ELECTRICAL SYSTEM

SECTION EL

CONTENTS

HOW TO READ DIAGRAMS

Description

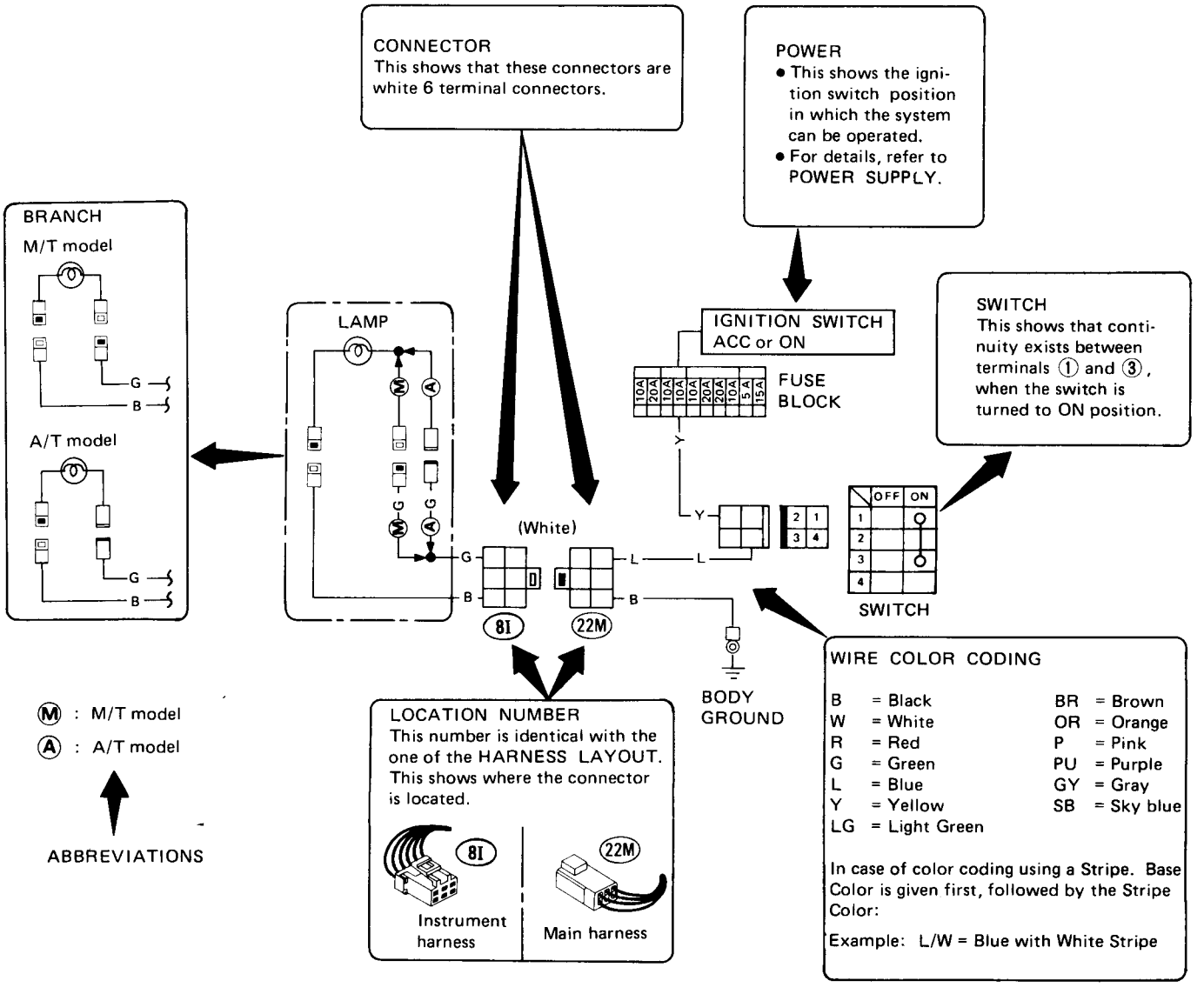
POWER SUPPLY ROUTING

This diagram is helpful in identifying specific problems in the power supply portion of the electrical circuits. For example, a vehicle has an inoperative rear window defogger. A quick check proves that meter and gauges in the vehicle are operative. The power supply diagram shows that there cannot be a problem between the battery, ignition relay, ignition switch or fuse since the power supply circuit for the rear window defogger is common with the meter and gauges. Therefore, the cause of this specific problem must lie past the fuse, such as in the wiring, rear window defogger, or ground.

WIRING DIAGRAM

This diagram identifies types and number of con nectors, electrical terminal positions in the connec tor, color coding of wires, and connector codes Refer to the following example.

Example

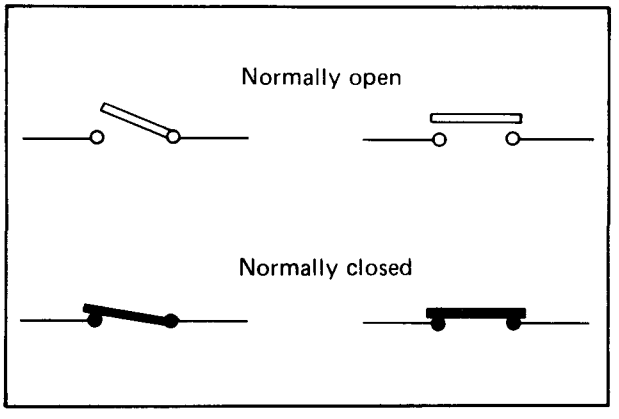


SEL768E

Description (Cont'd)

SWITCH POSITIONS IN DIAGRAMS

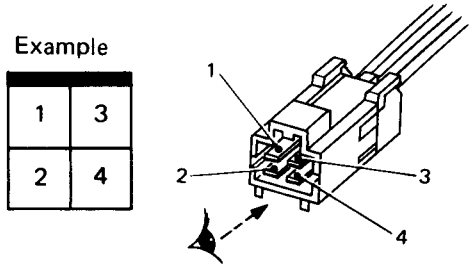
- Ignition switch in lock position
- Light switch and wiper switch in off position
- Doors closed



SEL764E

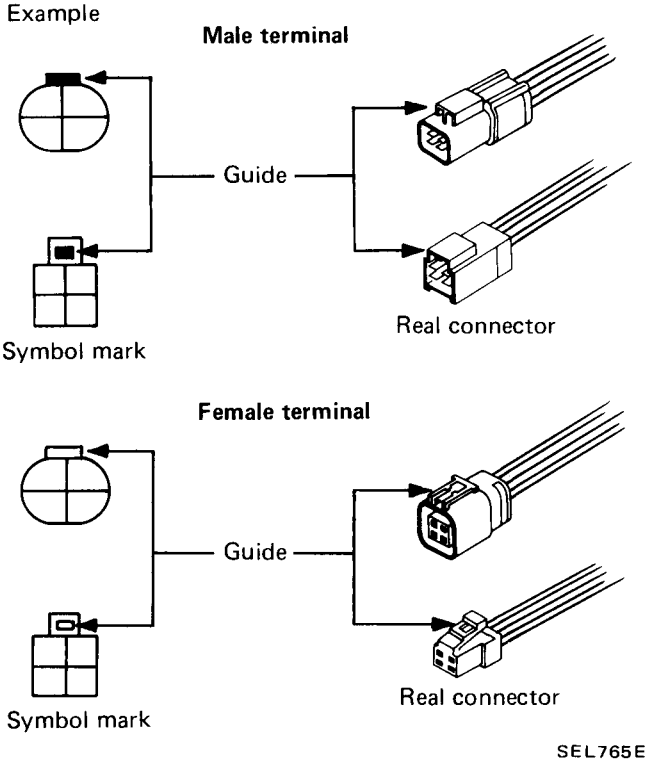
CONNECTOR SYMBOLS

1. Direction of connector



SEL766E

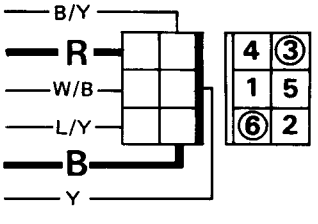
2. Male and female terminals
   Connectors for male terminals are in black and female terminals in white.



SEL765E

HOW TO IDENTIFY THE MULTIPLE SWITCH

The multiple switch is identified in the symbol chart and shown in the diagrams below.



WIPER SWITCH

	OFF	INT	LO	HI	WASH
1					○
2				○	
③	○	○	◍		
4	○	○			
5		○	◍	○	○
⑥		○	◍	○	○

Continuity circuit of wiper switch

SWITCH POSITION	CONTINUITY CIRCUIT
OFF	3 - 4
INT	3 - 4, 5 - 6
LO	3 - 6
HI	2 - 6
WASH	1 - 6

Case of wiper switch in LO position.
Continuity circuit: Red wire – Male connector – ③ terminal (Female connector) – ◍ Wiper switch ◍ – ⑥ terminal – Male connector – Black wire

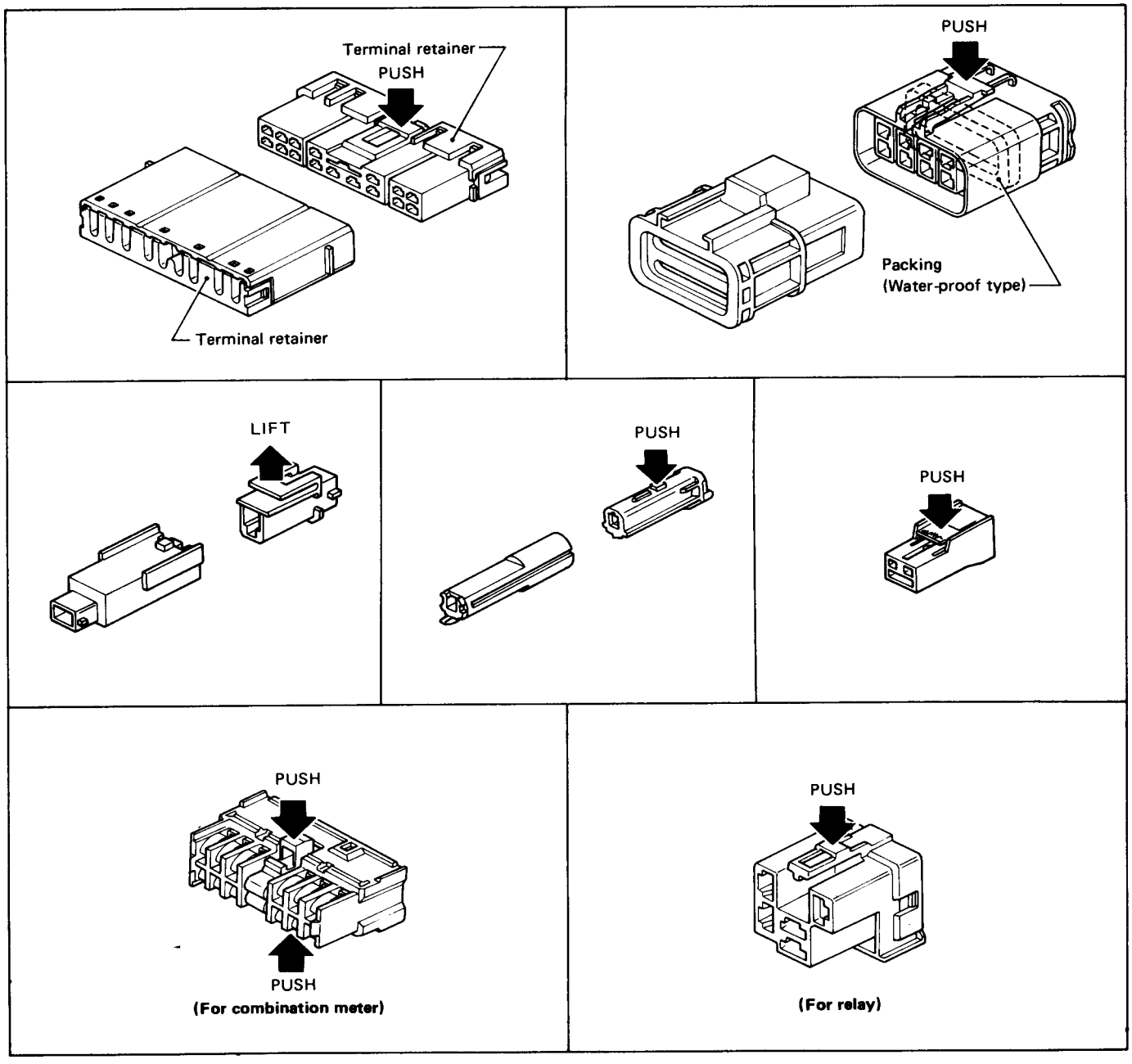
SEL767E

HARNESS CONNECTOR

- All harness connectors have been modified to prevent accidental looseness or disconnection.
- The connector can be disconnected by pushing or lifting the locking section.

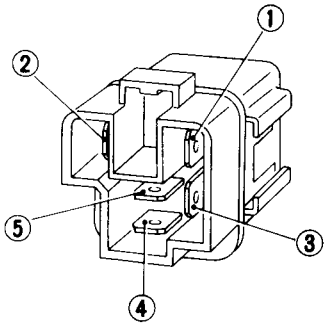
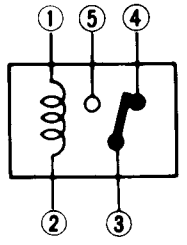
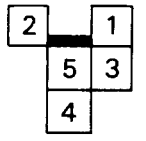
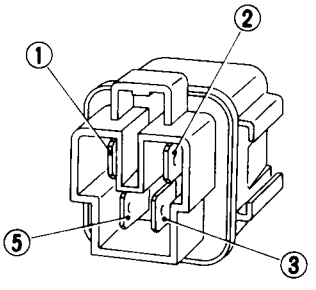
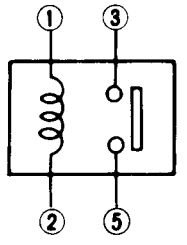
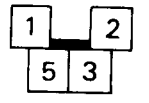
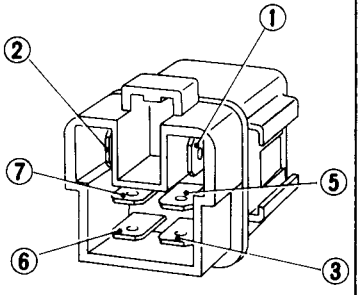
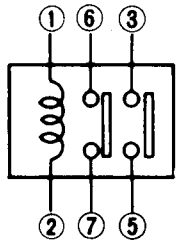
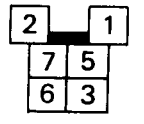
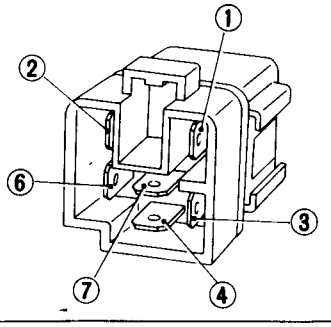
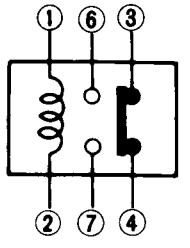
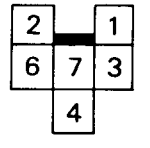
CAUTION:
Do not pull the harness when disconnect the connector.

[Example]



SEL769D

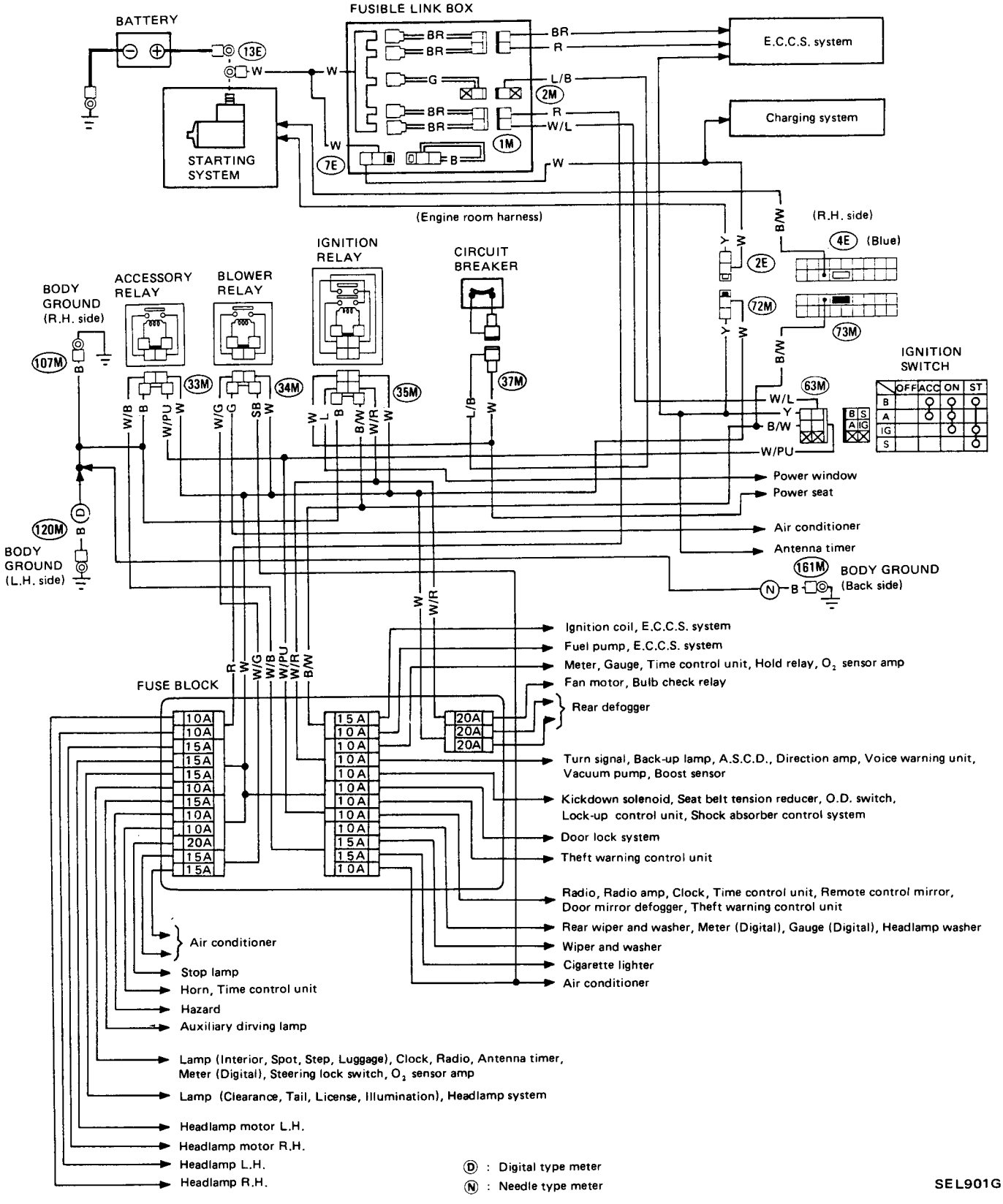
STANDARDIZED RELAY

Type	Outer view	Circuit	Symbols	Case color
1T				BLACK
1M				BLUE
2M				BROWN
1M·1B				GRAY

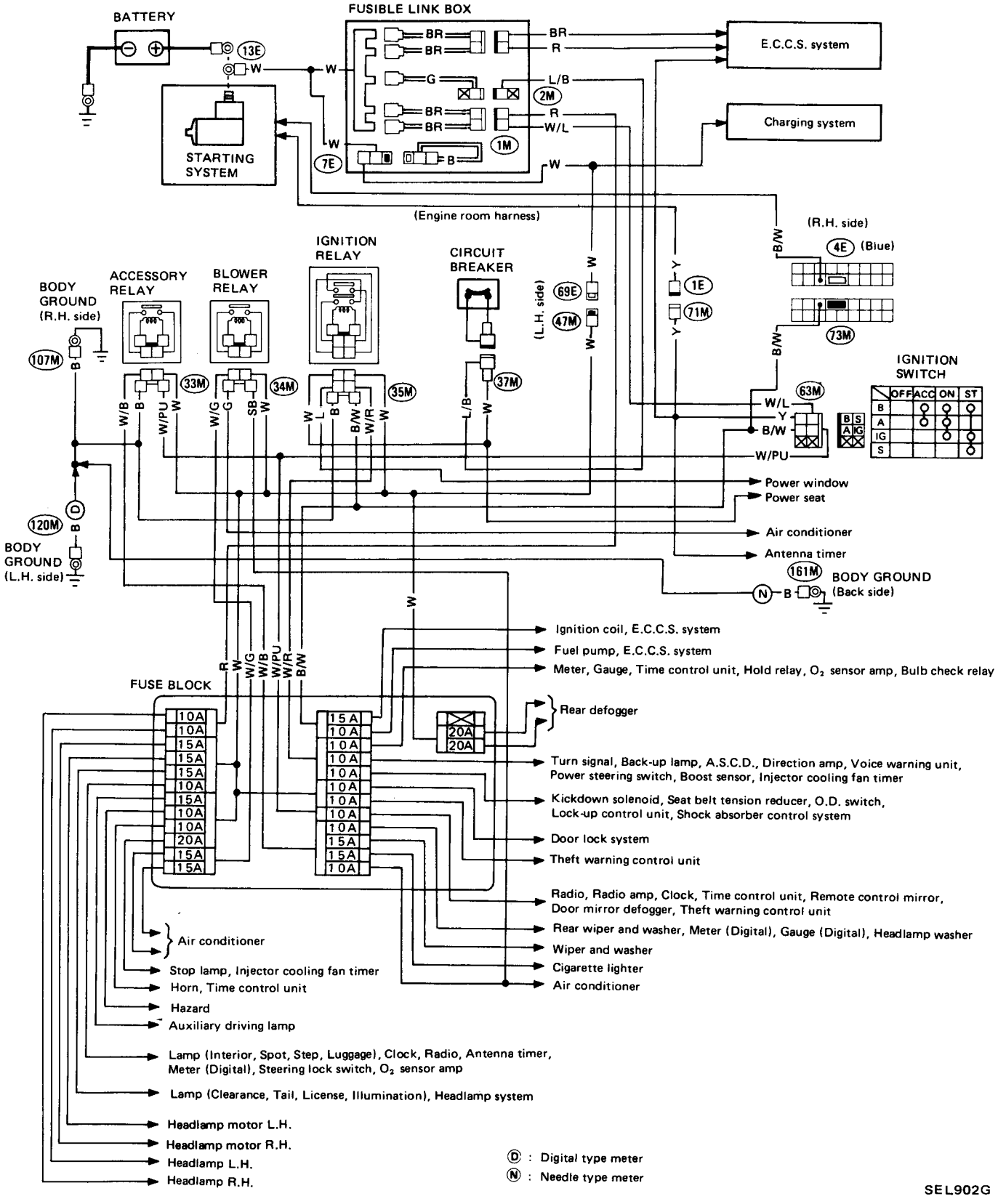
SEL639D

Wiring Diagram

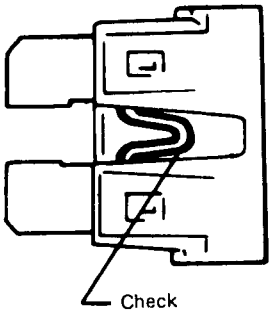
TURBO MODELS



NON-TURBO MODELS



Fuse

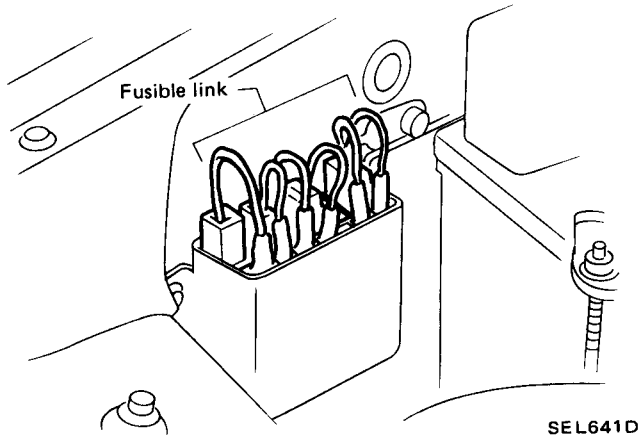


SEL276

a. If fuse is blown, be sure to eliminate cause of problem before installing new fuse.
b. Use fuse of specified rating. Never use fuse of more than specified rating.
c. Do not install fuse in oblique direction; always insert it into fuse holder properly.
d. Remove fuse for clock if vehicle is not used for a long period of time.

Fusible Link

A melted fusible link can be detected either by visual inspection or by feeling with finger tip. If its condition is questionable, use circuit tester or test lamp.



SEL641D

CAUTION:

a. If fusible link should melt, it is possible that critical circuit (power supply or large current carrying circuit) is shorted. In such a case, carefully check and eliminate cause of problem.
b. Never wrap periphery of fusible link with vinyl tape. Extreme care should be taken with this link to ensure that it does not come into contact with any other wiring harness or vinyl or rubber parts.

CAUTION:

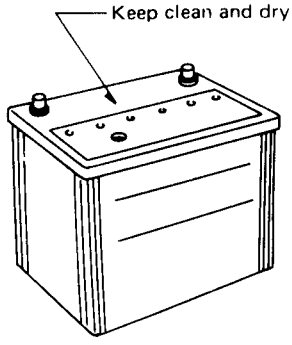
a. **If it becomes necessary to start the engine with a booster battery and jumper cables, use a 12-volt booster battery.**
b. **After connecting battery cables, ensure that they are tightly clamped to battery terminals for good contact.**
c. **Never add distilled water through the hole used to check specific gravity.**

How to Handle Battery

METHODS OF PREVENTING OVER-DISCHARGE

The following precautions must be taken to prevent over-discharging a battery.

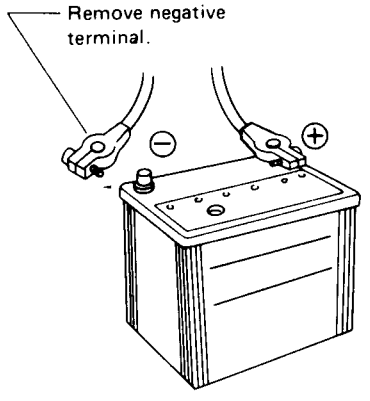
- The battery surface (particularly its top) should always be kept clean and dry.



SEL711E

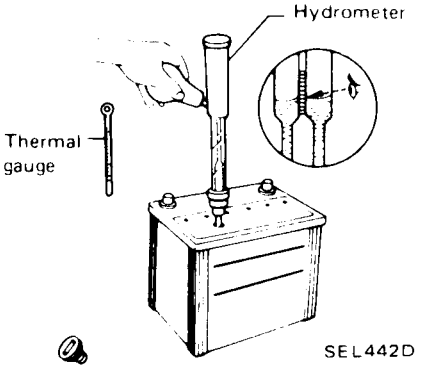
If the top surface of a battery is wet with electrolyte or water, leakage current will cause the battery to discharge. Always keep the battery clean and dry.

- When the vehicle is not going to be used over a long period of time, disconnect the negative battery terminal. (If the vehicle has an extended storage switch, turn it off.)



SEL712E

- Check the charge condition of the battery.



SEL442D

Periodically check the specific gravity of the electrolyte. Keep a close check on charge condition to prevent over-discharge.

CHECKING ELECTROLYTE LEVEL

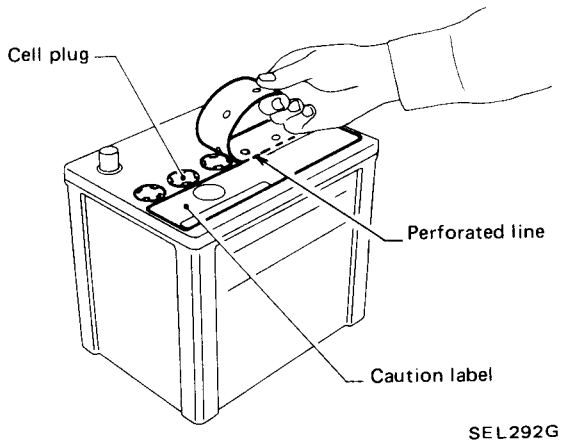
WARNING:

Do not allow battery fluid to come in contact with skin, eyes, fabrics, or painted surfaces. After touching a battery, do not touch or rub your eyes until you have thoroughly washed your hands. If the acid contacts the eyes, skin or clothing, immediately flush with water for 15 minutes and seek medical attention.

Normally the battery does not require additional water. However, when the battery is used under severe conditions, adding distilled water may be necessary during the battery life.
To maintain serviceability, a perforated line has been added to the battery caution label.

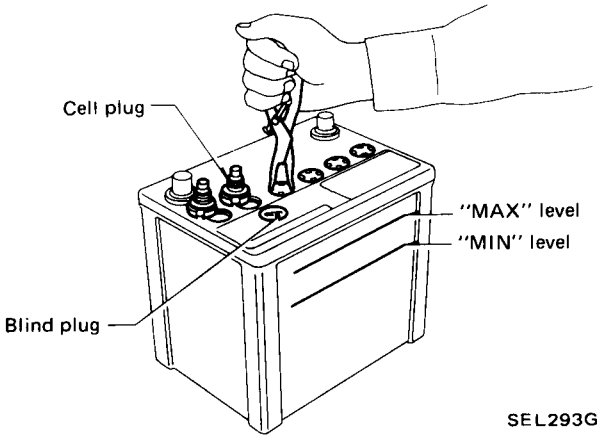
How to Handle Battery (Cont'd)

- If the electrolyte level is low, remove label at perforated line.



SEL292G

- Remove the cell plug using a suitable tool.
- Add distilled water up to the MAX level.

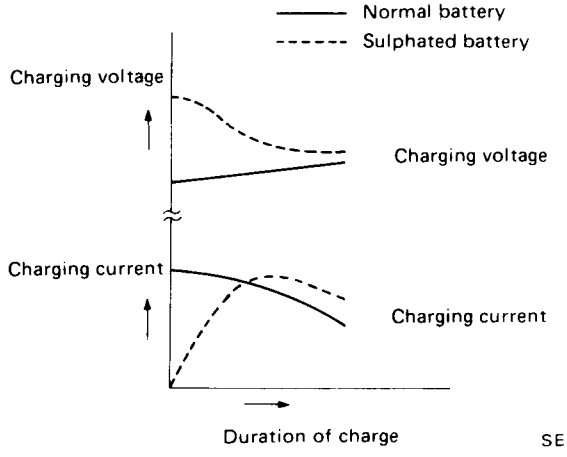


SEL293G

SULPHATION

When a battery has been left unattended for a long period of time and has a specific gravity of less than 1.100, it will be completely discharged, resulting in sulphation on the cell plates.

Compared with a battery discharged under normal conditions, the current flow in a "sulphated" battery is not as smooth although its voltage is high during the initial stage of charging, as shown in the following figure.



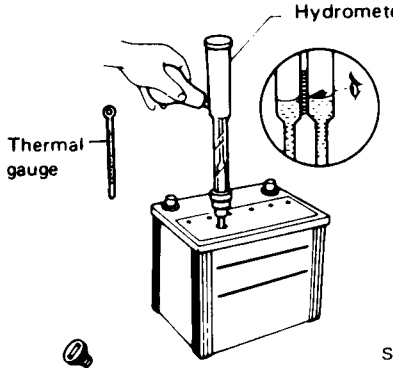
SEL709E

Specific Gravity Check

SPECIFIC GRAVITY CHECK

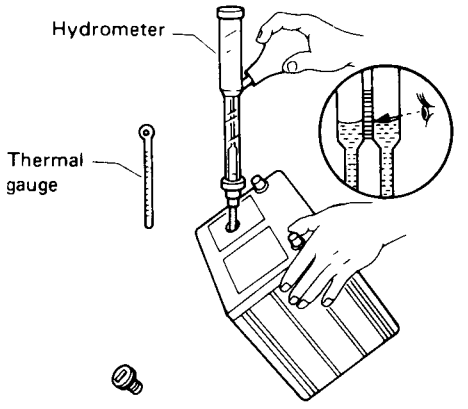
1. Read hydrometer and thermal gauge indications at eye level.

   Read top level with scale.



SEL442D

- When electrolyte level is too low, tilt battery case to raise it for easy measurement.

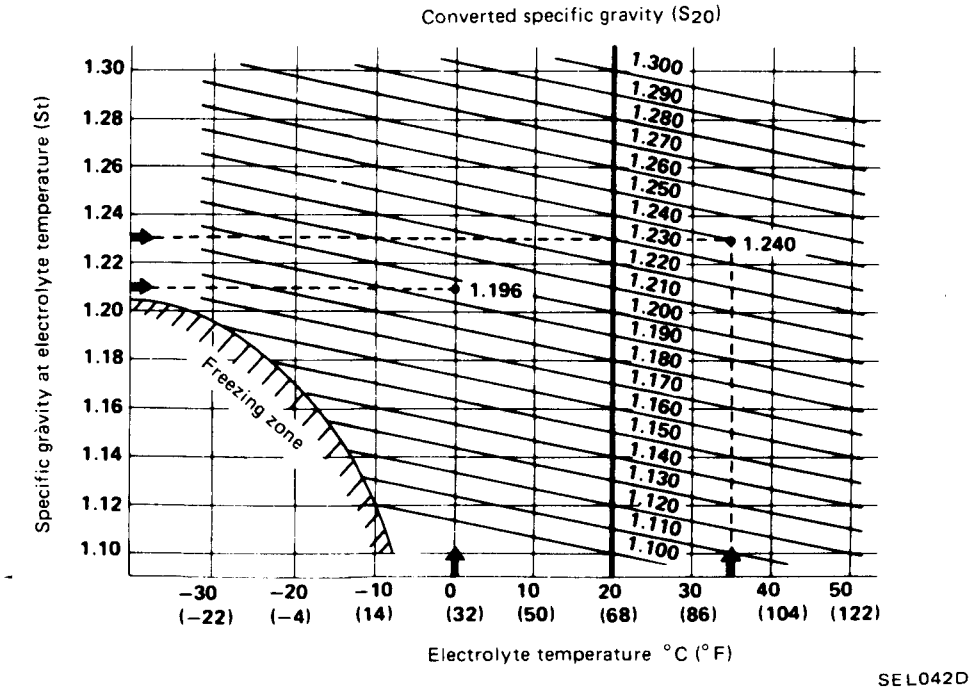


SEL710E

2. Convert into specific gravity at 20°C (68°F).

Example:

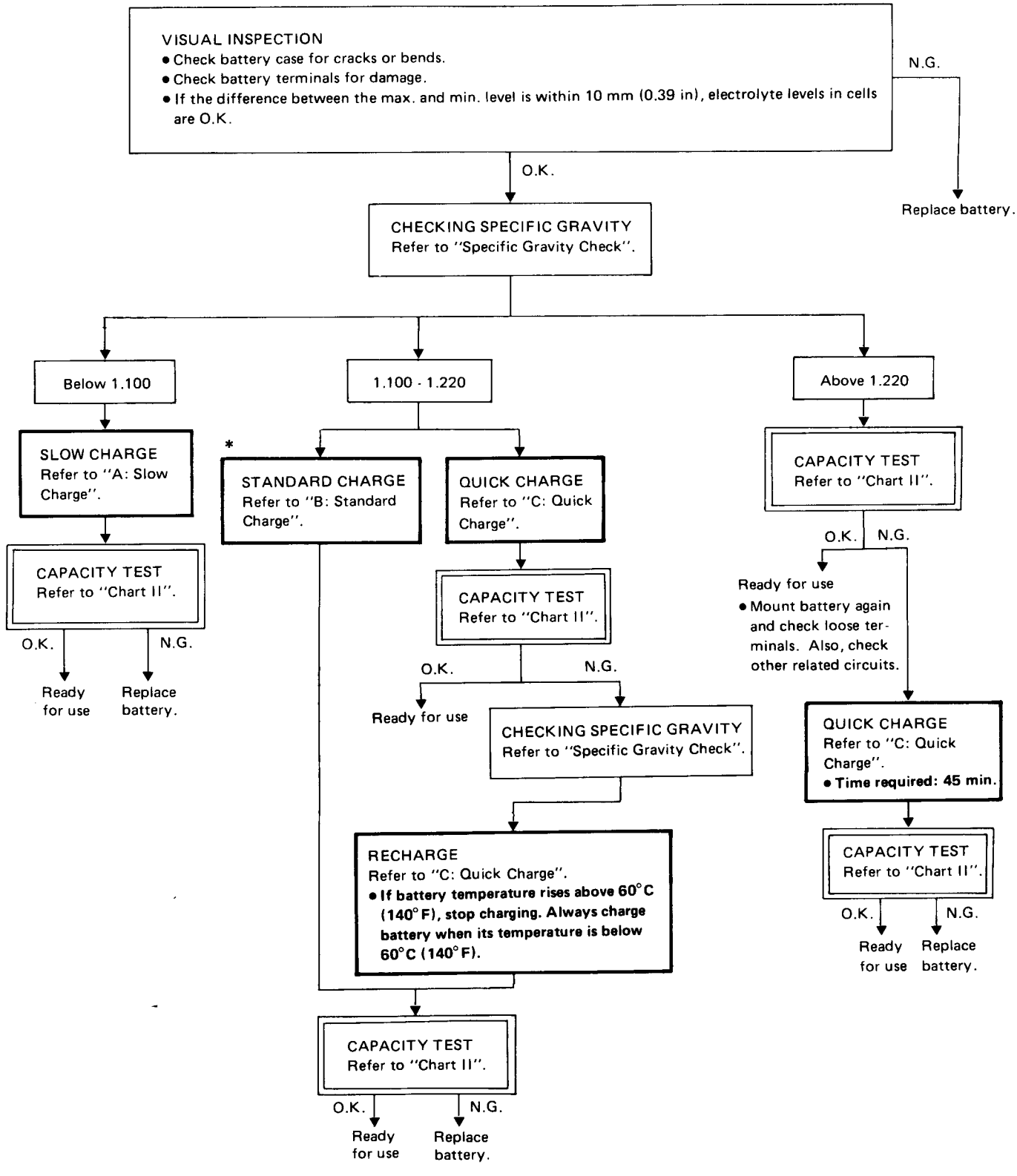
- When electrolyte temperature is 35°C (95°F) and specific gravity of electrolyte is 1.230, converted specific gravity at 20°C (68°F) is 1.240.
- When electrolyte temperature is 0°C (32°F) and specific gravity of electrolyte is 1.210, converted specific gravity at 20°C (68°F) is 1.196.



SEL042D

M.F. Battery Test and Charging Chart

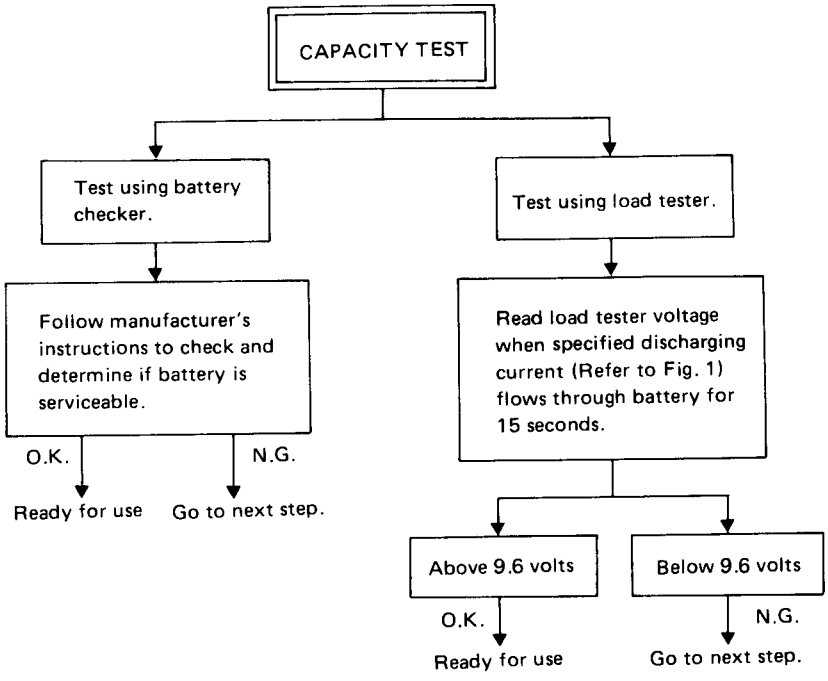
Chart I



*** "STANDARD CHARGE" is recommended in case that the vehicle is in storage after charging.**

M.F. Battery Test and Charging Chart (Cont'd)

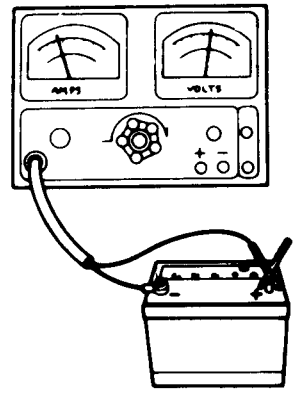
Chart II



- Check battery type and determine the specified current using the following table.

Fig. 1 DISCHARGING CURRENT (Load tester)

Type	Current (A)
NS40S-MF	90 (A)
NS40ZA-MF	99 (A)
NS60-MF	135 (A)
N50S-MF	150 (A)
N60-MF 55D23-MF	180 (A)
NS70-MF	195 (A)
N70Z-MF	210 (A)
NX120-7-MF	240 (A)



SEL697B

M.F. Battery Test and Charging Chart (Cont'd)

A: SLOW CHARGE

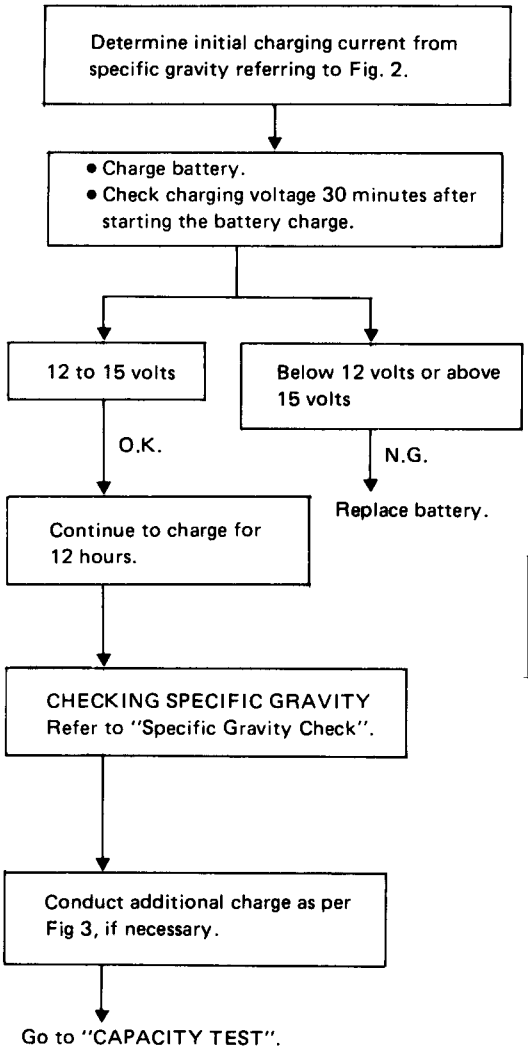
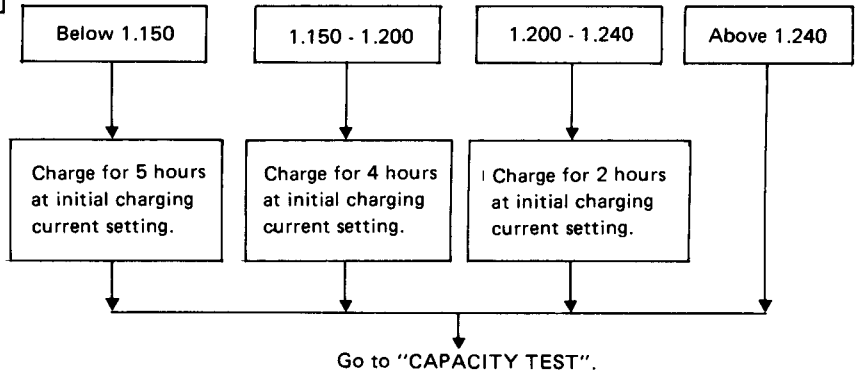


Fig. 2 INITIAL CHARGING CURRENT SETTING (Slow charge)

BATTERY TYPE / CONVERTED SPECIFIC GRAVITY	NS40S-MF NS40ZA-MF	NS60-MF	N60-MF 55D23-MF N50S-MF	NS70-MF	N70Z-MF	NX120-7-MF
Below 1.100	4.0 (A)	5.0 (A)	7.0 (A)	8.0 (A)	9.0 (A)	10.0 (A)

- Check battery type and determine the specified current using the following table.
- After starting charging, adjustment of charging current is not necessary.

Fig. 3 ADDITIONAL CHARGE (Slow charge)



CAUTION:

a. **Set charging current to value specified in Fig. 2. If charger is not capable of producing specified current value, set its charging current as close to that value as possible.**
b. **Keep battery away from open flame while it is being charged.**
c. **When connecting charger, connect leads first, then turn on charger. Do not turn on charger first, as this may cause a spark.**
d. **If battery temperature rises above 60°C (140°F), stop charging. Always charge battery when its temperature is below 60°C (140°F).**

M.F. Battery Test and Charging Chart (Cont'd)

B: STANDARD CHARGE

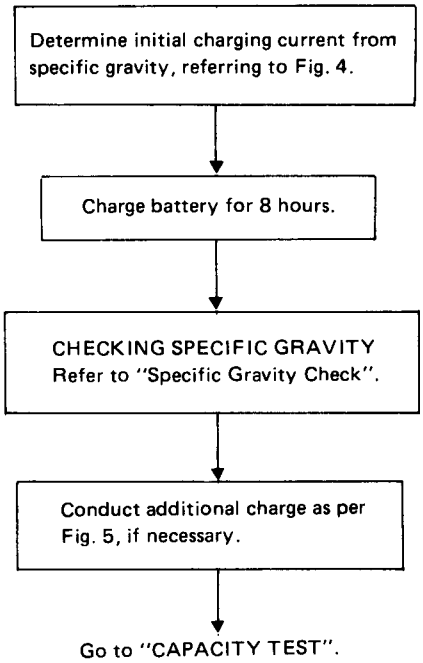
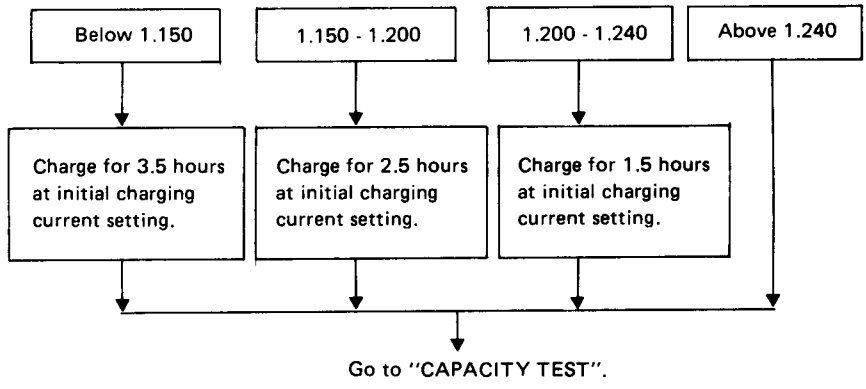


Fig. 4 INITIAL CHARGING CURRENT SETTING (Standard charge)

BATTERY TYPE / CONVERTED SPECIFIC GRAVITY	NS40S-MF NS40ZA-MF	NS60-MF	N60-MF 55D23-MF N50S-MF	NS70-MF	N70Z-MF	NX120-7-MF
1.100 - 1.130	4.0 (A)	5.0 (A)	6.0 (A)	7.0 (A)	8.0 (A)	9.0 (A)
1.130 - 1.160	3.0 (A)	4.0 (A)	5.0 (A)	6.0 (A)	7.0 (A)	8.0 (A)
1.160 - 1.190	2.0 (A)	3.0 (A)	4.0 (A)	5.0 (A)	6.0 (A)	7.0 (A)
1.190 - 1.220	2.0 (A)	2.0 (A)	3.0 (A)	4.0 (A)	5.0 (A)	5.0 (A)

- Check battery type and determine the specified current using the following table.
- After starting charging, adjustment of charging current is not necessary.

Fig. 5 ADDITIONAL CHARGE (Standard charge)



CAUTION:

a. **Do not use standard charge method on a battery whose specific gravity is less than 1.100.**
b. **Set charging current to value specified in Fig. 4. If charger is not capable of producing specified current value, set its charging current as close to that value as possible.**
c. **Keep battery away from open flame while it is being charged.**
d. **When connecting charger, connect leads first, then turn on charger. Do not turn on charger first, as this may cause a spark.**
e. **If battery temperature rises above 60°C (140°F), stop charging. Always charge battery when its temperature is below 60°C (140°F).**

M.F. Battery Test and Charging Chart (Cont'd)

C: QUICK CHARGE

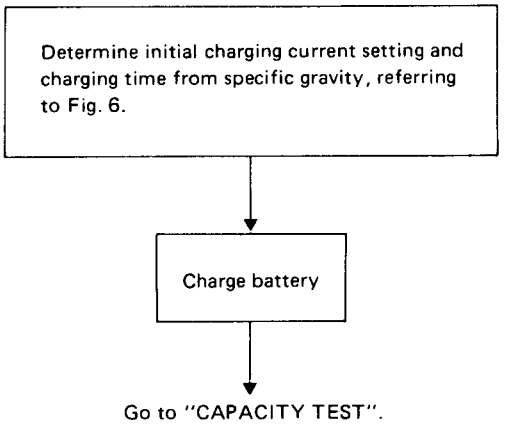


Fig. 6 INITIAL CHARGING CURRENT SETTING AND CHARGING TIME (Quick charge)

CONVERTED SPECIFIC GRAVITY \ BATTERY TYPE / CURRENT [A]	NS40S -MF NS40ZA -MF	NS60-MF N50S-MF	N60-MF 55D23-MF NS70-MF	N70Z-MF NX120-7 -MF
	10 (A)	15 (A)	20 (A)	30 (A)
1.100 - 1.130	2.5 hours			
1.130 - 1.160	2.0 hours			
1.160 - 1.190	1.5 hours			
1.190 - 1.220	1.0 hours			
Above 1.220	0.75 hours (45 min.)			

- Check battery type and determine the specified current using the following table.
- After starting charging, adjustment of charging current is not necessary.

CAUTION:

a. Do not use quick charge method on a battery whose specific gravity is less than 1.100.
b. Set initial charging current to value specified in Fig. 6. If charger is not capable of producing specified current value, set its charging current as close to that value as possible.
c. Keep battery away from open flame while it is being charged.
d. When connecting charger, connect leads first, then turn on charger. Do not turn on charger first, as this may cause a spark.
e. Be careful of a rise in battery temperature because a large current flow is required during quick-charge operation.
   If battery -temperature rises above 60°C (140°F), stop charging. Always charge battery when its temperature is below 60°C (140°F).
f. Do not exceed the charging time specified in Fig. 6. Because if the battery is charged over the charging time, it can cause deterioration of the battery.

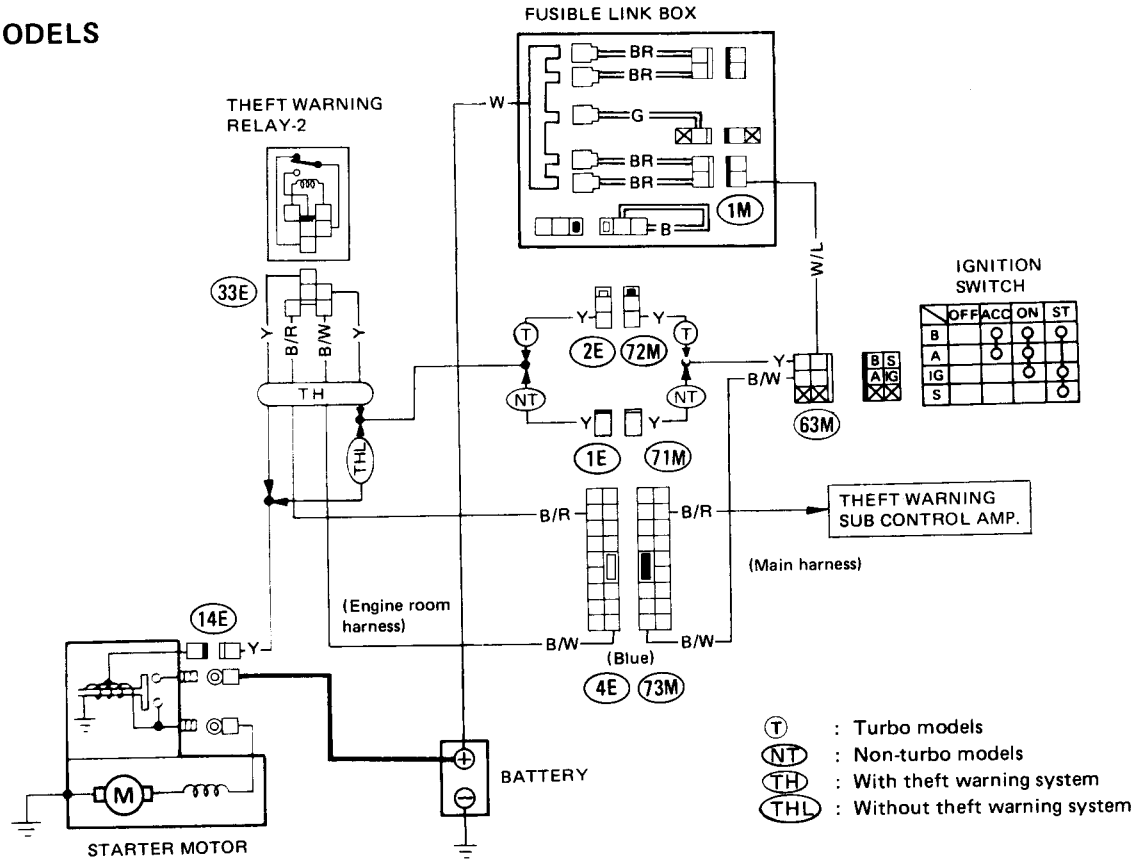
Service Data and Specifications (S.D.S.)

Applied model		U.S.A.	Canada, U.S.A.*
Type		55D23R-MF	N70Z-MF
		Maintenance-free	
Capacity	V-AH	12-60	12-70

*: Option

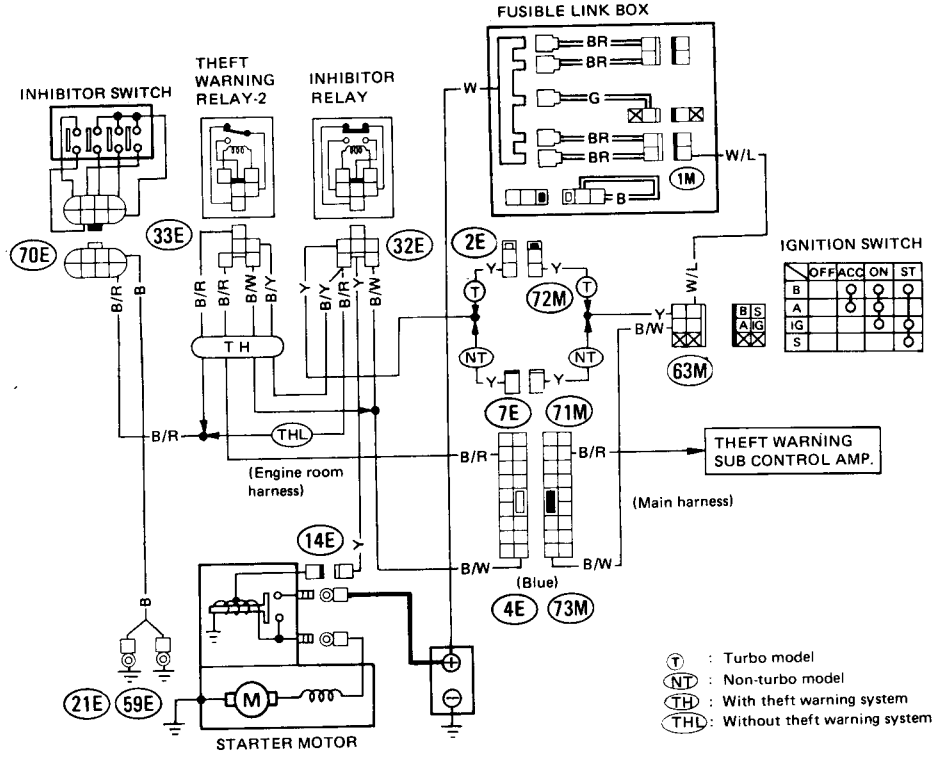
Wiring Diagram

M/T MODELS



SEL621D

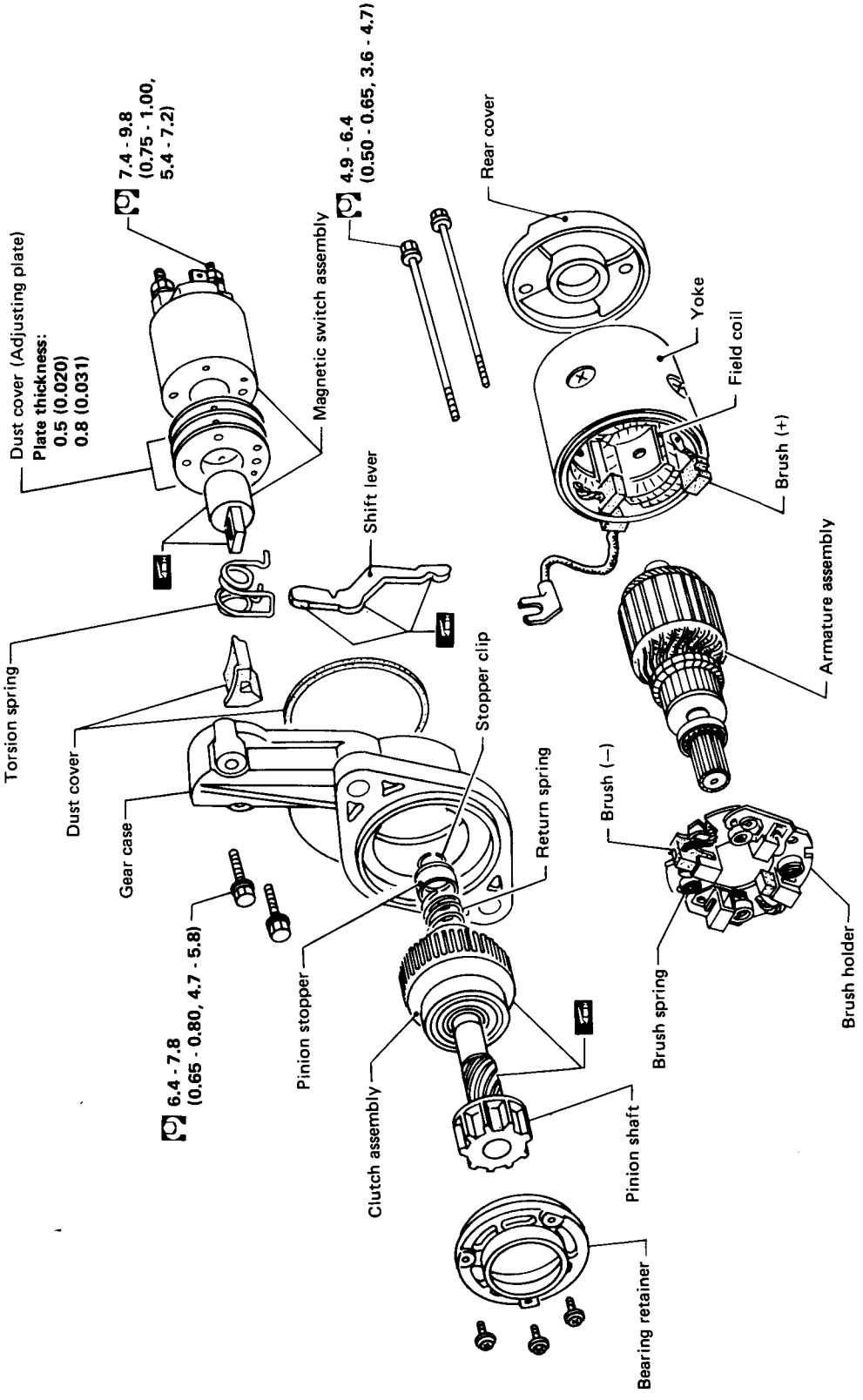
A/T MODELS



SEL498F

Construction

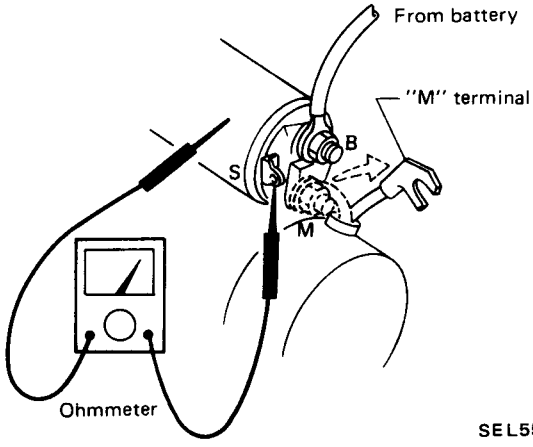
S114-374B, 403B



Magnetic Switch Check

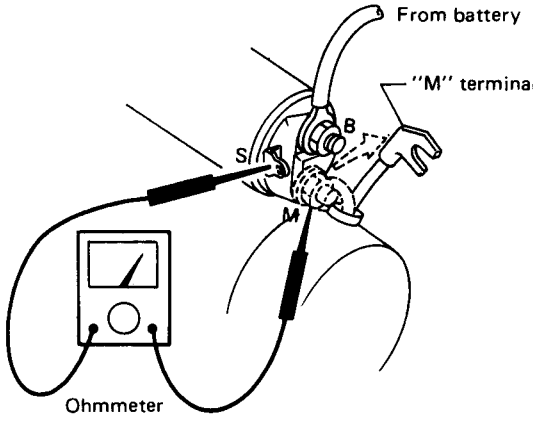
- Before starting to check, disconnect battery ground cable.
- Disconnect "M" terminal of starter motor.

1. Continuity test (between "S" terminal and switch body).
   - No continuity ... Replace.



SEL555E

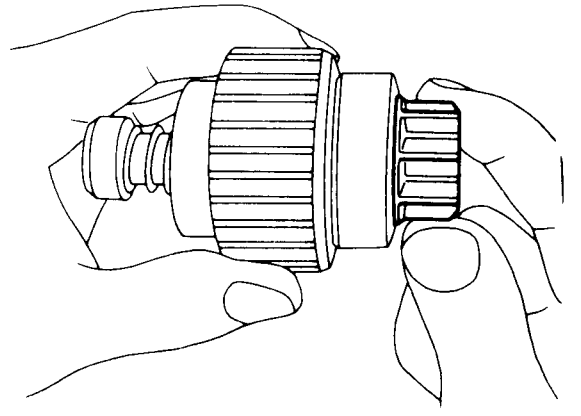
2. Continuity test (between "S" terminal and "M" terminal).
   - No continuity ... Replace.



SEL556E

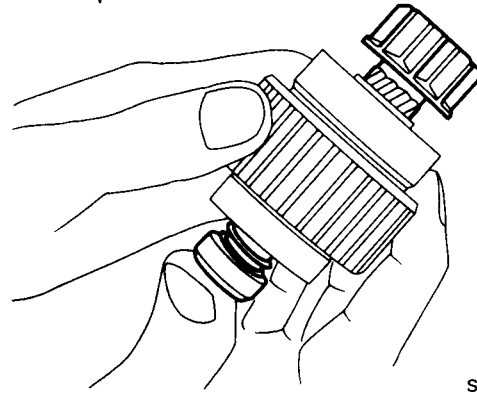
Pinion/Clutch Check

1. Check to see if clutch assembly locks in one direction and rotates smoothly in the opposite direction.
   - If it does not lock (or locks) in either direction or unusual resistance is evident ..... Replace.



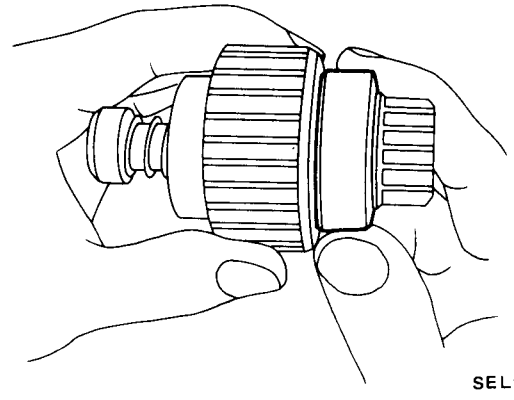
SEL569B

2. Check pinion movement.



SEL570B

3. Check ball bearing.
   Spin outer race of ball bearing to ensure that it turns smoothly without binding.



SEL571B

- Abnormal resistance . . . . Replace.

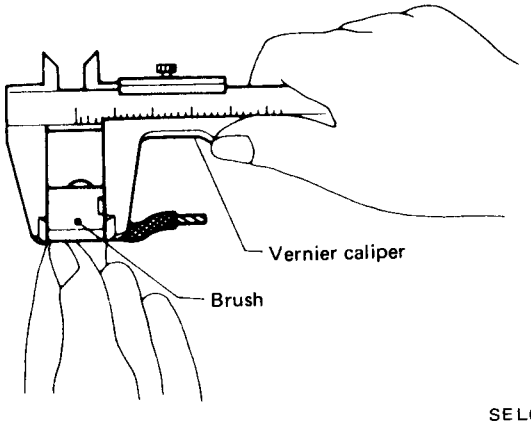
Brush Check

4. Inspection pinion teeth.
   - Replace pinion if teeth are worn or damaged. (Also check condition of ring gear teeth.)
5. Inspect reduction gear teeth.
   - Replace reduction gear if teeth are worn or damaged. (Also check condition of armature shaft gear teeth.)

BRUSH

Check wear of brush.

Wear limit length: 11 mm (0.43 in)

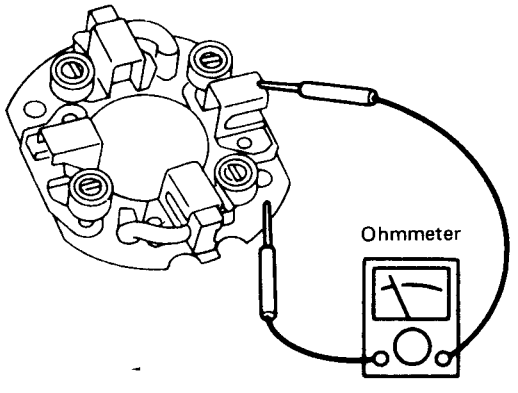


SEL626B

- Excessive wear ... Replace.

BRUSH HOLDER

1. Perform insulation test between brush holder (positive side) and its base (negative side).

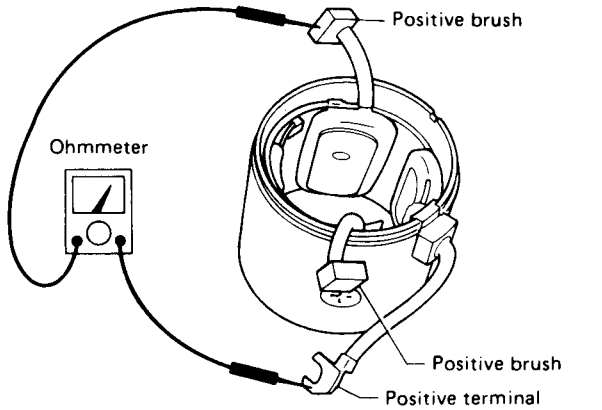


SEL568B

   - Continuity exists ... Replace.
2. Check brush holder to see if it moves smoothly.
   - If brush holder is bent, replace it; if sliding surface is dirty, clean.

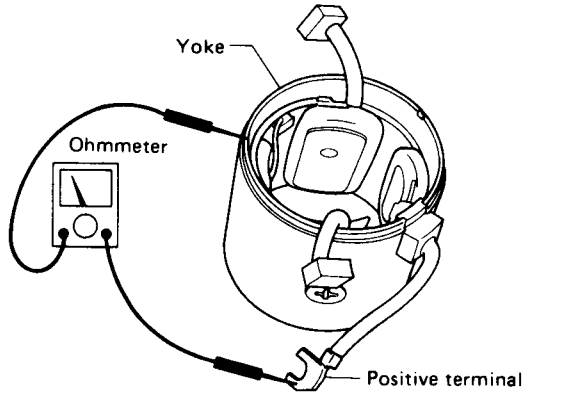
Field Coil Check

1. Continuity test (between field coil positive terminal and positive brushes).



SEL102E

   - No continuity ... Replace field coil.
2. Insulation test (between field coil positive terminal and yoke).

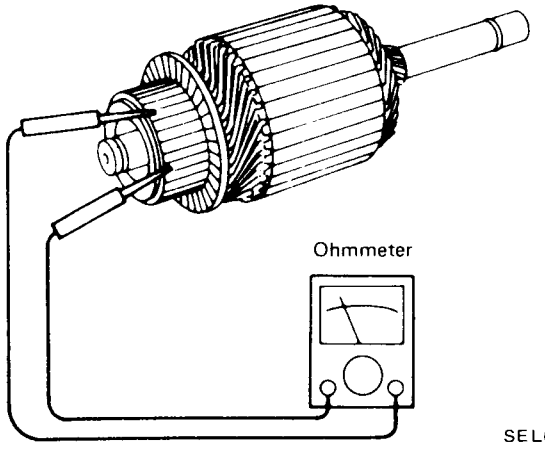


SEL103E

   - Continuity exists ... Replace field coil.

Armature Check

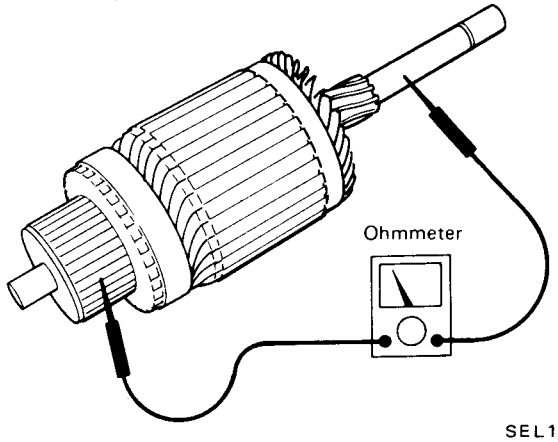
1. Continuity test (between two segments side by side).



SEL625B

- No continuity ... Replace.

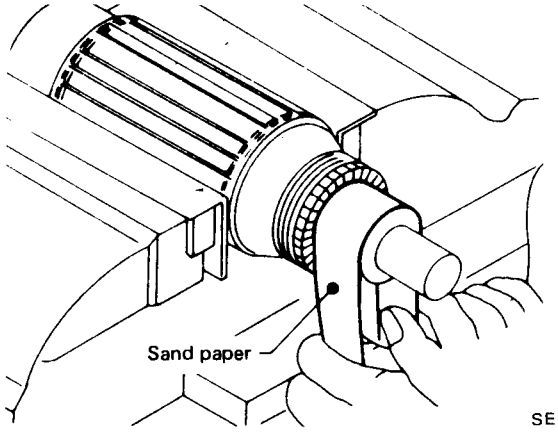
2. Insulation test (between each commutator bar and shaft).



SEL104E

- Continuity exists ... Replace.

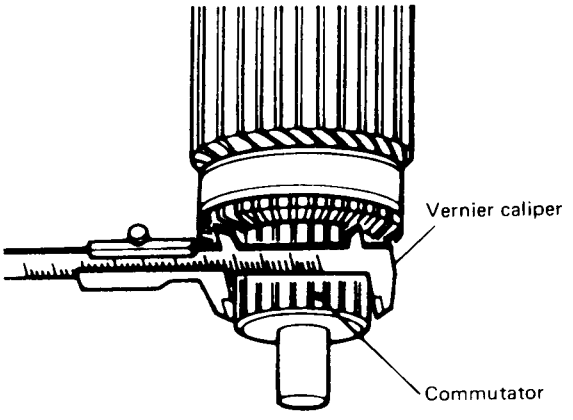
3. Check commutator surface.
   - Rough ... Sand lightly with No. 500 - 600 sandpaper.



SEL624B

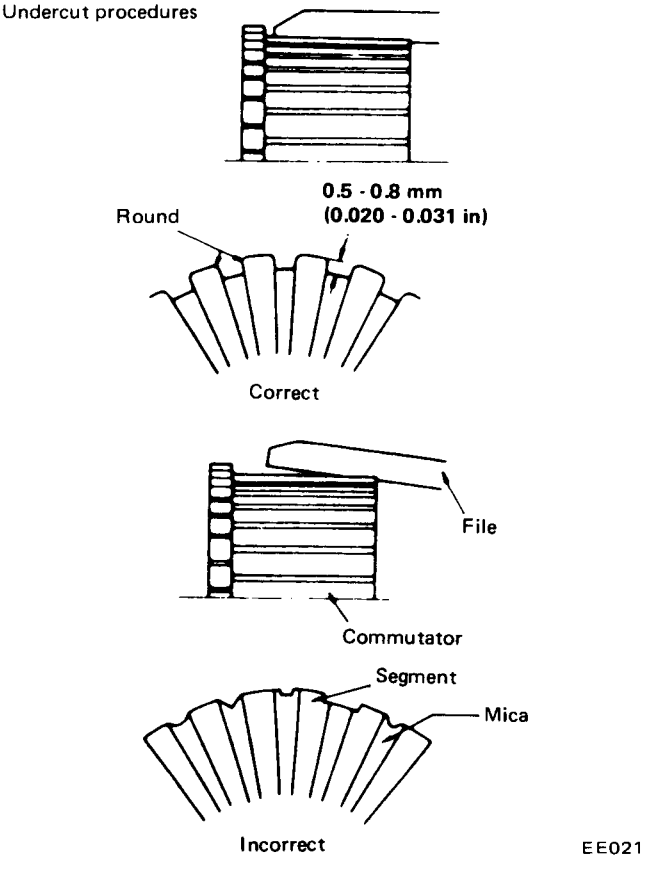
4. Check diameter of commutator.

   Commutator minimum diameter:
   29 mm (1.14 in)
   - Less than specified value ... Replace.



SEL418A

5. Check depth of insulating mica from commutator surface.
   - Less than 0.2 mm (0.008 in) ... Undercut to 0.5 - 0.8 mm (0.020 - 0.031 in)



EE021

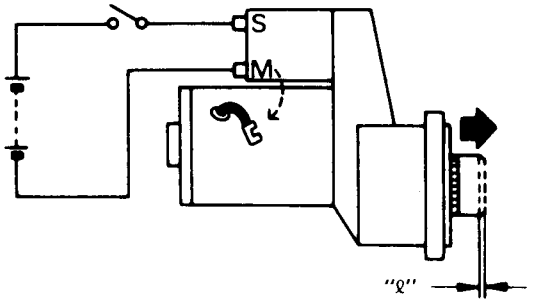
Assembly

Carefully observe the following instructions.

a. **Apply grease to:**
- Rear cover metal
- Gear case metal
- Frictional surface of pinion
- Moving portion of shift lever
- Plunger of magnetic switch

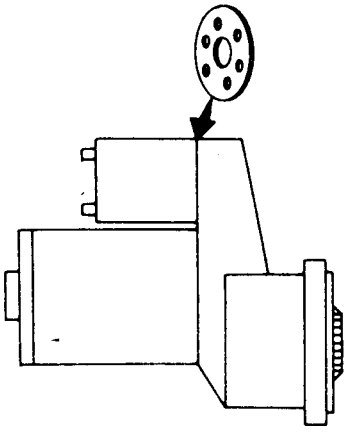
Compare difference "ℓ" in height of pinion when it is pushed out with magnetic switch energized and when it is pulled out by hand unitil it touches stopper.

Difference "ℓ":
0.3 - 1.5 mm (0.012 - 0.059 in)



SEL497D

- Not in the specified value ... Adjust by dust cover (Adjusting plate).



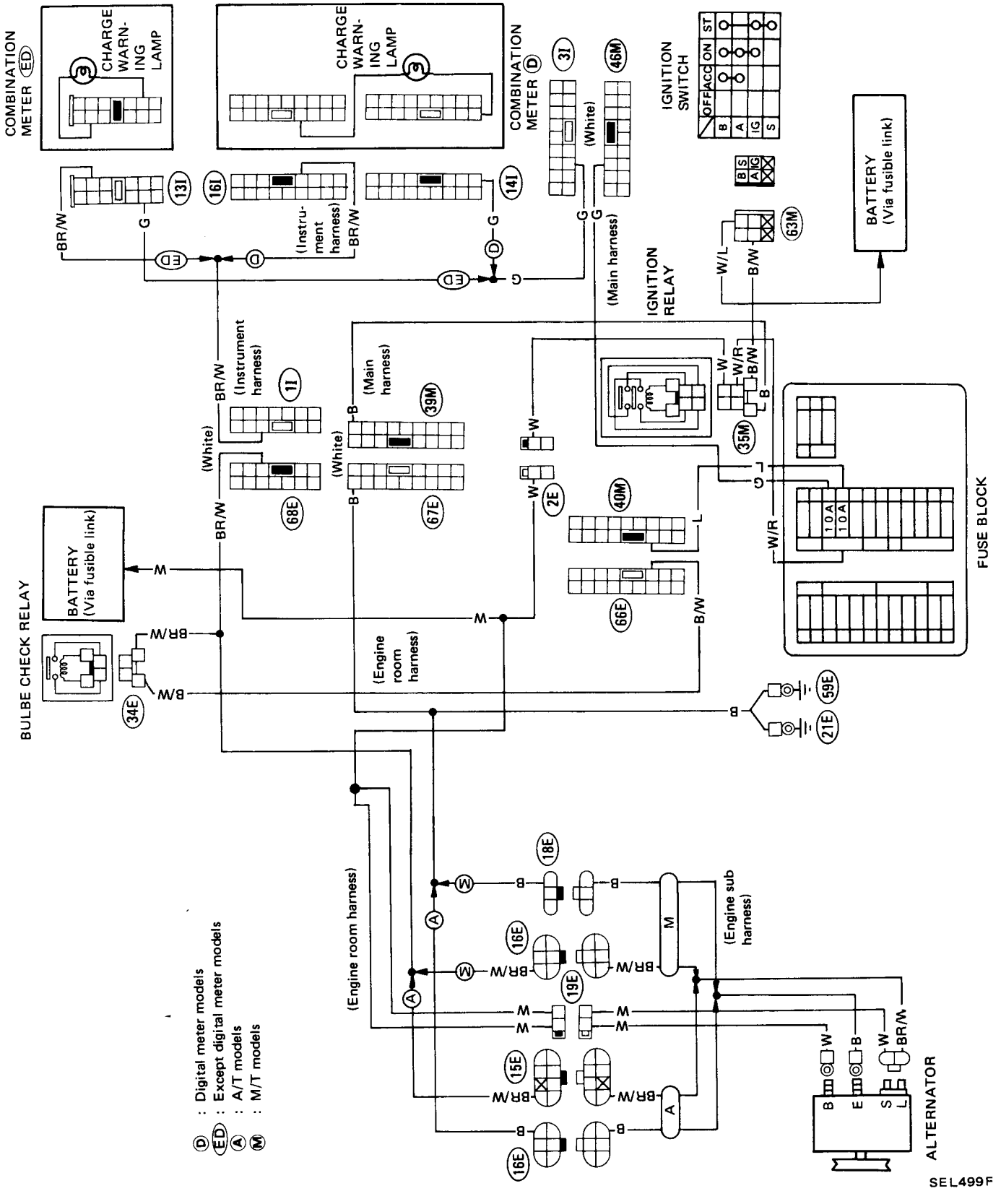
SEL573B

Service Data and Specification

Applied model			
Type		S114-374B	S114-403B
System voltage	V	12	
No-load			
Terminal voltage	V	11	
Current	A	Less than 100	
Revolution	rpm	More than 3,900	
Outer diameter of commutator	mm (in)	More than 29 (1.14)	
Minimum length of brush	mm (in)	11 (0.43)	
Brush spring tension	N (kg, lb)	15.7 - 19.6 (1.6 - 2.0, 3.5 - 4.4)	
Difference "ℓ" in height of pinion assembly	mm (in)	0.3 - 1.5 (0.012 - 0.059)	

Wiring Diagram

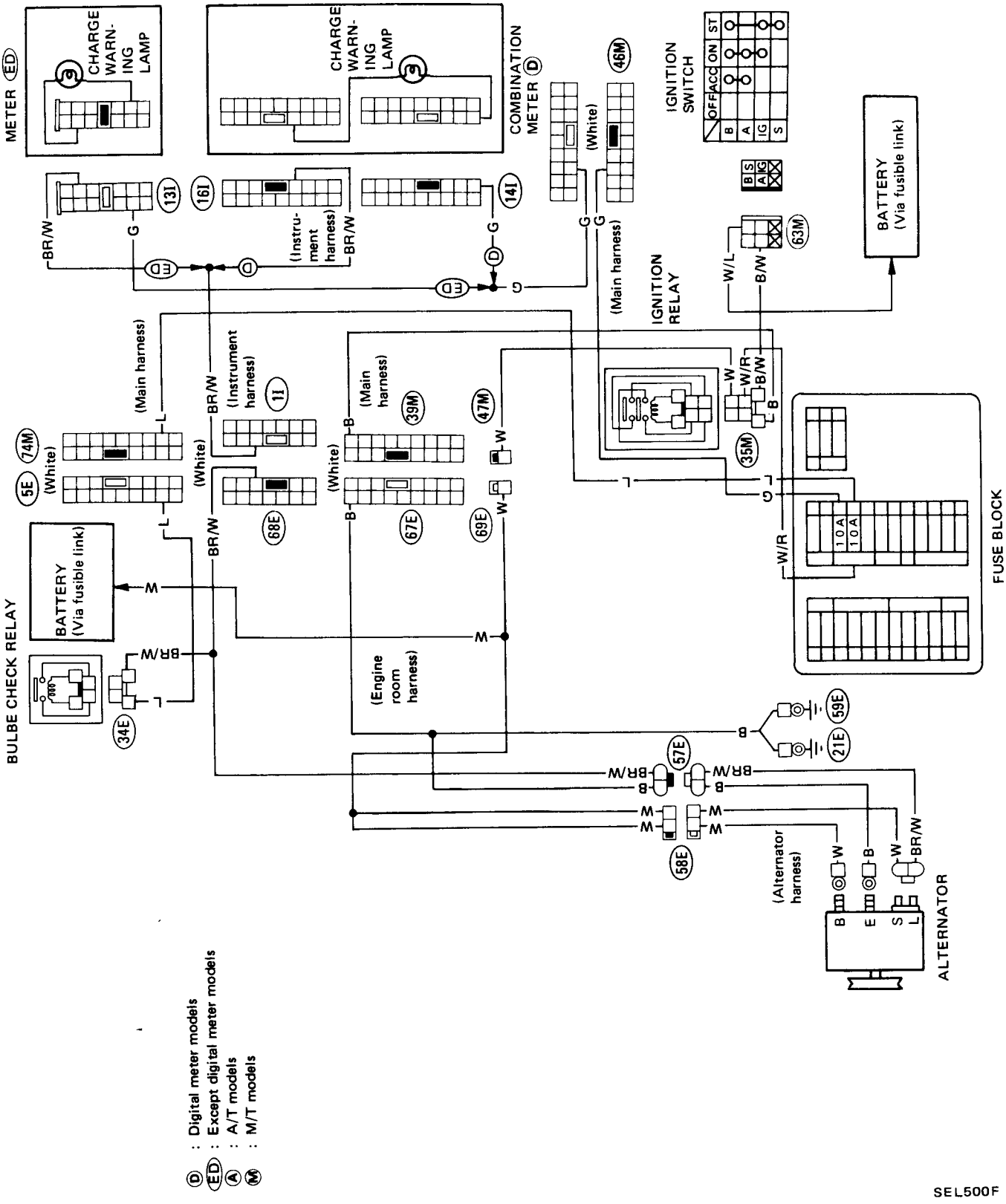
TURBO MODELS



: Digital meter models
(ED) : Except digital meter models
(A) : A/T models
(M) : M/T models

Wiring Diagram (Cont'd)

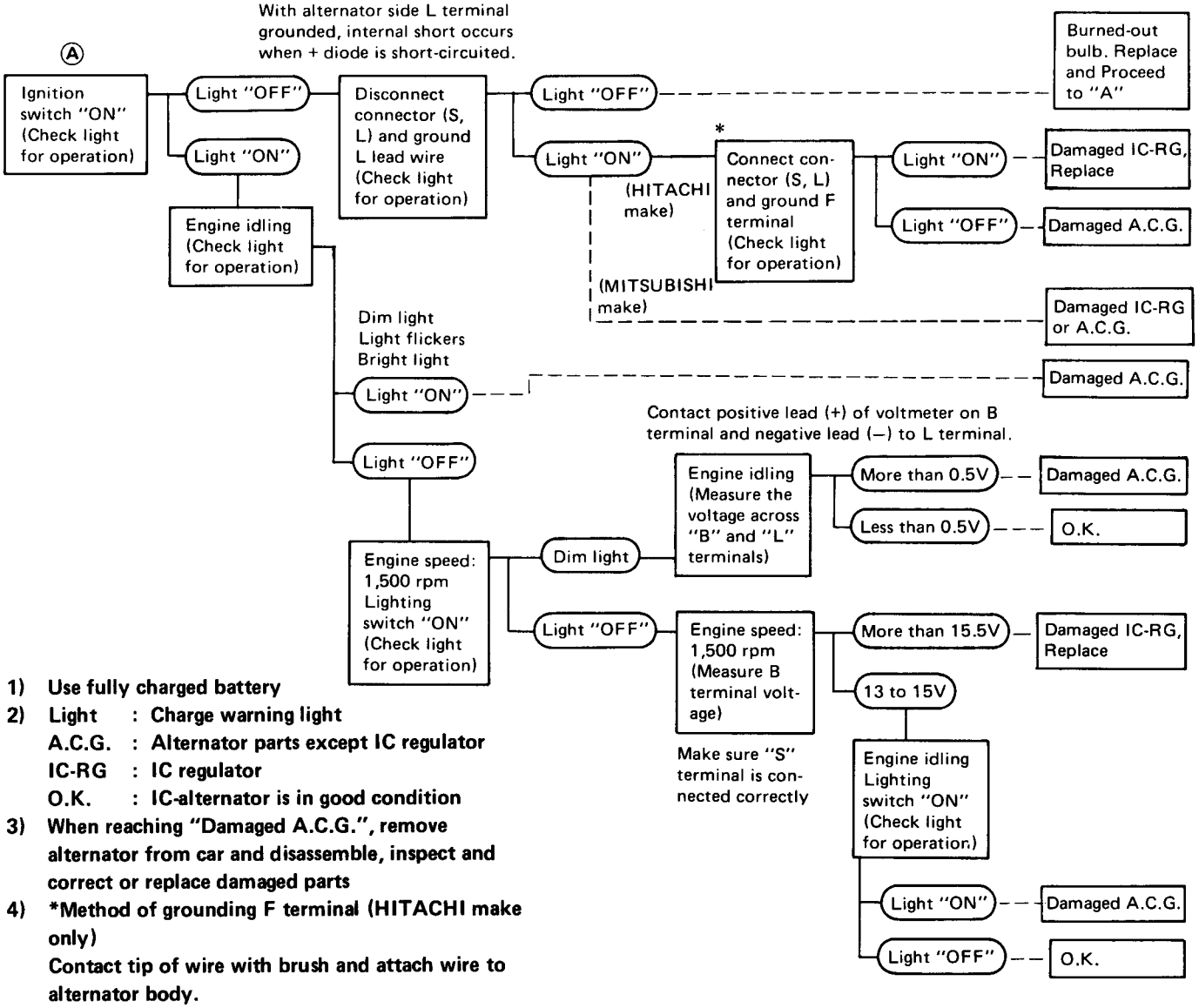
NON-TURBO MODELS



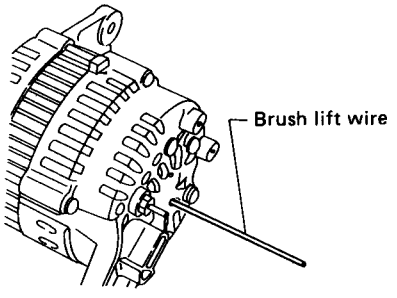
Trouble-shooting

Before conducting an alternator test, make sure that the battery is fully charged. A 30-Volt voltmeter and suitable test probes are necessary for the test. The alternator can be checked easily by referring to the Inspection Table.

WITH IC REGULATOR



1) **Use fully charged battery**
2) **Light : Charge warning light**
   A.C.G. : Alternator parts except IC regulator
   IC-RG : IC regulator
   O.K. : IC-alternator is in good condition
3) **When reaching "Damaged A.C.G.", remove alternator from car and disassemble, inspect and correct or replace damaged parts**
4) ***Method of grounding F terminal (HITACHI make only)**
   Contact tip of wire with brush and attach wire to alternator body.

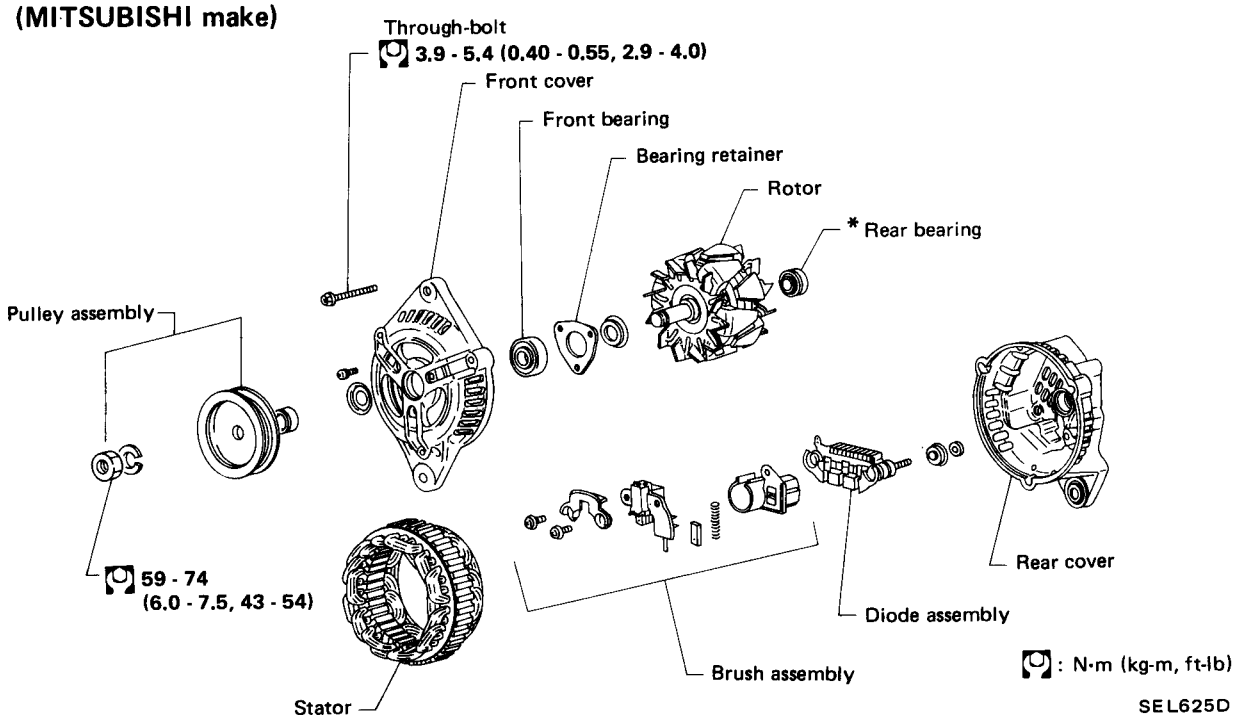


SEL766D

5) **Terminals "S", "L", "BAT" and "E" are marked on rear cover of alternator.**

Construction

A2T48195 (MITSUBISHI make)

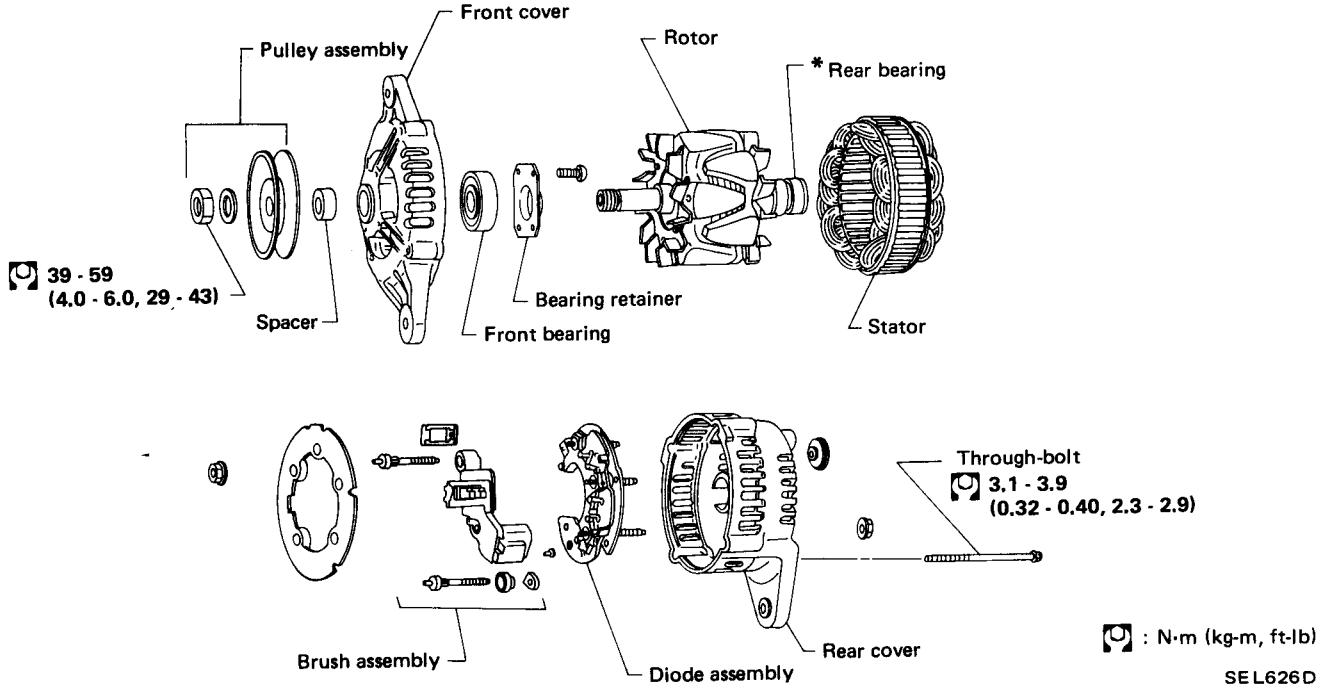


*Rear bearing

CAUTION:

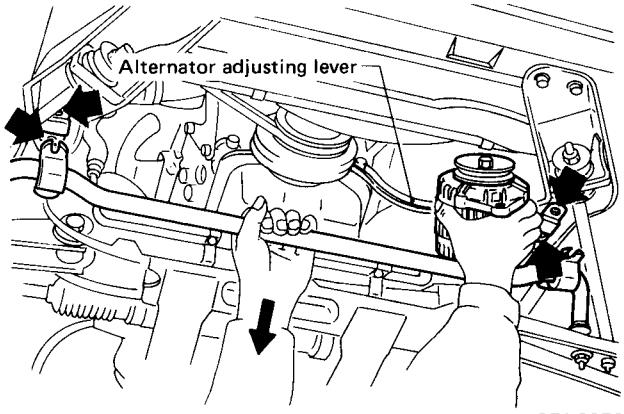
Rear cover may be hard to remove because a ring is used to lock outer race of rear bearing. Be careful not to lose this ring during removal.

LR170-701B (HITACHI make)



Removal

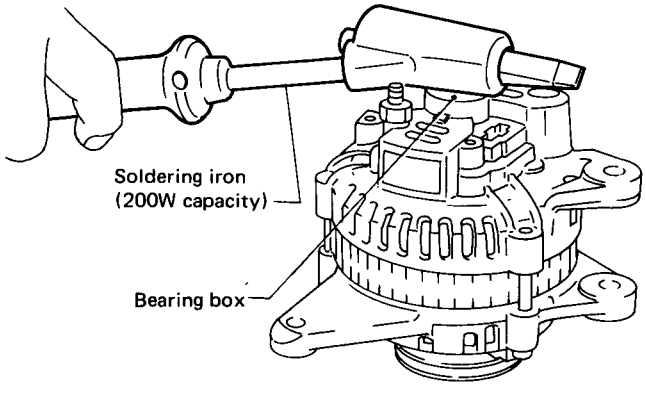
- Remove bolts from alternator.
- Remove bolts for front stabilizer.
- Manually move stabilizer down and remove alternator.



SEL627D

Disassembly

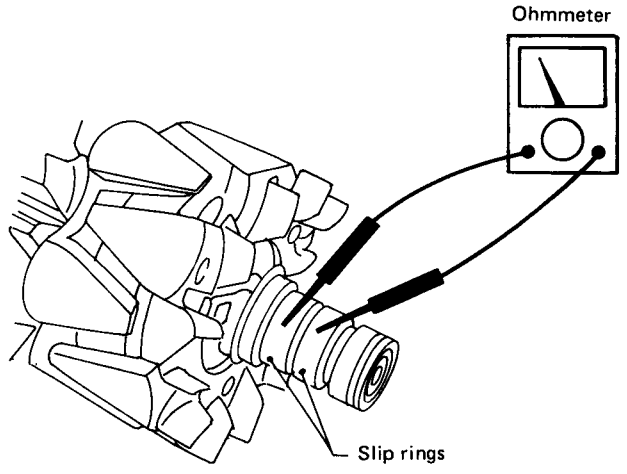
CAUTION:
Rear cover may be hard to remove because a ring is used to lock outer race of rear bearing. To facilitate removal of rear cover, heat only the bearing box section with a 200-watt soldering iron.
Do not use a heat gun, as it can damage diode assembly.



SEL628D

Rotor Slip Ring Check

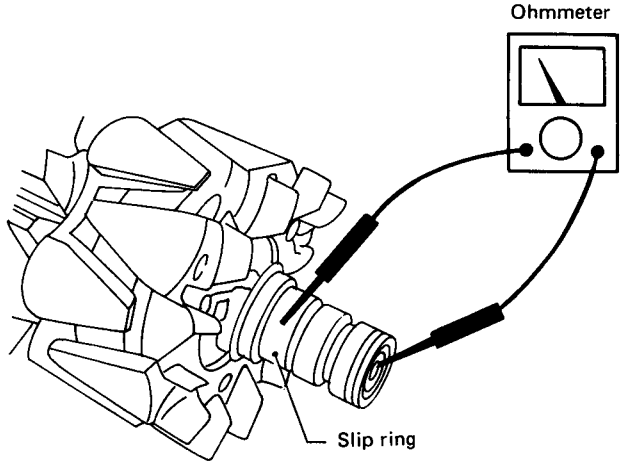
1. Continuity test



SEL629D

- No continuity ... Replace rotor.

2. Insulator test



SEL630D

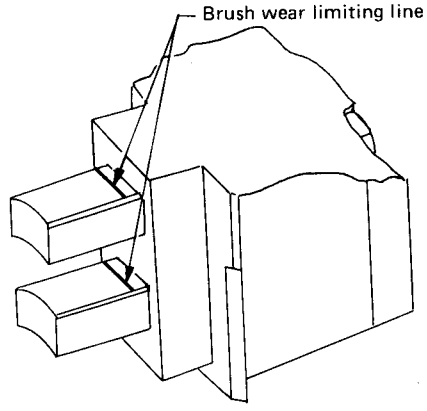
- Continuity exists ... Replace rotor.

3. Check slip ring for wear.

Slip ring minimum outer diameter:
21.6 mm (0.850 in) [HITACHI make]
22.4 mm (0.882 in) [MITSUBISHI make]

Brush Check

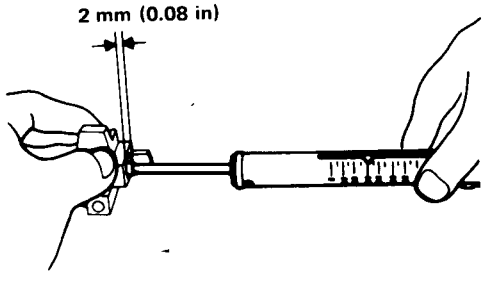
1. Check for smooth movement of brush.
   - Not smooth ... Check brush holder and clean.
2. Check brush for wear.



SEL631D

   - Replace brush if it is worn down to the limit line.
3. Check brush pig tail for damage.
   - Damaged ... Replace.
4. Check brush spring pressure.
   Measure brush spring pressure with brush projected approximately 2 mm (0.08 in) from brush holder.

   Spring pressure:
   1.471 - 3.531 N (150 - 360 g, 5.29 - 12.70 oz) [HITACHI make]
   3.040 - 4.217 N (310 - 430 g, 10.93 - 15.17 oz) [MITSUBISHI make]



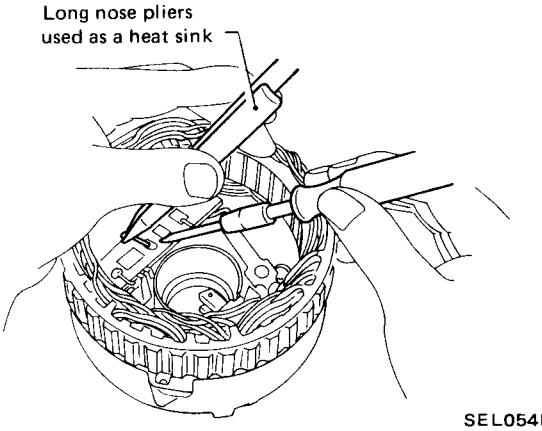
EE049

- Not in the specified value ... Replace.

Stator Check

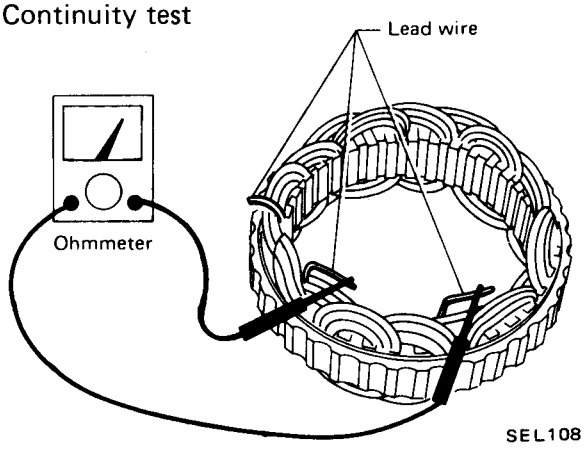
To test the stator or diode, you must separate them by unsoldering the connecting wires.

CAUTION:
Used only as much heat as required to melt solder.
Diodes will be damged if excessive heat is applied.



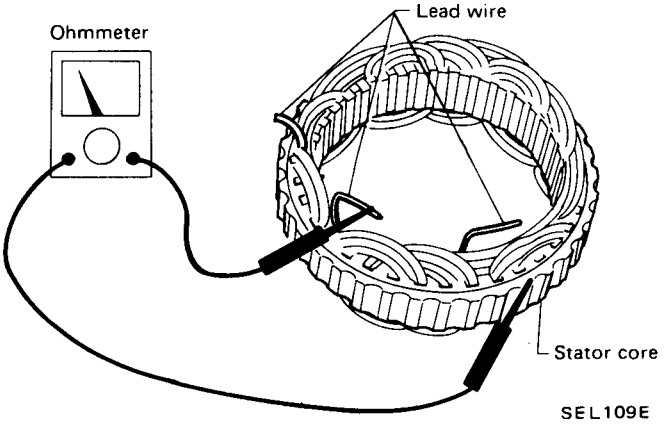
SEL054D

1. Continuity test



SEL108E

   - No continuity ... Replace stator.
2. Ground test



SEL109E

   - Continuity exists ... Replace stator.

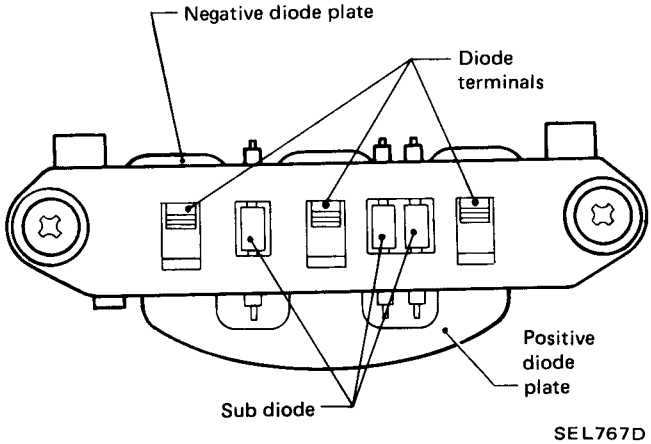
Diode Check

DIODE

- Use an ohmmeter to check condition of diodes as indicated in chart below.
- If any of the test results is not satisfactory, replace diode assembly.

	Ohmmeter probes		Continuity
	Positive ⊕	Negative ⊖	
Diodes check (Positive side)	Positive diode plate	Diode terminals	Yes
	Diode terminals	Positive diode plate	No
Diodes check (Negative side)	Negative diode plate	Diode terminals	No
	Diode terminals	Negative diode plate	Yes

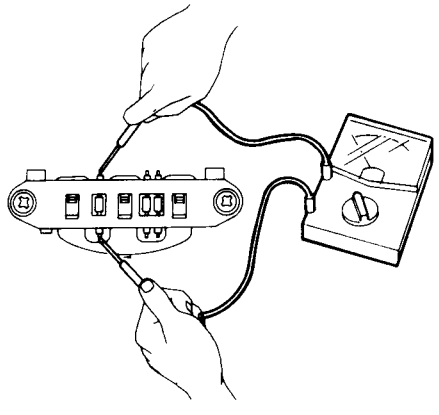
[MITSUBISHI make]



SEL767D

Sub-diode

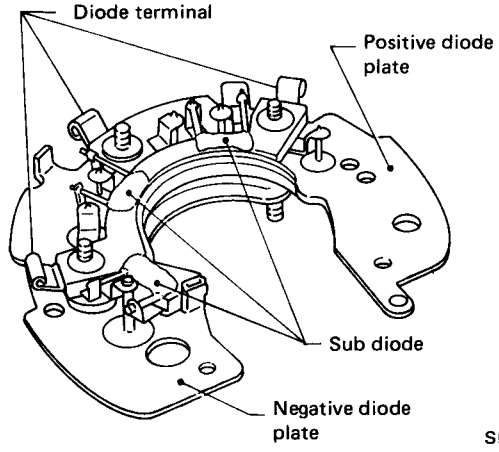
- Attach ohmmeters' probe to each end of diode and check for continuity.



SEL910A

- Continuity is N.G. ... Replace diode assembly.

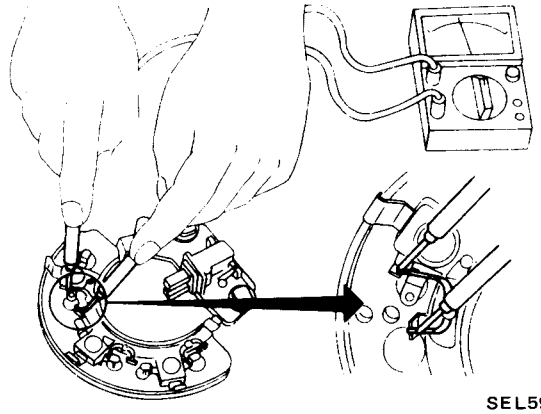
[HITACHI make]



SEL768D

Sub-diode

- Attach ohmmeter's probe to each end of diode to check for continuity.



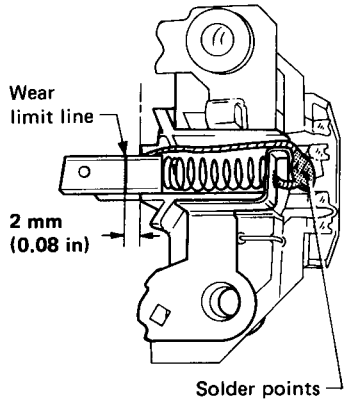
SEL593A

- Continuity is N.G. ... Replace diode assembly.

Assembly

Carefully observe the following instructions.

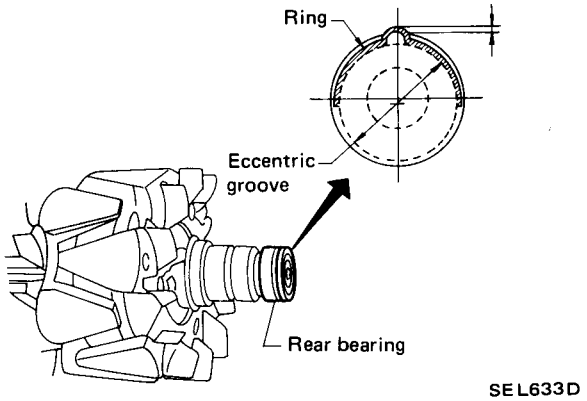
1. When soldering each stator coil lead wire to diode assembly terminal, perform the operation as fast as possible.
2. When soldering brush lead wire, observe the following.
   - Position brush so that its wear limit line protrudes 2 mm (0.08 in) beyond end face of brush holder.



SEL632D

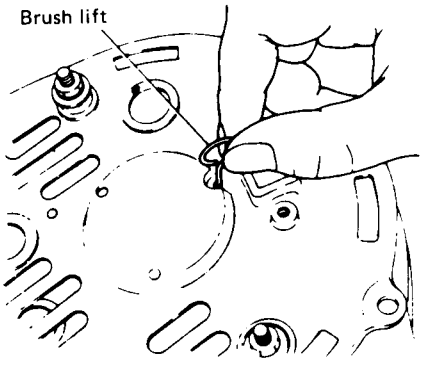
3. Fit ring into groove in rear bearing so that it is as close to the adjacent area as possible.

Quantity of protrusion:
Fix ring at the position of minimum protrusion.

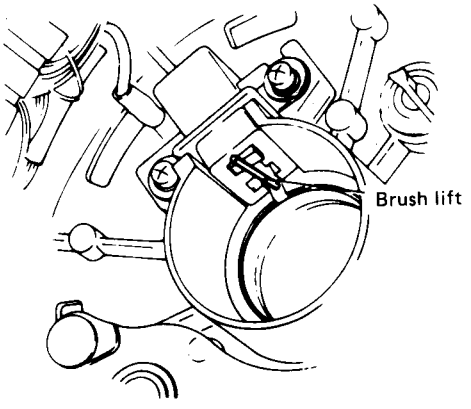


SEL633D

4. Before installing front cover with pulley and rotor to rear cover, push brush up with fingers and retain brush by inserting brush lift into brush lift hole from outside.
   After installing, remove wire for brush lift.



EE540



EE541

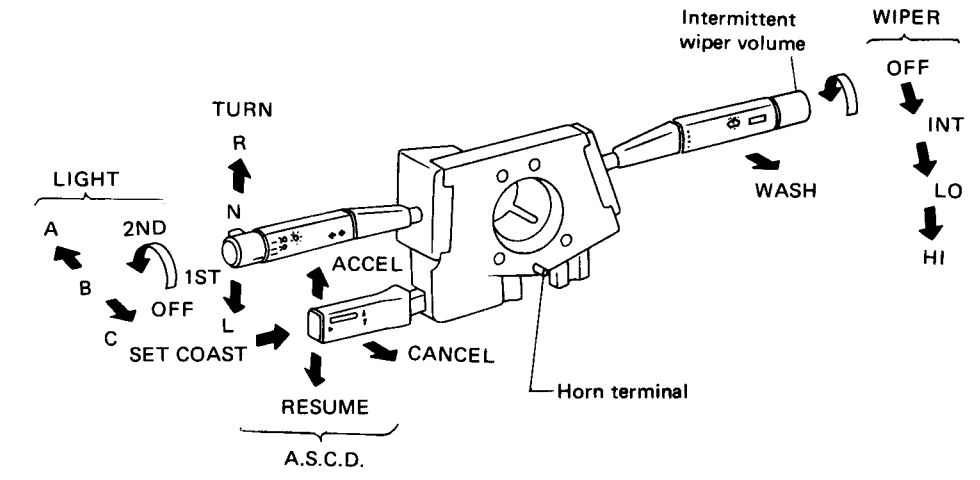
5. After installing front and rear covers of alternator, pull brush lift by pushing toward center.

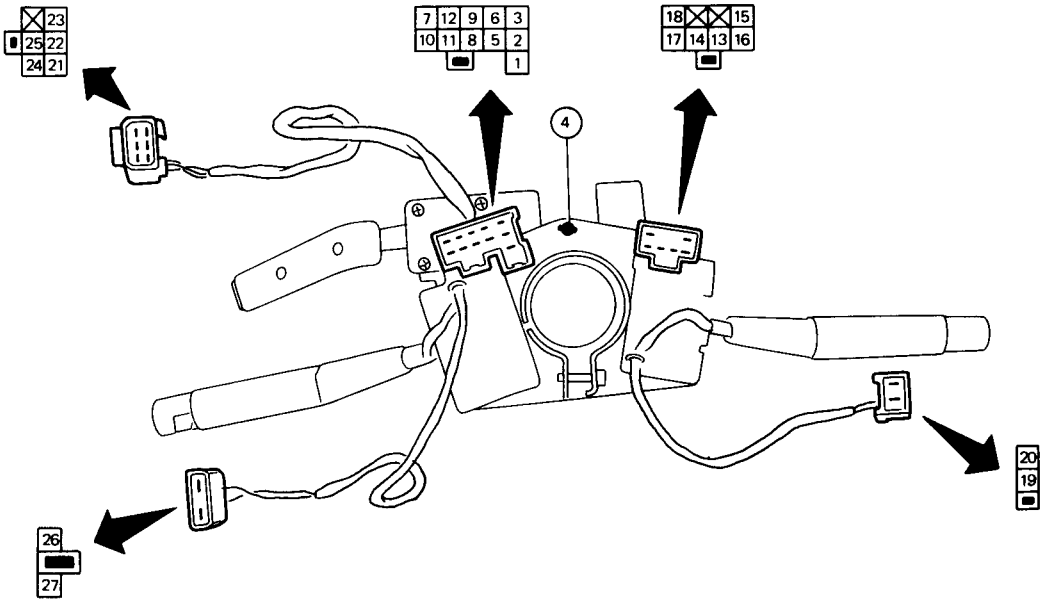
Do not pull brush lift by pushing toward outside of cover as it will damage slip ring sliding surface.

Service Data and Specification

Type	LR170-701B	A2T48195
Applied model	Without turbo-charger models	With turbocharger models
Nominal rating V-A	12-70	
Ground polarity	Negative	
Minimum revolution under no-load (when 14 volts is applied) rpm	Less than 1,000	Less than 1,100
Hot output current A/rpm	More than 21/1,300 More than 50/2,500 More than 70/5,000	More than 21/1,300 More than 50/2,500
Regulated output voltage V	14.4 - 15.0	14.1 - 14.7
Minimum length of brush mm (in)	More than 5.5 (0.217)	More than 8 (0.31)
Brush spring pressure N (g, oz)	1,471 - 3,531 (150 - 360, 5.29 - 12.70)	3,040 - 4,217 (310 - 430, 10.93 - 15.17)
Slip ring outer diameter mm (in)	More than 21.6 (0.850)	More than 22.4 (0.882)

Check





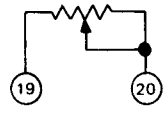
LIGHTING SWITCH

	OFF			1ST			2ND		
	A	B	C	A	B	C	A	B	C
5			○			○	○	○	○
6			○			○	○		○
7								○	
8			○			○	○	○	○
9			○			○	○		○
10								○	
11				○	○	○	○	○	○
12				○	○	○	○	○	○
26							○	○	○
27							○	○	○

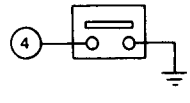
WIPER SWITCH

	OFF	INT	LO	HI	WASH
13	○	○			
14	○	○	○		
15		○	○	○	
16				○	
17		○	○	○	○
18					○

INTERMITTENT WIPER VOLUME



HORN SWITCH



A.S.C.D. SWITCH

	CANSEL	RESUME	ACCEL	SET COAST
21	○	○	○	○
22				○
23		○		
24			○	
25	○			

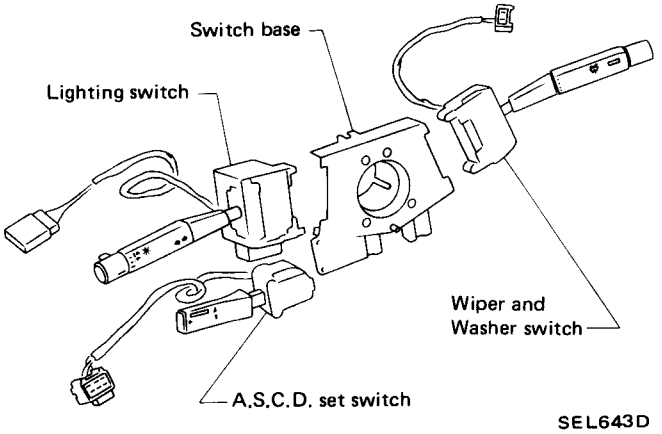
	R	N	L
1	○		○
2	○		
3			○

TURN SIGNAL SWITCH

SEL642D

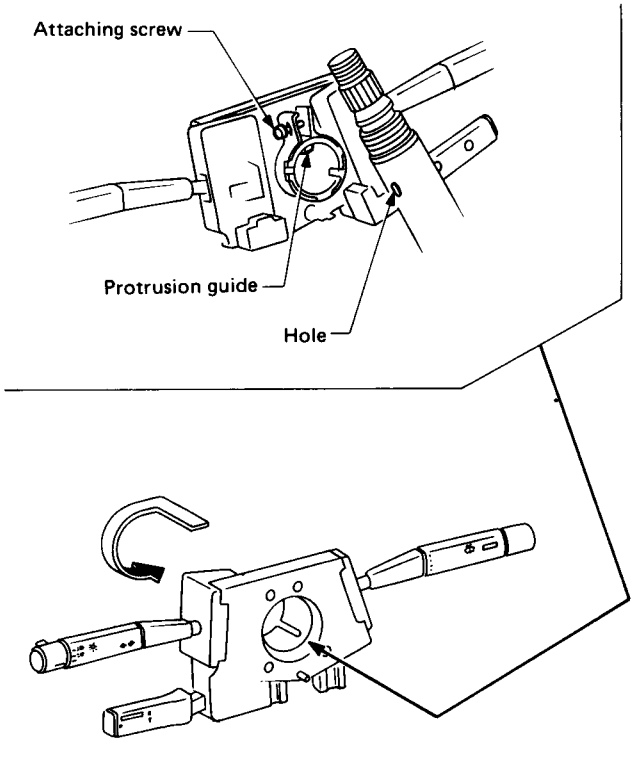
Replacement

Lighting switch, wiper & washer switch and A.S.C.D. switch can be replaced without removing combination switch base.



SEL643D

To remove combination switch base, remove base attaching screw and turn after pushing on it.

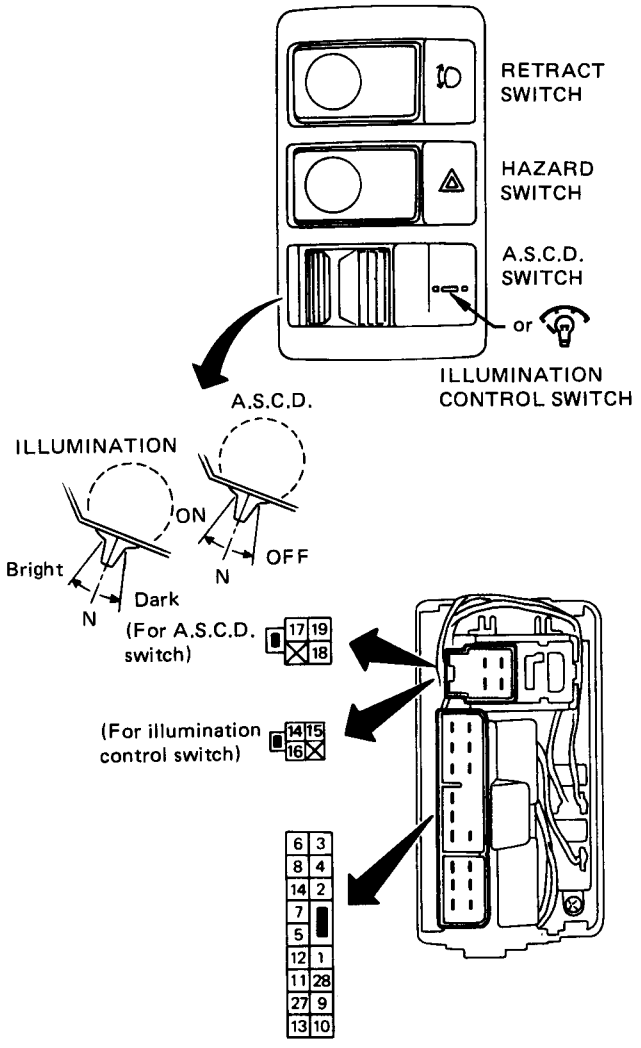


SEL644D

INSTRUMENT SWITCH

Check

INSTRUMENT SWITCH L.H.



RETRACT SWITCH

	UP	DOWN
9	○	
10	○	
11		○
12	○	○
27		○
28	○	
13	○	
	⊖	
14	○	

Indicator

HAZARD SWITCH

	OFF	ON
2	○	○
1	○	
7		○
3		○
4		○
5		○

A.S.C.D. MAIN SWITCH

	OFF	N	ON
17		○	○
18		○	○
19			○

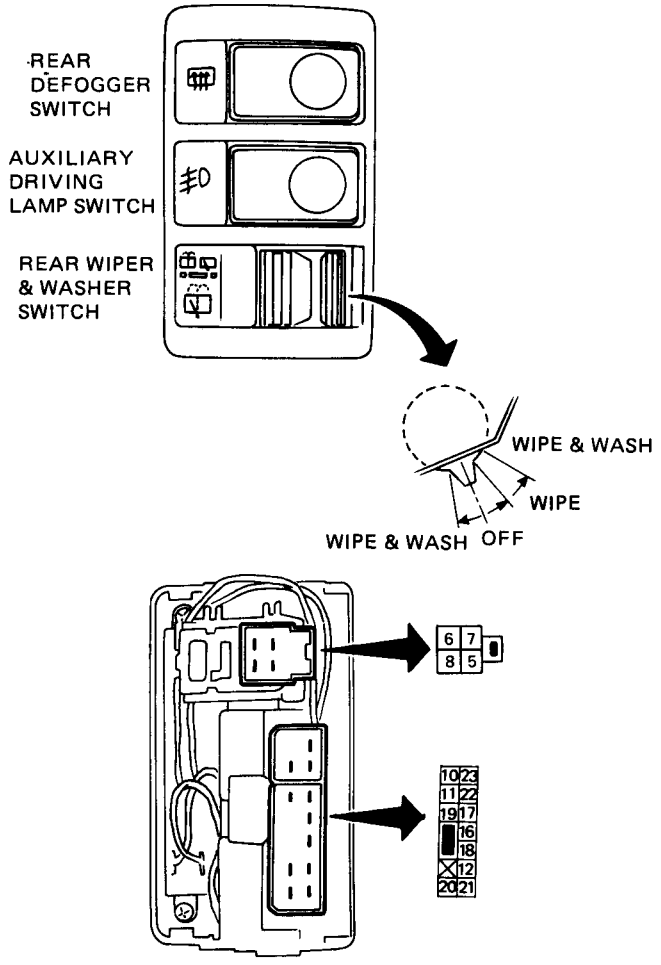
ILLUMINATION CONTROL SWITCH

	BRIGHT	DARK
15	○	
16		○
14	○	○

6 — ⊖ — 8

Illumination

INSTRUMENT SWITCH R.H.



REAR DEFOGGER SWITCH

	OFF	TIME	N
18		○	
19		○	
20		○	○
21		○	○
22			○
			⊖
23			○

Indicator

REAR WIPER & WASHER SWITCH

	WIPE WASH	OFF	WIPE	WIPE WASH
5	○	○	○	○
6		○		
7	○			○
8	○		○	○

AUXILIARY DRIVING LAMP SWITCH

	OFF	ON
10		○
11	○	○
	⊖	⊖
12	○	○

Indicator

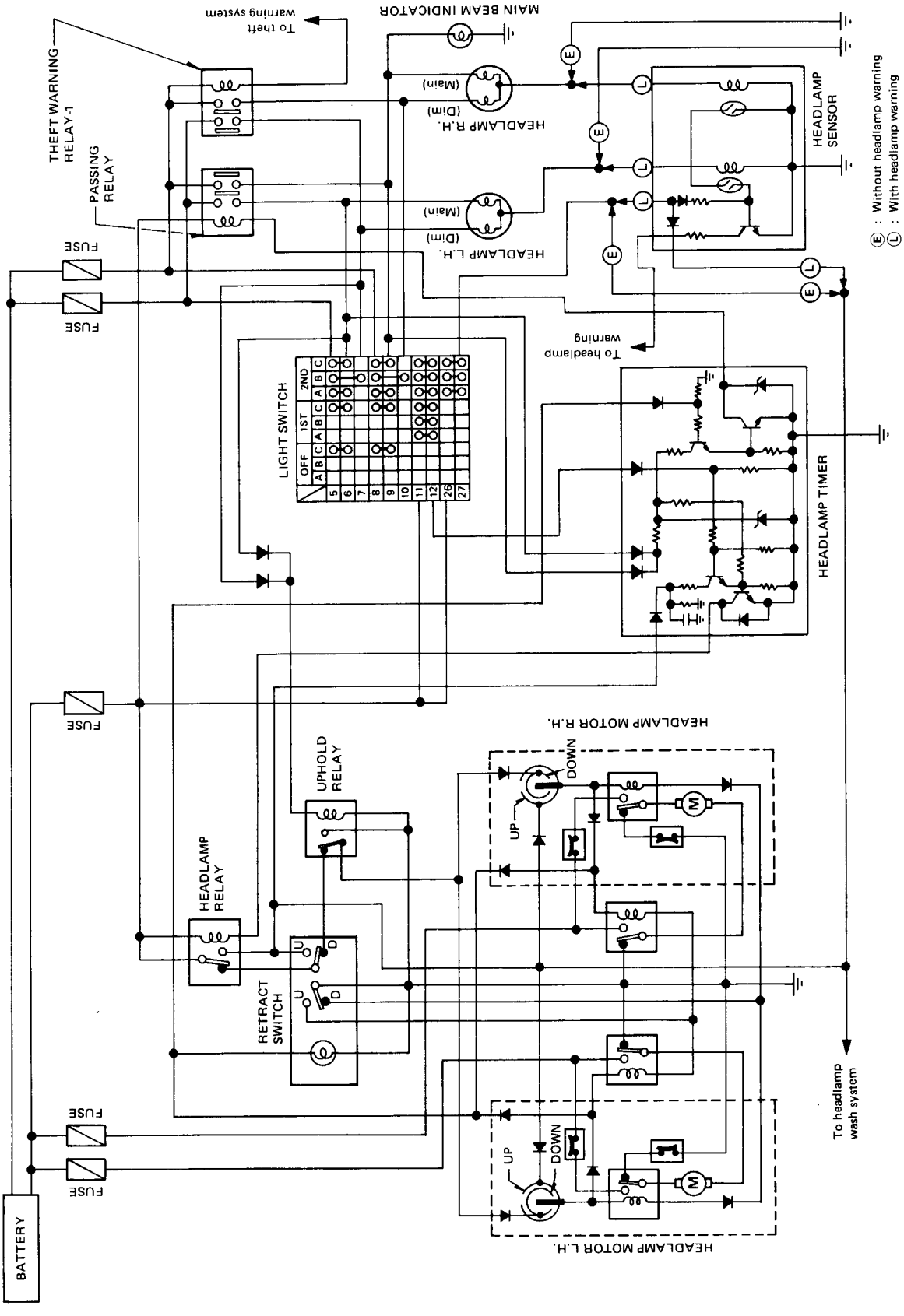
17 — ⊖ — 16

Illumination

SEL497F

- For removal, refer to "INSTRUMENT" in BF section.

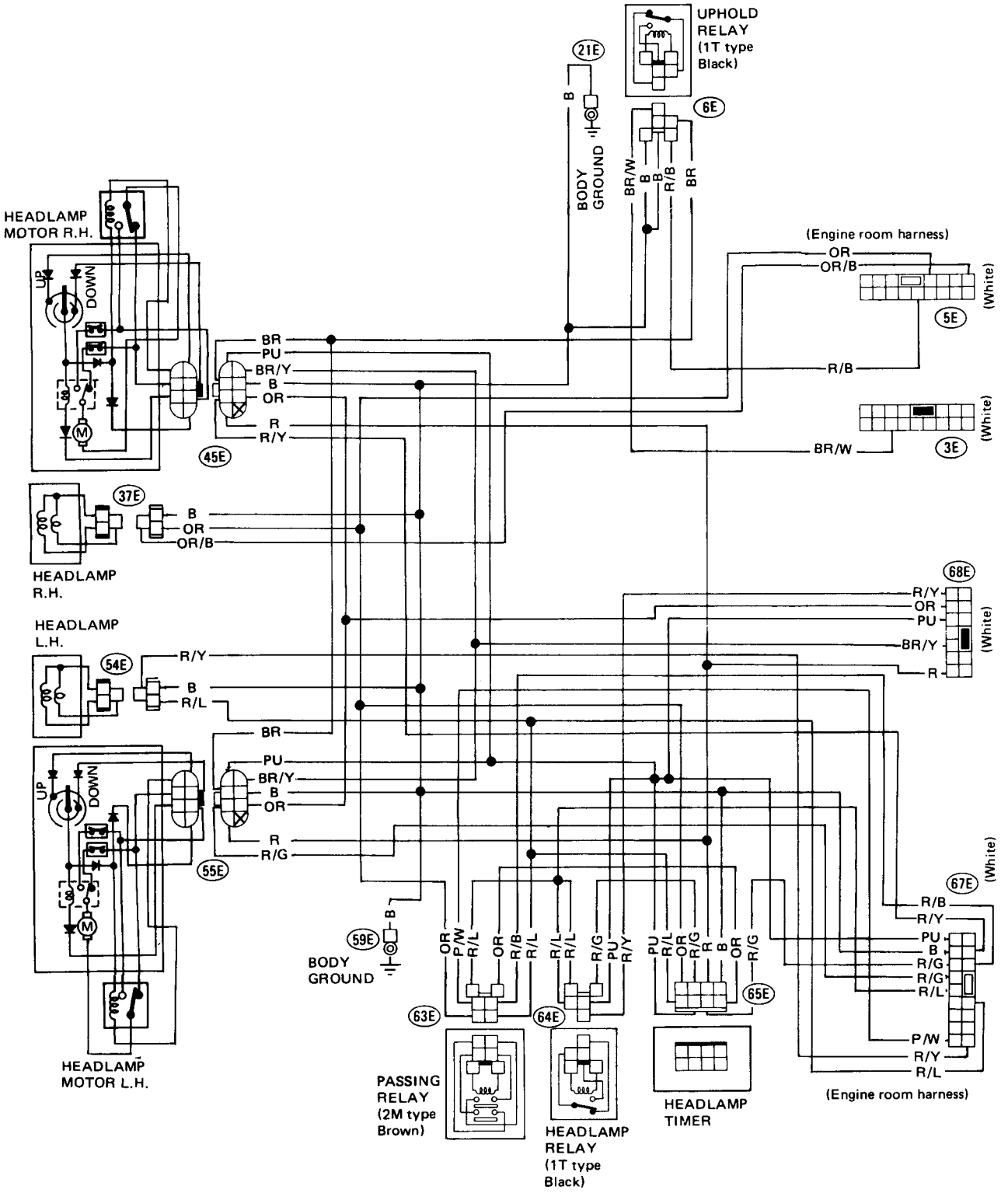
Schematic



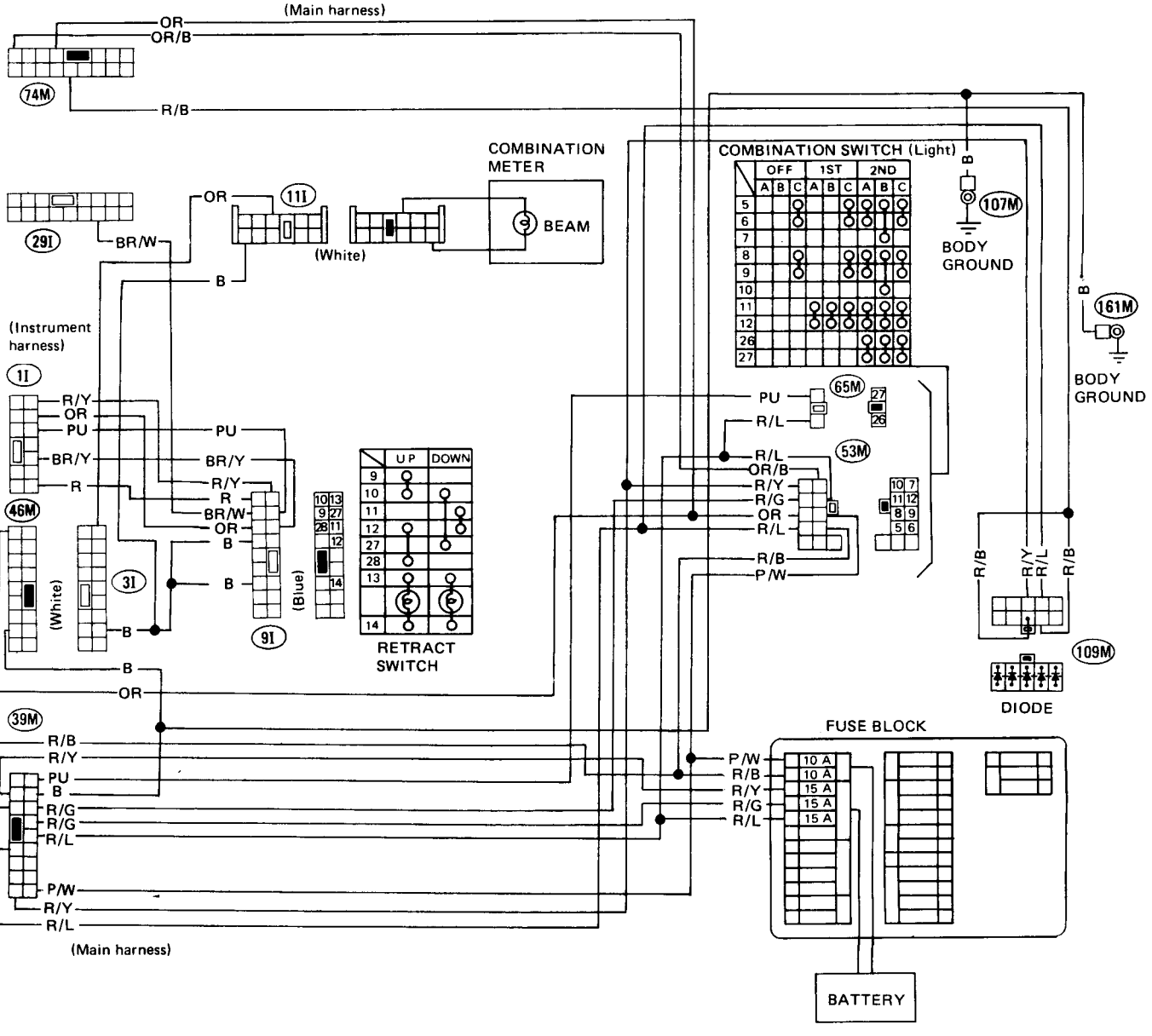
SEL448F

Wiring Diagram

WITHOUT HEADLAMP SENSOR (SF)



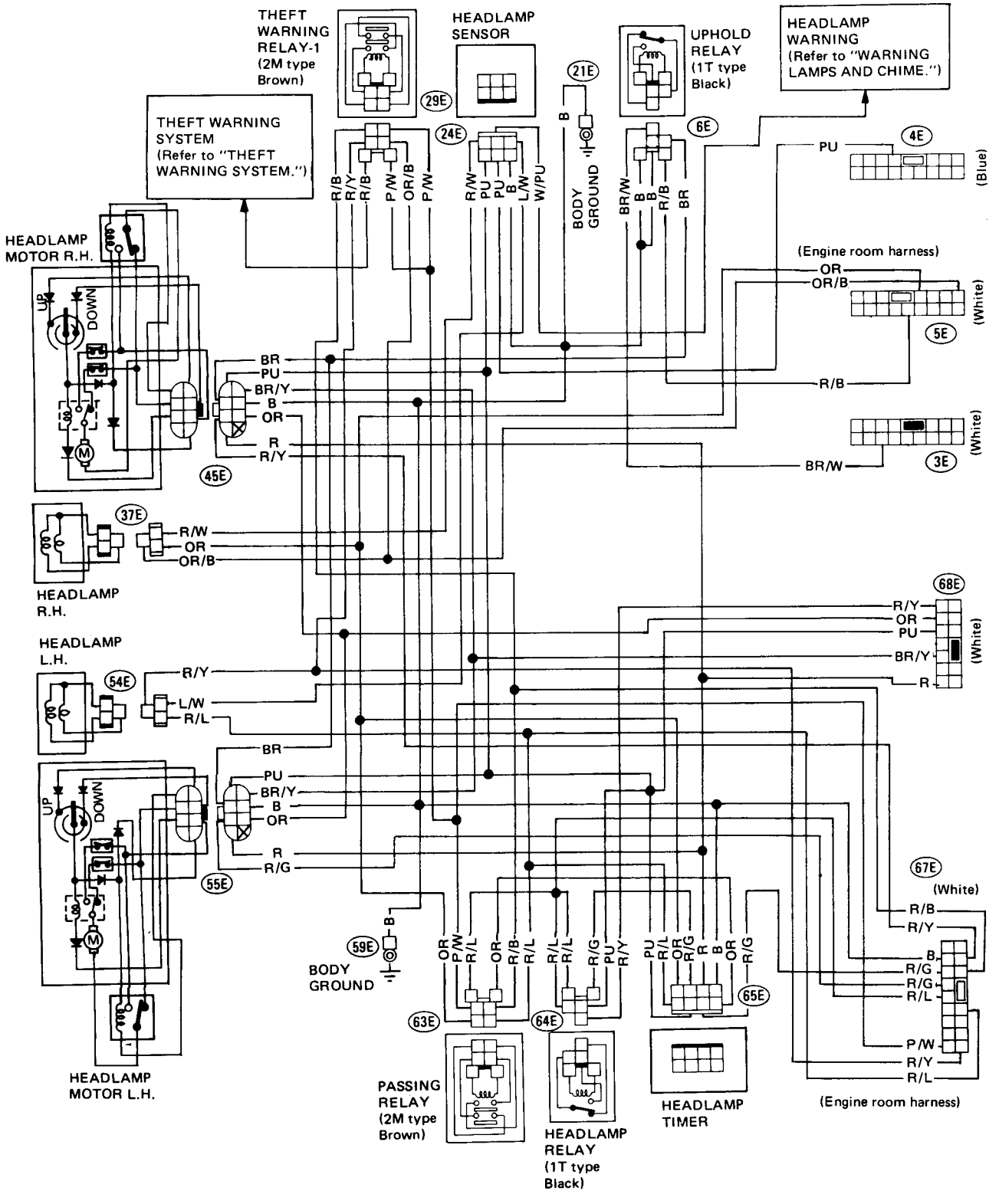
Wiring Diagram (Cont'd)



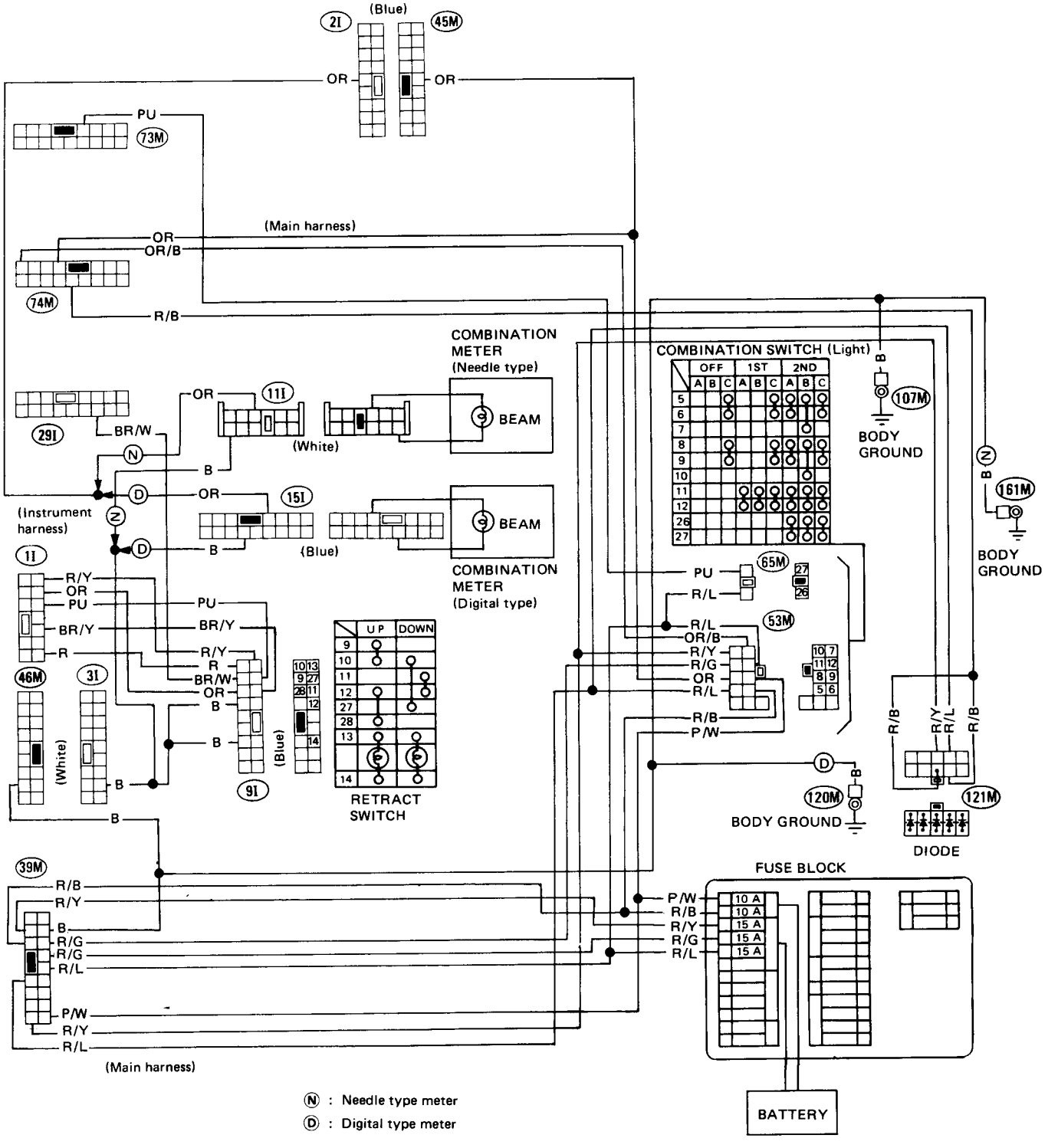
SEL903G

Wiring Diagram (Cont'd)

WITH HEADLAMP SENSOR (GL and GLL)



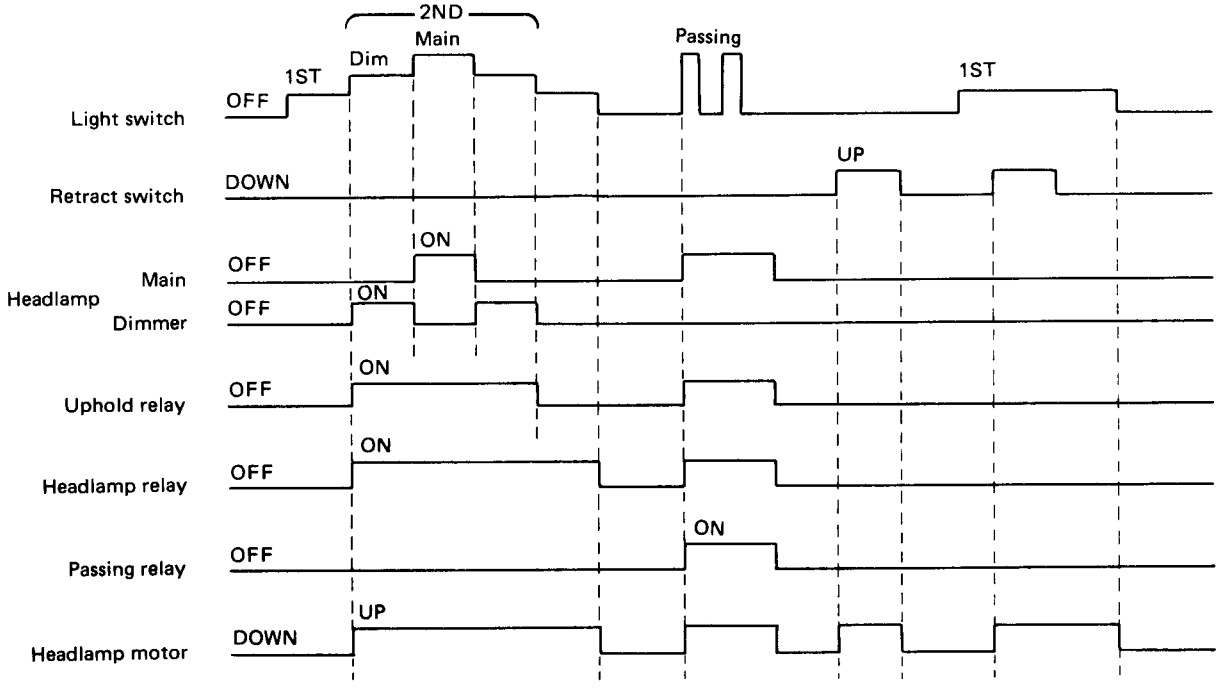
Wiring Diagram (Cont'd)



SEL904G

Operation

- The following chart depicts the operational modes of relays and headlamp motors in relation to the positions of the lighting switch and retract switch.



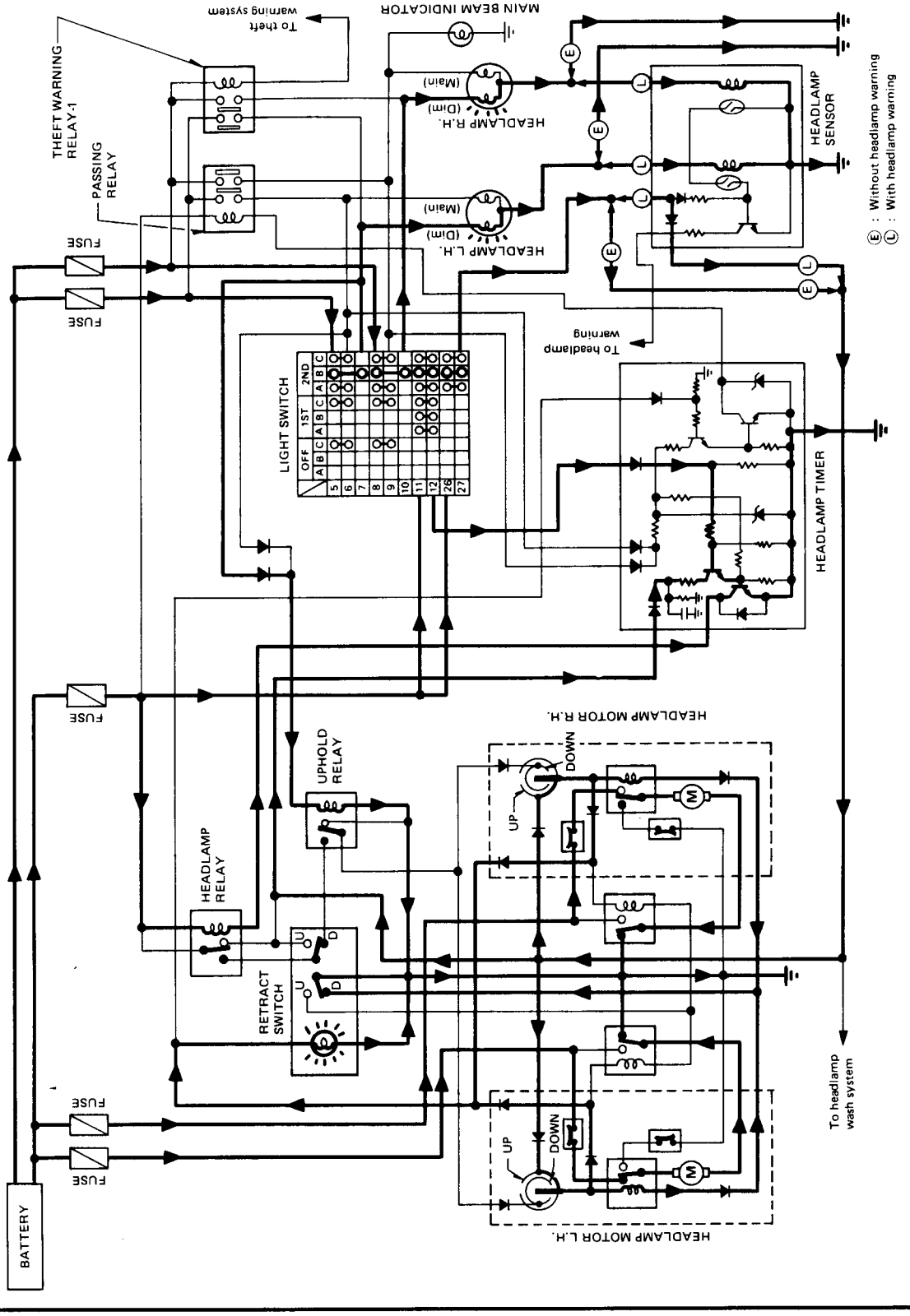
SEL743D

Description

CIRCUIT OPERATION

[A] When lighting switch is switched from "1ST" → "2ND"

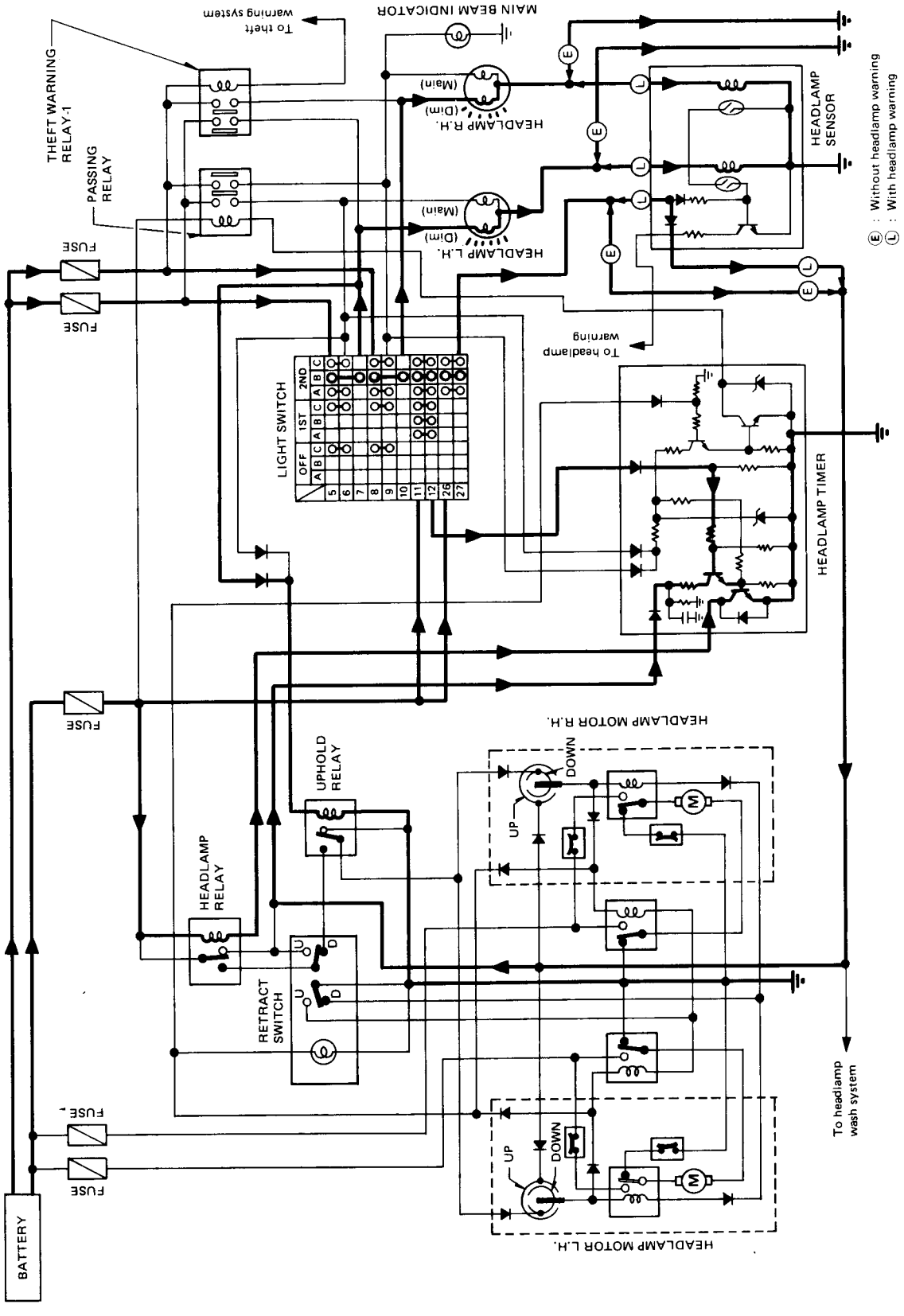
A-1: While operating the headlamp motor to open position



SEL501F

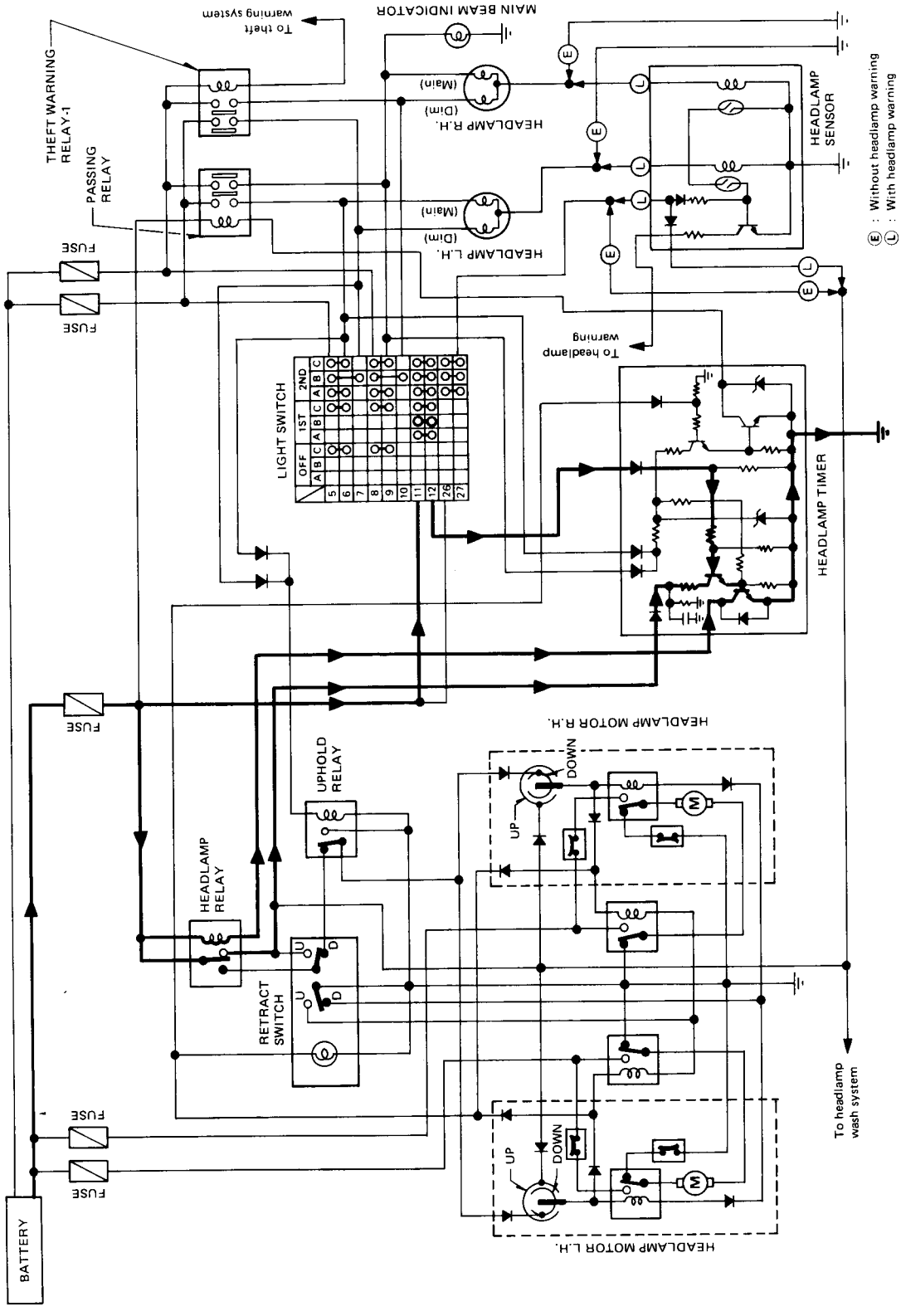
Description (Cont'd)

A-2: After the headlamp motor reaches fully open position



Description (Cont'd)

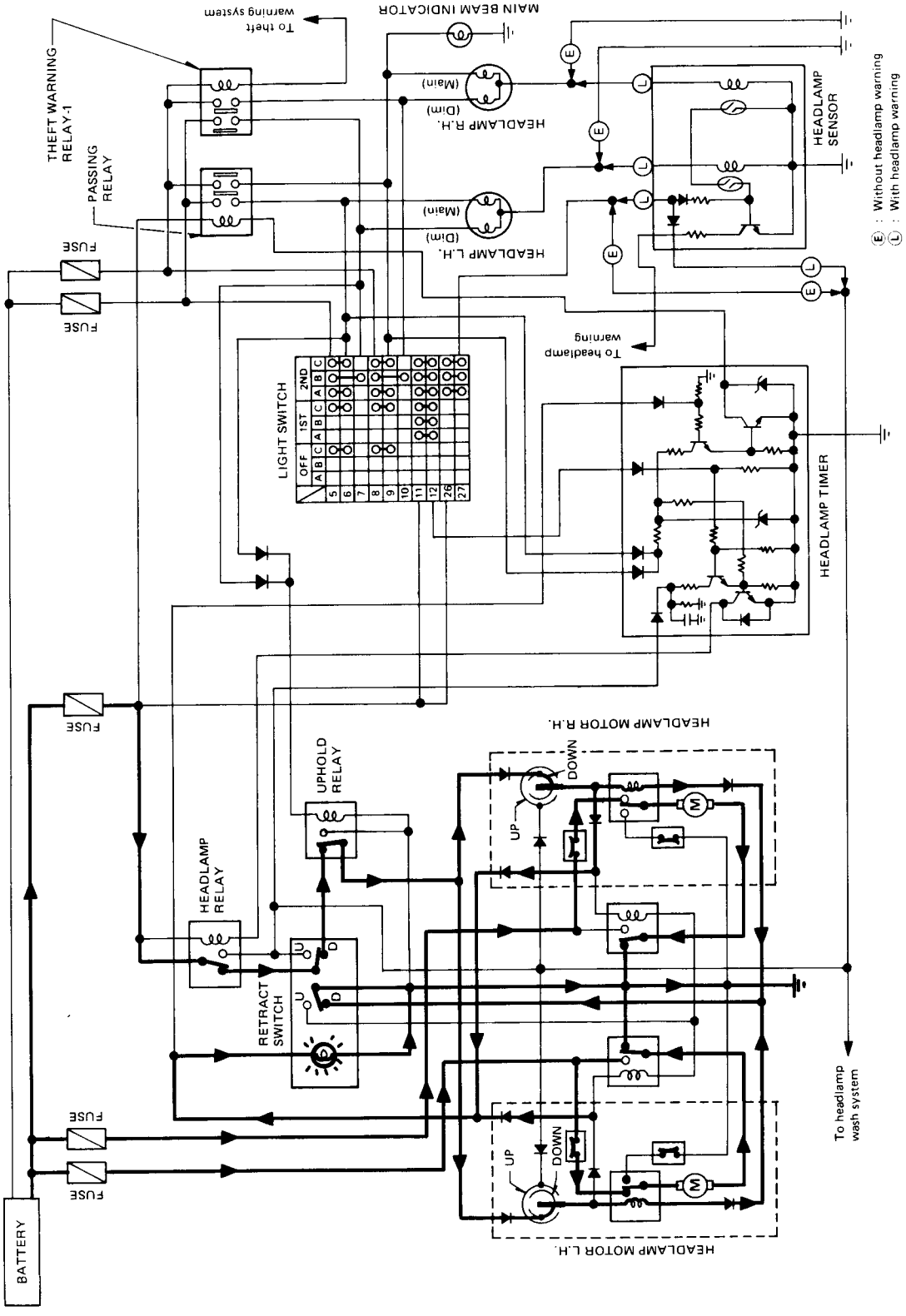
[B] When lighting switch is switched from "2ND" → "1ST"
(Headlamp goes out and keeps up by headlamp timer and headlamp relay.)



SEL503F

Description (Cont'd)

[C] When lighting switch is switched from "1ST" → "OFF"
(While operating the headlamp motor to closed position)

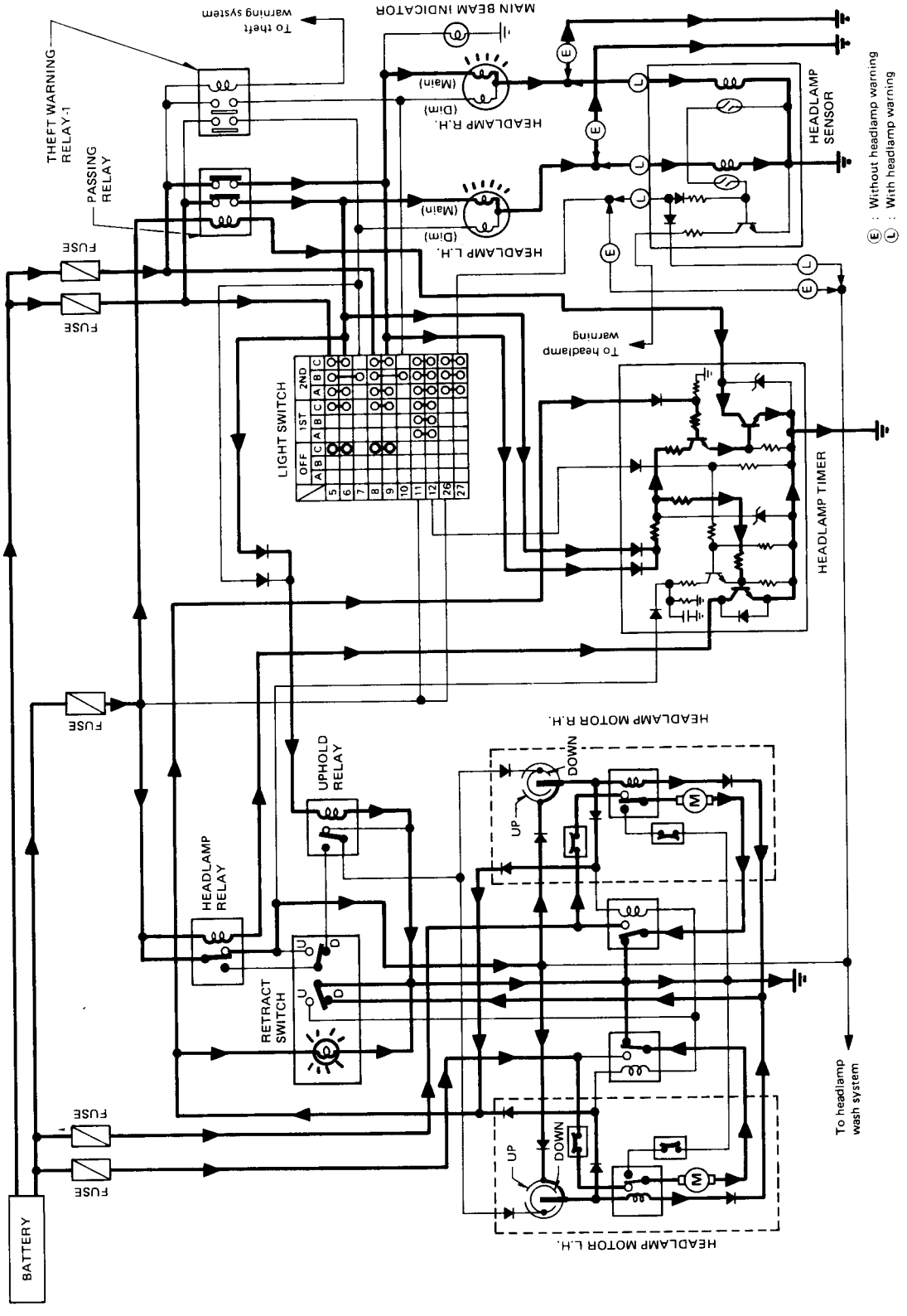


SEL504F

Description (Cont'd)

[D]

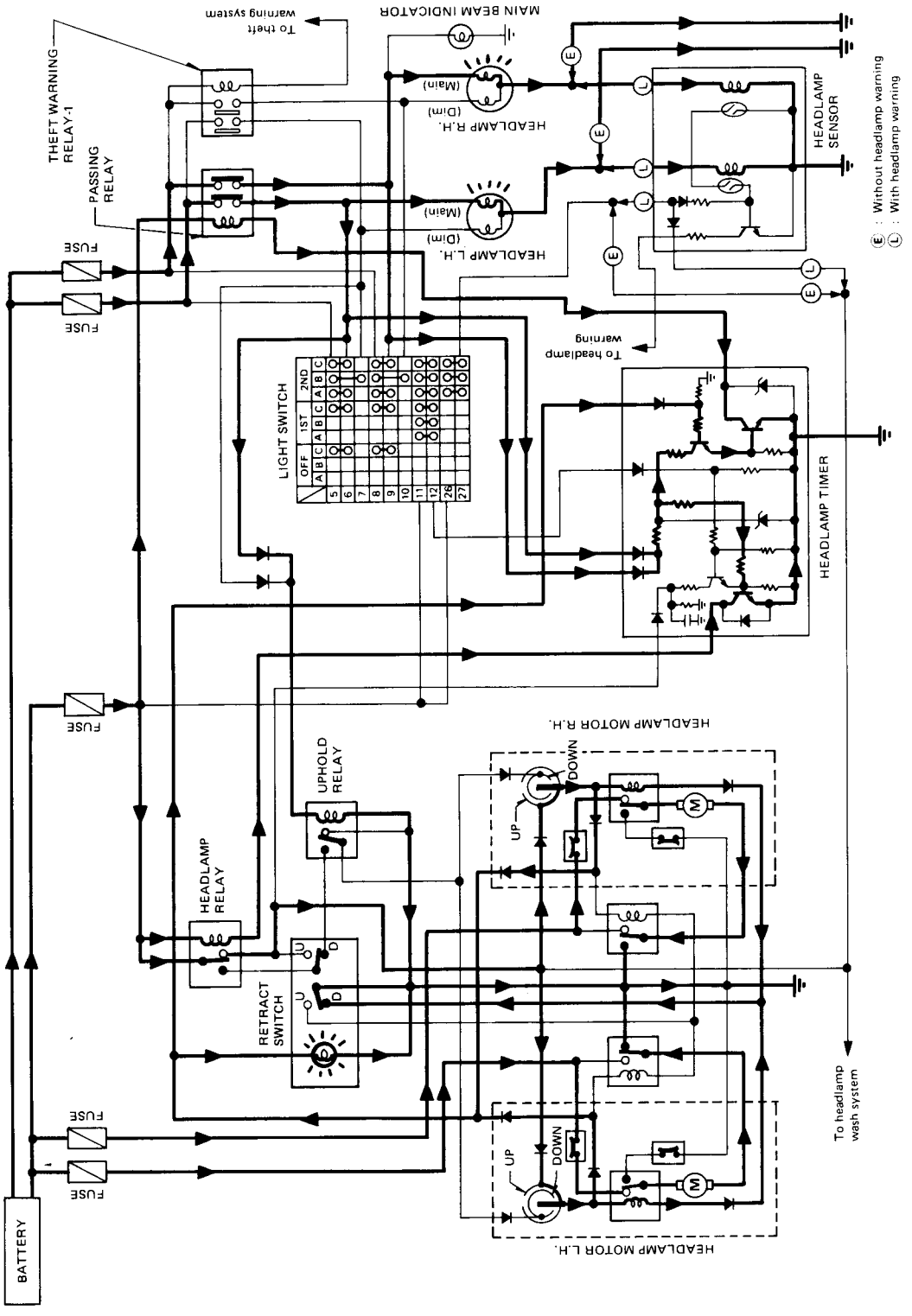
D-1: When lighting switch is switched to "PASSING"



SEL505F

Description (Cont'd)

D-2: After releasing lighting switch from "PASSING" (While operating the headlamp motor to open position)

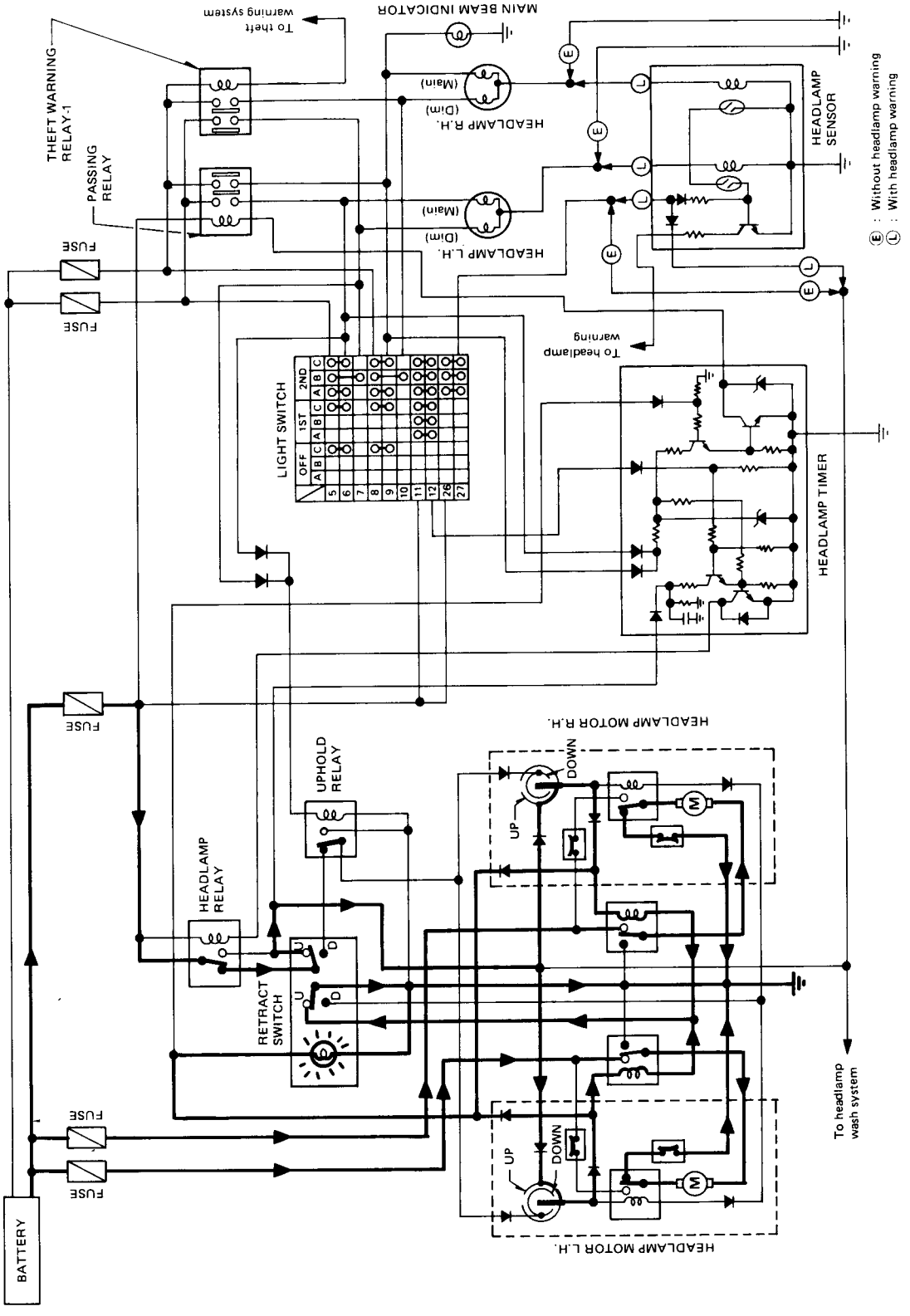


SEL506F

Closing operation is the same as [C] when lighting switch is switched from "1ST" → "OFF"

Description (Cont'd)

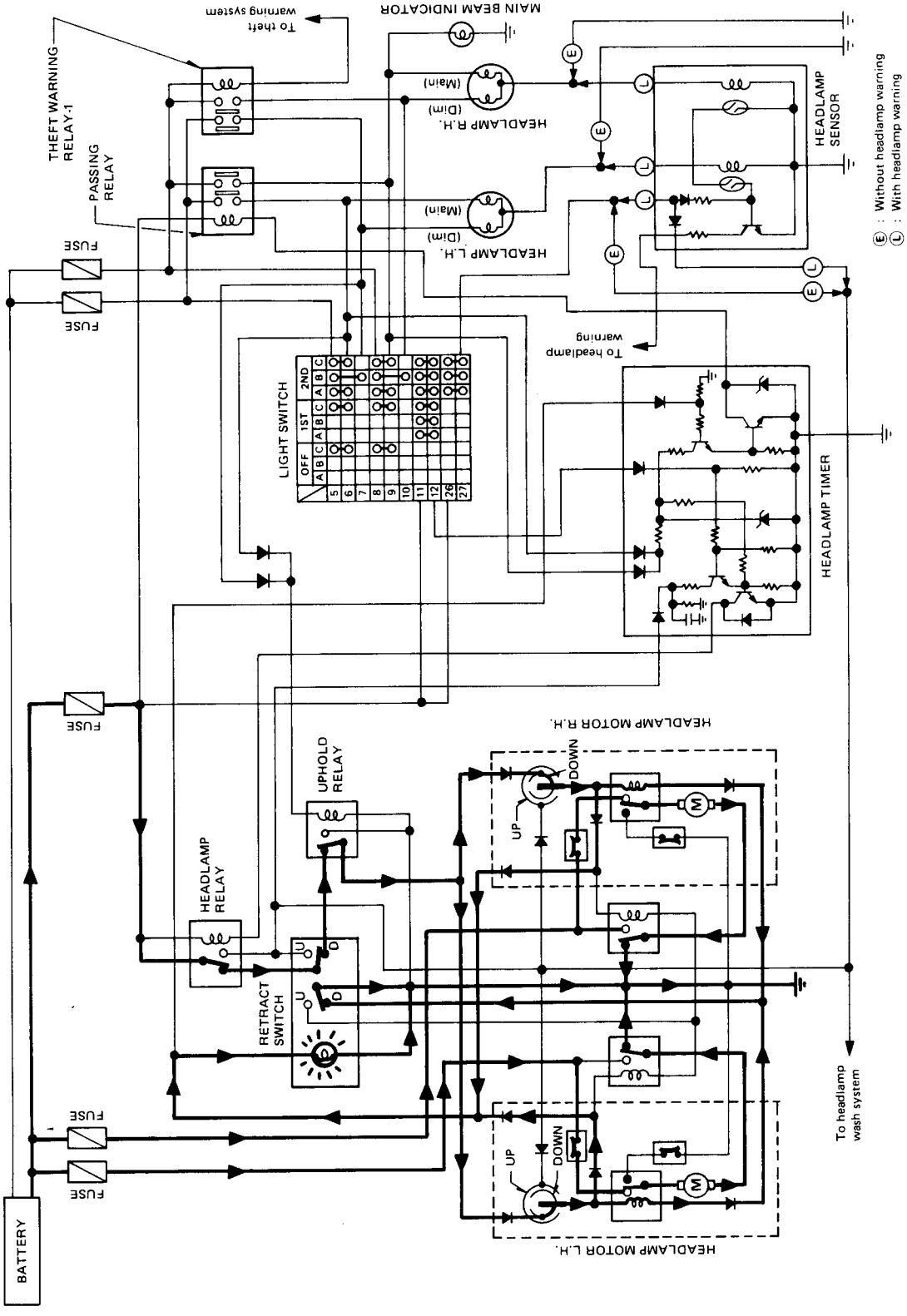
[E] When retractor switch is turned ON
(While operating the headlamp motor to open position)



SEL507F

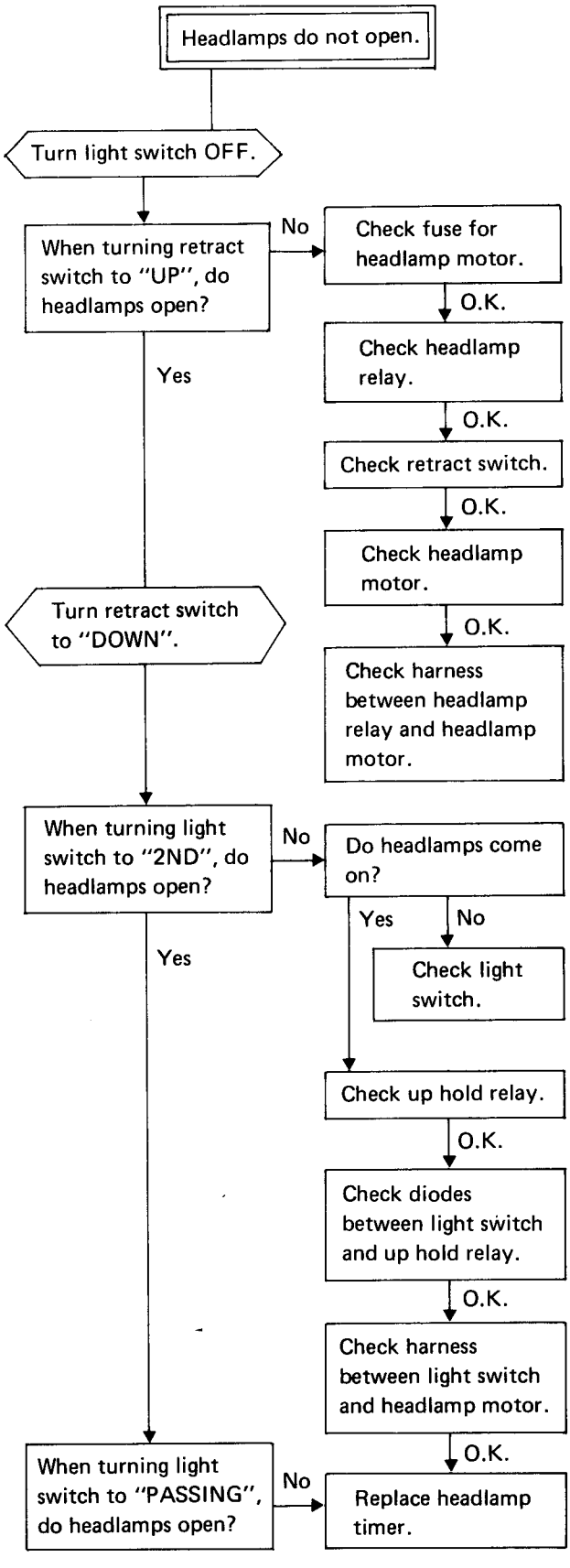
Description (Cont'd)

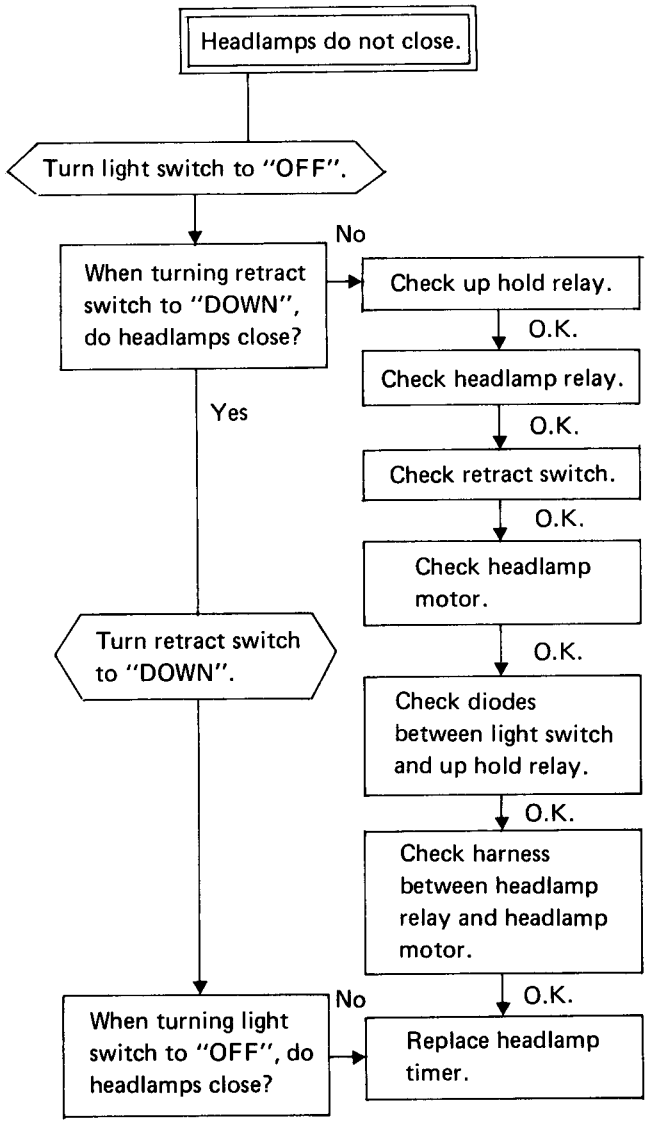
[F] When retractor switch is turned OFF
(While operating the headlamp motor to closed position)



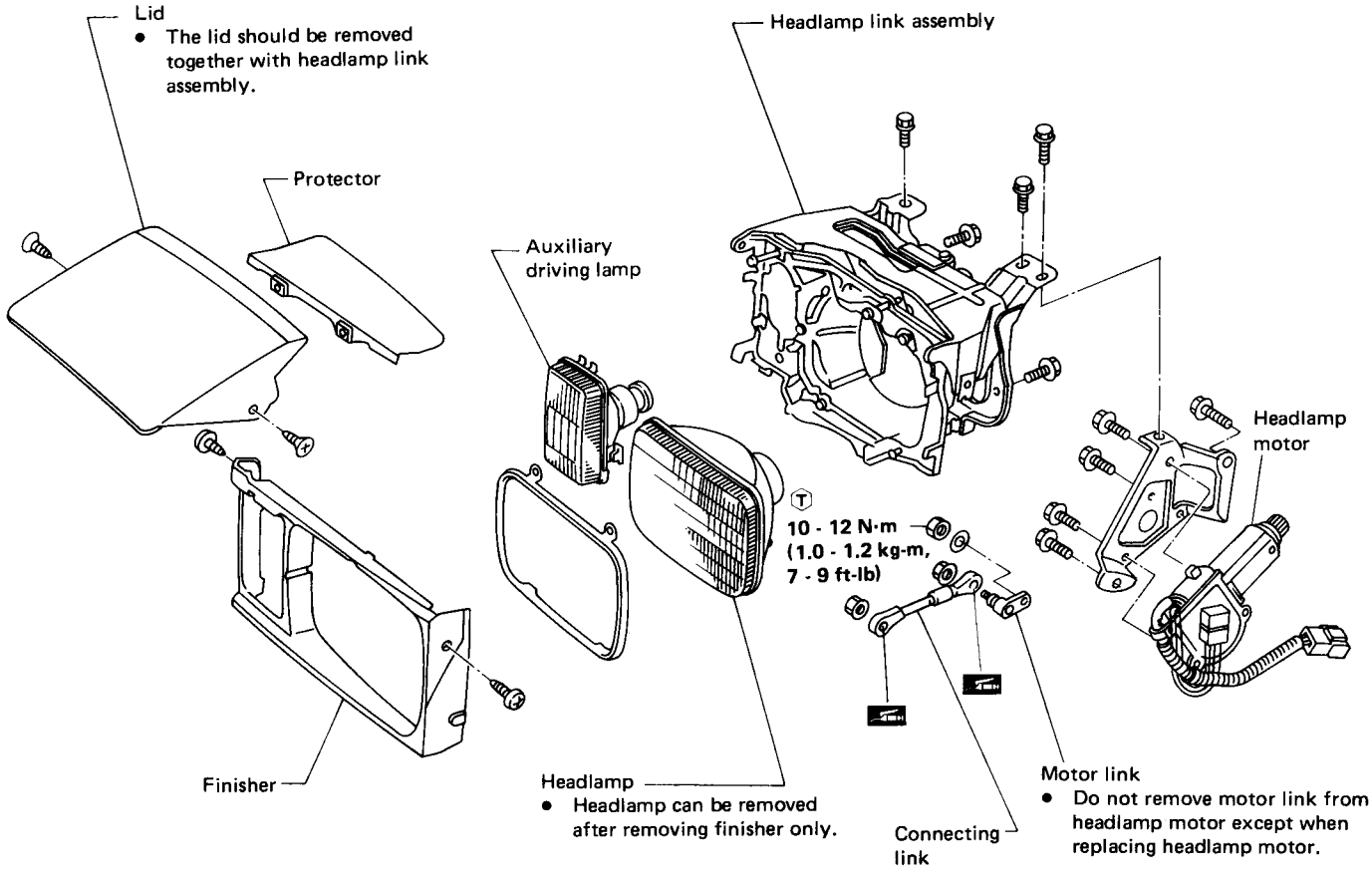
SEL508F

Trouble-shooting



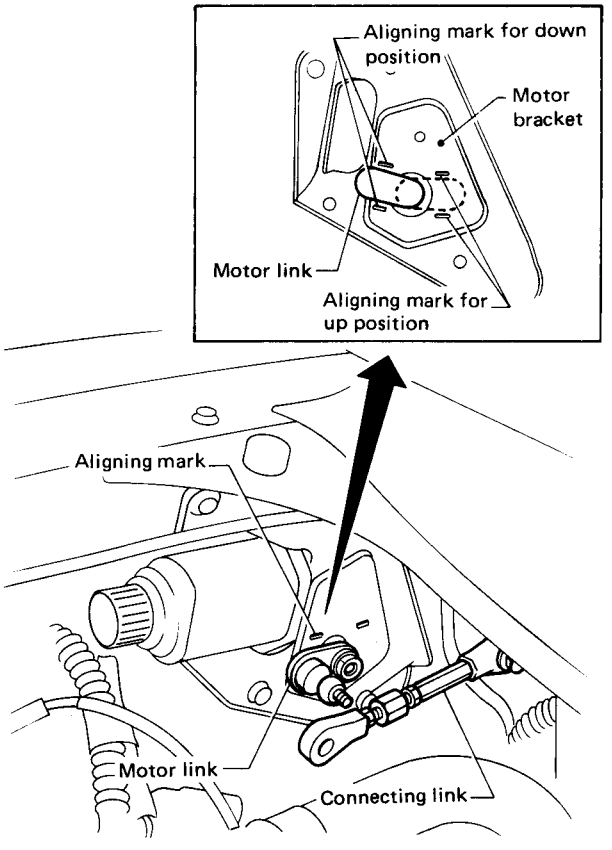


Removal


Lid
• The lid should be removed together with headlamp link assembly.
Protector
Auxiliary driving lamp
Headlamp link assembly
Headlamp motor
10 - 12 N·m
(1.0 - 1.2 kg-m,
7 - 9 ft-lb)
Finisher
Headlamp
• Headlamp can be removed after removing finisher only.
Connecting link
Motor link
• Do not remove motor link from headlamp motor except when replacing headlamp motor.
: Greasing point
SEL648D

Installation

1. Set the headlamp motor to "DOWN" position.
- Connect harness to headlamp motor and set retract switch to "DOWN". Headlamp motor can now be set to "DOWN" with retract switch.
2. Install the headlamp link assembly and headlamp motor in the body.
3. Install the connecting link.
- When installing the link to the motor, make sure the motor link is installed as shown below.

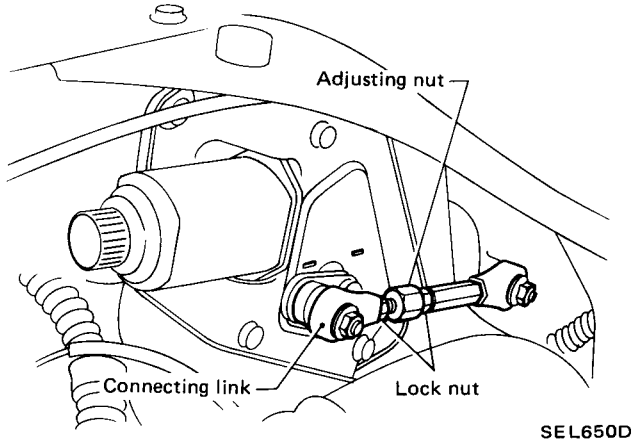


SEL649D

Adjustment

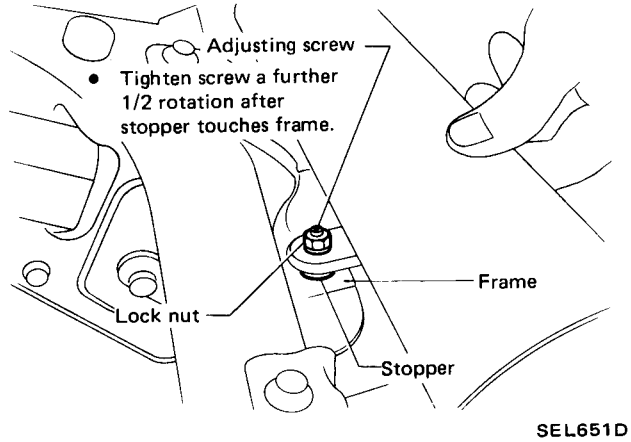
- After installing connecting link, always adjust it as follows:

1) Set the headlamp to "DOWN" position.
2) Adjust connecting link so that the lid is properly aligned with hood and fender.



SEL650D

3) Set the headlamp to "UP" position.
4) Adjust stopper screw.



SEL651D

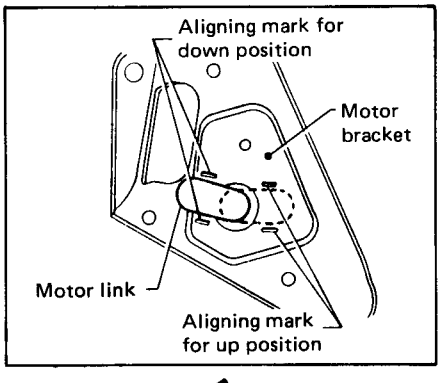
Headlamp Motor Check

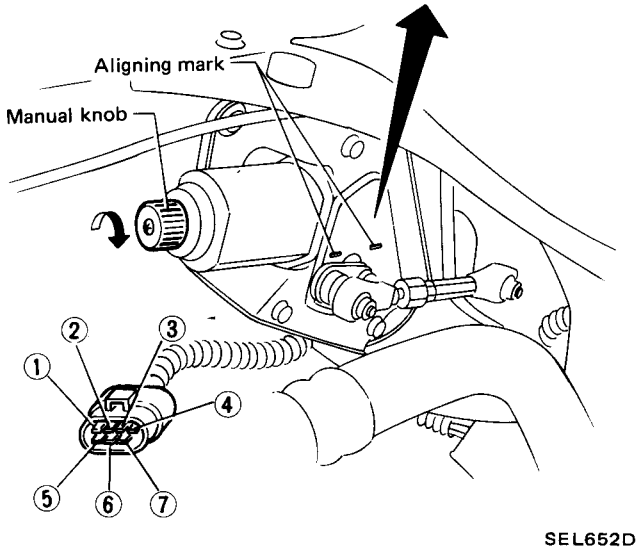
- Use an ohmmeter to check for continuity in headlamp motor circuit while rotating motor with manual knob.

CAUTION:

Prior to performing continuity test, disconnect ground cable from battery.

Headlamp	Ohmmeter probe		Continuity
	(+)	(−)	
DOWN	⑤	①	Yes
	①	⑤	No
	⑦	①	Yes
	①	⑦	No
UP	⑤	②	Yes
	②	⑤	No
	⑦	②	Yes
	②	⑦	No





SEL652D

Aiming Adjustment

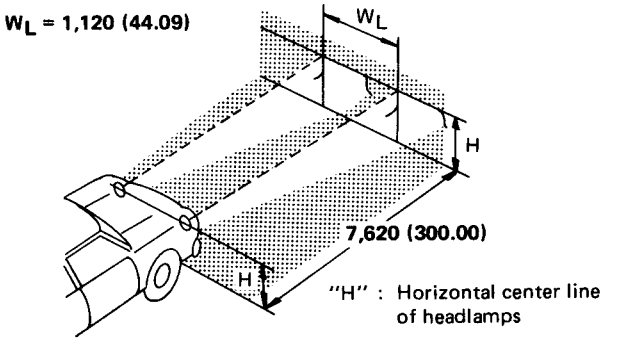
When performing headlamp aiming adjustment, use an aiming machine, aiming wall screen or headlamp tester. For operating instructions of any aimer, it should be in good repair, calibrated and used according to respective operation manuals supplied with the unit.

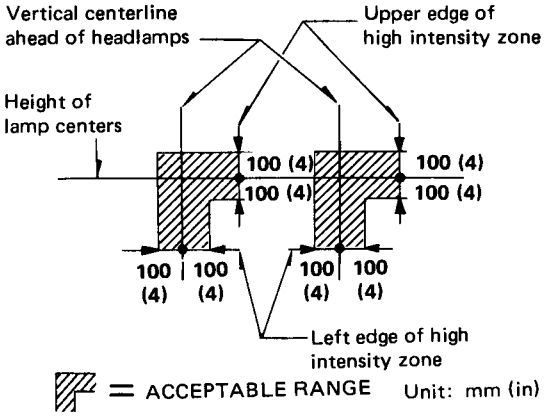
If aimer is not available, aiming adjustment can be done as follows:

For details, refer to the regulations in your own country.

CAUTION:

a. **Keep all tires inflated to correct pressures.**
b. **Place vehicle and tester on the same flat surface.**
c. **Ensure that there is no load in vehicle (coolant, engine oil filled up to correct level and full fuel tank) other than the driver (or equivalent weight placed in driver's position).**



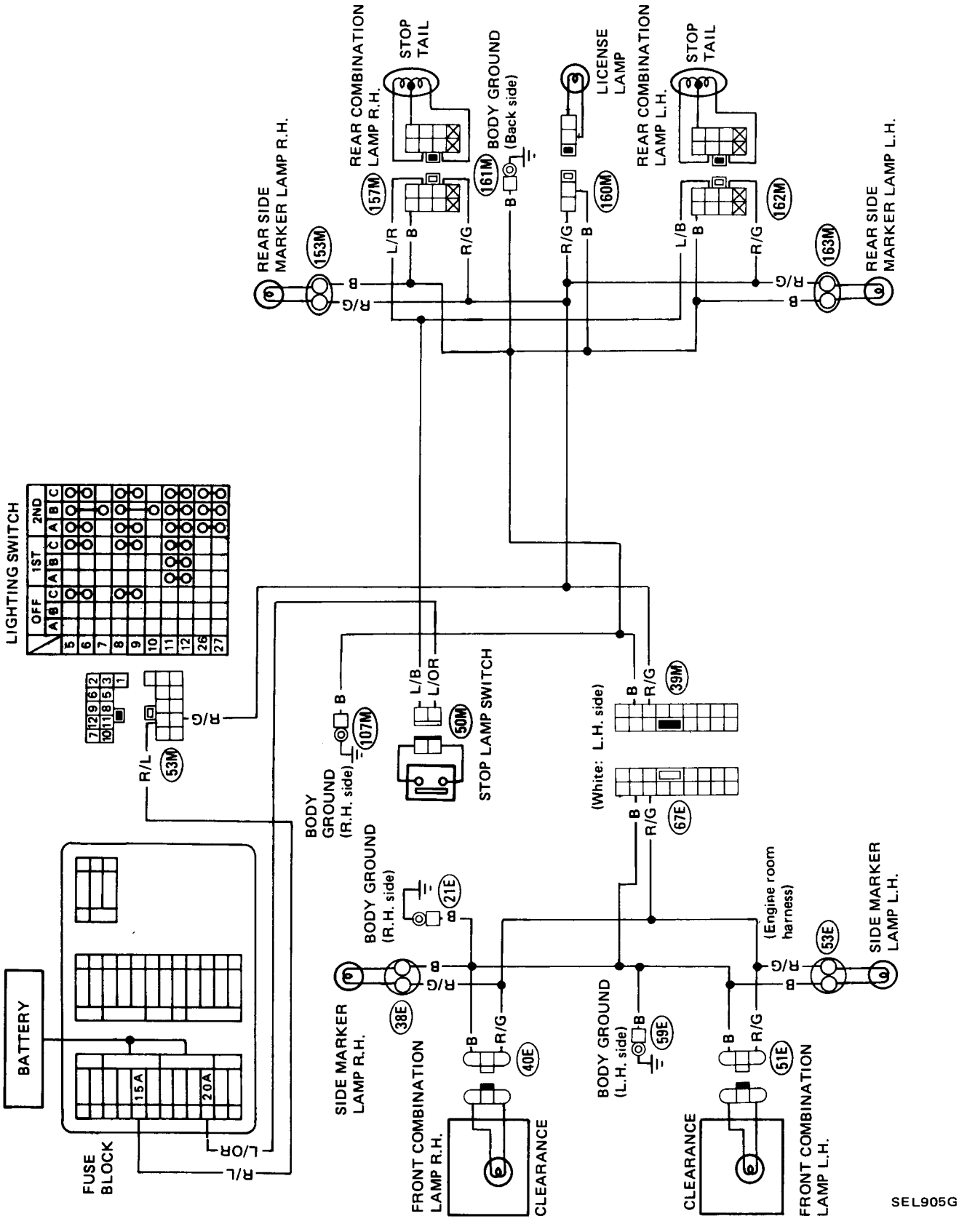


SEL914D

- **Adjust headlamps so that upper edge and left edge of high intensity zone are within the acceptable range as shown in the figure above.**
- **Dotted lines in illustration show center of headlamp.**

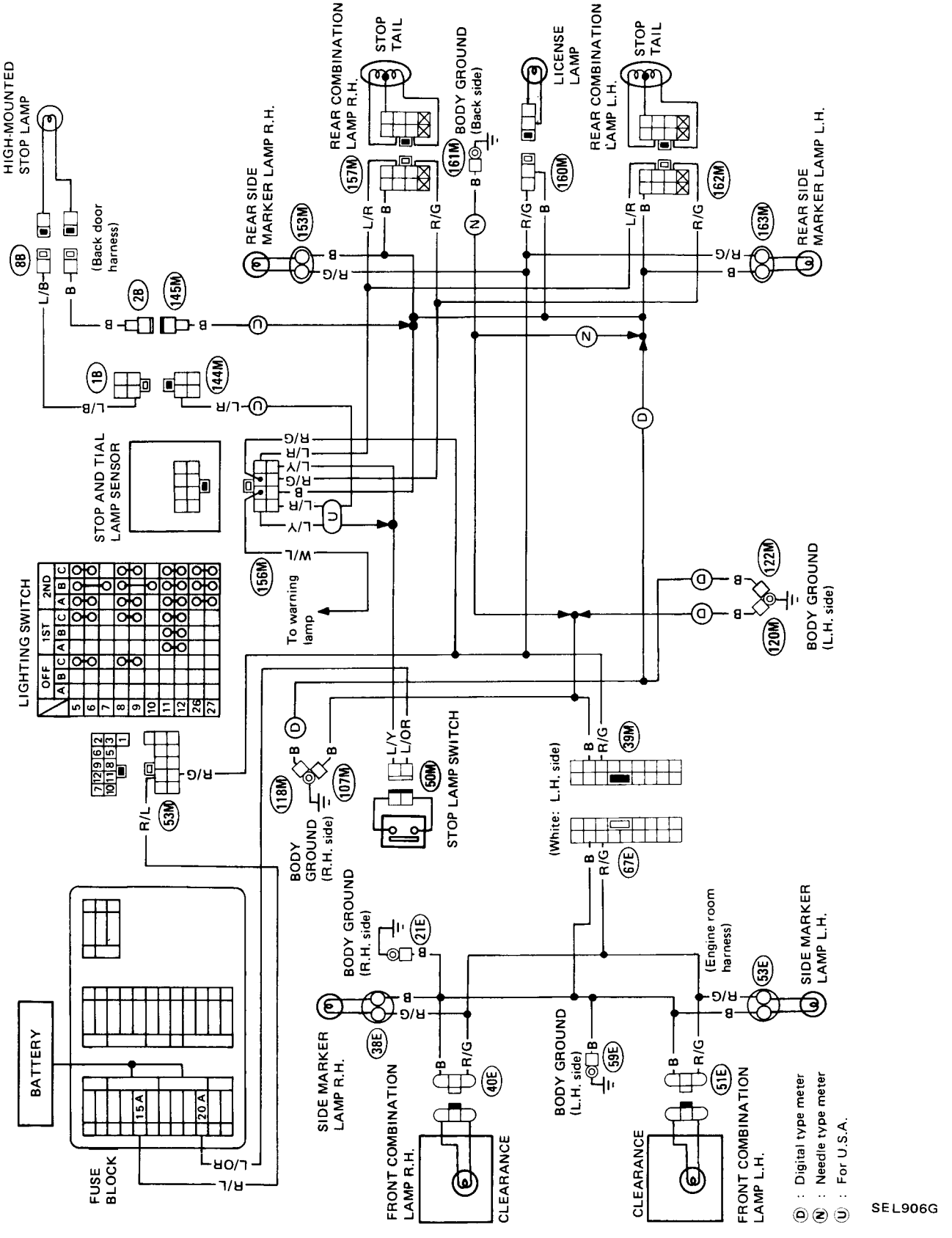
Clearance, License, Tail and Stop Lamps/Wiring Diagram

WITHOUT STOP & TAIL LAMP SENSOR (SF)

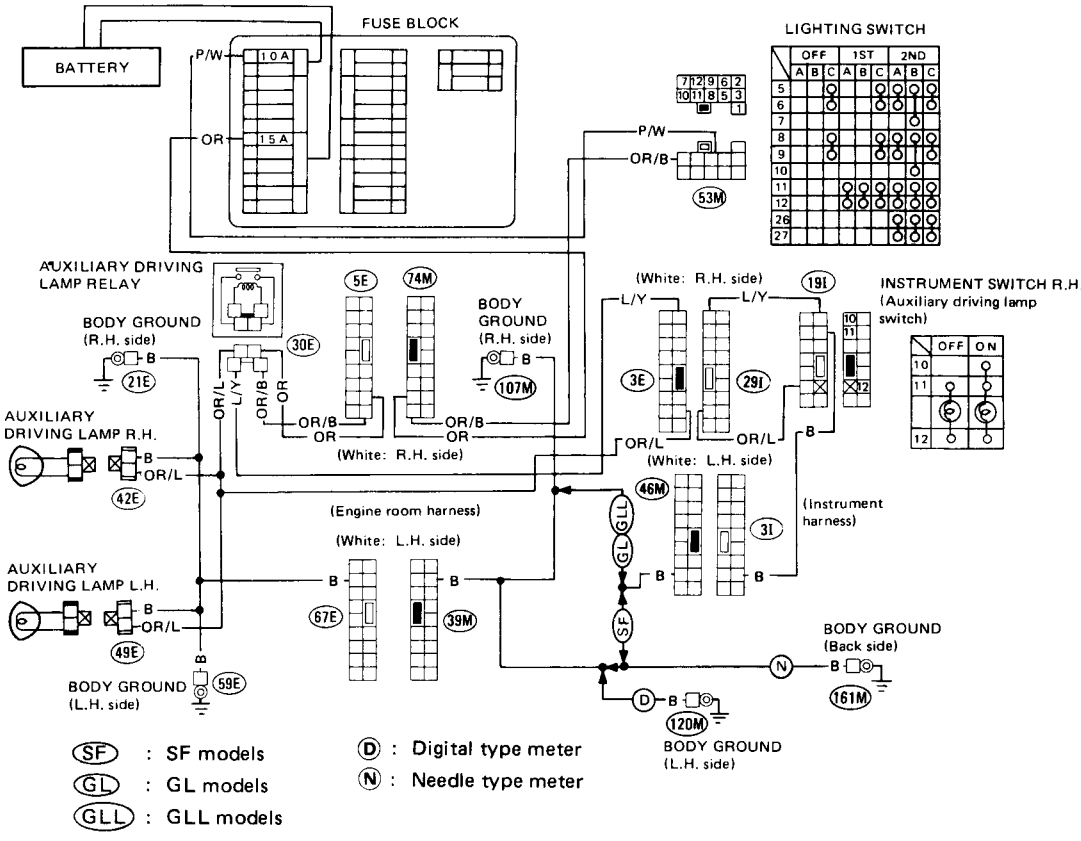


Clearance, License, Tail and Stop Lamps/Wiring Diagram (Cont'd)

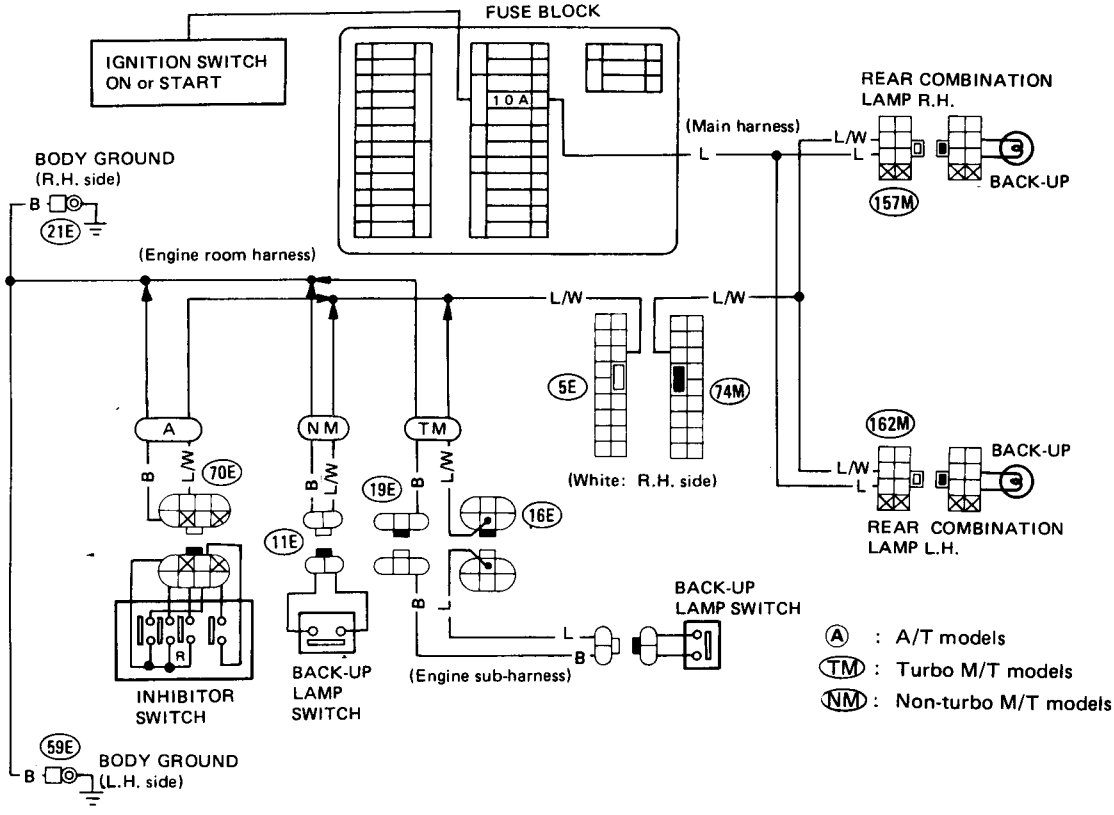
WITH STOP & TAIL LAMP SENSOR (GL and GLL)



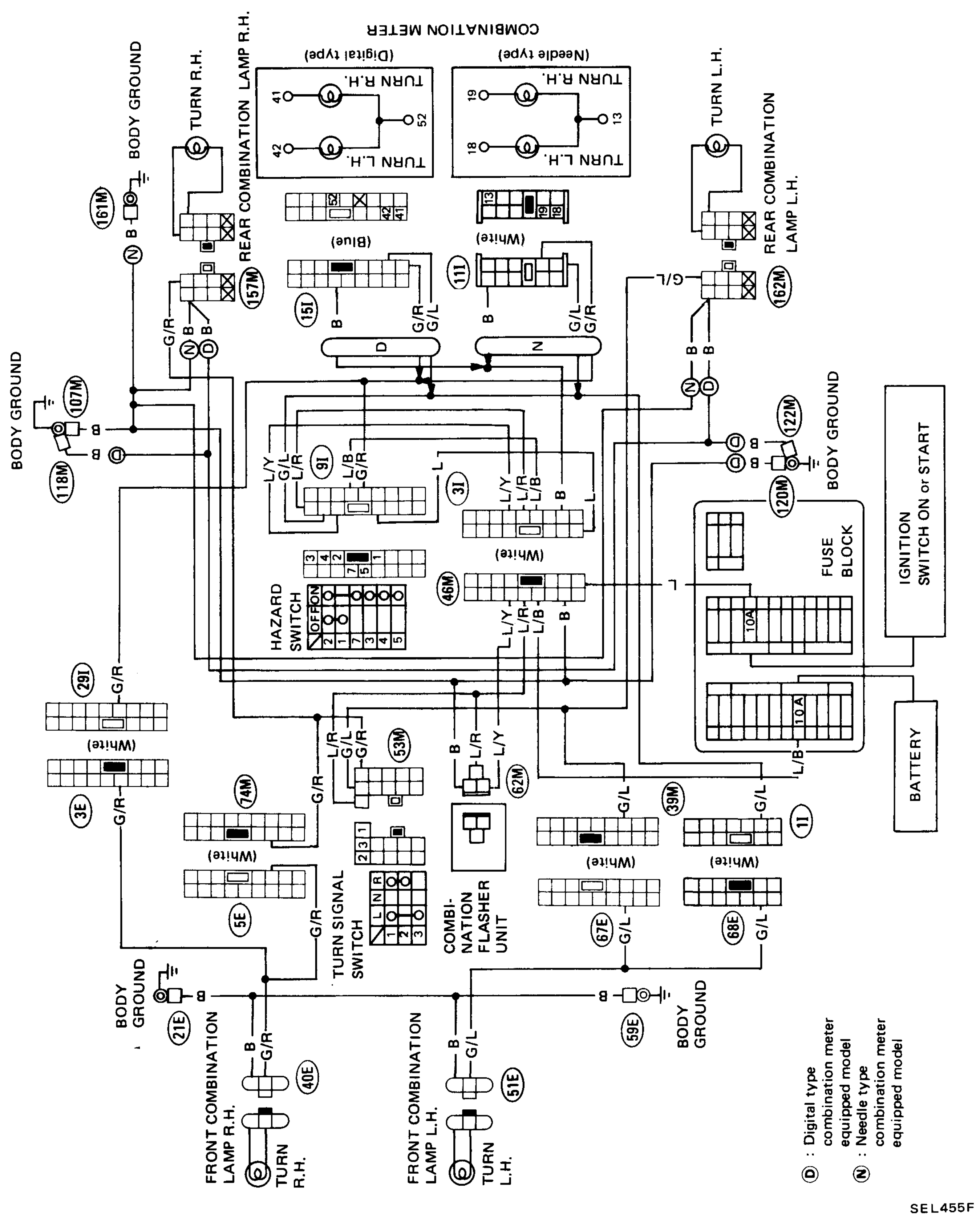
Auxiliary Driving Lamp/Wiring Diagram



Back-up Lamp/Wiring Diagram



Turn Signal and Hazard Warning Lamps/Wiring Diagram

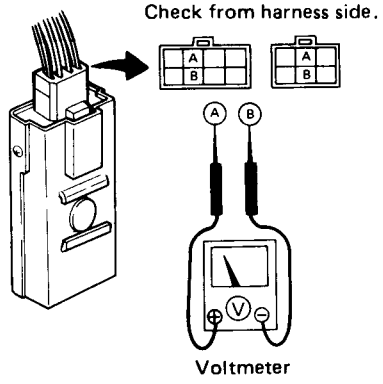


Stop and Tail Lamp Sensor Check

- **Before checking, ensure that bulbs meet specifications.**

STOP LAMP

Start engine.
Stop lamp switch on (Depress brake pedal).

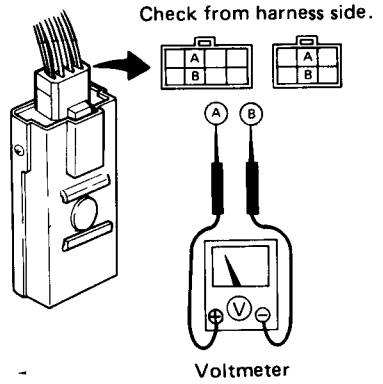


SEL515G

All stop lamps (Including high-mounted stop lamp) in good order ... Approx. 12 V
At least one of stop lamps (Including high-mounted stop lamp) is removed. ... Approx. 1 V

TAIL LAMP

Start engine.
Lighting switch on.



SEL516G

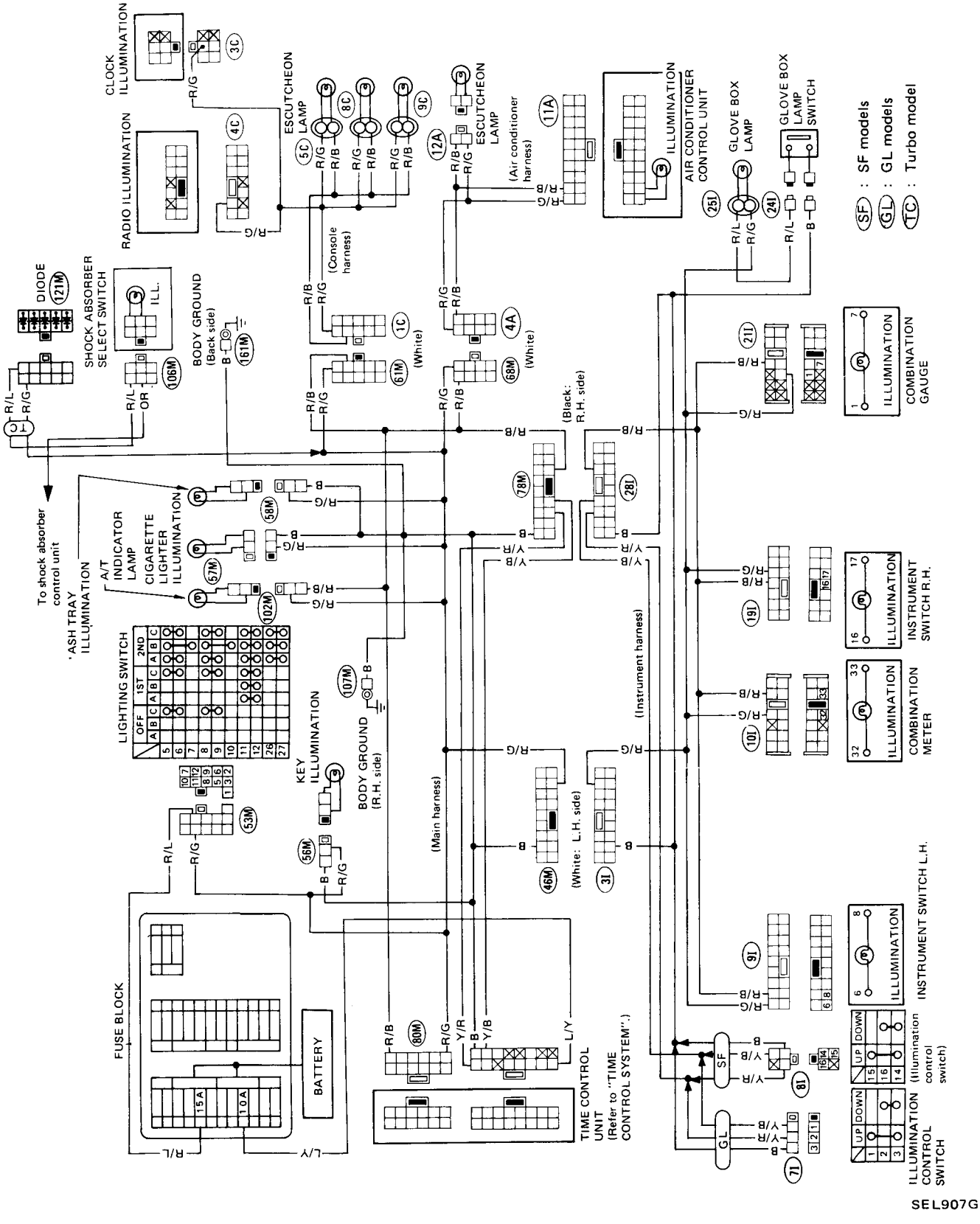
All tail lamps in good order. ... Approx. 12 V
At least one of tail lamps is removed. ... Approx. 1 V

Bulb Specifications

Item	Wattage (W)	Bulb No.
Headlamp	65, 35	H6054
Auxiliary driving lamp	55	–
Front combination lamp	27/8	1157
Front side marker lamp	3.4	158
Rear side marker lamp	3.4	158
Rear combination lamp		
Turn signal	27/8	1157
Stop/Tail	27/8	1157
Back-up	27	1073
License plate lamp	4.0	–
High-mounted stop lamp	27	1156
Interior lamp	10	–
Spot lamp	8	–
Rear (luggage) compartment lamp	3.4	–
Door step lamp	5	–
Leg room lamp	2	–

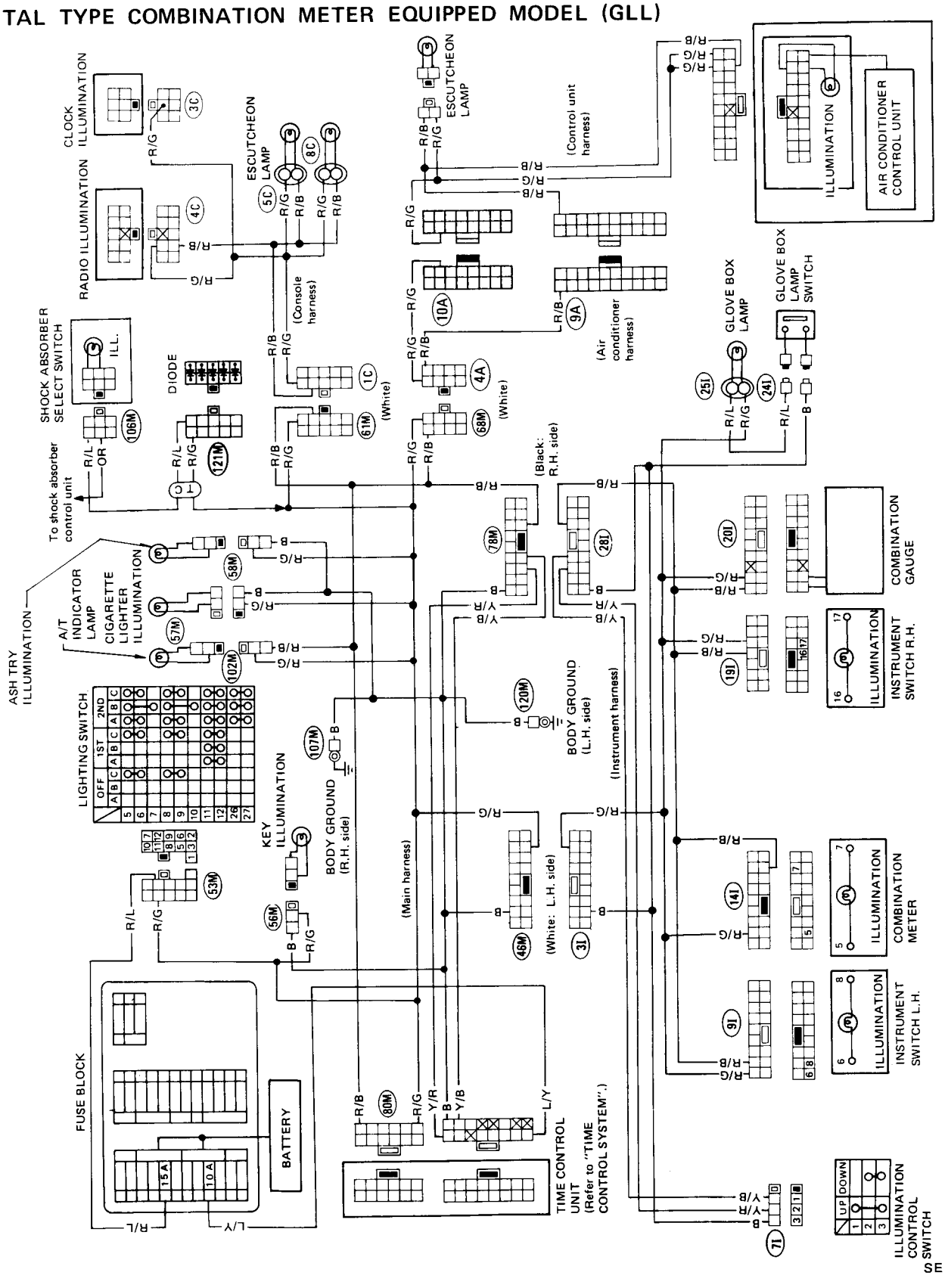
Illumination/Wiring Diagram

NEEDLE TYPE COMBINATION METER EQUIPPED MODEL (SF and GL)



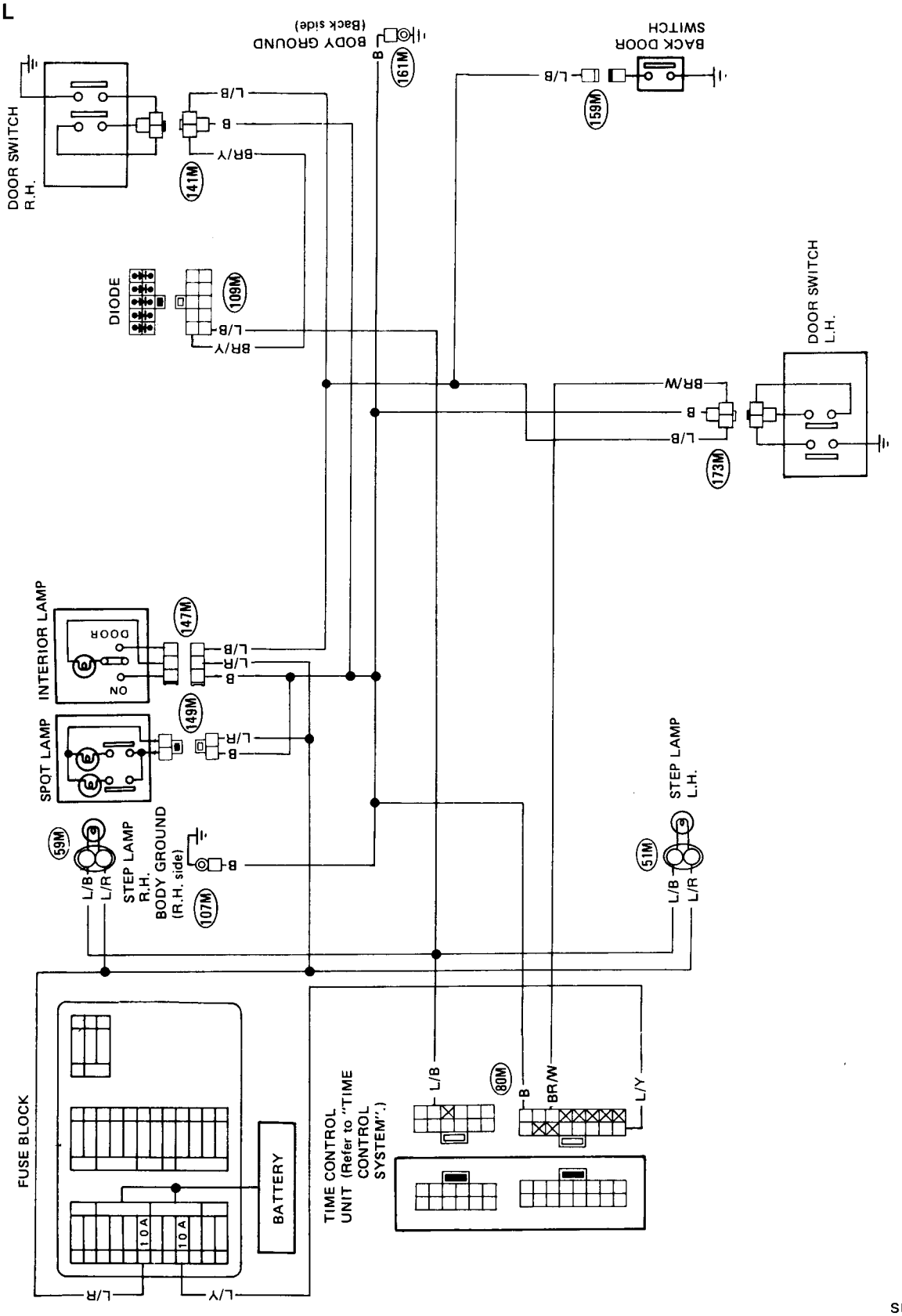
Illumination/Wiring Diagram (Cont'd)

DIGITAL TYPE COMBINATION METER EQUIPPED MODEL (GLL)



Interior, Luggage and Step Lamps/Wiring Diagram

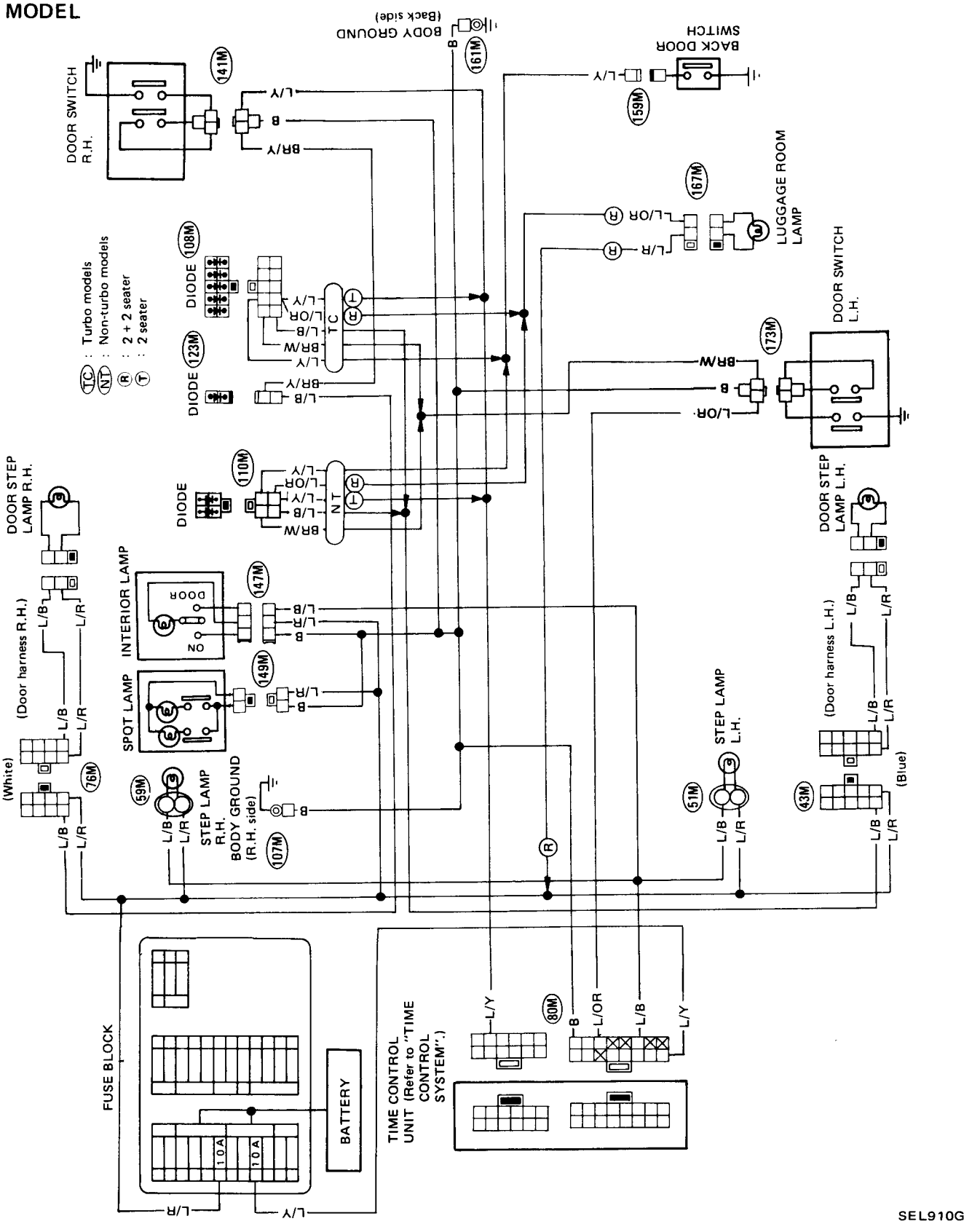
SF MODEL



SEL909G

Interior, Luggage and Step Lamps/Wiring Diagram (Cont'd)

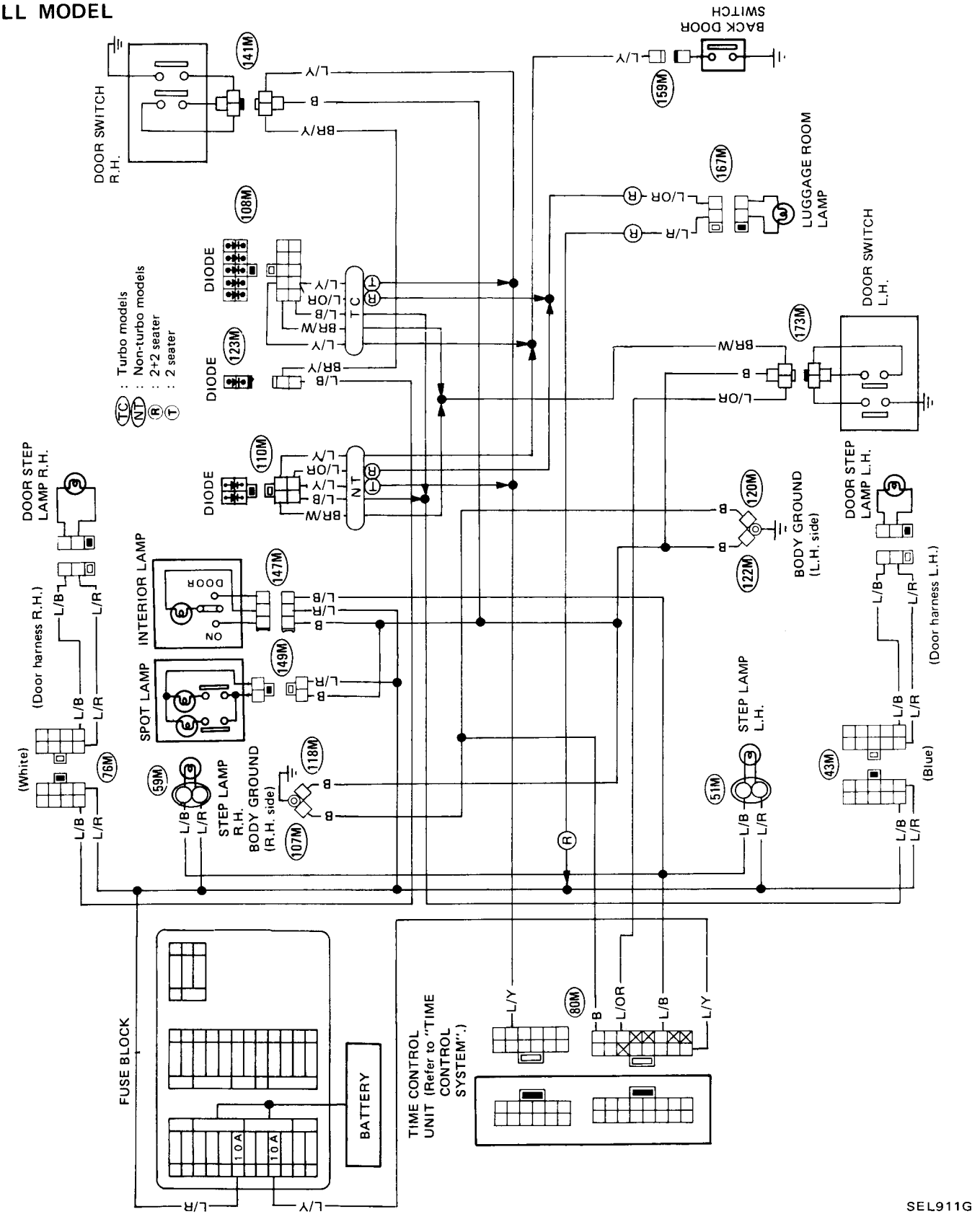
GL MODEL



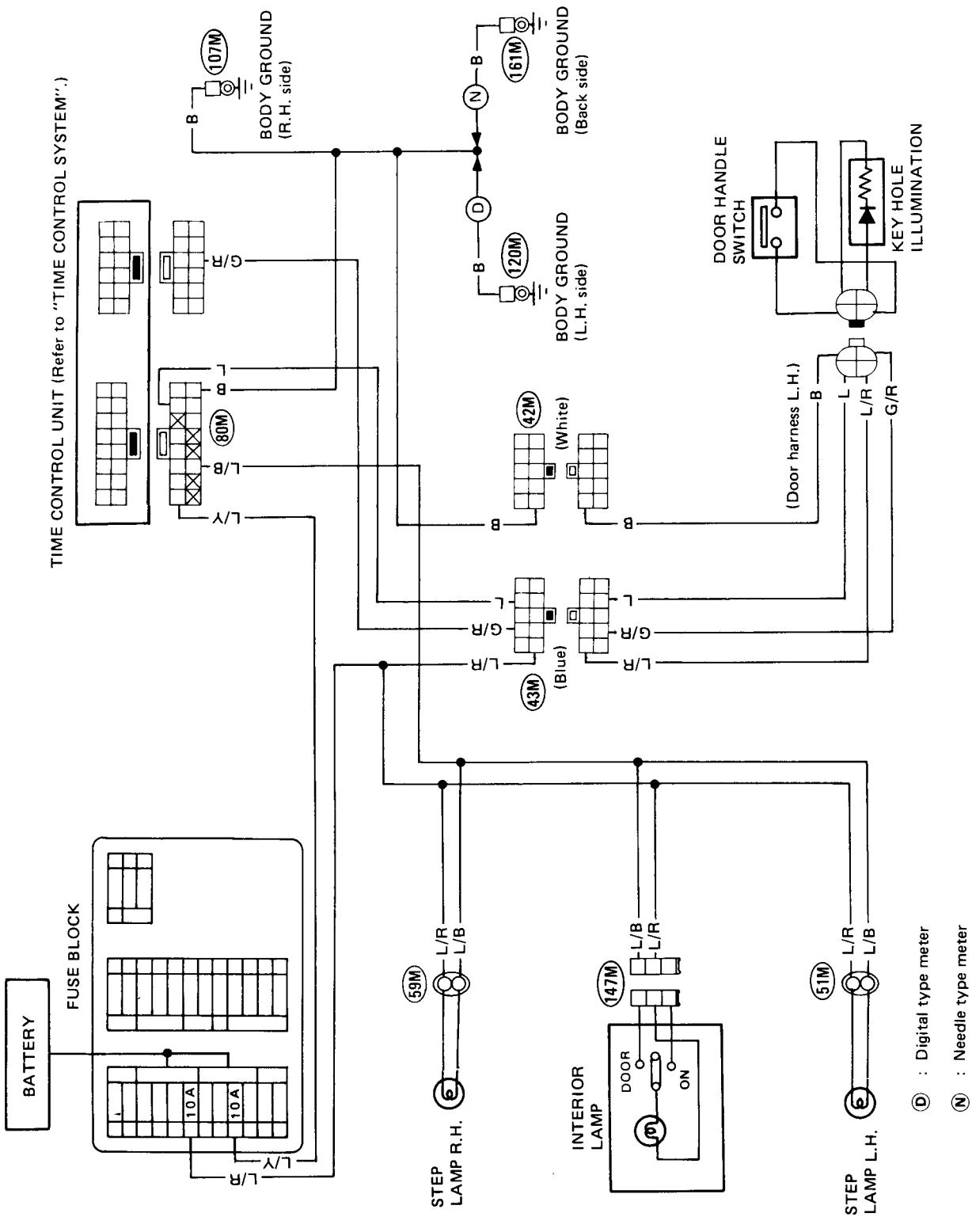
SEL910G

Interior, Luggage and Step Lamps/Wiring Diagram (Cont'd)

GLL MODEL



Illuminated Entry System and Door Key Illumination/Wiring Diagram

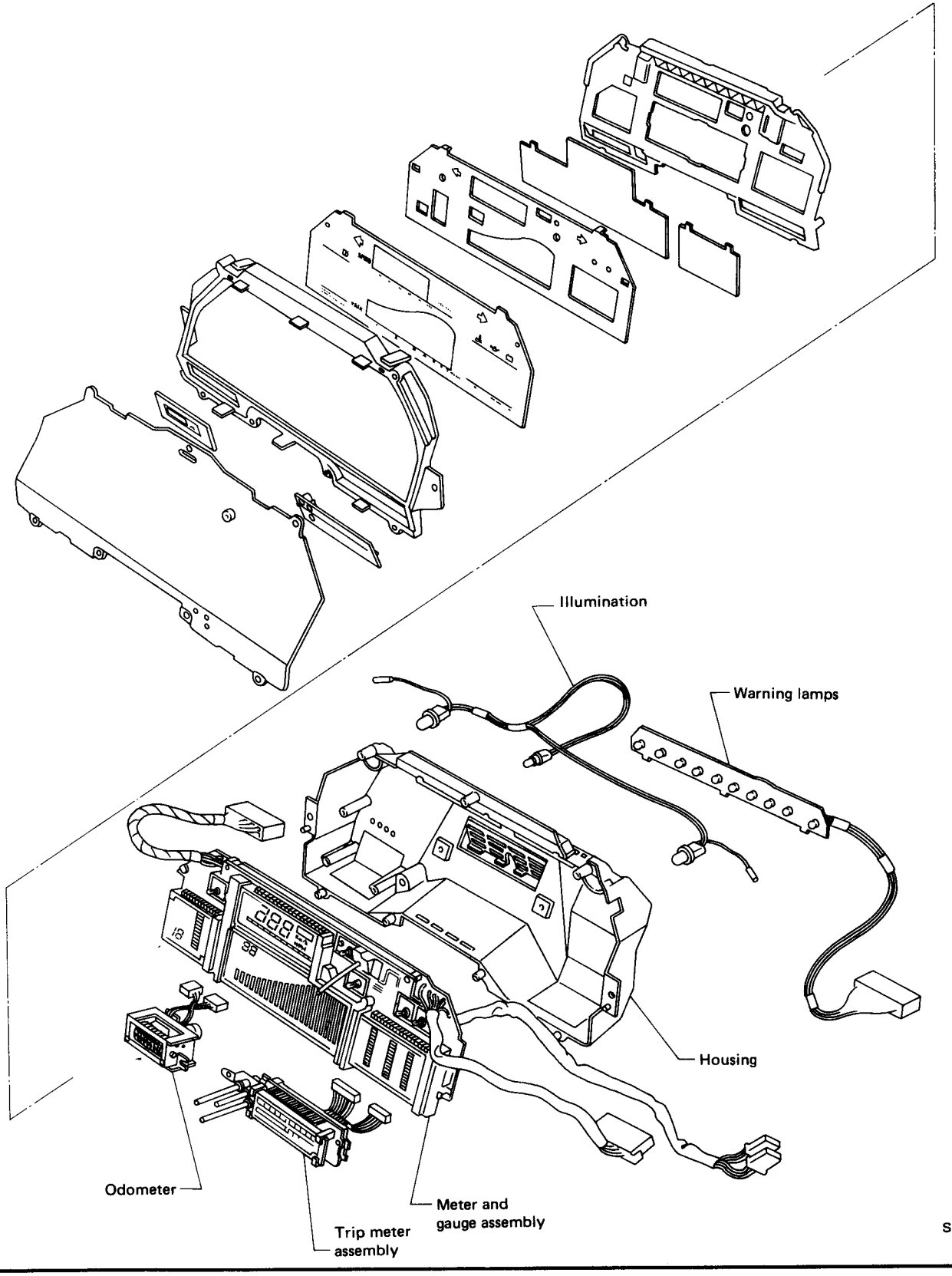


SEL461F

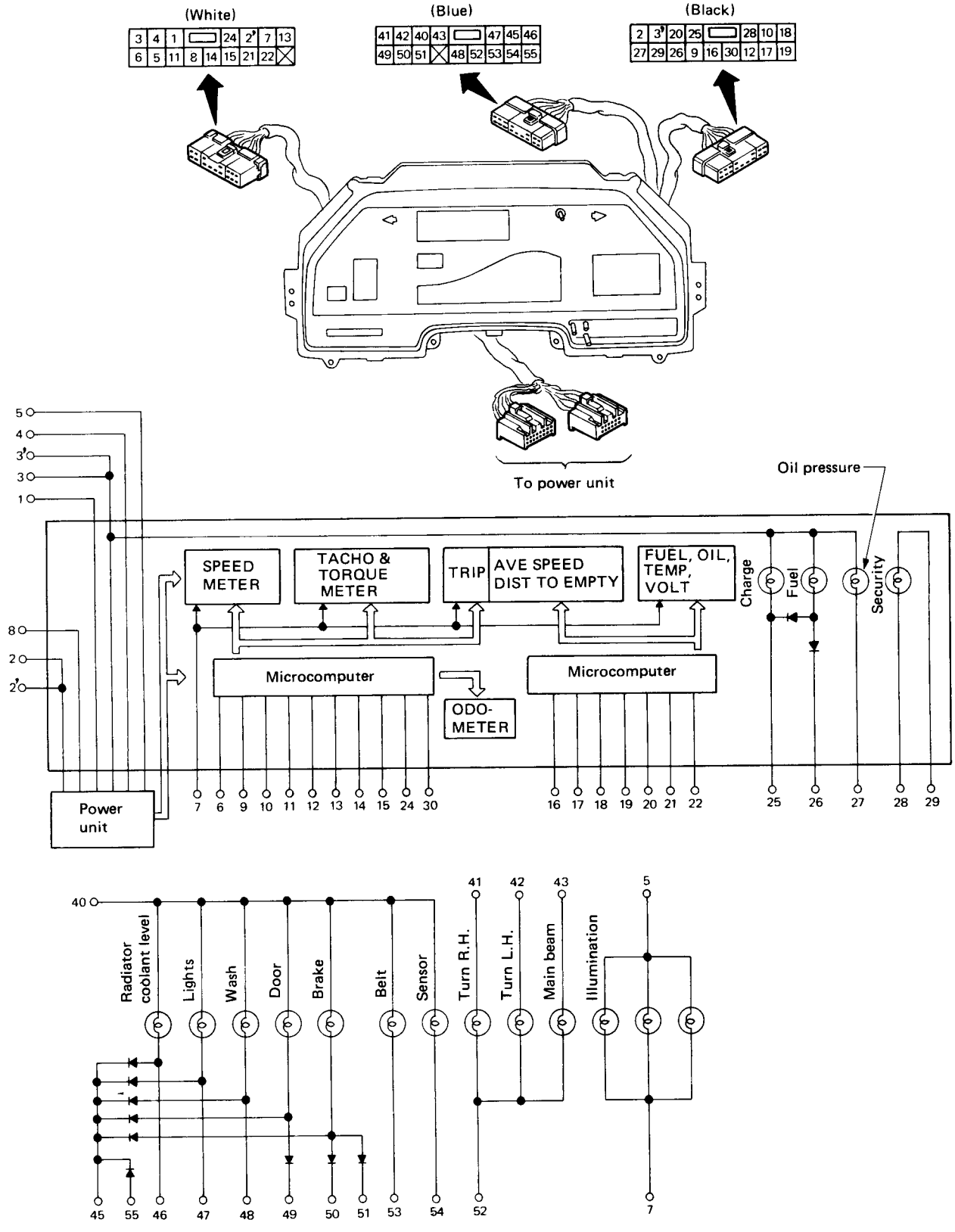
Note:

Combination Meter

CAUTION:
Do not touch electrical terminals with bare hands.

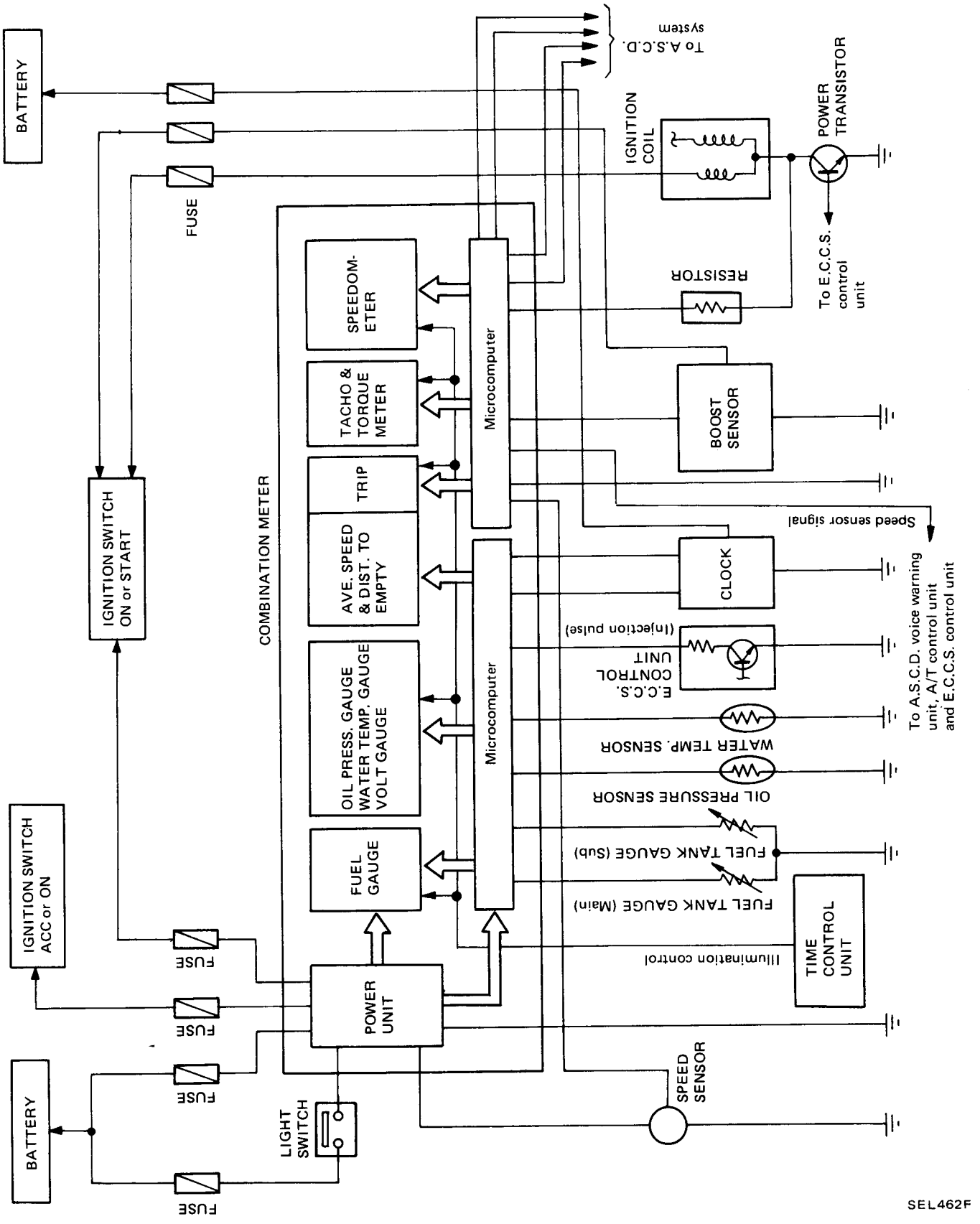


Combination Meter (Cont'd)

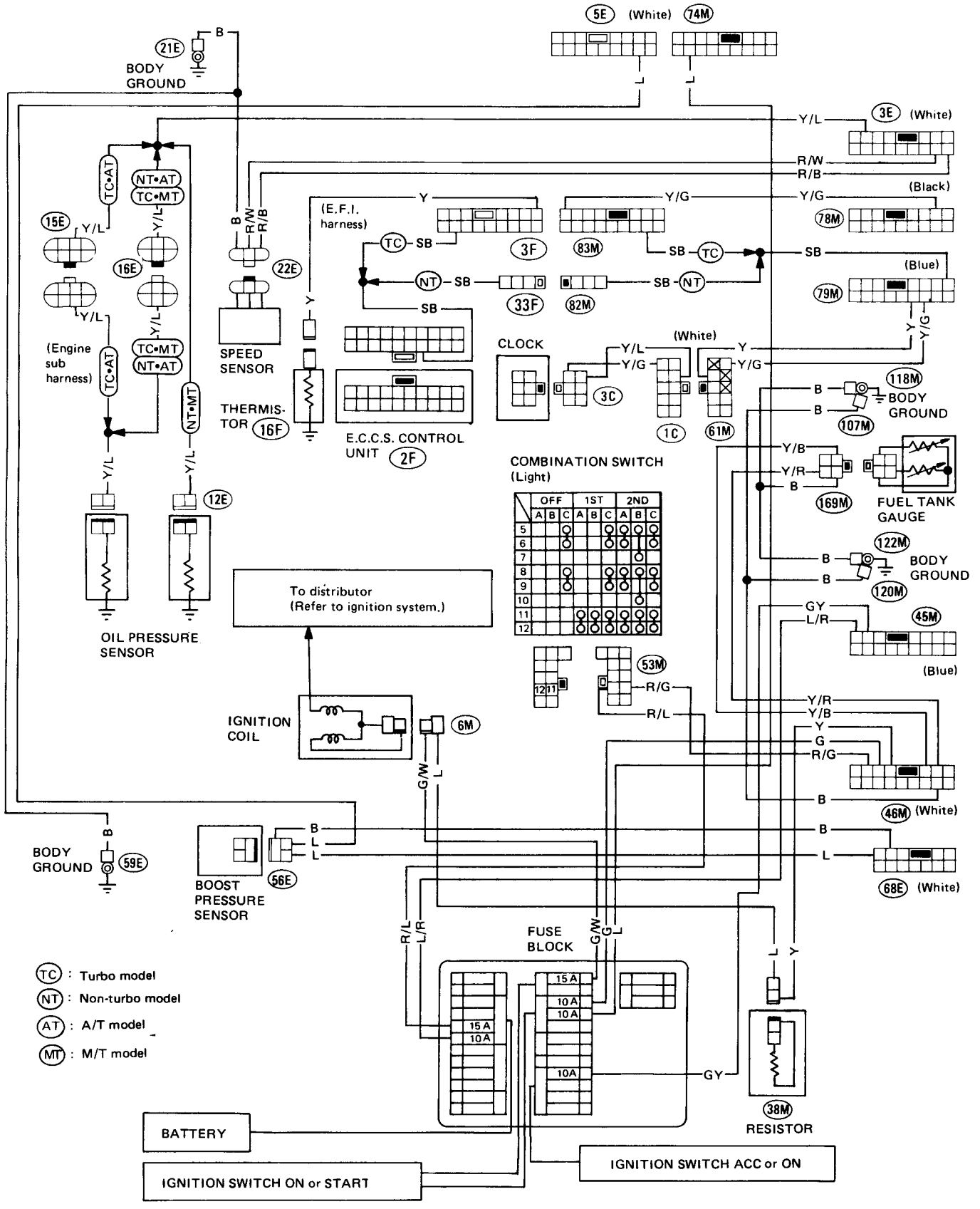


SEL056H

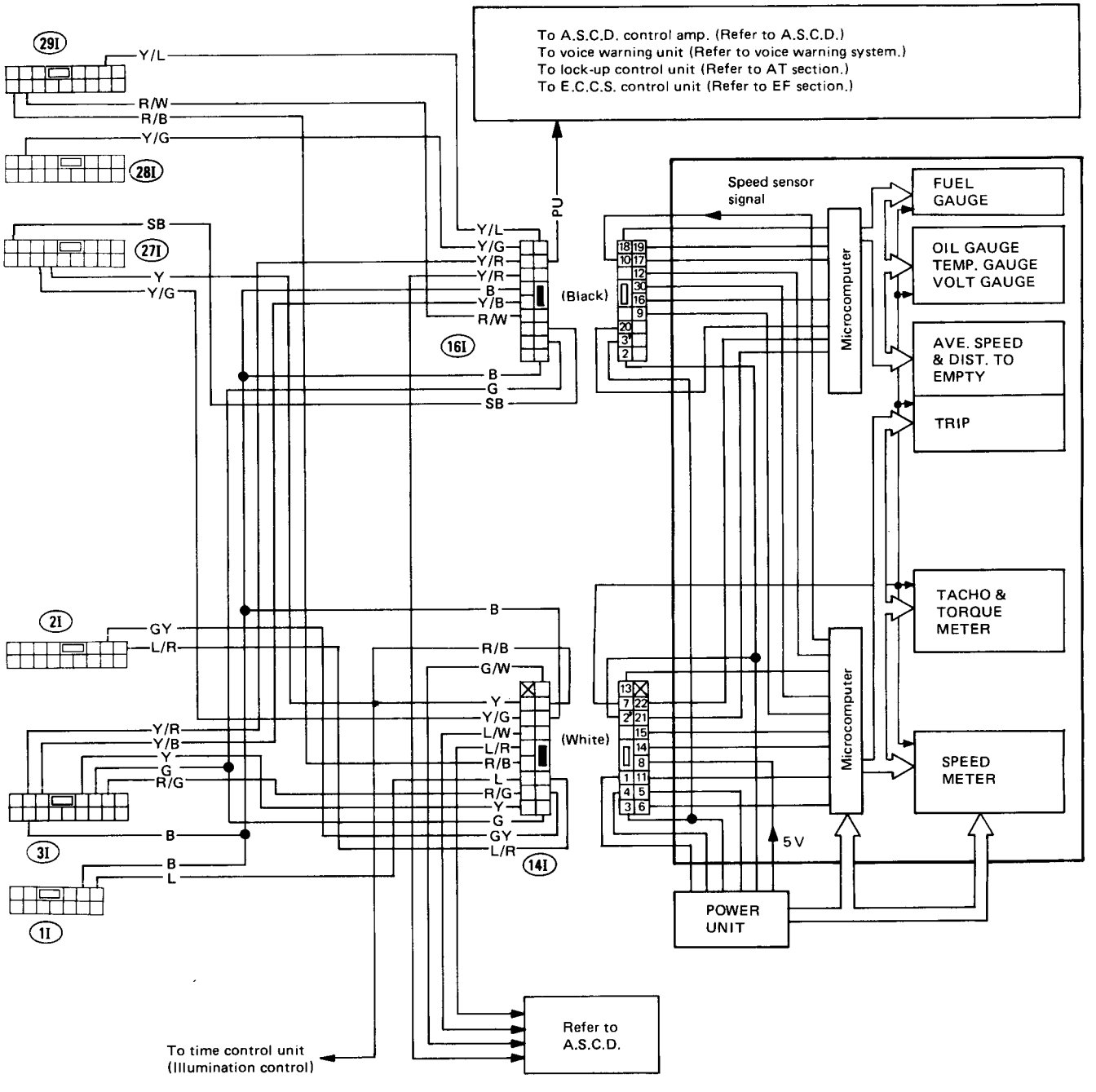
Schematic


BATTERY
FUSE
IGNITION SWITCH ON or START
IGNITION SWITCH ACC or ON
BATTERY
FUSE
FUSE
FUSE
FUSE
FUSE
COMBINATION METER
LIGHT SWITCH
POWER UNIT
Microcomputer
Microcomputer
SPEEDOM-ETER
TACHO & TORQUE METER
TRIP
AVE. SPEED & DIST. TO EMPTY
OIL PRESS. GAUGE WATER TEMP. GAUGE VOLT GAUGE
FUEL GAUGE
To A.S.C.D. system
IGNITION COIL
POWER TRANSISTOR
RESISTOR
To E.C.C.S. control unit
BOOST SENSOR
Speed sensor signal
CLOCK
E.C.C.S. CONTROL UNIT
(Injection pulse)
WATER TEMP. SENSOR
OIL PRESSURE SENSOR
FUEL TANK GAUGE (Sub)
FUEL TANK GAUGE (Main)
TIME CONTROL UNIT
Illumination control
SPEED SENSOR
To A.S.C.D. voice warning unit, A/T control unit and E.C.C.S. control unit
SEL462F

Wiring Diagram

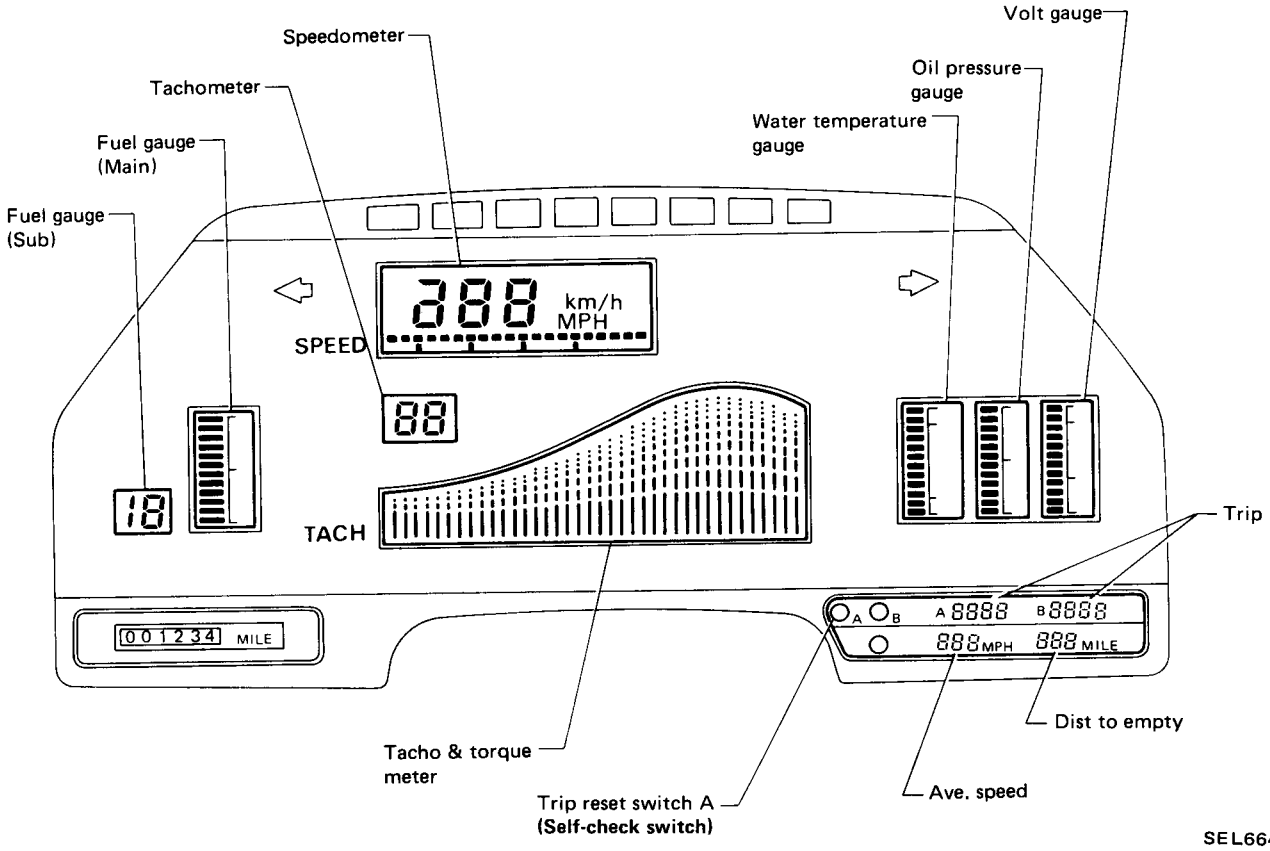


Wiring Diagram (Cont'd)



SEL912G

Display Check



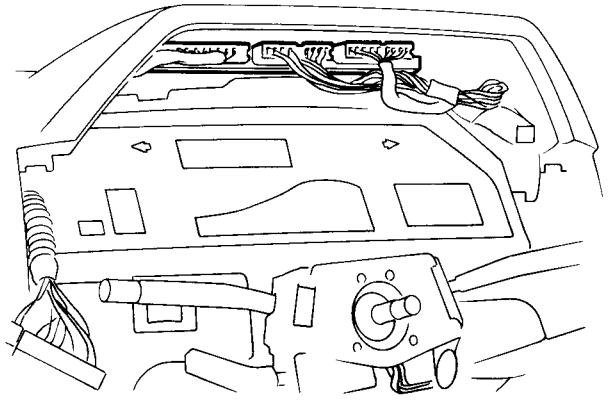
Display Check (Cont'd)

- The digital combination meter is provided with a self-check function to determine whether or not meter itself is malfunctioning.

Test procedure

(1) While pushing trip reset switch A, switch ignition switch from "OFF" to "ON". Trip reset switch A should remain pushed in until self-check operation starts.
(2) Meter starts to automatically perform self-check. Segments for meters and gauges should illuminate one after another.
(3) If any particular segment remains off, combination meter itself is faulty.

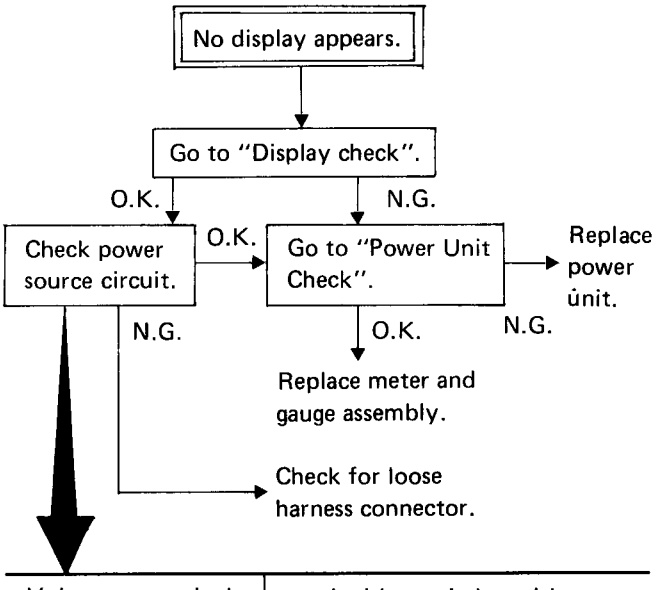
Preparation for Trouble-shooting



SEL665D

- Remove nut which holds instrument switch.
- Remove instrument switch.
- Remove cluster lid A.

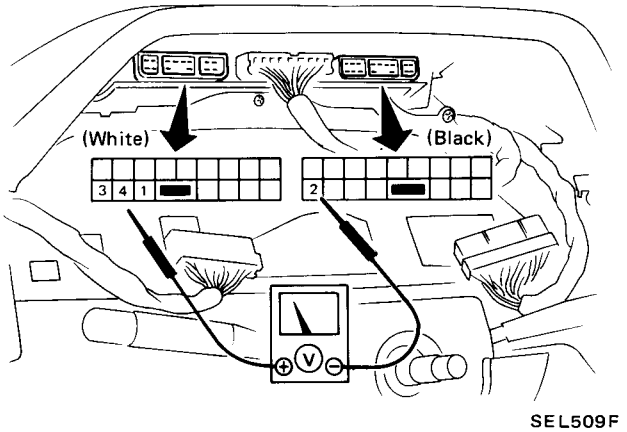
Trouble-shooting



Voltmeter terminals		Ignition switch position		
(+)	(−)	OFF	ACC	ON
①	②	Approx. 12V	12V	12V
③	②	0V	0V	Approx. 12V
④	②	0V	Approx. 12V	Approx. 12V

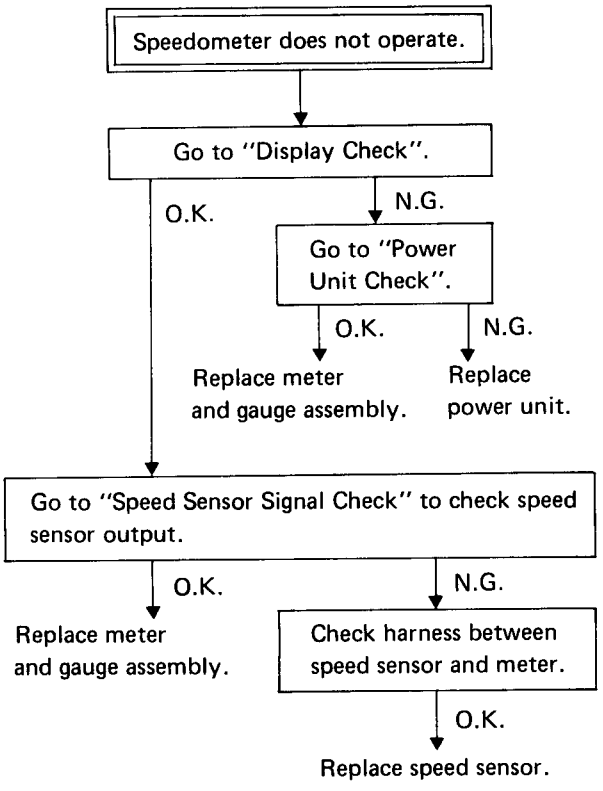
Ohmmeter terminals		Ignition switch OFF
(+)	(−)	
②	Body ground	Continuity exists

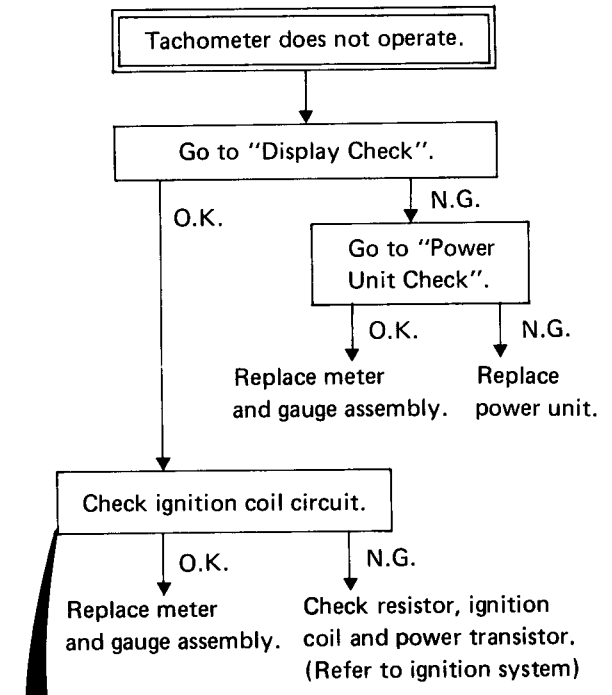
- Disconnect meter harness connector as shown below.



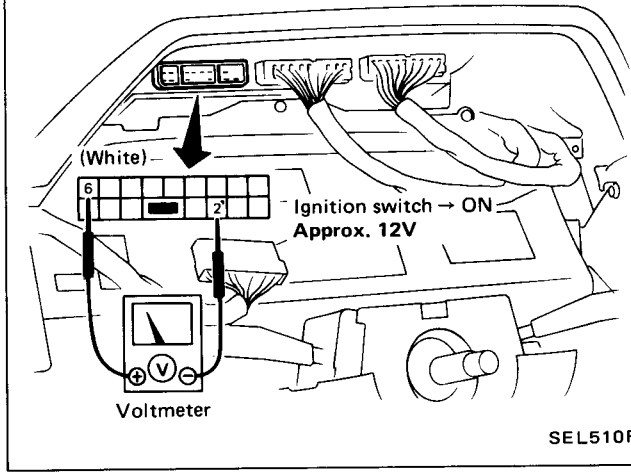
SEL509F

Trouble-shooting (Cont'd)





1. Disconnect meter harness connector (white).
2. Turn ignition switch to "ON".
3. Check terminal voltage between ⑥ and ②' .



Trouble-shooting (Cont'd)

Torque meter does not operate.
(Vertical side of "Tacho & Torque" meter.)

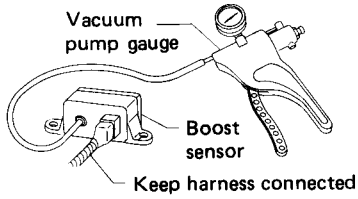
→ Go to "Display Check".

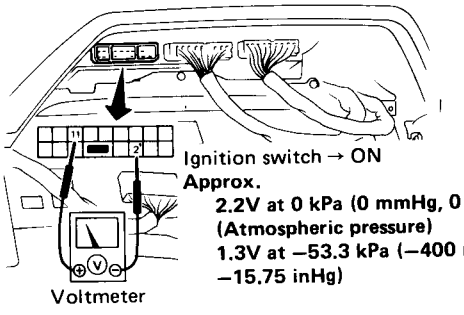
- O.K. → Check boost sensor circuit.
- N.G. → Go to "Power Unit Check".
  - O.K. → Replace meter and gauge assembly.
  - N.G. → Replace power unit.

Check boost sensor circuit.

- O.K. → Replace meter and gauge assembly.
- N.G. → Go to "Boost sensor check".
  - O.K. → Check harness between boost sensor and meter.
  - N.G. → Replace boost sensor.

1. Disconnect meter harness connector (white).
2. Connect vacuum pump gauge to boost sensor vacuum hose.
3. Turn the ignition switch to "ON".
4. Apply vacuum pressure to boost sensor by vacuum pump gauge and measure voltage across ⑪ and ②'.





Main fuel gauge does not operate.

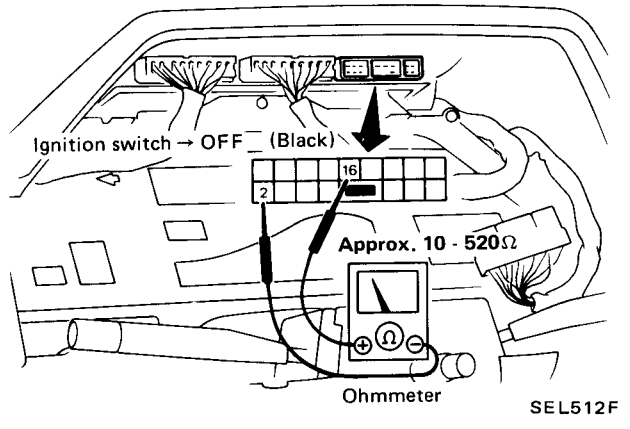
→ Go to "Display Check".

- O.K. → Check fuel tank main gauge circuit.
- N.G. → Go to "Power Unit Check".
  - O.K. → Replace meter and gauge assembly.
  - N.G. → Replace power unit.

Check fuel tank main gauge circuit.

- O.K. → Replace meter and gauge assembly.
- N.G. → Go to "Fuel tank gauge check".
  - O.K. → Check harness between fuel tank gauge and meter.
  - N.G. → Replace fuel tank gauge unit.

1. Disconnect meter harness connector (black).
2. Turn ignition switch to "OFF".
3. Measure resistance between ⑯ and ②.



Trouble-shooting (Cont'd)

Sub fuel gauge (digital display) does not operate.

Go to "Display Check".

O.K. → Check fuel injection pulse circuit.

N.G. → Go to "Power Unit Check".

- O.K. → Replace meter and gauge assembly.
- N.G. → Replace power unit.

Check fuel injection pulse circuit.

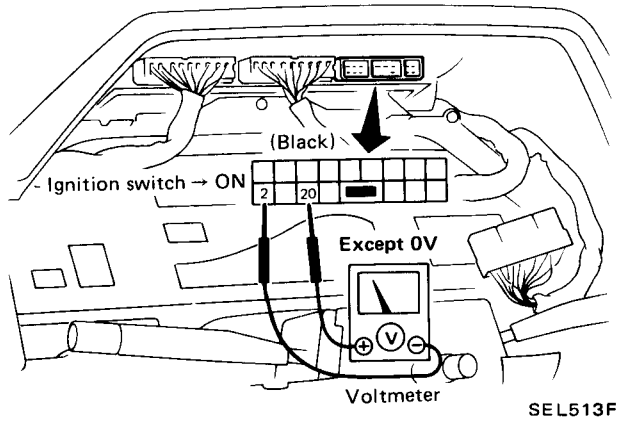
- O.K. → Check fuel tank sub gauge circuit.
- N.G. → Check harness.

Check fuel tank sub gauge circuit.

- O.K. → Replace meter and gauge assembly.
- N.G. → Go to "Fuel Tank Gauge Check".
  - O.K. → Check harness between fuel tank gauge and meter.
  - N.G. → Replace fuel tank gauge unit.

FUEL INJECTION PULSE CIRCUIT CHECK

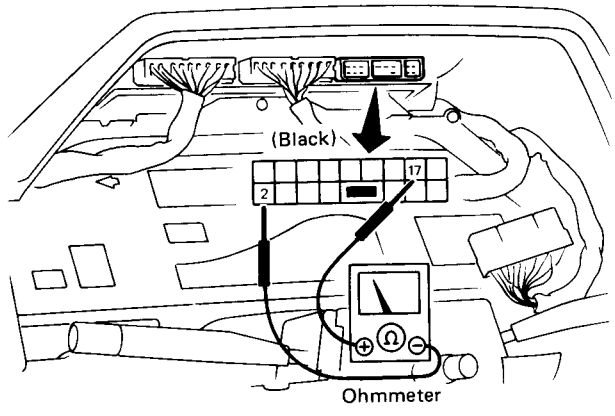
1. Disconnect meter harness connector (black).
2. Turn ignition switch to "ON".
3. Check for voltage across ⑳ and ②.



SEL513F

FUEL TANK SUB GAUGE CIRCUIT CHECK

1. Turn ignition switch to "OFF".
2. Measure resistance between ⑰ and ②.



Ignition switch → OFF

Fuel residue	Resistance
Less than 4ℓ	∞
5 - 20ℓ	Approx. 4 - 930Ω
More than 20ℓ	Less than 4Ω

SEL514F

Trouble-shooting (Cont'd)

Water temp, oil pressure and volt gauges do not operate at the same time.

→ Go to "Display Check".
- O.K. → Replace meter and gauge assembly.
- N.G. → Go to "Power Unit Check".
  - O.K. → Replace meter and gauge assembly.
  - N.G. → Replace power unit.

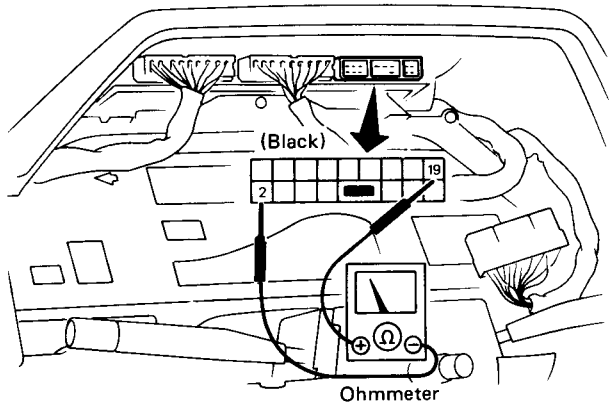
Only volt gauge does not operate.

→ Replace meter and gauge assembly.

Only water temp. gauge does not operate.

→ Go to "Display Check".
- O.K. → Check water temp. sensor (thermistor) circuit.
  - O.K. → Replace meter and gauge assembly.
  - N.G. → Go to "Thermistor Check".
    - O.K. → Check harness between thermistor and meter.
    - N.G. → Replace thermistor.
- N.G. → Replace meter and gauge assembly.

1. Disconnect meter harness connector (black).
2. Turn ignition switch to "OFF".
3. Measure resistance between ⑲ and ②.



Ignition switch → OFF

Engine coolant temperature	Resistance
60°C or less	70Ω or more
60°C or more	Approx. 10 - 70Ω

SEL515F

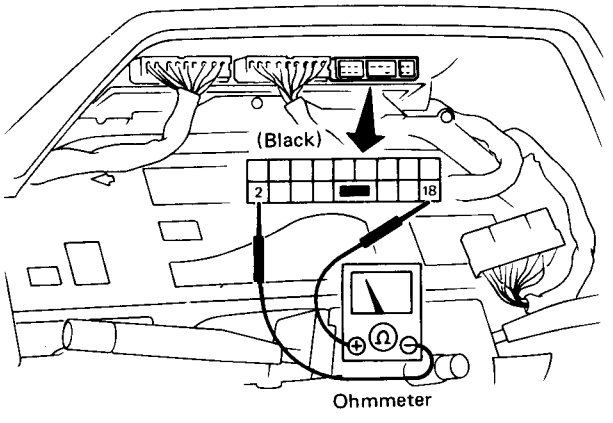
Trouble-shooting (Cont'd)

Only oil pressure gauge does not operate.

→ Go to "Display Check".

- O.K. → Check oil pressure sensor circuit.
  - O.K. → Replace meter and gauge assembly.
  - N.G. → Go to "Oil Pressure Sensor Check".
    - O.K. → Check harness between oil pressure sensor and meter.
    - N.G. → Replace oil pressure sensor.
- N.G. → Replace meter and gauge assembly.

1. Disconnect meter harness connector (black).
2. Measure resistance between ⑱ and ② when engine stopping and running.



Ohmmeter

Engine	Resistance
Stop	Approx. 75Ω or more
Idling	Approx. 60Ω or less

SEL516F

"Trip", "Ave. speed" and "Dist to empty" meters do not operate at the same time.

→ Go to "Display Check".

- O.K. → Replace trip meter assembly.
- N.G. → Go to "Power Unit Check".
  - O.K. → Replace trip meter assembly.
  - N.G. → Replace power unit.

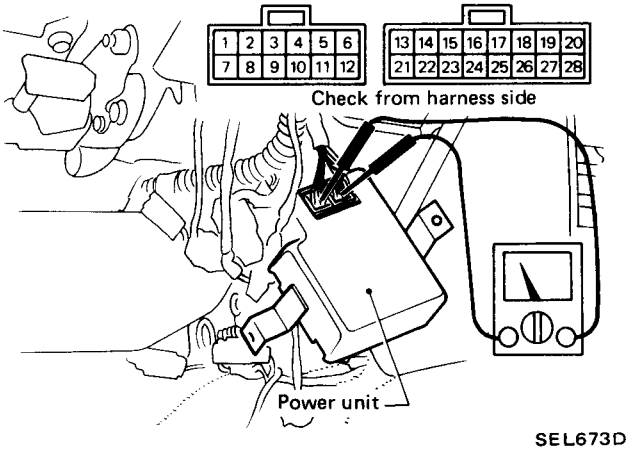
Only "Ave. speed" meter does not operate.

→ Go to "Display Check".

- O.K. → Check clock for proper operation.
  - O.K. → Check harness between clock and meter.
    - O.K. → Replace trip meter assembly.
  - N.G. → Replace clock.
- N.G. → Replace trip meter assembly.

Power Unit Check

- Remove power unit with harness connected.
- Perform voltage and continuity tests. Refer to chart below.



SEL673D

- Turn ignition switch to "ON".

Voltmeter terminal (+)	Voltmeter terminal (−)	Voltage [V]	Remarks
①	⑦	Approx. 12	Check when no display appears.
②	⑦	Approx. 5	Check when no display appears.
④	⑦	Approx. 16	Check when no display appears.
⑧	⑦	Approx. 5	Check when no display appears.
⑦	③	Approx. 22	Check when no display appears.
⑦	⑨	Approx. 28.5	Check when no display appears.
⑦	⑪	More than 6	For speedometer
⑦	㉑	More than 6	For tachometer
⑦	㉓	More than 6	For Temp, Oil, Volt gauge
⑦	㉕	More than 6	For Fuel gauge
⑦	㉗	More than 6	For "Trip", "Ave. speed" & "Dist to empty" meter.

- Turn ignition switch to "OFF".

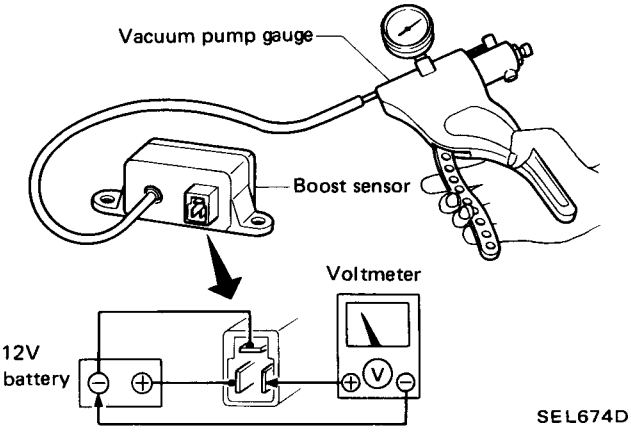
Ohmmeter (+)	Ohmmeter (−)	Continuity	Remarks
⑦	Body ground	Yes	Check when no display appears.

If specified voltage or continuity is not produced, replace power unit.

Boost Sensor Check

1. Connect vacuum pump gauge to boost sensor vacuum hose.
2. Disconnect harness connector from boost sensor and connect battery and voltmeter as shown.
3. Apply vacuum pressure to boost sensor by vacuum pump gauge and measure voltages.

   Approx. 2.2V at 0 kPa (0 mmHg, 0 inHg) (Atmospheric pressure)
   Approx. 1.3V at −53.3 kPa (−400 mmHg, −15.75 inHg)



SEL674D

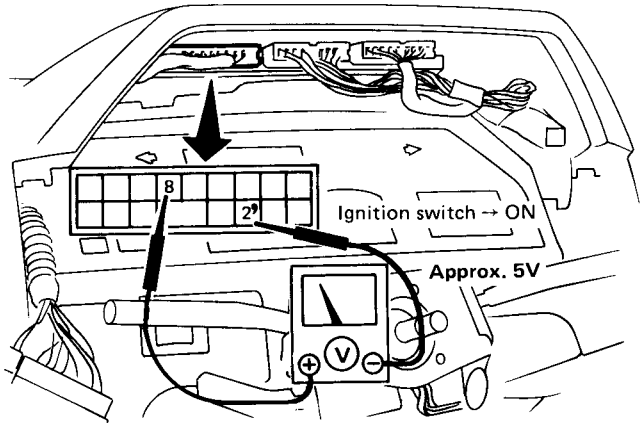
Speed Sensor Signal Check

SPEED SENSOR OUTPUT CHECK

When speedometer is functioning properly, this test is not necessary. Go to "Meter Output Check".

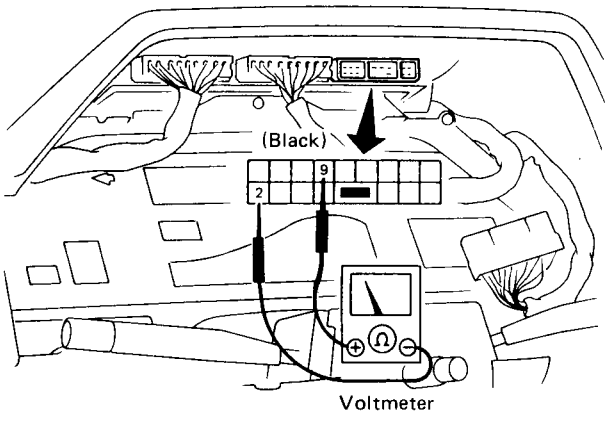
1. Remove cluster lid A.
2. Connect a voltmeter between ⑧ and ②' on combination meter side. Combination meter harness connector should remain connected to instrument harness.
3. Switch ignition switch from "OFF" to "ON". Voltmeter should indicate approximately 5 volts when switch is "ON".

If voltmeter indicates no voltage, go to "Power Unit Check".



SEL517F

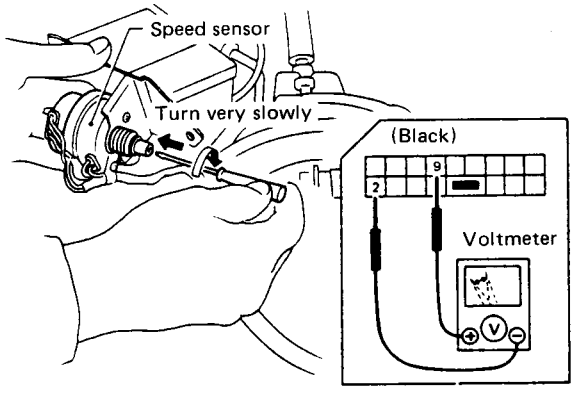
4. Turn ignition switch to "OFF".
5. Disconnect speedometer cable from speed sensor and remove speed sensor with harness connected.
6. Disconnect combination meter harness from instrument harness as shown below, and connect a voltmeter across ⑨ and ②.



SEL518F

7. Turn ignition switch "OFF" → "ON".
8. Slowly turn speed sensor rotor shaft with a suitable screwdriver to make sure voltmeter pointer deflects.

Do not turn rotor shaft quickly as voltmeter deflects 24 times per revolution of rotor shaft.



SEL519F

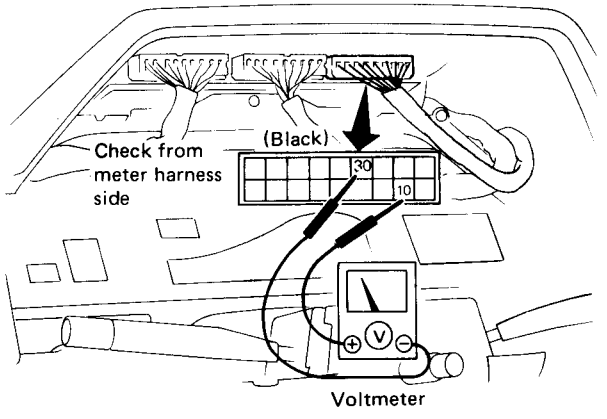
If voltmeter pointer does not deflect, replace speed sensor.

Speed Sensor Signal Check (Cont'd)

METER OUTPUT CHECK

- **Combination meter emits speed sensor signal to control E.C.C.S. control unit, A.S.C.D. control unit, voice warning unit and A/T control unit.**

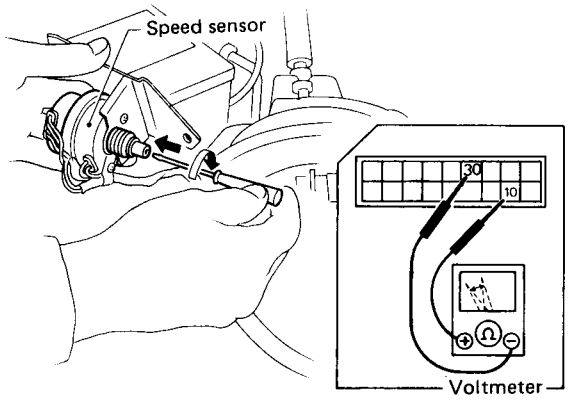
1. Disconnect speedometer cable from speed sensor and remove speed sensor with harness connected.
2. Remove cluster lid A.
3. Connect a voltmeter between ⑩ and ㉚ from meter harness side.



SEL748D

4. Turn ignition switch "OFF" → "ON".
5. Slowly turn speed sensor rotor shaft with a suitable screwdriver to make sure ohmmeter pointer deflects.

Ohmmeter pointer should deflect twice for each rotation or rotor shaft.



SEL749D

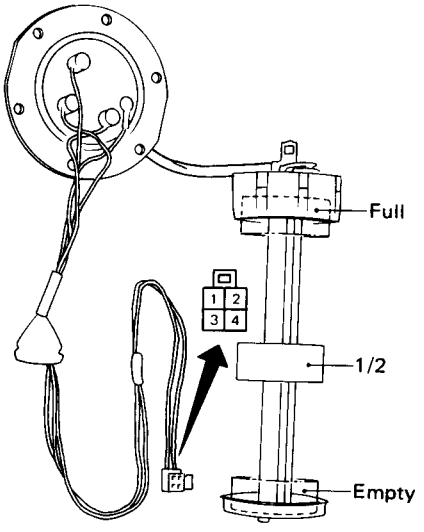
If ohmmeter pointer does not deflect, go to "Speed Sensor Output Check". (Refer to back page)

Fuel Tank Gauge Check

- For removal, refer to FE section.

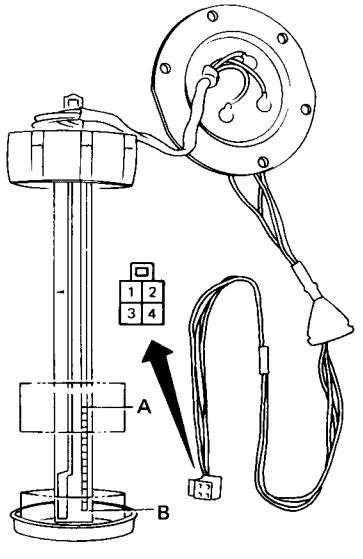
Ohmmeter terminal (+)	Ohmmeter terminal (−)	Float position	Resistance value
②	①	Full	Approx. 10 - 20Ω
		Empty	Approx. 480 - 520Ω
		1/2	Approx. 100 - 110Ω
③	①	A	Approx. 4Ω or below
		B	Approx. 870 - 930Ω
④	①	B	0Ω

Main gauge



SEL675D

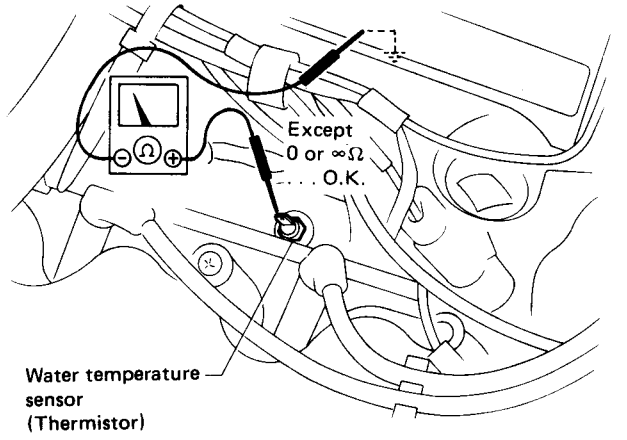
Sub gauge



SEL676D

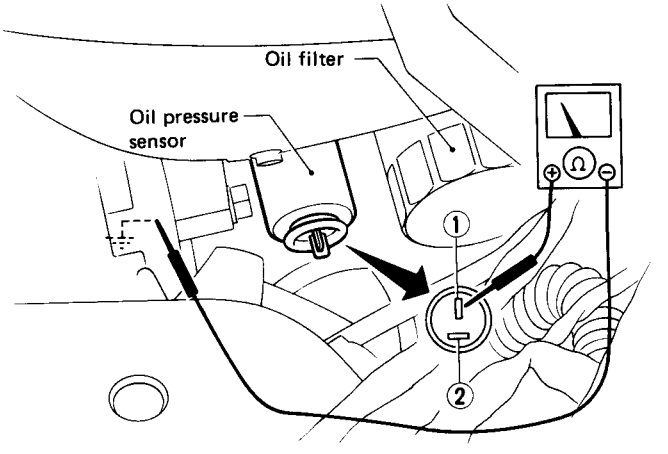
Water Temp Sensor Check

Cylinder head R.H. side



SEL677D

Oil Pressure Sensor Check



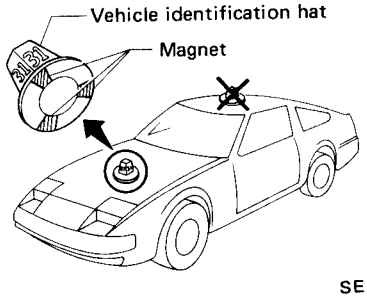
SEL678D

Ohmmeter terminal (+)	Ohmmeter terminal (−)	With engine stopped	With engine running (idling)
①	Engine ground	0Ω	∞
②		More than 74Ω	Less than 60Ω

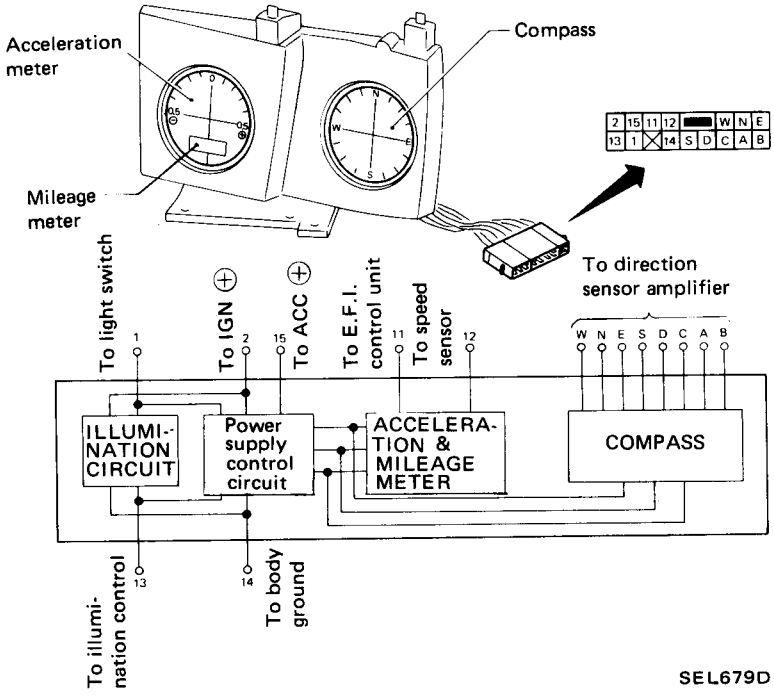
Combination Gauge

CAUTION:

- Never touch the combination gauge terminal with bare hands.
- Digital type combination gauge should not be disassembled.
- Do not place any magnet on roof. (e.g., CB antenna with magnet base)
- Place vehicle identification hat with magnet on engine hood, NOT ON ROOF. Otherwise, roof will become magnetized which will cause the direction sensor to malfunction, resulting in erroneous operation of the compass.

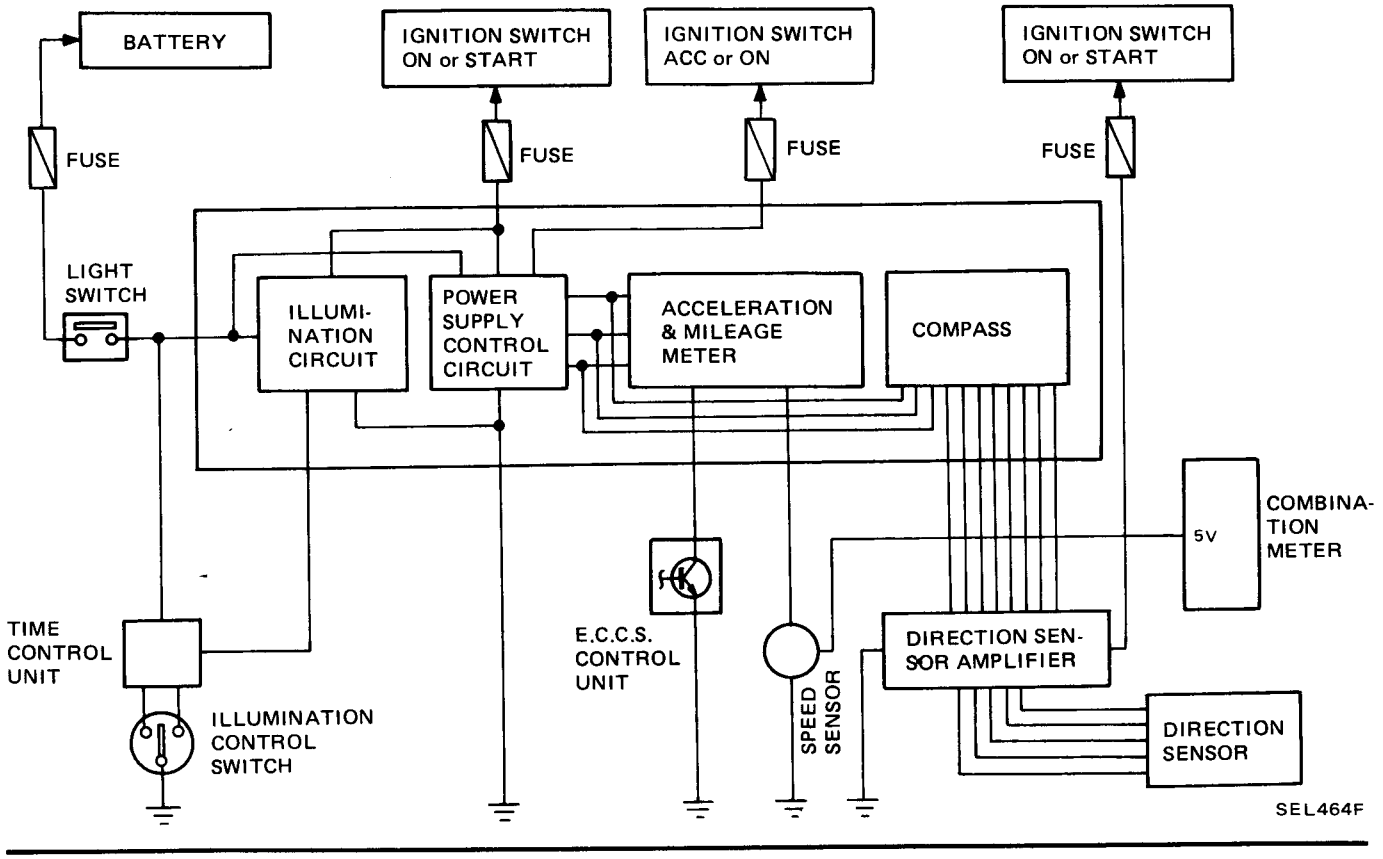


SEL321E



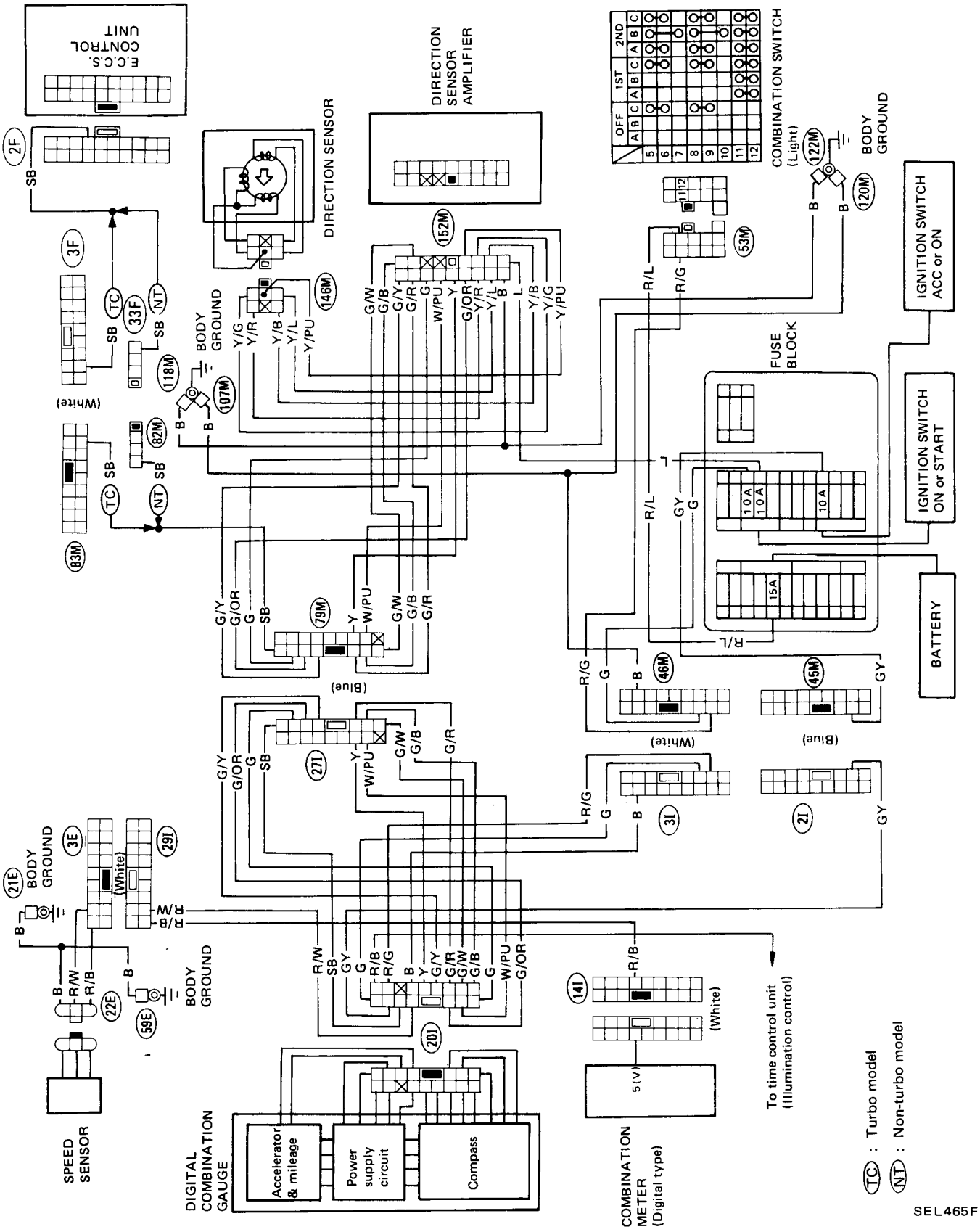
SEL679D

Schematic



SEL464F

Wiring Diagram



Trouble-shooting

No display appears.

↓

Check power supply circuit for combination gauge.

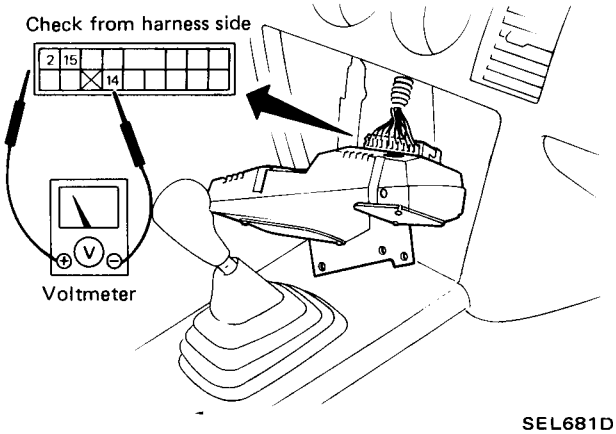
↓ O.K. → Replace combination gauge.

↓ N.G. → Check harness.

Voltmeter terminal		Ignition switch position		
(+)	(−)	OFF	ACC	ON
②	⑭	0V	0V	Approx. 12V
⑮	⑭	0V	Approx. 12V	Approx. 12V

Ohmmeter terminal		Ignition switch OFF
(+)	(−)	
⑭	Body ground	Continuity exists.

- Remove radio and A/C control assembly from center console and remove combination gauge with harness connected.



SEL681D

Display illumination will not darken when light switch is "ON".

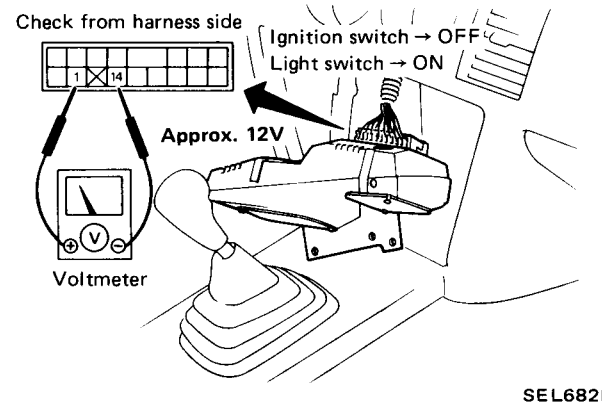
↓

Check light switch circuit for combination gauge.

↓ O.K. → Replace combination gauge.

↓ N.G. → Check harness.

1. Remove radio and A/C control assembly and remove combination gauge with harness connected.
2. Turn ignition switch to "OFF".
3. Turn light switch to "ON".
4. Measure voltage across ① and ⑭.



SEL682D

Trouble-shooting (Cont'd)

COMPASS

Compass will not indicate direction in which vehicle is being driven.

↓

Face vehicle toward the North to make sure arrow points to "N".

Display deviates by one graduation.

Slowly turn volume ① until arrow moves from Ⓐ (Ⓒ) to Ⓒ (Ⓐ). Then slowly return volume ① until arrow points to point Ⓑ.

Display deviates by two or more graduations.

When arrow deviates toward West, move switch ② to (+); when it deviates toward the East, move switch to (−). Return switch ② to Neutral when arrow stays between points Ⓐ and Ⓒ.

↓

Face vehicle toward the East to make sure arrow points to "E".

Display deviates by one graduation.

Slowly turn volume ③ until arrow moves from Ⓓ (Ⓕ) to Ⓕ (Ⓓ). Then slowly return volume ③ until arrow points to point Ⓔ.

Display deviates by two or more graduations.

When arrow deviates toward the North, move switch ④ to (+); when it deviates toward the South, move switch to (−). Return switch ④ to Neutral when arrow stays between points Ⓓ and Ⓕ.

↓

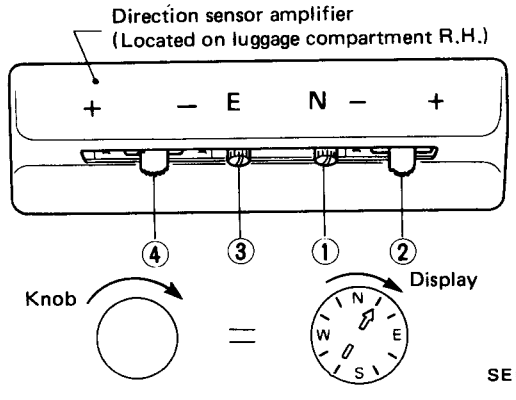
Again face vehicle toward the North to make sure arrow points to "N".

Still incorrect.

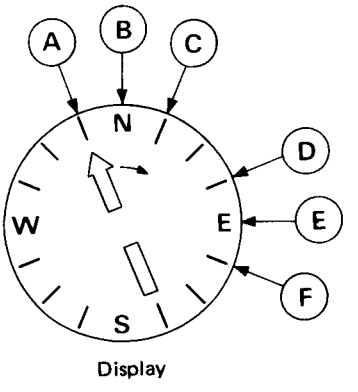
↓

Demagnetize entire roof as follows:

- Use a demagnetizer designed for open reel tapes.
- Spread a sheet of thin cloth over roof. Move demagnetizer in a circular motion over roof while lightly touching the cloth. Roof will then be demagnetized.

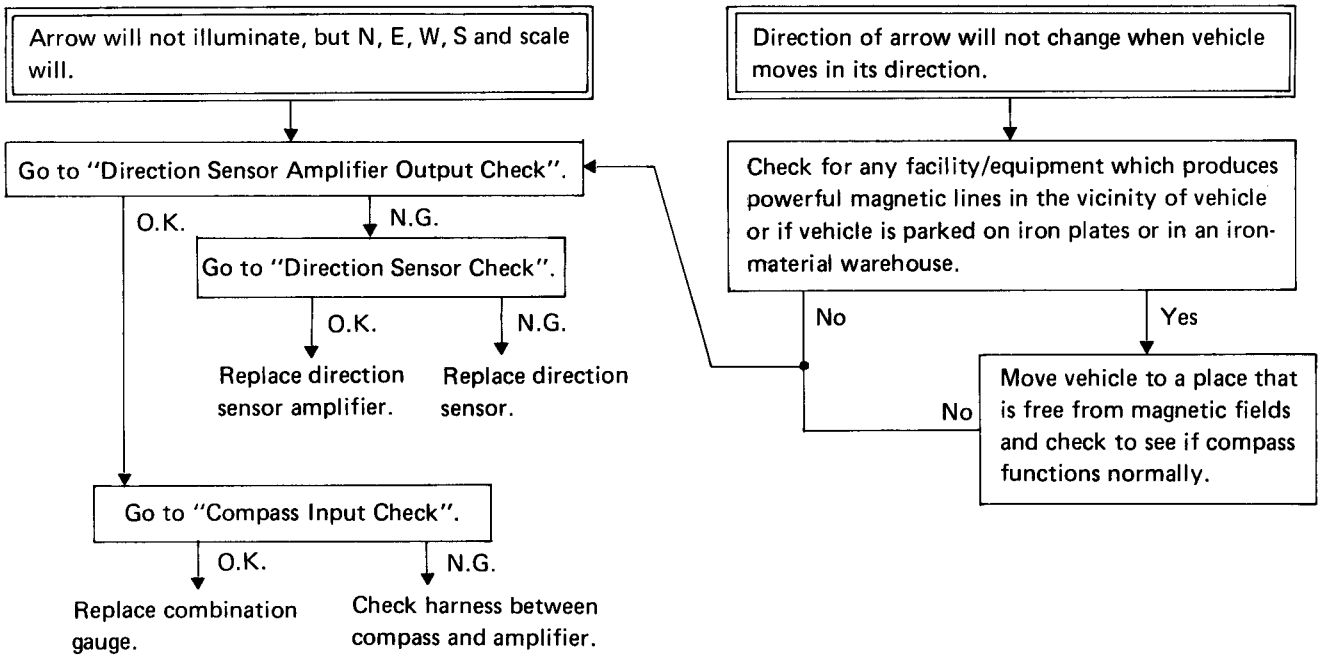


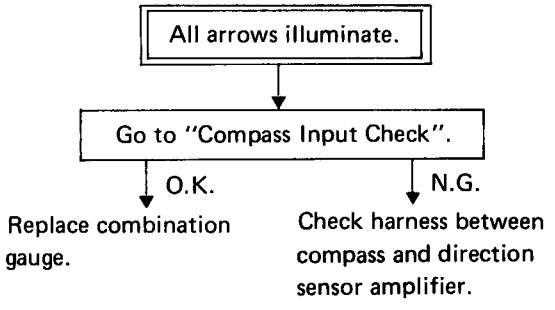
SEL683D

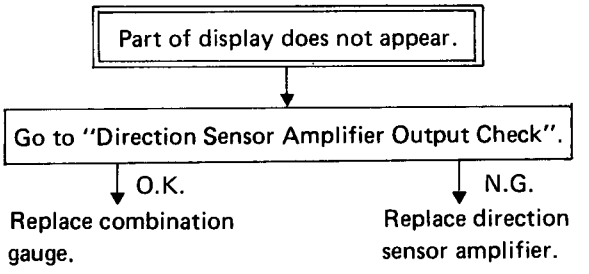


SEL684D

Trouble-shooting (Cont'd)







Trouble-shooting (Cont'd)

Irrelevant arrows are displayed.

Go to "Direction Sensor Amplifier Output Check".

O.K. → Check for loose harness connector to combination gauge.
- O.K. → Replace combination gauge.

N.G. → Check for loose harness connector to amplifier.
- O.K. → Replace amplifier.

ACCELERATION & MILEAGE METERS

Arrow remains at "0" despite acceleration/deceleration.

Does speedometer operate?

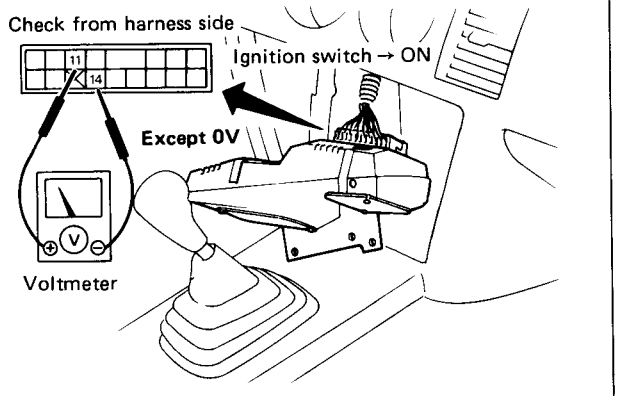
- Yes → Check harness between combination gauge and speed sensor.
  - N.G. → Replace combination gauge.
- No → Replace speed sensor.

Mileage meter registers "0" or abnormal value.

Does speedometer operate?

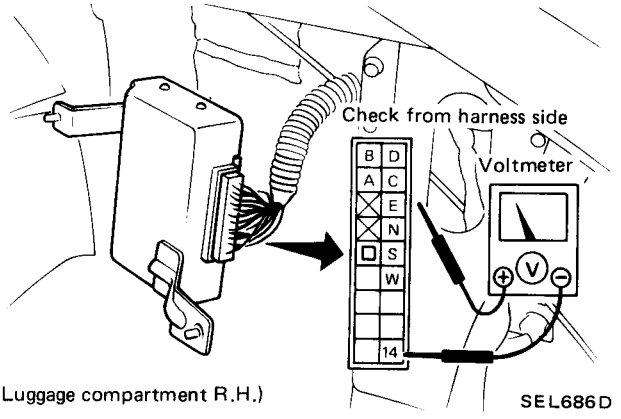
- Yes → Check fuel injection pulse circuit for combination gauge.
  - O.K. → Replace combination gauge.
  - N.G. → Check harness between combination gauge and E.F.I. control unit.
- No → Replace speed sensor.

1. Remove radio and A/C control assembly from center console. Remove combination gauge with harness connected.
2. Turn ignition switch to "ON".
3. Check to determine if voltage is produced across ⑪ and ⑭.



Direction Sensor Amplifier Output Check

- Connect direction sensor amplifier harness (if disconnected).
- Using a directional magnet, determine the direction in which car faces. Check voltage across terminals as indicated in chart below.
- Turn ignition switch to "ON".

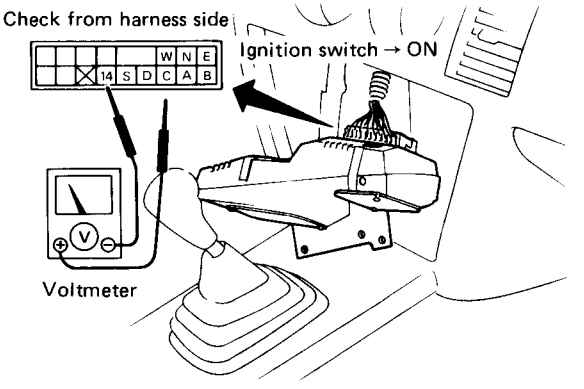


(Luggage compartment R.H.)

SEL686D

Compass Input Check

- Remove radio and A/C control assembly from center console and remove combination gauge with harness connected.
- Check voltages across terminals as indicated in chart below.
- Turn ignition switch ON.

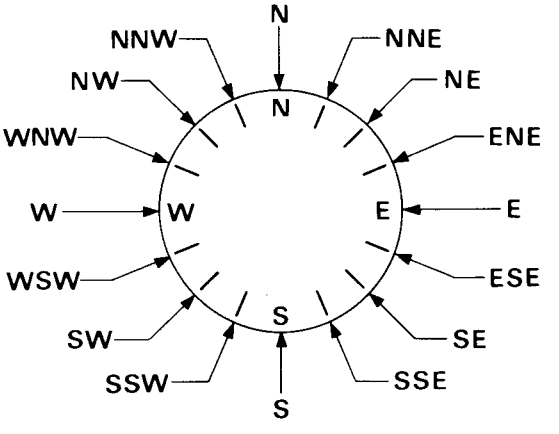


SEL687D

Voltmeter terminal (−)		⑭							
	(+)	Ⓝ	Ⓔ	Ⓢ	Ⓦ	Ⓑ	Ⓐ	Ⓒ	Ⓓ
Direction in which vehicle faces	NW	1	0	0	0	0	1	1	1
	NNW	1	0	0	0	1	0	1	1
	N	1	0	0	0	1	1	0	1
	NNE	1	0	0	0	1	1	1	0
	NE	0	1	0	0	1	1	1	0
	ENE	0	1	0	0	1	1	0	1
	E	0	1	0	0	1	0	1	1
	ESE	0	1	0	0	0	1	1	1
	SE	0	0	1	0	0	1	1	1
	SSE	0	0	1	0	1	0	1	1
	S	0	0	1	0	1	1	0	1
	SSW	0	0	1	0	1	1	1	0
	SW	0	0	0	1	1	1	1	0
	WSW	0	0	0	1	1	1	0	1
	W	0	0	0	1	1	0	1	1
	WNW	0	0	0	1	0	1	1	1

1: More than 4V
0: Less than 1V

CAUTION:
Before performing voltage measurements, ensure that there is no equipment or facility which would produce powerful magnet lines in the vicinity of vehicle.

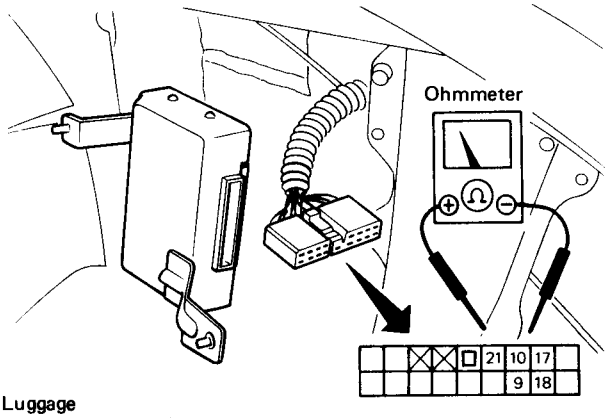


SEL688D

Direction Sensor Check

- Disconnect harness connector from direction sensor amplifier.
- Measure resistance values between terminals on harness side.

Ohmmeter terminal		Resistance
(+)	(–)	
⑨	㉑	Approx. 20 - 35Ω
⑩	㉑	Approx. 20 - 35Ω
⑰	⑱	Approx. 10 - 20Ω

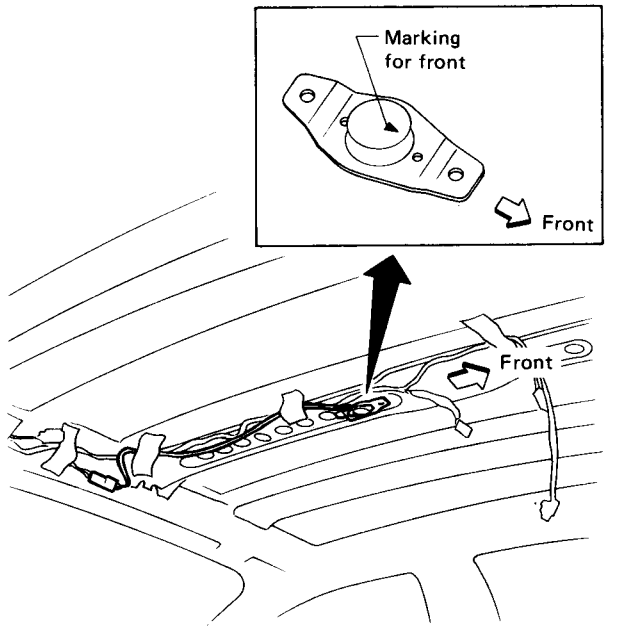


(Luggage compartment R.H.)

SEL689D

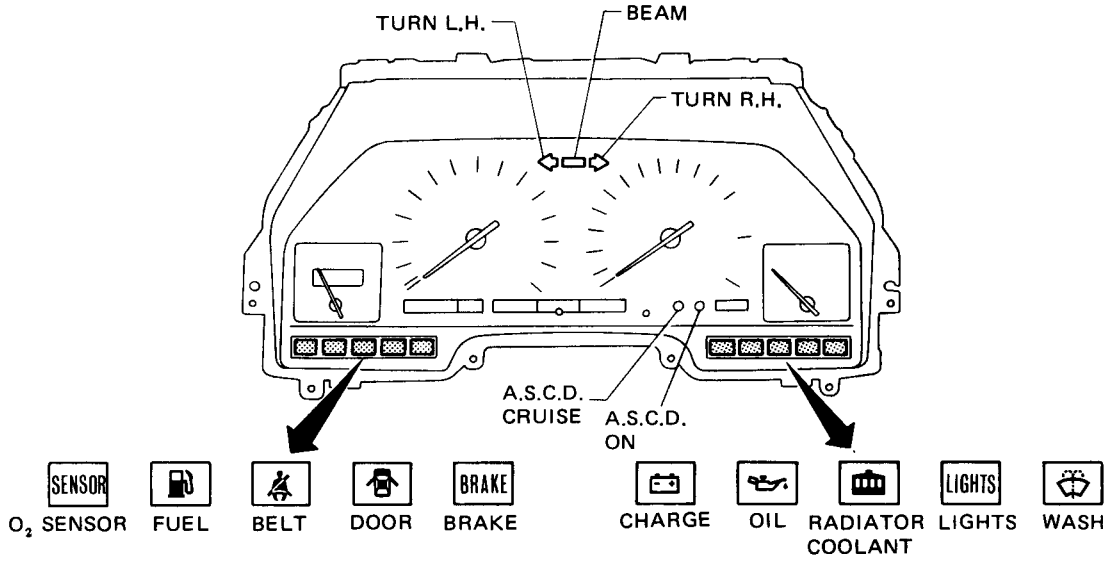
Direction Sensor Installation

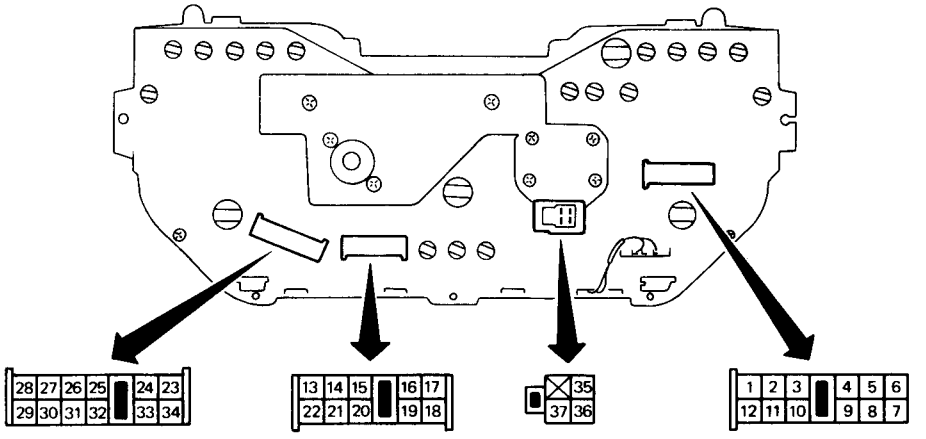
- When installing direction sensor in the vehicle, face it in the direction as shown in figure below.

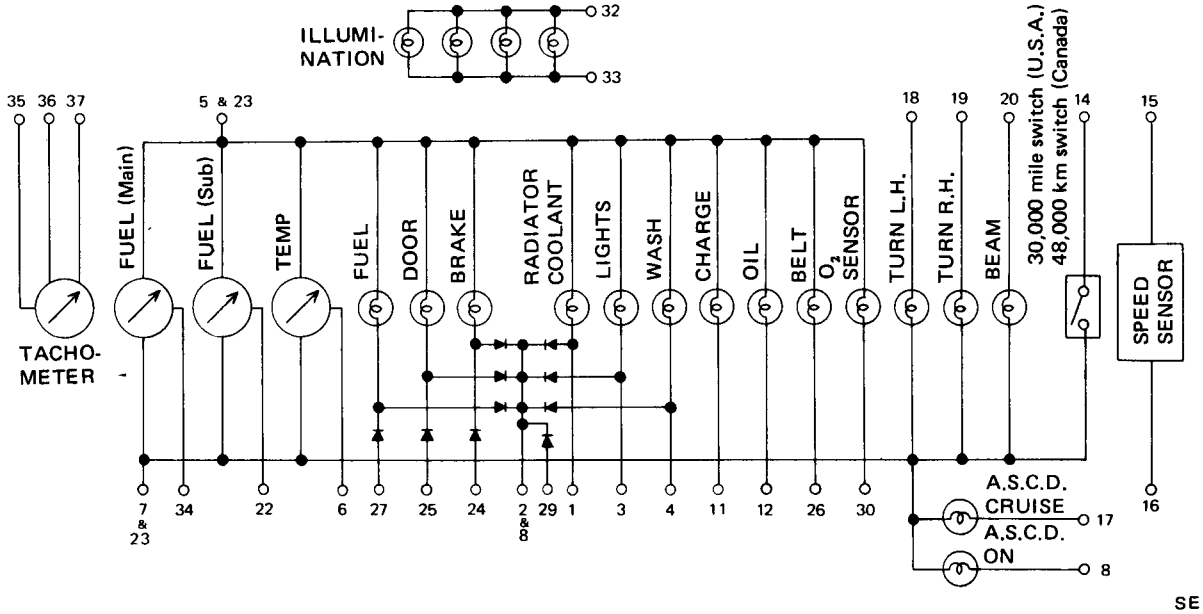


SEL742D

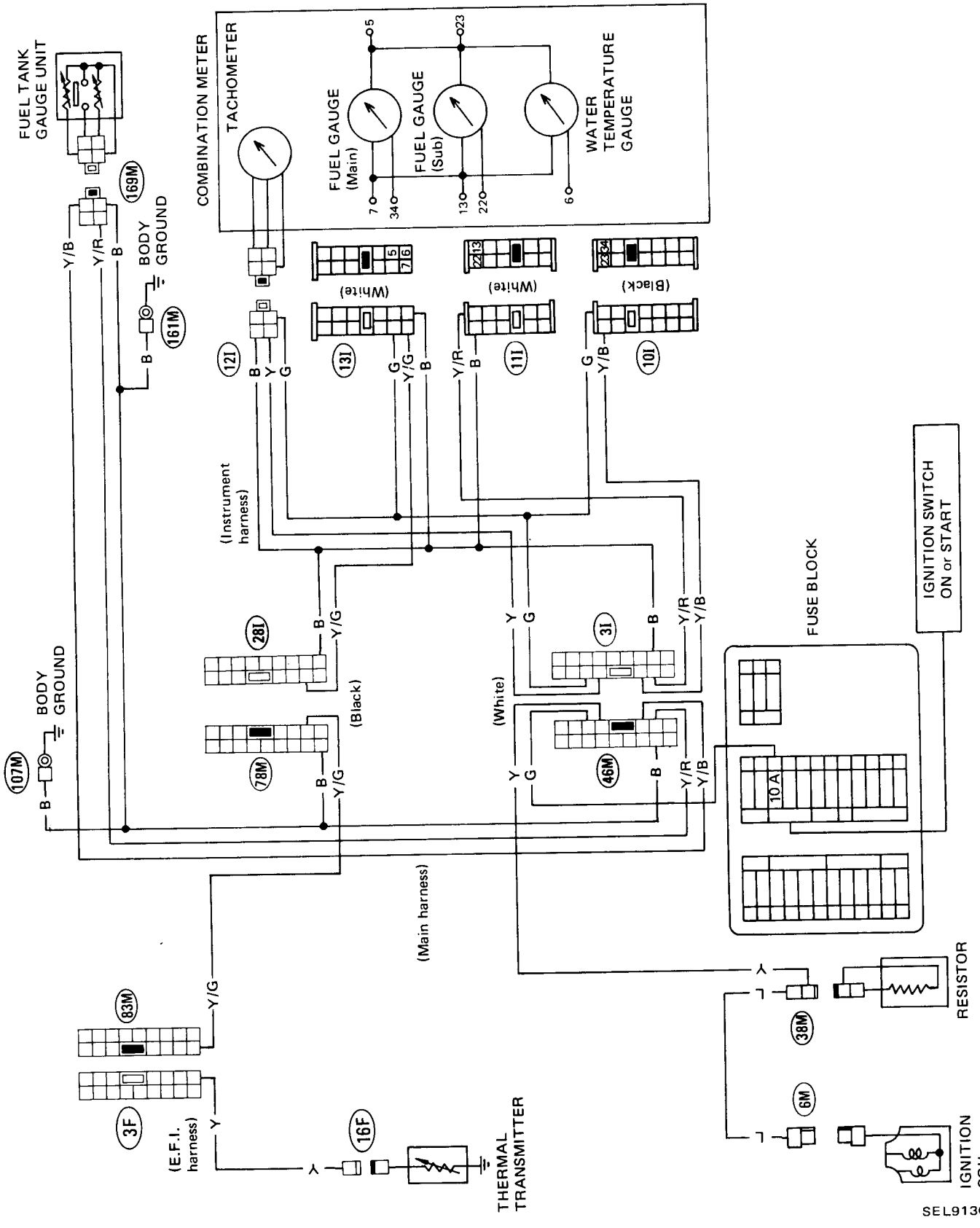
Combination Meter







SEL054H

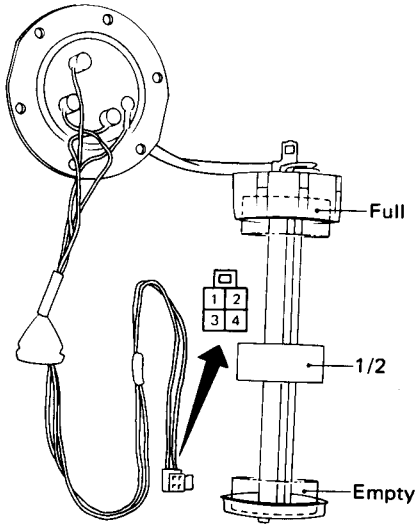

FUEL TANK GAUGE UNIT
COMBINATION METER
TACHOMETER
FUEL GAUGE (Main)
FUEL GAUGE (Sub)
WATER TEMPERATURE GAUGE
BODY GROUND
(Instrument harness)
(White)
(Black)
FUSE BLOCK
IGNITION SWITCH ON or START
10A
(Main harness)
RESISTOR
IGNITION COIL
THERMAL TRANSMITTER
(E.F.I. harness)
SEL913G

Fuel Tank Gauge Check

- For removal, refer to FE section.

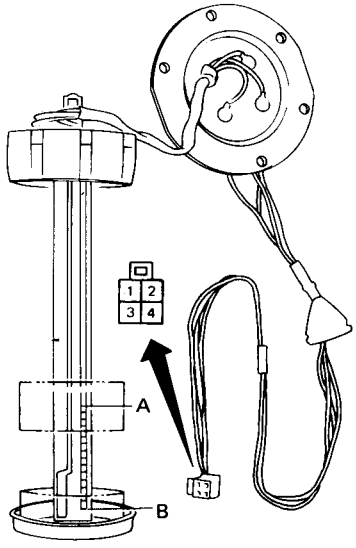
Ohmmeter terminal		Float position	Resistance value
(+)	(−)		
②	①	Full	Approx. 6Ω
		Empty	Approx. 80Ω
		1/2	Approx. 30 - 35Ω
③	①	A	More than 60Ω
		B	Less than 6Ω

Main gauge



SEL675D

Sub gauge

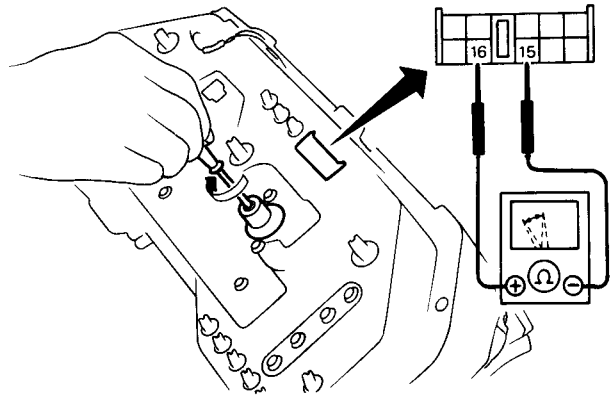


SEL676D

Speed Sensor Signal Check

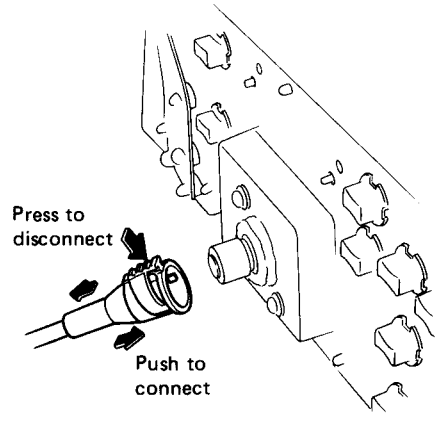
- Speed sensor is built into the speedometer.
- Turn speedometer slowly using small screwdriver, and check continuity of speed sensor circuit.

Continuity exists two times for each turn ... O.K.



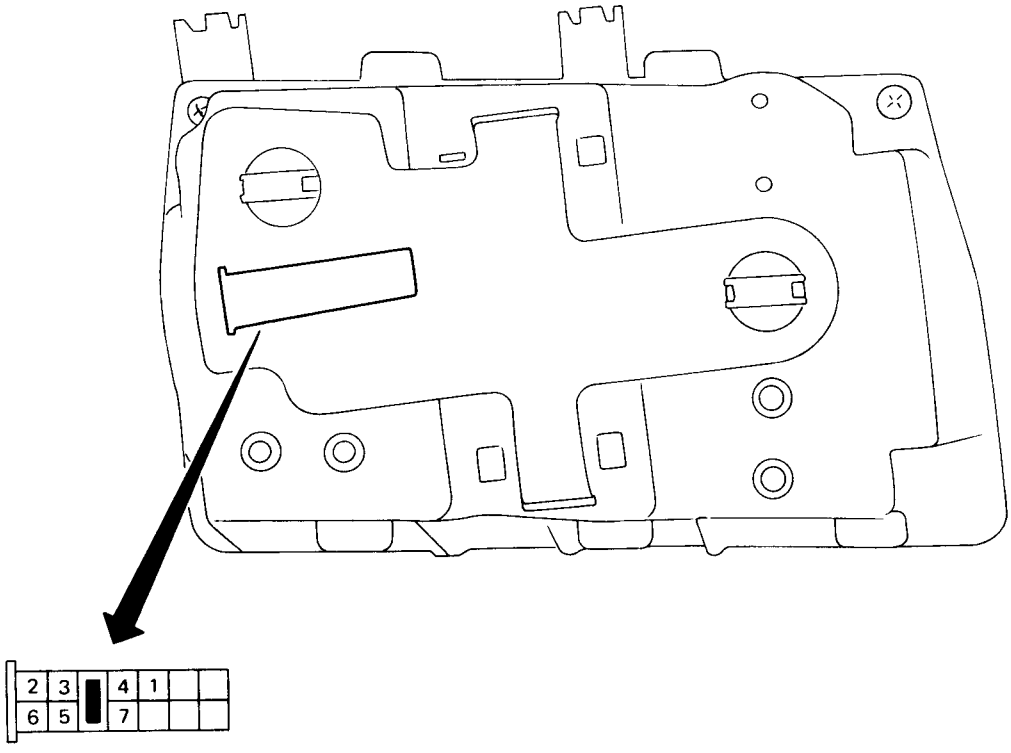
SEL696D

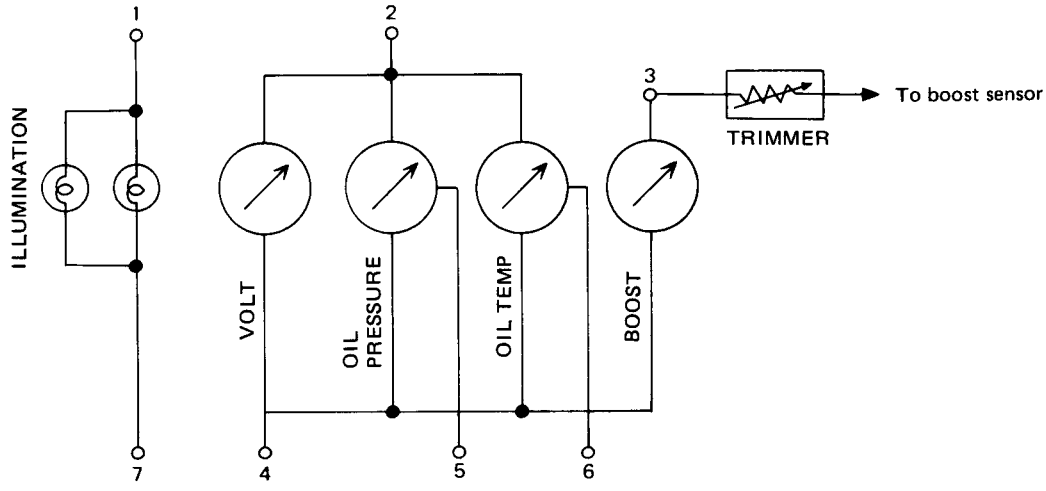
Speedometer Cable Removal



SEL692D

Combination Gauge

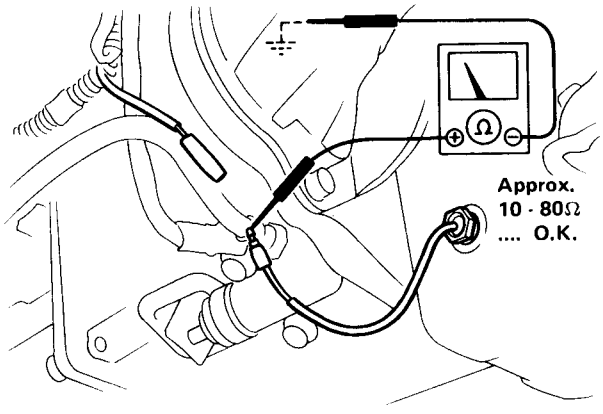




SEL693D

Oil Temp. Sensor Check

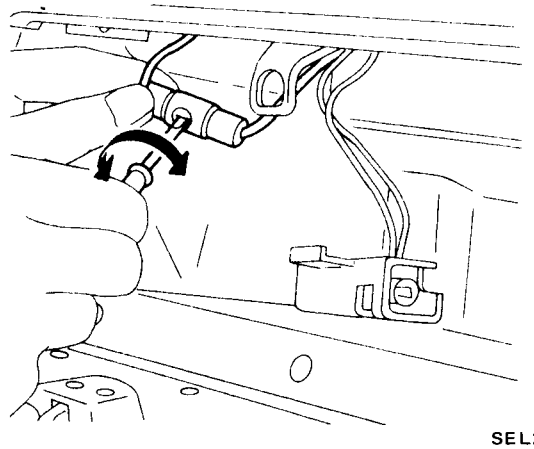
1. Warm up engine.
2. Stop engine and turn ignition switch OFF.
3. Check resistance of oil temp. sensor.



SEL695D

Boost Gauge Trimmer Adjustment

- When boost gauge does not give proper reading, adjust 0 kPa (0 mmHg, 0 inHg) point with the trimmer located on interior upper wall of glove box.
- Use a screwdriver to adjust trimmer.

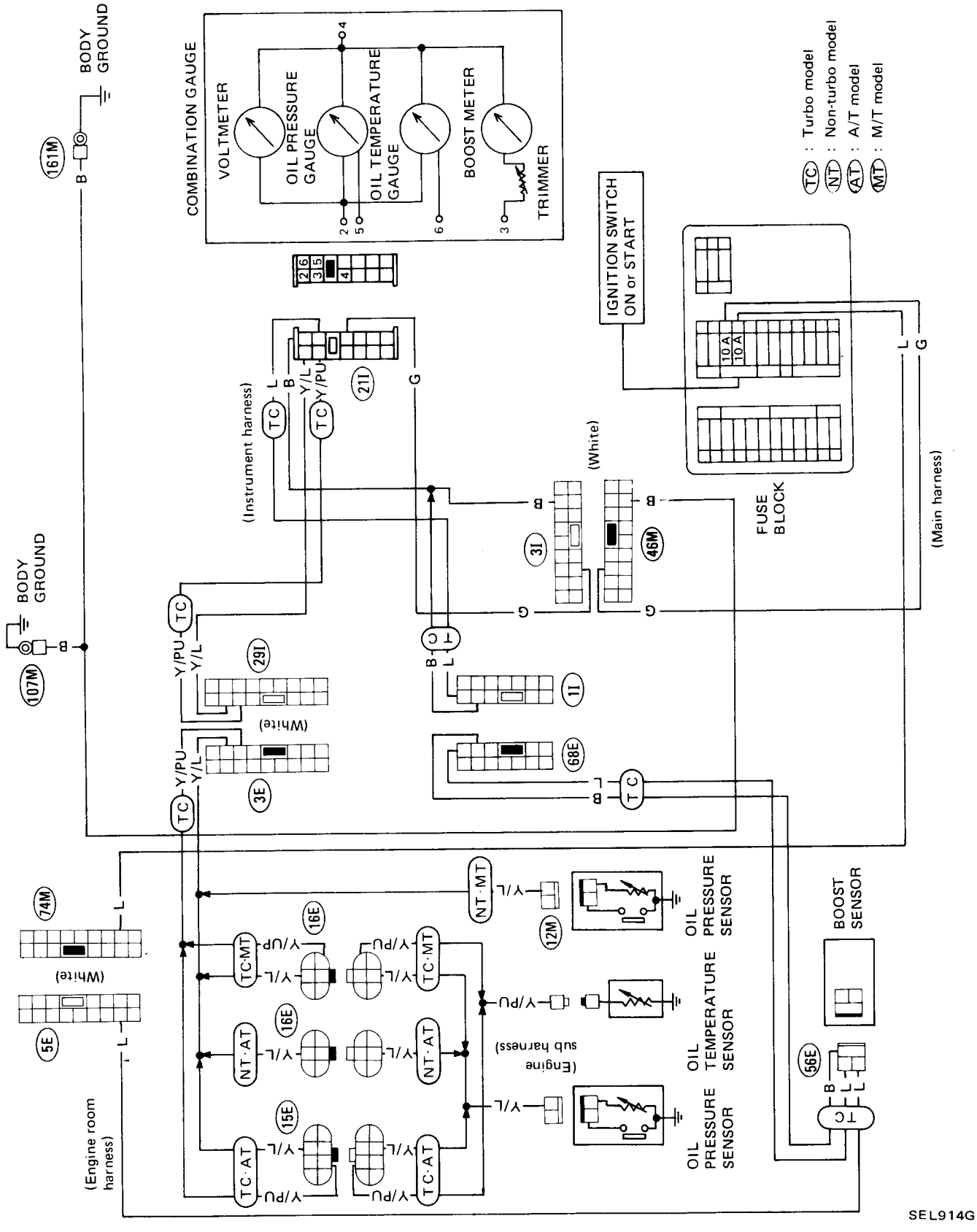


SEL273B

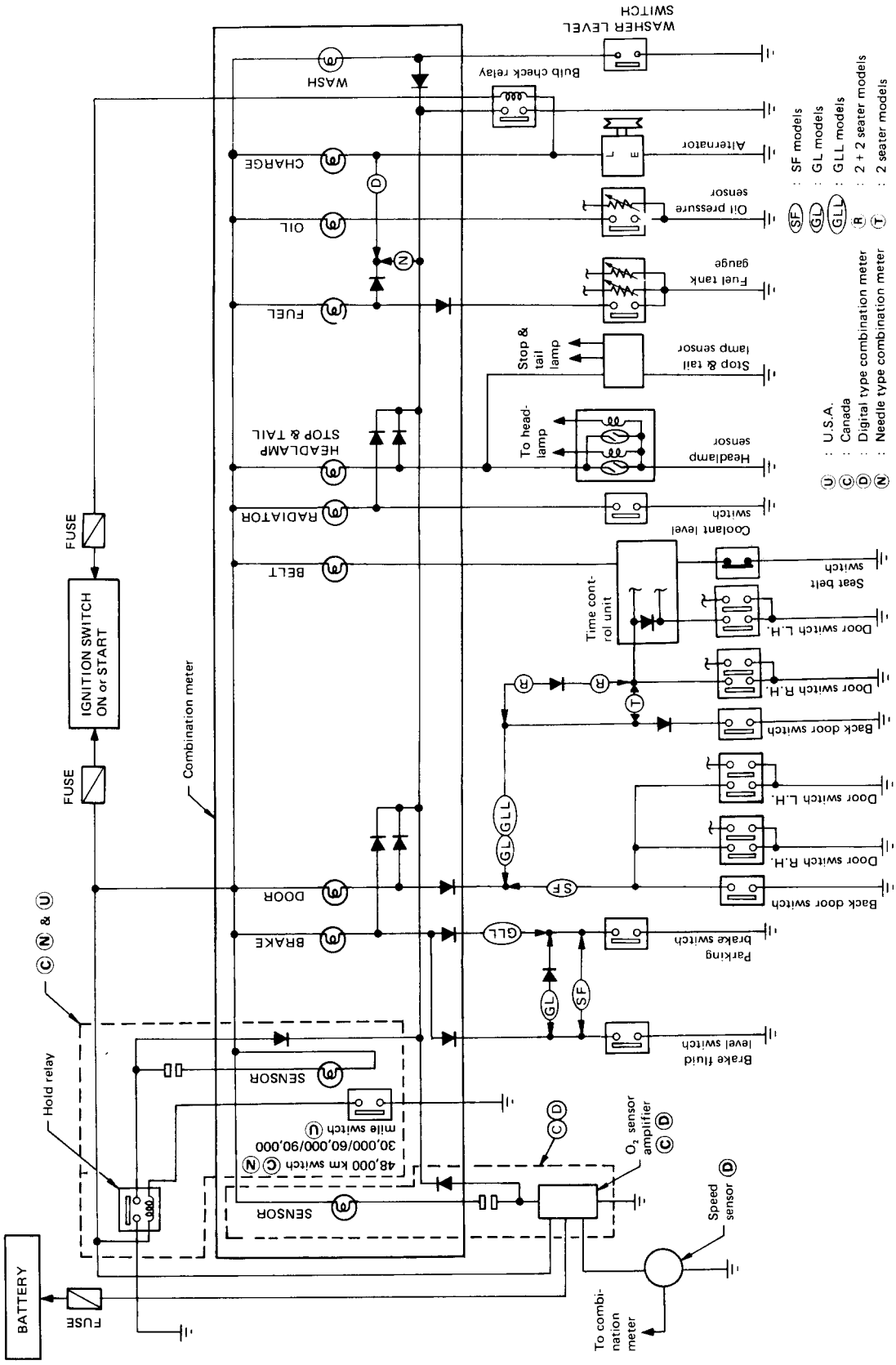
- For checking oil pressure sensor and boost sensor, refer to pages EL-53 and 56.

METER AND GAUGES —Needle Type Combination Gauge

Oil Temp, Oil Pressure, Boost and Volt Gauges/Wiring Diagram

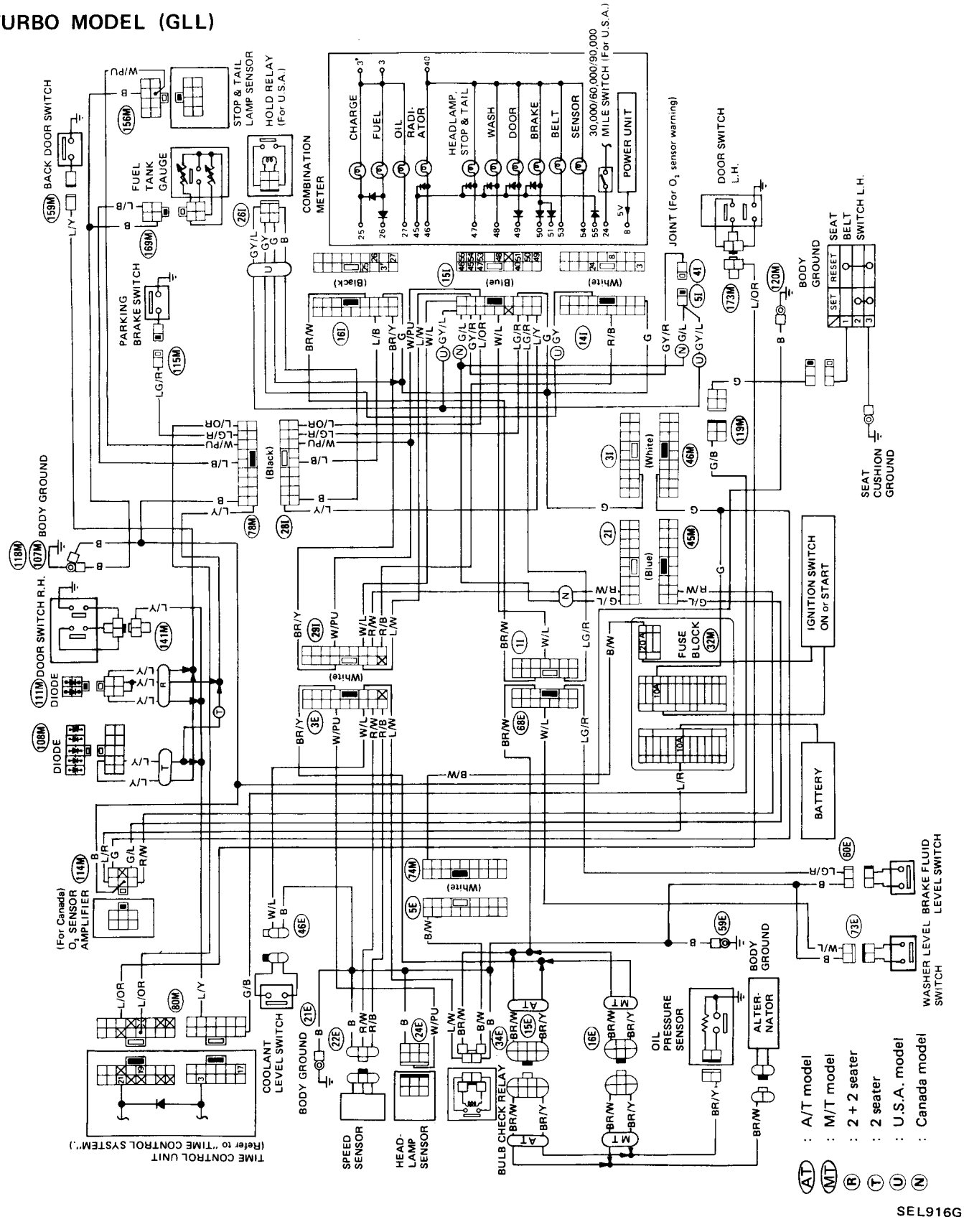


Schematic


WASHER LEVEL SWITCH
WASH
Bulb check relay
Alternator
CHARGE
Oil pressure sensor
OIL
Fuel tank gauge
FUEL
Stop & tail lamp
Stop & tail lamp sensor
To head-lamp
HEADLAMP STOP & TAIL
Headlamp sensor
RADIATOR
Coolant level switch
BELT
Seat belt switch
Time control unit
Door switch L.H.
Door switch R.H.
Back door switch
Door switch L.H.
Door switch R.H.
Back door switch
DOOR
BRAKE
Parking brake switch
Brake fluid level switch
SENSOR
mile switch Ⓤ
48,000 km switch Ⓒ Ⓝ
30,000/60,000/90,000
SENSOR
O_2 sensor amplifier Ⓒ Ⓓ
Speed sensor Ⓓ
To combination meter
Hold relay
Ⓒ Ⓝ & Ⓤ
FUSE
IGNITION SWITCH ON or START
FUSE
FUSE
BATTERY
Combination meter
SF models
GL models
GLL models
2 + 2 seater models
2 seater models
U.S.A.
Canada
Digital type combination meter
Needle type combination meter
SEL915G

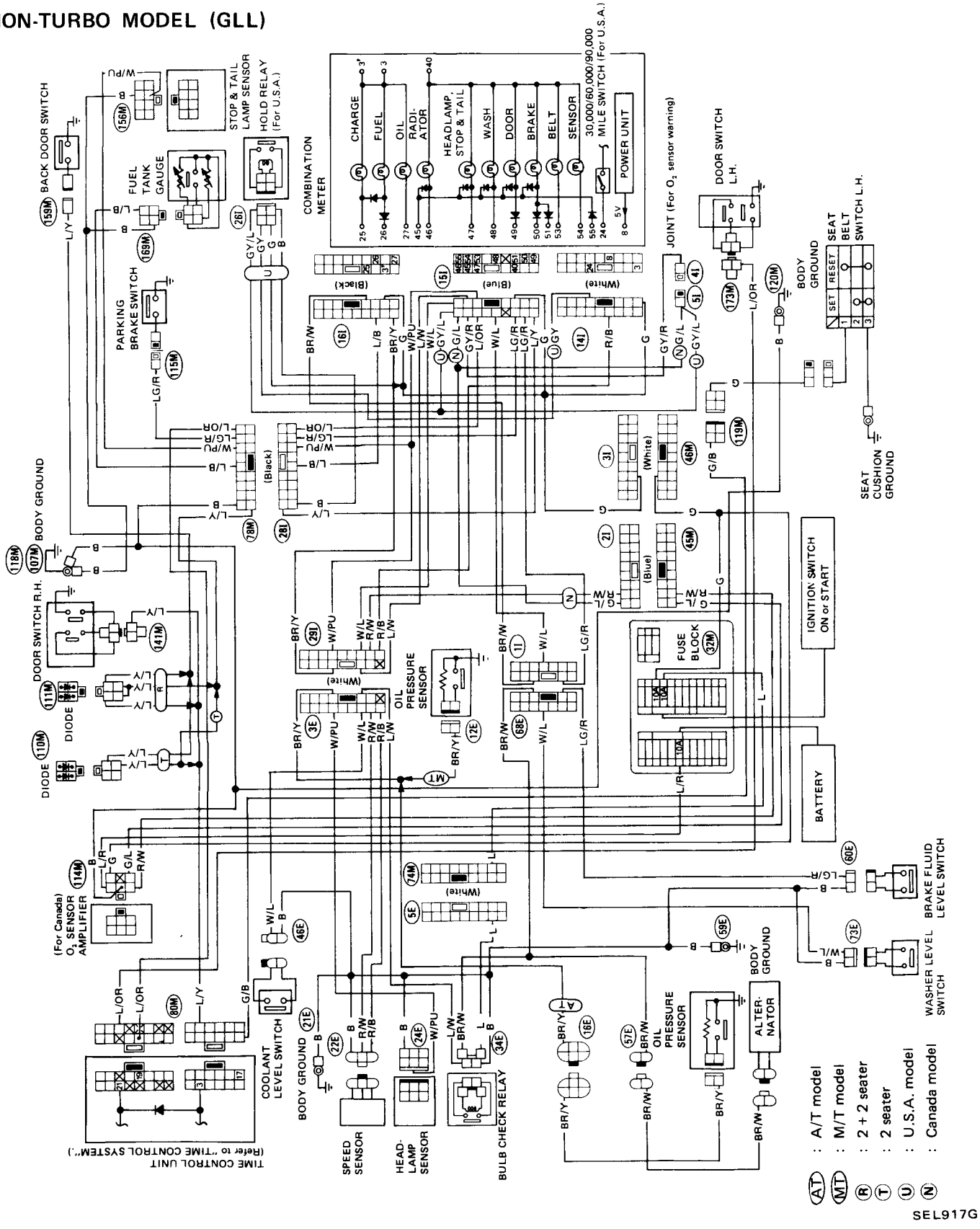
— Warning Lamps/Wiring Diagram— For Digital Type Combination Meter—

TURBO MODEL (GLL)



Warning Lamps/Wiring Diagram
—For Digital Type Combination Meter (Cont'd)—

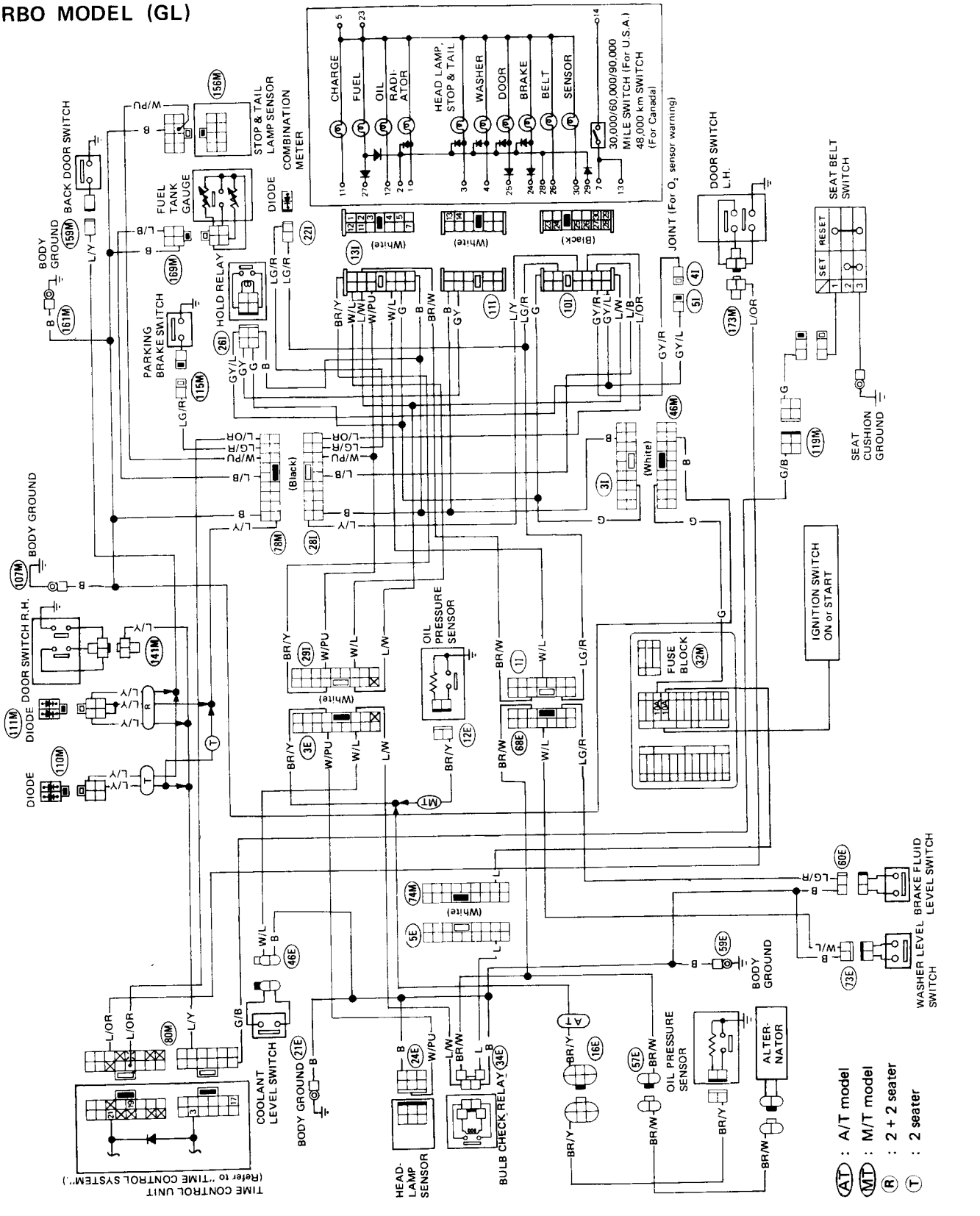
NON-TURBO MODEL (GLL)



SEL917G

Warning Lamps/Wiring Diagram —For Needle Type Combination Meter—

TURBO MODEL (GL)

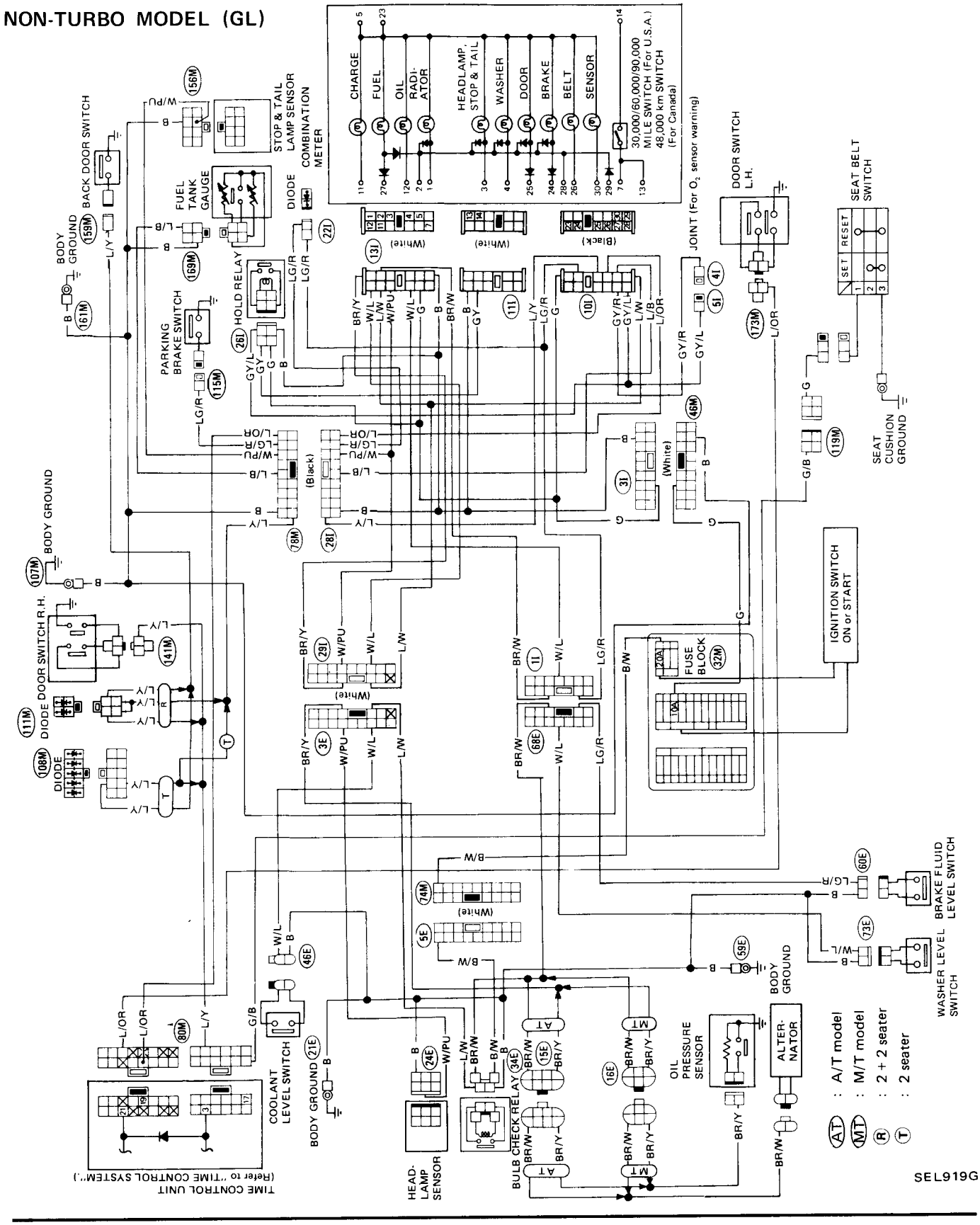


SEL918G

Warning Lamps/Wiring Diagram

—For Needle Type Combination Meter (Cont'd)—

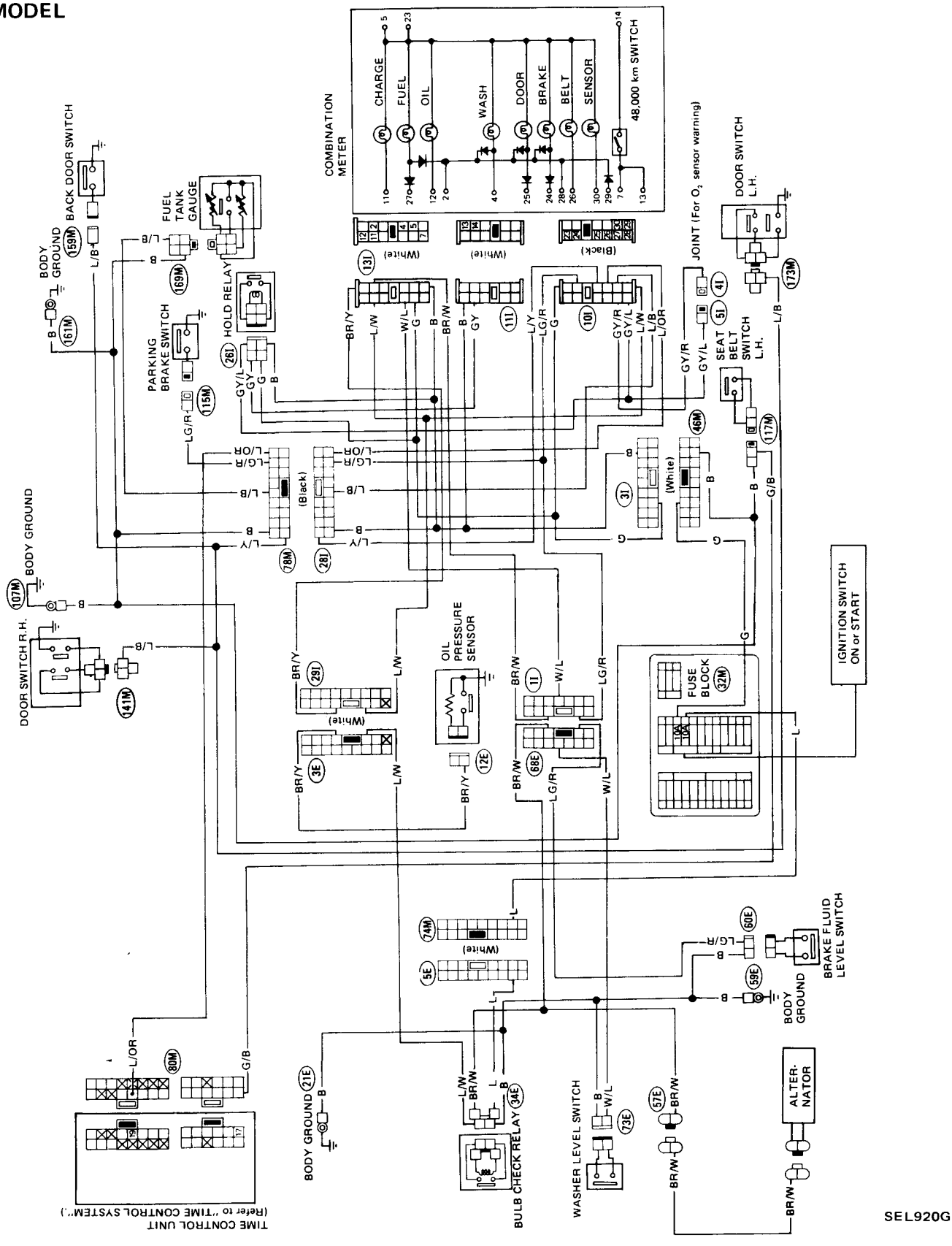
NON-TURBO MODEL (GL)



Warning Lamps/Wiring Diagram

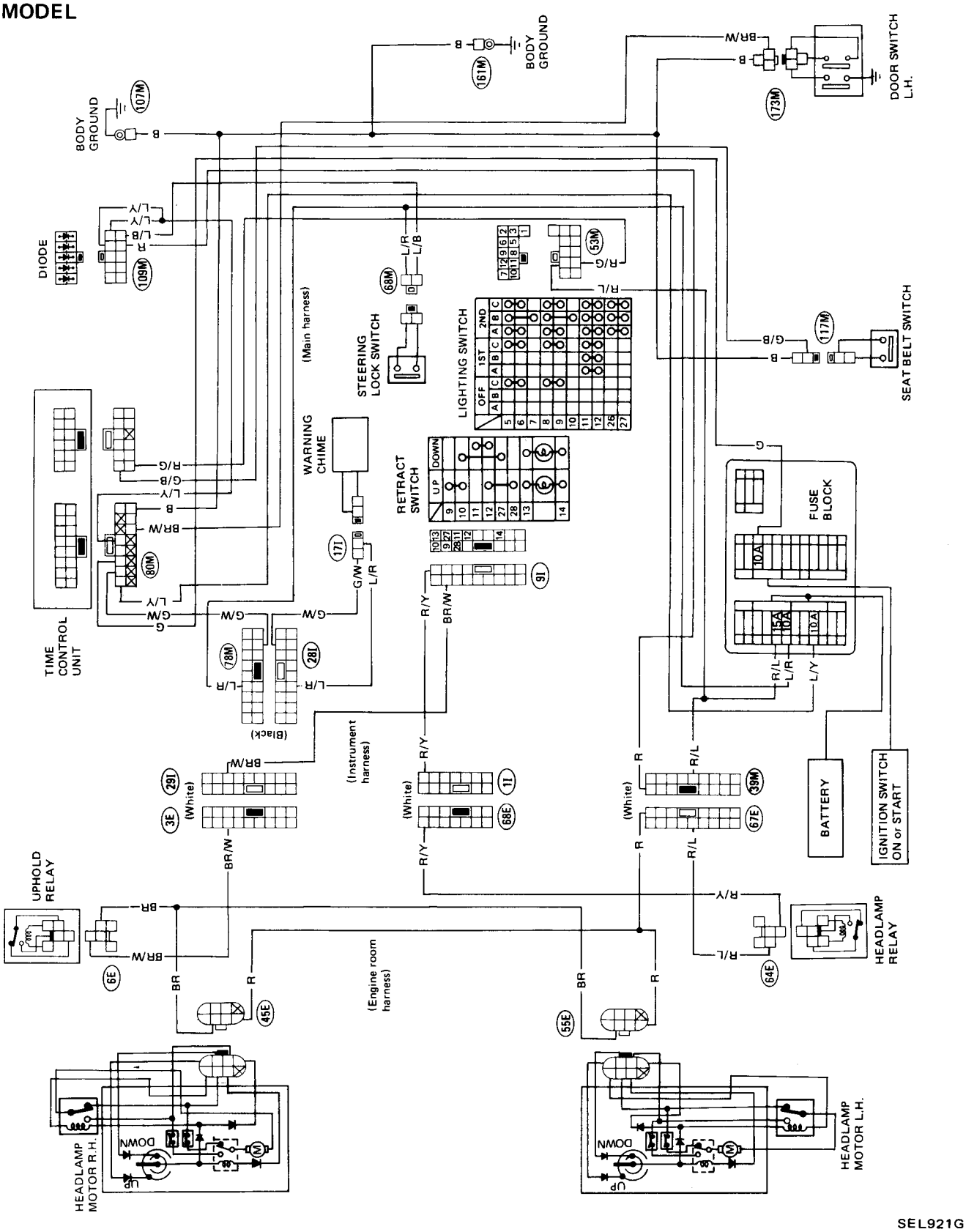
— For Needle Type Combination Meter (Cont'd) —

SF MODEL



Warning Chime/Wiring Diagram

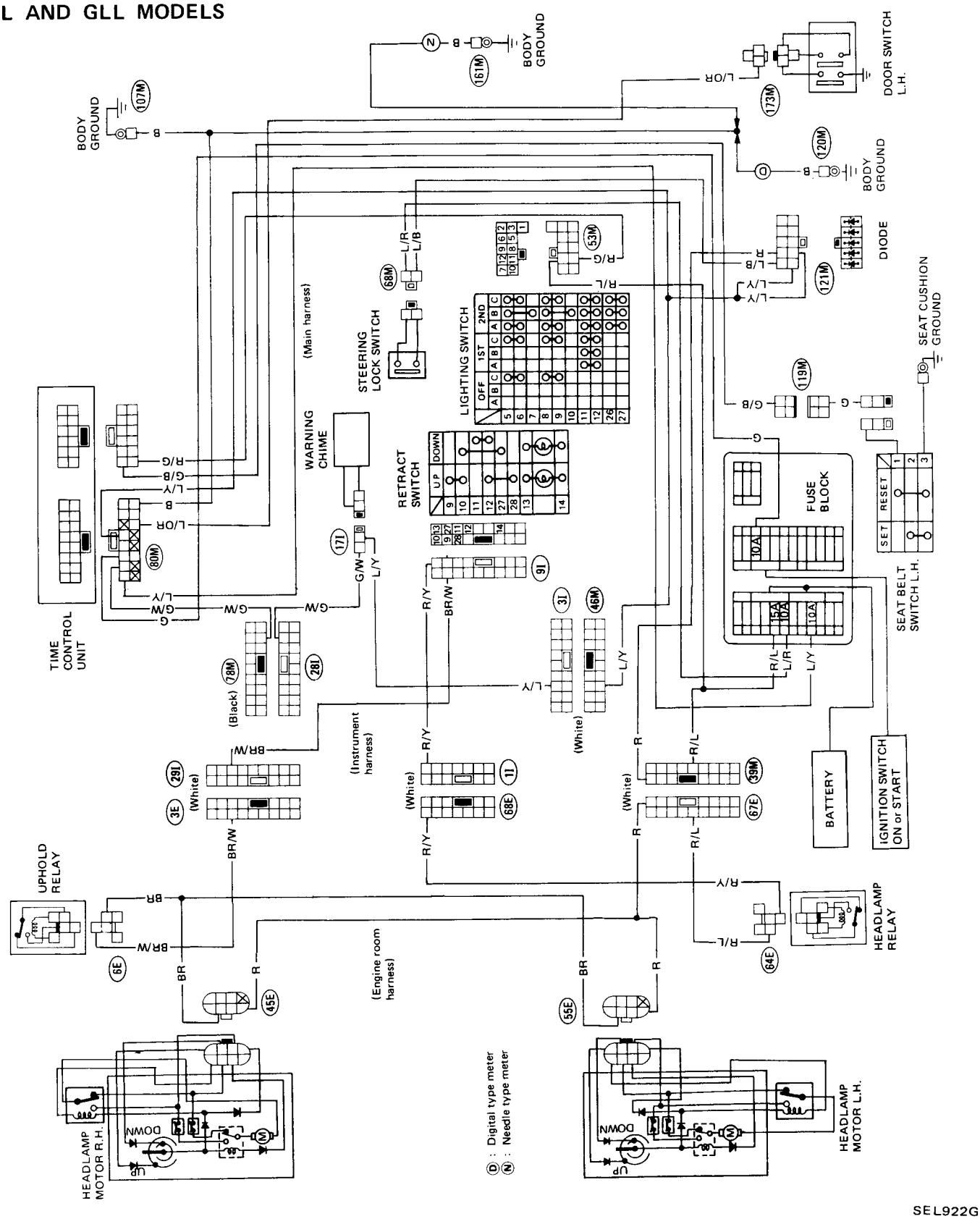
SF MODEL



SEL921G

Warning Chime/Wiring Diagram

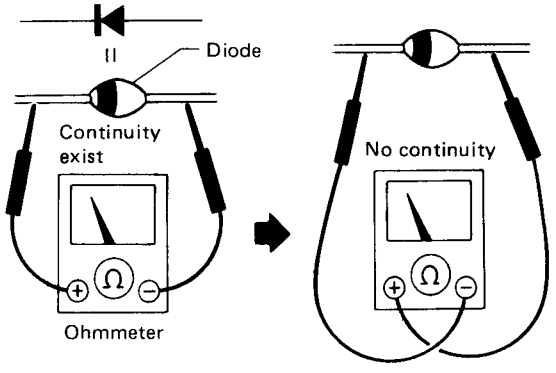
GL AND GLL MODELS



SEL922G

Diode Check

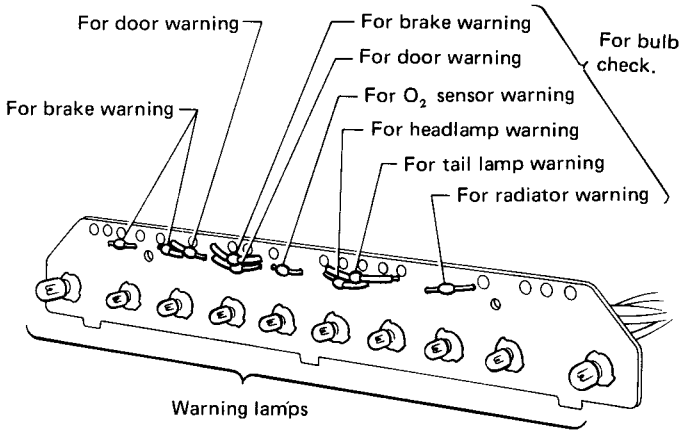
- Check continuity using an ohmmeter.
- Diode is functioning properly if test results are as shown below.



SEL700D

DIGITAL TYPE COMBINATION METER

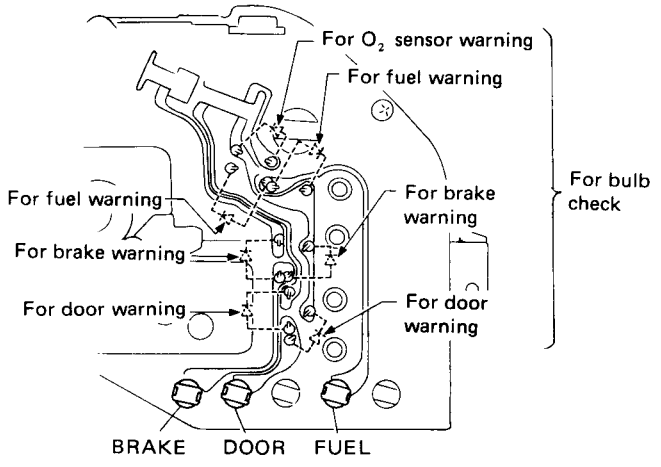
- Diodes for warning lamps are located on the panel where warning bulbs are fitted.

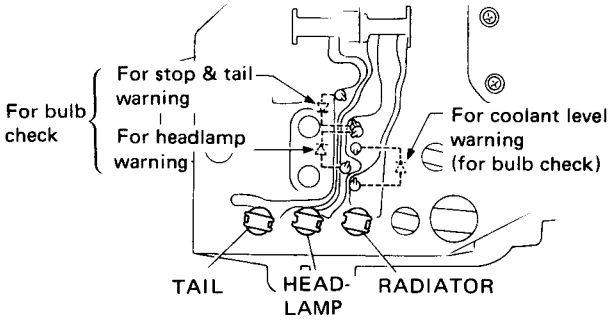


SEL701D

NEEDLE TYPE COMBINATION METER

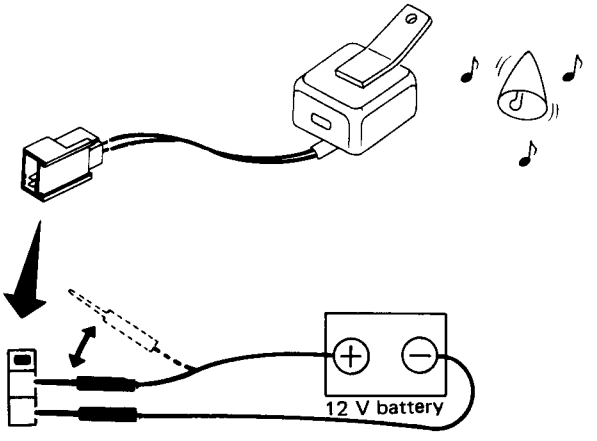
- Diodes for warning lamps are built into the combination meter printed circuit.





SEL702D

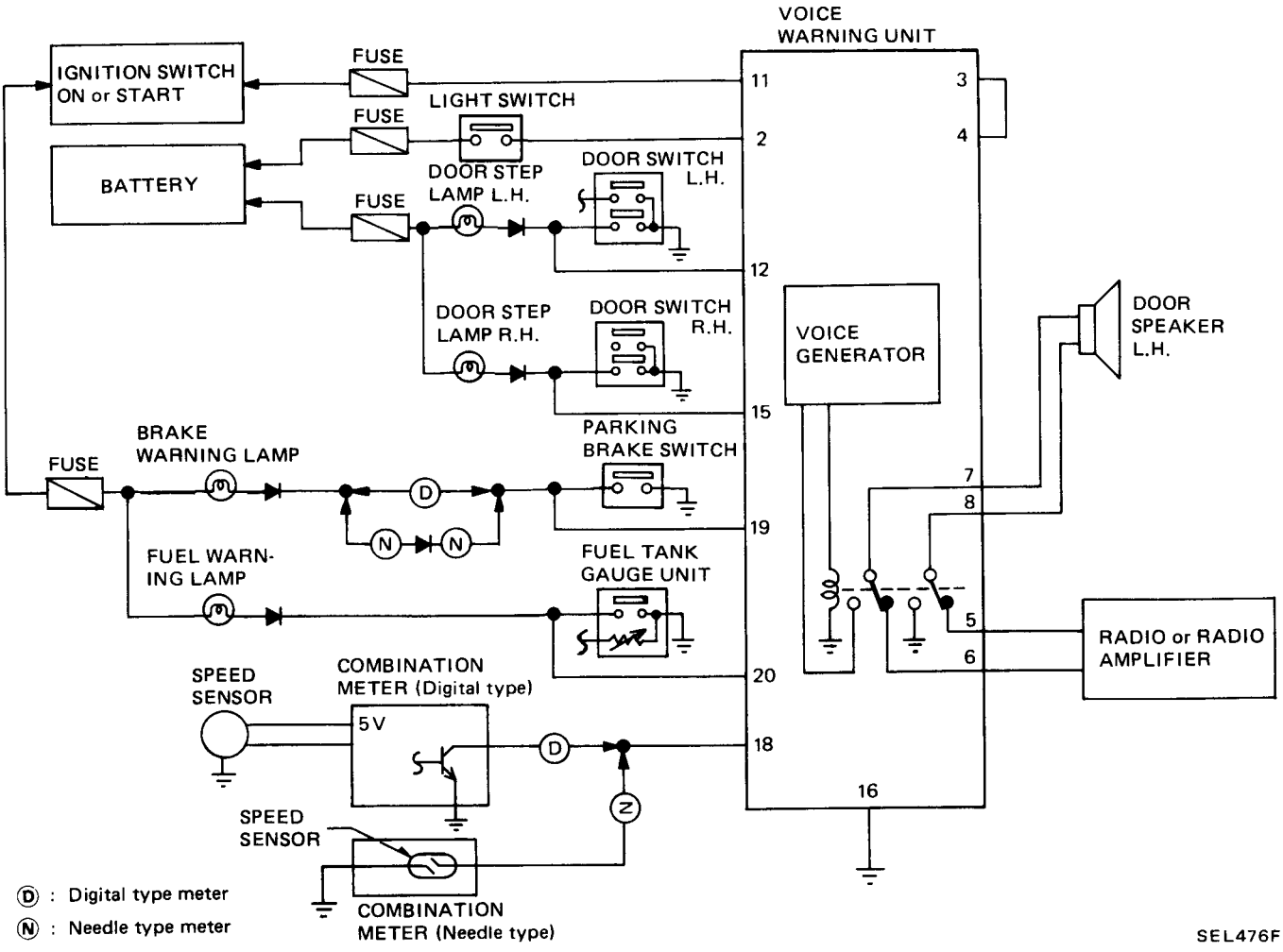
Warning Chime Check



SEL875D

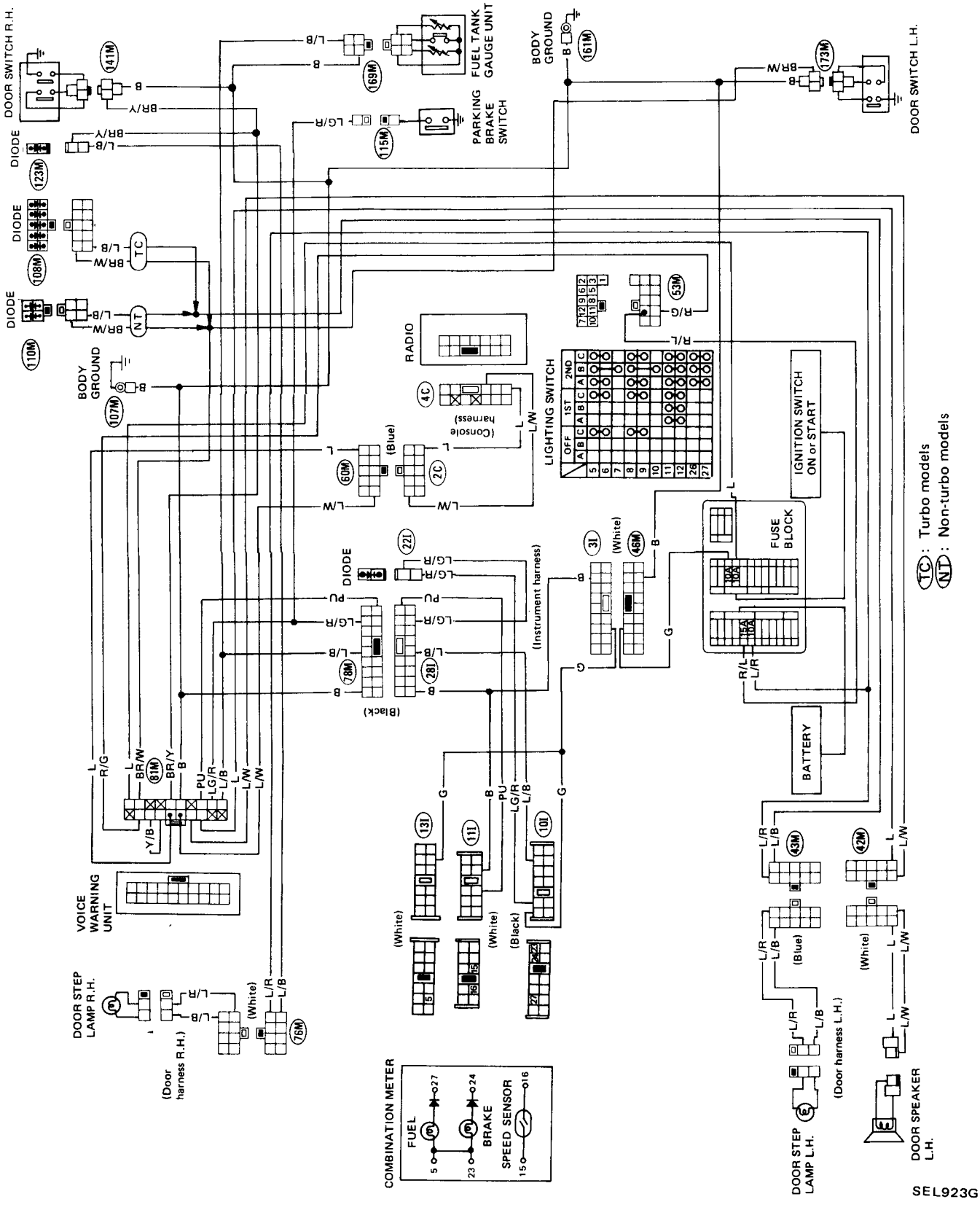
VOICE WARNING SYSTEM

Schematic



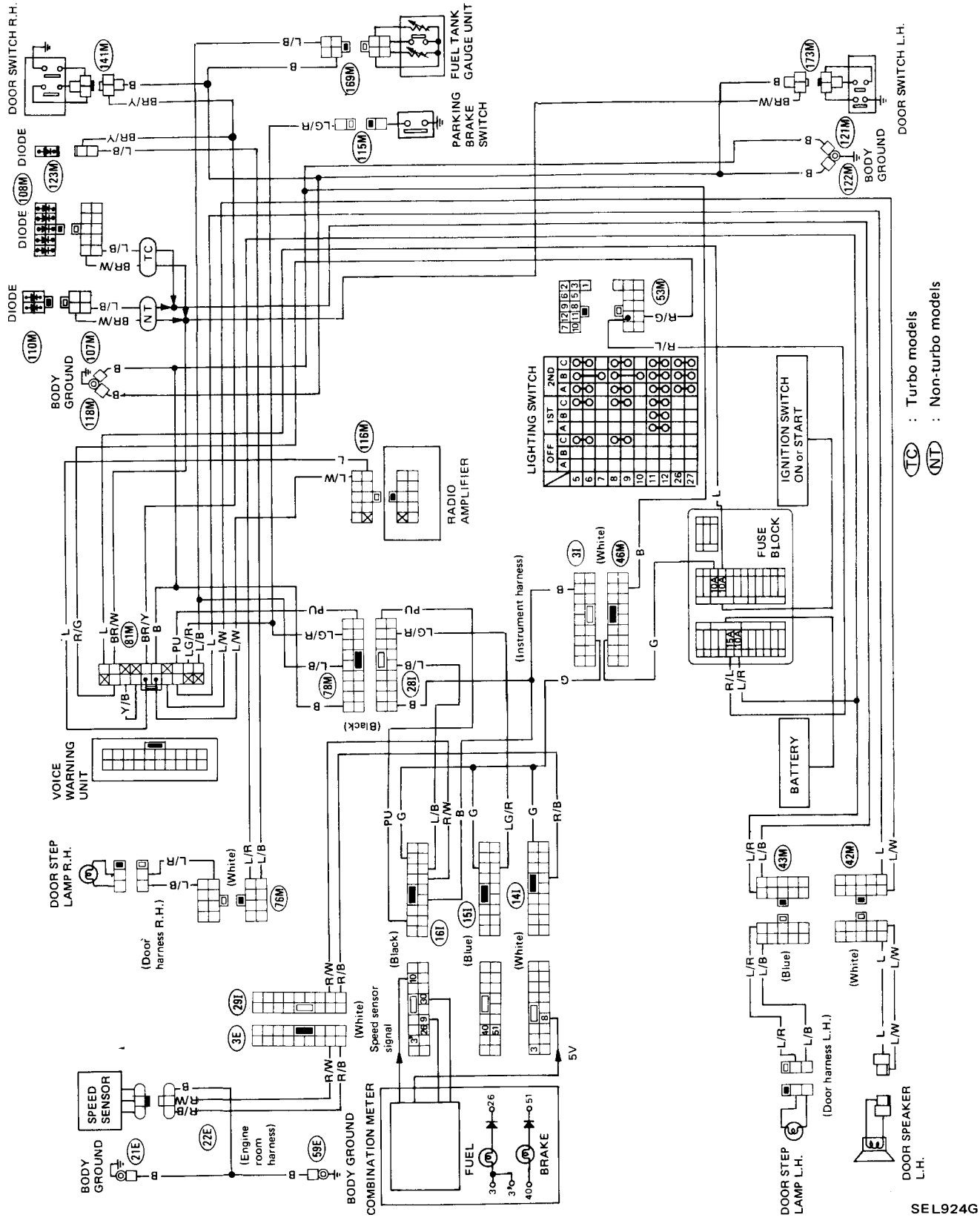
Wiring Diagram

NEEDLE TYPE COMBINATION METER



Wiring Diagram (Cont'd)

DIGITAL TYPE COMBINATION METER



VOICE WARNING SYSTEM

Operational Check

Item	Condition			Voice Warning
Left door	Ignition switch "ON"	Door switch L.H. is "ON". (Left door is open)	Speed switch is "ON". Vehicle speed is more than 10 km/h (6 MPH).	"Left door is open".
Right door		Door switch R.H. is "ON". (Right door is open)		"Right door is open".
Parking brake		Parking brake switch is "ON".		"Parking brake is ON".
Fuel level		Fuel level less than 10ℓ (2-5/8 US gal, 2-1/4 Imp gal)	–	"Fuel level is low".
Light	Ignition switch "OFF"	Door switch L.H. is "ON". (Left door is open)	Lighting switch is "ON".	"Lights are ON".

- If the warning is not properly given under the above condition, go to "Trouble-Shooting".

Trouble-shooting

NO VOICE WARNING IS GIVEN.

Ignition sw. "ACC"

Check if speaker in driver's door produces sound when radio is turned "ON".

N.G. → Check harness connector running to driver's door speaker.

O.K. → Ignition sw. "OFF"

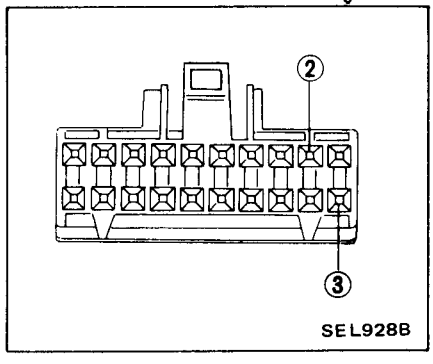
Check voice warning switch.

N.G. → Replace voice warning switch.

O.K.

Disconnect connector running to voice warning device and check voltage at each terminal of connector.

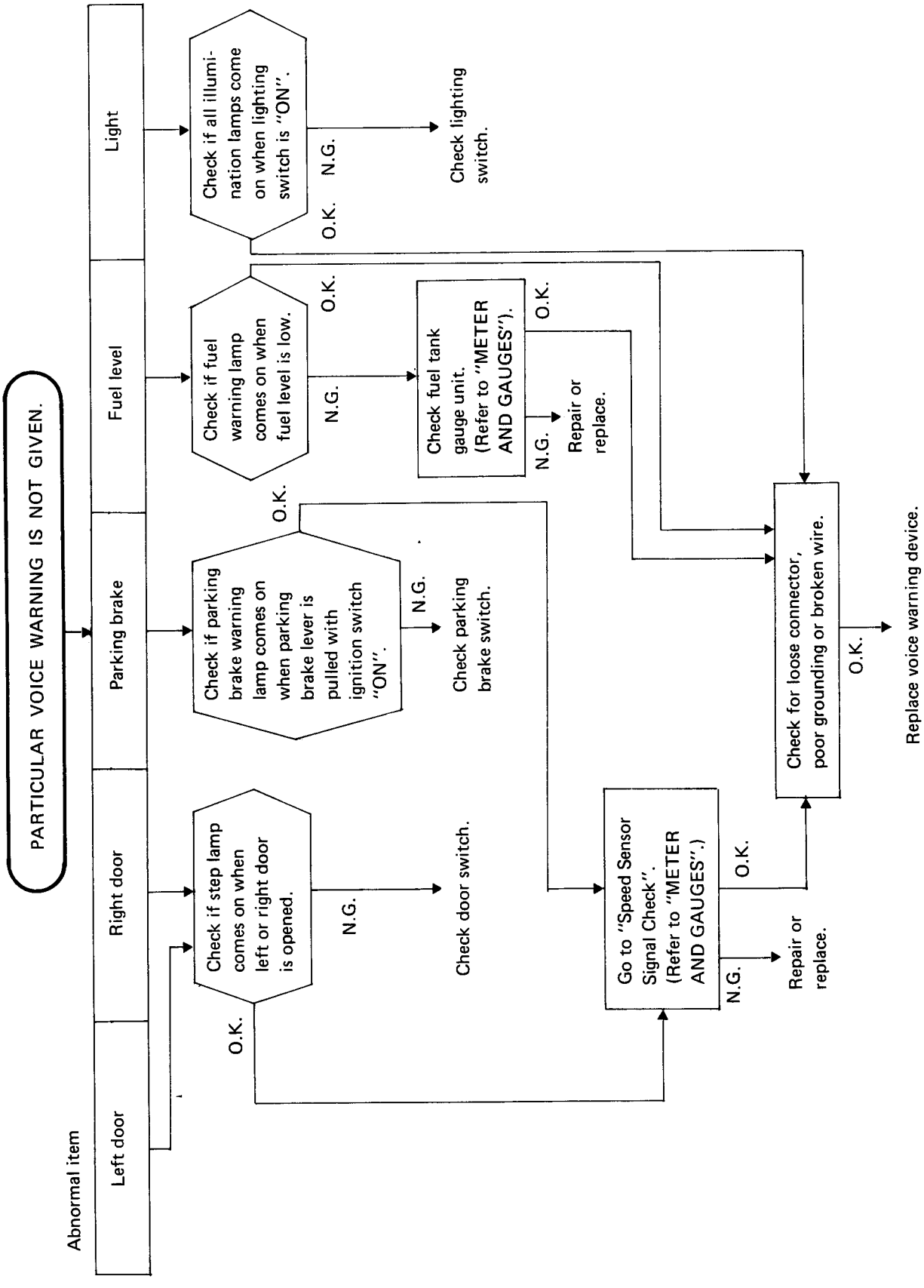
Voltmeter		Condition	Normal
Positive terminal	Negative terminal		
②	Body ground	Lighting switch "ON"	More than 9V
③		Ignition key "ON"	More than 9V



O.K. → Replace voice warning device.

N.G. → Check harness.

Trouble-shooting (Cont'd)



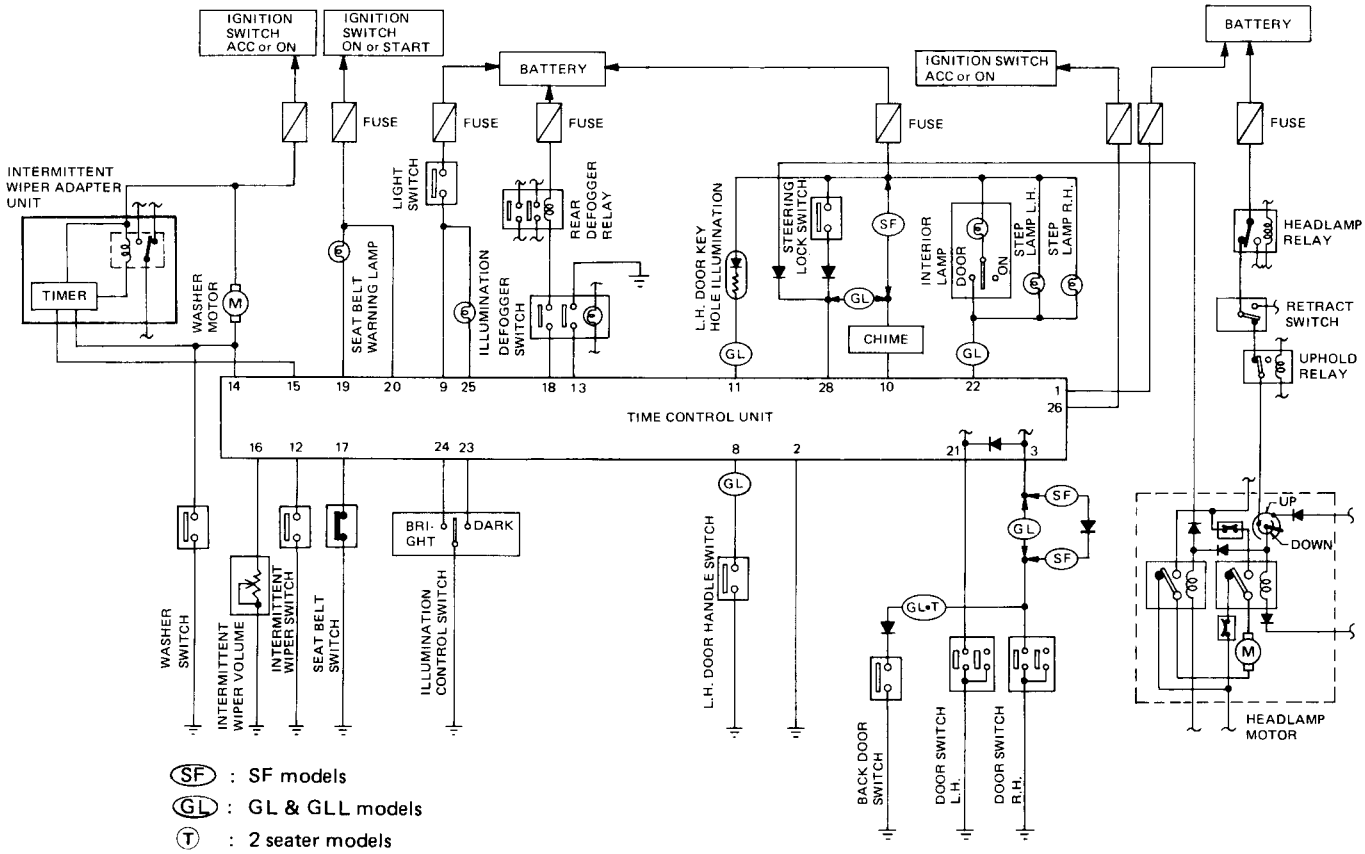
TIME CONTROL SYSTEM

Schematic

CAUTION:
Never touch the terminals of time control unit with bare hands.

- Time control unit has the following functions.

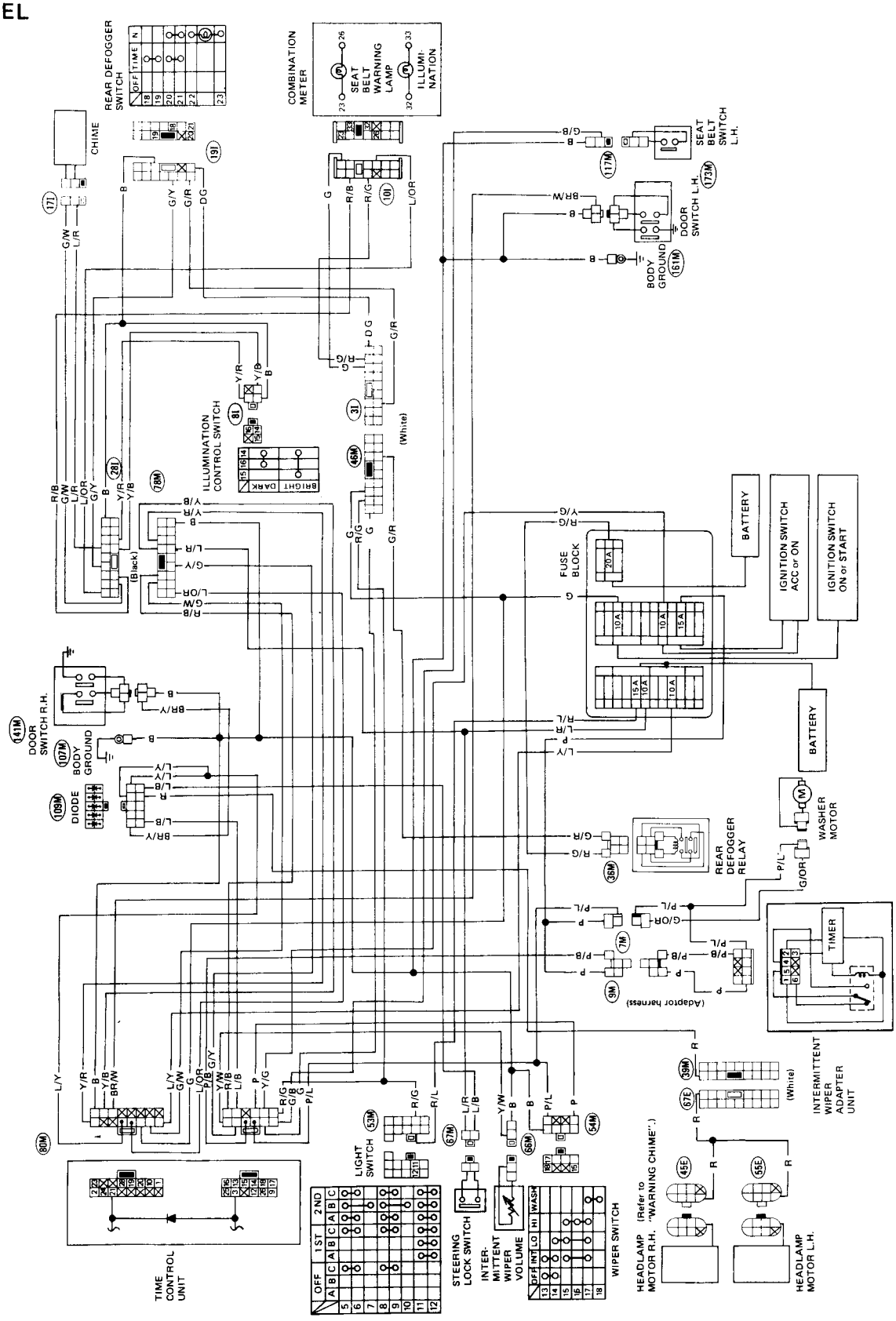
1) Intermittent wiper control timer
2) Interior lamp timer
3) Door key hole illumination timer
4) Illumination control timer
5) Light warning timer
6) Key warning timer
7) Seat belt warning timer
8) Rear defogger timer



SEL479F

Wiring Diagram

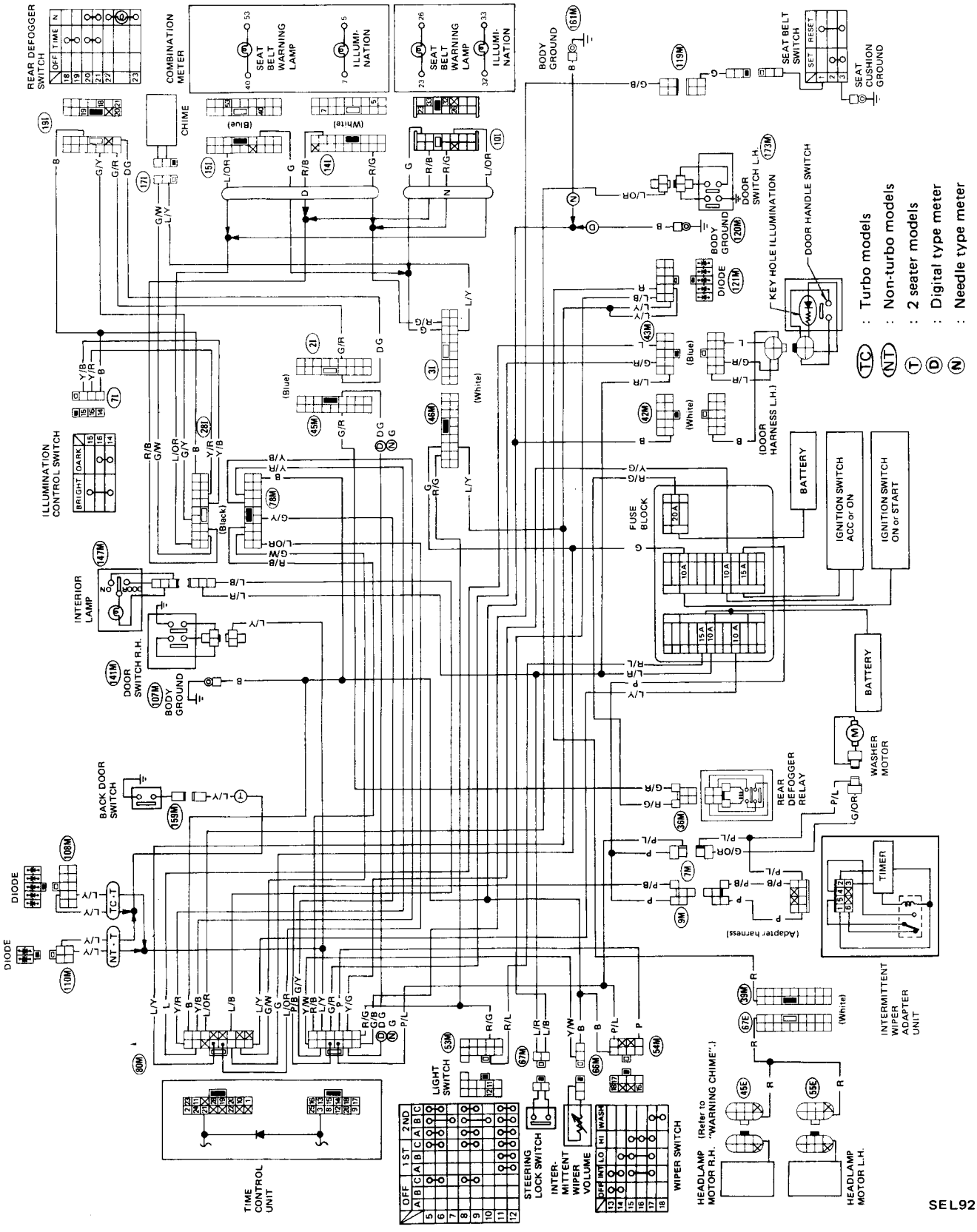
SF MODEL



SEL925G

Wiring Diagram (Cont'd)

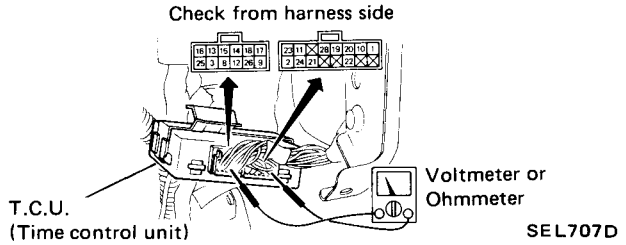
GL AND GLL MODELS



TIME CONTROL SYSTEM

Preparation for Trouble-shooting

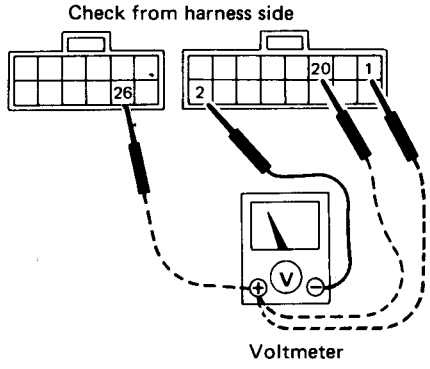
1. Remove R.H. dash side cover and remove blower motor.
2. Remove time control unit with harness connected.
3. Connect main harness to instrument harness (if disconnected).



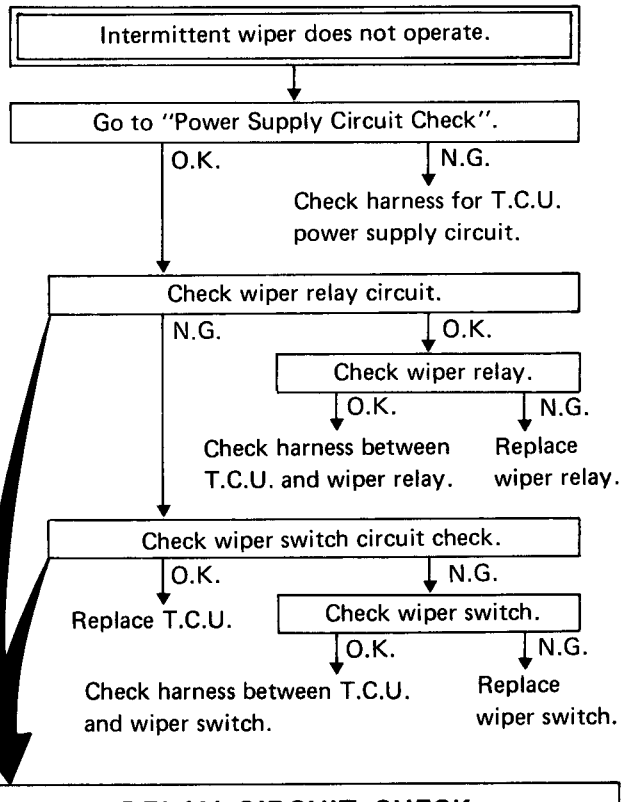
Power Supply Circuit Check

Voltmeter terminals		Ignition switch position		
(+)	(−)	OFF	ACC	ON
①	②	Approx. 12V	Approx. 12V	Approx. 12V
⑳	②	0V	0V	Approx. 12V
㉖	②	0V	Approx. 12V	Approx. 12V

Ohmmeter terminals		Continuity
(+)	(−)	
②	Body ground	Yes

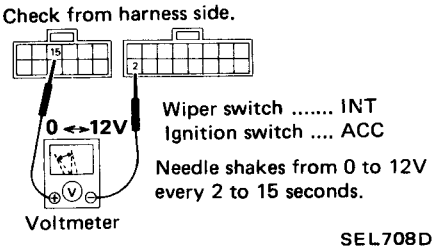


Trouble-shooting



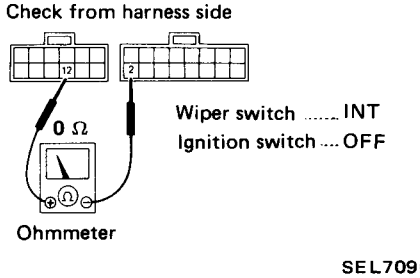
WIPER RELAY CIRCUIT CHECK

1. Turn wiper switch to "INT".
2. Turn ignition switch to "ACC".
3. Measure voltage across ⑮ and ②.



WIPER SWITCH CIRCUIT CHECK

1. Turn wiper switch to "INT".
2. Turn ignition switch to "OFF".
3. Check continuity between ⑫ and ②.



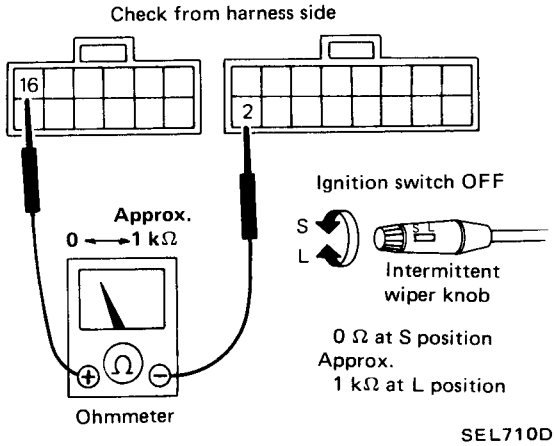
Trouble-shooting (Cont'd)

Intermittent time of wiper cannot be adjusted.

Check intermittent wiper volume circuit.

- O.K. → Replace T.C.U.
- N.G. → Check intermittent wiper volume.
  - O.K. → Check harness between T.C.U. and intermittent wiper volume.
  - N.G. → Replace wiper switch.

1. Turn ignition switch to "OFF".
2. Measure resistance between ⑯ and ② while turning intermittent wiper volume.

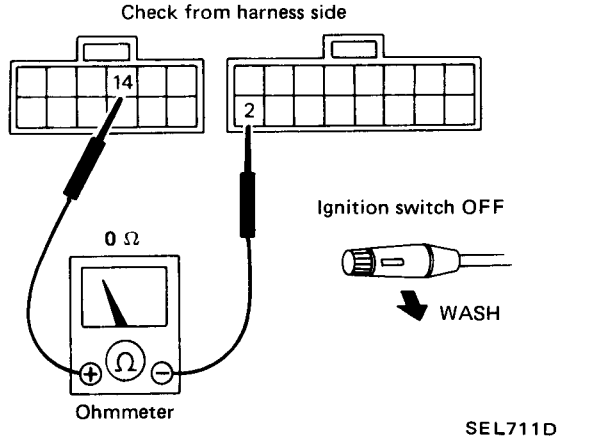


Wiper and washer activate individually but not in combination.

Check washer switch circuit.

- O.K. → Replace T.C.U.
- N.G. → Check harness between T.C.U. and washer switch.

1. Turn ignition switch to "OFF".
2. Turn washer switch to "ON".
3. Check continuity between ⑭ and ② .



Trouble-shooting (Cont'd)

Interior lamp and step lamps do not fade out after driver's door is closed.

Check if door warning lamp goes off after all doors are closed.

- O.K. → Go to "Power Supply Circuit Check".
- N.G. → Check door switch.

Go to "Power Supply Circuit Check".

- O.K. → Check interior lamp circuit.
- N.G. → Check harness for T.C.U. power supply circuit.

Check interior lamp circuit.

- N.G. → Replace T.C.U.
- O.K. → Check harness between T.C.U. and interior lamp.

Illuminated entry system will not operate.
(Interior lamp will not illuminate when outside door handle on driver's side is pulled.)

Check if interior lamp fades out after all doors are closed.

- O.K. → Check door handle switch circuit check.
- N.G. → Go to "Interior lamp circuit check".

Go to "Interior lamp circuit check".

- N.G. → Check harness between T.C.U. and interior lamp.
- O.K. → Check door handle switch circuit check.

Check door handle switch circuit check.

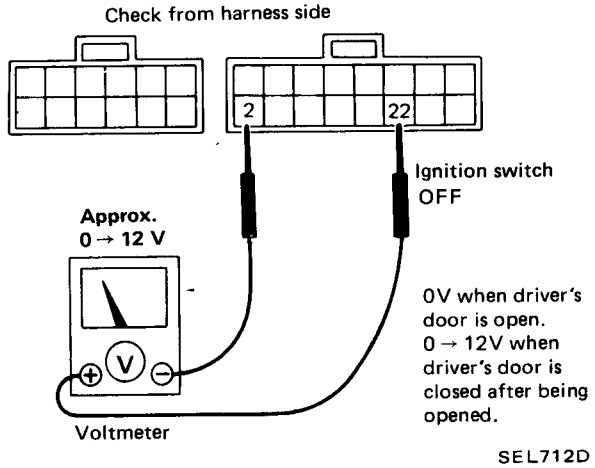
- O.K. → Replace T.C.U.
- N.G. → Check door handle switch.

Check door handle switch.

- O.K. → Check harness between T.C.U. and door handle switch.

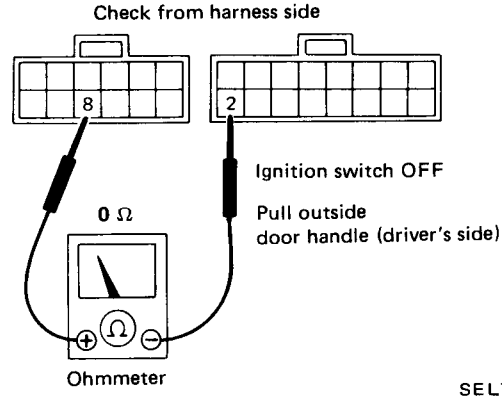
INTERIOR LAMP CIRCUIT CHECK

1. Turn ignition switch to "OFF".
2. Measure voltage across ㉒ and ② .



DOOR HANDLE SWITCH CIRCUIT CHECK

1. Turn ignition switch to "OFF".
2. Pull outside door handle (driver's side).
3. Check continuity between ⑧ and ② .



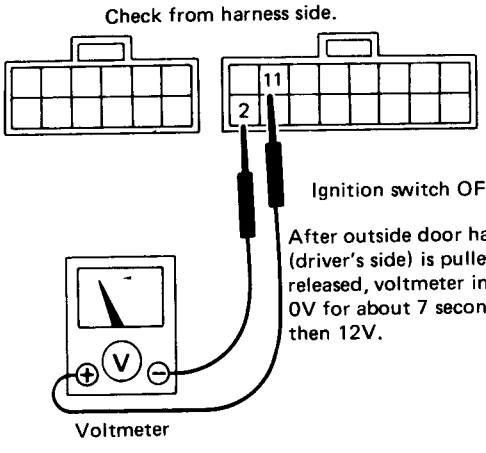
Trouble-shooting (Cont'd)

Door key hole illumination does not come on even if driver's side door handle is pulled.

→ Go to "Power Supply Circuit Check".

- N.G. → Check harness for T.C.U. power supply circuit.
- O.K. → Check key hole illumination circuit.
  - N.G. → Check key hole illumination and diode.
    - O.K. → Check harness between T.C.U. and key hole illumination.
  - O.K. → Go to "Door handle switch circuit check". (Refer to back page.)
    - O.K. → Replace T.C.U.
    - N.G. → Check harness between T.C.U. and door handle switch.

1. Turn ignition switch to "OFF".
2. Pull outside door handle (driver's side).
3. Measure voltage across ⑪ and ②.



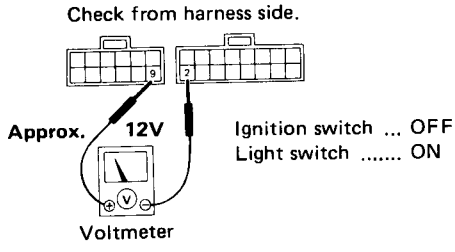
SEL714D

Illumination control system does not actuate.

→ Check light switch circuit.

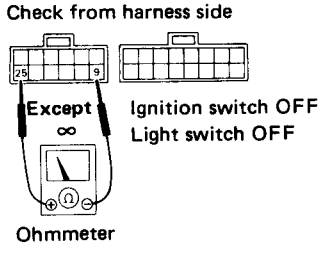
- O.K. → Check illumination circuit.
  - O.K. → Check illumination control circuit.
    - O.K. → Replace T.C.U.
    - N.G. → Check illumination control switch.
  - N.G. → Check for loose harness connector.
- N.G. → Check harness between T.C.U. and light switch.

LIGHT SWITCH CIRCUIT CHECK



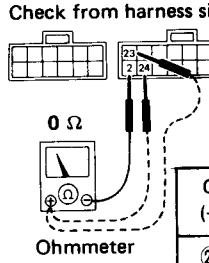
SEL715D

ILLUMINATION CIRCUIT CHECK



SEL716D

ILLUMINATION CONTROL CIRCUIT CHECK



Ohmmeter (+)	Ohmmeter (−)	Illumination control switch: DARK	Illumination control switch: BRIGHT
㉓	②	0 Ω	Except 0 Ω
㉔	②	Except 0 Ω	0 Ω

SEL717D

Trouble-shooting (Cont'd)

Light warning chime does not activate.

Check if other warning chimes function.

O.K. → Go to "Light switch circuit check". (Refer to back page.)

O.K. → Replace T.C.U.

N.G. → Check harness between T.C.U. and light switch.

N.G. → Go to "Power Supply Circuit Check".

O.K. → Check T.C.U. output for chime circuit.

O.K. → Check chime, and harness between T.C.U. and chime.

N.G. → Check harness for T.C.U. power supply circuit.

Key warning chime does not activate.

Check if other warning chimes function.

N.G. → Go to "Power Supply Circuit Check".

O.K. → Check steering lock switch circuit.

O.K. → Replace T.C.U.

N.G. → Check steering lock switch.

Seat belt warning chime does not activate.

Check if other warning chimes function.

N.G. → Check steering lock switch circuit.

O.K. → Check seat belt switch circuit.

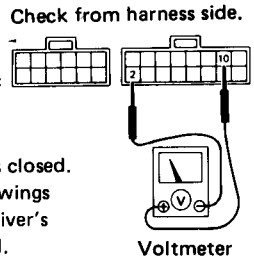
O.K. → Replace T.C.U.

N.G. → Check seat belt switch, and harness between T.C.U. and seat belt switch.

T.C.U. OUTPUT FOR CHIME CIRCUIT CHECK

1. Turn ignition switch to "OFF".
2. Measure voltage across ⑩ and ② when driver's door is opened and closed.

Check from harness side.



Ignition switch ... OFF
Light switch ... 1ST

- Approx. 12V when driver's side door is closed.
- Voltmeter needle swings (0 ↔ 12V) when driver's side door is opened.

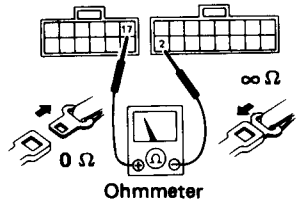
Voltmeter

SEL718D

SEAT BELT SWITCH CIRCUIT CHECK

1. Turn ignition switch to "OFF".
2. Unfasten driver's seat belt.
3. Check for continuity between ⑰ and ②.
4. Fasten driver's seat belt.
5. Check to determine if continuity does not exist between ⑰ and ②.

Check from harness side



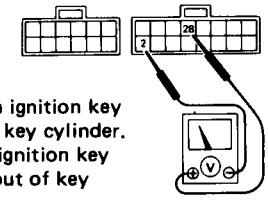
Ohmmeter

SEL721D

STEERING LOCK SWITCH CIRCUIT CHECK

1. Turn ignition switch to "OFF".
2. Check voltage between ㉘ and ②.

Check from harness side.



- 12V when ignition key is set into key cylinder.
- 0V when ignition key is pulled out of key cylinder.

Voltmeter

SEL719D

Trouble-shooting (Cont'd)

Seat belt warning lamp does not go off nor come on.

↓

Go to "Power Supply Circuit Check".

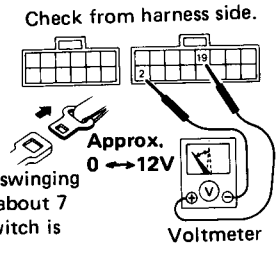
- O.K. → Check belt warning circuit.
- N.G. → Check harness for T.C.U. power supply circuit.

Check belt warning circuit.

- N.G. → Replace T.C.U.
- O.K. → Check warning lamp.

BELT WARNING CIRCUIT CHECK

1. Unfasten seat belt.
2. Measure voltage across ⑲ and ② when ignition switch is "ON".



Voltmeter needle keeps swinging (approx. 0 ↔ 12V) for about 7 seconds after ignition switch is turned ON.

SEL720D

Rear defogger does not activate, or does not go off automatically.

↓

Go to "Power Supply Circuit Check".

- O.K. → Check rear defogger circuit.
- N.G. → Check harness for T.C.U. power supply circuit.

Check rear defogger circuit.

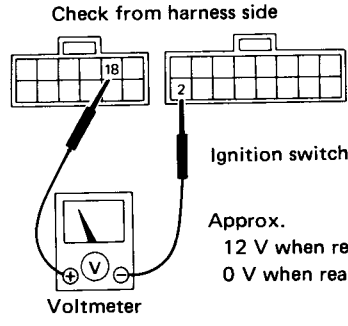
- N.G. → Check rear defogger relay, and harness between T.C.U. and rear defogger relay.
- O.K. → Check defogger switch circuit.

Check defogger switch circuit.

- O.K. → Replace T.C.U.
- N.G. → Check defogger switch, and harness between T.C.U. and defogger switch.

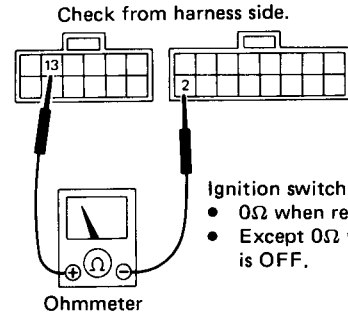
REAR DEFOGGER CIRCUIT CHECK

1. Turn ignition switch to "ON".
2. Measure voltage across ⑱ and ② while operating rear defogger switch.



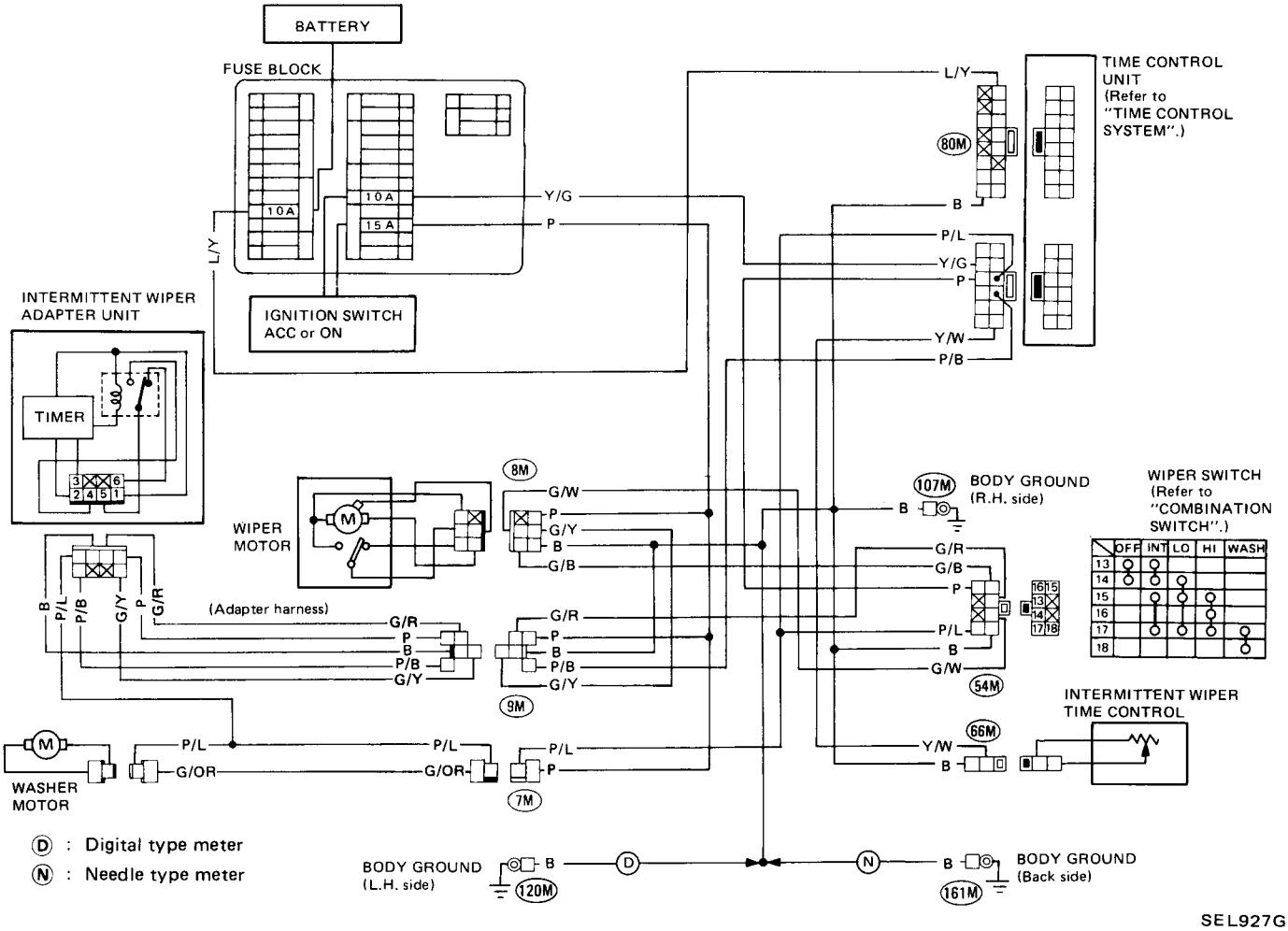
SEL722D

DEFOGGER SWITCH CIRCUIT CHECK



SEL723D

Windshield Wiper and Washer/Wiring Diagram



SEL927G

Windshield Wiper and Washer/Installation

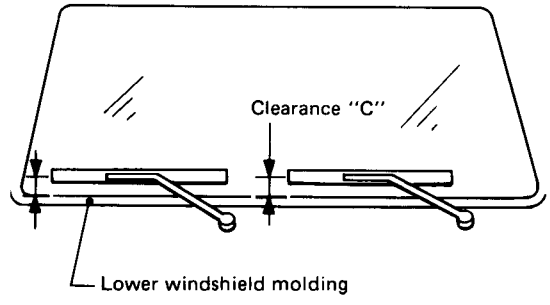
WIPER ARM

1. Prior to wiper arm installation, set wiper switch to "LOW" to operate wiper motor and then turn it "OFF" (Auto Stop).
2. Adjust wiper blades within clearance "C".
3. Tighten windshield wiper arm nuts to specified torque.

   13 - 18 N·m (1.3 - 1.8 kg-m, 9 - 13 ft-lb)

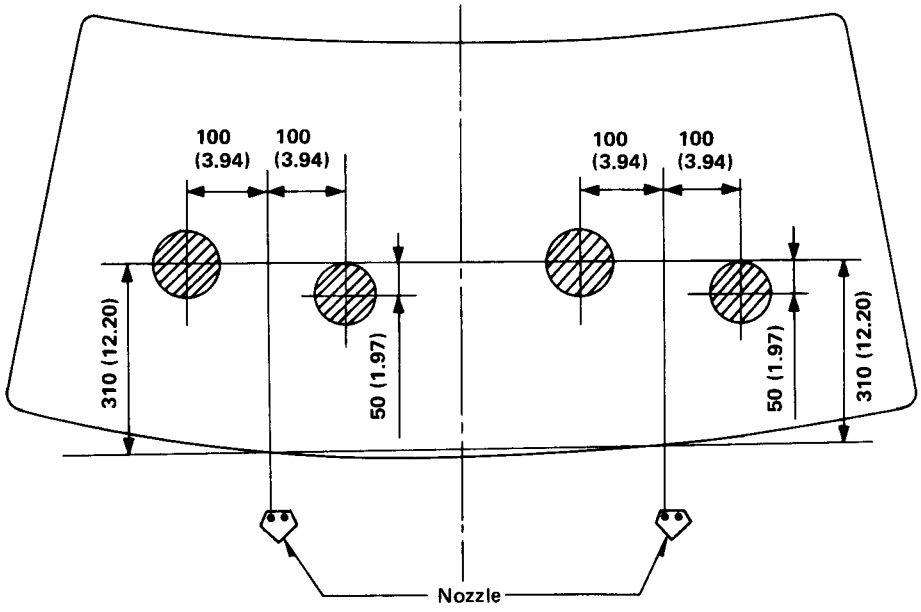
4. Eject washer fluid. Set wiper switch to "LOW" to operate wiper motor and then turn it "OFF".
5. Ensure that wiper blades stop within clearance "C".

   Clearance "C": 15 - 25 mm (0.59 - 0.98 in)



SEL355E

Washer Nozzle Adjustment

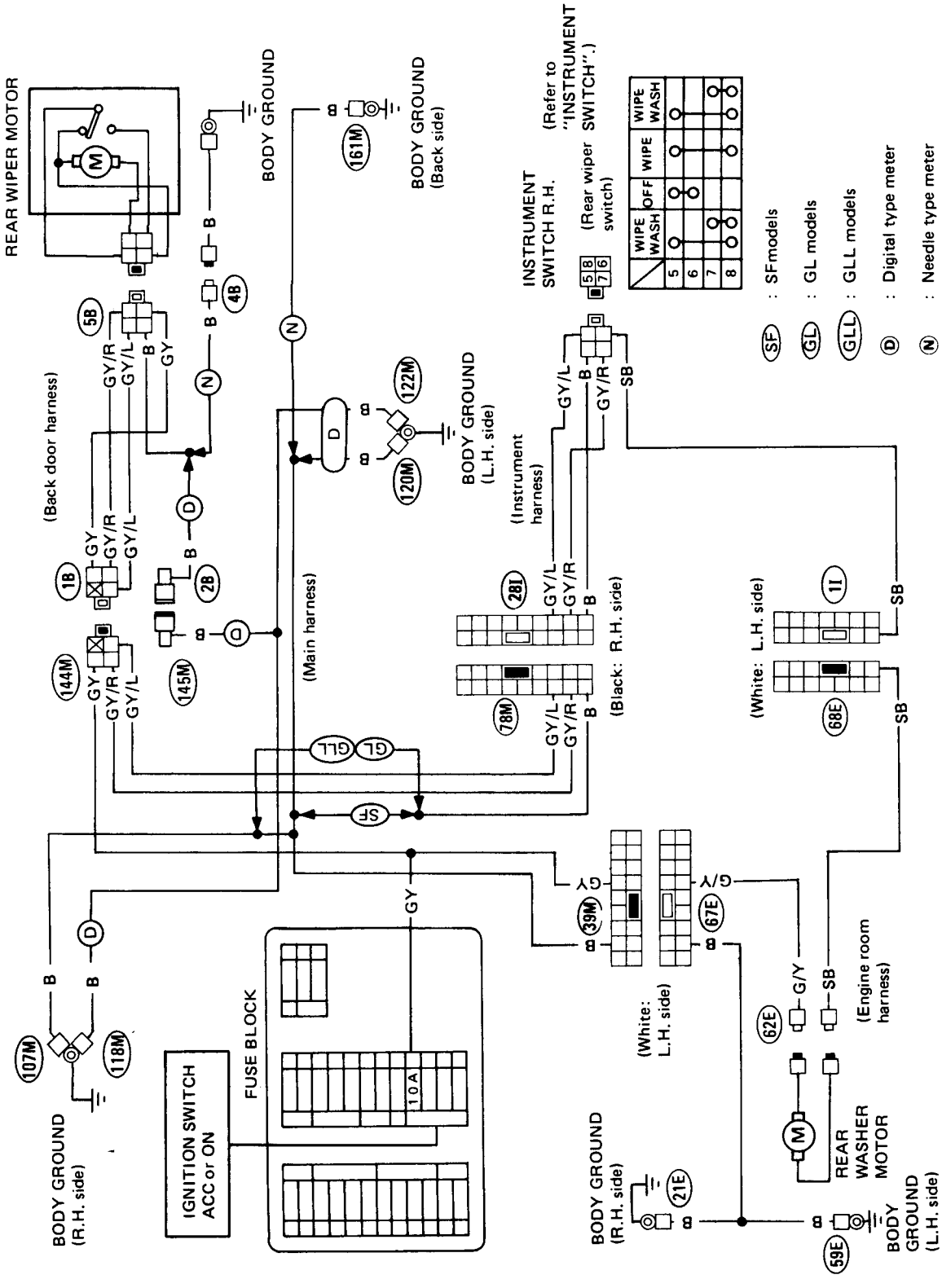


Note: All the diameters of these circles are less than 100 mm (3.94 in).

Unit: mm (in)

SEL553F

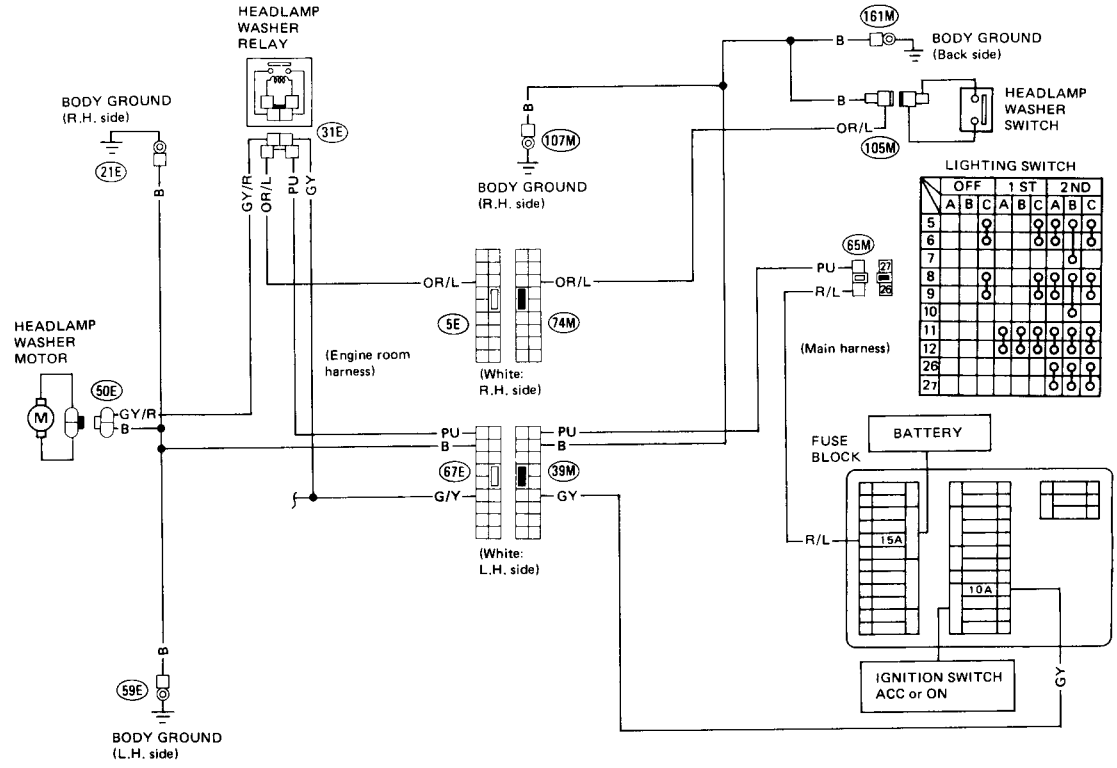
Rear Wiper and Washer/Wiring Diagram



SEL483F

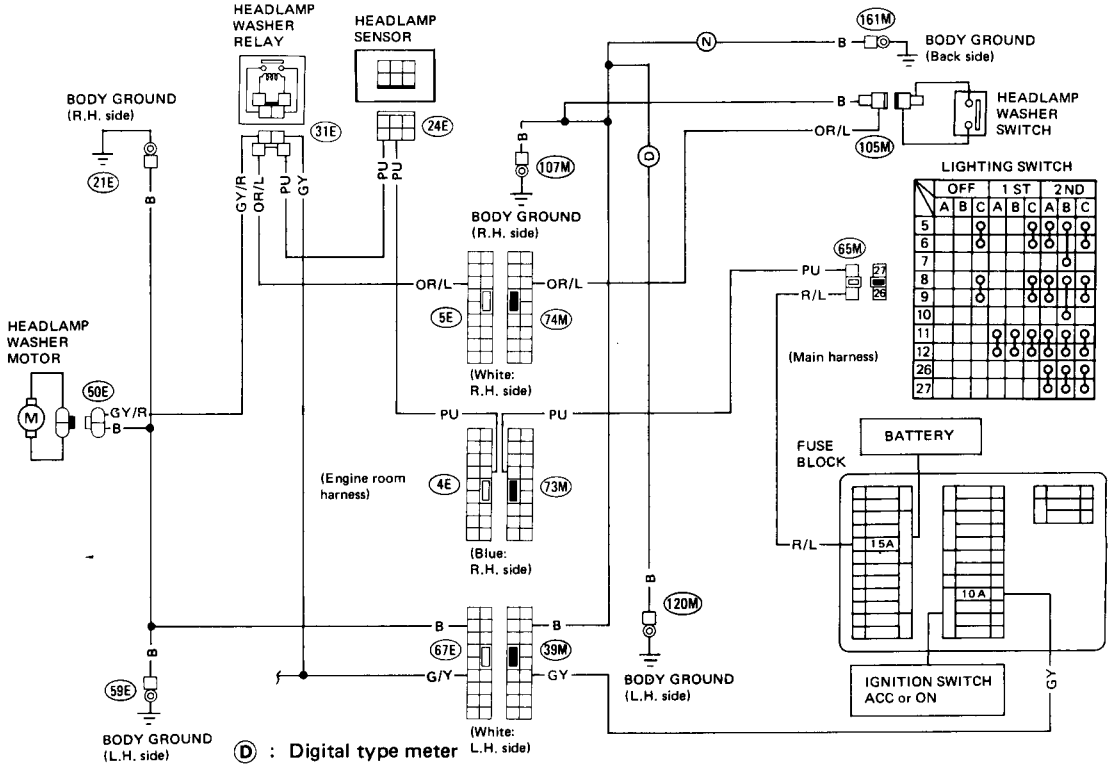
Headlamp Washer/Wiring Diagram

WITHOUT HEADLAMP SENSOR



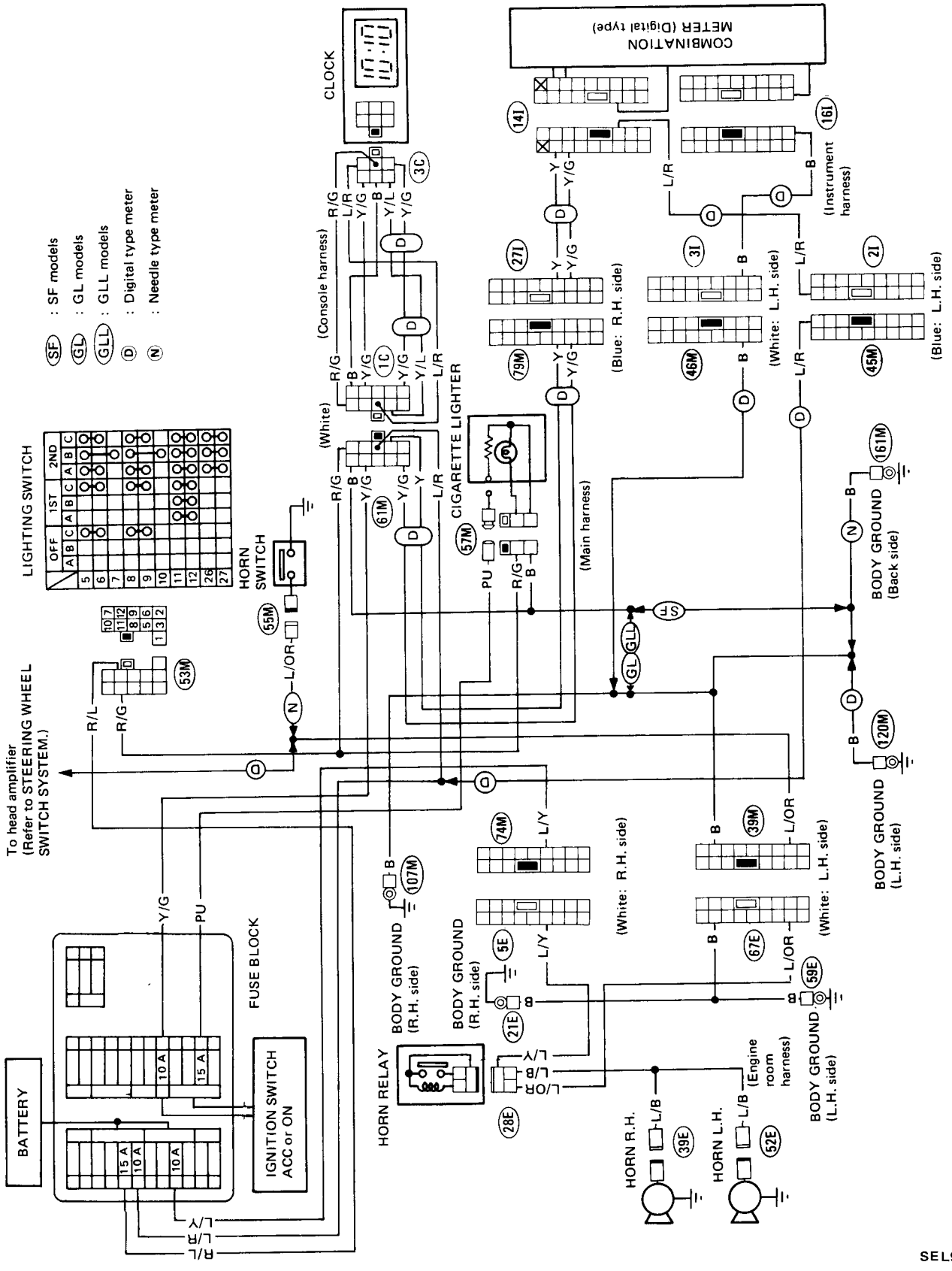
SEL484F

WITH HEADLAMP SENSOR



SEL485F

Wiring Diagram

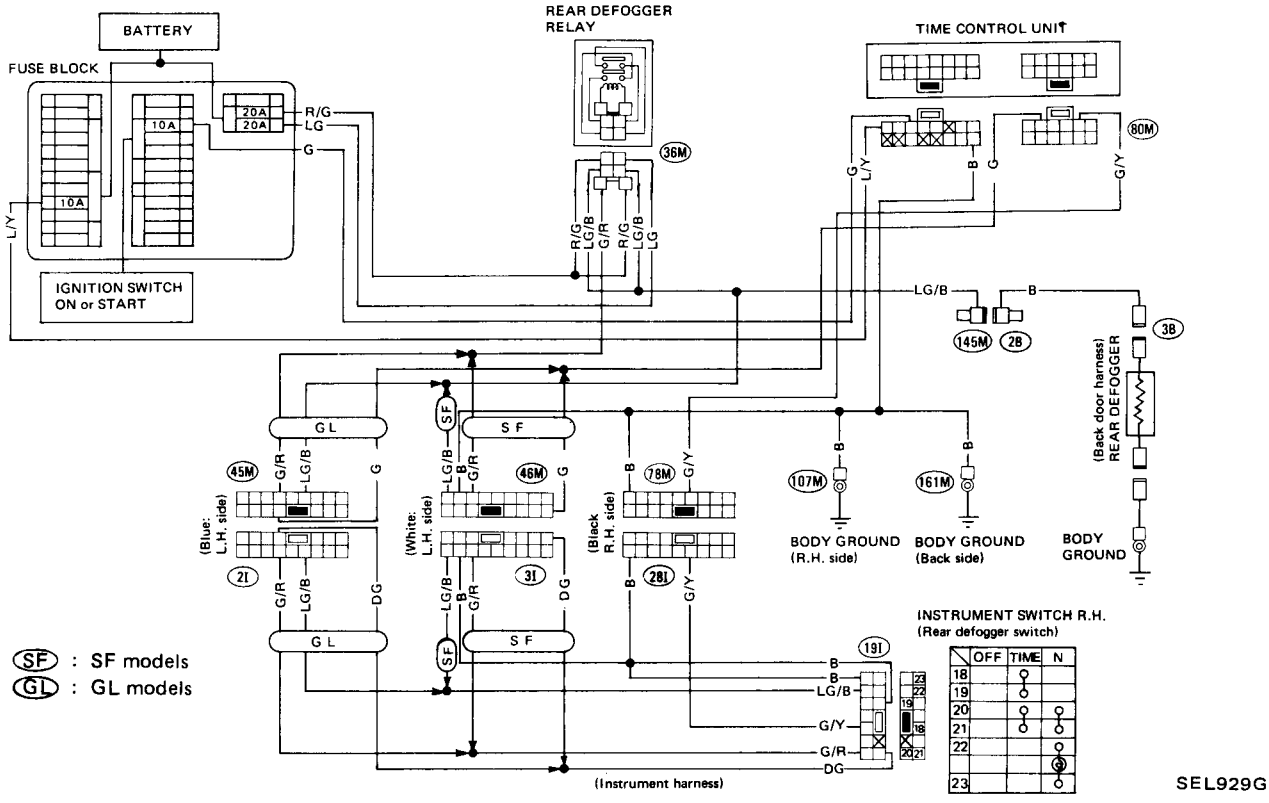


SEL928G

REAR WINDOW DEFOGGER

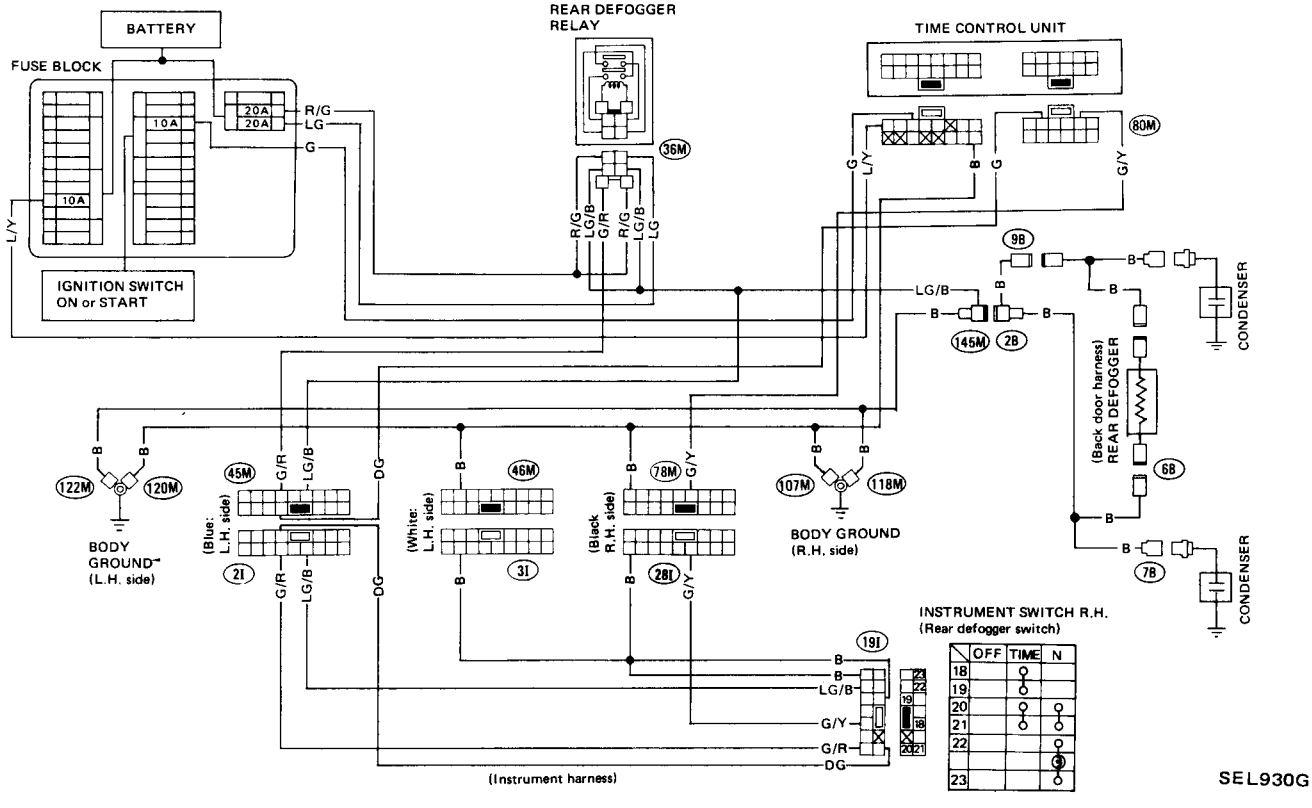
Wiring Diagram

SF AND GL MODELS



SEL929G

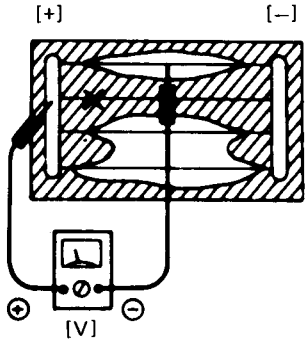
GLL MODEL



SEL930G

Filament Check

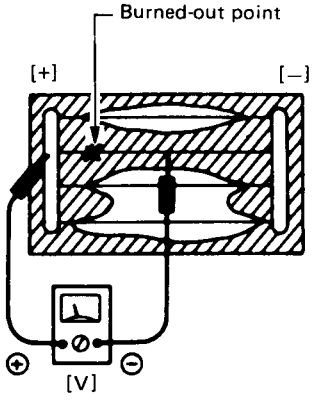
1. Attach probe circuit tester (in volt range) to middle portion of each filament.



6 volts (normal filament)

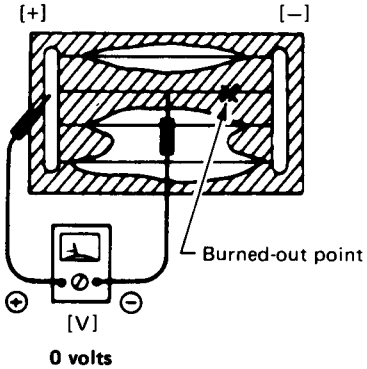
SEL263

2. If a filament is burned out, circuit tester registers 0 or 12 volts.



12 volts

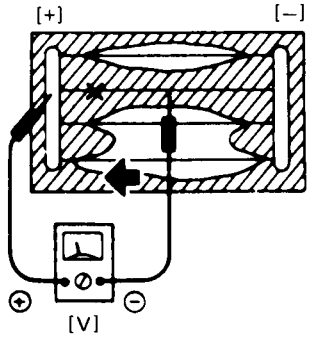
SEL264



0 volts

SEL265

3. To locate burned out point, move probe to left and right along filament to determine point where tester needle swings abruptly.



SEL266

Filament Repair

REPAIR EQUIPMENT

1. Conductive silver composition (Dupont No. 4817 or equivalent)
2. Ruler, 30 cm (11.8 in) long
3. Drawing pen
4. Heat gun
5. Alcohol
6. Cloth

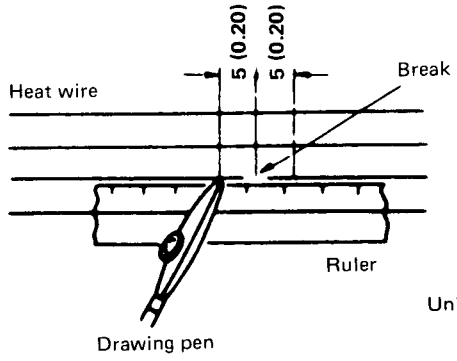
REPAIRING PROCEDURE

1. Wipe broken heat wire and its surrounding area clean with a cloth dampened in alcohol.
2. Apply a small amount of conductive silver composition to tip of drawing pen.

Shake silver composition container before use.

Filament Repair (Cont'd)

3. Place ruler on glass along broken line. Deposit conductive silver composition on break with drawing pen. Slightly overlap existing heat wire on both sides [preferably 5 mm (0.20 in)] of the break.

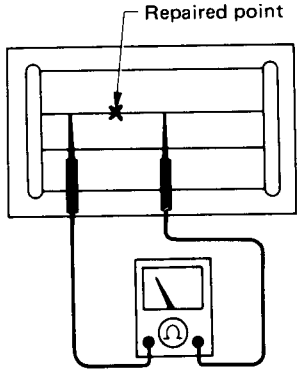


Unit: mm (in)

BE540

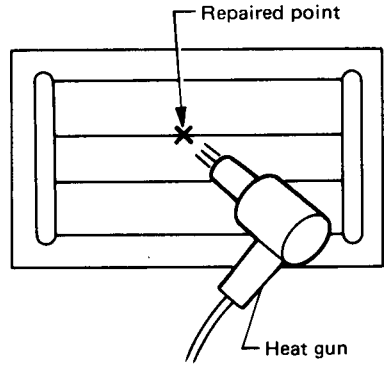
4. After repair has been completed, check repaired wire for continuity. This check should be conducted 10 minutes after silver composition is deposited.

Do not touch repaired area while test is being conducted.



SEL012D

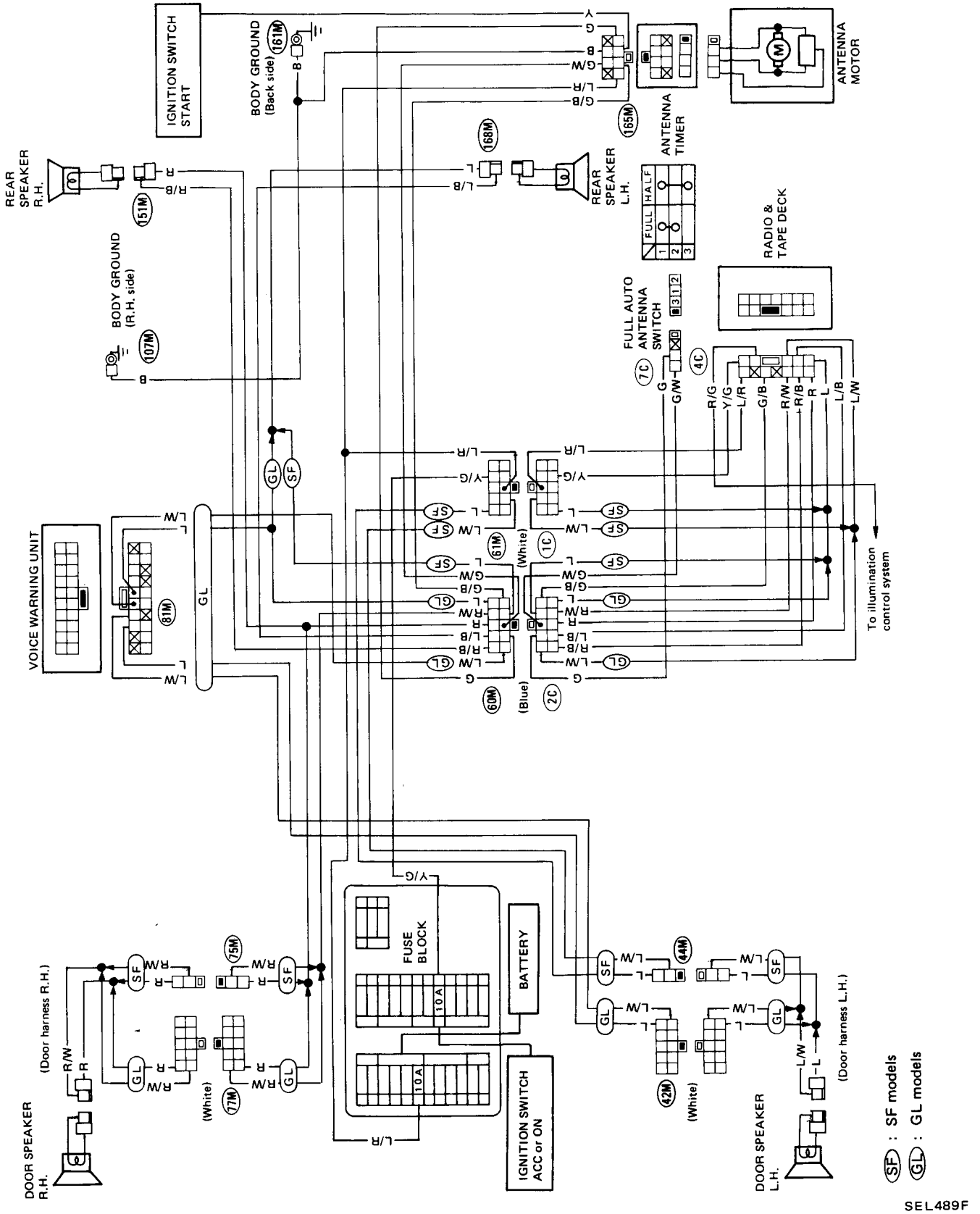
5. Apply a constant stream of hot air directly to the repaired area for approximately 20 minutes with a heat gun. A minimum distance of 3 cm (1.2 in) should be kept between repaired area and hot air outlet. If a heat gun is not available, let the repaired area dry for 24 hours.



SEL013D

Wiring Diagram

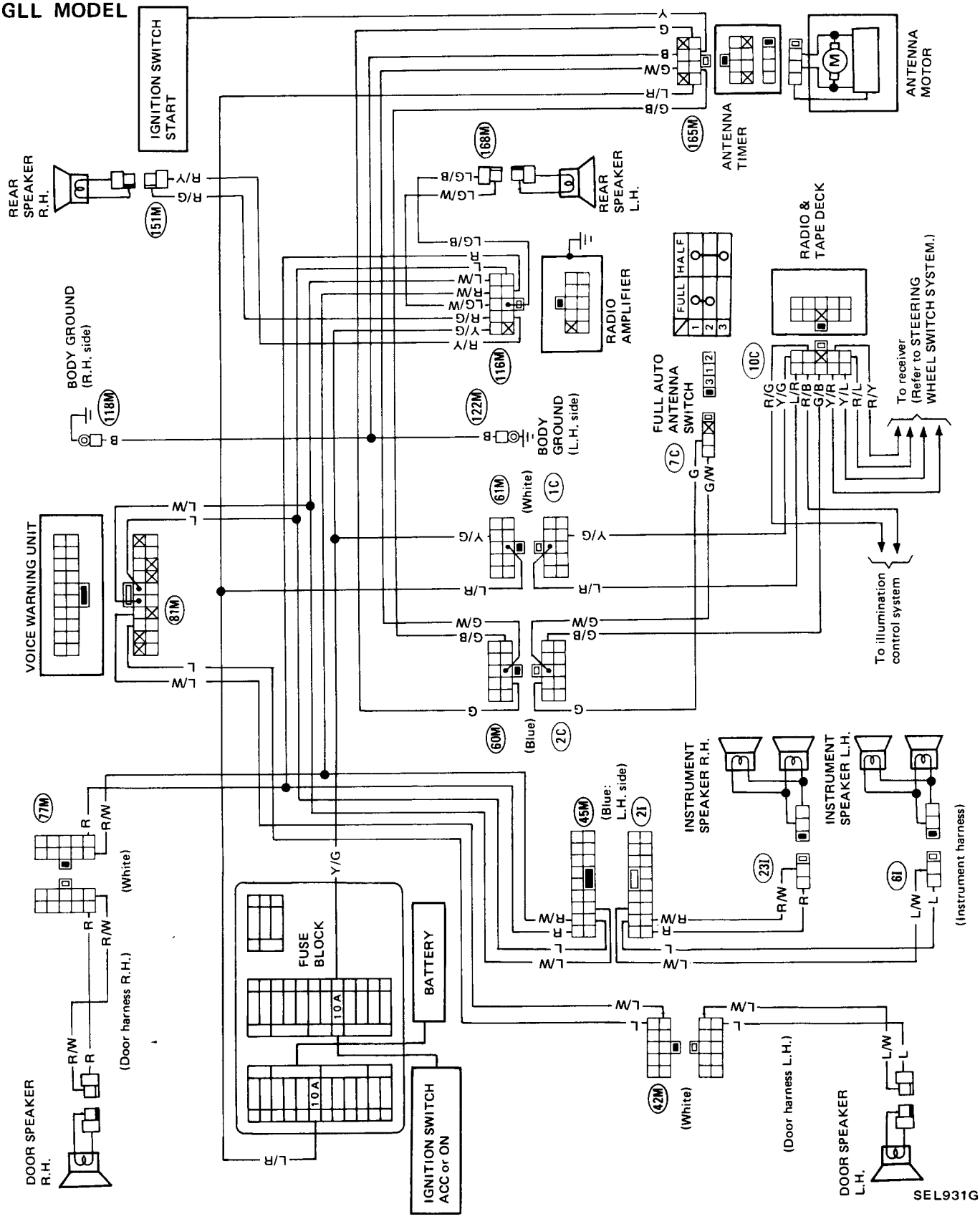
SF AND GL MODELS



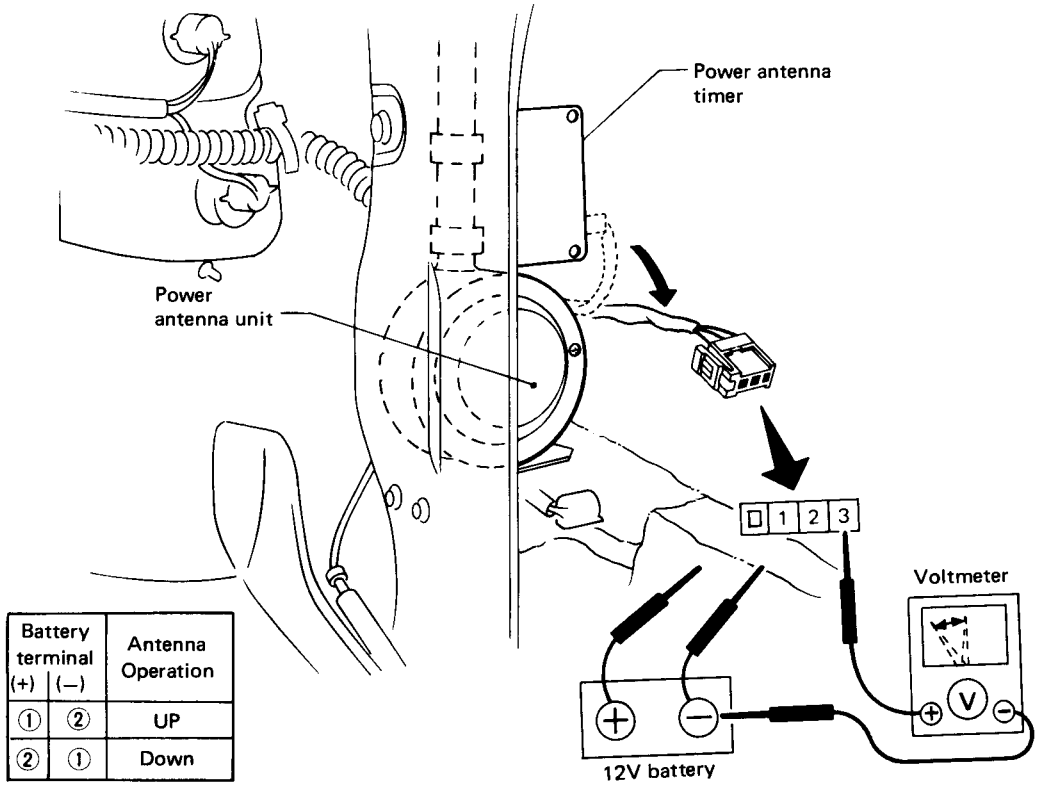
SEL489F

Wiring Diagram (Cont'd)

GLL MODEL



Power Antenna Motor Check



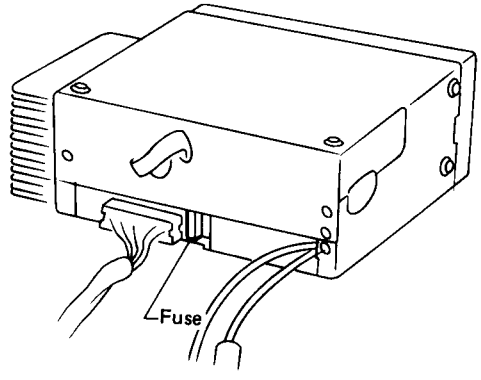
Battery terminal (+)	Battery terminal (−)	Antenna Operation
①	②	UP
②	①	Down

SEL732D

1. Disconnect, at connector, harness between power antenna unit and antenna timer.
2. Apply 12-volt battery voltage across ① and ② to make sure antenna rod extends and retracts.
3. Connect a voltmeter across terminal ③ and ground terminal of battery.
4. Check to determine if voltmeter varies between 0 and 12 volts (approx.) in relation to movement of antenna rod when 12-volt battery voltage is applied across ① and ②.

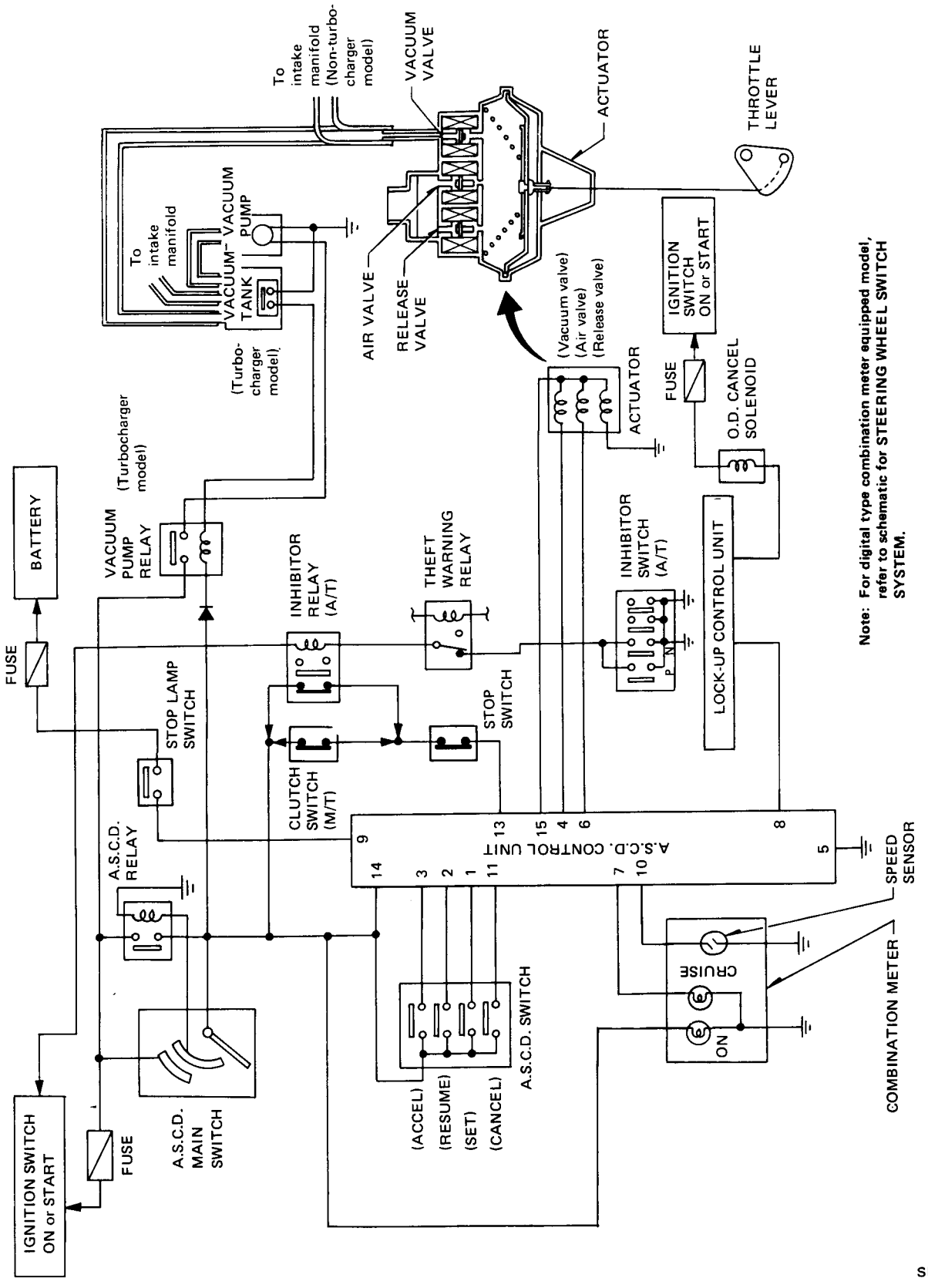
- **If above test results are not satisfactory, replace antenna motor.**

Radio Fuse Check



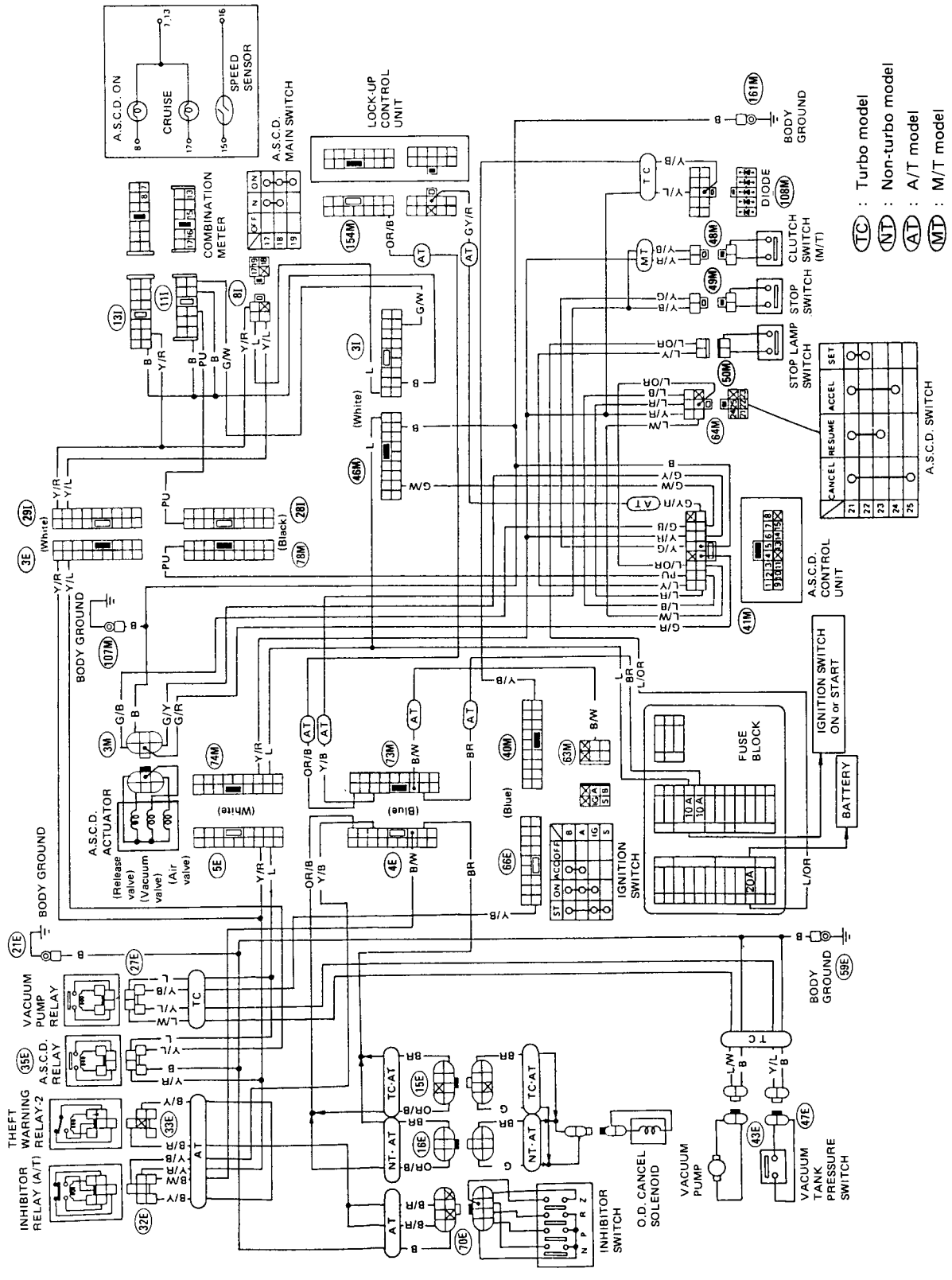
SEL733D

Schematic


To intake manifold (Non-turbo-charger model)
VACUUM VALVE
ACTUATOR
THROTTLE LEVER
To intake manifold
VACUUM TANK
VACUUM PUMP
(Turbo-charger model)
AIR VALVE
RELEASE VALVE
(Vacuum valve)
(Air valve)
(Release valve)
ACTUATOR
IGNITION SWITCH ON or START
FUSE
O.D. CANCEL SOLENOID
(Turbocharger model)
BATTERY
VACUUM PUMP RELAY
INHIBITOR RELAY (A/T)
THEFT WARNING RELAY
INHIBITOR SWITCH (A/T)
LOCK-UP CONTROL UNIT
FUSE
STOP LAMP SWITCH
STOP SWITCH
CLUTCH SWITCH (M/T)
A.S.C.D. RELAY
A.S.C.D. CONTROL UNIT
SPEED SENSOR
CRUISE
ON
COMBINATION METER
A.S.C.D. SWITCH
(ACCEL)
(RESUME)
(SET)
(CANCEL)
A.S.C.D. MAIN SWITCH
FUSE
IGNITION SWITCH ON or START
Note: For digital type combination meter equipped model, refer to schematic for STEERING WHEEL SWITCH SYSTEM.
SEL932G

Wiring Diagram

NEEDLE TYPE COMBINATION METER EQUIPPED MODEL



SEL933G

Wiring Diagram (Cont'd)

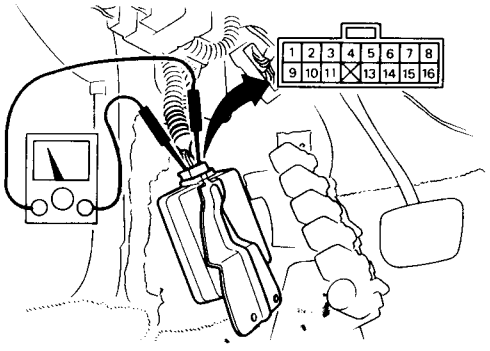
DIGITAL TYPE COMBINATION METER EQUIPPED MODEL

Refer to wiring diagram for STEERING WHEEL SWITCH SYSTEM.

AUTOMATIC SPEED CONTROL DEVICE (A.S.C.D.)

Preparation for Trouble-shooting

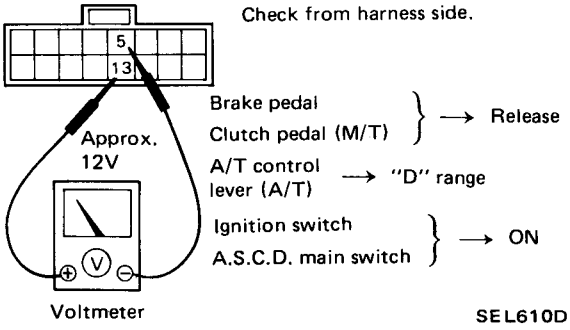
- Remove A.S.C.D. control unit with harness connected.



SEL520F

POWER SUPPLY CIRCUIT CHECK

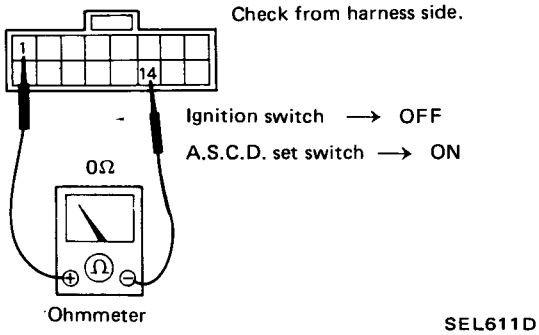
1. Release brake and clutch pedals.
2. Turn ignition switch to "ON".
3. Turn A.S.C.D. main switch to "ON".
4. Check voltage between ⑬ and ⑤.



SEL610D

SET SWITCH CIRCUIT CHECK

1. Turn ignition switch to "OFF".
2. Push A.S.C.D. set switch.
3. Check continuity between ① and ⑭.



SEL611D

Trouble-shooting

A.S.C.D. control unit cannot be set properly.

↓

Turn A.S.C.D. main switch "OFF" and then "ON" to make sure indicator (located above combination meter) illuminates.

↓ Yes

Check for loose vacuum hose.

↓ O.K.

Check power supply circuit for A.S.C.D. control unit.

↓ O.K.

Check set switch circuit for A.S.C.D. control unit.

↓ O.K.

Go to "A.S.C.D. Actuator Check".

↓ O.K.

*

(Next page)

No → Check A.S.C.D. main switch and A.S.C.D. relay.

N.G. → Check stop switch, clutch switch (M/T model), inhibitor relay and inhibitor switch (A/T model).

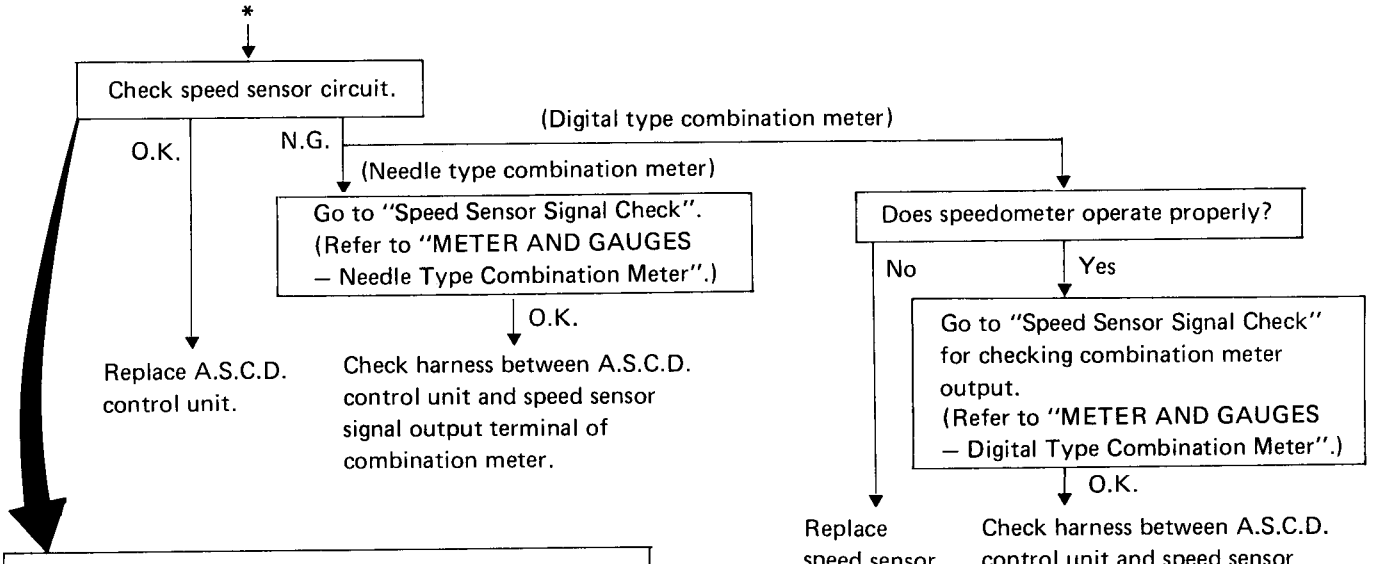
↓ O.K.

Check harness between A.S.C.D. power supply circuit.

N.G. → Check set switch, and harness between control unit and set switch.

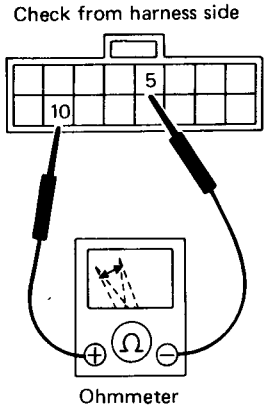
N.G. → Replace actuator.

Trouble-shooting (Cont'd)



1. Turn ignition switch to "OFF".
2. Disconnect speedometer cable from transmission.
3. Connect an ohmmeter between ⑩ and ⑤.
4. Turn ignition switch to "ON".
5. Slowly turn speedometer cable pinion by hand to make sure ohmmeter pointer deflects.

- **Ohmmeter pointer should deflect twice per rotation of pinion.**

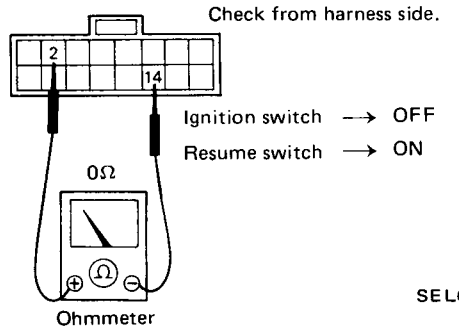


Trouble-shooting (Cont'd)

Resume switch will not operate.
→ Check resume switch circuit.
- O.K. → Replace A.S.C.D. control unit.
- N.G. → Check resume switch.

RESUME SWITCH CIRCUIT CHECK

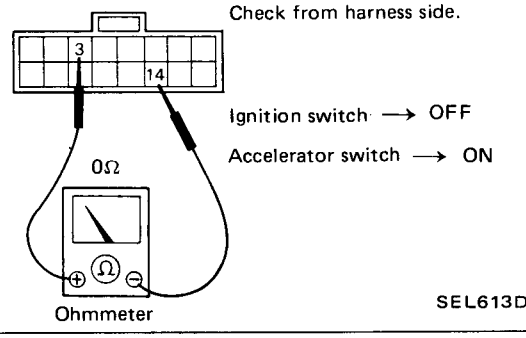
1. Turn ignition switch to "OFF".
2. Turn resume switch to "ON".
3. Check continuity between ② and ⑭.



Accelerate switch will not operate.
→ Check accelerate switch circuit.
- O.K. → Replace A.S.C.D. control unit.
- N.G. → Check accelerate switch.

ACCELERATE SWITCH CIRCUIT CHECK

1. Turn ignition switch to "OFF".
2. Turn accelerate switch to "ON".
3. Check continuity between ③ and ⑭.



Engine hunts.
→ Check vacuum hose for breakage, cracks or fracture.
- O.K. → Does A.S.C.D. wire move smoothly?
  - O.K. → Go to "Actuator Check".
    - O.K. → Replace A.S.C.D. control unit.
    - N.G. → Replace actuator.
  - N.G. → Repair or replace wire.
- N.G. → Repair or replace hose.

Large difference between set vehicle speed and actual speed.
→ Check A.S.C.D. wire and actuator move smoothly.
- O.K. → Check vacuum hose for breakage, cracks or fracture.
  - O.K. → Go to "Actuator Check".
    - O.K. → Replace A.S.C.D. control unit.
    - N.G. → Replace actuator.
  - N.G. → Repair or replace hose.
- N.G. → Replace wire or actuator.

Trouble-shooting (Cont'd)

A/T model only:
- When A.S.C.D. is set while vehicle is operating in "O.D." range, O.D. will be cancelled and shifting to O.D. cannot be made thereafter.
- While vehicle is being driven using A.S.C.D. in "O.D." range, O.D. will not be cancelled even if actual car speed is 6 km/h (4 MPH) lower than set speed. (Set speed cannot be maintained.)

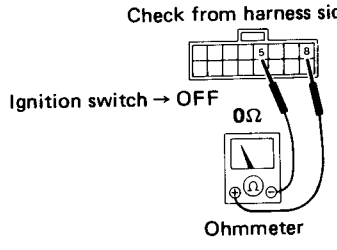
Check O.D. cancel circuit for A.S.C.D. control unit.

O.K. → Replace A.S.C.D. control unit.

N.G.
- **Electronic-controlled A/T** Check harness between lock-up control unit and A.S.C.D. control unit.
- **Conventional A/T** Check harness between O.D. cancel solenoid, O.D. cancel switch and A.S.C.D. control unit.

ELECTRONIC-CONTROLLED A/T EQUIPPED MODEL (E4N71B)

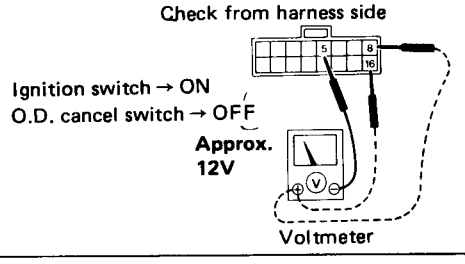
- Turn ignition switch to "OFF".
- Check continuity between ⑧ and ⑤.



SEL737D

CONVENTIONAL A/T EQUIPPED MODEL (4N71B)

- Turn ignition switch to "ON".
- Turn O.D. cancel switch to "OFF".
- Check voltage ⑧ - ⑤ and ⑯ - ⑤.

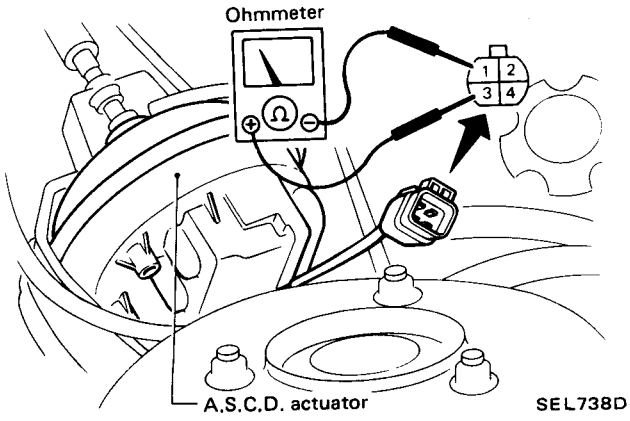


SEL741D

A.S.C.D. Actuator Check

1. Check continuity between terminal ① and terminals ②, ③ and ④.

Continuity exist ... O.K.

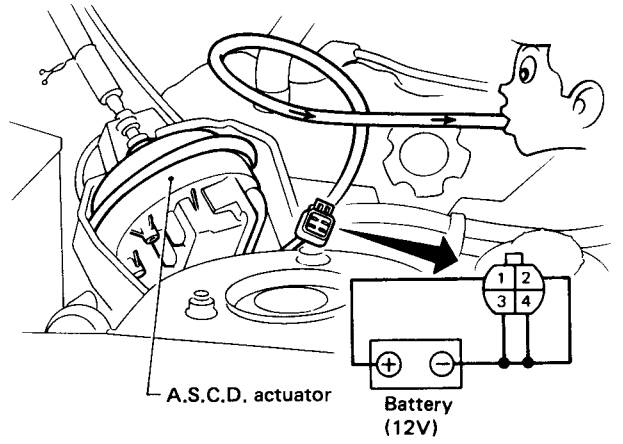


SEL738D

CAUTION:
Do not attempt to remove valves from actuator.

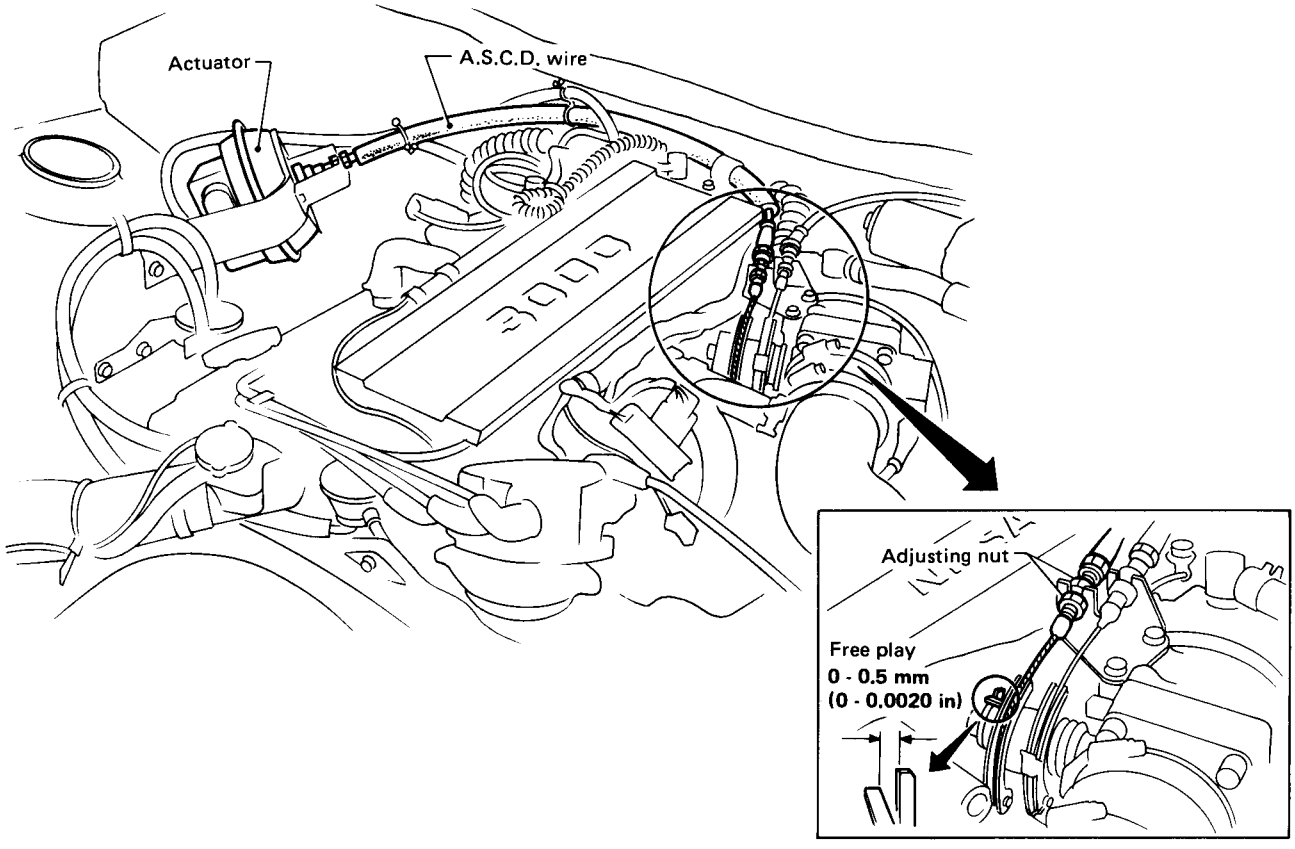
2. Connect battery (approx. 12V) to harness connector of actuator as shown below, and apply vacuum to actuator.
   If diaphragm moves smoothly, actuator is O.K.

CAUTION:
When checking actuator by applying vacuum, do not apply engine vacuum directly as it is too strong to check actuator properly.



SEL739D

A.S.C.D. Wire Adjustment



SEL740D

CAUTION:

- **Be careful not to twist wire when removing it.**
- **Be careful not to pinch vacuum hose when installing actuator.**
- **Do not tighten wire excessively during adjustment.**

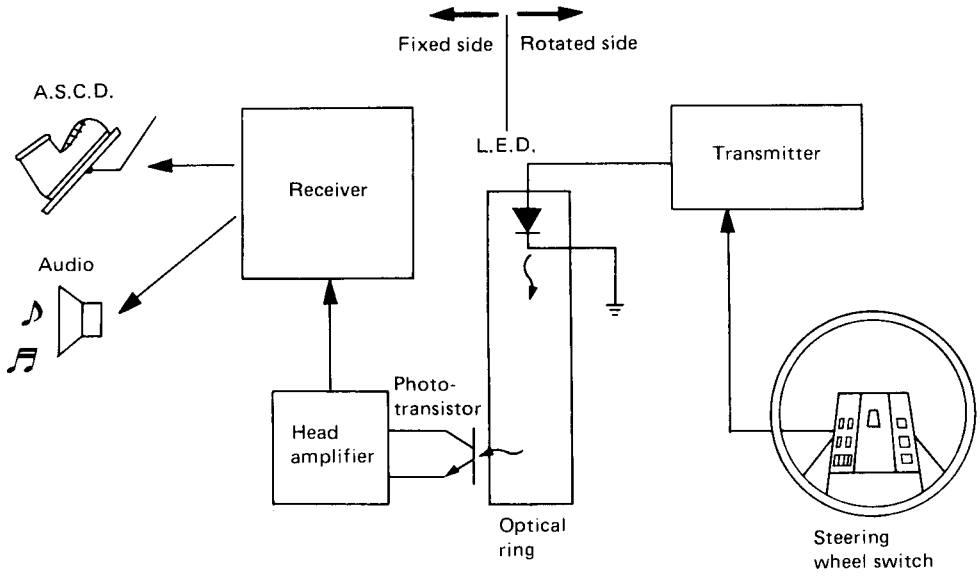
Without depressing the accelerator pedal, adjust wire tension with adjusting nut.

Wire free play (at throttle lever):
0 - 0.5 mm (0 - 0.020 in)

- For A.S.C.D. stop switch and clutch switch adjustment, refer to BR and CL sections.
- For vacuum pump and tank check, refer to HA section.

STEERING WHEEL SWITCH SYSTEM

Description



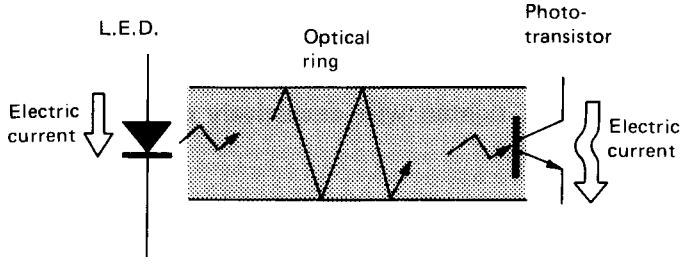
SEL647E

The steering wheel switch system transmits the on-off signal of the switch on the steering wheel to the receiver optically and operates A.S.C.D. and audio.

HOW TO TRANSMIT SWITCH SIGNAL OPTICALLY

(1) The on-off signal of the switch on the steering wheel is converted into an L.E.D. on-off signal by the transmitter.
(2) This L.E.D. signal (optical signal) is transmitted to the photo-transistor through the optical ring.
(3) The optical signal is re-converted into electrical signal by the photo-transistor and transmitted to the receiver. Receiver controls A.S.C.D. and radio.

By the three steps mentioned above, the on-off signal of the switch on the steering wheel is optically transmitted.



SEL648E

L.E.D. (Light Emitting Diode):

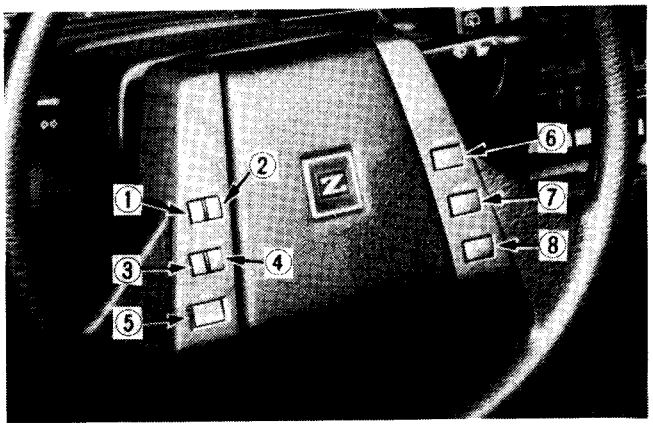
A diode which emits light when voltage is applied.

Photo-transistor:

A transistor which allows current to flow when light is applied.

Description (Cont'd)

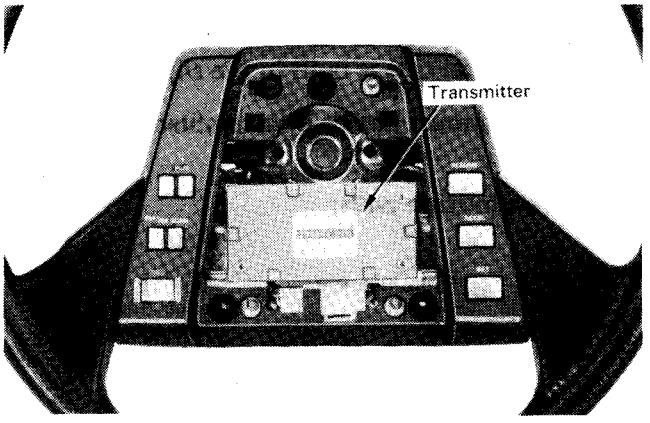
STEERING WHEEL SWITCH



- If two or more audio switches or A.S.C.D. switches are pressed simultaneously, all the pressed switches will be cancelled.
- If one switch is pressed while pressing another, the second one pressed will be cancelled.

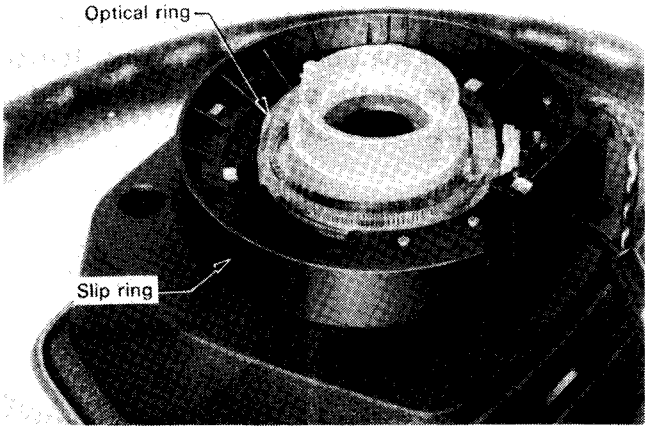
	Switch		Function
For Audio	①	SW	Power ON/OFF
	②	PLAY	Tape deck play
	③	AM/FM	AM/FM band selection
	④	SCAN	SCAN tuning (for radio) Auto program search (for tape deck)
	⑤	VOL	Volume
For A.S.C.D.	⑥	RESUME	Deceleration and resuming
	⑦	ACCEL	Acceleration
	⑧	SET	Cruising speed setting

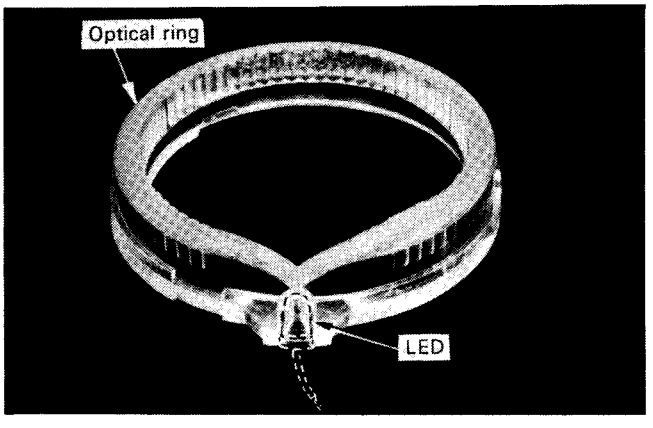
TRANSMITTER



The transmitter is a device which converts the signal from the steering wheel switch into intermittent current in order to flash the L.E.D.

OPTICAL RING



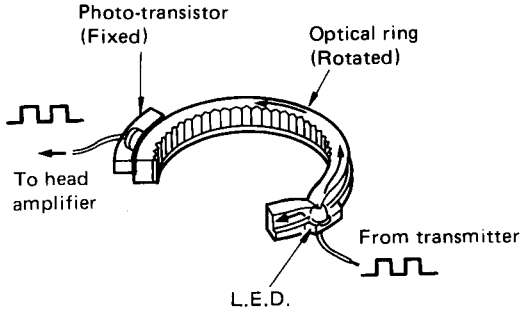


Description (Cont'd)

- The steering wheel switch system uses an acrylic optical ring, and this optical ring functions in the same way as optical fiber.
  The optical ring is built in the slip ring.

The slip ring must not be disassembled.

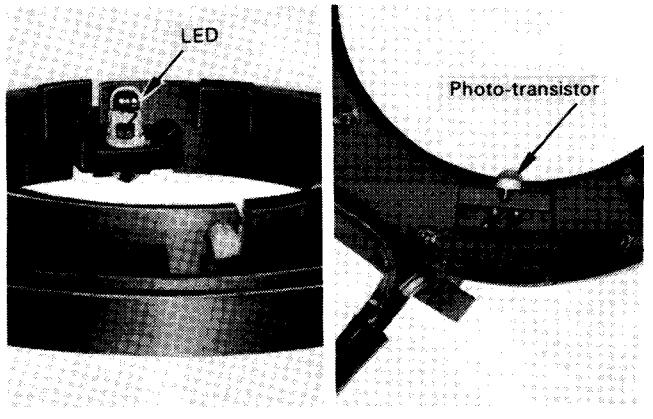
Light transmission path:



SEL649E

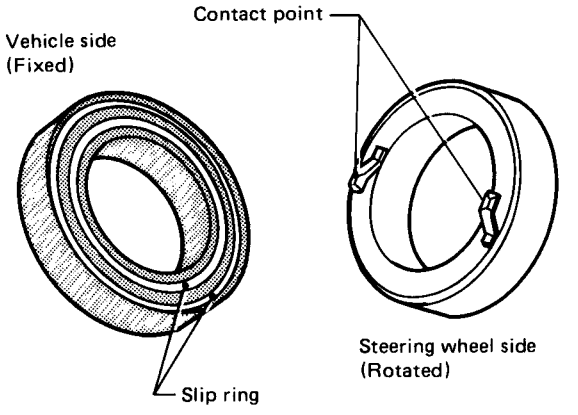
- As the L.E.D. embedded in the optical ring lights, its light moves forward while repeating reflection on the side wall of the ring. It eventually will reach the photo-transistor placed on the outer periphery of the ring.

L.E.D. and photo-transistor:



- The L.E.D. and optical ring are mounted on the steering wheel side of the slip ring and rotate with the steering wheel.
- The photo-transistor is mounted on the vehicle side of the slip ring and it does not rotate.

SLIP RING

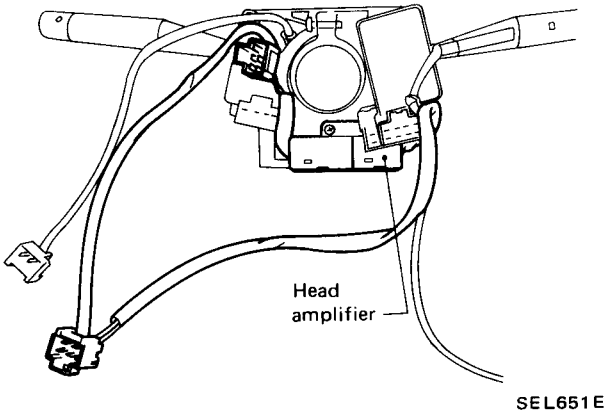


SEL650E

- Power for the transmitter is fed from the vehicle side through the slip ring.
- The horn switch circuit is connected to the vehicle side through the slip ring.

The slip ring must not be disassembled.

HEAD AMPLIFIER



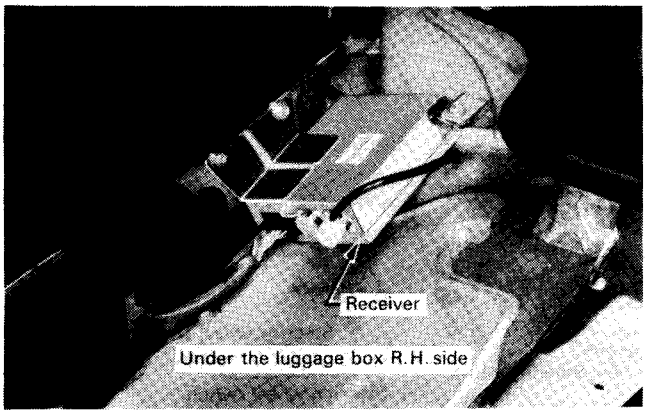
SEL651E

The photo-transistor allows a minimal amount of current to flow as it receives light. The head amplifier amplifies this current and sends it to the receiver.

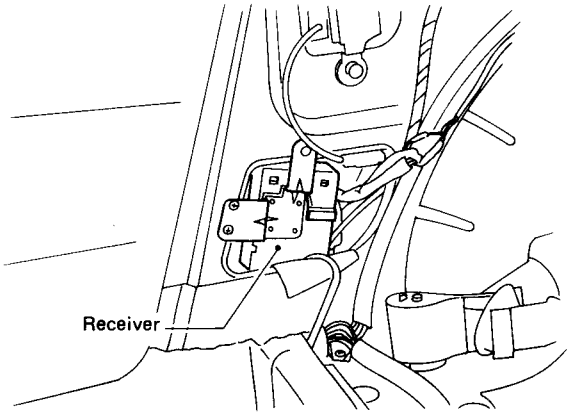
Description (Cont'd)

RECEIVER

2 seater model



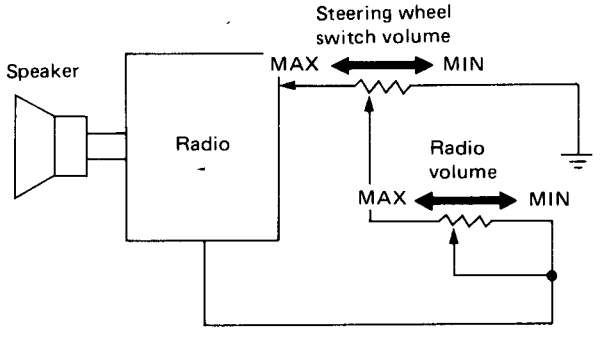
2+2 seater model



SEL900G

The receiver activates the radio or A.S.C.D. drive circuit corresponding to the steering wheel switch signal sent from the head amplifier.

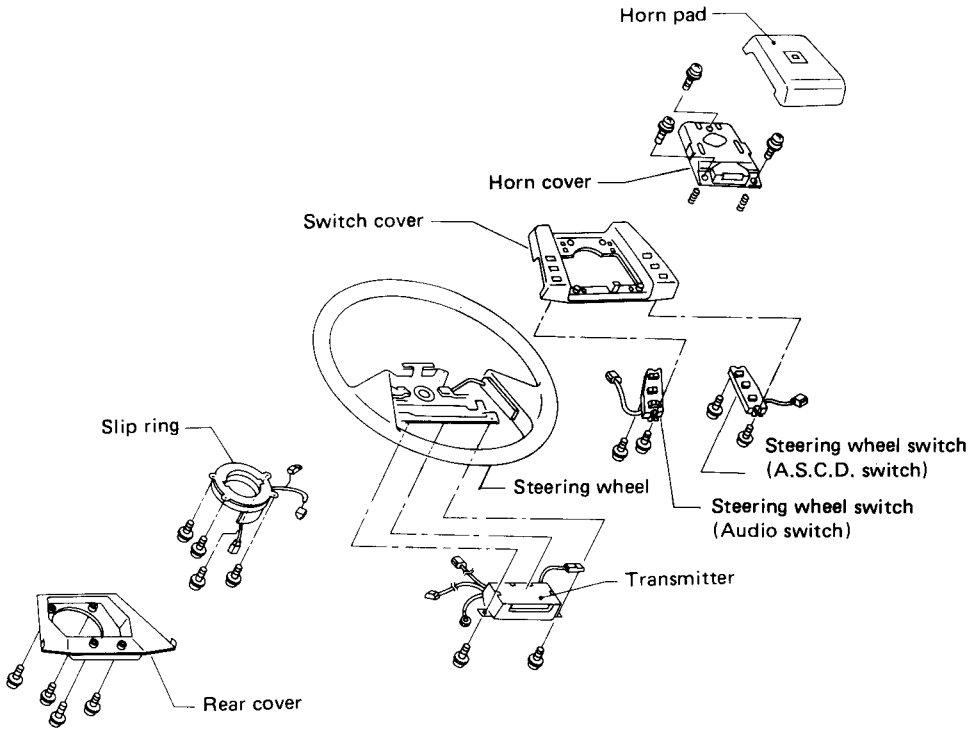
AUDIO VOLUME CONTROL



SEL652E

- The volume control on the steering wheel switch is connected in series with the volume control on the radio.
- When the volume control on the radio is set to a minimum, no sound will be heard from the loudspeaker even if the steering wheel switch volume control is adjusted.
- Sound level from the loudspeaker will be at the maximum when the steering wheel switch volume control is set to the maximum with the volume control on the radio also set to the maximum.

Steering Wheel Switch Removal and Installation



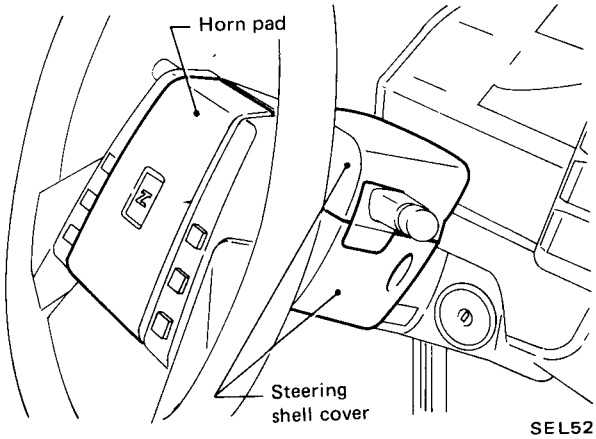
SEL653E

STEERING WHEEL REMOVAL AND INSTALLATION

To prevent the steering wheel switch from being damaged, be sure to observe the following procedure:

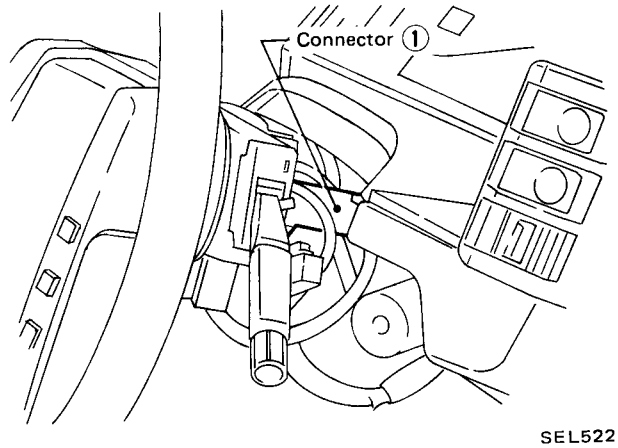
- When removing the steering wheel:

1. Remove the horn pad and both sections of the steering shell cover.



SEL521F

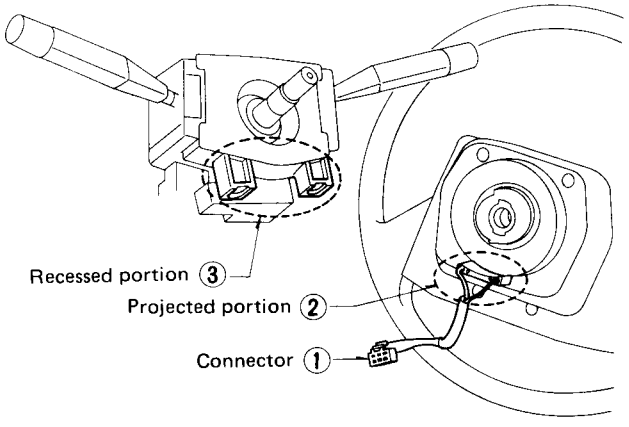
2. Disconnect the connector ① first and then loosen the steering nut and remove steering wheel.



SEL522F

Steering Wheel Switch Removal and Installation (Cont'd)

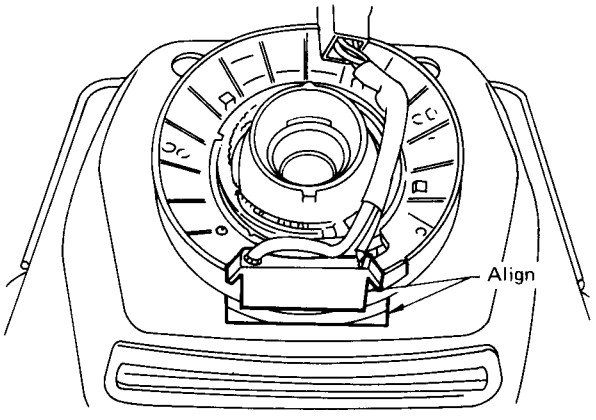
- **When installing the steering wheel:**
  First determine the slip ring position so that the projected portion ② of the slip ring will fit in the recessed portion ③ of the combination switch. Then install the steering wheel.



SEL523F

STEERING WHEEL REAR COVER REMOVAL

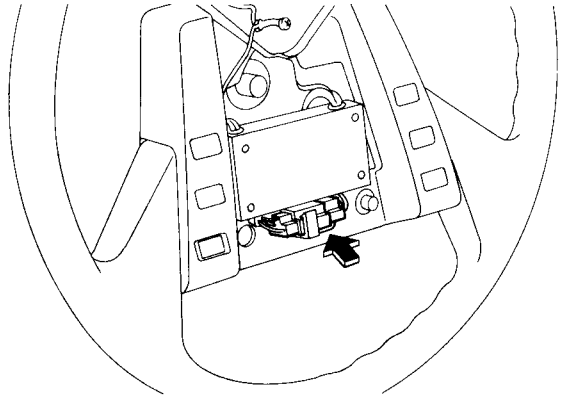
- Remove the rear cover with the projected portion of the slip ring fitted into the cutout portion of the rear cover.



SEL655E

SLIP RING REMOVAL

- Remove the connector joining the slip ring and transmitter after removing the transmitter mounting screws. Then remove the transmitter.

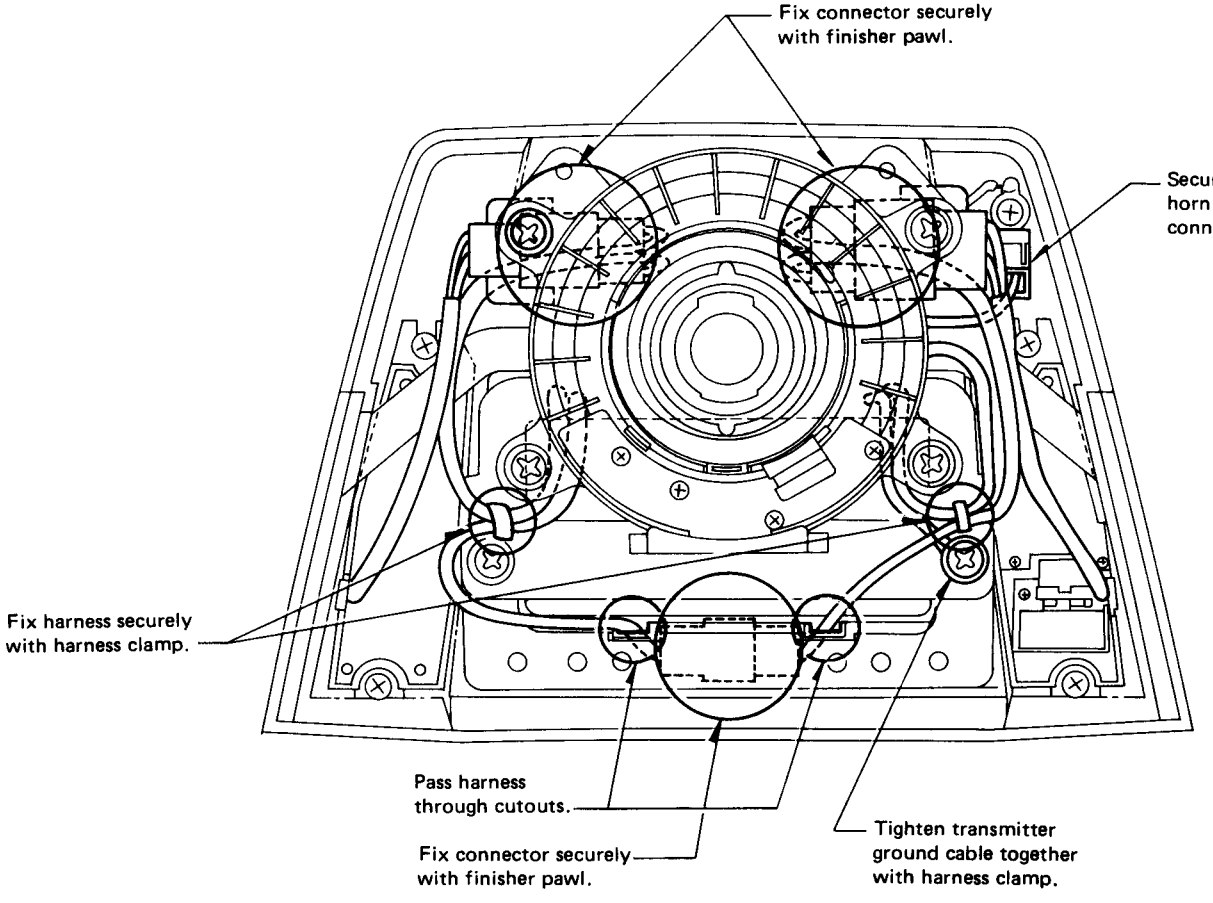


SEL656E

Steering Wheel Switch Removal and Installation (Cont'd)

TRANSMITTER AND SLIP RING INSTALLATION

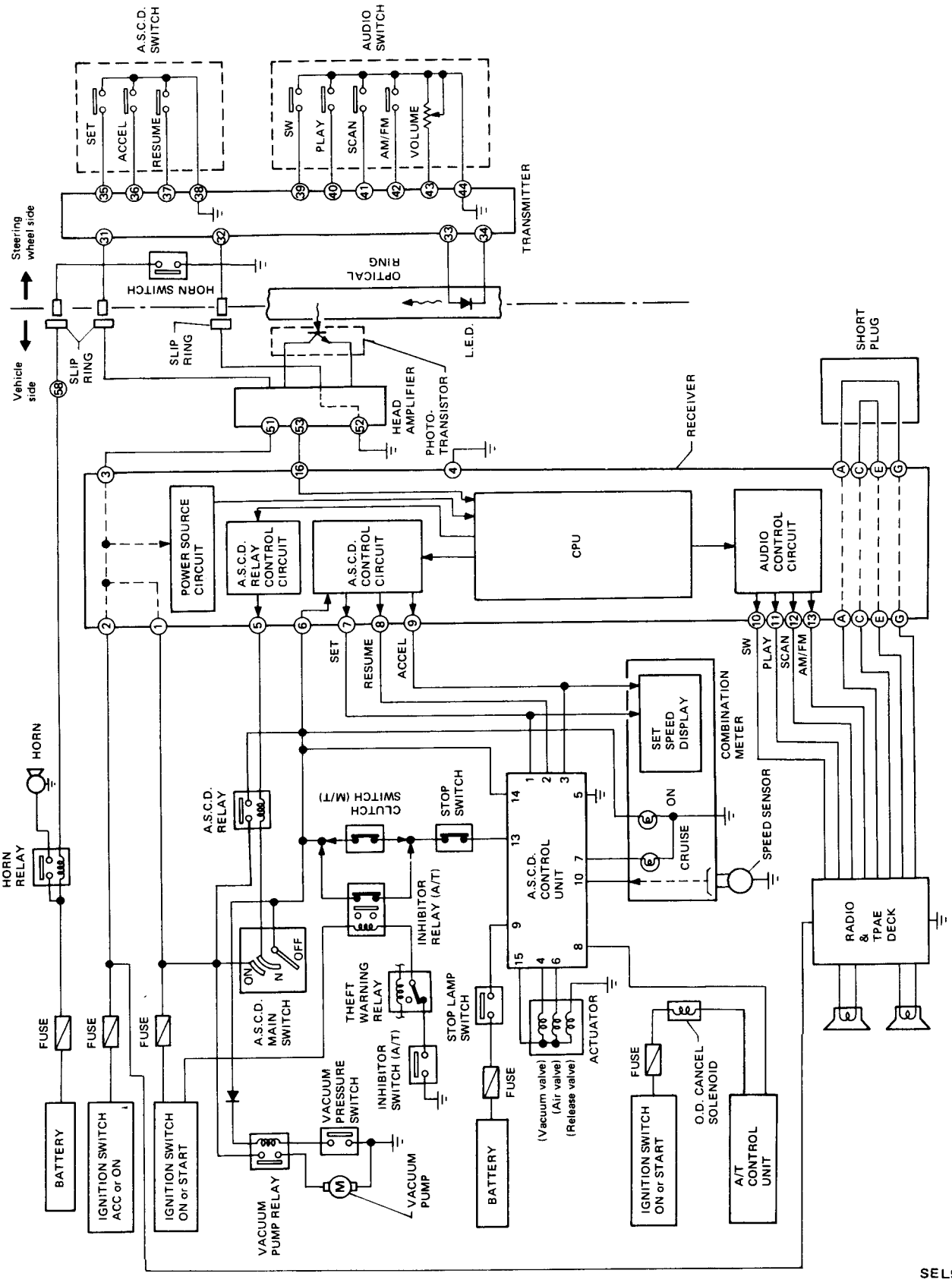
- When installing the transmitter and slip ring, arrange and secure the harnesses and connectors as shown in the following figure.



SEL657E

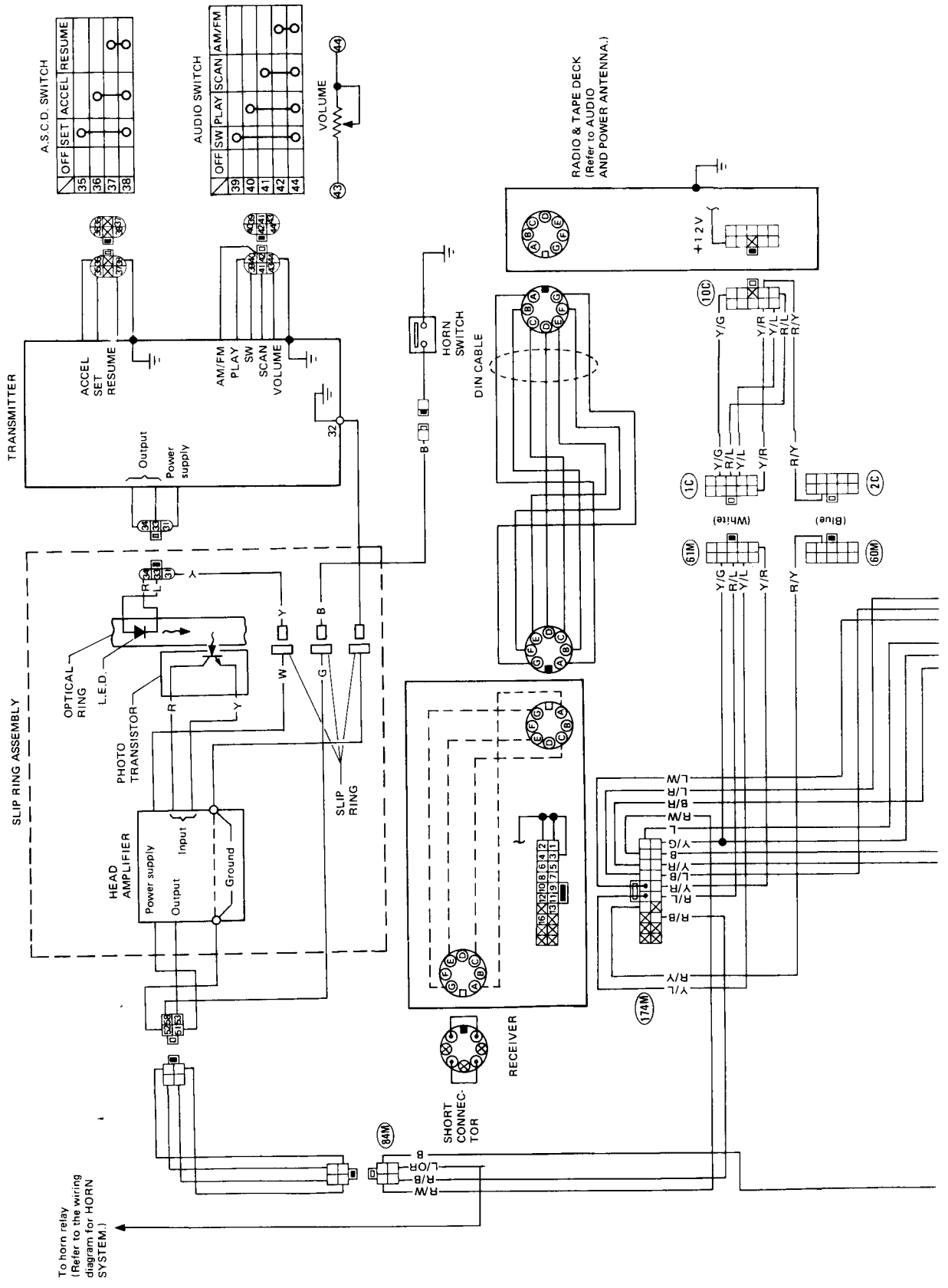
STEERING WHEEL SWITCH SYSTEM

Schematic



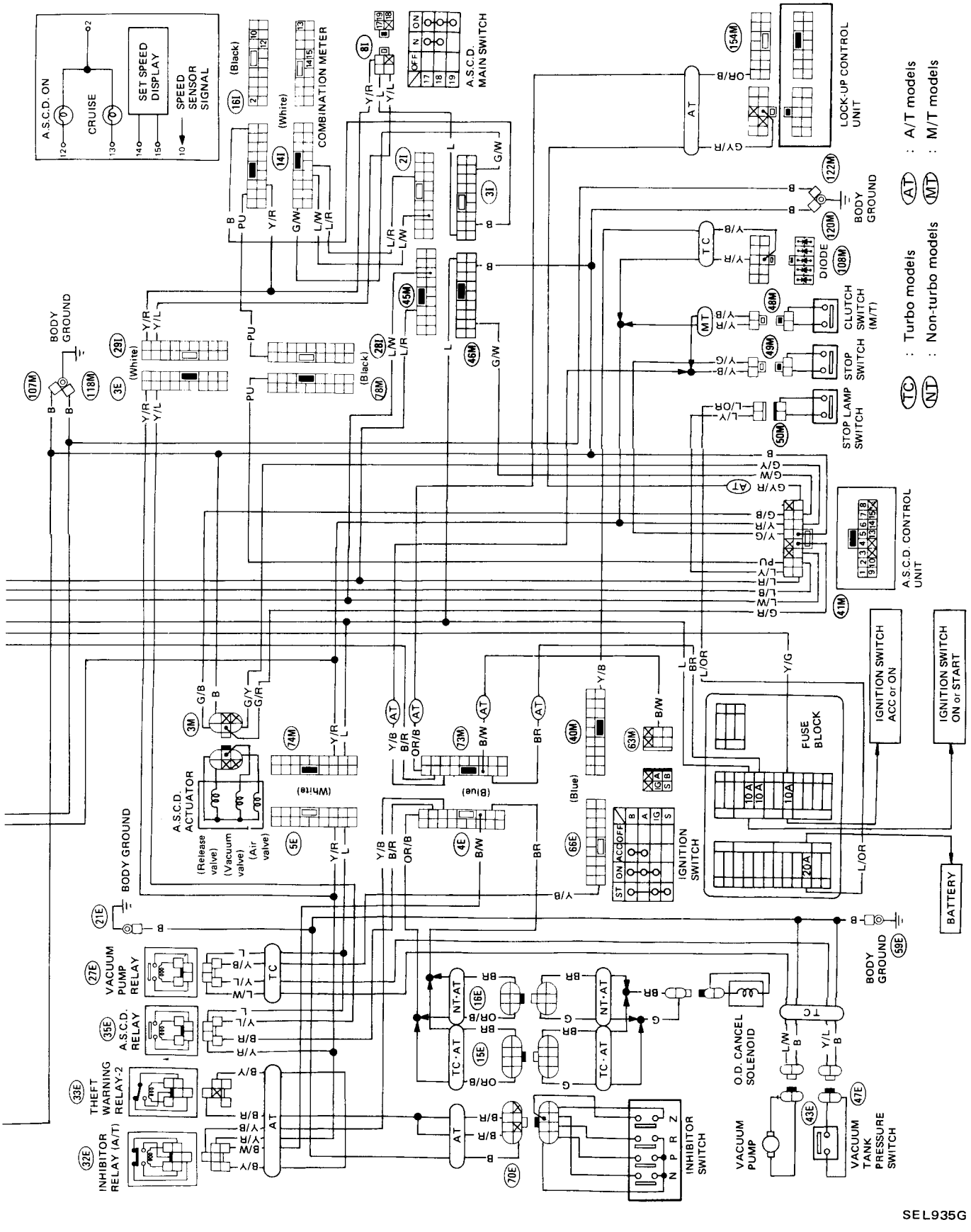
STEERING WHEEL SWITCH SYSTEM

Wiring Diagram

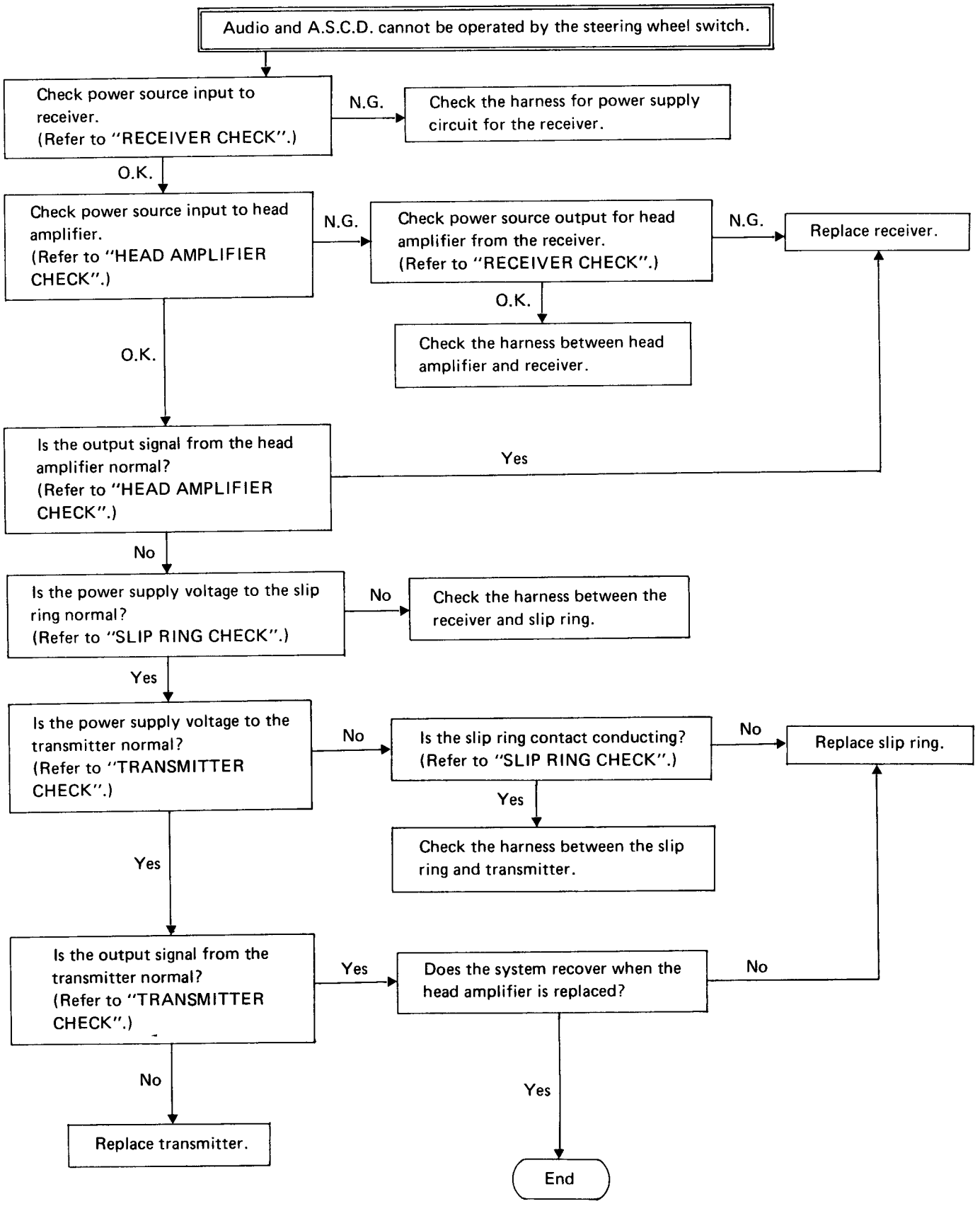


STEERING WHEEL SWITCH SYSTEM

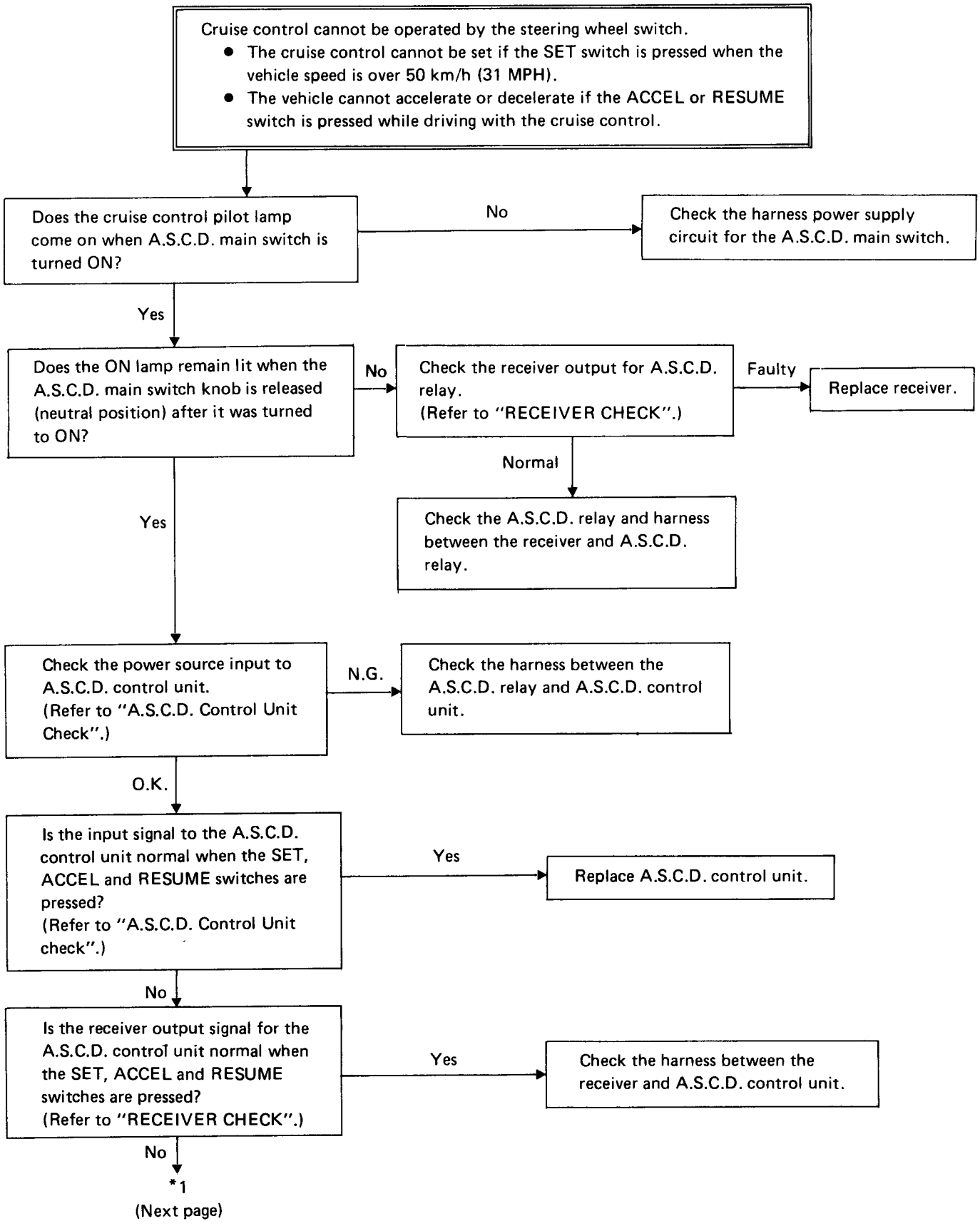
Wiring Diagram (Cont'd)



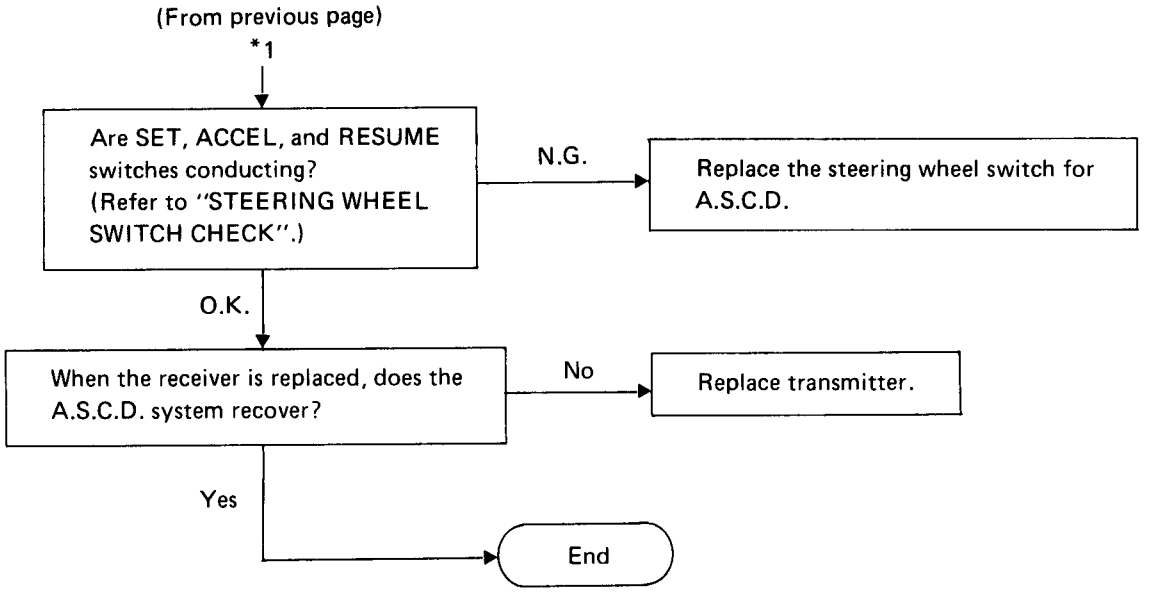
Trouble-shooting



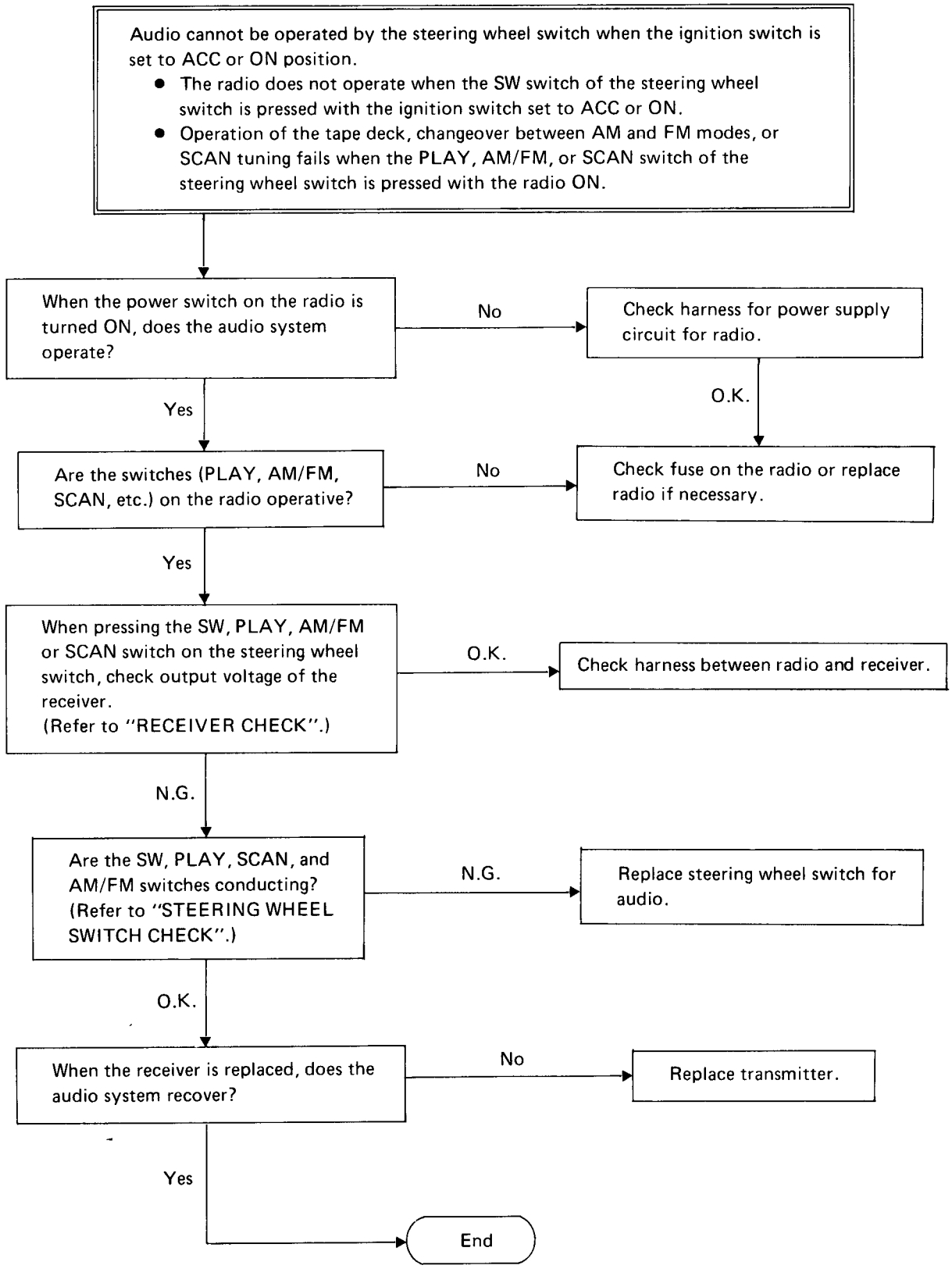
Trouble-shooting (Cont'd)



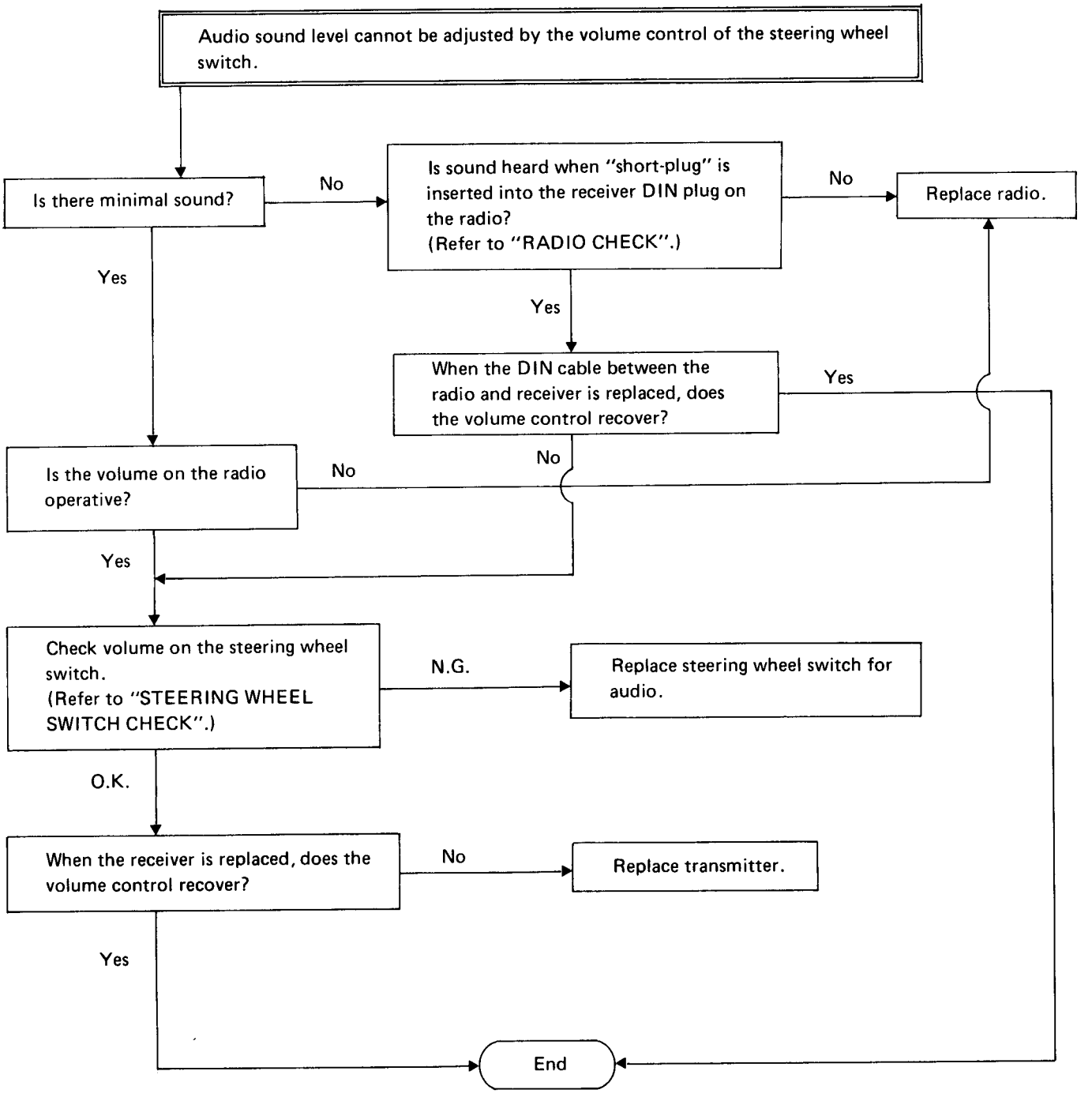
Trouble-shooting (Cont'd)



Trouble-shooting (Cont'd)



Trouble-shooting (Cont'd)



Trouble-shooting (Cont'd)

Radio volume decrease when the steering is turned rapidly under extremely low temperature conditions.

This results from a poor ground connection inside the steering column bearing. To correct the incident, apply low temperature grease to the steering column bearing as follows.

TROUBLE-SHOOTING PROCEDURE

1. Disconnect the battery ground cable.
2. Remove the horn pad, horn cover, and both sections of the steering shell cover.
3. Disconnect the steering switch transmitter harness connector from the rear of the combination switch.
4. Remove the steering wheel, using the tool and procedure described in the 1984 300ZX Service Manual, page ST-2.
5. Apply the low temperature grease to the steering column shaft bearing as follows:

1) Place the turn signal switch in neutral position to prevent grease from getting on the turn signal cancel cam.
2) Carefully apply approximately 1 mℓ (0.03 US fl oz, 0.04 Imp fl oz) of grease to the steering column bearing.

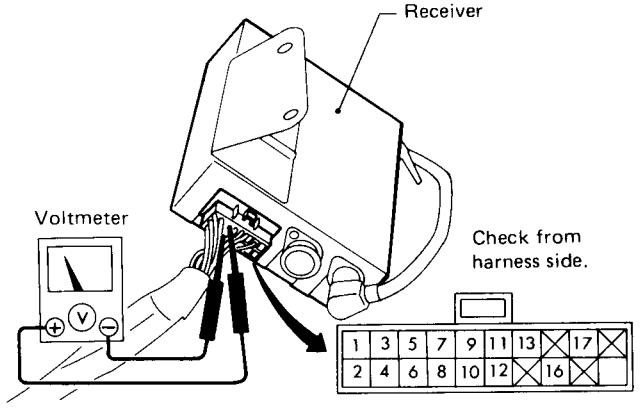
To facilitate application of the grease, a cone of paper or vinyl film is suggested.

3) Temporarily install the steering wheel. Insure that the projected portion of the slip ring fits in the recessed portion of the combination switch. Turn the steering wheel fully to the left and right a couple of times, taking care to prevent damage to the projected portion of the slip ring.
4) Remove the steering wheel.
5) Repeat steps b, c, and d.
6) Make sure that grease is applied to the entire bearing.

6. Install the steering wheel on the shaft in a straight ahead position. Be sure that the projected portion of the slip ring fits in the recessed portion of the combination switch.
7. Connect steering switch transmitter harness connector to combination switch.
8. Install horn cover, horn pad and both sections of the combination switch housing.
9. Connect battery ground cable.

Receiver Check

1. Remove luggage box.
2. Remove receiver with harness connected.
3. Turn ignition switch to ON.
4. Check voltage between terminals referring to the chart below.

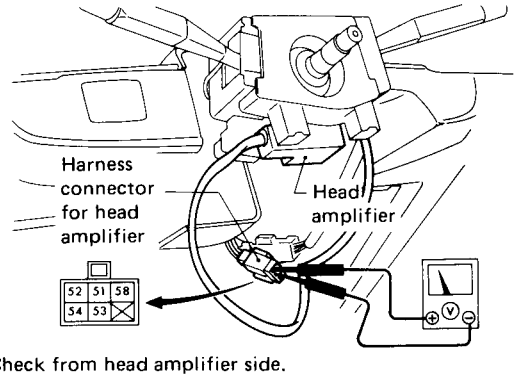


SEL660E

Check item		Voltmeter terminal (+)	Voltmeter terminal (−)	Switch condition		Specified voltage [V]
Power source input	IG	①	④	—		Approx. 12
	ACC	②	④			
Power source output for head amplifier and slip ring		③	④	—		Approx. 12
Output for A.S.C.D. relay		⑤	④	A.S.C.D. main switch	ON	0
					OFF	Approx. 5
Output for A.S.C.D. control unit		⑦	④	SET switch ON		Approx. 12
		⑧	④	RESUME switch ON		Approx. 12
		⑨	④	ACCEL switch ON		Approx. 12
Output for audio system (Check voltage while operating the SW, PLAY, SCAN or FM/AM on the steering wheel switch.)		⑩	④	SW switch	ON	0
					OFF	Approx. 5
		⑪	④	PLAY switch	ON	0
					OFF	Approx. 5
		⑫	④	SCAN switch	ON	0
					OFF	Approx. 5
		⑬	④	AM/FM switch	ON	0
					OFF	Approx. 5

Head Amplifier Check

1. Remove steering column cover.
2. Turn ignition switch to ON.
3. Check voltage between terminals at harness connector for head amplifier referring to chart below.
   (Leave the harness connector for head amplifier to be connected.)



Check from head amplifier side.

SEL661E

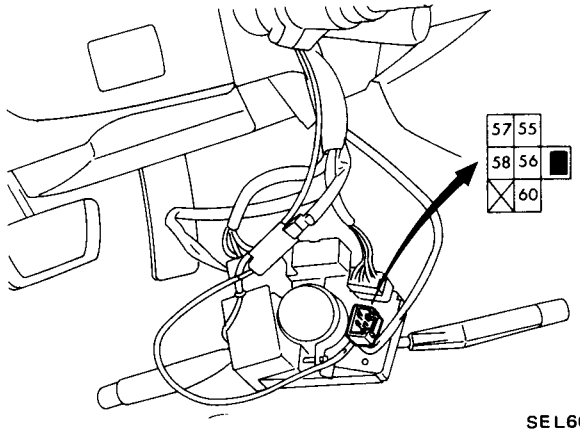
Check item	Voltmeter terminals		Specified voltage [V]
	(+)	(−)	
Power supply input	⑤①	⑤②	Approx. 12
Output for receiver	⑤③	⑤④	Approx. 2 - 4

Slip Ring Check

POWER SUPPLY VOLTAGE CHECK

1. Remove steering column cover.
2. Disconnect harness connector for slip ring at the back of combination switch.
3. Remove steering wheel.
4. Remove combination switch with harness connected.
5. Check voltage between terminals ⑤⑦ and ⑥⓪ when the ignition switch is turned to ON.

   Specified voltage: Approx. 12V

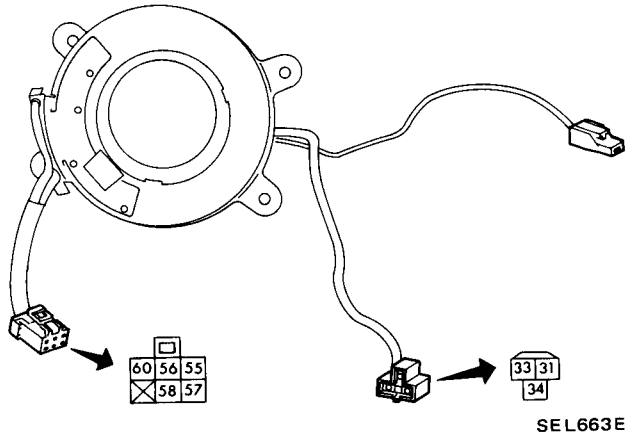


SEL662E

CONTINUITY CHECK

1. Remove slip ring from steering wheel.
2. Check continuity between terminals ⑤⑦ and ③①.

   Continuity exists ... O.K.



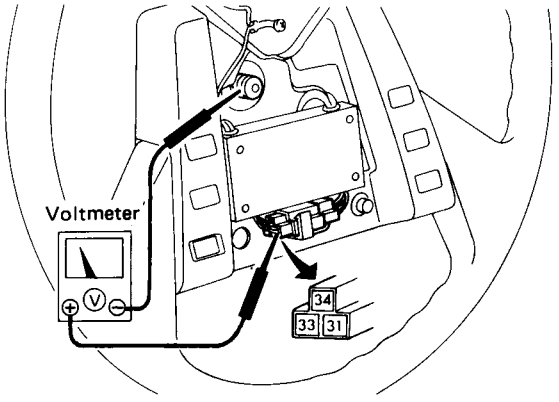
SEL663E

Transmitter Check

POWER SUPPLY VOLTAGE CHECK

1. Connect the harness connector for slip ring at the back of combination switch.
2. Install steering wheel on the column shaft.
3. Connect the voltmeter probe to:
   (+) terminal ... ㉛
   (−) terminal ... Steering column shaft
4. Check voltage when the ignition switch is turned to ON.

   Specified voltage: Approx. 12V

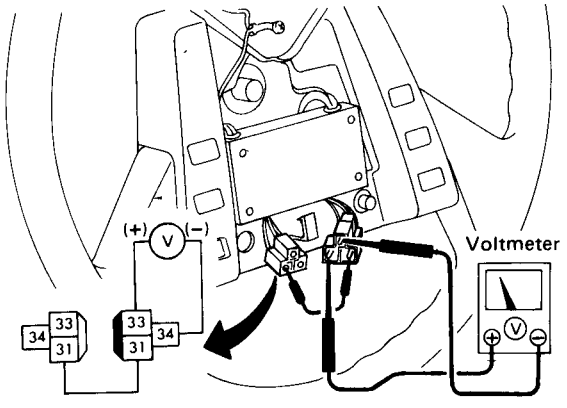


SEL664E

OUTPUT SIGNAL CHECK

1. Disconnect harness connector between transmitter and slip ring.
2. Connect terminals ㉛ and ㉛ with a suitable wire.
3. Check voltage between terminals ㉝ and ㉞ when the ignition switch is turned to ON.

   Specified voltage: Approx. 2 - 4V



SEL665E

Steering Wheel Switch Check

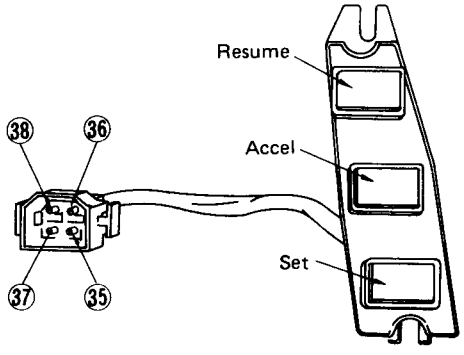
1. Disconnect harness connector for slip ring at the back of combination switch.
2. Remove steering wheel.
3. Remove steering wheel rear cover.
4. Disconnect harness connector between steering wheel switch and transmitter.
5. Remove steering wheel switches.

A.S.C.D. SWITCH CHECK

- Check continuity while pressing each switch.

  Below 300Ω ... O.K.

	OFF	SET	ACCEL	RESUME
㉟		○		
㊱			○	
㊲				○
㊳		○	○	○



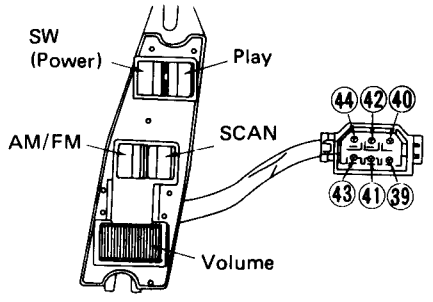
SEL666E

AUDIO SWITCH CHECK

- Check continuity while pressing each switch.

  Below 300Ω ... O.K.

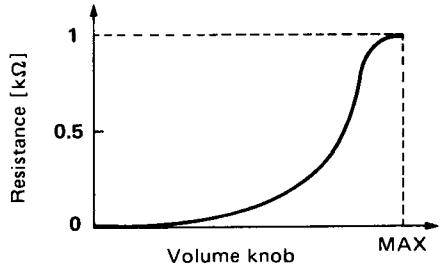
	OFF	SW (Power)	PLAY	SCAN	AM/FM
㊴		○			
㊵			○		
㊶				○	
㊷					○
㊹		○	○	○	○

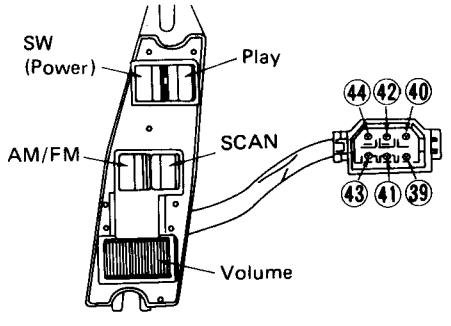


SEL667E

VOLUME CHECK

- Measure resistance between terminals ㊸ and ㊹ while operating the volume.



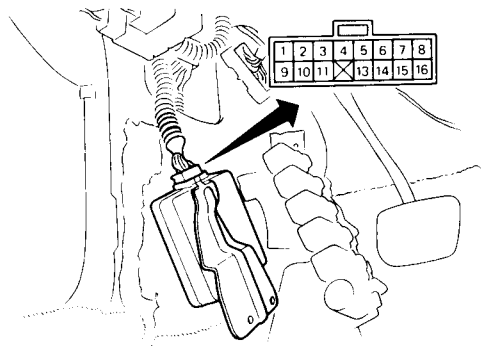


SEL668E

STEERING WHEEL SWITCH SYSTEM

A.S.C.D. Control Unit Check

1. Remove A.S.C.D. control unit with harness connected.
2. Check terminal voltage referring to chart below.



SEL736D

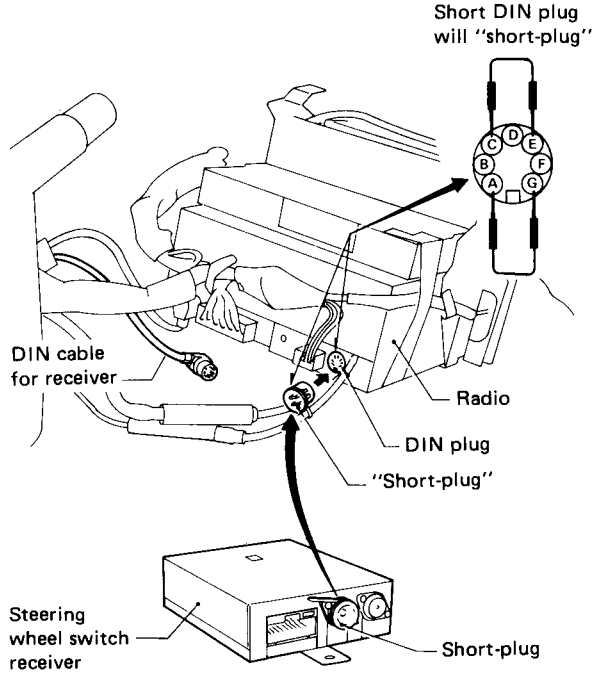
Check item	Voltmeter terminals		Switch condition		Specified voltage [V]
	(+)	(−)			
Power source input	⑭	⑤	A.S.C.D. main switch	ON	Approx. 12
Input signal	①	⑤	SET switch	ON	Approx. 12
	②	⑤	RESUME switch	ON	Approx. 12
	③	⑤	ACCEL switch	ON	Approx. 12

Radio Check

1. Remove radio with harness connected.
2. Disconnect DIN cable for steering wheel switch receiver from radio.
3. Remove luggage box.
4. Remove "short-plug" from steering wheel switch receiver.
5. Connect the "short-plug" to radio.
6. Check the sound when the radio is turned on.

The radio is normal if there is sound.

7. After finishing this check, be sure to re-install the "short-plug" on the steering wheel switch receiver.



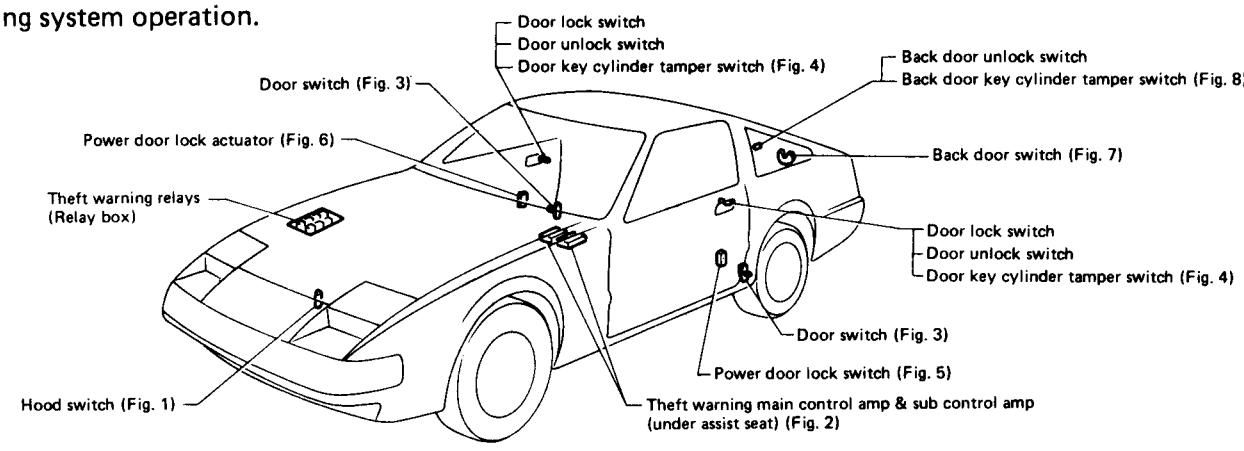
SEL669E

Note:

THEFT WARNING SYSTEM

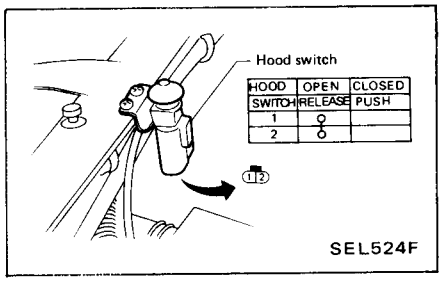
Location of Electrical Units

- When adjusting hood, front door, back door or removing & installing them or switches, check theft warning system operation.

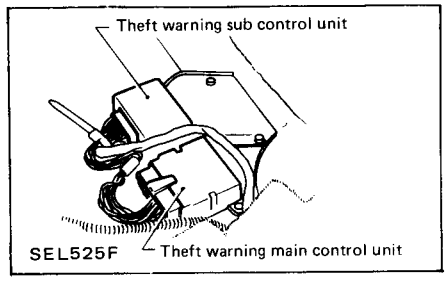


Operation of Switches and Sensors

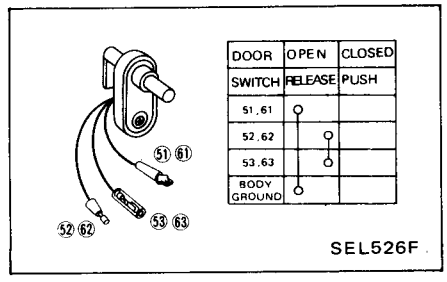
Hood switch (Fig. 1)



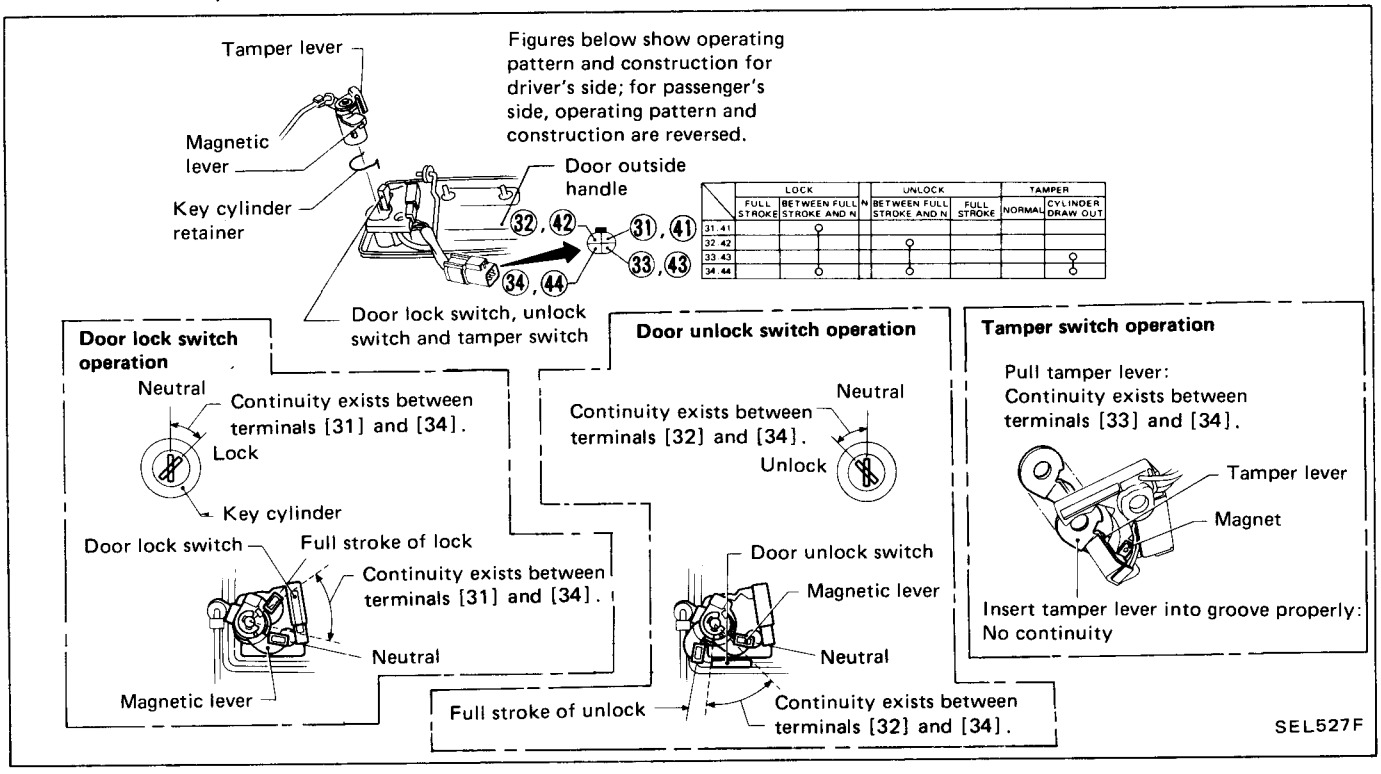
Theft warning main control unit & sub control unit (Fig. 2)



Door switch (Fig. 3)

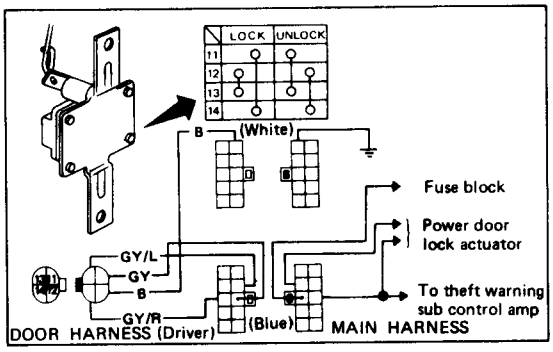


Door lock switch, unlock switch and key cylinder tamper switch (Fig. 4)

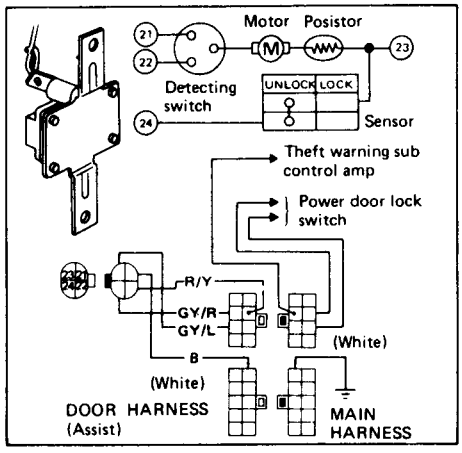


Operation of Switches and Sensors (Cont'd)

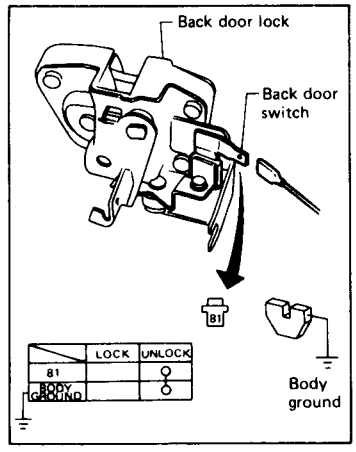
Power door lock switch (Fig. 5)



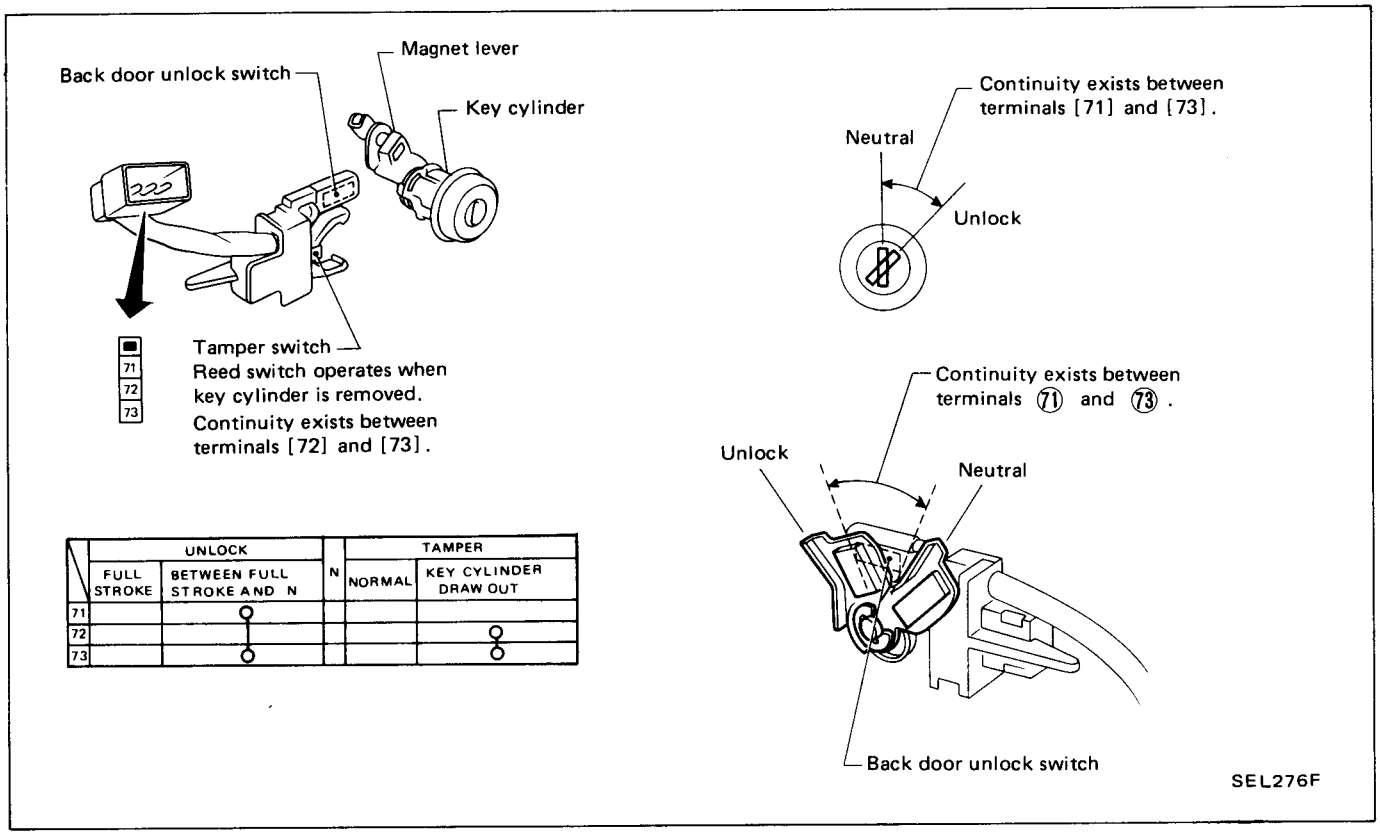
Power door lock actuator (Fig. 6)



Back door switch (Fig. 7)

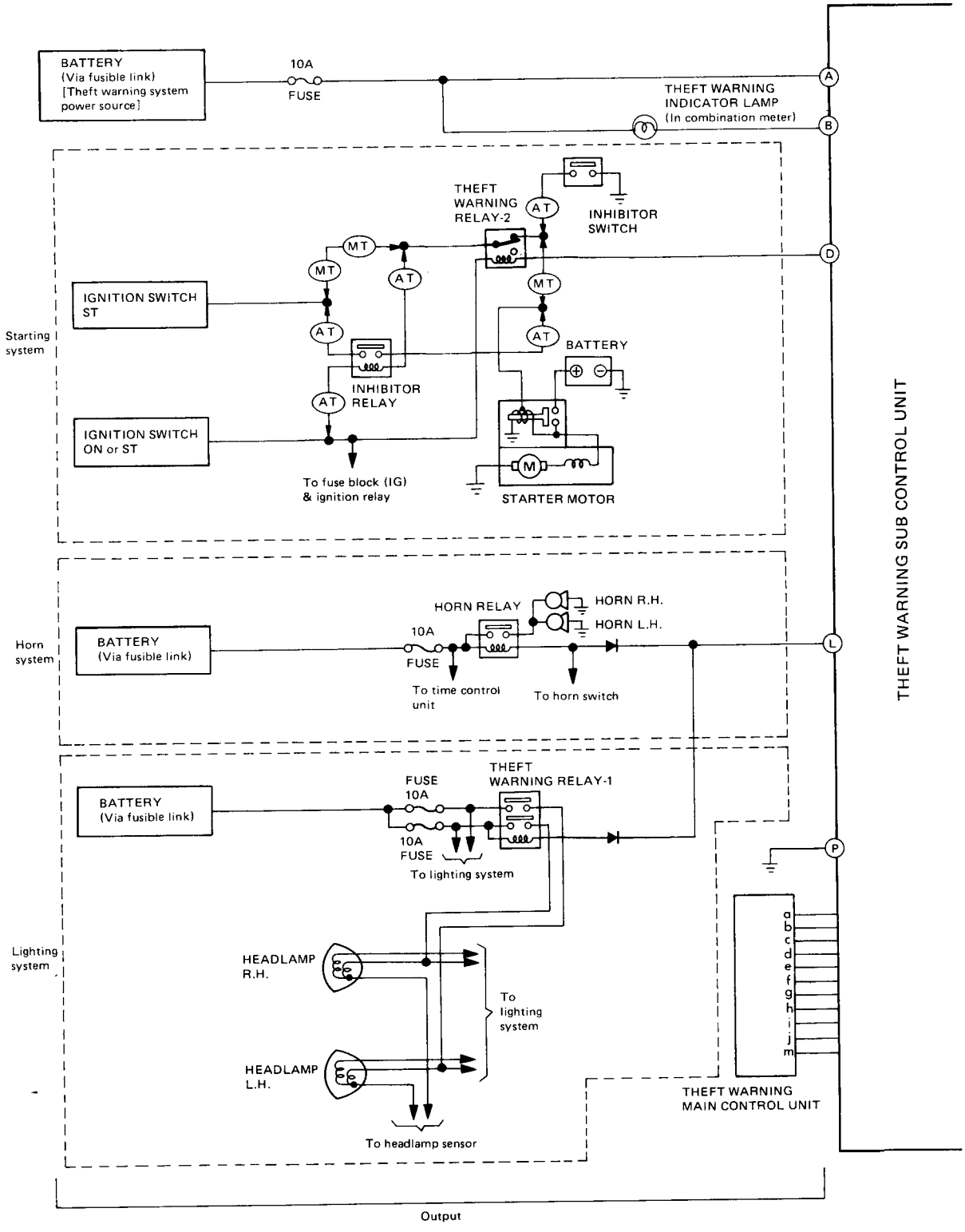


Back door unlock & key cylinder tamper switch (Fig. 8)

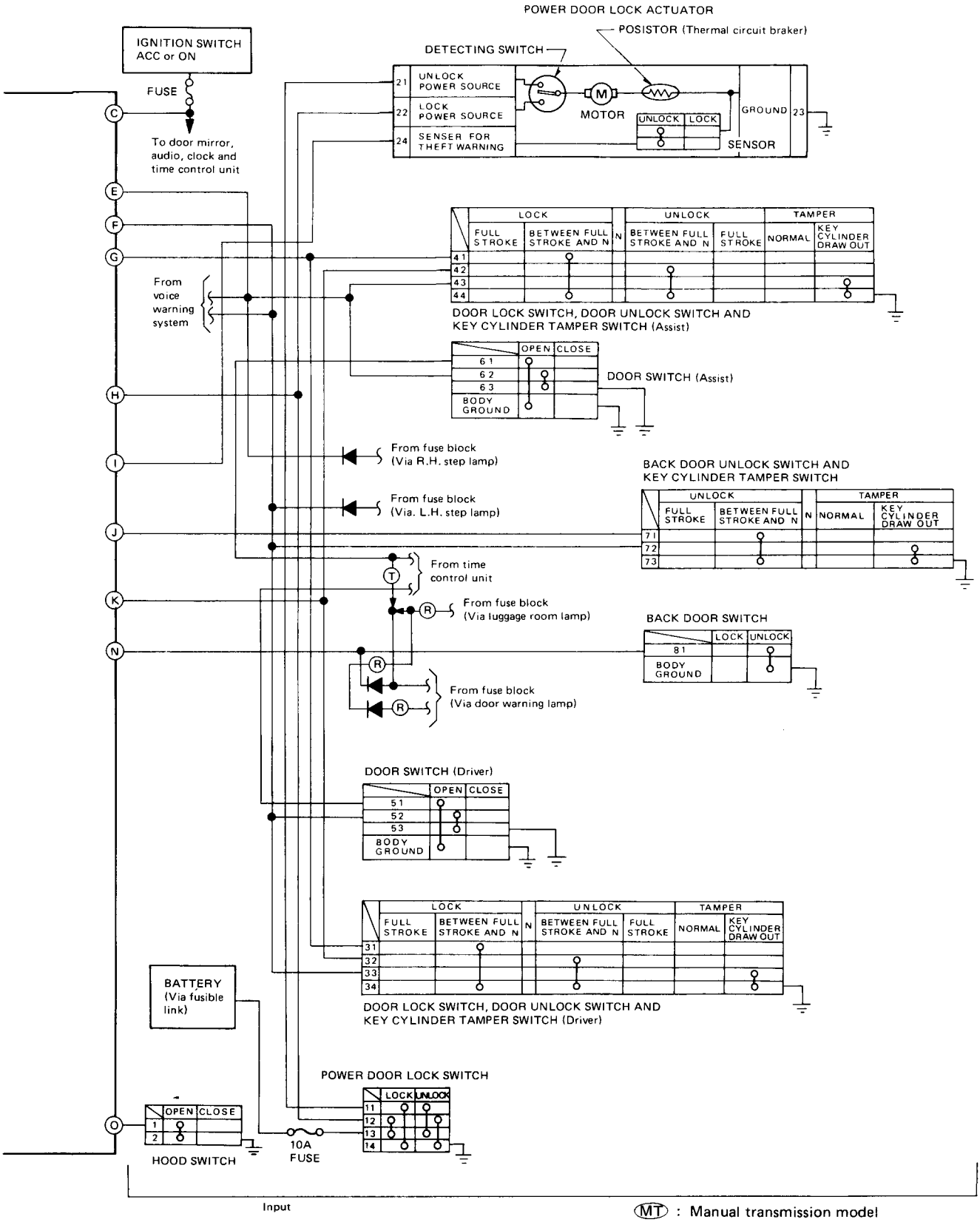


	UNLOCK		N	TAMPER	
	FULL STROKE	BETWEEN FULL STROKE AND N		NORMAL	KEY CYLINDER DRAW OUT
71		○			
72					○
73		○			○

Schematic


BATTERY
(Via fusible link)
[Theft warning system power source]
10A
FUSE
THEFT WARNING INDICATOR LAMP
(In combination meter)
A
B
THEFT WARNING RELAY-2
INHIBITOR SWITCH
AT
MT
IGNITION SWITCH ST
IGNITION SWITCH ON or ST
Starting system
INHIBITOR RELAY
BATTERY
To fuse block (IG) & ignition relay
STARTER MOTOR
D
THEFT WARNING SUB CONTROL UNIT
Horn system
HORN RELAY
HORN R.H.
HORN L.H.
10A FUSE
To time control unit
To horn switch
L
THEFT WARNING RELAY-1
FUSE 10A
10A FUSE
To lighting system
Lighting system
HEADLAMP R.H.
HEADLAMP L.H.
To lighting system
To headlamp sensor
P
a
b
c
d
e
f
g
h
i
j
m
THEFT WARNING MAIN CONTROL UNIT
Output

Schematic (Cont'd)

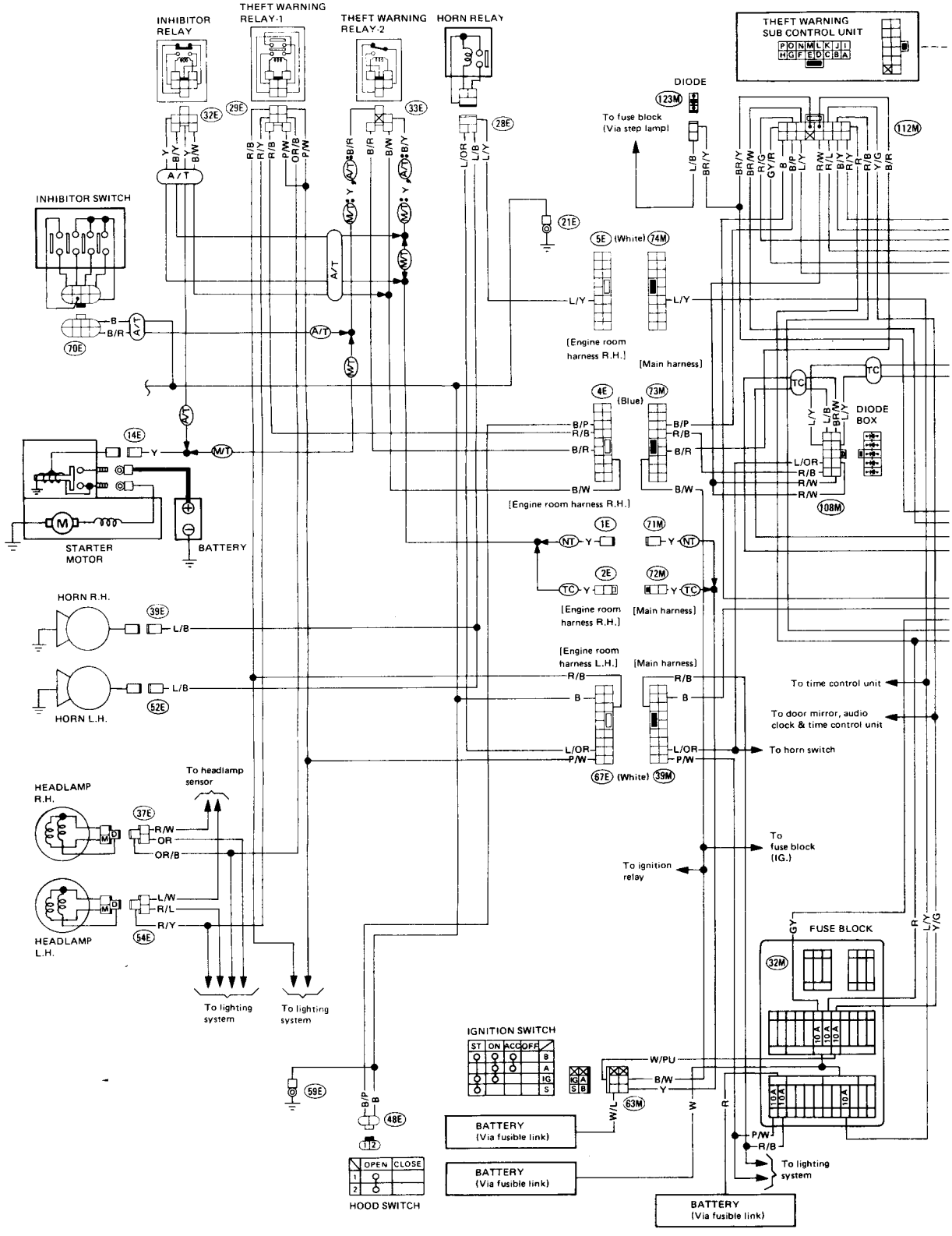


MT : Manual transmission model
AT : Automatic transmission model
T : 2 seater
R : 2+2 seater model

SEL528F

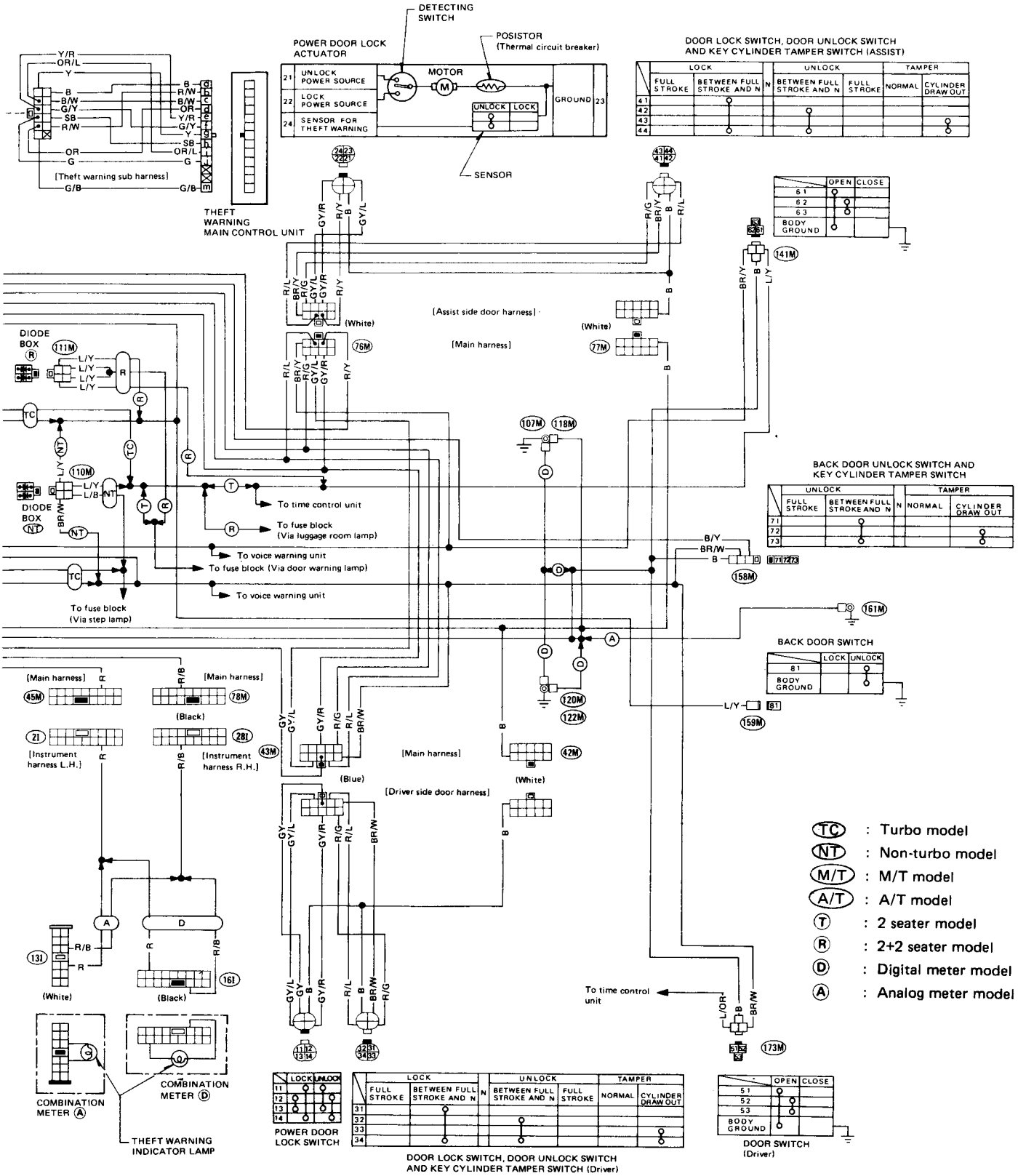
THEFT WARNING SYSTEM

Wiring Diagram



THEFT WARNING SYSTEM

Wiring Diagram (Cont'd)



SEL936G

THEFT WARNING SYSTEM

Trouble-shooting

- During trouble-shooting, if "checks Ⓐ – Ⓟ, Ⓩ" are indicated, be sure to refer to "checks Ⓐ – Ⓟ, Ⓩ" in the "Terminal check". (Refer to pages EL-182 - EL-184.)
- During trouble-shooting, if the cause of trouble is found to be due to "Faulty sub-control unit, Faulty main control unit or Faulty adapter harness", be sure to refer to "Control Unit Inspection".

Contents

No.	INCIDENT: The theft warning system responds in one of these ways.		Refer to **TROUBLE-SHOOTING PROCEDURE:**
1	Indicator lamp	does not blink (Remains out).	IND ①
2		remains blinking.	IND ②
3		does not come on (1).	IND ③
4		does not come on (2).	IND ④
5		remains lit.	IND ⑤
6		does not go out (Comes on).	IND ⑥
7		does not go out (Remains lit).	IND ⑦
8	Armed	is set even if ignition switch is in ACC or ON position.	ARM ①
9		is set even if at least one of doors is unlocked.	ARM ②
10		is set even if at least one of doors is open.	ARM ③
11		is not set (Armed phase).	ARM ④
12	Alarm	is given without any cause.	ALR ①
13		does not operate (Alarm phase).	ALR ②
14		does not stop (Alarm continues for outer 4 minutes).	ALR ③
15		does not stop even if stop signal is given.	ALR ④
16		stops too soon.	ALR ⑤
17		continues (Alarm is not intermittent).	ALR ⑥
18	Starter motor	cannot operate (Except alarm phase).	ST ①
19		can operate (Starter killed phase).	ST ②

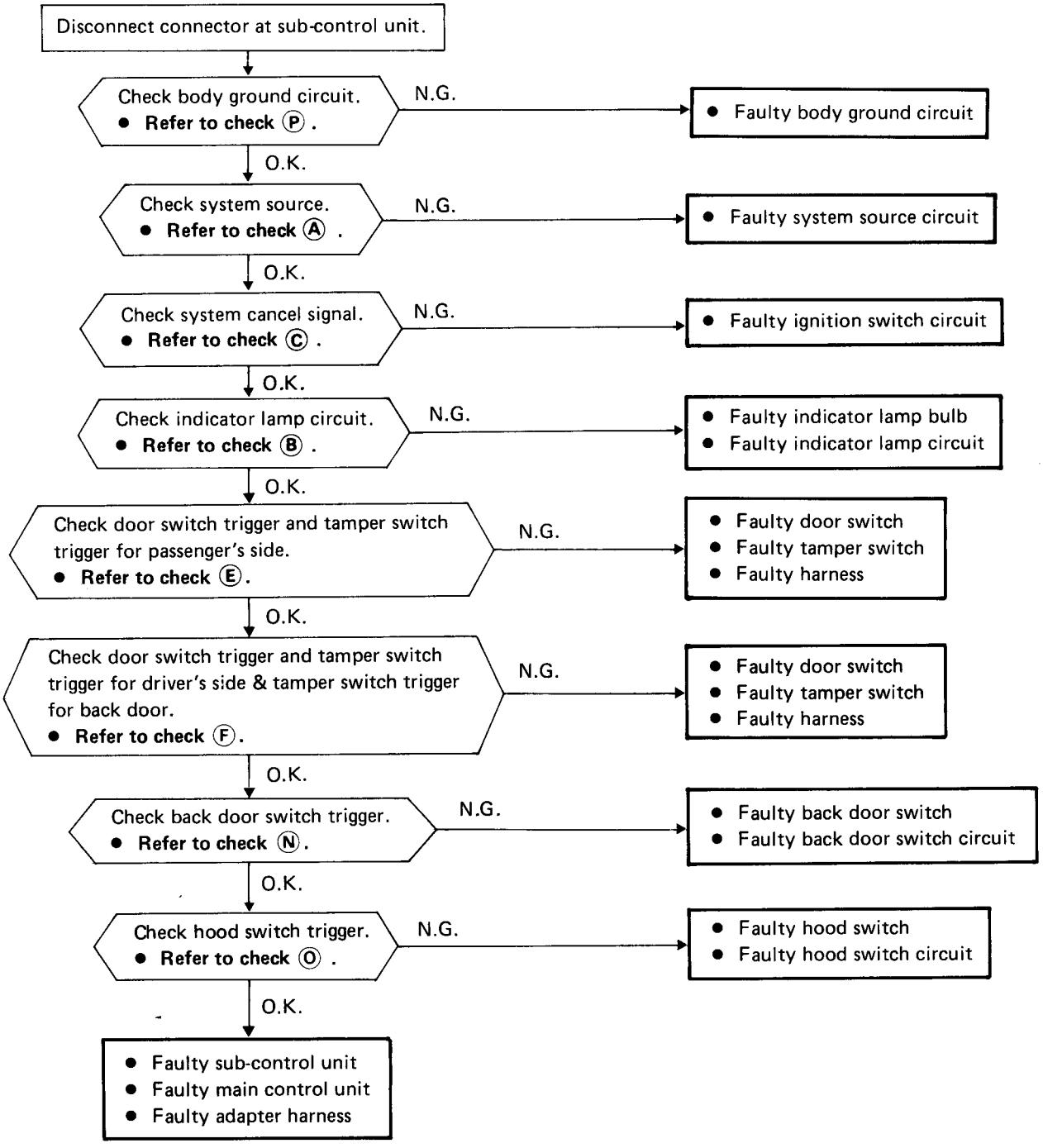
- Symbol: ▭ : Action ⬡ : Judgment ▭ : Probable cause

- "Armed phase" means that approx. 30 seconds have passed (Indicator lamp goes out) since locking and closing all doors.
- "Alarm phase" means that the horn sounds and the headlamps blink intermittently.
- "Starter killed phase" means that the starter does not work until one door is unlocked with the key after the alarm has sounded.

CUSTOMER COMPLAINT

1. Indicator lamp does not blink (Remains out).
   - Ignition switch OFF
   - At least one of the doors, hood, or back door is open.

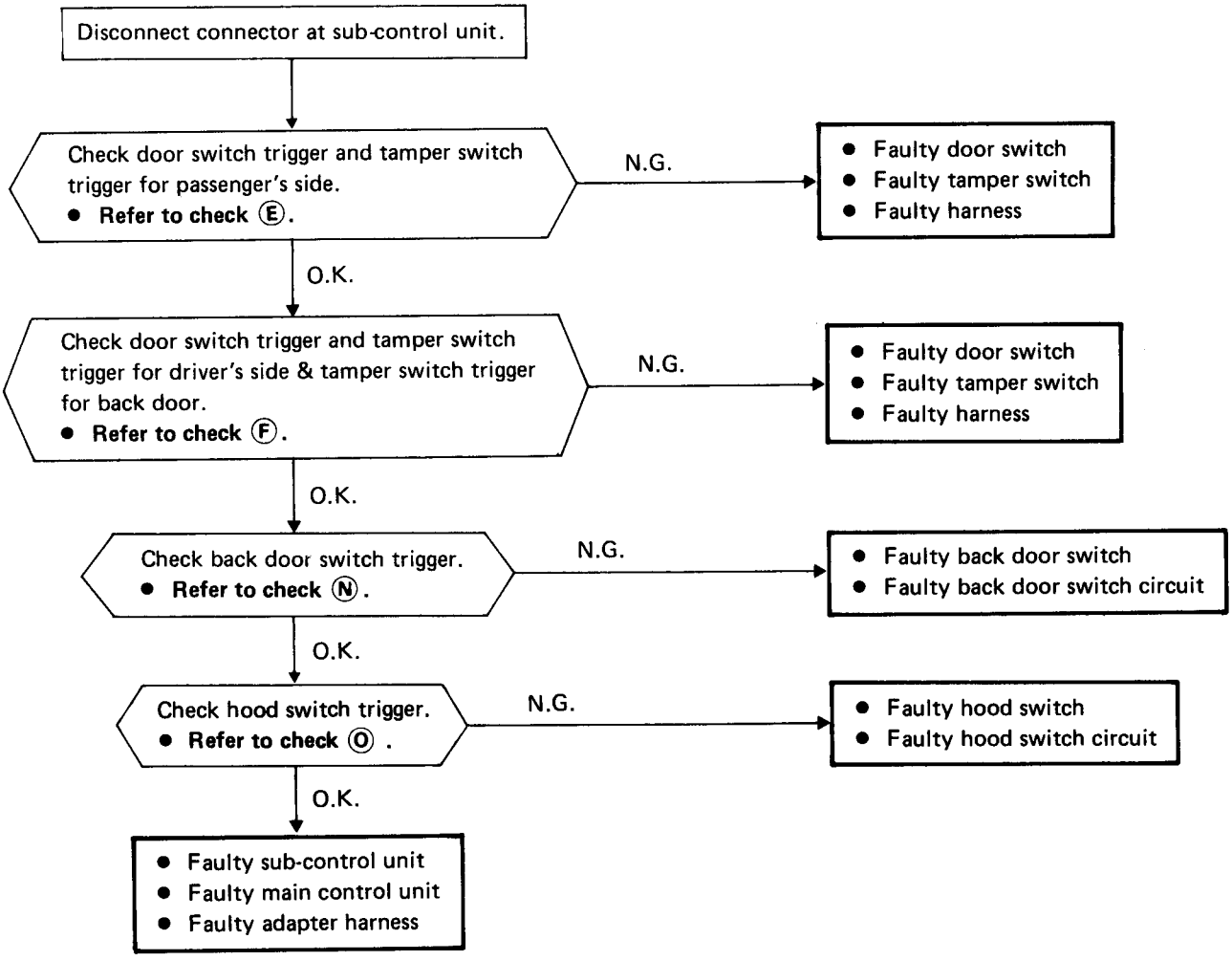
TROUBLE-SHOOTING PROCEDURE IND ①



Trouble-shooting (Cont'd)

2. Indicator lamp remains blinking.
   - Ignition switch OFF
   - Doors, hood and back door are closed.

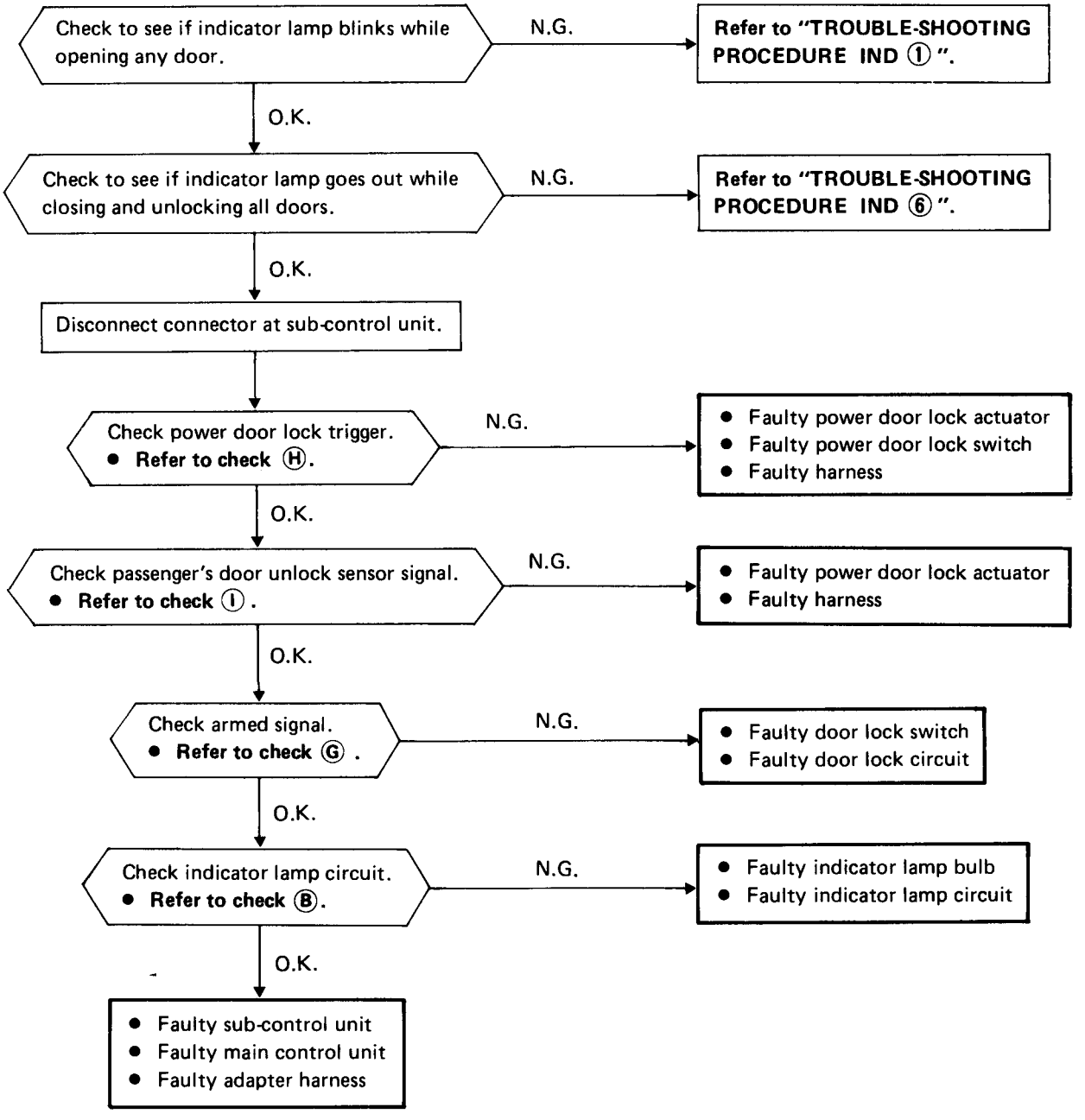
TROUBLE-SHOOTING PROCEDURE IND ②



Trouble-shooting (Cont'd)

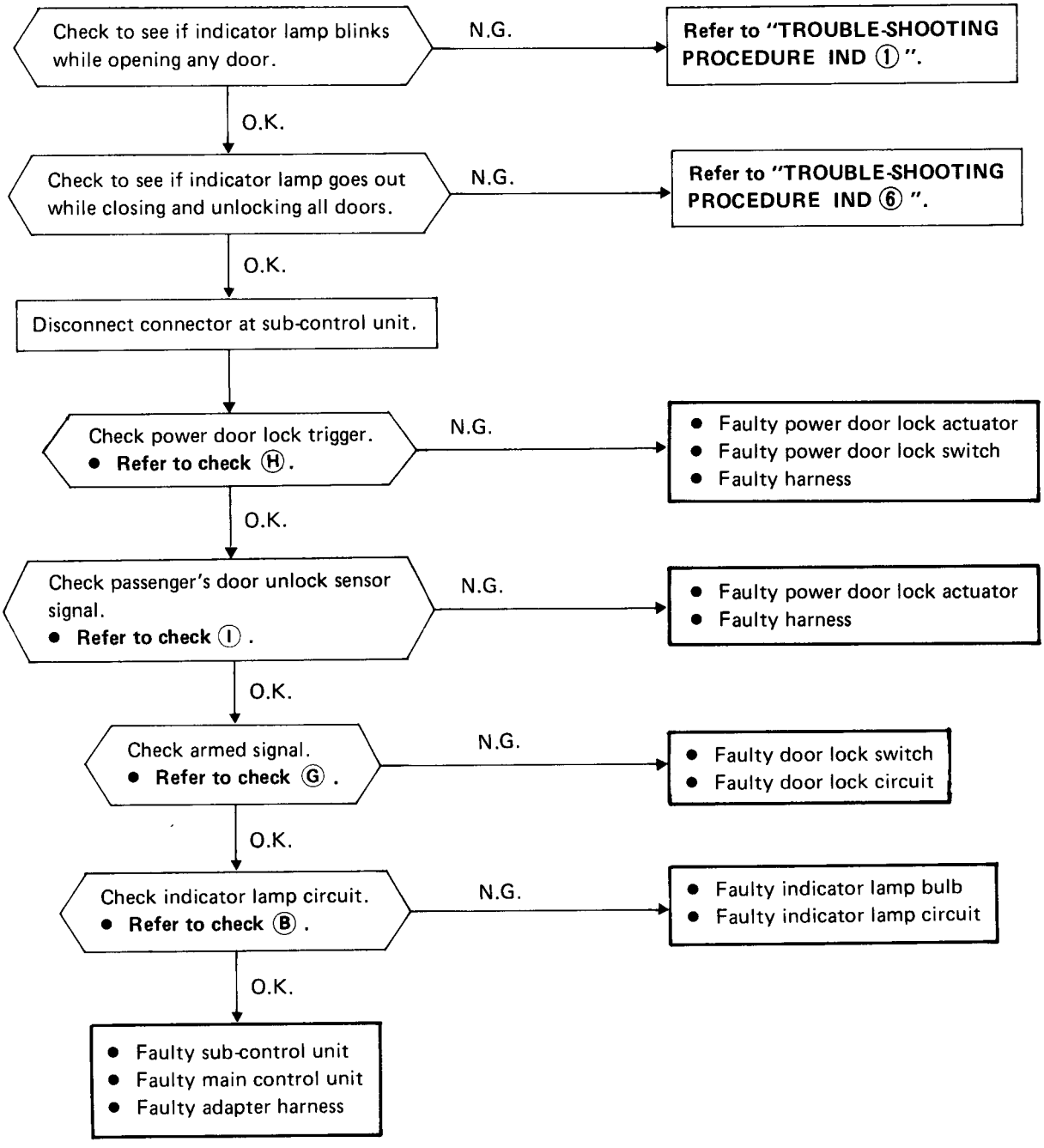
3. Indicator lamp does not come on (1).
   - Ignition switch OFF
   - Doors, hood and back door are closed.
   - After closing all doors, doors are locked with key.

TROUBLE-SHOOTING PROCEDURE IND ③



4. Indicator lamp does not come on (2).
   - Ignition switch OFF
   - After closing hood and back door, lock and close all doors without key. Or after locking and closing all doors, close hood and back door.

TROUBLE-SHOOTING PROCEDURE IND ④

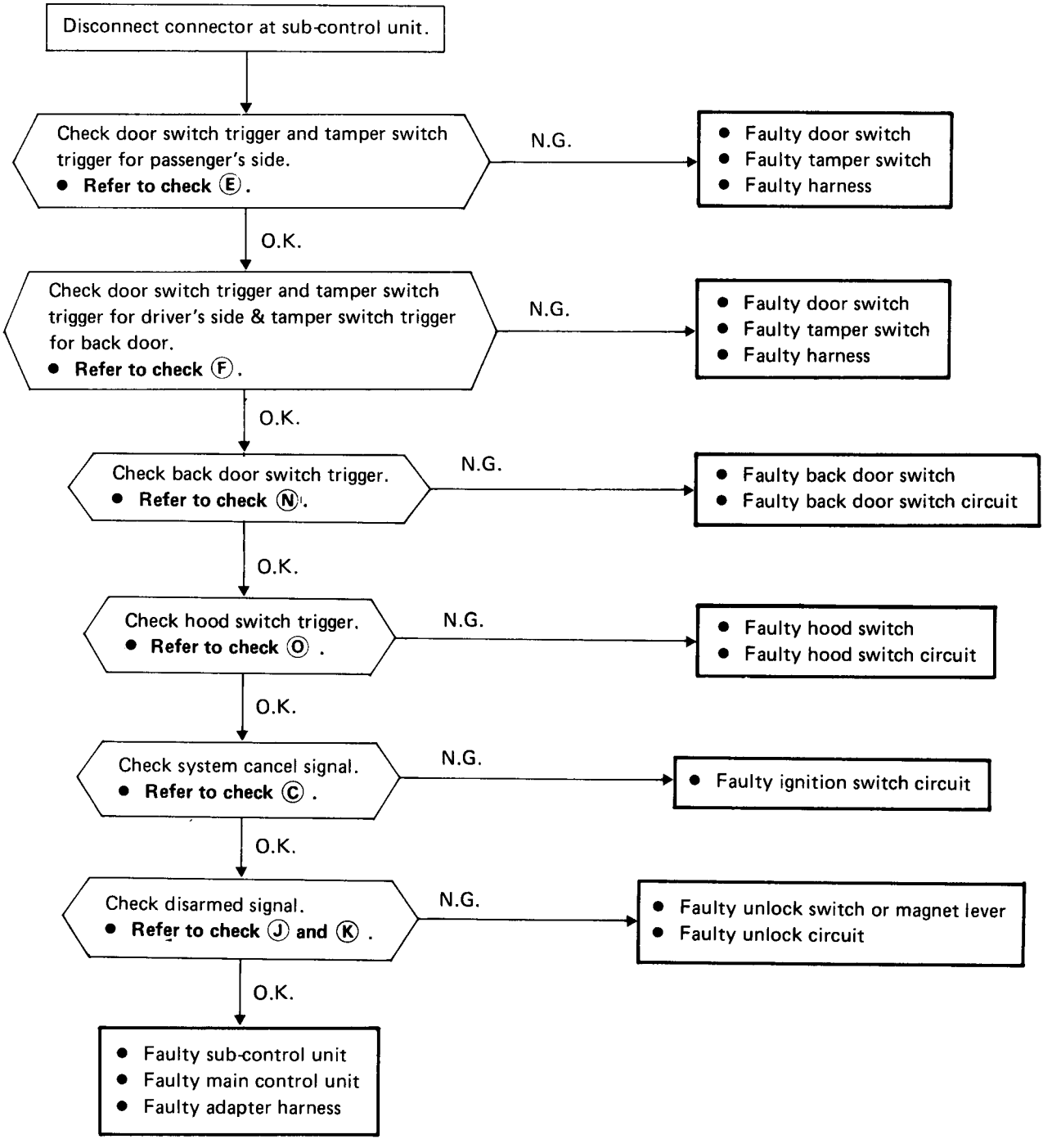


Trouble-shooting (Cont'd)

5. Indicator lamp remains lit.
   - Ignition switch OFF
   - At least one of the door is open or unlocked.

   or
   - Reset the armed phase.

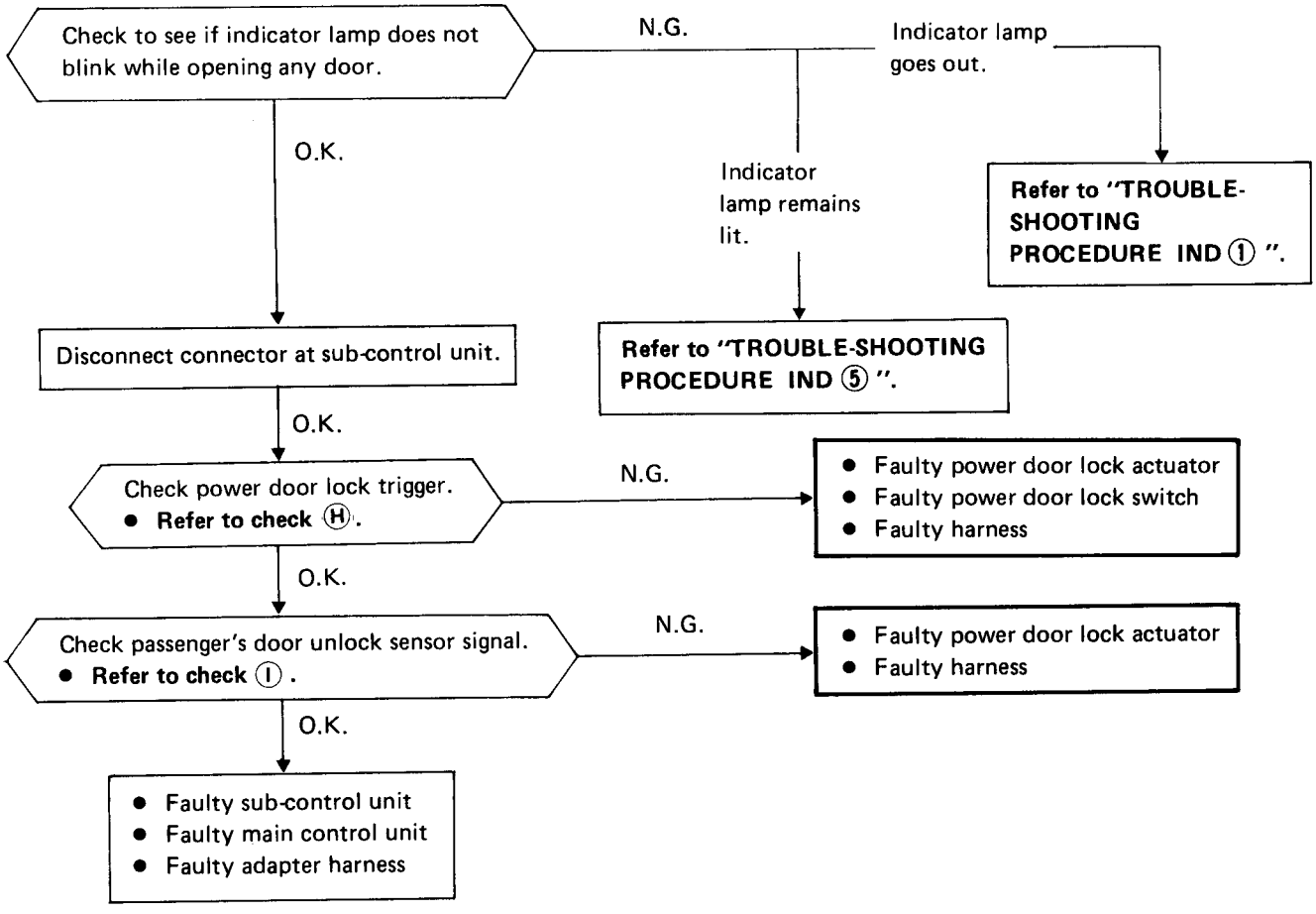
TROUBLE-SHOOTING PROCEDURE IND ⑤



Trouble-shooting (Cont'd)

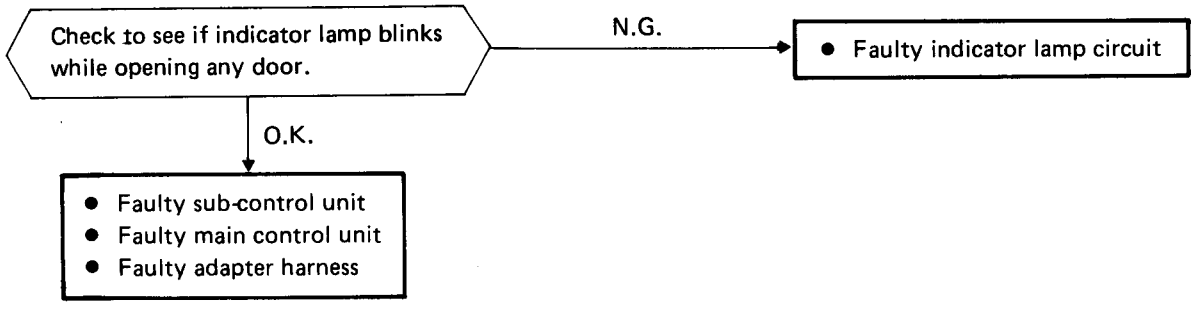
6. Indicator lamp does not go out (Comes on).
   - Ignition switch OFF
   - Doors close and at least one of the doors unlocks.

TROUBLE-SHOOTING PROCEDURE IND ⑥



7. Indicator lamp does not go out (Remains lit).
   - Ignition switch OFF.
   - More than 30 seconds have passed after closing and locking all doors.

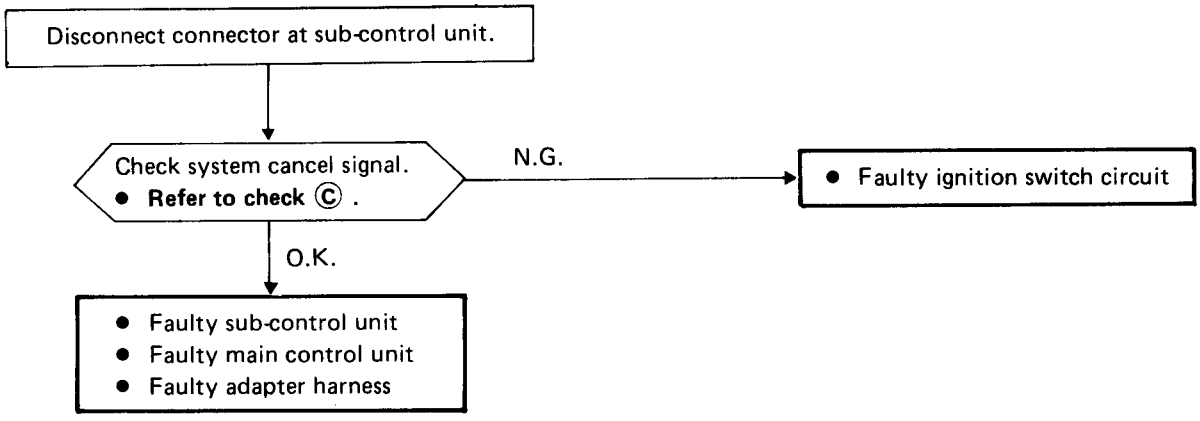
TROUBLE-SHOOTING PROCEDURE IND ⑦



Trouble-shooting (Cont'd)

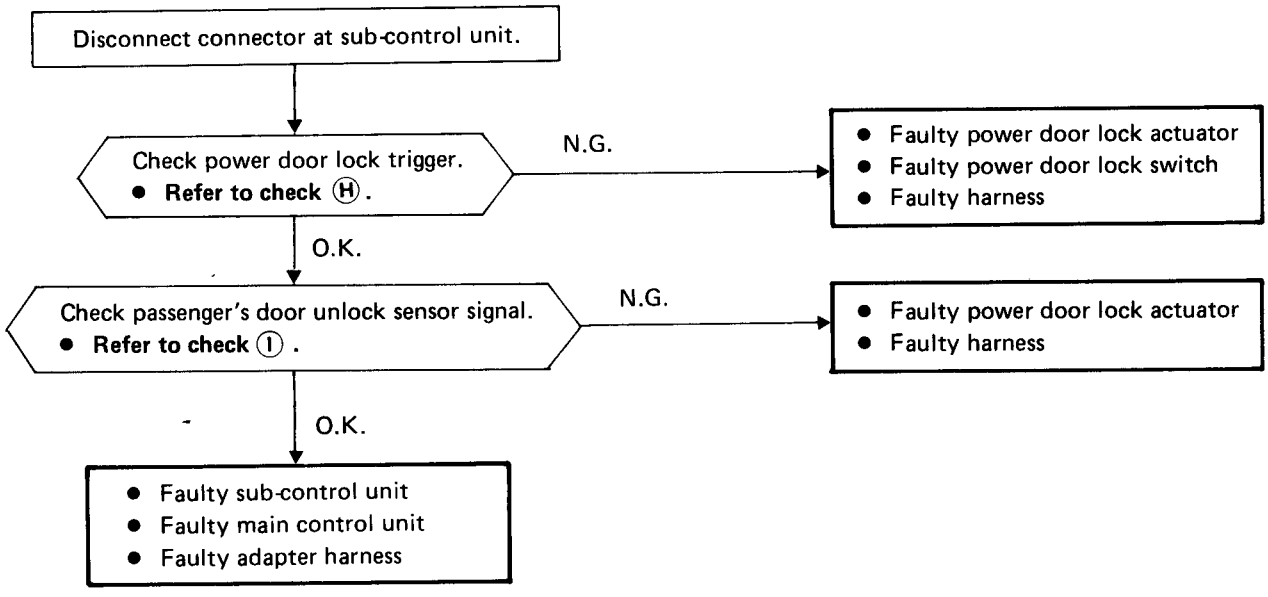
8. Armed is set, even if ignition switch is in ACC or ON position.

TROUBLE-SHOOTING PROCEDURE ARM ①



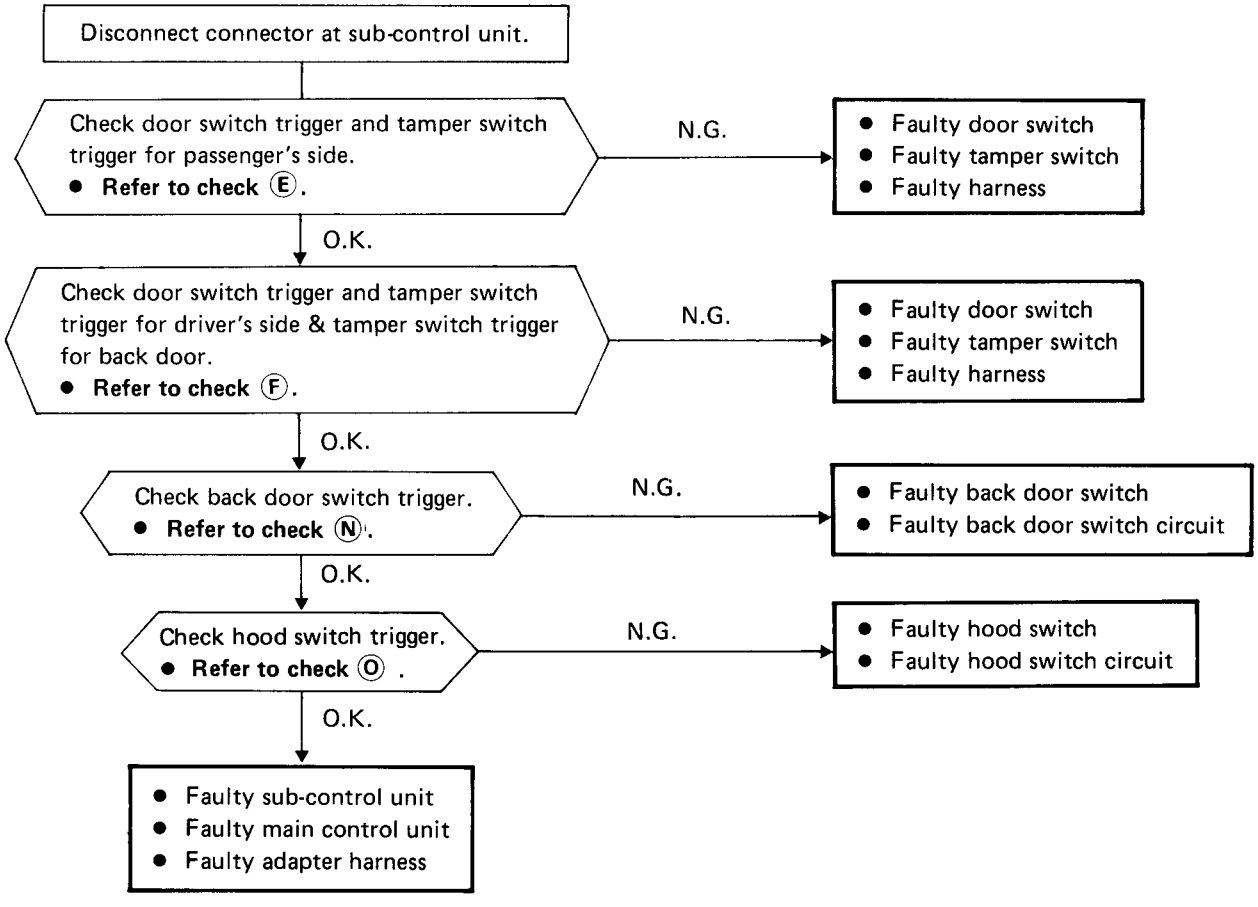
9. Armed is set, even if at least one of the doors is unlocked.

TROUBLE-SHOOTING PROCEDURE ARM ②



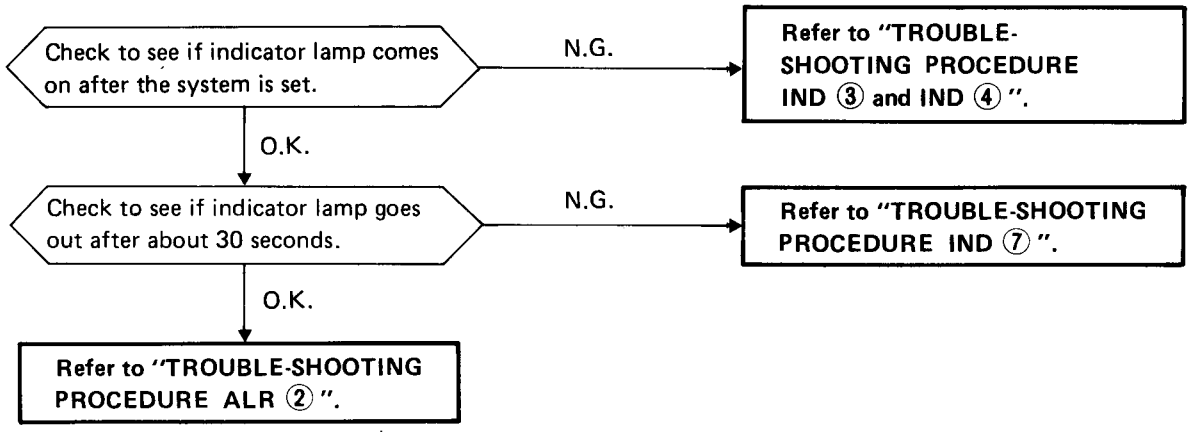
10. Armed is set, even if at least one of the doors is open.

TROUBLE-SHOOTING PROCEDURE ARM ③



11. Armed is not set, even if ignition switch is in OFF position and all doors are closed and locked.

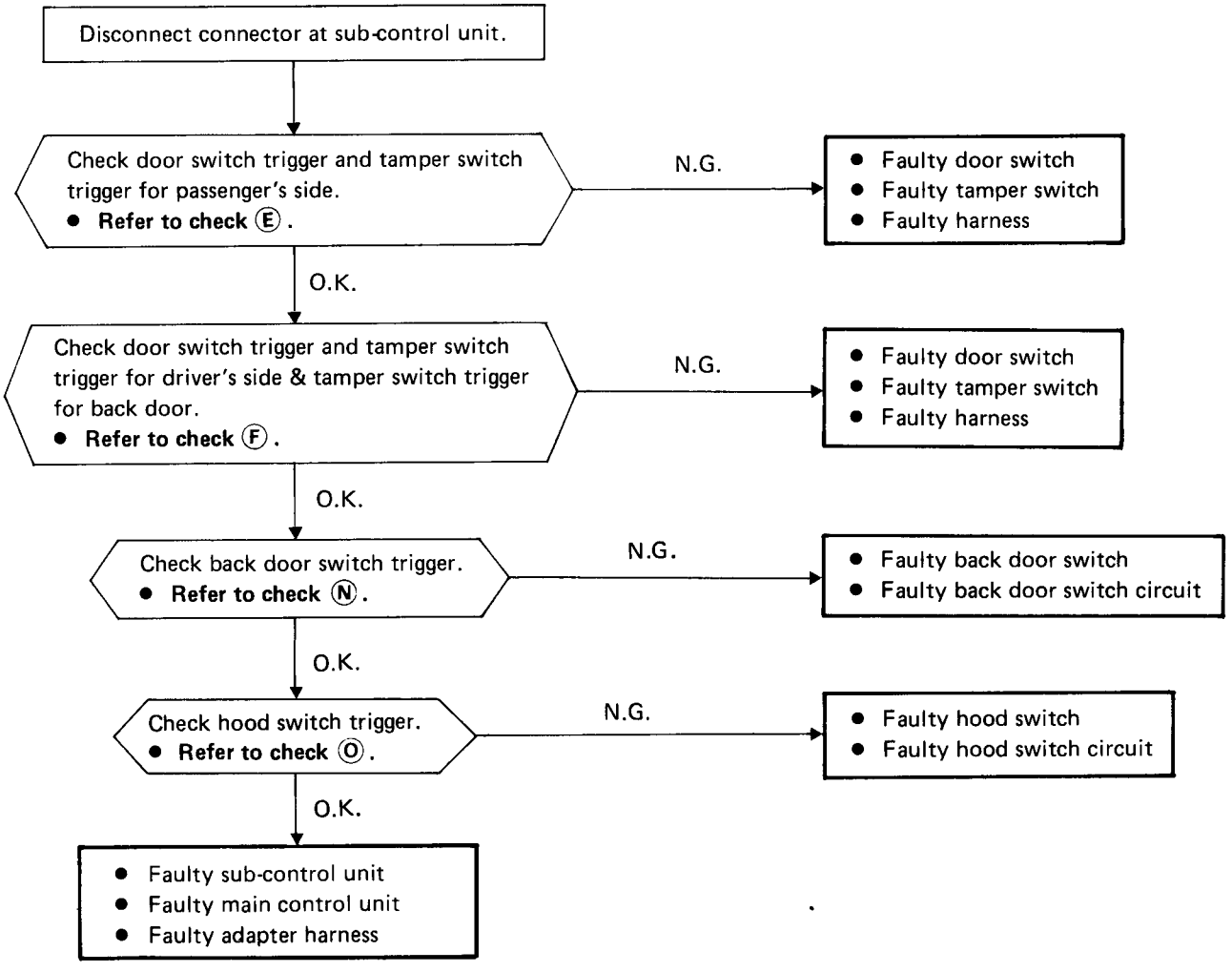
TROUBLE-SHOOTING PROCEDURE ARM ④



Trouble-shooting (Cont'd)

12. Alarm is given without any cause.
    - Ignition switch OFF
    - Doors locked and closed

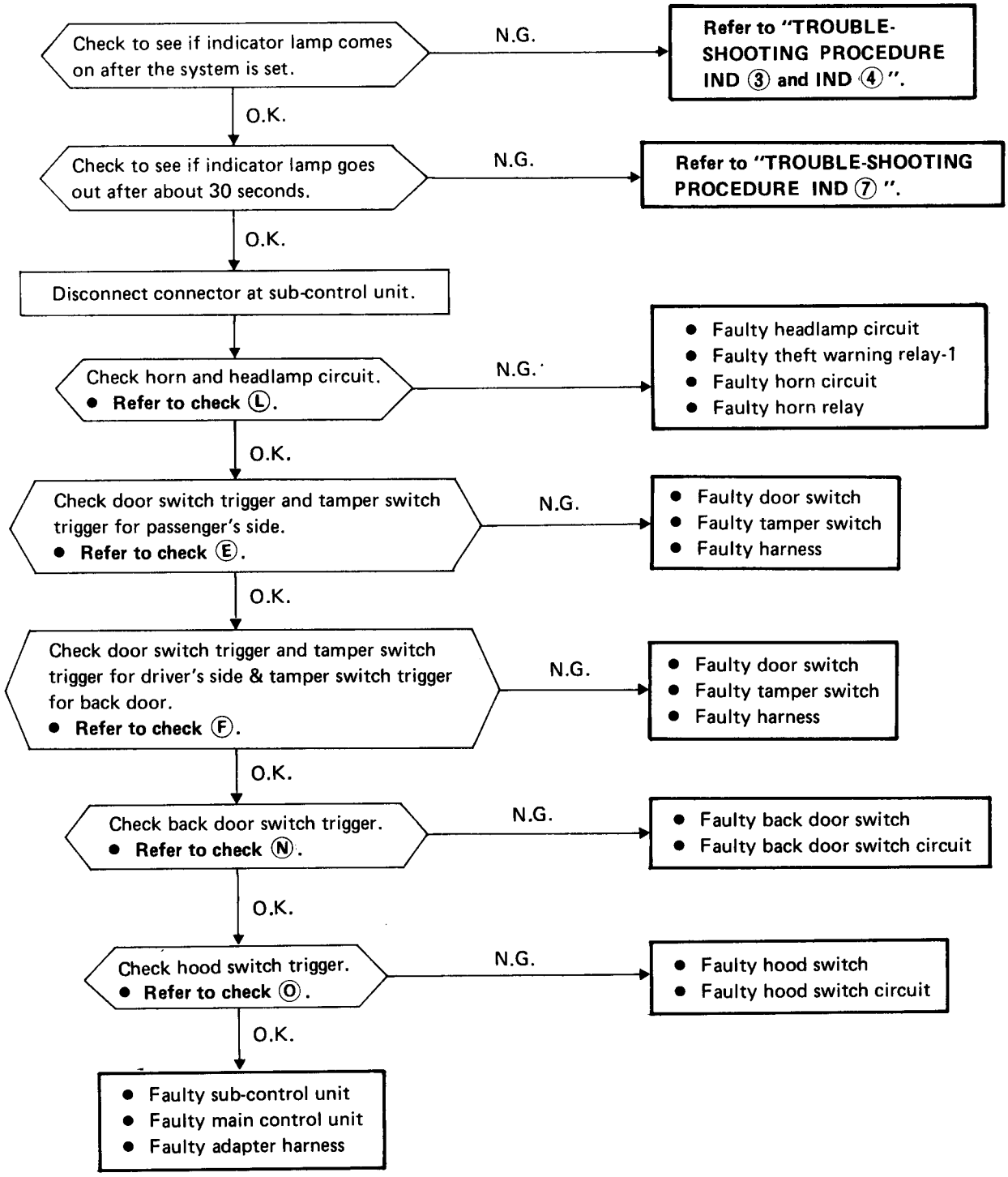
TROUBLE-SHOOTING PROCEDURE ALR ①



Trouble-shooting (Cont'd)

13. Alarm does not operate, even if any door is opened without key or any key cylinder is drawn out.

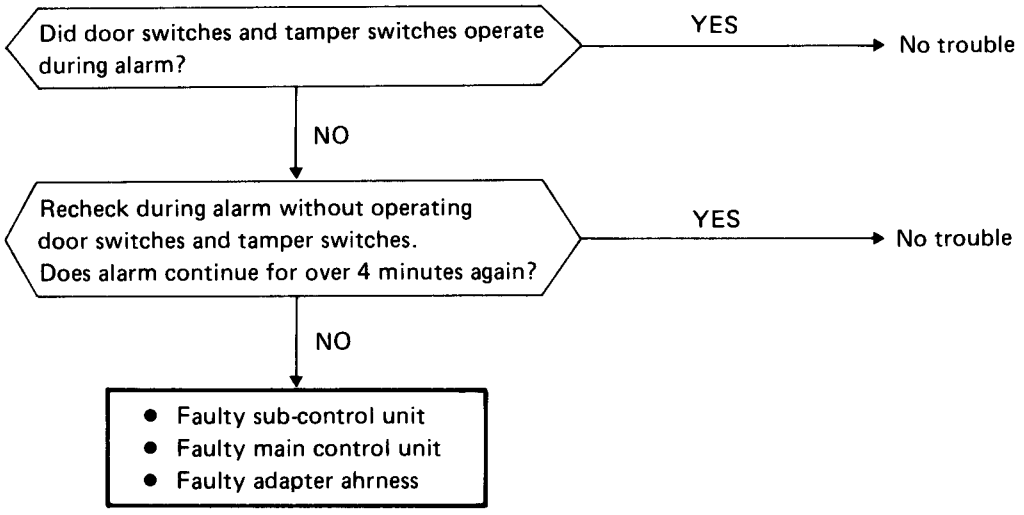
TROUBLE-SHOOTING PROCEDURE ALR ②



Trouble-shooting (Cont'd)

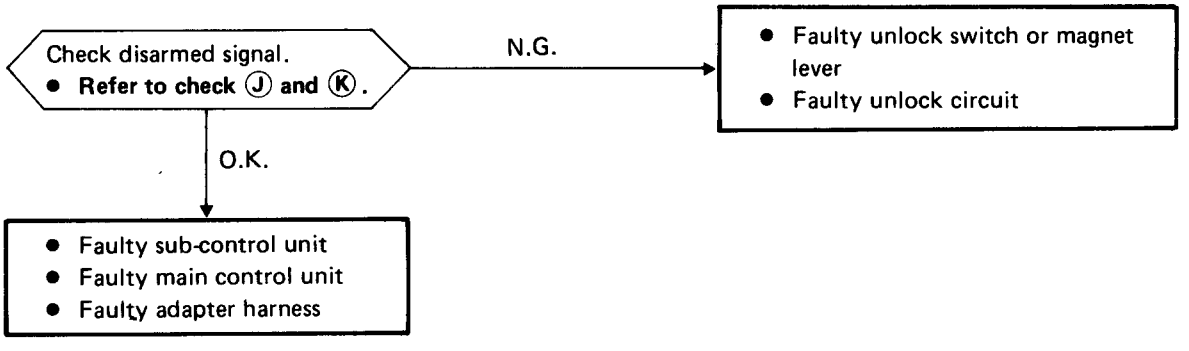
14. Alarm does not stop (Alarm continues for over 4 minutes).
    - Ignition switch OFF
    - Alarm phase

TROUBLE-SHOOTING PROCEDURE ALR ③



15. Alarm does not stop, even if any door or back door is unlocked with key or code number of keyless entry system is put in.

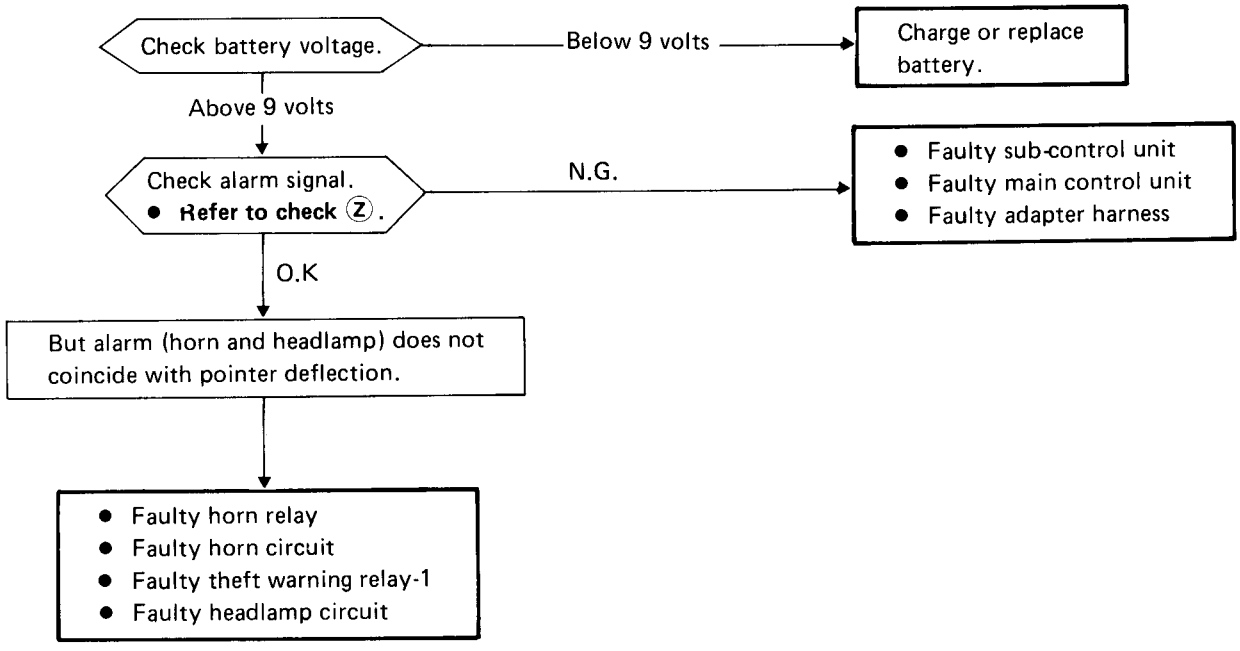
TROUBLE-SHOOTING PROCEDURE ALR ④



Trouble-shooting (Cont'd)

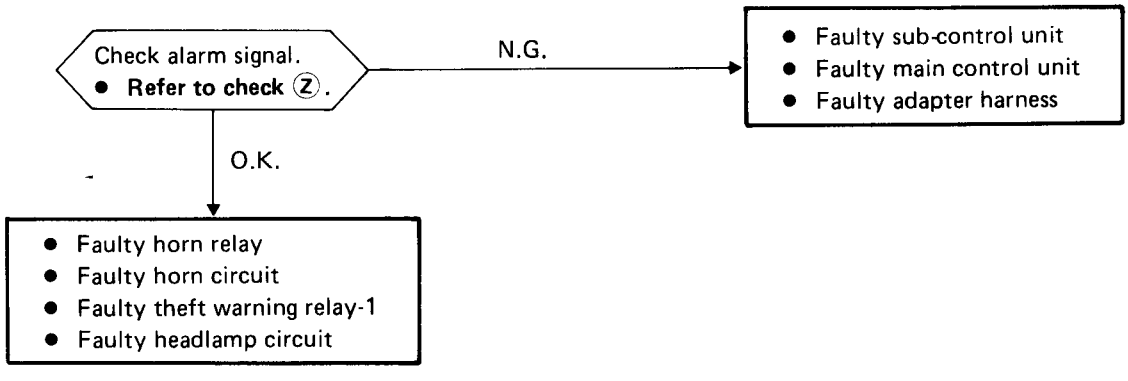
16. Alarm stops too soon (Alarm does not continue for 2 to 4 minutes).
    - Ignition switch OFF
    - Alarm phase

TROUBLE-SHOOTING PROCEDURE ALR ⑤



17. Alrm continues (Alarm is not intermittent).
    - Ignition switch OFF
    - Alarm phase

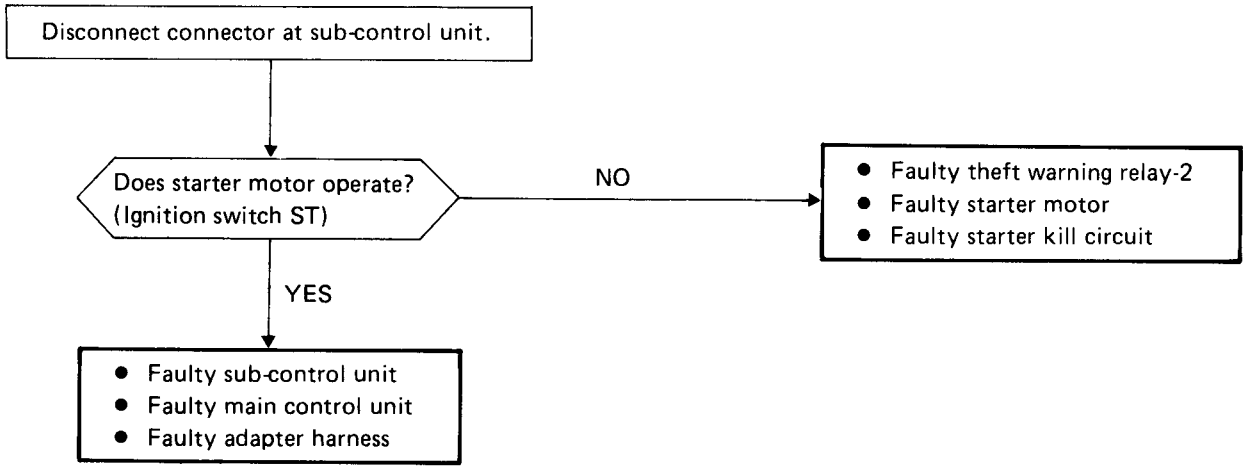
TROUBLE-SHOOTING PROCEDURE ALR ⑥



Trouble-shooting (Cont'd)

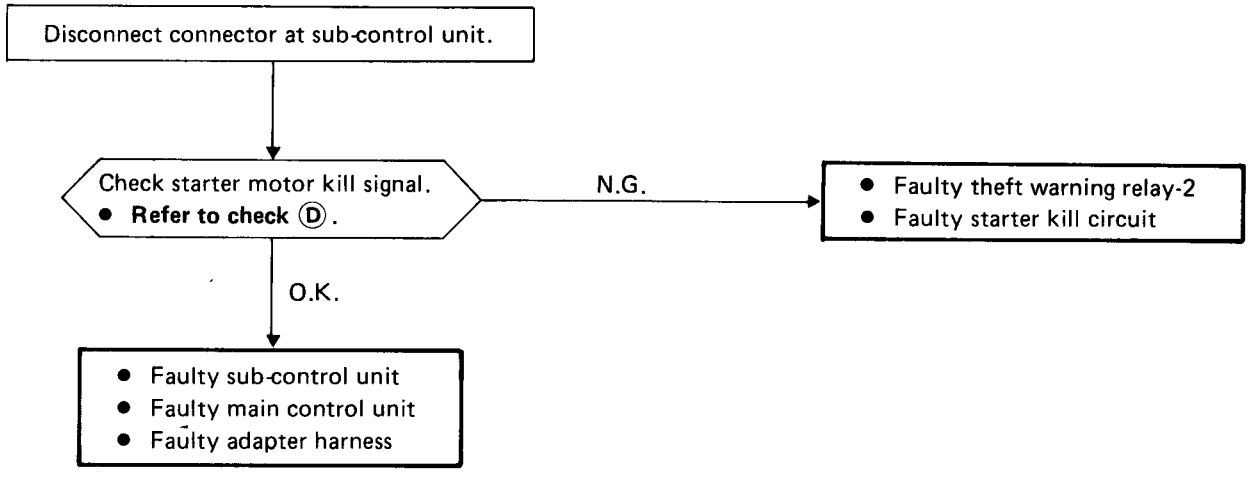
18. Starter motor does not operate (Except alarm phase).
    - Ignition switch ST

TROUBLE-SHOOTING PROCEDURE ST ①



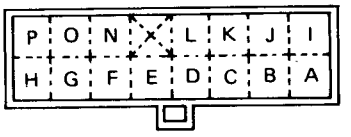
19. Starter motor operates (Starter killed phase).
    - Ignition switch ST

TROUBLE-SHOOTING PROCEDURE ST ②



THEFT WARNING SYSTEM

Terminal Check



Terminal arrangement of connector for theft warning sub-control unit (View from harness side)

Check table of connector terminals for sub-control unit. (Disconnect connector at sub-control unit)

Terminal	Function	From	Normal operation	If N.G., check
A	System source	Fuse box	Battery voltage should come between [A] and body ground	10A fuse, Harness
B	Security lamp operating control	Fuse box (Through security lamp)	Ground [B], security lamp should come on.	10A fuse, Harness, Bulb of security lamp
C	System cancel signal	Fuse box	Battery voltage should come between [C] and body ground when key is in A cc or ON.	10A fuse, Harness
D	Starter kill	Fuse box (Through theft warning relay-2)	Ground [D] starter should not operate.	Theft warning relay-2, Harness, Inhibitor relay (A/T), Inhibitor switch (A/T)
E	Door switch trigger and tamper switch trigger for passenger's side	Passenger's door switch and tamper switch	Battery voltage should come between [E] and body ground when passenger's door is closed. Zero voltage between [E] and body ground when passenger's door is open. Battery voltage between [E] and body ground when passenger's tamper switch is installed to key cylinder when passenger's door is closed.	Door switch, Tamper switch, Harness
F	Door switch trigger and tamper switch trigger of driver's side. Tamper switch trigger of back door.	Driver's door switch and tamper switch. Back door tamper switch.	Battery voltage should come between [F] and body ground when driver's door is closed. Zero voltage between [F] and body ground when driver's door is open. Battery voltage should come between [F] and body ground when driver's and back door tamper switches are installed to key cylinders (when driver's door is closed).	Door switch, Tamper switch, Harness
G	Arm signal	Door lock switches.	Continuity exists between [G] and body ground when key stops between neutral and full stroke of lock.	Door lock switch, Harness

Terminal Check (Cont'd)

Terminal	Function	From	Normal operation	If N.G., check
H	Power door lock trigger	Power door lock switch	Battery voltage should come between [H] and body ground when driver's door is locked. Zero voltage between [H] and body ground when driver's door is unlocked.	Power door lock actuator, Power door lock switch
I	Passenger's door unlock sensor signal	Power door lock actuator	Continuity exists between [I] and body ground when passenger's door is unlocked. No continuity between [I] and body ground when passenger's door is locked.	Power door lock actuator
J	Disarm signal Back door	Back door unlock switch	Continuity exists between [J] and body ground when key stops between neutral and full stroke of unlock.	Unlock switch, Harness
K	Disarm signal (Driver's and passenger's doors)	Door unlock switches	Continuity exists between [K] and body ground when key stops between neutral and full stroke of unlock.	Unlock switch, Harness
L	Alarm signal	Fuse box (Through horn relay) Fuse box (Through theft warning relay-1)	Ground [L], horn should sound and headlamp should come on.	Horn relay, Theft warning relay-1, 15A, 10A fuse, Harness
N	Back door switch trigger	Back door switch	Battery voltage should come between [N] and body ground when back door is closed. Zero voltage between [N] and body ground when back door is open.	Back door switch, Harness
O	Hood switch trigger	Hood switch	No continuity between [O] and body ground when hood is closed. Continuity exists between [O] and body ground when hood is open.	Hood switch, Harness
P	System ground	Body ground	Continuity exists between [P] and body ground.	Body ground terminal, Harness

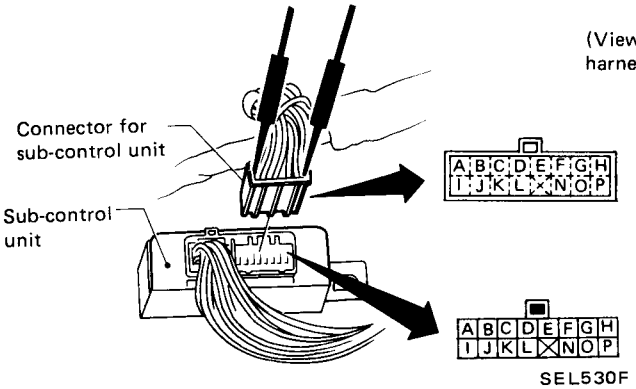
Connect connector to sub-control unit

Terminal	Function	From	Normal operation	If N.G., check
L (Check Ⓩ)	Alarm signal	Fuse box (Through horn relay) Fuse box (Through theft warning relay-1)	Pointer deflection should come intermittently under alarm phase.	Sub-control unit, Main control unit, Adapter harness

Terminal Check (Cont'd)

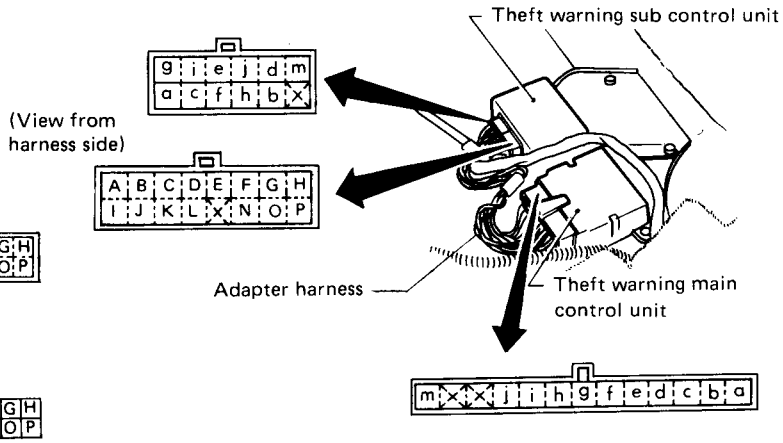
Preparation for check

- Disconnect body harness connector at sub-control unit. (Except check Ⓩ)



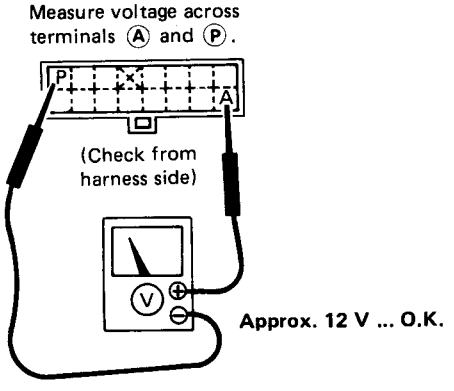
SEL530F

Terminal arrangement for check (View from harness side)



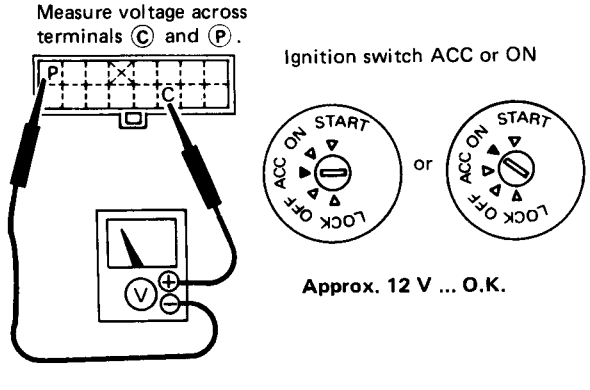
SEL531F

CHECK Ⓐ ... System source check



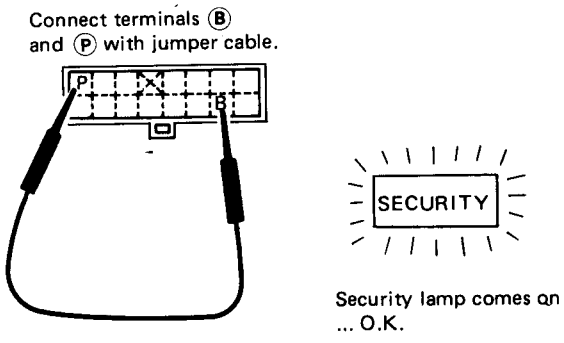
SEL535F

CHECK Ⓒ ... System cancel signal check



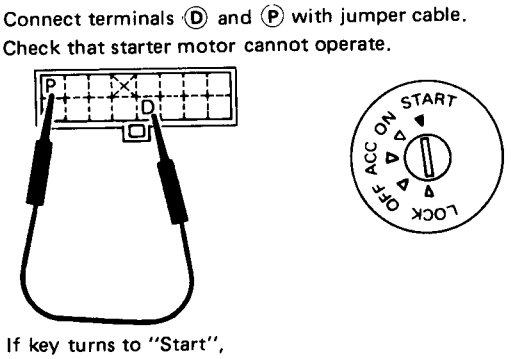
SEL537F

CHECK Ⓑ ... Security lamp circuit check



SEL536F

CHECK Ⓓ ... Starter kill signal check

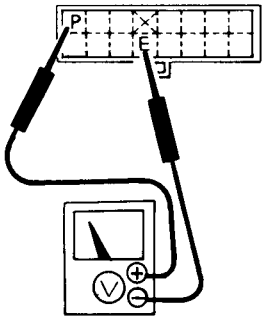


SEL538F

Terminal Check (Cont'd)

CHECK Ⓔ ... Door switch trigger and tamper switch trigger for passenger's side

Measure voltage across terminals Ⓟ and Ⓔ.

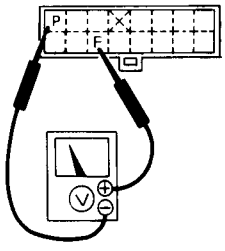


Passenger's door is closed.
..... 12V
Passenger's door is open.
..... 0V
Passenger's tamper switch is installed to key cylinder with passenger's door closed.
... 12V
Passenger's tamper switch is removed from key cylinder with passenger's door closed.
..... 0V
... O.K.

SEL539F

CHECK Ⓕ ... Door switch trigger and tamper switch trigger for driver's side & tamper switch trigger for back door

Measure voltage across terminals Ⓕ and Ⓟ.

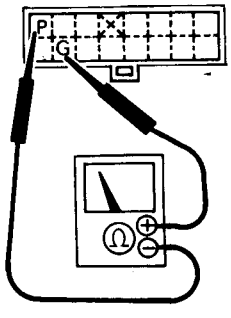


Driver's door is closed
..... 12V
Driver's door is open
..... 0V
Driver's and back door tamper switches are installed to key cylinders with driver's door closed
.... 12V
At least one of driver's and back door tamper switches is removed from key cylinder with driver's door closed.
..... 0V
... O.K.

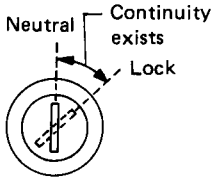
SEL540F

CHECK Ⓖ ... Arm signal check

Check for continuity between terminals Ⓖ and Ⓟ.



[Example]
Key cylinder for driver's side



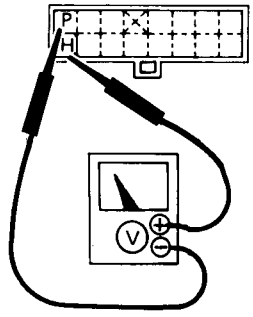
- Stop key between neutral and full stroke of lock

Continuity exists ... O.K.

SEL541F

CHECK Ⓗ ... Power door lock trigger

Measure voltage across terminals Ⓗ and Ⓟ.

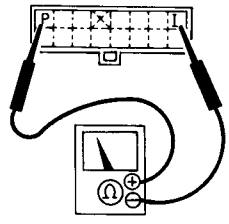


Driver's door is locked
..... 12V
Driver's door is unlocked
..... 0V
... O.K.

SEL542F

CHECK Ⓘ ... Passenger's door unlock sensor signal

Check for continuity between terminals Ⓘ and Ⓟ.

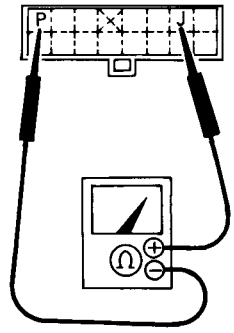


Passenger's door is unlocked
.....Continuity exists
Passenger's door is lock locked
.....No continuity
... O.K.

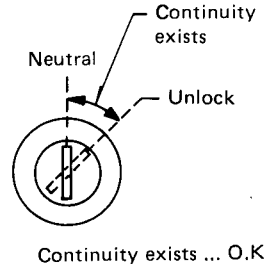
SEL543F

CHECK Ⓙ ... Disarm signal of back door unlock switch check

Check for continuity between terminals Ⓙ and Ⓟ.



- Stop key between neutral and full stroke of unlock

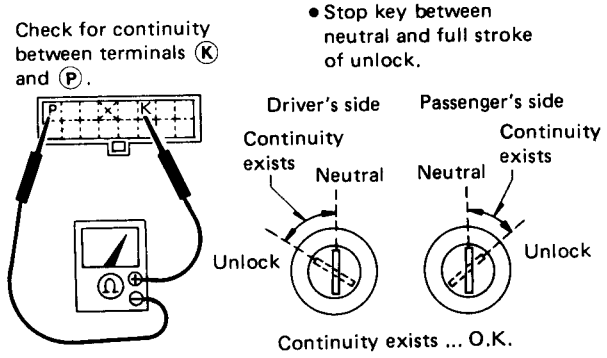


Continuity exists ... O.K.

SEL534F

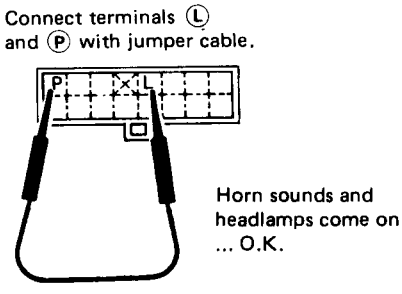
Terminal Check (Cont'd)

CHECK Ⓚ ... Disarm signal of door unlock switch check



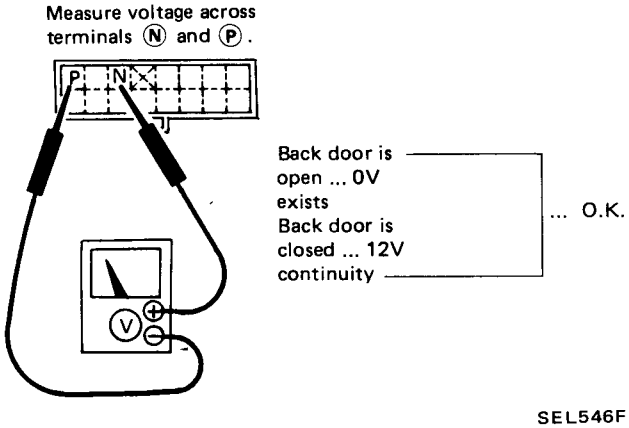
SEL544F

CHECK Ⓛ ... Alarm check



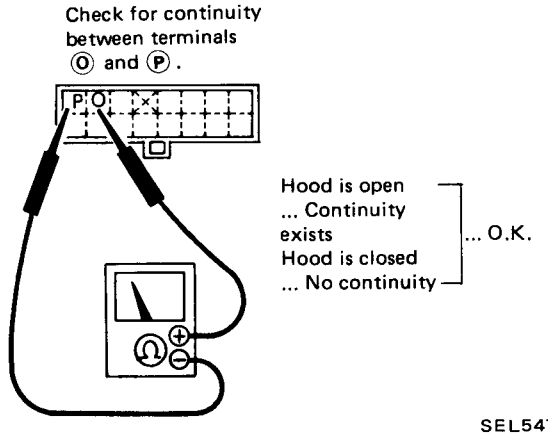
SEL545F

CHECK Ⓝ ... Back door switch trigger check



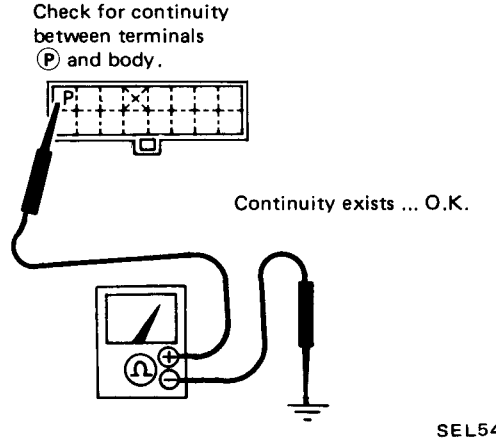
SEL546F

CHECK Ⓞ ... Hood switch trigger check



SEL547F

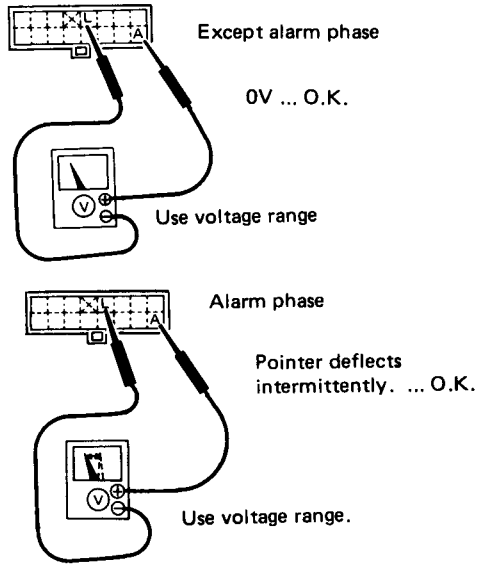
CHECK Ⓟ ... Body ground circuit check



SEL548F

CHECK Ⓩ ... Alarm signal check

1. Connect connector to theft warning sub-control unit.
2. Connect between terminals Ⓐ and Ⓛ.



SEL549F

Control Unit Check

CONTROL UNIT INSPECTION

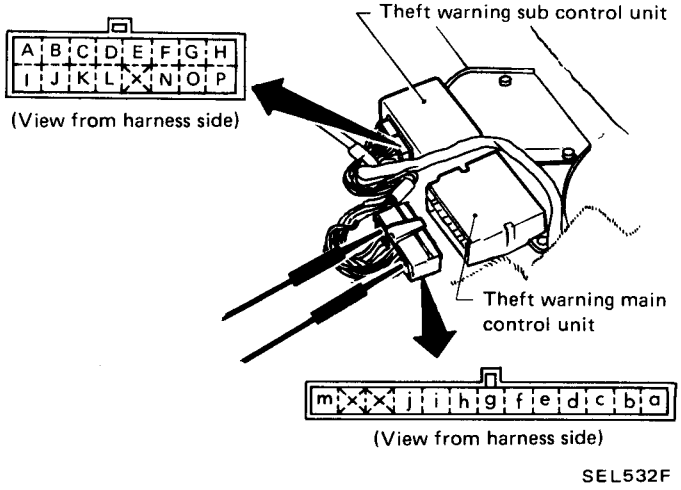
- This inspection is available only when the cause of trouble in "Trouble-shooting" is due to a " faulty sub-control unit" or "faulty main control unit" or "faulty adapter harness".
- This inspection should be carried out with adapter harness disconnected at main control unit. When disconnecting adapter harness, first disconnect battery ground cable. Be sure to reconnect battery ground cable afterwards.

TROUBLE-SHOOTING PROCEDURE

1. (O.K.) in following checks indicates "Replace main control unit" and (N.G.) indicates "Replace sub-control unit or "Replace adapter harness".
2. In case of (N.G.), check adapter harness referring to "Adapter harness check".
3. If theft warning does not operate normally even after replacing sub-control unit, replace main control unit.

Preparation for check

Disconnect adapter harness at main control unit.



SEL532F

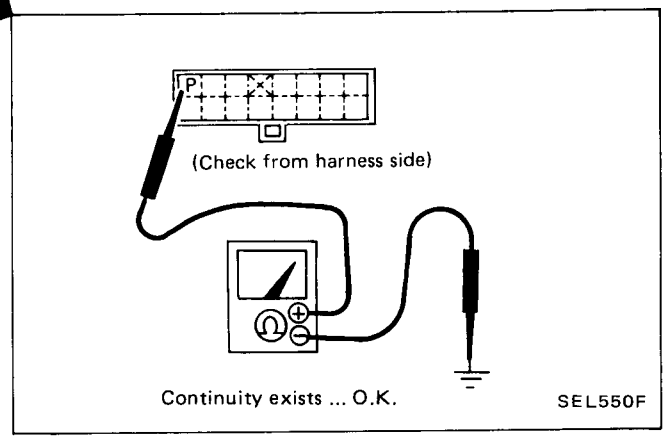
Control Unit Check (Cont'd)

Check ⓐ ... Ground circuit check

Check for continuity between terminals sub-control unit ⓟ and body.

N.G. → Faulty ground circuit

O.K.

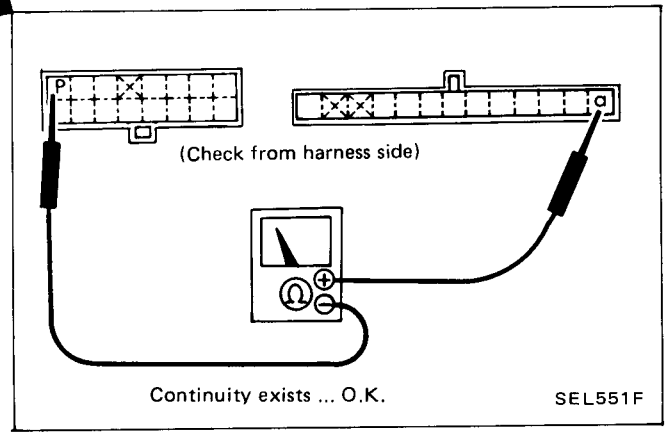


Check for continuity terminals ⓐ and sub-control unit ⓟ.

N.G. → (N.G.) Replace sub-control unit or adapter harness. (Refer to "Adapter harness check".)

O.K.

(O.K.) Replace main control unit.



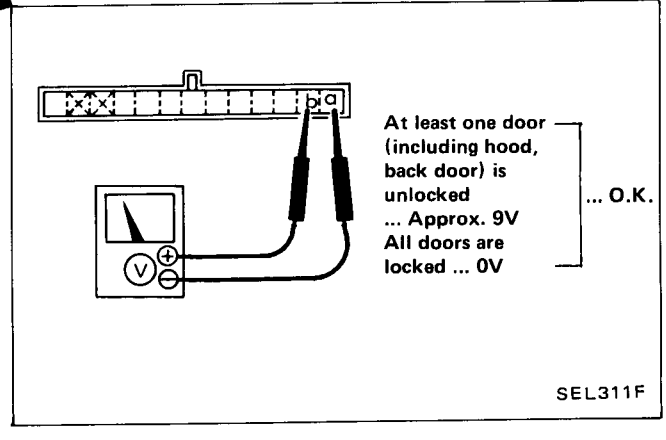
Check ⓑ ... Door unlock signal check

Measure voltage across terminals ⓑ and ⓐ.

N.G. → (N.G.) Replace sub-control unit or adapter harness. (Refer to "Adapter harness check".)

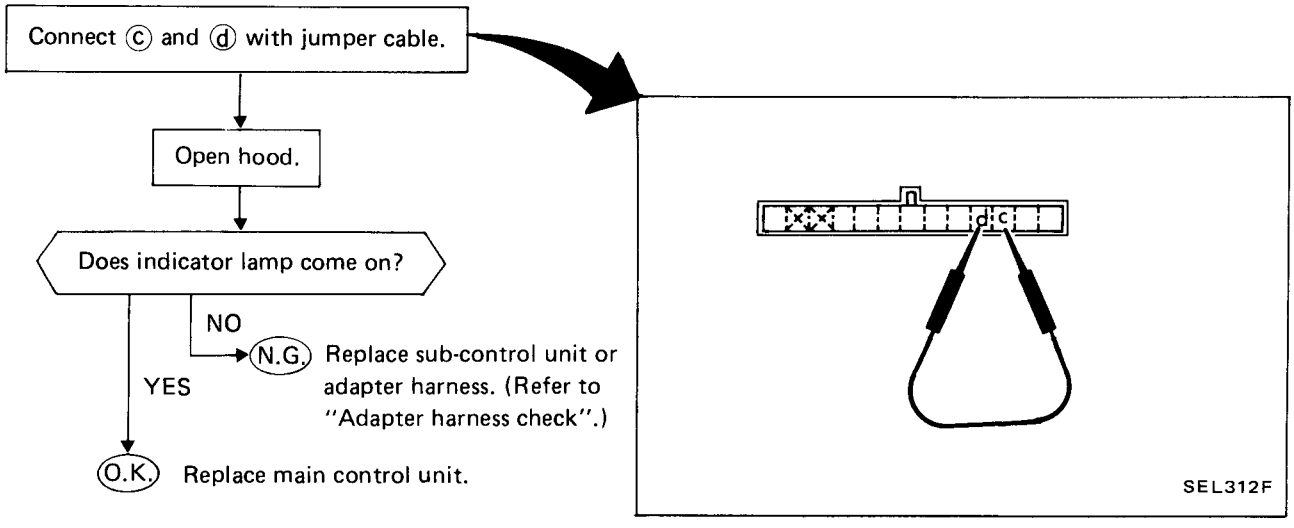
O.K.

(O.K.) Replace main control unit.

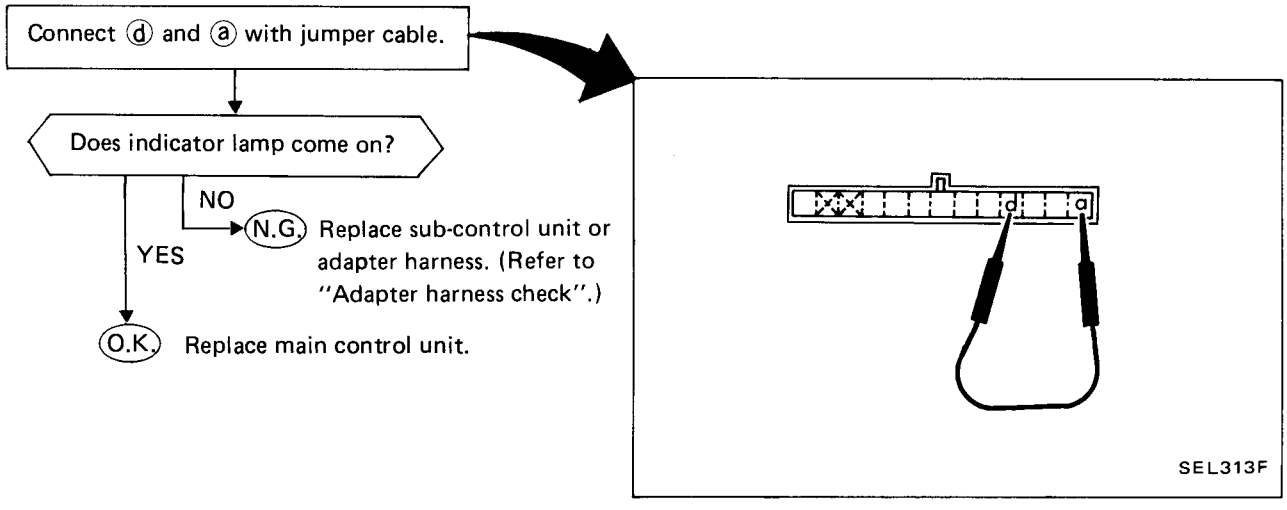


Control Unit Check (Cont'd)

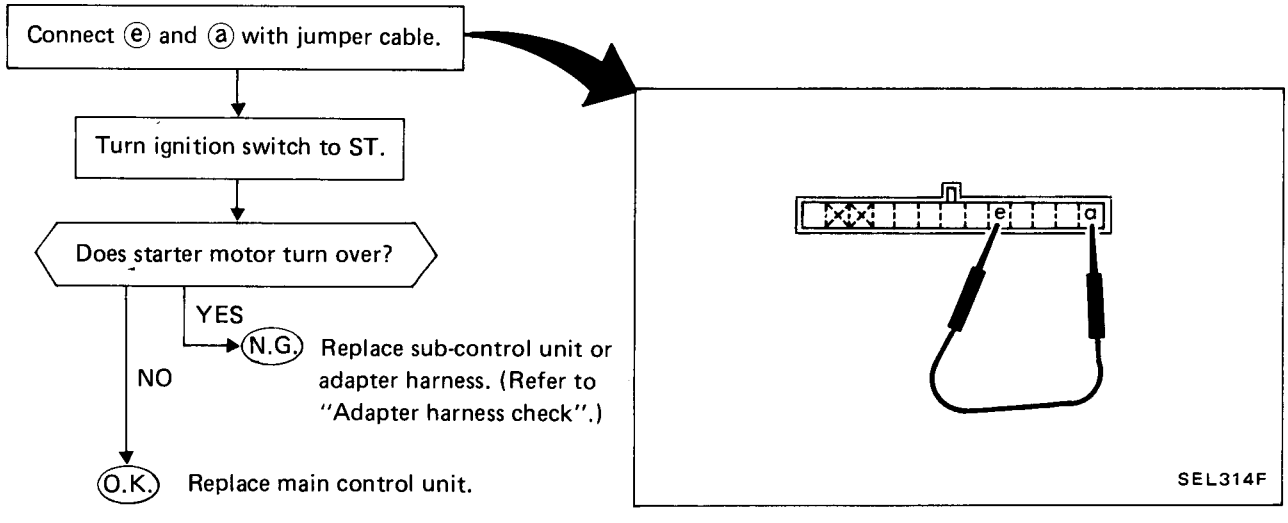
Check ⓒ ... Hood signal check



Check ⓓ ... Indicator lamp circuit check



Check ⓔ ... Starter kill singal check



Control Unit Check (Cont'd)

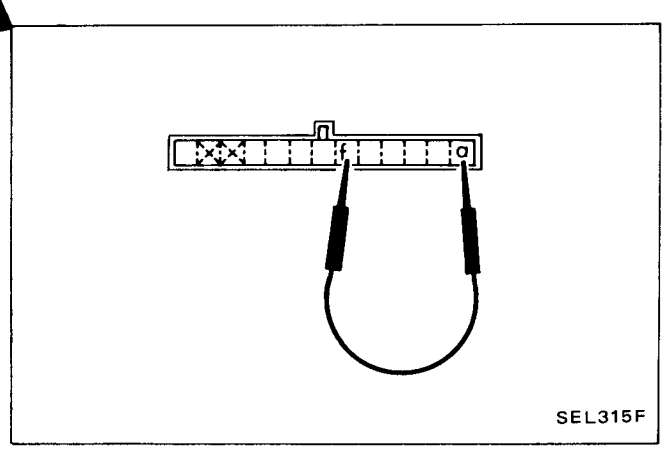
Check ⓕ ... Alarm check

Connect ⓕ and ⓐ with jumper cable.

Does horn sound and headlamp come on?

NO → (N.G.) Replace sub-control unit or adapter harness. (Refer to "Adapter harness check".)

YES → (O.K.) Replace main control unit.

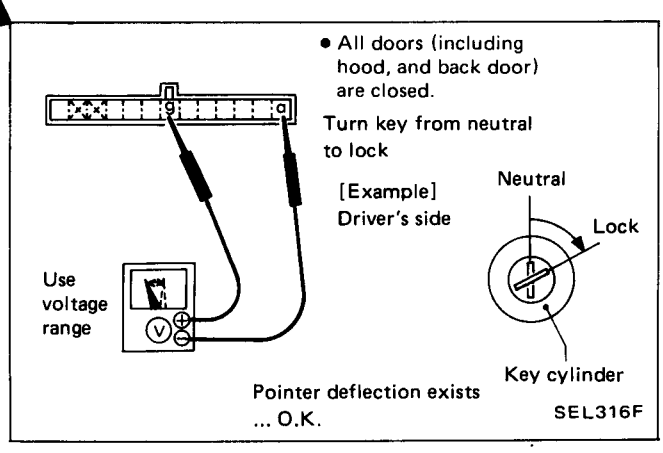


Check ⓖ ... Arm signal check

Connect between terminals ⓖ and ⓐ.

N.G. → (N.G.) Replace sub-control unit or adapter harness. (Refer to "Adapter harness check".)

O.K. → (O.K.) Replace main control unit.



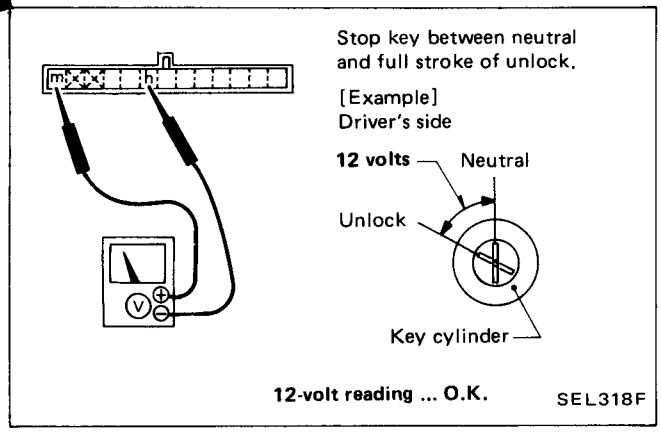
Control Unit Check (Cont'd)

Check ⓗ ... Unlock signal check

Measure voltage across terminals ⓗ and ⓜ.

O.K. → Ⓞ.K. Replace main control unit.

N.G. → Ⓝ.G. Replace sub-control unit or adapter harness. (Refer to "Adapter harness check".)

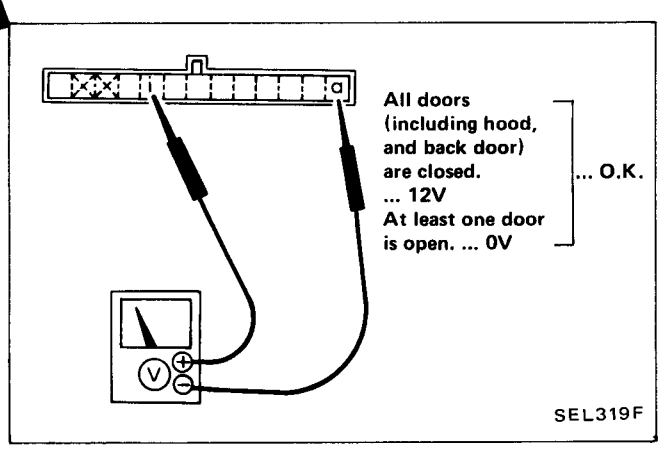


Check ⓘ ... Door switch signal check

Measure voltage across terminals ⓘ and ⓐ.

O.K. → Ⓞ.K. Replace main control unit.

N.G. → Ⓝ.G. Replace sub-control unit or adapter harness. (Refer to "Adapter harness check".)

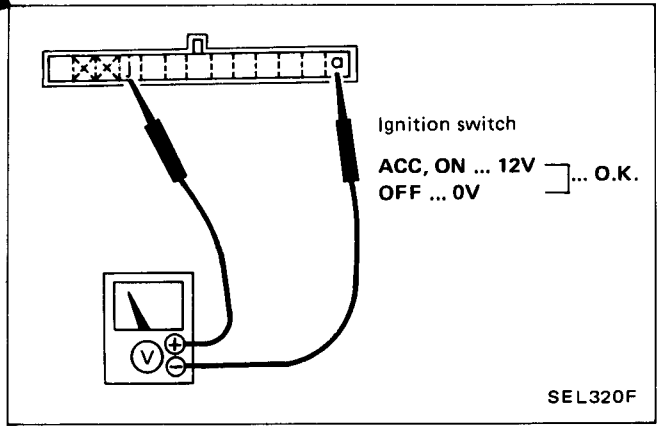


Check ⓙ ... System cancel signal check

Measure voltage across terminals ⓙ and ⓐ.

O.K. → Ⓞ.K. Replace main control unit.

N.G. → Ⓝ.G. Replace sub-control unit or adapter harness. (Refer to "Adapter harness check".)



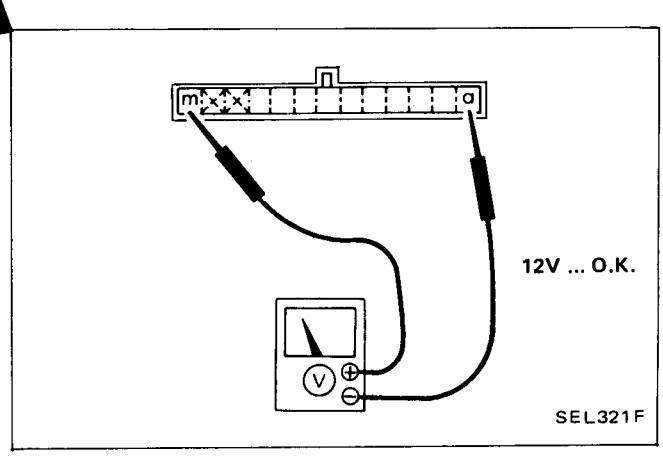
Control Unit Check (Cont'd)

Check ⓜ ... System source check

Measure voltage across terminals ⓜ and ⓐ.

O.K. → Ⓞ.K. Replace main control unit.

N.G. → Ⓝ.G. Replace sub-control unit or adapter harness. (Refer to "Adapter harness check".)



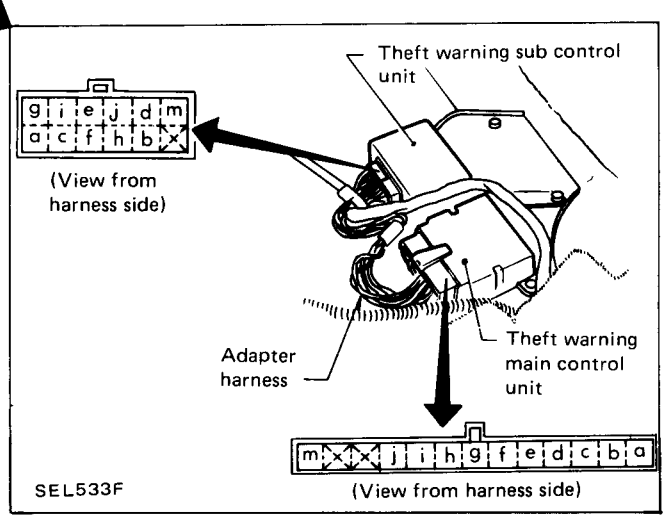
Adapter Harness Check

- This inspection is available only when the cause of trouble in "Control Unit Check" is due to a "Replace sub-control unit or adapter harness".

Check for continuity between same letter of sub-control unit and main control unit.

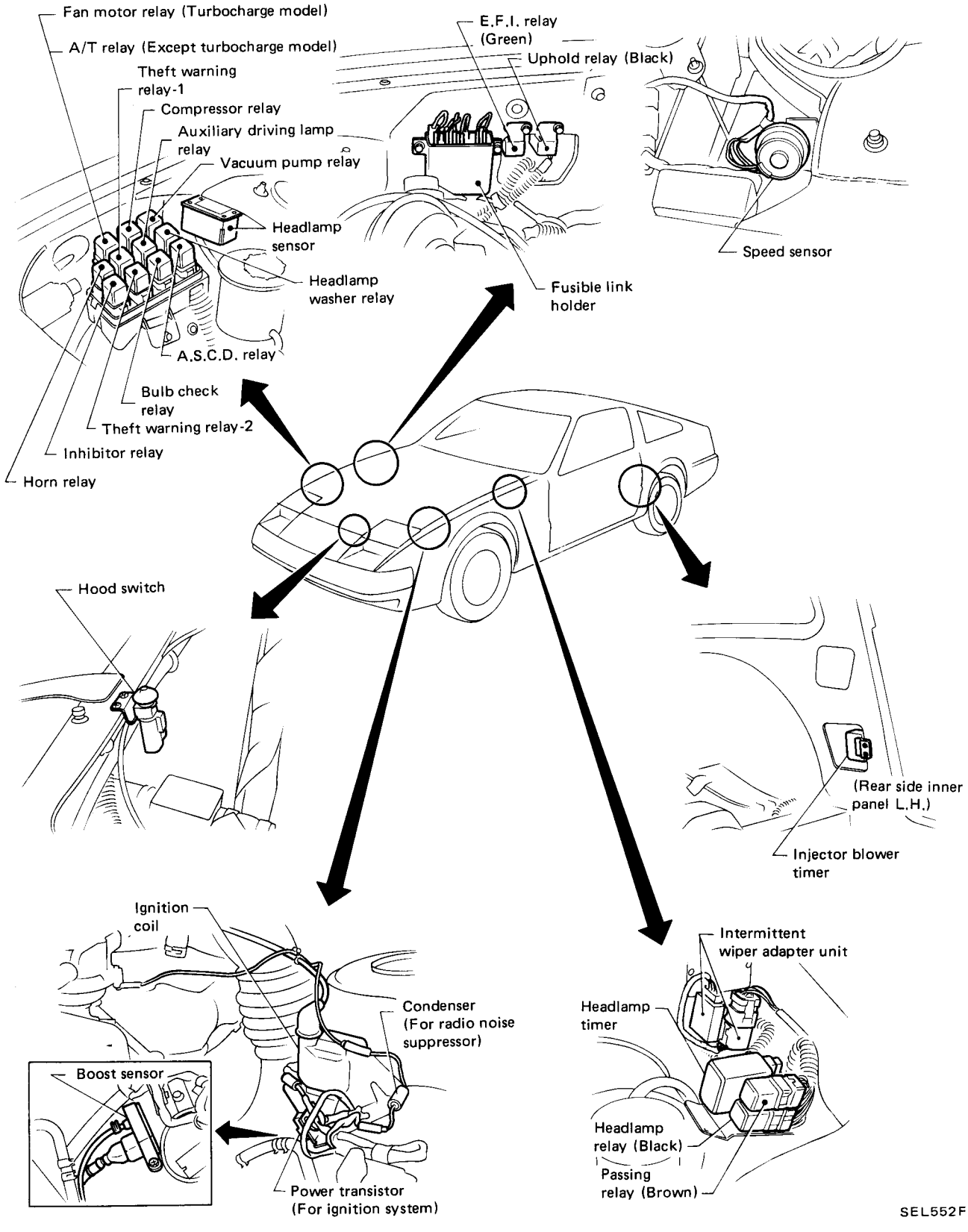
O.K. → Replace sub-control unit.

N.G. → Replace adapter harness.

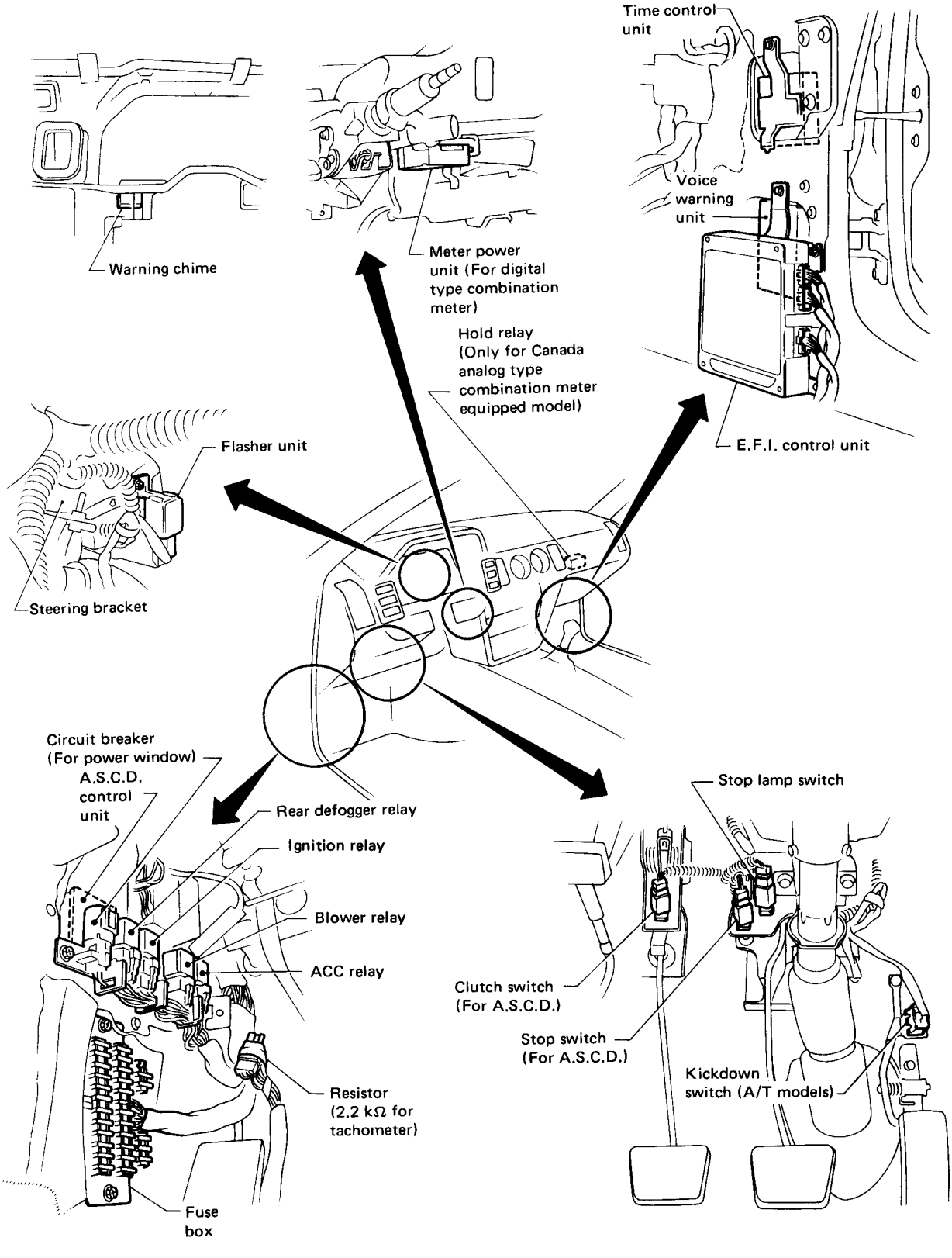


- If theft warning does not operate normally even after replacing adapter harness, replace sub-control unit.
- If theft warning does not operate normally even after replacing sub-control unit, replace adapter harness.

LOCATION OF ELECTRICAL UNITS

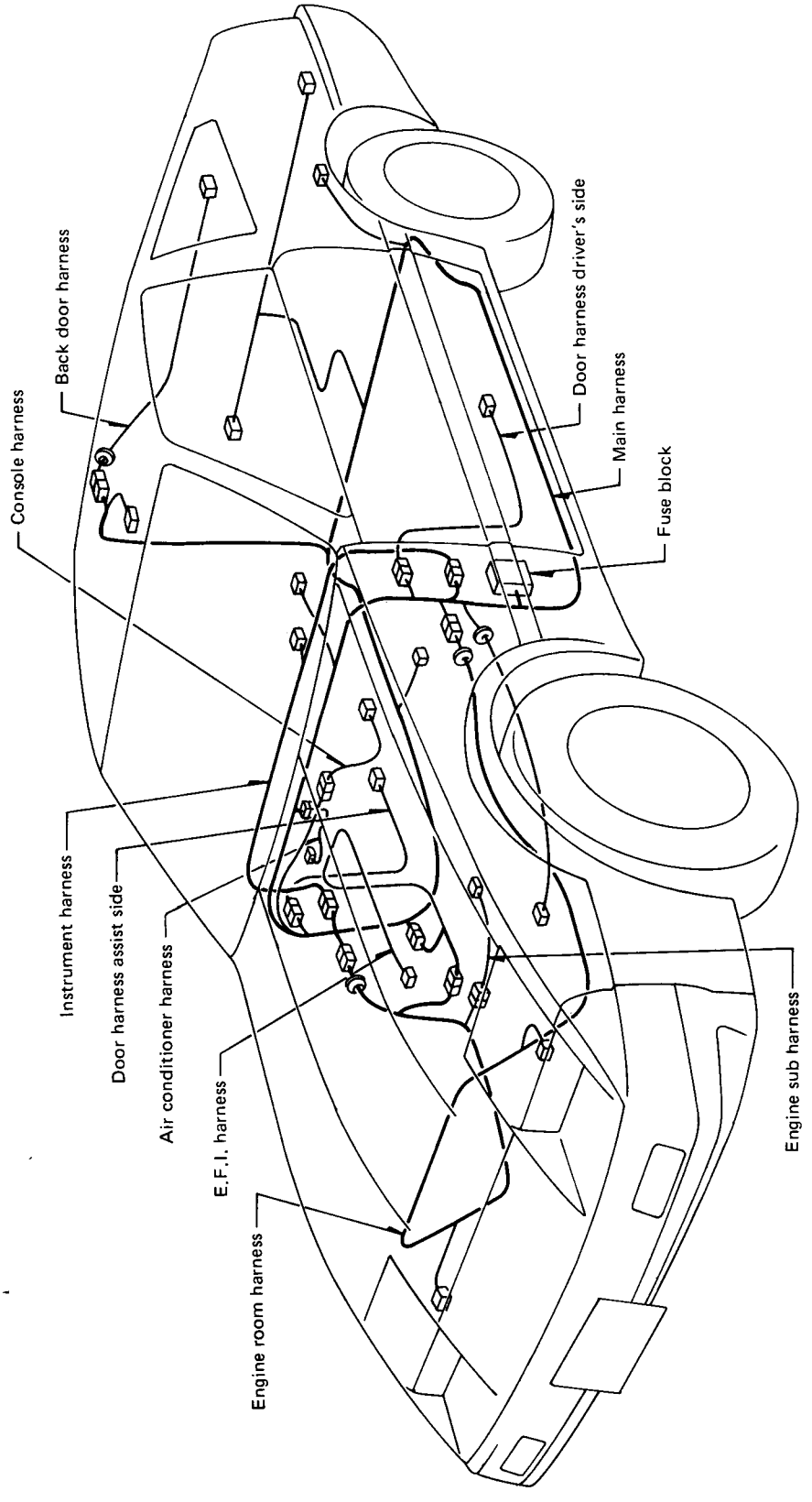


LOCATION OF ELECTRICAL UNITS



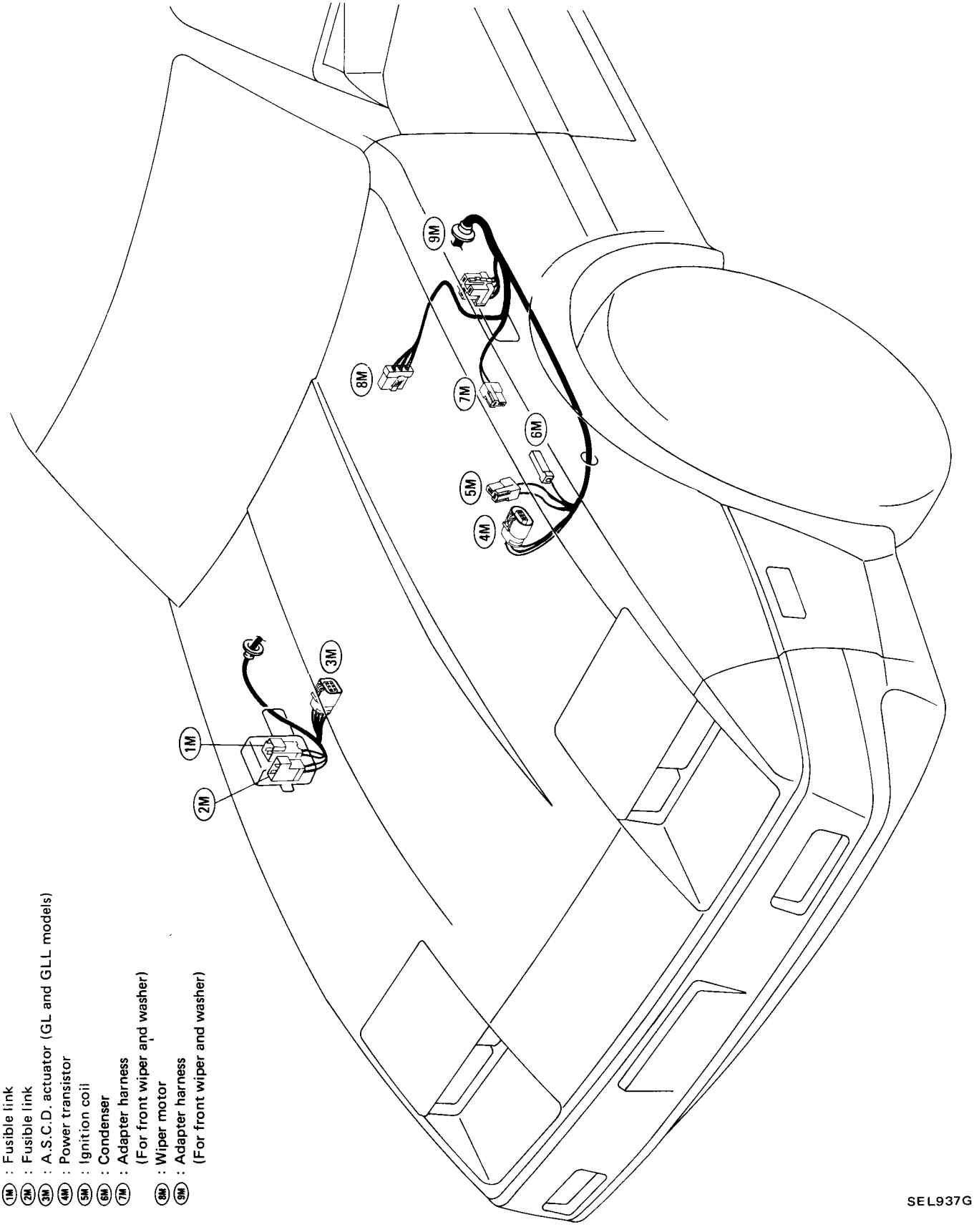
SEL753D

Outline



SEL496F

Main Harness



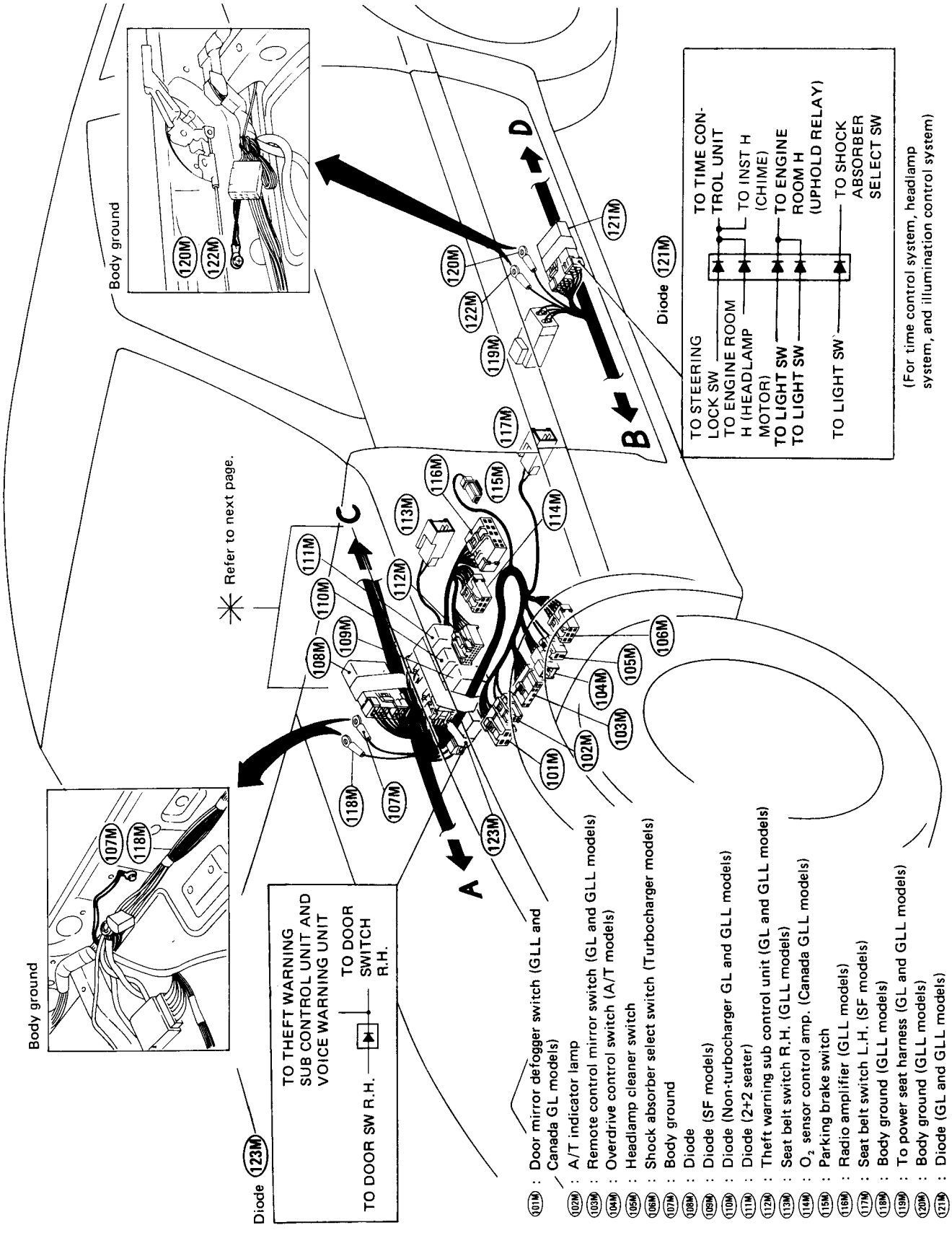
1M : Fusible link
2M : Fusible link
3M : A.S.C.D. actuator (GL and GLL models)
4M : Power transistor
5M : Ignition coil
6M : Condenser
7M : Adapter harness (For front wiper and washer)
8M : Wiper motor
9M : Adapter harness (For front wiper and washer)

SEL937G

Main Harness (Cont'd)

SEL938G

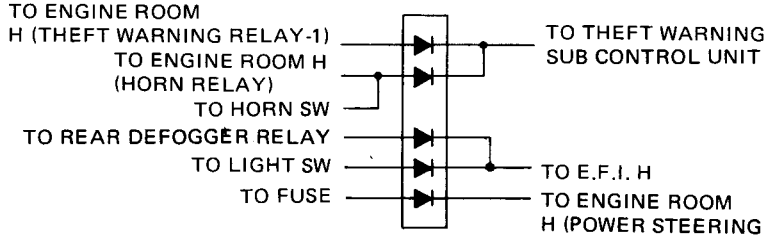
Main Harness (Cont'd)



(101M) : Door mirror defogger switch (GLL and Canada GL models)
(102M) : A/T indicator lamp
(103M) : Remote control mirror switch (GL and GLL models)
(104M) : Overdrive control switch (A/T models)
(105M) : Headlamp cleaner switch
(106M) : Shock absorber select switch (Turbocharger models)
(107M) : Body ground
(108M) : Diode
(109M) : Diode (SF models)
(110M) : Diode (Non-turbocharger GL and GLL models)
(111M) : Diode (2+2 seater)
(112M) : Theft warning sub control unit (GL and GLL models)
(113M) : Seat belt switch R.H. (GLL models)
(114M) : O_2 sensor control amp. (Canada GLL models)
(115M) : Parking brake switch
(116M) : Radio amplifier (GLL models)
(117M) : Seat belt switch L.H. (SF models)
(118M) : Body ground (GLL models)
(119M) : To power seat harness (GL and GLL models)
(120M) : Body ground (GLL models)
(121M) : Diode (GL and GLL models)
(122M) : Body ground (GLL models)
(123M) : Diode (GL and GLL models)

Diode (108M)

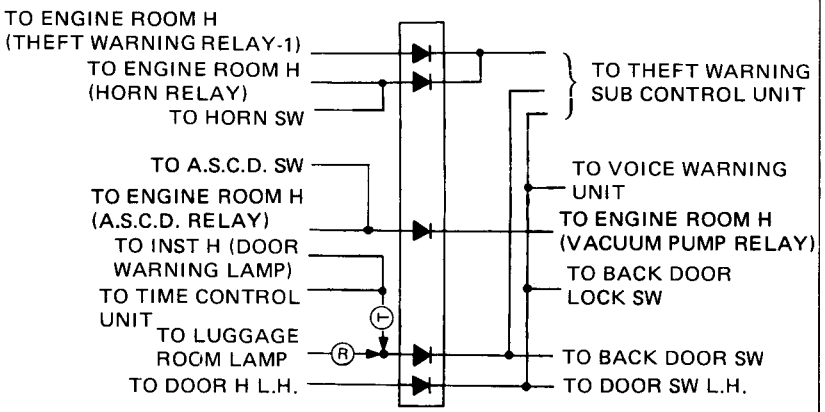
GL & GLL models (Non-turbocharger models)



(For theft warning system & E.C.C.S. system)

Diode (108M)

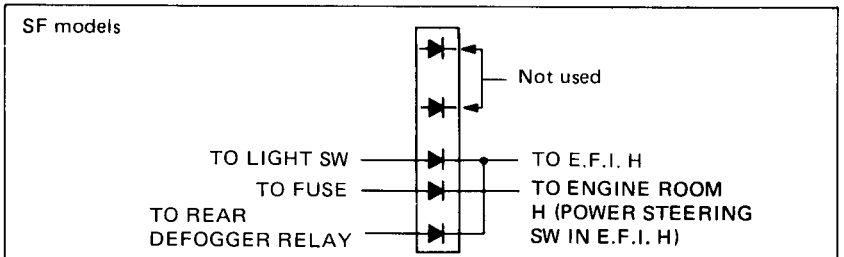
GL & GLL models (Turbocharger models)



(For theft warning system, A.S.C.D. system & voice warning system)

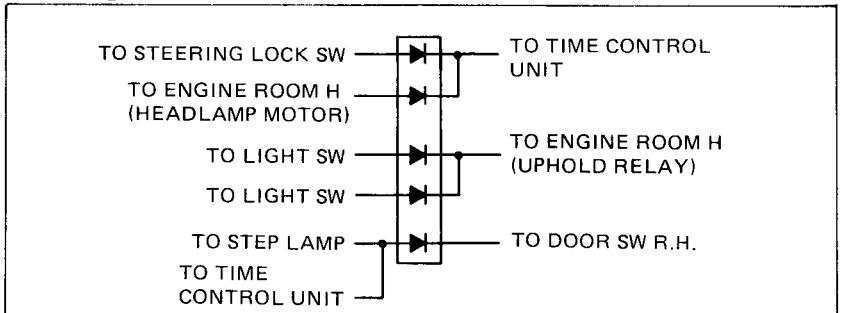
Diode (108M)

SF models



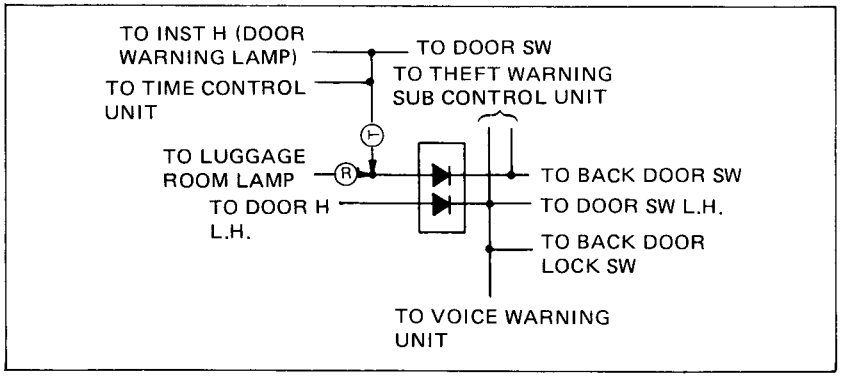
(For E.C.C.S. system)

Diode (109M)



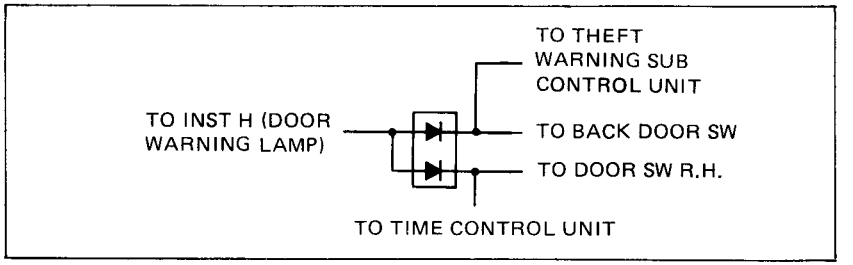
(For headlamp system & time control system)

Diode (110M)



(For theft warning system & voice warning system)

Diode (111M)

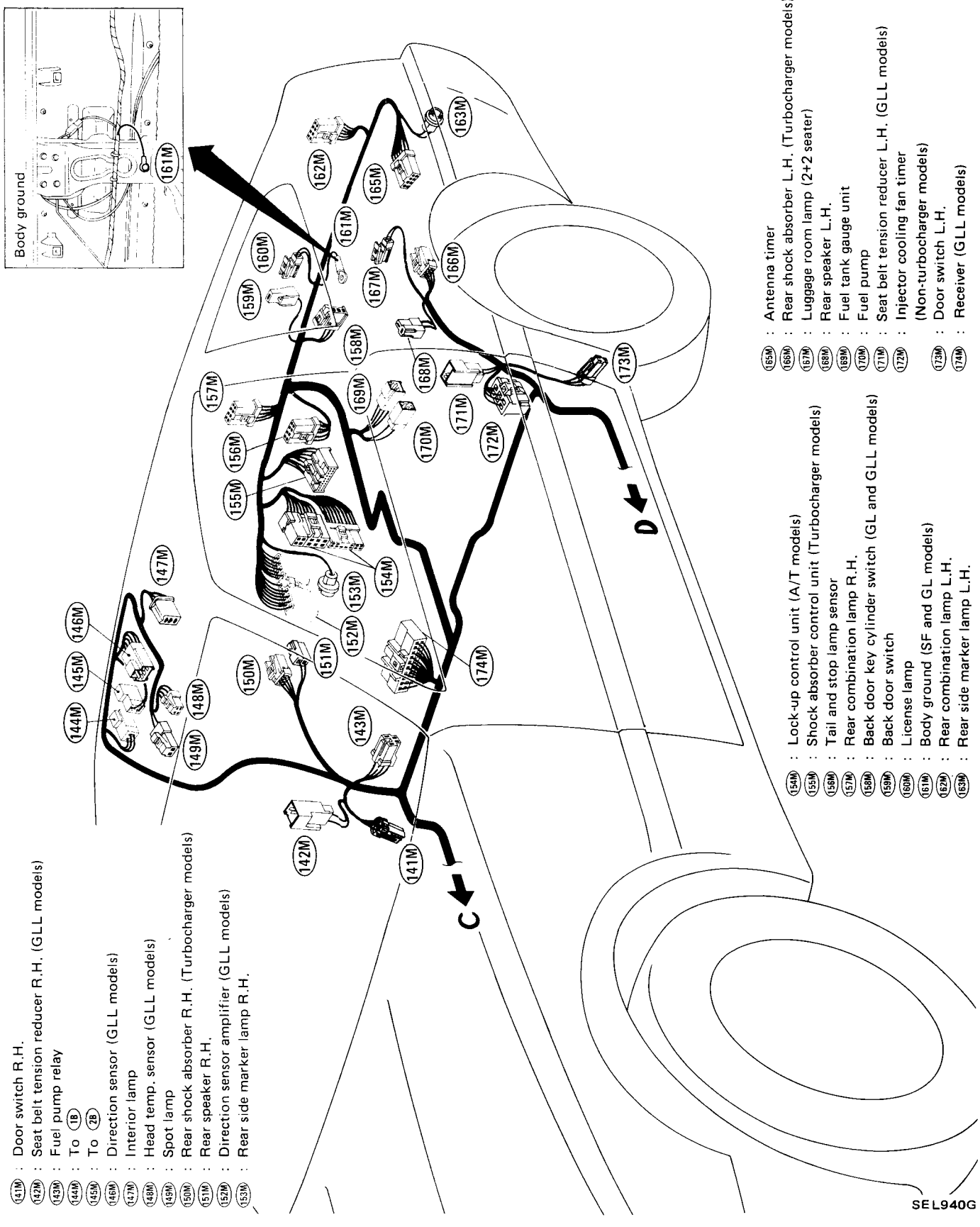


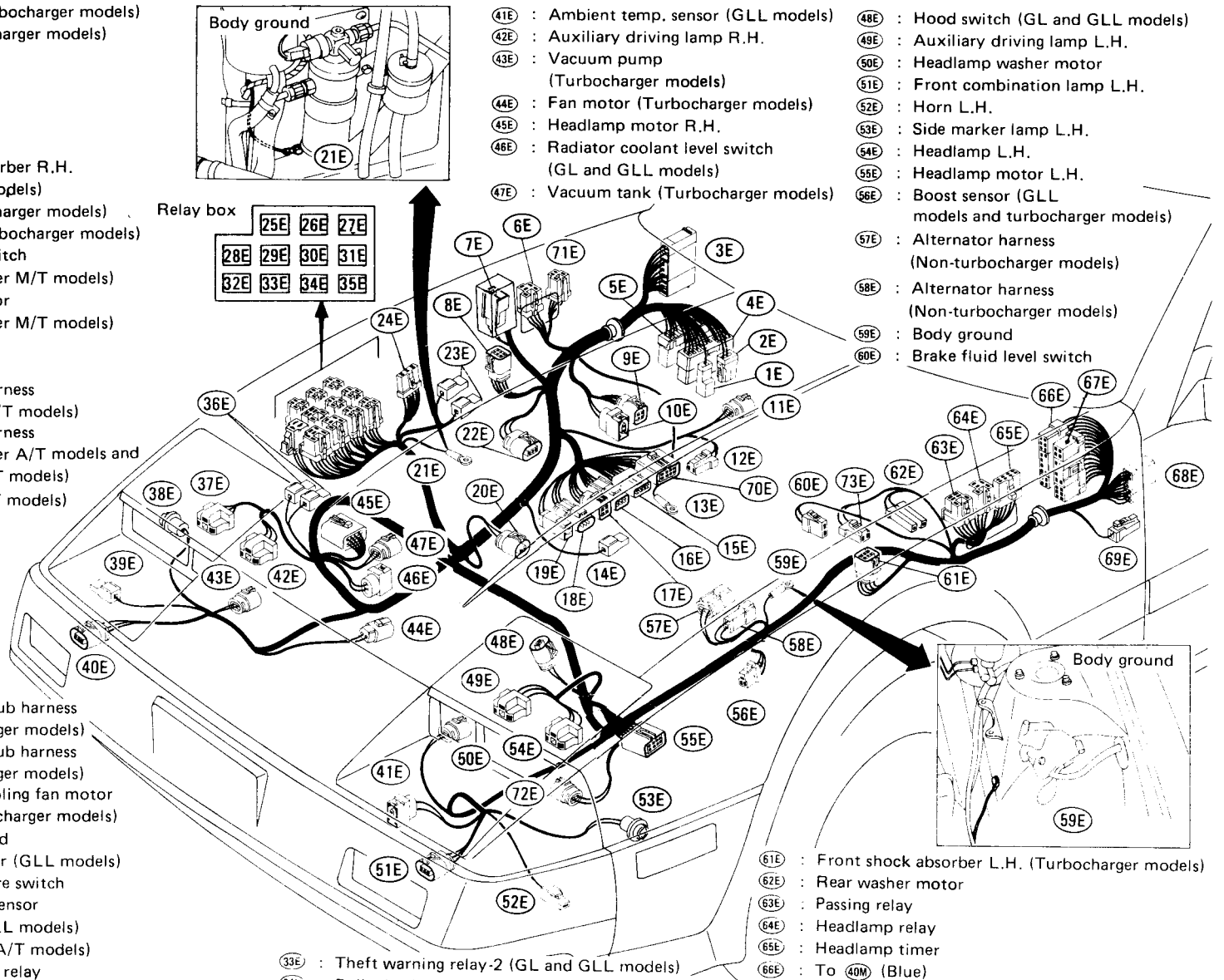
(For theft warning system & time control system)

Ⓡ : 2+2 seater
Ⓣ : 2 seater

SEL939G

Main Harness (Cont'd)





1E : To 71M (Non-turbocharger models)
2E : To 72M (Turbocharger models)
3E : To 29I (White)
4E : To 73M (Blue)
5E : To 74M (White)
6E : Uphold relay
7E : Fusible link
8E : Front shock absorber R.H. (Turbocharger models)
9E : To 6F (Turbocharger models)
10E : To 9F (Non-turbocharger models)
11E : Back-up lamp switch (Non-turbocharger M/T models)
12E : Oil pressure sensor (Non-turbocharger M/T models)
13E : Battery
14E : Starter motor
15E : To engine sub harness (Turbocharger A/T models)
16E : To engine sub harness (Non-turbocharger A/T models and turbocharger M/T models)
17E : Shift switch (A/T models)

18E : To engine sub harness (Turbocharger models)
19E : To engine sub harness (Turbocharger models)
20E : Injector cooling fan motor (Non-turbocharger models)
21E : Body ground
22E : Speed sensor (GLL models)
23E : Low-pressure switch
24E : Headlamp sensor (GL and GLL models)
25E : A/T relay (A/T models)
26E : Compressor relay
27E : Vacuum pump relay (Turbocharger models)
28E : Horn relay
29E : Theft warning relay-1 (GL and GLL models)
30E : Auxiliary driving lamp relay
31E : Headlamp washer relay
32E : Inhibitor relay (A/T models)

33E : Theft warning relay-2 (GL and GLL models)
34E : Bulb check relay
35E : A.S.C.D. relay
36E : Water cock air valve
37E : Headlamp R.H.
38E : Side marker lamp R.H.
39E : Horn R.H.
40E : Front combination lamp R.H.

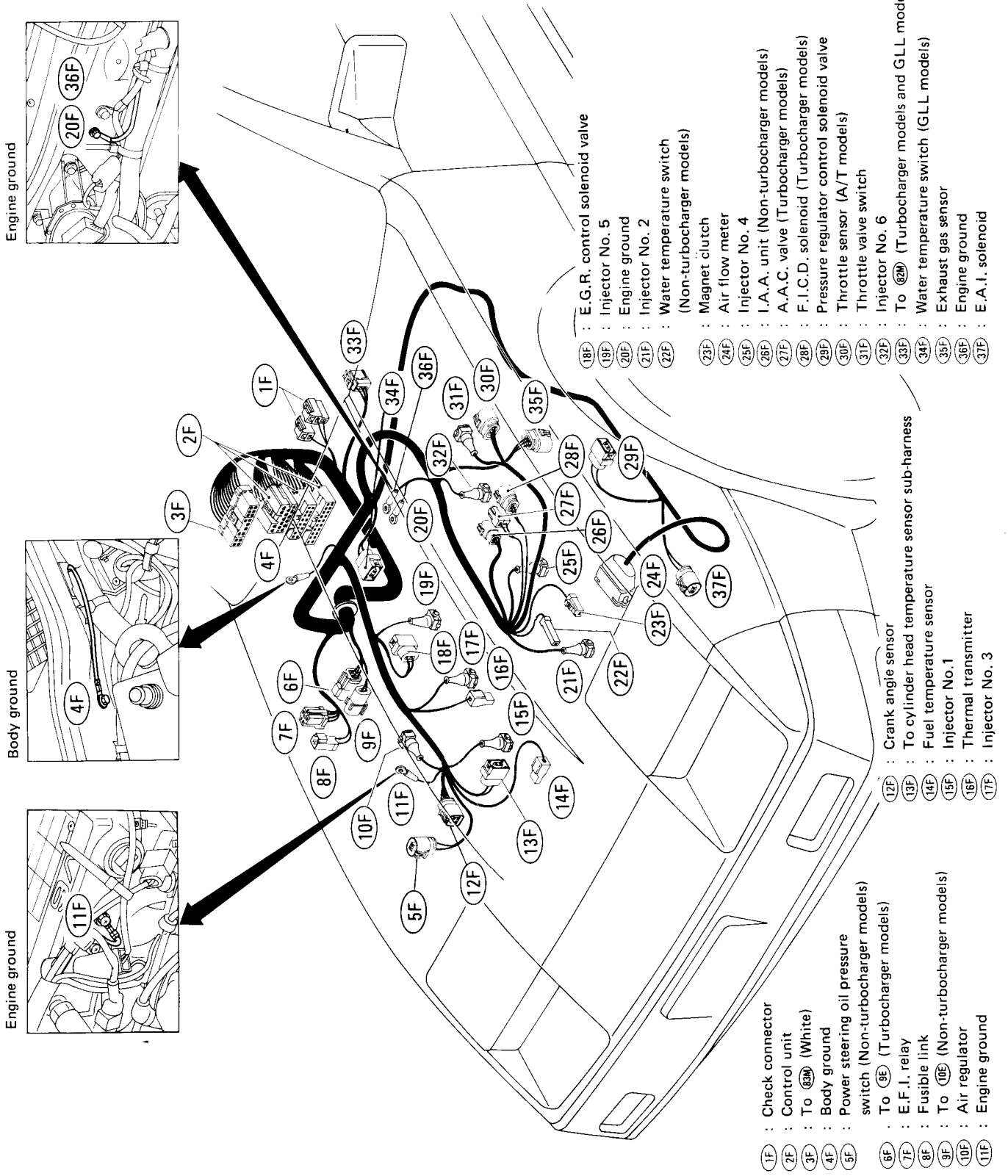
41E : Ambient temp. sensor (GLL models)
42E : Auxiliary driving lamp R.H.
43E : Vacuum pump (Turbocharger models)
44E : Fan motor (Turbocharger models)
45E : Headlamp motor R.H.
46E : Radiator coolant level switch (GL and GLL models)
47E : Vacuum tank (Turbocharger models)

48E : Hood switch (GL and GLL models)
49E : Auxiliary driving lamp L.H.
50E : Headlamp washer motor
51E : Front combination lamp L.H.
52E : Horn L.H.
53E : Side marker lamp L.H.
54E : Headlamp L.H.
55E : Headlamp motor L.H.
56E : Boost sensor (GLL models and turbocharger models)
57E : Alternator harness (Non-turbocharger models)
58E : Alternator harness (Non-turbocharger models)
59E : Body ground
60E : Brake fluid level switch

61E : Front shock absorber L.H. (Turbocharger models)
62E : Rear washer motor
63E : Passing relay
64E : Headlamp relay
65E : Headlamp timer
66E : To 40M (Blue)
67E : To 39M (White)
68E : To 11 (White)
69E : To 47M (Non-turbocharger models)
70E : Inhibitor switch (A/T models)
71E : Fan motor relay (Turbocharger models)
72E : Radiator thermo switch (Turbocharger models)
73E : Washer level switch

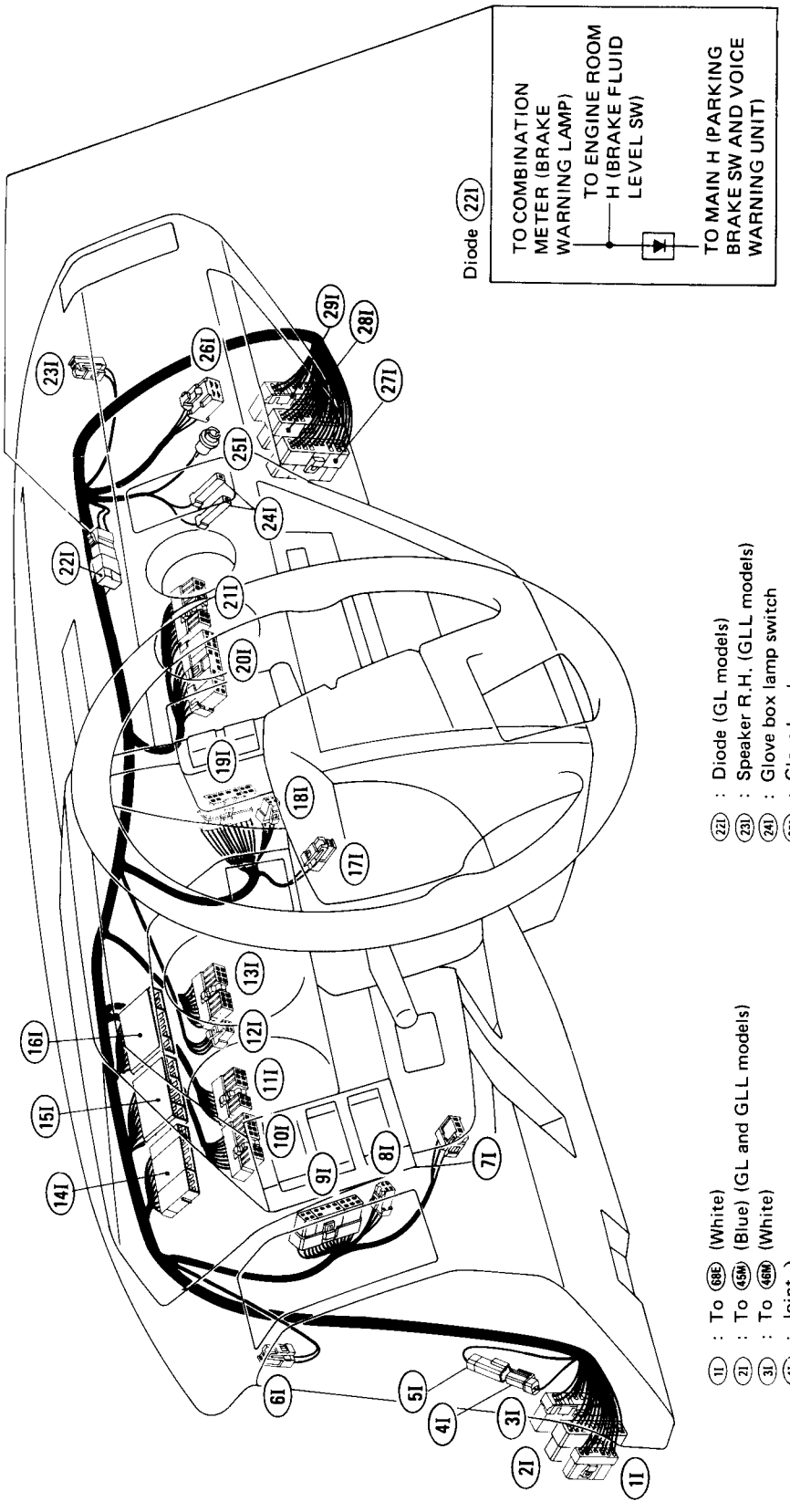
SEL941G

E.F.I. Harness

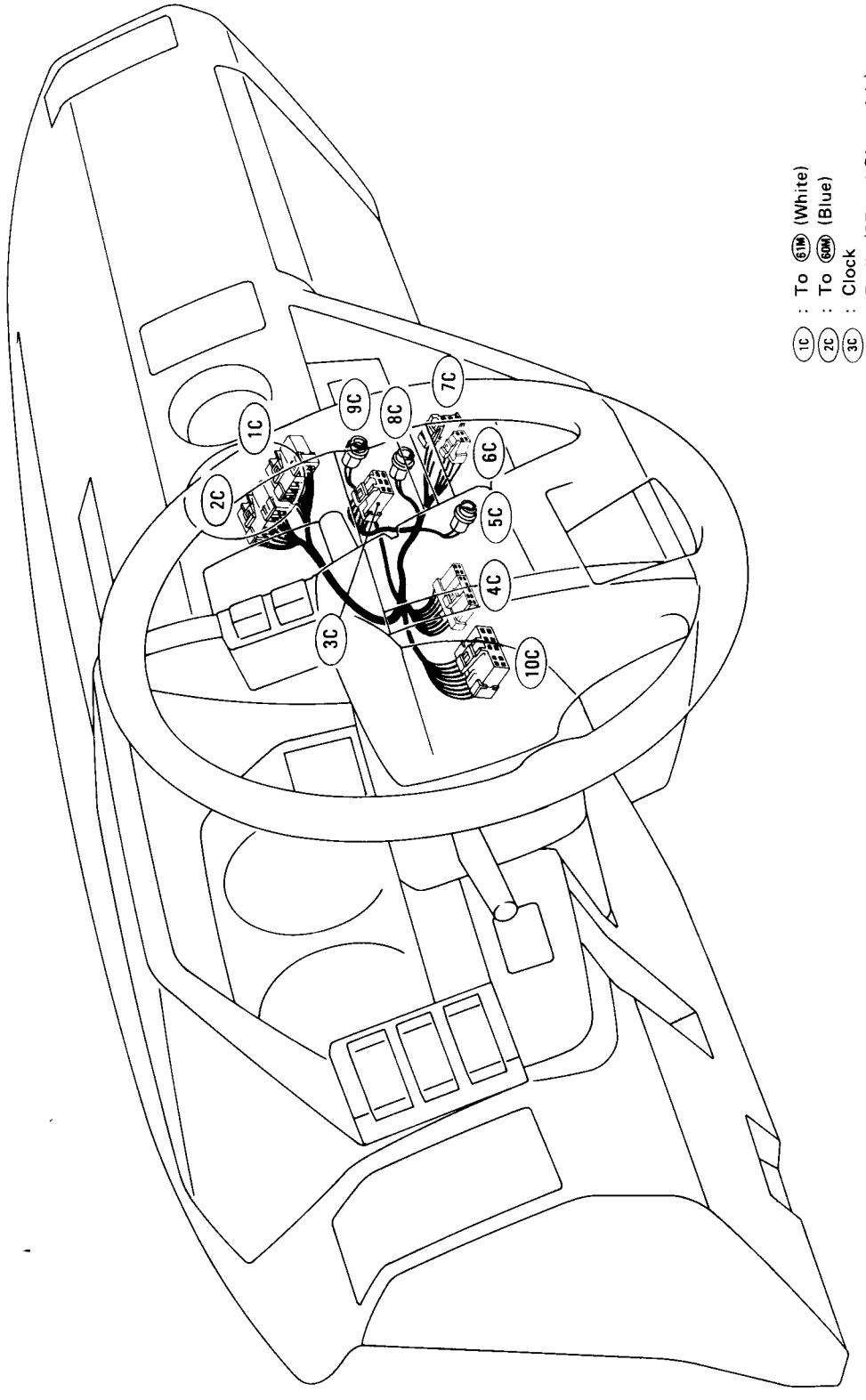


SEL942G

Instrument Harness



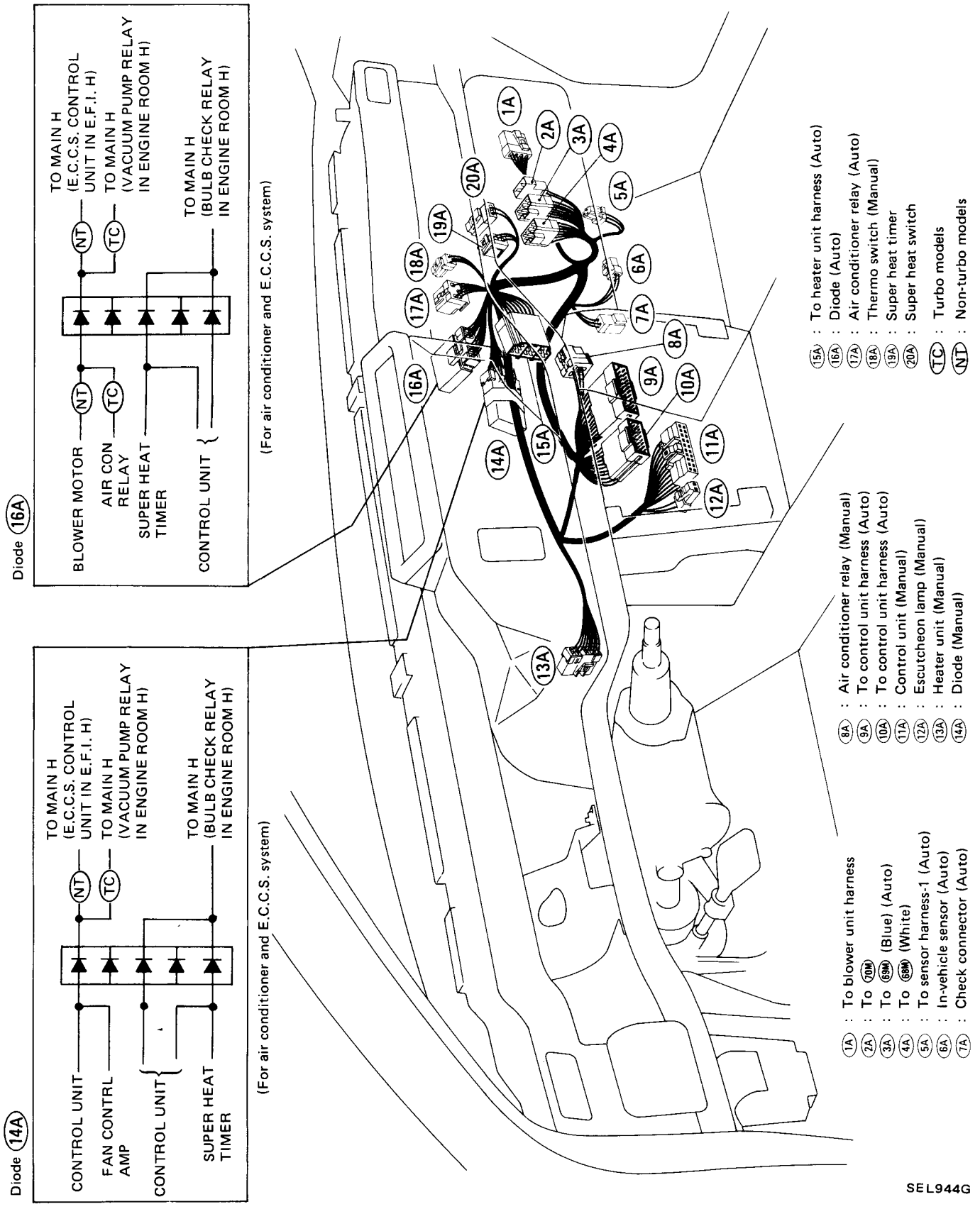
Console Harness



1C : To 61M (White)
2C : To 60M (Blue)
3C : Clock
4C : Radio (SF and GL models)
5C : Illumination lamp
6C : Antenna switch (SF models)
7C : Full auto antenna switch
8C : Illumination lamp
9C : Illumination lamp (SF and GL models)
10C : Radio (GLL models)

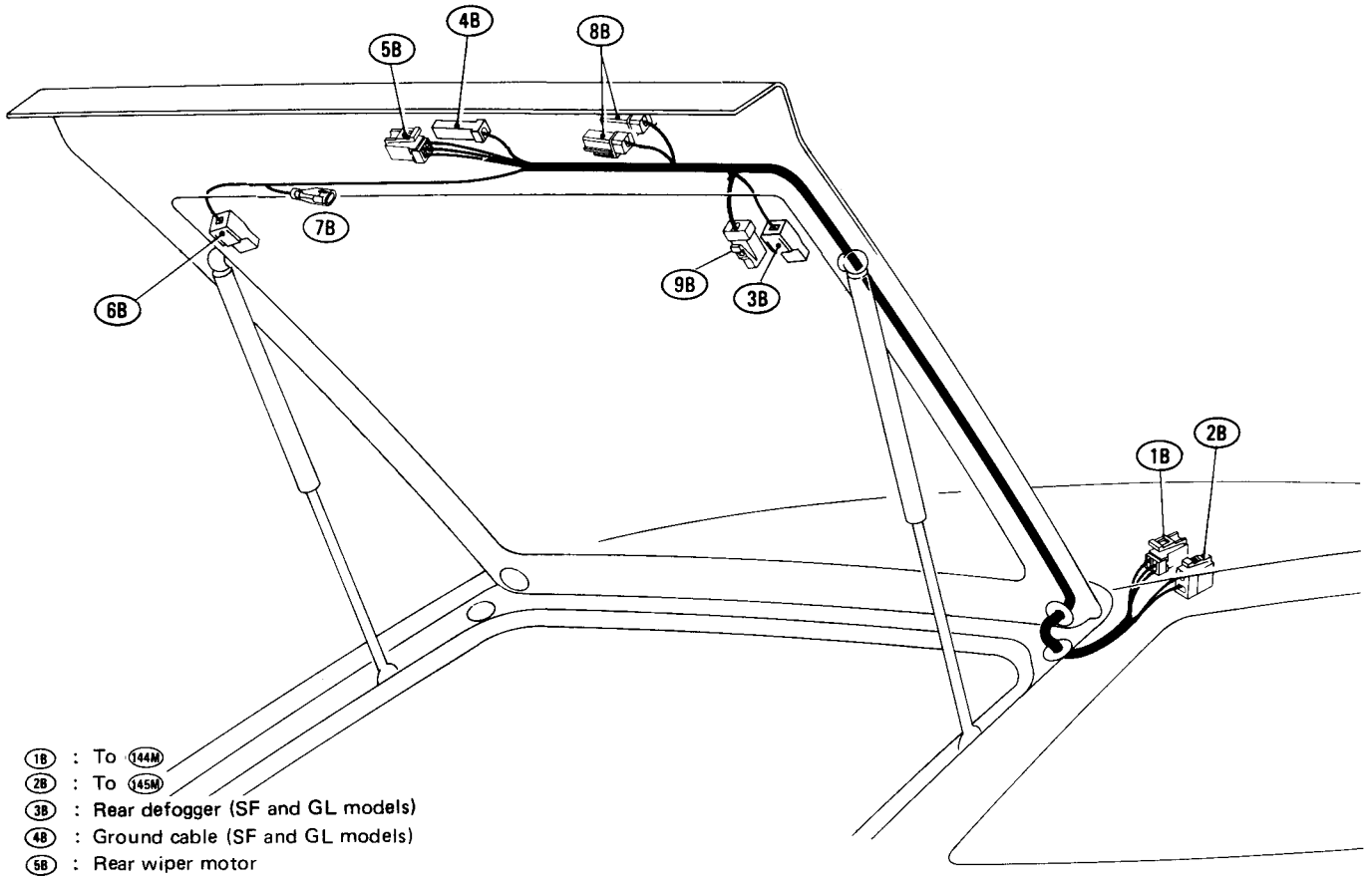
SEL394F

Air Conditioner Harness



HARNESS LAYOUT

Back Door Harness



(1B) : To (144M)
(2B) : To (145M)
(3B) : Rear defogger (SF and GL models)
(4B) : Ground cable (SF and GL models)
(5B) : Rear wiper motor
(6B) : Rear defogger (GLL models)
(7B) : Condenser (GLL models)
(8B) : High-mounted stop lamp (U.S.A. models)
(9B) : To rear defogger sub-harness (GLL models)

SEL945G