2. Combination Meter System

A: SCHEMATIC

1. COMBINATION METER

<Ref. to WI-58, SCHEMATIC, Combination Meter.>

2. OUTSIDE TEMPERATURE INDICATOR

<Ref. to WI-113, SCHEMATIC, Outside Temperature Display System.>

B: INSPECTION

CAUTION:
When measuring the voltage and resistance of the ECM, TCM, or each sensor, use a tapered pin with a diameter of less the an 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

Symptom	Repair order	Reference
Combination meter assembly does not operate.	(1) Power supply (2) Ground circuit	<Ref. to IDI-6, CHECK POWER SUPPLY AND GROUND CIRCUIT, INSPECTION, Combination Meter System.>
Speedometer does not operate.	(1) (MT) Vehicle speed sensor (AT) Transmission control module (2) Harness (3) Speedometer	MT: <Ref. to IDI-7, CHECK VEHICLE SPEED SENSOR, INSPECTION, Combination Meter System.>
		AT: <Ref. to IDI-8, CHECK TRANSMISSION CONTROL MODULE, INSPECTION, Combination Meter System.>
Tachometer does not operate.	(1) Engine control module (2) Harness (3) Tachometer	<Ref. to IDI-8, CHECK ENGINE CONTROL MODULE, INSPECTION, Combination Meter System.>
Fuel gauge does not operate.	(1) Fuel level sensor (2) Harness (3) Fuel gauge	<Ref. to IDI-9, CHECK FUEL LEVEL SENSOR, INSPECTION, Combination Meter System.>
Water temperature gauge does not operate.	(1) Engine coolant temperature sensor (2) Harness (3) Water temperature gauge	<Ref. to IDI-10, CHECK ENGINE COOLANT TEMPERATURE SENSOR, INSPECTION, Combination Meter System.>
Outside temperature indicator does not operate.	(1) Ambient sensor (2) Harness (3) Combination meter	<Ref. to IDI-11, CHECK OUTSIDE TEMPERATURE INDICATOR, INSPECTION, Combination Meter System.>

2. 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-12, REMOVAL, Combination Meter Assembly.> 2)Disconnect the combination meter harness connector. 3)Turn the ignition switch to ON. 4)Measure the voltage between the combination meter connector (i10) and chassis ground. ***Connector & terminal*** ***(i10) No. 7 (+) — Chassis ground (−):*** Is the measured value more than the specified value?	10 V	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 the combination meter connector (i10) and chassis ground. ***Connector & terminal*** ***(i10) No. 10 (+) — Chassis ground (−):*** Is the measured value more than the specified value?	10 V	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 the combination meter connector (i10) and chassis ground. ***Connector & terminal*** ***(i10) No. 6 — Chassis ground:*** Is the measured value less than the specified value?	10 Ω	Replace the combination meter printed circuit.	Repair the wiring harness.

3. CHECK VEHICLE SPEED SENSOR

	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 the voltage between the combination meter connector (i10) and chassis ground. ***Connector & terminal*** ***(i10) No. 2 (+) — Chassis ground (−):*** Is the measured value same as the specified value?	0 ←→ 4 V	Check the speedometer. <Ref. to IDI-14, REMOVAL, Speedometer.>	Go to step **2.**
2	**CHECK VEHICLE SPEED SENSOR POWER SUPPLY.** 1)Turn the ignition switch to OFF. 2)Disconnect the vehicle speed sensor harness connector. 3)Turn the ignition switch to ON. 4)Measure the voltage between the vehicle speed sensor connector (B17) and engine ground. ***Connector & terminal*** ***(B17) No. 3 (+) — Engine ground (−):*** Is the measured value more than the specified value?	10 V	Go to step **3.**	Check the harness for open or short between the ignition switch and vehicle speed sensor.
3	**CHECK HARNESS BETWEEN VEHICLE SPEED SENSOR AND ENGINE GROUND.** 1)Turn the ignition switch to OFF. 2)Measure the resistance between the vehicle speed sensor connector (B17) and engine ground. ***Connector & terminal*** ***(B17) No. 2 — Engine ground:*** Is the measured value less than the specified value?	10 Ω	Go to step **4.**	Repair the wiring harness.
4	**CHECK HARNESS BETWEEN VEHICLE SPEED SENSOR AND COMBINATION METER.** 1)Disconnect the connector from the combination meter. 2)Measure the resistance between the vehicle speed sensor harness connector and combination meter harness connector. ***Connector & terminal*** ***(B17) No. 1 — (i10) No. 2:*** Is the measured value less than the specified value?	10 Ω	Replace the vehicle speed sensor.	Repair the wiring harness.

4. CHECK TRANSMISSION CONTROL MODULE

	Step	Check	Yes	No
1	**CHECK TRANSMISSION CONTROL MODULE 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 the voltage between the transmission control module connector (B56: turbo model) or (B55: non-turbo model) and chassis ground. ***Connector & terminal*** ***Turbo model:*** ***(B56) No. 17 (+) — Chassis ground (−):*** ***Non-turbo model:*** ***(B55) No. 13 (+) — Chassis ground (−):*** Is the measured value same as the specified value?	0 ←→ 4 V	Go to step **2.**	Check the transmission control module. <Ref. to AT-2, Basic Diagnostic Procedure.>
2	**CHECK HARNESS BETWEEN TRANSMISSION CONTROL MODULE AND COMBINATION METER.** 1)Turn the ignition switch to OFF. 2)Disconnect the connector from the transmission control module and combination meter. 3)Measure the resistance between the transmission control module harness connector (B56: turbo model) or (B55: non-turbo model) and combination meter harness connector (i10). ***Connector & terminal*** ***Turbo model:*** ***(B56) No. 17 — (i10) No. 2:*** ***Non-turbo model:*** ***(B55) No. 13 — (i10) No. 2:*** Is the measured value less than the specified value?	10 Ω	Check the speedometer. <Ref. to IDI-14, REMOVAL, Speedometer.>	Repair the wiring harness.

5. CHECK ENGINE CONTROL MODULE

	Step	Check	Yes	No
1	**CHECK ENGINE CONTROL MODULE SIGNAL.** 1)Start the engine. 2)Measure the voltage between the engine control module connector (B136: turbo model) or (B134: non-turbo model) and engine ground. ***Connector & terminal*** ***Turbo model:*** ***(B136) No. 9 (+) — Engine ground (−):*** ***Non-turbo model:*** ***(B134) No. 30 (+) — Engine ground (−):*** Is the measured value same as the specified value?	0 ←→ 13 V	Go to step **2.**	Check the engine control module. <Ref. to EN(H4SO)-2, Basic Diagnostic Procedure.> or <Ref. to EN(H4DOTC)-2, Basic Diagnostic Procedure.>

	Step	Check	Yes	No
2	**CHECK HARNESS BETWEEN COMBINATION METER AND ENGINE CONTROL MODULE.** 1)Turn the ignition switch to OFF. 2)Disconnect the connector from the engine control module and combination meter. 3)Measure the resistance between the engine control module harness connector (B136: turbo model) or (B134: non-turbo model) and combination meter harness connector (i10). ***Connector & terminal*** ***Turbo model:*** ***(B136) No. 9 — (i10) No. 5:*** ***Non-turbo model:*** ***(B134) No. 30 — (i10) No. 5:*** Is the measured value less than the specified value?	10 Ω	Check the tachometer. <Ref. to IDI-15, REMOVAL, Tachometer.>	Repair the wiring harness.

6. CHECK FUEL LEVEL SENSOR

	Step	Check	Yes	No
1	**CHECK FUEL LEVEL SENSOR.** 1)Remove the fuel level sensor. <Ref. to FU(H4SO)-62, REMOVAL, Fuel Level Sensor.> or <Ref. to FU(H4DOTC)-65, REMOVAL, Fuel Level Sensor.> 2)Measure the resistance between the fuel level sensor terminals when setting the float to FULL and EMPTY position. ***Terminals*** ***No. 2 — No. 3:*** Is the measured value within the specified range?	FULL: 0.5 to 2.5 Ω EMPTY: 50 to 52 Ω	Go to step **2.**	Replace the fuel level sensor.
2	**CHECK FUEL SUB LEVEL SENSOR.** 1)Remove the fuel sub level sensor. <Ref. to FU(H4SO)-63, REMOVAL, Fuel Sub Level Sensor.> or <Ref. to FU(H4DOTC)-66, REMOVAL, Fuel Sub Level Sensor.> 2)Measure the resistance between the fuel sub level sensor terminals when setting the float to FULL and EMPTY position. ***Terminals*** ***No. 1 — No. 2:*** Is the measured value within the specified range?	FULL: 0.5 to 2.5 Ω EMPTY: 42 to 44 Ω	Go to step **3.**	Replace the fuel sub level sensor.
3	**CHECK HARNESS BETWEEN FUEL SUB LEVEL SENSOR AND COMBINATION METER.** 1)Disconnect the connector from the combination meter. 2)Measure the resistance between the fuel sub level sensor harness connector terminal and combination meter harness connector terminal. ***Connector & terminal*** ***(R59) No. 1 — (i12) No. 2:*** Is the measured value less than the specified value?	10 Ω	Go to step **4.**	Repair the wiring harness.

	Step	Check	Yes	No
4	**CHECK HARNESS BETWEEN FUEL LEVEL SENSOR AND FUEL SUB LEVEL SENSOR.** Measure the resistance between the fuel level sensor harness connector terminal and fuel sub level sensor harness connector terminal. ***Connector & terminal*** ***(R58) No. 3 — (R59) No.2:*** Is the measured value less than the specified value?	10 Ω	Go to step **5.**	Repair the wiring harness.
5	**CHECK FUEL LEVEL SENSOR GROUND CIRCUIT.** Measure the resistance between the fuel level sensor harness connector terminal and chassis ground. ***Connector & terminal*** ***(R58) No. 2 — Chassis ground:*** Is the measured value less than the specified value?	10 Ω	Check the fuel gauge. <Ref. to IDI-16, REMOVAL, Fuel Gauge.>	Repair the wiring harness.

7. CHECK ENGINE COOLANT TEMPERATURE SENSOR

	Step	Check	Yes	No
1	**CHECK ENGINE COOLANT TEMPERATURE SENSOR.** Check the engine coolant temperature sensor. <Ref. to EN(H4SO)-120, DTC P0117 — ENGINE COOLANT TEMPERATURE CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> or <Ref. to EN(H4DOTC)-128, DTC P0117 — ENGINE COOLANT TEMPERATURE CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> Is the engine coolant temperature sensor OK?	The engine coolant temperature sensor is OK.	Go to step **2.**	Replace the engine coolant temperature sensor.
2	**CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND COMBINATION METER.** 1)Turn the ignition switch to OFF. 2)Disconnect the connector from the engine coolant temperature sensor and combination meter. 3)Measure the resistance between the engine coolant temperature sensor harness connector (E8) and combination meter harness connector (i12). ***Connector & terminal*** ***(E8) No. 3 — (i12) No. 9:*** Is the measured value less than the specified value?	10 Ω	Check the water temperature gauge. <Ref. to IDI-17, REMOVAL, Water Temperature Gauge.>	Repair the wiring harness.

8. CHECK OUTSIDE TEMPERATURE INDICATOR

	Step	Check	Yes	No
1	**CHECK POWER SUPPLY FOR AMBIENT SENSOR.** 1)Turn the ignition switch OFF. 2)Disconnect the connector from the combination meter. 3)Turn the ignition switch ON. 4)Measure the voltage between the combination meter terminal and chassis ground. ***Connector & terminal*** ***(i11) No. 11 (+) — Chassis ground (−):*** Is the measured value more than the specified value?	4V	Go to step **2.**	Replace the combination meter printed circuit.
2	**CHECK HARNESS BETWEEN AMBIENT SENSOR AND COMBINATION METER.** 1)Turn the ignition switch OFF. 2)Disconnect the connector from the ambient sensor. 3)Measure the resistance between the ambient sensor harness connector terminal and combination meter harness connector terminal. ***Connector & terminal*** ***(F78) No. 1 — (i11) No. 11:*** ***(F78) No. 2 — (i11) No. 8:*** Is the measured value less than the specified value?	10 Ω	Go to step **3.**	Repair the wiring harness.
3	**CHECK AMBIENT SENSOR.** 1)Remove the ambient sensor. 2)Check the ambient sensor. <Ref. to IDI-18, INSPECTION, Ambient Sensor.> Is the ambient sensor OK?	The ambient sensor is OK.	Go to step **4.**	Replace the ambient sensor.
4	**CHECK OUTSIDE TEMPERATURE INDICATOR.** 1)Connect the combination meter harness connector. 2)Connect a resistor (2.2 kΩ) between the terminals of ambient sensor harness connector. 3)Turn the ignition switch ON and check the outside temperature indicator display. Is the outside temperature indicator indicating the specified value?	25°C (77°F)	Repair the poor contact of ambient sensor harness connector.	Replace the combination meter printed circuit.