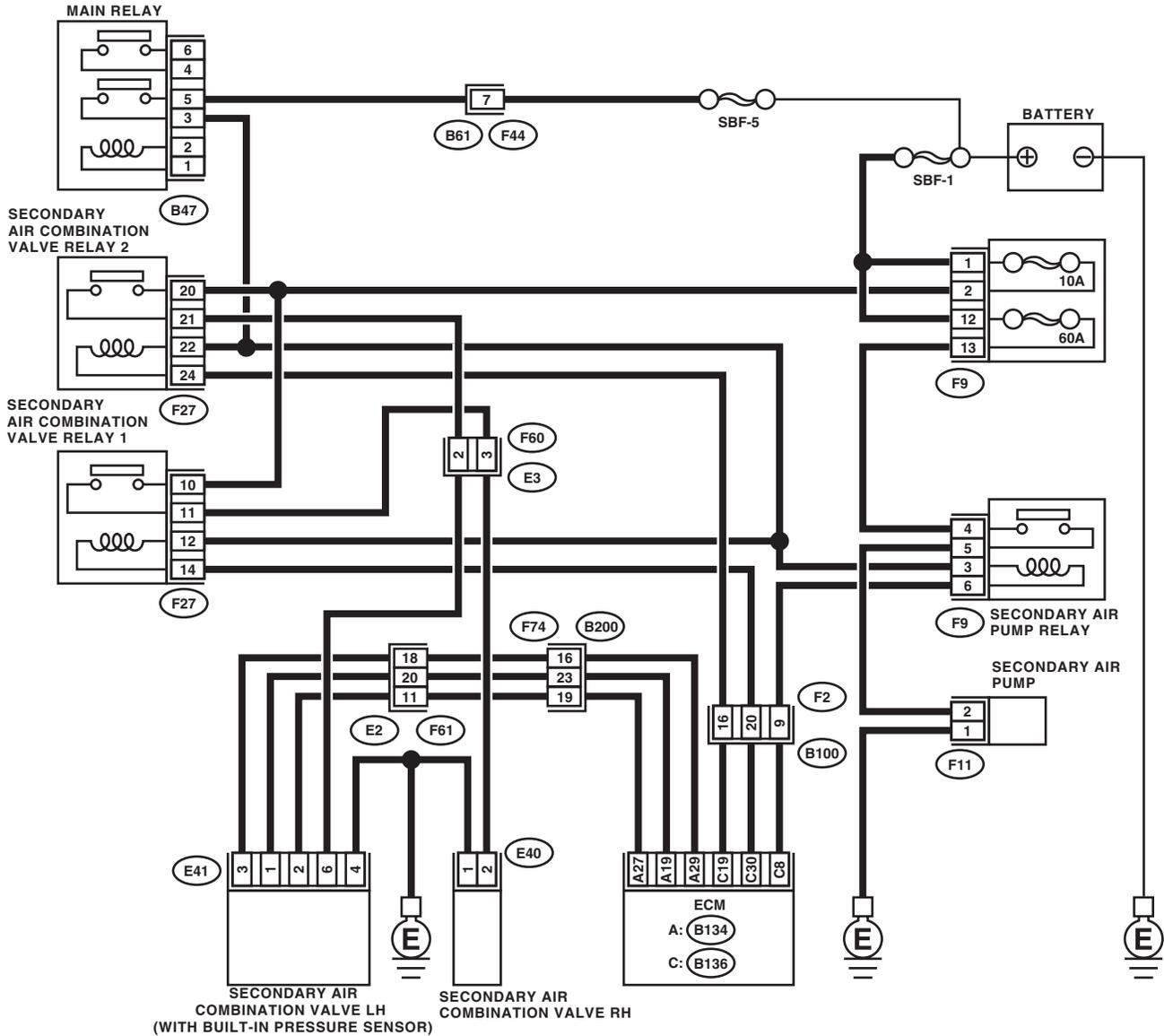
### **CAUTION:**

**After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## WIRING DIAGRAM:



EN-04401

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1</b> <b>CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE RELAY 2.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the ECM and secondary air combination valve relay 2. 3) Measure the resistance of the harness between the ECM and secondary air combination valve relay 2 terminal. <b>Connector &amp; terminal</b> <b>(B136) No. 19 — (F27) No. 24:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 2.	Repair open circuit of the harness between the ECM and secondary air combination valve relay 2 terminal.
<b>2</b> <b>CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE RELAY 2.</b> Measure the resistance of harness between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 19 — Chassis ground:</b>	Is the resistance more than 1 $M\Omega$ ?	Temporary poor contact occurs. Check for poor contact in the connector.	Repair open circuit of the harness between the ECM and secondary air combination valve relay 2 terminal.

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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### **BH:DTC P0417 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE “B” CIRCUIT SHORTED**

#### **DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-131, DTC P0417 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE “B” CIRCUIT SHORTED , Diagnostic Trouble Code (DTC) Detecting Criteria.>

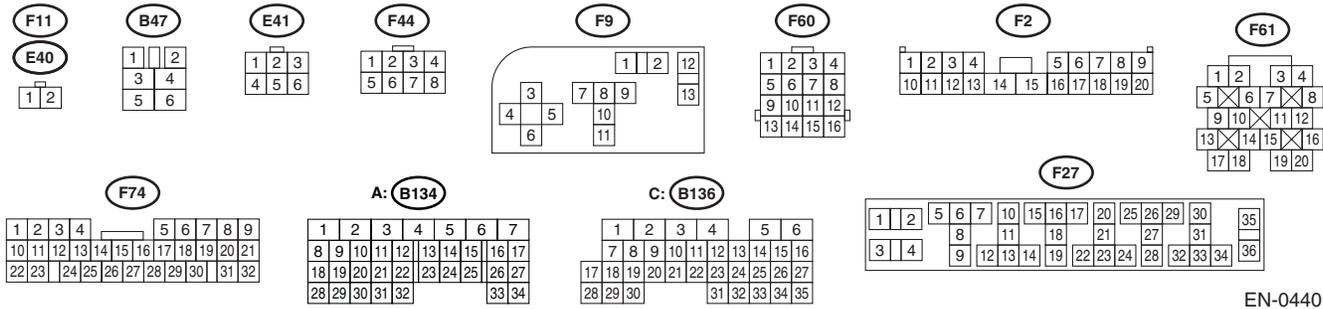
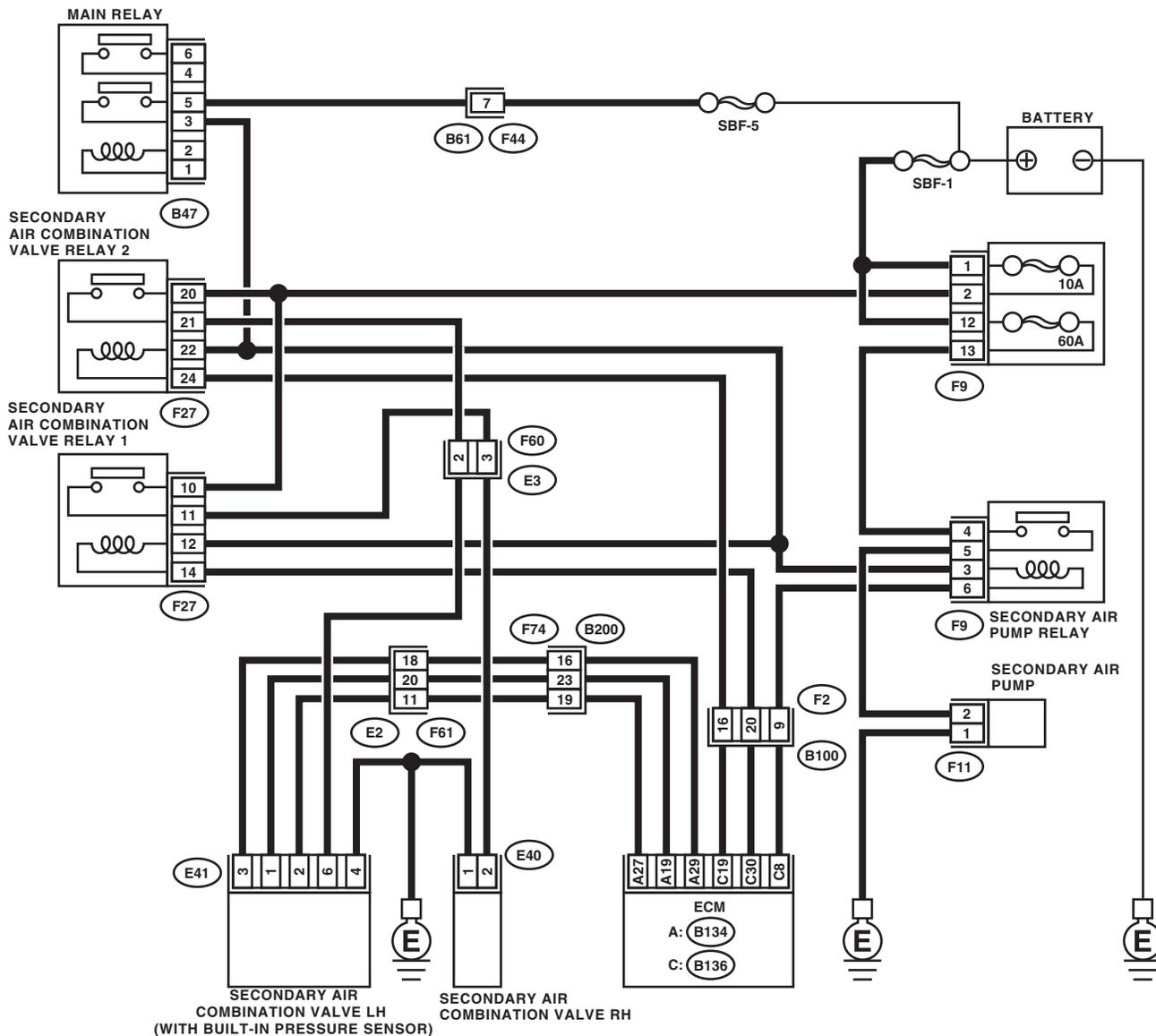
#### **CAUTION:**

**After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## WIRING DIAGRAM:



EN-04401

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE RELAY 2.</b></p> <p>1) Turn the ignition switch to OFF.            2) Disconnect the connector from the ECM and secondary air combination valve relay 2.            3) Measure the resistance of the harness between the ECM and secondary air combination valve relay 2 terminal.</p> <p><b>Connector &amp; terminal</b>  <b>(B136) No. 19 — (F27) No. 24:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step 2.</p>	<p>Repair open circuit of the harness between the ECM and secondary air combination valve relay 2 terminal.</p>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE RELAY 2.</b></p> <p>Measure the voltage between ECM and chassis ground.</p> <p><b>Connector &amp; terminal</b>  <b>(B136) No. 19 (+) — Chassis ground (-):</b></p>	<p>Is the voltage more than 10 V?</p>	<p>Repair battery short of the harness between the ECM and secondary air combination valve relay 2 terminal.</p>	<p>Temporary poor contact occurs. Check for poor contact in the connector.</p>

## **BI: DTC P0418 SECONDARY AIR INJECTION SYSTEM CONTROL “A” CIRCUIT OPEN**

### **DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-132, DTC P0418 SECONDARY AIR INJECTION SYSTEM CONTROL “A” CIRCUIT OPEN , Diagnostic Trouble Code (DTC) Detecting Criteria.>

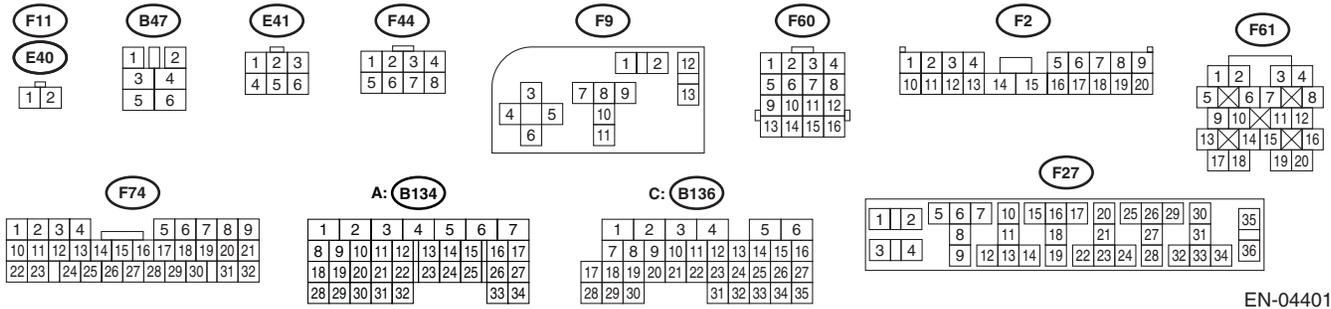
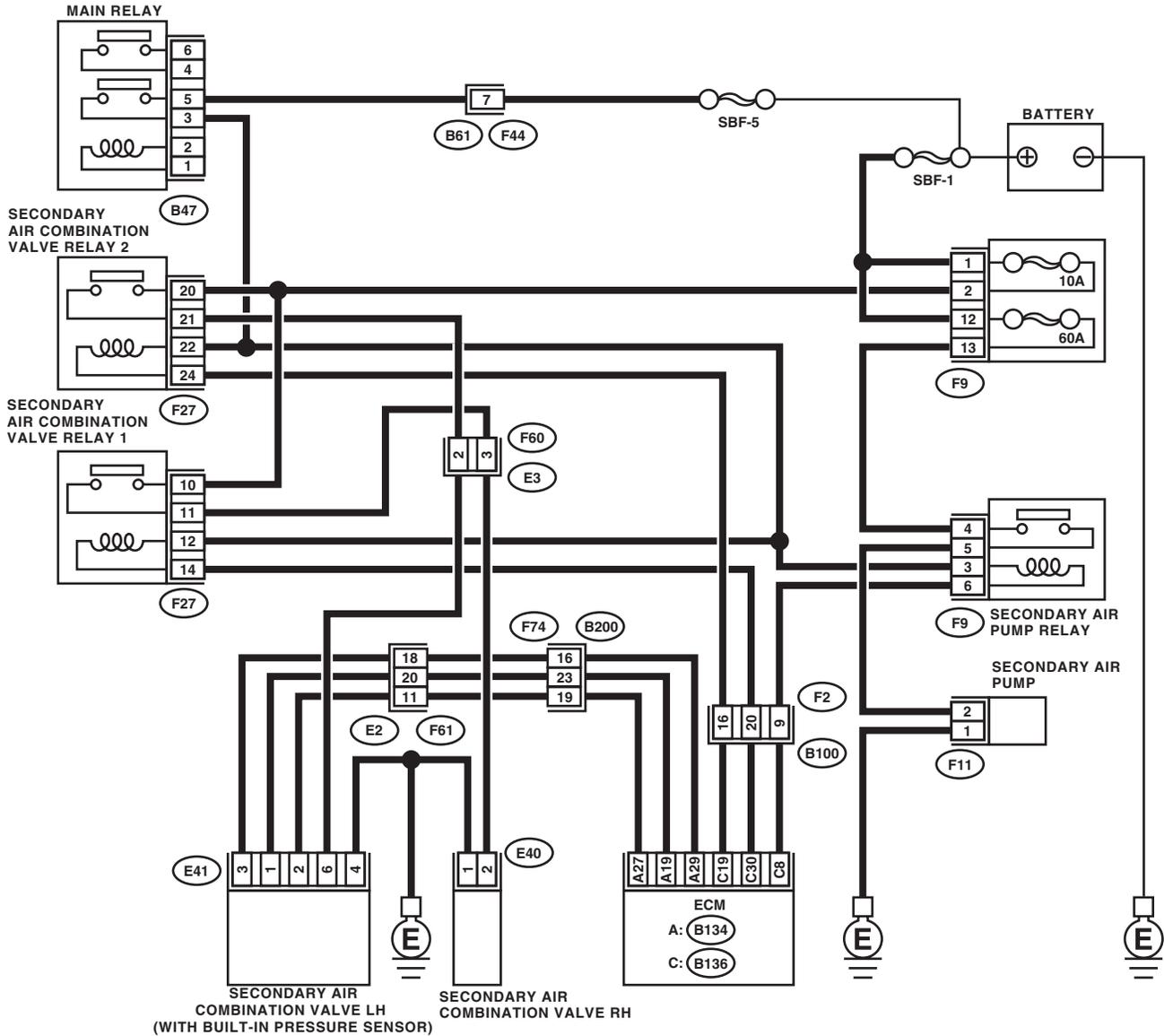
### **CAUTION:**

**After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## WIRING DIAGRAM:



EN-04401

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1</b> <b>CHECK HARNESS BETWEEN ECM AND SECONDARY AIR PUMP RELAY.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the ECM and secondary air pump relay. 3) Measure the resistance of the harness between the ECM and secondary air pump relay terminal. <b>Connector &amp; terminal</b> <b>(B136) No. 8 — (F9) No. 6:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 2.	Repair open circuit of the harness between the ECM and secondary air pump relay terminal.
<b>2</b> <b>CHECK HARNESS BETWEEN ECM AND SECONDARY AIR PUMP RELAY.</b> Measure the resistance of harness between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 8 — Chassis ground:</b>	Is the resistance more than 1 $M\Omega$ ?	Temporary poor contact occurs. Check for poor contact in the connector.	Repair ground short of the harness between the ECM and secondary air pump relay terminal.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-133, DTC P0420 CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

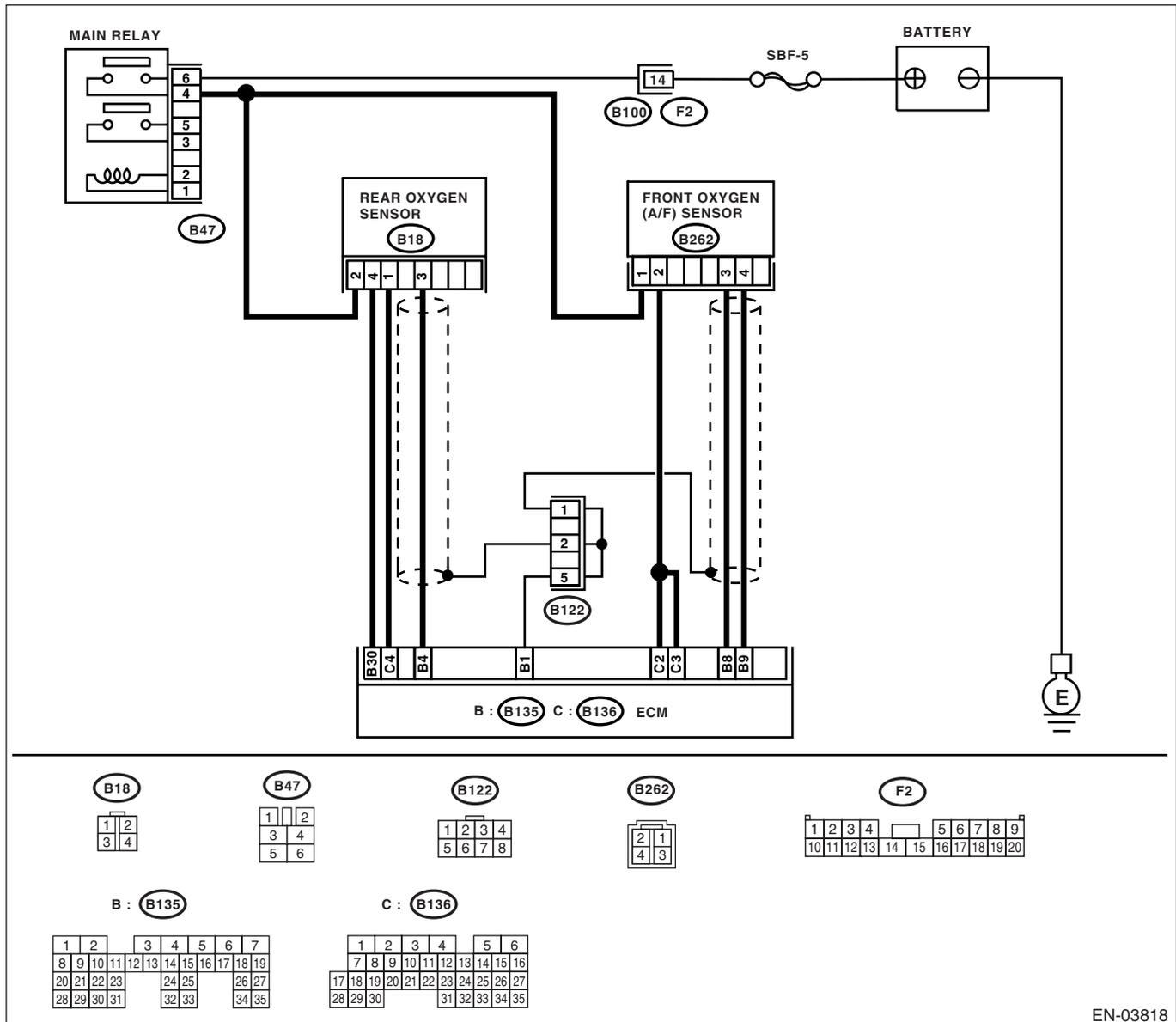
### TROUBLE SYMPTOM:

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

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

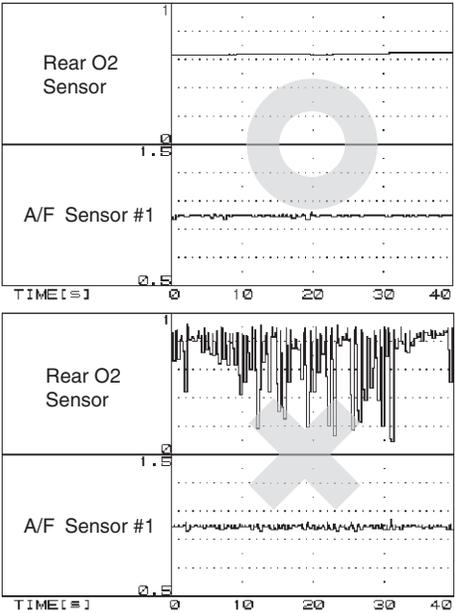
### WIRING DIAGRAM:



EN-03818

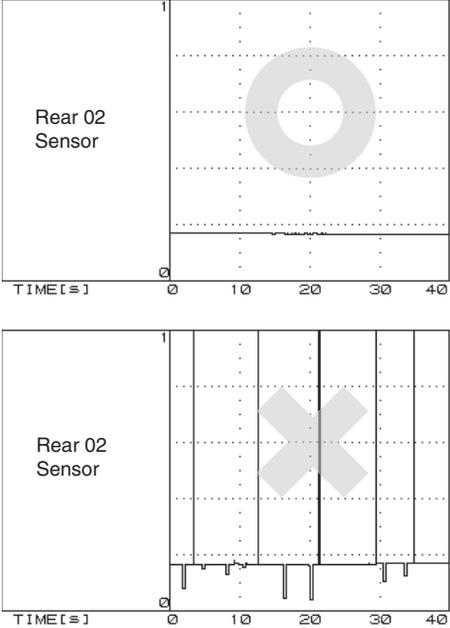
# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1	<p><b>CHECK ANY OTHER DTC ON DISPLAY.</b></p>	<p>Is any other DTC displayed?</p>	<p>Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". &lt;Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).&gt;  NOTE: In this case, it is not necessary to inspect DTC P0420.</p>
2	<p><b>CHECK EXHAUST SYSTEM.</b> 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.</p> <ul style="list-style-type: none"> <li>• Between cylinder head and front exhaust pipe</li> <li>• Between front exhaust pipe and front catalytic converter</li> <li>• Between front catalytic converter and rear catalytic converter</li> <li>• Loose part and improper installation of front oxygen (A/F) sensor or rear oxygen sensor</li> </ul>	<p>Is there any fault in exhaust system?</p>	<p>Repair or replace the exhaust system. &lt;Ref. to EX(H4DOTC)-2, General Description.&gt;</p>
3	<p><b>CHECK WAVEFORM DATA ON SUBARU SELECT MONITOR (WHILE DRIVING).</b> 1) Drive the vehicle at a constant speed of 80 — 113 km/h (50 — 70 MPH). 2) Keep the condition of step 1) for 5 minutes, then read the waveform data in a driving condition using Subaru Select Monitor.</p> <div style="display: flex; flex-direction: column; align-items: center;">  <p style="margin-top: 10px;">EN-04680</p> </div>	<p>Is normal waveform pattern displayed?</p>	<p>Contact your SOA Service Center.  NOTE: The probable cause is considered as the deterioration of multiple parts.</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
4	<p><b>CHECK WAVEFORM DATA ON SUBARU SELECT MONITOR (WHILE IDLING).</b></p> <p>1) Idle the engine.</p> <p>2) Under the condition of step 1), read the waveform data using Subaru Select Monitor.</p>  <p style="text-align: right;">EN-04681</p>	Is normal waveform pattern displayed?	Go to step 10.	Go to step 5.
5	<p><b>CHECK REAR OXYGEN SENSOR VOLTAGE.</b></p> <p>1) Warm-up the engine until engine coolant temperature is above 70°C (158°F), and keep the engine speed at 3,000 rpm. (Max. 2 minutes)</p> <p>2) Read the voltage of rear oxygen sensor using Subaru Select Monitor.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• For MT model, depress the clutch pedal.</li> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedure, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;</p>	Is the voltage more than 490 mV?	Go to step 9.	Go to step 6.
6	<p><b>CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.</b></p>	Does water enter the connector?	Dry the water thoroughly.	Go to step 7.
7	<p><b>CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connector from ECM and rear oxygen sensor.</p> <p>3) Measure the resistance of harness between ECM and rear oxygen sensor connector.</p> <p><b>Connector &amp; terminal</b>  <b>(B135) No. 4 — (B18) No. 3:</b>  <b>(B135) No. 30 — (B18) No. 4:</b></p>	Is the resistance more than 3 Ω?	Repair the open circuit of harness between ECM and rear oxygen sensor connector.	Go to step 8.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>8 CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between rear oxygen sensor connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B18) No. 3 (+) — Chassis ground (-):</b>	Is the voltage 0.2 — 0.5 V?	Go to step 11.	Repair the harness and connector. NOTE: Repair the following. • Open circuit in harness between rear oxygen sensor and ECM connector • Poor contact in rear oxygen sensor and ECM connector • Poor contact in ECM connector
<b>9 CHECK REAR OXYGEN SENSOR VOLTAGE.</b> 1) Warm-up the engine until engine coolant temperature is above 70°C (158°F), and rapidly reduce the engine speed from 3,000 rpm. 2) Read the voltage of rear oxygen sensor using Subaru Select Monitor. NOTE: • For MT model, depress the clutch pedal. • Subaru Select Monitor For detailed operation procedure, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.>	Is the voltage 250 mV or less?	Contact your SOA Service Center. NOTE: The probable cause is considered as the deterioration of multiple parts.	Go to step 6.
<b>10 CHECK CATALYTIC CONVERTER.</b>	Is the catalytic converter damaged?	Replace the catalytic converter. <Ref. to EC(H4DOTC)-5, Front Catalytic Converter.>	Contact your SOA Service Center. NOTE: The probable cause is considered as the deterioration of multiple parts.
<b>11 CHECK REAR OXYGEN SENSOR SHIELD.</b> 1) Turn the ignition switch to OFF. 2) Bare the harness sensor shield on the body side of rear oxygen sensor connector. 3) Measure the resistance between sensor shield and chassis ground.	Is resistance less than 1 Ω?	Replace the rear oxygen sensor. <Ref. to FU(H4DOTC)-43, Rear Oxygen Sensor.>	Repair the open circuit of rear oxygen sensor harness.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## BK:DTC P0442 EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (SMALL LEAK)

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-136, DTC P0442 EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (SMALL LEAK), Diagnostic Trouble Code (DTC) Detecting Criteria.>

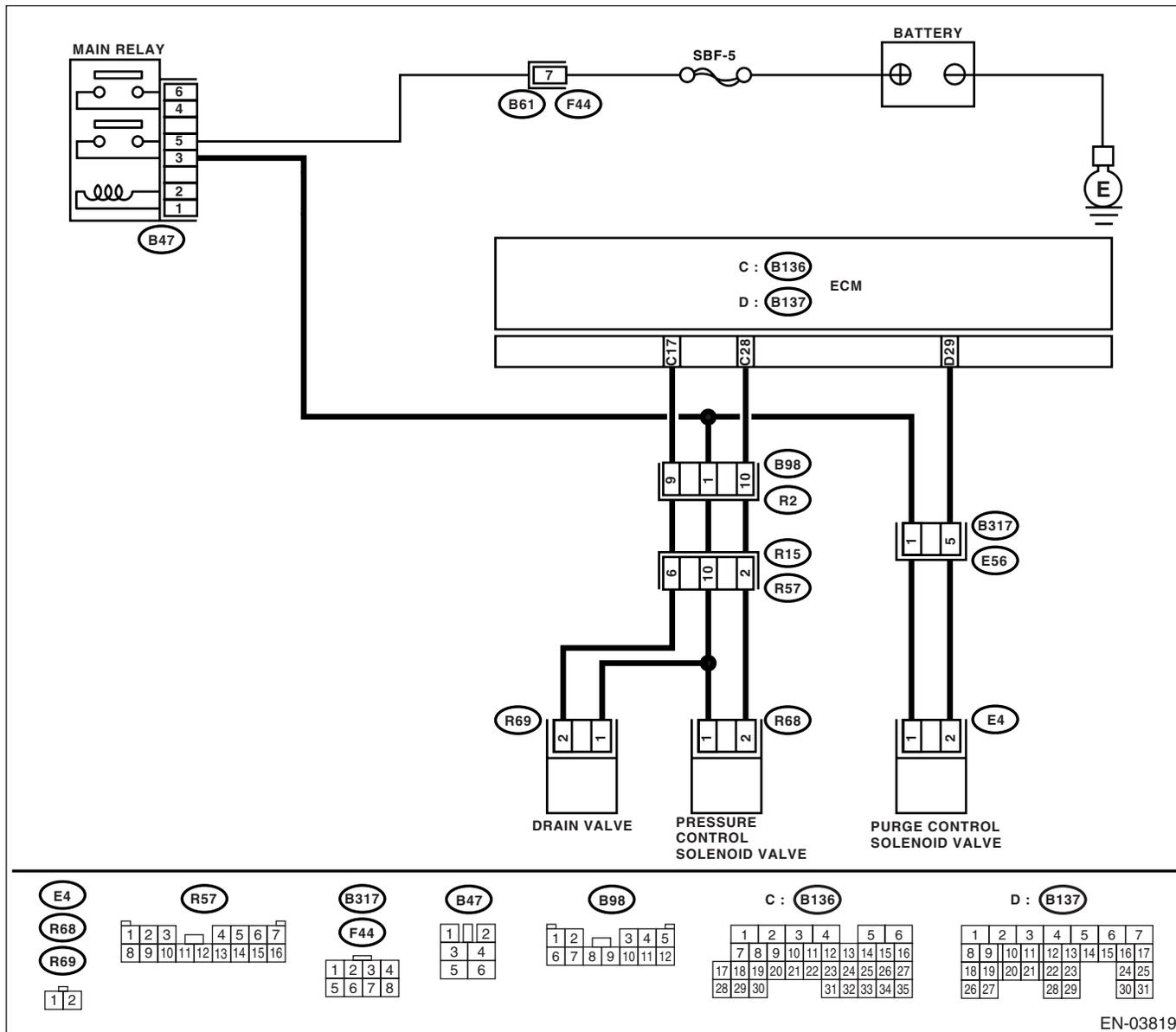
### TROUBLE SYMPTOM:

- Fuel odor
- There is a hole of more than 1.0 mm (0.04 in) dia. in evaporation system or fuel tank.

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03819

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No	
1	<b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2	<b>CHECK FUEL FILLER CAP.</b> 1) Turn the ignition switch to OFF. 2) Check the fuel filler cap. <b>NOTE:</b> The DTC is stored in memory if fuel filler cap is or was loose or if the cap chain has caught while tightening.	Is the fuel filler cap tightened securely?	Go to step 3.	Tighten fuel filler cap securely.
3	<b>CHECK FUEL FILLER CAP.</b>	Is the fuel filler cap SUBARU genuine?	Go to step 4.	Replace with a SUBARU genuine fuel filler cap.
4	<b>CHECK FUEL FILLER PIPE PACKING.</b>	Is there any damage to the seal between fuel filler cap and fuel filler pipe?	Repair or replace the fuel filler cap and fuel filler pipe. <Ref. to FU(H4DOTC)-54, Fuel Filler Pipe.>	Go to step 5.
5	<b>CHECK DRAIN VALVE.</b> 1) Connect the test mode connector. 2) Turn the ignition switch to ON. 3) Operate the drain valve. <b>NOTE:</b> Drain valve operation can also be executed using Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4DOTC)(diag)-47, Compulsory Valve Operation Check Mode.>	Does the drain valve operate?	Go to step 6.	Replace the drain valve. <Ref. to EC(H4DOTC)-20, Drain Valve.>
6	<b>CHECK PURGE CONTROL SOLENOID VALVE.</b> Operate the purge control solenoid valve. <b>NOTE:</b> Purge control solenoid valve operation can be executed using Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4DOTC)(diag)-47, Compulsory Valve Operation Check Mode.>	Does the purge control solenoid valve operate?	Go to step 7.	Replace the purge control solenoid valve. <Ref. to EC(H4DOTC)-8, Purge Control Solenoid Valve.>
7	<b>CHECK PRESSURE CONTROL SOLENOID VALVE.</b> Operate the pressure control solenoid valve. <b>NOTE:</b> The pressure control solenoid valve operation can be executed using the Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4DOTC)(diag)-47, Compulsory Valve Operation Check Mode.>	Does the pressure control solenoid valve operate?	Go to step 8.	Replace the pressure control solenoid valve. <Ref. to EC(H4DOTC)-16, Pressure Control Solenoid Valve.>

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

### ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>8</b> <b>CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE.</b> Turn the ignition switch to OFF.	Is there any hole of more than 1.0 mm (0.04 in) dia. on evaporation line?	Repair or replace the evaporation line. <Ref. to FU(H4DOTC)-65, Fuel Delivery, Return and Evaporation Lines.>	Go to step <b>9</b> .
<b>9</b> <b>CHECK CANISTER.</b>	Is the canister damaged or is there a hole of more than 1.0 mm (0.04 in) dia. in it?	Repair or replace the canister. <Ref. to EC(H4DOTC)-7, Canister.>	Go to step <b>10</b> .
<b>10</b> <b>CHECK FUEL TANK.</b> Remove the fuel tank. <Ref. to FU(H4DOTC)-51, Fuel Tank.>	Is the fuel tank damaged or is there any hole of more than 1.0 mm (0.04 in) dia. in it?	Repair or replace the fuel tank. <Ref. to FU(H4DOTC)-51, Fuel Tank.>	Go to step <b>11</b> .
<b>11</b> <b>CHECK ANY OTHER MECHANICAL TROUBLE IN EVAPORATIVE EMISSION CONTROL SYSTEM.</b>	Is there any hole of more than 1.0 mm (0.04 in) dia., crack, clogging, or disconnections, bend, misconnection of hoses or pipes in evaporative emission control system?	Repair or replace the hoses or pipes.	Contact with SOA Service Center.  NOTE: The deterioration of multiple parts can be thought as the cause.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## BL:DTC P0447 EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL CIRCUIT OPEN

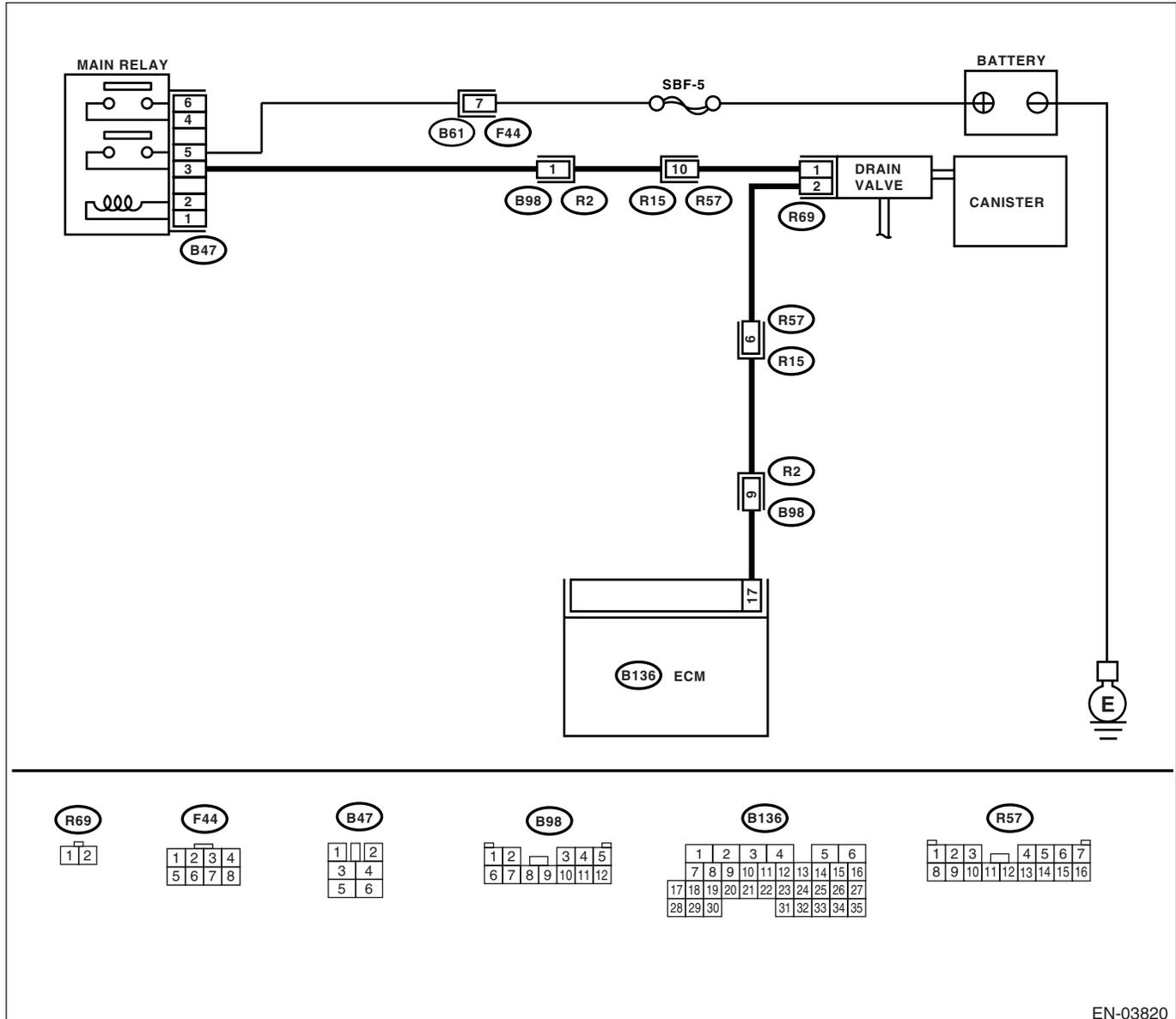
### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-151, DTC P0447 EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL CIRCUIT OPEN, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03820

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK OUTPUT SIGNAL OF ECM.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 17 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Go to step 2.	Go to step 3.
<b>2 CHECK POOR CONTACT.</b> Check poor contact of ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	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.) <b>NOTE:</b> In this case, repair the following item: <ul style="list-style-type: none"> <li>• Poor contact in drain valve connector</li> <li>• Poor contact in ECM connector</li> <li>• Poor contact of coupling connector</li> </ul>
<b>3 CHECK HARNESS BETWEEN DRAIN VALVE AND ECM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from drain valve and ECM. 3) Measure the resistance of harness between drain valve connector and chassis ground. <b>Connector &amp; terminal</b> <b>(R69) No. 2 — Chassis ground:</b>	Is the resistance more than 1 M $\Omega$ ?	Go to step 4.	Repair ground short circuit of harness between ECM and drain valve connector.
<b>4 CHECK HARNESS BETWEEN DRAIN VALVE AND ECM CONNECTOR.</b> Measure the resistance of harness between ECM and drain valve connector. <b>Connector &amp; terminal</b> <b>(B136) No. 17 — (R69) No. 2:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 5.	Repair the harness and connector. <b>NOTE:</b> In this case, repair the following item: <ul style="list-style-type: none"> <li>• Open circuit of harness between ECM and drain valve connector</li> <li>• Poor contact of coupling connector</li> </ul>
<b>5 CHECK DRAIN VALVE.</b> Measure the resistance between drain valve terminals. <b>Terminals</b> <b>No. 1 — No. 2:</b>	Is the resistance between 10 and 100 $\Omega$ ?	Go to step 6.	Replace the drain valve. <Ref. to EC(H4DOTC)-20, Drain Valve.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>6</b>      <b>CHECK POWER SUPPLY TO DRAIN VALVE.</b>                      1) Turn the ignition switch to ON.                      2) Measure the voltage between drain valve and chassis ground.  <b>Connector &amp; terminal</b>  <b>(R69) No. 1 (+) — Chassis ground (-):</b></p>	<p>Is the voltage more than 10 V?</p>	<p>Go to step 7.</p>	<p>Repair the harness and connector.                      NOTE:                      In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Open circuit of harness between main relay and drain valve</li> <li>• Poor contact of coupling connector</li> <li>• Poor contact of main relay connector</li> </ul>
<p><b>7</b>      <b>CHECK POOR CONTACT.</b>                      Check poor contact in drain valve connector.</p>	<p>Is there poor contact in drain valve connector?</p>	<p>Repair poor contact in drain valve connector.</p>	<p>Contact with SOA Service Center.                      NOTE:                      The deterioration of multiple parts can be thought as the cause.</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## BM:DTC P0448 EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL CIRCUIT SHORTED

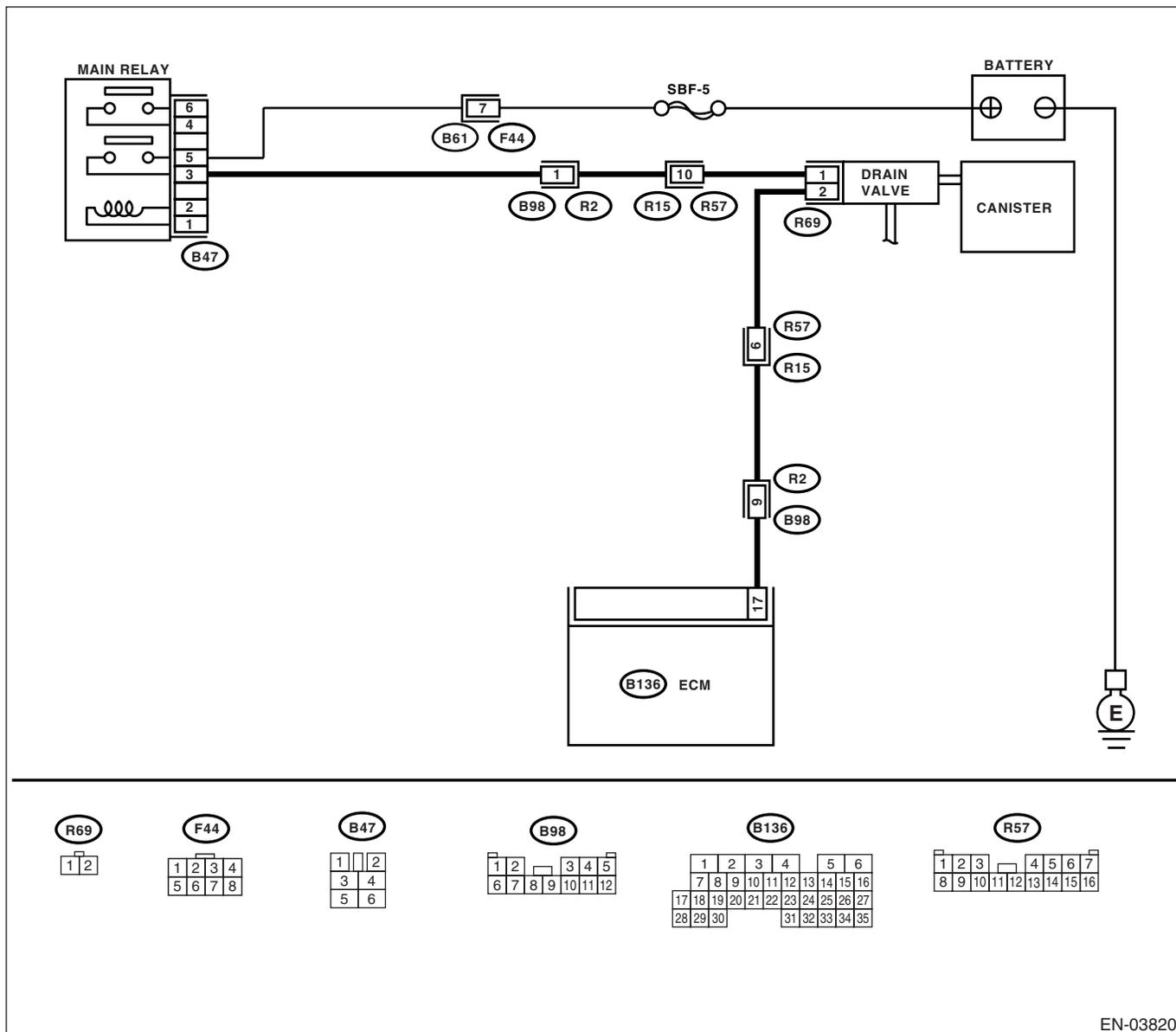
### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-153, DTC P0448 EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL CIRCUIT SHORTED, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03820

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK INPUT SIGNAL OF ECM.</b> 1) Turn the ignition switch to OFF. 2) Connect the test mode connector at the lower portion of instrument panel (on the drivers side). 3) Turn the ignition switch to ON. 4) While operating the drain valve, measure voltage between ECM and chassis ground. NOTE: Drain valve operation can also be executed using Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4DOTC)(diag)-47, Compulsory Valve Operation Check Mode.> <b>Connector &amp; terminal</b> <b>(B136) No. 17 (+) — Chassis ground (-):</b>	Is the voltage 0 — 10 V?	Go to step 2.	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.
<b>2 CHECK INPUT SIGNAL OF ECM.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 17 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Go to step 4.	Go to step 3.
<b>3 CHECK POOR CONTACT.</b> Check poor contact of ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Replace the ECM. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>
<b>4 CHECK HARNESS BETWEEN DRAIN VALVE AND ECM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the drain valve. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 17 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Repair battery short circuit of harness between ECM and drain valve connector. After repair, replace the ECM. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>	Go to step 5.
<b>5 CHECK DRAIN VALVE.</b> 1) Turn the ignition switch to OFF. 2) Measure the resistance between drain valve terminals. <b>Terminals</b> <b>No. 1 — No. 2:</b>	Is the resistance less than 1 $\Omega$ ?	Replace the drain valve <Ref. to EC(H4DOTC)-20, Drain Valve.> and ECM <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>.	Go to step 6.
<b>6 CHECK POOR CONTACT.</b> Check poor contact of ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Replace the ECM. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## BN:DTC P0451 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR

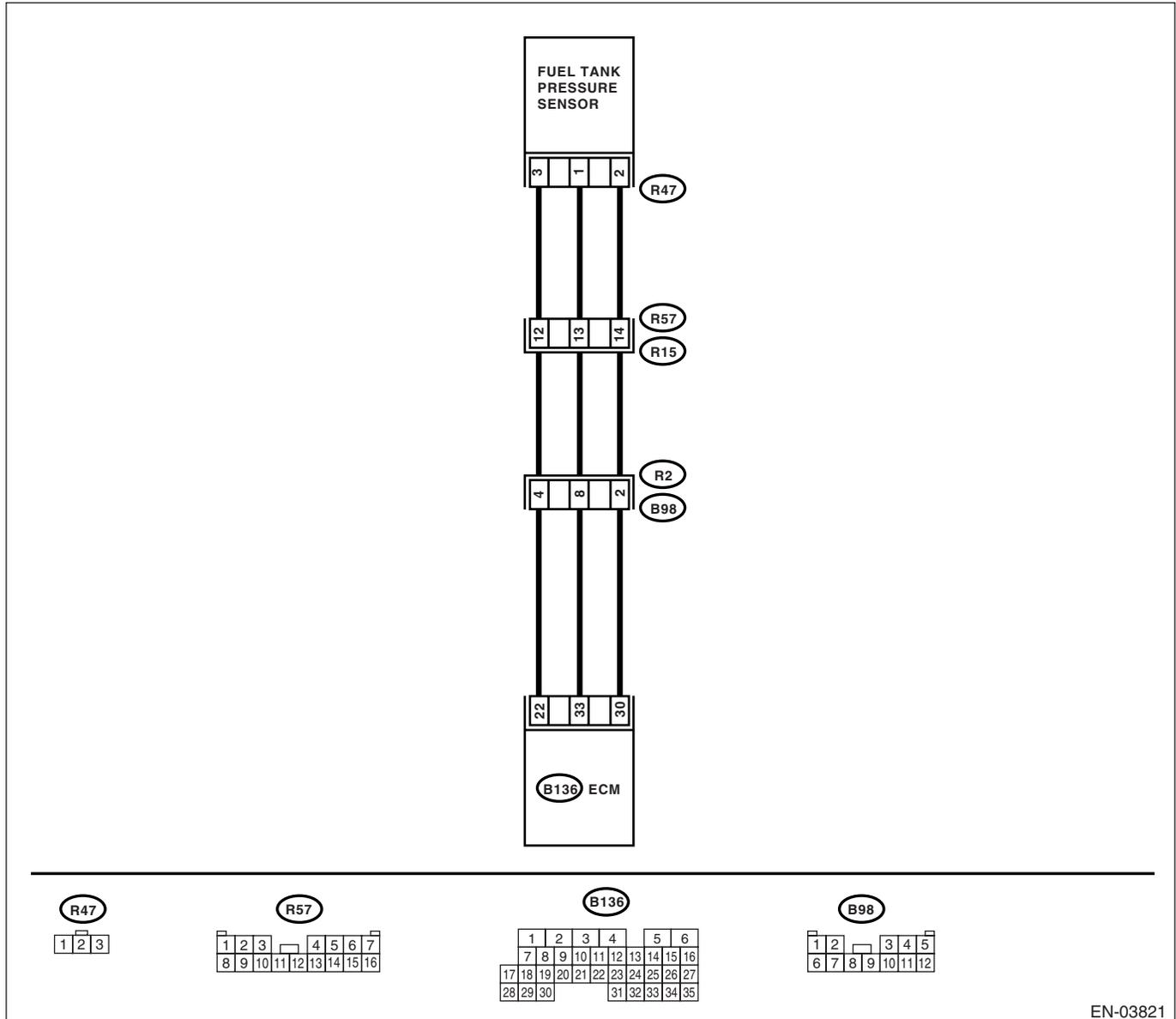
### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-155, DTC P0451 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03821

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1</b> <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
<b>2</b> <b>CHECK FUEL FILLER CAP.</b> 1) Turn the ignition switch to OFF. 2) Open the fuel flap.	Is the fuel filler cap tightened securely?	Go to step 3.	Tighten fuel filler cap securely.
<b>3</b> <b>CHECK PRESSURE VACUUM LINE.</b> NOTE: Check the following item. <ul style="list-style-type: none"><li>• Disconnection, leakage and clogging of the vacuum hoses and pipes between fuel tank pressure sensor and fuel tank</li><li>• Disconnection, leakage and clogging of the air ventilation hoses and pipes between fuel filler pipe and fuel tank</li></ul>	Is there a fault in pressure/vacuum line?	Repair or replace the hoses and pipes.	Replace the fuel tank pressure sensor. <Ref. to EC(H4DOTC)-15, Fuel Tank Pressure Sensor.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## BO:DTC P0452 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR LOW INPUT

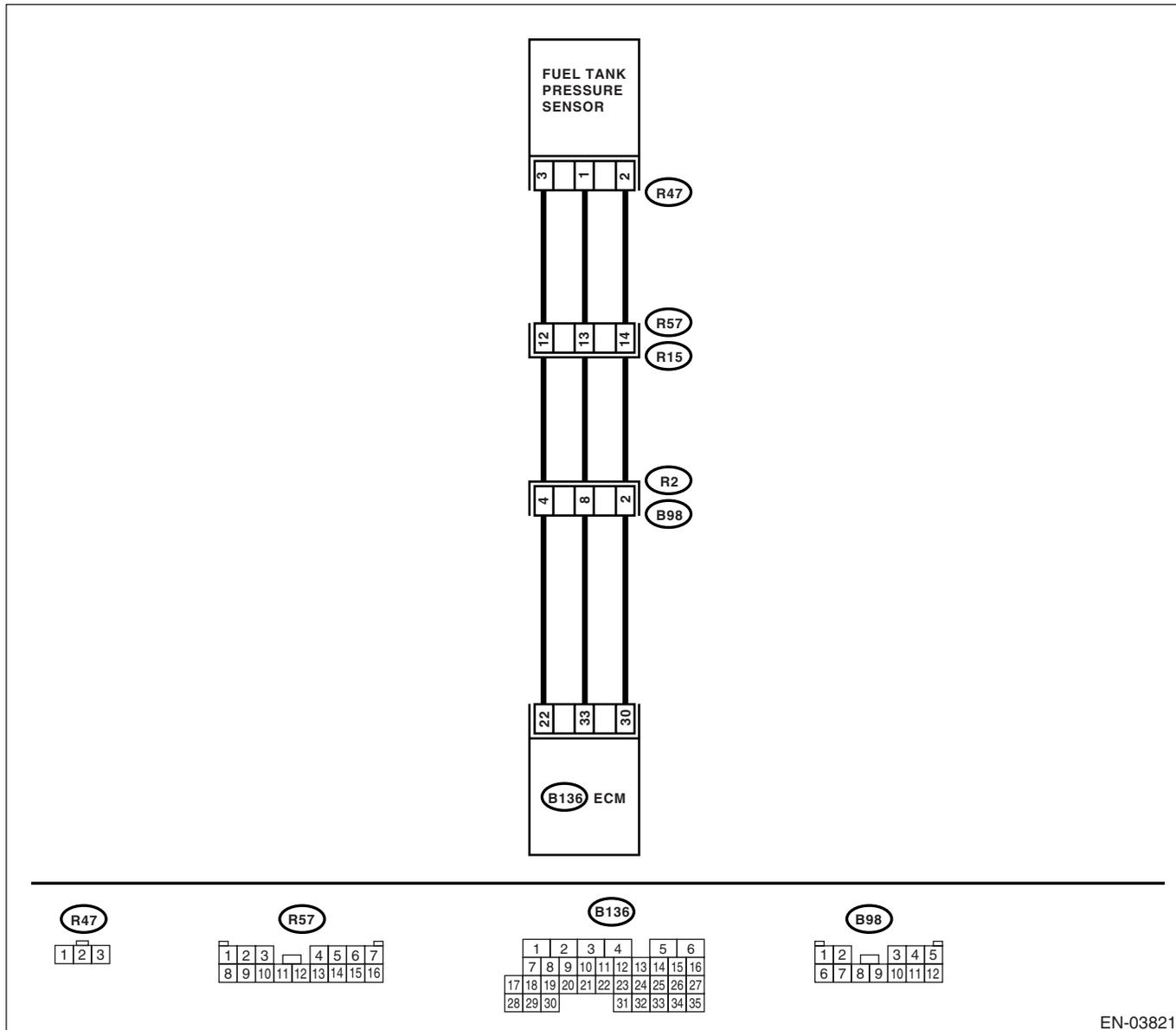
### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-157, DTC P0452 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03821

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1 CHECK CURRENT DATA.</b></p> <ol style="list-style-type: none"> <li>1) Turn the ignition switch to OFF.</li> <li>2) Remove the fuel filler cap.</li> <li>3) Install the fuel filler cap.</li> <li>4) Turn the ignition switch to ON.</li> <li>5) Read the data of the fuel tank pressure sensor signal using Subaru Select Monitor or general scan tool.</li> </ol> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedure, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• General scan tool</li> </ul> <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the measured value less than -2.8 kPa (-21.0 mmHg, -0.827 inHg)?</p>	<p>Go to step 2.</p>	<p>Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time.</p>
<p><b>2 CHECK POWER SUPPLY TO FUEL TANK PRESSURE SENSOR.</b></p> <p>Measure the voltage between ECM connector and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(B136) No. 22 (+) — Chassis ground (-):</b></p>	<p>Is the voltage more than 4.5 V?</p>	<p>Go to step 4.</p>	<p>Go to step 3.</p>
<p><b>3 CHECK POWER SUPPLY TO FUEL TANK PRESSURE SENSOR.</b></p> <p>Measure the voltage between ECM connector and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(B136) No. 22 (+) — Chassis ground (-):</b></p>	<p>Is the voltage more than 4.5 V?</p>	<p>Repair poor contact in ECM connector.</p>	<p>Contact with SOA Service Center.</p> <p>NOTE: The deterioration of multiple parts can be thought as the cause.</p>
<p><b>4 CHECK INPUT SIGNAL OF ECM.</b></p> <p>Measure the voltage between ECM and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(B136) No. 33 (+) — Chassis ground (-):</b></p>	<p>Is the voltage less than 0.2 V?</p>	<p>Go to step 6.</p>	<p>Go to step 5.</p>
<p><b>5 CHECK INPUT SIGNAL FOR ECM (USING SUBARU SELECT MONITOR).</b></p> <p>Read the data of fuel tank pressure sensor signal using Subaru Select Monitor.</p> <p>NOTE: Subaru Select Monitor</p> <p>For detailed operation procedure, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;</p>	<p>Does the voltage change when shaking the ECM harness and connector?</p>	<p>Repair poor contact in ECM connector.</p>	<p>Go to step 6.</p>
<p><b>6 CHECK HARNESS BETWEEN ECM AND COUPLING CONNECTOR IN REAR WIRING HARNESS.</b></p> <ol style="list-style-type: none"> <li>1) Turn the ignition switch to OFF.</li> <li>2) Remove the rear seat cushion.</li> <li>3) Separate rear wiring harness and fuel tank cord.</li> <li>4) Turn the ignition switch to ON.</li> <li>5) Measure the voltage between the rear wiring harness connector and chassis ground.</li> </ol> <p><b>Connector &amp; terminal</b> <b>(R15) No. 12 (+) — Chassis ground (-):</b></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 item:</p> <ul style="list-style-type: none"> <li>• Open circuit of harness between ECM and rear wiring harness connector</li> <li>• Poor contact of coupling connector</li> </ul>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>7</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND COUPLING CONNECTOR IN REAR WIRING HARNESS.</b></p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM. 3) Measure the resistance of harness between ECM and rear wiring harness connector.</p> <p><b>Connector &amp; terminal</b> <b>(B136) No. 30 — (R15) No. 14:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	Go to step <b>8</b> .	<p>Repair the harness and connector.</p> <p><b>NOTE:</b> In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Open circuit of harness between ECM and rear wiring harness connector</li> <li>• Poor contact of coupling connector</li> <li>• Poor contact of joint connector</li> </ul>
<p><b>8</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND COUPLING CONNECTOR IN REAR WIRING HARNESS.</b></p> <p>Measure the resistance of harness between rear wiring harness connector and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(R15) No. 14 — Chassis ground:</b></p>	<p>Is the resistance more than 1 <math>M\Omega</math>?</p>	Go to step <b>9</b> .	<p>Repair short circuit to ground in the harness between ECM and rear wiring harness connector.</p>
<p><b>9</b></p> <p><b>CHECK FUEL TANK CORD.</b></p> <p>1) Disconnect the connector from fuel tank pressure sensor. 2) Measure the resistance of fuel tank cord.</p> <p><b>Connector &amp; terminal</b> <b>(R57) No. 12 — (R47) No. 3:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	Go to step <b>10</b> .	<p>Repair open circuit in fuel tank cord.</p>
<p><b>10</b></p> <p><b>CHECK FUEL TANK CORD.</b></p> <p>Measure the resistance of fuel tank cord.</p> <p><b>Connector &amp; terminal</b> <b>(R57) No. 14 — (R47) No. 2:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	Go to step <b>11</b> .	<p>Repair open circuit in fuel tank cord.</p>
<p><b>11</b></p> <p><b>CHECK FUEL TANK CORD.</b></p> <p>Measure the resistance of the harness between fuel tank pressure sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(R47) No. 1 — Chassis ground:</b></p>	<p>Is the resistance more than 1 <math>M\Omega</math>?</p>	Go to step <b>12</b> .	<p>Repair ground short circuit in fuel tank cord.</p>
<p><b>12</b></p> <p><b>CHECK POOR CONTACT.</b></p> <p>Check poor contact in fuel tank pressure sensor connector.</p>	<p>Is there poor contact in fuel tank pressure sensor connector?</p>	<p>Repair poor contact in fuel tank pressure sensor connector.</p>	<p>Replace the fuel tank pressure sensor. &lt;Ref. to EC(H4DOTC)-15, Fuel Tank Pressure Sensor.&gt;</p>

## BP:DTC P0453 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR HIGH INPUT

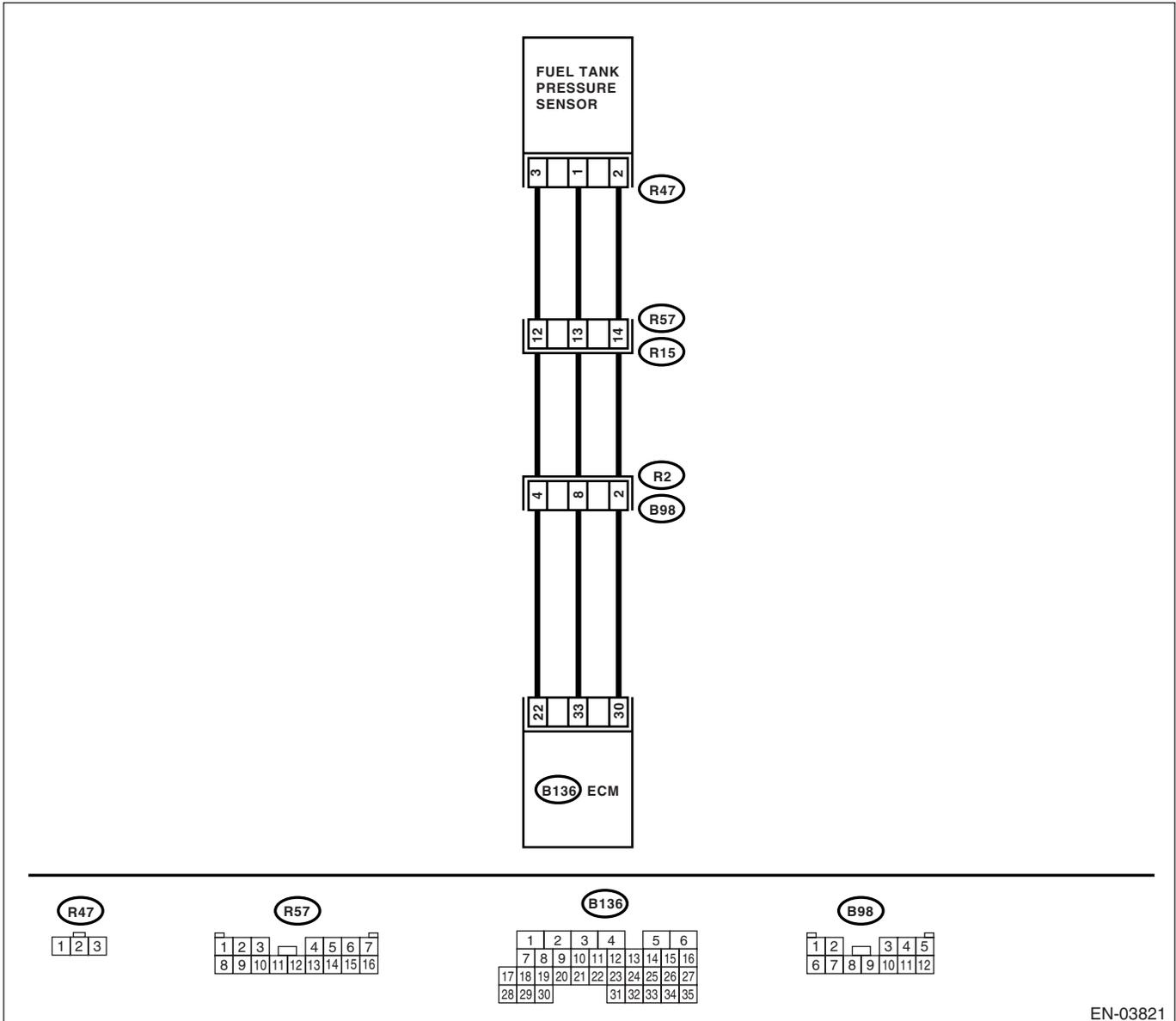
### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-159, DTC P0453 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

**After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

### WIRING DIAGRAM:



EN-03821

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1 CHECK CURRENT DATA.</b></p> <p>1) Turn the ignition switch to OFF. 2) Remove the fuel filler cap. 3) Install the fuel filler cap. 4) Turn the ignition switch to ON. 5) Read the data of the fuel tank pressure sensor signal using Subaru Select Monitor or general scan tool.</p> <p>NOTE: • Subaru Select Monitor For detailed operation procedure, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt; • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</p>	Is the measured value 2.8 kPa (21.0 mmHg, 0.827 inHg) or more?	Go to step 11.	Go to step 2.
<p><b>2 CHECK POWER SUPPLY TO FUEL TANK PRESSURE SENSOR.</b></p> <p>Measure the voltage between ECM connector and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(B136) No. 22 (+) — Chassis ground (-):</b></p>	Is the voltage more than 4.5 V?	Go to step 4.	Go to step 3.
<p><b>3 CHECK POWER SUPPLY TO FUEL TANK PRESSURE SENSOR.</b></p> <p>Measure the voltage between ECM connector and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(B136) No. 22 (+) — Chassis ground (-):</b></p>	Does the voltage change when shaking the ECM harness and connector?	Repair poor contact in ECM connector.	Replace the ECM. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>
<p><b>4 CHECK INPUT SIGNAL OF ECM.</b></p> <p>Measure the voltage between ECM and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(B136) No. 33 (+) — Chassis ground (-):</b></p>	Is the voltage less than 0.2 V?	Go to step 6.	Go to step 5.
<p><b>5 CHECK INPUT SIGNAL FOR ECM (USING SUBARU SELECT MONITOR).</b></p> <p>Read the data of fuel tank pressure sensor signal using Subaru Select Monitor.</p> <p>NOTE: Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;</p>	Is the measured value more than -2.8 kPa (-21.0 mmHg, -0.827 inHg) when shaking the ECM harness and connector?	Repair poor contact in ECM connector.	Go to step 6.
<p><b>6 CHECK HARNESS BETWEEN ECM AND COUPLING CONNECTOR IN REAR WIRING HARNESS.</b></p> <p>1) Turn the ignition switch to OFF. 2) Remove the rear seat cushion. 3) Separate rear wiring harness and fuel tank cord. 4) Turn the ignition switch to ON. 5) Measure the voltage between the rear wiring harness connector and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(R15) No. 12 (+) — Chassis ground (-):</b></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 item: • Open circuit of harness between ECM and rear wiring harness connector • Poor contact of coupling connector

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>7 CHECK HARNESS BETWEEN ECM AND COUPLING CONNECTOR IN REAR WIRING HARNESS.</b></p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM. 3) Measure the resistance of harness between ECM and rear wiring harness connector.</p> <p><b>Connector &amp; terminal</b> <b>(B136) No. 33 — (R15) No. 13:</b> <b>(B136) No. 30 — (R15) No. 14:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step <b>8</b>.</p>	<p>Repair the harness and connector.</p> <p><b>NOTE:</b> In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Open circuit of harness between ECM and rear wiring harness connector</li> <li>• Poor contact of coupling connector</li> </ul>
<p><b>8 CHECK FUEL TANK CORD.</b></p> <p>1) Disconnect the connector from fuel tank pressure sensor. 2) Measure the resistance of fuel tank cord.</p> <p><b>Connector &amp; terminal</b> <b>(R57) No. 13 — (R47) No. 1:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step <b>9</b>.</p>	<p>Repair open circuit in fuel tank cord.</p>
<p><b>9 CHECK FUEL TANK CORD.</b></p> <p>Measure the resistance of fuel tank cord.</p> <p><b>Connector &amp; terminal</b> <b>(R57) No. 14 — (R47) No. 2:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step <b>10</b>.</p>	<p>Repair open circuit in fuel tank cord.</p>
<p><b>10 CHECK POOR CONTACT.</b></p> <p>Check poor contact in fuel tank pressure sensor connector.</p>	<p>Is there poor contact in fuel tank pressure sensor connector?</p>	<p>Repair poor contact in fuel tank pressure sensor connector.</p>	<p>Replace the fuel tank pressure sensor. &lt;Ref. to EC(H4DOTC)-15, Fuel Tank Pressure Sensor.&gt;</p>
<p><b>11 CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from fuel tank pressure sensor. 3) Turn the ignition switch to ON. 4) Read the data of the fuel tank pressure sensor signal using Subaru Select Monitor or general scan tool.</p> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• General scan tool</li> </ul> <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the measured value 2.8 kPa (21.0 mmHg, 0.827 inHg) or more?</p>	<p>Repair short circuit to battery in the harness between ECM and fuel tank pressure sensor connector.</p>	<p>Replace the fuel tank pressure sensor. &lt;Ref. to EC(H4DOTC)-15, Fuel Tank Pressure Sensor.&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## BQ:DTC P0456 EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (VERY SMALL LEAK)

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-161, DTC P0456 EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (VERY SMALL LEAK), Diagnostic Trouble Code (DTC) Detecting Criteria.>

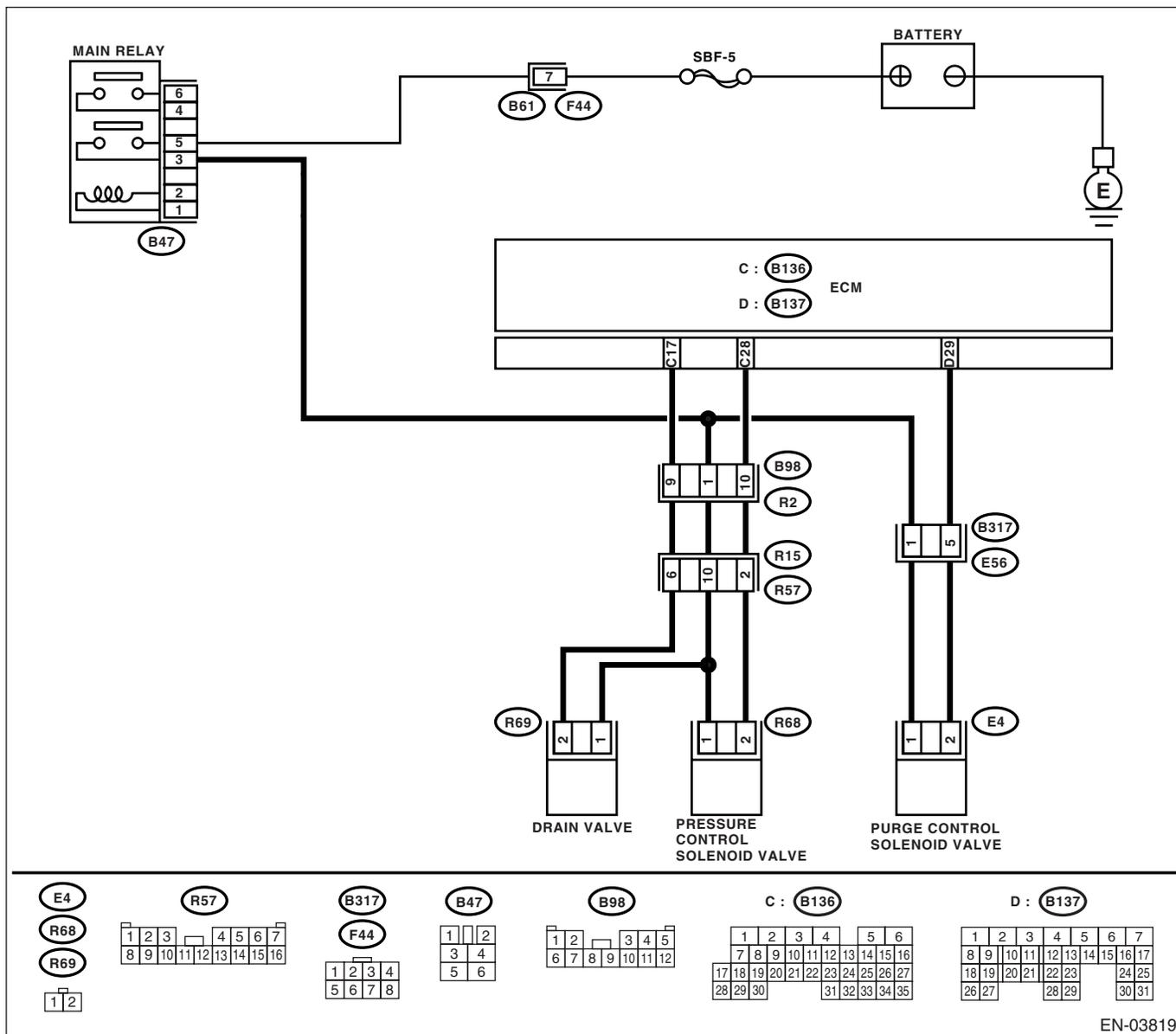
### TROUBLE SYMPTOM:

- Fuel odor
- There is a hole of more than 0.5 mm (0.020 in) dia. in evaporation system or fuel tank.

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03819

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2 <b>CHECK FUEL FILLER CAP.</b> 1) Turn the ignition switch to OFF. 2) Check the fuel filler cap. <b>NOTE:</b> The DTC is stored in memory if fuel filler cap is or was loose or if the cap chain was caught while tightening.	Is the fuel filler cap tightened securely?	Go to step 3.	Tighten fuel filler cap securely.
3 <b>CHECK FUEL FILLER CAP.</b>	Is the fuel filler cap SUBARU genuine?	Go to step 4.	Replace with a SUBARU genuine fuel filler cap.
4 <b>CHECK FUEL FILLER PIPE PACKING.</b>	Is there any damage to the seal between fuel filler cap and fuel filler pipe?	Repair or replace the fuel filler cap and fuel filler pipe. <Ref. to FU(H4DOTC)-54, Fuel Filler Pipe.>	Go to step 5.
5 <b>CHECK DRAIN VALVE.</b> 1) Connect the test mode connector. 2) Turn the ignition switch to ON. 3) Operate the drain valve. <b>NOTE:</b> Drain valve operation can also be executed using Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4DOTC)(diag)-47, Compulsory Valve Operation Check Mode.>	Does the drain valve operate?	Go to step 6.	Replace the drain valve. <Ref. to EC(H4DOTC)-20, Drain Valve.>
6 <b>CHECK PURGE CONTROL SOLENOID VALVE.</b> Operate the purge control solenoid valve. <b>NOTE:</b> Purge control solenoid valve operation can be executed using Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4DOTC)(diag)-47, Compulsory Valve Operation Check Mode.>	Does the purge control solenoid valve operate?	Go to step 7.	Replace the purge control solenoid valve. <Ref. to EC(H4DOTC)-8, Purge Control Solenoid Valve.>
7 <b>CHECK PRESSURE CONTROL SOLENOID VALVE.</b> Operate the pressure control solenoid valve. <b>NOTE:</b> The pressure control solenoid valve operation can be executed using the Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4DOTC)(diag)-47, Compulsory Valve Operation Check Mode.>	Does the pressure control solenoid valve operate?	Go to step 8.	Replace the pressure control solenoid valve. <Ref. to EC(H4DOTC)-8, Purge Control Solenoid Valve.>

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

### ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>8</b> <b>CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE.</b> Turn the ignition switch to OFF.	Is there any hole of more than 0.5 mm (0.020 in) dia. on evaporation line?	Repair or replace the evaporation line. <Ref. to FU(H4DOTC)-65, Fuel Delivery, Return and Evaporation Lines.>	Go to step <b>9</b> .
<b>9</b> <b>CHECK CANISTER.</b>	Is the canister damaged or is there a hole of more than 0.5 mm (0.020 in) dia. in it?	Repair or replace the canister. <Ref. to EC(H4DOTC)-7, Canister.>	Go to step <b>10</b> .
<b>10</b> <b>CHECK FUEL TANK.</b> Remove the fuel tank. <Ref. to FU(H4DOTC)-51, Fuel Tank.>	Is the fuel tank damaged or is there any hole of more than 0.5 mm (0.020 in) dia. in it?	Repair or replace the fuel tank. <Ref. to FU(H4DOTC)-51, Fuel Tank.>	Go to step <b>11</b> .
<b>11</b> <b>CHECK ANY OTHER MECHANICAL TROUBLE IN EVAPORATIVE EMISSION CONTROL SYSTEM.</b>	Is there any hole of more than 0.5 mm (0.020 in) dia., crack, clogging, or disconnections, bend, misconnection of hoses or pipes in evaporative emission control system?	Repair or replace the hoses or pipes.	Contact with SOA Service Center.  NOTE: The deterioration of multiple parts can be thought as the cause.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## BR:DTC P0457 EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (FUEL CAP LOOSE/OFF)

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-161, DTC P0457 EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (FUEL CAP LOOSE/OFF), Diagnostic Trouble Code (DTC) Detecting Criteria.>

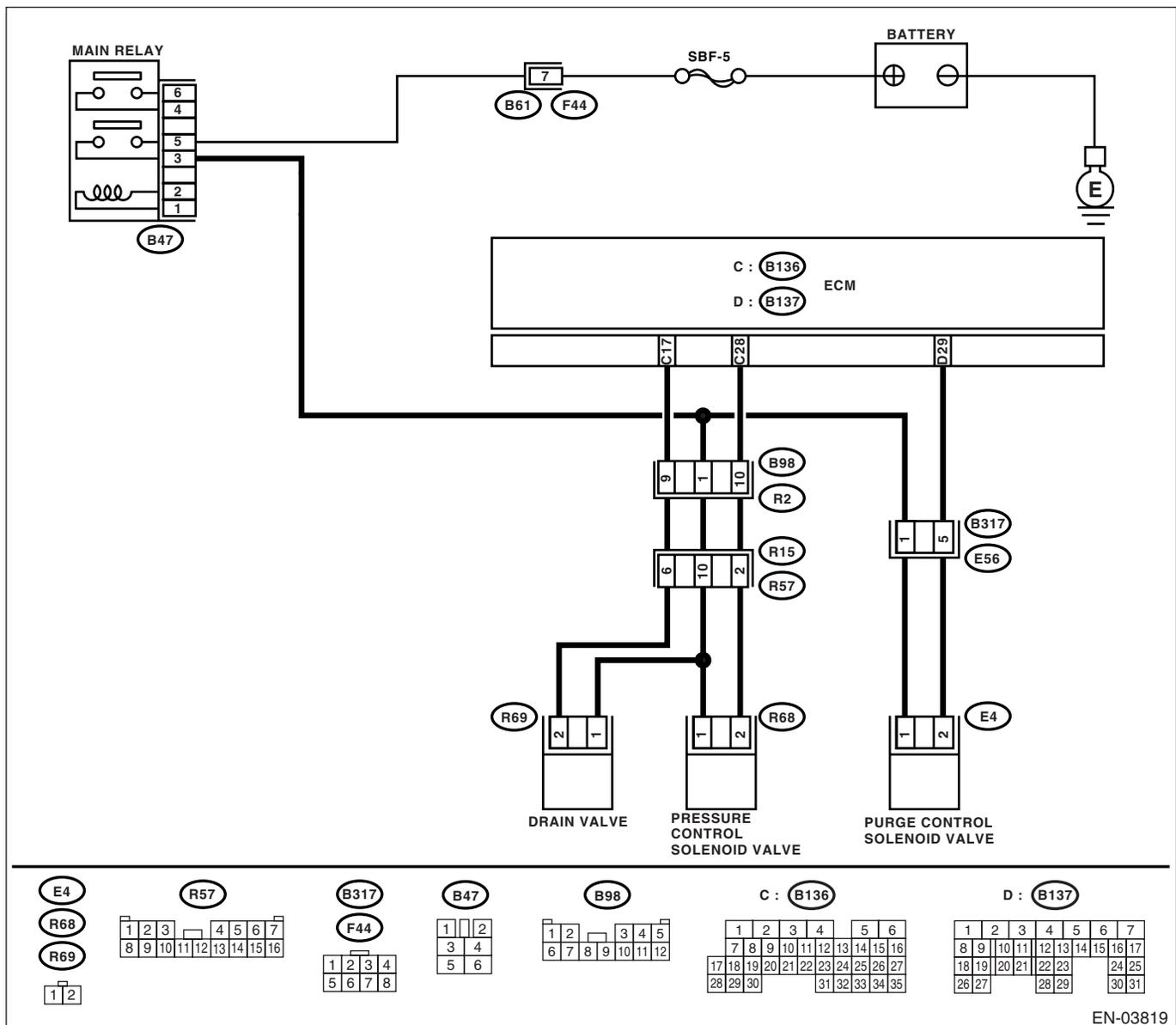
### TROUBLE SYMPTOM:

- Fuel odor
- Fuel filler cap loose or lost

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03819

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1</b> <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
<b>2</b> <b>CHECK FUEL FILLER CAP.</b> 1) Turn the ignition switch to OFF. 2) Check the fuel filler cap. <b>NOTE:</b> The DTC is stored in memory if fuel filler cap is or was loose or if the cap chain has caught while tightening.	Is the fuel filler cap tightened securely?	Go to step 3.	Tighten fuel filler cap securely.
<b>3</b> <b>CHECK FUEL FILLER CAP.</b>	Is the fuel filler cap SUBARU genuine?	Go to step 4.	Replace with a SUBARU genuine fuel filler cap.
<b>4</b> <b>CHECK FUEL FILLER PIPE PACKING.</b>	Is there any damage to the seal between fuel filler cap and fuel filler pipe?	Repair or replace the fuel filler cap and fuel filler pipe. <Ref. to FU(H4DOTC)-54, Fuel Filler Pipe.>	Go to step 5.
<b>5</b> <b>CHECK DRAIN VALVE.</b> 1) Connect the test mode connector. 2) Turn the ignition switch to ON. 3) Operate the drain valve. <b>NOTE:</b> Drain valve operation can also be executed using Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4DOTC)(diag)-47, Compulsory Valve Operation Check Mode.>	Does the drain valve operate?	Go to step 6.	Replace the drain valve. <Ref. to EC(H4DOTC)-20, Drain Valve.>
<b>6</b> <b>CHECK PURGE CONTROL SOLENOID VALVE.</b> Operate the purge control solenoid valve. <b>NOTE:</b> Purge control solenoid valve operation can be executed using Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4DOTC)(diag)-47, Compulsory Valve Operation Check Mode.>	Does the purge control solenoid valve operate?	Go to step 7.	Replace the purge control solenoid valve. <Ref. to EC(H4DOTC)-8, Purge Control Solenoid Valve.>
<b>7</b> <b>CHECK PRESSURE CONTROL SOLENOID VALVE.</b> Operate the pressure control solenoid valve. <b>NOTE:</b> The pressure control solenoid valve operation can be executed using the Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4DOTC)(diag)-47, Compulsory Valve Operation Check Mode.>	Does the pressure control solenoid valve operate?	Go to step 8.	Replace the pressure control solenoid valve. <Ref. to EC(H4DOTC)-8, Purge Control Solenoid Valve.>
<b>8</b> <b>CHECK CANISTER.</b>	Is the canister damaged?	Repair or replace the canister. <Ref. to EC(H4DOTC)-7, Canister.>	Go to step 9.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>9</b> <b>CHECK FUEL TANK.</b> Remove the fuel tank. <Ref. to FU(H4DOTC)-51, Fuel Tank.>	Is the fuel tank damaged?	Repair or replace the fuel tank. <Ref. to FU(H4DOTC)-51, Fuel Tank.>	Go to step <b>10</b> .
<b>10</b> <b>CHECK ANY OTHER MECHANICAL TROUBLE IN EVAPORATIVE EMISSION CONTROL SYSTEM.</b>	Are there holes of more than 0.5 mm (0.020 in) dia., cracks, clogging, or disconnections, misconnection of hoses or pipes in evaporative emission control system?	Repair or replace the hoses or pipes.	Contact with SOA Service Center. NOTE: The deterioration of multiple parts can be thought as the cause.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## BS:DTC P0458 EVAPORATIVE EMISSION SYSTEM PURGE CONTROL VALVE CIRCUIT LOW

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-162, DTC P0458 EVAPORATIVE EMISSION SYSTEM PURGE CONTROL VALVE CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

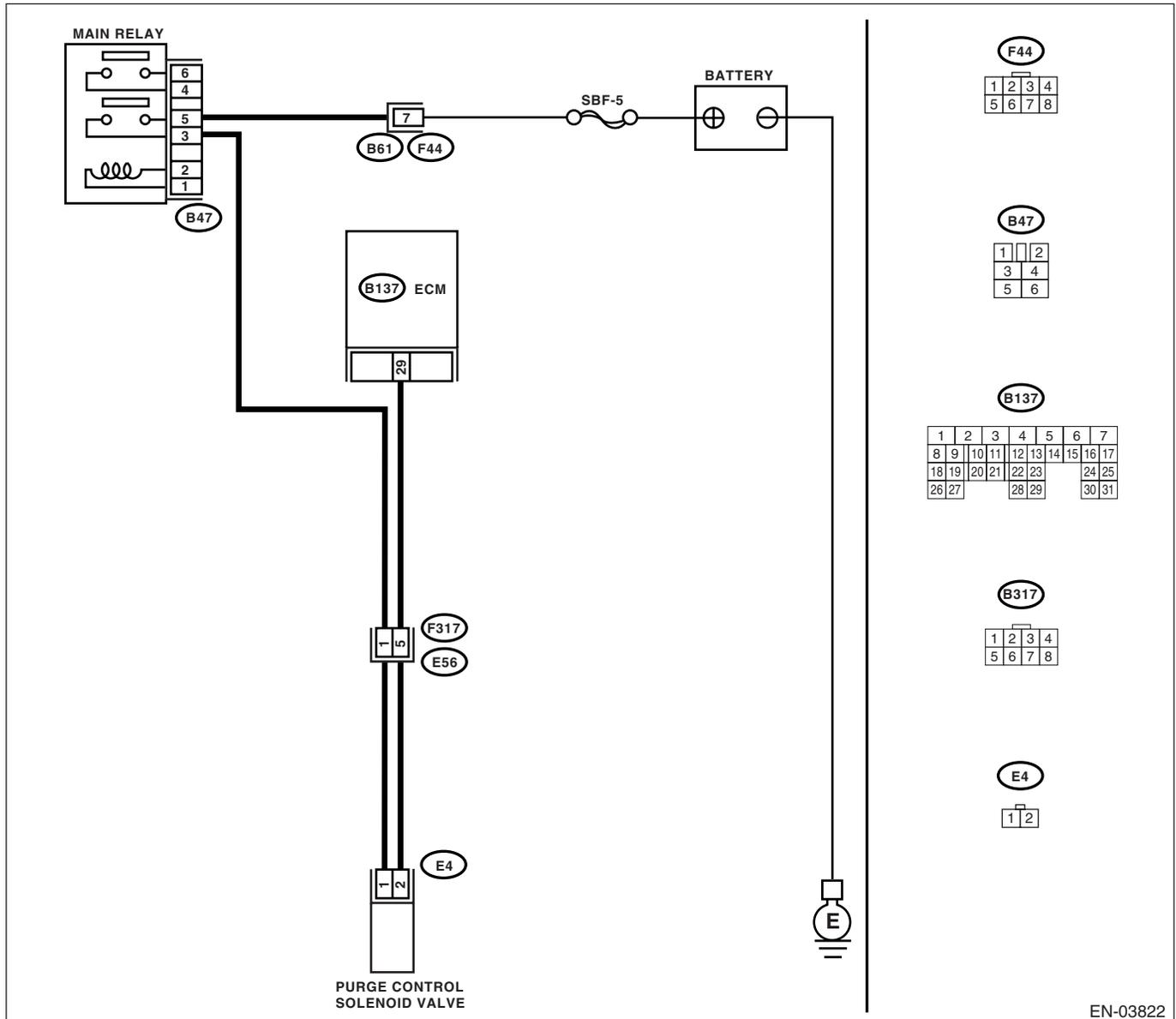
### TROUBLE SYMPTOM:

Improper idling

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK OUTPUT SIGNAL OF ECM.</b>                      1) Turn the ignition switch to ON.                      2) Measure the voltage between ECM and chassis ground.  <i>Connector &amp; terminal</i>  <i>(B137) No. 29 (+) — Chassis ground (-):</i></p>	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 2.
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN PURGE CONTROL SOLENOID VALVE AND ECM CONNECTOR.</b>                      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.  <i>Connector &amp; terminal</i>  <i>(E4) No. 2 — Engine ground:</i></p>	Is the resistance more than 1 M $\Omega$ ?	Go to step 3.	Repair the ground short circuit of harness between ECM and purge control solenoid valve connector.
<p><b>3</b></p> <p><b>CHECK HARNESS BETWEEN PURGE CONTROL SOLENOID VALVE AND ECM CONNECTOR.</b>                      Measure the resistance of harness between ECM and purge control solenoid valve.  <i>Connector &amp; terminal</i>  <i>(B137) No. 29 — (E4) No. 2:</i></p>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open circuit of harness between ECM and purge control solenoid valve connector.  NOTE: In this case, repair the following item: <ul style="list-style-type: none"> <li>• Open circuit of harness between ECM and purge control solenoid valve connector</li> <li>• Poor contact of coupling connector</li> </ul>
<p><b>4</b></p> <p><b>CHECK PURGE CONTROL SOLENOID VALVE.</b>                      1) Remove the purge control solenoid valve.                      2) Measure the resistance between purge control solenoid valve terminals.  <i>Terminals</i>  <i>No. 1 — No. 2:</i></p>	Is the resistance between 10 and 100 $\Omega$ ?	Go to step 5.	Replace the purge control solenoid valve. <Ref. to EC(H4DOTC)-8, Purge Control Solenoid Valve.>
<p><b>5</b></p> <p><b>CHECK POWER SUPPLY TO PURGE CONTROL SOLENOID VALVE.</b>                      1) Turn the ignition switch to ON.                      2) Measure the voltage between purge control solenoid valve and engine ground.  <i>Connector &amp; terminal</i>  <i>(E4) No. 1 (+) — Engine ground (-):</i></p>	Is the voltage more than 10 V?	Go to step 6.	Repair the open circuit of harness between main relay and purge control solenoid valve connector.
<p><b>6</b></p> <p><b>CHECK POOR CONTACT.</b>                      Check poor contact of purge control solenoid valve connector.</p>	Is there poor contact of purge control solenoid valve connector?	Repair the poor contact of purge control solenoid valve connector.	Contact with SOA Service Center.  NOTE: The deterioration of multiple parts can be thought as the cause.



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK OUTPUT SIGNAL OF ECM.</b> 1) Turn the ignition switch to OFF. 2) Connect the test mode connector at the lower portion of instrument panel (on the driver's side). 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM and chassis ground while operating the purge control solenoid valve.  <b>NOTE:</b> Purge control solenoid valve operation can be executed using Subaru Select Monitor. For procedure, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4DOTC)(diag)-47, Compulsory Valve Operation Check Mode.> <b>Connector &amp; terminal</b> <b>(B137) No. 29 (+) — Chassis ground (-):</b>	Is the voltage 0 — 13 V?	Go to step 2.	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.
<b>2 CHECK OUTPUT SIGNAL OF ECM.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground.  <b>Connector &amp; terminal</b> <b>(B137) No. 29 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Go to step 4.	Go to step 3.
<b>3 CHECK POOR CONTACT.</b> Check poor contact of ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Replace the ECM. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>
<b>4 CHECK HARNESS BETWEEN PURGE CONTROL SOLENOID VALVE AND ECM CONNECTOR.</b> 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.  <b>Connector &amp; terminal</b> <b>(B137) No. 29 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Repair the battery short circuit of harness between ECM and purge control solenoid valve connector. After repair, replace the ECM. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>	Go to step 5.
<b>5 CHECK PURGE CONTROL SOLENOID VALVE.</b> 1) Turn the ignition switch to OFF. 2) Measure the resistance between purge control solenoid valve terminals.  <b>Terminals</b> <b>No. 1 — No. 2:</b>	Is the resistance less than 1 $\Omega$ ?	Replace the purge control solenoid valve and ECM. <Ref. to EC(H4DOTC)-8, Purge Control Solenoid Valve.> <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>	Go to step 6.
<b>6 CHECK POOR CONTACT.</b> Check poor contact of ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Replace the ECM. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

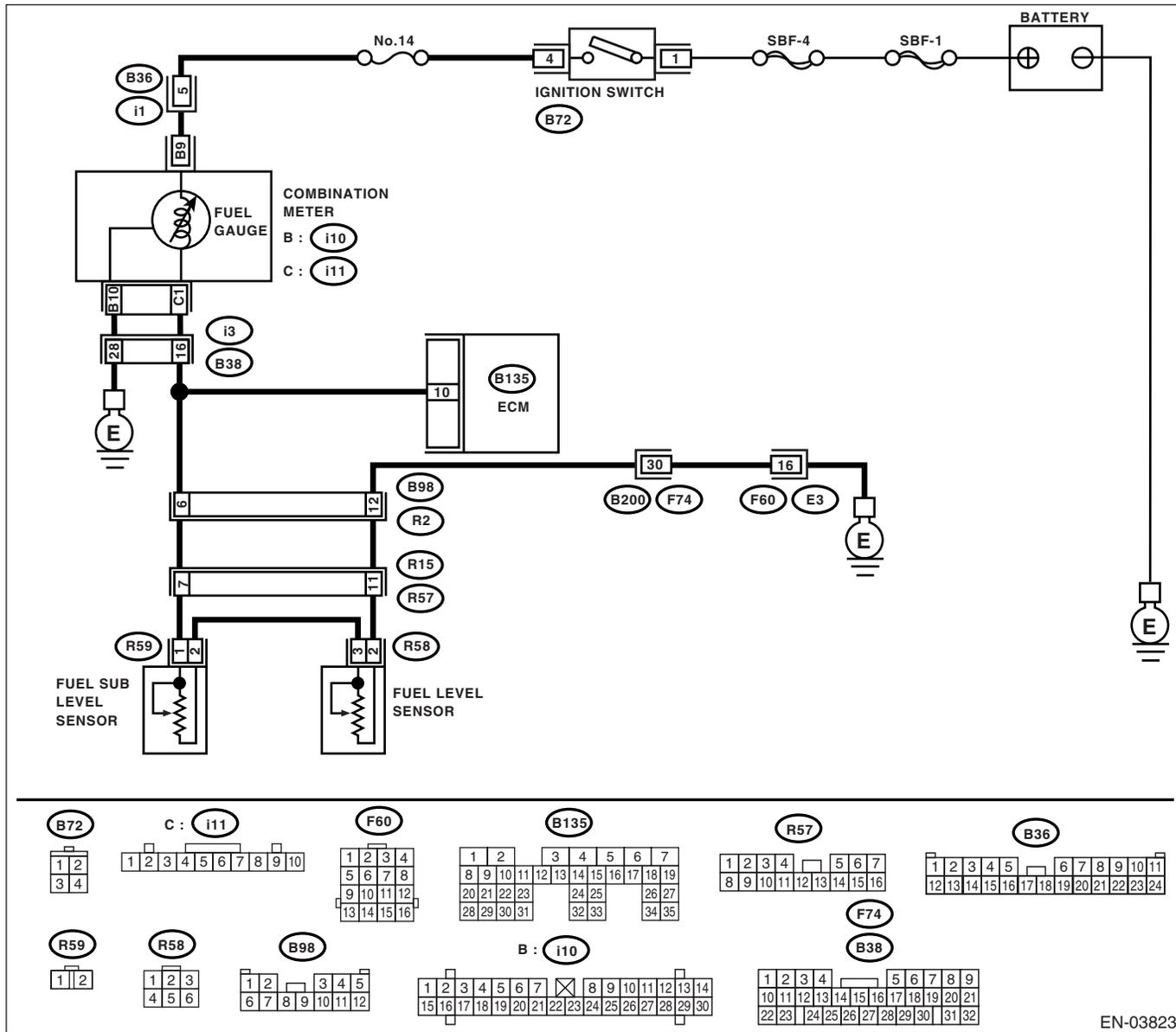
## BU:DTC P0461 FUEL LEVEL SENSOR "A" CIRCUIT RANGE/PERFORMANCE DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-166, DTC P0461 FUEL LEVEL SENSOR "A" CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03823

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>  NOTE: In this case, it is not necessary to inspect DTC P0461.	Replace the fuel level sensor and fuel sub level sensor. <Ref. to FU(H4DOTC)-60, Fuel Level Sensor.> <Ref. to FU(H4DOTC)-61, Fuel Sub Level Sensor.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## BV:DTC P0462 FUEL LEVEL SENSOR "A" CIRCUIT LOW

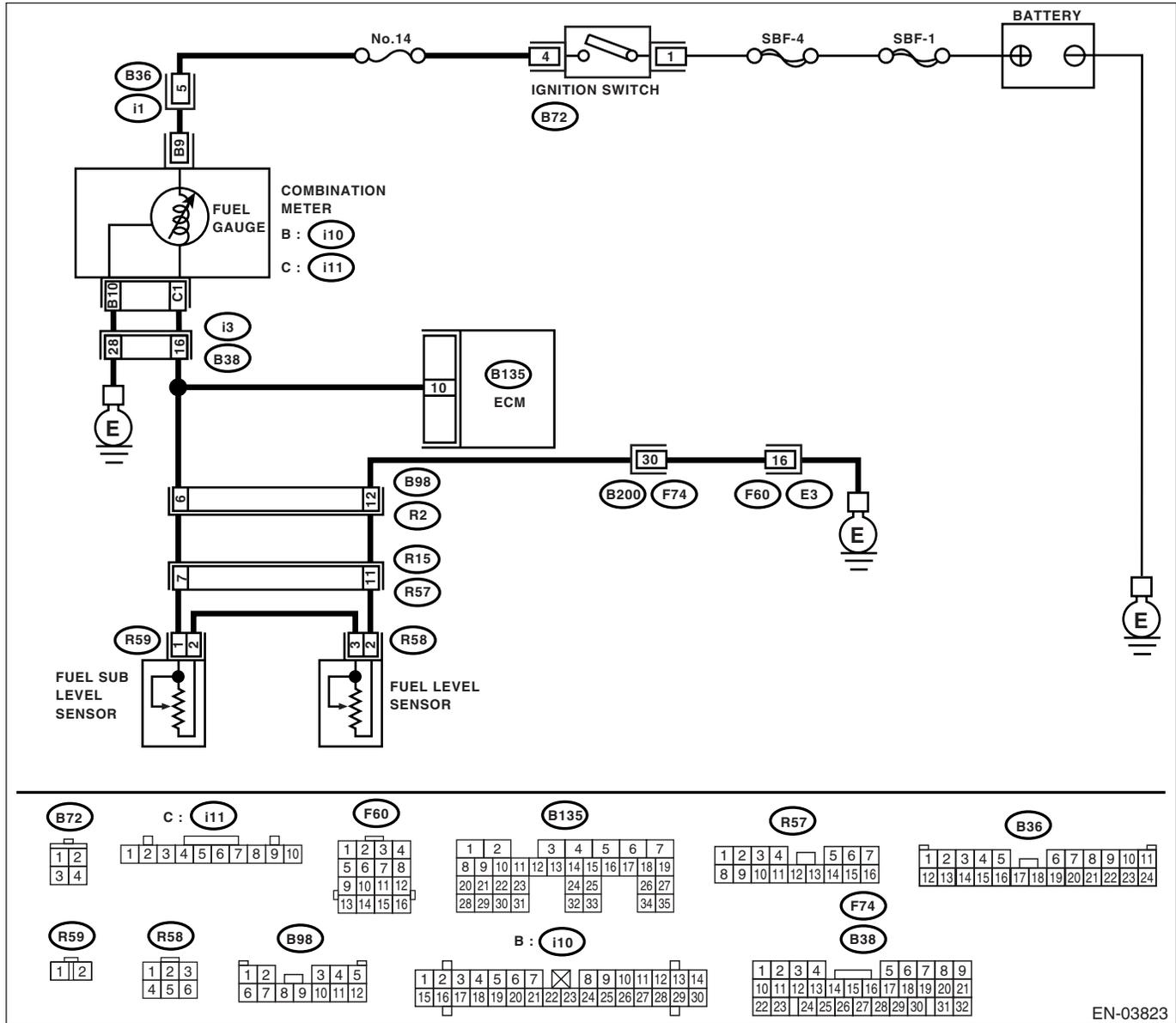
### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-168, DTC P0462 FUEL LEVEL SENSOR "A" CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03823

Step	Check	Yes	No	
1	<b>CHECK SPEEDOMETER AND TACHOMETER OPERATION IN COMBINATION METER.</b>	Does the speedometer and tachometer operate normally?	Go to step 2.	Repair or replace the combination meter. <Ref. to IDI-3, Combination Meter System.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>2</b></p> <p><b>CHECK INPUT SIGNAL OF ECM.</b>                      1) Turn the ignition switch to ON. (Engine OFF)                      2) Measure the voltage between ECM connector and chassis ground.  <i>Connector &amp; terminal</i>  <i>(B135) No. 10 (+) — Chassis ground (-):</i></p>	Is the voltage less than 0.12 V?	Go to step 4.	Go to step 3.
<p><b>3</b></p> <p><b>CHECK INPUT SIGNAL FOR ECM (USING SUBARU SELECT MONITOR).</b>                      Read data of the fuel level sensor signal using the Subaru Select Monitor.                       NOTE:                      Subaru Select Monitor                      For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;</p>	Does the voltage change when shaking the ECM harness and connector?	Repair poor contact in ECM connector.	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 may be the cause.  NOTE: In this case, repair the following item: <ul style="list-style-type: none"> <li>• Poor contact in combination meter connector</li> <li>• Poor contact in ECM connector</li> <li>• Poor contact of coupling connector</li> </ul>
<p><b>4</b></p> <p><b>CHECK INPUT VOLTAGE FROM ECM.</b>                      1) Turn the ignition switch to OFF.                      2) Separate fuel tank cord connector (R57) and rear wiring harness connector (R15).                      3) Turn the ignition switch to ON.                      4) Measure the voltage of harness between ECM connector and chassis ground.  <i>Connector &amp; terminal</i>  <i>(B135) No. 10 (+) — Chassis ground (-):</i></p>	Is the voltage more than 0.12 V?	Go to step 5.	Go to step 6.
<p><b>5</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND COMBINATION METER CONNECTOR.</b>                      1) Turn the ignition switch to OFF.                      2) Disconnect the connector from connector (i11), (i12) and ECM connector.                      3) Measure the resistance between ECM and chassis ground.  <i>Connector &amp; terminal</i>  <i>(B135) No. 10 — Chassis ground:</i></p>	Is the resistance more than 1 M $\Omega$ ?	Go to step 7.	Repair short circuit of the harness between the ECM and combination meter connector.
<p><b>6</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND COMBINATION METER CONNECTOR.</b>                      Measure the resistance between ECM and combination meter connector.  <i>Connector &amp; terminal</i>  <i>(B135) No. 10 — (i11) No. 1:</i></p>	Is the resistance less than 10 $\Omega$ ?	Repair or replace the combination meter. <Ref. to IDI-3, Combination Meter System.>	Repair the open circuit between ECM and combination meter connector.  NOTE: In this case, repair the following item: Poor contact of coupling connector

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>7</b> <b>CHECK FUEL TANK CORD.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the fuel sub level sensor. 3) Measure the resistance between fuel sub level sensor and chassis ground. <b>Connector &amp; terminal</b> <b>(R59) No. 1 — Chassis ground:</b>	Is the resistance more than 1 M $\Omega$ ?	Go to step <b>8</b> .	Repair ground short circuit in fuel tank cord.
<b>8</b> <b>CHECK FUEL TANK CORD.</b> 1) Disconnect the connector from fuel pump assembly. 2) Measure the resistance between fuel pump assembly and chassis ground. <b>Connector &amp; terminal</b> <b>(R59) No. 2 — Chassis ground:</b>	Is the resistance more than 1 M $\Omega$ ?	Go to step <b>9</b> .	Repair ground short circuit in fuel tank cord.
<b>9</b> <b>CHECK FUEL LEVEL SENSOR.</b> 1) Remove the fuel pump assembly. <Ref. to FU(H4DOTC)-58, Fuel Pump.> 2) Measure the resistance between fuel level sensor and terminals with its float set to the full position. <b>Terminals</b> <b>No. 2 — No. 3:</b>	Is the resistance between 0.5 and 2.5 $\Omega$ ?	Go to step <b>10</b> .	Replace the fuel level sensor.
<b>10</b> <b>CHECK FUEL SUB LEVEL SENSOR.</b> 1) Remove the fuel sub level sensor. <Ref. to FU(H4DOTC)-61, Fuel Sub Level Sensor.> 2) Measure the resistance between fuel sub level sensor and terminals with its float set to the full position. <b>Terminals</b> <b>No. 1 — No. 2:</b>	Is the resistance between 0.5 and 2.5 $\Omega$ ?	Repair poor contact of the harness between ECM and combination meter connector.	Replace the fuel sub level sensor.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## BW:DTC P0463 FUEL LEVEL SENSOR "A" CIRCUIT HIGH

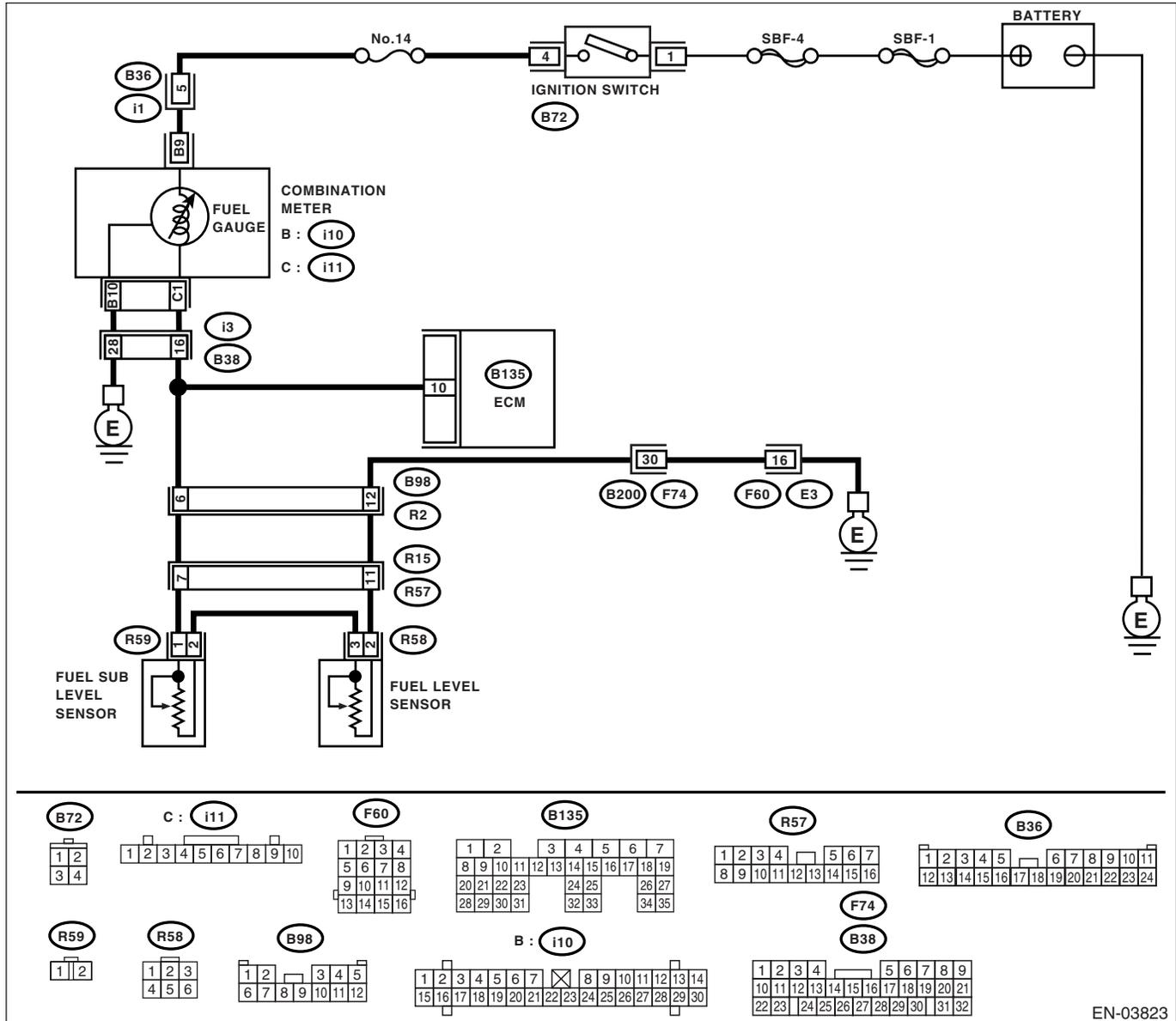
### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-170, DTC P0463 FUEL LEVEL SENSOR "A" CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03823

Step	Check	Yes	No	
1	<b>CHECK SPEEDOMETER AND TACHOMETER OPERATION IN COMBINATION METER.</b>	Does the speedometer and tachometer operate normally?	Go to step 2.	Repair or replace the combination meter. <Ref. to IDI-3, Combination Meter System.>

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

### ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>2</b> <b>CHECK INPUT SIGNAL OF ECM.</b> 1) Turn the ignition switch to ON. (Engine OFF) 2) Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B135) No. 10 (+) — Chassis ground (-):</b>	Is the voltage more than 4.75 V?	Go to step 3.	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 may be the cause.  NOTE: In this case, repair the following item: <ul style="list-style-type: none"> <li>• Poor contact in fuel pump connector</li> <li>• Poor contact of coupling connector</li> </ul>
<b>3</b> <b>CHECK INPUT VOLTAGE FROM ECM.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the combination meter connector (i11) and ECM connector. 3) Turn the ignition switch to ON. 4) Measure the voltage of harness between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B135) No. 10 (+) — Chassis ground (-):</b>	Is the voltage more than 4.75 V?	Go to step 4.	Repair battery short circuit between ECM and combination meter connector.
<b>4</b> <b>CHECK HARNESS BETWEEN ECM AND FUEL TANK CORD.</b> 1) Turn the ignition switch to OFF. 2) Separate fuel tank cord connector (R57) and rear wiring harness connector (R15). 3) Measure the resistance between ECM and fuel tank cord. <b>Connector &amp; terminal</b> <b>(B135) No. 10 — (R15) No. 7:</b>	Is the resistance less than 5 $\Omega$ ?	Go to step 5.	Repair open circuit between ECM and fuel tank cord.
<b>5</b> <b>CHECK HARNESS BETWEEN FUEL TANK CORD AND CHASSIS GROUND.</b> Measure the resistance between fuel tank cord and chassis ground. <b>Connector &amp; terminal</b> <b>(R15) No. 11 — Chassis ground:</b>	Is the resistance less than 5 $\Omega$ ?	Go to step 6.	Repair open circuit between fuel tank cord and chassis ground.  NOTE: In this case, repair the following item: Poor contact of coupling connector
<b>6</b> <b>CHECK FUEL TANK CORD.</b> 1) Disconnect the connector from the fuel level sensor. 2) Measure the resistance between the fuel level sensor and coupling connector. <b>Connector &amp; terminal</b> <b>(R57) No. 11 — (R58) No. 2:</b>	Is the resistance less than 10 $\Omega$ ?	Go to step 7.	Repair the open circuit between the coupling connector and fuel level sensor.
<b>7</b> <b>CHECK FUEL TANK CORD.</b> 1) Disconnect the connector from the fuel sub level sensor. 2) Measure the resistance between fuel level sensor and fuel sub level sensor. <b>Connector &amp; terminal</b> <b>(R58) No. 3 — (R59) No. 2:</b>	Is the resistance less than 10 $\Omega$ ?	Go to step 8.	Repair open circuit between fuel level sensor and fuel sub level sensor.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>8</b> <b>CHECK FUEL TANK CORD.</b> Measure the resistance between the fuel sub level sensor and coupling connector. <i><b>Connector &amp; terminal</b></i> <i><b>(R57) No. 7 — (R59) No. 1:</b></i>	Is the resistance less than 10 $\Omega$ ?	Go to step 9.	Repair the open circuit between the coupling connector and fuel sub level sensor.
<b>9</b> <b>CHECK FUEL LEVEL SENSOR.</b> 1) Remove the fuel pump assembly. <Ref. to FU(H4DOTC)-58, Fuel Pump.> 2) While moving the fuel level sensor float up and down, measure resistance between fuel level sensor terminals. <i><b>Terminals</b></i> <i><b>No. 2 — No. 3:</b></i>	Is the resistance more than 53 $\Omega$ ?	Replace the fuel level sensor. <Ref. to FU(H4DOTC)-60, Fuel Level Sensor.>	Go to step 10.
<b>10</b> <b>CHECK FUEL SUB LEVEL SENSOR.</b> 1) Remove the fuel sub level sensor. <Ref. to FU(H4DOTC)-61, Fuel Sub Level Sensor.> 2) While moving the fuel sub level sensor float up and down, measure resistance between fuel sub level sensor terminals. <i><b>Terminals</b></i> <i><b>No. 1 — No. 2:</b></i>	Is the resistance more than 45 $\Omega$ ?	Replace the fuel sub level sensor. <Ref. to FU(H4DOTC)-61, Fuel Sub Level Sensor.>	Replace the combination meter. <Ref. to IDI-10, Combination Meter.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## BX:DTC P0464 FUEL LEVEL SENSOR CIRCUIT INTERMITTENT

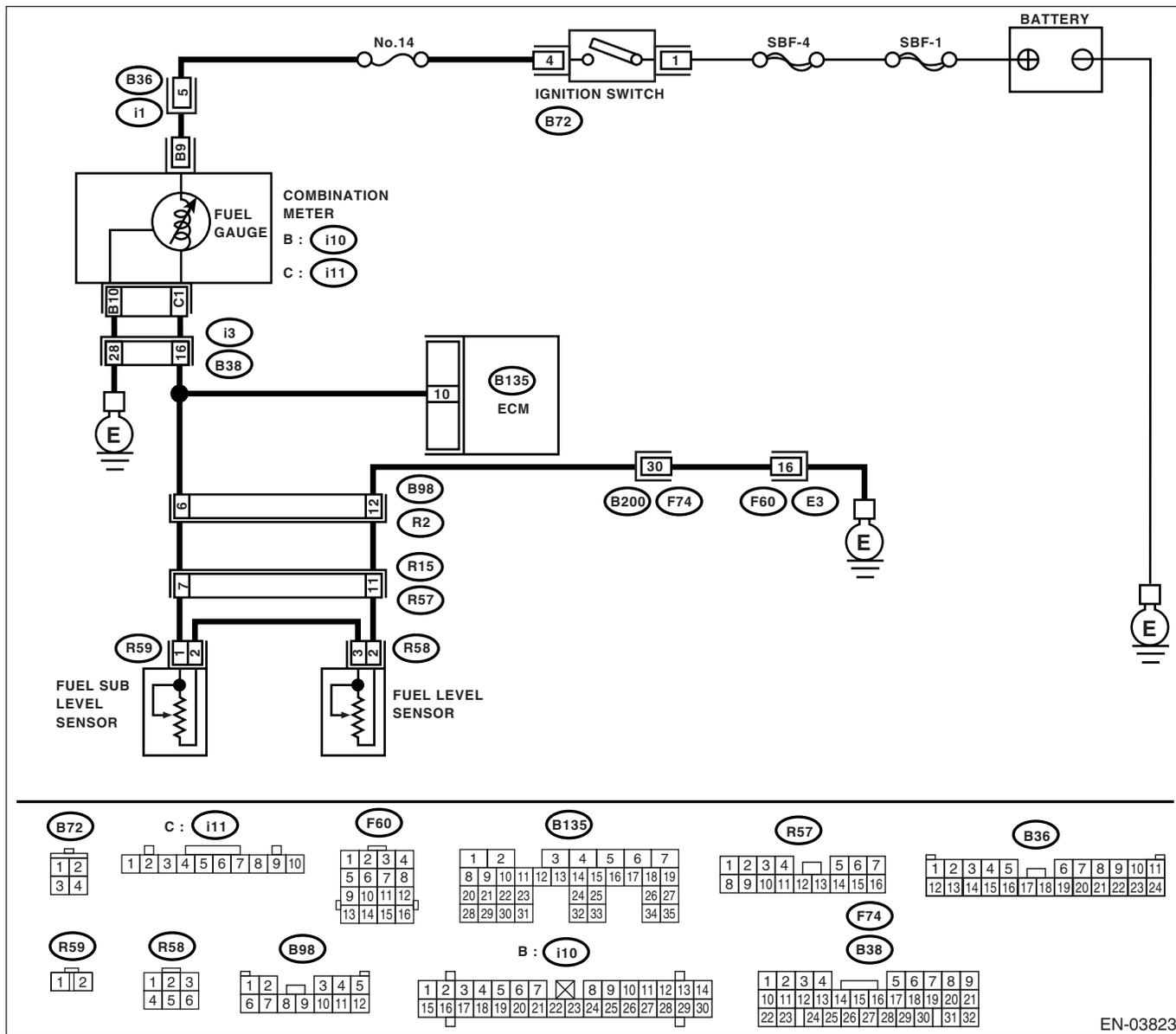
### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-172, DTC P0464 FUEL LEVEL SENSOR CIRCUIT INTERMITTENT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03823

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1	<b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>
2	<b>CHECK FUEL LEVEL SENSOR.</b> 1) Remove the fuel pump assembly. <Ref. to FU(H4DOTC)-58, Fuel Pump.> 2) While moving the fuel level sensor float up and down, make sure that the resistance between fuel level sensor terminals changes smoothly. <b>Terminals</b> <b>No. 3 — No. 2:</b>	Does the resistance change gradually?	Go to step 3.  Replace the fuel level sensor. <Ref. to FU(H4DOTC)-60, Fuel Level Sensor.>
3	<b>CHECK FUEL SUB LEVEL SENSOR.</b> 1) Remove the fuel sub level sensor. <Ref. to FU(H4DOTC)-61, Fuel Sub Level Sensor.> 2) While moving the fuel sub level sensor float up and down, make sure that the resistance between fuel level sensor terminals changes smoothly. <b>Terminals</b> <b>No. 1 — No. 2:</b>	Does the resistance change gradually?	Repair poor contact in ECM, combination meter and coupling connectors.  Replace the fuel sub level sensor. <Ref. to FU(H4DOTC)-61, Fuel Sub Level Sensor.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## BY:DTC P0483 FAN RATIONALITY CHECK

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-175, DTC P0483 FAN RATIONALITY CHECK, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### TROUBLE SYMPTOM:

- Occurrence of noise
- Overheating

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### NOTE:

If the vehicle, with the engine idling, is placed very close to a wall or another vehicle, preventing normal cooling function, the OBD system may detect malfunction.

Step	Check	Yes	No
1 <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>	Check radiator fan, fan motor and thermostat and if thermostat is stuck, replace thermostat. <Ref. to CO(H4SO)-32, Radiator Main Fan and Fan Motor.> <Ref. to CO(H4SO)-39, Radiator Sub Fan and Fan Motor.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## BZ:DTC P0502 VEHICLE SPEED SENSOR "A" CIRCUIT LOW INPUT

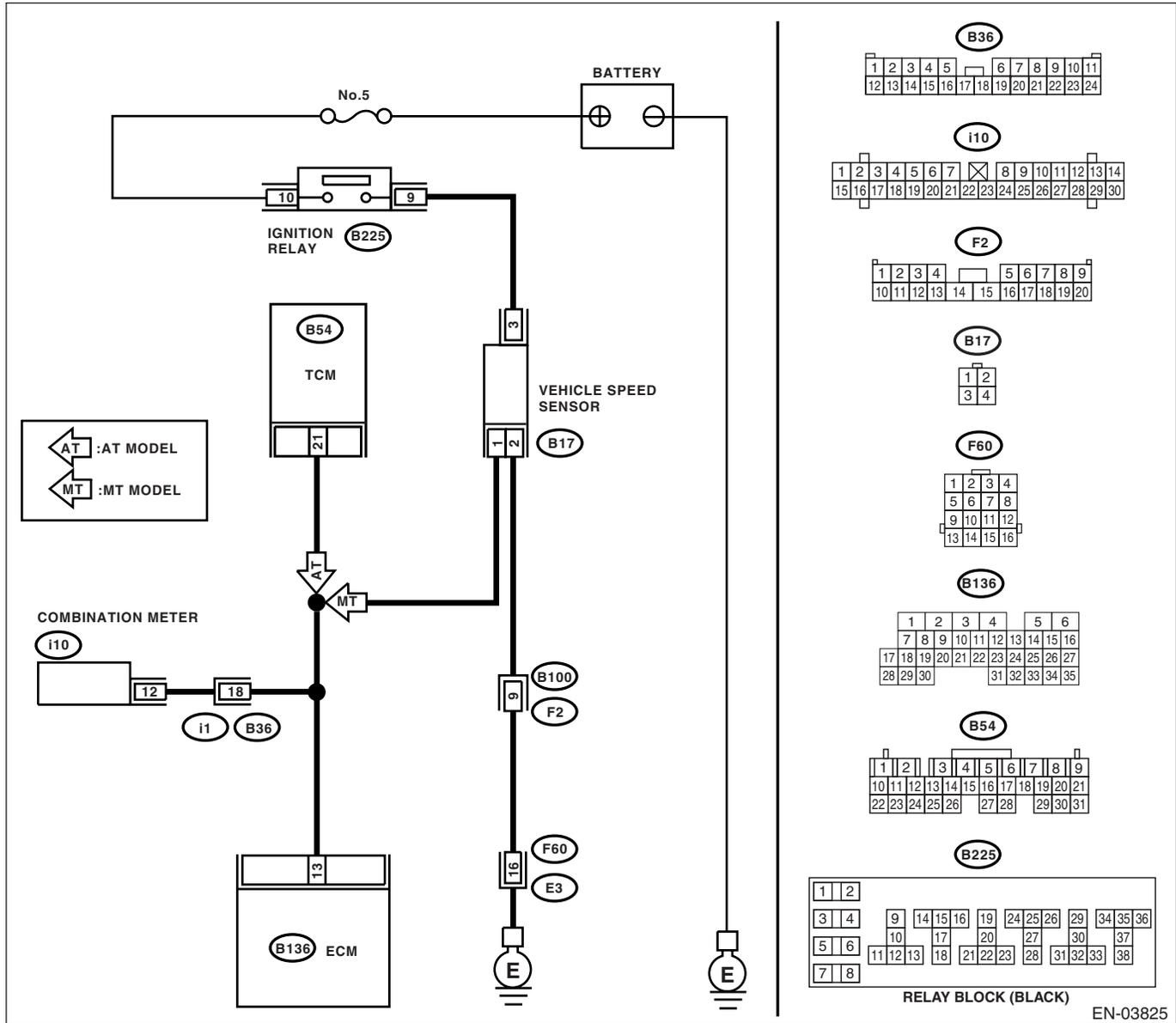
### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-176, DTC P0502 VEHICLE SPEED SENSOR "A" CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1</b> <b>CHECK HARNESS BETWEEN VEHICLE SPEED SENSOR AND ECM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from vehicle speed sensor and ECM. 3) Measure the resistance of harness between vehicle speed sensor connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B17) No. 1 — Chassis ground:</b>	Is the resistance more than 1 M $\Omega$ ?	Go to step 2.	Repair ground short circuit of harness between vehicle speed sensor and ECM connector.
<b>2</b> <b>CHECK POOR CONTACT.</b> Check poor contact in vehicle speed sensor connector.	Is there poor contact in vehicle speed sensor connector?	Repair the poor contact in vehicle speed sensor connector.	Replace the vehicle speed sensor. <Ref. to 5MT-35, Vehicle Speed Sensor.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

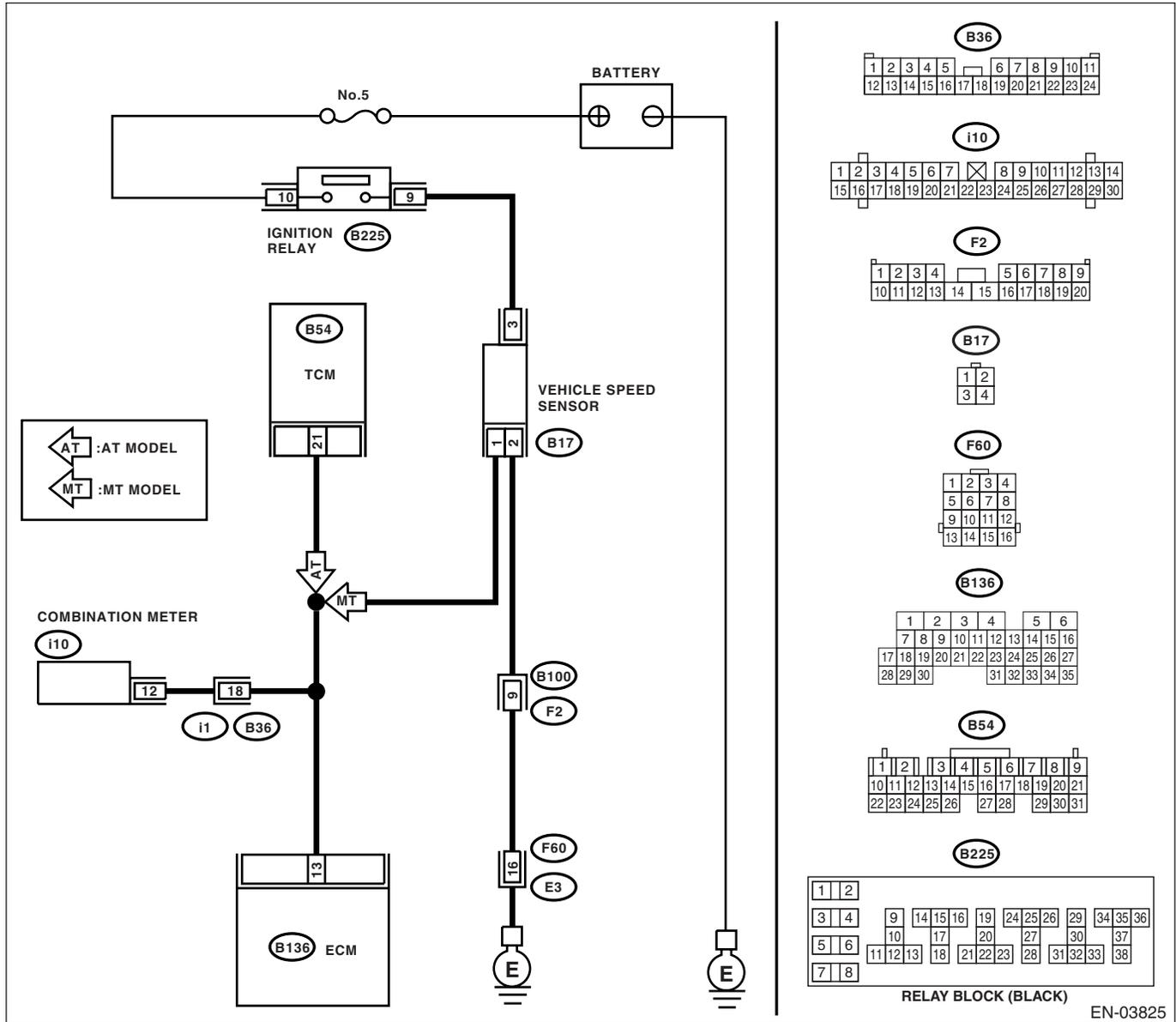
## CA:DTC P0503 VEHICLE SPEED SENSOR "A" INTERMITTENT/ERRATIC/HIGH DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-177, DTC P0503 VEHICLE SPEED SENSOR "A" INTERMITTENT/ERRATIC/HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



Step	Check	Yes	No
1	<b>CHECK SPEEDOMETER OPERATION IN COMBINATION METER.</b>	Does speedometer operate normally?	Go to step 2.
			Check the speedometer. <Ref. to IDI-12, Speedometer.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND COMBINATION METER CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connector from combination meter.</p> <p>3) Measure resistance between ECM and combination meter.</p> <p><b>Connector &amp; terminal</b> <b>(B136) No. 13 — (i10) No. 12:</b></p>	<p>Is the resistance less than 10 <math>\Omega</math>?</p>	<p>Repair poor contact in ECM connector.</p>	<p>Repair the harness and connector.</p> <p>NOTE: In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Open circuit of harness between ECM and combination meter connector</li> <li>• Poor contact in ECM connector</li> <li>• • Poor contact in combination meter connector</li> <li>• Poor contact of coupling connector</li> </ul>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## CB:DTC P0506 IDLE AIR CONTROL SYSTEM RPM LOWER THAN EXPECTED

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-178, DTC P0506 IDLE AIR CONTROL SYSTEM RPM LOWER THAN EXPECTED, Diagnostic Trouble Code (DTC) Detecting Criteria.>

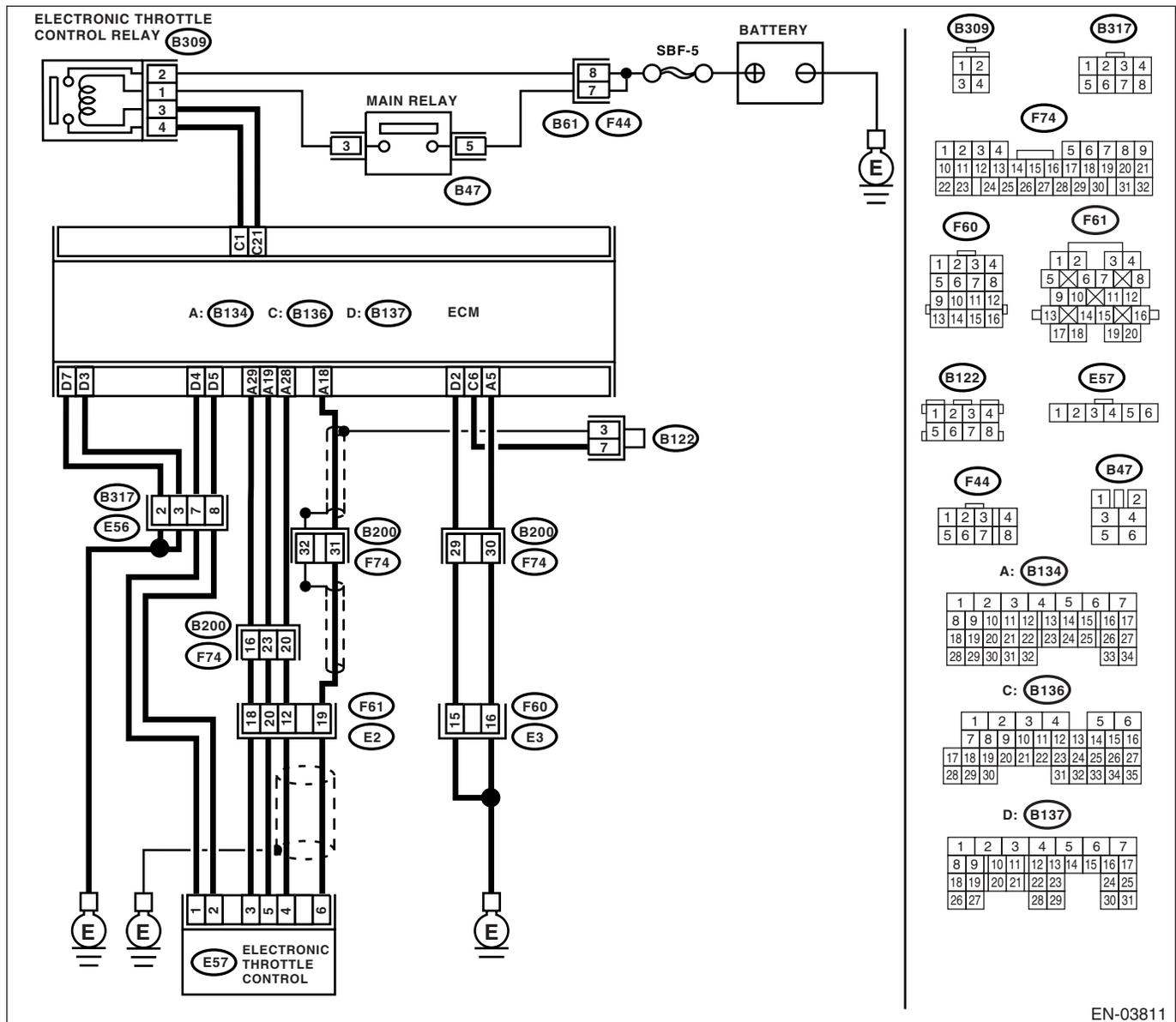
### TROUBLE SYMPTOM:

- Hard to start the engine.
- Engine does not start.
- Improper idling
- Engine stalls.

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03811

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1	<b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>  NOTE: In this case, it is not necessary to inspect DTC P0506.
2	<b>CHECK AIR CLEANER ELEMENT.</b> 1) Turn the ignition switch to OFF. 2) Check the air cleaner element.	Is the air cleaner element excessively clogged?	Go to step 2.  Replace the air cleaner element. <Ref. to IN(H4DOTC)-7, Air Cleaner Case.>
3	<b>CHECK ELECTRONIC THROTTLE CONTROL.</b> 1) Turn the ignition switch to OFF. 2) Remove the electronic throttle control. 3) Check the electronic throttle control.	Are foreign matter found inside electronic throttle control?	Remove foreign matter from electronic throttle control.  Perform the diagnosis of DTC P2101.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## CC:DTC P0507 IDLE AIR CONTROL SYSTEM RPM HIGHER THAN EXPECTED

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-180, DTC P0507 IDLE AIR CONTROL SYSTEM RPM HIGHER THAN EXPECTED, Diagnostic Trouble Code (DTC) Detecting Criteria.>

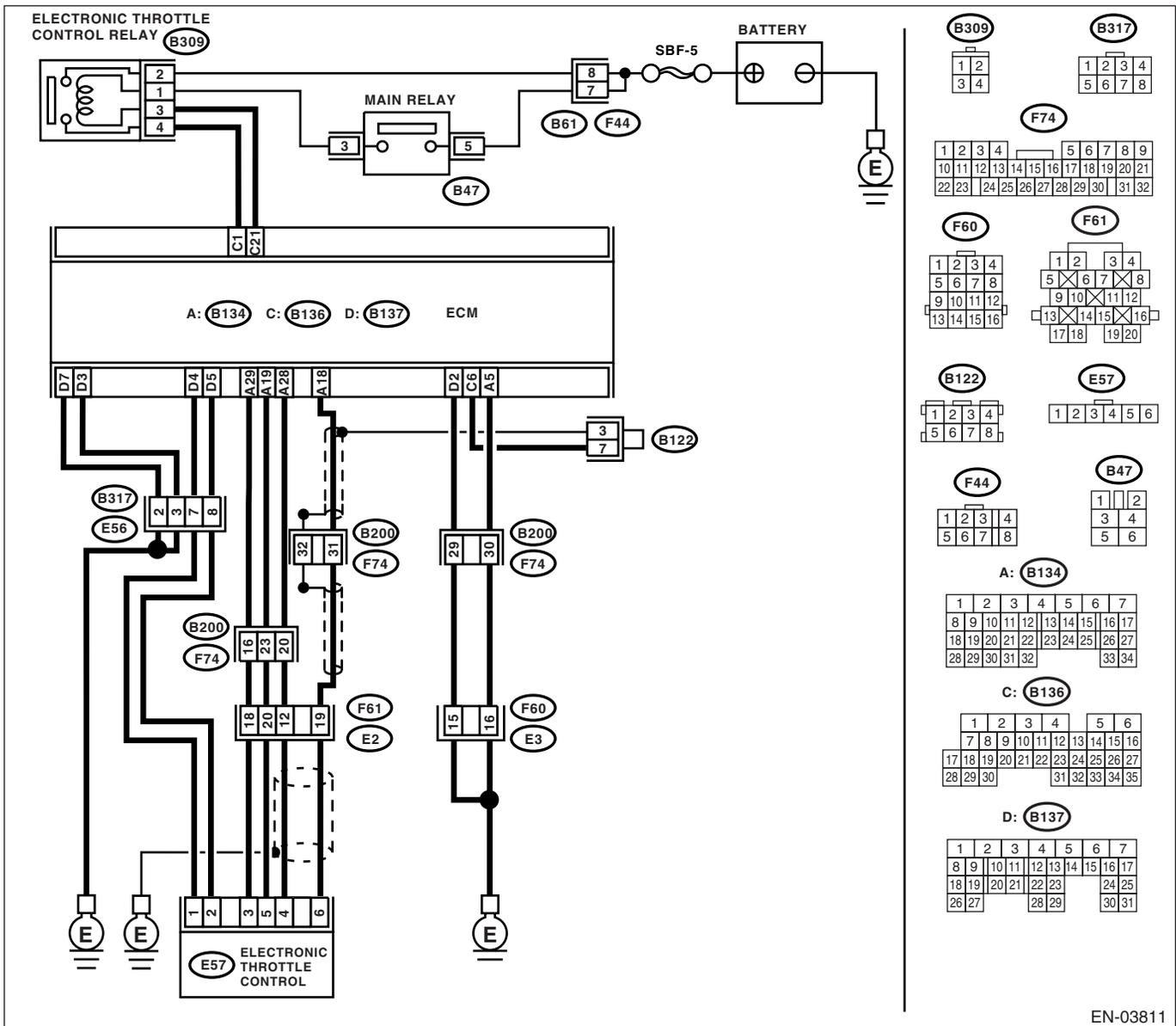
### TROUBLE SYMPTOM:

Engine keeps running at higher speed than specified idle speed.

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03811

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1</b> <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>  NOTE: In this case, it is not necessary to inspect DTC P0507.	Go to step 2.
<b>2</b> <b>CHECK AIR INTAKE SYSTEM.</b> 1) Turn the ignition switch to ON. 2) Start and idle the engine. 3) Check the following item. <ul style="list-style-type: none"> <li>• Loose installation of intake manifold and throttle body</li> <li>• Cracks of intake manifold gasket and throttle body gasket</li> <li>• Disconnection of vacuum hoses</li> </ul>	Is there any fault in air intake system?	Repair air suction and leaks.	Go to step 3.
<b>3</b> <b>CHECK ELECTRONIC THROTTLE CONTROL.</b> 1) Turn the ignition switch to OFF. 2) Remove the electronic throttle control. 3) Check the electronic throttle control.	Are foreign matter found inside electronic throttle control?	Remove foreign matter from electronic throttle control.	Perform the diagnosis of DTC P2101.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## CD:DTC P0512 STARTER REQUEST CIRCUIT

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-182, DTC P0512 STARTER REQUEST CIRCUIT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

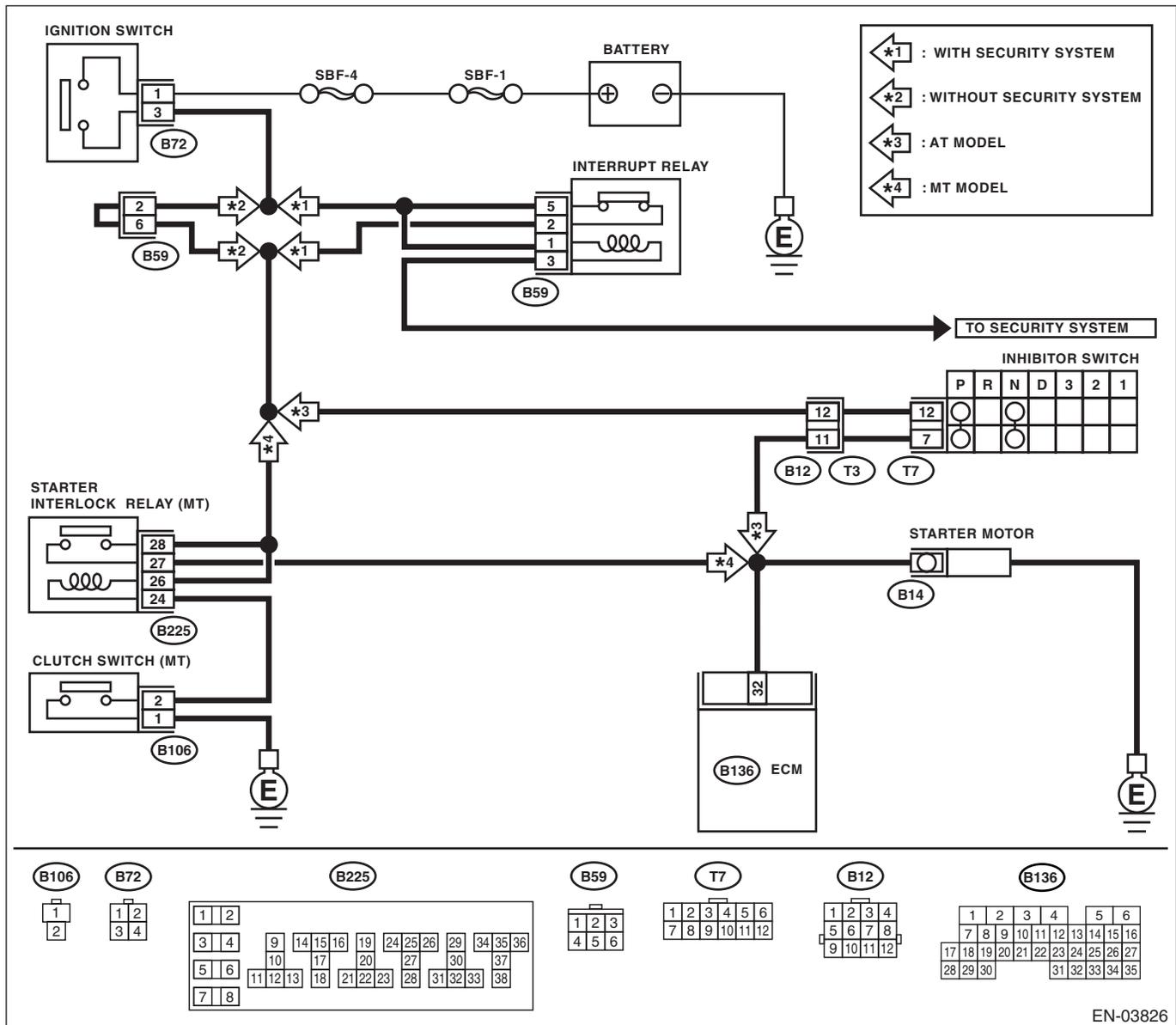
### TROUBLE SYMPTOM:

Failure of engine to start

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03826

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 <b>CHECK OPERATION OF STARTER MOTOR.</b>	Does the starter motor operate when ignition switch is turned ON?	Repair the battery short circuit in starter motor circuit. After repair, replace the ECM. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>	Check the starter motor circuit. <Ref. to EN(H4DOTC)(diag)-54, STARTER MOTOR CIRCUIT, Diagnostics for Engine Starting Failure.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## CE:DTC P0519 IDLE AIR CONTROL SYSTEM PERFORMANCE

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-184, DTC P0519 IDLE AIR CONTROL SYSTEM PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

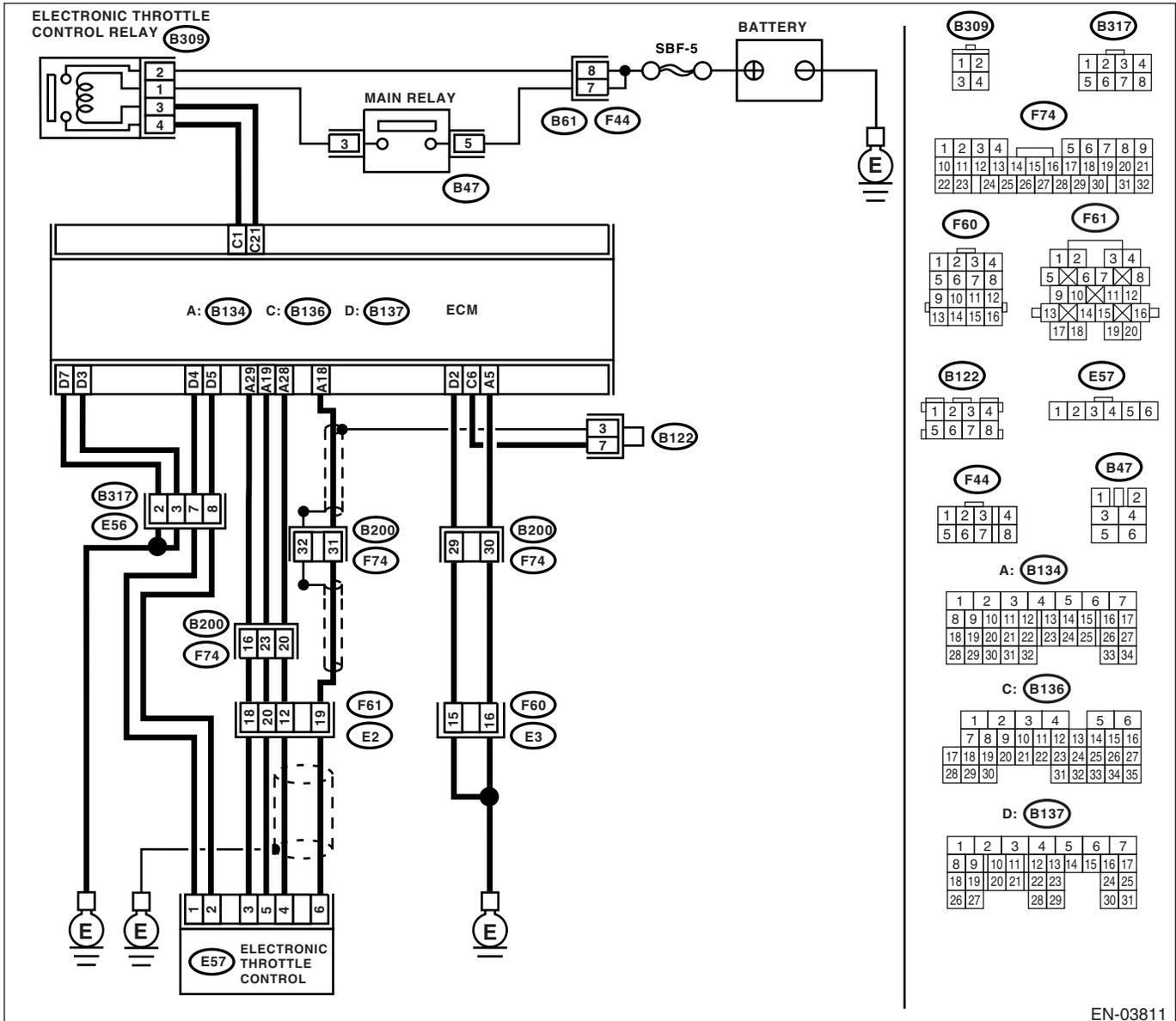
### TROUBLE SYMPTOM:

- Engine keeps running at higher speed than specified idle speed.
- Fuel is cut according to fail-safe function.

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03811

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1</b> <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>  NOTE: In this case, it is not necessary to inspect DTC P0519.	Go to step 2.
<b>2</b> <b>CHECK AIR INTAKE SYSTEM.</b> 1) Turn the ignition switch to ON. 2) Start and idle the engine. 3) Check the following item. <ul style="list-style-type: none"> <li>• Loose installation of intake manifold and throttle body</li> <li>• Cracks of intake manifold gasket and throttle body gasket</li> <li>• Disconnection of vacuum hoses</li> </ul>	Is there any fault in air intake system?	Repair air suction and leaks.	Go to step 3.
<b>3</b> <b>CHECK ELECTRONIC THROTTLE CONTROL.</b> 1) Turn the ignition switch to OFF. 2) Remove the electronic throttle control. 3) Check the electronic throttle control.	Are foreign matter found inside electronic throttle control?	Remove foreign matter from electronic throttle control.	Perform the diagnosis of DTC P2101.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## CF:DTC P0600 SERIAL COMMUNICATION LINK

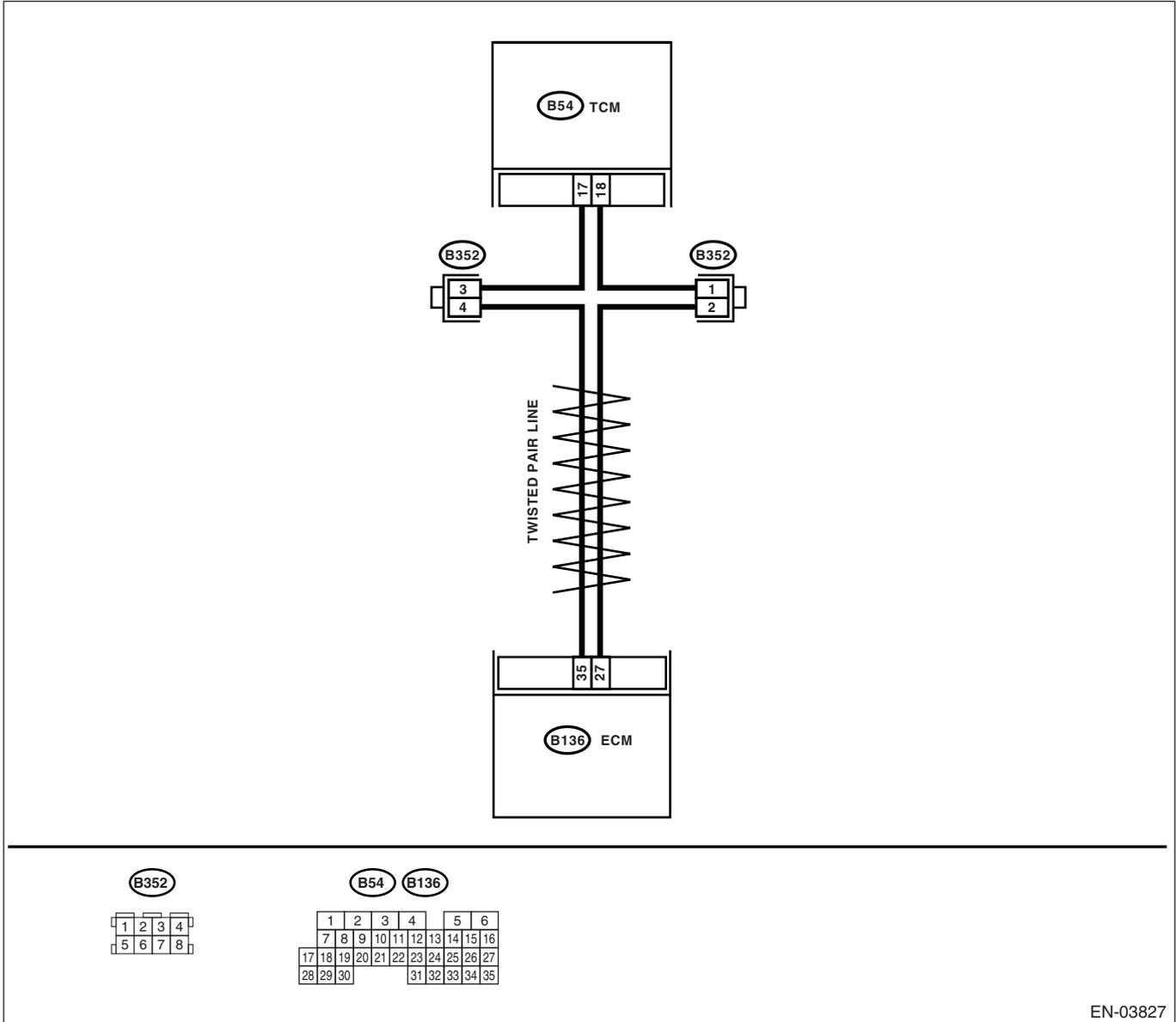
### DTC DETECTING CONDITION:

Immediately at fault recognition

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03827

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK HARNESS BETWEEN ECM AND TCM.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM. 3) Disconnect the connector from TCM. 4) Measure the resistance between ECM, TCU connectors. <i><b>Connector &amp; terminal</b></i> <i><b>(B136) No. 35 — (B54) No. 17:</b></i> <i><b>(B136) No. 27 — (B54) No. 18:</b></i>	Is the resistance less than 1 $\Omega$ ?	Go to step 2.	Repair the harness and connector.
<b>2 CHECK HARNESS BETWEEN ECM AND TCM.</b> Measure the resistance between ECM connector and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B136) No. 35 — Chassis ground:</b></i> <i><b>(B136) No. 27 — Chassis ground:</b></i>	Is the resistance more than 1 $M\Omega$ ?	Go to step 3.	Repair the harness and connector.
<b>3 CHECK HARNESS BETWEEN ECM AND TCM.</b> Check the resistance between ECM connectors. <i><b>Connector &amp; terminal</b></i> <i><b>(B136) No. 35 — (B136) No. 27:</b></i>	Is the resistance more than 1 $M\Omega$ ?	Go to step 4.	Repair the harness and connector.
<b>4 CHECK THE STATUS OF THE AT SYSTEM.</b> Diagnose the AT using the Subaru Select Monitor.	Is DTC P1718 displayed?	Check the AT system.	Replace the ECM. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## CG:DTC P0604 INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-186, DTC P0604 INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR, Diagnostic Trouble Code (DTC) Detecting Criteria.>

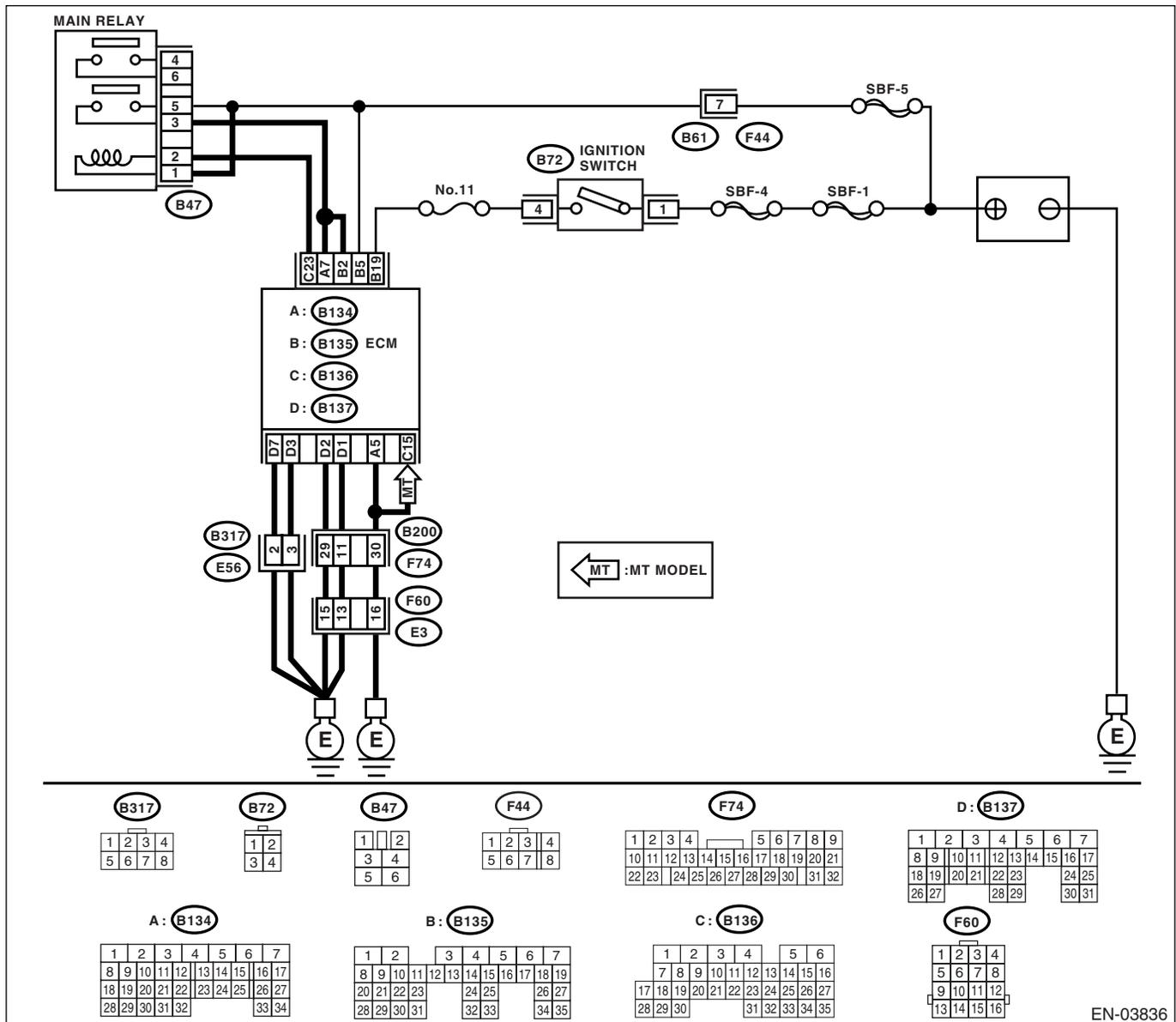
### TROUBLE SYMPTOM:

- Engine does not start.
- Engine stalls.

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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Step	Check	Yes	No
1 <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is DTC P0604 displayed on the Subaru Select Monitor or OBD-II general scan tool?	Replace the ECM. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>	Temporary poor contact occurs.

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

NOTE:

For the diagnostic procedure, refer to DTC P0607. <Ref. to EN(H4DOTC)(diag)-261, DTC P0607 CONTROL MODULE PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK INPUT VOLTAGE FROM ECM.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <i>(B134) No. 7 (+) — Chassis ground (-):</i> <i>(B135) No. 2 (+) — Chassis ground (-):</i>	Is the voltage 10 — 13 V?	Go to step 2.	Repair the open or ground short circuit of power supply circuit.
<b>2 CHECK INPUT VOLTAGE FROM ECM.</b> 1) Start the engine. 2) Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <i>(B134) No. 7 (+) — Chassis ground (-):</i> <i>(B135) No. 2 (+) — Chassis ground (-):</i>	Is the voltage 13 — 15 V?	Go to step 3.	Repair the open or ground short circuit of power supply circuit.
<b>3 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM and electronic throttle control. 3) Measure resistance of the harness between the ECM and electronic throttle control harness. <b>Connector &amp; terminal</b> <i>(E57) No. 5 — (B134) No. 19:</i> <i>(E57) No. 3 — (B134) No. 29:</i>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair open circuit of the harness between the ECM and electronic throttle control connector.
<b>4 CHECK ECM GROUND HARNESS.</b> Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <i>(B134) No. 5 (+) — Chassis ground (-):</i> <i>(B137) No. 7 (+) — Chassis ground (-):</i> <i>(B137) No. 1 (+) — Chassis ground (-):</i> <i>(B137) No. 2 (+) — Chassis ground (-):</i> <i>(B137) No. 3 (+) — Chassis ground (-):</i>	Is the voltage less than 1 V?	Replace the ECM. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>	Repair the following items. <ul style="list-style-type: none"> <li>• Further tighten the engine ground terminals.</li> <li>• Poor contact in ECM connector</li> <li>• Poor contact in coupling connector</li> </ul>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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

### NOTE:

For the diagnostic procedure, refer to DTC P2101. <Ref. to EN(H4DOTC)(diag)-340, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## CK:DTC P0691 FAN 1 CONTROL CIRCUIT LOW

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-193, DTC P0691 FAN 1 CONTROL CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### TROUBLE SYMPTOM:

- Radiator fan does not operate properly.
- Overheating

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK ANY OTHER DTC ON DISPLAY.	Is DTC P0691 displayed on the Subaru Select Monitor?	Inspect the radiator fan relay. <Ref. to CO(H4SO)-10, Radiator Fan System.>	Temporary poor contact occurs.

## CL:DTC P0692 FAN 1 CONTROL CIRCUIT HIGH

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-194, DTC P0692 FAN 1 CONTROL CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### TROUBLE SYMPTOM:

- Radiator fan does not operate properly.
- Overheating

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK ANY OTHER DTC ON DISPLAY.	Is DTC P0692 displayed on the Subaru Select Monitor?	Inspect the radiator fan relay. <Ref. to CO(H4SO)-10, Radiator Fan System.>	Temporary poor contact occurs.

## CM:DTC P0700 TRANSMISSION CONTROL SYSTEM (MIL REQUEST)

GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-195, DTC P0700 TRANSMISSION CONTROL SYSTEM (MIL REQUEST), Diagnostic Trouble Code (DTC) Detecting Criteria.>

### NOTE:

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

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## CN:DTC P0851 PARK/NEUTRAL SWITCH INPUT CIRCUIT LOW (AT MODEL)

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-196, DTC P0851 PARK/NEUTRAL SWITCH INPUT CIRCUIT LOW (AT MODEL), Diagnostic Trouble Code (DTC) Detecting Criteria.>

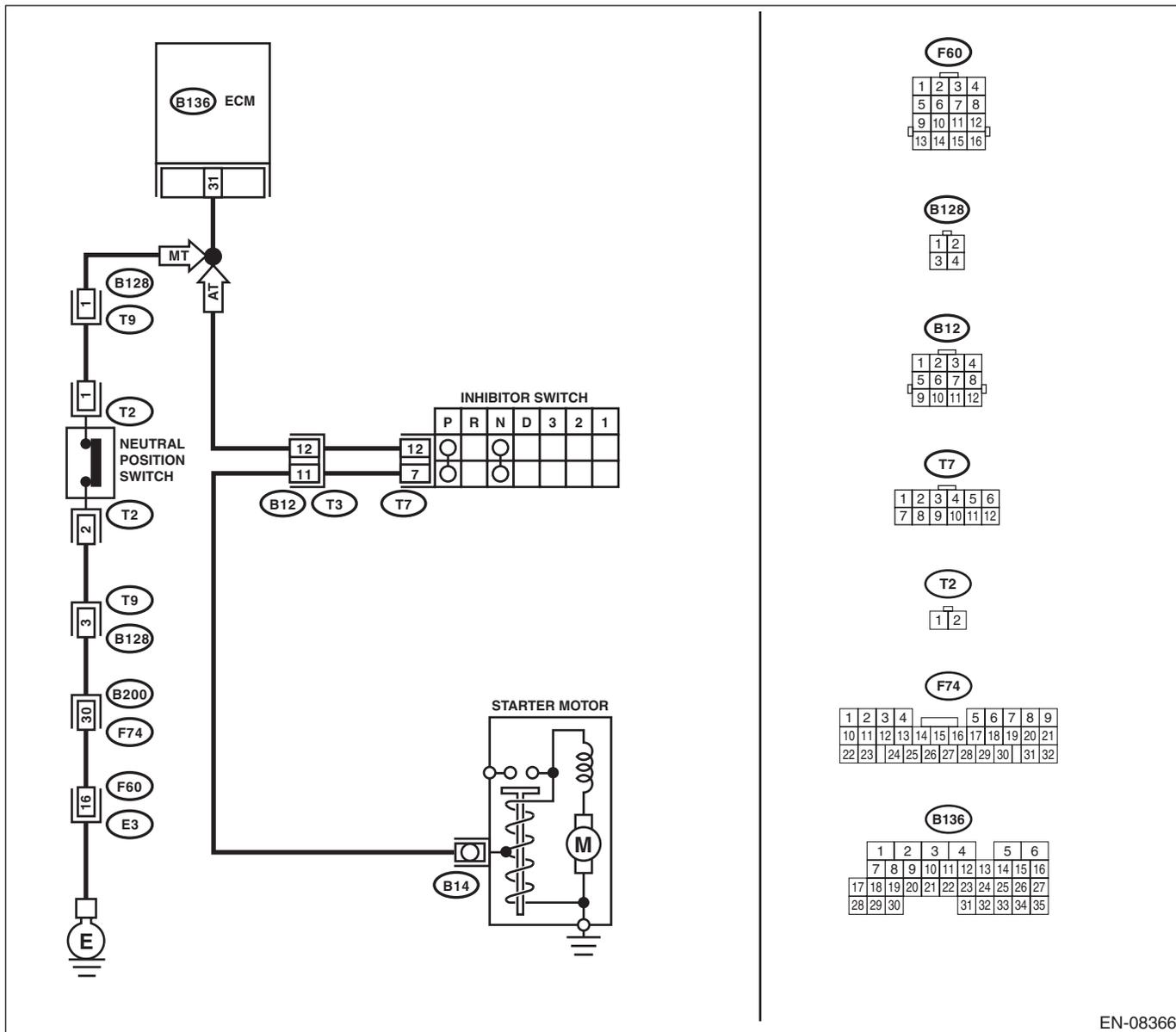
### TROUBLE SYMPTOM:

Improper idling

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-08366

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK INPUT SIGNAL OF ECM.</b> 1) Turn the ignition switch to ON. 2) Place the select lever other than "N" and "P" range. 3) Measure the voltage between ECM and chassis ground. <i>Connector &amp; terminal</i> <i>(B136) No. 31 (+) — Chassis ground (-):</i>	Is the voltage 4.5 — 5.5 V?	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time.	Go to step 2.
<b>2 CHECK HARNESS BETWEEN ECM AND TRANSMISSION HARNESS CONNECTOR.</b> 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. <i>Connector &amp; terminal</i> <i>(B136) No. 31 — Chassis ground:</i>	Is the resistance more than 1 M $\Omega$ ?	Go to step 3.	Repair the ground short circuit of harness between ECM and transmission harness connector.
<b>3 CHECK TRANSMISSION HARNESS CONNECTOR.</b> 1) Disconnect the connector from inhibitor switch. 2) Measure the resistance of harness between transmission harness connector and engine ground. <i>Connector &amp; terminal</i> <i>(T3) No. 12 — Engine ground:</i>	Is the resistance more than 1 M $\Omega$ ?	Go to step 4.	Repair the ground short circuit of harness between transmission harness connector and inhibitor switch connector.
<b>4 CHECK INHIBITOR SWITCH</b> Measure the resistance between inhibitor switch connector receptacle terminals with the select lever at a setting other than "P" and "N" ranges. <i>Terminals</i> <i>No. 7 — No. 12:</i>	Is the resistance more than 1 M $\Omega$ ?	Go to step 5.	Replace the inhibitor switch. <Ref. to 4AT-48, Inhibitor Switch.>
<b>5 CHECK SELECT CABLE CONNECTION.</b>	Is there any fault in the selector cable connection to the inhibitor switch?	Repair the selector cable connection. <Ref. to CS-26, INSPECTION, Select Cable.>	Contact with SOA Service Center. NOTE: The deterioration of multiple parts can be thought as the cause.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## CO:DTC P0851 NEUTRAL SWITCH INPUT CIRCUIT LOW (MT MODEL)

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-197, DTC P0851 NEUTRAL SWITCH INPUT CIRCUIT LOW (MT MODEL), Diagnostic Trouble Code (DTC) Detecting Criteria.>

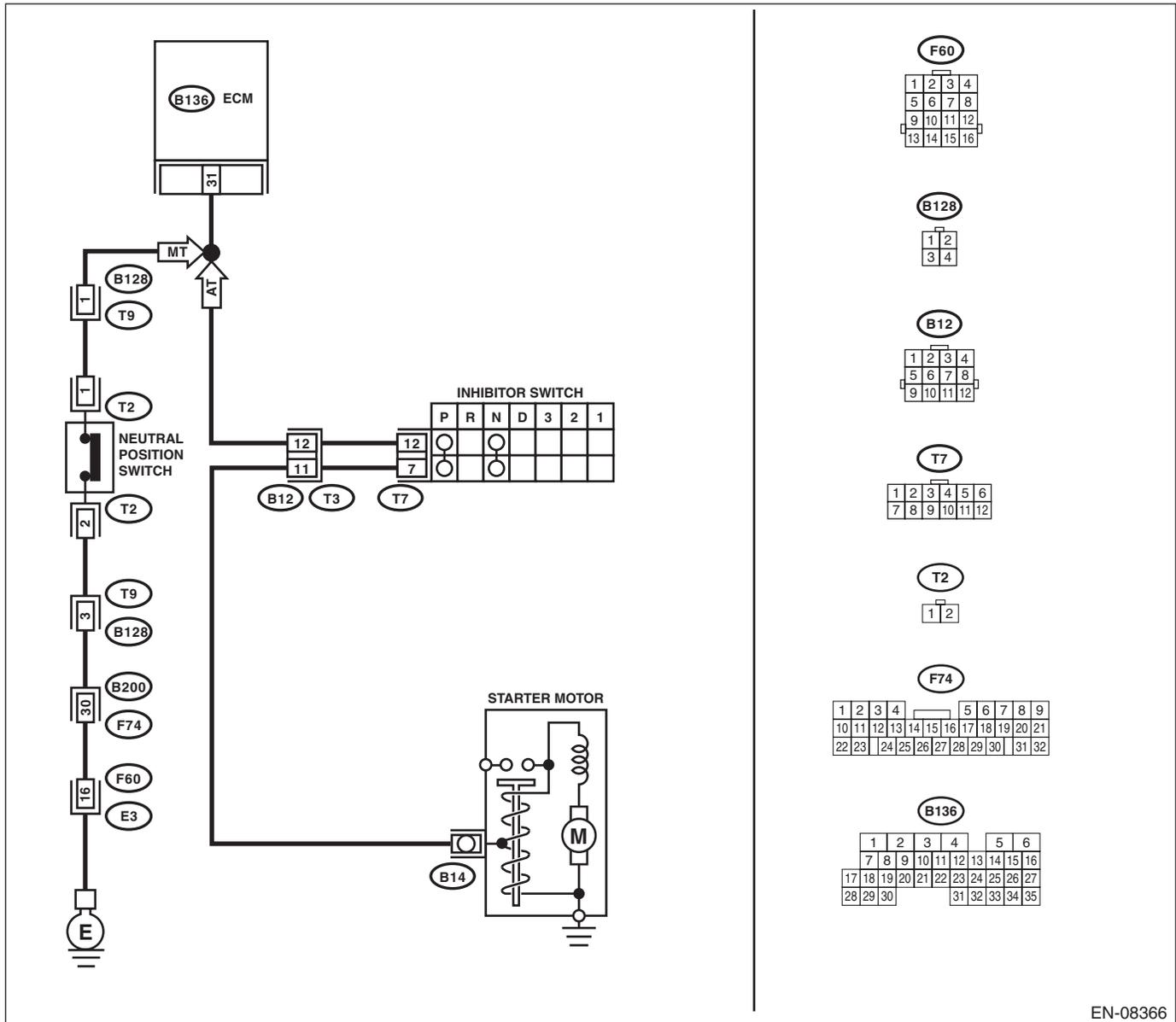
### TROUBLE SYMPTOM:

Improper idling

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK INPUT SIGNAL OF ECM.</b> 1) Turn the ignition switch to ON. 2) Place the shift lever except in neutral. 3) Measure the voltage between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 31 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Go to step 2.	Go to step 4.
<b>2 CHECK INPUT SIGNAL OF ECM.</b> 1) Place the shift lever in neutral. 2) Measure the voltage between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 31 (+) — Chassis ground (-):</b>	Is the voltage less than 1 V?	Go to step 3.	Go to step 4.
<b>3 CHECK POOR CONTACT.</b> Check poor contact of ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Contact with SOA Service Center. NOTE: The deterioration of multiple parts can be thought as the cause.
<b>4 CHECK NEUTRAL POSITION SWITCH.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the transmission harness. 3) Place the shift lever except in neutral. 4) Measure the resistance between transmission harness and connector terminals. <b>Connector &amp; terminal</b> <b>(T9) No. 1 — No. 3:</b>	Is the resistance more than 1 M $\Omega$ ?	Go to step 5.	Repair the short circuit in transmission harness, or replace the neutral position switch.
<b>5 CHECK NEUTRAL POSITION SWITCH.</b> 1) Place the shift lever in neutral. 2) Measure the resistance between transmission harness connector terminals.	Is the resistance less than 1 $\Omega$ ?	Go to step 6.	Repair the short circuit in transmission harness, or replace the neutral position switch.
<b>6 CHECK HARNESS BETWEEN ECM AND NEUTRAL POSITION SWITCH CONNECTOR.</b> Measure the resistance between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 31 — Chassis ground:</b>	Is the resistance more than 1 M $\Omega$ ?	Go to step 7.	Repair the ground short circuit of harness between ECM and transmission harness connector.
<b>7 CHECK HARNESS BETWEEN ECM AND NEUTRAL POSITION SWITCH CONNECTOR.</b> 1) Disconnect the connectors from ECM. 2) Measure the resistance of harness between ECM and transmission harness connector. <b>Connector &amp; terminal</b> <b>(B136) No. 31 — (B128) No. 1:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 8.	Repair the open circuit of the harness between ECM and transmission harness connector.
<b>8 CHECK HARNESS BETWEEN ECM AND NEUTRAL POSITION SWITCH CONNECTOR.</b> Measure the resistance of harness between transmission harness connector and engine ground. <b>Connector &amp; terminal</b> <b>(B128) No. 3 — Engine ground:</b>	Is the resistance less than 5 $\Omega$ ?	Go to step 9.	Repair the open circuit between transmission harness connector and engine ground terminal.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>9</b> <b>CHECK POOR CONTACT.</b> Check poor contact of transmission harness connector.	Is there poor contact in transmission harness connector?	Repair the poor contact of transmission harness connector.	Contact with SOA Service Center. NOTE: The deterioration of multiple parts can be thought as the cause.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## CP:DTC P0852 PARK/NEUTRAL SWITCH INPUT CIRCUIT HIGH (AT MODEL)

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-198, DTC P0852 PARK/NEUTRAL SWITCH INPUT CIRCUIT HIGH (AT MODEL), Diagnostic Trouble Code (DTC) Detecting Criteria.>

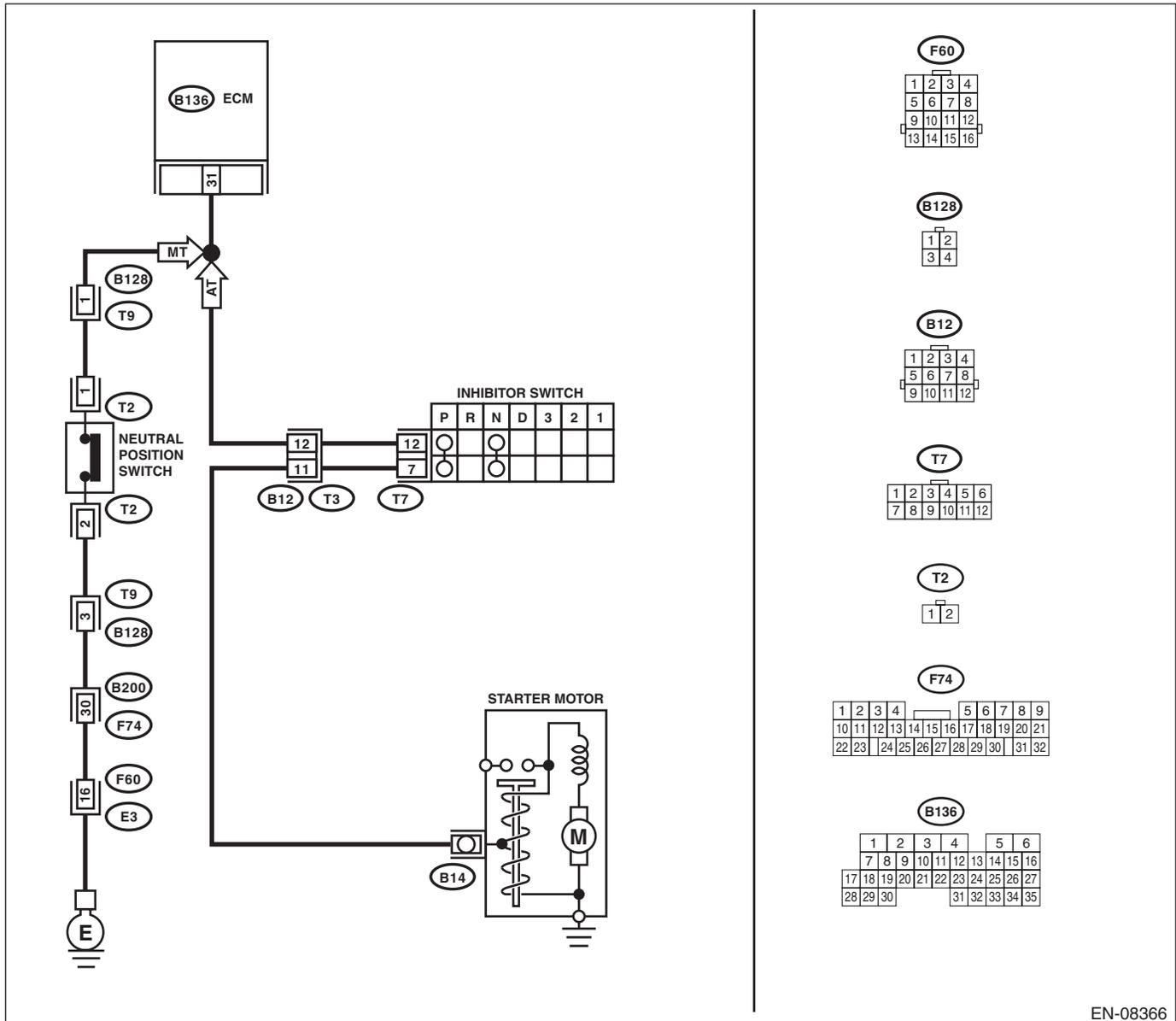
### TROUBLE SYMPTOM:

Improper idling

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-08366

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK INPUT SIGNAL OF ECM.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground with select lever at "N" and "P" range. <i>Connector &amp; terminal</i> <i>(B136) No. 31 (+) — Chassis ground (-):</i>	Is the voltage less than 1 V?	Go to step 2.	Go to step 4.
<b>2 CHECK INPUT SIGNAL OF ECM.</b> Measure the voltage between ECM and chassis ground with select lever at other than "N" and "P" range. <i>Connector &amp; terminal</i> <i>(B136) No. 31 (+) — Chassis ground (-):</i>	Is the voltage 4.5 — 5.5 V?	Go to step 3.	Go to step 4.
<b>3 CHECK POOR CONTACT.</b> Check poor contact of ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Contact with SOA Service Center. NOTE: The deterioration of multiple parts can be thought as the cause.
<b>4 CHECK INPUT SIGNAL OF ECM.</b> Measure the voltage between ECM and chassis ground. <i>Connector &amp; terminal</i> <i>(B136) No. 31 (+) — Chassis ground (-):</i>	Is the voltage more than 10 V?	Repair the battery short circuit of harness between ECM and inhibitor switch connector.	Go to step 5.
<b>5 CHECK HARNESS BETWEEN ECM AND INHIBITOR SWITCH CONNECTOR.</b> 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. <i>Connector &amp; terminal</i> <i>(B136) No. 31 — (T7) No. 12:</i>	Is the resistance less than 1 $\Omega$ ?	Go to step 6.	Repair the harness and connector. NOTE: In this case, repair the following item: <ul style="list-style-type: none"> <li>• Open circuit of harness between ECM and inhibitor switch connector</li> <li>• Poor contact of coupling connector</li> <li>• Poor contact of inhibitor switch connector</li> <li>• Poor contact in ECM connector</li> </ul>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>6</b>      <b>CHECK INHIBITOR SWITCH GROUND LINE.</b>                      Measure the resistance of harness between inhibitor switch connector and engine ground.  <i><b>Connector &amp; terminal</b></i>  <i><b>(T7) No. 12 — Engine ground:</b></i></p>	<p>Is the resistance less than 5 <math>\Omega</math>?</p>	<p>Go to step 7.</p>	<p>Repair open circuit of harness between inhibitor switch connector and starter motor ground line.                      NOTE:                      In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Open circuit of harness between inhibitor switch connector and starter motor ground line</li> <li>• Poor contact in starter motor connector</li> <li>• Poor contact in starter motor ground</li> <li>• Starter motor</li> </ul>
<p><b>7</b>      <b>CHECK INHIBITOR SWITCH</b>                      Measure the resistance between inhibitor switch connector receptacle's terminals with select lever at "N" and "P" range.  <i><b>Terminals</b></i>  <i><b>No. 7 — No. 12:</b></i></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step 8.</p>	<p>Replace the inhibitor switch. &lt;Ref. to 4AT-48, Inhibitor Switch.&gt;</p>
<p><b>8</b>      <b>CHECK SELECT CABLE CONNECTION.</b></p>	<p>Is there any fault in the selector cable connection to the inhibitor switch?</p>	<p>Repair the selector cable connection.                      &lt;Ref. to CS-26, INSPECTION, Select Cable.&gt;</p>	<p>Contact with SOA Service Center.                      NOTE:                      The deterioration of multiple parts can be thought as the cause.</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## CQ:DTC P0852 NEUTRAL SWITCH INPUT CIRCUIT HIGH (MT MODEL)

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-198, DTC P0852 PARK/NEUTRAL SWITCH INPUT CIRCUIT HIGH (AT MODEL), Diagnostic Trouble Code (DTC) Detecting Criteria.> <Ref. to GD(H4DOTC)-199, DTC P0852 NEUTRAL SWITCH INPUT CIRCUIT HIGH (MT MODEL), Diagnostic Trouble Code (DTC) Detecting Criteria.>

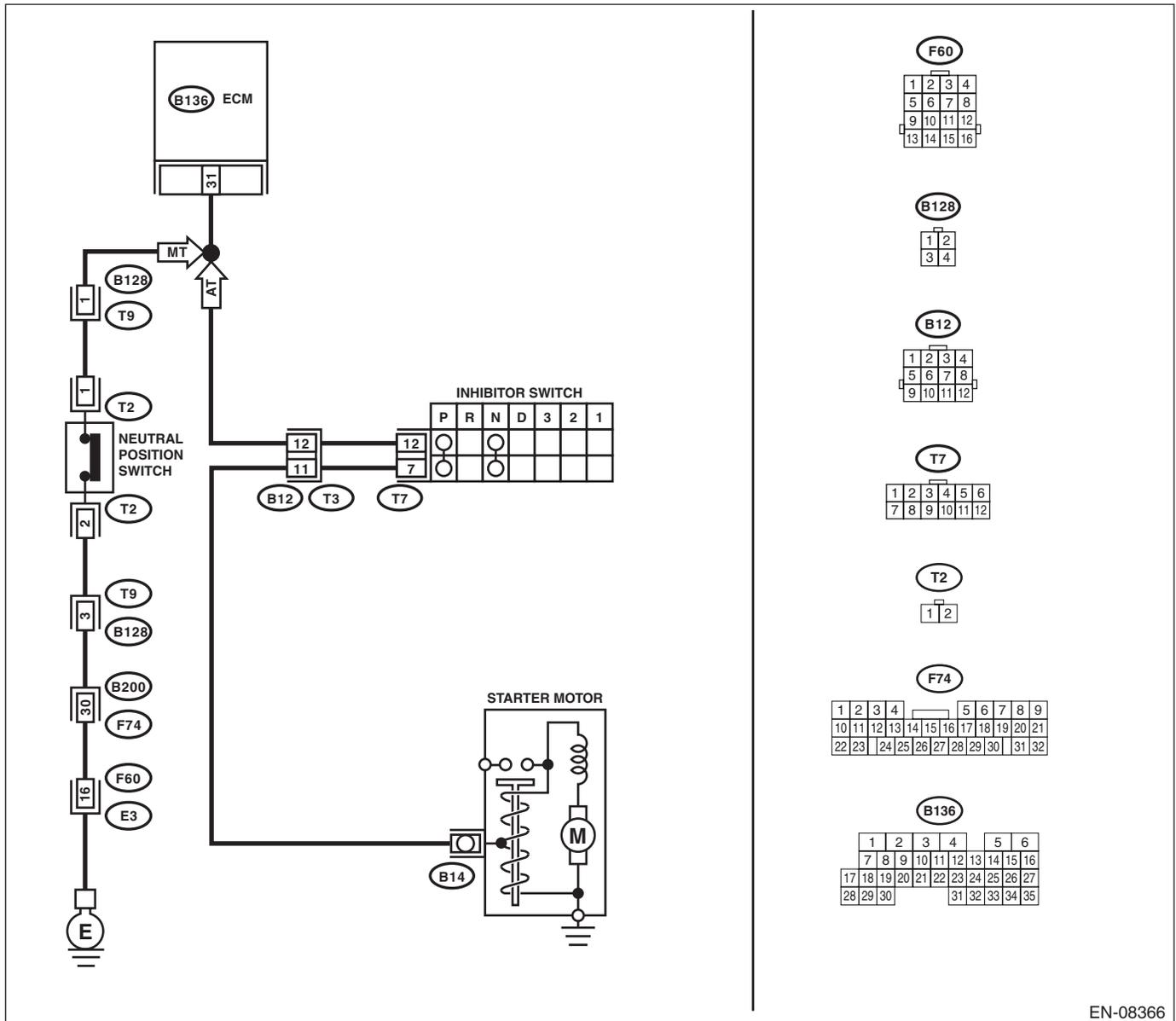
### TROUBLE SYMPTOM:

Improper idling

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-08366

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK INPUT SIGNAL OF ECM.</b> 1) Turn the ignition switch to ON. 2) Place the shift lever in a position except for neutral. 3) Measure the voltage between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 31 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Go to step 2.	Go to step 4.
<b>2 CHECK INPUT SIGNAL OF ECM.</b> 1) Place the shift lever in neutral. 2) Measure the voltage between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 31 (+) — Chassis ground (-):</b>	Is the voltage less than 1 V?	Go to step 3.	Go to step 4.
<b>3 CHECK POOR CONTACT.</b> Check poor contact of ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Contact with SOA Service Center. <b>NOTE:</b> The deterioration of multiple parts can be thought as the cause.
<b>4 CHECK INPUT SIGNAL OF ECM.</b> 1) Disconnect the connectors from ECM. 2) Measure the voltage between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 31 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Repair battery short circuit of harness between ECM and transmission harness connector.	Go to step 5.
<b>5 CHECK HARNESS BETWEEN ECM AND TRANSMISSION HARNESS CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and transmission harness connector (T9). 3) Measure the resistance of harness between ECM and neutral switch connector. <b>Connector &amp; terminal</b> <b>(B136) No. 31 — (B128) No. 1:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 6.	Repair the open circuit in harness between ECM and transmission harness connector.
<b>6 CHECK NEUTRAL POSITION SWITCH GROUND LINE.</b> Measure the resistance of harness between transmission harness connector and engine ground. <b>Connector &amp; terminal</b> <b>(B128) No. 3 — Engine ground:</b>	Is the resistance less than 5 $\Omega$ ?	Go to step 7.	Repair the open circuit in the neutral position switch ground line.
<b>7 CHECK NEUTRAL POSITION SWITCH.</b> 1) Place the shift lever in neutral. 2) Measure the resistance between transmission harness connector socket terminals. <b>Terminals</b> <b>No. 1 — No. 3:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 8.	Replace the neutral position switch.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
8	<b>CHECK POOR CONTACT.</b> Check poor contact of transmission harness connector.	Is there poor contact in transmission harness connector?	Repair the poor contact of transmission harness connector.	Contact with SOA Service Center. NOTE: The deterioration of multiple parts can be thought as the cause.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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

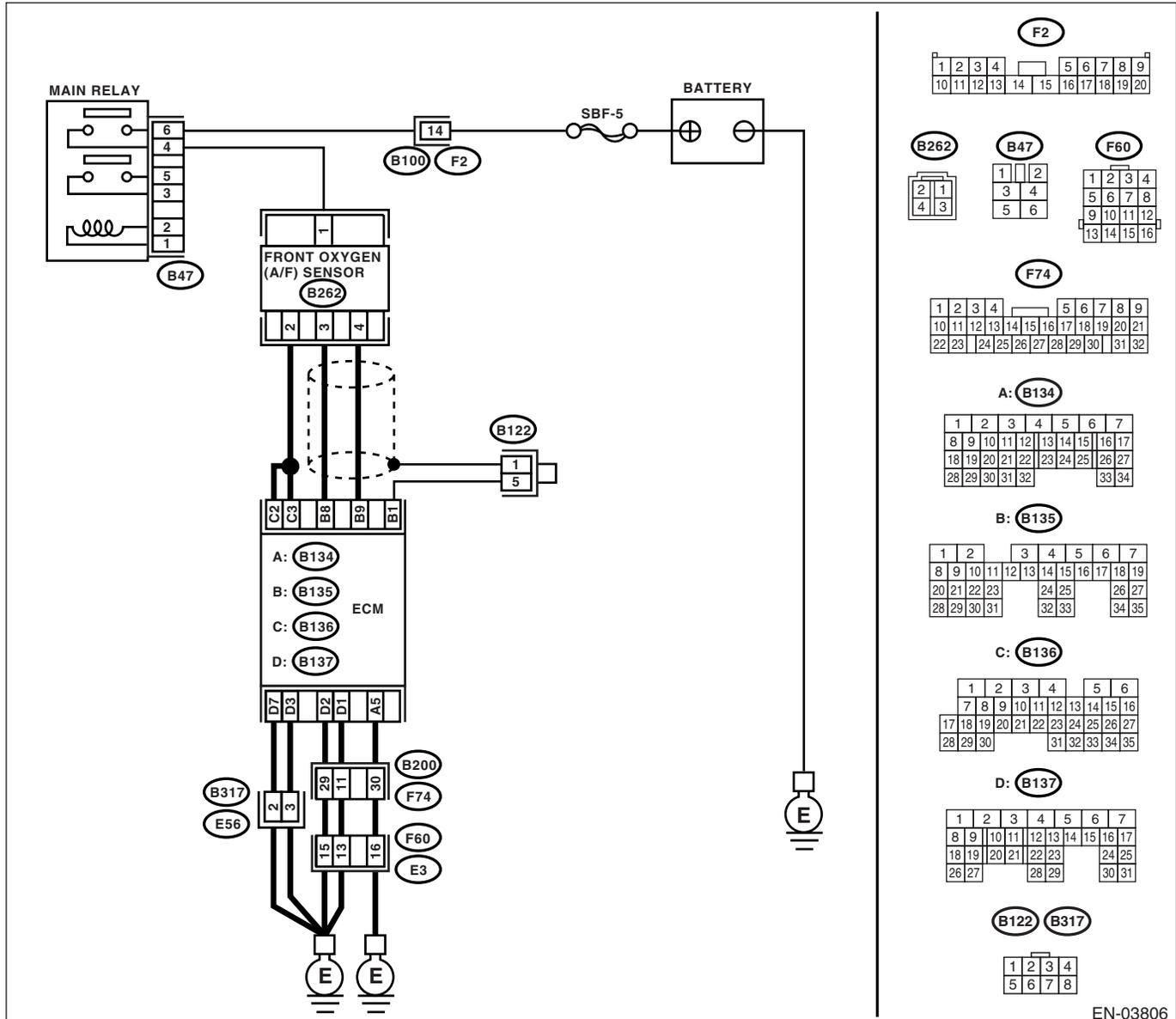
### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-200, DTC P1152 O2 SENSOR CIRCUIT RANGE/PERFORMANCE (LOW) (BANK1 SENSOR1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03806

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

### ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1</b> <b>CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.</b>	Does water enter the connector?	Dry the water thoroughly.	Go to step 2.
<b>2</b> <b>CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.</b> 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. <b>Connector &amp; terminal</b> <b>(B135) No. 9 — (B262) No. 4:</b> <b>(B135) No. 8 — (B262) No. 3:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 3.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of the harness between ECM and front oxygen (A/F) sensor connector. • Poor contact in front oxygen (A/F) sensor connector • Poor contact in ECM connector
<b>3</b> <b>CHECK POOR CONTACT.</b> Check for poor contact of the front oxygen (A/F) sensor connector.	Is there poor contact in the front oxygen (A/F) sensor connector?	Repair the poor contact of the front oxygen (A/F) sensor connector.	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4DOTC)-41, Front Oxygen (A/F) Sensor.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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

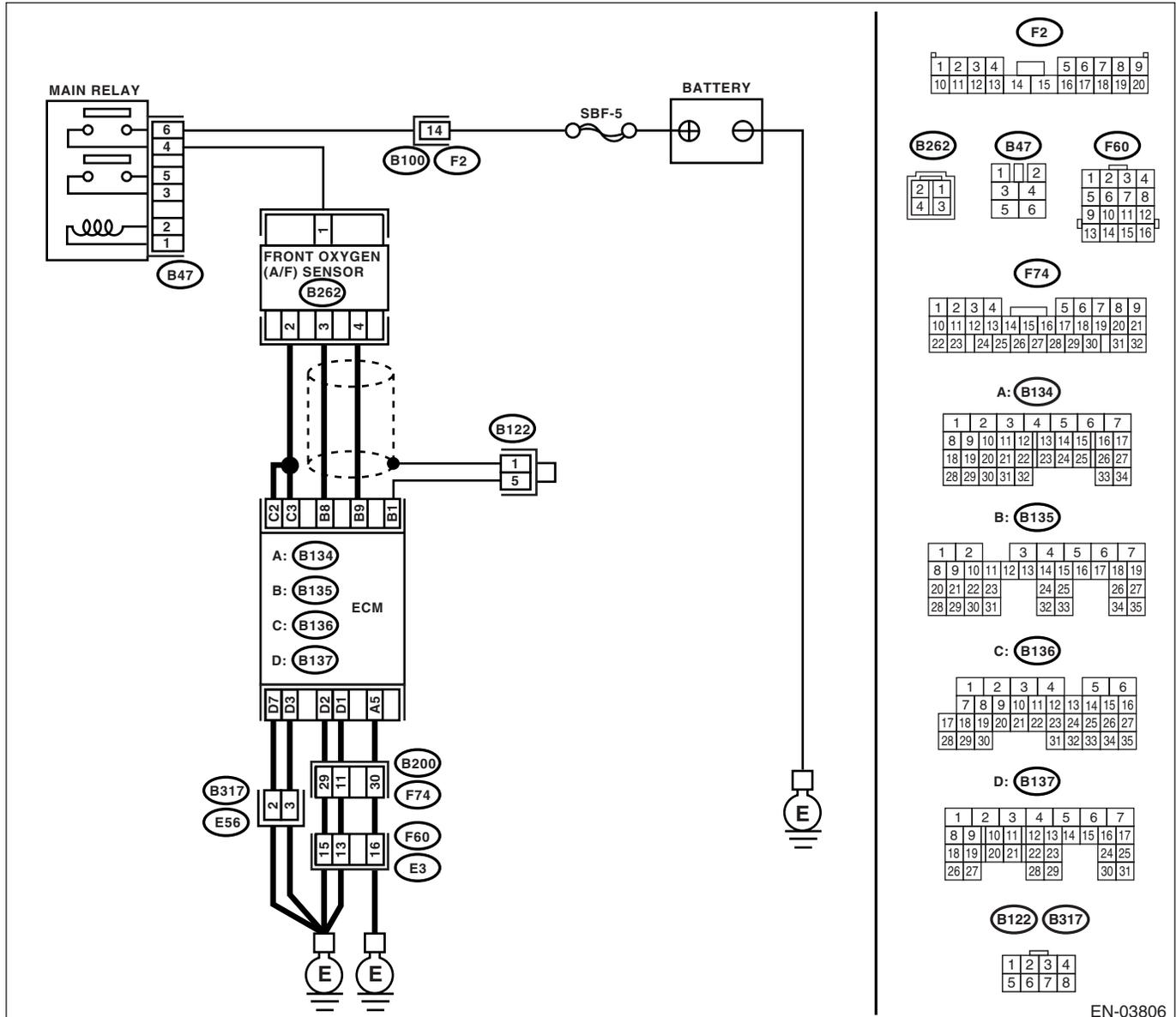
### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-203, DTC P1153 O2 SENSOR CIRCUIT RANGE/PERFORMANCE (HIGH) (BANK1 SENSOR1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03806

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No	
<b>1</b>	<b>CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.</b>	Does water enter the connector?	Dry the water thoroughly.	Go to step 2.
<b>2</b>	<b>CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM. 3) Measure the resistance of harness between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B135) No. 8 — Chassis ground:</b>	Is the resistance more than 1 M $\Omega$ ?	Go to step 3.	Repair the ground short circuit of harness between ECM and front oxygen (A/F) sensor connector.
<b>3</b>	<b>CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.</b> Measure the resistance of harness between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B135) No. 9 — Chassis ground:</b>	Is the resistance more than 1 M $\Omega$ ?	Go to step 4.	Repair the ground short circuit of harness between ECM and front oxygen (A/F) sensor connector.
<b>4</b>	<b>CHECK OUTPUT SIGNAL FOR ECM.</b> 1) Attach the connector to the ECM. 2) Turn the ignition switch to ON. 3) Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B135) No. 8 (+) — Chassis ground (-):</b>	Is the voltage more than 4.5 V?	Go to step 5.	Go to step 6.
<b>5</b>	<b>CHECK OUTPUT SIGNAL FOR ECM.</b> Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B135) No. 8 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Repair the battery short circuit of harness between ECM and front oxygen (A/F) sensor connector. After repair, replace the ECM. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>	Repair poor contact in ECM connector.
<b>6</b>	<b>CHECK OUTPUT SIGNAL FOR ECM.</b> Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B135) No. 9 (+) — Chassis ground (-):</b>	Is the voltage more than 4.95 V?	Go to step 7.	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4DOTC)-41, Front Oxygen (A/F) Sensor.>
<b>7</b>	<b>CHECK OUTPUT SIGNAL FOR ECM.</b> Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B135) No. 9 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Repair the battery short circuit of harness between ECM and front oxygen (A/F) sensor connector. After repair, replace the ECM. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>	Repair poor contact in ECM connector.

## CT:DTC P1160 RETURN SPRING FAILURE

NOTE:

For the diagnostic procedure, refer to DTC P2101. <Ref. to EN(H4DOTC)(diag)-340, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## CU:DTC P1400 FUEL TANK PRESSURE CONTROL SOLENOID VALVE CIRCUIT LOW

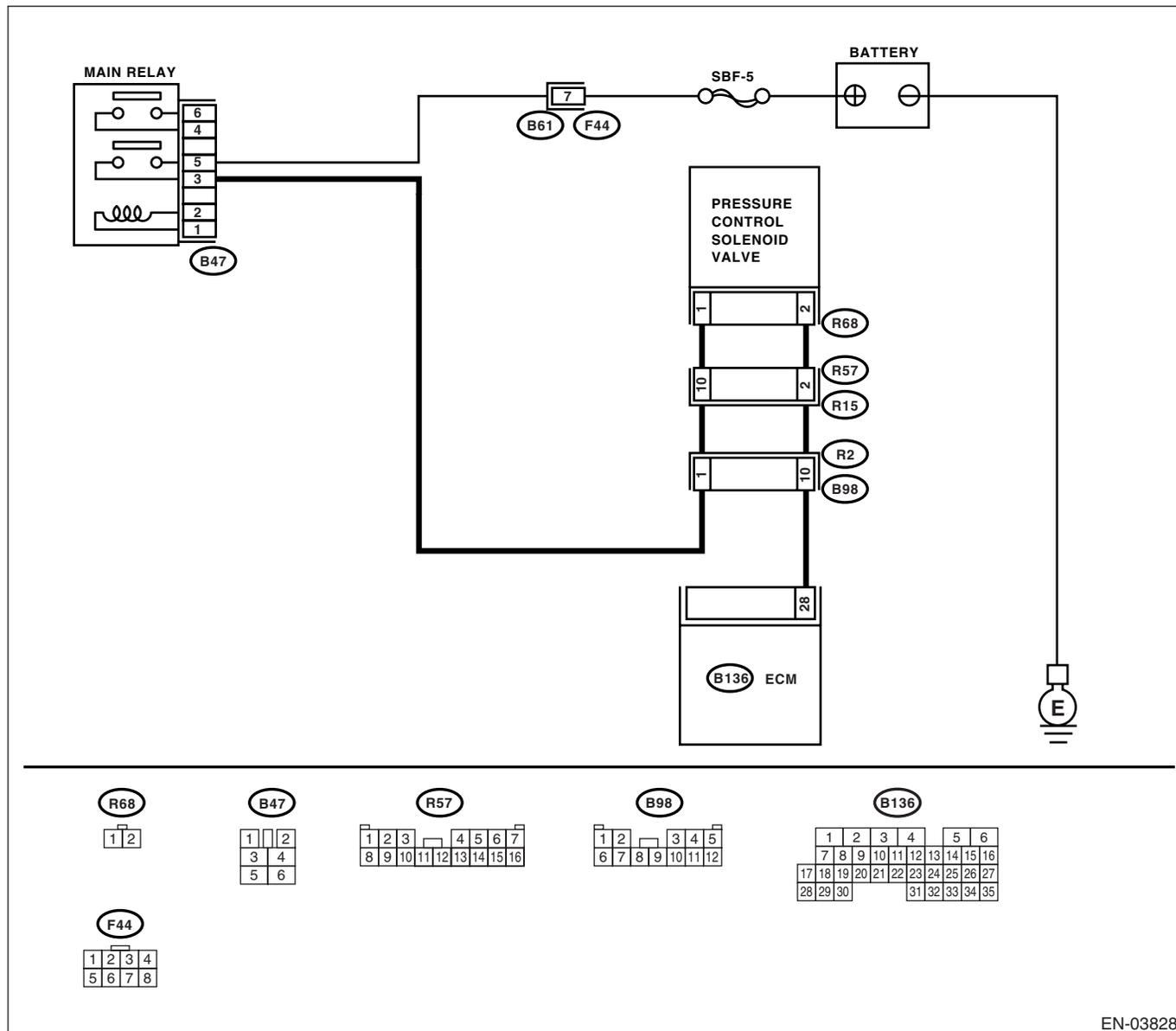
### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-208, DTC P1400 FUEL TANK PRESSURE CONTROL SOLENOID VALVE CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03828

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK OUTPUT SIGNAL OF ECM.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground. <i>Connector &amp; terminal</i> <i>(B136) No. 28 (+) — Chassis ground (-):</i>	Is the voltage more than 10 V?	Go to step 2.	Go to step 3.
<b>2 CHECK POOR CONTACT.</b> Check poor contact of ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Contact with SOA Service Center. NOTE: The deterioration of multiple parts can be thought as the cause.
<b>3 CHECK HARNESS BETWEEN PRESSURE CONTROL SOLENOID VALVE AND ECM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the pressure control solenoid valve and ECM. 3) Measure the resistance of the harness between the pressure control solenoid valve connector and chassis ground. <i>Connector &amp; terminal</i> <i>(R68) No. 2 — Chassis ground:</i>	Is the resistance more than 1 M $\Omega$ ?	Go to step 4.	Repair the ground short circuit of harness between ECM and Pressure control solenoid valve connector.
<b>4 CHECK HARNESS BETWEEN PRESSURE CONTROL SOLENOID VALVE AND ECM CONNECTOR.</b> Measure the resistance of the harness between the ECM and pressure control solenoid valve connector. <i>Connector &amp; terminal</i> <i>(B136) No. 28 — (R68) No. 2:</i>	Is the resistance less than 1 $\Omega$ ?	Go to step 5.	Repair the harness and connector. NOTE: In this case, repair the following item: <ul style="list-style-type: none"> <li>• Open circuit of harness between ECM and pressure control solenoid valve connector</li> <li>• Poor contact of coupling connector</li> </ul>
<b>5 CHECK PRESSURE CONTROL SOLENOID VALVE.</b> Measure the resistance between the pressure control solenoid valve terminals. <i>Terminals</i> <i>No. 1 — No. 2:</i>	Is the resistance between 10 and 100 $\Omega$ ?	Go to step 6.	Replace the pressure control solenoid valve. <Ref. to EC(H4DOTC)-16, Pressure Control Solenoid Valve.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>6</b></p> <p><b>CHECK POWER SUPPLY TO THE PRESSURE CONTROL SOLENOID VALVE.</b></p> <p>1) Turn the ignition switch to ON.</p> <p>2) Measure the voltage between the pressure control solenoid valve and chassis ground.</p> <p><b>Connector &amp; terminal</b>  <b>(R68) No. 1 (+) — Chassis ground (-):</b></p>	<p>Is the voltage more than 10 V?</p>	<p>Go to step 7.</p>	<p>Repair the harness and connector.</p> <p><b>NOTE:</b>                      In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Open circuit of harness between main relay and pressure control solenoid valve connector</li> <li>• Poor contact of coupling connector</li> <li>• Poor contact of main relay connector</li> </ul>
<p><b>7</b></p> <p><b>CHECK POOR CONTACT.</b></p> <p>Check poor contact of pressure control solenoid valve connector.</p>	<p>Is there poor contact of the pressure control solenoid valve connector?</p>	<p>Repair poor contact of the pressure control solenoid valve connector.</p>	<p>Contact with SOA Service Center.</p> <p><b>NOTE:</b>                      The deterioration of multiple parts can be thought as the cause.</p>

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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### **CV:DTC P1410 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE STUCK OPEN**

#### **DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-210, DTC P1410 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE STUCK OPEN, Diagnostic Trouble Code (DTC) Detecting Criteria.>

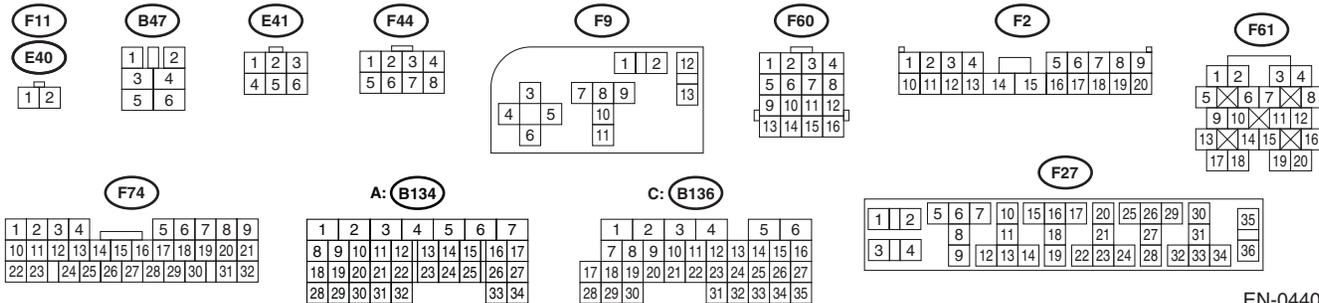
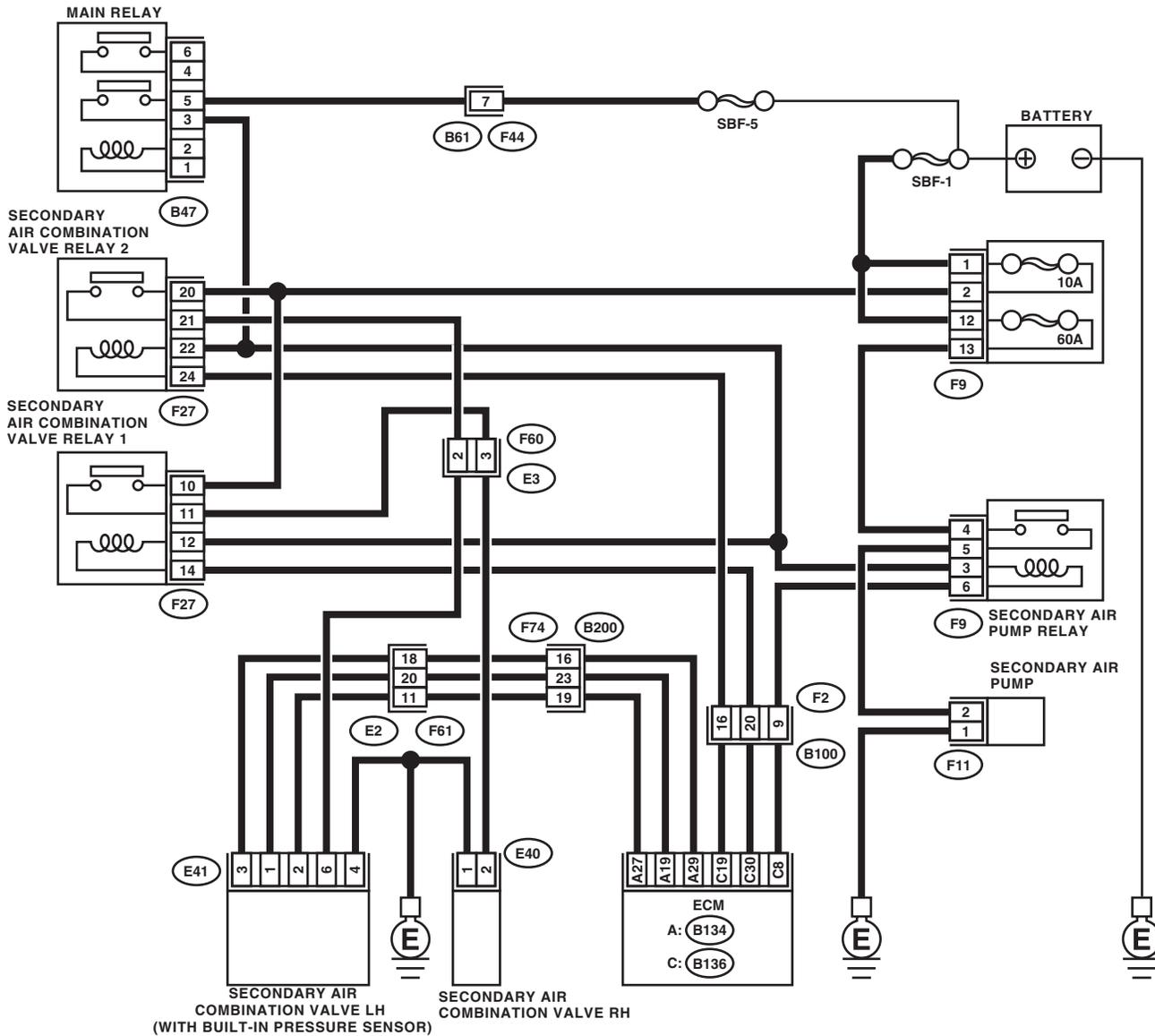
#### **CAUTION:**

**After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## WIRING DIAGRAM:



EN-04401

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<b>SECONDARY AIR COMBINATION VALVE INSPECTION</b> 1) Remove the secondary air combination valve. <Ref. to EC(H4DOTC)-10, Secondary Air Combination Valve.> 2) Blow in air from the secondary air combination valve air inlet, and check whether there are leaks at the pipe connections.	Are there air leaks from the pipe connections?	Replace the secondary air combination valve on the side with the air leak. <Ref. to EC(H4DOTC)-10, Secondary Air Combination Valve.>	Temporary poor contact occurs. Check for poor contact in the connector.

## **CW:DTC P1418 SECONDARY AIR INJECTION SYSTEM CONTROL “A” CIRCUIT SHORTED**

### **DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-212, DTC P1418 SECONDARY AIR INJECTION SYSTEM CONTROL “A” CIRCUIT SHORTED , Diagnostic Trouble Code (DTC) Detecting Criteria.>

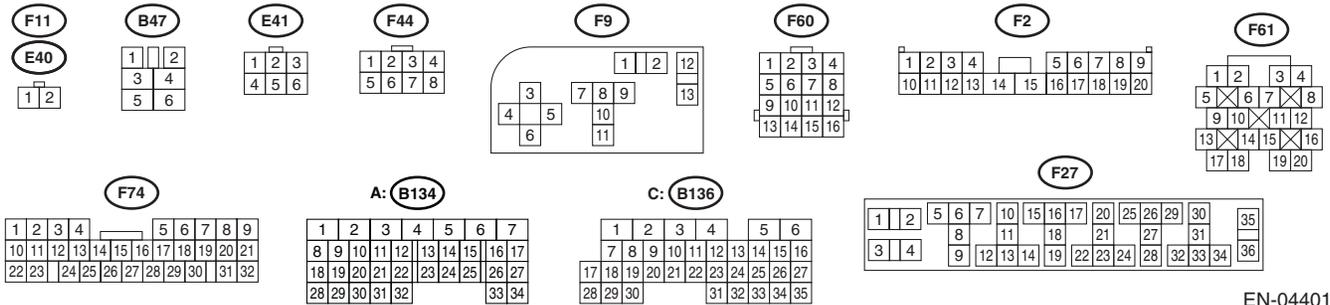
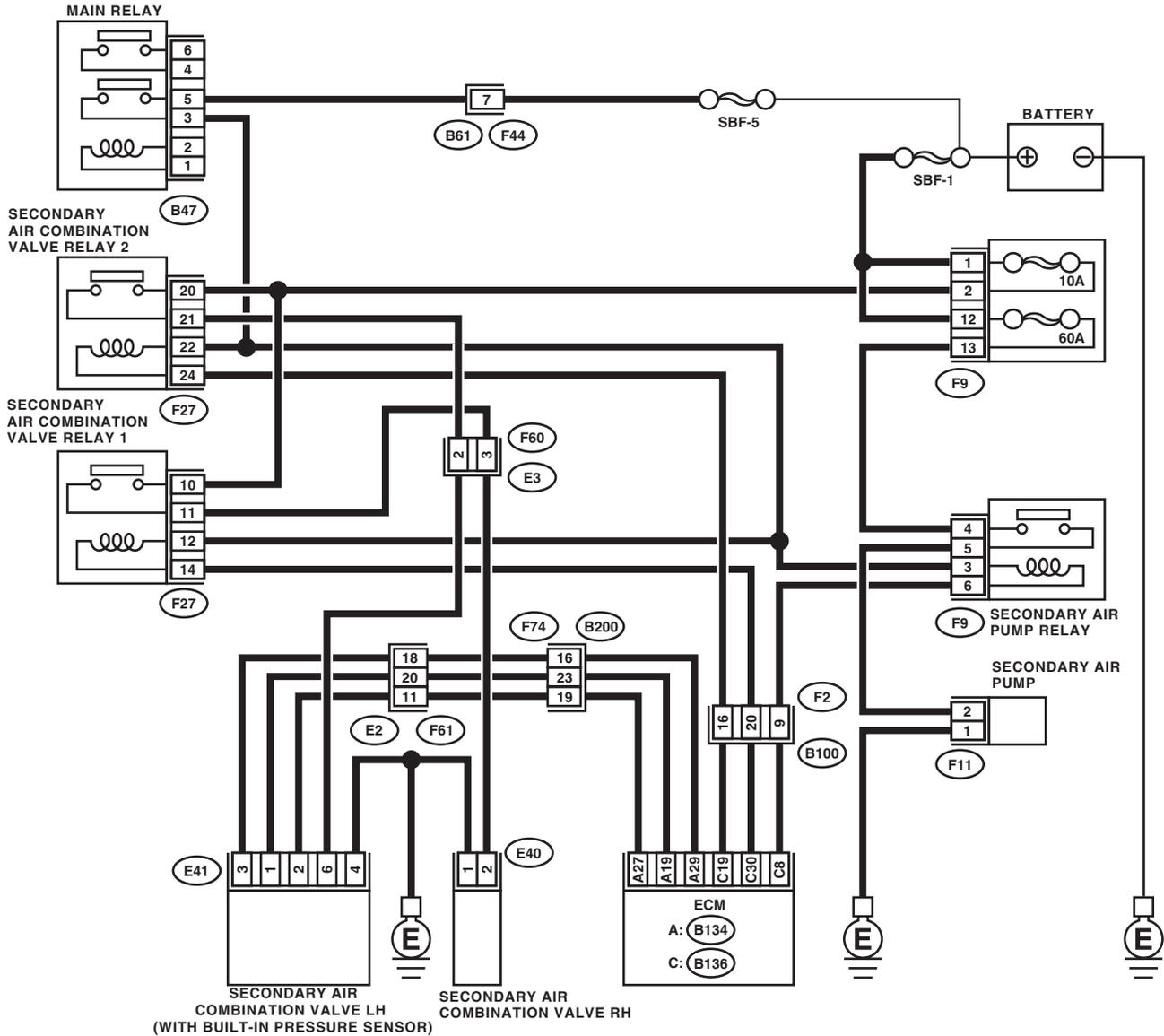
### **CAUTION:**

**After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## WIRING DIAGRAM:



EN-04401

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1</b> <b>CHECK HARNESS BETWEEN ECM AND SECONDARY AIR PUMP RELAY</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the ECM and secondary air pump relay. 3) Measure the resistance of the harness between the ECM and secondary air pump relay terminal. <b>Connector &amp; terminal</b> <b>(B136) No. 8 — (F9) No. 6:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 2.	Repair open circuit of the harness between the ECM and secondary air pump relay terminal.
<b>2</b> <b>CHECK HARNESS BETWEEN ECM AND SECONDARY AIR PUMP RELAY</b> Measure the voltage between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 8 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Repair the battery short of the harness between the ECM and secondary air pump relay terminal.	Temporary poor contact occurs. Check for poor contact in the connector.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

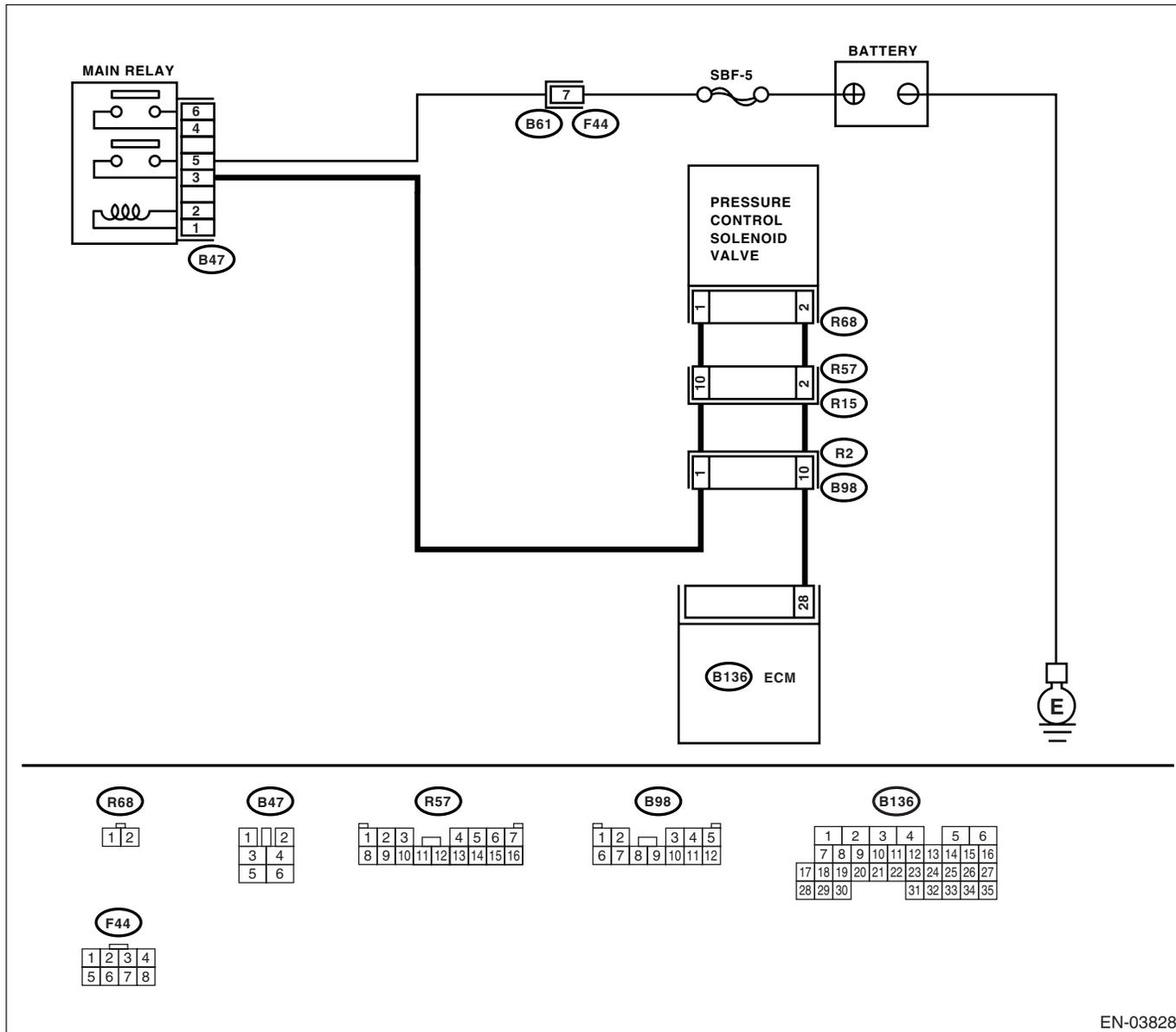
## CX:DTC P1420 FUEL TANK PRESSURE CONTROL SOL. VALVE CIRCUIT HIGH DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-213, DTC P1420 FUEL TANK PRESSURE CONTROL SOL. VALVE CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03828

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK INPUT SIGNAL OF ECM.</b>                      1) Turn the ignition switch to OFF.                      2) Connect the test mode connector at the lower portion of instrument panel (on the drivers side).                      3) Turn the ignition switch to ON.                      4) Measure the voltage between the ECM and chassis ground while operating the pressure control solenoid valve.</p> <p>NOTE:                      The pressure control solenoid valve operation can be executed using the Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". &lt;Ref. to EN(H4DOTC)(diag)-47, Compulsory Valve Operation Check Mode.&gt;</p> <p><b>Connector &amp; terminal</b>  <b>(B136) No. 28 (+) — Chassis ground (-):</b></p>	<p>Does the voltage change between 0 — 10 V?</p>	<p>Go to step 2.</p>	<p>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.</p>
<p><b>2</b></p> <p><b>CHECK INPUT SIGNAL OF ECM.</b>                      1) Turn the ignition switch to ON.                      2) Measure the voltage between ECM and chassis ground.</p> <p><b>Connector &amp; terminal</b>  <b>(B136) No. 28 (+) — Chassis ground (-):</b></p>	<p>Is the voltage more than 10 V?</p>	<p>Go to step 4.</p>	<p>Go to step 3.</p>
<p><b>3</b></p> <p><b>CHECK POOR CONTACT.</b>                      Check poor contact of ECM connector.</p>	<p>Is there poor contact in ECM connector?</p>	<p>Repair poor contact in ECM connector.</p>	<p>Replace the ECM. &lt;Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).&gt;</p>
<p><b>4</b></p> <p><b>CHECK HARNESS BETWEEN PRESSURE CONTROL SOLENOID VALVE AND ECM CONNECTOR.</b>                      1) Turn the ignition switch to OFF.                      2) Disconnect the connector from the pressure control solenoid valve.                      3) Turn the ignition switch to ON.                      4) Measure the voltage between ECM and chassis ground.</p> <p><b>Connector &amp; terminal</b>  <b>(B136) No. 28 (+) — Chassis ground (-):</b></p>	<p>Is the voltage more than 10 V?</p>	<p>Repair the battery short circuit of harness between the ECM and pressure control solenoid valve connector. After repair, replace the ECM. &lt;Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).&gt;</p>	<p>Go to step 5.</p>
<p><b>5</b></p> <p><b>CHECK PRESSURE CONTROL SOLENOID VALVE.</b>                      1) Turn the ignition switch to OFF.                      2) Measure the resistance between the pressure control solenoid valve terminals.</p> <p><b>Terminals</b>  <b>No. 1 — No. 2:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Replace the purge control solenoid valve &lt;Ref. to EC(H4DOTC)-16, Pressure Control Solenoid Valve.&gt; and ECM &lt;Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).&gt;</p>	<p>Go to step 6.</p>
<p><b>6</b></p> <p><b>CHECK POOR CONTACT.</b>                      Check poor contact of ECM connector.</p>	<p>Is there poor contact in ECM connector?</p>	<p>Repair poor contact in ECM connector.</p>	<p>Replace the ECM. &lt;Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## CY:DTC P1443 VENT CONTROL SOLENOID VALVE FUNCTION PROBLEM

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-215, DTC P1443 VENT CONTROL SOLENOID VALVE FUNCTION PROBLEM, Diagnostic Trouble Code (DTC) Detecting Criteria.>

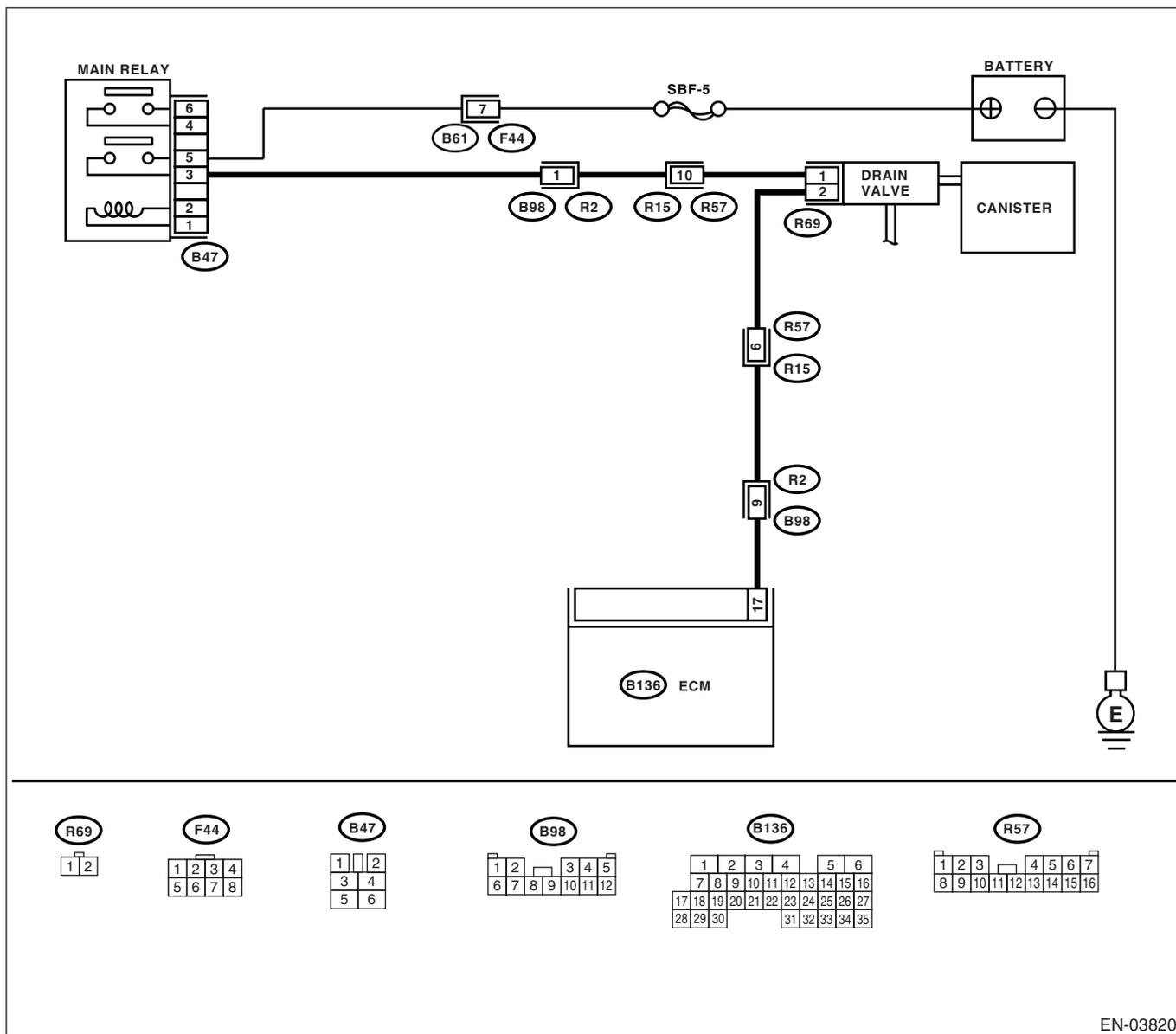
### TROUBLE SYMPTOM:

Improper fuel supply

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03820

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2 <b>CHECK DRAIN HOSE.</b> Check the drain hose for clogging.	Is there clogging in the drain hose?	Replace the drain hose.	Go to step 3.
3 <b>CHECK DRAIN VALVE OPERATION.</b> 1) Turn the ignition switch to OFF. 2) Connect the test mode connector at the lower portion of instrument panel (on the drivers side). 3) Turn the ignition switch to ON. 4) Operate the drain valve.  NOTE: Drain valve operation can also be executed using Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4DOTC)(diag)-47, Compulsory Valve Operation Check Mode.>	Does the drain valve operate?	Contact with SOA Service Center.  NOTE: The deterioration of multiple parts can be thought as the cause.	Replace the drain valve. <Ref. to EC(H4DOTC)-20, Drain Valve.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## CZ:DTC P1491 POSITIVE CRANKCASE VENTILATION (BLOW-BY) FUNCTION PROBLEM

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-217, DTC P1491 POSITIVE CRANKCASE VENTILATION (BLOW-BY) FUNCTION PROBLEM, Diagnostic Trouble Code (DTC) Detecting Criteria.>

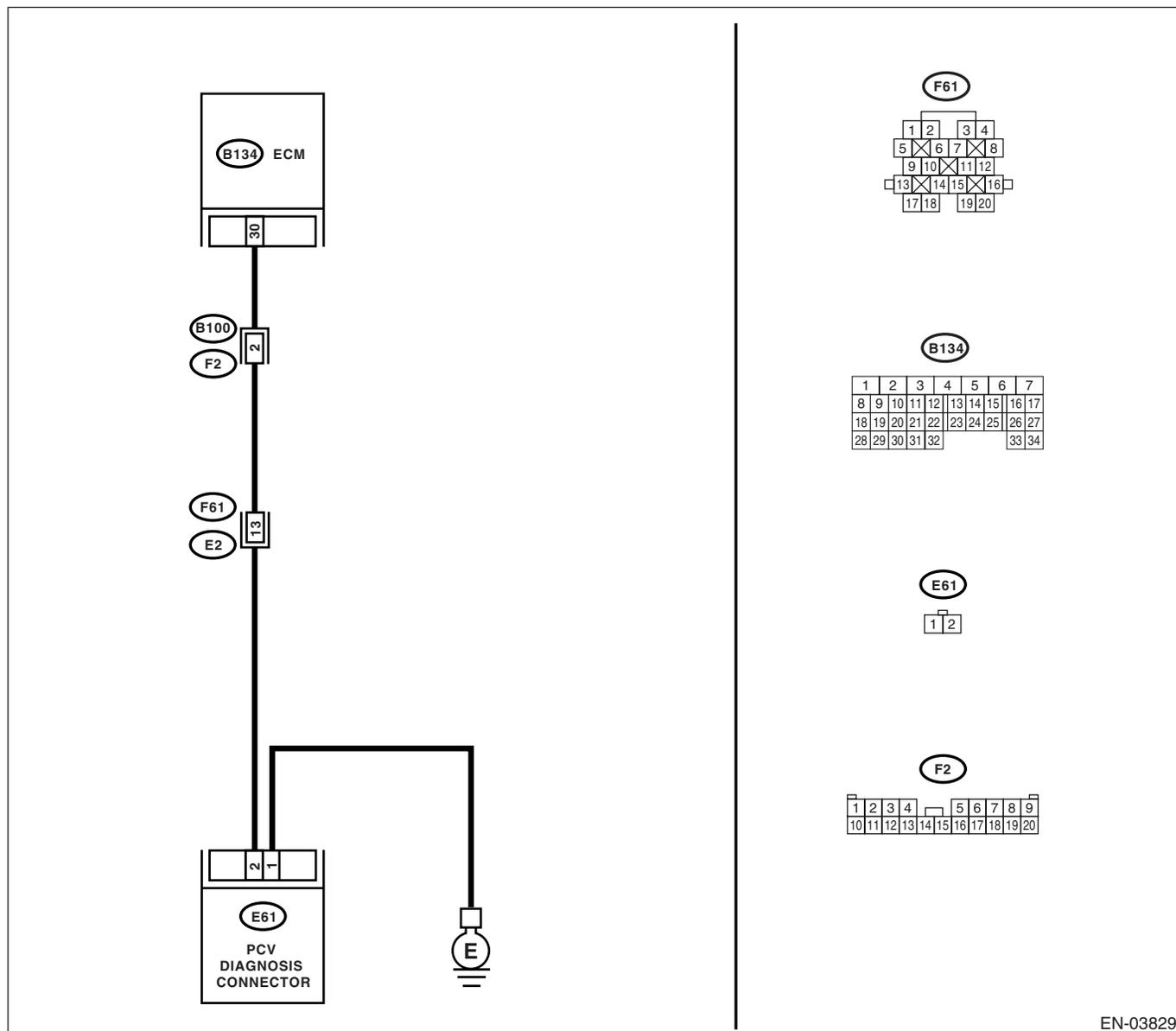
### TROUBLE SYMPTOM:

Improper idling

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03829

Step	Check	Yes	No
1	<b>CHECK BLOW-BY HOSE.</b> Check the condition of the blow-by hose.	Has the blow by hose been disconnected or cracked? Repair or replace the blow by hose.	Go to step 2.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>2</b> <b>CHECK HARNESS BETWEEN PCV DIAGNOSIS CONNECTOR AND ECM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the PCV diagnosis connector and ECM. 3) Measure the resistance of the harness between the PCV diagnosis connector and the ECM connector. <i>Connector &amp; terminal</i> <i>(B134) No. 30 — (E61) No. 2:</i>	Is the resistance less than 1 $\Omega$ ?	Go to step 3.	Repair the open circuit of the harness between the PCV diagnosis connector and ECM connector.
<b>3</b> <b>CHECK HARNESS BETWEEN PCV DIAGNOSIS CONNECTOR AND ECM CONNECTOR.</b> Measure the resistance of harness between PCV diagnosis connector and chassis ground. <i>Connector &amp; terminal</i> <i>(B134) No. 30 — Chassis ground:</i>	Is the resistance more than 1 M $\Omega$ ?	Go to step 4.	Repair the ground short of the harness between the PCV diagnosis connector and ECM connector.
<b>4</b> <b>CHECK PCV DIAGNOSIS CONNECTOR GROUND CIRCUIT.</b> Measure the resistance of harness between PCV diagnosis connector and engine ground. <i>Connector &amp; terminal</i> <i>(E61) No. 1 — Engine ground:</i>	Is the resistance less than 5 $\Omega$ ?	Go to step 5.	Repair the ground circuit of the PCV diagnosis connector.
<b>5</b> <b>CHECK PCV DIAGNOSIS CONNECTOR.</b> Measure the resistance between the PCV diagnosis connector terminals. <i>Terminals</i> <i>No. 1 — No. 2:</i>	Is the resistance less than 1 $\Omega$ ?	Repair poor contact of the ECM and PCV diagnosis connector.	Replace the PCV diagnosis connector.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## DA:DTC P1518 STARTER SWITCH CIRCUIT LOW INPUT

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-219, DTC P1518 STARTER SWITCH CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

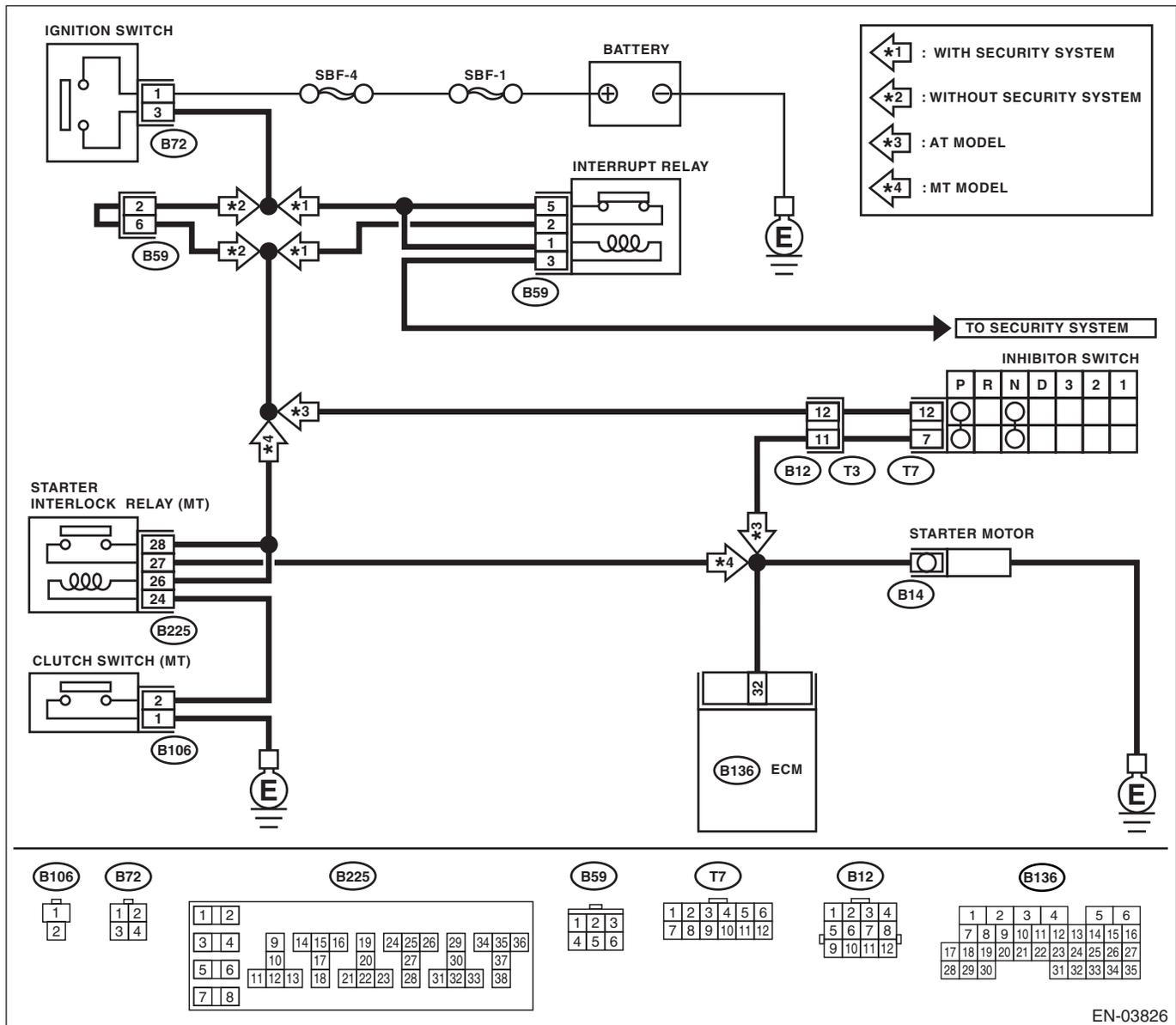
### TROUBLE SYMPTOM:

Failure of engine to start

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03826

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 <b>CHECK OPERATION OF STARTER MOTOR.</b>	Does the starter motor operate when ignition switch is turned to START?	Repair the harness and connector.  NOTE: In this case, repair the following item: <ul style="list-style-type: none"><li>• Open or ground short circuit of harness between ECM and starter motor connector</li><li>• Poor contact in ECM connector</li></ul>	Check the starter motor circuit. <Ref. to EN(H4DOTC)(diag)-54, STARTER MOTOR CIRCUIT, Diagnostics for Engine Starting Failure.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## DB:DTC P1560 BACK-UP VOLTAGE CIRCUIT MALFUNCTION

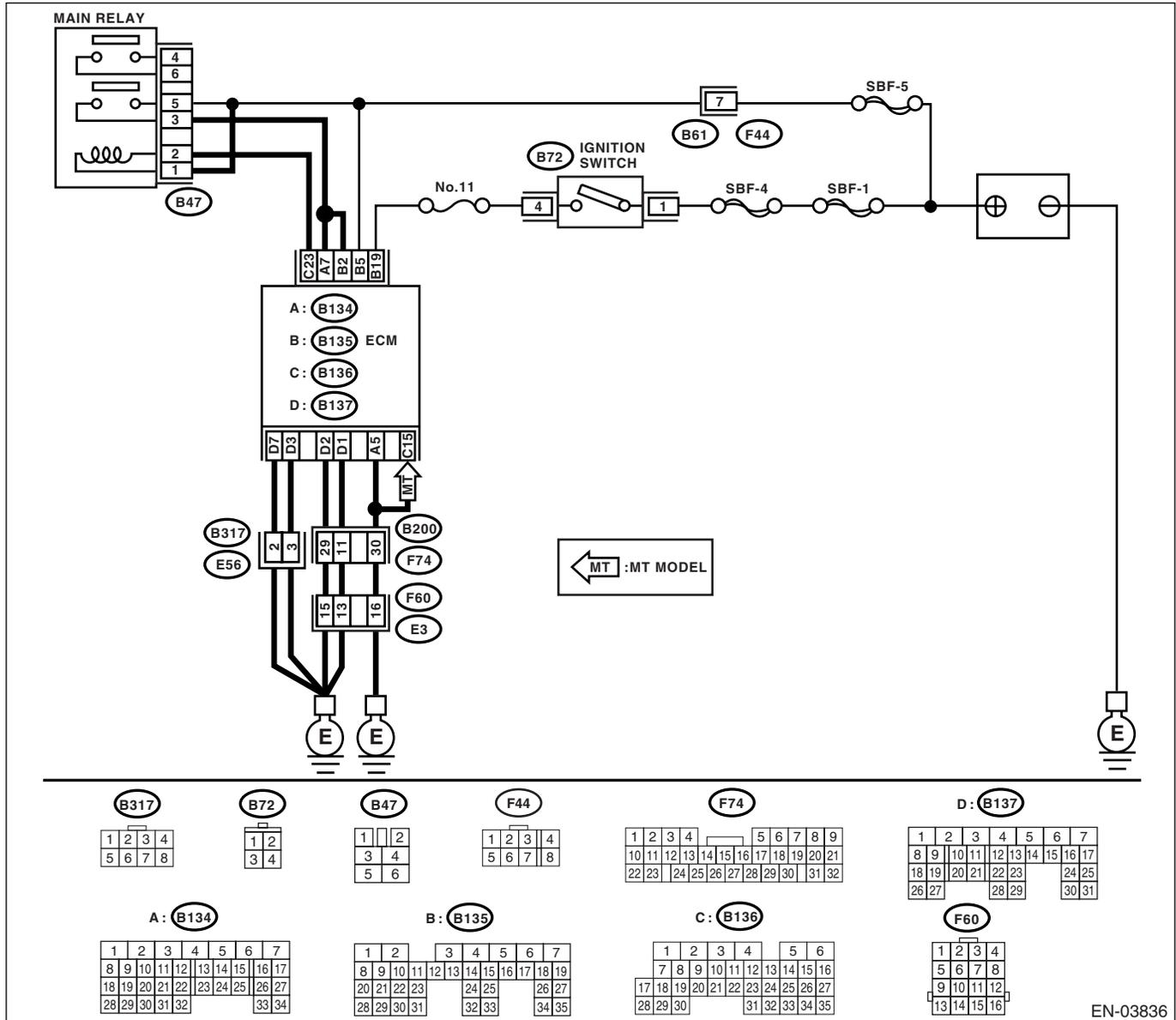
### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-220, DTC P1560 BACK-UP VOLTAGE CIRCUIT MALFUNCTION, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



Step	Check	Yes	No
1	<p><b>CHECK INPUT SIGNAL OF ECM.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Measure the voltage between ECM and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(B135) No. 5 (+) — Chassis ground (-):</b></p>	Is the voltage more than 10 V?  Repair poor contact in ECM connector.	Go to step 2.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>2 CHECK HARNESS BETWEEN ECM AND MAIN FUSE BOX CONNECTOR.</b> 1) Disconnect the connectors from ECM. 2) Measure the resistance of harness between ECM and chassis ground. <i>Connector &amp; terminal (B135) No. 5 — Chassis ground:</i>	Is the resistance less than 10 $\Omega$ ?	Repair the ground short circuit of harness between ECM connector and battery terminal.	Go to step 3.
<b>3 CHECK FUSE SBF-5.</b>	Is the fuse blown out?	Replace the fuse.	Repair the harness and connector. NOTE: In this case, repair the following item: <ul style="list-style-type: none"> <li>• Open circuit of harness between ECM and battery</li> <li>• Poor contact in ECM connector</li> <li>• Poor contact of battery terminal</li> </ul>

## DC:DTC P2004 INTAKE MANIFOLD RUNNER CONTROL STUCK OPEN (BANK 1)

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-222, DTC P2004 INTAKE MANIFOLD RUNNER CONTROL STUCK OPEN (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the **Clear Memory Mode** <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and **Inspection Mode** <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

Step	Check	Yes	No
<b>1 CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
<b>2 CHECK TUMBLE GENERATOR VALVE RH.</b> 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 matter is clogged)	Replace the tumble generator valve assembly. <Ref. to FU(H4DOTC)-37, Tumble Generator Valve Assembly.>	Clean the tumble generator valve.

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

### DD:DTC P2005 INTAKE MANIFOLD RUNNER CONTROL STUCK OPEN (BANK 2)

#### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-223, DTC P2005 INTAKE MANIFOLD RUNNER CONTROL STUCK OPEN (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### CAUTION:

**After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

Step	Check	Yes	No
1 <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2 <b>CHECK TUMBLE GENERATOR VALVE LH.</b> 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 matter is clogged)	Replace the tumble generator valve assembly. <Ref. to FU(H4DOTC)-37, Tumble Generator Valve Assembly.>	Clean the tumble generator valve.

### DE:DTC P2006 INTAKE MANIFOLD RUNNER CONTROL STUCK CLOSED (BANK 1)

#### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-224, DTC P2006 INTAKE MANIFOLD RUNNER CONTROL STUCK CLOSED (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### CAUTION:

**After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

Step	Check	Yes	No
1 <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2 <b>CHECK TUMBLE GENERATOR VALVE RH.</b> 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 matter is clogged)	Replace the tumble generator valve assembly. <Ref. to FU(H4DOTC)-37, Tumble Generator Valve Assembly.>	Clean the tumble generator valve.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## DF:DTC P2007 INTAKE MANIFOLD RUNNER CONTROL STUCK CLOSED (BANK 2)

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-225, DTC P2007 INTAKE MANIFOLD RUNNER CONTROL STUCK CLOSED (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the **Clear Memory Mode** <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and **Inspection Mode** <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

Step	Check	Yes	No
<b>1</b> <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
<b>2</b> <b>CHECK TUMBLE GENERATOR VALVE LH.</b> 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 matter is clogged)	Replace the tumble generator valve assembly. <Ref. to FU(H4DOTC)-37, Tumble Generator Valve Assembly.>	Clean the tumble generator valve.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## DG:DTC P2008 INTAKE MANIFOLD RUNNER CONTROL CIRCUIT / OPEN (BANK 1)

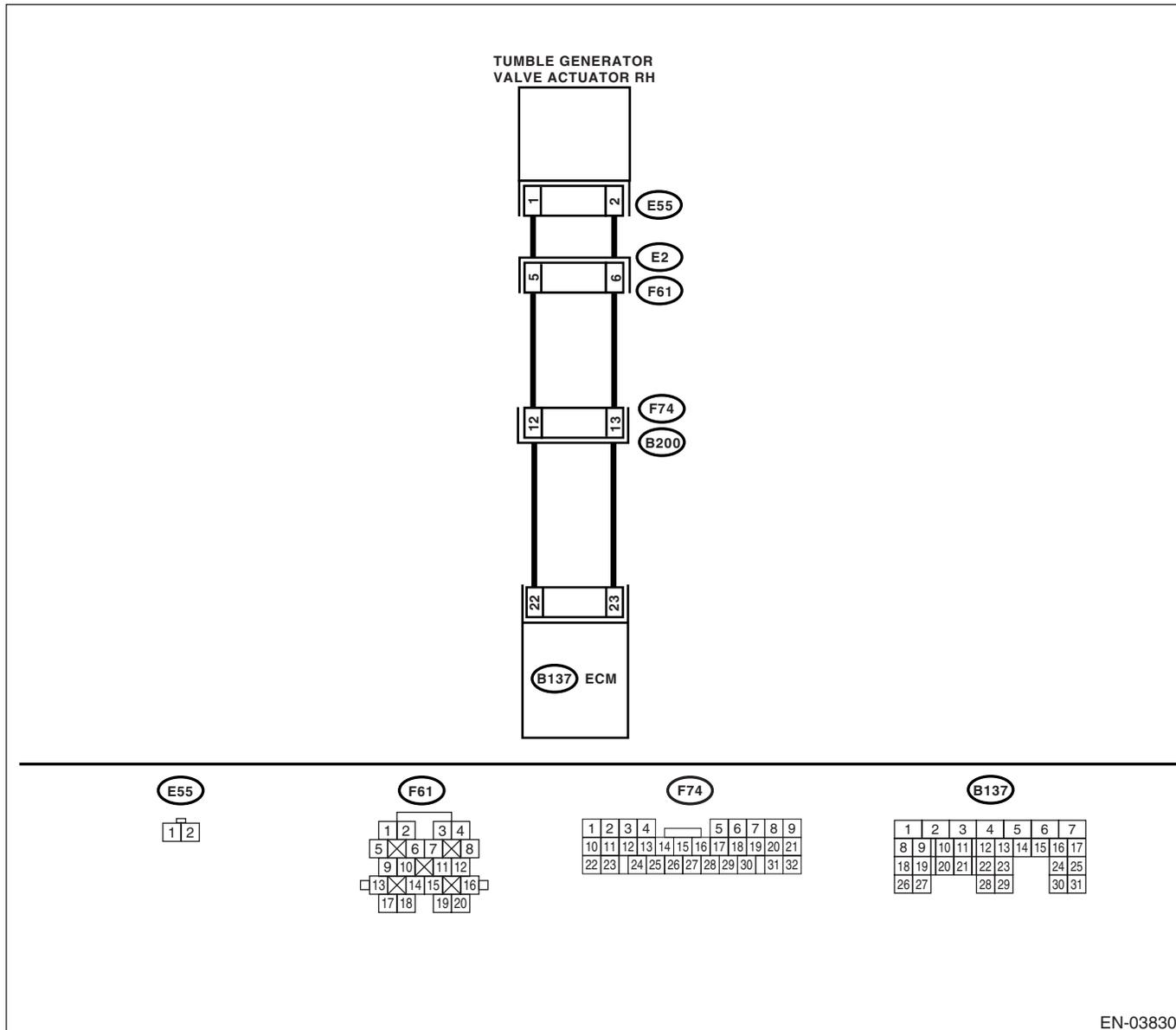
### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-226, DTC P2008 INTAKE MANIFOLD RUNNER CONTROL CIRCUIT / OPEN (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03830

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR CONNECTOR.</b></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><b>Connector &amp; terminal</b>                      (E55) No. 1 — (B137) No. 22:                      (E55) No. 2 — (B137) No. 23:</p>	<p>Is the resistance less than 1 <math>\Omega</math>?</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 item:</p> <ul style="list-style-type: none"> <li>• Open circuit of harness between ECM and tumble generator valve actuator connector</li> <li>• Poor contact of coupling connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK POOR CONTACT.</b>                      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 of tumble generator valve actuator connector.</p>	<p>Replace the tumble generator valve actuator. &lt;Ref. to FU(H4DOTC)-38, Tumble Generator Valve Actuator.&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## DH:DTC P2009 INTAKE MANIFOLD RUNNER CONTROL CIRCUIT LOW (BANK 1)

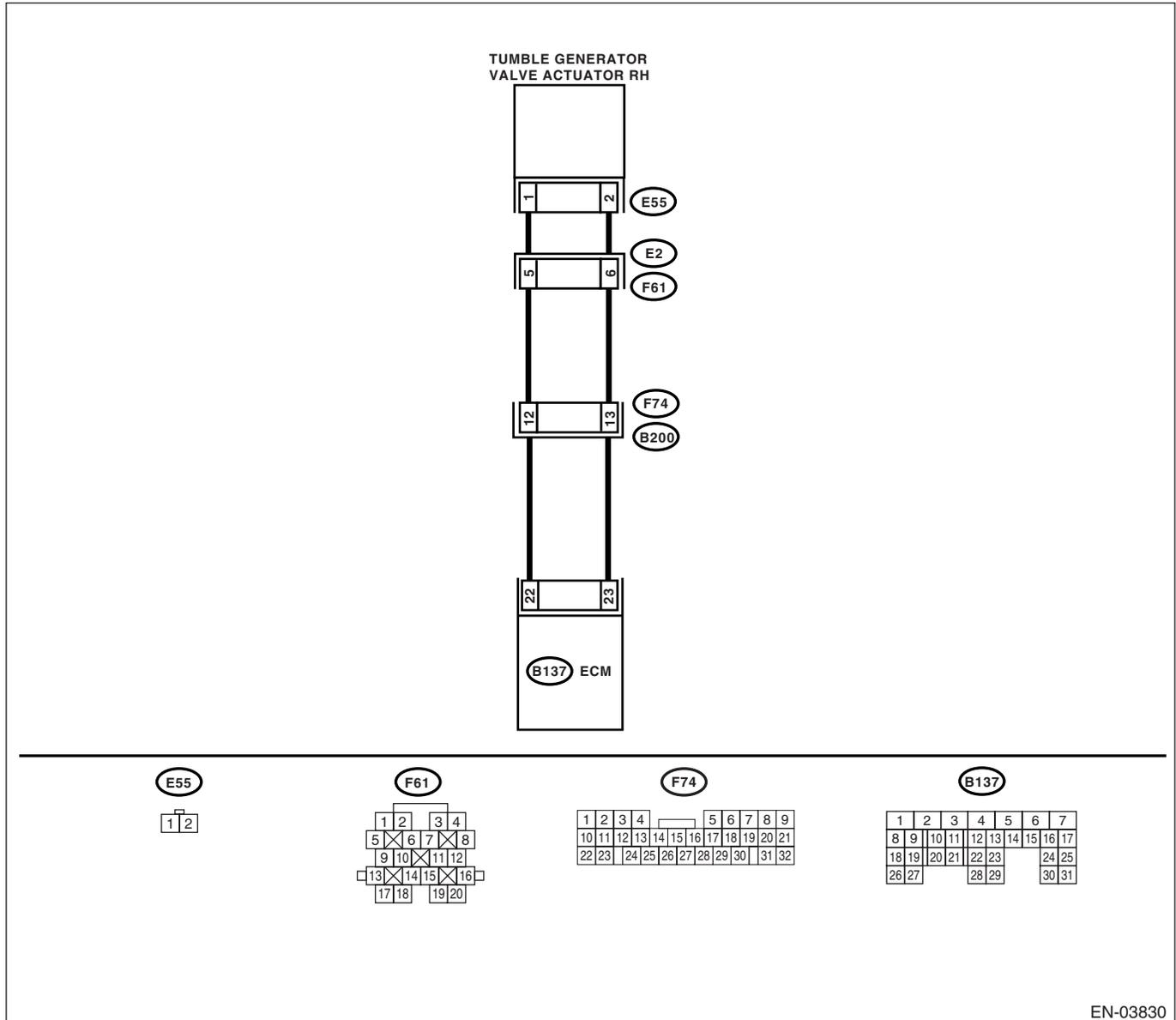
### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-228, DTC P2009 INTAKE MANIFOLD RUNNER CONTROL CIRCUIT LOW (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03830

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>1</p> <p><b>CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR CONNECTOR.</b></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><b>Connector &amp; terminal</b> <b>(E55) No. 1 (+) — Chassis ground (-):</b> <b>(E55) No. 2 (+) — Chassis ground (-):</b></p>	Is the voltage less than 5 V?	Replace the tumble generator valve actuator. <Ref. to FU(H4DOTC)-38, Tumble Generator Valve Actuator.>	Repair the battery short circuit between ECM and tumble generator valve actuator.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## DI: DTC P2011 INTAKE MANIFOLD RUNNER CONTROL CIRCUIT / OPEN (BANK 2)

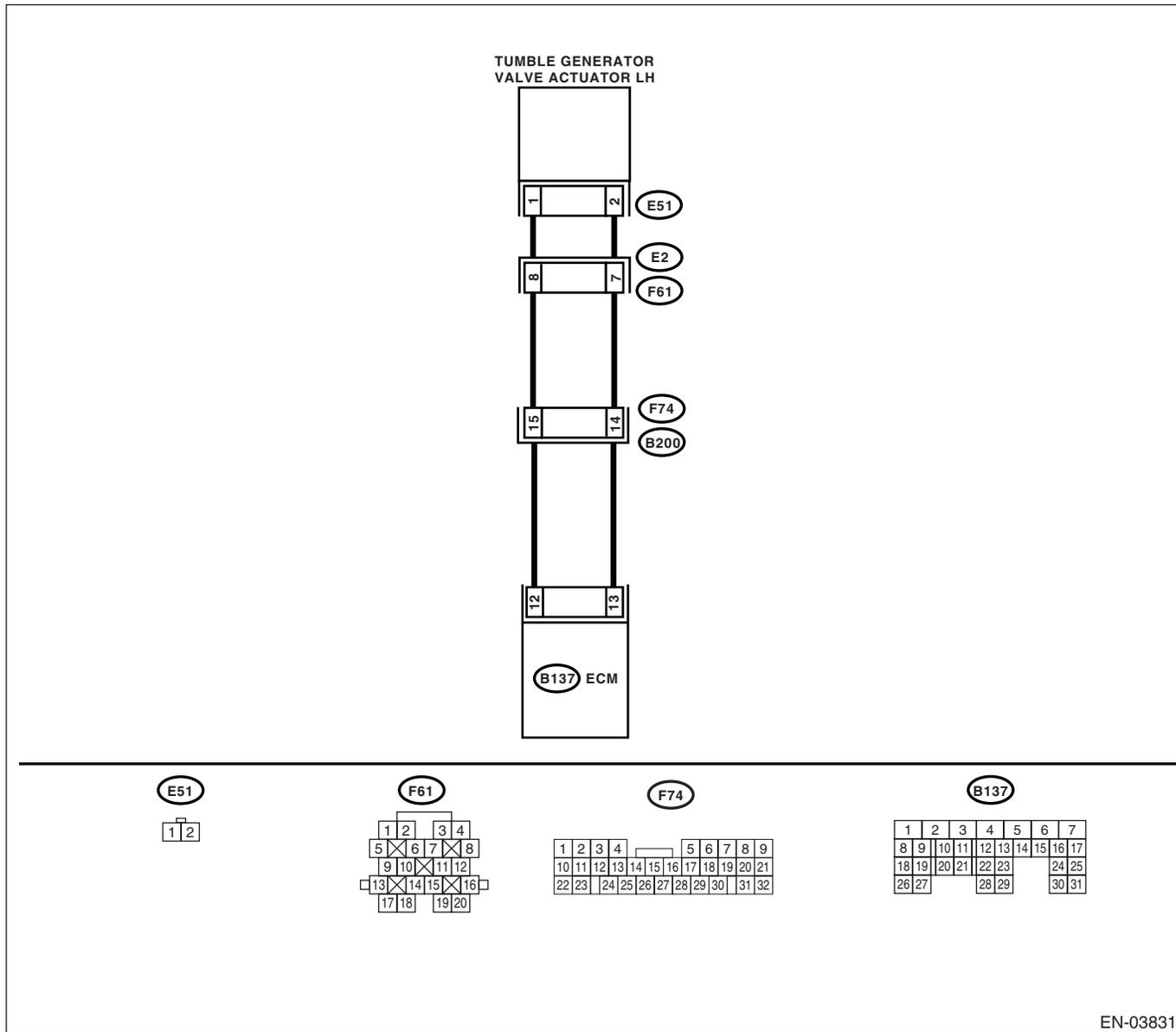
### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-230, DTC P2011 INTAKE MANIFOLD RUNNER CONTROL CIRCUIT / OPEN (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03831

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR CONNECTOR.</b></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><b>Connector &amp; terminal</b>                      (E51) No. 1 — (B137) No. 12:                      (E51) No. 2 — (B137) No. 13:</p>	<p>Is the resistance less than 1 <math>\Omega</math>?</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 item:</p> <ul style="list-style-type: none"> <li>• Open circuit of harness between ECM and tumble generator valve actuator connector</li> <li>• Poor contact of coupling connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK POOR CONTACT.</b>                      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 of tumble generator valve actuator connector.</p>	<p>Replace the tumble generator valve actuator. &lt;Ref. to FU(H4DOTC)-38, Tumble Generator Valve Actuator.&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## DJ:DTC P2012 INTAKE MANIFOLD RUNNER CONTROL CIRCUIT LOW (BANK 2)

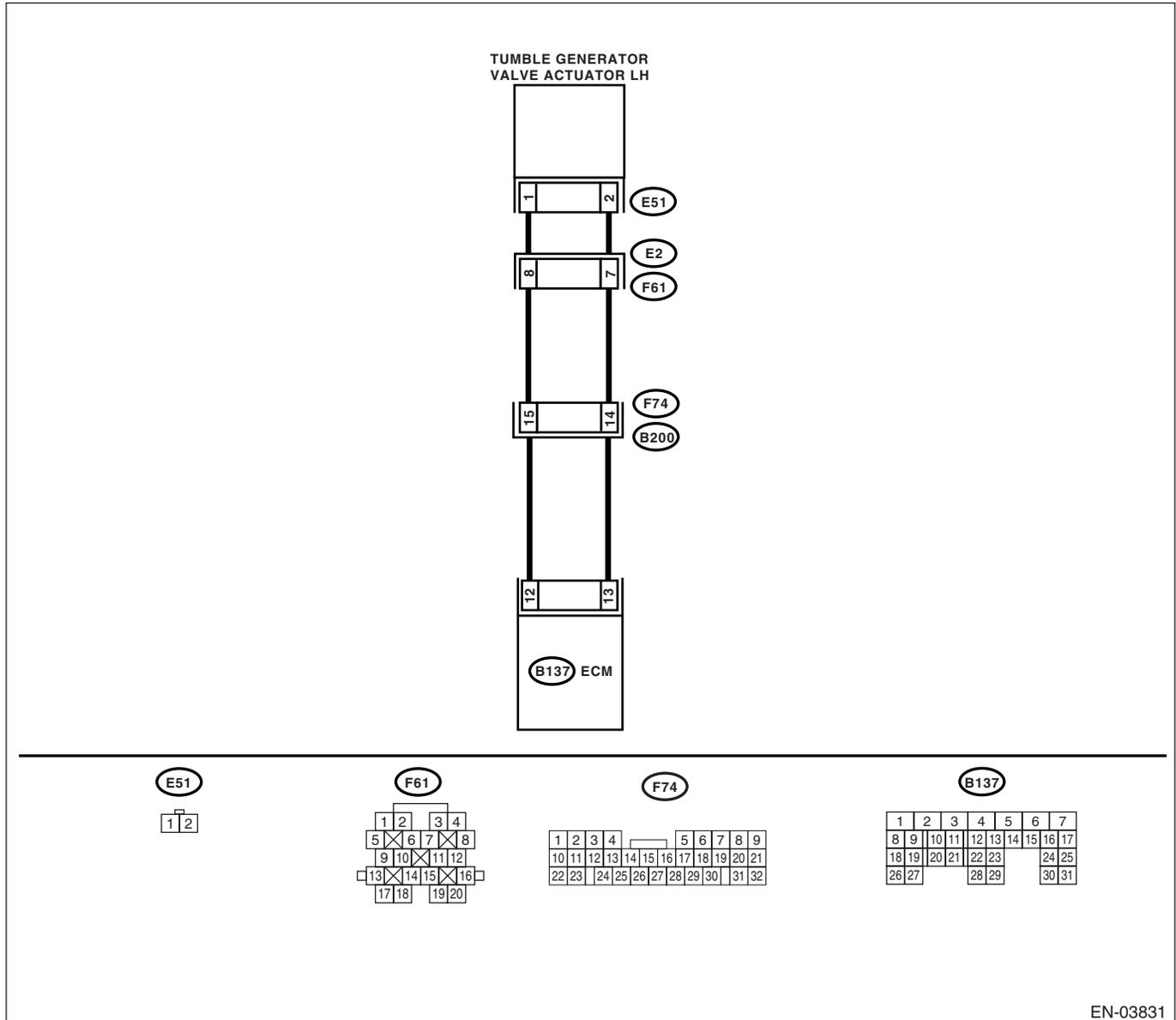
### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-232, DTC P2012 INTAKE MANIFOLD RUNNER CONTROL CIRCUIT LOW (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03831

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>1</p> <p><b>CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR CONNECTOR.</b></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><b>Connector &amp; terminal</b></p> <p><b>(E51) No. 1 (+) — Chassis ground (-):</b></p> <p><b>(E51) No. 2 (+) — Chassis ground (-):</b></p>	Is the voltage less than 5 V?	Replace the tumble generator valve actuator. <Ref. to FU(H4DOTC)-38, Tumble Generator Valve Actuator.>	Repair the battery short circuit between ECM and tumble generator valve actuator.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## DK:DTC P2016 INTAKE MANIFOLD RUNNER POSITION SENSOR / SWITCH CIRCUIT LOW (BANK 1)

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-234, DTC P2016 INTAKE MANIFOLD RUNNER POSITION SENSOR / SWITCH CIRCUIT LOW (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

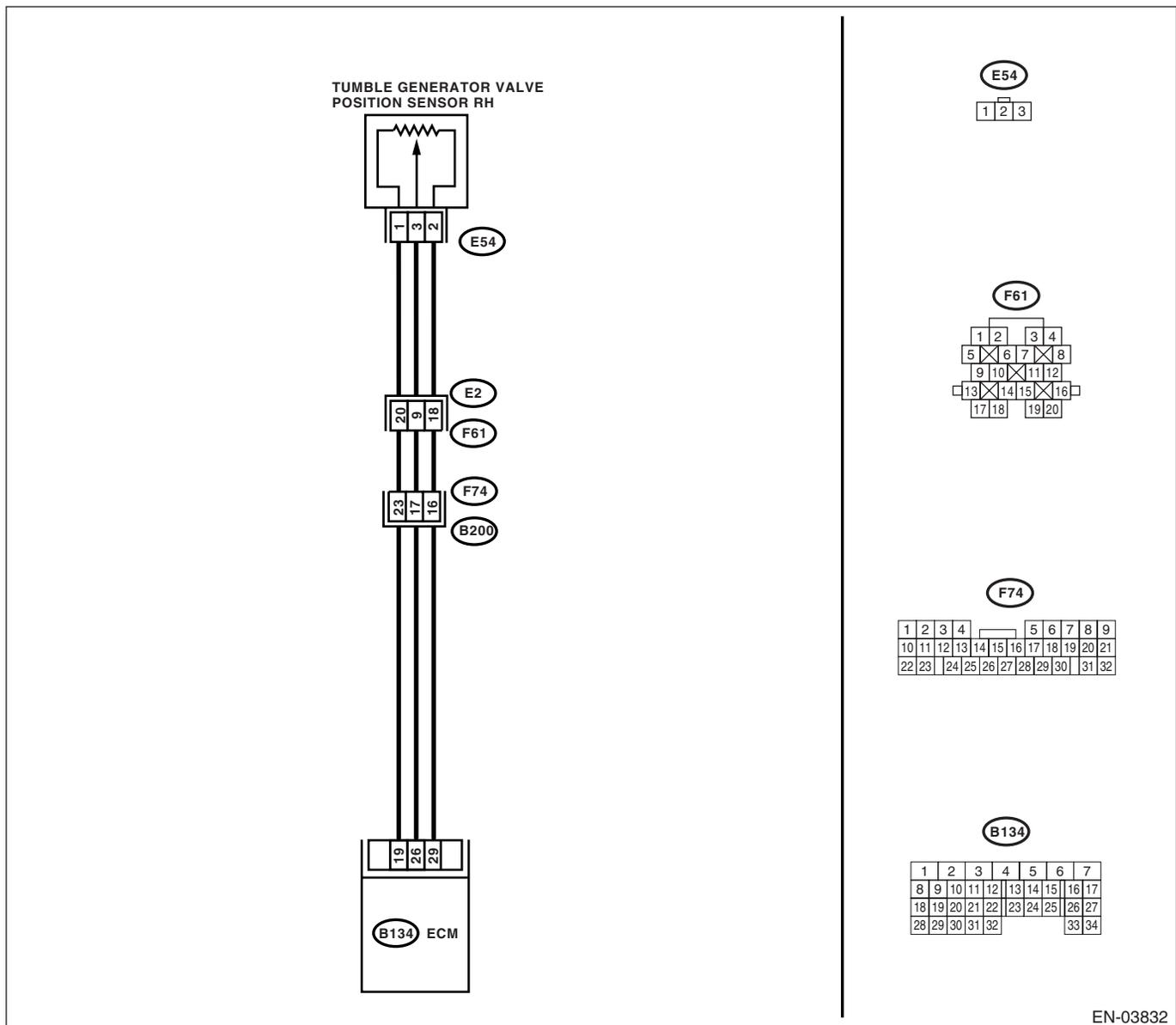
### TROUBLE SYMPTOM:

- Improper idling
- Engine stalls.
- Poor driving performance

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03832

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1</b>      <b>CHECK CURRENT DATA.</b>                      1) Start the engine.                      2) Read the data of tumble generator valve position sensor signal using Subaru Select Monitor or general scan tool.</p> <p>NOTE:                      • Subaru Select Monitor                      For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;                      • General scan tool                      For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the voltage less than 0.1 V?</p>	<p>Go to step 2.</p>	<p>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 may be the cause.</p> <p>NOTE:                      In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Poor contact of tumble generator valve position sensor connector</li> <li>• Poor contact in ECM connector</li> <li>• Poor contact of coupling connector</li> </ul>
<p><b>2</b>      <b>CHECK INPUT SIGNAL OF ECM.</b>                      Measure the voltage between ECM connector and chassis ground.  <b>Connector &amp; terminal</b>  <b>(B134) No. 19 (+) — Chassis ground (-):</b></p>	<p>Is the voltage more than 4.5 V?</p>	<p>Go to step 4.</p>	<p>Go to step 3.</p>
<p><b>3</b>      <b>CHECK INPUT SIGNAL OF ECM.</b>                      Measure the voltage between ECM connector and chassis ground.  <b>Connector &amp; terminal</b>  <b>(B134) No. 19 (+) — Chassis ground (-):</b></p>	<p>Does the voltage change when shaking the harness and connector of the ECM while monitoring the value with a voltage meter?</p>	<p>Repair poor contact in ECM connector.</p>	<p>Contact with SOA Service Center.</p> <p>NOTE:                      The deterioration of multiple parts can be thought as the cause.</p>
<p><b>4</b>      <b>CHECK INPUT SIGNAL OF ECM.</b>                      Measure the voltage between ECM connector and chassis ground.  <b>Connector &amp; terminal</b>  <b>(B134) No. 26 (+) — Chassis ground (-):</b></p>	<p>Is the voltage less than 0.1 V?</p>	<p>Go to step 6.</p>	<p>Go to step 5.</p>
<p><b>5</b>      <b>CHECK INPUT SIGNAL FOR ECM (USING SUBARU SELECT MONITOR).</b>                      Measure the voltage between ECM connector and chassis ground.</p>	<p>Does the voltage change by shaking the harness and connector of the ECM while monitoring the value with Subaru Select Monitor?</p>	<p>Repair poor contact in ECM connector.</p>	<p>Go to step 6.</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>6</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connectors from the 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><b>Connector &amp; terminal</b>  <b>(E54) No. 1 (+) — Engine ground (-):</b></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><b>NOTE:</b>                      In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Open circuit of harness between tumble generator valve position sensor and ECM connector</li> <li>• Poor contact of tumble generator valve position sensor connector</li> <li>• Poor contact in ECM connector</li> <li>• Poor contact of coupling connector</li> <li>• Poor contact of joint connector</li> </ul>
<p><b>7</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR.</b></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><b>Connector &amp; terminal</b>  <b>(B134) No. 26 — (E54) No. 3:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step 8.</p>	<p>Repair the harness and connector.</p> <p><b>NOTE:</b>                      In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Open circuit of harness between tumble generator valve position sensor and ECM connector</li> <li>• Poor contact in ECM connector</li> <li>• Poor contact of tumble generator valve position sensor connector</li> <li>• Poor contact of coupling connector</li> </ul>
<p><b>8</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR.</b></p> <p>Measure the resistance of the harness between the tumble generator valve position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b>  <b>(E54) No. 3 — Engine ground:</b></p>	<p>Is the resistance more than 1 <math>M\Omega</math>?</p>	<p>Go to step 9.</p>	<p>Repair the ground short circuit of the harness between the tumble generator valve position sensor and ECM connector.</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
9	<b>CHECK POOR CONTACT.</b> Check for poor contact in the tumble generator valve position sensor connector.	Is there poor contact in the tumble generator valve position sensor connector?	Repair poor contact of the tumble generator valve position sensor connector.	Replace the tumble generator valve position sensor. <Ref. to FU(H4DOTC)-39, Tumble Generator Valve Position Sensor.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## DL:DTC P2017 INTAKE MANIFOLD RUNNER POSITION SENSOR / SWITCH CIRCUIT HIGH (BANK 1)

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-236, DTC P2017 INTAKE MANIFOLD RUNNER POSITION SENSOR / SWITCH CIRCUIT HIGH (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

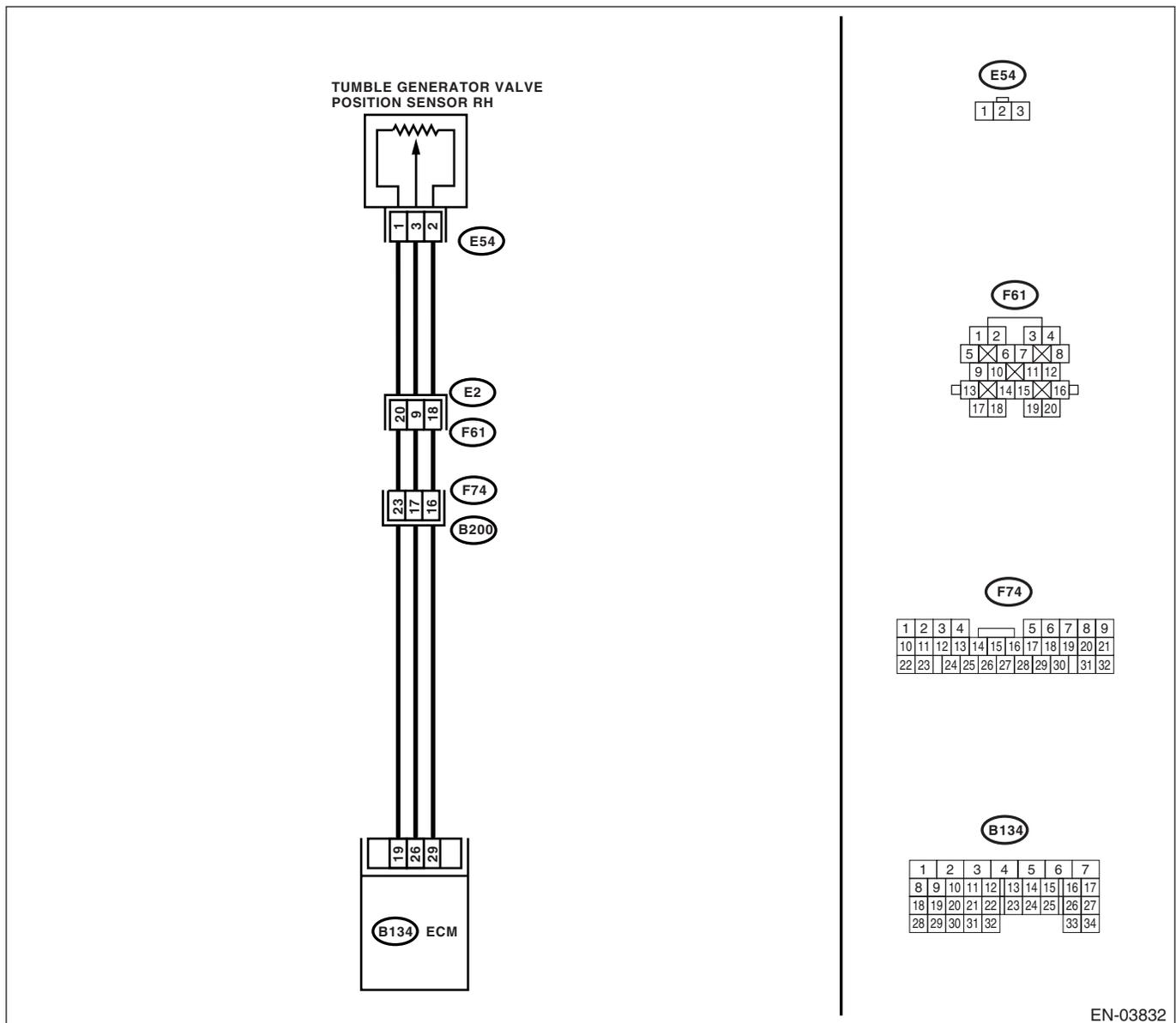
### TROUBLE SYMPTOM:

- Improper idling
- Engine stalls.
- Poor driving performance

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>

### WIRING DIAGRAM:



EN-03832

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK CURRENT DATA.</b></p> <p>1) Start the engine.</p> <p>2) Read the data of tumble generator valve position sensor signal using Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>Subaru Select Monitor</li> </ul> <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>General scan tool</li> </ul> <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the voltage more than 4.9 V?</p>	<p>Go to step 2.</p>	<p>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 may be the cause.</p> <p>NOTE:</p> <p>In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>Poor contact of tumble generator valve position sensor connector</li> <li>Poor contact in ECM connector</li> <li>Poor contact of coupling connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connectors from the tumble generator valve position sensor.</p> <p>3) Measure the resistance of the harness between the tumble generator valve position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E54) No. 2 — Engine ground:</b></p>	<p>Is the resistance less than 5 <math>\Omega</math>?</p>	<p>Go to step 3.</p>	<p>Repair the harness and connector.</p> <p>NOTE:</p> <p>In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>Open circuit of harness between tumble generator valve position sensor and ECM connector</li> <li>Poor contact of coupling connector</li> <li>Poor contact of joint connector</li> </ul>
<p><b>3</b></p> <p><b>CHECK HARNESS BETWEEN TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to ON.</p> <p>2) Measure the voltage between tumble generator valve position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E54) No. 3 (+) — Engine ground (-):</b></p>	<p>Is the voltage more than 4.9 V?</p>	<p>Repair the battery short circuit of harness between tumble generator valve position sensor and ECM connector. After repair, replace the ECM. &lt;Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).&gt;</p>	<p>Replace the tumble generator valve position sensor. &lt;Ref. to FU(H4DOTC)-39, Tumble Generator Valve Position Sensor.&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## DM:DTC P2021 INTAKE MANIFOLD RUNNER POSITION SENSOR / SWITCH CIRCUIT LOW (BANK 2)

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-238, DTC P2021 INTAKE MANIFOLD RUNNER POSITION SENSOR / SWITCH CIRCUIT LOW (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

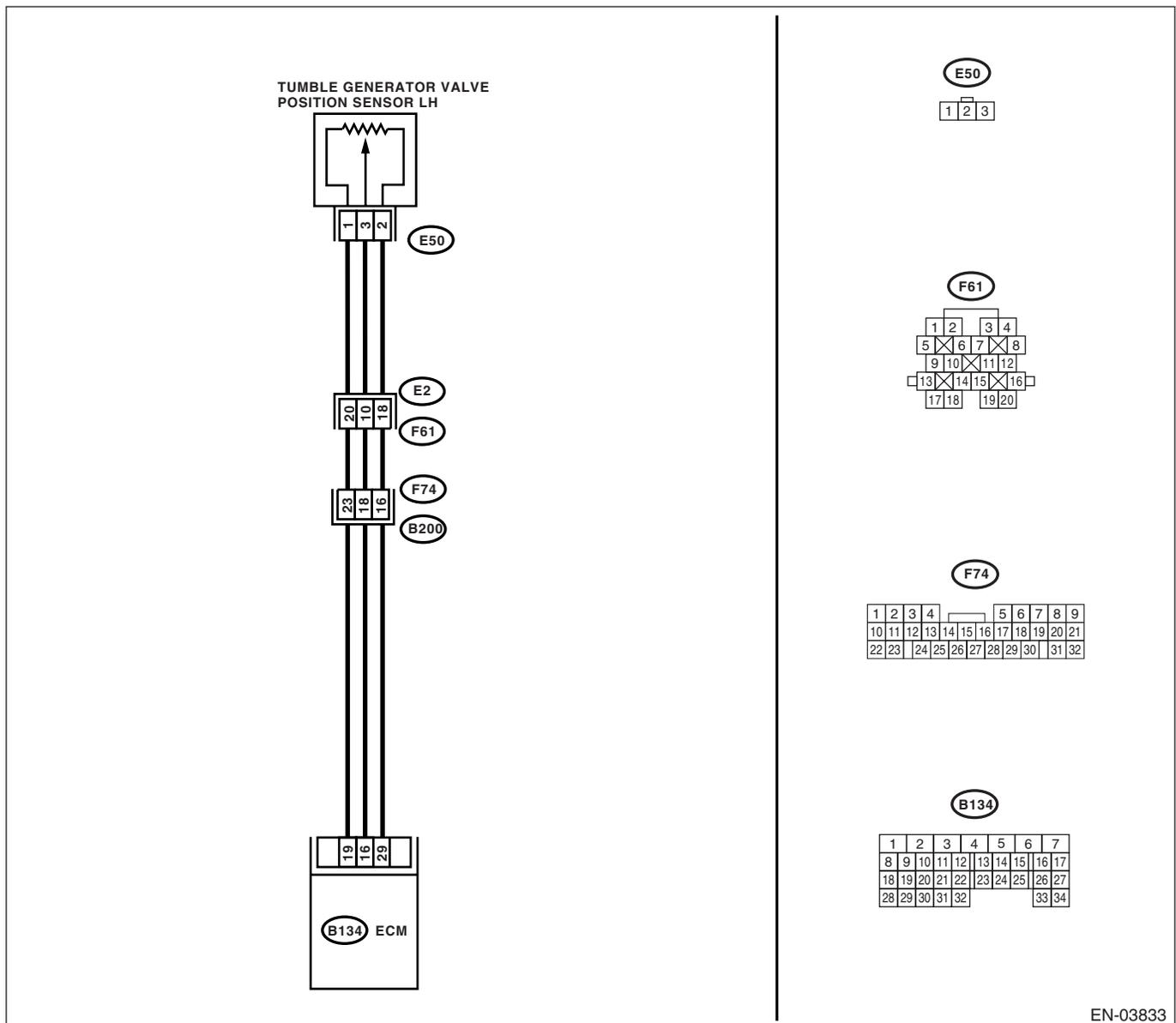
### TROUBLE SYMPTOM:

- Improper idling
- Engine stalls.
- Poor driving performance

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03833

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1</b> <b>CHECK CURRENT DATA.</b> 1) Start the engine. 2) Read the data of tumble generator valve position sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.	Is the voltage less than 0.1 V?	Go to step 2.	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 may be the cause. NOTE: In this case, repair the following item: • Poor contact of tumble generator valve position sensor connector • Poor contact in ECM connector • Poor contact of coupling connector
<b>2</b> <b>CHECK INPUT SIGNAL OF ECM.</b> Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B134) No. 19 (+) — Chassis ground (-):</b>	Is the voltage more than 4.5 V?	Go to step 4.	Go to step 3.
<b>3</b> <b>CHECK INPUT SIGNAL OF ECM.</b> Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B134) No. 19 (+) — Chassis ground (-):</b>	Does the voltage change when shaking the harness and connector of the ECM while monitoring the value with a voltage meter?	Repair poor contact in ECM connector.	Contact with SOA Service Center. NOTE: The deterioration of multiple parts can be thought as the cause.
<b>4</b> <b>CHECK INPUT SIGNAL OF ECM.</b> Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B134) No. 16 (+) — Chassis ground (-):</b>	Is the voltage less than 0.1 V?	Go to step 6.	Go to step 5.
<b>5</b> <b>CHECK INPUT SIGNAL FOR ECM (USING SUBARU SELECT MONITOR).</b> Measure the voltage between ECM connector and chassis ground.	Does the voltage change by shaking the harness and connector of ECM while monitoring the value with Subaru Select Monitor?	Repair poor contact in ECM connector.	Go to step 6.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>6</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connector from tumble generator valve position sensor.                      3) Turn the ignition switch to ON.                      4) Measure the voltage between the tumble generator valve position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b>  <b>(E50) No. 1 (+) — Engine ground (-):</b></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><b>NOTE:</b>                      In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Open circuit of harness between tumble generator valve position sensor and ECM connector</li> <li>• Poor contact of tumble generator valve position sensor connector</li> <li>• Poor contact in ECM connector</li> <li>• Poor contact of coupling connector</li> <li>• Poor contact of joint connector</li> </ul>
<p><b>7</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR.</b></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><b>Connector &amp; terminal</b>  <b>(B134) No. 16 — (E50) No. 3:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step 8.</p>	<p>Repair the harness and connector.</p> <p><b>NOTE:</b>                      In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Open circuit of harness between tumble generator valve position sensor and ECM connector</li> <li>• Poor contact in ECM connector</li> <li>• Poor contact of tumble generator valve position sensor connector</li> <li>• Poor contact of coupling connector</li> </ul>
<p><b>8</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR.</b></p> <p>Measure the resistance of the harness between the tumble generator valve position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b>  <b>(E50) No. 3 — Engine ground:</b></p>	<p>Is the resistance more than 1 M<math>\Omega</math>?</p>	<p>Go to step 9.</p>	<p>Repair the ground short circuit of the harness between the tumble generator valve position sensor and ECM connector.</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
9	<b>CHECK POOR CONTACT.</b> Check for poor contact in the tumble generator valve position sensor connector.	Is there poor contact in the tumble generator valve position sensor connector?	Repair poor contact of the tumble generator valve position sensor connector.	Replace the tumble generator valve position sensor. <Ref. to FU(H4DOTC)-39, Tumble Generator Valve Position Sensor.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## DN:DTC P2022 INTAKE MANIFOLD RUNNER POSITION SENSOR / SWITCH CIRCUIT HIGH (BANK 2)

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-240, DTC P2022 INTAKE MANIFOLD RUNNER POSITION SENSOR / SWITCH CIRCUIT HIGH (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

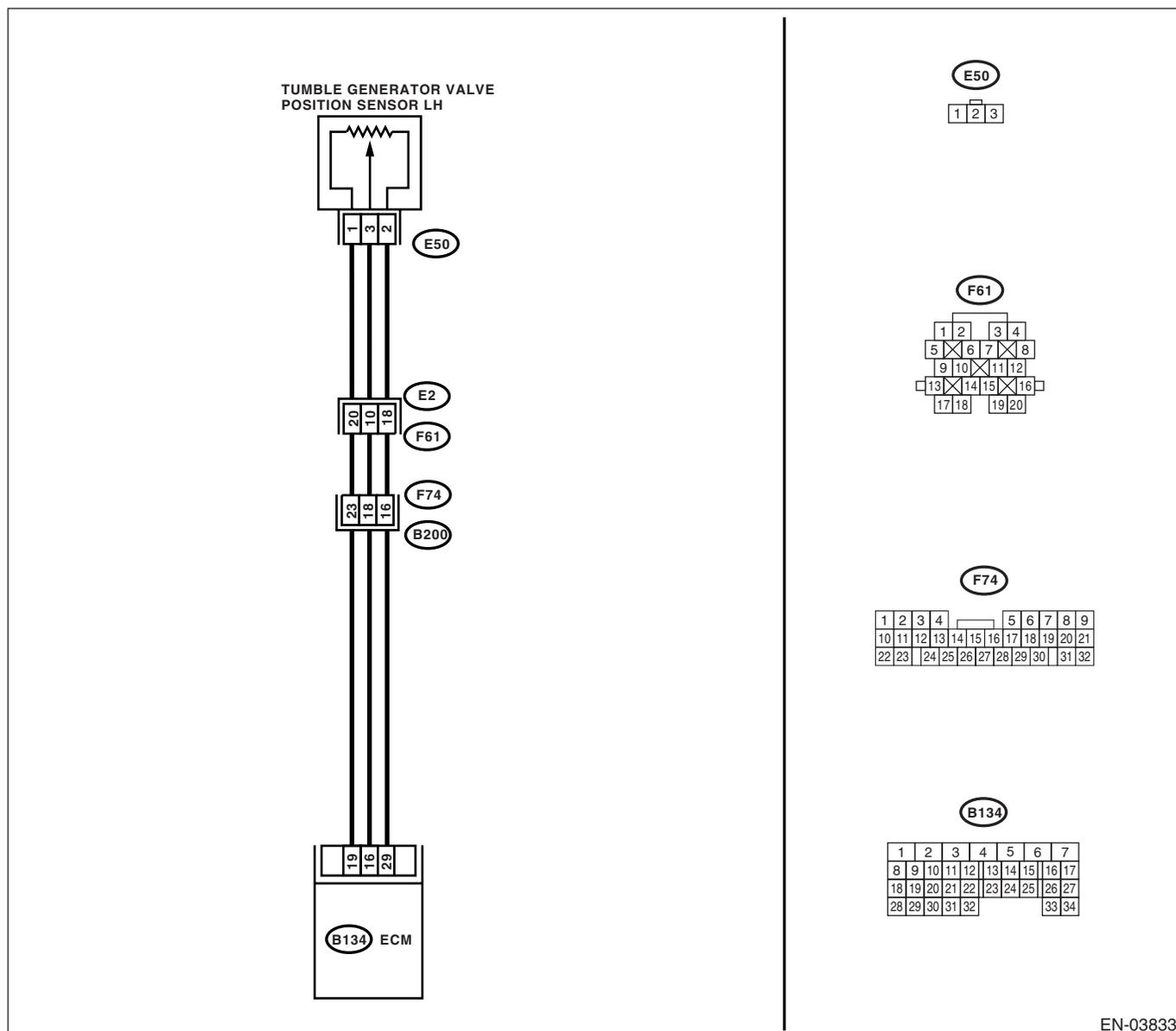
### TROUBLE SYMPTOM:

- Improper idling
- Engine stalls.
- Poor driving performance

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03833

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK CURRENT DATA.</b></p> <p>1) Start the engine.</p> <p>2) Read the data of tumble generator valve position sensor signal using Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• General scan tool</li> </ul> <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the voltage more than 4.9 V?</p>	<p>Go to step 2.</p>	<p>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 may be the cause.</p> <p>NOTE:</p> <p>In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Poor contact of tumble generator valve position sensor connector</li> <li>• Poor contact in ECM connector</li> <li>• Poor contact of coupling connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connectors from the tumble generator valve position sensor.</p> <p>3) Measure the resistance of harness between tumble generator valve position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E50) No. 2 — Engine ground:</b></p>	<p>Is the resistance less than 5 <math>\Omega</math>?</p>	<p>Go to step 3.</p>	<p>Repair the harness and connector.</p> <p>NOTE:</p> <p>In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Open circuit of harness between tumble generator valve position sensor and ECM connector</li> <li>• Poor contact of coupling connector</li> <li>• Poor contact of joint connector</li> </ul>
<p><b>3</b></p> <p><b>CHECK HARNESS BETWEEN TUMBLE GENERATOR VALVE POSITION SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to ON.</p> <p>2) Measure the voltage between tumble generator valve position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E50) No. 3 (+) — Engine ground (-):</b></p>	<p>Is the voltage more than 4.9 V?</p>	<p>Repair the battery short circuit of harness between tumble generator valve position sensor and ECM connector. After repair, replace the ECM. &lt;Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).&gt;</p>	<p>Replace the tumble generator valve position sensor. &lt;Ref. to FU(H4DOTC)-39, Tumble Generator Valve Position Sensor.&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## DO:DTC P2088 OCV SOLENOID VALVE SIGNAL A CIRCUIT OPEN (BANK 1)

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-242, DTC P2088 OCV SOLENOID VALVE SIGNAL A CIRCUIT OPEN (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

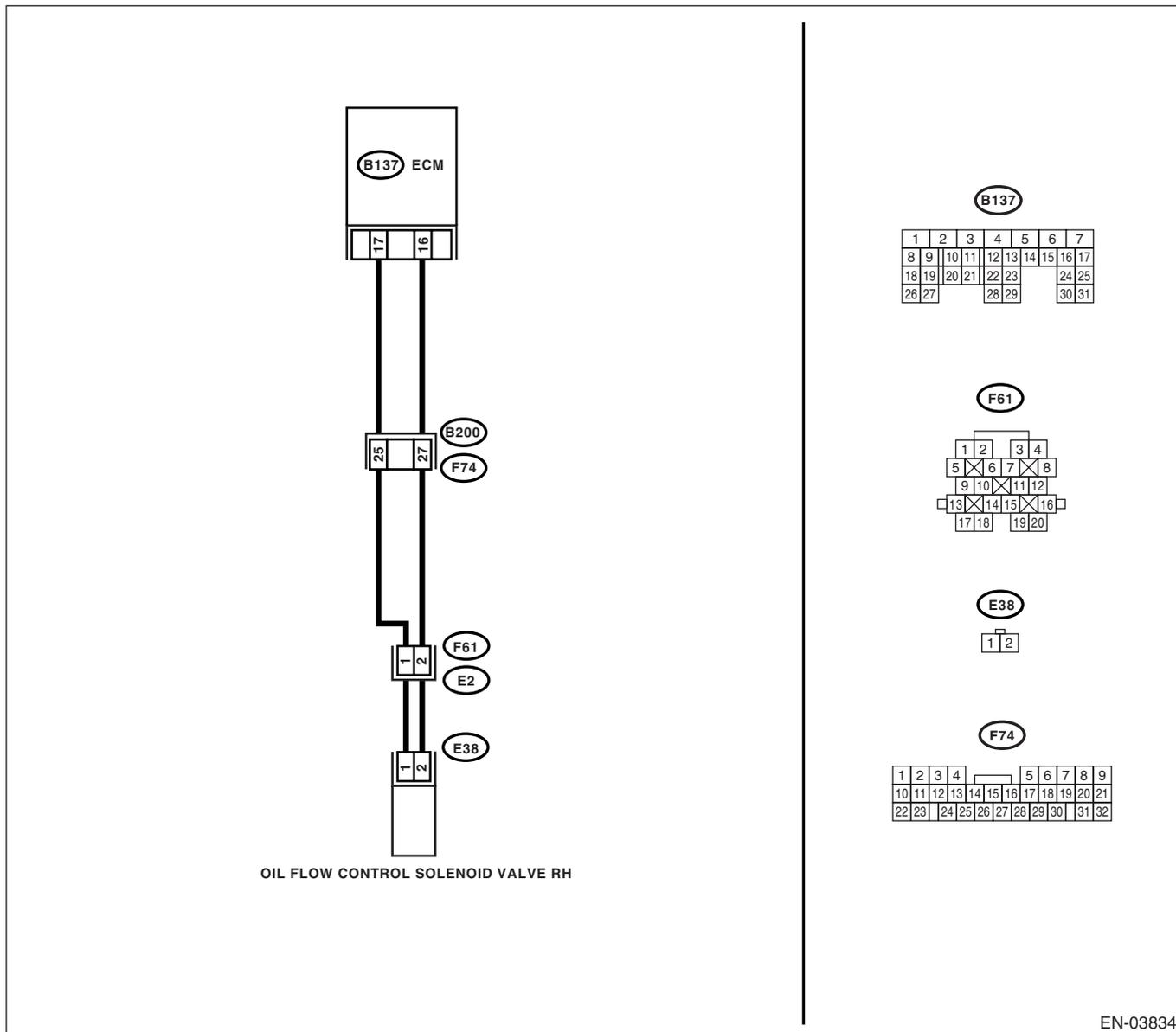
### TROUBLE SYMPTOM:

Improper idling

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connectors from ECM and oil flow control solenoid valve.</p> <p>3) Measure the resistance between ECM and oil flow control solenoid valve.</p> <p><b>Connector &amp; terminal</b>  <b>(B137) No. 17 — (E38) No. 1:</b>  <b>(B137) No. 16 — (E38) No. 2:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step 2.</p>	<p>Repair the open circuit of harness between ECM and oil flow control solenoid valve connector.</p> <p><b>NOTE:</b>            In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Open circuit of harness between ECM and oil flow control solenoid valve connector</li> <li>• Poor contact of the coupling connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.</b></p> <p>Measure the resistance between ECM and oil flow control solenoid valve.</p> <p><b>Connector &amp; terminal</b>  <b>(E38) No. 1 — Engine ground:</b>  <b>(E38) No. 2 — Engine ground:</b></p>	<p>Is the resistance more than 1 <math>M\Omega</math>?</p>	<p>Go to step 3.</p>	<p>Repair the short circuit between ECM and oil flow control solenoid valve connector.</p>
<p><b>3</b></p> <p><b>CHECK OIL FLOW CONTROL SOLENOID VALVE.</b></p> <p>1) Remove the oil flow control solenoid valve connector.</p> <p>2) Measure the resistance between oil flow control solenoid valve terminals.</p> <p><b>Terminals</b>  <b>No. 1 — No. 2:</b></p>	<p>Is the resistance between 6 and 12 <math>\Omega</math>?</p>	<p>Repair the poor contact of ECM and oil flow control solenoid valve.</p>	<p>Replace the oil flow control solenoid valve. &lt;Ref. to ME(H4DOTC)-52, Camshaft.&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## DP:DTC P2089 OCV SOLENOID VALVE SIGNAL A CIRCUIT SHORT (BANK 1)

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-244, DTC P2089 OCV SOLENOID VALVE SIGNAL A CIRCUIT SHORT (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

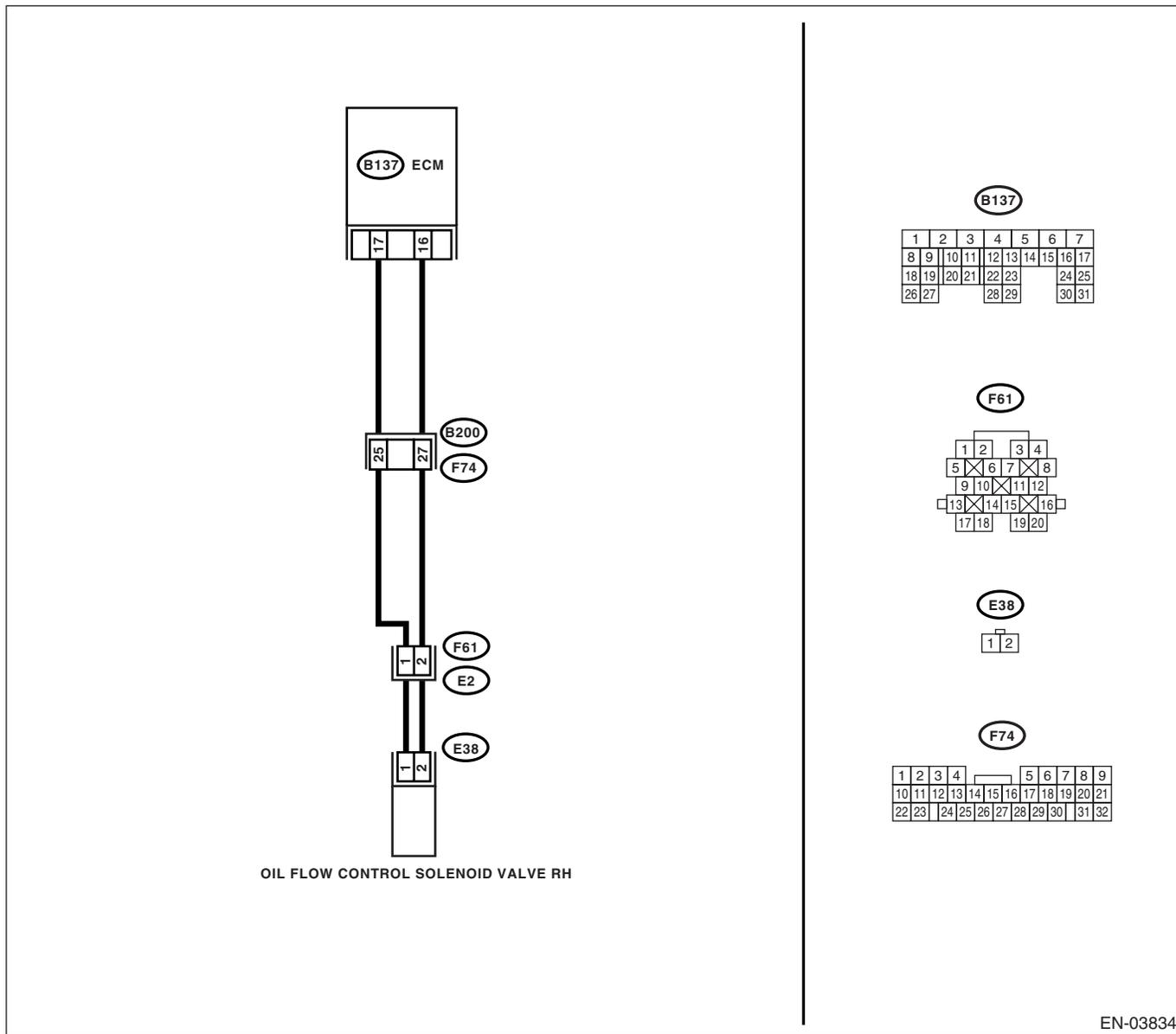
### TROUBLE SYMPTOM:

Improper idling

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connectors from ECM and oil flow control solenoid valve.                      3) Measure the resistance between ECM and oil flow control solenoid valve.</p> <p><b>Connector &amp; terminal</b>                      (B137) No. 17 — (E38) No. 1:                      (B137) No. 16 — (E38) No. 2:</p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step 2.</p>	<p>Repair the open circuit of harness between ECM and oil flow control solenoid valve connector.</p> <p>NOTE:                      In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Open circuit of harness between ECM and oil flow control solenoid valve connector</li> <li>• Poor contact of the coupling connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connectors from ECM and oil flow control solenoid valve.                      3) Measure the resistance between ECM and oil flow control solenoid valve.</p> <p><b>Connector &amp; terminal</b>                      (E38) No. 1 — Engine ground:                      (E38) No. 2 — Engine ground:</p>	<p>Is the resistance more than 1 <math>M\Omega</math>?</p>	<p>Go to step 3.</p>	<p>Repair the short circuit between ECM and oil flow control solenoid valve connector.</p>
<p><b>3</b></p> <p><b>CHECK OIL FLOW CONTROL SOLENOID VALVE.</b></p> <p>1) Remove the oil flow control solenoid valve connector.                      2) Measure the resistance between oil flow control solenoid valve terminals.</p> <p><b>Terminals</b>                      No. 1 — No. 2:</p>	<p>Is the resistance between 6 and 12 <math>\Omega</math>?</p>	<p>Repair the poor contact of ECM and oil flow control solenoid valve.</p>	<p>Replace the oil flow control solenoid valve. &lt;Ref. to ME(H4DOTC)-52, Camshaft.&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## DQ:DTC P2092 OCV SOLENOID VALVE SIGNAL A CIRCUIT OPEN (BANK 2)

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-246, DTC P2092 OCV SOLENOID VALVE SIGNAL A CIRCUIT OPEN (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

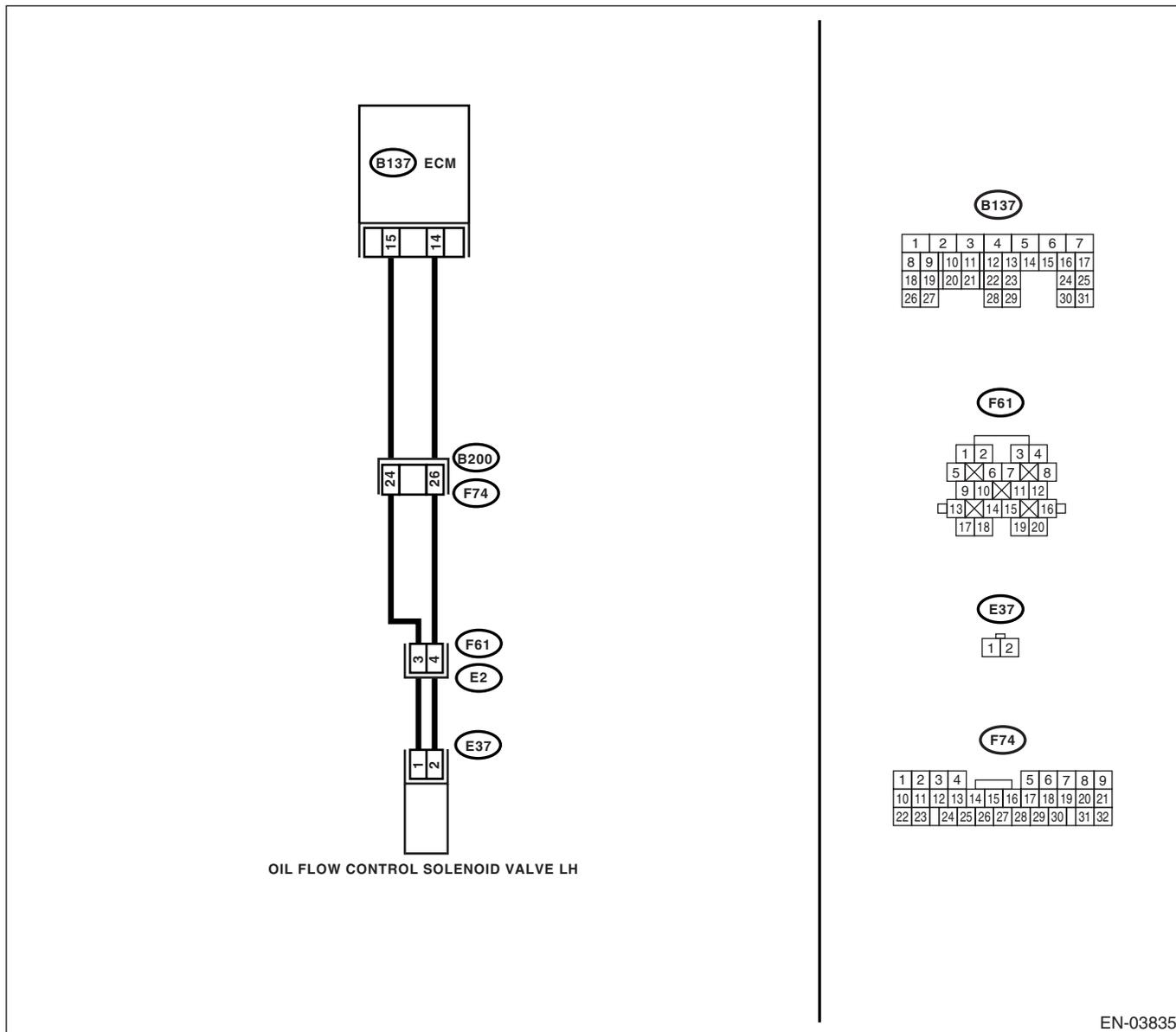
### TROUBLE SYMPTOM:

Improper idling

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03835

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connectors from ECM and oil flow control solenoid valve.</p> <p>3) Measure the resistance between ECM and oil flow control solenoid valve.</p> <p><b>Connector &amp; terminal</b>  <b>(B137) No. 15 — (E37) No. 1:</b>  <b>(B137) No. 14 — (E37) No. 2:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step 2.</p>	<p>Repair the open circuit of harness between ECM and oil flow control solenoid valve connector.</p> <p><b>NOTE:</b>            In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Open circuit of harness between ECM and oil flow control solenoid valve connector</li> <li>• Poor contact of the coupling connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.</b></p> <p>Measure the resistance between ECM and oil flow control solenoid valve.</p> <p><b>Connector &amp; terminal</b>  <b>(E37) No. 1 — Engine ground:</b>  <b>(E37) No. 2 — Engine ground:</b></p>	<p>Is the resistance more than 1 <math>M\Omega</math>?</p>	<p>Go to step 3.</p>	<p>Repair the short circuit between ECM and oil flow control solenoid valve connector.</p>
<p><b>3</b></p> <p><b>CHECK OIL FLOW CONTROL SOLENOID VALVE.</b></p> <p>1) Remove the oil flow control solenoid valve connector.</p> <p>2) Measure the resistance between oil flow control solenoid valve terminals.</p> <p><b>Terminals</b>  <b>No. 1 — No. 2:</b></p>	<p>Is the resistance between 6 and 12 <math>\Omega</math>?</p>	<p>Repair the poor contact of ECM and oil flow control solenoid valve.</p>	<p>Replace the oil flow control solenoid valve. &lt;Ref. to ME(H4DOTC)-52, Camshaft.&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## DR:DTC P2093 INTAKE CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT HIGH (BANK 2)

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-248, DTC P2093 INTAKE CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT HIGH (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

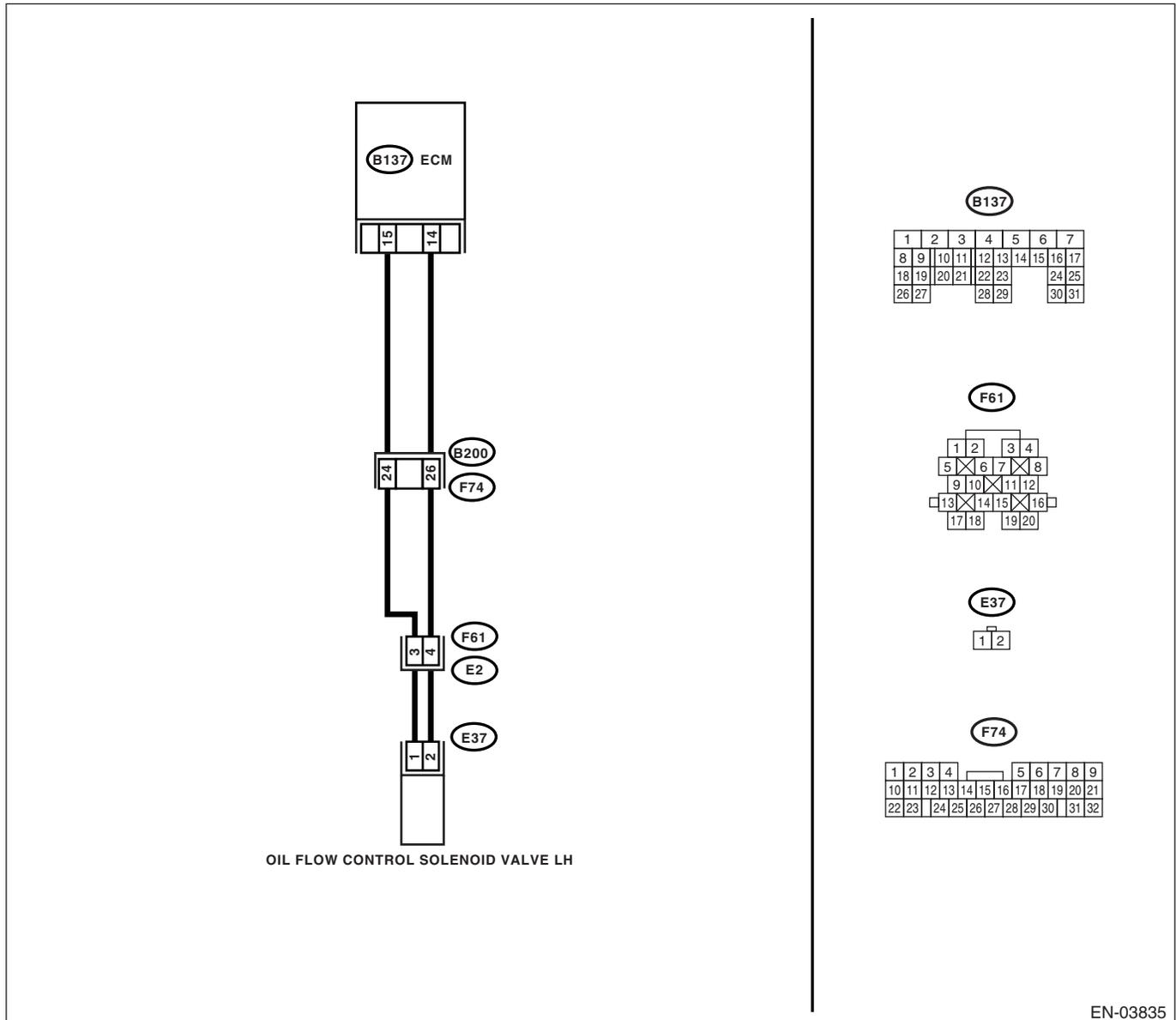
### TROUBLE SYMPTOM:

Improper idling

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03835

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.</b></p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and oil flow control solenoid valve. 3) Measure the resistance between ECM and oil flow control solenoid valve.</p> <p><b>Connector &amp; terminal</b> <b>(B137) No. 15 — (E37) No. 1:</b> <b>(B137) No. 14 — (E37) No. 2:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step 2.</p>	<p>Repair the open circuit of harness between ECM and oil flow control solenoid valve connector.</p> <p><b>NOTE:</b> In this case, repair the following item:</p> <ul style="list-style-type: none"> <li>• Open circuit of harness between ECM and oil flow control solenoid valve connector</li> <li>• Poor contact of the coupling connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.</b></p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and oil flow control solenoid valve. 3) Measure the resistance between ECM and oil flow control solenoid valve.</p> <p><b>Connector &amp; terminal</b> <b>(E37) No. 1 — Engine ground:</b> <b>(E37) No. 2 — Engine ground:</b></p>	<p>Is the resistance more than 1 <math>M\Omega</math>?</p>	<p>Go to step 3.</p>	<p>Repair the short circuit between ECM and oil flow control solenoid valve connector.</p>
<p><b>3</b></p> <p><b>CHECK OIL FLOW CONTROL SOLENOID VALVE.</b></p> <p>1) Remove the oil flow control solenoid valve connector. 2) Measure the resistance between oil flow control solenoid valve terminals.</p> <p><b>Terminals</b> <b>No. 1 — No. 2:</b></p>	<p>Is the resistance between 6 and 12 <math>\Omega</math>?</p>	<p>Repair the poor contact of ECM and oil flow control solenoid valve.</p>	<p>Replace the oil flow control solenoid valve. &lt;Ref. to ME(H4DOTC)-52, Camshaft.&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

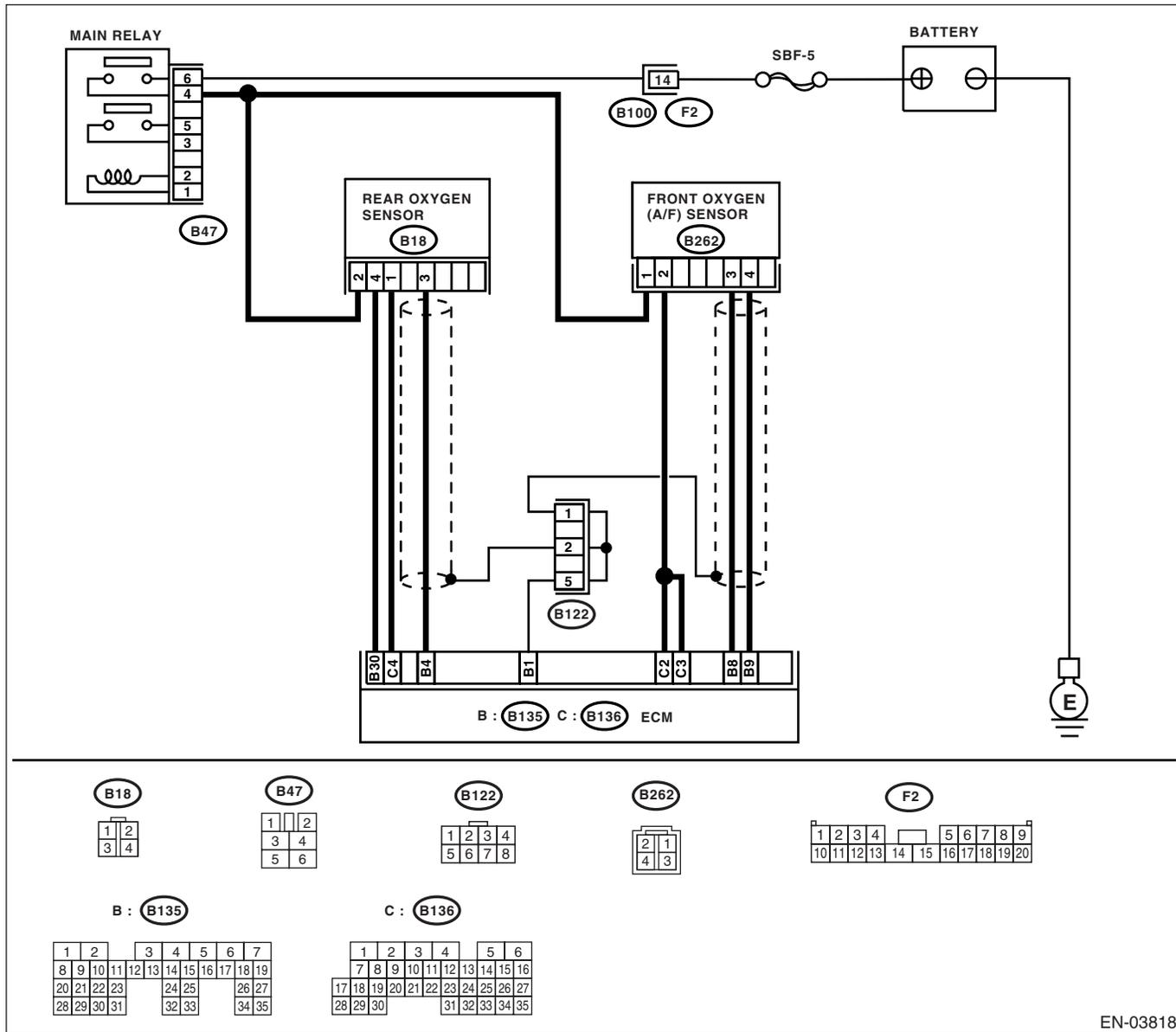
## DS:DTC P2096 POST CATALYST FUEL TRIM SYSTEM TOO LEAN BANK 1 DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-250, DTC P2096 POST CATALYST FUEL TRIM SYSTEM TOO LEAN BANK 1, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03818

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No	
1	<b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check DTC using List of Diagnostic Trouble Code (DTC). <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P2096.	Go to step 2.
2	<b>CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.</b>	Does water enter the connector?	Dry the water thoroughly.	Go to step 3.
3	<b>CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.</b> 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. <b>Connector &amp; terminal</b> <b>(B135) No. 8 — (B262) No. 3:</b> <b>(B135) No. 9 — (B262) No. 4:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of the harness between ECM and front oxygen (A/F) sensor connector. • Poor contact in front oxygen (A/F) sensor connector • Poor contact in ECM connector
4	<b>CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.</b> Measure the resistance of harness between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B135) No. 8 — Chassis ground:</b> <b>(B135) No. 9 — Chassis ground:</b>	Is the resistance more than 1 $M\Omega$ ?	Go to step 5.	Repair the ground short circuit of harness between ECM and front oxygen (A/F) sensor connector.
5	<b>CHECK OUTPUT SIGNAL FOR ECM.</b> 1) Attach the connector to the ECM. 2) Turn the ignition switch to ON. 3) Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B135) No. 8 (+) — Chassis ground (-):</b>	Is the voltage more than 4.5 V?	Go to step 6.	Go to step 7.
6	<b>CHECK OUTPUT SIGNAL FOR ECM.</b> Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B135) No. 8 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Repair the battery short circuit of harness between ECM and front oxygen (A/F) sensor connector. After repair, replace the ECM.<Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>	Repair poor contact in ECM connector.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No	
7	<p><b>CHECK OUTPUT SIGNAL FOR ECM.</b> Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B135) No. 9 (+) — Chassis ground (-):</b></p>	Is the voltage more than 4.95 V?	Go to step 8.	Go to step 9.
8	<p><b>CHECK OUTPUT SIGNAL FOR ECM.</b> Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B135) No. 9 (+) — Chassis ground (-):</b></p>	Is the voltage more than 10 V?	Repair the battery short circuit of harness between ECM and front oxygen (A/F) sensor connector. After repair, replace the ECM.<Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>	Repair poor contact in ECM connector.
9	<b>CHECK EXHAUST SYSTEM.</b>	Are there holes or loose bolts on exhaust system?	Repair the exhaust system.	Go to step 10.
10	<b>CHECK AIR INTAKE SYSTEM.</b>	Are there holes, loose bolts or disconnection of hose on air intake system?	Repair the air intake system.	Go to step 11.
11	<p><b>CHECK FUEL PRESSURE.</b> <b>WARNING:</b> • Place “NO FIRE” signs near the working area. • Be careful not to spill fuel. Measure the fuel pressure while disconnecting pressure regulator vacuum hose from intake manifold.&lt;Ref. to ME(H4DOTC)-25, INSPECTION, Fuel Pressure.&gt; <b>WARNING:</b> <b>Release fuel pressure before removing the fuel pressure gauge.</b> NOTE: If fuel pressure does not increase, squeeze the fuel return hose 2 to 3 times, then measure fuel pressure again.</p>	Is the measured value 284 — 314 kPa (2.9 — 3.2 kgf/cm <sup>2</sup> , 41 — 46 psi)?	Go to step 12.	Repair the following item. Fuel pressure is too high: • Clogged fuel return line or bent hose Fuel pressure is too low: • Improper fuel pump discharge • Clogged fuel supply line
12	<p><b>CHECK FUEL PRESSURE.</b> After connecting the pressure regulator vacuum hose, measure fuel pressure.&lt;Ref. to ME(H4DOTC)-25, INSPECTION, Fuel Pressure.&gt; <b>WARNING:</b> <b>Release fuel pressure before removing the fuel pressure gauge.</b> NOTE: • 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 the measured value 230 — 260 kPa (2.35 — 2.65 kgf/cm <sup>2</sup> , 33 — 38 psi)?	Go to step 13.	Repair the following item. Fuel pressure is too high: • Faulty pressure regulator • Clogged fuel return line or bent hose Fuel pressure is too low: • Faulty pressure regulator • Improper fuel pump discharge • Clogged fuel supply line

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>13</b>     <b>CHECK ENGINE COOLANT TEMPERATURE SENSOR.</b></p> <p>1) Start the engine and warm-up completely. 2) Read the data of the engine coolant temperature sensor signal using the Subaru Select Monitor or the general scan tool.</p> <p>NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt; • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the temperature above 60°C (140°F)?</p>	<p>Go to step 14.</p>	<p>Replace the engine coolant temperature sensor. &lt;Ref. to FU(H4DOTC)-27, Engine Coolant Temperature Sensor.&gt;</p>
<p><b>14</b>     <b>CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.</b></p> <p>1) Start the engine and warm-up engine until coolant temperature is greater than 60°C (140°F). 2) Place the shift lever in neutral position. 3) Turn the A/C switch to OFF. 4) Turn all the accessory switches off. 5) Read the data of mass air flow and intake air temperature sensor signal using the Subaru Select Monitor or general scan tool.</p> <p>NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt; • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the measured value 2.7 — 4.7 g/s (0.36 — 0.62 lb/m)</p>	<p>Go to step 15.</p>	<p>Replace the mass air flow and intake air temperature sensor. &lt;Ref. to FU(H4DOTC)-31, Mass Air Flow and Intake Air Temperature Sensor.&gt;</p>
<p><b>15</b>     <b>CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.</b></p> <p>1) Start the engine and warm-up engine until coolant temperature is greater than 60°C (140°F). 2) Place the shift lever in neutral position. 3) Turn the A/C switch to OFF. 4) Turn all the accessory switches off. 5) Open the front hood. 6) Measure the ambient temperature. 7) Read the data of mass air flow and intake air temperature sensor signal using the Subaru Select Monitor or general scan tool.</p> <p>NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt; • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Subtract ambient temperature from intake air temperature. Is the obtained value -10 — 50°C (-18 — 90°F)?</p>	<p>Go to step 16.</p>	<p>Check mass air flow and intake air temperature sensor. &lt;Ref. to FU(H4DOTC)-31, Mass Air Flow and Intake Air Temperature Sensor.&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>16 CHECK REAR OXYGEN SENSOR DATA.</b> 1) Warm-up the engine until engine coolant temperature is above 70°C (158°F), and keep the engine speed at 3,000 rpm. (Max. 2 minutes) 2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool. NOTE: • For MT model, depress the clutch pedal. • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.	Is the voltage more than 490 mV?	Go to step 20.	Go to step 17.
<b>17 CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.</b>	Does water enter the connector?	Dry the water thoroughly.	Go to step 18.
<b>18 CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and rear oxygen sensor. 3) Measure the resistance of harness between ECM and rear oxygen sensor connector. <i>Connector &amp; terminal</i> <i>(B135) No. 4 — (B18) No. 3:</i> <i>(B135) No. 30 — (B18) No. 4:</i>	Is the resistance more than 3 Ω?	Repair the open circuit of harness between ECM and rear oxygen sensor connector.	Go to step 19.
<b>19 CHECK HARNESS BETWEEN REAR OXYGEN SENSOR AND ECM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the rear oxygen sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between rear oxygen sensor harness connector and engine ground or chassis ground. <i>Connector &amp; terminal</i> <i>(B18) No. 3 (+) — Engine ground (-):</i>	Is the voltage 0.2 — 0.5 V?	Replace the rear oxygen sensor. <Ref. to FU(H4DOTC)-43, Rear Oxygen Sensor.>	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between rear oxygen sensor and ECM connector • Poor contact of the rear oxygen sensor connector • Poor contact in ECM connector

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>20</b>     <b>CHECK REAR OXYGEN SENSOR DATA.</b> 1) Warm-up the engine until engine coolant temperature is above 70°C (158°F), and drop the engine rpm suddenly from 3,000 rpm. 2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool. NOTE: • For MT model, depress the clutch pedal. • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt; • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the voltage less than 250 mV?</p>	<p>Go to step 21.</p>	<p>Go to step 17.</p>
<p><b>21</b>     <b>CHECK FRONT OXYGEN (A/F) SENSOR AND REAR OXYGEN SENSOR DATA.</b> 1) Warm-up the engine until engine coolant temperature is above 70°C (158°F), and leave it for 5 minutes or more with idling. 2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt; • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the voltage more than 0.8 V for more than 5 minutes?</p>	<p>Replace the front oxygen (A/F) sensor connector. &lt;Ref. to FU(H4DOTC)-41, Front Oxygen (A/F) Sensor.&gt;</p>	<p>Go to step 18.</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

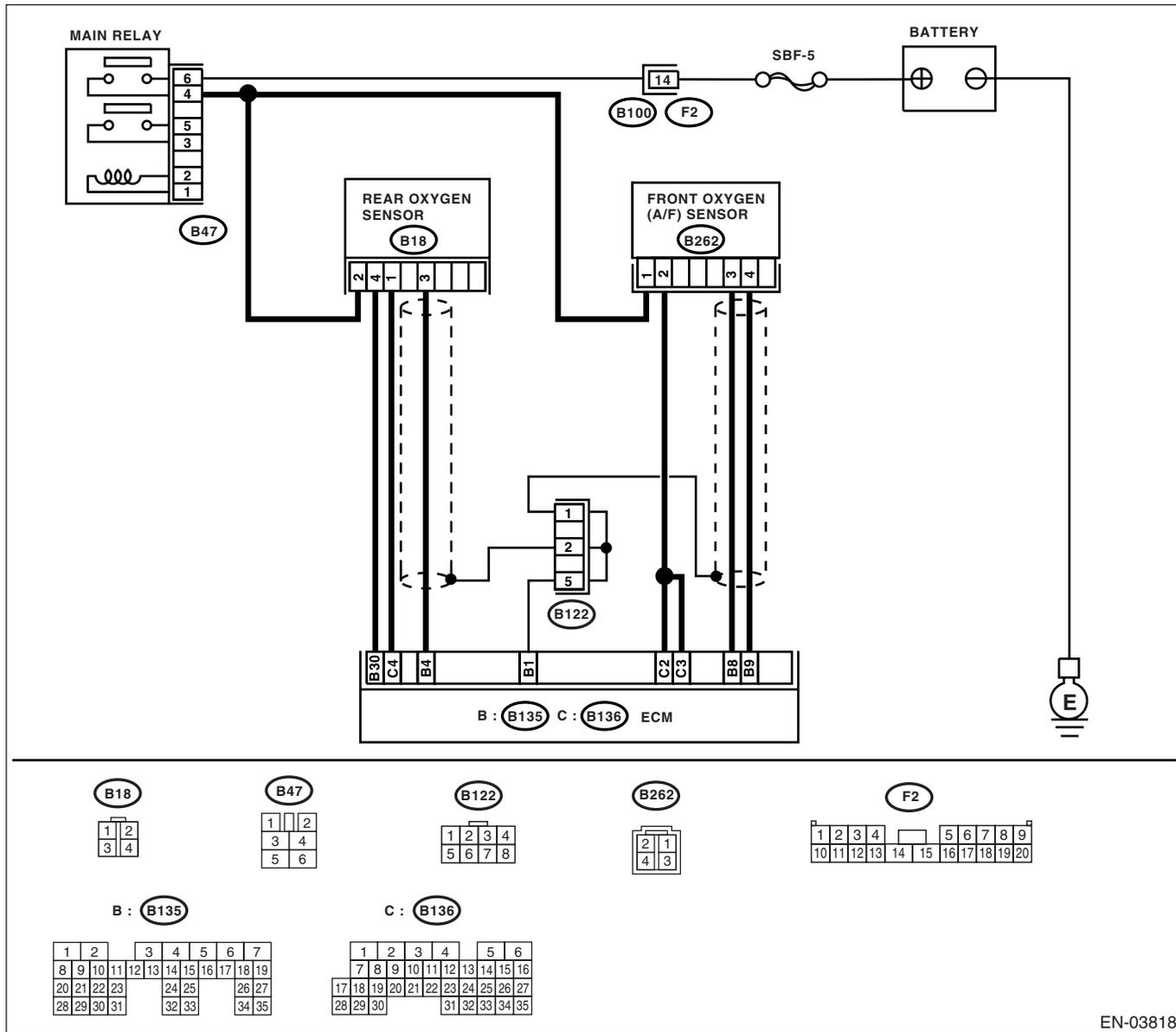
## DT:DTC P2097 POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1 DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-252, DTC P2097 POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03818

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No	
1	<b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Check DTC using List of Diagnostic Trouble Code (DTC). <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P2097.	Go to step 2.
2	<b>CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.</b>	Does water enter the connector?	Dry the water thoroughly.	Go to step 3.
3	<b>CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.</b> 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. <b>Connector &amp; terminal</b> <b>(B135) No. 8 — (B262) No. 3:</b> <b>(B135) No. 9 — (B262) No. 4:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of the harness between ECM and front oxygen (A/F) sensor connector. • Poor contact in front oxygen (A/F) sensor connector • Poor contact in ECM connector
4	<b>CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.</b> Measure the resistance of harness between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B135) No. 8 — Chassis ground:</b> <b>(B135) No. 9 — Chassis ground:</b>	Is the resistance more than 1 $M\Omega$ ?	Go to step 5.	Repair the ground short circuit of harness between ECM and front oxygen (A/F) sensor connector.
5	<b>CHECK OUTPUT SIGNAL FOR ECM.</b> 1) Attach the connector to the ECM. 2) Turn the ignition switch to ON. 3) Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B135) No. 8 (+) — Chassis ground (-):</b>	Is the voltage more than 4.5 V?	Go to step 6.	Go to step 7.
6	<b>CHECK OUTPUT SIGNAL FOR ECM.</b> Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B135) No. 8 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Repair the battery short circuit of harness between ECM and front oxygen (A/F) sensor connector. After repair, replace the ECM.<Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>	Repair poor contact in ECM connector.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No	
7	<p><b>CHECK OUTPUT SIGNAL FOR ECM.</b> Measure the voltage between ECM connector and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(B135) No. 9 (+) — Chassis ground (-):</b></p>	Is the voltage more than 4.95 V?	Go to step 8.	Go to step 9.
8	<p><b>CHECK OUTPUT SIGNAL FOR ECM.</b> Measure the voltage between ECM connector and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(B135) No. 9 (+) — Chassis ground (-):</b></p>	Is the voltage more than 10 V?	Repair the battery short circuit of harness between ECM and front oxygen (A/F) sensor connector. After repair, replace the ECM.<Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>	Repair poor contact in ECM connector.
9	<b>CHECK EXHAUST SYSTEM.</b>	Are there holes or loose bolts on exhaust system?	Repair the exhaust system.	Go to step 10.
10	<b>CHECK AIR INTAKE SYSTEM.</b>	Are there holes, loose bolts or disconnection of hose on air intake system?	Repair the air intake system.	Go to step 11.
11	<p><b>CHECK FUEL PRESSURE</b></p> <p><b>WARNING:</b></p> <ul style="list-style-type: none"> <li>• Place “NO FIRE” signs near the working area.</li> <li>• Be careful not to spill fuel.</li> </ul> <p>Measure the fuel pressure while disconnecting pressure regulator vacuum hose from intake manifold. &lt;Ref. to ME(H4DOTC)-25, INSPECTION, Fuel Pressure.&gt;</p> <p><b>WARNING:</b> <b>Release fuel pressure before removing the fuel pressure gauge.</b></p> <p>NOTE: If fuel pressure does not increase, squeeze the fuel return hose 2 to 3 times, then measure fuel pressure again.</p>	Is the measured value 284 — 314 kPa (2.9 — 3.2 kgf/cm <sup>2</sup> , 41 — 46 psi)?	Go to step 12.	Repair the following item. Fuel pressure is too high: <ul style="list-style-type: none"> <li>• Clogged fuel return line or bent hose</li> </ul> Fuel pressure is too low: <ul style="list-style-type: none"> <li>• Improper fuel pump discharge</li> <li>• Clogged fuel supply line</li> </ul>
12	<p><b>CHECK FUEL PRESSURE.</b></p> <p>After connecting the pressure regulator vacuum hose, measure fuel pressure.&lt;Ref. to ME(H4DOTC)-25, INSPECTION, Fuel Pressure.&gt;</p> <p><b>WARNING:</b> <b>Release fuel pressure before removing the fuel pressure gauge.</b></p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• If fuel pressure does not increase, squeeze fuel return hose 2 to 3 times, then measure fuel pressure again.</li> <li>• If the measured value at this step is out of specification, check or replace pressure regulator and pressure regulator vacuum hose.</li> </ul>	Is the measured value 230 — 260 kPa (2.35 — 2.65 kgf/cm <sup>2</sup> , 33 — 38 psi)?	Go to step 13.	Repair the following item. Fuel pressure is too high: <ul style="list-style-type: none"> <li>• Faulty pressure regulator</li> <li>• Clogged fuel return line or bent hose</li> </ul> Fuel pressure is too low: <ul style="list-style-type: none"> <li>• Faulty pressure regulator</li> <li>• Improper fuel pump discharge</li> <li>• Clogged fuel supply line</li> </ul>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>13 CHECK ENGINE COOLANT TEMPERATURE SENSOR.</b></p> <p>1) Start the engine and warm-up completely. 2) Read the data of the engine coolant temperature sensor signal using the Subaru Select Monitor or the general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• General scan tool</li> </ul> <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the temperature above 60°C (140°F)?</p>	<p>Go to step 14.</p>	<p>Replace the engine coolant temperature sensor. &lt;Ref. to FU(H4DOTC)-27, Engine Coolant Temperature Sensor.&gt;</p>
<p><b>14 CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.</b></p> <p>1) Start the engine and warm-up engine until coolant temperature is greater than 60°C (140°F). 2) Place the shift lever in neutral position. 3) Turn the A/C switch to OFF. 4) Turn all the accessory switches off. 5) Read the data of mass air flow and intake air temperature sensor signal using the Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• General scan tool</li> </ul> <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the measured value 2.7 — 4.7 g/s (0.36 — 0.62 lb/m)</p>	<p>Go to step 15.</p>	<p>Replace the mass air flow and intake air temperature sensor. &lt;Ref. to FU(H4DOTC)-31, Mass Air Flow and Intake Air Temperature Sensor.&gt;</p>
<p><b>15 CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.</b></p> <p>1) Start the engine and warm-up engine until coolant temperature is greater than 60°C (140°F). 2) Place the shift lever in neutral position. 3) Turn the A/C switch to OFF. 4) Turn all the accessory switches off. 5) Open the front hood. 6) Measure the ambient temperature. 7) Read the data of mass air flow and intake air temperature sensor signal using the Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• General scan tool</li> </ul> <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Subtract ambient temperature from intake air temperature. Is the obtained value -10 — 50°C (-18 — 90°F)?</p>	<p>Go to step 16.</p>	<p>Check mass air flow and intake air temperature sensor. &lt;Ref. to FU(H4DOTC)-31, Mass Air Flow and Intake Air Temperature Sensor.&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>16 CHECK REAR OXYGEN SENSOR DATA.</b>            1) Warm-up the engine until engine coolant temperature is above 70°C (158°F), and keep the engine speed at 3,000 rpm. (Max. 2 minutes)            2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool.  <b>NOTE:</b>            • For MT model, depress the clutch pedal.            • Subaru Select Monitor            For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;            • General scan tool            For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the voltage more than 490 mV?</p>	<p>Go to step 20.</p>	<p>Go to step 17.</p>
<p><b>17 CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.</b></p>	<p>Does water enter the connector?</p>	<p>Dry the water thoroughly.</p>	<p>Go to step 18.</p>
<p><b>18 CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.</b>            1) Turn the ignition switch to OFF.            2) Disconnect the connector from ECM and rear oxygen sensor.            3) Measure the resistance of harness between ECM and rear oxygen sensor connector.  <b>Connector &amp; terminal</b>  <b>(B135) No. 4 — (B18) No. 3:</b>  <b>(B135) No. 30 — (B18) No. 4:</b></p>	<p>Is the resistance more than 3 Ω?</p>	<p>Repair the open circuit of harness between ECM and rear oxygen sensor connector.</p>	<p>Go to step 19.</p>
<p><b>19 CHECK HARNESS BETWEEN REAR OXYGEN SENSOR AND ECM CONNECTOR.</b>            1) Turn the ignition switch to OFF.            2) Disconnect the connector from the rear oxygen sensor.            3) Turn the ignition switch to ON.            4) Measure the voltage between rear oxygen sensor harness connector and engine ground or chassis ground.  <b>Connector &amp; terminal</b>  <b>(B18) No. 3 (+) — Engine ground (-):</b></p>	<p>Is the voltage 0.2 — 0.5 V?</p>	<p>Replace the rear oxygen sensor.            &lt;Ref. to FU(H4DOTC)-43, Rear Oxygen Sensor.&gt;</p>	<p>Repair the harness and connector.  <b>NOTE:</b>            In this case, repair the following item:            • Open circuit of harness between rear oxygen sensor and ECM connector            • Poor contact of the rear oxygen sensor connector            • Poor contact in ECM connector</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>20</b>     <b>CHECK REAR OXYGEN SENSOR DATA.</b>            1) Warm-up the engine until engine coolant temperature is above 70°C (158°F), and drop the engine speed suddenly from 3,000 rpm.            2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool.</p> <p>NOTE:            • For MT model, depress the clutch pedal.            • Subaru Select Monitor</p> <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;            • General scan tool</p> <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the voltage less than 250 mV?</p>	<p>Go to step 21.</p>	<p>Go to step 17.</p>
<p><b>21</b>     <b>CHECK FRONT OXYGEN (A/F) SENSOR AND REAR OXYGEN SENSOR DATA.</b>            1) Warm-up the engine until engine coolant temperature is above 70°C (158°F), and leave it for 5 minutes or more with idling.            2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool.</p> <p>NOTE:            • Subaru Select Monitor</p> <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;            • General scan tool</p> <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the voltage more than 0.8 V for more than 5 minutes?</p>	<p>Replace the front oxygen (A/F) sensor connector.            &lt;Ref. to FU(H4DOTC)-41, Front Oxygen (A/F) Sensor.&gt;</p>	<p>Go to step 18.</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## DU:DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/ PERFORMANCE

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-190, DTC P0638 THROTTLE ACTUATOR CONTROL RANGE/PERFORMANCE (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.> <Ref. to GD(H4DOTC)-206, DTC P1160 RETURN SPRING FAILURE, Diagnostic Trouble Code (DTC) Detecting Criteria.> or <Ref. to GD(H4DOTC)-254, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

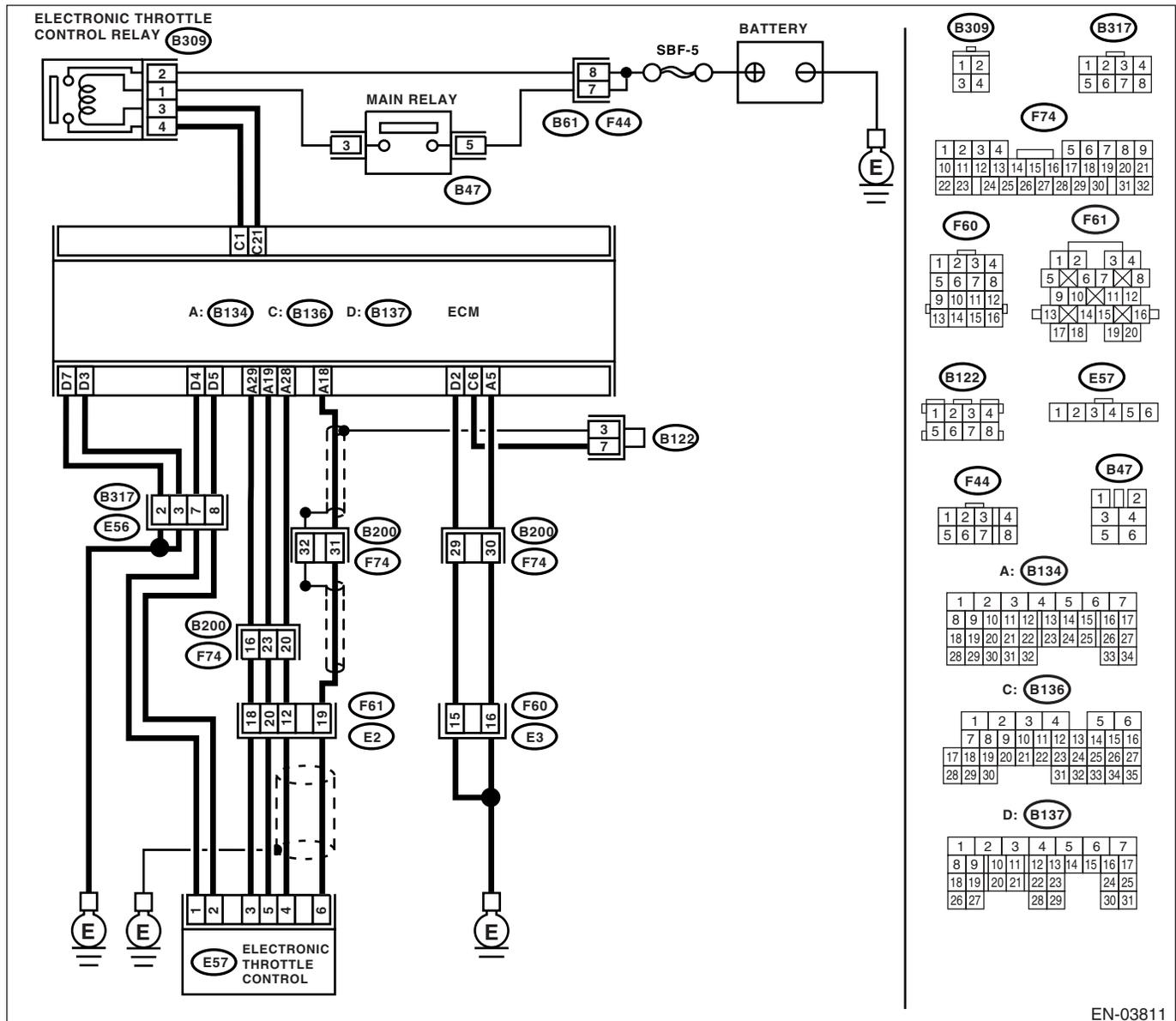
### TROUBLE SYMPTOM:

- Improper idling
- Poor driving performance
- Engine stalls.

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>

### WIRING DIAGRAM:



EN-03811

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<p><b>CHECK ELECTRONIC THROTTLE CONTROL RELAY.</b></p> <p>1) Turn the ignition switch to OFF. 2) Remove the electronic throttle control relay. 3) Connect the battery to terminals No. 1 and No. 3 of electronic throttle control relay. 4) Measure the resistance between electronic throttle control relay terminals.</p> <p><b>Terminals</b> <b>No. 2 — No. 4:</b></p>	Is the resistance less than 1 $\Omega$ ?	Go to step 2.	Replace the electronic throttle control relay.
2	<p><b>CHECK POWER SUPPLY OF ELECTRONIC THROTTLE CONTROL RELAY.</b></p> <p>1) Turn the ignition switch to ON. 2) Measure the voltage between the electronic control throttle relay connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(B309) No. 1 (+) — Engine ground (-):</b> <b>(B309) No. 2 (+) — Engine ground (-):</b></p>	Is the voltage more than 10 V?	Go to step 3.	Repair the open or ground short circuit of power supply circuit.
3	<p><b>CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.</b></p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM. 3) Turn the ignition switch to ON. 4) Measure the voltage between the electronic control throttle relay connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(B309) No. 3 (+) — Engine ground (-):</b></p>	Is the voltage more than 10 V?	Repair the power supply short circuit of harness between ECM and electronic throttle control.	Go to step 4.
4	<p><b>CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.</b></p> <p>1) Turn the ignition switch to OFF. 2) Measure the resistance between electronic throttle control relay connector and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(B309) No. 3 — Engine ground:</b> <b>(B309) No. 4 — Engine ground:</b></p>	Is the resistance more than 1 $M\Omega$ ?	Go to step 5.	Repair the ground short circuit of harness between ECM and electronic throttle control relay.
5	<p><b>CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.</b></p> <p>1) Turn the ignition switch to OFF. 2) Measure the resistance between ECM connector and electronic throttle control relay connector.</p> <p><b>Connector &amp; terminal</b> <b>(B136) No. 21 — (B309) No. 3:</b> <b>(B136) No. 1 — (B309) No. 4:</b></p>	Is the resistance less than 1 $\Omega$ ?	Go to step 6.	Repair the open circuit of harness between ECM and electronic throttle control relay.
6	<p><b>CHECK SENSOR OUTPUT.</b></p> <p>1) Connect all the connectors. 2) Turn the ignition switch to ON. 3) Measure the voltage between ECM connector terminals.</p> <p><b>Connector &amp; terminal</b> <b>(B134) No. 18 (+) — (B134) No. 29 (-):</b></p> <p>4) Check the voltage change while shaking the ECM harness and connector, engine harness connector (B136, F61), and electronic control throttle connector harness.</p>	Is the voltage more than 0.4 V?	Go to step 7.	Go to step 9.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>7 CHECK SENSOR OUTPUT.</b> 1) Connect all the connectors. 2) Turn the ignition switch to ON. 3) Measure the voltage between ECM connector terminals. <i><b>Connector &amp; terminal</b></i> <i><b>(B134) No. 28 (+) — (B134) No. 29 (-):</b></i> 4) Check the voltage change while shaking the ECM harness and connector, engine harness connector, and electronic control throttle connector harness.	Is the voltage more than 0.8 V?	Go to step 8.	Go to step 9.
<b>8 CHECK POOR CONTACT.</b> Check poor contact in connector between ECM and electronic throttle control.	Is there poor contact?	Repair the poor contact.	Go to step 13.
<b>9 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM. 3) Disconnect the connectors from electronic throttle control. 4) Measure the resistance between ECM connector and electronic throttle control connector. <i><b>Connector &amp; terminal</b></i> <i><b>(B134) No. 19 — (E57) No. 5:</b></i>	Is the resistance less than 1 $\Omega$ ?	Go to step 10.	Repair the open circuit of harness connector.
<b>10 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> Measure the resistance between ECM connector and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B134) No. 19 — Chassis ground:</b></i> <i><b>(B134) No. 18 — Chassis ground:</b></i> <i><b>(B134) No. 28 — Chassis ground:</b></i>	Is the resistance more than 1 M $\Omega$ ?	Go to step 11.	Repair the ground short circuit of harness.
<b>11 CHECK SENSOR POWER SUPPLY.</b> 1) Connect the ECM connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between electronic throttle control connector and engine ground. <i><b>Connector &amp; terminal</b></i> <i><b>(E57) No. 5 (+) — Engine ground (-):</b></i> 4) Check the voltage change by shaking the harness and connector of ECM and engine harness connector while monitoring the value with voltage meter.	Is the voltage 4.5 — 5.5 V?	Go to step 12.	Repair poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>
<b>12 CHECK SHORT CIRCUIT IN ECM.</b> 1) Turn the ignition switch to OFF. 2) Measure the resistance between electronic throttle control connector and engine ground. <i><b>Connector &amp; terminal</b></i> <i><b>(E57) No. 4 — Engine ground:</b></i> <i><b>(E57) No. 6 — Engine ground:</b></i>	Is the resistance more than 10 $\Omega$ ?	Go to step 13.	Repair poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>
<b>13 CHECK SENSOR OUTPUT.</b> 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. 4) Check the voltage change while shaking the ECM harness and connector, engine harness connector, and electronic control throttle connector harness.	Is the voltage 4.63 V?	Go to step 14.	Go to step 16.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>14 CHECK SENSOR OUTPUT.</b> 1) Read the data of sub throttle sensor signal using Subaru Select Monitor. 2) Check the voltage change while shaking the ECM harness and connector, engine harness connector, and electronic control throttle connector harness.	Is the voltage 4.73 V?	Go to step 15.	Go to step 16.
<b>15 CHECK POOR CONTACT.</b> Check poor contact in connector between ECM and electronic throttle control.	Is there poor contact?	Repair the poor contact.	Go to step 21.
<b>16 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM. 3) Disconnect the connectors from electronic throttle control. 4) Measure the resistance between ECM connector and electronic throttle control connector. <b>Connector &amp; terminal</b> (B134) No. 18 — (E57) No. 6: (B134) No. 28 — (E57) No. 4: (B134) No. 29 — (E57) No. 3:	Is the resistance less than 1 $\Omega$ ?	Go to step 17.	Repair the open circuit of harness connector.
<b>17 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Connect the ECM connector. 2) Measure the resistance between electronic throttle control connector and engine ground. <b>Connector &amp; terminal</b> (E57) No. 3 — Engine ground:	Is the resistance less than 5 $\Omega$ ?	Go to step 18.	Repair poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>
<b>18 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between electronic throttle control connector and engine ground. <b>Connector &amp; terminal</b> (E57) No. 5 (+) — Engine ground (-): 3) Check the voltage change by shaking the harness and connector of ECM and engine harness connector while monitoring the value with voltage meter.	Is the voltage less than 10 V?	Go to step 19.	Repair the battery short circuit of harness between ECM connector and electronic throttle control connector.
<b>19 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Measure the voltage between electronic throttle control connector and engine ground. <b>Connector &amp; terminal</b> (E57) No. 4 (+) — Engine ground (-): (E57) No. 6 (+) — Engine ground (-): 2) Check the voltage change by shaking the harness and connector of ECM and engine harness connector while monitoring the value with voltage meter.	Is the voltage less than 10 V?	Go to step 20.	Repair the short circuit of harness between ECM connector and electronic throttle control connector.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>20 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Turn the ignition switch to OFF. 2) Remove the ECM. 3) Measure the resistance between ECM connectors. <i>Connector &amp; terminal</i> (B134) No. 18 — (B134) No. 29: (B134) No. 28 — (B134) No. 29:	Is the resistance more than 1 M $\Omega$ ?	Go to step 21.	Repair the short circuit to sensor power supply.
<b>21 CHECK SENSOR OUTPUT.</b> 1) Turn the ignition switch to OFF. 2) Connect the connectors except for electric throttle control 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 22.	Repair the poor contact of electronic throttle control connector. Replace the electronic throttle control if defective.
<b>22 CHECK SENSOR OUTPUT.</b> Read the data of sub throttle sensor signal using Subaru Select Monitor.	Is the voltage 1.64 — 1.70 V?	Go to step 23.	Repair poor contact in ECM connector. Replace the electronic throttle control if defective.
<b>23 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM. 3) Disconnect the connectors from electronic throttle control. 4) Measure the resistance between ECM connector and electronic throttle control connector. <i>Connector &amp; terminal</i> (B137) No. 4 — (E57) No. 1: (B137) No. 5 — (E57) No. 2:	Is the resistance less than 1 $\Omega$ ?	Go to step 24.	Repair the open circuit of harness connector.
<b>24 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR.</b> 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 &amp; terminal</i> (E57) No. 1 (+) — Engine ground (-): (E57) No. 2 (+) — Engine ground (-):	Is the voltage less than 5 V?	Go to step 25.	Repair the power supply short circuit of harness between ECM and electronic throttle control.
<b>25 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM. 3) Measure the resistance between electronic throttle control connector and engine ground. <i>Connector &amp; terminal</i> (E57) No. 1 — Engine ground: (E57) No. 2 — Engine ground:	Is the resistance more than 1 M $\Omega$ ?	Go to step 26.	Repair the short circuit of harness.
<b>26 CHECK ELECTRONIC THROTTLE CONTROL MOTOR HARNESS.</b> Measure the resistance between electronic throttle control connector terminals. <i>Connector &amp; terminal</i> (E57) No. 2 — (E57) No. 1:	Is the resistance more than 1 M $\Omega$ ?	Go to step 27.	Repair the short circuit of harness.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>27</b> <b>CHECK ELECTRONIC THROTTLE CONTROL GROUND CIRCUIT.</b> Measure the resistance between ECM connector and engine ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B137) No. 3 — Engine ground:</b></i> <i><b>(B137) No. 7 — Engine ground:</b></i>	Is the resistance less than 10 $\Omega$ ?	Go to step <b>28</b> .	Repair the open circuit of harness.
<b>28</b> <b>CHECK ELECTRONIC THROTTLE CONTROL.</b> Measure the resistance between electronic throttle control terminals. <i><b>Terminals</b></i> <i><b>No. 1 — No. 2:</b></i>	Is the resistance less than 50 $\Omega$ ?	Go to step <b>29</b> .	Replace the electronic throttle control.
<b>29</b> <b>CHECK ELECTRONIC THROTTLE CONTROL.</b> 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 poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>	Replace the electronic throttle control.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## DV:DTC P2102 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT LOW

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-256, DTC P2102 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

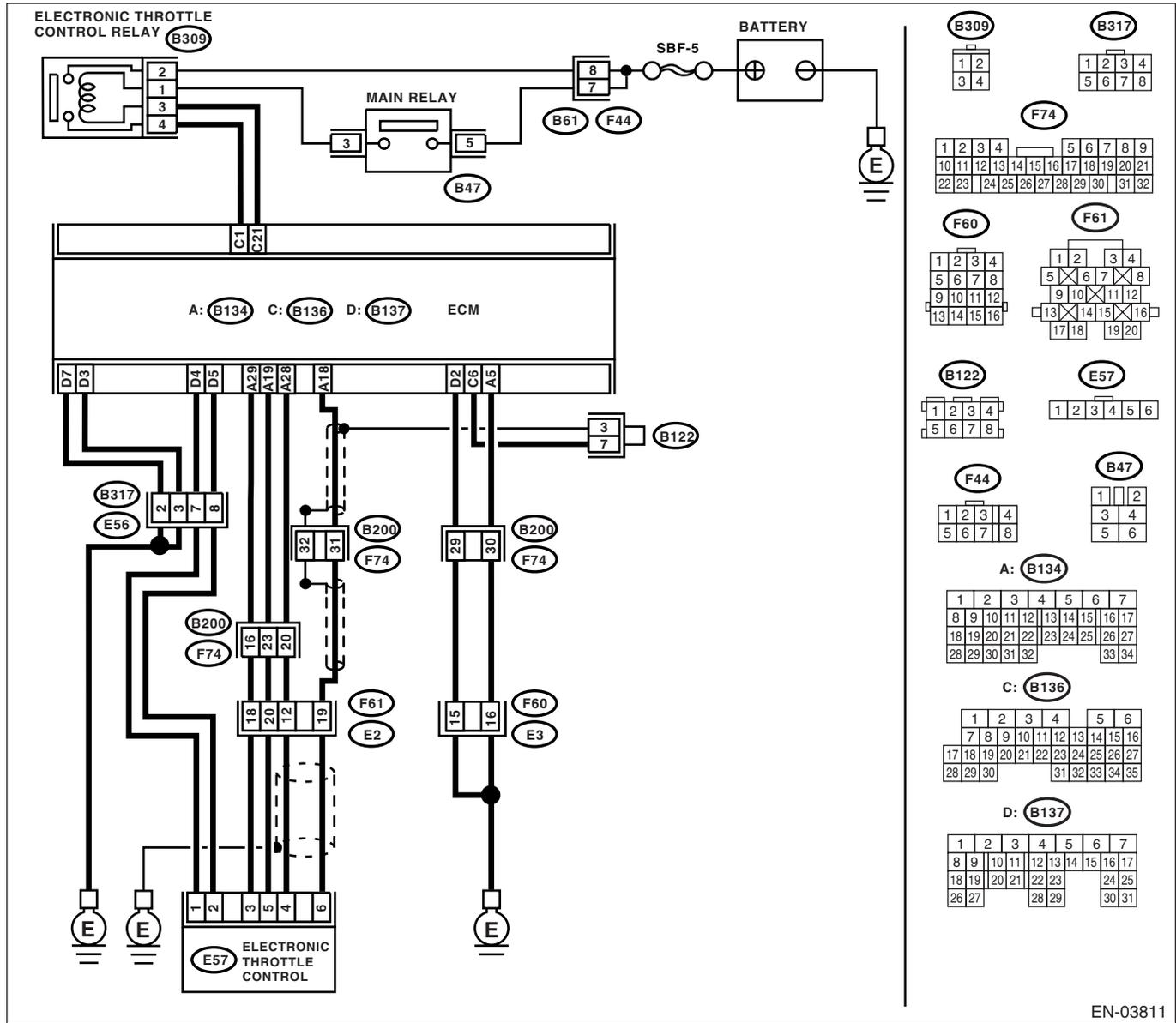
### TROUBLE SYMPTOM:

- Improper idling
- Poor driving performance
- Engine stalls.

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03811

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK ELECTRONIC THROTTLE CONTROL RELAY.</b></p> <p>1) Turn the ignition switch to OFF. 2) Remove the electronic throttle control relay. 3) Connect the battery to terminals No. 1 and No. 3 of electronic throttle control relay. 4) Measure the resistance between electronic throttle control terminals.</p> <p><b>Terminals</b> <b>(B309) No. 2 — (B309) No. 4:</b></p>	Is the resistance less than 1 $\Omega$ ?	Go to step 2.	Replace the electronic throttle control relay.
<p><b>2</b></p> <p><b>CHECK POWER SUPPLY OF ELECTRONIC THROTTLE CONTROL RELAY.</b></p> <p>1) Turn the ignition switch to ON. 2) Measure the voltage between the electronic control throttle relay connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(B309) No. 1 (+) — Engine ground (-):</b> <b>(B309) No. 2 (+) — Engine ground (-):</b></p>	Is the voltage more than 10 V?	Go to step 3.	Repair the open or ground short circuit of power supply circuit.
<p><b>3</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.</b></p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM. 3) Turn the ignition switch to ON. 4) Measure the voltage between the electronic control throttle relay connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(B309) No. 3 (+) — Engine ground (-):</b></p>	Is the voltage more than 10 V?	Repair the power supply short circuit of harness between ECM and electronic throttle control relay.	Go to step 4.
<p><b>4</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.</b></p> <p>1) Turn the ignition switch to OFF. 2) Measure the resistance between electronic throttle control relay connector and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(B309) No. 3 — Engine ground:</b> <b>(B309) No. 4 — Engine ground:</b></p>	Is the resistance more than 1 M $\Omega$ ?	Go to step 5.	Repair the ground short circuit of harness between ECM and electronic throttle control relay.
<p><b>5</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.</b></p> <p>Measure the resistance between ECM connector and electronic throttle control relay connector.</p> <p><b>Connector &amp; terminal</b> <b>(B136) No. 21 — (B309) No. 3:</b> <b>(B136) No. 1 — (B309) No. 4:</b></p>	Is the resistance less than 1 $\Omega$ ?	Repair poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>	Repair the open circuit of harness between ECM and electronic throttle control relay.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

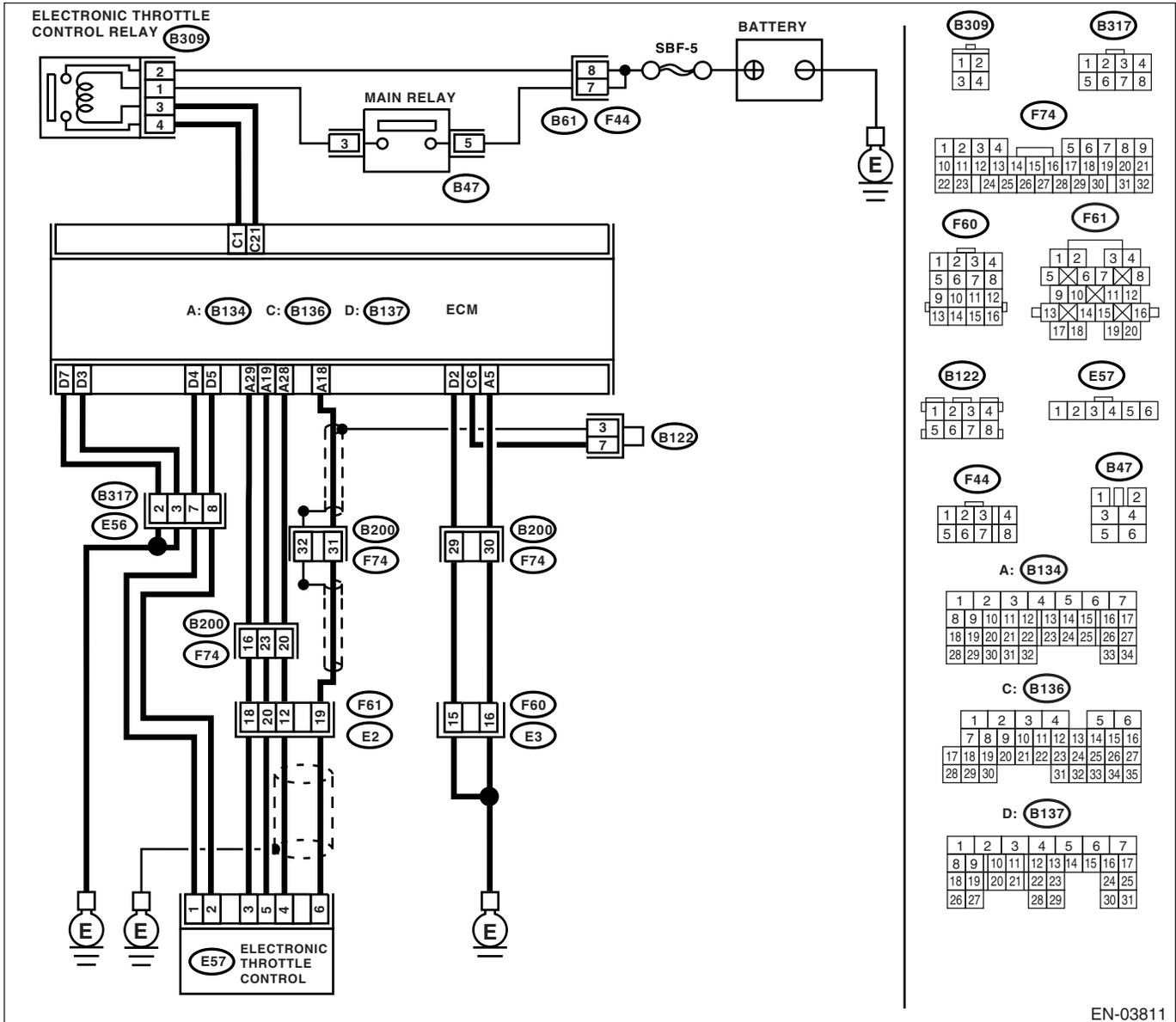
## DW:DTC P2103 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT HIGH DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-258, DTC P2103 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-03811

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<b>CHECK ELECTRONIC THROTTLE CONTROL RELAY.</b> 1) Turn the ignition switch to OFF. 2) Remove the electronic throttle control relay. 3) Measure the resistance between electronic throttle control relay terminals. <i>Terminals</i> <i>No. 2 — No. 4:</i>	Is the resistance more than 1 M $\Omega$ ?	Go to step 2.	Replace the electronic throttle control relay.
2	<b>CHECK SHORT CIRCUIT OF ELECTRONIC THROTTLE CONTROL RELAY POWER SUPPLY.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between the electronic control throttle relay connector and engine ground. <i>Connector &amp; terminal</i> <i>(B309) No. 4 (+) — Engine ground (-):</i>	Is the voltage more than 5 V?	Go to step 3.	Repair the power supply short circuit of harness between ECM and electronic throttle control relay.
3	<b>CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM. 3) Measure the resistance between ECM connector and engine ground. <i>Connector &amp; terminal</i> <i>(B136) No. 21 — Engine ground:</i>	Is the resistance more than 1 M $\Omega$ ?	Repair poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>	Repair the ground short circuit of harness between ECM and electronic throttle control relay.

## DX:DTC P2109 THROTTLE/PEDAL POSITION SENSOR “A” MINIMUM STOP PERFORMANCE

### NOTE:

For the diagnostic procedure, refer to DTC P2101. <Ref. to EN(H4DOTC)(diag)-340, 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)

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

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-262, DTC P2122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

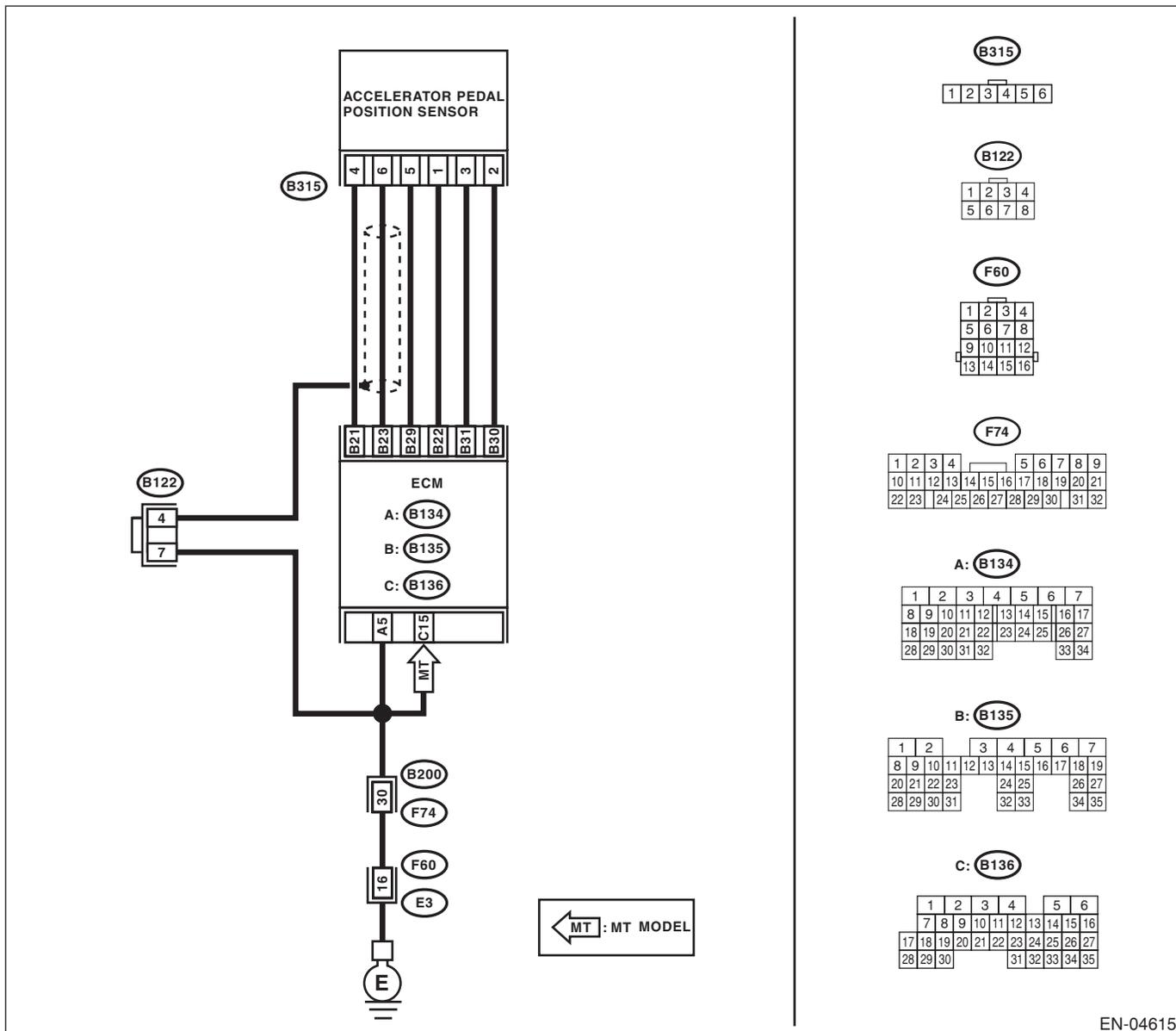
### TROUBLE SYMPTOM:

- Improper idling
- Poor driving performance

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-04615

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK ACCELERATOR PEDAL POSITION SENSOR OUTPUT.</b> 1) Turn the ignition switch to ON. 2) Read the data of main accelerator pedal position sensor signal using Subaru Select Monitor.	Is the voltage more than 0.4 V?	Go to step 2.	Go to step 3.
<b>2 CHECK POOR CONTACT.</b> Check poor contact of connector between ECM and accelerator pedal position sensor.	Is there poor contact?	Repair the poor contact.	Temporary poor contact occurred, but it is normal at present.
<b>3 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM. 3) Disconnect the connectors from accelerator pedal position sensor. 4) Measure the resistance of ECM connector and accelerator pedal position sensor connector.  <b>Connector &amp; terminal</b> <b>(B135) No. 21 — (B315) No. 4:</b> <b>(B135) No. 23 — (B315) No. 6:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open circuit of harness connector.
<b>4 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b> Measure the resistance between ECM connector and chassis ground.  <b>Connector &amp; terminal</b> <b>(B135) No. 21 — Chassis ground:</b> <b>(B135) No. 23 — Chassis ground:</b>	Is the resistance more than 1 M $\Omega$ ?	Go to step 5.	Repair the chassis short circuit of harness.
<b>5 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Connect the ECM connector. 2) Measure the resistance between accelerator pedal position sensor connector and chassis ground.  <b>Connector &amp; terminal</b> <b>(B315) No. 5 — Chassis ground:</b>	Is the resistance less than 5 $\Omega$ ?	Go to step 6.	Repair poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>
<b>6 CHECK POWER SUPPLY OF ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between accelerator pedal position sensor connector and chassis ground.  <b>Connector &amp; terminal</b> <b>(B315) No. 4 (+) — Chassis ground (-):</b>	Is the voltage 4.5 — 5.5 V?	Replace the accelerator pedal position sensor. <Ref. to SP(H4SO)-3, Accelerator Pedal.>	Repair poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-264, DTC P2123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

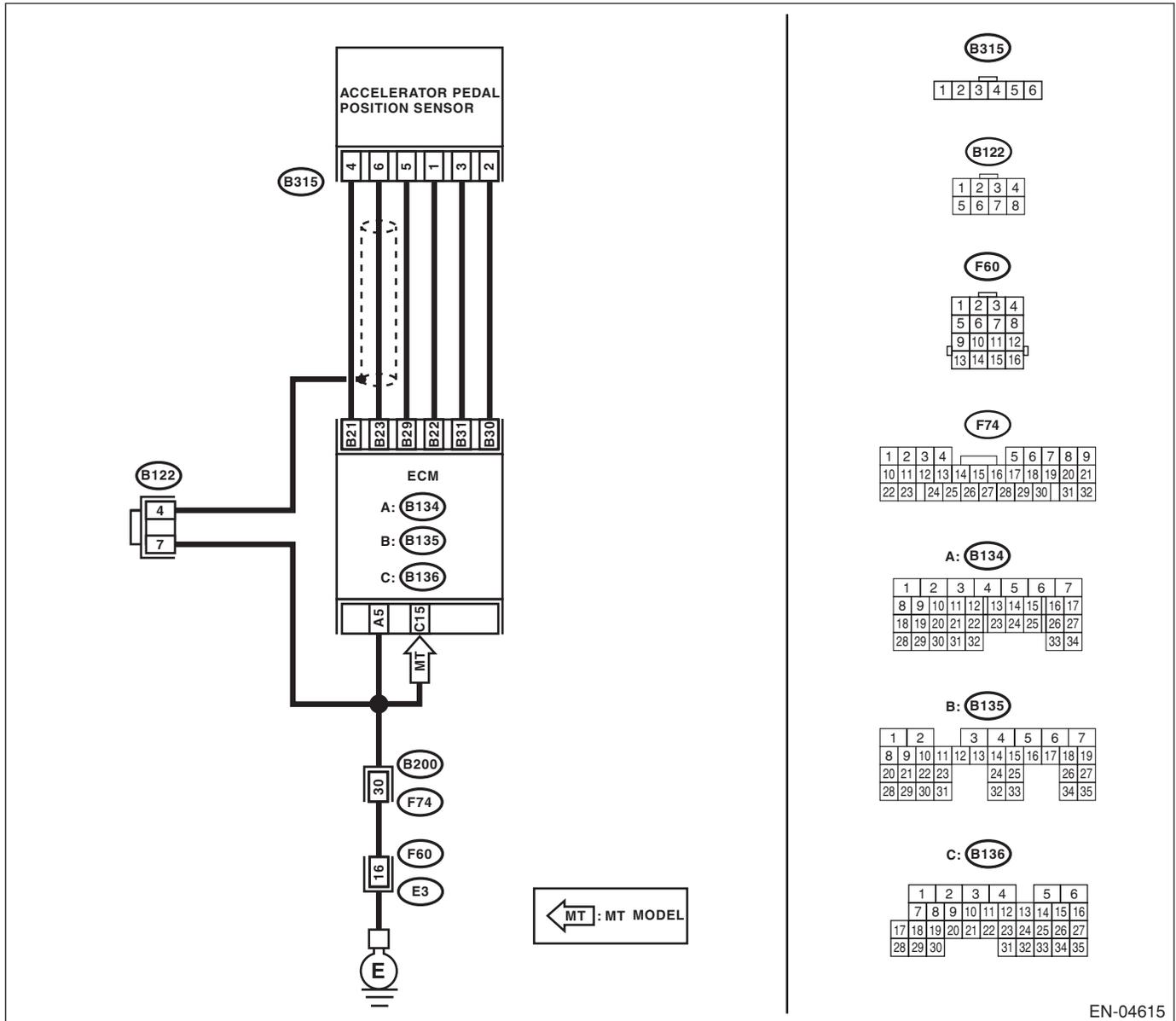
### TROUBLE SYMPTOM:

- Improper idling
- Poor driving performance

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-04615

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK ACCELERATOR PEDAL POSITION SENSOR OUTPUT.</b> 1) Turn the ignition switch to ON. 2) Read the data of main accelerator pedal position sensor signal using Subaru Select Monitor.	Is the voltage less than 4.8 V?	Go to step 2.	Go to step 3.
<b>2 CHECK POOR CONTACT.</b> Check poor contact of connector between ECM and accelerator pedal position sensor.	Is there poor contact?	Repair the poor contact.	Temporary poor contact occurred, but it is normal at present.
<b>3 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM. 3) Disconnect the connectors from accelerator pedal position sensor. 4) Measure the resistance between ECM connector and accelerator pedal position sensor connector.  <b>Connector &amp; terminal</b> <b>(B135) No. 21 — (B315) No. 4:</b> <b>(B135) No. 29 — (B315) No. 5:</b> <b>(B135) No. 23 — (B315) No. 6:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open circuit of harness connector.
<b>4 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Connect the ECM connector. 2) Measure the resistance between accelerator pedal position sensor connector and chassis ground.  <b>Connector &amp; terminal</b> <b>(B315) No. 5 — Chassis ground:</b>	Is the resistance less than 5 $\Omega$ ?	Go to step 5.	Repair poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>
<b>5 CHECK POWER SUPPLY OF ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between accelerator pedal position sensor connector and chassis ground.  <b>Connector &amp; terminal</b> <b>(B315) No. 4 (+) — Chassis ground (-):</b>	Is the voltage 4.5 — 5.5 V?	Go to step 6.	Repair the short circuit of harness between ECM connector and accelerator pedal position sensor connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>
<b>6 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Turn the ignition switch to OFF. 2) Connect the accelerator pedal position sensor connector. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM connector and chassis ground.  <b>Connector &amp; terminal</b> <b>(B135) No. 23 (+) — Chassis ground (-):</b>	Is the voltage less than 4.8 V?	Repair poor contact in ECM connector. Replace the ECM if defective.	Repair the poor contact of accelerator pedal position sensor connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-266, DTC P2127 THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

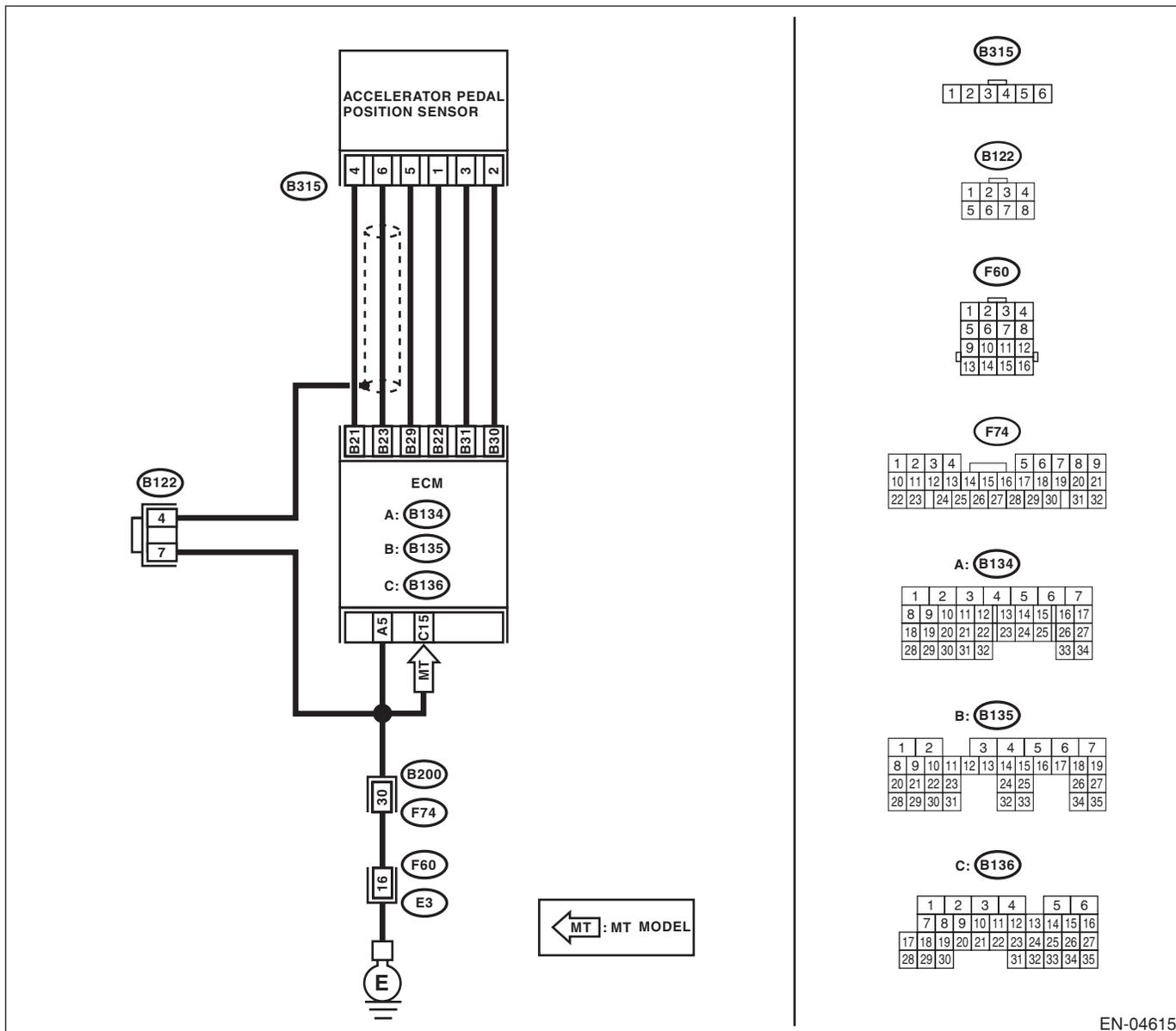
### TROUBLE SYMPTOM:

- Improper idling
- Poor driving performance

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-04615

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK ACCELERATOR PEDAL POSITION SENSOR OUTPUT.</b> 1) Turn the ignition switch to ON. 2) Read the data of sub accelerator pedal position sensor signal using Subaru Select Monitor.	Is the voltage more than 0.4 V?	Go to step 2.	Go to step 3.
<b>2 CHECK POOR CONTACT.</b> Check poor contact of connector between ECM and accelerator pedal position sensor.	Is there poor contact?	Repair the poor contact.	Temporary poor contact occurred, but it is normal at present.
<b>3 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM. 3) Disconnect the connectors from accelerator pedal position sensor. 4) Measure the resistance between ECM connector and accelerator pedal position sensor connector. <i>Connector &amp; terminal</i> (B135) No. 22 — (B315) No. 1: (B135) No. 31 — (B315) No. 3:	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open circuit of harness connector.
<b>4 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b> Measure the resistance between ECM connector and chassis ground. <i>Connector &amp; terminal</i> (B135) No. 22 — Chassis ground: (B135) No. 31 — Chassis ground:	Is the resistance more than 1 M $\Omega$ ?	Go to step 5.	Repair the chassis short circuit of harness.
<b>5 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Connect the ECM connector. 2) Measure the resistance between accelerator pedal position sensor connector and chassis ground. <i>Connector &amp; terminal</i> (B315) No. 2 — Chassis ground:	Is the resistance less than 5 $\Omega$ ?	Go to step 6.	Repair poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>
<b>6 CHECK POWER SUPPLY OF ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between accelerator pedal position sensor connector and chassis ground. <i>Connector &amp; terminal</i> (B315) No. 1 (+) — Chassis ground (-):	Is the voltage 4.5 — 5.5 V?	Replace the accelerator pedal position sensor. <Ref. to SP(H4SO)-3, Accelerator Pedal.>	Repair poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-268, DTC P2128 THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

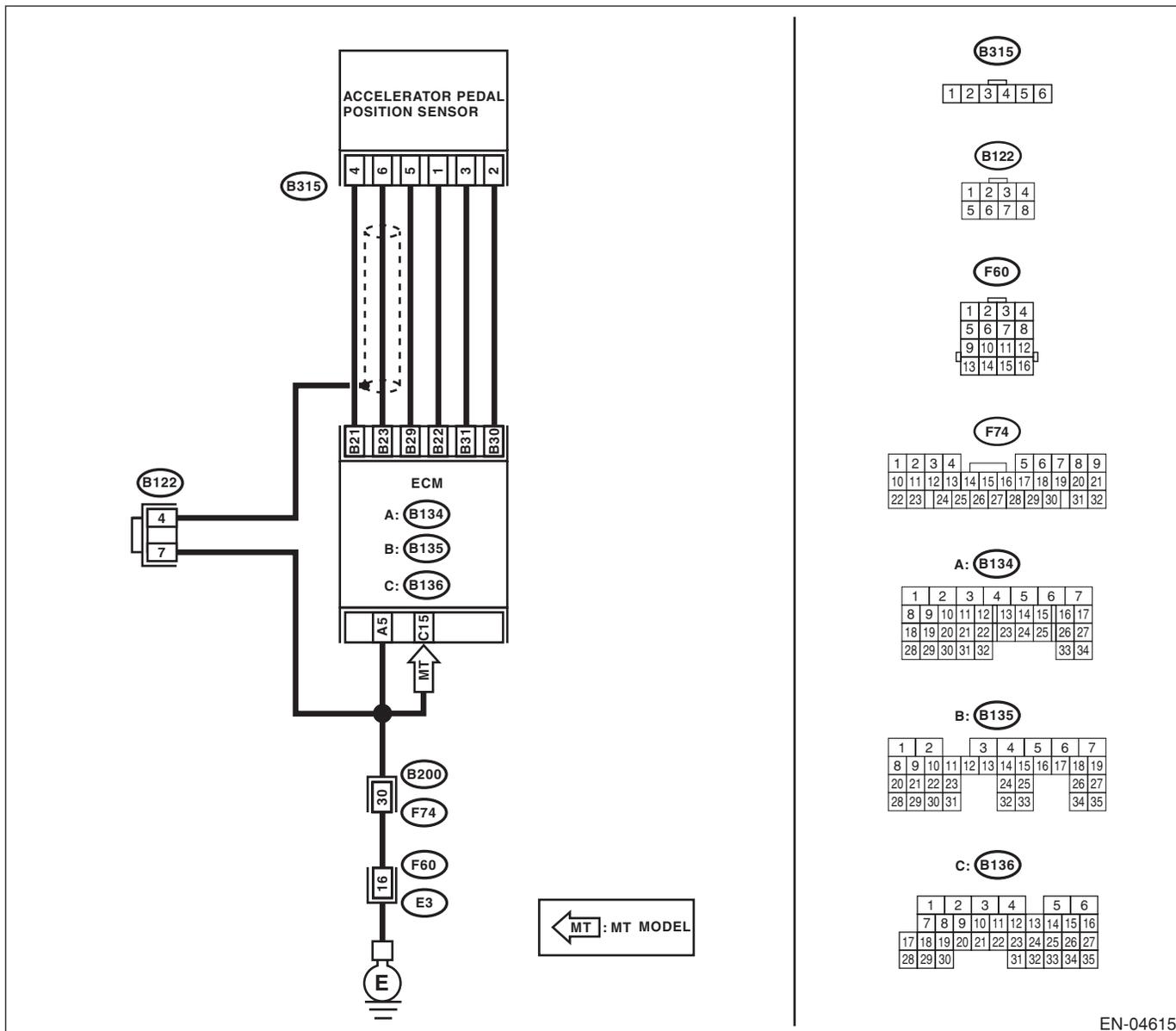
### TROUBLE SYMPTOM:

- Improper idling
- Poor driving performance

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-04615

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK ACCELERATOR PEDAL POSITION SENSOR OUTPUT.</b> 1) Turn the ignition switch to ON. 2) Read the data of sub accelerator pedal position sensor signal using Subaru Select Monitor.	Is the voltage less than 4.8 V?	Go to step 2.	Go to step 3.
<b>2 CHECK POOR CONTACT.</b> Check poor contact of connector between ECM and accelerator pedal position sensor.	Is there poor contact?	Repair the poor contact.	Temporary poor contact occurred, but it is normal at present.
<b>3 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM. 3) Disconnect the connectors from accelerator pedal position sensor. 4) Measure the resistance between ECM connector and accelerator pedal position sensor connector.  <b>Connector &amp; terminal</b> <b>(B135) No. 22 — (B315) No. 1:</b> <b>(B135) No. 30 — (B315) No. 2:</b> <b>(B135) No. 31 — (B315) No. 3:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open circuit of harness connector.
<b>4 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Connect the ECM connector. 2) Measure the resistance between accelerator pedal position sensor connector and chassis ground.  <b>Connector &amp; terminal</b> <b>(B315) No. 2 — Chassis ground:</b>	Is the resistance less than 5 $\Omega$ ?	Go to step 5.	Repair poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>
<b>5 CHECK POWER SUPPLY OF ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between accelerator pedal position sensor connector and chassis ground.  <b>Connector &amp; terminal</b> <b>(B315) No. 1 (+) — Chassis ground (-):</b>	Is the voltage 4.5 — 5.5 V?	Go to step 6.	Repair the short circuit of harness between ECM connector and accelerator pedal position sensor connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>
<b>6 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Turn the ignition switch to OFF. 2) Connect the accelerator pedal position sensor connector. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM connector and chassis ground.  <b>Connector &amp; terminal</b> <b>(B135) No. 31 (+) — Chassis ground (-):</b>	Is the voltage less than 4.8 V?	Repair poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>	Repair the poor contact of accelerator pedal position sensor connector. Replace the accelerator pedal position sensor if defective. <Ref. to SP(H4SO)-3, Accelerator Pedal.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## EC:DTC P2135 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A"/"B" VOLTAGE CORRELATION

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-270, DTC P2135 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A"/"B" VOLTAGE CORRELATION, Diagnostic Trouble Code (DTC) Detecting Criteria.>

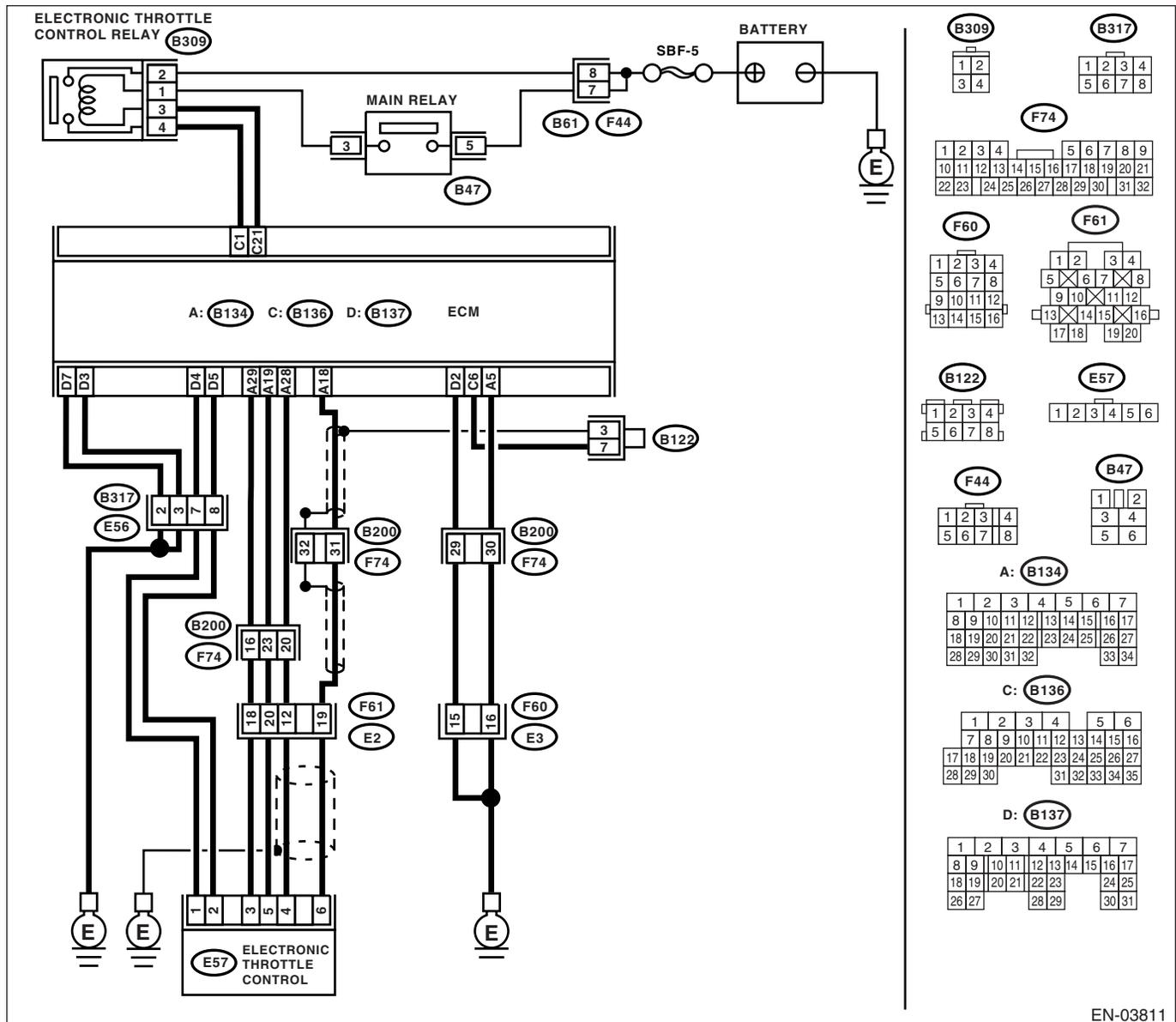
### TROUBLE SYMPTOM:

- Improper idling
- Poor driving performance

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>

### WIRING DIAGRAM:



EN-03811

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK SENSOR OUTPUT.</b>                      1) Turn the ignition switch to ON.                      2) Measure the voltage between ECM connector terminals.  <i><b>Connector &amp; terminal</b></i>  <i><b>(B134) No. 18 (+) — (B134) No. 29 (-):</b></i>                      3) Check the voltage change while shaking the ECM harness and connector, engine harness connector, and electronic control throttle connector harness.</p>	Is the voltage more than 0.4 V?	Go to step 2.	Go to step 4.
<p><b>2</b></p> <p><b>CHECK SENSOR OUTPUT.</b>                      1) Measure the voltage between ECM connector terminals.  <i><b>Connector &amp; terminal</b></i>  <i><b>(B134) No. 28 (+) — (B134) No. 29 (-):</b></i>                      2) Check the voltage change while shaking the ECM harness and connector, engine harness connector, and electronic control throttle connector harness.</p>	Is the voltage more than 0.8 V?	Go to step 3.	Go to step 4.
<p><b>3</b></p> <p><b>CHECK POOR CONTACT.</b>                      Check poor contact in connector between ECM and electronic throttle control.</p>	Is there poor contact?	Repair the poor contact.	Go to step 14.
<p><b>4</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b>                      1) Turn the ignition switch to OFF.                      2) Disconnect the connectors from ECM.                      3) Disconnect the connectors from electronic throttle control.                      4) Measure the resistance between ECM connector and electronic throttle control connector.  <i><b>Connector &amp; terminal</b></i>  <i><b>(B134) No. 19 — (E57) No. 5:</b></i></p>	Is the resistance less than 1 $\Omega$ ?	Go to step 5.	Repair the open circuit of harness connector.
<p><b>5</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b>                      Measure the resistance between ECM connector and chassis ground.  <i><b>Connector &amp; terminal</b></i>  <i><b>(B134) No. 19 — Chassis ground:</b></i>  <i><b>(B134) No. 18 — Chassis ground:</b></i>  <i><b>(B134) No. 28 — Chassis ground:</b></i></p>	Is the resistance more than 1 M $\Omega$ ?	Go to step 6.	Repair the ground short circuit of harness.
<p><b>6</b></p> <p><b>CHECK SENSOR POWER SUPPLY.</b>                      1) Connect the ECM connector.                      2) Turn the ignition switch to ON.                      3) Measure the voltage between electronic throttle control connector and engine ground.  <i><b>Connector &amp; terminal</b></i>  <i><b>(E57) No. 5 (+) — Engine ground (-):</b></i>                      4) Check the voltage change by shaking the harness and connector of ECM and engine harness connector while monitoring the value with voltage meter.</p>	Is the voltage 4.5 — 5.5 V?	Go to step 7.	Repair poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>
<p><b>7</b></p> <p><b>CHECK SHORT CIRCUIT IN ECM.</b>                      1) Turn the ignition switch to OFF.                      2) Measure the resistance between electronic throttle control connector and engine ground.  <i><b>Connector &amp; terminal</b></i>  <i><b>(E57) No. 4 — Engine ground:</b></i>  <i><b>(E57) No. 6 — Engine ground:</b></i></p>	Is the resistance more than 10 $\Omega$ ?	Go to step 8.	Repair poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>8 CHECK SENSOR OUTPUT.</b> 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. 4) Check the voltage change while shaking the ECM harness and connector, engine harness connector, and electronic control throttle connector harness.	Is the voltage less than 4.63 V?	Go to step 9.	Go to step 11.
<b>9 CHECK SENSOR OUTPUT.</b> 1) Read the data of sub throttle sensor signal using Subaru Select Monitor. 2) Check the voltage change while shaking the ECM harness and connector, engine harness connector, and electronic control throttle connector harness.	Is the voltage less than 4.73 V?	Go to step 10.	Go to step 11.
<b>10 CHECK POOR CONTACT.</b> 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.
<b>11 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM. 3) Disconnect the connectors from electronic throttle control. 4) Measure the resistance between ECM connector and electronic throttle control connector. <b>Connector &amp; terminal</b> (B134) No. 18 — (E57) No. 6: (B134) No. 28 — (E57) No. 4: (B134) No. 29 — (E57) No. 3:	Is the resistance less than 1 $\Omega$ ?	Go to step 12.	Repair the open circuit of harness connector.
<b>12 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Connect the ECM connector. 2) Measure the resistance between electronic throttle control connector and engine ground. <b>Connector &amp; terminal</b> (E57) No. 3 — Engine ground:	Is the resistance less than 5 $\Omega$ ?	Go to step 13.	Repair poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>
<b>13 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Connect the ECM connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between electronic throttle control connector and engine ground. <b>Connector &amp; terminal</b> (E57) No. 5 (+) — Engine ground (-): 4) Check the voltage change by shaking the harness and connector of ECM and engine harness connector while monitoring the value with voltage meter.	Is the voltage less than 10 V?	Go to step 14.	Repair the battery short circuit of harness between ECM connector and electronic throttle control connector.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>14</b> <b>CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Measure the voltage between electronic throttle control connector and engine ground. <i>Connector &amp; terminal</i> <i>(E57) No. 4 (+) — Engine ground (-):</i> <i>(E57) No. 6 (+) — Engine ground (-):</i> 2) Check the voltage change by shaking the harness and connector of ECM and engine harness connector while monitoring the value with voltage meter.	Is the voltage less than 10 V?	Go to step 15.	Repair the short circuit of harness between ECM connector and electronic throttle control connector.
<b>15</b> <b>CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the ECM connector. 3) Measure the resistance between ECM connectors. <i>Connector &amp; terminal</i> <i>(B134) No. 18 — (B134) No. 29:</i> <i>(B134) No. 28 — (B134) No. 29:</i>	Is the resistance more than 1 M $\Omega$ ?	Go to step 16.	Repair the short circuit to sensor power supply.
<b>16</b> <b>CHECK ELECTRONIC THROTTLE CONTROL HARNESS.</b> 1) Disconnect the connectors from ECM. 2) Disconnect the connectors from electronic throttle control. 3) Measure the resistance between electronic throttle control connector terminals. <i>Connector &amp; terminal</i> <i>(E57) No. 6 — (E57) No. 4:</i>	Is the resistance more than 1 M $\Omega$ ?	Repair poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>	Repair the short circuit of harness.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## ED:DTC P2138 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D"/"E" VOLTAGE CORRELATION

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-272, DTC P2138 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D"/"E" VOLTAGE CORRELATION, Diagnostic Trouble Code (DTC) Detecting Criteria.>

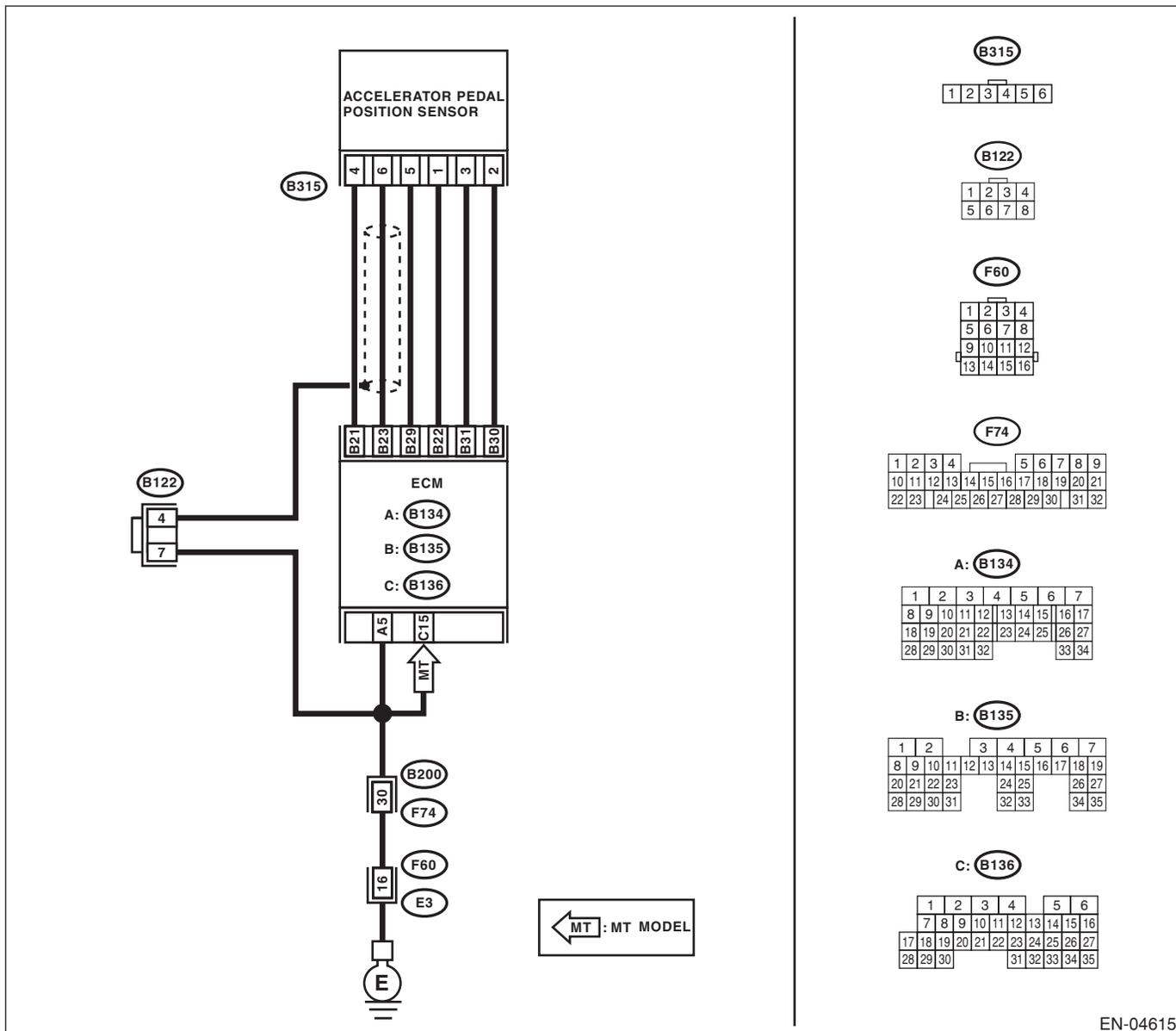
### TROUBLE SYMPTOM:

- Improper idling
- Poor driving performance

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

### WIRING DIAGRAM:



EN-04615

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK ACCELERATOR PEDAL POSITION SENSOR OUTPUT.</b> 1) Turn the ignition switch to ON. 2) Read the data of main accelerator pedal position sensor signal and sub accelerator pedal position sensor signal using Subaru Select Monitor. NOTE: For detailed operation procedure, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.>	Is the voltage more than 0.4 V?	Go to step 2.	Go to step 4.
<b>2 CHECK ACCELERATOR PEDAL POSITION SENSOR OUTPUT.</b> 1) Turn the ignition switch to ON. 2) Read the data of main accelerator pedal position sensor signal and sub accelerator pedal position sensor signal using Subaru Select Monitor. NOTE: For detailed operation procedure, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.>	Is the voltage less than 4.8 V?	Go to step 3.	Go to step 4.
<b>3 CHECK POOR CONTACT.</b> Check poor contact of connector between ECM and accelerator pedal position sensor.	Is there poor contact?	Repair the poor contact.	Temporary poor contact occurred, but it is normal at present.
<b>4 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM. 3) Disconnect the connectors from accelerator pedal position sensor. 4) Measure the resistance between ECM connector and accelerator pedal position sensor connector. <b>Connector &amp; terminal</b> (B135) No. 22 — (B315) No. 1: (B135) No. 30 — (B315) No. 2: (B135) No. 31 — (B315) No. 3: (B135) No. 21 — (B315) No. 4: (B135) No. 29 — (B315) No. 5: (B135) No. 23 — (B315) No. 6:	Is the resistance less than 1 $\Omega$ ?	Go to step 5.	Repair the open circuit of harness connector.
<b>5 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b> Measure the resistance between ECM connector and chassis ground. <b>Connector &amp; terminal</b> (B135) No. 23 — Chassis ground: (B135) No. 21 — Chassis ground: (B135) No. 31 — Chassis ground: (B135) No. 22 — Chassis ground:	Is the resistance more than 1 M $\Omega$ ?	Go to step 6.	Repair the chassis short circuit of harness.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>6</b> <b>CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Connect the ECM connector. 2) Measure the resistance between accelerator pedal position sensor connector and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B315) No. 2 — Chassis ground:</b></i> <i><b>(B315) No. 5 — Chassis ground:</b></i>	Is the resistance less than 5 $\Omega$ ?	Go to step 7.	Repair the poor contact of ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>
<b>7</b> <b>CHECK POWER SUPPLY OF ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between accelerator pedal position sensor connector and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B315) No. 1 (+) — Chassis ground (-):</b></i> <i><b>(B315) No. 4 (+) — Chassis ground (-):</b></i>	Is the voltage 4.5 — 5.5 V?	Go to step 8.	Repair the poor contact of ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>
<b>8</b> <b>CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Turn the ignition switch to OFF. 2) Connect the accelerator pedal position sensor connector. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM connector and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B135) No. 31 (+) — Chassis ground (-):</b></i> <i><b>(B135) No. 23 (+) — Chassis ground (-):</b></i>	Is the voltage less than 4.8 V?	Go to step 9.	Repair the poor contact of accelerator pedal position sensor connector. Replace the accelerator pedal position sensor if defective. <Ref. to SP(H4SO)-3, Accelerator Pedal.>
<b>9</b> <b>CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM. 3) Disconnect the connectors from accelerator pedal position sensor. 4) Measure the resistance between connector terminals of accelerator pedal position sensor. <i><b>Connector &amp; terminal</b></i> <i><b>(B315) No. 6 — (B315) No. 3:</b></i>	Is the resistance more than 1 M $\Omega$ ?	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>	Repair the short circuit of harness between ECM connector and accelerator pedal position sensor connector.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## EE:DTC P2227 BAROMETRIC PRESSURE CIRCUIT RANGE/PERFORMANCE

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-274, DTC P2227 BAROMETRIC PRESSURE CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Check DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>	Replace the ECM. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).> NOTE: The atmospheric pressure sensor is built into the ECM.

## EF:DTC P2228 BAROMETRIC PRESSURE CIRCUIT LOW

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-275, DTC P2228 BAROMETRIC PRESSURE CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Check DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>	Replace the ECM. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).> NOTE: The atmospheric pressure sensor is built into the ECM.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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## EG:DTC P2229 BAROMETRIC PRESSURE CIRCUIT HIGH

### DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-276, DTC P2229 BAROMETRIC PRESSURE CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### CAUTION:

After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Check DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-65, List of Diagnostic Trouble Code (DTC).>	Replace the ECM. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).> NOTE: The atmospheric pressure sensor is built into the ECM.

## **EH:DTC P2431 SECONDARY AIR INJECTION SYSTEM AIR FLOW /PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE**

### **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-277, DTC P2431 SECONDARY AIR INJECTION SYSTEM AIR FLOW /PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

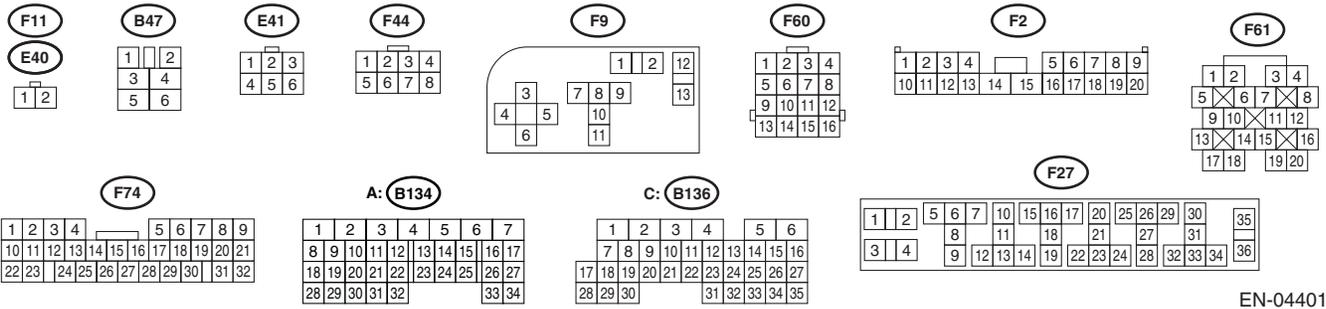
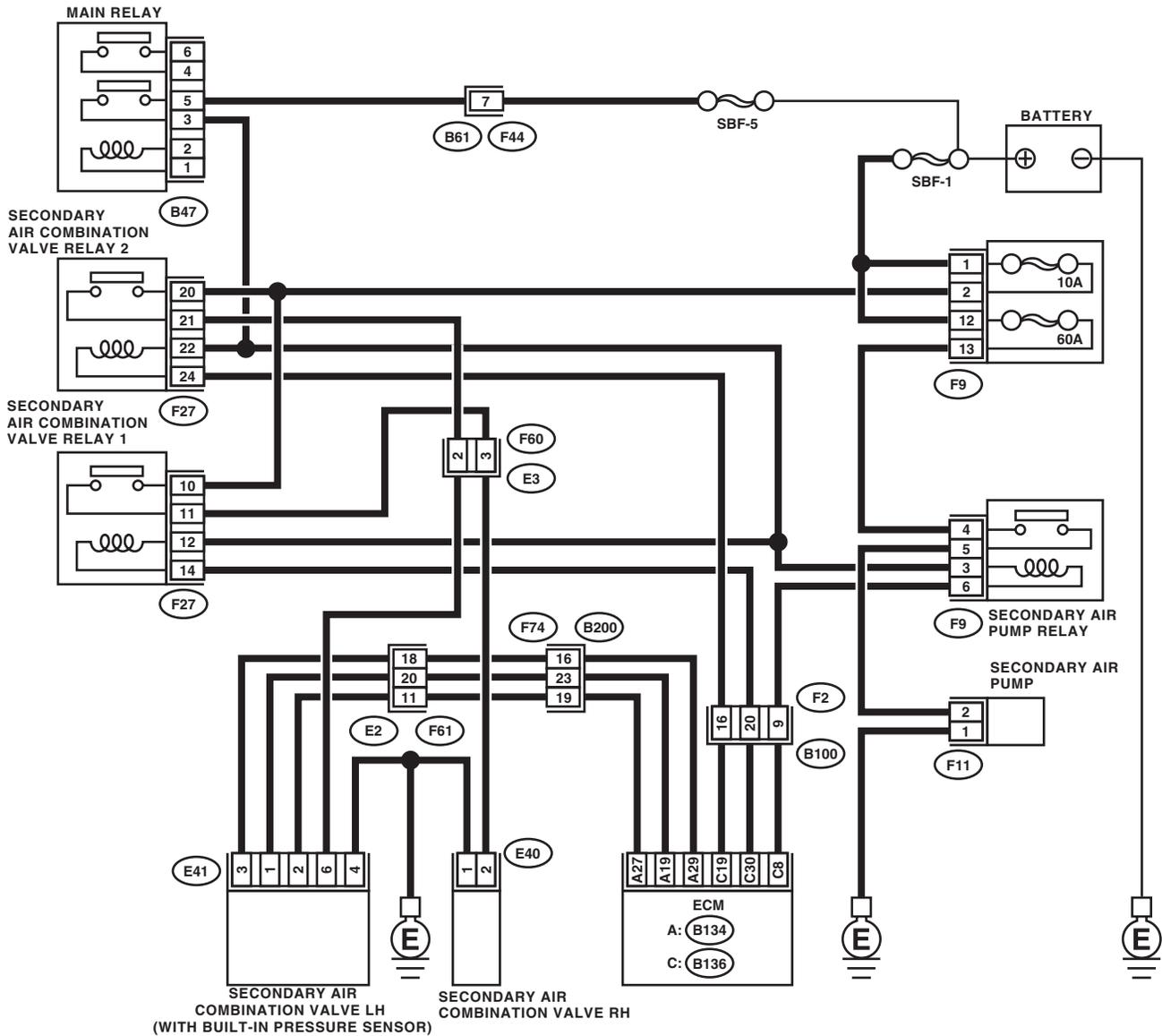
### **CAUTION:**

**After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## WIRING DIAGRAM:



EN-04401

Step	Check	Yes	No	
1	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Check the relative DTC.	Go to step 2.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>2</b></p> <p><b>CHECK CURRENT DATA.</b></p> <p>1) Turn the ignition switch to ON (engine OFF).</p> <p>2) Using the Subaru Select Monitor, read secondary air piping pressure, intake manifold absolute pressure and atmospheric pressure data, and compare with the actual atmospheric pressure.</p> <p>NOTE: Subaru Select Monitor</p> <p>For detailed operation procedure, refer to "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.&gt;</p>	<p>Is the difference with the actual atmospheric pressure Is there 200 mmHg (27 kpa, 8 inHg or 3.9 psig) or more?</p>	<p>Replace the secondary air combination valve (LH). &lt;Ref. to EC(H4DOTC)-10, Secondary Air Combination Valve.&gt;</p> <p>NOTE: The secondary air pressure sensor is a one piece combined part with the secondary air combination valve (LH).</p>	<p>Temporary poor contact occurs. Check for poor contact in the connector.</p>

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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### **EI: DTC P2432 SECONDARY AIR INJECTION SYSTEM AIR FLOW /PRESSURE SENSOR CIRCUIT LOW**

#### **DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-278, DTC P2432 SECONDARY AIR INJECTION SYSTEM AIR FLOW /PRESSURE SENSOR CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

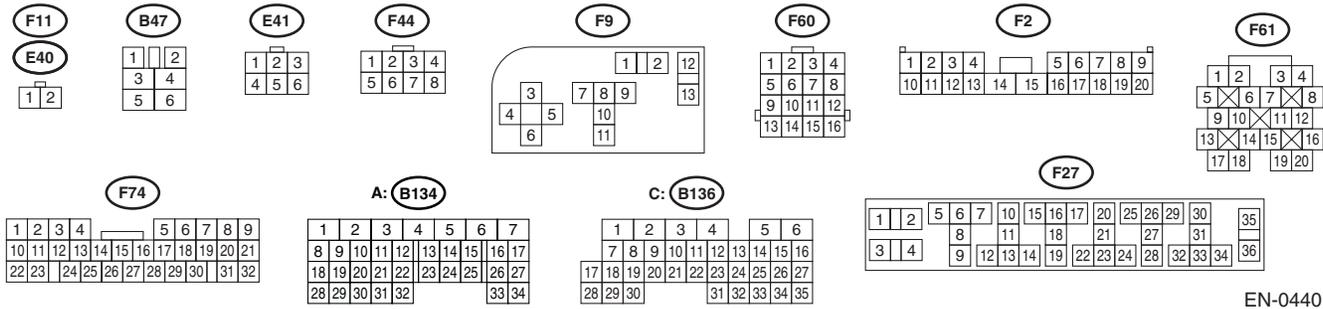
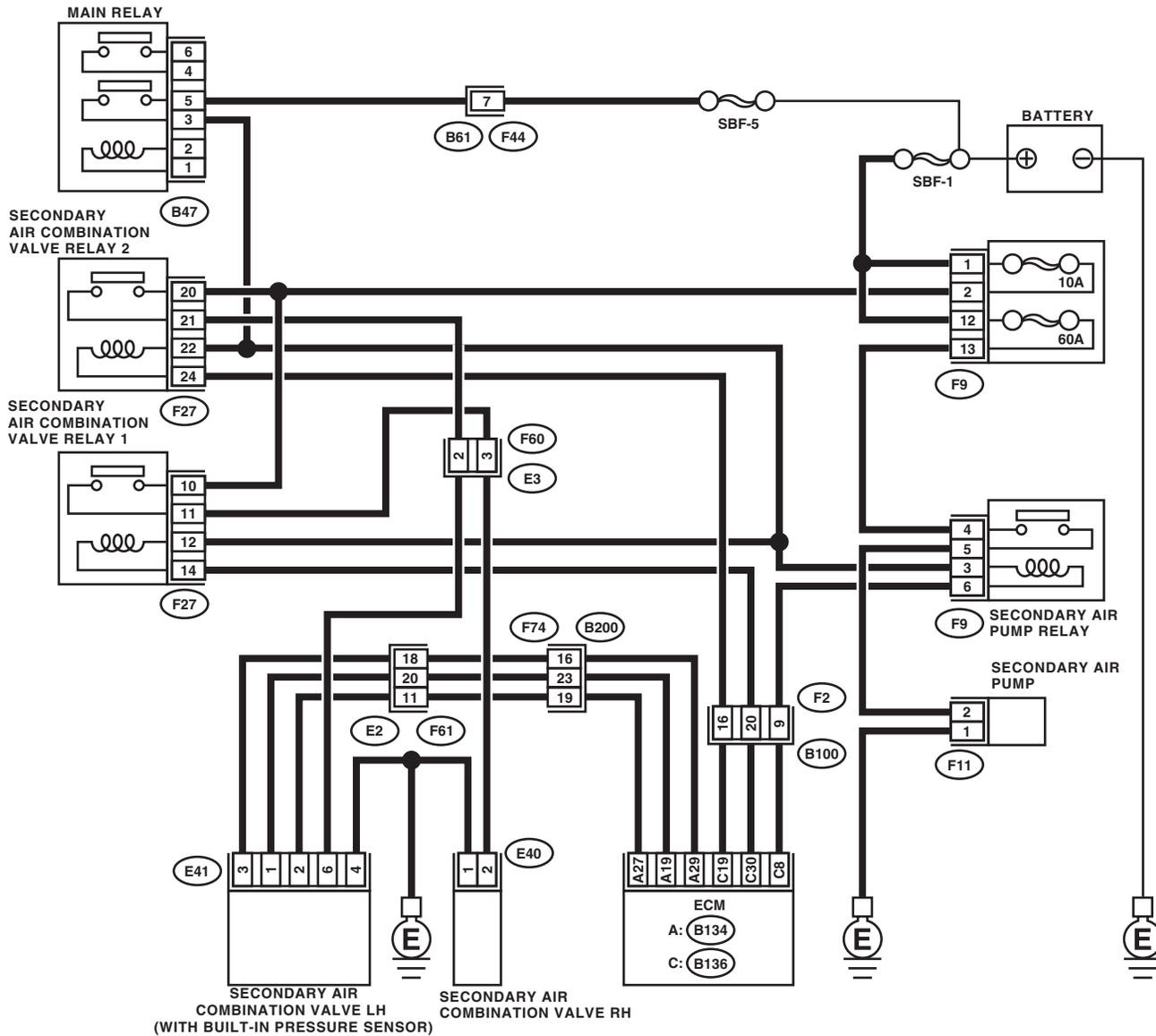
#### **CAUTION:**

**After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## WIRING DIAGRAM:



EN-04401

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE LH CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connector from the ECM and secondary air combination valve LH.                      3) Measure the resistance of the harness between the ECM and secondary air combination valve relay LH connector terminal.</p> <p><b>Connector &amp; terminal</b>                      (B134) No. 27 — (E41) No. 2:                      (B134) No. 19 — (E41) No. 1:                      (B134) No. 29 — (E41) No. 3:</p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step 2.</p>	<p>Repair open circuit of the harness between the ECM and secondary air combination valve relay LH connector terminal.</p>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE LH CONNECTOR.</b></p> <p>Measure the resistance of harness between ECM and chassis ground.</p> <p><b>Connector &amp; terminal</b>                      (B134) No. 27 — Chassis ground:</p>	<p>Is the resistance more than 1 <math>M\Omega</math>?</p>	<p>Temporary poor contact occurs. Check for poor contact in the connector.</p>	<p>Repair the ground short of the harness between the ECM and secondary air combination valve relay LH connector terminal.</p>

## **EJ: DTC P2433 SECONDARY AIR INJECTION SYSTEM AIR FLOW /PRESSURE SENSOR CIRCUIT HIGH**

### **DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-279, DTC P2433 SECONDARY AIR INJECTION SYSTEM AIR FLOW /PRESSURE SENSOR CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

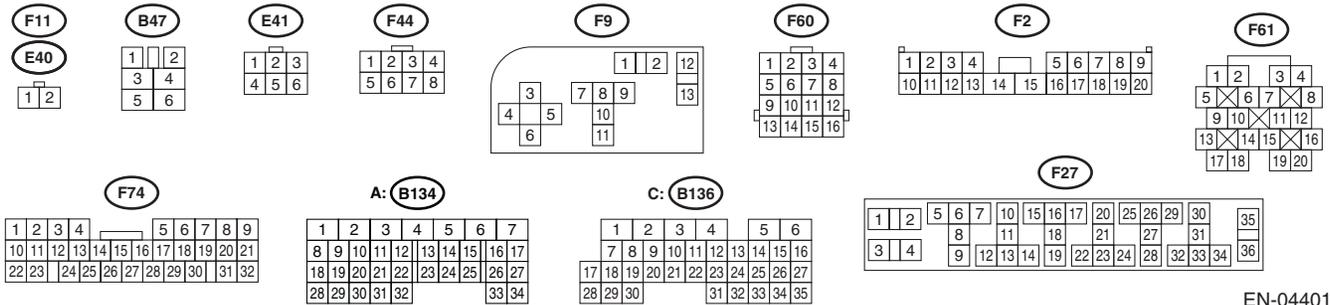
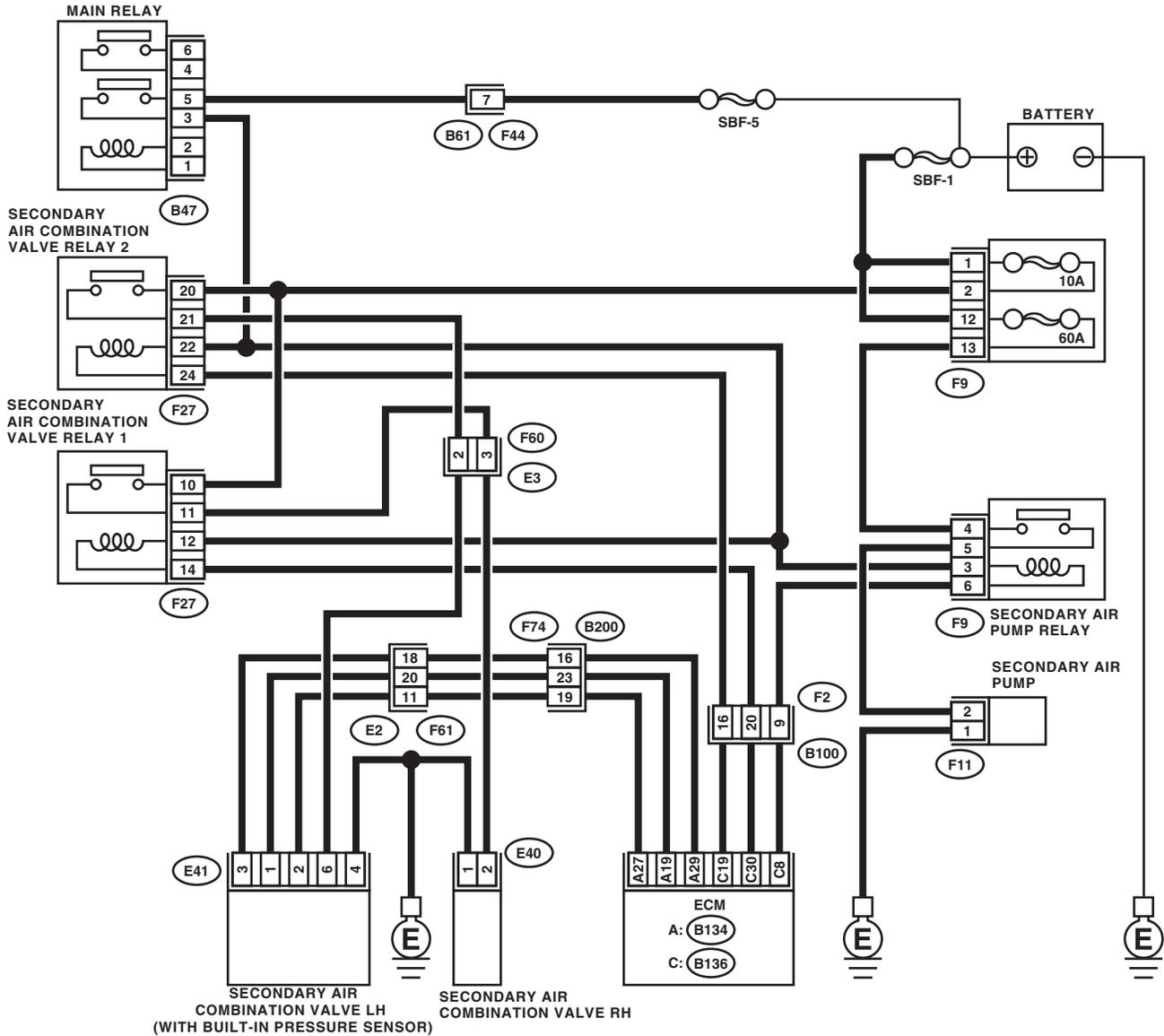
### **CAUTION:**

**After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## WIRING DIAGRAM:



EN-04401

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE LH CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connector from the ECM and secondary air combination valve LH.                      3) Measure the resistance of the harness between the ECM and secondary air combination valve relay LH connector terminal.</p> <p><b>Connector &amp; terminal</b>                      (B134) No. 27 — (E41) No. 2:                      (B134) No. 19 — (E41) No. 1:                      (B134) No. 29 — (E41) No. 3:</p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step 2.</p>	<p>Repair open circuit of the harness between the ECM and secondary air combination valve relay LH connector terminal.</p>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE LH CONNECTOR.</b></p> <p>Measure the voltage between ECM and chassis ground.</p> <p><b>Connector &amp; terminal</b>                      (B134) No. 27 (+) — Chassis ground (-):</p>	<p>Is the voltage more than 5 V?</p>	<p>Repair the short to battery in the harness between the ECM and secondary air combination valve relay LH connector terminal.</p>	<p>Temporary poor contact occurs. Check for poor contact in the connector.</p>

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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### **EK:DTC P2440 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE STUCK OPEN (BANK1)**

#### **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-280, DTC P2440 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE STUCK OPEN (BANK1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

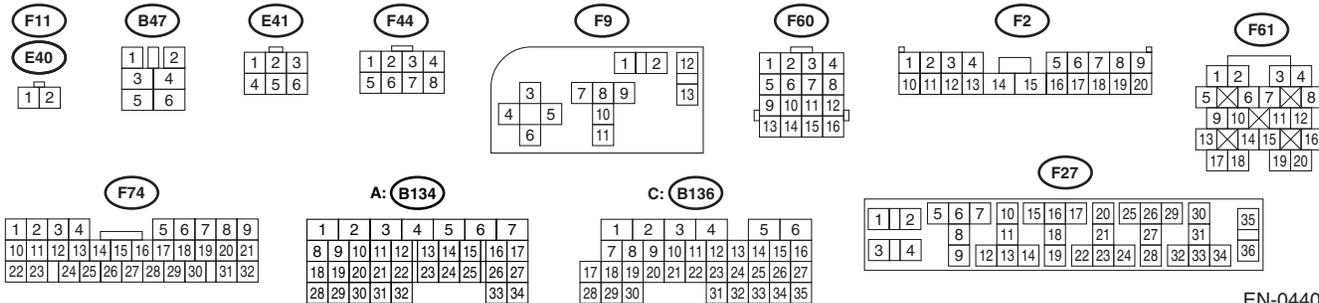
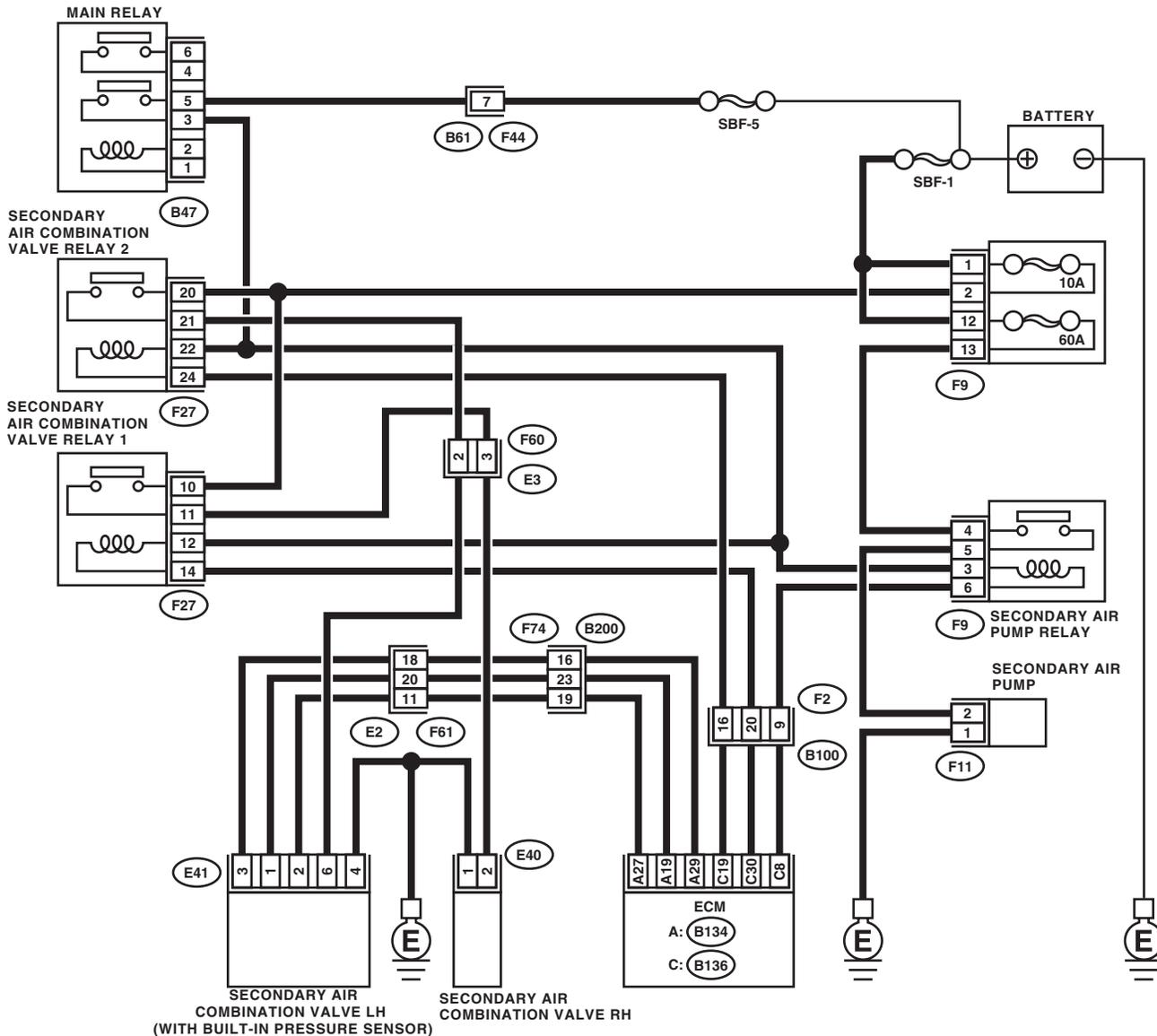
#### **CAUTION:**

**After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## WIRING DIAGRAM:



EN-04401

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1 CHECK SECONDARY AIR COMBINATION VALVE OPERATION.</b></p> <p>1) Connect the test mode connector. 2) Turn the ignition switch to ON. 3) Perform operation check for the secondary air combination valve using the Subaru Select Monitor.</p> <p>NOTE: Subaru Select Monitor Refer to "Compulsory Valve Operation Check Mode" for more operation procedure. &lt;Ref. to EN(H4DOTC)(diag)-47, Compulsory Valve Operation Check Mode.&gt;</p>	<p>Does the secondary air combination valve operate properly?</p>	Go to step 2.	Go to step 4.
<p><b>2 CHECK DUCT BETWEEN SECONDARY AIR PUMP AND SECONDARY AIR COMBINATION VALVE.</b></p> <p>Inspection of the duct between the secondary air pump and secondary air combination valve.</p>	<p>Is there damage or disconnection of the duct?</p>	Replace or connect the duct.	Go to step 3.
<p><b>3 CHECK PIPE BETWEEN SECONDARY AIR COMBINATION VALVE AND CYLINDER HEAD.</b></p> <p>Inspection of the pipe between the secondary air combination valve and cylinder head.</p>	<p>Is there damage or disconnection of the pipe?</p>	Replace or connect the pipe.	Temporary poor contact occurs. Check for poor contact in the connector.
<p><b>4 CHECK POWER SUPPLY TO SECONDARY AIR COMBINATION VALVE.</b></p> <p>In the condition of step 1, measure the voltage between the secondary air combination valve and the chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(E40) No. 2 (+) — Chassis ground (-):</b></p>	<p>Is the voltage more than 10 V?</p>	Replace the secondary air combination valve.	Go to step 5.
<p><b>5 CHECK HARNESS BETWEEN SECONDARY AIR COMBINATION VALVE RELAY AND SECONDARY AIR COMBINATION VALVE CONNECTOR TERMINAL.</b></p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from the secondary air combination valve relay and secondary air combination valve. 3) Measure resistance between the secondary air combination valve relay and secondary air combination valve connector terminal.</p> <p><b>Connector &amp; terminal</b> <b>(F27) No. 11 — (E40) No. 2:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	Go to step 6.	Repair the open circuit between the secondary air combination valve relay and secondary air combination valve connector terminal.
<p><b>6 CHECK SECONDARY AIR COMBINATION VALVE RELAY.</b></p> <p>1) Turn the ignition switch to OFF. 2) Remove the secondary air pump relay from the relay box. 3) Connect the battery to the secondary air combination valve relay terminals No. 12 and 14. 4) Measure the resistance between the secondary air combination valve relay terminals.</p> <p><b>Terminals</b> <b>No. 10 — No. 11:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	Go to step 7.	Replace the secondary air combination valve relay.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>7</b> <b>CHECK SECONDARY AIR COMBINATION VALVE RELAY POWER SOURCE.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between the secondary air combination valve relay connector and chassis ground. <b>Connector &amp; terminal</b> <b>(F27) No. 10 (+) — Chassis ground (-):</b> <b>(F27) No. 12 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Go to step <b>8</b> .	Repair the open or ground short circuit of power supply circuit.
<b>8</b> <b>CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE RELAY CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector of ECM. 3) Measure the resistance of the harness between the ECM and secondary air combination valve relay connector terminal. <b>Connector &amp; terminal</b> <b>(B136) No. 30 — (F27) No. 14:</b>	Is the resistance less than 1 $\Omega$ ?	Replace the ECM. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>	Repair open circuit of the harness between the ECM and secondary air pump relay connector terminal.

## EL:DTC P2441 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE STUCK CLOSED (BANK1)

### NOTE:

For the diagnostic procedure, refer to DTC P2440. <Ref. to EN(H4DOTC)(diag)-376, DTC P2440 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE STUCK OPEN (BANK1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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### **EM:DTC P2442 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE STUCK OPEN (BANK2)**

#### **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-280, DTC P2442 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE STUCK OPEN (BANK2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

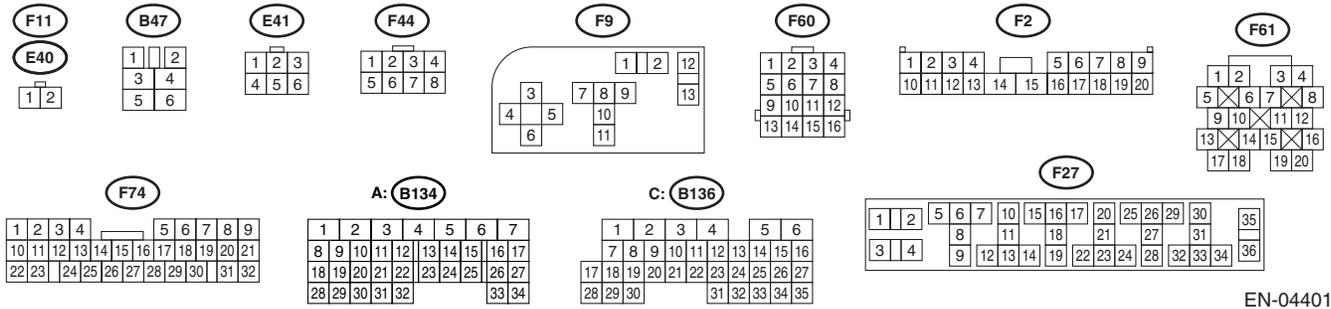
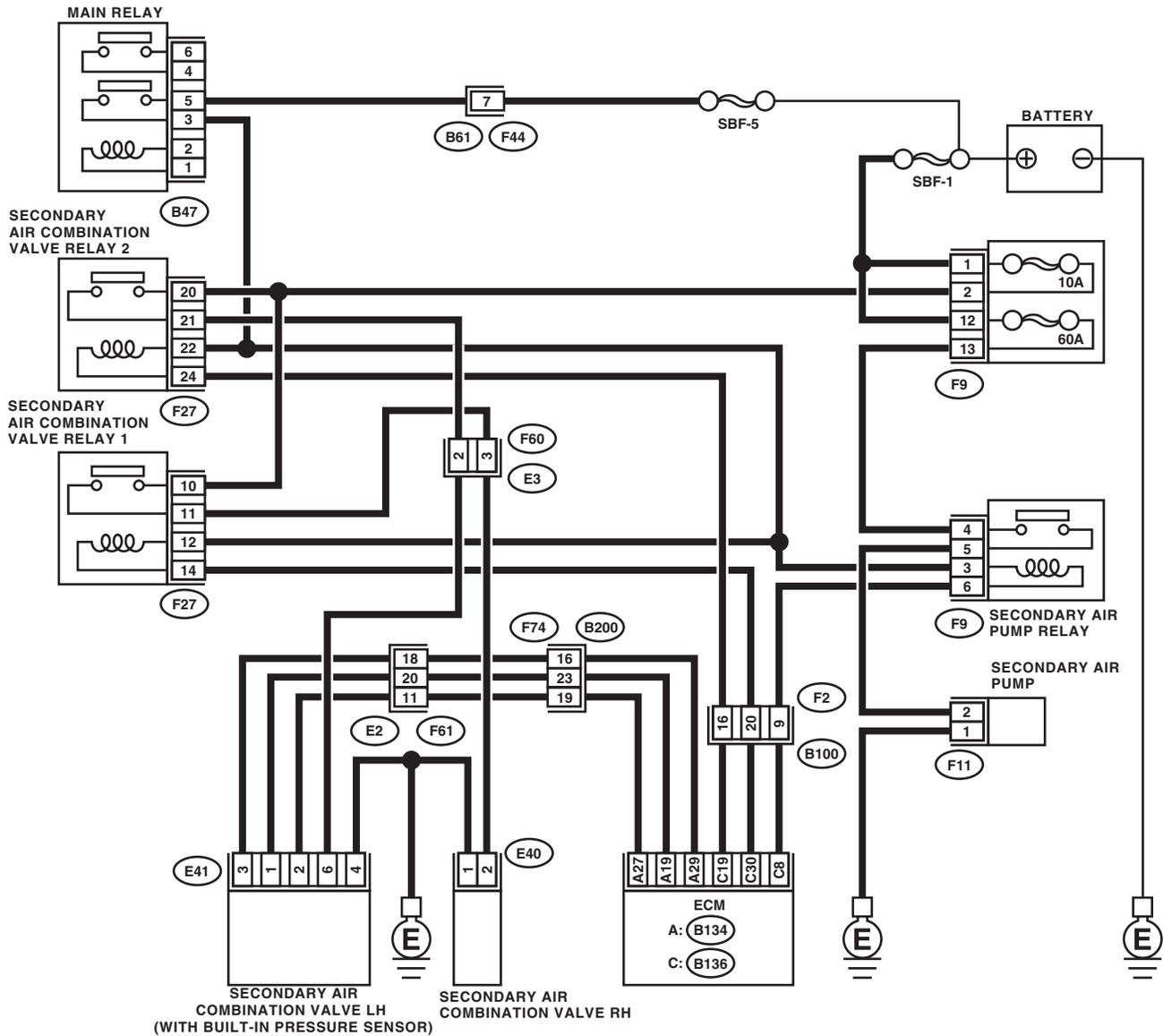
#### **CAUTION:**

**After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## WIRING DIAGRAM:



EN-04401

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>1 CHECK SECONDARY AIR COMBINATION VALVE OPERATION.</b></p> <p>1) Connect the test mode connector. 2) Turn the ignition switch to ON. 3) Perform operation check for the secondary air combination valve using the Subaru Select Monitor.</p> <p>NOTE: Subaru Select Monitor Refer to "Compulsory Valve Operation Check Mode" for more operation procedure. &lt;Ref. to EN(H4DOTC)(diag)-47, Compulsory Valve Operation Check Mode.&gt;</p>	<p>Do the secondary air combination valve operate properly?</p>	Go to step 2.	Go to step 4.
<p><b>2 CHECK DUCT BETWEEN SECONDARY AIR PUMP AND SECONDARY AIR COMBINATION VALVE.</b></p> <p>Inspection of the duct between the secondary air pump and secondary air combination valve.</p>	<p>Is there damage or disconnection of the duct?</p>	Replace or connect the duct.	Go to step 3.
<p><b>3 CHECK PIPE BETWEEN SECONDARY AIR COMBINATION VALVE AND CYLINDER HEAD.</b></p> <p>Inspection of the pipe between the secondary air combination valve and cylinder head.</p>	<p>Is there damage or disconnection of the pipe?</p>	Replace or connect the pipe.	Temporary poor contact occurs. Check for poor contact in the connector.
<p><b>4 CHECK POWER SUPPLY TO SECONDARY AIR COMBINATION VALVE.</b></p> <p>In the condition of step 1, measure the voltage between the secondary air combination valve and the chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(E41) No. 6 (+) — Chassis ground (-):</b></p>	<p>Is the voltage more than 10 V?</p>	Replace the secondary air combination valve.	Go to step 5.
<p><b>5 CHECK HARNESS BETWEEN SECONDARY AIR COMBINATION VALVE RELAY AND SECONDARY AIR COMBINATION VALVE CONNECTOR TERMINAL.</b></p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from the secondary air combination valve relay and secondary air combination valve. 3) Measure resistance between the secondary air combination valve relay and secondary air combination valve connector terminal.</p> <p><b>Connector &amp; terminal</b> <b>(F27) No. 21 — (E21) No. 6:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	Go to step 6.	Repair the open circuit between the secondary air combination valve relay and secondary air combination valve connector terminal.
<p><b>6 CHECK SECONDARY AIR COMBINATION VALVE RELAY.</b></p> <p>1) Turn the ignition switch to OFF. 2) Remove the secondary air pump relay from the relay box. 3) Connect the battery to the secondary air combination valve relay terminals No. 22 and 24. 4) Measure the resistance between the secondary air combination valve relay terminals.</p> <p><b>Terminals</b> <b>No. 20 — No. 21:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	Go to step 7.	Replace the secondary air combination valve relay.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>7</b> <b>CHECK SECONDARY AIR COMBINATION VALVE RELAY POWER SOURCE.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between the secondary air combination valve relay connector and chassis ground. <b>Connector &amp; terminal</b> <b>(F27) No. 20 (+) — Chassis ground (-):</b> <b>(F27) No. 22 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Go to step 8.	Repair the open or ground short circuit of power supply circuit.
<b>8</b> <b>CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE RELAY CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector of ECM. 3) Measure the resistance of the harness between the ECM and secondary air combination valve relay connector terminal. <b>Connector &amp; terminal</b> <b>(B136) No. 19 — (F27) No. 24:</b>	Is the resistance less than 1 $\Omega$ ?	Replace the ECM. <Ref. to FU(H4DOTC)-45, Engine Control Module (ECM).>	Repair open circuit of the harness between the ECM and secondary air pump relay connector terminal.

## EN:DTC P2443 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE STUCK CLOSED (BANK2)

### NOTE:

For the diagnostic procedure, refer to DTC P2442. <Ref. to EN(H4DOTC)(diag)-380, DTC P2442 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE STUCK OPEN (BANK2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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### **EO:DTC P2444 SECONDARY AIR INJECTION SYSTEM PUMP STUCK ON DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-281, DTC P2444 SECONDARY AIR INJECTION SYSTEM PUMP STUCK ON, Diagnostic Trouble Code (DTC) Detecting Criteria.>

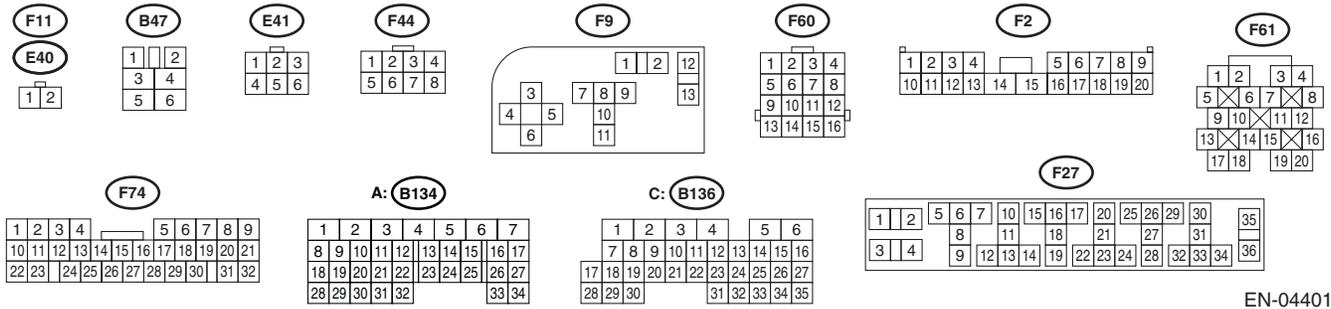
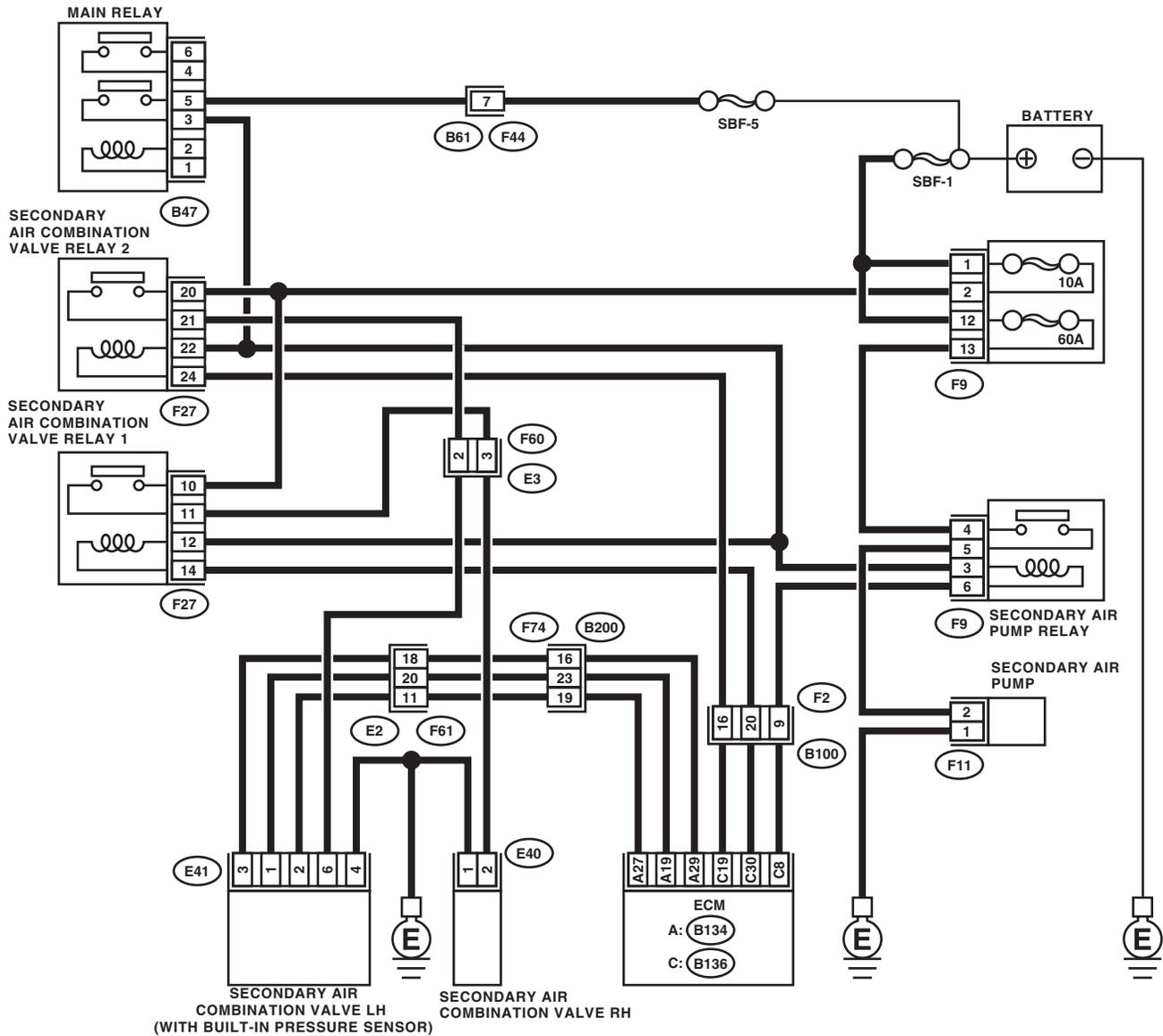
### **CAUTION:**

**After repairing or replacing the defective part, carry out the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-46, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

## WIRING DIAGRAM:



EN-04401

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1</b> <b>CHECK SECONDARY AIR PIPING PRESSURE.</b> 1) Turn the ignition switch to ON (engine OFF). 2) Using the Subaru Select Monitor, read secondary air piping pressure data, and compare with the actual atmospheric pressure. <b>NOTE:</b> Subaru Select Monitor For detailed operation procedure, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-27, Subaru Select Monitor.>	Is the difference with the actual atmospheric pressure 50 mmHg (6.7 kpa, 2.0 inHg or 0.97 psig) or more?	Replace the secondary air combination valve (LH). <Ref. to EC(H4DOTC)-10, Secondary Air Combination Valve.> <b>NOTE:</b> The secondary air pressure sensor is a one piece combined part with the secondary air combination valve (LH).	Go to step 2.
<b>2</b> <b>CHECK POWER SUPPLY TO SECONDARY AIR PUMP.</b> 1) Turn the ignition switch to ON (engine OFF). 2) Measure the voltage between the secondary air pump and chassis ground. <b>Connector &amp; terminal</b> <b>(F11) No. 2 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Go to step 3.	Temporary poor contact occurs. Check for poor contact in the connector.
<b>3</b> <b>CHECK SECONDARY AIR PUMP RELAY.</b> 1) Turn the ignition switch to OFF. 2) Remove the secondary air pump relay from the relay box. 3) Measure the resistance between the secondary air pump relay terminals. <b>Terminals</b> <b>No. 4 — No. 5:</b>	Is the resistance more than 1 MΩ?	Repair the battery short between the secondary air pump relay and secondary air pump connector terminal.	Replace the secondary air pump relay.