

BODY ELECTRICAL SYSTEM

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PRECAUTION

Take care to observe the following precautions when performing inspections or removal and replacement of body electrical related parts.

BE1HP-06

HEADLIGHT SYSTEM

BE270-01

- Halogen bulbs have pressurized gas inside and require special handling. They can burst if scratched or dropped. Hold a bulb only by its plastic or metal case. Don't touch the glass part of a bulb with bare hands.

BE27A-01

SRS (SUPPLEMENTAL RESTRAINT SYSTEM)

- The TOYOTA TACOMA is equipped with an SRS (Supplemental Restraint System) such as the driver airbag and front passenger airbag. Failure to carry out service operation in the correct sequence could cause the SRS to unexpectedly deploy during servicing, possibly leading to a serious accident. Before servicing (including removal or installation of parts, inspection or replacement), be sure to read the precautionary notices in the RS section.

BE1GN-0N

AUDIO SYSTEM

- If the negative (—) terminal cable is disconnected from the battery, the preset AM, FM 1 and FM 2 stations stored in memory are erased, so be sure to note the stations and reset them after the negative (—) terminal cable is reconnected to the battery.

BE1GP-0L

MOBILE COMMUNICATION SYSTEM

- If the vehicle is equipped with a mobile communication system, refer to precautions in the IN section.

PREPARATION

BE006-03

SST (SPECIAL SERVICE TOOLS)

	09843-18020 Diagnosis Check Wire
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BE

RECOMMENDED TOOLS

BE00C-04

	09082-00050 TOYOTA Electrical Tester Set.
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EQUIPMENT

BE00D-06

Voltmeter	
Ammeter	
Ohmmeter	
Test lead	
Thermometer	Engine coolant temperature sender gauge
Syphon	Brake fluid level warning switch

Oil bath	Engine oil level warning switch
Bulb (3.4 W)	Fuel sender gauge, Integration relay
Bulb (21 W)	Turn signal flasher relay
Dry cell battery	Fuel sender gauge, Power mirror
Torque wrench	
Clip remover	For removing cowl louver

BE218-02

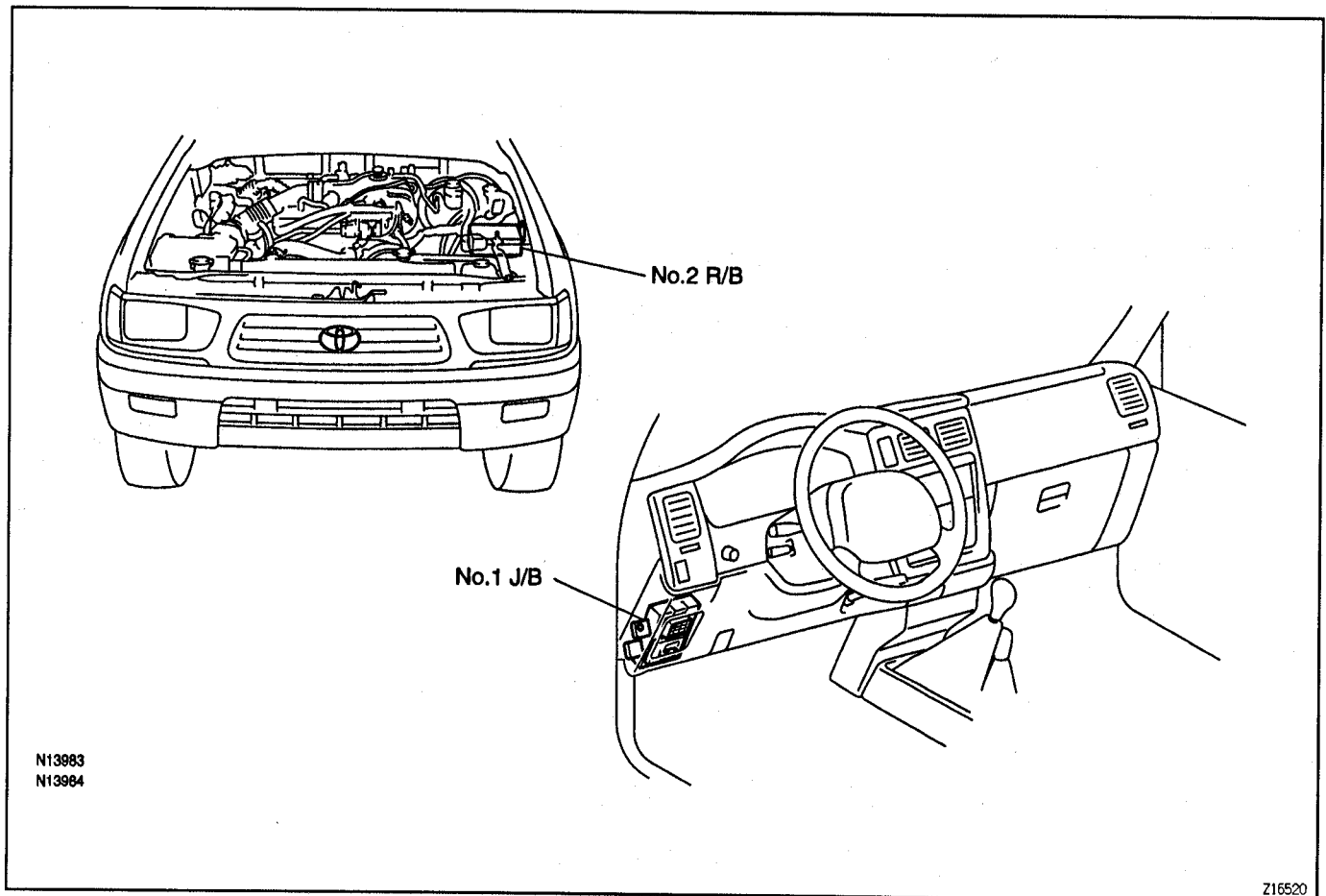
SSM (SPECIAL SERVICE MATERIALS)

08833-00080	Adhesive 1344, THREE BOND 1344, LOCTITE 242 or equivalent	Low oil pressure warning switch Engine coolant temperature sender gauge
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POWER SOURCE

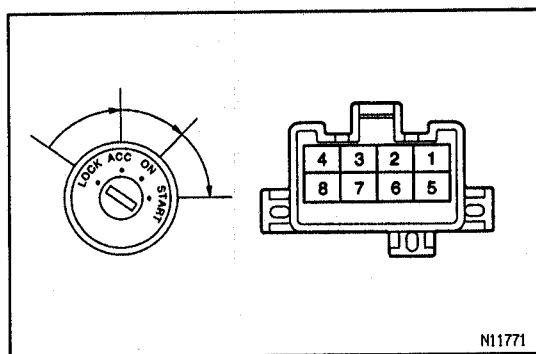
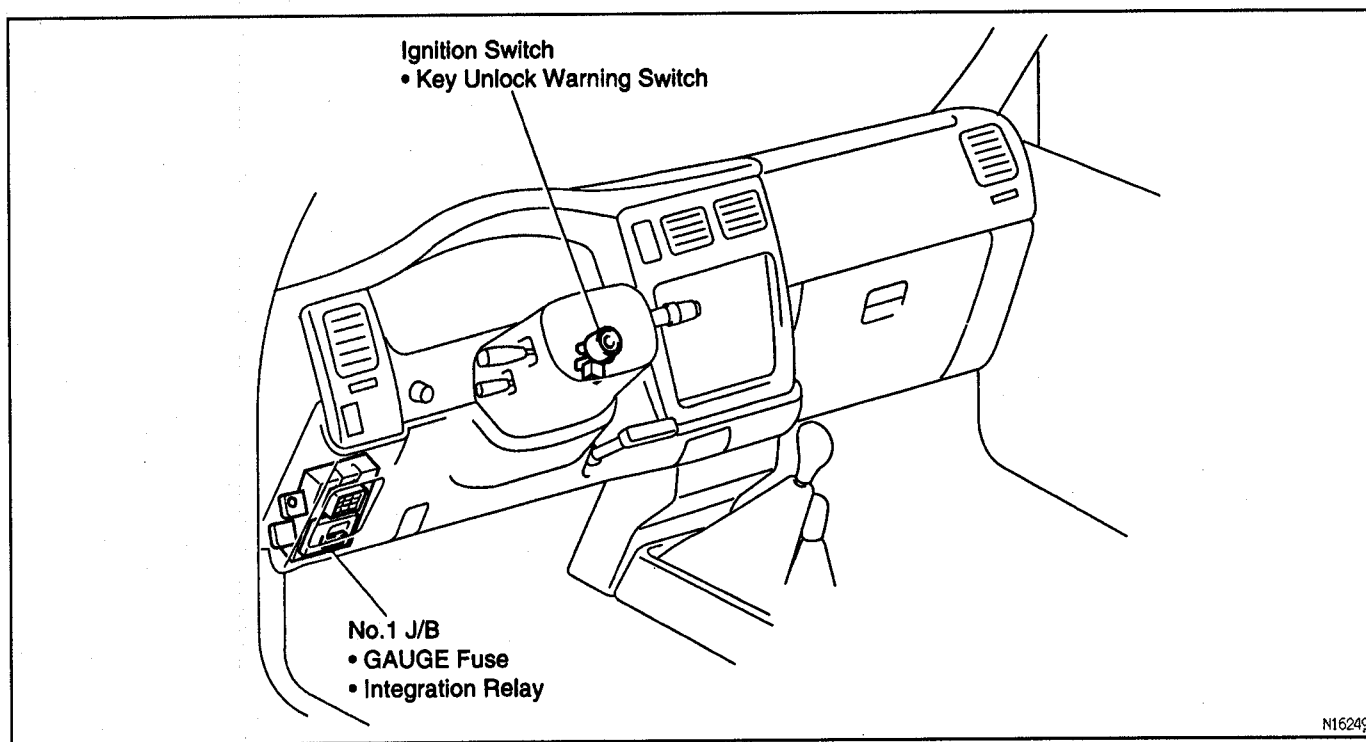
PARTS LOCATION

BE219-01



IGNITION SWITCH PARTS LOCATION

BE00F-0C



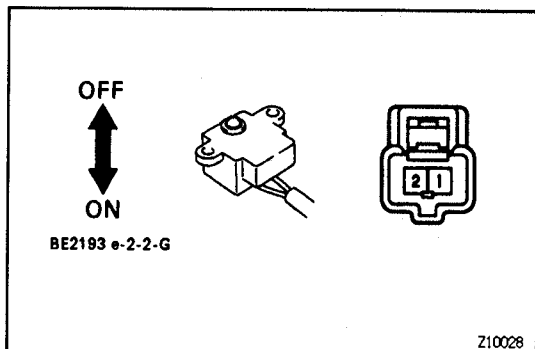
IGNITION SWITCH INSPECTION

BE00G-0E

INSPECT SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
LOCK	—	No continuity
ACC	2 - 3	Continuity
ON	2 - 3 - 4 6 - 7	Continuity
START	1 - 2 - 4 6 - 7 - 8	Continuity

If continuity is not as specified, replace the switch.

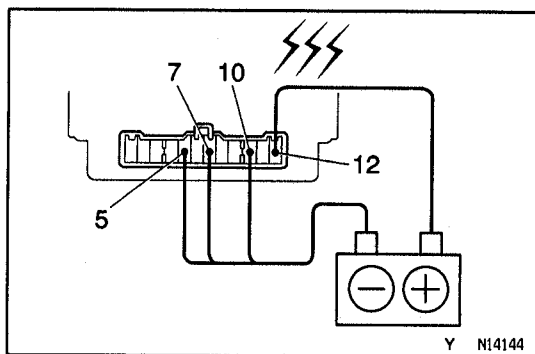


KEY UNLOCK WARNING SWITCH INSPECTION

INSPECT SWITCH CONTINUITY

Condition	Tester connection	Specified condition
Switch OFF (Key removed)	—	No continuity
Switch ON (Key set)	1 — 2	Continuity

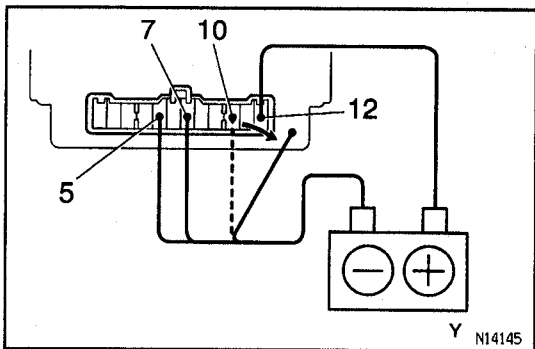
If continuity is not as specified, replace the switch.



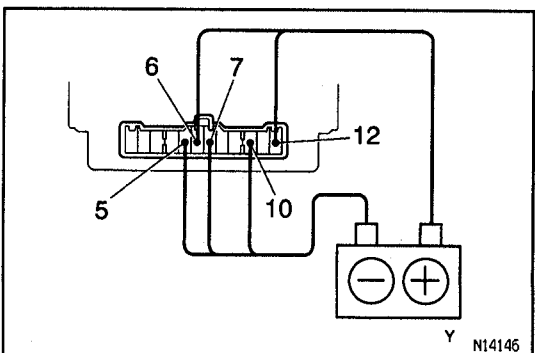
INTEGRATION RELAY INSPECTION

1. INSPECT KEY UNLOCK WARNING OPERATION

- Connect the positive (+) lead from the battery to terminal 12.
- Connect the negative (-) lead from the battery to terminals 5, 7 and 10.
- Check the chime sounds.

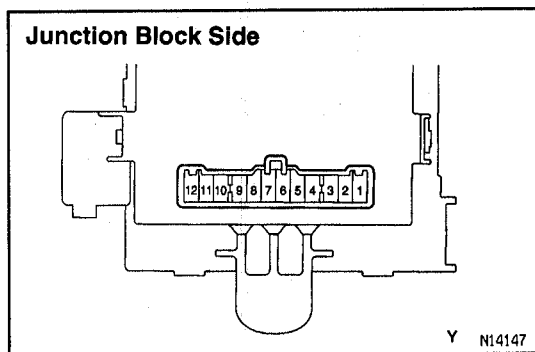


- Disconnect the negative (-) lead from the battery to terminal 10.
- Check that the chime stops sounding.



- Connect the negative (-) lead from the battery to terminal 10.
 - Connect the positive (+) lead from the battery to terminal 6.
 - Check that the chime stops sounding.
- If operation is not as specified, replace the relay.

Junction Block Side

**2. INSPECT RELAY CIRCUIT**

Remove the relay from the junction block No.1 and inspect the connectors on the junction block side.

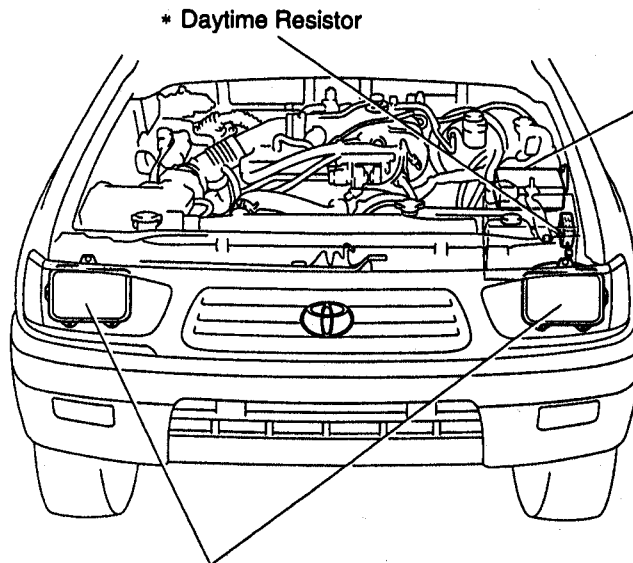
Tester connection	Condition	Specified condition
7 — Ground	Constant	Continuity
9 — Ground	Passenger's door courtesy switch OFF (Door opened and Room light switch not in "DOOR")	No continuity
9 — Ground	Passenger's door courtesy switch ON (Door closed and Room light switch not in "DOOR")	No continuity
11 — Ground	Constant	Continuity
12 — Ground	Passenger's door courtesy switch OFF (Door opened and Room light switch not in "DOOR")	No continuity
12 — Ground	Passenger's door courtesy switch ON (Door closed and Room light switch not in "DOOR")	No continuity
4 — Ground	Light control switch OFF	No voltage
4 — Ground	Light control switch TAIL or HEAD	Battery positive voltage
6 — Ground	Ignition switch LOCK or ACC	No voltage
6 — Ground	Ignition switch ON	Battery positive voltage
8 — Ground	Ignition switch LOCK	No voltage
8 — Ground	Ignition switch ACC or ON	Battery positive voltage

If circuit is as specified, try replacing the relay with a new one.

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

HEADLIGHT AND TAILLIGHT SYSTEM PARTS LOCATION

BE00H-0C



Headlight

No.2 R/B

- Headlight Control Relay
- * • Headlight Dimmer Relay
- Taillight Control Relay
- HEAD (RH) Fuse
- * • HEAD (HI RH) Fuse
- * • HEAD (LO RH) Fuse
- HEAD (LH) Fuse
- * • HEAD (HI LH) Fuse
- * • HEAD (LO LH) Fuse
- * • DRL Fuse
- TAIL Fuse
- DOME Fuse

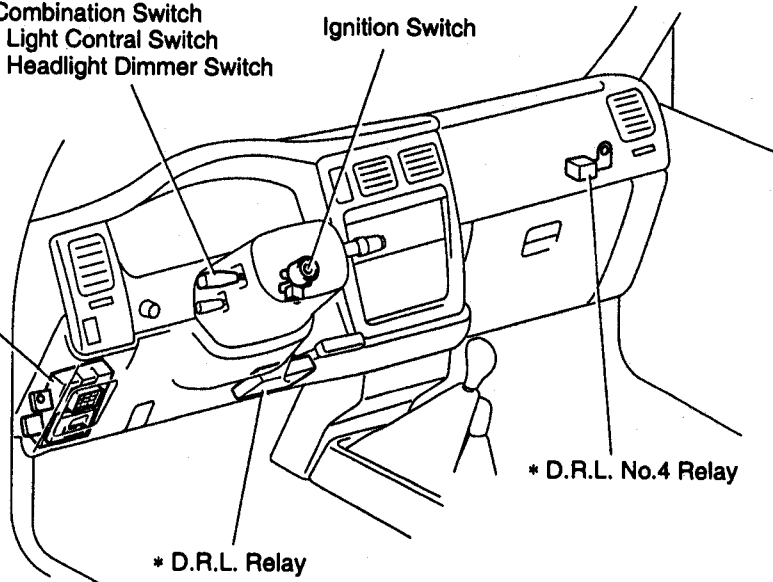
* : CANADA Models Only
D.R.L. : Daytime Running Light

- Combination Switch
- Light Control Switch
 - Headlight Dimmer Switch

Ignition Switch

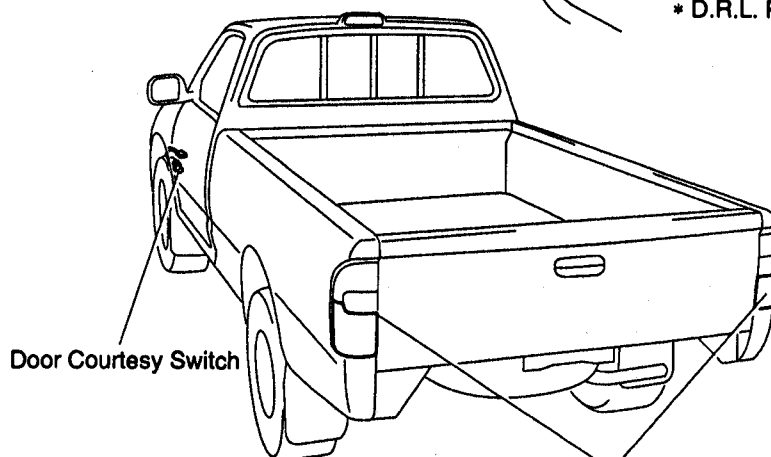
No.1 J/B

- Integration Relay
- ECU-B Fuse
- GAUGE Fuse



* D.R.L. Relay

* D.R.L. No.4 Relay



Door Courtesy Switch

Taillight

N13986
N13987
N13988

Z16521

BE

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.

USA:

Trouble	Parts name (See page)
Headlight does not light up (Taillight is normal)	1. HEAD LH Fuse (No.2 R/B) 2. HEAD RH Fuse (No.2 R/B) 3. Light Control Switch (BE-12) 4. Headlight Dimmer Switch (BE-12) 5. Headlight Bulb
Headlight does not light up (Taillight does not light up)	1. Light Control Switch (BE-12) 2. Headlight Dimmer Switch (BE-12) 3. Headlight Bulb 4. Wire Harness
Only one light comes on	1. HEAD LH Fuse (No.2 R/B) 2. HEAD RH Fuse (No.2 R/B) 3. Headlight Bulb 4. Wire Harness
"Lo-Beam" does not light up	1. Headlight Control Relay (No.2 R/B) 2. Headlight Dimmer Relay (No.2 R/B) 3. Headlight Dimmer Switch (BE-12) 4. Headlight Bulb 5. Wire Harness
"Hi-Beam" does not light up	1. Headlight Control Relay (No.2 R/B) 2. Headlight Dimmer Relay (No.2 R/B) 3. Headlight Dimmer Switch (BE-12) 4. Headlight Bulb 5. Wire Harness
"Flash" does not light up	1. Headlight Control Relay (No.2 R/B) 2. Headlight Dimmer Relay (No.2 R/B) 3. Headlight Dimmer Switch (BE-12) 4. Headlight Bulb 5. Wire Harness
Taillight does not light up (Headlight does not light up)	1. TAIL Fuse (No.2 R/B) 2. Light Control Switch (BE-12) 3. Taillight Bulb 4. Wire Harness
Taillight does not light up (Headlight is normal)	1. TAIL Fuse (No.2 R/B) 2. Light Control Switch (BE-12) 3. Taillight Control Relay (No.2 R/B) 4. Taillight Bulb 5. Wire Harness
Only one light goes out or does not light up	1. Taillight Bulb 2. Wire Harness
Rear Combination light does not light up	1. TAIL Fuse (No.2 R/B) 2. Taillight Bulb 3. Wire Harness

CANADA:

Trouble	Parts name (See page)
Only one side headlight does not light up.	1. Headlight Bulb 2. Wire Harness
"Lo-Beam" does not light up. (ALL)	1. D.R.L. Relay (BE-13) 2. Headlight Dimmer Relay (No.2 R/B) 3. Headlight Control Relay (No.2 R/B) 4. Headlight Dimmer Switch (BE-12) 5. Wire Harness
"Lo-Beam" does not light up. (ONE SIDE)	1. HEAD (LO LH) Fuse (No.2 R/B) 2. HEAD (LO RH) Fuse (No.2 R/B) 3. Headlight Bulb 4. Wire Harness
"Hi-Beam" does not light up. (ALL)	1. DRL Fuse (No.2 R/B) 2. Headlight Dimmer Relay (No.2 R/B) 3. Headlight Control Relay (No.2 R/B) 4. Headlight Dimmer Switch (BE-12) 5. Wire Harness
"Hi-Beam" does not light up. (ONE SIDE)	1. HEAD (HI LH) Fuse (No.2 R/B) 2. HEAD (HI RH) Fuse (No.2 R/B) 3. Headlight Bulb 4. Wire Harness
"Flash" does not light up.	1. Headlight Dimmer Switch (BE-12) 2. Wire Harness
Headlight does not light up. (Taillight is normal)	1. Headlight Control Relay (No.2 R/B) 2. D.R.L. Relay (BE-13) 3. D.R.L. No.4 Relay (BE-14) 4. D.R.L. Resistor (BE-14) 5. Headlight Dimmer Switch (BE-12) 6. Light Control Switch (BE-12) 7. Headlight Bulb 8. Wire Harness
Headlight does not light up. (Taillight does not light up)	1. Headlight Control Relay (No.2 R/B) 2. D.R.L. Relay (BE-13) 3. D.R.L. No.4 Relay (BE-14) 4. D.R.L. Resistor (BE-14) 5. Headlight Dimmer Switch (BE-12) 6. Light Control Switch (BE-12) 7. Headlight Bulb 8. Wire Harness
Only one side taillight does not light up.	1. Taillight Bulb 2. Wire Harness
Taillight does not light up. (Headlight is normal)	1. TAIL Fuse (No.2 R/B) 2. Taillight Control Relay (No.2 R/B) 3. Light Control Switch (BE-12) 4. Taillight Bulb 5. Wire Harness

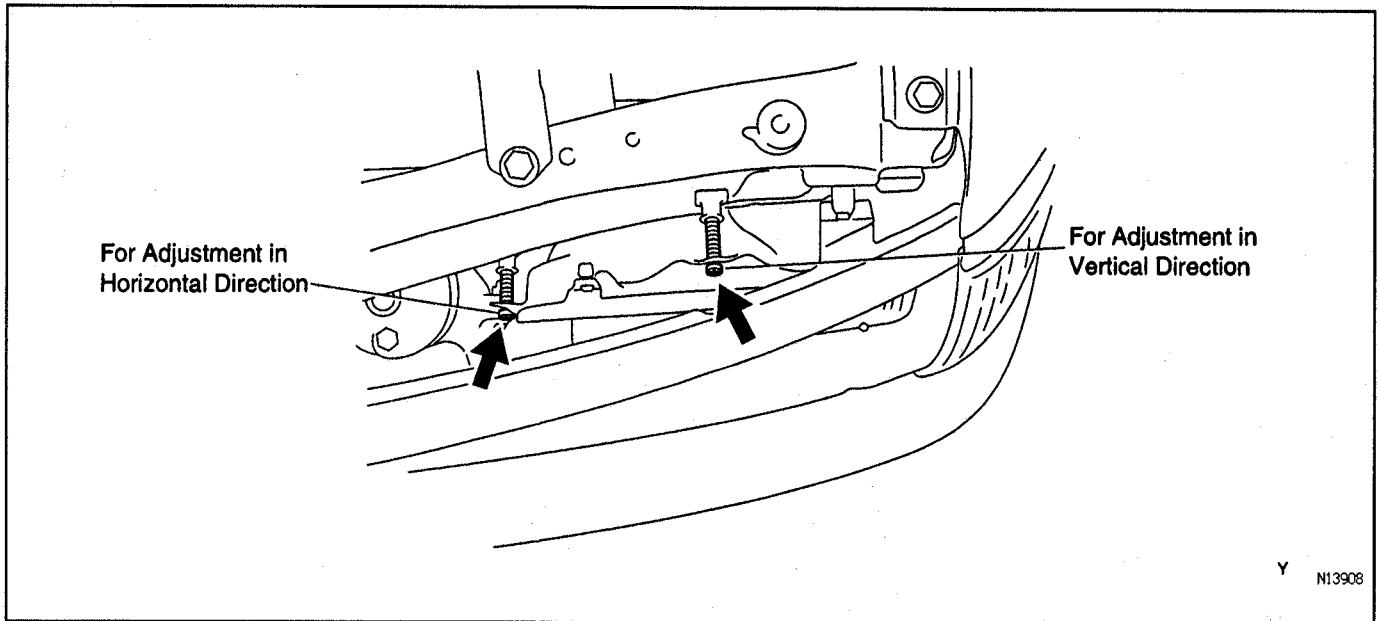
Trouble	Parts name	(See page)
Taillight does not light up. (Headlight does not light up)	1. Light Control Switch 2. Taillight Bulb 3. Wire Harness	(BE-12)
Headlight does not light up with light control SW in HEAD.	1. Light Control Switch 2. D.R.L. Relay 3. D.R.L. No.4 Relay 4. Wire Harness	(BE-12) (BE-13) (BE-14)
Headlight does not go out with light control SW in OFF.	1. Headlight Control Relay (No.2 R/B) 2. Light Control Switch 3. Wire Harness	(BE-12)
Taillight does not light up with light control SW in TAIL.	1. Taillight Control Relay (No.2 R/B) 2. Light Control Switch 3. Wire Harness	(BE-12)
Taillight does not go out with light control SW in OFF.	1. Taillight Control Relay (No.2 R/B) 2. Light Control Switch 3. Wire Harness	(BE-12)
Headlight do not light up with engine running, parking brake SW and light control SW in OFF.	1. ECU—B Fuse (No.1 J/B) 2. GAUGE Fuse (No.1 J/B) 3. DRL Fuse (No.2 R/B) 4. D.R.L. Relay 5. D.R.L. No.4 Relay 6. D.R.L. Resistor 7. Wire Harness 8. Generator L Terminal 9. Parking Brake Switch 10. Brake Fluid Level Warning Switch 11. Wire Harness	(BE-13) (BE-14) (BE-14) (BE-40) (BE-40)

LIGHT—ON WARNING SYSTEM

Trouble	Parts name	(See page)
"Light—on warning system" does not operate.	1. Integration Relay (No.1 J/B) 2. DOME Fuse (No.2 R/B) 3. GAUGE Fuse (No.1 J/B) 4. Door Courtesy Switch 5. Wire Harness	(BE-20)

HEADLIGHT AIMING ADJUSTMENT

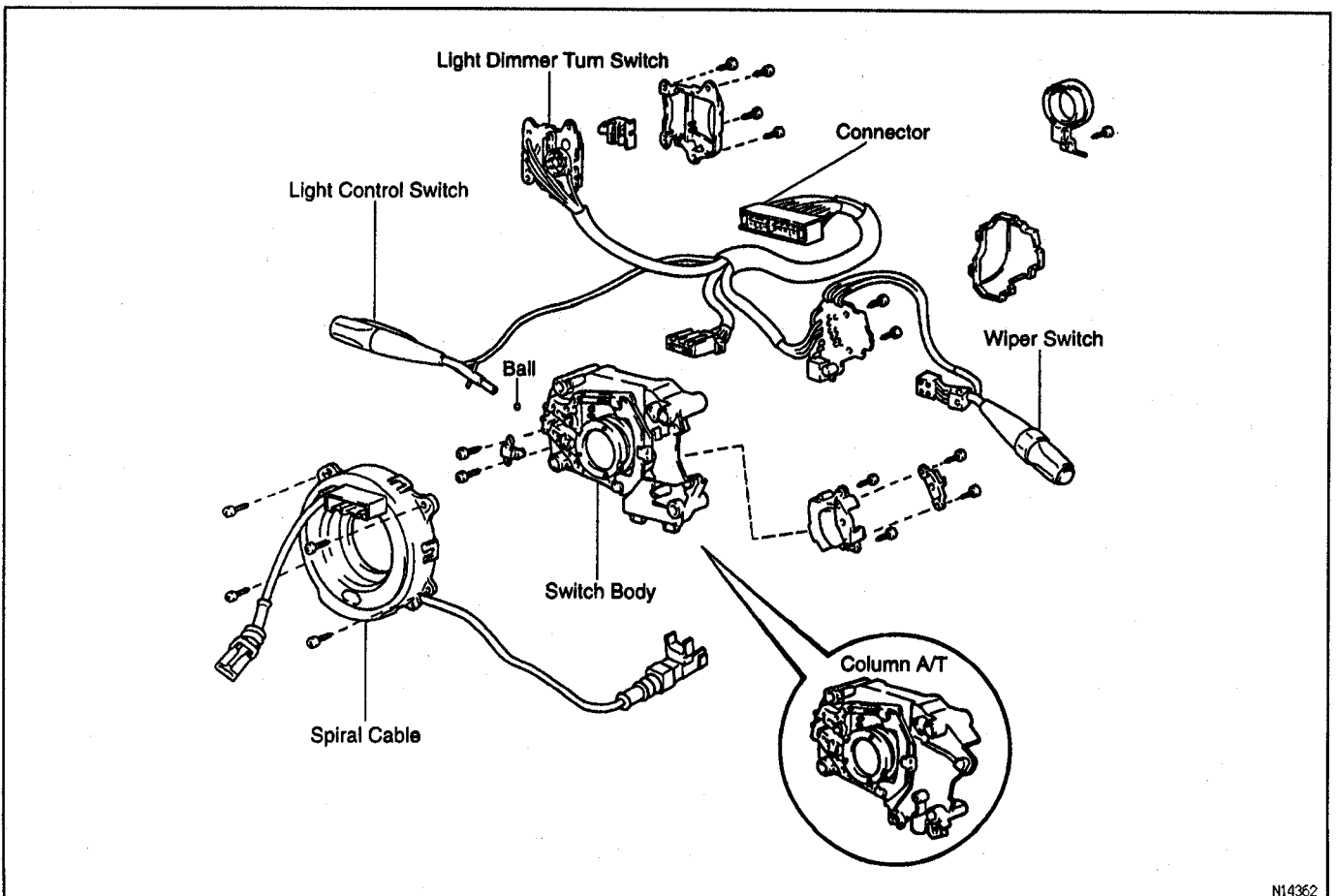
BOOK-08

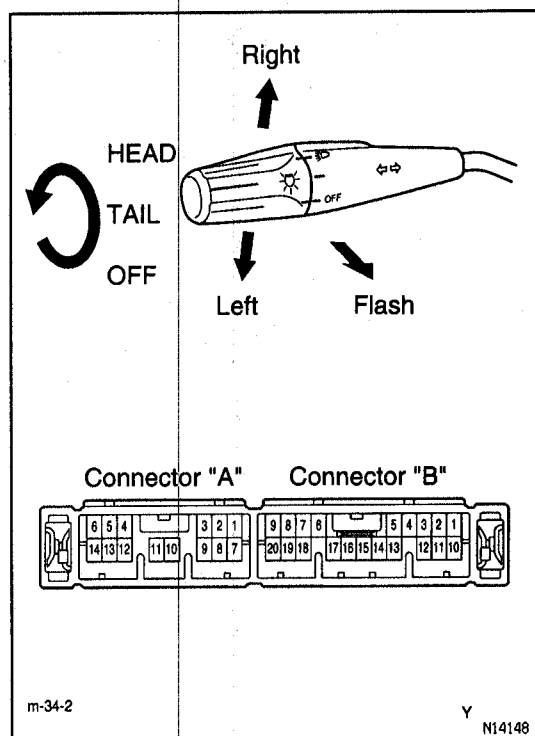


COMBINATION SWITCH DISASSEMBLY

BE210-02

See page SR-13.





COMBINATION SWITCH INSPECTION

1. INSPECT LIGHT CONTROL SWITCH CONTINUITY

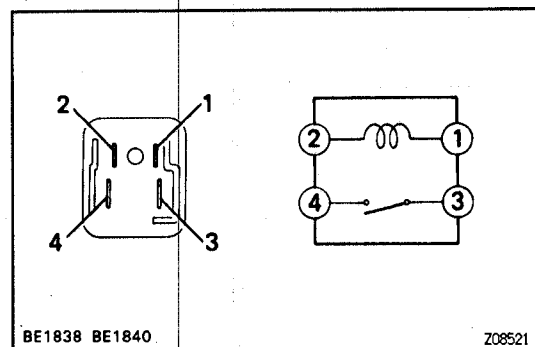
Switch position	Tester connection	Specified condition
OFF	—	No continuity
TAIL	A2 — A11	Continuity
HEAD	A2 — A11 — A13	Continuity

If continuity is not as specified, replace the switch.

2. INSPECT HEADLIGHT DIMMER SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
Low beam	A3 — A9	Continuity
High beam	A9 — A12	Continuity
Flash	A9 — A12 — A14	Continuity

If continuity is not as specified, replace the switch.



HEADLIGHT CONTROL RELAY INSPECTION

INSPECT RELAY CONTINUITY

Condition	Tester connection	Specified condition
Constant	1 — 2	Continuity
Apply B+ between terminals 1 and 2.	3 — 4	Continuity

If continuity is not as specified, replace the relay.

TAILLIGHT CONTROL RELAY INSPECTION

INSPECT RELAY CONTINUITY

Condition	Tester connection	Specified condition
Constant	1 — 2	Continuity
Apply B+ between terminals 1 and 2.	3 — 5	Continuity

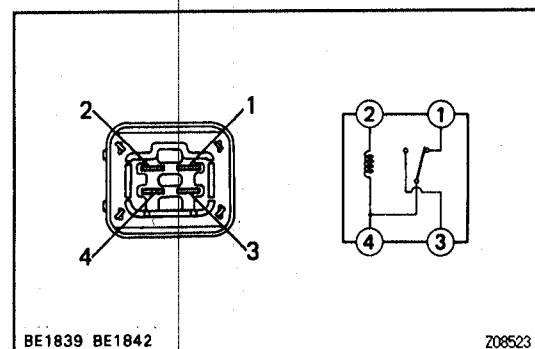
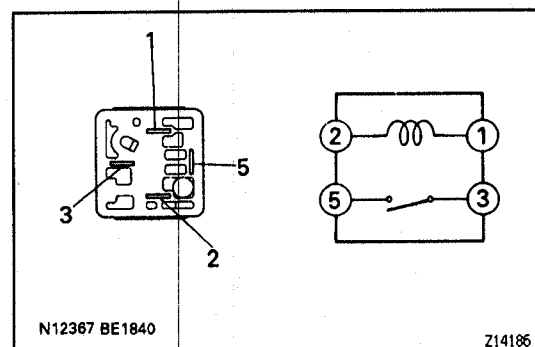
If continuity is not as specified, replace the relay.

HEADLIGHT DIMMER RELAY INSPECTION

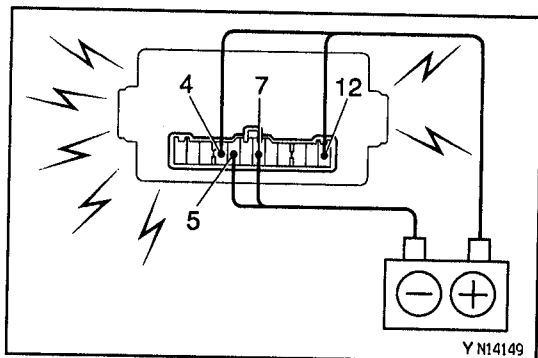
INSPECT RELAY CONTINUITY

Condition	Tester connection	Specified condition
Constant	1 — 4, 2 — 4	Continuity
Apply B+ between terminals 2 and 4.	3 — 4	Continuity

If continuity is not as specified, replace the relay.

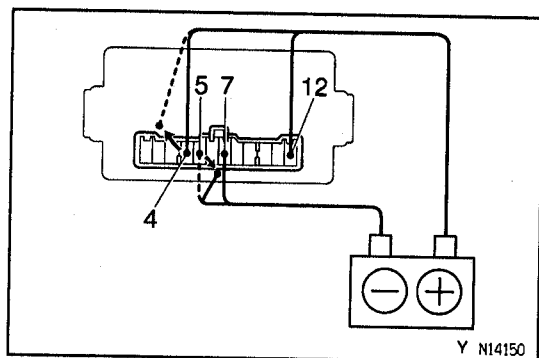


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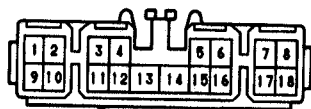


LIGHT-ON WARNING SYSTEM INSPECTION

1. **INSPECT DOOR COURTESY SWITCH**
See page BE-20.
 2. **INSPECT INTEGRATION RELAY OPERATION**
 - (a) Connect the positive (+) lead from the battery to terminal 12 and the negative (-) lead to terminal 7.
 - (b) Connect the positive (+) lead from the battery to terminal 4 and the negative (-) lead to terminal 5.
 - (c) Check that the buzzer does not sound when terminal 4 or 5 is connected to the positive (+) lead.
 - (d) Check that the buzzer does not sound when disconnecting terminal 4 or 5.
- If operation is not as specified, replace the relay.



Wire Harness Side



DAYTIME RUNNING LIGHT RELAY INSPECTION

BE2LA-02

INSPECT RELAY CIRCUIT

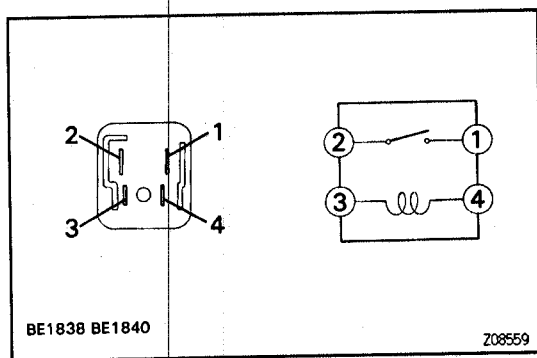
Connector Disconnected

Disconnect the connector from the relay and inspect the connector on the wire harness side, as shown in the chart.

Tester connection	Condition	Specified condition
5 - Ground	Light control switch position OFF or TAIL	No continuity
5 - Ground	Light control switch position HEAD	Continuity
7 - Ground	Headlight dimmer switch position Low beam and High	No continuity
7 - Ground	Headlight dimmer switch position Flash	Continuity
16 - Ground	Headlight dimmer switch position Low beam	No continuity
16 - Ground	Headlight dimmer switch position High beam or Flash	Continuity
8 - Ground	Parking brake switch position OFF (Parking brake lever released)	No continuity
8 - Ground	Parking brake switch position ON (Parking brake lever pulled up)	Continuity
12 - Ground	Constant	Continuity
13 - Ground	Constant	Continuity
17 - Ground	Constant	Continuity

Tester connection	Condition	Specified condition
18 — Ground	Brake fluid level warning position OFF	No continuity
18 — Ground	Brake fluid level warning position ON	Battery positive voltage
2 — Ground	Ignition switch position LOCK or ACC	No voltage
2 — Ground	Ignition switch position ON or START	Battery positive voltage
6 — Ground	Constant	Battery positive voltage
11 — Ground	Engine Stop	No voltage
11 — Ground	Engine Running	Battery positive voltage
15 — Ground	Constant	Battery positive voltage

If circuit is as specified, perform the inspection on the following page.



DAYTIME RUNNING LIGHT No.4 RELAY INSPECTION

BE1HT-06

INSPECT RELAY CONTINUITY

Condition	Tester connection	Specified condition
Constant	3 — 4	Continuity
Apply B+ between terminals 3 and 4.	1 — 2	Continuity

If continuity is not as specified, replace the relay.

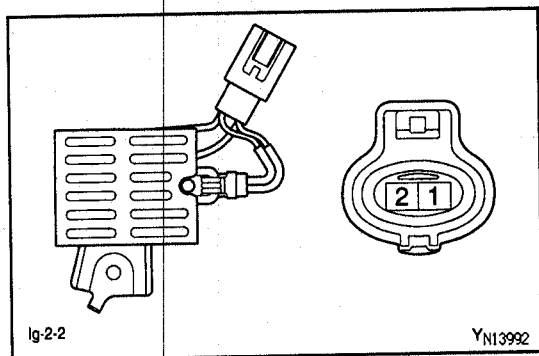
BE1HU-06

DAYTIME RESISTOR RESISTANCE

INSPECT RESISTOR CONTINUITY

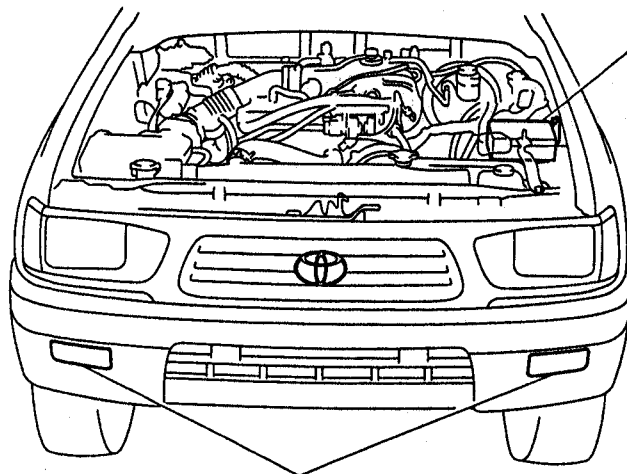
Condition	Tester connection	Specified condition
Constant	1 — 2	Approx. 337mΩ

If continuity is not as specified, replace the resistor.



TURN SIGNAL AND HAZARD WARNING SYSTEM PARTS LOCATION

BE007-08

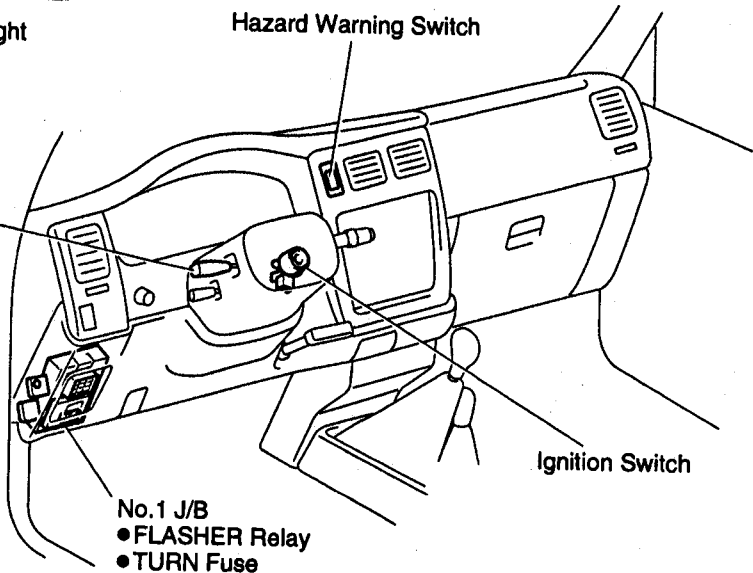


No.2 R/B
● HORN Fuse

Turn Signal and Hazard Warning Light

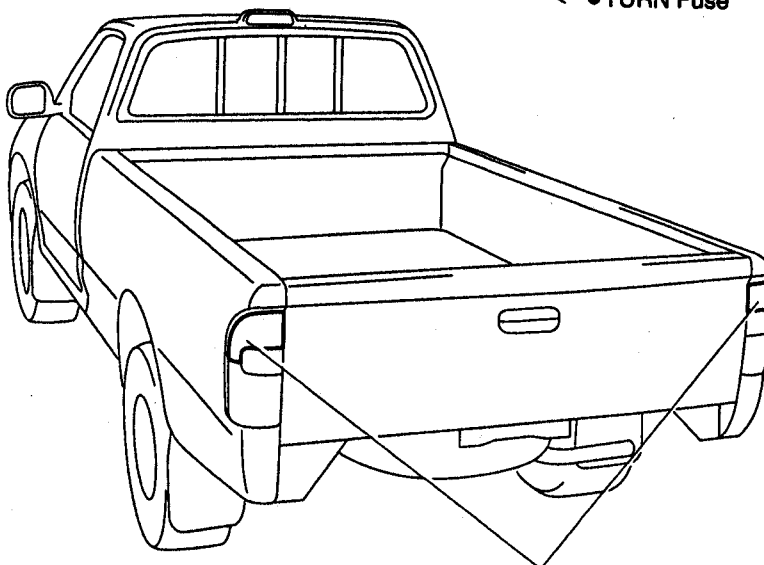
Hazard Warning Switch

Combination Switch
● Turn Signal Switch



No.1 J/B
● FLASHER Relay
● TURN Fuse

Ignition Switch



Turn Signal and Hazard Warning Light

N13989
N13990
N13991

Z16522

BE

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)
"Hazard" and "Turn" do not light up	1. Hazard Warning Switch	(BE-17)
	2. Turn Signal Flasher	(BE-17)
	3. Wire Harness	
The flashing frequency is abnormal	1. Bulb	
	2. Turn Signal Flasher	(BE-17)
	3. Wire Harness	
Hazard warning light does not light up (Turn signal is normal)	1. HORN Fuse (No.2 R/B)	
	2. Wire Harness	
Hazard warning light does not light up in one direction	1. Hazard Warning Switch	(BE-17)
	2. Wire Harness	
Turn signal does not light up (Combination meter, wiper and washer do not operate.)	1. Ignition Switch	(BE-4)
	2. TURN Fuse (No.1 J/B)	
	3. Turn Signal Switch	(BE-16)
	4. Wire Harness	
Turn signal does not light up (Combination meter, wiper and washer are normal.)	1. Turn Fuse (No.1 J/B)	
	2. Turn Signal Switch	(BE-16)
	3. Wire Harness	
Turn signal does not light up in one direction	1. Turn Signal Switch	(BE-16)
	2. Wire Harness	
Only one bulb does not light up	1. Bulb	
	2. Wire Harness	

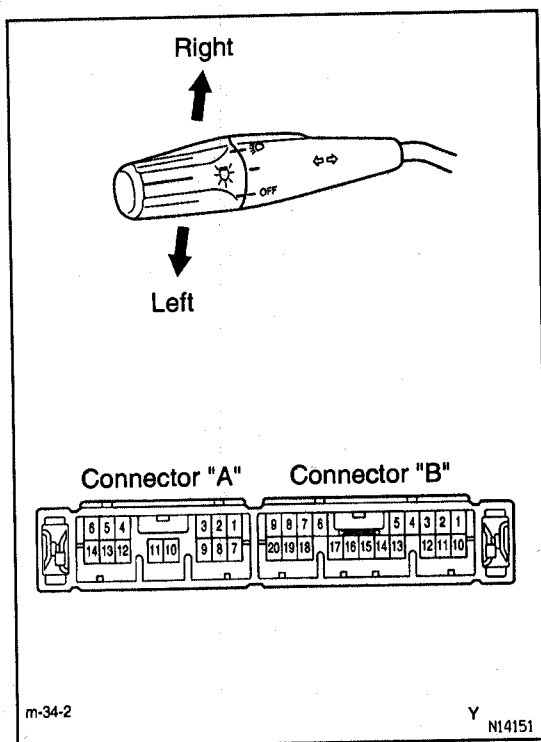
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TURN SIGNAL SWITCH INSPECTION

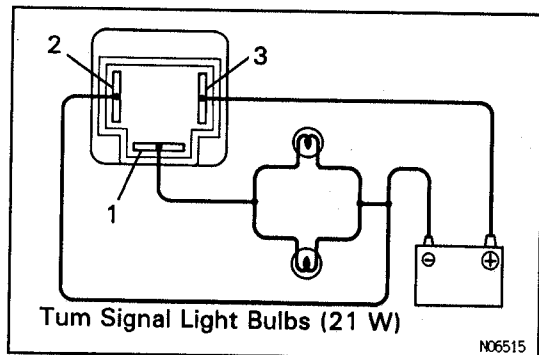
INSPECT SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
Left turn	A1 - A5	Continuity
Neutral	—	No continuity
Right turn	A1 - A8	Continuity

If continuity is not as specified, replace the switch.



8800W-00



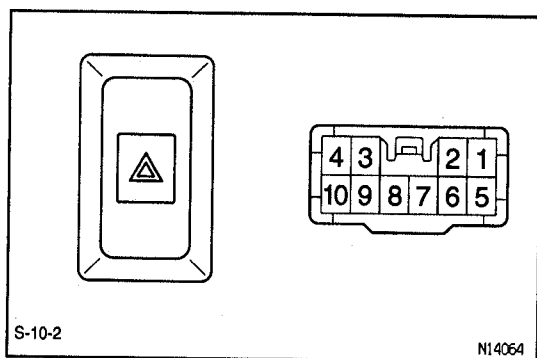
TURN SIGNAL FLASHER INSPECTION

INSPECT FLASHER OPERATION

- Connect the positive (+) lead from the battery to terminal 2 and the negative (-) lead to terminal 3.
- Connect the 2 turn signal light bulbs parallel to each other to terminals 1 and 3, check that the bulbs flash. HINT: The turn signal lights should flash 60 or 120 times per minute.

If one of the front or rear turn signal lights has an open circuit, the number of flashers will be more than 140 per minute.

If operation is not as specified, replace the flasher.



HAZARD WARNING SWITCH INSPECTION

8800W-00

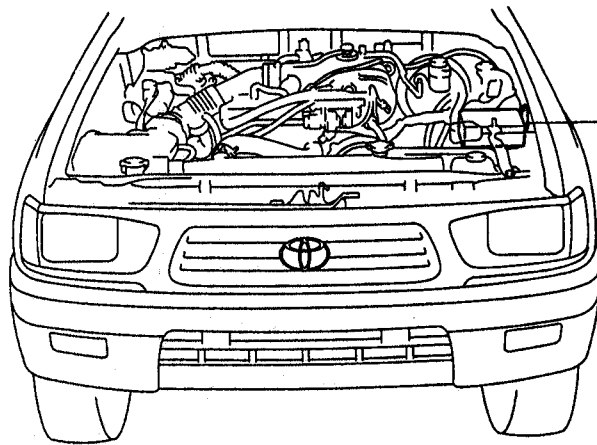
INSPECT SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
Switch OFF	7 - 10	Continuity
Switch ON	4 - 5 - 6 - 9 7 - 8	Continuity
Illumination circuit	2 - 3	Continuity

If continuity is not as specified, replace the switch.

INTERIOR LIGHT SYSTEM PARTS LOCATION

BODY-08

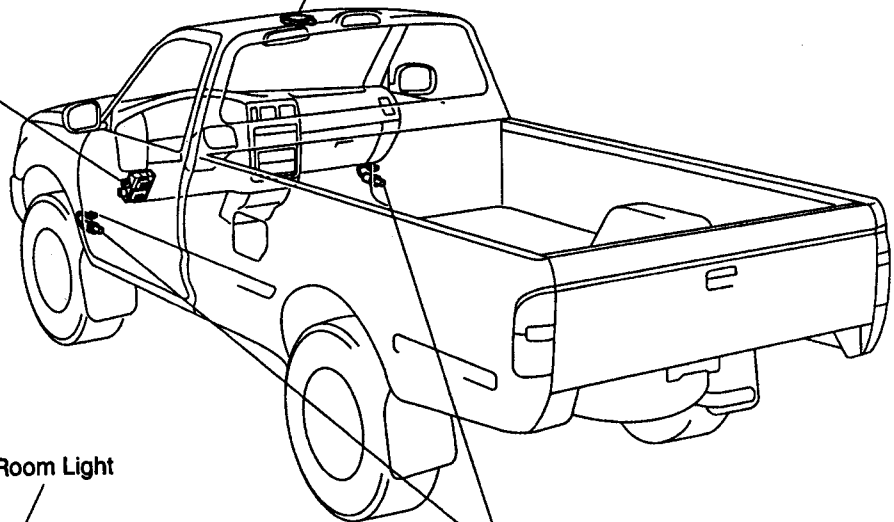


No.2 R/B
• DOME Fuse

REGULAR CAB:

No.1 J/B
• Integration Relay

Room Light

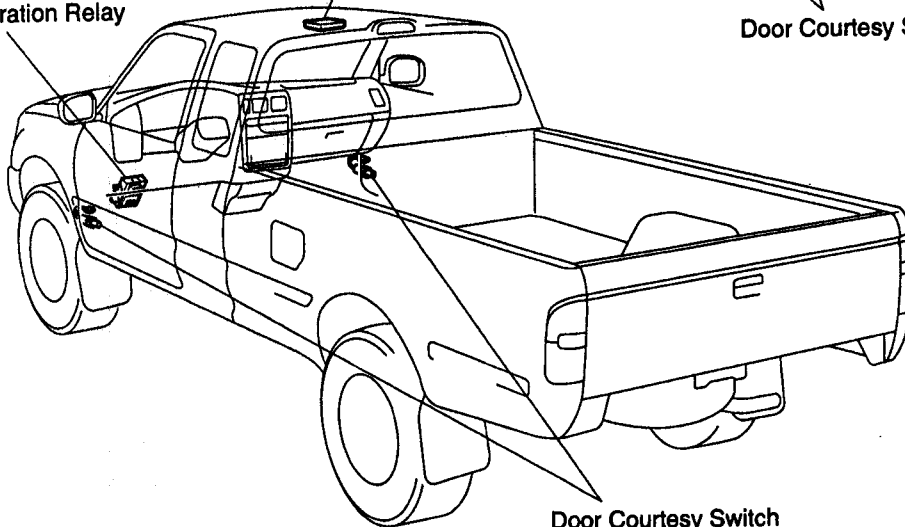


EXTRA CAB:

No.1 J/B
• Integration Relay

Room Light

Door Courtesy Switch



Door Courtesy Switch

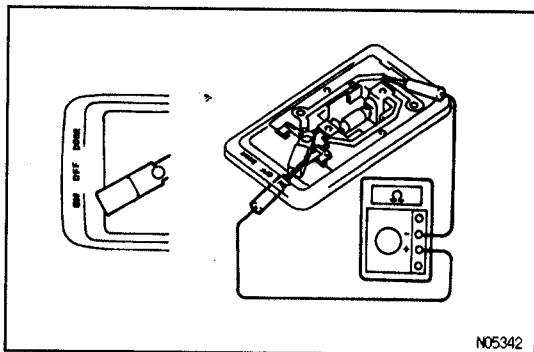
N13999
N14021
N14022

Z16523

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)
Room light does not light up	1. DOME Fuse (No.2 R/B)
	2. Integration Relay (No.1 J/B)
	3. Room Light Switch (BE-19)
	4. Door Courtesy Switch (BE-20)
	5. Bulb
	6. Wire Harness
Room light remains always on	1. Room Light Switch (BE-19)
	2. Door Courtesy Switch (BE-20)
	3. Wire Harness

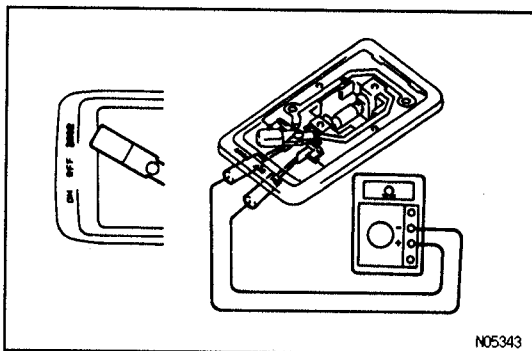


ROOM LIGHT SWITCH INSPECTION

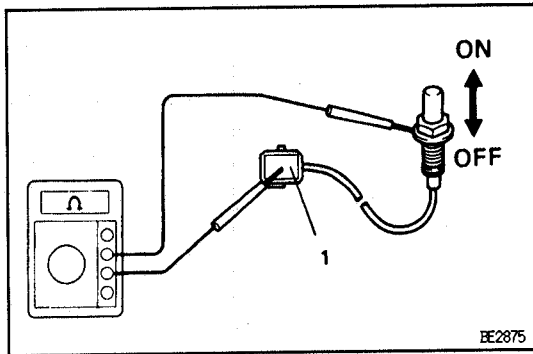
NE010-0E

INSPECT SWITCH CONTINUITY

- Disconnect the connector from room light switch.
- Turn the room light switch ON, check that there is continuity between terminal 2 and body ground.

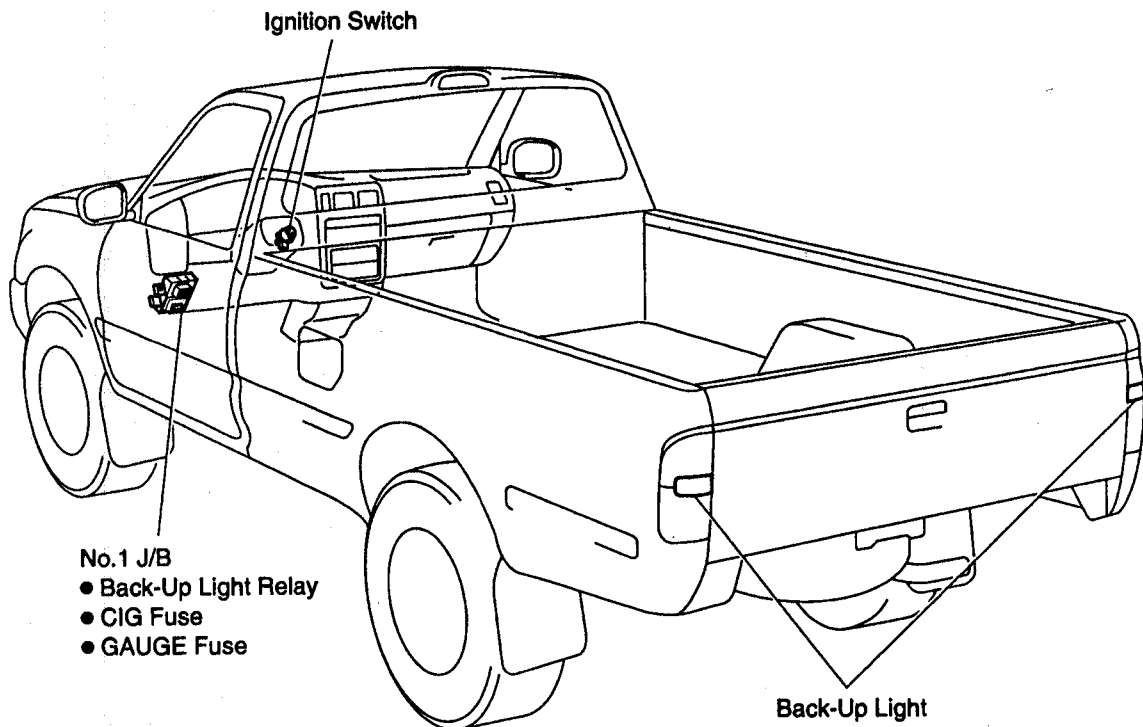


- Turn the room light switch to DOOR, check that there is continuity between terminals 1 and 2. If operation is not as specified, replace the switch.

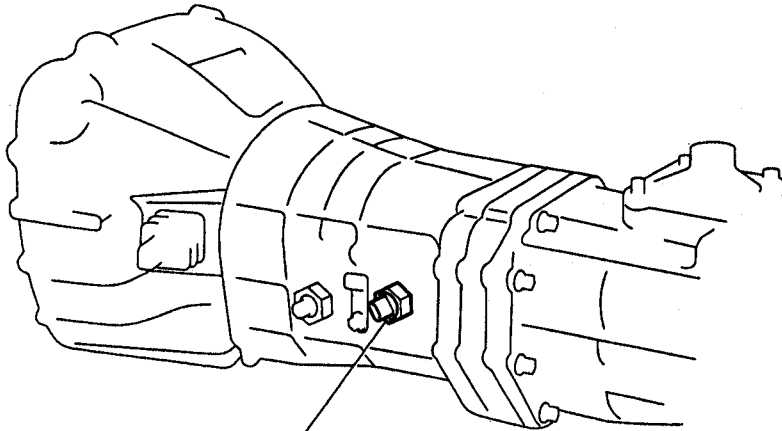
**DOOR COURTESY SWITCH INSPECTION****INSPECT SWITCH CONTINUITY**

- Check that there is no continuity between terminal and the switch body in the ON position (switch pin released : opened door).
- Check that there is continuity between terminal and the switch body in the OFF position (switch pin pushed in : closed door).

If operation is not as specified, replace the switch.

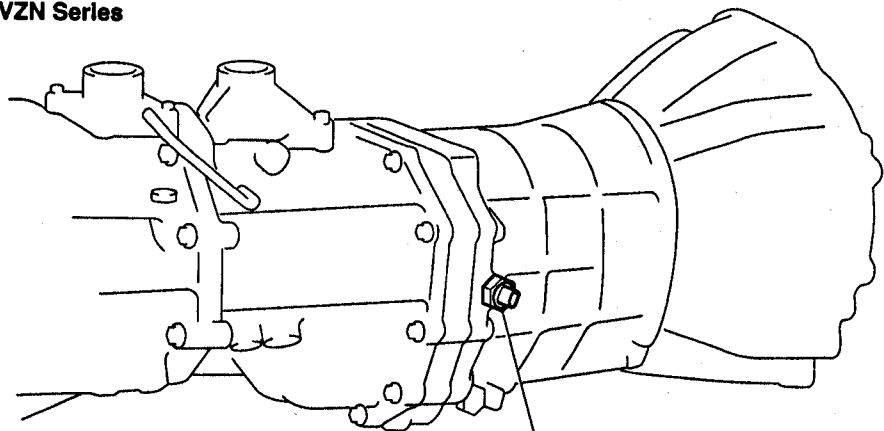
BACK-UP LIGHT SYSTEM PARTS LOCATION

RZN Series

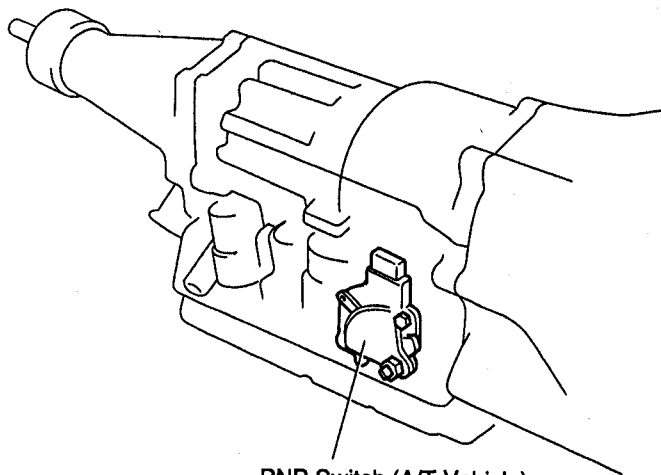


Back-Up Light Switch (M/T Vehicle)

VZN Series



Back-Up Light Switch (M/T Vehicle)



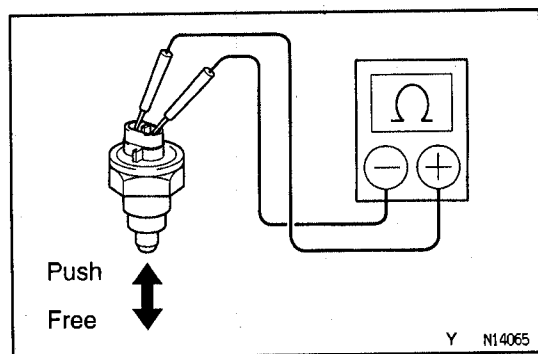
PNP Switch (A/T Vehicle)

N13996
N13997
N13998

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)
Back—Up Light does not light up	1. CIG Fuse (No.1 J/B)
	2. GAUGE Fuse (No.1 J/B)
	3. Ignition Switch (BE—4)
	4. Column A/T: Back—Up Light Relay (BE—22)
	5. Back—Up Light Switch (M/T) (BE—22)
	6. PNP Switch (A/T) (BE—22)
	7. Bulb
	8. Wire Harness
Back—Up Light remains always on	1. Wire Harness
Only one light does not light up	1. Bulb
	2. Wire Harness



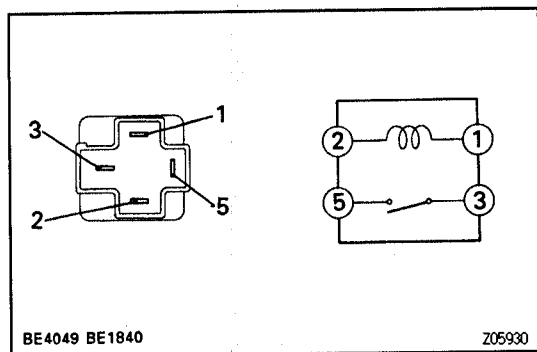
BACK—UP LIGHT SWITCH INSPECTION

BE014—00

INSPECT SWITCH CONTINUITY

Condition	Tester connection	Specified condition
Free	—	No continuity
Push	1 — 2	Continuity

If continuity is not as specified, replace the switch.



BACK—UP LIGHT RELAY INSPECTION

BE10W—00

INSPECT RELAY CONTINUITY

Condition	Tester connection	Specified condition
Constant	1 — 2	Continuity
Apply B+ between terminals 1 and 2.	3 — 5	Continuity

If continuity is not as specified, replace the relay.

PARK/NEUTRAL POSITION SWITCH INSPECTION

BE2TC—01

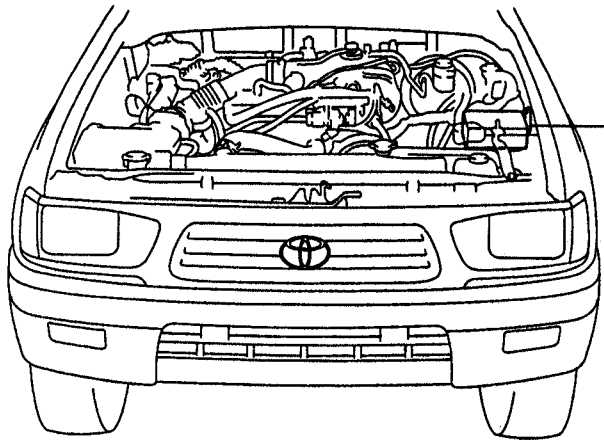
INSPECT SWITCH CONTINUITY

A43D: See page AT—12.

A340E, A340F: See page AT—76.

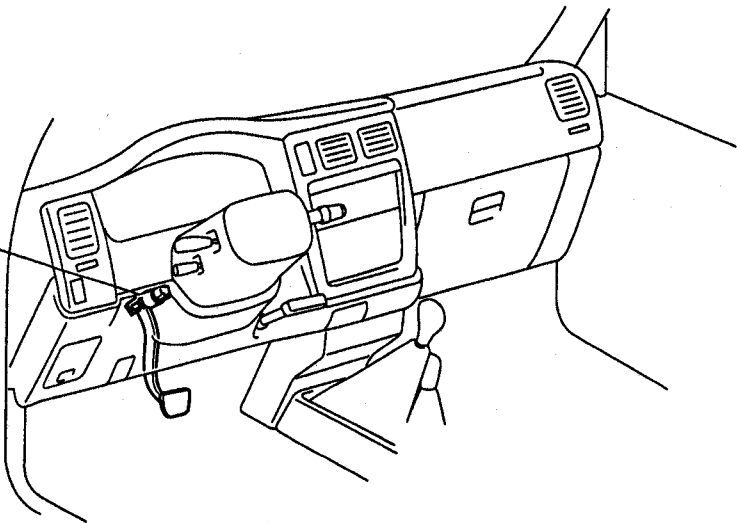
STOP LIGHT SYSTEM PARTS LOCATION

BE018-04

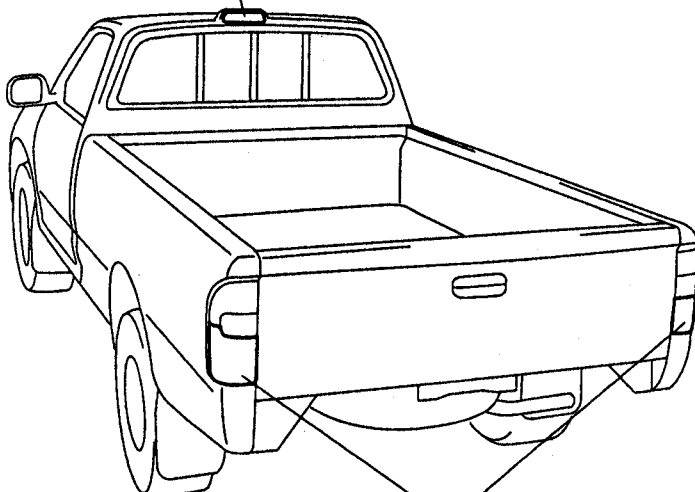


No.2 R/B
• STOP Fuse

Stop Light Switch



Hi-Mounted Stop Light



Stop Light

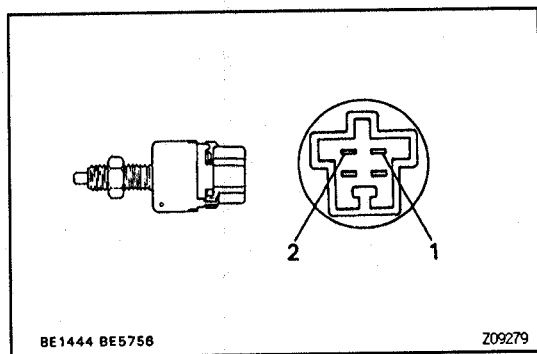
N13999
N14000
N14001

BE

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)
Stop light does not light up	1. STOP Fuse (No.2 R/B) 2. Stop Light Switch (BE-24) 3. Bulb 4. Wire Harness
Stop light remains always on	1. Stop Light Switch (BE-24) 2. Wire Harness
Only one light does not light up	1. Wire Harness 2. Bulb



STOP LIGHT SWITCH INSPECTION

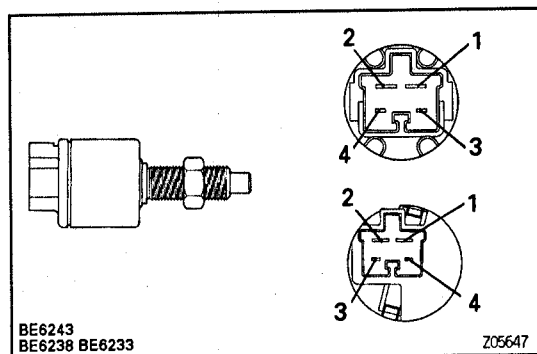
BE017-06

INSPECT SWITCH CONTINUITY w/o Cruise Control:

Switch position	Tester connection	Specified condition
Switch pin free (Brake pedal depressed)	1 - 2	Continuity
Switch pin pushed in (Brake pedal released)	—	No continuity

If continuity is not as specified, replace the switch.

BE



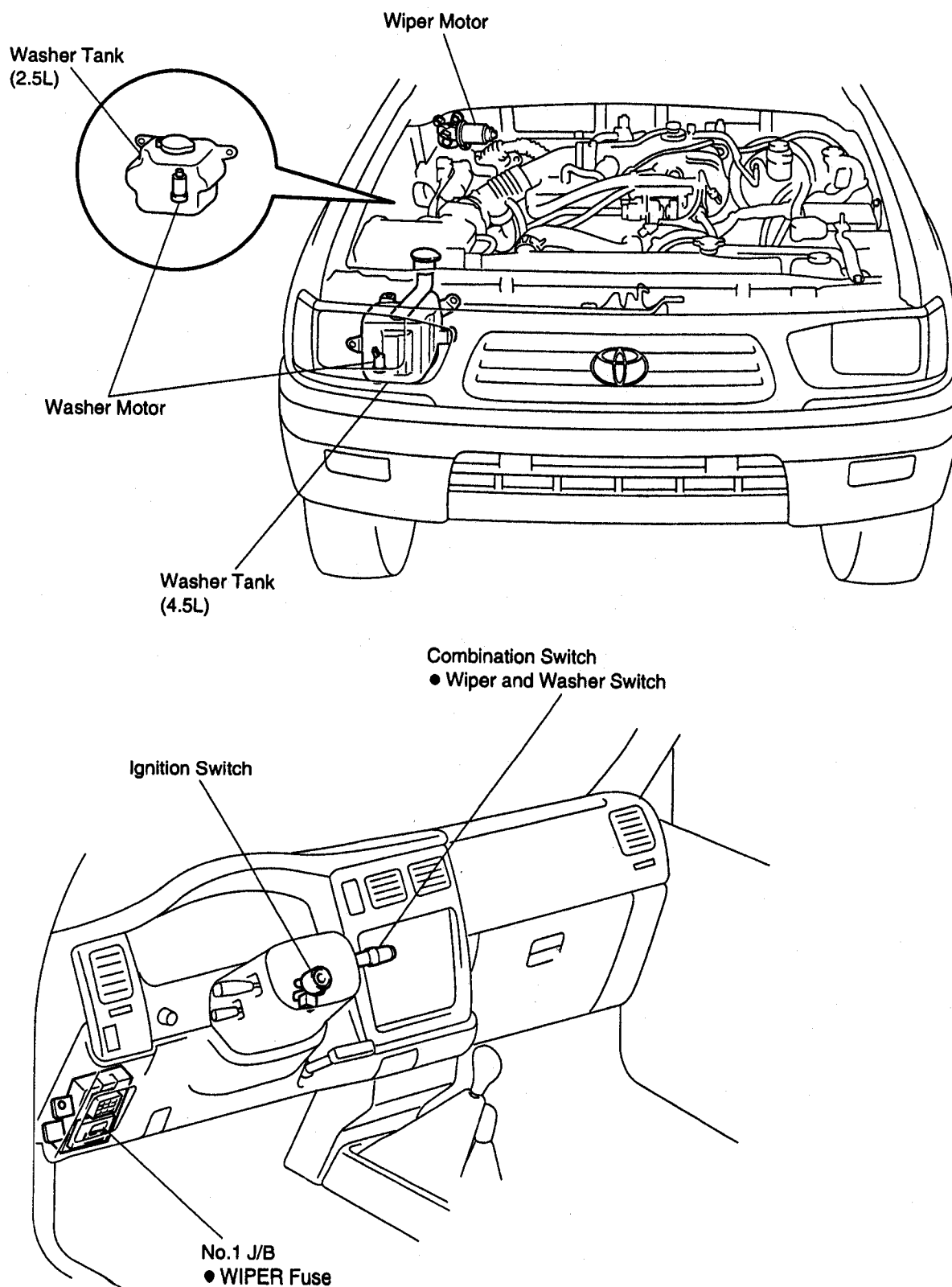
w/ Cruise Control:

Switch position	Tester connection	Specified condition
Switch pin free (Brake pedal depressed)	1 - 2	Continuity
Switch pin pushed in (Brake pedal released)	—	No continuity

If continuity is not as specified, replace the switch.

WIPER AND WASHER SYSTEM PARTS LOCATION

BE018-0E



N14002
N14003

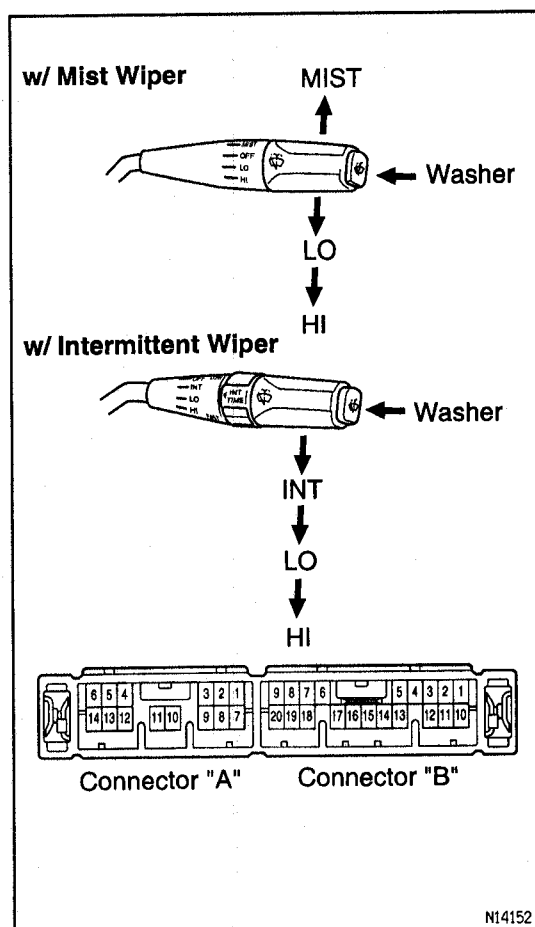
Z16525

BE

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)
Wiper does not operate or turn to off position	1. WIPER Fuse (No.1 J/B)	
	2. Ignition Switch	(BE-4)
	3. Wiper and Washer Switch	(BE-26)
	4. Wiper Motor	(BE-28)
	5. Wire harness	
Wiper does not operate in INT position	1. Wiper and Washer Switch	(BE-26)
	2. Wiper Motor	(BE-28)
	3. Wire Harness	
Washer does not operate	1. Wiper and Washer Switch	(BE-26)
	2. Washer Hose and Nozzle	
	3. Washer Motor	(BE-28)
	4. Wire Harness	



COMBINATION SWITCH INSPECTION

BE2LC-02

1. INSPECT WIPER SWITCH CONTINUITY

w/ Mist Wiper:

Switch position	Tester connection	Specified condition
MIST	B7 — B18	Continuity
OFF	B4 — B7	Continuity
LO	B7 — B18	Continuity
HI	B13 — B18	Continuity

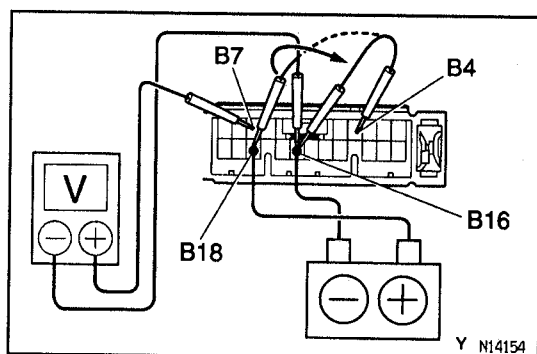
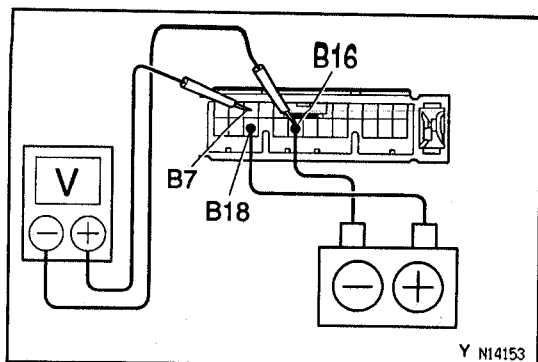
w/ Intermittent Wiper:

Switch position	Tester connection	Specified condition
OFF	B4 — B7	Continuity
INT	B4 — B7	Continuity
LO	B7 — B18	Continuity
HI	B13 — B18	Continuity

2. INSPECT WASHER SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
OFF	—	No continuity
ON	B8 — B16	Continuity

If continuity is not as specified, replace the switch.



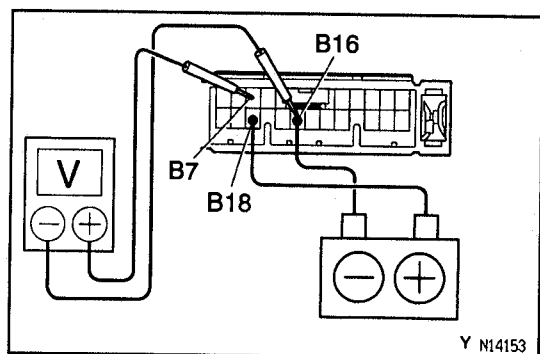
Intermittent Wiper Operation:

- Turn the wiper switch to INT position.
- Variable Type:
Turn the intermittent time control switch to FAST position.
- Connect the positive (+) lead from the battery to terminal B18 and the negative (−) lead to terminal B16.
- Connect the positive (+) lead from the voltmeter to terminal B7 and the negative (−) lead to terminal B16, and check that the meter needle indicates battery positive voltage.
- After connecting terminal B4 to terminal B18, connect to terminal B16. Then, check that the voltage rises from 0 volts to battery positive voltage within the time, as shown in the table.

INT time control switch position	Voltage
FAST	Approx. 1–3 sec. Battery positive voltage 0 volt
SLOW	Approx. 10–15 sec. Battery positive voltage 0 volt

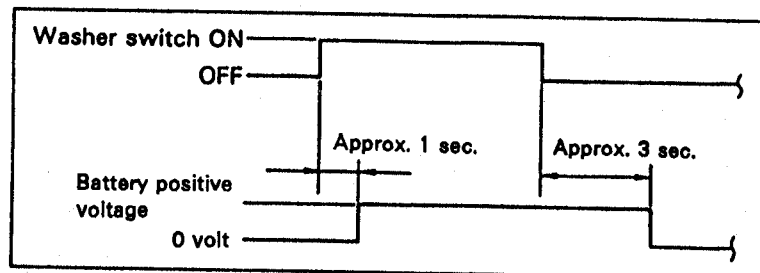
V03883

If operation is not as specified, replace the wiper and washer switch.



Washer Linked Wiper Operation:

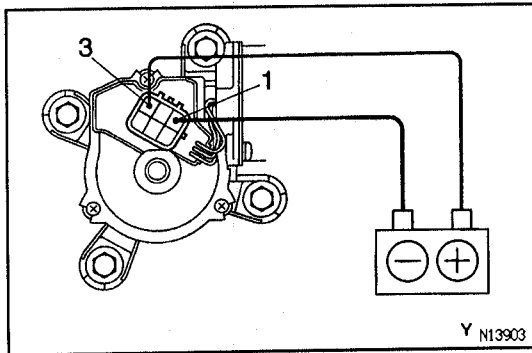
- Connect the positive (+) lead from the battery to terminal B18 and the negative (−) lead to terminal B16.
- Connect the positive (+) lead from the voltmeter to terminal B7 and the negative (−) lead to terminal B16.
- Push in the washer switch. Check that the voltage changes as shown in the table.



V03884

If operation is not as specified, replace the switch.

WIPER MOTOR INSPECTION

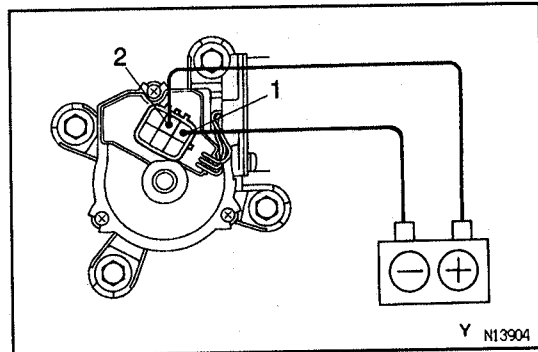


INSPECT MOTOR OPERATION

Low Speed:

Connect the positive (+) lead from the battery to terminal 3 and the negative (-) lead from the battery to the motor body or terminal 1, and check that the motor operates at low speed.

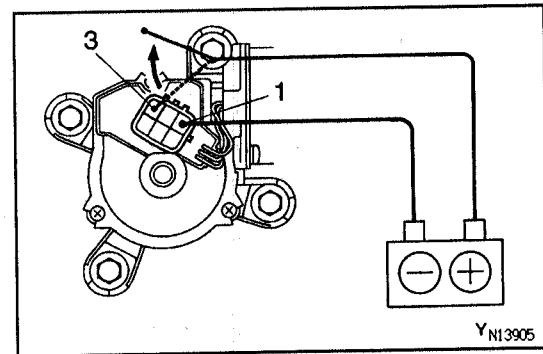
If operation is not as specified, replace the motor.



High Speed:

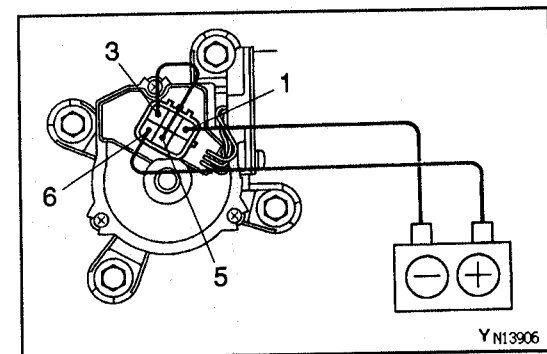
Connect the positive (+) lead from the battery to terminal 2 and the negative (-) lead from the battery to the motor body or terminal 1, and check that the motor operates at high speed.

If operation is not as specified, replace the motor.



Stopping at Stop Position:

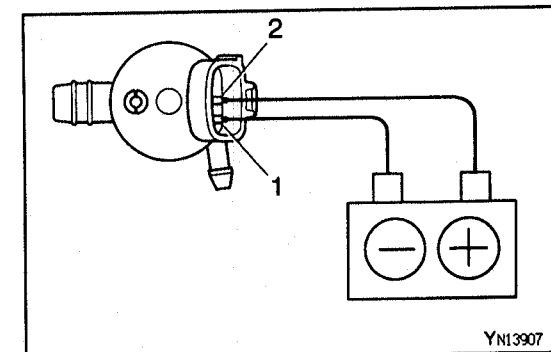
- (a) Operate the motor at low speed and stop the motor operation anywhere except at the stop position by disconnecting positive (+) lead from terminal 3.



- (b) Connect terminals 3 and 5.

- (c) Connect the positive (+) lead from the battery to terminal 6 and the negative (-) lead from the battery to the motor body or terminal 1, and check that the motor stops running at the stop position after the motor operates again.

If operation is not as specified, replace the motor.



WASHER MOTOR INSPECTION

INSPECT MOTOR OPERATION

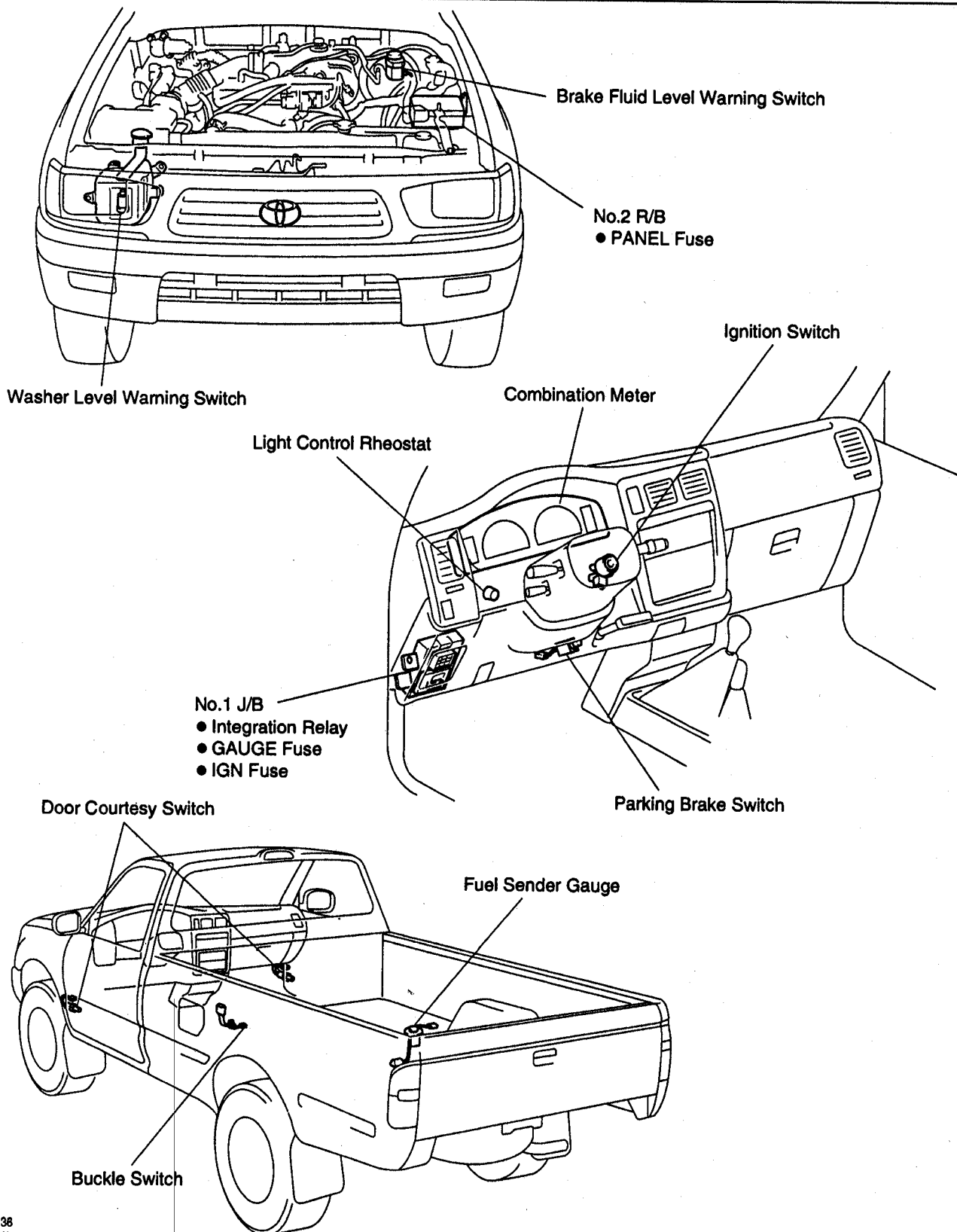
Connect the positive (+) lead from the battery to terminal 2 and the negative (-) lead to terminal 1, and check that the motor operates.

NOTICE: These tests must be performed quickly (within 20 seconds) to prevent the coil from burning out.

If operation is not as specified, replace the motor.

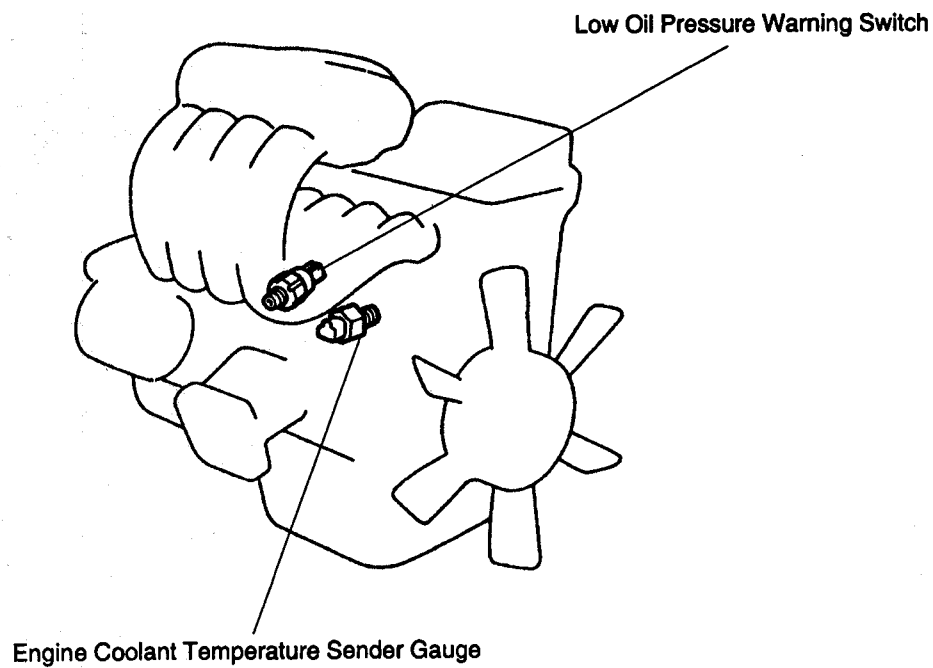
COMBINATION METER PARTS LOCATION

BE2LD-02

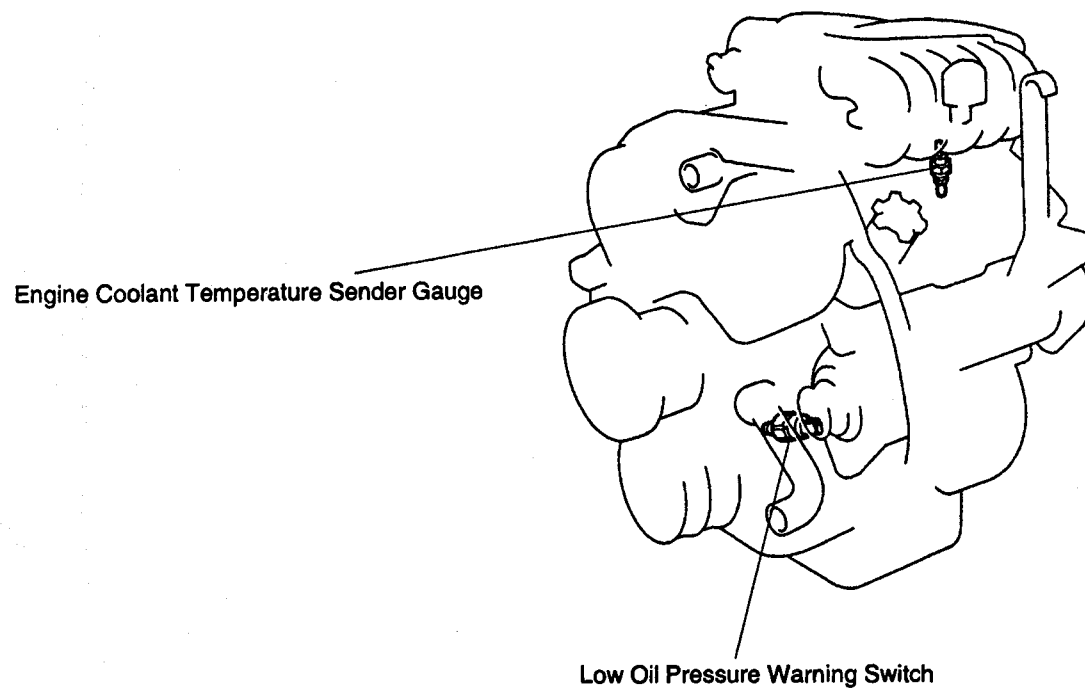


BE

RZN Series



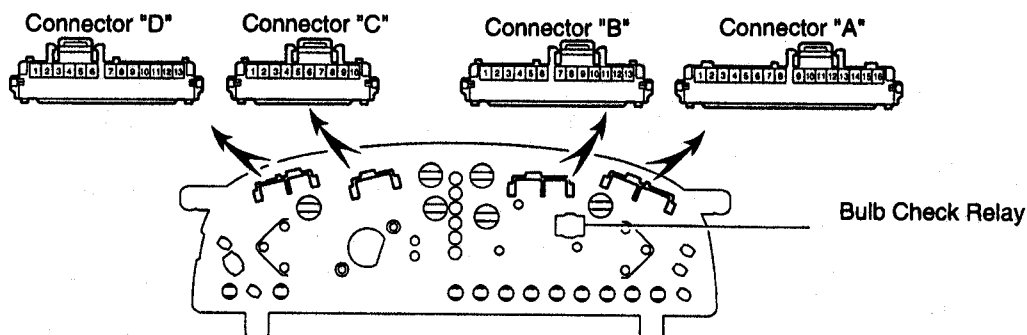
VZN Series



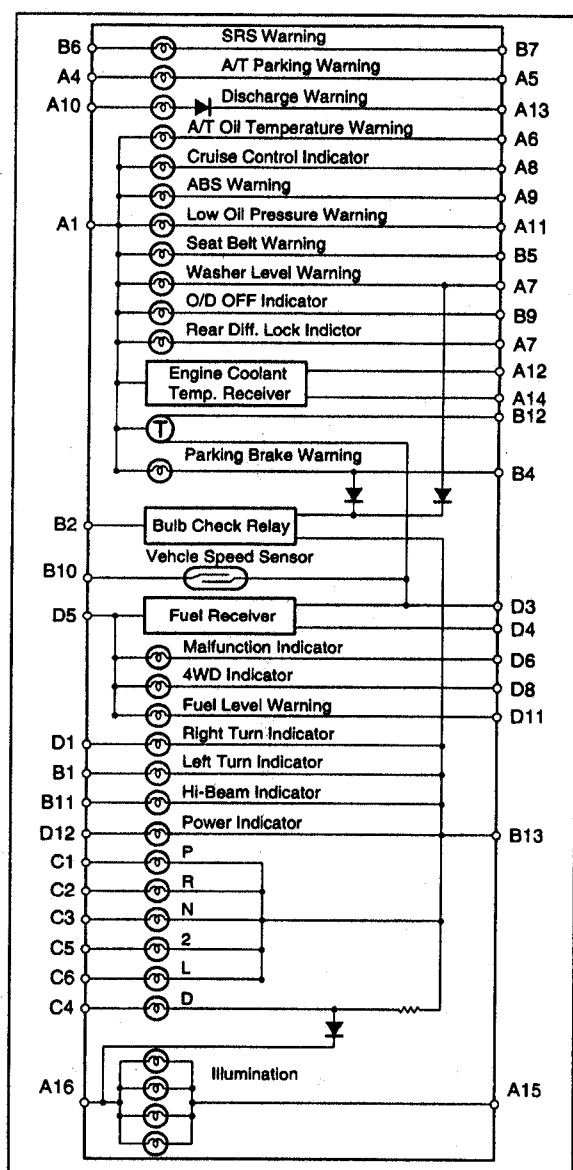
Y

METER CIRCUIT

w/ Tachometer



N15987



Ⓣ : TACHOMETER
Temp. : Temperature
Diff. : Differential

No.		Wiring connector side	
A	1	GAUGE Fuse	
	4	PNP switch (Floor A/T)	
	5	PNP switch (Floor A/T)	
	6	A/T oil temperature switch	
	7	Washer level warning switch (CANADA) Rear diff. lock control ECU (USA)	
	8	Cruise control ECU	
	9	ABS ECU	
	10	IGN Fuse	
	11	Low oil pressure warning switch	
	12	Engine coolant temperature sender gauge	
	13	Generator L terminal	
	14	Ground	
	15	Light control rheostat	
	16	TAIL Fuse	
	B	1	Turn signal switch (Left)
		2	STARTER Relay
4		Parking brake switch	
		Brake fluid level warning switch	
5		Buckle switch	
6		ECU-B Fuse	
7		Airbag sensor assembly	
9		O/D OFF switch	
10		Speed control unit	
11		Headlight dimmer switch	
12		Igniter	
13		Ground	
C		1	PNP switch
	2	PNP switch	
	3	PNP switch	
	4	PNP switch	
	5	PNP switch	
	6	PNP switch	
D	1	Turn signal switch (Right)	
	3	Ground	
	4	Fuel sender gauge	
	5	GAUGE Fuse	
	6	ECM	
	8	Transfer indicator switch (M/T, Floor A/T)	
	11	Fuel level warning switch (M/T, Floor A/T)	
	12	Pattern select switch (A/T)	

PNP : Park/Neutral Position

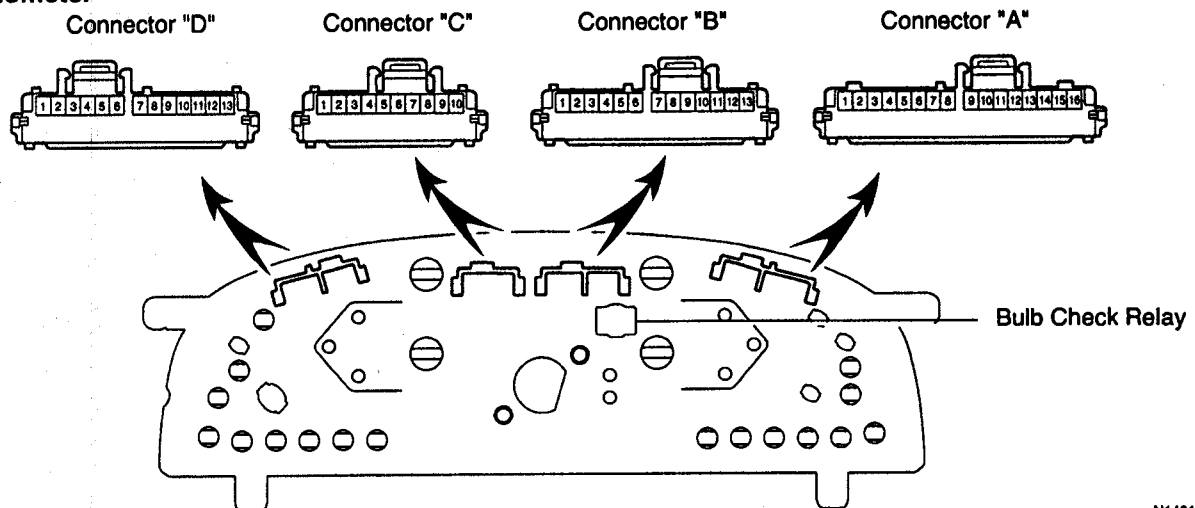
N15988

Y

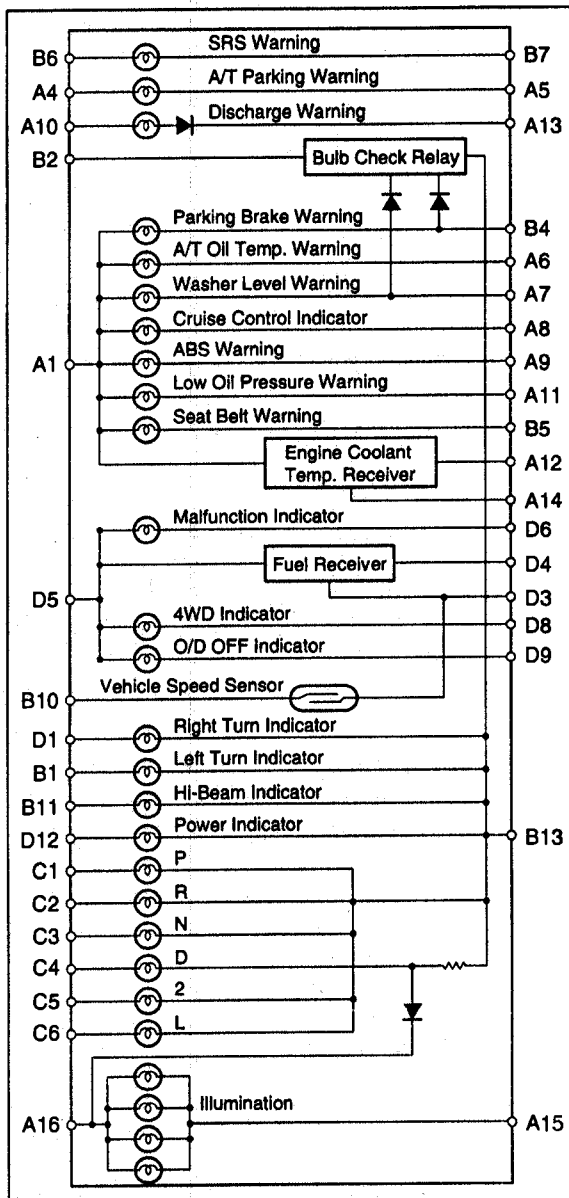
Z16515

BE

w/ o Tachometer



N14011



Temp. : Temperature
PNP : Park/Neutral Position

No.	Wiring connector side
A	1 GAUGE Fuse
	4 PNP switch (A/T)
	5 PNP switch (A/T)
	6 A/T oil temperature switch
	7 Washer level warning switch (CANADA)
	8 Cruise control ECU
	9 ABS ECU
	10 IGN Fuse
	11 Low oil pressure warning switch
	12 Engine coolant temperature sender gauge
	13 Generator L terminal
	14 Ground
	15 Light control rheostat
	16 TAIL Fuse
B	1 Turn signal switch (Left)
	2 STARTER Relay
	4 Parking brake switch
	4 Brake fluid level warning switch
	5 Buckle switch
	6 ECU-B Fuse
	7 Airbag sensor assembly
	9 O/D OFF switch
	10 Speed control unit
	11 Headlight dimmer switch
	13 Ground
C	1 PNP switch
	2 PNP switch
	3 PNP switch
	4 PNP switch
	5 PNP switch
	6 PNP switch
D	1 Turn signal switch (Right)
	3 Ground
	4 Fuel sender gauge
	5 GAUGE Fuse
	6 ECM
	8 Transfer indicator switch (M/T, Floor A/T)
	12 Pattern select switch (A/T)

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 and Engine Coolant Temperature Gauge do not operate	1. GAUGE Fuse (No.1 J/B) 2. Meter Circuit 3. Wire Harness (BE-31)
Fuel Gauge does not operate	1. GAUGE Fuse (No.1 J/B) 2. Meter Circuit 3. Wire Harness (BE-31)
Speedometer does not operate	1. Speedometer Driven Gear and Drive Gear
Tachometer does not operate	1. Meter Circuit 2. Igniter 3. Wire Harness (BE-31)
Fuel Gauge does not operate or abnormal operation	1. Fuel Receiver Gauge 2. Fuel Sender Gauge 3. Meter Circuit 4. Wire Harness (BE-36) (BE-37) (BE-31)
Engine Coolant Temperature Gauge does not operate or abnormal operation	1. Engine Coolant Temperature Receiver Gauge 2. Meter Circuit 3. Wire Harness (BE-38) (BE-31)
All illumination lights do not light up	1. PANEL Fuse (No.2 R/B) 2. Light Control Rheostat 3. Wire Harness (BE-42)
Brightness does not change even when rheostat turned	1. Bulb 2. Light Control Rheostat 3. Wire Harness (BE-42)
Only one illumination light does not light up	1. Bulb

WARNING LIGHTS

Trouble	Parts name (See page)
Warning lights do not light up (Except Discharge)	1. GAUGE Fuse (No.1 J/B) 2. IGN Fuse (No.1 J/B) 3. Meter Circuit 4. Wire Harness (BE-31)
Low oil pressure warning light does not light up	1. Bulb 2. Meter Circuit 3. Low Oil Pressure Warning Switch 4. Wire Harness (BE-31) (BE-39)
Fuel level warning light does not light up	1. Bulb 2. Meter Circuit 3. Fuel Level Warning Switch (BE-31) (BE-38)
Malfunction indicator does not light up	1. Bulb 2. ECM* 3. Wire Harness

Trouble	Parts name (See page)
Seat belt warning light does not light up	1. Bulb 2. Integration Relay (No.1 J/B) 3. Buckle Switch (BE-41) 4. Wire Harness
Discharge warning light does not light up	1. IGN Fuse (No.1 J/B) 2. Bulb 3. Wire Harness 4. Generator
Brake warning light does not light up	1. Bulb 2. Meter Circuit (BE-31) 3. Parking Brake Switch (BE-40) 4. Brake Fluid Level Warning Switch (BE-40)

*: 2RZ—FE, 3RZ—FE Engine See page EG—184.

5VZ—FE Engine See page EG—192.

INDICATOR LIGHTS

Trouble	Parts name (See page)
O/D OFF indicator light does not light up	1. Bulb 2. Meter Circuit (BE-31) 3. O/D OFF Switch (A/T) (See AT section) 4. Wire Harness
High beam indicator light does not light up	1. Bulb 2. Meter Circuit (BE-31) 3. Wire Harness 4. Headlight and Taillight System (BE-7)
Turn indicator light does not light up	1. Bulb 2. Meter Circuit (BE-31) 3. Wire Harness 4. Turn Signal and Hazard Warning System (BE-15)
Shift indicator lights do not light up (ALL)	1. Bulb 2. Meter Circuit (BE-31) 3. PNP Switch (A/T) (BE-22) 4. Wire Harness
Shift indicator lights do not light up (D)	1. Bulb 2. Meter Circuit (BE-31) 3. PNP Switch (A/T) (BE-22) 4. Light Control Rheostat (BE-41) 5. Wire Harness
Only one shift indicator does not light up	1. Bulb 2. Meter Circuit (BE-31)
Indicator lights do not light up (Except. Turn, Hi-beam)	1. GAUGE Fuse (No.1 J/B) 2. Wire Harness

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.

(km/h)

Standard indication	Allowable range
20	17 — 24
40	38 — 46
60	57.5 — 67
80	77 — 88
100	96 — 109
120	115 — 130
140	134 — 151.5
160	153 — 173

(mph)

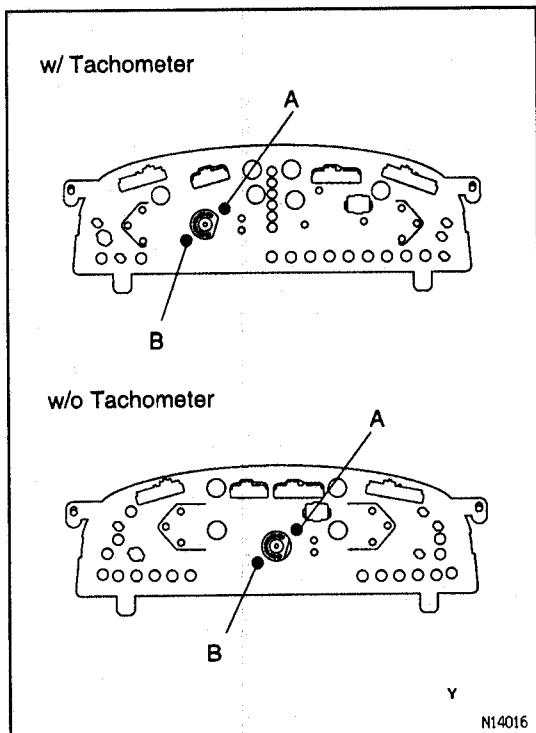
Standard indication	Allowable range
20	18 — 24
40	38 — 44
60	58 — 66
80	78 — 88
100	98 — 110
120	118 — 132

VEHICLE SPEED SENSOR INSPECTION

INSPECT SENSOR OPERATION

Check that there is continuity between terminals A and B 4 times for every revolution of the speedometer shaft.

If operation is not as specified, replace the speedometer.



TACHOMETER INSPECTION

9501H-02

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 at (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

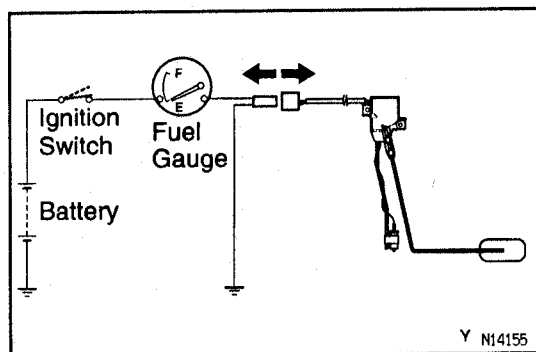
If error is excessive, replace the tachometer.

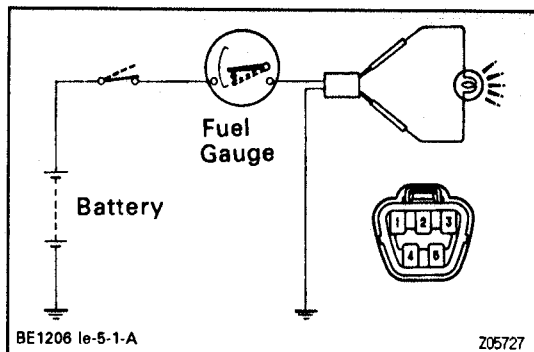
952LF-02

FUEL GAUGE INSPECTION

1. INSPECT 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 3 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 needle to stabilize.

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

2. INSPECT RECEIVER GAUGE RESISTANCE

Measure the resistance between terminals.

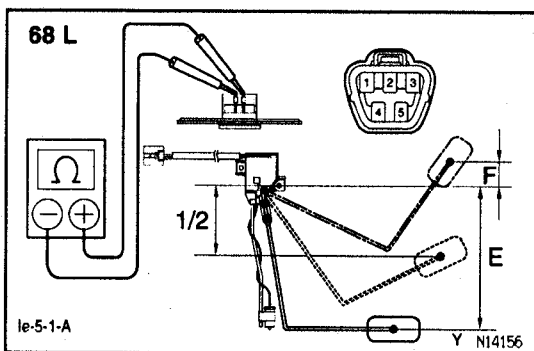
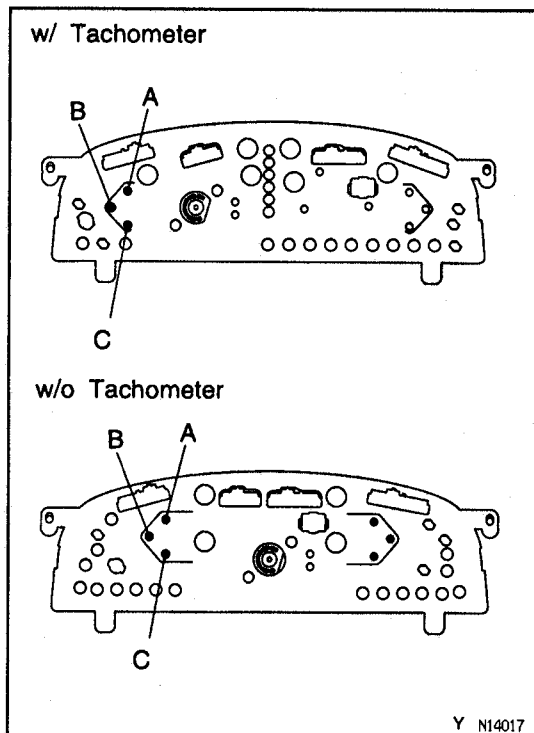
w/ Tachometer

Between terminals	Resistance (Ω)
A - B	Approx. 140~158
A - C	Approx. 233~271
B - C	Approx. 92~114

w/o Tachometer

Between terminals	Resistance (Ω)
A - B	Approx. 115~130
A - C	Approx. 208~244
B - C	Approx. 92~114

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



3. INSPECT SENDER GAUGE RESISTANCE

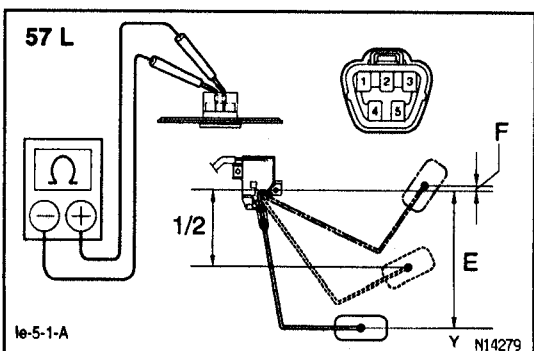
Measure the resistance between terminals 1 and 3. 68 L:

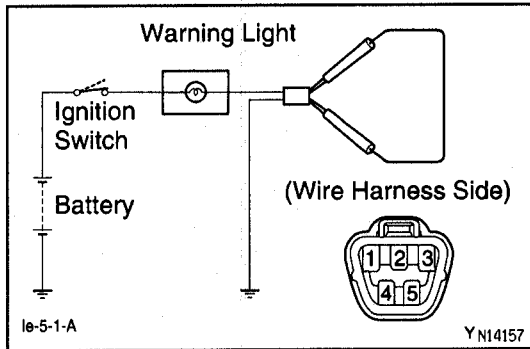
Float position mm (in.)	Resistance (Ω)
F: Approx. 28.0 (1.102)	F: Approx. 3.0
1/2: 81.3 (3.201)	1/2: Approx. 32.5
E: Approx. 183.9 (6.453)	E: Approx. 110.0

57 L:

Float position mm (in.)	Resistance (Ω)
F: Approx. 12.1 (0.478)	F: Approx. 3.0
1/2: 79.0 (3.110)	1/2: Approx. 32.5
E: Approx. 153.3 (6.035)	E: Approx. 110.0

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

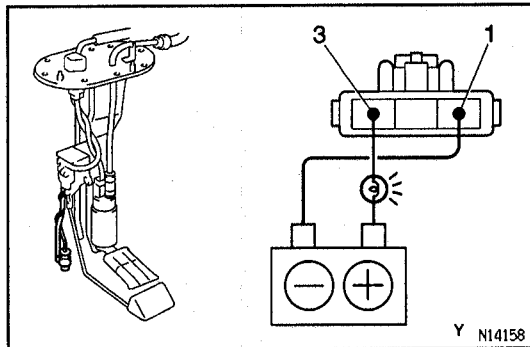




FUEL LEVEL WARNING INSPECTION

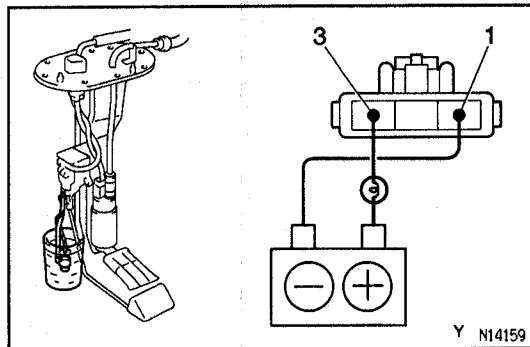
1. INSPECT WARNING LIGHT

- Disconnect the connector from the sender gauge.
 - Connect terminals 1 and 3 on the wire harness side connector.
 - Turn the ignition switch ON and check that the warning light lights up.
- If the warning light does not light up, test the bulb.

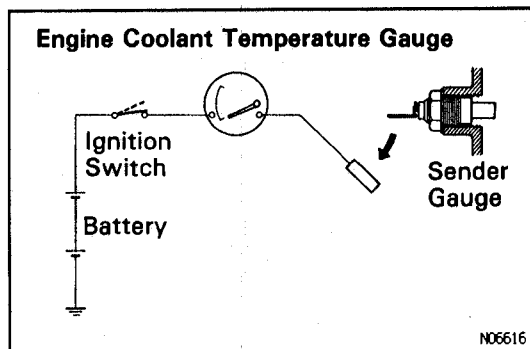


2. INSPECT SWITCH

- Apply battery positive voltage between terminals 1 and 3, and through a 3.4 W test bulb, and check that the bulb lights up.
- HINT: It will take a short time for bulb to light up.



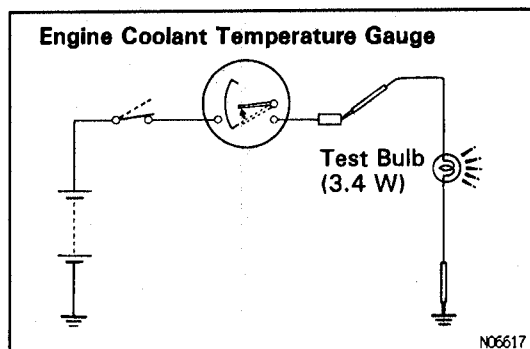
- Submerge the switch in fuel and check that the bulb goes out.
- If operation is not as specified, replace the sender gauge.



ENGINE COOLANT TEMPERATURE GAUGE INSPECTION

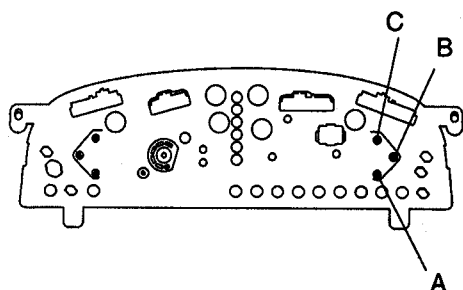
1. INSPECT RECEIVER GAUGE OPERATION

- Disconnect the connector from the sender gauge.
- Turn the ignition switch ON and check that the receiver gauge needle indicates COOL.

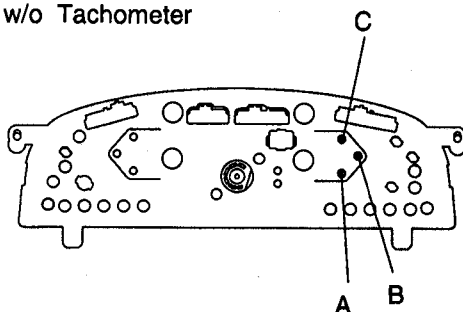


- Ground terminal on the wire harness side connector through a 3.4 W test bulb.
 - Turn the ignition switch ON, and check that the bulb lights up and the receiver gauge needle moves to the hot side.
- If operation is as specified, replace the sender gauge. Then, recheck the system.
- If operation is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

w/ Tachometer



w/o Tachometer



Y N14018

2. INSPECT RECEIVER GAUGE RESISTANCE

Measure the resistance between terminals.

w/ Tachometer

Between terminals	Resistance (Ω)
A - B	Approx. 85~95
A - C	Approx. 158~192
B - C	Approx. 215~255

w/o Tachometer

Between terminals	Resistance (Ω)
A - B	Approx. 85~95
A - C	Approx. 158~192
B - C	Approx. 215~255

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.

BE2DH-04

LOW OIL PRESSURE WARNING INSPECTION**1. INSPECT WARNING LIGHT**

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

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

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

2. INSPECT SWITCH

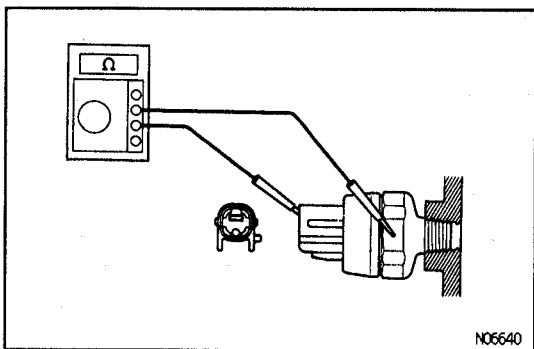
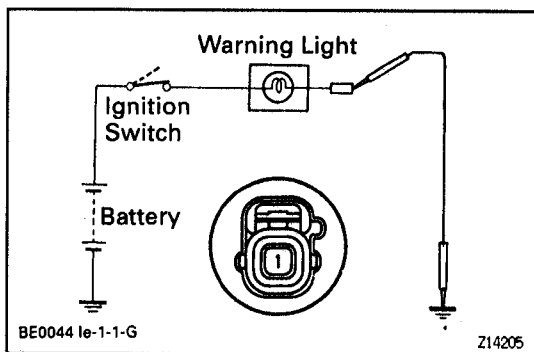
- (a) Disconnect the connector from the switch.
- (b) Check that there is continuity between terminal and ground with the engine stopped.

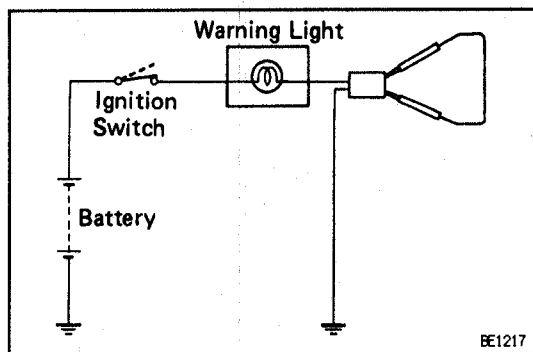
- (c) Check that there is no continuity between terminal and ground with the engine running.

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





BRAKE WARNING INSPECTION

1. INSPECT WARNING LIGHT

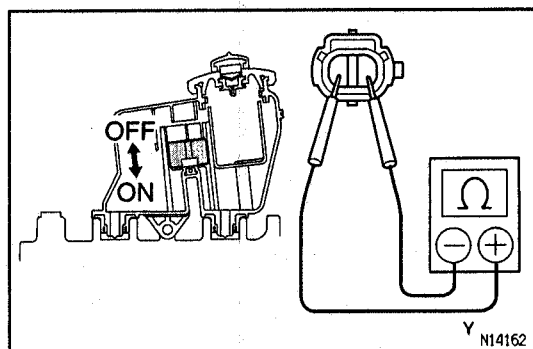
- Disconnect the connectors from the level warning switch and parking brake switch.
- Connect terminals on the wire harness side connector of the level warning switch connector.
- Turn the ignition switch ON and check that the warning light lights up.

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

2. INSPECT BRAKE FLUID LEVEL WARNING SWITCH CONTINUITY

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

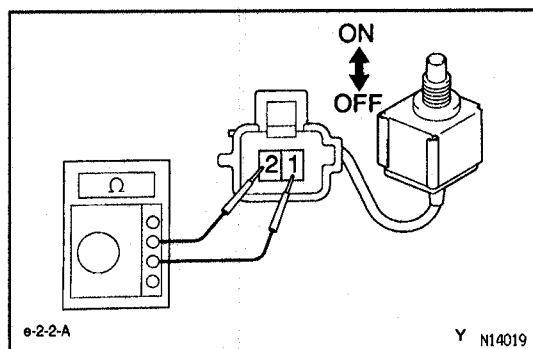
If operation is not as specified, replace the switch.



3. INSPECT PARKING BRAKE SWITCH CONTINUITY

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



WASHER LEVEL WARNING INSPECTION

1. INSPECT WARNING LIGHT

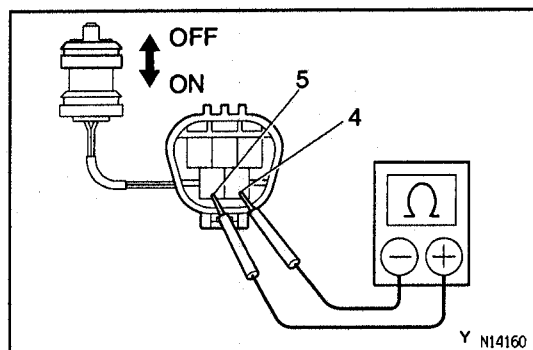
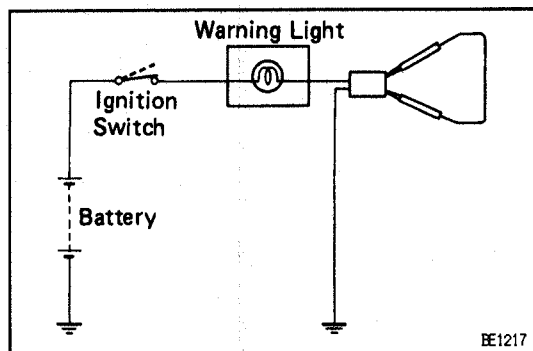
- Disconnect the connectors from the level warning switch and parking brake switch.
- Connect terminals on the wire harness side connector of the level warning switch connector.
- Remove the CHARGE fuse and turn the ignition switch ON, and check that the warning light comes on.

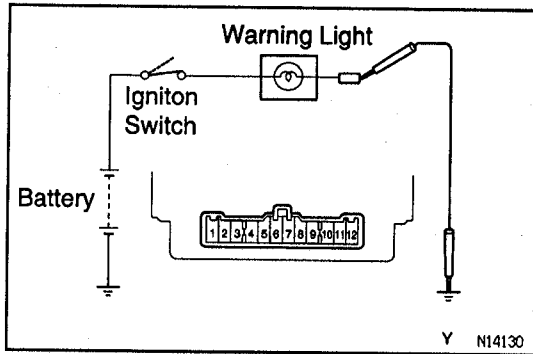
If the warning light does not light up, test the bulb.

2. INSPECT SWITCH

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

If operation is not as specified, replace the switch.





SEAT BELT WARNING INSPECTION

1. INSPECT WARNING LIGHT

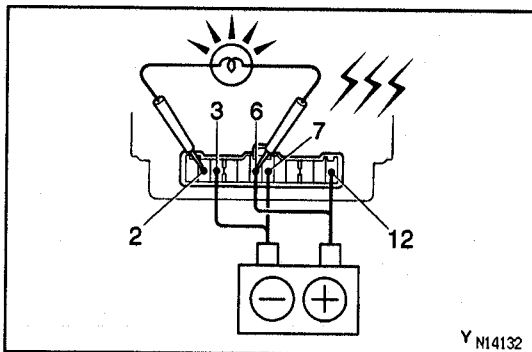
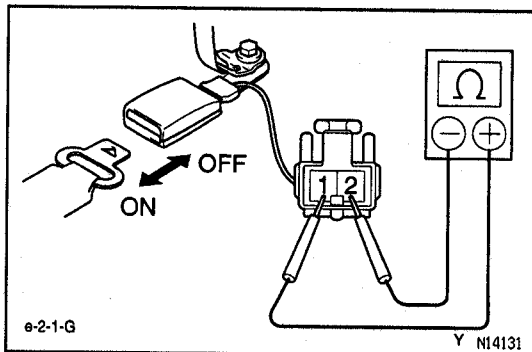
- Remove the integration relay from the No.1 J/B.
- Ground terminal 9 on the junction block side connector.
- Turn the ignition switch ON and check that the warning light lights up.

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

2. INSPECT BUCKLE SWITCH CONTINUITY

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

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



3. INSPECT INTEGRATION RELAY OPERATION

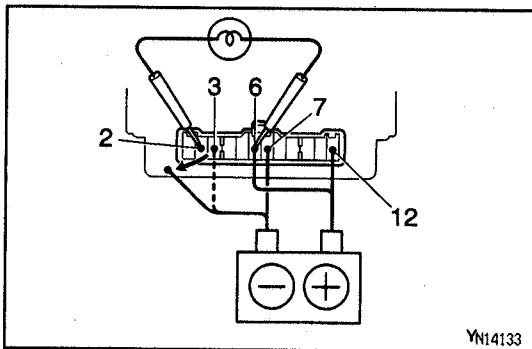
- Connect the positive (+) lead from the battery to terminal 12 and negative (-) lead from the battery to terminal 7.
- Connect the terminal 2 to terminal 5 through the 3.4 W test bulb.
- Connect the negative (-) lead from the battery to terminal 3.
- Check that the bulb lights and the chime sounds for 4 - 8 seconds.
- Return to step (a) and operate the chime again.
- Check that the buzzer does not sound when disconnecting terminal 3 from the negative (-) lead.
- Check that the chime stops sounding.

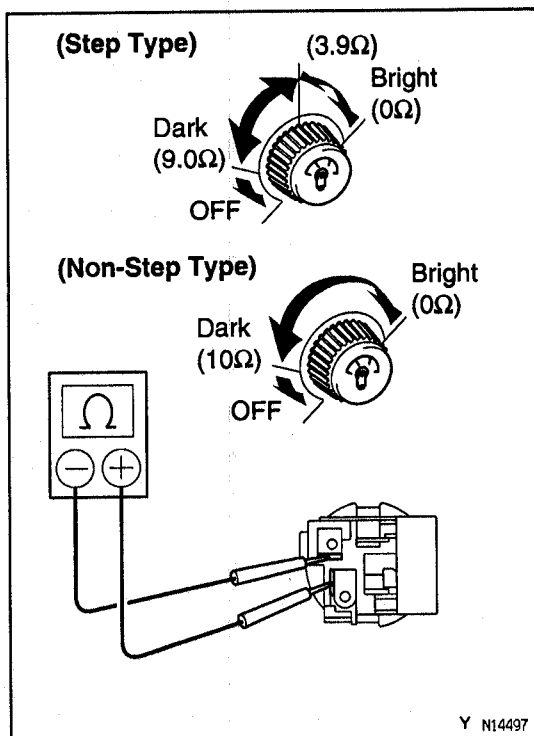
HINT: Check the chime within a period of 4 to 8 seconds.

If operation is not as specified, replace the relay.

4. INSPECT INTEGRATION RELAY CIRCUIT

See page BE-5.





LIGHT CONTROL RHEOSTAT INSPECTION

INSPECT LIGHT CONTROL RHEOSTAT STEP TYPE:

w/o Tachometer (DLX Grade M/T Vehicle)

Gradually turn the rheostat knob from the bright side to dark side, check that the resistance between terminals increases from approximately 0 to 9.0 Ω. If operation is not as specified, replace the rheostat.

NON-STEP TYPE:

w/ Tachometer (DLX Grade M/T Vehicle)

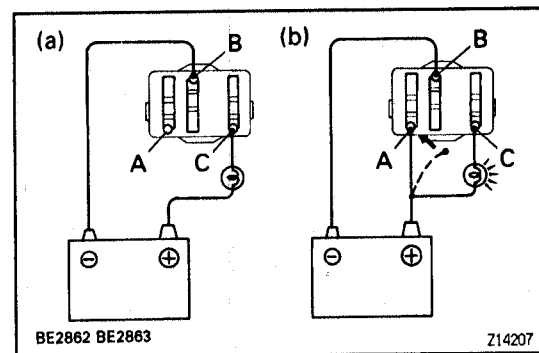
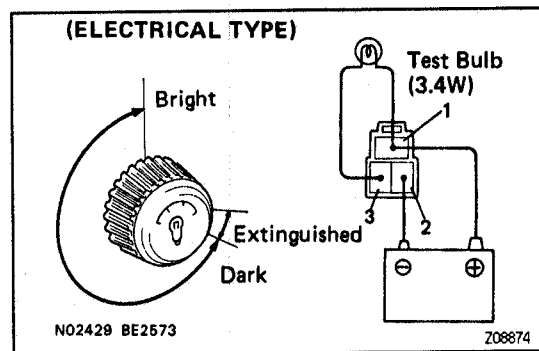
- Turn the rheostat knob OFF and check that there is no continuity between terminals. (Rheostat knob turned to fully counterclockwise)
 - Gradually, turn the rheostat knob from the dark side to bright side and check that the resistance decreases from 10 to 0 Ω. (Rheostat knob turned to clockwise)
- If operation is not as specified, replace the rheostat.

ELECTRICAL TYPE:

w/ All A/T Vehicle and SR5 Grade M/T Vehicle

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

If operation is not as specified, replace the rheostat.



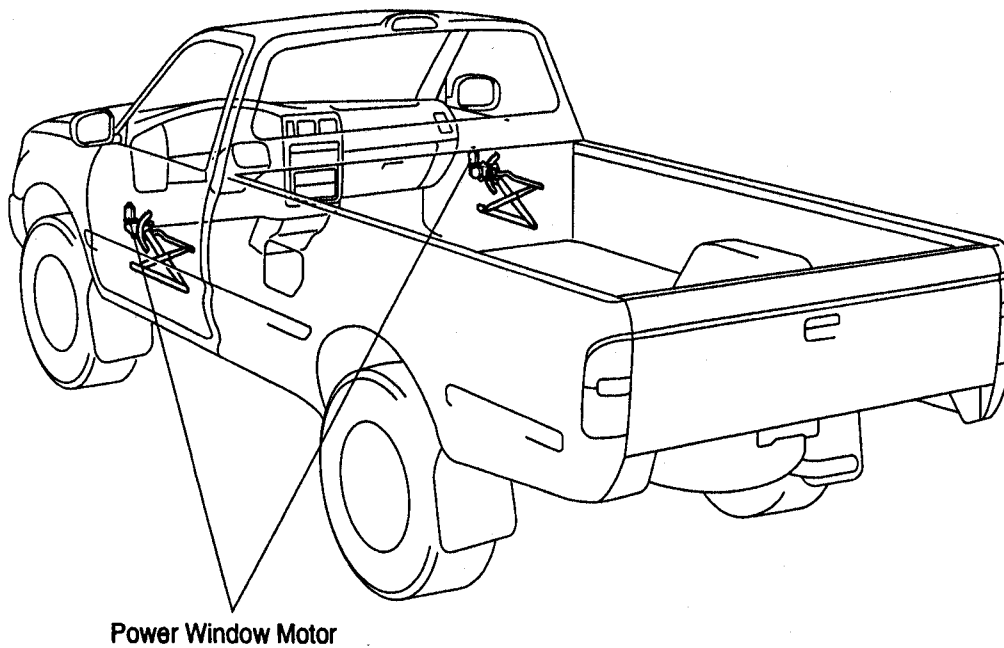
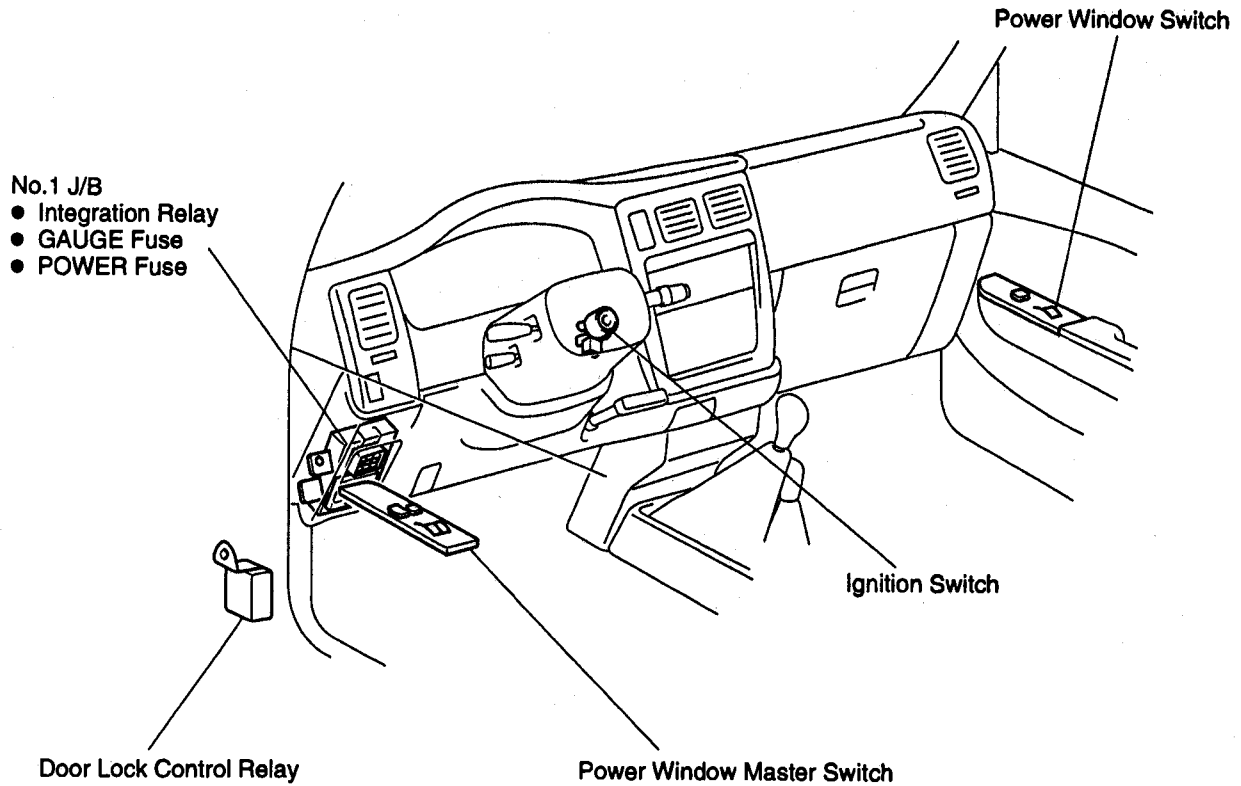
BULB CHECK RELAY INSPECTION

INSPECT RELAY OPERATION

- 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.
 - Connect the positive (+) lead from the battery to terminal A and check that the test bulb lights up.
- If operation is not as specified, replace the relay.

POWER WINDOW CONTROL SYSTEM PARTS LOCATION

1B601U-0C



N14006
N14007

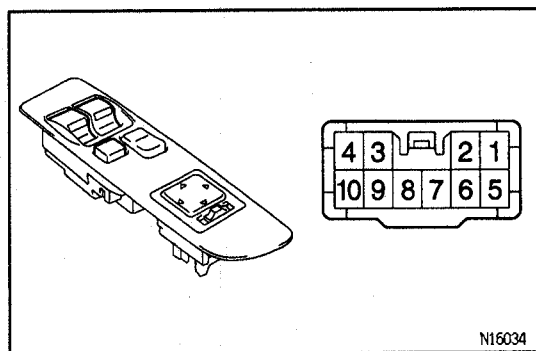
Z16527

BE

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)
Power window does not operate (Power door lock system does not operate.)	1. POWER Fuse (No.1 J/B) 2. GAUGE Fuse (No.1 J/B) 3. Integration Relay (No.1 J/B) 4. Door Lock Control Relay 5. Ignition Switch 6. Power Window Master Switch 7. Wire Harness	(BE-52) (BE-4) (BE-44)
Power Window does not operate (Power door lock system is normal.)	1. POWER Fuse (No.1 J/B) 2. GAUGE Fuse (No.1 J/B) 3. Ignition Switch (No.1 J/B) 4. Integration Relay (No.1 J/B) 5. Door Lock Control Relay 6. Power Window Master Switch 7. Wire Harness	(BE-52) (BE-44)
"One Touch Power Window System" does not operate	1. Power Window Master Switch	(BE-44)
Only one window glass does not move	1. Power Window Master Switch 2. Power Window Switch 3. Power Window Motor 4. Wire Harness	(BE-44) (BE-45) (BE-45)
"Window Lock System" does not operate	1. Power Window Master Switch	(BE-44)



POWER WINDOW MASTER SWITCH INSPECTION

BE01W-0E

INSPECT SWITCH CONTINUITY

Driver's switch: Window unlock

Switch position	Tester connection	Specified condition
UP	3 - 9, 4 - 6	Continuity
OFF	3 - 4 - 6	Continuity
DOWN	3 - 6, 4 - 9	Continuity

Driver's switch: Window lock

Switch position	Tester connection	Specified condition
UP	3 - 9, 4 - 6	Continuity
OFF	3 - 4 - 6	Continuity
DOWN	3 - 6, 4 - 9	Continuity

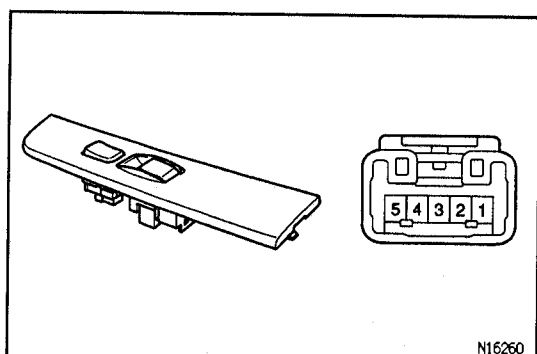
Passenger's switch: Window unlock

Switch position	Tester connection	Specified condition
UP	6 – 7, 9 – 10	Continuity
OFF	6 – 7 – 10	Continuity
DOWN	7 – 9, 6 – 10	Continuity

Passenger's switch: Window lock

Switch position	Tester connection	Specified condition
UP	9 – 10	Continuity
OFF	7 – 10	Continuity
DOWN	7 – 9	Continuity

If continuity is not as specified, replace the switch.



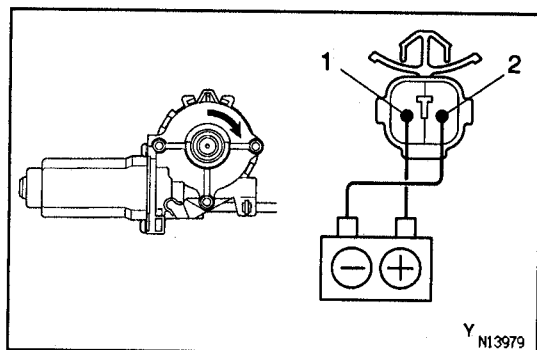
POWER WINDOW SWITCH INSPECTION

BE01X-06

INSPECT SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
UP	1 – 2, 3 – 4	Continuity
OFF	1 – 2, 3 – 5	Continuity
DOWN	3 – 5, 1 – 4	Continuity

If continuity is not as specified, replace the switch.



POWER WINDOW MOTOR INSPECTION

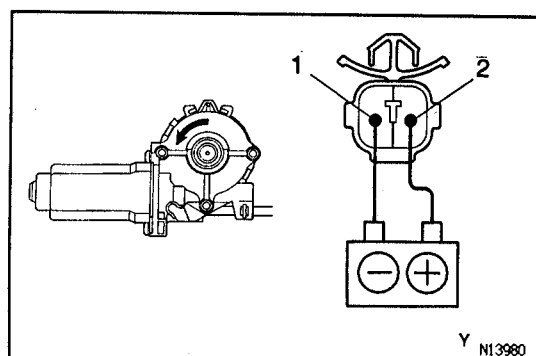
BE01Y-07

INSPECT MOTOR OPERATION

Driver's Side:

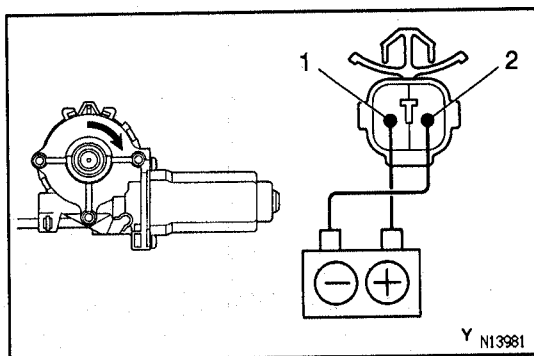
- (a) Connect the positive (+) lead from the battery to terminal 1 and negative (-) lead to terminal 2. Check that the motor turns clockwise.

BE

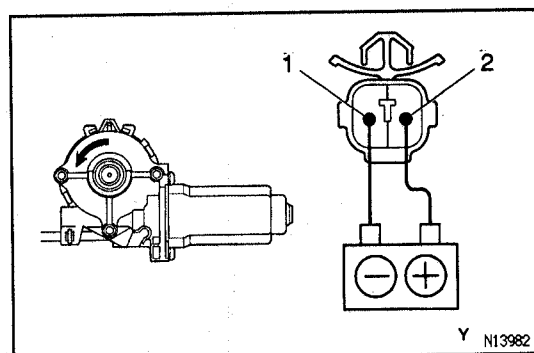


- (b) Reverse the polarity, check that the motor turns counterclockwise.

If operation is not as specified, replace the motor.

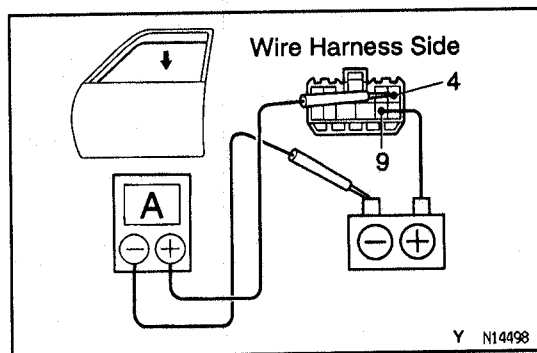
**Passenger's Side:**

- (a) Connect the positive (+) lead from the battery to terminal 1 and negative (-) lead to terminal 2. Check that the motor turns counterclockwise.



- (b) Reverse the polarity, check that the motor turns clockwise.

If operation is not as specified, replace the motor.

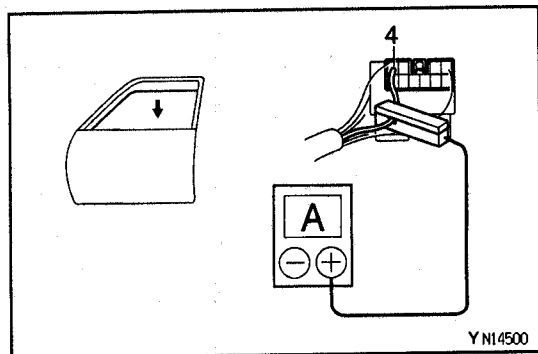
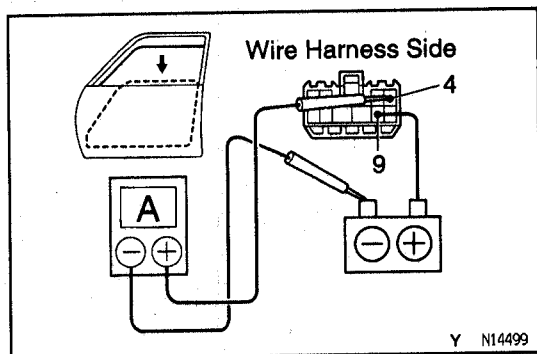
**ONE TOUCH POWER WINDOW INSPECTION****INSPECT POWER WINDOW****Using an ammeter**

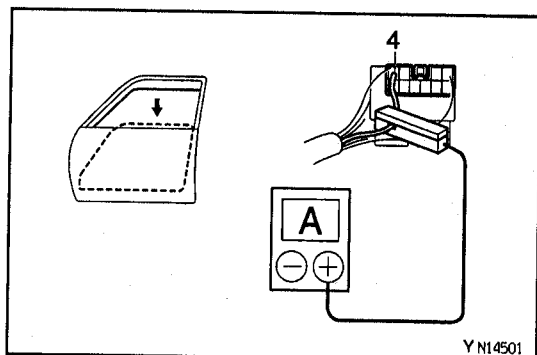
- (a) Disconnect the connector of the master switch.
- (b) Connect the positive (+) lead from the ammeter to terminal 4 on the wire harness side connector and the negative (-) lead to negative terminal of the battery.
- (c) Connect the positive (+) lead from the battery to terminal 9 on the wire harness side connector.
- (d) As the window goes down, check that the current increases to approximately 7.0 A.
- (e) Check that the current increases to approximately 14.5 A or more when the window stops going down. HINT: The circuit breaker opens some 4 — 40 seconds after the window stops going down, so that the check must be done before the circuit breaker operates. If the operation is as specified, replace the master switch.

Using an ammeter with a current — measuring probe.

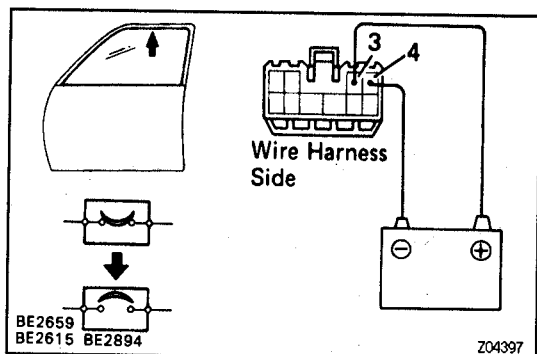
- (a) Remove the master switch with connector connected.
- (b) Attach a current—measuring probe to terminal 3 of the wire harness.
- (c) Turn the ignition switch ON and set the power window switch in the down position.
- (d) As the window goes down, check that the current increases to approximately 7.0 A.

8E01Z-06





- (e) Check that the current increases to approximately 14.5 A or more when the window stops going down.
HINT: The circuit breaker opens some 4 — 40 seconds after the window stops going down, so that the check must be done before the circuit breaker operates.
If operation is as specified, replace master switch.

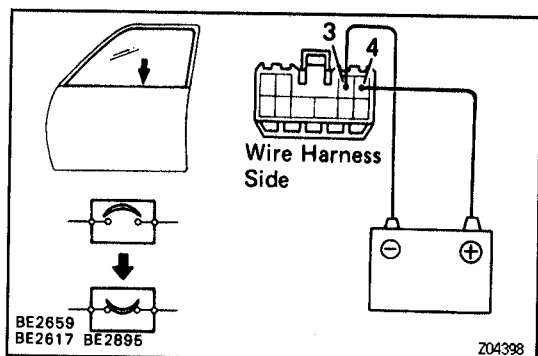


CIRCUIT BREAKER INSPECTION

BE020-06

INSPECT BREAKER OPERATION

- Disconnect the connector from the master switch.
- Connect the positive (+) lead from the battery to terminal 3 and the negative (—) lead to terminal 4 on the wire harness side connector, and raise the window to full closed position.
- Continue to apply voltage and check that there is a circuit breaker operation noise within approximately 4 — 40 seconds.
- Reverse the polarity and check that the window begins to descend within approximately 60 seconds.
If operation is not as specified, replace the motor.



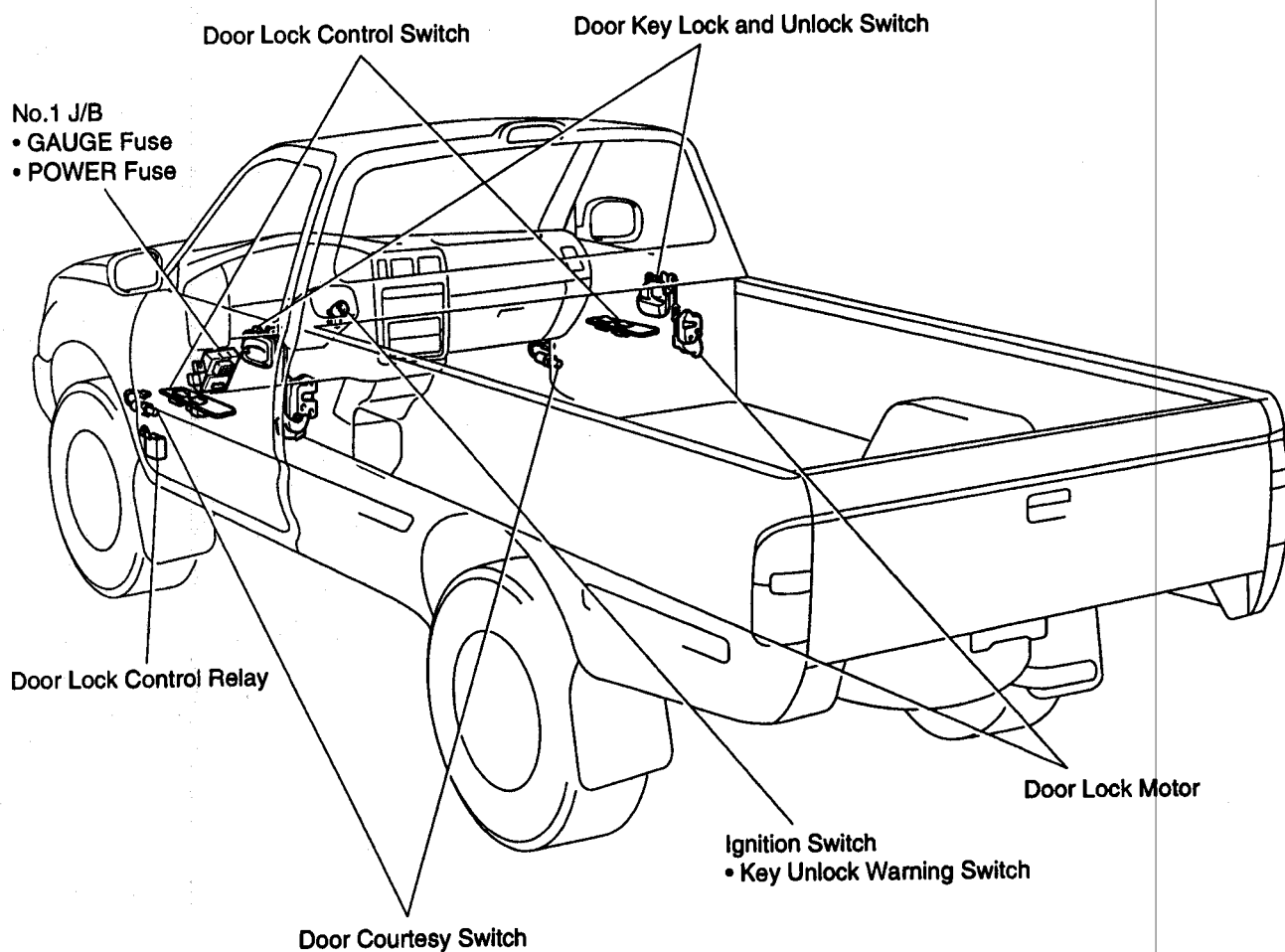
DOOR LOCK CONTROL RELAY INSPECTION

BE2TE-01

See page BE—52.

POWER DOOR LOCK CONTROL SYSTEM PARTS LOCATION

98022-00

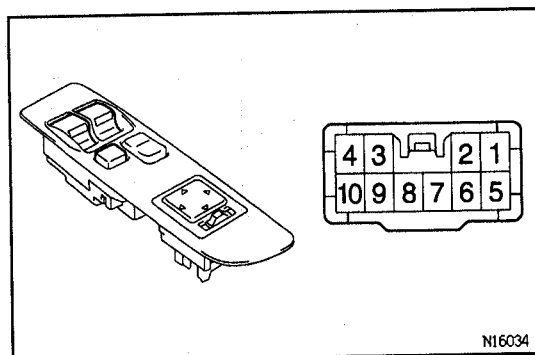


BE

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)
"Door lock control system" does not operate (All)	1. GAUGE Fuse (No.1 J/B) 2. POWER Fuse (No.1 J/B) 3. Door Lock Control Relay (BE-52) 4. Wire Harness 5. Other Parts
Malfunction in Door Lock / Unlock (Using door manual switch)	1. Door Lock Control Switch (BE-50) 2. Door Lock Control Relay (BE-52) 3. Wire Harness 4. Other Parts
Malfunction in Door Lock / Unlock (Using door manual switch and key)	1. Wire Harness 2. Other Parts
Malfunction in Door Lock / Unlock (Using Key)	1. Door Key Lock and Unlock Switch (BE-50) 2. Door Lock Control Relay (BE-52) 3. Wire Harness 4. Other Parts
Fault in 2 — Operation unlock function of Driver's side door key Lock and Unlock switch	1. Door Key Lock and Unlock Switch (BE-50) 2. Door Lock Control Relay (BE-52) 3. Wire Harness 4. Other Parts
Fault in key confine prevention operation	1. Key Unlock Warning Switch (BE-5) 2. Door Courtesy Switch (BE-20) 3. Door Lock Control Switch (BE-50) 4. Door Lock Control Relay (BE-52) 5. Wire Harness 6. Other Parts
One door lock does not operate	1. Door Lock Motor (BE-50) 2. Wire Harness



DRIVER'S DOOR LOCK CONTROL SWITCH INSPECTION

INSPECT SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
LOCK	1 - 5, 2 - 6	Continuity
OFF	—	No continuity
UNLOCK	2 - 5, 1 - 6	Continuity

If continuity is not as specified, replace the switch.

PASSENGER'S DOOR LOCK CONTROL SWITCH INSPECTION

INSPECT SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
LOCK	3 - 4	Continuity
OFF	—	No continuity
UNLOCK	2 - 4	Continuity

If continuity is not as specified, replace the switch.

DOOR KEY LOCK AND UNLOCK SWITCH INSPECTION

INSPECT SWITCH CONTINUITY

LH:

Switch position	Tester connection to terminal number	Specified condition
LOCK	5 - 6	Continuity
OFF	—	No continuity
UNLOCK	1 - 5	Continuity

If continuity is not as specified, replace the switch.

RH:

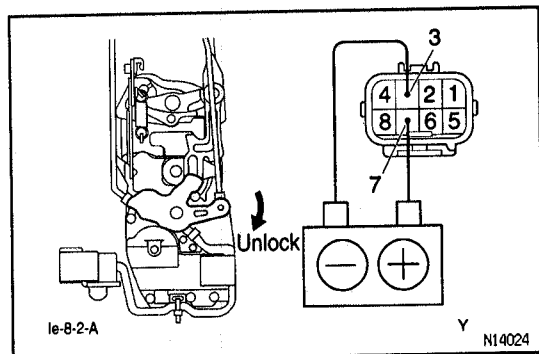
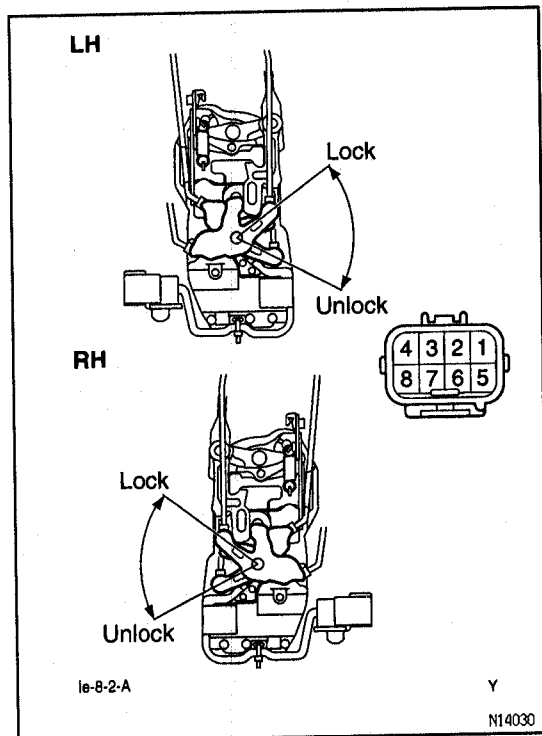
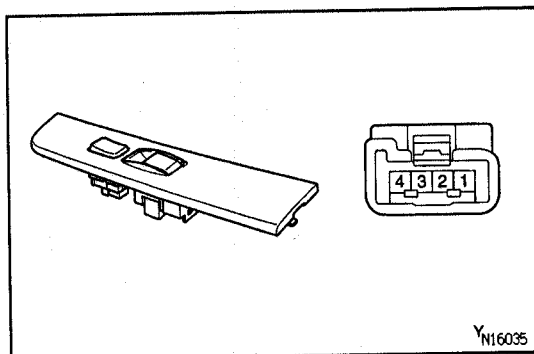
Switch position	Tester connection to terminal number	Specified condition
LOCK	8 - 7	Continuity
OFF	—	No continuity
UNLOCK	4 - 8	Continuity

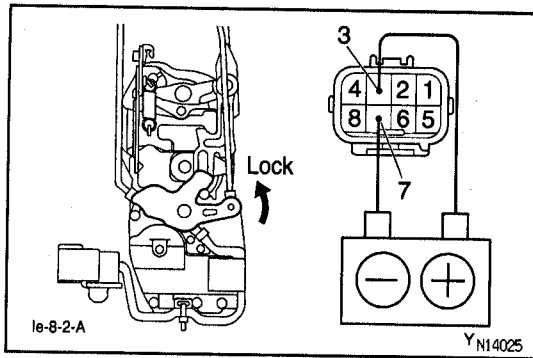
If continuity is not as specified, replace the switch.

DRIVER'S DOOR LOCK MOTOR INSPECTION

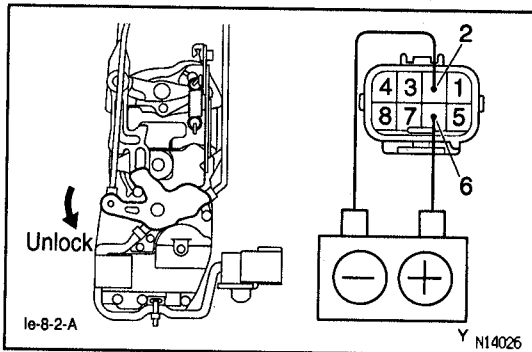
INSPECT MOTOR OPERATION

- (a) Connect the positive (+) lead from the battery to terminal 7 and the negative (−) lead to terminal 3, and check that the door lock link moves to UNLOCK position.





- (b) Remove the polarity and check that the door lock link moves to LOCK position.
If operation is not as specified, replace the door lock assembly.

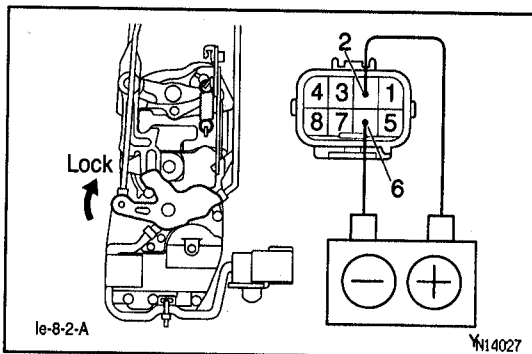


PASSENGER'S DOOR LOCK MOTOR INSPECTION

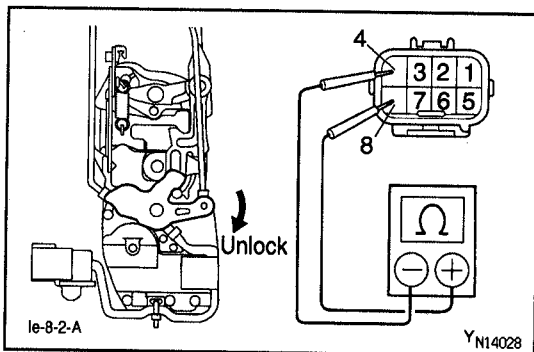
BE1J8-04

INSPECT MOTOR OPERATION

- (a) Connect the positive (+) lead from the battery to terminal 6 and the negative (-) lead to terminal 2, and check that the door lock moves to UNLOCK position.



- (b) Remove the polarity and check that the door lock link moves to LOCK position.
If operation is not as specified, replace the door lock assembly.



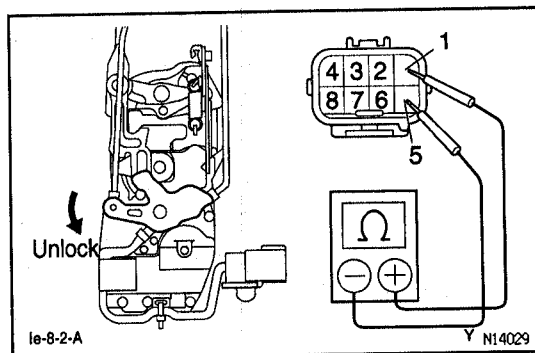
DRIVER'S DOOR UNLOCK DETECTION SWITCH INSPECTION

BE1J7-06

INSPECT SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
OFF (Door Lock set to LOCK)	—	No continuity
ON (Door Lock set to UNLOCK)	4 — 8	Continuity

If continuity is not as specified, replace the switch.

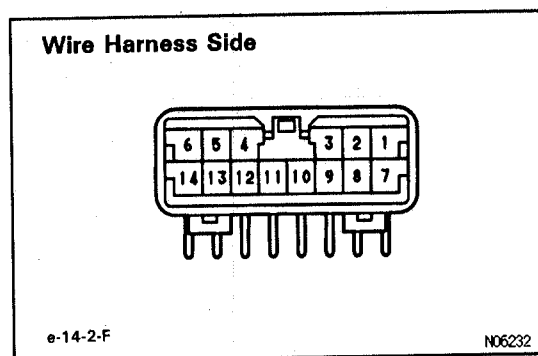


PASSENGER'S DOOR UNLOCK DETECTION SWITCH INSPECTION

INSPECT SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
OFF (Door Lock set to LOCK)	—	No continuity
ON (Door Lock set to UNLOCK)	1 — 5	Continuity

If continuity is not as specified, replace the switch.



DOOR LOCK CONTROL RELAY INSPECTION

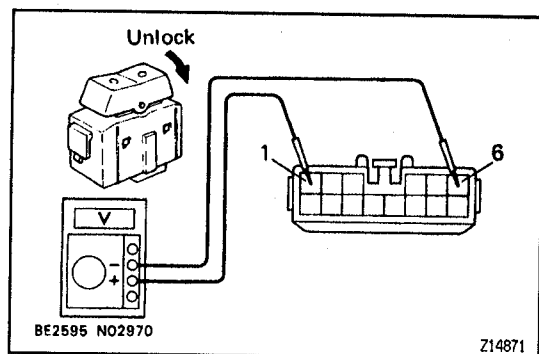
1. INSPECT RELAY CIRCUIT

Disconnect the connector from the relay and inspect the connector on the wire harness side, as shown in the chart.

If circuit is as specified, inspect the door lock signal and key-off power window signal.

Tester connection	Condition	Specified condition
3 — Ground	Door lock control switch or passenger's door key lock and unlock switch position LOCK or OFF	No continuity
3 — Ground	Door lock control switch or passenger's door key lock and unlock switch position UNLOCK or OFF	Continuity
4 — Ground	Door lock control switch or door key lock and unlock switch position UNLOCK	No continuity
4 — Ground	Door lock control switch or door key lock and unlock switch position LOCK	Continuity
7 — Ground	Passenger's door courtesy switch position OFF (Door closed)	No continuity
7 — Ground	Passenger's door courtesy switch position ON (Door opened)	Continuity
9 — Ground	Driver's door lock switch position UNLOCK	Continuity
9 — Ground	Driver's door lock switch position LOCK	No continuity

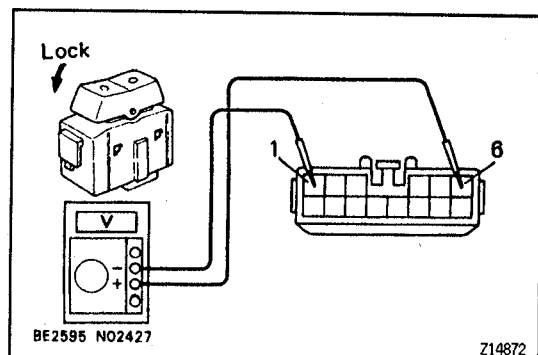
Tester connection	Condition	Specified condition
10 — Ground	Driver's key lock and unlock switch position Lock or OFF	No continuity
10 — Ground	Driver's key lock and unlock switch position UNLOCK	Continuity
11 — Ground	Constant	Continuity
12 — Ground	Passenger's door lock switch position UNLOCK	Continuity
12 — Ground	Passenger's door lock switch position LOCK	No continuity
14 — Ground	Driver's door courtesy switch position OFF (Door closed)	No continuity
14 — Ground	Driver's door courtesy switch position ON (Door opened)	Continuity
2 — Ground	Constant	Battery positive voltage
8 — Ground	Ignition switch position LOCK or ACC	No voltage
8 — Ground	Ignition switch position ON	Battery positive voltage
13 — Ground	Key unlock warning switch position OFF (Ignition key removed)	No voltage
13 — Ground	Key unlock warning switch position ON (Ignition key set)	Battery positive voltage

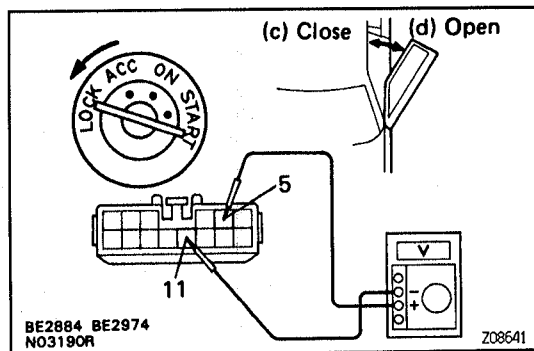


2. INSPECT DOOR LOCK SIGNAL

HINT: When the relay circuit is as specified, inspect the door lock signal.

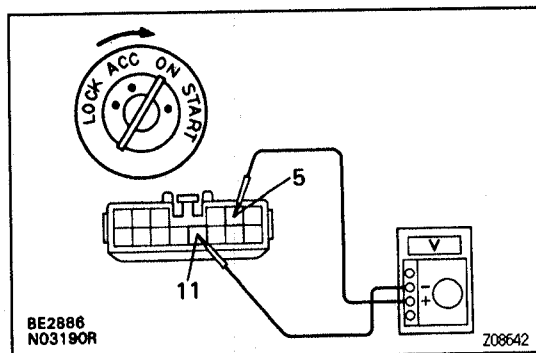
- (a) Connect the connector to the relay.
 - (b) Connect the positive (+) lead from the voltmeter to terminal 1 and the negative (-) lead to terminal 6.
 - (c) Set the door lock control switch to UNLOCK and check that the voltage rises from 0 V to battery positive voltage for approximately 0.2 seconds.
 - (d) Reverse the polarity of the voltmeter leads.
 - (e) Set the door lock control switch to LOCK and check that the voltage rises from 0 V to battery positive voltage for approximately 0.2 seconds.
- If operation is not as specified, replace the relay.



**3. INSPECT KEY — OFF POWER WINDOW SIGNAL**

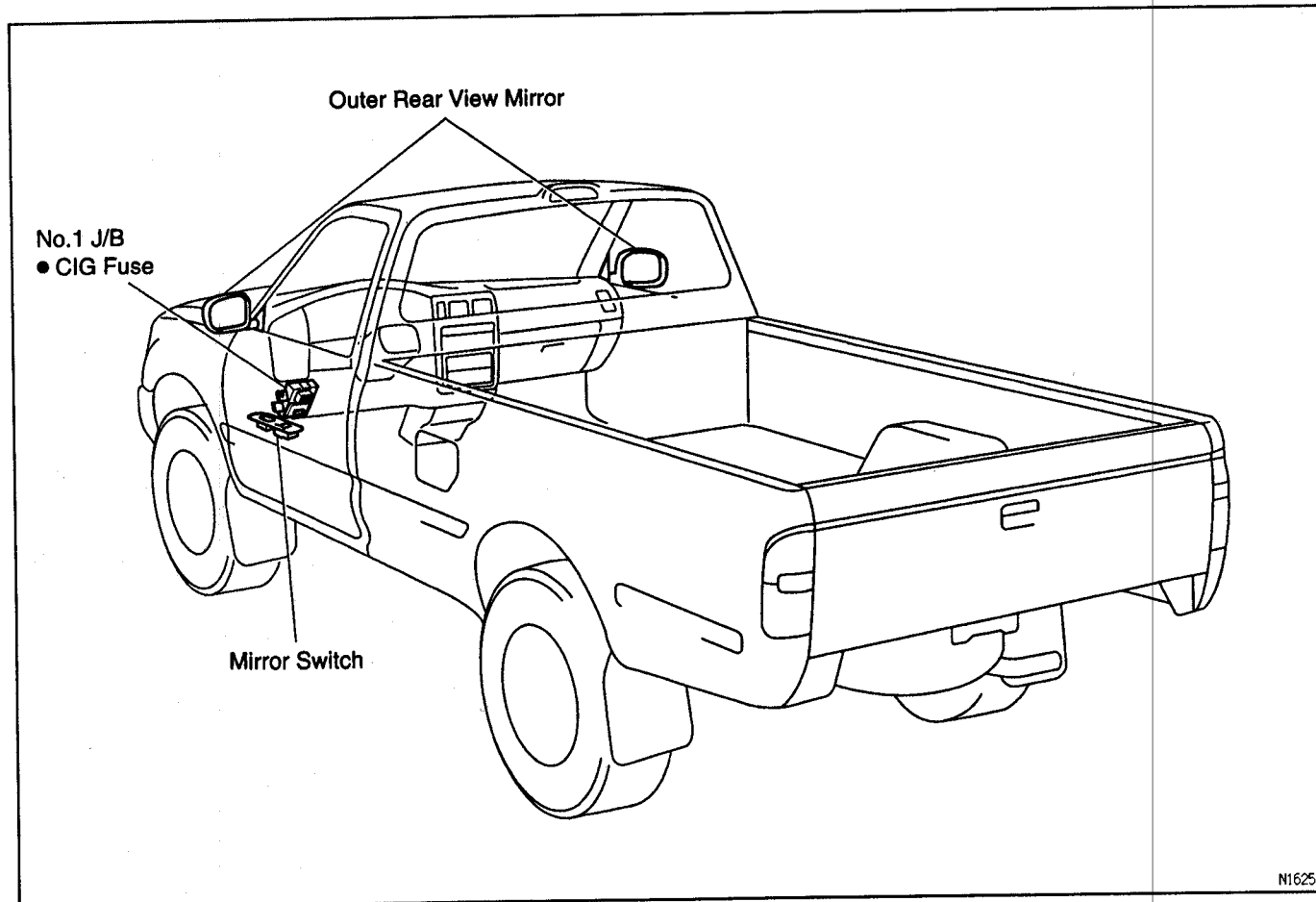
HINT: When the relay circuit is as specified, inspect the key — off power window signal.

- Connect the connector to the relay.
- Connect the positive (+) lead from the voltmeter to terminal 5 and the negative (–) lead to terminal 11.
- Close the door with ignition switch turned to LOCK or ACC, and check that the meter needle indicates battery positive voltage.
- Open the door and check that the meter needle indicates 0 V.
- Turn the ignition switch ON and check that the meter needle indicates battery positive voltage again. If operation is not as specified, replace the relay.



POWER MIRROR CONTROL SYSTEM PARTS LOCATION

ME037-08

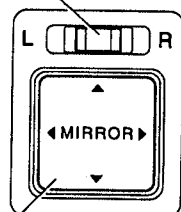


TROUBLESHOOTING

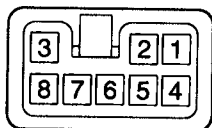
The table below will be useful for you in troubleshooting these electrical problems. The most likely causes of the malfunction are shown in the order of their probability. Inspect each part in the order shown, and replace the part when it is found to be faulty.

Trouble	Parts name (See page)
Power mirror on each side does not operate at all	1. CIG Fuse (No.1 J/B) 2. Mirror Switch (BE-55) 3. Mirror Motor (Up/Down or Left/Right Control) (BE-56) 4. Wire Harness
Left or Right power mirror does not operate at all	1. Mirror Switch (BE-55) 2. Mirror Motor (Up/Down or Left/Right Control) (BE-56) 3. Wire Harness
Up/Down Control of left or right power mirror does not operate	1. Mirror Motor (Up/Down Control) (BE-56) 2. Wire Harness
Left/Right control of left or right power mirror does not operate	1. Mirror Motor (Left/Right Control) (BE-56) 2. Wire Harness

Left / Right
Adjustment
Switch



Control Switch



S-8-2-B

Y

N14161

MIRROR SWITCH INSPECTION

BE028-07

INSPECT SWITCH CONTINUITY

Left side:

Switch position	Tester connection	Specified condition
OFF	—	No Continuity
UP	2 - 3, 1 - 7	Continuity
DOWN	1 - 2, 3 - 7	Continuity
LEFT	2 - 3, 1 - 8	Continuity
RIGHT	1 - 2, 3 - 8	Continuity

Right side:

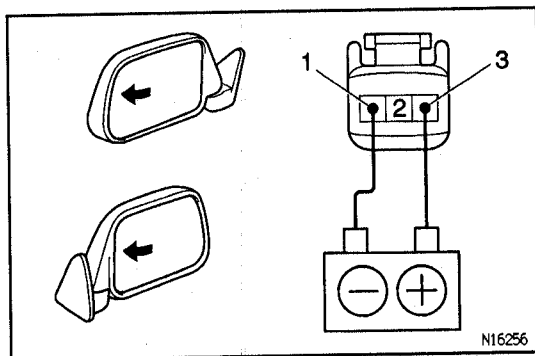
Switch position	Tester connection	Specified condition
OFF	—	No Continuity
UP	2 - 3, 1 - 5	Continuity
DOWN	1 - 2, 3 - 5	Continuity
LEFT	2 - 3, 1 - 6	Continuity
RIGHT	1 - 2, 3 - 6	Continuity

If continuity is not as specified, replace the switch.

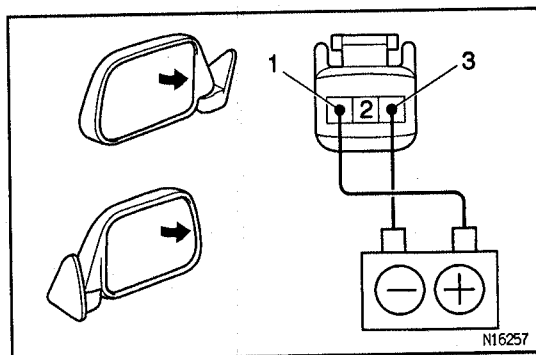
BE

MIRROR MOTOR INSPECTION**INSPECT MOTOR OPERATION**

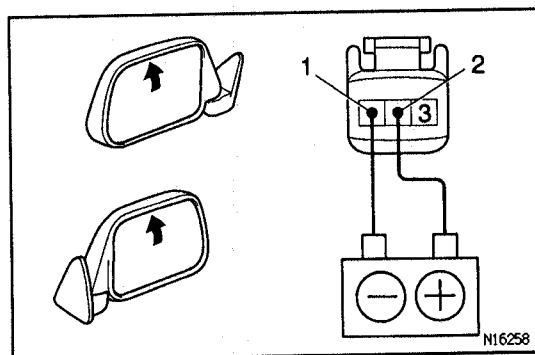
- (a) Connect the positive (+) lead from the battery to terminal 3 and negative (−) lead to terminal 1. Check that the mirror turns to left side.



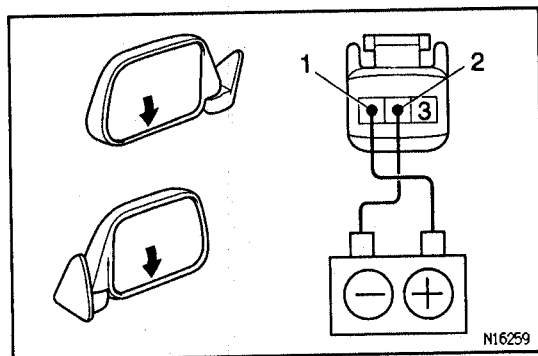
- (b) Remove the polarity and check that the mirror turns to right side.



- (c) Connect the positive (+) lead from the battery to terminal 2 and the negative (−) lead to terminal 1. Check that the mirror turns upward.

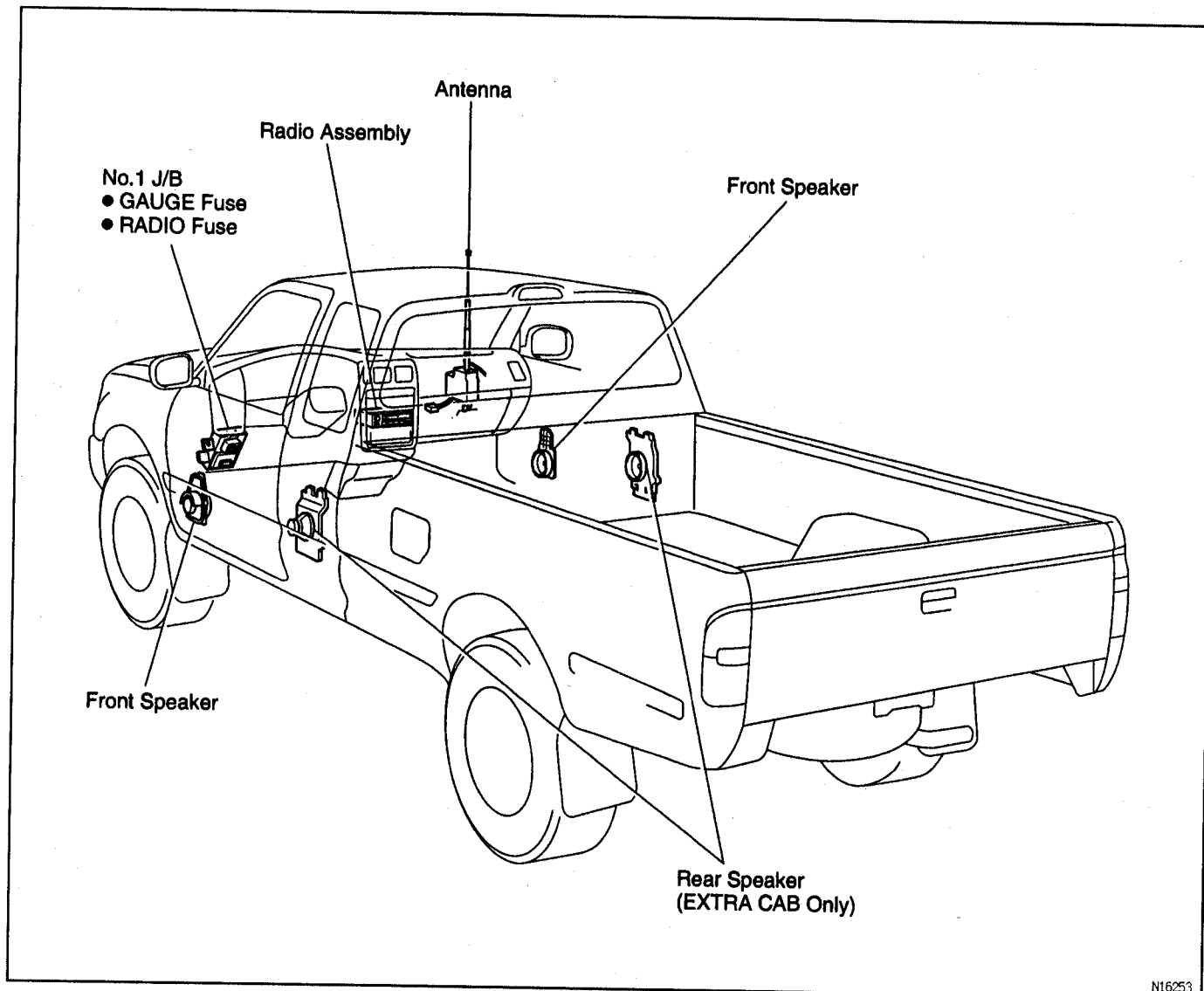


- (d) Reverse the polarity, that the mirror turns downward. If operation is not as specified, replace the mirror assembly.



AUDIO SYSTEM PARTS LOCATION

BE020-00



N16253

SYSTEM DESCRIPTION

BE1M2-0A

BE

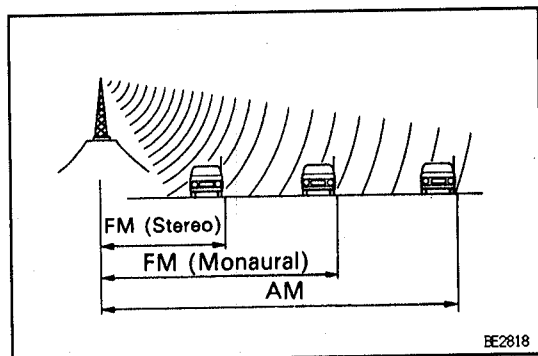
1. RADIO WAVE BAND

The radio wave bands used in radio broadcasting are as follows:

Frequency	30 kHz	300kHz	3 MHz	30 MHz	300 MHz
Designation	LF	MF	HF	VHF	
Radio wave		AM ↔		FM ↔	
Modulation method	Amplitude modulation			Frequency modulation	

LF: low Frequency MF: Medium Frequency HF: High Frequency VHF: Very High Frequency

V03941



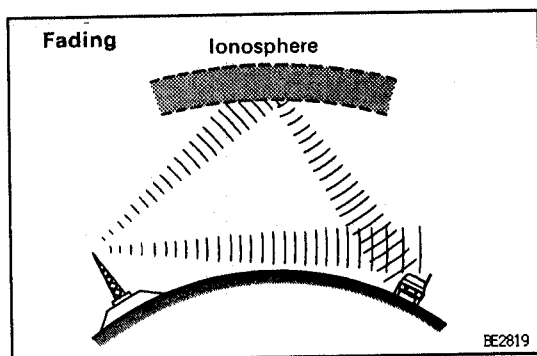
2. SERVICE AREA

There are great differences in the size of the service area for AM, FM monaural, and FM stereo broadcasts cannot be received even though AM comes in very clearly.

Not only does FM stereo have the smallest service area, but it also picks up static and other types of interference ("noise") easily.

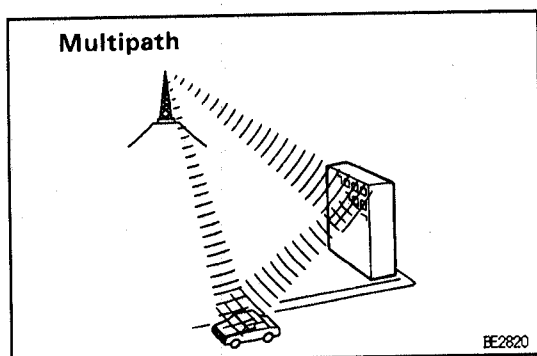
3. RECEPTION PROBLEMS

Besides the problem of static, there are also the problems called "fading", "multipath" and "fade out". These problems are caused not by electrical noise but by the nature of the radio waves themselves.



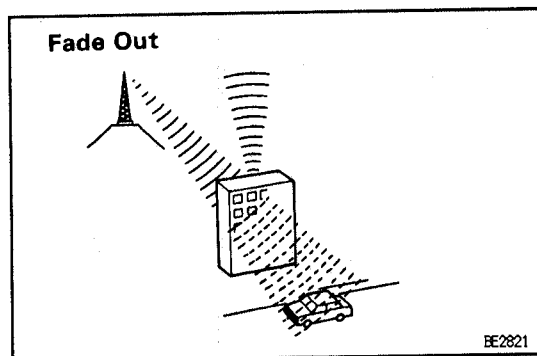
Fading

Besides electrical interference, AM broadcasts are also susceptible to other types of interference, especially at night. This is because AM radio waves bounce off the ionosphere at night. These radio waves then interfere with the signals from the same transmitter that reach the vehicle's antenna directly. This type of interference is called "fading".



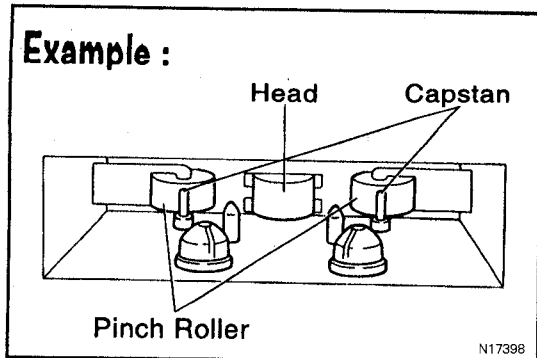
Multipath

One type of interference caused by the bouncing of radio waves off of obstructions is called "multipath". Multipath occurs when a signal from the broadcast transmitter antenna bounces off buildings and mountains and interferes with the signal that is received directly.



Fade Out

Because FM radio waves are of higher frequencies than AM radio waves, they bounce off buildings, mountains, and other obstructions. For this reason, FM signals often seem to gradually disappear or fade away as the vehicle goes behind a building or other obstruction. This is called "fade out".

Example :**MAINTENANCE****Tape Player/Head Cleaning**

- (a) Raise the cassette door with your finger. Next using a pencil or similar object, push in the guide.
- (b) Using a cleaning pen or cotton applicator soaked in cleaner, clean the head surface, pinch rollers and capstans.

TROUBLESHOOTING

NOTICE: When replacing the internal mechanism (computer part) of the audio system, be careful that no part of your body or clothing comes in contact with the terminals of the leads from the IC, etc. of the replacement part (spare part).

HINT: This inspection procedure is a simple troubleshooting which should be carried out on the vehicle during system operation and was prepared on the assumption of system component troubles (except for the wires and connectors, etc.).

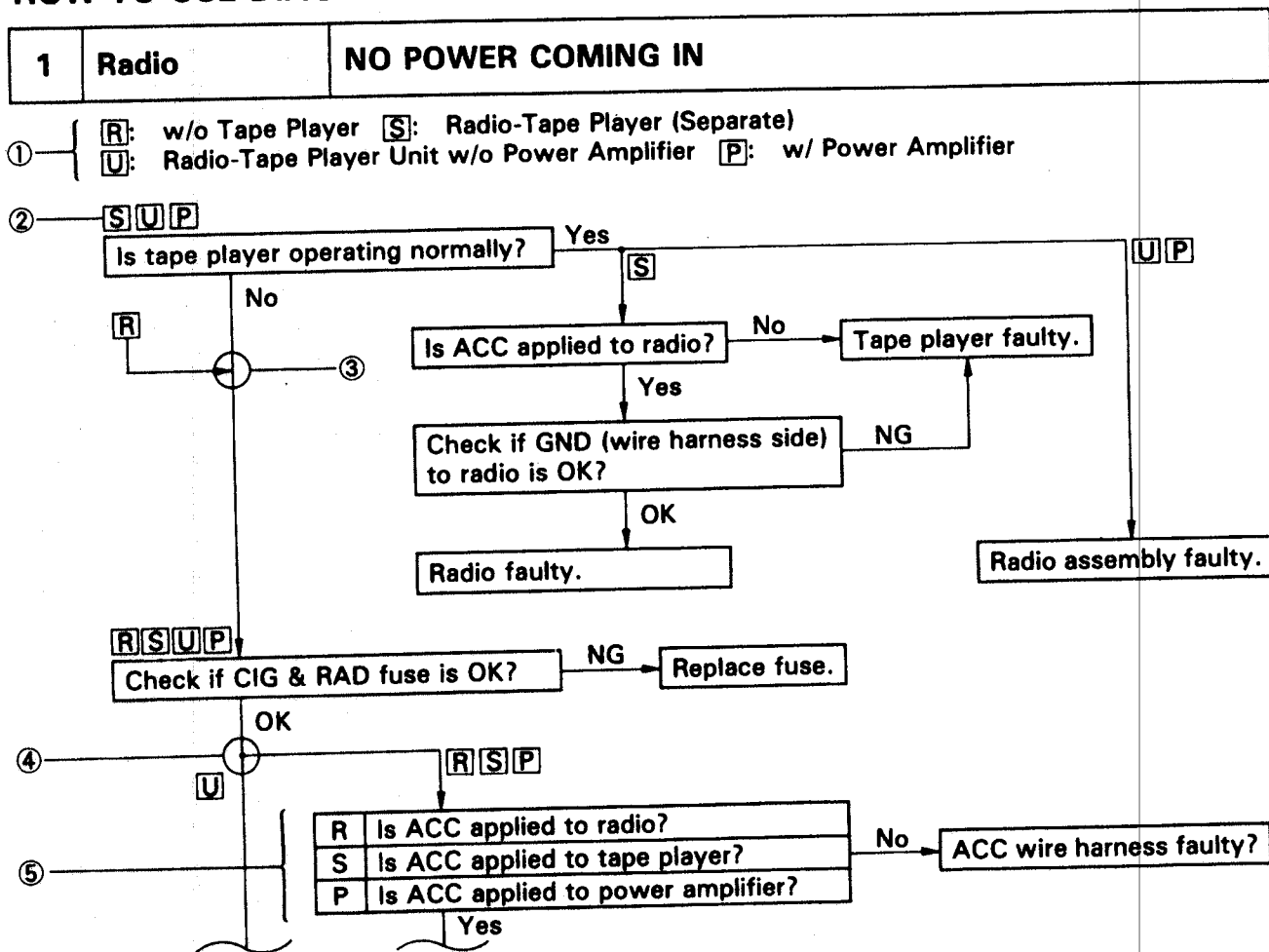
Always inspect the trouble taking the following items into consideration.

- Open or short circuit of the wire harness
- Connector or terminal connection fault

	Problem	No.
Radio	No power coming in.	1
	Power coming in, but radio not operating.	2
	Noise present, but AM — FM not operating.	3
	Either speaker does not work.	4
	Either AM or FM does not work.	5
	Reception poor (Volume faint).	5
	Few preset tuning bands.	5
	Sound quality poor.	6
	Cannot set station select button.	7
	Preset memory disappears.	7
Tape Player	Cassette tape cannot be inserted.	8
	Cassette tape inserts, but no power.	9
	Power coming in, but tape player not operating.	10
	Either speaker does not work.	11
	Sound quality poor (Volume faint).	12
	Tape jammed, malfunction with tape speed or auto—reverse.	13
	APS, SKIP, RPT buttons not operating.	14
	Cassette tape will not eject.	15
Antenna	Antenna does not fully extend or fully retract.	16
	Antenna — related.	17
Noise	Noise produced by vibration or shock while driving.	18
	Noise produced when engine starts.	19

The term "AM" includes LW, MW and the term "FM" includes UKW.

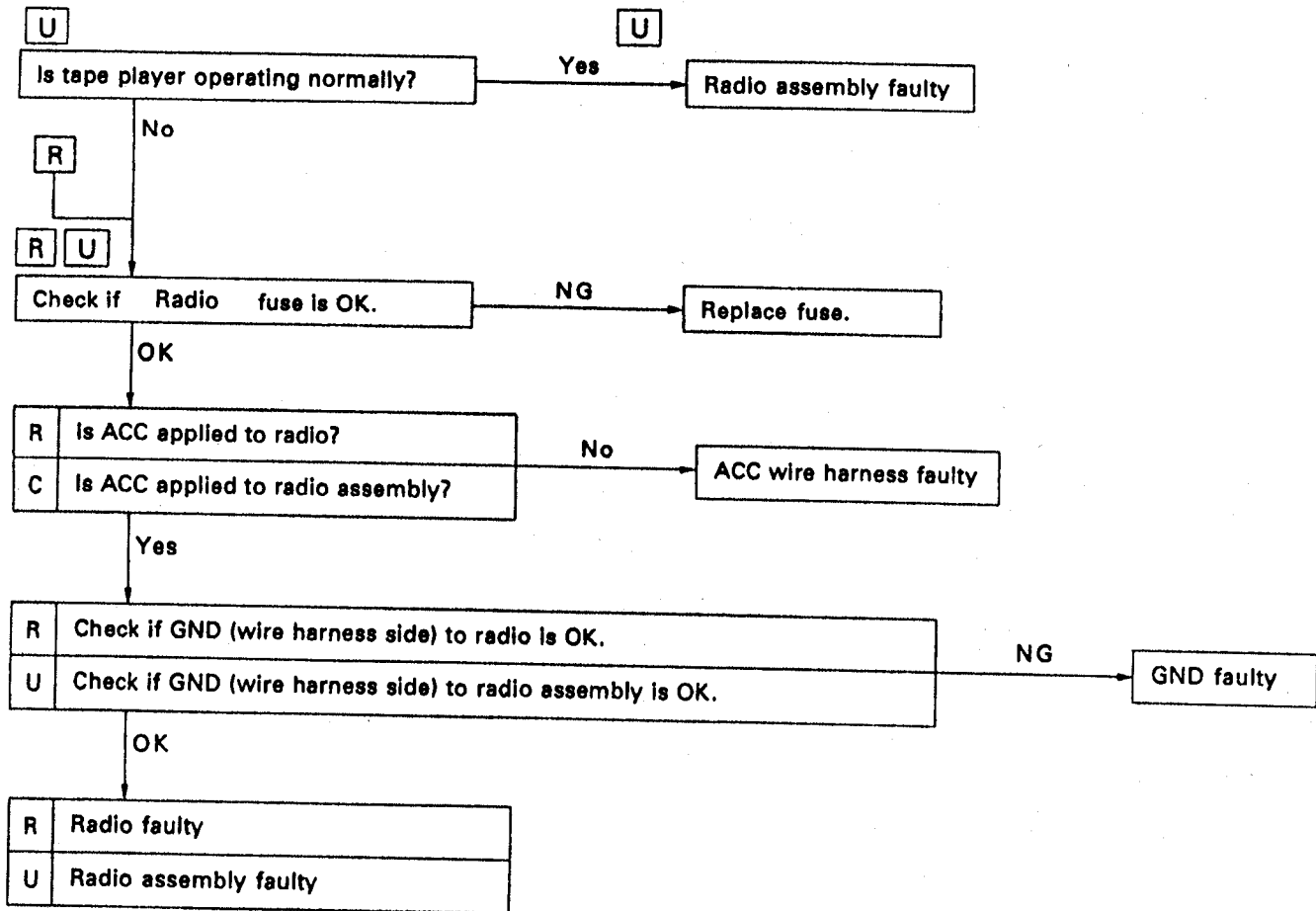
HOW TO USE DIAGNOSTIC CHART



- ① Audio system type and symbol used.
HINT: Confirm the applicable type of audio system.
- ② Symbol for type of audio system the question applies to.
HINT: If the audio system type is not applicable, proceed to next question below.
- ③ Junction without black circle.
HINT: Proceed to next question below.
- ④ Junction with black circle.
HINT: Proceed to question for applicable audio system type.
- ⑤ HINT: Select question for applicable audio system type.

1	Radio	NO POWER COMING IN
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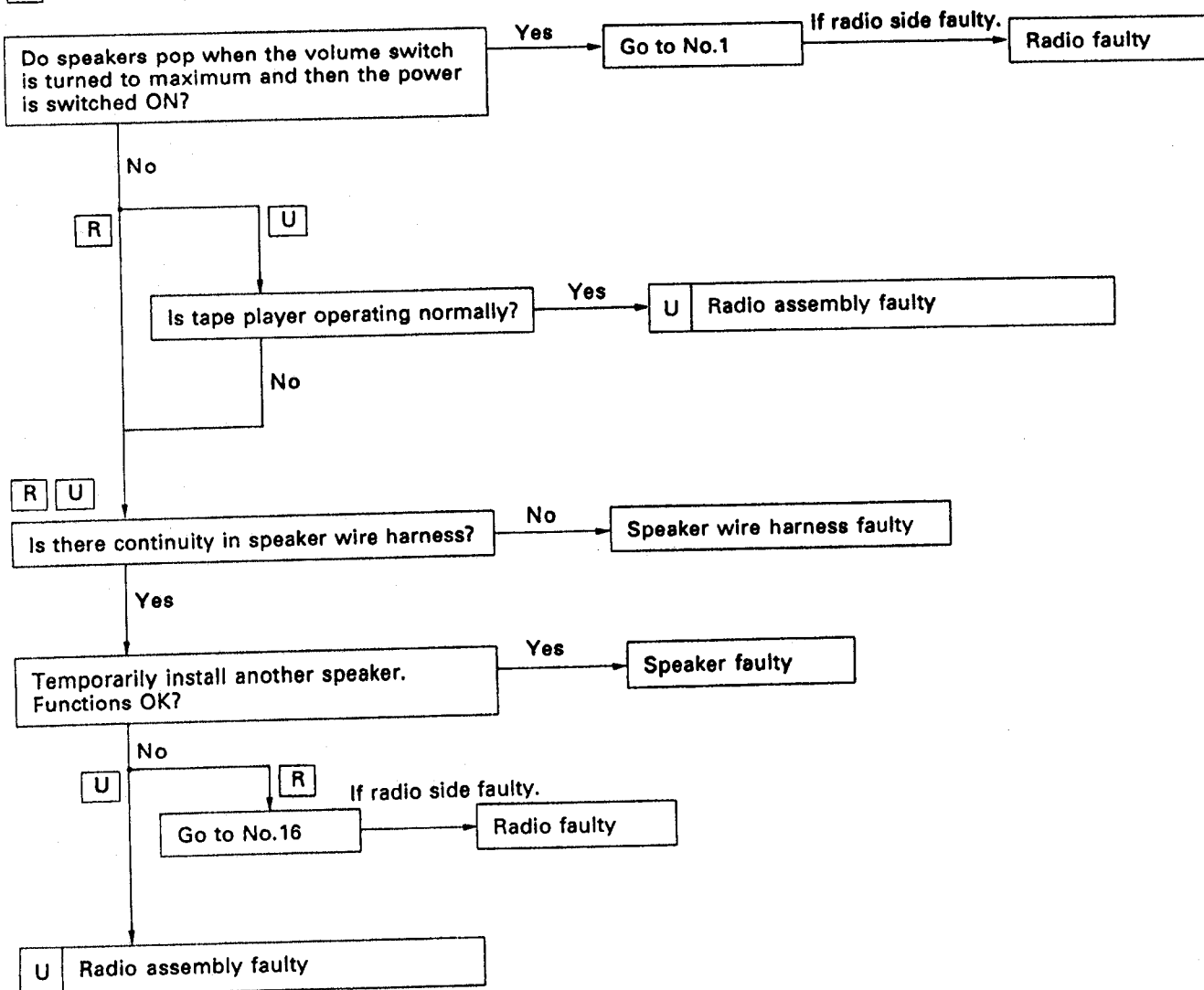
R : Radio **U** : Radio — Tape Player Unit



2	Radio	POWER COMING IN, BUT RADIO NOT OPERATING
---	-------	--

R : Radio

U : Radio - Tape Player Unit

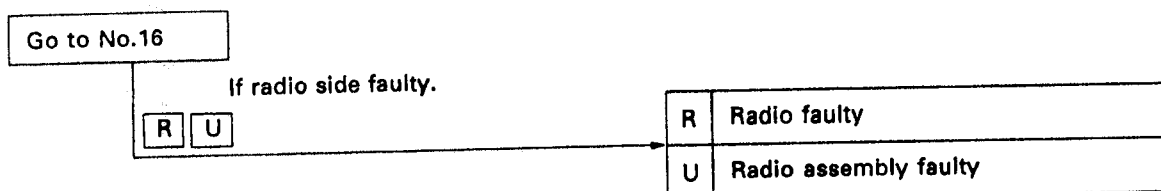


BE

3	Radio	NOISE PRESENT, BUT AM-FM NOT OPERATING
---	-------	--

R : Radio

U : Radio - Tape Player Unit



4

Radio

EITHER SPEAKER DOES NOT WORK

R : Radio

U : Radio – Tape Player Unit

U

Is tape player operating normally?

Yes

U

Radio assembly faulty

No

R **U**

Is hiss produced by non-functioning speaker?

Yes

R

Radio faulty

U

Radio assembly faulty

No

Is there continuity in speaker wire harness?

No

Speaker wire harness faulty

Yes

Temporarily install another speaker.
Functions OK?

Yes

Speaker faulty

No

R

Radio faulty

U

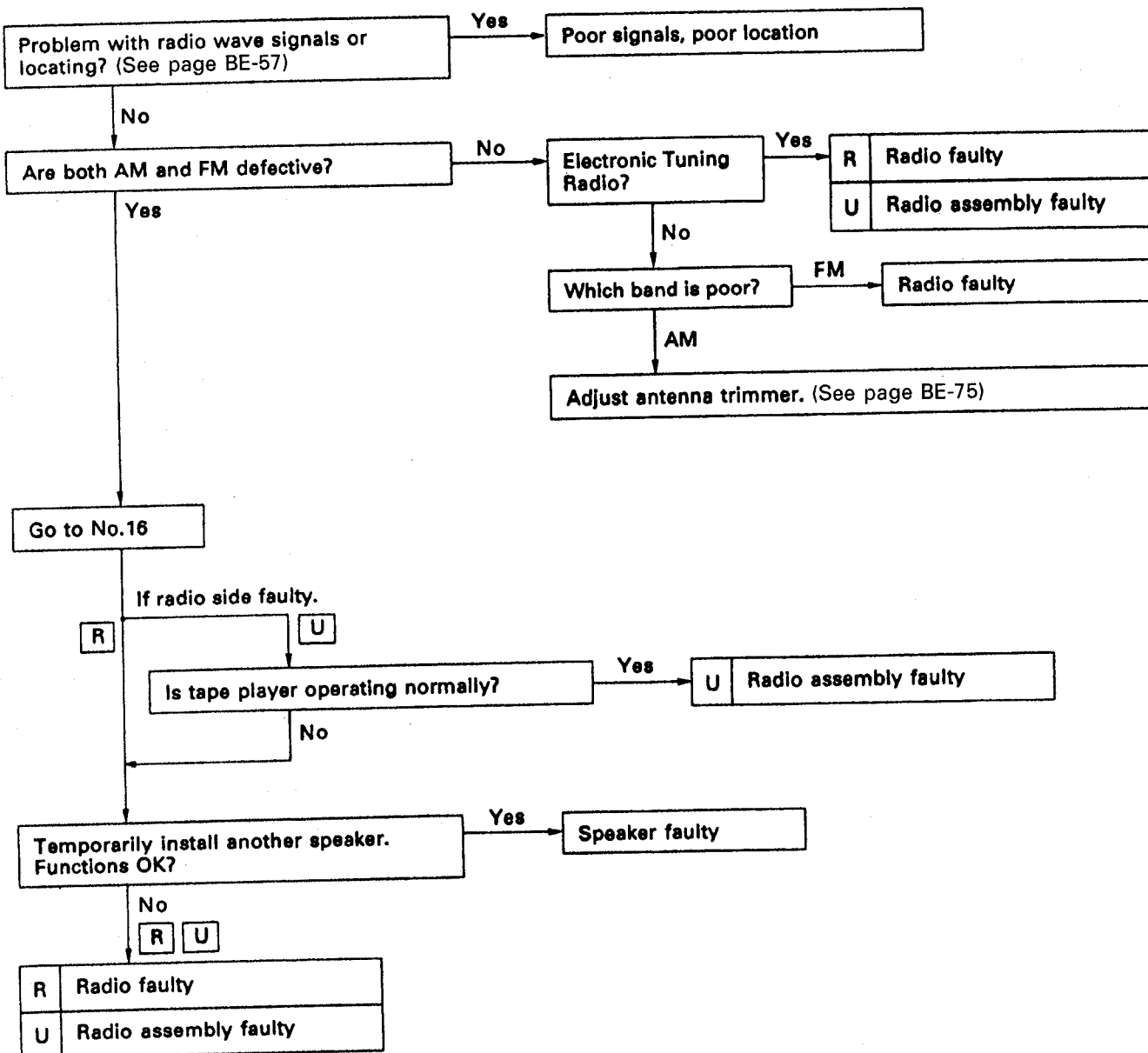
Radio assembly faulty

BE

5	Radio	EITHER AM OR FM DOES NOT WORK, RECEPTION POOR (VOLUME FAINT), FEW PRESET TUNING BANDS
---	-------	--

R : Radio

U : Radio – Tape Player Unit



BE

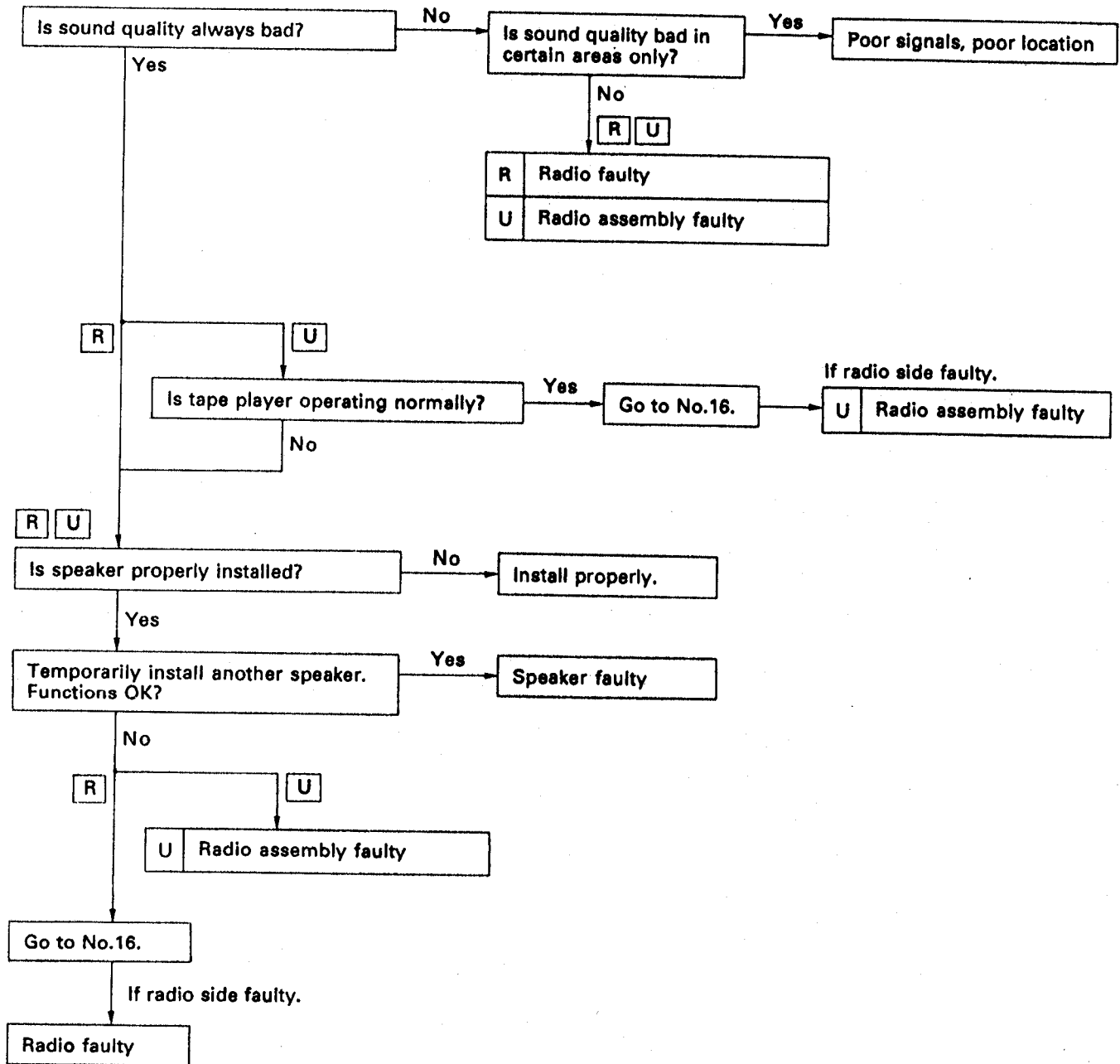
6

Radio

SOUND QUALITY POOR

R : Radio

U : Radio – Tape Player Unit

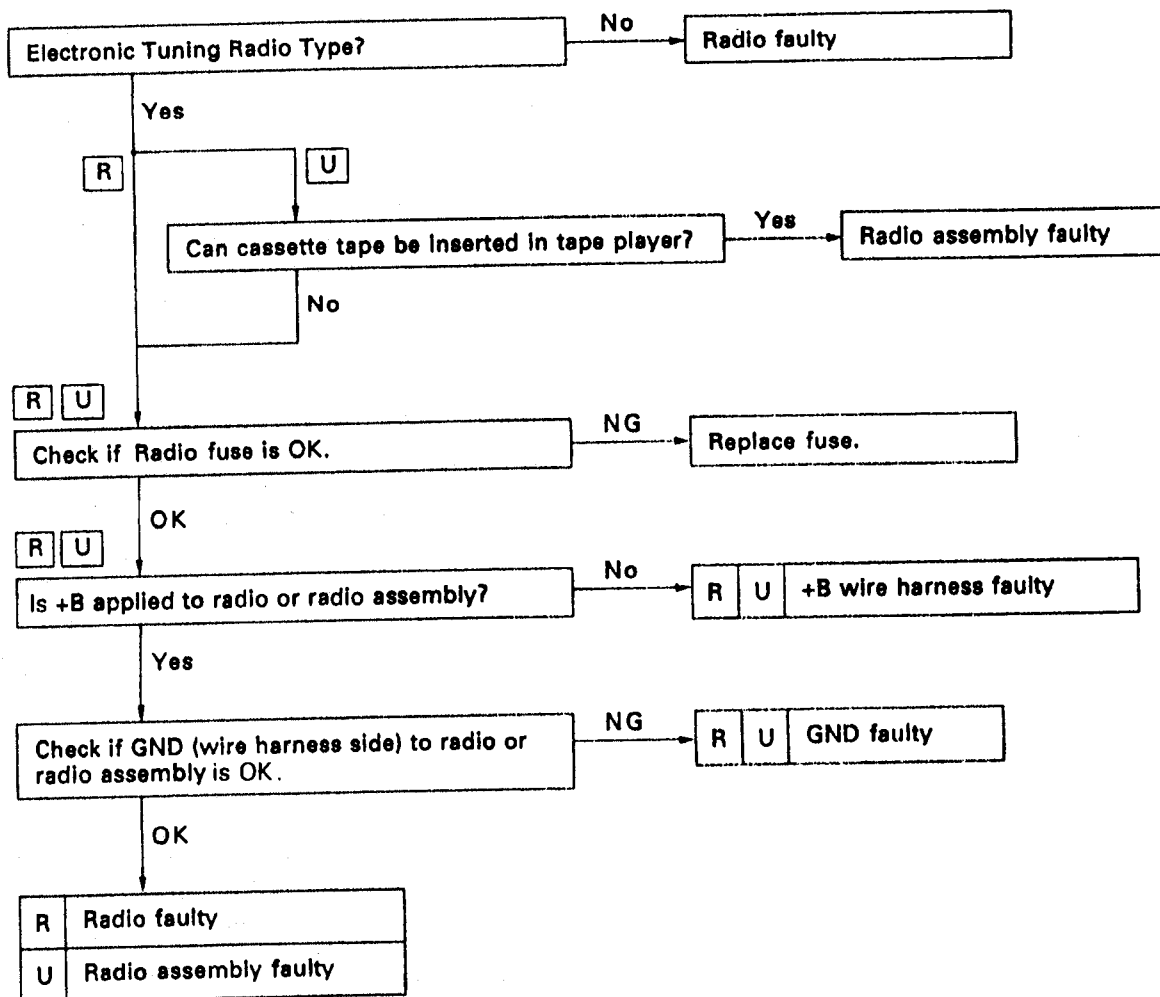


BE

7	Radio	CANNOT SET STATION SELECT BUTTON, PRESET MEMORY DISAPPEARS
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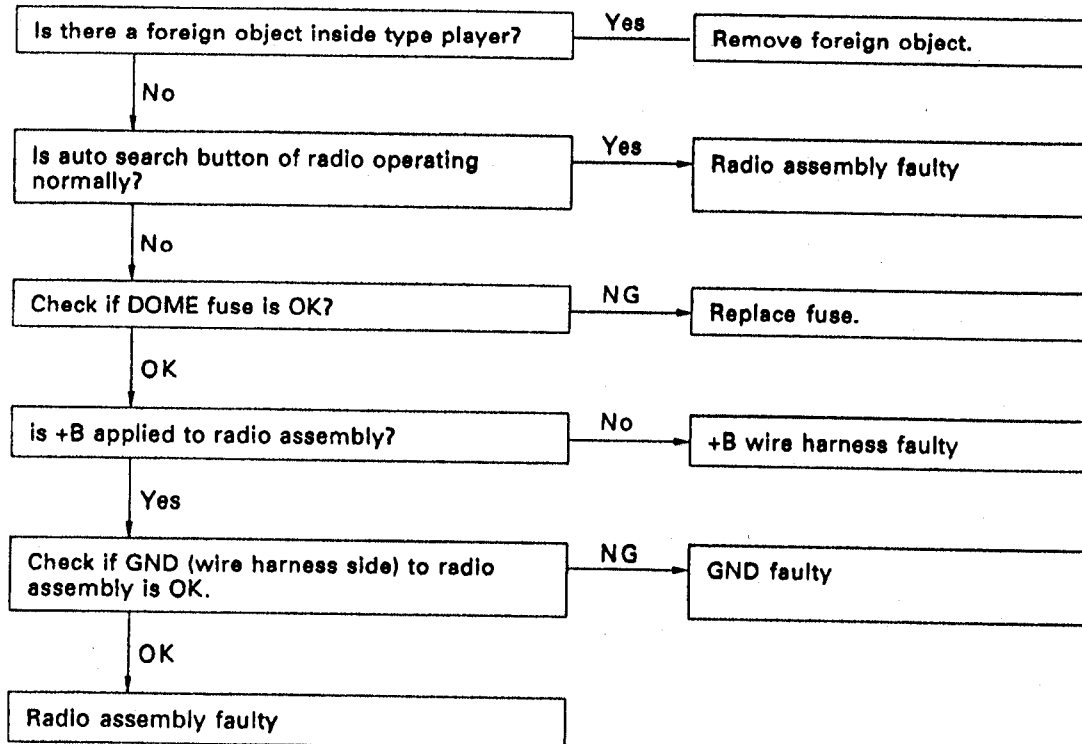
R : Radio

U : Radio - Tape Player Unit



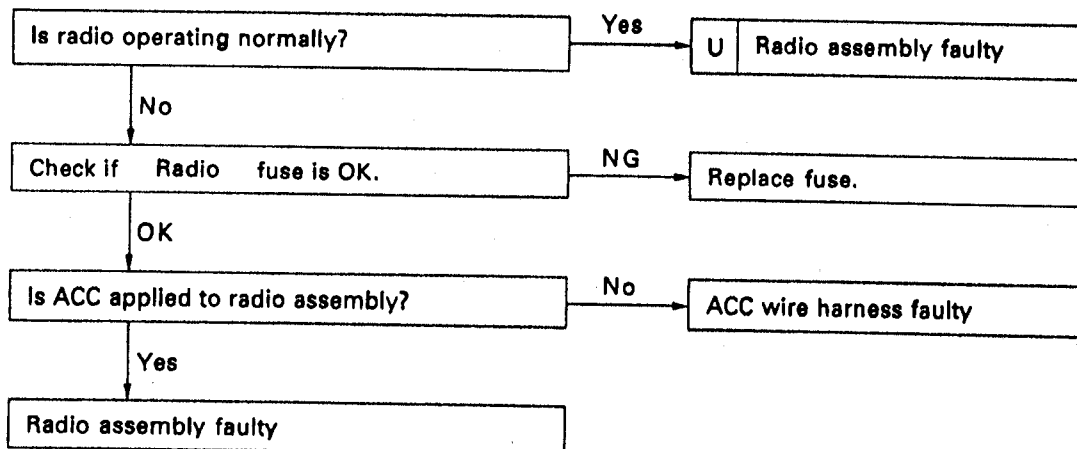
8	Tape Player	CASSETTE TAPE CANNOT BE INSERTED
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U : Radio – Tape Player Unit



9	Tape Player	CASSETTE TAPE INSERTS, BUT NO POWER
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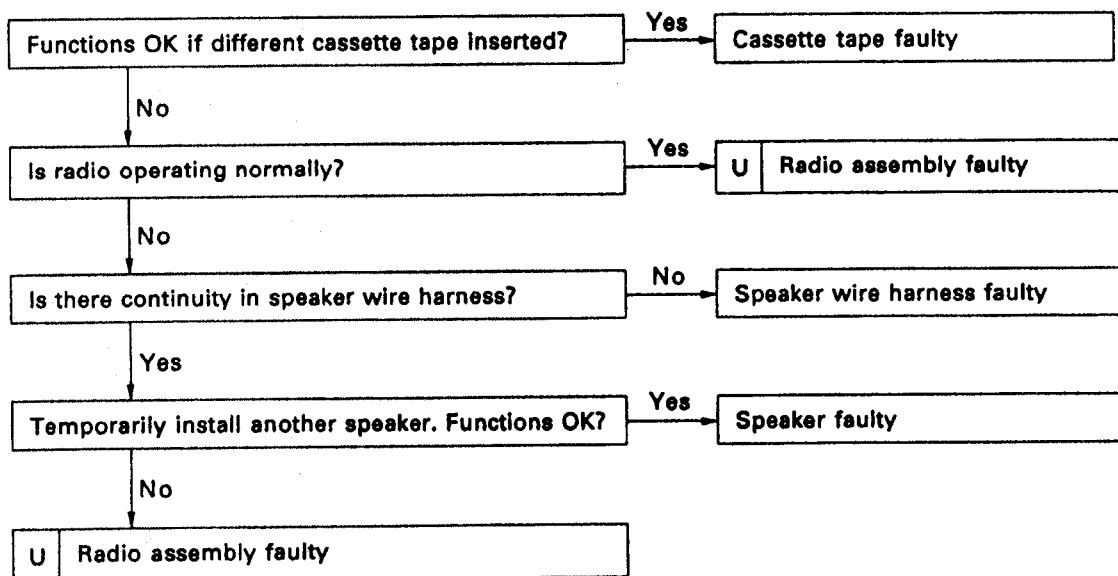
U : Radio – Tape Player Unit



BE

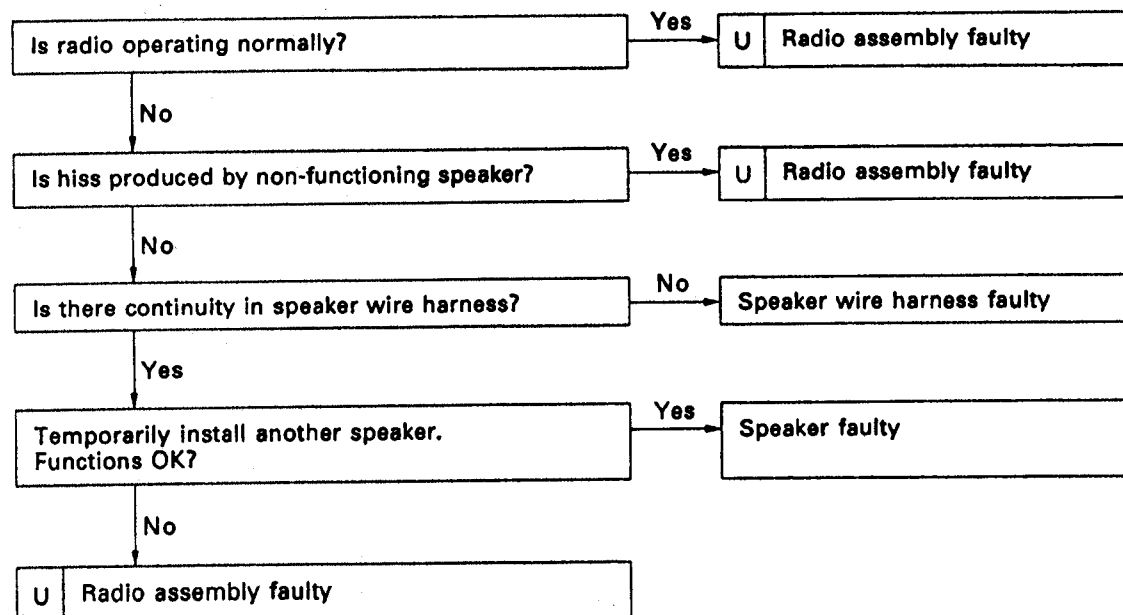
10	Tape Player	POWER COMING IN, BUT TAPE PLAYER NOT OPERATING
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U : Radio – Tape Player Unit



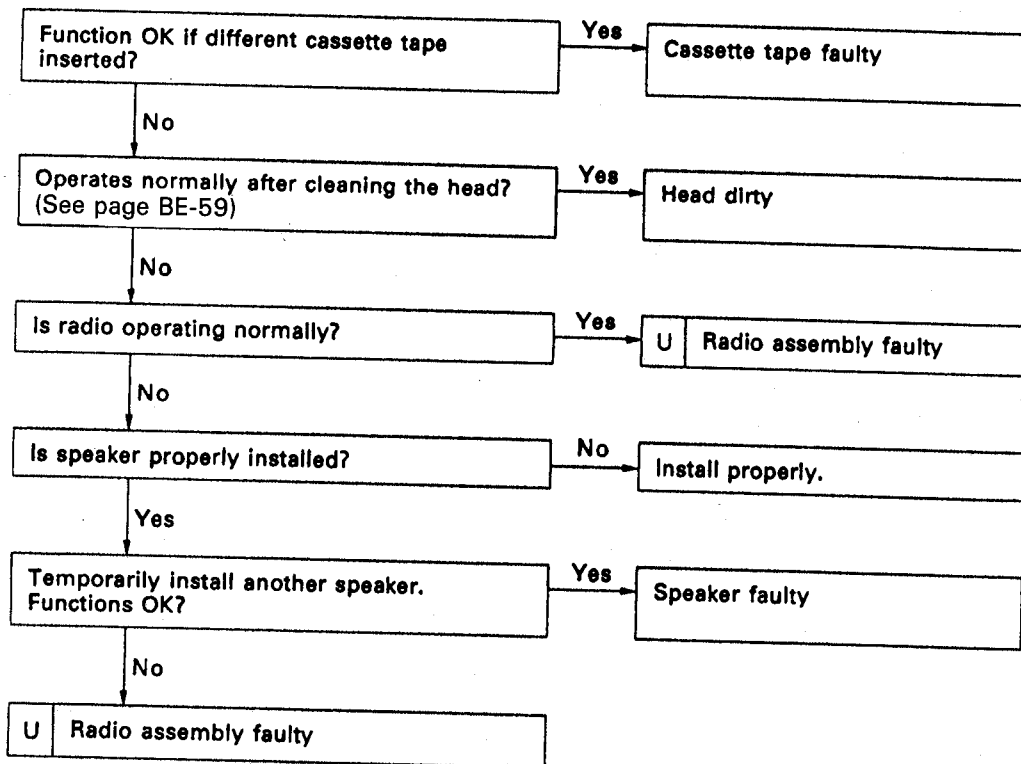
11	Tape Player	EITHER SPEAKER DOES NOT WORK
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U : Radio – Tape Player Unit



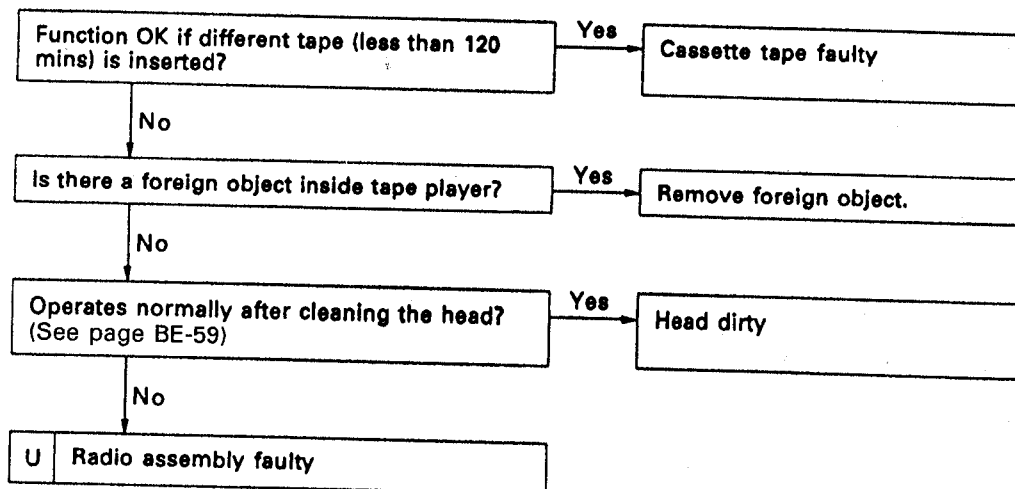
12	Tape Player	SOUND QUALITY POOR (VOLUME FAINT)
-----------	--------------------	--

U : Radio – Tape Player Unit

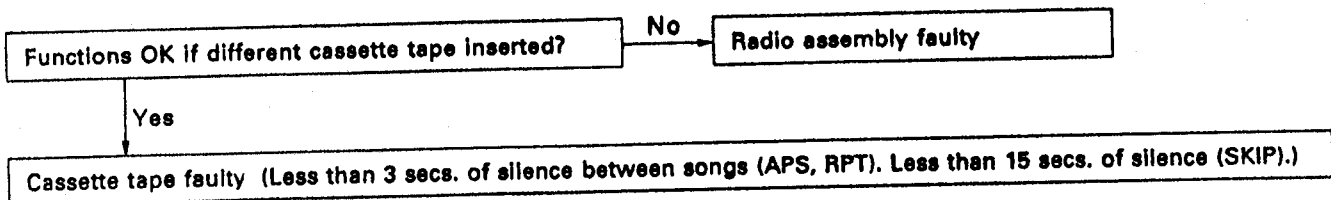


13	Tape Player	TAPE JAMMED, MALFUNCTION WITH TAPE SPEED OR AUTO-REVERSE
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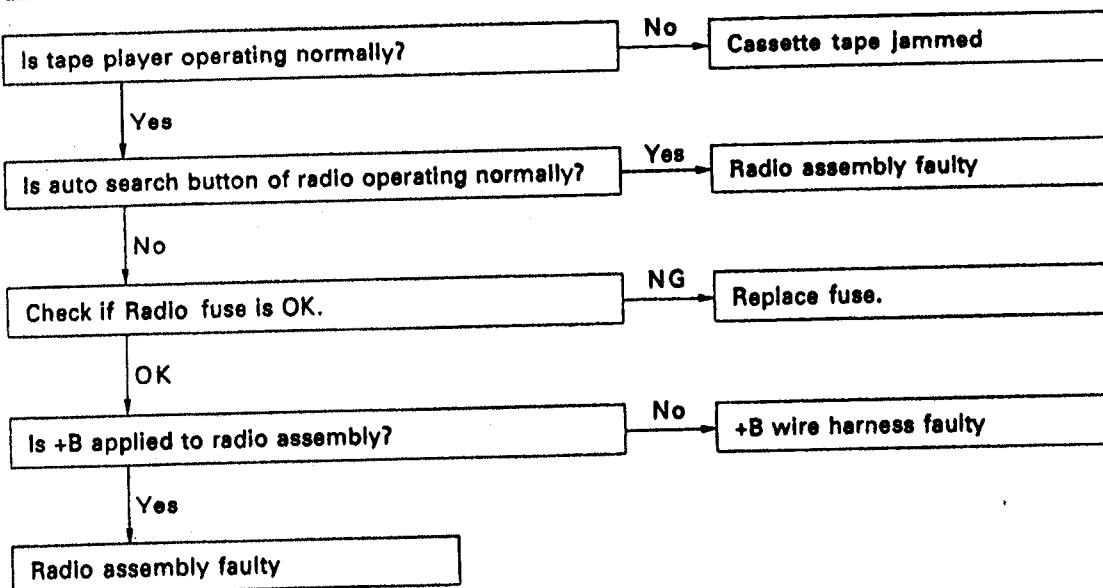
U : Radio – Tape Player Unit



BE

14 Tape Player APS, SKIP, RPT BUTTONS NOT OPERATING**15 Tape Player CASSETTE TAPE WILL NOT EJECT**

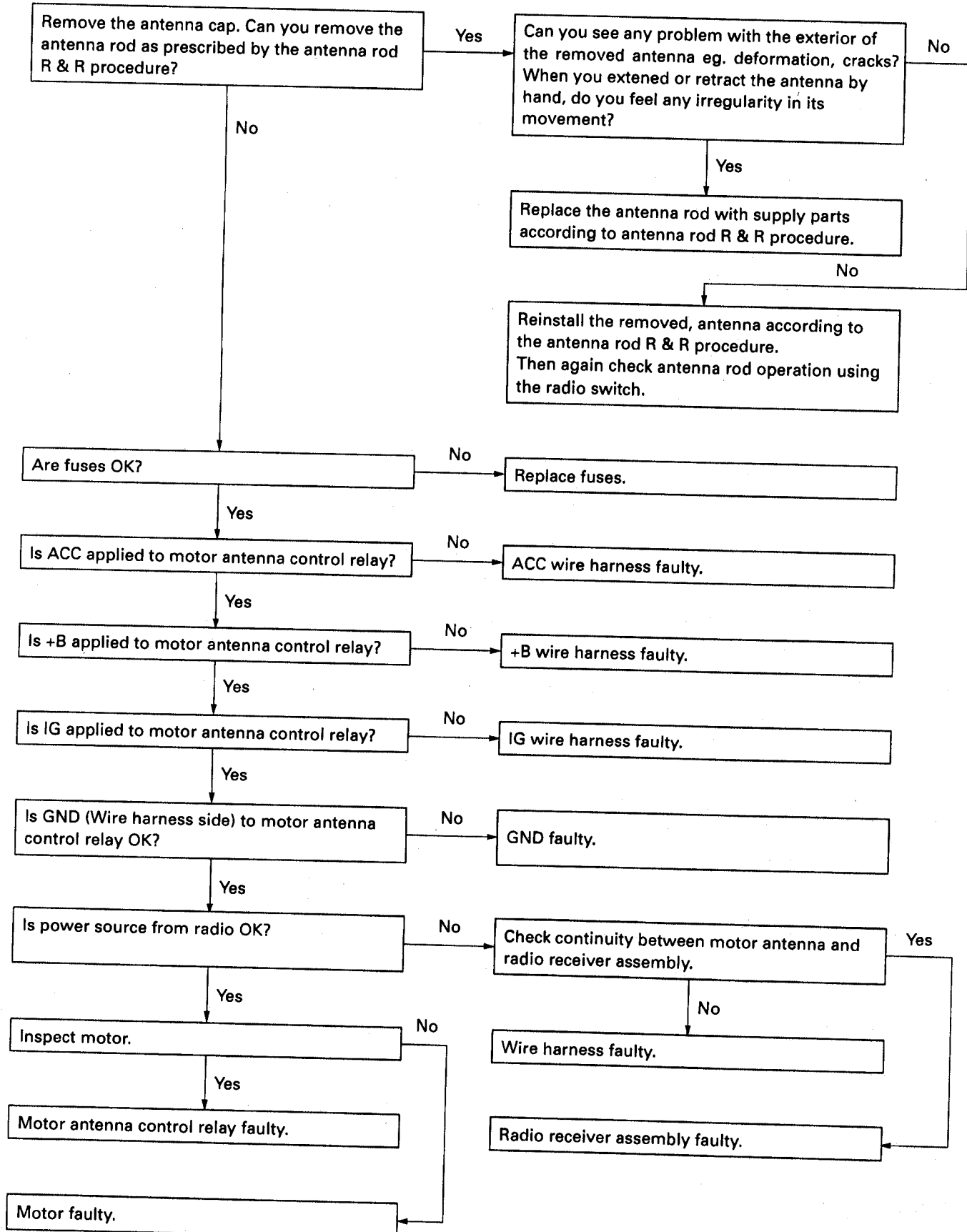
U : Radio - Tape Player Unit



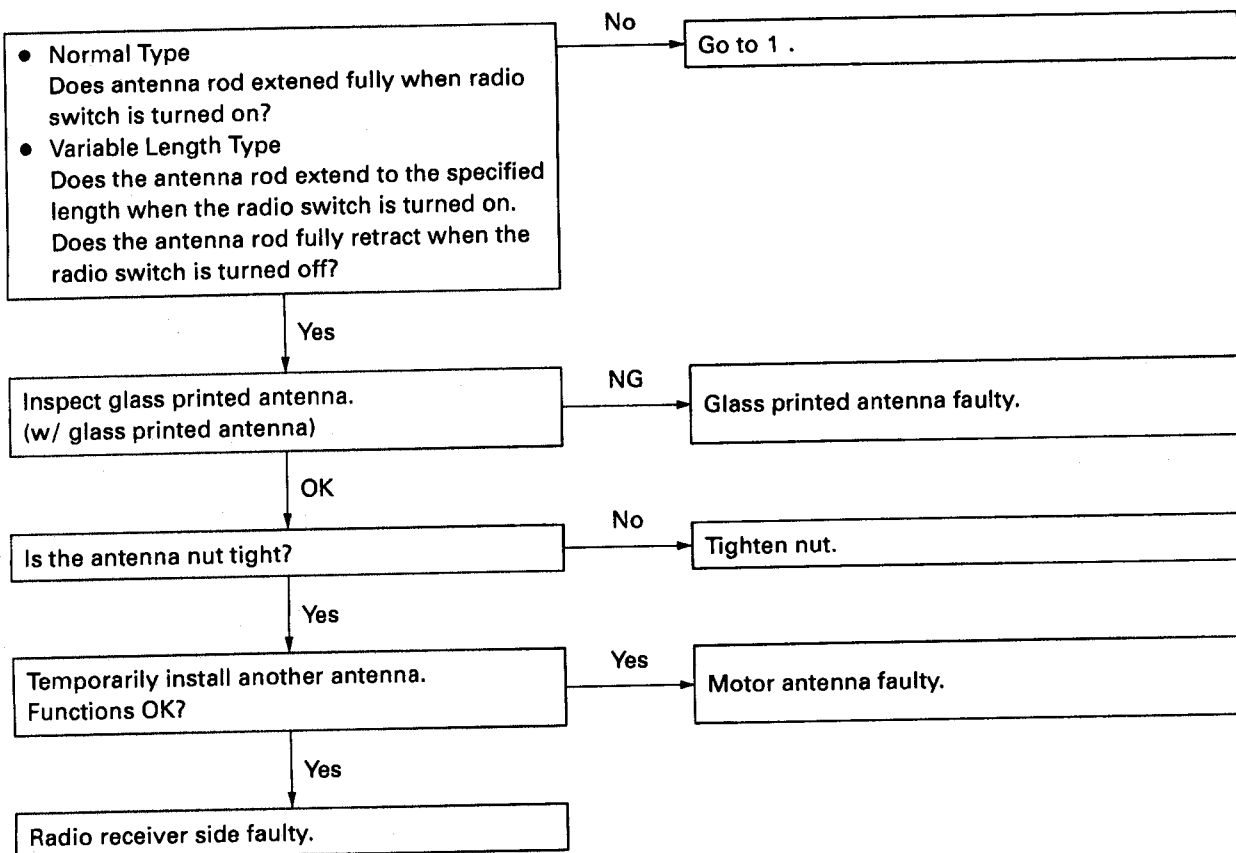
16

Antenna

ANTENNA DOES NOT FULLY EXTENDED OR FULLY RETRACT

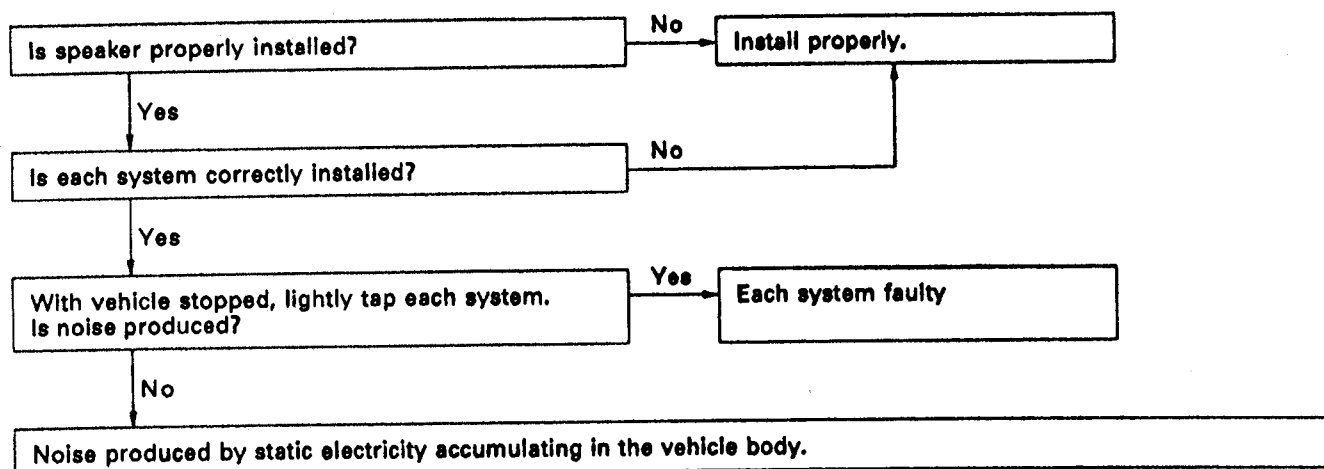


17	Antenna	ANTENNA-RELATED
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V06260

18	Noise	NOISE PRODUCED BY VIBRATION OR SHOCK WHILE DRIVING
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V06331

19 Noise

NOISE PRODUCED WHEN ENGINE STARTS

Whistling noise which becomes high-pitched when accelerator strongly depressed, disappears shortly after engine stops.

Yes

Generator noise

No

Whining noise occurs when A/C is operating.

Yes

A/C noise

No

Scratching noise occurs during sudden acceleration, driving on rough roads or when ignition switch is turned on.

Yes

Fuel gauge noise

No

Clicking sound heard when horn button is pressed, then released. Whirring/grating sound when pushed continuously.

Yes

Horn noise

No

Murmuring sound stops when engine stops.

Yes

Ignition noise

No

Tick-tock noise, occurs in co-ordination with blinking of flasher.

Yes

Turn signal noise

No

Noise occurs during window washer operation.

Yes

Washer noise

No

Scratching noise occurs while engine is running, continues a while even after engine stops.

Yes

Water temp. gauge noise

No

Scraping noise in time with wiper beat.

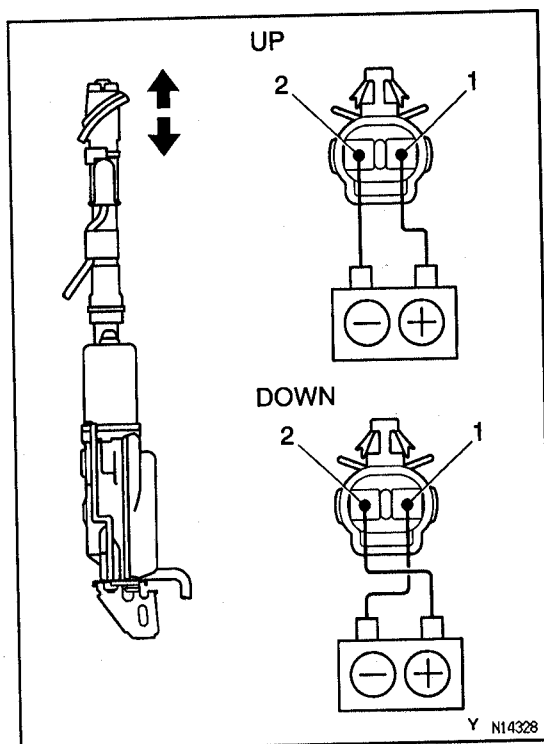
Yes

Wiper noise

No

Other type of noise

BE



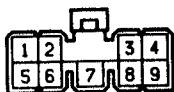
ANTENNA MOTOR INSPECTION

INSPECT MOTOR OPERATION

- Connect the positive (+) lead from battery to terminal 1 and the negative (−) lead to terminal 2.
- Check that the motor turns (moves upward).
NOTICE: These tests must be performed quickly (within 3 – 5 seconds) to prevent the coil from burning out.
- Then, reverse the polarity, check that the motor turns the opposite way (moves downward).
NOTICE: These tests must be performed quickly (within 3 – 5 seconds) to prevent the coil from burning out.

BE2LK-02

Wire Harness Side



G-9-1

Z10721

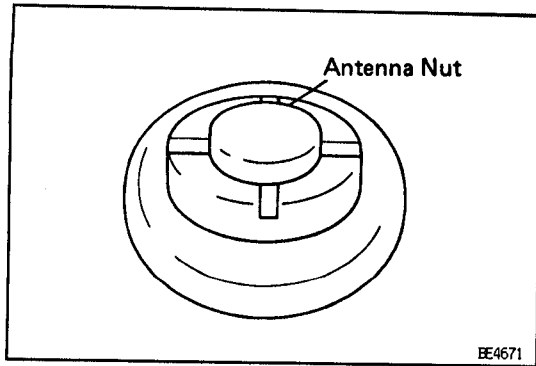
ANTENNA MOTOR CONTROL RELAY INSPECTION

INSPECT RELAY CIRCUIT

Disconnect the connector from the relay and inspect the connector on wire harness side, as shown in the chart.

If circuit is as specified, replace the relay.

Tester connection	Condition	Specified condition
1 – 4	Constant	Continuity
3 – Ground	Constant	Continuity
2 – Ground	Constant	Battery positive voltage
5 – Ground	Ignition switch position LOCK or ACC	No voltage
5 – Ground	Ignition switch position ON	Battery positive voltage
6 – Ground	Ignition switch position LOCK	No voltage
6 – Ground	Ignition switch position ACC or ON Radio switch and cassette OFF	No voltage
6 – Ground	Ignition switch position ACC or ON Radio switch of cassette ON	Battery positive voltage
8 – Ground	Ignition switch position LOCK	No voltage
8 – Ground	Ignition switch position ACC or ON Radio switch OFF or cassette ON	No voltage
8 – Ground	Ignition switch position ACC or ON Radio switch ON and cassette OFF	Battery positive voltage
9 – Ground	Ignition switch position LOCK	No voltage
9 – Ground	Ignition switch position ACC or ON	Battery positive voltage

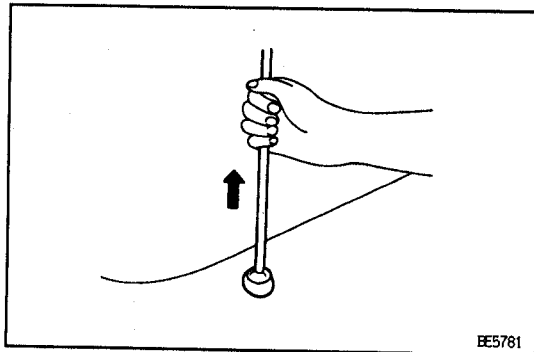


ANTENNA ROD REMOVAL AND INSTALLATION

1. REMOVE ANTENNA ROD

HINT: Perform this operation with the negative (—) cable connected to the battery terminal.

- (a) Turn the ignition switch to "LOCK" position.
- (b) Remove the antenna nut.



- (c) Press the "AM" button on the radio receiver, and simultaneously turn the ignition switch to "ACC" position.

HINT:

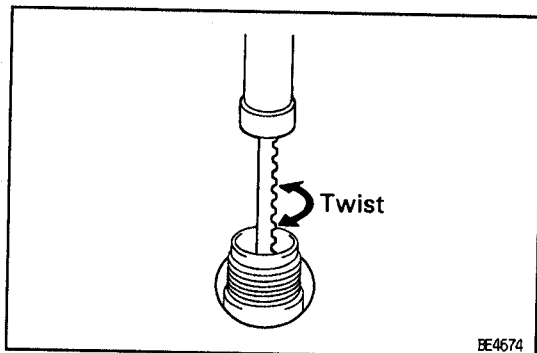
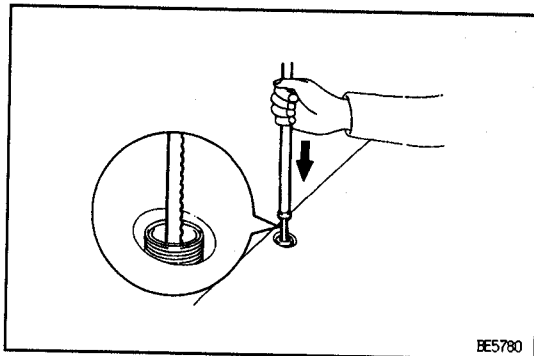
- The rod will extend fully and be released from the motor antenna.
- After removing the antenna rod, leave the ignition switch as "ACC".

NOTICE: To prevent body damage when the antenna rod is released, hold the rod while it comes out.

2. INSTALL ANTENNA ROD

- (a) Insert the cable of the rod until it reaches the bottom.

HINT: When inserting the cable, the teeth on the cable must face toward the front of the vehicle.



- (b) Wind the cable to retract the rod by turning the ignition switch to "LOCK" position.

HINT:

- In case the cable is not wound, twist it as shown in the illustration.
- Even if the rod has not retracted fully, install the antenna nut and inspect the antenna rod operation. It will finally retract fully.

- (c) Inspect the antenna rod operation by pushing the radio wave band select buttons.

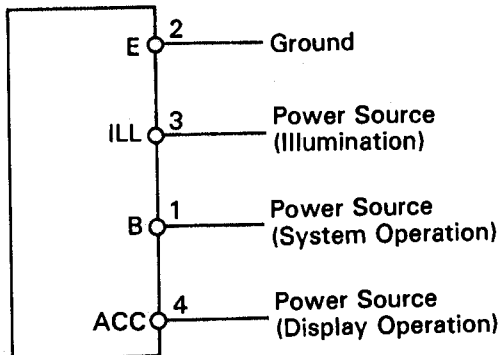
CLOCK TROUBLESHOOTING

BE02V-06

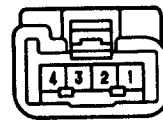
HINT: Troubleshoot the clock according to the table below.

Clock will not operate	1
Clock loses or gains time	2

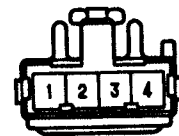
± 1.5 seconds / day



Connector
(Clock Side)



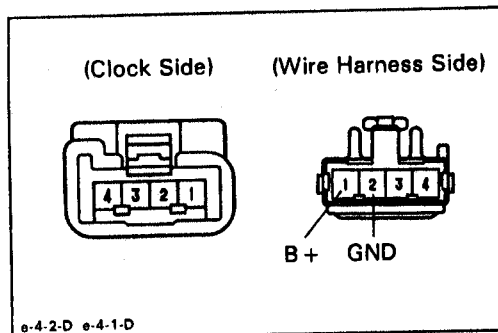
(Wire Harness Side)



BE1847 e-4-2-D e-4-1-D

Z04388

1 CLOCK WILL NOT OPERATE



- Check that the battery positive voltage is 10 — 16 V. If voltage is not as specified, replace the battery.
- Check that the DOME fuse is not blown. If the fuse is blown, replace the fuse and check for short.
- Troubleshoot the clock as follows.

HINT: Inspect the connector on the wire harness side.

Is there battery positive voltage between terminal B+ and body ground?

No

Open or short circuit in wire harness between terminal B+ and DOME fuse.

Yes

Is there continuity between terminal GND and body ground?

No

Open circuit in wire harness between terminal GND and body ground.

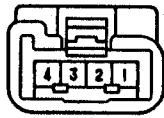
Yes

Replace clock.

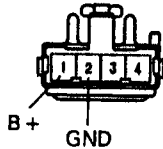
BE

2 CLOCK LOSES OR GAINS TIME

(Clock Side)



(Wire Harness Side)

e-4-2-D
e-4-1-D

- (a) Check that the battery positive voltage is 10 — 16 V.
If voltage is not as specified, replace the battery.
- (b) Inspect the error of the clock.
Allowable error (per day): ± 1.5 seconds
If the error exceeds the allowable error, replace the clock.
- (c) Check that the clock adjusting button is sticking in position and has failed to return.
If the button is not returned, repair or replace the clock.
- (d) Troubleshoot the clock as follows.

HINT: Inspect the connector on the wire harness side.

Is there 10 — 16 V between terminal B+ and body ground?

Below 10 V

Locate cause and repair, or recharge battery.

Yes

Adjust or replace clock.

W04422

CRUISE CONTROL SYSTEM

HOW TO PROCEED WITH

TROUBLESHOOTING	BE— 79
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SYMPTOMS	BE— 88

CIRCUIT INSPECTION

DTC. Code 11, 14 Actuator Motor	
Circuit	BE— 89
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Sensor Circuit	BE— 93
DTC. Code 21, 23 Vehicle Speed	
Sensor Circuit	BE— 96
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Clutch Switch Circuit	BE— 109
ECU Power Source Circuit	BE— 110
Back-up Power Source Circuit	BE— 112
Main Switch Circuit	BE— 114
Tc Circuit	BE— 116

ACTUATOR CONTROL CABLE

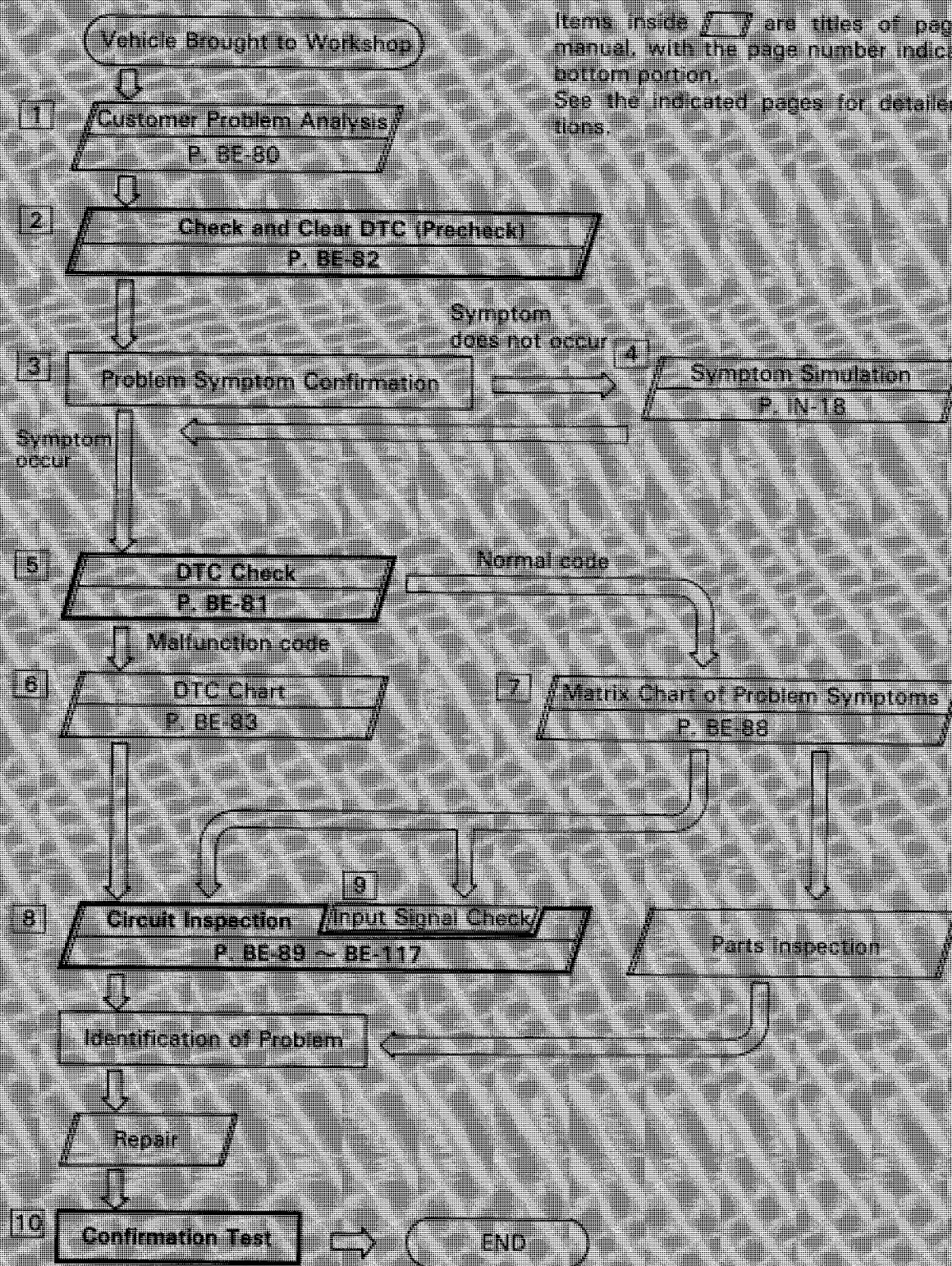
INSPECTION	BE— 117
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HOW TO PROCEED WITH TROUBLESHOOTING

Perform troubleshooting in accordance with the procedure on the following page.

Items inside are titles of pages in this manual, with the page number indicated in the bottom portion.

See the indicated pages for detailed explanations.



Step 2 , 5 , 8 , 10 : Diagnostic steps permitting the use of the TOYOTA hand-held tester or TOYOTA break-out-box.

CUSTOMER PROBLEM ANALYSIS

CRUISE CONTROL Check Sheet

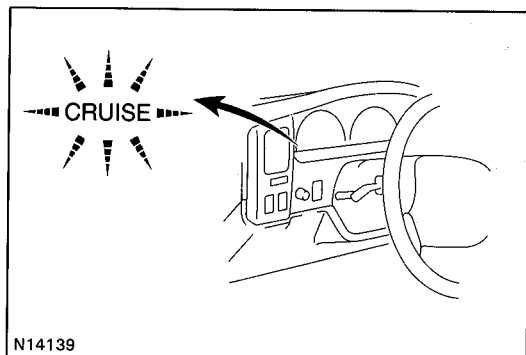
Inspector's:
Name _____

Customer's Name		Registration No.	
		Registration Year	/ /
		Frame No.	
Date Vehicle Brought In	/ /	Odometer Reading	km miles

Date Problem First Occurred	/ /
How Often Does Problem Occur?	☐ Continuous ☐ Intermittent (Times a day)
Vehicle Speed When Problem Occurred	km/h mph

Symptoms	☐ Auto cancel occurs	• Driving condition ☐ City driving ☐ Free way ☐ Up hill ☐ Down hill • After cancel occurred, did the driver activate cruise control again ? ☐ Yes ☐ No
	☐ Cancel does not occur	☐ With brake ON ☐ Except D position shift ☐ At about 40 km/h (25 mph) or less ☐ When control SW turns to CANCEL position
	☐ Cruise control malfunction	☐ Vehicle speed increases ☐ Vehicle speed decreases ☐ Hunting occurs ☐ O/D cut off does not occur ☐ O/D does not return
	☐ Switch malfunction	☐ SET ☐ ACCEL. ☐ COAST ☐ RESUME ☐ CANCEL
	☐ Faulty CRUISE MAIN indicator light	☐ Remains ON ☐ Does not light up ☐ Blinking

Diagnostic Trouble Code Check	1st Time	☐ Normal Code ☐ Malfunction Code (Code)
	2nd Time	☐ Normal Code ☐ Malfunction Code (Code)



DIAGNOSIS SYSTEM

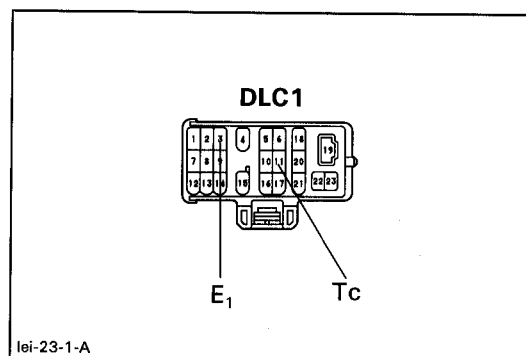
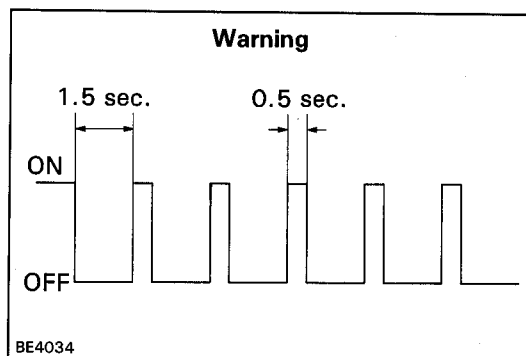
INDICATOR CHECK

1. Turn the ignition switch ON.
2. Check that the CRUISE MAIN indicator light comes on when the cruise control main switch is turned ON, and that the indicator light goes off when the main switch is turned OFF.

HINT: If the indicator check result is not normal, proceed to troubleshooting (See page BE-33) for the combination meter section.

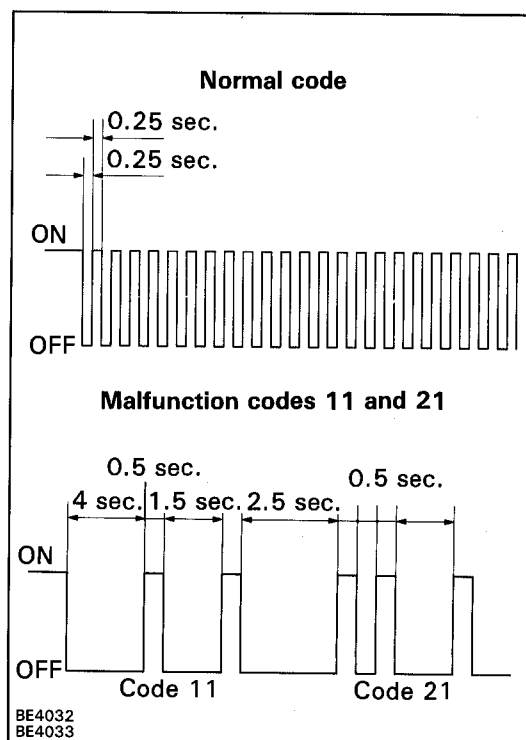
DTC CHECK

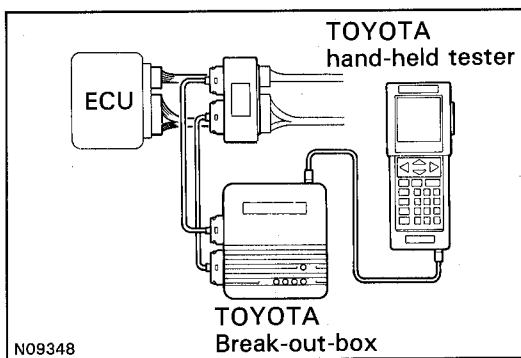
HINT: If a malfunction occurs in the vehicle speed sensors of actuator, etc. during cruise control driving, the ECU actuates AUTO CANCEL of the cruise control and blinks the CRUISE MAIN indicator light to inform the driver of a malfunction. At the same time, the malfunction is stored in memory as a DTC.



Output of DTC

1. Turn the ignition switch ON.
2. Using SST, connect terminals Tc and E₁ of DLC 1. SST 09843-18020
3. Read the DTC on the CRUISE MAIN indicator light.
HINT: If the DTC is not output, inspect the diagnosis circuit (See page BE-114).
As an example, the blinking patterns for codes; normal, 11 and 21 are shown in the illustration.
4. Check for the problem using the DTC table on the next page.
5. After completing the check, disconnect terminals Tc and E₁, and turn off the display.





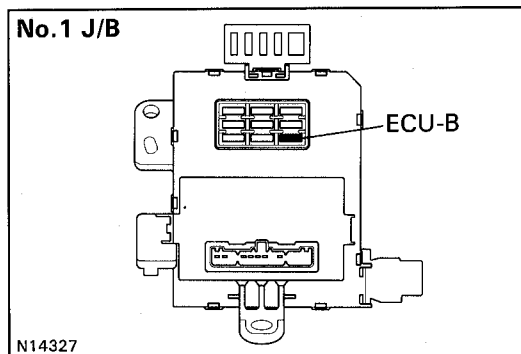
ECU TERMINAL VALUES MEASUREMENT USING TOYOTA BREAK-OUT-BOX AND TOYOTA HAND-HELD TESTER

- (a) Hook up the TOYOTA break-out-box and TOYOTA hand-held tester to the vehicle.
- (b) Read the ECU input/output values by following the prompts on the scan tool screen.

HINT: TOYOTA hand-held tester has a "Snapshot" function.

This records the measured values and is effective in the diagnosis of intermittent problems.

Please refer to the TOYOTA hand-held tester/TOYOTA break-out-box operator's manual for further details.



DTC CLEARANCE

1. After completing repairs, the DTC retained in memory can be cleared by removing the ECU-B fuse for 10 seconds or more, with the ignition switch off.
2. Check that the normal code is displayed after connecting the fuse.

DTC CHART

If a malfunction code is displayed during the DTC check, check the circuit listed for that code in the table below and proceed to the appropriate page.

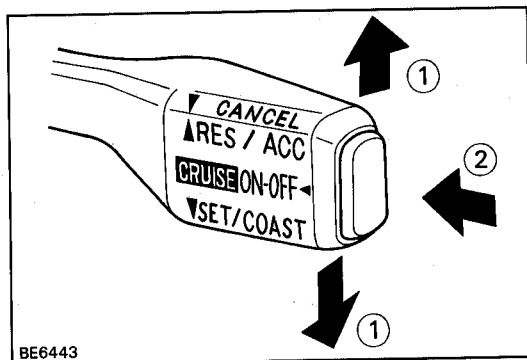
DTC No. (See page)	Detection Item	Trouble Area
—	• Normal	—
11 (BE-89)	• Actuator Motor Circuit	• Cruise control actuator motor • Harness or connector between actuator motor and Cruise Control ECU • Cruise Control ECU
12 (BE-91)	• Actuator Magnetic Clutch Circuit	• Cruise control magnetic clutch • Harness or connector between Cruise Control ECU and magnetic clutch and body ground • Cruise Control ECU
13 (BE-93)	• Actuator Position Sensor Circuit • Open in STOP Fuse	• Cruise control actuator motor • Cruise control actuator position sensor • Harness or connector between actuator position sensor and body ground • Harness or connector between actuator motor and Cruise Control ECU • Cruise Control ECU
14 (BE-89) (BE-93)	• Actuator Motor Circuit • Actuator Position Sensor Circuit	
21 (BE-96)	• Vehicle Speed Sensor	• Vehicle speed sensor • Combination meter • Harness or connector between vehicle speed sensor and combination meter, combination meter and Cruise Control ECU • Cruise Control ECU
*23 (BE-96)	• Actuator Control Cable • Vehicle Speed Sensor Circuit	• Actuator • Vehicle speed sensor • Harness or connector in OD and SPD circuit (Open or short intermittently) • Cruise Control ECU
32, 34 (BE-97)	• Control Switch Circuit (Cruise Control Switch)	• Cruise control switch • Harness or connector between control switch and Cruise Control ECU • Cruise Control ECU
41	• Cruise Control ECU	• Cruise Control ECU
42	• Source Voltage Drop	• Battery

HINT:

1. When 2 or more codes are indicated, the lowest numbered code will be displayed first.
2. If the inspection "Proceed to next circuit inspection shown on matrix chart" is given in the flow chart for each circuit, proceed to the circuit with the next highest number in the table to continue check.
3. If the trouble still reappears even though there are no abnormalities in any of the other circuits, then check or replace the cruise control ECU as the last step.

(*): When the vehicle speed decreases on uphill roads, the speed can be set again and driving continued.

(This is not a malfunction.)



BE6443

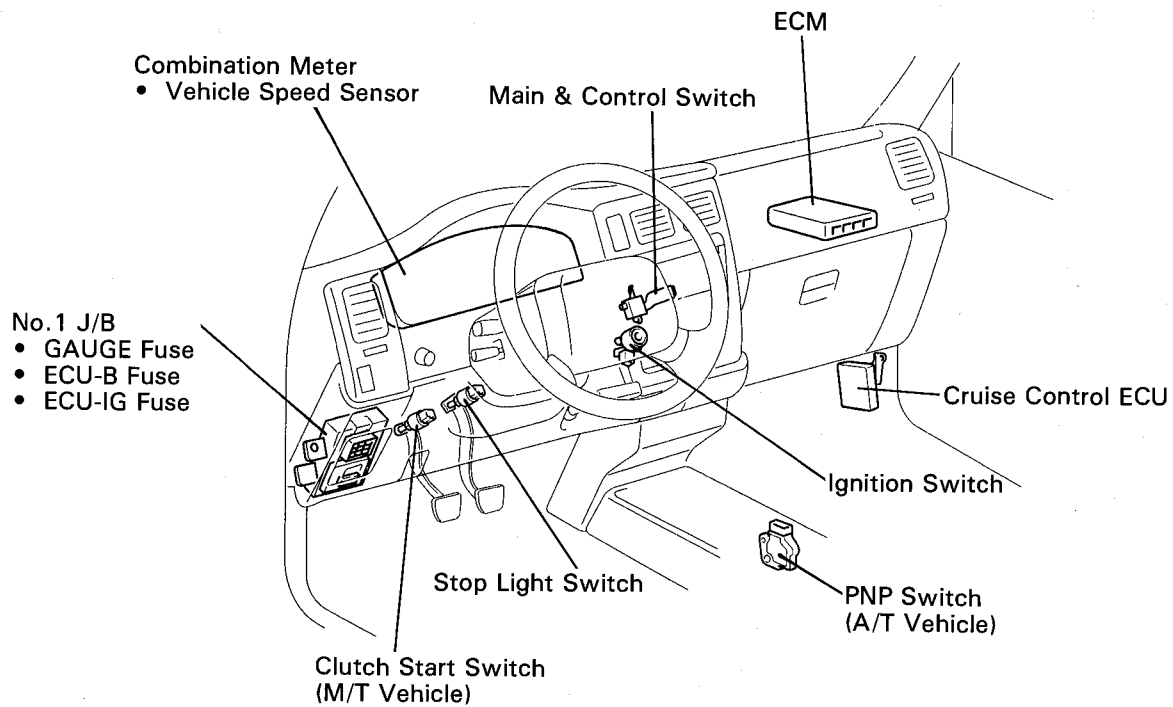
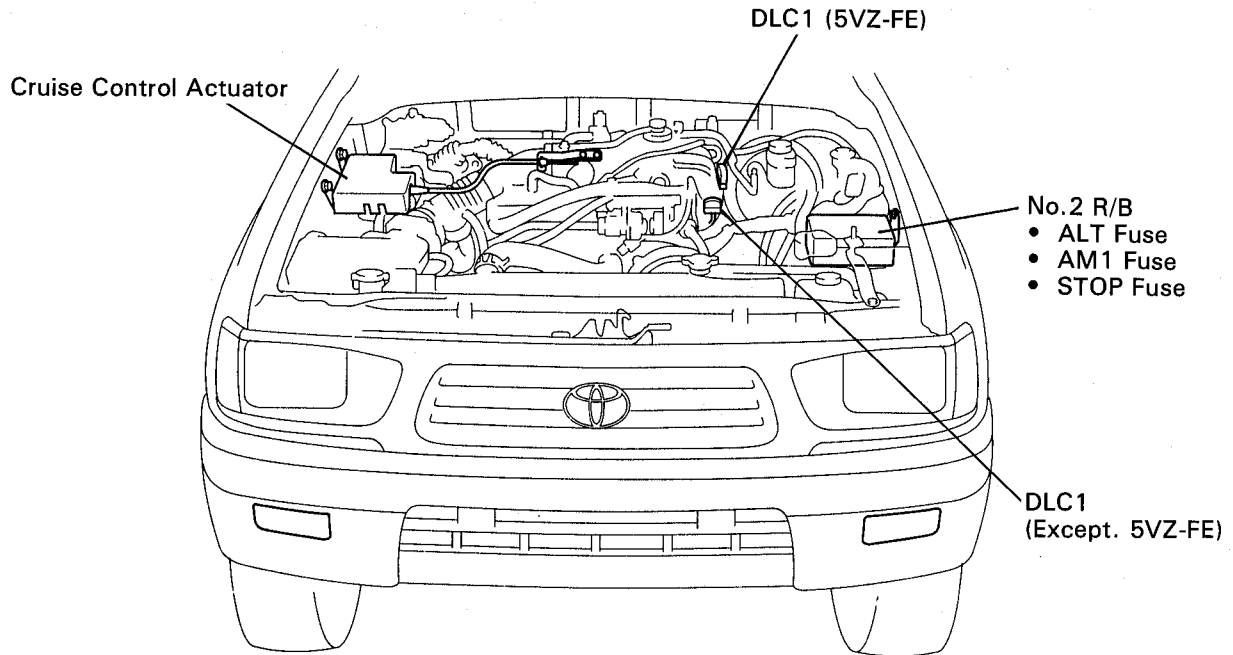
INPUT SIGNAL CHECK

Output of Code

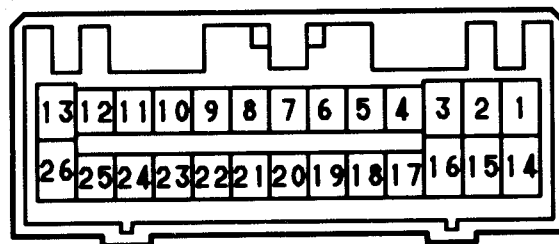
1. (a) For check No.1 ~ No.2.
Turn the ignition switch ON.
 - (b) For check No.3
① Turn ignition switch ON.
② Shift to D position. (A/T Vehicle)
 - (c) For check No.4
① Jack up the vehicle.
② Start the engine.
③ Shift to D position. (A/T Vehicle)
 2. Press the control switch to SET/COAST or RES/ACC position and hold it down or hold it up ①.
 3. Push the main switch ON ②.
 4. Check that the CRUISE MAIN indicator light blinks twice or 3 times repeatedly after 3 seconds.
 5. Turn the SET/COAST or RES/ACC switch OFF.
 6. Operate each switch as listed in the table below.
 7. Read the blinking pattern of the CRUISE MAIN indicator light.
 8. After performing the check, turn the main switch OFF.
- HINT: When 2 or more signals are input to the ECU, the lowest numbered code will be displayed first.

No.	Operation Method	CRUISE MAIN Indicator Light Blinking Pattern	Diagnosis
1	Turn SET/COAST switch ON.	Light ON 0.25 0.25 BE4006 OFF 1 sec.	SET/COAST switch circuit is normal.
2	Turn RES/ACC switch ON.	Light ON 1 sec. BE4006 OFF	RES/ACC switch circuit is normal.
3	Turn CANCEL switch ON.	Light ON 1 sec. BE4006 OFF	CANCEL switch circuit is normal.
	Turn stop light switch ON. (Depress brake pedal)		Stop light switch circuit is normal.
	Turn parking brake switch ON. (Pull up the parking brake lever)		Parking brake switch circuit is normal.
	Turn park/neutral position switch OFF. (Shift to except D position)	Light ON 1 sec. BE4006 OFF	Park/neutral position switch circuit is normal.
	Turn clutch switch OFF. (Depress clutch pedal)	Light ON 1 sec. BE4006 OFF	Clutch switch circuit is normal.
4	Drive at 40 km/h (25 mph) or higher.	Light ON 1 sec. BE4006 OFF	Vehicle speed sensor is normal.
	Drive at 40 km/h (25 mph) or below.	Light ON 1 sec. BE4006 OFF	

CRUISE CONTROL SYSTEM PARTS LOCATION



STANDARD VALUE OF ECU TERMINAL



vd-26-2-B

CRUISE Control ECU

Terminals	Symbols	Condition	Standard Value
2 – 13	D ↔ GND	(M/T) Depress clutch pedal. (A/T) Shift to except D position.	Below 1 V
		(M/T) Release clutch pedal. (A/T) Shift to D position.	10 – 14 V
7 – 13	Pi ↔ GND	IG ON. Main Switch ON. Main indicator light ON.	Below 1.2 V
		IG ON. Main Switch OFF. Main indicator light OFF.	10 – 14 V
8 – 13	Tc ↔ GND	Ignition switch ON.	10 – 14 V
9 – 13	O/D ↔ GND	Except during cruise control driving.	10 – 14 V
		O/D switch ON. During cruise control driving. (Driving on flat road)	10 – 14 V
		O/D switch OFF. During cruise control driving. (3rd driving)	Below 1 V
10 – 13	L ↔ GND	During cruise control driving.	9 – 14 V
		Except during cruise control driving.	Below 1 V
11 – 13	MC ↔ GND	During cruise control driving. COAST switch hold ON.	9 – 14 V
		Except during cruise control driving.	Below 1 V
12 – 13	MO ↔ GND	During cruise control driving. ACCEL switch hold ON.	8 – 14 V
		Except during cruise control driving.	Below 1 V
13 – Body Ground	GND ↔ Body Ground	Always.	Below 1 V
14 – 13	B ↔ GND	Ignition switch ON.	10 – 14 V
15 – 13	BATT ↔ GND	Always.	10 – 14 V
16 – 13	STP- ↔ GND	Depress brake pedal.	10 – 14 V
		Release brake pedal.	Below 1.5 V

Terminals	Symbols	Condition	Standard Value
18 - 13	CCS ↔ GND	IG ON. Main switch ON. Switch neutral position.	10 - 14 V
		IG ON. Main switch ON. CANCEL switch hold ON.	4.1 - 7.2 V
		IG ON. Main switch ON. SET/COAST switch hold ON.	2.3 - 4.6 V
		IG ON. Main switch ON. RESUME/ACCEL switch hold ON.	0.7 - 2.5 V
19 - 13	CMS ↔ GND	IG ON. Main switch hold ON. (Indicator light ON)	Below 2 V
		IG ON. Main switch OFF. (Indicator Light OFF)	10 - 14 V
20 - 13	SPD ↔ GND	IG ON. Main switch hold ON. (Indicator light ON)	Below 1.5 V or 4 - 5.5 V
		During driving. (Pulse generated)	Repeatedly change Below 1.5 V to 4 - 5
21 - 13	IDL ↔ GND	IG ON. Throttle valve fully opened.	10 - 14 V
		IG ON. Throttle valve fully closed.	Below 2 V
22 - 13	ECT ↔ GND	Gear position O/D.	Below 1.0 V
		Gear position 3rd.	10 - 14 V
23 - 13	VR1 ↔ GND	Ignition switch ON.	4.5 - 5 V
24 - 25	VR2 ↔ VR3	During cruise control driving.	1 - 4.5 V
		IG ON. Control plate fully opened.	3.4 - 5.1 V
		IG ON. Control plate fully closed.	0.6 - 1.6 V
25 - 13	VR3 ↔ GND	Always.	Below 1 V
26 - 13	L - ↔ GND	Always.	Below 1 V

MATRIX CHART OF PROBLEM SYMPTOMS

If a normal code is displayed during the DTC check but the trouble still occurs (reappears), troubleshoot for each problem symptom, checking the circuits for each symptom in the order given in the table below. Proceed to the page indicated for each circuit.

HINT:

- HINT:**
1. If the instruction "Proceed to next circuit inspection shown on matrix chart" is given in the flow chart for each circuit, proceed to the circuit with the next highest number in the table to continue the check.
 2. If the trouble still reappears even though there are no abnormalities in any of the other circuits, then check or replace the cruise control ECU as the last step.

[illegible]

CIRCUIT INSPECTION

DTC

11, 14

Actuator Motor Circuit

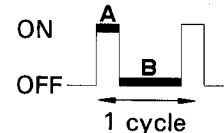
CIRCUIT DESCRIPTION

The actuator motor is operated by signals from the ECU. Acceleration and deceleration signals are transmitted by changes in the Duty Ratio (See note below).

Duty Ratio

The duty ratio is the ratio of the period of continuity in one cycle. For example, if A is the period of continuity in one cycle, and B is the period of non-continuity, then

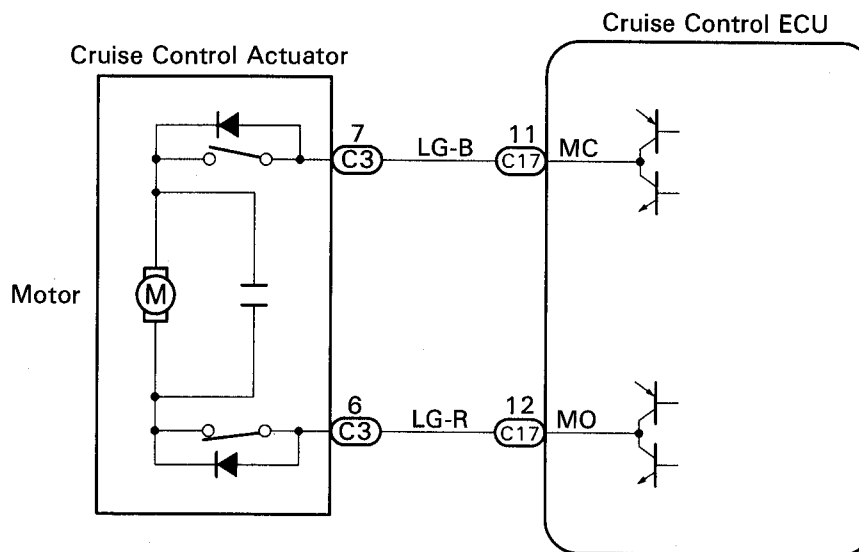
$$\text{Duty Ratio} = \frac{A}{A+B} \times 100 (\%)$$



BE4056

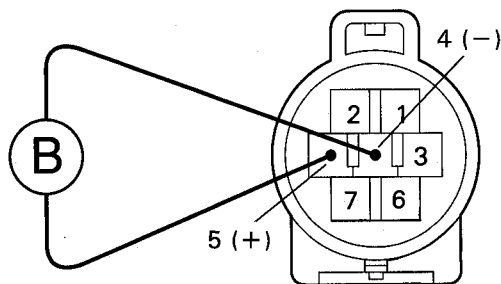
DTC No.	DTC Detecting Condition	Trouble area
11	• Short in motor circuit	• Cruise control actuator motor • Harness or connector between actuator motor and ECU • ECU
14	• Open in actuator motor circuit	

WIRING DIAGRAM

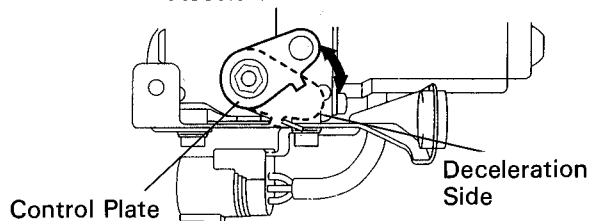


N14254

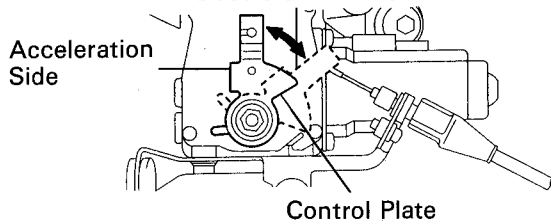
BE

1**Check actuator motor.****RZN Series Engine:**

Acceleration Side

**VZN Series Engine:**

Deceleration Side

N16042
N15972
N15973**P**

1. Remove cruise control actuator.
2. Disconnect actuator connector.

C

1. Connect positive (+) lead to terminal 5 and negative (−) lead to terminal 4 of actuator connector.
(Magnetic clutch ON)

NOTICE: Do not connect the high tension cables to the wrong battery terminal.

You will damage the cruise control actuator.

2. When battery positive voltage is applied to each of the actuator connector terminals check that the control plate moves smoothly without hesitating.

Terminal Moving direction	Connect			
	Positive (+)	Negative (−)	6	7
Acceleration side	○	○	○	○
Deceleration side	○	○	○	○

3. With the motor rotating as in 2., check that the motor is stopped by limit switches when the control plate moves to fully opened or fully closed position.

OK**NG**

Replace actuator assembly.

2**Check harness and connector between cruise control ECU and actuator motor (See page IN-24).****OK****NG**

Repair or replace harness or connector.

Proceed to next circuit inspection shown on matrix chart (See page BE-88).
However, when DTC 11, 23 is displayed, check and replace cruise control ECU.

DTC

12

Actuator Magnetic Clutch Circuit

CIRCUIT DESCRIPTION

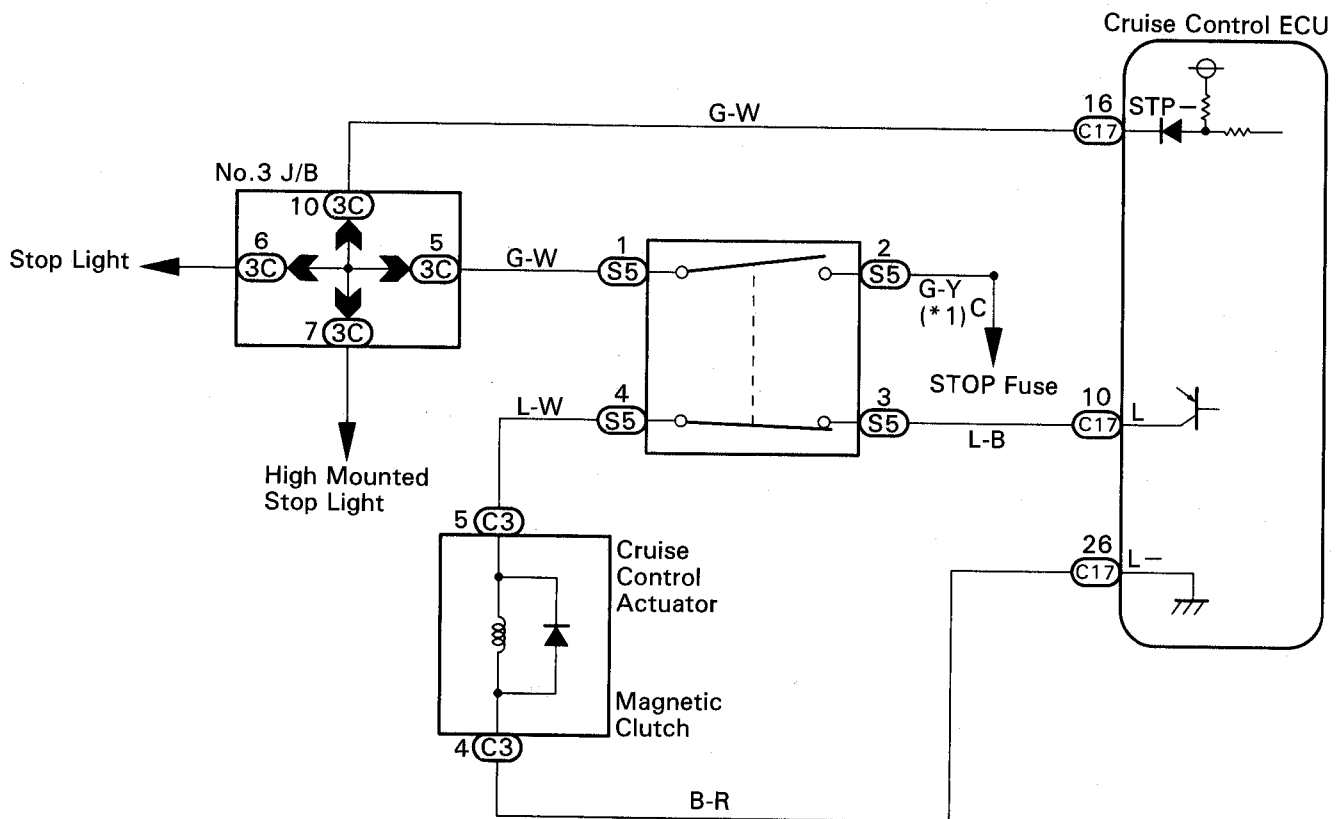
This circuit turns on the magnetic clutch inside the actuator during cruise control operation according to the signal from the ECU. If a malfunction occurs in the actuator or vehicle speed sensor, etc. during cruise control, the rotor shaft between the motor and control plate is released.

When the brake pedal is depressed, the stoplight switch turns on, supplying electrical power to the stoplight. Power supply to the magnetic clutch is mechanically cut and the magnetic clutch is turned OFF.

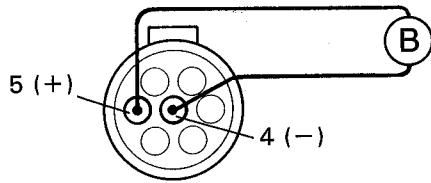
When driving downhill, if the vehicle speed exceeds the set speed by 15 km/h (9 mph), the ECU turns the magnetic clutch OFF. If the vehicle speed later drops to within 10 km/h (6 mph) above the set speed, then cruise control at the set speed is resumed.

DTC No.	DTC Detecting Condition	Trouble area
12	- Short in magnetic clutch circuit. - Open (0.8 sec) in magnetic clutch circuit. - Open in STOP Fuse.	- Cruise control magnetic clutch. - Harness or connector between ECU and magnetic clutch, magnetic clutch and body ground. - ECU

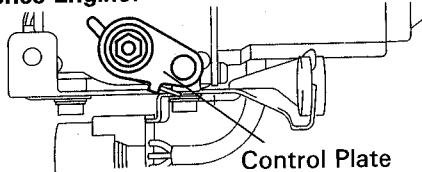
WIRING DIAGRAM



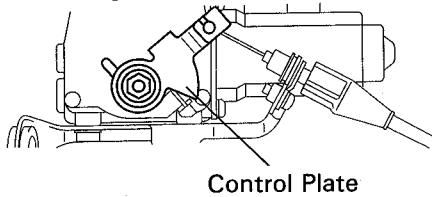
INSPECTION PROCEDURE

1 Check actuator magnetic clutch.

RZN Series Engine:



VZN Series Engine:

N15956
N16043
N16044

OK

- P** (1) Remove cruise control actuator.
(2) Disconnect actuator connector.

C Move the control plate by hand.

OK Control plate moves. (Magnetic clutch off)

- C** (1) Connect positive $\oplus$ lead to terminal 5 and negative $\ominus$ lead to terminal 4 of actuator connector.

(2) Move the control plate by hand.

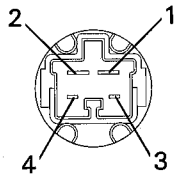
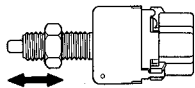
NOTICE: Do not connect the high tension cables to the wrong battery terminal.
You will damage the cruise control actuator.

OK Control plate does not move. (Magnetic clutch on)

NG Replace actuator assembly.

2 Check stop light switch.

Switch pin



BE1444 BE6234

OK

- P** Disconnect stop light switch connector.

C Check continuity between terminals.

Terminals	Continuity			
	1	2	3	4
Switch position				
Switch pin free (Brake pedal depressed)	○—○			
Switch pin pushed in (Brake pedal released)			○—○	

NG Replace stop light switch.

3 Check for open and short in harness and connectors between ECU and stop light switch, stop light switch and magnetic clutch, magnetic clutch and body ground (See page IN-28).

OK

NG Repair or replace harness or connector.

Proceed to next circuit inspection shown on matrix chart (See page BE-88).
However, when DTC 12 is displayed, check harness and connector for loose connection.
If connection is normal, check and replace ECU.

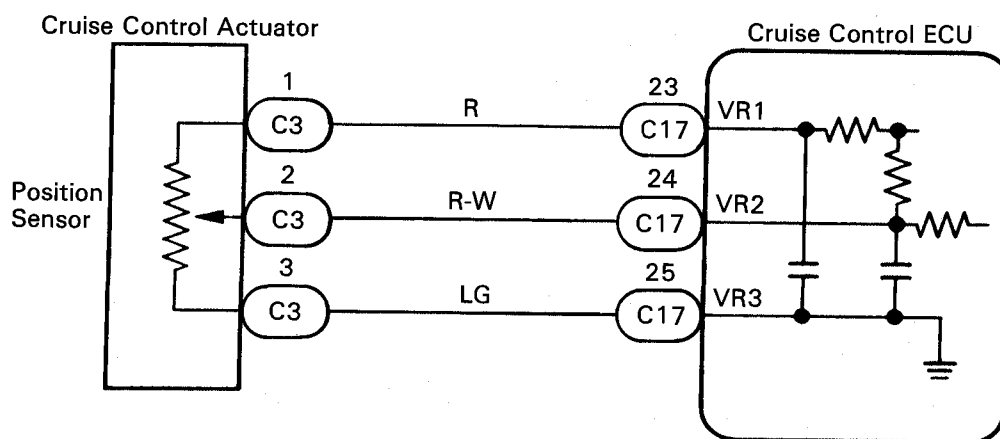
DTC 13, 14 Actuator Position Sensor Circuit

CIRCUIT DESCRIPTION

The circuit detects the rotation position of the actuator control plate and sends a signal to the ECU.

DTC No.	DTC Detecting Condition	Trouble area
13	Position sensor detects abnormal voltage.	- Cruise control actuator motor. - Cruise control actuator position sensor. - Harness or connector between actuator position sensor and body ground. - Harness or connector between actuator motor and ECU. - ECU
14	- Open in actuator motor circuit. - Position sensor signal value does not change when the motor operates.	

WIRING DIAGRAM



INSPECTION PROCEDURE

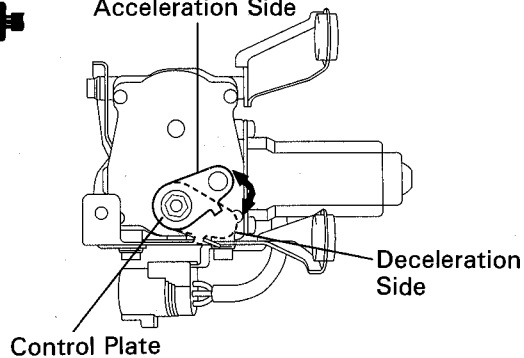
1

Check voltage between terminals VR2 and VR3 of ECU connector.

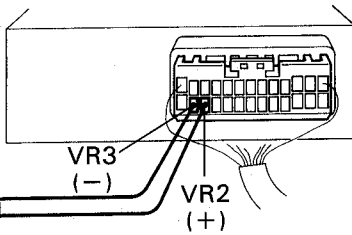
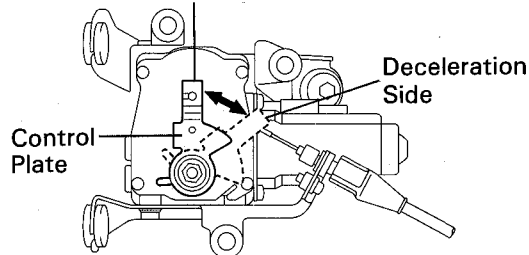
ON

**RZN Series Engine:**

Acceleration Side

**VZN Series Engine:**

Acceleration Side



BE3840
N14255
N14256
N15957

**P**

Remove ECU with connectors still connected.

C

(1) Turn ignition switch ON.

(2) Measure voltage between terminals VR2 and VR3 of ECU connector while turning control plate slowly by hand from the deceleration side to the acceleration side.

OK

Voltage:

Fully closed: Approx. 1.3 V

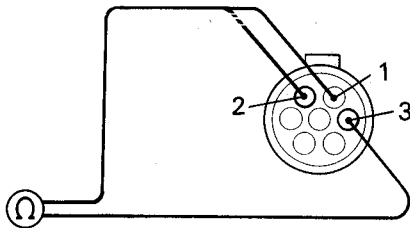
Fully opened: Approx. 4.6 V

Note: As the control plate is turned, the voltage should increase gradually without interruption.

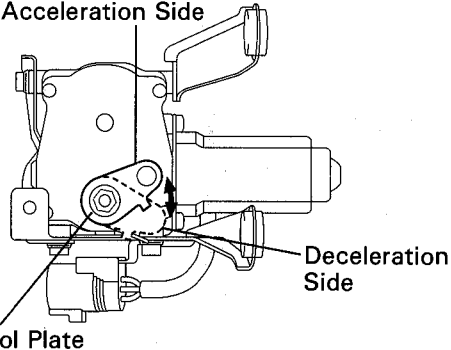
NG

OK

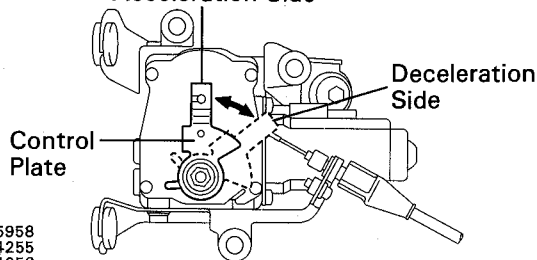
Proceed to next circuit inspection shown on matrix chart (See page BE-88).

2**Check actuator position sensor.****RZN Series Engine:**

Acceleration Side

**VZN Series Engine:**

Acceleration Side

N15958
N14255
N14256**P**

- (1) Remove cruise control actuator.
- (2) Disconnect actuator connector.

C

Measure resistance between actuator terminals 1 and 3 of actuator connector.

OK

Resistance: Approx. 2.2 kΩ

C

Measure resistance between terminals 2 and 3 of actuator connector while turning the control plate slowly by hand from the deceleration side to the acceleration side.

OK

Resistance:

Fully closed: Approx. 530 Ω

Fully opened: Approx. 2.0 kΩ

Note: As the control plate turns, the resistance should increase gradually without interruption.

OK**NG**

Replace actuator assembly.

3**Check for open and short in harness and connector between ECU and actuator position sensor (See page IN-28).****OK****NG**

Repair or replace harness or connector.

Check harness and connector for loose connection.
If connection is normal check and replace ECU.

DTC

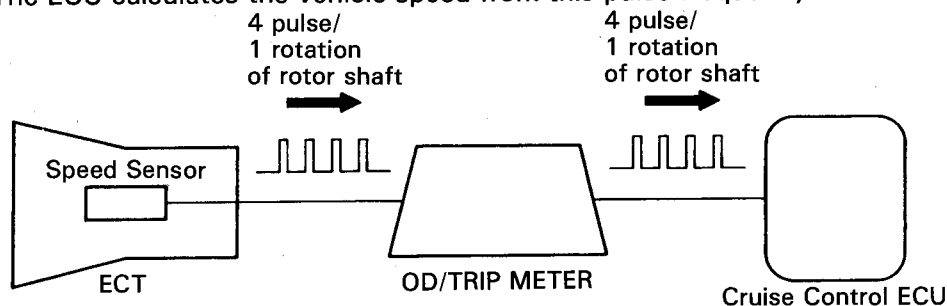
21, 23

Vehicle Speed Sensor Circuit

CIRCUIT DESCRIPTION

The vehicle speed sensor signal is sent to the cruise control ECU as the vehicle speed signal. The rotor shaft is driven by the gear of the transmission.

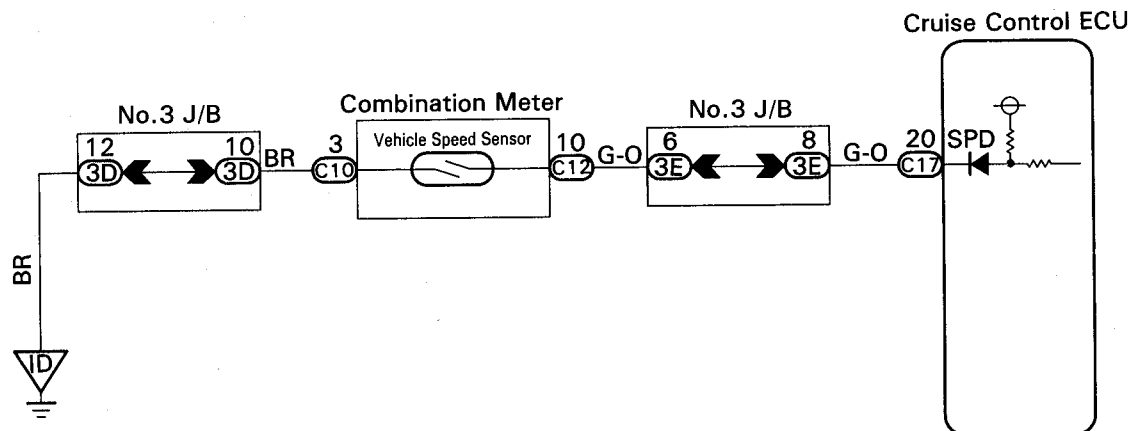
For each rotation of the shaft, the vehicle speed sensor sends a 4-pulse signal to the combination meter. This signal is converted inside the combination meter and sent as a 4-pulse signal to the cruise control ECU. The ECU calculates the vehicle speed from this pulse frequency.



N10528

DTC No.	DTC Detecting Condition	Trouble area
21	Speed signal is not input to the ECU while cruise control is set.	- Vehicle speed sensor - Combination meter - Harness or connector between speed sensor and combination meter, combination meter and ECU - ECU
23	- Vehicle speed decrease 16 km/h or more than preset speed. - Vehicle speed sensor pulse is abnormal.	- Actuator - Vehicle speed sensor - Harness or connector in OD and SPD circuit (Open or short intermittently) - ECU

WIRING DIAGRAM

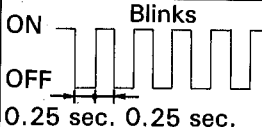
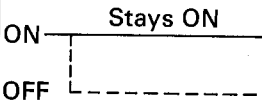


N14259

INSPECTION PROCEDURE

1

Input signal check.

Vehicle speed	Indicator light blinking pattern
Above 40 km/h (25 mph)	
Below 40 km/h (25 mph)	

BE4006

C

- (1) See input signal check on page BE-84.
 (2) Check indicator light operation when driving with vehicle speed above 40 km/h (25 mph), and with vehicle speed below 40 km/h (25 mph).

OK

Vehicle speed above 40 km/h (25 mph):
 Indicator light blinks
 Vehicle speed below 40 km/h (25 mph):
 Indicator light stays on

NG

OK

Proceed to next circuit inspection shown on matrix chart (See page BE-88).

2

Check speedometer circuit (See combination meter troubleshooting on page BE-33).

OK

NG

Repair or replace speed sensor, harness, connector or combination meter assembly.

Check harness and connector for loose connection.
 If connection is normal, check and replace ECU.

DTC

32, 34

Control Switch Circuit
(Cruise Control Switch)

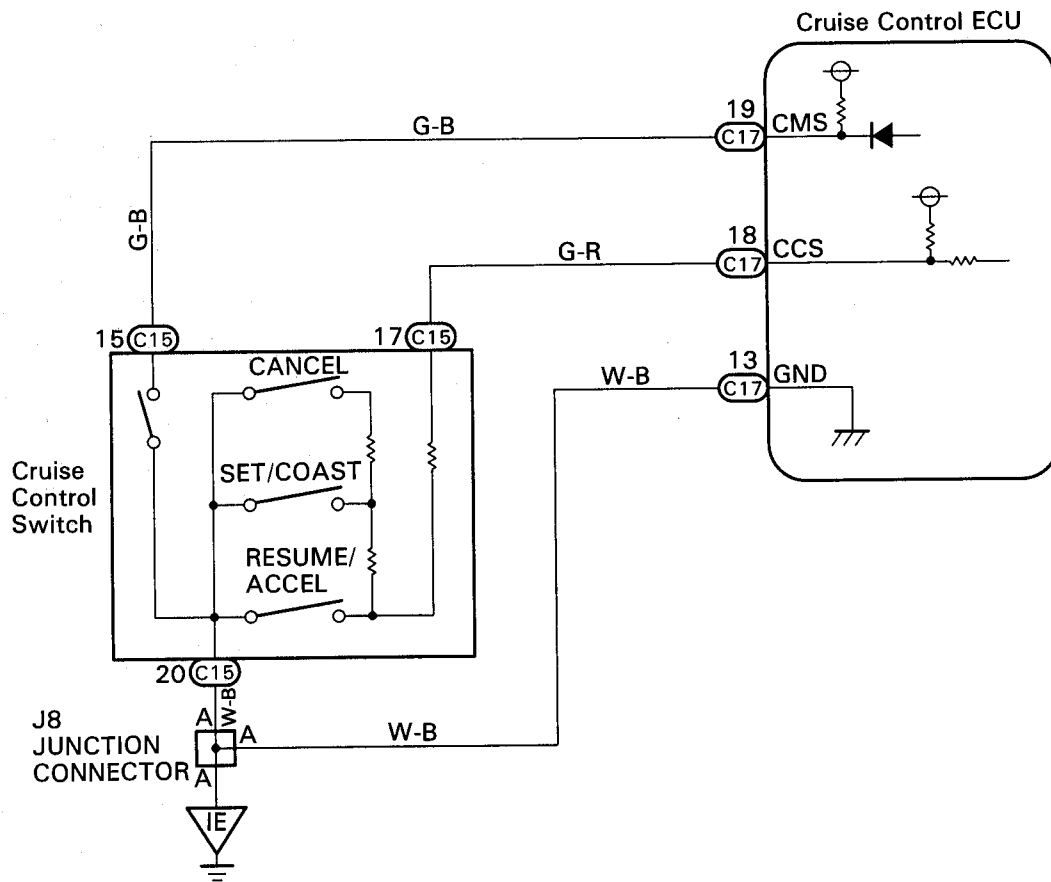
CIRCUIT DESCRIPTION

This circuit carries the SET/COAST, RESUME/ACCEL and CANCEL signals (each voltage) to the ECU.

DTC No.	DTC Detecting Condition	Trouble area
32	Short in, control switch circuit	• Cruise control switch. • Harness or connector between control switch and ECU. • ECU
34	Voltage abnormality in control switch	

BE

WIRING DIAGRAM

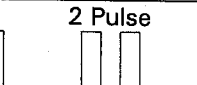
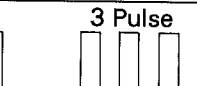
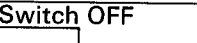


N14260

INSPECTION PROCEDURE

1

Input signal check.

Input Signal	Indicator light blinking pattern
SET/COAST SWITCH	ON  OFF
RESUME/ACCEL SWITCH	ON  OFF
CANCEL SWITCH	ON  OFF 

BE4006

P

- (1) See input signal check on page BE-84.
- (2) Check the indicator light operation when each of the SET/COAST, RESUME/ACCEL and CANCEL is turned ON.

OK

SET/COAST, RESUME/ACCEL Switch

The signals shown in the table on the left should be output when each switch is ON. The signal should disappear when the switch is turned OFF.

CANCEL Switch.

The indicator light goes off when the cancel switch is turned ON.

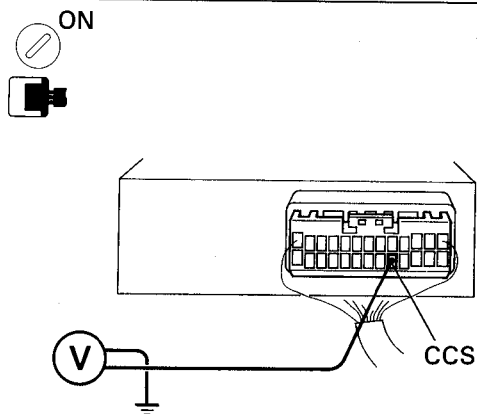
NG

OK

Proceed to next circuit inspection shown on matrix chart (See page BE-88).

2

Check voltage between terminal CCS of ECU connector and body ground.

BE3840
N15959

P

Remove ECU with connectors still connected.

C

- (1) Turn ignition switch ON.
- (2) Measure voltage between terminal CCS of ECU connector and body ground, when each of the SET/COAST, RESUME/ACCEL and CANCEL is turned ON.

OK

Switch position	Voltage
Neutral	10 – 14 V
RES/ACC	0.7 – 2.5 V
SET/COAST	2.3 – 4.6 V
CANCEL	4.1 – 7.2 V

NG

OK

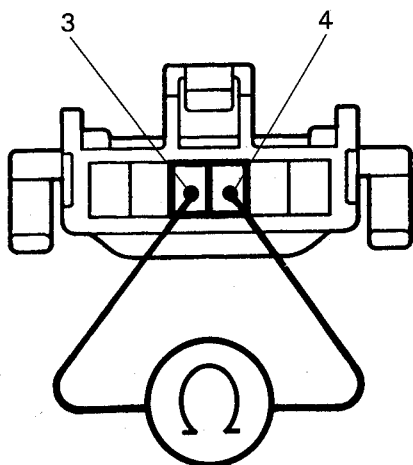
Proceed to next circuit inspection shown on matrix chart (See page BE-88).

Go to step 3 .

3 Check control switch.



Disconnect

BE4061
N16045

- P** 1. Remove steering wheel center pad.
2. Disconnect control switch connector (See page SR-13).

- C** Measure resistance between terminals 3 and 4 of control switch connector when control switch is operated.

OK

Switch position	Resistance
Neutral	1 M Ω or higher
RES/ACC	60 – 80 Ω
SET/COAST	180 – 220 Ω
CANCEL	400 – 440 Ω

Hint When diagnostic trouble code 34 is displayed, carefully check that resistance is always ∞ in neutral position, particularly when switching between RES/ACC and SET/COAST.

OK

NG Replace cruise control switch.

4

Check for open and short in harness and connector between ECU and control switch (See page IN-28).

OK

NG Repair or replace harness or connector.

Check and replace ECU.

Stop Light Switch Circuit

CIRCUIT DESCRIPTION

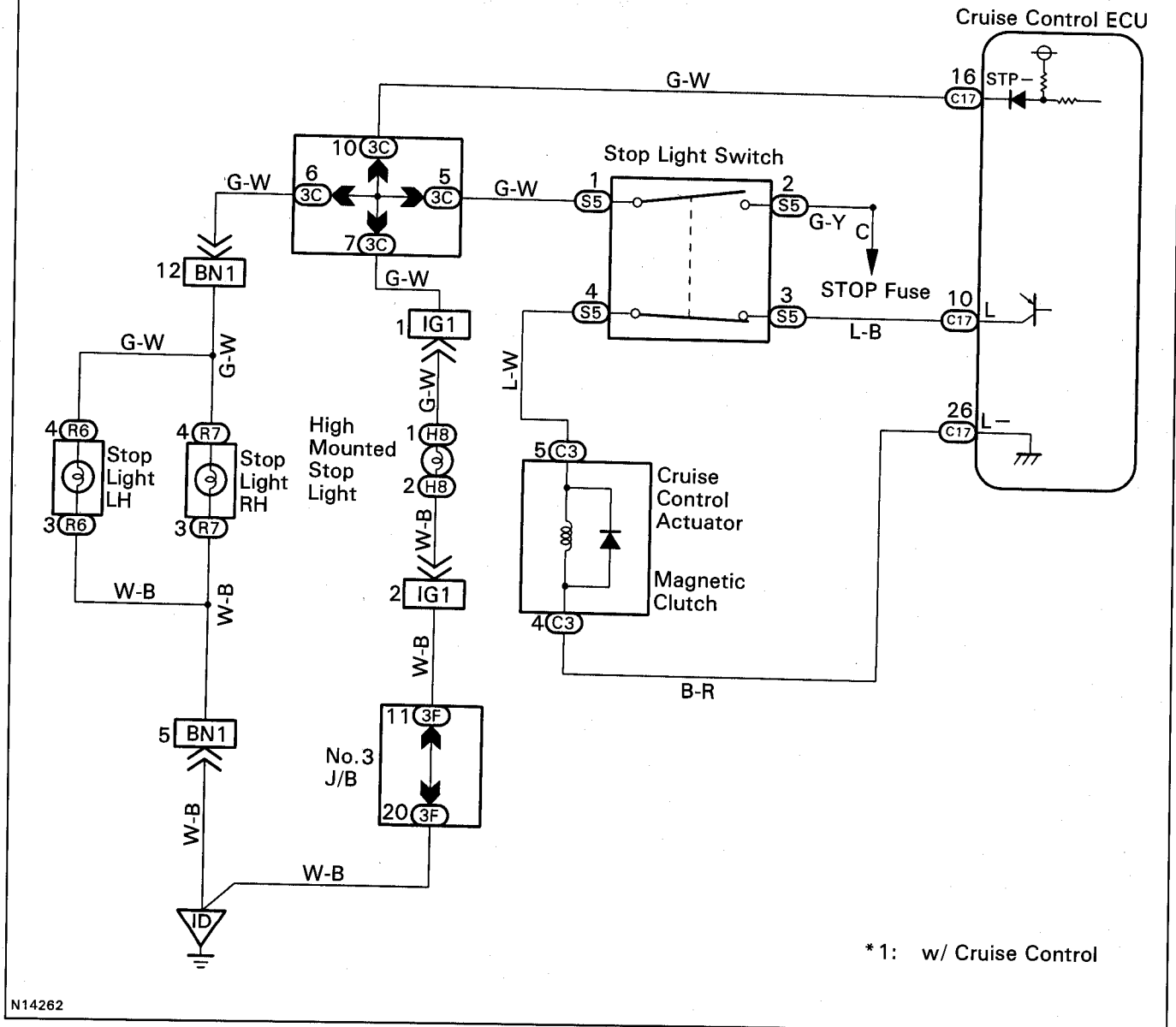
When the brake is on, battery voltage normally applies through the stop fuse and stop switch to terminal STP– of the ECU, and the ECU turns the cruise control off.

A fail-safe function is provided so that cancel functions normally even if there is a malfunction in the stop light signal circuit.

- ① If the harness connected to terminal STP– has an open, terminal STP– will have battery positive voltage and the cruise control will be turned off, also SET not occurring.
- ② The STP signal is not input because of the fuse disconnection, the clutch disconnecting signal is detected by the cruise control ECU and 1–2 code is output.
Thus, 1–2 code also means the STP fuse disconnection.

Also, when the brake is on, the magnetic clutch is cut electrically by the stop light switch, turning the cruise control off. (See page BE-92 for operation of the magnetic clutch.)

WIRING DIAGRAM



INSPECTION PROCEDURE

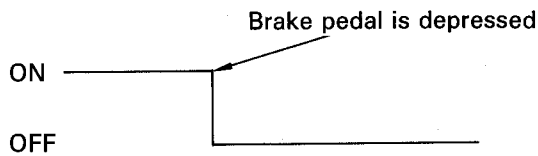
1 Check operation of stop light.

- C** Check that stop light comes on when brake pedal is depressed, and turns off when brake pedal is released.

OK

NG

Check stop light circuit.

2**Input signal check.**

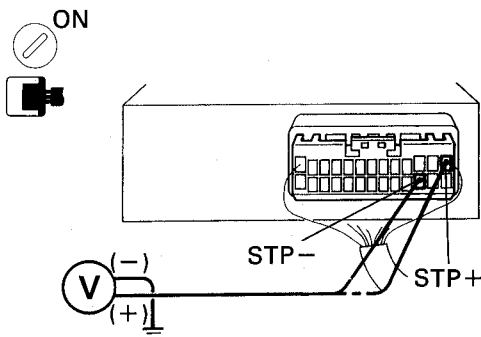
BE4006

NG

- C** (1) See input signal check on page BE-84.
(2) Check the indicator light when the brake pedal is depressed.

OK The indicator light goes off when the brake pedal is depressed.

OK Proceed to next circuit inspection shown on matrix chart (See page BE-88).

3**Check voltage between terminal STP+, STP- of ECU connector and body ground.**BE3840
N15960**NG**

- P** Remove ECU with connectors still connected.

- C** (1) Turn ignition switch ON.
(2) Measure voltage between terminal STP+, STP- of ECU connector and body ground when the brake pedal is depressed and released.

	STP+	STP-
Depressed	10 - 14 V	10 - 14 V
Released	10 - 14 V	Below 1 V

OK Proceed to next circuit inspection shown on matrix chart (See page BE-88).

4**Check for open in harness and connectors between terminal STP+ of ECU and stop light switch, terminal STP- of ECU and stop light switch (See page IN-26).****OK**

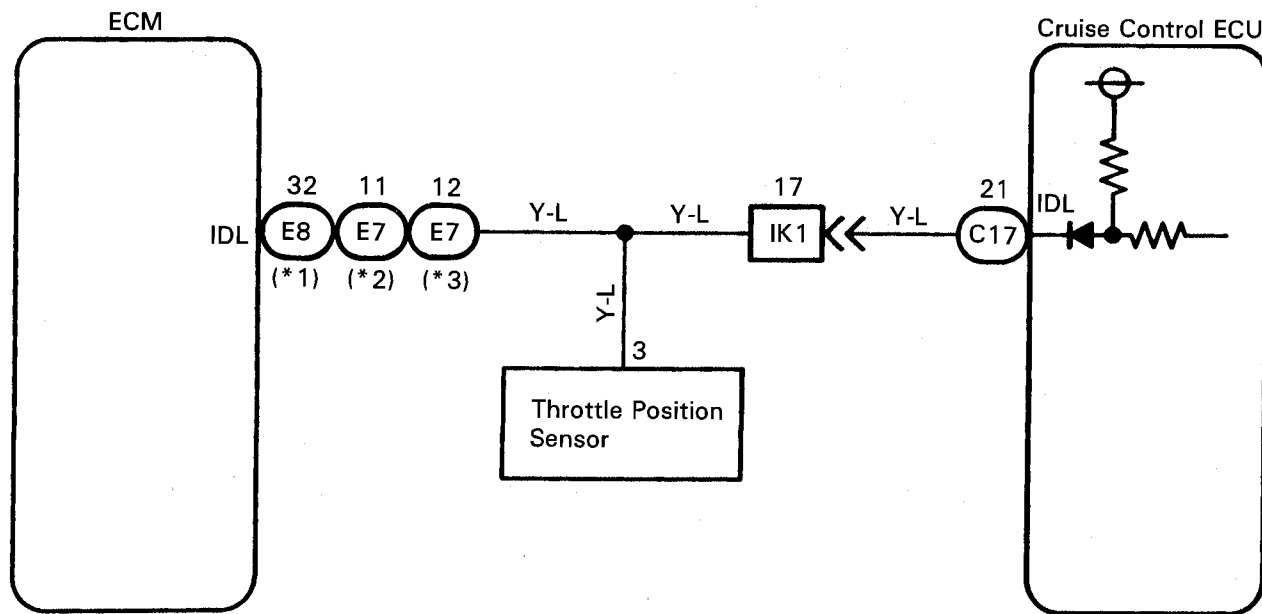
NG Repair or replace harness or connector.

Check and replace ECU.

Idle Switch Circuit**CIRCUIT DESCRIPTION**

When the idle switch is turned ON, a signal is sent to the ECU. The ECU uses this signal to correct the discrepancy between the throttle valve position and the actuator position sensor value to enable accurate cruise control at the set speed. If the idle switch is malfunctioning, problem symptoms also occur in the engine, so also inspect the engine.

WIRING DIAGRAM



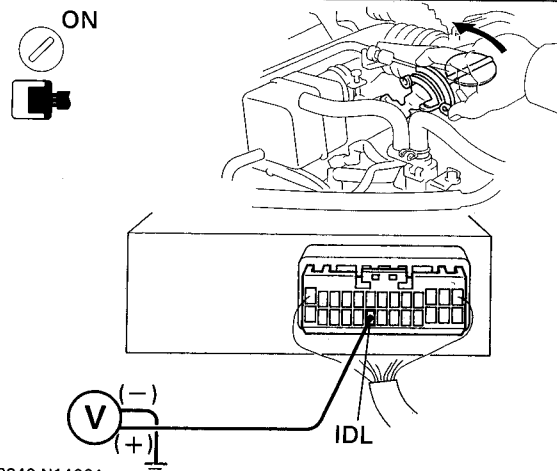
- *1: 5VZ-FE A/T
 *2: 5VZ-FE M/T, 3RZ-FE A/T
 *3: 3RZ-FE M/T, 2RZ-FE

N14263

INSPECTION PROCEDURE

1

Check voltage between terminal IDL of ECU connector and body ground.

BE3840 N14264
N15961

- P** (1) Remove cruise control ECU with connectors still connected.
 (2) Disconnect ECM and ABS & TRAC ECU connector.

- C** (1) Turn ignition switch ON.
 (2) Measure voltage between terminal IDL of ECU connector and body ground when the throttle valve is fully closed and fully opened.

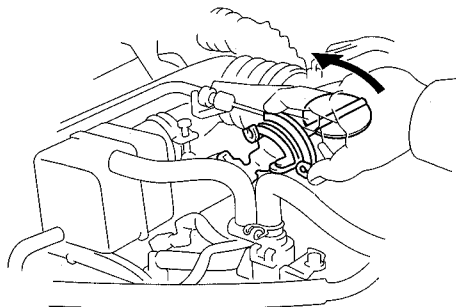
OK

Throttle valve position	Voltage
Fully opened	10 - 14 V
Fully closed	Below 2 V

NG

OK

Proceed to next circuit inspection shown on matrix chart (See page BE-88).

2 Check throttle position sensor.

N14264

P Disconnect throttle position sensor connector.**C** Measure resistance between terminals 1 and 2 of throttle position sensor connector when the throttle valve is fully closed and fully opened.**OK**

Throttle valve position	Resistance
Fully opened	1 MΩ or higher
Fully closed	Below 2.3 kΩ

OK**NG** Replace throttle position sensor.**3 Check for open and short in harness and connector between ECU and throttle position sensor, throttle position sensor and body ground (See page IN-28).****OK****NG** Repair or replace harness or connector.

Check and replace ECU.

Electronically Controlled Transmission Communication Circuit**CIRCUIT DESCRIPTION**

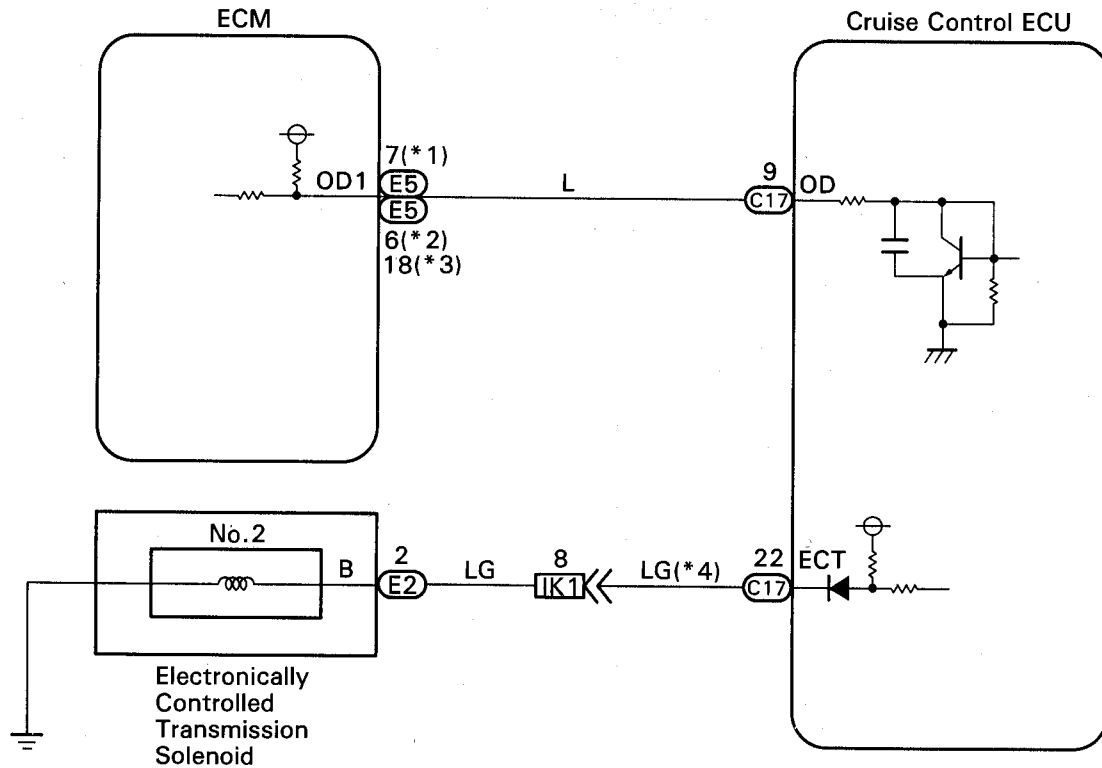
While the vehicle is climbing uphill under cruise control, when downshift occurs in the electronically controlled transmission, a signal is sent from the cruise control ECU to the electronically controlled transmission to prevent upshift until the end of the uphill slope. This is for smooth driving by reducing shifting due to ON/OFF operations of the overdrive.

Terminal ECT of the cruise control ECU detects the shift change signal from the electronically controlled transmission. (The signal is caused by the output to the electronically controlled transmission No.2 solenoid.)

While the vehicle speed is being reduced, when terminal ECT of the cruise control ECU detects downshift signal, terminal OD of the cruise control ECU sends a signal to OD1 of ECM to cut overdrive until the end of the uphill slope.

Then the gear shifts are reduced and gear shift points in the electronically controlled transmission are changed.

WIRING DIAGRAM



- *1: 5VZ-FE
- *2: Except 5VZ-FE Column A/T
- *3: Except 5VZ-FE Floor A/T
- *4: Except 2RZ-FE

N14265

INSPECTION PROCEDURE

1 Check operation of overdrive.

P Test drive after engine warm up.

C Check that overdrive ON ↔ OFF occurs with operation of OD switch ON-OFF.

OK

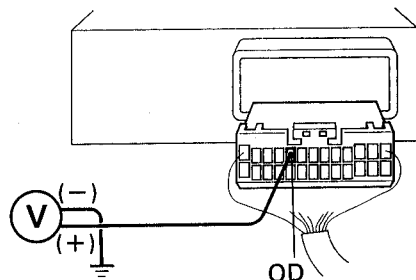
NG

Check and repair electronically controlled transmission (See page AT-79).

BE

2

Check voltage between terminal OD of harness side connector of ECU and body ground.



BE3841 N15962

OK

P Remove ECU with connector still connected.

C (1) Disconnect ECU connector.
(2) Turn ignition switch ON.
(3) Measure voltage between terminal OD of harness side connector of ECU and body ground.

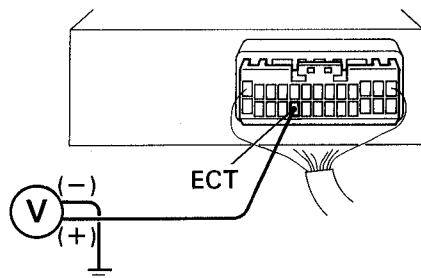
OK Voltage: 10 ~ 14 V

NG Go to step **5**.

Go to step **3**.

3

Check voltage between terminal ECT of cruise control ECU connector and body ground (On test drive).



N15963

NG

P (1) Connect ECU connector.
(2) Test drive after engine warm up.

C Check voltage between terminal ECT of cruise control ECU connector and body ground when OD switch is on and off.

OK	Gear Position	Voltage
	O/D	Below 1 V
	3rd	10 - 14 V

OK

Proceed to next circuit inspection shown on matrix chart (See page BE-87).

4

Check for open and short in harness and connector between terminal ECT of cruise control ECU and electronically controlled transmission solenoid (See page IN-28).

OK**NG**

Repair or replace harness or connector.

Check and repair ECU.

5

Check for open and short in harness and connector between terminal OD of ECU and terminal OD1 of ECM (See page IN-28).

OK**NG**

Repair or replace harness or connector.

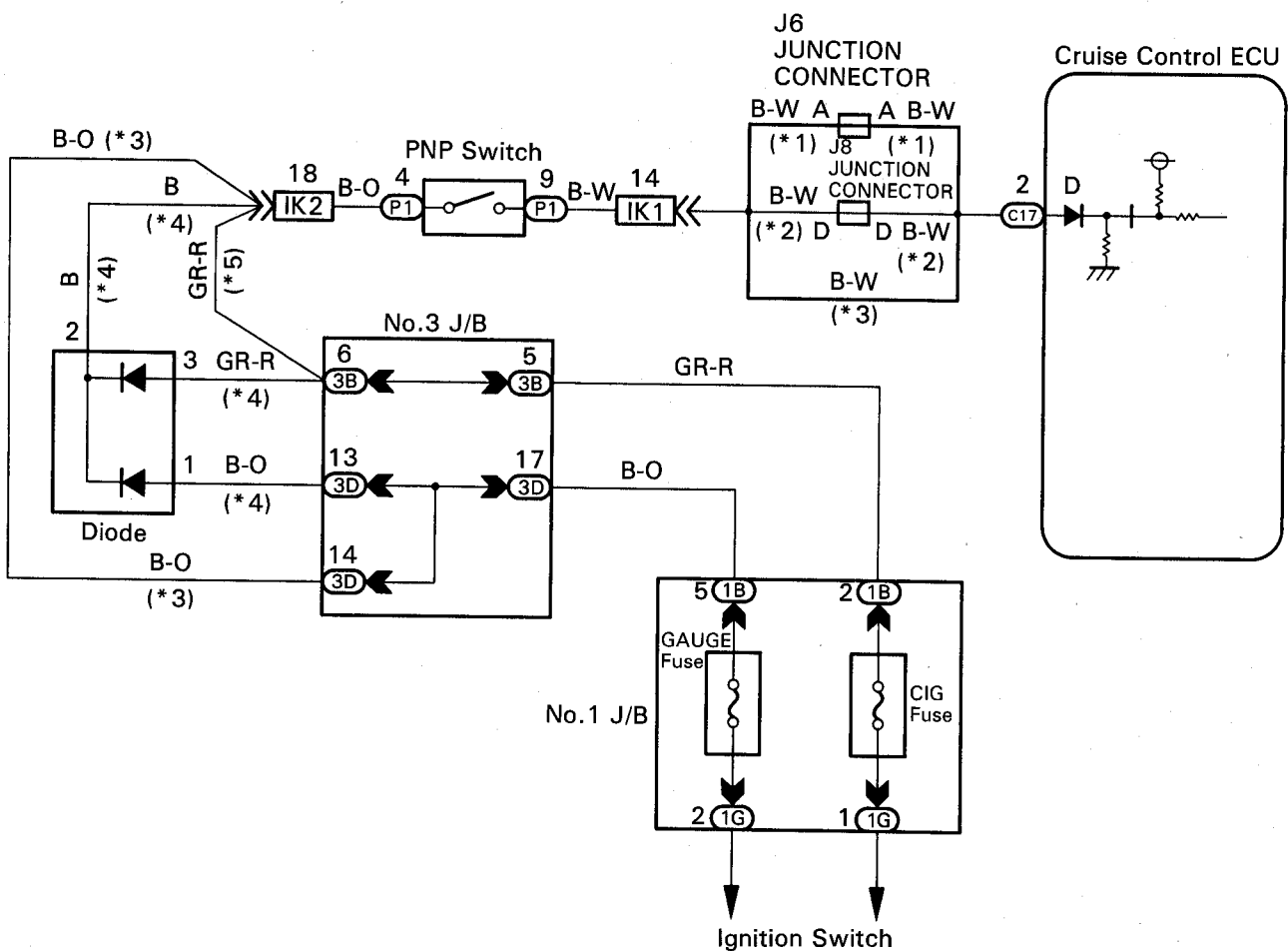
Check and replace ECM.

Park/Neutral Position Switch Circuit

CIRCUIT DESCRIPTION

When the shift position is put in except D position, a signal is sent from the park/neutral position switch to the ECU. When this signal is input during cruise control driving, the ECU cancels the cruise control.

WIRING DIAGRAM



- * 1: Column A/T (Except 5VZ-FE USA)
- * 2: Column A/T (5VZ-FE USA)
- * 3: Floor A/T
- * 4: CANADA Column A/T
- * 5: USA Column A/T

INSPECTION PROCEDURE

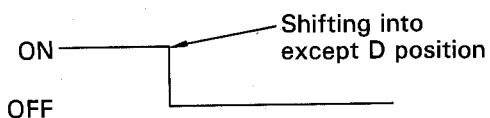
1 Check operation of starter.

- C** Check that the starter operates normally and that the engine starts.

OK

NG

Proceed to engine troubleshooting
(2RZ-FE, 3RZ-FE: See page EG-184)
(5VZ-FE: See page EG-192).

2 Input signal check.

BE4006

P

- (1) See input signal check on page BE-84.
(2) Check the indicator light when shifting into except D position.

OK

The indicator light goes off when shifting into except D position.

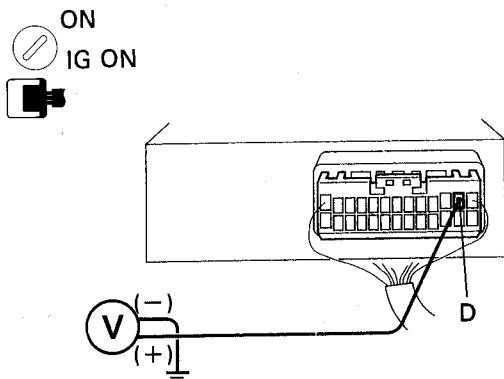
NG

OK

Proceed to next circuit inspection shown on matrix chart (See page BE-88).

3

Check voltage between terminal D of ECU connector and body ground.

BE3840
N15964

P

Remove ECU with connectors still connected.

C

- (1) Turn ignition switch ON.
(2) Measure voltage between terminal D of ECU connector and body ground when shifting into D position and other ranges.

OK

Shift Position	Voltage
D position	10 – 14 V
Other positions	Below 1 V

NG

OK

Proceed to next circuit inspection shown on matrix chart (See page BE-88).

4

Check for open in harness and connector between ECU and GAUGE fuse (See page IN-26).

OK

NG

Repair or replace harness or connector.

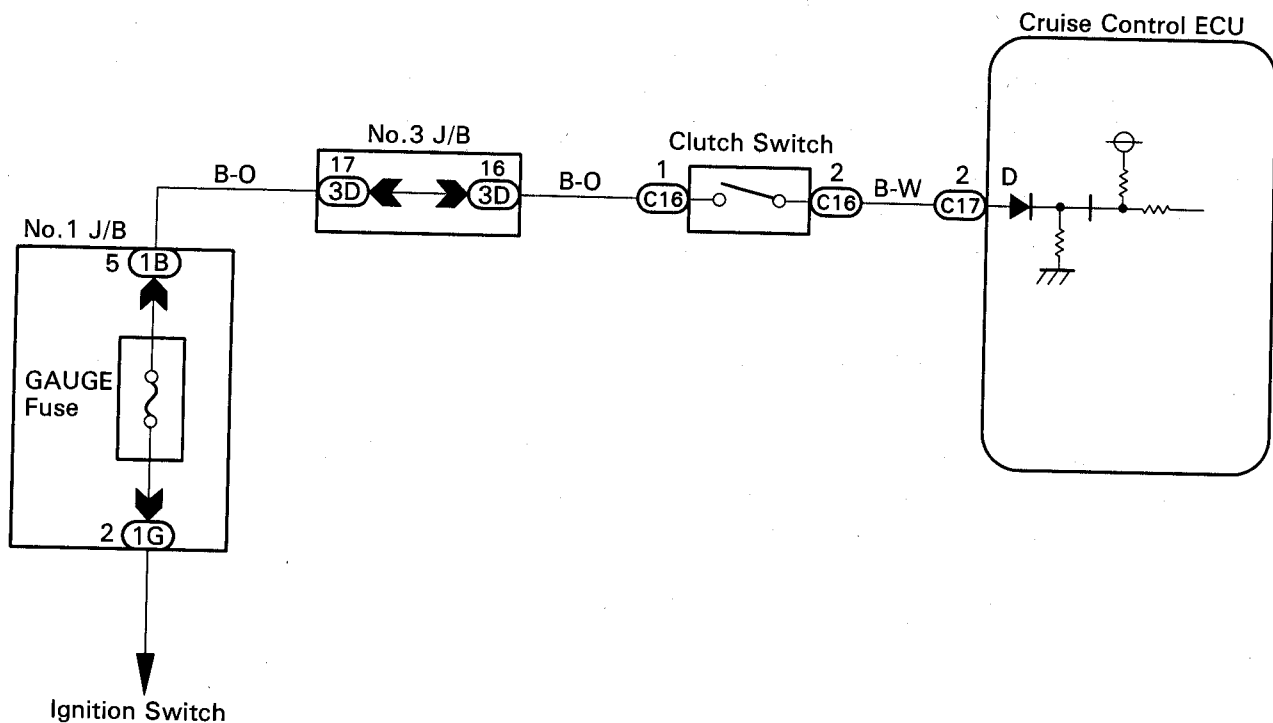
Check and replace ECU.

Clutch Switch Circuit

CIRCUIT DESCRIPTION

When the clutch pedal is depressed, the clutch switch sends a signal to the cruise control ECU. When the signal is input to the cruise control ECU during cruise control driving, the cruise control ECU cancels cruise control.

WIRING DIAGRAM



N14267

INSPECTION PROCEDURE

1 Check operation of starter.

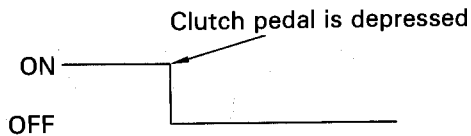
C Check that the starter operates normally and that the engine starts.

OK

NG

Proceed to engine troubleshooting
(2RZ-FE, 3RZ-FE: See page EG-184)
(5VZ-FE: See page EG-192).

BE

2**Input signal check.**

BE4006

NG**P**

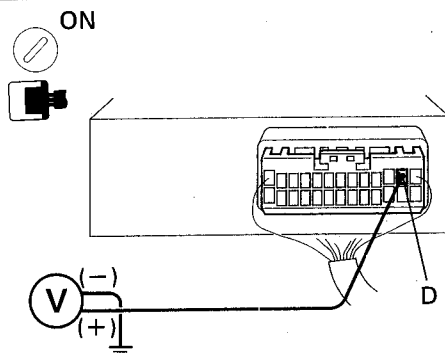
- (1) See input signal check on page BE-84.
 (2) Check the indicator light when the clutch pedal is depressed.

OK

The indicator light goes off when the clutch pedal is depressed.

OK

Proceed to next circuit inspection shown on matrix chart (See page BE-88).

3**Check voltage between terminal D of ECU connector and body ground.**BE3840
N15964**NG****P**

Remove ECU with connectors still connected.

C

- (1) Turn ignition switch ON.
 (2) Measure voltage between terminal D of ECU connector and body ground, when the clutch pedal is depressed.

OK

Switch Position	Voltage
ON (pedal depressed)	Below 1 V
OFF	10 – 14 V

OK

Proceed to next circuit inspection shown on matrix chart (See page BE-88).

4**Check for open in harness and connector between ECU and GAUGE fuse (See page IN-26).****OK****NG**

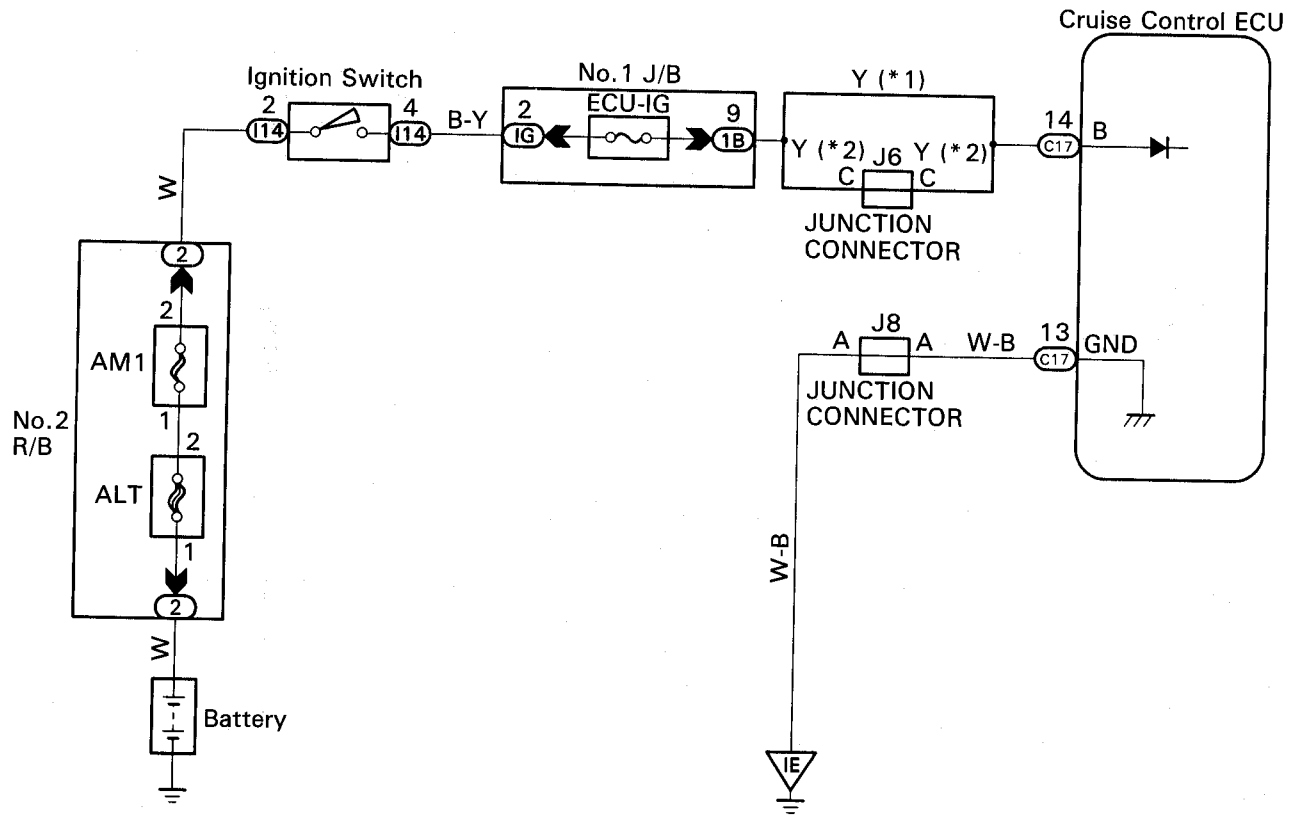
Repair or replace harness or connector.

Check and replace ECU.

ECU Power Source Circuit**CIRCUIT DESCRIPTION**

The ECU power source supplies power to the actuator and sensors, etc., Terminal GND and the cruise control ECU case are grounded.

WIRING DIAGRAM



*1: w/o ABS
*2: w/ABS

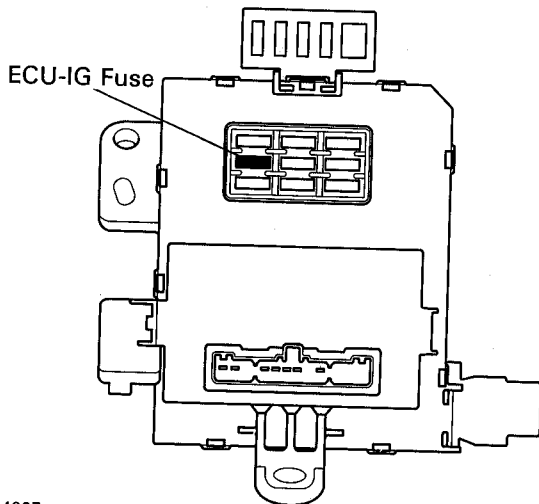
N14268

INSPECTION PROCEDURE

1

Check ECU-IG fuse.

No.1 J/B



- P** Remove ECU-IG fuse from No.1 J/B.
- C** Check continuity of ECU-IG fuse.
- OK** Continuity

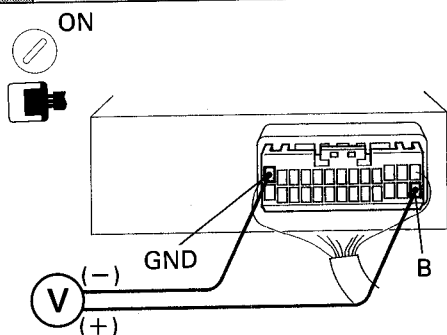
N14327

OK

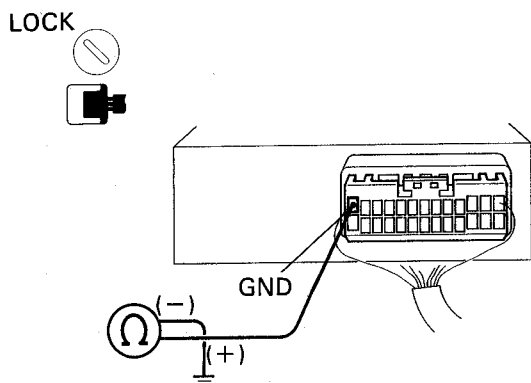
NG

Check for short in all the harness and components connected to the ECU-IG fuse (See attached wiring diagram).

BE

2**Check voltage between terminals B and GND of ECU connector.**BE3840
N15965**P** Remove ECU with connectors still connected.**C** (1) Turn ignition switch ON.
(2) Measure voltage between terminals B and GND of ECU connector.**OK** Voltage: 10 – 14 V**NG****OK**

Proceed to next circuit inspection shown on matrix chart (See page BE-88).

Go to step **3**.**3****Check continuity between terminal GND of ECU connector and body ground.**BE3842
N15966**P** Measure resistance between terminal GND of cruise control ECU connector and body ground.**OK** Resistance: 1 Ω or less**OK****NG**

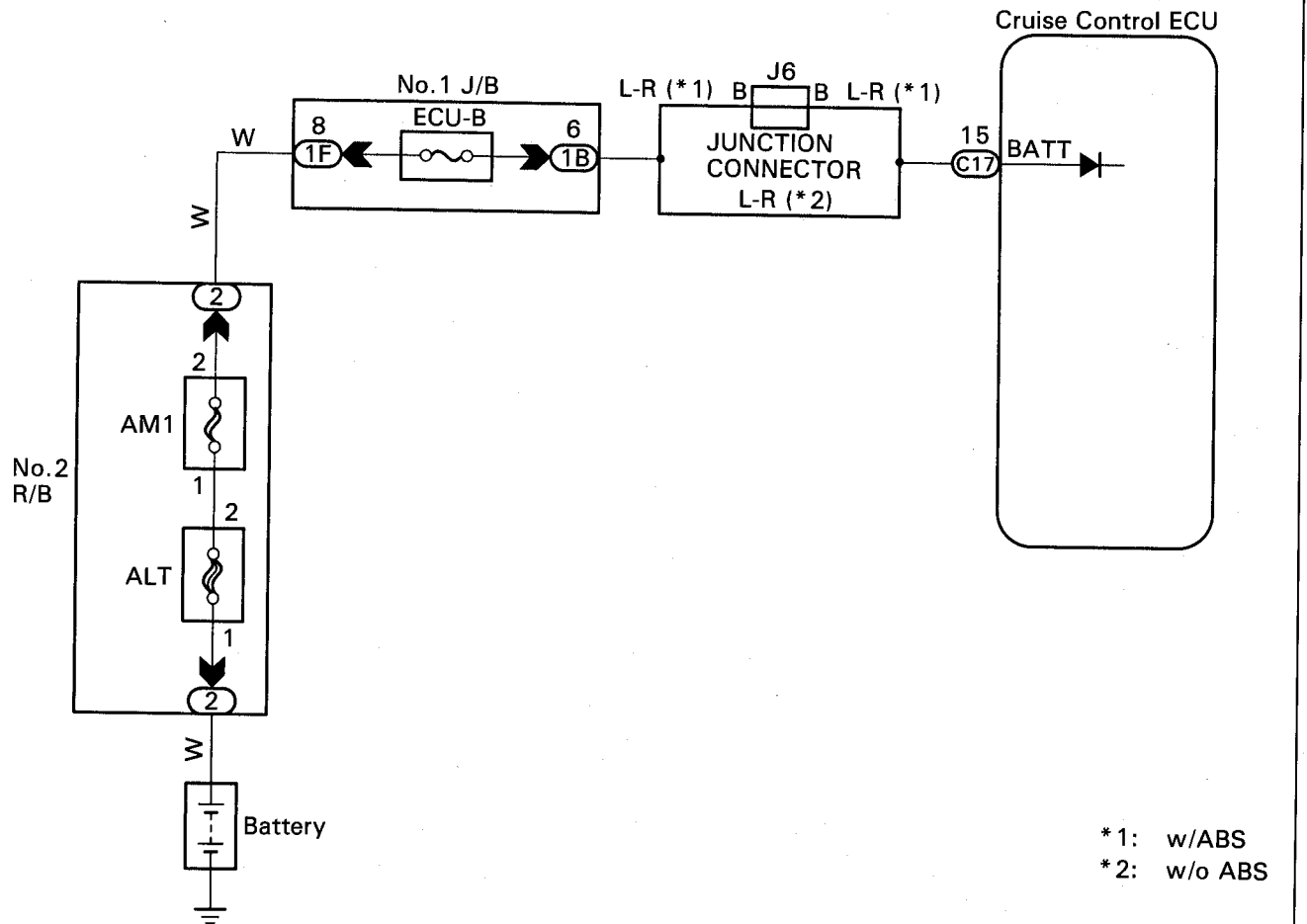
Repair or replace harness or connector.

Check and repair harness and connector between battery and ECU.

Back-up Power Source Circuit**CIRCUIT DESCRIPTION**

The ECU back-up power source provides power even when the ignition switch is off and is used for diagnostic code memory, etc.

WIRING DIAGRAM



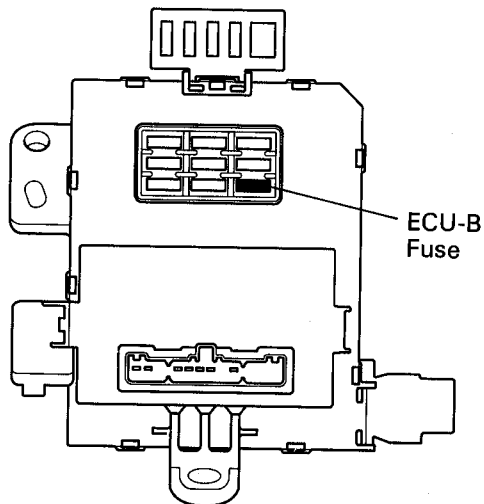
N14270

INSPECTION PROCEDURE

1

Check ECU-B fuse.

No. 1 J/B



N14327

- P** Remove ECU-B fuse from No.1 J/B.
- C** Check continuity of ECU-B fuse.
- OK** Continuity

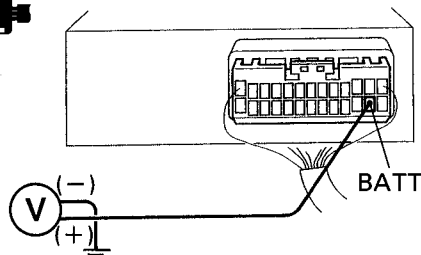
OK

NG

Check for short in all the harness and components connected to the ECU-B fuse (See attached wiring diagram).

2**Check voltage between terminal BATT of ECU connector and body ground.**

LOCK

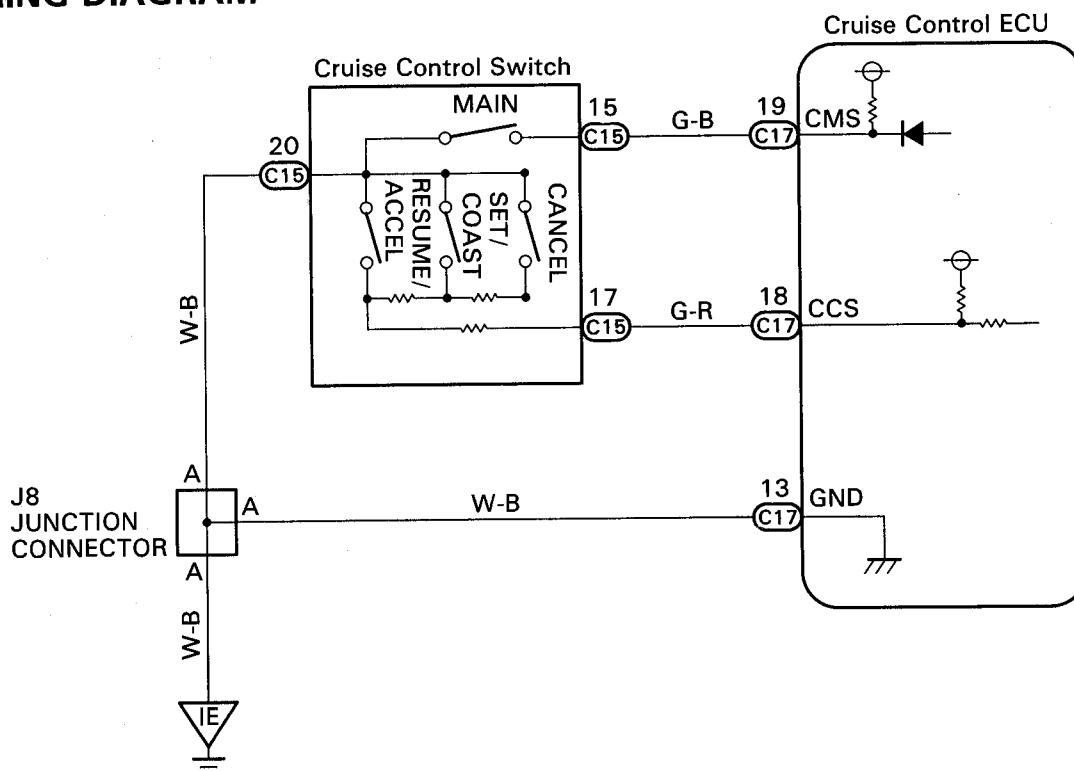
BE3842
N15967**P** Remove ECU with connectors still connected.**C** Measure voltage between terminal BATT of ECU connector and body ground.**OK** Voltage: 10 – 14 V**NG****OK**

Proceed to next circuit inspection shown on matrix chart (See page BE-88).

Check and repair harness and connector between battery and ECU.

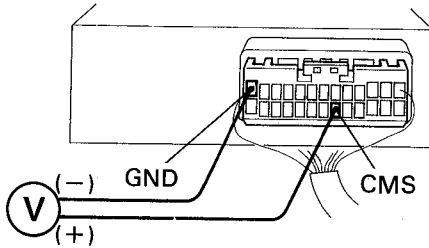
Main Switch Circuit (Cruise Control Switch)**CIRCUIT DESCRIPTION**

When the cruise control main switch is turned off, the cruise control does not operate.

WIRING DIAGRAM

1**Check voltage between terminal CMS and GND of cruise control ECU connector.**

ON

BE3840
N15968

P Remove cruise control ECU with connectors still connected.

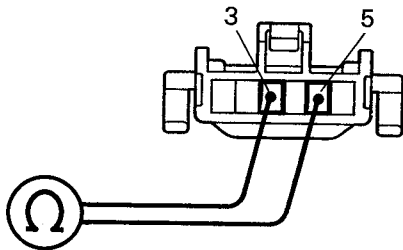
- C**
1. Turn ignition switch ON.
 2. Measure voltage between terminal CMS and GND of cruise control ECU connector when main switch is held ON and OFF.

OK

Main switch	Voltage
OFF	10 – 14 V
ON	Below 2 V

NG**OK**

Proceed to next circuit inspection shown on matrix chart (See page BE-88).

2**Check main switch.**

N15969

- P**
1. Remove steering wheel center pad (See page SR-13).
 2. Disconnect cruise control switch connector.

- C** Check continuity between terminals 3 and 5 of cruise control switch connector when main switch is held ON and OFF.

OK

○—○: Continuity

Terminals	3	5
Main switch		
OFF		
ON	○—○	○—○

OK**NG**

Replace control switch.

BE

3**Check harness and connector between cruise control ECU and main switch, main switch and body ground (See page IN-29).****OK****NG**

Repair or replace harness or connector.

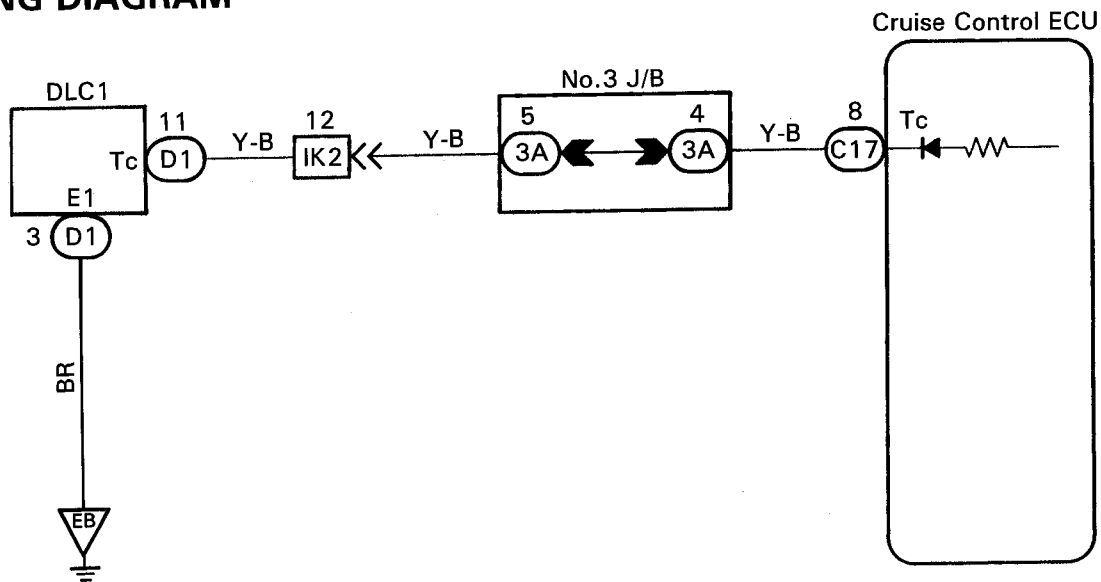
Check and replace cruise control ECU.

TC Circuit

CIRCUIT DESCRIPTION

This circuit sends a signal to the ECU that diagnostic code output is required.

WIRING DIAGRAM

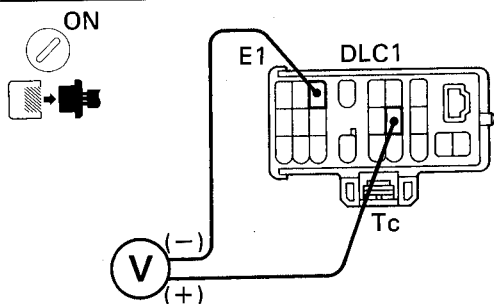


N14272

INSPECTION PROCEDURE

1

Check voltage between terminals Tc and E1 of DLC1.



BE3841 N15970

C

(1) Turn ignition switch ON.

(2) Measure voltage between terminals Tc and E1 of DLC1.

OK

Voltage: 10 – 14 V

OK

NG

Proceed to next circuit inspection shown on matrix chart (See page BE-88).

2

Check for open and short in harness and connector between ECU and DLC1, DLC1 and body ground (See page IN-26).

OK

NG

Repair or replace harness or connector.

Check and replace ECU.

Actuator Control Cable Inspection

- C**
1. Check that the actuator, control cable and throttle link are properly installed and that the cable and link are connected correctly.
 2. Check that the actuator and bell crank are operating smoothly.
 3. Check that the cable is not loose or too tight.

- Hint**
1. If the control cable is very loose, the vehicle's loss of speed going uphill will be large.
 2. If the control cable is too tight, the idle RPM will become high.

SERVICE SPECIFICATIONS

SERVICE DATA

BE02W-0E

DAYTIME RUNNING LIGHT RELAY (Wire harness side)	
Tester connection	Specified condition
2 — Ground (Ignition switch position: LOCK or ACC)	No voltage
2 — Ground (Ignition switch position: ON or START)	Battery positive voltage
6 — Ground (Constant)	Battery positive voltage
11 — Ground (Engine stop)	No voltage
11 — Ground (Engine Running)	Battery positive voltage
15 — Ground (Constant)	Battery positive voltage
18 — Ground (Brake fluid level warning position ON)	Battery positive voltage
TURN SIGNAL FLASHER	
Flashes / Minute	60 — 120
SPEEDOMETER (USING A SPEEDOMETER TESTER)	
Standard indication (km/h)	Allowable range (km/h)
20	17 — 24
40	38 — 46
60	57.5 — 67
80	77 — 88
100	96 — 109
120	115 — 130
140	134 — 151.5
160	153 — 173
Standard indication (mph)	Allowable range (mph)
20	18 — 24
40	38 — 44
60	58 — 66
80	78 — 88
100	98 — 110
120	118 — 132
TACHOMETER (ON-VEHICLE)	
Standard indication (rpm)	DC 13.5 V 20°C (68°F) Allowable range (rpm)
700	610 — 750
3,000	2,850 — 3,150
5,000	4,850 — 5,150
7,000	6,790 — 7,210
FUEL RECEIVER GAUGE (w/ Tachometer)	
Between terminals	Resistance Ω
A — B	Approx. 140~158
A — C	Approx. 233~271
B — C	Approx. 92~114
FUEL RECEIVER GAUGE (w/o Tachometer)	
Between terminals	Resistance Ω
A — B	Approx. 115~130
A — C	Approx. 208~244
B — C	Approx. 92~114

FUEL SENDER GAUGE (68L)	
Float position: mm (in.)	Resistance Ω
F Approx. 28.0 (1.102)	Approx. 3.0
1/2 Approx. 81.3 (3.201)	Approx. 32.5
E Approx. 163.9 (6.453)	Approx. 110.0
FUEL SENDER GAUGE (57L)	
Float position: mm (in.)	Resistance Ω
F Approx. 12.1 (0.476)	Approx. 3.0
1/2 Approx. 79.0 (3.110)	Approx. 32.5
E Approx. 153.3 (6.035)	Approx. 110.0
ENGINE COOLANT TEMPERATURE GAUGE (w/ Tachometer)	
Between terminals	Resistance Ω
A — B	Approx. 85~95
A — C	Approx. 158~192
B — C	Approx. 215~255
ENGINE COOLANT TEMPERATURE GAUGE (w/o Tachometer)	
Between terminals	Resistance Ω
A — B	Approx. 85~95
A — C	Approx. 158~192
B — C	Approx. 215~255
DOOR LOCK CONTROL RELAY (Wire harness side)	
Tester connection	Specified condition
2 — Ground (Constant)	Battery positive voltage
8 — Ground (Ignition switch position: LOCK or ACC)	No voltage
8 — Ground (Ignition switch position: ON)	Battery positive voltage
13 — Ground (Key unlock warning switch position: OFF) (Ignition key removed)	No voltage
13 — Ground (Key unlock warning switch position: ON) (Ignition key set)	Battery positive voltage
ANTENNA MOTOR CONTROL RELAY (Wire harness side)	
Tester connection	Specified condition
2 — Ground (Constant)	Battery positive voltage
5 — Ground (Ignition switch position: LOCK or ACC)	No voltage
5 — Ground (Ignition switch position: ON)	Battery positive voltage
6 — Ground (Ignition switch position: LOCK)	No voltage
6 — Ground (Ignition switch position: ACC or ON) (Radio switch and cassette OFF)	No voltage
6 — Ground (Ignition switch position: ACC or ON) (Radio switch of cassette ON)	Battery positive voltage
8 — Ground (Ignition switch position: LOCK)	No voltage
8 — Ground (Ignition switch position: ACC or ON) (Radio switch OFF or cassette ON)	No voltage
8 — Ground (Ignition switch position: ACC or ON) (Radio switch ON and cassette OFF)	Battery positive voltage
9 — Ground (Ignition switch position: LOCK or ACC)	No voltage
9 — Ground (Ignition switch position: ON)	Battery positive voltage

CRUISE CONTROL ECU (Wire harness side)	
24 — 26 (Constant)	Approx. 2.0 k Ω
25 — 26 (Actuator arm turned)	Resistance change even
10 — Ground (Brake pedal position: Released)	Approx. 38.0 Ω
10 — Ground (Brake pedal position: Depressed)	No continuity
18 — Ground (Control switch position: OFF)	No continuity
18 — Ground (Control switch position: RESUME / ACCEL)	Approx. 68.0 Ω
18 — Ground (Control switch position: SET / COAST)	Approx. 198.0 Ω
18 — Ground (Control switch position: CANCEL)	Approx. 418.0 Ω
14 — Ground (Ignition switch position: LOCK or ACC)	No voltage
14 — Ground (Ignition switch position: ON)	Battery positive voltage
15 — Ground (Constant)	Battery positive voltage
1 — Ground (Constant)	Battery positive voltage
16 — Ground (Brake pedal position: Released)	No voltage
16 — Ground (Brake pedal position: Depressed)	Battery positive voltage
20 — Ground (With ignition switch ON, speedsensor shaft turned)	Voltage changes repeatedly
CRUISE CONTROL ACTUATOR	
1 — 3	Approx. 2.0 k Ω
2 — 3 (The arm is moving from the closed to open position)	Approx. 0.5 to 1.8 k Ω