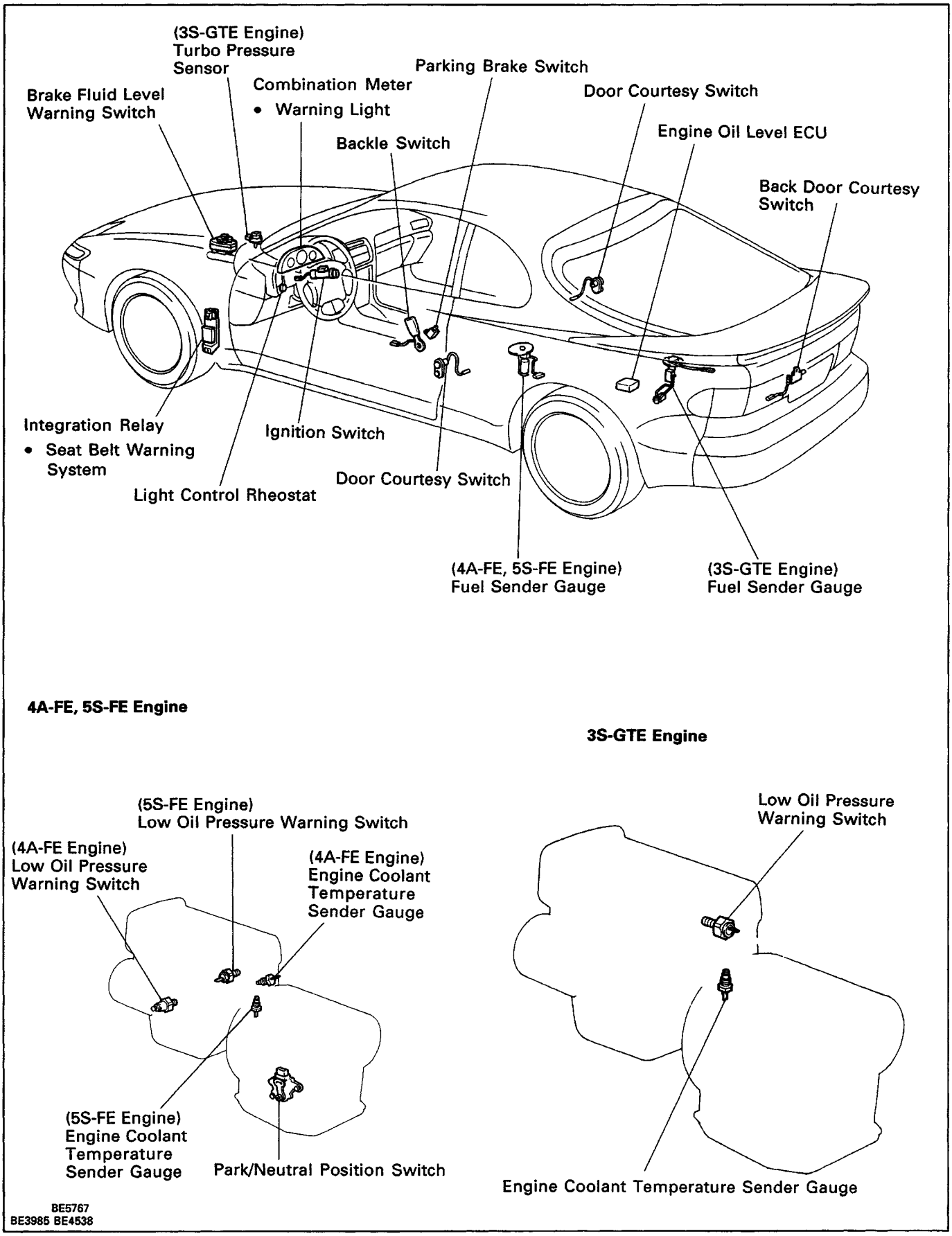
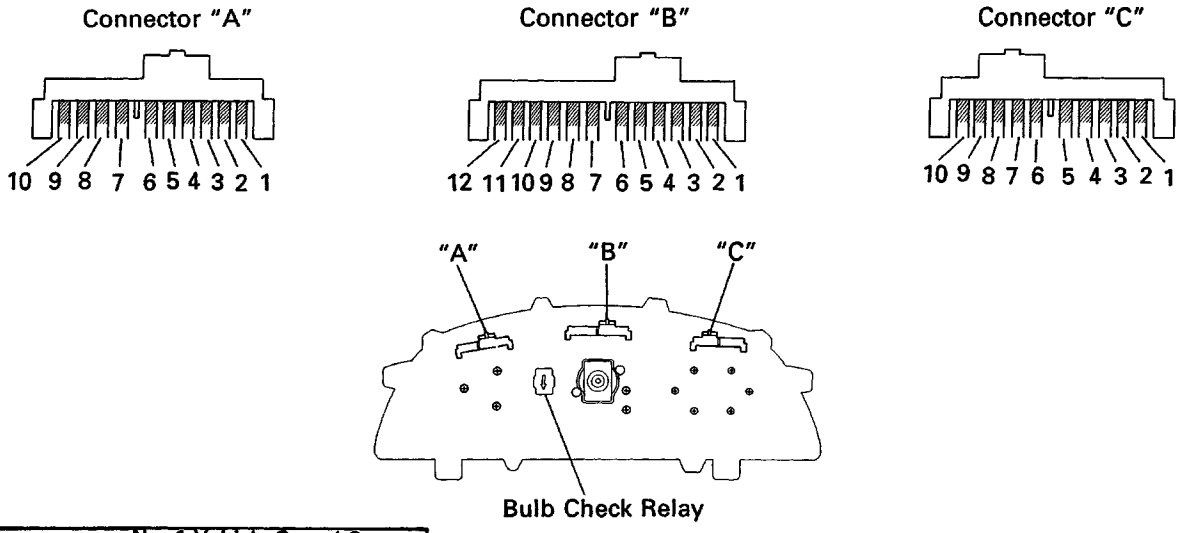
COMBINATION METER

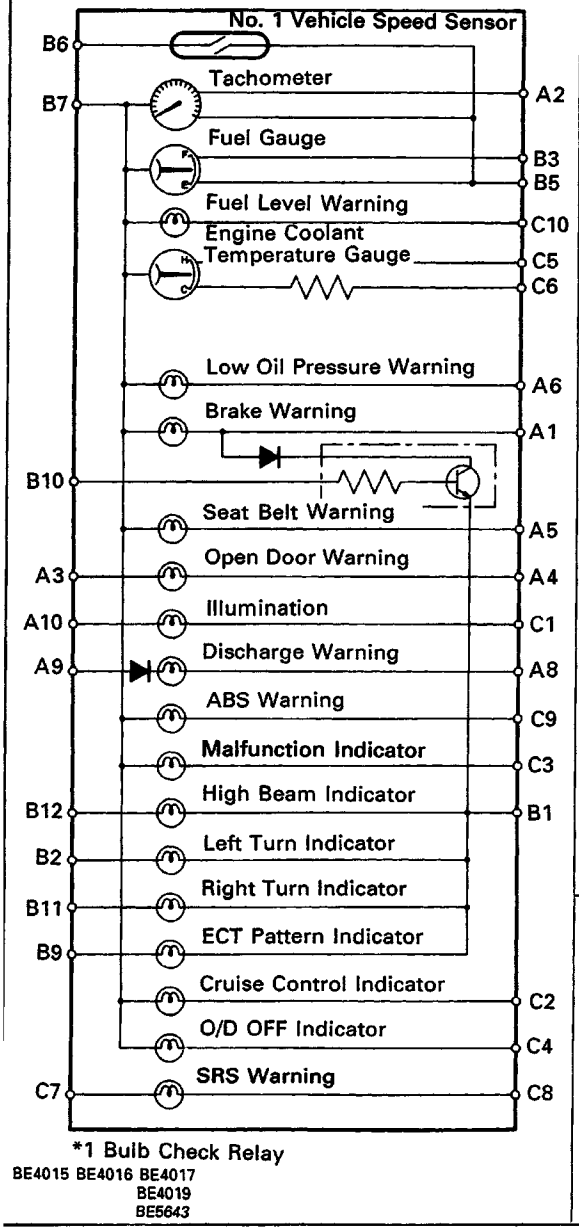
PARTS LOCATION



BE5767
BE3985 BE4538

METER CIRCUIT
(4A–FE, 5S–FE Engine)

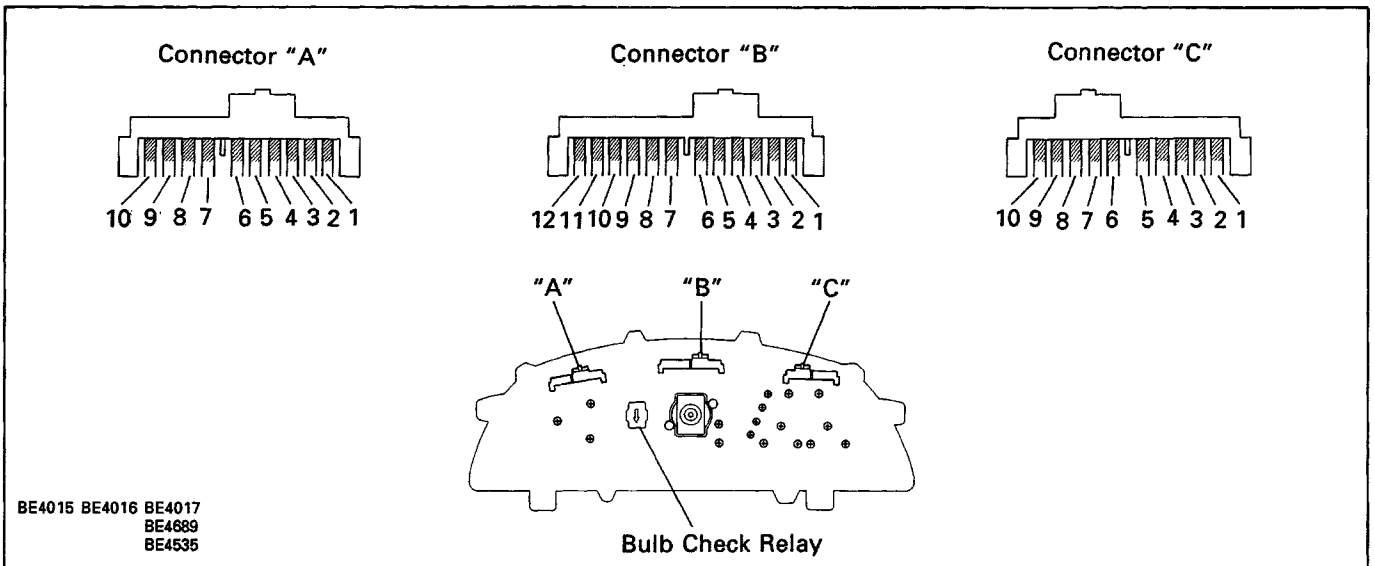




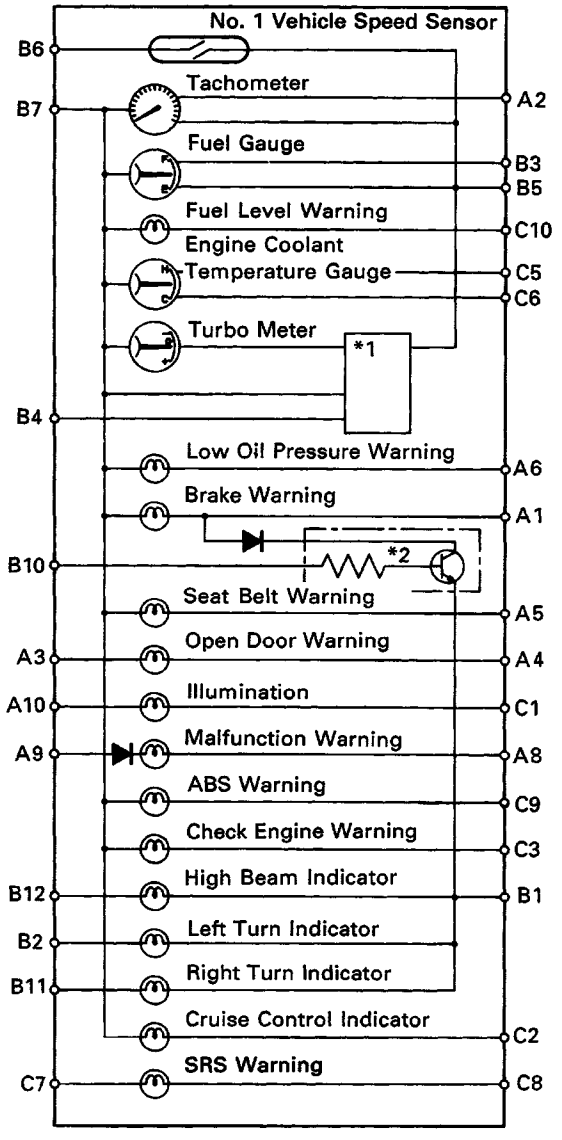
BE4015 BE4016 BE4017 BE4019 BE5643

No.		Wiring connector side
A	1	Brake Fluid Level Warning Switch–terminal 1, and Parking Brake Switch
	2	Igniter
	3	DOME Fuse
	4	Door Courtesy Switch
	5	Integration Relay–terminal 4
	6	Low Oil Pressure Warning Switch
	8	Alternator–terminal "L"
	9	IGN Fuse
	10	Taillight Control Relay
B	1	Ground
	2	Headlight Dimmer and Turn Signal Switch, and Hazard Warning Switch
	3	Fuel Sender Gauge–terminal 3
	5	Ground
	6	ECM
	7	GAUGE Fuse
	9	ECT Pattern Select Switch
	10	(A/T) Park/Neutral Position Switch (M/T) Starter Relay
	11	Headlight Dimmer and Turn Signal Switch, and Hazard Warning Switch
	12	Headlight Dimmer and Turn Signal Switch, and Headlight LO (LH)
C	1	Light Control Rheostat–terminal 3
	2	Cruise Control ECU
	3	ECM
	4	O/D OFF Switch
	5	Ground
	6	Engine Coolant Temperature Sender Gauge
	7	ECU–B Fuse
	8	Airbag ECU
	9	ABS ECU
	10	Fuel Sender Gauge–terminal 1

(3S–GTE Engine)



BE4015 BE4016 BE4017
BE4689
BE4535



*1 Turbo Meter Drive Circuit
*2 Bulb Check Relay

No.		Wiring connector side
A	1	Brake Fluid Level Warning Switch–terminal 1, and Parking Brake Switch
	2	Igniter
	3	DOME Fuse
	4	Door Courtesy Switch
	5	Integration Relay–terminal 4
	6	Low Oil Pressure Warning Switch
	8	Alternator–terminal "L"
	9	IGN Fuse
	10	TAIL Fuse
B	1	Ground
	2	Headlight Dimmer and Turn Signal Switch, and Hazard Warning Switch
	3	Fuel Sender Gauge–terminal 3
	4	Turbo Pressure sensor–terminal 2
	5	Ground
	6	ECM
	7	GAUGE Fuse
	10	Starter Switch
	11	Headlight Dimmer and Turn Signal Switch, and Hazard Warning Switch
	12	Headlight Dimmer and Turn Signal Switch, and Headlight LO (LH)
C	1	Light Control Rheostat–terminal 3
	2	Cruise Control ECU
	3	ECM
	5	Ground
	6	Engine Coolant Temperature Sender Gauge
	7	ECU–B Fuse
	8	Airbag ECU
	9	ABS ECU
	10	Fuel Sender Gauge–terminal 2

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 2. Wire Harness	BE–3 –
Speedometer does not operate	1. No. 1 Vehicle Speed Sensor 2. Speedometer	BE–50 BE–50
Tachometer does not operate	1. Tachometer 2. Wire Harness	BE–51 –
Fuel gauge does not operate	1. Receiver Gauge 2. Sender Gauge 3. Wire Harness	BE–51 BE–52 –
Fuel level warning light does not light up	1. Bulb 2. Warning Switch 3. Wire Harness	– BE–54 –
Engine coolant temperature gauge does not operate	1. Receiver Gauge 2. Sender Gauge 3. Wire Harness	BE–55 BE–55 –
Low oil pressure warning light does not light up	1. Bulb 2. Low Oil Pressure Warning Switch 3. Wire Harness	– BE–56 –
Brake warning light does not light up	1. Bulb 2. Brake Fluid Level Warning Switch 3. Parking Brake Switch 4. Wire Harness	– BE–56 BE–56 –
Seat belt warning light does not light up	1. Bulb 2. Buckle Switch 3. Integration Relay 4. Wire Harness	– BE–57 BE–57 –
Open door warning light does not light up	1. DOME Fuse 2. Bulb 3. Door Courtesy Switch 4. Wire Harness	– BE–3 BE–60 –
Meter illumination lights do not light up	1. Bulb 2. Light Control Switch 3. Wire Harness	– BE–20 –

* Tachometer, Fuel Gauge, Fuel Level Warning Light, Engine Coolant Temperature Gauge, Voltmeter, Low Oil Pressure Warning Light, Brake Warning Light, Seat Belt Warning Light, ABS Warning Light, Check Engine Warning Light, Cruise Control Indicator Light, O/D OFF Indicator Light and Turbo Meter

Trouble	Parts name	See page
Turbo meter does not operate	1. Turbo Meter 2. Turbo Pressure 3. Turbo Meter Drive Circuit 4. Wire Harness	BE–58 BE–58 BE–59 –

(mph)

Standard indication	Allowable range
20	19 – 22
40	3 9 – 42.5
60	59.5 – 63.5
80	79.5 – 84
100	100 – 105
120	120 – 125.5
140	140 – 146

(km/h)

Standard indication	Allowable range
20	18 – 23
40	40 – 44
60	6 0 – 64.5
80	80 – 85
100	100 – 105
120	120 – 125.5
140	140 – 146
160	160 – 167
180	180 – 188
200	200 – 209
220	220 – 230
240	240 – 251

SPEEDOMETER

SPEEDOMETER INSPECTION (ON–VEHICLE)

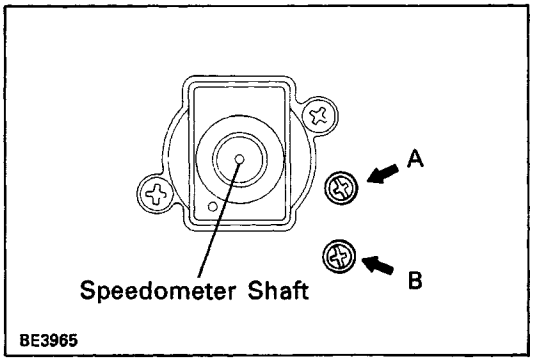
(a) Using a speedometer tester, inspect the speedometer for allowable indication error and check the operation of the odometer.

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.

HINT: Pointer vibration can be caused by a loose speedometer cable.



NO. 1 VEHICLE SPEED SENSOR

NO. 1 VEHICLE SPEED SENSOR INSPECTION

Check that there is continuity between terminals A and B four times per each revolution of the speedometer shaft.

If operation is not as specified, replace the speedometer.

DC 13.5 V, 25°C (77°F) rpm	
Standard indication	Allowable range
700	610 – 750
3,000	2,800 – 3,200
5,000	4,800 – 5,200
7,000	6,700 – 7,300

TACHOMETER

TACHOMETER INSPECTION (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 to heavy shocks.**

(b) Compare the tester and tachometer indications.
If error is excessive, replace the tachometer.

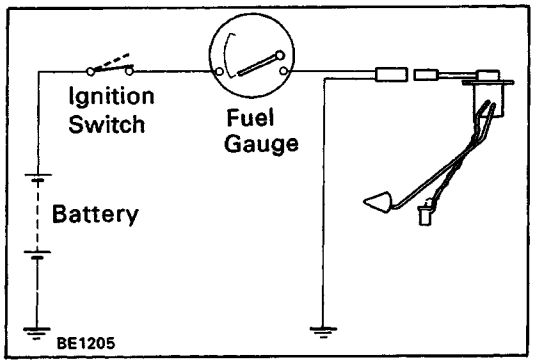
FUEL GAUGE SYSTEM

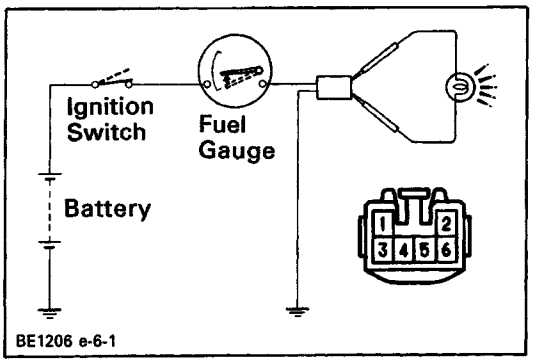
FUEL RECEIVER GAUGE INSPECTION

OPERATION

(a) Disconnect the connector from the sender gauge.

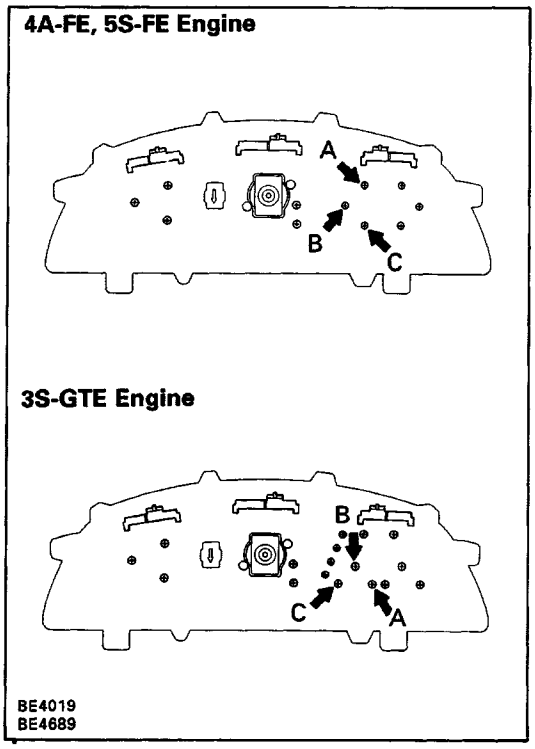
(b) Turn the ignition switch ON, check that the receiver gauge needle indicates EMPTY.





(c) Connect terminal 3 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 receiver gauge needle moves toward 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 as specified, replace the sender gauge. Then, recheck the system.
If operation is not as specified, measure the receiver gauge resistance.

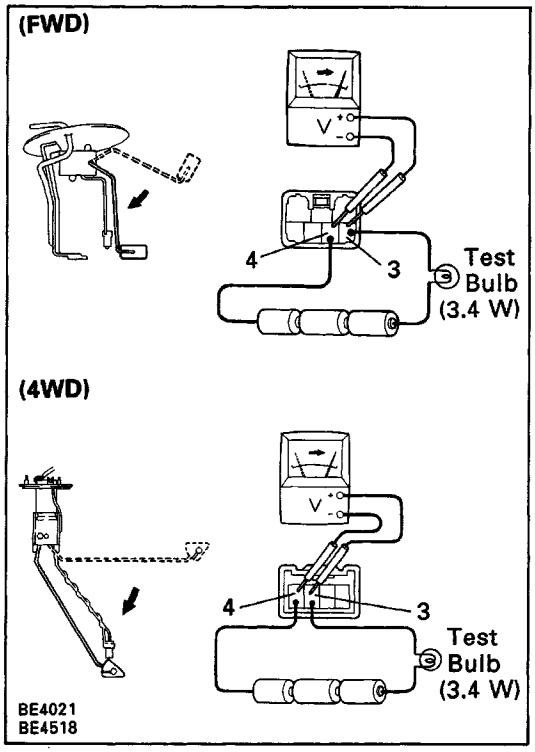


RESISTANCE

Measure the resistance between terminals.

Between terminals	Resistance (Ω)	
	4A–FE, 5S–FE Engine	3S–GTE Engine
A–B	Approx. 86	Approx. 101
A–C	Approx. 275	Approx. 252
B–C	Approx. 189	Approx. 151

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



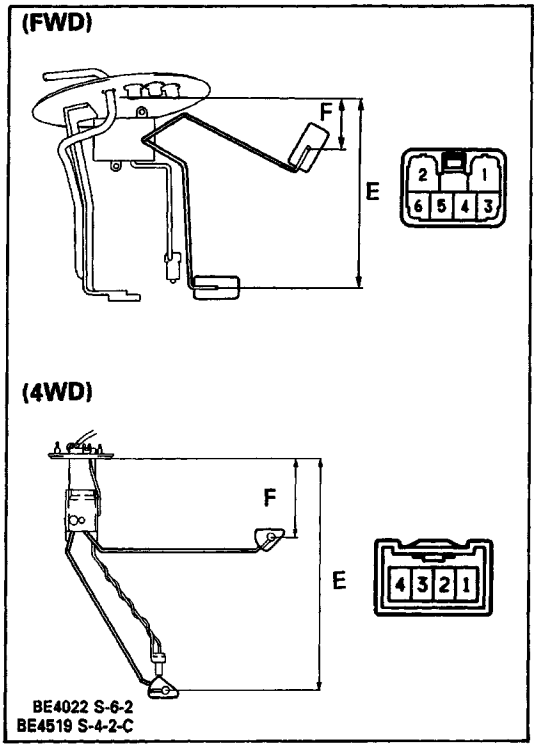
FUEL SENDER GAUGE INSPECTION

OPERATION

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

(b) Connect the positive (+) lead from the dry cell batteries to terminal 3 through a 3.4 W test bulb and the negative (–) lead to terminal 4.

(e) Check that the voltage rises between terminal 3 and 4 as the float is moved from the top to bottom position.

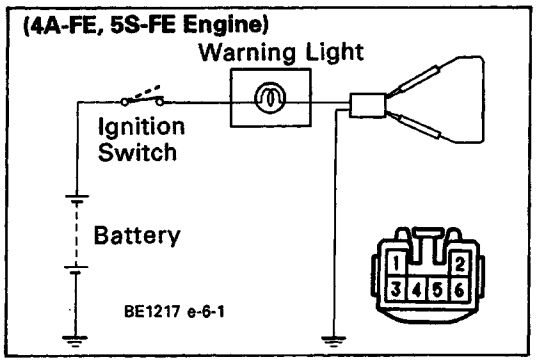


RESISTANCE

Measure the resistance between terminals 3 and 4 for each float position.

	Float position mm (in.)		Resistance (Ω)
	FWD	4WD	FWD 4WD
F	Approx. 45.0 (1.772)	Approx. 97.1 (3.823)	Approx. 3
E	Approx. 158.5 (6.240)	Approx. 272.4 (10.724)	Approx. 110

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

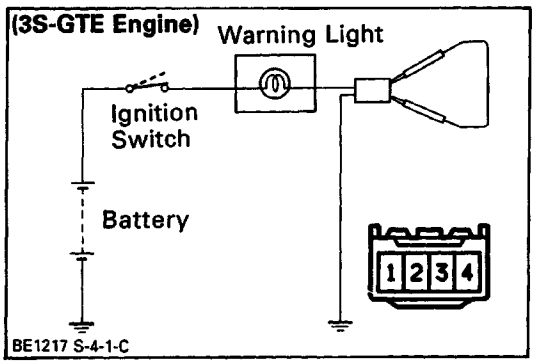


FUEL LEVEL WARNING SYSTEM

FUEL LEVEL WARNING LIGHT INSPECTION

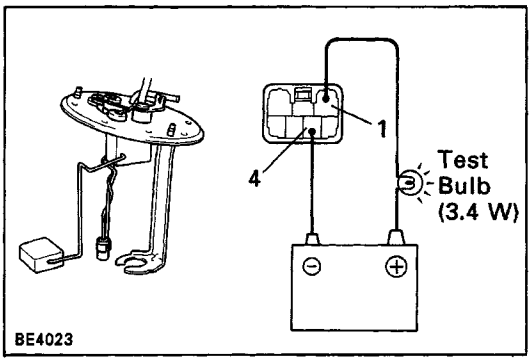
(4A–FE, 5S–FE Engine)

(a) Disconnect the connector from the sender gauge.
(b) Connect terminals 1 and 4 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.



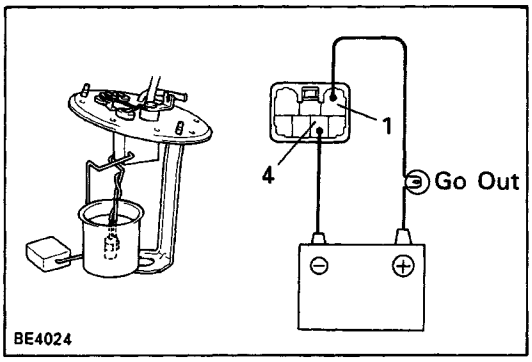
(3S–GTE Engine)

(d) Disconnect the connector from the sender gauge.
(e) Connect terminals 2 and 4 on the wire harness side connector.
(f) Turn the ignition switch ON, check that the warning light lights up.
If the warning light does not light up, test the bulb.

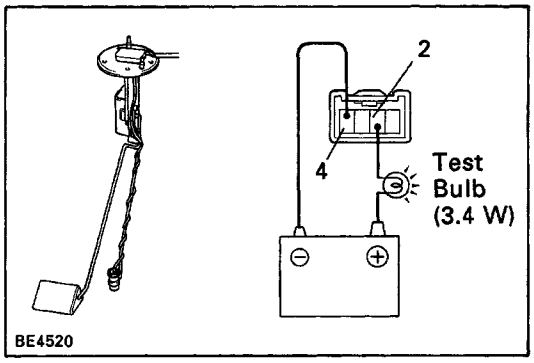


FUEL LEVEL WARNING SWITCH INSPECTION
(4A–FE, 5S–FE Engine)

(a) Apply battery positive voltage between terminals 1 and 4 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.

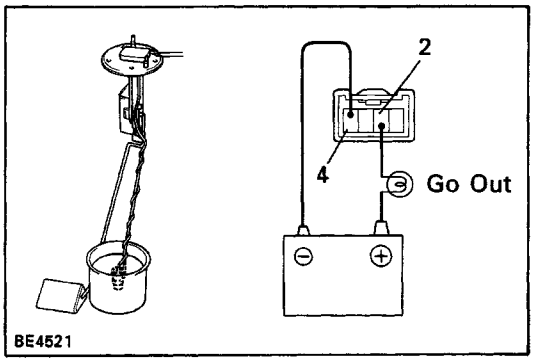


(b) Submerge the switch in fuel, check that the bulb goes out.
If operation is not as specified, replace the sender gauge.

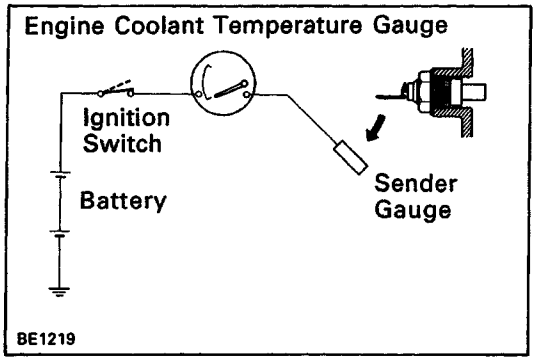


(3S–GTE Engine)

(a) Apply battery positive voltage between terminals 2 and 4 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 GAUGE SYSTEM

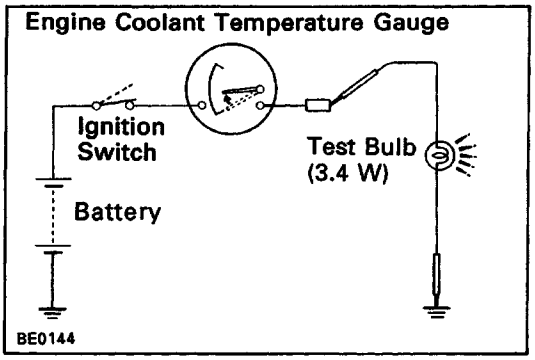
ENGINE COOLANT TEMPERATURE RECEIVER GAUGE

INSPECTION

OPERATION

(a) Disconnect the connector from the sender gauge.

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

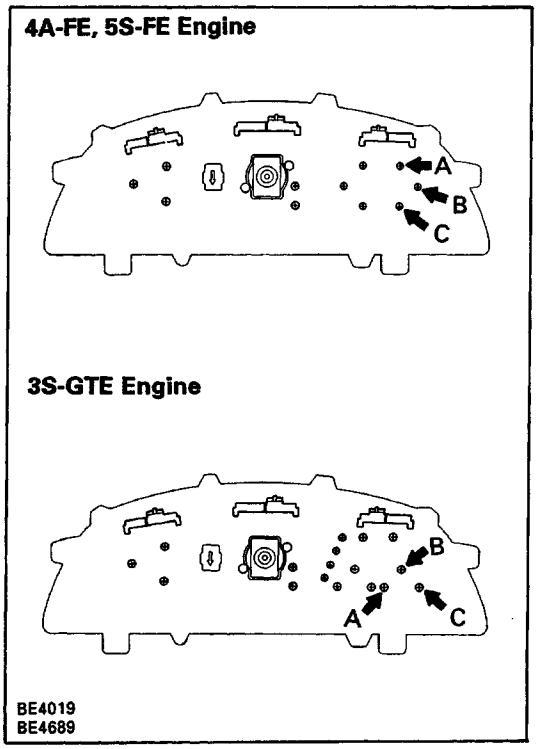


(c) Ground terminal on the wire harness side connector through a 3.4 W test bulb.

(d) Turn the ignition switch 4N, check that the bulb lights up and receiver gauge needle moves toward 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.



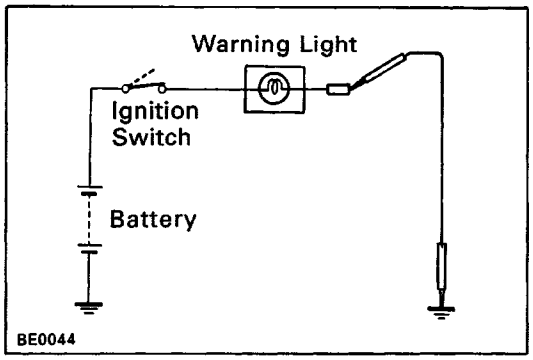
RESISTANCE

Measure the resistance between terminals.

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

Between terminals	Resistance (Ω)
A → B	Approx. 182
A → C	Approx. 131
B → C	Approx. 51

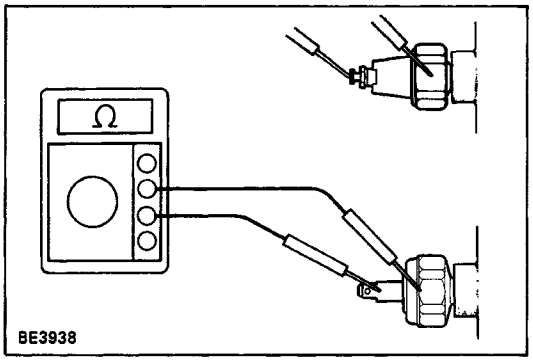
If resistance value is not as specified, replace the sender gauge.



LOW OIL PRESSURE WARNING SYSTEM

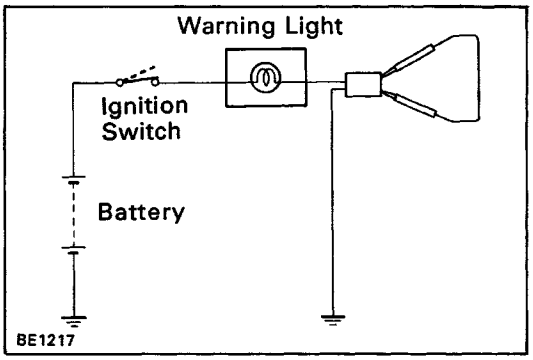
LOW OIL PRESSURE WARNING LIGHT INSPECTION

(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.



LOW OIL PRESSURE WARNING SWITCH INSPECTION

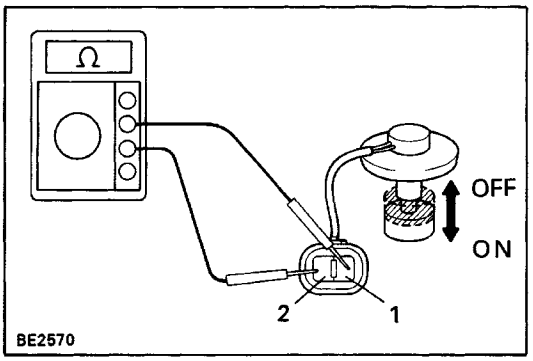
(a) Check that there is continuity between terminal and ground with the engine stopped.
(b) Check that there is no continuity between terminal and ground with the engine running.
HINT: Oil pressure should be over 29 kPa (0.3 kgf/cm^2, 4.3 psi).
If operation is not as specified, replace the switch.



BRAKE WARNING SYSTEM

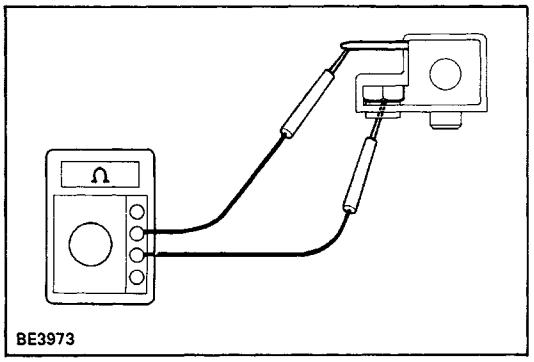
BRAKE WARNING LIGHT INSPECTION

(a) Disconnect the connectors from the brake fluid level warning switch and parking brake switch.
(b) Connect terminals on the wire harness side 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.



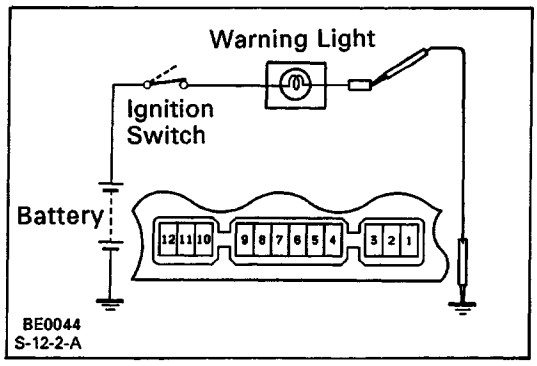
BRAKE FLUID LEVEL WARNING SWITCH INSPECTION

(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

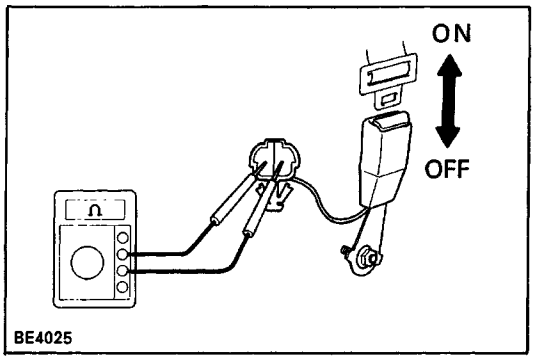
(a) Check that there is continuity between terminals with the switch ON (switch pin released).
(b) Check that there is no continuity between terminals with the switch OFF (switch pin pushed in).



SEAT BELT WARNING SYSTEM

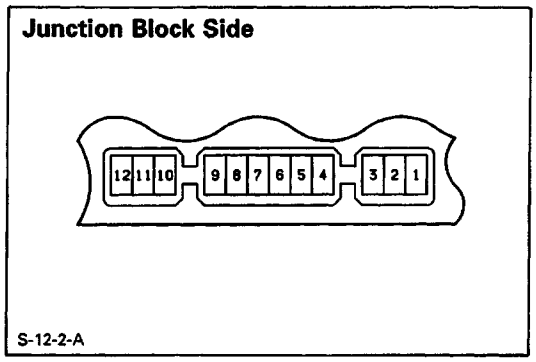
SEAT BELT WARNING LIGHT SYSTEM

(a) Remove the integration relay from the junction block.
(b) Ground terminal 4 on the junction block side connector.
(c) Turn the ignition switch ON, check that the warning light lights up.
If the warning lights does not light up, test the bulb.



SEAT BELT BUCKLE SWITCH INSPECTION

(a) Check that there is continuity between terminals on the switch side connector with the switch ON (belt fastened).
(b) Check that there is no continuity between terminals on the switch side connector with the switch OFF (belt unfastened).
If operation is not as specified, replace the seat belt inner.



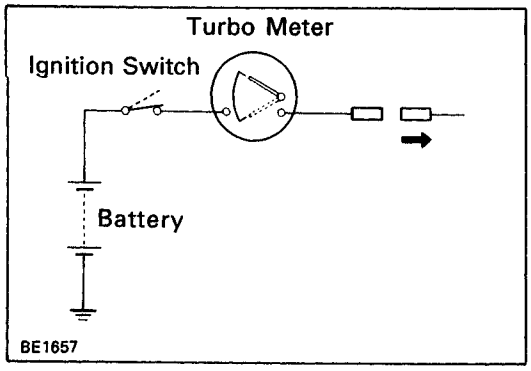
INTEGRATION RELAY INSPECTION

RELAY CIRCUIT

Remove the integration relay from the junction block and inspect the connector on the junction side as shown in the chart.

Check for	Tester connection	Condition		Specified value
Continuity	3 – Ground	Constant		Continuity
	5 – Ground	Buckle switch position	OFF (belt unfastened)	No continuity
			ON (belt fastened)	Continuity
Voltage	4 – Ground	Ignition switch position	LOCK or ACC	No voltage
			ON	Battery positive voltage
	6 – Ground	Ignition switch position	LOCK or ACC	No voltage
			ON	Battery positive voltage
	12 – Ground	Constant		Battery positive voltage

If circuit is as specified, replace the relay.

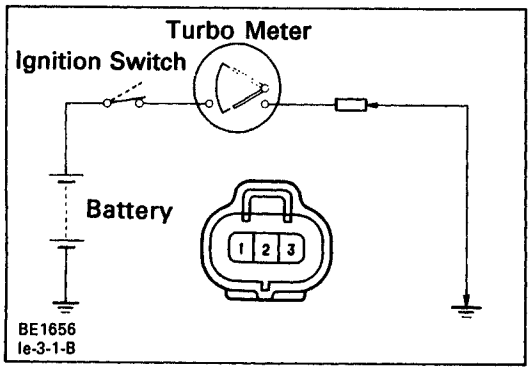


TURBO METER SYSTEM

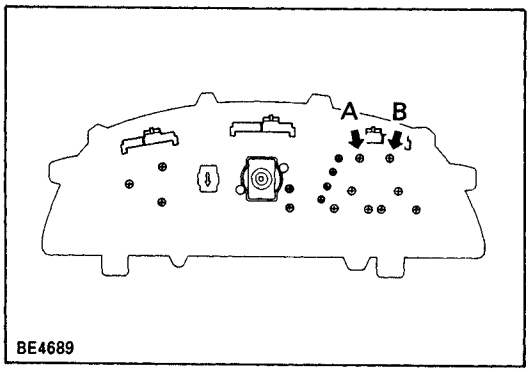
TURBO METER INSPECTION

OPERATION

(a) Disconnect the connector from the pressure sensor.
(b) Turn the ignition switch ON. Check that the meter needle moves to upper position.

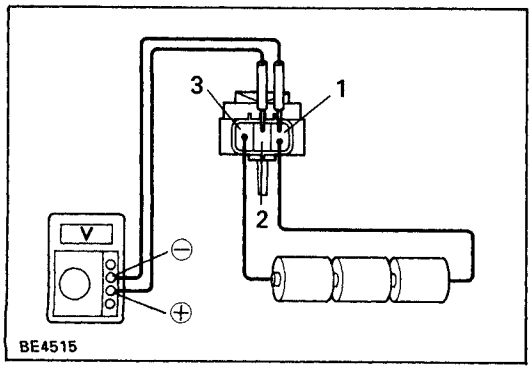


(c) Ground terminal 2 on the wire harness side.
Check that the meter needle moves to lower position.
If operation is not as specified, inspect the turbo meter drive circuit and resistance.



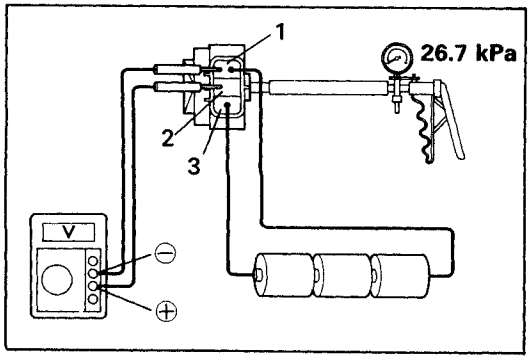
RESISTANCE

Measure the resistance between terminals A and B.
Resistance: Approx. 72Ω
If resistance value is not as specified, replace the turbo meter.

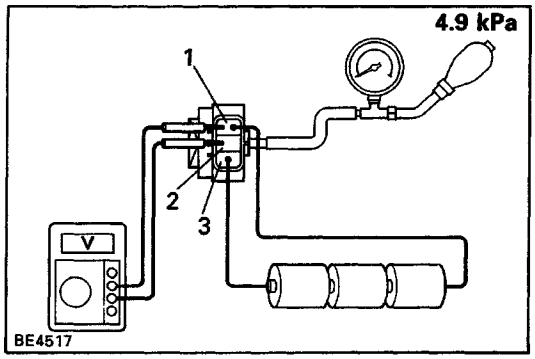


TURBO PRESSURE SENSOR INSPECTION

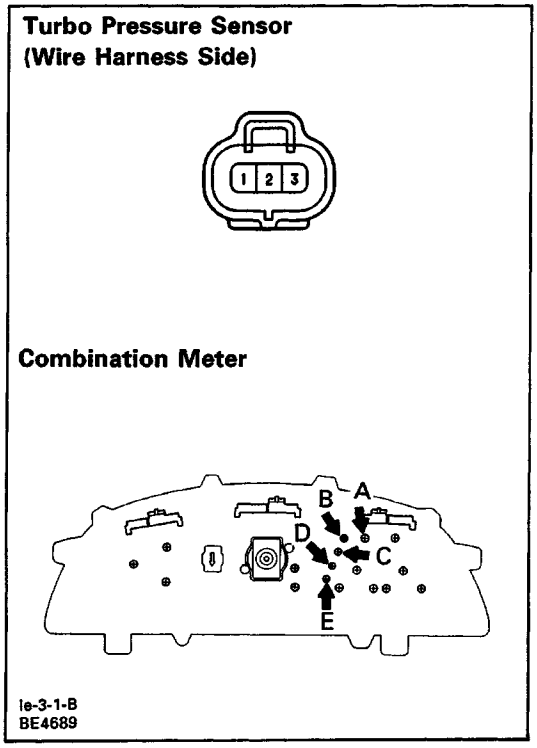
(a) Connect a series of three 1.5 V dry cell batteries.
(b) Connect the positive (+) lead from the dry cell batteries to terminal 3 and the negative¿–) lead to terminal 1.
(c) Connect the positive (+) lead from the voltmeter to terminal 2 and the negative (–) lead to terminal 1.
(d) Check that the voltage between terminals 2 and 1.
Voltage: Approx. 2.4 V



(e) Apply 26.7 kPa (200 mrnHg, 7.87 in.Hg) of vacuum.
Check that the voltage drops below approximately 2.4 V.



(f) Using SST, apply 4.9 kPa 10.5 kgf/cm^2, 7.1 psi of pressure.
Check that the voltage rises approximately 2.4 V.
SST 09992–00241
If operations are not as specified, replace the sensor.

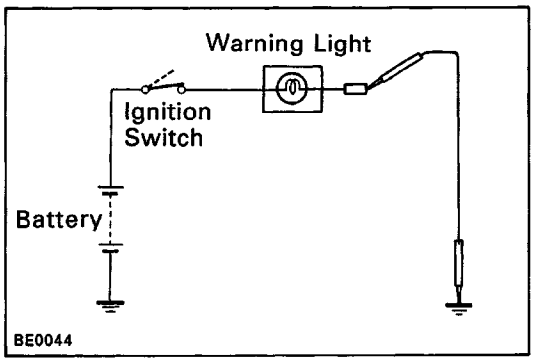


TURBO METER DRIVE CIRCUIT INSPECTION

(a) Disconnect the connector from the turbo pressure sensor.
(b) Remove the combination meter with connected three connectors.
(c) Inspect the connector on the wire harness side and terminals of the turbo meter drive circuit as shown in the chart.

Check for	Tester connection	Condition		Specified value
Continuity	A–B	Constant		Continuity
	C–2	Constant		Continuity
	D – Ground	Constant		Continuity
	1– Ground	Constant		Continuity
Voltage	E – Ground	Ignition switch position	LOCK or ACC	No voltage
			ON	Battery positive voltage
	3 – Ground	Ignition switch position	LOCK or ACC	No voltage
			ON	Battery positive voltage

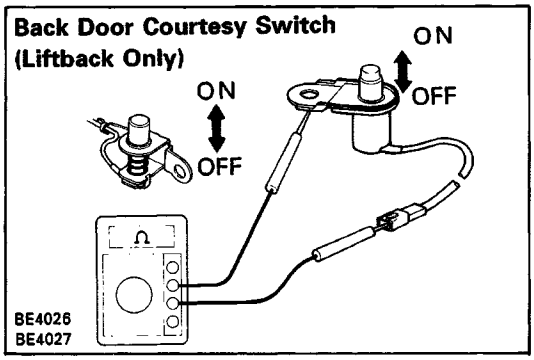
If circuit is as specified, replace the drive circuit.



OPEN DOOR WARNING SYSTEM

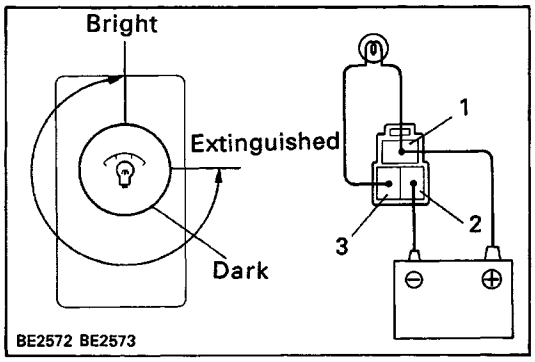
OPEN DOOR WARNING LIGHT INSPECTION

(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 does not light up, test the bulb.



COURTESY SWITCH INSPECTION

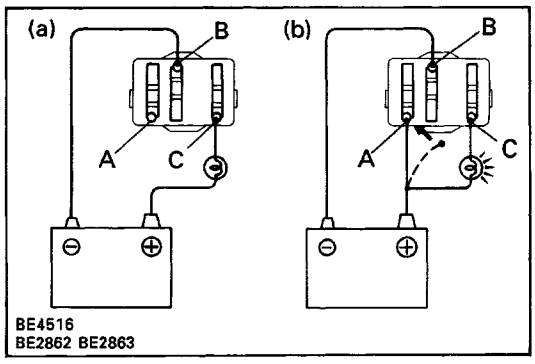
(a) Check that there is continuity between terminal and the switch body with the switch ON (switch pin released).
(b) Check that there is no continuity between terminal and the switch body with the switch OFF (switch pin pushed in).
If operation is not as specified, replace the switch.



METER ILLUMINATION CONTROL SYSTEM

LIGHT CONTROL RHEOSTAT INSPECTION

(a) Connect terminals 1 and 3 through a 3.4 watts test bulb.
(b) Connect the positive (+) lead from the battery to terminal 1 and the negative (–) lead to terminal 2.
(e) 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 SYSTEM

BULB CHECK RELAY INSPECTION

(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 lights up.
If operation is not as specified, replace the relay.