

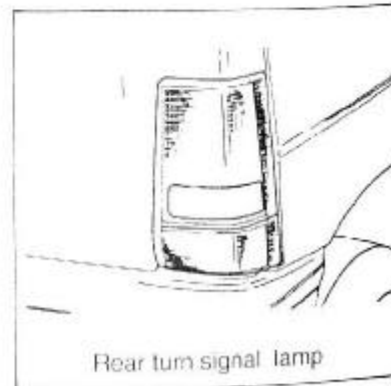
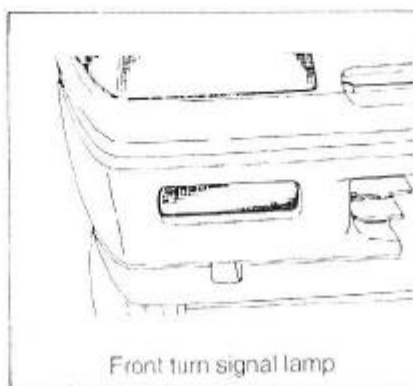
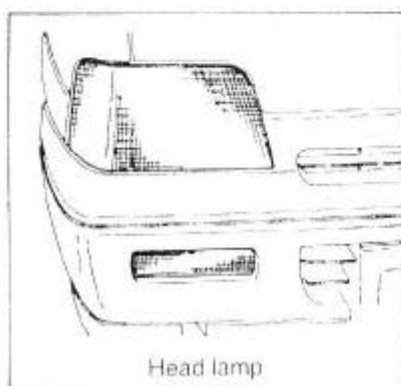
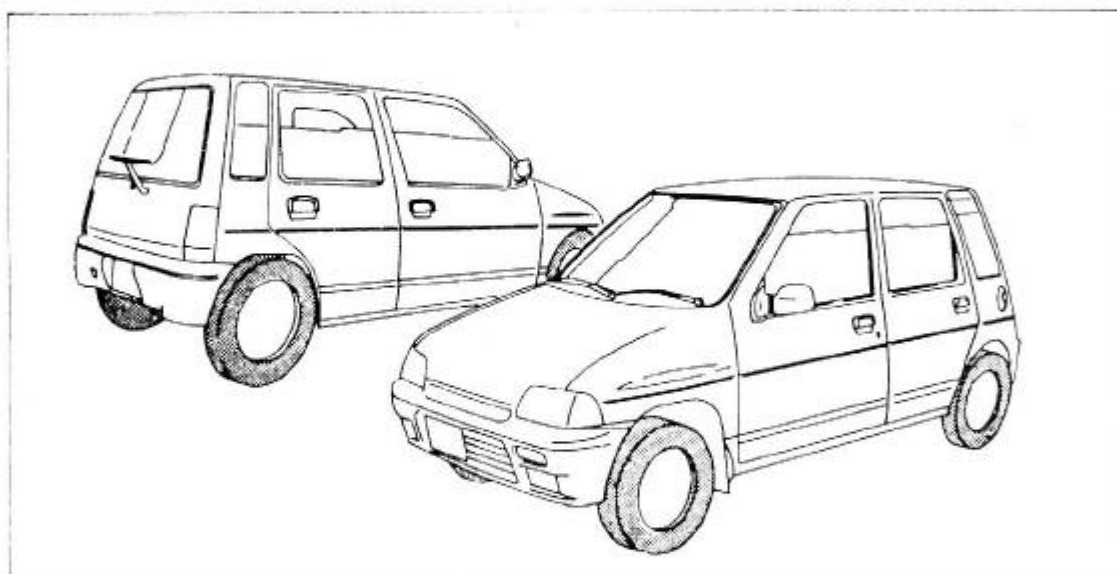
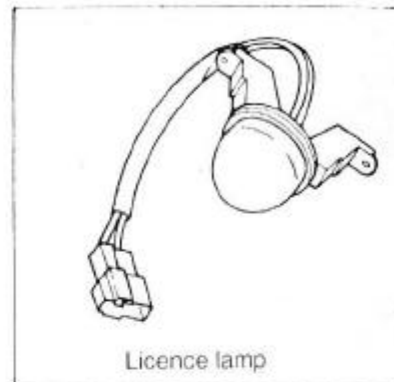
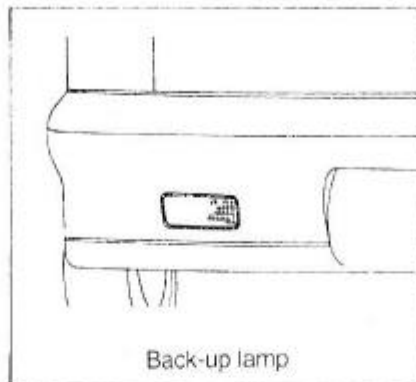
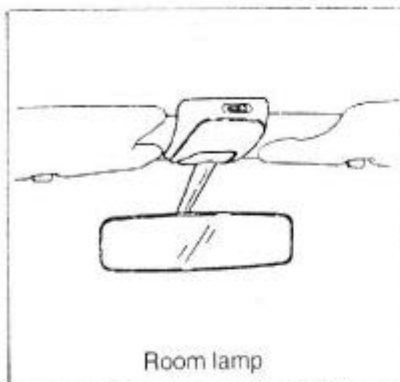
SECTION 8

BODY ELECTRIC SYSTEM

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GENERAL DESCRIPTION

LIGHTING SYSTEM



INSTRUMENT PANEL

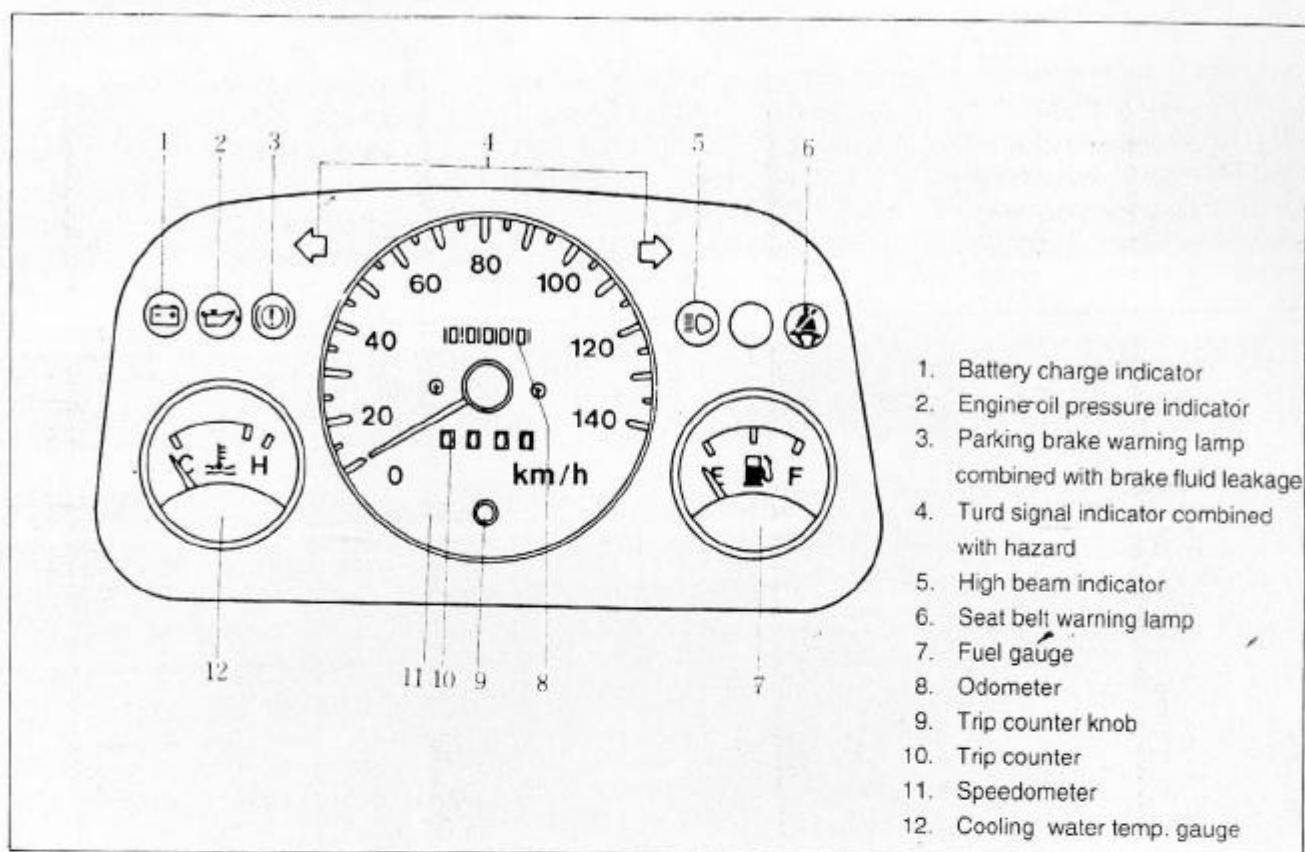


FIG. 8 — 1 INSTRUMENT PANEL ARRANGEMENT DIAGRAM

BATTERY CHARGE WARNING LIGHT

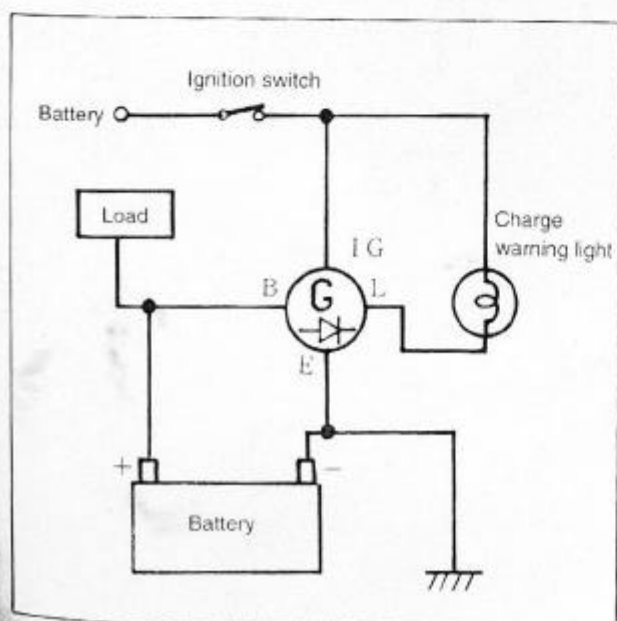


FIG. 8 — 2 CHARGE SYSTEM CIRCUIT

Charge warning light is a kind of indicator light which indicates the condition of battery charge (electricity is generated or not) to driver.

With ignition switch is ON and the engine starts, the charge warning light is turned on only when the battery charge is improper.

L terminal voltage : 10.5~13.5V

B terminal voltage : 14.2~14.8V

ENGINE OIL PRESSURE WARNING LIGHT

Oil pressure switch has only one terminal. It operates only oil pressure warning light.

When oil pressure is in below specified value, the switch turns ON and warning light is turned on.

When more than specified oil pressure is fed to switch, the switch contact is OFF and oil pressure warning light is turned off.

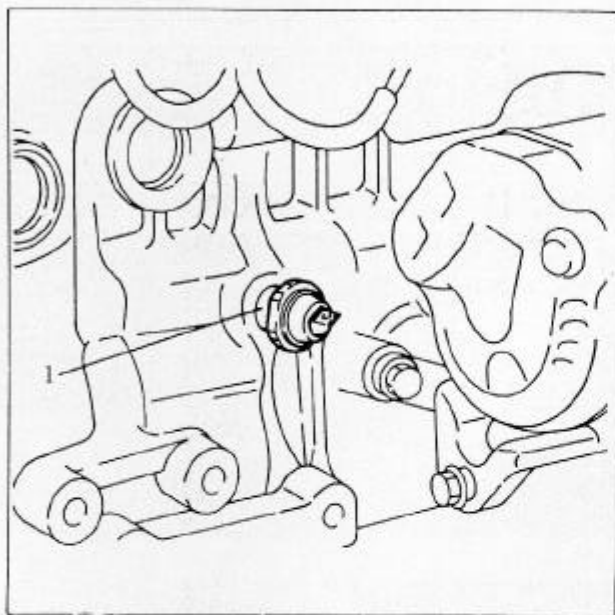


FIG. 8-3 LOCATION OF OIL PRESSURE SWITCH INSTALLATION

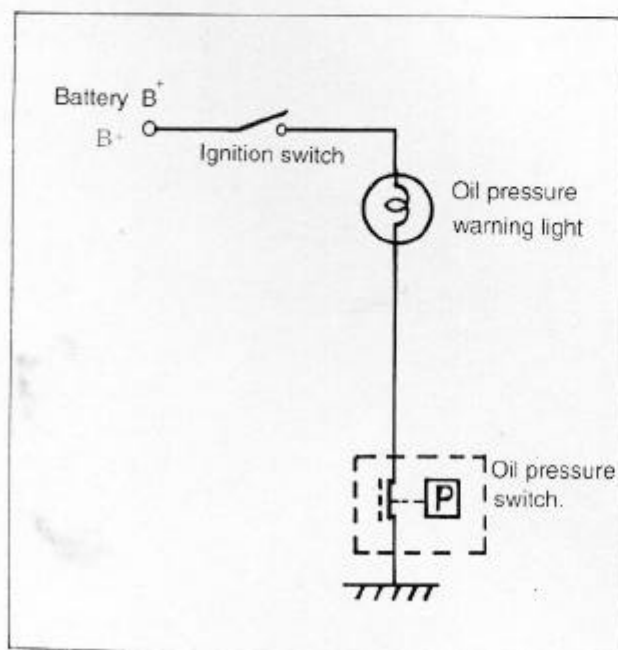


FIG. 8-4 OIL PRESSURE WARNING LIGHT CIRCUIT

BRAKE FLUID WARNING LIGHT (COMBINED IN PARKING BRAKE, BRAKE FLUID)

When the parking brake lever is pulled up, the parking brake switch is turned ON.

When no brake oil is present in brake oil tank the brake oil level switch is disconnected and warning light is turned ON.

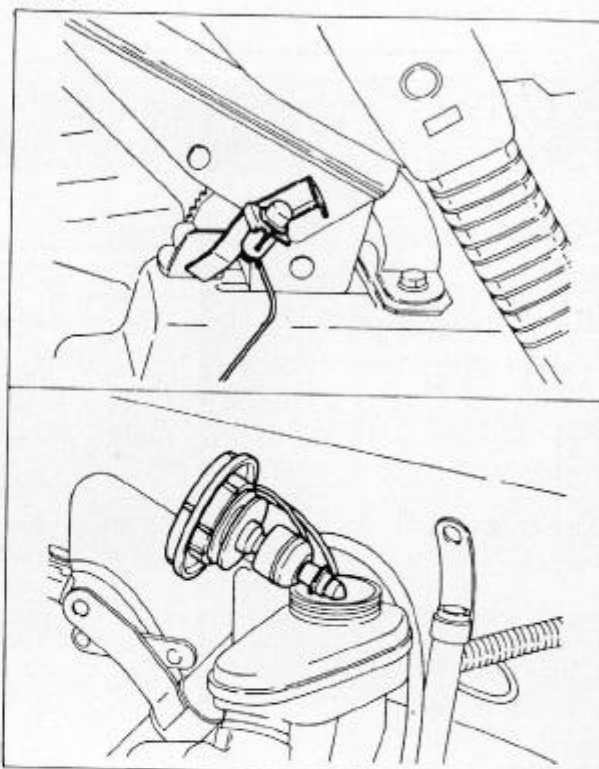


FIG. 8-5 PARKING BRAKE SWITCH POSITION (UPPER), BRAKE LEVEL SWITCH POSITION (BELOW)

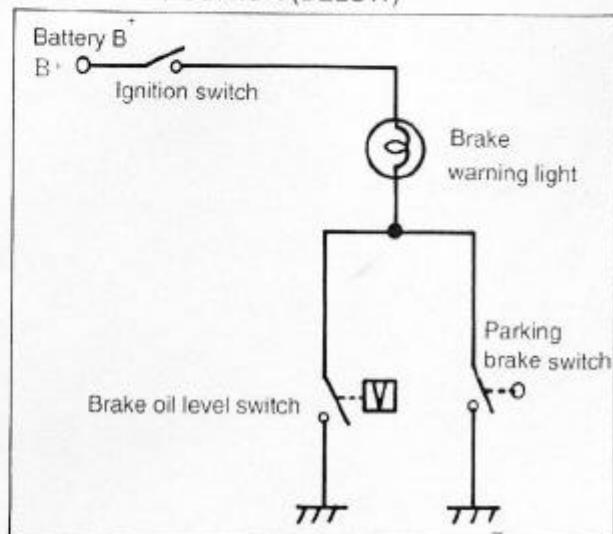


FIG. 8-6 PARKING BRAKE AND BRAKE FLUID CIRCUIT

SEAT BELT WARNING LIGHT

Seat belt switch is installed in the seat belt buckle switch as it is designed to maintain turn ON condition while driver does not wear the seat belt, the warning light goes on.

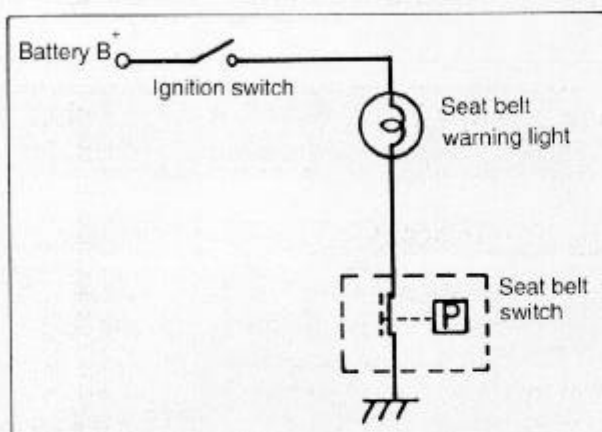


FIG. 8 — 7 SEAT BELT WARNING LIGHT CIRCUIT.

FUEL LEVEL GAGE

Fuel level gage let a driver know the remaining fuel quantity of fuel tank and fuel tank unit consist of variable resistances.

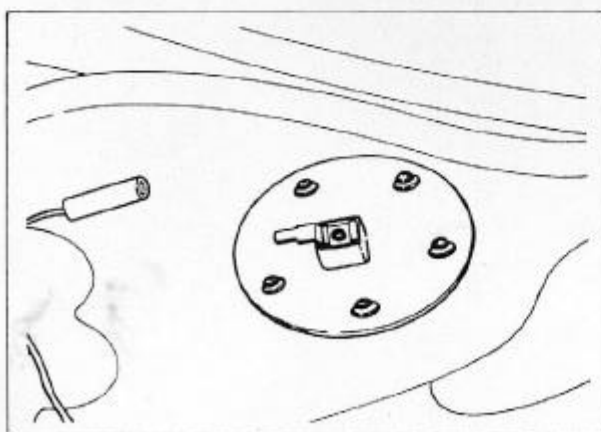


FIG. 8 — 8 LOCATION OF FUEL TANK UNIT INSTALLATION

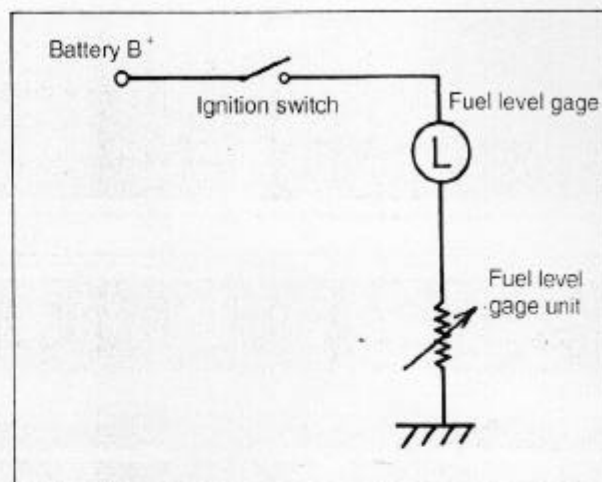


FIG. 8 — 9 FUEL LEVEL GAGE CIRCUIT

SPEEDOMETER

Speedometer indicates present car speed and mileage to driver and it is connected to transaxle with cable.

Maximum indicator scale 140km/h

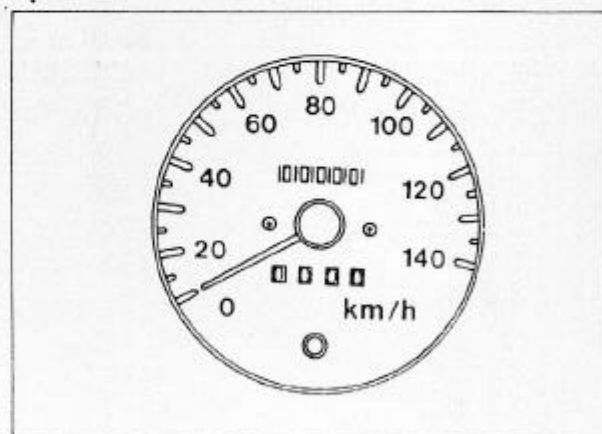


FIG. 8 — 10 SPEEDOMETER

COOLANT TEMPERATURE METER

It indicates engine coolant temperature to driver and installed on the intake manifold.

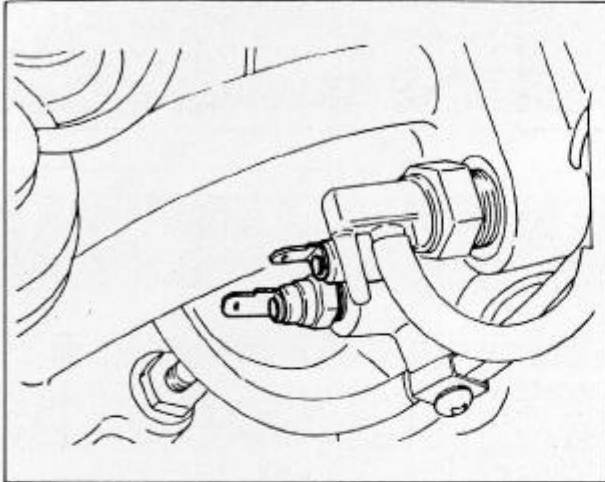


FIG. 8 — 11 LOCATION OF COOLING WATER TEMP. METER INSTALLATION

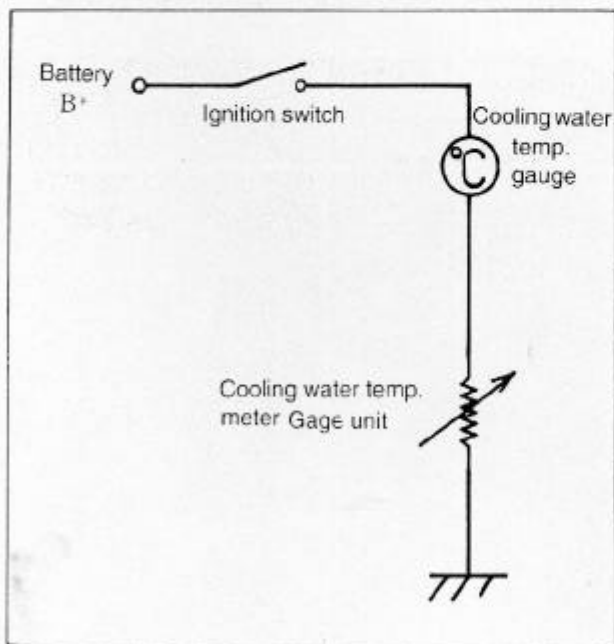


FIG. 8 — 12 COOLING WATER TEMP. GAGE CIRCUIT

WIPER

Wiper switch is installed with combination switch and replaced by assembly.

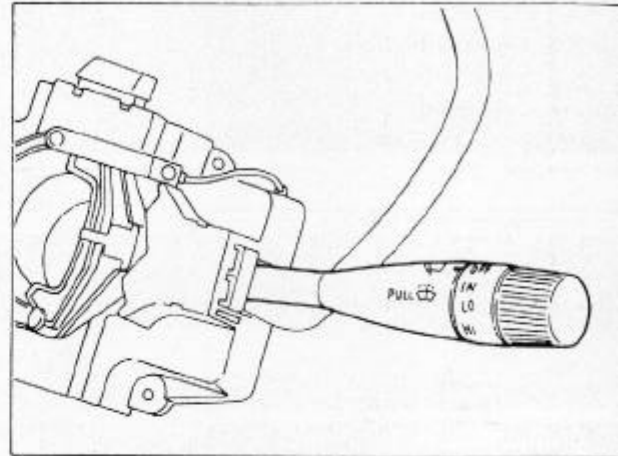


FIG. 8 — 13 WIPER SWITCH CONFIGURATION

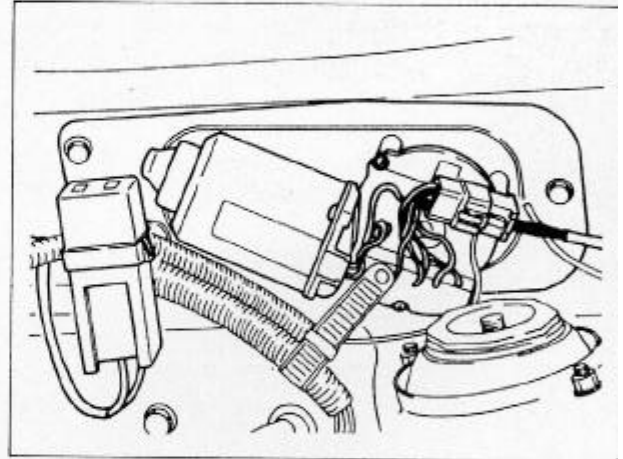


FIG. 8 — 14 LOCATION OF WIPER MOTOR INSTALLATION

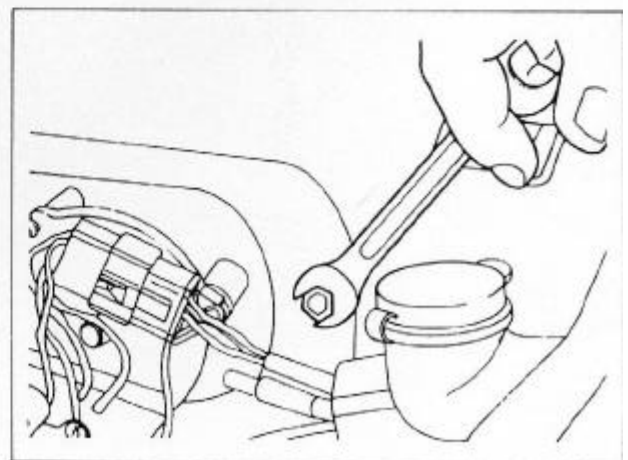


FIG. 8 — 15 WIPER MOTOR REMOVAL

WASHER NOZZLE

Nozzle is installed on the bonnet and cleaning fluid tank is installed on the inside of front, left fender.

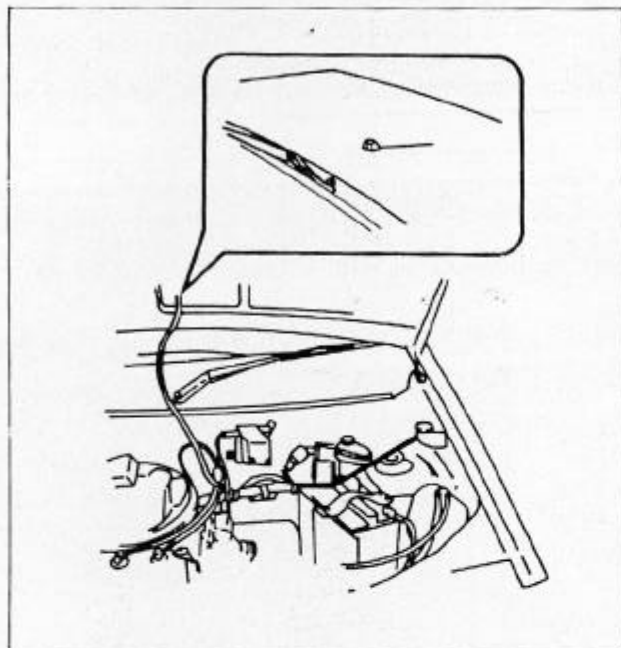


FIG. 8 — 16 NOZZLE

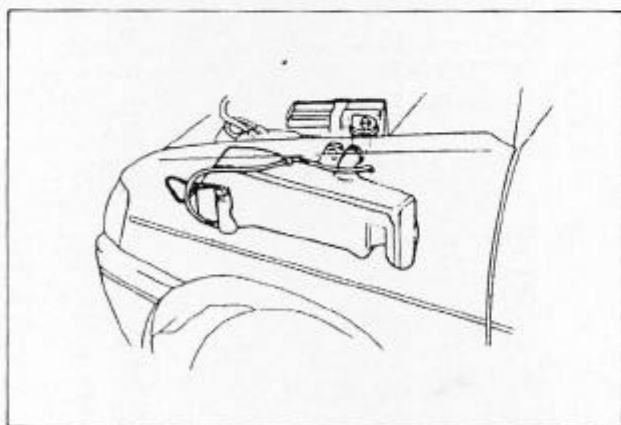


FIG. 8 — 17 WASHER TANK

MAIN FUSE

Cartridge type fuse which designed to improve the contact performance and serviceability is installed on the left side of engine room.

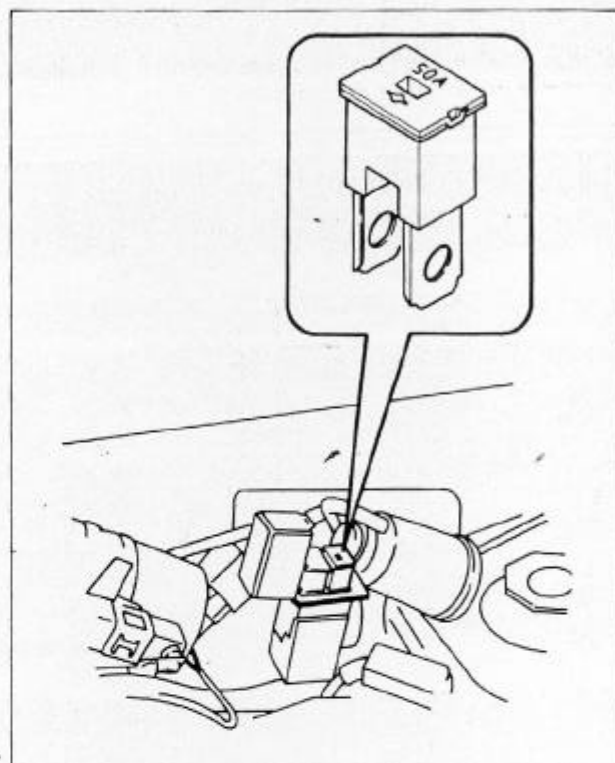


FIG. 8 — 18 FUSE(CARTRIDGE TYPE)

ON-CAR SERVICE

HEADLAMP ADJUSTMENT

Focus Adjustment

There are many methods to adjust headlight but one by using the projection headlight tester is described here.

- ① Park car so that the headlight is positioned 3m apart from tester face.

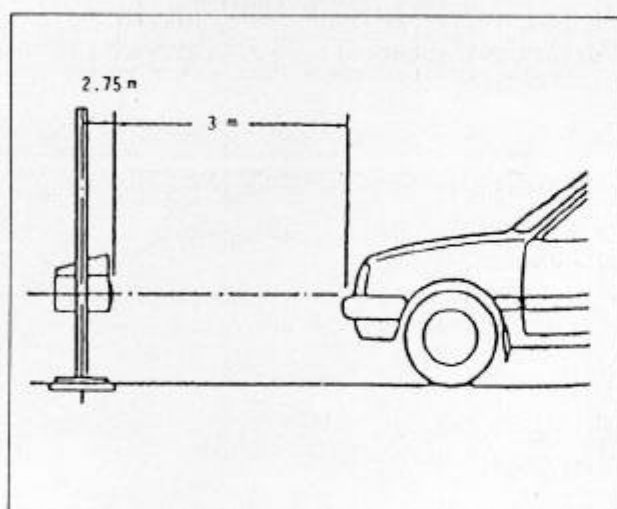


FIG. 8 — 19 HEADLIGHT FOCUS ADJUSTMENT

- ② Seeing transit finder, set tester upright to measured value point.
- ③ Face indicator box toward scope glass side

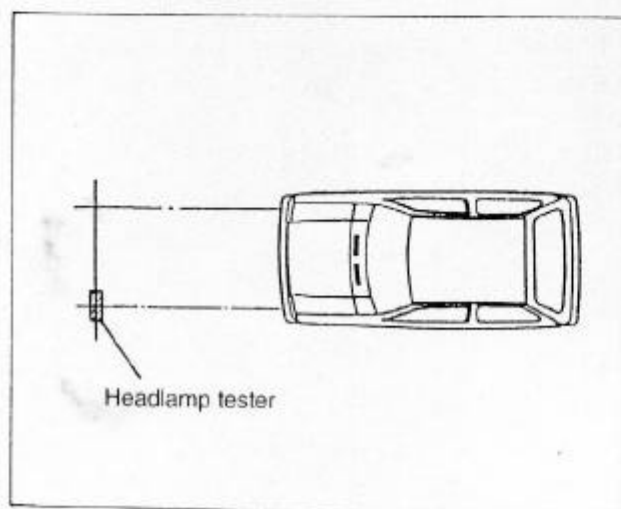


FIG. 8 — 20 BEAM ALIGNMENT

- ④ Adjust elevator stand so that the scale points "o" at that time. Read center of lamp configuration projected on a scope glass with a scale photometer indicates the luminous intensity read its scale.

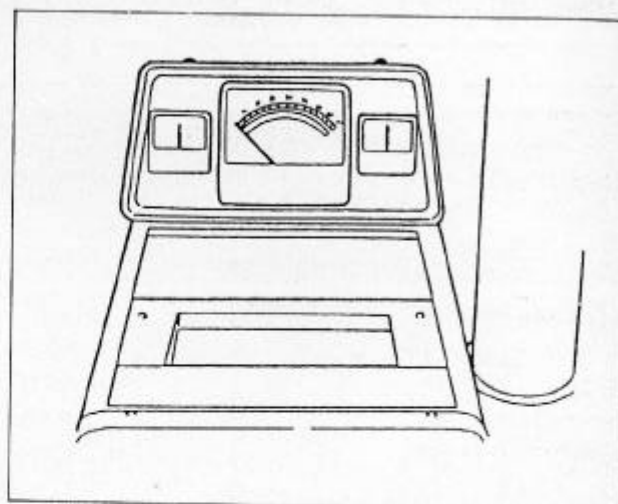


FIG. 8 — 21 TESTER O-RING ADJUSTMENT

- ⑤ In the conditions that the primary optical axis is out of view reference, use two adjusting screws on the top of headlight to adjust headlight position for vertical and horizontal alignment.

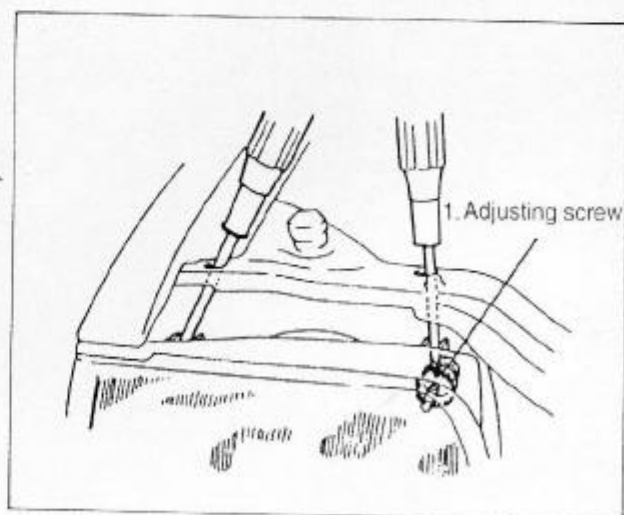


FIG. 8 — 22 HEADLIGHT ADJUSTMENT

EVALUATION STANDARD

Beam direction of primary optical axis is parallel to the advance direction of car, the direction of primary optical axis should not be upward. At a distance of 10m ahead, the horizontal amplitude should be within 30cm and vertical amplitude should be within 3/10 of lighting installation height for the left headlight, but leftward amplitude should be within 15cm and vertical amplitude of running car should be within 30cm.

BATTERY CHECK

① MF battery check can be done by using state of charge indicator installed on inside of car.

- **Green:** When the state of charge is above 50%~60%, as electrolyte specific gravity is high, the green ball rise and reaches to lower rod end then green color can be observed on the top surface.
- **Black:** When the state of charge is below 50%~60%, black color is observed.
- **Transparency:** When the electrolyte level drops below lower end of indicator, color disappears and it indicates over charge. Generally, in this condition, the battery is not usable any more.

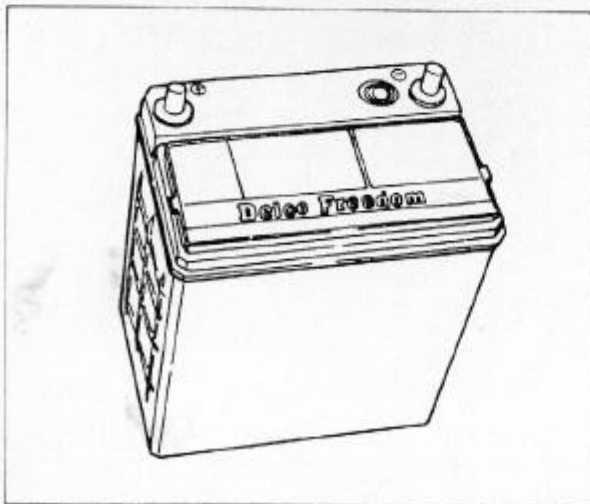


FIG. 8 — 23 MF BATTERY

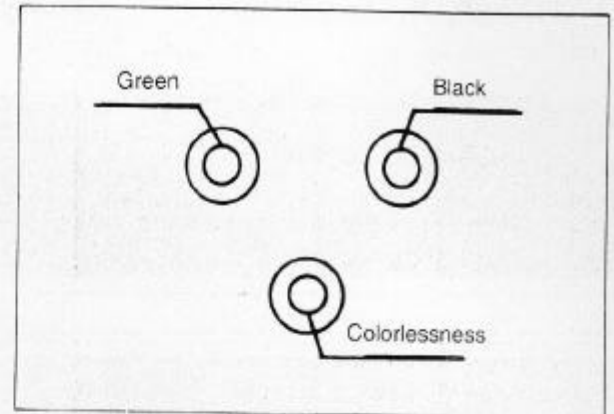


FIG. 8 — 24 MF BATTERY STATE OF CHARGE

WIRING HARNESS

Inspection and Maintenance

- Secure harness to designated points firmly and fix with suitable clips in which insulated coating of harness may be broken by contact with running parts, vibration and elongation, etc.
- Hide wires and terminals which is not connected with vinyl tape.
- Wrap with tape in which harness may be contacted with sheet metal flange portion and screw end.
- As connection of harness sustains connectors or terminals insert it until contact is felt also when connector is removed, disconnect it with the support of connector.
- When the wiring is installed in the engine room, avoid hot section such as exhaust system if possible and install in which temperature is low.

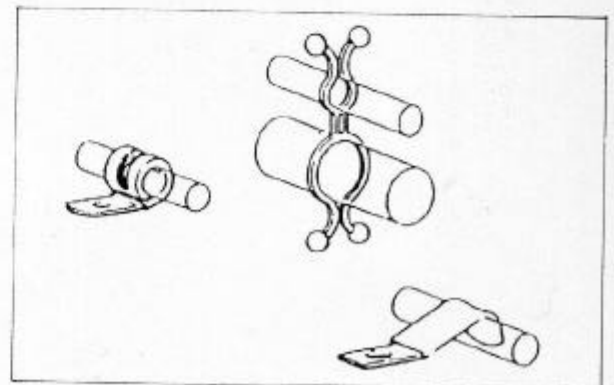


FIG. 8 — 25 FIXING METHOD USING CLAMP

ELECTRICAL CIRCUIT

ELECTRICAL CIRCUIT DIAGRAM

1) Usage and Markings

Name of each components are mentioned at the list of top of circuit diagram .

Name of components are arranged by order of alphabet and if possible, position it to the top of symbol.

All the vertical lines are the narrow path of electric current and the horizontally drawn line in the base of diagram indicates earth terminals .

Also, all the narrow lines of current is numbered continuously from the lowest of circuit diagram and the overlap of two same vertical lines is avoided doubling in order to simplicity the diagram. Number of these lines are entered in the tetragon like followings and it indicates that line is connected to the very number line.

Example)

98

 or

166

Fuses are mentioned in the top of circuit diagram. At every circuit, if fuses of the same size are used, it may be indistinguishable from each other. Example: F5.15A

"F5" indicates number 5 fuse in fuse box. First and second horizontal lines in the uppermost of diagram are No.30 terminal which is directly connected to battery to supply electric current. Third and fourth horizontal lines are NO.15 terminal and fifth line is 15A terminal, which are supplied by electric current when the ignition switch is turned ON. To know how to read the circuit diagram is the most important thing for trouble diagnosis. Circuit diagram show in this manual indicates no current in circuit and switch and component is nonoperational.

Working position is marked on the line with parallel or perpendicular. Lines of circuit are remarkably marked to avoid crossing the lines.

It is important not only to know the principle but to know marking symbol for reading circuit diagram.

As switches, relays and other components are indicated by symbol, it is easy to express.

Also identified color and connector terminal number is exactly marked for easy diagnosis of electrical system.

2) Major Component circuit Symbol

	Nonelectronic components		Fuse
	Protective components		Coil
	Caution components		Condenser
	Battery		Plug
	Earth		Close switch auto return
	General earth		Open switch auto return
	Electrical source		Convert switch
	Generator		Sequence switch
	Motor		Stop switch
	Light lamp		Manual rotary switch
	Speaker		Manual push switch
	Horn		Manual pull switch
	Permanent magnet		Manual push switch
	Indicator(Meter)		Manual rotary switch
	Cross area		Other type manual switch ex) Foot switch
	Terminal design		Manual rotary actuating switch
	Joint(Soldering)		Diode
	Cross part(Not jointed)		Gener diode
	Joint		Luminous diode
	Color code		Electrothermal overflow protection unit
	Manual mechanical sense switch		Sequence unit ex) Air conditioner Compressor, clutch, coupling
	Revolutional power source		Temperature sensitive relay
	Working component ex) Piston		PNP type transistor
	Electronic valve		NPN type transistor
	Hole sensor		Open-to-close relay
	Electronic sensor		Close-to-open relay
	Reed switch		
	Resistance		
	Variable resistance		
	Temperature sensitive resistor		

3) Circuit Identification Symbol

Symbol	Parts	Nomenclature
E	Miscellaneous parts	Miscellaneous parts
F	Protection device	Circuit breaker, fuse, protection relay, locking device, etc.
G	Power supply	Generator, battery
H	Communication method	Visible or audible device
K	Connecting device	Relay, timing relay, flasher relay
L	Sense unit	Ignition coil, choke coil
M	Motor	Wiper, automatic window
P	Meter	Tachometer, clock, volt-meter
R	Resistance	Circuit, preheating unit, voltage dropper
S	Switch	Wiper, signal unit, indicator
X	Connector jack	Plug contacts, accessory terminal
Y	Electromechanical device	Compressor electronic valve, electronic lifting device

4) Wiring Color

Each terminals are identified by conductor cross area and color based on industrial standard.

(Example) ——— Br R 0.85 ———

Br: Base color R: Tracer 0.85: Wire nominal size

Symbol	Color	Symbol	Color	Symbol	Color	Symbol	Color
B	Black	GY	Green with yellow tracer	PL	Pink with blue tracer	WR	White with red tracer
BW	Black with white tracer	GW	Green with white tracer	PB	Pink with black tracer	WB	White with black tracer
BrW	Brown with white tracer	GL	Green with blue tracer	R	Red	YB	Yellow with black tracer
BG	Black with green tracer	L	Blue	RY	Red with yellow tracer	YW	Yellow with white tracer
BY	Black with yellow tracer	LG	Blue with green tracer	RB	Red with black tracer	YL	Yellow with blue tracer
BR	Black with red tracer	LR	Blue with red tracer	RW	Red with white tracer	YG	Yellow with green tracer
BL	Black with blue tracer	LW	Blue with white tracer	WL	White with blue tracer	Y	Yellow
Br	Brown	LB	Blue with black tracer	WY	White with yellow tracer		
GR	Green with red tracer	P	Pink	WG	White with green tracer		

WIRING HARNESS LOCATION DIAGRAM

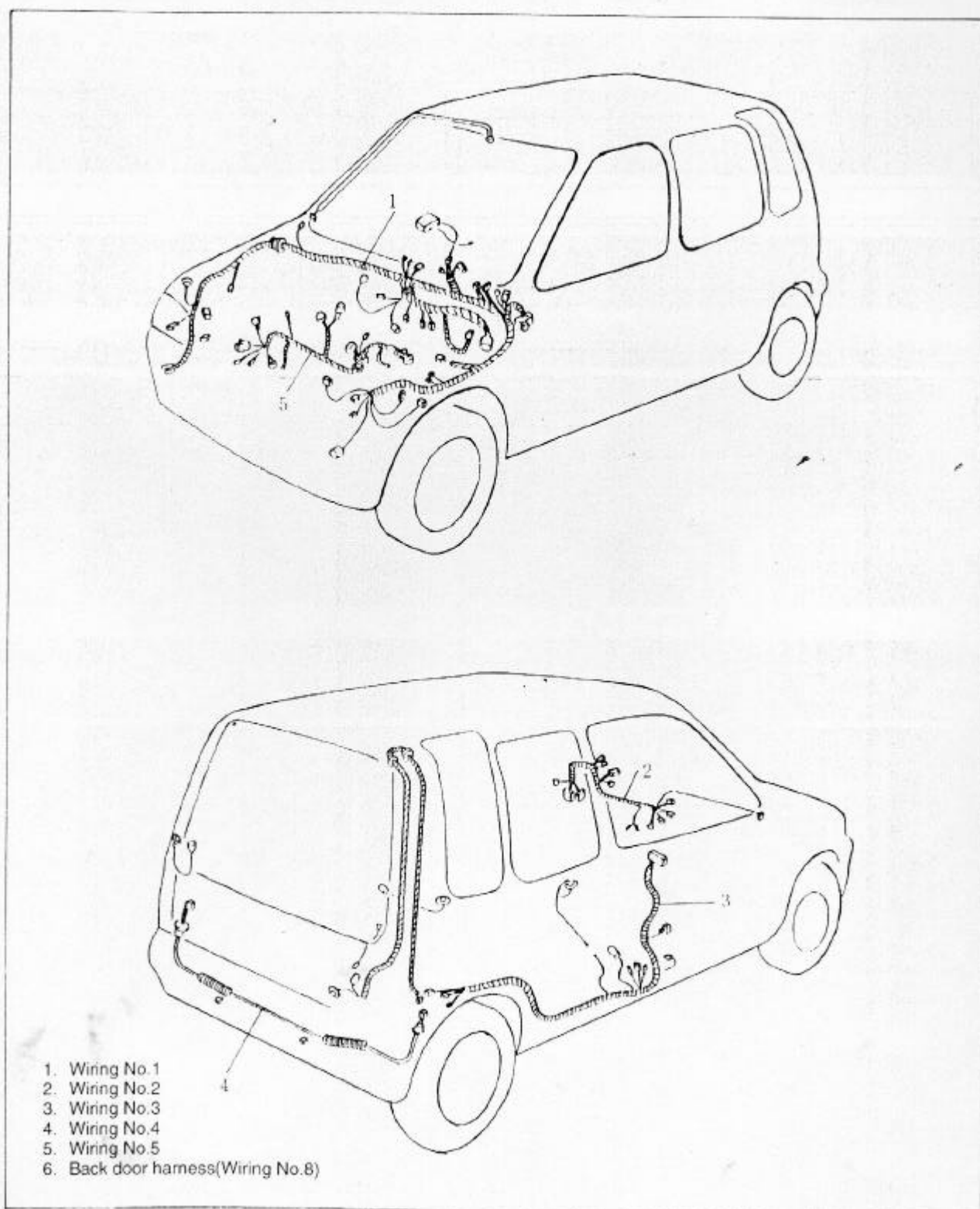


FIG. 8 — 26 WIRING HARNESS LOCATION DIAGRAM

WIRING HARNESS NOMENCLATURE

Symbol	Marking	Major component connection and connector connection
Ⓐ	W/H No.1	Main wiring, connected to main fuse, fuse box, headlight, ATM, lighter position sensor. All the wires of car are connected with connector from this wires(W/H No.1).
Ⓑ	W/H No.2	Connected to W/H No.1 with connectors(X2, X3). and connected to instrument panel, hot wire switch, radio(cassette), cigar lighter, rear washer fluid pump and switch, ect.
Ⓒ	W/H No.3	Connected to W/H No.1 with connector(X16) and connected to seat belt buckle switch, RH, LH door switch, fuel level gauge, parking brake switch, ect.
Ⓓ	W/H No.4	Connected to W/H No.3 with connector(X26). and connected to licence plate lamp, backup lamp, rear combination LH lamp, etc.
Ⓔ	W/H No.5	Connected to W/H No.1 with connectors(X5, X23) and connected to(Engine components such as) shift switch, shift solenoid, distributor, cooling fan switch, generator, starter motor, etc.
Ⓕ	W/H INR	Connected to W/H No.1 with connector(X12) and connected to air conditioner switch and air conditioner controller, etc.
Ⓖ	W/H ENG ROOM	Connected to W/H No.1 with connector(X13) and connected to dual cut switch, A/C V.S.V, temperature gauge, etc.
Ⓗ	W/H BACK DOOR	Connected to W/H No.3, and connected to rear wiper and hot wire.

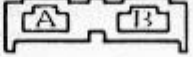
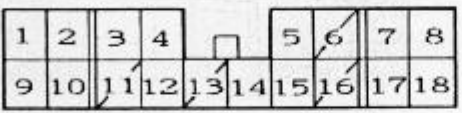
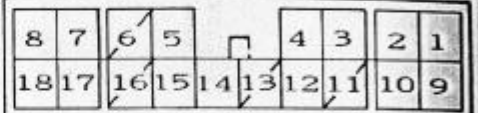
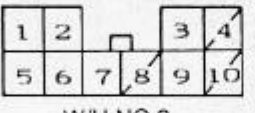
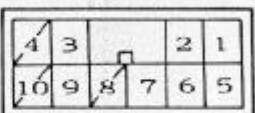
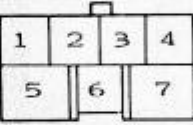
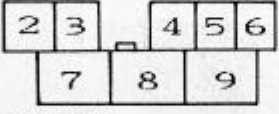
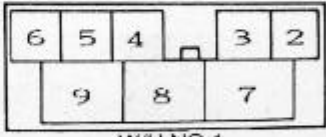

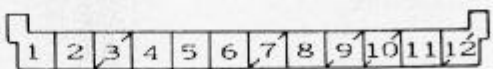
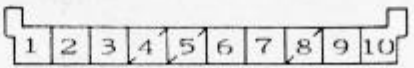
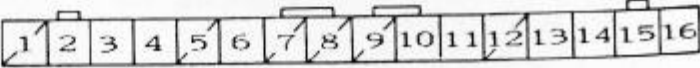
EARTH TERMINAL LOCATION

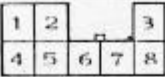
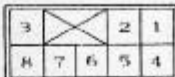


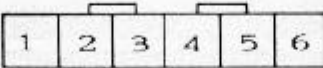
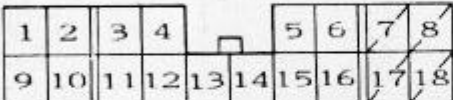
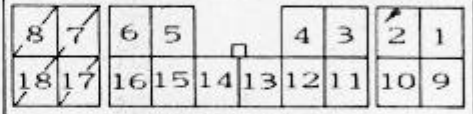
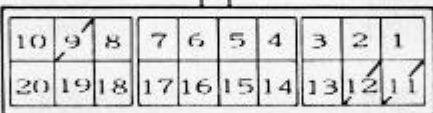

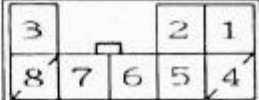
Symbol	Earth terminal location
1	Connected to battery " — " terminal, transaxle case and left side of body
2	Earth terminal of noise suppressor, noise filter connected to W/H No.5 and installed on cylinder block behind of generator.
3	Earth terminal of instrument panel, combination switch, signal relay, rear wiper motor, vacuum switch, fuel control relay and troubleshooting connector connected to W/H No.1 and installed on upper left side of fuse box.
4	Earth terminal of radiator fan motor, fuel control relay, rear washer motor and vacuum switch connected to W/H No.1 and installed on left side of ignition coil
5	Earth terminal of FR inside position light, FR.LH signal lamp, front washer motor and radiator fan motor relay connected to W/H No.1 and installed on engine room left side(body).
6	Earth terminal of FR.RH position light, FR.RH signal lamp connected to W/H No.1 and installed on engine room left side(body).
7	Earth terminal of backup light connected to W/H No.3 and installed on parking brake right side(under the right seat).
8	Hot wire earth connected to back door left side.
9	Earth terminal of radio connected to steering column bracket.
10	Earth terminal connected to engine exhaust manifold and body cross member.

CONNECTOR CONFIGURATION AND TERMINAL NUMBER LOCATION DIAGRAM

Connector configuration and terminal number

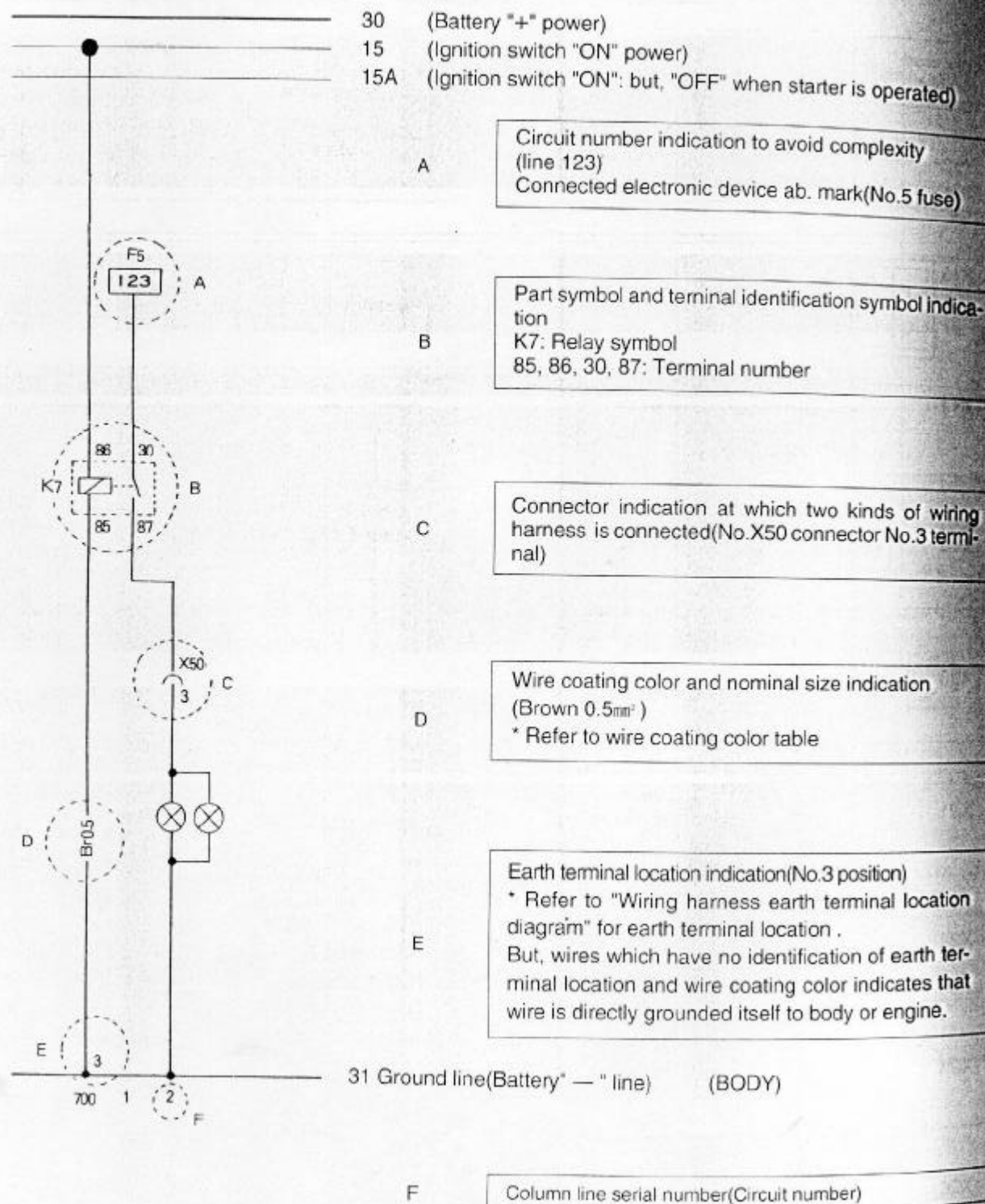
※ ("1" pin connector configuration is excepted)

Connector Number	Configuration and terminal number
X1	 W/H NO.1
X2	<div style="display: flex; justify-content: space-around;"> <div>  W/H NO.1 </div> <div>  W/H NO.2 </div> </div>
X3	<div style="display: flex; justify-content: space-around;"> <div>  W/H NO.2 </div> <div>  W/H NO.1 </div> </div>
X4	 W/H NO.1 1G SW
X5	<div style="display: flex; justify-content: space-around;"> <div>  W/H NO.5 </div> <div>  W/H NO.1 </div> </div>
X6	 W/H NO.1 CARB.SOL
X8	 W/H NO.2 MTR.
X9	 W/H NO.2 MTR
X11	 A/C CONTROLLER

Connector Number	Configuration and terminal number
X12	<div style="display: inline-block; vertical-align: top; margin-right: 20px;">  <p>W/H NO.1 A/C</p> </div> <div style="display: inline-block; vertical-align: top;">  <p>W/H INR A/C</p> </div>
X13	<div style="display: inline-block; vertical-align: top; margin-right: 20px;">  <p>W/H NO.1 A/C(E)</p> </div> <div style="display: inline-block; vertical-align: top;">  <p>W/H ENG ROOM A/C(E)</p> </div>
X14	 <p>A/C SW</p>
X16	<div style="display: inline-block; vertical-align: top; margin-right: 20px;">  <p>W/H NO.3</p> </div> <div style="display: inline-block; vertical-align: top;">  <p>W/H NO.1</p> </div>
X20	 <p>W/H NO.1 COMB SW</p>
X21	W/H NO.1 ATM
X22	W/H NO.5 SHIFT SW
X23	<div style="display: inline-block; vertical-align: top; margin-right: 20px;">W/H NO.1</div> <div style="display: inline-block; vertical-align: top;">W/H NO.5</div>
X26	<div style="display: inline-block; vertical-align: top; margin-right: 20px;">  <p>W/H NO.4</p> </div> <div style="display: inline-block; vertical-align: top;">  <p>W/H NO.3 W/H REAR</p> </div>
X32	W/H NO.2 RADIO

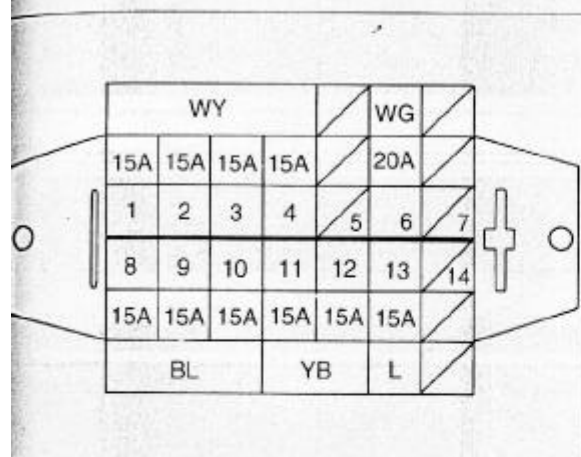
CONSTITUTION OF CIRCUIT

* In the below diagram, switch and relay condition is in "OFF"

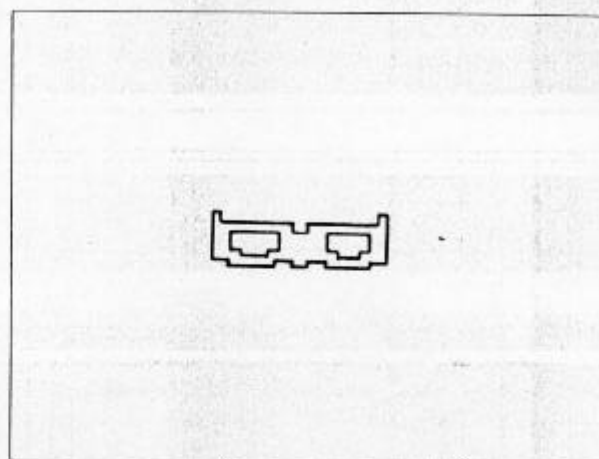


USE LOCATION AND USE

use Location



Fuse box



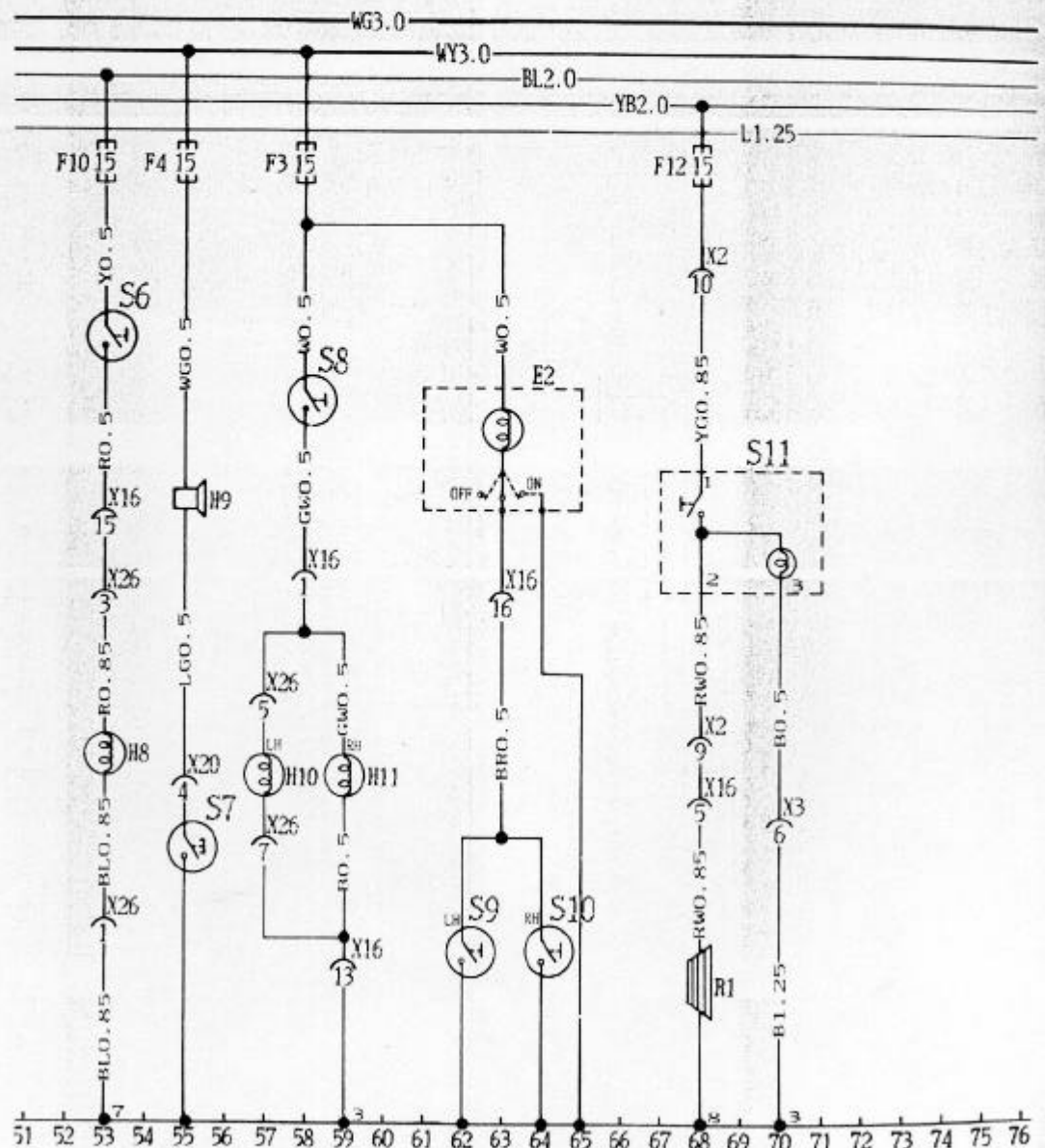
Main fuse

use Capacity and Use

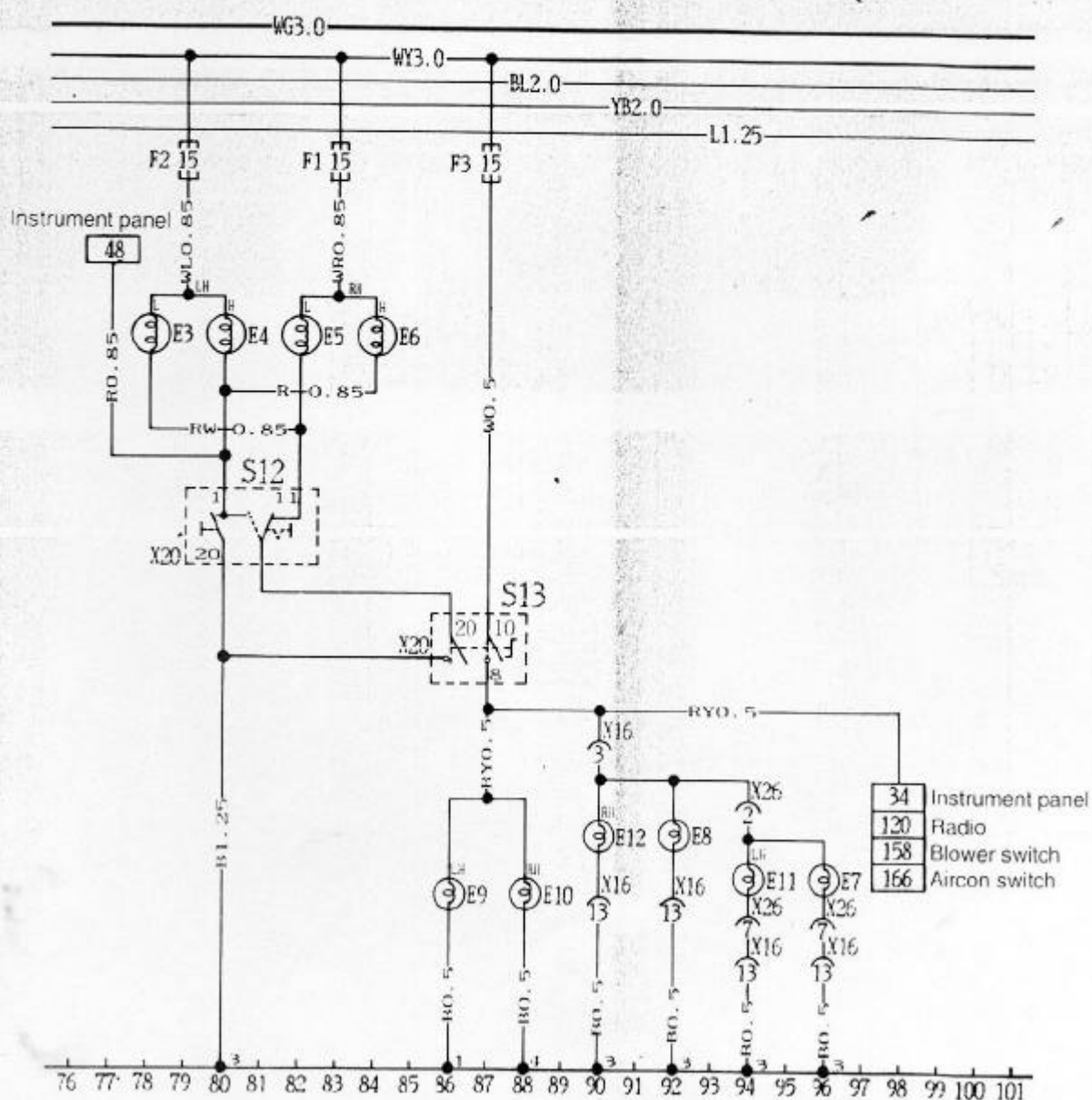
Fuse number	Capacity (A)	Use
1	15	Upward/downward headlight right
2	15	Upward headlight indicator, upward/downward headlight left
3	15	Brake switch, room light, light switch, radio and clock
4	15	Horn, emergency warning light switch
5	—	Not use
6	20	Radiator motor fan relay
7	—	Not use
8	15	IG coil, carburetor solenoid, B.V.V, N.S, instrument panel, radiator motor fan relay
9	15	Wiper switch, motor
10	15	Backup light switch, emergency warning light switch, A/C V.S.V
11	15	Blower motor
12	15	Hot wire switch
13	15	Cigar lighter, cassette radio
14	—	Not use

E2. Room light	61-65
H8. Back up light	53
H9. Horn	55
H10. Brake lamp, LH	57
H11. Brake lamp, RH	59
R1. Hot wire glass	68
S6. Back up light switch	59
S7. Horn switch	55

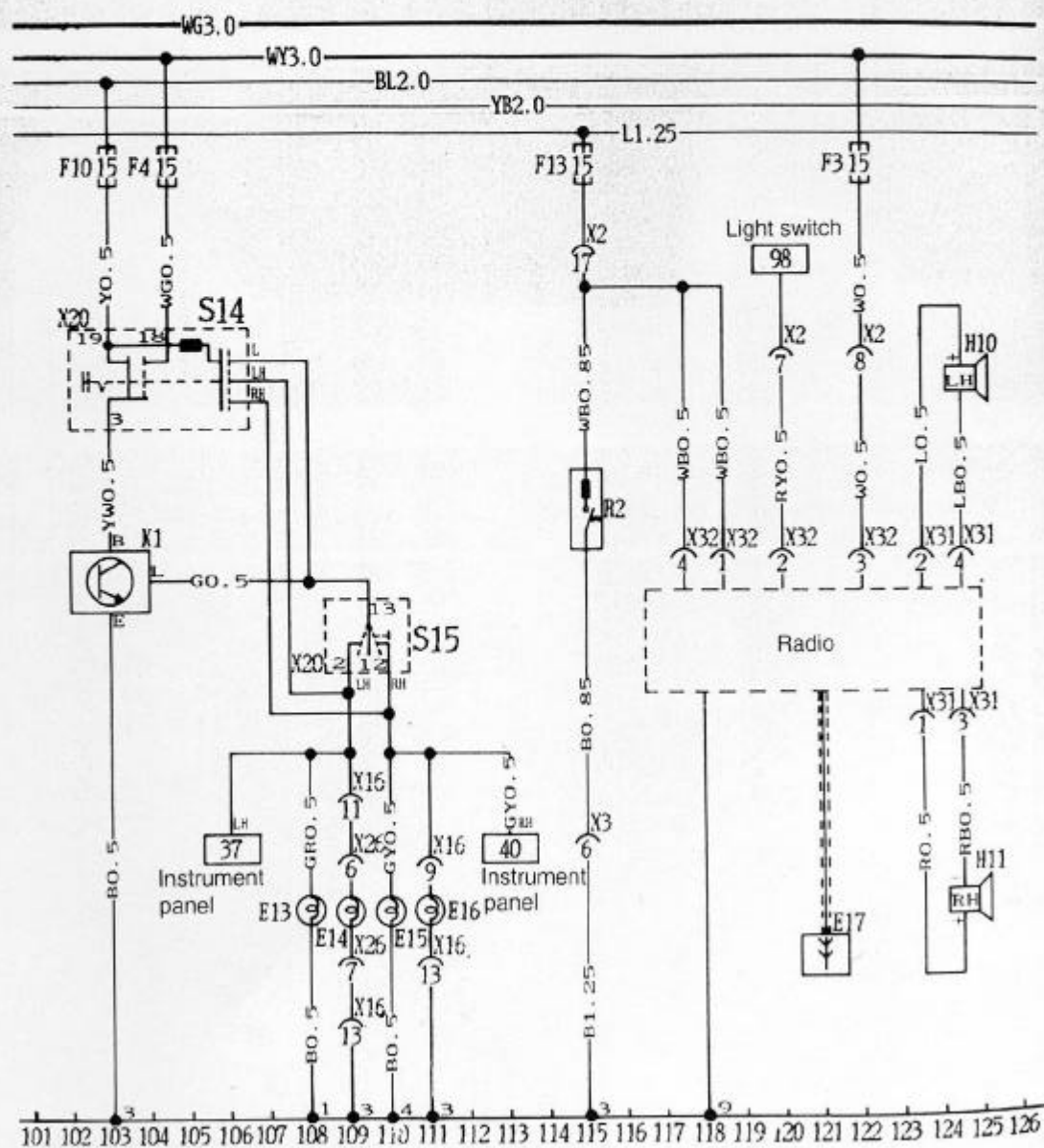
S8. Brake switch	
S9. Door switch, LH	
S10. Door switch, RH	
S11. Hot wire	6



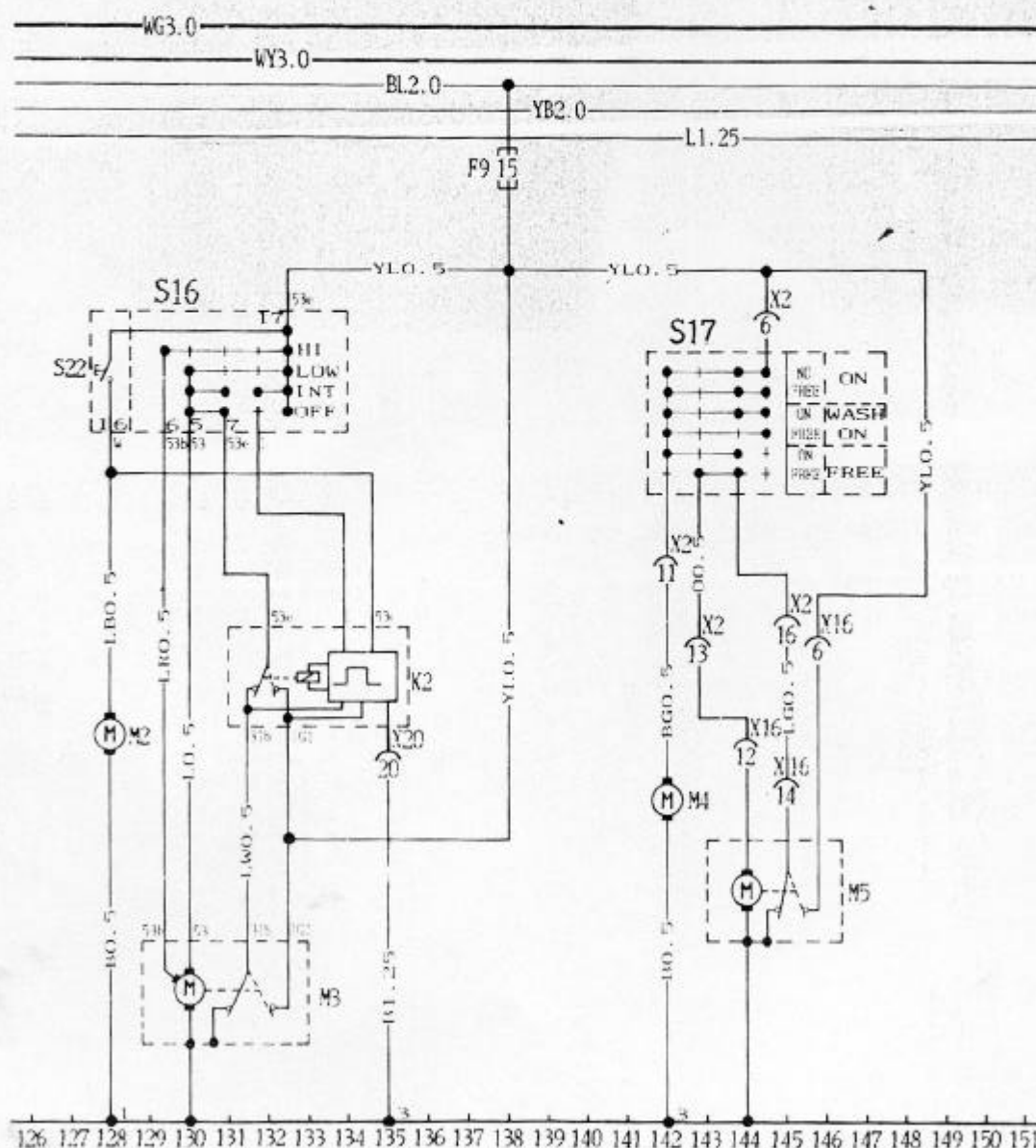
E3. Downward headlight, LH	78	E11. Tail lamp, rear, LH	92
E4. Upward headlight, LH	80	E12. Tail lamp, rear, RH	90
E5. Downward headlight, RH	82	S12. Dimmer switch	79-83
E6. Upward headlight, RH	84	S13. Light switch	85-88
E7. Licence plate lamp	96		
E8. A/T light	92		
E9. Position lamp, front, LH	86		
E10. Position lamp, front, RH	88		



E13. Turn sig. lamp, front, LH	108	R2. Cigar light	
E14. Turn sig. lamp, rear, LH	109	S14. Emergency waring light	102
E15. Turn sig. lamp, front, RH	110	S15. Turn sig. indicator switch	108
E16. Turn sig. lamp, rear, RH	111		
E17. Antena	121		
H10. speaker front, LH	124-125		
H11. Speaker front, RH	124-125		
K1. Bringker unit	103		



K2. Wiper relay	131~136
M2. Washer motor (Front)	128
M3. Wiper motor (Front)	129~133
M4. Washer pump (Rear)	142
M5. Wiper motor (Rear)	143~147
S16. Wiper switch (Front)	127~134
S17. Wiper switch (Rear)	142~147
S22. Wiper washer pump switch	128



E18. Blower switch light	154	S18. Cooling fan temp. switch	154
E19. Aircon switch light	166	S19. Blower switch	157-161
K3. Radiator motor fan relay	152-155	S20. Dual cut switch	167
M6. Radiator motor fan motor	153	S21. Aircon switch	165-171
M7. Blower motor	159	V1. Diode	155
P5. Aircon temp. gauge	176	Y4. Compressor	156
P6. Evaporator themister	174	Y5. V.S.V (vacuume switching valve)	172
K3. Series resistance	159		

