BODY SECTION

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

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

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

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

FUJI HEAVY INDUSTRIES LTD.

HVAC SYSTEM (HEATER, VENTILATOR AND A/C)	AC
AIRBAG SYSTEM	AB
SEAT BELT SYSTEM	SB
LIGHTING SYSTEM	LI
WIPER AND WASHER SYSTEMS	WW
ENTERTAINMENT	ET
COMMUNICATION SYSTEM	СОМ
GLASS/WINDOWS/MIRRORS	GW
BODY STRUCTURE	BS
BODY STRUCTURE	BS IDI
INSTRUMENTATION/DRIVER INFO	IDI
INSTRUMENTATION/DRIVER INFO SEATS	IDI SE
INSTRUMENTATION/DRIVER INFO SEATS SECURITY AND LOCKS SUNROOF/T-TOP/CONVERTIBLE TOP	IDI SE SL
INSTRUMENTATION/DRIVER INFO SEATS SECURITY AND LOCKS SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)	IDI SE SL SR

INSTRUMENTATION/DRIVER INFO

IDI

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1.	Combination Mater Custom	۷۲
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4.	Speedometer	17
5.	Tachometer	
6.	Fuel Gauge	
7.	Water Temperature Gauge	
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1. General Description S907001

A: SPECIFICATIONS 5907001E49

	Speedometer	Electric pulse type
	Temperature gauge	Thermistor cross coil type
	Fuel gauge	Resistance cross coil type
	Tachometer	Electric impulse type
	Turn signal indicator light	14 V — 1.4 W
	Charge indicator light	14 V — 1.4 W
	Oil pressure indicator light	14 V — 1.4 W
	ABS warning light	14 V — 1.4 W
	CHECK ENGINE warning light (Malfunction indicator light)	14 V — 1.4 W
	HI-beam indicator light	14 V — 1.4 W
	Door open warning light	LED
Combination meter	Seat belt warning light	14 V — 1.4 W
	Brake fluid and parking brake warning light	14 V — 1.4 W
	FWD indicator light	14 V — 1.4 W
	AIRBAG warning light	14 V — 1.4 W
	Meter illumination light	14 V — 3 W, 1.4 W
	AT OIL TEMP. warning light	14 V — 1.4 W
	LO indicator light	14 V — 1.4 W
	HOLD indicator light	14 V — 1.4 W
	POWER indicator light	14 V — 1.4 W
	Rear differential oil temperature warning light	14 V — 1.4 W
	Immobilizer indicator light	LED
	Low fuel warning light	14 V — 1.4 W
	LCD back light	14 V — 1.4 W

B: CAUTION S907001A03

- Be careful not to damage meters and instrument panel.
- Be careful not to damage meter glasses.Make sure that electrical connector is connected securely.
- After installation, make sure that each meter operates normally.
- Use gloves to avoid damage and getting fingerprints on the glass surface and meter surfaces.
- Do not apply excessive force to circuit plate.
- Do not drop or otherwise apply impact.

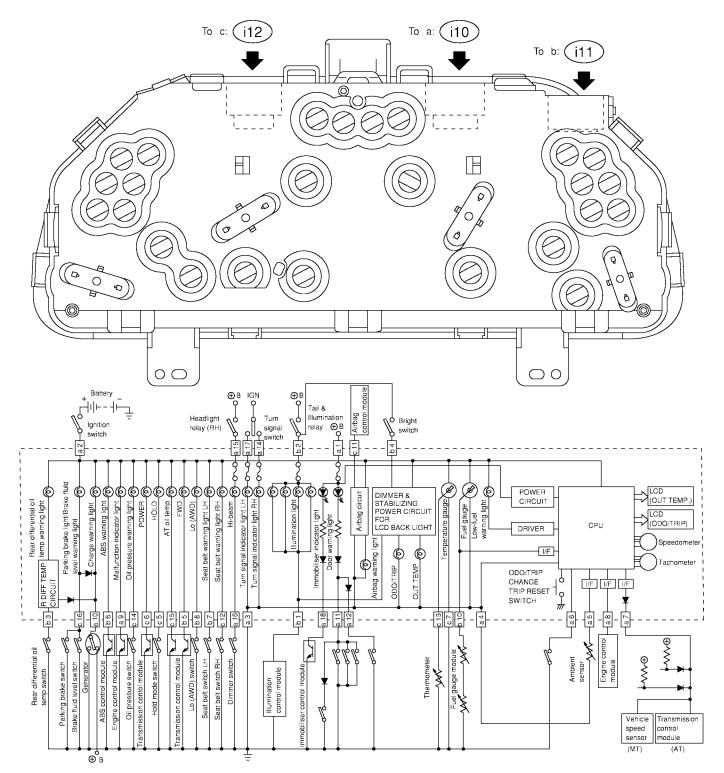
C: PREPARATION TOOL S907001A17

1. GENERAL TOOLS S907001A1701

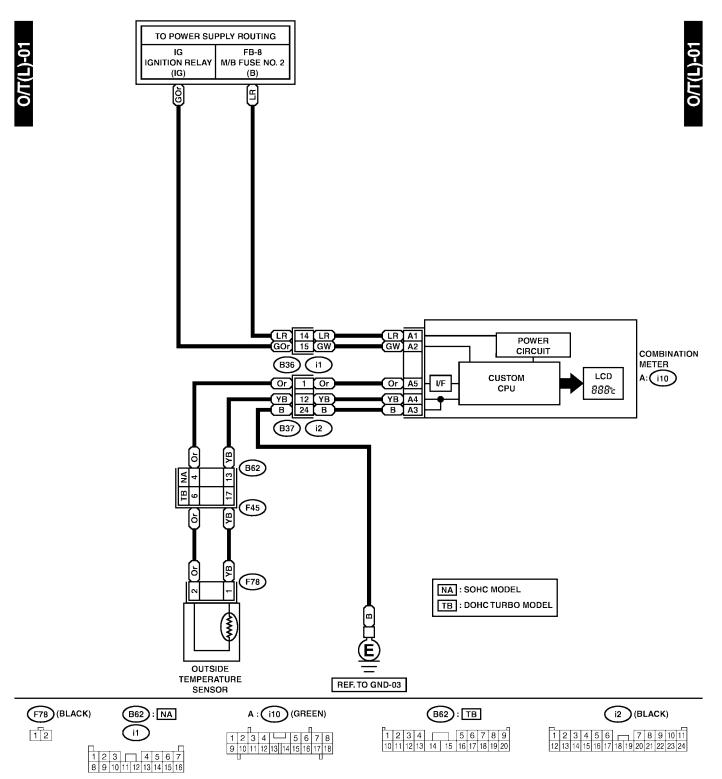
TOOL NAME	REMARKS
Circuit Tester	Used for measuring resistance and voltage.

2. Combination Meter System SUDFOT

- A: SCHEMATIC S907607A21
- 1. COMBINATION METER S907607A2101



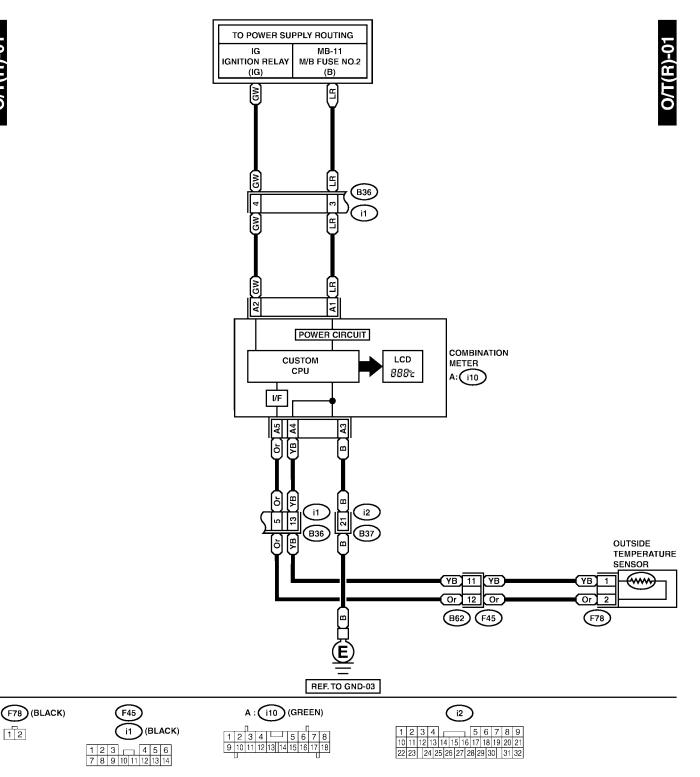
2. OUTSIDE TEMPERATURE INDICATOR LHD MODEL 5907607A2103



3. OUTSIDE TEMPERATURE INDICATOR RHD MODEL 5907607A2104



12



B: INSPECTION S907607A10

CAUTION:

When measuring voltage and resistance of the ECM, TCM, or each 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).

1. SYMPTOM CHART S907607A1007

Symptom	Repair order	Reference
Combination meter assembly does not operate.	(1) Power supply(2) Ground circuit	<ref. check<br="" idi-8="" to="">POWER SUPPLY AND GROUND CIRCUIT, INSPECTION, Combina- tion Meter System.></ref.>
Speedometer does not operate.	 (1) (MT) Vehicle speed sensor (AT) Transmission control module (2) Harness (3) Speedometer 	MT: <ref. idi-9<br="" to="">CHECK VEHICLE SPEED SENSOR, INSPECTION, Combina- tion Meter System.> AT: <ref. idi-10<br="" to="">CHECK TRANSMIS- SION CONTROL MODULE, INSPECTION, Combina- tion Meter System.></ref.></ref.>
Tachometer does not operate.	(1) Engine control module(2) Harness(3) Tachometer	<ref. check<br="" idi-11="" to="">ENGINE CONTROL MODULE, INSPECTION, Combina- tion Meter System.></ref.>
Fuel gauge does not operate.	(1) Fuel level sensor(2) Harness(3) Fuel gauge	<ref. check<br="" idi-12="" to="">FUEL LEVEL SENSOR, INSPECTION, Combina- tion Meter System.></ref.>
Water temperature gauge does not operate.	(1) Engine coolant temperature sensor(2) Harness(3) Water temperature gauge	<ref. check<br="" idi-13="" to="">ENGINE COOLANT TEMPERATURE SENSOR, INSPECTION, Combina- tion Meter System.></ref.>
Outside temperature indicator does not operate.	(1) Ambient sensor(2) Harness(3) Combination meter	<ref. check<br="" idi-14="" to="">OUTSIDE TEMPERA- TURE INDICATOR, INSPECTION, Combina- tion Meter System.></ref.>

2. CHECK POWER SUPPLY AND GROUND CIRCUIT S907607A1001

No.	Step	Check	Yes	No
1	CHECK POWER SUPPLY FOR COMBINA- TION METER. 1) Remove combination meter. <ref. idi-15<br="" to="">REMOVAL, Combination Meter Assembly.> 2) Disconnect combination meter harness connector. 3) Turn ignition switch to ON. 4) Measure voltage between combination meter connector (i10) and chassis ground. Connector & terminal (i10) No. 1 (+) — Chassis ground (-):</ref.>	Is the voltage more than 10 V?	Go to step 2.	Check harness for open or short between fuse and combination meter.
2	CHECK POWER SUPPLY FOR COMBINA- TION METER. Measure voltage between combination meter connector (i10) and chassis ground. <i>Connector & terminal</i> (i10) No. 2 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Go to step 3.	Check harness for open or short between ignition relay and combi- nation meter.
3	CHECK GROUND CIRCUIT OF COMBINA- TION METER. 1) Turn ignition switch to OFF. 2) Measure resistance of harness between combination meter connector (i10) and chas- sis ground. Connector & terminal (i10) No. 3 (+) — Chassis ground (-):	Is the resistance less than 10 Ω?	Replace combina- tion meter printed circuit.	Repair wiring har- ness.

3. CHECK VEHICLE SPEED SENSOR

S907607A1002

No.	Step	Check	Yes	No
1	 CHECK VEHICLE SPEED SENSOR. 1) Set the vehicle on a free roller, or lift-up the vehicle and support it with safety stands. 2) Remove the combination meter with harness connector. WARNING: Be careful not to get caught in the running wheels. 3) Drive the vehicle at a speed greater than 20 km/h (12 MPH). 4) Measure voltage between combination meter connector (i10) and chassis ground. Connector & terminal (i10) No. 7 (+) — Chassis ground (-): 	Is the voltage less than 1 V ←→ more than 4?	Check speedom- eter. <ref. to<br="">IDI-17 REMOVAL, Speedometer.></ref.>	Go to step 2.
2	 CHECK VEHICLE SPEED SENSOR POWER SUPPLY. 1) Turn ignition switch to OFF. 2) Disconnect vehicle speed sensor harness connector. 3) Turn ignition switch to ON. 4) Measure voltage between vehicle speed sensor connector (B17) and engine ground. Connector & terminal (B17) No. 3 (+) — Engine ground (-): 	Is the voltage more than 10 V?	Go to step 3.	Check harness for open or short between ignition relay and vehicle speed sensor.
3	CHECK HARNESS BETWEEN VEHICLE SPEED SENSOR AND ENGINE GROUND. 1) Turn ignition switch to OFF. 2) Measure resistance between vehicle speed sensor connector (B17) and engine ground. Connector & terminal (B17) No. 2 (+) — Engine ground (-):	Is the resistance less than 10 Ω ?	Go to step 4.	Repair wiring har- ness.
4	 CHECK HARNESS BETWEEN VEHICLE SPEED SENSOR AND COMBINATION METER. 1) Disconnect connector from combination meter. 2) Measure resistance between vehicle speed sensor harness connector and combination meter harness connector. Connector & terminal (B17) No. 1 — (i10) No. 7: 	Is the resistance less than 10 Ω?	Replace vehicle speed sensor.	Repair wiring har- ness.

4. CHECK TRANSMISSION CONTROL

MODULE S907607A1008

No.	Step	Check	Yes	No
1	CHECK TRANSMISSION CONTROL MOD- ULE SIGNAL. 1) Set the vehicle on a free roller, or lift-up the vehicle and support it with safety stands. WARNING: Be careful not to get caught in the running wheels. 2) Drive the vehicle faster than 10 km/h (6 MPH). 3) Measure voltage between transmission control module connector (B55) and chassis ground. Connector & terminal (B56) No. 17 (+) — Chassis ground (-):	Is the voltage less than 1 V $\leftarrow \rightarrow$ more than 4 V?	Go to step 2.	Check transmis- sion control mod- ule. <ref. at-2<br="" to="">Basic Diagnostic Procedure.></ref.>
2	CHECK HARNESS BETWEEN TRANSMIS- SION CONTROL MODULE AND COMBINA- TION METER. 1) Turn ignition switch to OFF. 2) Disconnect connector from transmission control module and combination meter. 3) Measure resistance between transmission control module harness connector (B55) and combination meter harness connector (i10). Connector & terminal (B56) No. 17 — (i10) No. 7:	Is the resistance less than 10 Ω?	Check speed meter. <ref. to<br="">IDI-17 REMOVAL, Speedometer.></ref.>	Repair wiring har- ness.

5. CHECK ENGINE CONTROL MODULE

S907607A1004

No.	Step	Check	Yes	No
1	CHECK ENGINE CONTROL MODULE SIG- NAL. 1) Start the engine. 2) Measure voltage between engine control module connector (B84, B134 or B136) and engine ground. Connector & terminal SOHC model: (B134) No. 30 (+) — Engine ground (–): SOHC without OBD model: (B84) No. 6 (+) — Engine ground (–): DOHC turbo model: (B136) No. 9 (+) — Engine ground (–):	Is the voltage 0 $\leftarrow \rightarrow$ 13 V or more?	Go to step 2.	Check engine control module. <ref. to<br="">EN(SOHC)-2, Basic Diagnostic Procedure.>, <ref. to<br="">EN(SOHCW/ oOBD)-2, Basic Diagnostic Proce- dure.> or <ref. to<br="">EN(DOHC TURBO)-2, Basic Diagnostic Proce- dure.></ref.></ref.></ref.>
2	CHECK HARNESS BETWEEN COMBINA- TION METER AND ENGINE CONTROL MODULE. 1) Turn ignition switch to OFF. 2) Disconnect connector from engine control module and combination meter. 3) Measure resistance between engine control module harness connector (B84, B134 or B136) and combination meter harness con- nector (i11). Connector & terminal SOHC model: (B134) No. 30 — (i10) No. 8: SOHC without OBD model: (B84) No. 6 (+) — (i10) No. 8: DOHC turbo model: (B136) No. 9 (+) — (i10) No. 8:	Is the resistance less than 10 Ω?	Check tachom- eter. <ref. to<br="">IDI-18 REMOVAL, Tachometer.></ref.>	Repair wiring har- ness.

6. CHECK FUEL LEVEL SENSOR S907607A1005

No.	Step	Check	Yes	No
1	CHECK FUEL LEVEL SENSOR. 1) Remove fuel level sensor. <ref. to<br="">FU(SOHC)-64, REMOVAL, Fuel Level Sensor.>, <ref. fu(sohcw="" oobd)-52,<br="" to="">REMOVAL, Fuel Level Sensor.> or <ref. to<br="">FU(DOHC TURBO)-62, REMOVAL, Fuel Level Sensor.> 2) Measure resistance between fuel level sen- sor terminals when setting the float to FULL and EMPTY position. Terminals No. 3 — No. 5:</ref.></ref.></ref.>	Is the resistance 0.5 to 2.5 Ω (FULL) and 50 to 52 Ω (EMPTY)?	Go to step 2.	Replace the fuel level sensor.
2	CHECK FUEL SUB LEVEL SENSOR. 1) Remove fuel sub level sensor. <ref. to<br="">FU(SOHC)-65, REMOVAL, Fuel Sub Level Sensor.>, <ref. fu(sohcw="" oobd)-53,<br="" to="">REMOVAL, Fuel Sub Level Sensor.> or <ref. to FU(DOHC TURBO)-63, REMOVAL, Sub Fuel Level Sensor.> 2) Measure resistance between fuel sub level sensor terminals when setting the float to FULL and EMPTY position. Terminals No. 1 — No. 2:</ref. </ref.></ref.>	Is the resistance 0.5 to 2.5 Ω (FULL) and 42 to 44 Ω (EMPTY)?	Go to step 3.	Replace the fuel sub level sensor.
3	 CHECK HARNESS BETWEEN FUEL SUB LEVEL SENSOR AND COMBINATION METER. 1) Disconnect connector from combination meter. 2) Measure resistance between fuel sub level sensor harness connector terminal and com- bination meter harness connector terminal. Connector & terminal (R59) No. 1 – (i11) No. 10: 	Is the resistance less than 10 Ω?	Go to step 4.	Repair wiring har- ness.
4	CHECK HARNESS BETWEEN FUEL LEVEL SENSOR AND FUEL SUB LEVEL SENSOR. Measure resistance between fuel level sensor harness connector terminal and fuel sub level sensor harness connector terminal. Connector & terminal (R58) No. 3 — (R59) No. 2:	Is the resistance less than 10 Ω?	Go to step 5.	Repair wiring har- ness.
5	CHECK FUEL LEVEL SENSOR GROUND CIRCUIT. Measure resistance between fuel level sensor harness connector terminal and chassis ground. Connector & terminal (R58) No. 5 — Chassis ground:	Is the resistance less than 10 Ω?	Check fuel gauge. <ref. idi-19,<br="" to="">REMOVAL, Fuel Gauge.></ref.>	Repair wiring har- ness.

7. CHECK ENGINE COOLANT TEMPERATURE SENSOR S907607A1006

No.	Step	Check	Yes	No
1	CHECK ENGINE COOLANT TEMPERA- TURE SENSOR. Check engine coolant temperature sensor. <ref. dtc<br="" en(sohc)-122,="" to="">P0117—ENGINE COOLANT TEMPERATURE SENSOR CIRCUIT LOW INPUT—, Diagnos- tic Procedure with Diagnostic Trouble Code (DTC).>, <ref. en(sohcw="" oobd)-70,<br="" to="">DTC21 ENGINE COOLANT TEMPERATURE SENSOR, Diagnostic Procedure with Diag- nostic Trouble Code (DTC).> or <ref. to<br="">EN(DOHC TURBO)-130, DTC P0117—ENGINE COOLANT TEMPERATURE SENSOR CIRCUIT LOW INPUT—, Diagnos- tic Procedure with Diagnostic Trouble Code (DTC).></ref.></ref.></ref.>	Is engine coolant tempera- ture sensor OK?	Go to step 2.	Replace engine coolant tempera- ture sensor.
2	CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND COMBINATION METER. 1) Turn ignition switch to OFF. 2) Disconnect connector from engine coolant temperature sensor and combination meter. 3) Measure resistance between engine cool- ant temperature sensor harness connector (E8) and combination meter harness connec- tor (i12). Connector & terminal (E8) No. 3 — (i12) No. 13:	Is the resistance less than 10 Ω?	Check water tem- perature gauge. <ref. idi-20<br="" to="">REMOVAL, Water Temperature Gauge.></ref.>	Repair wiring har- ness.

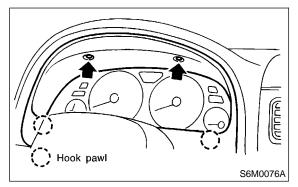
8. CHECK OUTSIDE TEMPERATURE INDICATOR S907607A1009

No.	Step	Check	Yes	No
1	CHECK POWER SUPPLY FOR AMBIENT SENSOR. 1) Turn ignition switch OFF. 2) Disconnect connector from ambient sensor. 3) Turn ignition switch ON. 4) Measure voltage between ambient sensor harness connector terminal and chassis ground. Connector & terminal (F78) No. 2 (+) — Chassis ground (-):	Is the voltage more than 4 V?	Go to step 2.	Check harness for open or short between ambient sensor and com- bination meter.
2	CHECK AMBIENT SENSOR. 1) Turn ignition switch OFF. 2) Remove ambient sensor. 3) Check ambient sensor. <ref. idi-21<br="" to="">INSPECTION, Ambient Sensor.></ref.>	Is the ambient sensor OK?	Go to step 3.	Replace the ambi- ent sensor.
3	 CHECK HARNESS BETWEEN AMBIENT SENSOR AND COMBINATION METER. 1) Disconnect connector from combination meter. 2) Measure resistance between ambient sen- sor harness connector terminal and combina- tion meter harness connector terminal. Connector & terminal (F78) No. 1 – (i10) No. 4: (F78) No. 2 – (i10) No. 5: 	Is the resistance less than 10 Ω?	Go to step 4.	Repair wiring har- ness.
4	 CHECK OUTSIDE TEMPERATURE INDICATOR. 1) Connect combination meter harness connector. 2) Connect a resistor (3.0 kΩ) between terminals of ambient sensor harness connector. 3) Turn ignition switch ON and check the outside temperature indicator display. 	Is the outside temperature indicator indicating 25°C (77°F)?	Check poor con- tact in ambient sensor harness connector.	Replace combina- tion meter printed circuit.

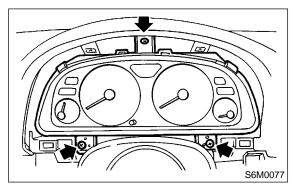
3. Combination Meter Assembly 5007335

A: REMOVAL S907335A18

- 1) Disconnect ground cable from battery.
- 2) Set tilt steering at the lowest position.
- 3) Remove screws and detach meter visor.



4) Remove screws of combination meter and pull out the meter toward you.



5) Disconnect connector in the upper area of combination meter to remove meter.

CAUTION:

• Be careful not to damage meter or instrument panel.

• Pay particular attention to avoid damaging the meter glass.

B: INSTALLATION S907335A11

Install in the reverse order of removal.

CAUTION:

• Make sure that electrical connector is connected securely.

• Make sure that each meter operates normally.

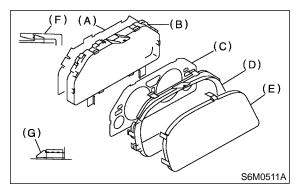
C: DISASSEMBLY S907335A06

CAUTION:

Use gloves to avoid damage and getting fingerprints on the glass surface and meter surfaces.

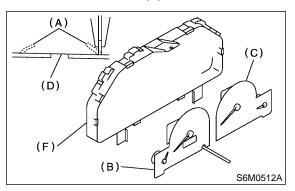
1) Disengage claw (F) to remove case (B) from back cover (A).

2) Disengage claw (G) to remove meter glass (E), reflector (D), and window plate (C) from inner case.

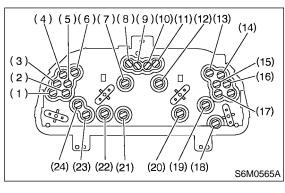


3) Pull up claw (A) of combination meter printed circuit with combination pliers. Push out speedometer assembly (B) and tachometer assembly (C) using hole (D).

4) Pull up claw in the center of combination meter printed circuit and remove combination meter printed circuit from case (F).



1. BULB REPLACEMENT S907335A0601



- (1) Check engine
- (2) Oil pressure
- (3) Charge
- (4) Seat belt (RHD)
- (5) AT oil temp.
- (6) Brake
- (7) Tachometer
- (8) Turn RH
- (9) Airbag warning light
- (10) HI-beam
- (11) Turn LH
- (12) Speedometer
- (13) FWD
- (14) Seat belt (LHD)
- (15) ABS
- (16) AWD LO
- (17) R. DIFF TEMP
- (18) Low fuel
- (19) Speedometer and fuel gauge
- (20) Odometer and trip meter
- (21) HOLD
- (22) Outside air temperature display
- (23) POWER
- (24) Tachometer and temperature gauge

D: ASSEMBLY S907335A02

Assemble in the reverse order of disassembly.

4. Speedometer S907608

A: REMOVAL S907608A18

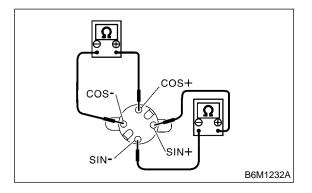
Disassemble combination meter, and then remove speedometer and fuel gauge assembly. <Ref. to IDI-15 DISASSEMBLY, Combination Meter Assembly.>

B: INSTALLATION S907608A11

Install in the reverse order of removal.

C: INSPECTION S907608A10

Measure resistance between speedometer terminals.



Tester connection	Resistance
Terminals SIN+ —SIN—	200±8 Ω
Terminals COS+ —COS—	200±8 Ω

If NG, replace speedometer and fuel gauge assembly.

5. Tachometer S907609

A: REMOVAL S907609A18

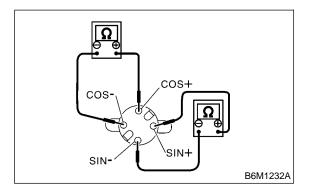
Disassemble combination meter, and then remove tachometer and water temperature gauge assembly. <Ref. to IDI-15 DISASSEMBLY, Combination Meter Assembly.>

B: INSTALLATION S907609A11

Install in the reverse order of removal.

C: INSPECTION S907609A10

Measure resistance between tachometer terminals.



Tester connection	Resistance
Terminals SIN+ —SIN—	200±8 Ω
Terminals COS+ —COS—	200±8 Ω

If NG, replace tachometer and water temperature gauge assembly.

6. Fuel Gauge S907610

A: REMOVAL S907610A18

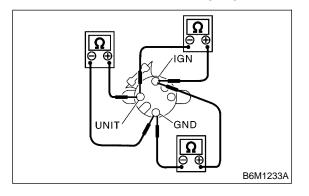
Disassemble combination meter, and then remove speedometer and fuel gauge assembly. <Ref. to IDI-15 DISASSEMBLY, Combination Meter Assembly.>

B: INSTALLATION S907610A11

Install in the reverse order of removal.

C: INSPECTION S907610A10

Measure resistance between fuel gauge terminals.



Tester connection	Resistance
Terminals IGN — GND	170±10 Ω
Terminals IGN — UNIT	35±10 Ω
Terminals UNIT — GND	136±10 Ω

If NG, replace speedometer and fuel gauge assembly.

7. Water Temperature Gauge SB07611

A: REMOVAL S907611A18

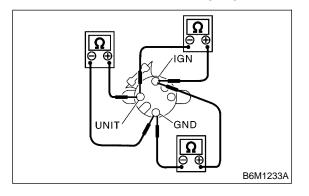
Disassemble combination meter, and then remove tachometer and water temperature gauge assembly. <Ref. to IDI-15 DISASSEMBLY, Combination Meter Assembly.>

B: INSTALLATION S907611A11

Install in the reverse order of removal.

C: INSPECTION S907611A10

Measure resistance between fuel gauge terminals.



Tester connection	Resistance
Terminals IGN — GND	208±10 Ω
Terminals IGN — UNIT	56±10 Ω
Terminals UNIT — GND	264±10 Ω

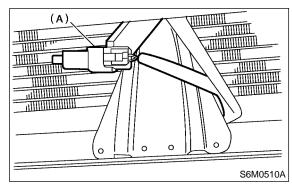
If NG, replace tachometer and water temperature gauge assembly.

8. Ambient Sensor 5907644

A: REMOVAL S907644A18

- 1) Disconnect ground cable from battery.
- 2) Disconnect ambient sensor connector.
- 3) Remove ambient sensor (A) from radiator lower

panel.

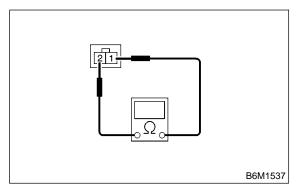


B: INSTALLATION S907644A11

Install in the reverse order of removal.

C: INSPECTION S907644A10

Measure resistance between ambient sensor terminals.



Tester connection	Resistance
1 — 2	3.0 kΩ/25°C (77°F)

If NG, replace the ambient sensor.

MEMO: