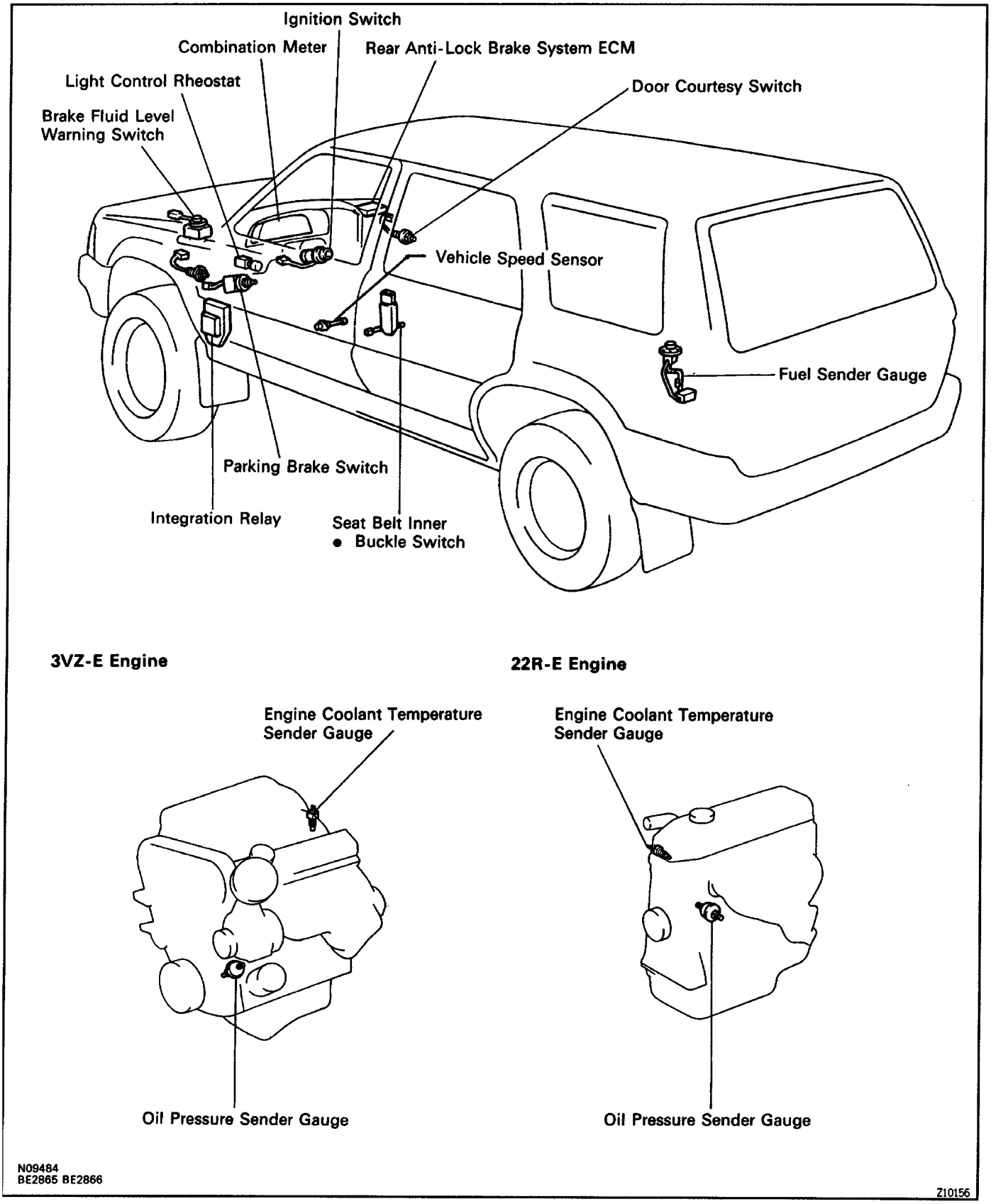
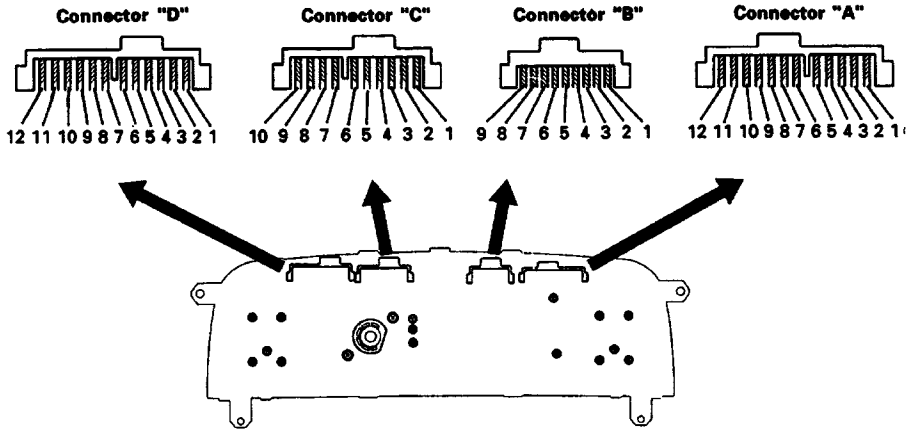
# COMBINATION METER
## PARTS LOCATION



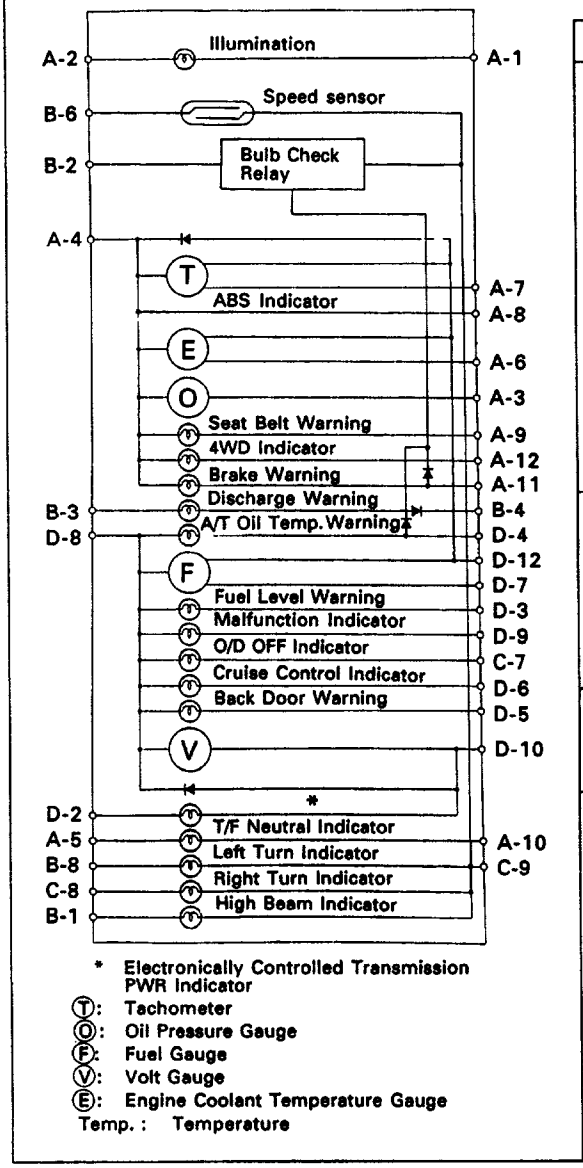

N09484
BE2865 BE2866

Z10156

# METER CIRCUIT




N12236
N12235




* Electronically Controlled Transmission PWR Indicator
Ⓣ: Tachometer
Ⓞ: Oil Pressure Gauge
Ⓕ: Fuel Gauge
Ⓥ: Volt Gauge
Ⓔ: Engine Coolant Temperature Gauge
Temp. : Temperature

| No. | | Wiring connector side |
|---|---|---|
| A | 1 | Light Control Rheostat-terminal 3 |
| | 2 | TAIL Fuse |
| | 3 | Oil Pressure Sender Gauge |
| | 4 | GAUGE Fuse |
| | 5 | Park/Neutral Start Switch |
| | 6 | Engine Coolant Temperature Sender Gauge |
| | 7 | Igniter |
| | 8 | Rear Anti-Lock Brake System ECU or ABS ECU (w/ 4ABS) |
| | 9 | Integration Relay-terminal 8 |
| | 10 | Park/Neutral Start Switch |
| | 11 | Brake Fluid Level Warning Switch-terminal 1 and Parking Brake Switch-terminal 1 |
| | 12 | Transfer Indicator Switch |
| B | 1 | Headlight Dimmer Switch-terminal 6/13 |
| | 2 | STARTER Relay |
| | 3 | IGN Fuse |
| | 4 | CHARGE Fuse |
| | 6 | ECM |
| | 8 | Turn Signal Switch |
| C | 7 | O/D Main Switch and ECM |
| | 8 | Turn Signal Switch |
| | 9 | Ground |
| D | 2 | Electronically Controlled Transmission Pattern Select Switch |
| | 3 | Fuel Sender Gauge-terminal 4 |
| | 4 | A/T Oil Temperature Switch |
| | 5 | Back Door Unlock Warning Switch and Rear Wiper Control Relay |
| | 6 | Cruise Control Main Switch |
| | 7 | Fuel Sender Gauge-terminal 2 |
| | 8 | GAUGE Fuse |
| | 9 | ECM |
| | 10 | Ground |
| | 12 | Ground |

# 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.

| Trouble | Parts name | (See page) |
|---|---|---|
| Gauges and Indicator Lights do not operate | 1. GAUGE Fuse<br>2. Wire Harness | (BE–11) |
| Volt Gauge does not work | 1. Volt Gauge<br>2. Wire Harness | (BE–49) |
| Tachometer does not operate | 1. Tachometer<br>2. Wire Harness | (BE–49) |
| Fuel Gauge does not operate | 1. Receiver Gauge<br>2. Sender Gauge<br>3. Wire Harness | (BE–49)<br>(BE–50) |
| Engine Coolant Temperature Gauge does not operate | 1. Receiver Gauge<br>2. Wire Harness | (BE–51) |
| Oil Pressure Gauge does not operate | 1. Receiver Gauge<br>2. Sender Gauge<br>3. Wire Harness | (BE–51)<br>(BE–52) |
| Brake Warning Light does not light up | 1. Bulb Burned Out<br>2. Brake Fluid Level Warning Switch<br>3. Parking Brake Switch<br>4. Wire Harness | <br>(BE–53)<br>(BE–53) |
| Seat Belt Warning Light does not light up | 1. Bulb Burned Out<br>2. Integration Relay<br>3. Wire Harness | <br>(BE–55) |
| Discharge Warning Light does not light | 1. IGN Fuse<br>2. CHARGE Fuse<br>3. Bulb Burned out<br>4. Wire Harness | (BE–11)<br>(BE–11) |

# SPEEDOMETER INSPECTION

### INSPECT SPEEDOMETER (ON–VEHICLE)

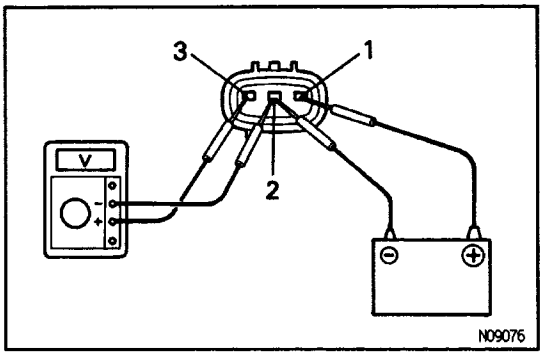
(a) Using a speedometer tester, inspect the speedometer for allowable indication error and check the operation of the odometer.

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.

| USA (mph) | | CANADA (km/h) | |
|---|---|---|---|
| Standard indication | Allowable range | Standard indication | Allowable range |
| 20 | 18 – 24 | 20 | 17 – 24 |
| 40 | 38 – 44 | 40 | 38 – 46 |
| 60 | 56 – 66 | 60 | 57.5 – 67 |
| 80 | 78 – 88 | 80 | 77 – 88 |
| 100 | 98 – 110 | 100 | 96 – 109 |
| 120 | 118 – 132 | 120 | 115 – 130 |
| | | 140 | 134 – 151.5 |
| | | 160 | 153 – 173 |




# VEHICLE SPEED SENSOR INSPECTION

### INSPECT VEHICLE 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) Rotate shaft.

(d) Check that voltage changes from approx. 0 V to 11 V or more between terminals 3 and 2.

HINT: The voltage change should be 4 times for every revolution of the speed sensor shaft.

If operation is not as specified, replace the sensor.

# TACHOMETER INSPECTION

**INSPECT TACHOMETER (ON–VEHICLE)**

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

**NOTICE:**

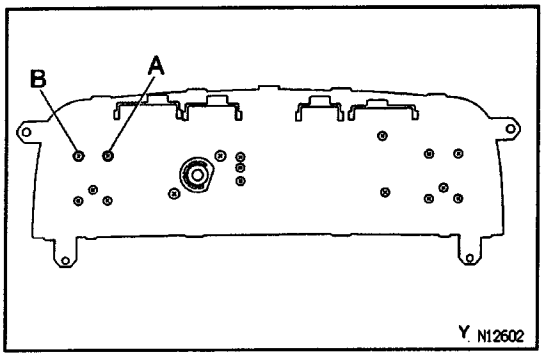
- **Reversing the connection of the tachometer will damage the transistors and diodes inside.**
- **When removing or installing the tachometer, be careful not to drop or subject it to heavy shocks.**

(b) Compare the tester and tachometer indications.

**RPM (DC 13.5 V, 20˚C (68˚F))**

| Standard indication (RPM) | Allowable range (RPM) |
|---|---|
| 700 | 630 – 770 |
| 3,000 | 2,850 – 3,150 |
| 5,000 | 4,850 – 5,150 |
| 7,000 | 6,790 – 7,210 |

If error is excessive, replace the tachometer.




# VOLT GAUGE INSPECTION

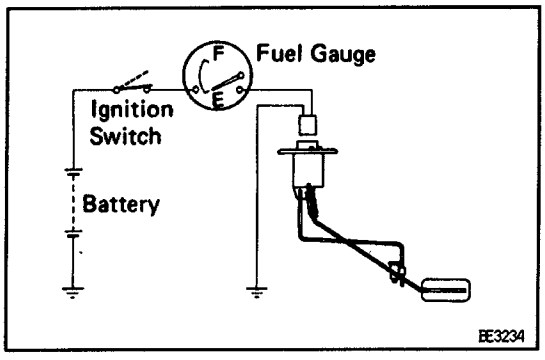
**INSPECT VOLT GAUGE**

Measure the resistance between terminals A and B.

**Resistance:**

**Approx. 347Ω**

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

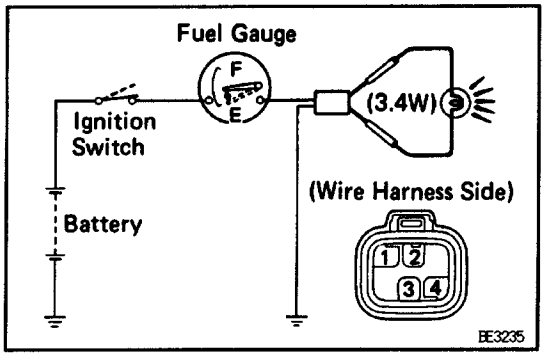



# FUEL GAUGE INSPECTION

**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.

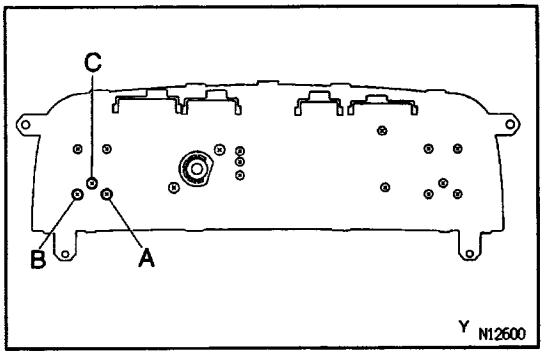



(c) Connect terminals 2 and 4 on the wire harness side connector through a 3.4 W test bulb.

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

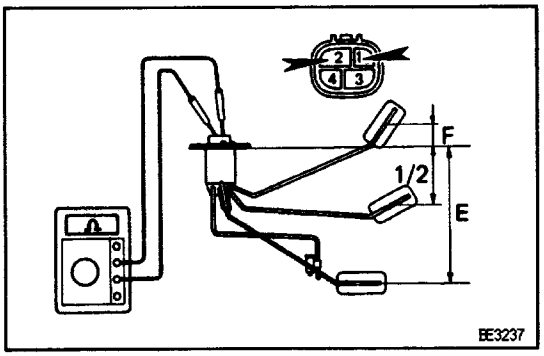



### 2. INSPECT FUEL RECEIVER GAUGE RESISTANCE

Measure the resistance between terminals.

| Between terminals | Resistance (Ω) |
|---|---|
| A – B | Approx. 123 |
| A – C | Approx. 260 |
| B – C | Approx. 137 |

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

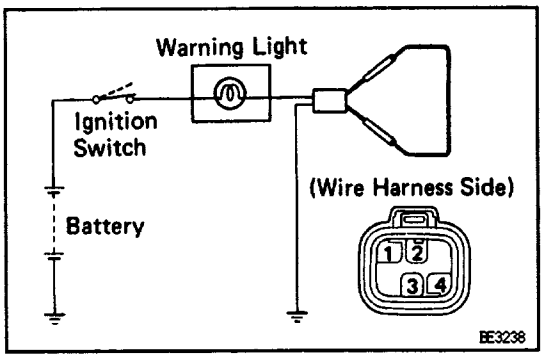



### 3. INSPECT FUEL SENDER GAUGE RESISTANCE

Measure the resistance between terminals 1 and 2.

| Float position (mm) | Resistance (Ω) |
|---|---|
| F : Approx. 25 (0.98) | F : Approx. 3 |
| 1/2 : Approx. 76 (2.99) | 1/2 : Approx. 32.5 |
| E : Approx. 176 (6.12) | E : Approx. 110 |

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




## FUEL LEVEL WARNING INSPECTION

### 1. INSPECT FUEL LEVEL WARNING LIGHT

(a) Disconnect the connector from the sender gauge.

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

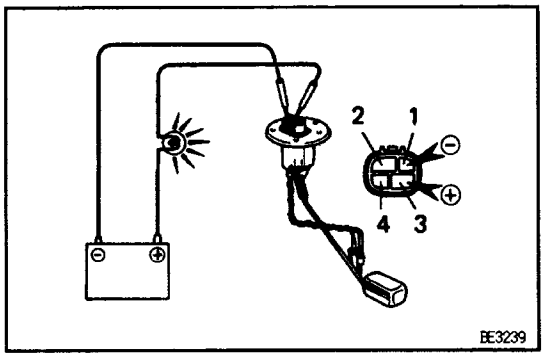
(c) Turn the ignition switch ON, check that the warning light lights up.

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

### 2. INSPECT FUEL LEVEL WARNING SWITCH

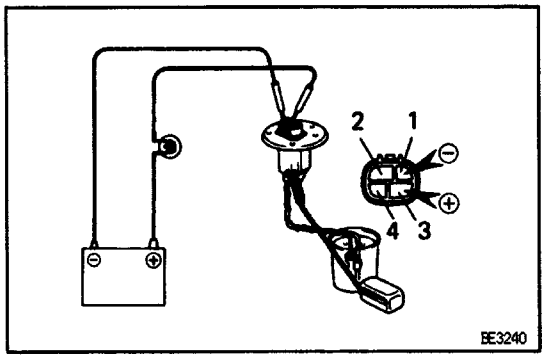
(a) Apply battery positive voltage between terminals 1 and 3 through a 3.4 W test bulb, check that the bulb lights up.

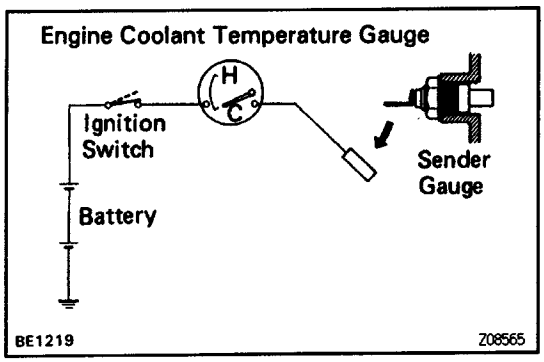
HINT: It will take a short time for the bulb to light up.




(b) Submerge the switch in fuel, check that the bulb goes out.

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



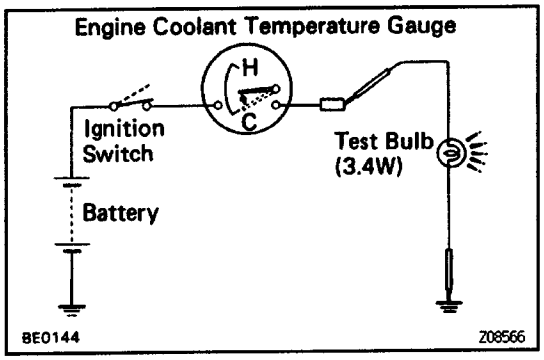



# ENGINE COOLANT TEMPERATURE RECEIVER GAUGE INSPECTION

**1. INSPECT ENGINE COOLANT 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.

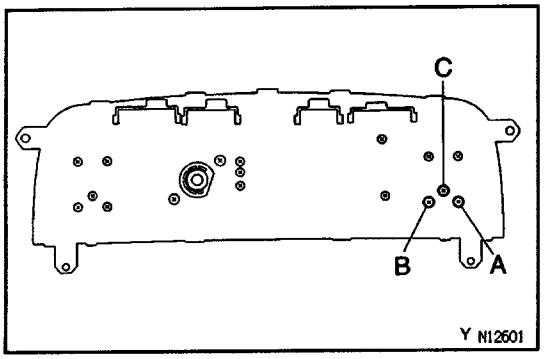



(c) Ground terminal on the wire harness side connector through a 3.4 W test bulb.

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



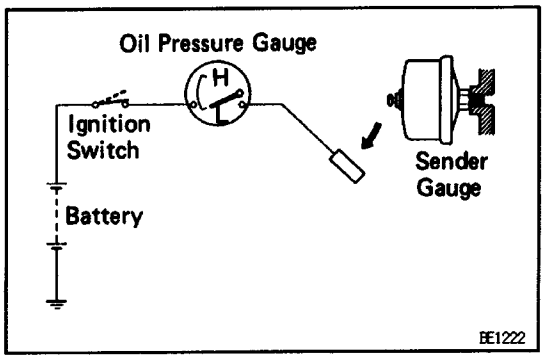

**2. INSPECT ENGINE COOLANT TEMPERATURE RECEIVER GAUGE RESISTANCE**

Measure the–resistance between terminals.

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

| Between terminals | Resistance (Ω) |
|---|---|
| A – B | Approx. 57 |
| A – C | Approx. 135 |
| B – C | Approx. 217 |

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

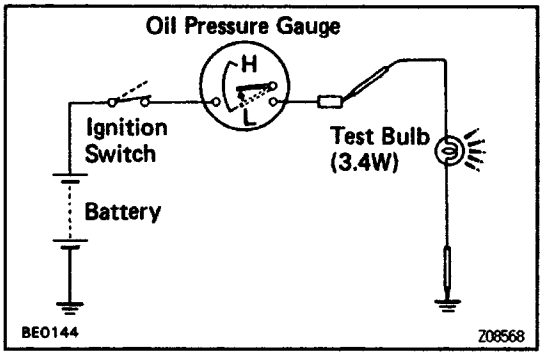



# OIL PRESSURE RECEIVER GAUGE INSPECTION

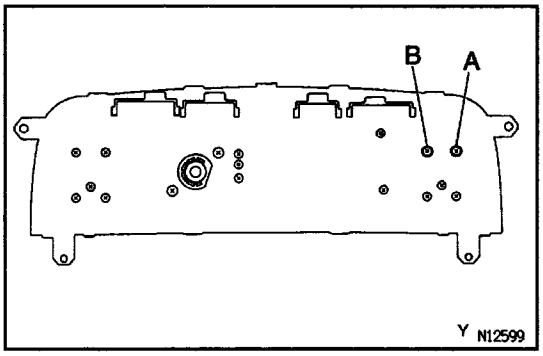
**1. INSPECT OIL PRESSURE RECEIVER GAUGE OPERATION**

(a) Disconnect the connector from the sender gauge.

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




(c) Ground terminal on the wire harness side connector through a 3.4W test bulb.
(d) Turn the ignition switch ON, check that the bulb lights up and the receiver gauge needle moves to the high side.
If operation is not as specified, measure the receiver gauge.



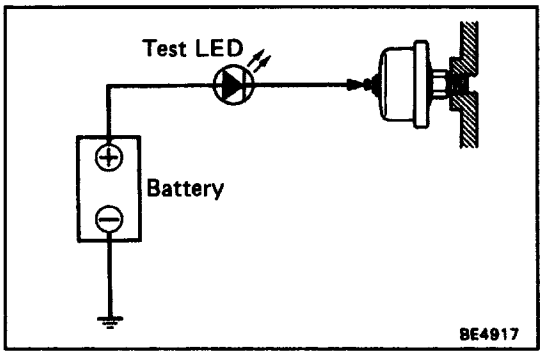

**2. INSPECT OIL PRESSURE RECEIVER GAUGE RESISTANCE**

Measure the resistance between terminals A and B.

**Resistance:**

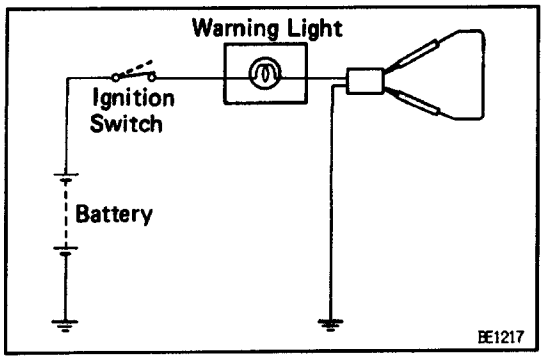
**Approx. 25 Ω**

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




**3. INSPECT OIL PRESSURE SENDER GAUGE**

(a) Disconnect the connector from the sender gauge.
(b) Apply battery positive voltage to the sender gauge terminal through a test LED.
(c) Check that the bulb does not light when the engine is stopped.
(d) Check that the LED flashes when the engine is running.
The number of flashes should vary with the engine speed.
If operation is not as specified, replace the sender gauge.




# BRAKE WARNING INSPECTION

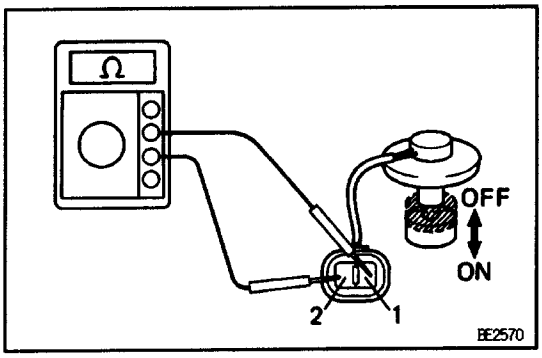
**1. INSPECT BRAKE FLUID LEVEL WARNING LIGHT**

(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) Remove the CHARGE fuse and turn the ignition switch ON, check that the warning light comes on.

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

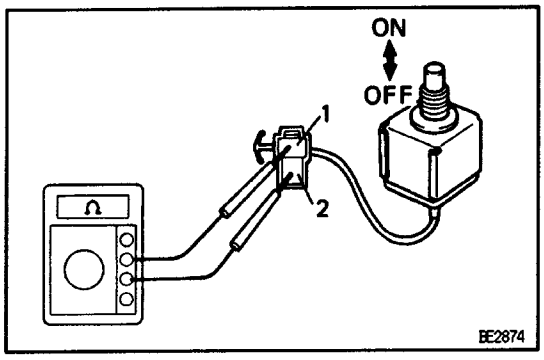



**2. INSPECT BRAKE FLUID LEVEL WARNING SWITCH**

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

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

If operation is not as specified, replace the switch.



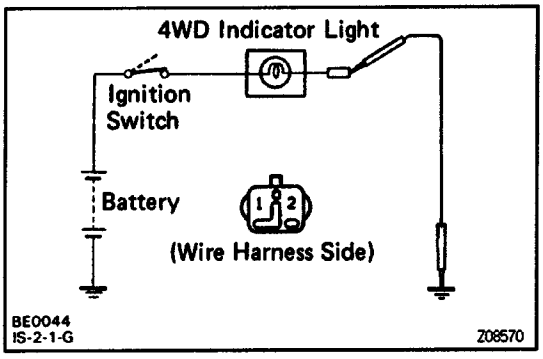

# PARKING BRAKE SWITCH INSPECTION

**INSPECT PARKING BRAKE SWITCH**

(a) Check that there is continuity between terminals with the switch ON (switch pin released).

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

If operation is not as specified, replace the switch.



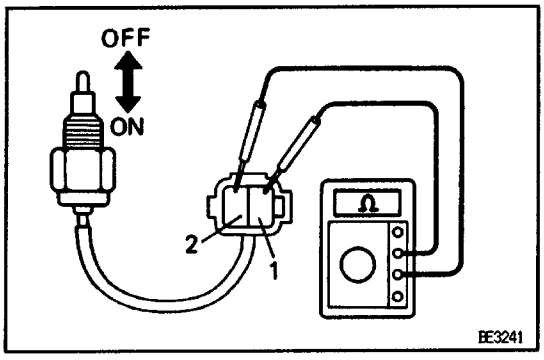

# 4WD INDICATOR INSPECTION

**1. INSPECT 4WD INDICATOR LIGHT**

(a) Disconnect the connector from the 4WD indicator switch. Connect the switch terminal 2 and body ground.

(b) Turn the ignition switch ON. Check that the bulb lights up.

If operation is not as specified, remove and test the bulb.



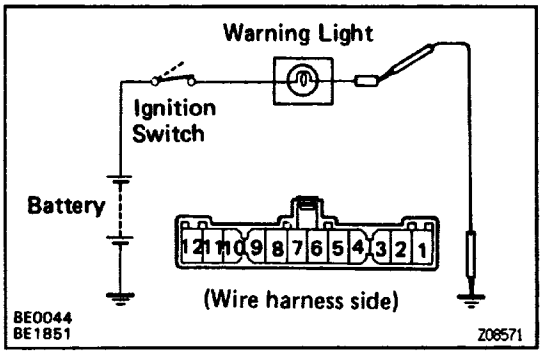

**2. INSPECT 4WD INDICATOR SWITCH OPERATION**

(a) Check the continuity between terminals.

(b) Check the there is continuity when the switch pin is pushed.

(c) Check that there is no continuity when the switch is free.

If operation is not as specified, replace the switch.



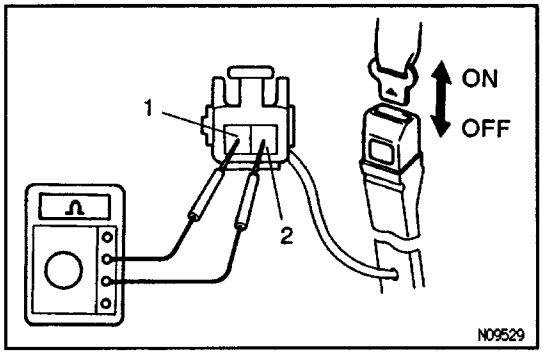

# SEAT BELT WARNING LIGHT INSPECTION

**INSPECT SEAT BELT WARNING LIGHT**

(a) Disconnect the wire harness side connector from the integration relay.

(b) Ground terminal 8 on the wire harness side 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.

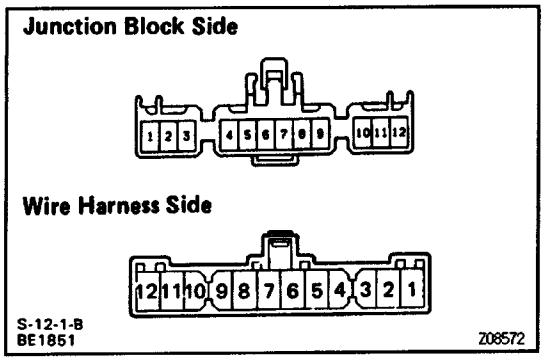



# BUCKLE SWITCH INSPECTION

**INSPECT BUCKLE SWITCH**

(a) Check that there is continuity between terminals with the switch ON (belt unfastened).

(b) Check that there is no continuity between terminals with the switch OFF (belt fastened).
If operation is not as specified, replace the seat belt inner assembly.




# INTEGRATION RELAY INSPECTION

## INSPECT INTEGRATION RELAY CIRCUIT

Remove the integration relay and inspect the connectors on the wire harness side and the junction block side, as shown in the chart.

### Wire Harness Side

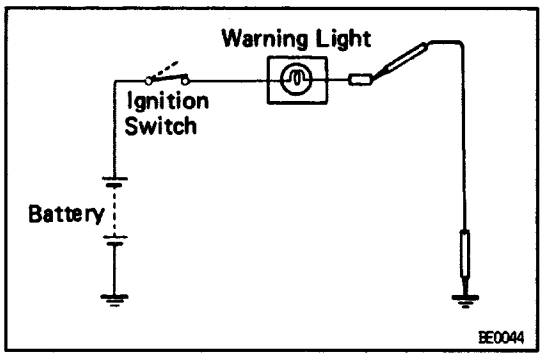
| Tester connection to terminal number | Condition | Specified condition |
|---|---|---|
| 2 – 3 | Key unlock –warning switch position OFF (Ignition key removed) | No continuity |
| 2 – 3 | Key unlock warning switch position ON (Ignition key set) | Continuity |
| 6 – Ground | Buckle switch position OFF (Belt fastened) | No continuity |
| 6 – Ground | Buckle switch position ON (Belt unfastened) | Continuity |
| 8 – 9 | Constant | * Continuity |
| 10 – Ground | Drivers door courtesy switch position OFF (Door closed) | No continuity |
| 10 – Ground | Driver's door courtesy switch position ON (Door opened) | Continuity |
| 12 – Ground | Passenger's door courtesy switch position OFF (Door closed) | No continuity |
| 12 – Ground | Passenger's door courtesy switch position ON (Door opened) | Continuity |

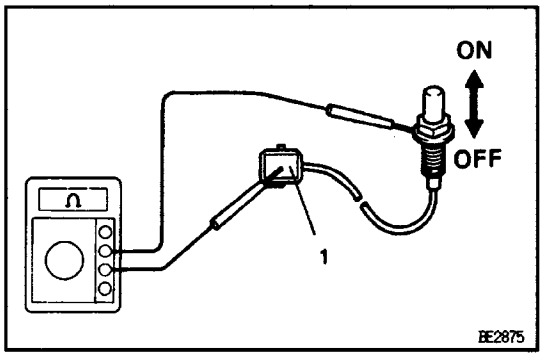
* There is resistance because this circuit includes the bulb.

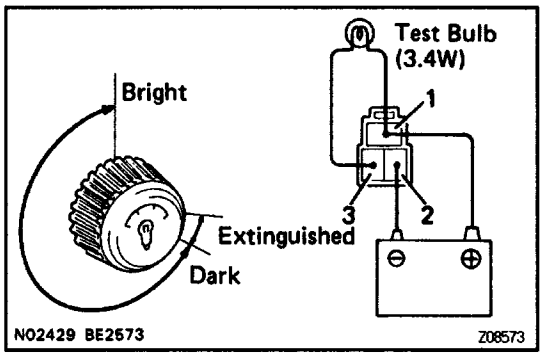
### Junction Block Side

| Tester connection to terminal number | Condition | Specified condition |
|---|---|---|
| 7 – Ground | Constant | Continuity |
| 3 – Ground | Constant | Battery positive voltage |
| 9 – Ground | Ignition switch position LOCK or ACC | No voltage |
| 9 – Ground | Ignition switch position ON | Battery positive voltage |

If circuit is not as specified, replace the relay.




# OPEN DOOR WARNING LIGHT INSPECTION

### INSPECT OPEN DOOR WARNING LIGHT

(a) Disconnect the connector from the door courtesy 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.

# DOOR COURTESY SWITCH INSPECTION

### INSPECT DOOR COURTESY SWITCH

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

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

If operation is not as specified, replace the switch.

# LIGHT CONTROL RHEOSTAT INSPECTION

### INSPECT LIGHT CONTROL RHEOSTAT

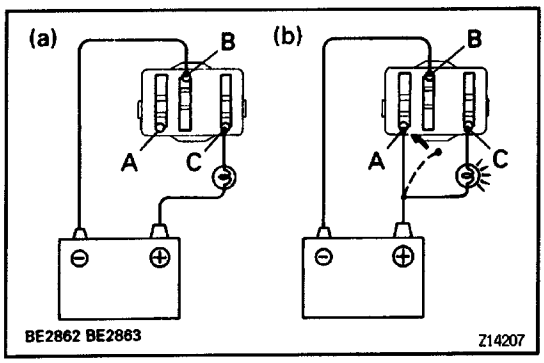
(a) Connect terminals 1 and 3 through a 3.4W test bulb.

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

(c) Turn the rheostat knob to fully counterclockwise, check that the test bulb goes out.

(d) Gradually turn the rheostat knob to clockwise, check that the test bulb brightness changes from dark to bright.

If operation is not as specified, replace the rheostat.




# BULB CHECK RELAY INSPECTION

**INSPECT BULB CHECK RELAY**

(a) Connect the positive (+) lead from the battery to terminal C through a 1.4 W test bulb and the negative (–) lead to terminal B, check that the test bulb does not light up.

(b) Connect the positive (+) lead from the battery to terminal A, check that the test bulb light up.

If operation is not as specified, replace the relay.