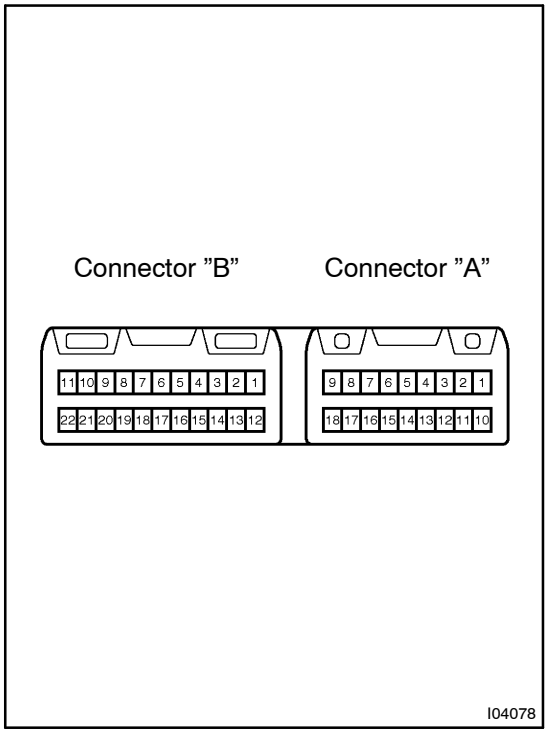
BE0MQ–02



INSPECTION

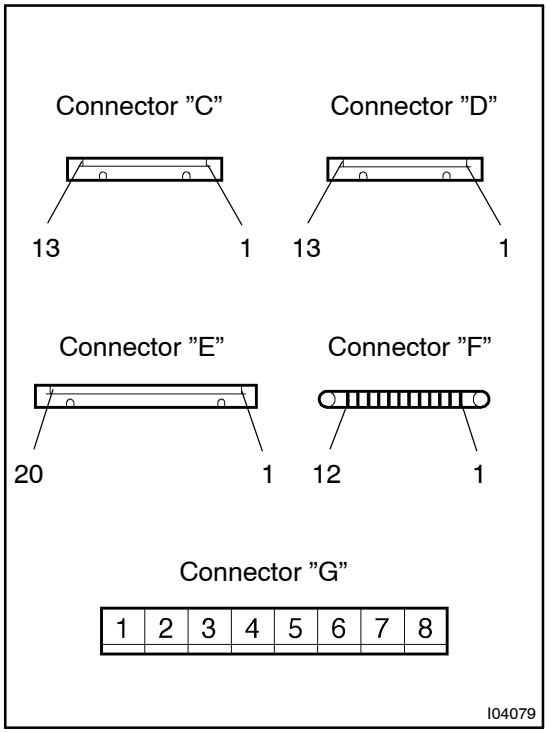
1. INSPECT COMBINATION METER CIRCUIT

Connector disconnected:

Disconnect connector ”A” and ”B” from the combination meter and inspect the connectors on the wire harness side as shown in the table.

Tester connection	Condition	Specified condition
A1 – Ground	Ignition switch ON	Battery voltage
A3 – A4	Constant	Continuity
A7 – Ground	Light control switch HEAD and headlight dimmer switch HI	Continuity
A8 – Ground B22 – Ground	Constant	Continuity
A10 – Ground	Window washer level warning switch Float down	Continuity
B1 – Ground	Ignition switch ON	Battery voltage
B4 – B6	Constant	Approx. 10 kΩ
B13 – Ground	Constant	Battery voltage
B14 – Ground	Constant	Battery voltage
B9 – Ground	Light control switch in HEAD	Battery voltage
B15 – Ground	Light control switch in HEAD	Battery voltage

If circuit is not as specified, wiring diagram and inspect the circuits connected to other parts.



2. LHD Models:
INSPECT COMBINATION METER CIRCUIT PLATE
Warning light circuit plate:

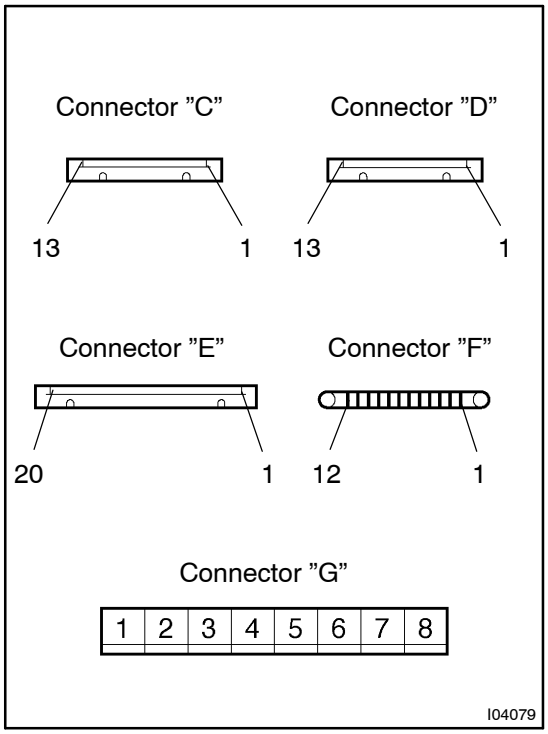
(a) Remove meter cover.

(b) Disconnect connectors ”C”, ”D”, ”E”, ”F” and ”G” from the meter circuit plate and inspect the connectors on the wire harness side as shown in the table.

Tester connection	Check indicator light	Specified condition
D2 (+) – D4 (–)	Hi–beam indicator light	Continuity
C3 (+) – C5 (–)	Check engine warning light	Continuity
C3 (+) – C7 (–)	Engine oil level warning light	Continuity
D6 (+) – D8 (–)	Taillight indiactor light	Continuity
D10 (+) – D12 (–)	Fuel level warning light	Continuity
E2 (–) – E20 (+)	Rear fog light indicator light	Continuity
E3 (–) – E4 (+)	Open door warning light	Continuity
E4 (+) – E5 (–)	SRS warning light	Continuity
E6 (–) – E20 (+)	Headlight leveling indiactor	Continuity
E7 (–) – E20 (+)	Rear Lights warning light	Continuity
E8 (–) – E20 (+)	Seat belt warning light	Continuity
E9 (–) – E20 (+)	CRUISE MAIN indicator light	Continuity
E10 (–) – E20 (+)	Discharge warning light	Continuity
E11 (–) – E20 (+)	ECT PWR indicator light	Continuity
E12 (–) – E20 (+)	Low oil pressure warning light	Continuity
E13 (–) – E20 (+)	ECT SNOW indicator light	Continuity
E14 (–) – E20 (+)	Brake warning light	Continuity
E15 (–) – E20 (+)	VSC OFF indicator light	Continuity
E16 (–) – E20 (+)	ABS warning light	Continuity
E17 (–) – E20 (+)	Window washer level warning light	Continuity
E18 (–) – E20 (+)	TRAC OFF indicator light	Continuity
E19 (–) – E20 (+)	Slip warning light	Continuity
F1 (–) – F12 (+)	A/T shift indicator light (D)	Continuity
F2 (–) – F12 (+)	A/T shift indicator light (N)	Continuity
F4 (–) – F12 (+)	A/T shift indicator light (L)	Continuity
F5 (–) – F12 (+)	A/T shift indicator light (R)	Continuity

F8 (–) – F12 (+)	A/T shift indicator light (P)	Continuity
F10 (–) – F12 (+)	A/T shift indicator light (3)	Continuity
F11 (–) – F12 (+)	A/T shift indicator light (2)	Continuity
G1 (+) – G5 (–)	Left turn signal indicator light	Continuity
G6 (+) – G5 (–)	Right turn signal indicator light	Continuity

If circuit is not as specified, replace the bulb or circuit plate.



3. RHD Models:
INSPECT COMBINATION METER CIRCUIT PLATE
Warning light circuit plate:

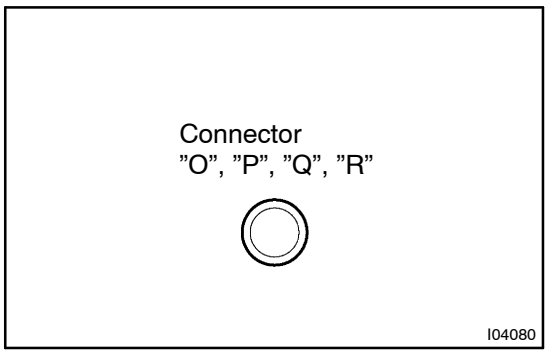
(a) Remove meter cover.

(b) Disconnect connectors ”C”, ”D”, ”E”, ”F” and ”G” from the meter circuit plate and inspect the connectors on the wire harness side as shown in the table.

Tester connection	Check indicator light	Specified condition
C2 (–) – C4 (+)	Fuel level warning light	Continuity
C6 (–) – C8 (+)	Taillight indiactor light	Continuity
C10 (–) – C12 (+)	Hi–beam indicator light	Continuity
D6 (–) – D10 (–)	Engine oil level warning light	Continuity
D8 (–) – D10 (+)	Check engine warning light	Continuity
E1 (+) – E2 (–)	Slip warning light	Continuity
E3 (–) – E1 (+)	TRAC OFF indicator light	Continuity
E4 (–) – E1 (+)	Window washer level warning light	Continuity
E5 (–) – E1 (+)	ABS warning light	Continuity
E6 (–) – E1 (+)	VSC OFF indicator light	Continuity
E7 (–) – E1 (+)	Brake warning light	Continuity
E8 (–) – E1 (+)	ECT SNOW indicator light	Continuity
E9 (–) – E1 (+)	Low oil pressure warning light	Continuity
E10 (–) – E1 (+)	ECT PWR indicator light	Continuity
E11 (–) – E1 (+)	Discharge warning light	Continuity
E12 (–) – E1 (+)	CRUISE MAIN indicator light	Continuity
E13 (–) – E1 (+)	Seat belt warning light	Continuity

E15 (–) – E1 (+)	Headlight leveling indiactor	Continuity
E16 (–) – E17 (+)	SRS warning light	Continuity
E18 (–) – E17 (+)	Open door warning light	Continuity
E19 (–) – E1 (+)	Rear fog light indicator light	Continuity
E20 (–) – E17 (+)	Front fog light indicator light	Continuity
F1 (+) – F2 (–)	A/T shift indicator light (L)	Continuity
F3 (–) – F1 (+)	A/T shift indicator light (2)	Continuity
F4 (–) – F1 (+)	A/T shift indicator light (3)	Continuity
F5 (–) – F1 (+)	A/T shift indicator light (P)	Continuity
F8 (–) – F1 (+)	A/T shift indicator light (R)	Continuity
F11 (–) – F1 (+)	A/T shift indicator light (N)	Continuity
F12 (–) – F1 (+)	A/T shift indicator light (D)	Continuity
G1 (+) – G5 (–)	Left turn signal indicator light	Continuity
G6 (+) – G5 (–)	Right turn signal indicator light	Continuity

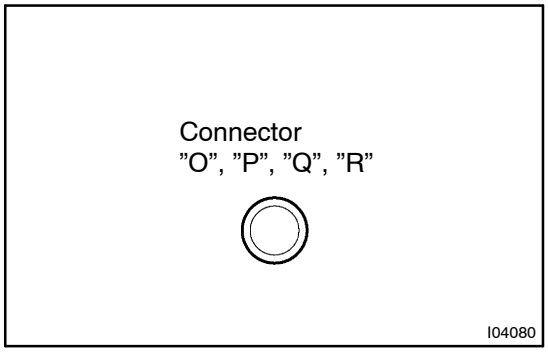
If circuit is not as specified, replace the bulb or circuit plate.



4. LHD Models:
INSPECT COMBINATION METER CIRCUIT PLATE
From combination meter ECU to gauges:

Terminal	Resistance (Ω)
O1 – O4 (Water temperature receiver gauge)	Approx. 164.2
O2 – O3 (Water temperature receiver gauge)	Approx. 151.8
P1 – P4 (Tachometer)	Approx. 164.2
P2 – P3 (Tachometer)	Approx. 151.8
Q1 – Q4 (Speedometer)	Approx. 164.2
R1 – R3 (Fuel receiver gauge)	Approx. 151.8
R2 – R4 (Fuel receiver gauge)	Approx. 164.2

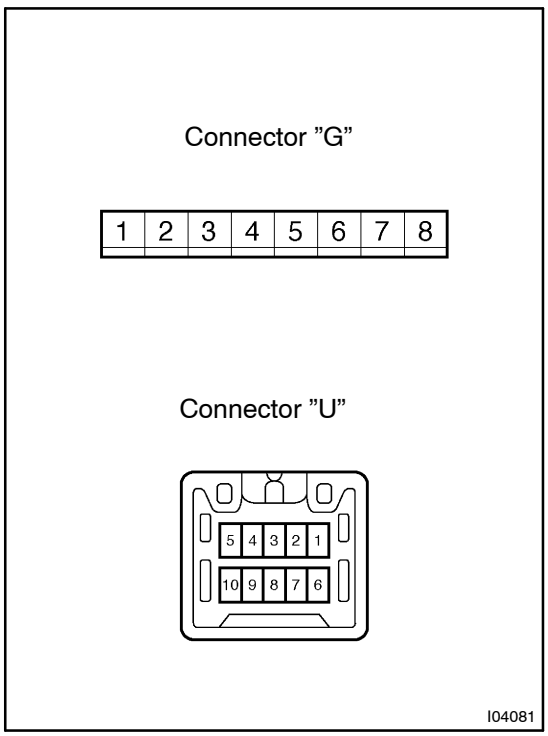
If circuit is not as specified, inspect the gauge or meter.
Then recheck system.
If circuit is not as specified, replace the circuit plate.



5. RHD Models:
INSPECT COMBINATION METER CIRCUIT PLATE
From combination meter ECU to gauges:

Terminal	Resistance (Ω)
O1 – O3 (Water temperature receiver gauge)	Approx. 164.2
O2 – O4 (Water temperature receiver gauge)	Approx. 151.8
P1 – P4 (Tachometer)	Approx. 164.2
P2 – P3 (Tachometer)	Approx. 151.8
Q1 – Q4 (Speedometer)	Approx. 164.2
Q2 – Q3 (Speedometer)	Approx. 151.8
R1 – R4 (Fuel receiver gauge)	Approx. 164.2
R2 – R3 (Fuel receiver gauge)	Approx. 151.8

If circuit is not as specified, inspect the gauge or meter.
Then recheck system.
If circuit is not as specified, replace the circuit plate.

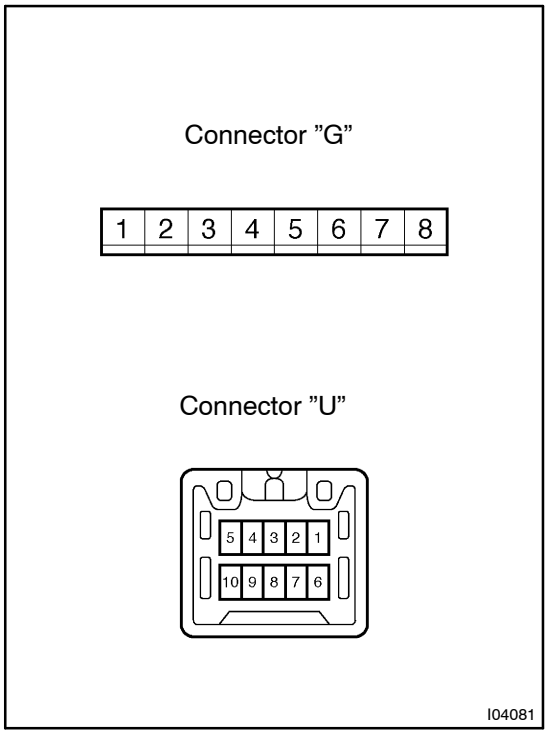


6. LHD Models:
INSPECT COMBINATION METER CIRCUIT PLATE
From combination meter ECU to telltale light assembly:

Disconnect connector ”G” and ”U” from the meter circuit plate and inspect the connectors on the wire harness side as follows.

Tester connection	Specified condition
G1 – U9	Continuity
G3 – U1	Continuity
G5 – U10	Continuity
G6 – U4	Continuity
G7 – U3	Continuity
G8 – U8	Continuity

If circuit is not as specified, replace the circuit plate.

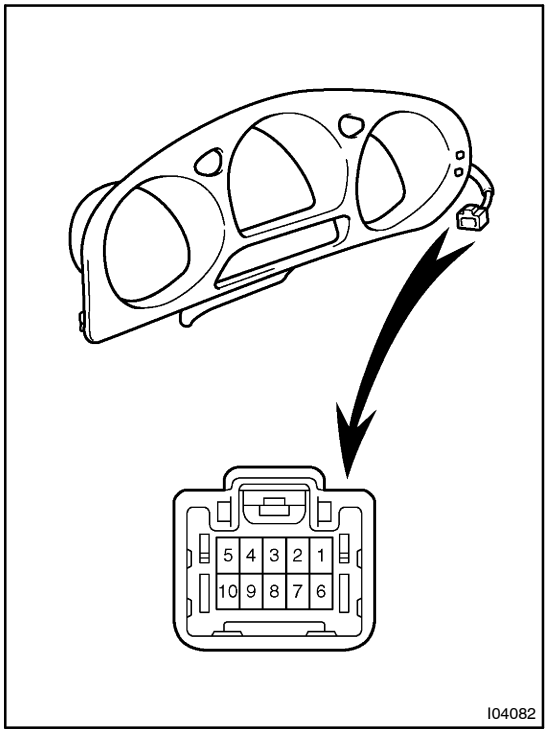


7. RHD Models:
INSPECT COMBINATION METER CIRCUIT PLATE
From combination meter ECU to telltale light assembly:

Disconnect connector ”G” and ”U” from the meter circuit plate and inspect the connectors on the wire harness side as follows.

Tester connection	Specified condition
G1 – U9	Continuity
G3 – U1	Continuity
G5 – U10	Continuity
G6 – U4	Continuity
G7 – U3	Continuity
G8 – U8	Continuity

If circuit is not as specified, replace the circuit plate.



8. INSPECT TELLTALE LIGHT ASSEMBLY CONTINUITY

Switch position	Tester connection	Condition
ODO/ TRIP switch Free	3 – 10	No continuity
ODO/ TRIP switch Pushed in	3 – 10	Continuity
RESET switch Free	8 – 10	No continuity
RESET switch Pushed in	8 – 10	Continuity
Turn signal switch RIGHT	4 – 10	Continuity
Turn signal switch LEFT	9 – 10	Continuity

If continuity is not as specified, replace the telltale light assembly.

9. INSPECT SPEEDOMETER ON–VEHICLE

Using a speedometer tester, inspect the speedometer for allowable indication error and check the operation of the odometer.
HINT:
Tire wear and tire over or under inflation will increase the indication error.

Europe Models and G.C.C countries

(mph)		(km/h)	
Standard indication	Allowable range	Standard indication	Allowable range
20	20 – 24.5	20	20 – 26
40	40 – 46.5	40	40 – 48
60	60 – 68.5	60	60 – 70
80	80 – 90.5	80	80 – 92
100	100 – 112.5	100	100 – 114
–	–	120	120 – 136
–	–	140	140 – 158
–	–	160	160 – 180

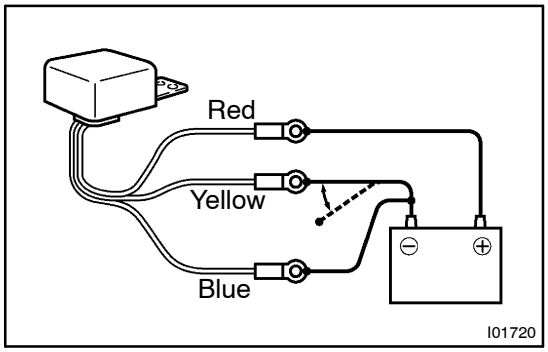
Australia

(mph)		(km/h)	
Standard indication	Allowable range	Standard indication	Allowable range
–	–	40	36 – 44
–	–	60	54 – 66
–	–	80	72 – 88
–	–	100	90 – 110
–	–	120	108 – 132
–	–	140	126 – 154
–	–	160	144 – 176

General Countries

(mph)		(km/h)	
Standard indication	Allowable range	Standard indication	Allowable range
20	21 – 23.5	20	21 – 25
40	41.5 – 44	40	41.5 – 46
60	62.5 – 66	60	62.5 – 67
80	83 – 87	80	83 – 88
100	104 – 108.5	100	104 – 109
–	–	120	125 – 130.5
–	–	140	145.5 – 151..5
–	–	160	166 – 173

If error is excessive, replace the speedometer.



10. INSPECT SPEED WARNING BUZZER

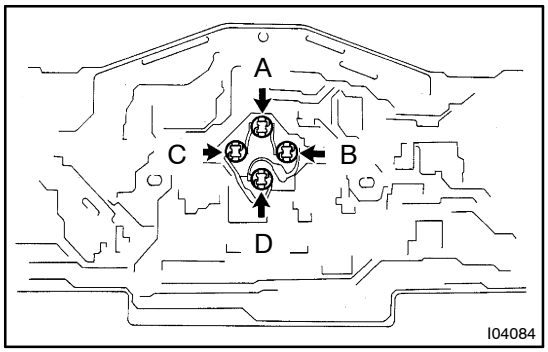
(a) Connect the positive (+) lead from the battery to terminal Red and the negative (–) lead to terminal Blue.

(b) Connect the intermittently negative (–) lead to terminal Yellow, check that the chime sound.

HINT:

The sound will be distorted if the chime is tilted.

If operation is not as specified, replace the buzzer.



11. INSPECT SPEEDOMETER RESISTANCE

Measure the resistance between terminals with fixing pointer to the stopper.

Tester connection	Resistance (Ω)
A – B	140 – 185
C – D	130 – 175

If resistance value is not as the specified, replace the meter.

12. INSPECT TACHOMETER (On–vehicle

(a) Connect a tune–up test tachometer, and start the engine.

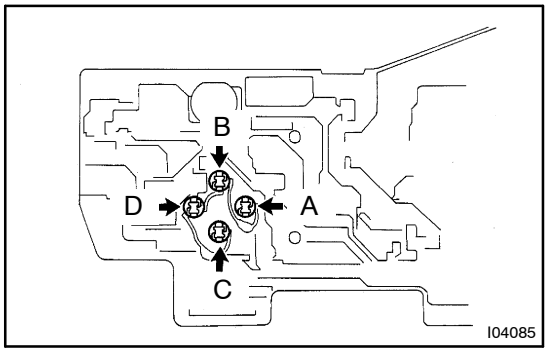
NOTICE:

- **Reversing the connection of the tachometer will damage the transistors and diodes inside.**
- **When removing or installing the tachometer, be careful not to drop or subject it to heavy shocks.**

(b) Compare the tester and tachometer indications.

DC 13.5 V 25 °C at (77 °F)

Standard indication	Allowable range
700	630 – 770
1,000	900 – 1,100
2,000	1,850 – 2,150
3,000	2,800 – 3,200
4,000	3,800 – 4,200
5,000	4,800 – 5,200
6,000	5,750 – 6,250
7,000	6,700 – 7,300

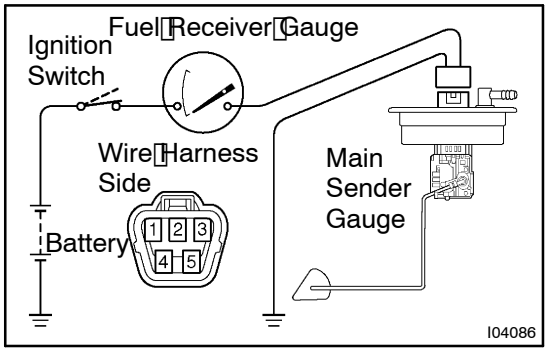


13. INSPECT TACHOMETER RESISTANCE

Measure the resistance between terminals with fixing pointer to the stopper.

Tester connection	Resistance (Ω)
A – B	140 – 185
C – D	130 – 175

If resistance value is not as specified, replace the meter.

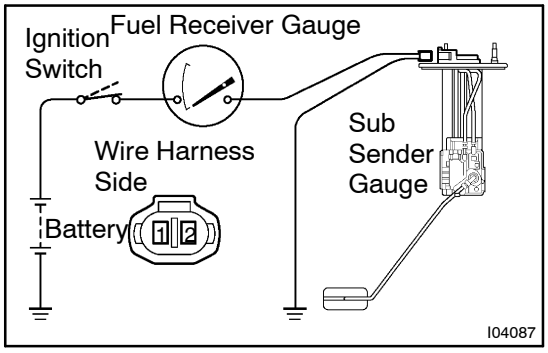


14. INSPECT FUEL RECEIVER GAUGE OPERATION (See page DI–588)

(a) Disconnect the connector from the main sender gauge.

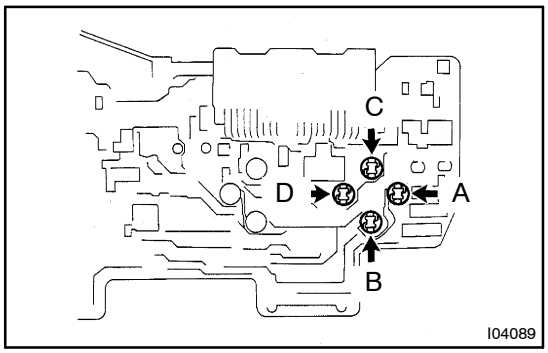
(b) Disconnect the battery terminal once then after 30 seconds, reconnect the terminal.

(c) Turn the ignition switch ON, check that the receiver gauge needle indicates EMPTY.



(d) Connect the main sender gauge.
(e) Disconnect the connector from the sub sender gauge.
(f) Disconnect the battery terminal once then after 30 seconds, reconnect the terminal.
(g) Turn the ignition switch ON, check that the receiver gauge needle indicates EMPTY.

HINT:
Because of the silicon oil in the gauge, it will take a short time for needle to stabilize.
If operation is not as specified, inspect the receiver gauge resistance.

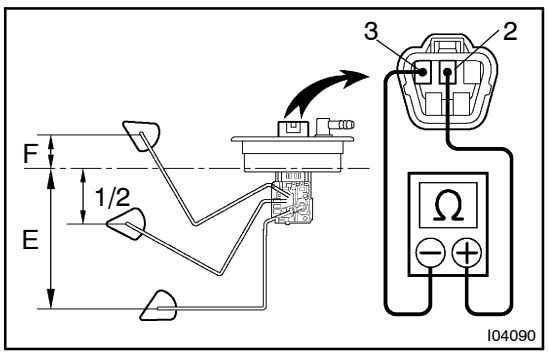


15. INSPECT FUEL RECEIVER GAUGE RESISTANCE

Measure the resistance between terminals with fixing pointer to the stopper.

Tester connection	Resistance (Ω)
A – B	140 – 185
C – D	130 – 175

If resistance value is not as specified, replace the receiver gauge.

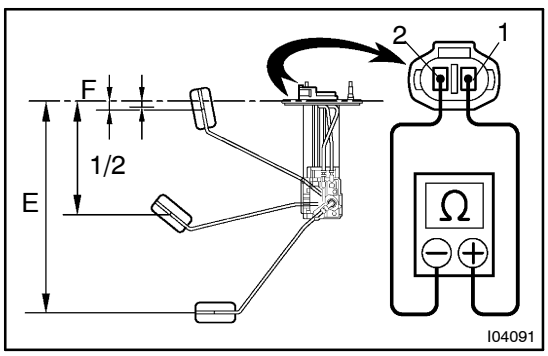


16. INSPECT FUEL MAIN SENDER GAUGE RESISTANCE

Measure the resistance between terminals 1 and 2 for each float position.

Float position mm (in.)	Resistance (Ω)
F: Approx. 34.6 (1.36) ± 3 (0.12)	Approx. 2.0 ± 1.0
1/2: Approx. 52.4 (2.06) ± 3 (0.12)	Approx. 26.1 ± 3.0
E: Approx. 134.9 (5.31) ± 3 (0.12)	Approx. 48.7 ± 1.0

If resistance value is not as specified, replace the main sender gauge.



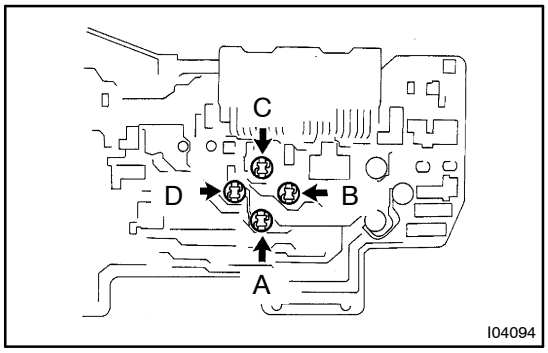
17. INSPECT FUEL SUB SENDER GAUGE RESISTANCE

Measure the resistance between terminals 1 and 2 for each float position.

Float position mm (in.)	Resistance (Ω)
F: Approx. 9.5 (0.37) ± 3 (0.12)	Approx. 2.0 ± 1.0
1/2: Approx. 110.5 (4.35) ± 3 (0.12)	Approx. 33.0 ± 3.0
E: Approx. 206.5 (8.13) ± 3 (0.12)	Approx. 61.3 ± 1.0

If resistance value is not as specified, replace the sub sender gauge.

18. INSPECT WATER TEMPERATURE RECEIVER GAUGE OPERATION
(See page DI–590)



19. INSPECT WATER TEMPERATURE RECEIVER GAUGE RESISTANCE

Measure the resistance between terminals with fixing pointer to the stopper.

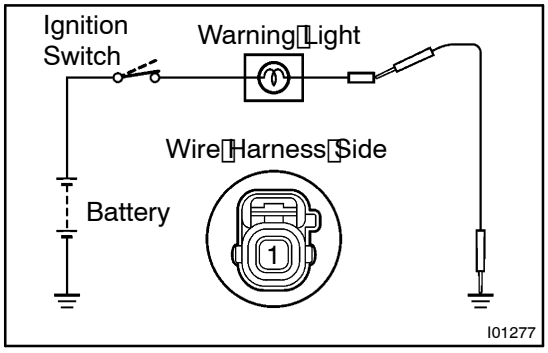
Tester connection	Resistance (Ω)
A – B	140 – 185
C – D	130 – 175

If resistance value is not as specified, replace the receiver gauge.

HINT:

This circuit includes the diode.

If resistance value is not as specified, replace the receiver gauge.

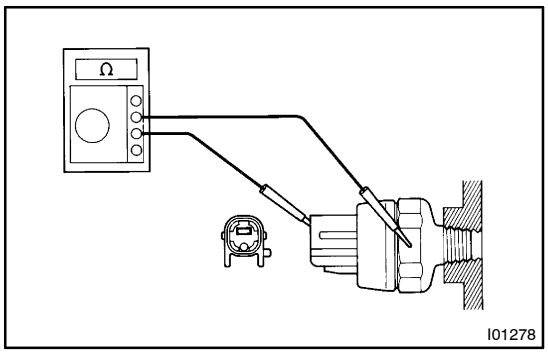


20. INSPECT LOW OIL PRESSURE WARNING LIGHT

(a) Disconnect the connector from the warning switch and ground terminal on the wire harness side connector.

(b) Turn the ignition switch ON and check that the warning light lights up.

If the warning light does not light up, test the bulb.



21. INSPECT LOW OIL PRESSURE SWITCH CONTINUITY

(a) Disconnect the connector from the switch.

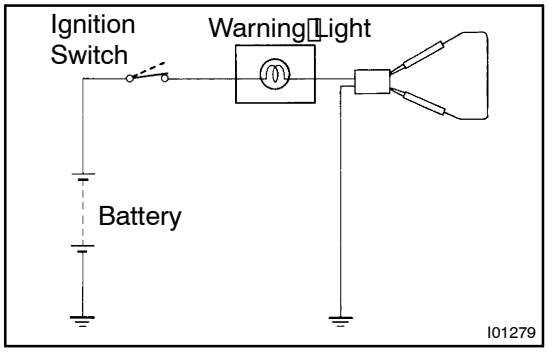
(b) Check that continuity exists between terminal and ground with the engine stopped.

(c) Check that no continuity exists between terminal and ground with the engine running.

HINT:

Oil pressure should be over 24.5 kPa (0.25 kgf/cm^2, 3.55 psi).

If operation is not as specified, replace the switch.



22. INSPECT BRAKE WARNING LIGHT

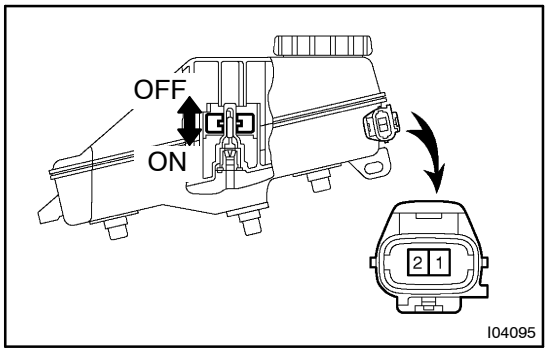
(a) Disconnect the connector from the brake fluid warning switch.

(b) Release the parking brake pedal.

(c) Connect the terminals on the wire harness side of the level warning switch connector.

(d) Start the engine, check that the warning light lights up.

If the warning light does not light up, test the bulb or wire harness.



23. INSPECT BRAKE FLUID LEVEL WARNING SWITCH CONTINUITY

(a) Remove the reservoir tank cap and strainer.

(b) Disconnect the connector.

(c) Check that no continuity exists between the terminals with the switch OFF (float up).

(d) Use siphon, etc. to take fluid out of the reservoir tank.

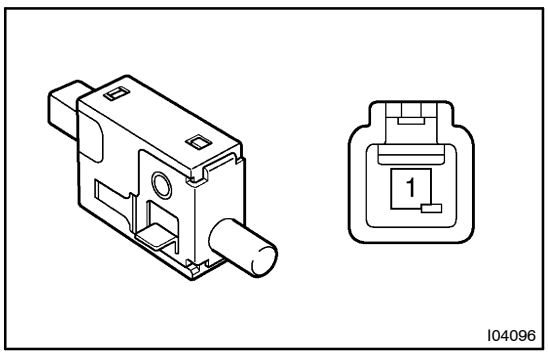
(e) Check that continuity exists between the terminals with the switch ON (float down)

(f) Pour the fluid back in the reservoir tank.

If operation is not as specified, replace the switch.

24. INSPECT BRAKE FLUID LEVEL WARNING SWITCH CIRCUIT

(See page DI–671)



25. INSPECT PARKING BRAKE SWITCH CONTINUITY

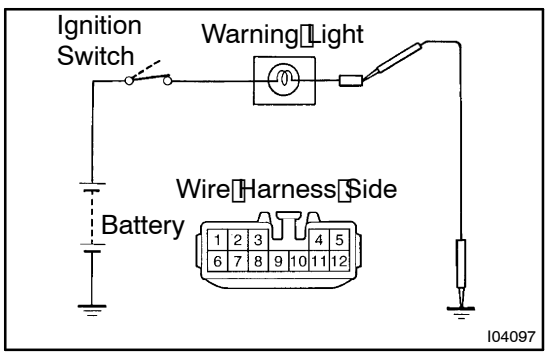
(a) Check that continuity exists between the terminal and switch body with the switch ON (switch pin released).

(b) Check that no continuity exists between the terminal and switch body with the switch OFF (switch pin pushed in).

If operation is not as specified, replace the switch or inspect ground point.

26. INSPECT PARKING BRAKE SWITCH CIRCUIT

(See page DI–632)



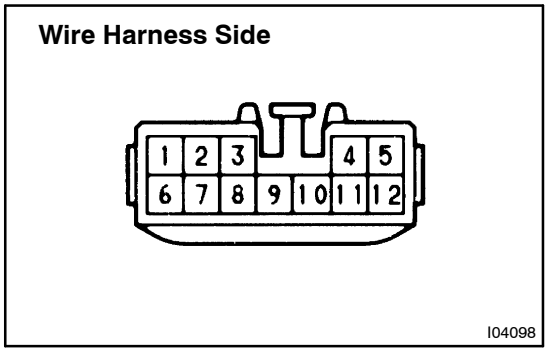
27. INSPECT REAR LIGHTS WARNING LIGHT

(See page DI–677)

(a) Disconnect the connector from the light failure sensor and ground terminal 3 on the wire harness side connector.

(b) Start the engine, check that the warning light lights up.

If the warning light does not light up, inspect the bulb or wire harness.



28. INSPECT LIGHT FAILURE SENSOR CIRCUIT

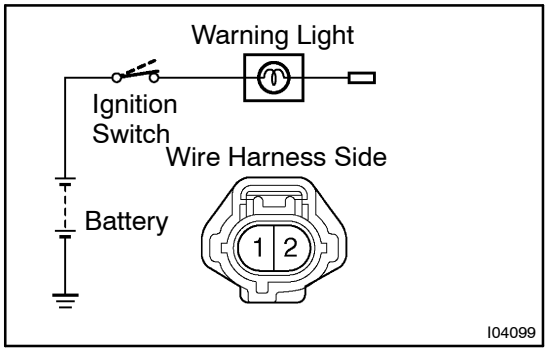
Disconnect connector from the light failure sensor and inspect the connectors on the wire harness side as follows.

Tester connection	Condition	Specified condition
1 – Ground	Constant	Continuity *
2 – Ground	Constant	Continuity *
6 – Ground	Constant	Continuity *
7 – Ground	Constant	Continuity *
11 – Ground	Constant	Continuity
12 – Ground	Constant	Continuity *
5 – Ground	Light control switch OFF	No voltage
5 – Ground	Light control switch in TAIL or HEAD	Battery voltage
8 – Ground	Ignition switch in LOCK or ACC	No voltage
8 – Ground	Ignition switch ON	Battery voltage
9, 10 – Ground	Stop light switch OFF	No voltage
9, 10 – Ground	Stop light switch ON	Battery voltage

*: There is resistance because this circuit is grounded through the bulb.

If circuit is as specified, replace the relay.

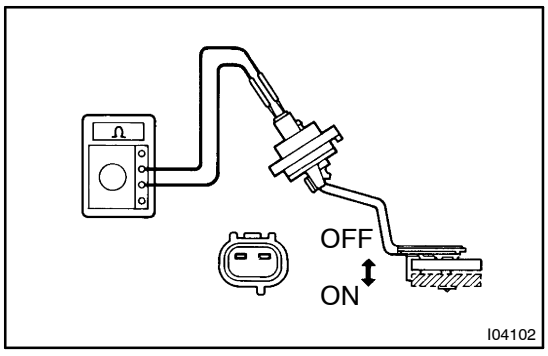
If circuit is not as specified, wiring diagram and inspect the circuits connected to other parts.



29. INSPECT ENGINE OIL LEVEL WARNING LIGHT

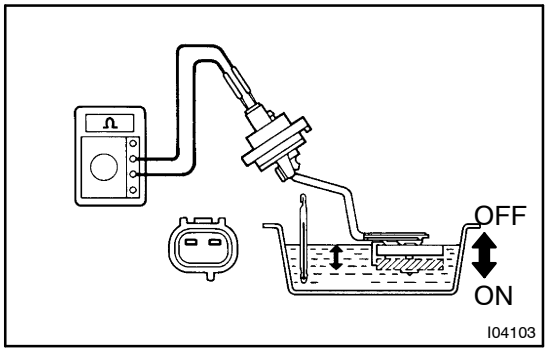
(a) Disconnect the connector from the switch.
(b) Run the engine.
(c) Turn the ignition switch ON, check that the warning light lights up approximatery 40 seconds later.

If the warning light does not light up, inspect bulb or wire harness.



30. INSPECT ENGINE OIL LEVEL WARNING SENSOR

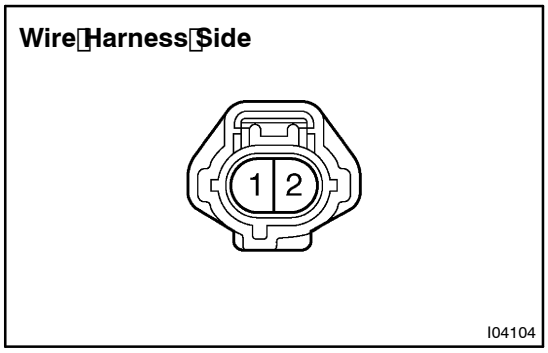
(a) Check that continuity exists between terminals with the switch to below 40 °C (104 °F). (Warning switch ON)
(b) Heat the switch to above 60 °C (140 °F) in an oil bath.



(c) Check that there is continuity between terminals with the switch ON (float up).

(d) Check that there is no continuity between terminals with the switch OFF (float down).

If operation is not as specified, replace the switch.

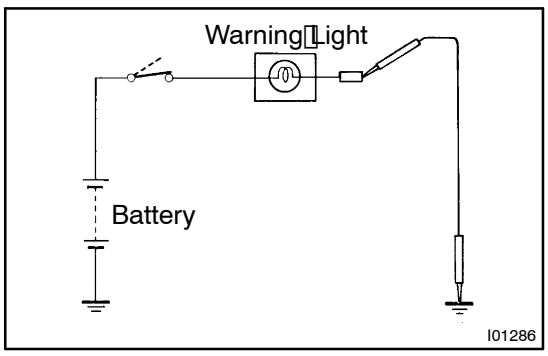


31. INSPECT ENGINE OIL LEVEL WARNING SENSOR CIRCUIT

Disconnect the switch connector and inspect the connector on wire harness side, as shown.

Tester connection	Condition	Specified condition
2 – Ground	Constant	Continuity

If continuity is not as specified, inspect the wire harness or ground point.



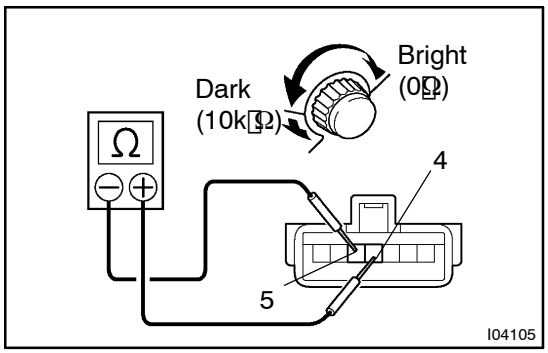
32. INSPECT OPEN DOOR WARNING LIGHT

Disconnect the connector from the door courtesy switch and ground terminal 1 on the wire harness side, and check that the warning light lights up.

If the warning light does not light up, inspect the bulb or wire harness.

33. INSPECT DOOR COURTESY SWITCH CONTINUITY AND CIRCUIT

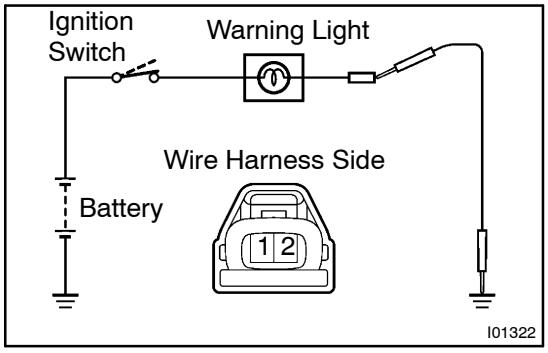
See page BE–66



34. INSPECT LIGHT CONTROL RHEOSTAT OPERATION

Gradually, turn the rheostat knob from the bright side to dark side and check that the resistance decreases from 10 kΩ to 0 Ω between terminal 4 and 5. (Rheostat knob turned to clockwise)

If operation is not as specified, replace the rheostat light control.

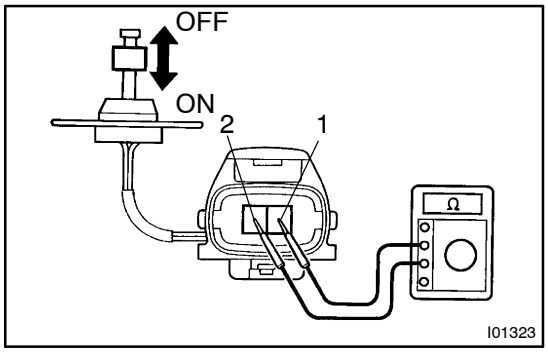


35. INSPECT WINDOW WASHER LEVEL WARNING LIGHT

(a) Disconnect the connector from the warning switch and ground terminal on the wire harness side connector.

(b) Engine running and check that the warning light lights up.

If the warning light does not light up, inspect the bulb or wire harness.

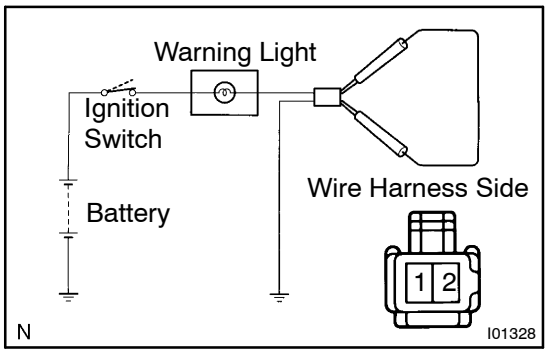


36. INSPECT WINDOW WASHER LEVEL WARNING SWITCH CONTINUITY

(a) Check that no continuity exists between the terminals with the switch OFF (float up).

(b) Check that continuity exists between the terminals with the switch ON (float down).

If operation is not as specified, replace the switch or inspect ground point.

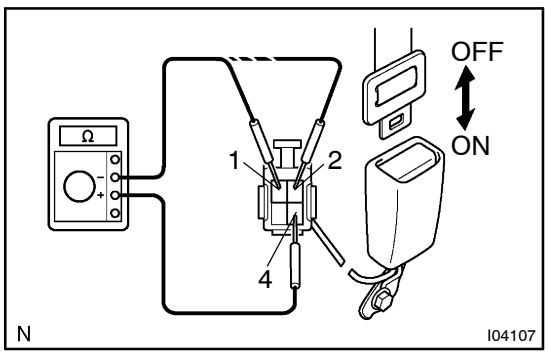


37. INSPECT SEAT BELT WARNING LIGHT

(a) Disconnect the connector from the retractor switch and ground terminal on the wire harness side connector.

(b) Turn the ignition switch ON and check that the warning light lights up.

If the warning light does not light up, inspect the bulb or wire harness.

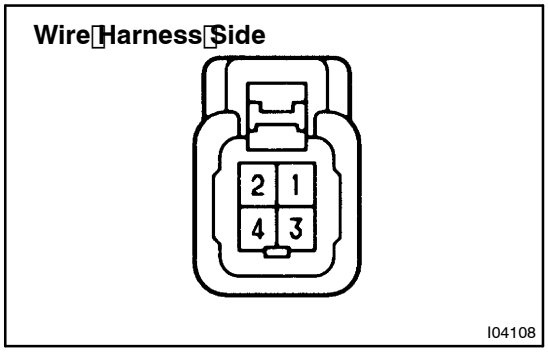


38. INSPECT SEAT BELT BUCKLE SWITCH CONTINUITY

(a) Check that continuity exists between the terminals 2 and 4 on the switch side connector with the switch ON (belt fastened).

(b) Check that continuity exists between the terminals 1 and 4 on the switch side connector with the switch OFF (belt unfastened).

If operation is not as specified, replace the switch.

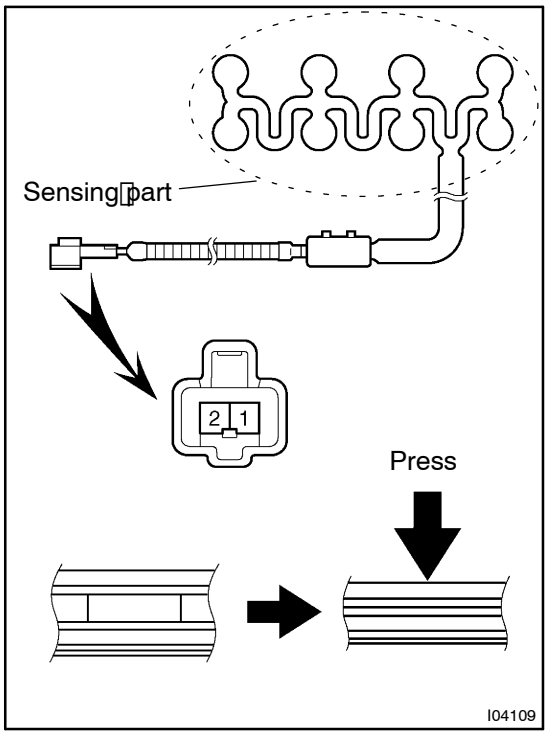


39. INSPECT SEAT BELT BUCKLE SWITCH CIRCUIT
Driver side: (See page DI–666)
Passenger side: (See page DI–621)

Disconnect the switch connector and inspect the connector on wire harness side, as shown.

Tester connection	Condition	Specified condition
4 – Ground	Constant	Continuity

If continuity is not as specified, inspect the circuits connected to other parts.



40. Passenger seat only:
INSPECT SEAT BELT WARNING OCCUPANT DETECTION SENSOR CONTINUITY

Check that continuity exists between the terminals 1 and 2 when pressing the sensing part.

If operation is not as specified, replace the sensor.

41. Passenger seat only:
INSPECT SEAT BELT WARNING OCCUPANT DETECTION SENSOR CIRCUIT
(See page DI–621)