BE2ME−01

INSPECTION

1. INSPECT SPEEDOMETER ON−VEHICLE

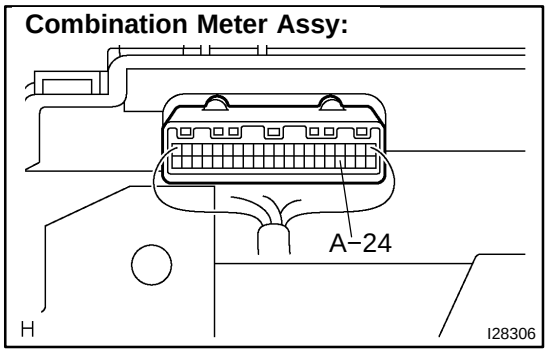
Using a speedometer tester, check the speedometer for indication error and check operation of the odometer.

HINT:

Tire wear and tire over or under inflation will increase the indication error.

USA (mph)		CANADA (km/h)	
Standard Indication	Allowable Range	Standard Indication	Allowable Range
20	19 to 22	20	17.5 to 21.5
40	39 to 42.5	40	38 to 42
60	59.5 to 63.5	60	58 to 63
80	79.5 to 84	80	78 to 84
100	100 to 105	100	98.5 to 104.5
−		120	119 to 125
−		140	139 to 146
−		160	159 to 167

If the error is excessive, replace the speedometer.

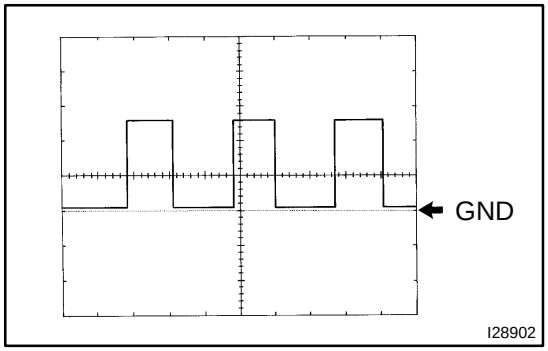


2. INSPECT INPUT VEHICLE SPEED SIGNAL WAVEFORM (A/T)

(a) Remove the combination meter with connectors still connected.

(b) Connect the oscilloscope to terminal A−24 and body ground.

(c) Start the engine.



(d) Check the signal waveform according to the condition(s) in the table below.

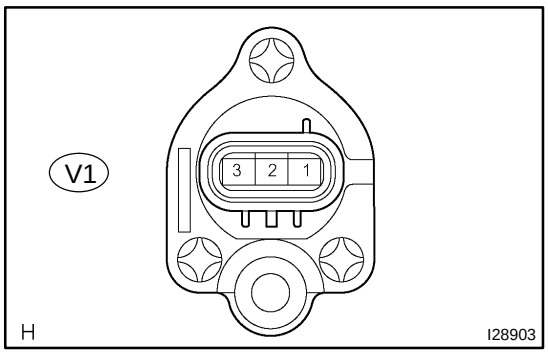
Item	Condition
Tool setting	5 V/DIV, 20 ms/DIV
Vehicle condition	Driving at approx. 20 km/h (12 mph)

OK:

As shown in the illustration

HINT:

As vehicle speed increases, the cycle of the signal waveform narrows.



3. INSPECT INPUT VEHICLE SPEED SIGNAL WAVEFORM (M/T)

(a) Shift the shift lever to neutral.

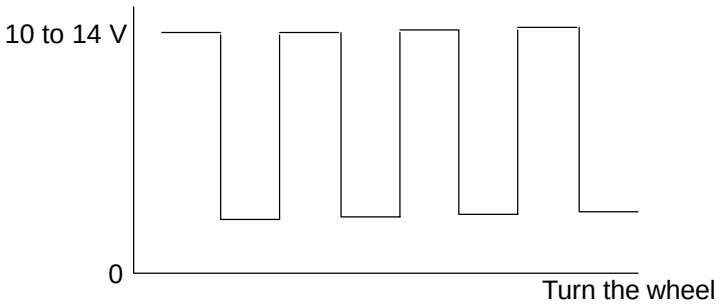
(b) Jack up either of the front wheel.

(c) Turn the ignition switch to ON.

(d) Measure the voltage between terminals 2 and 3 of speed sensor when the front wheel is turning slowly.

Standard voltage:

Voltage is generated intermittently.



4. INSPECT TACHOMETER ON−VEHICLE

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

NOTICE:

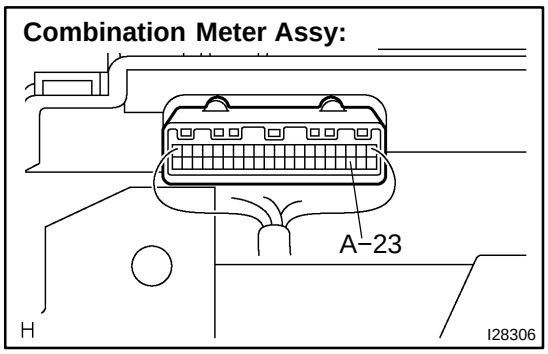
- **Reversing the connection of the tachometer will damage the transistors and diodes inside the tachometer.**
- **When removing or installing the tachometer, be careful not to drop or subject it to heavy shocks.**

(b) Compare the tester and tachometer indications.

DC 13.5 V at 20˚C (68˚F)

2UZ−FE		1GR−FE	
Standard Indication	Allowable Range	Standard Indication	Allowable Range
700	630 to 770	700	630 to 770
1,000	900 to 1,100	1,000	900 to 1,000
2,000	1,875 to 2,125	2,000	1,850 to 2,150
3,000	2,850 to 3,150	3,000	2,800 to 3,200
4,000	3,850 to 4,150	4,000	3,800 to 4,200
5,000	4,850 to 5,150	5,000	4,800 to 5,100
6,000	5,820 to 6,180	6,000	5,750 to 6,250

If the error is excessive, replace the tachometer.

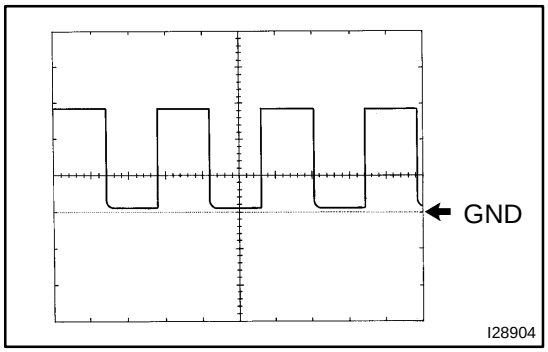


5. INSPECT INPUT TACHO SIGNAL WAVEFORM

(a) Remove the combination meter with connector still connected.

(b) Connect the oscilloscope to terminal A−23 and body ground.

(c) Start the engine.

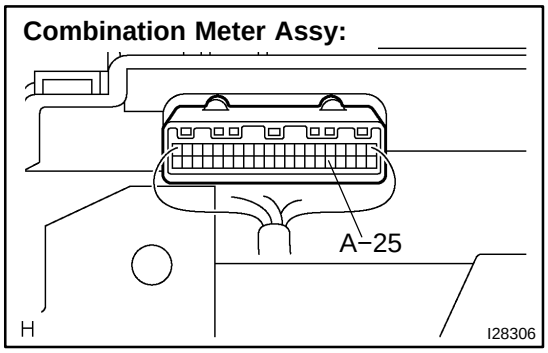


(d) Check the signal waveform according to the condition(s) in the table below.

Item	Condition
Tool setting	5 V/DIV, 10 ms/DIV
Vehicle condition	Engine idle speed

OK:

As shown in the illustration

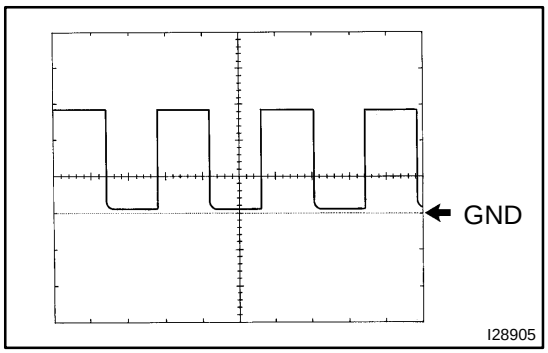


6. INSPECT OUTPUT TACHO SIGNAL WAVEFORM

(a) Remove the combination meter with connector still connected.

(b) Connect the oscilloscope to terminal A−25 and body ground.

(c) Start the engine.

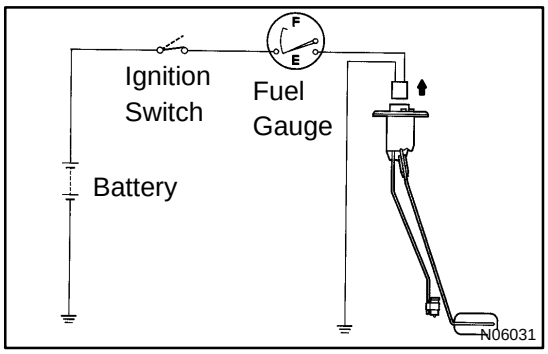


(d) Check the signal waveform according to the condition(s) in the table below.

Item	Condition
Tool setting	5 V/DIV, 10 ms/DIV
Vehicle condition	Engine idle speed

OK:

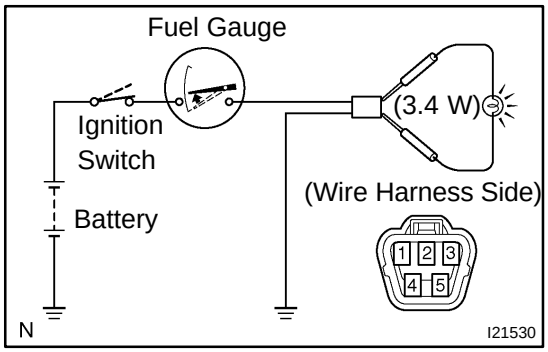
As shown in the illustration



7. INSPECT FUEL RECEIVER GAUGE OPERATION

(a) Disconnect the connector from the sender gauge.

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



(c) Connect terminals 2 and 3 of the wire harness side connector through a 3.4 W test bulb.

(d) Turn the ignition switch ON, and check that the bulb lights up and the receiver gauge needle moves towards the full side.

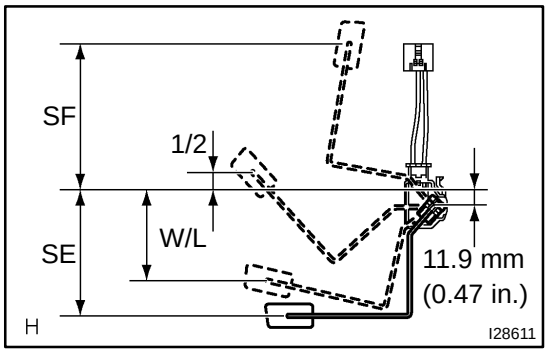
HINT:

Because of the silicon oil in the gauge, it will take a short time for needle to stabilize.

If the operation is not as specified, inspect the receiver gauge resistance.

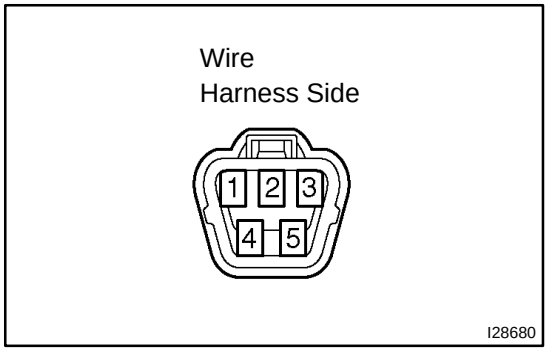
8. INSPECT FUEL SENDER GAUGE RESISTANCE

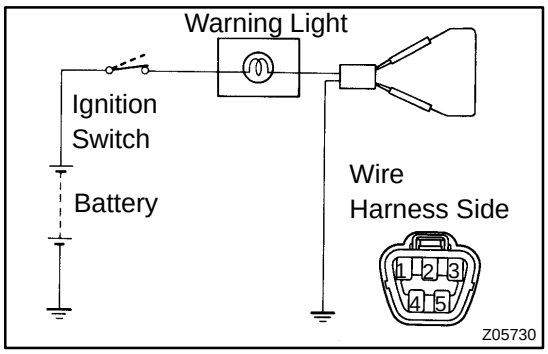
Measure the resistance between terminals 2 and 3 at each float position.



Float Position mm (in.)	Resistance (Ω)
SF: Approx. 116.5 (4.59) ± 2.5 (0.10)	Approx. 4.0
1/2: Approx. 14 (0.55)	Approx. 59.0
W/L: Approx. 72.2 (2.84)	Approx. 98.8
SE: Approx. 100 (3.90) ± 2.5 (0.10)	Approx. 110.0 ± 2.5

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





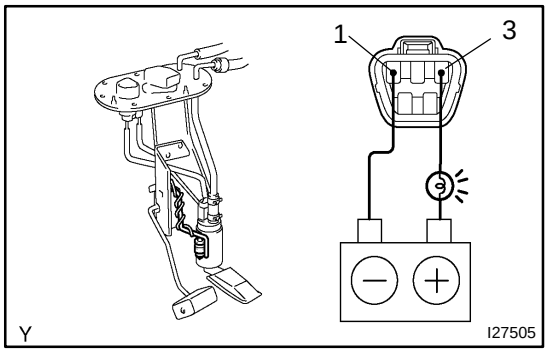
9. INSPECT FUEL LEVEL WARNING LIGHT

(a) Disconnect the connector from the sender gauge.

(b) Connect terminals 1 and 3 of the wire harness side connector.

(c) 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.

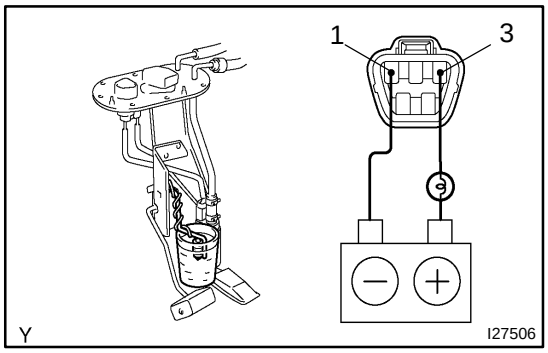


10. INSPECT FUEL LEVEL WARNING SWITCH

(a) Apply battery voltage between terminals 1 and 3 through a 3.4 W test bulb, and check that the bulb lights up.

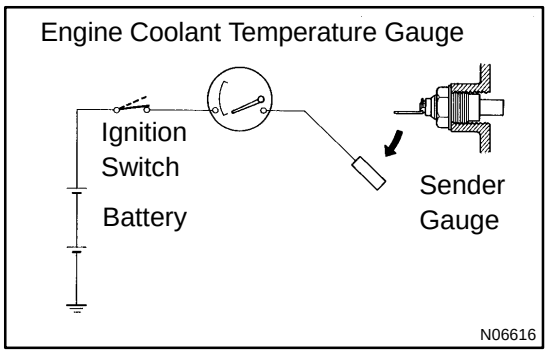
HINT:

It will take a short time for the bulb to light up.



(b) Submerge the switch in fuel, and check that the bulb turns off.

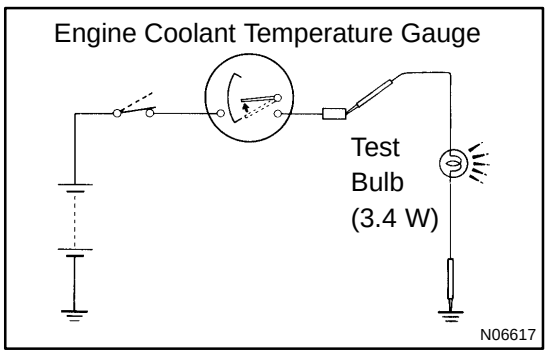
If operation is not as specified, replace the sender gauge.



11. INSPECT ENGINE COOLANT TEMPERATURE RECEIVER GAUGE OPERATION

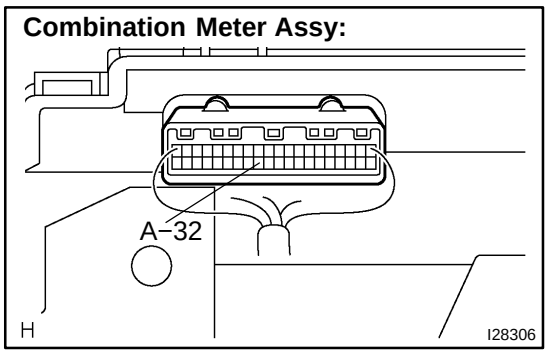
(a) Disconnect the connector from the sender gauge.

(b) Turn the ignition switch ON, and check that the receiver gauge needle indicates cool side.



(c) Ground the terminal of the wire harness side connecter through a 3.4 W test bulb.

(d) Turn the ignition switch ON, check that the bulb lights up and the receiver gauge needle moves to the hot side.

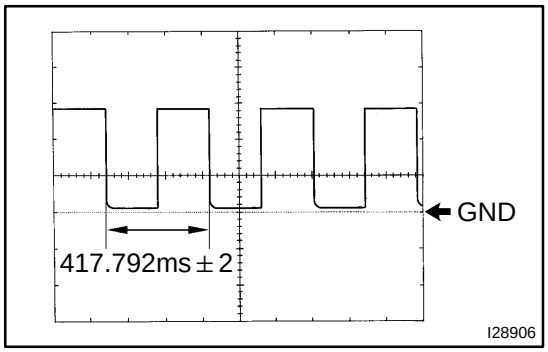


12. INSPECT INPUT ENGINE COOLANT TEMPERATURE SIGNAL WAVEFORM

(a) Remove the combination meter with connectors still connected.

(b) Connect the oscilloscope to terminal A32 and body ground.

(c) Start the engine.

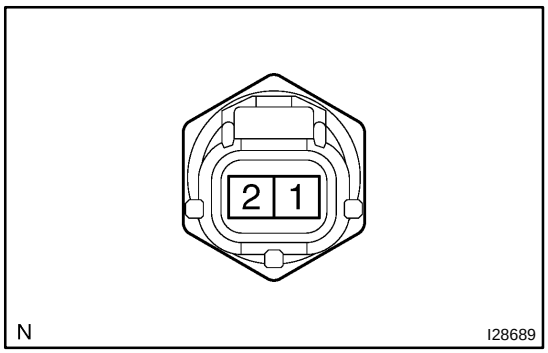


(d) Check the signal waveform according to the condition(s) in the table below.

Item	Condition
Tool setting	5 V/DIV, 10 ms/DIV
Vehicle condition	Ignition switch ACC or ON

OK:

As shown in the illustration



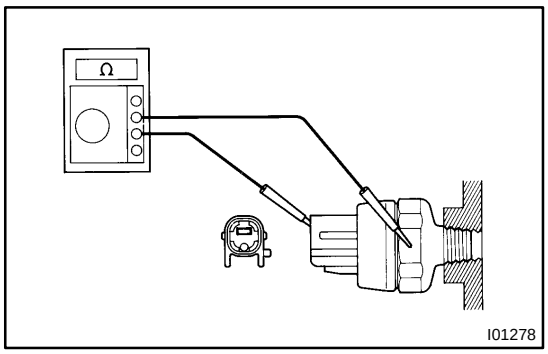
13. INSPECT ENGINE COOLANT TEMPERATURE SENDER GAUGE RESISTANCE

(a) Disconnect the connector from the engine coolant temperature sender gauge.

(b) Measure the resistance according to the value(s) in the table below.

Temperature °C (°F)	Resistance (kΩ)
−20 (−4)	13.54 to 16.63
20 (68)	2.28 to 2.63
80 (176)	0.31 to 0.33
110 (230)	0.13 to 0.15

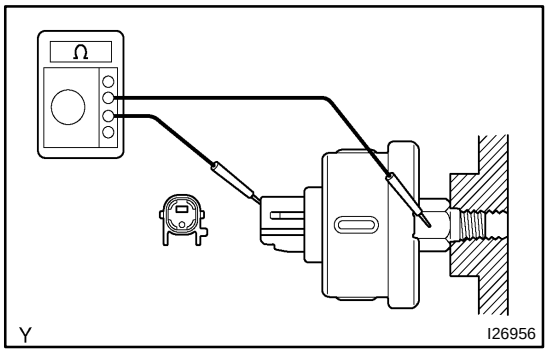
If the resistance value is not as specified, replace the sender gauge.



14. 1GR−FE (Standard cab): INSPECT OIL PRESSURE SWITCH CONTINUITY

(a) Disconnect the connector from the switch.
(b) Check that continuity exists between the terminal and ground with the engine stopped.
(c) Check that no continuity exists between the terminal and ground with the engine running.

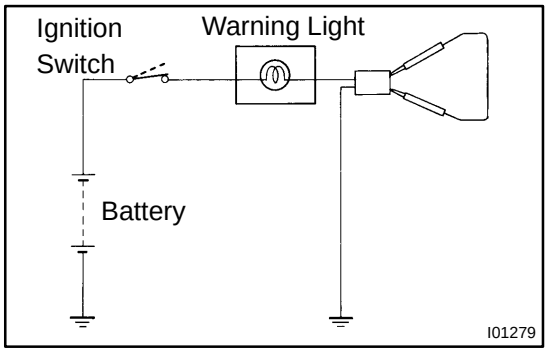
HINT:
The oil pressure should be over 24.5 kPa (0.25 kgf/cm^2, 3.55 psi).
If the continuity is not as specified, replace the switch.



15. 1GR−FE (Access cab) and 2UZ−FE: INSPECT OIL PRESSURE SENDER GAUGE CONTINUITY

(a) Disconnect the connector from the sender gauge.
(b) Check that no continuity exists between the terminal and ground with the engine stopped.
(c) Check that continuity exists between the terminal and ground with the engine running.

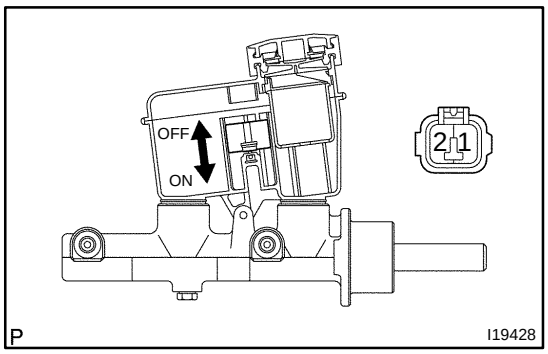
HINT:
The oil pressure should be over 29.0 kPa (0.3 kgf/cm^2, 4.2 psi).
If the continuity is not as specified, replace the seder gauge.



16. 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 harness side of the level warning switch connector.
(d) Start the engine, and check that the warning light lights up.

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

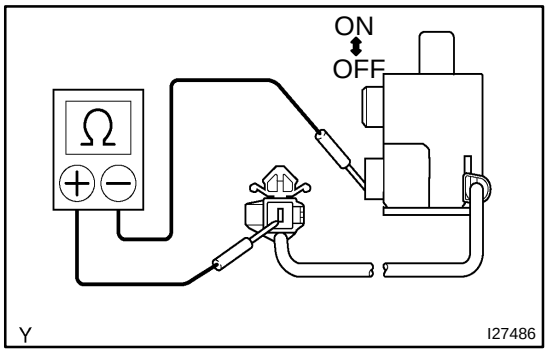


17. INSPECT BRAKE FLUID LEVEL WARNING SWITCH CONTINUITY

(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).
(d) Use siphon to take fluid out of the reservoir tank.
(e) Check that continuity exists between the terminals with the switch ON (sink).

If the continuity is not as specified, replace the switch.

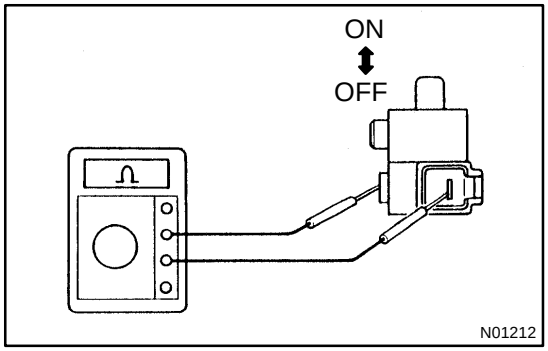
(f) Pour the fluid back in the reservoir tank.



18. Double cab:
INSPECT PARKING BRAKE SWITCH CONTINUITY

(a) Check that there is continuity between the terminal and switch body with the switch ON (switch pin released).
(b) Check that there is no continuity between the terminals with the switch OFF (switch pin pushed in).

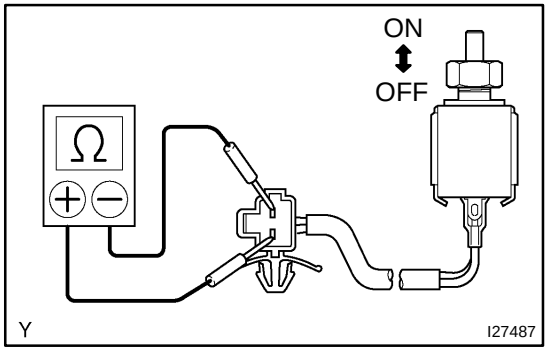
If the continuity is not as specified, replace the switch.



19. Except double cab (A/T):
INSPECT PARKING BRAKE SWITCH CONTINUITY

(a) Check that there is continuity between the terminal and switch body with the switch ON (switch pin released).
(b) Check that there is no continuity between the terminals with the switch OFF (switch pin pushed in).

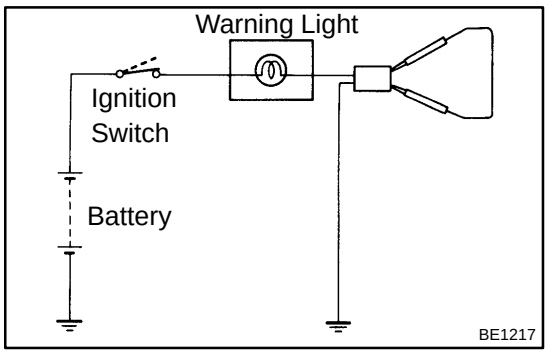
If the continuity is not as specified, replace the switch.



20. Except double cab (M/T):
INSPECT PARKING BRAKE SWITCH CONTINUITY

(a) Check that there is continuity between the terminals with the switch ON (switch pin released).
(b) Check that there is no continuity between the terminals with the switch OFF (switch pin pushed in).

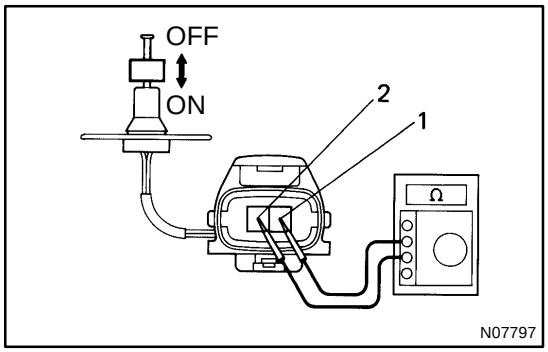
If the continuity is not as specified, replace the switch.



21. INSPECT WASHER LEVEL WARNING LIGHT

(a) Disconnect the connectors from the level warning switch.
(b) Connect the terminals of the wire harness side of the level warning switch connector.
(c) Turn the ignition switch ON, and check that the warning light turns on.

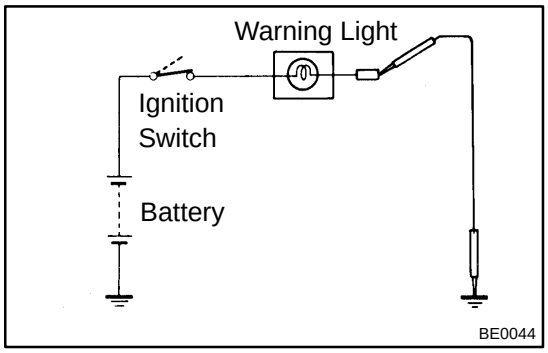
If the warning light does not turn on, inspect the bulb.



22. INSPECT WASHER LEVEL SWITCH CONTINUITY

(a) Check that there is no continuity between the terminals with the switch OFF (float).
(b) Check that there is continuity between the terminals with the switch ON (sink).

If the continuity is not as specified, replace the switch.



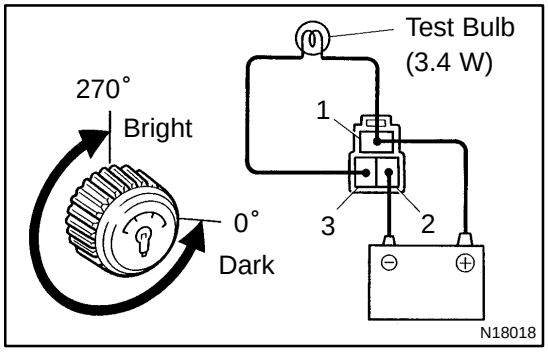
23. INSPECT DRIVER'S SEAT BELT WARNING LIGHT

(a) Disconnect connector B from the combination meter.
(b) Connect the negative (−) lead from the battery to terminal 9.
(c) 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.

24. INSPECT BUCKLE SWITCH CONTINUITY

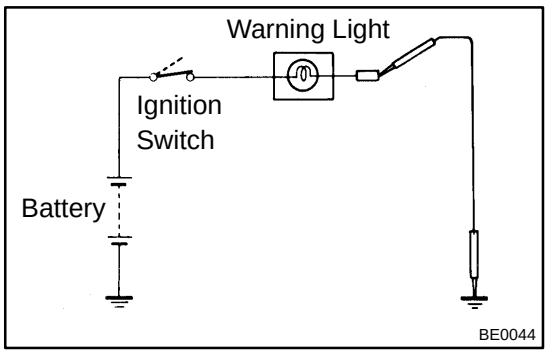
The seat belt buckle switch cannot be inspected indepently because it is a hall effect switch.



25. INSPECT LIGHT CONTROL RHEOSTAT OPERATION

(a) Connect terminals 1 and 3 through a 3.4 W test bulb.
(b) Connect the positive (+) lead from the battery to terminal 1 and the negative (−) lead to terminal 2.
(c) Turn the rheostat knob fully counterclockwise, and check that the test bulb turns off.
(d) Gradually turn the rheostat knob clockwise, and check that the test bulb brightness changes from dark to bright.

If operation is not as specified, replace the rheostat.

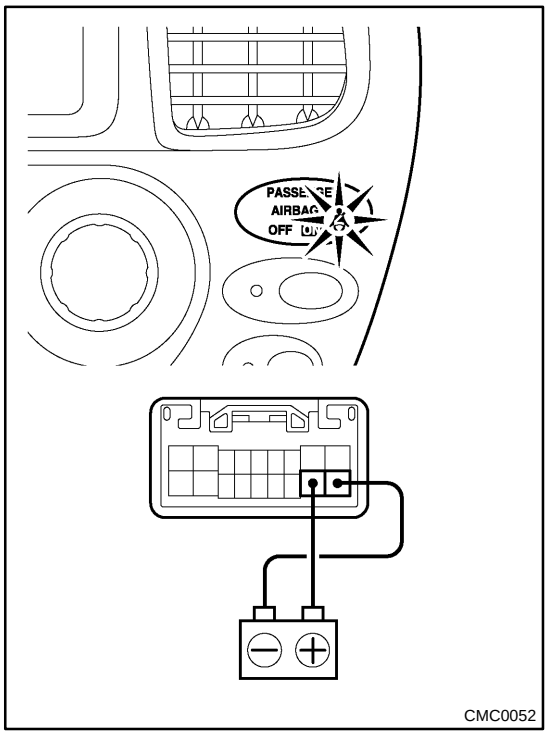


26. INSPECT OPEN DOOR WARNING LIGHT

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

(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.



27. INSPECT PASSENGER SEAT BELT WARNING LIGHT

(a) Remove the center cluster finish panel.

(b) Disconnect the connectors from the center integration.

(c) Connect the positive(+) lead the vattery to the terminal 11 and negative (−) lead terminal 10, and check that the warning light lights up.

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

28. MAINTENANCE LIQUID RESETTING PROCEDURE

(a) Set the display window to ODO.
(b) Turn the ignition switch off.
(c) Pressing the reset switch, turn the ignition switch to the ON position (keep pressing for at least 5 seconds.)
(d) Reset procedure is completed.

HINT:

- If the ignition switch is turned off during the reset procedure.
  LCD: off
  IND: off
- If the reset switch is pressed off during the reset procedure.
  LCD: return to ODO
  IND: Keep the previous state of reset

Indicator Condition:

State	Condition	Specified State
Blinking	The vehicle runs 4,500 miles after the previous setting	The indicator blinks for 12 seconds after the ignition switch is on (after 3 seconds for a bulb check).
Continuously Illuminated	The vehicle runs 5,000 miles after the previous setting	The indicator is continuously illuminated after the ignition switch is on.

− MEMO −