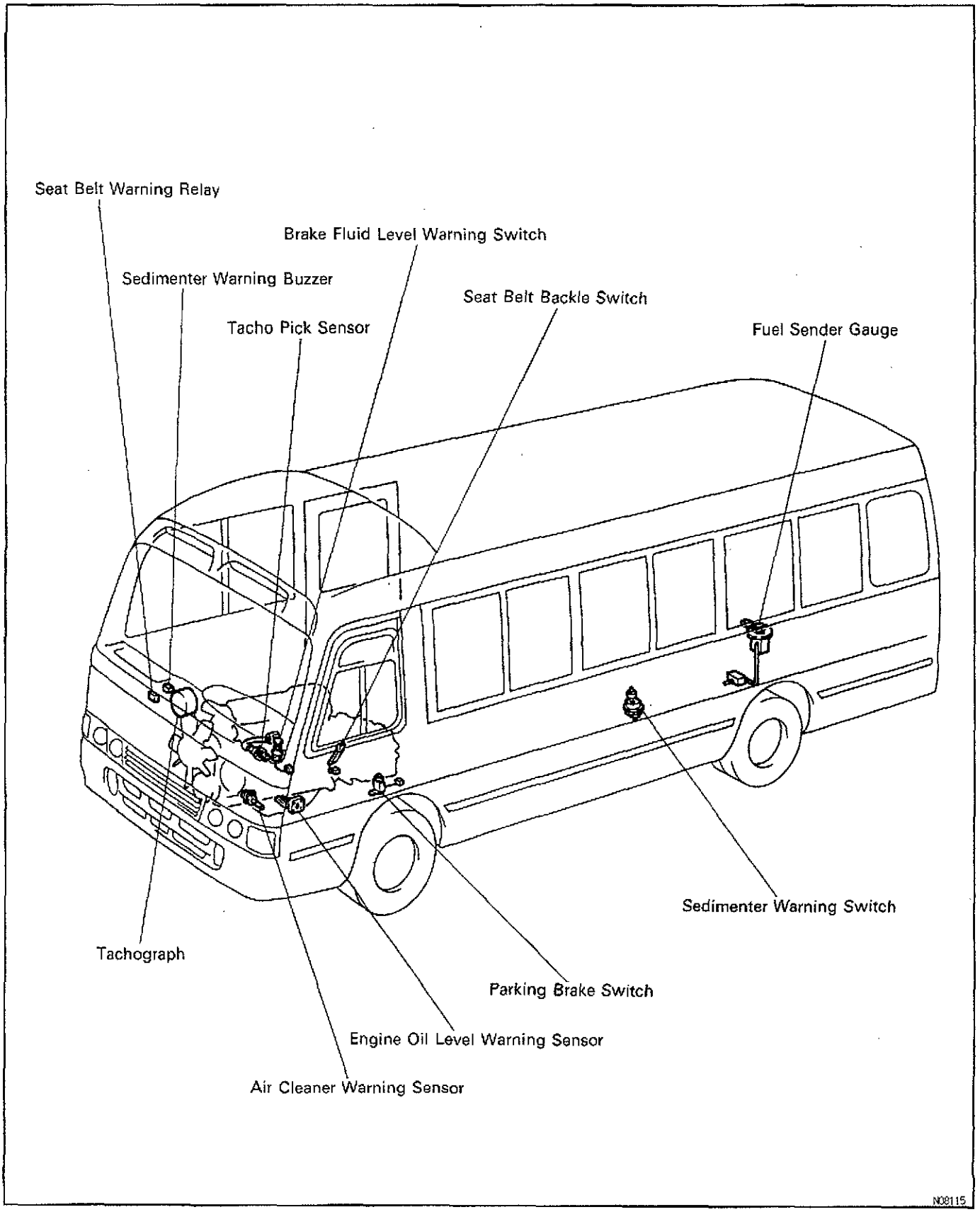
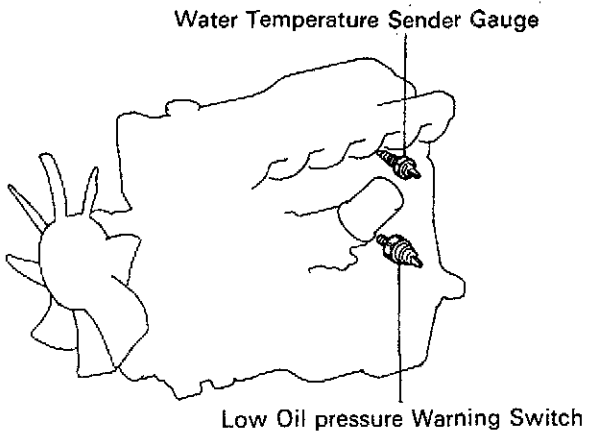
COMBINATION METER
PARTS LOCATION

BE02S-01

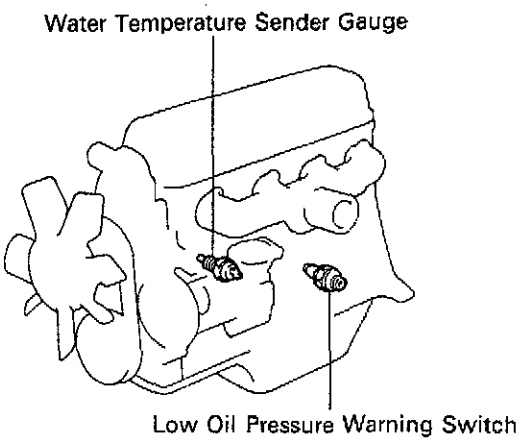


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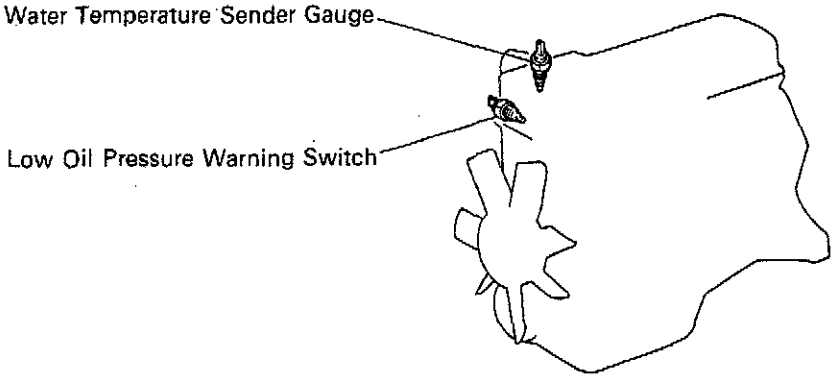
1HZ Engine



3B and 14B Engines



RZ Engine



BE5993 BE5994
N08114

Z07779

BE01E-02

TROUBLESHOOTING

The table below will be useful for you in troubleshooting these electrical problems. The most likely causes of the malfunction are shown in the order of their probability. Inspect each part in the order shown, and replace the part when it is found to be faulty.

METER, GAUGES AND ILLUMINATION

Trouble	Parts' name	See page
Tachometer, Fuel Gauge and Water Temperature Gauge do not operate	1. GAUGE Fuse	BE–9 and 10
	2. Combination Meter Wiring Circuit	BE–46 and 47
	3. Wire Harness	
	4. Meter Circuit Plate	
Speedometer does not operate	1. Speed Sensor	BE–49
	2. Speedometer Driven Gear and Drive Gear	
Tachometer does not operate	1. Combination Meter Wiring Circuit	BE–46 and 47
	2. Wire Harness	
	3. Igniter (Engine)	
	Tacho Pick Sensor (Disel M/T)	BE–53
	ECT ECU (Disel A/T)	
	4. Meter Circuit Plate	
Fuel Gauge does not operate or abnormal operation	1. Fuel Receiver Gauge	BE–54
	2. Fuel Sender Gauge	BE–55
	3. Combination Meter Wiring Circuit	BE–46 and 47
	4. Wire Harness	
Water Temperature Sender Gauge does not operates or abnormal operation	1. Water Temperature Receiver Gauge	BE–56
	2. Water Temperature Sender Gauge	
	3. Combination Meter Wiring Circuit	BE–46 and 47
	4. Wire Harness	
All illumination lights do not light up	1. TAIL Fuse	BE–9 and 10
	2. Wire Harness	
Only one illumination light does not light up	1. Bulb	BE–6
	2. Wire Harness	

WARNING LIGHTS

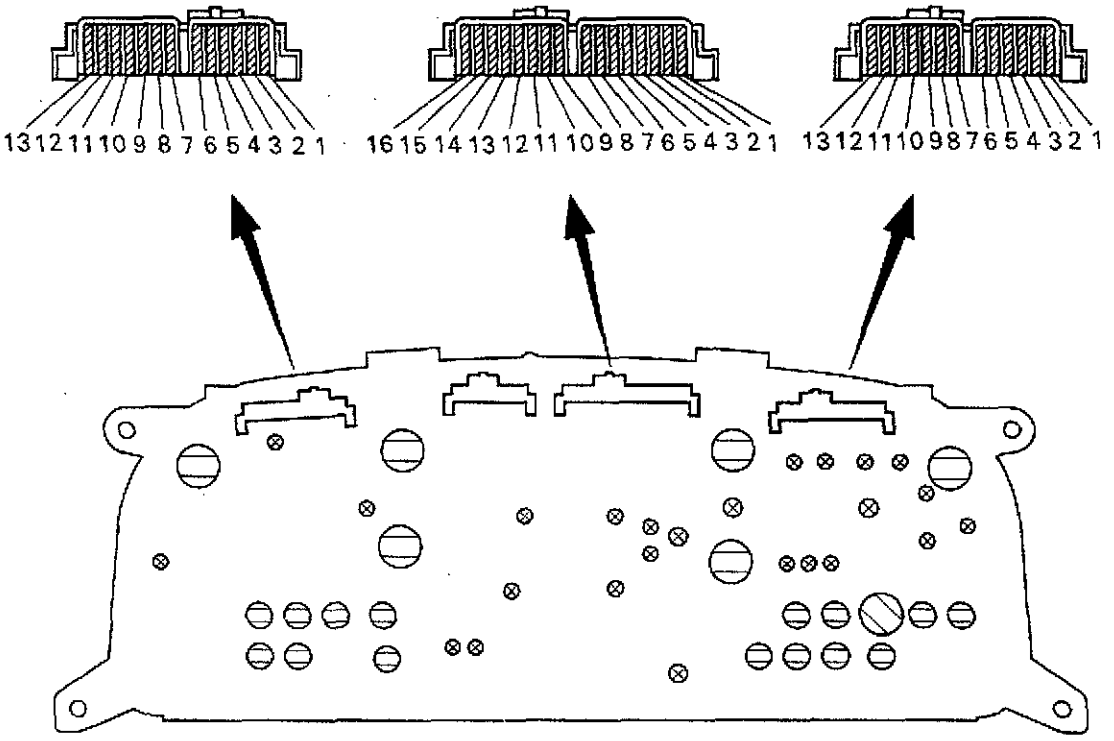
Trouble	Parts' name	See page
Warning light do not light up (Except. Discharge)	1. GAUGE Fuse	BE–9 and 10
	2. Combination Meter Wiring Circuit	BE–46 and 47
	3. Wire Harness	
Timing Belt Warning light does not light up	1. Bulb	BE–6
	2. Warning Switch	BE–49
	3. Combination Meter Wiring Circuit	BE–46 and 47
Discharge Warning Light does not light up	1. IG Fuse	BE–9 and 10
	2. Bulb	BE–6
	3. Wire Harness	
	4. Alternator	
Sedimenter Warning Light dose not light up	1. Bulb	BE–6
	2. Combination Meter Wiring Circuit	BE–46 and 47
	3. Sedimenter Warning Switch	BE–56
	4. Wire Harness	
Brake Warning does not light up	1. Bulb	BE–6
	2. Combination Meter Wiring Circuit	BE–46 and 47
	3. Brake Fluid Level Warning Switch	BE–60
	4. Vacuum Switch	
	5. Parking Brake Switch	BE–60
	6. Bulb Check Relay (ADR)	
Air Filter Warning light does not light up	1. Bulb	BE–6
	2. Combination Meter Wiring Circuit	BE–46 and 47
	3. Air Filter Warning Switch	BE–60
Engine Oil Level Warning Light does not light up	1. Bulb	BE–6
	2. Combination Meter Wiring Circuit	BE–46 and47
	3. Engine Oil Level Sensor	BE–58
Seat Belt Warning Light does not light up	1. Bulb	BE–6
	2. Combination Meter Wiring Circuit	BE–46 and 47
	3. Seat Belt Buckle Switch	BE–61
	4. Seat Belt Warning Relay	BE–61
Low Oil Pressure Warning Light does not light up	1. Bulb	BE–6
	2. Combination Meter Wiring Circuit	BE–46 and 47
	3. Oil Pressure Switch	BE–58

INDICATOR LIGHTS

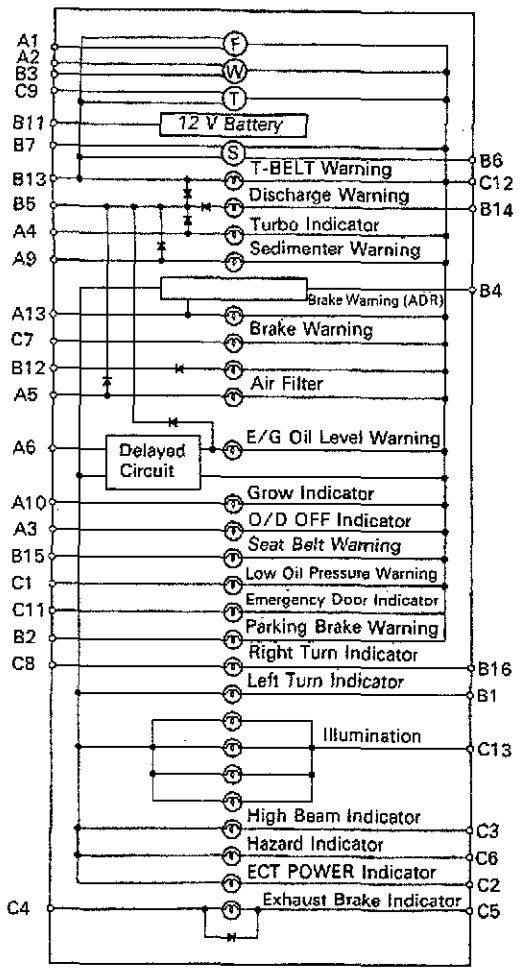
Trouble	Parts' name	See page
Center Door Indicator Light does not light up	1. Bulb	BE—6
	2. Combination Meter Wiring Circuit	BE—46 and 47
	3. Center Door Courtesy Switch	BE—67
	4. Auto Door Control Relay	BE—80
	5. Wire Harness	
Glow Indicator Light does not light up	1. Bulb	BE—6
	2. Combination Meter Wiring Circuit	BE—46 and 47
	3. Glow Timer	
	4. Wire Harness	
O/D OFF Indicator Light does not light up	1. Bulb	BE—6
	2. Combination Meter Wiring Circuit	BE—46 and 47
	3. O/D OFF Switch	
	4. Wire Harness	
Emergency Exit Door Indicator Light does not light up	1. Bulb	BE—6
	2. Combination Meter Wiring Circuit	BE—46 and 47
	3. Emergency Exit Door Courtesy Switch	
Turn Indicator Light does not light up	1. Bulb	BE—6
	2. Combination Meter Wiring Circuit	BE—46 and 47
	3. Wire Harness	
	4. Turn Signal and Hazard Warning System	BE—20
High Beam Indicator Light does not light up	1. Bulb	BE—6
	2. Combination Meter Wiring Circuit	BE—46 and 47
	3. Wire Harness	
	4. Headlight System	
Hazard Indicator Light does not light up	1. Bulb	BE—6
	2. Combination Meter Wiring Circuit	BE—46 and 47
	3. Wire Harness	
	4. Turn Signal and Hazard Warning System	BE—20
ECT PWR Indicator Light does not light up	1. Bulb	BE—6
	2. Combination Meter Wiring Circuit	BE—46 and 47
	3. ECT ECU	
	4. Wire Harness	
Exhaust Brake Indicator light does not Light up	1. Bulb	BE—6
	2. Combination Meter Wiring Circuit	BE—46 and 47
	3. Exhaust Brake Switch	
	4. Exhaust Brake ECU	

BE01F–02

METER CIRCUIT



N07584



Ⓕ : *Fuel Sender Gauge*
Ⓦ : Water Temperature Sender Gauge
Ⓣ : Tachometer
Ⓢ : Speedometer

N07764

No.		Wiring Connector Side
A	1	Fuel Sender Gauge
	2	*Ground*
	3	O/D OFF Switch
	4	Turbo Warning Relay
	5	Air Filter Warning Switch
	6	Engine Oil Level Sensor
	9	*Sedimenter Buzzer*
	10	Glow Timer
	13	Brake Fluid Level Warning Switch Vacuum Switch Parking Brake Switch
B	1	Turn Signal Switch (L)
	2	Ground
	3	Water Temperature Sender Gauge
	4	Ignition Switch (ST)
	5	ALT Terminal L
	6	Tachograph, Automatic Door, Exhaust Brake etc.
	7	Speed Sensor
	11	12 V Battery
	12	Auto Door Switch
	13	Ground
	14	IG Fuse
	15	Seat Belt Buckle Switch
	16	Turn Signal Switch (R)
C	1	Oil Pressure Switch
	2	ECT ECU
	3	Headlight Dimmer Switch
	4	Exhaust Brake Switch (M/T) Ground (A/T)
	5	IG Fuse (M/T) *Exhaust Brake Switch (A/T)*
	6	Hazard Warning Switch
	7	Brake Fluid Level Warning Switch Vacuum Switch Parking Brake Switch
	8	*Parking Brake Switch*
	9	Pick-up Sensor (Diesel E/G, M/T) Igniter (Gasoline E/G) ECT ECU (A/T)
	11	Emergency Exit Door Courtesy Switch
	12	GAUGE Fuse
	13	TAIL Fuse

BE

V02936

BE02T-01

SPEEDOMETER

1. INSPECT SPEEDOMETER ON VEHICLE

(a) 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.
If error is excessive, replace the speedometer.

(b) Check the speedometer for pointer vibration and abnormal noise.

EUROPE

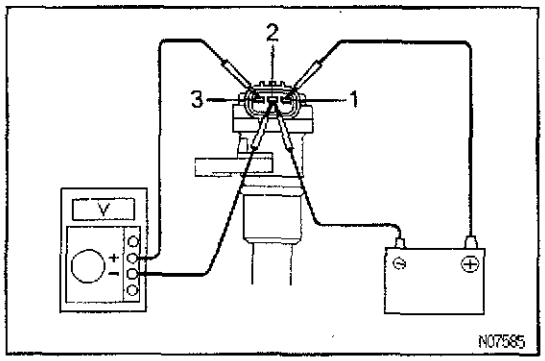
Standard indication (km/h)	Allowable range (km/h)	Standard indication (mph)	Allowable range (mph)
20	20 – 26	20	20 – 24.5
40	40 – 48	40	40 – 46.5
60	60 – 70	60	60 – 68.5
80	80 – 92	80	80 – 90.5
100	100 – 114	100	100 – 112.5
120	120 – 136	–	
140	140 – 158	–	
160	160 – 180	–	

GENERAL

Standard indication (km/h)	Allowable range (km/h)	Standard indication (mph)	Allowable range (mph)
20	17 – 27	20	18 – 24
40	38 – 46	40	38 – 44
60	57.5 – 67	60	58 – 66
80	77 – 88	80	78 – 88
100	96 – 109	100	98 – 110
120	115 – 130	120	118 – 132
140	134 – 151.5	–	
160	153 – 173	–	

AUSTRALIA

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



2. INSPECT SPEED SENSOR

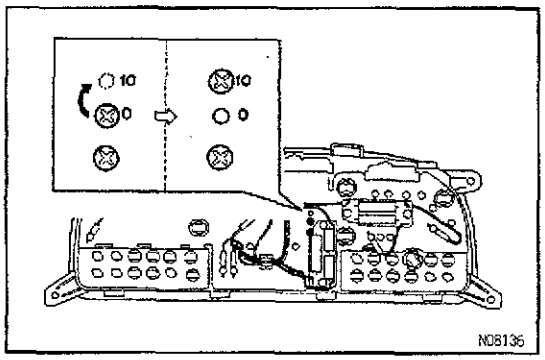
(a) Connect the positive (+) lead from battery to terminal 1 and negative (−) lead to terminal 2.

(b) Connect the positive (+) lead from tester to terminal 3 and negative (−) lead to terminal 2.

(c) Revolve shaft.

(d) Check that there is voltage changer from approx. 0 V to 11 V or more between terminal 3 and 2.
HINT: The voltage should change 20 times for each revolution of the speed sensor shaft.
If operation is not as specified, replace the sensor.

BE

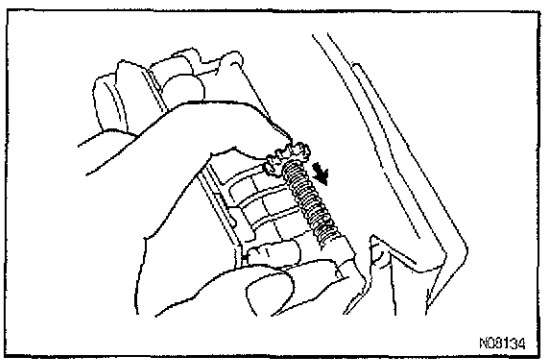


TIMING BELT WARNING

BE0ZU-01

1. RESET TIMING BELT WARNING

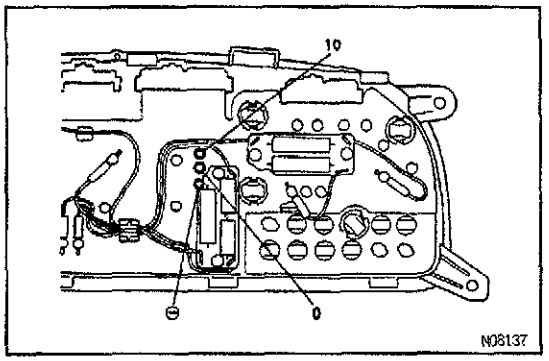
The T−belt warning light lights up when the vehicle has run 100,000 km. When the belt has been replaced, remove the screw from the "0" position at the rear of the meter and reinstall it in the "10" position.
HINT: When the warning light lights up after 200,000 km, remove the screw from the "10" position and reinstall it at the "0" position. After 300,000 km, install the screw back at the "10" position.



2. IF REPLACING TIMING BELT BEFORE WARNING LIGHT LIGHTS UP

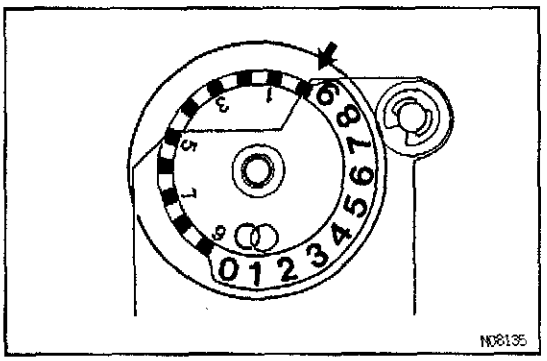
(a) Remove the speedometer unit from the combination meter.

(b) Disengage the gear on top of the odometer, and adjust the cam location as shown in the illustration.

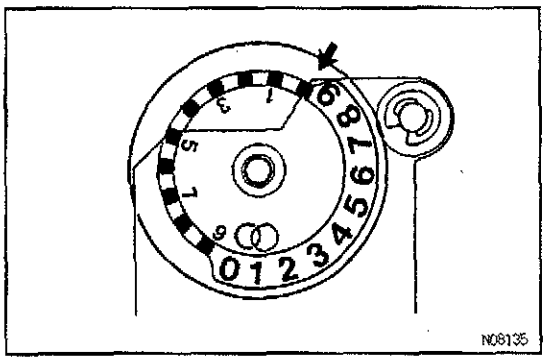


HINT: Install the screw at the "0" and "⊖" position.

(c) Install the speedometer in the combination meter and install the combination meter in the vehicle.



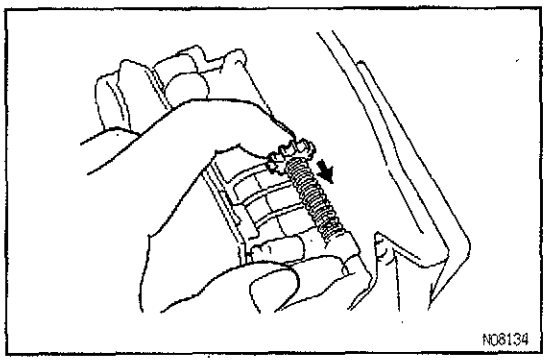
BE



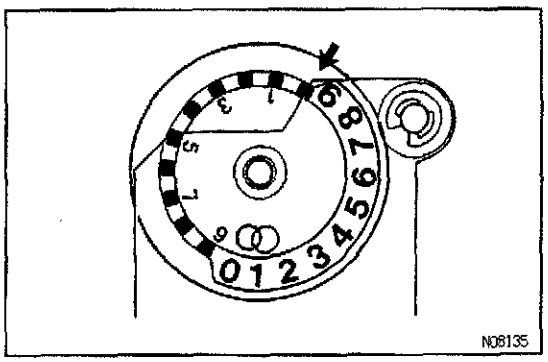
3. REPLACE SPEEDOMETER

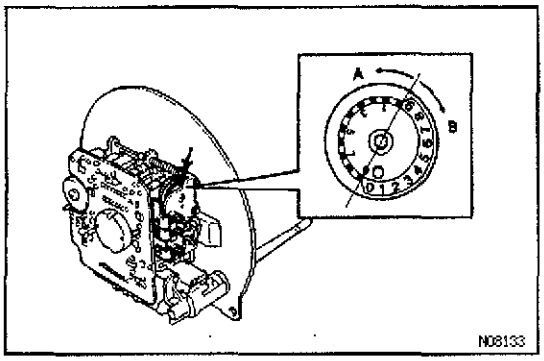
(a) Remove the speedometer unit from the combination meter.

(b) Read the number indicated by the T–belt microswitch in the speedometer.

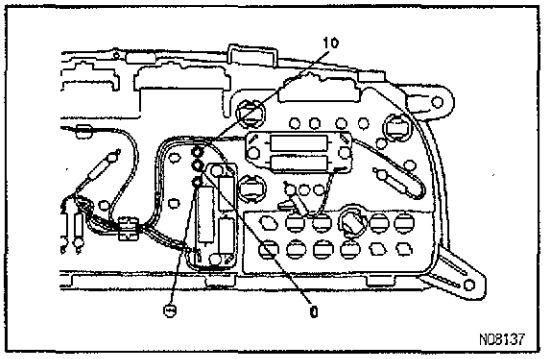


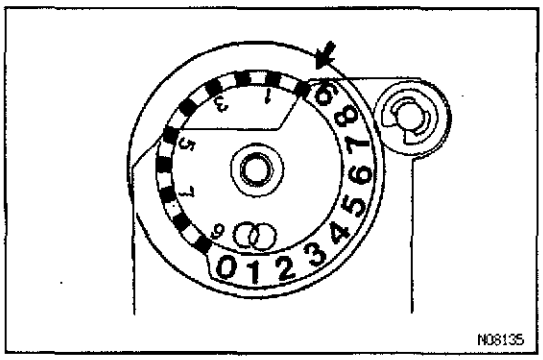
(c) Disengage the gear on top of the odometer, reset the T–belt microswitch to the reading in (b) above, then engage the gear.





(d) When the arrow in the illustration indicates the A side, install the screws at "0" and the "⊖" positions. For the B side, install the screws at the "10" and "⊖" position.

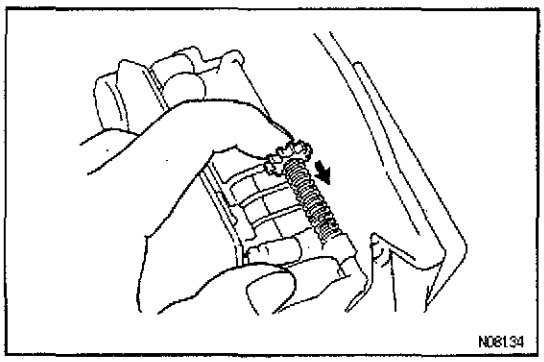




4. INSPECT TIMING BELT WARNING MICRO SWITCH

(a) Remove the speedometer unit from the combination meter.

(b) Read the number indicated by the T–belt microswitch in the speedometer.



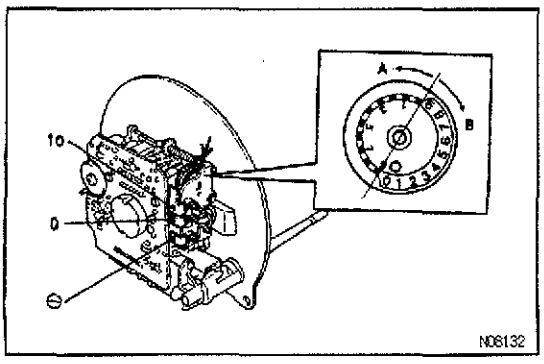
(c) Disengage the gear on top of the odometer and check the continuity between the terminals when the cam for the microswitch is rotated.

Position "A"

Condition	Tester connection	Specified value
Constant	0 – ⊖	No continuity
Constant	10 – ⊖	Continuity

Position "B"

Condition	Tester connection	Specified value
Constant	0 – ⊖	Continuity
Constant	10 – ⊖	No continuity



TACHOGRAPH

1. INSPECT TACHOGRAPH ON VEHICLE

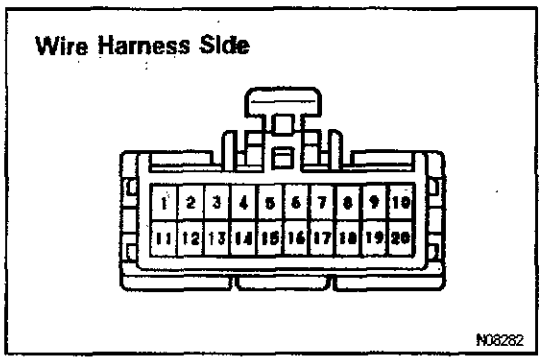
(a) Using a speedometer tester, inspect the tachograph for allowable indication error and record error.
Check the operation of the odometer.
HINT: Tire wear and tire over or under inflation will increase the indication error and record error.
If error is excessive, replace the speedometer.

(b) Check the speedometer for pointer vibration and abnormal noise.
Indication

Standard indication (km/h)	Allowable range (km/h)
20	17 – 23
40	40 – 44.5
60	60 – 65
80	80 – 85
100	100 – 105

Record

Standard record (km/h)	Allowable range (km/h)
20	17 – 23
40	37 – 43
60	57 – 63
80	76.5 – 83.5
100	95.5 – 104.5



2. INSPECT TACHOGRAPH

Inspect the tachograph continuity between terminals.
Wire harness side

Tester connection	Condition	Specified value
8 – Ground	Constant	Continuity
13 – Ground	Constant	Continuity
7 – Ground	Constant	Battery voltage
9 – Ground	Ignition Switch "ON"	Battery voltage
12 – Ground	Ignition Switch "ON" Light Switch "TAIL"	Battery voltage

If continuity or voltage are not as specified, replace the tachograph.

BE02W-01

TACHOMETER

1. INSPECT TACHOMETER (ON–VEHICLE)

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

NOTICE:

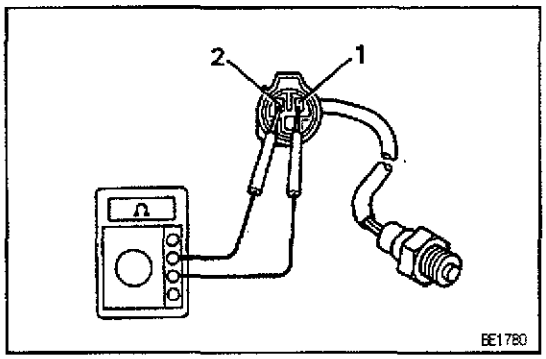
- **Reversing the connection of the tachometer will damage the transistors and diodes inside.**
- **When removing or installing the tachometer, be careful not to drop or subject it to heavy shocks.**

(b) Compare the tester and tachometer indications.

DC 13.5 V 20°C (68 °F)

Standard indication (rpm)	Allowable range (rpm)
700	630 – 770
1,000	900 – 1,100
2,000	1,875 – 2,125
3,000	2,850 – 3,150
4,000	3,850 – 4,150

If error is excessive, replace the tachometer.



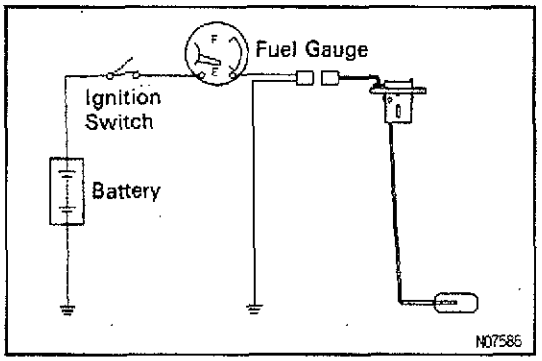
2. INSPECT PICK–UP SENSOR (Diesel Engine)

Measure the resistance between terminals 1 and 2.

Resistance: Approx. 730 Ω

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

BE



BE01J-02

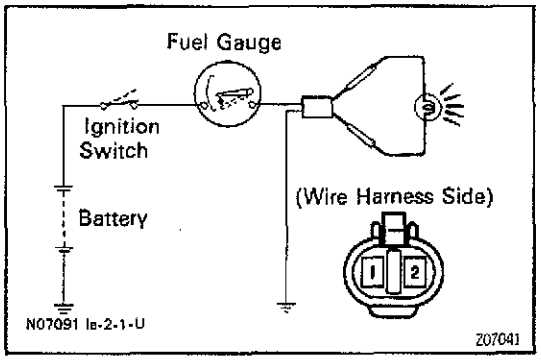
FUEL GAUGE

1. INSPECT FUEL RECEIVER GAUGE

OPERATION

(a) Disconnect the connector from the sender gauge.

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

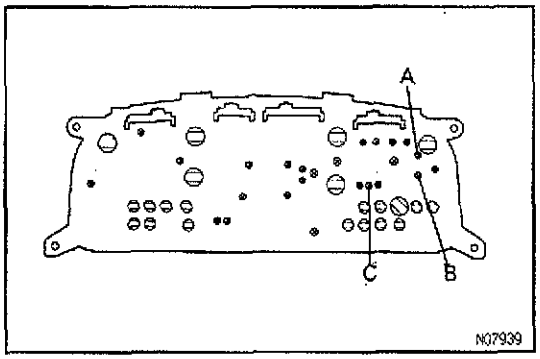


(c) Connect terminals 1 and 2 on the wire harness side connector through a 3.4 watts test bulb.

(d) Turn the ignition switch ON, 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 the needle to stabilize.

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



RESISTANCE

Measure the resistance between terminals.

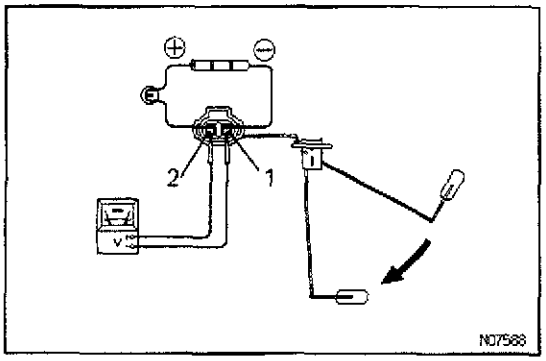
12V Vehicles

Between terminals	Resistance (Ω)
A – B	Approx. 115.8
A – C	Approx. 160.6
B – C	Approx. 276.4

24V Vehicles

Between terminals	Resistance (Ω)
A – B	Approx. 86.8
A – C	Approx. 160.6
B – C	Approx. 247.4

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



2. INSPECT FUEL SENDER GAUGE

(OPERATION)

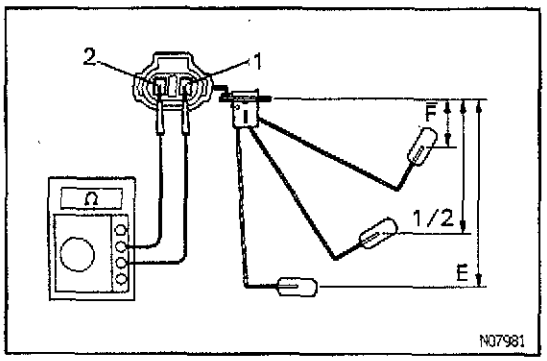
(a) Connect a series of three 1.5 V dry batteries.

(b) Connect the positive (+) lead from the dry cell batteries to terminal 2 through a 3.4 W test bulb and the negative (−) lead to terminal 1.

(c) Check the positive (+) lead from the voltmeter to terminal 2 and the negative (−) lead to terminal 1.

(d) Check that the voltage rises as the float is moved from the top to bottom position.

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



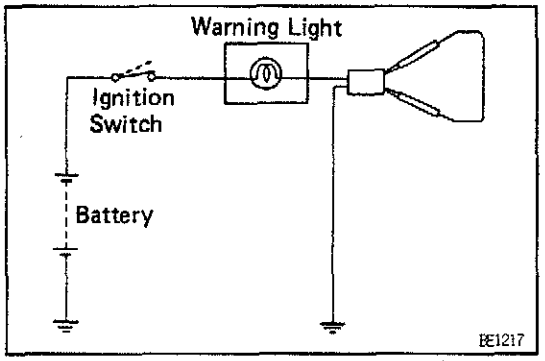
(RESISTANCE)

Measure the terminals between 1 and 2.

Float position (mm)	Resistance (Ω)
F : Approx. 83.0	F : Approx. 3.0
1 / 2 : Approx. 200.0	1 / 2 : Approx. 32.5
E : Approx. 302.0	E : Approx. 110.0

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

BE

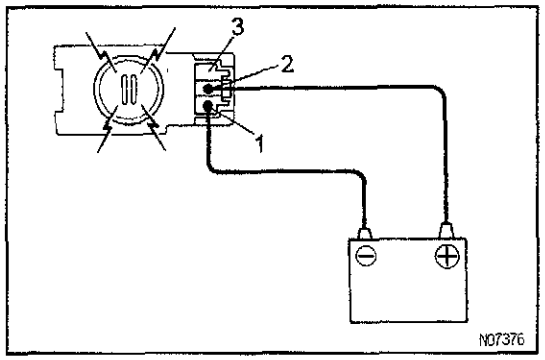


FUEL SEDIMENTER WARNING

BE0ZX–01

1. INSPECT FUEL SEDIMENTER WARNING LIGHT

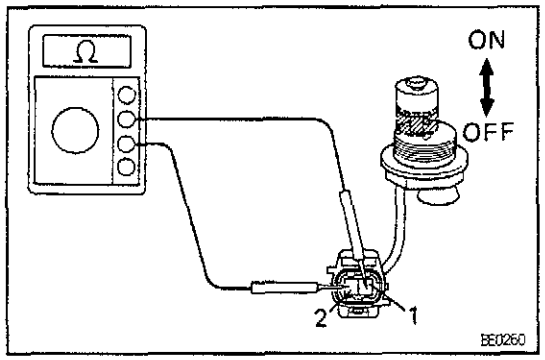
(a) Disconnect the connector from the warning switch and connect terminals on the wire harness side connector.
(b) Remove the CHARGE fuse and turn the ignition switch ON.
(c) Check that the warning light lights up and the warning buzzer sounds.



2. INSPECT WARNING BUZZER

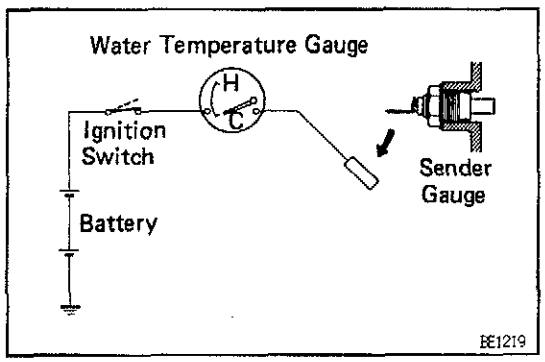
Connect the positive (+) lead from the battery to terminal 2 and the negative (–) lead to terminal 1, check that the buzzer sounds.
If buzzer does not sound, replace the buzzer.

BE



3. INSPECT FUEL SEDIMENTER WARNING SWITCH

(a) Check that there is no continuity between terminals with the warning switch OFF (float down).
(b) Check that there is continuity between terminals with the warning switch ON (float up).
If operation is not as specified, replace the switch.

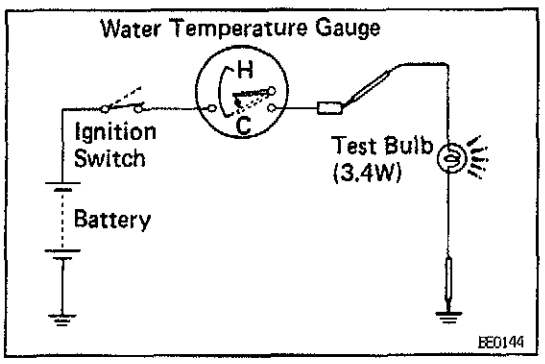


WATER TEMPERATURE GAUGE

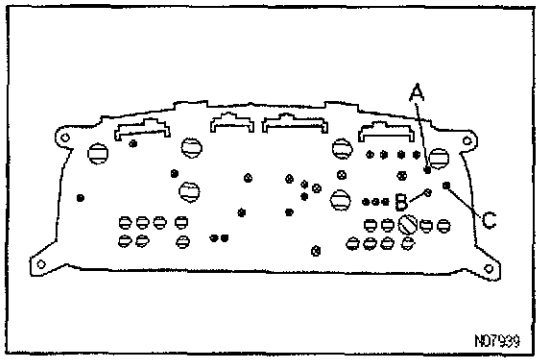
BE01L–02

INSPECT WATER TEMPERATURE RECEIVER GAUGE (OPERATION)

(a) Disconnect the connector from the sender gauge.
(b) Turn the ignition switch ON, check that the receiver gauge needle indicates COOL.



(c) Ground terminal on the wire harness side connecter through a 3.4 watts test bulb.
(d) Turn the ignition switch ON, check that the bulb lights up and the receiver gauge needle moves to the hot side.
If operation is as specified, replace the sender gauge. Then, recheck the system.
If operation is not as specified, measure the receiver gauge resistance.



(RESISTANCE)

G.C.C

HINT:

A – C: Connect the negative (–) lead from the electrical tester to terminal A and the positive (+) lead to terminal C.

B – C: Connect the negative (–) lead from the electrical tester to terminal B and the positive (+) lead to terminal C.

12V Vehicles

Between terminals	Resistance (Ω)
A – B	Approx. 75.0
A – C	Approx. 165.0
B – C	Approx. 178.0

24V Vehicles

Between terminals	Resistance (Ω)
A – B	Approx. 125.0
A – C	Approx. 165.0
B – C	Approx. 246.0

BE

OTHER COUNTRY

HINT: *Connect the negative (–) lead from the electrical tester to terminal B and the positive (+) lead to terminal A.*

Measure the resistance between terminals.

12V Vehicles

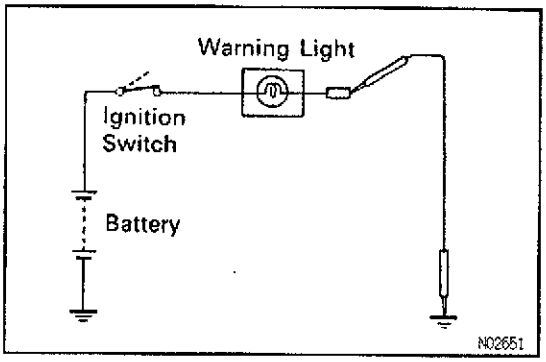
Between terminals	Resistance (Ω)
A – B	Approx. 75.0

24V Vehicles

Between terminals	Resistance (Ω)
A – B	Approx. 75.0

HINT: Connect the test leads so that the current from the ohmmeter can flow according to the above order. This circuit includes the diode.

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



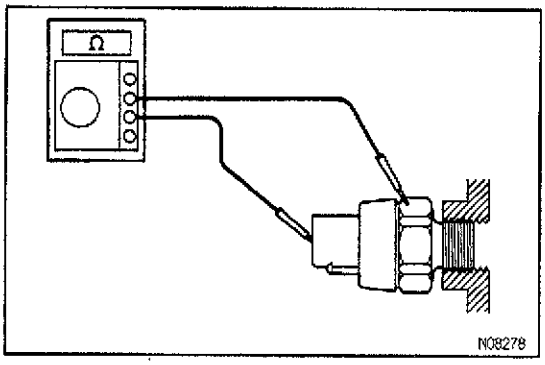
LOW OIL PRESSURE WARNING

BE01M-03

1. 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, check that the warning light lights up.
If the warning light does not light up, test the bulb.



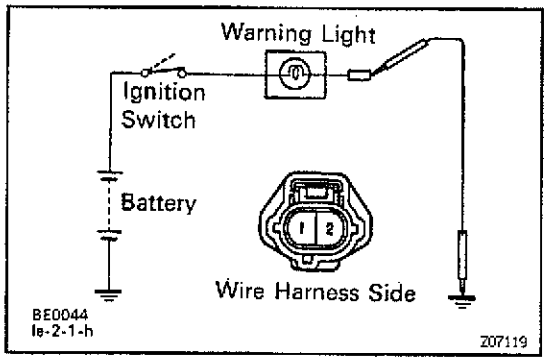
2. INSPECT LOW OIL PRESSURE WARNING SWITCH

(a) Disconnect the connector from the switch.

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

(c) Check that there is no continuity between terminal and ground with the engine running.
HINT: Oil pressure should be over 49 kPa (0.5 kgf/cm², 7.1 psi).
If operation is not as specified, replace the switch.

BE



ENGINE OIL LEVEL WARNING

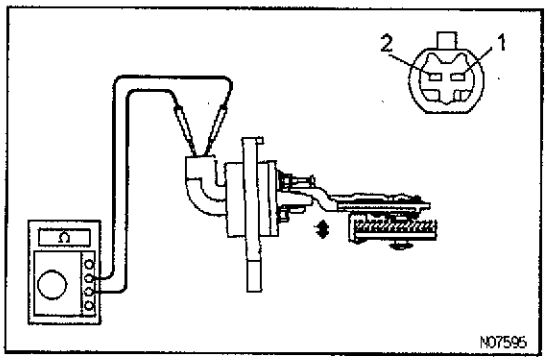
BE02Y-02

1. INSPECT ENGINE OIL LEVEL WARNING LIGHT

(a) Disconnect the connector from the switch.

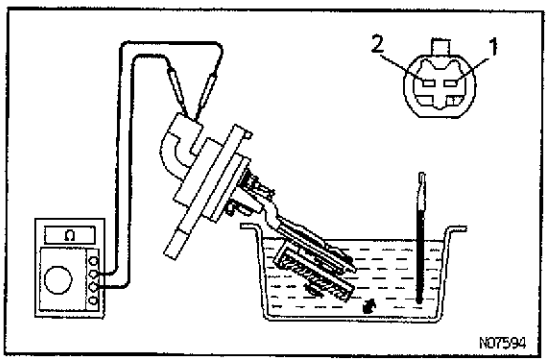
(b) Ground terminal 1 on the wire harness connector.

(c) Turn the ignition switch ON, check that the warning light lights up approximately 40 seconds later.
If the warning light does not light up, inspect bulb or wire harness.



2. INSPECT ENGINE OIL LEVEL WARNING SENSOR (OPERATION)

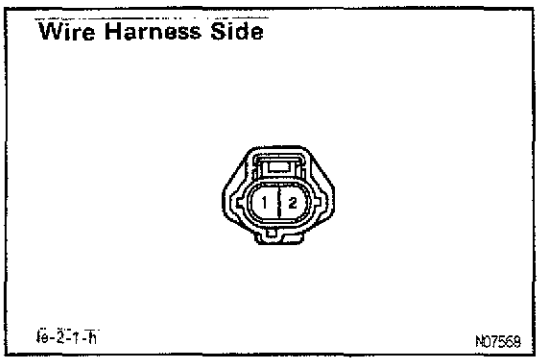
(a) Check that there is continuity between terminals with each switch position.



(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.

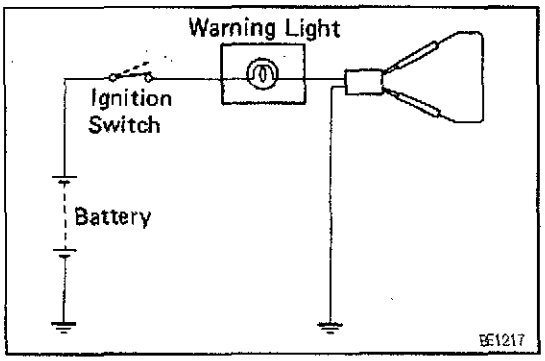


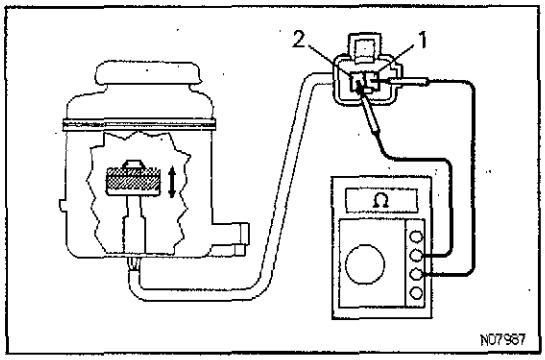
3. INSPECT CIRCUIT

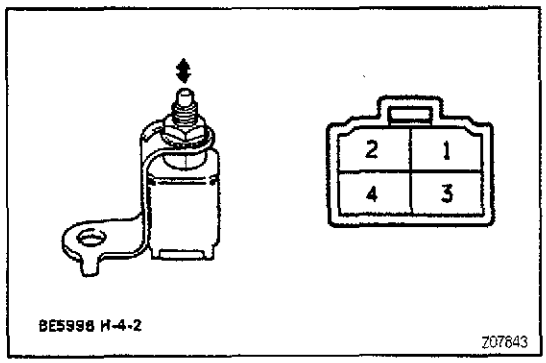
Disconnect the switch connector and inspect the connector on wire harness side as shown.

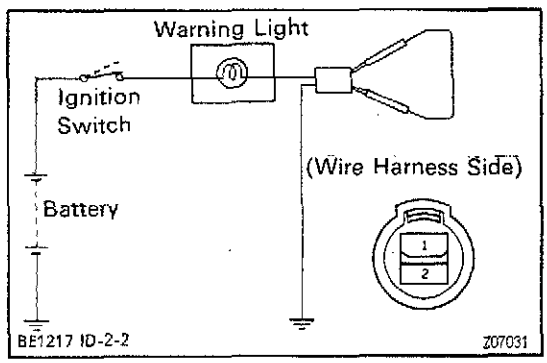
Tester connection	Condition	Specified value (Continuity)
2 — Ground	Constant	Continuity

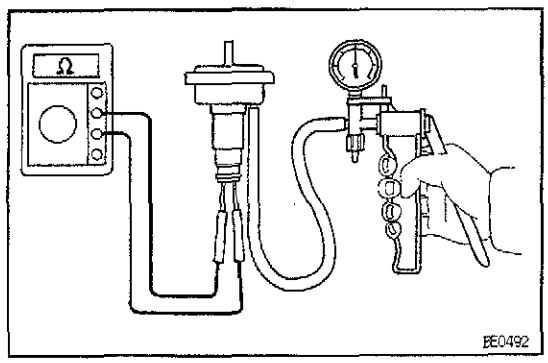
If continuity is not as specified, inspect the wire harness or ground point.











BRAKE WARNING

BE01P-03

1. INSPECT BRAKE WARNING LIGHT

(a) Disconnect the connectors from the level warning switch and parking brake switch.

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

(c) Turn the ignition switch ON, check that the warning light lights up.

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

2. INSPECT BRAKE FLUID LEVEL WARNING SWITCH

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

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

If operation is not as specified, replace the switch.

3. INSPECT PARKING BRAKE SWITCH

Inspect the switch continuity between terminals.

Condition	Terminal connection	Specified value
ON (switch pin released)	2 – 4	Continuity
OFF (switch pin pushed in)	1 – 3	Continuity

If continuity is not as specified, replace the switch.

AIR CLEANER WARNING

BE02Z-01

1. INSPECT AIR CLEANER WARNING LIGHT

(a) Disconnect the connector from the vacuum switch. Connect the wire harness side connector terminals 1 and 2.

(b) Start the engine. Check that the bulb lights up.

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

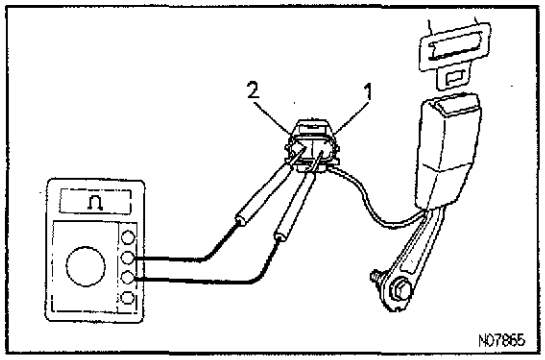
2. INSPECT VACUUM SWITCH

(a) With a vacuum of 3.9 ± 0.5 kPa (29.4 ± 3.7 mmHg, 1.157 ± 0.146 in.Hg) or above, check that there is continuity between terminals.

(b) Check that there is not continuity between terminals with no vacuum.

If operation is not as specified, replace the switch.

BE100-02



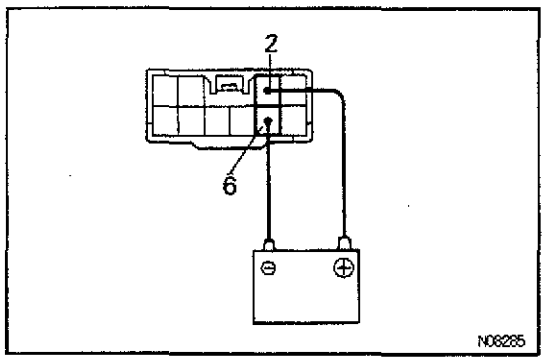
SEAT BELT WARNING

1. INSPECT BUCKLE SWITCH

(a) Check that there is continuity between terminals on the switch side connector with the switch OFF (belt fastened).

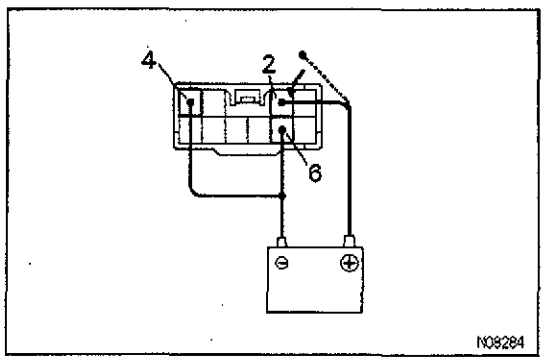
(b) Check that there is no continuity between terminals on the switch side connector with the switch ON (belt unfastened).

If operation is not as specified, replace the seat belt inner.



2. INSPECT SEAT BELT WARNING RELAY

(a) Connect the positive (+) lead from the battery to terminal 2 and the negative (−) lead to terminal 6, check that the buzzer does not sound.



(b) Connect the negative (−) lead from the battery to terminals 4 and 6 and the positive (+) lead to terminal 2, check that the buzzer sounds for 4 – 8 seconds.

If operation is not as specified, replace the relay.