

Combination Meter System

INSTRUMENTATION/DRIVER INFO

2. Combination Meter System

A: WIRING DIAGRAM

1. COMBINATION METER

<Ref. to WI-137, WIRING DIAGRAM, Combination Meter System.>

B: INSPECTION

1. SELF-DIAGNOSIS

The self-diagnosis (checking of each meter, warning light, indicator, illumination, LCD) of combination meter can be performed in the following procedure.

NOTE:

Perform the steps described in 2) through 4) within 10 seconds.

1) Within 3 seconds after turning the ignition switch to ON, set the lighting switch to tail light or headlight position.

2) Press the odo/trip meter knob three times.

3) Turn the lighting switch to OFF, and press the odo/trip meter knob three times.

4) Set the lighting switch to tail light or headlight position again, and press the odo/trip meter knob three times.

NOTE:

- If the odo/trip meter knob is pressed four times in the step, it will switch to the DTC display mode. <Ref. to IDI-11, DTC DISPLAY MODE, INSPECTION, Combination Meter System.>

- When the self-diagnosis function operates, the warning light, indicator, and LCD display checks are performed. After this, the buzzer will sound for 0.5 seconds every time the odo/trip meter knob is pressed, and operation checks are performed in the order of meter indicator needle operation, meter indicator needle indication, and LCD. Turn the ignition switch to OFF to cancel the self-diagnosis function.

- When the engine starts during diagnosis, the self-diagnosis function is not cancelled, however, once the vehicle starts driving, the self-diagnosis function is deactivated automatically for safety.

5) Move on to the "Meter Indicator Needle Operation Check".

Check meter operation, warning light, indicator light, and LCD.

Meter indicator needle	LCD display, illumination	Warning lights, indicator lights
MIN indication ↓ MAX indication	ILL1 (lowest brightness) ↓ (Display each level for 1 second) ILL6 (highest brightness)	Light ON The engine coolant temperature warning light illuminates in red.
MAX indication ↓ MIN indication	ILL6 (highest brightness) ↓ (Display each level for 1 second) ILL1 (lowest brightness)	

6) Press the odo/tripmeter knob once.

7) Move on to the "Meter Indicator Needle Indication Check".

Check meter operation, warning light, indicator light, and LCD.

NOTE:

- The meter indicator needle will switch every 1.5 seconds.

- The ILL illumination level will be at the brightness it was set to when switching to the "Meter Indicator Needle Indication Check".

Speedometer (km/h)	Tachometer (rpm)	Fuel gauge	Engine coolant temperature gauge	Low fuel warning light	Warning lights, indicator lights
0	0	Lowest position	Lowest position	Light ON	Light OFF The engine coolant temperature indicator light illuminates in blue.
0	0	E	C	Light ON	
40	1000	1/2	1/2	Light OFF	
100	4000	F	H	Light OFF	
40	1000	1/2	1/2	Light OFF	
0	0	E	C	Light ON	

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8) Press the odo/tripmeter knob once.
9) Move on to the "LCD Display Check".
Check the LCD.

NOTE:

- All warning lights and indicator lights turn off.
- The meter indicator needle maintains its position in the "Meter Indicator Needle Indication Check".
- The ILL illumination level is lit at ILL6 (highest brightness).

Illuminating order	1	2	3	4	5	6	7	8	9	10	11	12	13	Go back to 1 and repeat
ODO, TRIP A/B	All lights ON	All lights OFF	ODO	All lights OFF	TRIP A	All lights OFF	TRIP B	All lights OFF	All lights OFF	All lights OFF	TRIP A	All lights OFF	TRIP B	
Odo/trip meter	88888.8	111111	22222.2	333333	44444.4	555555	66666.6	777777	88888.8	999999	00000.0	888888	88888.8	
AT shift indicator	All lights ON	1	2	3	4	5	6	7	P	R	N	D	E	
▲ ▼	▲ ▼	All lights OFF	▲	All lights OFF	▼	All lights OFF	▲	All lights OFF	▼	All lights OFF	▲	All lights OFF	▼	

2. SYMPTOM CHART

Symptoms	Repair order	Reference
Combination meter assembly does not operate.	1. Power supply 2. Ground circuit 3. Combination meter	<Ref. to IDI-6, CHECK POWER SUPPLY AND GROUND CIRCUIT, INSPECTION, Combination Meter System.>
Speedometer does not operate.	1. VDC C/U 2. Harness 3. Combination meter	<Ref. to IDI-6, CHECK VDC CONTROL MODULE, INSPECTION, Combination Meter System.>
Tachometer does not operate.	1. ECM 2. Harness 3. Combination meter	<Ref. to IDI-7, CHECK ENGINE CONTROL MODULE (ECM), INSPECTION, Combination Meter System.>
Fuel gauge does not operate.	1. Combination meter 2. Communication circuit 3. Harness 4. Body integrated unit 5. Fuel level sensor	<Ref. to IDI-8, CHECK FUEL LEVEL SENSOR, INSPECTION, Combination Meter System.>
Warning buzzer for key left in ignition does not sound.	1. Communication circuit 2. Combination meter	<Ref. to IDI-10, CHECK WARNING BUZZER FOR KEY LEFT IN IGNITION, INSPECTION, Combination Meter System.>

CAUTION:

When measuring the voltage and resistance of each control module or sensor, use a tapered pin with a diameter of less than 0.64 mm (0.025 in) in order to avoid poor contact. Do not insert the pin more than 2 mm (0.08 in).

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3. CHECK POWER SUPPLY AND GROUND CIRCUIT

Step	Check	Yes	No
1 CHECK POWER SUPPLY FOR COMBINATION METER. 1) Remove the combination meter. <Ref. to IDI-16, REMOVAL, Combination Meter.> 2) Disconnect the combination meter harness connector. 3) Turn the ignition switch to ON. 4) Measure the voltage between combination meter connector and chassis ground. Connector & terminal (i10) No. 2 (+) — Chassis ground (-):	Is the voltage 10 V or more?	Go to step 2.	Check the harness for open or short between the ignition switch and combination meter.
2 CHECK POWER SUPPLY FOR COMBINATION METER. Measure the voltage between combination meter connector and chassis ground. Connector & terminal (i10) No. 1 (+) — Chassis ground (-):	Is the voltage 10 V or more?	Go to step 3.	Check the harness for open or short between the fuse and combination meter.
3 CHECK GROUND CIRCUIT OF COMBINATION METER. 1) Turn the ignition switch to OFF. 2) Measure the resistance of harness between combination meter connector and chassis ground. Connector & terminal (i10) No. 21 — Chassis ground: (i10) No. 22 — Chassis ground:	Is the resistance less than 10 Ω ?	Replace the meter case assembly.	Repair the wiring harness.

4. CHECK VDC CONTROL MODULE

Step	Check	Yes	No
1 CHECK VEHICLE SPEED SIGNAL. 1) Lift up the vehicle and support it with rigid racks. 2) Drive the vehicle faster than 10 km/h (6 MPH). WARNING: Be careful not to get caught in the running wheels. 3) Measure the voltage between combination meter connector and chassis ground. Connector & terminal (i10) No. 31 (+) — Chassis ground (-):	Is the voltage less than 1 V $\longleftrightarrow$ 5 V or more?	Replace the meter case assembly.	Go to step 2.
2 CHECK HARNESS BETWEEN VDC CONTROL MODULE AND COMBINATION METER. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the VDC control module and combination meter. 3) Measure the resistance between VDC control module harness connector and combination meter harness connector. Connector & terminal (B310) No. 33 — (i10) No. 31:	Is the resistance less than 10 Ω ?	Check the VDC control module. <Ref. to VDC(diag)-2, Basic Diagnostic Procedure.>	Repair the wiring harness.

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5. CHECK ENGINE CONTROL MODULE (ECM)

Step	Check	Yes	No
1 CHECK ECM SIGNAL. 1) Start the engine. 2) Measure the voltage between ECM connector and chassis ground. Connector & terminal (B136) No. 22 (+) — Chassis ground (-):	Is the voltage 0 $\longleftrightarrow$ 14 V or more?	Go to step 2.	Inspect the ECM. <Ref. to EN(H4SO)(diag)-2, Basic Diagnostic Procedure.> <Ref. to EN(H4DOTC)(diag)-2, Basic Diagnostic Procedure.>
2 CHECK HARNESS BETWEEN COMBINATION METER AND ECM. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and combination meter. 3) Measure the resistance between ECM harness connector and combination meter harness connector. Connector & terminal (B136) No. 22 — (i10) No. 32:	Is the resistance less than 10 Ω ?	Replace the meter case assembly.	Repair the wiring harness.

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6. CHECK FUEL LEVEL SENSOR

Step	Check	Yes	No
1 CHECK COMBINATION METER. Check combination meter fuel gauge indication status.	Does the fuel gauge indicate EMPTY and is the remaining fuel or similar warning light blinking?	Go to step 4.	Go to step 2.
2 CHECK COMBINATION METER. Perform self-diagnosis of the combination meter. <Ref. to IDI-4, SELF-DIAGNOSIS, INSPECTION, Combination Meter System.>	Is operation normal?	Go to step 3.	Replace the meter case assembly.
3 CHECK THE COMMUNICATION STATUS. 1) Prepare the Subaru Select Monitor kit. 2) Turn the ignition switch to ON (engine OFF), and run the "PC application for Subaru Select Monitor". 3) Read the DTC of body integrated unit using Subaru Select Monitor. <Ref. to LAN(diag)-14, OPERATION, Subaru Select Monitor.>	Is DTC being displayed?	Perform the diagnosis according to DTC. <Ref. to LAN(diag)-28, LIST, List of Diagnostic Trouble Code (DTC).>	Go to step 4.
4 CHECK HARNESS. 1) Disconnect the harness connector of body integrated unit. 2) Measure the resistance between the body integrated unit harness connector terminal and chassis ground. Connector & terminal (B281) No. 7 — Chassis ground:	Is the resistance less than 2 — 96 Ω?	Go to step 5. When "Yes" was chosen in step 1, Go to step 9.	Repair the wiring harness.
5 CHECK COMMUNICATION BETWEEN THE BODY INTEGRATED UNIT AND METER. 1) Remove the fuel sub level sensor. <Ref. to FU(H4SO)-60, REMOVAL, Fuel Sub Level Sensor.> <Ref. to FU(H4DOTC)-67, REMOVAL, Fuel Sub Level Sensor.> 2) Short the fuel sub level sensor connector terminal to the chassis ground using a suitable lead wire with 100 Ω resistance connected between connector terminal and chassis ground. 3) Turn the ignition switch to ON. Terminal (R59) No. 1 — Chassis ground:	Does the meter needle indicate EMPTY?	Go to step 7.	Go to step 6.
6 CHECK BODY INTEGRATED UNIT. Under the same conditions as step 5, read the data of "Fuel Level Sensor Resistance" of the body integrated unit using the Subaru Select Monitor. <Ref. to LAN(diag)-14, OPERATION, Subaru Select Monitor.>	Is the data displayed as 100 Ω?	Go to step 11.	Replace the body integrated unit. <Ref. to SL-42, REMOVAL, Body Integrated Unit.>
7 CHECK COMMUNICATION BETWEEN THE BODY INTEGRATED UNIT AND METER. 1) Remove the fuel sub level sensor. <Ref. to FU(H4SO)-60, REMOVAL, Fuel Sub Level Sensor.> <Ref. to FU(H4DOTC)-67, REMOVAL, Fuel Sub Level Sensor.> 2) Short the fuel sub level sensor connector terminal to the chassis ground using a suitable lead wire with 2 — 6 Ω resistance connected between connector terminal and chassis ground. 3) Turn the ignition switch to ON. Terminal (R59) No. 1 — Chassis ground:	Does the meter needle indicate FULL?	Go to step 9.	Go to step 8.

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Step	Check	Yes	No
8 CHECK BODY INTEGRATED UNIT. Under the same conditions as step 7, read the data of "Fuel Level Sensor Resistance" of the body integrated unit using the Subaru Select Monitor. <Ref. to LAN(diag)-14, OPERATION, Subaru Select Monitor.>	Is it approximately 2 — 6 Ω ?	Go to step 11.	Replace the body integrated unit. <Ref. to SL-42, REMOVAL, Body Integrated Unit.>
9 CHECK FUEL SUB LEVEL SENSOR. 1) Remove the fuel sub level sensor. <Ref. to FU(H4SO)-60, REMOVAL, Fuel Sub Level Sensor.> <Ref. to FU(H4DOTC)-67, REMOVAL, Fuel Sub Level Sensor.> 2) Measure the resistance between fuel sub level sensor connector terminals when the float is in FULL or EMPTY position. Connector & terminal (R59) No. 1 — No. 2:	Is the resistance 1.0 — 3.0 Ω (FULL), and 61 — 63 Ω (EMPTY)?	Go to step 10.	Replace the fuel sub level sensor.
10 CHECK FUEL LEVEL SENSOR. 1) Remove the fuel level sensor. <Ref. to FU(H4SO)-58, REMOVAL, Fuel Level Sensor.> <Ref. to FU(H4DOTC)-66, REMOVAL, Fuel Level Sensor.> 2) Measure the resistance between fuel level sensor connector terminals when the float is in FULL or EMPTY position. Connector & terminal (R58) No. 1 — No. 4:	Is the resistance 1.0 — 3.0 Ω (FULL), and 31 — 33 Ω (EMPTY)?	Check the harness and connector for possible intermittent poor contact.	Replace the fuel level sensor.
11 CHECK COMBINATION METER OPERATION. 1) Remove the combination meter. 2) Install the combination meter to another vehicle with a normally operating fuel meter and check meter operation.	Is the fuel meter OK?	Replace the body integrated unit. <Ref. to SL-42, REMOVAL, Body Integrated Unit.>	Replace the meter case assembly.

7. CHECK ENGINE COOLANT TEMPERATURE SENSOR

Step	Check	Yes	No
1 CHECK THE COMMUNICATION STATUS. 1) Connect the Subaru Select Monitor and then turn the ignition switch and Subaru Select Monitor to ON. 2) Read the DTC of the body integrated unit. <Ref. to LAN(diag)-14, OPERATION, Subaru Select Monitor.>	Is DTC being displayed?	Perform the diagnosis according to DTC. <Ref. to LAN(diag)-28, LIST, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2 CHECK ENGINE COOLANT TEMPERATURE SENSOR. Check the engine coolant temperature sensor. <Ref. to EN(H4SO)(diag)-2, Basic Diagnostic Procedure.> <Ref. to EN(H4DOTC)(diag)-2, Basic Diagnostic Procedure.>	Is the engine coolant temperature sensor OK?	Replace the meter case assembly.	Replace the engine coolant temperature sensor.

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8. CHECK WARNING BUZZER FOR KEY LEFT IN IGNITION

Step	Check	Yes	No
1 CHECK WARNING BUZZER FOR KEY LEFT IN IGNITION. 1) Insert the key into the ignition key lock. 2) Open the driver's side door.	Does the buzzer from the meter sound?	Normal operation.	Go to step 2.
2 CHECK THE COMMUNICATION STATUS. 1) Prepare the Subaru Select Monitor. 2) On the "System Selection Menu" display screen, select the {Integ. unit mode}. 3) Display the current data display and display "Key Warning Switch Input". 4) Remove and insert the key.	Does display switch between ON ⇔ OFF?	Go to step 3.	Check the ignition switch circuit. <Ref. to SL-36, INSPECTION, Ignition Key Lock.>
3 CHECK THE COMMUNICATION STATUS. 1) Display the current data display and display "Driver's Door Switch Input". 2) Open and close the door.	Does display switch between ON ⇔ OFF?	Go to step 4.	Check the door switch circuit. <Ref. to SL-9, CHECK DOOR LOCK SWITCH, INSPECTION, Door Lock Control System.>
4 CHECK THE COMMUNICATION STATUS. 1) Turn the ignition switch to ON (engine OFF), and start "Application for Subaru Select Monitor". 2) Read the DTC of the body integrated unit. <Ref. to LAN(diag)-14, OPERATION, Subaru Select Monitor.>	Is DTC being displayed?	Perform the diagnosis according to DTC. <Ref. to LAN(diag)-28, LIST, List of Diagnostic Trouble Code (DTC).>	Go to step 5.
5 CHECK COMBINATION METER. Perform the self-diagnosis of combination meter. <Ref. to IDI-4, SELF-DIAGNOSIS, INSPECTION, Combination Meter System.>	Did the buzzer sound?	Go to step 6.	Replace the meter case assembly.
6 CHECK COMBINATION METER. 1) Remove the combination meter. 2) Install the combination meter to another vehicle with a normally operating buzzer and check buzzer operation.	Did the buzzer sound?	Replace the body integrated unit. <Ref. to SL-42, REMOVAL, Body Integrated Unit.>	Replace the meter case assembly.

9. DTC DISPLAY MODE

It is possible to display the DTC of the combination meter through the following procedures.

- 1) Within 3 seconds after turning the ignition switch to ON, set the lighting switch to tail light or headlight position.
- 2) Press the odometer/tripmeter knob four times.
- 3) Turn the lighting switch to OFF, and press the odometer/trip meter knob four times.
- 4) Set the lighting switch to tail light or headlight position again, and press the odometer/tripmeter knob four times.

NOTE:

- Perform the steps described in 2) and 4) within 10 seconds.
- When the engine starts during diagnosis, the self-diagnosis function is not cancelled, however, once turning the ignition switch to OFF or the vehicle starts driving, DTC display mode is cancelled automatically for safety.
- When the DTC display mode operates, {ECM}, {TCM}, {VDC} is displayed cyclically in this order for every three seconds or every press of the trip knob. DTC is displayed in the following table according to type of control module, receiving DTC, DTC detected, No DTC.
- When the DTCs of individual control modules change from current malfunctions to past malfunctions, and the trouble is cleared, when the engine is started three or more times, the DTC will no longer be displayed in the combination meter. In this case, read the DTC using Subaru Select Monitor.

Control module	Condition	Display
ECM	Receiving DTC	Trip "A" + "P (Blink)"
	DTC detected	Trip "A" + "P xxxx"
	No DTC	Trip "A" + "P ----"
TCM	Receiving DTC	Trip "B" + "P (Blink)"
	DTC detected	Trip "B" + "P xxxx"
	No DTC	Trip "B" + "P ----"
VDC CM	Receiving DTC	Trip "A" + "C (Blink)"
	DTC detected	Trip "A" + "C xxxx"
	No DTC	Trip "A" + "C ----"
When CAN communication error is occurred	—	"-----"

NOTE:

Only receiving DTC is displayed because the MT model is not equipped with a TCM.