ENGINE (DIÀGNOSTICS)

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

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

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

Immediately at fault recognition

#### **TROUBLE SYMPTOM:**

- Engine stalls.
- · Erroneous idling

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, Inspection Mode.>.

	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""></ref.>	Go to step 2.
	CHECK CURRENT DATA.  1) Start the engine and let it idle.  2) Inspect the VVT advance timing and OCV duty output using Subaru Select Monitor and OBD-II general scan tool.  NOTE:  • Subaru Select Monitor  For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to="">  • OBD-II general scan tool  For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>	Is the VVT advance timing more than approx. 0°C and the OCV duty output more than approx. 10%?	Inspect the following items and repair or replace if necessary.  • Engine oil (amount, contamination)  • Oil pipe (clog)  • Oil flow control solenoid valve (clog or contamination in oil passage, settling at spring, stuck at valve)  • Intake camshaft (sludge, damage at camshaft)  • Timing belt (timing mark aligning)	A temporary mal- function. Conduct the following to clean the oil pas- sage. Replace the engine oil and idle the engine for 5 minutes, then replace the oil filter and engine oil.

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# B: DTC P0021 — "A" CAMSHAFT POSITION-TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE (BANK 2) —

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

Immediately at fault recognition

#### TROUBLE SYMPTOM:

- Engine stalls.
- · Erroneous idling

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.

	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""></ref.>	Go to step 2.
2	CHECK CURRENT DATA.  1) Start the engine and let it idle.  2) Inspect the VVT advance timing and OCV duty output using Subaru Select Monitor and OBD-II general scan tool.  NOTE:  • Subaru Select Monitor  For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to="">  • OBD-II general scan tool  For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>	Is the VVT advance timing more than approx. 0°C and the OCV duty output more than approx. 10%?	necessary. • Engine oil (amount, contamination)	A temporary malfunction. Conduct the following to clean the oil passage. Replace the engine oil and idle the engine for 5 minutes, then replace the oil filter and engine oil.

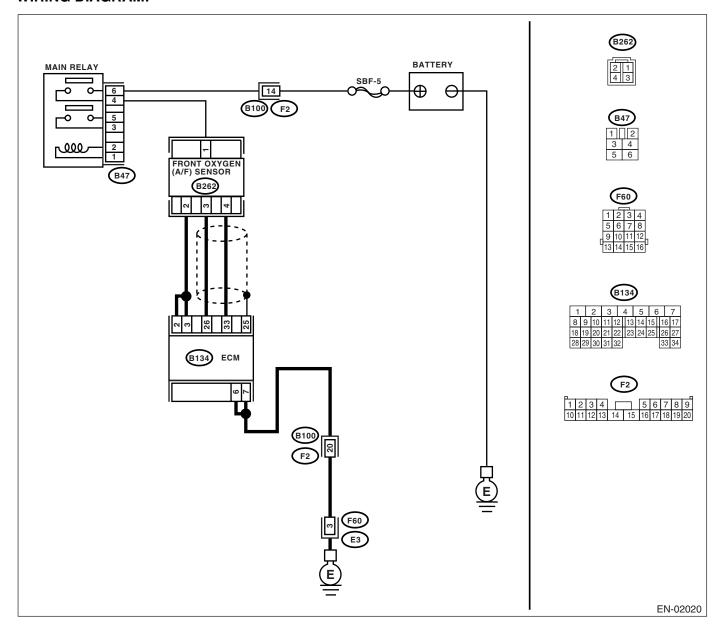
ENGINE (DIÀGNOSTICS)

## C: 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)-12, DTC P0030 HO2S HEATER CONTROL CIRCUIT (BANK 1 SENSOR 1) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.  1) Start the engine and warm-up engine. 2) Turn the ignition switch to OFF. 3) Disconnect the connectors from ECM and front oxygen (A/F) sensor. 4) Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector.  Connector & terminal (B134) No. 2 — (B262) No. 2: (B134) No. 3 — (B262) No. 2:	Is the resistance less than 1 $\Omega$ ?	Go to step 2.	Repair the open circuit in harness between ECM and front oxygen (A/F) sensor connector.
2	CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.  Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector.  Connector & terminal  (B134) No. 26 — (B262) No. 3:  (B134) No. 33 — (B262) No. 4:	Is the resistance less than 1 $\Omega$ ?	Go to step 3.	Repair the open circuit in harness between ECM and front oxygen (A/F) sensor connector.
3	CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.  Measure the resistance of harness between main relay and front oxygen (A/F) sensor connector.  Connector & terminal (B47) No. 4 — (B262) No. 1:	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open circuit in harness between ECM and front oxygen (A/F) sensor connector.
4	CHECK FRONT OXYGEN (A/F) SENSOR.  Measure the resistance between front oxygen (A/F) sensor connector terminals.  Terminals  No. 1 — No. 2:	Is the resistance less than 5 $\Omega$ ?	Go to step 5.	Replace the front oxygen (A/F) sen- sor. <ref. to<br="">FU(H4DOTC)-37, Front Oxygen (A/ F) Sensor.&gt;</ref.>
5	CHECK POOR CONTACT.  Check the poor contact in ECM and front oxygen (A/F) sensor connector.	Is there poor contact in ECM or front oxygen (A/F) sensor connector?	Repair the poor contact in ECM or front oxygen (A/F) sensor connector.	Replace the front oxygen (A/F) sen- sor. <ref. to<br="">FU(H4DOTC)-37, Front Oxygen (A/ F) Sensor.&gt;</ref.>

ENGINE (DIÀGNOSTICS)

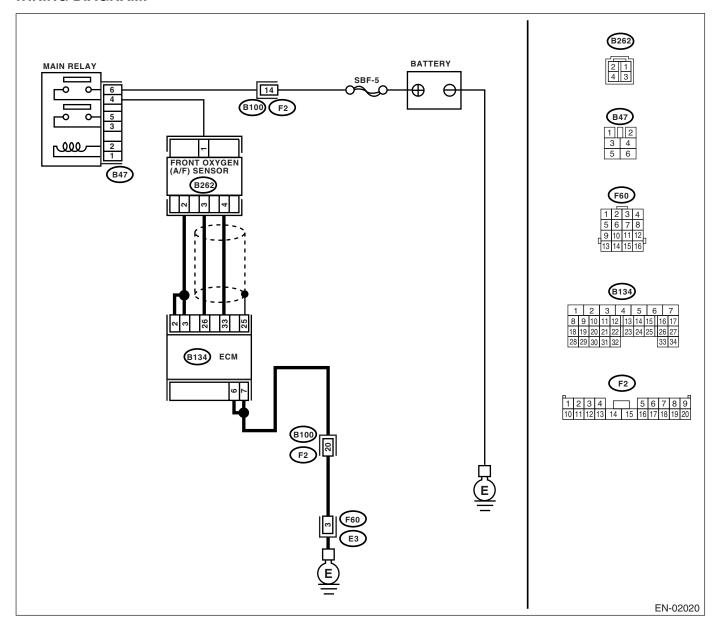
### D: DTC P0031 — HO2S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 1)

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

- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-14, DTC P0031 HO2S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 1) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK POWER SUPPLY TO FRONT OXY-GEN (A/F) SENSOR.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from front oxygen (A/F) sensor.  3) Turn the ignition switch to ON.  4) Measure the voltage between front oxygen (A/F) sensor connector and engine ground.  Connector & terminal  (B262) No. 1 (+) — Engine ground (-):	Is the voltage more than 10 V?		Repair the power supply line. NOTE: In this case, repair the following: • Open circuit in harness between main relay and front oxygen (A/F) sensor connector • Poor contact in front oxygen (A/F) sensor connector • Poor contact in main relay connector
2	CHECK GROUND CIRCUIT OF ECM.  Measure the resistance of harness between ECM connector and chassis ground.  Connector & terminal  (B134) No. 6 — Chassis ground:  (B134) No. 7 — Chassis ground:	Is the resistance less than 5 $\Omega$ ?	Go to step 3.	Repair the harness and connector.  NOTE: In this case, repair the following:  Open circuit in harness between ECM and engine ground cable Poor contact in ECM connector Poor contact in coupling connector
4	CHECK CURRENT DATA.  1) Start the engine. 2) Read the data of front oxygen (A/F) sensor heater current using Subaru Select Monitor or OBD-II general scan tool.  NOTE: • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to=""> • OBD-II scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.  CHECK OUTPUT SIGNAL FROM ECM.  1) Start and idle the engine. 2) Measure the voltage between ECM connector and chassis ground.</ref.>	Is the current more than 0.2 A?	Repair the poor contact in connector.  NOTE: In this case, repair the following: • Poor contact in front oxygen (A/F) sensor connector • Poor contact in ECM connector  Go to step 6.	Go to step <b>5</b> .
5	nector and chassis ground.  Connector & terminal  (B134) No. 2 (+) — Chassis ground (-):  (B134) No. 3 (+) — Chassis ground (-):  CHECK OUTPUT SIGNAL FROM ECM.  Measure the voltage between ECM connector and chassis ground.  Connector & terminal  (B134) No. 2 (+) — Chassis ground (-):  (B134) No. 3 (+) — Chassis ground (-):	Shake the ECM harness and connector, while monitoring value of voltage meter. Does the voltage change?	Repair the poor contact in ECM connector.	Go to step 6.

	Step	Check	Yes	No
6	CHECK FRONT OXYGEN (A/F) SENSOR.	Is the resistance less than 10	Repair the har-	Replace the front
	<ol> <li>Turn the ignition switch to OFF.</li> </ol>	$\Omega$ ?	ness and connec-	oxygen (A/F) sen-
	<ol><li>Measure the resistance between front oxy-</li></ol>		tor.	sor. <ref. th="" to<=""></ref.>
	gen (A/F) sensor connector terminals.			FU(H4DOTC)-37,
	Terminals		In this case, repair	Front Oxygen (A/
	No. 1 — No. 2:			F) Sensor.>
			<ul> <li>Open or ground</li> </ul>	
			short circuit in har-	
			ness between front	
			oxygen (A/F) sen-	
			sor and ECM con-	
			nector	
			<ul> <li>Poor contact in</li> </ul>	
			front oxygen (A/F)	
			sensor connector	
			<ul> <li>Poor contact in</li> </ul>	
			ECM connector	

**ENGINE (DIAGNOSTICS)** 

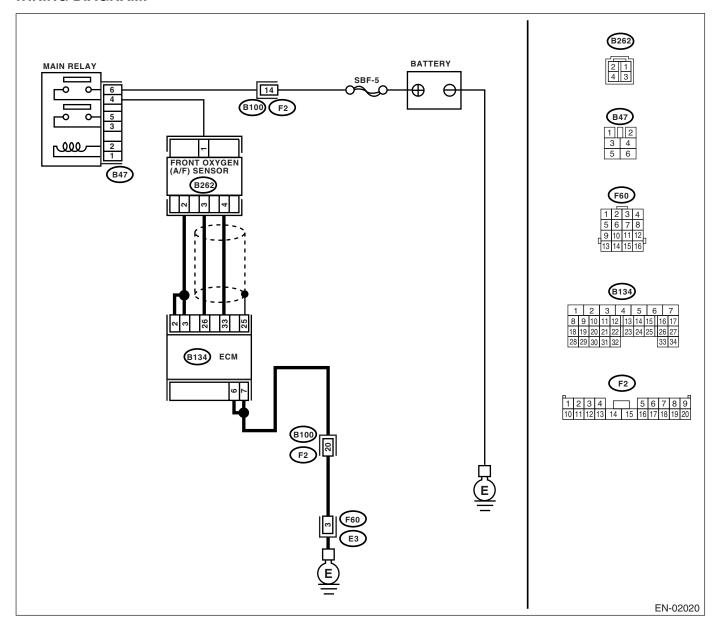
# E: DTC P0032 — HO2S HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 1) —

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

- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-16, DTC P0032 HO2S HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 1) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK OUTPUT SIGNAL FROM ECM.  1) Turn the ignition switch to ON.  2) Measure the voltage between ECM connector and chassis ground.  Connector & terminal  (B134) No. 2 (+) — Chassis ground (-):  (B134) No. 3 (+) — Chassis ground (-):	Is the voltage more than 8 V?	Go to step 3.	Go to step 2.
2	CHECK FRONT OXYGEN (A/F) SENSOR HEATER CURRENT.  1) Turn the ignition switch to OFF.  2) Repair the battery short circuit in harness between ECM and front oxygen (A/F) sensor connector.  3) Turn the ignition switch to ON.  4) Read the data of front oxygen (A/F) sensor heater current using Subaru Select Monitor or the OBD-II general scan tool.	Is the current more than 2.3 A?	Replace the ECM. <ref. to<br="">FU(H4DOTC)-42, Engine Control Module (ECM).&gt;</ref.>	END
	NOTE: • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to=""> • OBD-II general scan tool For detailed operation procedure, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>			
3	CHECK OUTPUT SIGNAL FROM ECM.  Measure the voltage between ECM connector and chassis ground.  Connector & terminal  (B134) No. 2 (+) — Chassis ground (-):  (B134) No. 3 (+) — Chassis ground (-):	Shake the ECM harness and connector, while monitoring value of voltage meter. Does the voltage change?	Repair the battery short circuit in har- ness between ECM and front oxygen (A/F) sen- sor connector.	END

**ENGINE (DIAGNOSTICS)** 

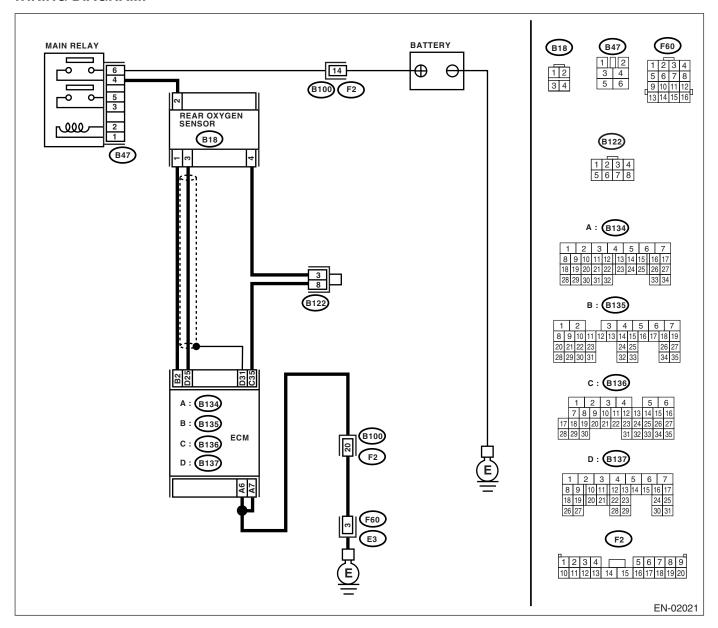
### F: DTC P0037 — HO2S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 2)

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

- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-18, DTC P0037 HO2S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 2) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK GROUND CIRCUIT OF ECM.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from ECM.  3) Measure the resistance of harness between ECM connector and chassis ground.  Connector & terminal  (B134) No. 6 — Chassis ground:  (B134) No. 7 — Chassis ground:	Is the resistance less than 5 $\Omega$ ?	Go to step 2.	Repair the harness and connector.  NOTE: In this case, repair the following:  Open circuit in harness between ECM and engine ground cable  Poor contact in ECM connector  Poor contact in coupling connector
2	CHECK CURRENT DATA.  1) Start the engine. 2) Read the data of rear oxygen sensor heater current using Subaru Select Monitor or OBD-II general scan tool.  NOTE: • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to=""> • OBD-II scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>	Is the current more than 0.2 A?	Repair the connector.  NOTE: In this case, repair the following:  Poor contact in rear oxygen sensor connector  Poor contact in rear oxygen sensor connecting harness connector  Poor contact in ECM connector	Go to step 3.
3	CHECK OUTPUT SIGNAL FROM ECM.  1) Start and idle the engine.  2) Measure the voltage between ECM connector and chassis ground.  Connector & terminal  (B135) No. 2 (+) — Chassis ground (-):	Is the voltage less than 1 V?	Go to step 6.	Go to step 4.
4	CHECK OUTPUT SIGNAL FROM ECM.  Measure the voltage between ECM connector and chassis ground.  Connector & terminal  (B135) No. 2 (+) — Chassis ground (-):	Shake the ECM harness and connector, while monitoring value of voltage meter. Does the voltage change?	Repair the poor contact in ECM connector.	Go to step 5.
5	CHECK OUTPUT SIGNAL FROM ECM.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from rear oxygen sensor.  3) Measure the voltage between ECM connector and chassis ground.  Connector & terminal  (B135) No. 2 (+) — Chassis ground (-):	Is the voltage less than 1 V?	Replace the ECM. <ref. to<br="">FU(H4DOTC)-42, Engine Control Module (ECM).&gt;</ref.>	Repair the battery short circuit in harness between ECM and rear oxygen sensor connector. After repair, replace the ECM. <ref. (ecm).="" control="" engine="" fu(h4dotc)-42,="" module="" to=""></ref.>

	Step	Check	Yes	No
6	-			
В	CHECK POWER SUPPLY TO REAR OXY- GEN SENSOR.	Is the voltage more than 10 V?	Go to step 7.	Repair the power
				supply line.
	Turn the ignition switch to OFF.      Disconnect the connector from rear average.			NOTE:
	Disconnect the connector from rear oxygen			In this case, repair
	sensor.			the following:
	3) Turn the ignition switch to ON.			Open circuit in
	Measure the voltage between rear oxygen			harness between
	sensor connector and engine ground or chas-			main relay and
	sis ground.			rear oxygen sen-
	Connector & terminal			sor connector
	(B18) No. 2 (+) — Chassis ground (–):			<ul> <li>Poor contact in</li> </ul>
				rear oxygen sen-
				sor connector
				Poor contact in
				coupling connector
7	CHECK REAR OXYGEN SENSOR.	Is the resistance less than 30	Repair the har-	Replace the rear
	<ol> <li>Turn the ignition switch to OFF.</li> </ol>	Ω?	ness and connec-	oxygen sensor.
	2) Measure the resistance between rear oxy-		tor.	<ref. th="" to<=""></ref.>
	gen sensor connector terminals.		NOTE:	FU(H4DOTC)-39,
	Terminals		In this case, repair	Rear Oxygen Sen-
	No. 1 — No. 2:		the following:	sor.>
			<ul> <li>Open circuit in</li> </ul>	
			harness between	
			rear oxygen sen-	
			sor and ECM con-	
			nector	
			<ul> <li>Poor contact in</li> </ul>	
			rear oxygen sen-	
			sor connector	
			Poor contact in	
			ECM connector	
			<ul> <li>Poor contact in</li> </ul>	
			coupling connector	

ENGINE (DIÀGNOSTICS)

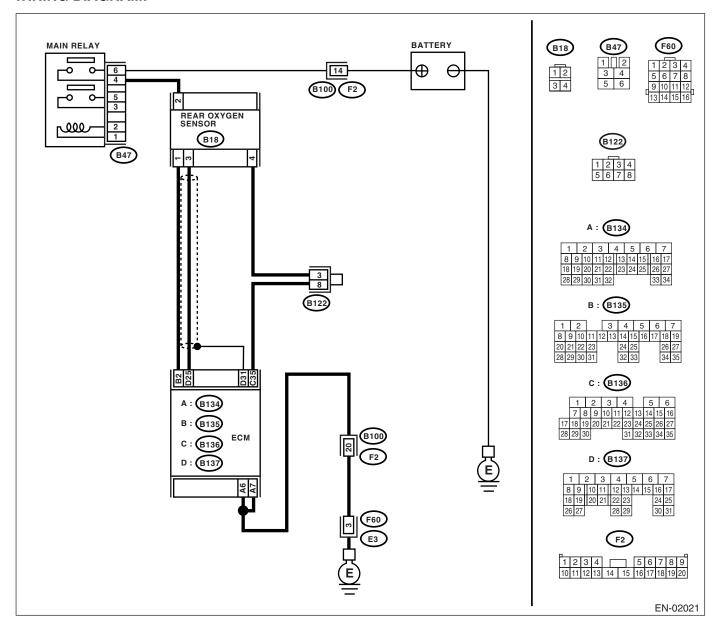
# G: DTC P0038 — HO2S HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 2) —

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

- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-20, DTC P0038 HO2S HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 2) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



			1	ī
	Step	Check	Yes	No
1	CHECK INPUT SIGNAL FOR ECM.  1) Turn the ignition switch to OFF.  2) Measure the voltage between ECM connector and chassis ground.  Connector & terminal  (B135) No. 2 (+) — Chassis ground (-):	Is the voltage more than 8 V?	Go to step 2.	Go to step 3.
2	CHECK CURRENT DATA.  1) Repair the battery short circuit in 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 Subaru Select Monitor or the OBD-II general scan tool.  NOTE:  • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to="">  • OBD-II general scan tool For detailed operation procedure, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>	Is the current more than 7 A?	Replace the ECM. <ref. (ecm).="" control="" engine="" fu(h4dotc)-42,="" module="" to=""></ref.>	END
3	CHECK POOR CONTACT. Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	END

**ENGINE (DIÀGNOSTICS)** 

# H: DTC P0068 — MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT RANGE/PERFORMANCE —

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

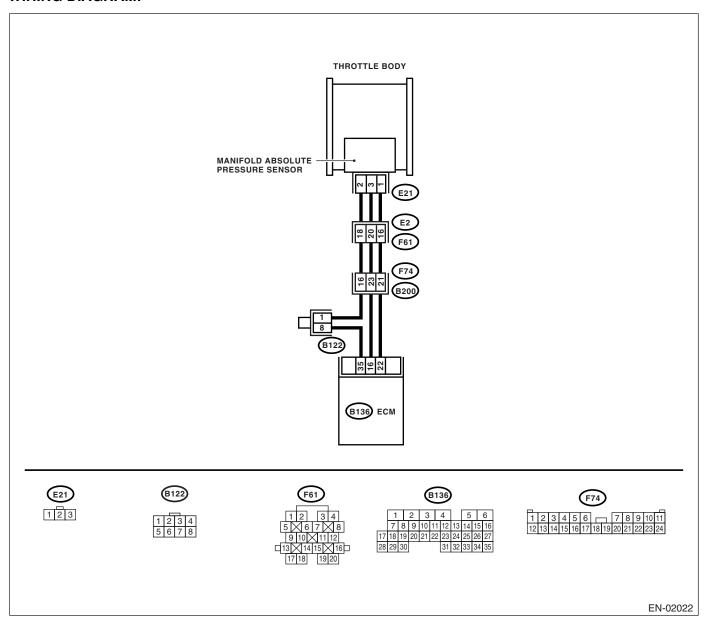
- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-22, DTC P0068 MANIFOLD PRESSURE SENSOR RANGE/PERFORMANCE —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **TROUBLE SYMPTOM:**

Failure of engine to start

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK IDLE SWITCH SIGNAL.  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. en(h4dotc)-29,="" monitor.="" select="" subaru="" to=""></ref.>	Does the LED of {Idle Switch Signal} come on?	Go to step 2.	Check the throttle position sensor circuit. <ref. "a"="" "b"="" (dtc).="" code="" diagnostic="" dtc="" en(h4dotc)-374,="" p2135="" pedal="" position="" procedure="" rationality="" sensor="" switch="" throttle="" to="" trouble="" voltage="" with="" —="" —,=""> NOTE: In this case, it is not necessary to inspect DTC P0106.</ref.>
2	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC. "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""> NOTE: In this case, it is not necessary to inspect DTC P0106.</ref.>	Go to step 3.
3	CHECK CONDITION OF MANIFOLD ABSO- LUTE PRESSURE SENSOR.	Is the manifold absolute pres- sure sensor installation bolt tightened securely?	Go to step 4.	Tighten the manifold absolute pressure sensor installation bolt securely.
4	CHECK CONDITION OF THROTTLE BODY.	Is the throttle body installation bolt tightened securely?	Replace the manifold absolute pressure sensor. <ref. absolute="" fu(h4dotc)-31,="" manifold="" pressure="" sensor.="" to=""></ref.>	Tighten the throttle body installation bolt securely.

ENGINE (DIÀGNOSTICS)

# I: DTC P0101 — MASS OR VOLUME AIR FLOW CIRCUIT RANGE/PERFOR-MANCE —

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

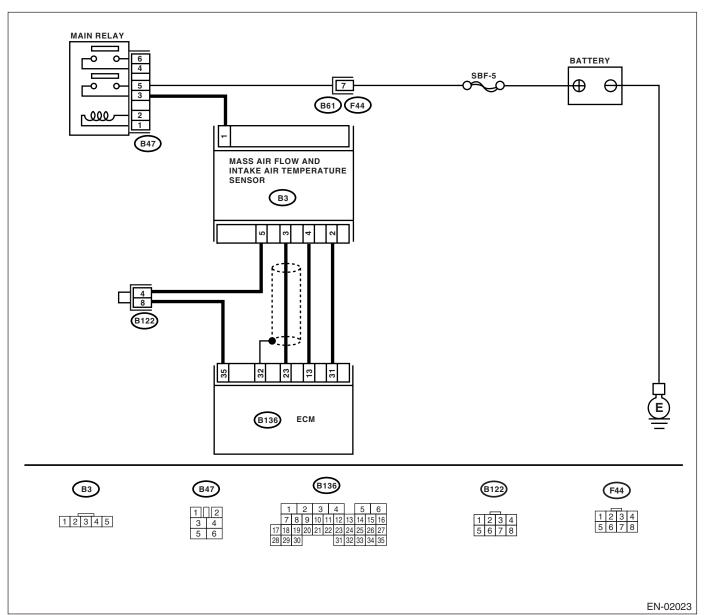
- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-24, DTC P0101 MASS OR VOLUME AIR FLOW CIRCUIT RANGE/PERFORMANCE —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- · Poor driving performance

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



Step	Check	Yes	No
1 CHECK ANY OTHER DTC ON DISPLAY.		vant DTC using "List of Diagnostic Trouble Code (DTC)". <ref. diagnostic<="" en(h4dotc)-68,="" list="" of="" th="" to=""><th></th></ref.>	

ENGINE (DIÀGNOSTICS)

## J: DTC P0102 — MASS OR VOLUME AIR FLOW CIRCUIT LOW INPUT — DTC DETECTING CONDITION:

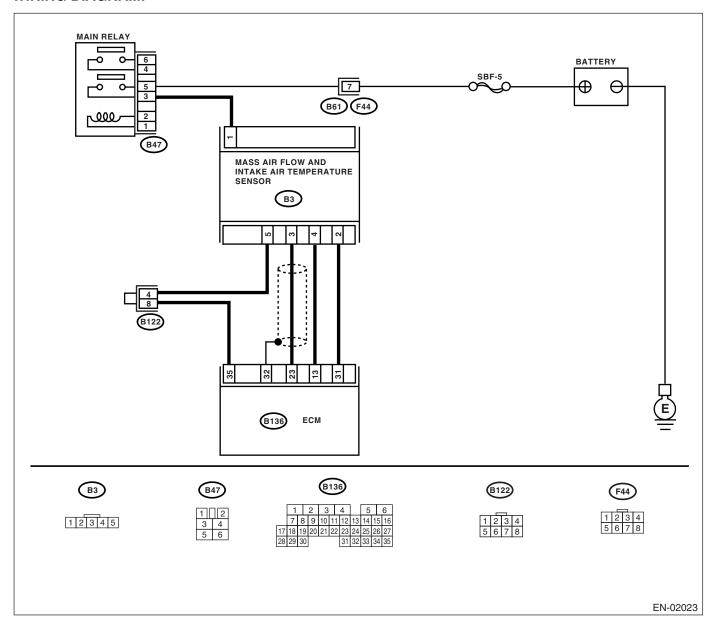
- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-27, DTC P0102 MASS OR VOLUME AIR FLOW CIRCUIT LOW INPUT —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.  1) Turn the ignition switch to OFF. 2) Connect the Subaru Select Monitor or OBD-II general scan tool to data link connector. 3) Turn the ignition switch to ON and Subaru Select Monitor or the OBD-II general scan tool switch to ON. 4) Start the engine. 5) Read the mass air flow sensor voltage using Subaru Select Monitor or OBD-II general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to=""> • OBD-II general scan tool For detailed operation procedures, refer to the</ref.>		Even if malfunction indicator light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair the harness or connector in the mass air flow sensor.  NOTE: In this case, repair the following:  Open or ground short circuit in harness between mass air flow sensor.	-
2	CHECK INPUT SIGNAL FOR ECM.  Measure the voltage between ECM connector and chassis ground while engine is idling.	Is the voltage more than 0.2 V?	sor and ECM con- nector • Poor contact in mass air flow sen- sor or ECM con- nector Go to step 4.	Go to step 3.
	Connector & terminal (B136) No. 23 (+) — Chassis ground (–):			
3	CHECK INPUT SIGNAL FOR ECM (USING SUBARU SELECT MONITOR).  Measure the voltage between ECM connector and chassis ground while engine is idling.	Shake the ECM harness and connector, while monitoring value of Subaru Select Monitor. Does the voltage change?	Repair the poor contact in ECM connector.	Contact your SOA Service Center. NOTE: Inspection by DTM is required, be- cause probable cause is deteriora- tion of multiple parts.
4	CHECK POWER SUPPLY TO MASS AIR FLOW SENSOR.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from mass air flow sensor.  3) Turn the ignition switch to ON.  4) Measure the voltage between mass air flow sensor connector and chassis ground.  Connector & terminal  (B3) No. 1 (+) — Chassis ground (-):	Is the voltage more than 5 V?	Go to step 5.	Repair the open circuit between mass air flow sensor and main relay.

	Step	Check	Yes	No
5	CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW SENSOR CONNECTOR.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from ECM.  3) Measure the resistance of harness between ECM and mass air flow sensor connector.  Connector & terminal  (B136) No. 23 — (B3) No. 3:  (B136) No. 31 — (B3) No. 2:  (B136) No. 35 — (B3) No. 5:	Is the resistance less than 1 $\Omega$ ?	Go to step <b>6.</b>	Repair the open circuit between ECM and mass air flow sensor connector.
6	CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW SENSOR CONNECTOR Measure the resistance of harness between ECM and chassis ground.  Connector & terminal  (B136) No. 23 — Chassis ground:  (B136) No. 31 — Chassis ground:  (B136) No. 35 — 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 sen- sor connector.
7	CHECK POOR CONTACT Check poor contact in mass air flow sensor connector.	Is there poor contact in mass air flow sensor connector?	Repair the poor contact in mass air flow sensor connector.	Replace the mass air flow and intake air temperature sensor. <ref. to<br="">FU(H4DOTC)-30, Mass Air Flow and Intake Air Temper- ature Sensor.&gt;</ref.>

**ENGINE (DIAGNOSTICS)** 

## K: DTC P0103 — MASS OR VOLUME AIR FLOW CIRCUIT HIGH INPUT — DTC DETECTING CONDITION:

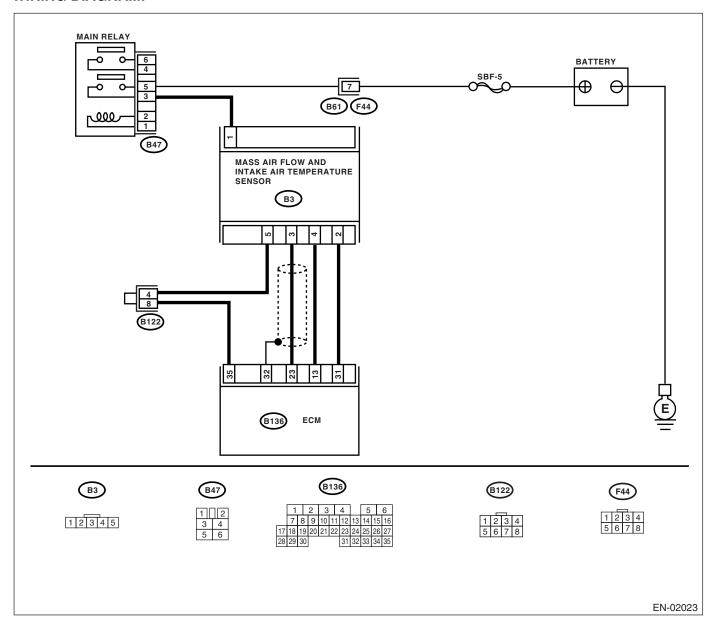
- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-29, DTC P0103 MASS OR VOLUME AIR FLOW CIRCUIT HIGH INPUT —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.  1) Turn the ignition switch to OFF. 2) Connect the Subaru Select Monitor or OBD-II general scan tool to data link connector. 3) Turn the ignition switch to ON and Subaru Select Monitor or OBD-II general scan tool switch to ON. 4) Start the engine. 5) Read the mass air flow sensor voltage using Subaru Select Monitor or OBD-II general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to=""> • OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>		Even if malfunction indicator light lights up, the circuit has returned to a normal condition at this time.	
2	CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW SENSOR CONNECTOR.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from mass air flow sensor.  3) Turn the ignition switch to ON.  4) Measure the voltage between mass air flow sensor connector and chassis ground.  Connector & terminal  (B3) No. 3 (+) — Chassis ground (-):	Is the voltage more than 5 V?	Repair the battery short of harness between mass air flow sensor con- nector and ECM connector.	Go to step 3.
3	CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW SENSOR CONNECTOR.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from ECM.  3) Measure the resistance between ECM connector and mass air flow sensor connector.  Connector & terminal  (B3) No. 2 — (B136) No. 31:	Is the resistance less than 1 $\Omega$ ?	Replace the mass air flow sensor. <ref. to<br="">FU(H4DOTC)-30, Mass Air Flow and Intake Air Temper- ature Sensor.&gt;</ref.>	Repair the open harness between mass air flow sen- sor connector and ECM connector.

**ENGINE (DIAGNOSTICS)** 

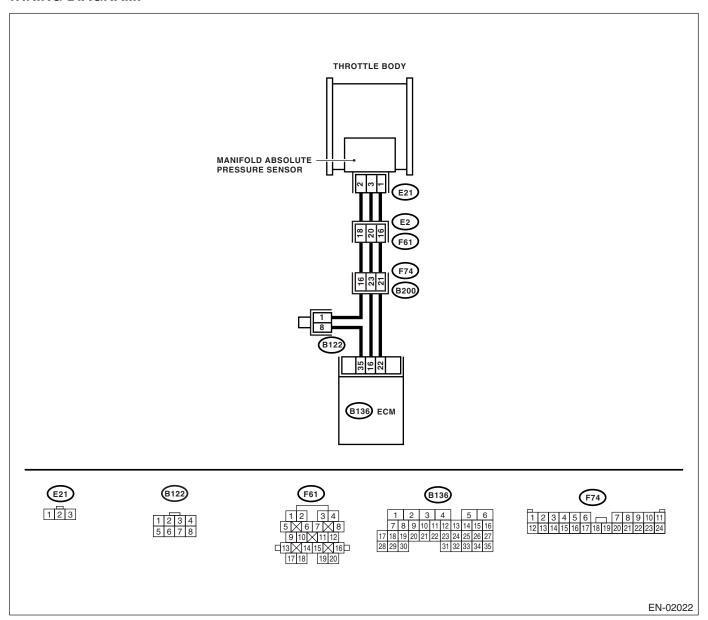
# L: DTC P0107 — MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT LOW INPUT —

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

- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-31, DTC P0107 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT LOW INPUT —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK INPUT SIGNAL FOR ECM.  Measure the voltage between ECM connector and chassis ground.  Connector & terminal  (B136) No. 16 (+) — Chassis ground (-):	Is the voltage more than 4.5 V?		Go to step 2.
2	CHECK INPUT SIGNAL FOR ECM.  Measure the voltage between ECM connector and chassis ground.  Connector & terminal  (B136) No. 16 (+) — Chassis ground (-):	Shake the ECM harness and connector, while monitoring value of voltage meter. Does the voltage change?	Repair the poor contact in ECM connector.	Contact your SOA Service Center. NOTE: Inspection by DTM is required, be- cause probable cause is deteriora- tion of multiple parts.
3	CHECK INPUT SIGNAL FOR ECM.  Measure the voltage between ECM and chassis ground.  Connector & terminal  (B136) No. 22 (+) — Chassis ground (-):	Is the voltage less than 0.7 V?	Go to step 4.	Contact your SOA Service Center. NOTE: Inspection by DTM is required, be- cause probable cause is deteriora- tion of multiple parts.
4	CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.  1) Turn the ignition switch to OFF. 2) Disconnect the connector from manifold absolute pressure sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between manifold absolute pressure sensor connector and engine ground.  Connector & terminal (E21) No. 3 (+) — Engine ground (-):	Is the voltage more than 4.5 V?	Go to step 5.	Repair the open circuit in harness between ECM and manifold absolute pressure sensor connector.
5	CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.  1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance of harness between ECM and manifold absolute pressure sensor connector.  Connector & terminal (B136) No. 35 — (E21) No. 2:	Is the resistance less than 1 $\Omega$ ?	Go to step 6.	Repair the open circuit in harness between ECM and manifold absolute pressure sensor connector.
6	CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.  Measure the resistance of harness between manifold absolute pressure sensor connector and engine ground.  Connector & terminal  (E21) No. 1 — Engine ground:	Is the resistance more than 1 $\mbox{M}\Omega ?$	Go to step 7.	Repair the ground short circuit in har- ness between ECM and mani- fold absolute pres- sure sensor connector.
7	CHECK POOR CONTACT. Check poor contact in manifold absolute pressure sensor connector.	Is there poor contact in manifold absolute pressure sensor connector?	Repair the poor contact in manifold absolute pressure sensor connector.	Replace the manifold absolute pressure sensor. <ref. absolute="" fu(h4dotc)-31,="" manifold="" pressure="" sensor.="" to=""></ref.>

**ENGINE (DIAGNOSTICS)** 

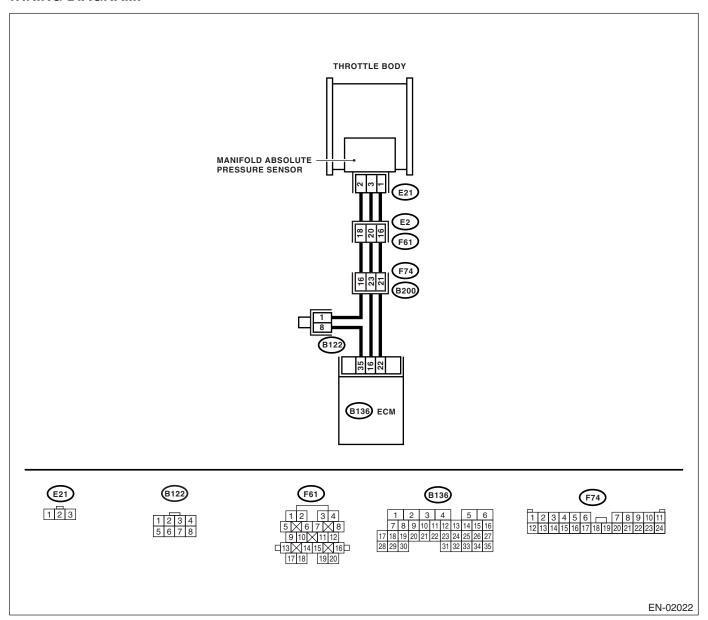
# M: DTC P0108 — MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT HIGH INPUT —

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

- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-33, DTC P0108 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT HIGH INPUT —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK INPUT SIGNAL FOR ECM.  Measure the voltage between ECM connector and chassis ground.  Connector & terminal  (B136) No. 16 (+) — Chassis ground (-):	Is the voltage more than 4.5 V?		Go to step 2.
2	CHECK INPUT SIGNAL FOR ECM.  Measure the voltage between ECM connector and chassis ground.  Connector & terminal  (B136) No. 16 (+) — Chassis ground (-):	Shake the ECM harness and connector, while monitoring value of voltage meter. Does the voltage change?	Repair the poor contact in ECM connector.	Contact your SOA Service Center.  NOTE: Inspection by DTM is required, be- cause probable cause is deteriora- tion of multiple parts.
3	CHECK INPUT SIGNAL FOR ECM.  Measure the voltage between ECM connector and chassis ground.  Connector & terminal  (B136) No. 22 (+) — Chassis ground (-):	Is the voltage more than 4.5 V?	Go to step 4.	Contact your SOA Service Center. NOTE: Inspection by DTM is required, be- cause probable cause is deteriora- tion of multiple parts.
4	CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.  1) Turn the ignition switch to OFF. 2) Disconnect the connector from manifold absolute pressure sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between manifold absolute pressure sensor connector and engine ground.  Connector & terminal  (E21) No. 3 (+) — Engine ground (-):	Is the voltage more than 4.5 V?	Go to step 5.	Repair the open circuit in harness between ECM and manifold absolute pressure sensor connector.
5	CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.  1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance of harness between ECM and manifold absolute pressure sensor connector.  Connector & terminal (B136) No. 22 — (E21) No. 1:	Is the resistance less than 1 $\Omega$ ?	Go to step 6.	Repair the open circuit in harness between ECM and manifold absolute pressure sensor connector.
6	CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.  Measure the resistance of harness between ECM and manifold absolute pressure sensor connector.  Connector & terminal (B136) No. 35 — (E21) No. 2:	Is the resistance less than 1 $\Omega$ ?	Go to step 7.	Repair the open circuit in harness between ECM and manifold absolute pressure sensor connector.
7	CHECK POOR CONTACT.  Check poor contact in manifold absolute pressure sensor connector.	Is there poor contact in manifold absolute pressure sensor connector?	Repair the poor contact in manifold absolute pressure sensor connector.	Replace the manifold absolute pressure sensor. <ref. absolute="" fu(h4dotc)-31,="" manifold="" pressure="" sensor.="" to=""></ref.>

**ENGINE (DIAGNOSTICS)** 

# N: DTC P0111 — INTAKE AIR TEMPERATURE CIRCUIT RANGE/PERFOR-MANCE —

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

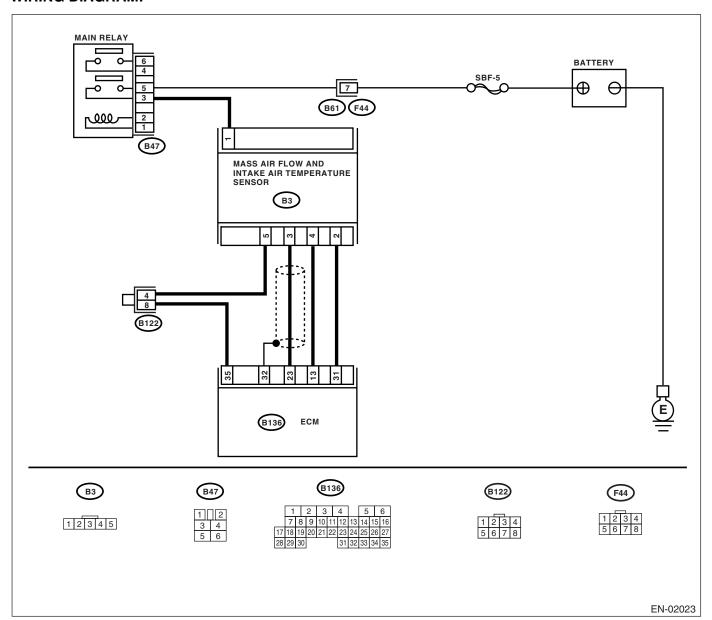
- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-35, DTC P0111 INTAKE AIR TEMPERATURE CIRCUIT RANGE/PERFORMANCE —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""> NOTE: In this case, it is not necessary to inspect DTC P0111.</ref.>	Go to step 2.
2	CHECK ENGINE COOLANT TEMPERATURE.  1) Start the engine and warm it up completely. 2) Measure the engine coolant temperature using Subaru Select Monitor or OBD-II general scan tool.  NOTE: • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to=""> • OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>	Is the engine coolant temperature 75°C (167°F) — 95°C (203°F)?	•	Inspect the DTC P0125 using "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""></ref.>

**ENGINE (DIAGNOSTICS)** 

## O: DTC P0112 — INTAKE AIR TEMPERATURE CIRCUIT LOW INPUT — DTC DETECTING CONDITION:

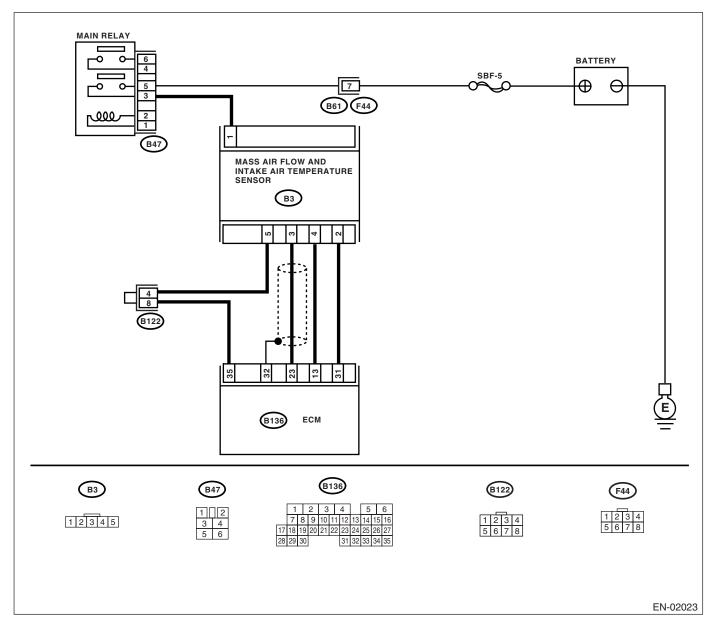
- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-37, DTC P0112 INTAKE AIR TEMPERATURE CIRCUIT LOW INPUT —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK CURRENT DATA.  1) Start the engine. 2) Read the data of intake air temperature sensor signal using Subaru Select Monitor or the OBD-II general scan tool.  NOTE: • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to=""> • OBD-II general scan tool For detailed operation procedure, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>	Is the temperature more than 55°C (131°F)?	Go to step 2.	Repair the poor contact.  NOTE: In this case, repair the following:  • Poor contact mass air flow and intake air temperature sensor  • Poor contact in ECM  • Poor contact in
2	CHECK HARNESS BETWEEN MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR AND ECM CONNECTOR.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from mass air flow and intake air temperature sensor.  3) Turn the ignition switch to ON.  4) Read the data of intake air temperature sensor signal using Subaru Select Monitor or the OBD-II general scan tool.  NOTE:  • Subaru Select Monitor  For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to="">  • OBD-II general scan tool  For detailed operation procedure, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>	Is the temperature less than –36°C (–33°F)?	Replace the mass air flow and intake air temperature sensor. <ref. air="" and="" flow="" fu(h4dotc)-30,="" intake="" mass="" sensor.="" temperature="" to=""></ref.>	joint connector Repair the ground short circuit in har- ness between mass air flow and intake air tempera- ture sensor and ECM connector.

**ENGINE (DIAGNOSTICS)** 

## P: DTC P0113 — INTAKE AIR TEMPERATURE CIRCUIT HIGH INPUT — DTC DETECTING CONDITION:

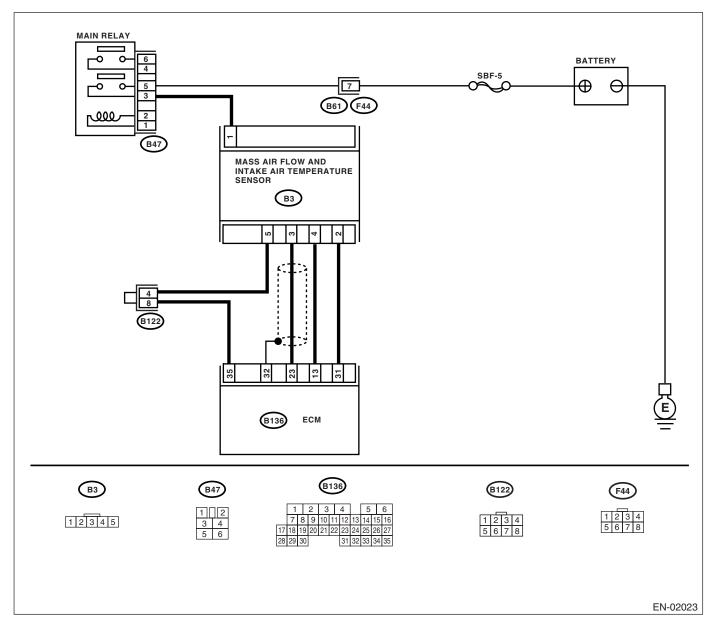
- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-39, DTC P0113 INTAKE AIR TEMPERATURE CIRCUIT HIGH INPUT —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK CURRENT DATA.	Is the temperature less than	Go to step 2.	Repair the poor
	1) Start the engine.	-36°C (-33°F)?	do to step 2.	contact.
	Read the data of intake air temperature			NOTE:
	sensor signal using Subaru Select Monitor or			In this case, repair
	the OBD-II general scan tool.			the following:
	NOTE:			<ul> <li>Poor contact in</li> </ul>
	<ul> <li>Subaru Select Monitor</li> </ul>			mass air flow and
	For detailed operation procedure, refer to the			intake air tempera-
	"READ CURRENT DATA FOR ENGINE". < Ref.			ture sensor
	to EN(H4DOTC)-29, Subaru Select Monitor.>			<ul> <li>Poor contact in ECM</li> </ul>
	<ul> <li>OBD-II general scan tool</li> <li>For detailed operation procedure, refer to the</li> </ul>			Poor contact in
	OBD-II General Scan Tool Instruction Manual.			joint connector
2	CHECK HARNESS BETWEEN MASS AIR	Is the voltage more than 10 V?	Repair the battery	Go to step 3.
	FLOW AND INTAKE AIR TEMPERATURE	is the voltage more than 10 v:	short circuit in har-	do to step 3.
	SENSOR AND ECM CONNECTOR.		ness between	
	Turn the ignition switch to OFF.		mass air flow and	
	2) Disconnect the connector from mass air		intake air tempera-	
	flow and intake air temperature sensor.		ture sensor and	
	3) Measure the voltage between mass air flow		ECM connector.	
	and intake air temperature sensor connector			
	and engine ground.			
	Connector & terminal			
3	(B3) No. 4 (+) — Engine ground (-):  CHECK HARNESS BETWEEN MASS AIR	Is the voltage more than 10 V?	Danair the bettery	Co to stop 4
3	FLOW AND INTAKE AIR TEMPERATURE	is the voltage more than 10 v?	short circuit in har-	Go to step 4.
	SENSOR AND ECM CONNECTOR.		ness between	
	Turn the ignition switch to ON.		mass air flow and	
	2) Measure the voltage between mass air flow		intake air tempera-	
	and intake air temperature sensor connector		ture sensor and	
	and engine ground.		ECM connector.	
	Connector & terminal			
	(B3) No. 4 (+) — Engine ground (-):			
4	CHECK HARNESS BETWEEN MASS AIR	Is the voltage more than 4 V?	Go to step 5.	Repair the har-
	FLOW AND INTAKE AIR TEMPERATURE			ness and connec-
	SENSOR AND ECM CONNECTOR.			tor.
	Measure the voltage between mass air flow and intake air temperature sensor and mani-			NOTE:
	fold absolute pressure sensor connector and			In this case, repair the following:
	engine ground.			Open circuit in
	Connector & terminal			harness between
	(B3) No. 4 (+) — Engine ground (–):			mass air flow and
				intake air tempera-
				ture sensor and
				ECM connector
				Poor contact in
				mass air flow and
				intake air tempera-
				ture sensor
				<ul> <li>Poor contact in ECM</li> </ul>
				Poor contact in
				joint connector
]				John Commector

Step	Check	Yes	No
5 CHECK HARNESS BETWEEN MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR AND ECM CONNECTOR.  1) Turn the ignition switch to OFF.  2) Measure the resistance of harness between mass air flow and intake air temperature sensor and engine ground.  Connector & terminal  (B3) No. 5 — Engine ground:	Is the resistance less than 5 $\Omega$ ?	Replace the mass air flow and intake air temperature sensor. <ref. air="" and="" flow="" fu(h4dotc)-30,="" intake="" mass="" sensor.="" temperature="" to=""></ref.>	Repair the harness and connector.  NOTE: In this case, repair the following:  Open circuit in harness between mass air flow and intake air temperature sensor and ECM connector Poor contact in mass air flow and intake air temperature sensor Poor contact in ECM Poor contact in inconnector

**ENGINE (DIÀGNOSTICS)** 

# Q: DTC P0117 — ENGINE COOLANT TEMPERATURE CIRCUIT LOW INPUT — DTC DETECTING CONDITION:

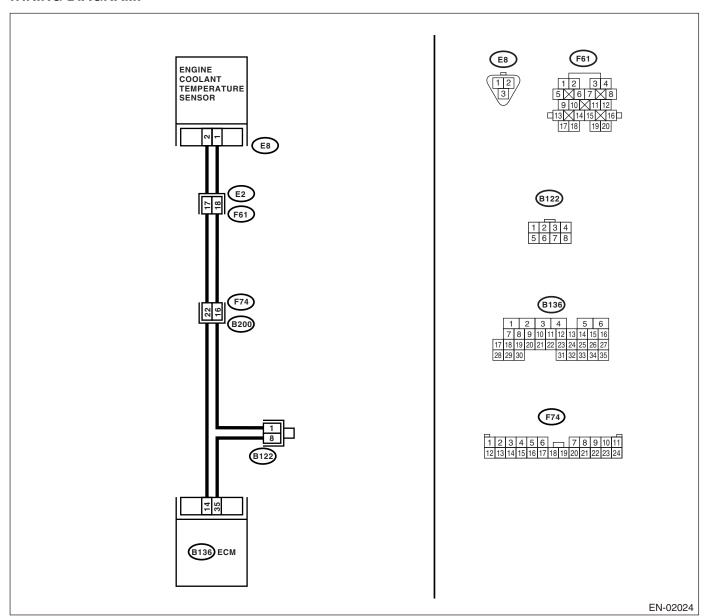
- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-41, DTC P0117 ENGINE COOLANT TEMPERATURE CIRCUIT LOW INPUT —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### TROUBLE SYMPTOM:

- Hard to start
- Erroneous idling
- Poor driving performance

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



1		T		
	Step	Check	Yes	No
1	CHECK CURRENT DATA.  1) Start the engine. 2) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor or OBD-II general scan tool.  NOTE: • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to=""> • OBD-II general scan tool For detailed operation procedures, refer to the</ref.>	Is the temperature more than 120°C (248°F)?	Go to step 2.	Repair the poor contact.  NOTE: In this case, repair the following:  Poor contact in engine coolant temperature sensor  Poor contact in ECM  Poor contact in
2	OBD-II General Scan Tool Instruction Manual.  CHECK HARNESS BETWEEN ENGINE	Is the temperature more than	Replace the	coupling connector • Poor contact in joint connector Repair the ground
	COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from engine coolant temperature sensor.  3) Turn the ignition switch to ON.  4) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor or OBD-II general scan tool.	-40°C (-40°F)?	engine coolant temperature sen- sor. <ref. to<br="">FU(H4DOTC)-26, Engine Coolant Temperature Sen- sor.&gt;</ref.>	short circuit in har- ness between engine coolant temperature sen- sor and ECM con- nector.
	NOTE: • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to=""> • OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>			

**ENGINE (DIÀGNOSTICS)** 

## R: DTC P0118 — ENGINE COOLANT TEMPERATURE CIRCUIT HIGH INPUT — DTC DETECTING CONDITION:

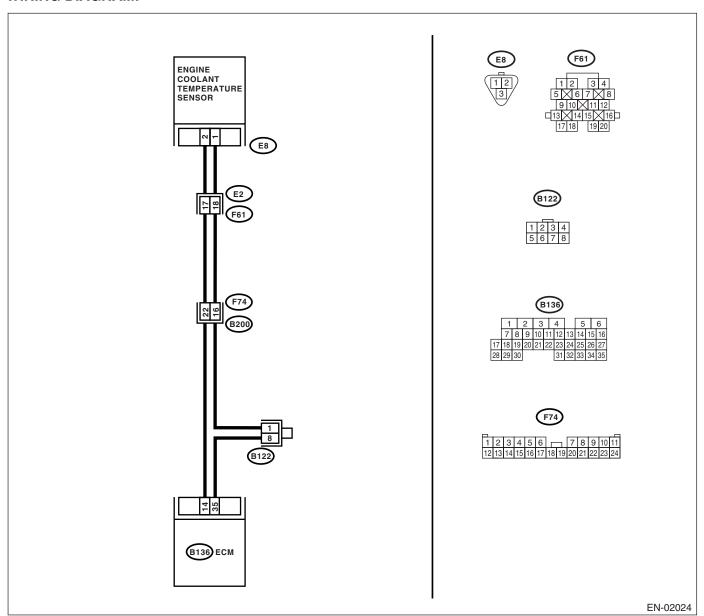
- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-43, DTC P0118 ENGINE COOLANT TEMPERATURE CIRCUIT HIGH INPUT —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### TROUBLE SYMPTOM:

- Hard to start
- Erroneous idling
- Poor driving performance

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1) 2) tu or NO • Fo to •	HECK CURRENT DATA.  Start the engine. Read the data of engine coolant temperater sensor signal using Subaru Select Monitor OBD-II general scan tool.  OTE: Subaru Select Monitor or detailed operation procedure, refer to the READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru=""> OBD-II general scan tool or detailed operation procedures, refer to the BD-II General Scan Tool Instruction Manual.</ref.>	Is the temperature less than –40°C (–40°F)?	Go to step 2.	Repair the poor contact.  NOTE: In this case, repair the following:  • Poor contact in engine coolant temperature sensor  • Poor contact in ECM  • Poor contact in coupling connector  • Poor contact in joint connector
Cr E( 1) 2) ar 3) ar gr	HECK HARNESS BETWEEN ENGINE OOLANT TEMPERATURE SENSOR AND CM CONNECTOR.  Turn the ignition switch to OFF. Disconnect the connector from engine cool- nt temperature sensor. Measure the voltage between engine cool- nt temperature sensor connector and engine round. Connector & terminal (E8) No. 2 (+) — Engine ground (-):	Is the voltage more than 10 V?	Repair the battery short circuit in harness between ECM and engine coolant temperature sensor connector.	Go to step 3.
C( E( 1) 2) ar gr	HECK HARNESS BETWEEN ENGINE OOLANT TEMPERATURE SENSOR AND CM CONNECTOR.  Turn the ignition switch to ON.  Measure the voltage between engine cool- nt temperature sensor connector and engine round.  Connector & terminal (E8) No. 2 (+) — Engine ground (-):	Is the voltage more than 10 V?	Repair the battery short circuit in harness between ECM and engine coolant temperature sensor connector.	Go to step 4.
C( E( M te gr	HECK HARNESS BETWEEN ENGINE OOLANT TEMPERATURE SENSOR AND CM CONNECTOR. leasure the voltage between engine coolant emperature sensor connector and engine round. Connector & terminal (E8) No. 2 (+) — Engine ground (-):	Is the voltage more than 4 V?	Go to step 5.	Repair the harness and connector.  NOTE: In this case, repair the following:  Open circuit in harness between ECM and engine coolant temperature sensor connector  Poor contact in engine coolant temperature sensor connector  Poor contact in ECM connector  Poor contact in coupling connector  Poor contact in coupling connector  Poor contact in coupling connector

# DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC) ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
5 CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.  1) Turn the ignition switch to OFF. 2) Measure the resistance of harness between engine coolant temperature sensor connector and engine ground.  Connector & terminal (E8) No. 1 — Engine ground:	Is the resistance less than 5 Ω?	Replace the engine coolant temperature sensor. <ref. coolant="" engine="" fu(h4dotc)-26,="" sensor.="" temperature="" to=""></ref.>	Repair the harness and connector.  NOTE: In this case, repair the following:  Open circuit in harness between ECM and engine coolant temperature sensor connector  Poor contact in engine coolant temperature sensor connector  Poor contact in ECM connector  Poor contact in coupling connector  Poor contact in coupling connector

**ENGINE (DIAGNOSTICS)** 

#### S: DTC P0122 — THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIR-CUIT LOW INPUT —

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

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-45, DTC P0122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT LOW INPUT —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

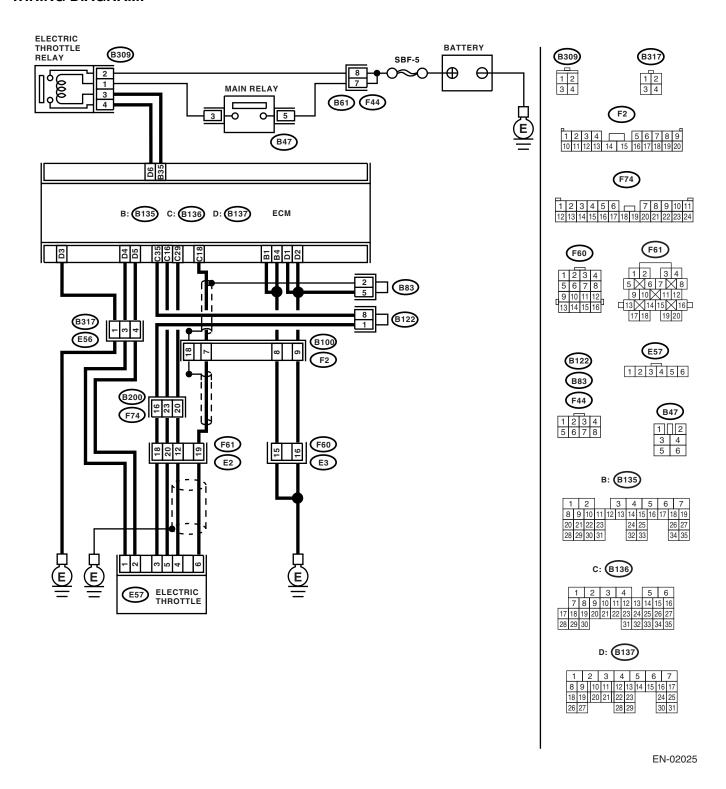
#### **TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.

ENGINE (DIÀGNOSTICS)



	Step	Check	Yes	No
1	CHECK OUTPUT VOLTAGE OF SENSOR.	Is the voltage more than 0.4 V?	Go to step 2.	Go to step 3.
	1) Turn the ignition switch to ON.		•	
	2) Measure the voltage between ECM con-			
	nector terminals.			
	Connector & terminal			
	(B136) No. 29 (+) — (B136) No. 35 (-):			
	3) Shake the ECM harness and connector,			
	engine harness connectors and electric throttle.			
2		Is there poor contact in the	Repair the poor	Connector has
_	Check poor contact in connectors between	connectors between ECM and	contact in connec-	returned to a nor-
	ECM and electric throttle.	electric throttle?	tors.	mal condition at
				this time. A tempo-
				rary poor contact
				of the connector
				may be the cause.
3	CHECK HARNESS BETWEEN ECM AND	Is the resistance less than 1	Go to step 4.	Repair open of
	ELECTRIC THROTTLE.  1) Turn the ignition switch to OFF.	Ω?		harness connector.
	<ul><li>2) Disconnect the connector from ECM.</li></ul>			tor.
	Disconnect the connector from electric			
	throttle.			
	4) Measure the resistance between ECM con-			
	nector and electric throttle connector.			
	Connector & terminal			
4	(B136) No. 16 — (E57) No. 5:	le the verietemen menus them d	Ca ta atan F	Danain tha abaa
4	CHECK HARNESS BETWEEN ECM AND ELECTRIC THROTTLE.	Is the resistance more than 1 $M\Omega$ ?	Go to step 5.	Repair the chassis short of har-
	Measure the resistance between ECM connec-	10152:		ness.
	tor and chassis ground.			
	Connector & terminal			
	(B136) No. 18 — Chassis ground:			
	(B136) No. 16 — Chassis ground:			
5	CHECK POWER SURPLY TO SENSOR.	Is the voltage 4.5 — 5.5 V?	Go to step 6.	Repair the poor
	Connect the ECM connector.      Turn the implicant quitable to CN.			contact in ECM
	<ul><li>2) Turn the ignition switch to ON.</li><li>3) Measure the voltage between electric throt-</li></ul>			connector. If prob- lem persists,
	tle connector and engine ground.			replace the ECM.
	Connector & terminal			<ref. td="" to<=""></ref.>
	(E57) No. 5 (+) — Engine ground (–):			FU(H4DOTC)-42,
	4) Shake the ECM harness and connector,			Engine Control
	engine harness connectors, while monitoring			Module (ECM).>
	value of voltage meter.			
6	CHECK SHORT OF ECM.	Is the resistance more than 10	Repair the poor	Repair the poor
	Turn the ignition switch to OFF.	Ω?	contact in electric	the contact in ECM
	Measure the resistance between electric     throttle connector and engine ground		throttle connector.	connector. If prob-
	throttle connector and engine ground.  Connector & terminal		If problem persists, replace the accel-	lem persists, replace the ECM.
	(E57) No. 6 — Engine ground:		erator position	<ref. td="" to<=""></ref.>
	( / =		sensor.	FU(H4DOTC)-42,
				Engine Control
				Module (ECM).>

ENGINE (DIÀGNOSTICS)

## T: DTC P0123 — THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT HIGH INPUT —

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

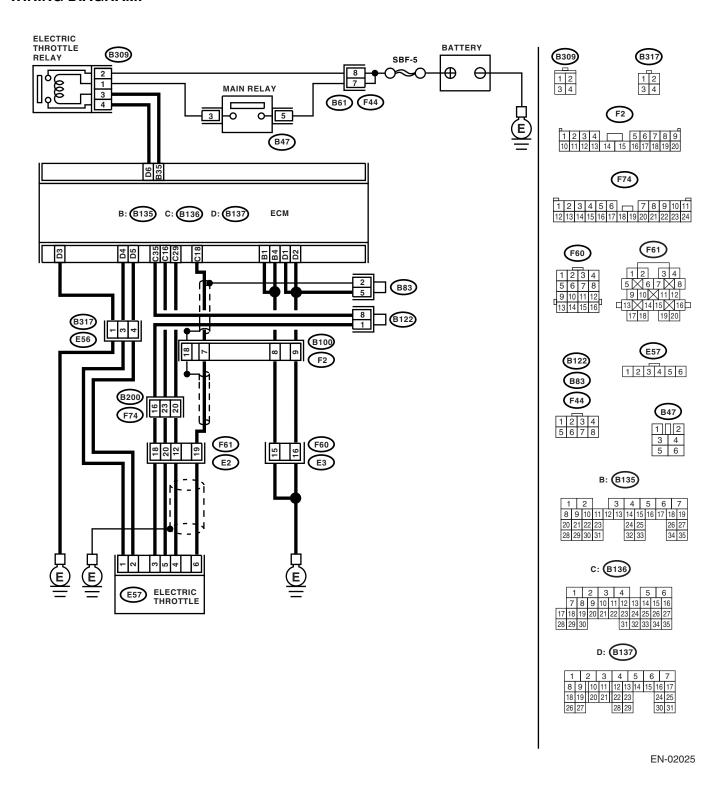
- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-47, DTC P0123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT HIGH INPUT —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



# DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC) ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK OUTPUT VOLTAGE OF SENSOR.  1) Turn the ignition switch to ON.  2) Read the data of main throttle sensor signals, using the Subaru Select Monitor.  3) Shake the ECM harness and connector, engine harness connectors, electric throttle connector harness while monitoring value of voltage meter.	Is the voltage less than 4.63 V?	Go to step 2.	Go to step 3.
2	CHECK POOR CONTACT IN CONNECTORS. Check poor contact in connectors between ECM and electric throttle.	connectors between ECM and electric throttle?	Repair the poor contact in connectors.	Connector has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.
3	CHECK HARNESS BETWEEN ECM AND ELECTRIC THROTTLE.  1) Turn the ignition switch to OFF.  2) Disconnect the connectors from ECM.  3) Disconnect the connectors from electric throttle.  4) Measure the resistance between ECM connector and electric throttle connector.  Connector & terminal  (B136) No. 18 — (E57) No. 6:  (B136) No. 35 — (E57) No. 3:	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open of harness connector.
4	CHECK HARNESS BETWEEN ECM AND ELECTRIC THROTTLE.  1) Connect the ECM connector.  2) Measure the resistance between the electric throttle connector and engine ground.  Connector & terminal  (E57) No. 3 — Engine ground:	Is the resistance less than 1 $\Omega$ ?	Go to step 5.	Repair the poor contact in ECM connector. If the problem persists, replace the ECM. <ref. (ecm).="" control="" engine="" fu(h4dotc)-42,="" module="" to=""></ref.>
5	CHECK HARNESS BETWEEN ECM AND ELECTRIC THROTTLE.  1) Turn the ignition switch to ON. 2) Measure the voltage between electric throttle connector and engine ground.  Connector & terminal  (E57) No. 5 (+) — Engine ground (-):  3) Shake the ECM harness and connector, engine harness connectors, while monitoring value of voltage meter.	Is the voltage more than 10 V?	Go to step <b>6.</b>	Repair the battery short of harness between ECM connector and electric throttle connector.
6	CHECK POWER SUPPLY TO SENSOR.  1) Measure the voltage between the electric throttle connector and engine ground.  Connector & terminal  (E57) No. 6 (+) — Engine ground (-):  2) Shake the ECM harness and connector, engine harness connectors, while monitoring value of voltage meter.	Is the voltage less than 10 V?	Go to step <b>7</b> .	Repair the short of harness between ECM connector and electric throttle connector.

	Step	Check	Yes	No
ELEC 1) Tu 2) Di 3) M necto <i>Cor</i>	CTRIC THROTTLE.  urn the ignition switch to OFF. isconnect the connector from ECM. leasure the resistance between ECM con-	Is the resistance more than 1 $\mbox{M}\Omega ?$	contact in harness.	Repair the short of harness of power supply to sensor.

ENGINE (DIÀGNOSTICS)

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

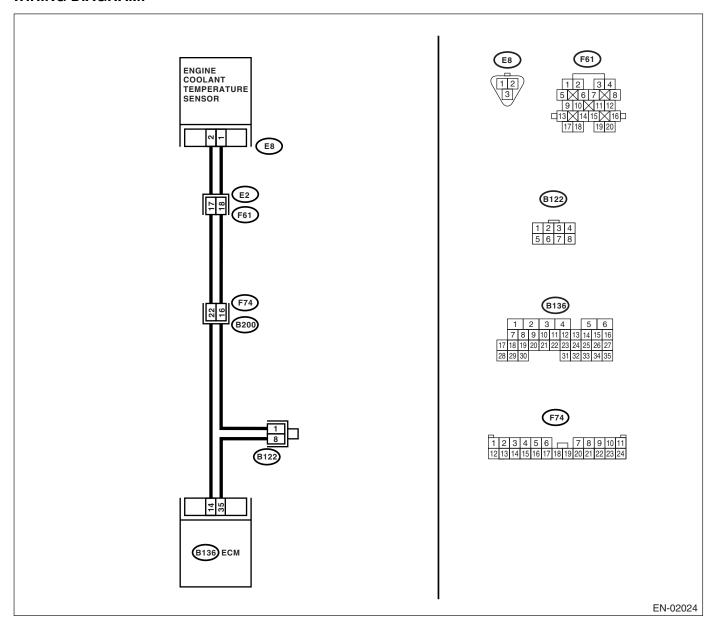
#### **DTC DETECTING CONDITION:**

- · Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-49, DTC P0125 INSUFFICIENT COOLANT TEM-PERATURE FOR CLOSED LOOP FUEL CONTROL —, Diagnostic Trouble Code (DTC) Detecting Criteria.> TROUBLE SYMPTOM:

Engine will not return to idling.

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""> NOTE: In this case, it is not necessary to inspect DTC P0125.</ref.>	
2	CHECK ENGINE COOLING SYSTEM.  NOTE: Check the following items.  Thermostat open stuck  Coolant level  Coolant freeze  Tire diameter	Is there a fault in engine cooling system?	Replace the ther- mostat. <ref. to<br="">CO(H4SO)-24, Thermostat.&gt;</ref.>	Replace the engine coolant temperature sensor. <ref. coolant="" engine="" fu(h4dotc)-26,="" sensor.="" temperature="" to=""></ref.>

ENGINE (DIÀGNOSTICS)

### V: DTC P0128 — COOLANT THERMOSTAT (COOLANT TEMPERATURE BE-LOW THERMOSTAT REGULATING TEMPERATURE) —

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

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-51, DTC P0128 COOLANT THERMOSTAT (COOLANT TEMPERATURE BELOW THERMOSTAT REGULATING TEMPERATURE) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### TROUBLE SYMPTOM:

Thermostat remains open.

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.

	Step	Check	Yes	No
1	CHECK VEHICLE CONDITION.	Was 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	CHECK FOR OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Codes (DTC)". <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""></ref.>	Go to step 3.
3	CHECK ENGINE COOLANT.	Are coolant level and mixture ratio of cooling water to anti-freeze solution correct?	Go to step 4.	Replace the engine coolant. <ref. co(h4so)-17,="" coolant.="" engine="" replacement,="" to=""></ref.>
4	CHECK RADIATOR FAN.  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. and="" co(h4so)-33,="" fan="" main="" motor.="" radiator="" to=""> and <ref. and="" co(h4so)-39,="" fan="" motor.="" radiator="" sub="" to="">.</ref.></ref.>	Replace the ther- mostat. <ref. to<br="">CO(H4SO)-24, Thermostat.&gt;</ref.>

**ENGINE (DIAGNOSTICS)** 

## W: DTC P0129 — ATMOSPHERIC PRESSURE SENSOR CIRCUIT RANGE/PER-FORMANCE —

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

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-53, DTC P0129 BAROMETRIC PRESSURE TOO LOW —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.

	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	FU(H4DOTC)-42,	It is not necessary to inspect DTC P0129.

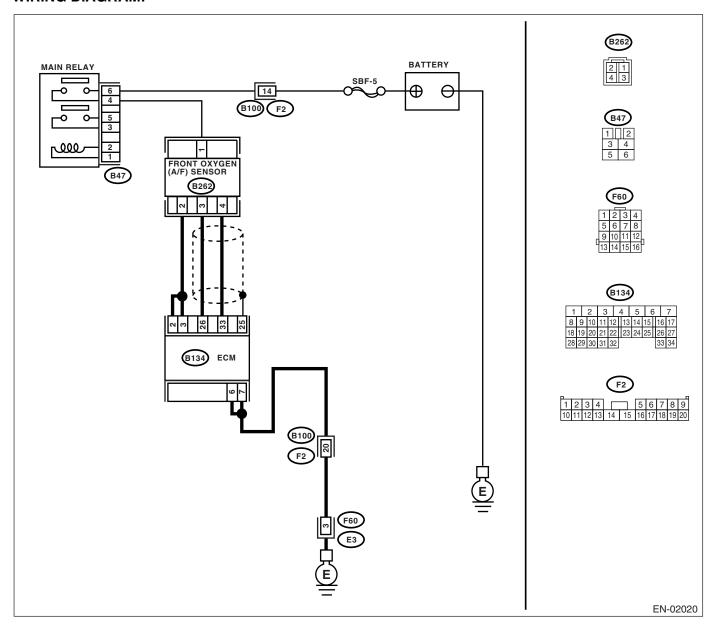
ENGINE (DIÀGNOSTICS)

## X: DTC P0131 — O<sub>2</sub> SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 1) — DTC DETECTING CONDITION:

- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-54, DTC P0131 O<sub>2</sub> SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 1) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



Step	Check	Yes	No
1 CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and front oxygen (A/F) sensor connector. 3) Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector.  Connector & terminal (B134) No. 26 — Chassis ground: (B134) No. 33 — Chassis ground:	Is the resistance more than 1 $M\Omega$ ?	Replace the front oxygen (A/F) sen- sor. <ref. to<br="">FU(H4DOTC)-37, Front Oxygen (A/ F) Sensor.&gt;</ref.>	Repair ground short circuit in har- ness between ECM and front oxygen (A/F) sen- sor connector.

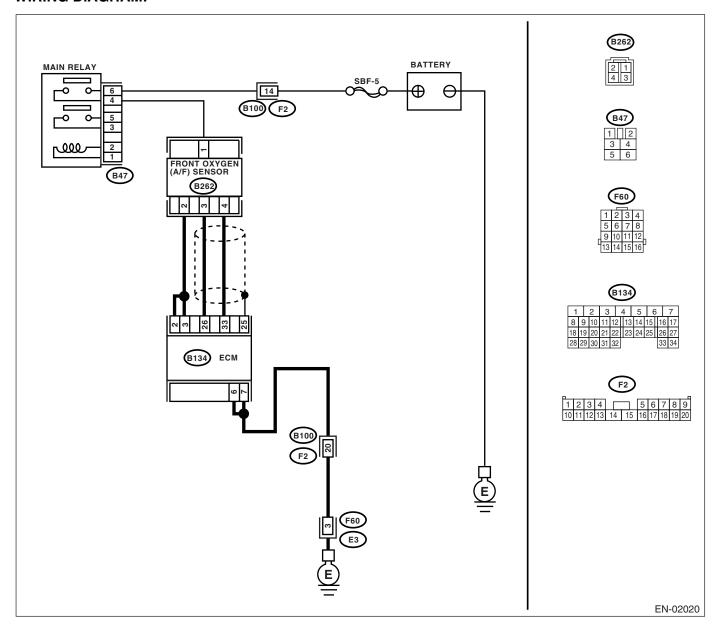
ENGINE (DIÀGNOSTICS)

## Y: DTC P0132 — O<sub>2</sub> SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 1) — DTC DETECTING CONDITION:

- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-56, DTC P0132 O<sub>2</sub> SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 1) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
FRONT TOR. 1) Turn 2) Disco gen (A/F 3) Meas ECM cor Conne (B134	the ignition switch to ON. connect the connectors from front oxy- sure the voltage of harness between nnector and chassis ground. cotor & terminal 4) No. 26 (+) — Chassis ground (-): 4) No. 33 (+) — Chassis ground (-):	Is the voltage more than 8 V?	oxygen (A/F) sen- sor. <ref. to<br="">FU(H4DOTC)-37,</ref.>	Repair battery short circuit in har- ness between ECM and front oxygen (A/F) sen- sor connector.

ENGINE (DIÀGNOSTICS)

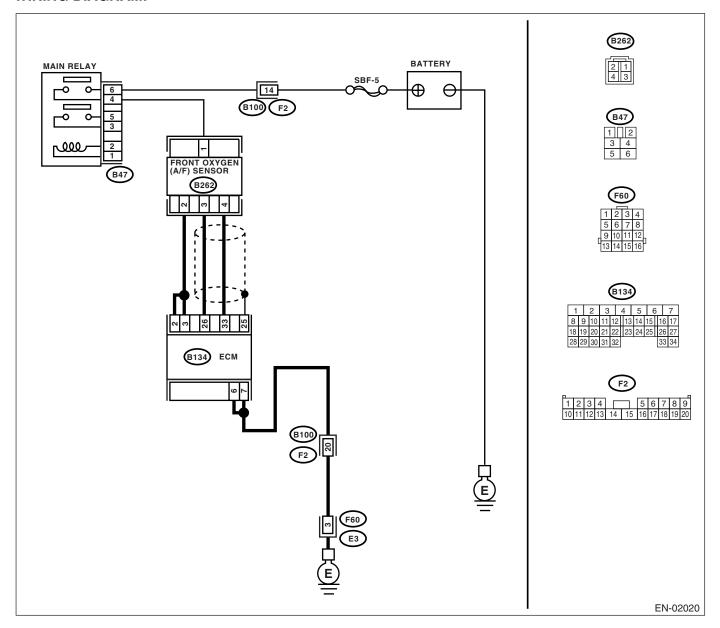
### Z: DTC P0133 — O<sub>2</sub> SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 1)

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

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-58, DTC P0133 O<sub>2</sub> SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 1) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""> NOTE: In this case, it is not necessary to inspect DTC P0133.</ref.>	Go to step 2.
2	CHECK EXHAUST SYSTEM.  NOTE: Check the following items.  Loose installation of front portion of exhaust pipe onto cylinder heads  Loose connection between front exhaust pipe and front catalytic converter  Damage of exhaust pipe resulting in a hole	Is there a fault in exhaust system?	Repair the exhaust system.	Replace the front oxygen (A/F) sen- sor. <ref. to<br="">FU(H4DOTC)-37, Front Oxygen (A/ F) Sensor.&gt;</ref.>

ENGINE (DIÀGNOSTICS)

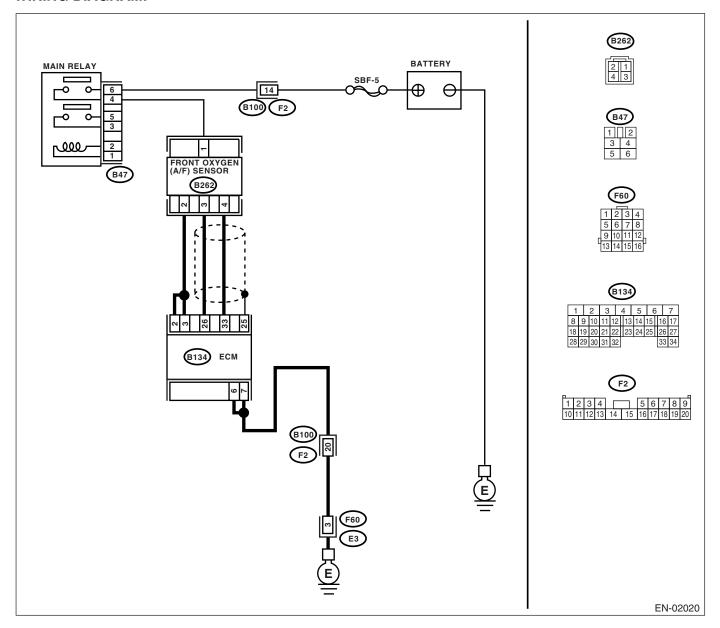
## AA: DTC P0134 — $O_2$ SENSOR CIRCUIT NO ACTIVITY DETECTED (BANK 1 SENSOR 1) —

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

- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-61, DTC P0134 O<sub>2</sub> SENSOR CIRCUIT NO ACTIVITY DETECTED (BANK 1 SENSOR 1) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



Step	Check	Yes	No
1 CHECK HARNESS BETWEEN EFFRONT OXYGEN (A/F) SENSOR TOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from front oxygen (A/F) sensor connect 3) Measure the resistance of harr between ECM and front oxygen (A connector.  Connector & terminal (B134) No. 26 — (B262) No. 3 (B134) No. 33 — (B262) No. 4	CONNEC- Ω?  a ECM and or. ess (F) sensor	Replace the front oxygen (A/F) sen- sor. <ref. to<br="">FU(H4DOTC)-37, Front Oxygen (A/ F) Sensor.&gt;</ref.>	Repair open circuit in harness between ECM and front oxygen (A/F) sensor connector.

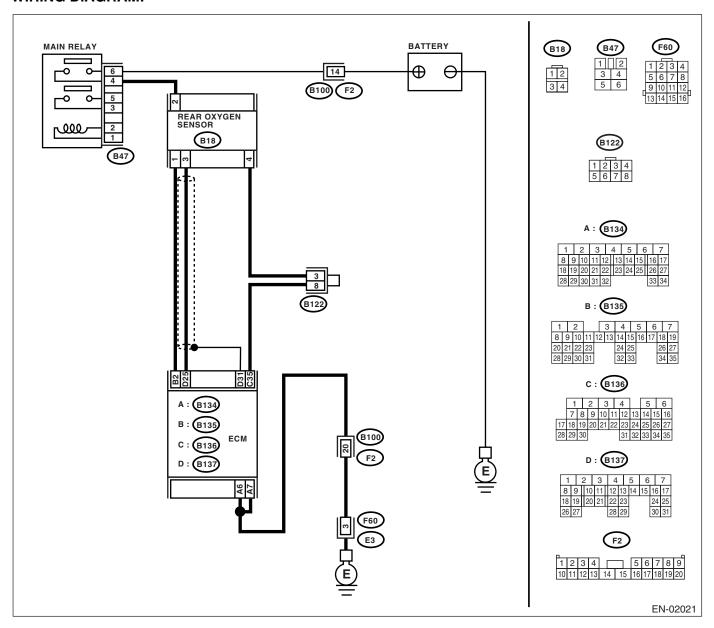
ENGINE (DIÀGNOSTICS)

## AB:DTC P0137 — O<sub>2</sub> SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 2) — DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-63, DTC P0137 O<sub>2</sub> SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 2) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Using the List of Diagnostic Trou- ble Code (DTC), check the appro- priate DTC. <ref. to EN(H4DOTC)- 68, List of Diag- nostic Trouble Code (DTC).&gt;</ref. 	Go to step 2.
2	CHECK REAR OXYGEN SENSOR DATA.  1) Warm-up the engine until engine coolant temperature is above 70°C (158°F), and keep the engine speed at 2,000 rpm to 3,000 rpm for 2 minutes.  2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or OBD-II general scan tool.  NOTE:  • Subaru Select Monitor  For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DIS-PLAY FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to="">  • OBD-II general scan tool  For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>	Does the value fluctuate?	Go to step 6.	Go to step 3.
3	CHECK REAR OXYGEN SENSOR DATA. Read the data of rear oxygen sensor signal using Subaru Select Monitor or OBD-II general scan tool.	Is the voltage 0.2 — 0.4 V?	Go to step 4.	Replace the rear oxygen sensor. <ref. to<br="">FU(H4DOTC)-39, Rear Oxygen Sen- sor.&gt;</ref.>
4	CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.  1) Turn the ignition switch to OFF.  2) Disconnect the connectors from ECM and rear oxygen sensor.  3) Measure the resistance of harness between ECM and rear oxygen sensor connector.  Connector & terminal (B137) No. 25 — (B18) No. 3:	Is the resistance more than 3 $\Omega$ ?	Repair the open circuit in harness between ECM and rear oxygen sensor connector.	Go to step 5.
5	CHECK HARNESS BETWEEN REAR OXY-GEN SENSOR AND ECM CONNECTOR.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from rear oxygen sensor.  3) Turn the ignition switch to ON.  4) Measure the voltage between rear oxygen sensor harness connector and engine ground or chassis ground.  Connector & terminal  (B18) No. 3 (+) — Engine ground (-):	Is the voltage more than 0.2 V?	Replace the rear oxygen sensor. <ref. to<br="">FU(H4DOTC)-39, Rear Oxygen Sen- sor.&gt;</ref.>	Repair the harness and connector.  NOTE: In this case, repair the following:  Open circuit in harness between rear oxygen sensor and ECM connector  Poor contact in rear oxygen sensor connector  Poor contact in ECM connector

# DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC) ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
6	CHECK EXHAUST SYSTEM. Check the exhaust system parts.  NOTE: Check the following items.  • Loose installation of portions  • Damage (crack, hole etc.) of parts  • Looseness and ill fitting of parts between front oxygen (A/F) sensor and rear oxygen sensor	Is there a fault in exhaust system?	Repair or replace the faulty parts.	Replace the rear oxygen sensor. <ref. to<br="">FU(H4DOTC)-39, Rear Oxygen Sen- sor.&gt;</ref.>

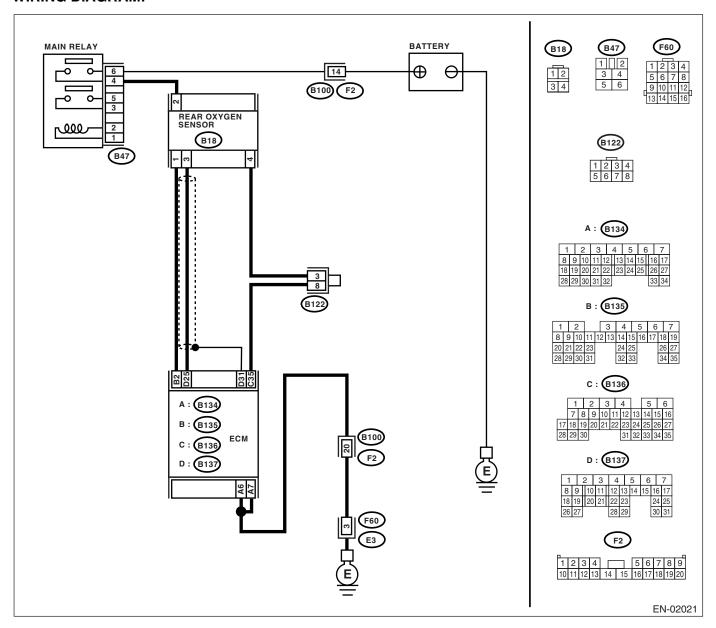
**ENGINE (DIAGNOSTICS)** 

## AC:DTC P0138 — O<sub>2</sub> SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 2) — DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-65, DTC P0138 O<sub>2</sub> SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 2) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



# DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC) ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Using the List of Diagnostic Trou- ble Code (DTC), check the appro- priate DTC. <ref. to EN(H4DOTC)- 68, List of Diag- nostic Trouble Code (DTC).&gt;</ref. 	Go to step 2.
2	CHECK REAR OXYGEN SENSOR DATA.  1) Warm-up the engine until engine coolant temperature is above 70°C (158°F), and keep the engine speed at 2,000 rpm to 3,000 rpm for 2 minutes.  2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or OBD-II general scan tool.  NOTE:  • Subaru Select Monitor  For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DIS-PLAY FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to="">  • OBD-II general scan tool  For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>	Does the value fluctuate?	Go to step 6.	Go to step 3.
3	CHECK REAR OXYGEN SENSOR DATA. Read the data of rear oxygen sensor signal using Subaru Select Monitor or OBD-II general scan tool.	Is the voltage 0.2 — 0.4 V?	Go to step 4.	Replace the rear oxygen sensor. <ref. to<br="">FU(H4DOTC)-39, Rear Oxygen Sen- sor.&gt;</ref.>
4	CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.  1) Turn the ignition switch to OFF.  2) Disconnect the connectors from ECM and rear oxygen sensor.  3) Measure the resistance of harness between ECM and rear oxygen sensor connector.  Connector & terminal  (B137) No. 25 — (B18) No. 3:	Is the resistance more than 3 $\Omega$ ?	Repair the open circuit in harness between ECM and rear oxygen sensor connector.	Go to step 5.
5	CHECK HARNESS BETWEEN REAR OXY-GEN SENSOR AND ECM CONNECTOR.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from rear oxygen sensor.  3) Turn the ignition switch to ON.  4) Measure the voltage between rear oxygen sensor harness connector and engine ground or chassis ground.  Connector & terminal  (B18) No. 3 (+) — Engine ground (-):	Is the voltage more than 0.2 V?	Replace the rear oxygen sensor. <ref. to<br="">FU(H4DOTC)-39, Rear Oxygen Sen- sor.&gt;</ref.>	Repair the harness and connector.  NOTE: In this case, repair the following:  Open circuit in harness between rear oxygen sensor and ECM connector  Poor contact in rear oxygen sensor connector  Poor contact in ECM connector

	Step	Check	Yes	No
6	CHECK EXHAUST SYSTEM. Check the exhaust system parts.  NOTE: Check the following items.  • Loose installation of portions  • Damage (crack, hole etc.) of parts  • Looseness and ill fitting of parts between front oxygen (A/F) sensor and rear oxygen sensor	Is there a fault in exhaust system?	Repair or replace the faulty parts.	Replace the rear oxygen sensor. <ref. to<br="">FU(H4DOTC)-39, Rear Oxygen Sen- sor.&gt;</ref.>

ENGINE (DIÀGNOSTICS)

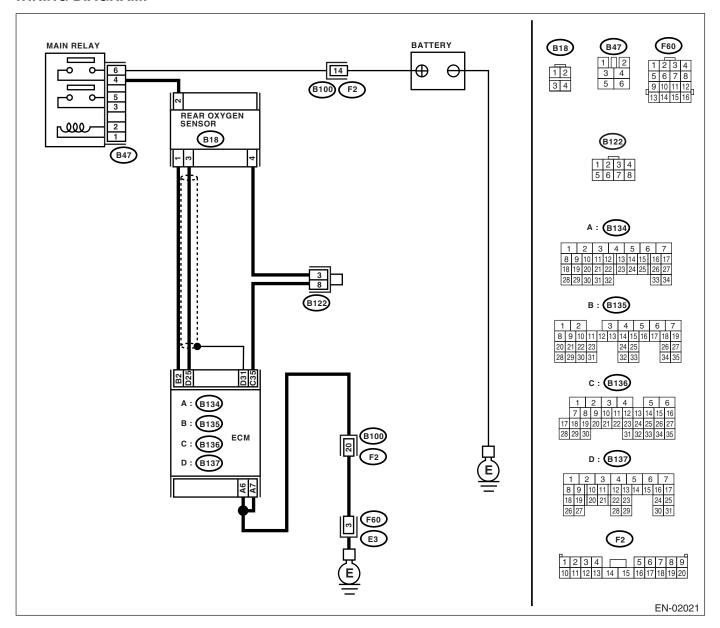
### AD: DTC P0139 — O<sub>2</sub> SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 2)

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

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-67, DTC P0139 O<sub>2</sub> SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 2) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



Step	Check	Yes	No
1 CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?		Replace the rear oxygen sensor. <ref. to<br="">FU(H4DOTC)-39, Rear Oxygen Sen- sor.&gt;</ref.>

ENGINE (DIÀGNOSTICS)

### AE:DTC P0171 — SYSTEM TOO LEAN (BANK 1) —

NOTE:

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

**ENGINE (DIAGNOSTICS)** 

## AF:DTC P0172 — SYSTEM TOO RICH (BANK 1) — DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-70, DTC P0171 SYSTEM TOO LEAN (BANK 1) , Diagnostic Trouble Code (DTC) Detecting Criteria.> <Ref. to GD(H4DOTC)-73, DTC P0172 SYSTEM TOO RICH (BANK 1) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.

	Step	Check	Yes	No
1	CHECK EXHAUST SYSTEM.	Are there holes or loose bolts on exhaust system?	Repair the exhaust system.	Go to step 2.
2	CHECK AIR INTAKE SYSTEM.	Are there holes, loose bolts or disconnection of hose on air intake system?	Repair the air intake system.	Go to step 3.
3	CHECK FUEL PRESSURE.  Warning: Place "NO FIRE" signs near the working area. Be careful not to spill fuel on the floor.  Release the fuel pressure.  (1) Disconnect the connector from fuel pump relay.  (2) Start the engine and run it until it stalls.  (3) After the engine stalls, crank it for 5 more seconds.  (4) Turn the ignition switch to OFF.  Connect the connector to fuel pump relay.  Disconnect the fuel delivery hose from fuel filter, and connect fuel pressure gauge.  Install the fuel filler cap.  Start the engine and idle while gear position is neutral.  Measure the fuel pressure while disconnecting pressure regulator vacuum hose from intake manifold.  Warning: Before removing the fuel pressure gauge, release fuel pressure does not increase, squeeze fuel return hose 2 to 3 times, then measure fuel pressure again.		Go to step 4.	Repair the following items. Fuel pressure too high:  • Clogged fuel return line or bent hose Fuel pressure too low:  • Improper fuel pump discharge • Clogged fuel supply line

# DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC) ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
4	CHECK FUEL PRESSURE.  After connecting the pressure regulator vacuum hose, measure fuel pressure.  Warning: Before removing the fuel pressure gauge, release fuel pressure.  NOTE:  If the fuel pressure does not increase, squeeze fuel return hose 2 to 3 times, then measure fuel pressure again.  If out of specification as measured at this step, check or replace the pressure regulator and pressure regulator vacuum hose.	Is the measured value 206 — 235 kPa (2.1 — 2.4 kg/cm <sup>2</sup> , 30 — 34 psi)?	Go to step 5.	Repair the following items. Fuel pressure too high:     Faulty pressure regulator     Clogged fuel return line or bent hose Fuel pressure too low:     Faulty pressure regulator     Improper fuel pump discharge     Clogged fuel supply line
5	CHECK ENGINE COOLANT TEMPERATURE SENSOR.  1) Start the engine and warm-up completely. 2) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor or OBD-II general scan tool.  NOTE:  • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to="">  • OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>	Is the temperature more than 60°C (140°F)?	Go to step 6.	Replace the engine coolant temperature sensor. <ref. coolant="" engine="" fu(h4dotc)-26,="" sensor.="" temperature="" to=""></ref.>
6	CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE.  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 accessory switches to OFF.  5) Read the data of mass air flow and intake air temperature sensor signal using Subaru Select Monitor or OBD-II general scan tool.  NOTE:  • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to="">  • OBD-II general scan tool For detailed operation procedure, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>	Is the measured value within the followings? Ignition ON: 73.3 — 106.6 kPa (550 — 800 mmHg, 21.65 — 31.50 inHg) Idling: 24.0 — 41.3 kPa (180 — 310 mmHg, 7.09 — 12.20 inHg)	Go to step 7.	Replace the mass air flow and intake air temperature sensor. <ref. air="" and="" flow="" fu(h4dotc)-30,="" intake="" mass="" sensor.="" temperature="" to=""></ref.>

Step	Check	Yes	No
7 CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.  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 accessory switches to 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 Subaru Select Monitor or OBD-II general scan tool.  NOTE:  • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to="">  • OBD-II general scan tool For detailed operation procedure, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>	Subtract ambient temperature from intake air temperature. Is the obtained value –10 — 50°C (14 — 122°F)?	Service Center. NOTE: Inspection by DTM is required, be-	FU(H4DOTC)-30, Mass Air Flow and Intake Air Temper-

ENGINE (DIÀGNOSTICS)

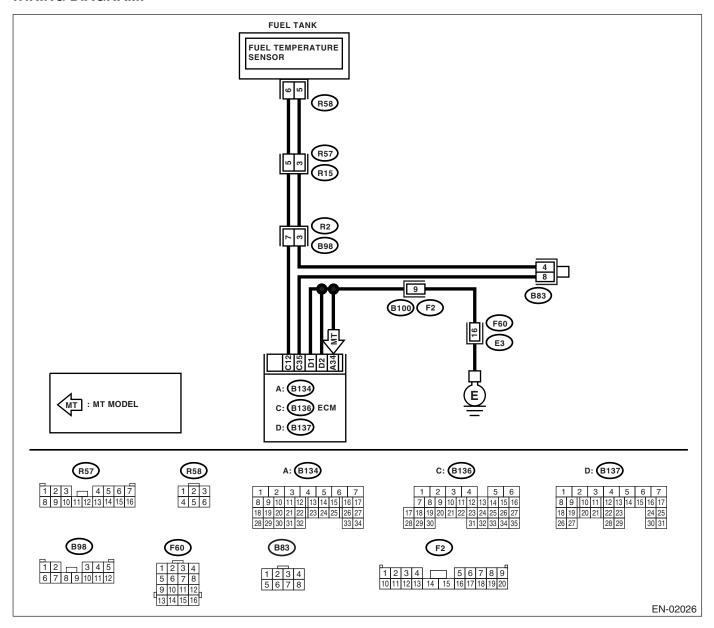
#### AG:DTC P0181 — FUEL TEMPERATURE SENSOR "A" CIRCUIT RANGE/PER-FORMANCE —

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

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-76, DTC P0181 FUEL TEMPERATURE SENSOR "A" CIRCUIT RANGE/PERFORMANCE —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



Step	Check	Yes	No
1 CHECK FOR OTHER DTC ON DISPLAY.	Is any other DTC displayed?	"List of Diagnostic Trouble Codes	Replace the fuel temperature sen- sor. <ref. to<br="">EC(H4DOTC)-9, Fuel Temperature Sensor.&gt;</ref.>

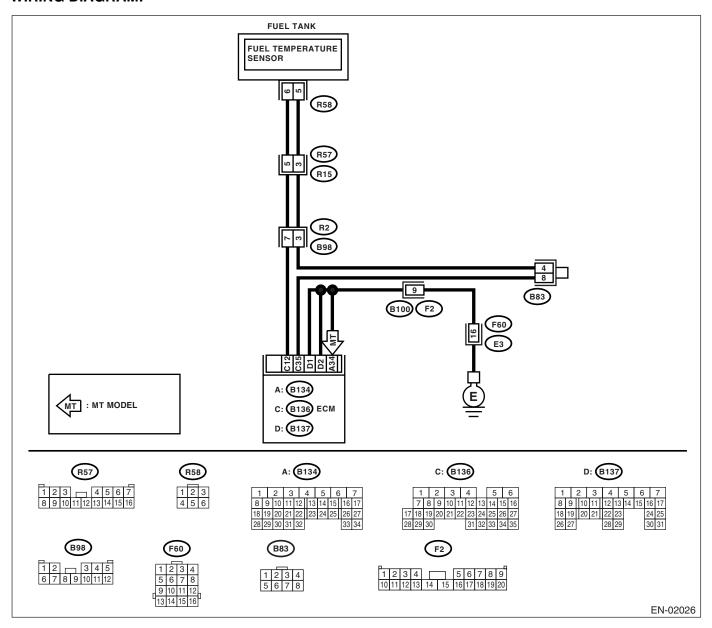
**ENGINE (DIÀGNOSTICS)** 

## AH:DTC P0182 — FUEL TEMPERATURE SENSOR "A" CIRCUIT LOW INPUT — DTC DETECTING CONDITION:

- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-79, DTC P0182 FUEL TEMPERATURE SENSOR "A" CIRCUIT LOW INPUT —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK CURRENT DATA.  1) Start the engine.  2) Read the data of fuel temperature sensor signal using Subaru Select Monitor or OBD-II general scan tool.	Is the temperature more than 150°C (302°F)?	Go to step 2.	The malfunction indicator light may light up, however, the circuit is returned to the
	NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to=""> • OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>			normal status at the moment.
2	CHECK CURRENT DATA.  1) Turn ignition switch to OFF.  2) Remove the access hole lid.  3) Disconnect the connector from fuel pump.  4) Turn ignition switch to ON.  5) Read the data of fuel temperature sensor signal using Subaru Select Monitor or OBD-II general scan tool.  NOTE:  • Subaru Select Monitor  For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to="">  • OBD-II general scan tool  For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>	Is the temperature less than –40°C (–40°F)?	Replace the fuel temperature sen- sor. <ref. to<br="">EC(H4DOTC)-9, Fuel Temperature Sensor.&gt;</ref.>	Repair short circuit to ground in har- ness between fuel pump and ECM connector.

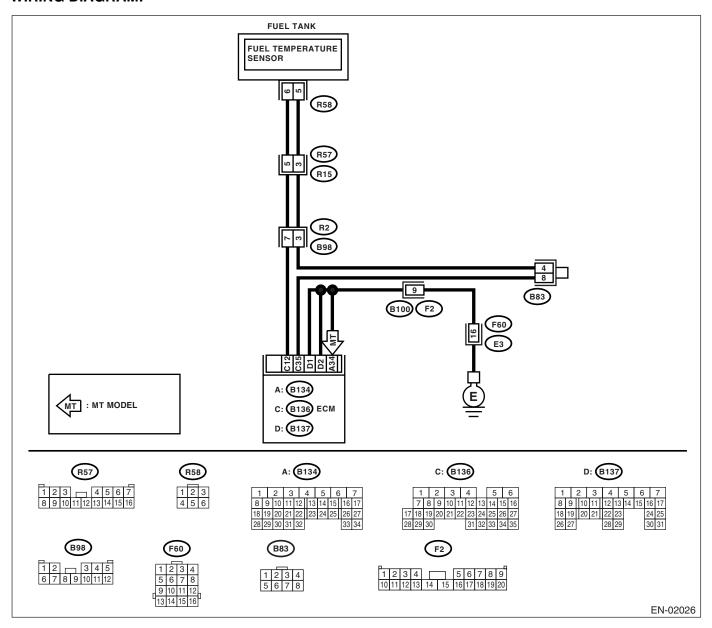
**ENGINE (DIÀGNOSTICS)** 

## AI: DTC P0183 — FUEL TEMPERATURE SENSOR "A" CIRCUIT HIGH INPUT — DTC DETECTING CONDITION:

- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-81, DTC P0183 FUEL TEMPERATURE SENSOR "A" CIRCUIT HIGH INPUT —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK CURRENT DATA.  1) Start the engine. 2) Read the data of fuel temperature sensor signal using Subaru Select Monitor or OBD-II general scan tool.  NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to=""> • OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>	Is the temperature less than –40°C (–40°F)?	Go to step 2.	Repair poor contact.  NOTE: In this case, repair the following: Poor contact in fuel pump connector Poor contact in ECM connector Poor contact in coupling connector Poor contact in joint connector
2	CHECK HARNESS BETWEEN FUEL TEM-PERATURE SENSOR AND ECM CONNECTOR.  1) Turn ignition switch to OFF.  2) Remove the access hole lid.  3) Disconnect the connector from fuel pump.  4) Measure the voltage between fuel pump connector and chassis ground.  Connector & terminal  (R58) No. 6 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Repair short circuit to battery in har- ness between ECM and fuel pump connector.	Go to step 3.
3	CHECK HARNESS BETWEEN FUEL TEM-PERATURE SENSOR AND ECM CONNECTOR.  1) Turn ignition switch to ON. 2) Measure the voltage between fuel pump connector and chassis ground.  Connector & terminal  (R58) No. 6 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Repair short circuit to battery in har- ness between ECM and fuel pump connector.	Go to step 4.
4	CHECK HARNESS BETWEEN FUEL TEM-PERATURE SENSOR AND ECM CONNECTOR.  Measure the voltage between fuel pump connector and chassis ground.  Connector & terminal  (R58) No. 6 (+) — Chassis ground (-):	Is the voltage more than 4 V?	Go to step 5.	Repair harness and connector.  NOTE: In this case, repair the following:  Open circuit in harness between ECM and fuel pump connector  Poor contact in fuel pump connector  Poor contact in ECM connector  Poor contact in coupling connector

	Step	Check	Yes	No
5	Step  CHECK HARNESS BETWEEN FUEL TEM- PERATURE SENSOR AND ECM CONNEC- TOR.  1) Turn ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance of harness between fuel pump connector and ECM.  Connector & terminal (R58) No. 5 — (B136) No. 35:	Check Is the resistance less than 1 $\Omega$ ?	Yes Replace the fuel temperature sensor. <ref. ec(h4dotc)-9,="" fuel="" sensor.="" temperature="" to=""></ref.>	Repair harness and connector.  NOTE: In this case, repair the following:  Open circuit in harness between ECM and fuel pump connector Poor contact in
				fuel pump connector  • Poor contact in ECM connector  • Poor contact in coupling connector  • Poor contact in joint connector

**ENGINE (DIAGNOSTICS)** 

## AJ:DTC P0222 — THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT LOW INPUT —

## **DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-83, DTC P0222 THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT LOW INPUT —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

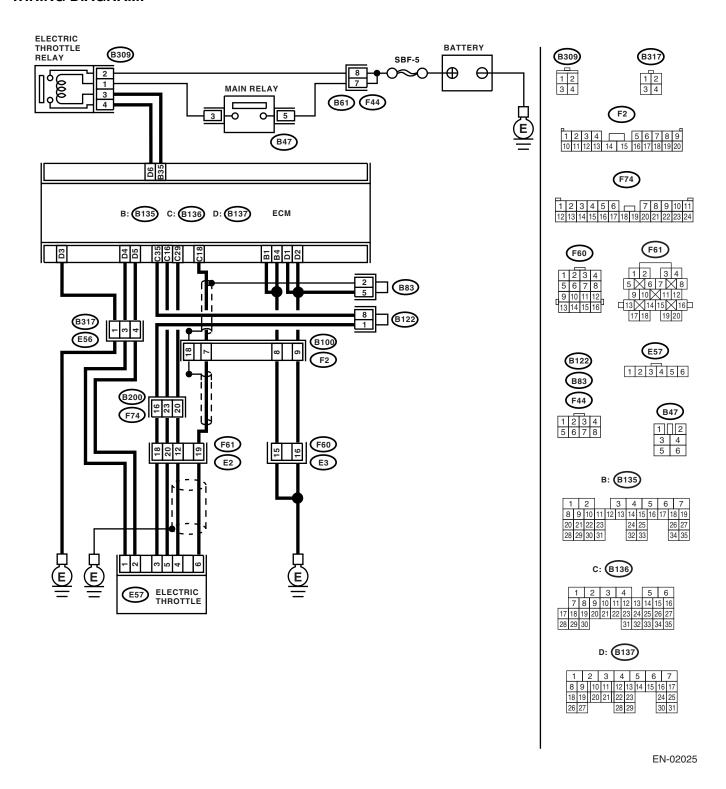
### **TROUBLE SYMPTOM:**

- · Erroneous idling
- Poor driving performance
- Engine stalls.

## **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.

ENGINE (DIÀGNOSTICS)



ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK OUTPUT VOLTAGE OF SENSOR.	Is the voltage more than 0.8 V?		Go to step 3.
	<ol> <li>Turn the ignition switch to ON.</li> <li>Measure the voltage between ECM connector terminals.</li> <li>Connector &amp; terminal         (B136) No. 29 (+) — (B136) No. 35 (-):</li> <li>Shake the ECM harness and connector, engine harness connectors (E84, E22), electric throttle connector harness while monitoring value of voltage meter.</li> </ol>	-		S to 5.5p 5.
2	CHECK POOR CONTACT IN CONNECTORS. Check poor contact in the connectors between the ECM and electric throttle.	Is there poor contact in the connectors between ECM and electric throttle?	Repair the poor contact in connectors.	Connector has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.
3	CHECK HARNESS BETWEEN ECM AND ELECTRIC THROTTLE.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from ECM.  3) Disconnect the connector from electric throttle.  4) Measure the resistance between the ECM connector and electric throttle connector.  Connector & terminal  (B136) No. 16 — (E57) No. 5:	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open circuit of harness connector.
4	CHECK HARNESS BETWEEN ECM AND ELECTRIC THROTTLE. Check the resistance between the ECM connector and chassis ground.  Connector & terminal (B136) No. 29 — Chassis ground: (B136) No. 16 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega ?$	Go to step 5.	Repair the chassis short of harness.
5	CHECK POWER SURPLY TO SENSOR.  1) Connect the ECM connectors.  2) Turn the ignition switch to ON.  3) Measure the voltage between electric throttle connector and engine ground.  Connector & terminal  (E57) No. 5 (+) — Engine ground (-):  4) Shake the ECM harness and connector, engine harness connectors, while monitoring value of voltage meter.	Is the voltage 4.5 — 5.5 V?	Go to step 6.	Repair the poor contact in ECM connector. If problem persists, replace the ECM. <ref. (ecm).="" control="" engine="" fu(h4dotc)-42,="" module="" to=""></ref.>
6	CHECK SHORT OF ECM.  1) Turn the ignition switch to OFF.  2) Measure the resistance between electric throttle connector and engine ground.  Connector & terminal  (E57) No. 4 — Engine ground:	Is the resistance more than 10 $\Omega$ ?	Repair the poor contact in electric throttle connector. If problem persists, replace the electric throttle.	Repair the poor contact in ECM connectors. If problem persists, replace the ECM. <ref. (ecm).="" control="" engine="" fu(h4dotc)-42,="" module="" to=""></ref.>

ENGINE (DIÀGNOSTICS)

## AK:DTC P0223 — THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIR-CUIT HIGH INPUT —

## **DTC DETECTING CONDITION:**

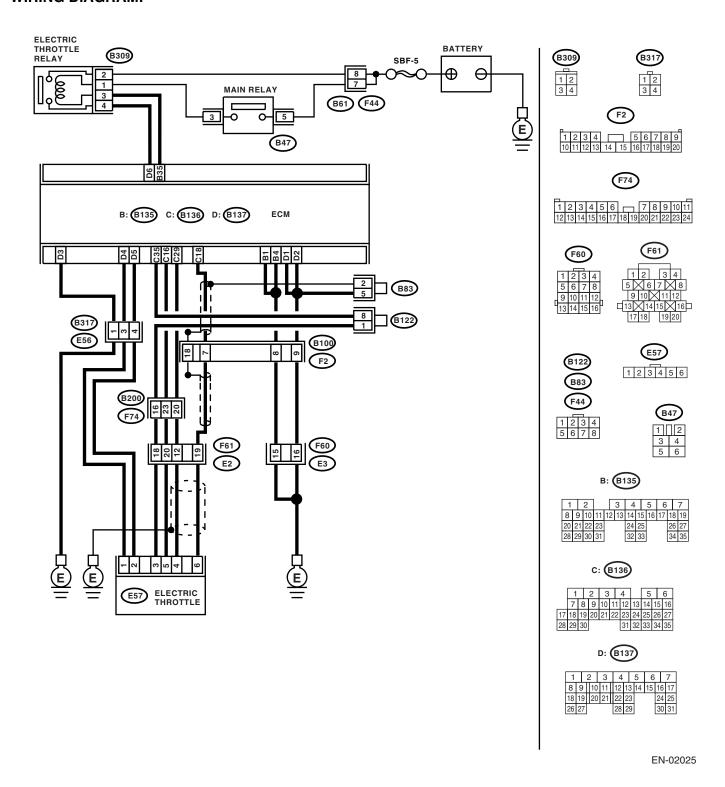
- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-85, DTC P0223 THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT HIGH INPUT —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

## TROUBLE SYMPTOM:

- · Erroneous idling
- Poor driving performance
- Engine stalls.

## **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK OUTPUT VOLTAGE OF SENSOR.  1) Turn the ignition switch to ON.  2) Read the data of sub throttle sensor signals, using the Subaru Select Monitor.  3) Shake the ECM harness and connector, engine harness connectors, electric throttle connector harness while monitoring value of voltage meter.	Is the voltage less than 4.73 V?	Go to step 2.	Go to step 3.
2	CHECK POOR CONTACT IN CONNECTORS. Check poor contact in connectors between ECM and electric throttle.	connectors between ECM and electric throttle?	Repair the poor contact in connectors.	Connector has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.
3	CHECK HARNESS BETWEEN ECM AND ELECTRIC THROTTLE.  1) Turn the ignition switch to OFF.  2) Disconnect the connectors from ECM.  3) Disconnect the connectors from electric throttle.  4) Measure the resistance between ECM connector and electric throttle connector.  Connector & terminal  (B136) No. 35 — (E57) No. 3:  (B136) No. 29 — (E57) No. 4:	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open circuit of harness connector.
4	CHECK HARNESS BETWEEN ECM AND ELECTRIC THROTTLE.  1) Connect the ECM connector.  2) Measure the resistance between the electric throttle connector and engine ground.  Connector & terminal  (E57) No. 3 — Engine ground:	Is the resistance less than 5 $\Omega$ ?	Go to step 5.	Repair the poor contact in ECM connector. If the problem persists, replace the ECM. <ref. (ecm).="" control="" engine="" fu(h4dotc)-42,="" module="" to=""></ref.>
5	CHECK HARNESS BETWEEN ECM AND ELECTRIC THROTTLE.  1) Connect the ECM connector.  2) Turn the ignition switch to ON.  3) Measure the voltage between electric throttle connector and engine ground.  Connector & terminal  (E57) No. 5 — Engine ground:  4) Shake the ECM harness and connector, engine harness connectors, while monitoring value of voltage meter.	Is the voltage more than 10 V?	Go to step 6.	Repair the battery short of harness between ECM connector and electric throttle connector.
6	CHECK HARNESS BETWEEN ECM AND ELECTRIC THROTTLE.  1) Measure the voltage between the electric throttle connector and engine ground.  Connector & terminal  (E57) No. 4 (+) — Engine ground (-):  2) Shake the ECM harness and connector, engine harness connectors, while monitoring value of voltage meter.	Is the voltage less than 10 V?	Go to step 7.	Repair the short of harness between ECM connector and electric throt- tle connector.

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
7	CHECK HARNESS BETWEEN ECM AND ELECTRIC THROTTLE.	Is the resistance more than 1 $M\Omega$ ?	Repair the poor contact in electric	Short circuit of sensor power sup-
	<ol> <li>Turn the ignition switch to OFF.</li> <li>Disconnect the connector from ECM.</li> <li>Measure the voltage between connectors.</li> <li>Connector &amp; terminal (B136) No. 29 — (B136) No. 16:</li> </ol>		throttle connector. If problem persists, replace the electric throttle.	ply may be the cause.

**ENGINE (DIÀGNOSTICS)** 

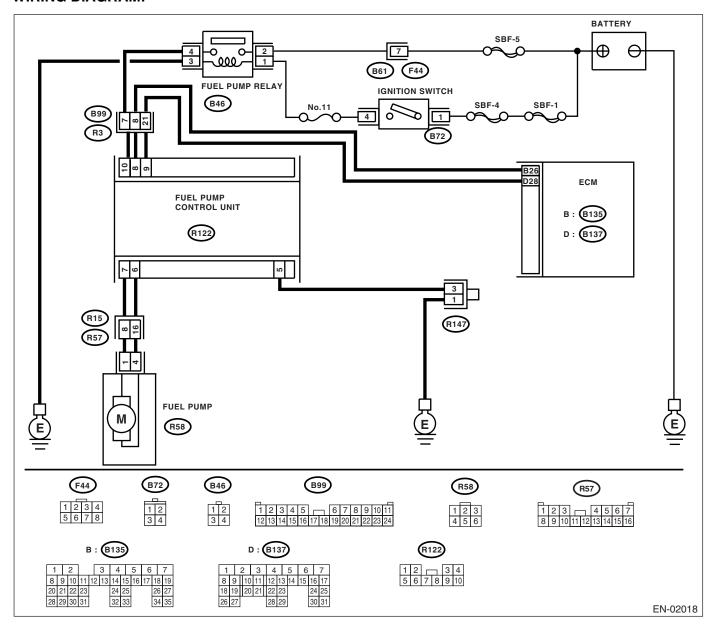
## AL:DTC P0230 — FUEL PUMP PRIMARY CIRCUIT —

### **DTC DETECTING CONDITION:**

- · Immediately at fault recognition
- GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-87, DTC P0230 FUEL PUMP PRIMARY CIRCUIT
- -, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



ENGINE (DIAGNOSTICS)

	Ston	Check	Yes	No
1	Step CHECK POWER SUPPLY CIRCUIT TO FUEL			
	PUMP CONTROL UNIT.  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	is the voltage more than 10 v?	Go to step 2.	Repair the power supply circuit.  NOTE: In this case repair the following:  Open or ground
	control unit and chassis ground.  Connector & terminal  (R122) No. 10 (+) — Chassis ground (-):			short circuit in harness between fuel pump relay and fuel pump control unit  Poor contact in fuel pump control unit connector  Poor contact in fuel pump relay connector
2	CHECK GROUND CIRCUIT OF FUEL PUMP CONTROL UNIT.  1) Turn the ignition switch to OFF.  2) Measure the resistance of harness between fuel pump control unit and chassis ground.  Connector & terminal  (R122) No. 5 — Chassis ground:	Is the resistance less than 5 $\Omega$ ?	Go to step 3.	Repair the harness and connector.  NOTE: In this case, repair the following:  Open circuit between fuel pump control unit and chassis ground Poor contact in fuel pump control unit connector
3	CHECK HARNESS BETWEEN FUEL PUMP CONTROL UNIT AND FUEL PUMP CONNECTOR.  1) Disconnect the connector from fuel pump. 2) Measure the resistance of harness between fuel pump control unit and fuel pump connector.  Connector & terminal (R122) No. 7 — (R58) No. 1: (R122) No. 6 — (R58) No. 4:	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open circuit between fuel pump control unit and fuel pump.
4	CHECK HARNESS BETWEEN FUEL PUMP CONTROL UNIT AND FUEL PUMP CONNECTOR.  Measure the resistance of harness between fuel pump control unit and chassis ground.  Connector & terminal  (R122) No. 7 — Chassis ground:  (R122) No. 6 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega ?$	Go to step 5.	Repair the ground short circuit between fuel pump control unit and fuel pump.

	Step	Check	Yes	No
5	CHECK HARNESS BETWEEN FUEL PUMP CONTROL UNIT AND ECM CONNECTOR.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from ECM.  3) Measure the resistance of harness between fuel pump control unit and ECM connector.  Connector & terminal  (R122) No. 9 — (B137) No. 28:  (R122) No. 8 — (B135) No. 26:	Is the resistance less than 1 $\Omega$ ?	Go to step 6.	Repair the harness and connector.  NOTE: In this case, repair the following:  Open circuit between fuel pump control unit and ECM Poor contact in fuel pump control unit and ECM connector
6	CHECK HARNESS BETWEEN FUEL PUMP CONTROL UNIT AND ECM CONNECTOR.  Measure the resistance of harness between fuel pump control unit and chassis ground.  Connector & terminal  (R122) No. 9 — Chassis ground:  (R122) No. 8 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega ?$	Go to step 7.	Repair the ground short circuit between fuel pump control unit and ECM.
7	CHECK POOR CONTACT.  Check poor contact in ECM and fuel pump control unit connector.	Is there poor contact in ECM and fuel pump control unit connector?	Repair the poor contact in ECM and fuel pump control unit.	Go to step 8.
8	CHECK EXPERIENCE OF OUT OF GAS.	Have the vehicle been out of gas before?	Complete the diagnosis.  NOTE: DTC may be recorded due to the idle running of fuel pump at out of gas.	Fuel Pump Control

**ENGINE (DIAGNOSTICS)** 

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

## **DTC DETECTING CONDITION:**

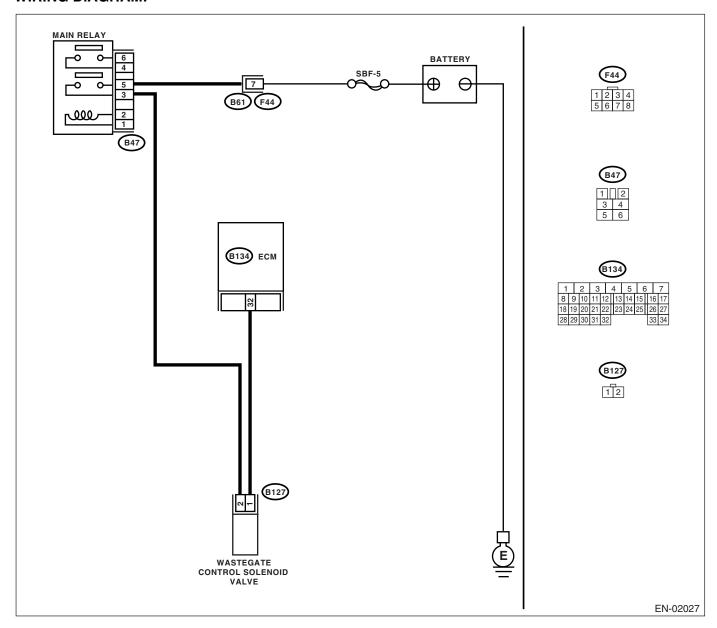
- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-89, DTC P0244 TURBO/SUPER CHARGER WASTEGATE SOLENOID "A" RANGE/PERFORMANCE —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- · Poor driving performance

#### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



Step	Check	Yes	No
1 CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	EN(H4DOTC)-68,	Replace the wastegate control solenoid valve. <ref. control="" fu(h4dotc)-36,="" solenoid="" to="" valve.="" wastegate=""></ref.>

**ENGINE (DIAGNOSTICS)** 

## AN:DTC P0245 — TURBO/SUPER CHARGER WASTEGATE SOLENOID "A" LOW —

## **DTC DETECTING CONDITION:**

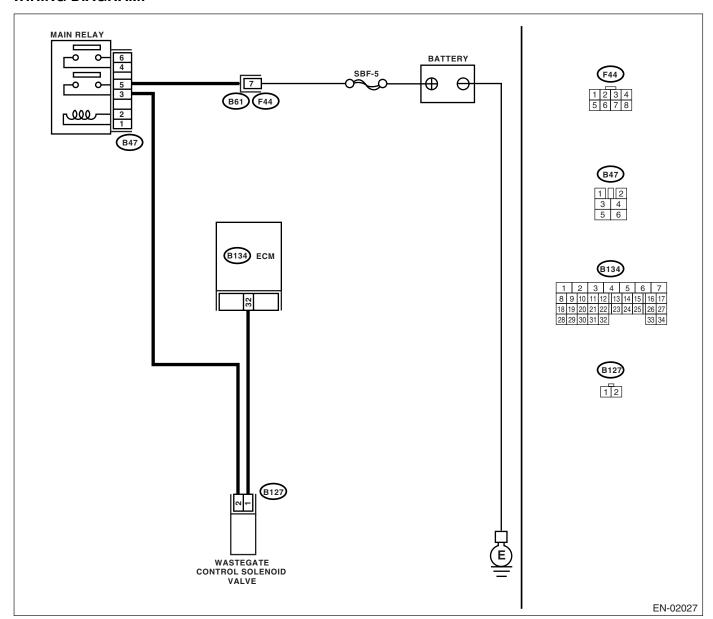
- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-91, DTC P0245 TURBO/SUPER CHARGER WASTEGATE SOLENOID "A" LOW —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### **TROUBLE SYMPTOM:**

Erroneous idling

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK OUTPUT SIGNAL FROM ECM.  1) Turn the ignition switch to ON.  2) Measure the voltage between ECM and chassis ground.  Connector & terminal  (B134) No. 32 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Even if malfunction indicator light lights up, the circuit has returned to a normal condition at this time.	·
2	CHECK HARNESS BETWEEN WASTEGATE CONTROL SOLENOID VALVE AND ECM CONNECTOR.  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.  Connector & terminal  (B127) No. 1 — Engine ground:	Is the resistance less than 10 $\Omega$ ?	Repair the ground short circuit in har- ness between ECM and waste- gate control sole- noid valve connector.	Go to step 3.
3	CHECK HARNESS BETWEEN WASTEGATE CONTROL SOLENOID VALVE AND ECM CONNECTOR.  Measure the resistance of harness between ECM and wastegate control solenoid valve of harness connector.  Connector & terminal (B134) No. 32 — (B127) No. 1:	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open circuit in harness between ECM and wastegate control solenoid valve connector.  NOTE: In this case, repair the following:  Open circuit in harness between ECM and wastegate control solenoid valve connector
4	CHECK WASTEGATE CONTROL SOLE-NOID VALVE.  1) Remove the wastegate control solenoid valve.  2) Measure the resistance between wastegate control solenoid valve terminals.  Terminals  No. 1 — No. 2:	Is the resistance 30 — 40 $\Omega$ ?	Go to step 5.	Replace the wastegate control solenoid valve. <ref. control="" fu(h4dotc)-36,="" solenoid="" to="" valve.="" wastegate=""></ref.>
5	CONTROL SOLENOID VALVE.  1) Turn the ignition switch to ON.  2) Measure the voltage between wastegate control solenoid valve and engine ground.  Connector & terminal  (B127) No. 2 (+) — Engine ground (-):	Is the voltage more than 10 V?		Repair the open circuit in harness between main relay and wastegate control solenoid valve connector.
6	CHECK POOR CONTACT. Check poor contact in wastegate control solenoid valve connector.	Is there poor contact in waste- gate control solenoid valve connector?	Repair the poor contact in wastegate control solenoid valve connector.	Contact your SOA Service Center. NOTE: Inspection by DTM is required, be- cause probable cause is deteriora- tion of multiple parts.

**ENGINE (DIAGNOSTICS)** 

## AO:DTC P0246 — TURBO/SUPER CHARGER WASTEGATE SOLENOID "A" HIGH —

## **DTC DETECTING CONDITION:**

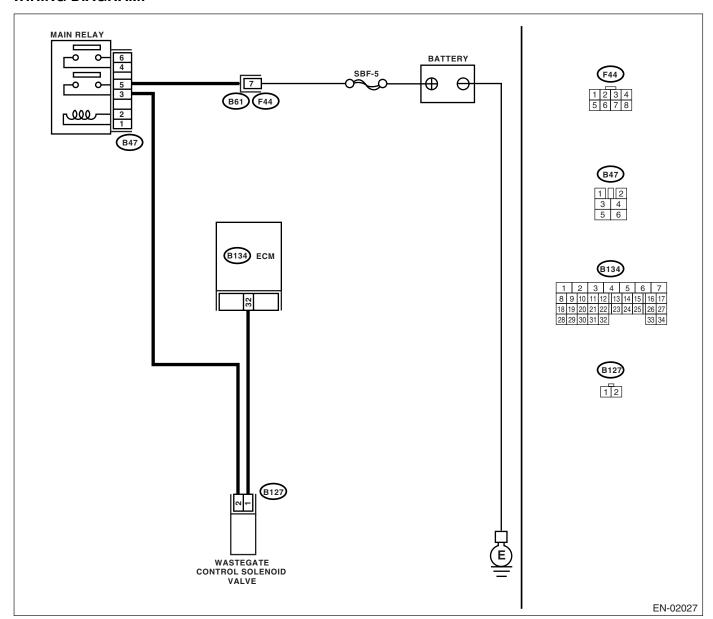
- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-93, DTC P0246 TURBO/SUPER CHARGER WASTEGATE SOLENOID "A" HIGH —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### **TROUBLE SYMPTOM:**

Erroneous idling

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK OUTPUT SIGNAL FROM ECM.  1) Turn the ignition switch to ON.  2) Measure the voltage between ECM and chassis ground.  Connector & terminal  (B134) No. 32 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Go to step 3.	Go to step 2.
2	CHECK POOR CONTACT. Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Replace the ECM. <ref. to<br="">FU(H4DOTC)-42, Engine Control Module (ECM).&gt;</ref.>
3	CHECK HARNESS BETWEEN WASTEGATE CONTROL SOLENOID VALVE AND ECM CONNECTOR.  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.  Connector & terminal  (B134) No. 32 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Repair the battery short circuit in harness between ECM and wastegate control solenoid valve connector. After repair, replace the ECM. <ref. (ecm).="" control="" engine="" fu(h4dotc)-42,="" module="" to=""></ref.>	Go to step 4.
4	CHECK WASTEGATE CONTROL SOLE-NOID VALVE.  1) Turn the ignition switch to OFF.  2) Measure the resistance between wastegate control solenoid valve terminals.  Terminals  No. 1 — No. 2:	Is the resistance less than 1 $\Omega$ ?	Replace the wastegate control solenoid valve <ref. control="" fu(h4dotc)-36,="" solenoid="" to="" valve.="" wastegate=""> and ECM <ref. (ecm).="" control="" engine="" fu(h4dotc)-42,="" module="" to=""></ref.></ref.>	Go to step 5.
5	CHECK POOR CONTACT. Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Replace the ECM. <ref. to<br="">FU(H4DOTC)-42, Engine Control Module (ECM).&gt;</ref.>

**ENGINE (DIAGNOSTICS)** 

## AP:DTC P0301 — CYLINDER 1 MISFIRE DETECTED —

NOTE

For the diagnostic procedure, refer to DTC P0304. <Ref. to EN(H4DOTC)-169, DTC P0304 — CYLINDER 4 MISFIRE DETECTED —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## AQ:DTC P0302 — CYLINDER 2 MISFIRE DETECTED —

NOTE:

For the diagnostic procedure, refer to DTC P0304. <Ref. to EN(H4DOTC)-169, DTC P0304 — CYLINDER 4 MISFIRE DETECTED —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## AR:DTC P0303 — CYLINDER 3 MISFIRE DETECTED —

NOTE:

For the diagnostic procedure, refer to DTC P0304. <Ref. to EN(H4DOTC)-169, DTC P0304 — CYLINDER 4 MISFIRE DETECTED —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

ENGINE (DIÀGNOSTICS)

## AS:DTC P0304 — CYLINDER 4 MISFIRE DETECTED —

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- Immediately at fault recognition (A misfire which could damage catalyst occurs.)
- GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-95, DTC P0301 CYLINDER 1 MISFIRE DETECTED —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

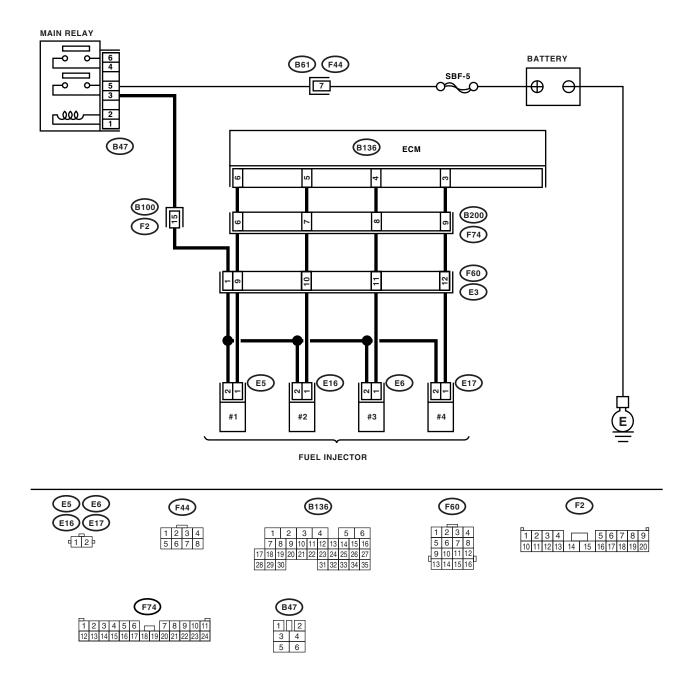
### TROUBLE SYMPTOM:

- Engine stalls.
- Erroneous idling
- · Rough driving

### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.

### **WIRING DIAGRAM:**



EN-02019

	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""></ref.>	Go to step 2.
2	CHECK OUTPUT SIGNAL FROM ECM.  1) Turn the ignition switch to ON.  2) Measure the voltage between ECM connector and chassis ground on faulty cylinders.  Connector & terminal  #1 (B136) No. 6 (+) — Chassis ground (-):  #2 (B136) No. 5 (+) — Chassis ground (-):  #3 (B136) No. 4 (+) — Chassis ground (-):  #4 (B136) No. 3 (+) — Chassis ground (-):		Go to step 7.	Go to step 3.
3	CHECK HARNESS BETWEEN FUEL INJECTOR AND ECM CONNECTOR.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from fuel injector on faulty cylinders.  3) Disconnect the connector from ECM.  4) Measure the resistance between ECM connector and engine ground on faulty cylinders.  Connector & terminal  #1 (E5) No. 1 — Engine ground:  #2 (E16) No. 1 — Engine ground:  #3 (E6) No. 1 — Engine ground:  #4 (E17) No. 1 — Engine ground:	Is the resistance more than 1 $M\Omega$ ?	Go to step 4.	Repair the ground short circuit in har- ness between fuel injector and ECM connector.
4	CHECK HARNESS BETWEEN FUEL INJECTOR AND ECM CONNECTOR.  Measure the resistance of harness connector between ECM connector and fuel injector on faulty cylinders.  Connector & terminal #1 (B136) No. 6 — (E5) No. 1: #2 (B136) No. 5 — (E16) No. 1: #3 (B136) No. 4 — (E6) No. 1: #4 (B136) No. 3 — (E17) No. 1:	Is the resistance less than 1 $\Omega$ ?	Go to step 5.	Repair the harness and connector.  NOTE: In this case, repair the following:  Open circuit in harness between ECM and fuel injector connector  Poor contact in coupling connector
5	CHECK FUEL INJECTOR.  Measure the resistance between fuel injector terminals on faulty cylinder.  Terminals  No. 1 — No. 2:	Is the resistance 5 — 20 $\Omega$ ?	Go to step 6.	Replace the faulty fuel injector. <ref. to FU(H4DOTC)- 32, Fuel Injector.&gt;</ref. 

ENGINE (DIAGNOSTICS)

	Stan	Check	Yes	No
6	Step SUPPLY LINE			-
6	CHECK POWER SUPPLY LINE.  1) Turn the ignition switch to ON.  2) Measure the voltage between fuel injector and engine ground on faulty cylinders.  Connector & terminal  #1 (E5) No. 2 (+) — Engine ground (-):  #2 (E16) No. 2 (+) — Engine ground (-):  #3 (E6) No. 2 (+) — Engine ground (-):  #4 (E17) No. 2 (+) — Engine ground (-):	Is the voltage more than 10 V?	Repair the poor contact in all con- nectors in fuel injector circuit.	Repair the harness and connector.  NOTE: In this case, repair the following:  Open circuit in harness between main relay and fuel injector connector on faulty cylinders
				Poor contact in coupling connector     Poor contact in main relay connector     Poor contact in fuel injector connector on faulty cylinders
7	CHECK HARNESS BETWEEN FUEL INJECTOR AND ECM CONNECTOR.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from fuel injector on faulty cylinder.  3) Turn the ignition switch to ON.  4) Measure the voltage between ECM connector and chassis ground on faulty cylinders.  Connector & terminal  #1 (B136) No. 6 (+) — Chassis ground (-):  #2 (B136) No. 5 (+) — Chassis ground (-):  #3 (B136) No. 4 (+) — Chassis ground (-):		Repair the battery short circuit in harness between ECM and fuel injector. After repair, replace the ECM. <ref. (ecm).="" control="" engine="" fu(h4dotc)-42,="" module="" to=""></ref.>	Go to step 8.
8	CHECK FUEL INJECTOR.  1) Turn the ignition switch to OFF.  2) Measure the resistance between fuel injector terminals on faulty cylinder.  Terminals  No. 1 — No. 2:	Is the resistance less than 1 $\Omega$ ?	Replace the faulty fuel injector <ref. fu(h4dotc)-32,="" fuel="" injector.="" to=""> and ECM <ref. (ecm).="" control="" engine="" fu(h4dotc)-42,="" module="" to=""></ref.></ref.>	Go to step 9.
9	CHECK INSTALLATION OF CAMSHAFT PO- SITION SENSOR/CRANKSHAFT POSITION SENSOR.	Is the camshaft position sensor or crankshaft position sensor loosely installed?	Tighten the cam- shaft position sen- sor or crankshaft position sensor.	Go to step 10.
10	CHECK CRANK SPROCKET. Remove the timing belt cover.	Is the crank sprocket rusted or does it have broken teeth?	Replace the crank sprocket. <ref. to<br="">ME(H4DOTC)-60, Crank Sprocket.&gt;</ref.>	Go to step 11.
11	CHECK INSTALLATION CONDITION OF TIMING BELT.  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. assembly.="" belt="" me(h4dotc)-50,="" timing="" to=""></ref.>	Go to step 12.

	Step	Check	Yes	No
12	CHECK FUEL LEVEL.	Is the fuel meter indication higher than the "Lower" level?	Go to step 13.	Replenish the fuel so fuel meter indi- cation is higher than the "Lower" level. After replen- ishing fuel; Go to step 13.
13	CHECK STATUS OF MALFUNCTION INDI- CATOR LIGHT.  1) Clear the memory using Subaru Select Monitor. <ref. clear="" en(h4dotc)-44,="" memory<br="" to="">Mode.&gt;  2) Start the engine, and drive the vehicle more than 10 minutes.</ref.>	Is the malfunction indicator light coming on or blinking?	Go to step 15.	Go to step 14.
14	CHECK CAUSE OF MISFIRE DIAGNOSED.	Was the cause of misfire diagnosed when the engine is running?	Finish the diag- nostics operation, if the engine has no abnormality.	Repair the poor contact.  NOTE: In this case, repair the following: • Poor contact in ignition coil connector • Poor contact in fuel injector connector on faulty cylinders • Poor contact in ECM connector • Poor contact in coupling connector
15	CHECK AIR INTAKE SYSTEM.	Is there a fault in air intake system?	Repair the air intake system.  NOTE: Check the following items: Are there air leaks or air suction caused by loose or dislocated nuts and bolts? Are there cracks or any disconnection of hoses?	Go to step 16.
16	CHECK CYLINDER.	Is there a fault in that cylinder?	Repair or replace the faulty parts. NOTE: Check the follow- ing items. • Spark plug • Fuel injector • Compression pressure	Go to DTC P0171 and P0172. <ref. to EN(H4DOTC)- 141, DTC P0171 — SYSTEM TOO LEAN (BANK 1) — , Diagnostic Pro- cedure with Diag- nostic Trouble Code (DTC).&gt;</ref. 

**ENGINE (DIAGNOSTICS)** 

## AT:DTC P0327 — KNOCK SENSOR 1 CIRCUIT LOW INPUT (BANK 1 OR SINGLE SENSOR) —

## **DTC DETECTING CONDITION:**

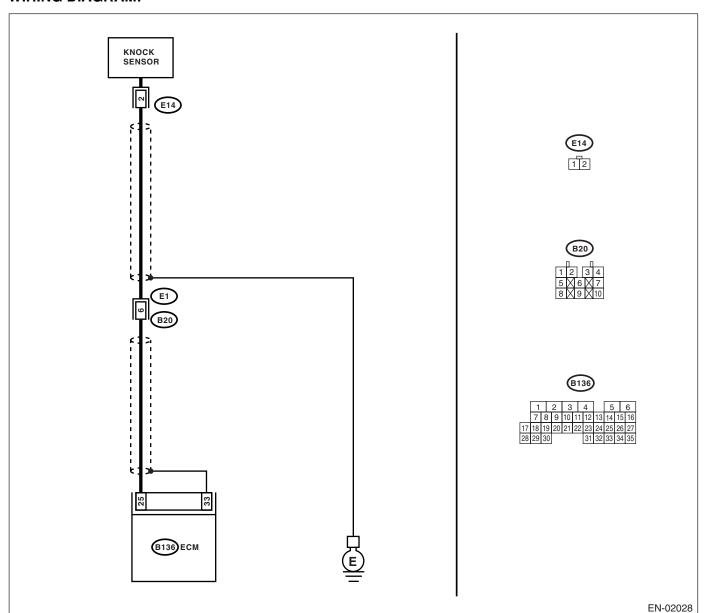
- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-103, DTC P0327 KNOCK SENSOR 1 CIRCUIT LOW INPUT (BANK 1 OR SINGLE SENSOR) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### **TROUBLE SYMPTOM:**

- · Poor driving performance
- Knocking occurs.

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK HARNESS BETWEEN KNOCK SENSOR AND ECM CONNECTOR.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from ECM.  3) Measure the resistance between ECM harness connector and chassis ground.  Connector & terminal  (B136) No. 25 — Chassis ground:	Is the resistance more than 700 k $\Omega$ ?	Go to step 2.	Repair the harness and connector.  NOTE: In this case, repair the following:  Open circuit in harness between knock sensor and ECM connector Poor contact in knock sensor connector Poor contact in coupling connector
2	CHECK KNOCK SENSOR.  1) Disconnect the connector from knock sensor.  2) Measure the resistance between knock sensor connector terminal and engine ground.  Terminals  No. 2 — Engine ground:	Is the resistance more than 700 k $\Omega$ ?	Go to step 3.	Repair the har- ness and connec- tor.  NOTE: In this case, repair the following:  Poor contact in knock sensor con- nector  Poor contact in coupling connector
3	CHECK CONDITION OF KNOCK SENSOR INSTALLATION.	Is the knock sensor installation bolt tightened securely?	Replace the knock sensor. <ref. to<br="">FU(H4DOTC)-29, Knock Sensor.&gt;</ref.>	Tighten the knock sensor installation bolt securely.

**ENGINE (DIAGNOSTICS)** 

## AU:DTC P0328 — KNOCK SENSOR 1 CIRCUIT HIGH INPUT (BANK 1 OR SINGLE SENSOR) —

## **DTC DETECTING CONDITION:**

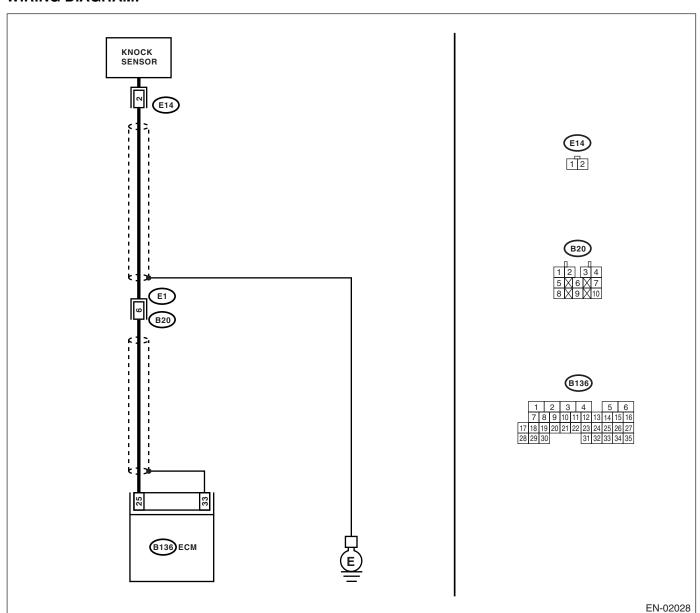
- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-105, DTC P0328 KNOCK SENSOR 1 CIRCUIT HIGH INPUT (BANK 1 OR SINGLE SENSOR) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### **TROUBLE SYMPTOM:**

- · Poor driving performance
- Knocking occurs.

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK HARNESS BETWEEN KNOCK SEN- SOR AND ECM CONNECTOR. Measure the resistance of harness between ECM connector and chassis ground. Connector & terminal (B136) No. 25 — Chassis ground:	Is the resistance less than 400 $\mbox{k}\Omega$ ?	Go to step 2.	Go to step 3.
2	CHECK KNOCK SENSOR.  1) Disconnect the connector from knock sensor.  2) Measure the resistance between knock sensor connector terminal and engine ground.  Terminals  No. 2 — Engine ground:	Is the resistance less than 400 $\mbox{k}\Omega ?$	Replace the knock sensor. <ref. to<br="">FU(H4DOTC)-29, Knock Sensor.&gt;</ref.>	Repair the ground short circuit in harness between knock sensor connector and ECM connector.  NOTE: The harness between both connectors is shielded. Repair the short circuit of harness together with shield.
3	CHECK INPUT SIGNAL FOR ECM.  1) Connect the connectors to ECM and knock sensor.  2) Turn the ignition switch to ON.  3) Measure the voltage between ECM and chassis ground.  Connector & terminal  (B136) No. 25 (+) — Chassis ground (-):	Is the voltage more than 2 V?	Even if malfunction indicator light lights up, 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:  Poor contact in knock sensor connector  Poor contact in ECM connector  Poor contact in coupling connector	

**ENGINE (DIAGNOSTICS)** 

## AV:DTC P0335 — CRANKSHAFT POSITION SENSOR "A" CIRCUIT — DTC DETECTING CONDITION:

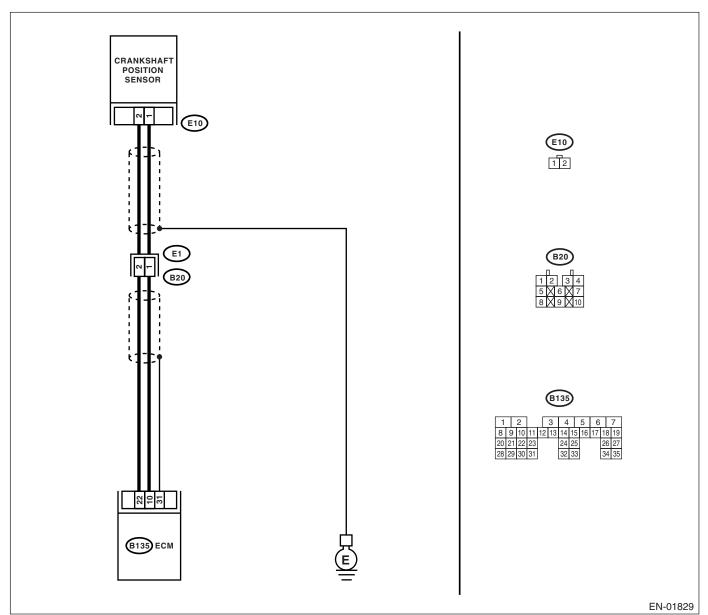
- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-107, DTC P0335 CRANKSHAFT POSITION SENSOR "A" CIRCUIT —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### TROUBLE SYMPTOM:

- Engine stalls.
- Failure of engine to start

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
SHAFT PO NECTOR. 1) Turn the 2) Disconr position se 3) Measur between cr and engine Connecte	ARNESS BETWEEN CRANK- DSITION SENSOR AND ECM CON- e ignition switch to OFF. nect the connector from crankshaft nsor. e the resistance of harness rankshaft position sensor connector	Is the resistance more than 100 k $\Omega$ ?	Repair the harness and connector.  NOTE: In this case, repair the following:  Open circuit in harness between crankshaft position sensor and ECM connector  Poor contact in ECM connector  Poor contact in coupling connector	Go to step 2.
SHAFT PO NECTOR. Measure th crankshaft engine grow Connected	ARNESS BETWEEN CRANK-DSITION SENSOR AND ECM CON- ne resistance of harness between position sensor connector and und. or & terminal to. 1 — Engine ground:	Is the resistance more than 1 $\mbox{M}\Omega ?$	Go to step 3.	Repair the ground short circuit in harness between crankshaft position sensor and ECM connector.  NOTE: The harness between both connectors are shielded. Repair ground short circuit in harness together with shield.
SHAFT PO NECTOR. Measure th crankshaft engine grow Connected	ARNESS BETWEEN CRANK-DSITION SENSOR AND ECM CON- ne resistance of harness between position sensor connector and und. or & terminal to. 2 — Engine ground:	Is the resistance less than 5 $\Omega$ ?	Go to step 4.	Repair the harness and connector.  NOTE: In this case, repair the following:  Open circuit in harness between crankshaft position sensor and ECM connector  Poor contact in ECM connector  Poor contact in coupling connector
4 CHECK CO SITION SE		Is the crankshaft position sensor installation bolt tightened securely?	Go to step 5.	Tighten the crank- shaft position sen- sor installation bolt securely.
<ol> <li>Remove</li> <li>Measur</li> </ol>		Is the resistance 1 — 4 k $\Omega$ ?	Repair the poor contact in crank-shaft position sensor connector.	Replace the crank- shaft position sen- sor. <ref. to<br="">FU(H4DOTC)-27, Crankshaft Posi- tion Sensor.&gt;</ref.>

**ENGINE (DIAGNOSTICS)** 

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

## **DTC DETECTING CONDITION:**

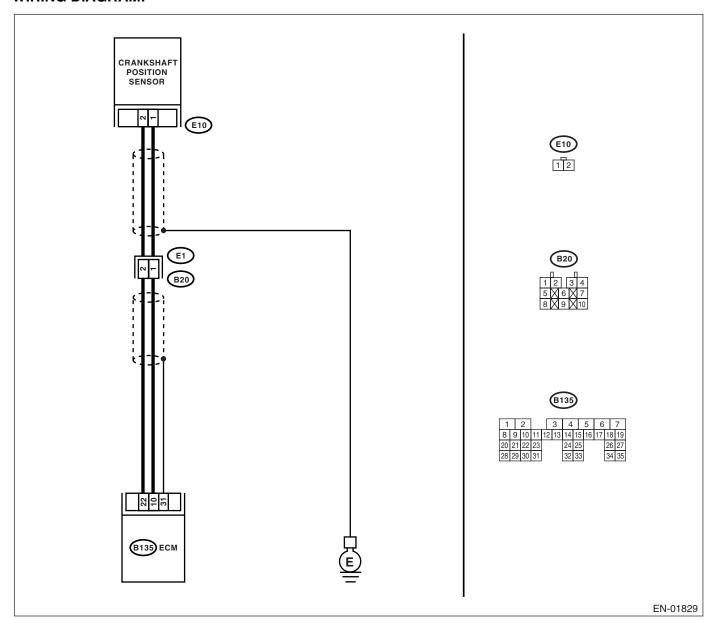
- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-109, DTC P0336 CRANKSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

## TROUBLE SYMPTOM:

- Engine stalls.
- · Failure of engine to start

#### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""></ref.>	Go to step 2.
2	CHECK CONDITION OF CRANKSHAFT PO- SITION SENSOR. Turn the ignition switch to OFF.	Is the crankshaft position sensor installation bolt tightened securely?	Go to step 3.	Tighten the crank- shaft position sen- sor installation bolt securely.
3	CHECK CRANK SPROCKET. Remove the front belt cover.	Are the crank sprocket teeth cracked or damaged?	Replace the crank sprocket. <ref. to<br="">FU(H4DOTC)-27, Crankshaft Posi- tion Sensor.&gt;</ref.>	Go to step 4.
4	CHECK INSTALLATION CONDITION OF TIMING BELT.  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 installa- tion condition of timing belt. <ref. to ME(H4DOTC)- 50, Timing Belt Assembly.&gt;</ref. 	Replace the crank- shaft position sen- sor. <ref. to<br="">FU(H4DOTC)-27, Crankshaft Posi- tion Sensor.&gt;</ref.>

**ENGINE (DIAGNOSTICS)** 

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

## **DTC DETECTING CONDITION:**

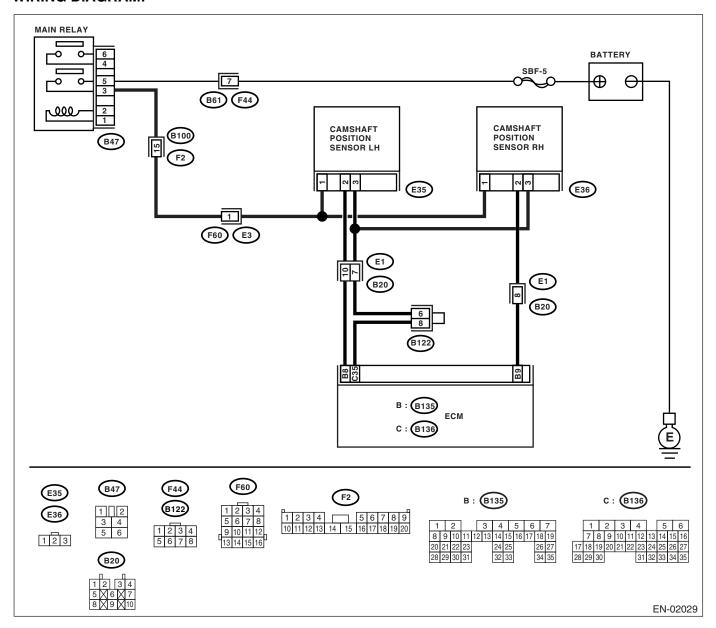
- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-111, DTC P0340 CAMSHAFT POSITION SENSOR "A" CIRCUIT (BANK 1 OR SINGLE SENSOR) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

## TROUBLE SYMPTOM:

- Engine stalls.
- · Failure of engine to start

#### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK POWER SUPPLY TO CAMSHAFT POSITION SENSOR.  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.  Connector & terminal  (E36) No. 1 (+) — Engine ground (-):	Is the voltage more than 10 V?	short circuit between main relay connector and camshaft position sensor connector.	Go to step 2.
2	CHECK POWER SUPPLY TO CAMSHAFT POSITION SENSOR.  1) Turn the ignition switch to ON.  2) Measure the voltage between camshaft position sensor and engine ground.  Connector & terminal  (E36) No. 1 (+) — Engine ground (-):	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.
3	CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from ECM.  3) Measure the resistance between camshaft position sensor and ECM.  Connector & terminal  (E36) No. 2 — (B135) No. 9:  (E35) No. 3 — (B136) No. 35:	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open circuit between camshaft position sensor and ECM.
4	CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM.  Measure the resistance between camshaft position sensor and engine ground.  Connector & terminal  (E36) No. 2 — Engine ground:  (E35) No. 3 — Engine ground:	Is the resistance more than 1 $\mbox{M}\Omega\mbox{?}$	Go to step 5.	Repair the ground short circuit between camshaft position sensor and ECM.
5	CHECK CONDITION OF CAMSHAFT POSITION SENSOR.	Is the camshaft position sensor installation bolt tightened securely?	Go to step 6.	Tighten the cam- shaft position sen- sor installation bolt securely.
6	CHECK CAMSHAFT POSITION SENSOR. Check the camshaft position sensor wave form. <ref. (ecm)="" control="" en(h4dotc)-19,="" engine="" i="" module="" o="" signal.="" to=""></ref.>	Is any abnormality found in waveform?	Replace the cam- shaft position sen- sor. <ref. to<br="">FU(H4DOTC)-28, Camshaft Position Sensor.&gt;</ref.>	Go to step 7.
7	CHECK POOR CONTACT. Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Replace the ECM. <ref. to<br="">FU(H4DOTC)-42, Engine Control Module (ECM).&gt;</ref.>

**ENGINE (DIAGNOSTICS)** 

### AY:DTC P0345 — CAMSHAFT POSITION SENSOR "A" CIRCUIT (BANK 2) — DTC DETECTING CONDITION:

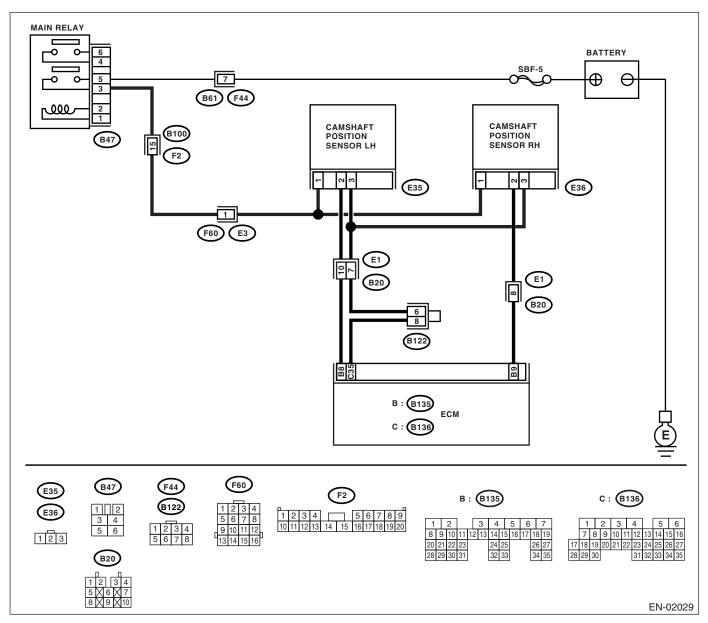
- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-113, DTC P0345 CAMSHAFT POSITION SENSOR "A" CIRCUIT (BANK 2) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### TROUBLE SYMPTOM:

- Engine stalls.
- Failure of engine to start

### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK POWER SUPPLY TO CAMSHAFT POSITION SENSOR.  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.  Connector & terminal  (E35) No. 1 (+) — Engine ground (-):	Is the voltage more than 10 V?	short circuit between main relay connector and camshaft position sensor connector.	Go to step 2.
2	CHECK POWER SUPPLY TO CAMSHAFT POSITION SENSOR.  1) Turn the ignition switch to ON. 2) Measure the voltage between camshaft position sensor and engine ground.  Connector & terminal  (E35) No. 1 (+) — Engine ground (-):	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.
3	CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from ECM.  3) Measure the resistance between camshaft position sensor and ECM.  Connector & terminal  (E35) No. 2 — (B135) No. 8:  (E35) No. 3 — (B136) No. 35:	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open circuit between camshaft position sensor and ECM.
4	CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM.  Measure the resistance between camshaft position sensor and engine ground.  Connector & terminal  (E35) No. 2 — Engine ground:  (E35) No. 3 — Engine ground:	Is the resistance more than 1 $\mbox{M}\Omega\mbox{?}$	Go to step 5.	Repair the ground short circuit between camshaft position sensor and ECM.
5	CHECK CONDITION OF CAMSHAFT POSITION SENSOR.	Is the camshaft position sensor installation bolt tightened securely?	Go to step 6.	Tighten the cam- shaft position sen- sor installation bolt securely.
6	CHECK CAMSHAFT POSITION SENSOR. Check the camshaft position sensor wave form. <ref. (ecm)="" control="" en(h4dotc)-19,="" engine="" i="" module="" o="" signal.="" to=""></ref.>	Is any abnormality found in waveform?	Replace the cam- shaft position sen- sor. <ref. to<br="">FU(H4DOTC)-28, Camshaft Position Sensor.&gt;</ref.>	Go to step 7.
7	CHECK POOR CONTACT. Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Replace the ECM. <ref. to<br="">FU(H4DOTC)-42, Engine Control Module (ECM).&gt;</ref.>

**ENGINE (DIAGNOSTICS)** 

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

### **DTC DETECTING CONDITION:**

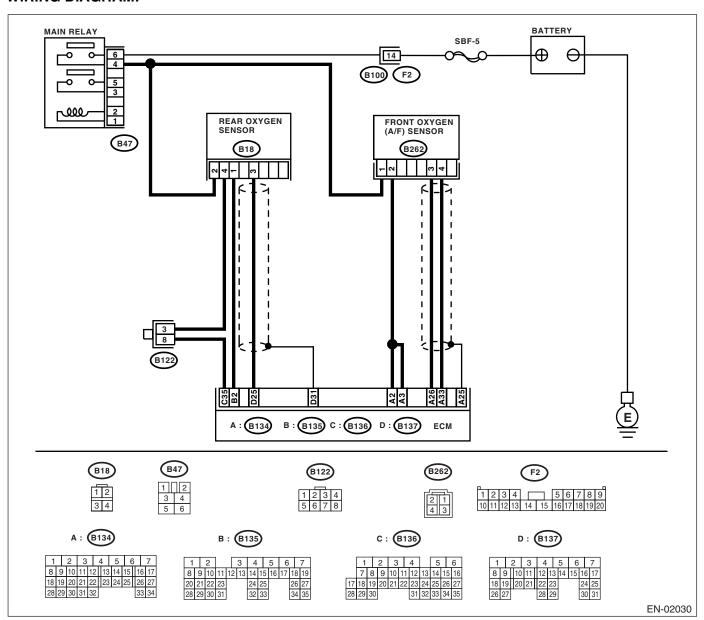
- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-114, DTC P0420 CATALYST SYSTEM EFFICIEN-CY BELOW THRESHOLD (BANK 1) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### TROUBLE SYMPTOM:

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

#### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""> NOTE: In this case, it is not necessary to inspect DTC P0420.</ref.>	Go to step 2.
2	CHECK EXHAUST SYSTEM.  Check for gas leaks or air suction caused by loose or dislocated nuts and bolts, and open hole at exhaust pipes.  NOTE: Check the following positions.  Between cylinder head and front exhaust pipe  Between front exhaust pipe and front catalytic converter  Between front catalytic converter and rear catalytic converter	Is there a fault in exhaust system?	Repair or replace the exhaust sys- tem. <ref. to<br="">EX(H4DOTC)-2, General Descrip- tion.&gt;</ref.>	Go to step 3.
3	CHECK REAR CATALYTIC CONVERTER.  Separate the rear catalytic converter from rear exhaust pipe.	Is there damage at rear face of rear catalyst?	Replace the front catalytic converter. <ref. catalytic="" converter.="" ec(h4dotc)-3,="" front="" to=""> and rear catalytic converter <ref. catalytic="" converter.="" ec(h4dotc)-4,="" rear="" to=""></ref.></ref.>	Go to step 4.
4	CHECK FRONT CATALYTIC CONVERTER. Remove the front catalytic converter.	Is there damage at rear face or front face of front catalyst?	Replace the front catalytic converter. <ref. catalytic="" converter.="" ec(h4dotc)-3,="" front="" to=""></ref.>	Contact your SOA Service Center. NOTE: Inspection by DTM is required, be- cause probable cause is deteriora- tion of multiple parts.

**ENGINE (DIAGNOSTICS)** 

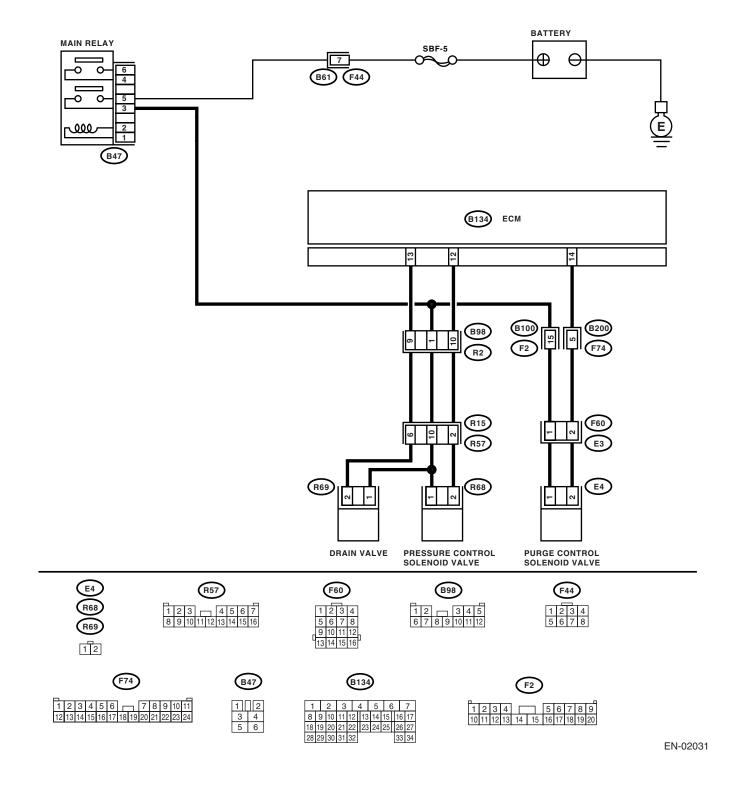
## BA:DTC P0442 — EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (SMALL LEAK) —

### **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-117, 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 repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK FOR OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the rele-	Go to step 2.
	CHECK FOR OTHER DIG ON DISPLAT.	is any other DTO displayed:	vant DTC using "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""></ref.>	·
2	CHECK FUEL FILLER CAP.  1) Turn ignition switch to OFF.  2) Check the fuel filler cap.  NOTE:  The DTC is stored in memory if fuel filler cap is or was loose or if the cap chain was caught while tightening.		Go to step 3.	Tighten fuel filler cap securely.
3	CHECK FUEL FILLER CAP.	Is the fuel filler cap SUBARU genuine?	Go to step 4.	Replace with a SUBARU genuine fuel filler cap.
4	CHECK FUEL FILLER PIPE PACKING.	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<br="">FU(H4DOTC)-50, Fuel Filler Pipe.&gt;</ref.>	Go to step 5.
5	CHECK DRAIN VALVE.  1) Connect the test mode connector.  2) Turn ignition switch to ON.  3) Operate the drain valve.  NOTE:  Drain valve operation can also be executed using Subaru Select Monitor. For the procedure, refer to "Compulsory Valve Operation Check Mode". <ref. check="" compulsory="" en(h4dotc)-45,="" mode.="" operation="" to="" valve=""></ref.>		Go to step 6.	Replace the drain valve. <ref. to<br="">EC(H4DOTC)-19, Drain Valve.&gt;</ref.>
6	CHECK PURGE CONTROL SOLENOID VALVE. Operate the purge control solenoid valve. NOTE: Purge control solenoid valve operation can also be executed using Subaru Select Monitor. For the procedure, refer to "Compulsory Valve Operation Check Mode". <ref. check="" compulsory="" en(h4dotc)-45,="" mode.="" operation="" to="" valve=""></ref.>		Go to step <b>7</b> .	Replace the purge control solenoid valve. <ref. to<br="">EC(H4DOTC)-7, Purge Control Solenoid Valve.&gt;</ref.>
7	CHECK PRESSURE CONTROL SOLENOID VALVE.  Operate the pressure control solenoid valve.  NOTE:  Pressure control solenoid valve operation can also be executed using Subaru Select Monitor.  For the procedure, refer to "Compulsory Valve Operation Check Mode". <ref. check="" compulsory="" en(h4dotc)-45,="" mode.="" operation="" to="" valve=""></ref.>		Go to step 8.	Replace the pressure control sole- noid valve. <ref. to EC(H4DOTC)- 13, Pressure Con- trol Solenoid Valve.&gt;</ref. 

	Step	Check	Yes	No
8	CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE. Turn ignition switch to OFF.	Is there a hole of more than 1.0 mm (0.04 in) dia. on evaporation line?	Repair or replace the evaporation line. <ref. to<br="">FU(H4DOTC)-63, Fuel Delivery, Return and Evapo- ration Lines.&gt;</ref.>	Go to step 9.
9	CHECK CANISTER.	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)-6, Canister.&gt;</ref. 	Go to step 10.
10	CHECK FUEL TANK. Remove the fuel tank. <ref. fu(h4dotc)-47,="" fuel="" tank.="" to=""></ref.>	Is the fuel tank damaged or is there a hole of more than 1.0 mm (0.04 in) dia. in it?	Repair or replace the fuel tank. <ref. to FU(H4DOTC)- 47, Fuel Tank.&gt;</ref. 	Go to step 11.
11	CHECK ANY OTHER MECHANICAL TROUBLE IN EVAPORATIVE EMISSION CONTROL SYSTEM.	Are there holes of more than 1.0 mm (0.04 in) dia., cracks, 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: Inspection by DTM is required, be- cause probable cause is deteriora- tion of multiple parts.

**ENGINE (DIAGNOSTICS)** 

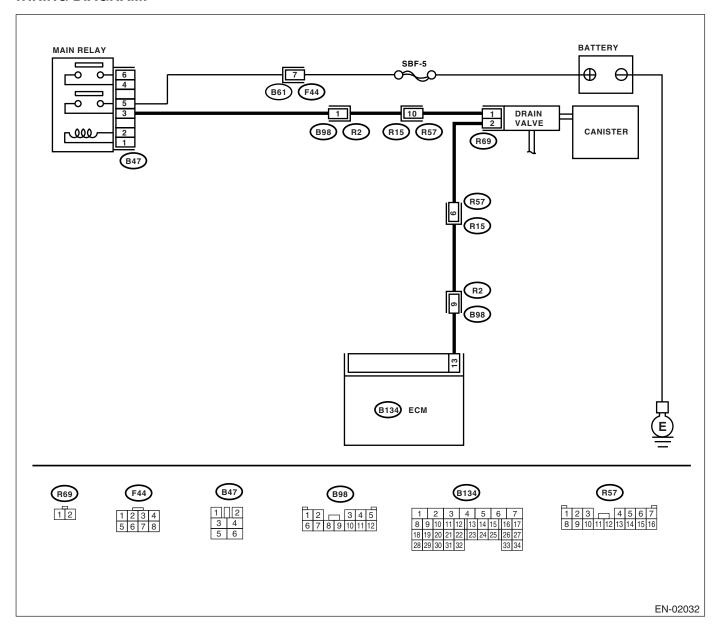
## BB:DTC P0447 — EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL CIRCUIT OPEN —

### **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-142, DTC P0447 EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL CIRCUIT OPEN —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK OUTPUT SIGNAL FROM ECM.  1) Turn ignition switch to ON.  2) Measure the voltage between ECM and chassis ground.  Connector & terminal  (B134) No. 13 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Go to step 2.	Go to step 3.
2	CHECK FOR POOR CONTACT. Check for poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	The malfunction indicator light may light up, however, the circuit is returned to the normal status at the moment. (However, the possibility of poor contact still remains.) NOTE: In this case, repair the following:  Poor contact in drain valve connector Poor contact in ECM connector Poor contact in coupling connector
3	CHECK HARNESS BETWEEN DRAIN VALVE AND ECM CONNECTOR.  1) Turn 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.  Connector & terminal (R69) No. 2 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega\mbox{?}$	Go to step 4.	Repair short circuit to ground in har- ness between ECM and drain valve connector.
4	CHECK HARNESS BETWEEN DRAIN VALVE AND ECM CONNECTOR. Measure the resistance of harness between ECM and drain valve connector. Connector & terminal (B134) No. 13 — (R69) No. 2:	Is the resistance less than 1 $\Omega$ ?	Go to step 5.	Repair harness and connector.  NOTE: In this case, repair the following:  • Open circuit in harness between ECM and drain valve connector  • Poor contact in coupling connector
5	CHECK DRAIN VALVE.  Measure the resistance between drain valve terminals.  Terminals  No. 1 — No. 2:	Is the resistance 10 — 100 $\Omega$ ?	Go to step 6.	Replace the drain valve. <ref. to<br="">EC(H4DOTC)-19, Drain Valve.&gt;</ref.>

	Step	Check	Yes	No
6	CHECK POWER SUPPLY TO DRAIN VALVE.  1) Turn ignition switch to ON.  2) Measure the voltage between drain valve and chassis ground.  Connector & terminal  (R69) No. 1 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Go to step 7.	Repair harness and connector.  NOTE: In this case, repair the following:  Open circuit in harness between main relay and drain valve Poor contact in coupling connector Poor contact in main relay connector
7	CHECK FOR POOR CONTACT. Check for poor contact in drain valve connector.	Is there poor contact in drain valve connector?	Repair poor contact in drain valve connector.	Contact with SOA Service Center. NOTE: Inspection by DTM is required, be- cause probable cause is deteriora- tion of multiple parts.

ENGINE (DIÀGNOSTICS)

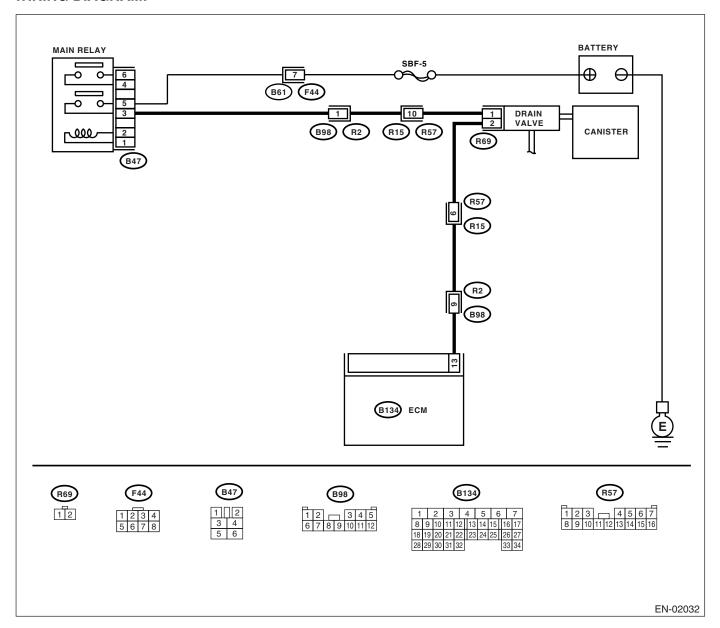
## BC:DTC P0448 — EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL CIRCUIT SHORTED —

### **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-144, DTC P0448 EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL CIRCUIT SHORTED —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



<u></u>	Step	Check	Yes	No
1	CHECK INPUT SIGNAL FOR ECM.  1) Turn ignition switch to OFF.  2) Connect the test mode connector at the lower portion of instrument panel (on the driver's side).  3) Turn ignition switch to ON.  4) While operating the drain valve, measure voltage between ECM and chassis ground.  NOTE:  Drain valve operation can be executed using Subaru Select Monitor. For the procedure, refer to "Compulsory Valve Operation Check Mode". <ref. check="" compulsory="" en(h4dotc)-45,="" mode.="" operation="" to="" valve="">  Connector &amp; terminal</ref.>		Go to step 2.	The malfunction indicator light may light up, however, the circuit is returned to the normal status at the moment. In this case, repair poor contact in ECM connector.
	(B134) No. 13 (+) — Chassis ground (-):	la de contrara de 1000	0-4-4-4	0-1-1-2
2	CHECK INPUT SIGNAL FOR ECM.  1) Turn ignition switch to ON.  2) Measure the voltage between ECM and chassis ground.  Connector & terminal  (B134) No. 13 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Go to step 4.	Go to step 3.
3	CHECK FOR POOR CONTACT. Check for poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Replace the ECM. <ref. to<br="">FU(H4DOTC)-42, Engine Control Module (ECM).&gt;</ref.>
4	CHECK HARNESS BETWEEN DRAIN VALVE AND ECM CONNECTOR.  1) Turn ignition switch to OFF. 2) Disconnect the connector from drain valve. 3) Turn ignition switch to ON. 4) Measure the voltage between ECM and chassis ground.  Connector & terminal (B134) No. 13 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Repair short circuit to battery in har- ness between ECM and drain valve connector. After repair, replace the ECM. <ref. to<br="">FU(H4DOTC)-42, Engine Control Module (ECM).&gt;</ref.>	Go to step 5.
5	CHECK DRAIN VALVE.  1) Turn ignition switch to OFF.  2) Measure the resistance between drain valve terminals.  Terminals  No. 1 — No. 2:	Is the resistance less than 1 $\Omega$ ?	Replace the drain valve <ref. drain="" ec(h4dotc)-19,="" to="" valve.=""> and ECM <ref. (ecm).="" control="" engine="" fu(h4dotc)-42,="" module="" to="">.</ref.></ref.>	Go to step 6.
6	CHECK FOR POOR CONTACT. Check for poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Replace the ECM. <ref. to<br="">FU(H4DOTC)-42, Engine Control Module (ECM).&gt;</ref.>

ENGINE (DIÀGNOSTICS)

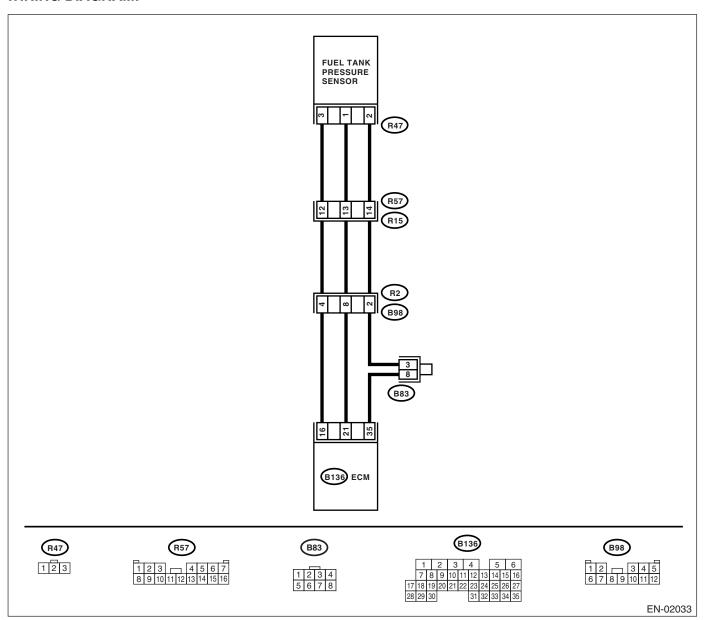
## BD:DTC P0451 — EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR RANGE/PERFORMANCE —

### **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-146, DTC P0451 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR RANGE/PERFORMANCE —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK FOR OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""></ref.>	Go to step 2.
2	CHECK FUEL FILLER CAP.  1) Turn 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.
3	CHECK PRESSURE/VACUUM LINE.  NOTE: Check the following items.  • Disconnection, leakage and clogging of the vacuum hoses and pipes between fuel tank pressure sensor and fuel tank  • Disconnection, leakage and clogging of air ventilation hoses and pipes between fuel filler pipe and fuel tank	Is there a fault in pressure/vac- uum line?	Repair or replace the hoses and pipes.	Replace the fuel tank pressure sen- sor. <ref. to<br="">EC(H4DOTC)-11, Fuel Tank Pres- sure Sensor.&gt;</ref.>

ENGINE (DIÀGNOSTICS)

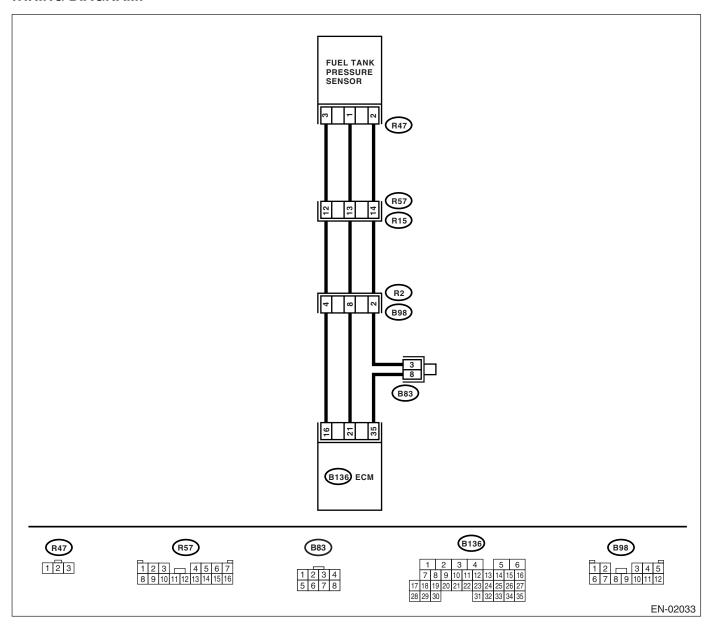
## BE:DTC P0452 — EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR LOW INPUT —

### **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-148, DTC P0452 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR LOW INPUT —, Diagnostic Trouble Code (DTC) Detecting Criteria.

### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK CURRENT DATA.	Is the measured valve less	Go to step 2.	The malfunction
	<ol> <li>Turn ignition switch to OFF.</li> <li>Remove the fuel filler cap.</li> <li>Install the fuel filler cap.</li> <li>Turn ignition switch to ON.</li> <li>Read the data of fuel tank pressure sensor signal using Subaru Select Monitor or the OBD-II general scan tool.</li> </ol>	than –2.8 kPa (–21.0 mmHg, –0.827 inHg)?		indicator light may light up, however, the circuit is returned to the normal status at the moment.
	NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to=""> • OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>			
2	CHECK POWER SUPPLY TO FUEL TANK PRESSURE SENSOR.  Measure the voltage between ECM connector and chassis ground.  Connector & terminal  (B136) No. 16 (+) — Chassis ground (-):	Is the voltage more than 4.5 V?	Go to step 4.	Go to step 3.
3	CHECK POWER SUPPLY TO FUEL TANK PRESSURE SENSOR.  Measure the voltage between ECM connector and chassis ground.  Connector & terminal  (B136) No. 16 (+) — Chassis ground (-):	Is the voltage more than 4.5 V?	Repair poor contact in ECM connector.	Contact with SOA Service Center. NOTE: Inspection by DTM is required, be- cause probable cause is deteriora- tion of multiple parts.
4	CHECK INPUT SIGNAL FOR ECM.  Measure the voltage between ECM and chassis ground.  Connector & terminal  (B136) No. 21 (+) — Chassis ground (-):	Is the voltage less than 0.2 V?	Go to step 6.	Go to step 5.
5	CHECK INPUT SIGNAL FOR ECM. (USING SUBARU SELECT MONITOR.) Read the data of fuel tank pressure sensor signal using Subaru Select Monitor. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to=""></ref.>	shaking the ECM harness and connector?		Go to step 6.
6	CHECK HARNESS BETWEEN ECM AND COUPLING CONNECTOR IN REAR WIRING HARNESS.  1) Turn ignition switch to OFF. 2) Remove the rear seat cushion. 3) Separate rear wiring harness and fuel tank cord. 4) Turn ignition switch to ON. 5) Measure the voltage between rear wiring harness connector and chassis ground.  Connector & terminal  (R15) No. 12 (+) — Chassis ground (-):	Is the voltage more than 4.5 V?	Go to step <b>7.</b>	Repair harness and connector.  NOTE: In this case, repair the following:  Open circuit in harness between ECM and rear wiring harness connector Poor contact in coupling connector

	Step	Check	Yes	No
7	CHECK HARNESS BETWEEN ECM AND COUPLING CONNECTOR IN REAR WIRING HARNESS.  1) Turn ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance of harness between ECM and rear wiring harness connector.  Connector & terminal (B136) No. 35 — (R15) No. 14:	Is the resistance less than 1 $\Omega$ ?	Go to step 8.	Repair harness and connector.  NOTE: In this case, repair the following:  Open circuit in harness between ECM and rear wiring harness connector  Poor contact in coupling connector  Poor contact in ioint connector
8	CHECK HARNESS BETWEEN ECM AND COUPLING CONNECTOR IN REAR WIRING HARNESS.  Measure the resistance of harness between rear wiring harness connector and chassis ground.  Connector & terminal  (R15) No. 14 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega\mbox{?}$	Go to step 9.	Repair short circuit to ground in har- ness between ECM and rear wir- ing harness con- nector.
9	CHECK FUEL TANK CORD.  1) Disconnect the connector from fuel tank pressure sensor.  2) Measure the resistance of fuel tank cord.  Connector & terminal  (R57) No. 12 — (R47) No. 3:	Is the resistance less than 1 $\Omega$ ?	Go to step 10.	Repair open circuit in fuel tank cord.
10	CHECK FUEL TANK CORD.  Measure the resistance of fuel tank cord.  Connector & terminal  (R57) No. 14 — (R47) No. 2:	Is the resistance less than 1 $\Omega$ ?	Go to step 11.	Repair open circuit in fuel tank cord.
11	CHECK FUEL TANK CORD.  Measure the resistance of harness between fuel tank pressure sensor connector and engine ground.  Connector & terminal  (R47) No. 1 — Chassis ground:	Is the resistance more than 1 M $\Omega$ ?	Go to step 12.	Repair short circuit to ground in fuel tank cord.
12	CHECK FOR POOR CONTACT. Check for poor contact in fuel tank pressure sensor connector.	Is there poor contact in fuel tank pressure sensor connector?	Repair poor contact in fuel tank pressure sensor connector.	Replace the fuel tank pressure sen- sor. <ref. to<br="">EC(H4DOTC)-11, Fuel Tank Pres- sure Sensor.&gt;</ref.>

**ENGINE (DIAGNOSTICS)** 

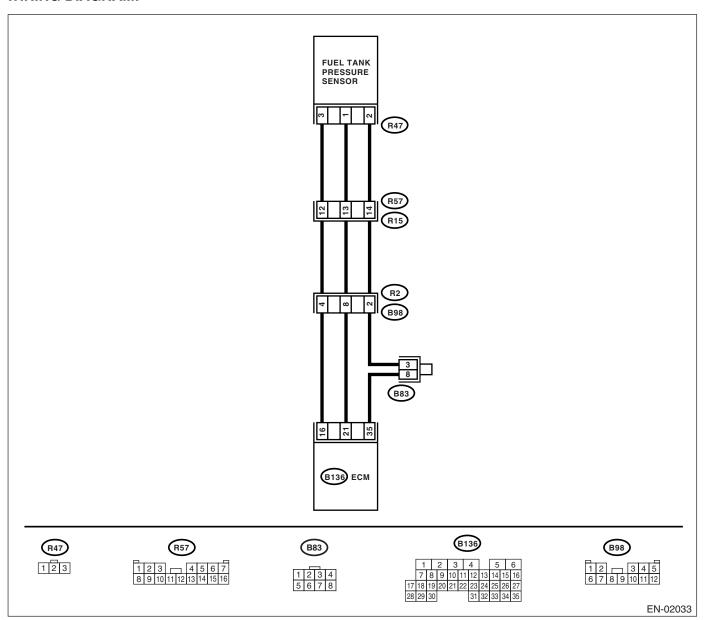
## BF:DTC P0453 — EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR HIGH INPUT —

### **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-150, DTC P0453 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR HIGH INPUT —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK CURRENT DATA.	Is the measured value more	Go to step 11.	Go to step 2.
	<ol> <li>Turn ignition switch to OFF.</li> <li>Remove the fuel filler cap.</li> <li>Install the fuel filler cap.</li> <li>Turn ignition switch to ON.</li> </ol>	than 2.8 kPa (21.0 mmHg, 0.827 inHg)		
	<ul><li>5) Read the data of fuel tank pressure sensor signal using Subaru Select Monitor or the OBD-II general scan tool.</li></ul>			
	NOTE: • Subaru Select Monitor			
	For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. to EN(H4DOTC)-29, Subaru Select Monitor.&gt;</ref. 			
	<ul> <li>OBD-II general scan tool</li> <li>For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.</li> </ul>			
2	CHECK POWER SUPPLY TO FUEL TANK PRESSURE SENSOR.	Is the voltage more than 4.5 V?	Go to step 4.	Go to step 3.
	Measure the voltage between ECM connector and chassis ground.  Connector & terminal			
	(B136) No. 16 (+) — Chassis ground (–):			
3	CHECK POWER SUPPLY TO FUEL TANK PRESSURE SENSOR.  Measure the voltage between ECM connector and chassis ground.	Does the measured value exceed the specified value by shaking the ECM harness and connector?	Repair poor contact in ECM connector.	Replace the ECM. <ref. to<br="">FU(H4DOTC)-42, Engine Control</ref.>
	Connector & terminal (B136) No. 16 (+) — Chassis ground (–):			Module (ECM).>
4	CHECK INPUT SIGNAL FOR ECM.  Measure the voltage between ECM and chassis ground.	Is the voltage less than 0.2 V?	Go to step 6.	Go to step 5.
	Connector & terminal (B136) No. 21 (+) — Chassis ground (–):			
5	CHECK INPUT SIGNAL FOR ECM. (USING SUBARU SELECT MONITOR.)	Does the measured value exceed -2.8 kPa (-21.0	Repair poor contact in ECM con-	Go to step 6.
	Read the data of fuel tank pressure sensor signal using Subaru Select Monitor.	ing the ECM harness and con-	nector.	
	NOTE: • Subaru Select Monitor For detailed operation procedures, refer to	nector?		
	"READ CURRENT DATA FOR ENGINE". < Ref. to EN(H4DOTC)-29, Subaru Select Monitor.>			
6	CHECK HARNESS BETWEEN ECM AND COUPLING CONNECTOR IN REAR WIRING	Is the voltage more than 4.5 V?	Go to step 7.	Repair harness and connector.
	<ul><li>HARNESS.</li><li>1) Turn ignition switch to OFF.</li><li>2) Remove the rear seat cushion.</li><li>3) Separate rear wiring harness and fuel tank</li></ul>			NOTE: In this case, repair the following:
	cord. 4) Turn ignition switch to ON.			Open circuit in harness between ECM and rear wir-
	<ol> <li>Measure the voltage between rear wiring harness connector and chassis ground.</li> <li>Connector &amp; terminal</li> </ol>			ing harness con- nector • Poor contact in
	(R15) No. 12 (+) — Chassis ground (–):			coupling connector

	Step	Check	Yes	No
7	CHECK HARNESS BETWEEN ECM AND COUPLING CONNECTOR IN REAR WIRING HARNESS.  1) Turn ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance of harness between ECM and rear wiring harness connector.  Connector & terminal (B136) No. 21 — (R15) No. 13: (B136) No. 35 — (R15) No. 14:	Is the resistance less than 1 $\Omega$ ?	Go to step 8.	Repair harness and connector. NOTE: In this case, repair the following: • Open circuit in harness between ECM and rear wiring harness connector • Poor contact in coupling connector
8	CHECK FUEL TANK CORD.  1) Disconnect the connector from fuel tank pressure sensor.  2) Measure the resistance of fuel tank cord.  Connector & terminal  (R57) No. 13 — (R47) No. 1:	Is the resistance less than 1 $\Omega$ ?	Go to step 9.	Repair open circuit in fuel tank cord.
9	CHECK FUEL TANK CORD.  Measure the resistance of fuel tank cord.  Connector & terminal  (R57) No. 14 — (R47) No. 2:	Is the resistance less than 1 $\Omega$ ?	Go to step 10.	Repair open circuit in fuel tank cord.
10	CHECK FOR POOR CONTACT. Check for poor contact in fuel tank pressure sensor connector.	Is there poor contact in fuel tank pressure sensor connector?	Repair poor contact in fuel tank pressure sensor connector.	Replace the fuel tank pressure sen- sor. <ref. to<br="">EC(H4DOTC)-11, Fuel Tank Pres- sure Sensor.&gt;</ref.>
11	CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR.  1) Turn ignition switch to OFF. 2) Disconnect the connector from fuel tank pressure sensor. 3) Turn ignition switch to ON. 4) Read the data of fuel tank pressure sensor signal using Subaru Select Monitor or the OBD-II general scan tool.  NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to=""> • OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>	Is the measured value more than 2.8 kPa (21.0 mmHg, 0.827 inHg)?	Repair short circuit to battery in harness between ECM and fuel tank pressure sensor connector.	Replace the fuel tank pressure sen- sor. <ref. to<br="">EC(H4DOTC)-11, Fuel Tank Pres- sure Sensor.&gt;</ref.>

ENGINE (DIÀGNOSTICS)

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

### **DTC DETECTING CONDITION:**

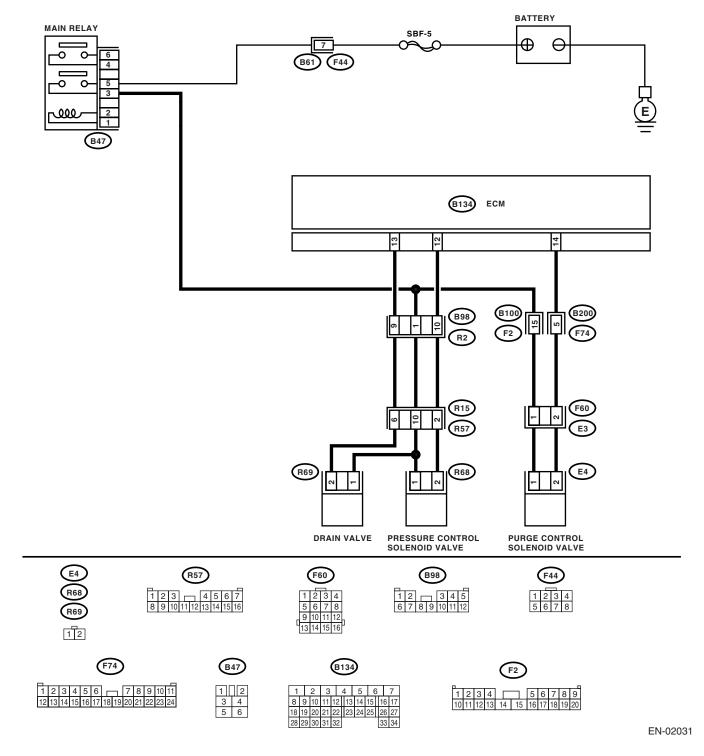
- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-152, DTC P0456 EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (VERY SMALL LEAK) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### 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 repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK FOR OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""></ref.>	Go to step 2.
2	CHECK FUEL FILLER CAP.  1) Turn ignition switch to OFF.  2) Check the fuel filler cap.  NOTE: The DTC is stored in memory if fuel filler cap is or was loose or if the cap chain was caught while tightening.		Go to step 3.	Tighten fuel filler cap securely.
3	CHECK FUEL FILLER CAP.	Is the fuel filler cap SUBARU genuine?	Go to step 4.	Replace with a SUBARU genuine fuel filler cap.
4	CHECK FUEL FILLER PIPE PACKING.	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<br="">FU(H4DOTC)-50, Fuel Filler Pipe.&gt;</ref.>	Go to step 5.
5	CHECK DRAIN VALVE.  1) Connect the test mode connector.  2) Turn ignition switch to ON.  3) Operate the drain valve.  NOTE:  Drain valve operation can also be executed using Subaru Select Monitor. For the procedure, refer to "Compulsory Valve Operation Check Mode". <ref. check="" compulsory="" en(h4dotc)-45,="" mode.="" operation="" to="" valve=""></ref.>		Go to step 6.	Replace the drain valve. <ref. to<br="">EC(H4DOTC)-19, Drain Valve.&gt;</ref.>
6	CHECK PURGE CONTROL SOLENOID VALVE. Operate the purge control solenoid valve.  NOTE: Purge control solenoid valve operation can also be executed using Subaru Select Monitor. For the procedure, refer to "Compulsory Valve Operation Check Mode". <ref. check="" compulsory="" en(h4dotc)-45,="" mode.="" operation="" to="" valve=""></ref.>		Go to step 7.	Replace the purge control solenoid valve. <ref. to<br="">EC(H4DOTC)-7, Purge Control Solenoid Valve.&gt;</ref.>
7	CHECK PRESSURE CONTROL SOLENOID VALVE.  Operate the pressure control solenoid valve.  NOTE:  Pressure control solenoid valve operation can also be executed using Subaru Select Monitor.  For the procedure, refer to "Compulsory Valve Operation Check Mode". <ref. check="" compulsory="" en(h4dotc)-45,="" mode.="" operation="" to="" valve=""></ref.>		Go to step 8.	Replace the pressure control sole- noid valve. <ref. to EC(H4DOTC)-7, Purge Control Solenoid Valve.&gt;</ref. 

	Step	Check	Yes	No
8	CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE. Turn ignition switch to OFF.	Is there a hole of more than 0.5 mm (0.020 in) dia. on evaporation line?	Repair or replace the evaporation line. <ref. to<br="">FU(H4DOTC)-63, Fuel Delivery, Return and Evapo- ration Lines.&gt;</ref.>	Go to step 9.
9	CHECK CANISTER.	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)-6, Canister.&gt;</ref. 	Go to step 10.
10	CHECK FUEL TANK. Remove the fuel tank. <ref. fu(h4dotc)-47,="" fuel="" tank.="" to=""></ref.>	Is the fuel tank damaged or is there a hole of more than 0.5 mm (0.020 in) dia. in it?	Repair or replace the fuel tank. <ref. to FU(H4DOTC)- 47, Fuel Tank.&gt;</ref. 	Go to step 11.
11	CHECK ANY OTHER MECHANICAL TROUBLE IN EVAPORATIVE EMISSION CONTROL SYSTEM.	Are there holes of more than 0.5 mm (0.020 in) dia., cracks, 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: Inspection by DTM is required, be- cause probable cause is deteriora- tion of multiple parts.

ENGINE (DIÀGNOSTICS)

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

### **DTC DETECTING CONDITION:**

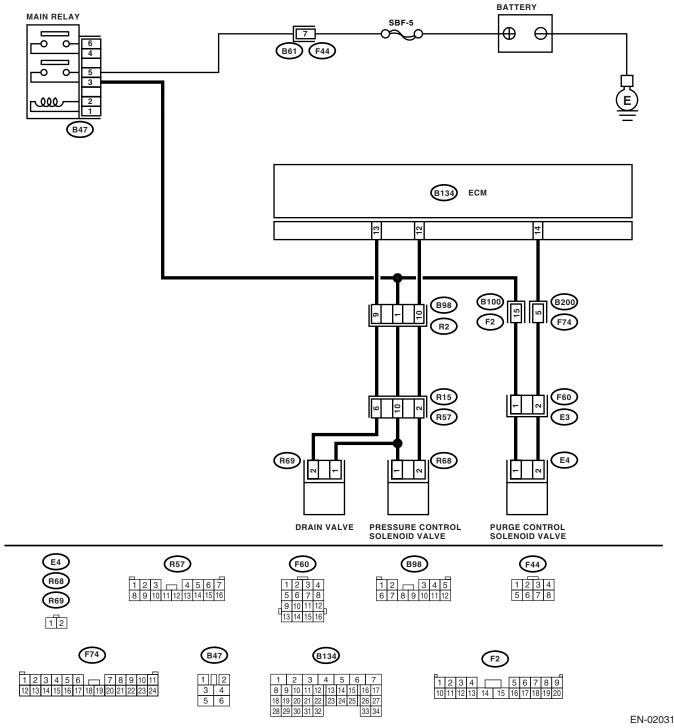
- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-152, DTC P0457 EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (FUEL CAP LOOSE/OFF) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### TROUBLE SYMPTOM:

- Fuel odor
- Fuel filler cap is loose or not installed.

### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK FOR OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""></ref.>	Go to step 2.
2	CHECK FUEL FILLER CAP.  1) Turn ignition switch to OFF.  2) Check the fuel filler cap.  NOTE:  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	CHECK FUEL FILLER CAP.	Is the fuel filler cap SUBARU genuine?	Go to step 4.	Replace with a SUBARU genuine fuel filler cap.
4	CHECK FUEL FILLER PIPE PACKING.	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<br="">FU(H4DOTC)-50, Fuel Filler Pipe.&gt;</ref.>	Go to step 5.
5	CHECK DRAIN VALVE.  1) Connect the test mode connector.  2) Turn ignition switch to ON.  3) Operate the drain valve.  NOTE:  Drain valve operation can also be executed using Subaru Select Monitor. For the procedure, refer to "Compulsory Valve Operation Check Mode". <ref. check="" compulsory="" en(h4dotc)-45,="" mode.="" operation="" to="" valve=""></ref.>	Does the drain valve operate?	Go to step 6.	Replace the drain valve. <ref. to<br="">EC(H4DOTC)-7, Purge Control Solenoid Valve.&gt;</ref.>
6	CHECK PURGE CONTROL SOLENOID VALVE. Operate the purge control solenoid valve. NOTE: Purge control solenoid valve operation can also be executed using Subaru Select Monitor. For the procedure, refer to "Compulsory Valve Operation Check Mode". <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""></ref.>	Does the purge control sole- noid valve operate?	Go to step 7.	Replace the purge control solenoid valve. <ref. to<br="">EC(H4DOTC)-7, Purge Control Solenoid Valve.&gt;</ref.>
7	CHECK PRESSURE CONTROL SOLENOID VALVE.  Operate the pressure control solenoid valve.  NOTE:  Pressure control solenoid valve operation can also be executed using Subaru Select Monitor.  For the procedure, refer to "Compulsory Valve Operation Check Mode". <ref. check="" compulsory="" en(h4dotc)-45,="" mode.="" operation="" to="" valve=""></ref.>	Does the pressure control solenoid valve operate?	Go to step 8.	Replace the pressure control sole- noid valve. <ref. to EC(H4DOTC)-7, Purge Control Solenoid Valve.&gt;</ref. 
8	CHECK CANISTER.	Is the canister damaged?	Repair or replace the canister. <ref. to EC(H4DOTC)-6, Canister.&gt;</ref. 	Go to step 9.

	Step	Check	Yes	No
9	CHECK FUEL TANK. Remove the fuel tank. <ref. fu(h4dotc)-47,="" fuel="" tank.="" to=""></ref.>	Is the fuel tank damaged?	Repair or replace the fuel tank. <ref. to FU(H4DOTC)- 47, Fuel Tank.&gt;</ref. 	Go to step 10.
10	CHECK ANY OTHER MECHANICAL TROUBLE IN EVAPORATIVE EMISSION CONTROL SYSTEM.	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?	- P	Contact with SOA Service Center. NOTE: Inspection by DTM is required, be- cause probable cause is deteriora- tion of multiple parts.

**ENGINE (DIÀGNOSTICS)** 

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

### **DTC DETECTING CONDITION:**

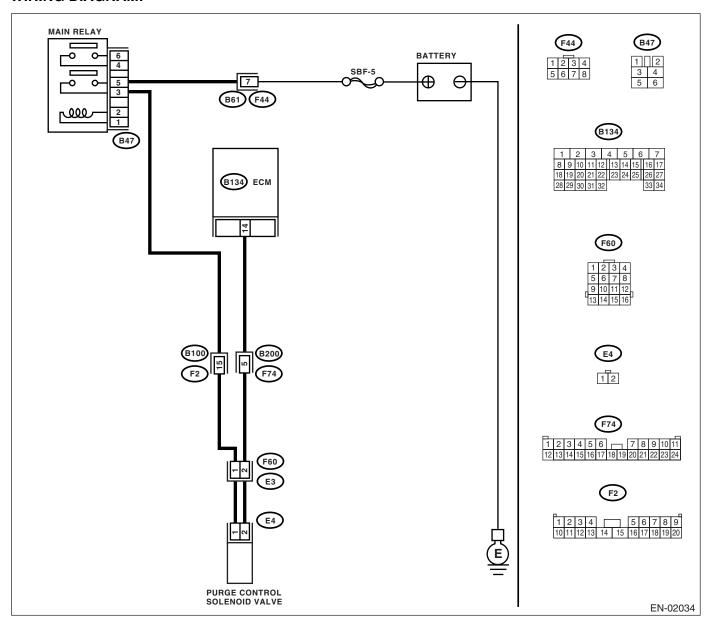
- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-153, DTC P0458 EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT LOW —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### TROUBLE SYMPTOM:

Erroneous idling

### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK OUTPUT SIGNAL FROM ECM.  1) Turn the ignition switch to ON.  2) Measure the voltage between ECM and chassis ground.  Connector & terminal	Is the voltage more than 10 V?	Even if malfunction indicator light lights up, the circuit has returned to a normal condi-	Go to step 2.
2	(B134) No. 14 (+) — Chassis ground (-):  CHECK HARNESS BETWEEN PURGE CONTROL SOLENOID VALVE AND ECM CONNECTOR.  1) Turn the ignition switch to OFF.  2) Disconnect the connectors from purge con-	Is the resistance more than 1 $\mbox{M}\Omega ?$	tion at this time. Go to step 3.	Repair the ground short circuit in har- ness between ECM and purge control solenoid
	trol solenoid valve and ECM.  3) Measure the resistance of harness between purge control solenoid valve connector and engine ground.  Connector & terminal  (E4) No. 2 — Engine ground:			valve connector.
3	CHECK HARNESS BETWEEN PURGE CONTROL SOLENOID VALVE AND ECM CONNECTOR.  Measure the resistance of harness between ECM and purge control solenoid valve of harness connector.  Connector & terminal  (B134) No. 14 — (E4) No. 2:	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open circuit in harness between ECM and purge control solenoid valve connector.  NOTE: In this case, repair the following:  Open circuit in harness between ECM and purge control solenoid valve connector  Poor contact in coupling connector
4	CHECK PURGE CONTROL SOLENOID  VALVE.  1) Remove the purge control solenoid valve.  2) Measure the resistance between purge control solenoid valve terminals.  Terminals  No. 1 — No. 2:	Is the resistance 10 — 100 $\Omega$ ?	Go to step 5.	Replace the purge control solenoid valve. <ref. to<br="">EC(H4DOTC)-7, Purge Control Solenoid Valve.&gt;</ref.>
5	CHECK POWER SUPPLY TO PURGE CONTROL SOLENOID VALVE.  1) Turn the ignition switch to ON.  2) Measure the voltage between purge control solenoid valve and engine ground.  Connector & terminal  (E4) No. 1 (+) — Engine ground (-):	Is the voltage more than 10 V?	Go to step 6.	Repair the open circuit in harness between main relay and purge control solenoid valve connector.
6	CHECK POOR CONTACT. Check poor contact in purge control solenoid valve connector.	Is there poor contact in purge control solenoid valve connec- tor?	Repair the poor contact in purge control solenoid valve connector.	Contact your SOA Service Center. NOTE: Inspection by DTM is required, be- cause probable cause is deteriora- tion of multiple parts.

**ENGINE (DIÀGNOSTICS)** 

## BJ:DTC P0459 — EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT HIGH —

### **DTC DETECTING CONDITION:**

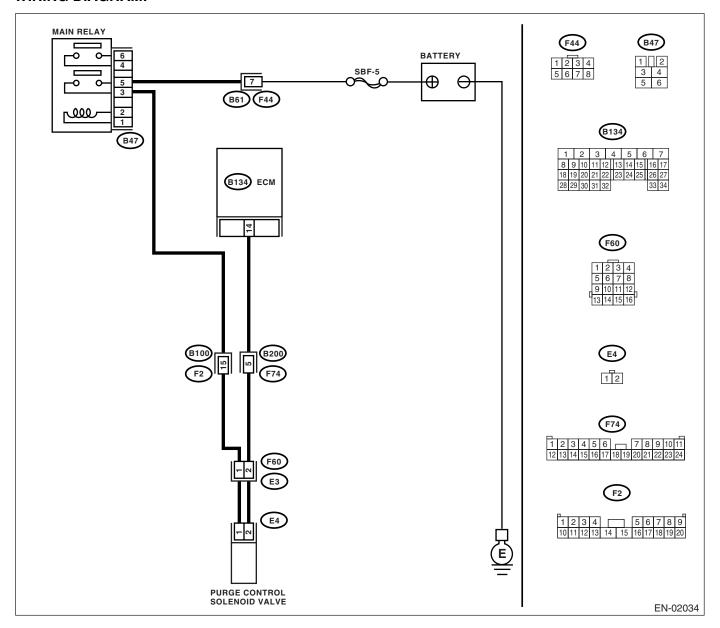
- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-155, DTC P0459 EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT HIGH —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### TROUBLE SYMPTOM:

Erroneous idling

### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK OUTPUT SIGNAL FROM ECM.  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) While operating the purge control solenoid valve, measure the voltage between ECM and chassis ground.  NOTE: Purge control solenoid valve operation can be executed using the Subaru Select Monitor. For procedure, refer to "Compulsory Valve Operation Check Mode". <ref. check="" compulsory="" en(h4dotc)-45,="" mode.="" operation="" to="" valve="">  Connector &amp; terminal  (B134) No. 14 (+) — Chassis ground (-):</ref.>		Go to step 2.	Even if malfunction indicator light lights up, the circuit has returned to a normal condition at this time. In this case, repair the poor contact in ECM connector.
2	CHECK OUTPUT SIGNAL FROM ECM.  1) Turn the ignition switch to ON.  2) Measure the voltage between ECM and chassis ground.  Connector & terminal  (B134) No. 14 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Go to step 4.	Go to step 3.
3	CHECK POOR CONTACT. Check the poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Replace the ECM. <ref. to<br="">FU(H4DOTC)-42, Engine Control Module (ECM).&gt;</ref.>
4	CHECK HARNESS BETWEEN PURGE CONTROL SOLENOID VALVE AND ECM CONNECTOR.  1) Turn the ignition switch to OFF. 2) Disconnect the connector from purge control solenoid valve. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM and chassis ground.  Connector & terminal  (B134) No. 14 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Repair the battery short circuit in harness between ECM and purge control solenoid valve connector. After repair, replace the ECM. <ref. (ecm).="" control="" engine="" fu(h4dotc)-42,="" module="" to=""></ref.>	Go to step 5.
5	CHECK PURGE CONTROL SOLENOID VALVE.  1) Turn the ignition switch to OFF.  2) Measure the resistance between purge control solenoid valve terminals.  Terminals  No. 1 — No. 2:	Is the resistance less than 1 $\Omega$ ?	Replace the purge control solenoid valve <ref. control="" ec(h4dotc)-7,="" purge="" solenoid="" to="" valve.=""> and ECM <ref. (ecm).="" control="" engine="" fu(h4dotc)-42,="" module="" to=""></ref.></ref.>	Go to step 6.
6	CHECK POOR CONTACT. Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Replace the ECM. <ref. to<br="">FU(H4DOTC)-42, Engine Control Module (ECM).&gt;</ref.>

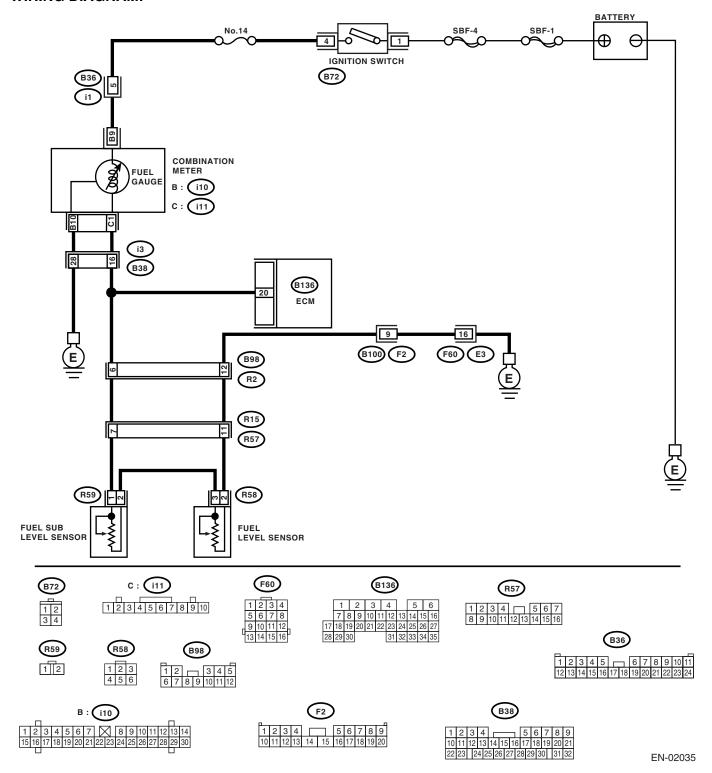
ENGINE (DIÀGNOSTICS)

### BK:DTC P0461 — FUEL LEVEL SENSOR CIRCUIT RANGE/PERFORMANCE — DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-157, DTC P0461 FUEL LEVEL SENSOR CIRCUIT RANGE/PERFORMANCE —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



Step	Check	Yes	No
1 CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""> NOTE: In this case, it is not necessary to inspect DTC P0461.</ref.>	Replace the fuel level sensor. <ref. fu(h4dotc)-57,="" fuel="" level="" sensor.="" to=""> and fuel sub level sensor   Sensor. Sensor Sensor   Sensor Sensor   Sensor Sensor   Sensor Sensor</ref.>

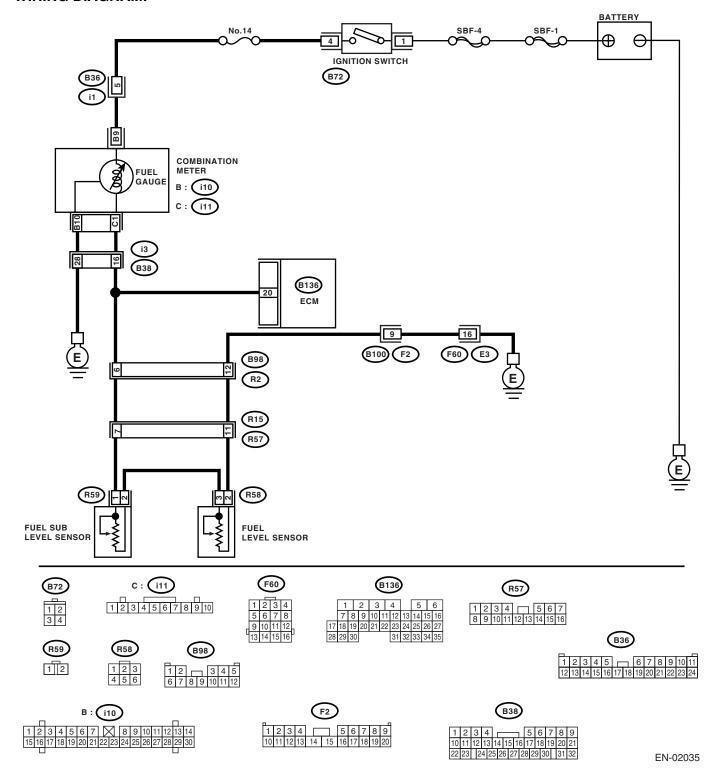
**ENGINE (DIAGNOSTICS)** 

# BL:DTC P0462 — FUEL LEVEL SENSOR CIRCUIT LOW INPUT — DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-159, DTC P0462 FUEL LEVEL SENSOR CIRCUIT LOW INPUT —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK SPEEDOMETER AND TACHOMETER OPERATION IN COMBINATION METER.	Does the speedometer and tachometer operate normally?	Go to step 2.	Repair or replace the combination meter. <ref. idi-<br="" to="">3, Combination Meter System.&gt;</ref.>
2	CHECK INPUT SIGNAL FOR ECM.  1) Turn the ignition switch to ON. (engine OFF)  2) Measure the voltage between ECM connector and chassis ground.  Connector & terminal  (B136) No. 20 (+) — Chassis ground (-):	Is the voltage less than 0.12 V?	Go to step 4.	Go to step 3.
3	CHECK INPUT SIGNAL FOR ECM. (USING SUBARU SELECT MONITOR)  Read the data of fuel level sensor signal using Subaru Select Monitor.  NOTE:  • Subaru Select Monitor  For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to=""></ref.>	Does the voltage change, while shaking the ECM harness and connector?	Repair the poor contact in ECM connector.	Even if malfunction indicator light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.  NOTE: In this case, repair the following:  Poor contact in combination meter connector  Poor contact in ECM connector  Poor contact in coupling connectors
5	CHECK INPUT VOLTAGE OF ECM.  1) Turn the ignition switch to OFF.  2) Separate the 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.  Connector & terminal  (B136) No. 20 (+) — Chassis ground (-):  CHECK HARNESS BETWEEN ECM AND	Is the voltage more than 0.12 V?	Go to step <b>5</b> .  Go to step <b>7</b> .	Repair the ground
	COMBINATION METER.  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.  Connector & terminal  (B136) No. 20 — Chassis ground:	MΩ?		short circuit in har- ness between ECM and combi- nation meter con- nector.

	Step	Check	Yes	No
6	CHECK HARNESS BETWEEN ECM AND COMBINATION METER.  Measure the resistance between ECM and combination meter connector.  Connector & terminal  (B136) No. 20 — (i11) No. 1:	Is the resistance less than 10 $\Omega$ ?	Repair or replace the combination meter. <ref. idi-<br="" to="">3, Combination Meter System.&gt;</ref.>	Repair the open circuit between ECM and combination meter connector.  NOTE: In this case, repair the following: Poor contact in coupling connector
7	CHECK FUEL TANK CORD.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from fuel sub level sensor.  3) Measure the resistance between fuel sub level sensor and chassis ground.  Connector & terminal  (R59) No. 1 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega\mbox{?}$	Go to step 8.	Repair the ground short circuit in fuel tank cord.
8	CHECK FUEL TANK CORD.  1) Disconnect the connector from fuel pump assembly.  2) Measure the resistance between fuel pump assembly and chassis ground.  Connector & terminal  (R59) No. 2 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega\mbox{?}$	Go to step 9.	Repair the ground short circuit in fuel tank cord.
9	CHECK FUEL LEVEL SENSOR.  1) Remove the fuel pump assembly. <ref. fu(h4dotc)-55,="" fuel="" pump.="" to="">  2) Measure the resistance between fuel level sensor and terminals with its float set to the full position.  Terminals  No. 2 — No. 3:</ref.>	Is the resistance 0.5 — 2.5 $\Omega$ ?	·	Replace the fuel level sensor.
10	CHECK FUEL SUB LEVEL SENSOR.  1) Remove the fuel sub level sensor. <ref. fu(h4dotc)-58,="" fuel="" level="" sensor.="" sub="" to="">  2) Measure the resistance between fuel sub level sensor and terminals with its float set to the full position.  Terminals  No. 1 — No. 2:</ref.>	Is the resistance 0.5 — 2.5 $\Omega$ ?	Repair the poor contact in harness between ECM and combination meter connector.	Replace the fuel sub level sensor.

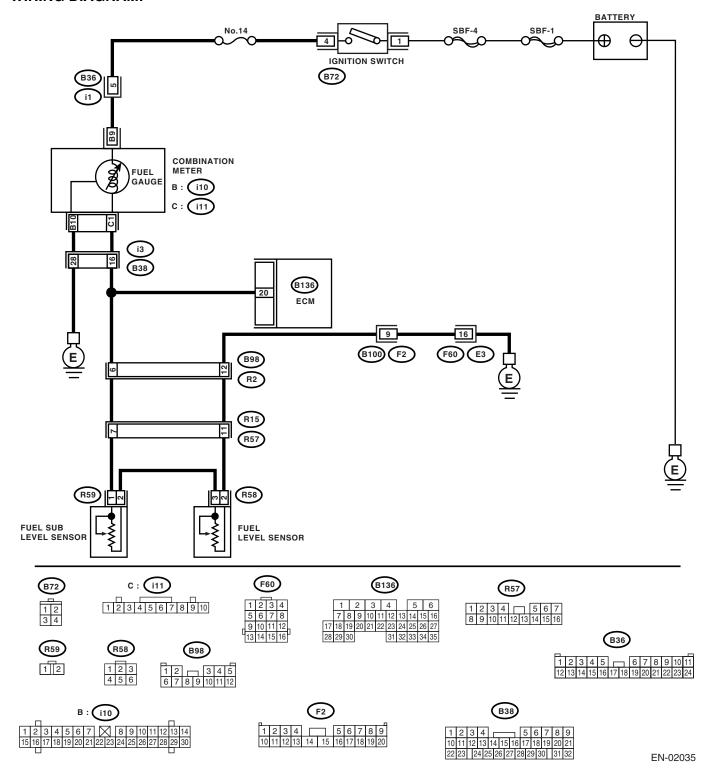
**ENGINE (DIAGNOSTICS)** 

# BM:DTC P0463 — FUEL LEVEL SENSOR CIRCUIT HIGH INPUT — DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-161, DTC P0463 FUEL LEVEL SENSOR CIRCUIT HIGH INPUT —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK SPEEDOMETER AND TACHOME- TER OPERATION IN COMBINATION METER.	Does the speedometer and tachometer operate normally?	Go to step 2.	Repair or replace the combination meter. <ref. idi-<br="" to="">3, Combination Meter System.&gt;</ref.>
2 CHECK INPUT SIGNAL FOR ECM.  1) Turn the ignition switch to ON. (engine OFF)  2) Measure the voltage between ECM connector and chassis ground.  Connector & terminal  (B136) No. 20 (+) — Chassis ground (-):	Is the voltage more than 4.75 V?	Go to step 3.	Even if malfunction indicator light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.  NOTE: In this case, repair the following:  Poor contact in fuel pump connector  Poor contact in coupling connector
3 CHECK INPUT VOLTAGE OF ECM. 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. Connector & terminal (B136) No. 20 (+) — Chassis ground (-):	Is the voltage more than 4.75 V?	Go to step 4.	Repair the battery short circuit between ECM and combination meter connector.
4 CHECK HARNESS BETWEEN ECM AND FUEL TANK CORD.  1) Turn the ignition switch to OFF.  2) Separate the fuel tank cord connector (R57) and rear wiring harness connector (R15).  3) Measure the resistance between ECM and fuel tank cord.  Connector & terminal (B136) No. 20 — (R15) No. 7:	Is the resistance less than 5 $\Omega$ ?	Go to step 5.	Repair the open circuit between ECM and fuel tank cord.
5 CHECK HARNESS BETWEEN FUEL TANK CORD AND CHASSIS GROUND. Measure the resistance between fuel tank cord and chassis ground. Connector & terminal (R15) No. 11 — Chassis ground:	Is the resistance less than 5 $\Omega$ ?	Go to step 6.	Repair the open circuit between fuel tank cord and chassis ground.  NOTE: In this case, repair the following: Poor contact in coupling connectors
6 CHECK FUEL TANK CORD.  1) Disconnect the connector from fuel level sensor.  2) Measure the resistance between fuel level sensor and coupling connector.  Connector & terminal  (R57) No. 11 — (R58) No. 2:	Is the resistance less than 10 $\Omega$ ?	Go to step 7.	Repair the open circuit between coupling connector and fuel level sensor.

	Step	Check	Yes	No
7	CHECK FUEL TANK CORD.  1) Disconnect the connector from fuel sub level sensor.  2) Measure the resistance between fuel level sensor and fuel sub level sensor.  Connector & terminal  (R58) No. 3 — (R59) No. 2:	Is the resistance less than 10 $\Omega$ ?	Go to step 8.	Repair the open circuit between fuel level sensor and fuel sub level sensor.
8	CHECK FUEL TANK CORD.  Measure the resistance between fuel sub level sensor and coupling connector.  Connector & terminal  (R57) No. 7 — (R59) No. 1:	Is the resistance less than 10 $\Omega$ ?	Go to step 9.	Repair the open circuit between coupling connector and fuel sub level sensor.
9	CHECK FUEL LEVEL SENSOR.  1) Remove the fuel pump assembly. <ref. fu(h4dotc)-55,="" fuel="" pump.="" to="">  2) While moving the fuel level sensor float up and down, measure the resistance between fuel level sensor terminals.  Terminals  No. 2 — No. 3:</ref.>	Is the resistance more than 53 $\Omega$ ?	Replace the fuel level sensor. <ref. to FU(H4DOTC)- 57, Fuel Level Sensor.&gt;</ref. 	Go to step 10.
10	CHECK FUEL SUB LEVEL SENSOR.  1) Remove the fuel sub level sensor. <ref. fu(h4dotc)-58,="" fuel="" level="" sensor.="" sub="" to=""> 2) While moving the fuel sub level sensor float up and down, measure the resistance between fuel sub level sensor terminals.  Terminals  No. 1 — No. 2:</ref.>	Is the resistance more than 45 $\Omega$ ?	Replace the fuel sub level sensor. <ref. to<br="">FU(H4DOTC)-58, Fuel Sub Level Sensor.&gt;</ref.>	Replace the combination meter. <ref. assembly.="" combination="" idi-10,="" meter="" to=""></ref.>

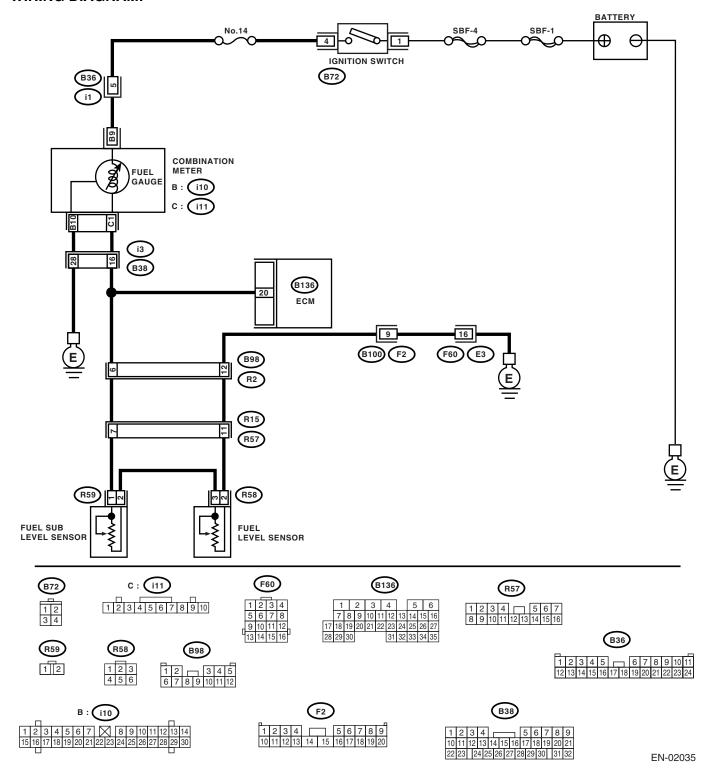
**ENGINE (DIAGNOSTICS)** 

## BN:DTC P0464 — FUEL LEVEL SENSOR CIRCUIT INTERMITTENT — DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-163, DTC P0464 FUEL LEVEL SENSOR CIRCUIT INTERMITTENT —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""></ref.>	Go to step 2.
2	CHECK FUEL LEVEL SENSOR.  1) Remove the fuel pump assembly. <ref. fu(h4dotc)-55,="" fuel="" pump.="" to="">  2) While moving the fuel level sensor float up and down, make sure that the resistance between fuel level sensor terminals changes smoothly.  Terminals  No. 3 — No. 2:</ref.>	Does the resistance change smoothly?	Go to step 3.	Replace the fuel level sensor. <ref. to FU(H4DOTC)- 57, Fuel Level Sensor.&gt;</ref. 
3	CHECK FUEL SUB LEVEL SENSOR.  1) Remove the fuel sub level sensor. <ref. fu(h4dotc)-58,="" fuel="" level="" sensor.="" sub="" to="">  2) While moving the fuel sub level sensor float up and down, make sure that the resistance between fuel level sensor terminals changes smoothly.  Terminals  No. 1 — No. 2:</ref.>	Does the resistance change smoothly?	Repair the poor contact in ECM, combination meter and coupling connectors.	Replace the fuel sub level sensor. <ref. to<br="">FU(H4DOTC)-58, Fuel Sub Level Sensor.&gt;</ref.>

**ENGINE (DIÀGNOSTICS)** 

### BO:DTC P0483 — COOLING FAN RATIONALITY CHECK —

### **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION
   Ref. to GD(H4DOTC)-166, DTC P0483 COOLING FAN RATIONALITY CHECK —, Diagnostic Trouble Code (DTC) Detecting Criteria.

### TROUBLE SYMPTOM:

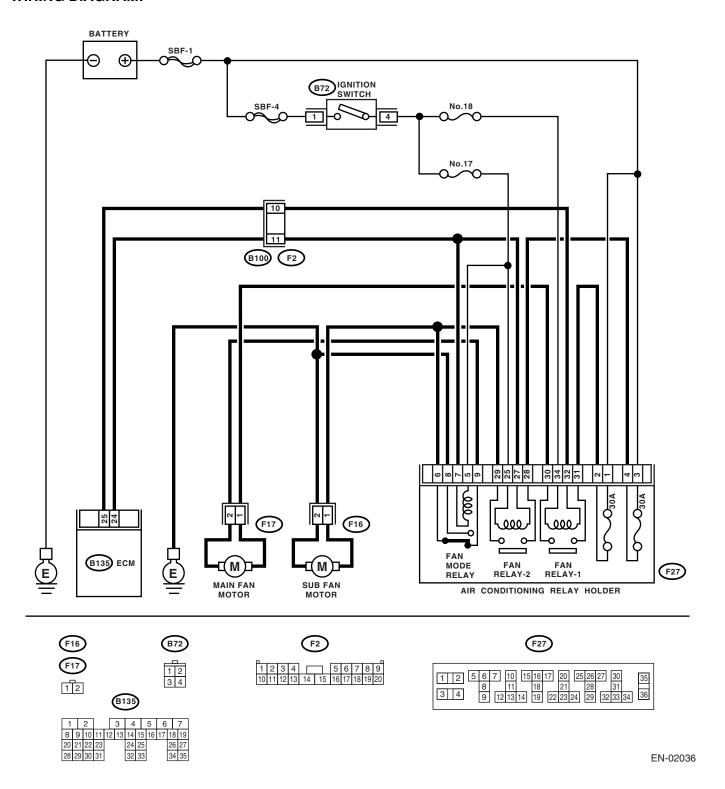
- Occurrence of noise
- Overheating

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, 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	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""></ref.>	Check the radiator fan, fan motor and thermostat. <ref. and="" co(h4so)-33,="" fan="" main="" motor.="" radiator="" to=""> and <ref. and="" co(h4so)-39,="" fan="" motor.="" radiator="" sub="" to=""> If thermostat is stuck, replace thermostat.</ref.></ref.>

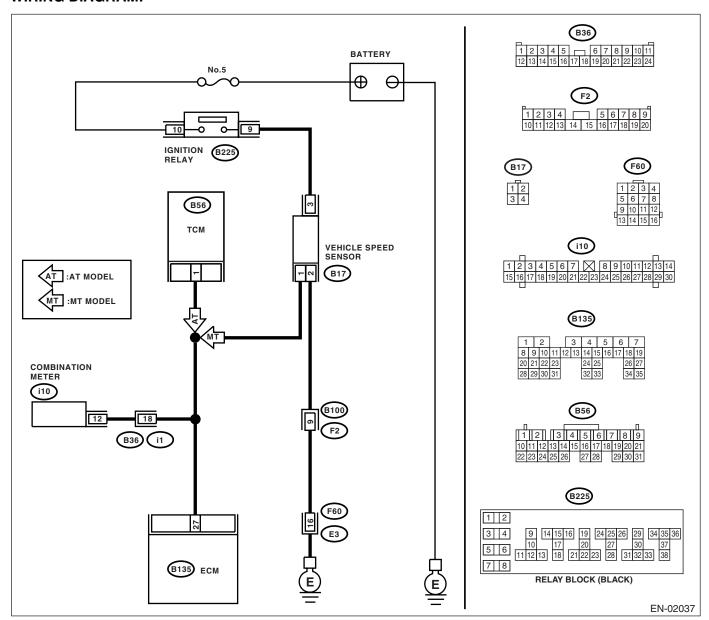
**ENGINE (DIAGNOSTICS)** 

## BP:DTC P0502 — VEHICLE SPEED SENSOR CIRCUIT LOW INPUT — DTC DETECTING CONDITION:

- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-167, DTC P0502 VEHICLE SPEED SENSOR CIR-CUIT LOW INPUT —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK HARENESS BETWEEN VEHICLE SPEED SENSOR AND ECM CONNECTOR.  1) Turn the ignition switch to OFF.  2) Disconnect the connectors from vehicle speed sensor and ECM.  3) Measure the resistance of harness between vehicle speed sensor connector and chassis ground.  Connector & terminal  (B17) No. 1 — Chassis ground:	Is the resistance more than 1 M $\Omega$ ?	Go to step 2.	Repair the ground short circuit in har- ness between vehicle speed sen- sor and ECM con- nector.
2	CHECK POOR CONTACT.  Check poor contact in the vehicle speed sensor connector.	Is there poor contact in the vehicle speed sensor connector?	Repair poor contact in the vehicle speed sensor connector.	Replace the vehi- cle speed sensor. <ref. 5mt-40,<br="" to="">Vehicle Speed Sensor.&gt;</ref.>

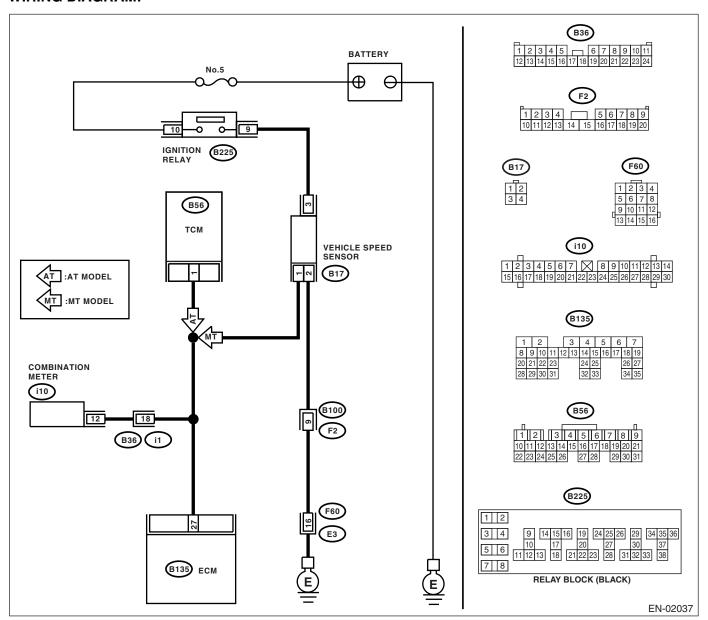
**ENGINE (DIAGNOSTICS)** 

# BQ:DTC P0503 — VEHICLE SPEED SENSOR INTERMITTENT/ERRATIC/HIGH — DTC DETECTING CONDITION:

- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-169, DTC P0503 VEHICLE SPEED SENSOR INTERMITTENT/ERRATIC/HIGH —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK SPEEDOMETER OPERATION IN COMBINATION METER.	Does the speedometer operate normally?	Go to step 2.	Check the speed- ometer. <ref. to<br="">IDI-12, Speedom- eter.&gt;</ref.>
2	CHECK HARNESS BETWEEN ECM AND COMBINATION METER CONNECTOR.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from combination meter.  3) Measure the resistance between ECM and combination meter.  Connector & terminal  (B135) No. 27 — (i10) No. 12:	Is the resistance less than 10 $\Omega$ ?	Repair the poor contact in ECM connector.	Repair the harness and connector.  NOTE: In this case, repair the following:  Open circuit in harness between ECM and combination meter connector Poor contact in ECM connector Poor contact in combination meter connector Poor contact in combination meter connector Poor contact in combination meter connector

**ENGINE (DIAGNOSTICS)** 

# BR:DTC P0506 — IDLE CONTROL SYSTEM RPM LOWER THAN EXPECTED — DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-171, DTC P0506 IDLE CONTROL SYSTEM RPM LOWER THAN EXPECTED —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

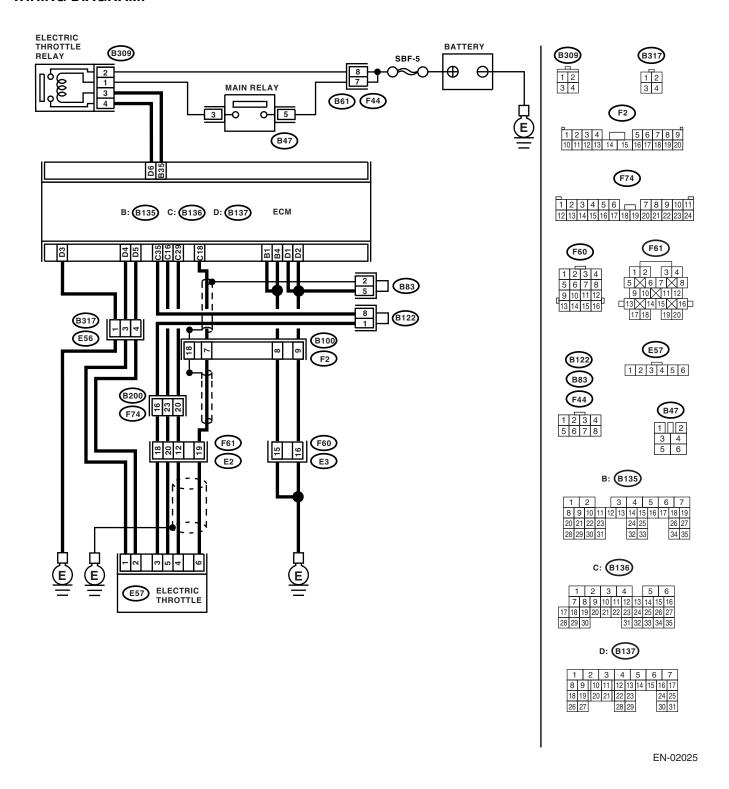
### **TROUBLE SYMPTOM:**

- Engine is difficult to start.
- Engine does not start.
- Erroneous idling
- Engine stalls.

### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.

ENGINE (DIÀGNOSTICS)



ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""> NOTE: In this case, it is not necessary to inspect DTC P0506.</ref.>	Go to step 2.
2	CHECK AIR CLEANER ELEMENT.  1) Turn the ignition switch to OFF.  2) Check air cleaner element.	Is there excessive clogging on air cleaner element.	Replace the air cleaner ele- ment. <ref. to<br="">IN(H4DOTC)-7, Air Cleaner.&gt;</ref.>	Go to step 3.
3	CHECK ELECTRIC THROTTLE.  1) Turn the ignition switch to OFF.  2) Remove the electric throttle.  3) Check the electric throttle.	Are there foreign particles in electric throttle?	Remove the for- eign particles from electric throttle.	Perform the diagnosis of DTC P2101.

ENGINE (DIÀGNOSTICS)

## BS:DTC P0507 — IDLE CONTROL SYSTEM RPM HIGHER THAN EXPECTED — DTC DETECTING CONDITION:

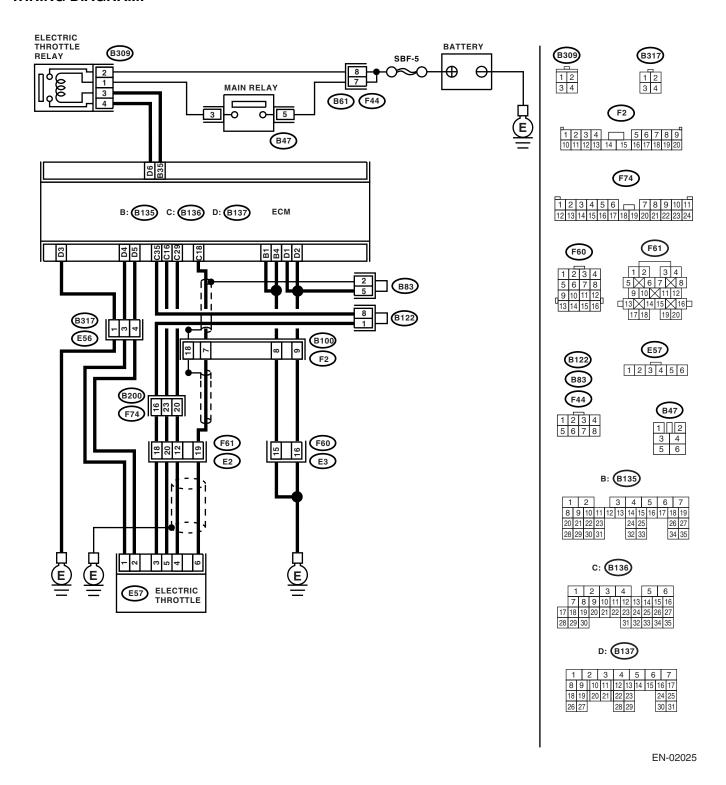
- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-173, DTC P0507 IDLE CONTROL SYSTEM RPM HIGHER THAN EXPECTED —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### TROUBLE SYMPTOM:

Engine keeps running at higher revolution than specified idling revolution.

### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""> NOTE: In this case, it is not necessary to inspect DTC P0507.</ref.>	Go to step 2.
2	CHECK AIR INTAKE SYSTEM.  1) Turn the ignition switch to ON.  2) Start the engine, and idle it.  3) Check the following items.  • Loose installation of intake manifold and throttle body  • Cracks of intake manifold gasket and throttle body gasket  • Disconnections of vacuum hoses	Is there a fault in air intake system?	Repair the air suction and leaks.	Go to step 3.
3	<ul><li>CHECK ELECTRIC THROTTLE.</li><li>1) Turn the ignition switch to OFF.</li><li>2) Remove the electric throttle.</li><li>3) Check the electric throttle.</li></ul>	Are there foreign particles in electric throttle?	Remove the for- eign particles from electric throttle.	Perform the diagnosis of DTC P2102.

**ENGINE (DIAGNOSTICS)** 

### BT:DTC P0512 — STARTER REQUEST CIRCUIT —

### **DTC DETECTING CONDITION:**

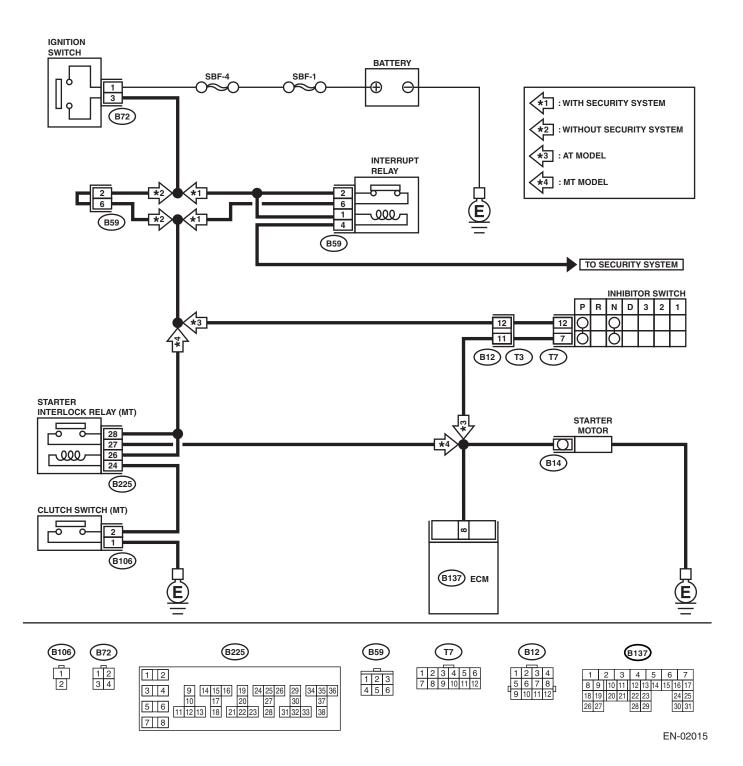
- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-175, DTC P0512 STARTER REQUEST CIRCUIT
   —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### **TROUBLE SYMPTOM:**

Failure of engine to start

### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OPERATION OF STARTER MOTOR.	when ignition switch is turned to ON?	short circuit in starter motor cir- cuit. After repair, replace the ECM. <ref. to<br="">FU(H4DOTC)-42,</ref.>	Check the starter motor circuit. <ref. cir-cuit,="" diagnostics="" en(h4dotc)-57,="" engine="" failure.="" for="" motor="" starter="" starting="" to=""></ref.>

ENGINE (DIÀGNOSTICS)

## BU:DTC P0519 — IDLE CONTROL SYSTEM MALFUNCTION (FAIL-SAFE) — DTC DETECTING CONDITION:

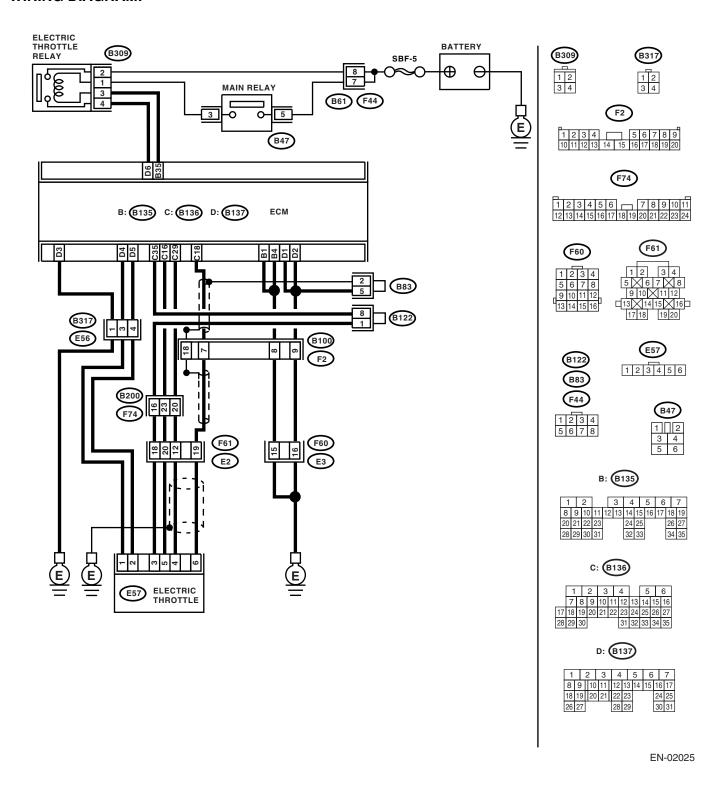
- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-176, DTC P0519 IDLE CONTROL SYSTEM MAL-FUNCTION (FAIL-SAFE) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### TROUBLE SYMPTOM:

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

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""> NOTE: In this case, it is not necessary to inspect DTC P0519.</ref.>	Go to step 2.
2	CHECK AIR INTAKE SYSTEM.  1) Turn the ignition switch to ON.  2) Start the engine, and idle it.  3) Check the following items.  • Loose installation of intake manifold and throttle body  • Cracks of intake manifold gasket and throttle body gasket  • Disconnections of vacuum hoses	Is there a fault in air intake system?	Repair the air suction and leaks.	Go to step 3.
3	<ul><li>CHECK ELECTRIC THROTTLE.</li><li>1) Turn the ignition switch to OFF.</li><li>2) Remove the electric throttle.</li><li>3) Check the electric throttle.</li></ul>	Are there foreign particles in electric throttle?	Remove the for- eign particles from electric throttle.	Perform the diagnosis of DTC P2102.

**ENGINE (DIAGNOSTICS)** 

# BV:DTC P0545 — EXHAUST GAS TEMPERATURE SENSOR CIRCUIT LOW-BANK 1 —

### **DTC DETECTING CONDITION:**

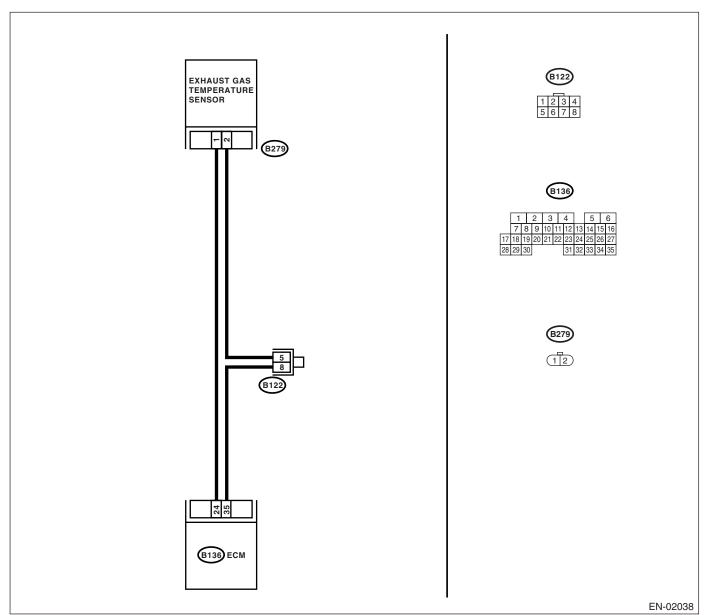
- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-177, DTC P0545 EXHAUST GAS TEMPERATURE SENSOR CIRCUIT LOW-BANK 1 —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### **TROUBLE SYMPTOM:**

- · Hard to start
- · Erroneous idling
- · Poor driving performance

### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK CURRENT DATA.  1) Start the engine.  2) Read the data of exhaust gas temperature sensor signal using Subaru Select Monitor or OBD-II general scan tool.  NOTE:  • Subaru Select Monitor  For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to="">  • OBD-II general scan tool  For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>	Is the temperature more than 1200°C (2192°F)?	Go to step 2.	Repair the poor contact.  NOTE: In this case, repair the following: Poor contact in exhaust gas temperature sensor Poor contact in ECM Poor contact in joint connector
2	CHECK HARNESS BETWEEN EXHAUST GAS TEMPERATURE SENSOR AND ECM CONNECTOR.  1) Turn the ignition switch to OFF. 2) Disconnect the connector from exhaust gas temperature sensor. 3) Turn the ignition switch to ON. 4) Read the data of exhaust gas temperature sensor signal using Subaru Select Monitor or OBD-II general scan tool.  NOTE: • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to=""> • OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>	Is the temperature less than 372°C (702°F)?	Replace the exhaust gas temperature sensor. <ref. exhaust="" fu(h4dotc)-41,="" sensor.="" temperature="" to=""></ref.>	Repair the ground short circuit in harness between exhaust gas temperature sensor and ECM connector.

**ENGINE (DIAGNOSTICS)** 

### BW:DTC P0546 — EXHAUST GAS TEMPERATURE SENSOR CIRCUIT HIGH-BANK 1 —

### **DTC DETECTING CONDITION:**

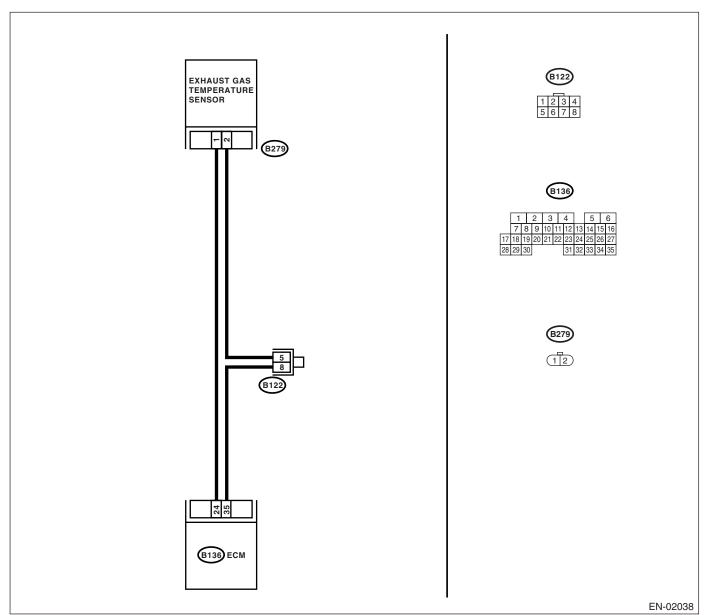
- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-179, DTC P0546 EXHAUST GAS TEMPERATURE SENSOR CIRCUIT HIGH-BANK 1 —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### **TROUBLE SYMPTOM:**

- · Hard to start
- · Erroneous idling
- · Poor driving performance

### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK CURRENT DATA.	Is the temperature less than	Go to step 2.	Repair the poor
	1) Start the engine.	372°C (702°F)?		contact.
	2) Read the data of exhaust gas temperature			NOTE:
	sensor signal using Subaru Select Monitor or			In this case, repair
	OBD-II general scan tool.			the following:  • Poor contact in
	NOTE:  • Subaru Select Monitor			exhaust gas tem-
	For detailed operation procedure, refer to the			perature sensor
	"READ CURRENT DATA FOR ENGINE". <ref.< td=""><td></td><td></td><td>Poor contact in</td></ref.<>			Poor contact in
	to EN(H4DOTC)-29, Subaru Select Monitor.>			ECM
	<ul> <li>OBD-II general scan tool</li> </ul>			<ul> <li>Poor contact in</li> </ul>
	For detailed operation procedures, refer to the			joint connector
	OBD-II General Scan Tool Instruction Manual.			
2	CHECK HARNESS BETWEEN EXHAUST	Is the voltage more than 10 V?	Repair the battery	Go to step 3.
	GAS TEMPERATURE SENSOR AND ECM CONNECTOR.		short circuit in har- ness between	
	Turn the ignition switch to OFF.		ECM and exhaust	
	<ul><li>2) Disconnect the connector from exhaust gas</li></ul>		gas temperature	
	temperature sensor.		sensor connector.	
	3) Measure the voltage between exhaust gas			
	temperature sensor connector and engine			
	ground.			
	Connector & terminal			
3	(B279) No. 1 (+) — Engine ground (-): CHECK HARNESS BETWEEN EXHAUST	Is the voltage more than 10 V?	Repair the battery	Go to step 4.
١	GAS TEMPERATURE SENSOR AND ECM	is the voltage more than 10 v:	short circuit in har-	do to step 4.
	CONNECTOR.		ness between	
	1) Turn the ignition switch to ON.		ECM and exhaust	
	2) Measure the voltage between exhaust gas		gas temperature	
	temperature sensor connector and engine		sensor connector.	
	ground.			
	Connector & terminal (B279) No. 1 (+) — Engine ground (–):			
4	CHECK HARNESS BETWEEN EXHAUST	Is the voltage more than 4 V?	Go to step 5.	Repair the har-
-	GAS TEMPERATURE SENSOR AND ECM	is the voltage more than + v:	αο το στερ <b>σ.</b>	ness and connec-
	CONNECTOR.			tor.
	Measure the voltage between exhaust gas			NOTE:
	temperature sensor connector and engine			In this case, repair
	ground.			the following:
	Connector & terminal			Open circuit in
	(B279) No. 1 (+) — Engine ground (–):			harness between
				ECM and exhaust
				gas temperature sensor connector
				Poor contact in
				exhaust gas tem-
				perature sensor
				connector
				Poor contact in
				ECM connector
				Poor contact in     ioint connector
				joint connector

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
5	CHECK HARNESS BETWEEN EXHAUST	Is the resistance less than 5	Replace the	Repair the har-
	GAS TEMPERATURE SENSOR AND ECM	Ω?	exhaust gas tem-	ness and connec-
	CONNECTOR.		perature sensor.	tor.
	<ol> <li>Turn the ignition switch to OFF.</li> </ol>		<ref. td="" to<=""><td>NOTE:</td></ref.>	NOTE:
	<ol><li>Measure the resistance of harness</li></ol>		FU(H4DOTC)-41,	In this case, repair
	between exhaust gas temperature sensor con-		Exhaust Tempera-	the following:
	nector and engine ground.		ture Sensor.>	<ul> <li>Open circuit in</li> </ul>
	Connector & terminal			harness between
	(B279) No. 2 — Engine ground:			ECM and exhaust
				gas temperature
				sensor connector
				<ul> <li>Poor contact in</li> </ul>
				exhaust gas tem-
				perature sensor
				connector
				<ul> <li>Poor contact in</li> </ul>
				ECM connector
				<ul> <li>Poor contact in</li> </ul>
				joint connector

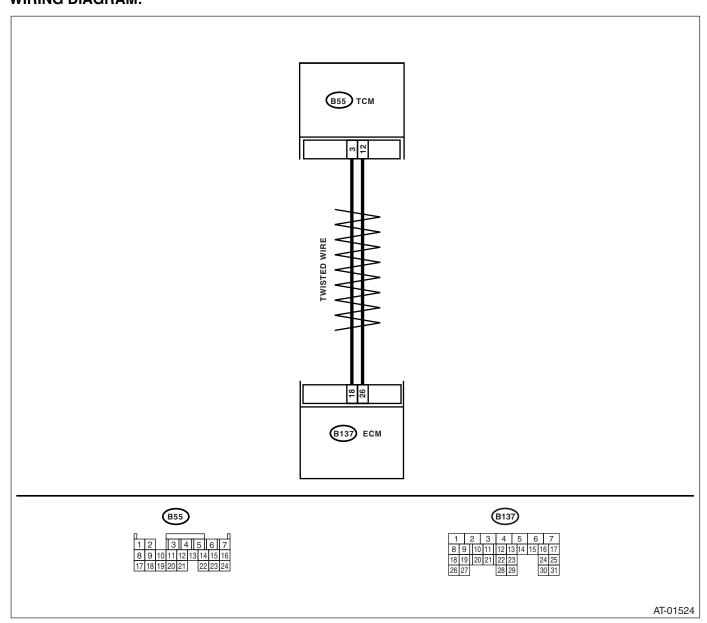
ENGINE (DIÀGNOSTICS)

## **BX:DTC P0600 — IMPROPER CAN COMMUNICATION —**

#### DTC DETECTING CONDITION:

Immediately at fault recognition

#### **CAUTION:**



		T		
	Step	Check	Yes	No
1	CHECK HARNESS BETWEEN ECM AND TCM.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from ECM.  3) Disconnect the connector from TCM.  4) Measure the resistance between connectors of ECM and TCM.  Connector & terminal  (B137) No. 18 — (B55) No. 3:  (B137) No. 26 — (B54) No. 12:	Is the resistance less than 1 $\Omega$ ?	Go to step 2.	Repair the harness connector.
2	CHECK HARNESS BETWEEN ECM AND TCM.  Measure the resistance between ECM connector and chassis ground.  Connector & terminal  (B137) No. 18 — Chassis ground:  (B137) No. 26 — Chassis ground:	Is the resistance more than 1 M $\Omega$ ?	Go to step 3.	Repair the harness connector.
3	CHECK HARNESS BETWEEN ECM AND TCM.  Measure the resistance of ECM connectors.  Connector & terminal  (B137) No. 18 — (B137) No. 26:	Is the resistance more than 1 $\mbox{M}\Omega ?$	Go to step 4.	Repair the harness connector.
4	CHECK AT SYSTEM STATUS. Check the AT using Subaru Select Monitor.	Does the Subaru Select Monitor display DTC P1718?	Inspect the AT system.	Replace the ECM. <ref. to<br="">FU(H4DOTC)-42, Engine Control Module (ECM).&gt;</ref.>

ENGINE (DIÀGNOSTICS)

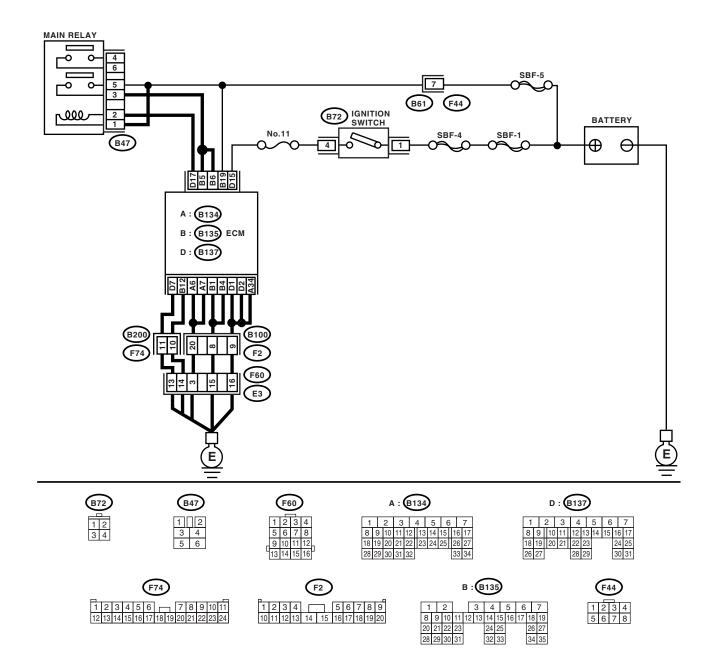
## BY:DTC P0604 — INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR —

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

- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-182, 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:**

#### **WIRING DIAGRAM:**



EN-02016

Ī	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Moni-	Replace the ECM.	A temporary poor
		tor or OBD-II general scan tool	<ref. th="" to<=""><th>contact.</th></ref.>	contact.
		indicate DTC P0604?	FU(H4DOTC)-42,	
			Engine Control	
L			Module (ECM).>	

ENGINE (DIÀGNOSTICS)

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

NOTE:

For the diagnostic procedure, refer to DTC P0607. <Ref. to EN(H4DOTC)-260, DTC P0607 — CONTROL MODULE PERFORMANCE —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

**ENGINE (DIAGNOSTICS)** 

### CA:DTC P0607 — CONTROL MODULE PERFORMANCE —

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

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-183, DTC P0605 INTERNAL CONTROL MODULE READ ONLY MEMORY (ROM) ERROR —, Diagnostic Trouble Code (DTC) Detecting Criteria.> <Ref. to GD(H4DOTC)-184, DTC P0607 CONTROL MODULE PERFORMANCE —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

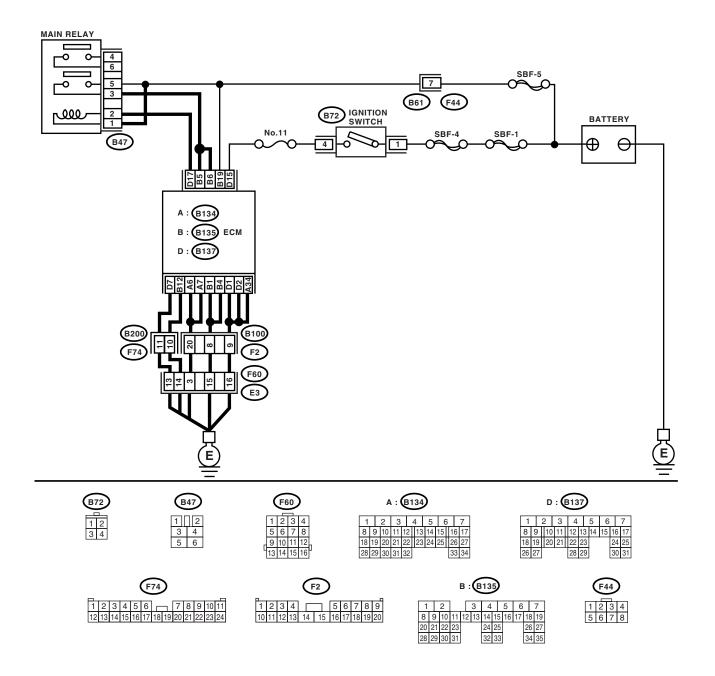
#### TROUBLE SYMPTOM:

- Erroneous idling
- · Poor driving performance

#### **CAUTION:**

ENGINE (DIÀGNOSTICS)

#### WIRING DIAGRAM:



EN-02016

	Step	Check	Yes	No
1	CHECK INPUT VOLTAGE OF ECM.  1) Turn the ignition switch to ON.  2) Measure the voltage between ECM connector and ground.  Connector & terminal  (B135) No. 5 (+) — Chassis ground (-):  (B135) No. 6 (+) — Chassis ground (-):	Is the voltage 10 — 13 V?	Go to step 2.	Repair the open circuit or ground short of power supply circuit.
2	CHECK INPUT VOLTAGE OF ECM.  1) Start the engine. 2) Measure the voltage between ECM connector and ground.  Connector & terminal  (B135) No. 5 (+) — Chassis ground (-):  (B135) No. 6 (+) — Chassis ground (-):	Is the voltage 13 — 15 V?	Go to step 3.	Repair the open circuit or ground short of power supply circuit.
3	CHECK GROUND HARNESS OF ECM.  Measure the voltage between ECM connector and ground.  Connector & terminal  (B137) No. 1 (+) — Chassis ground (-):  (B137) No. 2 (+) — Chassis ground (-):	Is the voltage less than 1 V?	Repair poor contact of ECM connector. If poor contact occur, replace the ECM.	Retighten the engine ground terminal.

ENGINE (DIÀGNOSTICS)

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

NOTE:

For the diagnostic procedure, refer to DTC P2101. <Ref. to EN(H4DOTC)-348, DTC P2101 — THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

**ENGINE (DIAGNOSTICS)** 

### CC:DTC P0691 — COOLING FAN 1 CONTROL CIRCUIT LOW —

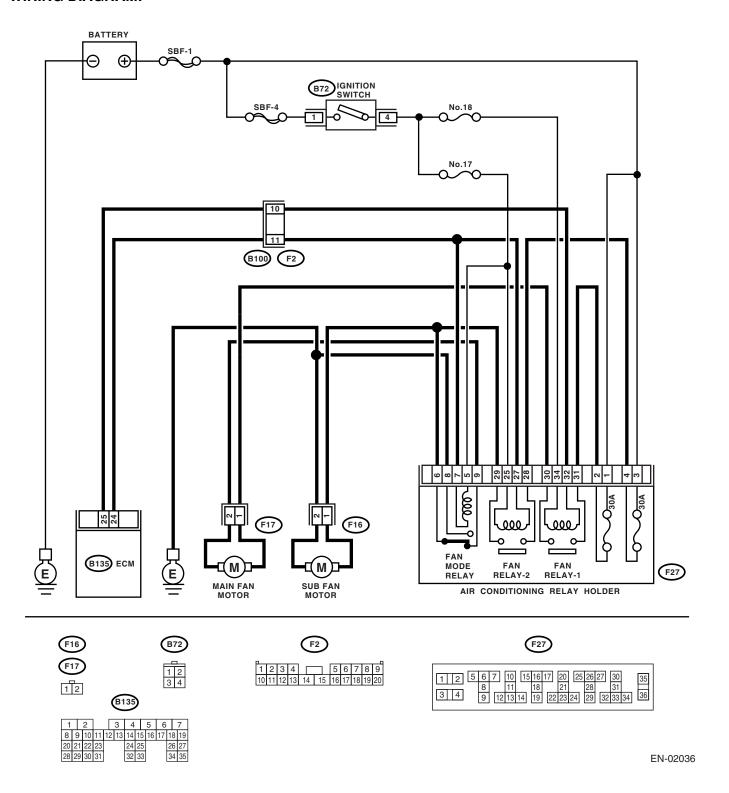
### **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-190, DTC P0691 COOLING FAN 1 CONTROL CIRCUIT LOW —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### TROUBLE SYMPTOM:

- Radiator fan does not operate properly.
- Overheating

#### **CAUTION:**



	Step	Check	Yes	No
1 (				-
1 2 3 4 8 9 N F U	CHECK OUTPUT SIGNAL FROM ECM.  1) Turn the ignition switch to OFF.  2) Connect the test mode connector.  3) Turn the ignition switch to ON.  4) While operating the radiator fan relay, measure voltage between ECM terminal and ground.  NOTE: Radiator fan relay operation can be executed using Subaru Select Monitor. For procedure, refer to "Compulsory Valve Operation Check Mode". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to="">  Connector &amp; terminal  (B135) No. 25 (+) — Chassis ground (-):</ref.>		Repair poor contact in ECM connector.	Go to step 2.
	(B135) No. 24 (+) — Chassis ground (–):			
1 1 2 3	CHECK GROUND SHORT CIRCUIT IN RADIATOR FAN RELAY CONTROL CIRCUIT.  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.  Connector & terminal  (B135) No. 25 — Chassis ground:  (B135) No. 24 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega ?$	Go to step 3.	Repair ground short circuit in radiator fan relay control circuit.
1 A 2 3	CHECK POWER SUPPLY FOR RELAY.  1) Remove the fan relay 1 and fan relay 2 from A/C relay holder.  2) Turn the ignition switch to ON.  3) Measure the voltage between fuse and relay box (F/B) connector and chassis ground.  Connector & terminal  (F27) No. 27 (+) — Chassis ground (-):  (F27) No. 32 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Go to step 4.	Repair open circuit in harness between ignition switch and fuse and relay box (F/B) connector.
1 2	CHECK FAN RELAY.  1) Turn the ignition switch to OFF.  2) Measure the resistance between main fan relay terminals.  Terminals  No. 32 — No. 34: (Fan relay 1)  No. 25 — No. 27: (Fan relay 2)	Is the resistance 87 — 107 $\Omega$ ?	Go to step 5.	Replace the fan relay.
L	CHECK OPEN CIRCUIT IN MAIN FAN RE- LAY CONTROL CIRCUIT.  Measure the resistance of harness between ECM and fan relay connector.  Connector & terminal  (B135) No. 25 — (F27) No. 32:  (B135) No. 24 — (F27) No. 27:	Is the resistance less than 1 $\Omega$ ?	Go to step 6.	Repair harness and connector.  NOTE: In this case, repair the following:  Open circuit in harness between ECM and fan relay connector  Poor contact in coupling connector
	CHECK POOR CONTACT. Check poor contact in ECM or fan relay connector.	Is there poor contact in ECM or fan relay connector?	Repair poor contact in ECM or fan relay connector.	Contact your SOA Service Center.

**ENGINE (DIÀGNOSTICS)** 

### CD:DTC P0692 — COOLING FAN 1 CONTROL CIRCUIT HIGH —

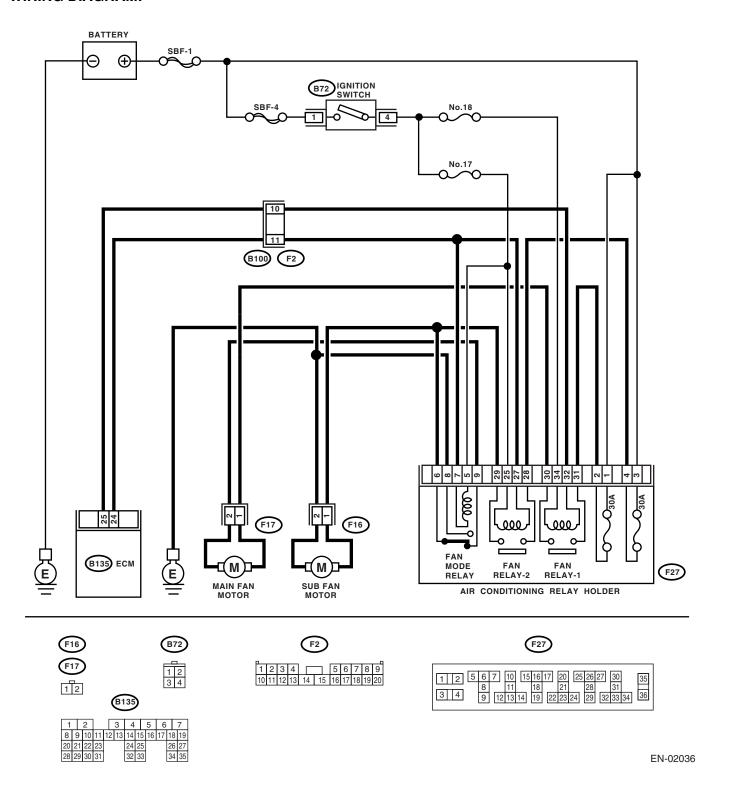
### **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-191, DTC P0692 COOLING FAN 1 CONTROL CIRCUIT HIGH —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### TROUBLE SYMPTOM:

- Radiator fan does not operate properly.
- Overheating

#### **CAUTION:**



# DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC) ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OUTPUT SIGNAL FROM ECM.  1) Turn the ignition switch to OFF.  2) Connect the test mode connector.  3) Turn the ignition switch to ON.  4) While operating the radiator fan relay, measure the voltage between ECM and chassis ground.  NOTE: Radiator fan relay operation can be execute using the Subaru Select Monitor. For procedure, refer to "Compulsory Valve Operation Check Mode". <ref. check="" compulsory="" en(h4dotc)-45,="" mode.="" operation="" to="" valve="">  Connector &amp; terminal  (B135) No. 25 (+) — Chassis ground (-): (B135) No. 24 (+) — Chassis ground (-):</ref.>	Does the voltage change 0 — 10 V?	Even if malfunction indicator light lights up, the circuit has returned to a normal condition at this time. In this case, repair the poor contact in ECM connector.	Go to step 2.
2 CHECK SHORT CIRCUIT IN RADIATOR FAN RELAY CONTROL CIRCUIT.  1) Turn the ignition switch to OFF. 2) Remove the fan relay 1, fan relay 2 and far mode relay. 3) Disconnect the test mode connector. 4) Turn the ignition switch to ON. 5) Measure the voltage between ECM and chassis ground.  Connector & terminal (B135) No. 25 (+) — Chassis ground (-): (B135) No. 24 (+) — Chassis ground (-):		Repair the battery short circuit in radiator fan relay control circuit. After repair, replace the ECM. <ref. (ecm).="" control="" engine="" fu(h4dotc)-42,="" module="" to=""></ref.>	Go to step 3.
3 CHECK FAN RELAY. 1) Turn the ignition switch to OFF. 2) Remove the fan relay. 3) Measure the resistance between fan relay terminals. Terminals No. 30 — No. 31: (Fan relay 1) No. 28 — No. 29: (Fan relay 2)	Is the resistance less than 1 $\Omega$ ?	Replace the fan relay and ECM. <ref. to<br="">FU(H4DOTC)-42, Engine Control Module (ECM).&gt;</ref.>	Go to step 4.
4 CHECK FAN MODE RELAY.  1) Remove the fan mode relay.  2) Measure the resistance between fan mode relay terminals.  Terminals  No. 8 — No. 9: (Fan mode relay)	Is the resistance less than 1 $\Omega$ ?	Replace the fan mode relay and ECM. <ref. to<br="">FU(H4DOTC)-42, Engine Control Module (ECM).&gt;</ref.>	Go to step 5.
CHECK POOR CONTACT.  Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Replace the ECM. <ref. to<br="">FU(H4DOTC)-42, Engine Control Module (ECM).&gt;</ref.>

**ENGINE (DIAGNOSTICS)** 

## CE:DTC P0700 — REQUEST AT MIL ON —

GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-192, DTC P0700 — REQUEST AT MIL ON —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

NOTE:

Refer to AT-section for diagnostic procedure. <Ref. to 4AT(H4SO)-2, PROCEDURE, Basic Diagnostic Procedure.>

**ENGINE (DIÀGNOSTICS)** 

# CF:DTC P0851 — NEUTRAL SWITCH INPUT CIRCUIT LOW — DTC DETECTING CONDITION:

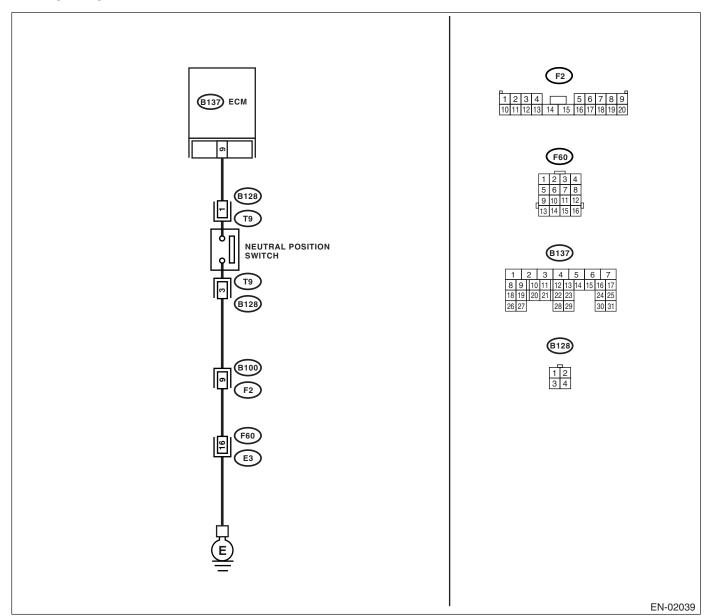
- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-194, DTC P0851 NEUTRAL SWITCH INPUT CIRCUIT LOW (MT MODEL) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### TROUBLE SYMPTOM:

Erroneous idling

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK INPUT SIGNAL FOR ECM.	Is the voltage more than 10 V?	Go to step 2.	Go to step 4.
	1) Turn the ignition switch to ON.	ğ	,	'
	2) Place the shift lever in neutral.			
	<ol><li>Measure the voltage between ECM and</li></ol>			
	chassis ground.			
	Connector & terminal			
	(B137) No. 9 (+) — Chassis ground (–):			
2	CHECK INPUT SIGNAL FOR ECM.	Is the voltage less than 1 V?	Go to step 3.	Go to step 4.
	1) Place the shift lever in a position except for			
	neutral.			
	Measure the voltage between ECM and     shape is ground.			
	chassis ground.  Connector & terminal			
	(B137) No. 9 (+) — Chassis ground (–):			
3	CHECK POOR CONTACT.	le there peer centeet in ECM	Danair naor aon	Contact your SOA
3	Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair poor con- tact in ECM con-	Service Center.
	Check poor contact in Edw connector.	Connector?	nector.	Service Cerrier.
4	CHECK NEUTRAL POSITION SWITCH.	Is the resistance more than 1	Go to step 5.	Repair short circuit
•	Turn the ignition switch to OFF.	$M\Omega$ ?	αυ ιυ δι <b>ε</b> μ <b>3.</b>	in transmission
	<ul><li>2) Disconnect the connector from transmis-</li></ul>	14122.		harness or replace
	sion harness.			neutral position
	Place the shift lever in neutral.			switch.
	4) Measure the resistance between transmis-			
	sion harness and connector terminals.			
	Connector & terminal			
	(T9) No. 1 — No. 3:			
5	CHECK NEUTRAL POSITION SWITCH.	Is the resistance less than 1	Go to step 6.	Repair short circuit
	1) Place the shift lever in a position except for	$\Omega$ ?		in transmission
	neutral.			harness or replace
	2) Measure the resistance between transmis-			neutral position
	sion harness connector terminals.			switch.
6	CHECK HARNESS BETWEEN ECM AND	Is the resistance more than 1	Go to step 7.	Repair ground
	NEUTRAL POSITION SWITCH CONNEC-	ΜΩ?		short circuit in har-
	TOR.			ness between ECM and trans-
	Measure the resistance between ECM and chassis ground.			mission harness
	Connector & terminal			connector.
	(B137) No. 9 — Chassis ground:			connector.
7	CHECK HARNESS BETWEEN ECM AND	Is the resistance less than 1	Go to step 8.	Repair open circuit
<b>'</b>	NEUTRAL POSITION SWITCH CONNEC-	$\Omega$ ?	00 10 316p 0.	in harness
	TOR.			between ECM and
	Disconnect the connector from ECM.			transmission har-
	Measure the resistance of harness			ness connector.
	between ECM and transmission harness con-			
	nector.			
	Connector & terminal			
	(B137) No. 9 — (B128) No. 1:			
8	CHECK HARNESS BETWEEN ECM AND	Is the resistance less than 5	Go to step 9.	Repair open circuit
	NEUTRAL POSITION SWITCH CONNEC-	Ω?		between transmis-
	TOR.			sion harness con-
	Measure the resistance of harness between			nector and engine
	transmission harness connector and engine			ground terminal.
	ground.			
	Connector & terminal			
	(B128) No. 1 — Engine ground:	la Managara de la Calanda	Danaina	0
9	CHECK POOR CONTACT.	Is there poor contact in trans-	Repair poor con-	Contact your SOA
	Check poor contact in transmission harness	mission harness connector?	tact in transmis-	Service Center.
	connector.		sion harness	
			connector.	

**ENGINE (DIÀGNOSTICS)** 

# CG:DTC P0852 — NEUTRAL SWITCH INPUT CIRCUIT HIGH — DTC DETECTING CONDITION:

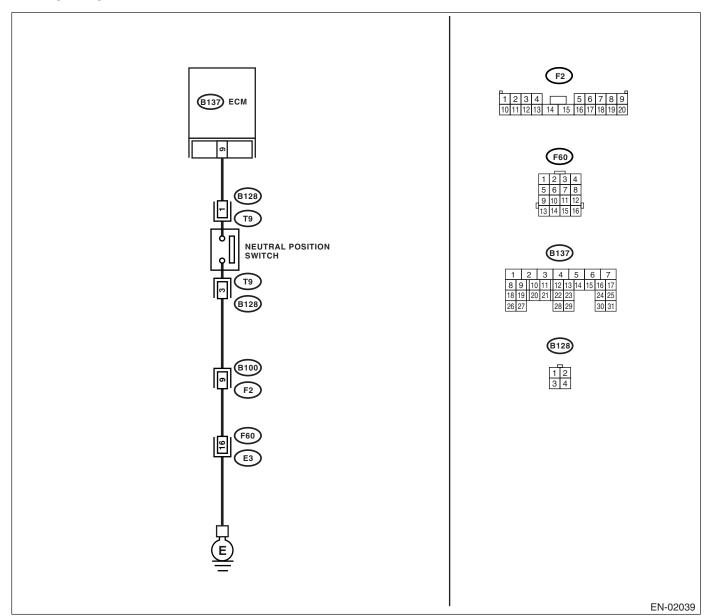
- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-195, DTC P0852 NEUTRAL SWITCH INPUT CIRCUIT HIGH (AT MODEL) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### TROUBLE SYMPTOM:

Erroneous idling

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK INPUT SIGNAL FOR ECM.  1) Turn the ignition switch to ON.  2) Set the shift lever to except neutral position.  3) Measure the voltage between ECM and chassis ground.  Connector & terminal  (B137) No. 9 (+) — Chassis ground (-):	Is the voltage less than 1 V?	Go to step 2.	Go to step 4.
2	CHECK INPUT SIGNAL FOR ECM.  1) Set the shift lever to neutral position.  2) Measure the voltage between ECM and chassis ground.  Connector & terminal  (B137) No. 9 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Go to step 3.	Go to step 4.
3	CHECK POOR CONTACT. Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Contact your SOA Service Center.
4	CHECK INPUT SIGNAL FOR ECM.  1) Disconnect ECM connector from ECM.  2) Measure the voltage between ECM and chassis ground.  Connector & terminal  (B137) No. 9 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Repair the battery short circuit in har- ness between ECM and trans- mission connector.	Go to step 5.
5	CHECK HARNESS BETWEEN ECM AND TRANSMISSION HARNESS CONNECTOR.  1) Turn the ignition switch to OFF.  2) Disconnect the connectors from ECM and transmission harness connector (T9).  3) Measure the resistance of harness between ECM and neutral switch connector.  Connector & terminal  (B137) No. 9 — (B128) No. 1:	Is the resistance less than 1 $\Omega$ ?	Go to step 6.	Repair the harness and connector.  NOTE: In this case, repair the following:  Open circuit in harness between ECM and transmission harness Poor contact in transmission harness connector Poor contact in ECM connector
6	CHECK NEUTRAL POSITION SWITCH GROUND LINE.  Measure the resistance of harness between transmission harness connector and engine ground.  Connector & terminal (B128) No. 3 — Engine ground:	Is the resistance less than 5 $\Omega$ ?	Go to step 7.	Repair the open circuit in harness of neutral position switch ground line.
7	CHECK NEUTRAL POSITION SWITCH.  1) Set the shift lever to except neutral position.  2) Measure the resistance between transmission harness connector receptacle's terminals.  Terminals  No. 1 — No. 3:	Is the resistance less than 1 $\Omega$ ?	Go to step 8.	Replace the neutral position switch.
8	CHECK POOR CONTACT.  Check poor contact in the transmission harness connector.	Is there poor contact in the transmission harness connector?	Repair poor contact in transmission harness connector.	Contact your SOA Service Center.

ENGINE (DIÀGNOSTICS)

### CH: DTC P1086 — TUMBLE GENERATED VALVE POSITION SENSOR 2 CIR-CUIT LOW —

#### DTC DETECTING CONDITION:

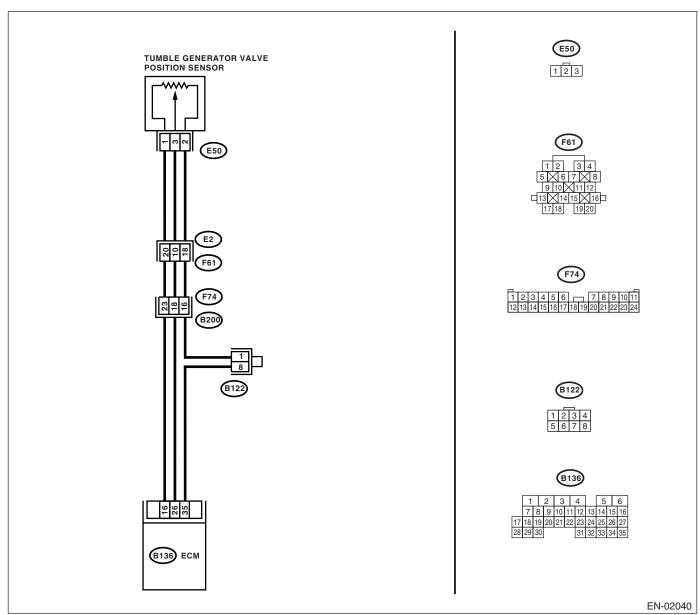
- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-197, DTC P1086 TUMBLE GENERATED VALVE POSITION SENSOR 2 CIRCUIT LOW —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- · Poor driving performance

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



Step	Check	Yes	No
1 CHECK CURRENT DATA.  1) Start the engine. 2) Read the data of throttle position sensor signal using Subaru Select Monitor or OBD-II general scan tool.  NOTE: • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to=""> • OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>	Is the voltage less than 0.1 V?	Go to step 2.	Even if malfunction indicator light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.  NOTE: In this case, repair the following:  Poor contact in throttle position sensor connector Poor contact in ECM connector Poor contact in coupling connector
2 CHECK INPUT SIGNAL FOR ECM.  Measure the voltage between ECM connector and chassis ground while tumble generator valve is fully closed.  Connector & terminal  (B136) No. 16 (+) — Chassis ground (-):	Is the voltage more than 4.5 V?	Go to step 4.	Go to step 3.
3 CHECK INPUT SIGNAL FOR ECM. Measure the voltage between ECM connector and chassis ground. Connector & terminal (B136) No. 16 (+) — Chassis ground (-):	Shake the ECM harness and connector, while monitoring value of voltage meter. Does the voltage change?	Repair the poor contact in ECM connector.	Contact your SOA Service Center. NOTE: Inspection by DTM is required, be- cause probable cause is deteriora- tion of multiple parts.
4 CHECK INPUT SIGNAL FOR ECM.  Measure the voltage between ECM connector and chassis ground.  Connector & terminal  (B136) No. 26 (+) — Chassis ground (-):	Is the voltage less than 0.1 V?	Go to step 6.	Go to step 5.
5 CHECK INPUT SIGNAL FOR ECM. (USING SUBARU SELECT MONITOR) Measure the voltage between ECM connector and chassis ground.	Shake the ECM harness and connector, while monitoring value of Subaru Select Monitor. Does the voltage change?	Repair the poor contact in ECM connector.	Go to step 6.

# DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC) ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
6	CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR.  1) Turn the ignition switch to OFF. 2) Disconnect the connectors from tumble generator valve position sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between tumble generator valve position sensor connector and engine ground.  Connector & terminal  (E50) No. 1 (+) — Engine ground (-):	Is the voltage more than 4.5 V?	Go to step 7.	Repair the harness and connector.  NOTE: In this case, repair the following:  Open circuit in harness between tumble generator valve position sensor and ECM connector  Poor contact in tumble generator valve position sensor connector  Poor contact in ECM connector  Poor contact in ECM connector  Poor contact in ECM connector  Poor contact in coupling connector  Poor contact in coupling connector
7	CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR.  1) Turn the ignition switch to OFF.  2) Measure the resistance of harness between ECM connector and tumble generator valve position sensor connector.  Connector & terminal  (B136) No. 26 — (E50) No. 3:	Is the resistance less than 1 $\Omega$ ?	Go to step 8.	Repair the harness and connector.  NOTE: In this case, repair the following:  Open circuit in harness between tumble generator valve position sensor and ECM connector  Poor contact in ECM connector  Poor contact in tumble generator valve position sensor connector  Poor contact in tumble generator valve position sensor connector  Poor contact in coupling connector
8	CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR.  Measure the resistance of harness between tumble generator valve position sensor connector and engine ground.  Connector & terminal  (E50) No. 3 — Engine ground:	Is the resistance more than 1 $\mbox{M}\Omega\mbox{?}$	Go to step 9.	Repair the ground short circuit in harness between tumble generator valve position sensor and ECM connector.
9	CHECK POOR CONTACT. Check poor contact in tumble generator valve position sensor connector.	Is there poor contact in tumble generator valve position sensor connector?	Repair the poor contact in tumble generator valve position sensor connector.	Replace the tum- ble generator valve assembly. <ref. to<br="">FU(H4DOTC)-34, Tumble Generator Valve Assembly.&gt;</ref.>

**ENGINE (DIAGNOSTICS)** 

# CI: DTC P1087 — TUMBLE GENERATED VALVE POSITION SENSOR 2 CIRCUIT HIGH —

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

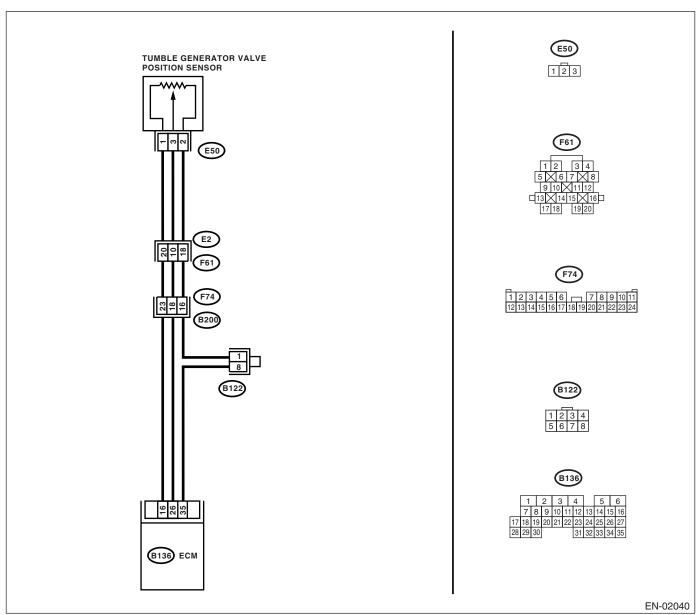
- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-199, DTC P1087 TUMBLE GENERATED VALVE POSITION SENSOR 2 CIRCUIT HIGH —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- · Poor driving performance

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



# DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC) ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK CURRENT DATA.  1) Start the engine. 2) Read the data of throttle position sensor signal using Subaru Select Monitor or OBD-II general scan tool.  NOTE: • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to=""> • OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>	Is the voltage more than 4.9 V?	Go to step 2.	Even if malfunction indicator light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.  NOTE: In this case, repair the following:  Poor contact in tumble generator valve position sensor connector Poor contact in ECM connector Poor contact in coupling connector
2 CHECK HARNESS BETWEEN TUMBLE GENERATOR VALVE POSITION SENSOR AND ECM CONNECTOR.  1) Turn the ignition switch to OFF. 2) Disconnect the connector from throttle position sensor. 3) Measure the resistance of harness between throttle position sensor connector and engine ground.  Connector & terminal (E50) No. 2 — Engine ground:	Is the resistance less than 5 $\Omega$ ?	Go to step 3.	Repair the harness and connector.  NOTE: In this case, repair the following:  Open circuit in harness between tumble generator valve position sensor and ECM connector  Poor contact in coupling connector  Poor contact in joint connector
3 CHECK HARNESS BETWEEN THROTTLE POSITION SENSOR AND ECM CONNECTOR.  1) Turn the ignition switch to ON. 2) Measure the voltage between throttle position sensor connector and engine ground.  Connector & terminal  (E50) No. 3 (+) — Engine ground (-):	Is the voltage more than 4.9 V?	Repair the battery short circuit in harness between tumble generator valve position sensor and ECM connector. After repair, replace the ECM. <ref. (ecm).="" control="" engine="" fu(h4dotc)-42,="" module="" to=""></ref.>	assembly. <ref. td="" to<=""></ref.>

**ENGINE (DIAGNOSTICS)** 

# CJ: DTC P1088 — TUMBLE GENERATED VALVE POSITION SENSOR 1 CIRCUIT LOW —

#### DTC DETECTING CONDITION:

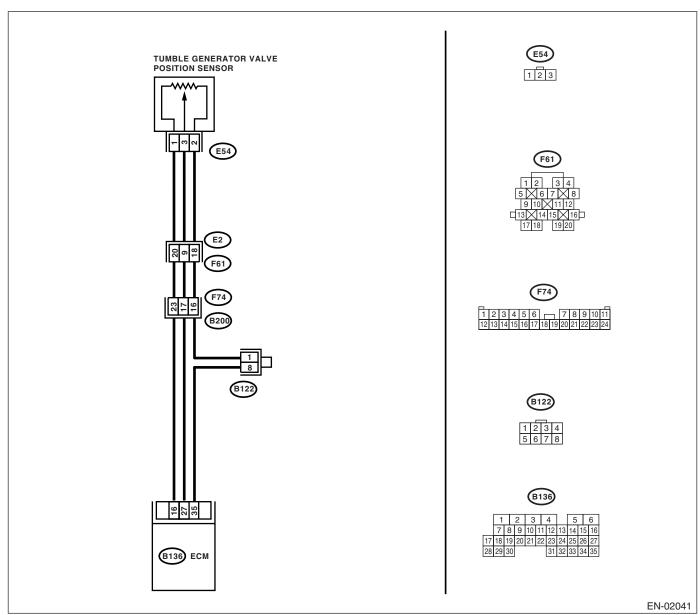
- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-201, DTC P1088 TUMBLE GENERATED VALVE POSITION SENSOR 1 CIRCUIT LOW —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- · Poor driving performance

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



# DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC) ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<ol> <li>Start the engine.</li> <li>Read the data of tumble generator valve position sensor signal using Subaru Select Monitor or OBD-II general scan tool.</li> <li>NOTE:         <ul> <li>Subaru Select Monitor</li> <li>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to=""></ref.></li> <li>OBD-II general scan tool</li> <li>For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.</li> </ul> </li> </ol>	Is the voltage less than 0.1 V?	Go to step 2.	Even if malfunction indicator light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.  NOTE: In this case, repair the following:  Poor contact in tumble generator valve position sensor connector Poor contact in ECM connector Poor contact in coupling connector
2 CHECK INPUT SIGNAL FOR ECM.  Measure the voltage between ECM connector and chassis ground while throttle valve is fully closed.  Connector & terminal  (B136) No. 16 (+) — Chassis ground (-):	Is the voltage more than 4.5 V?	Go to step 4.	Go to step 3.
Measure the voltage between ECM connector and chassis ground.	Shake the ECM harness and connector, while monitoring value of voltage meter. Does the voltage change?	Repair the poor contact in ECM connector.	Contact your SOA Service Center. NOTE: Inspection by DTM is required, be- cause probable cause is deteriora- tion of multiple parts.
4 CHECK INPUT SIGNAL FOR ECM.  Measure the voltage between ECM connector and chassis ground.  Connector & terminal  (B136) No. 27 (+) — Chassis ground (-):	Is the voltage less than 0.1 V?	Go to step 6.	Go to step 5.
SUBARU SELECT MONITOR)  Measure the voltage between ECM connector	Shake the ECM harness and connector, while monitoring value of Subaru Select Monitor. Does the voltage change?	Repair the poor contact in ECM connector.	Go to step 6.

	Step	Check	Yes	No
6	CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR.  1) Turn the ignition switch to OFF. 2) Disconnect the connectors from throttle position sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between throttle position sensor connector and engine ground.  Connector & terminal  (E54) No. 1 (+) — Engine ground (-):	Is the voltage more than 4.5 V?	Go to step 7.	Repair the harness and connector.  NOTE: In this case, repair the following:  Open circuit in harness between tumble generator valve position sensor and ECM connector  Poor contact in throttle position sensor connector  Poor contact in ECM connector  Poor contact in coupling connector  Poor contact in coupling connector
7	CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR.  1) Turn the ignition switch to OFF. 2) Measure the resistance of harness between ECM connector and throttle position sensor connector.  Connector & terminal  (B136) No. 27 — (E54) No. 3:	Is the resistance less than 1 $\Omega$ ?	Go to step 8.	Repair the harness and connector.  NOTE: In this case, repair the following:  Open circuit in harness between tumble generator valve position sensor and ECM connector  Poor contact in ECM connector  Poor contact in tumble generator valve position sensor connector  Poor contact in tumble generator valve position sensor connector  Poor contact in coupling connector
8	CHECK HARNESS BETWEEN ECM AND THROTTLE POSITION SENSOR CONNECTOR.  Measure the resistance of harness between tumble generator valve position sensor connector and engine ground.  Connector & terminal  (E54) No. 3 — Engine ground:	Is the resistance more than 1 $\mbox{M}\Omega\mbox{?}$	Go to step 9.	Repair the ground short circuit in harness between tumble generator valve position sensor and ECM connector.
9	CHECK POOR CONTACT. Check poor contact in tumble generator valve position sensor connector.	Is there poor contact in tumble generator valve position sensor connector?	Repair the poor contact in tumble generator valve position sensor connector.	Replace the tum- ble generator valve assembly. <ref. to<br="">FU(H4DOTC)-34, Tumble Generator Valve Assembly.&gt;</ref.>

**ENGINE (DIÀGNOSTICS)** 

# CK:DTC P1089 — TUMBLE GENERATED VALVE POSITION SENSOR 1 CIRCUIT HIGH —

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

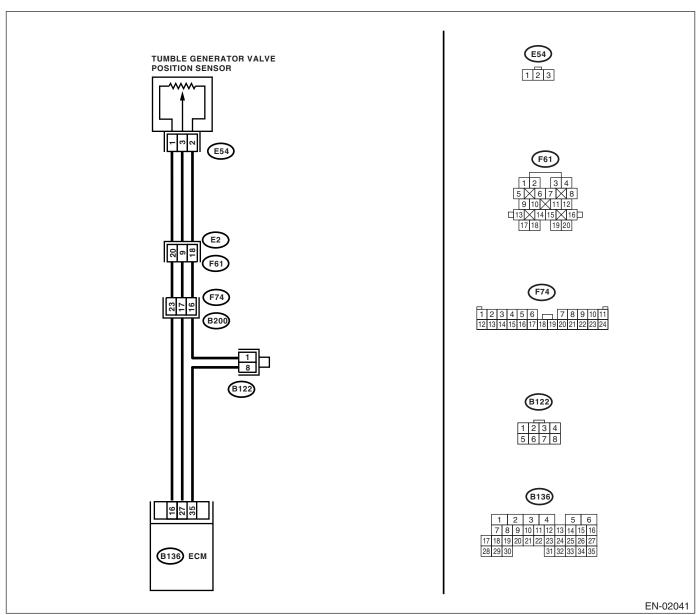
- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-203, DTC P1089 TUMBLE GENERATED VALVE POSITION SENSOR 1 CIRCUIT HIGH —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **TROUBLE SYMPTOM:**

- · Erroneous idling
- Engine stalls.
- · Poor driving performance

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK CURRENT DATA.  1) Start the engine.  2) Read the data of tumble generator valve position sensor signal using Subaru Select Monitor or OBD-II general scan tool.  NOTE:  • Subaru Select Monitor  For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to="">  • OBD-II general scan tool  For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>	Is the voltage more than 4.9 V?	Go to step 2.	Even if malfunction indicator light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.  NOTE: In this case, repair the following:  Poor contact in tumble generator valve position sensor connector Poor contact in ECM connector Poor contact in coupling connector
2	CHECK HARNESS BETWEEN TUMBLE GENERATOR VALVE POSITION SENSOR AND ECM CONNECTOR.  1) Turn the ignition switch to OFF. 2) Disconnect the connector from throttle position sensor. 3) Measure the resistance of harness between tumble generator valve position sensor connector and engine ground.  Connector & terminal (E54) No. 2 — Engine ground:	Is the resistance less than 5 $\Omega$ ?	Go to step 3.	Repair the harness and connector.  NOTE: In this case, repair the following:  Open circuit in harness between tumble generator valve position sensor and ECM connector  Poor contact in coupling connector  Poor contact in joint connector
3	CHECK HARNESS BETWEEN TUMBLE GENERATOR VALVE POSITION SENSOR AND ECM CONNECTOR.  1) Turn the ignition switch to ON. 2) Measure the voltage between throttle position sensor connector and engine ground.  Connector & terminal (E54) No. 3 (+) — Engine ground (-):	Is the voltage more than 4.9 V?	short circuit in har-	assembly. <ref. td="" to<=""></ref.>

ENGINE (DIÀGNOSTICS)

# CL:DTC P1090 — TUMBLE GENERATED VALVE SYSTEM 1 (VALVE OPEN) — DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION<Ref. to GD(H4DOTC)-205, DTC P1090 TUMBLE GENERATED VALVE SYSTEM 1 (VALVE OPEN) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""></ref.>	Go to step 2.
2	CHECK TUMBLE GENERATOR VALVE RH.  1) Remove the tumble generator valve assembly.  2) Check the tumble generator valve body.	Does the tumble generator valve move smoothly? (No dirt or foreign materials clogged)	Replace the tum- ble generator valve assembly. <ref. to<br="">FU(H4DOTC)-34, Tumble Generator Valve Assembly.&gt;</ref.>	Clean the tumble generator valve.

**ENGINE (DIAGNOSTICS)** 

# CM:DTC P1091 — TUMBLE GENERATED VALVE SYSTEM 1 (VALVE CLOSE) — DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-206, DTC P1091 TUMBLE GENERATED VALVE SYSTEM 1 (VALVE CLOSE) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)" <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""></ref.>	Go to step 2.
2	CHECK TUMBLE GENERATOR VALVE RH.  1) Remove the tumble generator valve assembly.  2) Check the tumble generator valve body.	Does the tumble generator valve move smoothly? (No dirt or foreign materials clogged)	Replace the tum- ble generator valve assembly. <ref. to<br="">FU(H4DOTC)-34, Tumble Generator Valve Assembly.&gt;</ref.>	Clean the tumble generator valve.

ENGINE (DIÀGNOSTICS)

# CN:DTC P1092 — TUMBLE GENERATED VALVE SYSTEM 2 (VALVE OPEN) — DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-207, DTC P1092 TUMBLE GENERATED VALVE SYSTEM 2 (VALVE OPEN) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""></ref.>	Go to step 2.
2	CHECK TUMBLE GENERATOR VALVE RH.  1) Remove the tumble generator valve assembly.  2) Check the tumble generator valve body.	Does the tumble generator valve move smoothly? (No dirt or foreign materials clogged)	Replace the tum- ble generator valve assembly. <ref. to<br="">FU(H4DOTC)-34, Tumble Generator Valve Assembly.&gt;</ref.>	Clean the tumble generator valve.

**ENGINE (DIAGNOSTICS)** 

# CO:DTC P1093 — TUMBLE GENERATED VALVE SYSTEM 2 (VALVE CLOSE) — DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-208, DTC P1093 TUMBLE GENERATED VALVE SYSTEM 2 (VALVE CLOSE) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""></ref.>	Go to step 2.
2	CHECK TUMBLE GENERATOR VALVE RH.  1) Remove the tumble generator valve assembly.  2) Check the tumble generator valve body.	Does the tumble generator valve move smoothly? (No dirt or foreign materials clogged)	Replace the tum- ble generator valve assembly. <ref. to<br="">FU(H4DOTC)-34, Tumble Generator Valve Assembly.&gt;</ref.>	Clean the tumble generator valve.

**ENGINE (DIÀGNOSTICS)** 

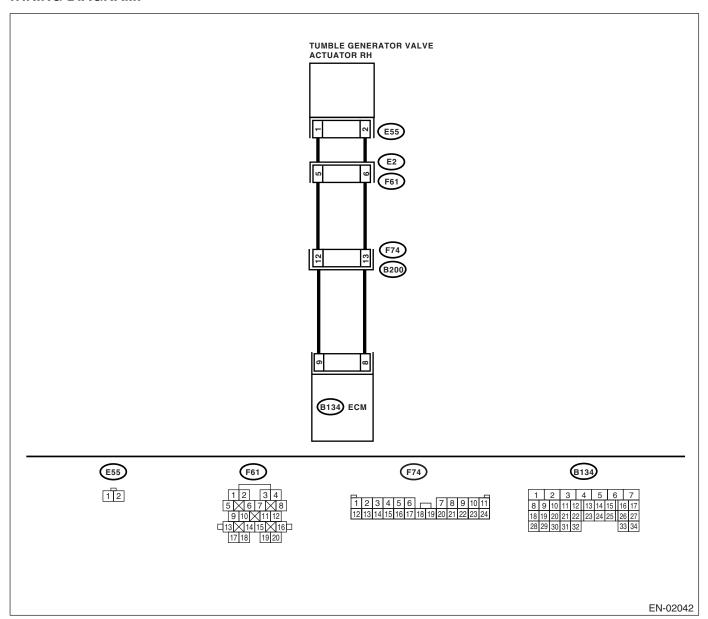
## CP:DTC P1094 — TUMBLE GENERATED VALVE SIGNAL 1 CIRCUIT MALFUNC-TION (OPEN) —

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

- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-209, DTC P1094 TUMBLE GENERATED VALVE SIGNAL 1 CIRCUIT MALFUNCTION (OPEN) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR CONNECTOR.  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.  Connector & terminal (E55) No. 1 — (B134) No. 9: (E55) No. 2 — (B134) No. 8:	Is the resistance less than 1 $\Omega$ ?	Go to step 2.	Repair the open circuit between ECM and tumble generator valve connector.  NOTE: In this case, repair the following:  Open circuit in harness between ECM and tumble generator valve actuator connector.  Poor contact in coupling connector.
2	CHECK POOR CONTACT.  Check poor contact in tumble generator valve actuator connector.	Is there poor contact in tumble generator valve actuator connector?	Repair the poor contact in tumble generator valve actuator connector.	Replace the tum- ble generator valve assembly. <ref. to<br="">FU(H4DOTC)-34, Tumble Generator Valve Assembly.&gt;</ref.>

ENGINE (DIÀGNOSTICS)

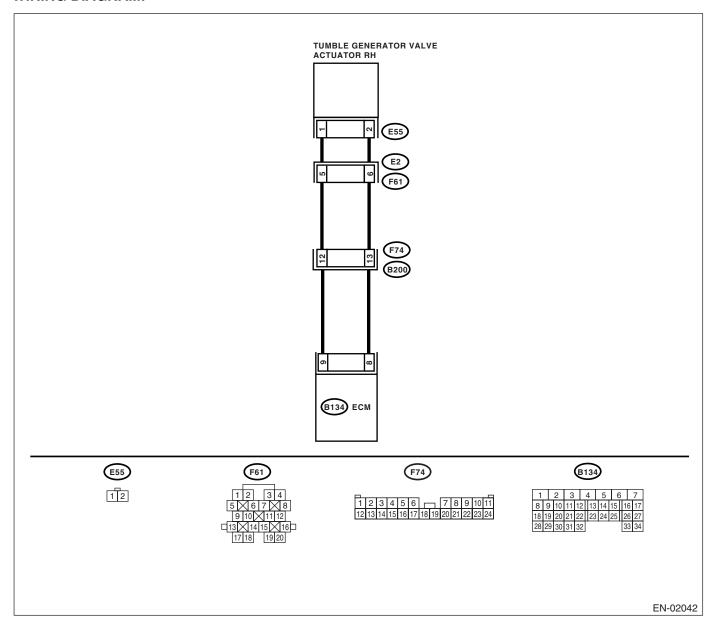
## CQ:DTC P1095 — TUMBLE GENERATED VALVE SIGNAL 1 CIRCUIT MAL-FUNCTION (SHORT) —

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

- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-211, DTC P1095 TUMBLE GENERATED VALVE SIGNAL 1 CIRCUIT MALFUNCTION (SHORT) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



Step	Check	Yes	No
1 CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR CONNECTOR.  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.  Connector & terminal  (E55) No. 1 (+) — Chassis ground (-):  (E55) No. 2 (+) — Chassis ground (-):	Is the voltage less than 5 V?	Replace the tum- ble generator valve assembly. <ref. to<br="">FU(H4DOTC)-34, Tumble Generator Valve Assembly.&gt;</ref.>	between ECM and tumble generator

**ENGINE (DIÀGNOSTICS)** 

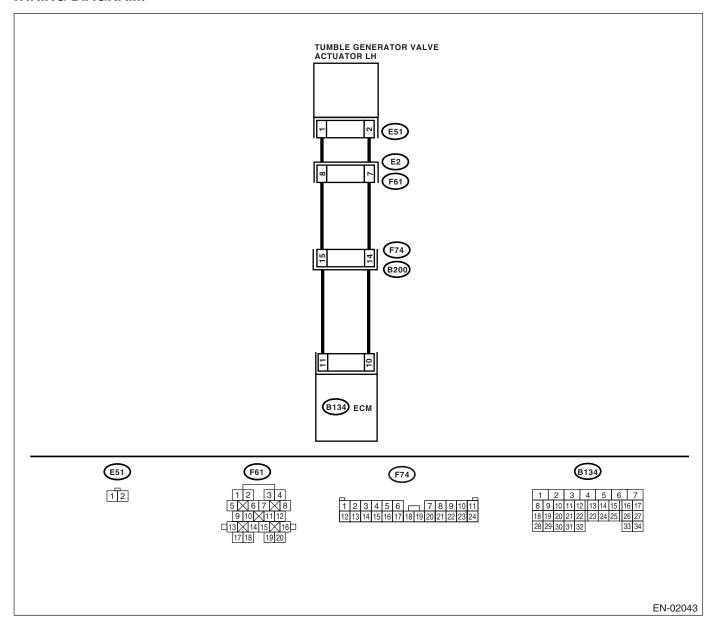
## CR:DTC P1096 — TUMBLE GENERATED VALVE SIGNAL 2 CIRCUIT MALFUNC-TION (OPEN) —

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

- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-213, DTC P1096 TUMBLE GENERATED VALVE SIGNAL 2 CIRCUIT MALFUNCTION (OPEN) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR CONNECTOR.  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.  Connector & terminal (E51) No. 1 — (B134) No. 11: (E51) No. 2 — (B134) No. 10:	Is the resistance less than 1 $\Omega$ ?	Go to step 2.	Repair the open circuit between ECM and tumble generator valve connector.  NOTE: In this case, repair the following:  Open circuit in harness between ECM and tumble generator valve actuator connector.  Poor contact in coupling connector.
2	CHECK POOR CONTACT.  Check poor contact in tumble generator valve actuator connector.	Is there poor contact in tumble generator valve actuator connector?	Repair the poor contact in tumble generator valve actuator connector.	Replace the tumble generator valve assembly. <ref. assembly.="" fu(h4dotc)-34,="" generator="" to="" tumble="" valve=""></ref.>

**ENGINE (DIÀGNOSTICS)** 

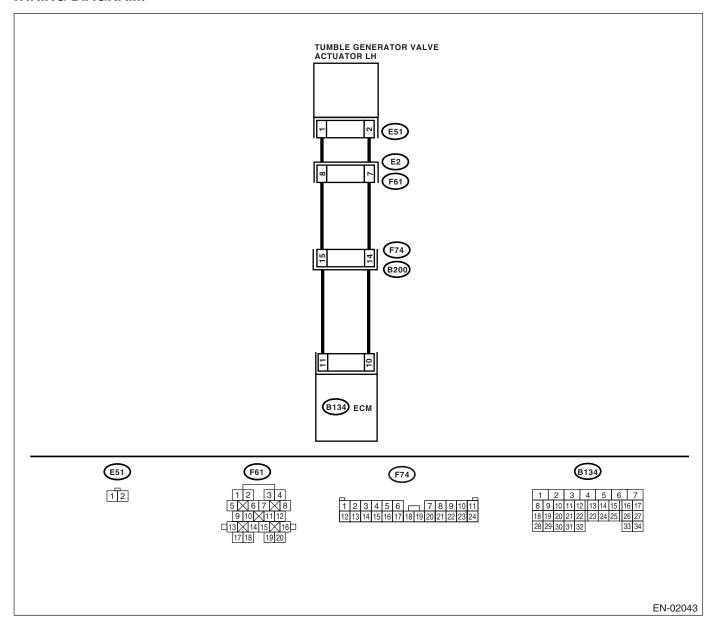
## CS:DTC P1097 — TUMBLE GENERATED VALVE SIGNAL 2 CIRCUIT MALFUNC-TION (SHORT) —

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

- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-215, DTC P1097 TUMBLE GENERATED VALVE SIGNAL 2 CIRCUIT MALFUNCTION (SHORT) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



Step	Check	Yes	No
1 CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR CONNECTOR.  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.  Connector & terminal  (E51) No. 1 (+) — Chassis ground (-):  (E51) No. 2 (+) — Chassis ground (-):		ble generator valve assembly. <ref. th="" to<=""><th>between ECM and tumble generator</th></ref.>	between ECM and tumble generator

**ENGINE (DIÀGNOSTICS)** 

## CT:DTC P1110 — ATMOSPHERIC PRESSURE SENSOR CIRCUIT MALFUNC-TION (LOW INPUT) —

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

- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-217, DTC P1110 ATMOSPHERIC PRESSURE SENSOR CIRCUIT MALFUNCTION (LOW INPUT) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.

S	tep	Check	Yes	No
1 CHECK ANY OT				contact.

## CU:DTC P1111 — ATMOSPHERIC PRESSURE SENSOR CIRCUIT MALFUNC-TION (HIGH INPUT) —

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

- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-218, DTC P1111 ATMOSPHERIC PRESSURE SENSOR CIRCUIT MALFUNCTION (HIGH INPUT) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### CALITION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK ANY OTHER DTC ON DISPLAY.			contact.

**ENGINE (DIAGNOSTICS)** 

# CV:DTC P1152 — O<sub>2</sub> SENSOR CIRCUIT RANGE/PERFORMANCE (LOW) (BANK 1 SENSOR 1) —

#### NOTE:

For the diagnostic procedure, refer to DTC P1153. <Ref. to EN(H4DOTC)-299, DTC P1153 —  $O_2$  SENSOR CIRCUIT RANGE/PERFORMANCE (HIGH) (BANK1 SENSOR1) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

ENGINE (DIÀGNOSTICS)

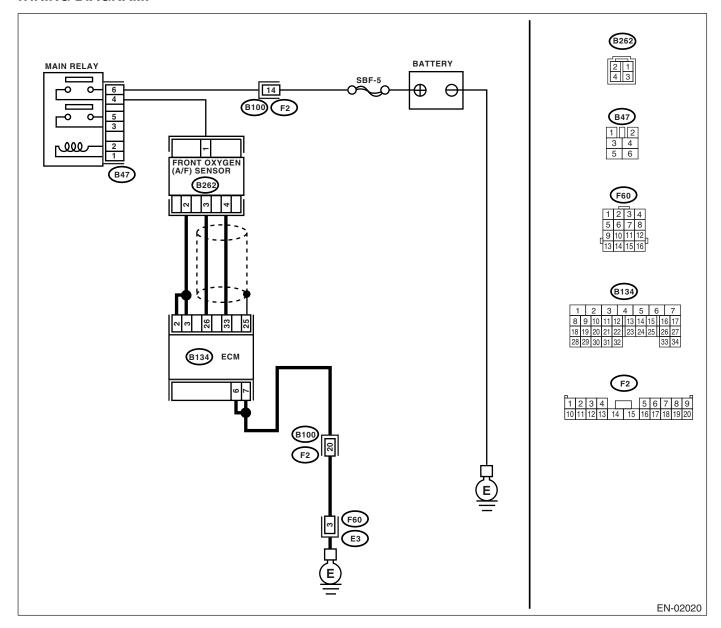
# CW: DTC P1153 — $O_2$ SENSOR CIRCUIT RANGE/PERFORMANCE (HIGH) (BANK1 SENSOR1) —

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

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-222, DTC P1153 O<sub>2</sub> SENSOR CIRCUIT RANGE/PERFORMANCE (HIGH) (BANK1 SENSOR1) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the rele-	Go to step 2.
			vant DTC using "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""></ref.>	
2	CHECK FRONT (A/F) OXYGEN SENSOR DA-	Is the measured value within	Go to step 3.	Go to step 4.
	<ol> <li>TA.</li> <li>Start engine.</li> <li>While observing the Subaru Select Monitor or OBD-II general scan tool screen, warm-up the engine until coolant temperature is above 75°C (167°F).</li> <li>If the engine is already warmed-up, operate at idle speed for at least 1 minute.</li> <li>Read data of front oxygen (A/F) sensor signal using Subaru Select Monitor or OBD-II general scan tool.</li> <li>NOTE:</li> <li>Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to=""></ref.></li> <li>OBD-II general scan tool</li> <li>For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.</li> </ol>	0.86 — 1.15 at idle?		
3	CHECK REAR OXYGEN SENSOR SIGNAL.  1) Race engine at speeds from idling to 5,000 rpm for a total of 5 cycles.  NOTE:  To increase engine speed to 5,000 rpm, slowly depress accelerator pedal, taking approximately 5 seconds, and quickly release accelerator pedal to decrease engine speed.  2) Operate the LED operation mode for engine.  NOTE:  • Subaru Select Monitor  For detailed operation procedure, refer to the "LED OPERATION MODE FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to=""></ref.>	Does the LED of {Rear O <sub>2</sub> Rich Signal} blink?	Check front oxygen (A/F) sensor circuit.	Check rear oxygen sensor circuit. <ref. to<br="">FU(H4DOTC)-39, Rear Oxygen Sen- sor.&gt;</ref.>
4	CHECK EXHAUST SYSTEM. Check exhaust system parts.  NOTE: Check the following items.  Loose installation of portions  Damage (crack, hole etc.) of parts  Looseness of front oxygen (A/F) sensor  Looseness and ill fitting of parts between front oxygen (A/F) sensor and rear oxygen sensor	Is there a fault in exhaust system?	Repair or replace faulty parts.	Replace front oxygen (A/F) sensor. <ref. (a="" f)="" front="" fu(h4dotc)-37,="" oxygen="" sensor.="" to=""></ref.>

ENGINE (DIÀGNOSTICS)

### CX:DTC P1160 — RETURN SPRING FAILURE —

NOTE:

For the diagnostic procedure, refer to DTC P2101. <Ref. to EN(H4DOTC)-348, DTC P2101 — THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

**ENGINE (DIAGNOSTICS)** 

## CY:DTC P1301 — MISFIRE DETECTED (HIGH TEMPERATURE EXHAUST GAS)

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

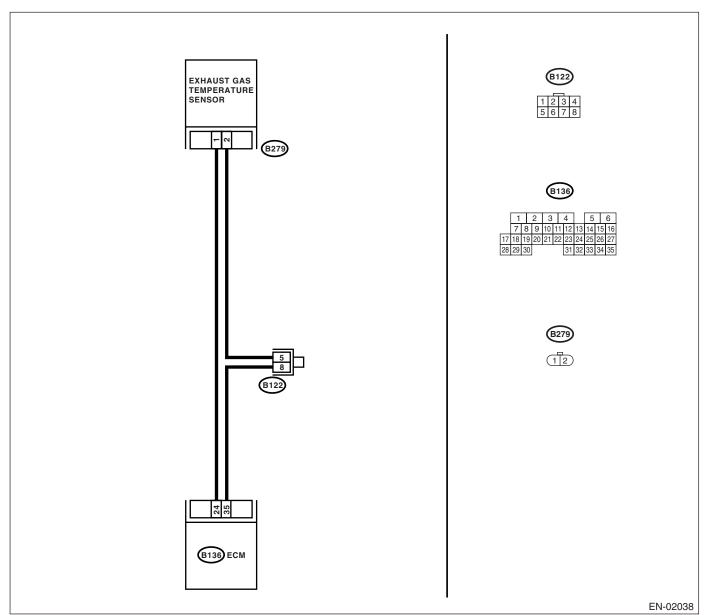
- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-227, DTC P1301 MISFIRE DETECTED (HIGH TEMPERATURE EXHAUST GAS) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **TROUBLE SYMPTOM:**

- · Erroneous idling
- Engine stalls.
- Poor driving performance

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



# DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC) ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK ANY OTHER DTC. Conduct the troubleshooting for all DTC P0301, P0302, P0303 and P0304. <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""></ref.>	Does failure for repair or replacement exist?	Repair or replace the failure, then replace precata- lytic converter.	Contact your SOA Service Center. NOTE: Inspection by DTM is required, be- cause probable cause is deteriora- tion of multiple parts.

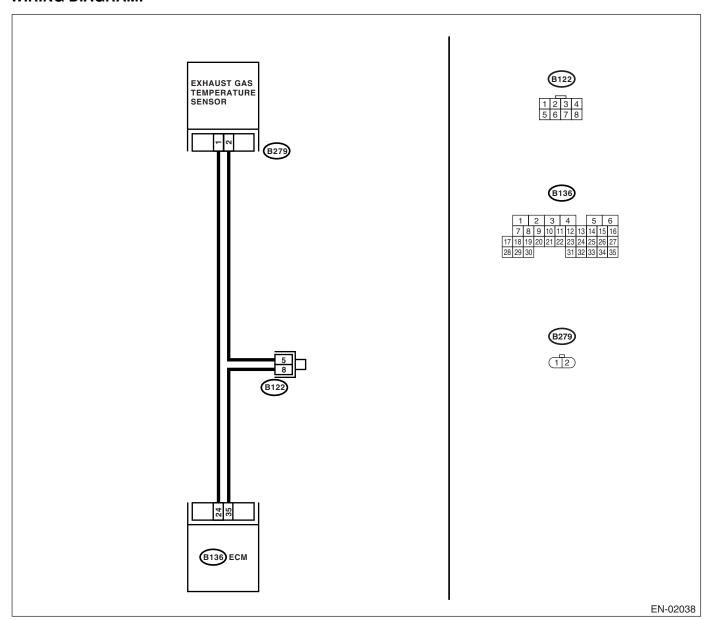
**ENGINE (DIAGNOSTICS)** 

## CZ:DTC P1312 — EXHAUST GAS TEMPERATURE SENSOR MALFUNCTION — DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-229, DTC P1312 EXHAUST GAS TEMPERATURE SENSOR MALFUNCTION —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



# DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC) ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Trouble Code (DTC)". <ref. th="" to<=""><th></th></ref.>	

**ENGINE (DIAGNOSTICS)** 

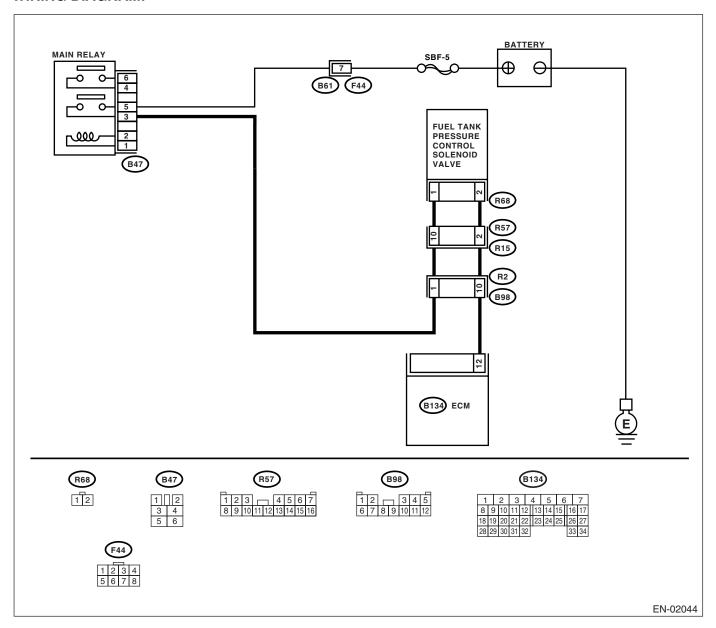
### DA:DTC P1400 — FUEL TANK PRESSURE CONTROL SOLENOID VALVE CIR-CUIT LOW —

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

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-230, DTC P1400 FUEL TANK PRESSURE CONTROL SOLENOID VALVE CIRCUIT LOW —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



# DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC) ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK OUTPUT SIGNAL FROM ECM.  1) Turn ignition switch to ON.  2) Measure the voltage between ECM and chassis ground.  Connector & terminal  (B134) No. 12 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Go to step 2.	Go to step 3.
2	CHECK FOR POOR CONTACT. Check for poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Contact with SOA Service Center. NOTE: Inspection by DTM is required, be- cause probable cause is deteriora- tion of multiple parts.
3	CHECK HARNESS BETWEEN FUEL TANK PRESSURE CONTROL SOLENOID VALVE AND ECM CONNECTOR.  1) Turn ignition switch to OFF.  2) Disconnect the connectors from fuel tank pressure control solenoid valve and ECM.  3) Measure the resistance of harness between fuel tank pressure control solenoid valve connector and chassis ground.  Connector & terminal  (R68) No. 2 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega ?$	Go to step 4.	Repair short circuit to ground in har- ness between ECM and fuel tank pressure control solenoid valve connector.
4	CHECK HARNESS BETWEEN FUEL TANK PRESSURE CONTROL SOLENOID VALVE AND ECM CONNECTOR.  Measure the resistance of harness between ECM and fuel tank pressure control solenoid valve connector.  Connector & terminal  (B134) No. 12 — (R68) No. 2:	Is the resistance less than 1 $\Omega$ ?	Go to step 5.	Repair harness and connector.  NOTE: In this case, repair the following:  Open circuit in harness between ECM and fuel tank pressure control solenoid valve connector  Poor contact in coupling connector
5	CHECK FUEL TANK PRESSURE CONTROL SOLENOID VALVE.  Measure the resistance between fuel tank pressure control solenoid valve terminals.  Terminals  No. 1 — No. 2:	Is the resistance 10 — 100 $\Omega$ ?	Go to step 6.	Replace the fuel tank pressure control solenoid valve. <ref. control="" ec(h4dotc)-7,="" purge="" solenoid="" to="" valve.=""></ref.>

		_	1	
	Step	Check	Yes	No
6	CHECK POWER SUPPLY TO FUEL TANK PRESSURE CONTROL SOLENOID VALVE.	Is the voltage more than 10 V?	Go to step 7.	Repair harness and connector.
	1) Turn ignition switch to ON. 2) Measure the voltage between fuel tank pressure control solenoid valve and chassis ground.  Connector & terminal  (R68) No. 1 (+) — Chassis ground (-):			NOTE: In this case, repair the following:  Open circuit in harness between main relay and fuel tank pressure con- trol solenoid valve connector Poor contact in coupling connector Poor contact in main relay connec- tor
7	CHECK FOR POOR CONTACT. Check for poor contact in fuel tank pressure control solenoid valve connector.	Is there poor contact in fuel tank pressure control solenoid valve connector?	Repair poor contact in fuel tank pressure control solenoid valve connector.	Contact with SOA Service Center. NOTE: Inspection by DTM is required, be- cause probable cause is deteriora- tion of multiple parts.

ENGINE (DIÀGNOSTICS)

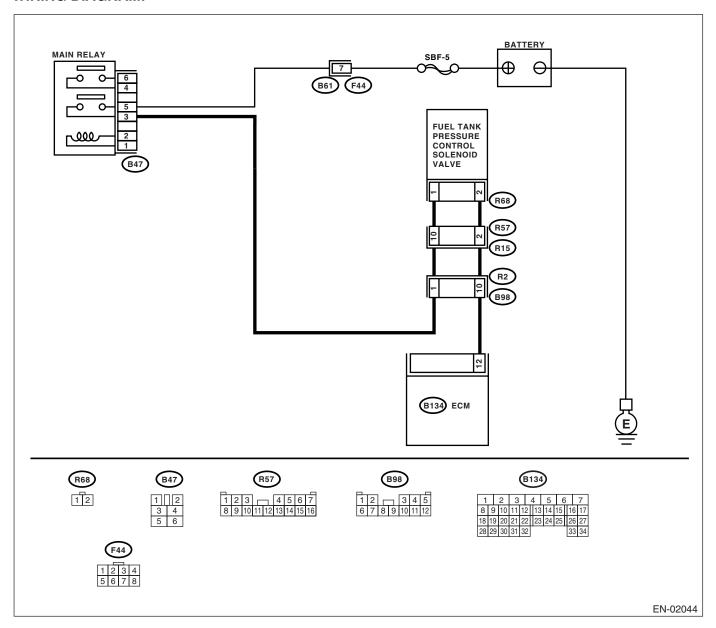
## DB:DTC P1420 — FUEL TANK PRESSURE CONTROL SOL. VALVE CIRCUIT HIGH —

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

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-232, DTC P1420 FUEL TANK PRESSURE CONTROL SOL. VALVE CIRCUIT HIGH —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK INPUT SIGNAL FOR ECM.  1) Turn ignition switch to OFF.  2) Connect the test mode connector at the lower portion of instrument panel (on the driver's side).  3) Turn ignition switch to ON.  4) While operating the fuel tank pressure control solenoid valve, measure voltage between ECM and chassis ground.  NOTE: Fuel tank pressure control solenoid valve operation can be executed using Subaru Select Monitor. For the procedure, refer to "Compulsory Valve Operation Check Mode". <ref. check="" compulsory="" en(h4dotc)-45,="" mode.="" operation="" to="" valve="">  Connector &amp; terminal</ref.>		Go to step 2.	The malfunction indicator light may light up, however, the circuit is returned to the normal status at the moment. In this case, repair poor contact in ECM connector.
2	(B134) No. 12 (+) — Chassis ground (-):  CHECK INPUT SIGNAL FOR ECM.  1) Turn ignition switch to ON.  2) Measure the voltage between ECM and chassis ground.  Connector & terminal  (B134) No. 12 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Go to step 4.	Go to step 3.
3	CHECK FOR POOR CONTACT. Check for poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Replace the ECM. <ref. to<br="">FU(H4DOTC)-42, Engine Control Module (ECM).&gt;</ref.>
4	CHECK HARNESS BETWEEN FUEL TANK PRESSURE CONTROL SOLENOID VALVE AND ECM CONNECTOR.  1) Turn ignition switch to OFF. 2) Disconnect the connector from fuel tank pressure control solenoid valve. 3) Turn ignition switch to ON. 4) Measure the voltage between ECM and chassis ground. Connector & terminal (B134) No. 12 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Repair short circuit to battery in harness between ECM and fuel tank pressure control solenoid valve connector. After repair, replace the ECM. <ref. (ecm).="" control="" engine="" fu(h4dotc)-42,="" module="" to=""></ref.>	Go to step 5.
5	CHECK FUEL TANK PRESSURE CONTROL SOLENOID VALVE.  1) Turn ignition switch to OFF.  2) Measure the resistance between fuel tank pressure control solenoid valve terminals.  Terminals  No. 1 — No. 2:	Is the resistance less than 1 $\Omega$ ?	Replace the fuel tank pressure control solenoid valve <ref. control="" ec(h4dotc)-13,="" pressure="" solenoid="" to="" valve.=""> and the ECM <ref. (ecm).="" control="" engine="" fu(h4dotc)-42,="" module="" to="">.</ref.></ref.>	Go to step 6.
6	CHECK FOR POOR CONTACT. Check for poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Replace the ECM. <ref. to<br="">FU(H4DOTC)-42, Engine Control Module (ECM).&gt;</ref.>

ENGINE (DIÀGNOSTICS)

## DC:DTC P1443 — VENT CONTROL SOLENOID VALVE FUNCTION PROBLEM — DTC DETECTING CONDITION:

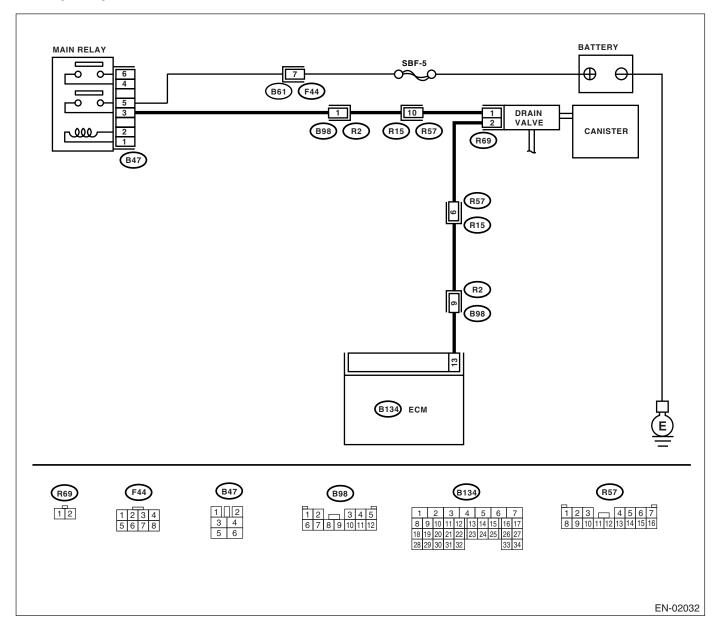
- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-234, DTC P1443 VENT CONTROL SOLENOID VALVE FUNCTION PROBLEM —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### TROUBLE SYMPTOM:

Improper fuel supply

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK FOR OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""></ref.>	Go to step 2.
2	CHECK VENT LINE HOSES. Check the following items. Clogging of vent hoses between canister and drain valve Clogging of vent hose between drain valve and air filter Clogging of drain filter	Is there a fault in vent line?	Repair or replace faulty parts.	Go to step 3.
3	CHECK DRAIN VALVE OPERATION.  1) Turn ignition switch to OFF.  2) Connect the test mode connector at the lower portion of instrument panel (on the driver's side).  3) Turn ignition switch to ON.  4) Operate the drain valve.  NOTE:  Drain valve operation can also be executed using Subaru Select Monitor. For the procedure, refer to "Compulsory Valve Operation Check Mode". <ref. check="" compulsory="" en(h4dotc)-45,="" mode.="" operation="" to="" valve=""></ref.>		Contact with SOA Service Center. NOTE: Inspection by DTM is required, be- cause probable cause is deteriora- tion of multiple parts.	

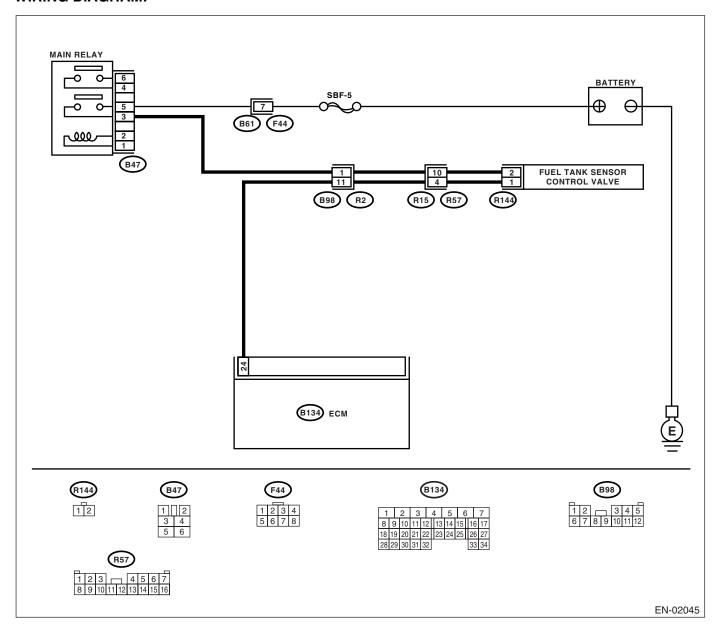
ENGINE (DIÀGNOSTICS)

## DD:DTC P1446 — FUEL TANK SENSOR CONTROL VALVE CIRCUIT LOW — DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION<Ref. to GD(H4DOTC)-235, DTC P1446 FUEL TANK SENSOR CONTROL VALVE CIRCUIT LOW —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK OUTPUT SIGNAL FROM ECM.	Is the voltage more than 10 V?	Go to step 2.	Go to step 3.
	<ol> <li>Turn ignition switch to ON.</li> </ol>			
	Measure the voltage between ECM and			
	chassis ground.  Connector & terminal			
	(B134) No. 24 (+) — Chassis ground (–):			
2	CHECK FOR POOR CONTACT.	Is there poor contact in ECM	Repair poor con-	The malfunction
	Check for poor contact in ECM connector.	connector?	tact in ECM con- nector.	indicator light may light up, however, the circuit is returned to the normal status at the moment. (However, the possibility of poor contact still remains.) NOTE: In this case, repair the following:  Poor contact in fuel tank sensor control valve connector  Poor contact in
				ECM connector • Poor contact in coupling connector
3	SENSOR CONTROL VALVE AND ECM CONNECTOR.  1) Turn ignition switch to OFF. 2) Disconnect the connectors from fuel tank sensor control valve and ECM. 3) Measure the resistance of harness between fuel tank sensor control valve connector and chassis ground.  Connector & terminal  (R144) No. 2 — Chassis ground:		Go to step 4.	Repair short circuit to ground in har- ness between ECM and fuel tank sensor control valve connector.
4	CHECK HARNESS BETWEEN FUEL TANK SENSOR CONTROL VALVE AND ECM CONNECTOR.  Measure the resistance of harness between ECM and fuel tank sensor control valve connector.  Connector & terminal  (B134) No. 24 — (R144) No. 2:	Is the resistance less than 1 $\Omega$ ?	Go to step 5.	Repair harness and connector.  NOTE: In this case, repair the following:  Open circuit in harness between ECM and fuel tank sensor control valve connector  Poor contact in coupling connector
5	CHECK FUEL TANK SENSOR CONTROL VALVE.  Measure the resistance between fuel tank sensor control valve terminals.  Terminals  No. 1 — No. 2:	Is the resistance 10 — 100 $\Omega$ ?	Go to step 6.	Replace the fuel tank sensor con- trol valve. <ref. to<br="">EC(H4DOTC)-19, Drain Valve.&gt;</ref.>

# DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC) ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
6	CHECK POWER SUPPLY TO FUEL TANK SENSOR CONTROL VALVE.	Is the voltage more than 10 V?	Go to step 7.	Repair harness and connector.
	1) Turn ignition switch to ON. 2) Measure the voltage between fuel tank sensor control valve and chassis ground.  Connector & terminal  (R144) No. 1 (+) — Chassis ground (-):			NOTE: In this case, repair the following:  Open circuit in harness between main relay and fuel tank sensor control valve  Poor contact in coupling connector  Poor contact in main relay connec-
				tor
7	CHECK FOR POOR CONTACT.  Check for poor contact in fuel tank sensor control valve connector.	Is there poor contact in fuel tank sensor control valve connector?	Repair poor contact in fuel tank sensor control valve connector.	Contact with SOA Service Center. NOTE: Inspection by DTM is required, be- cause probable cause is deteriora- tion of multiple parts.

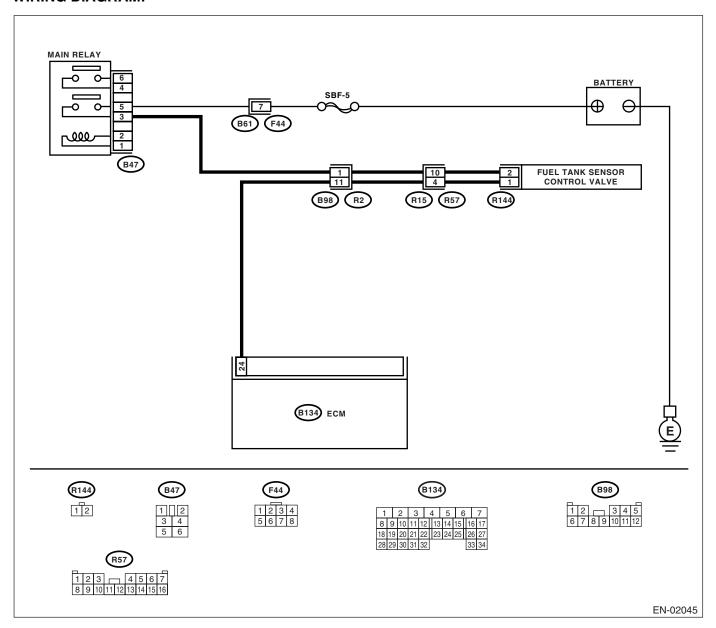
**ENGINE (DIAGNOSTICS)** 

## DE:DTC P1447 — FUEL TANK SENSOR CONTROL VALVE CIRCUIT HIGH — DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-237, DTC P1447 FUEL TANK SENSOR CONTROL VALVE CIRCUIT HIGH —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



# DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC) ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK OUTPUT SIGNAL FROM ECM.  1) Turn ignition switch to ON.  2) Measure the voltage between ECM and chassis ground.  Connector & terminal  (B134) No. 24 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Go to step 3.	Go to step 2.
2	CHECK FOR POOR CONTACT. Check for poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Replace the ECM. <ref. to<br="">FU(H4DOTC)-42, Engine Control Module (ECM).&gt;</ref.>
3	CHECK HARNESS BETWEEN FUEL TANK SENSOR CONTROL VALVE AND ECM CONNECTOR.  1) Turn ignition switch to OFF. 2) Disconnect the connector from fuel tank sensor control valve. 3) Turn ignition switch to ON. 4) Measure the voltage between ECM and chassis ground.  Connector & terminal  (B134) No. 24 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Repair short circuit to battery in harness between ECM and fuel tank sensor control valve connector. After repair, replace the ECM. <ref. (ecm).="" control="" engine="" fu(h4dotc)-42,="" module="" to=""></ref.>	Go to step 4.
4	CHECK FUEL TANK SENSOR CONTROL VALVE.  1) Turn ignition switch to OFF.  2) Measure the resistance between fuel tank sensor control valve terminals.  Terminals  No. 1 — No. 2:	Is the resistance less than 1 $\Omega$ ?	Replace the fuel tank sensor control valve <ref. control="" ec(h4dotc)-12,="" fuel="" sensor="" tank="" to="" valve.="">and the ECM <ref. (ecm).="" control="" engine="" fu(h4dotc)-42,="" module="" to="">.</ref.></ref.>	Go to step 5.
5	CHECK FOR POOR CONTACT. Check for poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Replace the ECM. <ref. to<br="">FU(H4DOTC)-42, Engine Control Module (ECM).&gt;</ref.>

**ENGINE (DIAGNOSTICS)** 

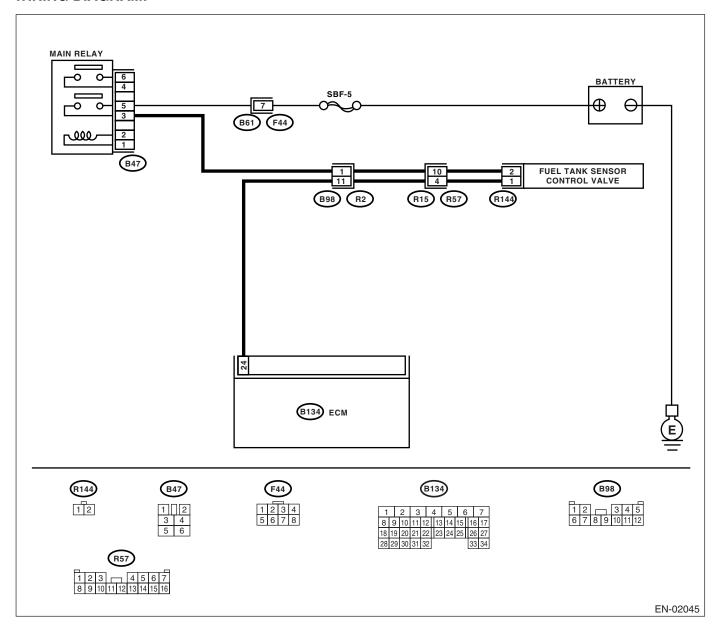
# DF:DTC P1448 — FUEL TANK SENSOR CONTROL VALVE RANGE/PERFOR-MANCE —

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

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-239, DTC P1448 FUEL TANK SENSOR CONTROL VALVE RANGE PERFORMANCE —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



# DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC) ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK FOR OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using the "List of Diagnostic Trouble Codes (DTC)". <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""></ref.>	Go to step 2.
2	CHECK FUEL FILLER CAP.  1) Turn 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.
3	CHECK EVAPORATIVE EMISSION LINE.  NOTE: Check the following items.  • Disconnection, leakage and clogging of hoses between fuel tank pressure sensor and fuel tank.  • Disconnection, leakage and clogging of hoses and pipes between fuel filler pipe and fuel tank.	Is there any trouble in evapora- tive emission line?	Repair the hoses and pipes.	Replace the fuel tank pressure sensor.

**ENGINE (DIAGNOSTICS)** 

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

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

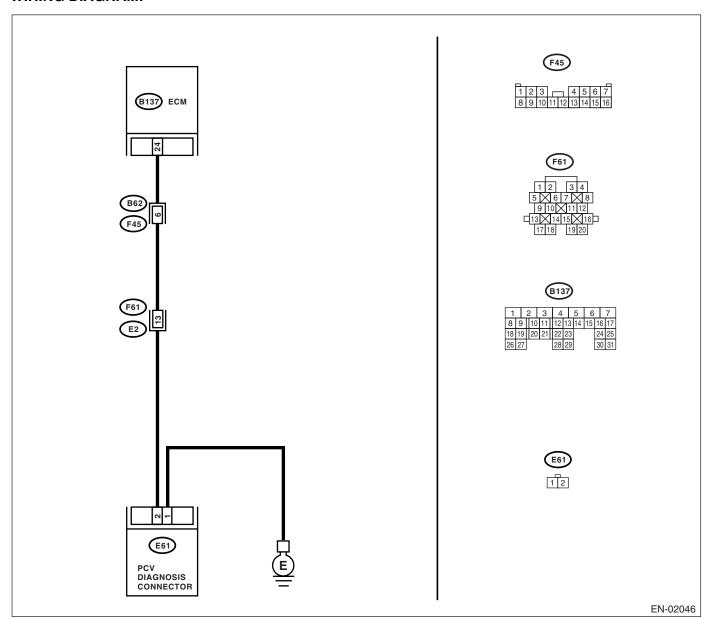
- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-243, DTC P1491 POSITIVE CRANKCASE VENTI-LATION (BLOW-BY) FUNCTION PROBLEM —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### TROUBLE SYMPTOM:

Erroneous idling

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



# DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC) ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK BLOW-BY HOSE. Check the blow-by hose.	Is there disconnection or crack in blow-by hose?	Replace or repair blow-by hose.	Go to step 2.
2	INSPECT HARNESS BETWEEN PCV DIAGNOSIS CONNECTOR AND ECM CONNECTOR.  1) Turn the ignition switch to OFF. 2) Disconnect the connector from PCV diagnosis connector and ECM. 3) Measure the resistance of harness between PCV diagnosis connector and ECM connector.  Connector & terminal (B137) No. 24 — (E61) No. 2:	Is the resistance less than 1 $\Omega$ ?	Go to step 3.	Repair open circuit in harness between PCV diagnosis connec- tor and ECM.
3	INSPECT HARNESS BETWEEN PCV DIAGNOSIS CONNECTOR AND ECM CONNECTOR.  Measure the resistance of harness between PCV diagnosis connector and chassis ground.  Connector & terminal  (B137) No. 24 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega ?$	Go to step 4.	Repair short circuit to chassis ground in harness between PCV diagnosis connec- tor and ECM.
4	INSPECT PCV DIAGNOSIS CONNECTOR GROUND CIRCUIT.  Measure the resistance between PCV diagnosis connector and engine ground.  Connector & terminal  (B61) No. 1 — Engine ground:	Is the resistance less than 5 $\Omega$ ?	Go to step 5.	Repair PCV diagnosis connector ground circuit.
5	INSPECT PCV DIAGNOSIS CONNECTOR.  Measure the resistance between PCV diagnosis connector and terminal.  Terminals  No. 1 — No. 2:	Is the resistance less than 1 $\Omega$ ?	Repair poor contact in ECM and PCV diagnosis connector.	Replace PCV diagnosis connector.

**ENGINE (DIAGNOSTICS)** 

## DH:DTC P1518 — STARTER SWITCH CIRCUIT LOW INPUT —

### DTC DETECTING CONDITION:

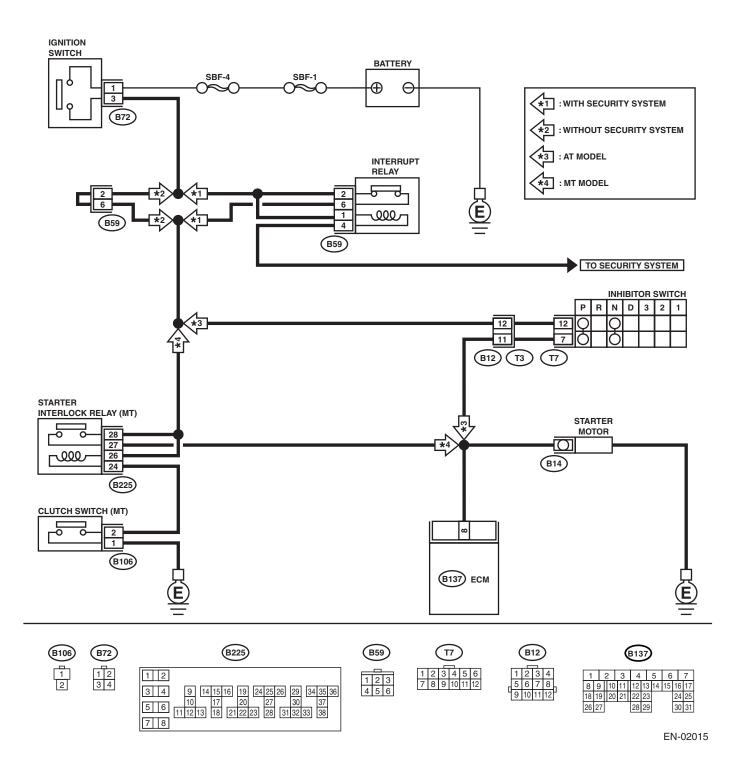
- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-245, DTC P1518 STARTER SWITCH CIRCUIT LOW INPUT —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### TROUBLE SYMPTOM:

Failure of engine to start

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



Step	Check	Yes	No
1 CHECK OPERATION OF STARTER MOTOR.	when ignition switch is turned to START?	NOTE: In this case, repair	CUIT, Diagnostics for Engine Start-

**ENGINE (DIÀGNOSTICS)** 

## DI: DTC P1544 — EXHAUST GAS TEMPERATURE TOO HIGH — DTC DETECTING CONDITION:

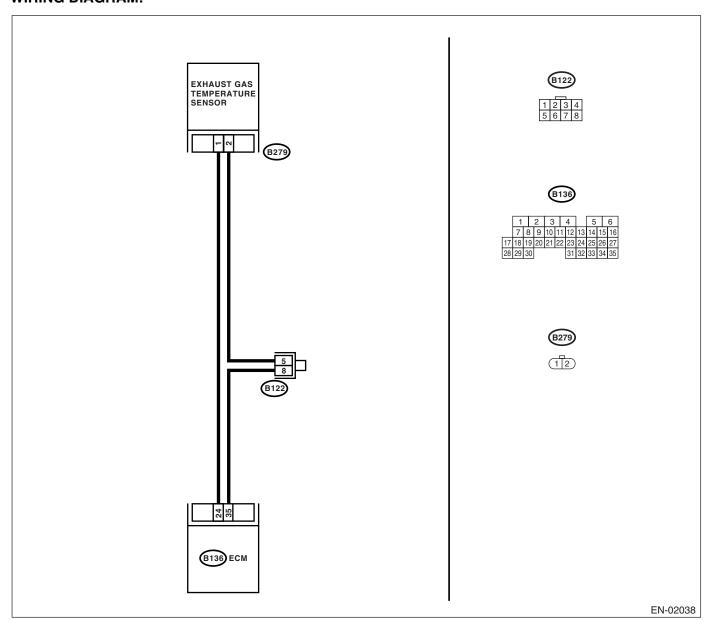
- · Immediately at fault recognition
- GENERAL DESCRIPTION<Ref. to GD(H4DOTC)-246, DTC P1544 EXHAUST GAS TEMPERATURE TOO HIGH —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""> NOTE: In this case, it is not necessary to inspect DTC P1544.</ref.>	Go to step 2.
2	CHECK EXHAUST SYSTEM. Check the exhaust system parts.  NOTE: Check the following items.  Loose installation of exhaust manifold  Cracks or hole of exhaust manifold  Loose installation of front oxygen (A/F) sensor	Is there a fault in exhaust system?	Repair or replace the failure, then replace precata- lytic converter.	Contact your SOA Service Center. NOTE: Inspection by DTM is required, be- cause probable cause is deteriora- tion of multiple parts.

**ENGINE (DIÀGNOSTICS)** 

# DJ:DTC P1560 — BACK-UP VOLTAGE CIRCUIT MALFUNCTION — DTC DETECTING CONDITION:

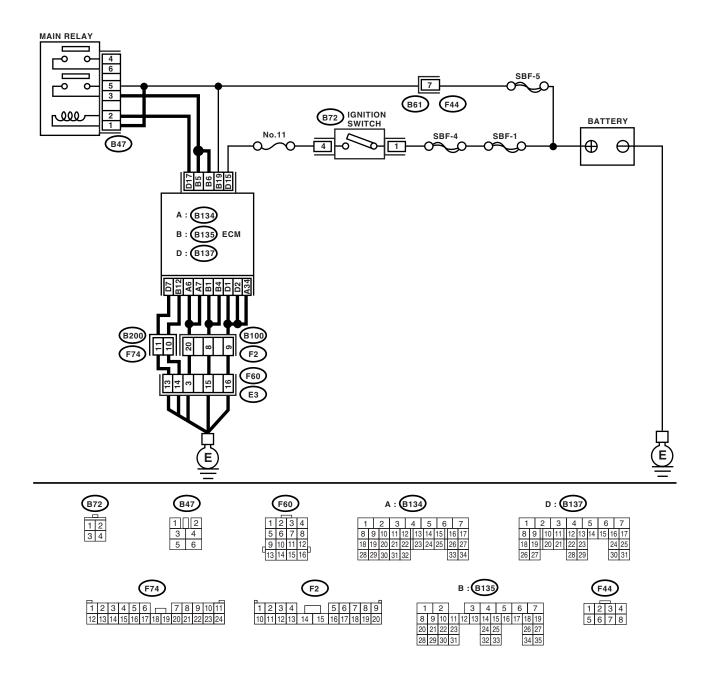
Immediately at fault recognition

• GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-247, DTC P1560 — BACK-UP VOLTAGE CIRCUIT MALFUNCTION —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.

#### **WIRING DIAGRAM:**



EN-02016

	Step	Check	Yes	No
1	CHECK INPUT SIGNAL FOR ECM.  1) Turn the ignition switch to OFF.  2) Measure the voltage between ECM and chassis ground.  Connector & terminal  (B135) No. 19 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Repair the poor contact in ECM connector.	Go to step 2.
2	CHECK HARNESS BETWEEN ECM AND MAIN FUSE BOX CONNECTOR.  1) Disconnect the connector from ECM. 2) Measure the resistance of harness between ECM and chassis ground.  Connector & terminal  (B135) No. 19 — Chassis ground:	Is the resistance less than 10 $\Omega$ ?	Repair the ground short circuit in harness between ECM connector and battery terminal.	Go to step 3.
3	CHECK FUSE SBF-5.	Is the fuse blown?	Replace the fuse.	Repair the harness and connector.  NOTE: In this case, repair the following:  Open circuit in harness between ECM and battery Poor contact in ECM connector Poor contact in battery terminal

**ENGINE (DIAGNOSTICS)** 

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

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

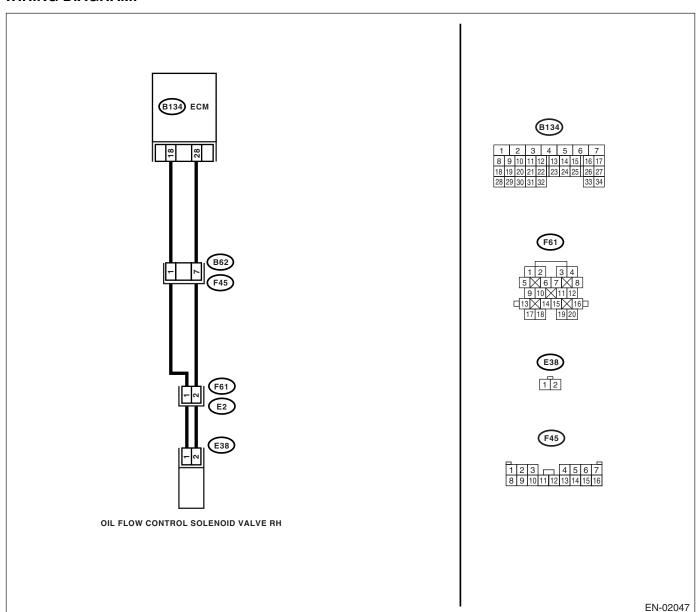
- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-248, DTC P2088 OCV SOLENOID VALVE SIGNAL A CIRCUIT OPEN (BANK 1) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### TROUBLE SYMPTOM:

Erroneous idling

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from ECM and oil flow control solenoid valve.  3) Measure the resistance between ECM and oil flow control solenoid valve.  Connector & terminal  (B134) No. 18 — (E38) No. 1:  (B134) No. 28 — (E38) No. 2:	Is the resistance less than 1 $\Omega$ ?	Go to step 2.	Repair the open circuit in harness between ECM and oil flow control solenoid valve connector.  NOTE: In this case, repair the following:  Open circuit in harness between ECM and oil flow control solenoid valve connector  Poor contact in coupling connector.
2	CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.  Measure the resistance between ECM and oil flow control solenoid valve.  Connector & terminal  (E38) No. 1 — Engine ground:  (E38) No. 2 — Engine ground:	Is the resistance more than 1 $\mbox{M}\Omega\mbox{?}$	Go to step 3.	Repair the short circuit between ECM and oil flow control solenoid valve connector.
3	CHECK OIL FLOW CONTROL SOLENOID VALVE.  1) Remove the oil flow control solenoid valve. 2) Measure the resistance between oil flow control solenoid valve terminal.  Terminals  No. 1 — No. 2:	Is the resistance 6 — 12 $\Omega$ ?	Repair the poor contact in ECM and oil flow con- trol solenoid valve.	Replace the oil flow control sole- noid valve. <ref. to ME(H4DOTC)- 61, Camshaft.&gt;</ref. 

**ENGINE (DIAGNOSTICS)** 

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

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

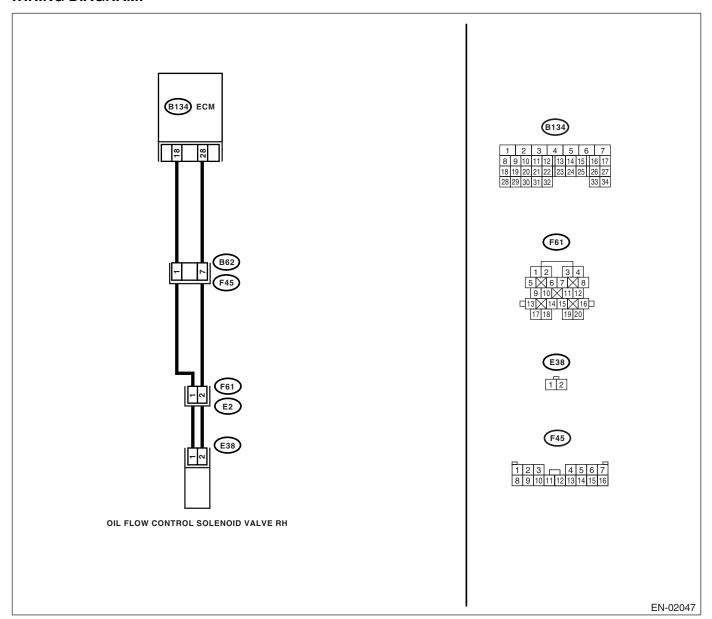
- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-250, DTC P2089 OCV SOLENOID VALVE SIGNAL A CIRCUIT SHORT (BANK 1) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### TROUBLE SYMPTOM:

Erroneous idling

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from ECM and oil flow control solenoid valve.  3) Measure the resistance between ECM and oil flow control solenoid valve.  Connector & terminal  (B134) No. 18 — (E38) No. 1:  (B134) No. 28 — (E38) No. 2:	Is the resistance less than 1 $\Omega$ ?	Go to step 2.	Repair the open circuit in harness between ECM and oil flow control solenoid valve connector.  NOTE: In this case, repair the following:  Open circuit in harness between ECM and oil flow control solenoid valve connector  Poor contact in coupling connector.
2	CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from ECM and oil flow control solenoid valve.  3) Measure the resistance between ECM and oil flow control solenoid valve.  Connector & terminal  (E38) No. 1 — Engine ground:  (E38) No. 2 — Engine ground:	Is the resistance more than 1 $\mbox{M}\Omega\mbox{?}$	Go to step 3.	Repair the short circuit between ECM and oil flow control solenoid valve connector.
3	CHECK OIL FLOW CONTROL SOLENOID VALVE.  1) Remove the oil flow control solenoid valve. 2) Measure the resistance between oil flow control solenoid valve terminal.  Terminals  No. 1 — No. 2:	Is the resistance 6 — 12 $\Omega$ ?	Repair the poor contact in ECM and oil flow con- trol solenoid valve.	Replace the oil flow control sole- noid valve. <ref. to ME(H4DOTC)- 61, Camshaft.&gt;</ref. 

**ENGINE (DIAGNOSTICS)** 

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

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

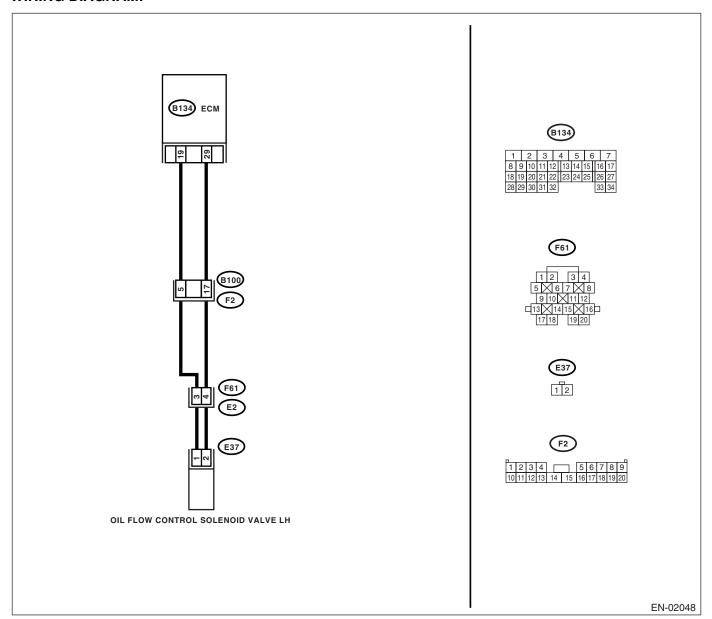
- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-252, DTC P2092 OCV SOLENOID VALVE SIGNAL A CIRCUIT OPEN (BANK 2) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **TROUBLE SYMPTOM:**

Erroneous idling

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from ECM and oil flow control solenoid valve.  3) Measure the resistance between ECM and oil flow control solenoid valve.  Connector & terminal  (B134) No. 19 — (E37) No. 1:  (B134) No. 29 — (E37) No. 2:	Is the resistance less than 1 $\Omega$ ?	Go to step 2.	Repair the open circuit in harness between ECM and oil flow control solenoid valve connector.  NOTE: In this case, repair the following:  Open circuit in harness between ECM and oil flow control solenoid valve connector  Poor contact in coupling connector.
2	CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.  Measure the resistance between ECM and oil flow control solenoid valve.  Connector & terminal  (E37) No. 1 — Engine ground:  (E37) No. 2 — Engine ground:	Is the resistance more than 1 $\mbox{M}\Omega\mbox{?}$	Go to step 3.	Repair the short circuit between ECM and oil flow control solenoid valve connector.
3	CHECK OIL FLOW CONTROL SOLENOID VALVE.  1) Remove the oil flow control solenoid valve. 2) Measure the resistance between oil flow control solenoid valve terminal.  Terminals  No. 1 — No. 2:	Is the resistance 6 — 12 $\Omega$ ?	Repair the poor contact in ECM and oil flow con- trol solenoid valve.	Replace the oil flow control sole- noid valve. <ref. to ME(H4DOTC)- 61, Camshaft.&gt;</ref. 

**ENGINE (DIAGNOSTICS)** 

### DN:DTC P2093 — OCV SOLENOID VALVE SIGNAL A CIRCUIT SHORT (BANK 2)

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

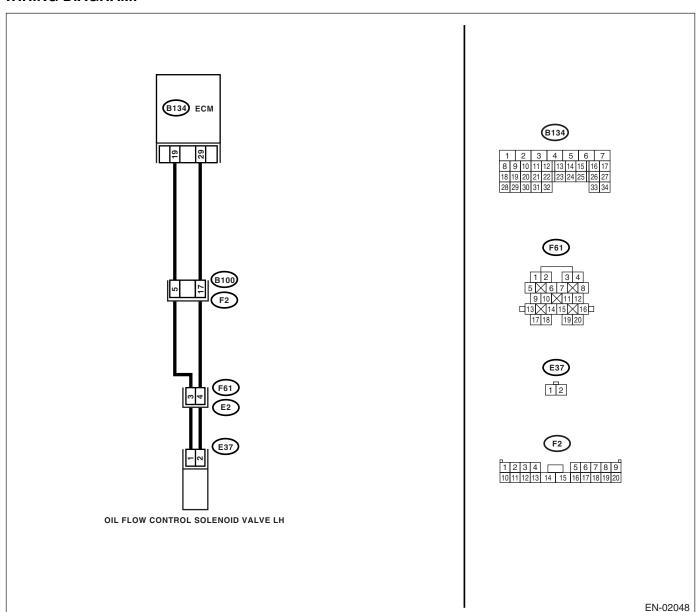
- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-254, DTC P2093 OCV SOLENOID VALVE SIGNAL A CIRCUIT SHORT (BANK 2) —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **TROUBLE SYMPTOM:**

Erroneous idling

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from ECM and oil flow control solenoid valve.  3) Measure the resistance between ECM and oil flow control solenoid valve.  Connector & terminal  (B134) No. 19 — (E37) No. 1:  (B134) No. 29 — (E37) No. 2:	Is the resistance less than 1 $\Omega$ ?	Go to step 2.	Repair the open circuit in harness between ECM and oil flow control solenoid valve connector.  NOTE: In this case, repair the following:  Open circuit in harness between ECM and oil flow control solenoid valve connector  Poor contact in coupling connector.
2	CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from ECM and oil flow control solenoid valve.  3) Measure the resistance between ECM and oil flow control solenoid valve.  Connector & terminal  (E37) No. 1 — Engine ground:  (E37) No. 2 — Engine ground:	Is the resistance more than 1 $\mbox{M}\Omega\mbox{?}$	Go to step 3.	Repair the short circuit between ECM and oil flow control solenoid valve connector.
3	CHECK OIL FLOW CONTROL SOLENOID VALVE.  1) Remove the oil flow control solenoid valve. 2) Measure the resistance between oil flow control solenoid valve terminal.  Terminals  No. 1 — No. 2:	Is the resistance 6 — 12 $\Omega$ ?	Repair the poor contact in ECM and oil flow con- trol solenoid valve.	Replace the oil flow control sole- noid valve. <ref. to ME(H4DOTC)- 61, Camshaft.&gt;</ref. 

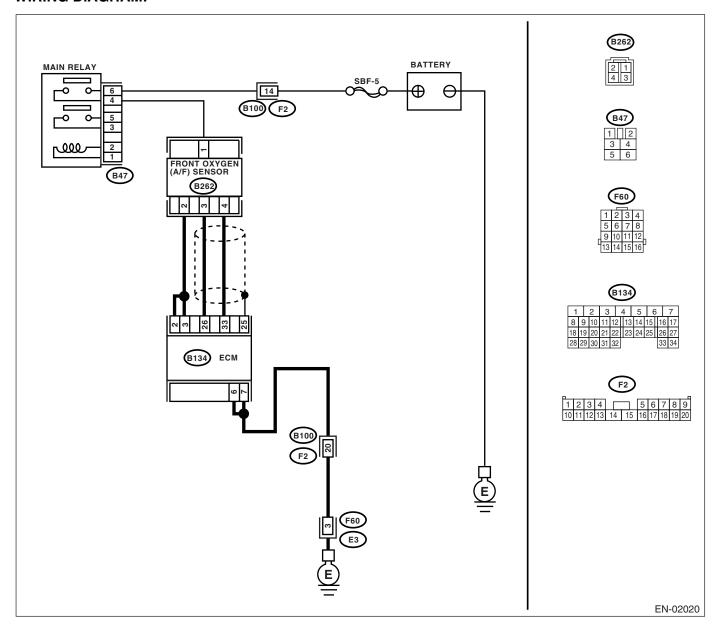
**ENGINE (DIAGNOSTICS)** 

## DO: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)-256, DTC P2096 POST CATALYST FUEL TRIM SYSTEM TOO LEAN BANK 1 —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""></ref.>	Go to step 2.
2	CHECK FRONT (A/F) OXYGEN SENSOR DATA.  1) Start engine. 2) While observing the Subaru Select Monitor or OBD-II general scan tool screen, warm-up the engine until coolant temperature is above 75°C (167°F).  If the engine is already warmed-up, operate at idle speed for at least 1 minute. 3) Read data of front oxygen (A/F) sensor signal using Subaru Select Monitor or OBD-II general scan tool.  NOTE:  • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to="">  • OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>	Is the measured value within 0.86 — 1.15 at idle?	Go to step 3.	Go to step 4.
3	CHECK REAR OXYGEN SENSOR SIGNAL.  1) Race engine at speeds from idling to 5,000 rpm for a total of 5 cycles.  NOTE:  To increase engine speed to 5,000 rpm, slowly depress accelerator pedal, taking approximately 5 seconds, and quickly release accelerator pedal to decrease engine speed.  2) Operate the LED operation mode for engine.  NOTE:  • Subaru Select Monitor  For detailed operation procedure, refer to the "LED OPERATION MODE FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to=""></ref.>	Signal} blink?	Check front oxygen (A/F) sensor circuit.	Check rear oxygen sensor circuit. <ref. to<br="">FU(H4DOTC)-39, Rear Oxygen Sen- sor.&gt;</ref.>
4	CHECK EXHAUST SYSTEM. Check exhaust system parts.  NOTE: Check the following items.  • Loose installation of portions  • Damage (crack, hole etc.) of parts  • Looseness of front oxygen (A/F) sensor  • Looseness and ill fitting of parts between front oxygen (A/F) sensor and rear oxygen sensor	Is there a fault in exhaust system?	Repair or replace faulty parts.	Go to step <b>5</b> .
5	CHECK AIR INTAKE SYSTEM.	Are there holes, loose bolts or disconnection of hose on air intake system?	Repair the air intake system.	Go to step 6.

	Step	Check	Yes	No
6	CHECK FUEL PRESSURE. Warning:	Is the measured value 284 — 314 kPa (2.9 — 3.2 kg/cm <sup>2</sup> , 41	Go to step 7.	Repair the follow- ing items.
	<ul> <li>Warning:</li> <li>Place "NO FIRE" signs near the working area.</li> <li>Be careful not to spill fuel on the floor.</li> <li>1) Release the fuel pressure. <ul> <li>(1) Disconnect the connector from fuel pump relay.</li> <li>(2) Start the engine and run it until it stalls.</li> <li>(3) After the engine stalls, crank it for 5 more seconds.</li> <li>(4) Turn the ignition switch to OFF.</li> </ul> </li> <li>2) Connect the connector to fuel pump relay.</li> <li>3) Disconnect the fuel delivery hose from fuel filter, and connect fuel pressure gauge.</li> <li>4) Install the fuel filler cap.</li> <li>5) Start the engine and idle while gear position is neutral.</li> <li>6) Measure the fuel pressure while disconnecting pressure regulator vacuum hose from intake manifold.</li> </ul> <li>Warning:  <ul> <li>Before removing the fuel pressure gauge, release fuel pressure.</li> </ul> </li>	314 kPa (2.9 — 3.2 kg/cm <sup>2</sup> , 41 — 46 psi)?		
	If the fuel pressure does not increase, squeeze fuel return hose 2 to 3 times, then measure fuel pressure again.			
7	CHECK FUEL PRESSURE.  After connecting the pressure regulator vacuum hose, measure fuel pressure.  Warning: Before removing the fuel pressure gauge, release fuel pressure.  NOTE:  If the fuel pressure does not increase, squeeze fuel return hose 2 to 3 times, then measure fuel pressure again.  If out of specification as measured at this step, check or replace the pressure regulator and pressure regulator vacuum hose.	Is the measured value 206 — 235 kPa (2.1 — 2.4 kg/cm², 30 — 34 psi)?	Go to step 8.	Repair the following items. Fuel pressure too high: Faulty pressure regulator Clogged fuel return line or bent hose Fuel pressure too low: Faulty pressure regulator Improper fuel pump discharge Clogged fuel supply line
8	CHECK ENGINE COOLANT TEMPERATURE SENSOR.  1) Start the engine and warm-up completely. 2) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor or OBD-II general scan tool.  NOTE: • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to=""> • OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>	Is the temperature more than 60°C (140°F)?	Go to step 9.	Replace the engine coolant temperature sensor. <ref. coolant="" engine="" fu(h4dotc)-26,="" sensor.="" temperature="" to=""></ref.>

	Step	Check	Yes	No
9	CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE.  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 accessory switches to OFF.  5) Read the data of mass air flow and intake air temperature sensor signal using Subaru Select Monitor or OBD-II general scan tool.  NOTE:  • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to="">  • OBD-II general scan tool For detailed operation procedure, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>	Is the measured value within the followings? Ignition ON: 73.3 — 106.6 kPa (550 — 800 mmHg, 21.65 — 31.50 inHg) Idling: 24.0 — 41.3 kPa (180 — 310 mmHg, 7.09 — 12.20 inHg)	Go to step 10.	Replace the mass air flow and intake air temperature sensor. <ref. air="" and="" flow="" fu(h4dotc)-30,="" intake="" mass="" sensor.="" temperature="" to=""></ref.>
10	CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.  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 accessory switches to 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 Subaru Select Monitor or OBD-II general scan tool.  NOTE:  • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to="">  • OBD-II general scan tool For detailed operation procedure, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>	Subtract ambient temperature from intake air temperature. Is the obtained value –10 — 50°C (14 — 122°F)?	Go to step 11.	Check the mass air flow and intake air temperature sensor. <ref. air="" and="" flow="" fu(h4dotc)-30,="" intake="" mass="" sensor.="" temperature="" to=""></ref.>
11	CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.  1) Turn the ignition switch to OFF.  2) Disconnect the connectors from ECM and front oxygen (A/F) sensor connector.  3) Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector.  Connector & terminal  (B134) No. 26 — Chassis ground:  (B134) No. 33 — Chassis ground:	Is the resistance more than 1 MΩ?	Go to step 12.	Repair ground short circuit in har- ness between ECM and front oxygen (A/F) sen- sor connector.

	Step	Check	Yes	No
12	CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.  1) Turn the ignition switch to OFF. 2) Disconnect the connectors from front oxygen (A/F) sensor. 3) Measure the voltage of harness between ECM connector and chassis ground.  Connector & terminal  (B134) No. 26 (+) — Chassis ground (-): (B134) No. 33 (+) — Chassis ground (-):	Is the voltage more than 8 V?	Go to step 13.	Repair battery short circuit in har- ness between ECM and front oxygen (A/F) sen- sor connector.
13	CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.  1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and front oxygen (A/F) sensor connector. 3) Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector.  Connector & terminal (B134) No. 26 — (B262) No. 3: (B134) No. 33 — (B262) No. 4:	Is the resistance less than 1 Ω?	Replace the front oxygen (A/F) sen- sor. <ref. to<br="">FU(H4DOTC)-37, Front Oxygen (A/ F) Sensor.&gt;</ref.>	Repair open circuit in harness between ECM and front oxygen (A/F) sensor connector.

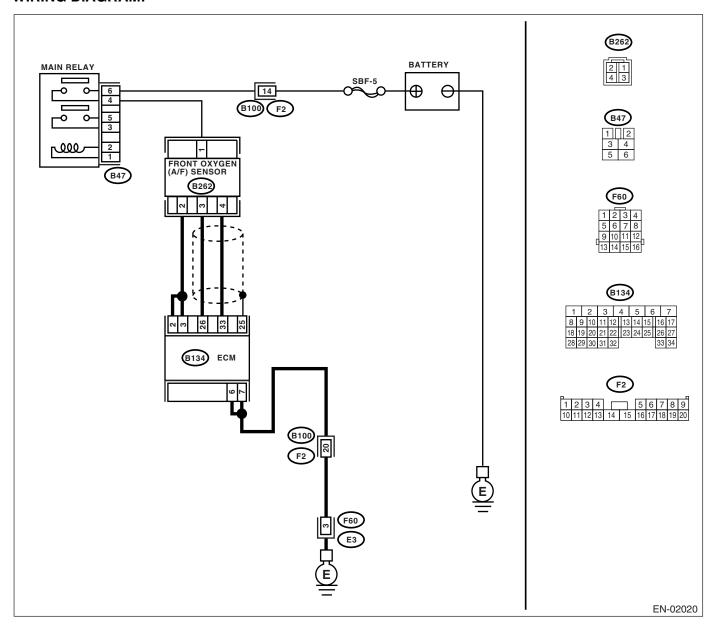
ENGINE (DIÀGNOSTICS)

# DP: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)-258, DTC P2097 POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1 —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" code="" diagnostic="" en(h4dotc)-68,="" list="" of="" to="" trouble=""></ref.>	Go to step 2.
1 1 2 2 3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	CHECK FRONT (A/F) OXYGEN SENSOR DATA.  1) Start engine. 2) While observing the Subaru Select Monitor or OBD-II general scan tool screen, warm-up the engine until coolant temperature is above 75°C (167°F).  If the engine is already warmed-up, operate at tidle speed for at least 1 minute.  3) Read data of front oxygen (A/F) sensor signal using Subaru Select Monitor or OBD-II general scan tool.  NOTE:  • Subaru Select Monitor  For detailed operation procedure, refer to the 'READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to="">  • OBD-II general scan tool  For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>	0.86 — 1.15 at idle?	Go to step 3.	Go to step 4.
r N N N N N N N N N N N N N N N N N N N	CHECK REAR OXYGEN SENSOR SIGNAL.  1) Race engine at speeds from idling to 5,000 rpm for a total of 5 cycles.  NOTE: To increase engine speed to 5,000 rpm, slowly depress accelerator pedal, taking approximately 5 seconds, and quickly release accelerator pedal to decrease engine speed.  2) Operate the LED operation mode for engine.  NOTE: Subaru Select Monitor For detailed operation procedure, refer to the 'LED OPERATION MODE FOR ENGINE''. <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to=""></ref.>		Check front oxygen (A/F) sensor circuit.	Check rear oxygen sensor circuit. <ref. to<br="">FU(H4DOTC)-39, Rear Oxygen Sen- sor.&gt;</ref.>
4 ()	CHECK EXHAUST SYSTEM. Check exhaust system parts.  NOTE: Check the following items.  Loose installation of portions  Damage (crack, hole etc.) of parts  Looseness of front oxygen (A/F) sensor  Looseness and ill fitting of parts between front oxygen (A/F) sensor and rear oxygen sensor	Is there a fault in exhaust system?	Repair or replace faulty parts.	Go to step 5.
5 (	CHECK AIR INTAKE SYSTEM.	Are there holes, loose bolts or disconnection of hose on air intake system?	Repair the air intake system.	Go to step 6.

	Step	Check	Yes	No
6	CHECK FUEL PRESSURE.	Is the measured value 284 —	Go to step 7.	Repair the follow-
	Warning: • Place "NO FIRE" signs near the working area. • Be careful not to spill fuel on the floor.	314 kPa (2.9 — 3.2 kg/cm <sup>2</sup> , 41 — 46 psi)?		ing items. Fuel pressure too high:  • Clogged fuel
	<ol> <li>Release the fuel pressure.         <ul> <li>Disconnect the connector from fuel pump relay.</li> <li>Start the engine and run it until it stalls.</li> <li>After the engine stalls, crank it for 5 more seconds.</li> <li>Turn the ignition switch to OFF.</li> <li>Connect the connector to fuel pump relay.</li> <li>Disconnect the fuel delivery hose from fuel filter, and connect fuel pressure gauge.</li> <li>Install the fuel filler cap.</li> <li>Start the engine and idle while gear position is neutral.</li> <li>Measure the fuel pressure while disconnecting pressure regulator vacuum hose from intake manifold.</li> <li>Warning:</li> <li>Before removing the fuel pressure gauge,</li> <li>Turn the ingine and run it until it stalls.</li> <li>Measure the fuel pressure gauge.</li> <li>Measure the fuel pressure while disconnecting pressure regulator vacuum hose from intake manifold.</li> <li>Warning:</li> <li>Before removing the fuel pressure gauge,</li> <li>Measure the fuel pressure gauge,</li></ul></li></ol>			return line or bent hose Fuel pressure too low: • Improper fuel pump discharge • Clogged fuel supply line
	release fuel pressure.  NOTE: If the fuel pressure does not increase, squeeze fuel return hose 2 to 3 times, then measure fuel pressure again.			
7	CHECK FUEL PRESSURE.  After connecting the pressure regulator vacuum hose, measure fuel pressure.  Warning: Before removing the fuel pressure gauge, release fuel pressure.  NOTE:  If the fuel pressure does not increase, squeeze fuel return hose 2 to 3 times, then measure fuel pressure again.  If out of specification as measured at this step, check or replace the pressure regulator and pressure regulator vacuum hose.		Go to step 8.	Repair the following items. Fuel pressure too high:  • Faulty pressure regulator • Clogged fuel return line or bent hose Fuel pressure too low:  • Faulty pressure regulator • Improper fuel pump discharge • Clogged fuel supply line
8	CHECK ENGINE COOLANT TEMPERATURE SENSOR.  1) Start the engine and warm-up completely. 2) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor or OBD-II general scan tool.  NOTE:  • Subaru Select Monitor  For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to="">  • OBD-II general scan tool  For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>	Is the temperature more than 60°C (140°F)?	Go to step 9.	Replace the engine coolant temperature sensor. <ref. coolant="" engine="" fu(h4dotc)-26,="" sensor.="" temperature="" to=""></ref.>

			T	T
	Step	Check	Yes	No
9	CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE.  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 accessory switches to OFF.  5) Read the data of mass air flow and intake air temperature sensor signal using Subaru Select Monitor or OBD-II general scan tool.  NOTE:  • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to="">  • OBD-II general scan tool For detailed operation procedure, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>	Is the measured value within the followings? Ignition ON: 73.3 — 106.6 kPa (550 — 800 mmHg, 21.65 — 31.50 inHg) Idling: 24.0 — 41.3 kPa (180 — 310 mmHg, 7.09 — 12.20 inHg)	Go to step 10.	Replace the mass air flow and intake air temperature sensor. <ref. air="" and="" flow="" fu(h4dotc)-30,="" intake="" mass="" sensor.="" temperature="" to=""></ref.>
10	CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.  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 accessory switches to 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 Subaru Select Monitor or OBD-II general scan tool.  NOTE:  • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)-29,="" monitor.="" select="" subaru="" to="">  • OBD-II general scan tool For detailed operation procedure, refer to the OBD-II General Scan Tool Instruction Manual.</ref.>	Subtract ambient temperature from intake air temperature. Is the obtained value –10 — 50°C (14 — 122°F)?	Go to step 11.	Check the mass air flow and intake air temperature sensor. <ref. air="" and="" flow="" fu(h4dotc)-30,="" intake="" mass="" sensor.="" temperature="" to=""></ref.>
11	CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.  1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and front oxygen (A/F) sensor connector. 3) Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector.  Connector & terminal (B134) No. 26 — Chassis ground: (B134) No. 33 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega ?$	Go to step 12.	Repair ground short circuit in har- ness between ECM and front oxygen (A/F) sen- sor connector.

	Step	Check	Yes	No
12	CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.  1) Turn the ignition switch to OFF. 2) Disconnect the connectors from front oxygen (A/F) sensor. 3) Measure the voltage of harness between ECM connector and chassis ground.  Connector & terminal  (B134) No. 26 (+) — Chassis ground (-): (B134) No. 33 (+) — Chassis ground (-):	Is the voltage more than 8 V?	Go to step 13.	Repair battery short circuit in har- ness between ECM and front oxygen (A/F) sen- sor connector.
13	CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.  1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and front oxygen (A/F) sensor connector. 3) Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector.  Connector & terminal (B134) No. 26 — (B262) No. 3: (B134) No. 33 — (B262) No. 4:	Is the resistance less than 1 $\Omega$ ?	Replace the front oxygen (A/F) sen- sor. <ref. to<br="">FU(H4DOTC)-37, Front Oxygen (A/ F) Sensor.&gt;</ref.>	Repair open circuit in harness between ECM and front oxygen (A/F) sensor connector.

**ENGINE (DIAGNOSTICS)** 

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

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

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-187, DTC P0638 THROTTLE ACTUATOR CONTROL RANGE/PERFORMANCE (BANK 1) —, Diagnostic Trouble Code (DTC) Detecting Criteria.> <Ref. to GD(H4DOTC)-225, DTC P1160 RETURN SPRING FAILURE —, Diagnostic Trouble Code (DTC) Detecting Criteria.> <Ref. to GD(H4DOTC)-260, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

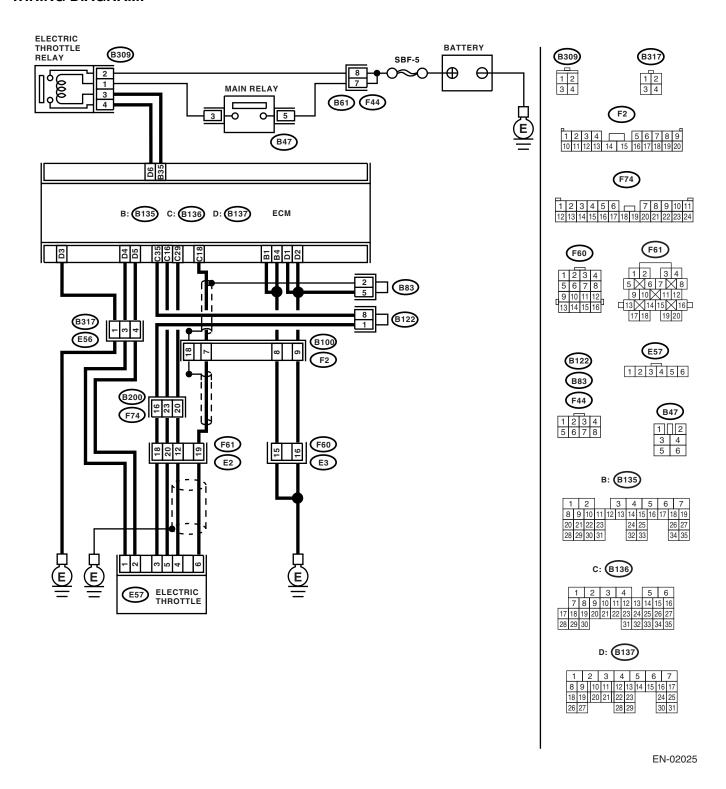
#### TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance
- Engine stalls.

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.

ENGINE (DIÀGNOSTICS)



	Step	Check	Yes	No
1	CHECK ELECTRIC THROTTLE RELAY.	Is the resistance less than 1	Go to step 2.	Replace the elec-
'	Turn the ignition switch to OFF.	$\Omega$ ?	Go to step 2.	tric throttle relay.
	<ul><li>2) Remove the electric throttle relay.</li></ul>	22:		the timothe relay.
	<ul><li>3) Connect the battery to electric throttle relay.</li></ul>			
	terminal No. 1 and No. 3.			
	Measure the resistance between electric			
	throttle relay terminals.			
	Terminals			
	No. 2 — No. 4:			
2	CHECK POWER SUPPLY TO ELECTRIC	Is the voltage more than 5 V?	Go to step 3.	Repair the open
	THROTTLE RELAY.	is the voltage more than 5 v?	Go to step 3.	power supply cir-
	Measure the voltage between electric throttle			cuit or ground
	relay connector and engine ground.			short.
	Connector & terminal			SHOLL.
	(B309) No. 1 (+) — Engine ground (–):			
	(B309) No. 2 (+) — Engine ground (-):			
2	CHECK HARNESS BETWEEN ECM AND	Is the voltage less than 5 V?	Co to stop 4	Donoir chart of the
3	ELECTRIC THROTTLE.	is the voltage less than 5 v?	Go to step 4.	Repair short of the
	Disconnect the connector from ECM.			power supply cir- cuit between ECM
	<ul><li>2) Turn the ignition switch to ON.</li></ul>			and electric throt-
	<ul><li>3) Measure the voltage between electric throt-</li></ul>			tle.
	tle relay connector and engine ground.			ue.
	Connector & terminal			
	(B309) No. 3 (+) — Engine ground (–):			
4	CHECK HARNESS BETWEEN ECM AND	la tha maistana a mana than d	0-1	Danieliu de a consumed
4		Is the resistance more than 1 $M\Omega$ ?	Go to step 5.	Repair the ground
	ELECTRIC THROTTLE.	IVIS 2 ?		short of harness between ECM and
	<ol> <li>Turn the ignition switch to OFF.</li> <li>Measure the resistance between electric</li> </ol>			electric throttle
	throttle relay connector and chassis ground.			relay.
	Connector & terminal			Tolay.
	(B309) No. 3 — Engine ground:			
	(B309) No. 4 — Engine ground:			
5	CHECK HARNESS BETWEEN ECM AND	Is the resistance less than 1	Go to step 6.	Repair the open
٦	ELECTRIC THROTTLE RELAY.	$\Omega$ ?	Go to step <b>o.</b>	circuit of harness
	Turn the ignition switch to OFF.	22:		between ECM and
	<ul><li>2) Measure the resistance between electric</li></ul>			electric throttle
	throttle connector and electric throttle relay			relay.
	connector.			· Jiayi
	Connector & terminal			
	(B135) No. 35 — (B309) No. 3:			
	(B137) No. 6 — (B309) No. 4:			
6	CHECK OUTPUT VOLTAGE OF SENSOR.	Is the voltage more than 0.4 V?	Go to sten 7.	Go to step 9.
	Connect all the connectors.			
	Turn the ignition switch to ON.			
	Measure the voltage between ECM con-			
	nector terminals.			
	Connector & terminal			
	(B136) No. 18 (+) — (B136) No. 35 (–):			
	4) Shake the ECM harness and connector,			
	engine harness connectors (B136, F61), elec-			
	tric throttle connector harness while monitoring			
	value of voltage meter.			
<u> </u>	raids of voltage motor.			

	Step	Check	Yes	No
7	CHECK OUTPUT VOLTAGE OF SENSOR.  1) Connect all the connectors.  2) Turn the ignition switch to ON.  3) Measure the voltage between ECM connector terminals.  Connector & terminal  (B136) No. 29 (+) — (B136) No. 35 (-):  4) Shake the ECM harness and connector, engine harness connectors, electric throttle connector harness while monitoring value of voltage meter.	Is the voltage more than 0.8 V?	Go to step 8.	Go to step 9.
8	CHECK POOR CONTACT.  Check poor contact between ECM connector and electric throttle connector.	Is there poor contact between ECM connector and electric throttle connector?	Repair the poor contact.	Go to step 13.
9	CHECK HARNESS BETWEEN ECM AND ELECTRIC THROTTLE.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from ECM.  3) Disconnect the connector from electric throttle.  4) Measure the resistance between ECM connector and electric throttle connector.  Connector & terminal  (B136) No. 16 — (E57) No. 5:	Is the resistance less than 1 $\Omega$ ?	Go to step 10.	Repair the open harness connector.
10	CHECK THE HARNESS BETWEEN ECM AND ELECTRIC THROTTLE. Measure the resistance between ECM connector and chassis ground.  Connector & terminal (B136) No. 16 — Chassis ground: (B136) No. 18 — Chassis ground: (B136) No. 29 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega\mbox{?}$	Go to step 11.	Repair the ground short of harness.
11	CHECK POWER SUPPLY TO SENSOR.  1) Connect the ECM connector.  2) Turn the ignition switch to ON.  3) Measure the resistance between electric throttle connector and engine ground.  Connector & terminal  (E57) No.5 (+) — Engine ground (-):  4) Shake the ECM harness and connector, engine harness connectors, while monitoring value of voltage meter.	Is the voltage 4.5 — 5.5 V?	Go to step 12.	Repair the poor contact in ECM connector. If problem persists, replace the ECM. <ref. (ecm).="" control="" engine="" fu(h4dotc)-42,="" module="" to=""></ref.>
12	CHECK SHORT OF ECM.  1) Turn the ignition switch to OFF.  2) Measure the resistance between electric throttle connector and engine ground.  Connector & terminal  (E57) No. 6 — Engine ground:  (E57) No. 4 — Engine ground:	Is the resistance more than 10 $\Omega$ ?	Go to step 13.	Repair the poor contact in ECM connector. If prob- lem persists, replace the ECM.
13	CHECK OUTPUT VOLTAGE OF SENSOR.  1) Connect all the connectors.  2) Turn the ignition switch to ON.  3) Read the data of main throttle sensor signal, using the Subaru Select Monitor.  4) Shake the ECM harness and connector, engine harness connectors, electric throttle connector harness while monitoring value of voltage meter.	Is the voltage 4.63 V?	Go to step 14.	Go to step 16.

	Step	Check	Yes	No
14	CHECK OUTPUT VOLTAGE OF SENSOR.	Is the voltage 4.73 V?	Go to step 15.	Go to step 16.
	Read the data of sub throttle sensor signal,	lo the voltage 1.76 v.	Go to stop 10.	Go to stop 10.
	using the Subaru Select Monitor.			
	2) Shake the ECM harness and connector,			
	engine harness connectors, electric throttle			
	connector harness while monitoring value of			
	voltage meter.			
15	CHECK POOR CONTACT IN CONNECTORS.	Is there poor contact in con-	Repair the poor	Go to step 21.
	Check poor contact in connectors between	nectors between ECM and	contact in connec-	
	ECM and electric throttle?	electric throttle?	tors.	
16	CHECK HARNESS BETWEEN ECM AND	Is the resistance less than 1	Go to step 17.	Repair the open
	ELECTRIC THROTTLE.	Ω?		harness connec-
	<ol> <li>Turn the ignition switch to OFF.</li> </ol>			tor.
	Disconnect the connector from ECM.			
	3) Disconnect the connector from electric			
	throttle.			
	<ol> <li>Measure the resistance between ECM con- nector and electric throttle connector.</li> </ol>			
	Connector & terminal			
	(B136) No. 35 — (E57) No. 3:			
	(B136) No. 18 — (E57) No. 6:			
	(B136) No. 29 — (E57) No. 4:			
17	CHECK HARNESS BETWEEN ECM AND	Is the resistance less than 5	Go to step 18.	Repair the poor
	ELECTRIC THROTTLE.	$\Omega$ ?		contact in ECM
	1) Connect the ECM connector.			connector. If prob-
	2) Measure the resistance between electric			lem persists,
	throttle connector and engine ground.			replace the ECM.
	Connector & terminal			
	(E57) No. 3 — Engine ground:			
18	CHECK HARNESS BETWEEN ECM AND	Is the voltage more than 10 V?	Go to step 19.	Repair the battery
	ELECTRIC THROTTLE.			short of harness
	Turn the ignition switch to ON.			between ECM
	<ol><li>Measure the voltage between electric throt- tle connector and engine ground.</li></ol>			connector and electric throttle
	Connector & terminal			connector.
	(E57) No. 5 (+) — Engine ground (–):			COTTIECTOL.
	3) Shake the ECM harness and connector,			
	engine harness connectors, while monitoring			
	value of voltage meter.			
19	CHECK HARNESS BETWEEN ECM AND	Is the voltage less than 10 V?	Go to step 20.	Repair the short of
	ELECTRIC THROTTLE.			harness between
	1) Measure the voltage between electric throt-			ECM connector
	tle connector and engine ground.			and electric throt-
	Connector & terminal			tle connector.
	(E57) No. 6 (+) — Engine ground (–):			
	(E57) No. 4 (+) — Engine ground (–):			
	2) Shake the ECM harness and connector,			
	engine harness connectors, while monitoring			
	value of voltage meter.			
20	CHECK HARNESS BETWEEN ECM AND	Is the resistance more than 1	Go to step 21.	Repair the short of
	ELECTRIC THROTTLE.	ΜΩ?		sensor power sup-
	Turn the ignition switch to OFF.  O Remove the FCM.			ply.
	2) Remove the ECM.  3) Measure the voltage between ECM can.			
	Measure the voltage between ECM con- pactors			
	nectors.  Connector & terminal			
	(B136) No. 18 — (B136) No. 35:			
	(B136) No. 29 — (B136) No. 35:			
	(טטום) און (טטום) און (טטום)	1	1	I

	Step	Check	Yes	No
21	CHECK OUTPUT VOLTAGE OF SENSOR.	Is the voltage 0.81 — 0.87 V?	Go to step 22.	Repair the poor
	Turn the ignition switch to OFF.     Connect all the connectors except electric.			contact in electric
	<ol><li>Connect all the connectors except electric throttle replay.</li></ol>			throttle connector.  If problem persists,
	3) Turn the ignition switch to ON.			replace the electric
	4) Read the data of main throttle sensor sig-			throttle.
	nals, using Subaru Select Monitor.	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
22	CHECK OUTPUT VOLTAGE OF SENSOR. Read the data of sub throttle sensor signals, using Subaru Select Monitor.	Is the voltage 1.64 — 1.70 V?	Go to step 23.	Repair the poor contact in electric throttle connector. If problem persists, replace the electric throttle.
23	CHECK HARNESS BETWEEN ECM AND ELECTRIC THROTTLE MOTOR.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from ECM.  3) Disconnect the connectors from electric throttle.  4) Measure the resistance between ECM connector and electric throttle connector.  Connector & terminal  (B137) No. 5 — (E57) No. 2:  (B137) No. 4 — (E57) No. 1:	Is the resistance less than 1 $\Omega$ ?	Go to step 24.	Repair the open harness connector.
24	CHECK HARNESS BETWEEN ECM AND ELECTRIC THROTTLE MOTOR.  1) Connect the connectors to ECM.  2) Turn the ignition switch to ON.  3) Measure the voltage between electric throttle connector and engine ground.  Connector & terminal  (E57) No. 2 (+) — Engine ground (-):  (E57) No. 1 (+) — Engine ground (-):	Is the voltage less than 5 V?	Go to step 25.	Repair the short of harness to power supply circuit between ECM and electric throttle.
25	CHECK HARNESS BETWEEN ECM AND	Is the resistance more than 1	Go to step 26.	Repair the short of
	<ol> <li>ELECTRIC THROTTLE MOTOR.</li> <li>Turn the ignition switch to OFF.</li> <li>Disconnect the connector from ECM.</li> <li>Measure the resistance between electric throttle connector and engine ground.</li> <li>Connector &amp; terminal         <ul> <li>(E57) No. 2 — Engine ground:</li> <li>(E57) No. 1 — Engine ground:</li> </ul> </li> </ol>	ΜΩ?		harness.
26	CHECK ELECTRIC THROTTLE MOTOR	Is the resistance more than 1	Go to step 27.	Repair the short of
	HARNESS. Measure the resistance between electric throttle connector terminals.  Connector & terminal  (E57) No. 2 — (E57) No. 1:	MΩ?		harness.
27	CHECK ELECTRIC THROTTLE GROUND	Is the resistance less than 10	Go to step 28.	Repair the open
	CIRCUIT.  Measure the resistance between ECM connector and engine ground.  Connector & terminal  (B137) No. 3 — Engine ground:	Ω?		circuit harness.
28	CHECK ELECTRIC THROTTLE.	Is the resistance less than 5	Go to step 29.	Replace the elec-
	Measure the resistance between electric throt- tle terminals.  Terminals  No. 1 — No. 2:	Ω?		tric throttle.
		1	1	<u>l</u>

	Step	Check	Yes	No
29	CHECK ELECTRIC THROTTLE.  Open and close the throttle valve to its full width with finger.	Does it return to specified position (3 mm (0.12 in) open from fully closed position.) when finger is released?	contact in ECM	Replace the electric throttle.

ENGINE (DIÀGNOSTICS)

# DR:DTC P2102 — THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT LOW — DTC DETECTING CONDITION:

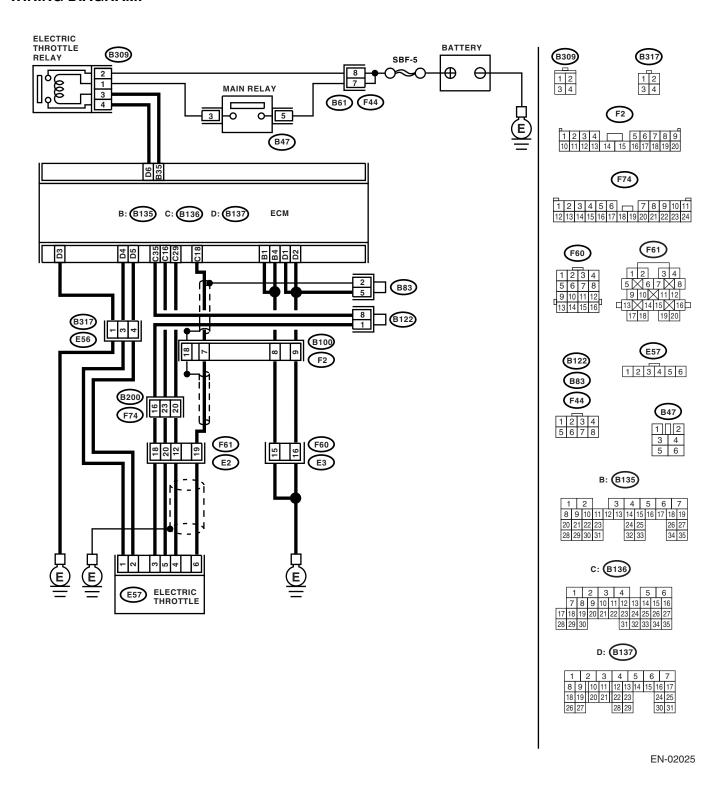
- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-262, DTC P2102 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT LOW —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance
- Engine stalls.

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK ELECTRIC THROTTLE RELAY.  1) Turn the ignition switch to OFF.  2) Remove the electric throttle relay.  3) Connect the battery to electric throttle relay terminal No. 1 and No. 3.  4) Measure the resistance between electric throttle terminals.  Connector & terminal  (B309) No. 2 — (B309) No. 4:	Is the resistance less than 1 $\Omega$ ?	Go to step 2.	Replace the electric throttle relay.
2	CHECK POWER TO ELECTRIC THROTTLE RELAY  Measure the voltage between electric throttle relay connector and engine ground.  Connector & terminal  (B309) No. 1 (+) — Engine ground (-):  (B309) No. 2 (+) — Engine ground (-):	Is the voltage more than 5 V?	Go to step 3.	Repair the open power supply circuit or ground short.
3	CHECK HARNESS BETWEEN ECM AND ELECTRIC THROTTLE.  1) Disconnect the connector from ECM. 2) Turn the ignition switch to ON. 3) Measure the voltage between electric throttle relay connector and engine ground.  Connector & terminal  (B309) No. 3 (+) — Engine ground (-):	Is the voltage less than 5 V?	Go to step 4.	Repair the short of power supply cir- cuit between ECM and electric throt- tle.
4	CHECK HARNESS BETWEEN ECM AND ELECTRIC THROTTLE RELAY.  1) Turn the ignition switch to OFF.  2) Measure the resistance between electric throttle relay connector and chassis ground.  Connector & terminal  (B309) No. 3 — Engine ground:  (B309) No. 4 — Engine ground:	Is the resistance more than 1 $\mbox{M}\Omega ?$	Go to step 5.	Repair the ground short of harness between ECM and electric throttle relay.
5	CHECK HARNESS BETWEEN ECM AND ELECTRIC THROTTLE RELAY.  Measure the resistance between ECM connector and electric throttle relay connector.  Connector & terminal  (B135) No. 35 — (B309) No. 3:  (B137) No. 6 — (B309) No. 4:	Is the resistance less than 1 $\Omega$ ?	Repair the poor contact in ECM connector. If prob- lem persists, replace the ECM.	Repair the open harness between ECM and electric throttle relay.

**ENGINE (DIAGNOSTICS)** 

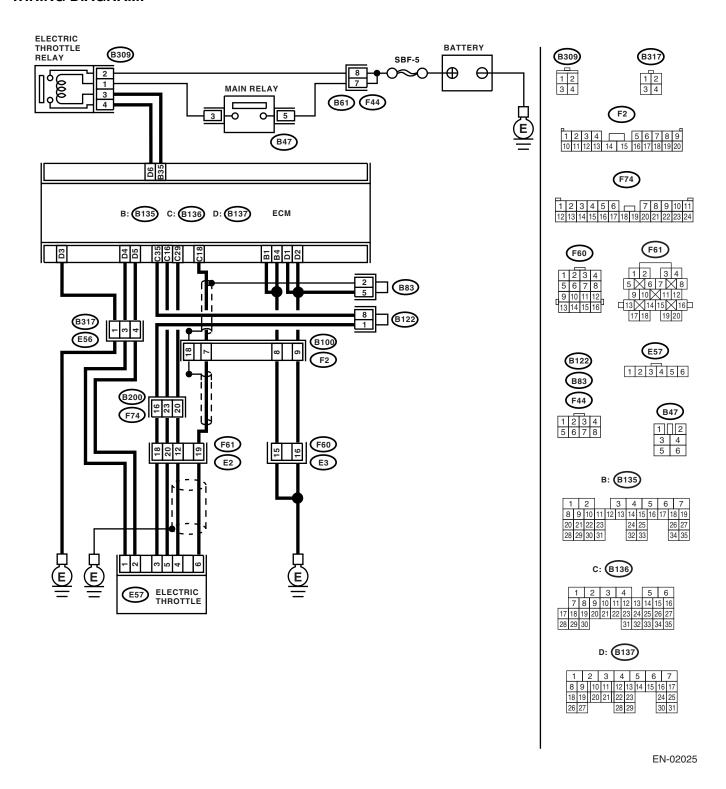
# DS:DTC P2103 — THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT HIGH — DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-264, DTC P2103 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT HIGH —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.

ENGINE (DIÀGNOSTICS)



	Step	Check	Yes	No
1	CHECK ELECTRIC THROTTLE RELAY.  1) Turn the ignition switch to OFF.  2) Remove the electric throttle relay.  3) Measure the resistance between electric throttle relay terminals.  Terminals  No. 2 — No. 4:	Is the resistance more than 1 M $\Omega$ ?	Go to step 2.	Replace the electric throttle relay.
2	CHECK SHORT OF ELECTRIC THROTTLE RELAY POWER SUPPLY CIRCUIT.  1) Turn the ignition switch to ON.  2) Measure the voltage between electric throttle relay connector and engine ground.  Connector & terminal  (B309) No. 4 (+) — Engine ground (-):	Is the voltage more than 5 V?	Go to step 3.	Repair the short of power supply to harness between ECM and electric throttle relay.
3	CHECK HARNESS BETWEEN ECM AND ELECTRIC THROTTLE RELAY.  1) Turn the ignition switch to OFF.  2) Disconnect the connectors from ECM.  3) Measure the resistance between ECM connector and engine ground.  Connector & terminal  (B135) No. 35 — Engine ground:	Is the resistance more than 1 $\mbox{M}\Omega ?$	Repair the poor contact in ECM connector. If prob- lem persists, replace the ECM.	Repair the ground short of harness between ECM and electric throttle relay.

ENGINE (DIÀGNOSTICS)

# DT:DTC P2109 — THROTTLE/PEDAL POSITION SENSOR A MINIMUM STOP PERFORMANCE —

NOTE:

For the diagnostic procedure, refer to DTC P2101. <Ref. to EN(H4DOTC)-348, DTC P2101 — THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

**ENGINE (DIAGNOSTICS)** 

### DU:DTC P2122 — THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIR-CUIT LOW INPUT —

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

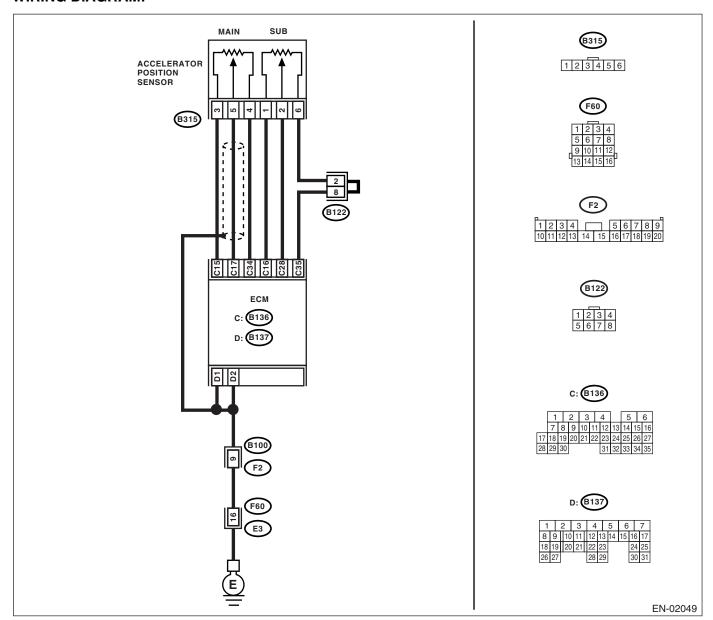
- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-268, DTC P2122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT LOW INPUT —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

#### **TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance

#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK OUTPUT VOLTAGE OF ACCELERATOR POSITION SENSOR.  1) Turn the ignition switch to ON. 2) Measure the voltage between ECM connector terminals.  Connector & terminal  (B136) No. 17 (+) — (B136) No. 34 (-): 3) Shake the ECM harness and connector,	Is the voltage more than 0.4 V?	Go to step 2.	Go to step 3.
	accelerator position sensor.			
2	CHECK POOR CONTACT IN CONNECTORS. Check poor contact in connectors between ECM and accelerator position sensor.	Is there poor contact in con- nectors between ECM and accelerator position sensor?	Repair the poor contact in connectors.	Connector has returned to its normal condition at this time. A temporary poor contact of the connector may be the cause.
3	CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from ECM.  3) Disconnect the connector from accelerator position sensor.  4) Measure the resistance between ECM connector and accelerator position sensor.  Connector & terminal  (B136) No. 17 — (B315) No. 5:  (B136) No. 15 — (B315) No. 3:	Ω?	Go to step 4.	Repair the open harness connector.
4	CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.  Measure the resistance between ECM connector and chassis ground.  Connector & terminal  (B136) No. 17 — Chassis ground:  (B136) No. 15 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega ?$	Go to step 5.	Repair the open harness connector.
5	CHECK ACCELERATOR POSITION SENSOR POWER SUPPLY  1) Connect the ECM connector.  2) Turn the ignition switch to ON.  3) Measure the voltage between accelerator position sensor connector and engine ground.  Connector & terminal  (B315) No. 3 (+) — Engine ground (-):  4) Shake the ECM harness and connector, while monitoring value of voltage meter.	Is the voltage 4.5 — 5.5 V?	Go to step 6.	Repair the poor contact in ECM connector. If problem persists, replace the ECM. <ref. (ecm).="" control="" engine="" fu(h4dotc)-42,="" module="" to=""></ref.>
6	CHECK ACCELERATOR POSITION SENSOR.  Measure the resistance of accelerator position sensor.  Terminals  No. 3 — No. 4:	Is the resistance 1.2 — 4.8 $k\Omega$ ?	Go to step 7.	Replace the accelerator position sensor.
7	CHECK ACCELERATOR POSITION SENSOR.  Measure the resistance of accelerator position sensor when accelerator pedal is released.  Terminals  No. 5 — No. 4:	Is the resistance 0.2 — 1.0 $k\Omega$ ?	Go to step 8.	Replace the accelerator position sensor.

Step	Check	Yes	No
8 CHECK ACCELERATOR POSITION SENSOR.  Measure the resistance of accelerator position sensor when acceleration pedal is being depressed.  Terminals  No. 5 — No. 4:	kΩ?		Replace the accelerator position sensor.

ENGINE (DIÀGNOSTICS)

## DV:DTC P2123 — THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIR-CUIT HIGH INPUT —

### **DTC DETECTING CONDITION:**

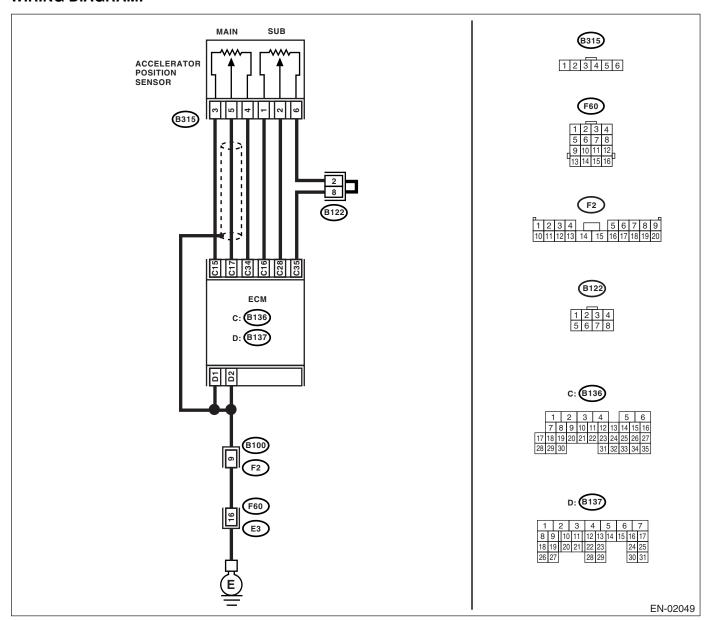
- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-270, DTC P2123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT HIGH INPUT —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

## TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance

#### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK OUTPUT VOLTAGE OF ACCELERATOR POSITION SENSOR.  1) Turn the ignition switch to ON. 2) Read the data of main accelerator position sensor signals, using Subaru Select Monitor. 3) Shake the ECM harness and connector, engine harness connector, accelerator position sensor connector harness while monitoring value of voltage meter.	<u> </u>	Go to step 2.	Go to step 3.
2	CHECK POOR CONTACT IN CONNECTORS. Check poor contact in connectors between ECM and accelerator position sensor.	connectors between ECM and accelerator position sensor?	Repair the poor contact in connectors.	Connector has returned to its normal condition at this time. A temporary poor contact in the connector might have been the cause.
3	CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.  1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connector from accelerator position sensor. 4) Measure the resistance between ECM connector and accelerator position sensor.  Connector & terminal (B136) No. 34 — (B315) No. 4:	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open harness connector.
4	CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.  1) Connect the ECM connector.  2) Measure the resistance between accelerator position sensor and engine ground.  Connector & terminal  (B315) No. 4 — Engine ground:	Is the resistance less than 5 $\Omega$ ?	Go to step 5.	Repair the poor contact in ECM connector. If problem persists, replace the ECM. <ref. (ecm).="" control="" engine="" fu(h4dotc)-42,="" module="" to=""></ref.>
5	CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.  1) Connect the ECM connector.  2) Turn the ignition switch to ON.  3) Measure the voltage between accelerator position sensor connector and engine ground.  Connector & terminal  (B315) No. 3 (+) — Engine ground (-):  4) Shake the ECM harness and connector, while monitoring value of voltage meter.	Is the voltage more than 6 V?	Go to step 6.	Repair the battery short of harness between ECM connector and accelerator posi- tion sensor.
6	CHECK POWER SUPPLY TO ACCELERATOR POSITION SENSOR.  1) Measure the voltage between accelerator position sensor connector and engine ground.  Connector & terminal  (B315) No. 5 (+) — Engine ground (-):  2) Shake the ECM harness and connector, while monitoring value of voltage meter.	Is the voltage less than 4.8 V?	Go to step 7.	Repair the short of harness between ECM connector and accelerator position sensor connector.

Step	Check	Yes	No
7 CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.  1) Turn the ignition switch to OFF.  2) Connect the accelerator position sensor connector.  3) Turn the ignition switch to ON.  4) Measure the voltage between ECM connector and chassis ground.  Connector & terminal  (B136) No. 17 (+) — Chassis ground (-):	· ·	contact in ECM connector. If prob- lem persists, replace the ECM.	Repair the poor contact in electric throttle connector. If problem persists, replace the electric throttle.

**ENGINE (DIAGNOSTICS)** 

## DW:DTC P2127 — THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIR-CUIT LOW INPUT —

## **DTC DETECTING CONDITION:**

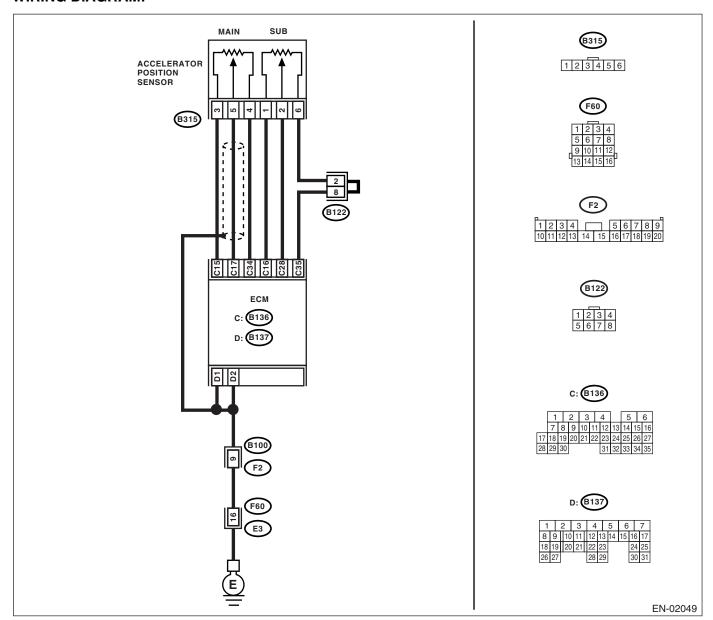
- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-272, DTC P2127 THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT LOW INPUT —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### **TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance

### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK OUTPUT VOLTAGE OF ACCELERATOR POSITION SENSOR.  1) Turn the ignition switch to ON. 2) Measure the voltage between ECM connector terminals.  Connector & terminal  (B136) No. 28 (+) — (B136) No. 35 (-): 3) Shake the ECM harness and connector,	Is the voltage more than 0.4 V?	Go to step 2.	Go to step 3.
	accelerator position sensor.			
2	CHECK POOR CONTACT IN CONNECTORS. Check poor contact in connectors between ECM and accelerator position sensor.	Is there any poor contact in connectors between ECM and accelerator position sensor?	Repair the poor contact in connectors.	Connector has returned to its normal condition at this time. A temporary poor contact in the connector might have been the cause.
3	CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from ECM.  3) Disconnect the connector from accelerator position sensor.  4) Measure the resistance between ECM connector and accelerator position sensor.  Connector & terminal  (B136) No. 28 — (B315) No. 2:  (B136) No. 16 — (B315) No. 1:	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open harness connector.
4		Is the resistance more than 1 $\mbox{M}\Omega\mbox{?}$	Go to step 5.	Repair the ground short of harness.
6	CHECK POWER SUPPLY TO ACCELERATOR POSITION SENSOR.  1) Connect the ECM connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between accelerator position sensor connector and engine ground.  Connector & terminal  (B315) No. 1 (+) — Engine ground (-): 4) Shake the ECM harness and connector, while monitoring value of voltage meter.  CHECK ACCELERATOR POSITION SENSOR.  Measure the resistance of accelerator position sensor.	Is the voltage 4.5 — 5.5 V? Is the resistance 0.75 — 3.15 $\mbox{k}\Omega$ ?	Go to step <b>6</b> .  Go to step <b>7</b> .	Repair the poor contact in ECM connector. If problem persists, replace the ECM. <ref. (ecm).="" control="" engine="" fu(h4dotc)-42,="" module="" to="">  Replace the accelerator position sensor.</ref.>
	Terminals No. 1 — No. 6:			
7	CHECK ACCELERATOR POSITION SENSOR.  Measure the resistance of accelerator position sensor when accelerator pedal is released.  Terminals  No. 2 — No. 6:	Is the resistance 0.15 — 0.63 k $\Omega$ ?	Go to step 8.	Replace the accelerator position sensor.

Step	Check	Yes	No
	kΩ?		Replace the accelerator position sensor.

ENGINE (DIÀGNOSTICS)

## DX:DTC P2128 — THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIR-CUIT HIGHT INPUT —

### **DTC DETECTING CONDITION:**

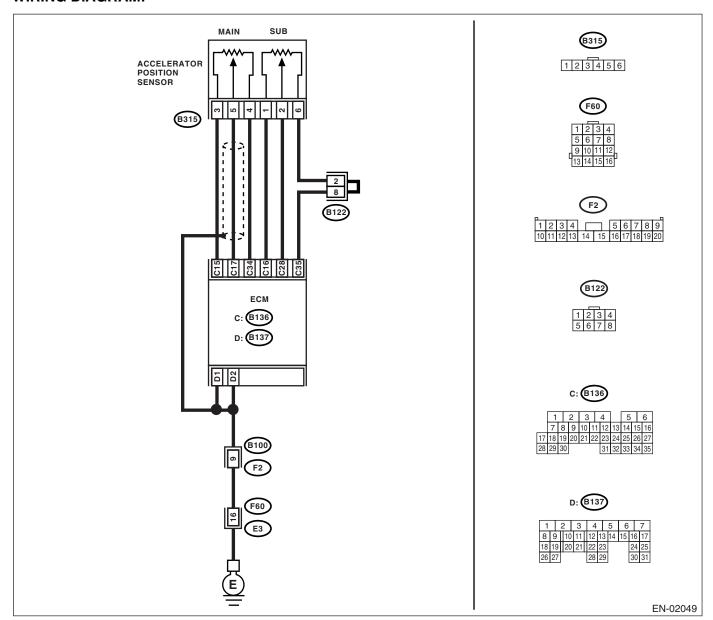
- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-274, DTC P2128 THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT HIGH INPUT —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### **TROUBLE SYMPTOM:**

- · Erroneous idling
- Poor driving performance

#### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK OUTPUT VOLTAGE OF ACCELERA-		Go to step 2.	Go to step 3.
	TOR POSITION SENSOR.  1) Turn the ignition switch to ON. 2) Read the data of sub accelerator position sensor signals, using Subaru Select Monitor. 3) Shake the ECM harness and connector, engine harness connector, accelerator position sensor connector harness while monitoring value of voltage meter.	To the voltage loss than 1.5 v.	Go to dtop 2.	do to diop <b>o</b> .
2	CHECK POOR CONTACT IN CONNECTORS. Check poor contact in connectors between ECM and accelerator position sensor.	Is there any poor contact in connectors between ECM and accelerator position sensor?	Repair the poor contact in connectors.	Connector has returned to its normal condition at this time. A temporary poor contact in the connector might have been the cause.
3	CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.  1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connector from accelerator position sensor. 4) Measure the resistance between ECM connector and accelerator position sensor.  Connector & terminal (B136) No. 35 — (B315) No. 6:	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open harness connector.
4	CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.  1) Connect the ECM connector. 2) Measure the resistance between accelerator position sensor connector and engine ground.  Connector & terminal  (B315) No. 6 — Engine ground:	Is the resistance less than 5 $\Omega$ ?	Go to step 5.	Repair the poor contact in ECM connector. If problem persists, replace the ECM.
5	CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.  1) Connect the ECM connector.  2) Turn the ignition switch to ON.  3) Measure the voltage between accelerator position sensor connector and engine ground.  Connector & terminal  (B315) No. 1 (+) — Engine ground (-):  4) Shake the ECM harness and connector, while monitoring value of voltage meter.	Is the voltage less than 6 V?	Go to step 6.	Repair the battery short of harness between ECM connector and accelerator position sensor connector.
6	CHECK POWER SUPPLY TO ACCELERATOR POSITION SENSOR.  1) Measure the voltage between accelerator position sensor connector and engine ground.  Connector & terminal  (B315) No. 2 (+) — Engine ground (-):  2) Shake the ECM harness and connector, while monitoring value of voltage meter.	Is the voltage less than 4.8 V?	Go to step 7.	Repair the short of harness between ECM connector and accelerator position sensor connector.

	Step	Check	Yes	No
CE 1) 2) co 3) 4) ne	HECK HARNESS BETWEEN ECM AND ACELERATOR POSITION SENSOR.  Turn the ignition switch to OFF.  Connect the accelerator position sensor nnector.  Turn the ignition switch to ON.  Measure the voltage between ECM conctor and chassis ground.  Connector & terminal  (B136) No. 16 (+) — Chassis ground (-):	Is the voltage 4.8 V?	Repair the poor contact in ECM connector. If problem persists, replace the ECM. <ref. (ecm).="" control="" engine="" fu(h4dotc)-42,="" module="" to=""></ref.>	Repair the poor contact in electric throttle connector. If problem persists, replace the electric throttle.

**ENGINE (DIAGNOSTICS)** 

# DY:DTC P2135 — THROTTLE/PEDAL POSITION SENSOR/SWITCH "A"/"B" VOLTAGE RATIONALITY —

### **DTC DETECTING CONDITION:**

- · Immediately at fault recognition
- GENERAL DESCRIPTION<Ref. to GD(H4DOTC)-276, DTC P2135 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" / "B" VOLTAGE RATIONALITY —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

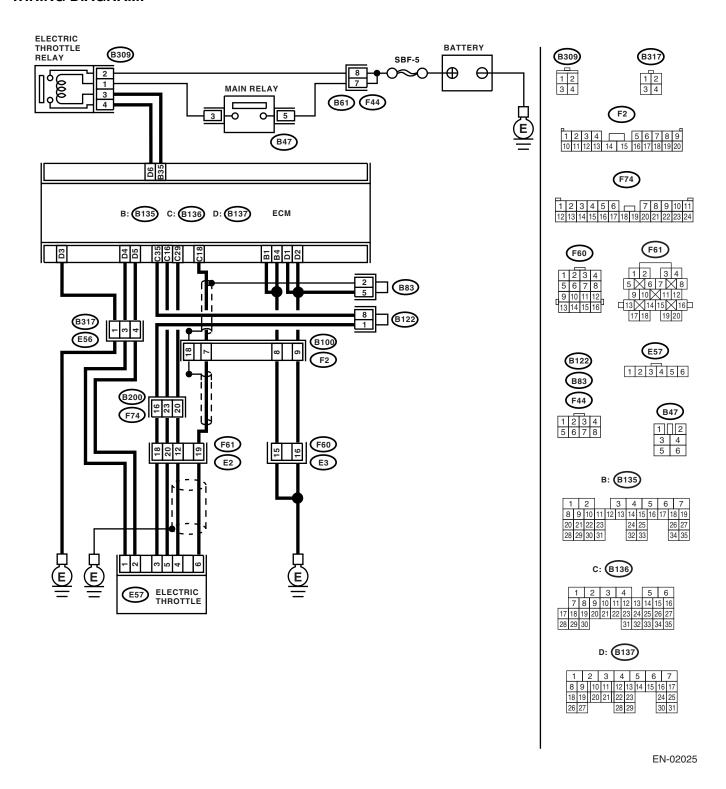
### TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance

### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.

ENGINE (DIÀGNOSTICS)



	Step	Check	Yes	No
1	CHECK OUTPUT VOLTAGE OF ACCELERA-			Go to step 4.
	TOR POSITION SENSOR.			·
	<ol> <li>Turn the ignition switch to ON.</li> </ol>			
	Measure the voltage between ECM con-			
	nector terminals.			
	Connector & terminal			
	(B136) No. 18 (+) — (B136) No. 35 (-):			
	<ol> <li>Shake the ECM harness and connector, engine harness connectors, electric throttle</li> </ol>			
	connector harness while monitoring value of			
	voltage meter.			
2	CHECK OUTPUT VOLTAGE OF ACCELERA-	Is the voltage more than 0.8 V?	Go to step 3.	Go to step 4.
ľ	TOR POSITION SENSOR.	lo the voltage more than 6.6 v.	do to stop <b>c.</b>	Go to stop 41
	Measure the voltage between ECM con-			
	nector terminals.			
	Connector & terminal			
	(B136) No. 29 (+) — (B136) No. 35 (–):			
	2) Shake the ECM harness and connector,			
	engine harness connectors, electric throttle			
	connector harness while monitoring value of			
	voltage meter.			
3	CHECK POOR CONTACT IN CONNECTORS.	Is there any poor contact in	Repair the poor	Go to step 14.
	Check poor contact in connectors between ECM and electric throttle.	connectors between ECM and electric throttle?	contact in connectors.	
4	CHECK HARNESS BETWEEN ECM AND	Is the resistance less than 1	Go to step 5.	Repair the open
7	ELECTRIC THROTTLE.	$\Omega$ ?	Go to step 3.	harness connec-
	Turn the ignition switch to OFF.	22:		tor.
	2) Disconnect the connector from ECM.			
	3) Disconnect the connector from electric			
	throttle.			
	4) Measure the resistance between ECM con-			
	nector and electric throttle connector.			
	Connector & terminal			
_	(B136) No. 16 — (E57) No. 5:	le the verictore a very thou d	Ca ta atam C	Denois the essessed
5	CHECK HARNESS BETWEEN ECM AND ELECTRIC THROTTLE.	Is the resistance more than 1 $M\Omega$ ?	Go to step 6.	Repair the ground short of harness.
	Measure the resistance between ECM connec-	IVIS 2 ?		Short of harness.
	tor and chassis ground.			
	Connector & terminal			
	(B136) No. 18 — Chassis ground:			
	(B136) No. 29 — Chassis ground:			
	(B136) No. 16 — Chassis ground:			
6	CHECK POWER SUPPLY TO SENSOR.	Is the voltage 4.5 — 5.5 V?	Go to step 7.	Repair the poor
	Connect the ECM connector.			contact in ECM
	2) Turn the ignition switch to ON.			connector. If prob-
	<ol> <li>Measure the voltage between electric throt- tle connector and engine ground.</li> </ol>			lem persists, replace the ECM.
	Connector & terminal			replace lile ECIVI.
	(E57) No. 5 (+) — Engine ground (–):			
	4) Shake the ECM harness and connector,			
	engine harness connectors, while monitoring			
	value of voltage meter.			

	Step	Check	Yes	No
7	CHECK SHORT OF ECM.  1) Turn the ignition switch to OFF.  2) Measure the resistance between electric throttle connector and engine ground.  Connector & terminal  (E57) No. 6 — Engine ground:  (E57) No. 4 — Engine ground:	Is the resistance more than 10 $\Omega$ ?	Go to step 8.	Repair the poor contact in ECM connector. If problem persists, replace the ECM. <ref. (ecm).="" control="" engine="" fu(h4dotc)-42,="" module="" to=""></ref.>
8	CHECK OUTPUT VOLTAGE OF ACCELERATOR POSITION SENSOR.  1) Connect all the connectors. 2) Turn the ignition switch to ON. 3) Read the data of main throttle sensor signals, using Subaru Select Monitors. 4) Shake the ECM harness and connector, engine harness connector, electric throttle connector harness while monitoring value of voltage meter.	Is the voltage less than 4.63 V?	Go to step 9.	Go to step 11.
9	CHECK OUTPUT VOLTAGE OF ACCELERATOR POSITION SENSOR.  1) Read the data of sub throttle sensor signals, using Subaru Select Monitors.  2) Shake the ECM harness and connector, engine harness connector, electric throttle connector harness while monitoring value of voltage meter.	Is the voltage less than 4.73 V?	Go to step 10.	Go to step 11.
10	CHECK POOR CONTACT IN CONNECTORS. Check poor contact in connectors between ECM and electric throttle.	Is there any poor contact in connectors between ECM and electric throttle?	Repair the poor contact in connectors.	Connector has returned to a normal condition at this time. A temporary poor contact in the connector might have been the cause.
11	CHECK HARNESS BETWEEN ECM AND ELECTRIC THROTTLE.  1) Turn the ignition switch to OFF.  2) Disconnect the connector from ECM.  3) Disconnect the connector from electric throttle.  4) Measure the resistance between ECM connector and electric throttle connector.  Connector & terminal  (B136) No. 35 — (E57) No. 3:  (B136) No. 18 — (E57) No. 6:  (B136) No. 29 — (E57) No. 4:	Is the resistance less than 1 $\Omega$ ?	Go to step 12.	Repair the open harness connector.
12	CHECK HARNESS BETWEEN ECM AND ELECTRIC THROTTLE.  1) Connect the ECM connector.  2) Measure the resistance between electric throttle connector and engine ground.  Connector & terminal  (E57) No. 3 — Engine ground:	Is the resistance less than 5 $\Omega$ ?	Go to step 13.	Repair the poor contact in ECM connector. If problem persists, replace the ECM.

	Step	Check	Yes	No
13	CHECK HARNESS BETWEEN ECM AND ELECTRIC THROTTLE.  1) Connect the ECM connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between electric throttle connector and engine ground.  Connector & terminal (E57) No. 5 (+) — Engine ground (-): 4) Shake the ECM harness and connector, engine harness connectors, while monitoring value of voltage meter.	Is the voltage more than 10 V?	Go to step 14.	Repair the battery short of harness between ECM connector and electric throttle connector.
14	CHECK HARNESS BETWEEN ECM AND ELECTRIC THROTTLE.  1) Measure the voltage between electric throttle connector and engine ground.  Connector & terminal (E57) No. 6 (+) — Engine ground (-): (E57) No. 4 (+) — Engine ground (-): 2) Shake the ECM harness and connector, engine harness connectors, while monitoring value of voltage meter.	Is the voltage less than 10 V?	Go to step 15.	Repair the short of harness between ECM connector and electric throt- tle connector.
15	CHECK HARNESS BETWEEN ECM AND ELECTRIC THROTTLE.  1) Turn the ignition switch to OFF.  2) Disconnect the electric throttle connector.  3) Measure the resistance between ECM connectors.  Connector & terminal (B136) No. 18 — (B136) No. 35: (B136) No. 29 — (B136) No. 35:	Is the resistance more than 1 M $\Omega$ ?	Go to step 16.	Repair the short of power supply sensor.
16	CHECK ELECTRIC THROTTLE HARNESS.  1) Disconnect the connector from ECM.  2) Disconnect the connector from electric throttle.  3) Measure the resistance between electric throttle connector terminals.  Connector & terminal  (E57) No. 6 — (E57) No. 4:	Is the resistance more than 1 $\mbox{M}\Omega ?$	Repair the poor contact in ECM connector. If problem persists, replace the ECM.	Repair the short of harness.

ENGINE (DIÀGNOSTICS)

## DZ:DTC P2138 — THROTTLE/PEDAL POSITION SENSOR/SWITCH "D"/"E" VOLTAGE RATIONALITY —

### **DTC DETECTING CONDITION:**

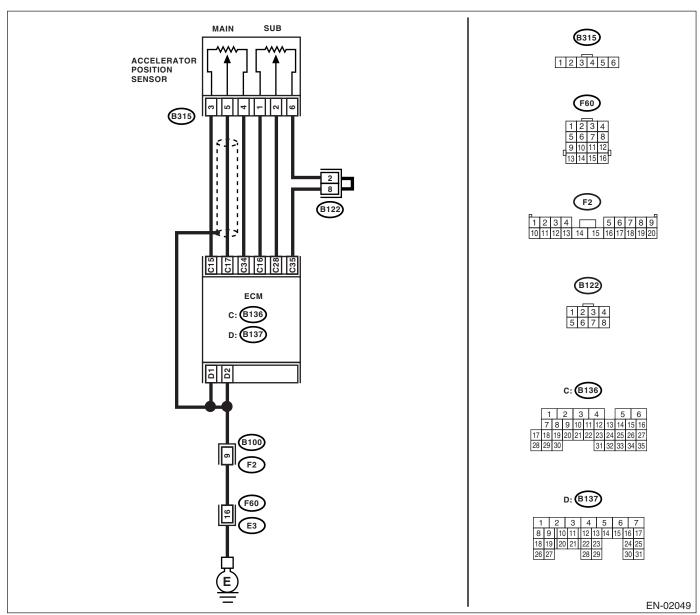
- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-278, DTC P2138 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" / "E" VOLTAGE RATIONALITY —, Diagnostic Trouble Code (DTC) Detecting Criteria.>

### TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance

### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-44, OP-ERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-36, OPERATION, Inspection Mode.>.



	Step	Check	Yes	No
1	CHECK OUTPUT VOLTAGE OF ACCELERA-	Is the voltage more than 0.4 V?	Go to step 2.	Go to step 3.
	TOR POSITION SENSOR.			
	<ol> <li>Turn the ignition switch to ON.</li> </ol>			
	<ol><li>Measure the voltage between ECM con-</li></ol>			
	nector terminals.			
	Connector & terminal			
	(B136) No. 17 (+) — (B136) No. 34 (–): (B136) No. 28 (+) — (B136) No. 35 (–):			
	3) Shake the ECM harness and connector,			
	accelerator position sensor connector and har-			
	ness.			
2	CHECK POOR CONTACT IN CONNECTORS.	Is there any poor contact in	Repair the poor	Go to step 9.
	Check poor contact in connectors between	connectors between ECM and	contact in connec-	
	ECM and electric throttle.	electric throttle?	tors.	
3	CHECK HARNESS BETWEEN ECM AND AC-	Is the resistance less than 1	Go to step 4.	Repair the open
	CELERATOR POSITION SENSOR.	Ω?		harness connec-
	1) Turn the ignition switch to OFF.			tor.
	2) Disconnect the connector from ECM.			
	3) Disconnect the connector from accelerator			
	position sensor.			
	<ol> <li>Measure the resistance between ECM con- nector and accelerator position sensor connec-</li> </ol>			
	tor.			
	Connector & terminal			
	(B136) No. 17 — (B315) No. 5:			
	(B136) No. 15 — (B315) No. 3:			
	(B136) No. 28 — (B315) No. 2:			
	(B136) No. 16 — (B315) No. 1:			
4	CHECK HARNESS BETWEEN ECM AND AC-		Go to step 5.	Repair the ground
	CELERATOR POSITION SENSOR.  Measure the resistance between ECM connec-	ΜΩ?		short of harness.
	tor and chassis ground.			
	Connector & terminal			
	(B136) No. 17 — Chassis ground:			
	(B136) No. 15 — Chassis ground:			
	(B136) No. 28 — Chassis ground:			
	(B136) No. 16 — Chassis ground:			
5	CHECK POWER SUPPLY TO ACCELERA-	Is the voltage 4.5 — 5.5 V?	Go to step 6.	Repair the poor
	TOR POSITION SENSOR.			contact in ECM
	Connect the ECM connector.      Turn the impition quitable to CM			connector. If prob-
	<ul><li>2) Turn the ignition switch to ON.</li><li>3) Measure the voltage between accelerator</li></ul>			lem persists, replace the ECM.
	position sensor connector and engine ground.			TEPIACE LITE ECIVI.
	Connector & terminal			
	(B315) No. 3 (+) — Engine ground (–):			
	(B315) No. 1 (+) — Engine ground (–):			
	4) Shake the ECM harness and connector,			
	while monitoring value of voltage meter.			
6	CHECK ACCELERATOR POSITION SEN-	Is the resistance 1.2 — 4.8	Go to step 7.	Replace the accel-
	SOR.	kΩ?		erator position
	Measure the resistance of accelerator position			sensor.
	sensor.			
	Terminals			
	No. 3 — No. 4:			

	Step	Check	Yes	No
7	CHECK ACCELERATOR POSITION SENSOR.  Measure the resistance of accelerator position sensor.  Terminals  No. 1 — No. 6:	Is the resistance 0.75 — 3.15 k $\Omega$ ?	Go to step 8.	Replace the accelerator position sensor.
8	CHECK ACCELERATOR POSITION SENSOR.  Measure the resistance of accelerator position sensor when the acceleration pedal is released.  Terminals  No. 5 — No. 4:	Is the resistance 0.2 — 0.8 k $\Omega$ ?	Go to step 9.	Replace the accelerator position sensor.
9	CHECK ACCELERATOR POSITION SENSOR.  Measure the resistance of accelerator position sensor when the acceleration pedal is released.  Connector & terminal No. 2 — No. 6:	Is the resistance 0.15 — 0.63 k $\Omega$ ?	Go to step 10.	Replace the accelerator position sensor.
10	CHECK ACCELERATOR POSITION SENSOR.  Measure the resistance of accelerator position sensor when the acceleration pedal is being depressed.  Terminals  No. 5 — No. 4:	Is the resistance 0.5 — 2.5 k $\Omega$ ?	Go to step 11.	Replace the accelerator position sensor.
11	CHECK ACCELERATOR POSITION SENSOR.  Measure the resistance of accelerator position sensor when the acceleration pedal is being depressed.  Terminals  No. 2 — No. 6:	Is the resistance 0.28 — 1.68 k $\Omega$ ?	Go to step 12.	Replace the accelerator position sensor.
12	CHECK OUTPUT VOLTAGE OF ACCELERATOR POSITION SENSOR.  1) Turn the ignition switch to OFF. 2) Connect all the connectors. 3) Turn the ignition switch to ON. 4) Read the data of main accelerator position sensor signals and sub accelerator position sensor signals, using Subaru Select Monitor. 5) Shake the ECM harness and connector, engine harness connector, accelerator position sensor connector harness while monitoring value of voltage meter.	Is the voltage less than 4.8 V?	Go to step 13.	Go to step 14.
13	CHECK POOR CONTACT IN CONNECTORS.  Check poor contact in connectors between  ECM and electric throttle.	Is there any poor contact in connectors between ECM and electric throttle?	Repair the poor contact in connectors.	Go to step 19.

	Step	Check	Yes	No
14	CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.  1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connector from accelerator position sensor. 4) Measure the resistance between ECM connector and accelerator position sensor connector.  Connector & terminal (B136) No. 34 — (B315) No. 4: (B136) No. 35 — (B315) No. 6:  CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.	Is the resistance less than 1 $\Omega$ ?	Yes Go to step 15.  Go to step 16.	No Repair the open harness connector.  Repair the poor contact in ECM
	1) Connect the ECM connector. 2) Measure the resistance between accelerator position sensor and engine ground.  Connector & terminal  (B315) No. 4 — Engine ground:  (B315) No. 6 — Engine ground:	127		connector. If prob- lem persists, replace the ECM.
16	CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.  1) Connect the ECM connector.  2) Turn the ignition switch to ON.  3) Measure the voltage between accelerator position sensor and engine ground.  Connector & terminal  (B315) No. 3 (+) — Engine ground (-):  (B315) No. 1 (+) — Engine ground (-):  4) Shake the ECM harness and connector, while monitoring value of voltage meter.	Is the voltage less than 6 V?	Go to step 17.	Repair the battery short of harness between ECM connector and accelerator posi- tion sensor.
17	CHECK POWER SUPPLY TO ACCELERATOR POSITION SENSOR.  1) Measure the voltage between accelerator position sensor connector and engine ground.  Connector & terminal  (B315) No. 5 (+) — Engine ground (-):  (B315) No. 2 (+) — Engine ground (-):  2) Shake the ECM harness and connector, while monitoring value of voltage meter.	Is the voltage less than 4.8 V?	Go to step 18.	Repair the short of harness between ECM connector and accelerator position sensor connector.
18	CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.  1) Turn the ignition switch to OFF. 2) Connect the accelerator position sensor connector. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM connector and chassis ground.  Connector & terminal (B136) No. 17 (+) — Chassis ground (-): (B136) No. 28 (+) — Chassis ground (-):	Is the voltage less than 4.8 V?	Go to step 19.	Repair the poor contact in accelerator position sensor connector. If problem persists, replace the accelerator position sensor.

Step		Check	Yes	No
19	CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.  1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connector from accelerator position sensor. 4) Measure the resistance between terminals of accelerator position sensor connector.  Connector & terminal (B315) No. 5 — (B315) No. 2:	Is the resistance less than 1 $\mbox{M}\Omega\mbox{?}$	connector. If prob- lem persists,	Repair the short of harness between accelerator position sensor connector and accelerator position sensor connector.