ELECTRICAL SYSTEM

SECTION EL

When you read wiring diagrams:
- Read GI section, "HOW TO READ WIRING DIAGRAMS".

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WIRING DIAGRAM REFERENCE CHART

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LOCK-UP CONTROL SYSTEM	AT SECTION	HEATER AND AIR CONDITIONER	HA SECTION
ADJUSTABLE SHOCK ABSORBER	FA SECTION		

EL

HARNESS CONNECTOR

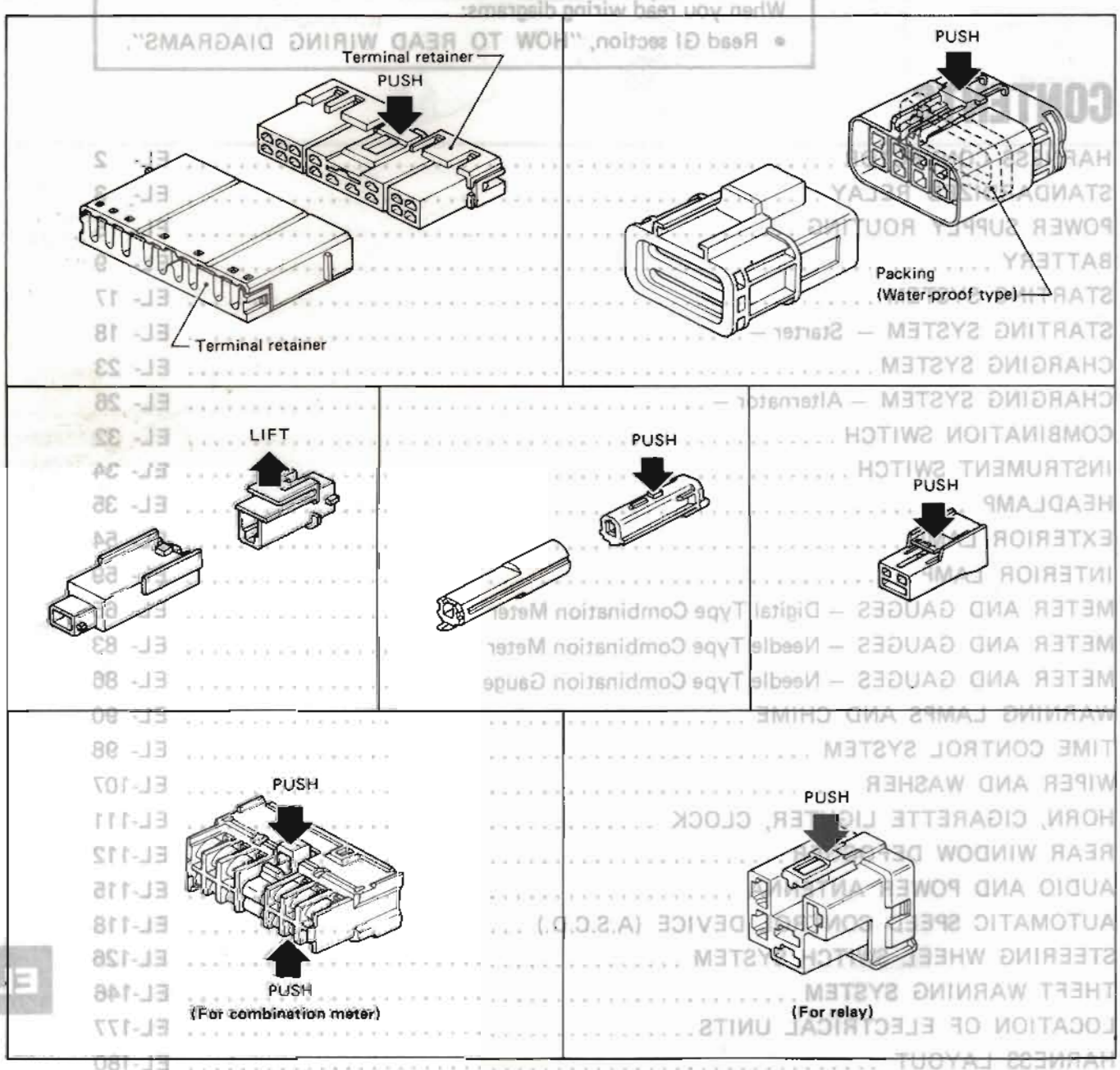
Description

HARNESS CONNECTOR

- All harness connectors are designed so that they do not become loose or disconnected accidentally.
- The connector can be disconnected by pushing or lifting the locking section.

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

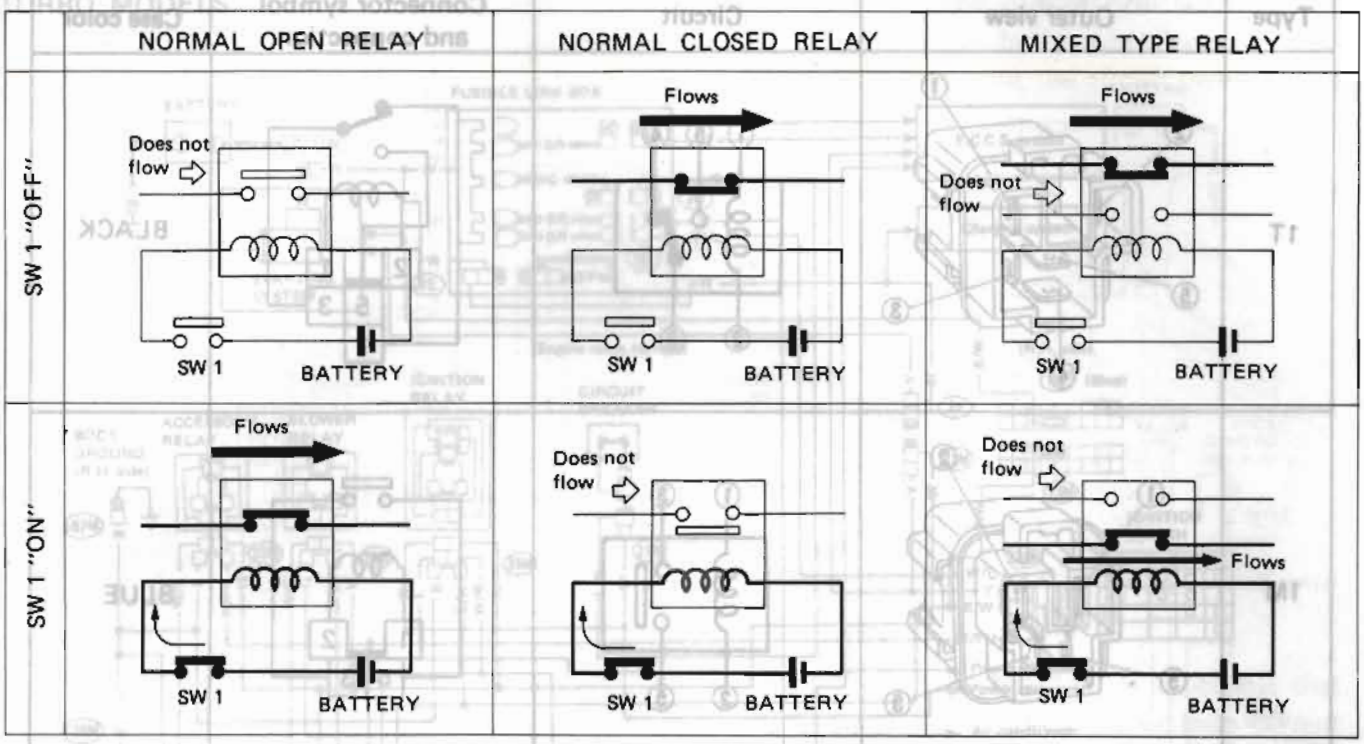
[Example]



SEL769D

Normal Open, Normal Closed and Mixed Type Relays

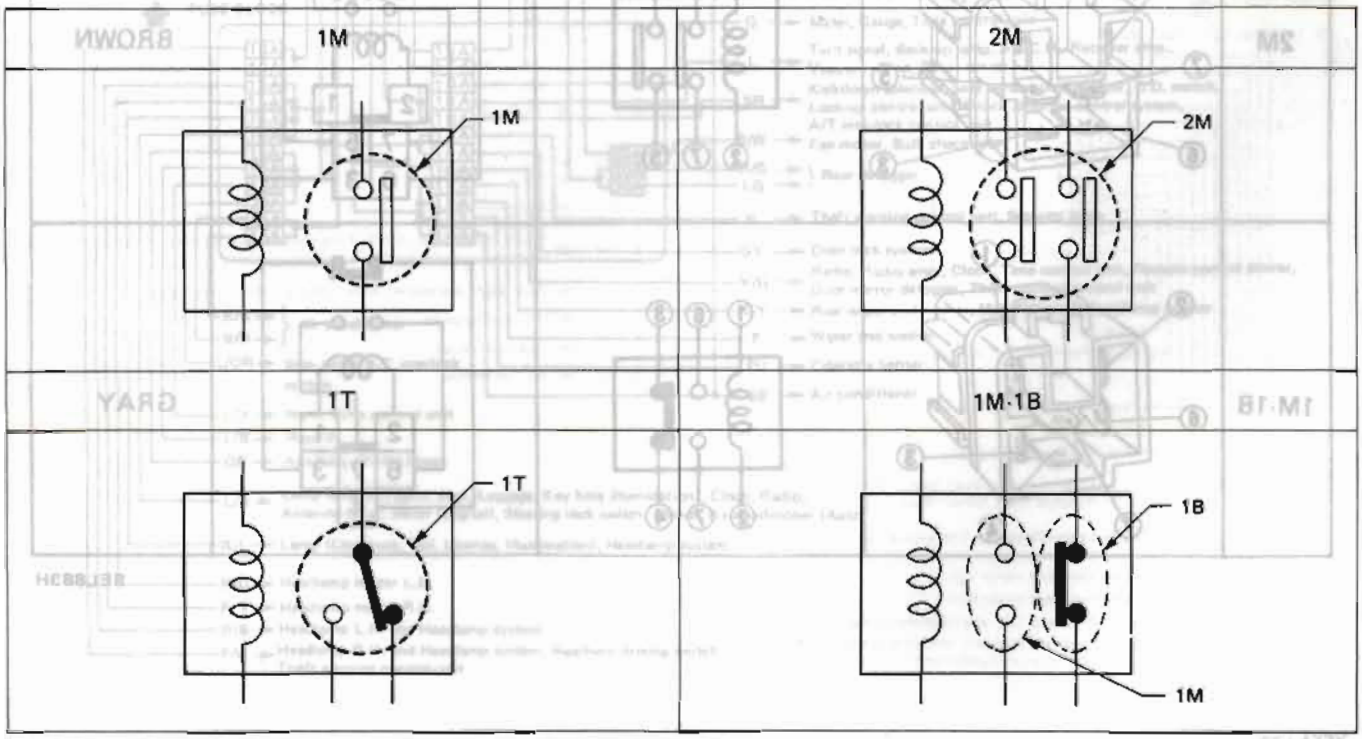
Relays can mainly be divided into three types: normal open, normal closed and mixed type relays.



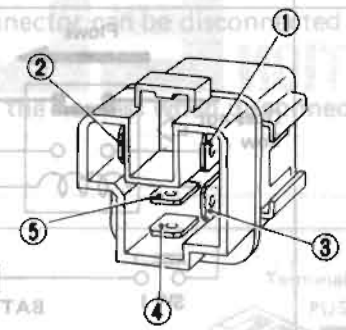
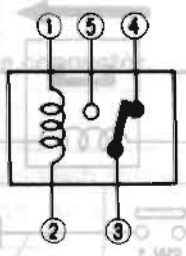
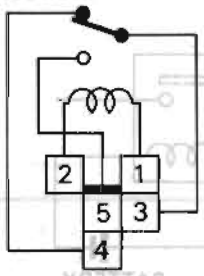
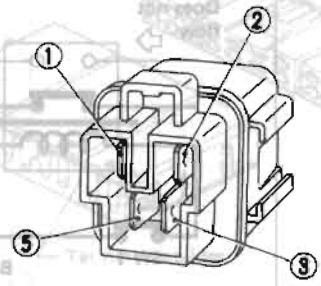
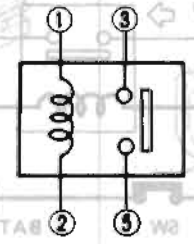
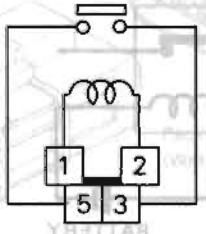
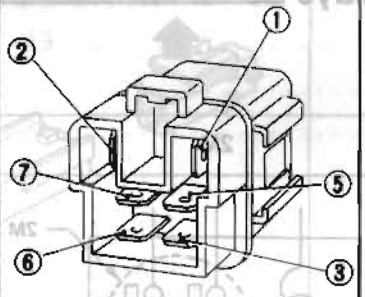
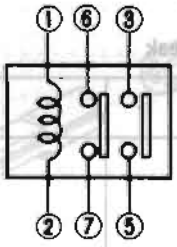
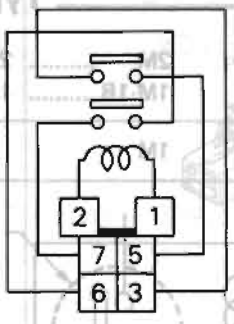
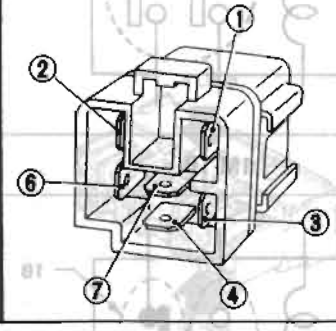
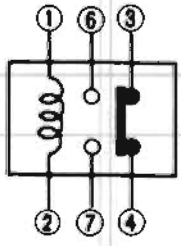
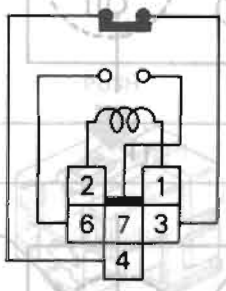
SEL881H

Type of Standardized Relays

1M ..... 1 Make
1T ..... 1 Transfer
2M ..... 2 Make
1M·1B ..... 1 Make 1 Break



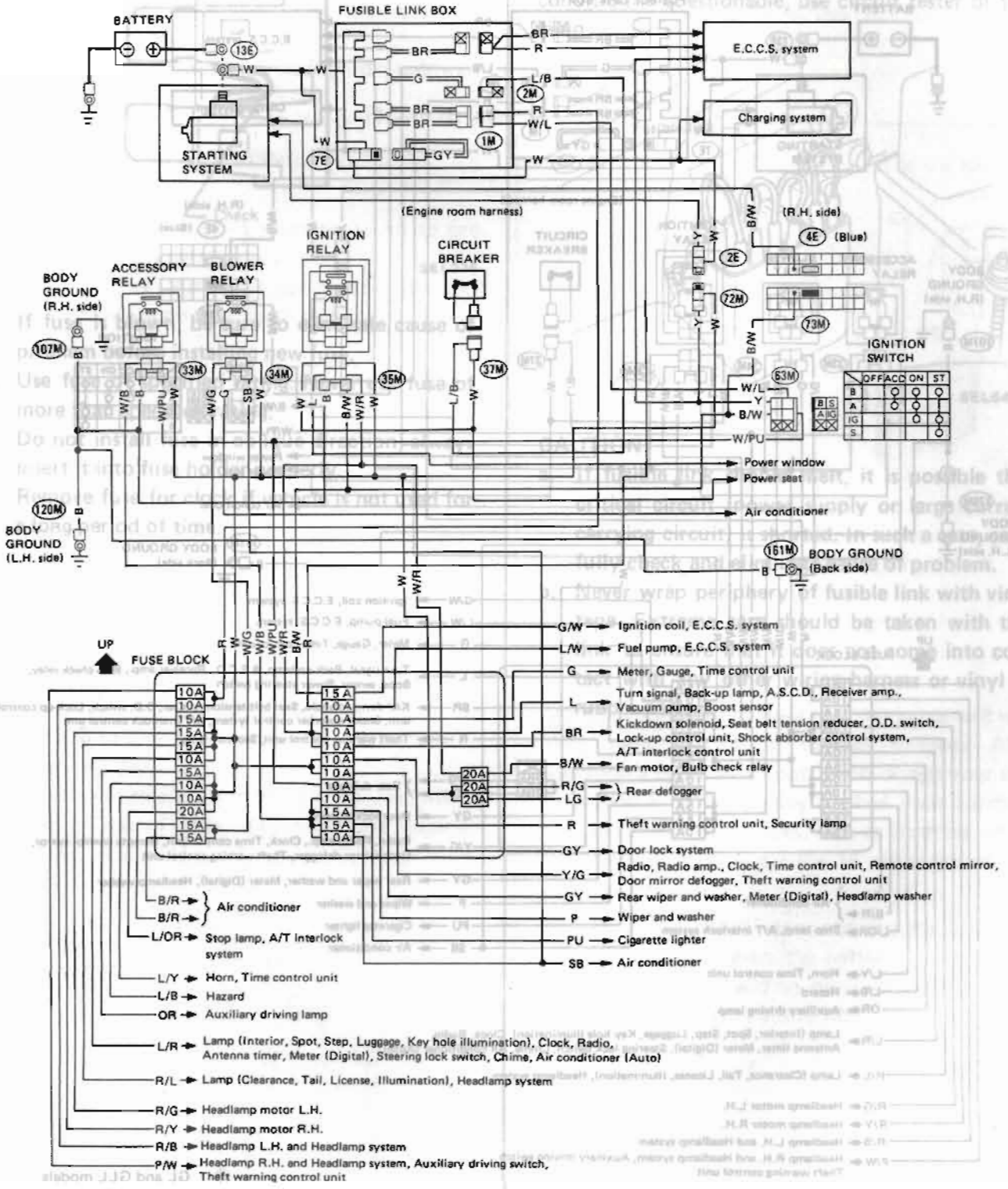
SEL882H

Type	Outer view	Circuit	Connector symbol and connection	Case color
1T				BLACK
1M				BLUE
2M				BROWN
1M·1B				GRAY

SEL883H

Wiring Diagram

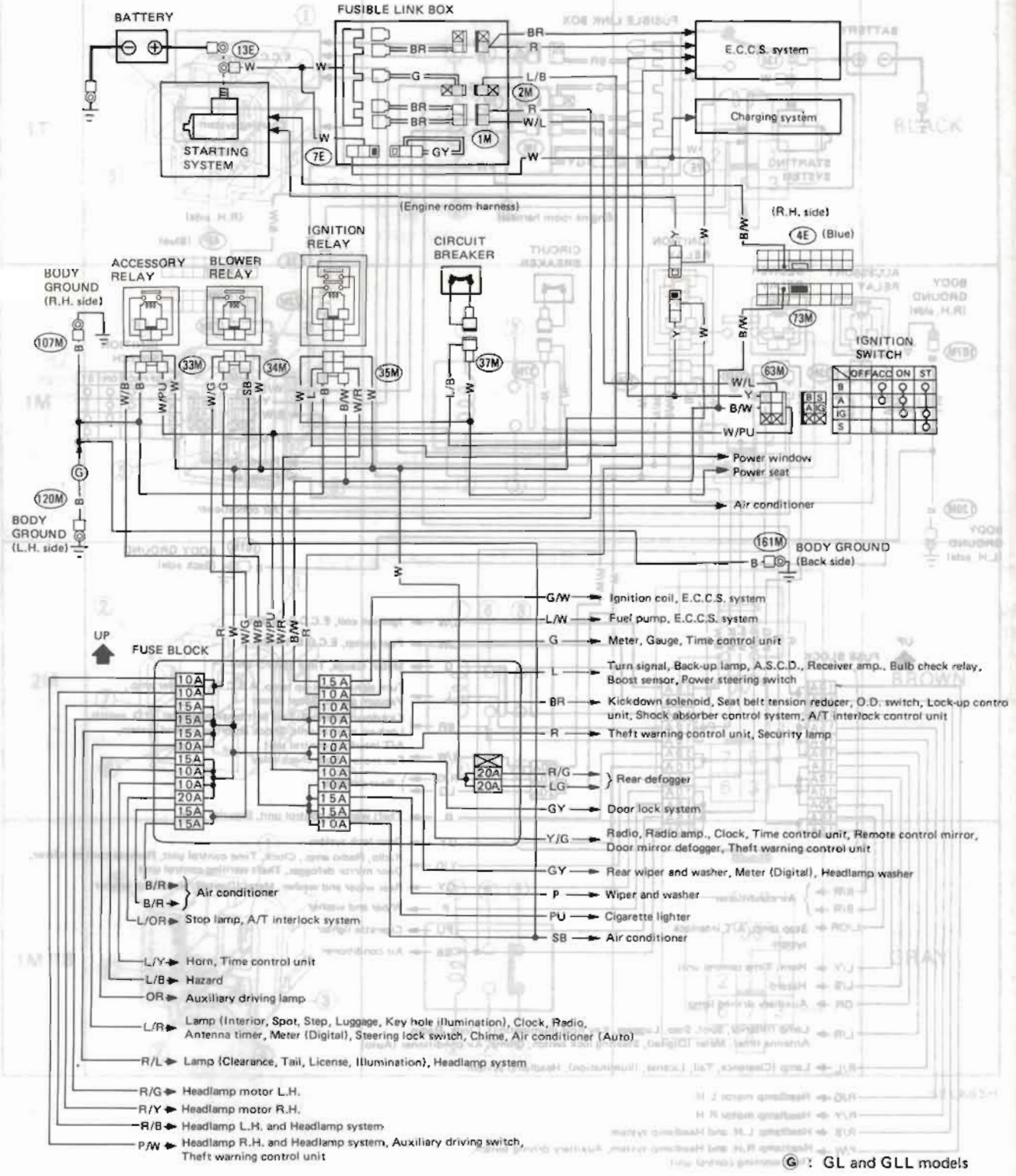
TURBO MODELS



SEL473K

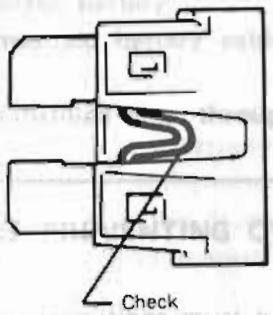
Wiring Diagram (Cont'd)

NON-TURBO MODELS



SEL474K

Fuse

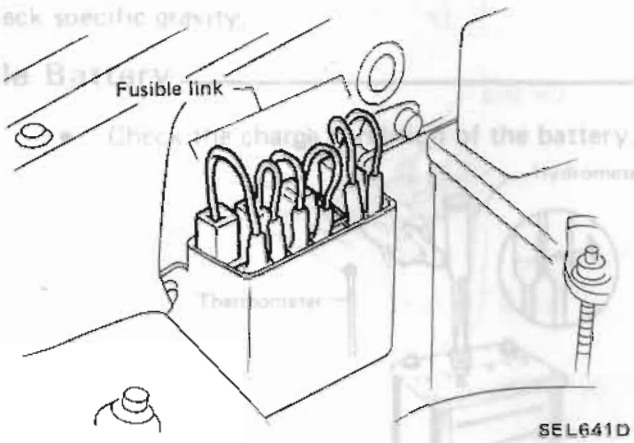


SEL276

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.



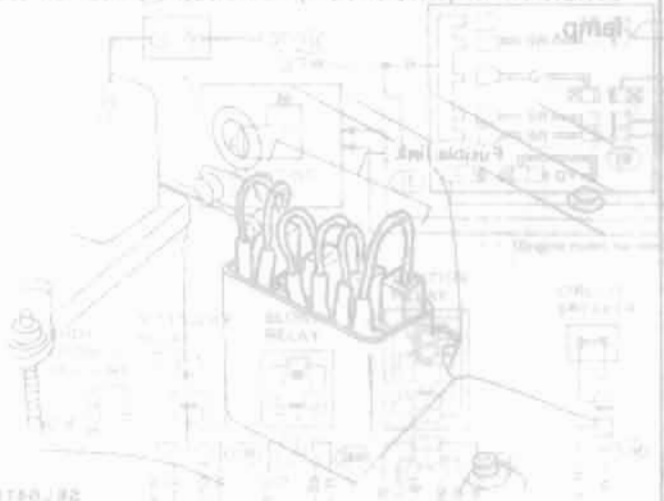
SEL641D

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.

POWER SUPPLY ROUTING

Note:





CAUTION:

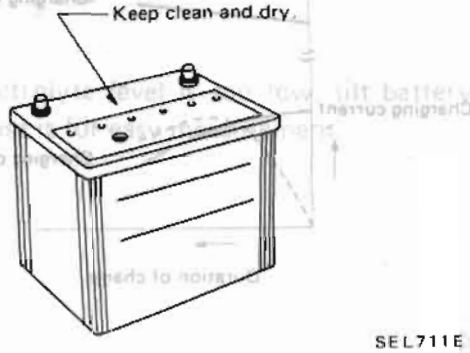
a. **If it becomes necessary to start the engine with a booster battery and jumper cables, use a 12-volt booster battery.**
b. **After connecting battery cables, ensure that they are tightly clamped to battery terminals for good contact.**
c. **Never add distilled water through the hole used to check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

How to Handle Battery

METHODS OF PREVENTING OVER-DISCHARGE

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

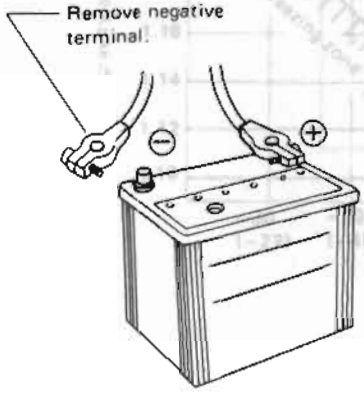
- The battery surface (particularly its top) should always be kept clean and dry.



SEL711E

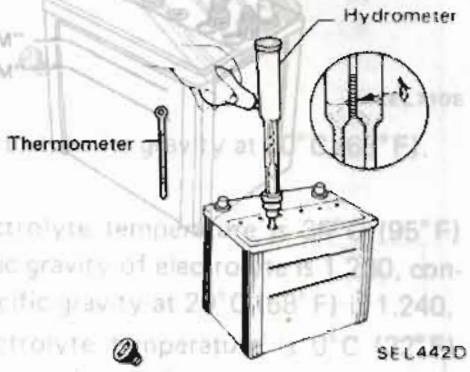
If the top surface of a battery is wet with electrolyte or water, leakage current will cause the battery to discharge. Always keep the battery clean and dry.

- When the vehicle is not going to be used over a long period of time, disconnect the negative battery terminal.



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

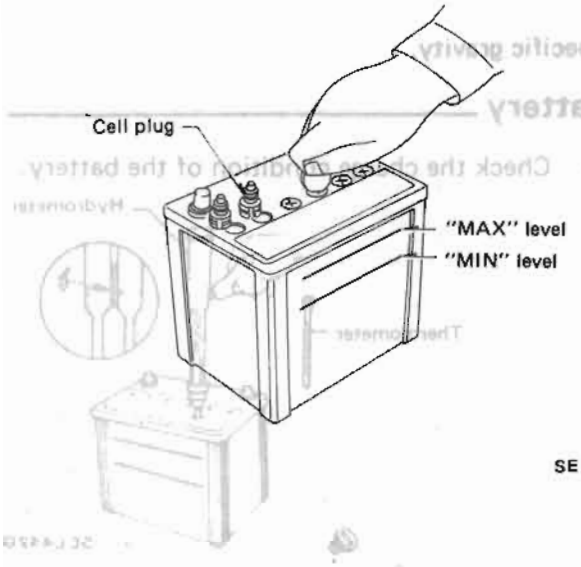
WARNING:

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.

How to Handle Battery (Cont'd)

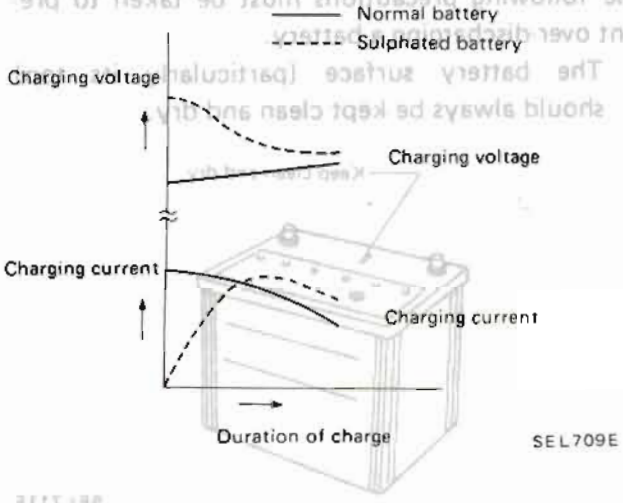
- If the electrolyte level is low, remove cell plug using a suitable tool.
- Add distilled water up to the MAX level.



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.

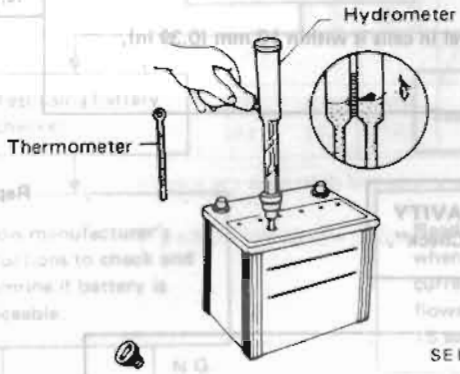


Specific Gravity Check

SPECIFIC GRAVITY CHECK

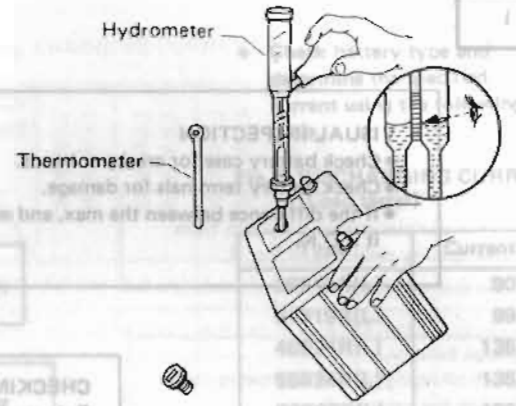
1. Read hydrometer and thermometer indications at eye level.

   Read top level with scale.



SEL442D

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

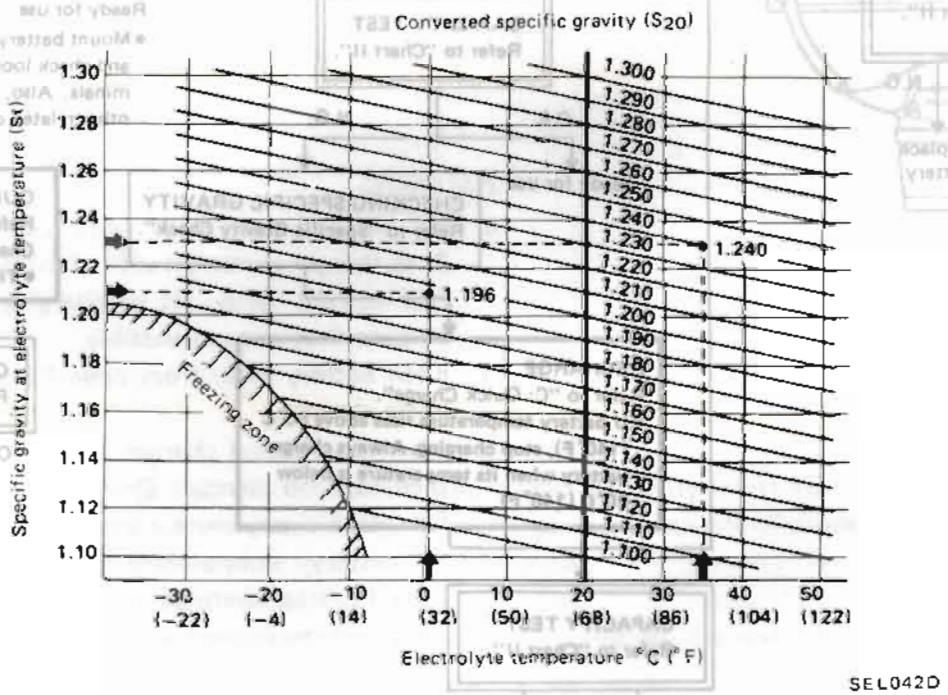


SEL710E

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

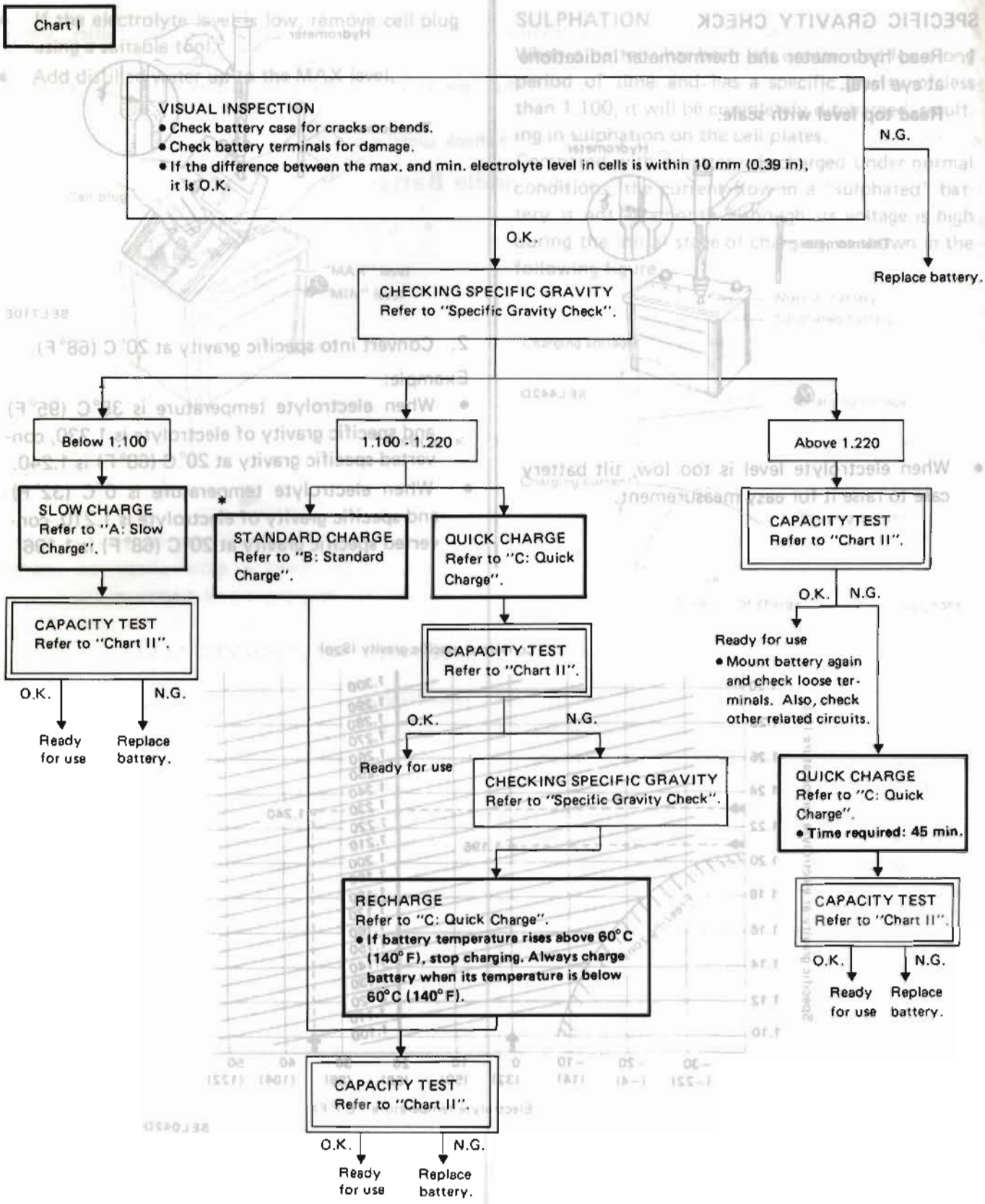
Example:

- 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

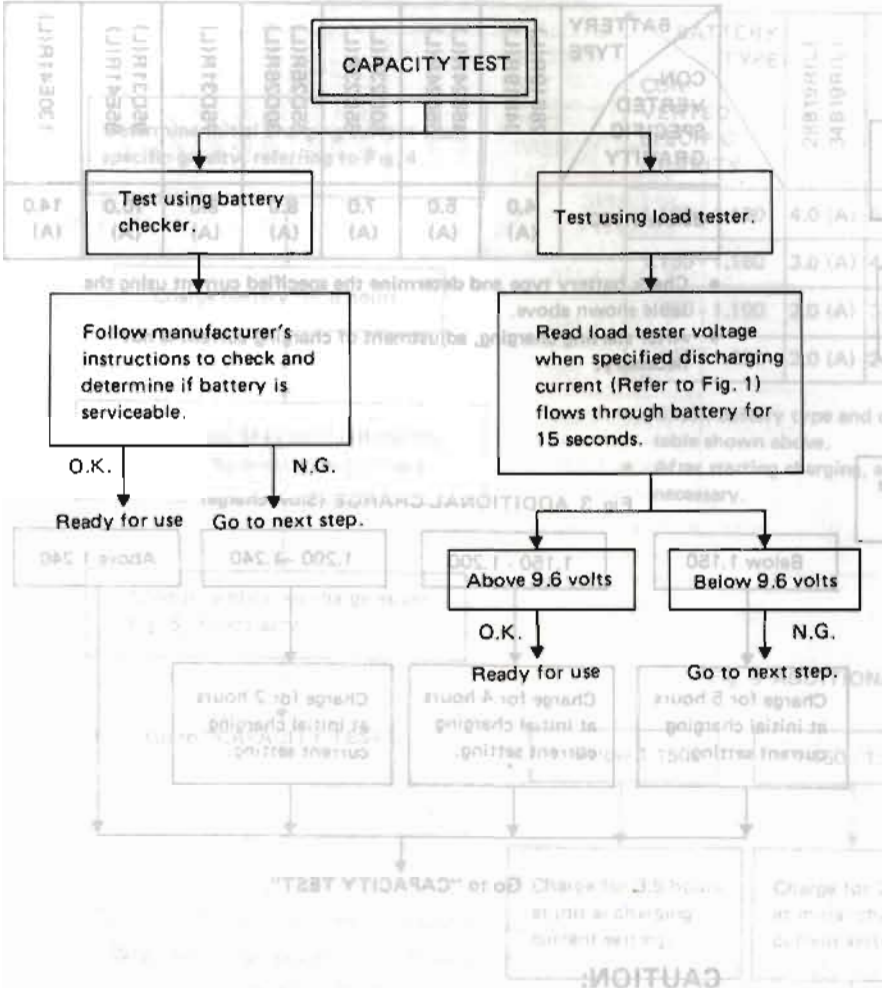
Battery Test and Charging Chart



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

Battery Test and Charging Chart (Cont'd)

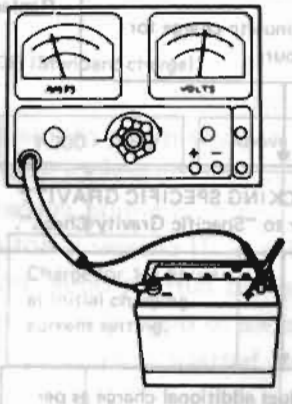
Chart II



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

Fig. 1 DISCHARGING CURRENT (Load tester)

Type	Current (A)
28B19R(L)	90
34B19R(L)	99
46B24R(L)	135
55B24R(L)	135
50D23R(L)	150
55D23R(L)	180
65D26R(L)	195
80D26R(L)	195
75D31R(L)	210
95D31R(L)	240
95E41R(L)	300
130E41R(L)	330



SEL697B

Battery Test and Charging Chart (Cont'd)

A: SLOW CHARGE

Determine initial charging current from specific gravity referring to Fig. 2.

- Charge battery.
- Check charging voltage 30 minutes after starting the battery charge.

12 to 15 volts — O.K. → Continue to charge for 12 hours.

Below 12 volts or above 15 volts — N.G. → Replace battery.

CHECKING SPECIFIC GRAVITY
Refer to "Specific Gravity Check".

Conduct additional charge as per Fig 3, if necessary.

Go to "CAPACITY TEST".

Fig. 2 INITIAL CHARGING CURRENT SETTING (Slow charge)

CONVERTED SPECIFIC GRAVITY \ BATTERY TYPE	28B19R(L) 34B19R(L)	46B24R(L) 55B24R(L)	50D23R(L) 55D23R(L)	65D26R(L) 80D26R(L)	75D31R(L)	95D31R(L) 95E41R(L)	130E41R(L)
Below 1.100	4.0 (A)	5.0 (A)	7.0 (A)	8.0 (A)	9.0 (A)	10.0 (A)	14.0 (A)

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

Fig. 3 ADDITIONAL CHARGE (Slow charge)

Below 1.150	1.150 - 1.200	1.200 - 1.240	Above 1.240
Charge for 5 hours at initial charging current setting.	Charge for 4 hours at initial charging current setting.	Charge for 2 hours at initial charging current setting.	

Go to "CAPACITY TEST".

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).

Battery Test and Charging Chart (Cont'd)

B: STANDARD CHARGE

Determine initial charging current from specific gravity, referring to Fig. 4.

↓

Charge battery for 8 hours.

↓

CHECKING SPECIFIC GRAVITY
Refer to "Specific Gravity Check".

↓

Conduct additional charge as per Fig. 5, if necessary.

↓

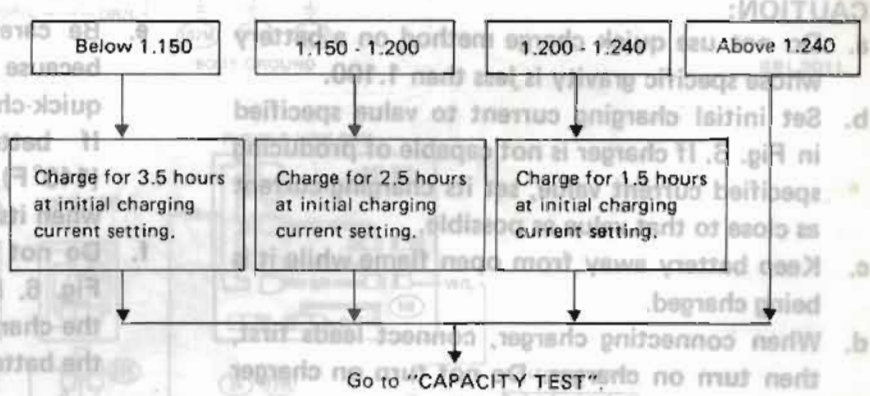
Go to "CAPACITY TEST".

Fig. 4 INITIAL CHARGING CURRENT SETTING (Standard charge)

BATTERY TYPE / CONVERTED SPECIFIC GRAVITY	28B19R(L) 34B19R(L)	46B24R(L) 55B24R(L)	50D23R(L) 55D23R(L)	65D26R(L) 80D26R(L)	75D31R(L)	95D31R(L) 95E41R(L)	130E41R(L)
1.100 - 1.130	4.0 (A)	5.0 (A)	6.0 (A)	7.0 (A)	8.0 (A)	9.0 (A)	13.0 (A)
1.130 - 1.160	3.0 (A)	4.0 (A)	5.0 (A)	6.0 (A)	7.0 (A)	8.0 (A)	11.0 (A)
1.160 - 1.190	2.0 (A)	3.0 (A)	4.0 (A)	5.0 (A)	6.0 (A)	7.0 (A)	9.0 (A)
1.190 - 1.220	2.0 (A)	2.0 (A)	3.0 (A)	4.0 (A)	5.0 (A)	5.0 (A)	7.0 (A)

- Check battery type and determine the specified current using the table shown above.
- 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).

Battery Test and Charging Chart (Cont'd)

C: QUICK CHARGE

Determine initial charging current setting and charging time from specific gravity, referring to Fig. 6.

↓

Charge battery

↓

Go to "CAPACITY TEST".

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

CONVERTED SPECIFIC GRAVITY / CURRENT [A] / BATTERY TYPE	28B19R(L) 34B19R(L)	46B24R(L) 55B24R(L) 50D23R(L)	55D23R(L) 65D26R(L) 80D26R(L)	75D31R(L) 95D31R(L) 95E41R(L)	130E41R(L)
	10 (A)	15 (A)	20 (A)	30 (A)	40 (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 table shown above.
- 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).

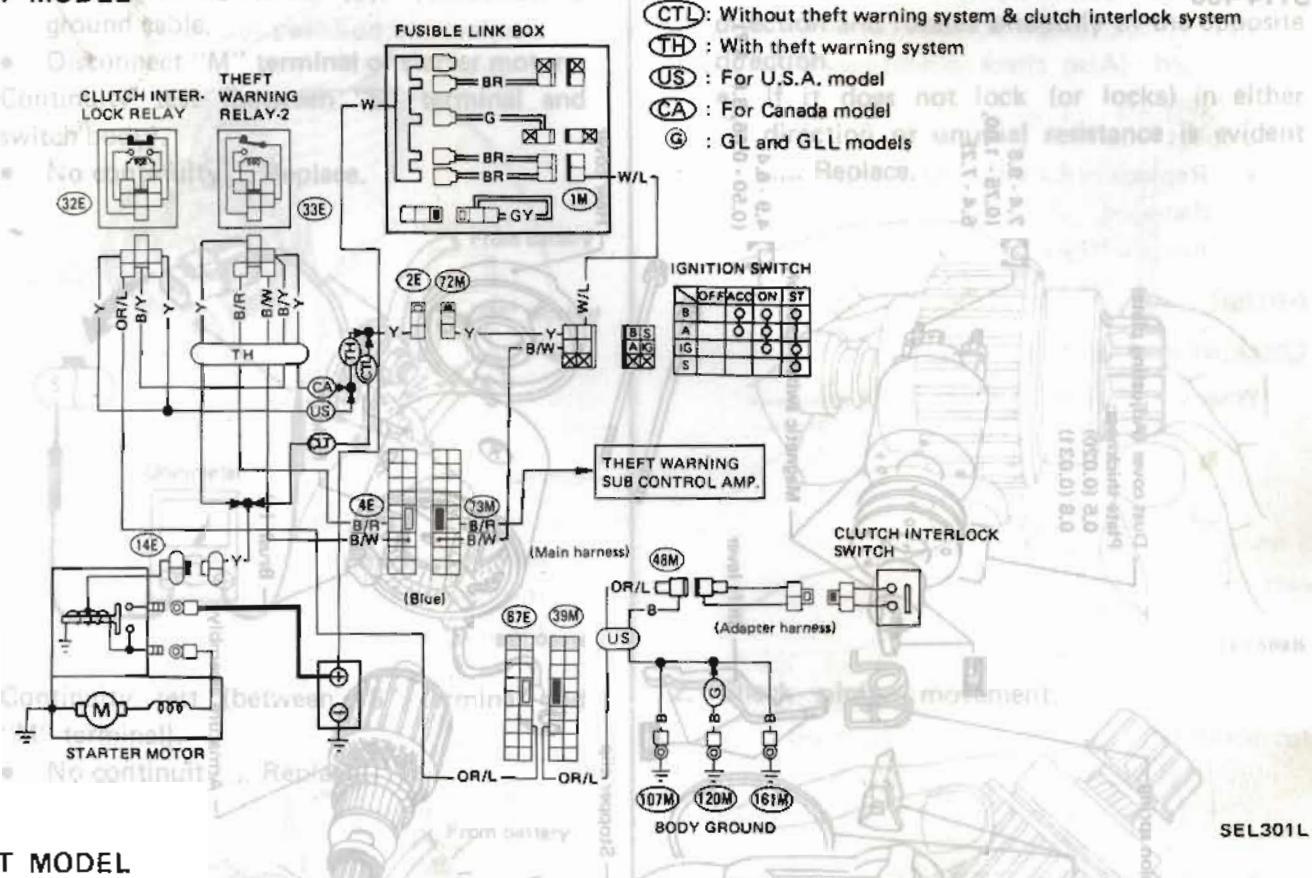
f. Do not exceed the charging time specified in Fig. 6. Because if the battery is charged over the charging time, it can cause deterioration of the battery.

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

Applied model	U.S.A.	U.S.A. option and Canada
Type	65D23R	75D31R
Capacity V-AH	12-60	12-70

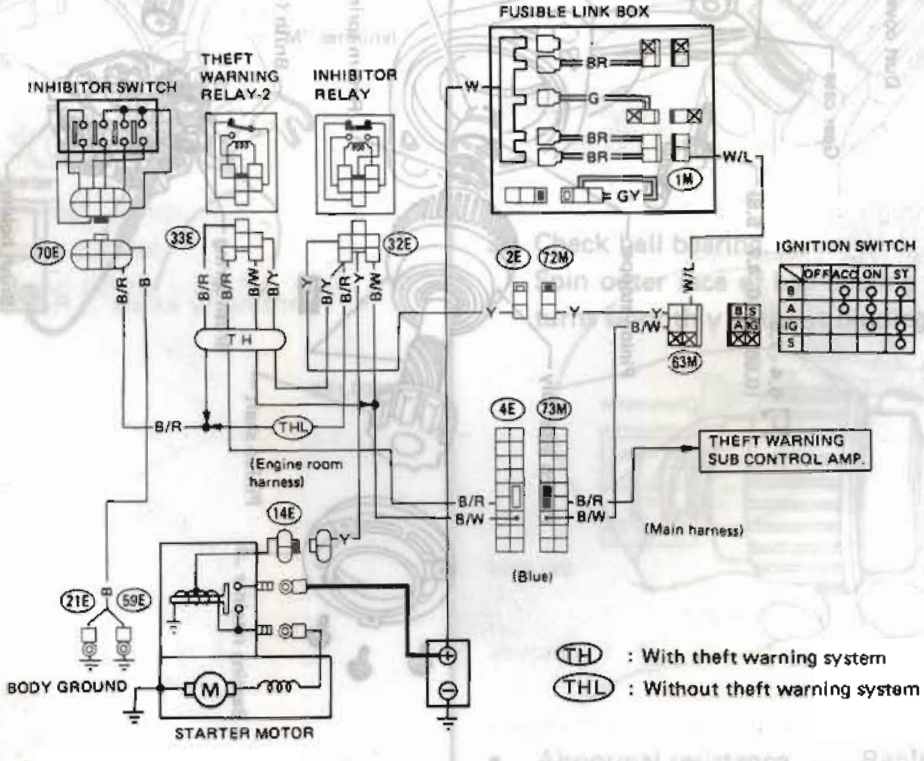
Wiring Diagram

M/T MODEL



SEL301L

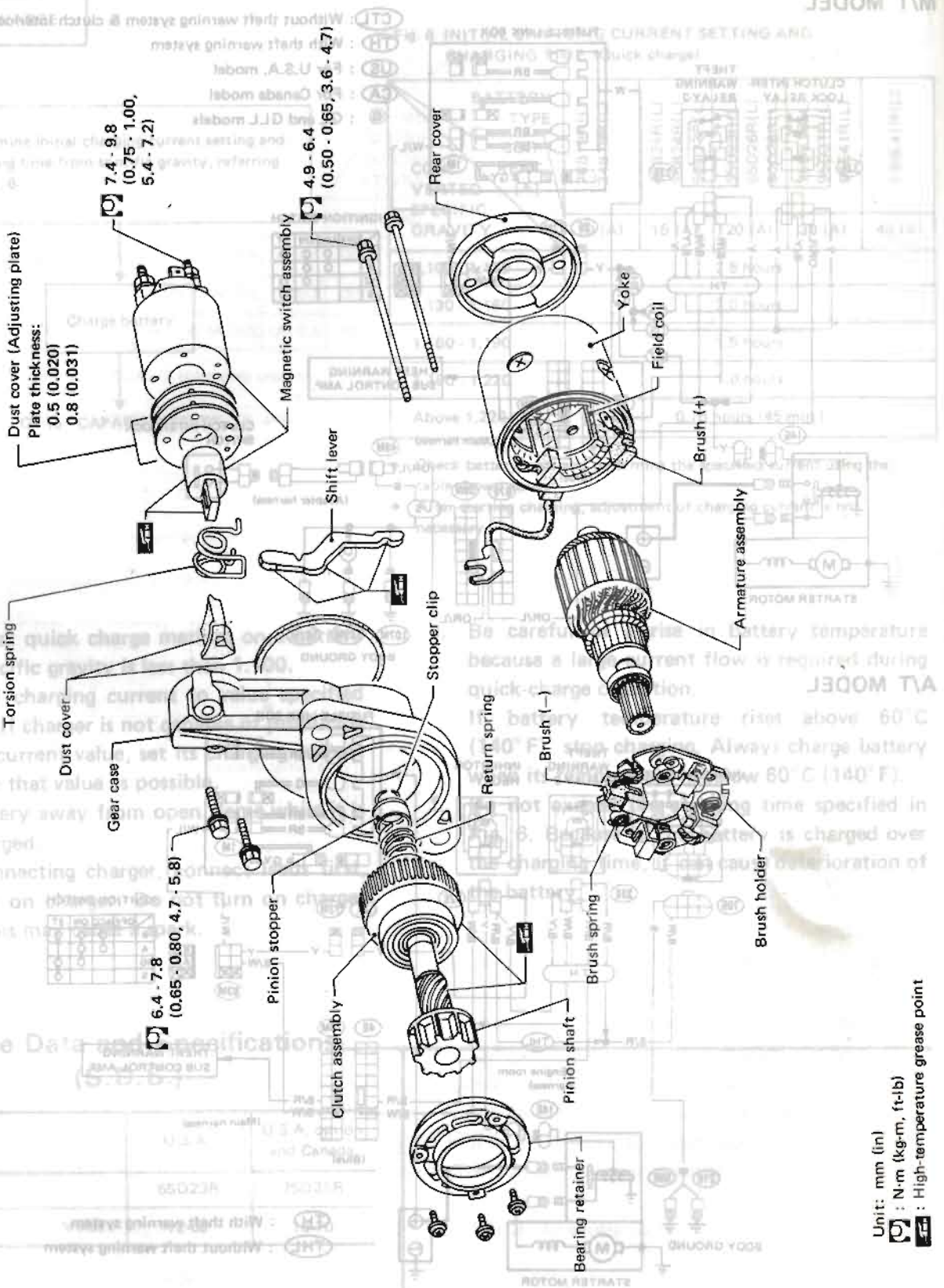
A/T MODEL



SEL302L

Construction

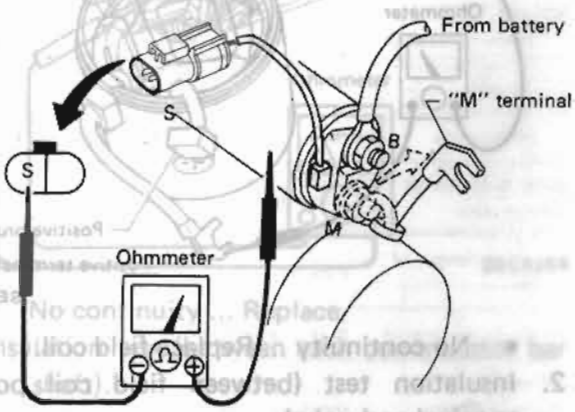
S114-458



Magnetic Switch Check

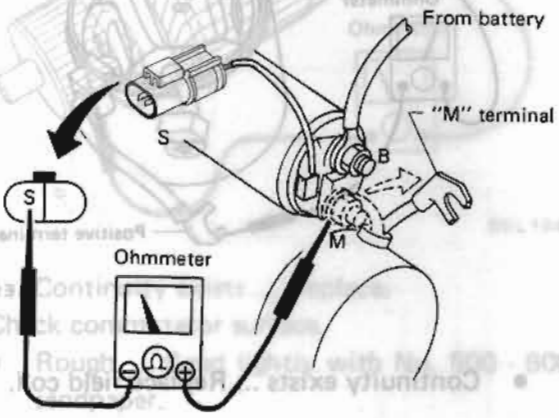
- Before starting to check, disconnect battery ground cable.
- Disconnect "M" terminal of starter motor.

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



SEL036H

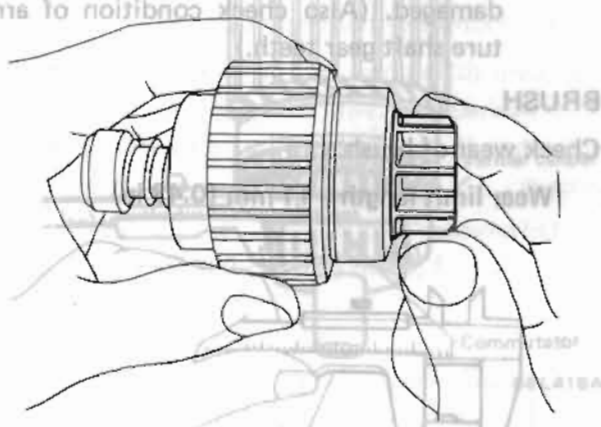
2. Continuity test (between "S" terminal and "M" terminal).
   - No continuity ... Replace.



SEL038H

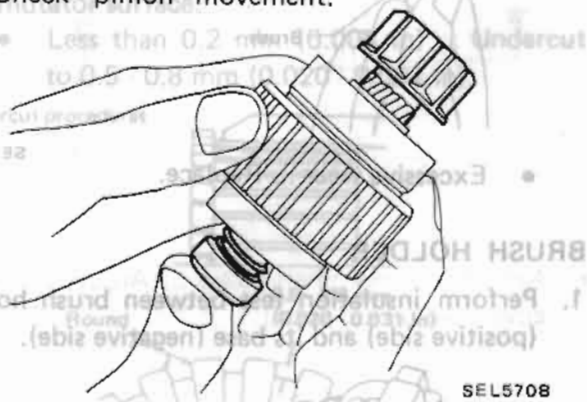
Pinion/Clutch Check

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.



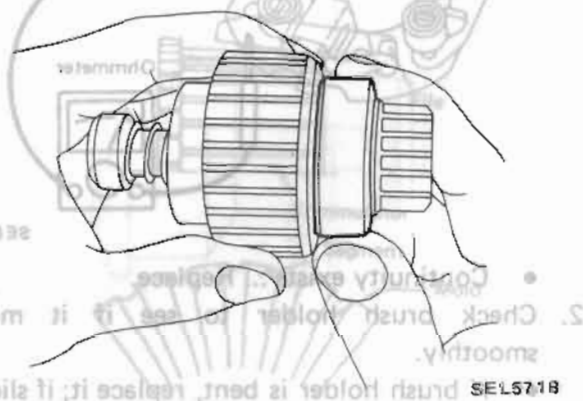
SEL569B

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.

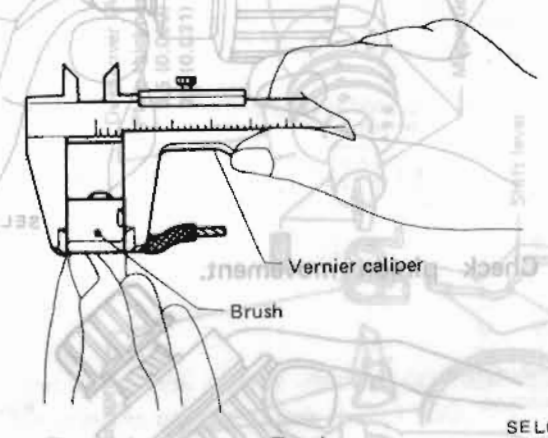
Brush Check

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)

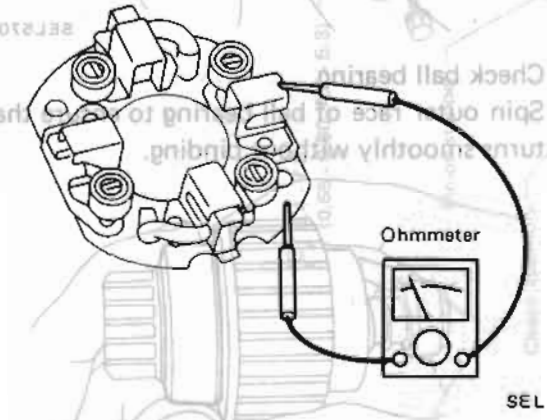


SEL626B

- Excessive wear ... Replace.

BRUSH HOLDER

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



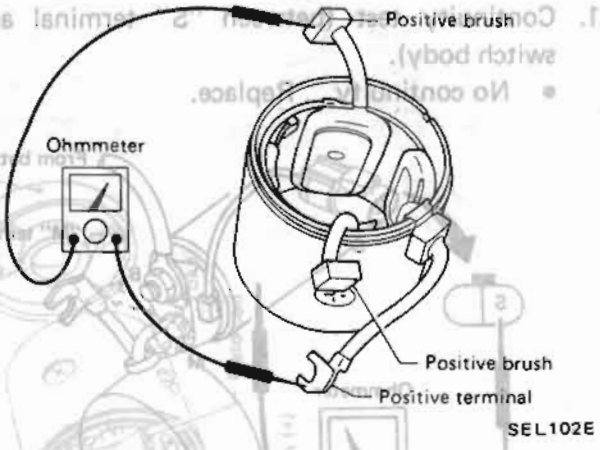
SEL568B

- 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

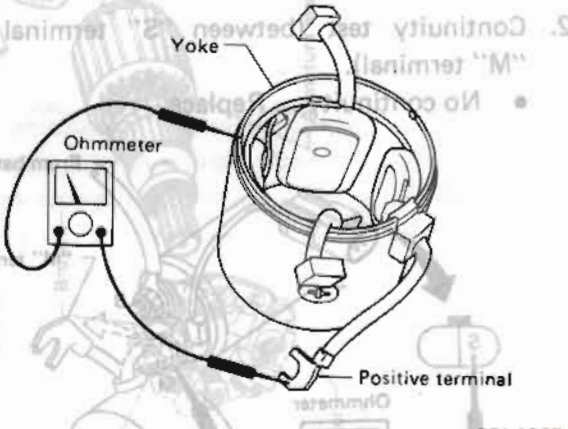
1. Continuity test (between field coil positive terminal and positive brushes).



SEL102E

- No continuity ... Replace field coil.

2. Insulation test (between field coil positive terminal and yoke).

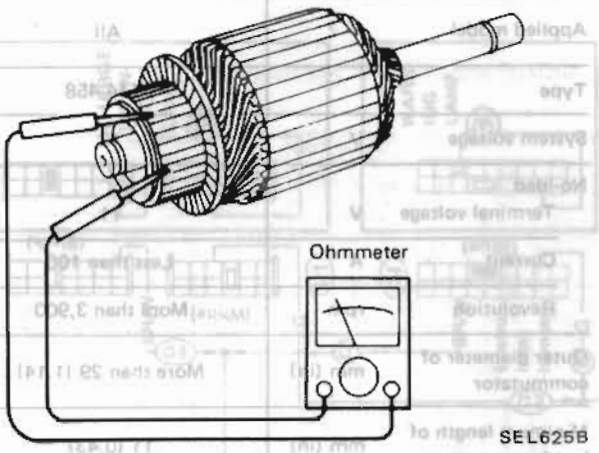


SEL103E

- Continuity exists ... Replace field coil.

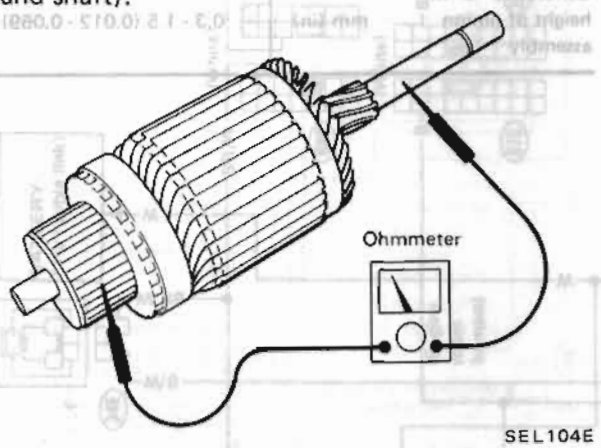
Armature Check

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



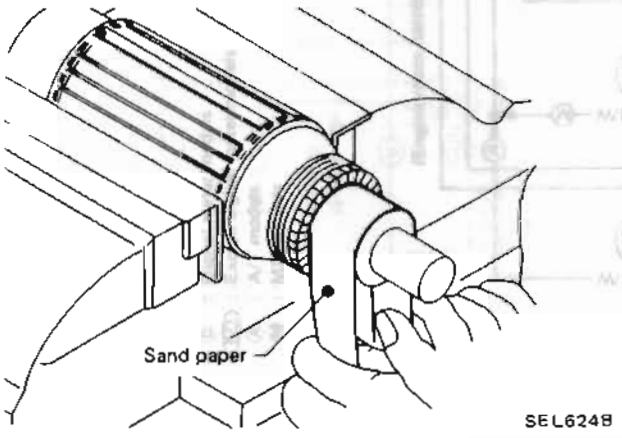
- No continuity ... Replace.

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



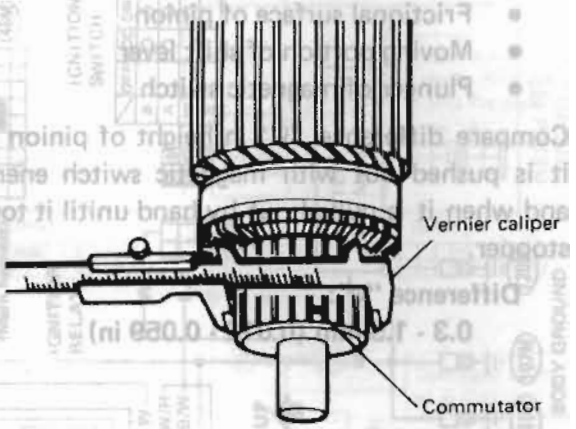
- Continuity exists ... Replace.

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

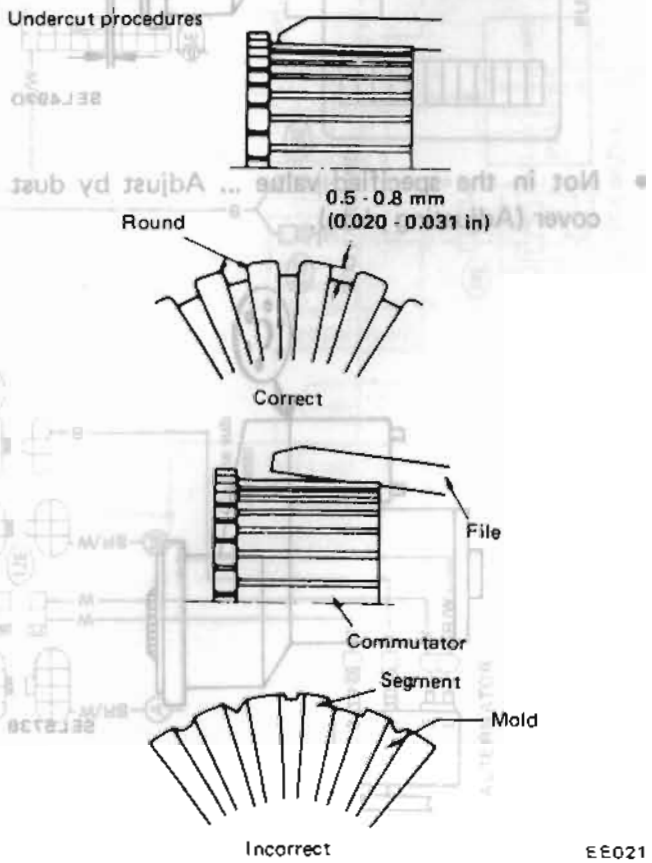


4. Check diameter of commutator.

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



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



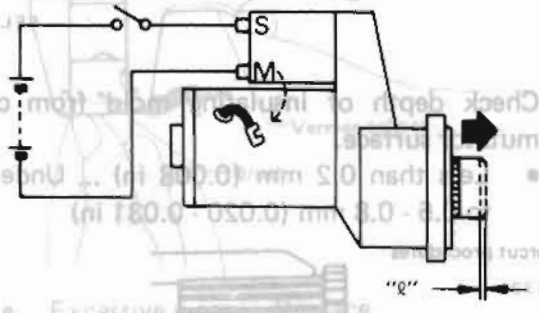
Assembly

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

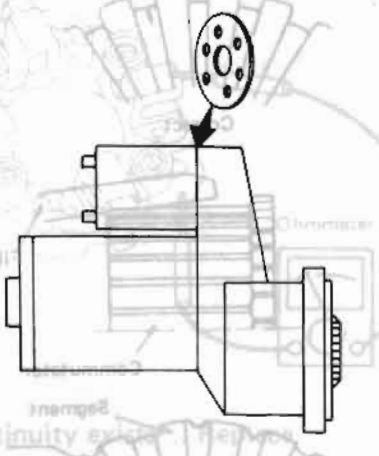
Compare difference "ℓ" in height of pinion when it is pushed out with magnetic switch energized and when it is pulled out by hand unitil it touches stopper.

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



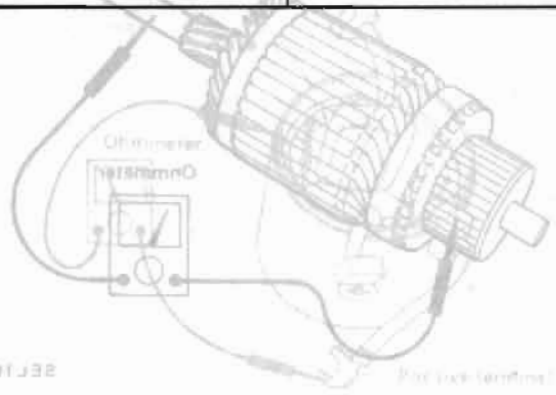
SEL497D

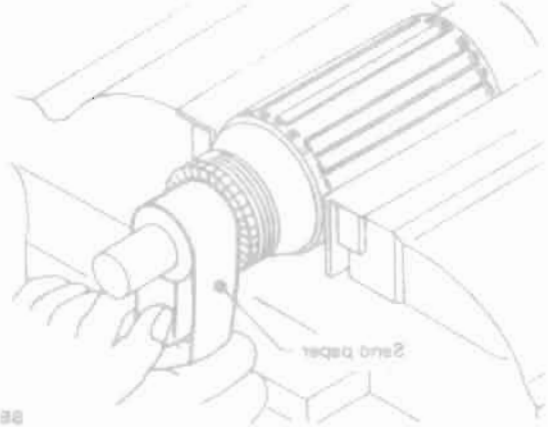
- Not in the specified value ... Adjust by dust cover (Adjusting plate).


SEL573B

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

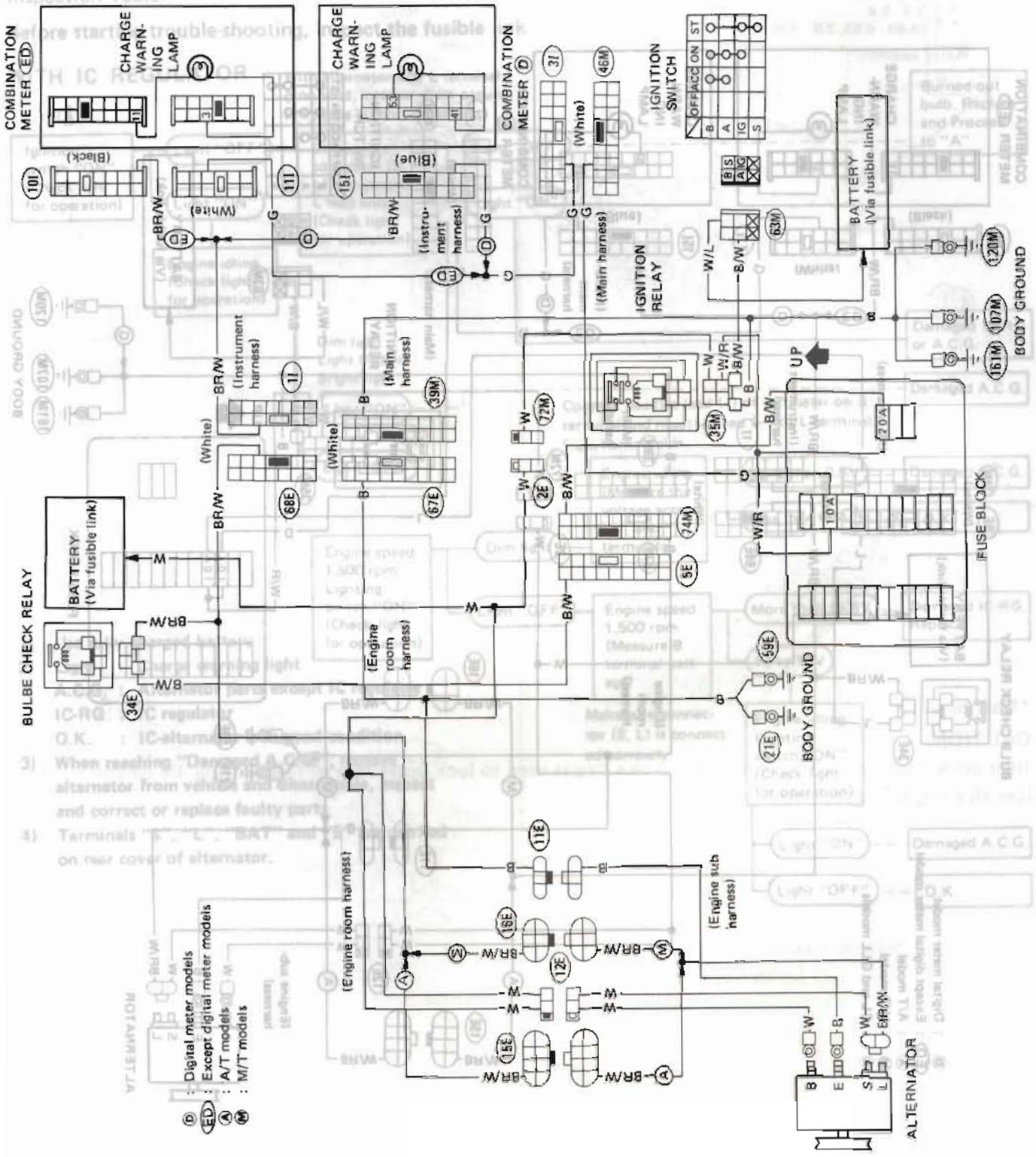
Applied model		All
Type		S114-458
System voltage	V	12
No-load		
Terminal voltage	V	11
Current	A	Less than 100
Revolution	rpm	More than 3,900
Outer diameter of commutator	mm (in)	More than 29 (1.14)
Minimum length of brush	mm (in)	11 (0.43)
Brush spring tension	N (kg, lb)	15.7 - 19.6 (1.6 - 2.0, 3.5 - 4.4)
Difference "ℓ" in height of pinion assembly	mm (in)	0.3 - 1.5 (0.012 - 0.059)





Wiring Diagram

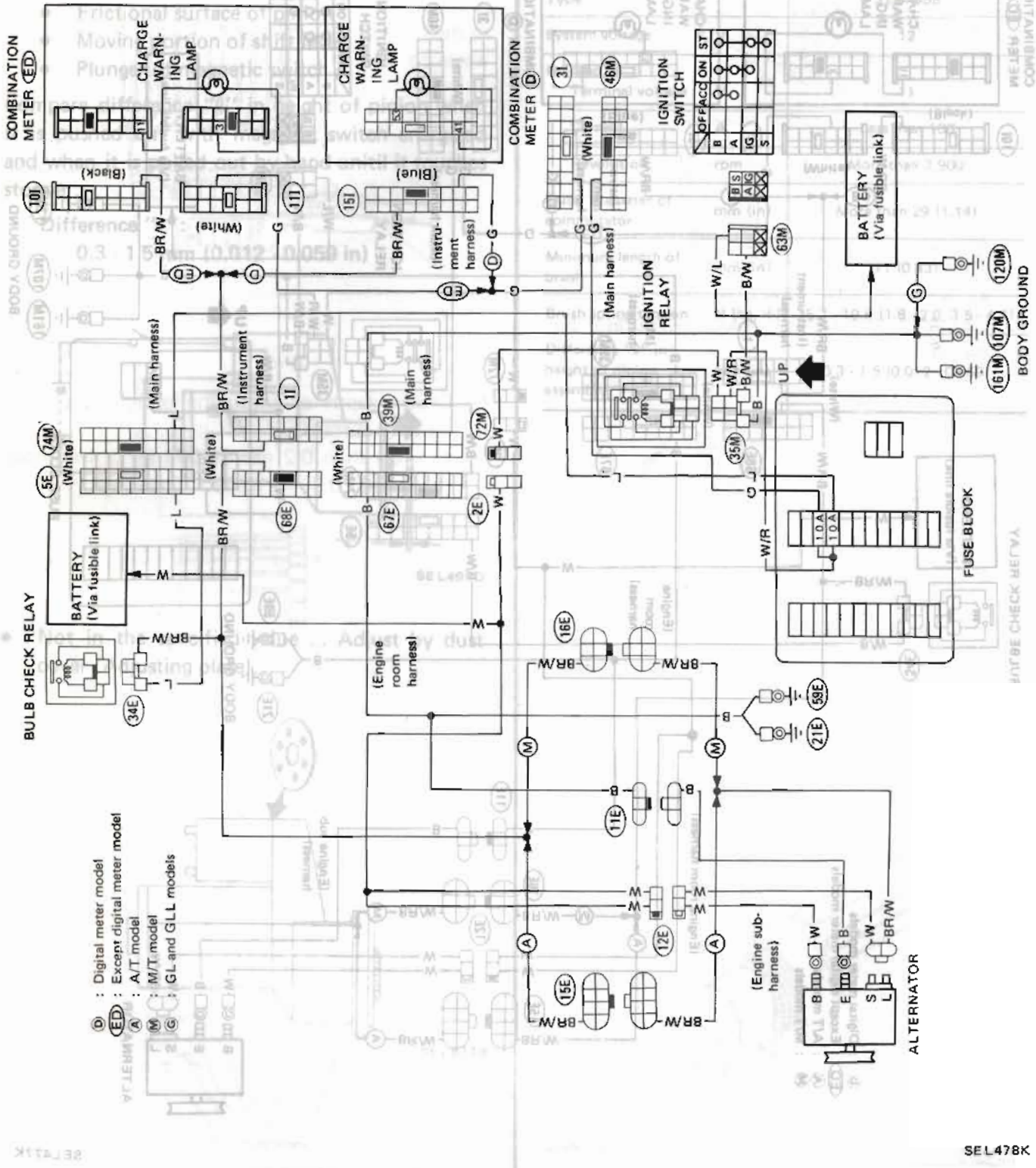
TURBO MODEL



SEL477K

Wiring Diagram (Cont'd)

NON-TURBO MODEL



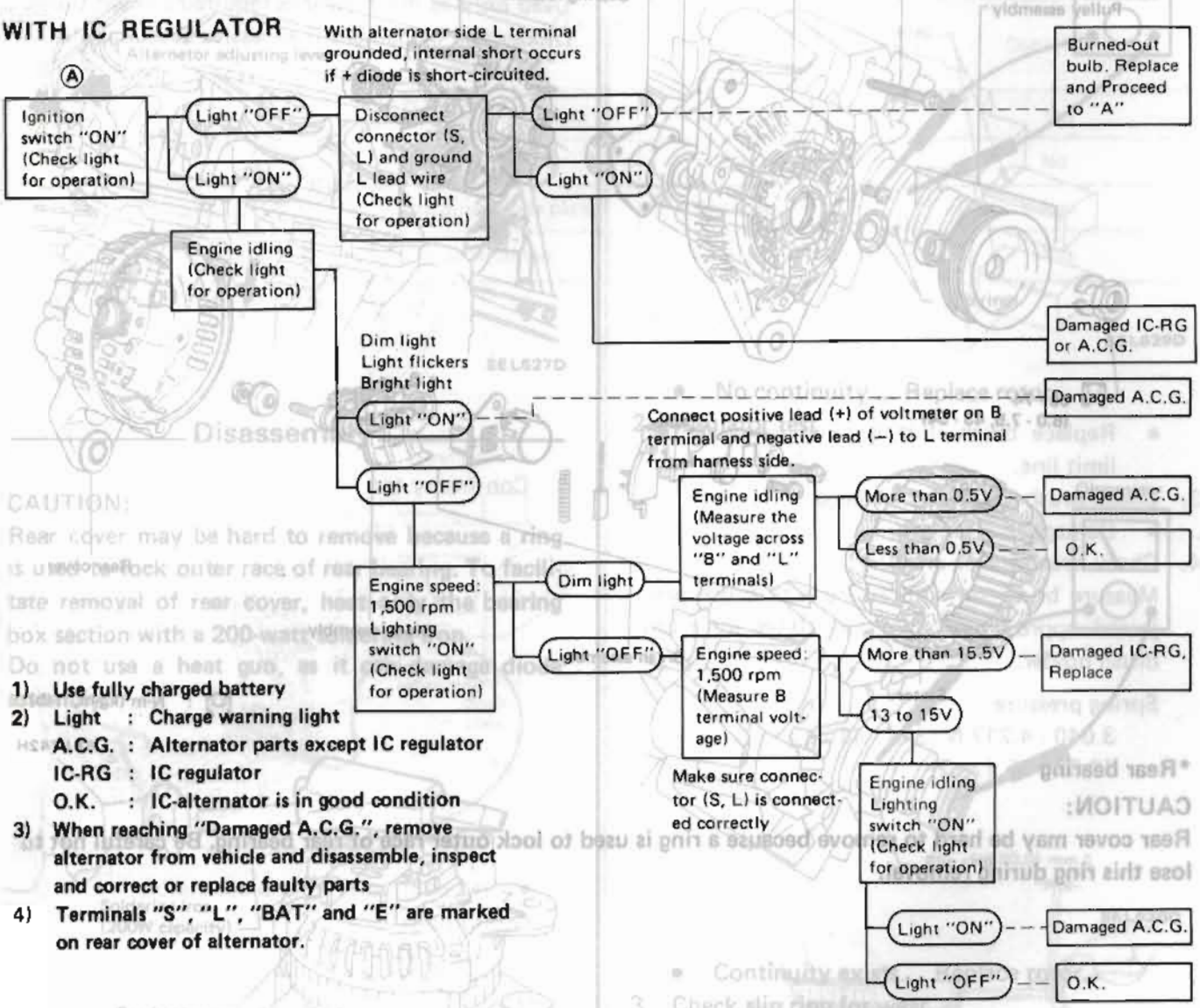
D : Digital meter model
ED : Except digital meter model
A : A/T model
M : M/T model
G : GL and GLL models

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.

Before starting trouble-shooting, inspect the fusible link.

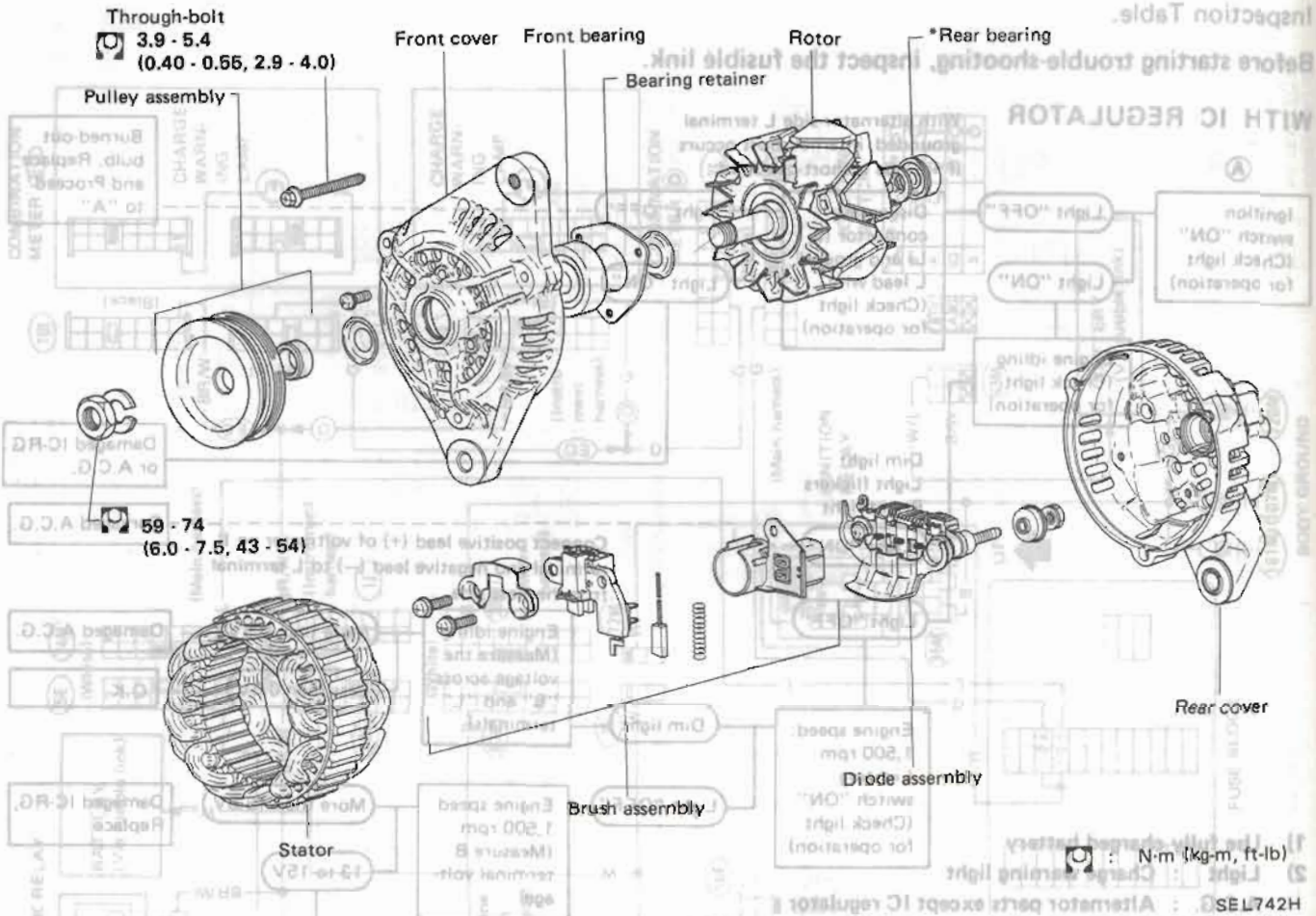
WITH IC REGULATOR



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 vehicle and disassemble, inspect and correct or replace faulty parts
4) Terminals "S", "L", "BAT" and "E" are marked on rear cover of alternator.

Construction

A2T48195B



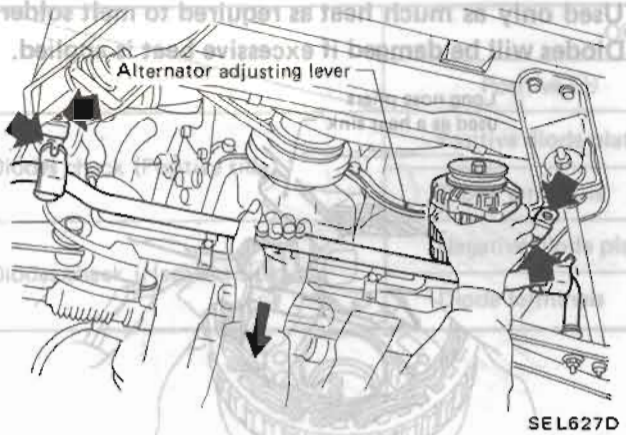
*Rear bearing

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.

Removal

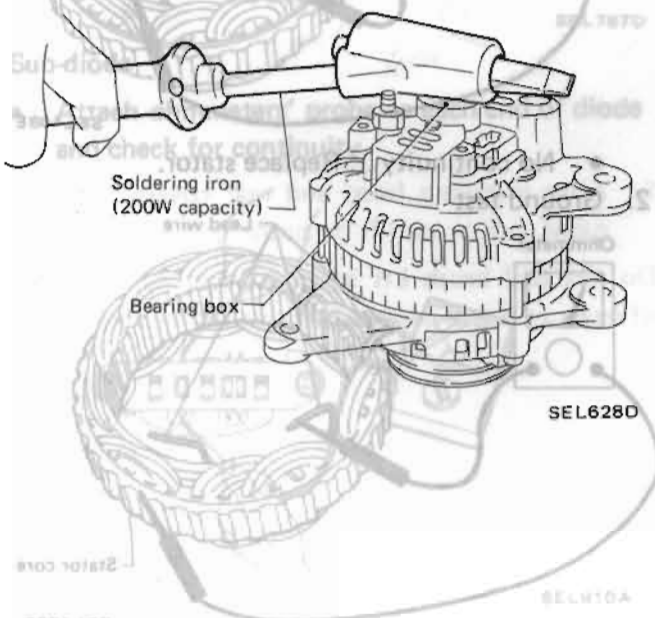
- Remove bolts from alternator.
- Remove bolts for front stabilizer.
- Manually move stabilizer down and remove alternator.



SEL627D

Disassembly

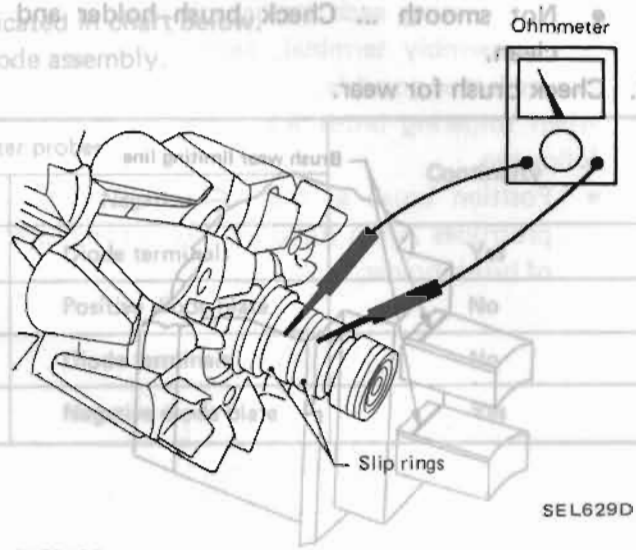
CAUTION:
Rear cover may be hard to remove because a ring is used to lock outer race of rear bearing. To facilitate removal of rear cover, heat only the bearing box section with a 200-watt soldering iron.
Do not use a heat gun, as it can damage diode assembly.



SEL628D

Rotor Slip Ring Check

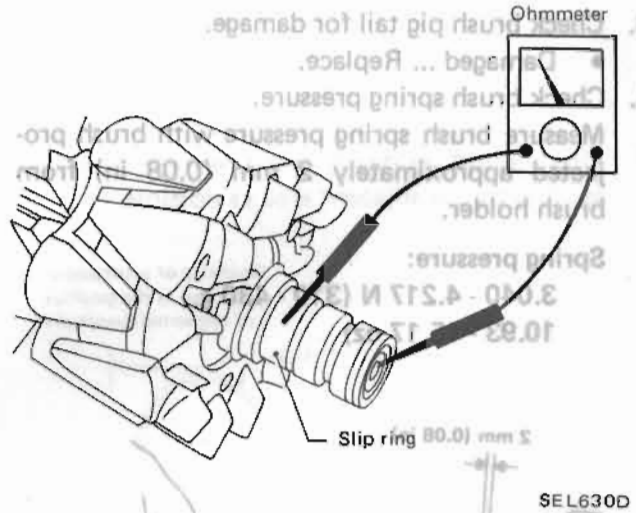
1. Continuity test



SEL629D

- No continuity ... Replace rotor.

2. Insulator test



SEL630D

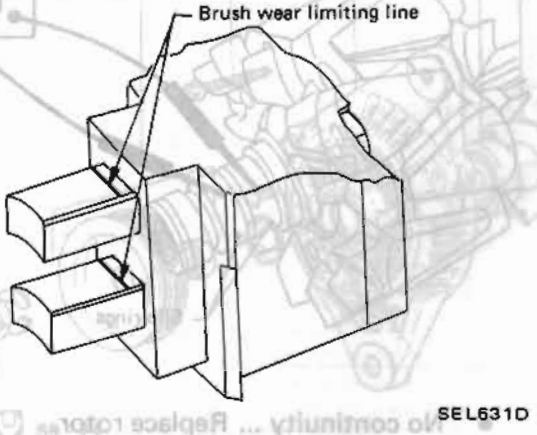
- Continuity exists ... Replace rotor.

3. Check slip ring for wear.

Slip ring minimum outer diameter:
22.4 mm (0.882 in)

Brush Check

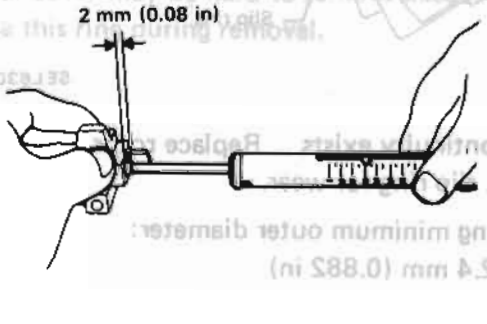
1. Check for smooth movement of brush.
   - Not smooth ... Check brush holder and clean.
2. Check brush for wear.



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:
   3.040 - 4.217 N (310 - 430 g, 10.93 - 15.17 oz)



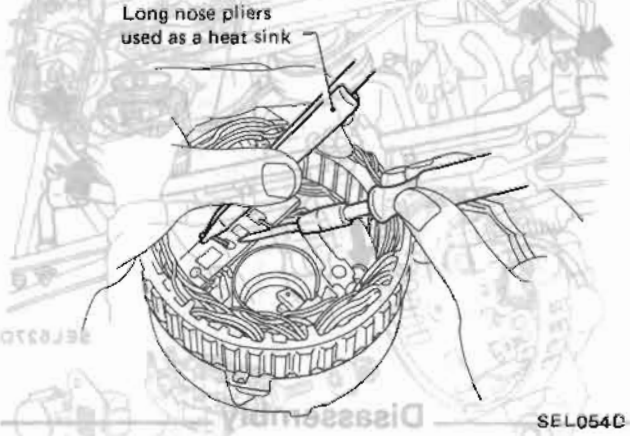
EE049

- Not in the specified value ... Replace.

Stator Check

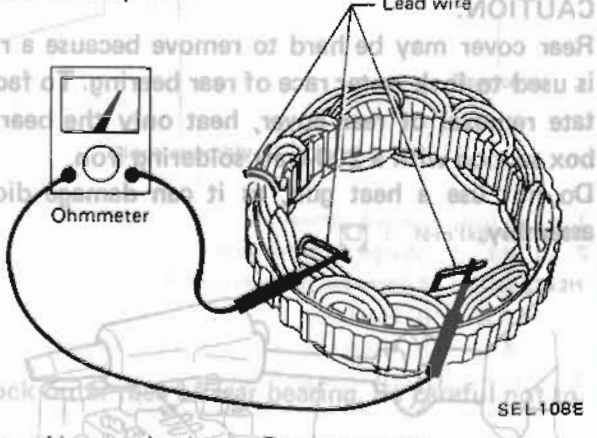
To test the stator or diode, you must separate them by unsoldering the connecting wires.

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



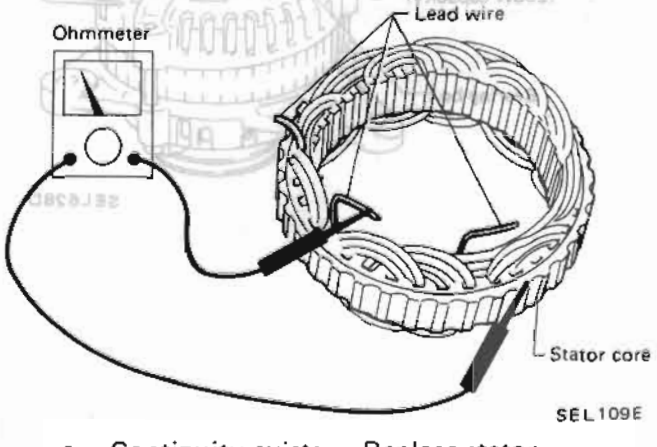
SEL054D

1. Continuity test



SEL108E

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



SEL109E

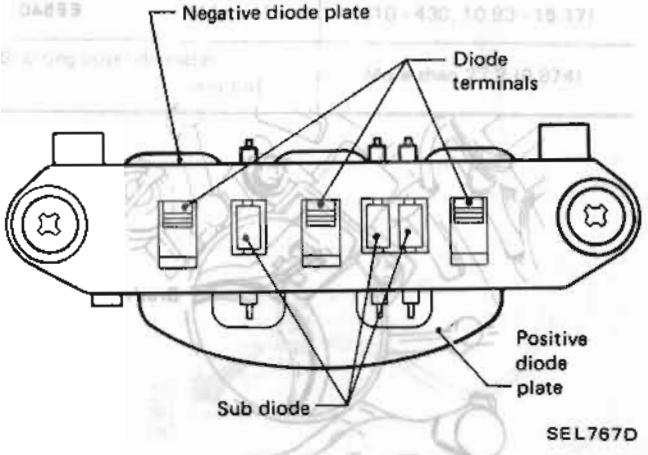
   - Continuity exists ... Replace stator.

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.

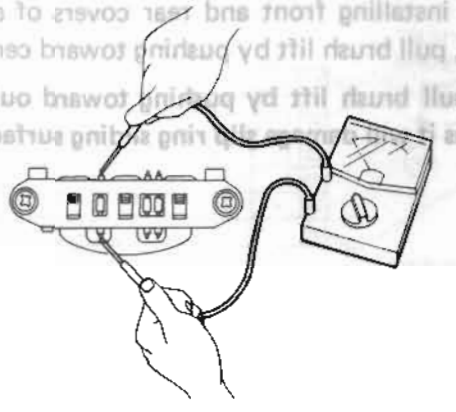
	Ohmmeter probes		Continuity
	Positive ⊕	Negative ⊖	
Diodes check (Positive side)	Positive diode plate	Diode terminals	Yes
	Diode terminals	Positive diode plate	No
Diodes check (Negative side)	Negative diode plate	Diode terminals	No
	Diode terminals	Negative diode plate	Yes



SEL767D

Sub-diode

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

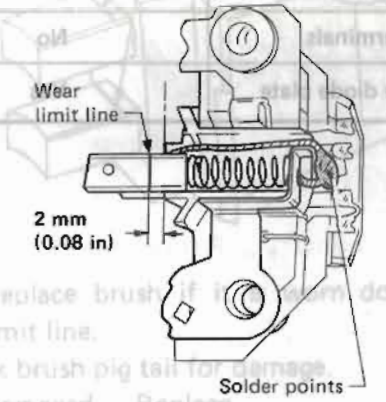

SEL910A

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

Assembly

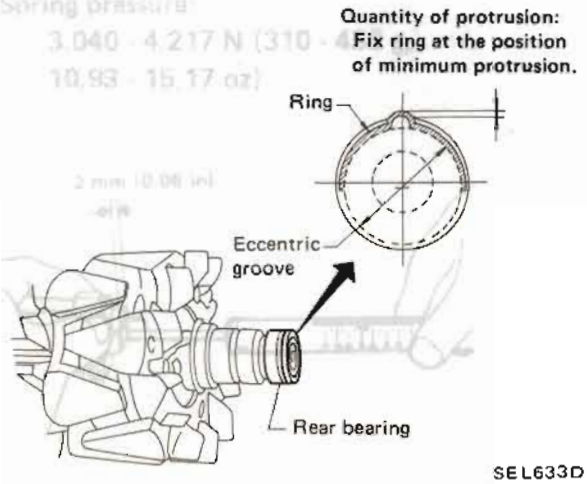
Carefully observe the following instructions.

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.



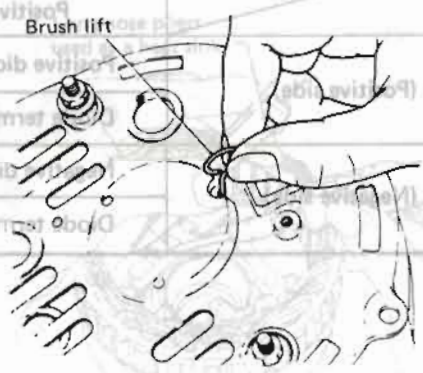
SEL632D

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

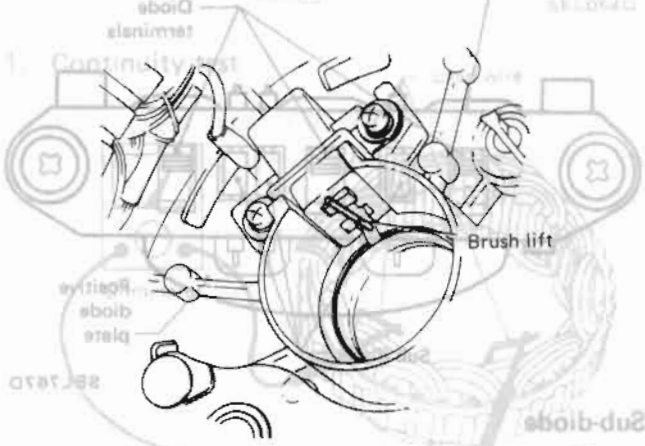


SEL633D

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



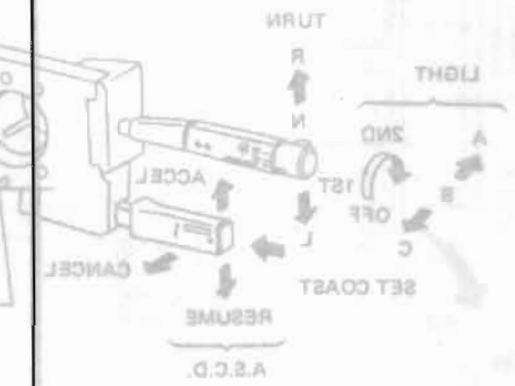
EE541

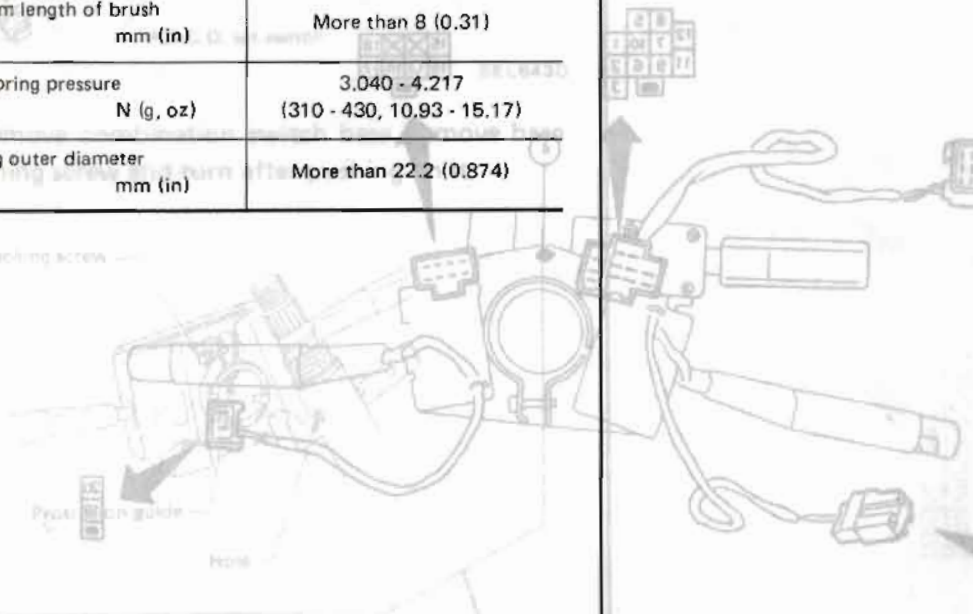
5. After installing front and rear covers of alternator, pull brush lift by pushing toward center.

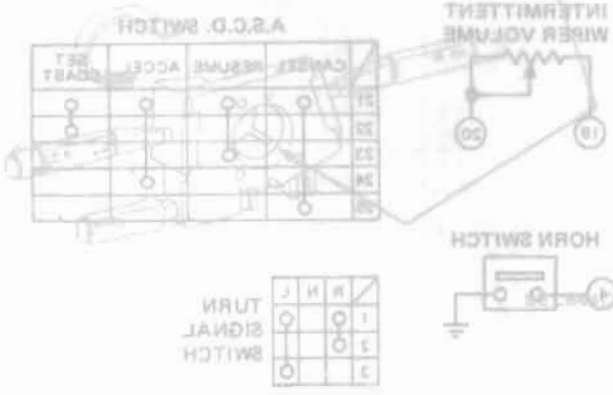
Do not pull brush lift by pushing toward outside of cover as it will damage slip ring sliding surface.

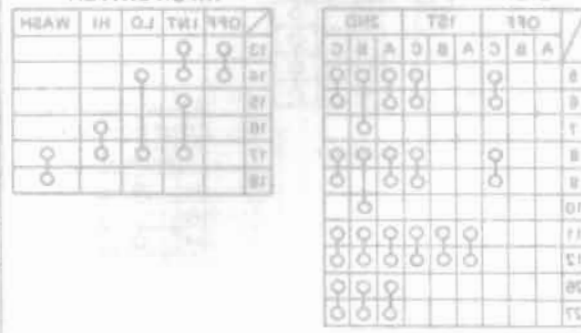
Service Data and Specifications (S.D.S.)

Type	A2T48195B
Applied model	All
Nominal rating V-A	12-70
Ground polarity	Negative
Minimum revolution under no-load (when 14 volts is applied) rpm	Less than 1,100
Hot output current A/rpm	More than 21/1,300 More than 50/2,500
Regulated output voltage V	14.1 - 14.7
Minimum length of brush mm (in)	More than 8 (0.31)
Brush spring pressure N (g, oz)	3.040 - 4.217 (310 - 430, 10.93 - 15.17)
Slip ring outer diameter mm (in)	More than 22.2 (0.874)

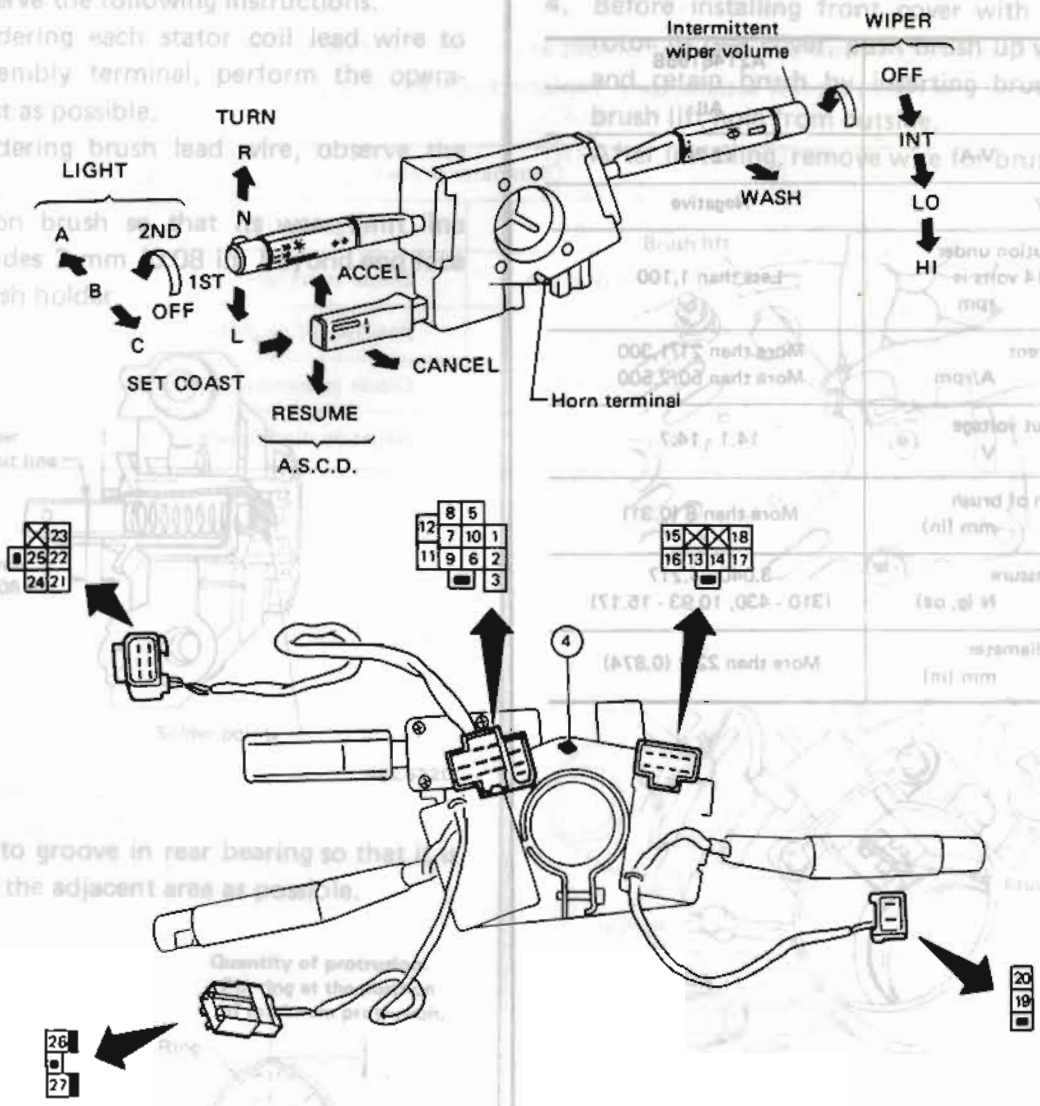








Check



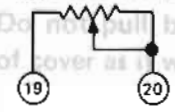
LIGHTING SWITCH

	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					○

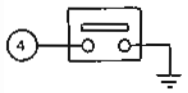
INTERMITTENT WIPER VOLUME



A.S.C.D. SWITCH

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

HORN SWITCH



	R	N	L
1	○		○
2	○		
3			○

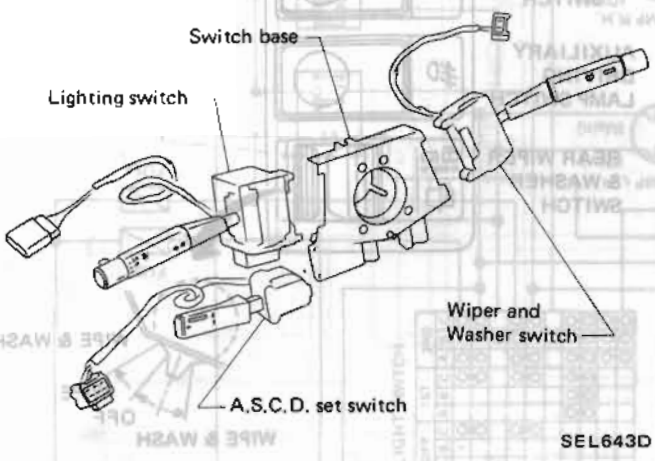
TURN SIGNAL SWITCH

SEL332L

COMBINATION SWITCH

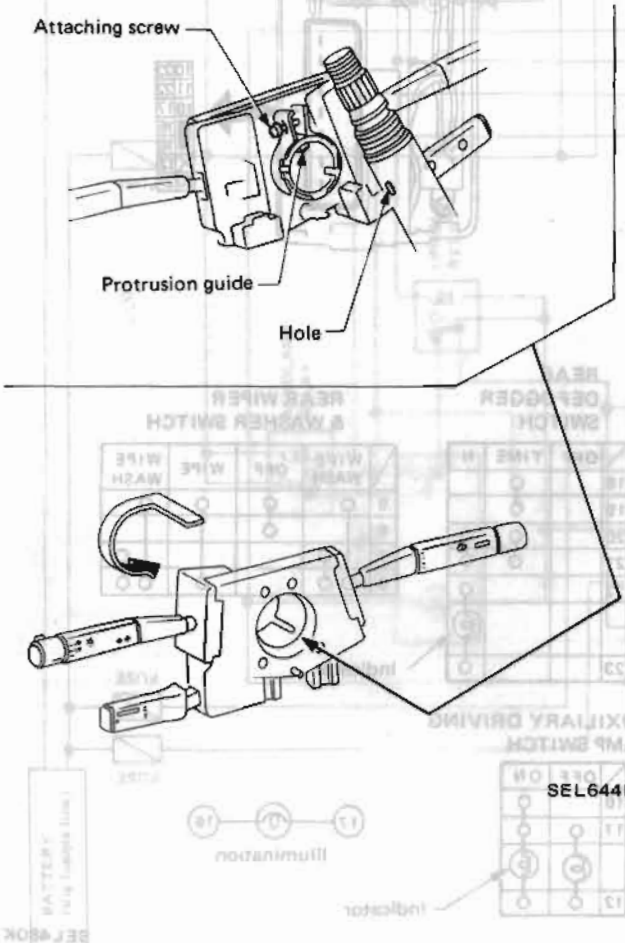
Replacement

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.

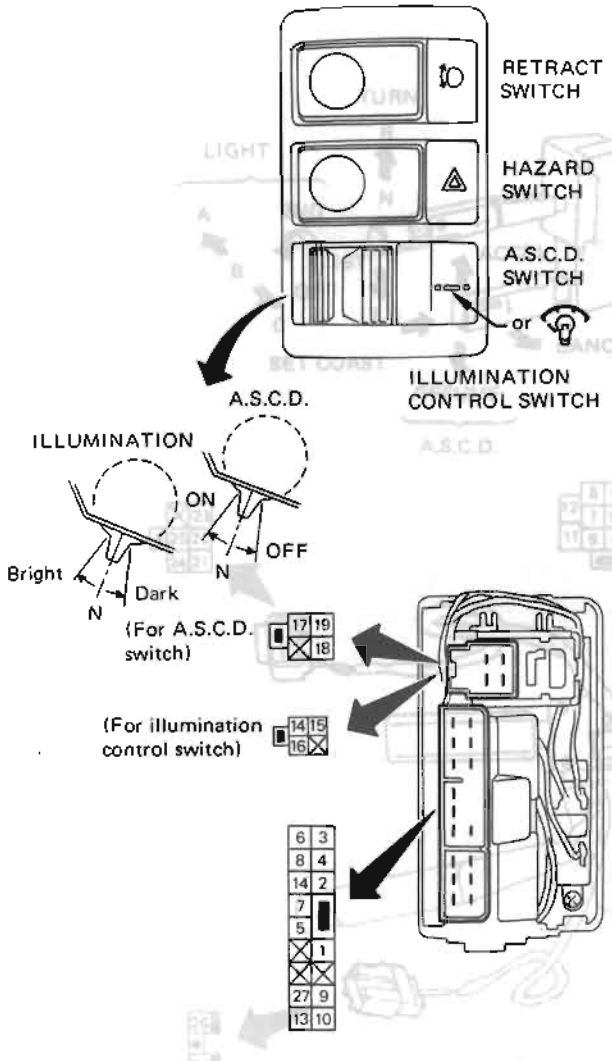


SEL644D

INSTRUMENT SWITCH

Check

INSTRUMENT SWITCH L.H.



RETRACT SWITCH

	UP	DOWN
9		
10		
27		
13		
	E	
14		

Indicator

HAZARD SWITCH

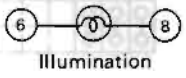
	OFF	ON
2		
1		
7		
3		
4		
5		

A.S.C.D. MAIN SWITCH

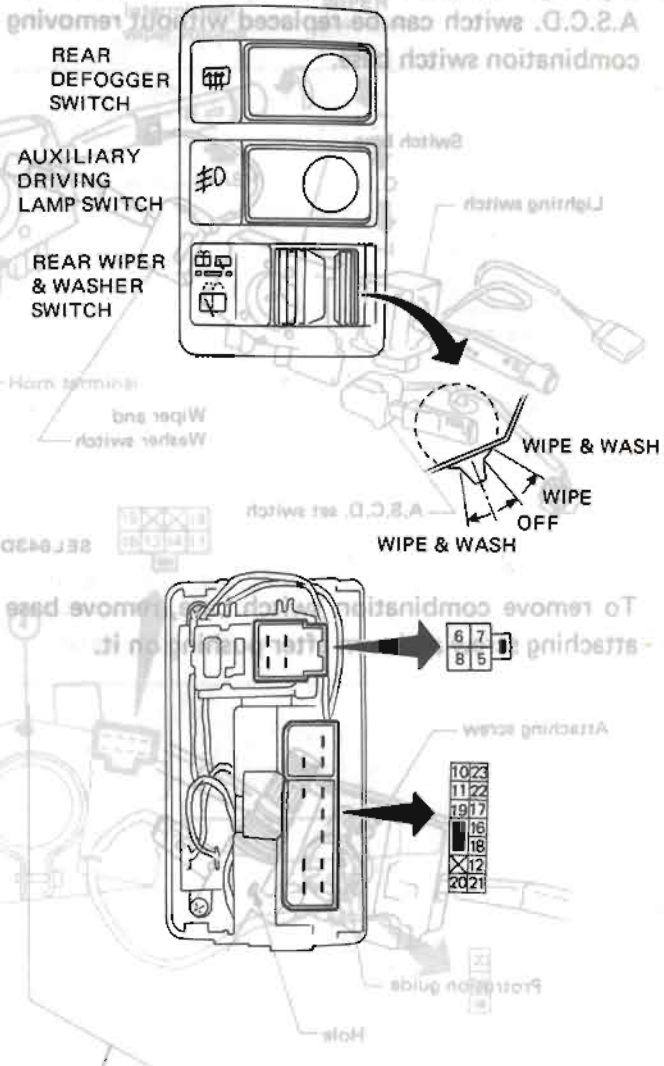
	OFF	N	ON
17			
18			
19			

ILLUMINATION CONTROL SWITCH

	BRIGHT	DARK
15		
16		
14		



INSTRUMENT SWITCH R.H.



REAR DEFOGGER SWITCH

	OFF	TIME	N
18			
19			
20			
21			
22			
		E	
23			

Indicator

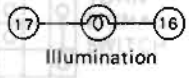
REAR WIPER & WASHER SWITCH

	WIPE WASH	OFF	WIPE	WIPE WASH
5				
6				
7				
8				

AUXILIARY DRIVING LAMP SWITCH

	OFF	ON
10		
11		
	E	E
12		

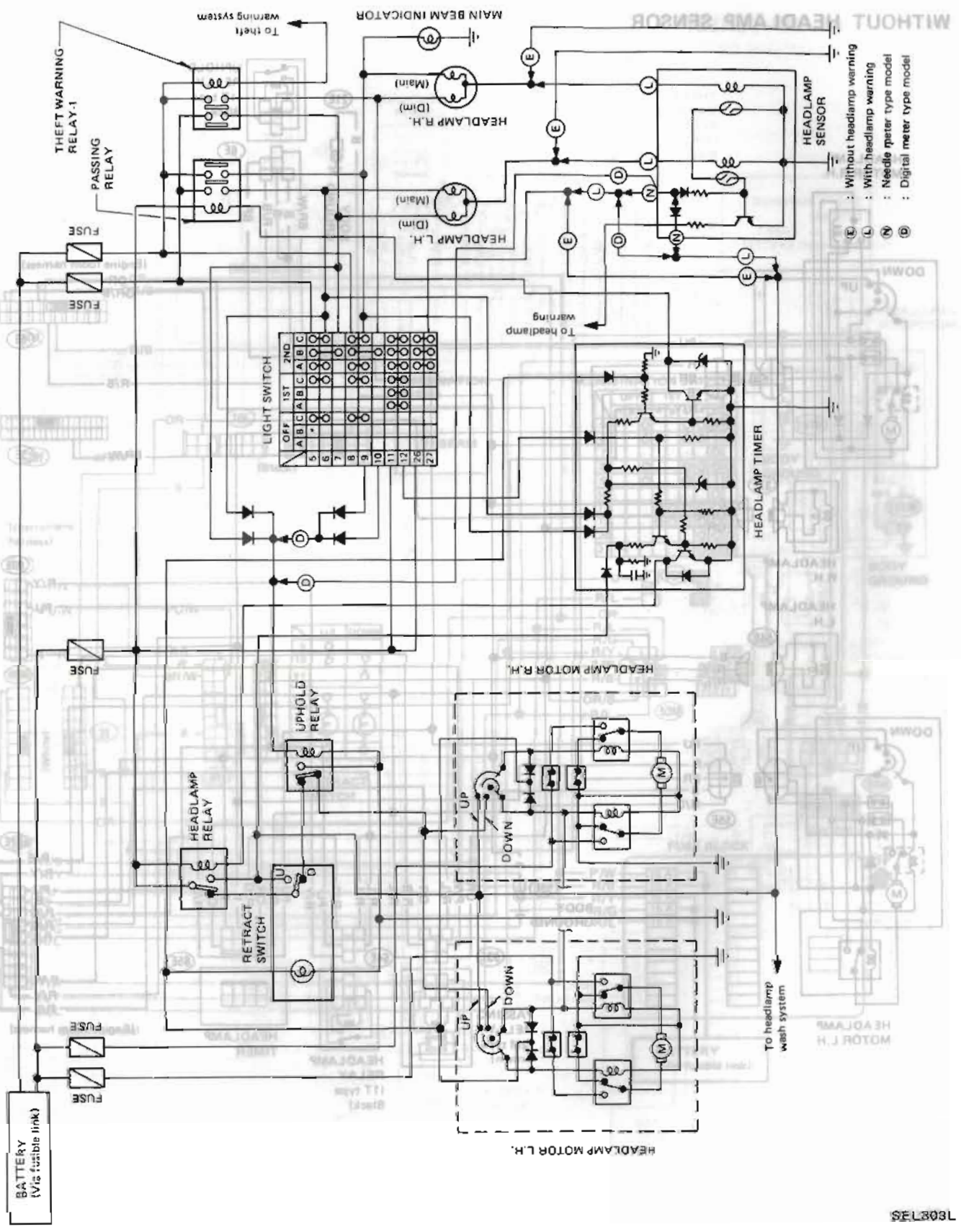
Indicator



SEL480K

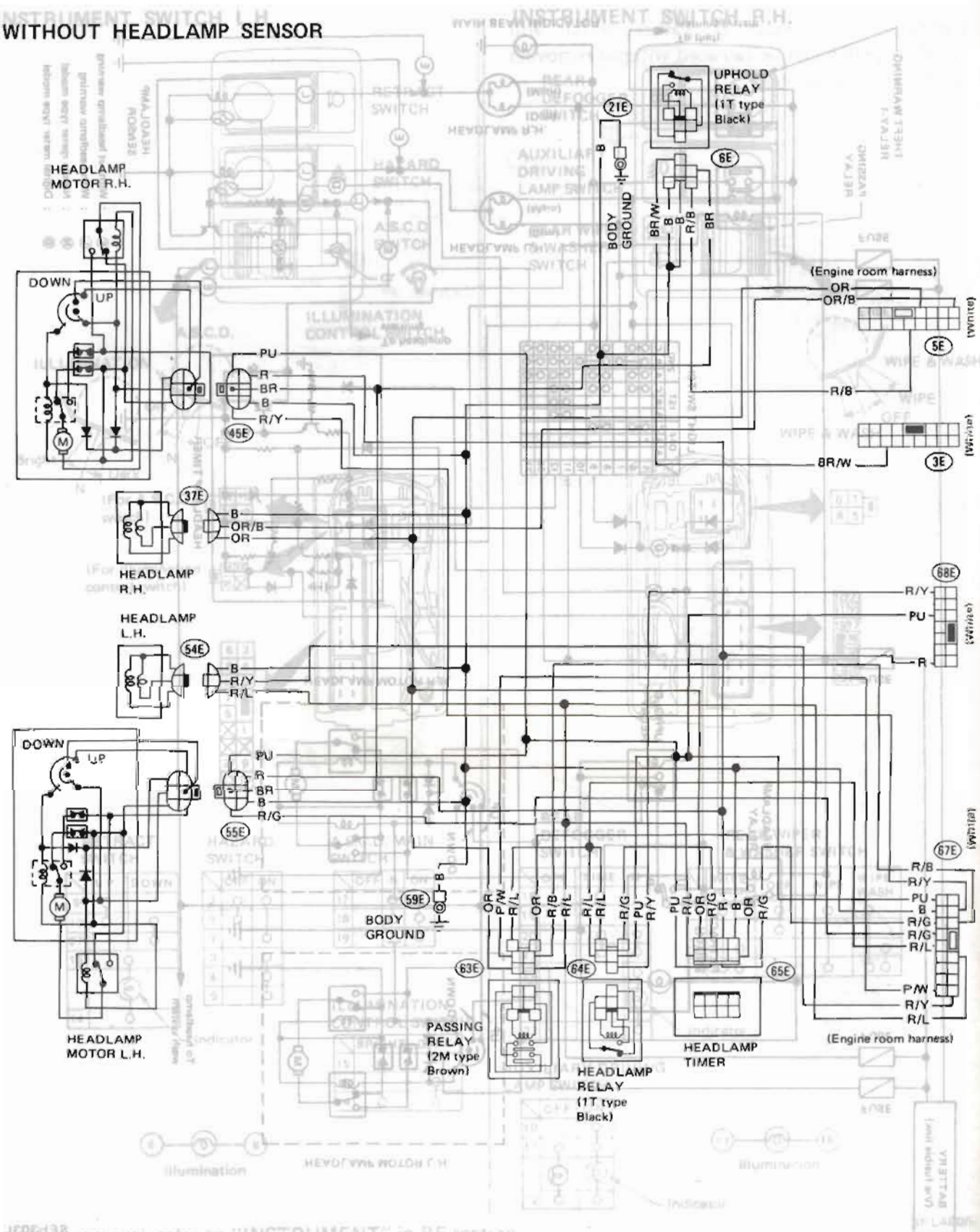
- For removal, refer to "INSTRUMENT" in BF section.

Schematic

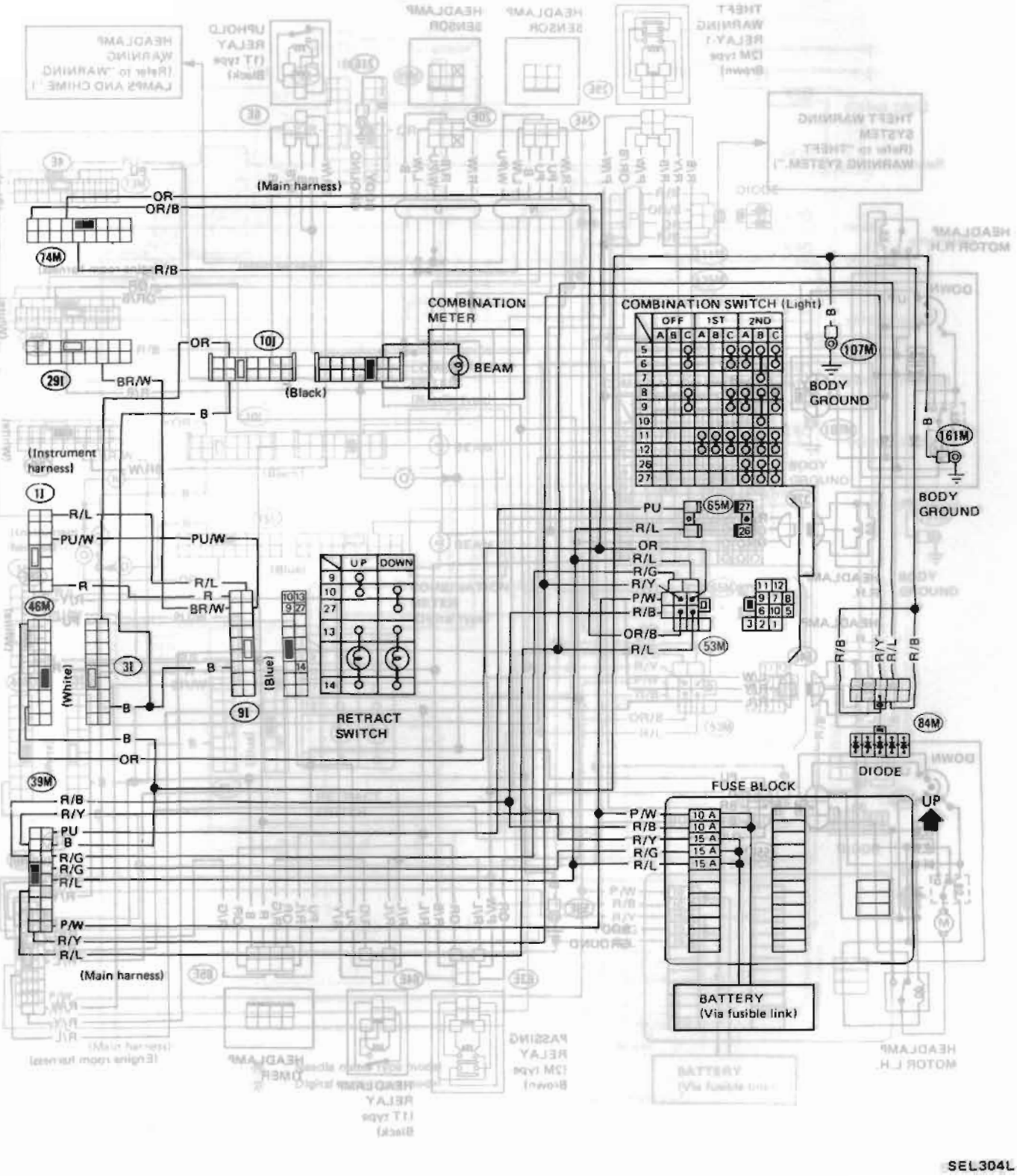

THEFT WARNING RELAY-1
PASSING RELAY
To theft warning system
MAIN BEAM INDICATOR
HEADLAMP R.H.
HEADLAMP L.H.
(Main)
(Dim)
HEADLAMP SENSOR
: Without headlamp warning
: With headlamp warning
: Needle meter type model
: Digital meter type model
FUSE
LIGHT SWITCH
To headlamp warning
HEADLAMP TIMER
HEADLAMP MOTOR R.H.
HEADLAMP MOTOR L.H.
UP
DOWN
UPHOLD RELAY
HEADLAMP RELAY
RETRACT SWITCH
To headlamp wash system
BATTERY
(Via fusible link)
SEL303L

Wiring Diagram

WITHOUT HEADLAMP SENSOR

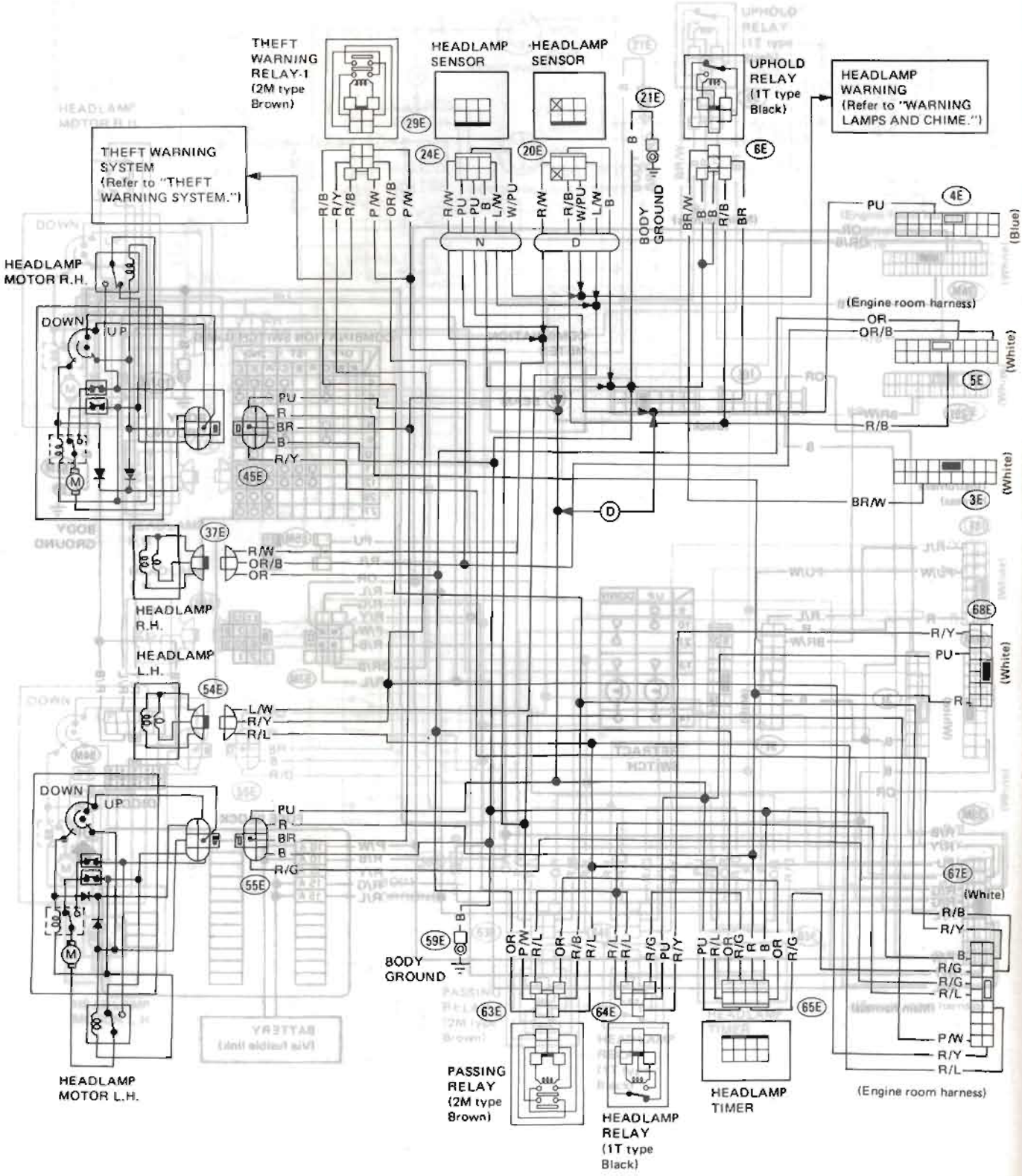


Wiring Diagram (Cont'd)

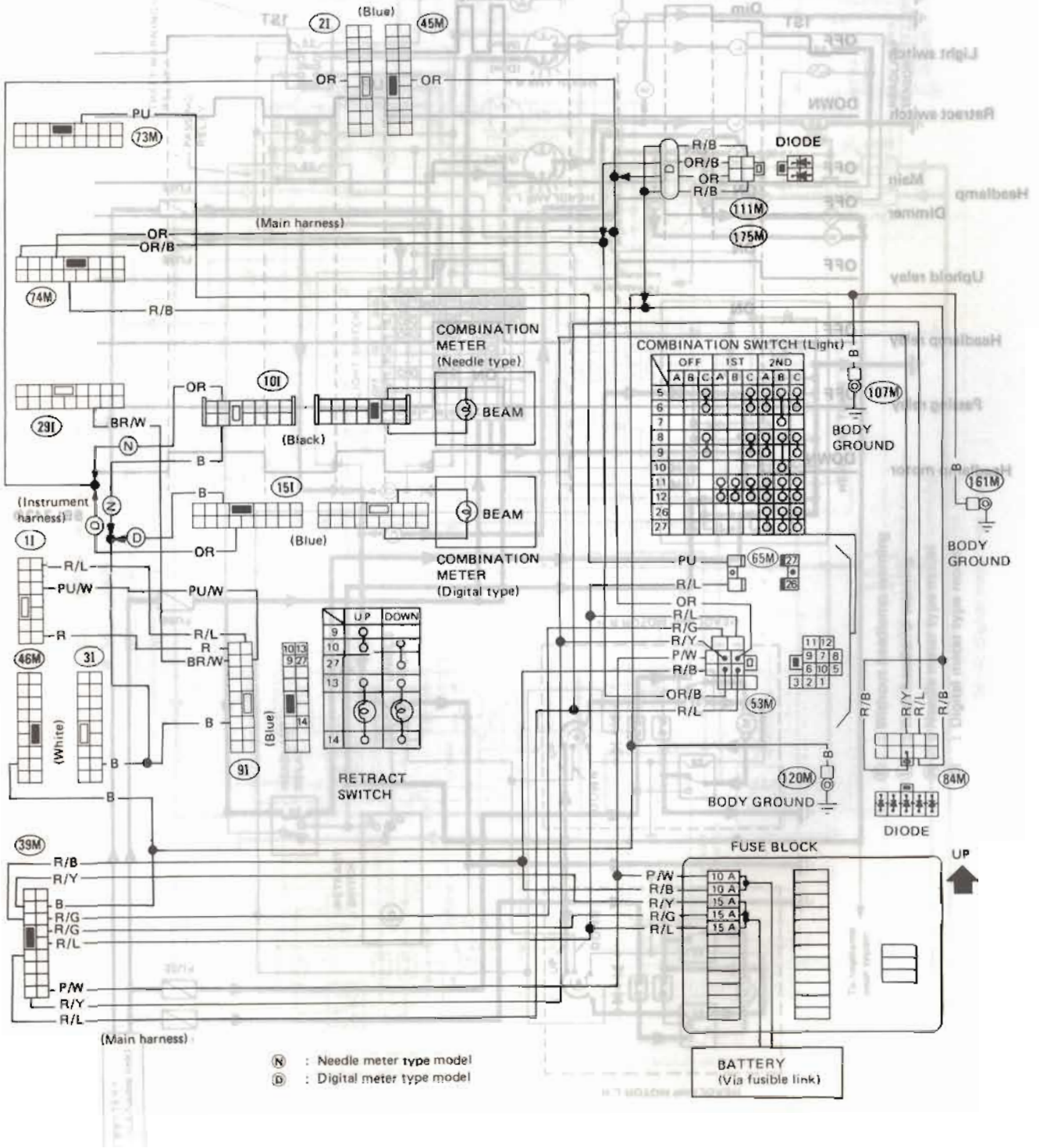


Wiring Diagram (Cont'd)

WITH HEADLAMP SENSOR



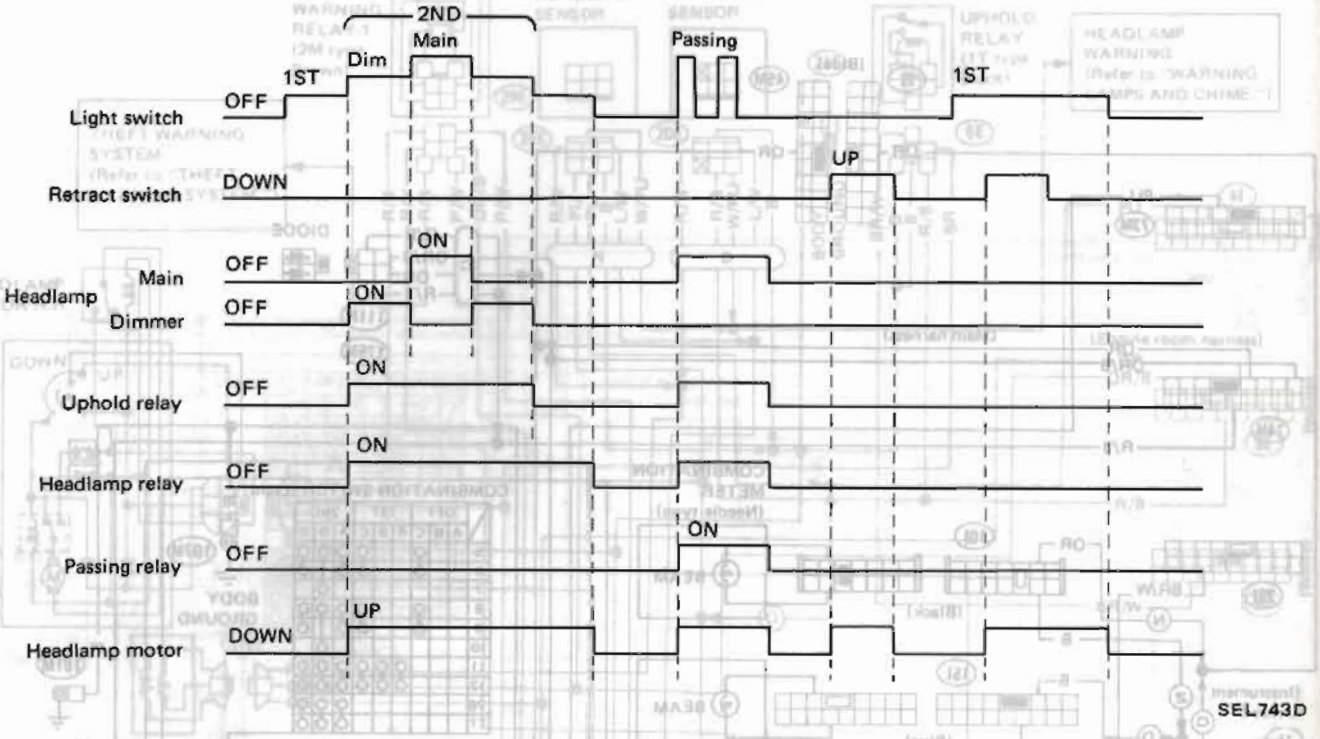
Wiring Diagram (Cont'd)



SEL305L

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.

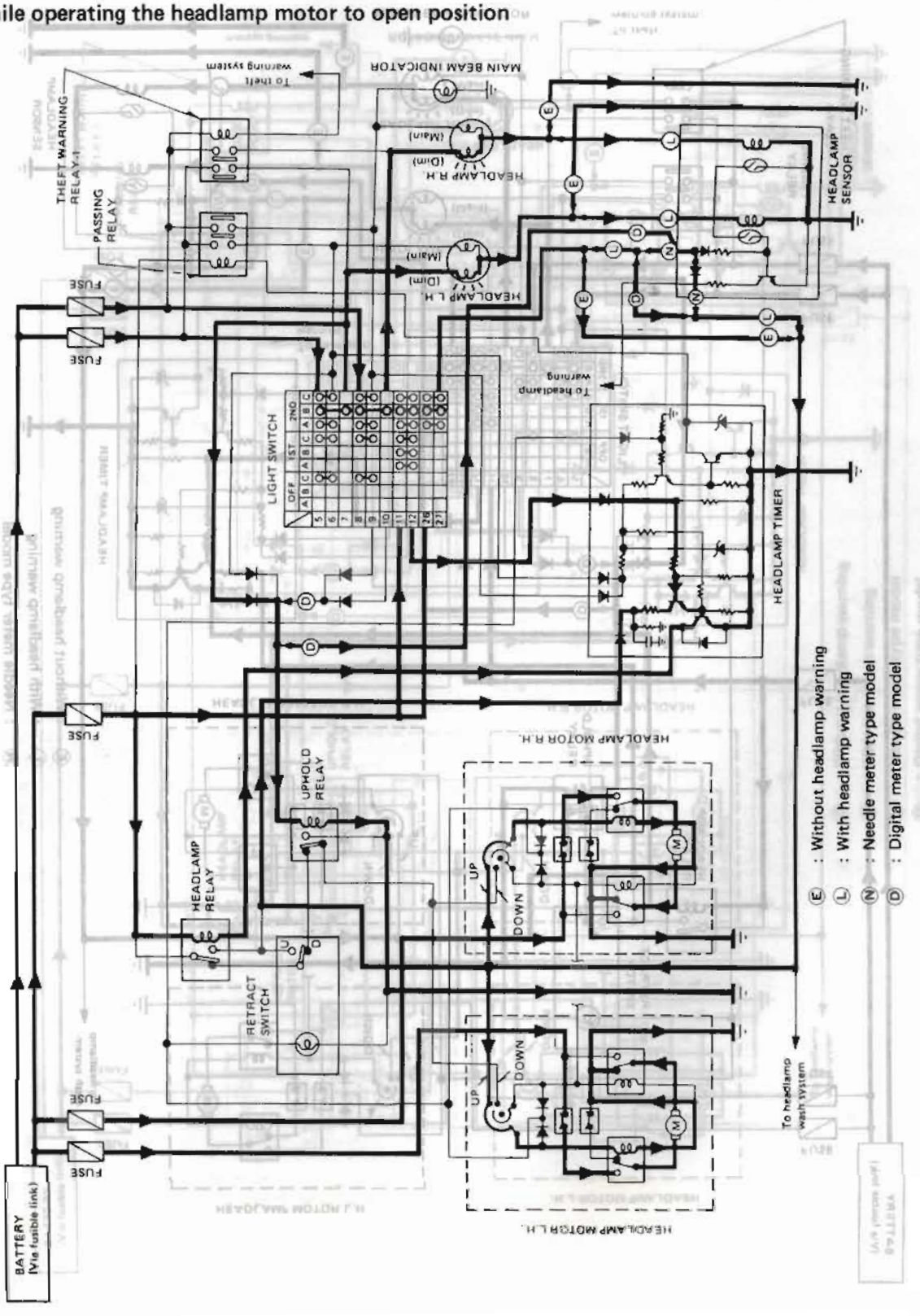


Description

CIRCUIT OPERATION

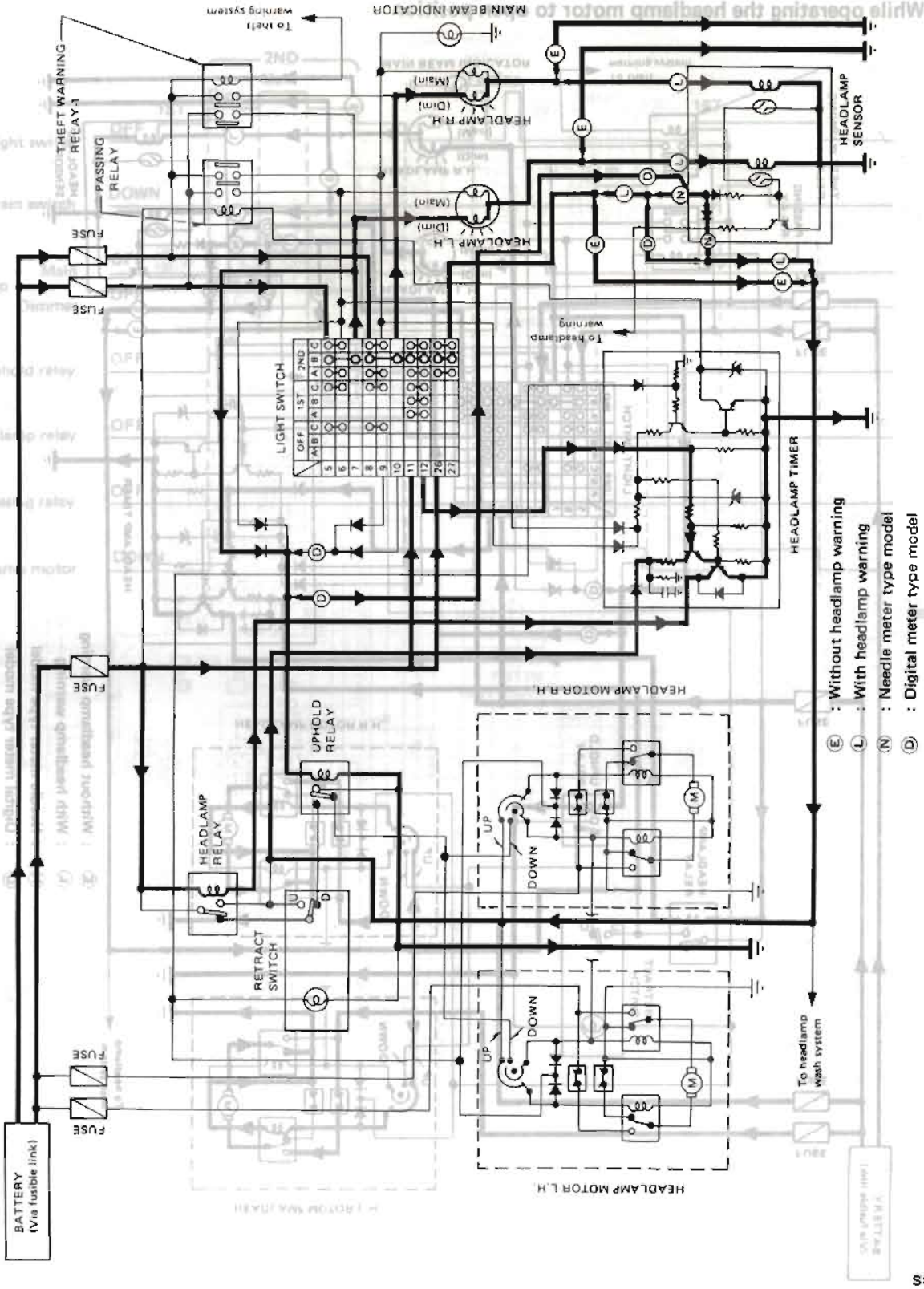
[A] When lighting switch is switched from "1ST" → "2ND"

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



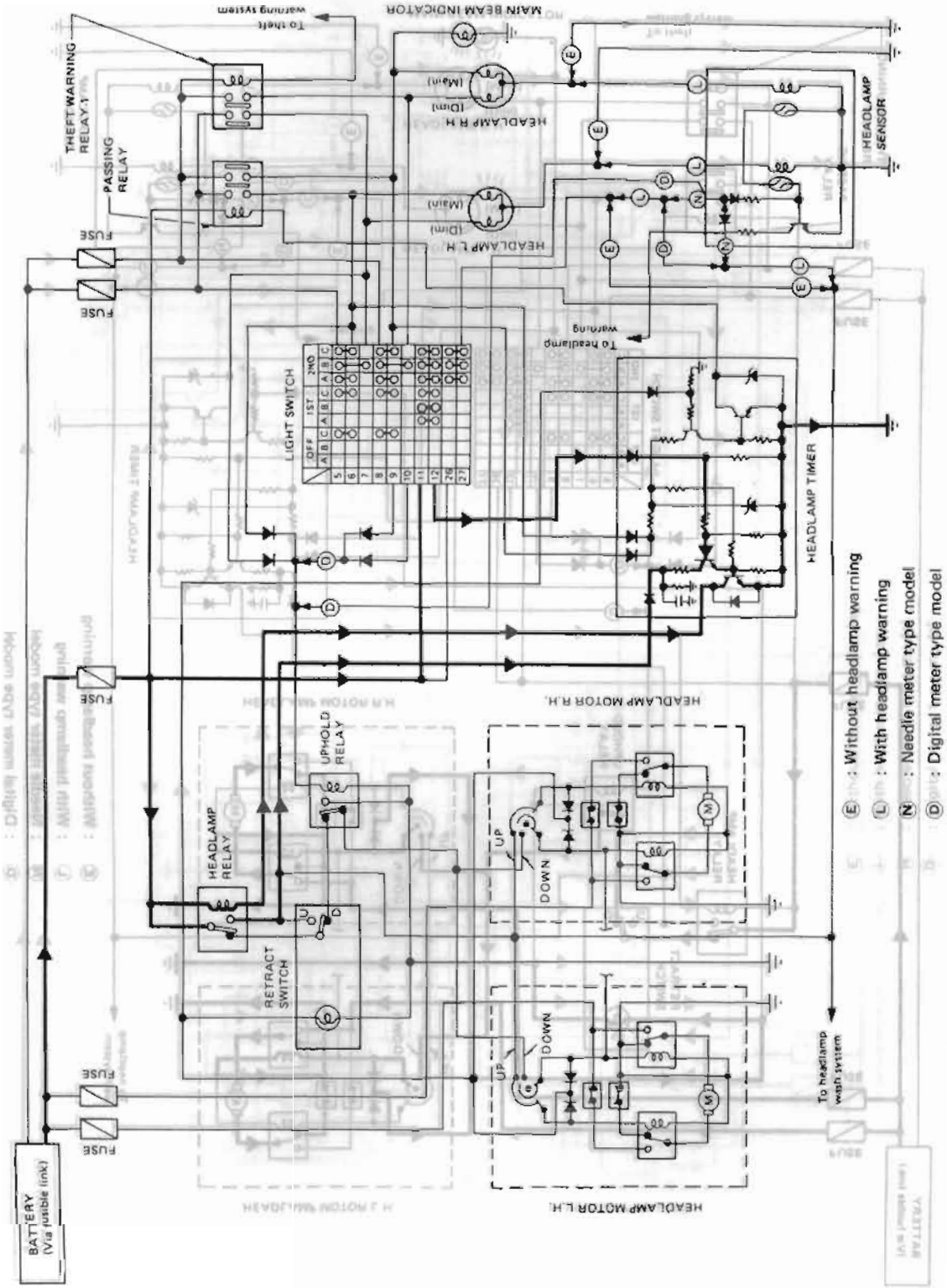
Description (Cont'd)

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



Description (Cont'd)

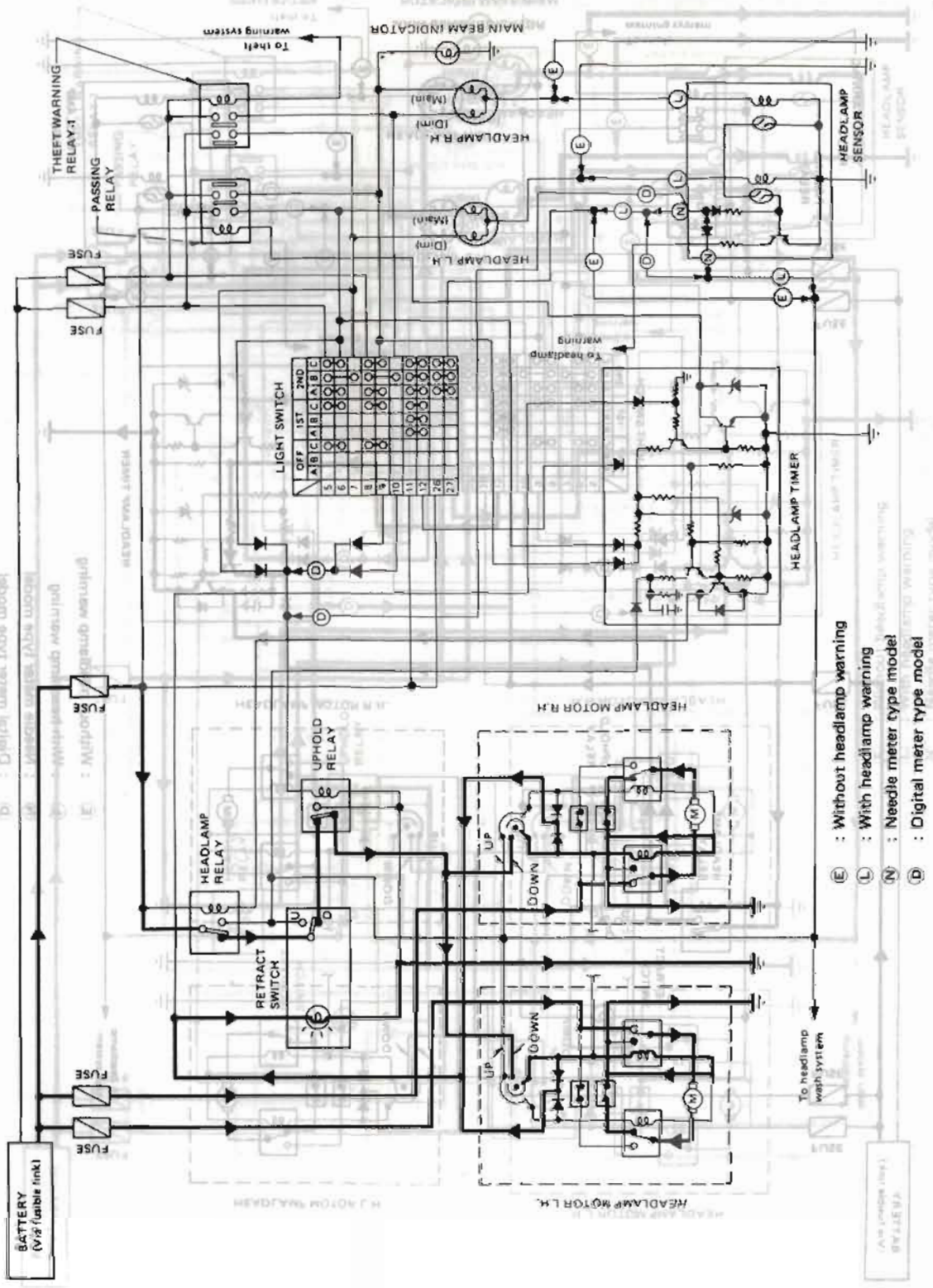
[B] When lighting switch is switched from "2ND" → "1ST".
(Headlamp goes out and keeps up by headlamp timer and headlamp relay.)



SEL457L

Description (Cont'd)

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

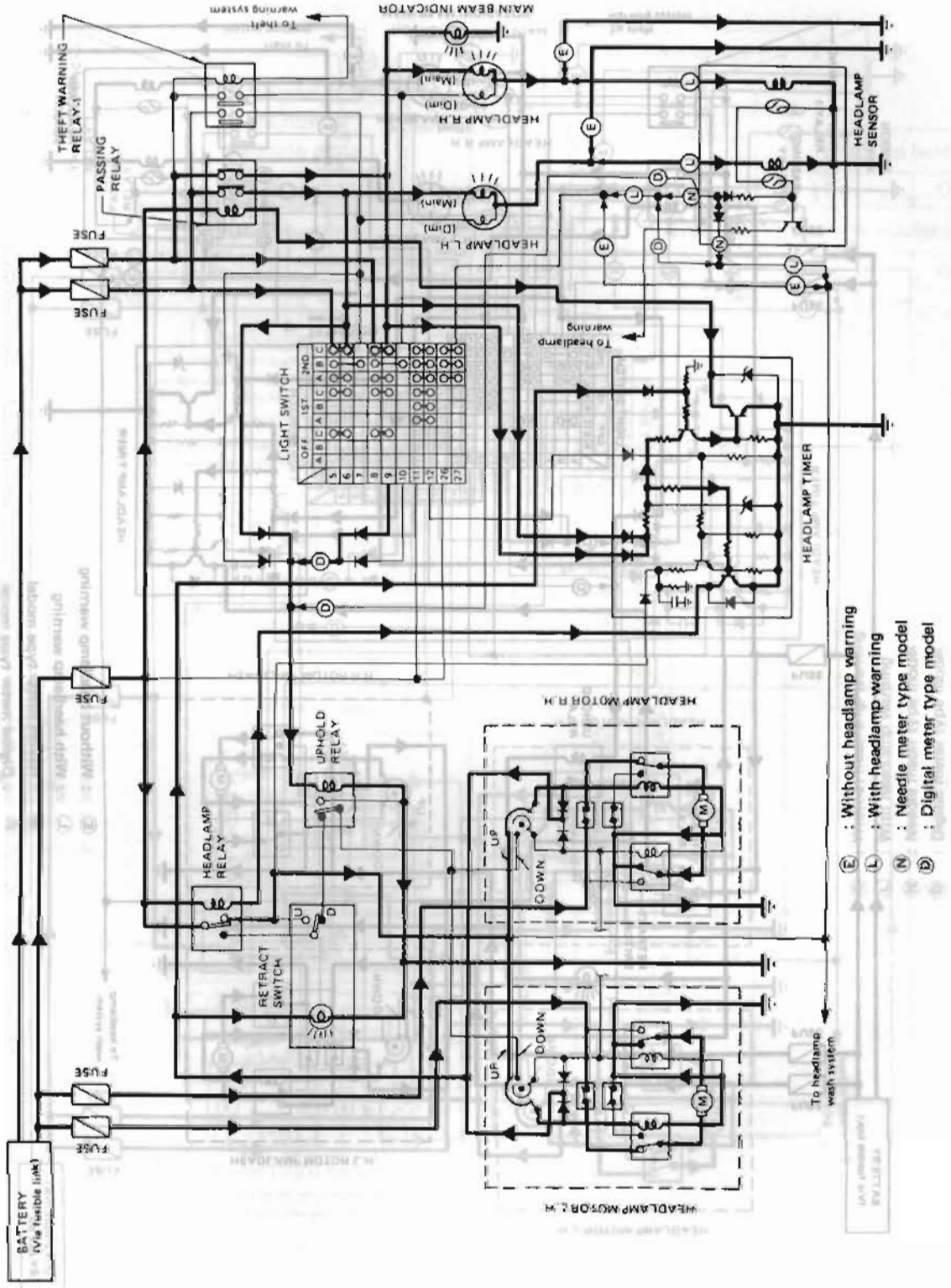


SEL458L

Description (Cont'd)

[D]

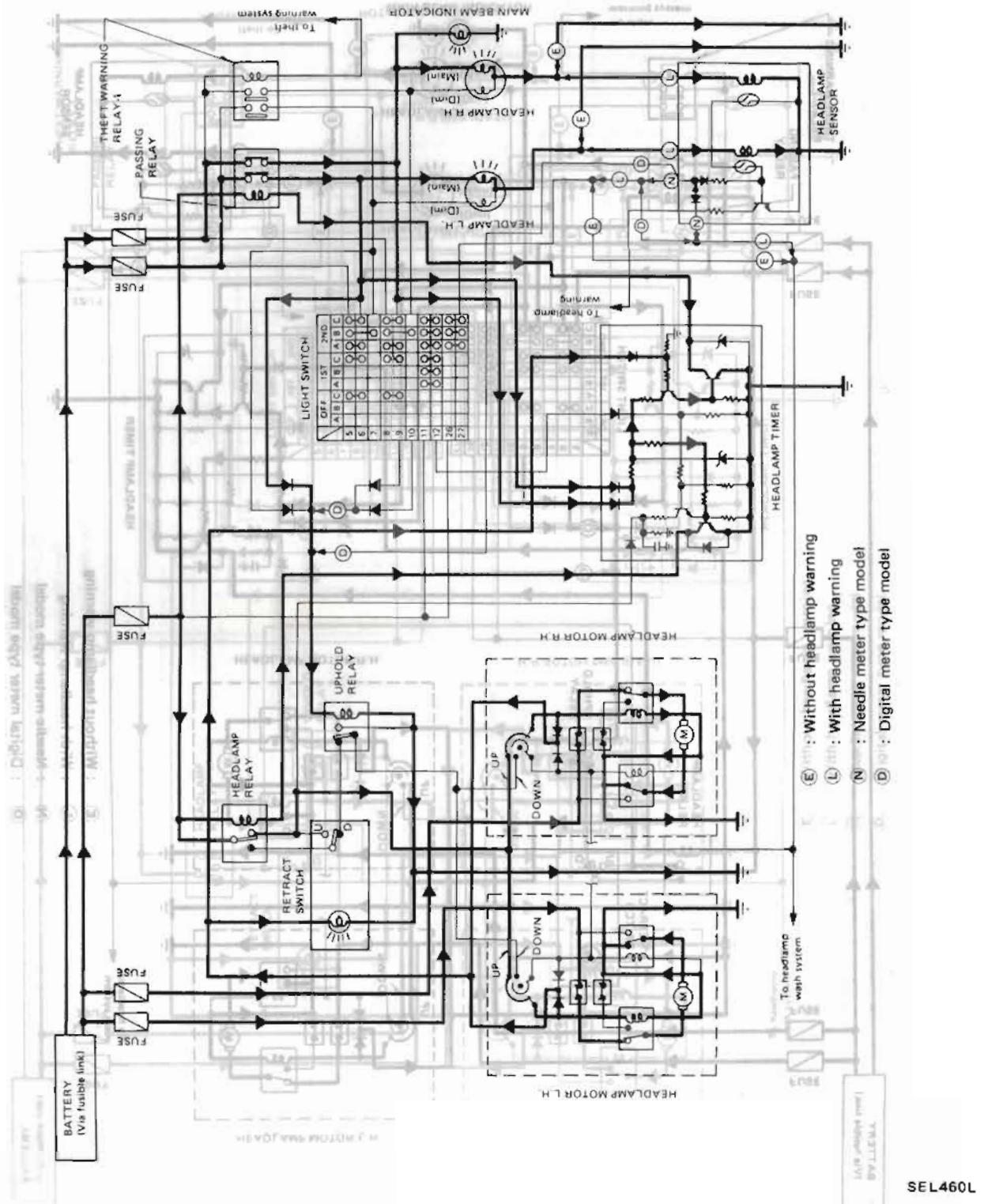
D-1: **When lighting switch is switched to "PASSING"**



SEL459L

Description (Cont'd)

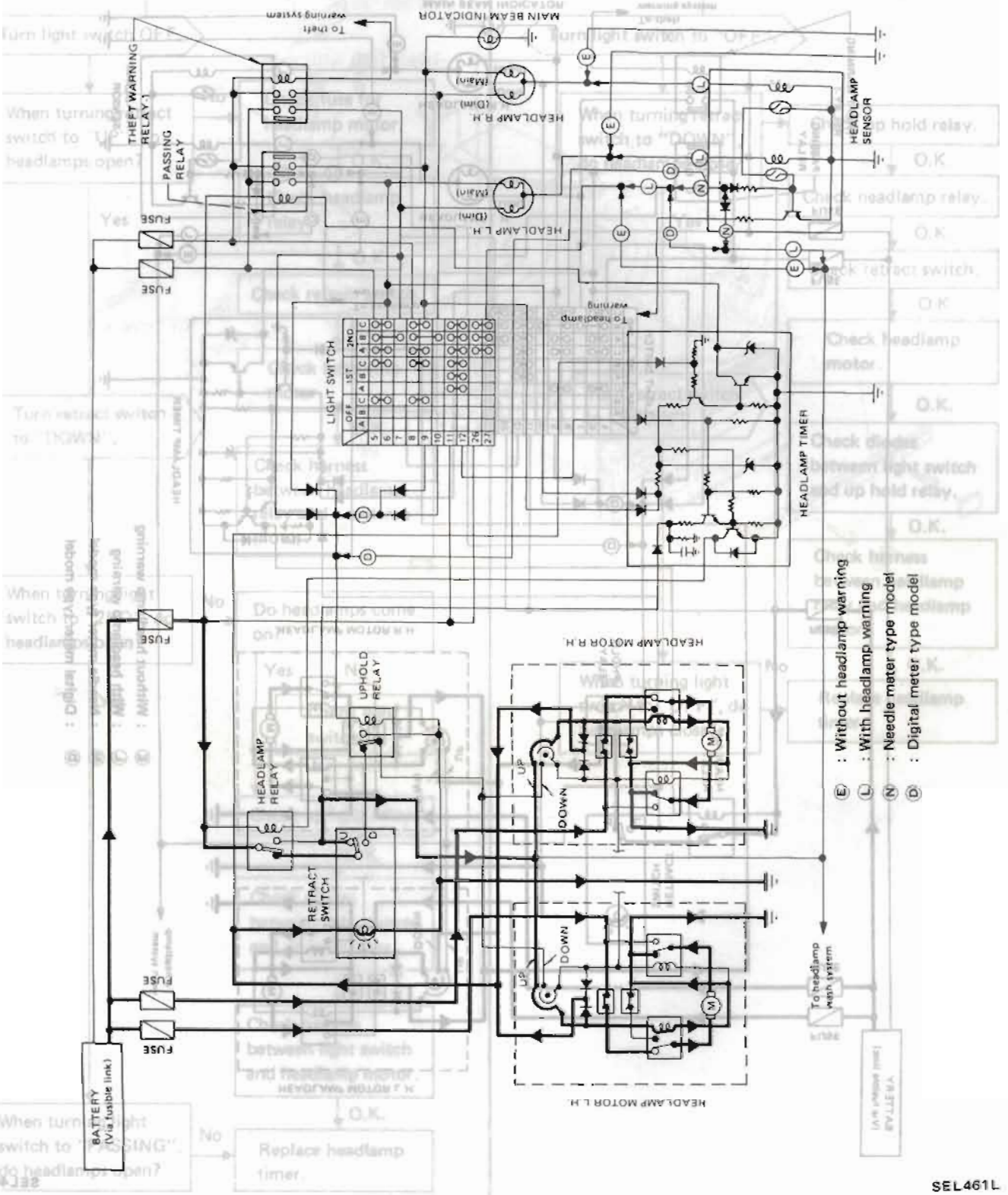
D-2: After releasing lighting switch from "PASSING"
(While operating the headlamp motor to open position)



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

Description (Cont'd)

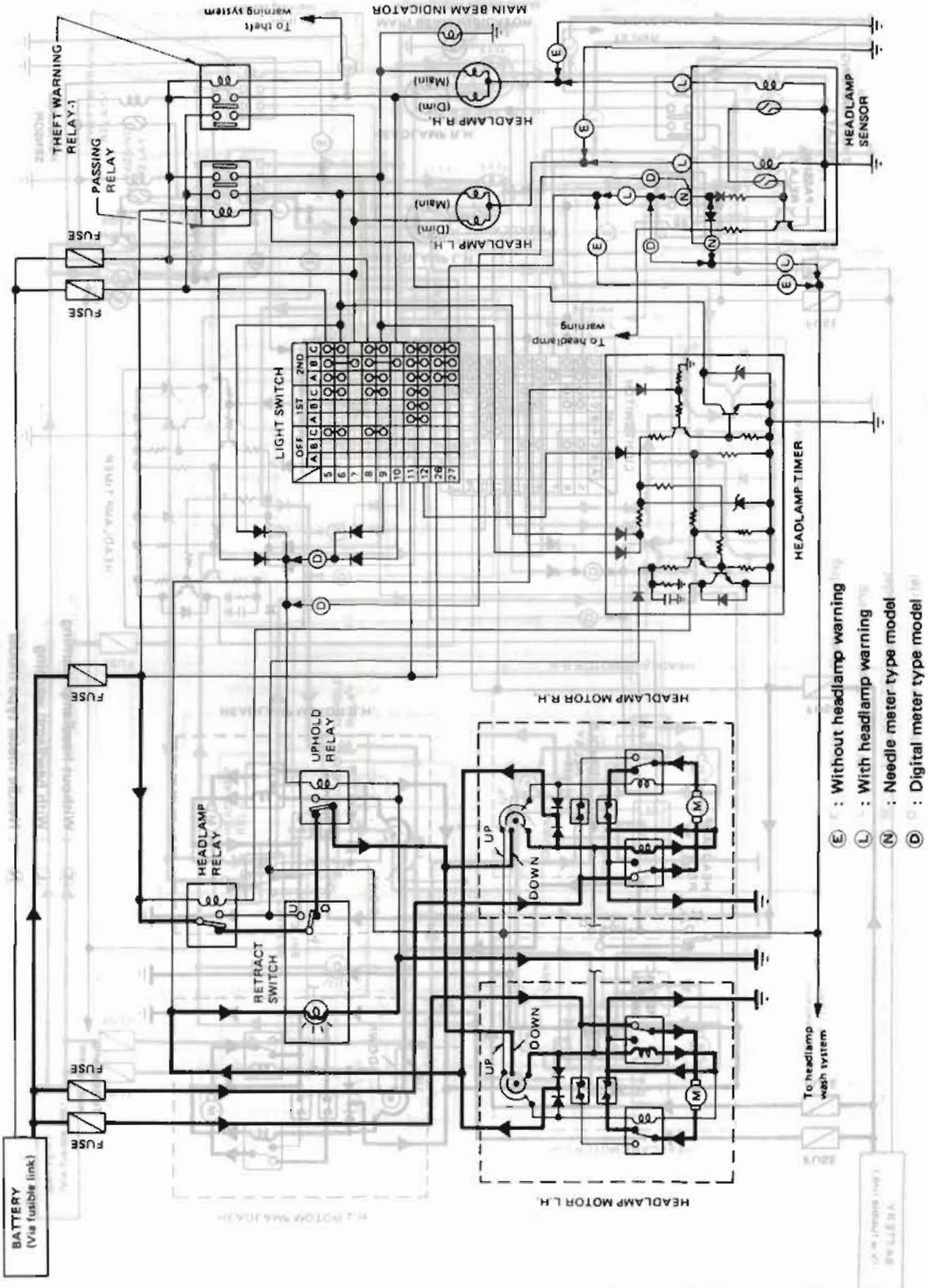
[E] When retractor switch is turned ON
(While operating the headlamp motor to open position)



SEL461L

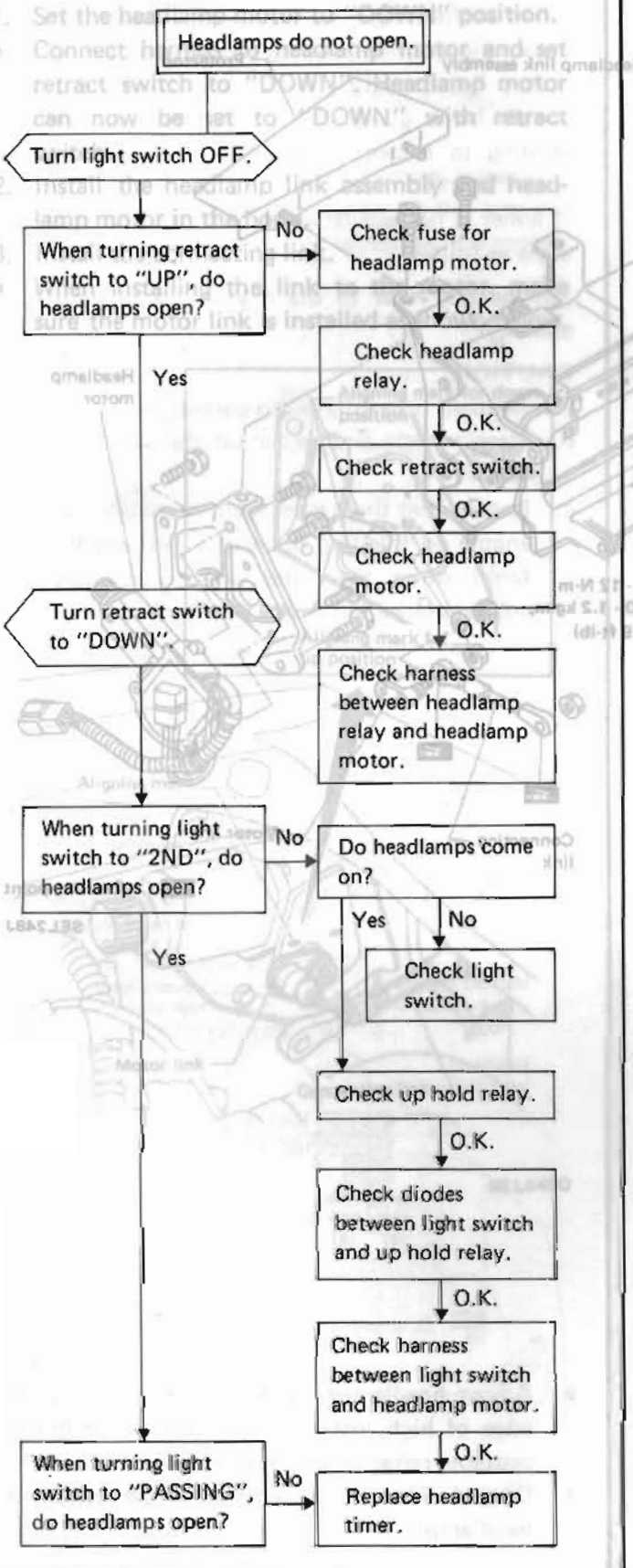
Description (Cont'd)

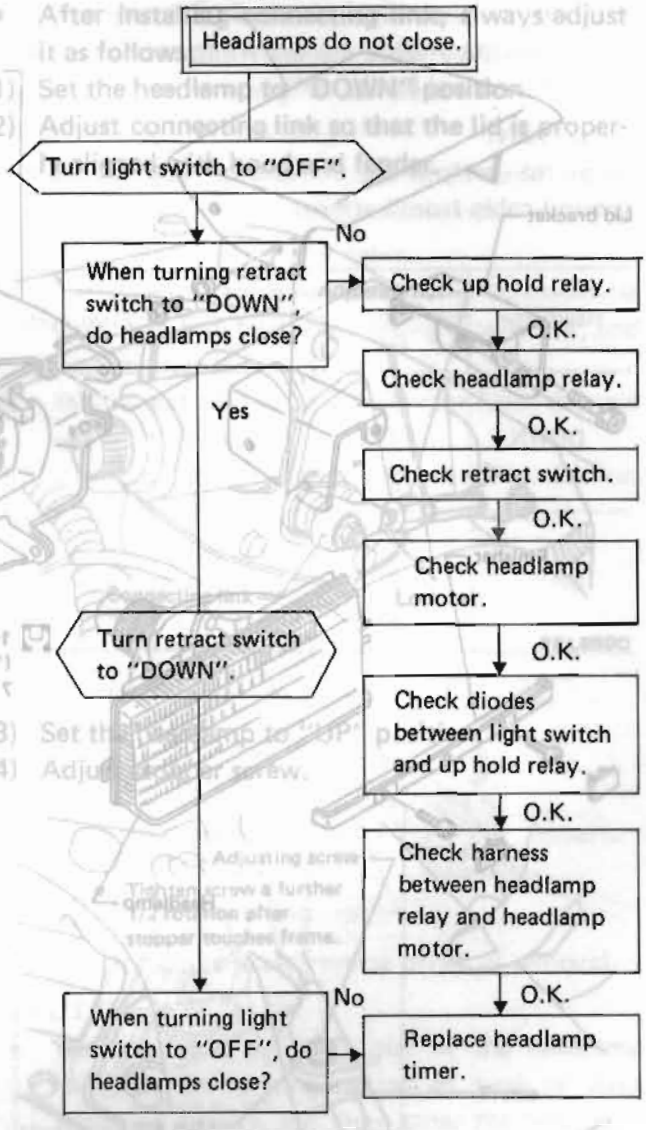
[F] When retractor switch is turned OFF
(While operating the headlamp motor to closed position)



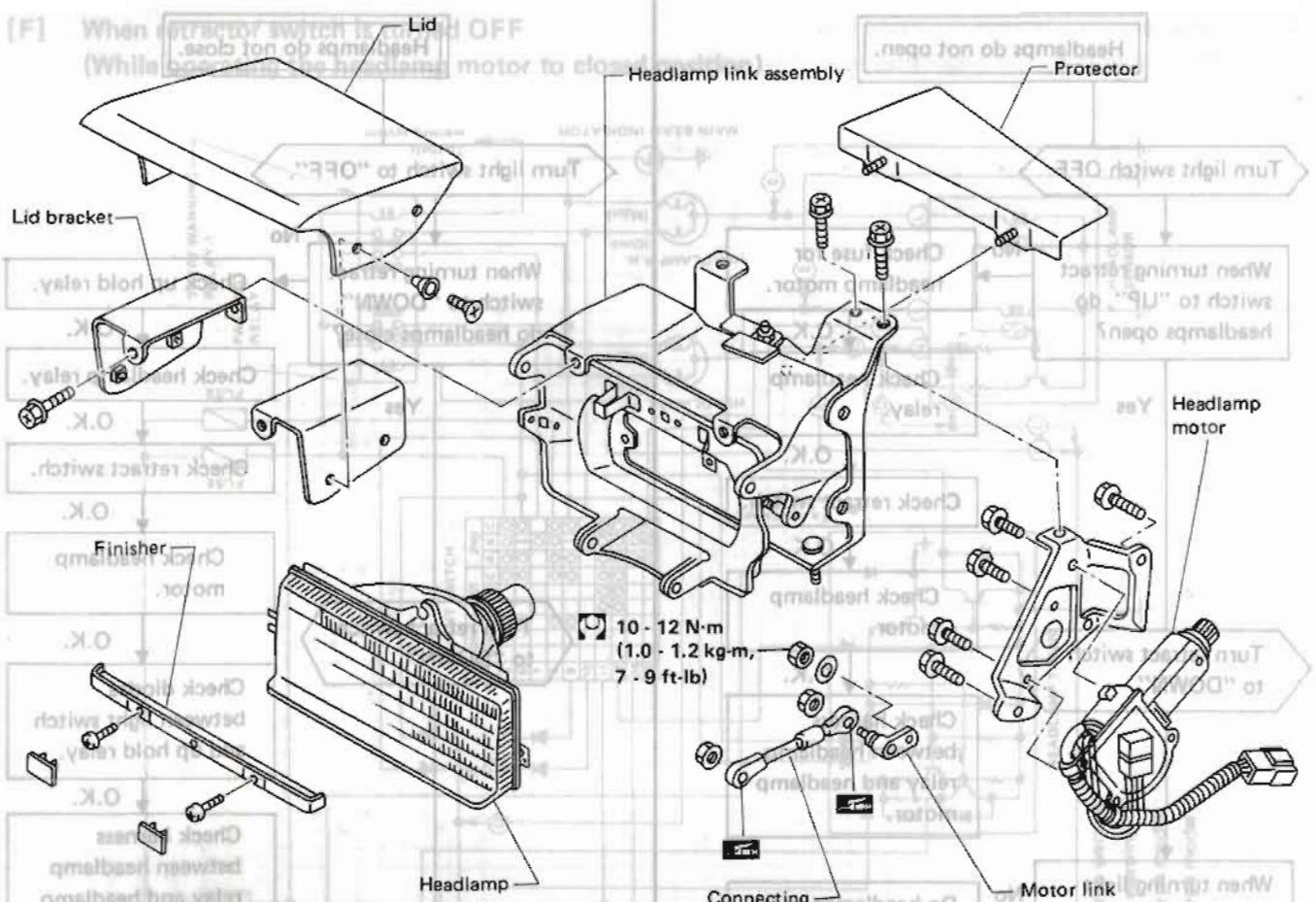
SEL462L

Trouble-shooting



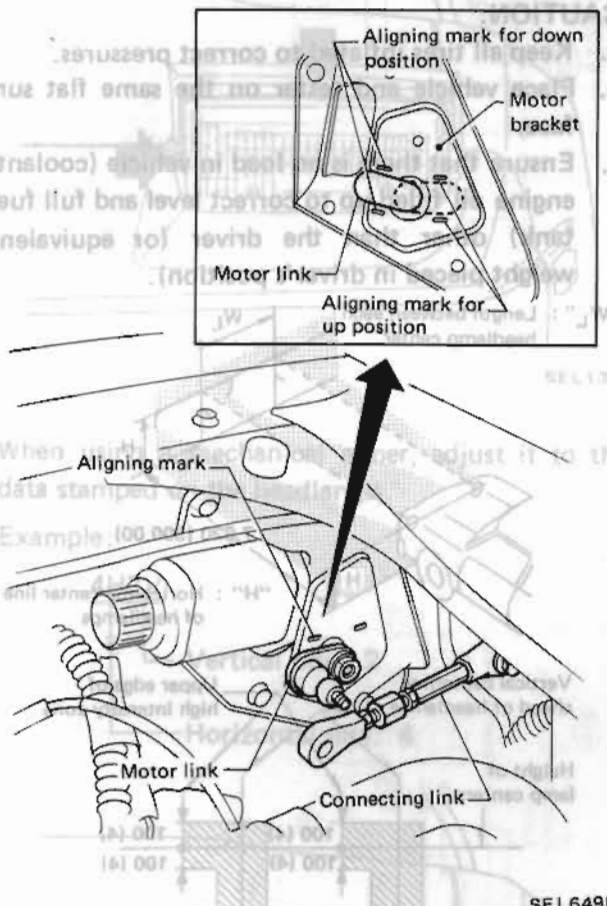


Removal


Lid
Headlamp link assembly
Protector
Lid bracket
Headlamp motor
Finisher
10 - 12 N·m
(1.0 - 1.2 kg-m,
7 - 9 ft-lb)
Headlamp
Connecting link
Motor link
: Greasing point
SEL248J

Installation

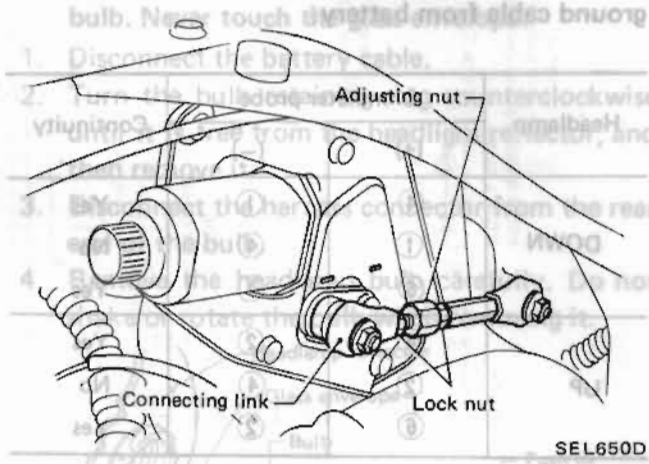
1. Set the headlamp motor to "DOWN" position.
• Connect harness to headlamp motor and set retract switch to "DOWN". Headlamp motor can now be set to "DOWN" with retract switch.
2. Install the headlamp link assembly and headlamp motor in the body.
3. Install the connecting link.
• When installing the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



SEL649D

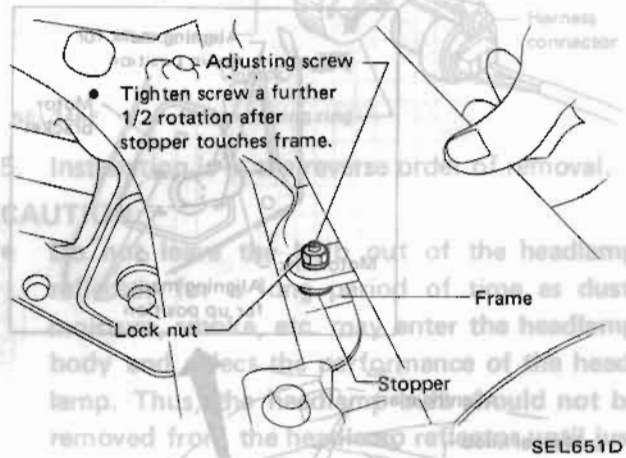
Adjustment

• 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

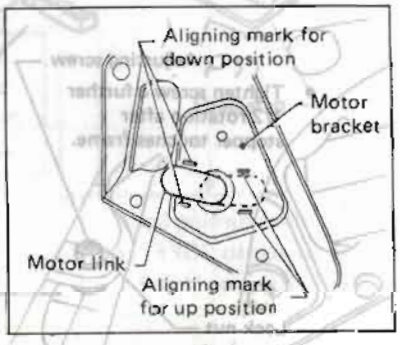
Headlamp Motor Check

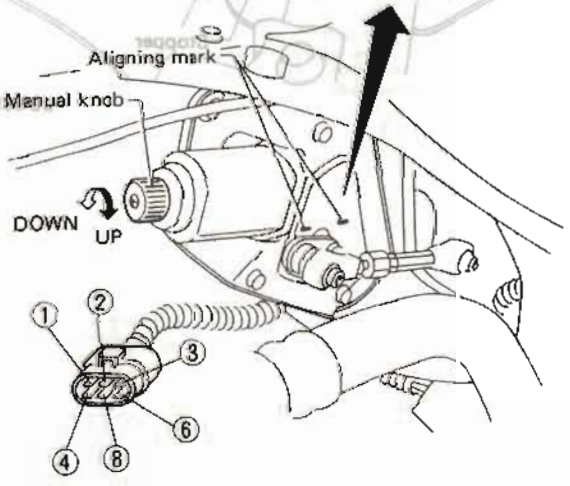
- Use an ohmmeter to check for continuity in headlamp motor circuit while rotating motor with manual knob.

CAUTION:

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

Headlamp	Ohmmeter probe (+)	Ohmmeter probe (−)	Continuity
DOWN	④	①	Yes
	①	④	No
	⑥	①	Yes
UP	④	②	Yes
	②	④	No
	⑥	②	Yes





SEL333L

Aiming Adjustment

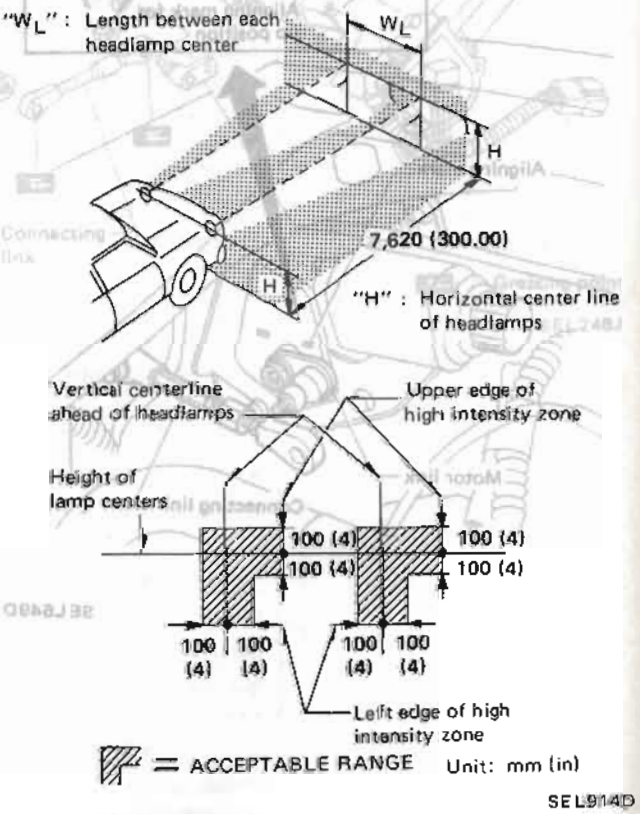
When performing headlamp aiming adjustment, use an aiming machine, aiming wall screen or headlamp tester. For operating instructions of any aimer, it should be in good repair, calibrated and used according to respective operation manuals supplied with the unit.

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

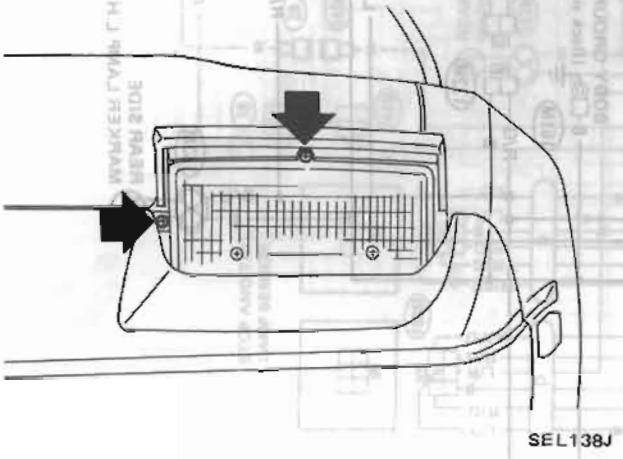
- Adjust headlamps so that upper edge and left edge of high intensity zone are within the acceptable range as shown in the figure above.
- Dotted lines in illustration show center of headlamp.

Aiming Adjustment (Cont'd)

LOW BEAM

1. Turn headlamp low beam on.
2. Use adjusting screws to perform aiming adjustment.

- **Before adjusting headlamps, remove covers.**
- **First tighten the adjust screw all the way and then make adjustment by loosening the screw.**



SEL138J

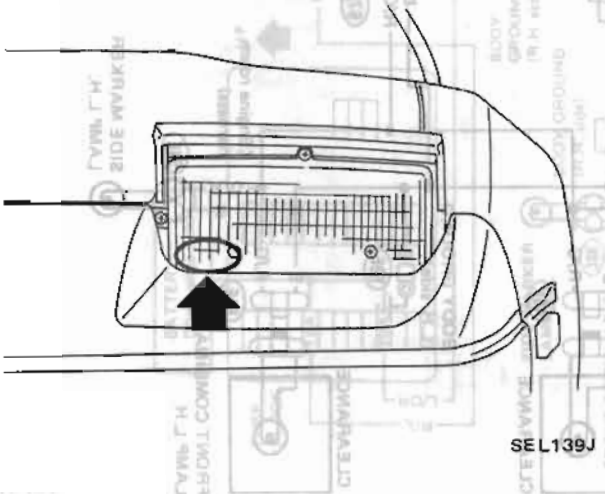
When using a mechanical aimer, adjust it to the data stamped on the headlamps.

Example:

4H2V

Vertical side: 2

Horizontal side: 4



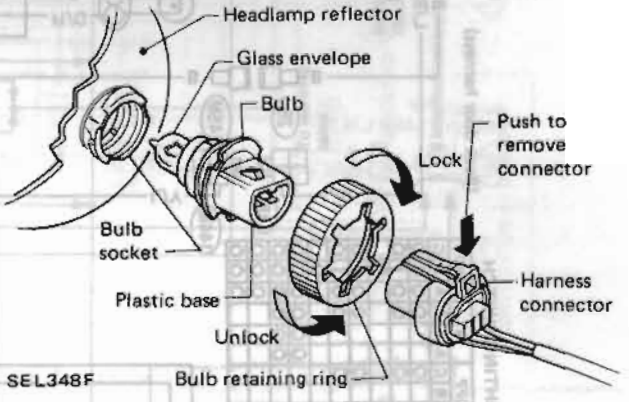
SEL139J

Bulb Replacement

The headlamp is a semi-sealed beam type which uses a replaceable halogen bulb. A bulb can be replaced from the engine compartment side without removing the headlamp body.

- **Grasp only its plastic base when handling the bulb. Never touch the glass envelope.**

1. Disconnect the battery cable.
2. Turn the bulb retaining ring counterclockwise until it is free from the headlight reflector, and then remove it.
3. Disconnect the harness connector from the rear end of the bulb.
4. Remove the headlamp bulb carefully. Do not shake or rotate the bulb when removing it.



SEL348F

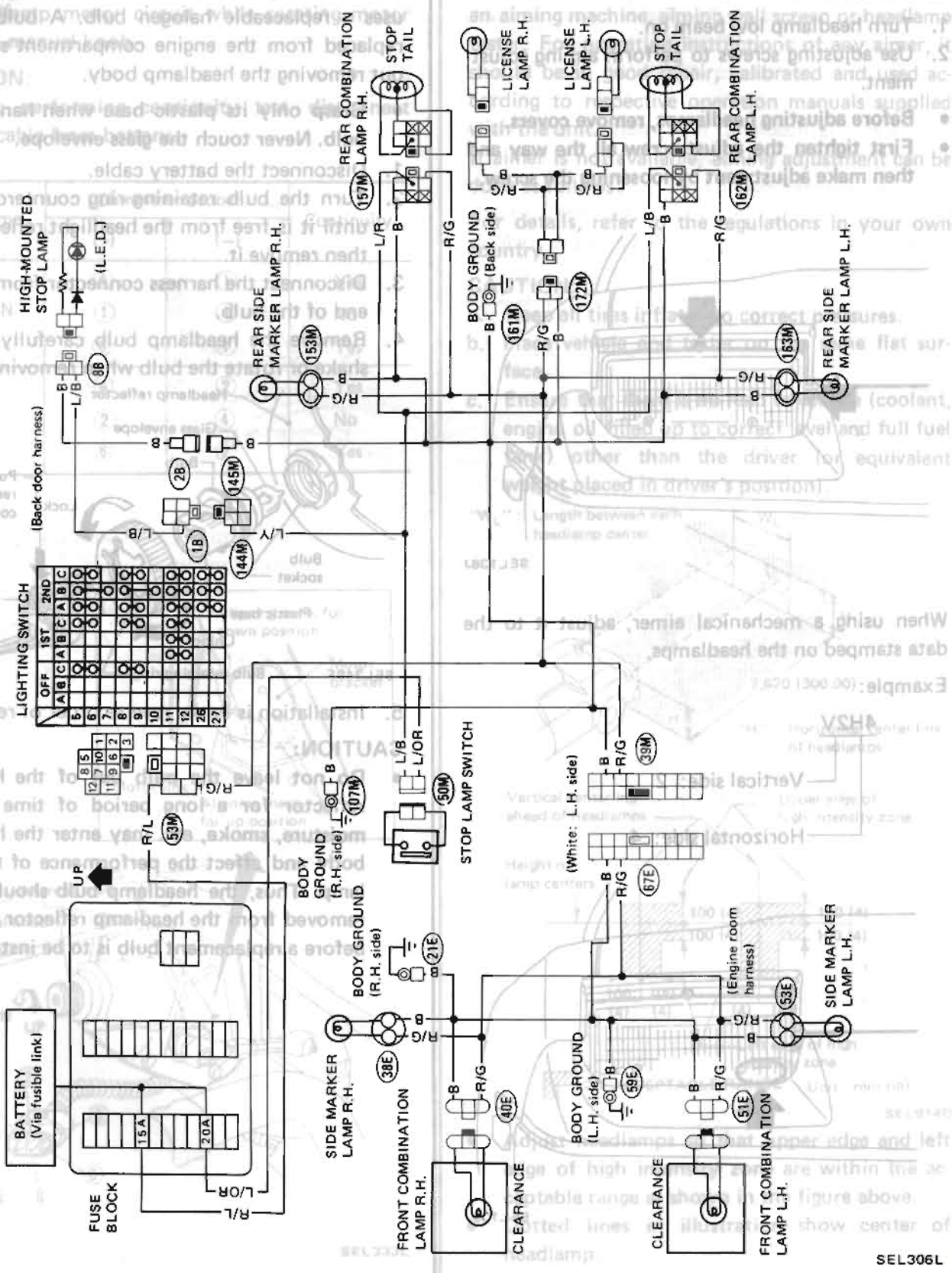
5. Installation is in the reverse order of removal.

CAUTION:

- **Do not leave the bulb out of the headlamp reflector for a long period of time as dust, moisture, smoke, etc. may enter the headlamp body and affect the performance of the headlamp. Thus, the headlamp bulb should not be removed from the headlamp reflector until just before a replacement bulb is to be installed.**

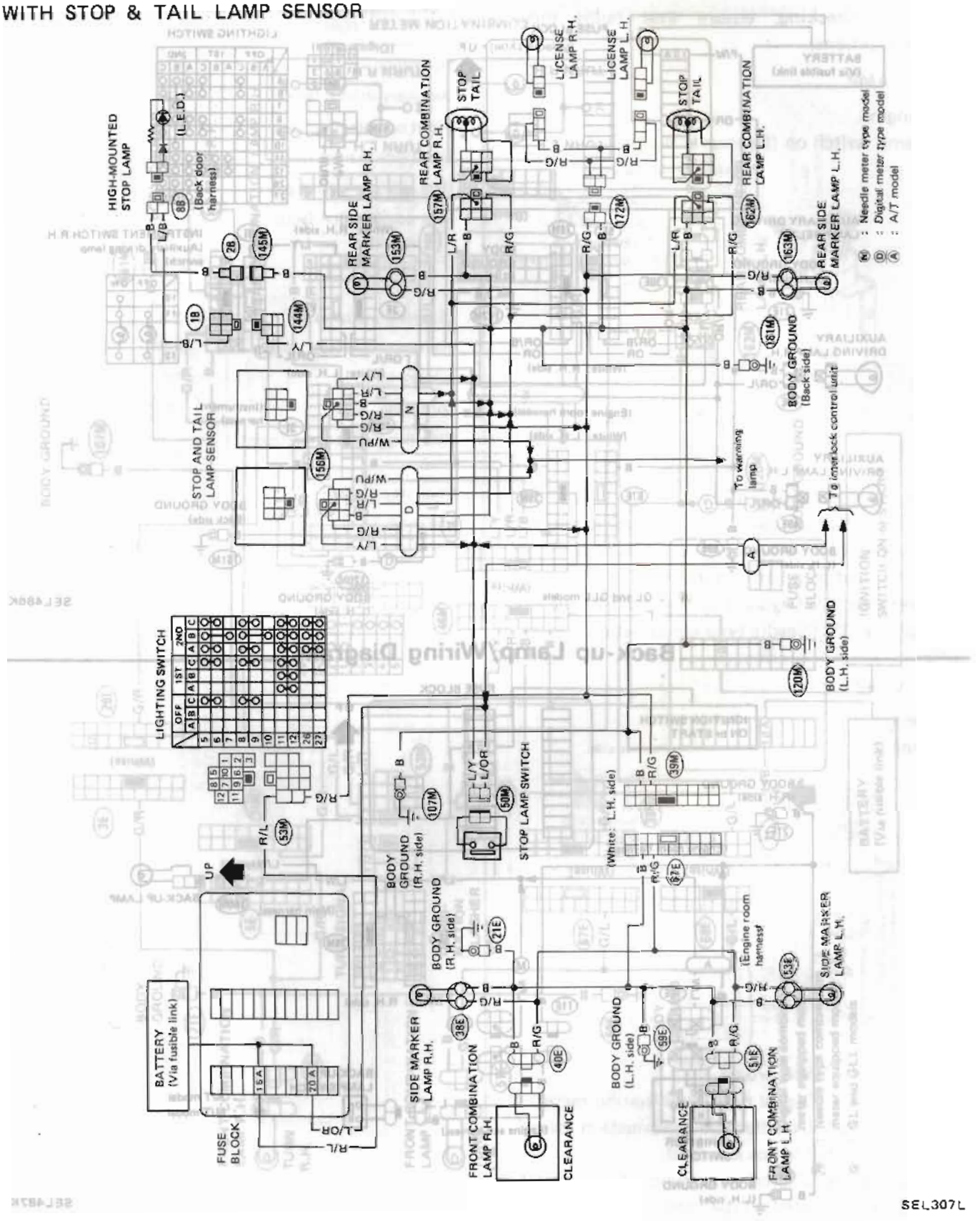
Clearance, License, Tail and Stop Lamps/Wiring Diagram

WITHOUT STOP & TAIL LAMP SENSOR



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

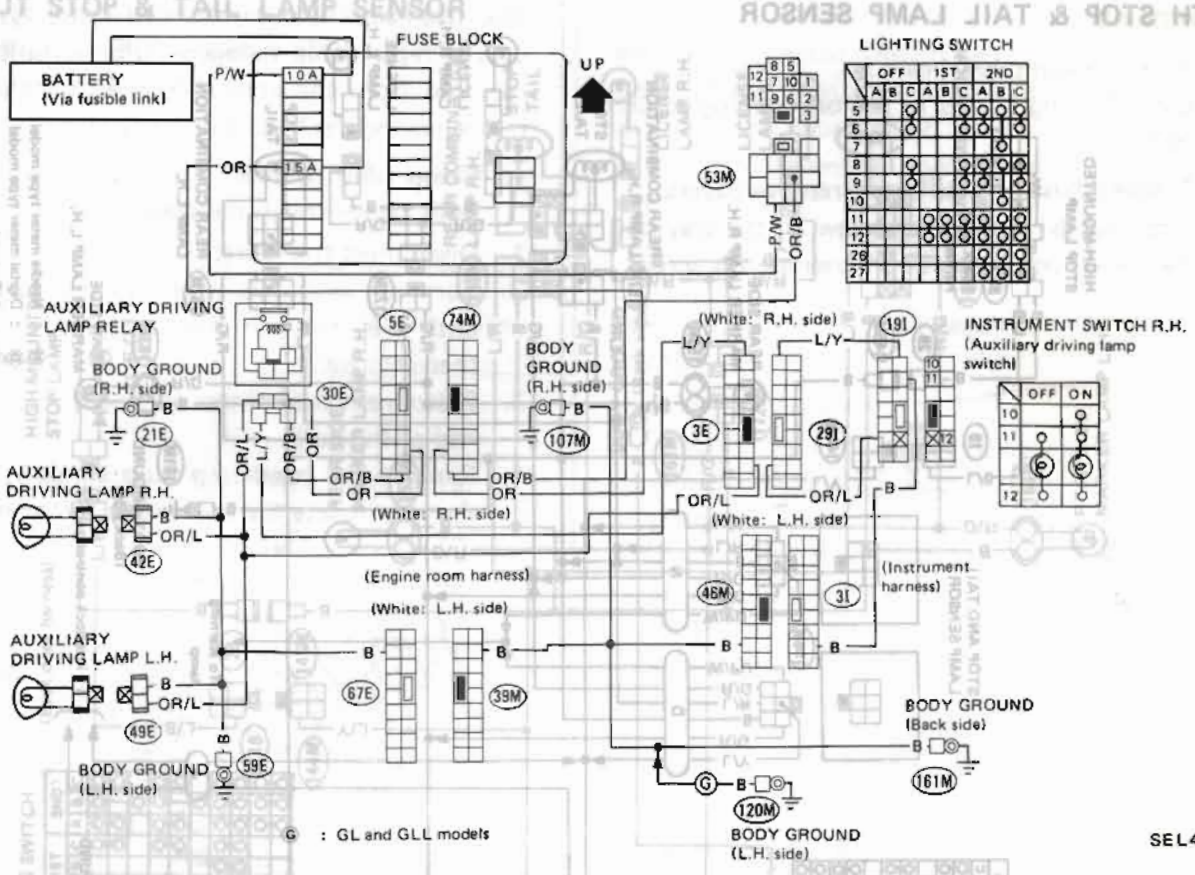
WITH STOP & TAIL LAMP SENSOR



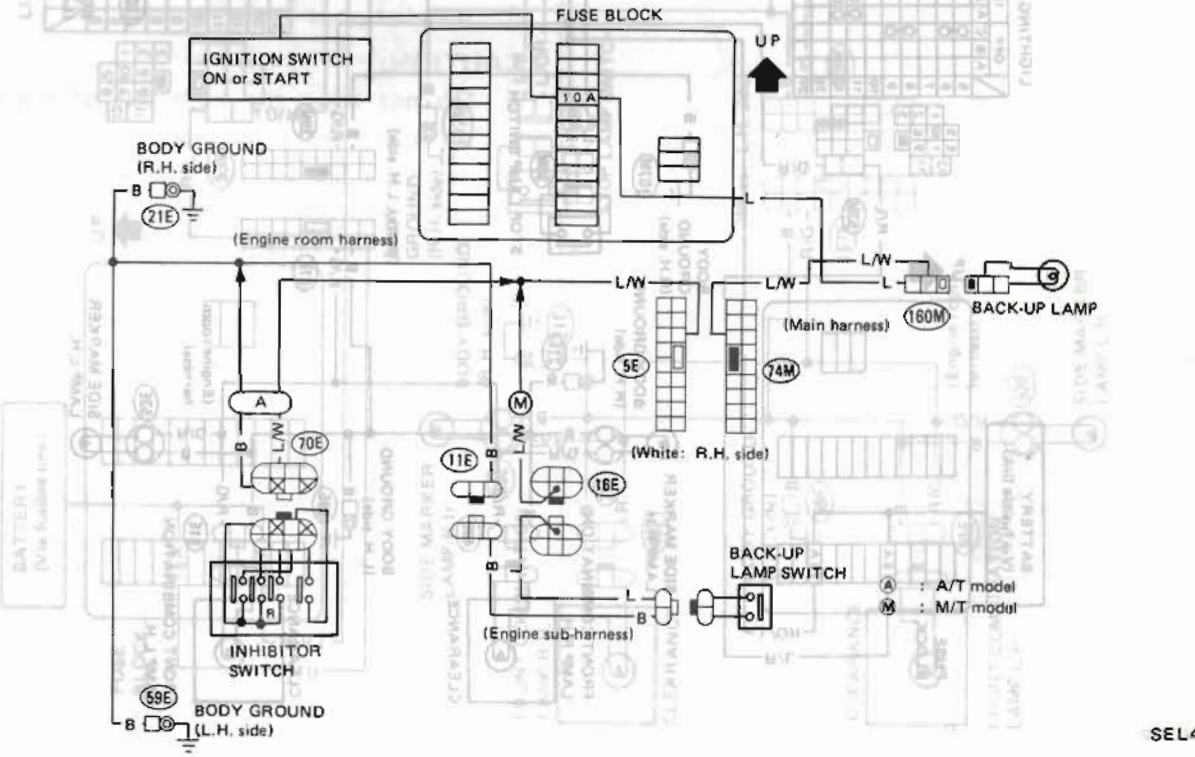
SEL307L

EXTERIOR LAMP

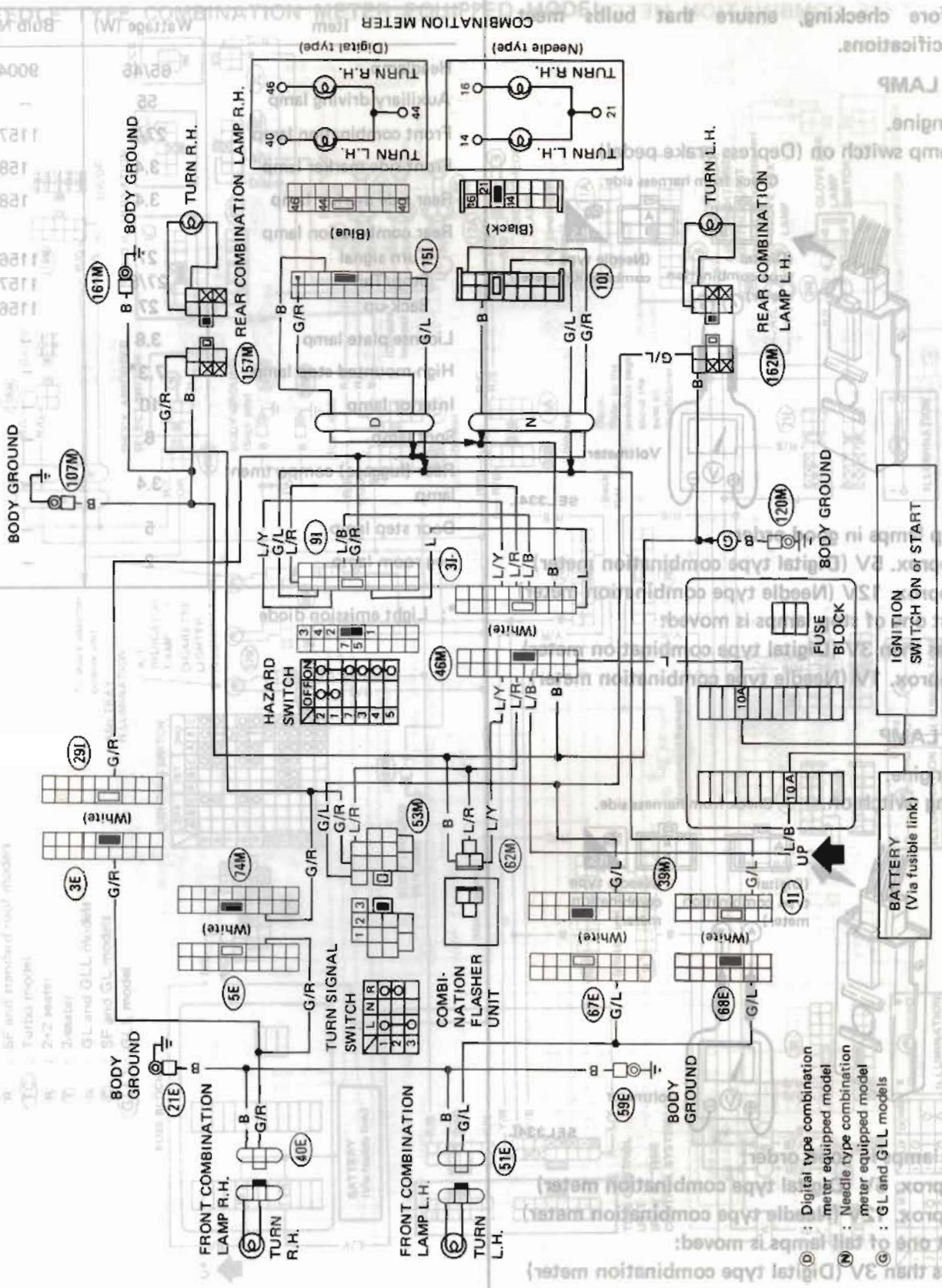
Auxiliary Driving Lamp/Wiring Diagram



Back-up Lamp/Wiring Diagram



Turn Signal and Hazard Warning Lamps/Wiring Diagram

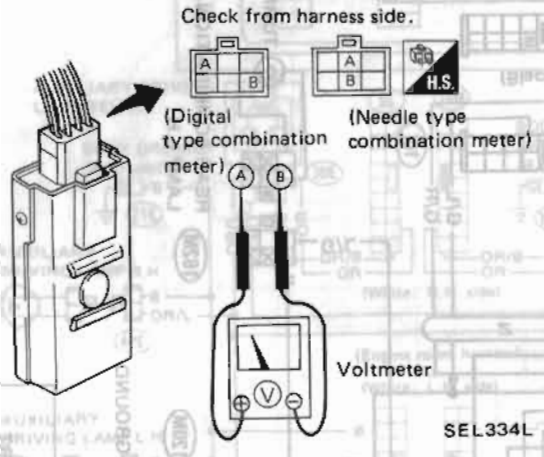


Stop and Tail Lamp Sensor Check

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

STOP LAMP

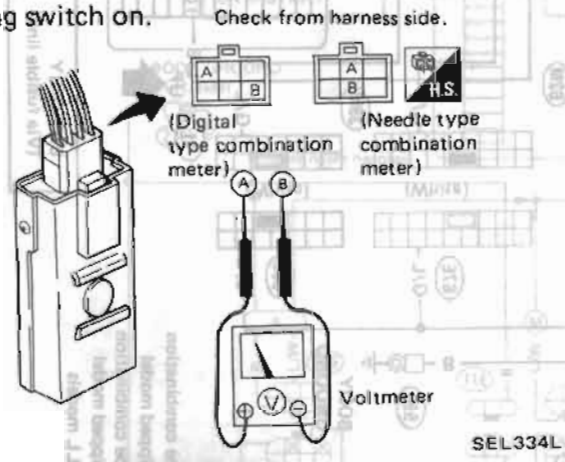
Start engine.
Stop lamp switch on (Depress brake pedal).



All stop lamps in good order:
Approx. 5V (Digital type combination meter)
Approx. 12V (Needle type combination meter)
At least one of stop lamps is moved:
Less than 3V (Digital type combination meter)
Approx. 1V (Needle type combination meter)

TAIL LAMP

Start engine.
Lighting switch on.



All tail lamps in good order:
Approx. 5V (Digital type combination meter)
Approx. 12V (Needle type combination meter)
At least one of tail lamps is moved:
Less than 3V (Digital type combination meter)
Approx. 1V (Needle type combination meter)

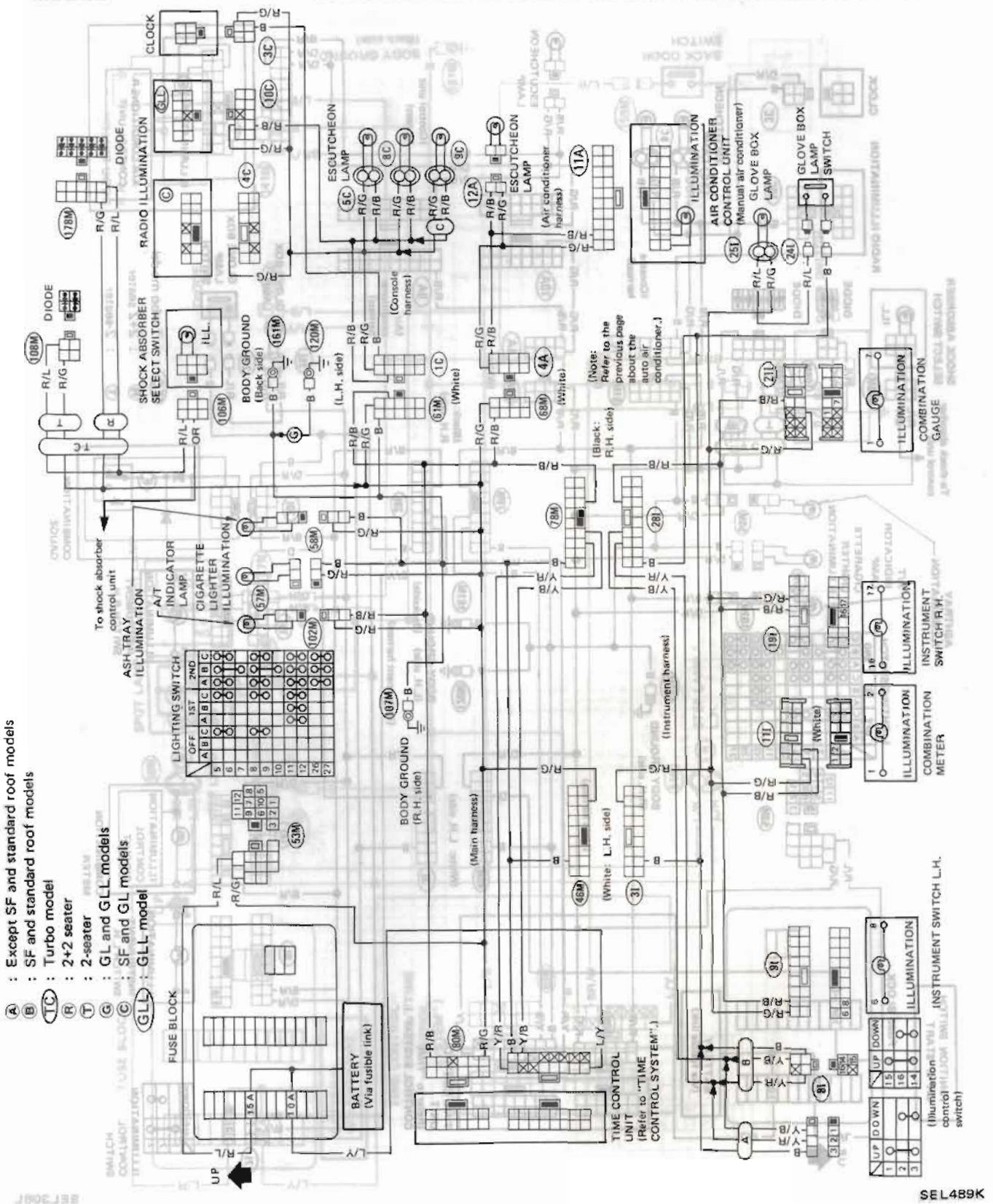
Bulb Specifications

Item	Wattage (W)	Bulb No.
Headlamp	65/45	9004
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	1156
Stop/Tail	27/8	1157
Back-up	27	1156
License plate lamp	3.8	–
High-mounted stop lamp	7.3*	–
Interior lamp	10	–
Spot lamp	8	–
Rear (luggage) compartment lamp	3.4	–
Door step lamp	5	–
Leg room lamp	2	–

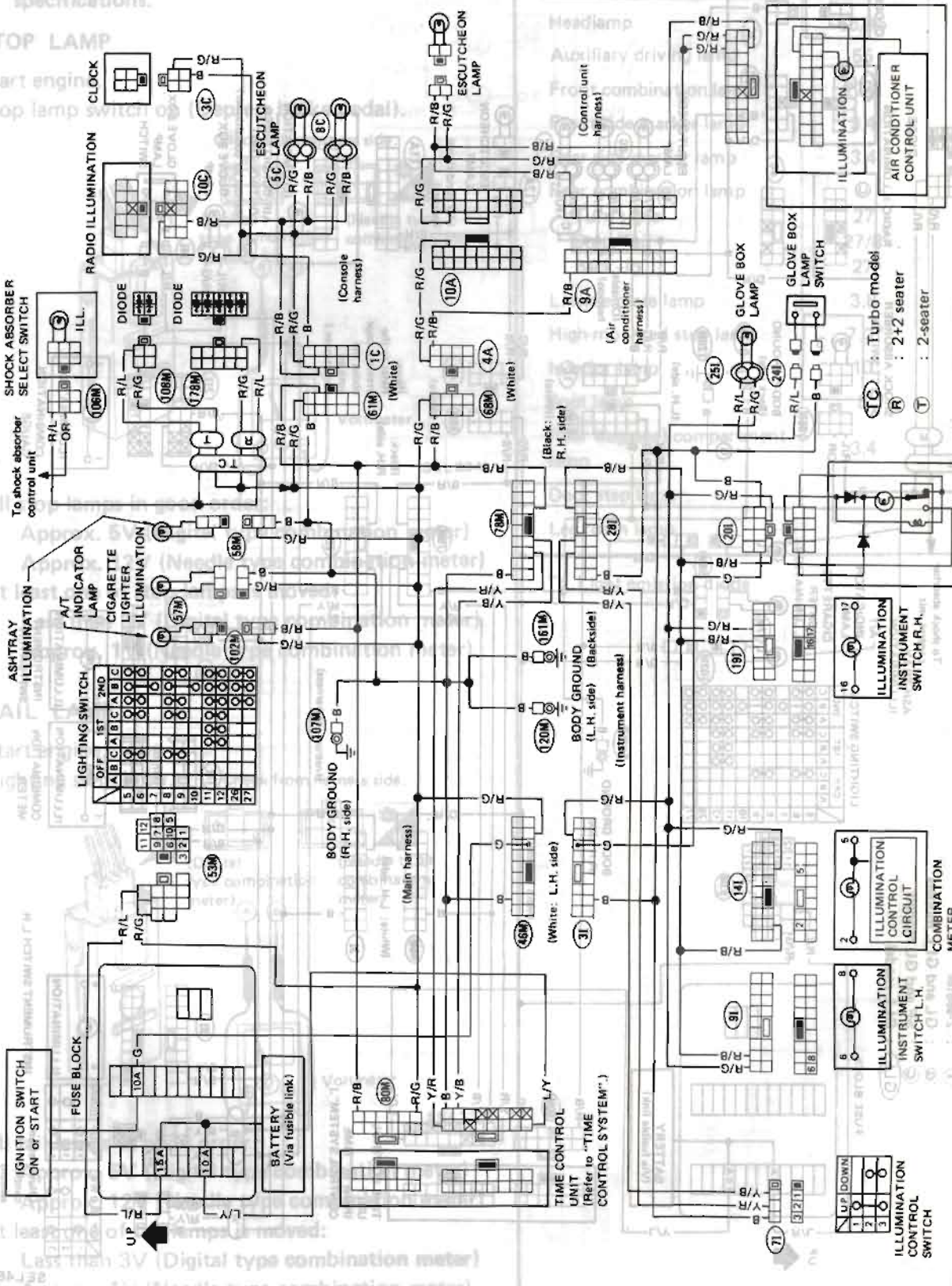
*: Light emission diode

Illumination/Wiring Diagram

NEEDLE TYPE COMBINATION METER EQUIPPED MODEL

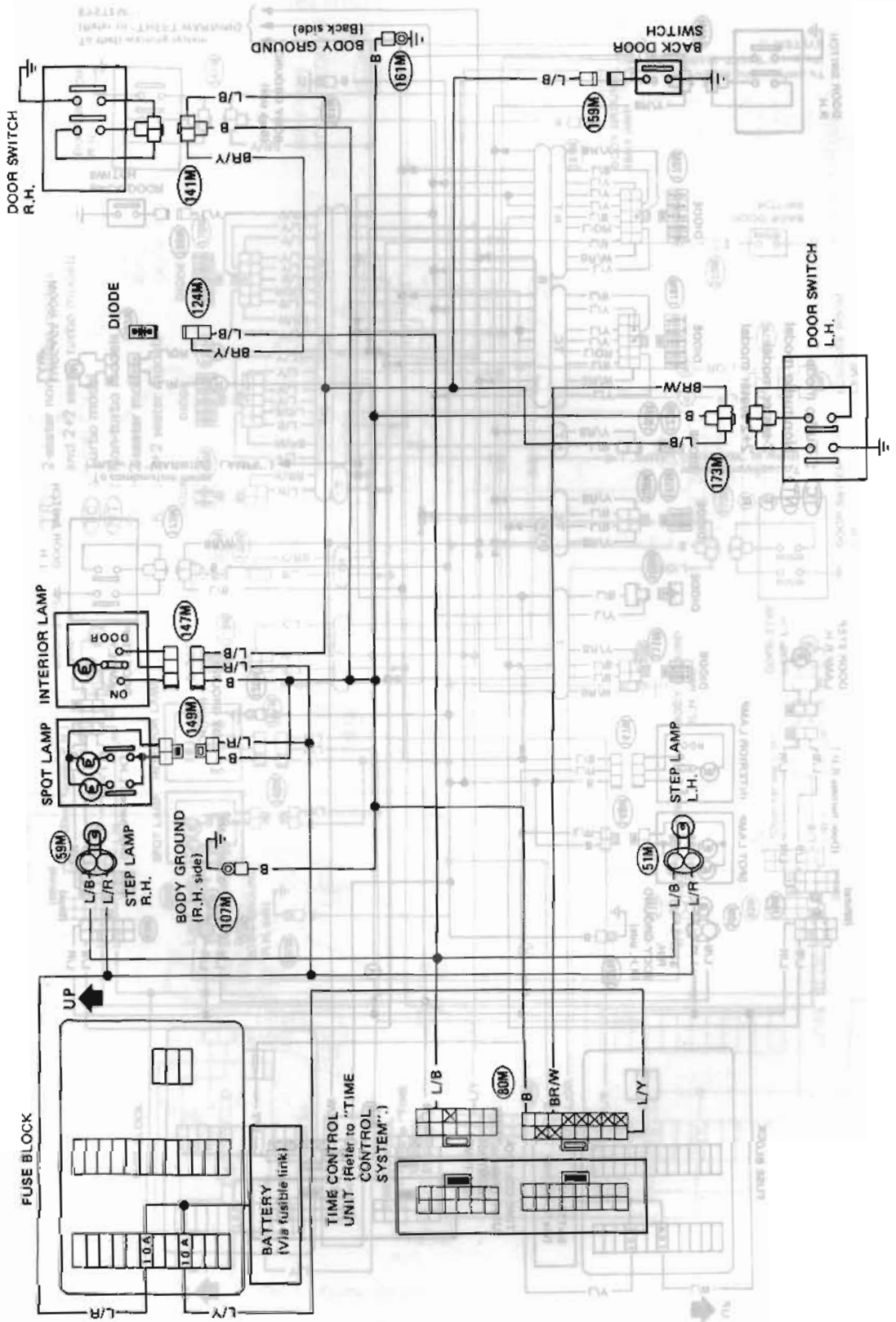


DIGITAL TYPE COMBINATION METER EQUIPPED MODEL (GLL)



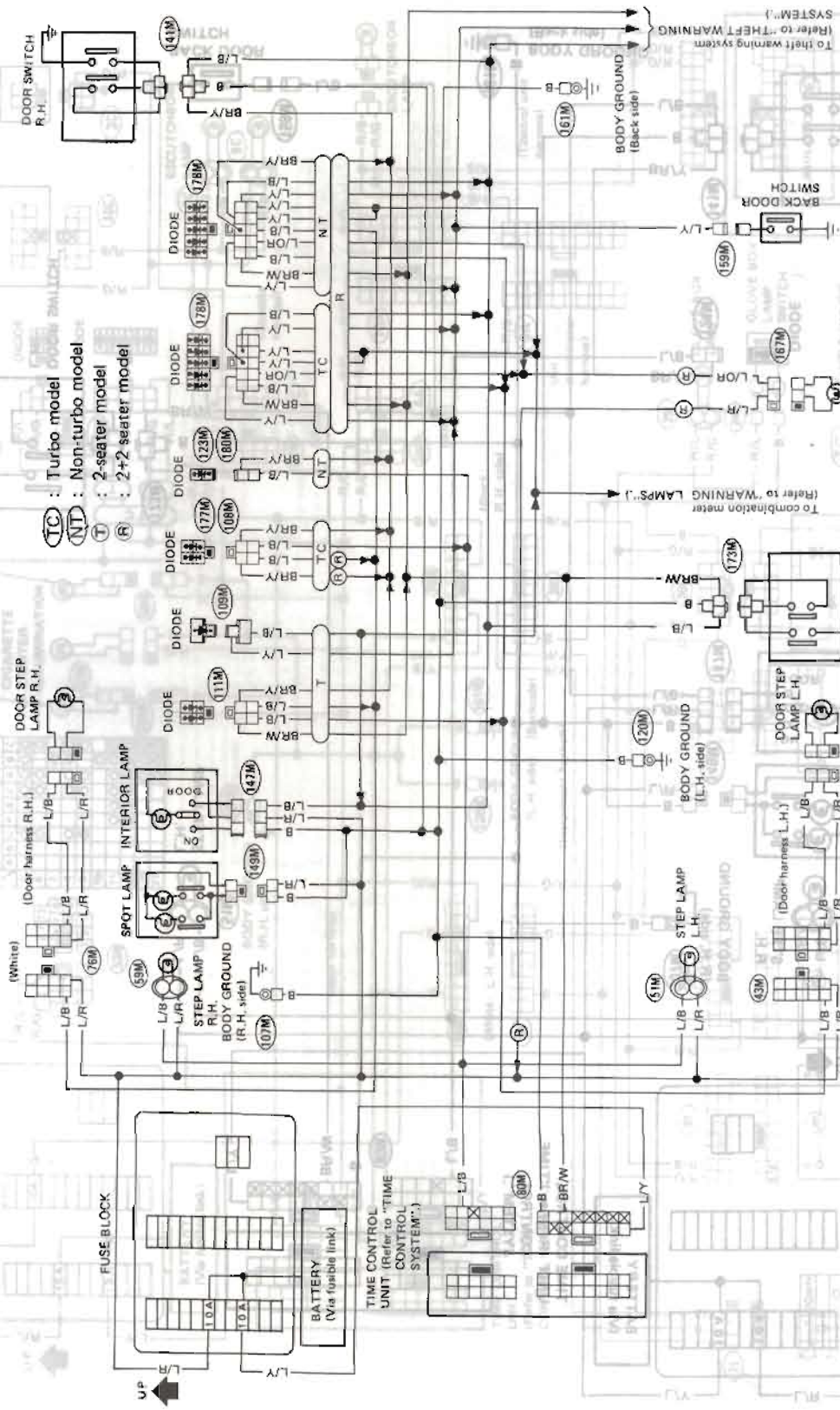
Interior, Luggage and Step Lamps/Wiring Diagram

SF MODEL



SEL491K

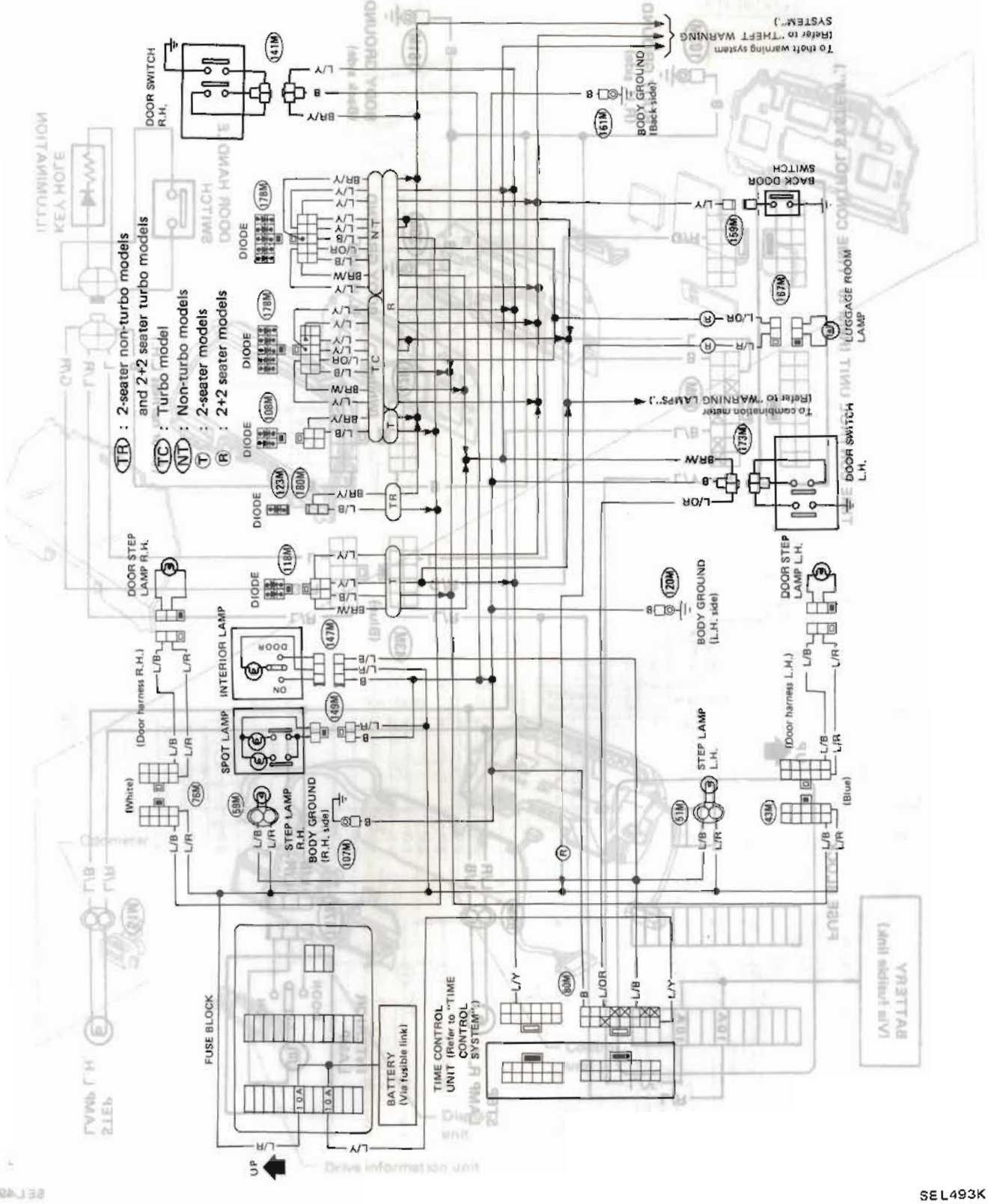
GL MODEL



SEL492K

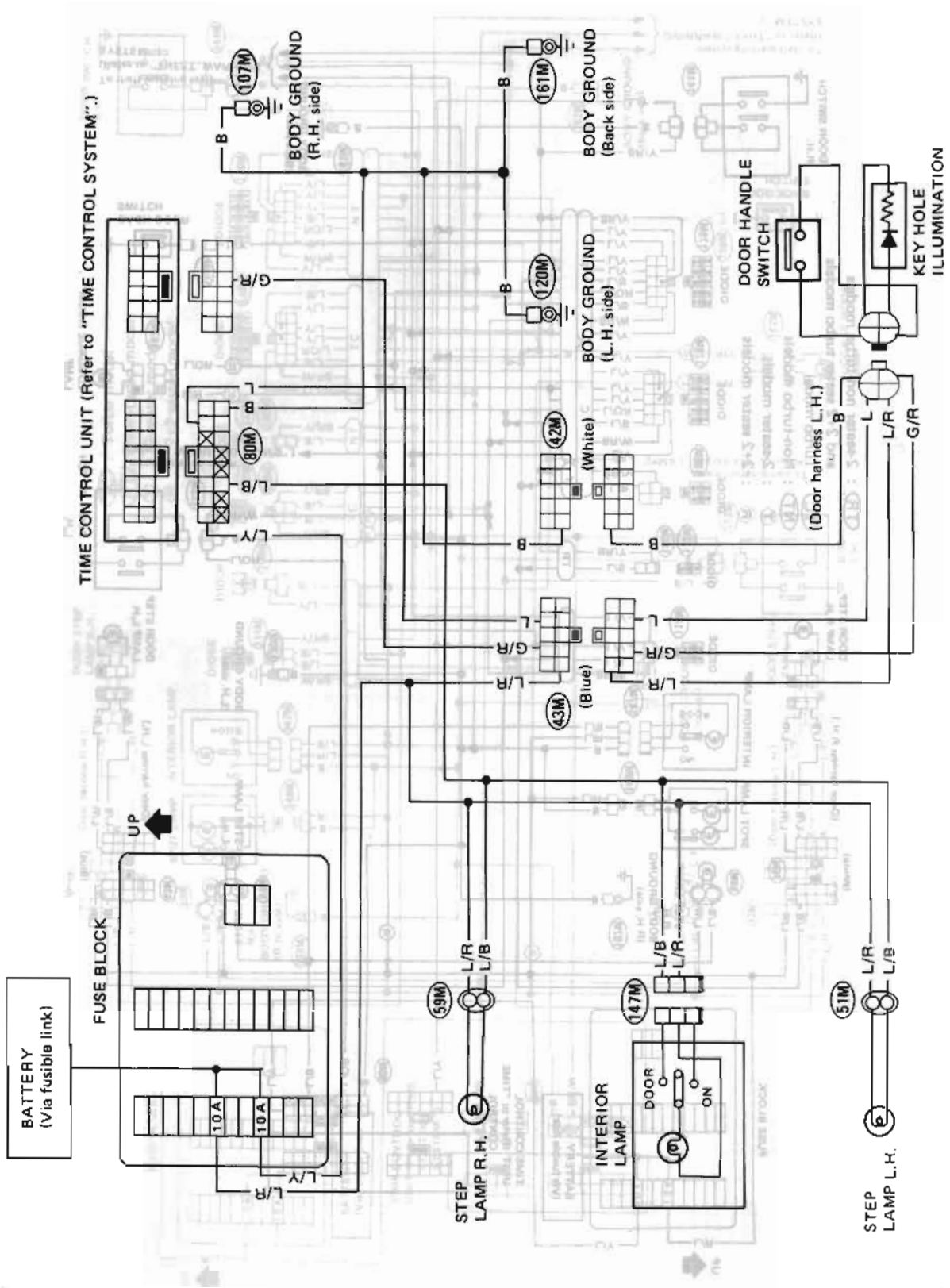
Interior, Luggage and Step Lamps/Wiring Diagram (Cont'd)

GLL MODEL



SEL493K

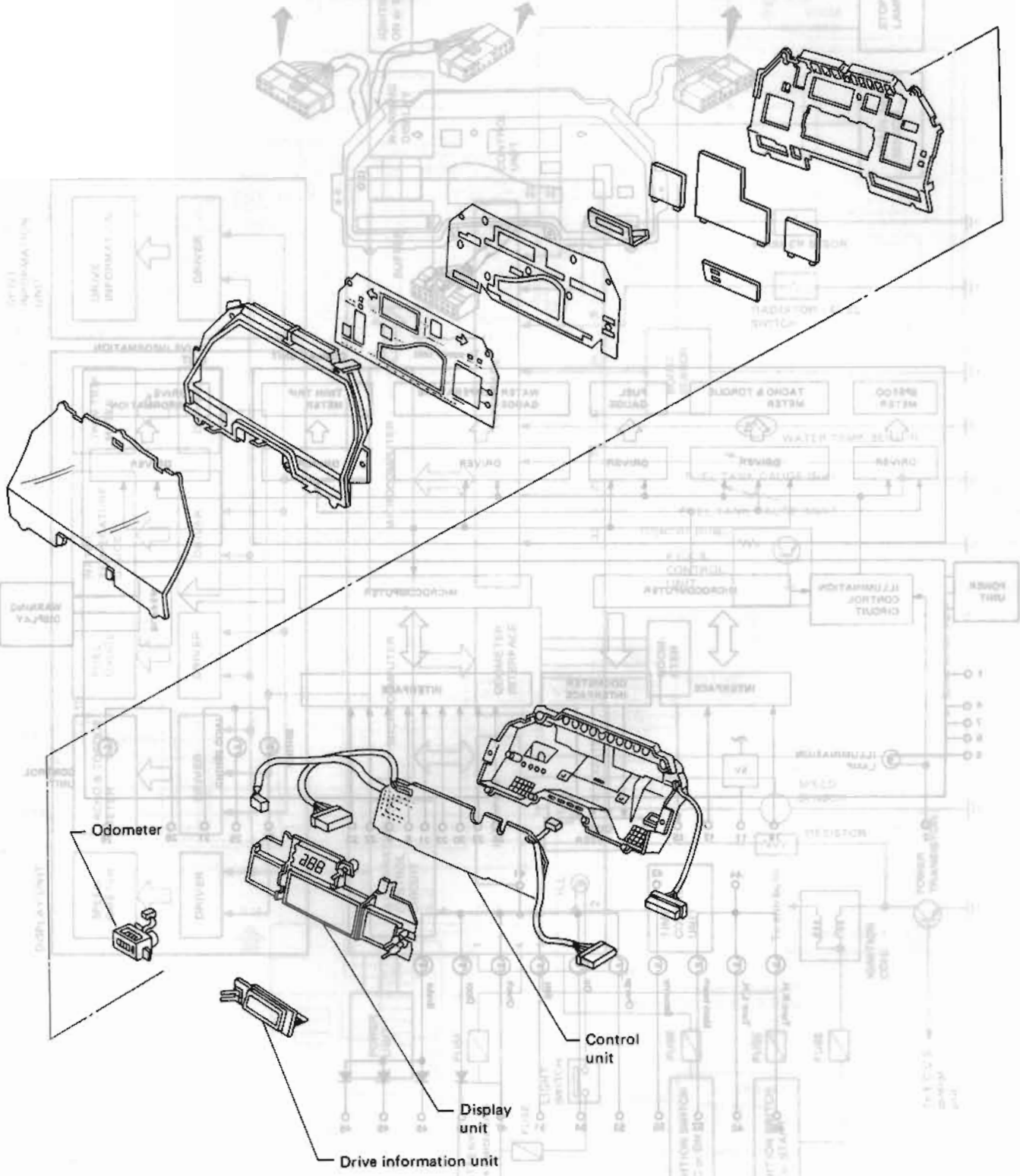
Illuminated Entry System and Door Key Illumination/Wiring Diagram



SEL494K

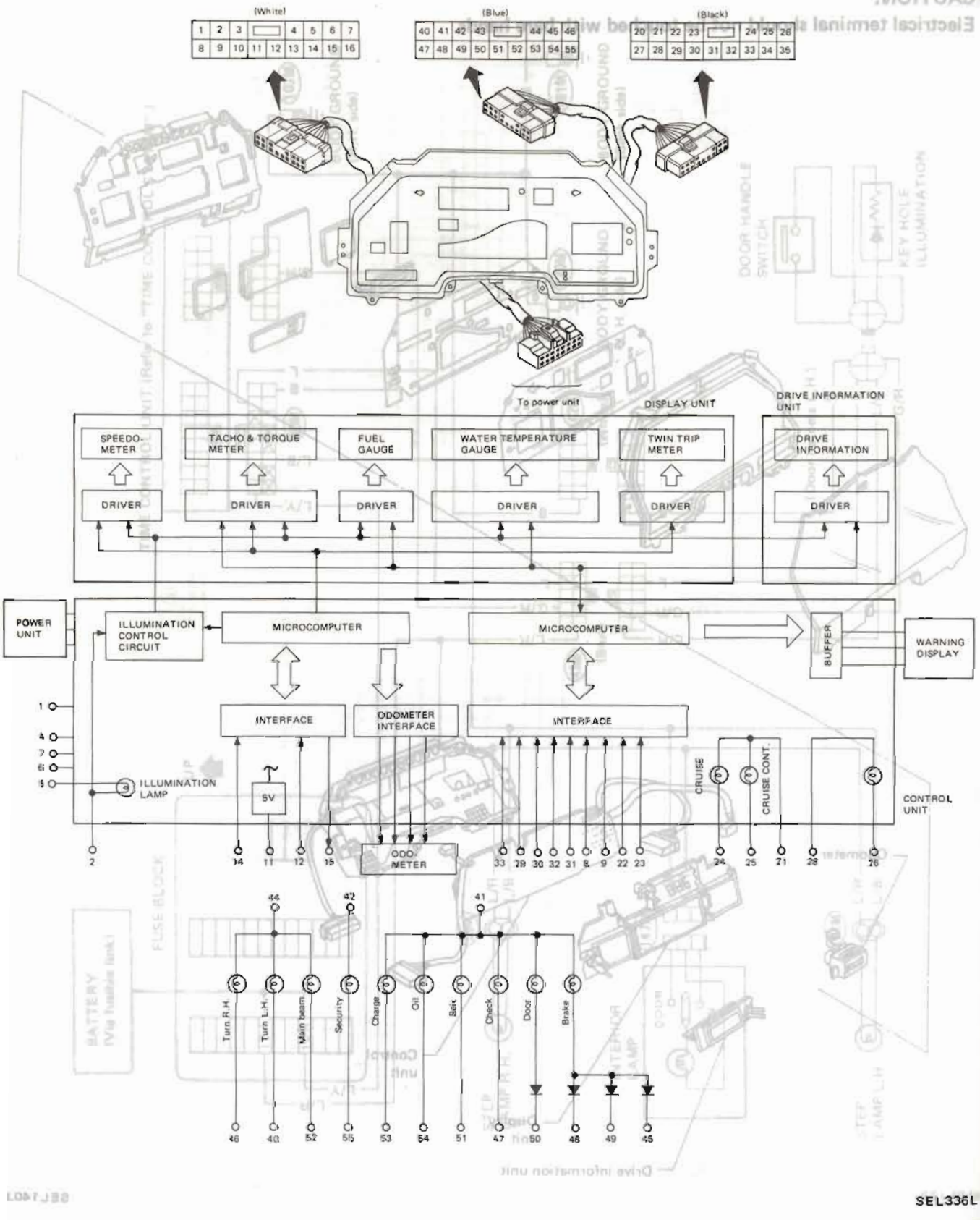
Combination Meter

CAUTION:
Electrical terminal should not be touched with bare hands.



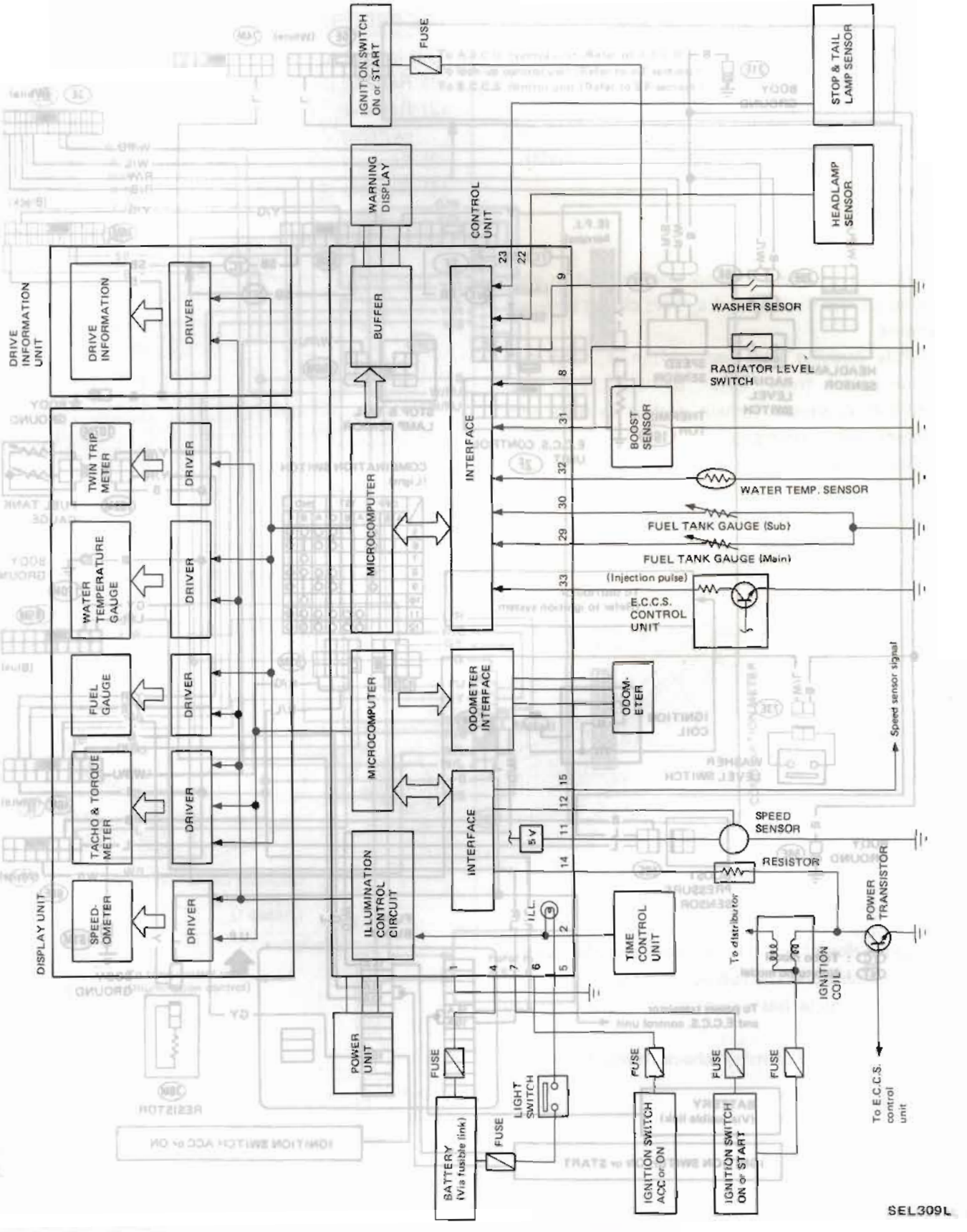
SEL140J

Combination Meter (Cont'd)

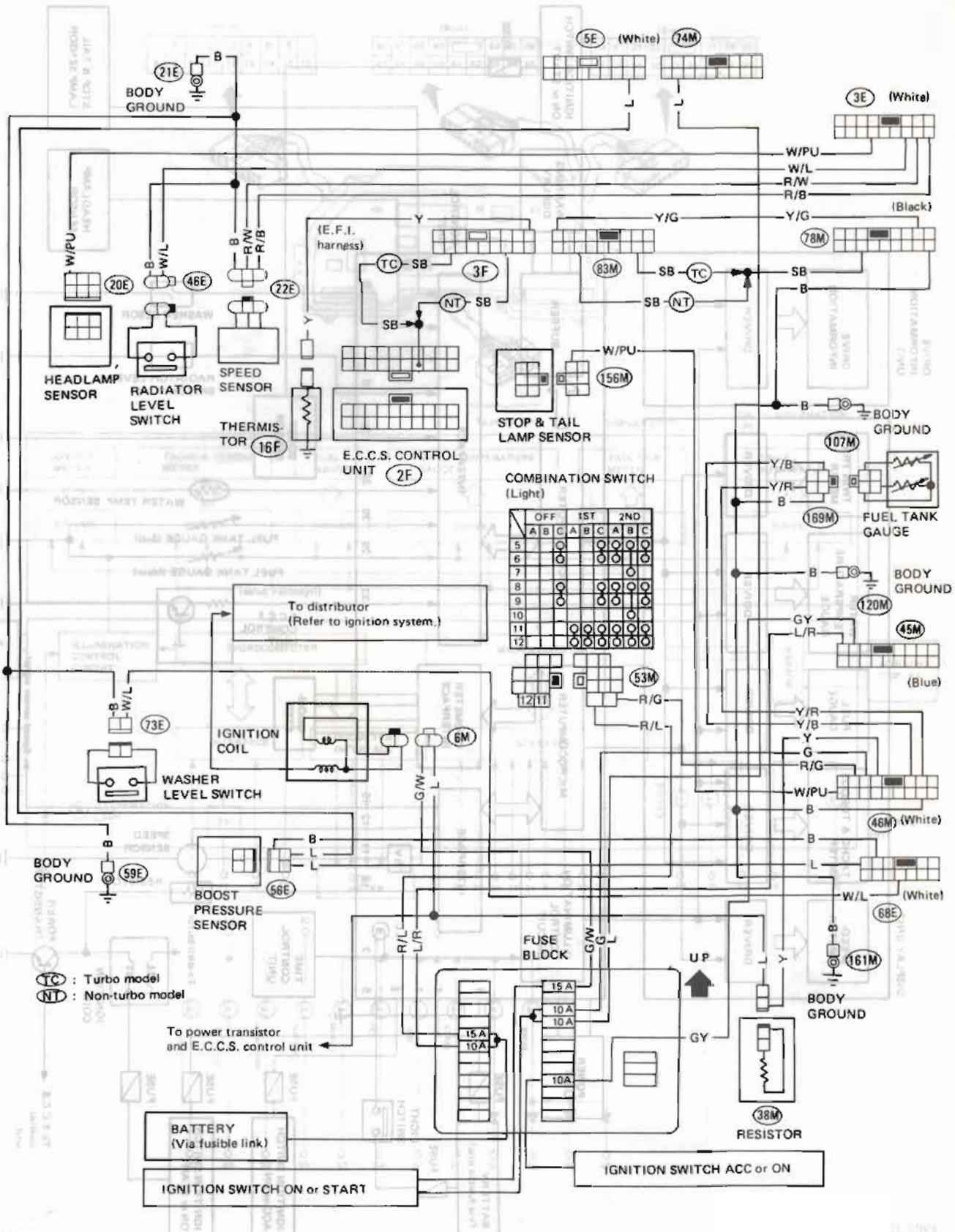


SEL336L

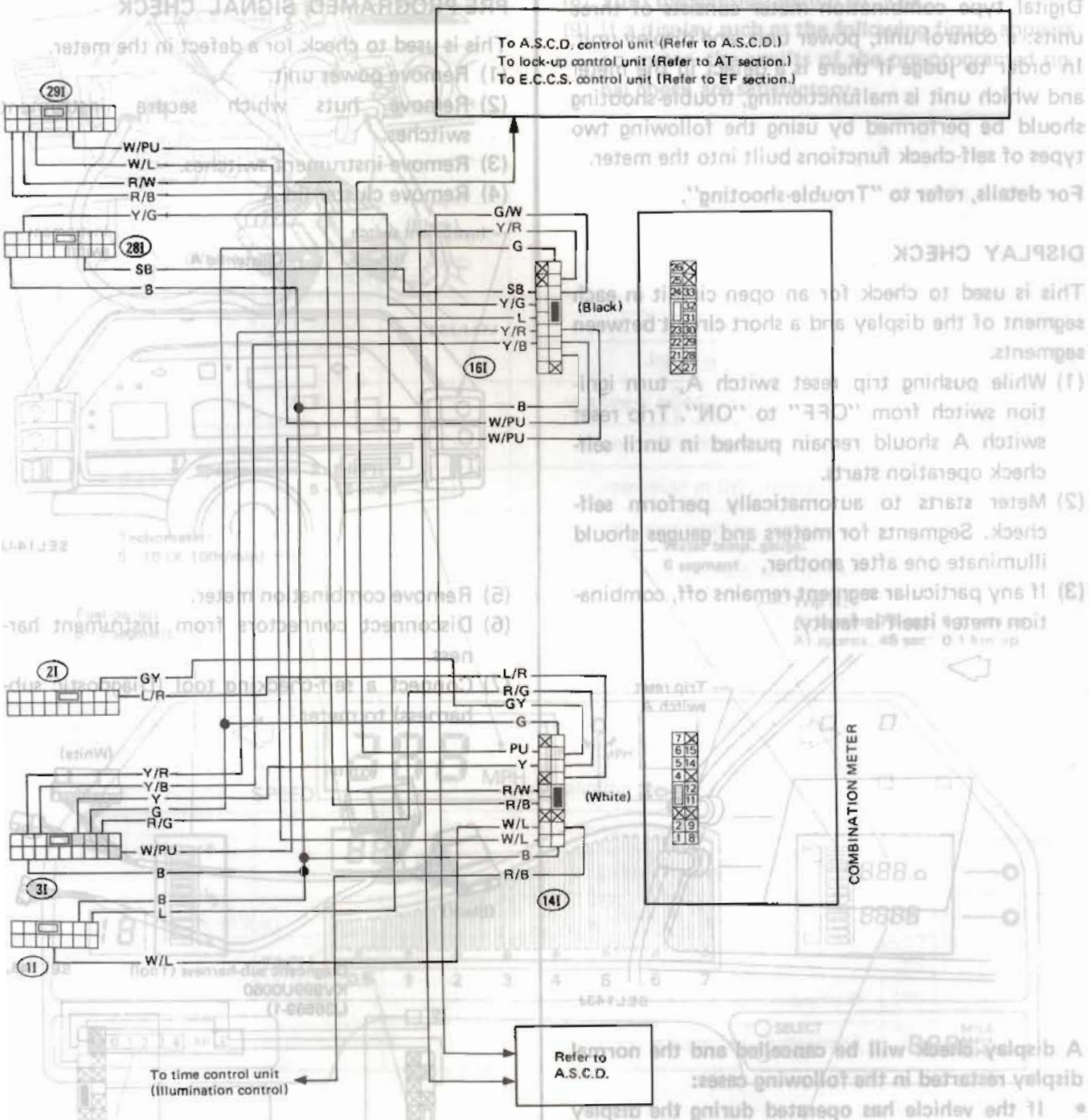
Schematic


IGNITION SWITCH ON or START
FUSE
STOP & TAIL LAMP SENSOR
WARNING DISPLAY
HEADLAMP SENSOR
CONTROL UNIT
DRIVE INFORMATION UNIT
DRIVE INFORMATION
DRIVER
BUFFER
INTERFACE
WASHER SESOR
RADIATOR LEVEL SWITCH
BOOST SENSOR
TWIN TRIP METER
WATER TEMPERATURE GAUGE
FUEL GAUGE
TACHO & TORQUE METER
SPEED-OMETER
DISPLAY UNIT
MICROCOMPUTER
WATER TEMP. SENSOR
FUEL TANK GAUGE (Sub)
FUEL TANK GAUGE (Main)
(Injection pulse)
E.C.C.S. CONTROL UNIT
ODOMETER INTERFACE
ODOM-ETER
Speed sensor signal
SPEED SENSOR
RESISTOR
POWER TRANSISTOR
ILLUMINATION CONTROL CIRCUIT
TIME CONTROL UNIT
To distributor
IGNITION COIL
POWER UNIT
LIGHT SWITCH
BATTERY (Via fusible link)
IGNITION SWITCH ACC or ON
IGNITION SWITCH ON or START
To E.C.C.S. control unit
SEL309L

Wiring Diagram



Wiring Diagram (Cont'd)



Self-check

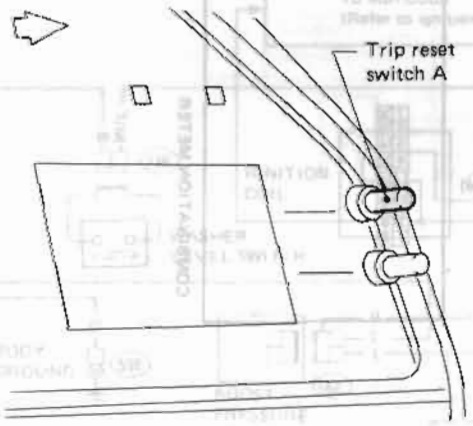
Digital type combination meter consists of three units: a control unit, power unit, and display unit. In order to judge if there is a defect in the meter and which unit is malfunctioning, trouble-shooting should be performed by using the following two types of self-check functions built into the meter.

For details, refer to "Trouble-shooting".

DISPLAY CHECK

This is used to check for an open circuit in each segment of the display and a short circuit between segments.

(1) While pushing trip reset switch A, turn 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.



SEL143J

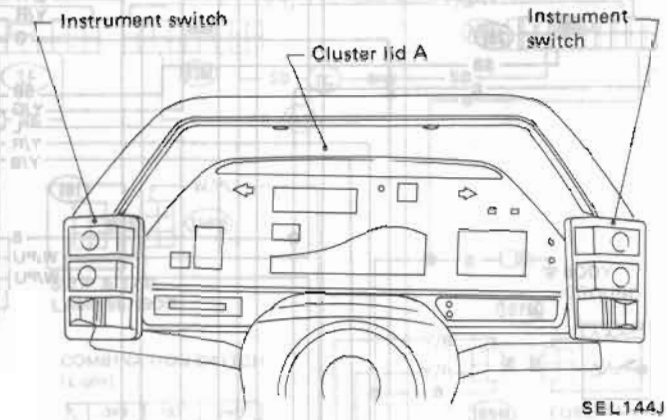
A display check will be cancelled and the normal display restarted in the following cases:

- **If the vehicle has operated during the display check.**
- **If a series of display check items have been completed.**

PRE-PROGRAMED SIGNAL CHECK

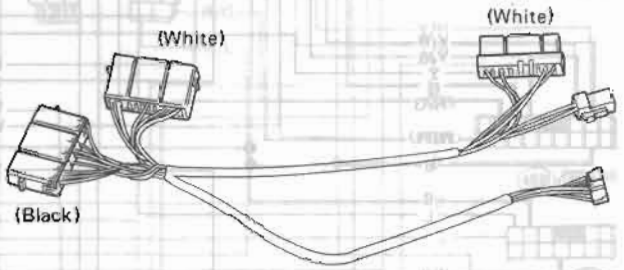
This is used to check for a defect in the meter.

(1) Remove power unit.
(2) Remove nuts which secure instrument switches.
(3) Remove instrument switches.
(4) Remove cluster lid A.



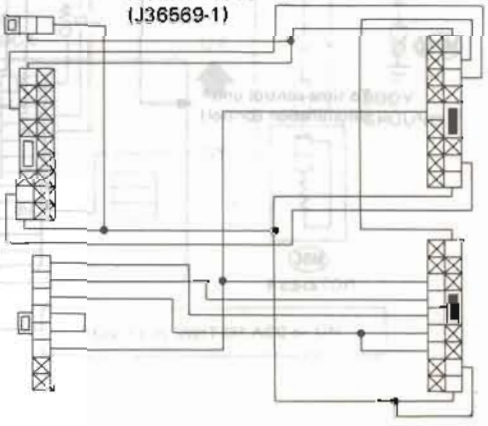
SEL144J

(5) Remove combination meter.
(6) Disconnect connectors from instrument harness.
(7) Connect a self-checking tool (Diagnostic sub-harness) to meter.

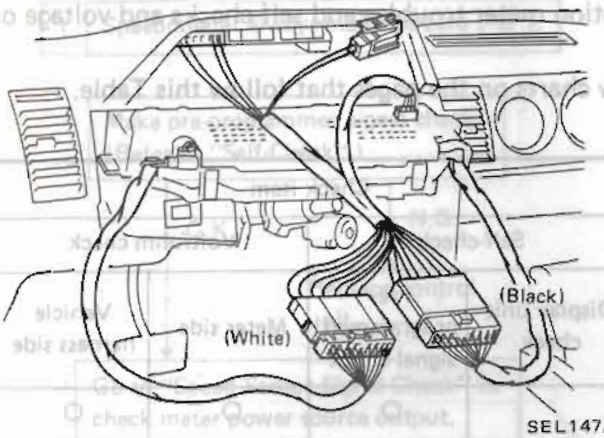


SEL145J

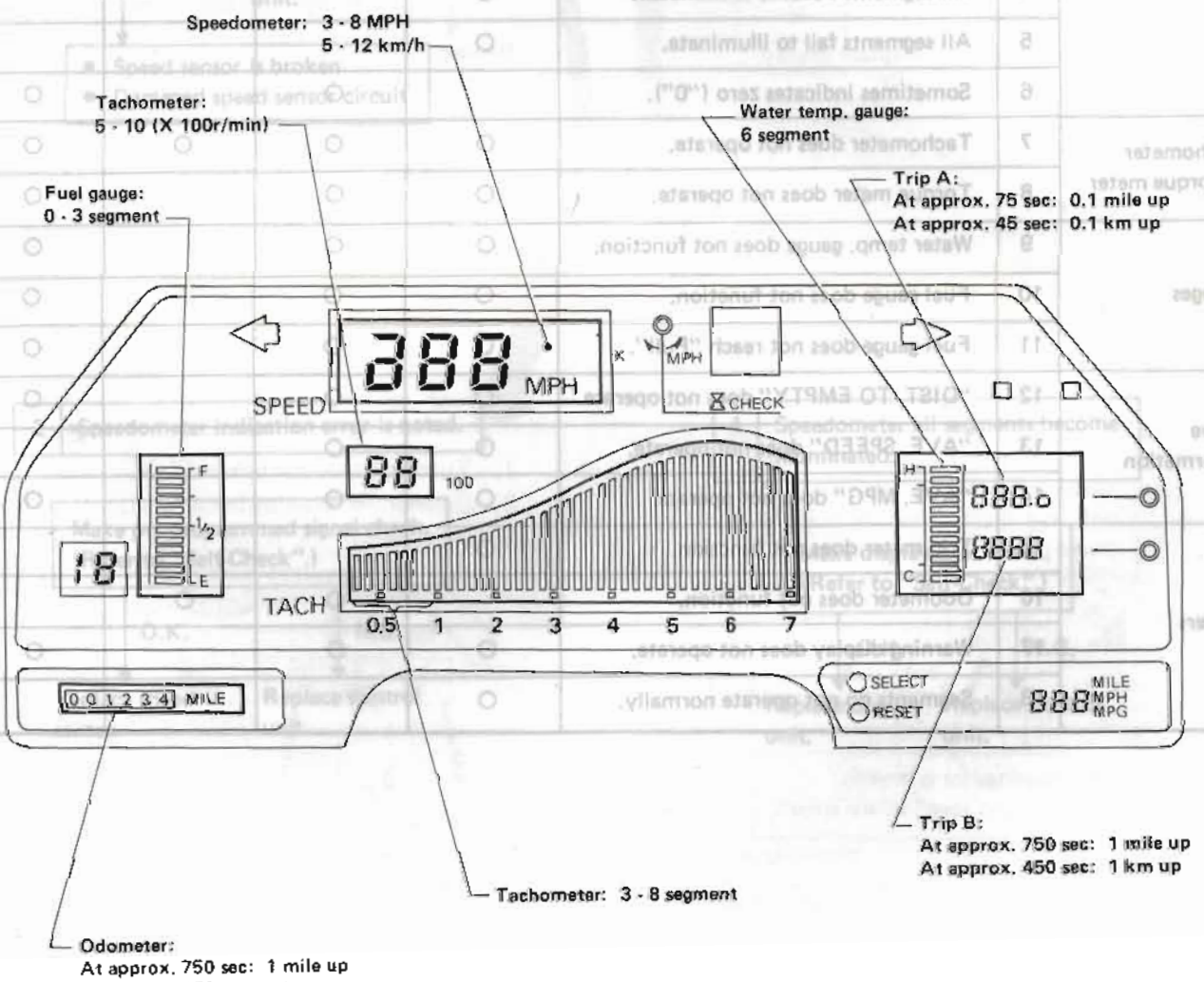
Diagnostic sub-harness (Tool)
KV999U0060
(J36569-1)


SEL146J

Self-check (Cont'd)



(8) Turn the ignition switch to "ON".
(9) If a display such as the following figure appears on meter, the results of the pre-programed signal check are satisfactory.



Trouble-shooting —Quick Reference Table—

The following Quick Reference Table lists various combination meter troubles and self-checks and voltage or resistance checks to be made.
For trouble-shooting procedures, refer to the pertinent flow charts on the pages that follow this Table.

Reference flow chart number		Trouble condition	Check item			
			Self-check		Volt/ohm check	
			Display unit check	Pre-programmed signal check	Meter side	Vehicle harness side
Speedometer	1	Always indicates zero ("0").		○	○	○
	2	Indication error is noted.		○		○
	3	Indicated value changes irregularly.		○		○
	4	All segments become illuminated.	○			
	5	All segments fail to illuminate.	○			
	6	Sometimes indicates zero ("0").		○		○
Tachometer & torque meter	7	Tachometer does not operate.	○	○	○	○
	8	Torque meter does not operate.	○	○		○
Gauges	9	Water temp. gauge does not function.	○	○		○
	10	Fuel gauge does not function.	○	○		○
	11	Fuel gauge does not reach "Full".	○	○		○
Drive information	12	"DIST. TO EMPTY" does not operate.	○	○		○
	13	"AVE. SPEED" does not operate.	○	○		
	14	"AVE. MPG" does not operate.	○	○		○
Others	15	Trip meter does not function.	○			
	16	Odometer does not function.		○	○	
	17	Warning display does not operate.	○	○		○
	18	Segments do not operate normally.	○			

Trouble-shooting Flow Chart

1 Speedometer always indicates zero ("0").

Make pre-programmed signal check. (Refer to "Self-Check".)

- O.K. → Go to "Speed Sensor Signal Check" to check meter power source output.
  - O.K. → Speed sensor is broken / Damaged speed sensor circuit
  - N.G. → Replace control unit.
- N.G. → Replace control unit.

2 Speedometer indication error is noted.

Make pre-programmed signal check. (Refer to "Self-Check".)

- O.K. → Replace speed sensor.
- N.G. → Replace control unit.

3 Speedometer indicated value changes irregularly.

To see if display changes, lightly tap on control unit and display unit with screwdriver while making pre-programmed signal check.

- O.K. → Speed sensor is broken / Damaged speed sensor circuit
- N.G. → Replace control unit

4 Speedometer all segments become illuminated.

Make display unit check. (Refer to "Self-Check".)

- O.K. → Replace display unit.
- N.G. → Replace control unit.

Trouble-shooting Flow Chart (Cont'd)

5 Speedometer all segments fail to illuminate.

Go to "Power Unit Check" to check power unit output voltage for speedometer.

- O.K. → Make display unit check. (Refer to "Self-Check".)
  - O.K. → Replace control unit.
  - N.G. → Replace display unit.
- N.G. → Replace power unit.

6 Speedometer sometimes indicates zero ("0").

While making pre-programmed signal check, lightly tap on control unit and display unit with screwdriver to see if display changes.

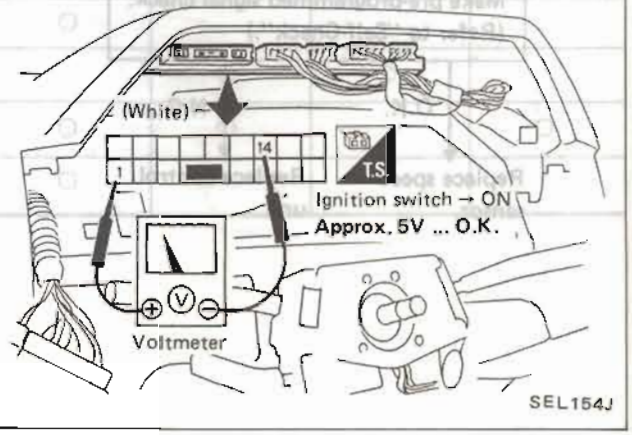
- O.K. → Replace control unit.
- N.G.
  - Speed sensor is broken.
  - Damaged speed sensor circuit.

7 Tachometer does not operate.

Make pre-programmed signal check. (Refer to "Self-Check".)

- O.K. → Check tachometer input signal circuit.
  - O.K. → Replace control unit.
  - N.G.
    - Malfunctioning ignition circuit
- N.G. → Make display unit check. (Refer to "Self-Check".)
  - O.K. → Replace control unit.
  - N.G. → Replace display unit.

1. Turn ignition switch to "ON".
2. Connect voltmeter between ① and ⑭.

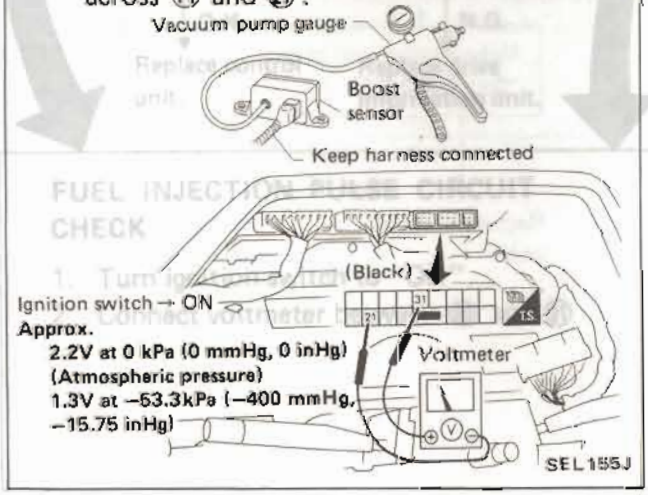


Trouble-shooting Flow Chart (Cont'd)

8 Torque meter does not operate.

Make pre-programmed signal check. (Refer to "Self-Check".)
- O.K. → Check boost sensor circuit.
  - O.K. → Replace control unit.
  - N.G. → Go to "Boost Sensor Check".
    - O.K. → • Damaged boost sensor circuit
    - N.G. → Replace boost sensor.
- N.G. → Make display unit check. (Refer to "Self-Check".)
  - O.K. → Replace control unit.
  - N.G. → Replace display unit.

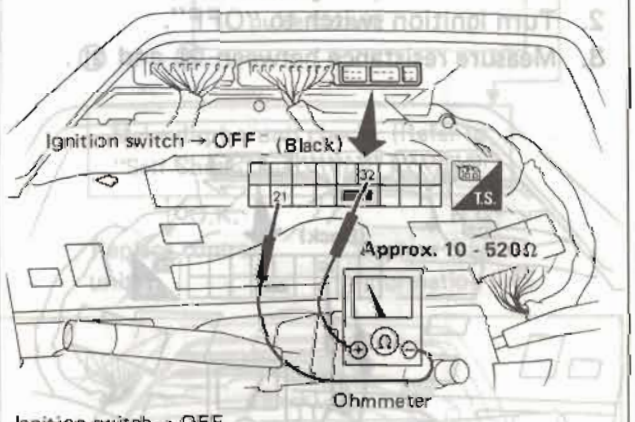
1. Disconnect meter harness connector (Black).
2. Connect vacuum pump gauge to boost sensor vacuum hose.
3. Turn the ignition switch to "ON".
4. Apply vacuum pressure to boost sensor by vacuum pump gauge and measure voltage across ⑪ and ㉑.



9 Water temp. gauge does not function.

Make pre-programmed signal check. (Refer to "Self-Check".)
- O.K. → Check water temp. sensor (thermistor) circuit.
  - O.K. → Replace control unit.
  - N.G. → Go to "Thermistor Check".
    - O.K. → • Damaged boost sensor circuit
    - N.G. → Replace thermistor.
- N.G. → Make display unit check. (Refer to "Self-Check".)
  - O.K. → Replace control unit.
  - N.G. → Replace display unit.

1. Disconnect meter harness connector (Black).
2. Turn ignition switch to "OFF".
3. Measure resistance between ㉜ and ㉑.



Engine coolant temperature	Resistance
60°C (140°F) or less	70Ω or more
60°C (140°F) or more	Approx. 10 - 70Ω

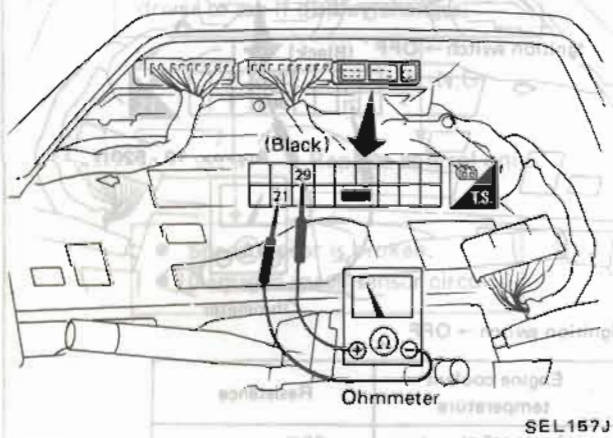
Trouble-shooting Flow Chart (Cont'd)

10 Fuel gauge does not function.

Make pre-programmed signal check. (Refer to "Self-Check".)

- O.K. → Check fuel tank gauge circuit.
  - O.K. → Replace control unit.
  - N.G. → Go to "Fuel Tank Gauge unit Check".
    - O.K. → • Damaged fuel tank gauge unit circuit.
    - N.G. → Replace fuel tank gauge unit.
- N.G. → Make display unit check. (Refer to "Self-Check".)
  - Replace control unit.
  - Replace display unit.

1. Disconnect meter harness connector (Black).
2. Turn ignition switch to "OFF".
3. Measure resistance between ㉙ and ㉑.



11 Fuel gauge does not reach "Full".

Make pre-programmed signal check. (Refer to "Self-Check".)

- O.K. → Check fuel tank gauge circuit.
  - O.K. → Replace control unit.
  - N.G. → Go to "Fuel Tank Gauge Unit Check".
    - O.K. → • Damaged fuel tank gauge unit circuit.
    - N.G. → Replace fuel tank gauge unit.
- N.G. → Make display unit check. (Refer to "Self-Check".)
  - Replace control unit.
  - Replace display unit.

Trouble-shooting Flow Chart (Cont'd)

12 "DIST. TO EMPTY" does not operate.

Is speedometer normal?
- NO → Go to "Trouble-shooting 1-6".
- YES →

Is fuel gauge normal?
- NO → Go to "Trouble-shooting 10-11".
- YES →

Make pre-programmed signal check. (Refer to "Self-Check".)
- N.G. → Replace control unit.
- O.K. →

Check injection pulse circuit.
- N.G. → • Malfunctioning E.C.C.S. control unit • Damaged injection pulse circuit
- O.K. →

Make display unit check. (Refer to "Self-Check".)
- O.K. → Replace control unit.
- N.G. → Replace drive information unit.

13 "AVE. SPEED" does not operate.

Make display unit check. (Refer to "Self-Check".)
- O.K. → Replace control unit.
- N.G. → Replace drive information unit.

14 "AVE. MPG" does not operate.

Is speedometer normal?
- NO → Go to "Trouble-shooting 1-6".
- YES →

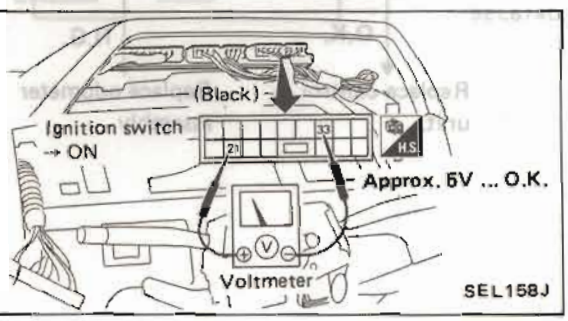
Make pre-programmed signal check. (Refer to "Self-Check".)
- N.G. → Replace control unit.
- O.K. →

Check injection pulse circuit.
- N.G. → • Malfunctioning E.C.C.S. control unit • Damaged injection pulse circuit
- O.K. →

Make display unit check. (Refer to "Self-Check".)
- O.K. → Replace control unit.
- N.G. → Replace drive information unit.

FUEL INJECTION PULSE CIRCUIT CHECK

1. Turn ignition switch to "ON".
2. Connect voltmeter between ㉝ and ㉑ .



Trouble-shooting Flow Chart (Cont'd)

15 Trip meter does not function.

Is speedometer normal?

- NO → Go to "Trouble-shooting 1-6".
- YES → Make display unit check. (Refer to "Self-Check".)
  - O.K. → Replace control unit.
  - N.G. → Replace display unit.

16 Odometer does not function.

Is speedometer normal?

- NO → Go to "Trouble-shooting 1-6".
- YES → Make pre-programmed signal check. (Refer to "Self-Check".)
  - O.K. → Replace control unit.
  - N.G. → Replace odometer assembly.

17 Warning display does not operate.

Make display unit check. (Refer to "Self-Check".)

- O.K. → Replace control unit.
- N.G. → Replace warning display assembly.

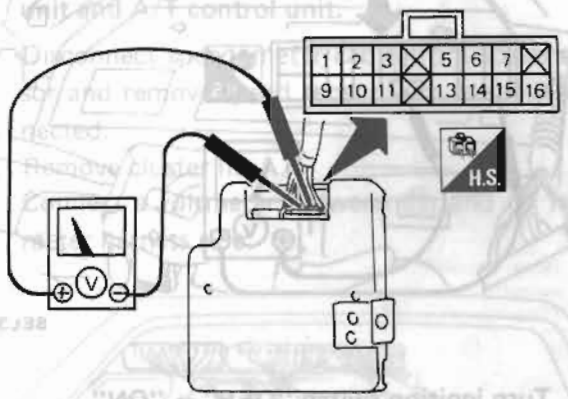
18 Segments do not operate normally.

Go to "Power Unit Check"

- O.K. → Make display unit check. (Refer to "Self-Check".)
  - O.K. → Replace control unit.
  - N.G. → Replace display unit.
- N.G. → Replace power unit.

Power Unit Check

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



SEL159J

- Turn ignition switch to "ON".

Voltmeter terminal (+)	Voltmeter terminal (−)	Voltage [V]	Remarks
②	⑨	Approx. 12	Check when no display appears.
③	⑨	Approx. 0	Check when no display appears.
⑤	⑨	Approx. 22	Check when no display appears.
⑥	⑨	Approx. 26	Check when no display appears.
⑨	⑦	Approx. 23	Check when no display appears.
⑨	⑬, ⑭	Approx. 14	For speedometer, fuel, information, tachometer
⑨	⑮, ⑯	Approx. 19	For temp., trip

- Turn ignition switch to "OFF".

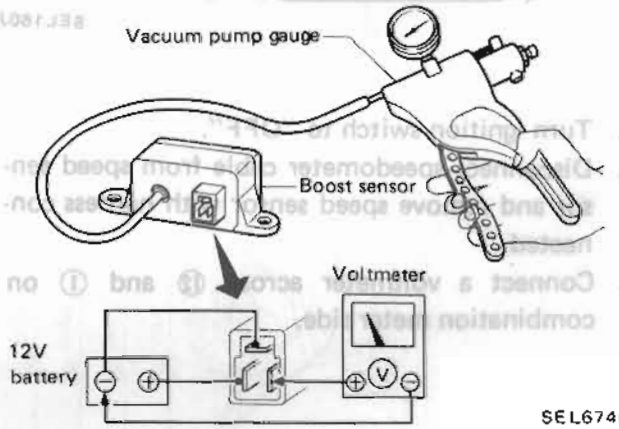
Ohmmeter (+)	Ohmmeter (−)	Continuity	Remarks
⑨	Body ground	Yes	Check when no display appears.

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

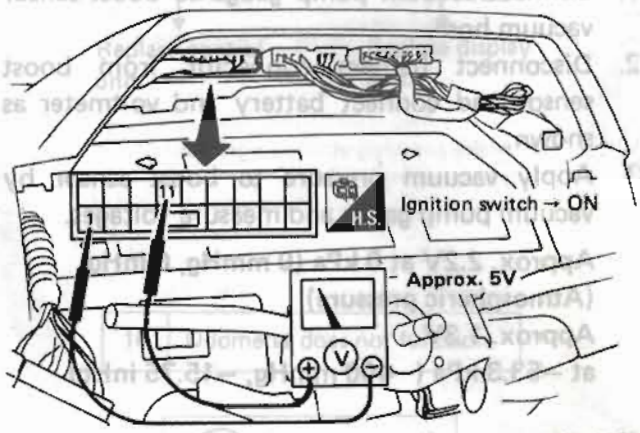
Speed Sensor Signal Check

SPEED SENSOR OUTPUT CHECK

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

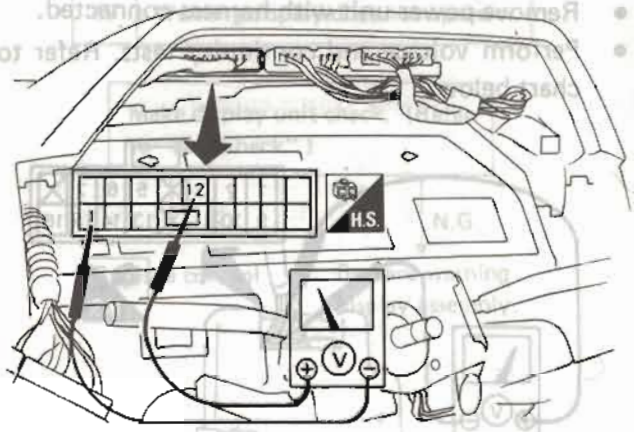
1. Remove cluster lid A.
2. Connect a voltmeter between ⑪ and ① on combination meter side. Combination meter harness connector should remain connected to instrument harness.
3. Turn ignition switch from "OFF" to "ON". Voltmeter should indicate approximately 5 volts when switch is "ON".

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



SEL160J

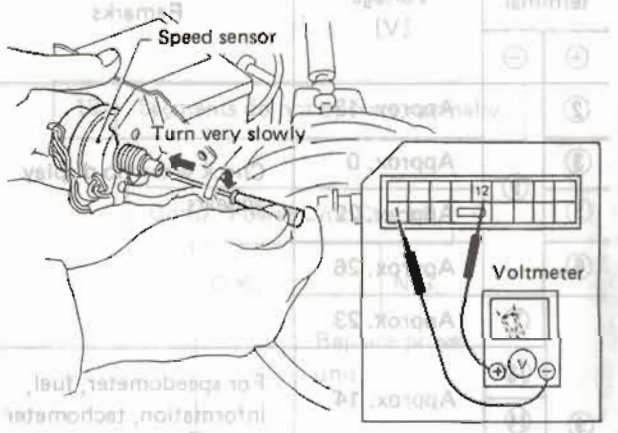
4. Turn ignition switch to "OFF".
5. Disconnect speedometer cable from speed sensor and remove speed sensor with harness connected.
6. Connect a voltmeter across ⑫ and ① on combination meter side.



SEL337L

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.



SEL338L

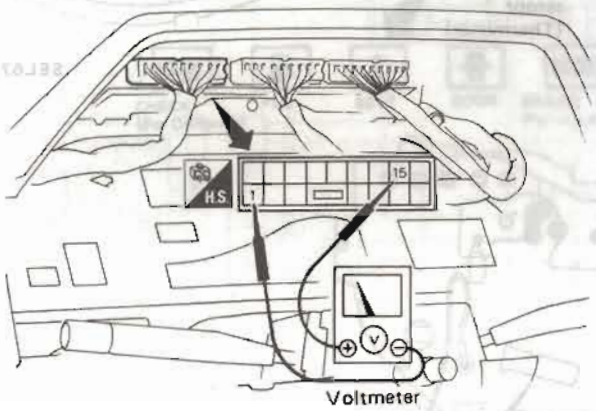
If voltmeter pointer does not deflect, replace speed sensor.

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 and A/T control unit.**

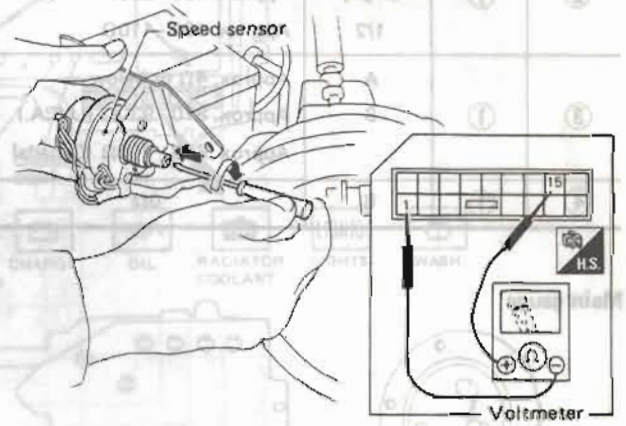
1. Disconnect speedometer cable from speed sensor and remove speed sensor with harness connected.
2. Remove cluster lid A.
3. Connect a voltmeter between ⑮ and ① from meter harness side.



SEL339L

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.



SEL340L

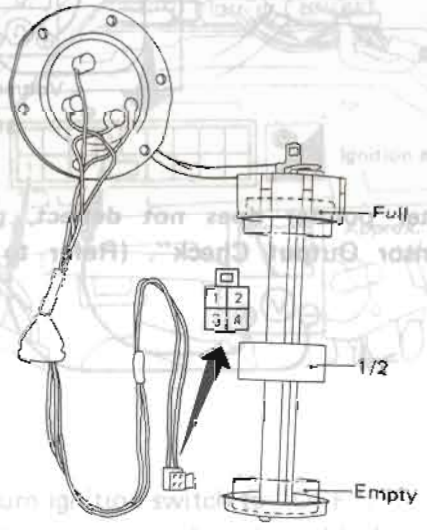
If ohmmeter pointer does not deflect, go to "Speed Sensor Output Check". (Refer to back page)

Fuel Tank Gauge Check

- For removal, refer to FE section.

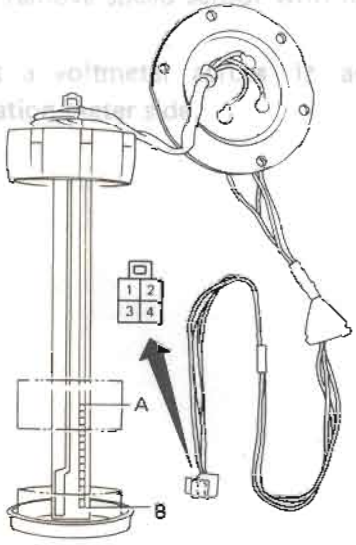
Ohmmeter terminal (+)	Ohmmeter terminal (−)	Float position	Resistance value
②	①	Full	Approx. 1Ω
		Empty	Approx. 480 - 520Ω
		1/2	Approx. 100 - 110Ω
③	①	A	Approx. 4Ω or below
		B	Approx. 870 - 930Ω (U.S.A.)
			Approx. 650 - 700Ω (Canada)
④	①	B	0Ω

Main gauge



SEL675D

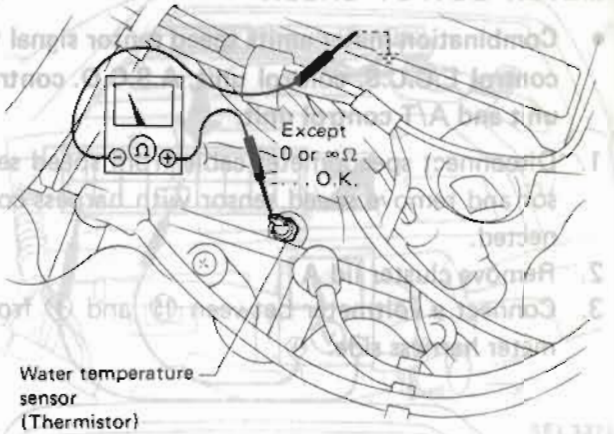
Sub gauge



SEL676D

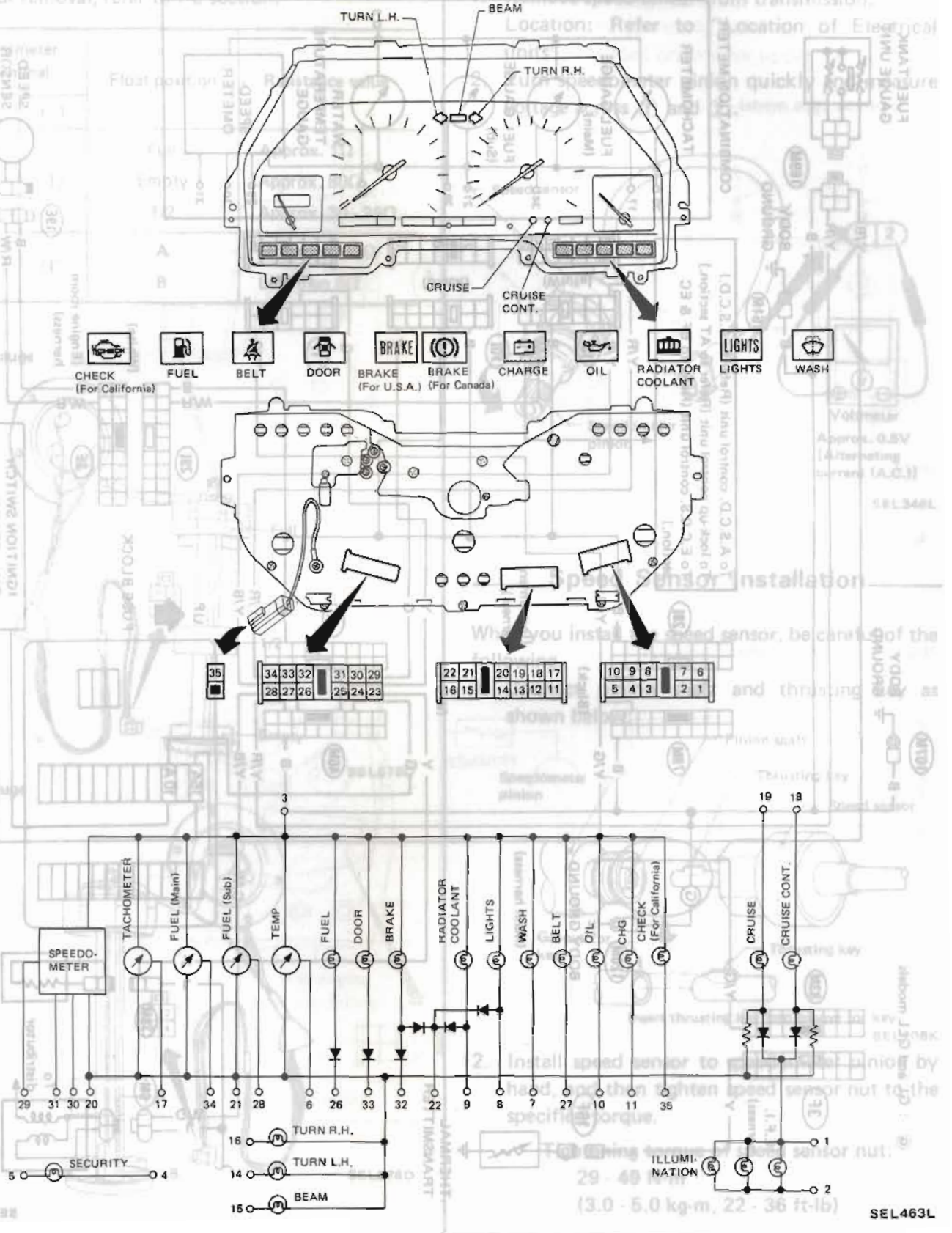
Water Temp. Sensor Check

Cylinder head R.H. side

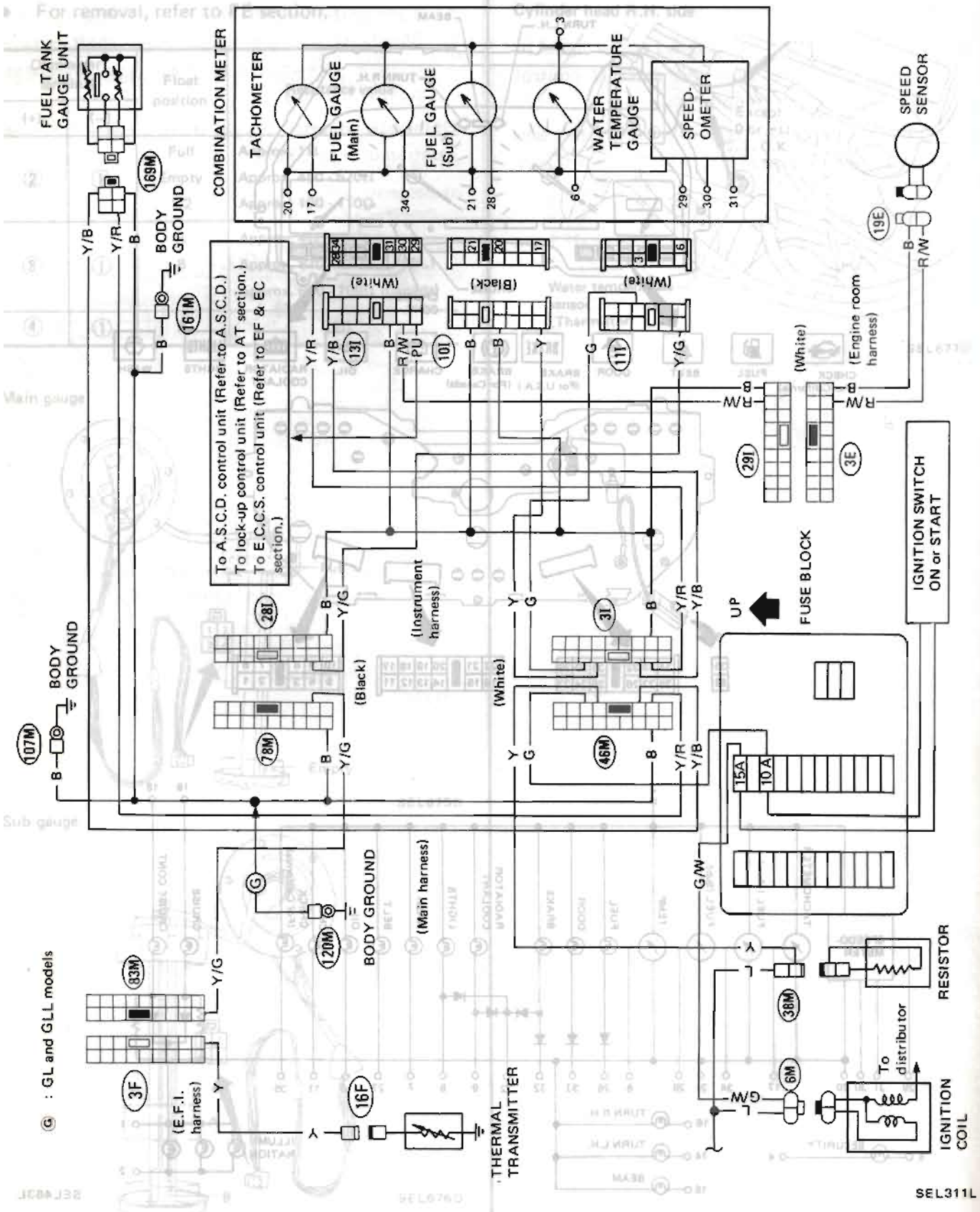


SEL677D

Combination Meter



Speedometer, Tachometer, Fuel and Water Temperature Gauges/Wiring Diagram

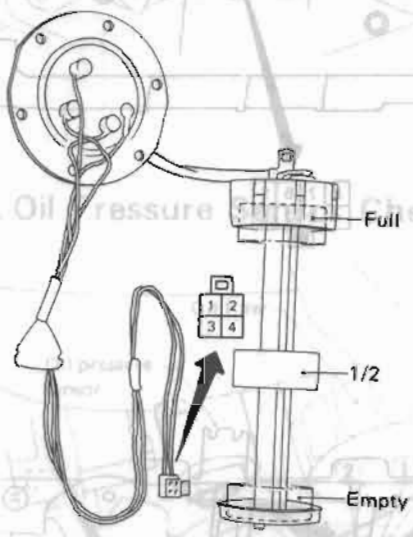


Fuel Tank Gauge Check

- For removal, refer to FE section.

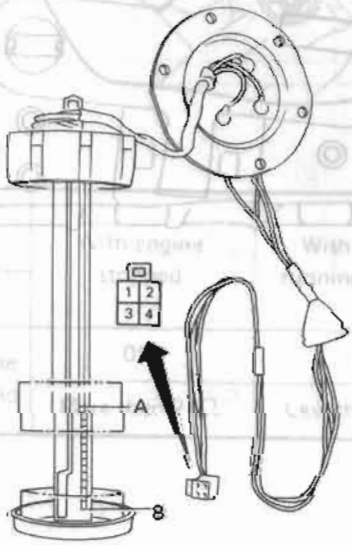
Ohmmeter terminal		Float position	Resistance value
(+)	(–)		
②	①	Full	Approx. 1Ω
		Empty	Approx. 80Ω
		1/2	Approx. 30 - 35Ω
③	①	A	More than 60Ω
		B	Less than 6Ω

Main gauge



SEL675D

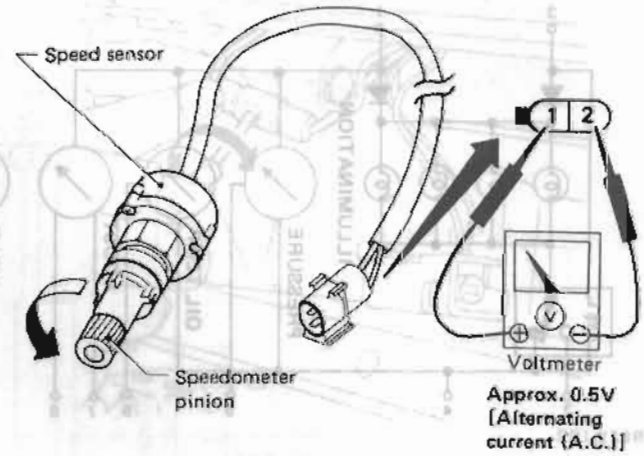
Sub gauge



SEL676D

Speed Sensor Signal Check

1. Remove speed sensor from transmission.
   Location: Refer to "Location of Electrical units".
2. Turn speedometer pinion quickly and measure voltage across ① and ②.

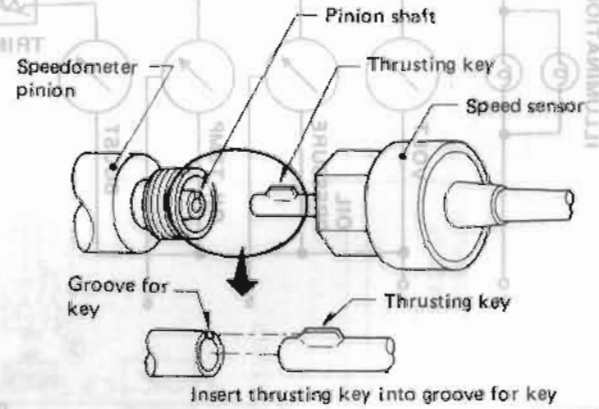


SEL346L

Speed Sensor Installation

When you install the speed sensor, be careful of the following.

1. Connect pinion shaft and thrusting key as shown below:



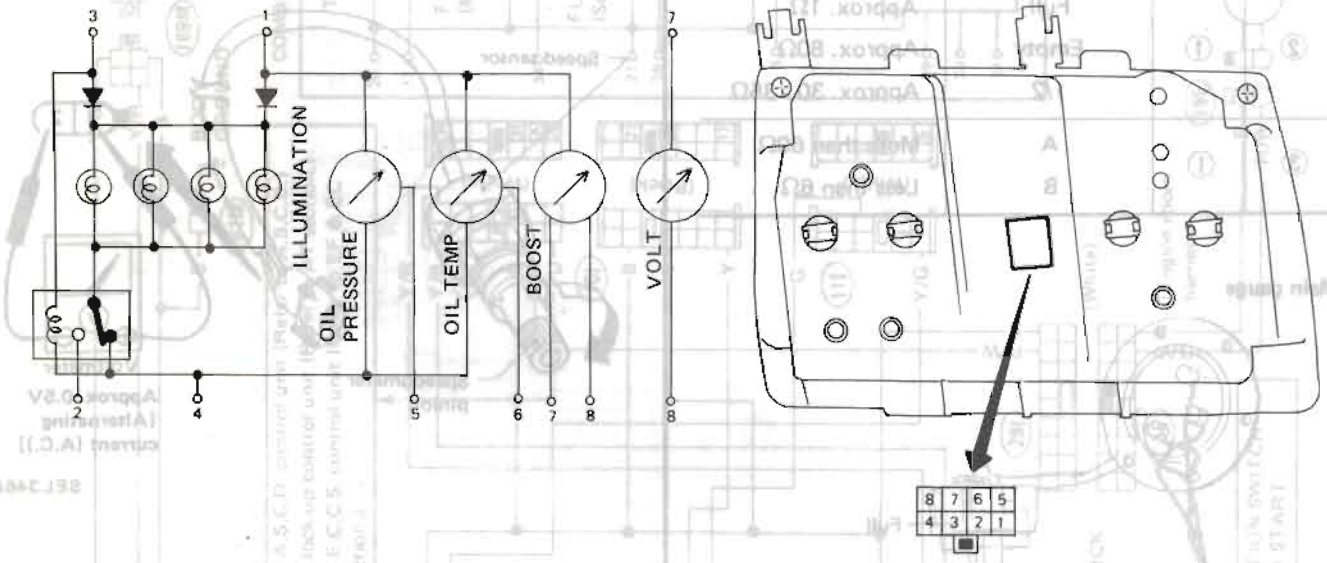
SEL708K

2. Install speed sensor to speedometer pinion by hand, and then tighten speed sensor nut to the specified torque.

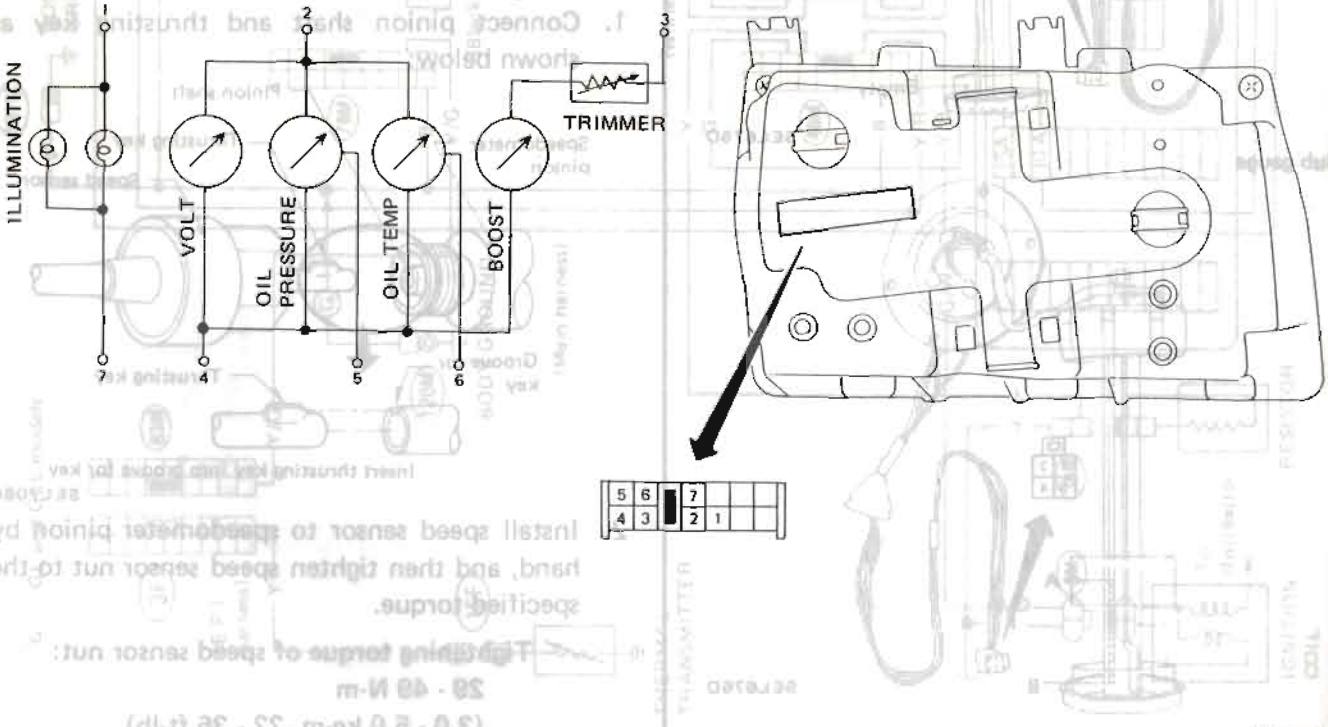
Tightening torque of speed sensor nut:
29 - 49 N·m
(3.0 - 5.0 kg-m, 22 - 36 ft-lb)

Combination Gauge

Digital meter type model



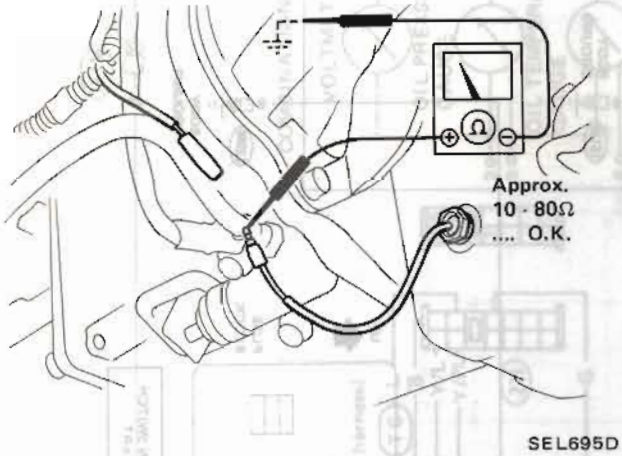
Needle meter type model



SEL312L

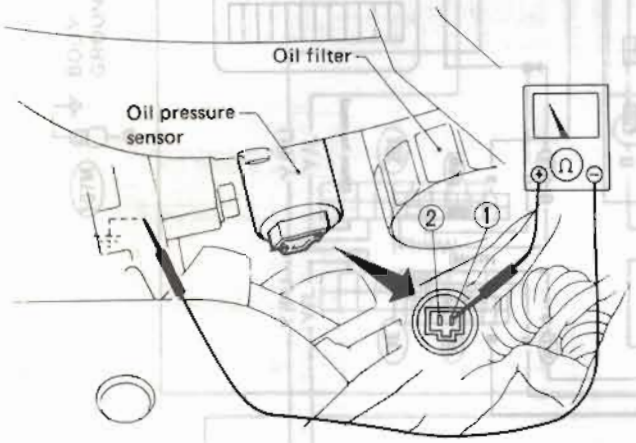
Oil Temp. Sensor Check

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



SEL695D

Oil Pressure Sensor Check

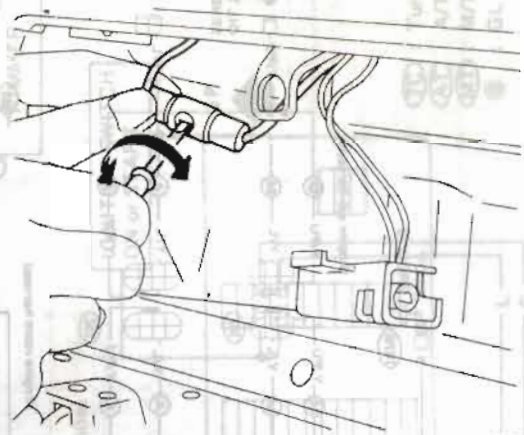


SEL341L

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

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.

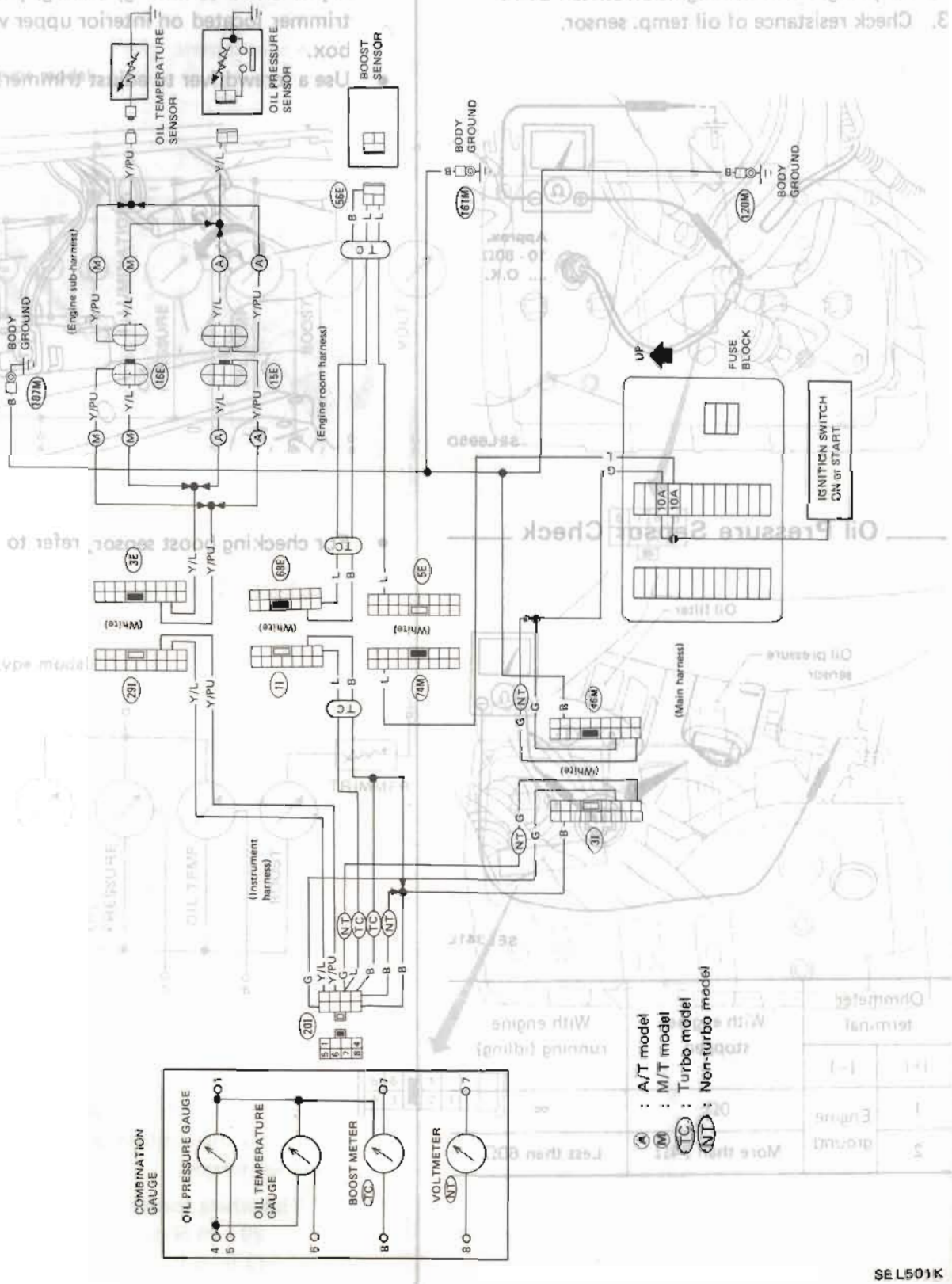


SEL273B

- For checking boost sensor, refer to page EL-79.

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

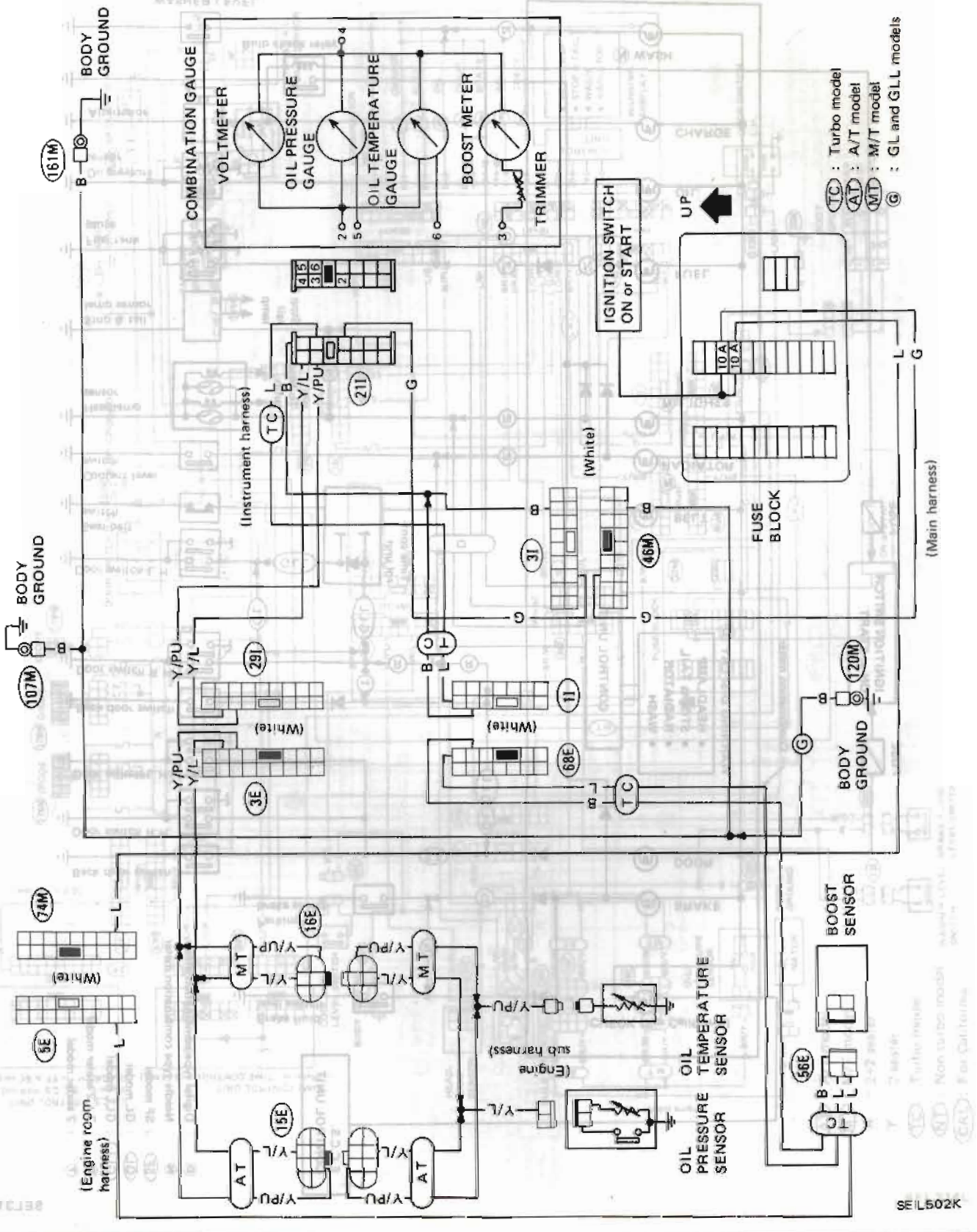
DIGITAL METER TYPE MODEL



METER AND GAUGES —Needle Type Combination Gauge

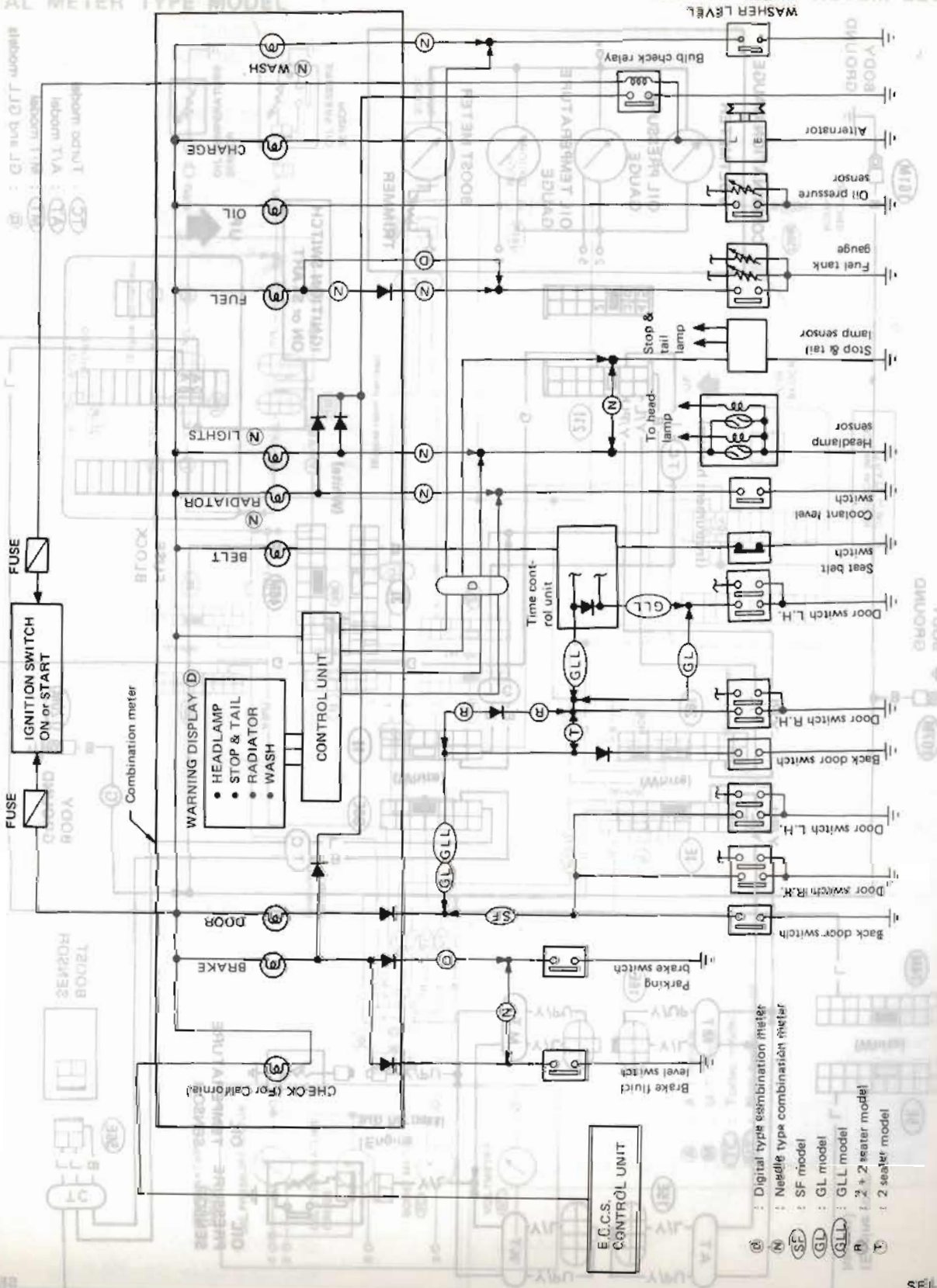
Oil Temp., Oil Pressure, Boost and Volt Gauges/Wiring Diagram (Cont'd)

NEEDLE METER TYPE MODEL



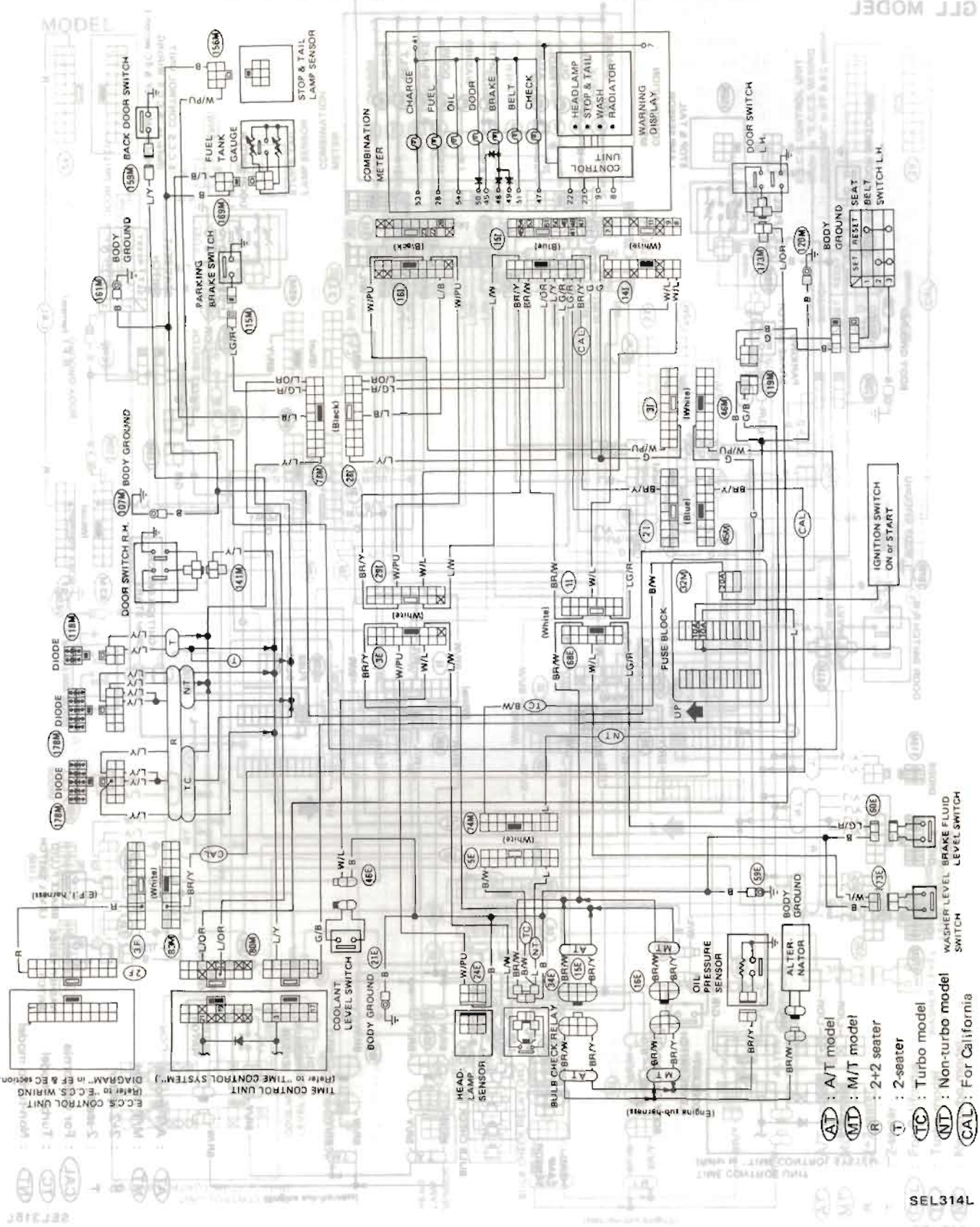
WARNING LAMPS AND CHIME

Schematic



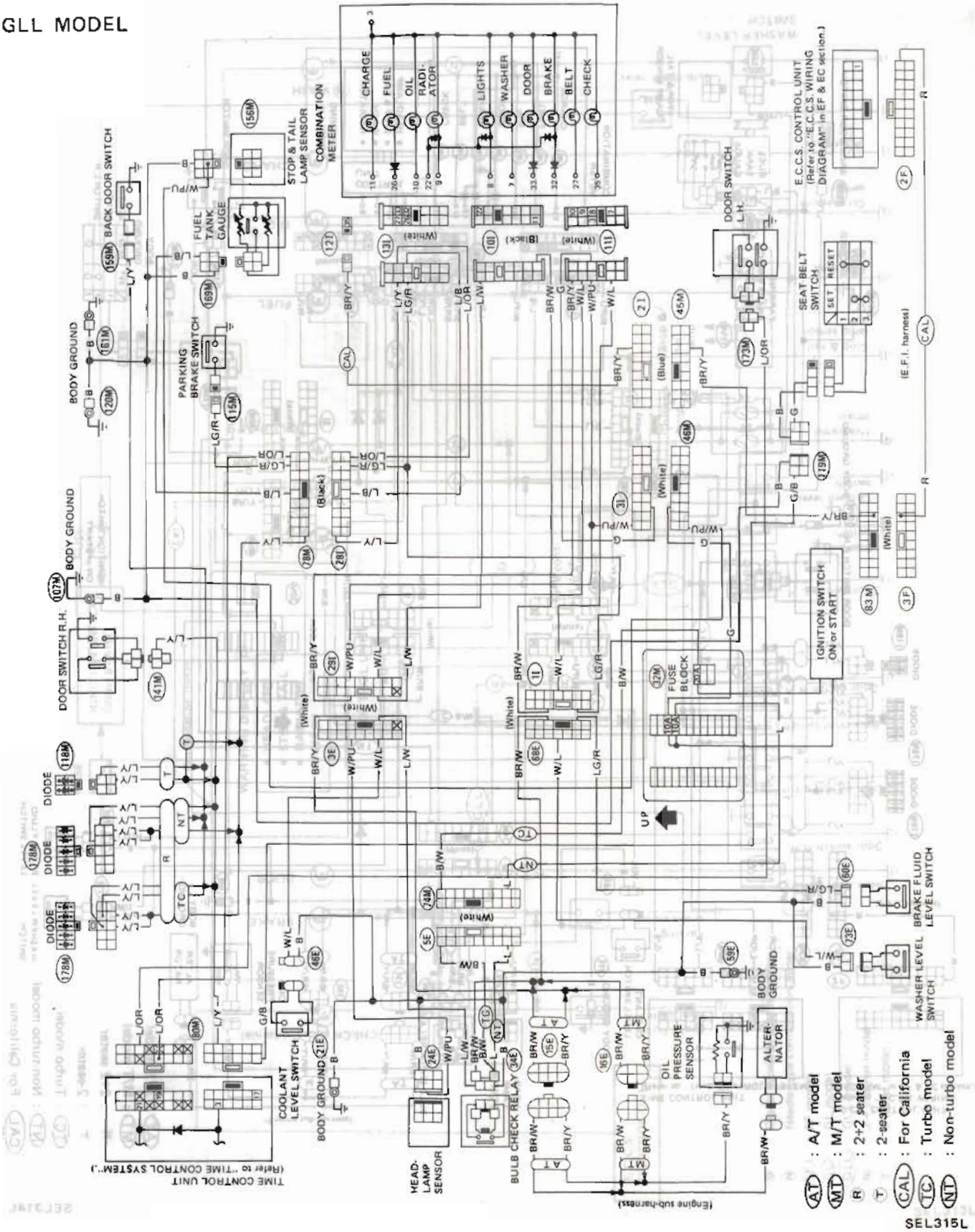
SEL313L

Warning Lamps/Wiring Diagram — For Digital Type Combination Meter



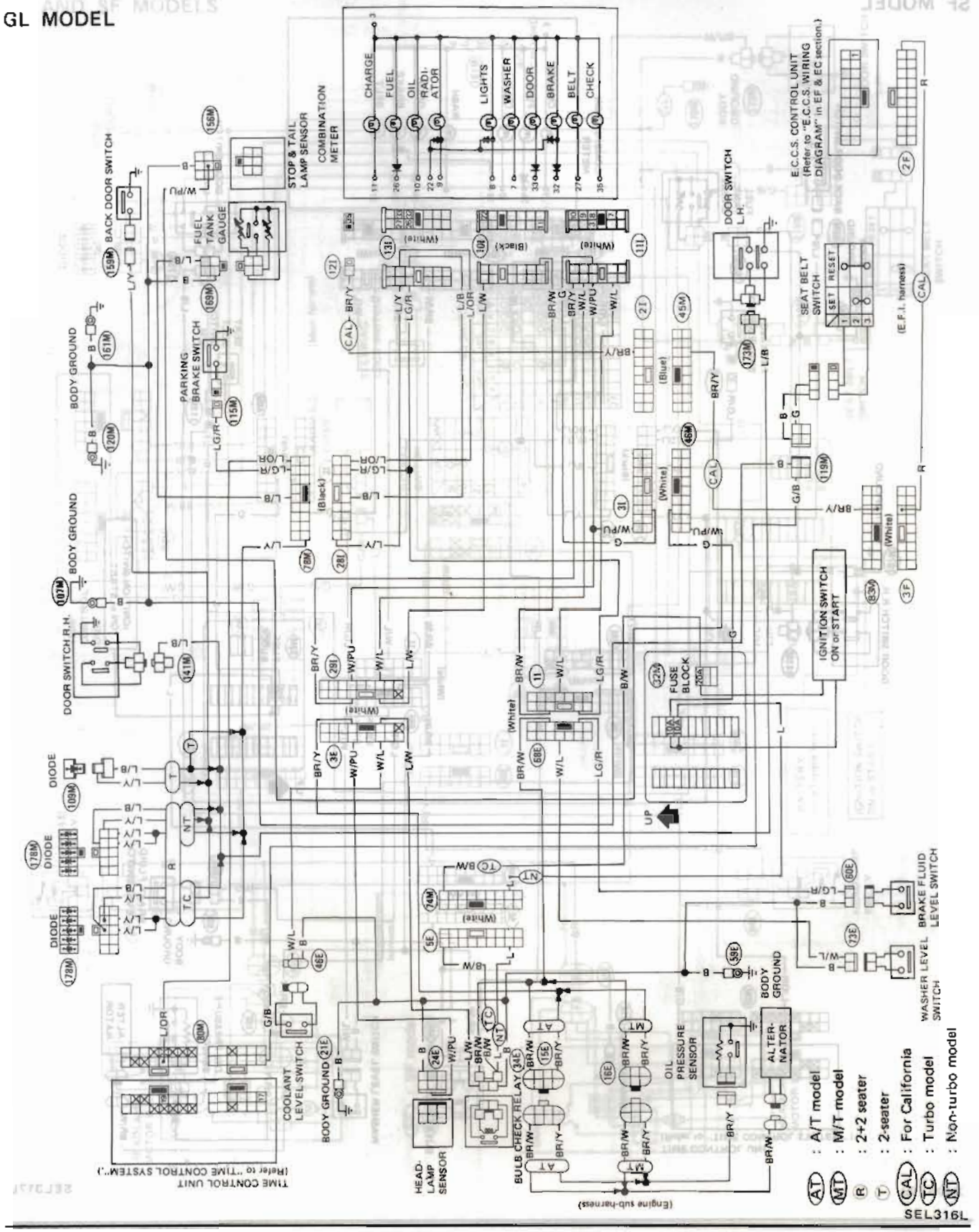
Warning Lamps/Wiring Diagram —For Needle Type Combination Meter—

GLL MODEL



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

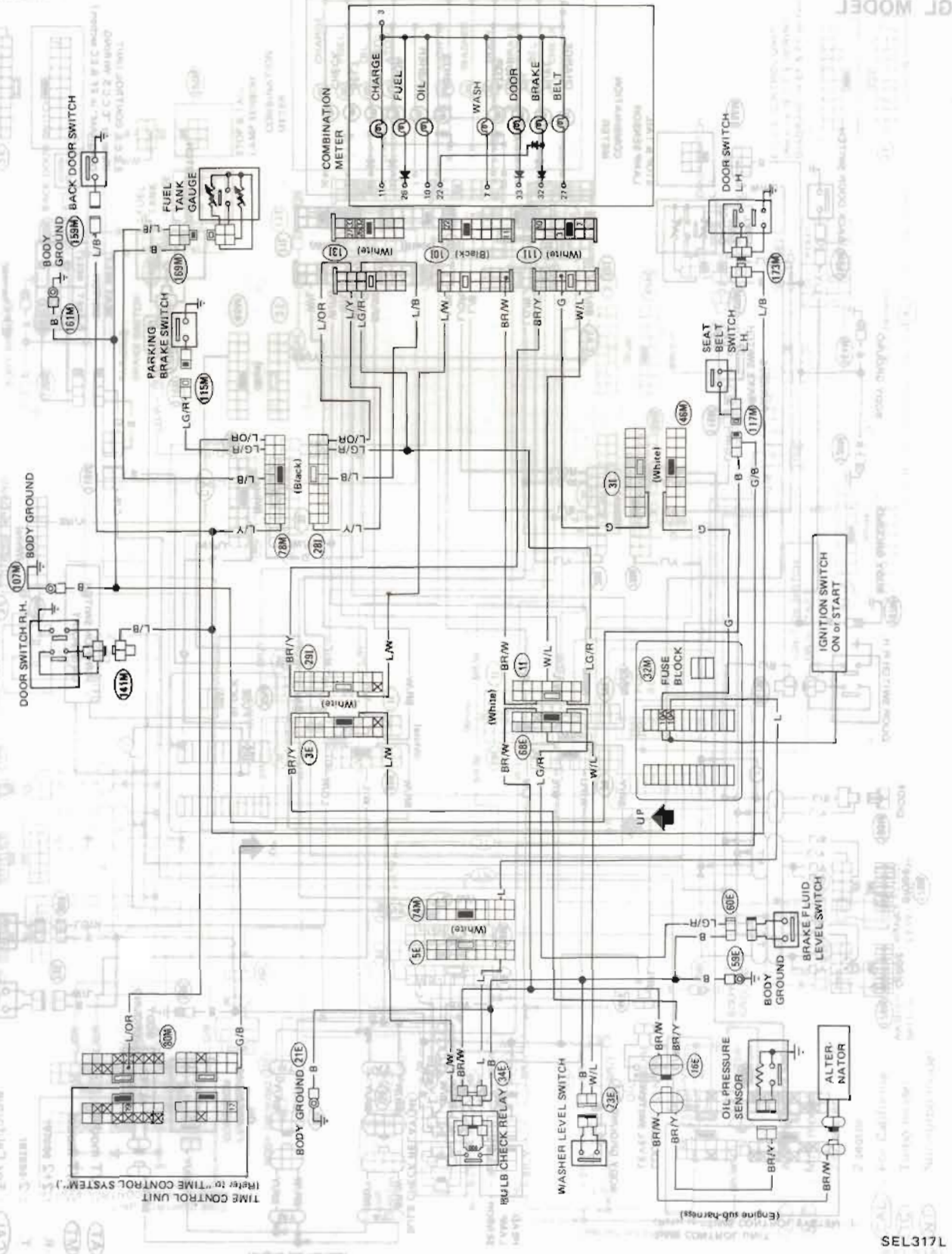
GL MODEL



SEL316L

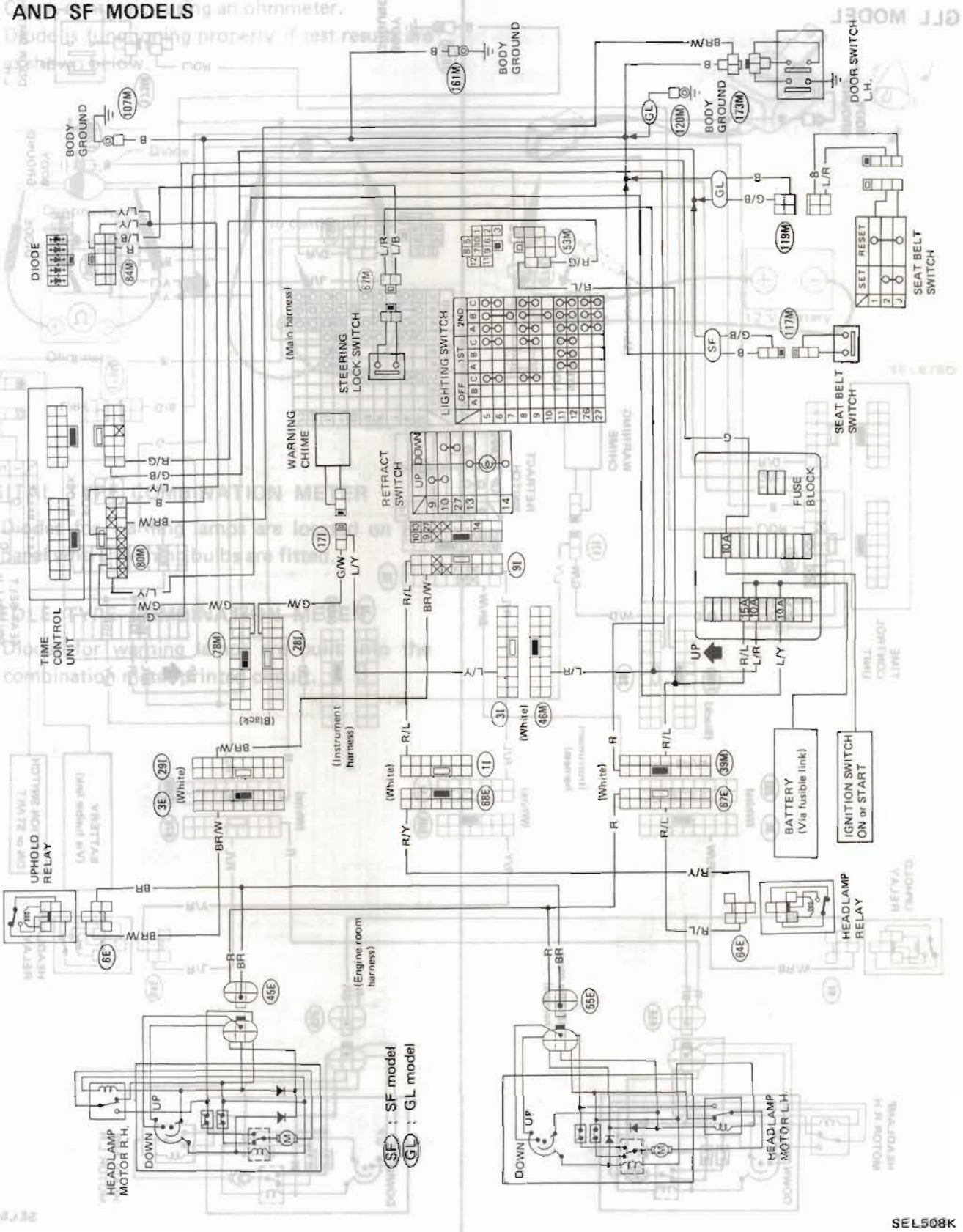
Warning Lamps/Wiring Diagram
— For Needle Type Combination Meter (Cont'd) —

SF MODEL



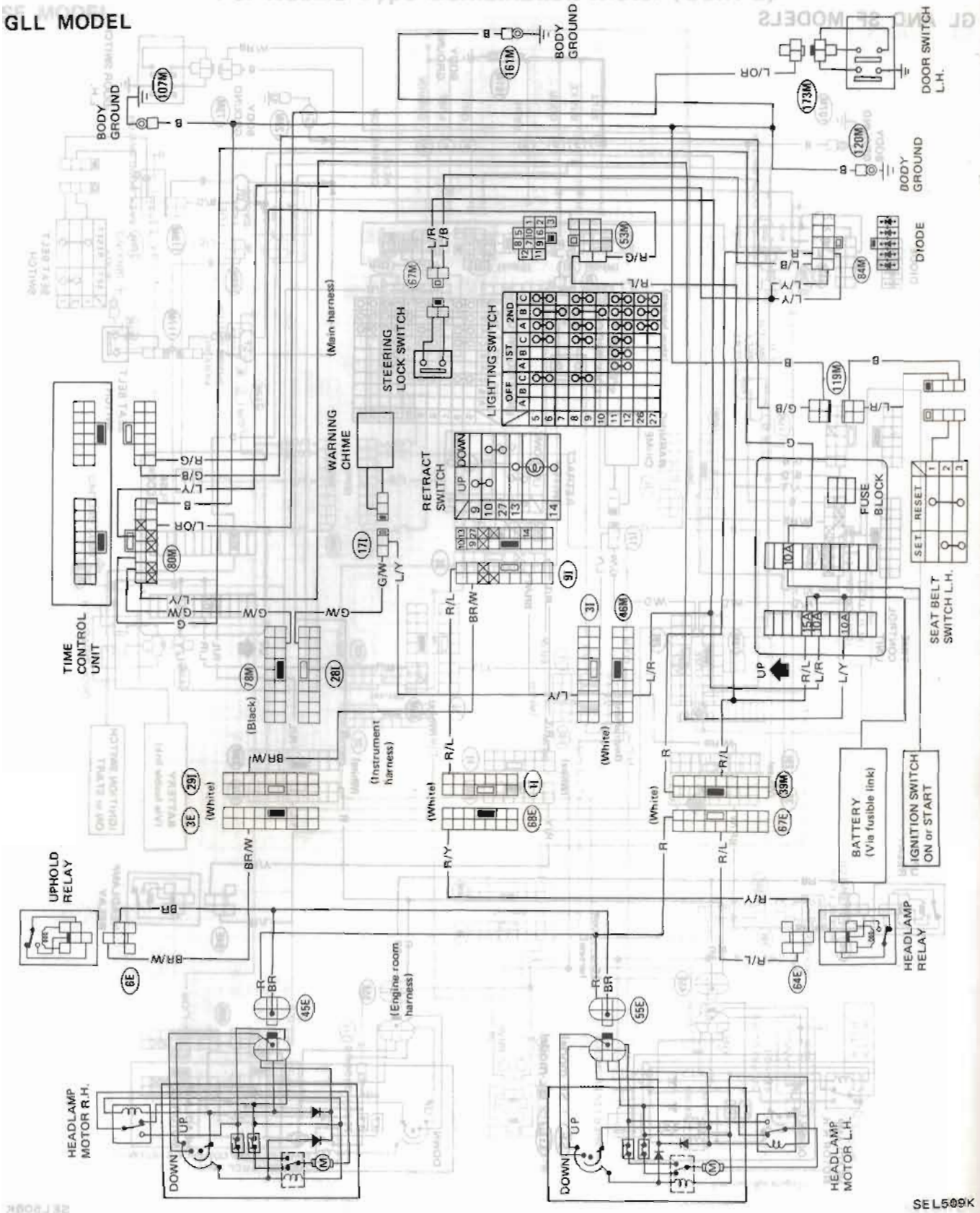
Warning Chime/Wiring Diagram

GL AND SF MODELS



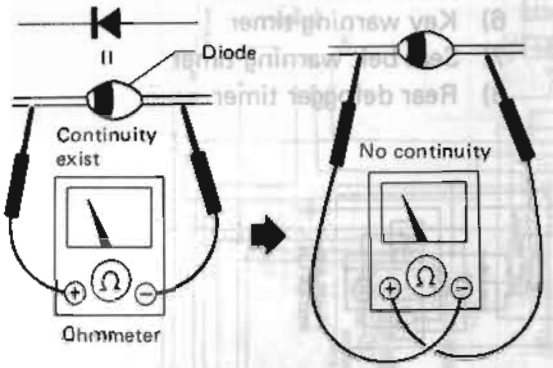
SEL508K

Warning Chime/Wiring Diagram (Cont'd)



Diode Check

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



SEL700D

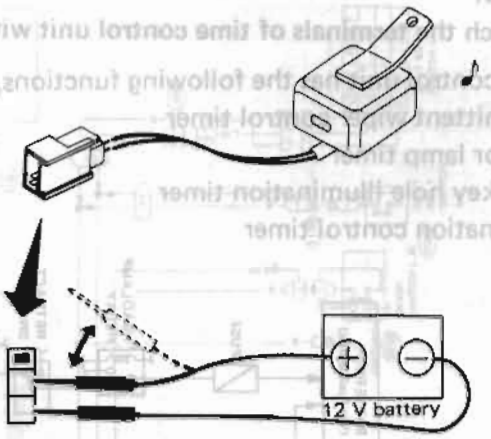
DIGITAL TYPE COMBINATION METER

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

NEEDLE TYPE COMBINATION METER

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

Warning Chime Check



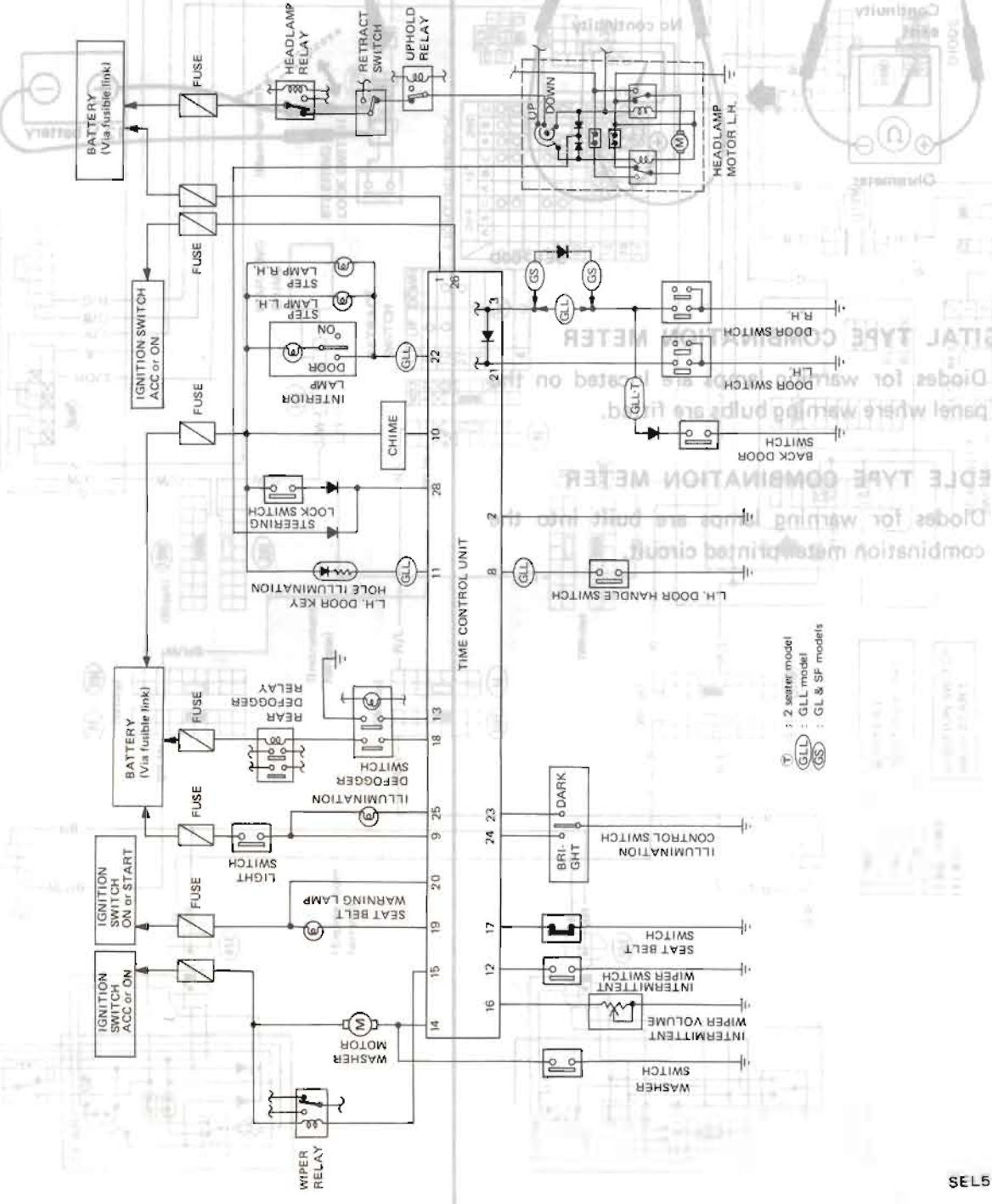
SEL875D

Schematic

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

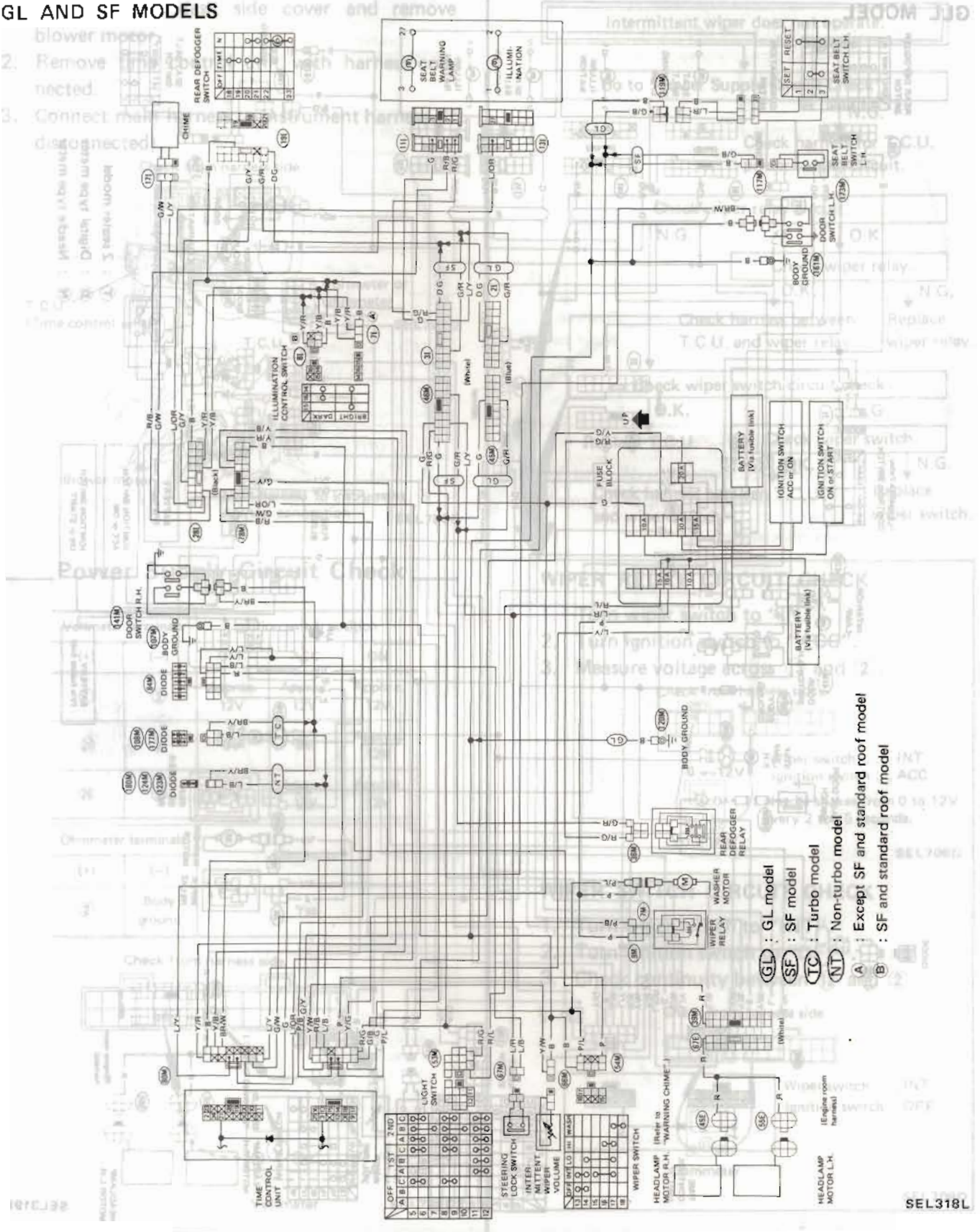
- Time control unit has the following functions.

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



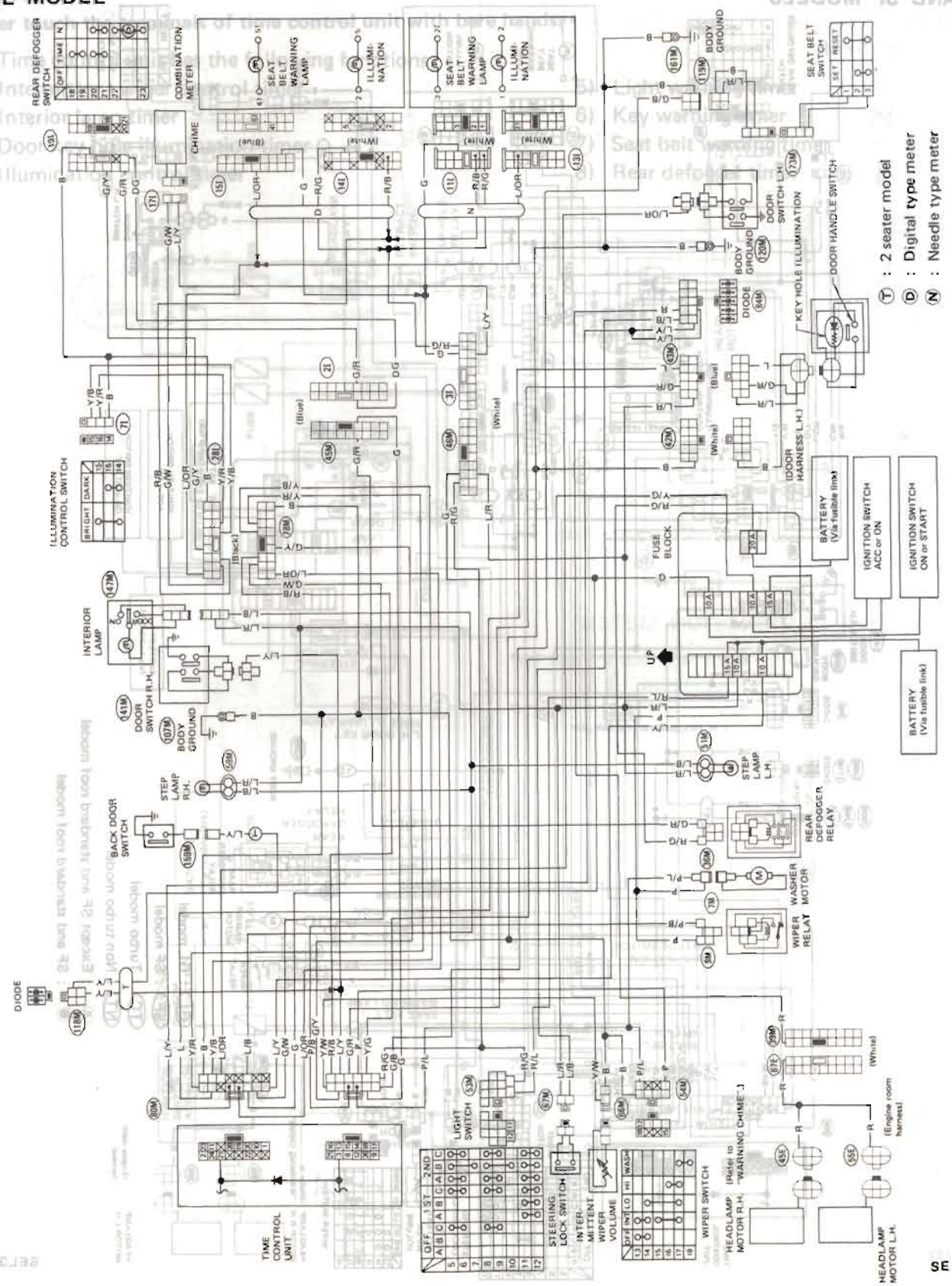
Wiring Diagram

GL AND SF MODELS



Wiring Diagram (Cont'd)

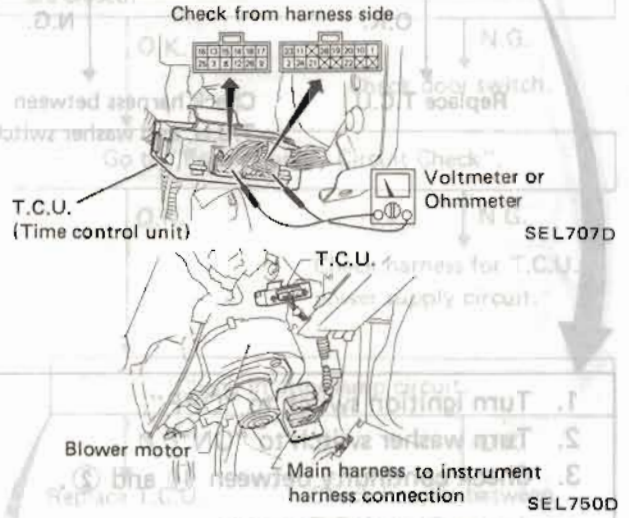
GLL MODEL



TIME CONTROL SYSTEM

Preparation for Trouble-shooting

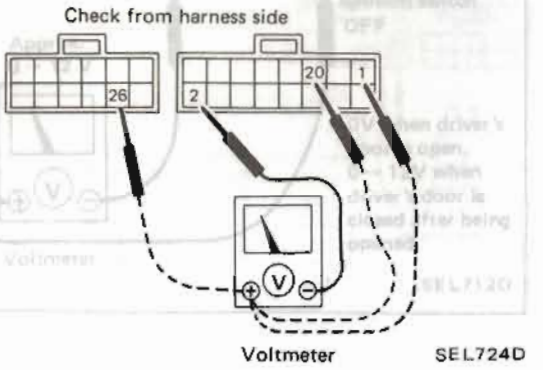
1. Remove R.H. dash side cover and remove blower motor.
2. Remove time control unit with harness connected.
3. Connect main harness to instrument harness (if disconnected).



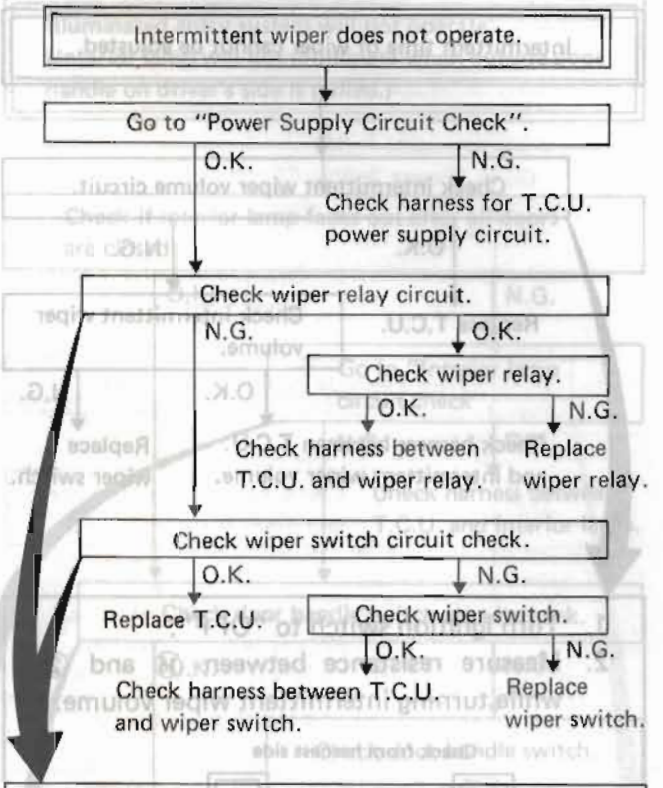
Power Supply Circuit Check

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

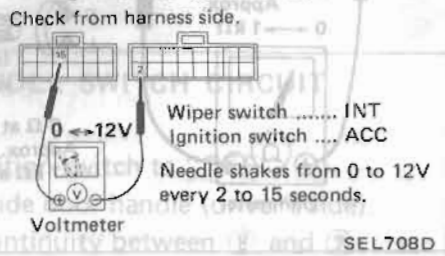


Trouble-shooting



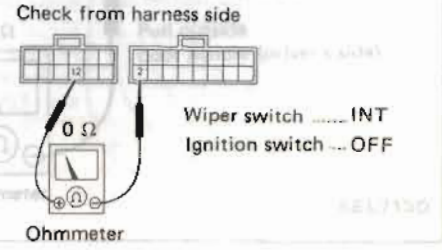
WIPER RELAY CIRCUIT CHECK

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.



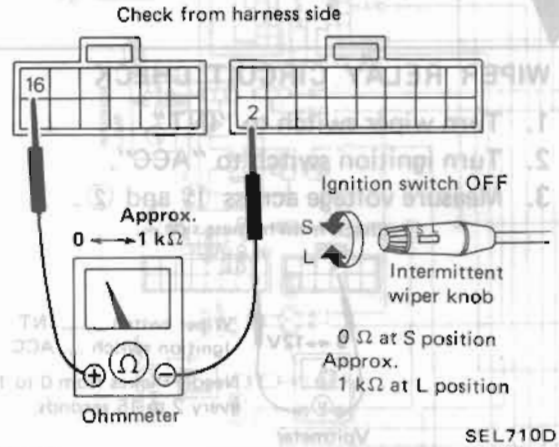
Trouble-shooting (Cont'd)

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.

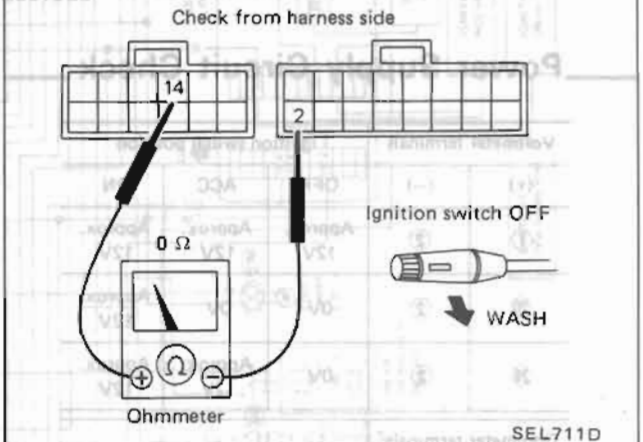


Wiper and washer activate individually but not in combination.

→ 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. / N.G. → Check door switch.

Go to "Power Supply Circuit Check".

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

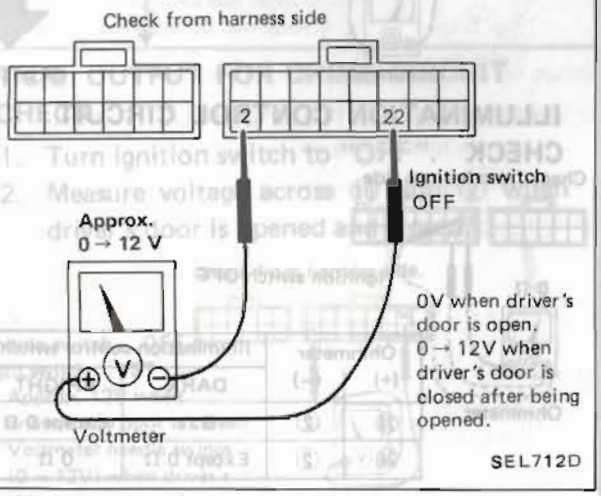
Check interior lamp circuit.

N.G. → Replace T.C.U.

O.K. → Check harness between T.C.U. and interior lamp.

INTERIOR LAMP CIRCUIT CHECK

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



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. / N.G. → 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.

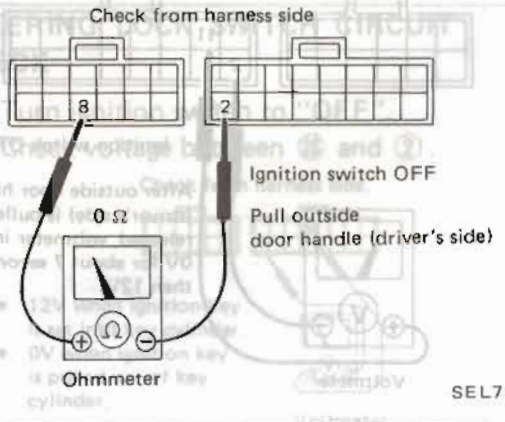
O.K. → Replace T.C.U.

N.G. → Check door handle switch.

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

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 .



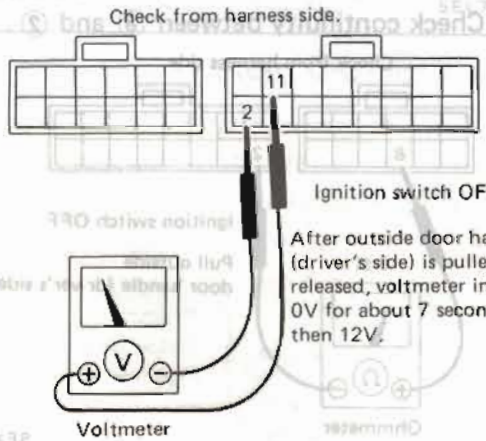
Trouble-shooting (Cont'd)

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.



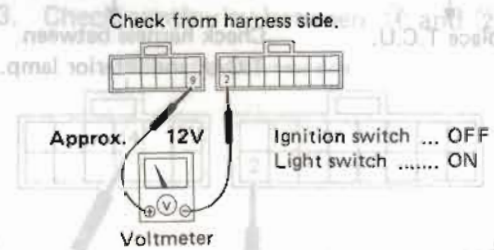
SEL714D

Illumination control system does not actuate.

→ Check light switch circuit.

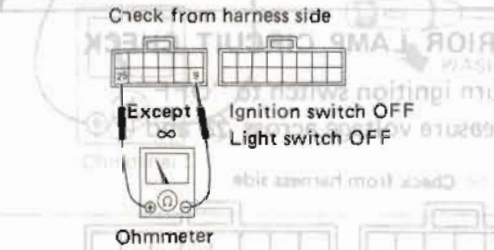
- O.K. → Check illumination circuit.
  - O.K. → Check illumination control circuit.
    - O.K. → Replace T.C.U.
    - N.G. → Check illumination control switch.
  - N.G. → Check for loose harness connector.
- N.G. → Check harness between T.C.U. and light switch.

LIGHT SWITCH CIRCUIT CHECK



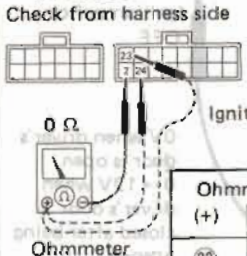
SEL715D

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. → T.C.U. OUTPUT FOR CHIME CIRCUIT CHECK
  - N.G. → Check harness for T.C.U. power supply circuit.

Key warning chime does not activate.

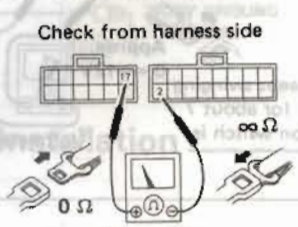
Check if other warning chimes function.
- O.K. → Check steering lock switch circuit.
  - O.K. → Replace T.C.U.
  - N.G. → Check steering lock switch.
- N.G. → Go to "Power Supply Circuit Check".

Seat belt warning chime does not activate.

Check if other warning chimes function.
- 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.
- N.G. → Go to "Power Supply Circuit Check".

SEAT BELT SWITCH CIRCUIT CHECK

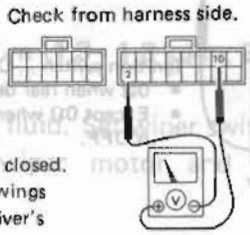
1. Turn ignition switch to "OFF".
2. Unfasten driver's seat belt.
3. Check for continuity between ⑰ and ②.
4. Fasten driver's seat belt.
5. Check to determine if continuity does not exist between ⑰ and ②.



SEL721D

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.

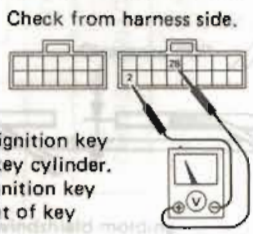


Ignition switch ... OFF
Light switch ... 1ST
- Approx. 12V when driver's side door is closed.
- Voltmeter needle swings (0 ↔ 12V) when driver's side door is opened.

SEL718D

STEERING LOCK SWITCH CIRCUIT CHECK

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



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

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.

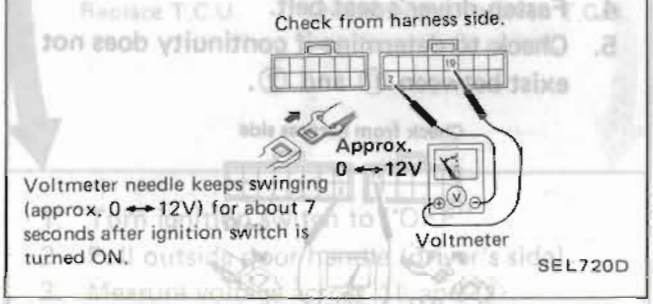
Check belt warning circuit.

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".



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 defogger switch circuit.

O.K. → Check rear defogger relay, and harness between T.C.U. and rear defogger relay.

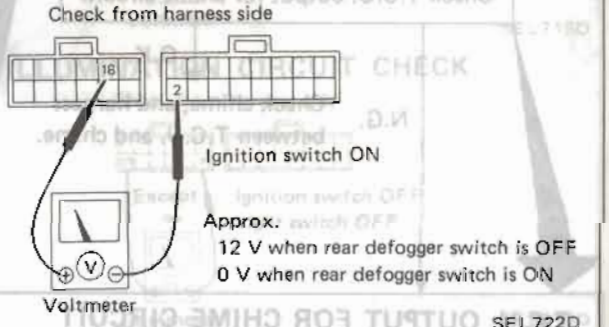
Check defogger switch circuit.

O.K. → Replace T.C.U.

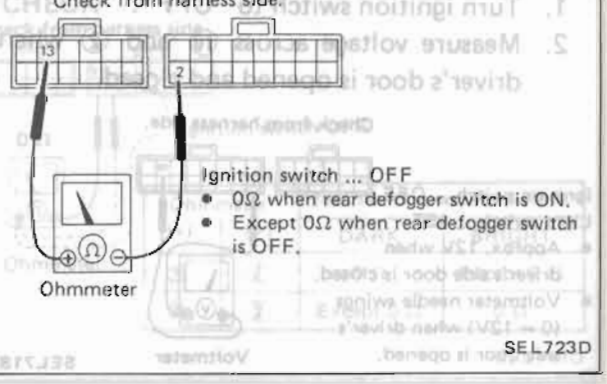
N.G. → Check defogger switch, and harness between T.C.U. and defogger switch.

REAR DEFOGGER CIRCUIT CHECK

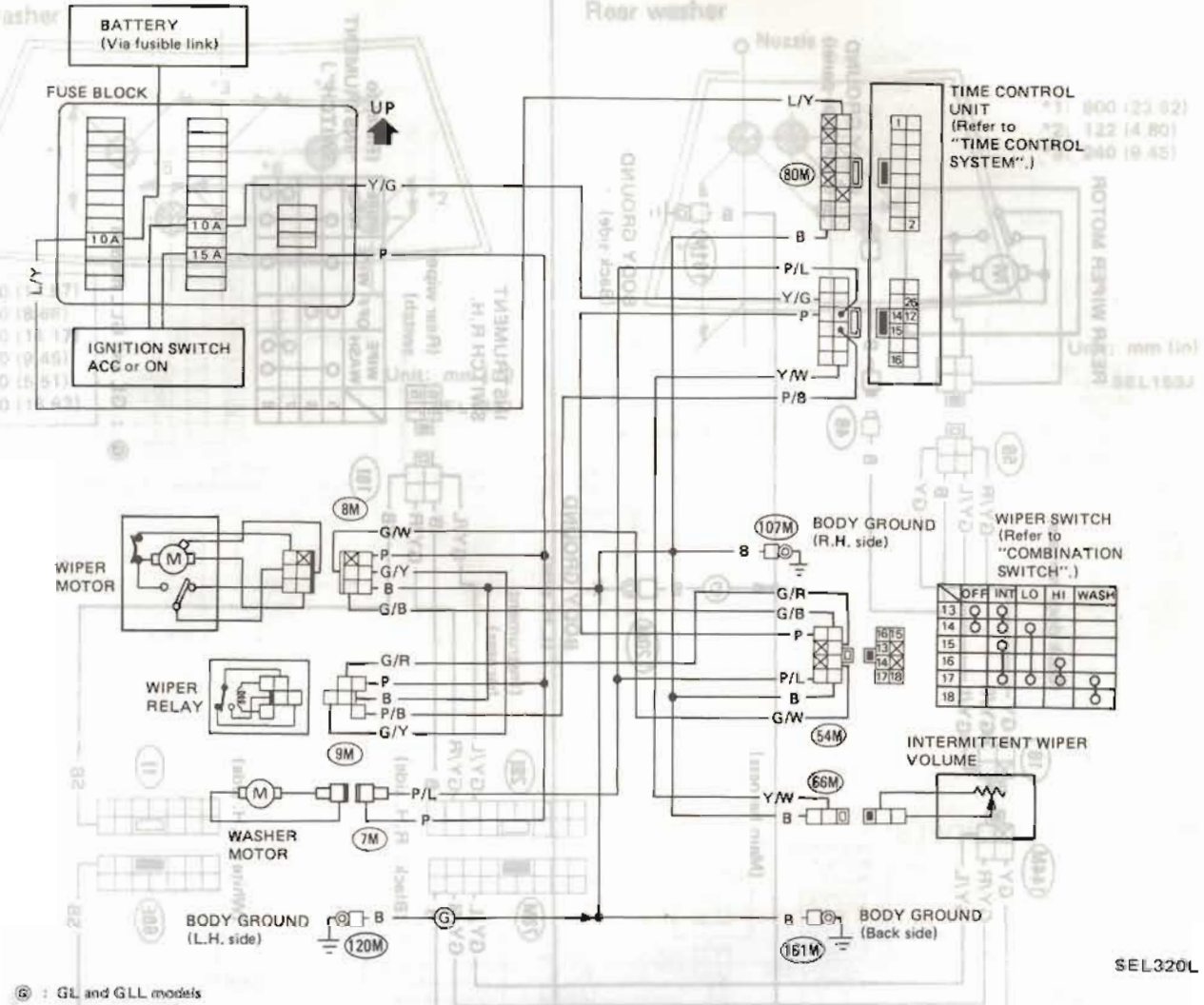
1. Turn ignition switch to "ON".
2. Measure voltage across ⑱ and ② while operating rear defogger switch.



DEFOGGER SWITCH CIRCUIT CHECK



Windshield Wiper and Washer/Wiring Diagram



G : GL and GLL models

Windshield Wiper and Washer/Installation

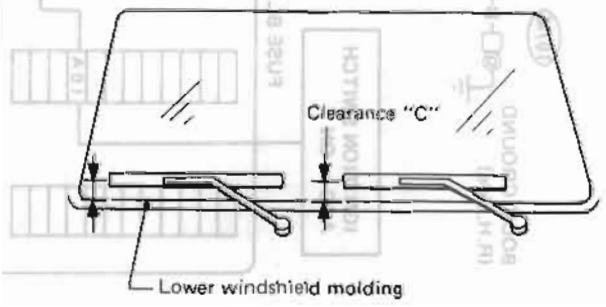
WIPER ARM

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)

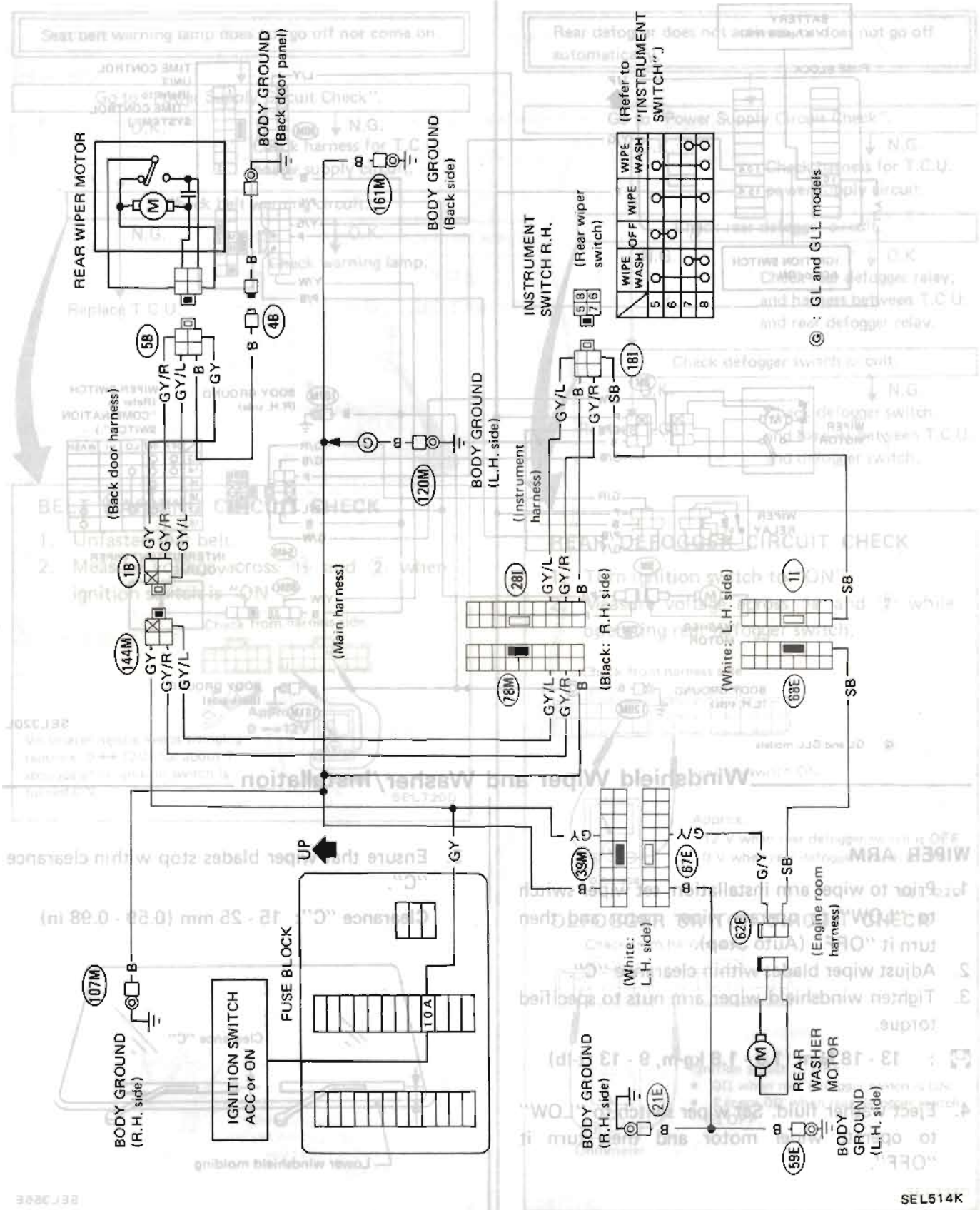
4. Eject washer fluid. Set wiper switch to "LOW" to operate wiper motor and then turn it "OFF".
5. Ensure that wiper blades stop within clearance "C".

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



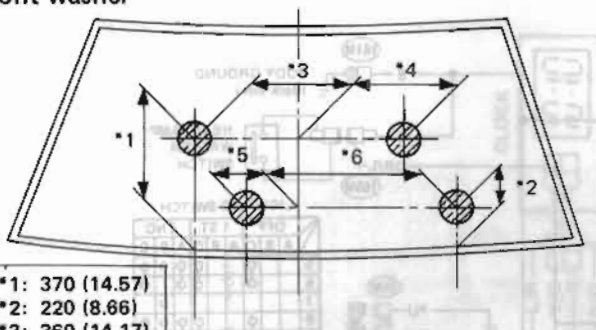
SEL355E

Rear Wiper and Washer/Wiring Diagram



Washer Nozzle Adjustment

Front washer

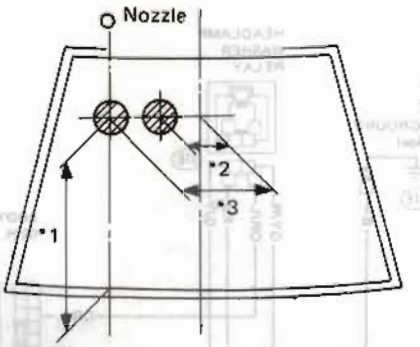


*1: 370 (14.57)
*2: 220 (8.66)
*3: 360 (14.17)
*4: 240 (9.45)
*5: 140 (5.51)
*6: 430 (16.93)

Unit: mm (in)

SEL152J

Rear washer



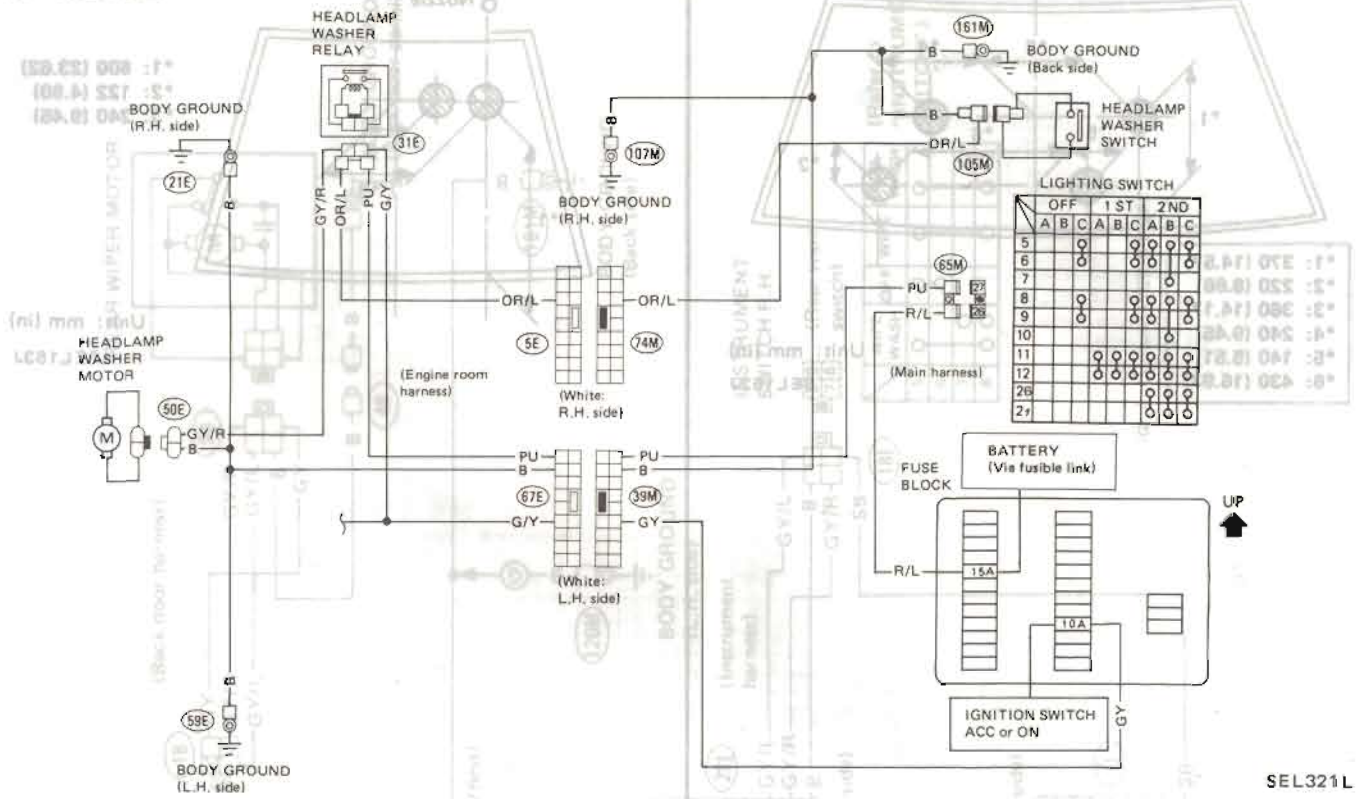
*1: 600 (23.62)
*2: 122 (4.80)
*3: 240 (9.45)

Unit: mm (in)

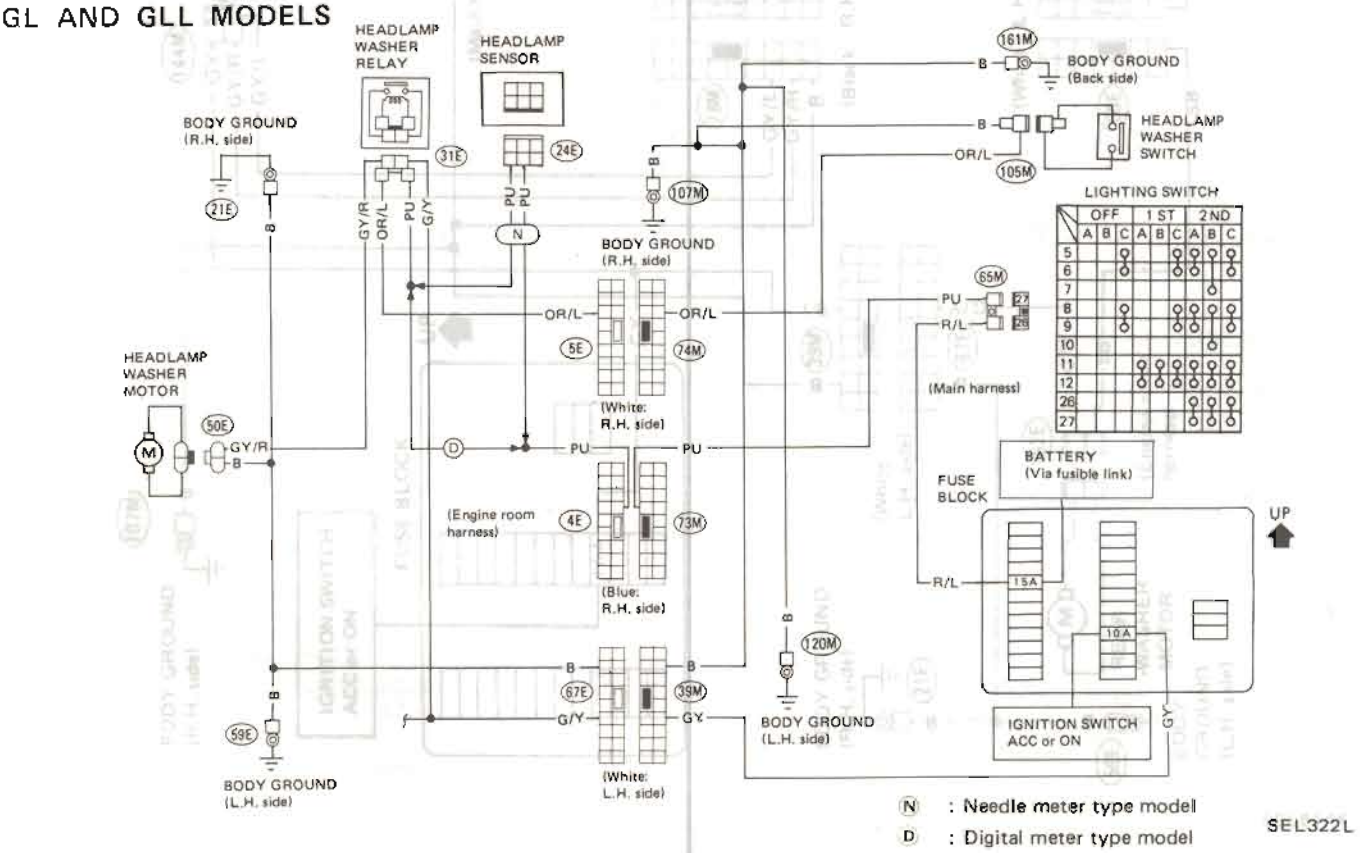
SEL153J

Headlamp Washer/Wiring Diagram

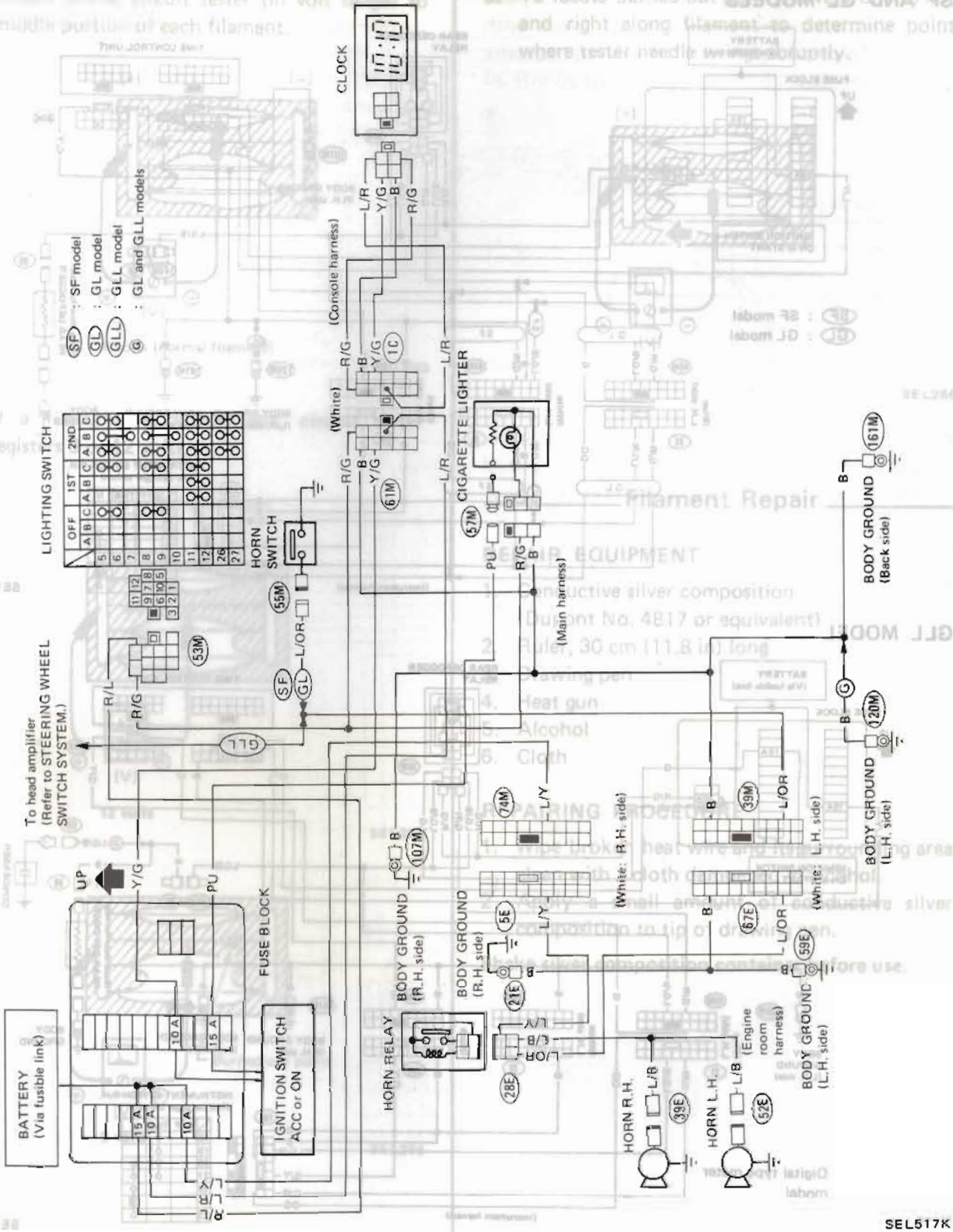
SF MODEL



GL AND GLL MODELS

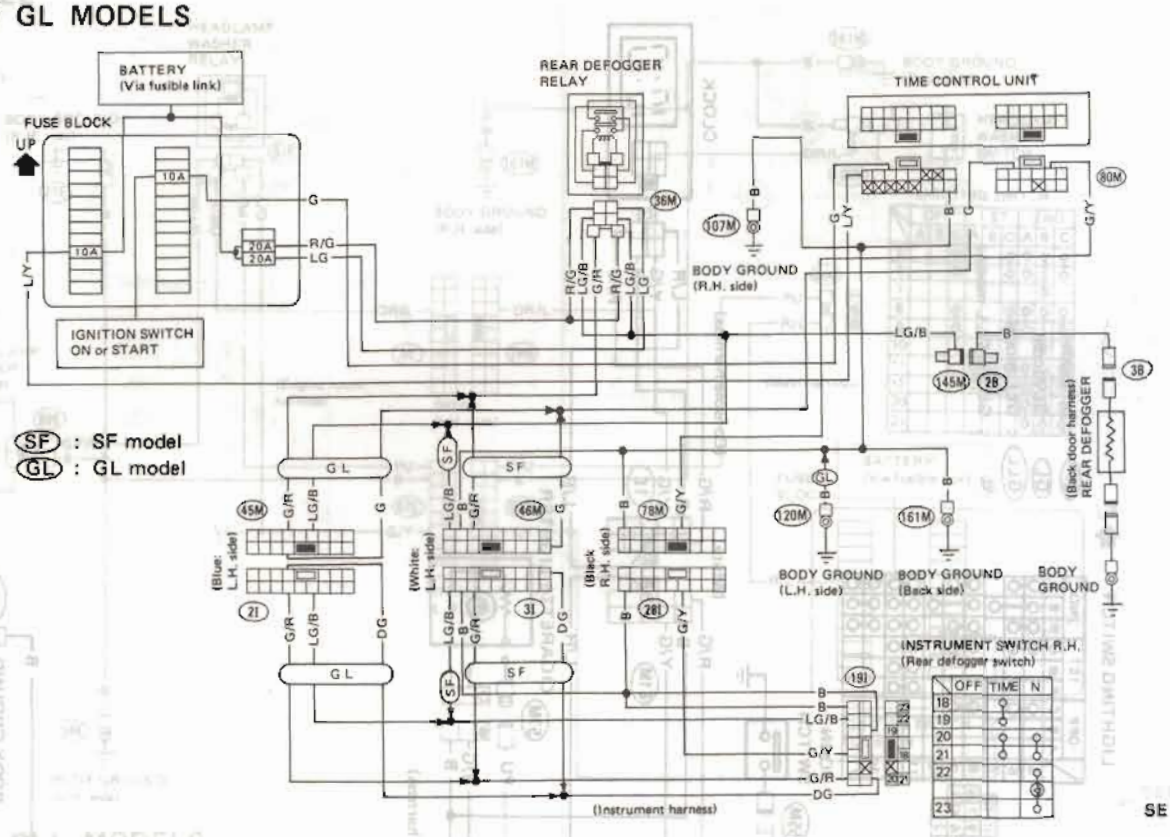


Wiring Diagram



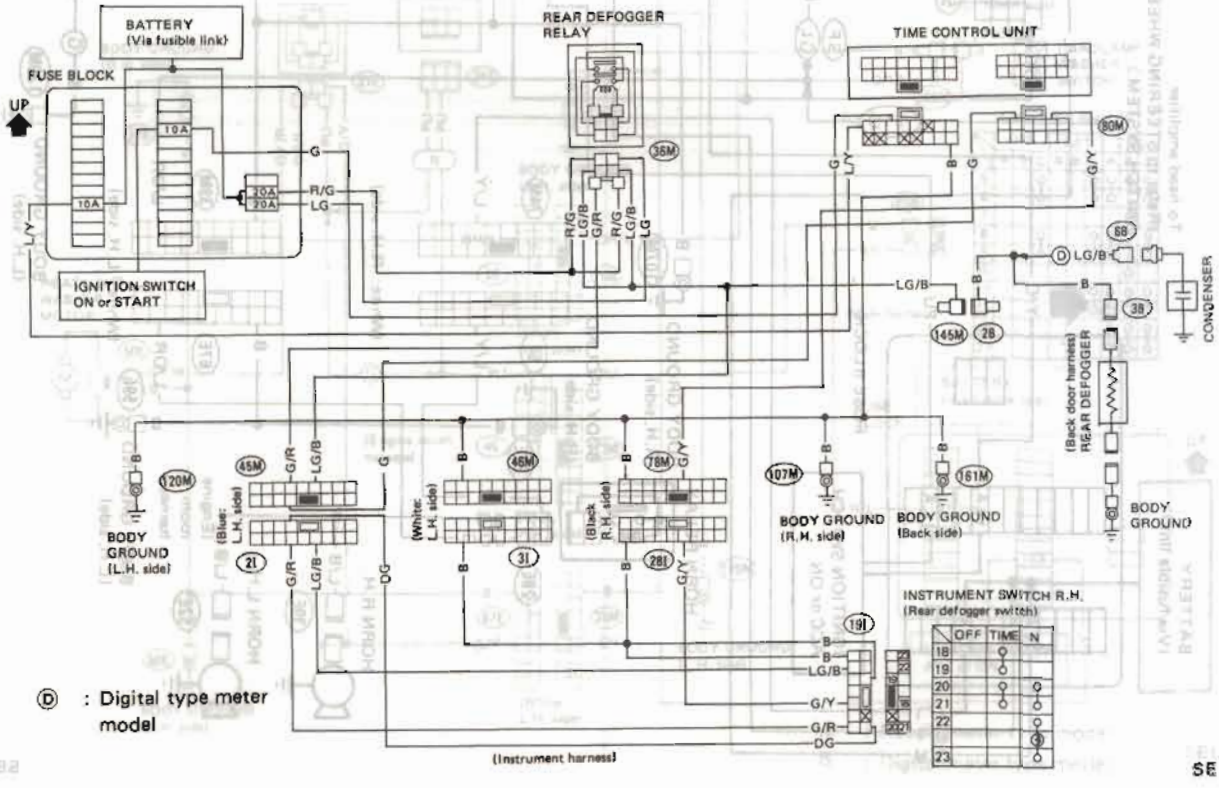
Wiring Diagram

SF AND GL MODELS



SEL518K

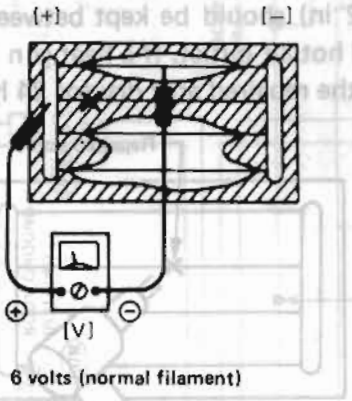
GLL MODEL



SEL323L

Filament Check

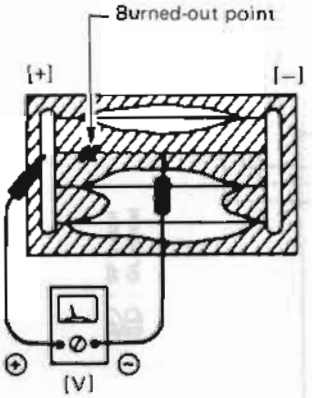
1. Attach probe circuit tester (in volt range) to middle portion of each filament.



6 volts (normal filament)

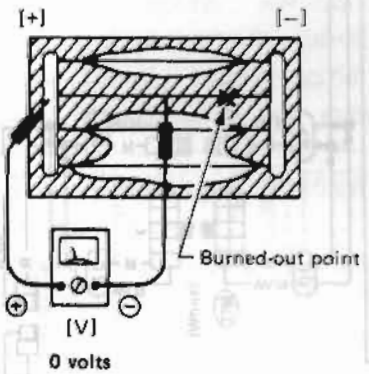
SEL263

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



12 volts

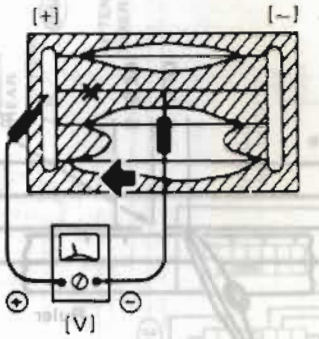
SEL264



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

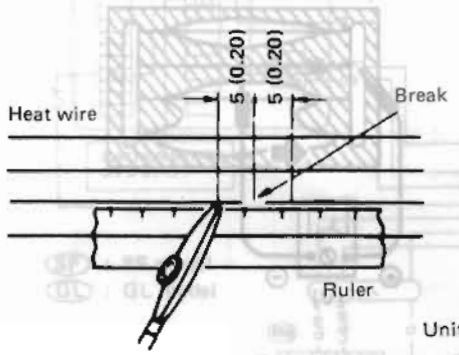
REPAIRING PROCEDURE

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.

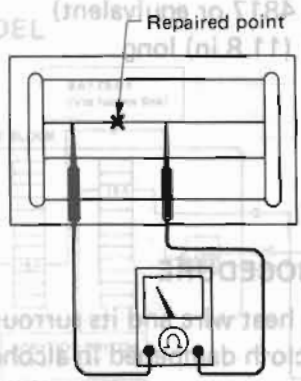


Unit: mm (in)

BE540

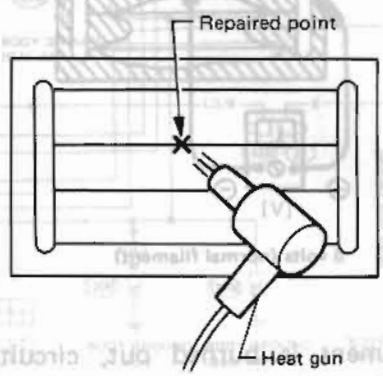
4. After repair has been completed, check repaired wire for continuity. This check should be conducted 10 minutes after silver composition is deposited.

Do not touch repaired area while test is being conducted.



SEL012D

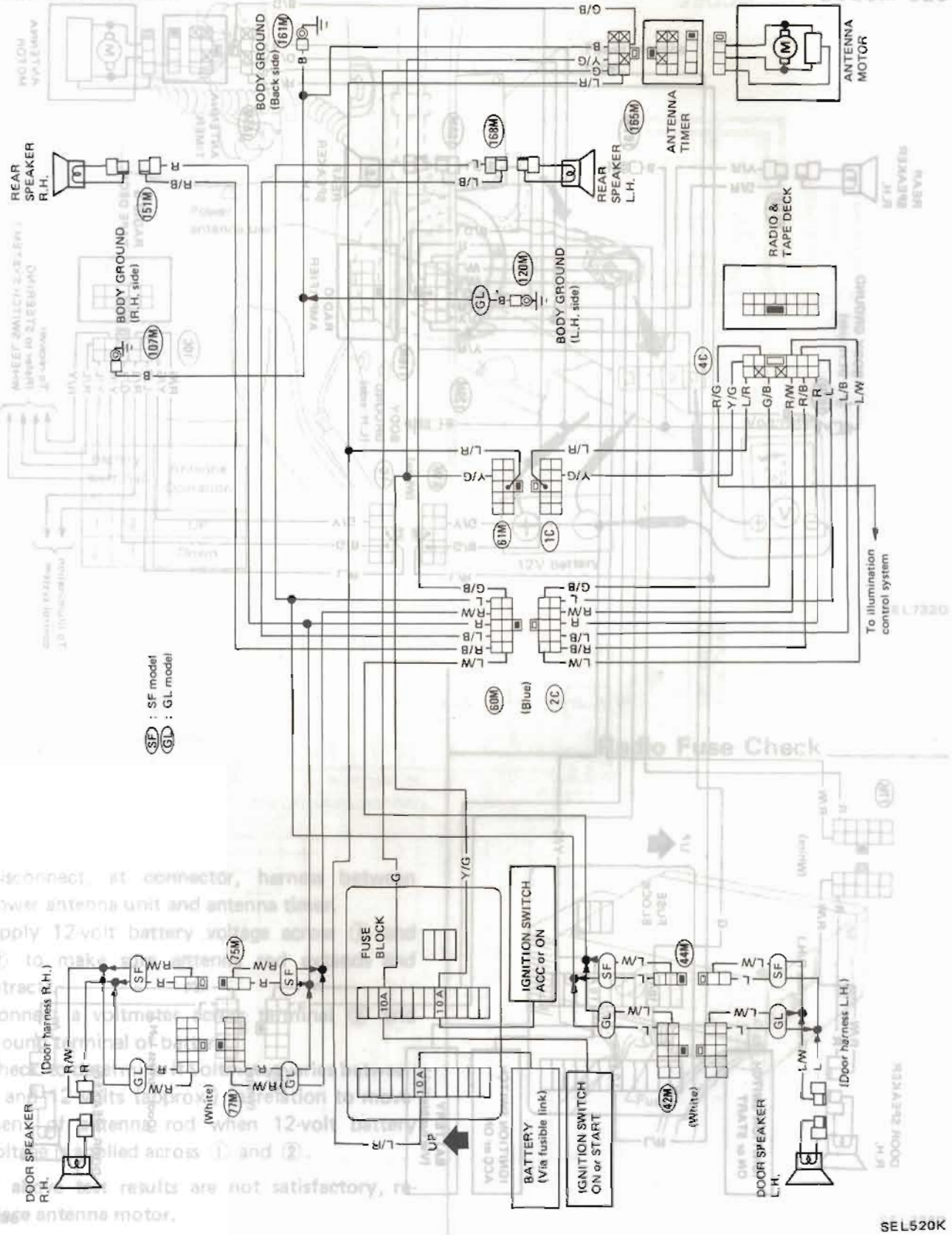
5. Apply a constant stream of hot air directly to the repaired area for approximately 20 minutes with a heat gun. A minimum distance of 3 cm (1.2 in) should be kept between repaired area and hot air outlet. If a heat gun is not available, let the repaired area dry for 24 hours.



SEL013D

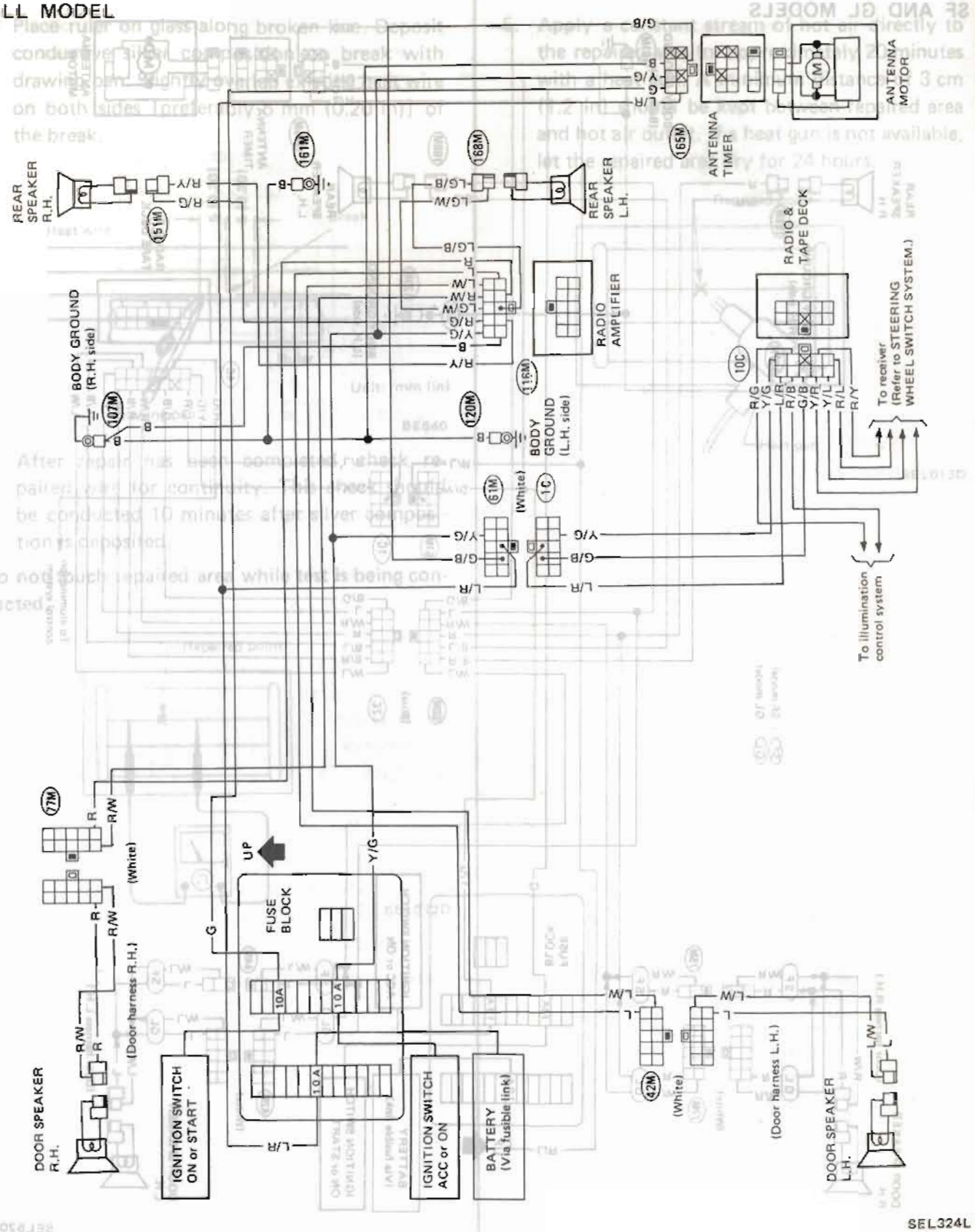
Wiring Diagram

SF AND GL MODELS

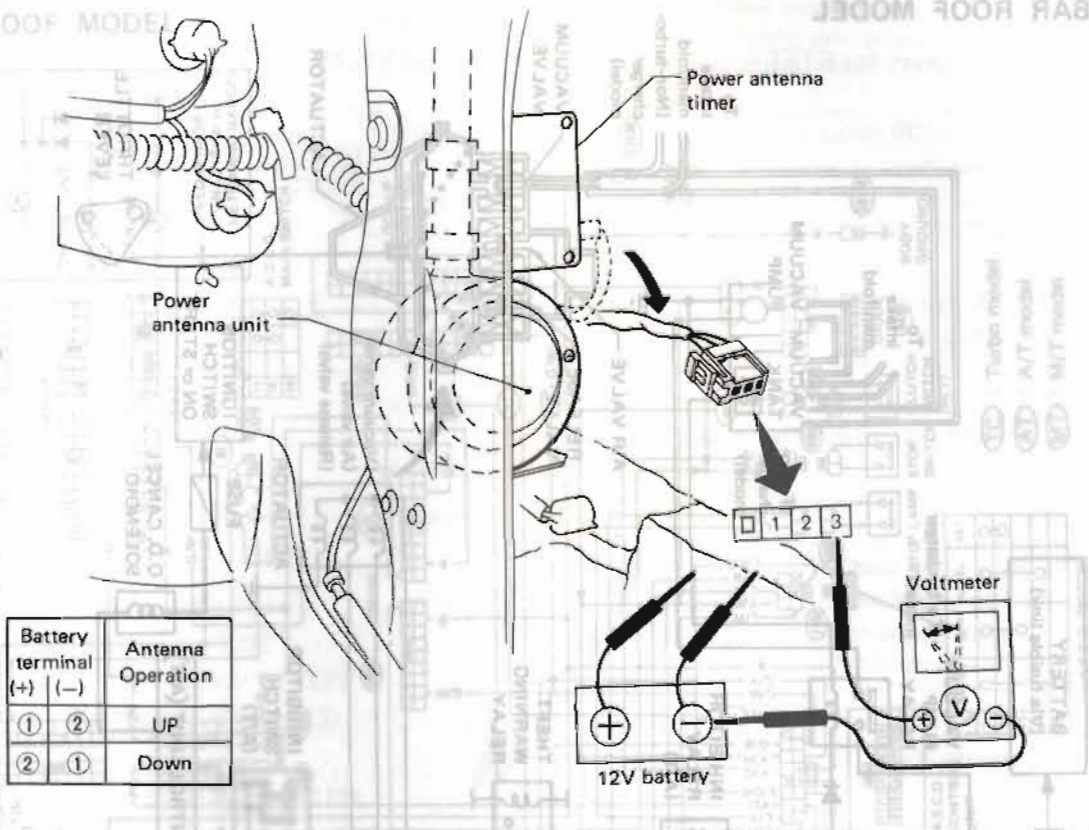


Wiring Diagram (Cont'd)

GLL MODEL



Power Antenna Motor Check



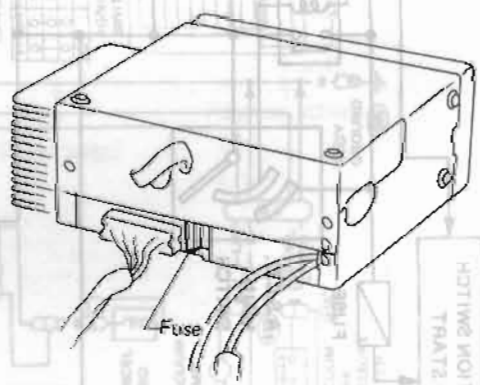
Battery terminal (+)	Battery terminal (−)	Antenna Operation
①	②	UP
②	①	Down

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.

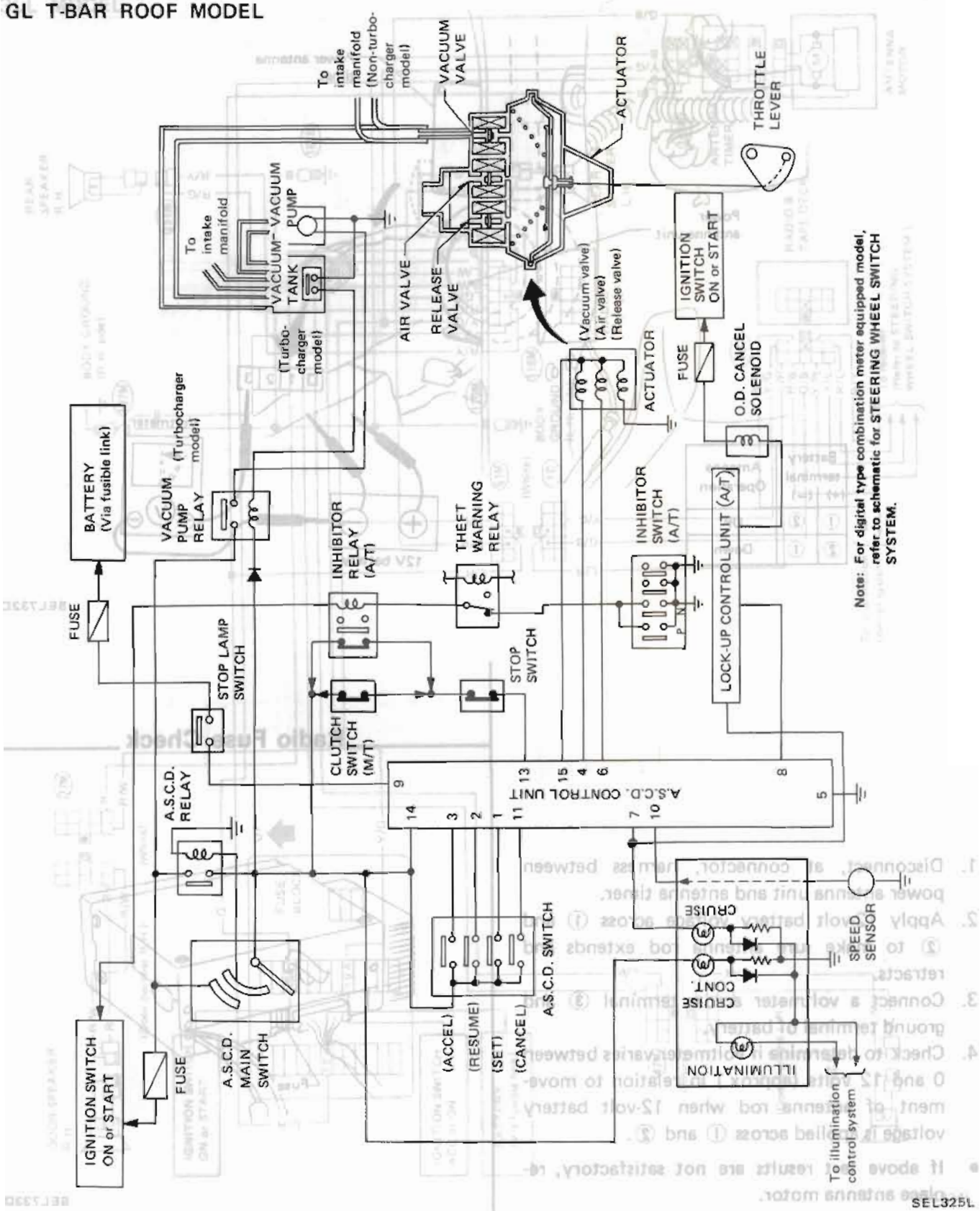
Radio Fuse Check



SEL733D

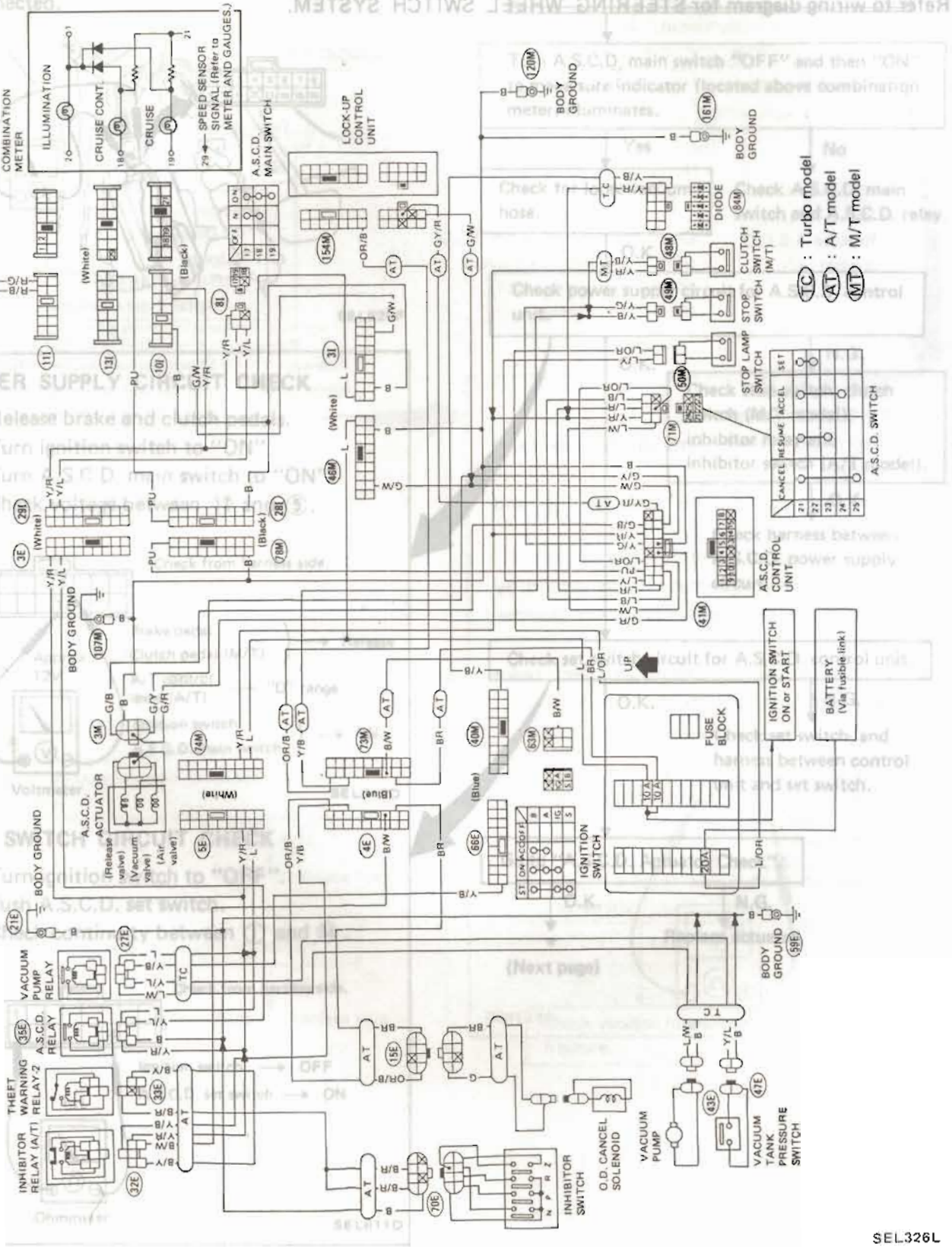
Schematic

GL T-BAR ROOF MODEL



Wiring Diagram

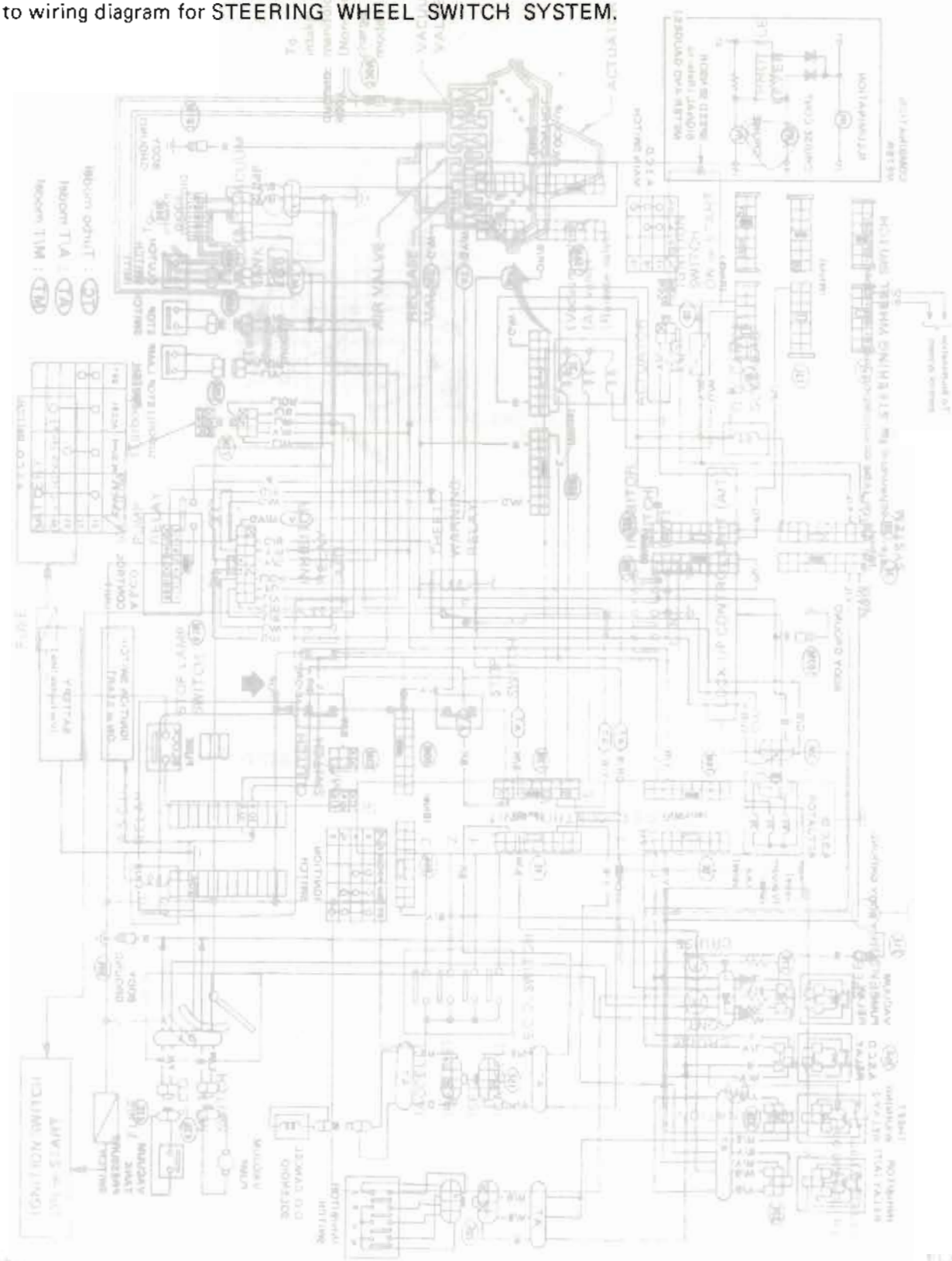
GL T-BAR ROOF MODEL



Wiring Diagram (Cont'd)

GLL MODEL

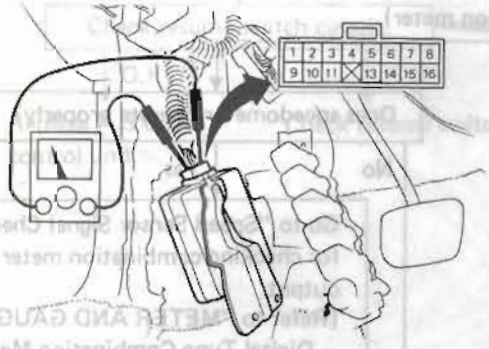
Refer to wiring diagram for STEERING WHEEL SWITCH SYSTEM.



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

Preparation for Trouble-shooting

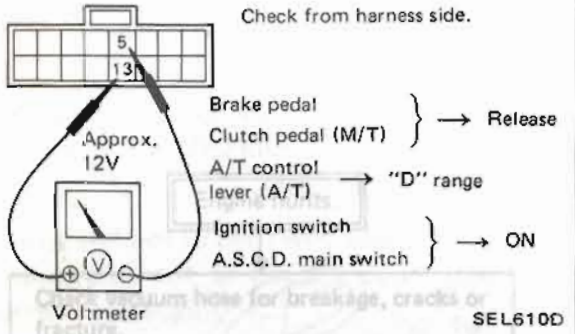
- Remove A.S.C.D. control unit with harness connected.



SEL520F

POWER SUPPLY CIRCUIT CHECK

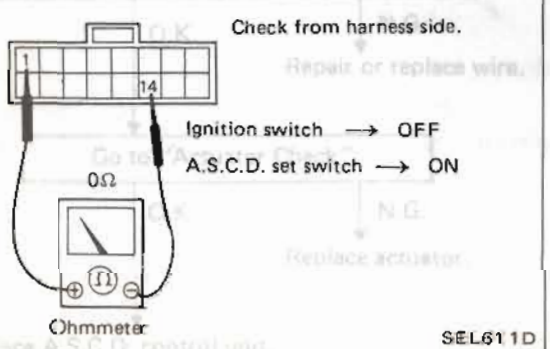
1. Release brake and clutch pedals.
2. Turn ignition switch to "ON".
3. Turn A.S.C.D. main switch to "ON".
4. Check voltage between ⑬ and ⑤.



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.

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

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.

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.

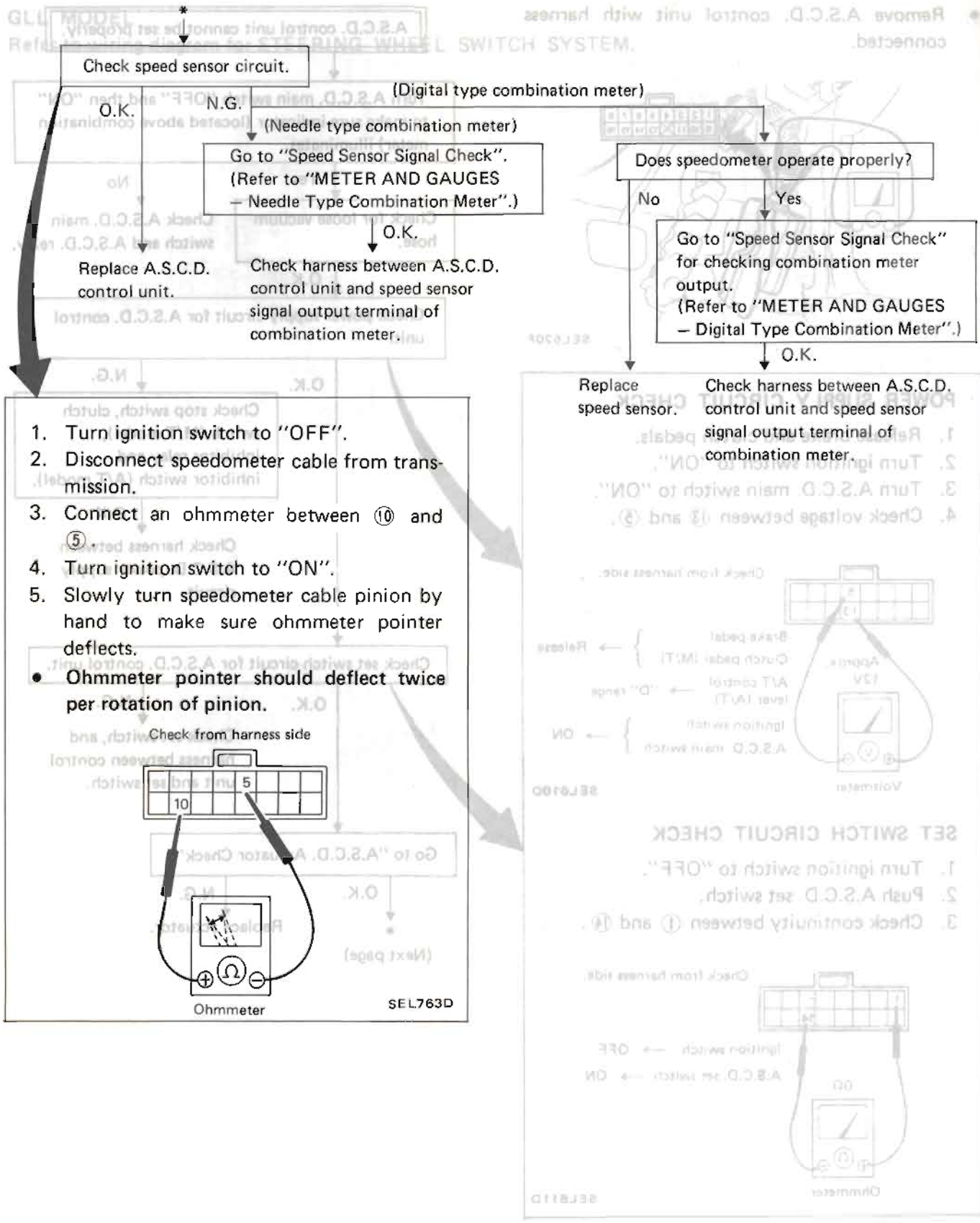
O.K. → Go to "A.S.C.D. Actuator Check".

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

O.K. → * (Next page)

N.G. → Replace actuator.

Trouble-shooting (Cont'd)



Trouble-shooting (Cont'd)

Resume switch will not operate.

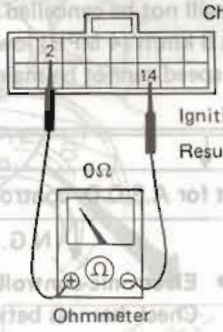
Check resume switch circuit.

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.

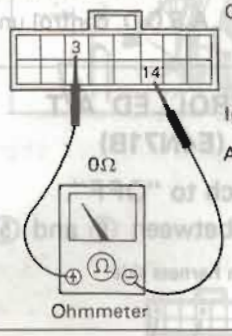
Check accelerate switch circuit.

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. → Replace wire or actuator.

N.G. → Repair or replace hose.

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.)

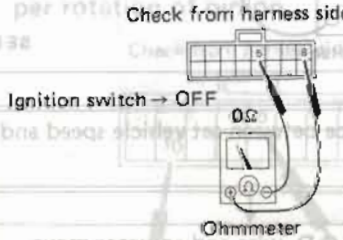
Check O.D. cancel circuit for A.S.C.D. control unit.

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)

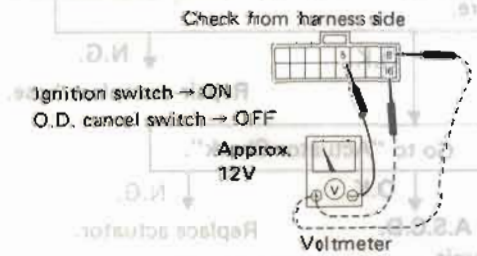
- Turn ignition switch to "OFF".
- Check continuity between ⑧ and ⑤.



SEL737D

CONVENTIONAL A/T EQUIPPED MODEL (4N71B)

- Turn ignition switch to "ON".
- Turn O.D. cancel switch to "OFF".
- Check voltage ⑧ - ⑤ and ⑩ - ⑤.

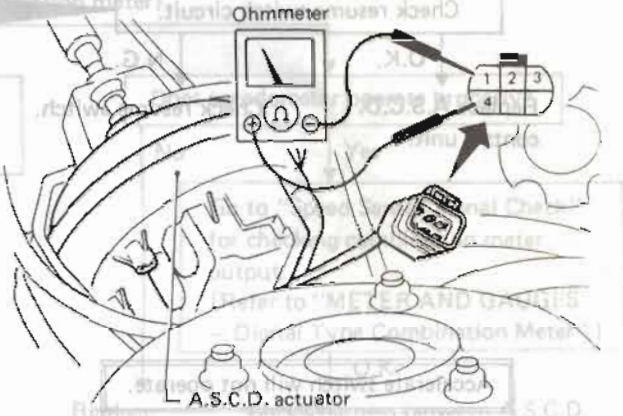


SEL741D

A.S.C.D. Actuator Check

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

Continuity exist ... O.K.

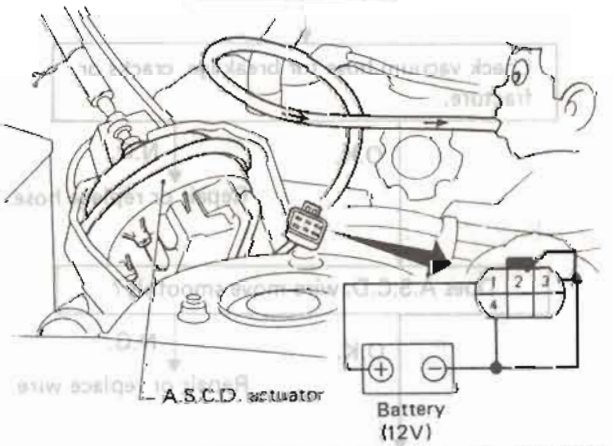


SEL342L

CAUTION:
Do not attempt to remove valves from actuator.

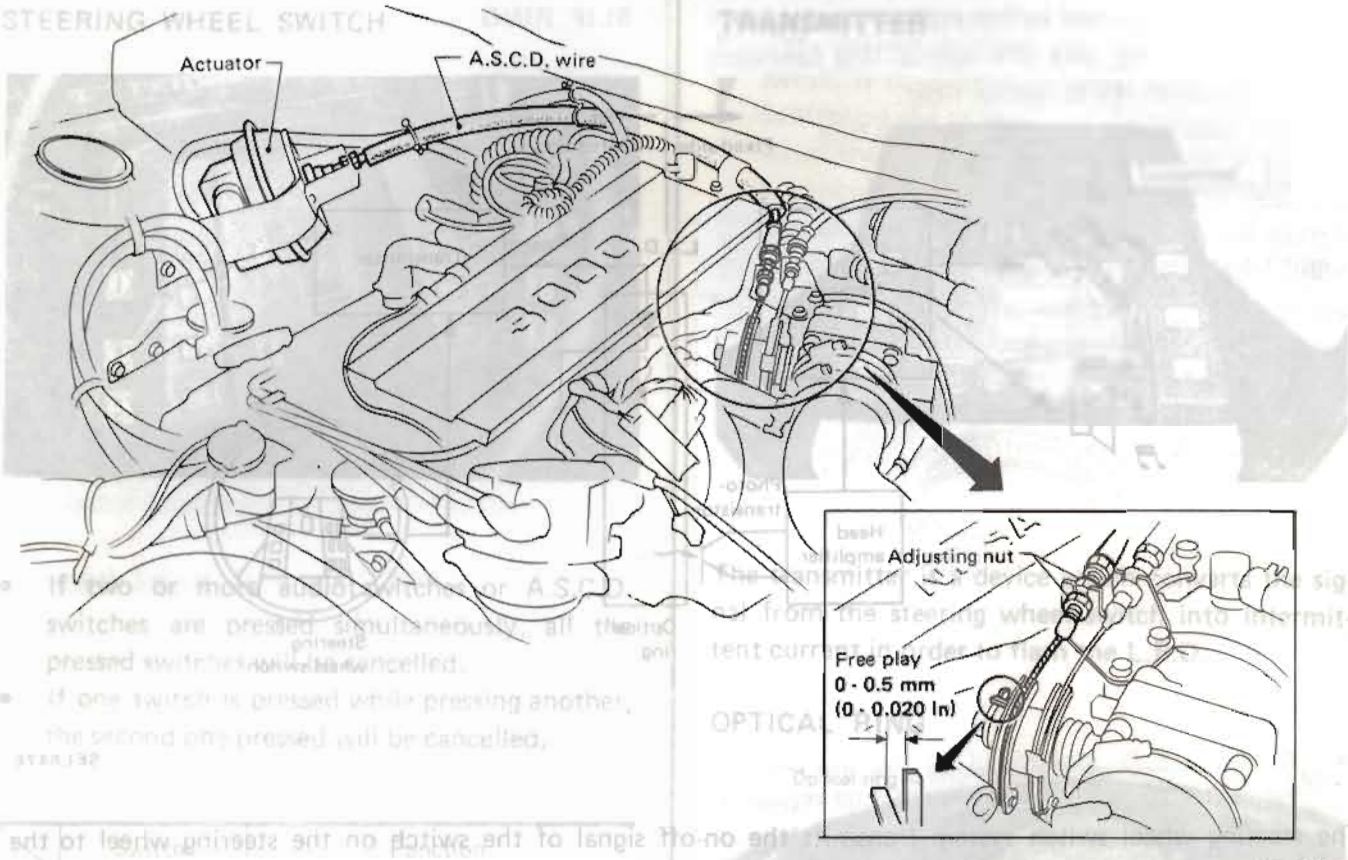
2. Connect battery (approx. 12V) to harness connector of actuator as shown below, and apply vacuum to actuator.
   If diaphragm moves smoothly, actuator is O.K.

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



SEL343L

A.S.C.D. Wire Adjustment



SEL740D

CAUTION:

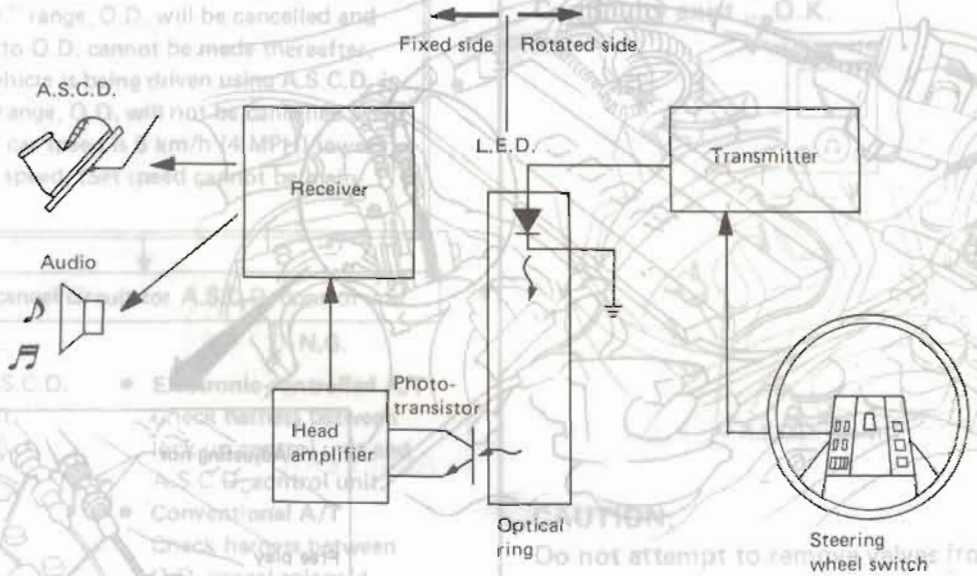
- Be careful not to twist wire when removing it.
- Be careful not to pinch vacuum hose when installing actuator.
- Do not tighten wire excessively during adjustment.

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.

Description



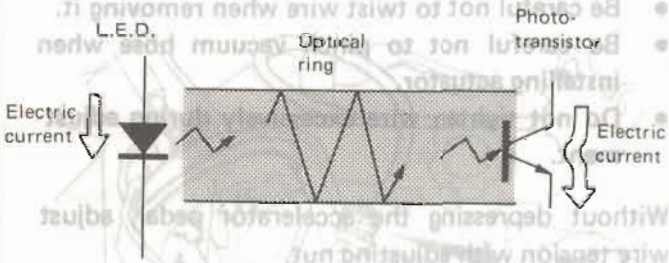
SEL647E

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):

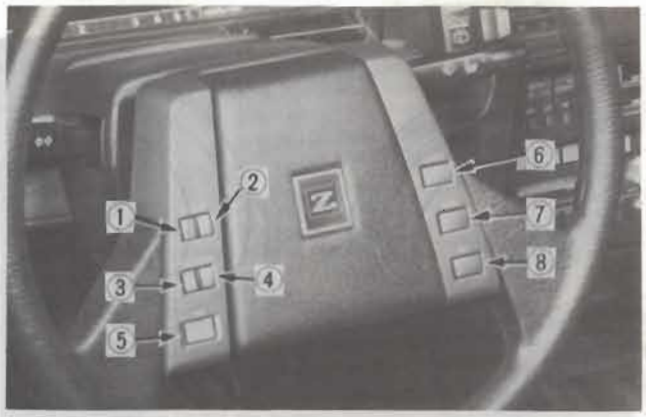
A diode which emits light when voltage is applied.

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.

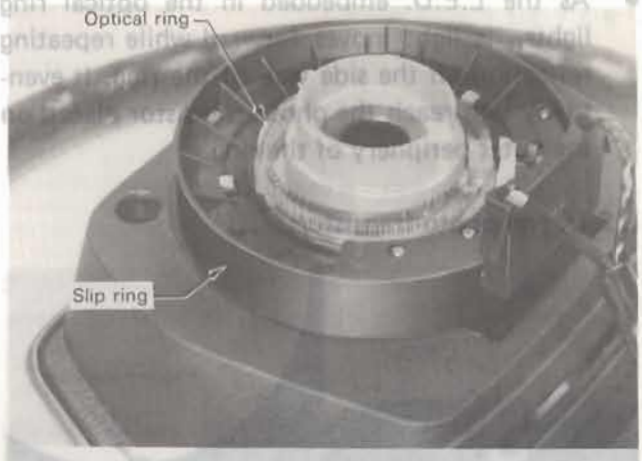
	Switch		Function
For Audio	①	SW	Power ON/OFF
	②	PLAY	Tape deck play
	③	AM/FM	AM/FM band selection
	④	SCAN	SCAN tuning (for radio) Auto program search (for tape deck)
	⑤	VOL	Volume
For A.S.C.D.	⑥	RESUME	Deceleration and resuming
	⑦	ACCEL	Acceleration
	⑧	SET	Cruising speed setting

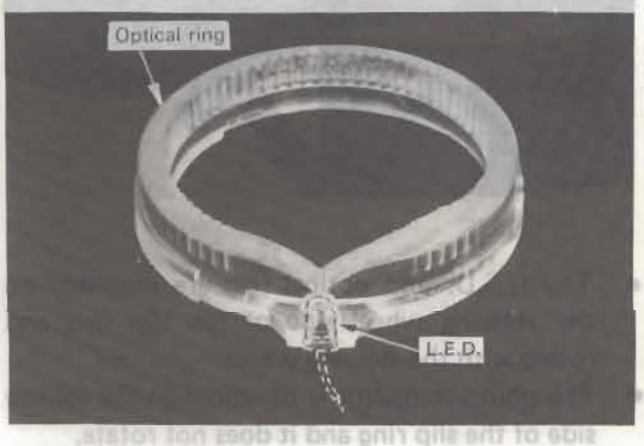
TRANSMITTER



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



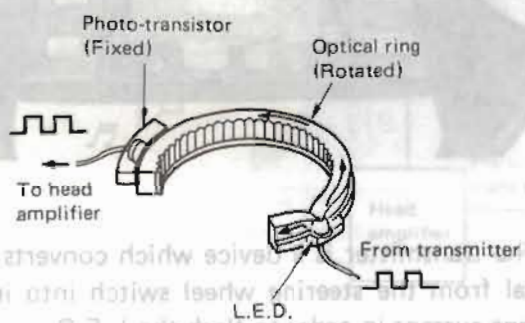


Description (Cont'd)

- 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.

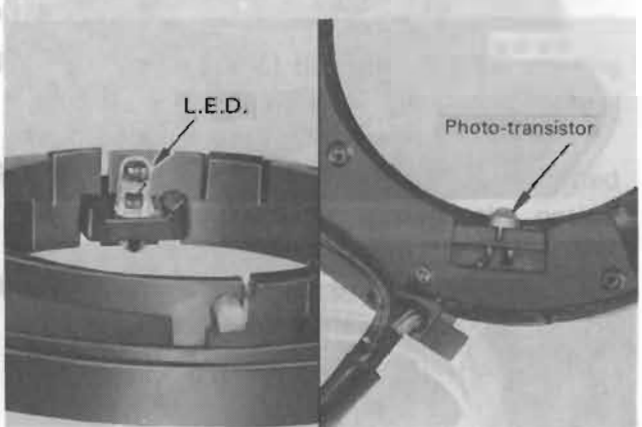
Light transmission path:



SEL649E

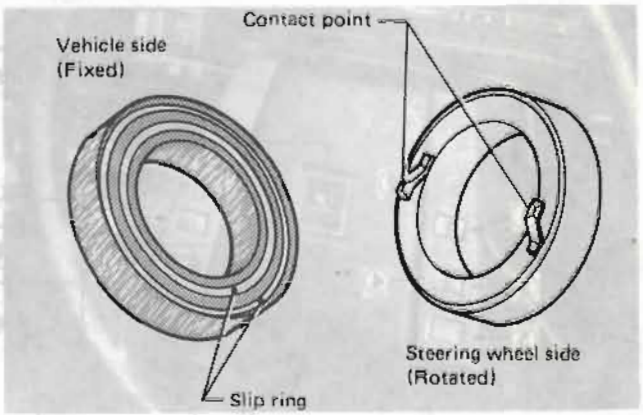
- As the L.E.D. embedded in the optical ring lights, its light moves forward while repeating reflection on the side wall of the ring. It eventually will reach the photo-transistor placed on the outer periphery of the ring.

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

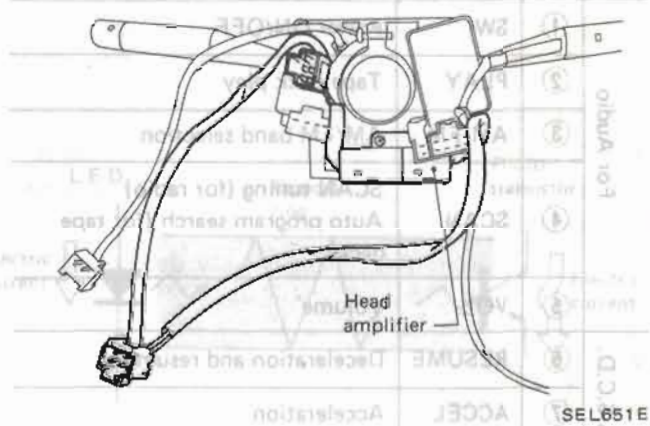


SEL650E

- 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.

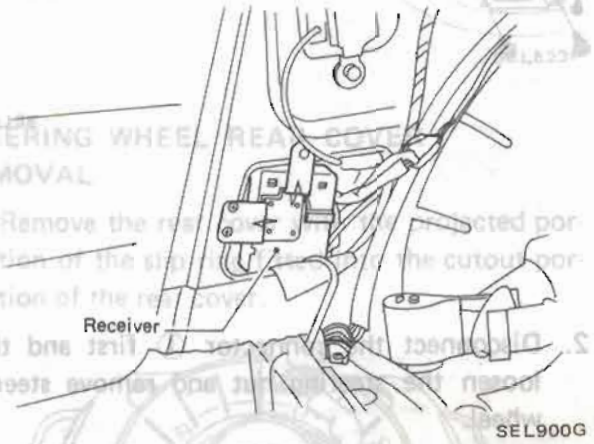
Description (Cont'd)

RECEIVER

2 seater model

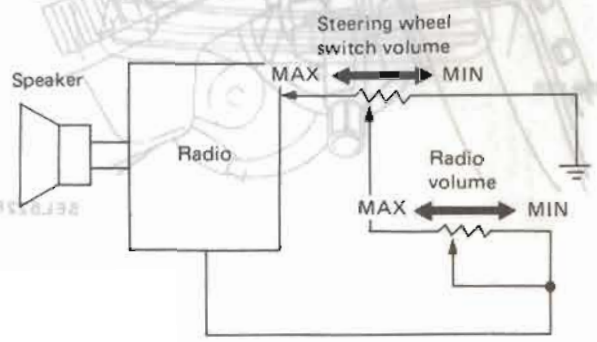


2+2 seater model



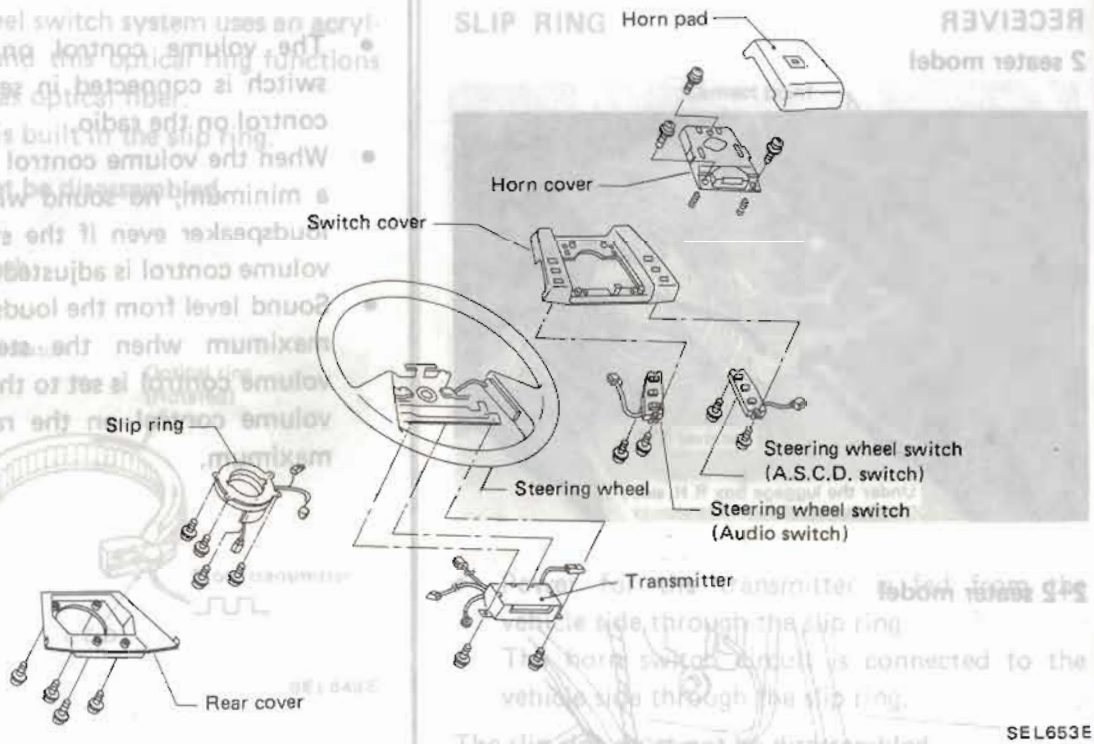
The receiver activates the radio or A.S.C.D. drive circuit corresponding to the steering wheel switch signal sent from the head amplifier.

AUDIO VOLUME CONTROL



- 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



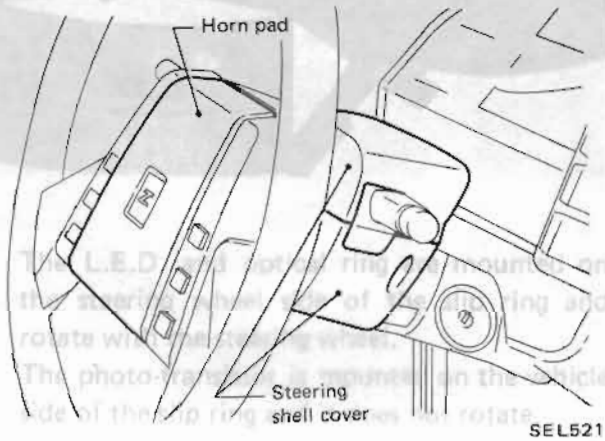
SEL653E

STEERING WHEEL REMOVAL AND INSTALLATION

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

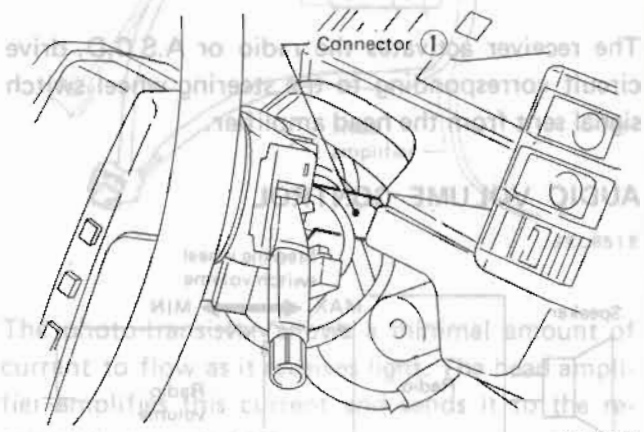
- When removing the steering wheel:

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



SEL521F

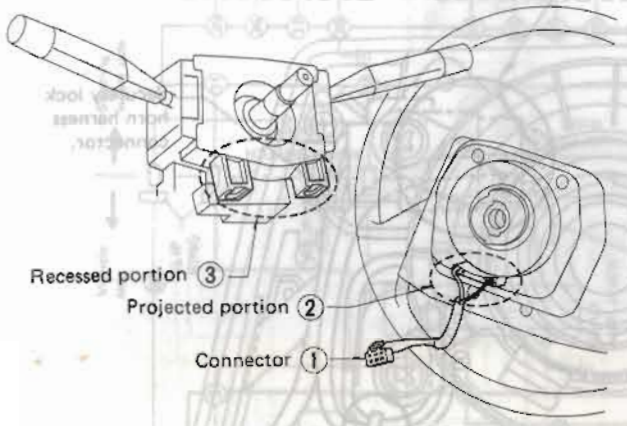
2. Disconnect the connector ① first and then loosen the steering nut and remove steering wheel.



SEL522F

Steering Wheel Switch Removal and Installation (Cont'd)

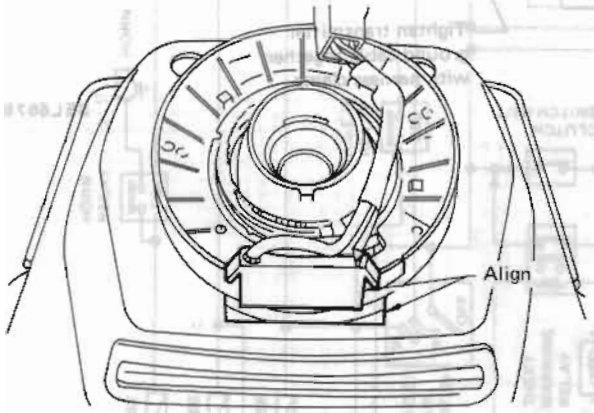
- When installing the steering wheel:
  First determine the slip ring position so that the projected portion ② of the slip ring will fit in the recessed portion ③ of the combination switch. Then install the steering wheel.



SEL523F

STEERING WHEEL REAR COVER REMOVAL

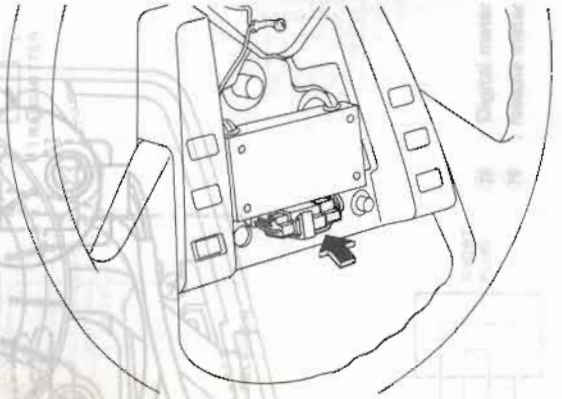
- Remove the rear cover with the projected portion of the slip ring fitted into the cutout portion of the rear cover.



SEL655E

SLIP RING REMOVAL

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

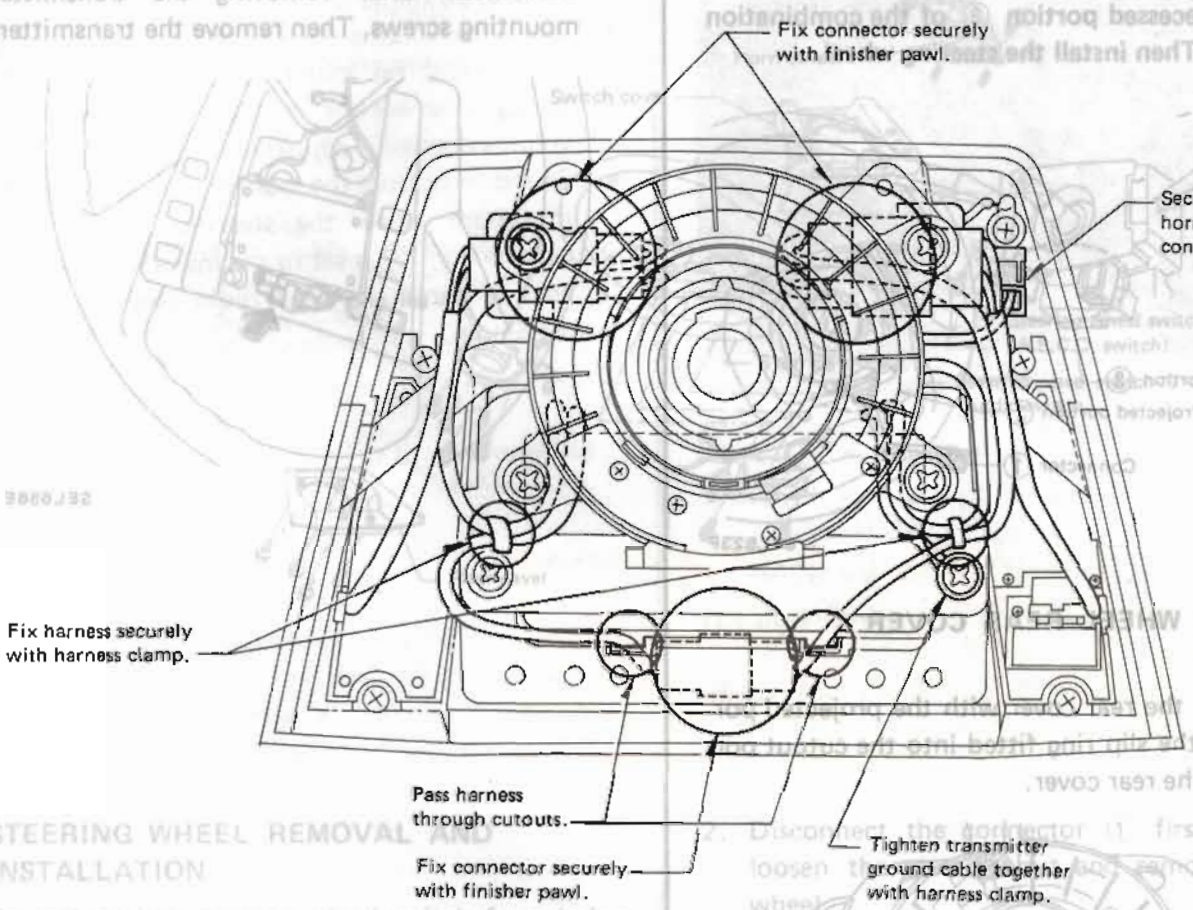


SEL656E

Steering Wheel Switch Removal and Installation (Cont'd)

TRANSMITTER AND SLIP RING INSTALLATION

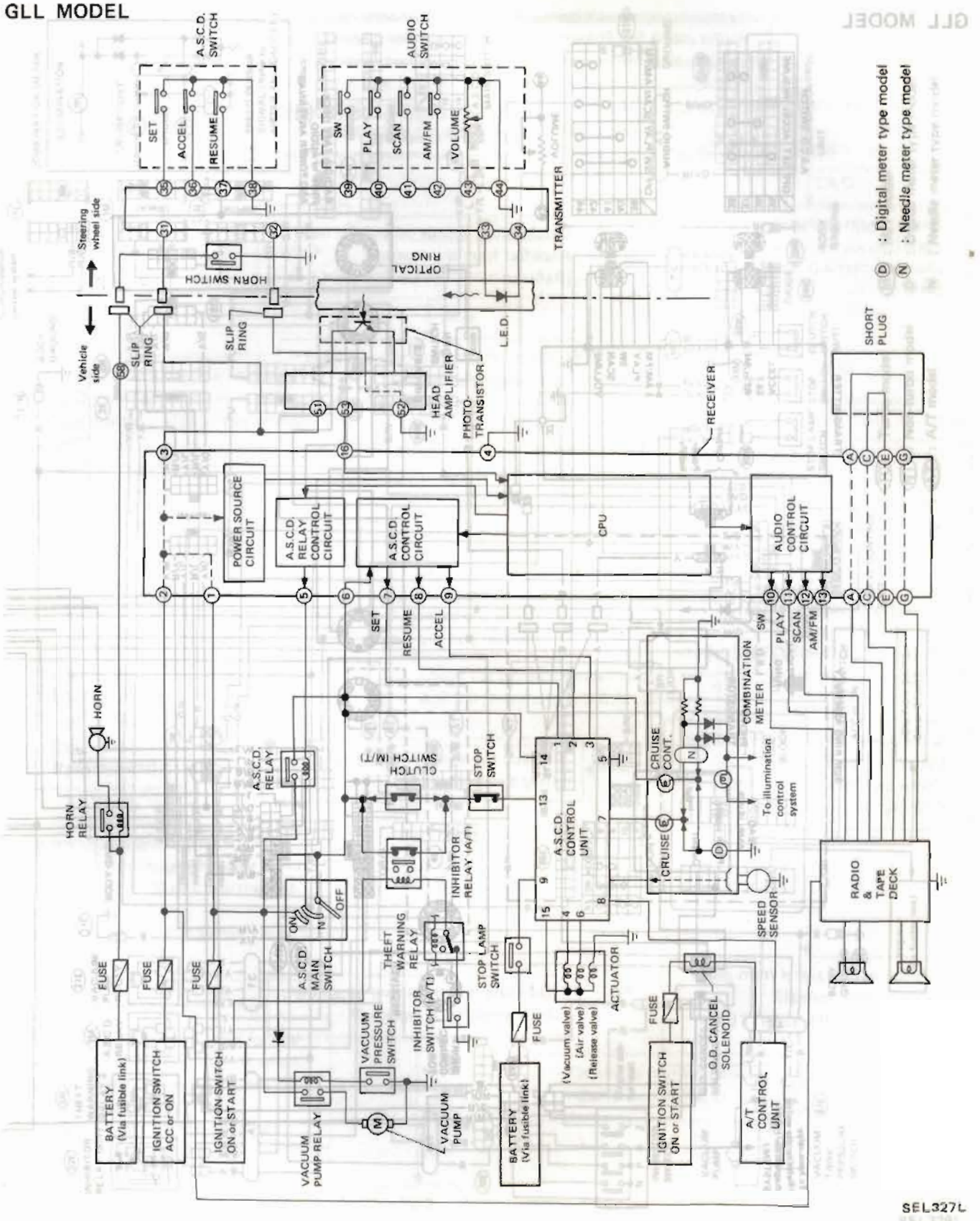
- When installing the transmitter and slip ring, arrange and secure the harnesses and connectors as shown in the following figure.



STEERING WHEEL SWITCH SYSTEM

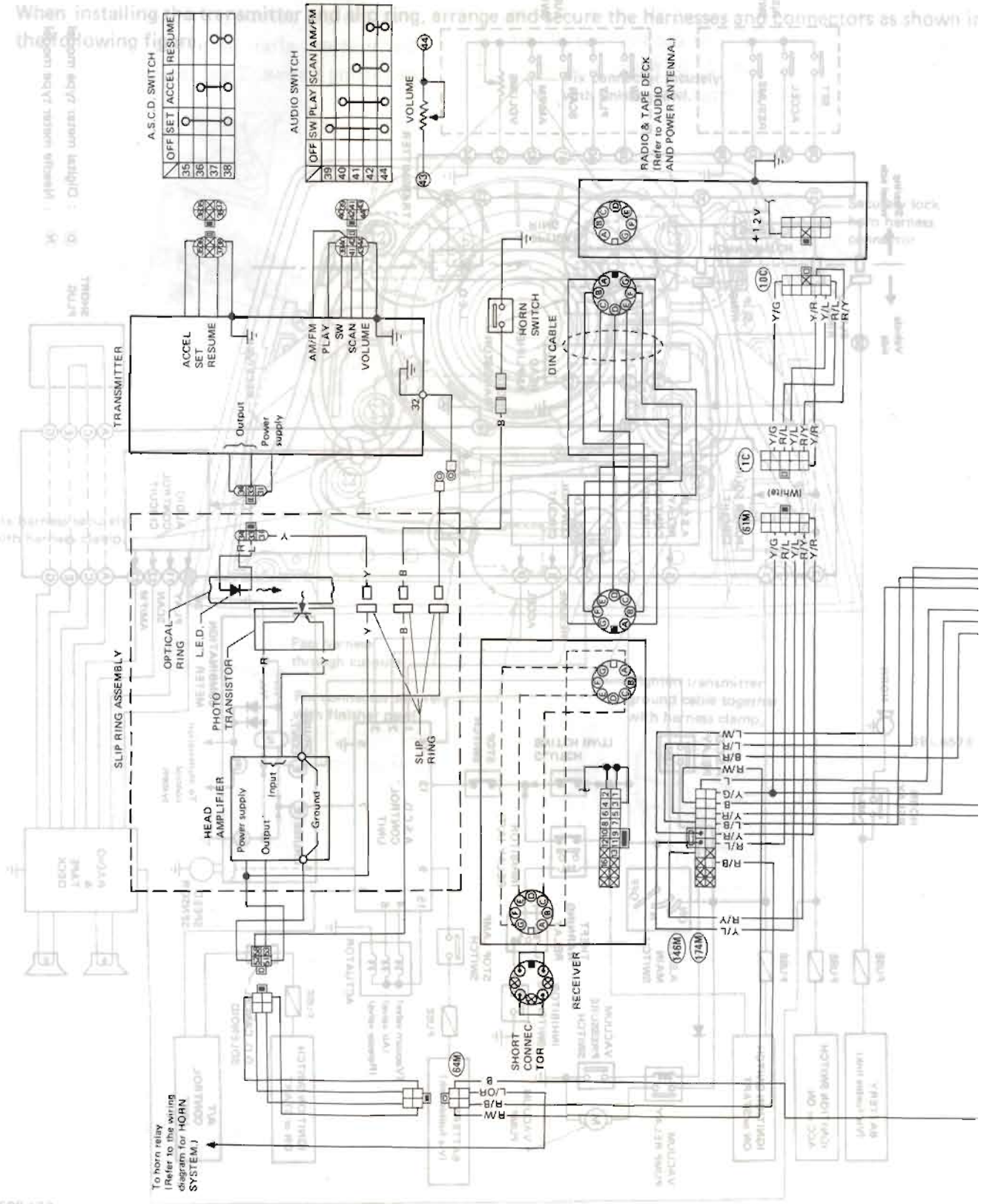
Schematic

GLL MODEL

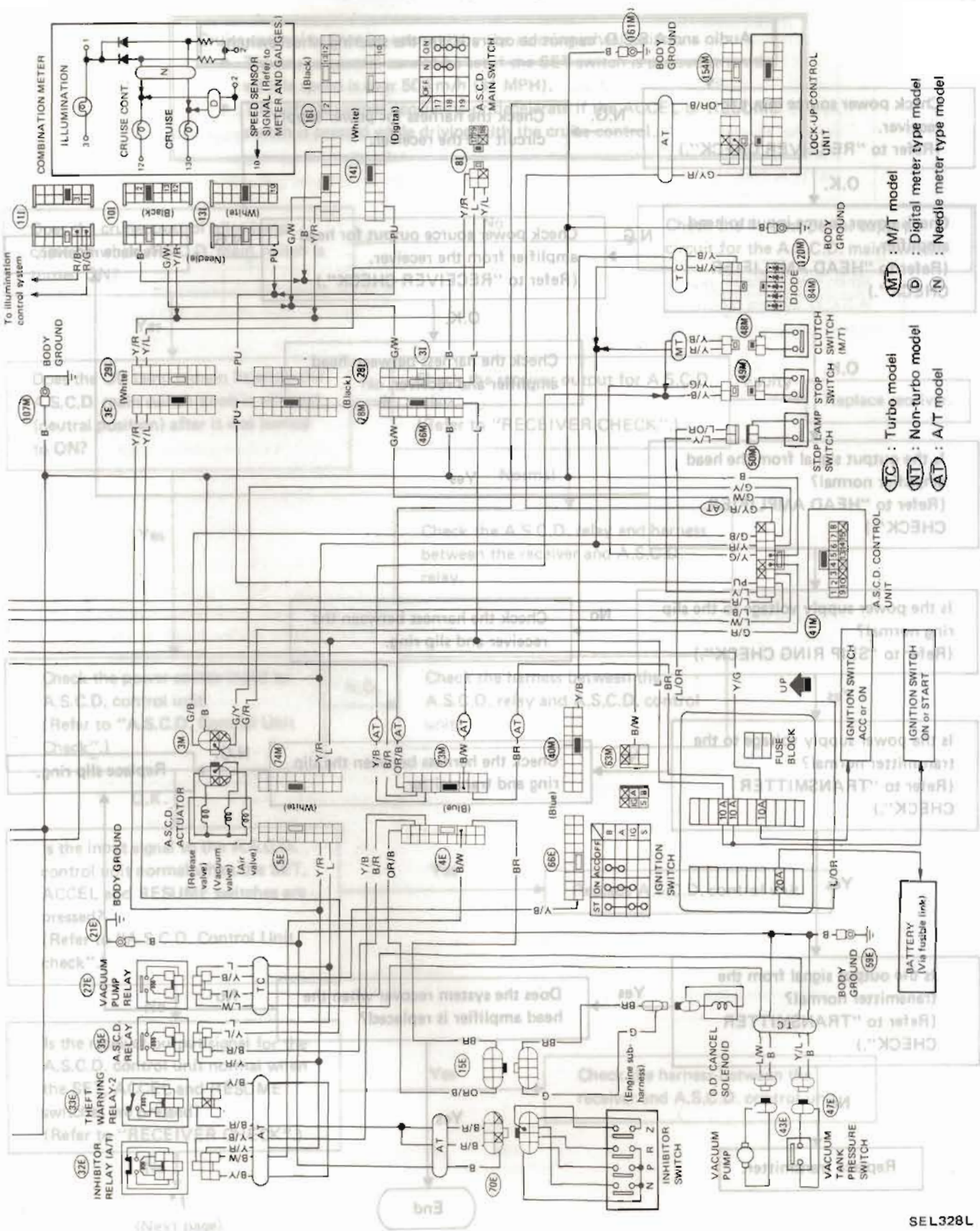


Wiring Diagram

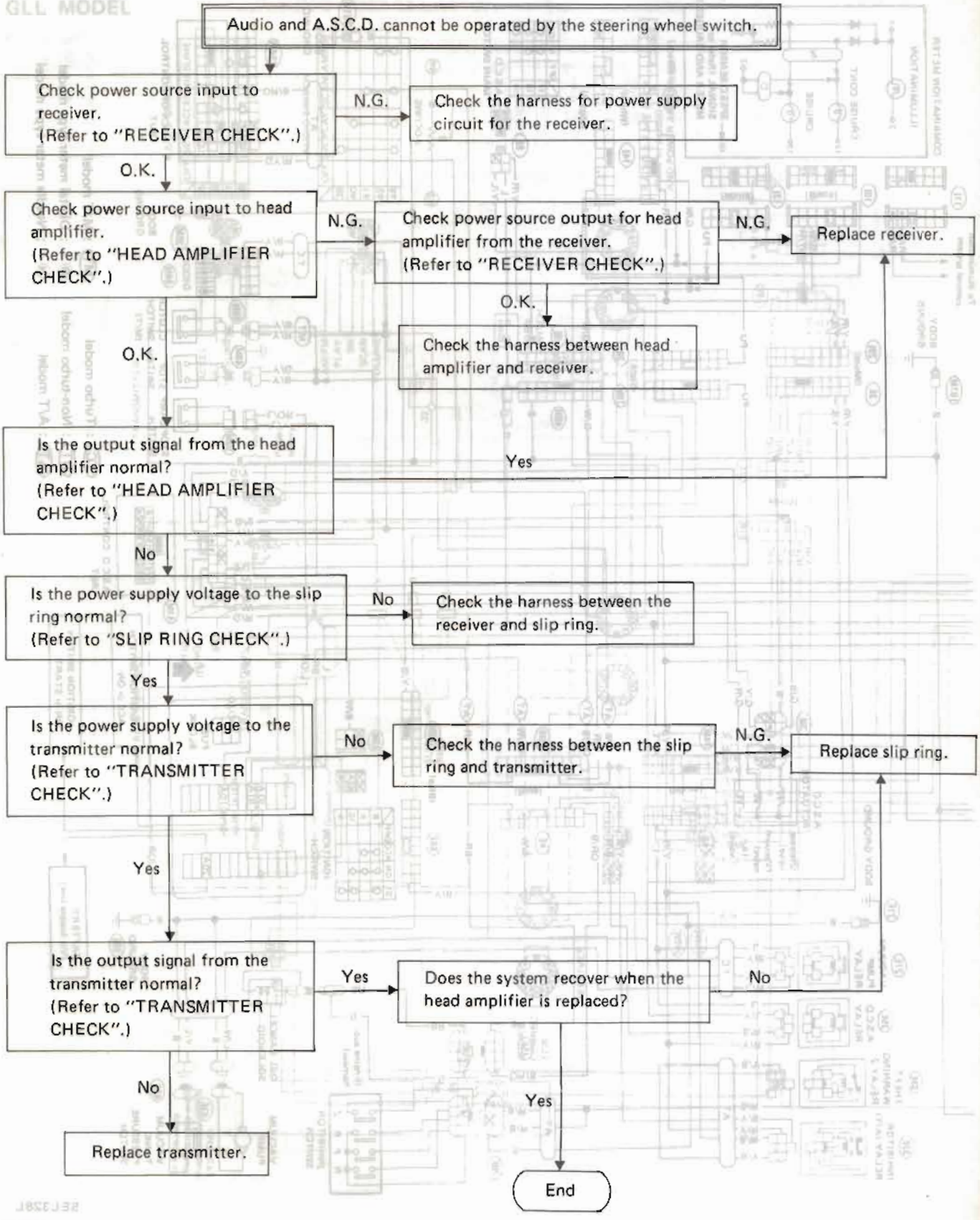
GLL MODEL



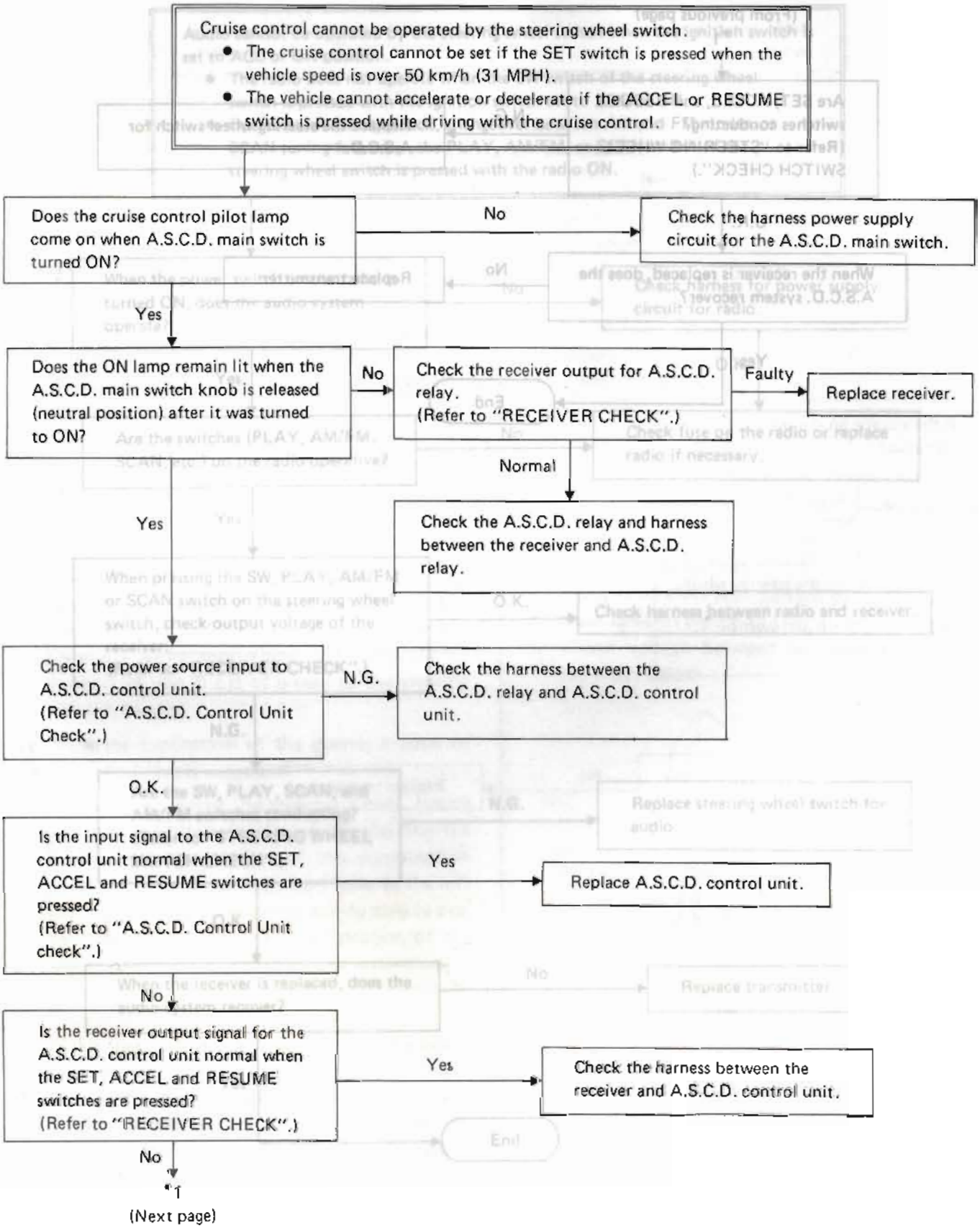
Wiring Diagram (Cont'd)



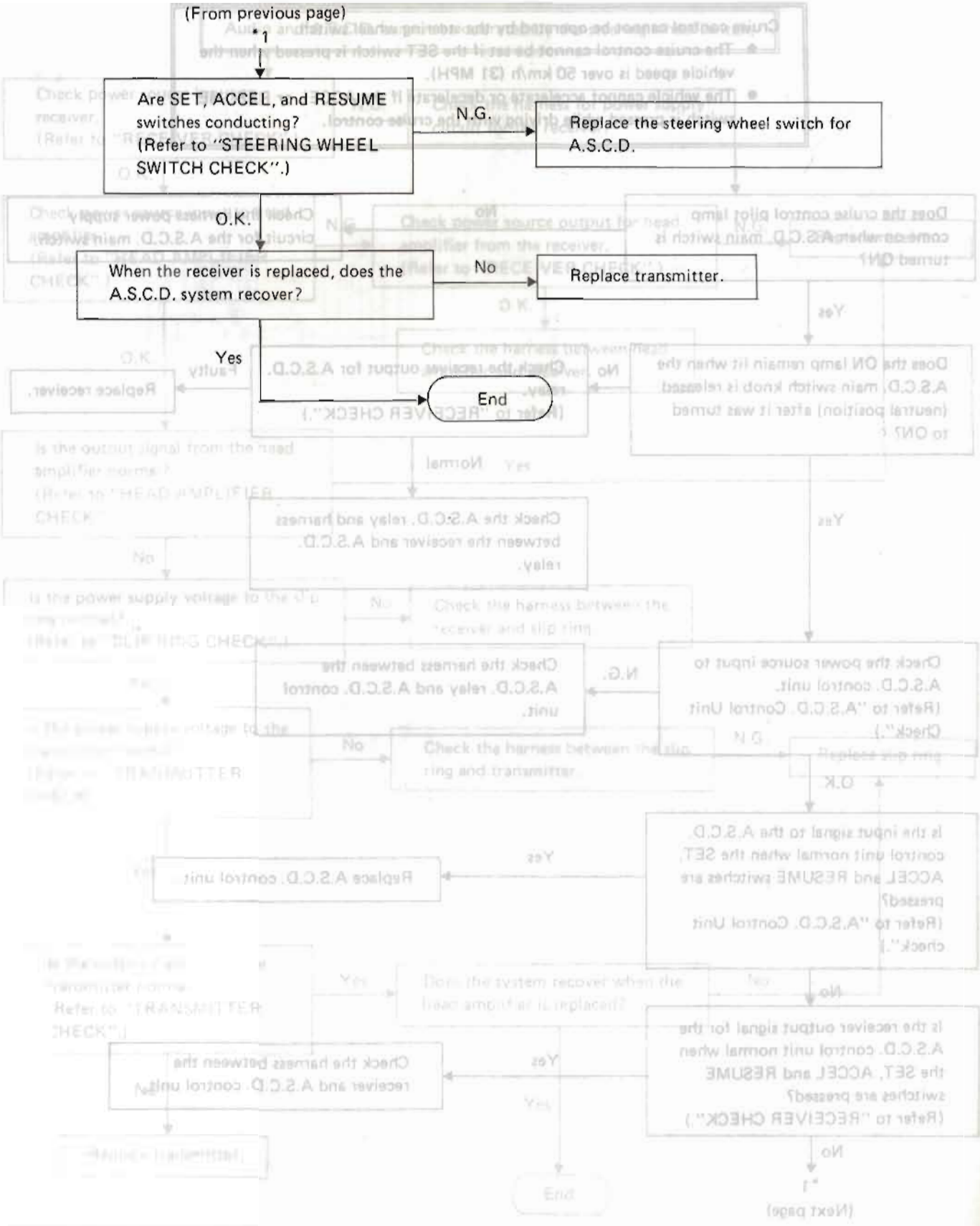
Trouble-shooting



Trouble-shooting (Cont'd)



Trouble-shooting (Cont'd)



Trouble-shooting (Cont'd)

Audio cannot be operated by the steering wheel switch when the ignition switch is set to ACC or ON position.

- The radio does not operate when the SW switch of the steering wheel switch is pressed with the ignition switch set to ACC or ON.
- Operation of the tape deck, changeover between AM and FM modes, or SCAN tuning fails when the PLAY, AM/FM, or SCAN switch of the steering wheel switch is pressed with the radio ON.

When the power switch on the radio is turned ON, does the audio system operate?

No → Check harness for power supply circuit for radio.

O.K. →

Yes ↓

Are the switches (PLAY, AM/FM, SCAN, etc.) on the radio operative?

No → Check fuse on the radio or replace radio if necessary.

Yes ↓

When pressing the SW, PLAY, AM/FM or SCAN switch on the steering wheel switch, check output voltage of the receiver.
(Refer to "RECEIVER CHECK".)

O.K. → Check harness between radio and receiver.

N.G. ↓

Are the SW, PLAY, SCAN, and AM/FM switches conducting?
(Refer to "STEERING WHEEL SWITCH CHECK".)

N.G. → Replace steering wheel switch for audio.

O.K. ↓

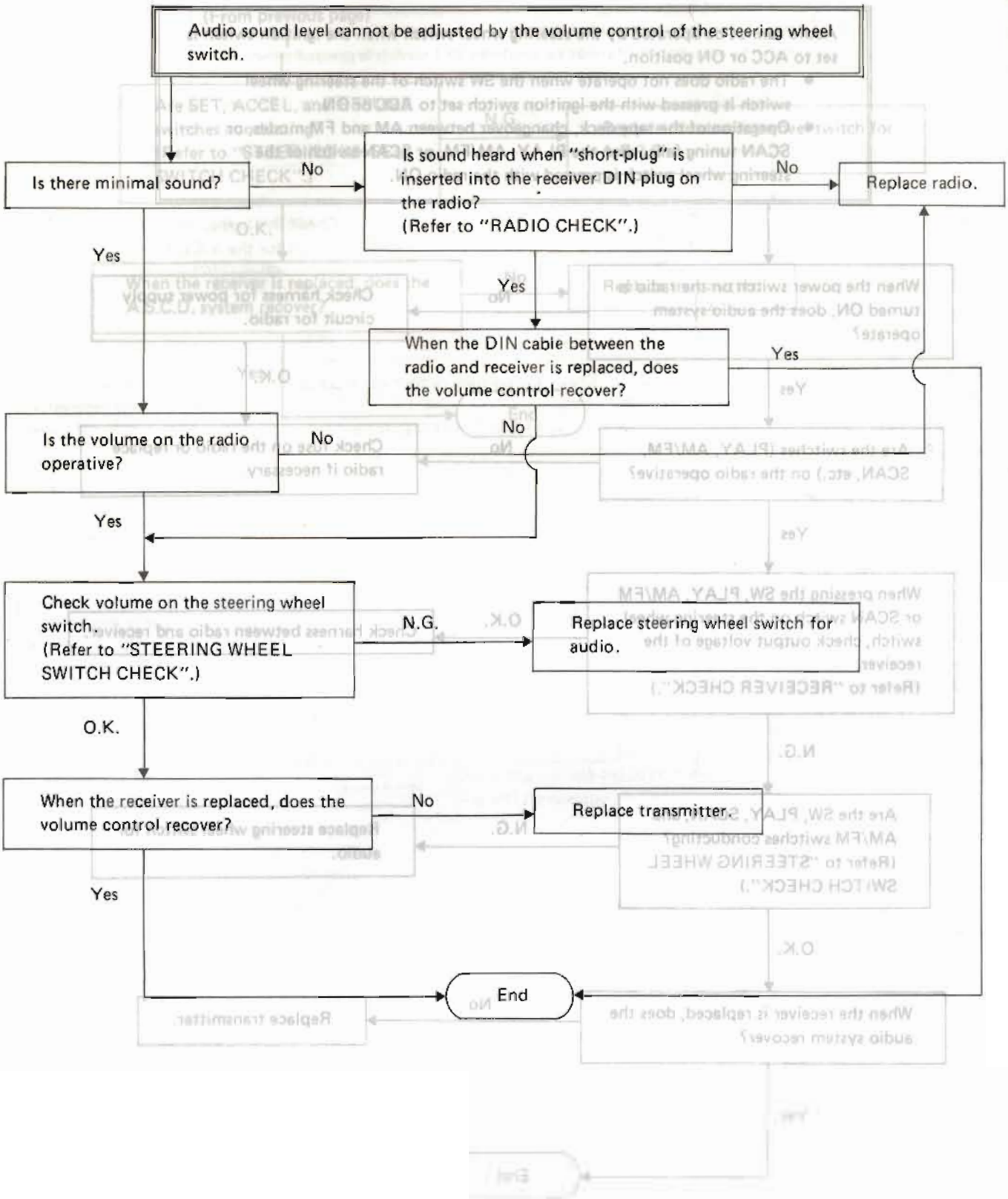
When the receiver is replaced, does the audio system recover?

No → Replace transmitter.

Yes ↓

End

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 ST section.
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.

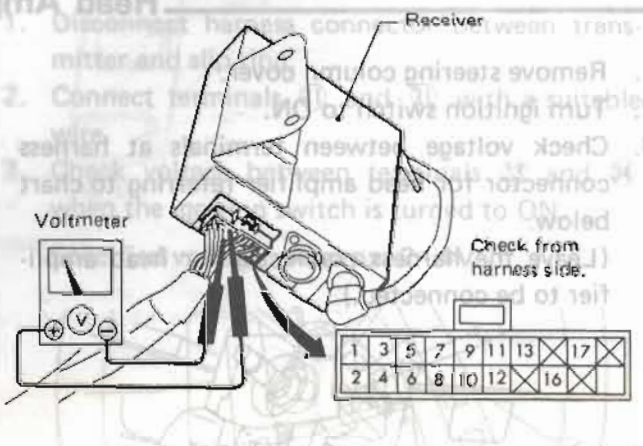
To facilitate application of the grease, a cone of paper or vinyl film is suggested.

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.



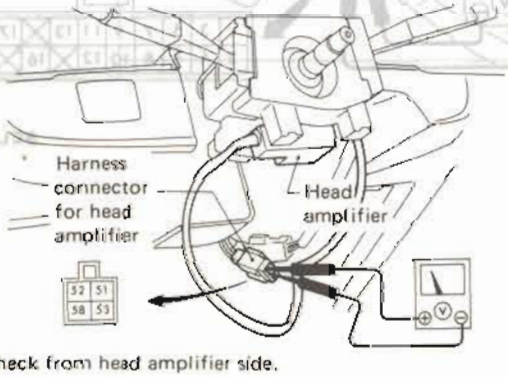
SEL660E

Receiver Check (Cont'd)

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.

SEL344L

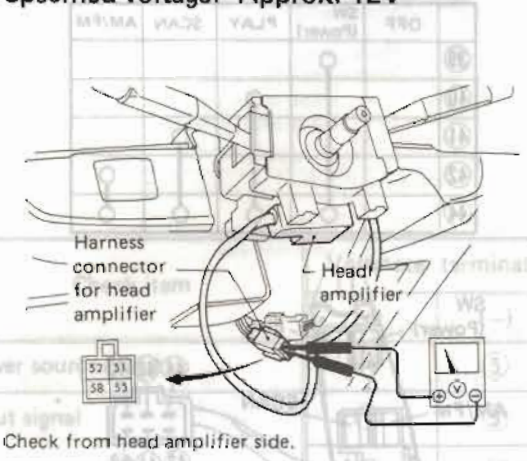
Check item	Voltmeter terminals (+)	Voltmeter terminals (−)	Specified voltage [V]
Power supply input	⑤①	⑤②	Approx. 12
Output for receiver	⑤③	⑤②	Approx. 2 - 4

Slip Ring Check

POWER SUPPLY VOLTAGE CHECK

1. Remove steering column cover.
2. Check voltage between terminals ㊶ and ㊷ when the ignition switch is turned to ON.

Specified voltage: Approx. 12V



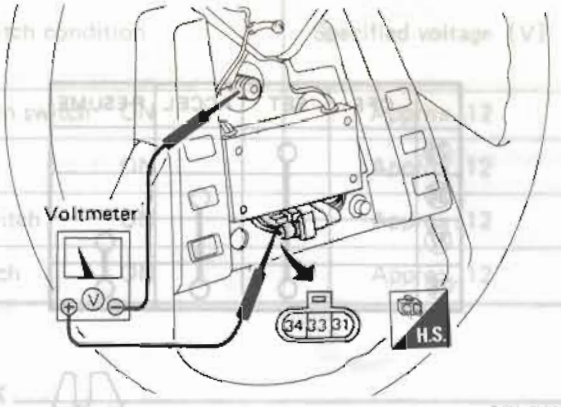
SEL344L

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

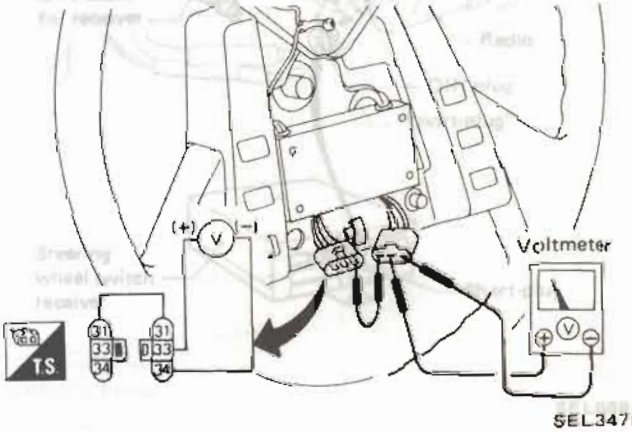


SEL702K

OUTPUT SIGNAL CHECK

1. Disconnect harness connector between transmitter and slip ring.
2. Connect terminals ㉝ 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



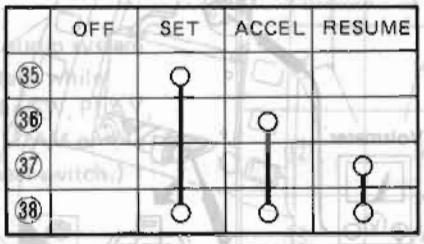
SEL347L

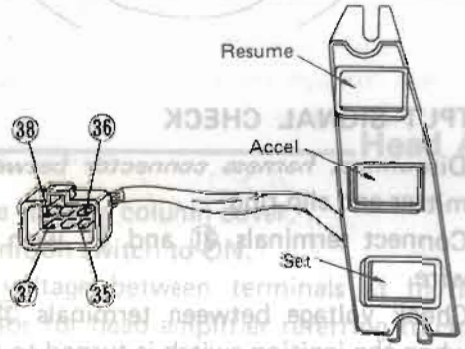
Steering Wheel Switch Check

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.

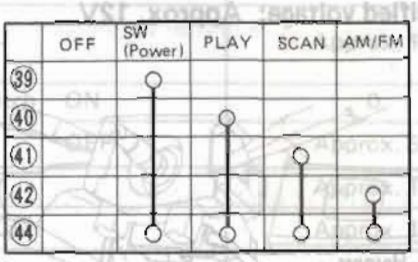


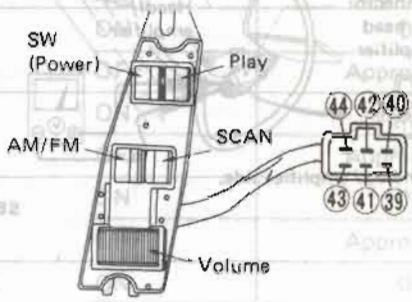


SEL704K

AUDIO SWITCH CHECK

- Check continuity while pressing each switch.
  Below 300Ω ... O.K.

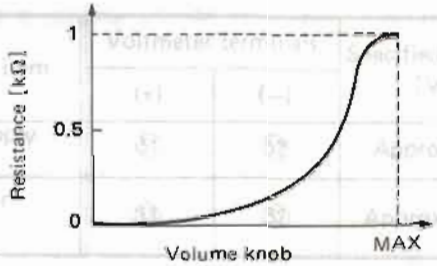


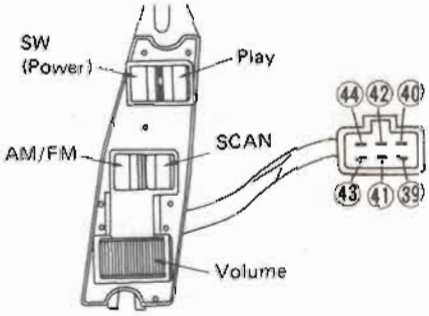


SEL709K

VOLUME CHECK

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



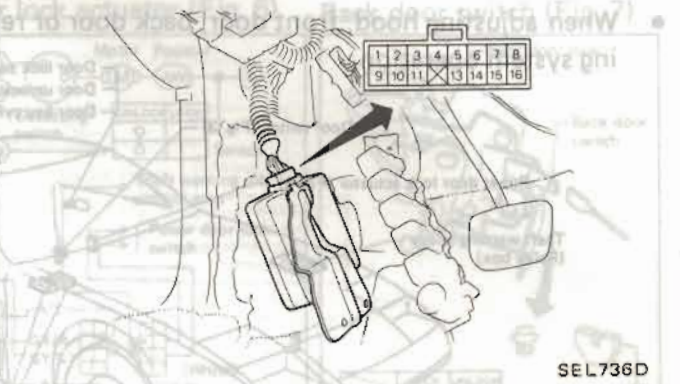


SEL710K

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

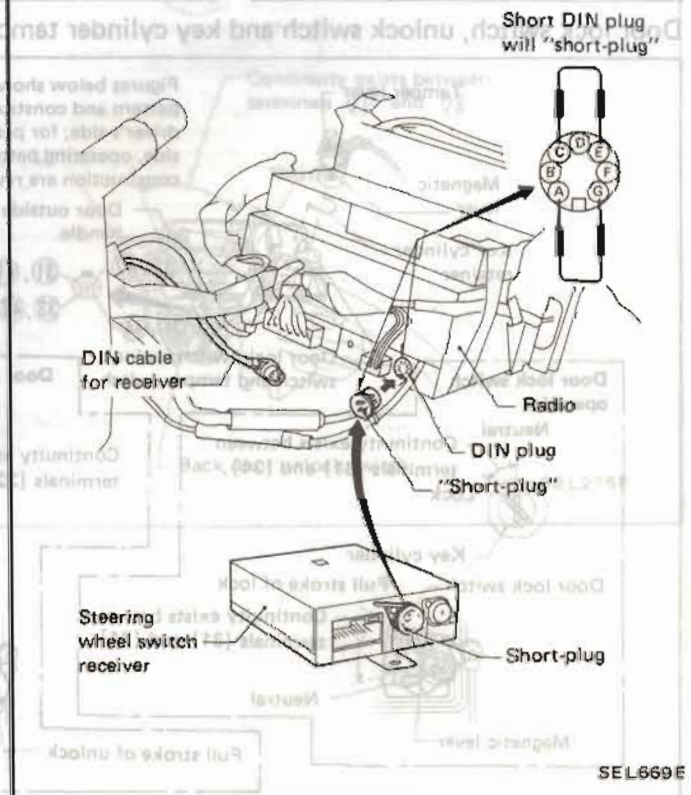
Check item	Voltmeter terminals (+)	Voltmeter terminals (−)	Switch condition		Specified voltage [V]
Power source input	⑭	⑤	A.S.C.D. main switch	ON	Approx. 12
Input signal	①	⑤	SET switch	ON	Approx. 12
	②	⑤	RESUME switch	ON	Approx. 12
	③	⑤	ACCEL switch	ON	Approx. 12

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.

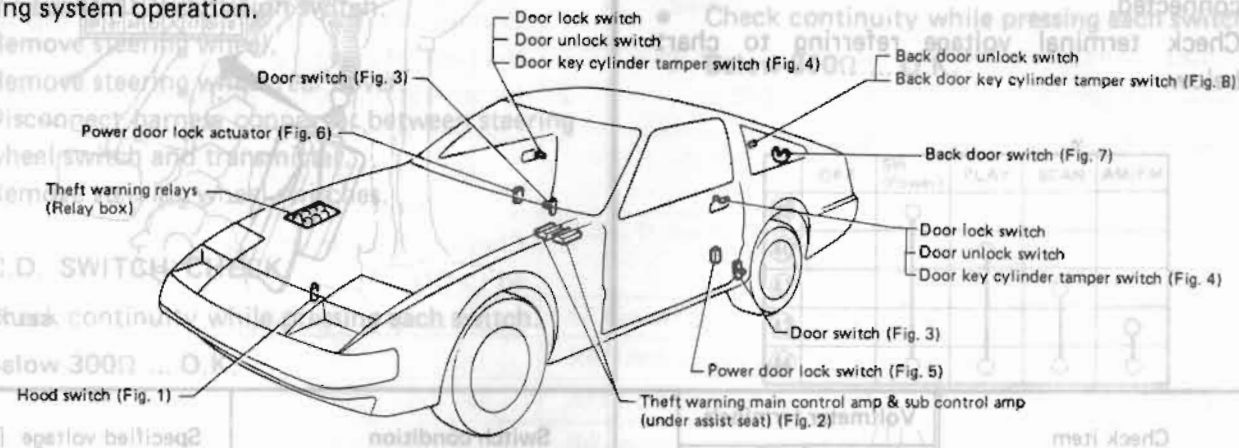


SEL669E

THEFT WARNING SYSTEM

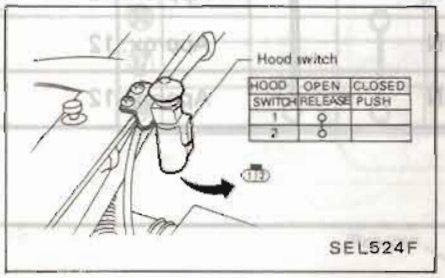
Location of Electrical Units

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

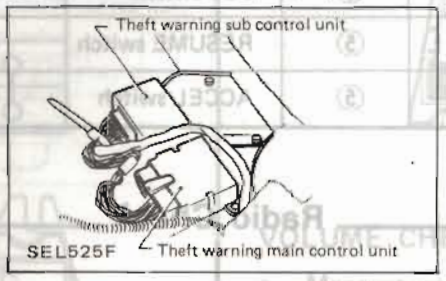


Operation of Switches and Sensors

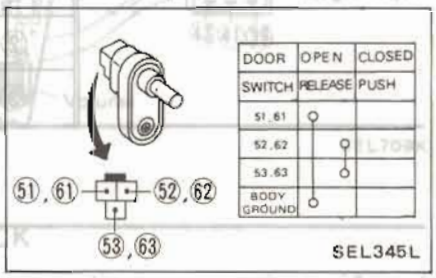
Hood switch (Fig. 1)



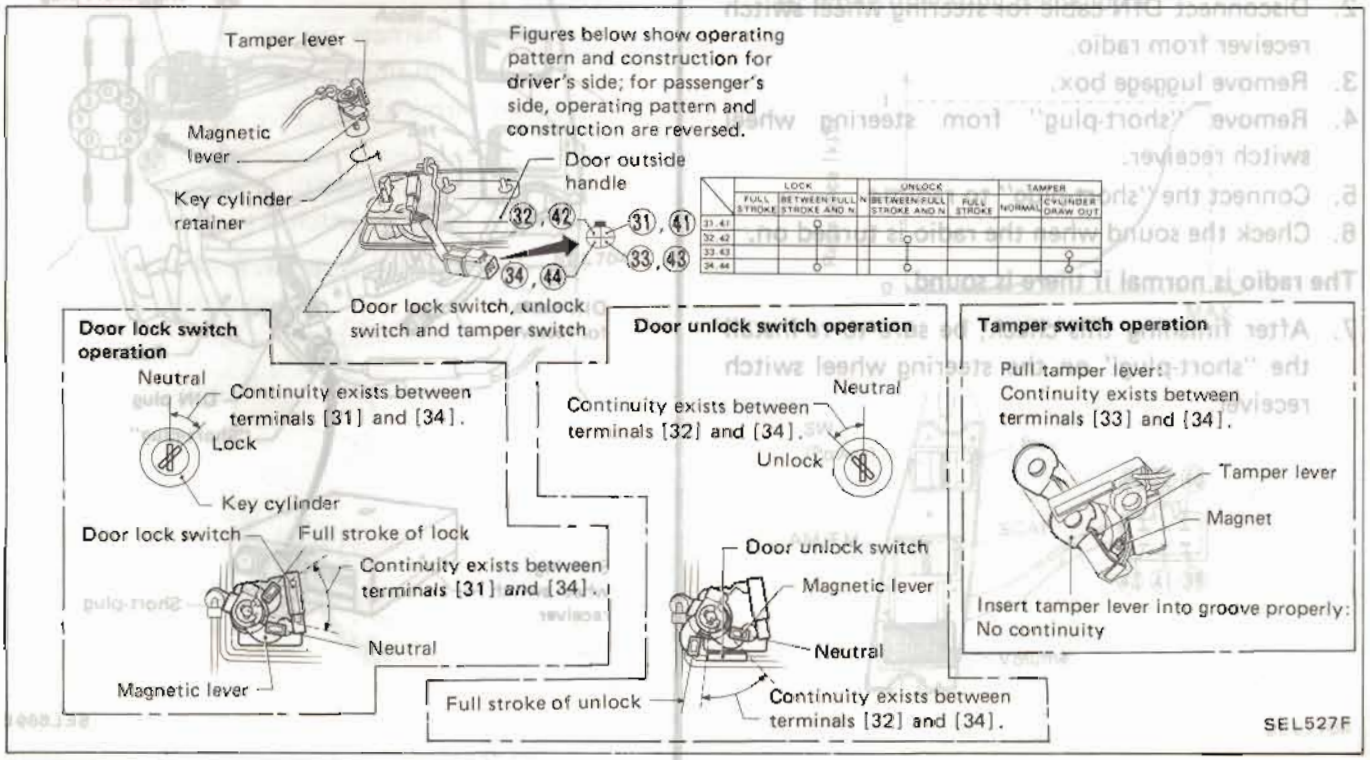
Theft warning main control unit & sub control unit (Fig. 2)



Door switch (Fig. 3)

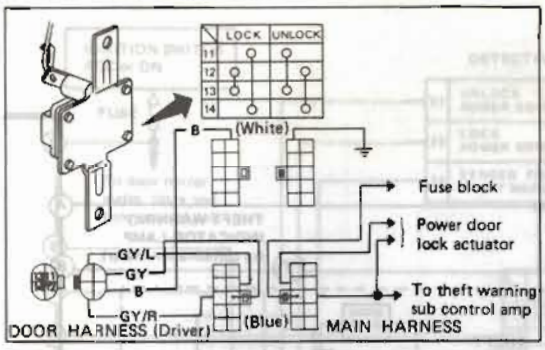


Door lock switch, unlock switch and key cylinder tamper switch (Fig. 4)

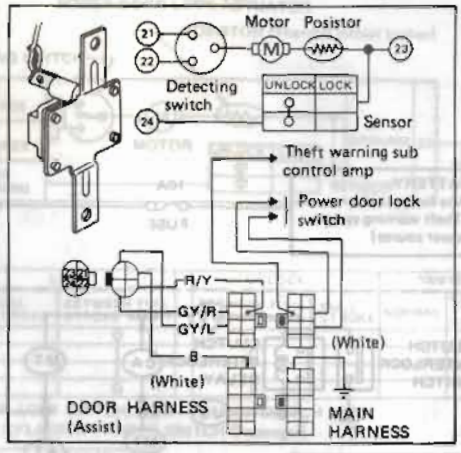


Operation of Switches and Sensors (Cont'd)

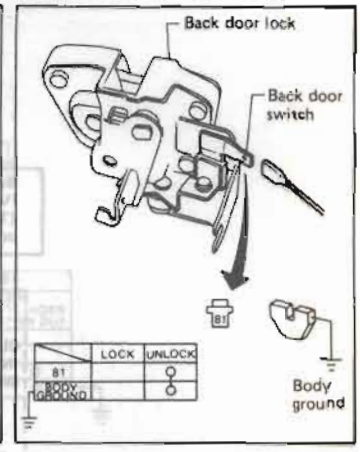
Power door lock switch (Fig. 5)



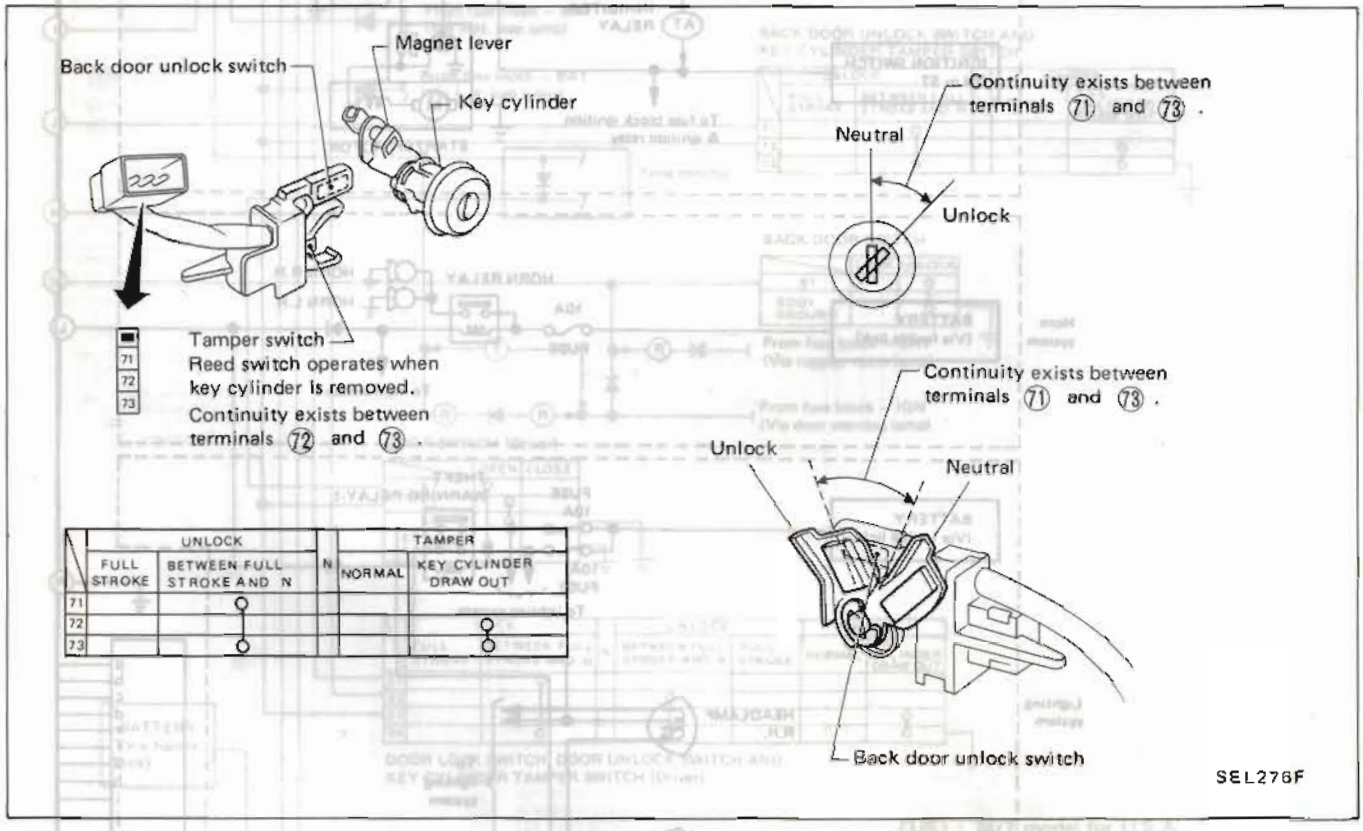
Power door lock actuator (Fig. 6)



Back door switch (Fig. 7)

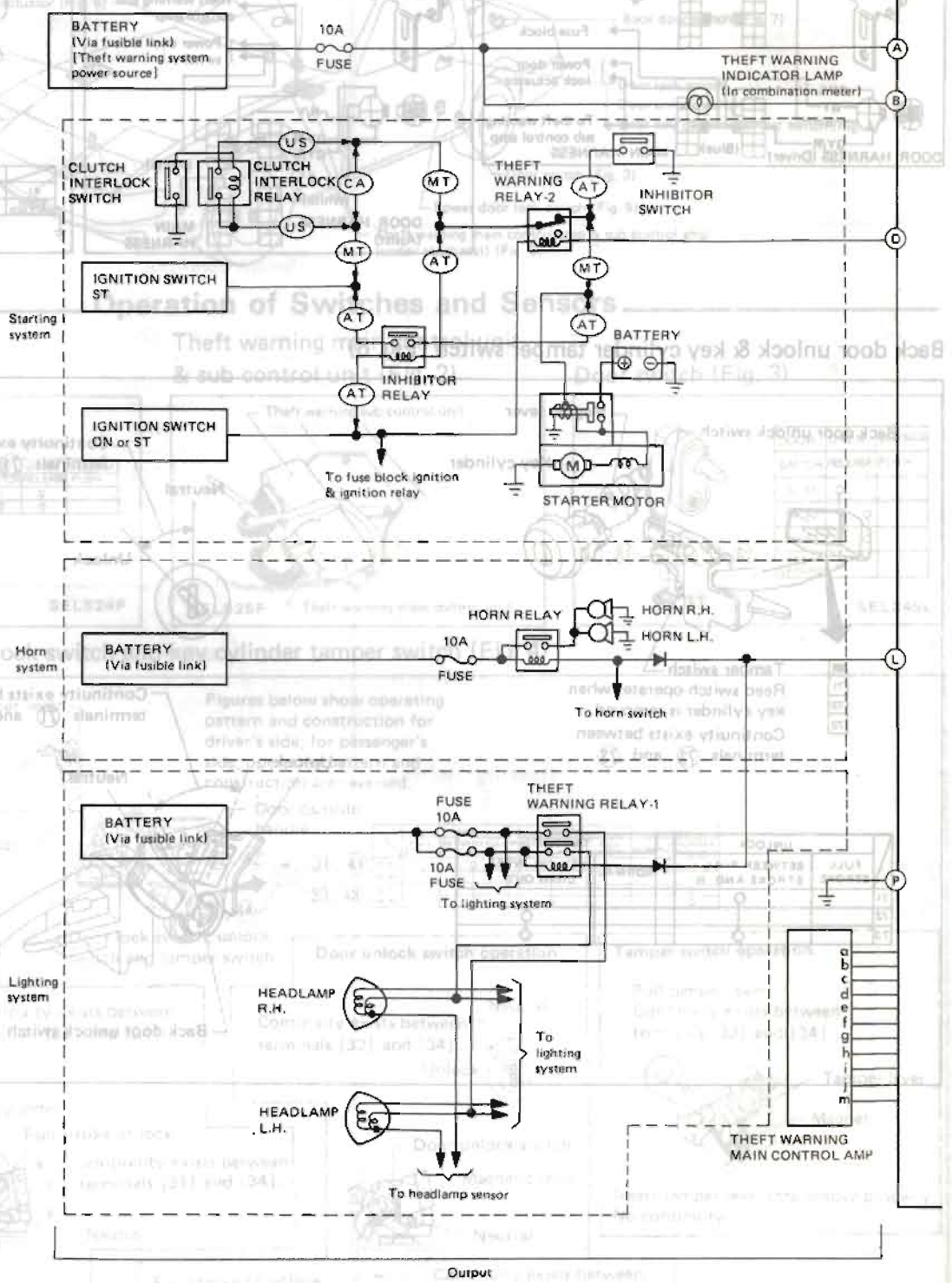


Back door unlock & key cylinder tamper switch (Fig. 8)

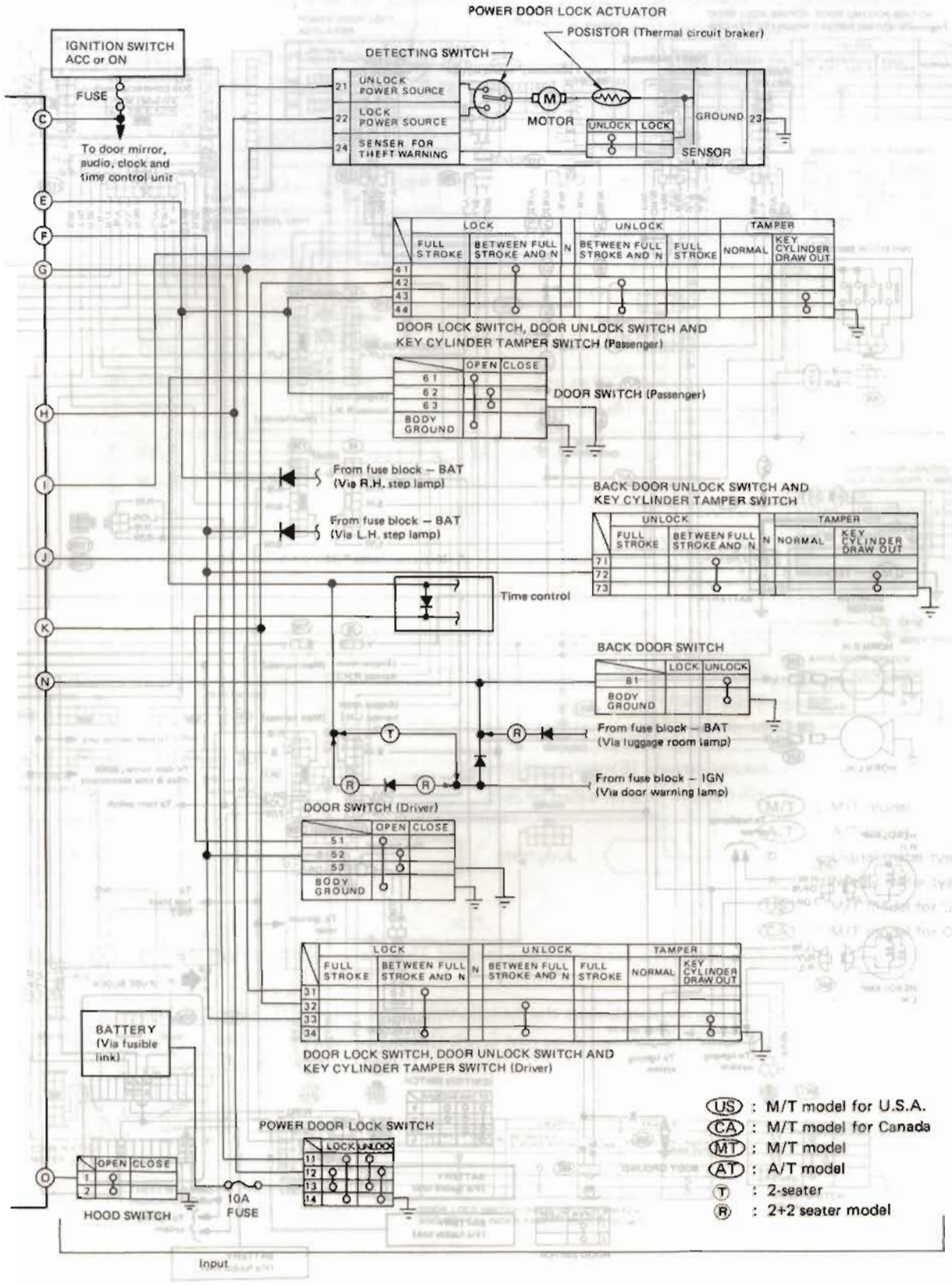


	UNLOCK		N	TAMPER	
	FULL STROKE	BETWEEN FULL STROKE AND N		NORMAL	KEY CYLINDER DRAW OUT
71		○			
72					○
73		○			

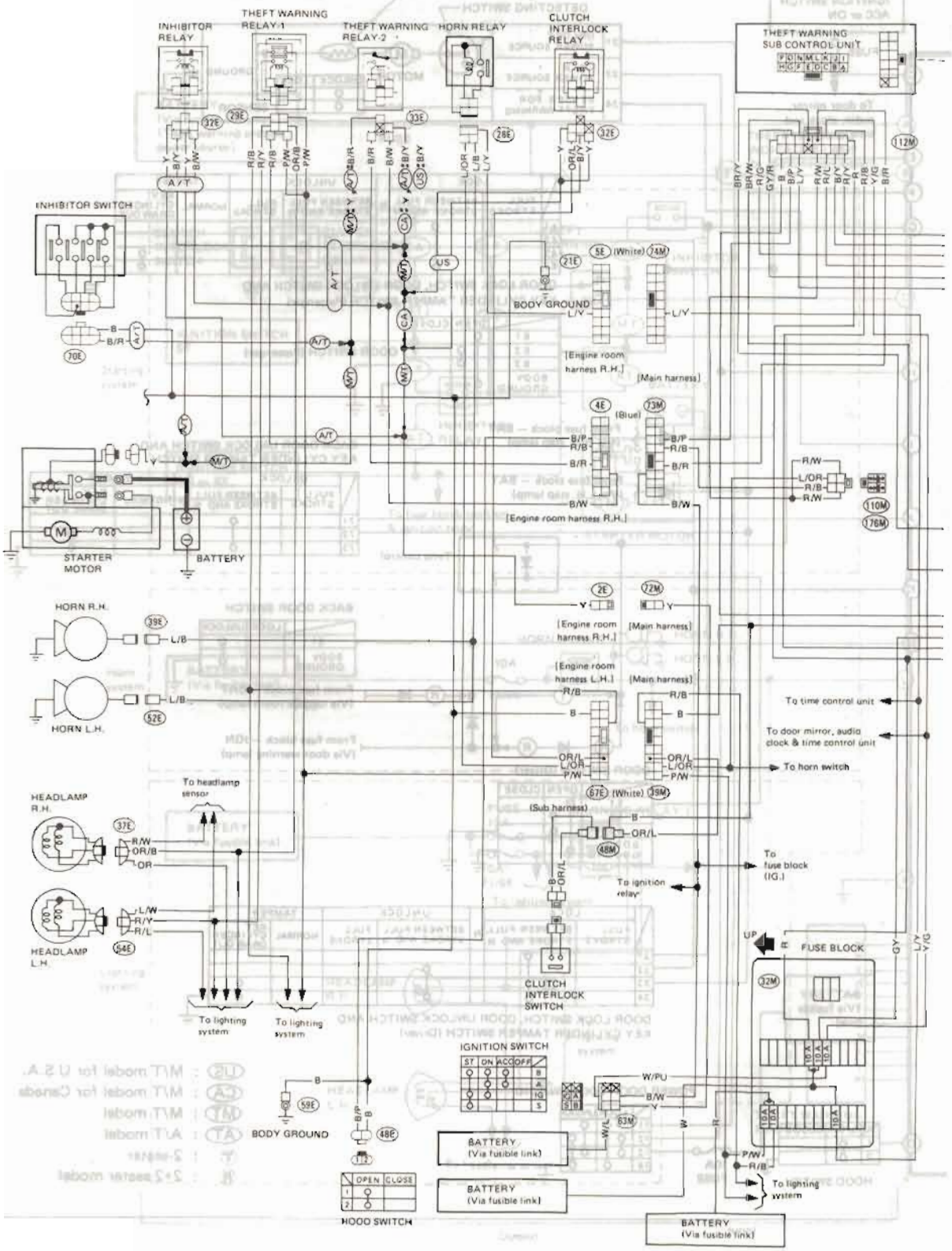
Schematic


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

Schematic (Cont'd)

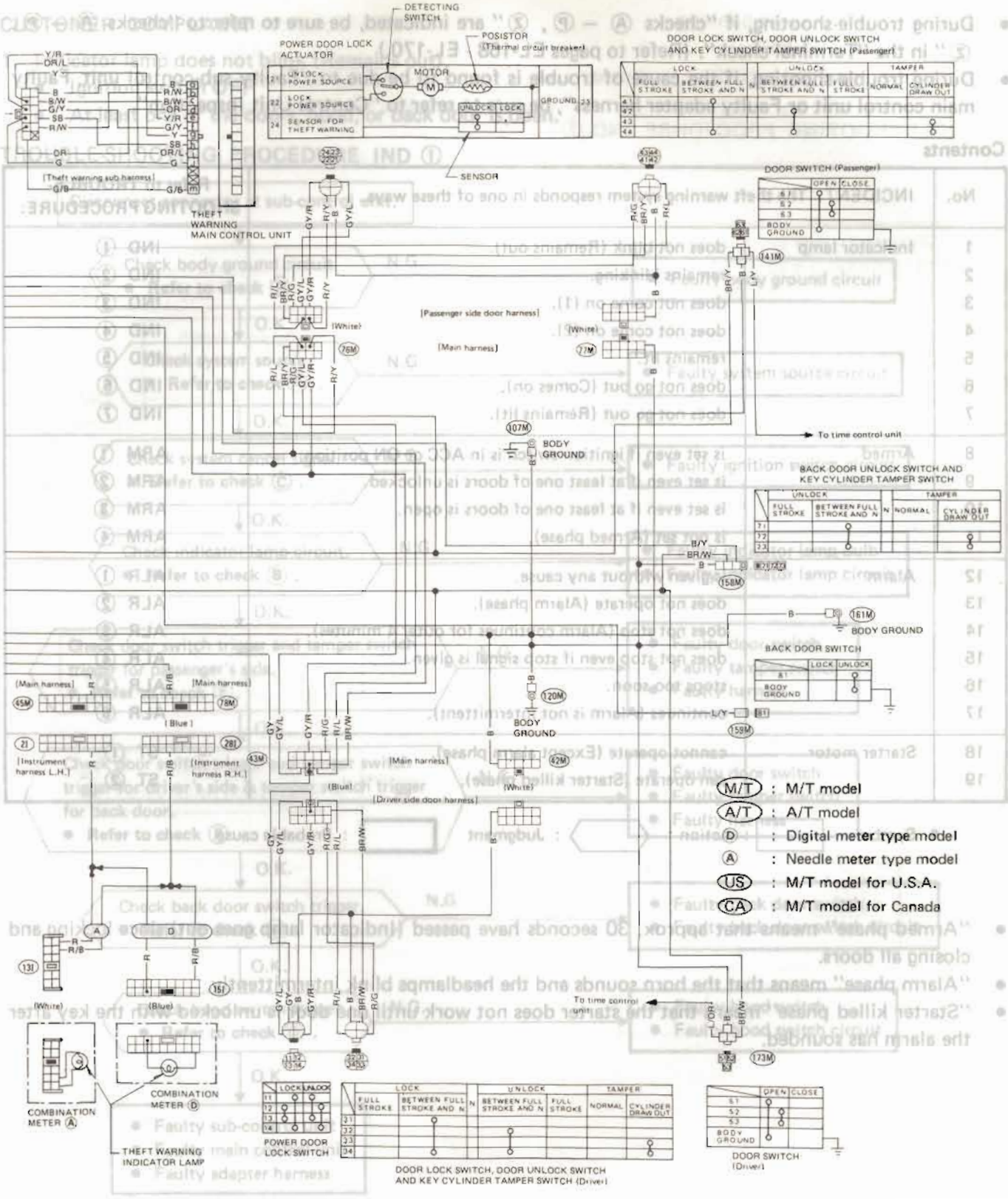


Wiring Diagram



THEFT WARNING SYSTEM

Wiring Diagram (Cont'd)



SEL329L

Trouble-shooting

- During trouble-shooting, if "checks Ⓐ — Ⓟ, Ⓩ" are indicated, be sure to refer to "checks Ⓐ — Ⓟ, Ⓩ" in the "Terminal check". (Refer to pages EL-168 - EL-170.)
- 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

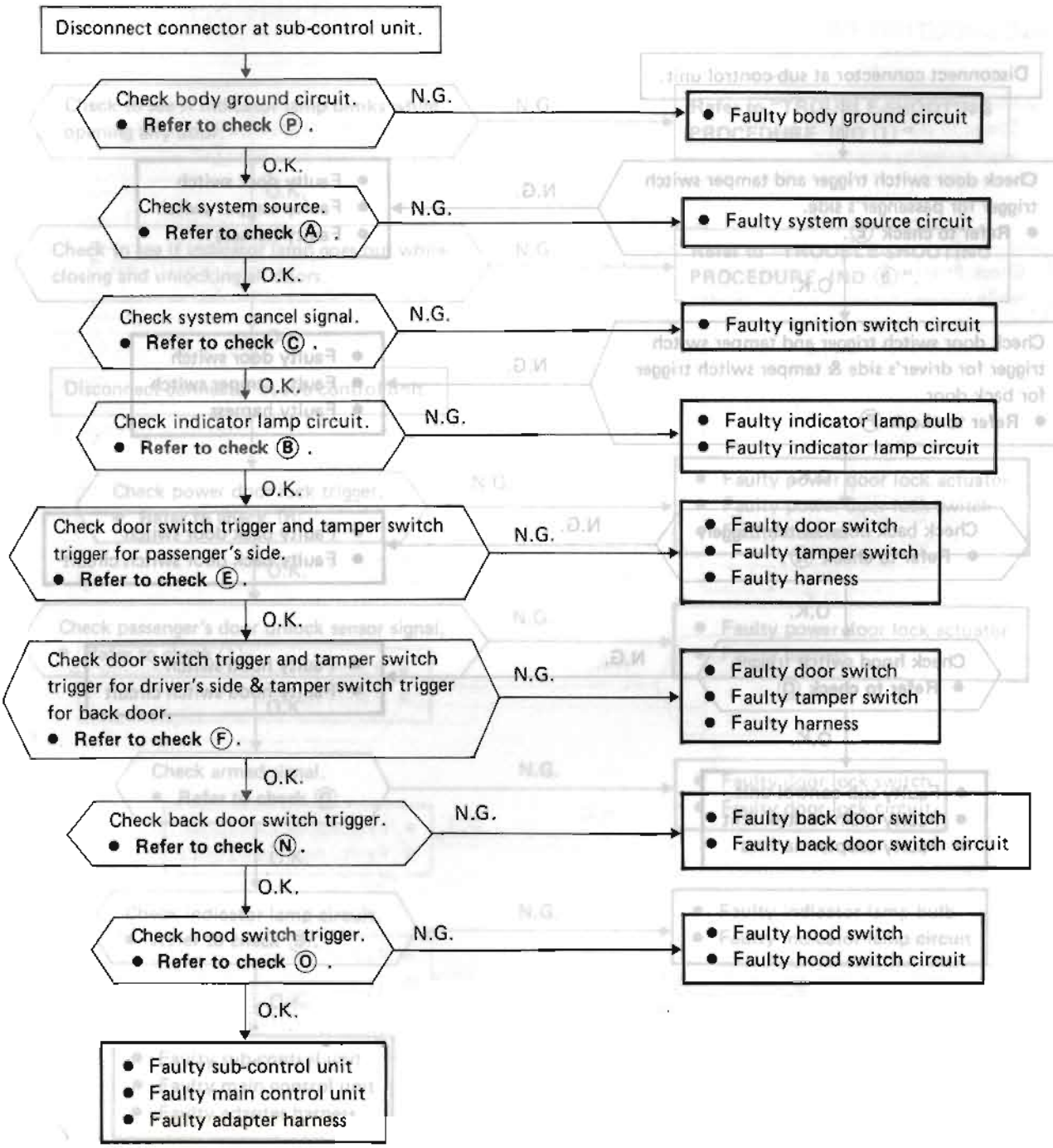
- "Armed phase" means that approx. 30 seconds have passed (Indicator lamp goes out) since locking and closing all doors.
- "Alarm phase" means that the horn sounds and the headlamps blink intermittently.
- "Starter killed phase" means that the starter does not work until one door is unlocked with the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

Trouble-shooting (Cont'd)

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.

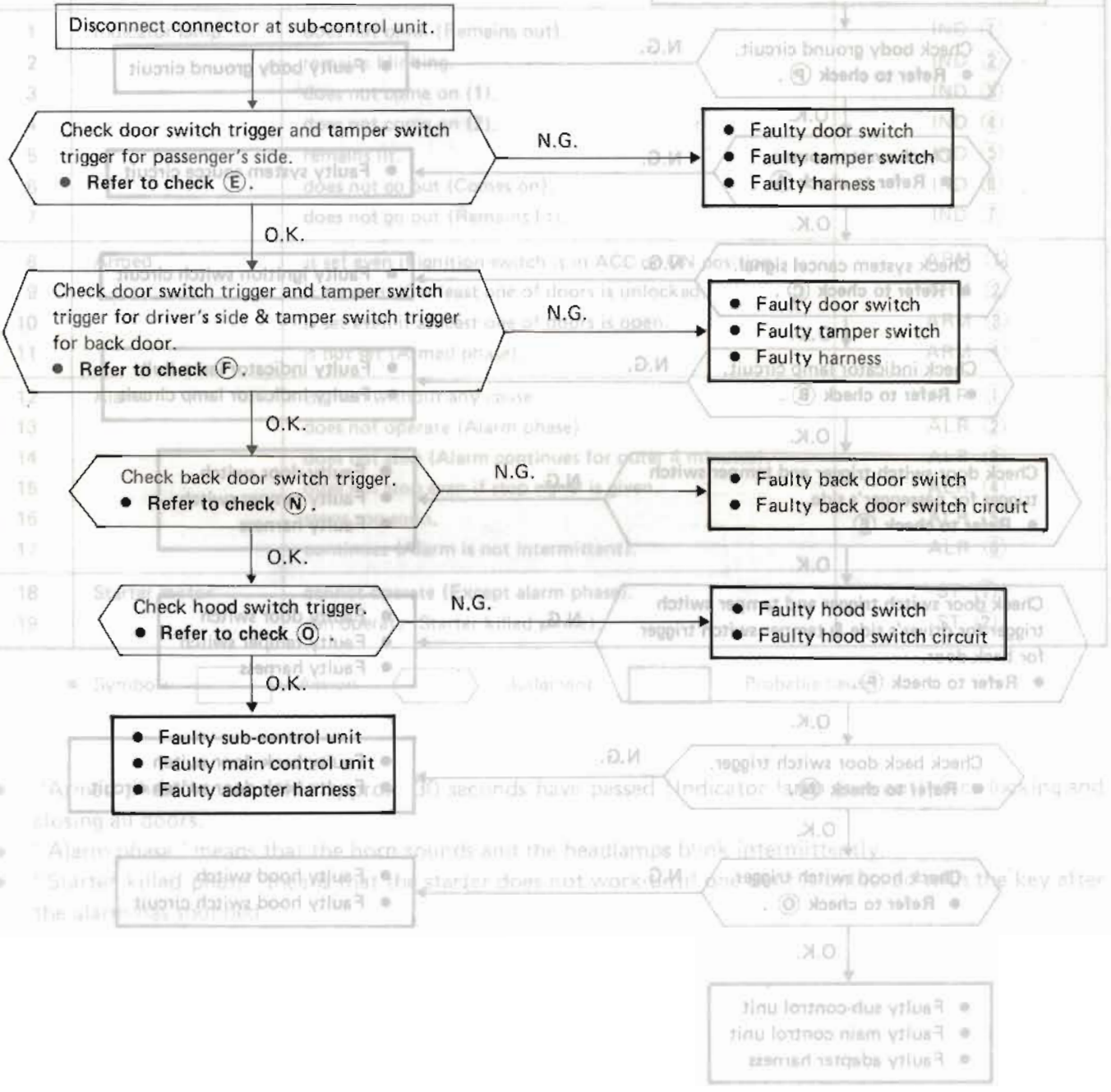
TROUBLE-SHOOTING PROCEDURE IND ①



Trouble-shooting (Cont'd)

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

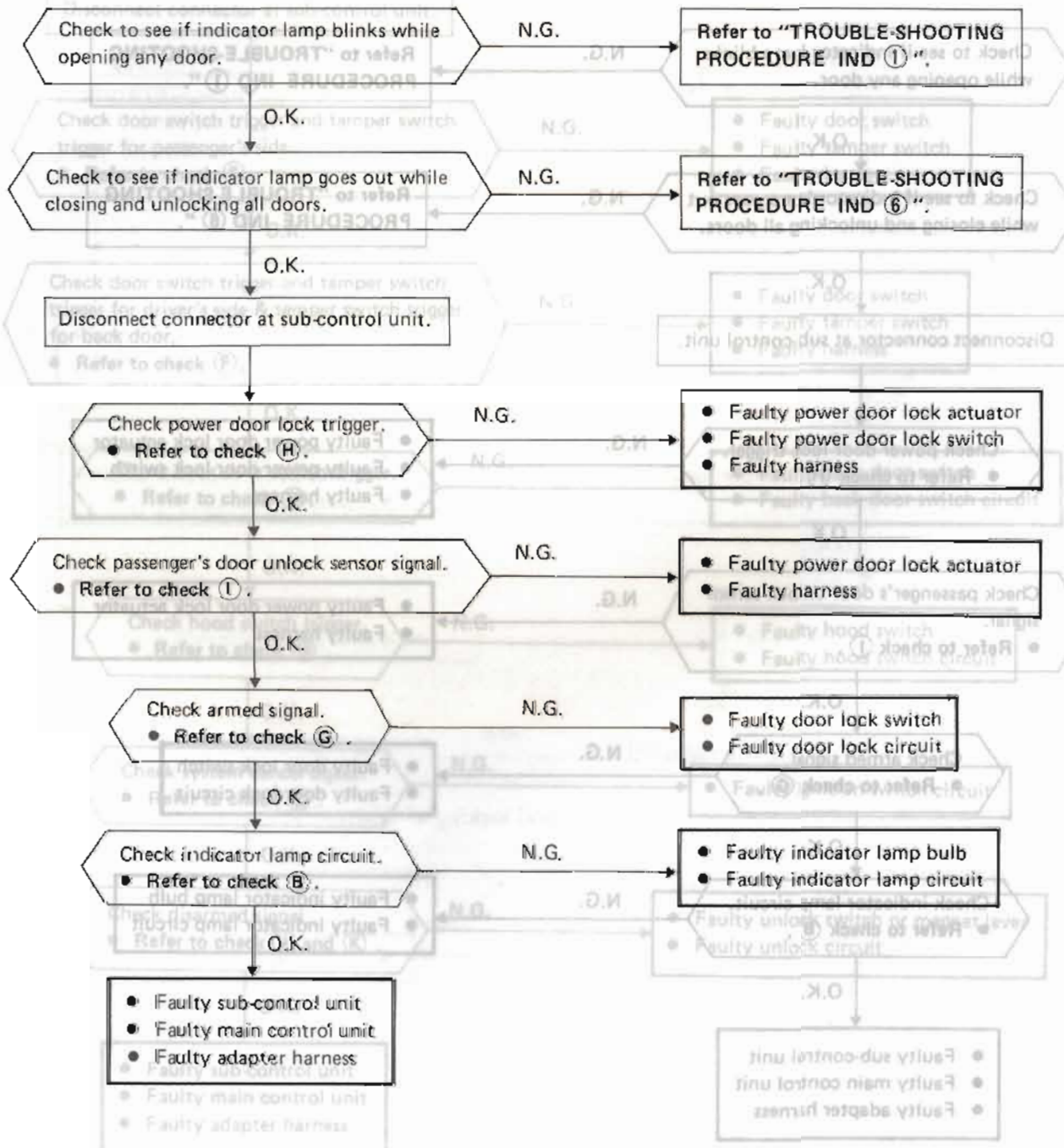
TROUBLE-SHOOTING PROCEDURE IND ②



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.

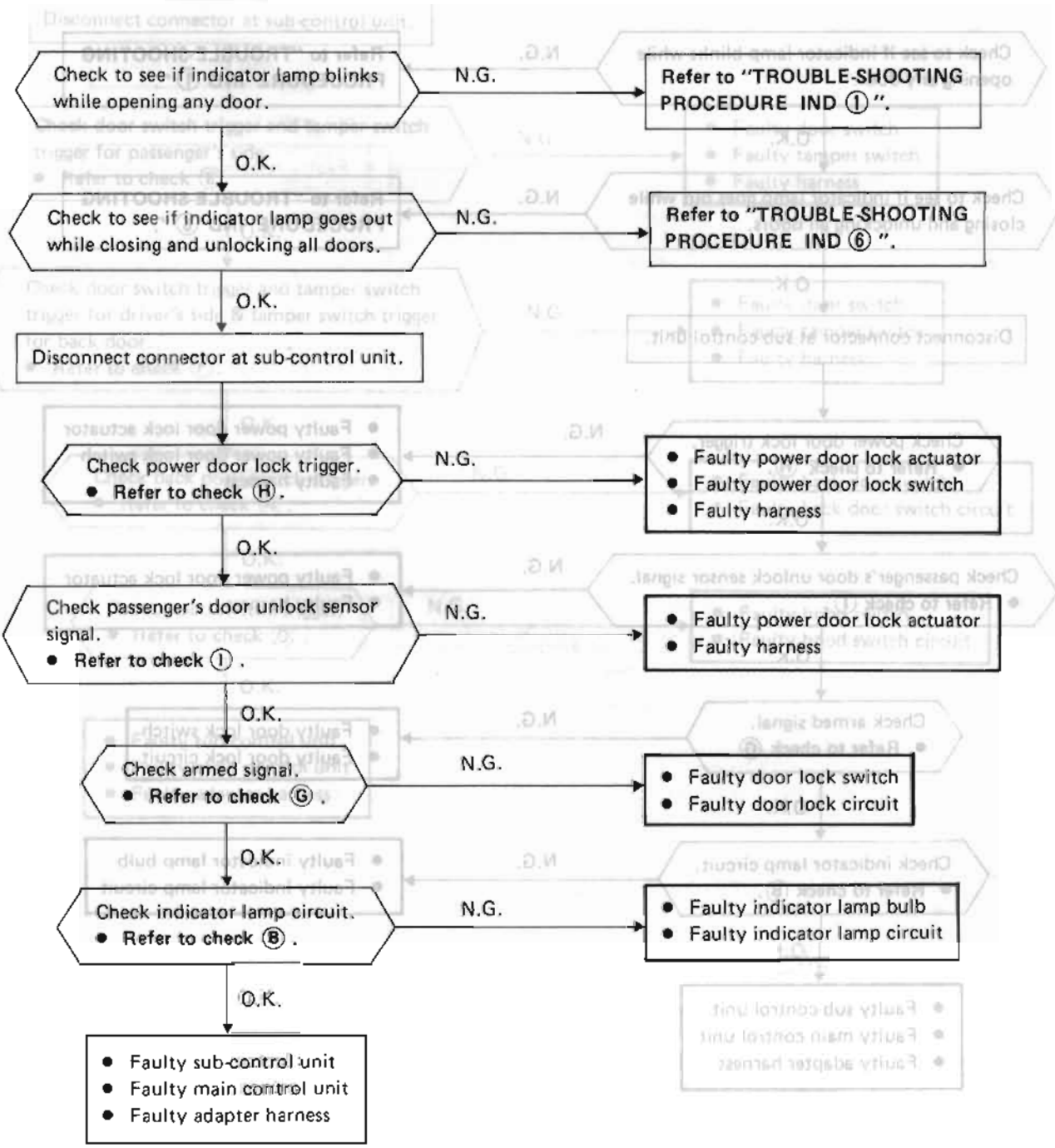
TROUBLE-SHOOTING PROCEDURE IND ③



Trouble-shooting (Cont'd)

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

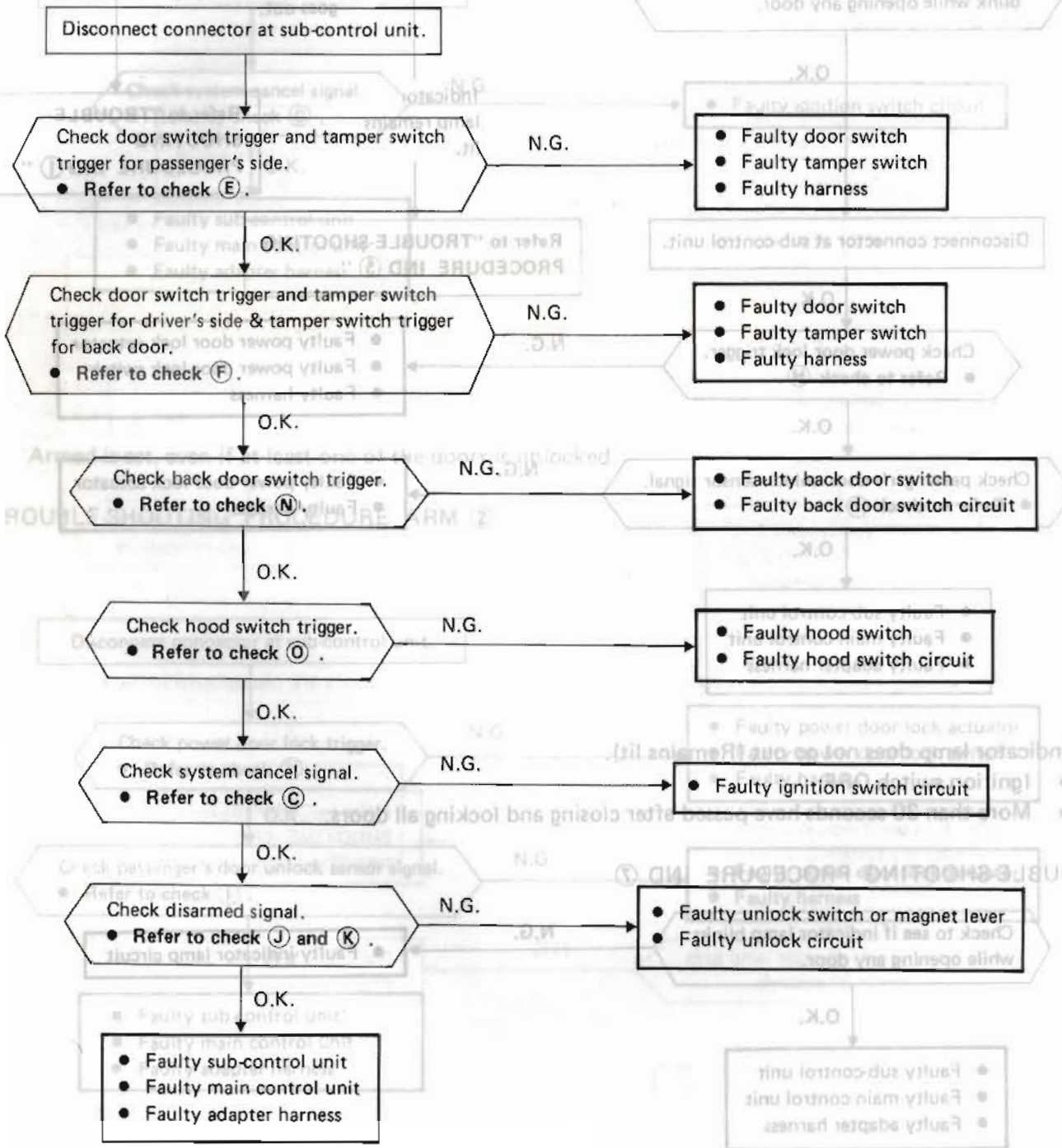


Trouble-shooting (Cont'd)

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

   or
   - Reset the armed phase.

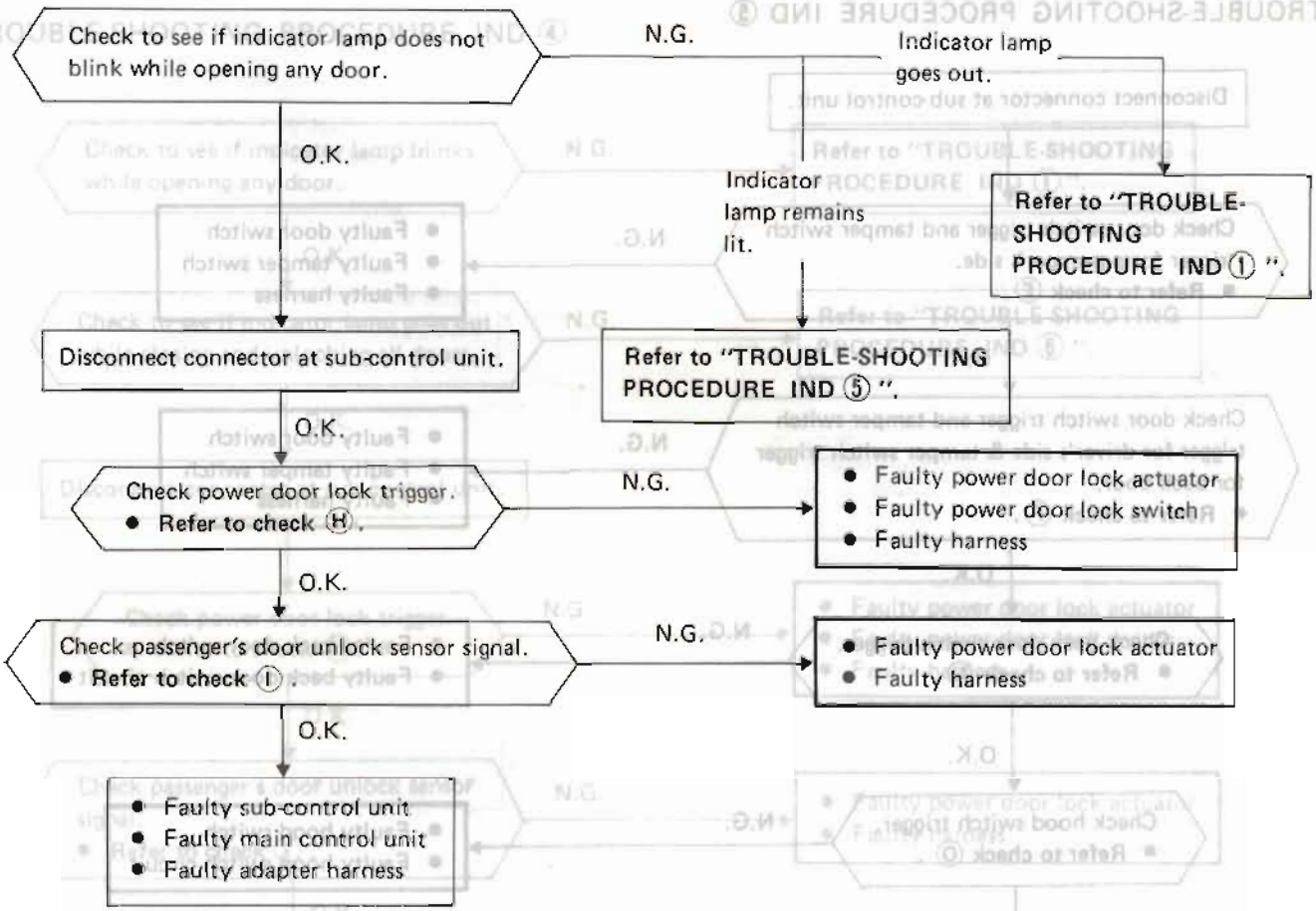
TROUBLE-SHOOTING PROCEDURE IND ⑤



Trouble-shooting (Cont'd)

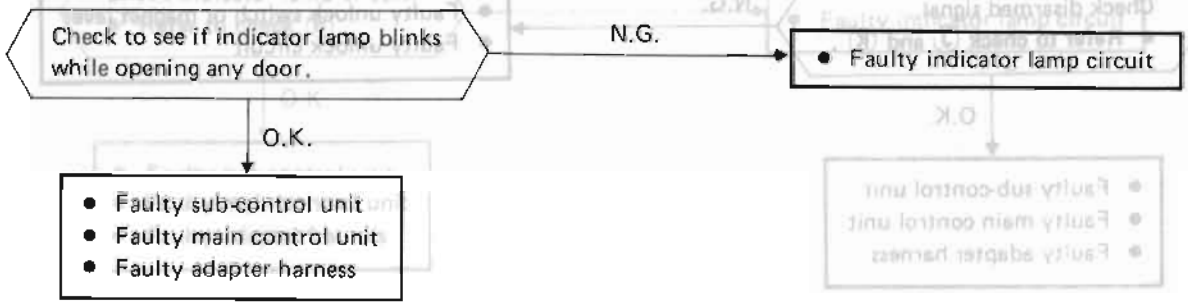
6. Indicator lamp does not go out (Comes on).
   - Ignition switch OFF
   - Doors close and at least one of the doors unlocks.

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.

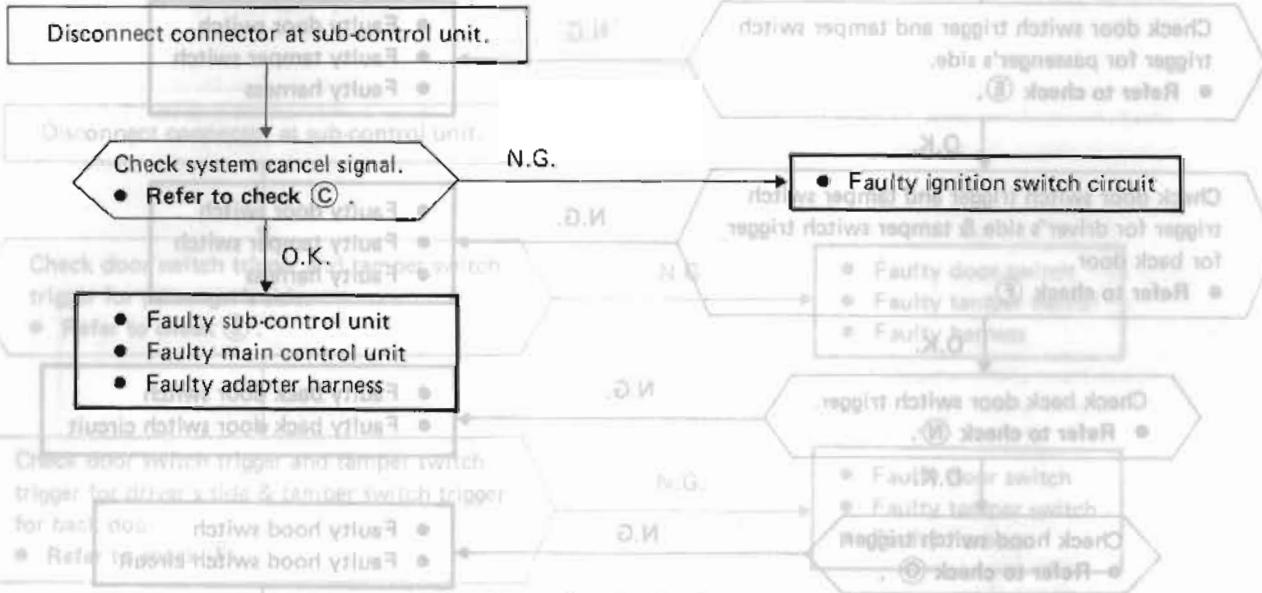
TROUBLE-SHOOTING PROCEDURE IND ⑦



Trouble-shooting (Cont'd)

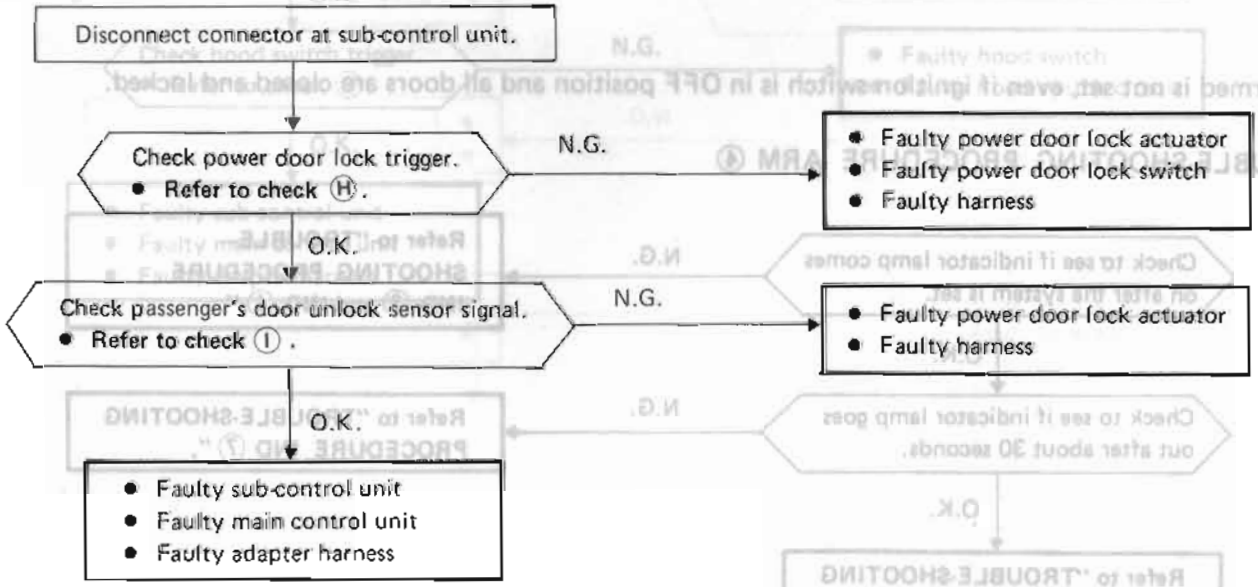
8. Armed is set, even if ignition switch is in ACC or ON position.

TROUBLE-SHOOTING PROCEDURE ARM ①



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

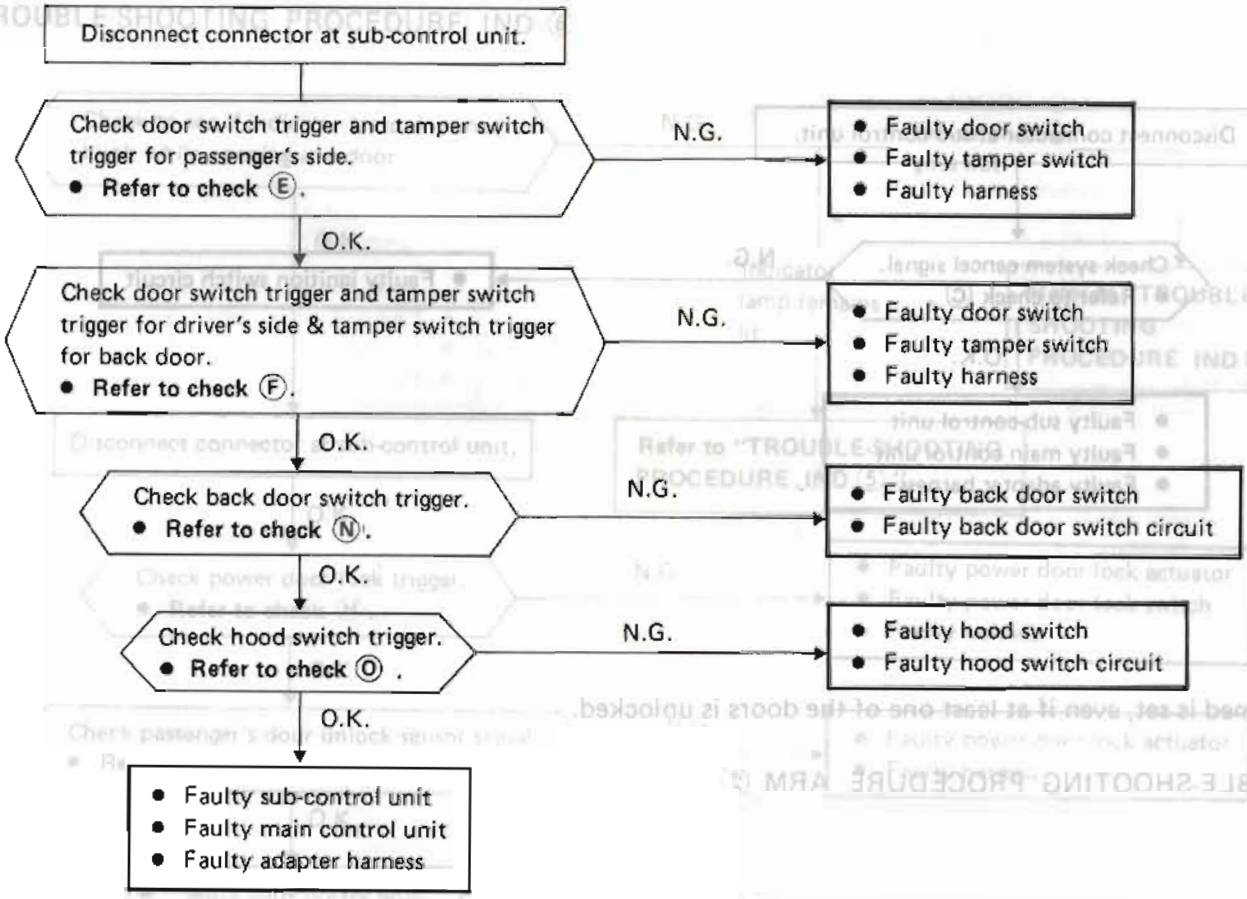
TROUBLE-SHOOTING PROCEDURE ARM ②



Trouble-shooting (Cont'd)

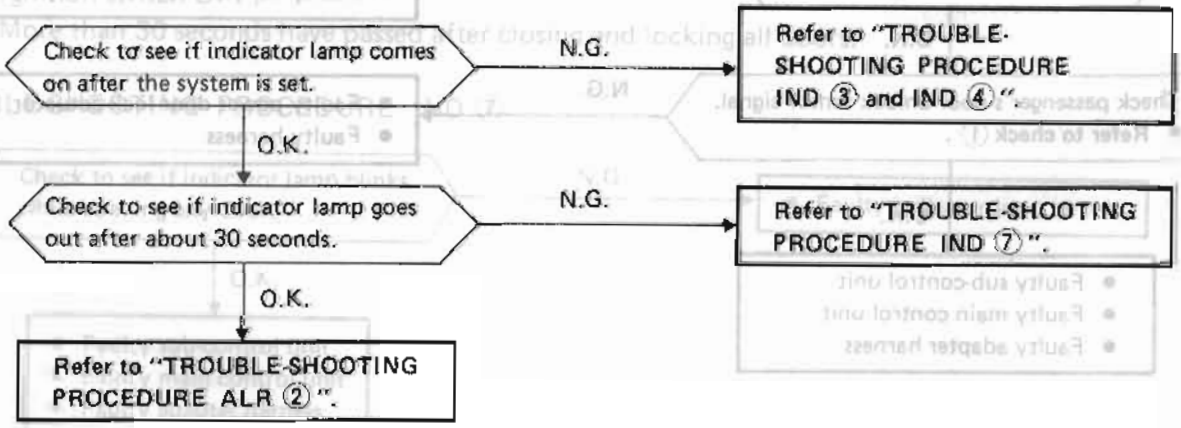
10. Armed is set, even if at least one of the doors is open.

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.

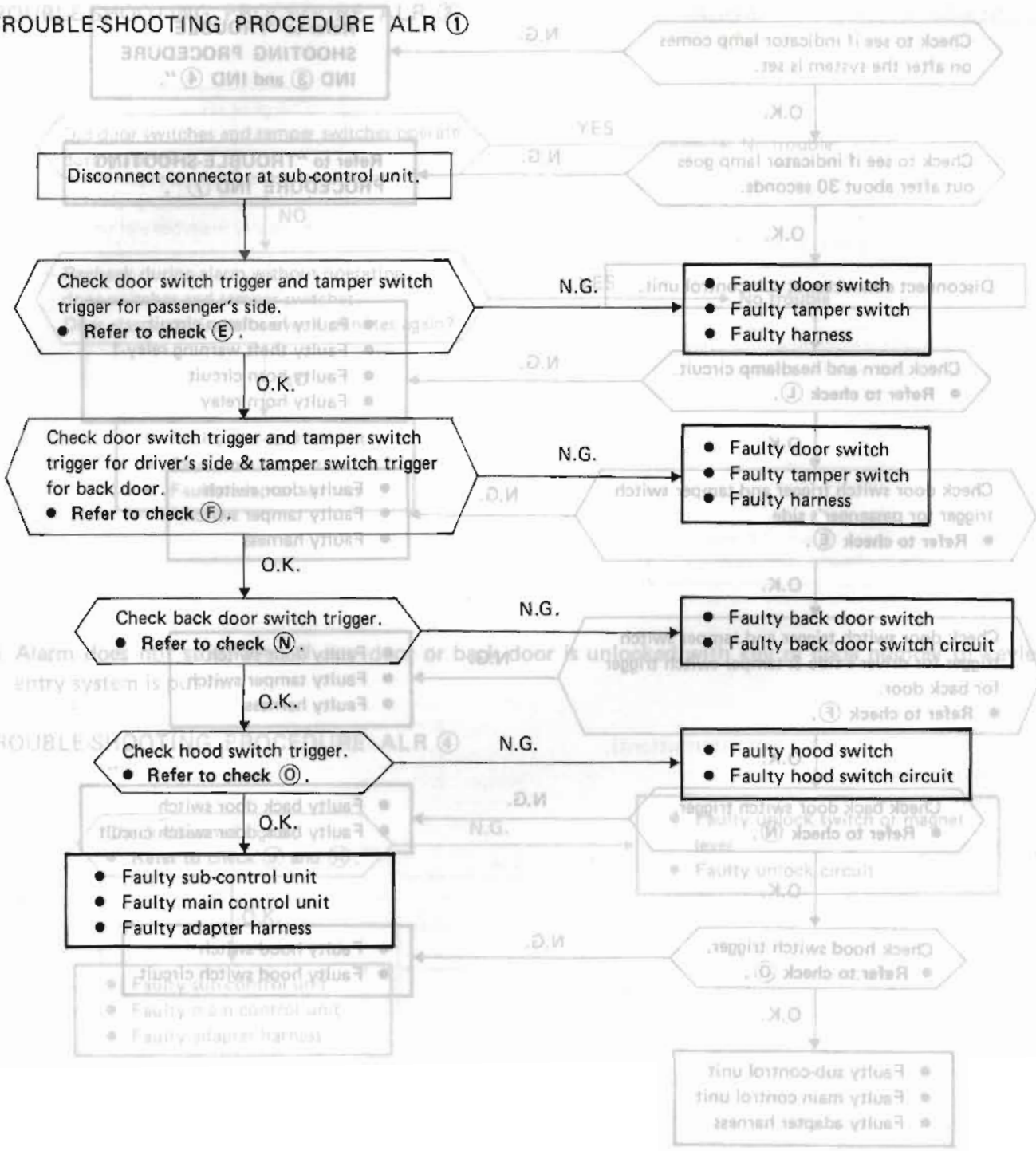
TROUBLE-SHOOTING PROCEDURE ARM ④



Trouble-shooting (Cont'd)

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

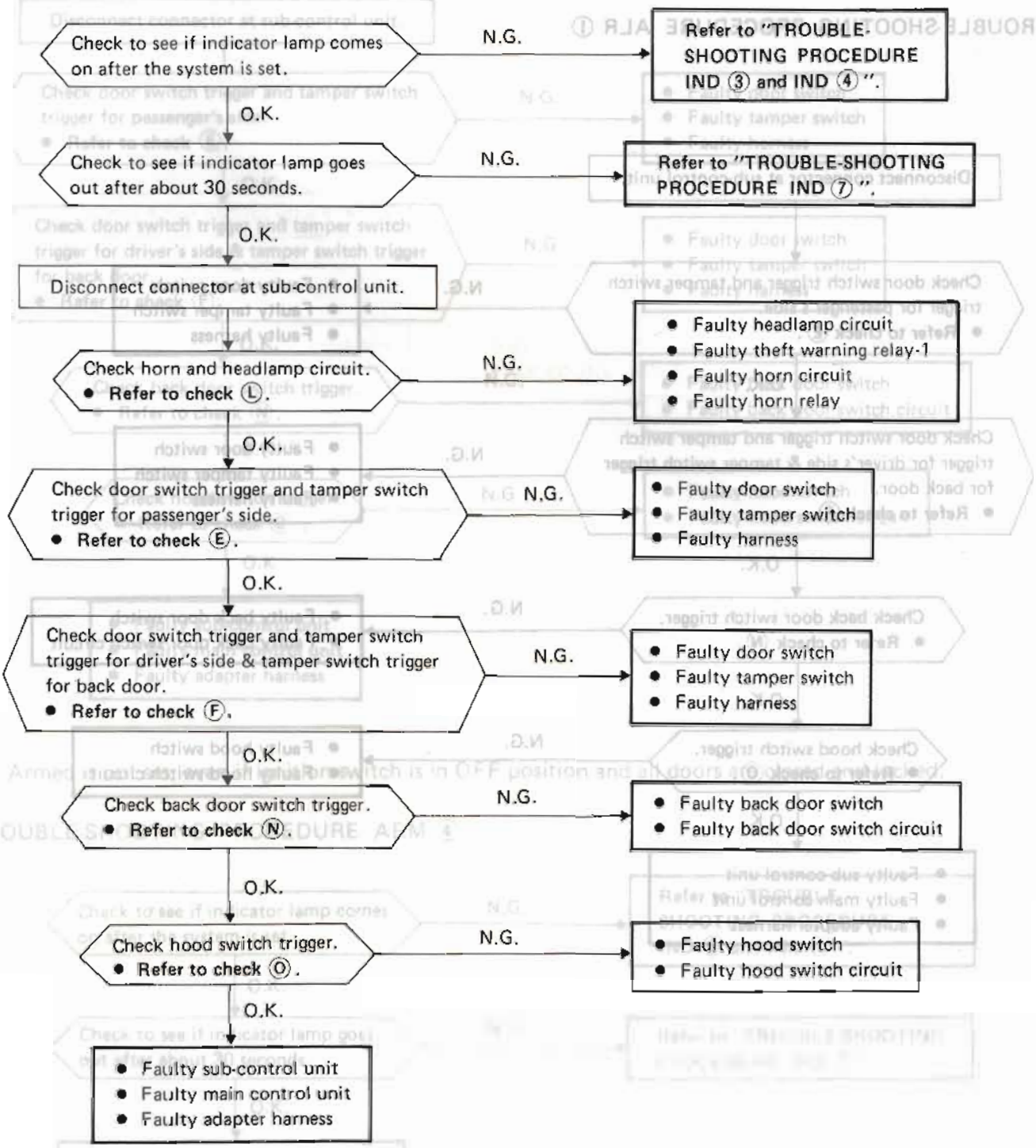
TROUBLE-SHOOTING PROCEDURE ALR ①



Trouble-shooting (Cont'd)

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

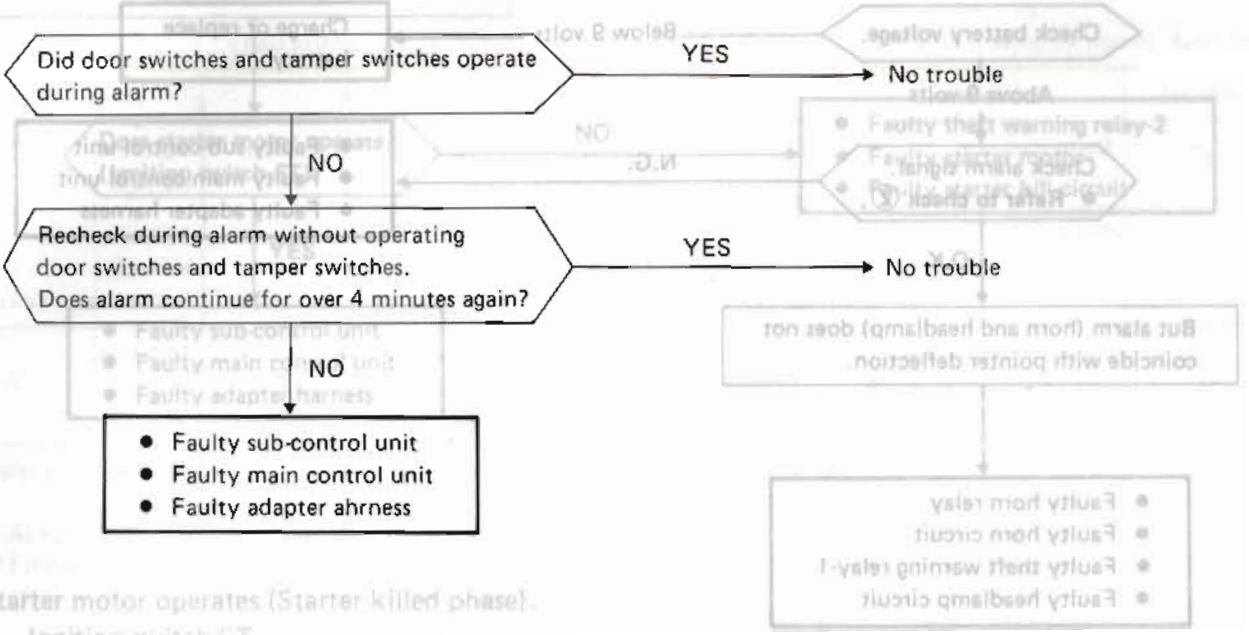
TROUBLE-SHOOTING PROCEDURE ALR ②



Trouble-shooting (Cont'd)

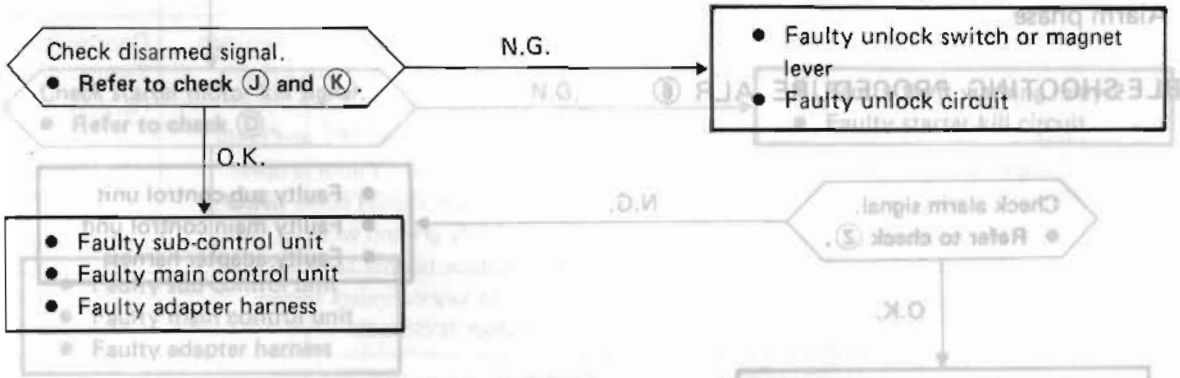
14. Alarm does not stop (Alarm continues for over 4 minutes).
    - Ignition switch OFF
    - Alarm phase

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.

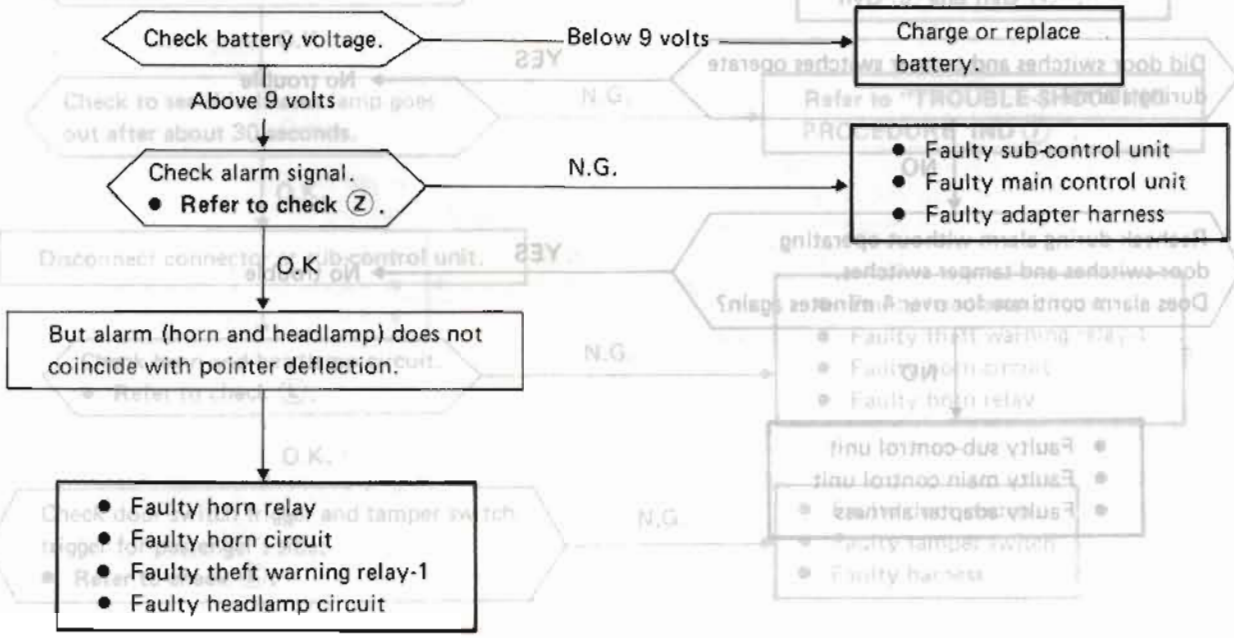
TROUBLE-SHOOTING PROCEDURE ALR ④



Trouble-shooting (Cont'd)

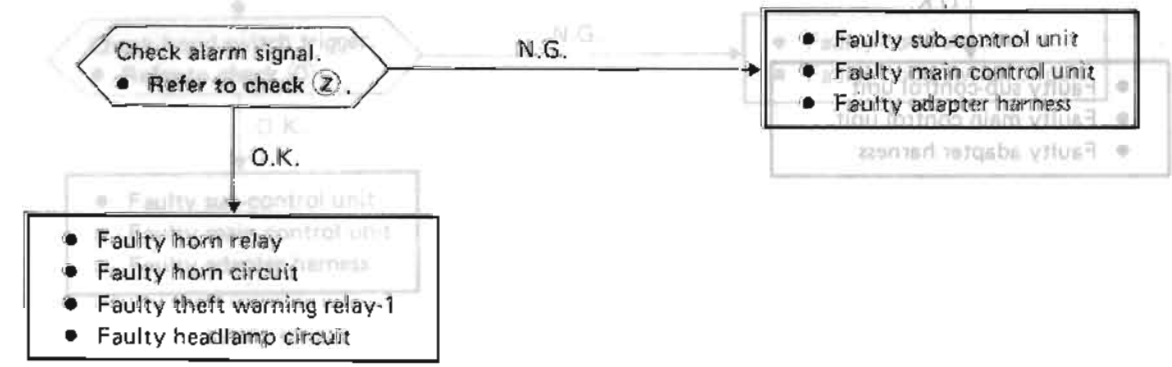
16. Alarm stops too soon (Alarm does not continue for 2 to 4 minutes).
- Ignition switch OFF
- Alarm phase

TROUBLE-SHOOTING PROCEDURE ALR ⑤



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

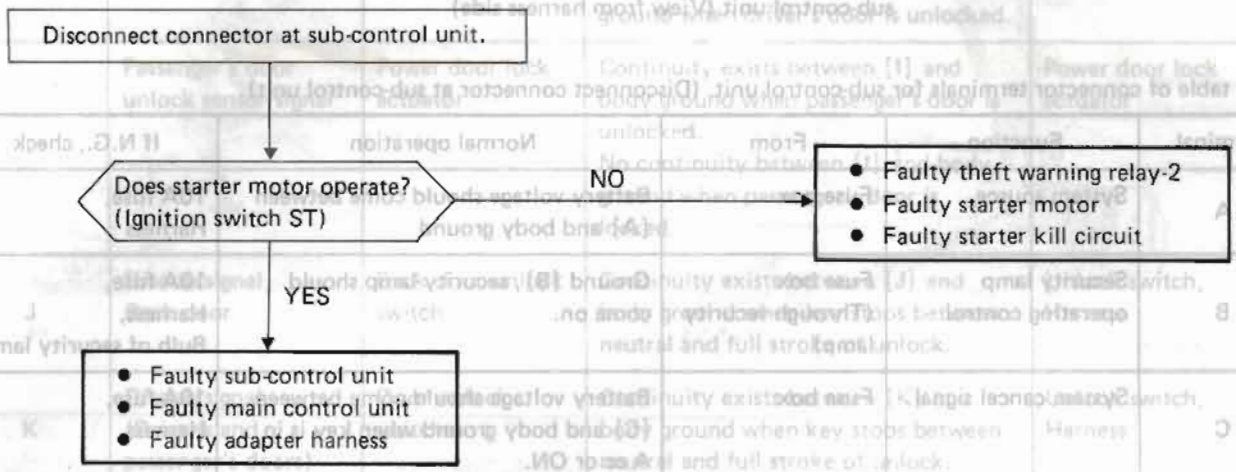
TROUBLE-SHOOTING PROCEDURE ALR ⑥



Trouble-shooting (Cont'd)

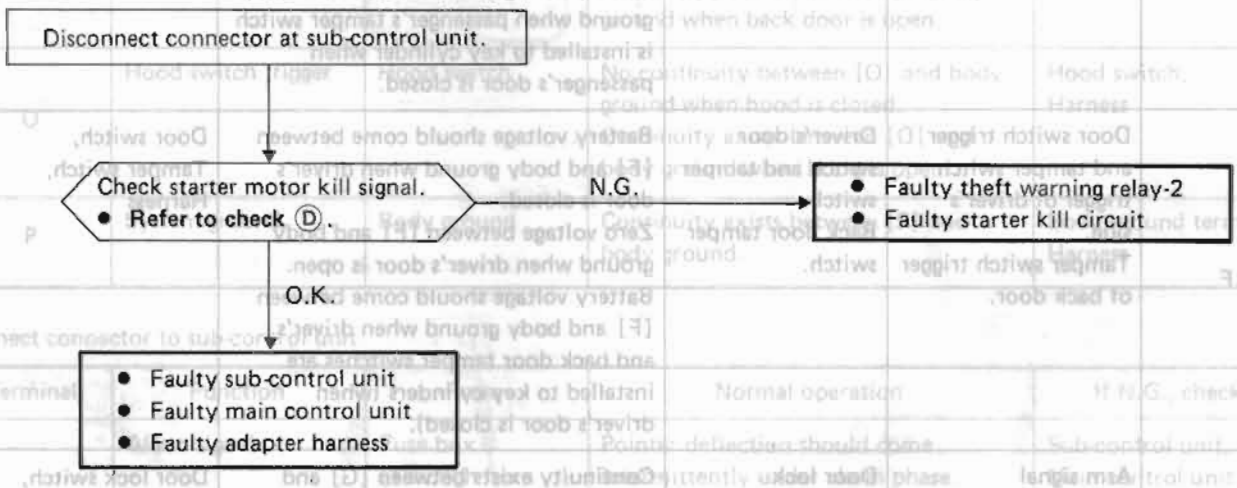
18. Starter motor does not operate (Except alarm phase).
    - Ignition switch ST

TROUBLE-SHOOTING PROCEDURE ST ①

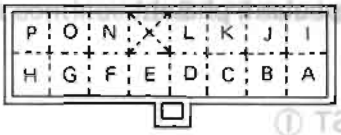


19. Starter motor operates (Starter killed phase).
    - Ignition switch ST

TROUBLE-SHOOTING PROCEDURE ST ②



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

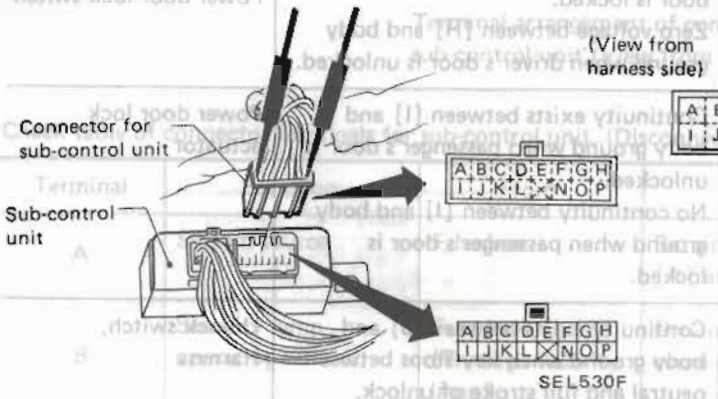
Connect connector to sub-control unit

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

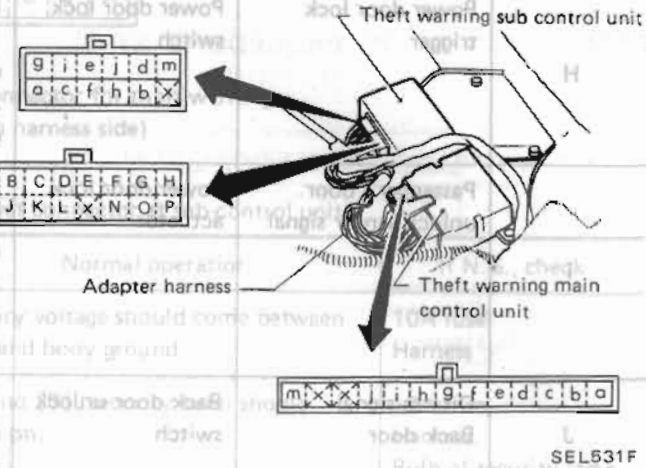
Terminal Check (Cont'd)

Preparation for check

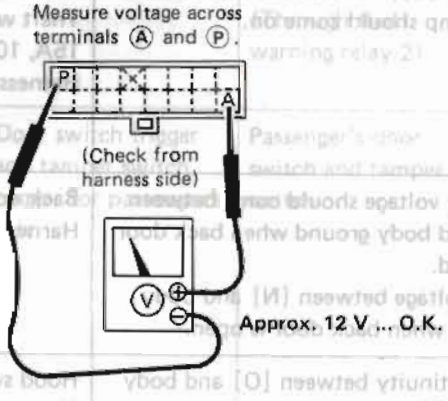
- Disconnect body harness connector at sub-control unit. (Except check Ⓩ)



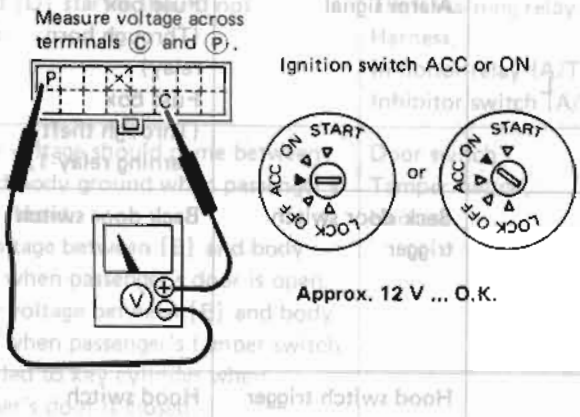
Terminal arrangement for check
(View from harness side)



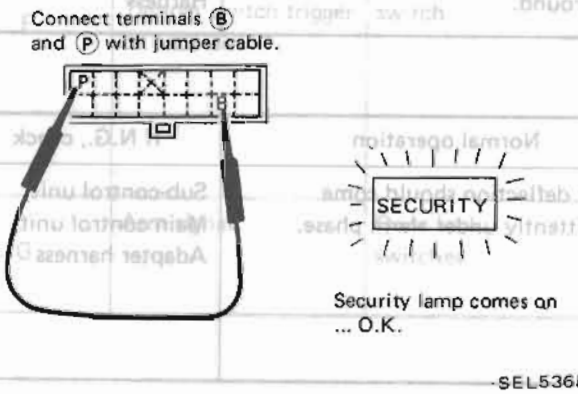
CHECK Ⓐ ... System source check



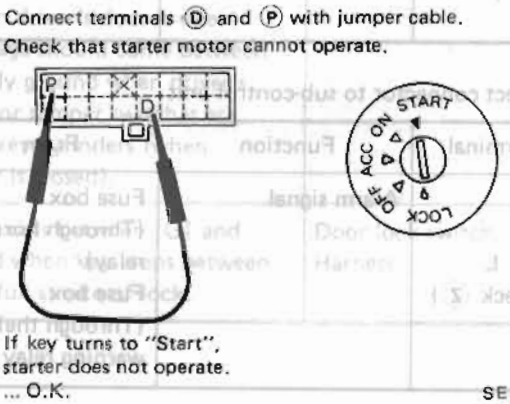
CHECK Ⓒ ... System cancel signal check



CHECK Ⓑ ... Security lamp circuit check

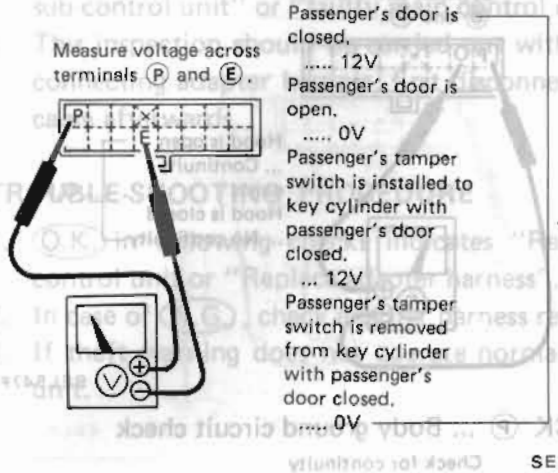


CHECK Ⓓ ... Starter kill signal check



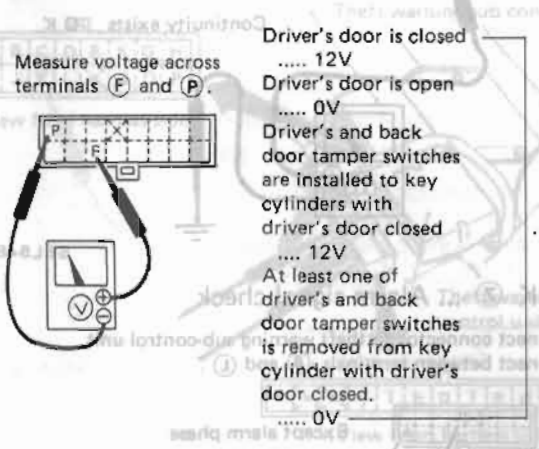
Terminal Check (Cont'd)

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



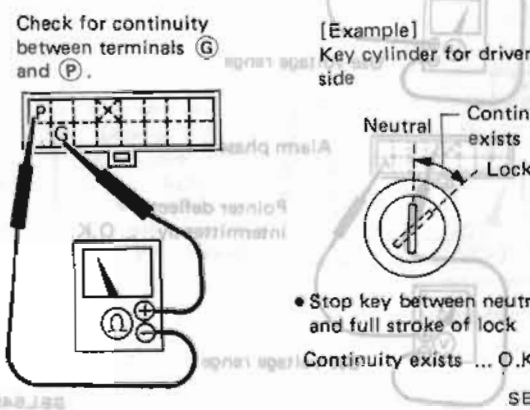
SEL539F

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



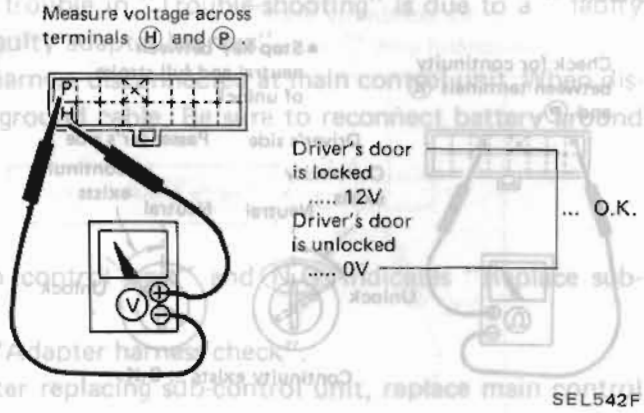
SEL540F

CHECK Ⓖ ... Arm signal check



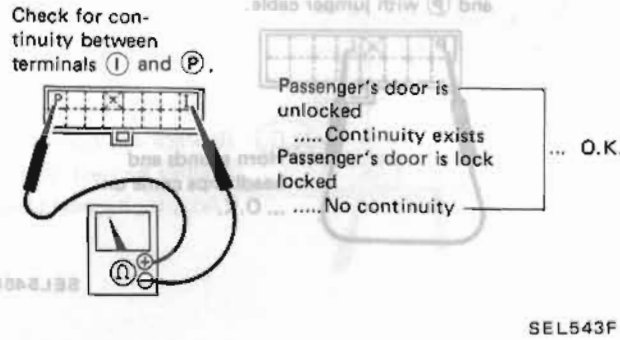
SEL541F

CHECK Ⓗ ... Power door lock trigger



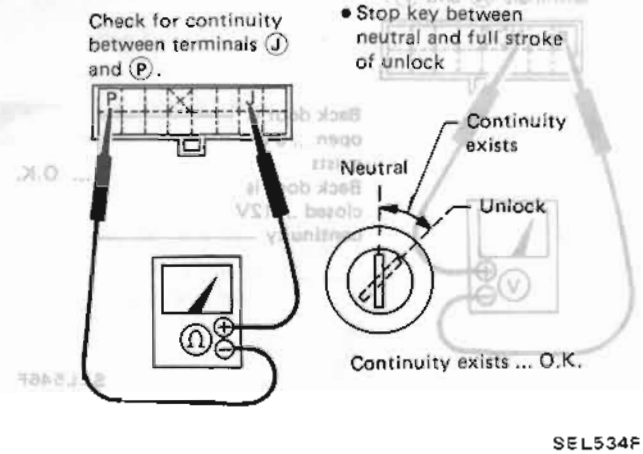
SEL542F

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



SEL543F

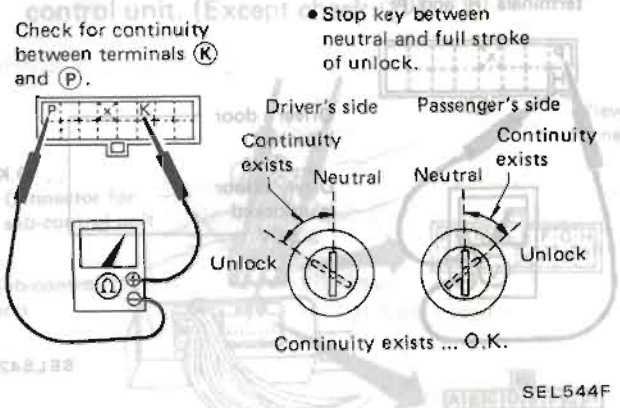
CHECK Ⓙ ... Disarm signal of back door unlock switch check



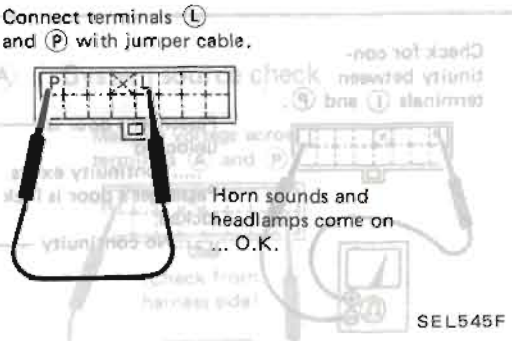
SEL534F

Terminal Check (Cont'd)

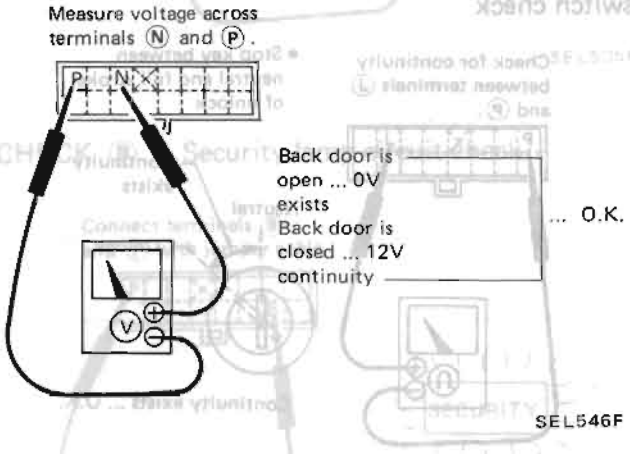
CHECK Ⓚ ... Disarm signal of door unlock switch check



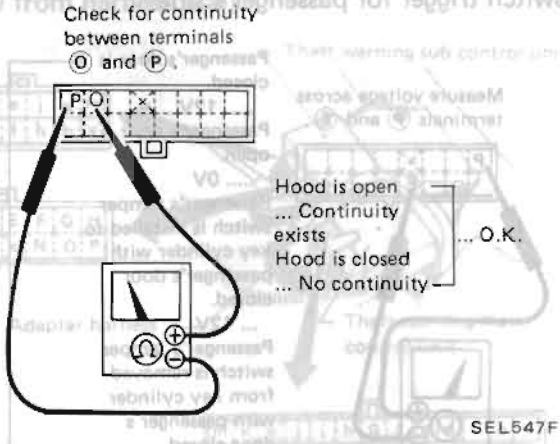
CHECK Ⓛ ... Alarm check



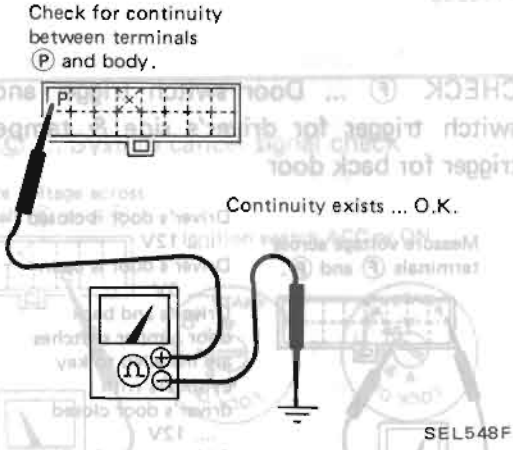
CHECK Ⓝ ... Back door switch trigger check



CHECK Ⓞ ... Hood switch trigger check

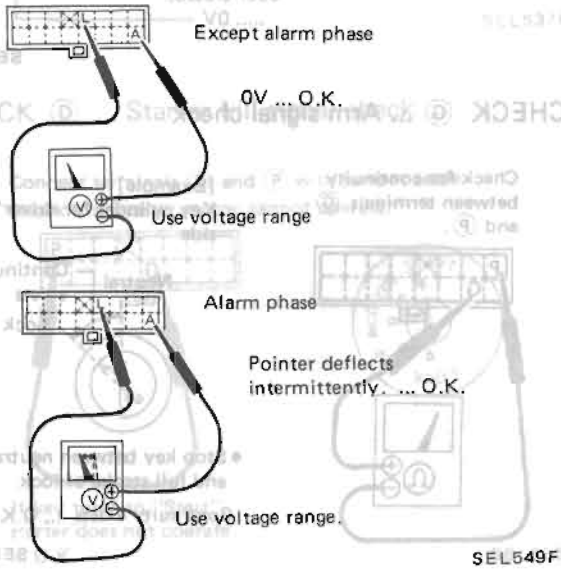


CHECK Ⓟ ... Body ground circuit check



CHECK Ⓩ ... Alarm signal check

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



Control Unit Check

CONTROL UNIT INSPECTION

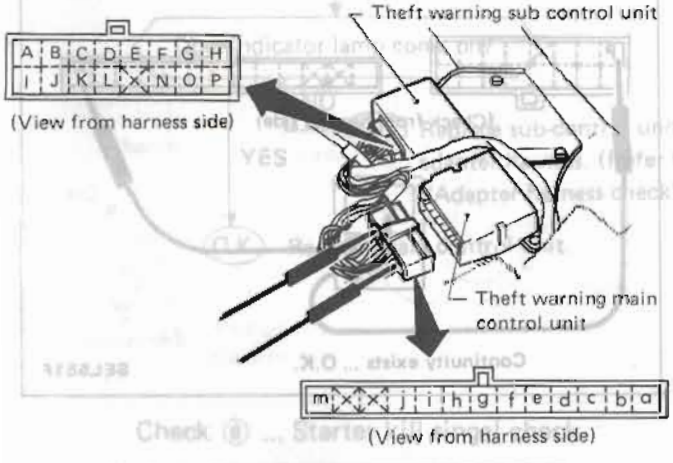
- This inspection is available only when the cause of trouble in "Trouble-shooting" is due to a " faulty sub-control unit" or "faulty main control unit" or "faulty adapter harness".
- This inspection should be carried out with adapter harness disconnected at main control unit. When disconnecting adapter 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

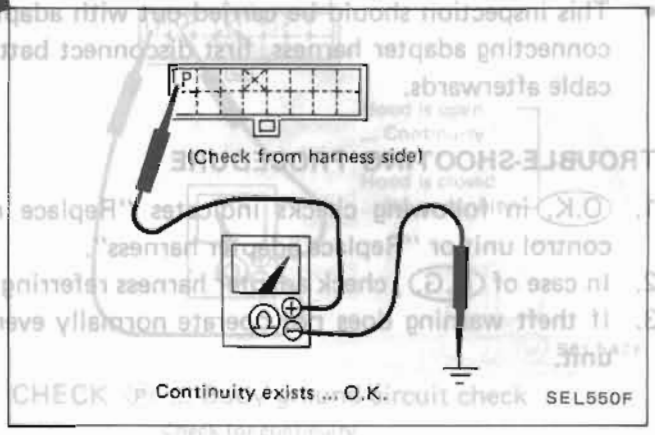
Control Unit Check (Cont'd)

Check ⓐ ... Ground circuit check

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

N.G. → Faulty ground circuit

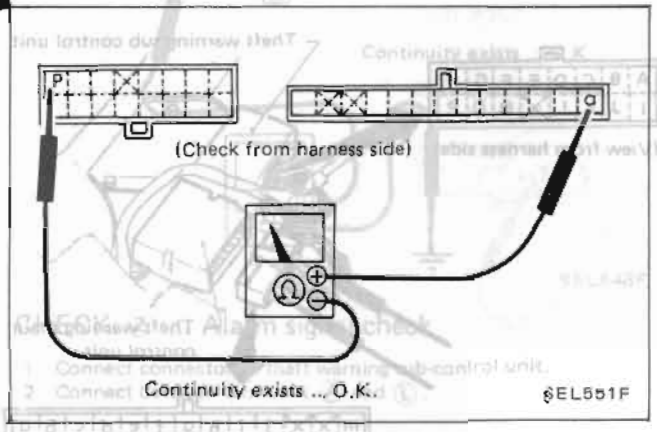
O.K.



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.



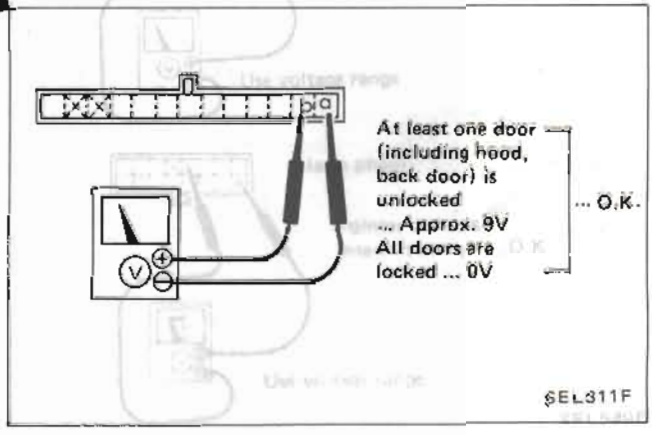
(O.K.) Replace main control unit.

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".)

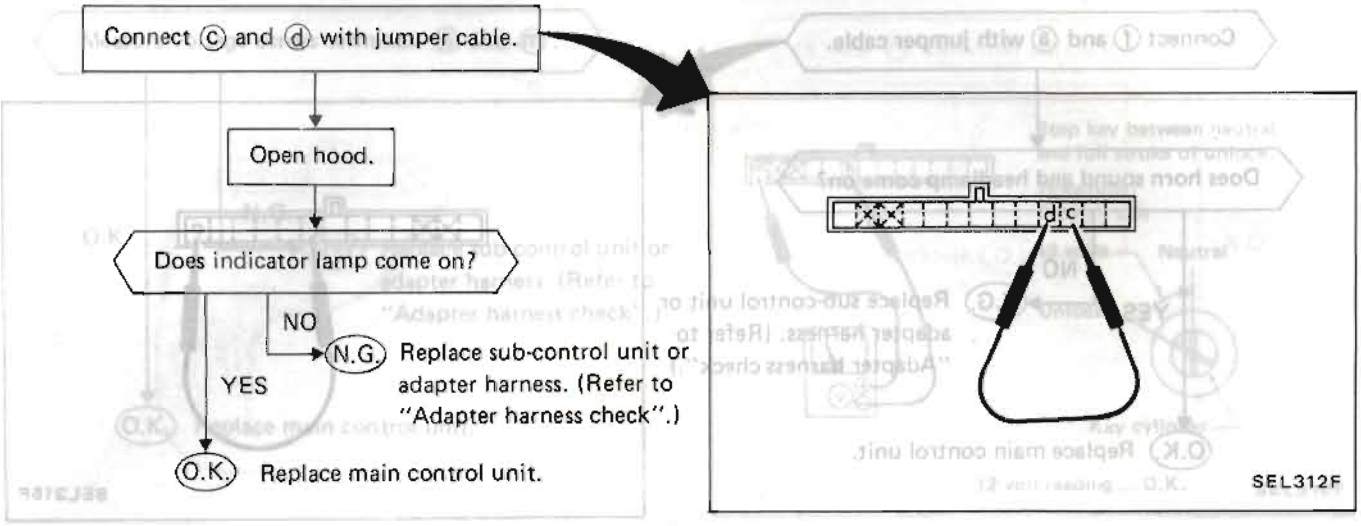
O.K.



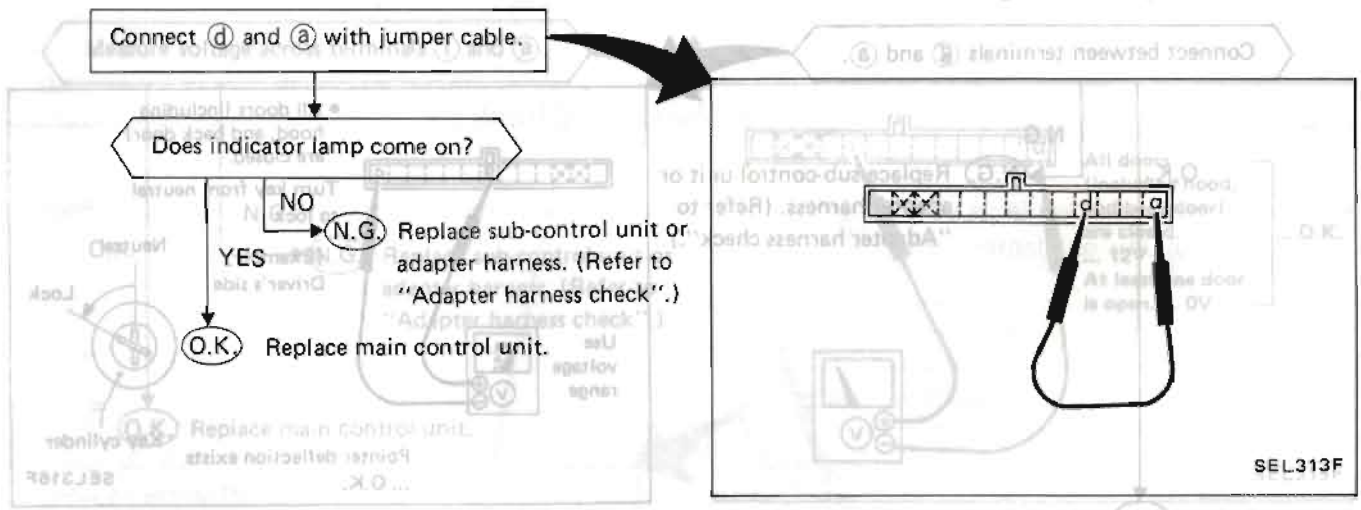
(O.K.) Replace main control unit.

Control Unit Check (Cont'd)

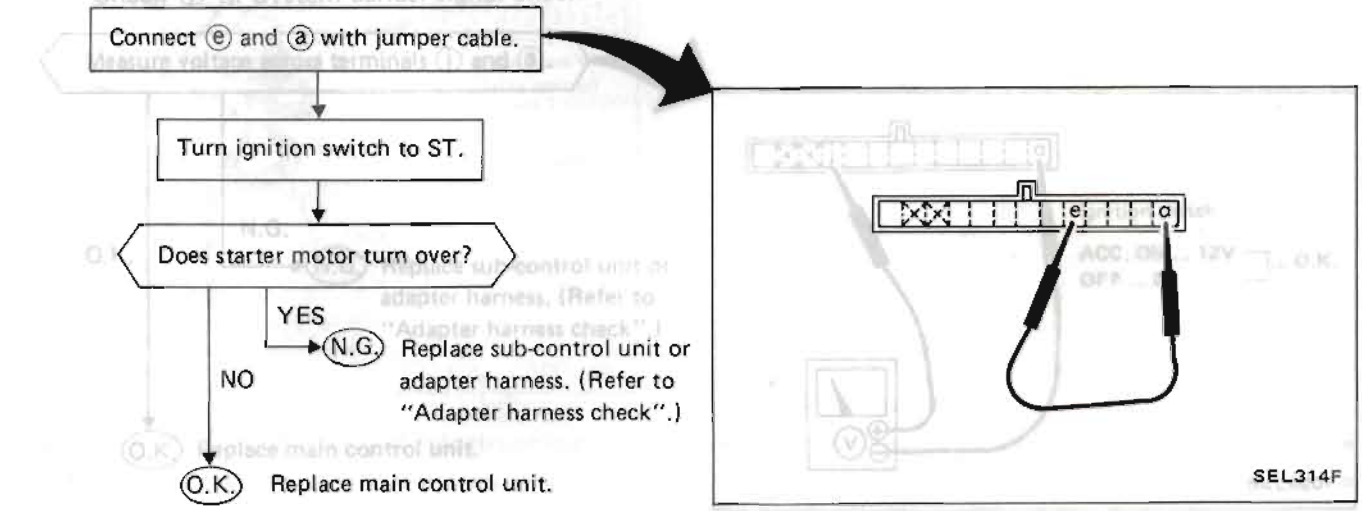
Check ⓒ ... Hood signal check



Check ⓓ ... Indicator lamp circuit check



Check ⓔ ... Starter kill singal check



Control Unit Check (Cont'd)

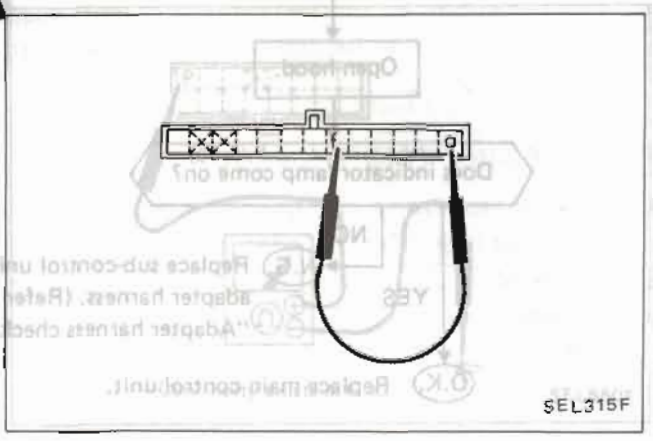
Check ⓕ ... Alarm check

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.

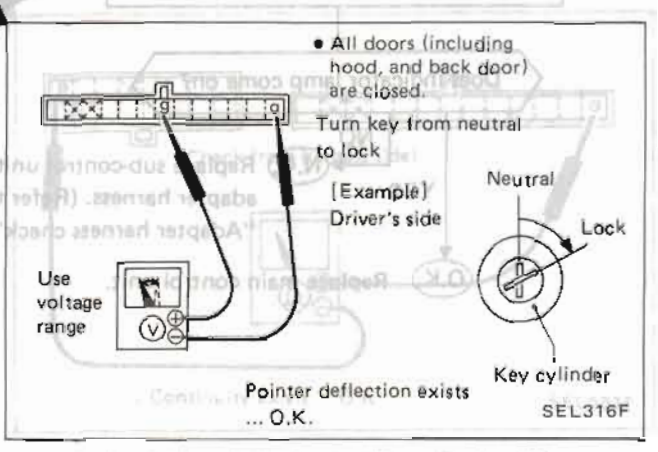


Check ⓖ ... Arm signal check

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.



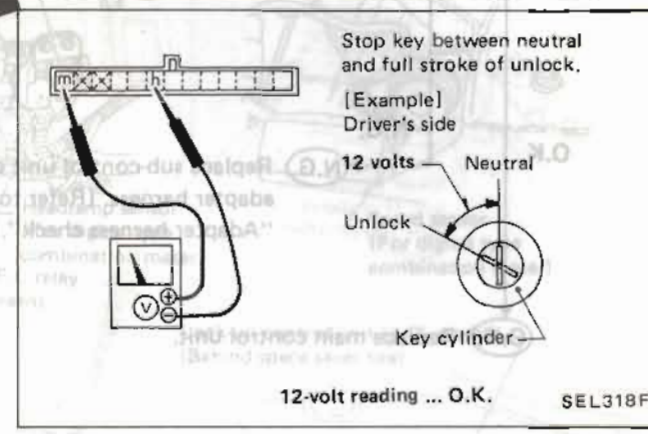
Control Unit Check (Cont'd)

Check ⓗ ... Unlock signal check

Measure voltage across terminals ⓗ and ⓜ.

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

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

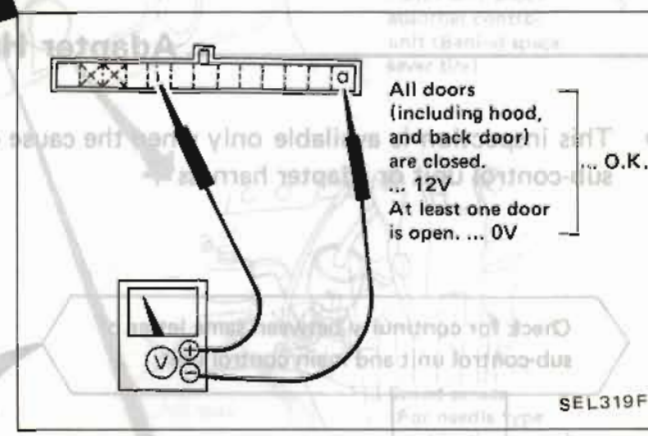


Check ⓘ ... Door switch signal check

Measure voltage across terminals ⓘ and ⓐ.

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

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

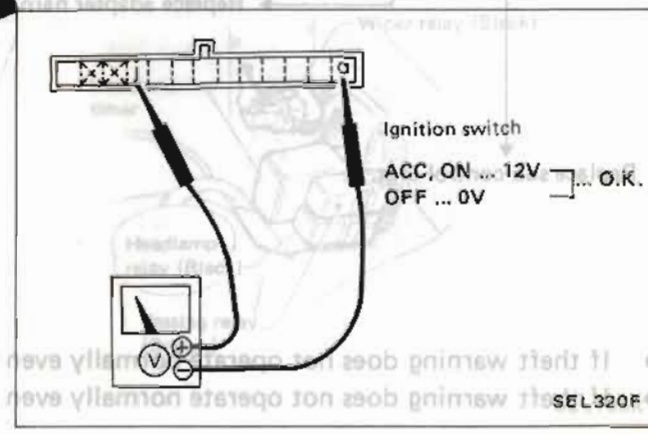


Check ⓙ ... System cancel signal check

Measure voltage across terminals ⓙ and ⓐ.

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

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



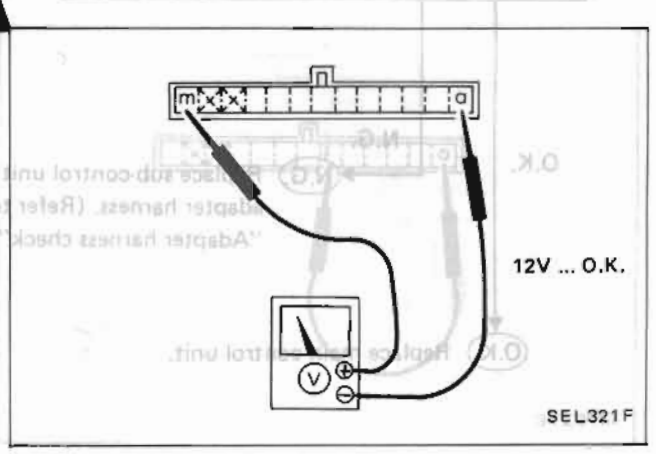
Control Unit Check (Cont'd)

Check ⓜ ... System source check

Measure voltage across terminals ⓜ and ⓐ.

O.K. → Replace main control unit.

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



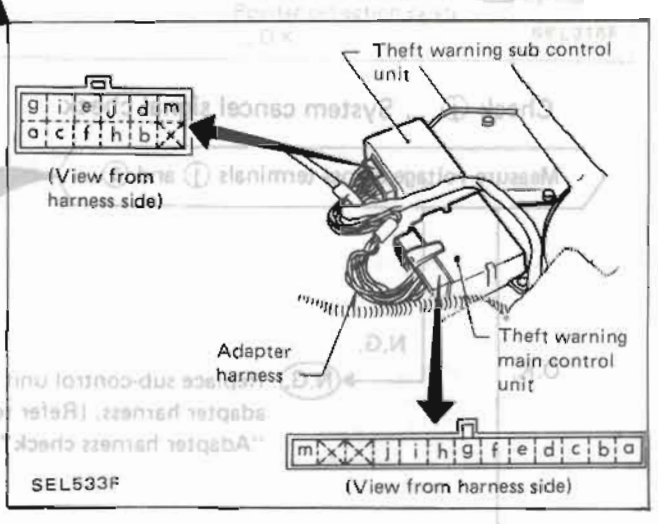
Adapter Harness Check

- 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.

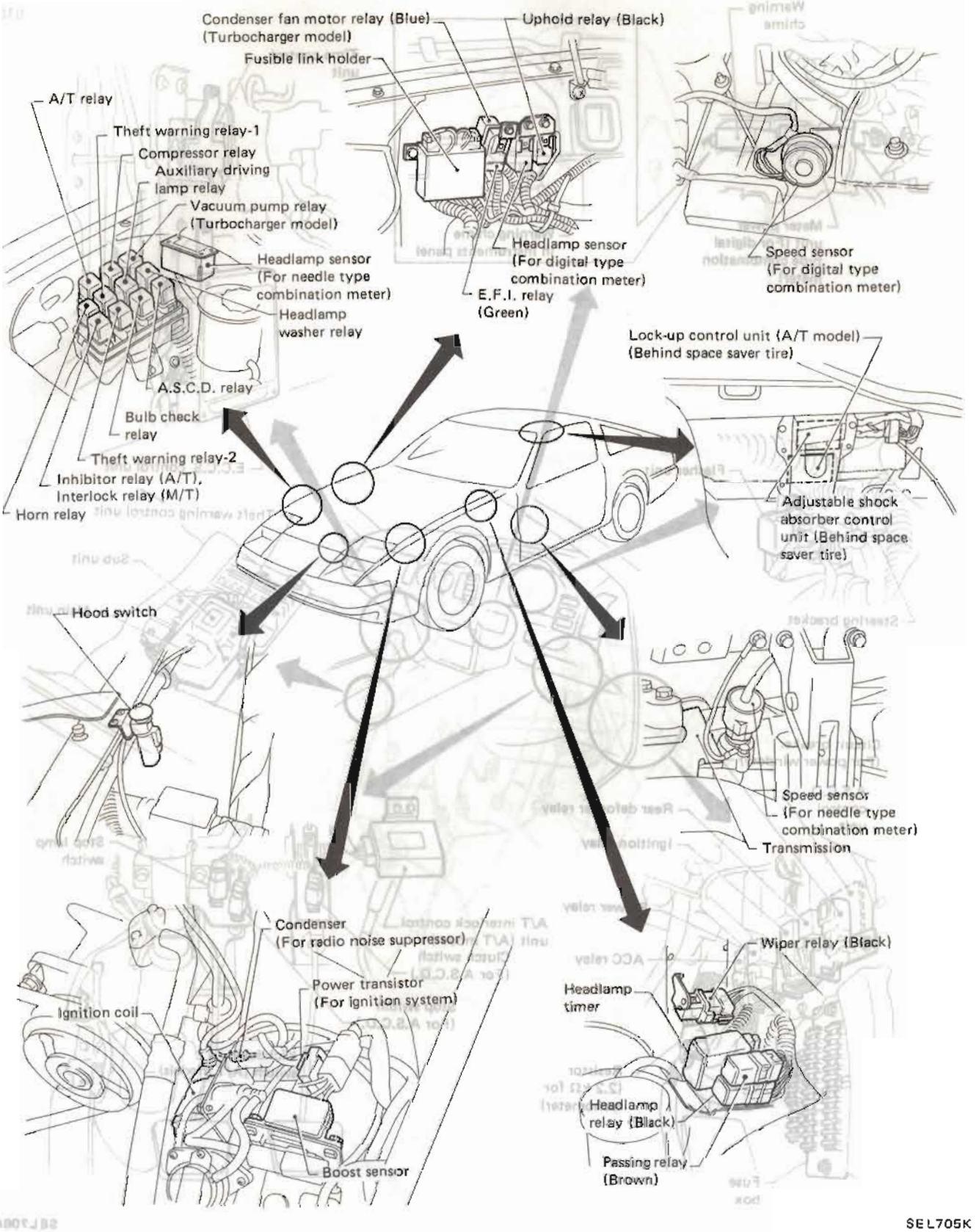
O.K. → Replace sub-control unit.

N.G. → Replace adapter harness.



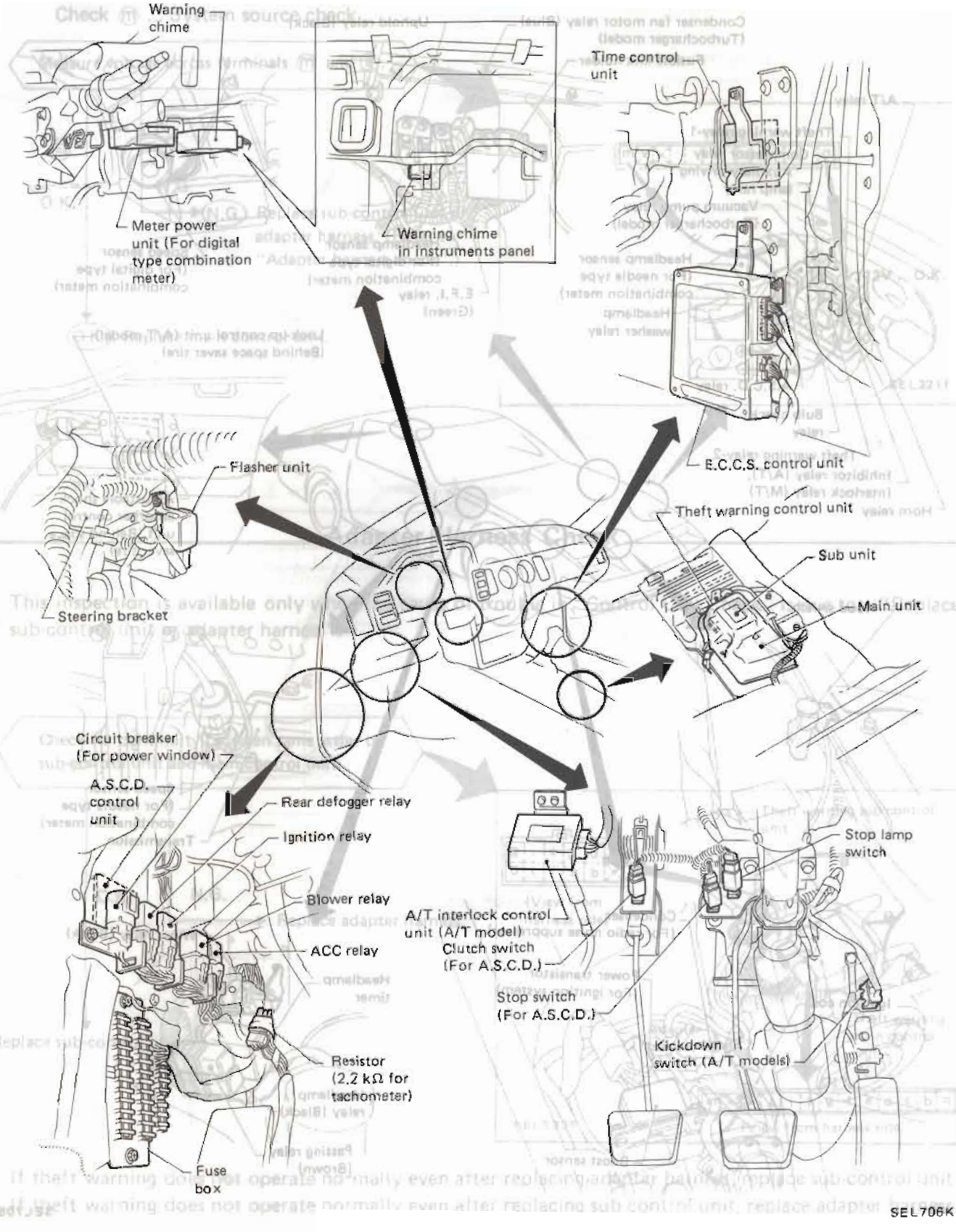
- If theft warning does not operate normally even after replacing adapter harness, replace sub-control unit.
- If theft warning does not operate normally even after replacing sub-control unit, replace adapter harness.

LOCATION OF ELECTRICAL UNITS

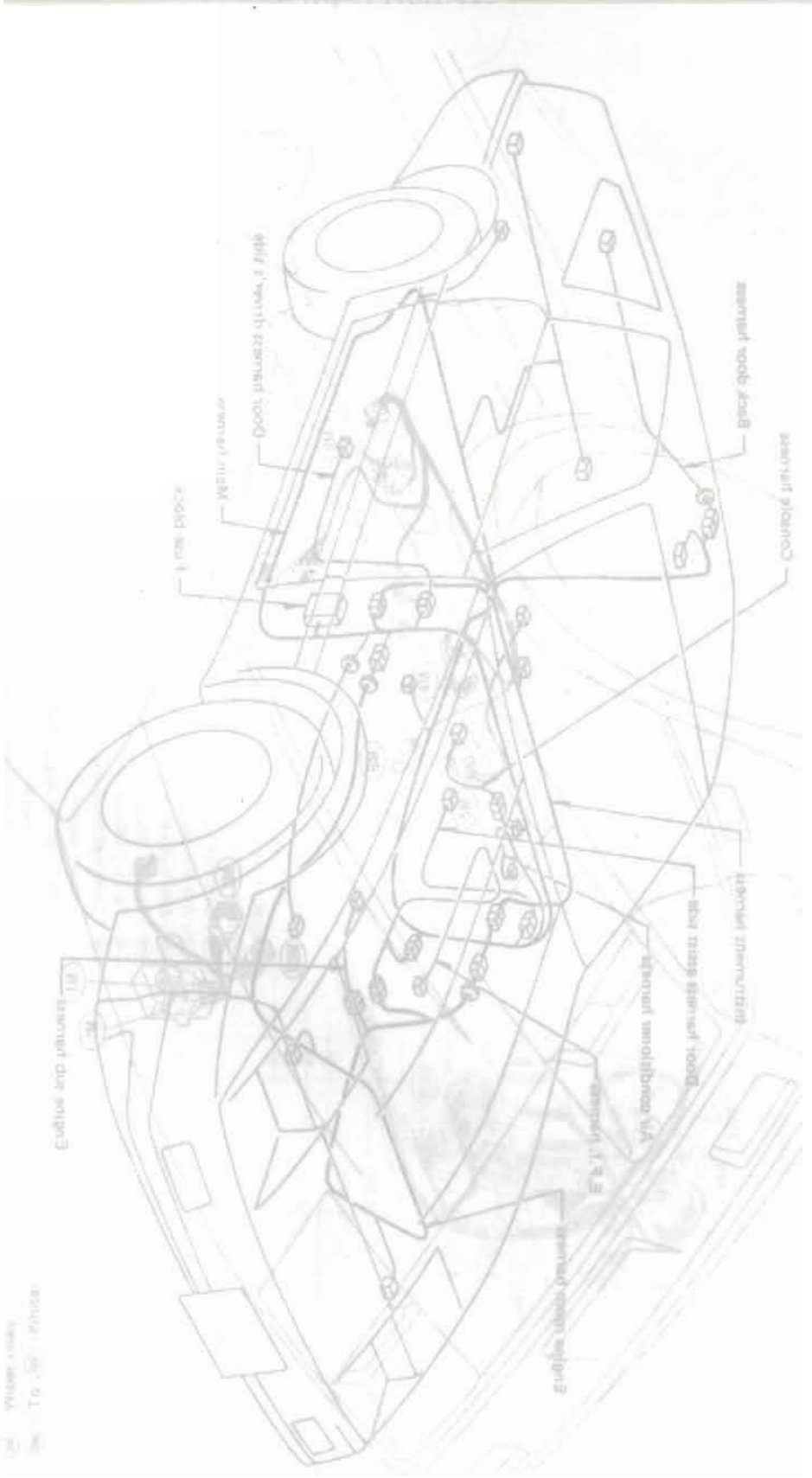


SEL705K

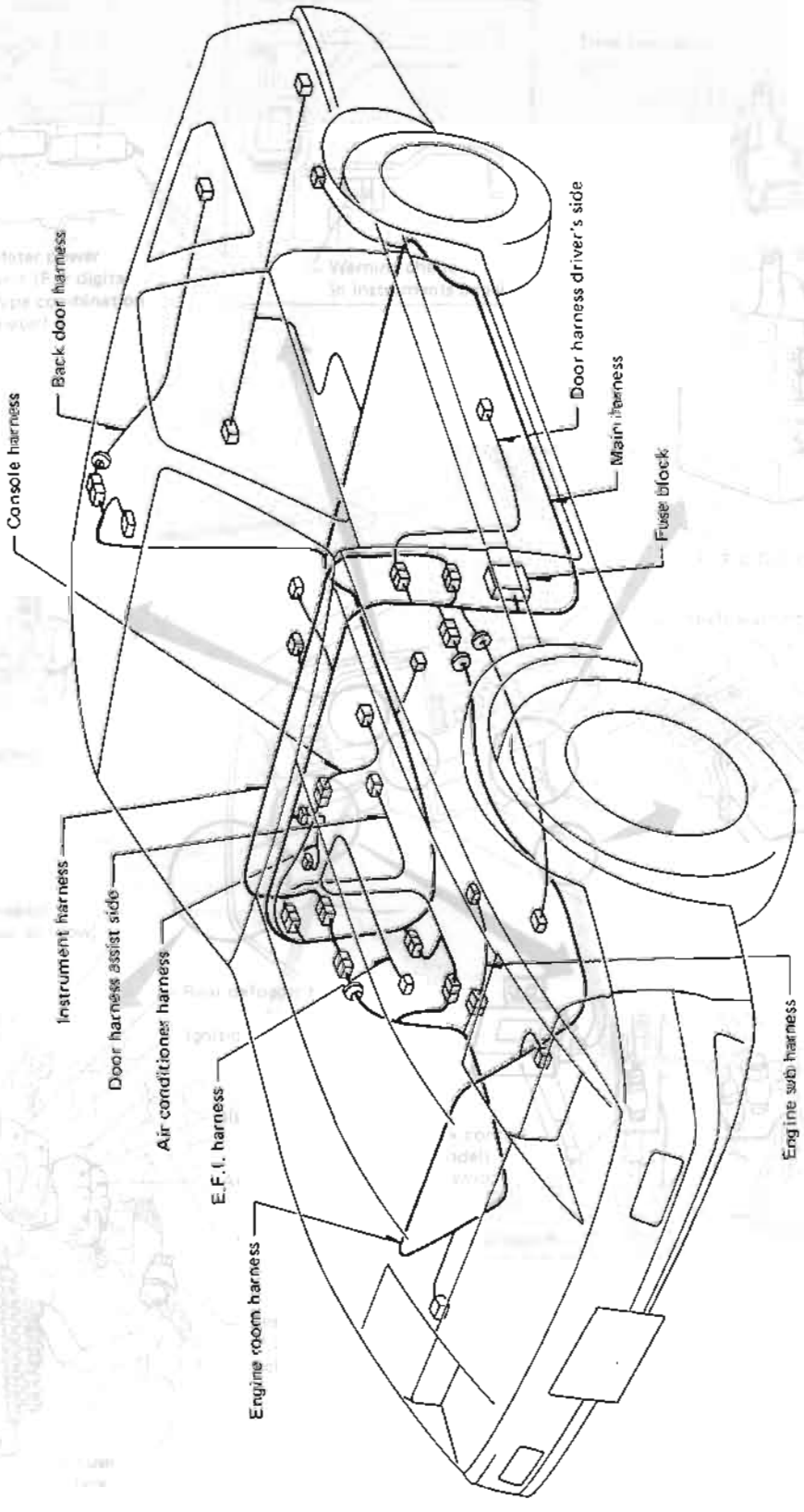
LOCATION OF ELECTRICAL UNITS



Note:

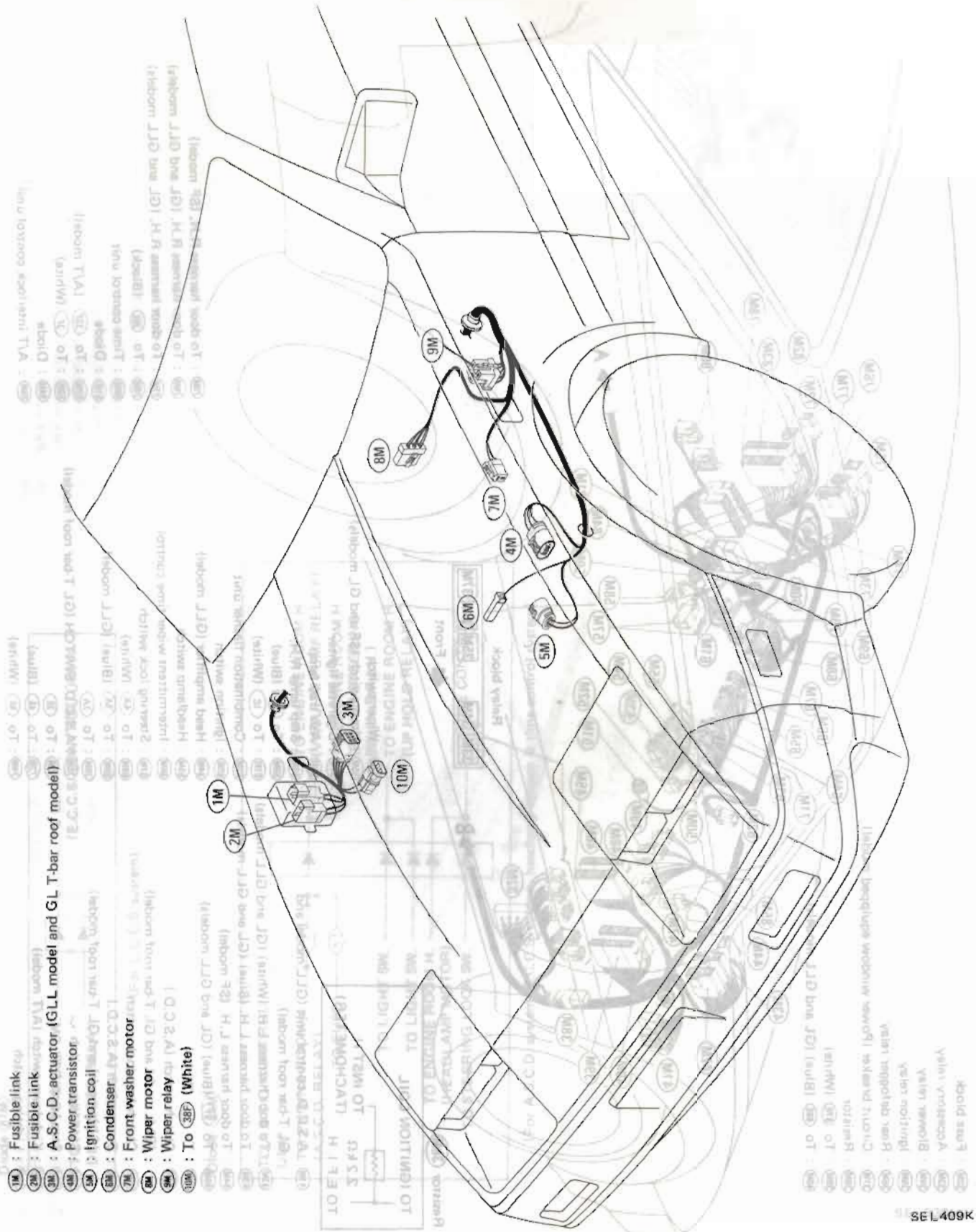


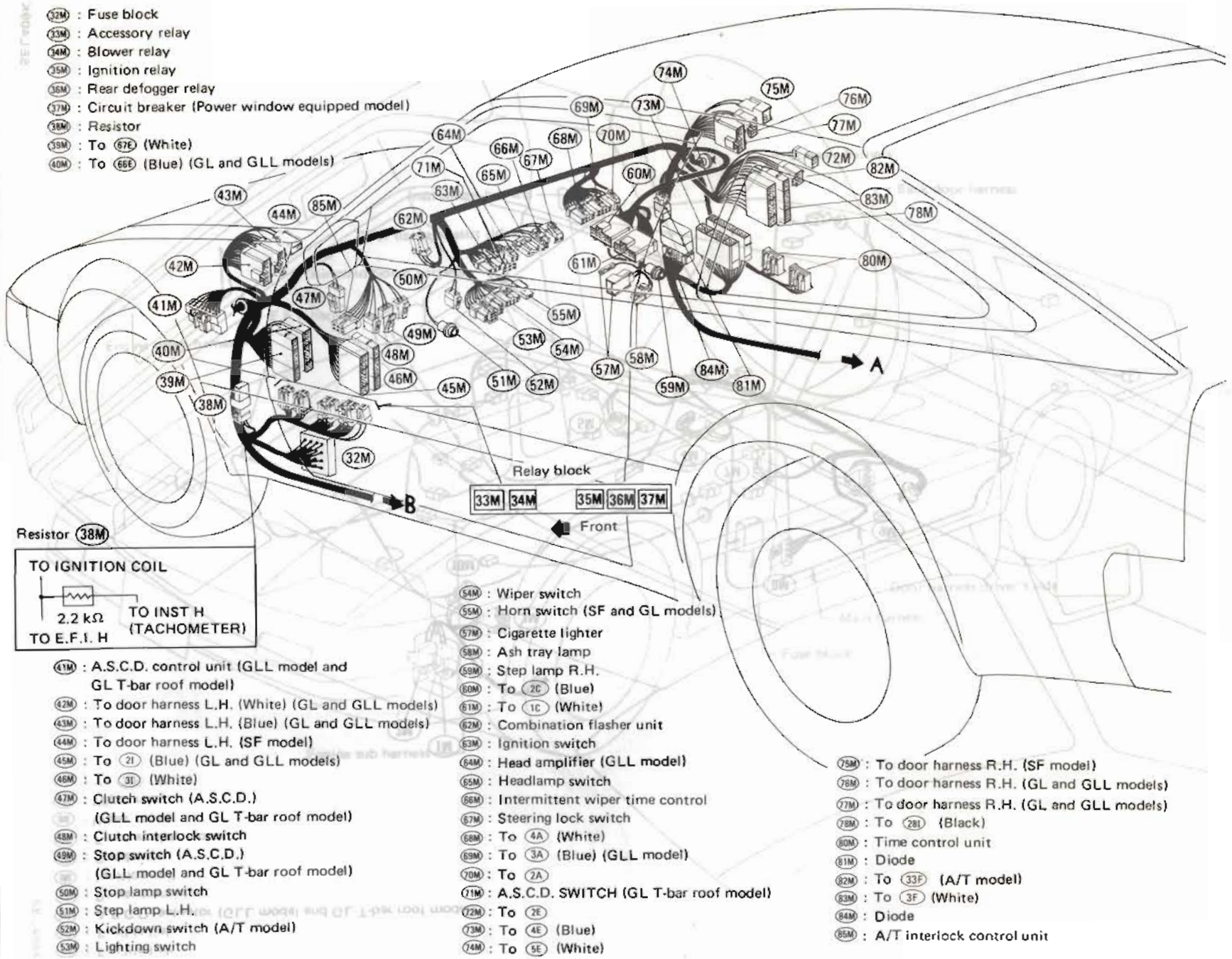
Outline



SEL466F

Main Harness





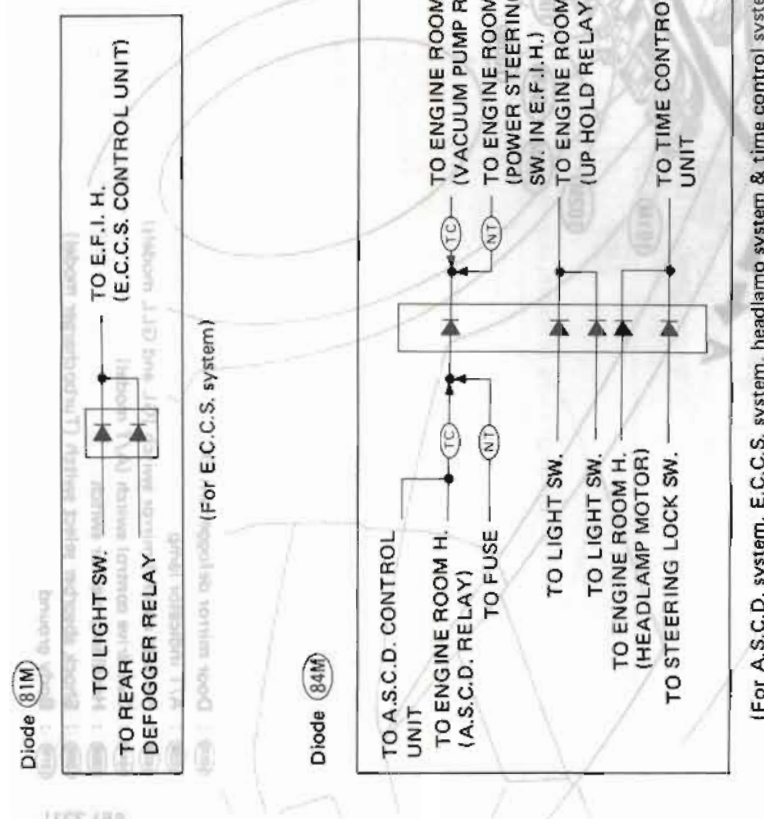
(32M) : Fuse block
(33M) : Accessory relay
(34M) : Blower relay
(35M) : Ignition relay
(36M) : Rear defogger relay
(37M) : Circuit breaker (Power window equipped model)
(38M) : Resistor
(39M) : To (67E) (White)
(40M) : To (66E) (Blue) (GL and GLL models)

(41M) : A.S.C.D. control unit (GLL model and GL T-bar roof model)
(42M) : To door harness L.H. (White) (GL and GLL models)
(43M) : To door harness L.H. (Blue) (GL and GLL models)
(44M) : To door harness L.H. (SF model)
(45M) : To (2I) (Blue) (GL and GLL models)
(46M) : To (3I) (White)
(47M) : Clutch switch (A.S.C.D.) (GLL model and GL T-bar roof model)
(48M) : Clutch interlock switch
(49M) : Stop switch (A.S.C.D.) (GLL model and GL T-bar roof model)
(50M) : Stop lamp switch
(51M) : Step lamp L.H.
(52M) : Kickdown switch (A/T model)
(53M) : Lighting switch

(54M) : Wiper switch
(55M) : Horn switch (SF and GL models)
(57M) : Cigarette lighter
(58M) : Ash tray lamp
(59M) : Step lamp R.H.
(60M) : To (2C) (Blue)
(61M) : To (1C) (White)
(62M) : Combination flasher unit
(63M) : Ignition switch
(64M) : Head amplifier (GLL model)
(65M) : Headlamp switch
(66M) : Intermittent wiper time control
(67M) : Steering lock switch
(68M) : To (4A) (White)
(69M) : To (3A) (Blue) (GLL model)
(70M) : To (2A)
(71M) : A.S.C.D. SWITCH (GL T-bar roof model)
(72M) : To (2E)
(73M) : To (4E) (Blue)
(74M) : To (5E) (White)

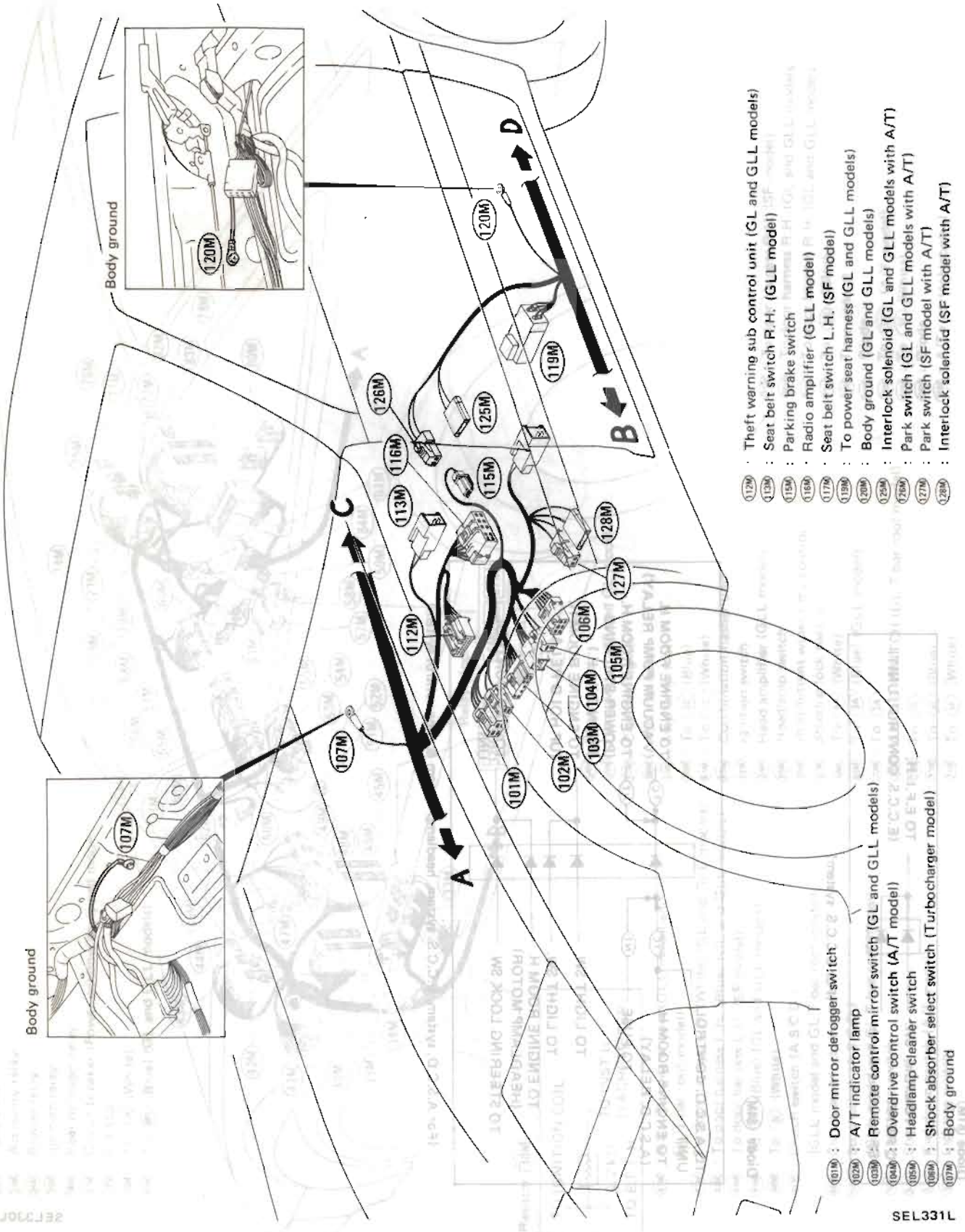
(75M) : To door harness R.H. (SF model)
(76M) : To door harness R.H. (GL and GLL models)
(77M) : To door harness R.H. (GL and GLL models)
(78M) : To (28I) (Black)
(80M) : Time control unit
(81M) : Diode
(82M) : To (33F) (A/T model)
(83M) : To (3F) (White)
(84M) : Diode
(85M) : A/T interlock control unit

Main Harness (Cont'd)



SEL330L

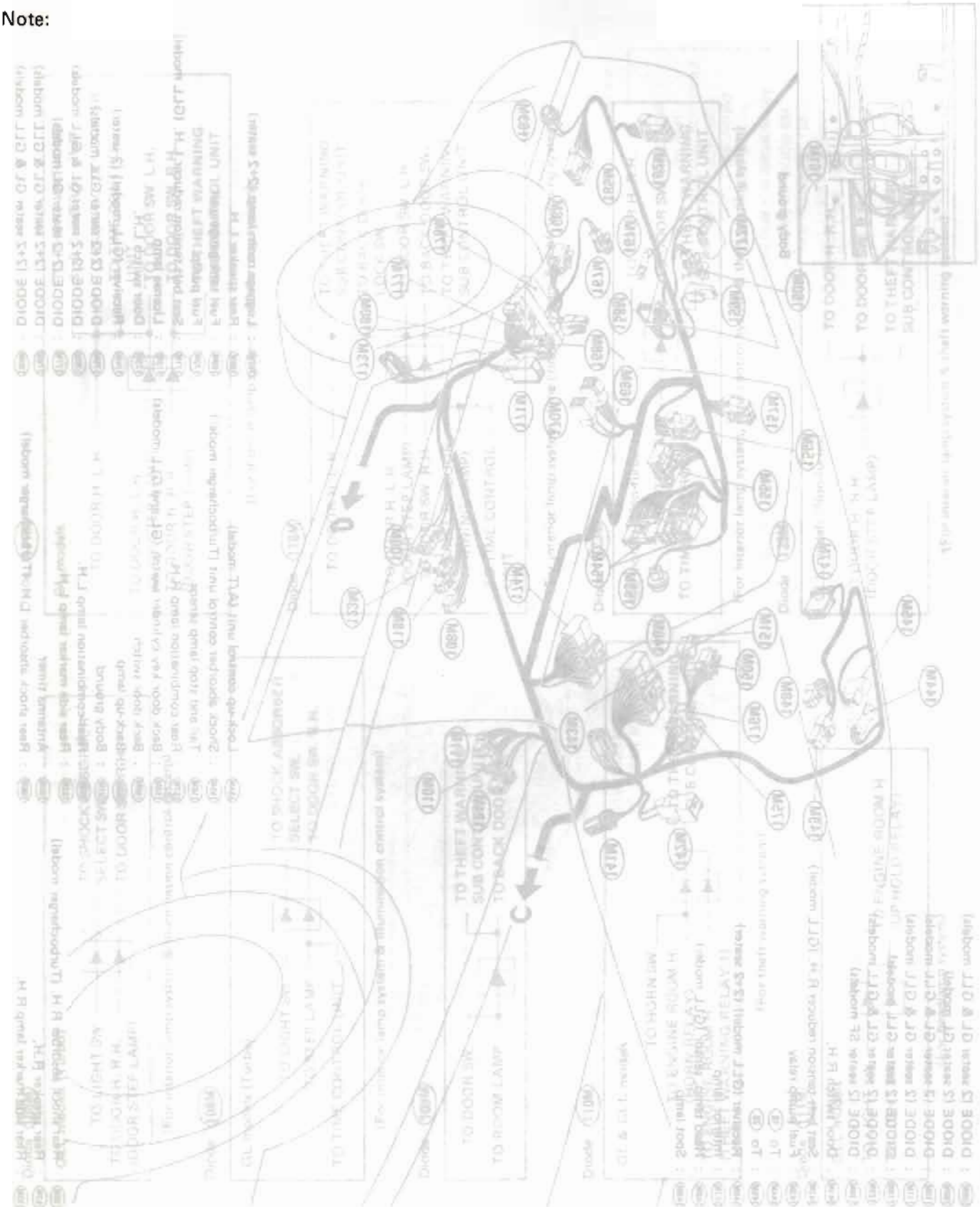
Main Harness (Cont'd)

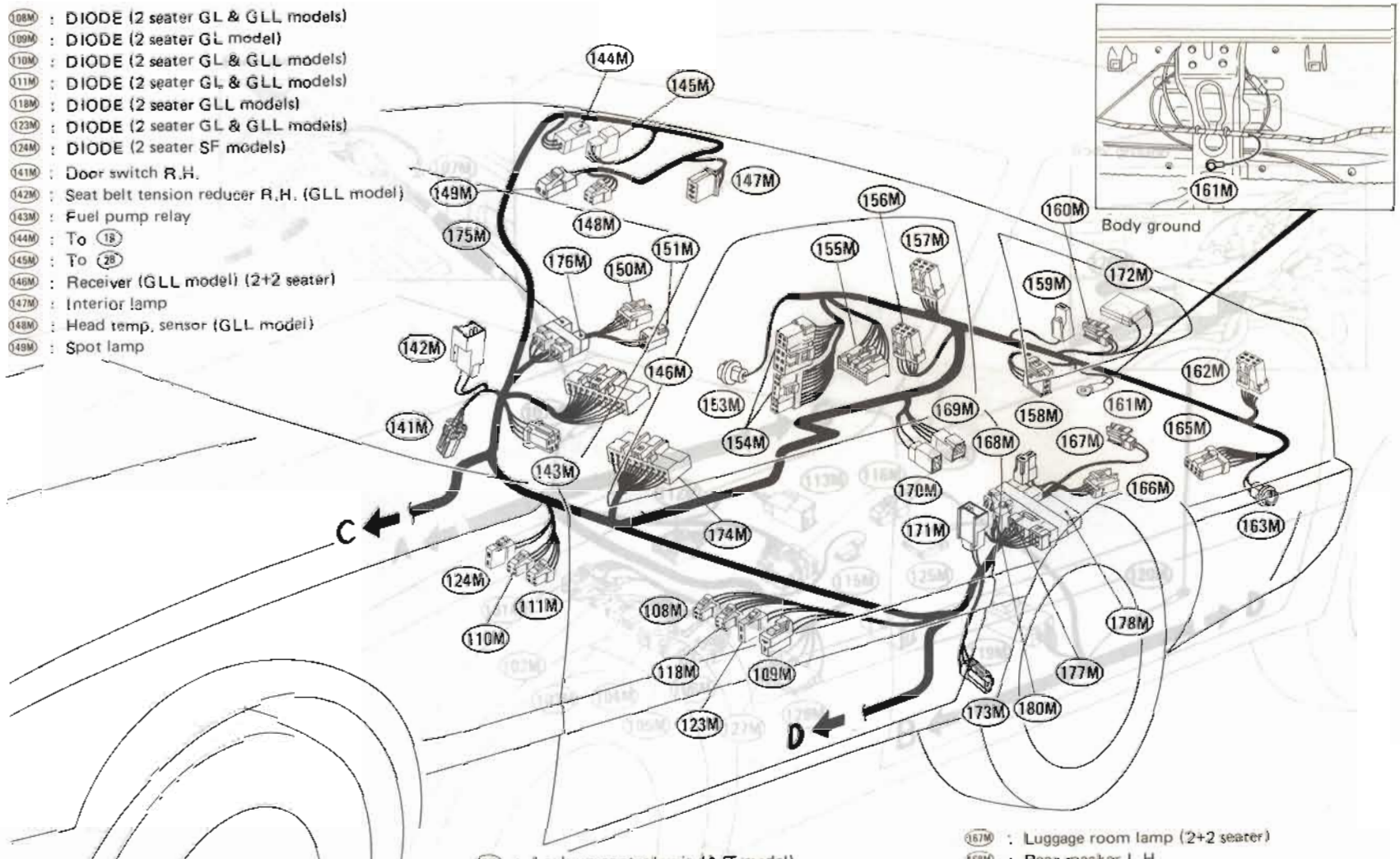


(101M) : Door mirror defogger switch
(102M) : A/T indicator lamp
(103M) : Remote control mirror switch (GL and GLL models)
(104M) : Overdrive control switch (A/T model)
(105M) : Headlamp cleaner switch
(106M) : Shock absorber select switch (Turbocharger model)
(107M) : Body ground

(112M) : Theft warning sub control unit (GL and GLL models)
(113M) : Seat belt switch R.H. (GLL model)
(115M) : Parking brake switch
(116M) : Radio amplifier (GLL model)
(125M) : Seat belt switch L.H. (SF model)
(126M) : To power seat harness (GL and GLL models)
(128M) : Body ground (GL and GLL models)
(127M) : Interlock solenoid (GL and GLL models with A/T)
(119M) : Park switch (GL and GLL models with A/T)
(120M) : Park switch (SF model with A/T)
(128M) : Interlock solenoid (SF model with A/T)

Note:





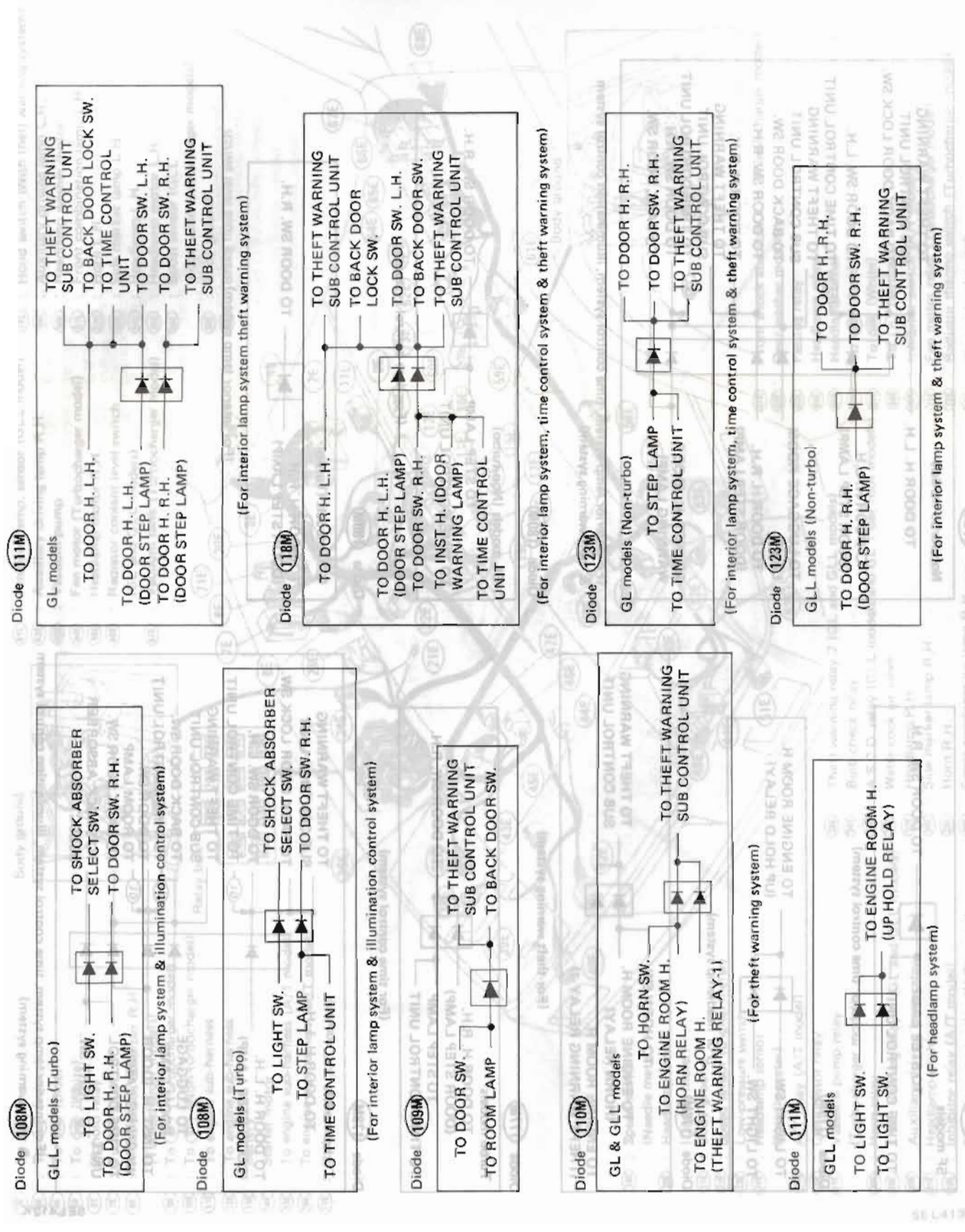
(108M) : DIODE (2 seater GL & GLL models)
(109M) : DIODE (2 seater GL model)
(110M) : DIODE (2 seater GL & GLL models)
(111M) : DIODE (2 seater GL & GLL models)
(118M) : DIODE (2 seater GLL models)
(123M) : DIODE (2 seater GL & GLL models)
(124M) : DIODE (2 seater SF models)
(141M) : Door switch R.H.
(142M) : Seat belt tension reducer R.H. (GLL model)
(143M) : Fuel pump relay
(144M) : To (18)
(145M) : To (28)
(146M) : Receiver (GLL model) (2+2 seater)
(147M) : Interior lamp
(148M) : Head temp. sensor (GLL model)
(149M) : Spot lamp

(150M) : Rear shock absorber R.H. (Turbocharger model)
(151M) : Rear speaker R.H.
(153M) : Rear side marker lamp R.H.

(154M) : Lock-up control unit (A/T model)
(155M) : Shock absorber control unit (Turbocharger model)
(156M) : Tail and stop lamp sensor
(157M) : Rear combination lamp R.H.
(158M) : Back door key cylinder switch (GL and GLL models)
(159M) : Back door switch
(160M) : Back-up lamp
(161M) : Body ground
(162M) : Rear combination lamp L.H.
(163M) : Rear side marker lamp L.H.
(165M) : Antenna timer
(166M) : Rear shock absorber L.H. (Turbocharger model)

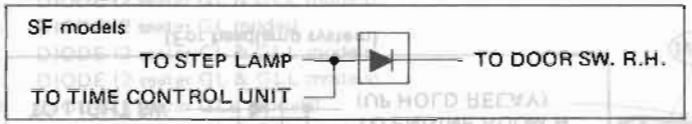
(167M) : Luggage room lamp (2+2 seater)
(168M) : Rear speaker L.H.
(169M) : Fuel tank gauge unit
(170M) : Fuel pump
(171M) : Seat belt tension reducer L.H. (GLL model)
(172M) : License lamp
(173M) : Door switch L.H.
(174M) : Receiver (GLL model) (2 seater)
(175M) : DIODE (2+2 seater GLL models)
(176M) : DIODE (2+2 seater GL & GLL models)
(177M) : DIODE (2+2 seater GL models)
(178M) : DIODE (2+2 seater GL & GLL models)
(180M) : DIODE (2+2 seater GL & GLL models)

Main Harness (Cont'd)



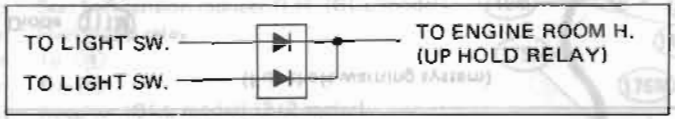
Diode (124M)

SF models



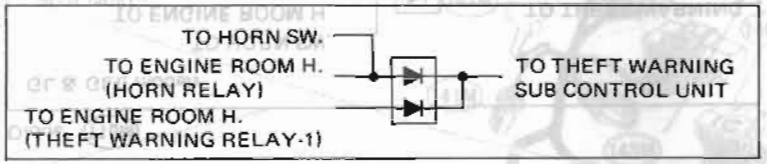
(For time control system)

Diode (175M)



(For headlamp system)

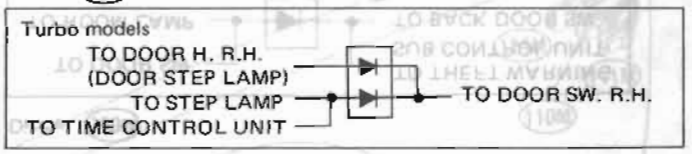
Diode (176M)



(For theft warning system)

Diode (177M)

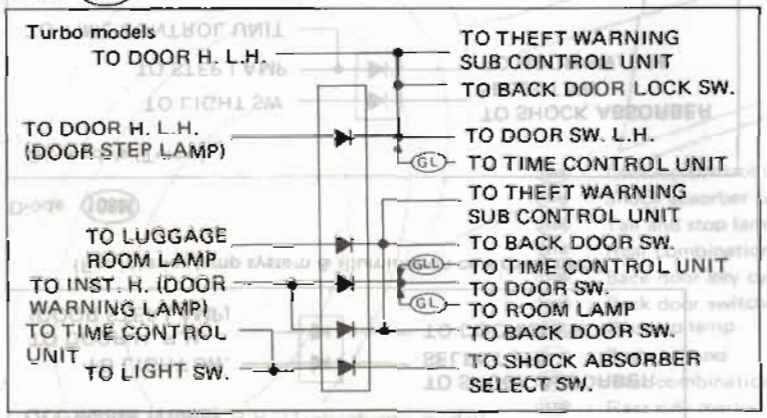
Turbo models



(For time control system)

Diode (178M)

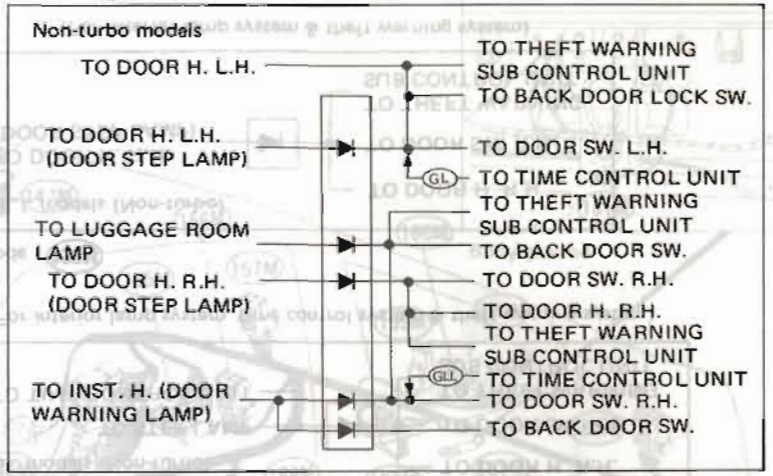
Turbo models



(For interior lamp system, time control system, illumination control system & theft warning system)

Diode (178M)

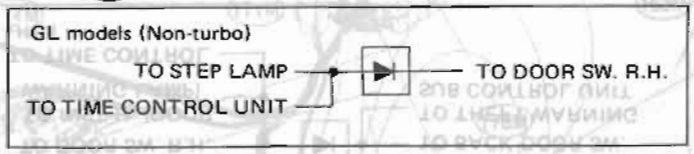
Non-turbo models



(For interior lamp system, time control system, illumination control system & theft warning system)

Diode (180M)

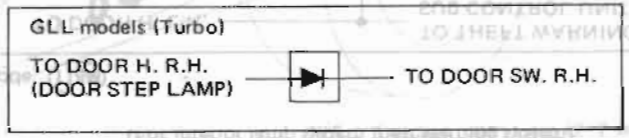
GL models (Non-turbo)



(For time control system)

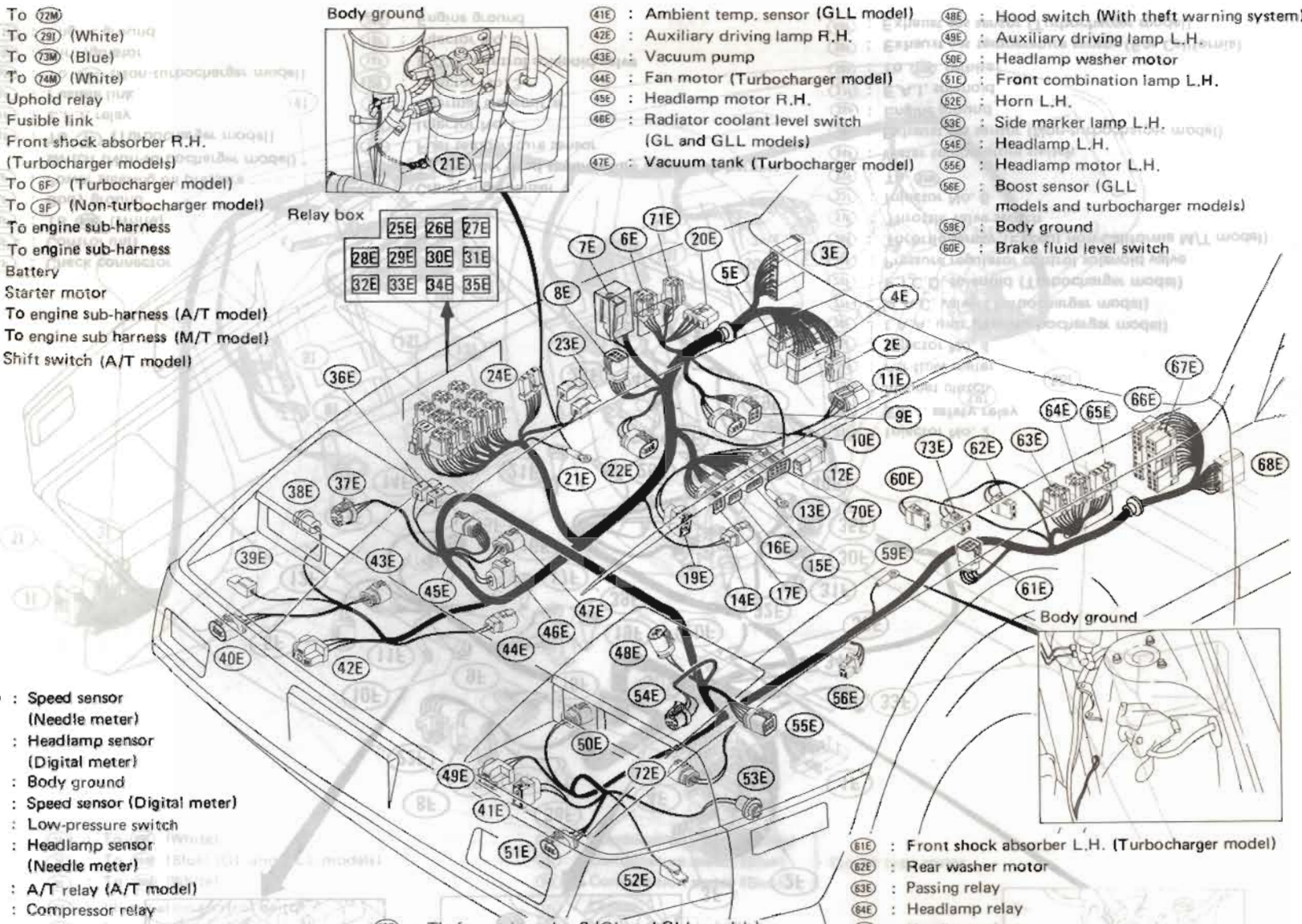
Diode (180M)

GLL models (Turbo)



(For interior lamp system)

SEL412K



2E : To 72M
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 model)
10E : To 9F (Non-turbocharger model)
11E : To engine sub-harness
12E : To engine sub-harness
13E : Battery
14E : Starter motor
15E : To engine sub-harness (A/T model)
16E : To engine sub harness (M/T model)
17E : Shift switch (A/T model)

19E : Speed sensor (Needle meter)
20E : Headlamp sensor (Digital meter)
21E : Body ground
22E : Speed sensor (Digital meter)
23E : Low-pressure switch
24E : Headlamp sensor (Needle meter)
25E : A/T relay (A/T model)
26E : Compressor relay
27E : Vacuum pump relay (Turbocharger model)
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 model) Clutch interlock relay (M/T model)

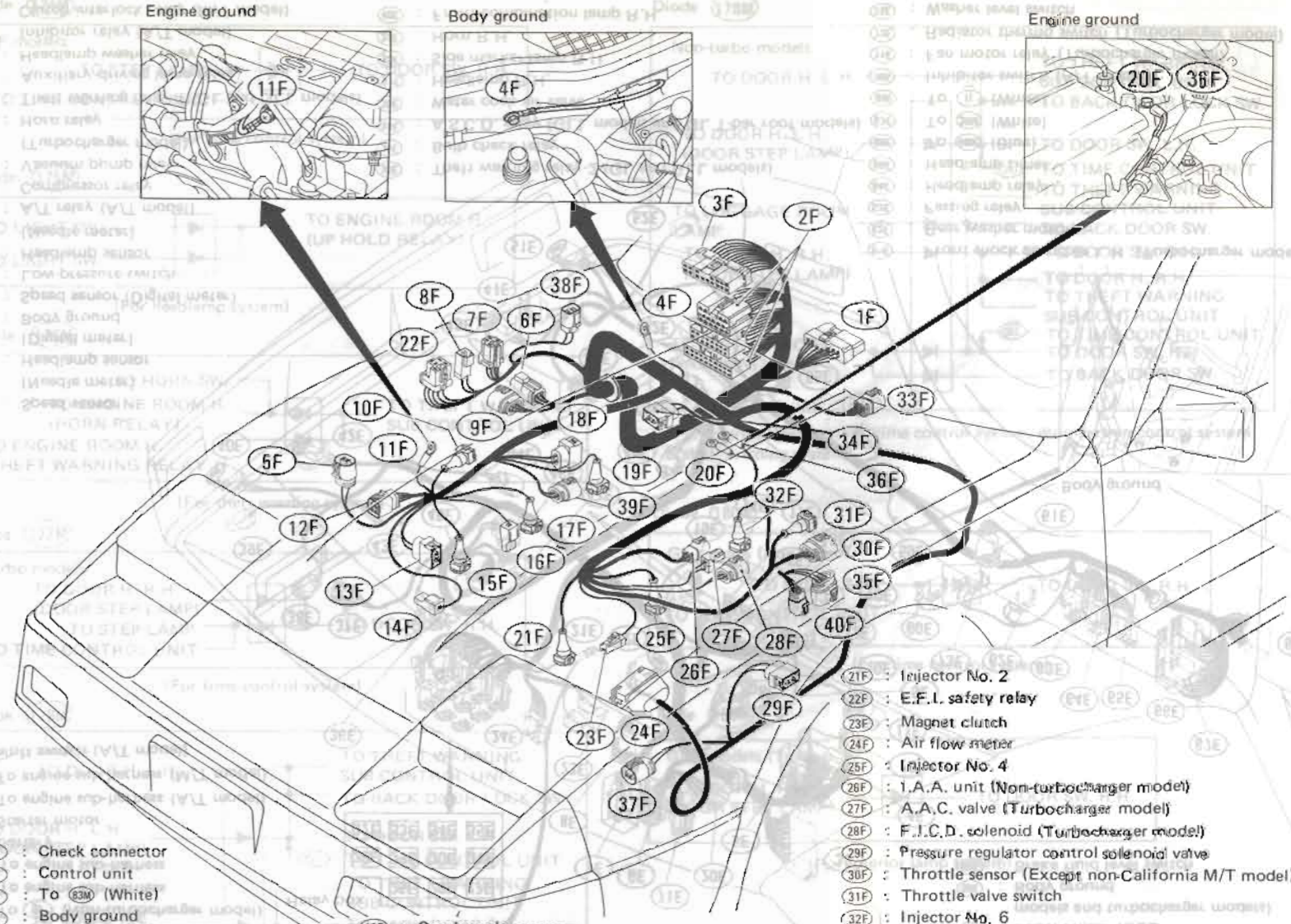
33E : Theft warning relay-2 (GL and GLL models)
34E : Bulb check relay
35E : A.S.C.D. relay (GLL models and GL T-bar roof models)
36E : Water cock air valve
37E : Headlamp R.H.
38E : Side marker lamp R.H.
39E : Horn R.H.
40E : Front combination lamp R.H.

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

48E : Hood switch (With theft warning system)
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)
59E : Body ground
60E : Brake fluid level switch

61E : Front shock absorber L.H. (Turbocharger model)
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)
70E : Inhibitor switch (A/T model)
71E : Fan motor relay (Turbocharger model)
72E : Radiator thermo switch (Turbocharger model)
73E : Washer level switch

SEL413K



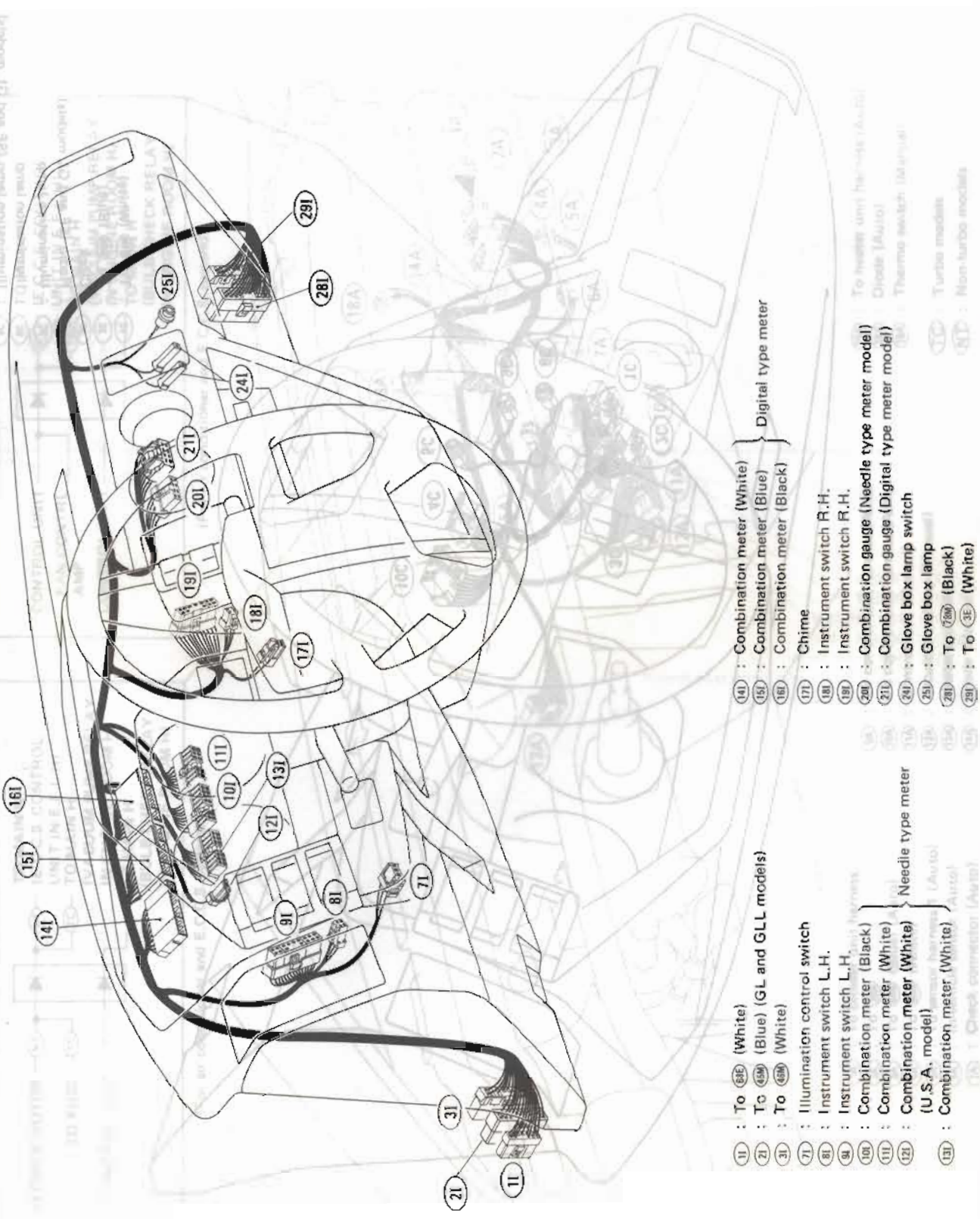
1F : Check connector
2F : Control unit
3F : To 83M (White)
4F : Body ground
5F : Power steering oil pressure switch (Non-turbocharger model)
6F : To 9E (Turbocharger model)
7F : E.F.I. relay
8F : Fusible link
9F : To 10E (Non-turbocharger model)
10F : Air regulator
11F : Engine ground

12F : Crank angle sensor
13F : To cylinder head temperature sensor sub-harness
14F : Fuel temperature sensor
15F : Injector No.1
16F : Thermal transmitter
17F : Injector No. 3
18F : E.G.R. control solenoid valve
19F : Injector No. 5
20F : Engine ground

21F : Injector No. 2
22F : E.F.I. safety relay
23F : Magnet clutch
24F : Air flow meter
25F : Injector No. 4
26F : I.A.A. unit (Non-turbocharger model)
27F : A.A.C. valve (Turbocharger model)
28F : F.I.C.D. solenoid (Turbocharger model)
29F : Pressure regulator control solenoid valve
30F : Throttle sensor (Except non-California M/T model)
31F : Throttle valve switch
32F : Injector No. 6
33F : To 82M
34F : Water temperature switch
35F : Exhaust gas sensor (Non-turbocharger model)
36F : Engine ground
37F : E.A.I. solenoid
38F : To 10M (White)
39F : Exhaust gas temperature sensor (For California)
40F : Exhaust gas sensor (Turbocharger model)

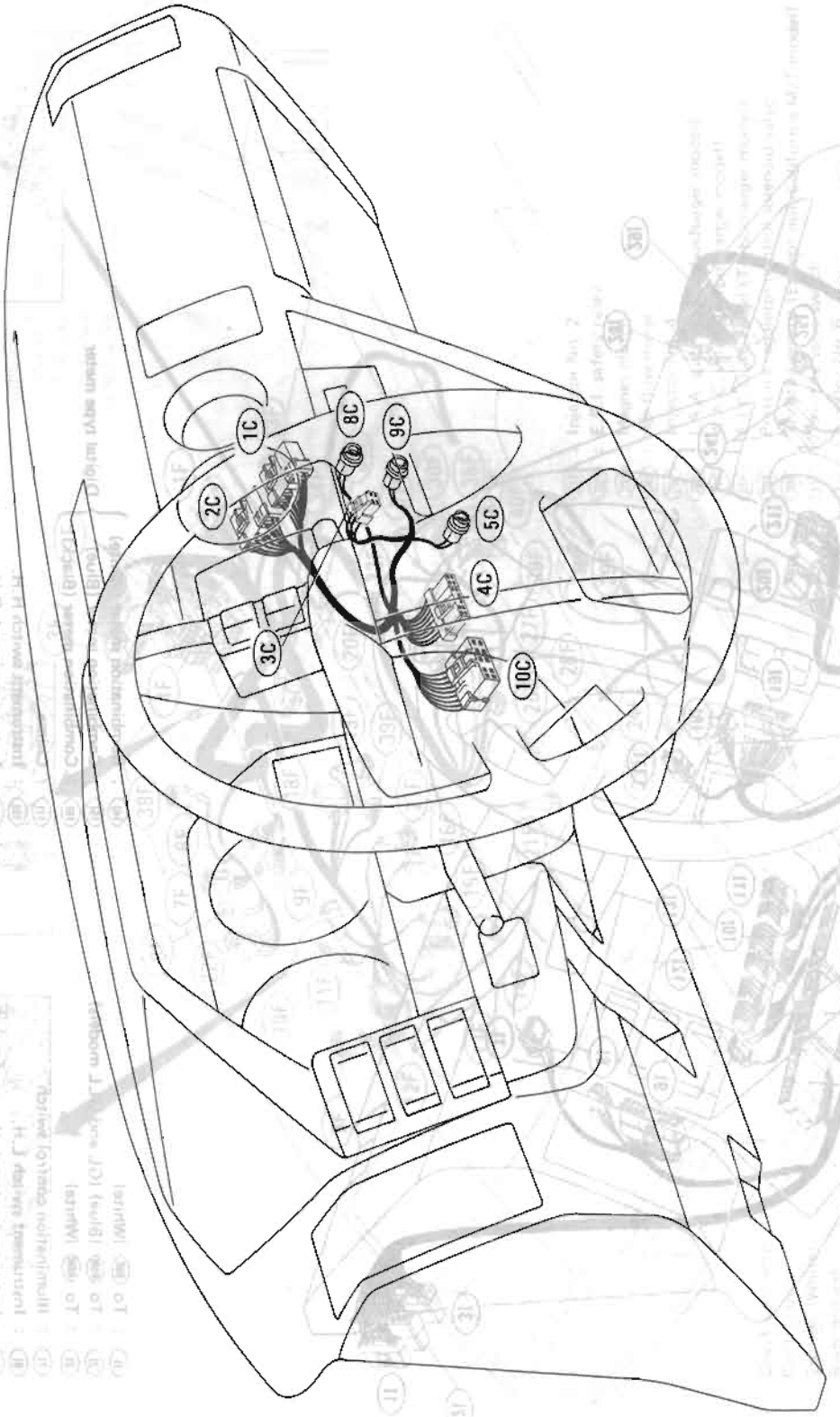
SEL460K

Instrument Harness



SEL414K

Console Harness



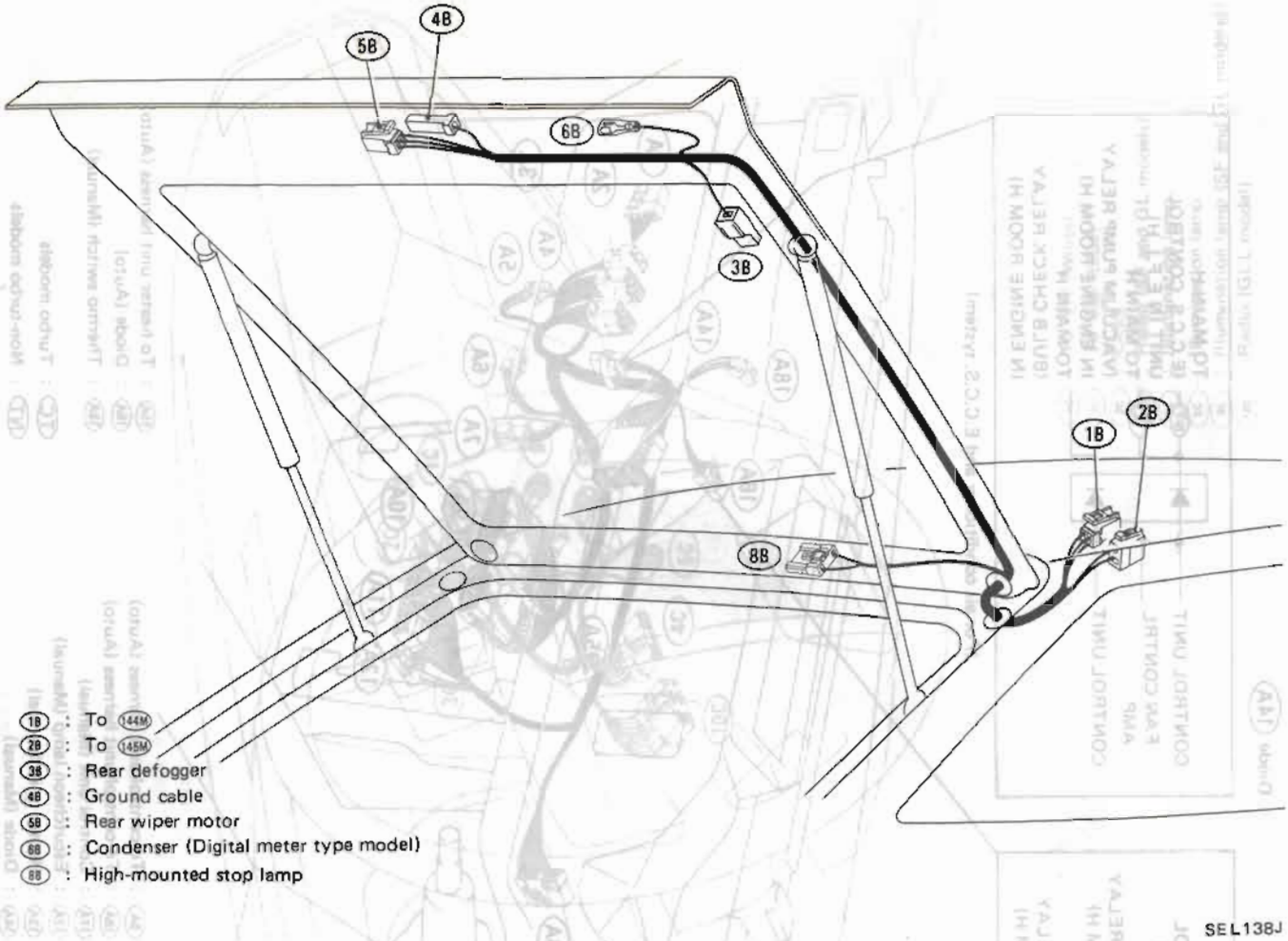
1C : To (E18) (White)
2C : To (E28) (Blue)
3C : Clock
4C : Radio (SF and GL models)
5C : Illumination lamp
9C : Illumination lamp
9C : Illumination lamp (SF and GL models)
10C : Radio (GLL model)

SEL415K

HARNESS LAYOUT

Air Conditioner Harness

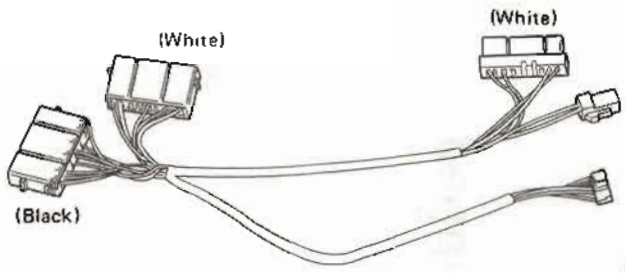
Back Door Harness



1B : To 144M
2B : To 145M
3B : Rear defogger
4B : Ground cable
5B : Rear wiper motor
6B : Condenser (Digital meter type model)
8B : High-mounted stop lamp

SEL138J

SPECIAL SERVICE TOOLS

Tool number (Kent-Moore No.)	Tool name	
KV999U0060 (J36569-1)	* Diagnostic sub-harness (For digital type combination meter)	 SEL145J
(J36126)	Washer nozzle adjusting tool	