

WORKSHOP MANUAL

NHR · NKR · NPR · NQR · NPS

CAB AND CHASSIS ELECTRICAL

SECTION 8

ISUZU

ISUZU



International Service & Parts
Tokyo, Japan

NOTICE

Before using this Workshop Manual to assist you in performing vehicle service and maintenance operations, it is recommended that you carefully read and thoroughly understand the information contained in Section 0A under the headings "GENERAL REPAIR INSTRUCTIONS" and "HOW TO USE THIS MANUAL".

All material contained in this Manual is based on latest product information available at the time of publication.

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Applicable Model

N-Series		
NHR55	NPR66	NPS71
NHR69	NPR69	NQR66
NKR55	NPR70	NQR70
NKR66	NPR71	NQR71
NKR69		

THIS MANUAL INCLUDES THE FOLLOWING SECTIONS:

SECTION NO.	CONTENTS
8	CAB AND CHASSIS ELECTRICAL

SECTION 8

CAB AND CHASSIS ELECTRICAL



CAUTION:

When fasteners are removed, always reinstall them at the same location from which they were removed. If a fastener needs to be replaced, use the correct part number fastener for that application. If the correct part number fastener is not available, a fastener of equal size and strength (or stronger) may be used. Fasteners that are not reused, and those requiring thread locking compound, will be called out. The correct torque values must be used when installing fasteners that require it. If the above conditions are not followed, parts or system damage could result.

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GENERAL INFORMATION

The chassis electrical system is of 12-volt specifications with a negative ground polarity.

Wire sizes are appropriate to respective circuits, and classified by color. (The classification of harnesses by color is shown on the circuit diagram for ease of harness identification.)

The wire size is determined by load capacity and the length of wire required.

The vehicle harnesses are: body harness, floor harness, engine harness, frame front harness, frame rear harness, rear body harness, dome light harness, door harness and battery cable.

The harnesses are protected either by tape or corrugated tube, depending on harness location.

The circuit for each system consists of the power source, wire, fuse, relay switch, load parts and ground, all of which are shown on the circuit diagram.

In this manual, each electrical device is classified by system. For major parts shown on the circuit based on the circuit diagram for each system, a summary, diagnosis of troubles, inspection and removal and installation procedures are detailed.

NOTES FOR WORKING ON ELECTRICAL ITEMS

BATTERY CABLE

Disconnecting the Battery Cable

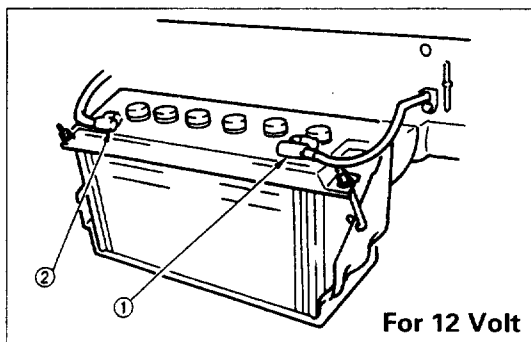
- 1) All switches should be in the "OFF" position.
- 2) Disconnect the battery ground cable.
- 3) Disconnect the battery positive cable
- 4) Disconnect the battery cable ③



CAUTION:

It is important that the battery ground cable be disconnected first.

Disconnecting the battery positive cable first can result in a short circuit.



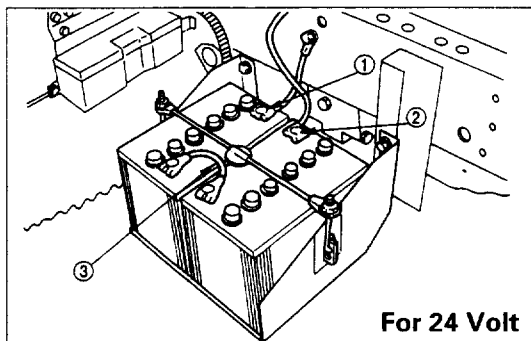
Connecting the Battery Cable

Follow the disconnecting procedure in the reverse order.



CAUTION:

Clean the battery terminal and apply a light coat of grease to prevent terminal corrosion.



Connector Handling

Disconnecting The Connectors

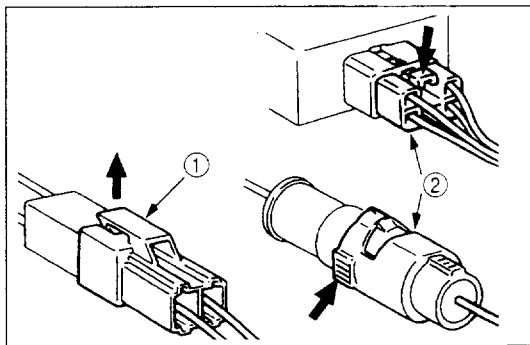
Some connectors have a tang lock to hold the connectors together during vehicle operation. Some tang locks are released by pulling them towards you ①.

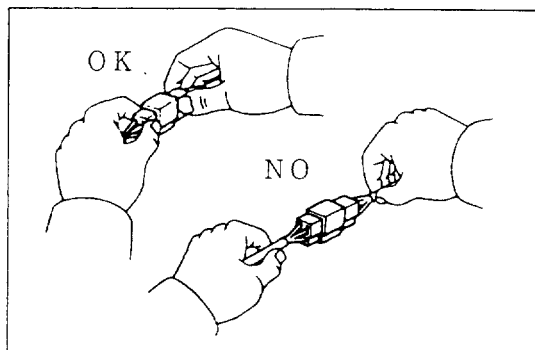
Other tang locks are released by pressing them forward ②.

Determine which type of tang lock is on the connector being handled.

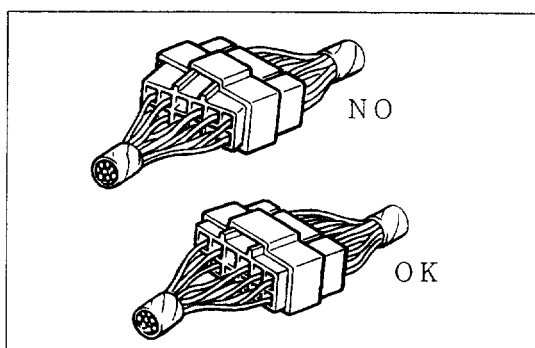
Firmly grasp both sides (male and female) of the connector.

Release the tang lock and carefully pull the two halves of the connector apart.



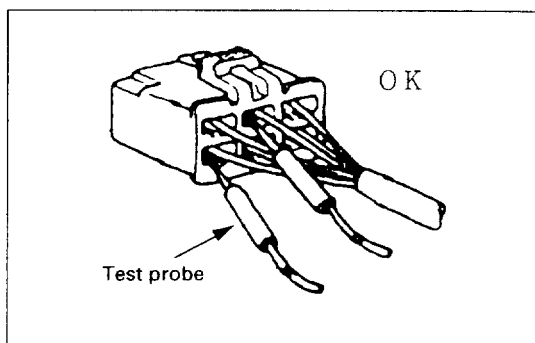


Never pull on the wires to separate the connectors. This will result in wire breakage.



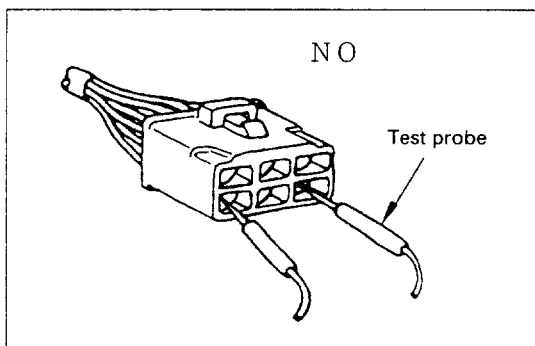
Connecting the Connector

Firmly grasp both sides (male and female) of the connector. Be sure that the connector pins and pin holes match. Be sure that both sides of the connector are aligned with each other. Firmly but carefully push the two sides of the connector together until a distinct click is heard.

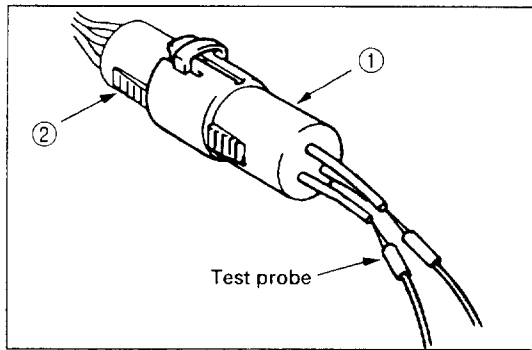


Connector Inspection

Use a circuit tester to check the connector for continuity. Insert the test probes from the connector wire side.

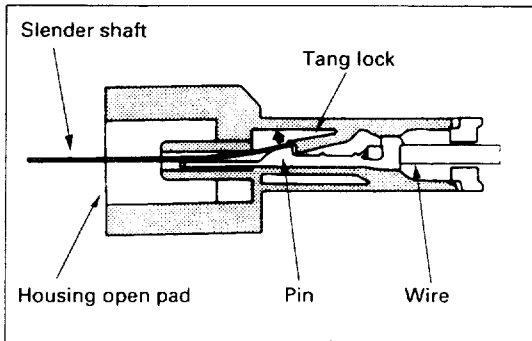


Never insert the circuit tester test probes into the connector open end to test the continuity. Broken or open connector terminals will result.



Waterproof Connector Inspection

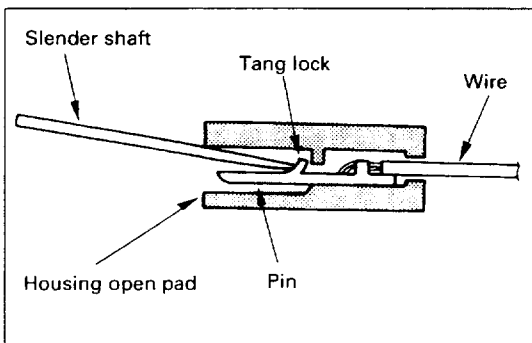
It is not possible to insert the test probes into the connector wire side of a waterproof connector. Use one side of a connector ① with its wires cut to make the test. Connect the test connector ② to the connector to be tested. Connect the test probes to the cut wires to check the connector continuity.



Connector Pin Removal

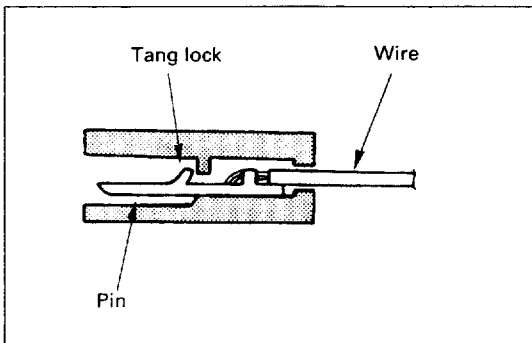
Connector Housing Tang Lock Type

- 1) Insert a slender shaft into the connector housing open end.
- 2) Push the tang lock up (in the direction of the arrow in the illustration). Pull the wire with pin free from the wire side of the connector.



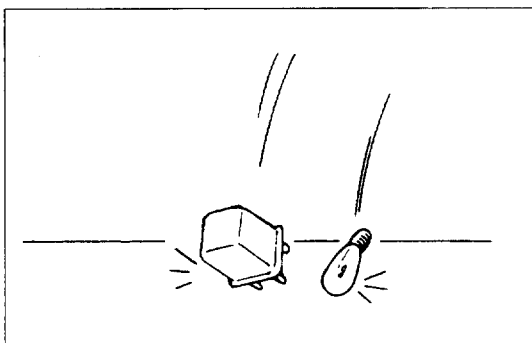
Pin Tang Lock Type

- 1) Insert a slender shaft into the connector housing open end.
- 2) Push the tang lock flat (toward the wire side of the connector). Pull the wire with pin free from the wire side of the connector.



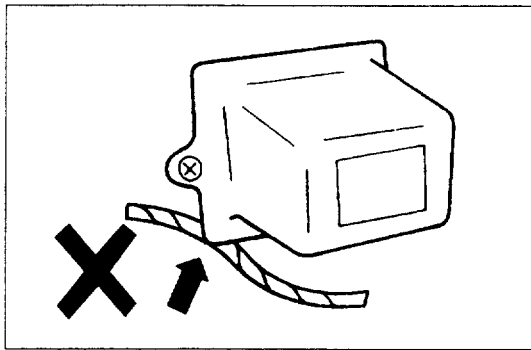
Connector Pin Insertion

- 1) Check that the tang lock is fully up.
- 2) Insert the pin from the connector wire side. Push the pin in until the tang lock closes firmly.
- 3) Gently pull on the wires to make sure that the connector pin is firmly set in place.



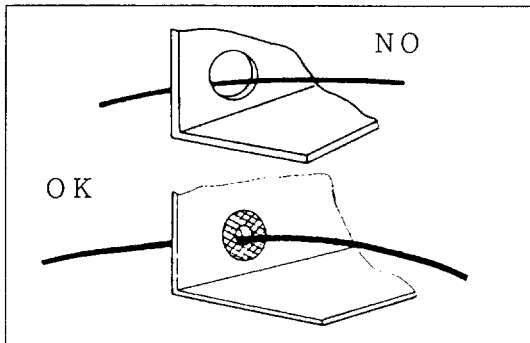
Parts Handling

Be careful when handling electrical parts. They should not be dropped or thrown, because short circuit or other damage may result.

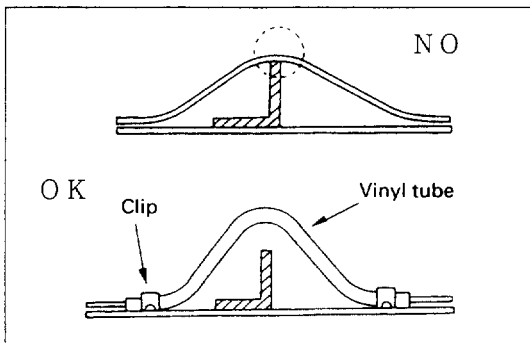


Cable Harness

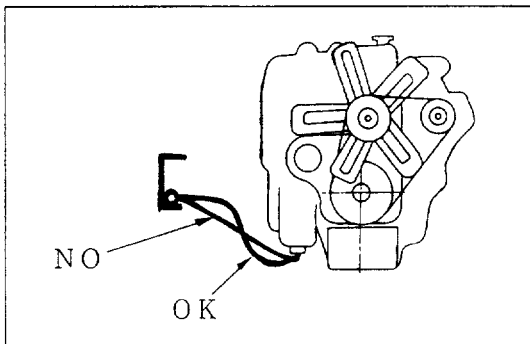
When installing the parts, be careful not to pinch or wedge the wiring harness.
All electrical connections must be kept clean and tight.



Use a grommet or guard tube to protect the wiring harness from contacting a sharp edge or surface.



Position the wiring harness with a enough clearance from the other parts and guard the wiring harness with a vinyl tube and clips to avoid direct contact.



The wiring harness between engine and chassis should be long enough to prevent chafing or damage due to various vibrations.

SPLICING WIRE

1. Open the Harness

If the harness is taped, remove the tape. To avoid wire insulation damage, use a sewing "seam ripper" (available from sewing supply stores) to cut open the harness.

If the harness has a block plastic conduit, simply pull out the desired wire.

2. Cut the wire

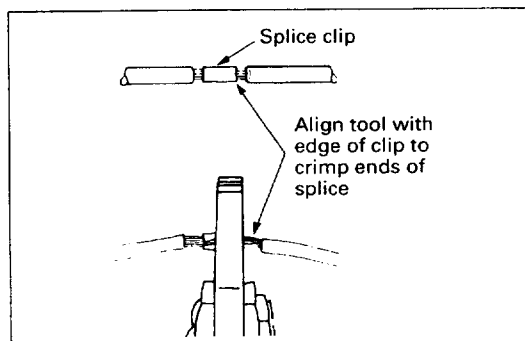
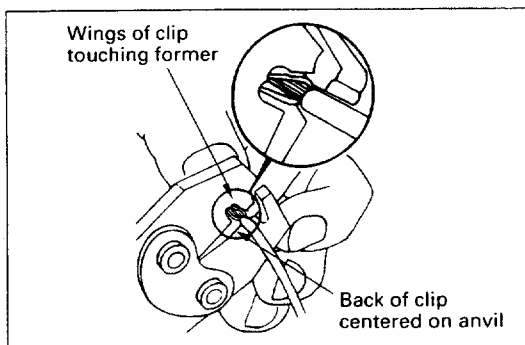
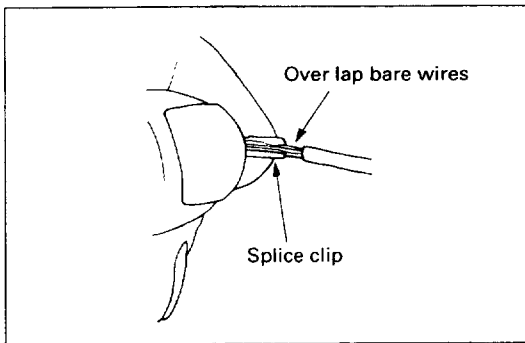
Begin by cutting as little wire off the harness as possible. You may need the extra length of wire later if you decide to cut more wire off to change the location of a splice. You may have to adjust splice locations to make certain that each splice is at least 1-2/2" (40 mm) away from other splices, harness branches, or connectors.

3. Strip the insulation

When replacing a wire, use a wire of the same size as the original wire. Check the stripped wire for nicks or cut stands. If the wire is damaged, repeat the procedure on a new section of wire. The two stripped wire ends should be equal in length.

4. Crimp the Wires

Select the proper clip to secure the splice. To determine the proper clip size for the wire being spliced, follow the directions included with your clips. Select the correct anvil on the crimper. (On most crimpers your choice is limited to either a small or large anvil.) Overlap the two stripped wire ends and hold them between your thumb and forefinger. Then, center the splice clip under the stripped wires and hold it in place.

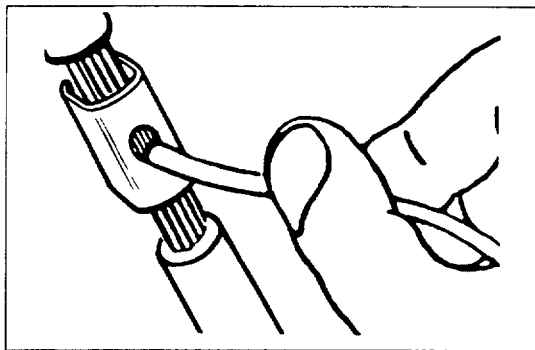


- Open the crimping tool to its full width and rest one handle on a firm flat surface.
- Center the back of the splice clip on the proper anvil and close the crimping tool to the point where the back of the splice clip touches the wings of the clip.
- Make sure that the clip and wires are still in the correct position. Then, apply steady pressure until the crimping tool closes.

Before crimping the ends of the clip, be sure that:

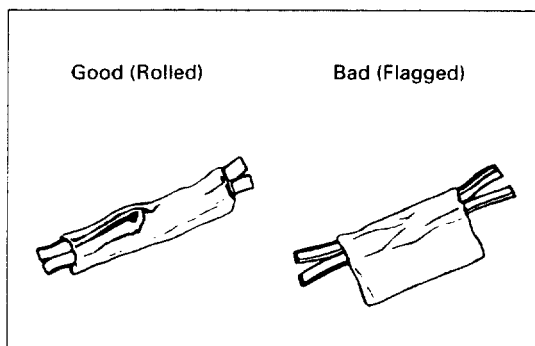
- The wires extend beyond the clip in each direction.
- No strands of wire are cut loose, and
- No insulation is caught under the clip.

Crimp the splice again, once on each end. Do not let the crimping tool extend beyond the edge of the clip or you may damage or nick the wires.



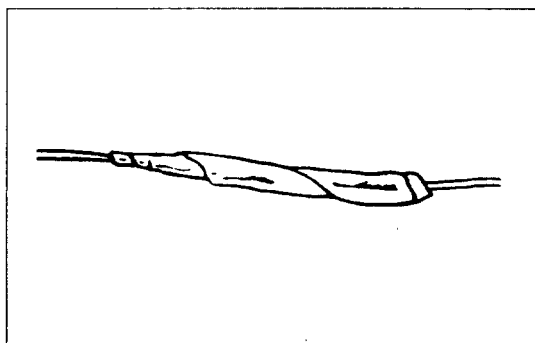
5. Solder

Apply 60/40 rosin core solder to the opening in the back of the clip. Follow the manufacturer's instructions for the solder equipment you are using.



6. Tape the Splice





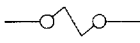

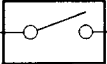
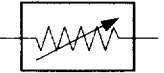
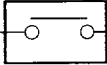
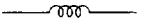
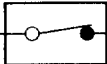
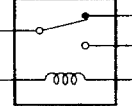

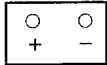



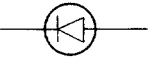

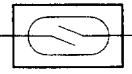



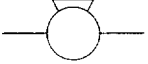
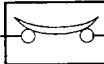
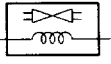
Center and roll the splicing tape. The tape should cover the entire splice. Roll on enough tape to duplicate the thickness of the insulation on the existing wires. Do not flag the tape. Flagged tape may not provide enough insulation, and the flagged ends will tangle with the other wires in the harness.



If the wire does not belong in a conduit or other harness covering, tape the wire again. Use a winding motion to cover the first piece of tape.

SYMBOLS AND ABBREVIATIONS

SYMBOLS

Symbol	Meaning of Symbol	Symbol	Meaning of Symbol
	Fuse		Bulb
	Fusible link		Double filament bulb
	Fusible link wire		Motor
	Switch		Variable register Rheostat
	Switch		Coil (inductor), solenoid, magnetic valve
	Switch (Normal close type)		Relay
	Contact wiring		
	Battery		
	Diode		Connector
	Electronic Parts		Light emitting diode
	Resistor		Reed switch
	Speaker		Condenser
	Buzzer		Horn
	Circuit breaker		Vacuum switching valve

ABBREVIATIONS

Abbreviation	Meaning of Abbreviation	Abbreviation	Meaning of Abbreviation
A	Ampere (S)	kW	kilowatt
ABS	Anti-lock brake system	LH	Left hand
ASM	Assembly	LWB	Long wheel base
AC	Alternating current	M/T	Manual transmission
A/C	Air conditioner	OD	Over drive
ACC	Accessories	OPT	Option
A/T	Automatic transmission	QOS	Quick on start
C/B	Circuit breaker	RH	Right hand
CSD	Cold start device	RR	Rear
DIS	Direct ignition system	RWAL	Rear wheel anti-lock brake system
EBCM	Electronic brake control module	ST	Start
ECGI	Electronic control gasoline injection	STD	Standard
ECM	Electronic control module	SW	Switch
ECU	Electronic control unit	SWB	Short wheel base
EFE	Early fuel evaporation	TCM	Transmission control module
4A/T	4-speed automatic transmission	3A/T	3-speed automatic transmission
4X4	Four-wheel drive	V	Volt
FL	Fusible link	VSV	Vacuum switching valve
FRT	Front	W	Watt (S)
H/L	Headlight	WOT	Wide open throttle
IC	Integrated circuit	W/	With
IG	Ignition	W/O	Without

PARTS FOR ELECTRICAL CIRCUIT

WIRING

Wire Color

All wires have color-coded insulation.

Wires belonging to a system's main harness will have a single color. Wires belonging to a system's sub-circuits will have a colored stripe. Striped wires use the following code to show wire size and colors.

Example: 0.5 G / R

Red (Stripe color)
Green (Base color)
Wire size (0.5 mm²)

Abbreviations are used to indicate wire color within a circuit diagram.

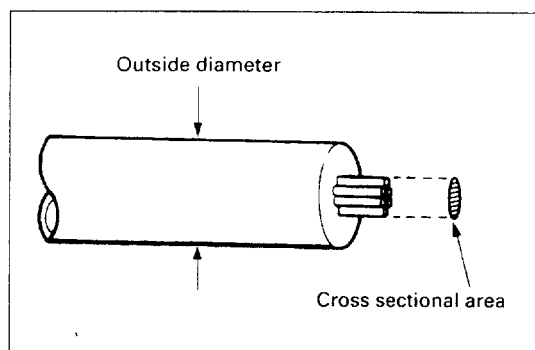
Refer to the following table.

Wire Color Coding

Color-Coding	Meaning	Color-coding	Meaning
B	Black	BR	Brown
W	White	LG	Light green
R	Red	GR	Grey
G	Green	P	Pink
Y	Yellow	LB	Light blue
L	Blue	V	Violet
O	Orange		

Distinction of Circuit by Wire Base Color

Base color	Circuits	Base color	Circuits
B	Starter circuit	Y	Instrument circuit
W	Charging circuit	L, O, BR, LG, GR, P, LB, V	Other circuit
R	Lighting circuit		
G	Signal circuits		



Wire Size

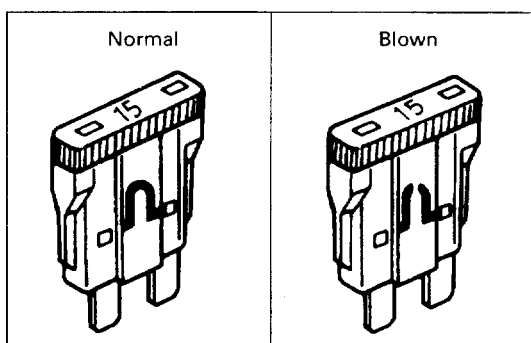
The size of wire used in a circuit is determined by the amount of current (amperage), the length of the circuit, and the voltage drop allowed. The following wire size and load capacity, shown below, are specified by AWG (American Wire Gauge) (Nominal size means approximate cross sectional area).

Wire Size Table

Nominal size	Cross sectional area (mm ²)	Outside diameter (mm)	Allowable current (A)	AWG size (cross reference)
0.3	0.372	1.8	9	22
0.5	0.563	2.0	12	20
0.85	0.885	2.2	16	18
1.25	1.287	2.5	21	16
2	2.091	2.9	28	14
3	3.296	3.6	37.5	12
5	5.227	4.4	53	10
8	7.952	5.5	67	8
15	13.36	7.0	75	6
20	20.61	8.2	97	4

FUSE, FUSIBLE LINK AND CIRCUIT BREAKER

FUSE



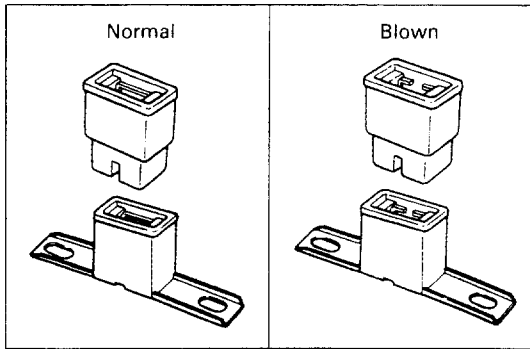
Fuses are the most common form of circuit protection used in vehicle wiring. A fuse is a thin piece of wire or strip of metal encased in a glass or plastic housing. It is wired in series with the circuit it protects. When there is an overload of current in a circuit, such as a short to ground, the wire or metal strip is designed to burn out and interrupt the flow of current. This prevents a surge of high current from reaching and damaging other components in the circuit.

Determine the cause of the overloaded before replacing the fuse.

The replacement fuse must have the same amperage specifications as the original fuse.

Never replace a blown fuse with a fuse of a different amperage specification.

Doing so can result in an electrical fire or other serious circuit damage. A blown fuse is easily



FUSIBLE LINK

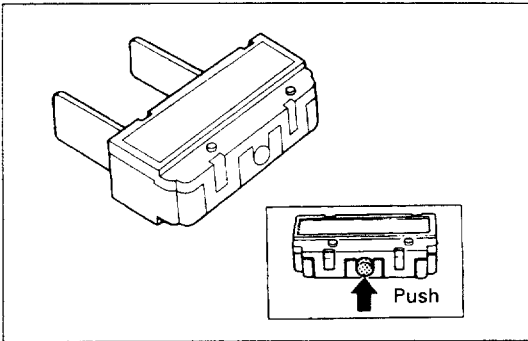
The fusible link is primarily used to protect circuits where high amounts of current flow and where it would not be practical to use a fuse. For example, the starter circuit. When a current overload occurs, the fusible link melts open and interrupts the flow of current so as to prevent the rest of the wiring harness from burning.

Determine the cause of the overload before replacing the fusible link. The replacement fusible link must have the same amperage specification as the original fusible link.

Never replace a blown fusible link with a fusible link of a different amperage specification. Doing so can result in an electrical fire or other serious circuit damage. A blown fusible link is easily identified.

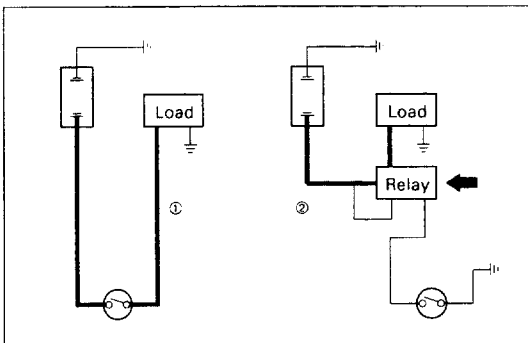
Fusible Link Specifications

Type	Rating	Case Color	Maximum Circuit Current (A)
Connector	30A	Pink	15
Connector	40A	Green	20
Bolted	50A	Red	25
Bolted	60A	Yellow	30
Bolted	80A	Black	40



CIRCUIT BREAKER

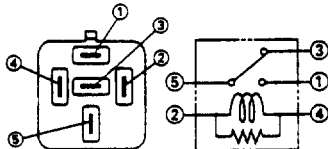
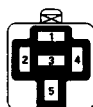
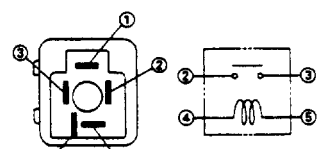
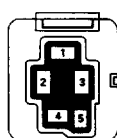
The circuit breaker is a protective device designed to open the circuit when a current load is in excess of rated breaker capacity. If there is a short or other type of overload condition in the circuit, the excessive current will open the circuit between the circuit breaker terminals. The reset knob pops out when the circuit is open. Push the reset knob in place to restore the circuit after repairing it.



RELAY

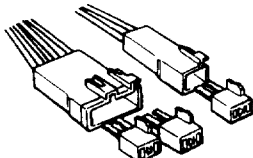

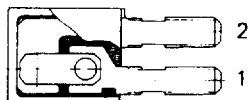
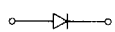
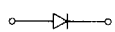
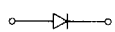
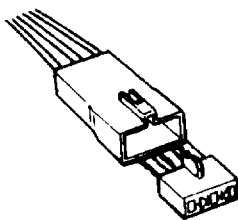
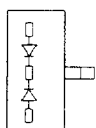
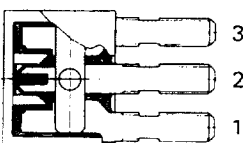
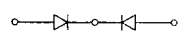
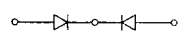
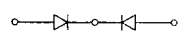
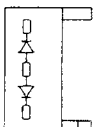
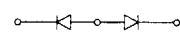
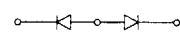
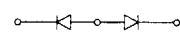
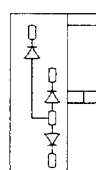
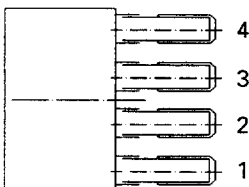
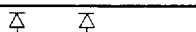
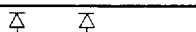
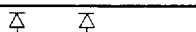
Battery and load location may require that a switch be placed some distance from either component. This means a longer wire and a higher voltage drop ①. The installation of a relay between the battery and the load reduces the voltage drop ②. Because the switch controls the relay, amperage through the switch can be reduced.

RELAY SPECIFICATION, CONFIGURATION AND INSPECTION

Name/ Color	Rated voltage/Coil resistance	Internal circuit	Name/ Color	Rated voltage/Coil resistance	Internal circuit
MR5C (1T)/ Black	12V/ Approx. 90Ω Minimum operating voltage: 7V at 25°C (77°F)	  (connector face)	MR82C/ White label	12V/ Approx. 23Ω Minimum operating voltage: 7V at 20°C (68°F)	  (connector face)
MR5C (1T)/ Brown	12V/ Approx. 90Ω Minimum operating voltage: 10.5V at 25°C (77°F)		MR82C/ Green label	24V/ Approx. 100Ω Minimum operating voltage: 16V at 20°C (68°F)	
MR5C (1T)/ Green	24V/ Approx. 266Ω Minimum operating voltage: 16V at 25°C (77°F)				
MR5C (1T)/ Grey	24V/ Approx. 266Ω Minimum operating voltage: 20V at 25°C (77°F)				
Inspection	The way	Check to see if there is any continuity between the relay terminals.	Inspection	The way	Check to see if there is any continuity between the relay terminals.
	Result			Result	
	Normal	(When no voltage is applied relay terminals ②-④) ③-⑤ … continuity ①-⑤ … No continuity Inspection		Normal	(When no voltage is applied relay terminals ④-⑤) ②-③ … No continuity
	Abnormal	(When minimum operating voltage is applied relay terminals between ②-④) ③-⑤ … continuity ①-⑤ … No continuity		Abnormal	(When minimum operating voltage is applied relay terminals between ④-⑤) ②-③ … No continuity
	Normal	(When minimum operating voltage is applied relay terminals between ②-④) ③-⑤ … No continuity ①-⑤ … continuity		Normal	(When minimum operating voltage is applied relay terminals between ④-⑤) ②-③ … continuity

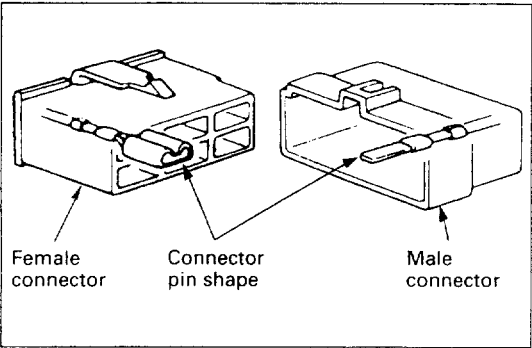
DIODE

DIODE SPECIFICATIONS AND CONFIGURATIONS

SHAPE	MARK/ COLOR	CONSTRUCTION	CHECKING	THERE SHOULD BE CONTINUITY IN EITHER A OR B WHEN A CIRCUIT TESTER IS CONNECTED WITH DIODE TERMINAL																				
	 BLACK		<table><tr><td>TERMINAL NO.</td><td colspan="2"></td></tr><tr><td></td><td>2</td><td>1</td></tr><tr><td>CONNECTION PATTERN</td><td>A</td><td>+</td><td>-</td></tr><tr><td></td><td>B</td><td>-</td><td>+</td></tr></table>	TERMINAL NO.				2	1	CONNECTION PATTERN	A	+	-		B	-	+							
TERMINAL NO.																								
	2	1																						
CONNECTION PATTERN	A	+	-																					
	B	-	+																					
	 BLACK		<table><tr><td>TERMINAL NO.</td><td colspan="3"></td></tr><tr><td></td><td>3</td><td>2</td><td>1</td></tr><tr><td>CONNECTION PATTERN</td><td>A</td><td>-</td><td>+</td><td></td></tr><tr><td></td><td>B</td><td>+</td><td>-</td><td></td></tr></table>	TERMINAL NO.					3	2	1	CONNECTION PATTERN	A	-	+			B	+	-				
	TERMINAL NO.																							
	3	2	1																					
CONNECTION PATTERN	A	-	+																					
	B	+	-																					
	 BLACK		<table><tr><td>TERMINAL NO.</td><td colspan="3"></td></tr><tr><td></td><td>3</td><td>2</td><td>1</td></tr><tr><td>CONNECTION PATTERN</td><td>A</td><td>-</td><td>+</td><td></td></tr><tr><td></td><td>B</td><td>+</td><td>-</td><td></td></tr></table>	TERMINAL NO.					3	2	1	CONNECTION PATTERN	A	-	+			B	+	-				
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	3	2	1																					
CONNECTION PATTERN	A	-	+																					
	B	+	-																					
	 BLACK		<table><tr><td>TERMINAL NO.</td><td colspan="4"></td></tr><tr><td></td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>CONNECTION PATTERN</td><td>A</td><td></td><td>+</td><td>-</td></tr><tr><td></td><td>B</td><td></td><td>+</td><td></td></tr></table>	TERMINAL NO.						4	3	2	1	CONNECTION PATTERN	A		+	-		B		+		
TERMINAL NO.																								
	4	3	2	1																				
CONNECTION PATTERN	A		+	-																				
	B		+																					

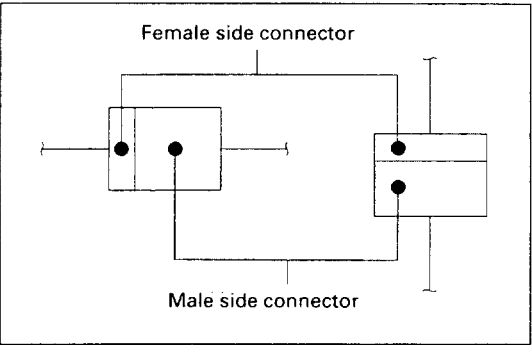
MAXIMUM RATING (Temp. =25°C)

Items	Rating	Remarks
Peak reverse voltage	400V	
Transient peak reverse voltage	500V	
Average output current	1.5A	Temp. = 40°C
Working ambient temperature	-30°C~80°C	
Storage temperature	-40°C~100°C	

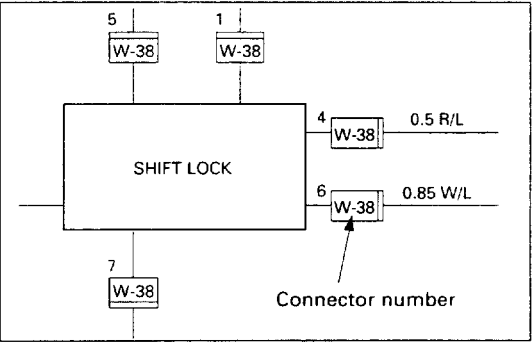


CONNECTOR

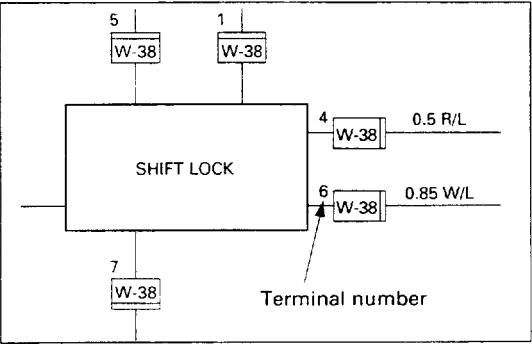
The connector pin shape determines whether the connector is male or female.
The connector housing configuration does not determine whether a connector is male or female.



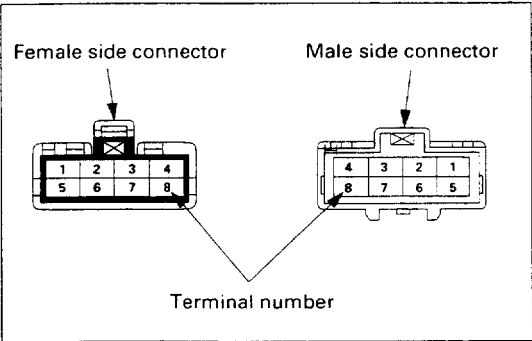
The symbol illustrated in the figure is used as connector, in the circuit of this section.



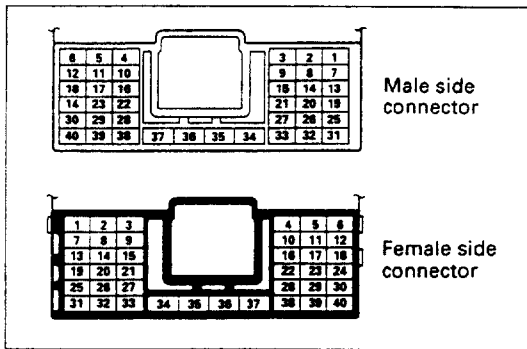
Connector is identified with a number.



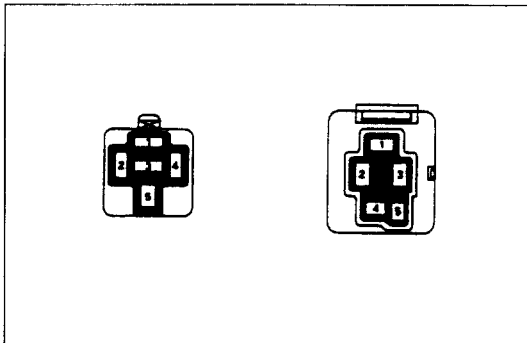
The applicable terminal number is shown for each connector.



Connector terminal numbers are clearly shown.
Male side connector terminal numbers are in sequence from upper right to lower left.
Female side connector terminal numbers are in sequence from upper left to lower right.

**NOTE:**

For those connectors on which specific terminal numbers or symbols are shown (such as ECM), the terminal numbers or symbols are used in the circuit diagram, irrespective of the above rule.



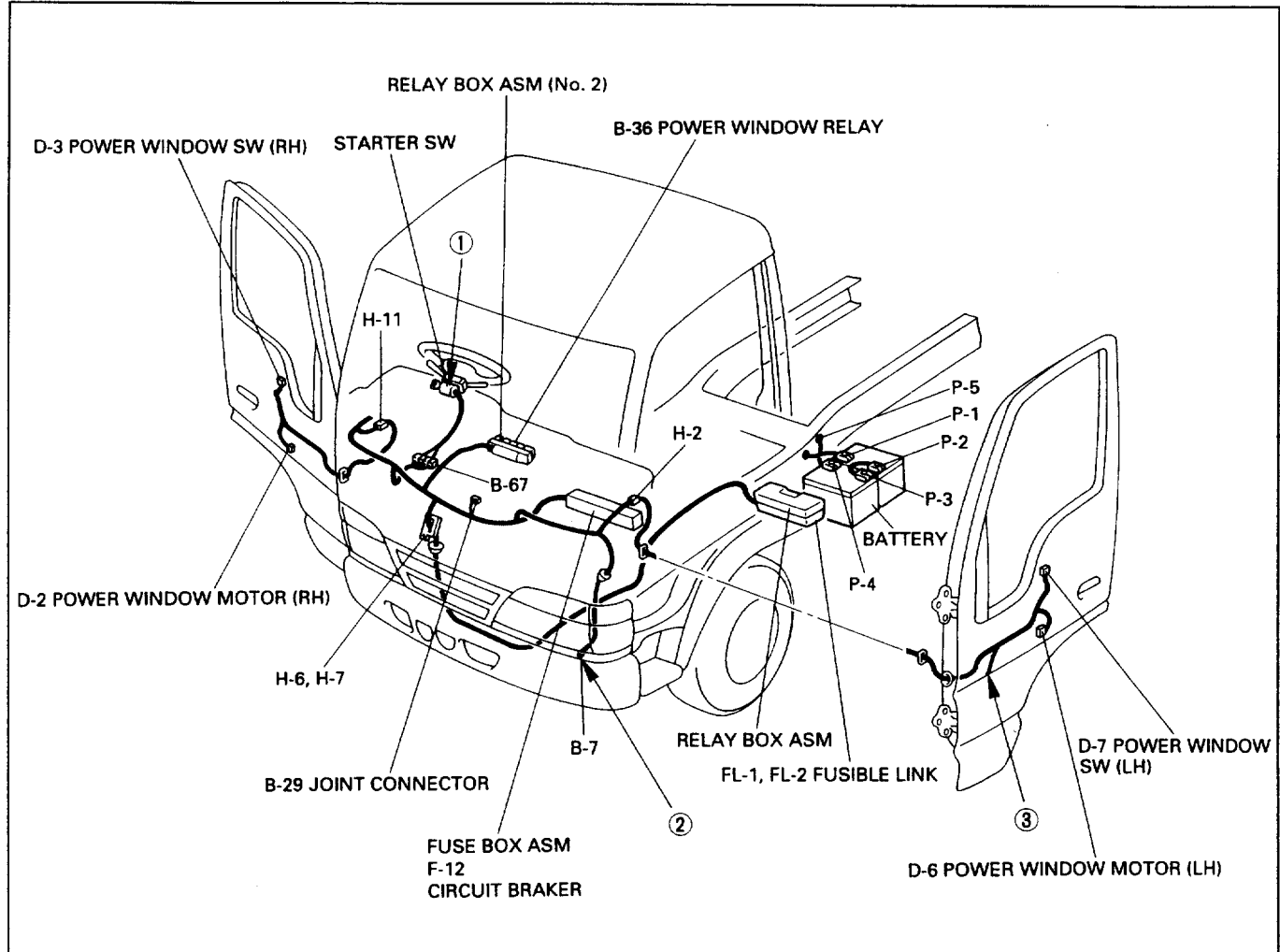
The connectors used for relays have their own terminal number assignment, irrespective of the above rule.

READING THE CIRCUIT DIAGRAM

In this manual, each system has its own parts location illustration, circuit diagram and connector configuration used in the circuit diagram.

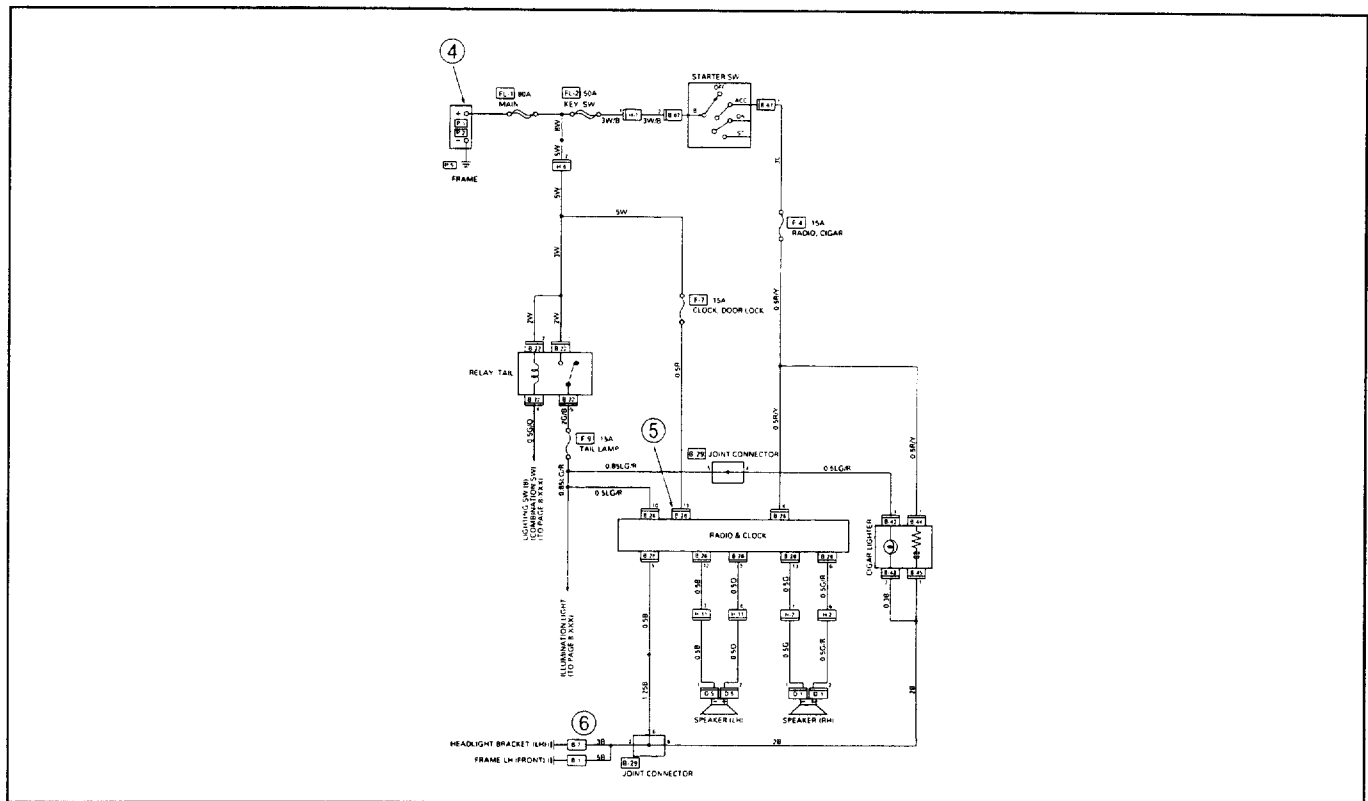
PARTS LOCATION

The parts location shows the location of the parts ① and the connector ② used in each harness routing ③.



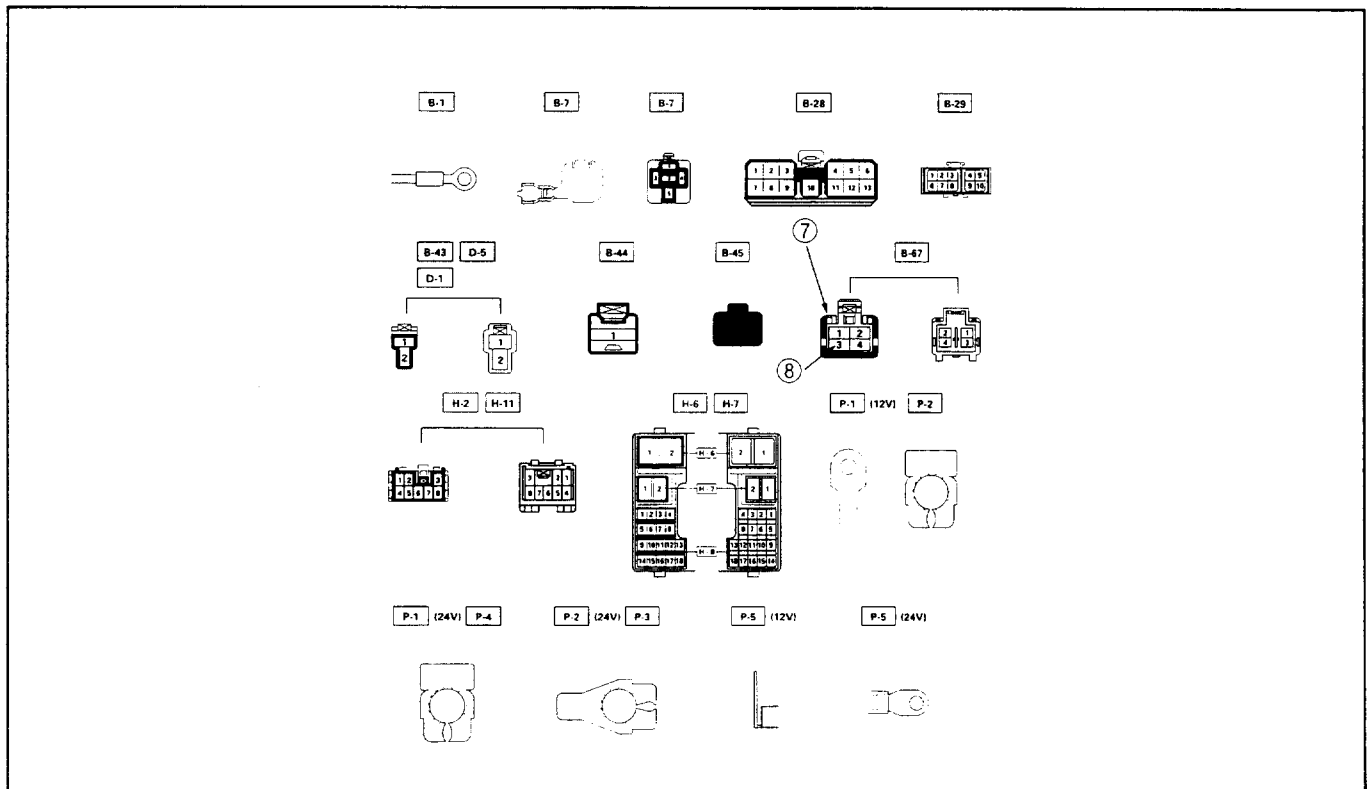
CIRCUIT DIAGRAM

The circuit diagram shows the power supply ④ the load or loads ⑤ and the grounding point(s) ⑥.



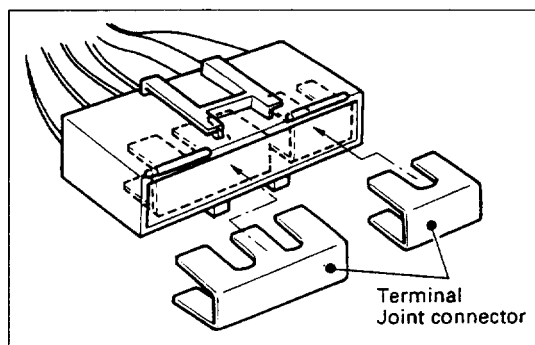
CONNECTOR LIST

The connector list shows each connectors' configuration ⑦ and the pin number ⑧.



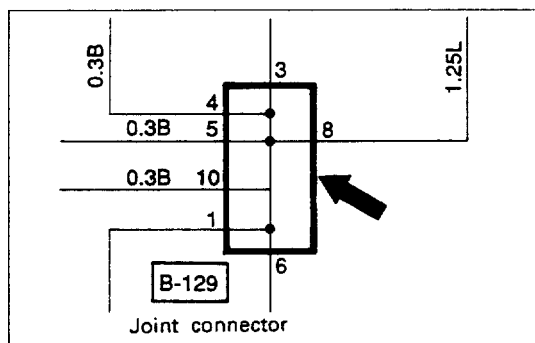
CONNECTOR SYMBOL

Connector Symbol	Harness name	Connector Symbol	Harness name
B	Body harness	L	Dome Light harness
D	Door harness	N	Floor harness (LH & RH)
E	Engine harness	P	Battery harness
H	For joint between harnesses	R	Rear body harness
J	Frame front & frame rear harness		



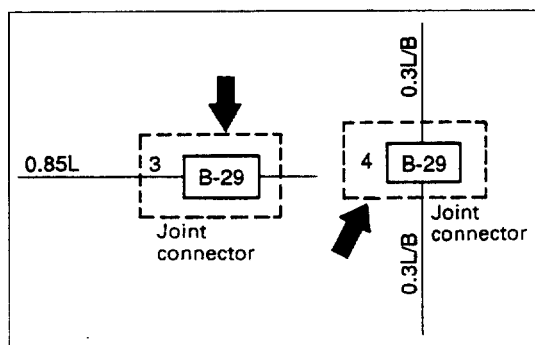
JOINT CONNECTOR

This connector has the structure of plural number of terminals collectively connected inside the connector.



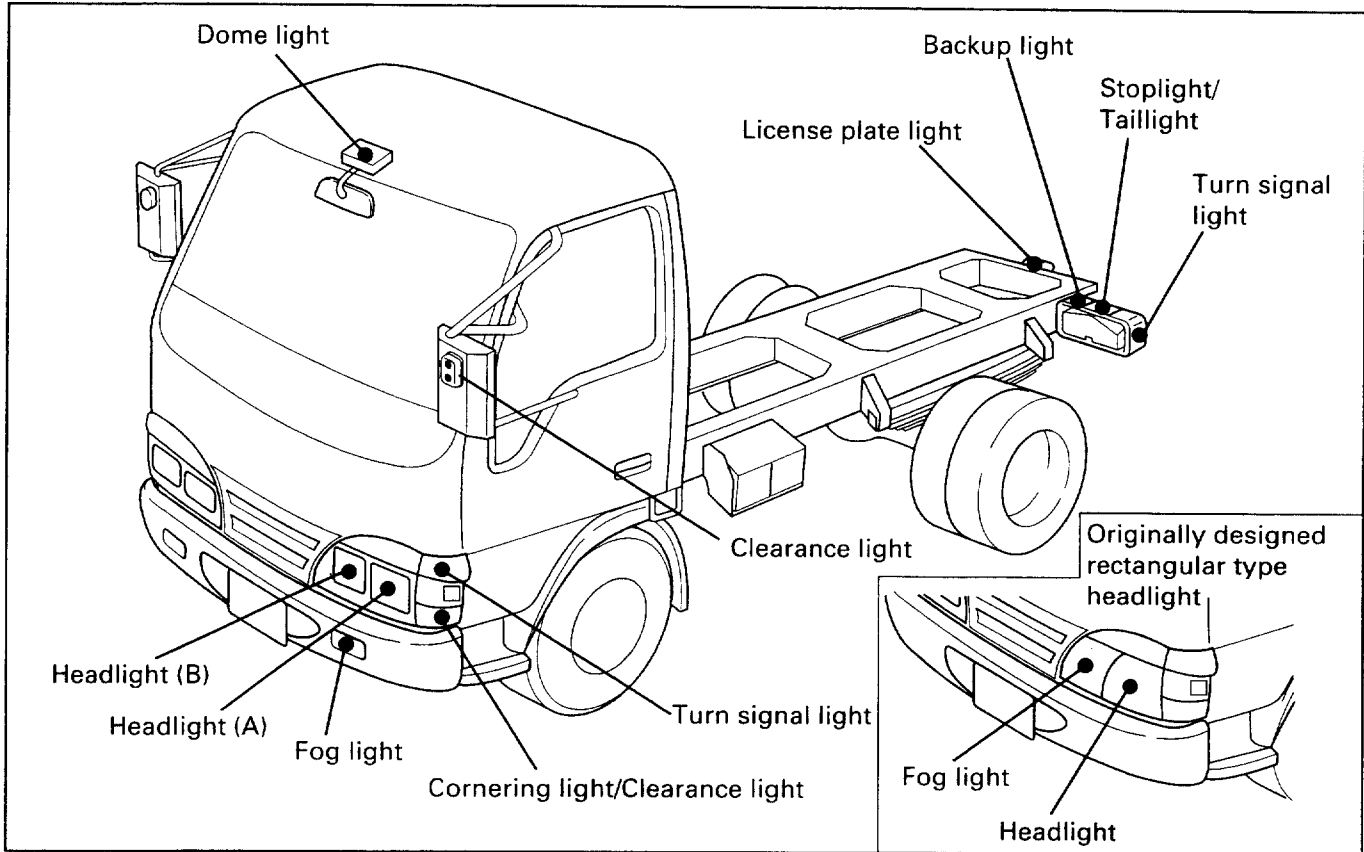
How to show joint connector in the circuit diagram

1. When joint connector can be shown as actual circuit diagram.
2. When one joint connector must be shown from different angles in the circuit diagram.



MAIN DATA AND SPECIFICATIONS

BULB SPECIFICATIONS



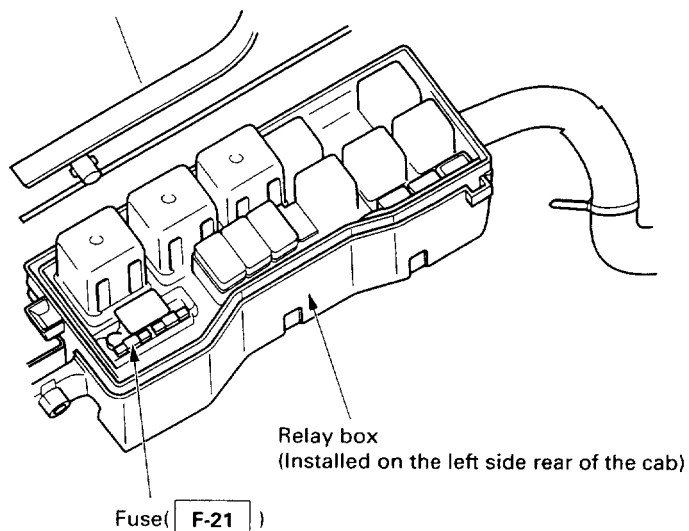
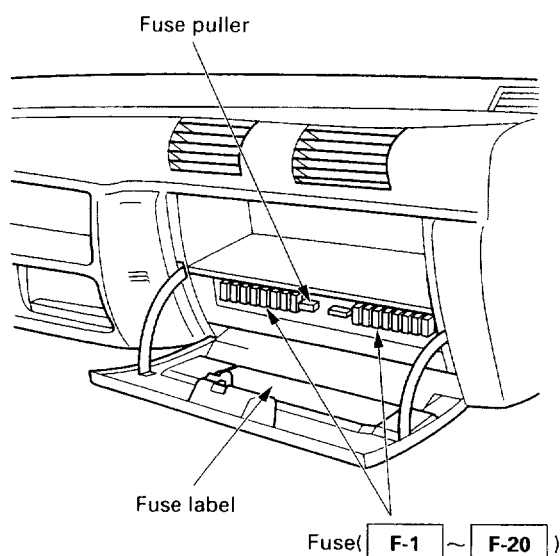
Light Name		Rated Power	No. of Bulb	Lens Color	Remarks
Headlight	Rectangular type	A 45W/40W	2	Clear	12V
		B 45W	2		
		A 55W/50W	2		24V
		B 55W	2		
	Originally designed rectangular type		2	Clear	12V
					24V
Front combination light	Turn signal light	21W	2	Amber	12V
		25W			24V
	Cornering light/Clearance light	27W/8W	2	Clear	12V
		30W/10W			24V
Fog light	Front	55W	2	Clear	12V
					24V
	Rear	21W	1	Red	12V
Rear combination light	Stoplight/Taillight	21W/5W	2	Red	12V
		25W/10W			24V
	Turn signal light	21W	2	Amber	12V
		25W			24V
	Backup light	21W	2	Clear	12V
		25W			24V

Light Name			Rated Power	No. of Bulb	Lens Color	Remarks
License plate light			10W	1	Clear	12V
			12W			24V
Dome light			10W	1	White	12V
			12W			24V
Clearance light (Fitted on the outside mirror)			5W	2	Clear	24V
Indicator/ Warning Light (In the meter assembly)	Glow		2W	1		12V
			1.8W			24V
	OD OFF		2W	1		12V
			1.8W			24V
	A/T OIL TEMP		2W	1		12V
			1.8W			24V
	4WD		1.8W	1		24V
	UNLADEN		1.8W	1		24V
	Engine oil pressure		2W	1		12V
			1.8W			24V
	Fuel sedimenter		2W	1		12V
			1.8W			24V
	Brake fluid level / Parking brake		2W	1		12V
			1.8W			24V
	Charge		2W	1		12V
			1.8W			24V
	Exhaust brake		2W	1		12V
	High beam		2W	1		12V
			1.8W			24V
	Turn signal		2W	1		12V
			1.8W			24V
	Fuel level		2W	1		12V
			1.8W			24V
	Hazard		2W	1		12V
Illumination	Illumination light for meter assembly		2W	1		12V
			1.8W			24V
	Hazard warning Switch		2W	1		12V
			1.8W			24V
	Dome light switch		2W	1		12V
			1.8W			24V
	Front fog light switch		2W	1		12V
			1.8W			24V
	Rear fog light switch	For indicator	60mA	1		12V
		For illumination	60mA	1		
	Cigar lighter		1.4W	1		12V
			1.8W			24V
	Heater bezel		1.4W	1		

Light Name		Rated Power	No. of Bulb	Lens Color	Remarks
Illumination	Ashtray	1.4W	1		
	4WD Switch	40mA	1		24V
	Pattern select switch (UNLADEN)	40mA	1		24V
	OD Switch	1.8W	1		24V

FUSE AND FUSIBLE LINK LOCATION

FUSE AND CIRCUIT BREAKER



826LX010

FUSE LABEL-FOR 12Volt

25A ①	HEATER
10A ②	AIR CON
10A ③	STARTER
15A ④	AUDIO CIGAR LIGHTER
10A ⑤	HEAD LIGHT (RH)
10A ⑥	HEAD LIGHT (LH)
15A ⑦	POWER DOOR LOCK
15A ⑧	HAZARD, HORN
15A ⑨	TAIL LIGHT
10A ⑩	FOG LIGHT

FUSE LABEL-FOR 24Volt

15A ①	AIR CON HEATER
②	—
10A ③	STARTER
15A ④	AUDIO CIGAR LIGHTER
10A ⑤	HEAD LIGHT (RH)
10A ⑥	HEAD LIGHT (LH)
15A ⑦	POWER DOOR LOCK
15A ⑧	HAZARD, HORN
15A ⑨	TAIL LIGHT
10A ⑩	STOP LIGHT

15A F-21	MARKER LIGHT
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15A ⑪	WIPER, WASHER
10A ⑫	GAUGE BACK
15A ⑬	RR. HEATER ECU (IGN)
15A ⑭	FUEL HEATER EXH. BRAKE
10A ⑩	HDLF LEVELING ECU (BAT)
25A ⑮	POWER WINDOW
10A ⑰	STOP LIGHT
15A ⑱	GENERATOR
10A ⑲	TURN S/LIGHT
10A ⑳	ENG. STOP

15A ⑪	WIPER, WASHER
10A ⑫	GAUGE BACK
10A ⑬	FUEL HEATER EXH. BRAKE
15A ⑭	RR. HEATER
15A ⑮	POWER WINDOW
10A ⑯	ECU (BAT)
10A ⑰	ENG. STOP
10A ⑱	ECU (IGN)
10A ⑲	TURN S/LIGHT
15A ⑳	GENERATOR

NOTE:

The fuse numbers ① ~ ⑳ indicated on the fuse labels are expressed as F-1 ~ F-20 in the circuit diagrams of this manual.

FUSE AND CIRCUIT BREAKER

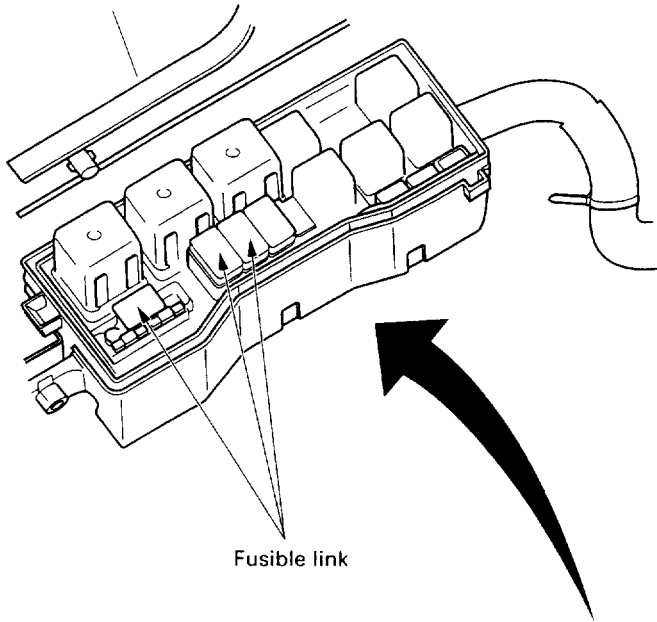
FUSE LABEL-FOR 24Volt MITICS

15A ①	AIR CON HEATER
②	—
10A ③	STARTER
15A ④	AUDIO CIGAR LIGHTER
10A ⑤	HEAD LIGHT (RH)
10A ⑥	HEAD LIGHT (LH)
15A ⑦	POWER DOOR LOCK
15A ⑧	HAZARD, HORN
15A ⑨	TAIL LIGHT
10A ⑩	STOP LIGHT

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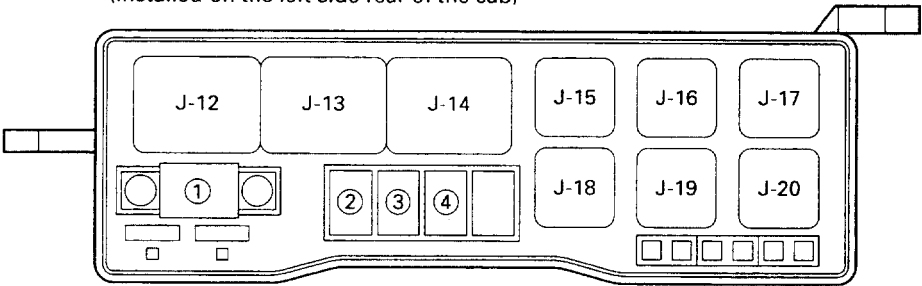
15A ⑪	WIPER, WASHER
10A ⑫	GAUGE BACK
10A ⑬	ECU (IGN)
10A ⑭	FUEL HEATER EXH. BRAKE
15A ⑮	RR. HEATER
15A ⑯	POWER WINDOW
10A ⑰	ENG. STOP
10A ⑱	HDLF LEVELING
10A ⑲	TURN S/LIGHT
15A ⑳	GENERATOR

FUSIBLE LINK



Fusible link

Relay box
(Installed on the left side rear of the cab)

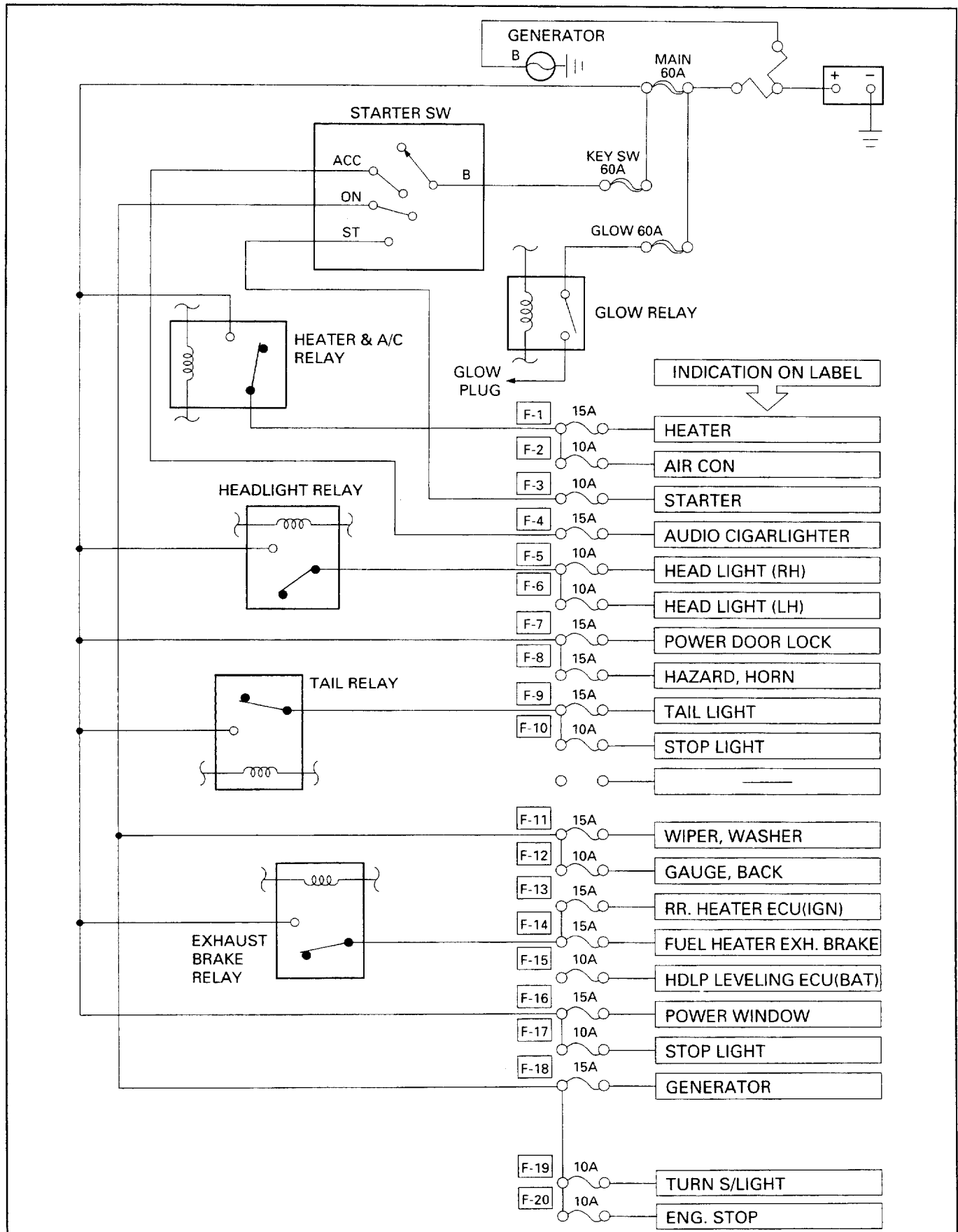


826LX011

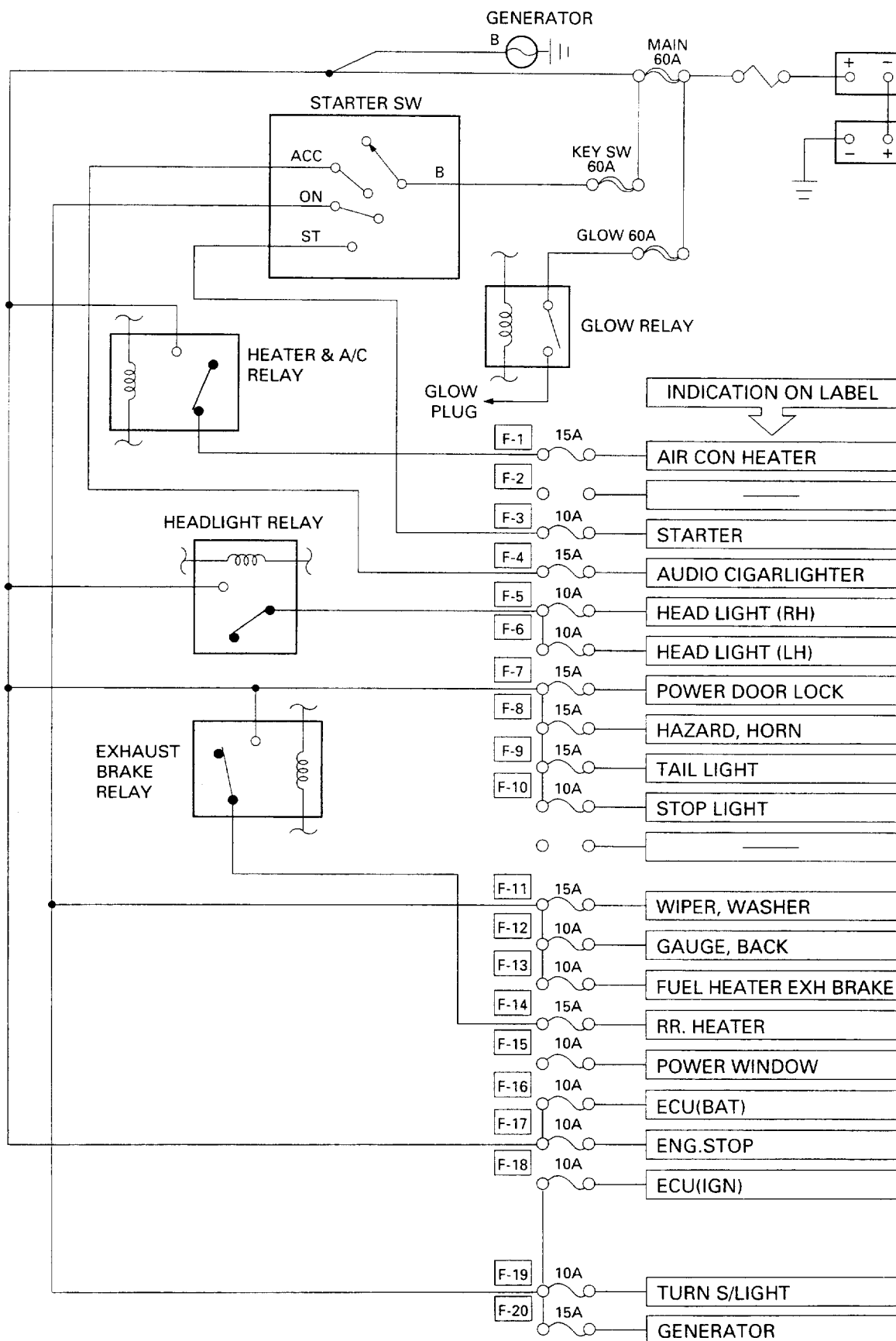
No.	Name	Capacity	Remarks
①	MAIN	80A	12V
		60A	24V
②	KEY SW	50A	12V
		40A	24V
		60A	24V (70T.TC)
③	GLOW	60A	12V
		60A	24V
④	CERAMIC/H	60A	24V (70TC)

FUSE BLOCK CIRCUIT

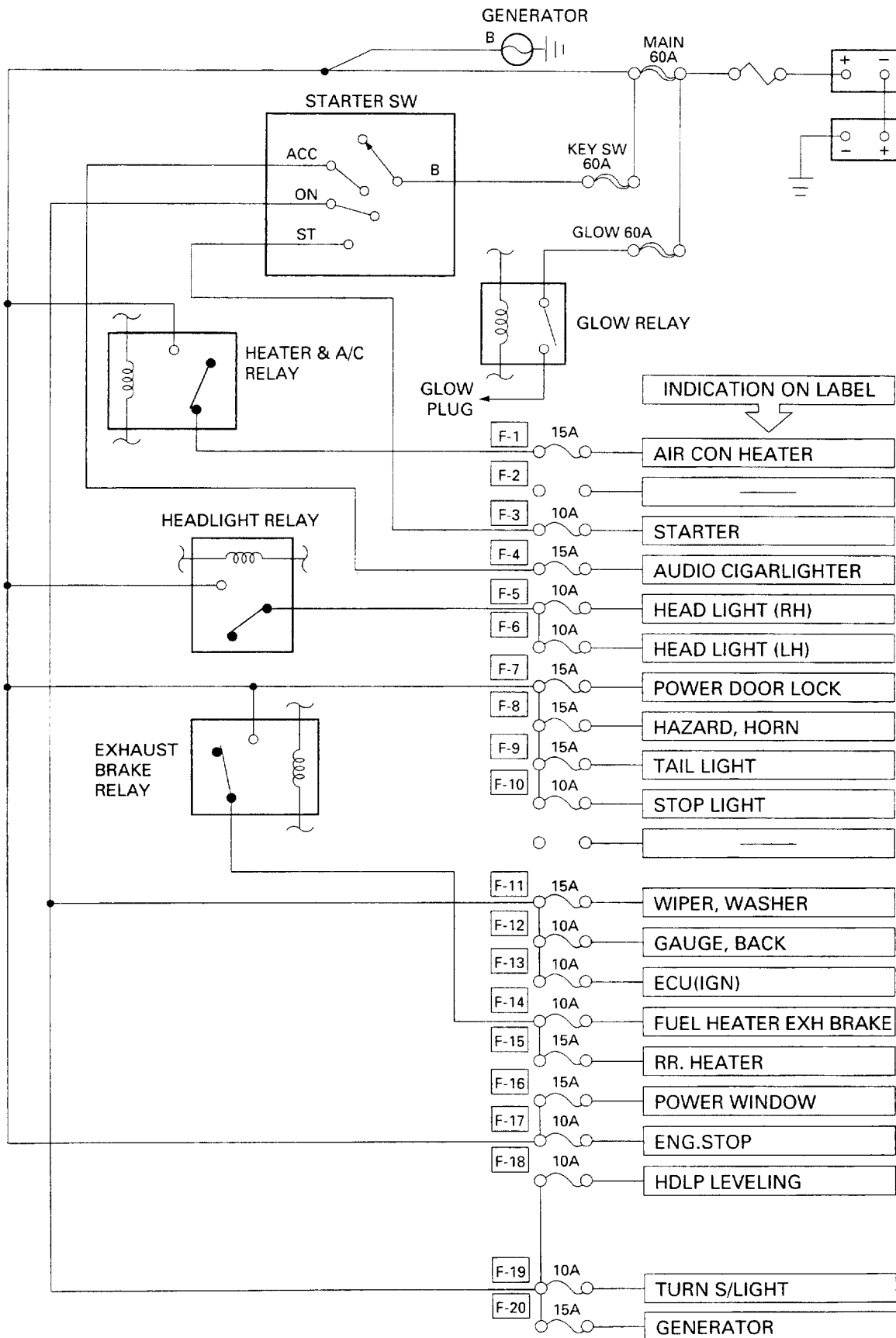
FOR 12VOLT-NHR55-NKR55-NPR69



FOR 24VOLT-NPR66-NQR66-NPS71-NPR71-NQR71



FOR 24VOLT-NPR70TC-NQR70TC



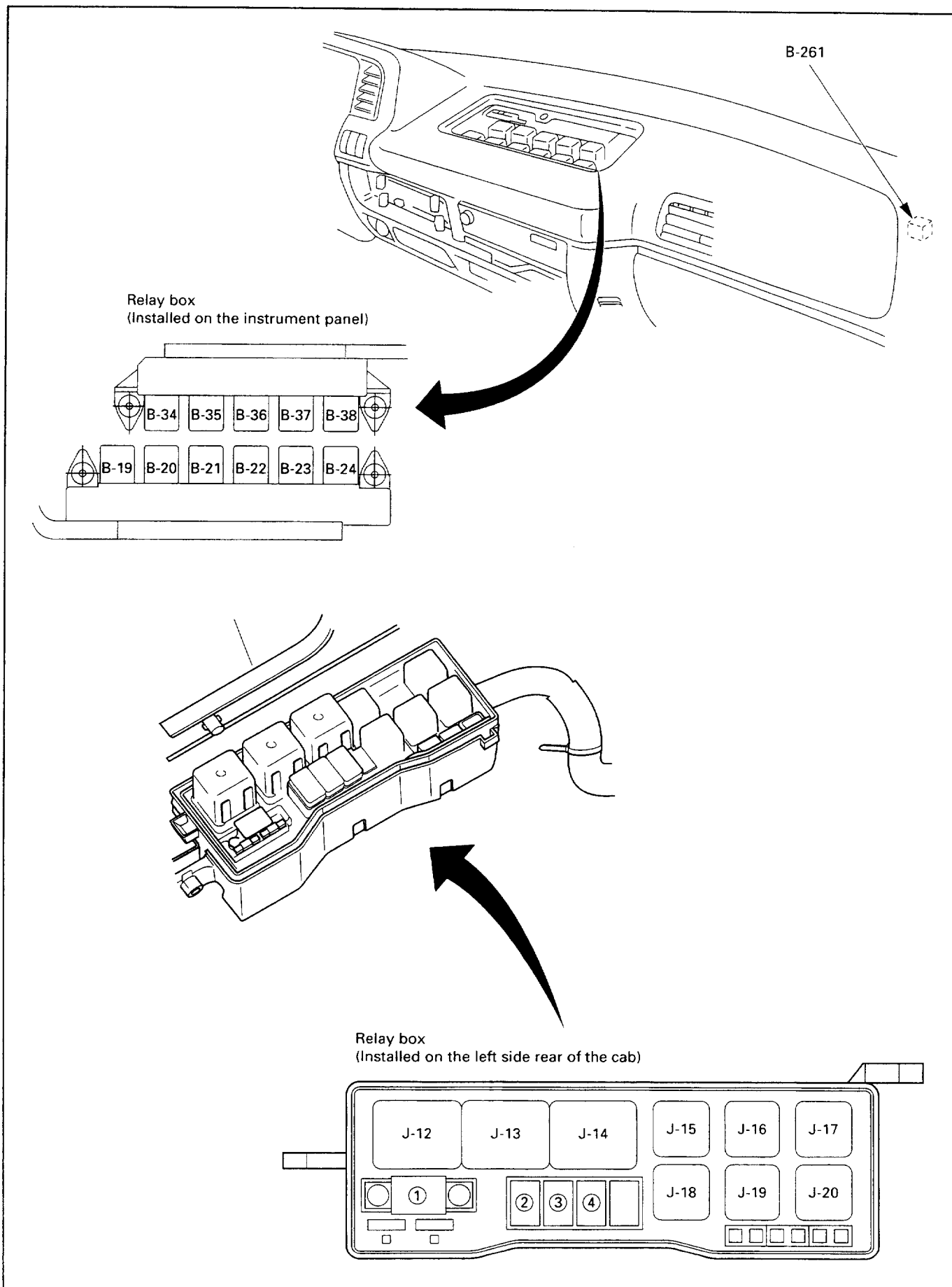
REFERENCE TABLE OF FUSE AND CIRCUIT BREAKER

FUSE

Fuse No.	Capacity	Indication on label	Main parts (Load)
F-1	25A (12V)	HEATER, AIR CON	Blower motor, Blower resistor, Fan switch, A/C thermo relay, Electronic thermostat
	15A (24V)		Blower motor, Blower resistor, Fan switch, A/C switch, A/C thermo relay, Pressure switch, A/C cut relay, Thermo switch (A/C cut), VSV: FICD, Electronic thermostat
F-2	10A (12V)	AIR CON	A/C switch, A/C thermo relay, Pressure switch, Magnetic clutch, VSV: FICD, Electronic thermostat,
F-3	10A	STARTER	Starter relay, Inhibitor switch, QOSII controller, QOSIII controller
F-4	15A	RADIO, CIGAR	Cigar lighter, Radio
F-5	10A	HEAD LAMP (RH)	Headlight (RH), Dimmer relay
F-6	10A	HEAD LAMP (LH)	Headlight (LH), Dimmer relay, Cornering light relay, Cornering right
F-7	15A	CLOCK, DOOR LOCK	Radio & clock, Dome light switch, Dome light, Door switch (RH & LH), Backup buzzer, Door lock switch, Door lock relay, Door lock actuator, Door lock controller, speedometer
F-8	15A	HAZARD, HORN	Hazard warning switch, Horn, Horn relay, Horn switch, Flasher unit
F-9	15A	TAIL, FOG LAMP	Tail relay, Illumination light(s), Fog light switch, Fog light, Lighting switch, Rear fog light switch, Rear fog light relay
F-10	10A	STOP LAMP	Stoplight switch, Stoplight, Shift lock controller
F-11	15A	WIPER, WASHER	Wiper & Washer switch, Wiper motor, Washer motor, Intermittent relay
F-12	10A	METER, BACK	Exhaust brake control relay, A/T ECU, OD OFF indicator, UNLADEN indicator, CSD Relay, Backup buzzer, Backup light switch, Backup light, Inhibitor Switch, Neutral switch, Starter relay, QOS II controller, QOS III controller, Glow relay, Glow-1 relay, Glow-2 relay, Glow indicator (Meter), Coolant temperature gauge, Thermo unit, vehicle speed sensor (Installed on the meter assembly & Transmission), Meter assembly, Power window relay, Cornering light relay, 4WD switch, 4WD relay, 4WD detective switch, VSV: transfer control (2WD & 4WD)

Fuse No.	Capacity	Indication on label	Main parts (Load)
F-13	15A (12V)	FUEL HEATER	Fuel heater
	10A (24V)		
F-14	15A	REAR HEATER	Rear heater, Rear heater switch
F-15	10A	EXH. BRAKE	Exhaust brake switch, Exhaust brake control relay, Exhaust brake magnetic valve, Clutch switch, Accel switch
F-16	10A (12V)	FOG LAMP	Fog light switch, Fog light
	10A (24V)	ECU (IGN)	ECU, shift lock controller
F-17	10A	TURN S/LAMP	Flasher unit, Front turn signal light, Rear turn signal light, Turn signal light switch
F-18	15A	GENERATOR	Generator, Charge relay, QOSIII controller
F-19	10A	ENG. STOP	Engine stop motor, Fuel cut solenoid
F-20	10A (12V)	LEVELING	Headlight leveling switch, Headlight leveling motor (Actuator)
F-21	15A	MARKER LAMP	Marker light, Marker light relay

RELAY LOCATION



RELAY LIST

Voltage	Model	Connector No.	B-9	B-19	B-20	B-21	B-22	B-23
		Name	Intermittent	Charge	Head-light	Heater & AIR CON.	Tail	Dimmer
12V	NHR 55		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	NKR 55		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	NPR 69		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24V	NKR 66		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	NKS 66		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	NPR 66		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	NQR 70		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	NPS 66		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

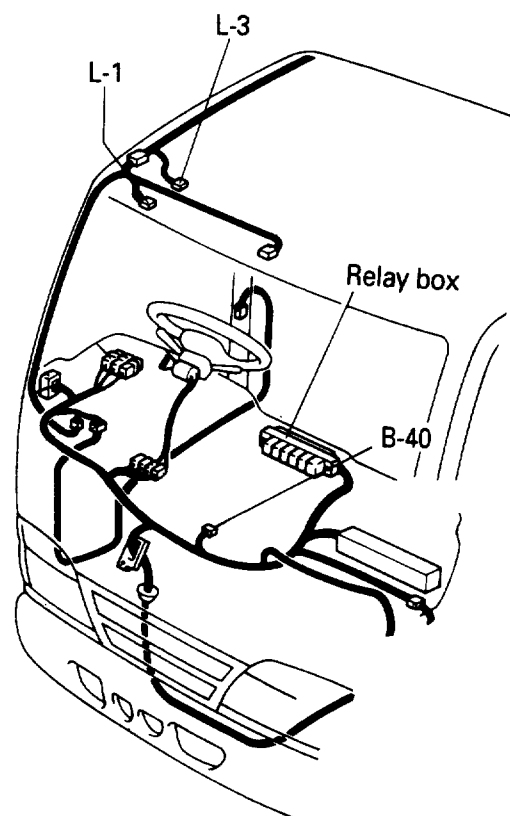
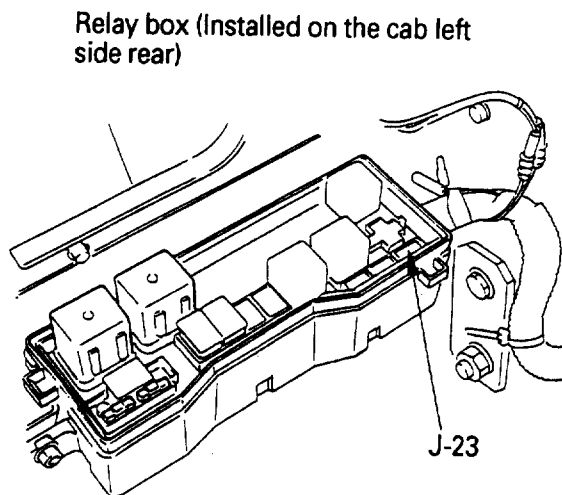
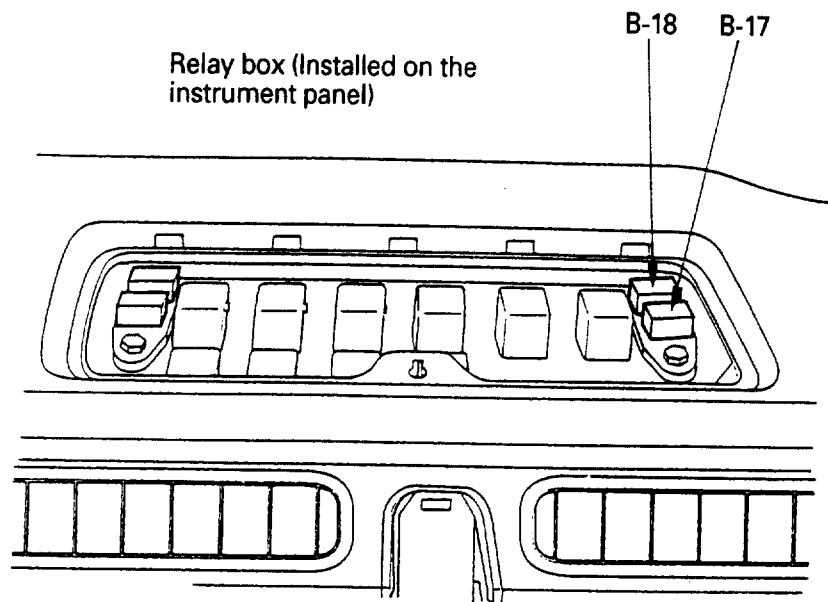
Voltage	Model	Connector No.	B-24	B-34	B-35		B-36	B-37
		Name	Horn	Rear fog	Cornering light	RR Fog	Power window	A/C Thermo
12V	NHR 55		<input type="radio"/>	—	<input type="radio"/>	—	<input type="radio"/>	<input type="radio"/>
	NKR 55		<input type="radio"/>	—	<input type="radio"/>	—	<input type="radio"/>	<input type="radio"/>
	NPR 69		<input type="radio"/>	<input type="radio"/>	—	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24V	NKR 66		<input type="radio"/>	—	<input type="radio"/>	—	<input type="radio"/>	<input type="radio"/>
	NKS 66		<input type="radio"/>	—	<input type="radio"/>	—	<input type="radio"/>	<input type="radio"/>
	NPR 66		<input type="radio"/>	—	<input type="radio"/>	—	<input type="radio"/>	<input type="radio"/>
	NQR 70		<input type="radio"/>	—	<input type="radio"/>	—	<input type="radio"/>	<input type="radio"/>
	NPS 66		<input type="radio"/>	—	<input type="radio"/>	—	<input type="radio"/>	<input type="radio"/>

8 – 34 CHASSIS ELECTRICAL

Voltage	Model	Connector No.	B-38	J-12	J-13		J-14	J-16
		Name	Exh. brake	Starter	Glow	Glow-1	Glow-2	CSD
12V	NHR 55		○	○	○	—	—	○
	NKR 55		○	○	○	—	—	○
	NPR 69		○	○	—	○	○	—
24V	NKR 66		○	○	○	—	—	—
	NKS 66		○	○	○	—	—	—
	NPR 66		○	○	○	—	—	—
	NQR 70		○	○	○	—	—	—
	NPS 66		○	○	○	—	—	—

Voltage	Model	Connector No.	J-18	J-19		J-20
		Name	Exh. brake control	4WD	A/C cut	Marker light
12V	NHR 55		○	—	—	—
	NKR 55		○	—	—	—
	NPR 69		○	—	—	○
24V	NKR 66		○	—	—	—
	NKS 66		○	○	—	—
	NPR 66		○	—	—	—
	NQR 70		○	—	—	—
	NPS 66		○	○	—	—

DIODE LOCATION



Connector No.	B-17	B-18	B-40	J-23	L-1	L-3
Usage	QOSIII, Lighting	Dome light, A/C	4A/T ECU	VSV: FICD	Dome light	Dome light

REFERENCE TABLE OF GROUNDING POINT

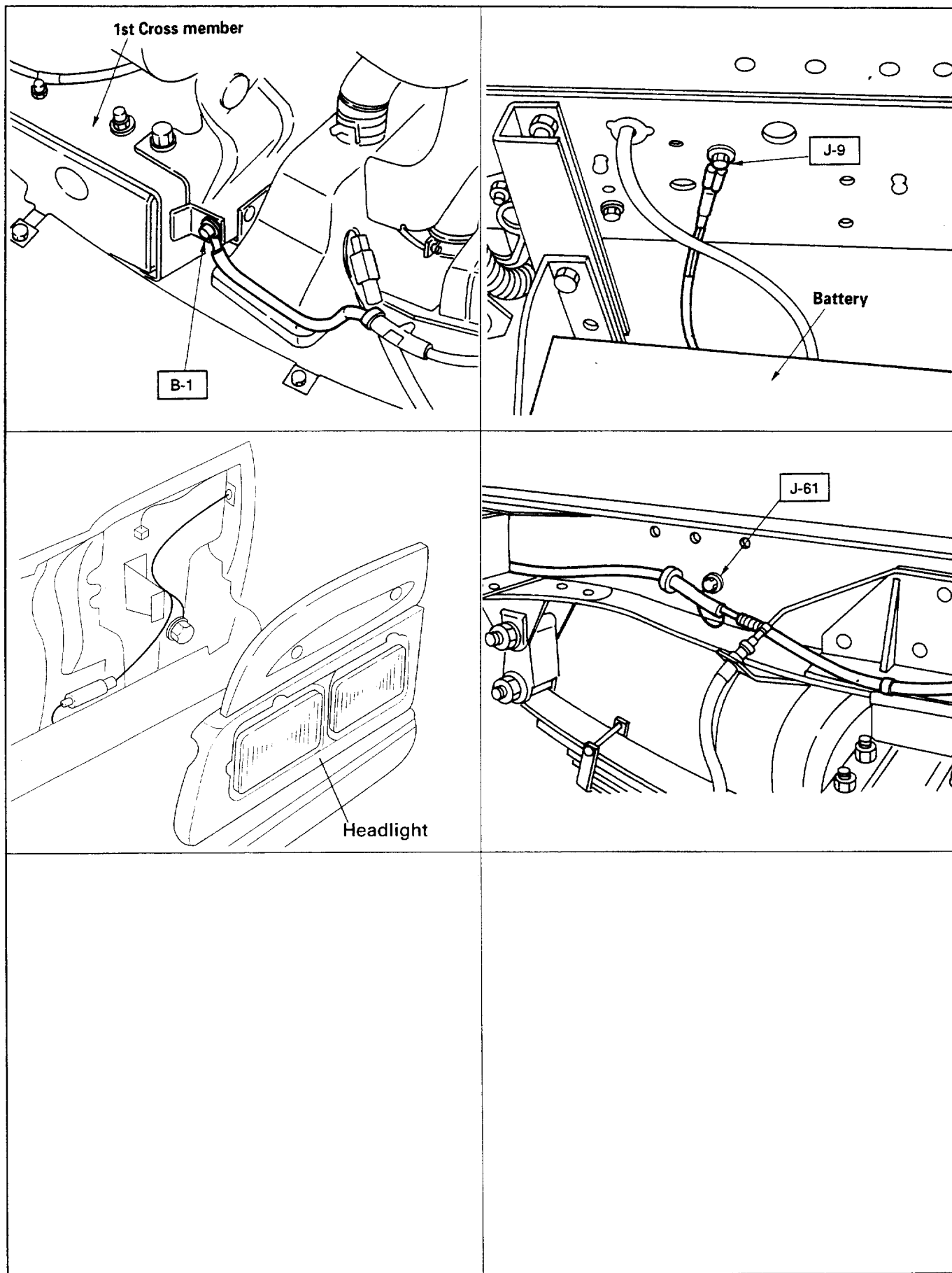
Note:

Abnormal phenomena of electrical components are considered resulted from defective grounding.
In repair, be sure to inspect grounding points and to tighten all fastening parts surrounding the grounding points.

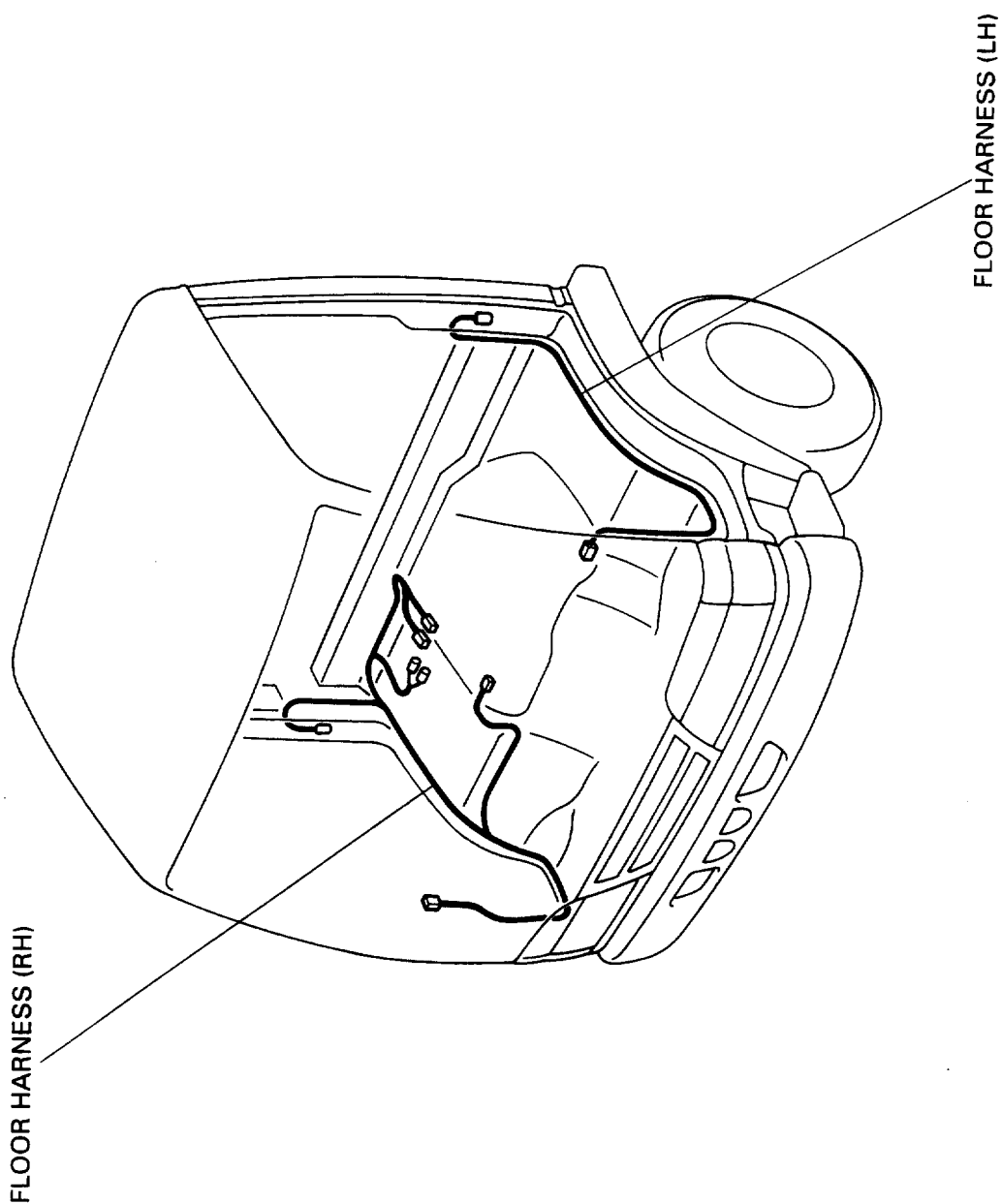
Connector No.	Cable harness name	Location	Main parts (Load)
B-1	Body harness	Frame-LH (FRT)	Vehicle speed sensor, Heater & A/C relay, Fan switch, Ceramic heater relay, Ceramic heater thermo relay, Meter, High beam indicator light
B-7		Headlight bracket-LH	Charge relay, Exhaust brake relay, QOS II control unit, QOS III control unit, OD Switch, OD OFF relay, Dome light switch, Key remind and back up buzzer, Meter, Brake fluid switch, Tail relay, Cornering light switch, Cornering light, Cornering light relay, Fog light switch, Fog light, Dimmer relay, Door lock switch, Door lock relay, Power window switch (RH), Power window relay, Stoplight switch, Mirror switch, Wiper motor, Washer motor intermittent relay, ECU, Pattern select switch, Kickdown switch, Shift indicator, Shift lock controller, Radio, Cigar lighter, Heater & A/C relay, Fan Switch, Ceramic heater relay, Ceramic heater thermo relay, ALDL connector (ECU), Vehicle speed sensor, Horn relay Rear heater switch, Rear heater, Radio & clock, Cigar lighter, Fan switch, Blower resistor, A/C Switch, Blower motor, Electronic thermostat, Accel switch, QOS II control unit, Door lock switch, Door lock controller, Headlight leveraging switch, Headlight leveraging motor, 4WD Switch, Shift lock controller, Power window relay, Power window switch, QOS III control unit, 4 A/T ECU, Pattern select switch
J-9	Frame front harness	Frame-LH (CTR)	Marker light relay, Marker light, Water sedimenter switch, Fuel tank unit, Starter relay, Inhibitor switch, 4WD switch, VSV; Transfer control (2WD & 4WD), 4WD detective switch, 4WD relay, Neutral switch, Fuel heater, Pressure switch, A/C thermo relay, VSV: FICD, Exhaust brake control relay, Exhaust brake magnetic valve, Accel switch, Clutch switch, VSV: intake throttle, Engine stop motor,

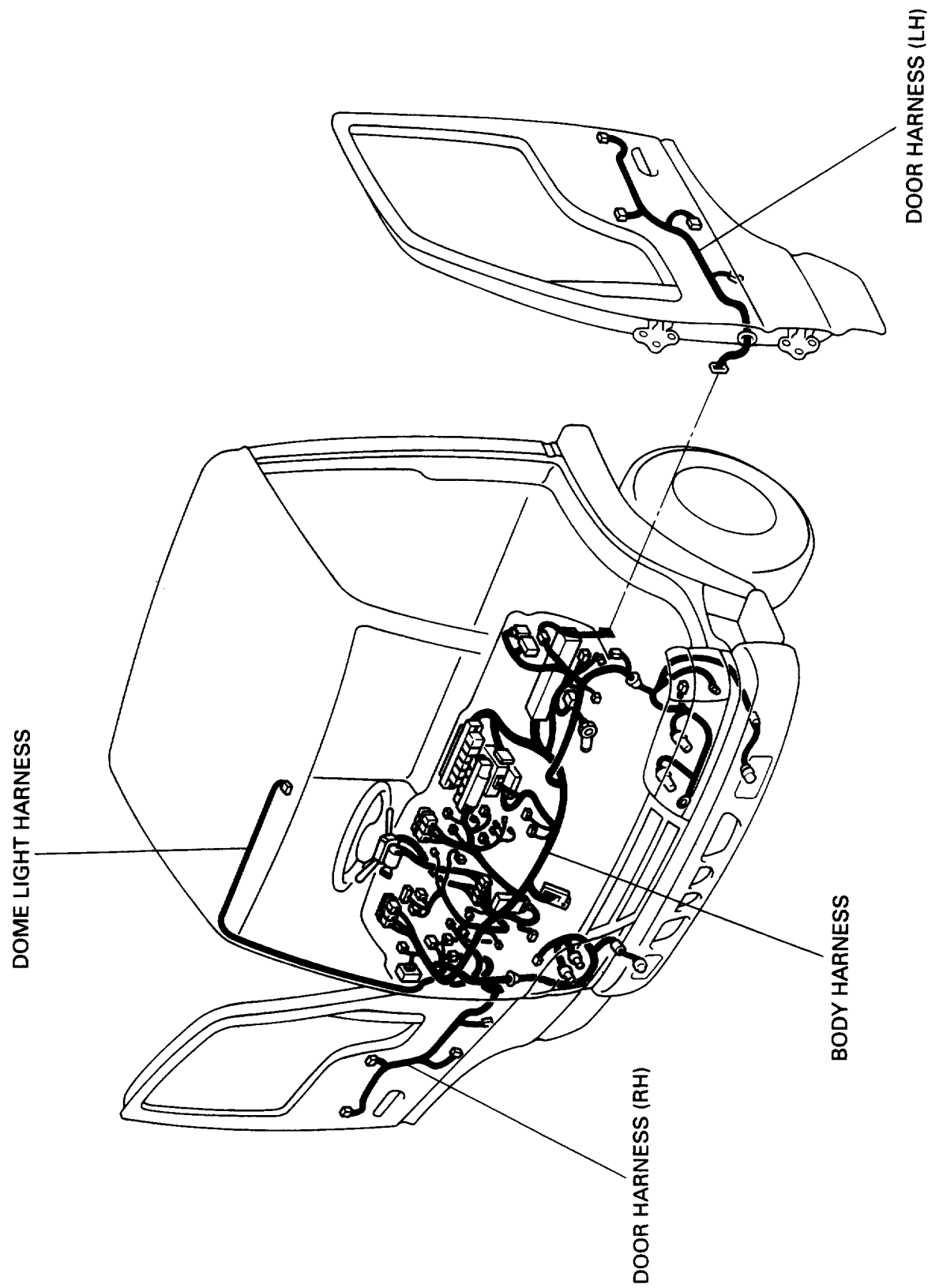
Connector No.	Cable harness name	Location	Main parts (Load)
J-61	Frame rear harness	Frame-LH (RR)	License plate light, Taillight, Rear fog light, Rear turn signal light, Stoplight, Stoplight Switch, License plate light, Backup light

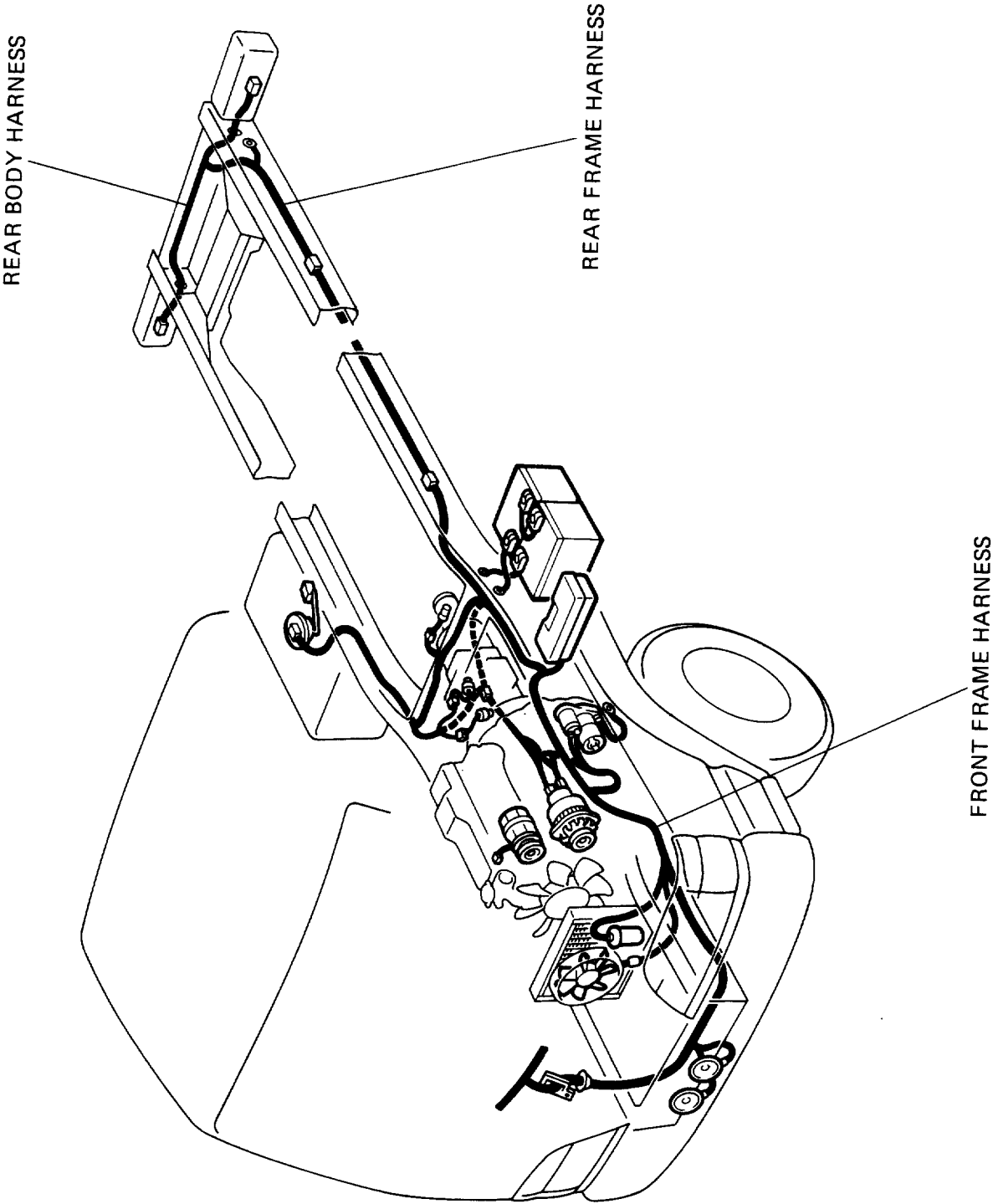
GROUNDING POINT LOCATION



CABLE HARNESS ROUTING







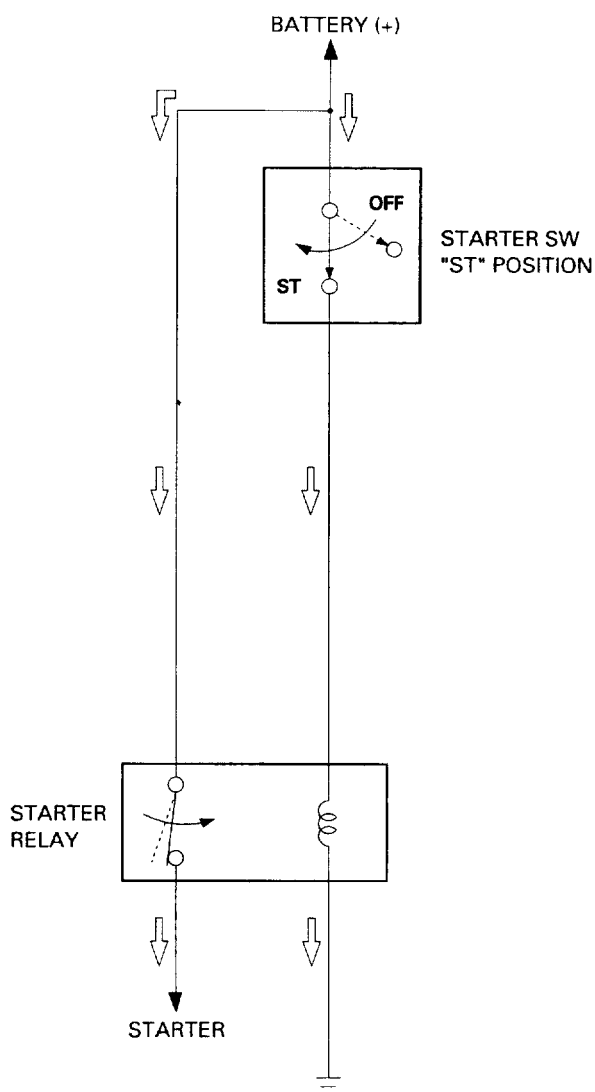
SYSTEM REPAIR

START AND CHARGING

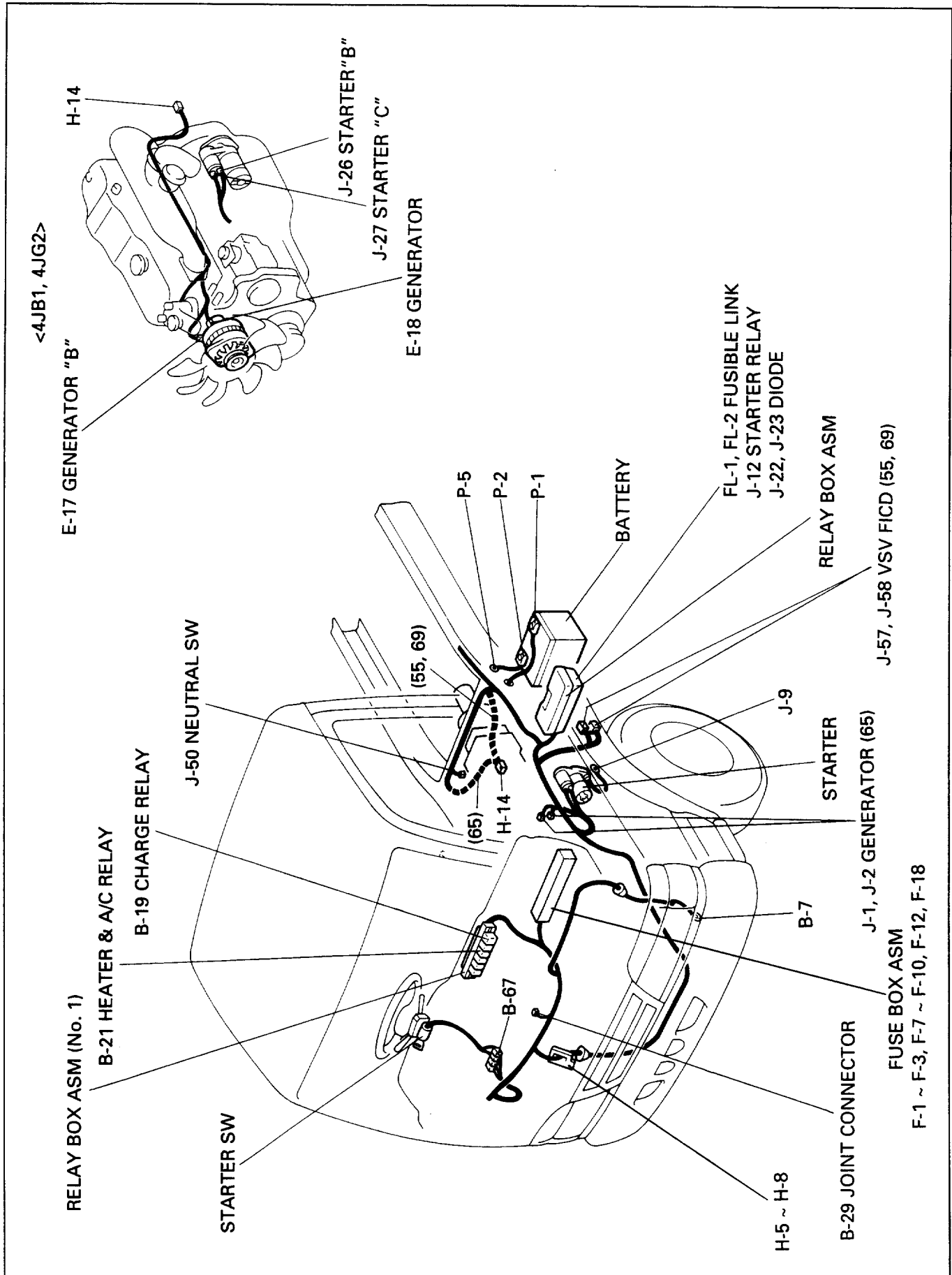
GENERAL DESCRIPTION

The system consists of the starter switch, starter, AC generator, starter relay, charge relay, heater and A/C relay, inhibitor switch and neutral switch. When the starter SW is set to the "ST" position, the battery voltage is applied to the starter solenoid coil through the starter relay to start the starter.

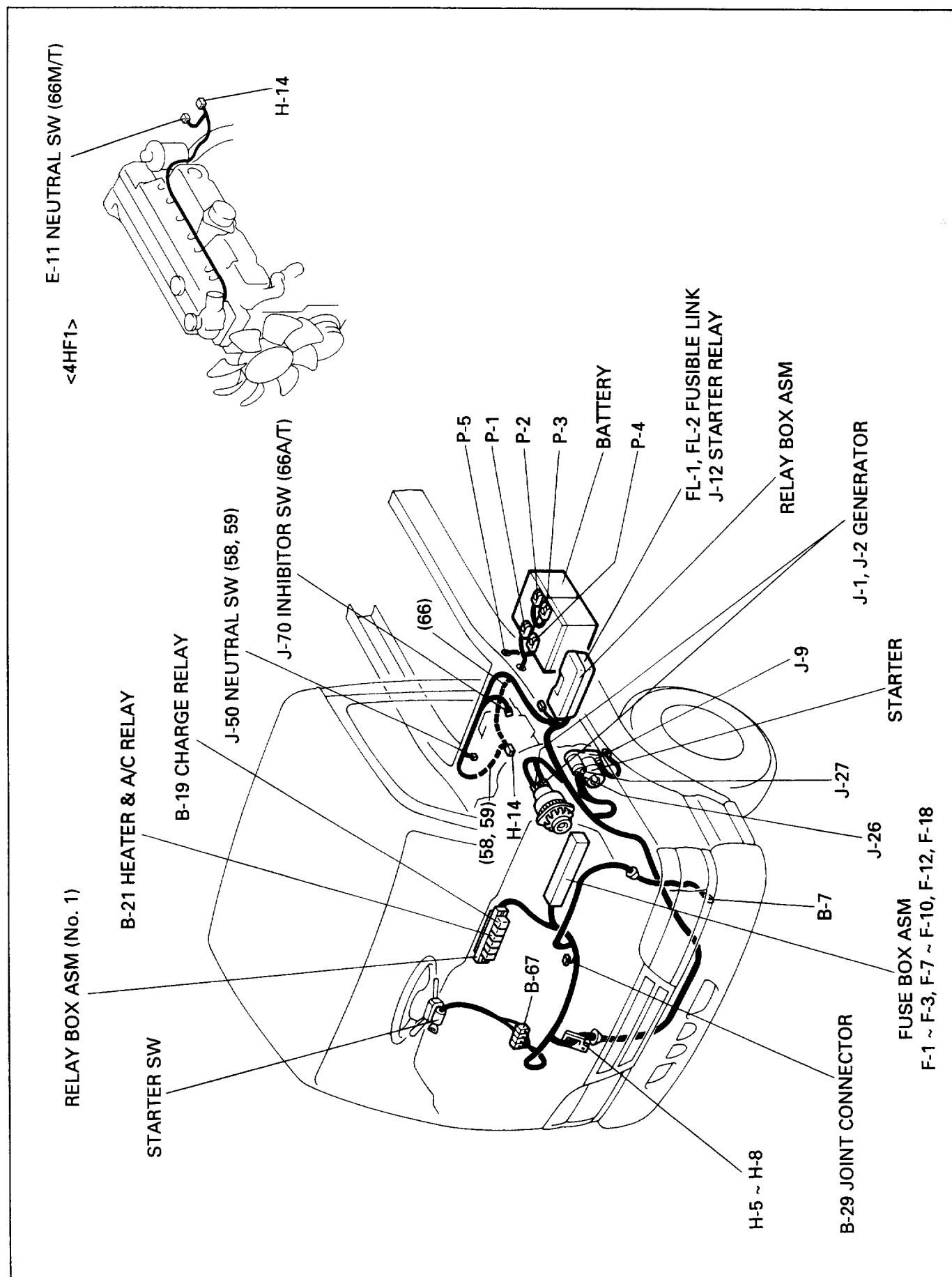
STARTING CIRCUIT



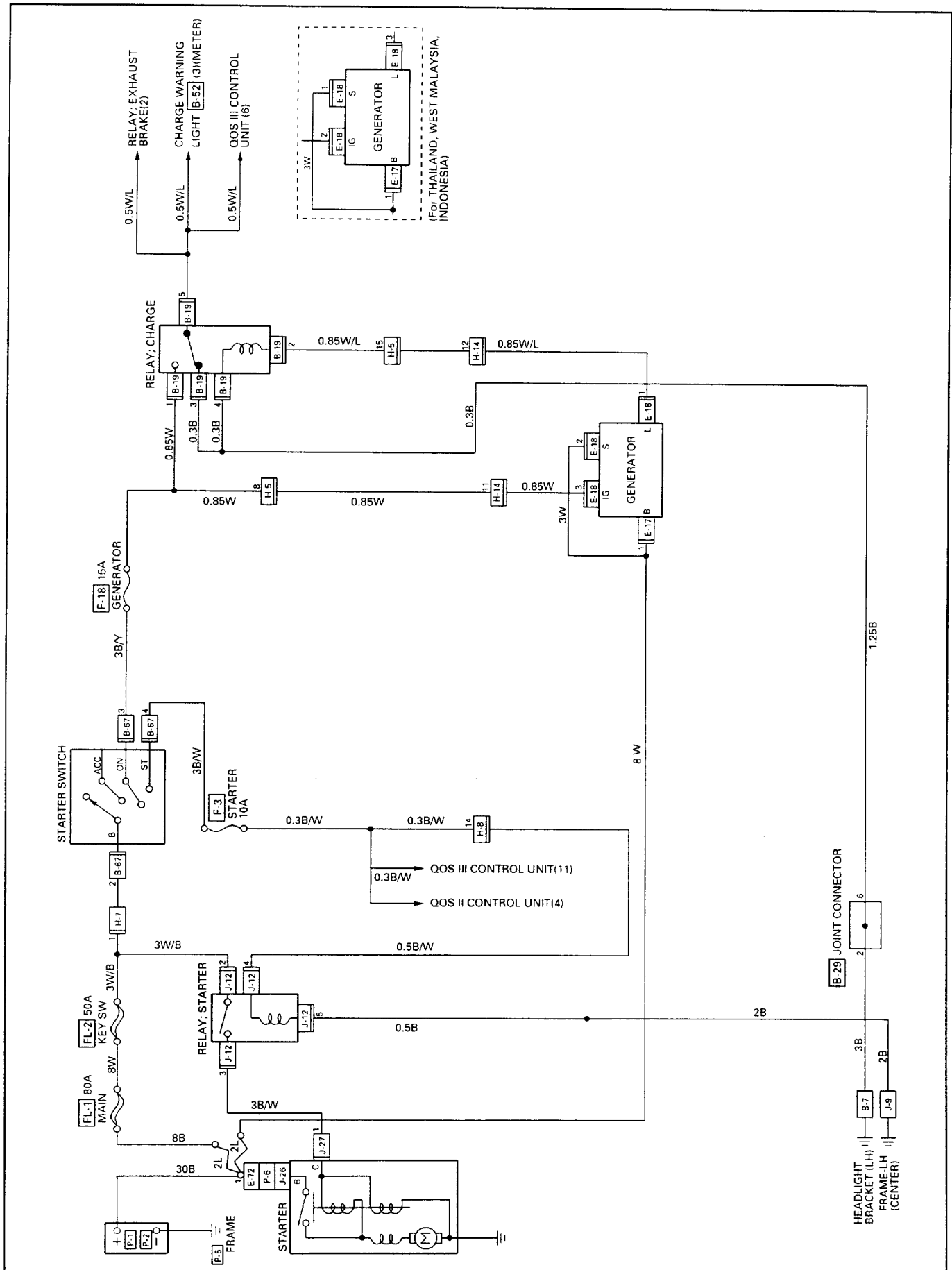
PARTS LOCATION - FOR 12 VOLT



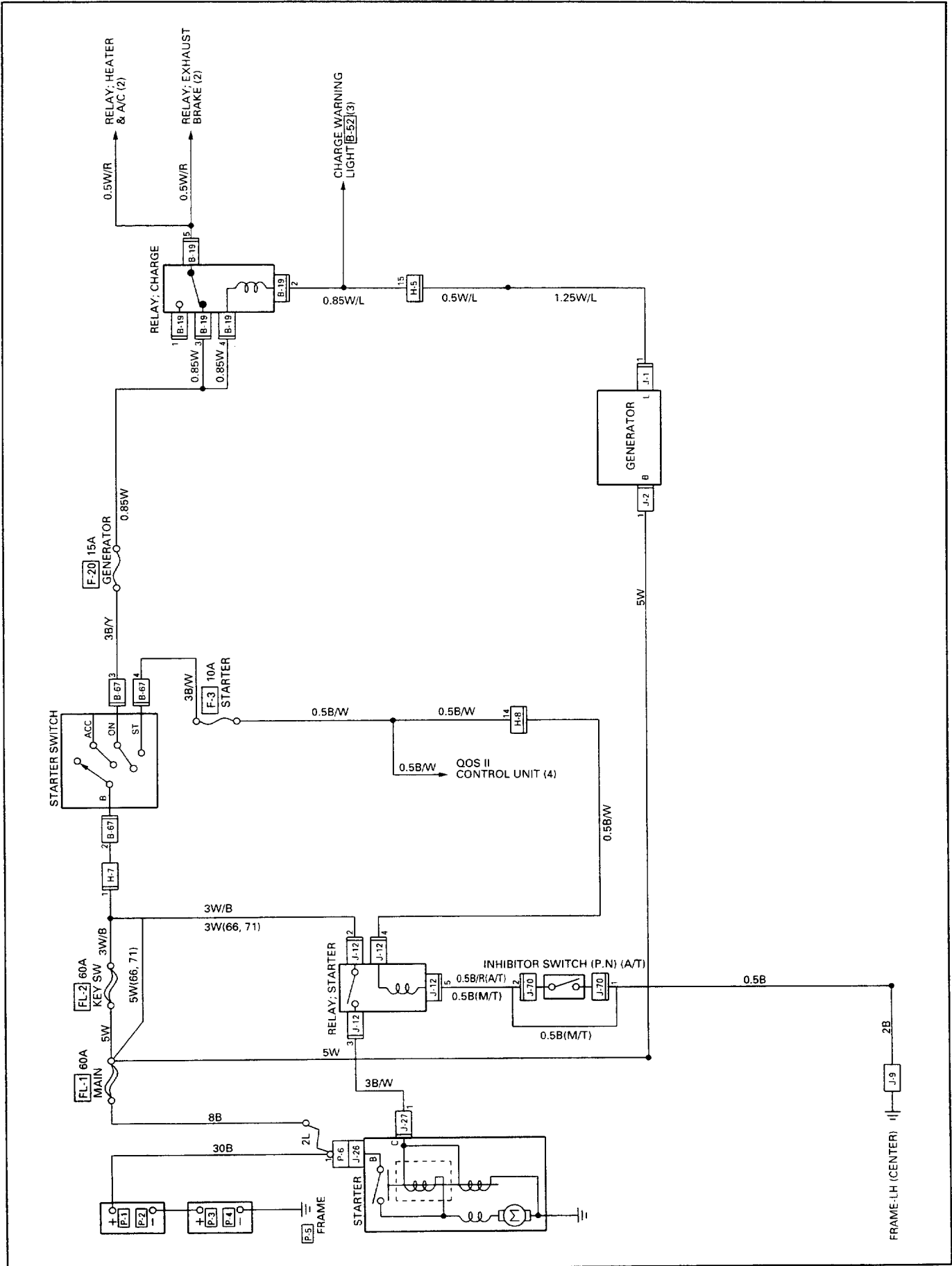
PARTS LOCATION - FOR 24 VOLT



CIRCUIT DIAGRAM - FOR 12 VOLT

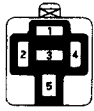


CIRCUIT DIAGRAM - FOR 24 VOLT

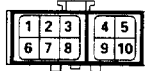


CONNECTOR LIST

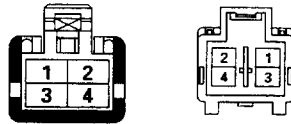
B-19



B-29

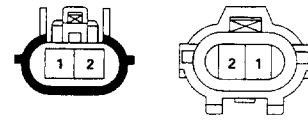


B-67

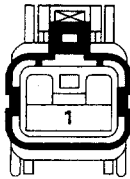


E-11

J-70

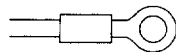


E-17



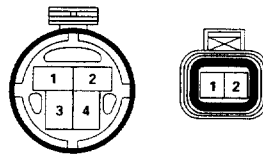
E-17

J-2



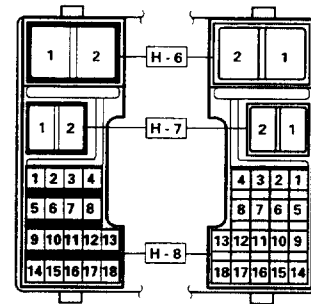
E-18

J-1

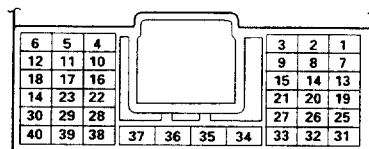
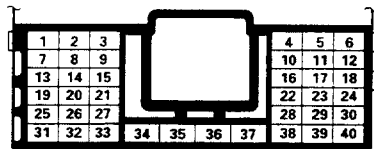


H-7

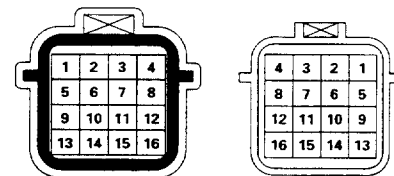
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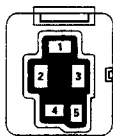
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H-14



J-12



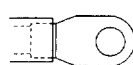
J-26

P-6

(Except 66)

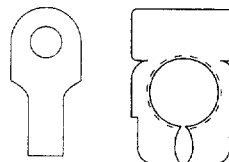
P-5

(24V)



P-1 (12V)

P-2



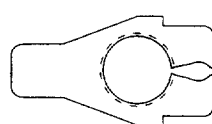
P-1 (24V)

P-4



P-2 (24V)

P-3

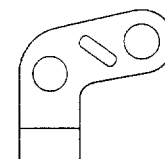


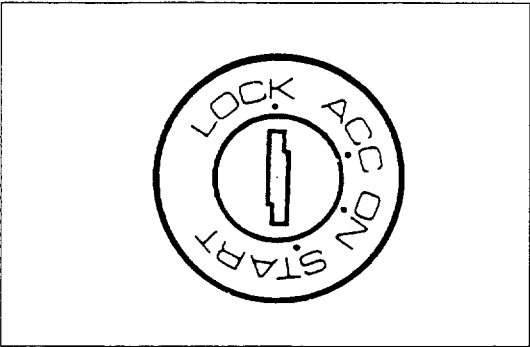
P-5 (12V)



P-6

(Except 66)





STARTER SWITCH

The starter switch positions are LOCK, ACC, ON and START. Turning the starter key to these positions a circuit for starting the engine, the operation of accessories, or stop the engine.

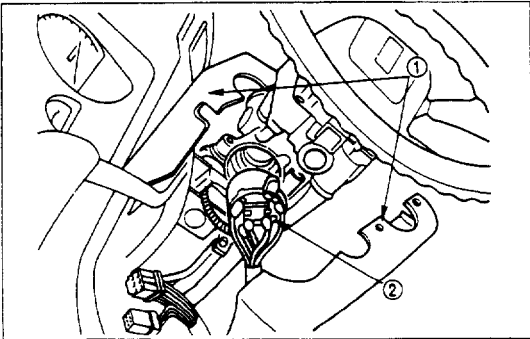


INSPECTION

Check the continuity between the starter switch connector terminals.
Repair or replace the switch when the result of inspection is found abnormal.



Connector No.		B-67				B-68				
		1	2	3	4	1	2	4	5	6
Starter SW key position	Terminal No.	ACC	B	ON	ST	B1	P1	P2	W	W
	Removed									
	LOCK									
	ACC									
Inserted	ON									
	START									



REMOVAL

- Preparation:**
Disconnect the battery ground cable.
- Steering Cowl**
Remove four screws and take off the steering cowl.
 - Starter Switch**
 - Disconnect the connector.
 - Remove the screw.



INSTALLATION

To install, follow the removal steps in the reverse order.

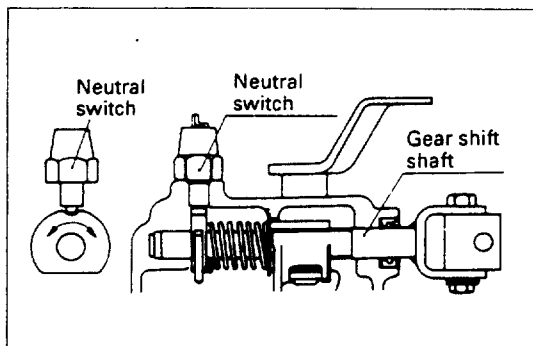
NEUTRAL SWITCH



INSPECTION

Check to see if there is any continuity between the switch terminals.

Replace the switch when the result of inspection is found abnormal.



QOS (QUICK ON START) SYSTEM

QOSII: 4HF1 AND 4JB1 MODEL ENGINE

GENERAL DESCRIPTION

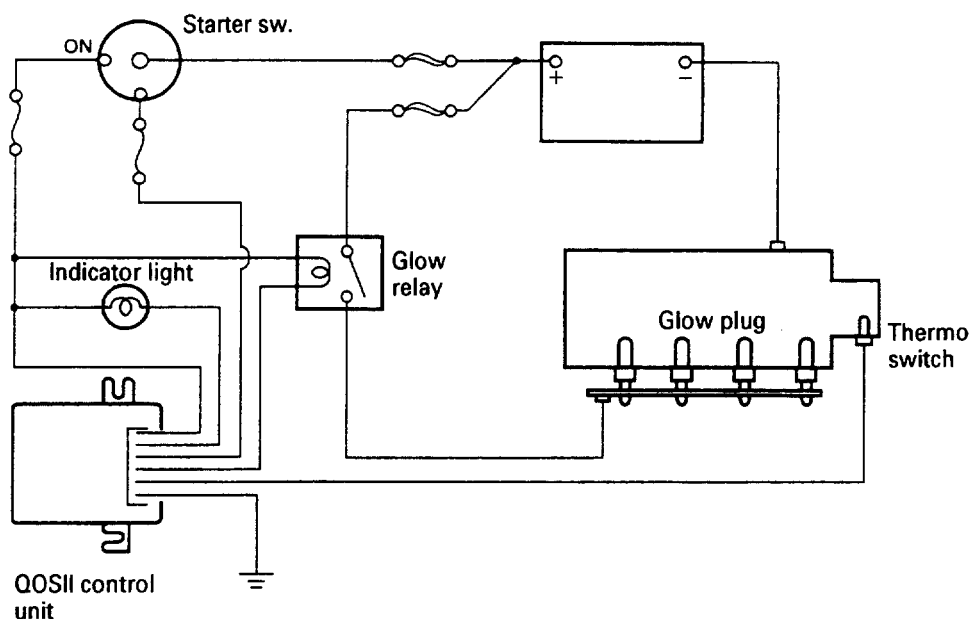
The circuit consists of starter switch, QOSII control unit, glow relay, thermo switch, glow plug fuel cut solenoid, CSD relay, CSD solenoid and glow indicator light.

The QOS-II controller controls glow plug relay by the ON or OFF signal of QOS thermo switch. Immediately when the starter switch turns "ON", the glow plug relay indicator light turns on to start preheating.

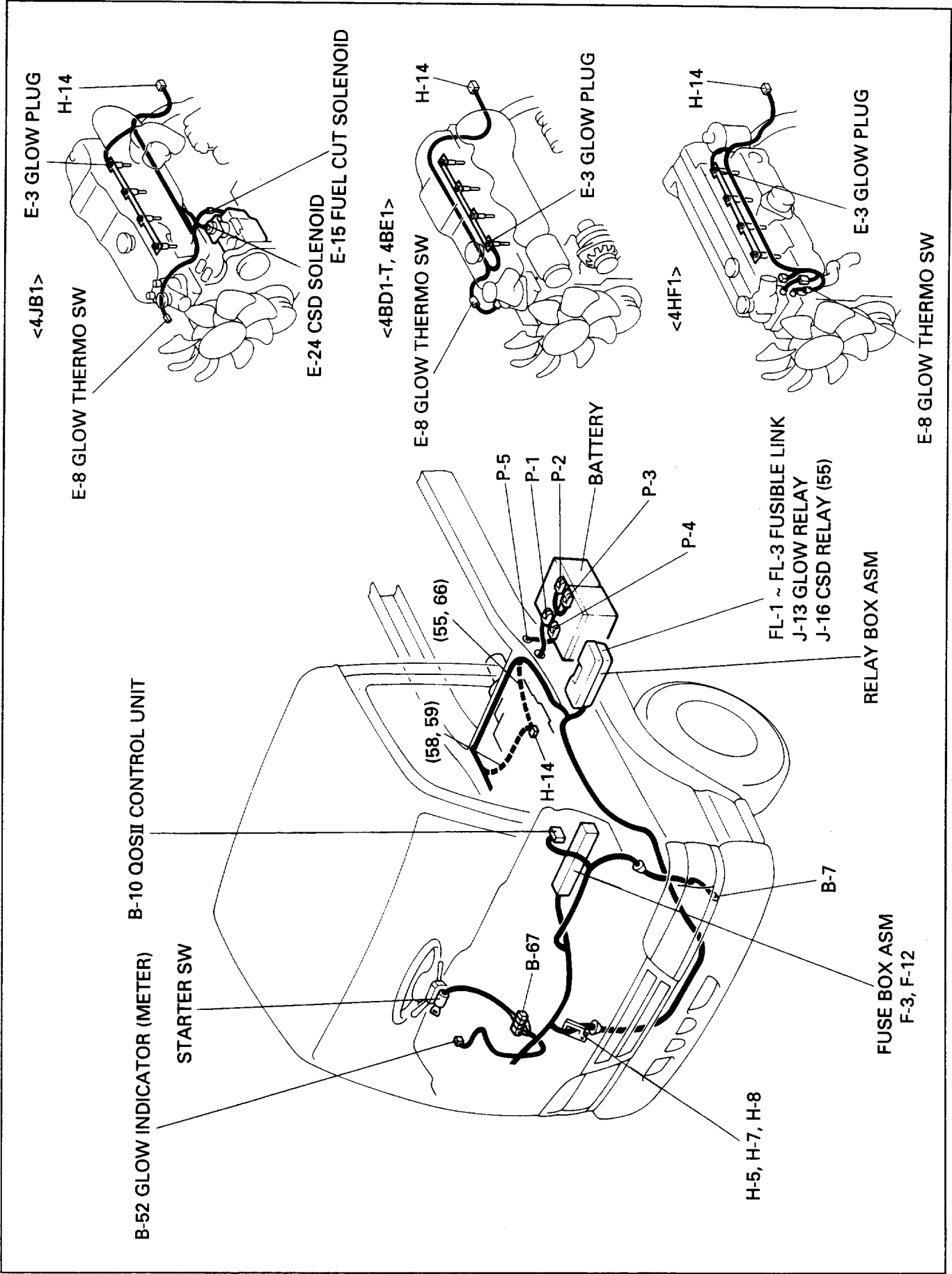
The engine should be started after the indicator light is off. However, the glow plug relay keeps preheating for a fixed period even after the indicator light turns off. When the fixed time is over, QOS-II controller performs to switch the glow plug relay off to stop preheating.

For details, refer to 6D6 "PREHEATING SYSTEM".

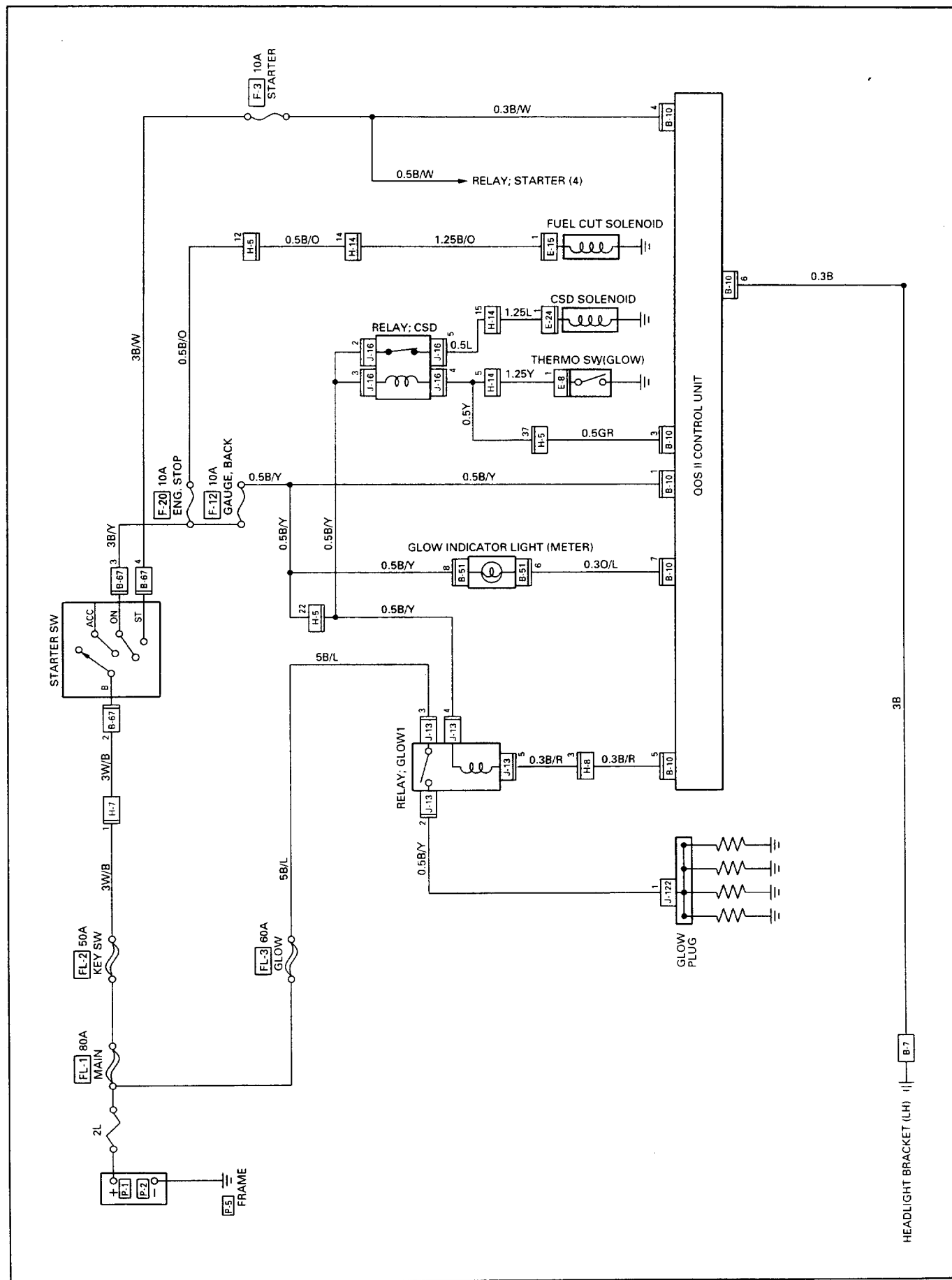
SYSTEM CIRCUIT

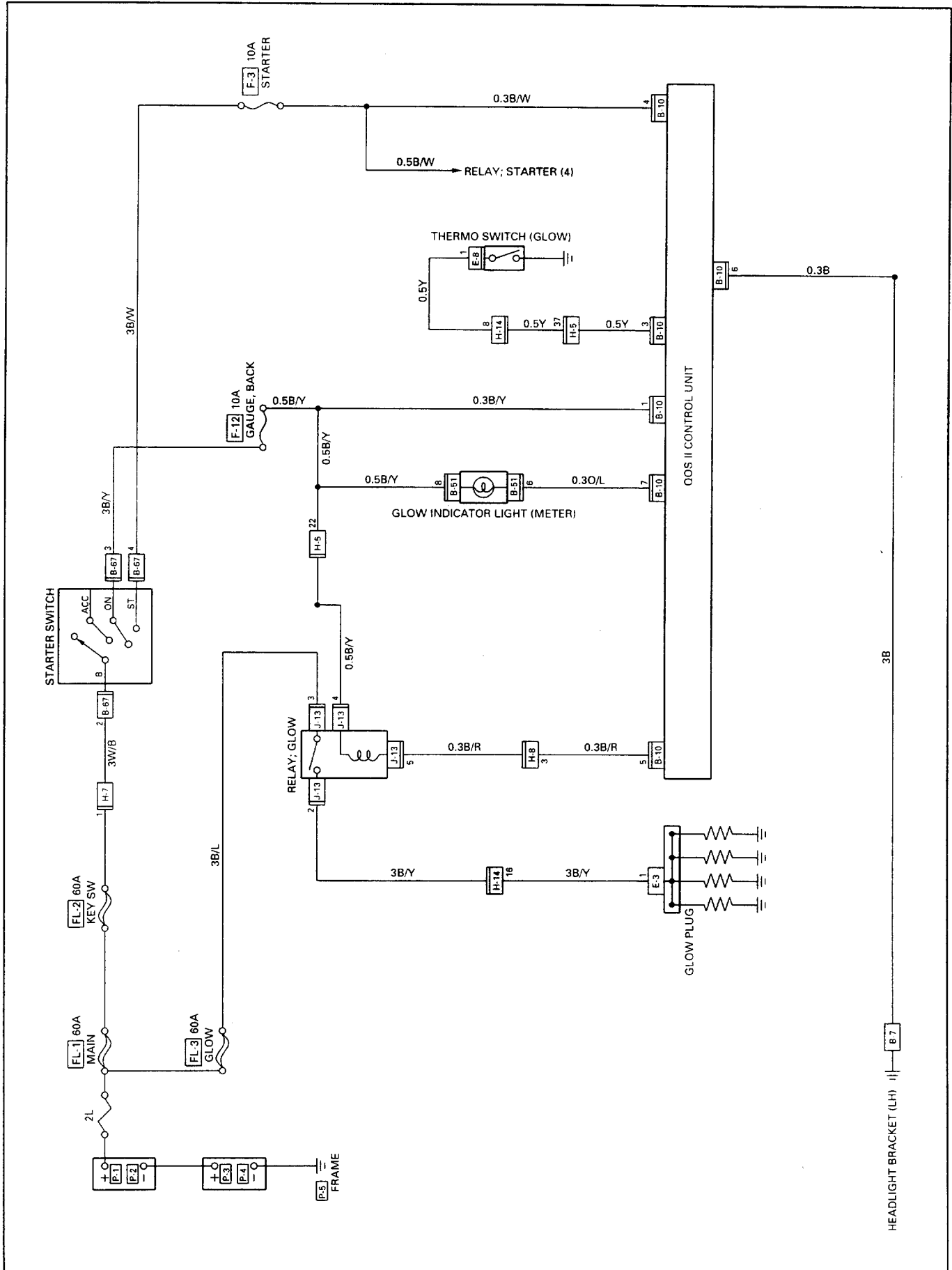


PARTS LOCATION

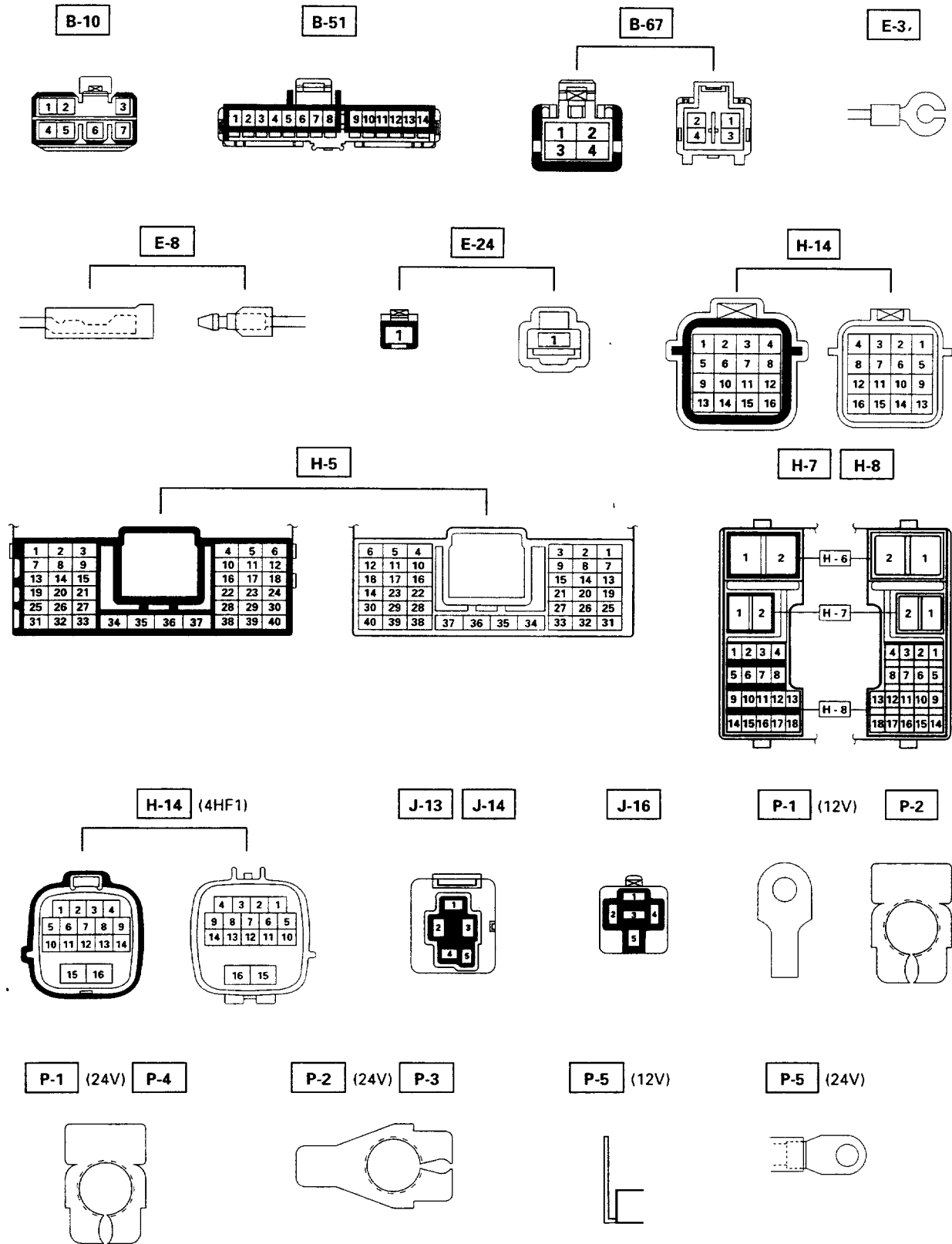


CIRCUIT DIAGRAM - NHR55 · NKR55





CONNECTOR LIST



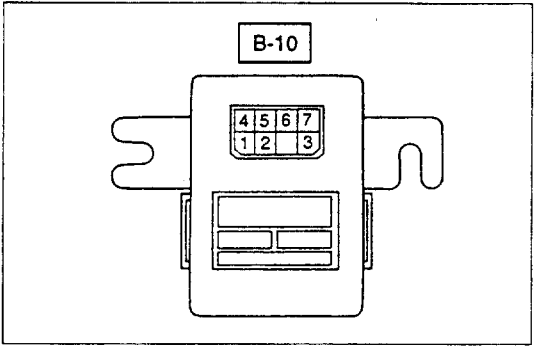
STARTER SWITCH

Refer to "START AND CHARGING" in this section.

GLOW INDICATOR LIGHT

THERMO SWITCH

Refer to "METER AND WARNING/INDICATOR LIGHT" in this section.



QOSII CONTROL UNIT

Terminal No.	Connected to
1	Starter switch (ON)
2	—
3	Thermo switch
4	Starter switch (ST)
5	Glow relay
6	Ground
7	Glow indicator (Meter)

QOSIII - 4JG2 ENGINE MODEL

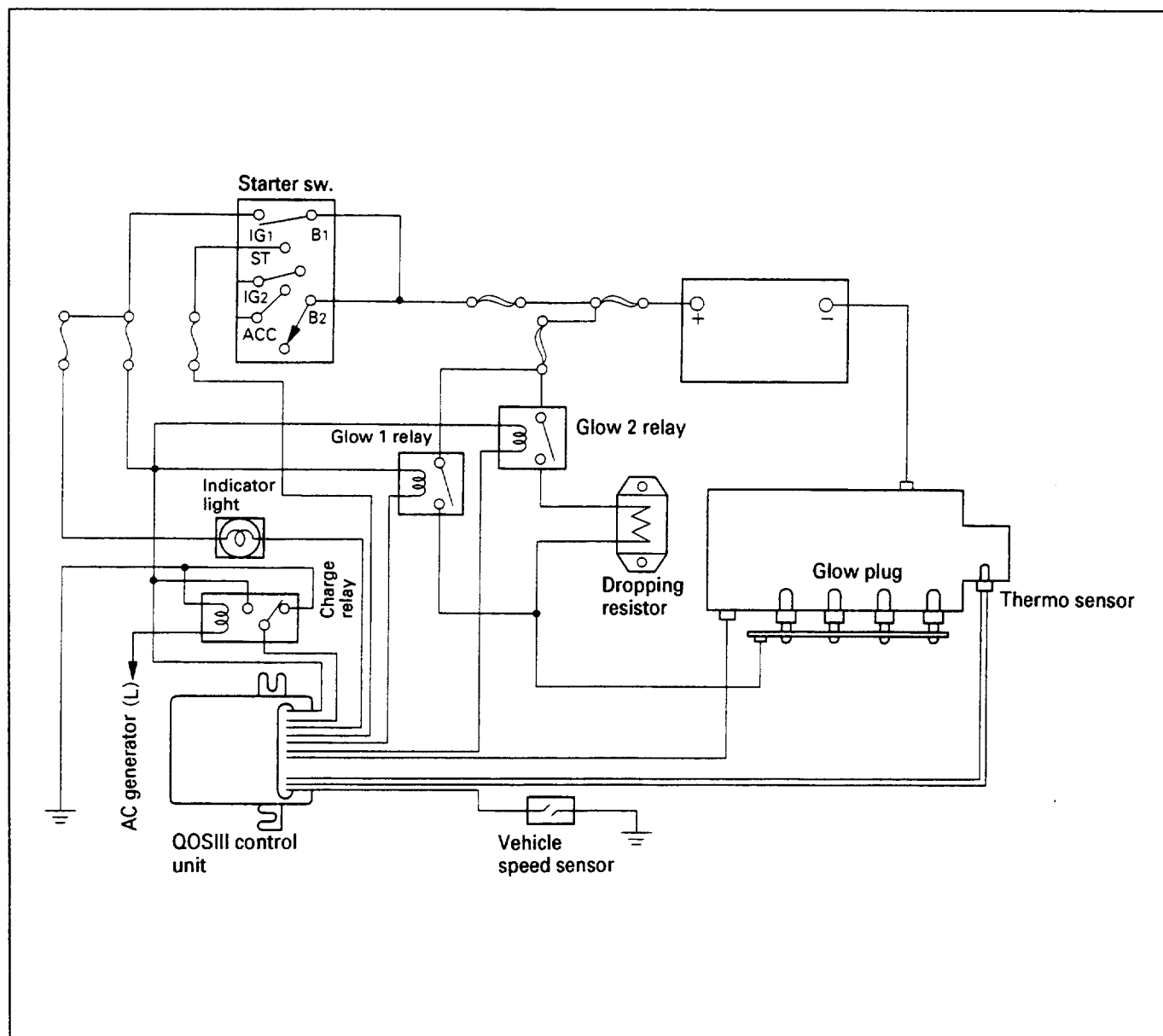
GENERAL DESCRIPTION

The system consists of starter switch, QOS III control unit, glow relay, charge relay, fuel cut solenoid, dropping resistor, thermo sensor, glow plug, engine speed sensor, accel switch and glow indicator light. Perceiving the engine coolant temperature when the engine started, the thermo sensor varies the glowing time to always get the most suitable condition for engine starting.

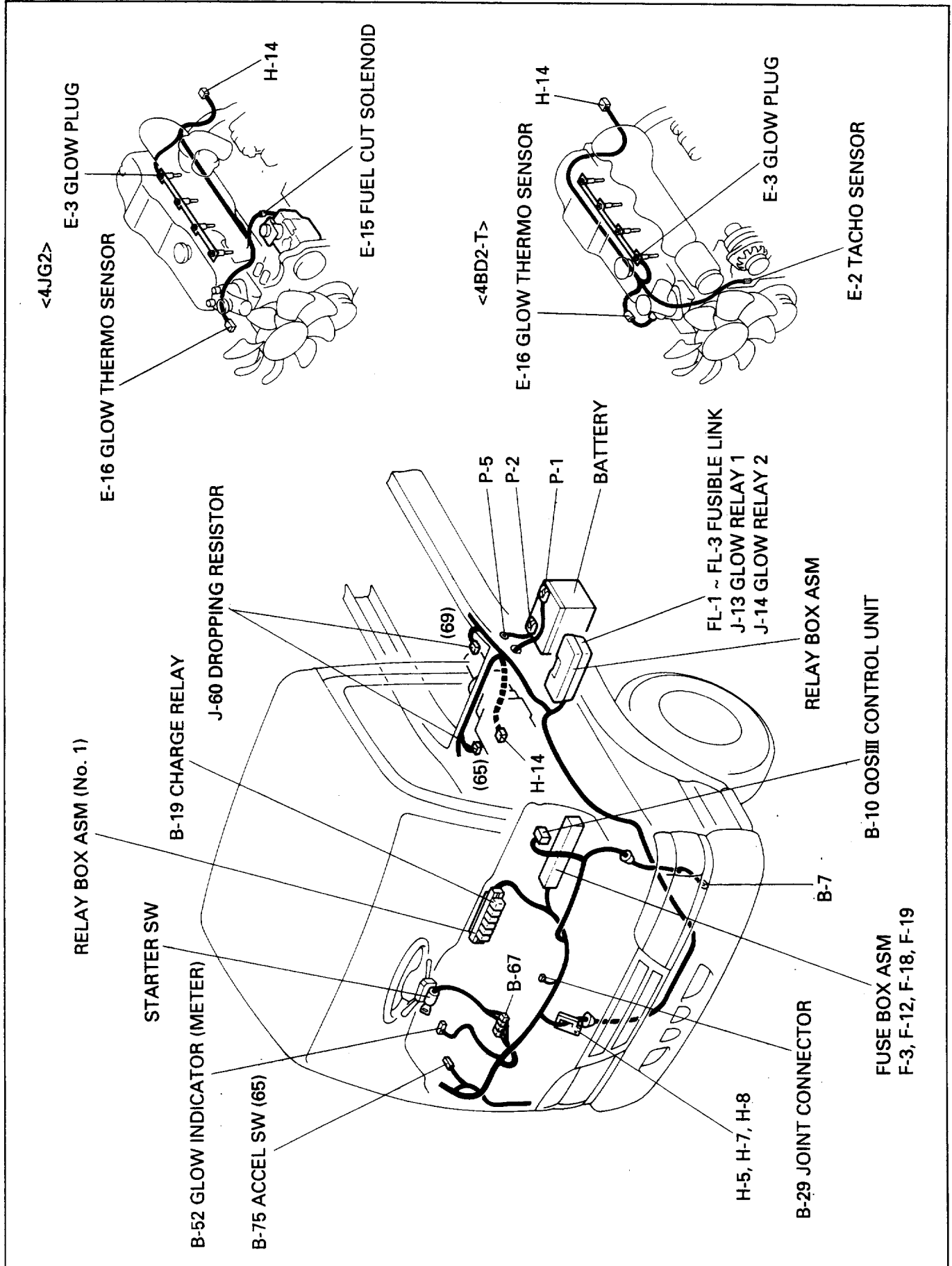
The indicator timer starts to operate as soon as the starter switch turns to "ON" position, and the indicator light turns on and keeps lit until the glow plugs have been heated to the level ready for the engine starting, when the indicator light is off.

For details, refer to section 6D6 "PREHEATING SYSTEM".

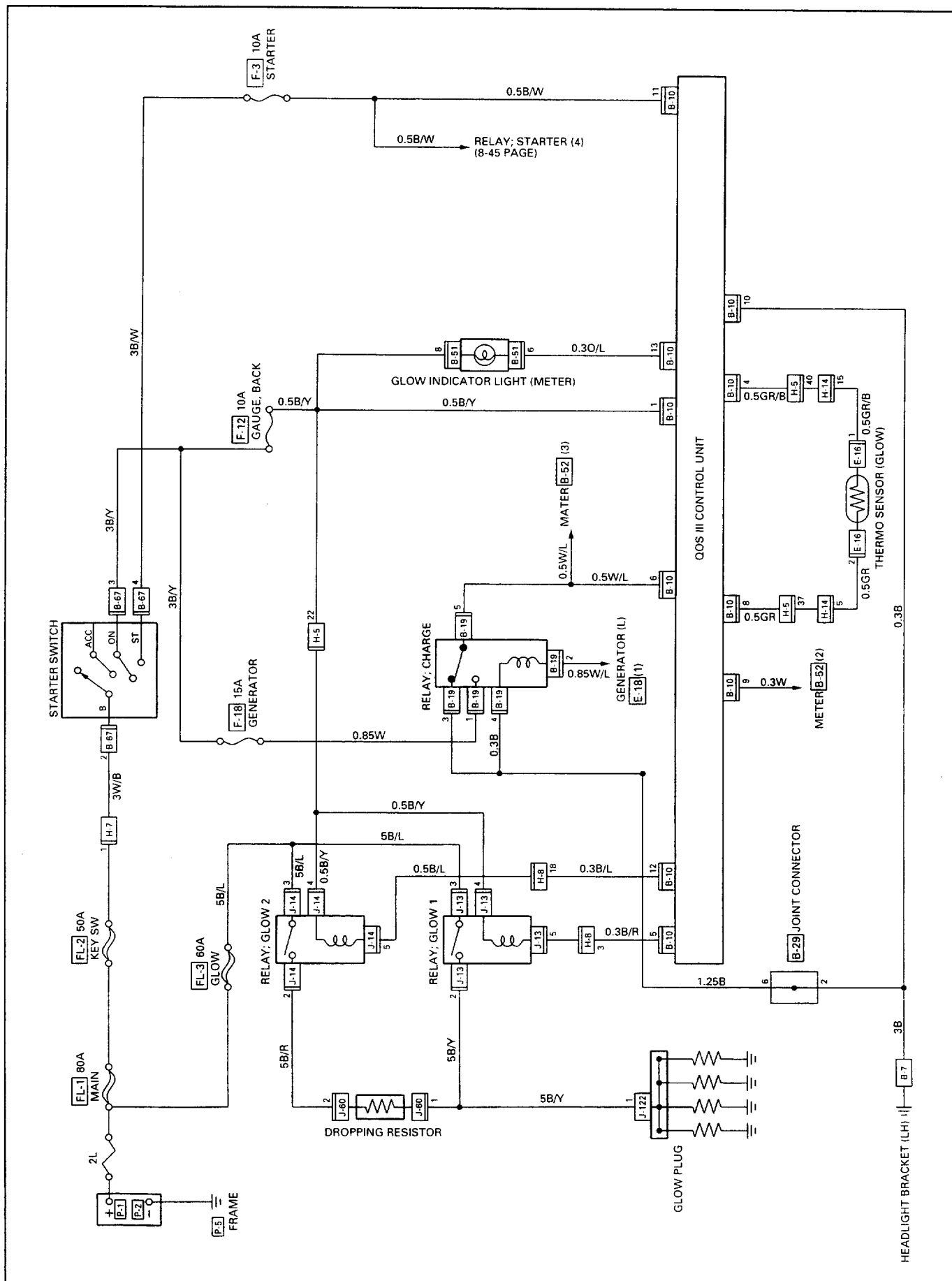
SYSTEM CIRCUIT



PARTS LOCATION

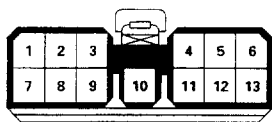


CIRCUIT DIAGRAM - NPR69

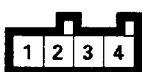


CONNECTOR LIST

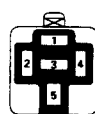
B-10



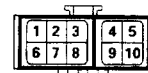
B-17



B-19



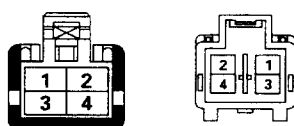
B-29



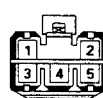
B-51



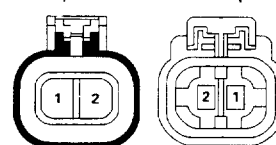
B-67



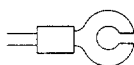
B-75



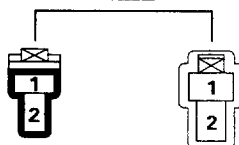
E-2



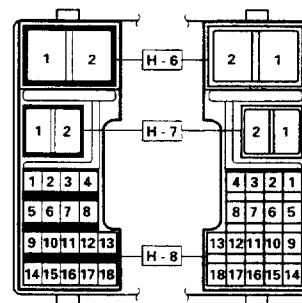
E-3 J-122



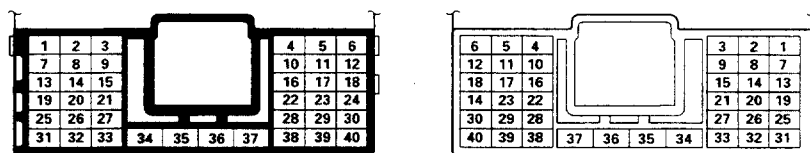
E-16



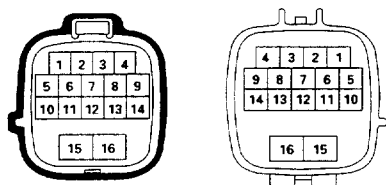
H-7 H-8



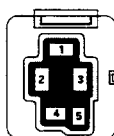
H-5



H-14



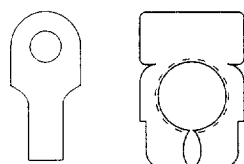
J-13 J-14



J-60



P-1 P-2



P-5

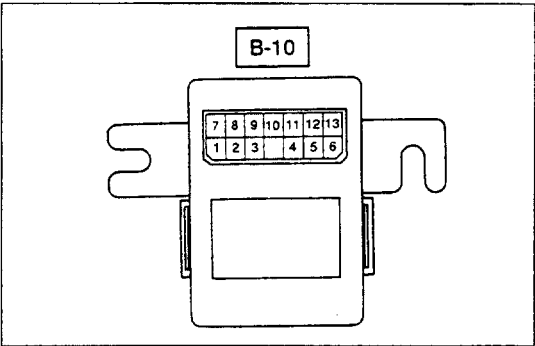


STARTER SWITCH

Refer to "START AND CHARGING" in this section.

GLOW INDICATOR LIGHT

Refer to "METER AND WARNING/INDICATOR LIGHT" in this section.



QOSIII CONTROL UNIT

Terminal No.	Connected to
1	Starter switch (ON)
2	—
3	Engine speed sensor (NPR65)
4	Thermo sensor (–)
5	Glow 1 relay
6	Charge relay
7	—
8	Thermo sensor (+)
9	Meter
10	Ground
11	Starter switch (ST)
12	Glow 2 relay
13	Glow indicator (Meter)

MEMO

Blank lined area for notes.

EXHAUST BRAKE SYSTEM

GENERAL DESCRIPTION

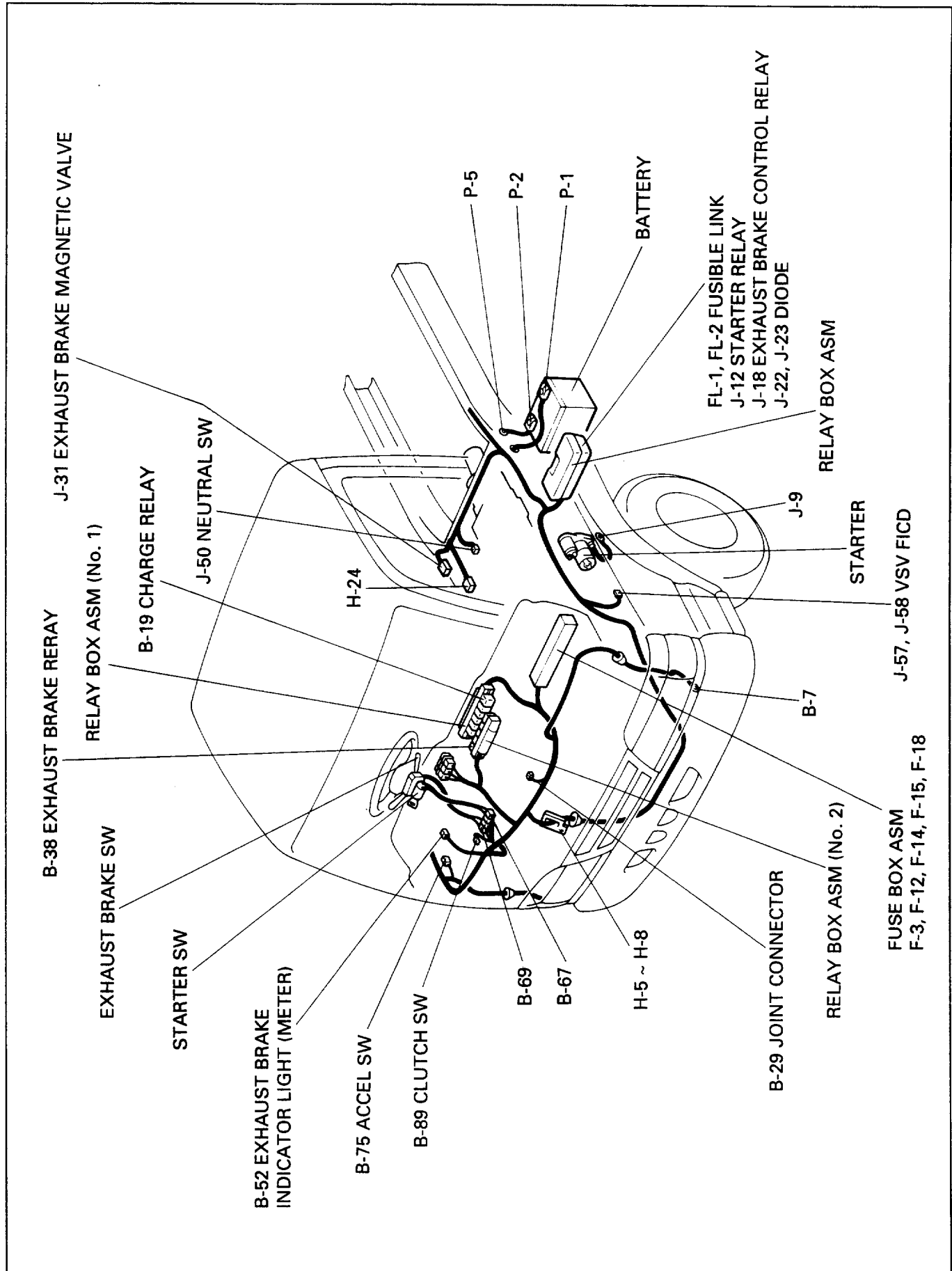
This circuit consists of starter switch, exhaust brake switch (combination switch), accelerator switch, clutch switch, vacuum switching valve, neutral switch and relay.

Exhaust brake is a system to increase exhaust pressure by means of squeezing exhaust gas from engine and exert engine brake.

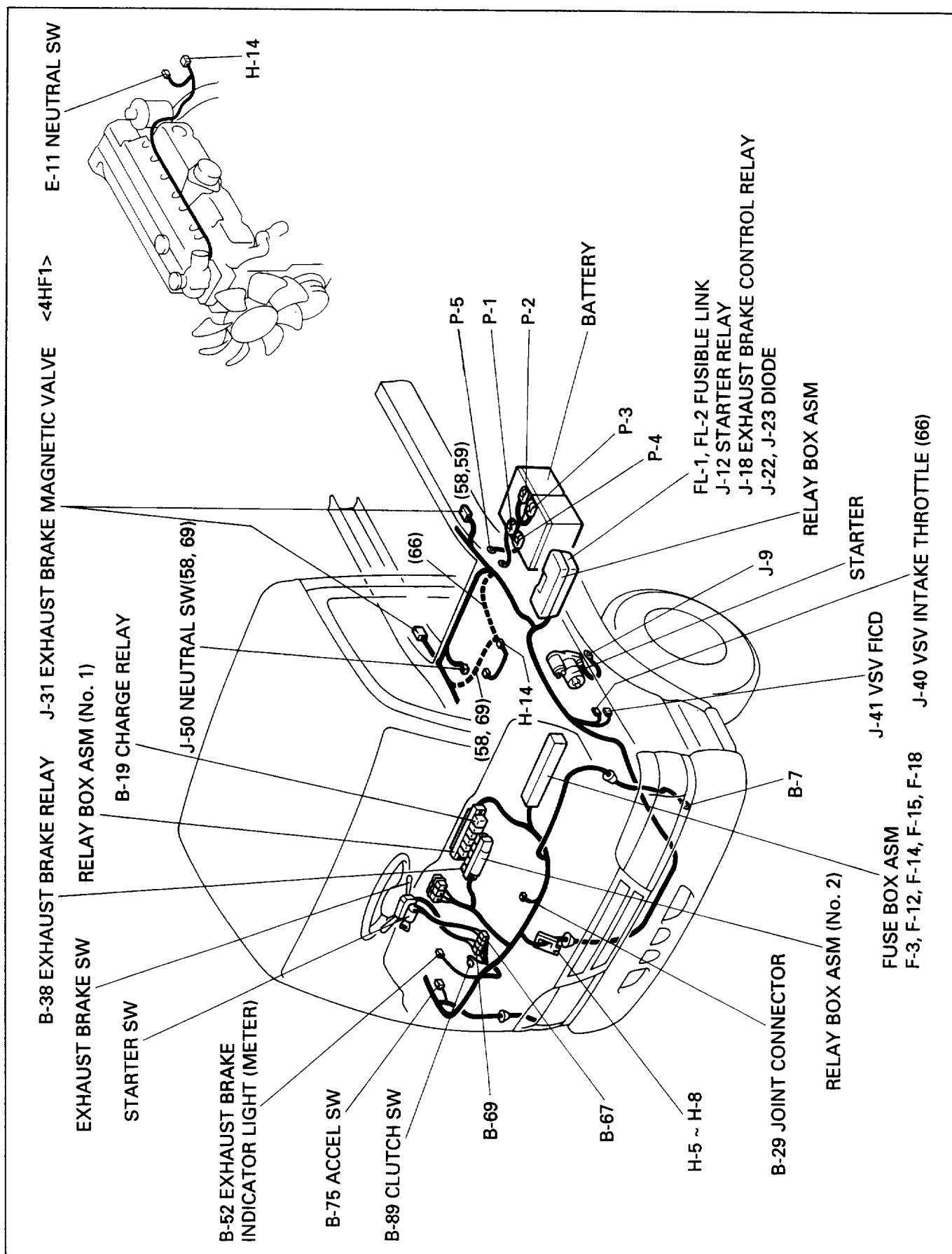
Turn the exhaust brake SW on, and the exhaust brake valve starts to work by the function of the magnetic valve to enable the exhaust brake to operate, when the exhaust brake indicator light will be on.

When either the accelerator pedal or the clutch pedal is depressed while driving, the switch of the depressed pedal will turn off, subsequently the exhaust braking will stop working.

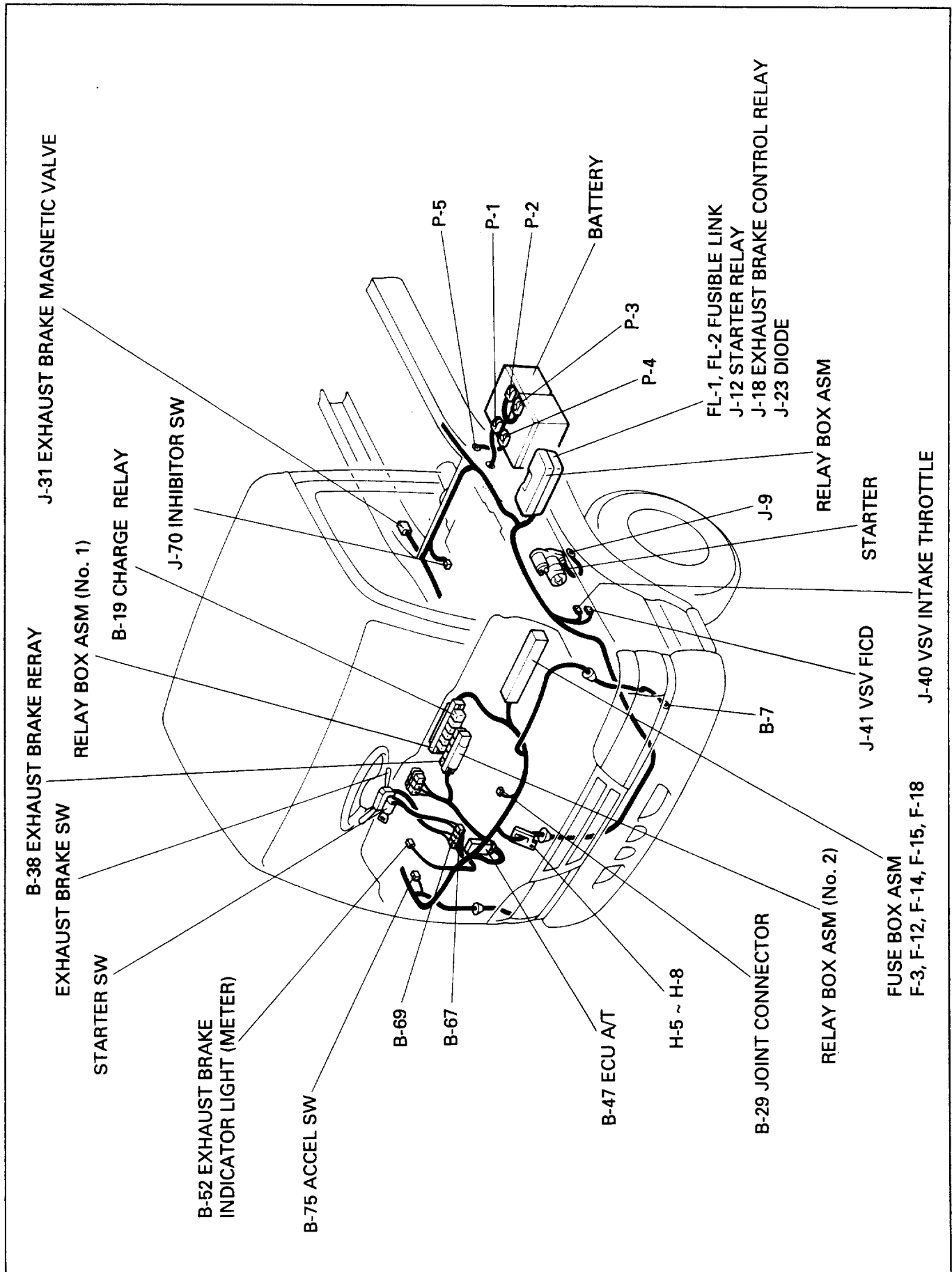
PARTS LOCATION - NHR55 · NKR55 · NPR69



**PARTS LOCATION - NKR66(M/T) · NPR66(M/T) · NQR66(M/T) · NPS66(M/T) ·
NPR70 · NPR71**

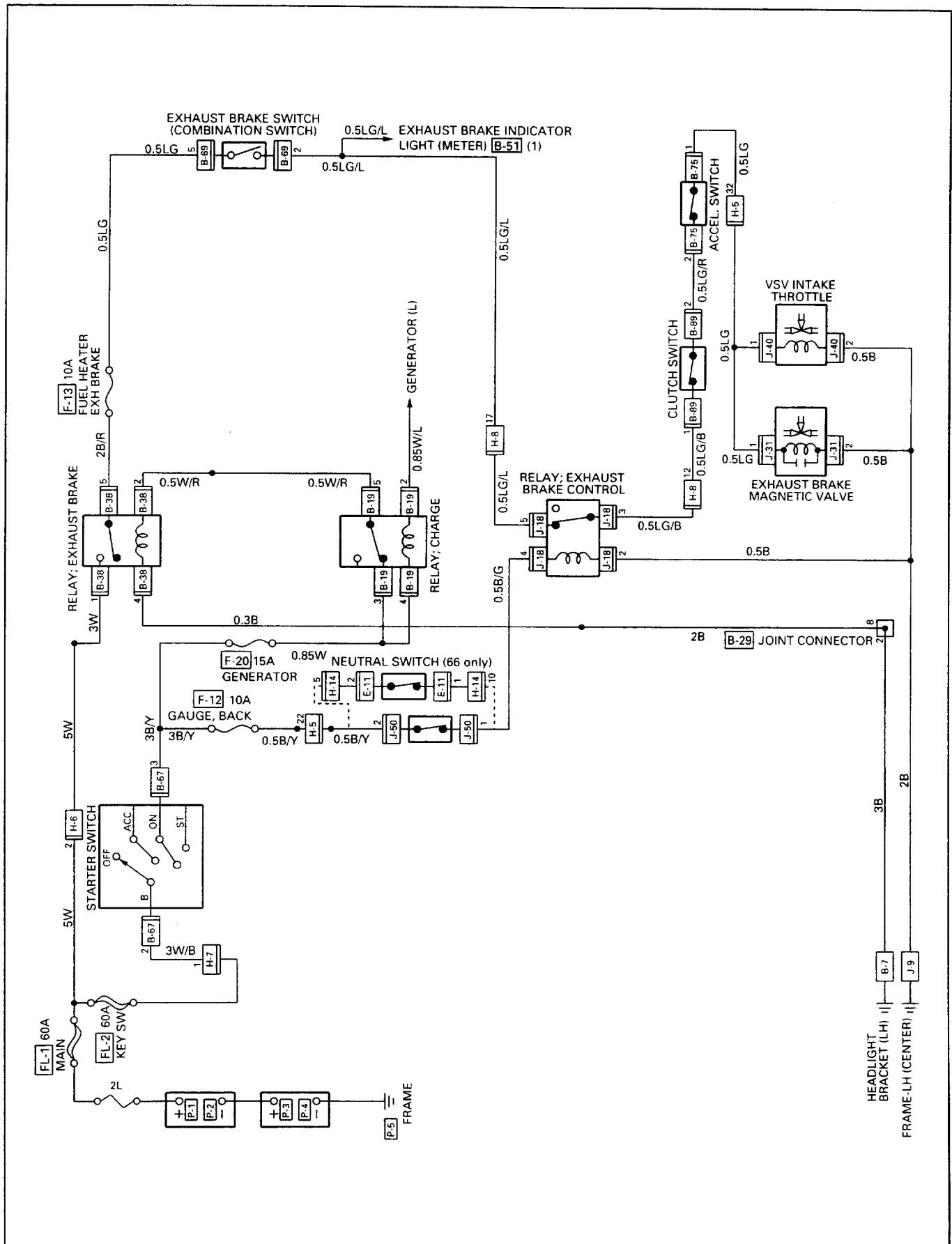


PARTS LOCATION - NPR66 . . . A/T

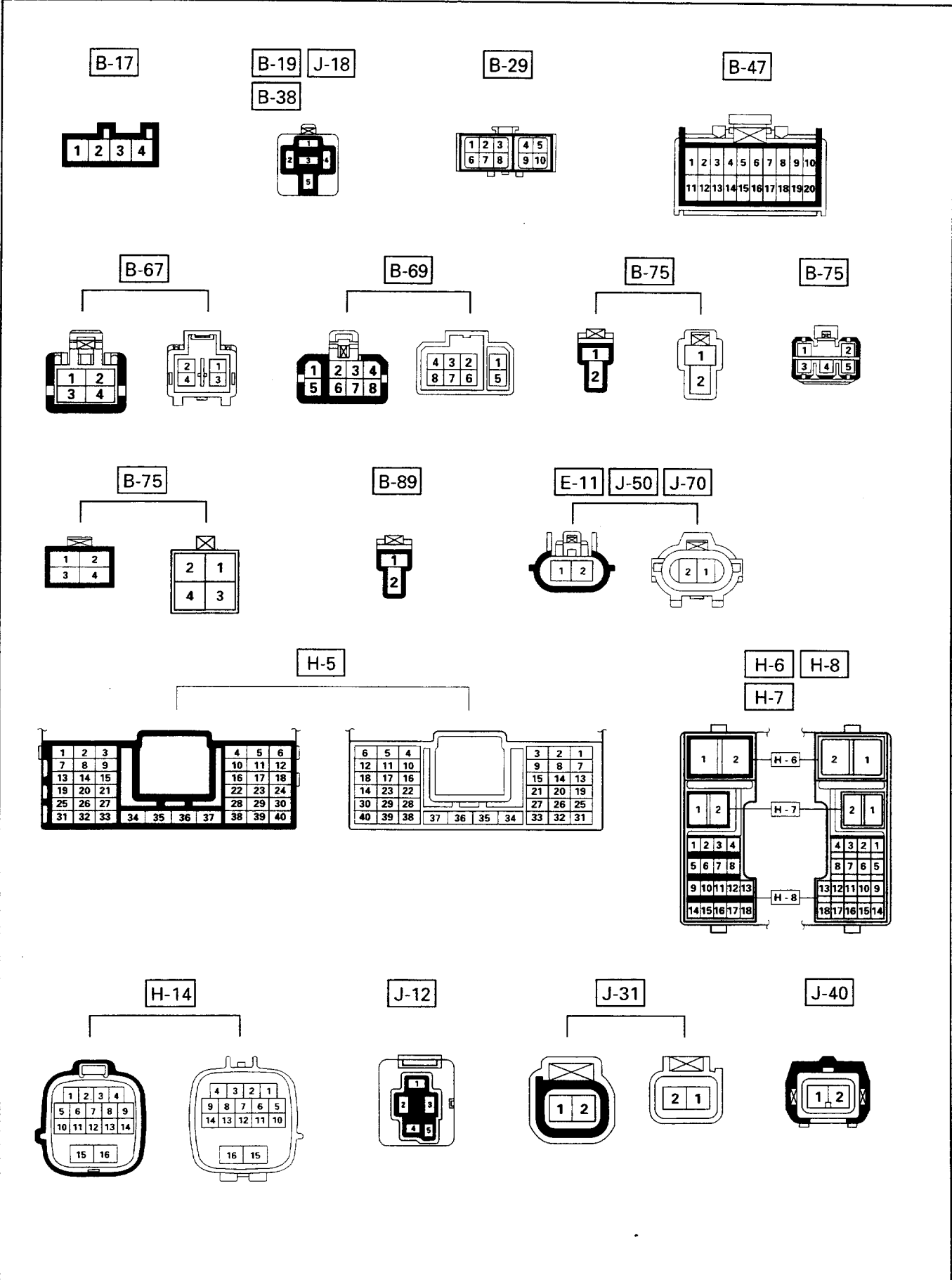




CIRCUIT DIAGRAM - NKR66(M/T) · NPR66(M/T) · NQR66(M/T) · NPS66(M/T) · NPR70 · NPR71

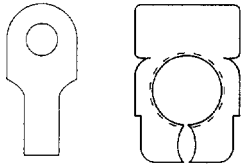


CONNECTOR LIST

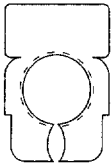


CONNECTOR LIST

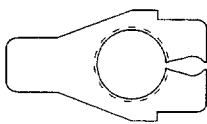
P-1 (12V) P-2



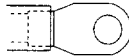
P-1 (24V) P-4



P-2 (24V) P-3



P-5 (24V)



P-5 (12V)



NEUTRAL SWITCH STARTER RELAY CHARGE RELAY STARTER SWITCH

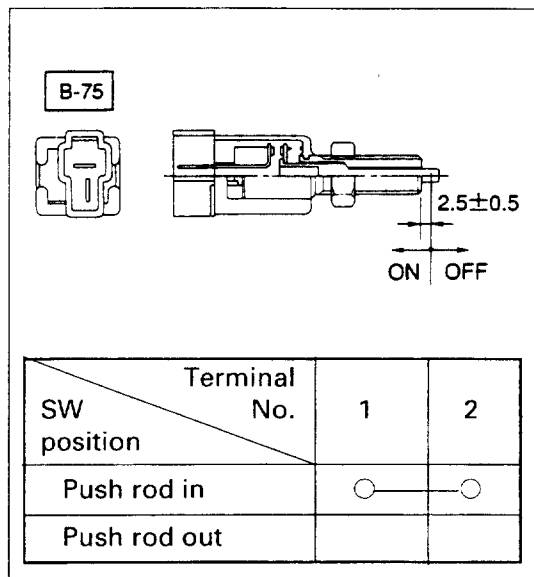
Refer to "START AND CHARGING" in this section.

ACCEL SWITCH (2-Pole type connector)



INSPECTION

1. Check the continuity between the switch connector terminals.
2. Check to see if switch push rod operate smoothly.
Repair or replace the accel switch when result of inspection is found abnormal.

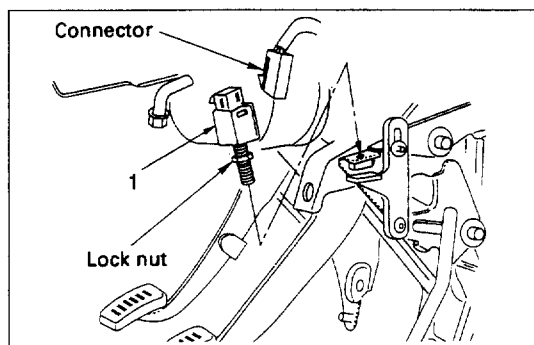


REMOVAL

Preparation:

Disconnect the battery ground cable.

1. **Accel Switch**
 - 1) Disconnect the connector.
 - 2) Loosen the lock nut of the switch.
 - 3) Remove the switch by turning it.



INSTALLATION

To install, follow the removal steps in the reverse order, noting the following points.



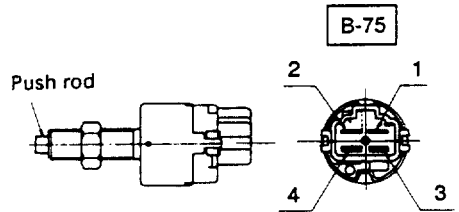
- 1) Check to see if the accel pedal has been returned by the return spring to the specified position.
- 2) Turn the accel switch clockwise until the tip of the threaded portion of the switch contacts the pedal arm.



- 3) Tighten the lock nut to the specified torque.

Lock nut torque N·m (kg-cm/lb-in)

13 (130 / 113)



SW position \ Terminal No.	1	2	3	4
Push rod out	○	○	○	○
Push rod in		○	○	

(4 - Pole type connector)



INSPECTION

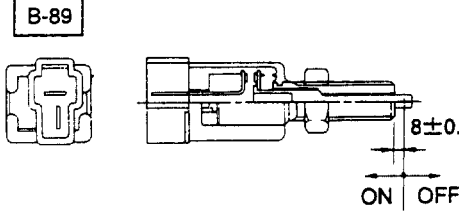
- 1. Check the continuity between the switch connector terminals.
- 2. Check to see if switch push rod operate smoothly.
Repair or replace the switch when result of inspection is found abnormal.



REMOVAL AND INSTALLATION

Refer to "ACCEL SWITCH (2-POLE TYPE CONNECTOR)" in this section.





SW position \ Terminal No.	1	2
Push rod in	○	○
Push rod out		

CLUTCH SWITCH



INSPECTION

- 1. Check the continuity between the switch connector terminals.
- 2. Check to see if switch push rod operate smoothly.
Repair or replace the switch when result of inspection is found abnormal.



REMOVAL AND INSTALLATION

Refer to "ACCEL SWITCH (2-POLE TYPE CONNECTOR)" in this section.



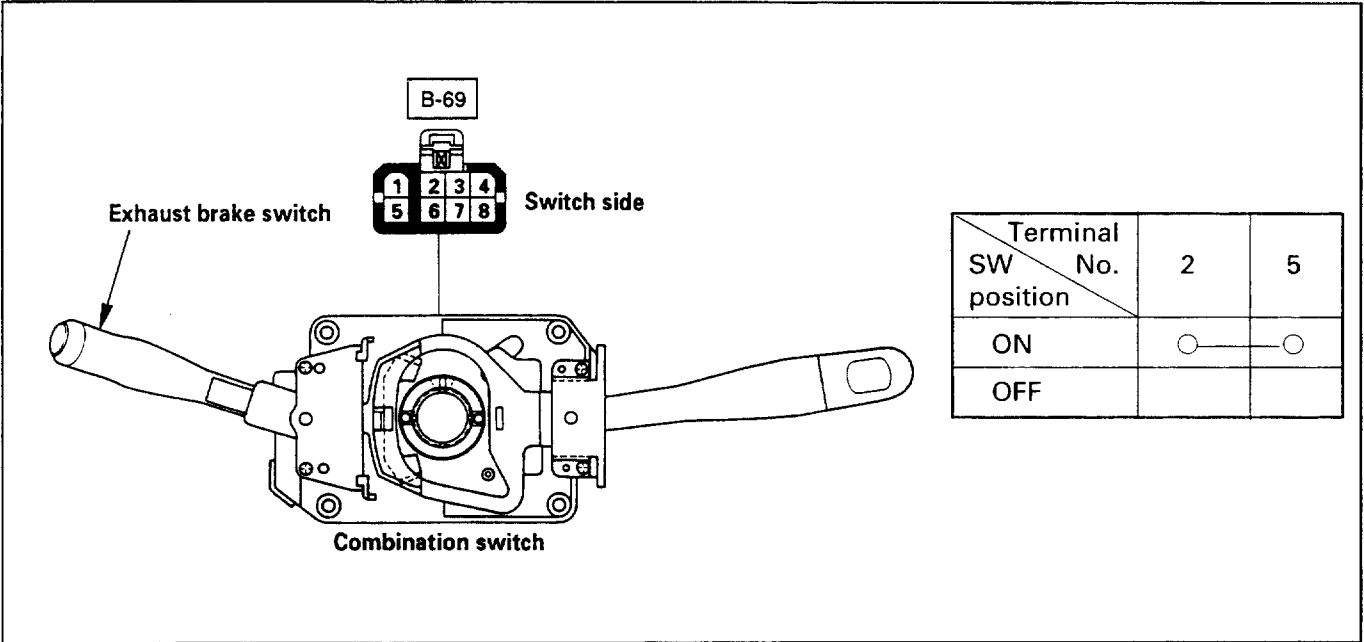
EXHAUST BRAKE SWITCH



INSPECTION



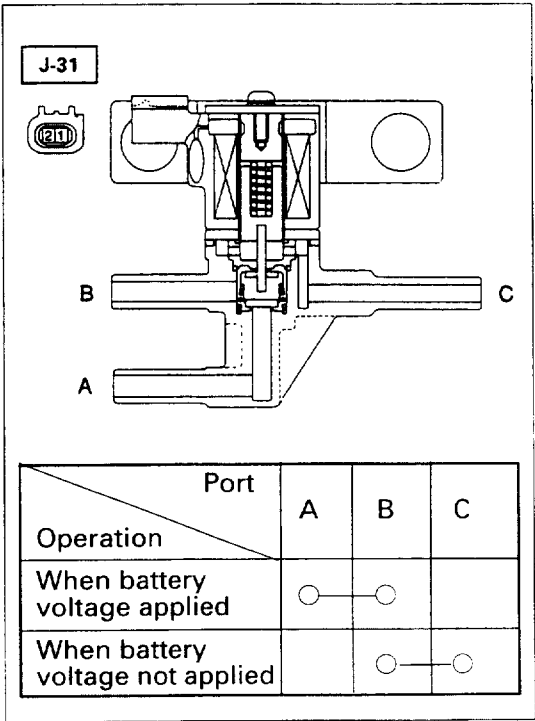
Check the continuity between the terminals of the exhaust brake switch.
Repair or replace the switch when the result of inspection is found abnormal.



REMOVAL AND INSTALLATION



Refer to "HEADLIGHT, FOG LIGHT AND CORNERING LIGHT" in this section.

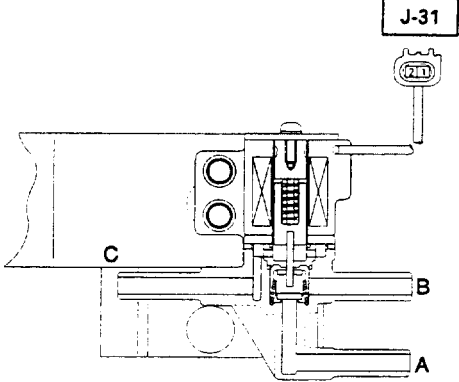


EXHAUST BRAKE MAGNETIC VALVE (4JG2 engine)



INSPECTION

Connect the magnetic valve connector terminal No.1 to the battery (+) terminal and terminal No. 2 to the (-) terminal and then check the continuity among each port.
Repair or replace the magnetic valve when the result of inspection is found abnormal.



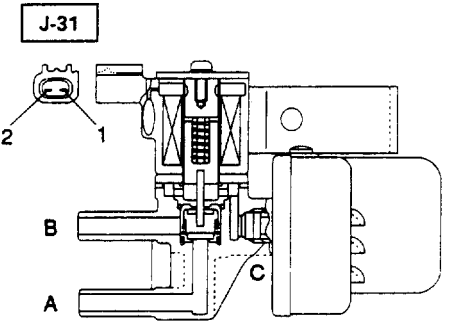
Port	A	B	C
Operation			
When battery voltage applied	○ — ○		
When battery voltage not applied		○ — ○	

EXHAUST BRAKE MAGNETIC VALVE
(4B Series engine)



INSPECTION

Connect the magnetic valve connector terminal No. 1 to the battery (+) terminal and terminal No. 2 to the (-) terminal and then check the continuity among each port.



Port	A	B	C
Operation			
When battery voltage applied	○ — ○		
When battery voltage not applied		○ — ○	

EXHAUST BRAKE MAGNETIC VALVE
(4JG2, 4H Series engine)

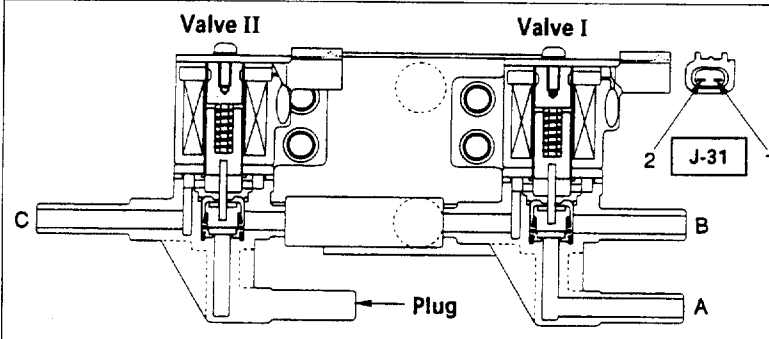


INSPECTION

Connect the magnetic valve connector terminal No. 1 to the battery (+) terminal and terminal No. 2 to the (-) terminal and then check the continuity among each port.

**EXHAUST BRAKE MAGNETIC VALVE
(4H Series engine)
AIR EXHAUST MAGNETIC VALVE
(4H Series engine)**

Connect the magnetic valve connector terminal No. 1 to the battery (+) terminal and terminal No. 2 to the (-) terminal and then check the continuity among each port.



Valve II

Valve I

2

J-31

1

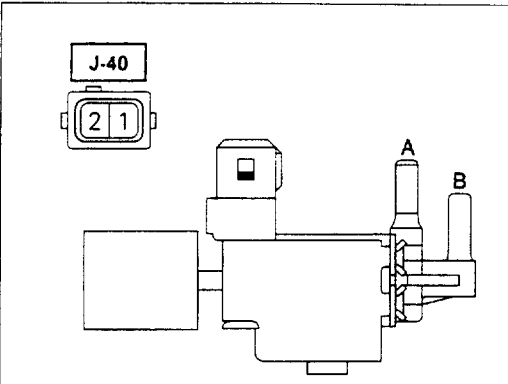
C

B

A

Plug

Operation		Port		
Valve I	Valve II	A	B	C
Battery voltage not applied	Battery voltage not applied		○	○
Battery voltage applied	Battery voltage not applied	○	○	
Battery voltage not applied	Battery voltage applied			
Battery voltage applied	Battery voltage applied	○	○	



J-40

2

1

A

B

Port	A	B
When battery voltage applied	○	○
When battery voltage not applied		

VACUUM SWITCHING VALVE: INTAKE THROTTLE (4H Series engine)



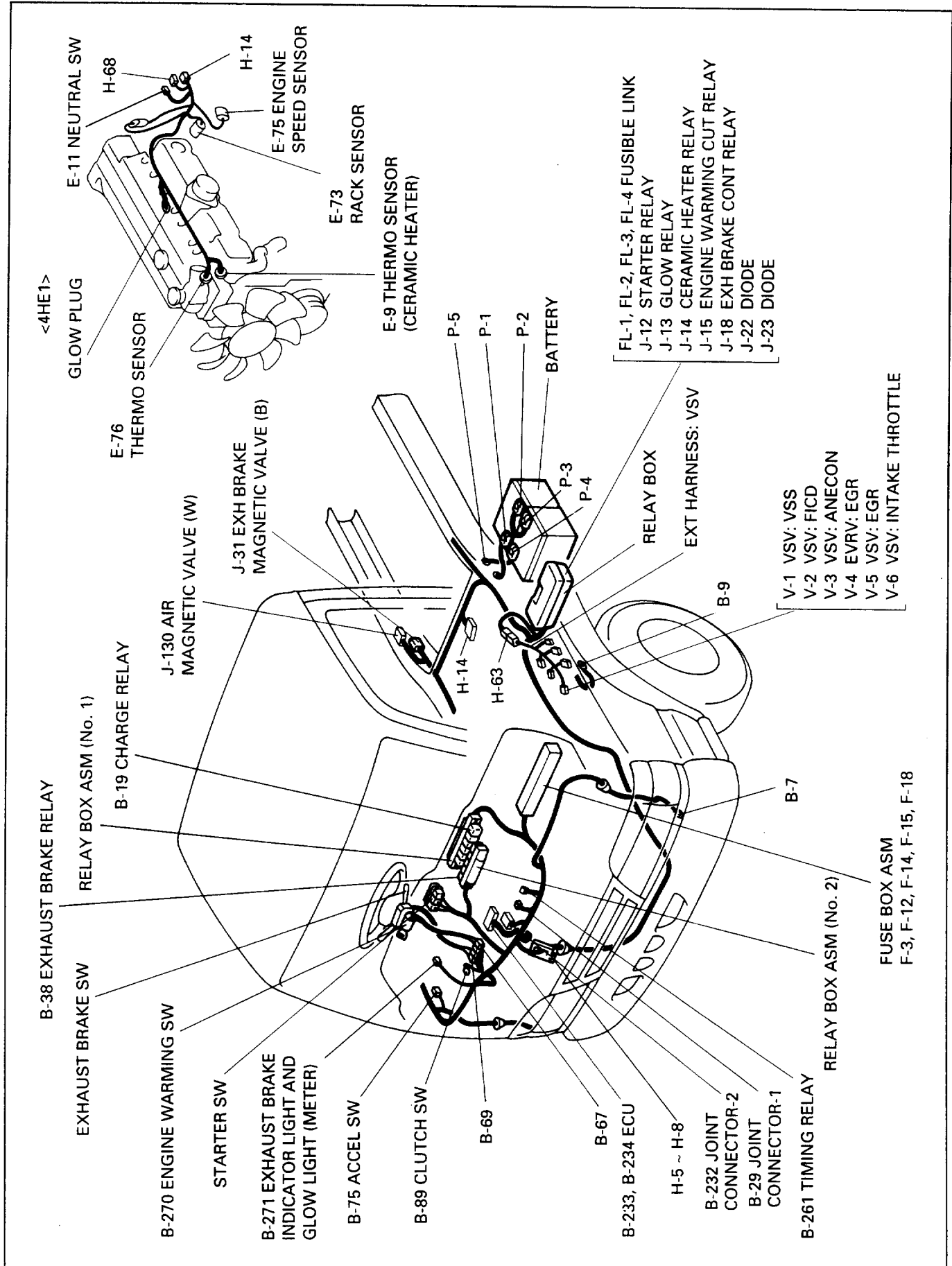
INSPECTION

Connect the magnetic valve connector terminal No. 1 to the battery (+) terminal and terminal No. 2 to the (-) terminal and then check the continuity among each port.

Repair or replace the vacuum switching valve when the result of inspection is found abnormal.

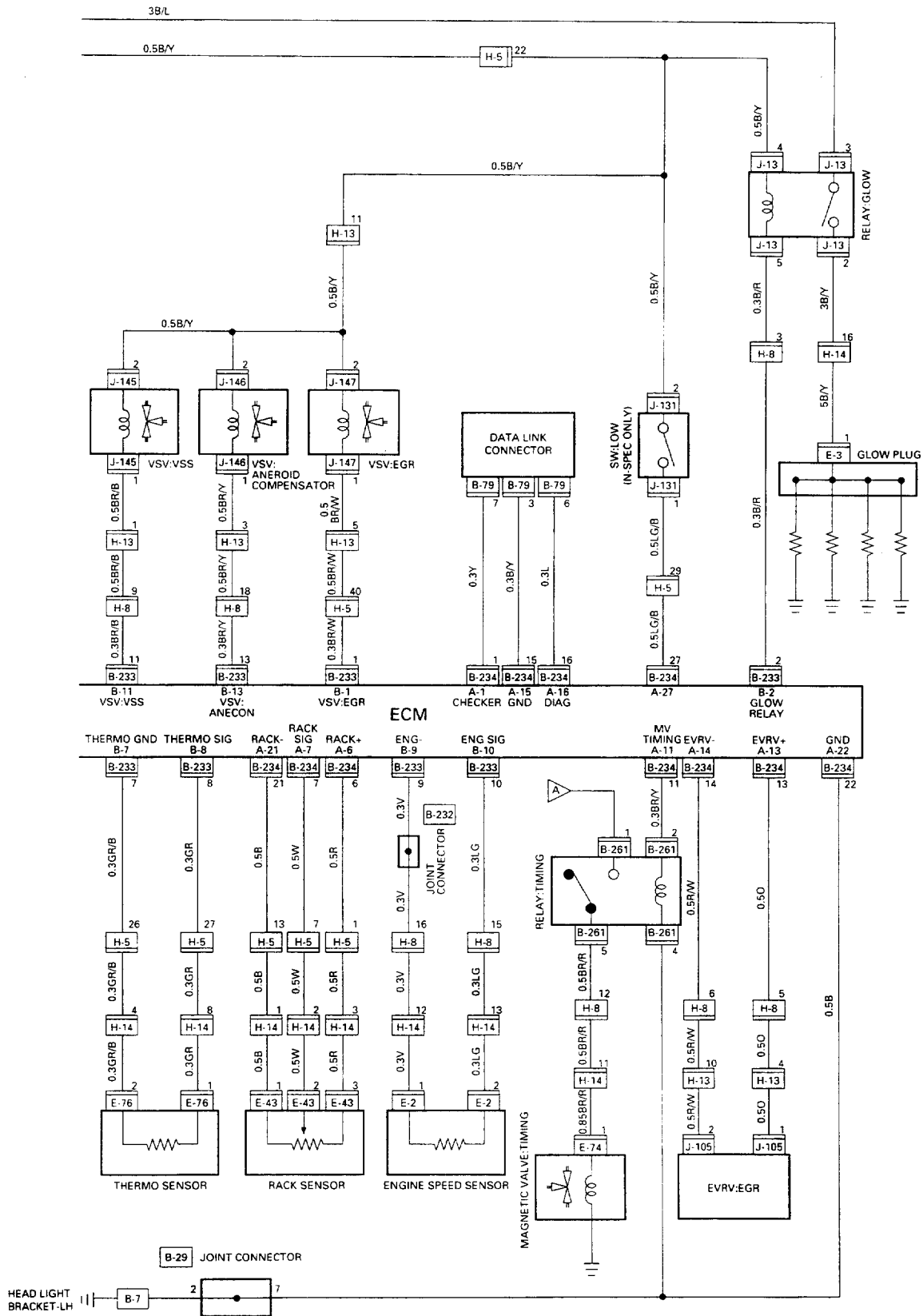
EXHAUST BRAKE SYSTEM AND ENGINE CONTROL

PARTS LOCATION - NPR70TC · NQR70TC

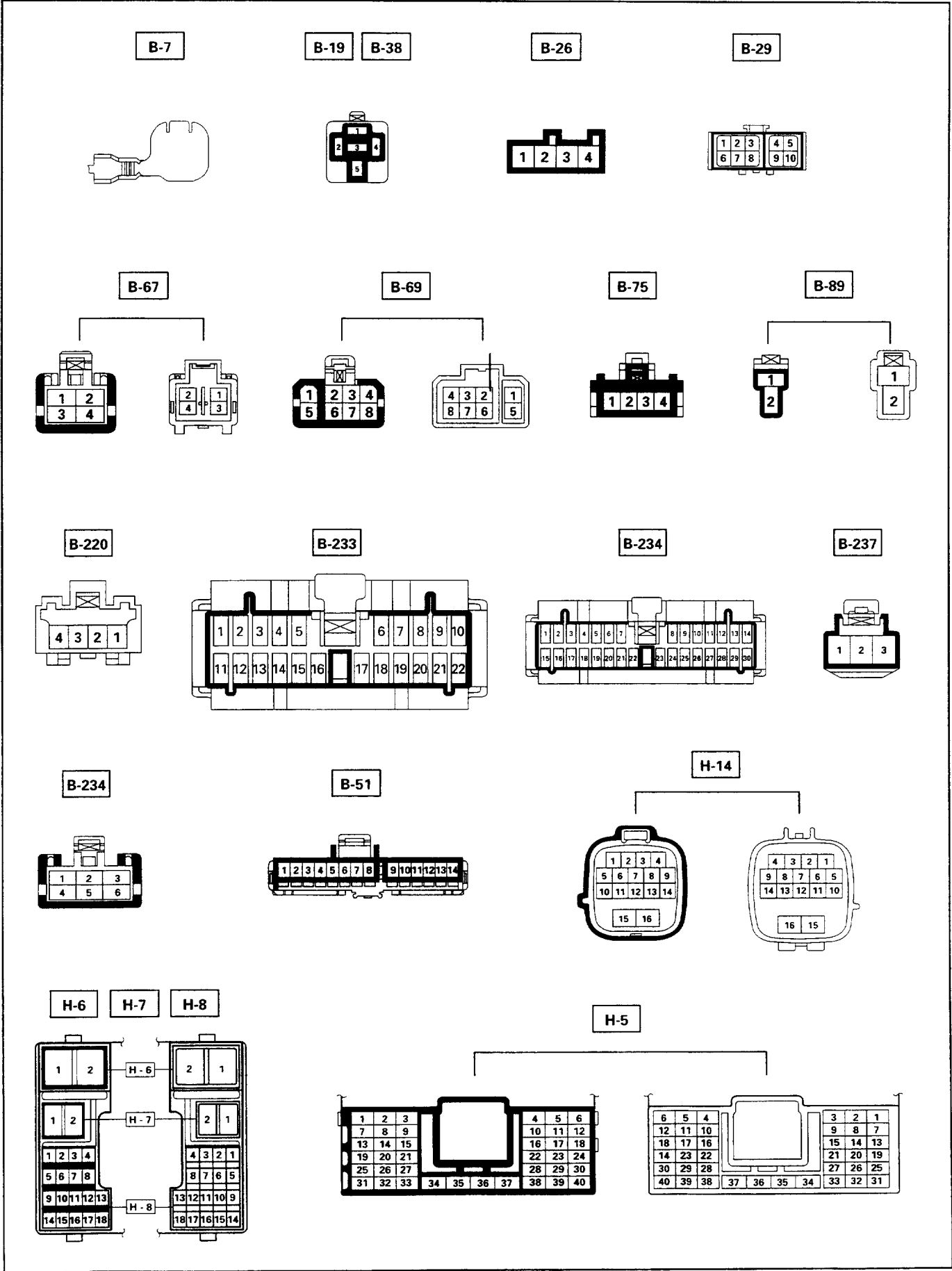




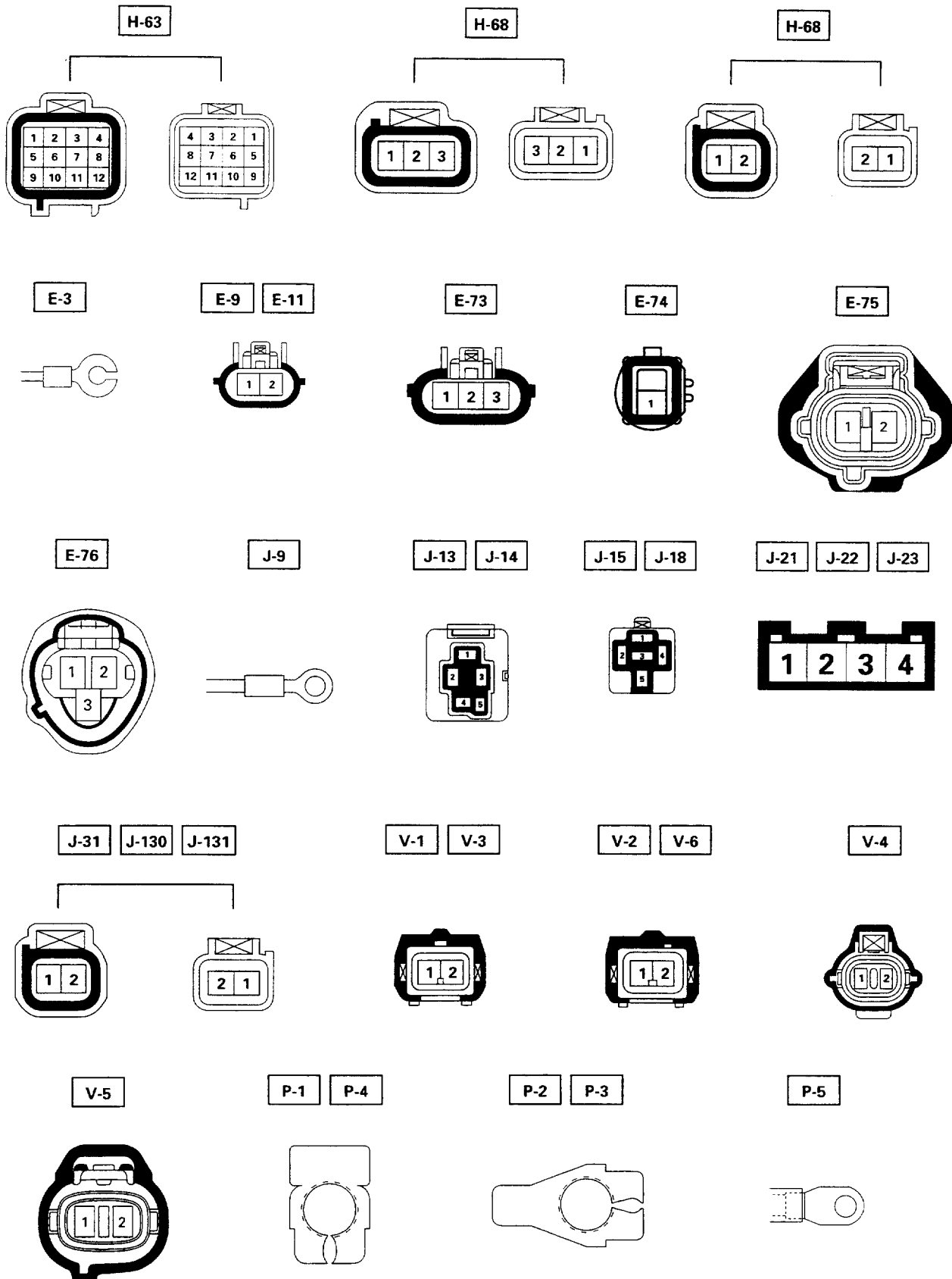
CIRCUIT DIAGRAM FOR 24 VOLT - NPR70TC · NQR70TC



CONNECTOR LIST



CONNECTOR LIST



ENGINE STOP SYSTEM

GENERAL DESCRIPTION

The circuit consists of starter switch and engine stop motor.

The engine stop mechanism aims at shut-off of fuel supply.

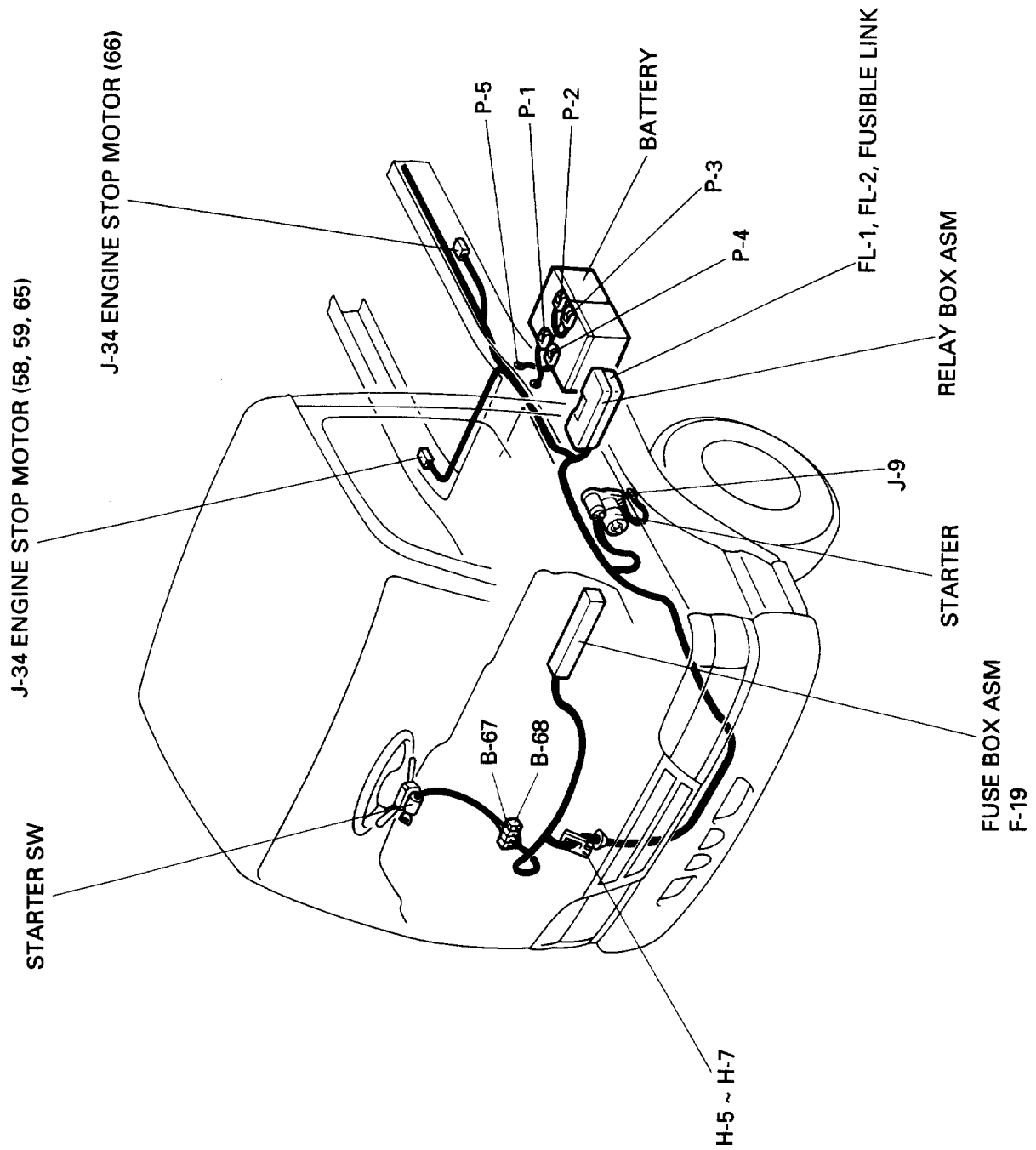
available are motor type and solenoid type depending on the types of the engine mounted.

Motor type is forcible pull the injection pump control rack to the direction of fuel supply reduction by means of engine stop motor, thus shutting it off.

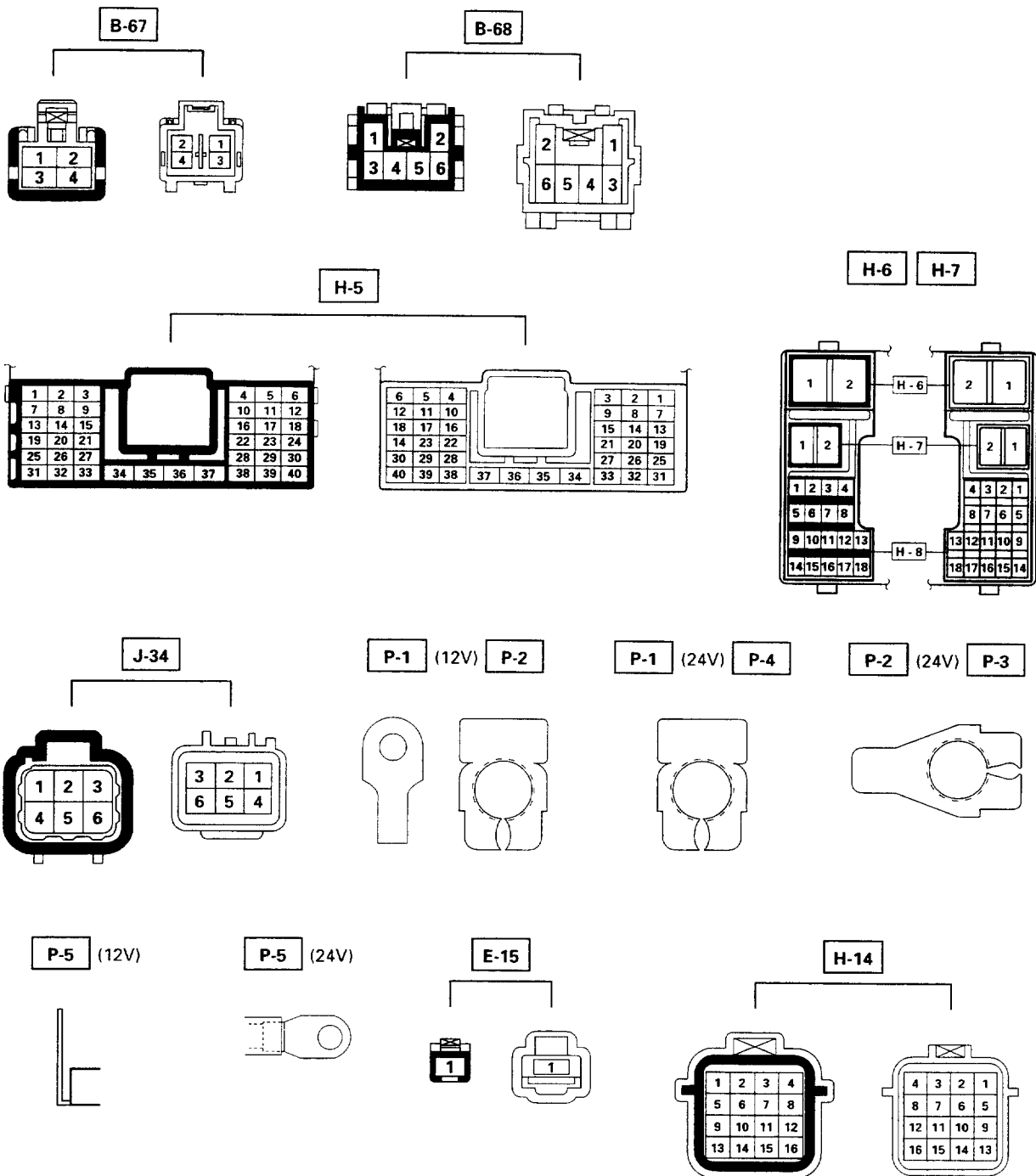
Solenoid type is to have the starter switch turn from "ON" position to "OFF", so that the solenoid valve fitted to the injection pump closes to shut off the fuel circuit.

Engine stop system	Engine model
Motor type	4HF1
Solenoid type	4JB1, 4JG2

PARTS LOCATION

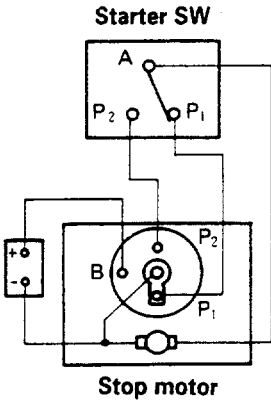


CONNECTOR LIST



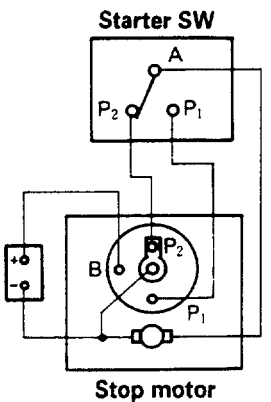
FUNCTION OF ENGINE STOP MOTOR

Starter SW



Stop motor

Starter SW

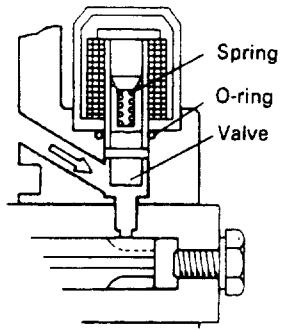


Stop motor

Turn the starter switch from "ACC" position to "ON", and the engine stop motor will turn by 180 degrees (from 0° to 180°) so that the stop motor's electrode will be in potential equal to that of the starter switch for the stop.

Turn the starter switch from "ON" position to "ACC" or "LOCK", and then the stop motor will rotate by 180 degree (from 180° to 360°) and cease operating.

Starter SW key position	Connector No.	B-68			Stop motor	Stop lever position
	Terminal No.	A	P1	P2		
LOCK	1	○	○		0° (360°)	Stop
ACC	1	○	○			
ACC → ON					0° → 180°	Stop → Run
ON		○		○	180°	Stop
START		○		○		
ON → ACC LOCK					0° → 360°	Stop → Run



Key position	Solenoid valve
LOCK	Close
ACC	
ON	Open
START	

SOLENOID TYPE

STARTER SWITCH AND SOLENOID VALVE

Turn the starter switch from "ON" position to "OFF", and then the solenoid valve fitted to the injection pump closes to cut off the fuel circuit.

For the circuit of solenoid type fuel cut, refer to QOSIII circuit diagrams in this section.

HEADLIGHT, FOG LIGHT, REAR FOG LIGHT AND CORNERING LIGHT

GENERAL DESCRIPTION

The circuit consists of headlight, fog light, Cornering light, starter switch, Combination switch (Lighting switch, dimmer - passing switch, cornering light switch), fog light switch, high beam indicator light and relay.

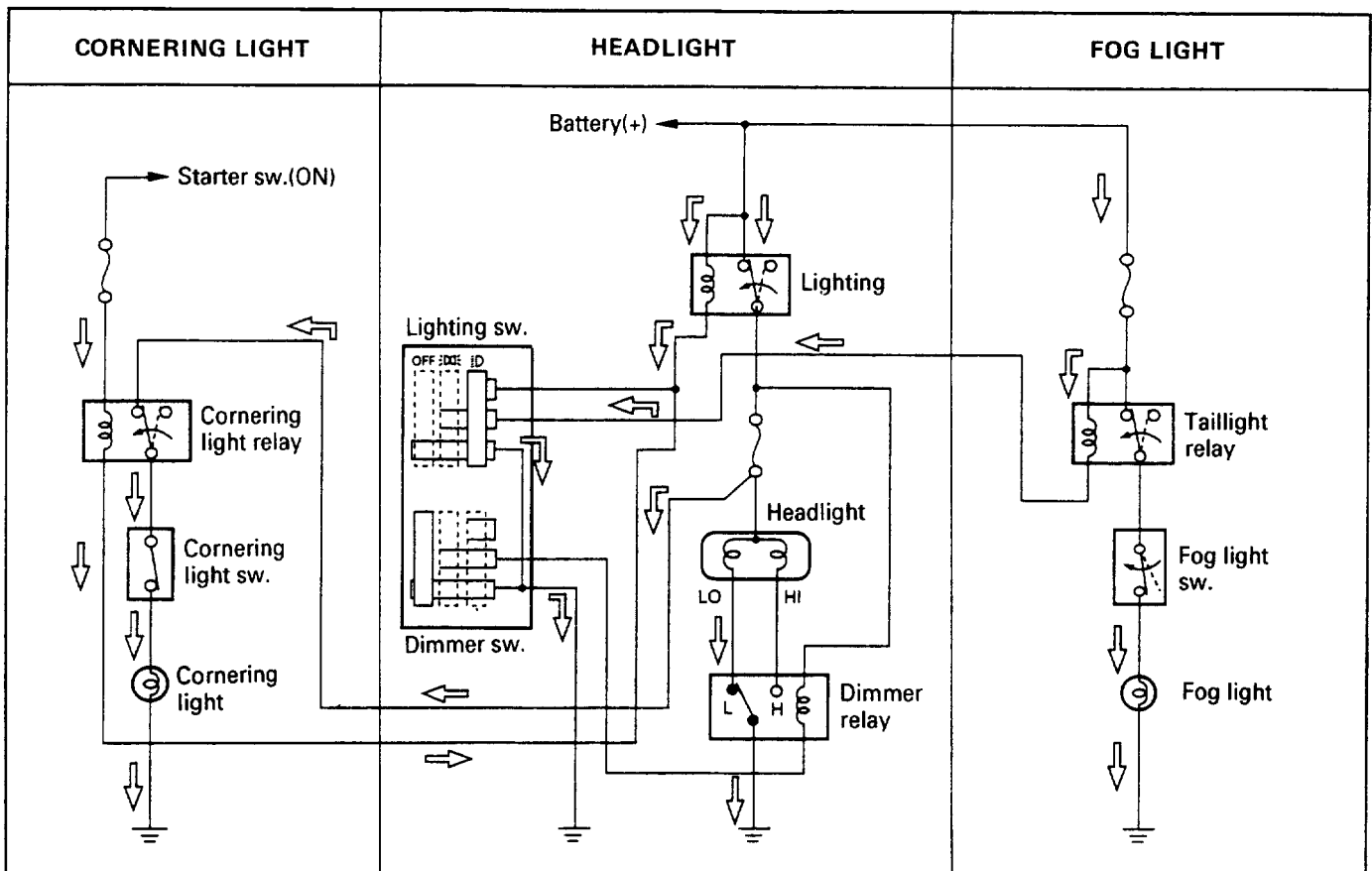
When the lighting SW is turned on by setting it at headlight position, the lighting relay is actuated to turn on the headlight. The optical axis of the headlight can be turned up or down by operating the dimmer SW while headlight is on.

The passing SW is independent of the lighting SW, and the optical axis of the passing light can be turned up only while the switch lever is pulled up and held in this state.

Fog light turns on by switching it to "ON" position to activate relay only while lighting SW is on.

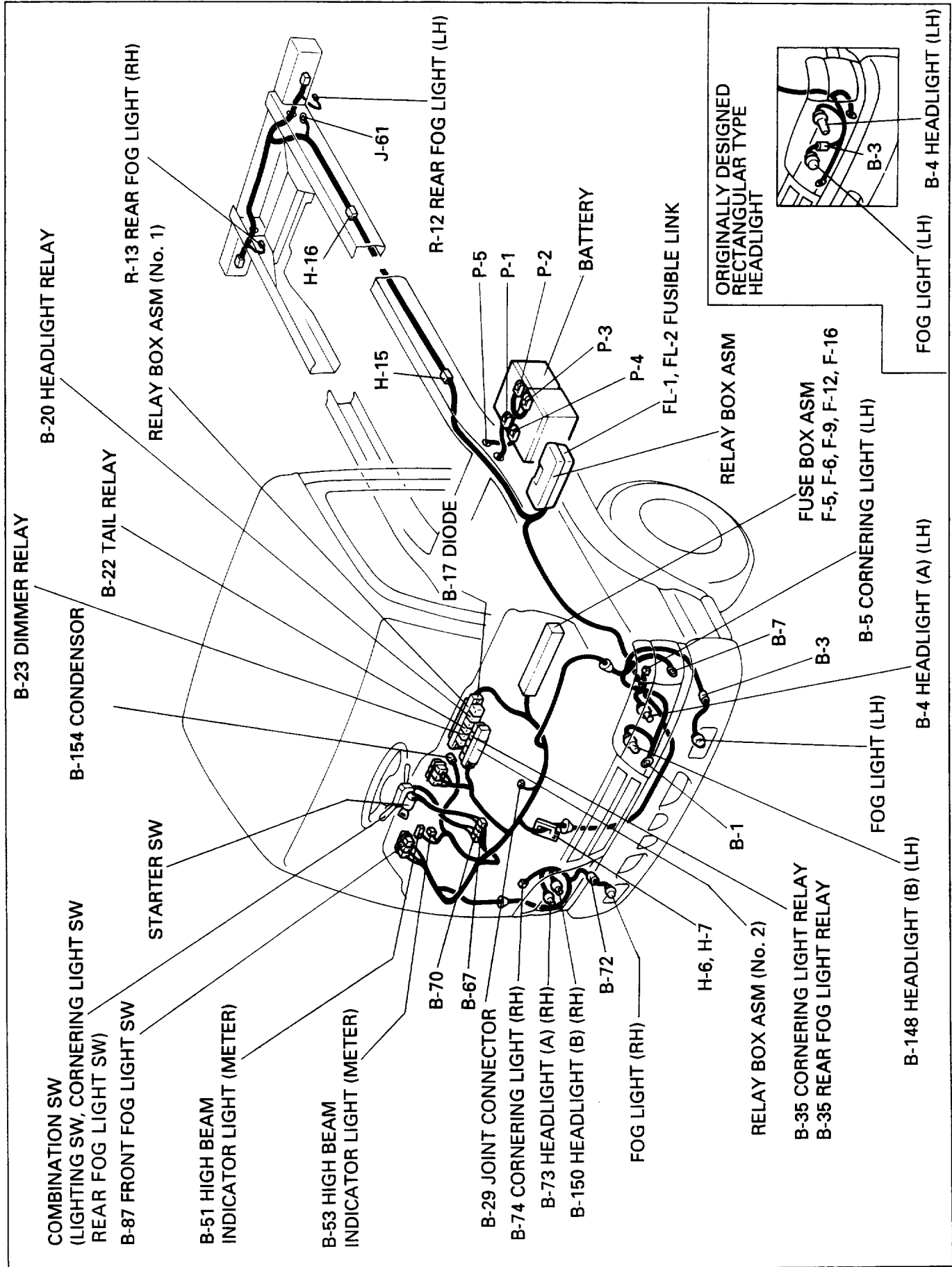
When the headlight is on, turn the turn-signal switch left or right, and then the cornering switch built in the combination switch turns on, followed by the cornering light turning on.

LIGHTING CIRCUIT



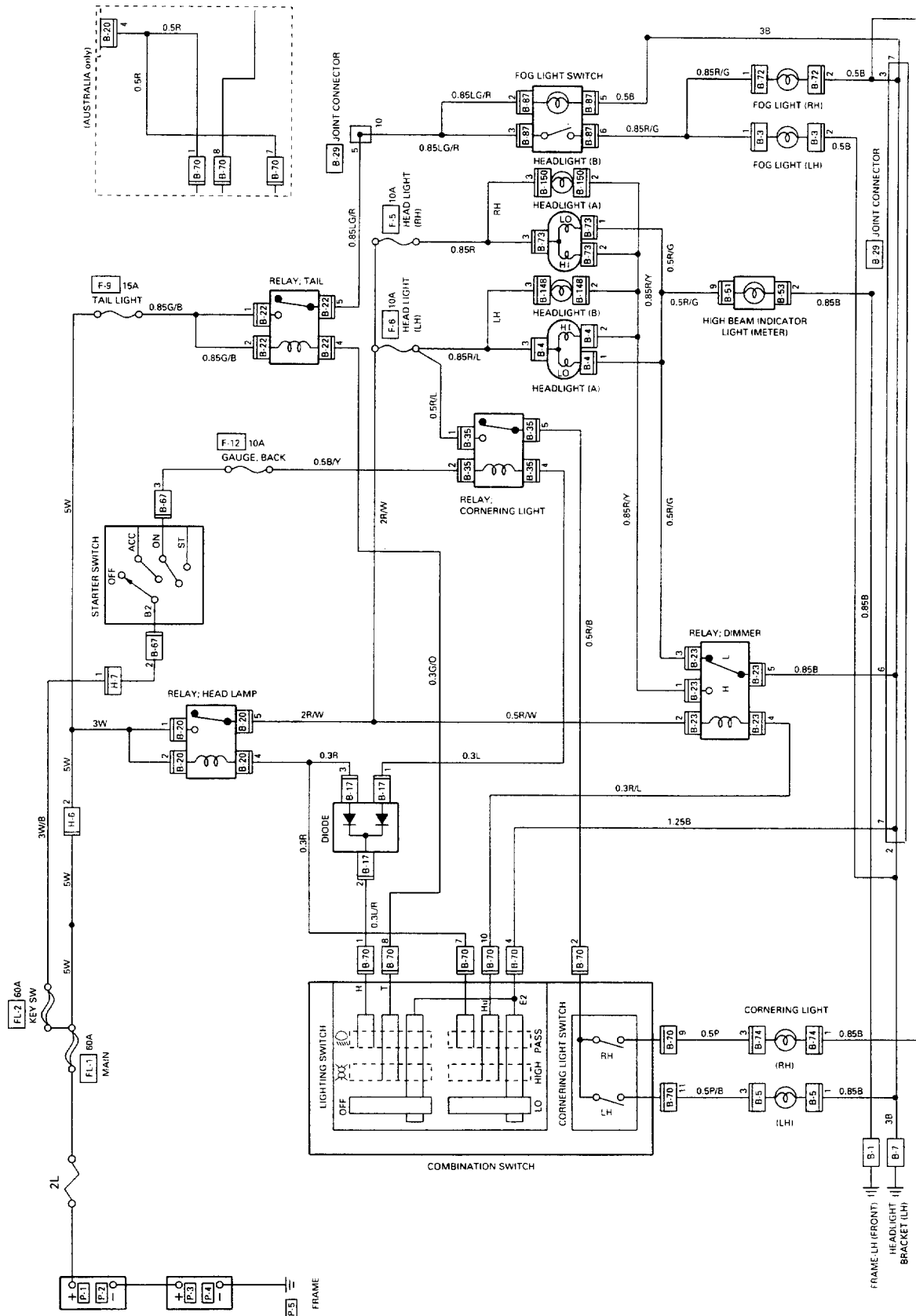
NOTE: Arrow marks "⇒" indicate the direction of current.

PARTS LOCATION



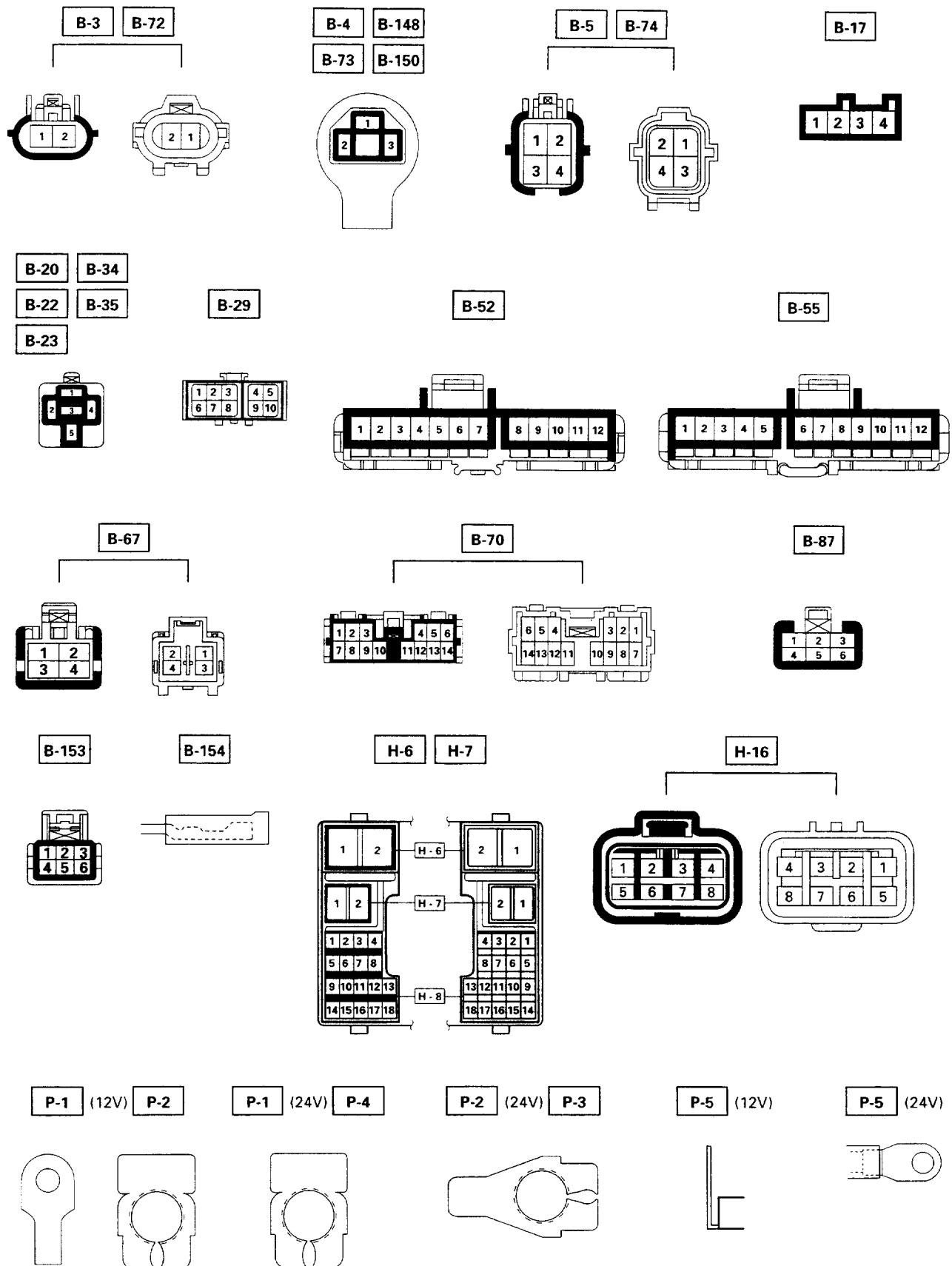


CIRCUIT DIAGRAM - FOR 24VOLT





CONNECTOR LIST



DIAGNOSIS

QUICK CHART FOR CHECK POINT

1. HEADLIGHT

Check point Trouble mode	Fuse		Headlight relay	Lighting SW	Dimmer- passing SW	Dimmer relay	Headlight bulb		Cable harness
	F-5 (10A)	F-6 (10A)					LH	RH	
1-1. Both Headlights inoperative			○ (1)	○ (3)					○ (2)
1-2. Headlight on the left (or right) side inoperative	○ (1)	○ ((1))							○ (2)
1-3. Headlight in low-beam inoperative						(1)			○ (2)
1-4. Headlight in high-beam inoperative						(1)			○ (2)
1-5. Headlight on the left (or right) side in low (or high)-beam inoperative							○ (1)	○ ((1))	○ (2)
1-6. Headlight beam does not change					○ (1)	(2)			○ (3)
1-7. Headlights remain on when the lighting switch turned off			○ (1)	○ (2)					○ (3)
1-8. Headlights come on with the lighting SW at the clearance light position				○ (1)					

NOTE: Figure in parenthesis “()” indicates the order of inspection.

2. FOG LIGHT

Check point Trouble mode	Fuse F-9 (15A) 24V F-10 (10A) 12V	Taillight relay	Fog light SW	Fog light bulb		Cable harness
				LH	RH	
2-1. Both fog lights inoperative (while lighting switch is on)	○ (1)	○ (2)	○ (3)			○ (4)
2-2. Fog light on the left (or right) side inoperative (while lighting switch is on)				○ (1)	○ ((1))	○ (2)
2-3. Fog lights remains on		○ (1)	○ (2)			○ (3)

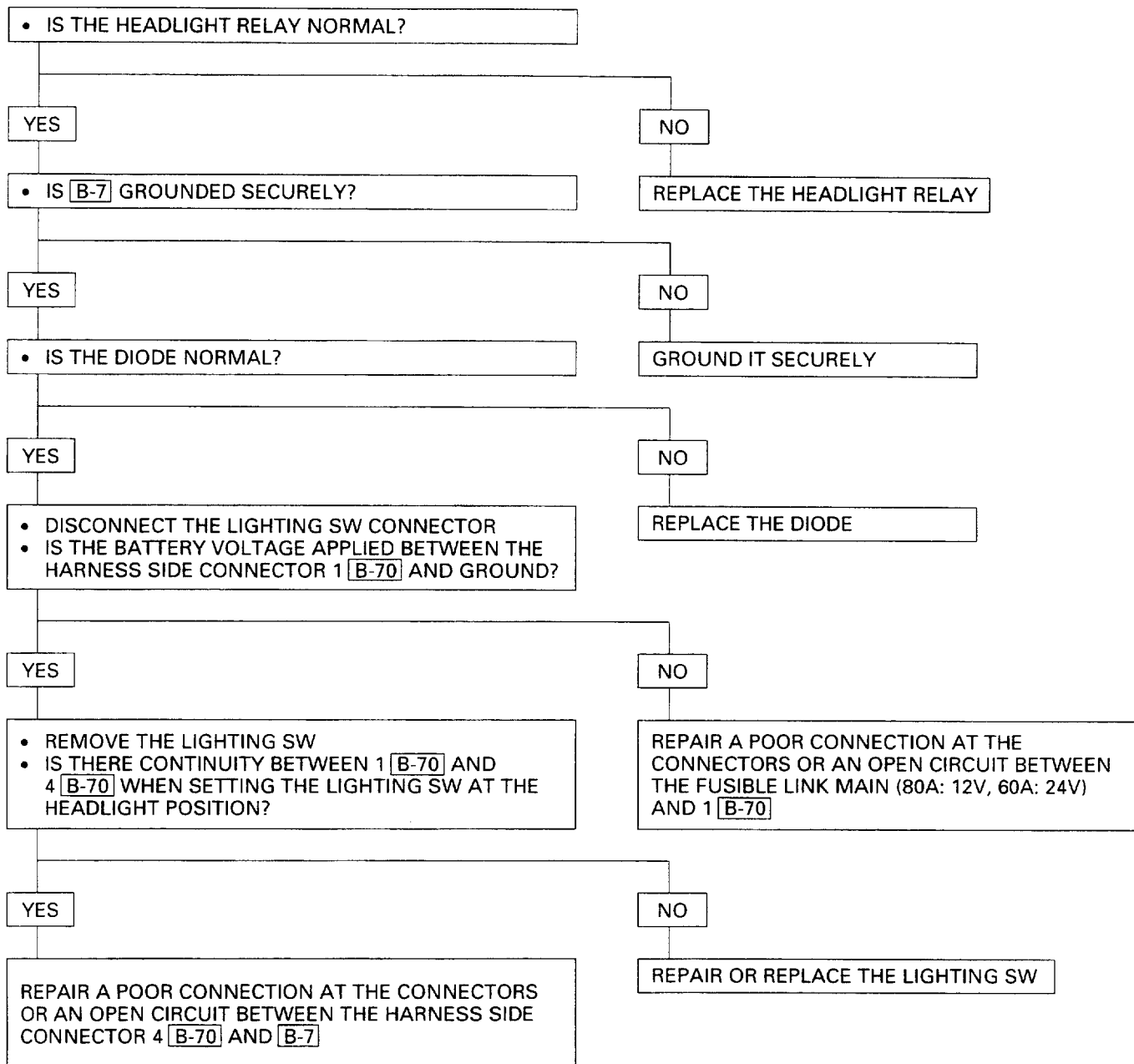
NOTE: Figure in parenthesis “()” indicates the order of inspection.

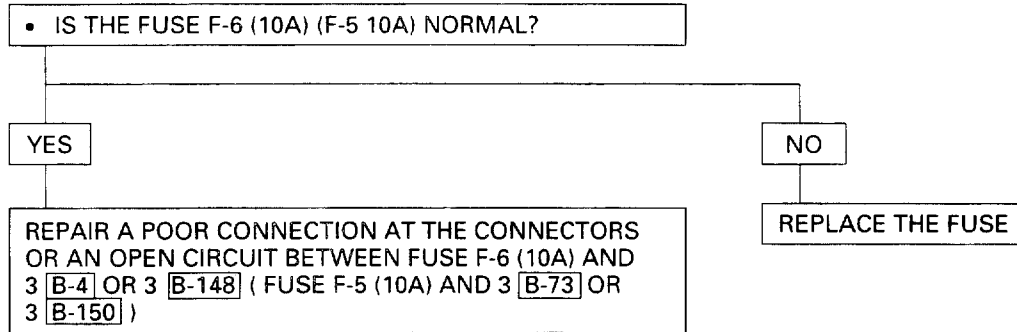
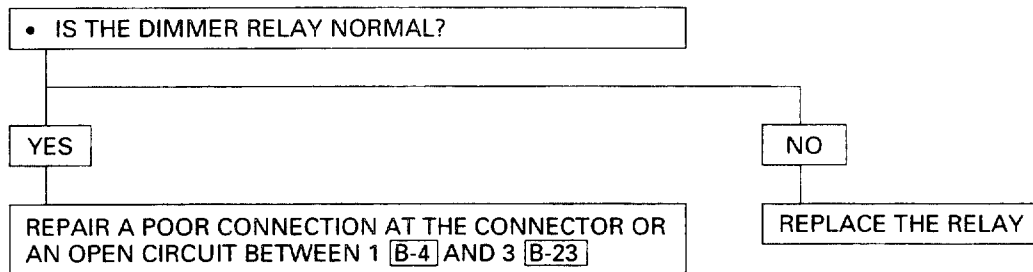
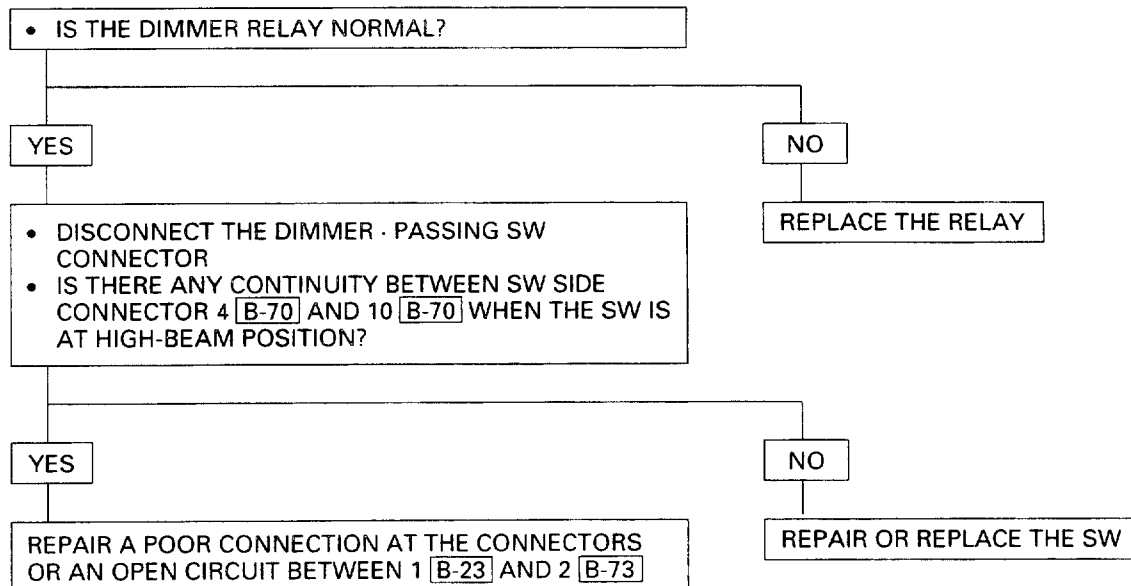
3. CORNERING LIGHT

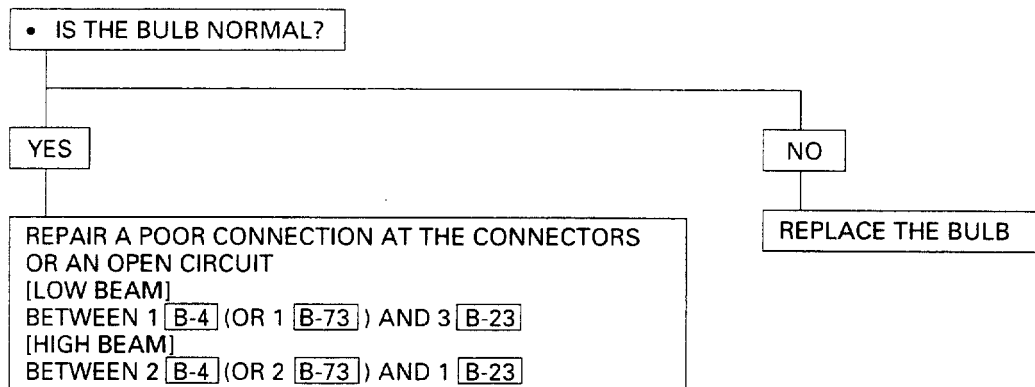
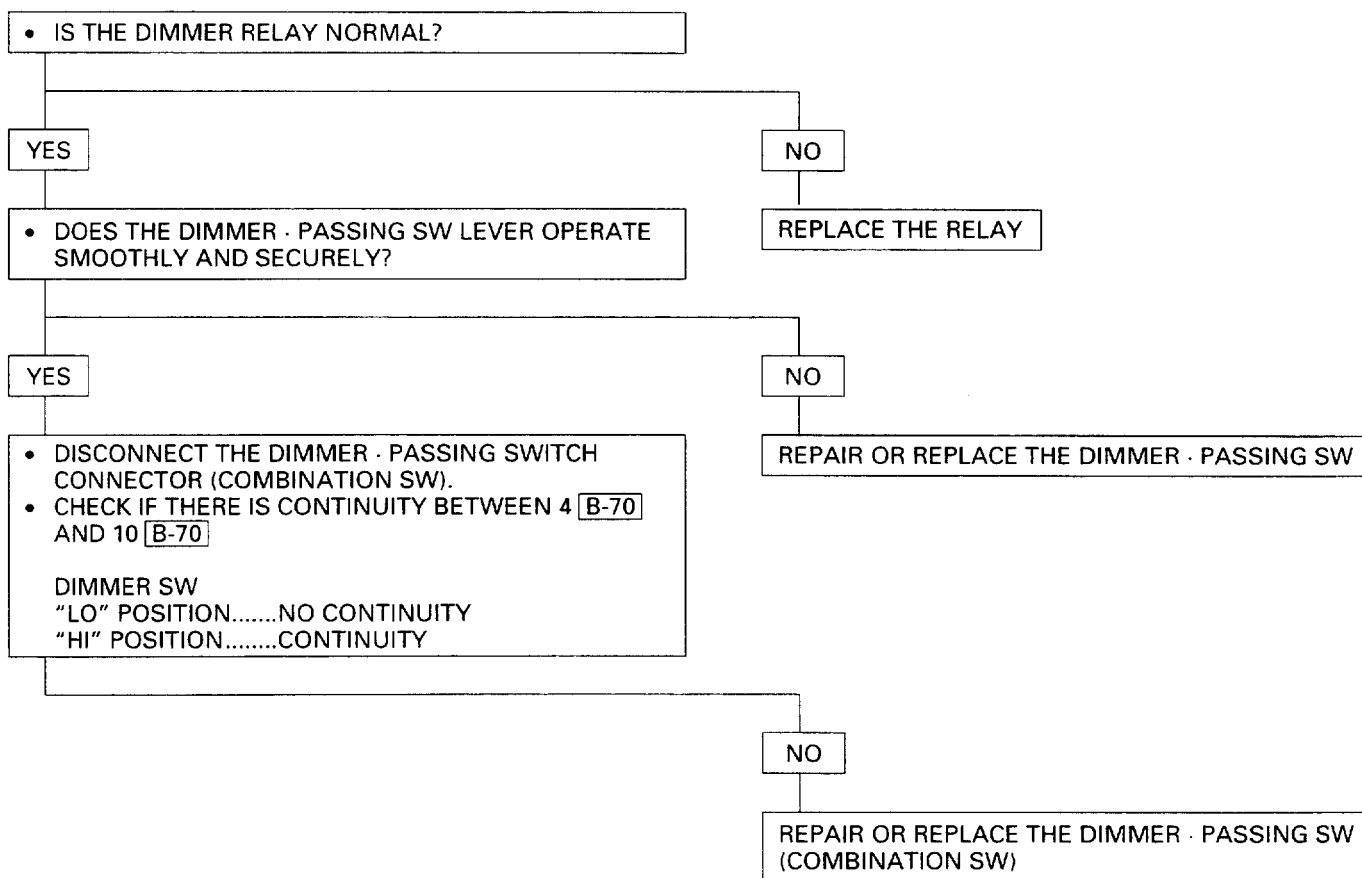
<div>Check point</div> <div>Trouble mode</div>	Fuse		Cornering light SW	Cornering light bulb	Cornering light relay	Cable harness
	F-6 (10A)	F-12 (10A)				
3-1. Both cornering lights inoperative	○ (2)	○ (1)	○ (5)		○ (3)	○ (4)
3-2. Cornering light on the left (or right) side inoperative			○ (2)	○ (1)		○ (3)
3-3. Cornering light remains on even when steering wheel is in the straight ahead position.			○ (1)			

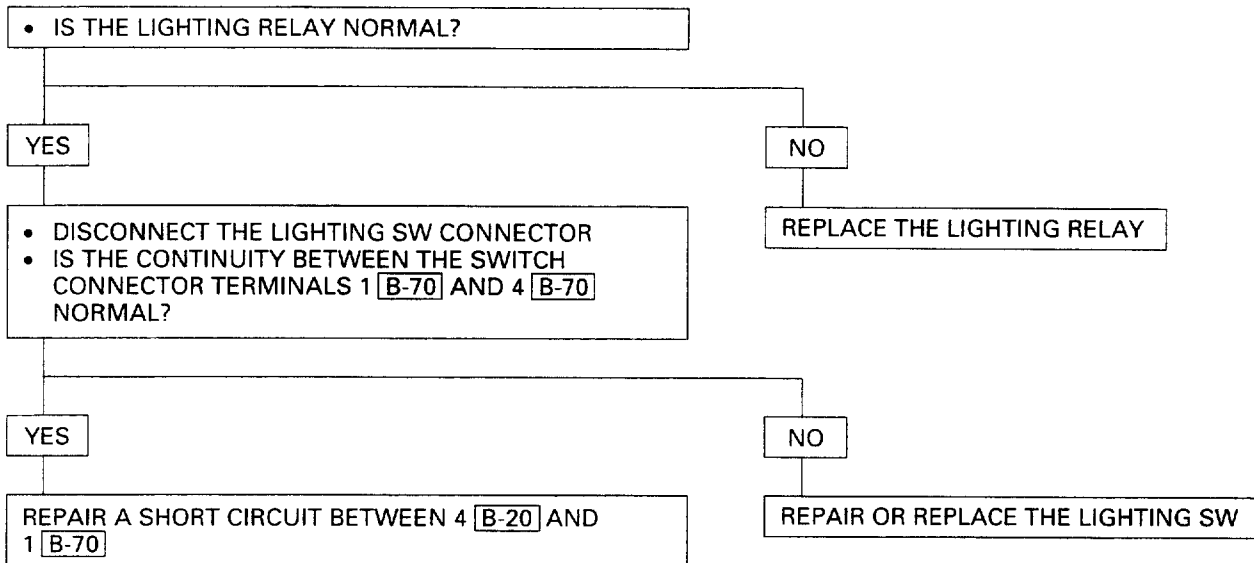
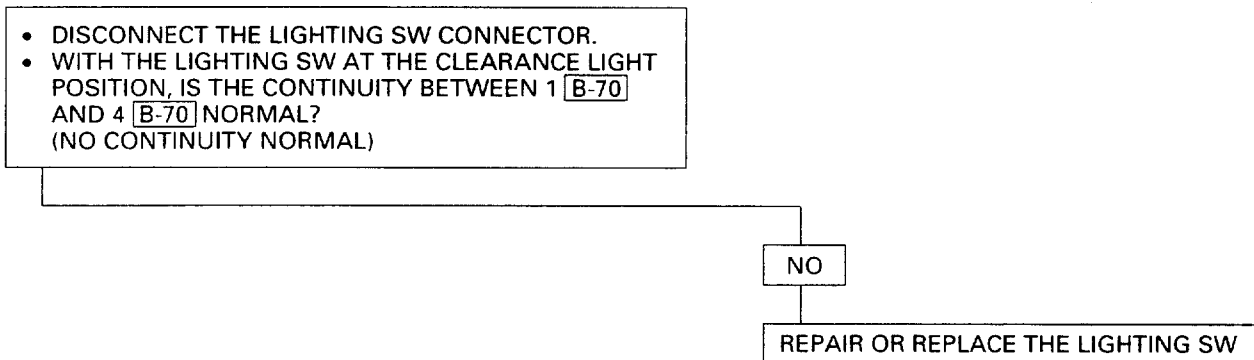
4. REAR FOG LIGHT

<div>Check point</div> <div>Trouble mode</div>	Fuse F-21 (15A)	Rear fog light SW	Rear fog light relay	Rear fog light bulb	Cable harness
4-1. Rear fog light inoperative (while headlight is on)	○ (2)	○ (4)	○ (3)	○ (1)	○ (5)

1-1. BOTH HEADLIGHTS INOPERATIVE

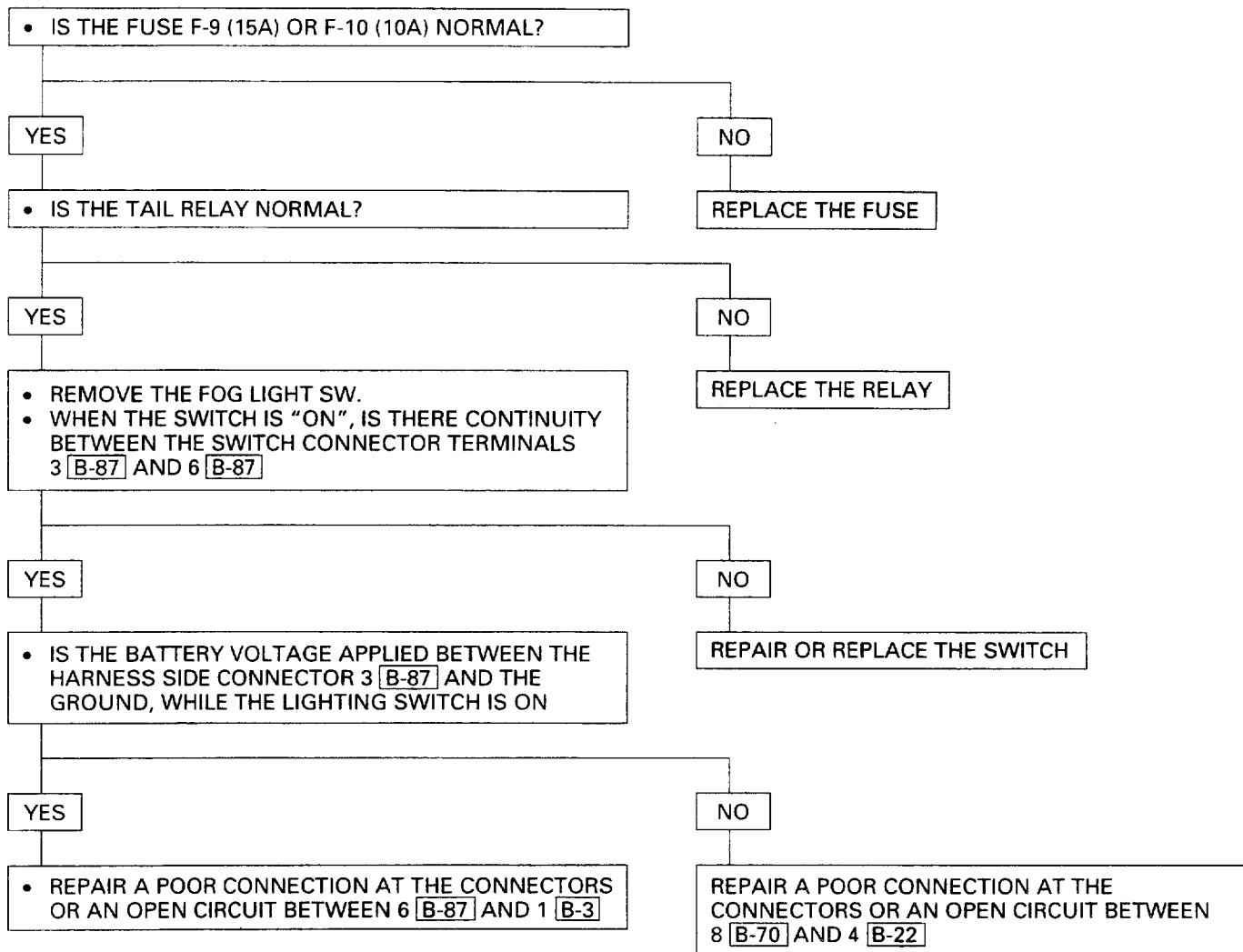
1-2. HEADLIGHT ON THE LEFT (OR RIGHT) SIDE INOPERATIVE**1-3. HEADLIGHTS IN LOW-BEAM INOPERATIVE****1-4. HEADLIGHT IN HIGH-BEAM INOPERATIVE**

1-5. HEADLIGHT ON THE LEFT (OR RIGHT) SIDE IN LOW (OR HIGH) BEAM INOPERATIVE**1-6. HEADLIGHT BEAM DOES NOT CHANGE**

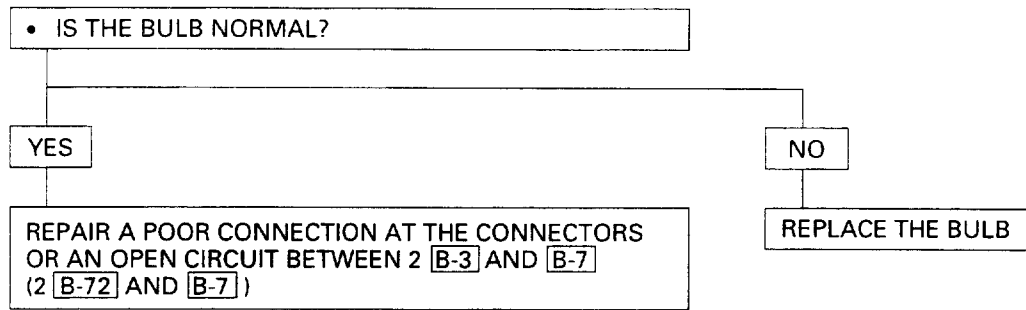
1-7. HEADLIGHTS REMAIN ON WHEN THE LIGHTING SW IS TURNED OFF**1-8. HEADLIGHT COME ON WITH THE LIGHTING SW AT THE CLEARANCE
LIGHT POSITION**

2. FOG LIGHT

2-1. BOTH FOG LIGHT INOPERATIVE (WHILE LIGHTING SWITCH IS ON)

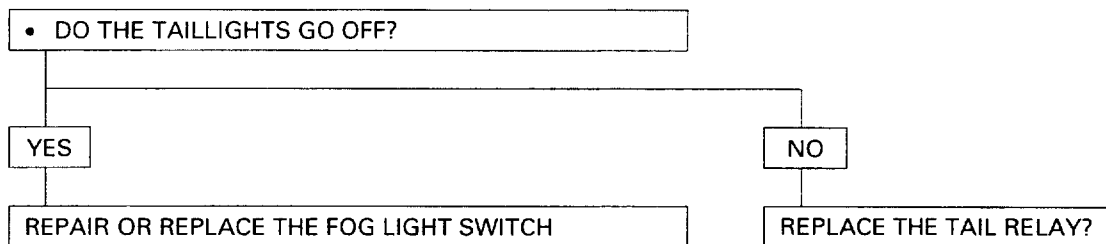


2-2. FOG LIGHT ON THE LEFT (OR RIGHT) SIDE INOPERATIVE (WHILE LIGHTING SWITCH IS ON)



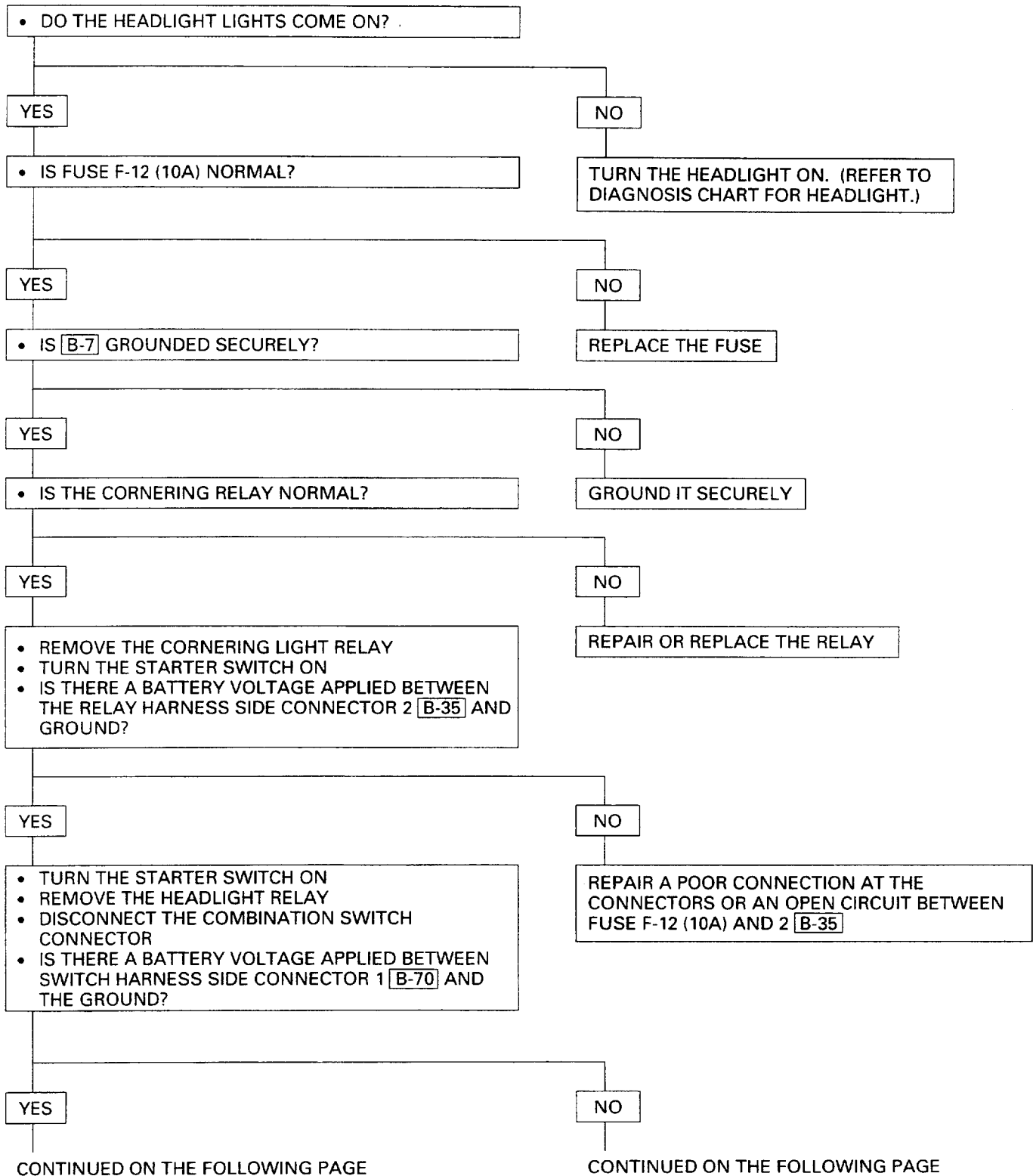
NOTE: FIGURES IN PARENTHESIS “()” INDICATE PLACE OF INSPECTION FOR THE FOG LIGHT ON THE RIGHT.

2-3. FOG LIGHTS REMAINS ON



3. CORNERING LIGHT

3-1. BOTH CORNERING LIGHTS INOPERATIVE



CONTINUED FROM THE PREVIOUS PAGE

- IS THERE ANY CONTINUITY BETWEEN THE SWITCH CONNECTORS 2 [B-70] AND 11 [B-70] (WHEN TURNING LEFT) OR 2 [B-70] AND 9 [B-70] (WHEN TURNING RIGHT) RESPECTIVELY?

YES

REPAIR A POOR CONNECTION OR AN OPEN CIRCUIT BETWEEN THE HARNESS SIDE CONNECTORS 5 [B-35] AND 2 [B-70]

CONTINUED FROM THE PREVIOUS PAGE

REPAIR A POOR CONNECTION OR A OPEN CIRCUIT AT THE CONNECTOR BETWEEN 4 [B-35] AND 1 [B-70]

NO

REPAIR OR REPLACE THE SWITCH

3-2. CORNERING LIGHT ON THE LEFT (OR RIGHT) SIDE INOPERATIVE

- IS THE CORNERING LIGHT BULB ON THE LEFT (OR RIGHT) NORMAL?

YES

- DISCONNECT THE COMBINATION SWITCH CONNECTOR
- IS THERE ANY CONTINUITY BETWEEN THE SWITCH CONNECTOR TERMINALS 2 [B-70] AND 11 [B-70] (IN TURNING LEFT) (2 [B-70] - 9 [B-70]: IN TURNING RIGHT)

YES

- IS THERE ANY CONTINUITY BETWEEN THE CORNERING LIGHT SWITCH HARNESS SIDE CONNECTOR TERMINALS 11 [B-70] AND 3 [B-5] (9 [B-70] AND 3 [B-74])?

YES

REPAIR A POOR CONNECTION AT THE CONNECTORS OR AN OPEN CIRCUIT BETWEEN 1 [B-5] AND [B-7] OR 1 [B-74] AND [B-7]

NO

REPLACE THE BULB

NO

REPAIR OR REPLACE THE CORNERING LIGHT SWITCH

NO

REPAIR A POOR CONNECTION AT THE CONNECTORS OR AN OPEN CIRCUIT BETWEEN 11 [B-70] AND 3 [B-5] (9 [B-70] AND 3 [B-74])

NOTE: FIGURES IN PARENTHESIS "()" INDICATE PLACE OF INSPECTION FOR THE CORNERING LIGHT ON THE RIGHT.

3-3. CORNERING LIGHT REMAINS ON EVEN WHEN STEERING WHEEL IS IN STRAIGHT AHEAD POSITION

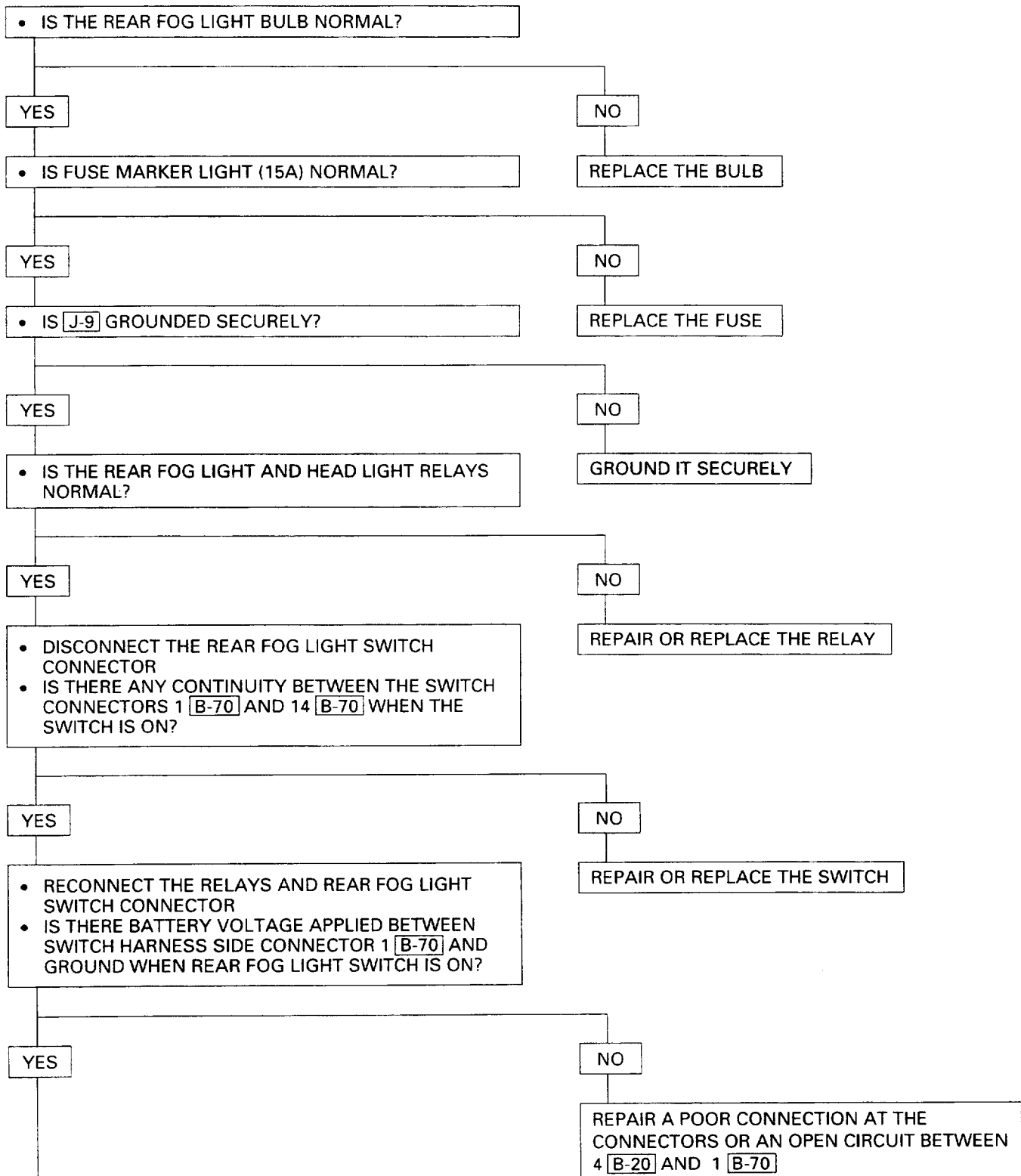
- DOES THE CORNERING LIGHT SWITCH OPERATE SMOOTHLY

NO

REPAIR OR REPLACE THE CORNERING LIGHT SWITCH (COMBINATION SWITCH)

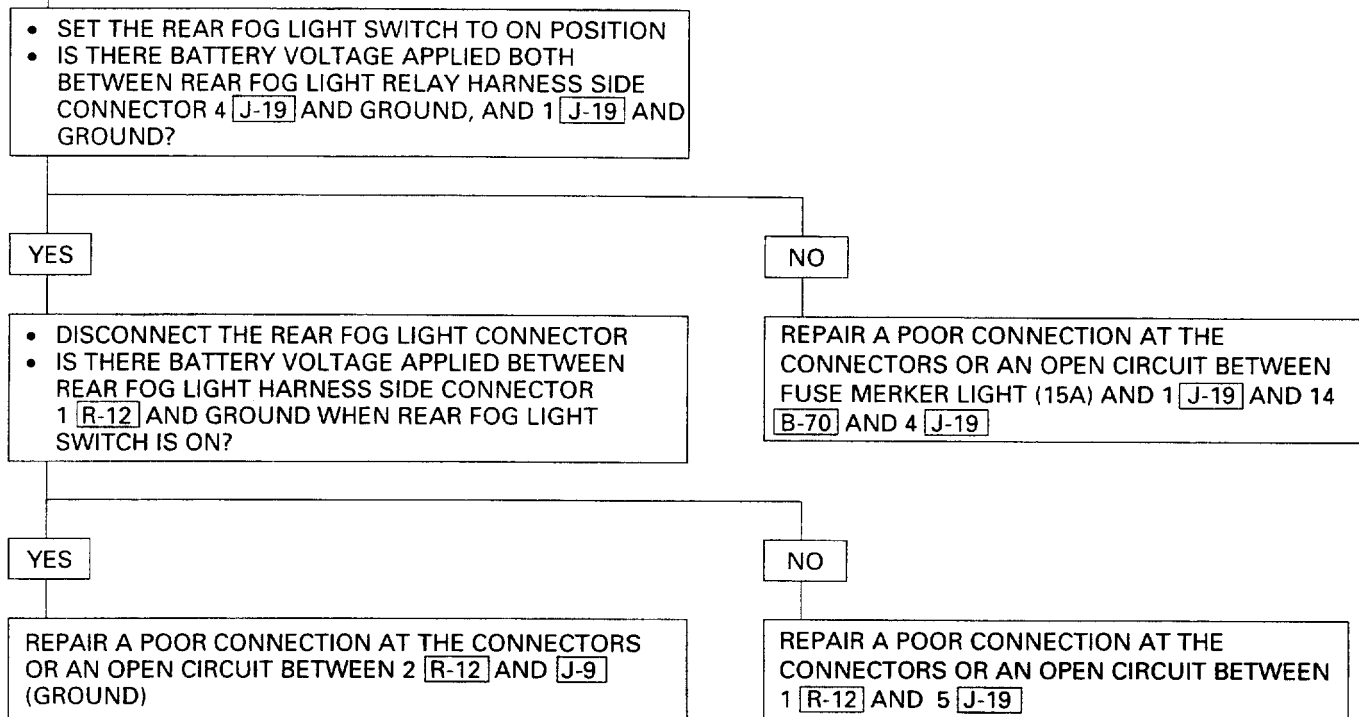
4. REAR FOG LIGHT

4-1. REAR FOG LIGHT INOPERATIVE (WHILE HEADLIGHT IS ON)



CONTINUED ON THE FOLLOWING PAGE

CONTINUED FROM THE PREVIOUS PAGE



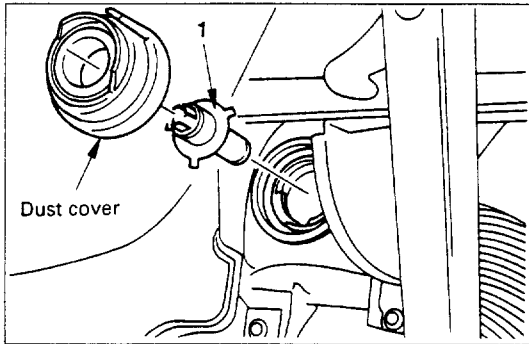
STARTER SWITCH

Refer to "START AND CHARGING" in this section.

HIGH BEAM INDICATOR LIGHT

Refer to "METER AND WARNING/INDICATOR LIGHT" in this section.

HEADLIGHT BULB



REMOVAL

Preparation:

Disconnect the battery ground cable.

1. Headlight Bulb

- 1) Tilt up the cab.
- 2) Disconnect the connector.
- 3) Remove the dust cover.
- 4) Remove the bulb by loosen the clip.

NOTE:

In case of non-tilt type cab, and depending on the equipment fitted, above removal is not applied.

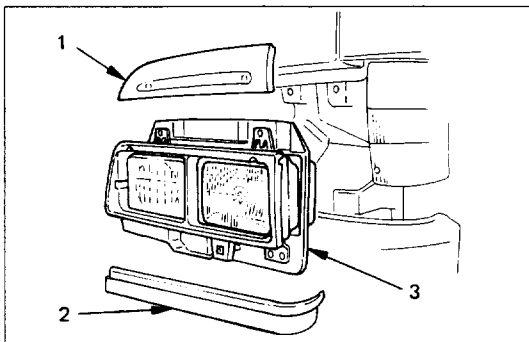
In such a case, the bulbs can be removed after headlight and fog light assembly is removed. (Refer to HEADLIGHT ASSEMBLY in this section.



INSTALLATION

To install, follow the removal steps in the reverse order.

HEADLIGHT ASSEMBLY



REMOVAL

Preparation:

Disconnect the battery ground cable.

1. Dummy lens

- Remove two screws.

2. Lower cover

- Pull the lower cover to disconnect the clips.

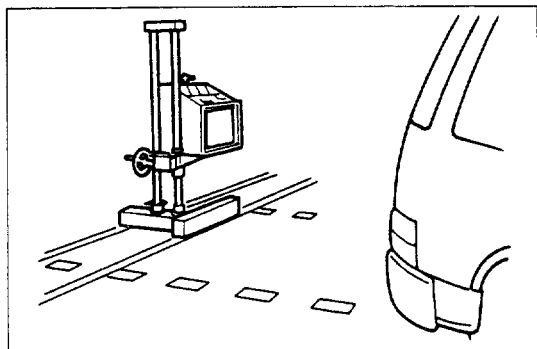
3. Headlight assembly

- Remove the fixing screws.
- Disconnect the connectors.

INSTALLATION

To install, follow the removal steps in the reverse order, noting the following point.

1. After installing the headlight assembly, be sure to adjust the headlight aim.

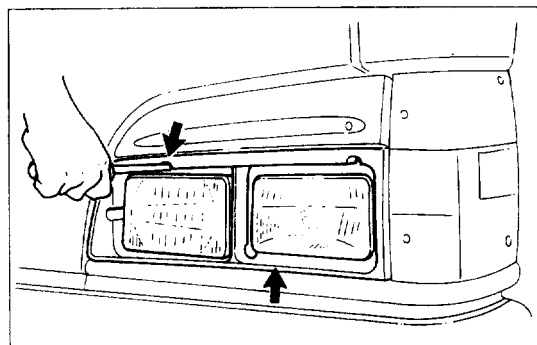


AIMING OF HEADLIGHT

Preparation:

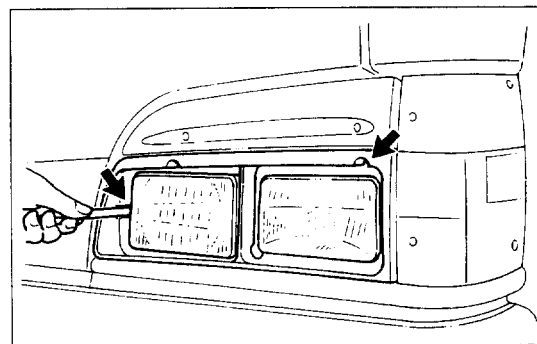
Place the unloaded vehicle on a level surface and check to see if the inflation pressure of the tires is correct, the lenses are clean, and the battery is sufficiently charged. Adjust the aim with the headlight tester.

When adjusting, follow the procedure of the tester manufacturer's.



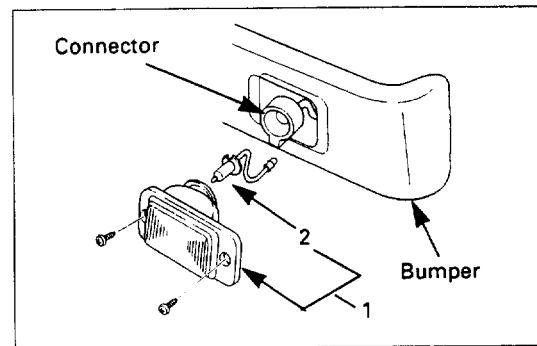
VERTICAL ADJUSTMENT

Use a screwdriver for vertical adjustment.



HORIZONTAL ADJUSTMENT

Use a screwdriver for horizontal adjustment.



FRT FOG LIGHT BULB



REMOVAL

Preparation:

Disconnect the battery ground cable.

1. Fog Light Assembly

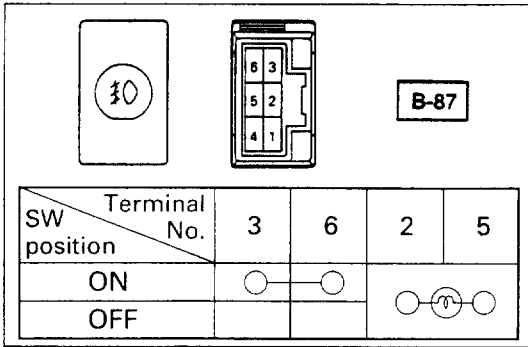
- 1) Remove two screws.
- 2) Disconnect the connector.

2. Bulb



INSTALLATION

To install, follow the removal steps in the reverse order.



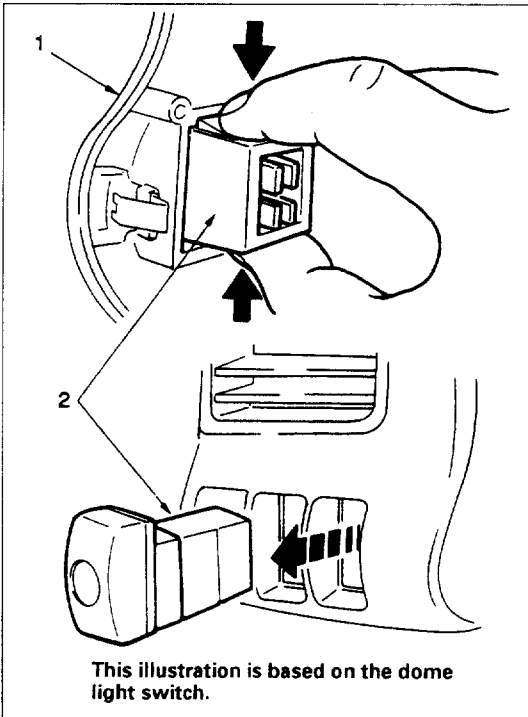
FOG LIGHT SWITCH



INSPECTION

Check the continuity between the connector terminals while operating the switch.

Replace the switch when the result of inspection is found abnormal.



REMOVAL

Preparaion:

Disconnect the battery ground cable.

1. Meter Cluster

Refer to "METER AND WARNING/INDICATOR LIGHT" in this section.

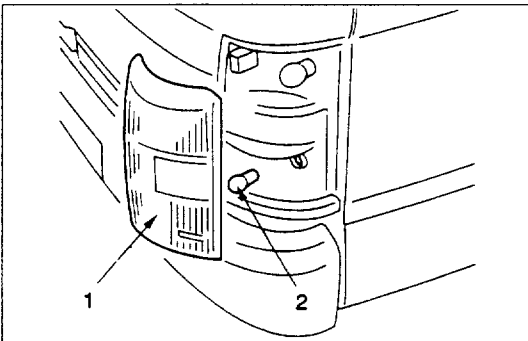
2. Fog Light Switch

Release the lock pushing the switch from the back side of the meter cluster.



INSTALLATION

To install, follow the removal steps in the reverse order.



CORNERING LIGHT/BULB



REMOVAL

Preparation:

Disconnect the battery ground cable.

1. Front Combination Light Lens

Remove four screws.

2. Bulb



INSTALLATION

To install, follow the removal steps in the reverse order.

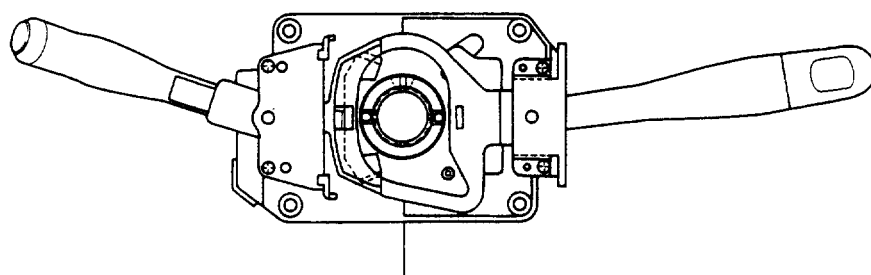
COMBINATION SWITCH (LIGHTING SWITCH, DIMMER-PASSING SWITCH, CORNERING LIGHT SWITCH AND REAR FOG LIGHT SWITCH)



INSPECTION

Check the continuity between the connector terminals while operating the switch.

Replace the switch when the result of inspection is found abnormal.

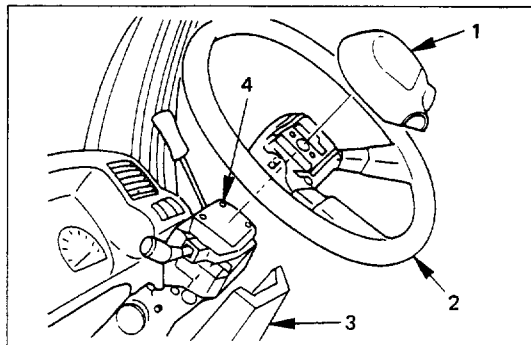


B-70



Switch side

Terminal No.		1	2	4	5	7	8	9	10	11	12	13	14
SW position													
Lighting SW		○		○			○						
				○			○						
	REAR FOG SW	○		○			○						○
	OFF												
Dimmer-passing SW	High beam			○					○				
	Passing			○		○			○				
Cornering light SW	Turning left		○							○			
	Neutral												
	Turning right		○					○					



REMOVAL

Preparation:

Disconnect the battery ground cable.

1. Horn Pad

- 1) Hold the horn pad and pull it upward.

2. Steering Wheel

- 1) Remove the steering shaft nut.
- 2) Remove the steering wheel by using steering wheel remover.

(Refer to Section 3D "STEERING COLUMN" for steering wheel removal steps.)



3. Steering Cowl

Remove four screws

4. Combination Switch

- 1) Remove four screws.
- 2) Disconnect the connector.



INSTALLATION

To install, follow the removal steps in the reverse order, noting the following point.

1. Tighten the steering shaft nut to the specified torque.

Shaft nut torque	N·m (kg·m/lb·ft)
	49 (5/36)

HEADLIGHT LEVELING

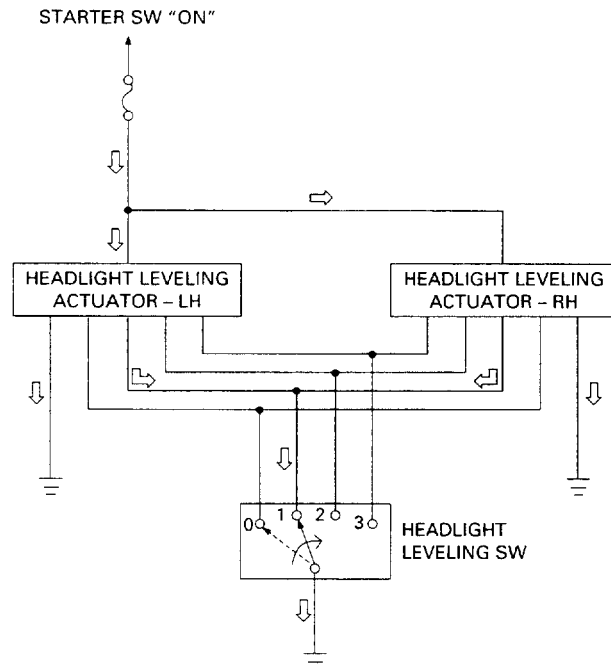
GENERAL DESCRIPTION

The circuit consists of starter SW, headlight leveling SW and headlight leveling actuator.

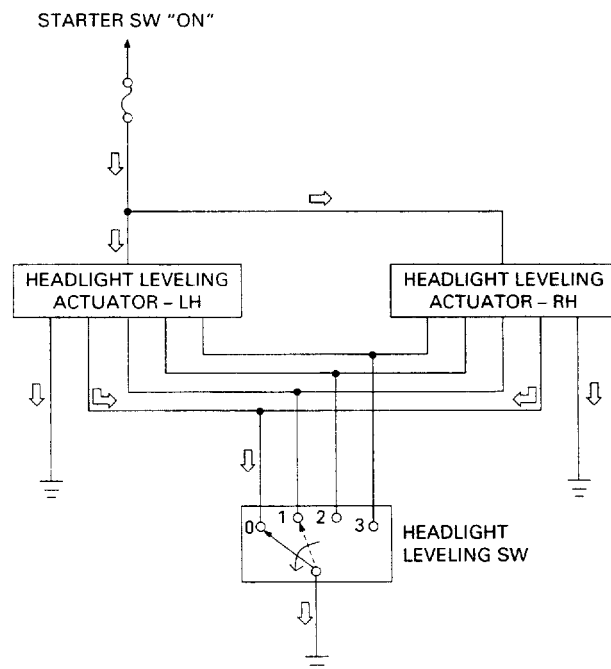
When the headlight leveling SW is operated with the starter SW at ON position, the actuator is operated to change the angle of the optical axis of the headlight.

OPERATION OF THE CIRCUIT

1. When headlight leveling SW is turned to "1" position

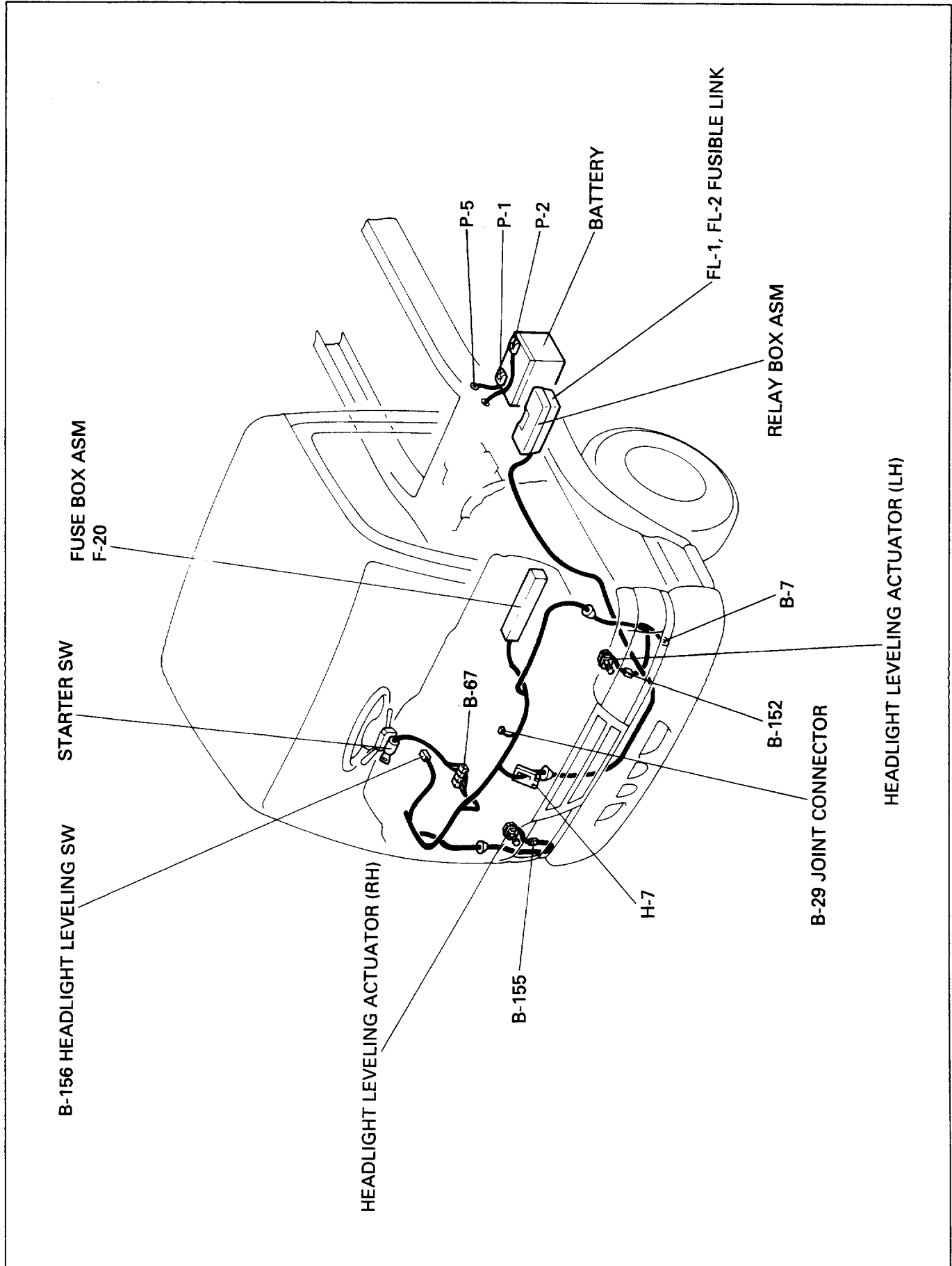


2. When headlight leveling SW is turned to "0" position



NOTE: Arrow marks "⇒" indicate the direction of current.

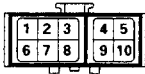
PARTS LOCATION



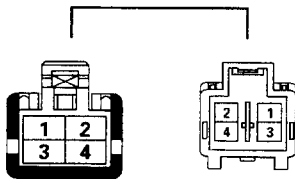


CONNECTOR LIST

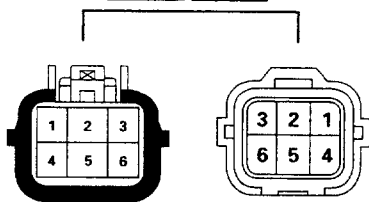
B-29



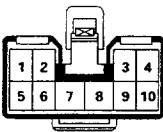
B-67



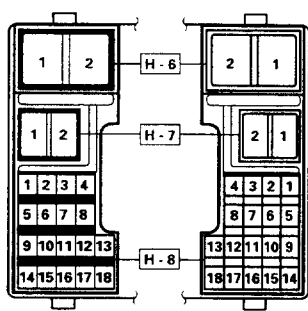
B-152 B-155



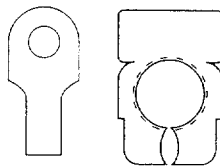
B-156



H-7



P-1 P-2



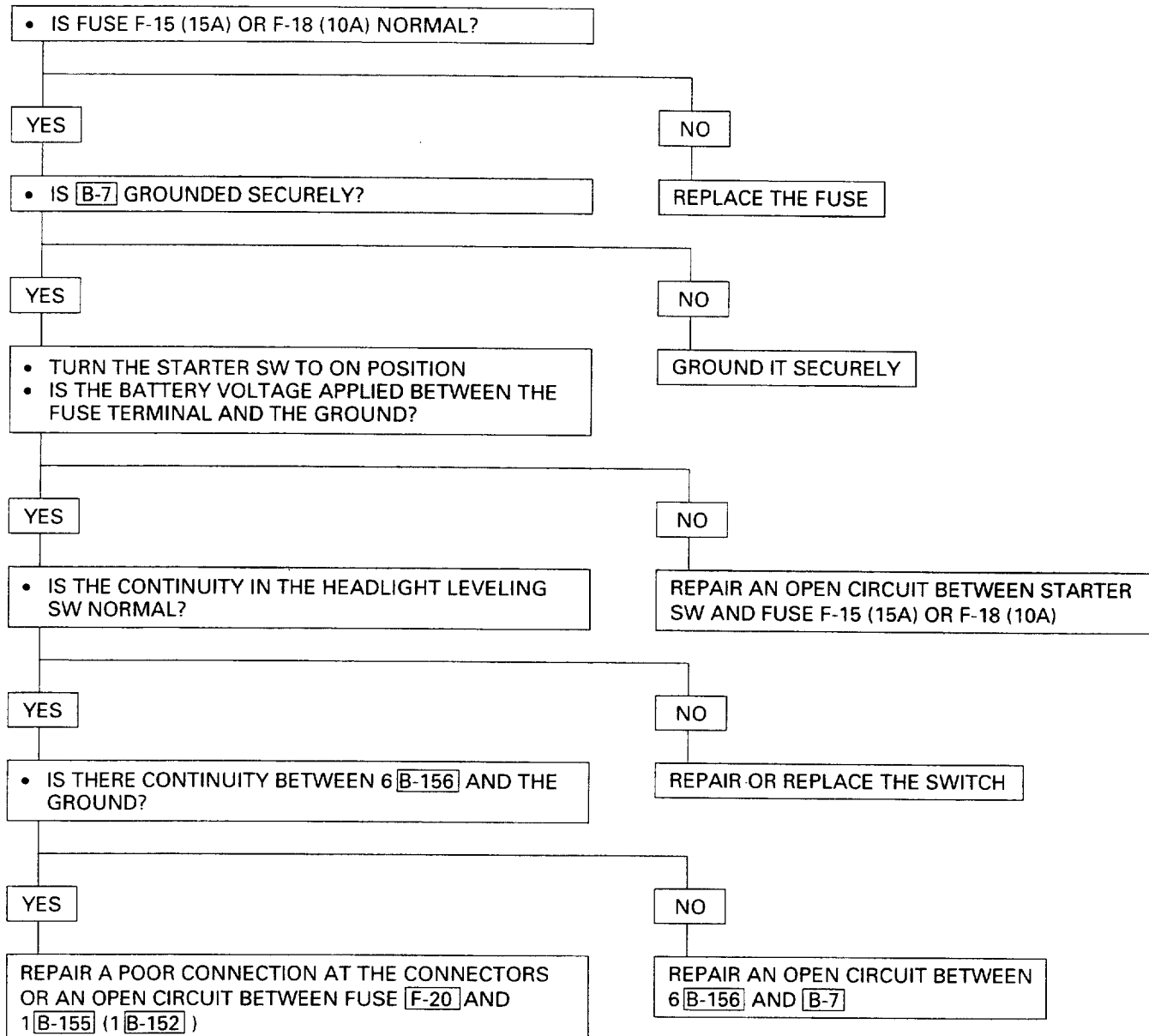
P-5

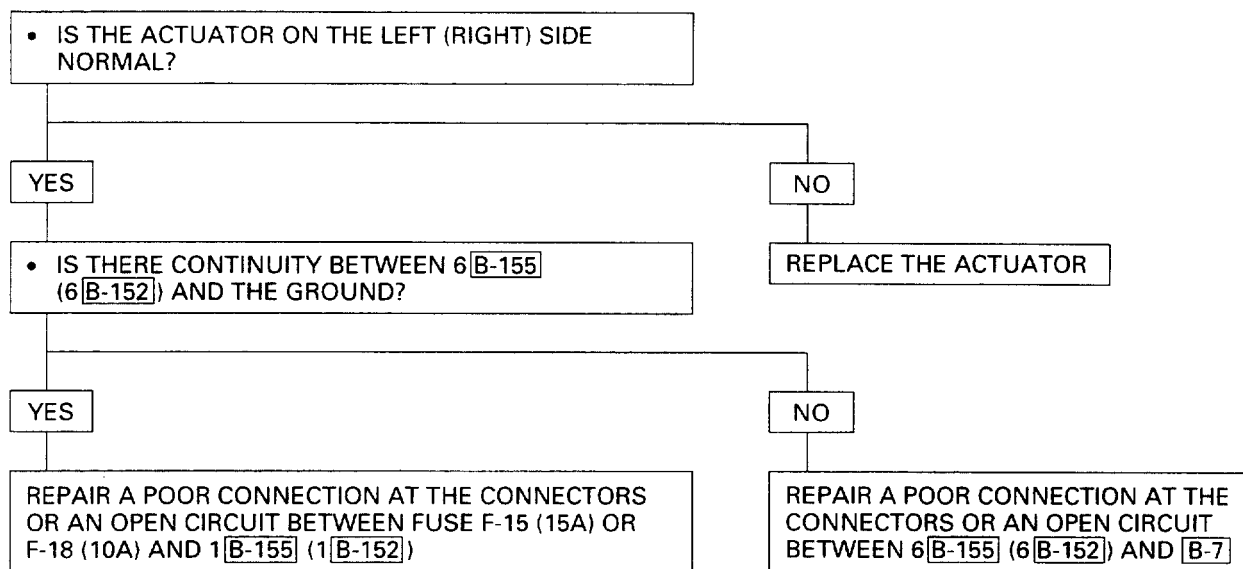
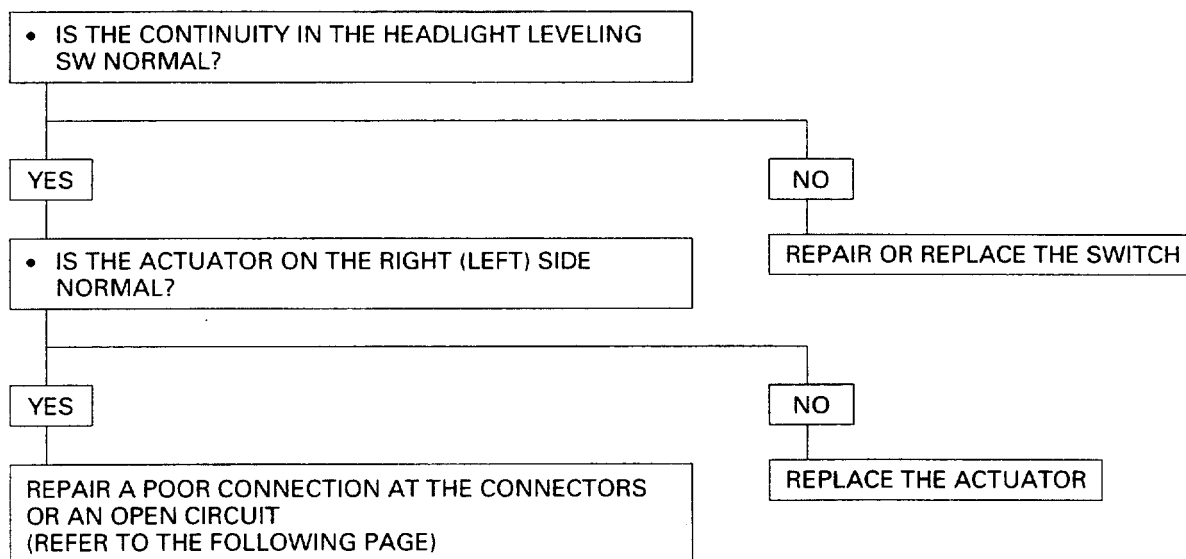


DIAGNOSIS

QUICK CHART FOR CHECK POINTS

Trouble mode	Check point	Fuse	Headlight leveling switch	Headlight leveling actuator	Cable harness
		F-18 (10A):24V F-15 (15A):12V			
1. Both actuators inoperative		○	○		○
2. Actuator on the left (right) side inoperative				○	○
3. When leveling SW is turned to a certain position, actuator inoperative			○	○	○

1. BOTH ACTUATORS INOPERATIVE

2. ACTUATOR ON THE RIGHT (LEFT) SIDE INOPERATIVE**3. WHEN HEADLIGHT LEVELING SW IS TURNED TO A CERTAIN POSITION, ACTUATOR INOPERATIVE**

Inspect and repair the circuit that is corresponding to the headlight leveling switch position where the actuator becomes inoperative.

Actuator – RH

Headlight level SW position	Circuit
1	Between 3 B-156 and 3 B-155
2	Between 2 B-156 and 4 B-155
3	Between 1 B-156 and 5 B-155
0	Between 4 B-156 and 2 B-155

Actuator – LH

Headlight level SW position	Circuit
1	Between 3 B-156 and 3 B-152
2	Between 2 B-156 and 4 B-152
3	Between 1 B-156 and 5 B-152
0	Between 4 B-156 and 2 B-152

STARTER SWITCH

Refer to “START AND CHARGING” in this manual.

HEADLIGHT LEVELING SWITCH



INSPECTION

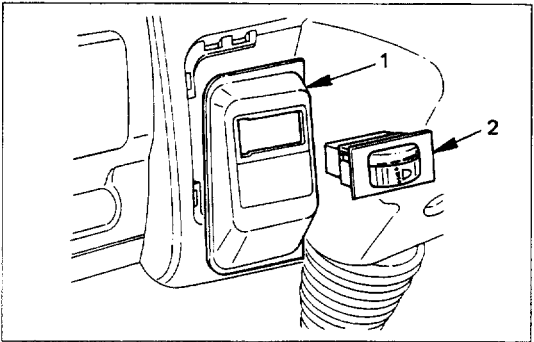
Check the continuity between the switch connector terminals.

Repair or replace the switch when the result of inspection is found abnormal.

B-156

Switch side

Terminal No. SW position	1	2	3	4	6
0				○	○
↕			○	○	○
1			○		○
↕		○	○		○
2		○			○
↕	○	○			○
3	○				○



REMOVAL

Preparation:

Disconnect the battery ground cable.

- 1. Switch Bezel
- 2. Headlight Leveling Switch

Disconnect the connector.



INSTALLATION

To install, follow the removal steps in the reverse order.

HEADLIGHT LEVELING ACTUATOR



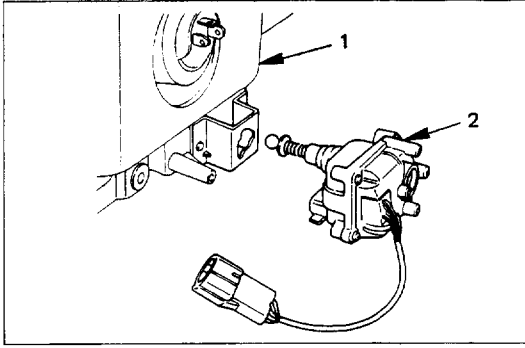
INSPECTION

Apply the battery voltage to the connector terminals and check its function.

B-152 B-155

Actuator side

Terminal No. Headlight position	1	2	3	4	5	6
0 → 1	+		-			-
1 → 2	+			-		-
2 → 3	+				-	-
3 → 2	+			-		-
2 → 1	+		-			-
1 → 0	+	-				-



REMOVAL

Preparation:

Disconnect the battery ground cable.

1. Headlight Assembly

Refer to HEADLIGHT ASSEMBLY removal steps in this manual.

2. Headlight Leveling Actuator

- 1) Disconnect the connector.
- 2) Remove the screw.



INSTALLATION

To install, follow the removal steps in the reverse order, noting the following point.

1. After installing the headlight leveling actuator and headlight assembly, be sure to adjust the headlight aim.

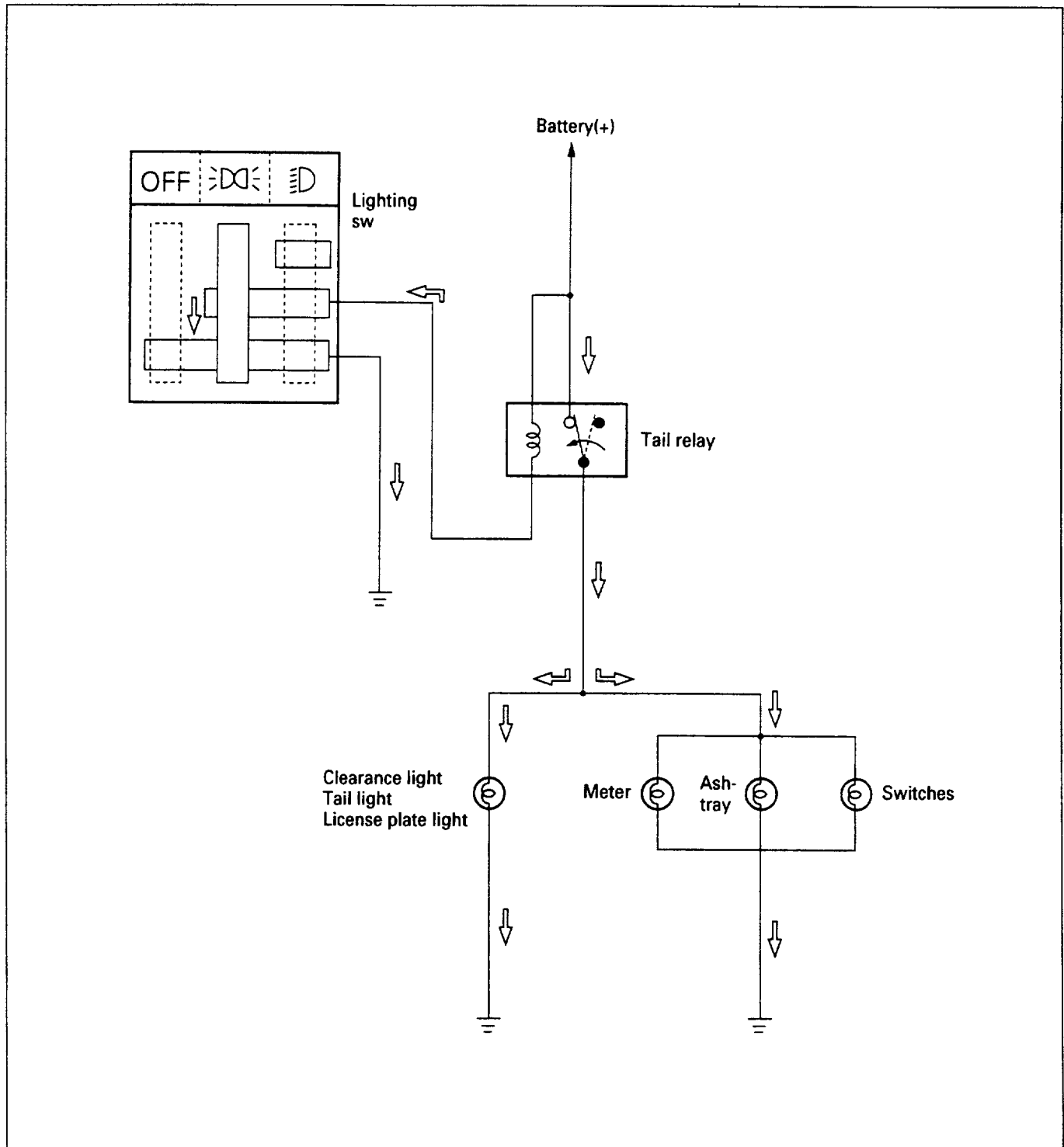
CLEARANCE LIGHT, TAILLIGHT, LICENSE PLATE LIGHT AND ILLUMINATION LIGHT

GENERAL DESCRIPTION

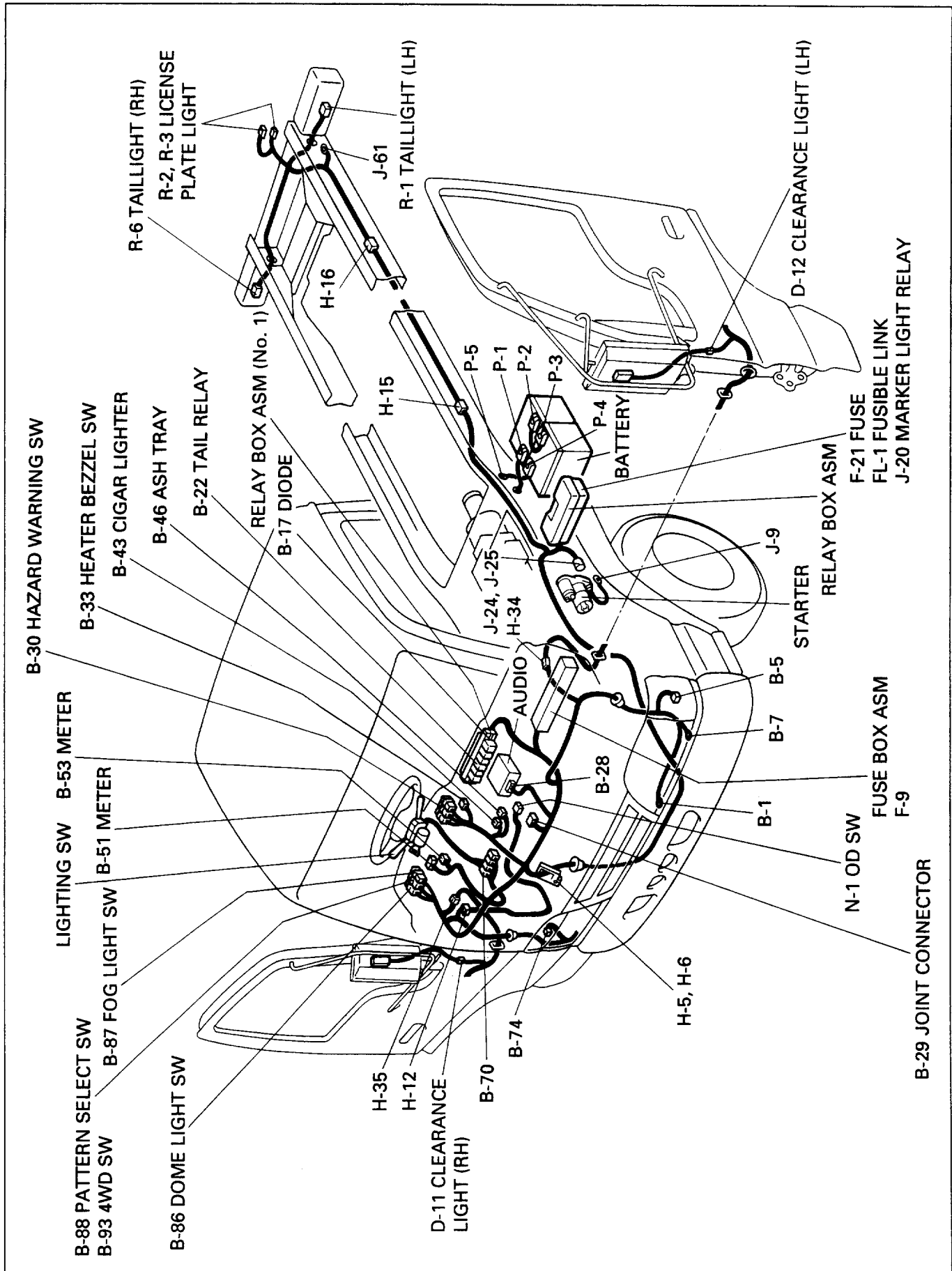
The circuit consists of the lighting switch, clearance light, taillight, license plate light and the illumination light for each of switch, meter and ashtray.

All these lights come on when the lighting switch are turned on with the switch to either clearance or headlight position.

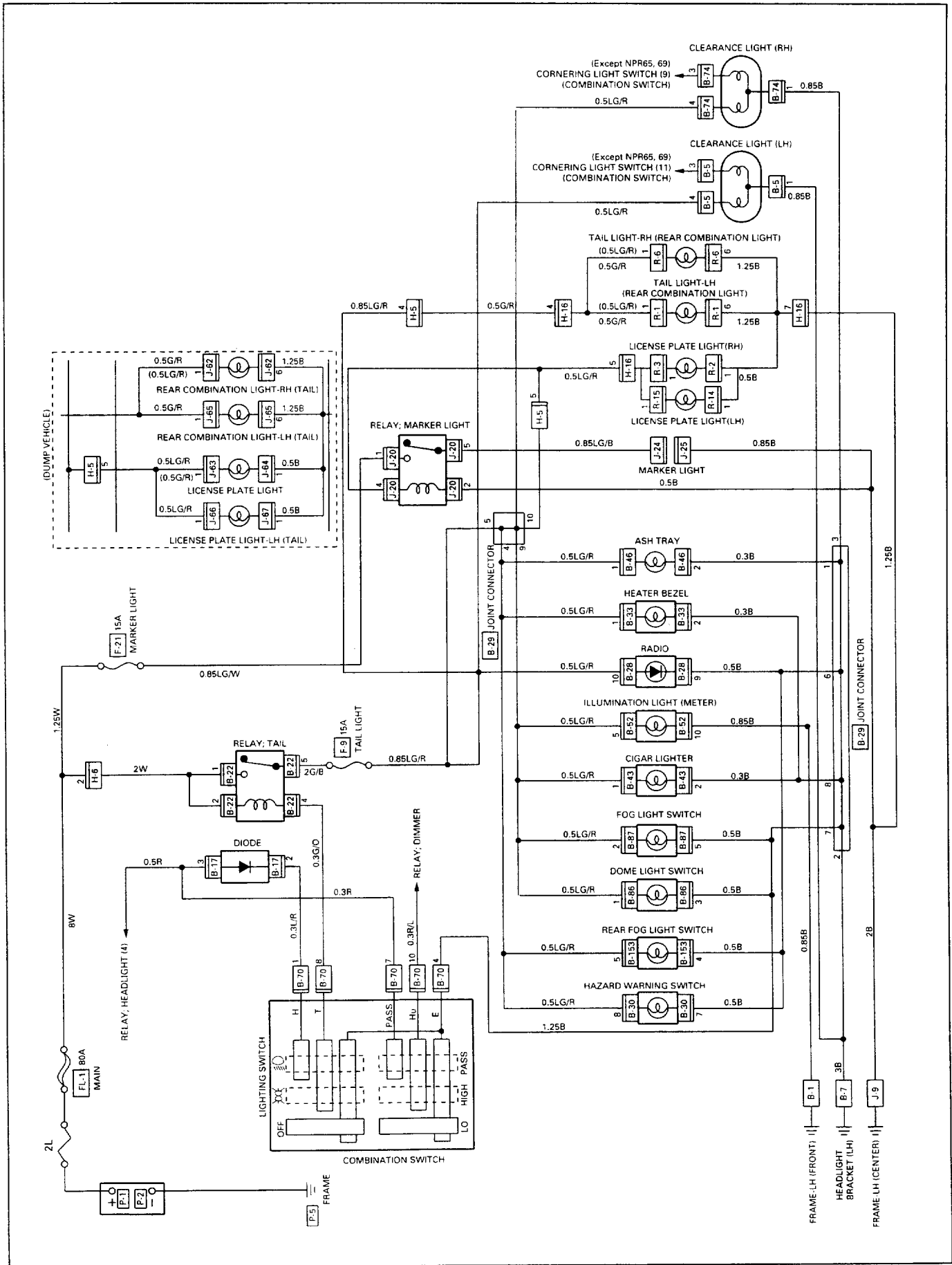
LIGHTING CIRCUIT

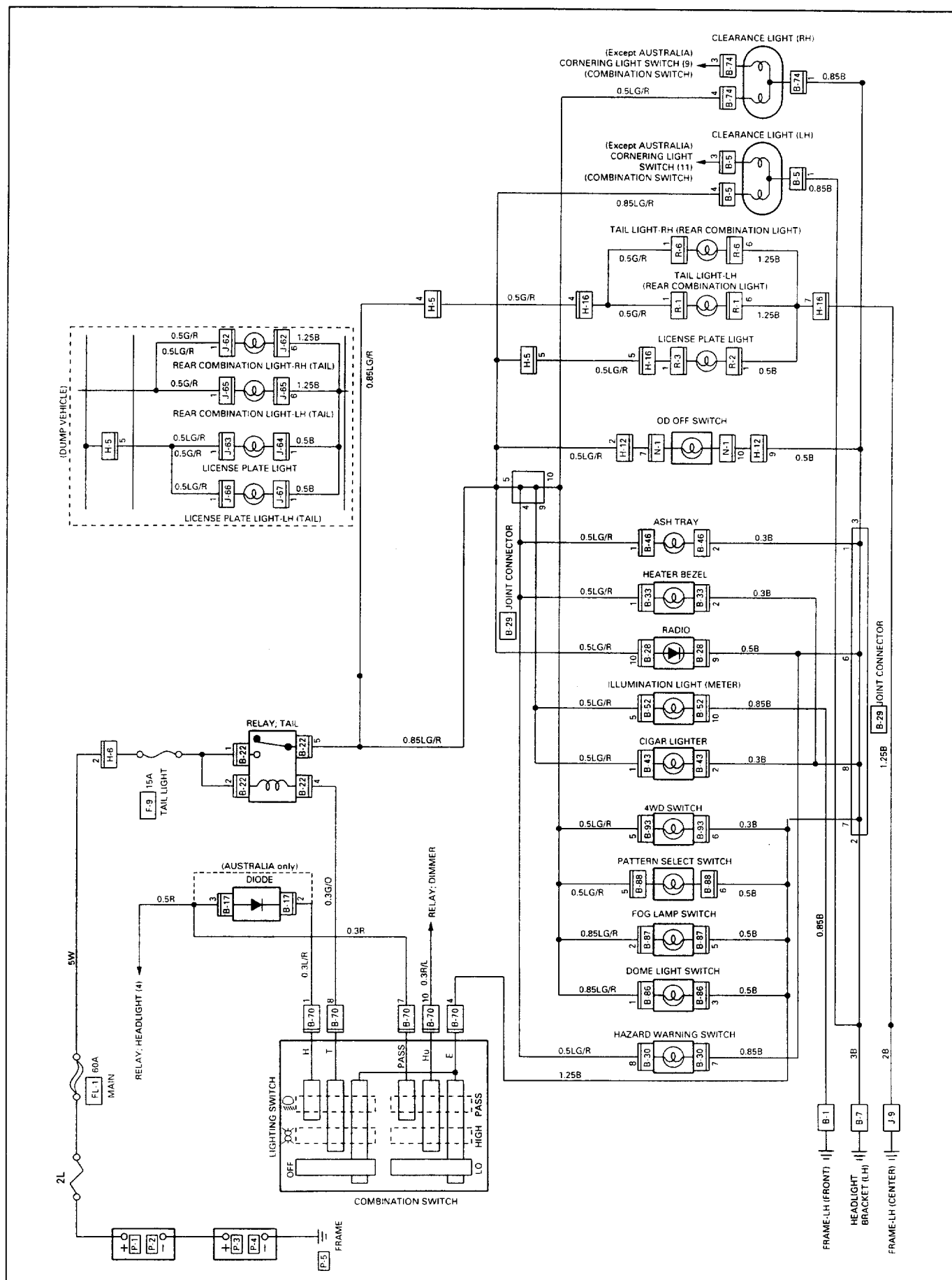


PARTS LOCATION

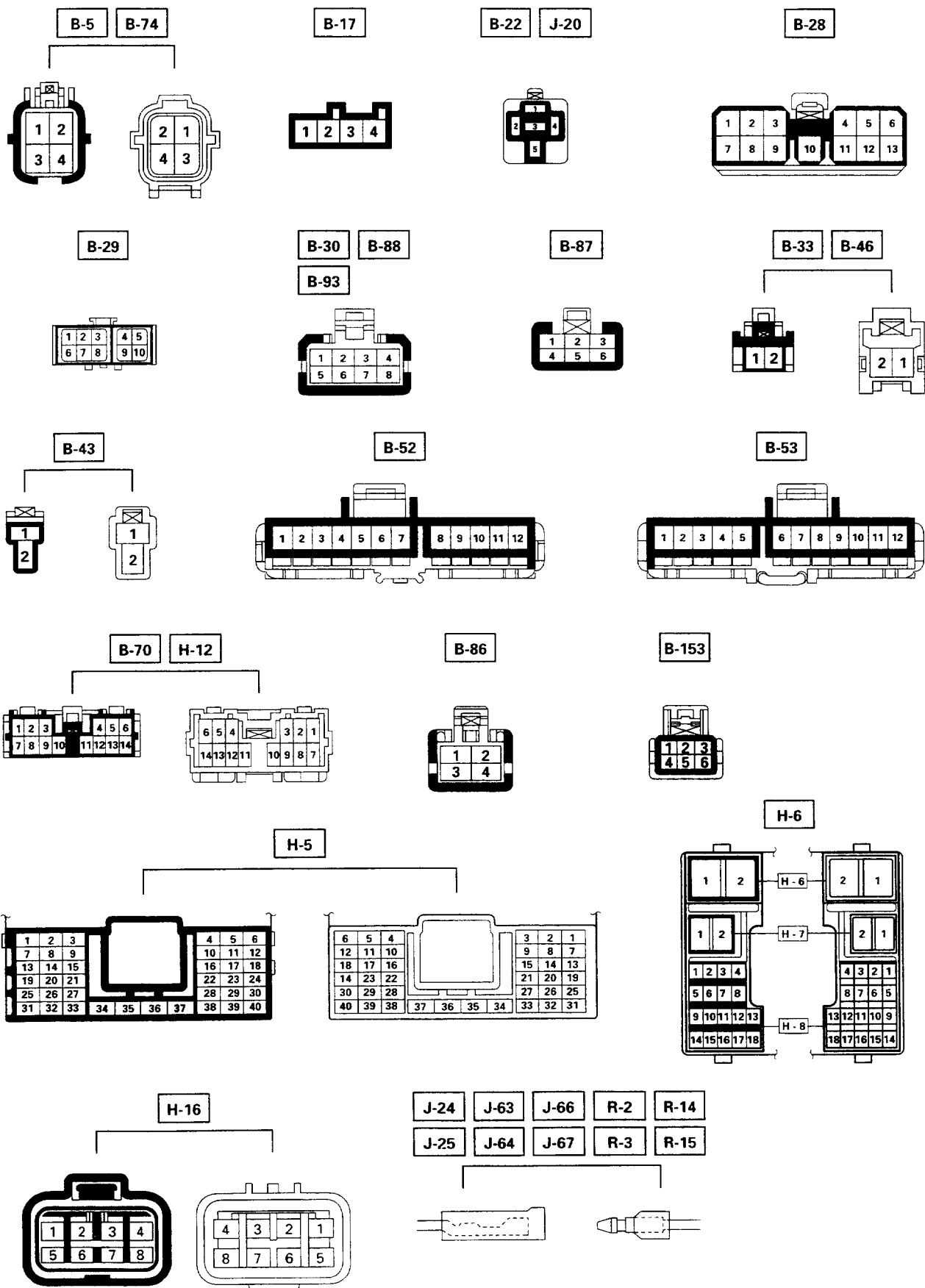


CIRCUIT DIAGRAM - FOR 12 VOLT

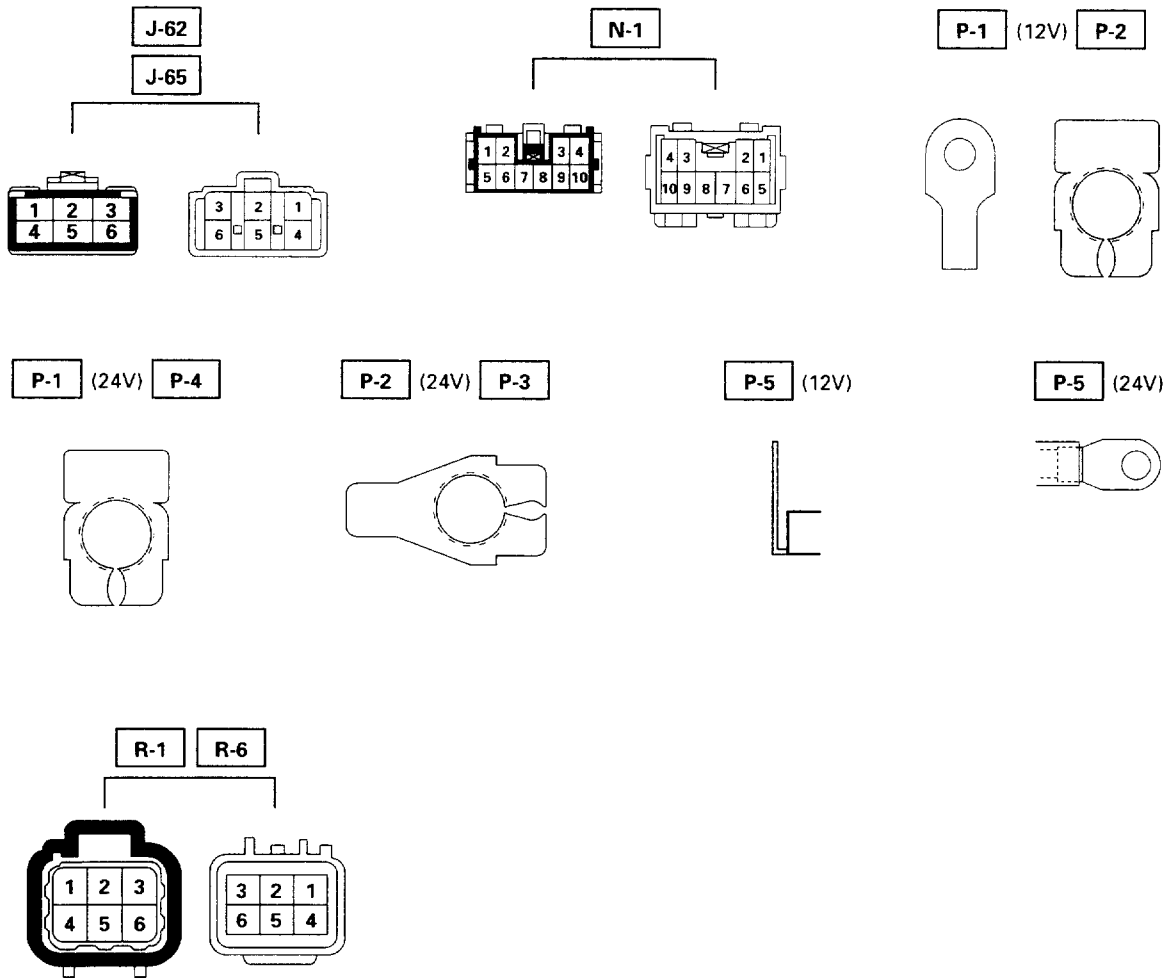




CONNECTOR LIST



CONNECTOR LIST



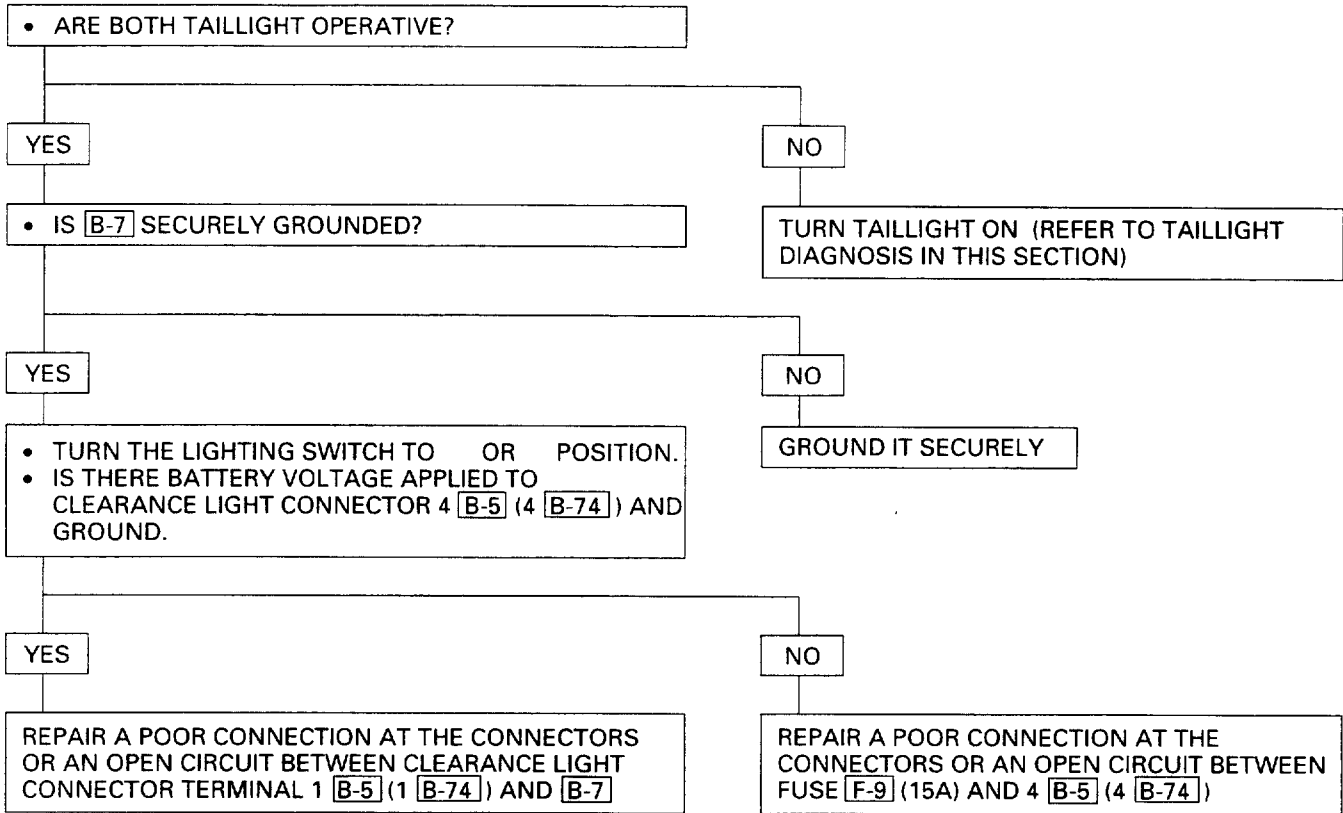
DIAGNOSIS

QUICK CHART FOR CHECK POINT

Check point Trouble mode	Fuse		Lighting SW	Taillight bulb	Clearance light bulb	License plate light bulb	Marker light relay	Cable harness
	F-9 (15A)	F-21 (15A)						
1. Both clearance lights inoperative	○ (1)		○ (3)		○ (2)			○ (4)
2. Clearance light on the left (or right) side inoperative					○ (1)			○ (2)
3. Both taillights inoperative	○ (1)		○ (2)					○ (3)
4. Taillight on the left (or right) side inoperative				○ (1)				○ (2)
5. License plate light inoperative						○ (1)		○ (2)
6. Marker light inoperative		○ (1)					○ (2)	○ (3)

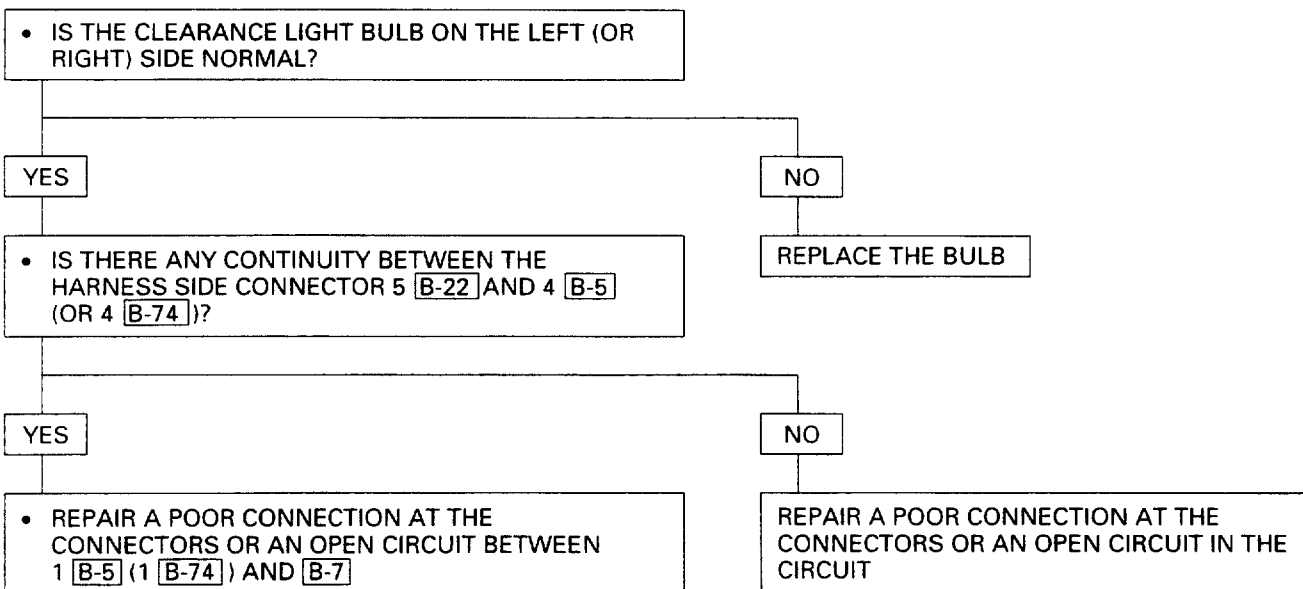
NOTE: Figure in parenthesis “()” indicates the order of inspection.

1. BOTH CLEARANCE LIGHTS INOPERATIVE



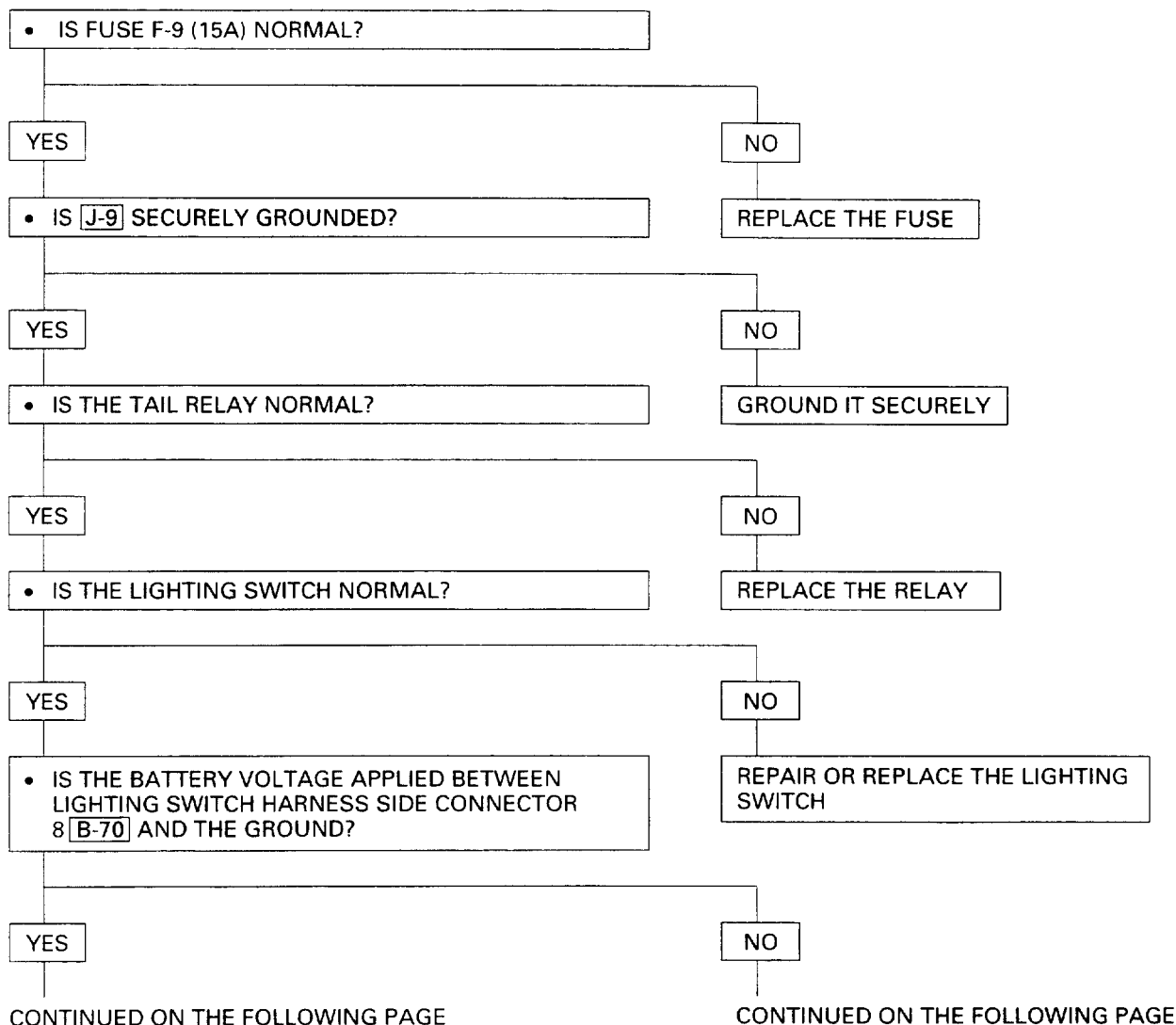
NOTE: FIGURE IN PARENTHESIS "()" INDICATES PLACE OF INSPECTION FOR CLEARANCE LIGHT ON THE RIGHT SIDE.

2. CLEARANCE LIGHT ON THE LEFT (OR RIGHT) SIDE INOPERATIVE



NOTE: FIGURE IN PARENTHESIS "()" INDICATES PLACE OF INSPECTION FOR CLEARANCE LIGHT ON THE RIGHT SIDE.



3. BOTH TAILLIGHTS INOPERATIVE



CONTINUED FROM THE PREVIOUS PAGE

- TURN THE LIGHTING SWITCH TO  OR  POSITION
- IS THERE BATTERY VOLTAGE APPLIED TO 4  H-16



YES

- REPAIR A POOR CONNECTION AT THE CONNECTORS OR AN OPEN CIRCUIT BETWEEN LIGHTING SWITCH HARNESS SIDE CONNECTORS 7  H-16 AND  J-9

CONTINUED FROM THE PREVIOUS PAGE

REPAIR A POOR CONNECTION AT THE CONNECTORS OR AN OPEN CIRCUIT BETWEEN FUSE F-9 (15A) AND 8  B-70




NO

REPAIR A POOR CONNECTION AT THE CONNECTORS OR AN OPEN CIRCUIT BETWEEN TAILLIGHT RELAY CONNECTORS 5  B-22 AND 4  H-16

4. TAILLIGHT ON THE LEFT (OR RIGHT) SIDE INOPERATIVE

- IS TAILLIGHT BULB ON THE LEFT (OR RIGHT) SIDE NORMAL?

YES

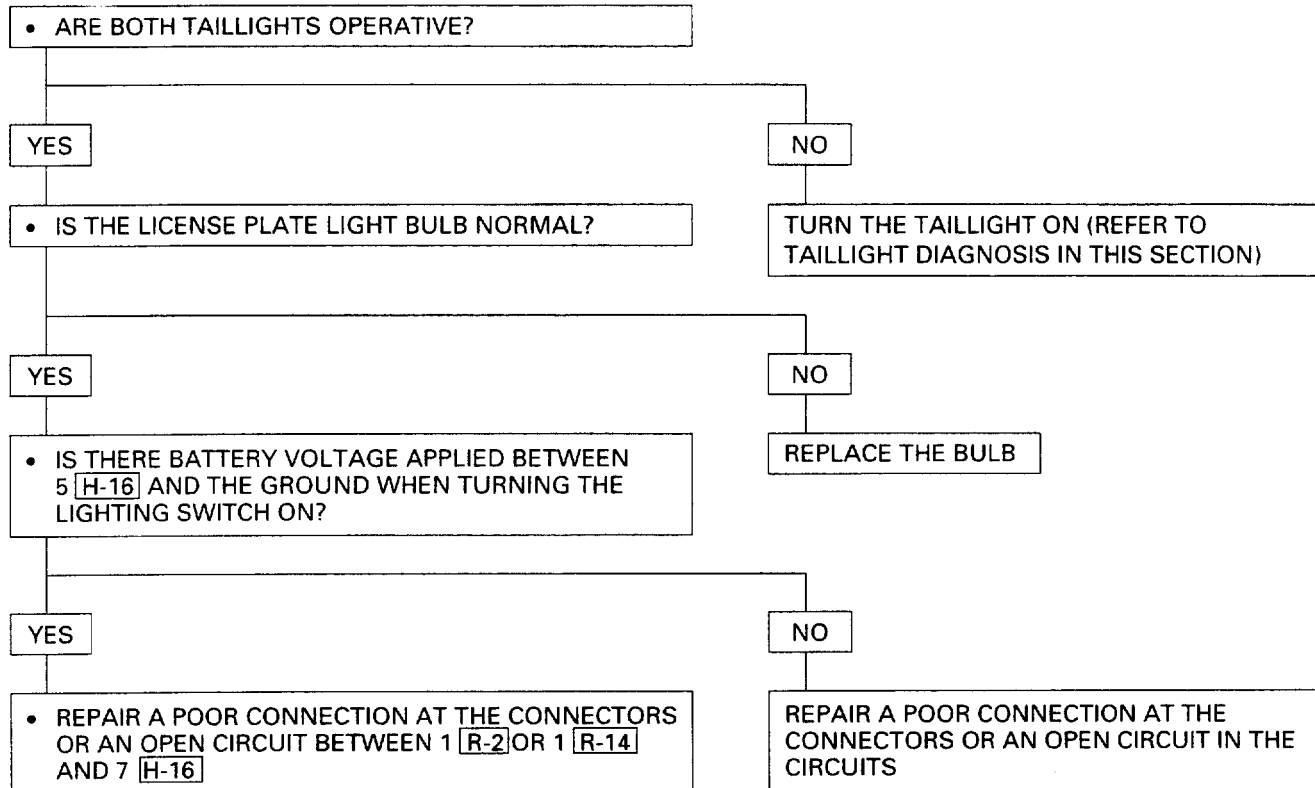
- REPAIR A POOR CONNECTION AT THE CONNECTORS OR AN OPEN CIRCUIT BETWEEN CONNECTOR TERMINAL 4  H-16 AND TAILLIGHT CONNECTOR 1  R-1 (1  R-6)

NO

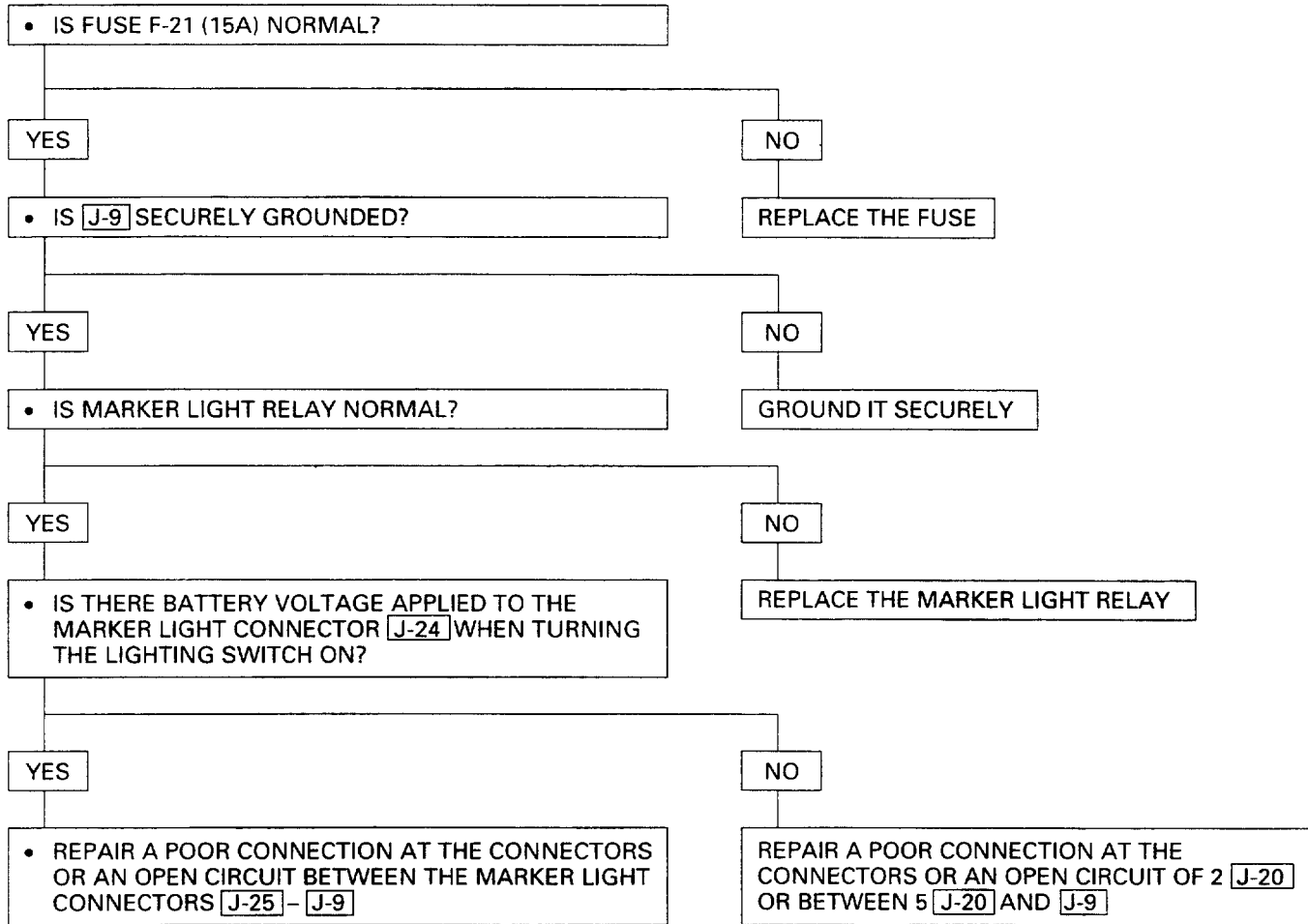
REPLACE THE BULB

NOTE: FIGURE IN PARENTHESIS "() " INDICATES PLACE OF INSPECTION FOR TAILLIGHT ON THE RIGHT SIDE.

5. LICENSE PLATE LIGHT INOPERATIVE



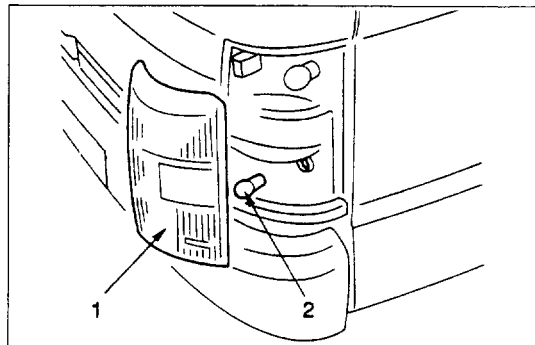
6. MARKER LIGHT INOPERATIVE



LIGHTING SWITCH

Refer to "HEADLIGHT, FOG LIGHT AND CORNERING LIGHT" in this section.

CLEARANCE LIGHT/BULB



REMOVAL

1. Front Combination Light Lens

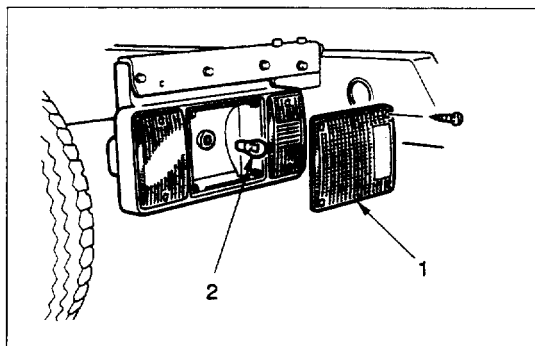
1) Remove four screws.

2. Bulb



INSTALLATION

To install, follow the removal steps in the reverse order.



REMOVAL

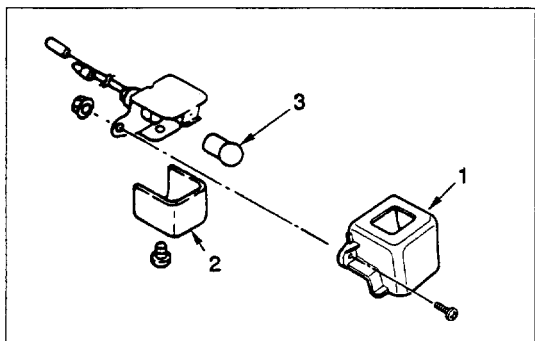
1. Lens

2. Bulb



INSTALLATION

To install, follow the removal steps in the reverse order.



REMOVAL

1. Cover

2. Lens

3. Bulb



INSTALLATION

To install, follow the removal steps in the reverse order.

TURN SIGNAL LIGHT, HAZARD WARNING LIGHT, AND STOPLIGHT

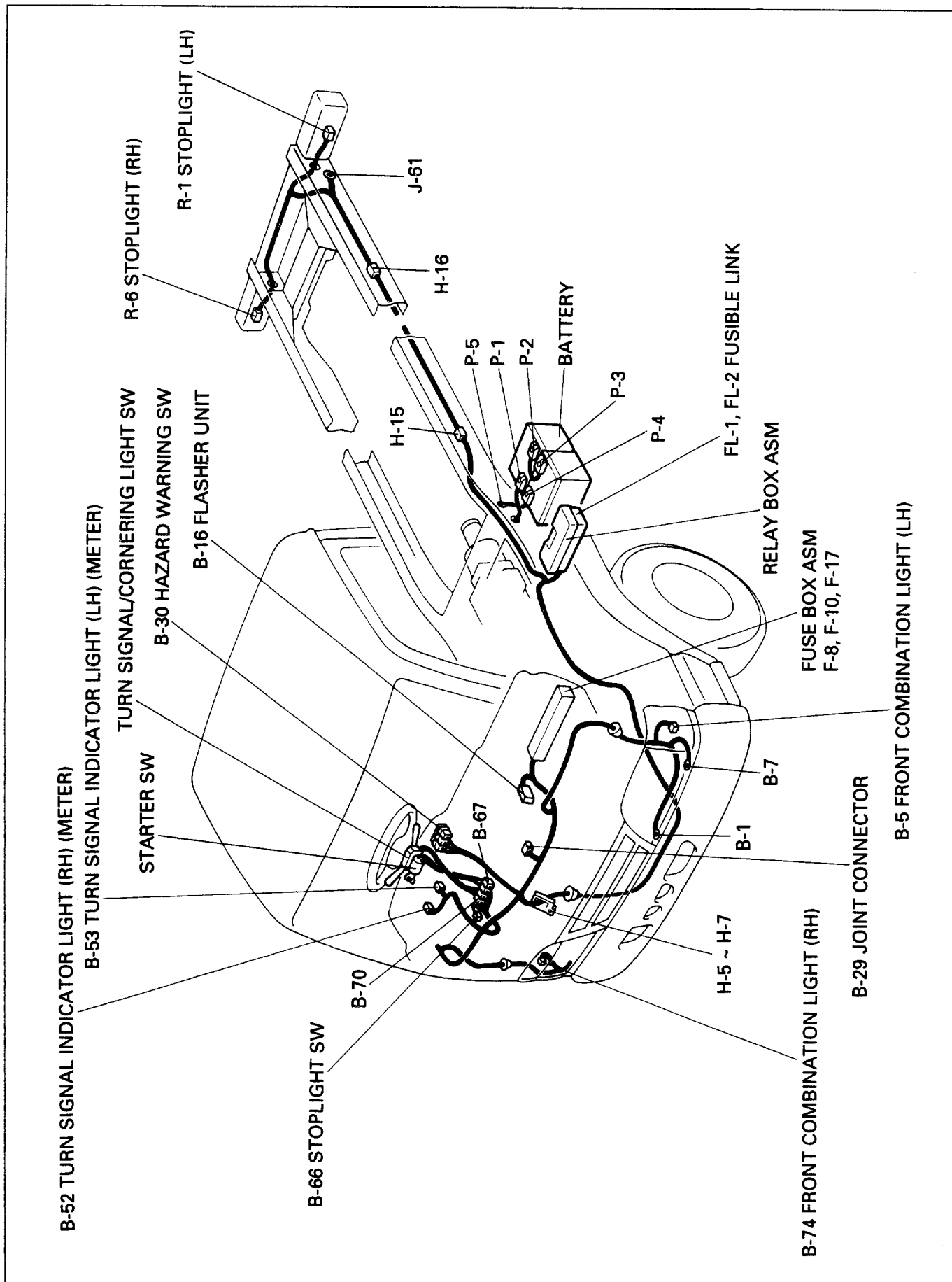
GENERAL DESCRIPTION

The circuit consists of the starter switch, turn signal light (front and rear), turn signal light switch, hazard warning light, flasher unit, stoplight and stoplight switch.

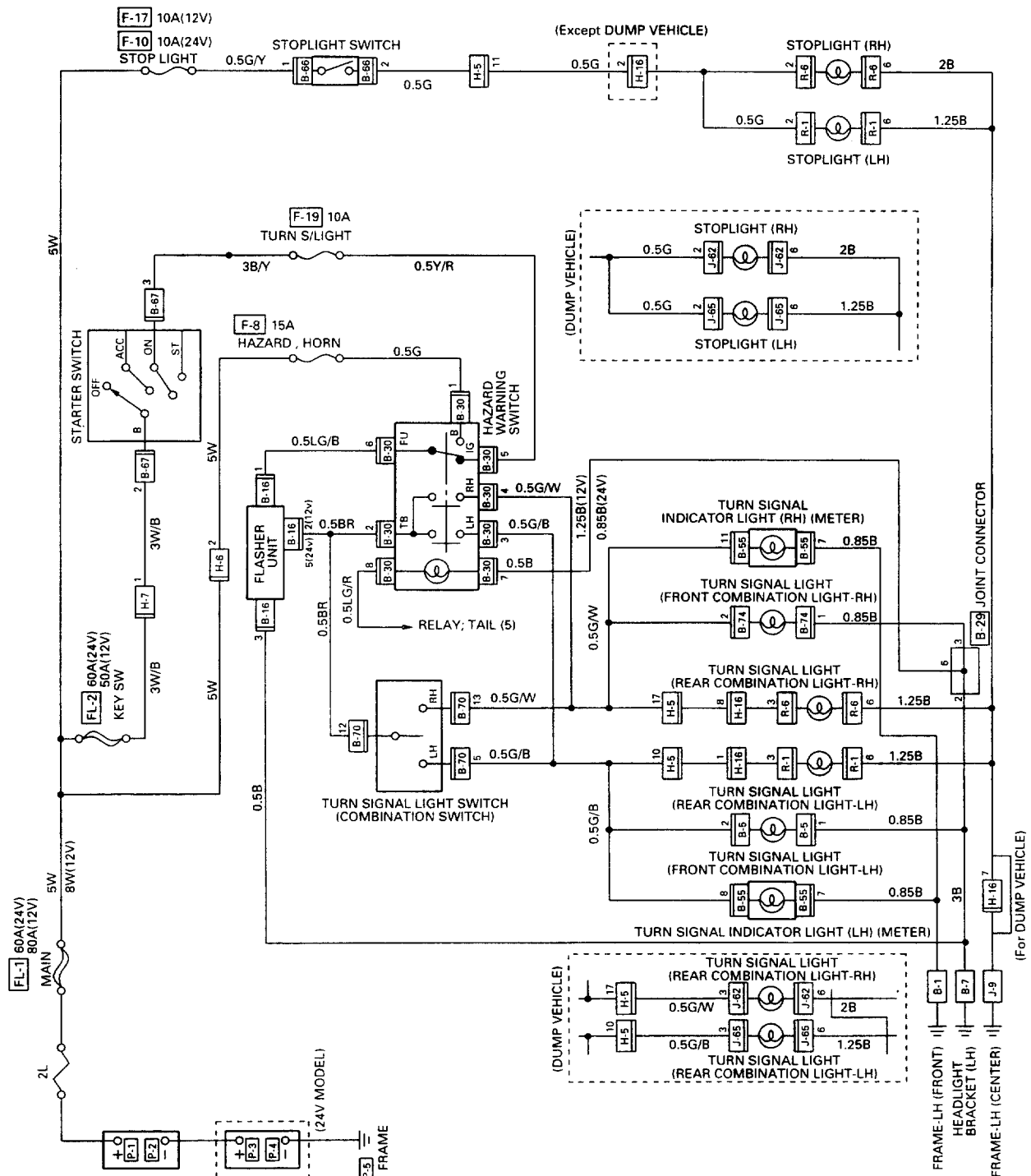
When turning on the respective switches with the starter switch on, the turn signal light will operate. When the turn signal light is flashing, the indicator light in the meter also start flashing. When the hazard warning switch is turned on, the current flows to the flasher unit through the hazard warning switch to cause the hazard warning light to flash, independent of the position of the starter switch. At the same time, the indicator lights in the meter also start flashing.

The stoplight switch will turn on and the light comes on once the brake pedal is depressed, independent of the position of the starter switch.

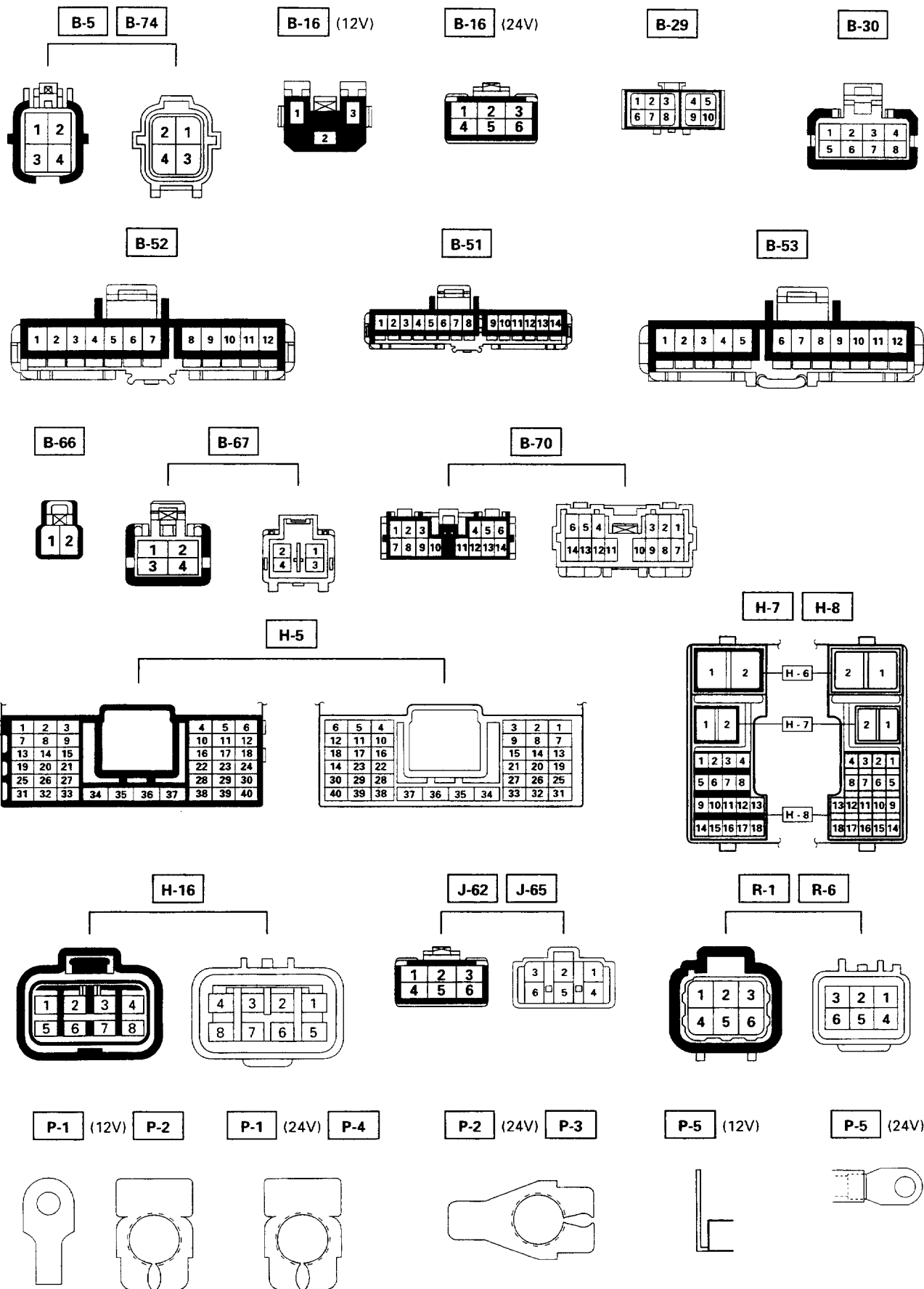
PARTS LOCATION



CIRCUIT DIAGRAM



CONNECTOR LIST



DIAGNOSIS

QUICK CHART FOR CHECK POINT

1. TURN SIGNAL LIGHT, HAZARD WARNING LIGHT

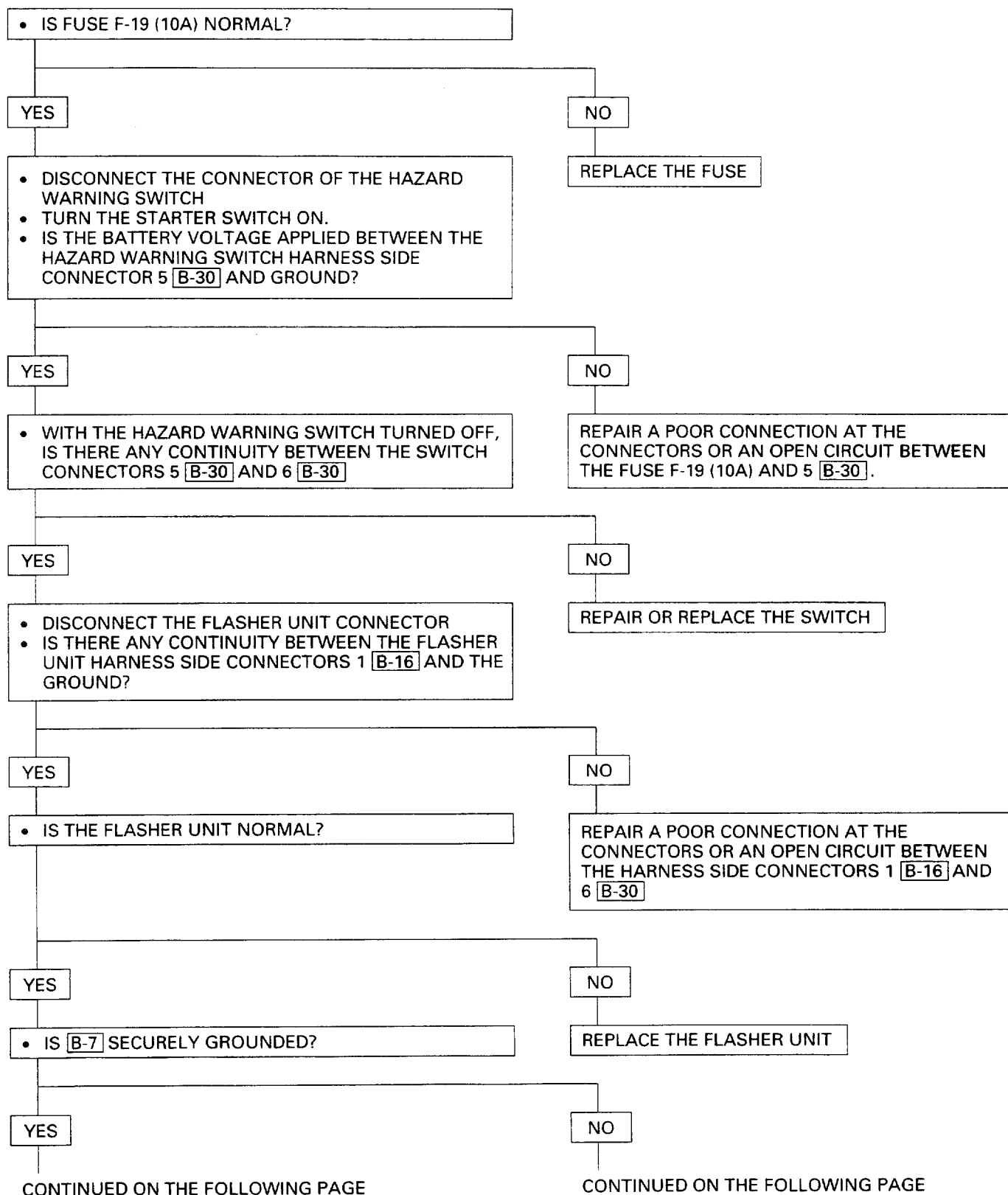
Trouble mode \ Check point	Fuse		Turn signal light SW	Hazard warning light SW	Flasher unit	Turn signal light bulb	Cable harness
	F-8 (15A)	F-19 (10A)					
1-1. Turn signal lights inoperative		○ (1)	○ (3)		○ (2)		○ (4)
1-2. Turn signal lights flashes too quickly						○ (1)	○ (2)
1-3. Hazard warning lights inoperative	○ (1)			○ (2)			

NOTE: Figure in parenthesis “()” indicates the order of inspection.

2. STOPLIGHT

Trouble mode \ Check point	Fuse F-10(10A):24V F-17(10A):12V	Stoplight SW	Stoplight bulb	Cable harness
2-1. Both stoplights inoperative	○ (1)	○ (2)		○ (3)
2-2. Stoplight on the left (or right) side inoperative			○ (1)	○ (2)

NOTE: Figure in parenthesis “()” indicates the order of inspection.

1. TURN SIGNAL LIGHT, HAZARD WARNING LIGHT**1-1. TURN SIGNAL LIGHTS INOPERATIVE**

CONTINUED FROM THE PREVIOUS PAGE

- IS THERE ANY CONTINUITY BETWEEN THE HARNESS SIDE CONNECTORS 3 [B-16] AND [B-7] ?

YES

- DISCONNECT THE COMBINATION SWITCH CONNECTOR
- IS THERE ANY CONTINUITY BETWEEN THE SWITCH CONNECTORS 5 [B-70] AND 12 [B-70] (WHEN TURNING LEFT), 13 [B-70] AND 12 [B-70] (WHEN TURNING RIGHT) RESPECTIVELY?

YES

- REPAIR A POOR CONNECTION AT THE CONNECTORS OR AN OPEN CIRCUIT BETWEEN THE HARNESS SIDE CONNECTORS 2 [B-16] (12V), 5 [B-16] (24V) AND 12 [B-70]

CONTINUED FROM THE PREVIOUS PAGE

GROUND IT SECURELY

NO

REPAIR A POOR CONNECTION AT THE CONNECTORS OR AN OPEN CIRCUIT BETWEEN THE CIRCUIT

NO

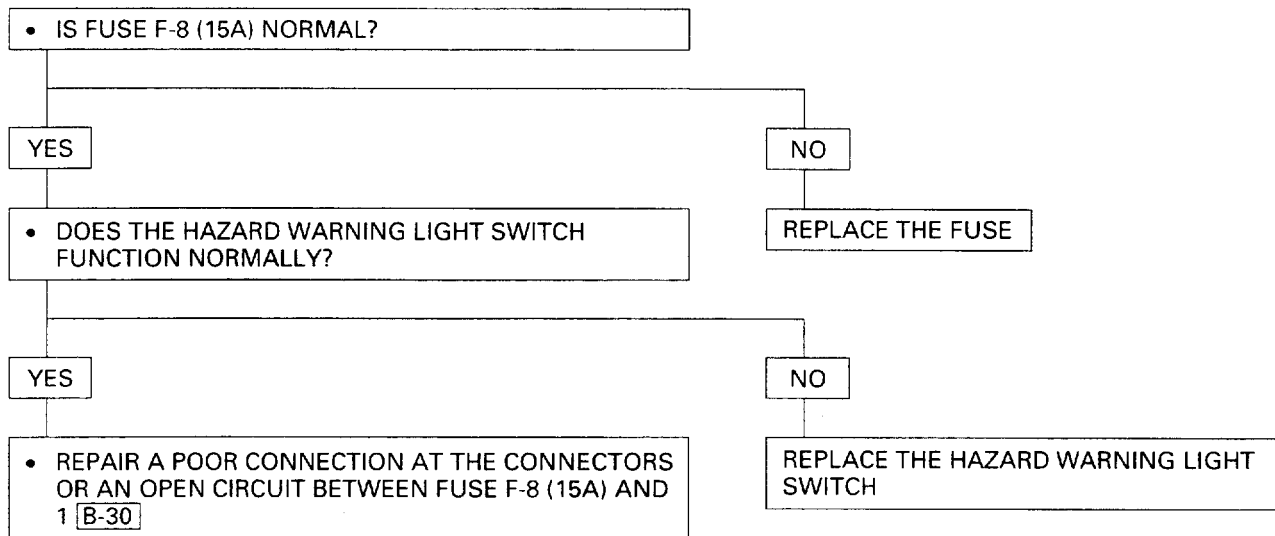
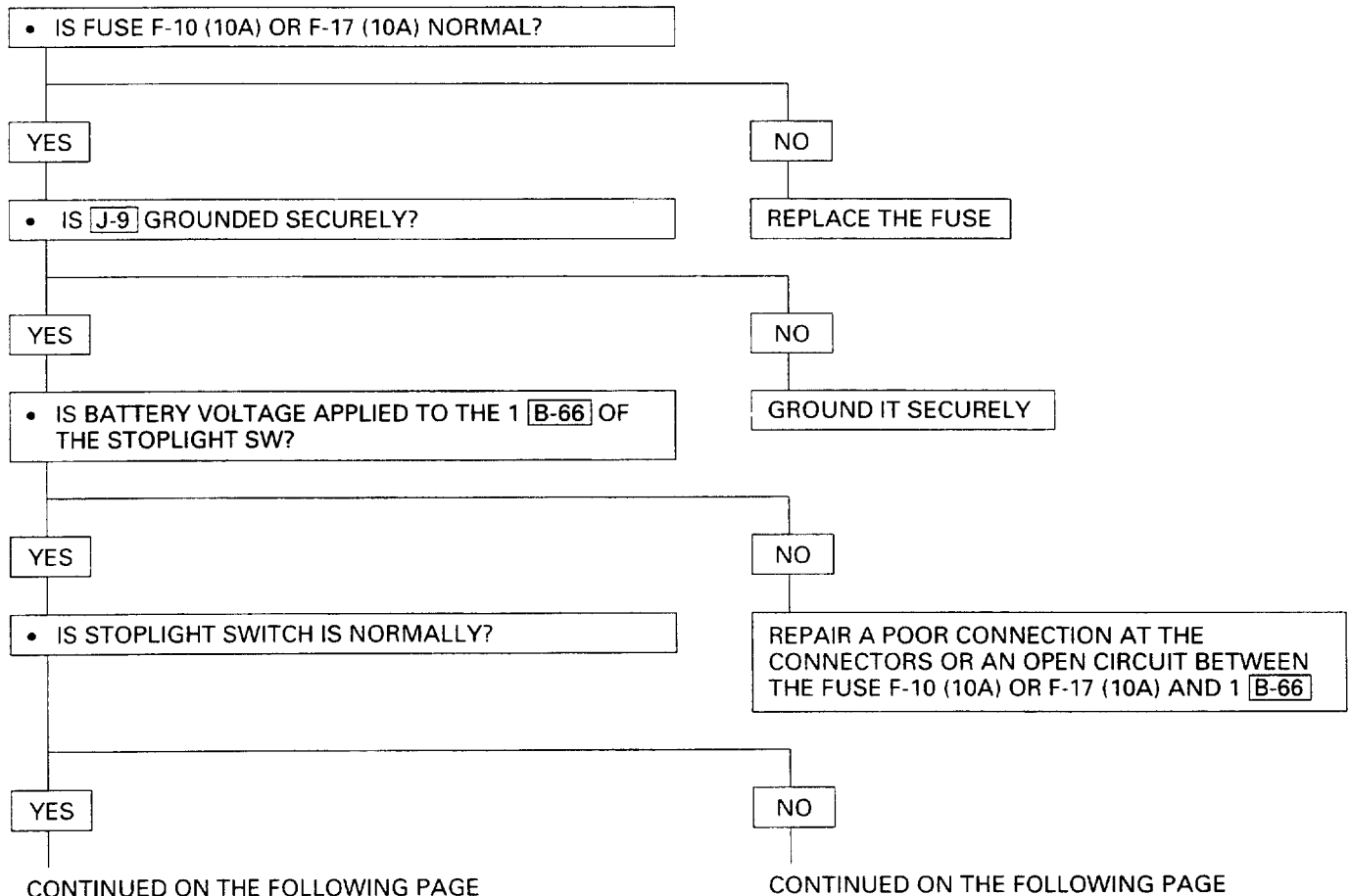
REPAIR OR REPLACE THE SWITCH

1-2. TURN SIGNAL LIGHTS FLASHES TOO QUICKLY

- DOES ANY TURN SIGNAL LIGHT REMAIN UNLIGHTED?

YES

DISCONNECT AND REINSTALL THE BULB, OR REPLACE IT, OR REPAIR AN OPEN CIRCUIT IN THE CIRCUIT OF THE INOPERATIVE BULB, OR CHECK THE GROUND

1-3. HAZARD WARNING LIGHTS INOPERATIVE**2. STOPLIGHT****2-1. BOTH STOPLIGHTS INOPERATIVE**

CONTINUED FROM THE PREVIOUS PAGE

- DOES THE PUSH ROD OF THE STOPLIGHT SW OPERATE SMOOTHLY?

YES

REPAIR A POOR CONNECTION AT THE CONNECTORS OR AN OPEN CIRCUIT BETWEEN 2 [B-66] AND [J-9]

CONTINUED FROM THE PREVIOUS PAGE

REPLACE THE STOPLIGHT SW

NO

REPLACE THE STOPLIGHT SW

2-2. STOPLIGHT ON THE LEFT (OR RIGHT)SIDE INOPERATIVE

- IS THE STOPLIGHT BULB ON THE LEFT (OR RIGHT) SIDE NORMAL?

YES

- IS THERE CONTINUITY BETWEEN THE STOPLIGHT CONNECTOR 2 [J-65] AND 11 [H-5] OR 2 [R-1] AND 2 [H-16] (2 [J-62] AND 11 [H-5] OR 2 [R-6] AND 2 [H-16])

YES

- REPAIR A POOR CONNECTION AT THE CONNECTORS OR AN OPEN CIRCUIT BETWEEN THE STOPLIGHT CONNECTOR 6 [J-65] AND [J-9] OR 6 [R-1] AND 7 [H-16] (6 [J-62] AND [J-9] OR 6 [R-6] AND 7 [H-16])

NO

REPLACE THE BULB

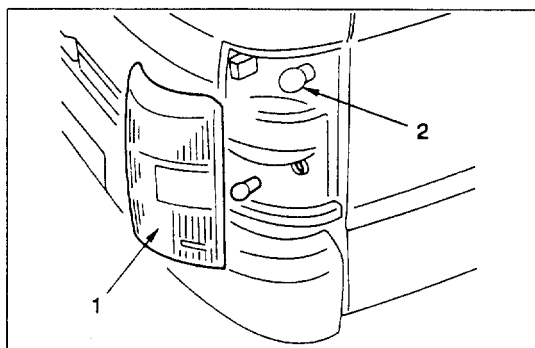
NO

REPAIR A POOR CONNECTION AT CONNECTORS OR AN OPEN CIRCUIT

NOTE: FIGURE IN PARENTHESIS "()" INDICATE THE PLACE OF INSPECTION FOR THE RIGHT SIDE STOPLIGHT.

STARTER SWITCH

Refer to "START AND CHARGING" in this section.

**REMOVAL****Preparation:**

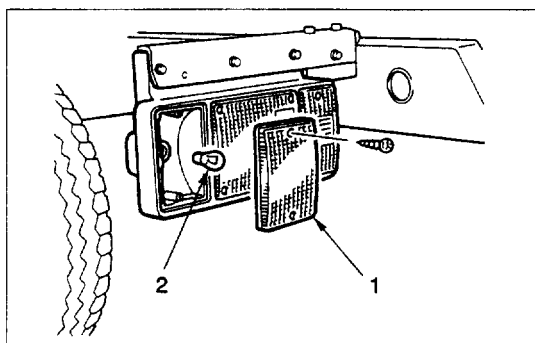
Disconnect the battery ground cable.

1. Front Combination Light Lens

Remove four screws.

2. Bulb**INSTALLATION**

To install, follow the removal steps in the reverse order.

**REMOVAL****Preparation:**

Disconnect the battery ground cable.

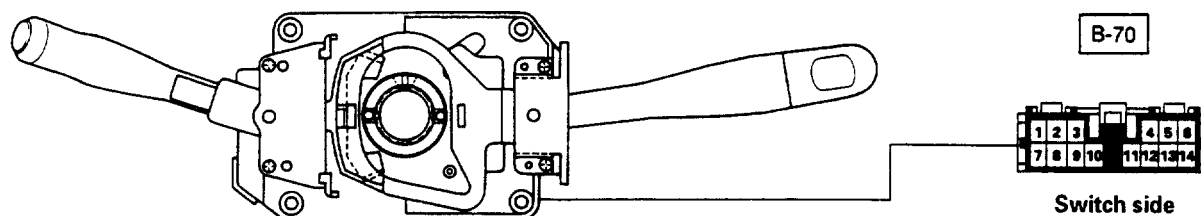
1. Lens**2. Bulb****INSTALLATION**

To install, follow the removal steps in the reverse order.

**TURN SIGNAL LIGHT SWITCH
(COMBINATION SWITCH)****INSPECTION**

Check the continuity between the terminals of the turn signal light switch.

Repair or replace the switch when the result of inspection is found abnormal.



Terminal No.		2	5	9	11	12	13
Turn signal light SW	Turning left		○			○	
	Neutral						
	Turning right					○	○



REMOVAL AND INSTALLATION

Refer to "HEADLIGHT, FOG LIGHT AND CORNERING LIGHT" in this section.

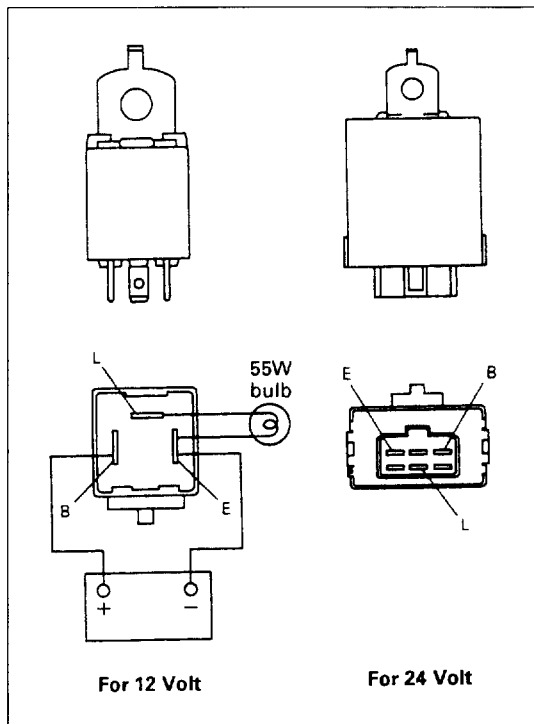
FLASHER UNIT



INSPECTION

When a 55W bulb is connected to the unit side terminals "L" and "E" while connecting the battery (+) terminal to terminal "B", and the battery (-) terminal to terminal "E" does the bulb light on and off?

Replace the unit when the result of inspection is found abnormal.



STOPLIGHT BULB



REMOVAL AND INSTALLATION

Refer to "CLEARANCE LIGHT, TAILLIGHT, LICENSE PLATE LIGHT AND ILLUMINATION LIGHT" for TAILLIGHT BULB removal and installation steps in this section.

STOPLIGHT SWITCH

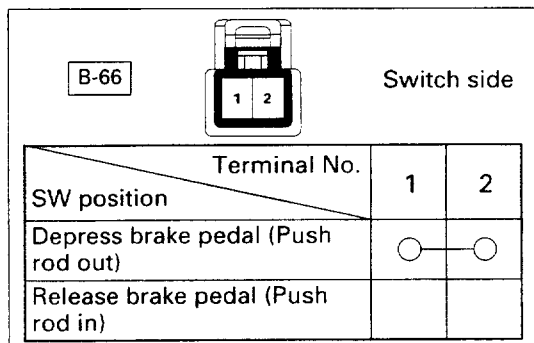


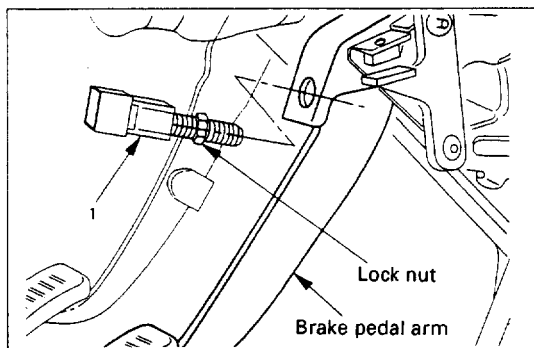
INSPECTION

1) Check to see if the stoplight switch is installed correctly to the specified position. Adjust the position when the result of the inspection is found abnormal.

2) Check to see if there is any continuity between the terminals of the stoplight switch.

Replace the switch when the result of inspection is found abnormal.





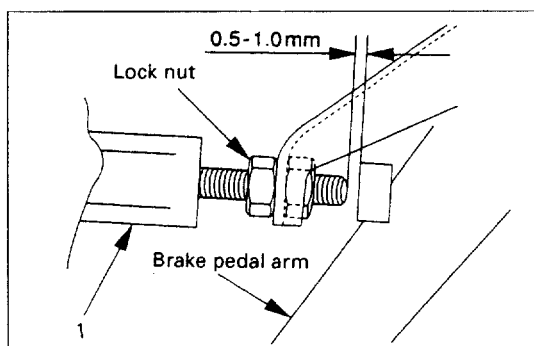
REMOVAL

Preparation:

Disconnect the battery ground cable.

1. Stoplight Switch

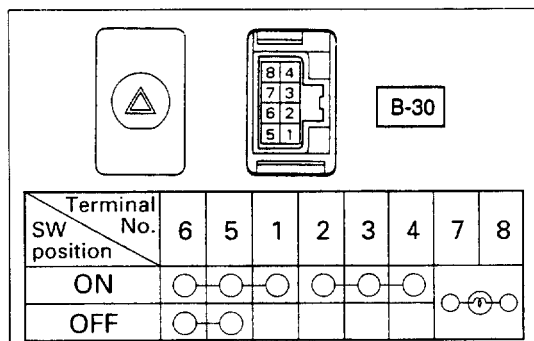
- 1) Disconnect the connector.
- 2) Loosen the lock nut of the switch.
- 3) Remove the switch by turning it.



INSTALLATION

To install, follow the removal steps in the reverse order, noting the following points.

- 1) Check to see if the brake pedal has been returned by the return spring to the specified position.
- 2) Turn the stoplight switch clockwise until the tip of the threaded portion of the switch contacts the pedal arm.
- 3) Turn the switch counterclockwise until the space between the tip of the threaded portion and the pedal arm is 0.5 to 1.0mm (0.02 - 0.04in.)

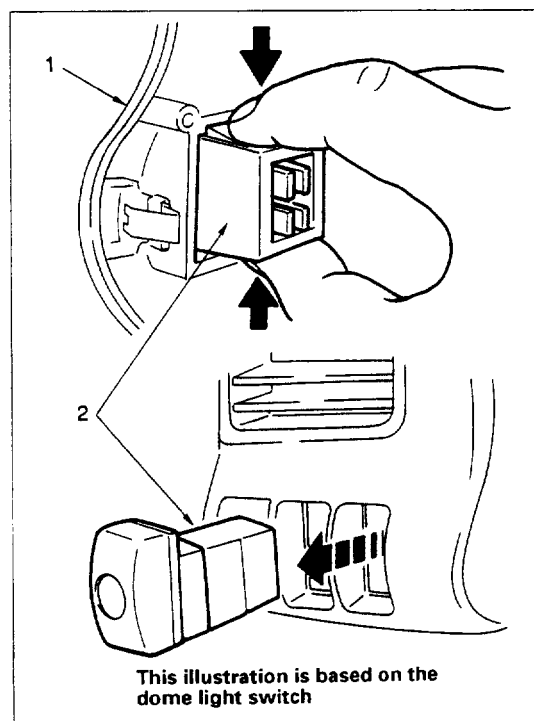


HAZARD WARNING SWITCH

INSPECTION

Check the continuity between the terminals of the hazard warning switch.

Repair or replace the switch when the result of inspection is found abnormal.



REMOVAL

Preparation:

Disconnect the battery ground cable.

1. Meter cluster

Refer to the "METER AND WARNING/INDICATOR LIGHT" in this section.

2. Hazard Warning Switch

Release the lock pushing the switch from the back side of the meter cluster.

INSTALLATION

To install, follow the removal steps in the reverse order noting the following point.

1. Push the switch with your fingers until locks securely.

This illustration is based on the dome light switch

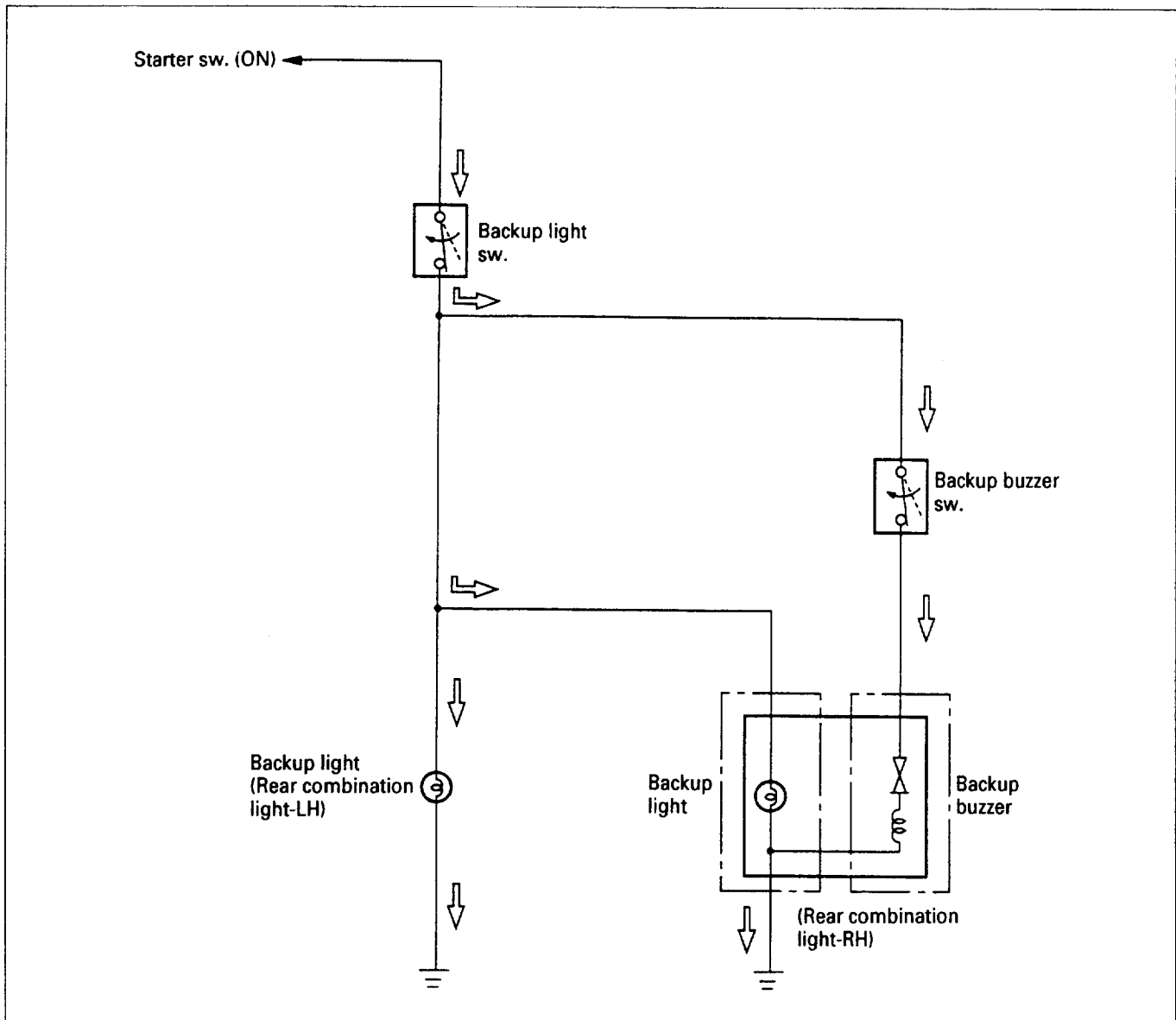
HORN, BACKUP LIGHT AND BACKUP BUZZER

GENERAL DESCRIPTION

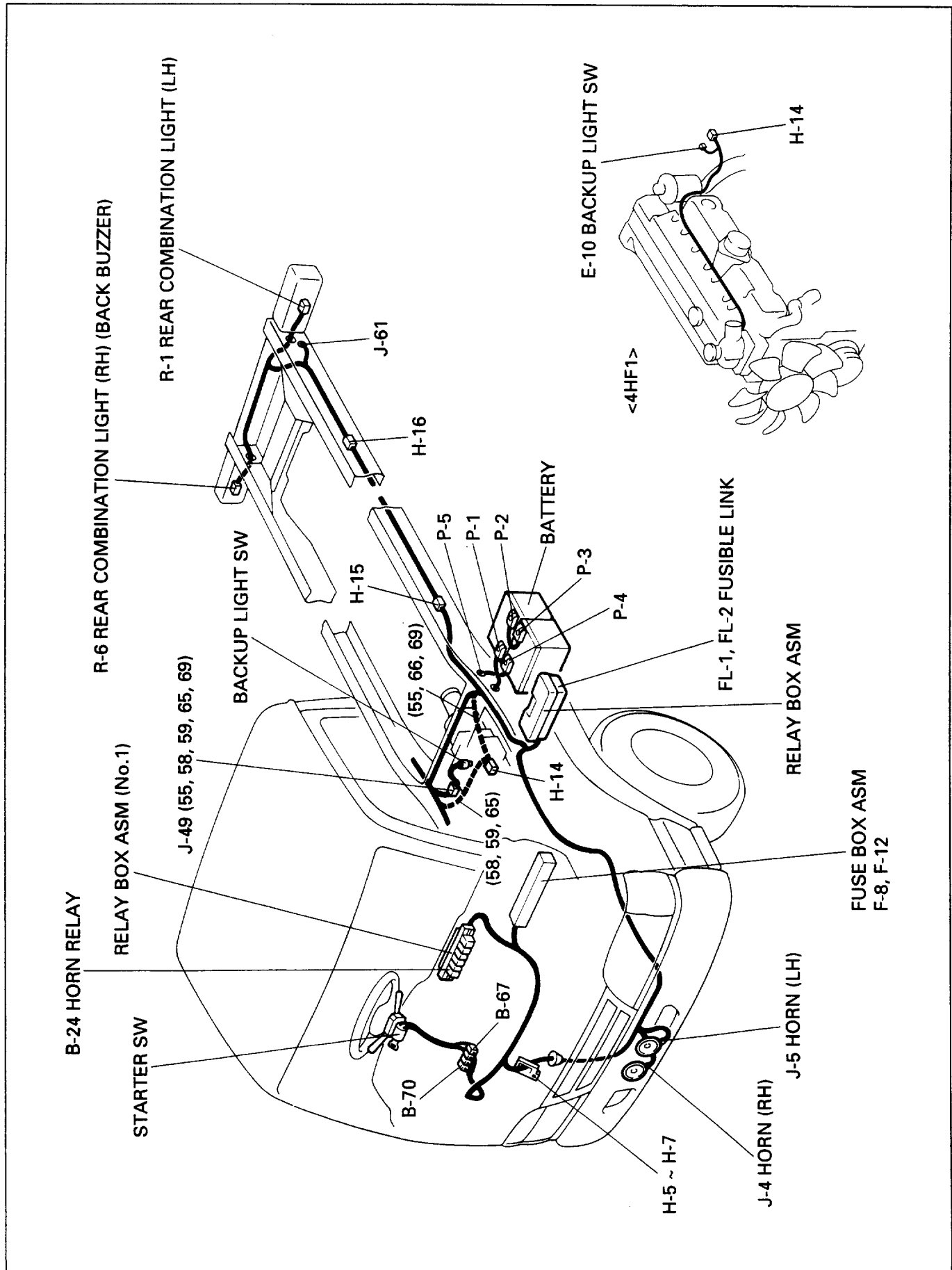
The circuit consists of the starter switch, horn, horn switch, backup light (Rear combination light), backup light switch, back buzzer and the relay.

When the horn switch is turned on independent of the position of the starter switch, the relay is activated to sound the horn. When the backup light switch turns on with the starter switch on, the backup light will operate.

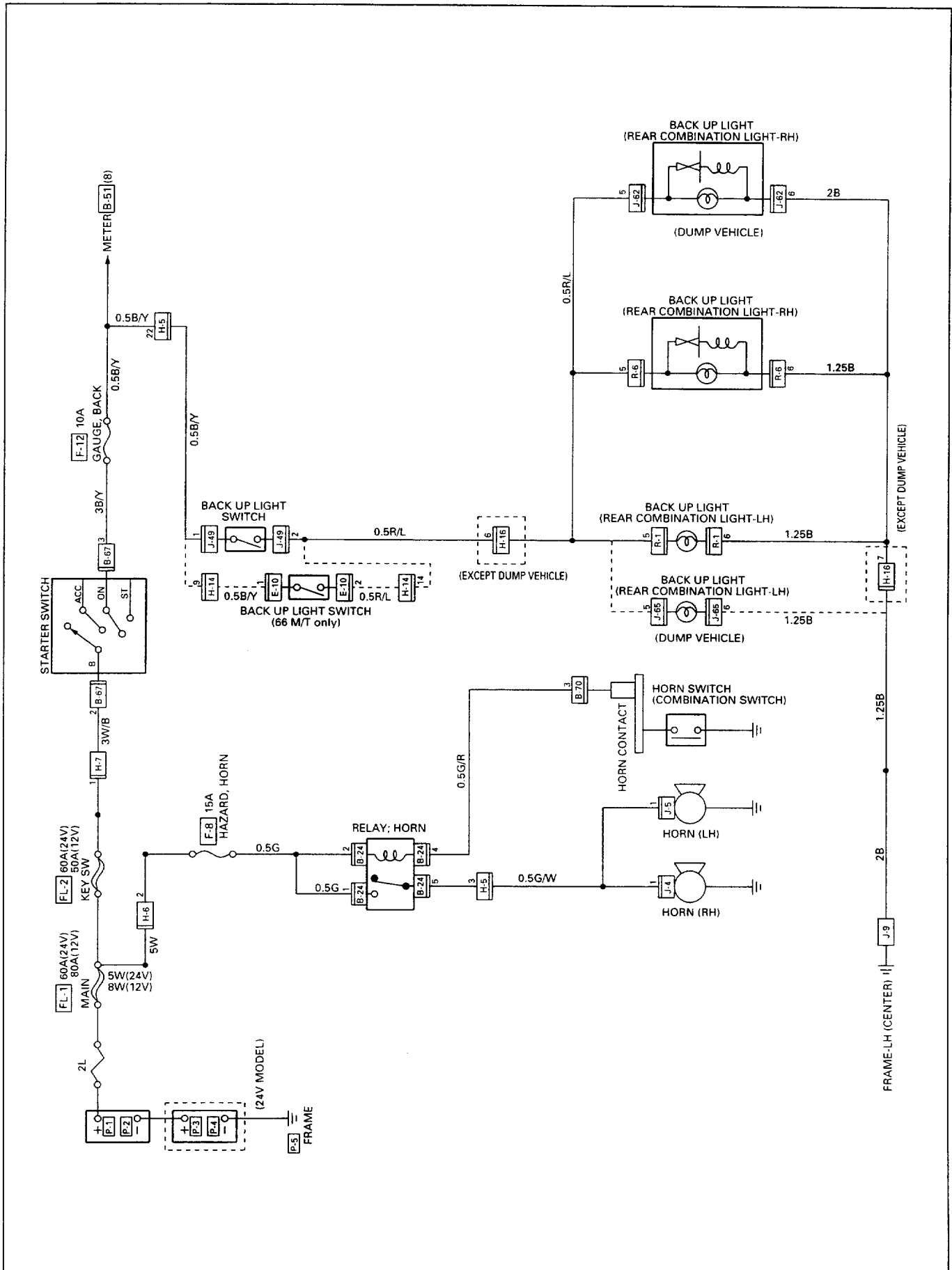
BACKUP LIGHT AND BACKUP BUZZER CIRCUIT



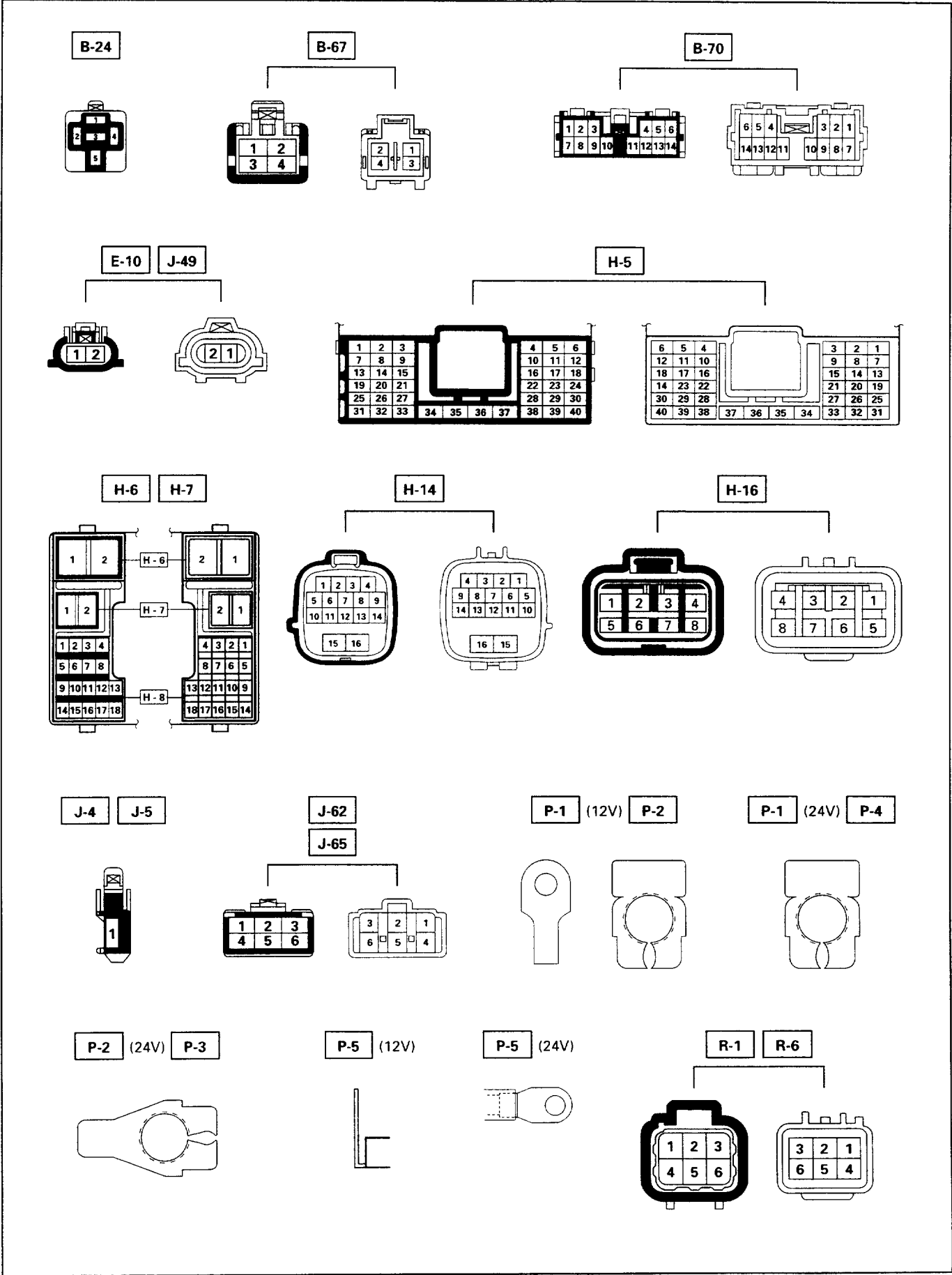
PARTS LOCATION



CIRCUIT DIAGRAM



CONNECTOR LIST



DIAGNOSIS

QUICK CHART FOR CHECK POINT

1. HORN

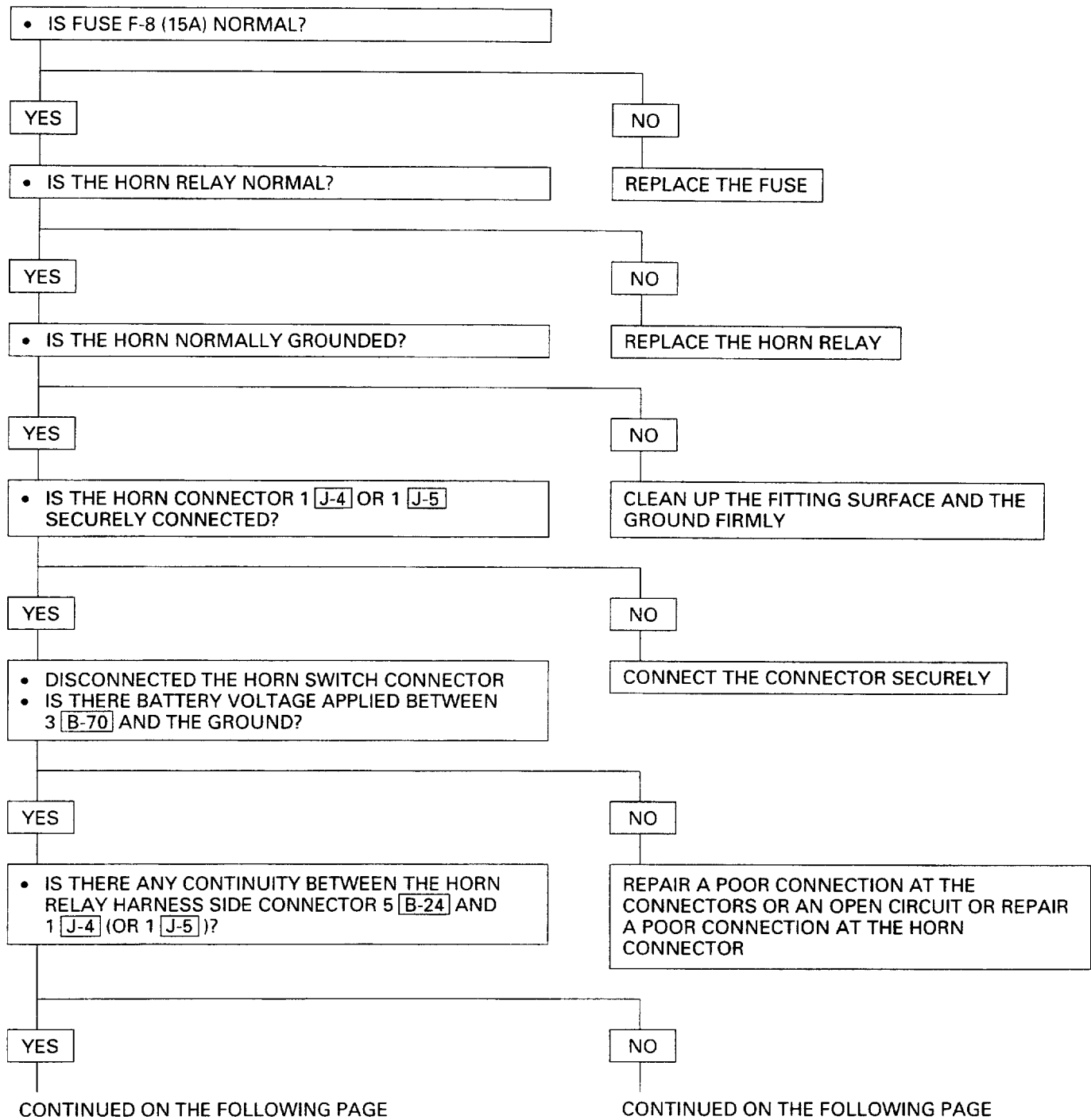
Check point Trouble mode	Fuse F-8 (15A)	Horn	Horn SW	Horn relay	Horn contact	Cable harness
1-1. Horn does not sound	○ (1)	○ (4)	○ (6)	○ (2)	○ (5)	○ (3)
1-2. Horn does not shut off			○ (2)	○ (1)		○ (3)

NOTE: Figure in parenthesis “()” indicates the order of inspection.

2. BACKUP LIGHT

Check point Trouble mode	Fuse F-12 (10A)	Backup light SW (Inhibitor SW)	Backup light bulb	Backup buzzer	Cable harness
2-1. Both backup lights inoperative	○ (1)	○ (3)			○ (2)
2-2. Backup light on the left (or right) side inoperative			○ (1)		○ (2)
2-3. Backup light remains on		○ (1)			

NOTE: Figure in parenthesis “()” indicates the order of inspection.

1. HORN**1-1. HORN DOES NOT SOUND**

CONTINUED FROM THE PREVIOUS PAGE

- DOES THE HORN SOUND WHEN CONNECTING THE BATTERY (+) TERMINAL TO THE HORN CONNECTOR 1 **J-4** (1 **J-5**), AND (-) TERMINAL TO THE HORN BRACKET?

CONTINUED FROM THE PREVIOUS PAGE

REPAIR A POOR CONNECTION AT THE CONNECTORS OR AN OPEN CIRCUIT IN THE CIRCUIT

NO

PEPLACE THE HORN

1-2. HORN DOES NOT SHUT OFF

- IS THE HORN RELAY NORMAL?

YES

- REMOVE THE HORN SW
- IS THE MOVABLE PORTION OF THE HORN SW ALWAYS OUT OF CONTACT WITH THE GROUND BRACKET?

YES

REPAIR A SHORT CIRCUIT BETWEEN HORN RELAY HARNESS SIDE CONNECTOR 4 **B-24** AND 3 **B-70**

NO

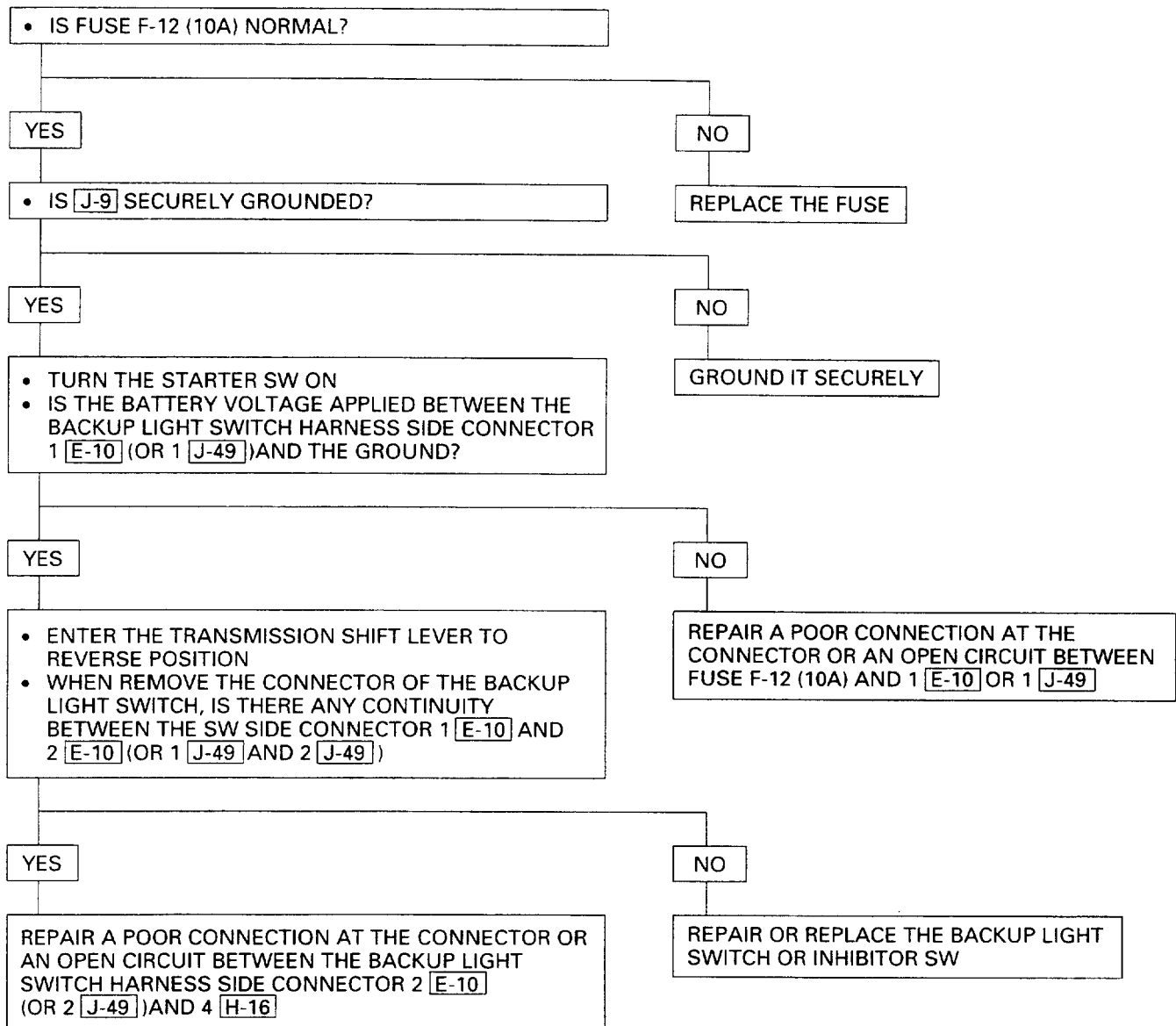
REPLACE THE HORN RELAY

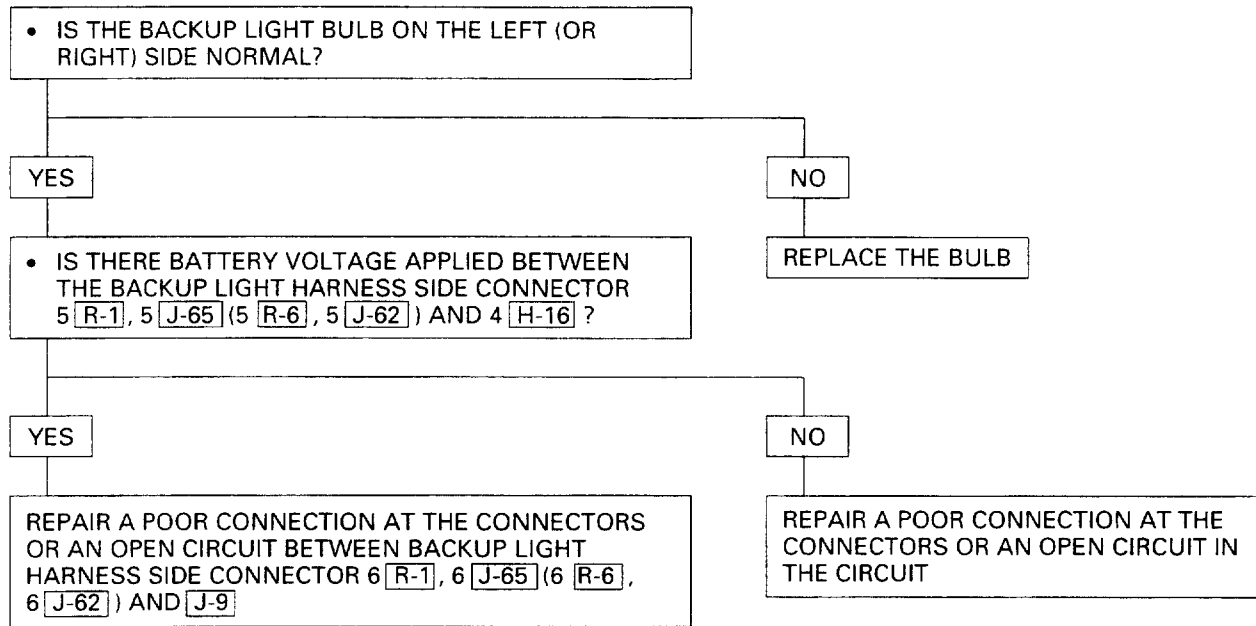
NO

REPAIR OR REPLACE THE HORN SW

2. BACKUP LIGHT

2-1. BACKUP LIGHTS INOPERATIVE



2-2. BACKUP LIGHT ON THE LEFT (OR RIGHT)SIDE INOPERATIVE**2-3. BACKUP LIGHT REMAINS ON**

REPAIR OR REPLACE THE BACKUP LIGHT SW OR INHIBITOR SW

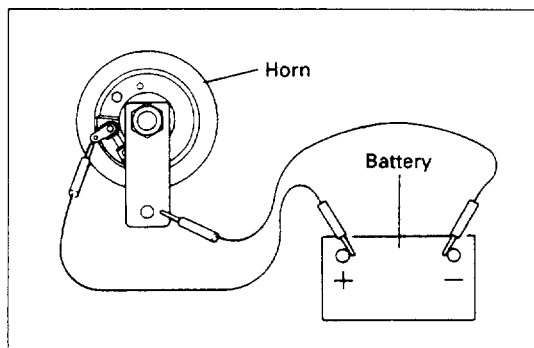
STARTER SWITCH

Refer to "START AND CHARGING" in this section.

HORN

INSPECTION

Check to see if horn sound when a battery voltage between horn terminal and the fixing bracket. Repair or replace the horn when the result of inspection is found abnormal.



REMOVAL

Preparation:

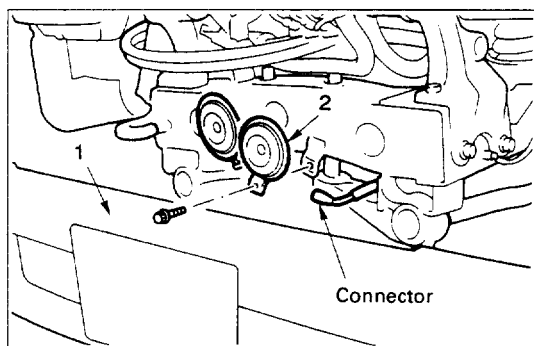
Disconnect the battery ground cable.

1. Bumper

Refer to "BUMPER" in section 2B.

2. Horn

Disconnect the connector.



INSTALLATION

To install, follow the removal steps in the reverse order.



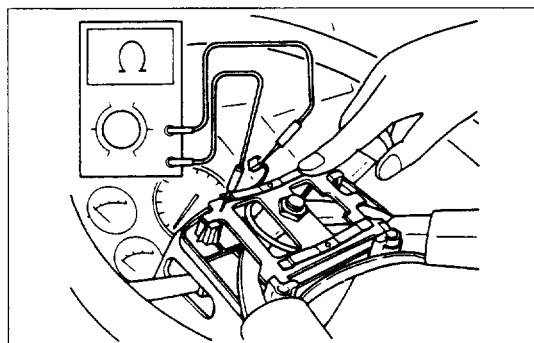
HORN SWITCH

INSPECTION

With the contact point of the horn switch pressed to the switch bracket, check the continuity between the connector terminal and the bracket of the switch.

Check the contact condition between horn contact of the combination switch and contact plate of steering wheel.

Repair or replace the switch when the result of inspection is found abnormal.



REMOVAL

Preparation:

Disconnect the battery ground cable.

1. Horn Pad

1) Hold the horn pad and pull it upward.

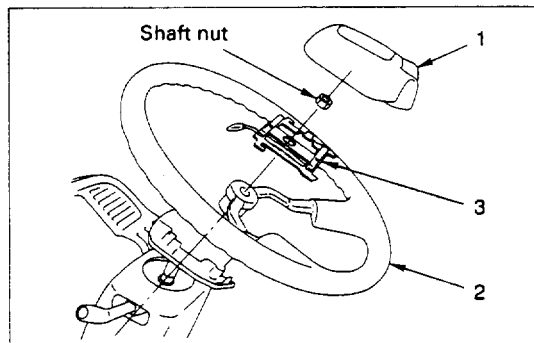
2. Steering Wheel

1) Remove the steering shaft nut.

2) Remove the steering wheel by using steering wheel remover.

(Refer to Section 3D "STEERING COLUMN" for steering wheel removal steps.)

3. Horn Switch





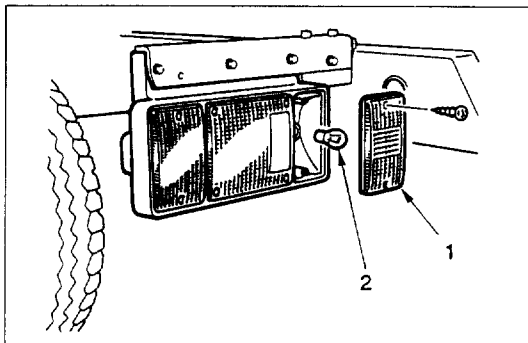
INSTALLATION

To install, follow the removal steps in the reverse order, noting the following point.



1. Tighten the steering shaft nut to the specified torque

Shaft nut torque	N·m (kg·m/lb·ft)
49 (5/36)	



BACKUP LIGHT BULB



REMOVAL

Preparation:

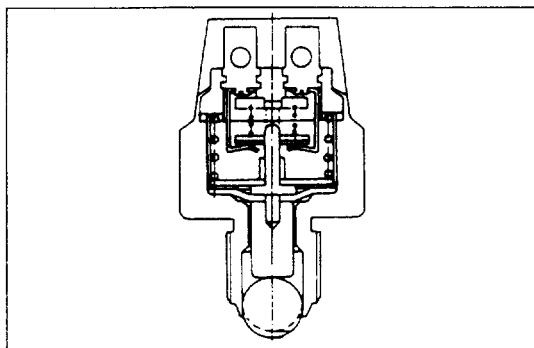
Disconnect the battery ground cable.

1. Lens
2. Bulb



INSTALLATION

To install, follow the removal steps in the reverse order.



BACKUP LIGHT SWITCH

INSPECTION

1. With the switch installed to the transmission, check the continuity between the terminals of the switch connectors.

When the continuity is found between the terminals only with the switch shifted to the reverse position, the switch is normal.

2. When the result of the above inspection is found abnormal, remove the switch from the transmission and conduct a test on the switch alone.

If the continuity appears between the connector terminals when the ball of the switch is pushed, the switch is normal. (When the ball is released, the continuity disappears.)

3. If there is no continuity with the switch installed to the transmission, even though the switch is found to be normal, then adjust the stroke of the switch by changing the thickness of the switch gasket.



REMOVAL

Preparation:

Disconnect the battery ground cable.

1. **Backup Light Switch**

- 1) Disconnect the connectors.
- 2) Remove the switch by turning it counterclockwise.

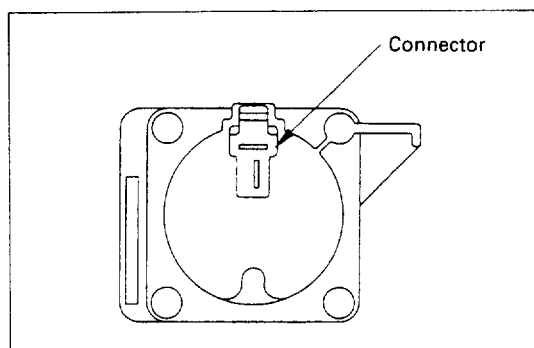


INSTALLATION

1. **Backup Light Switch**



Apply liquid gasket to the screw portion of the switch to prevent oil leak.

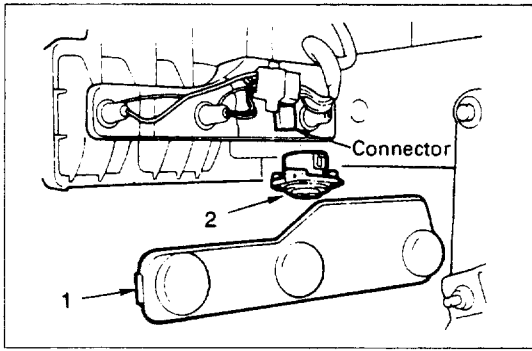


BACKUP BUZZER

INSPECTION

Apply battery voltage to the backup buzzer connector to check the buzzer sound.

Repair or replace the buzzer when the result of inspection is found abnormal.



REMOVAL

Preparation:

Disconnect the battery ground cable.

1. Rear Combination Light Cover

2. Backup Buzzer

- 1) Remove the rear combination light connector fixing screw.
- 2) Remove buzzer fixing screw.
- 3) Disconnect the connector.



INSTALLATION

To install, follow the removal steps in the reverse order.

DOMESTIC LIGHT AND BACKUP BUZZER

GENERAL DESCRIPTION

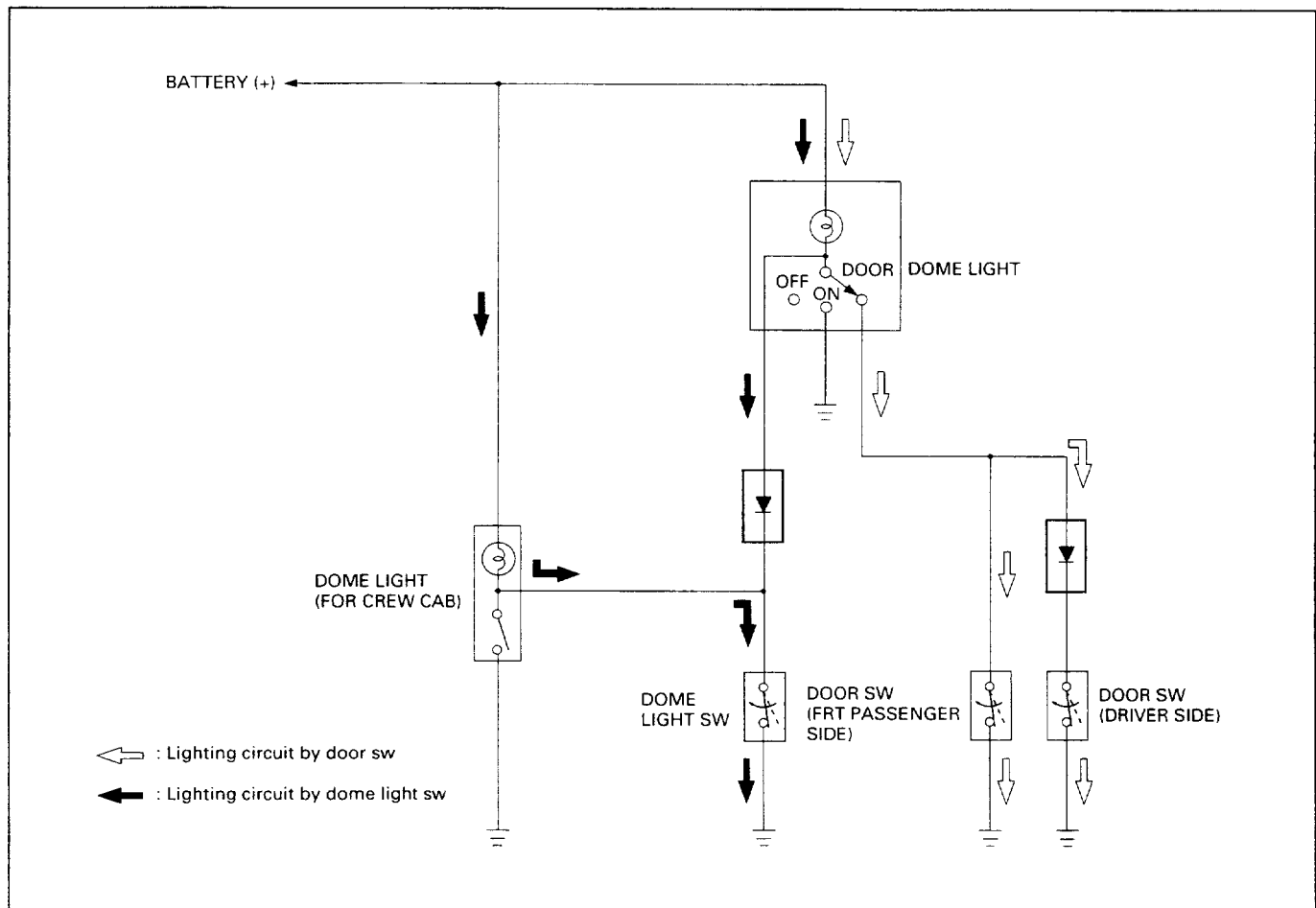
The circuit consists of the starter switch, dome light, dome light switch, door switch, backup light switch and the backup buzzer.

The dome light lights up when the left or right side door is opened with the switch set at the door mode. It can be lit by operating ON or OFF of the dome light switch.

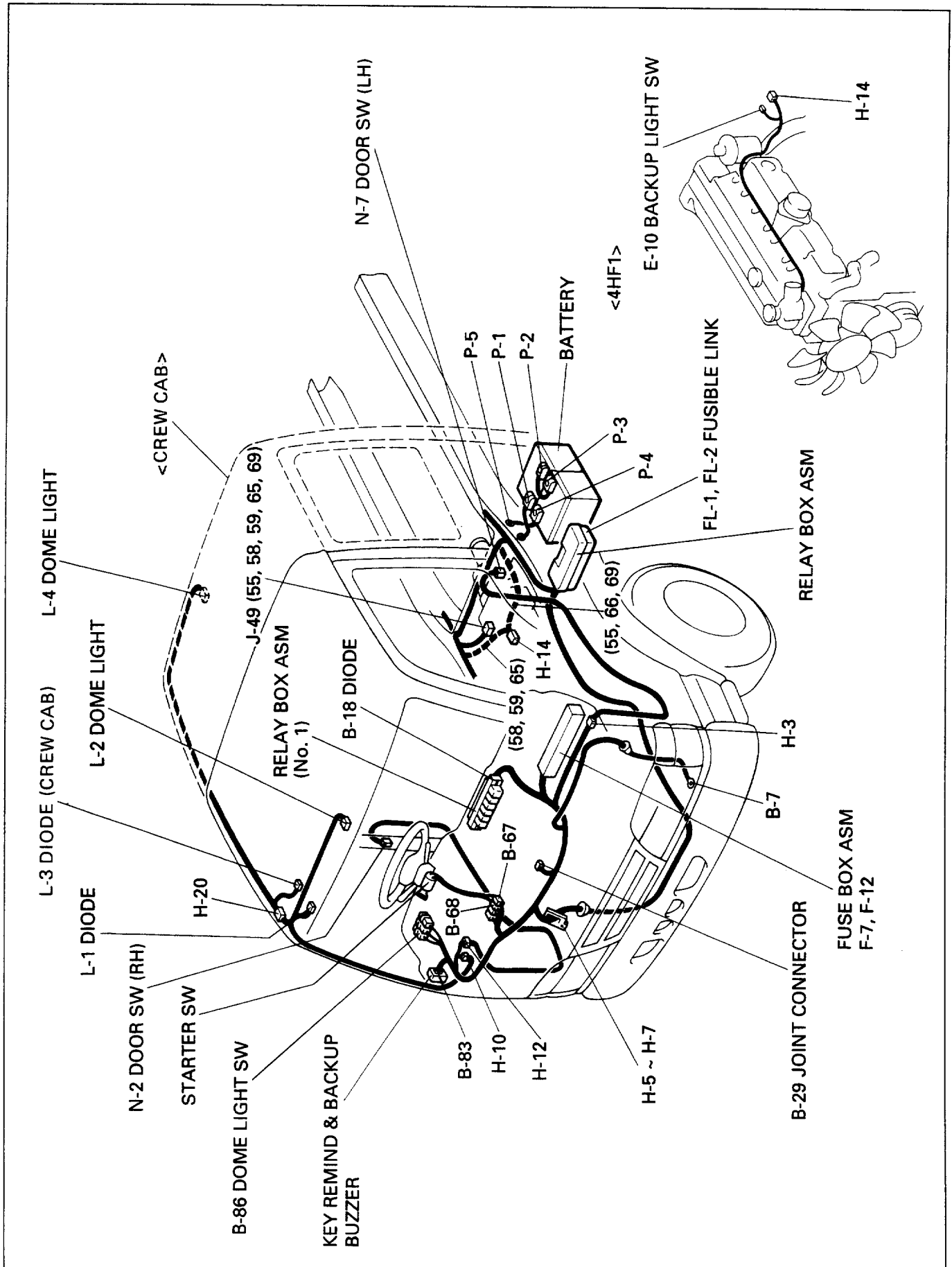
The dome light can be lit by respective switch independent of the position of the starter switch.

By operating the dome light switch fitted on the instrument panel, the dome light can be lit independent of the switch position of dome light.

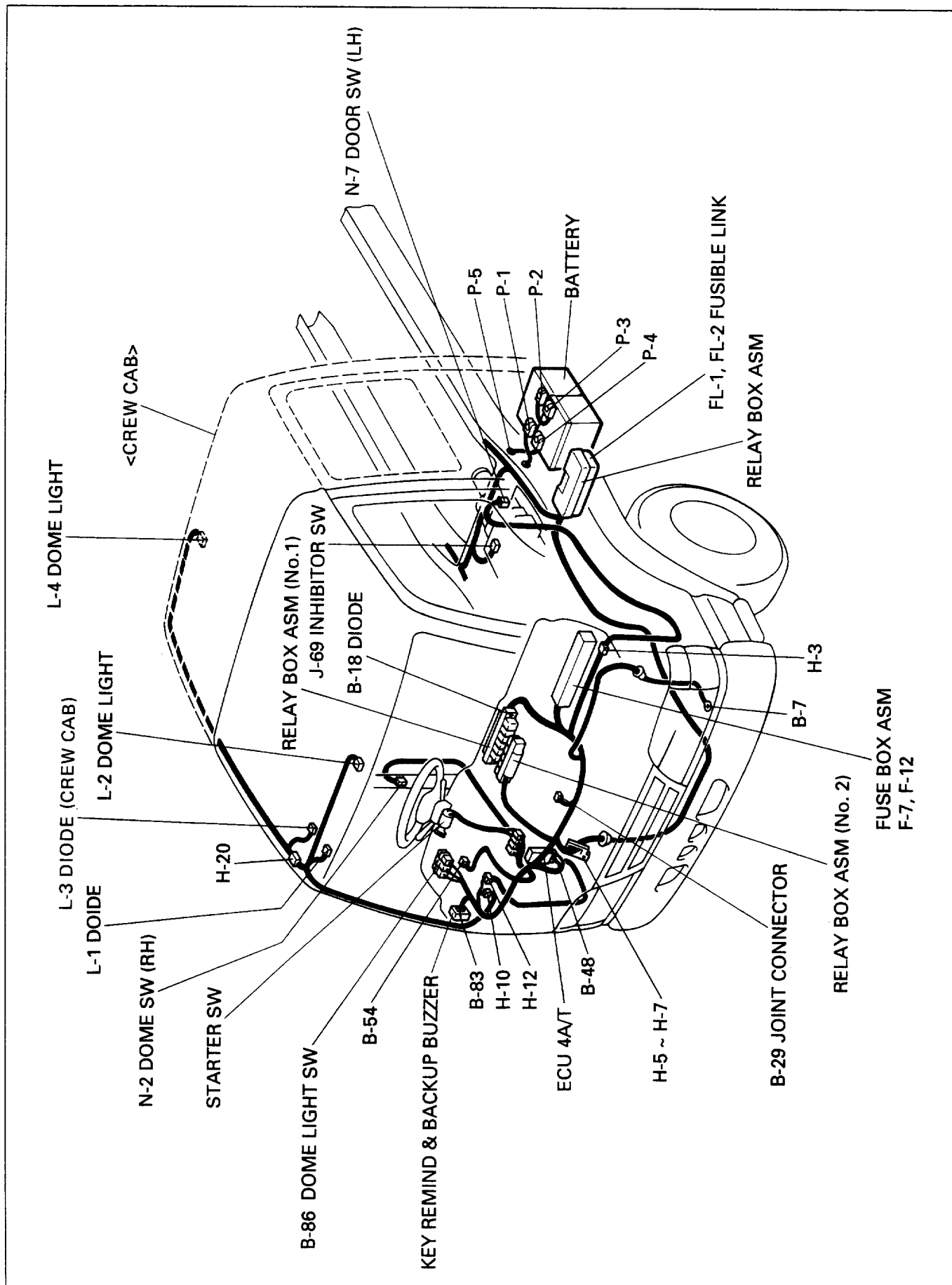
LIGHTING CIRCUIT



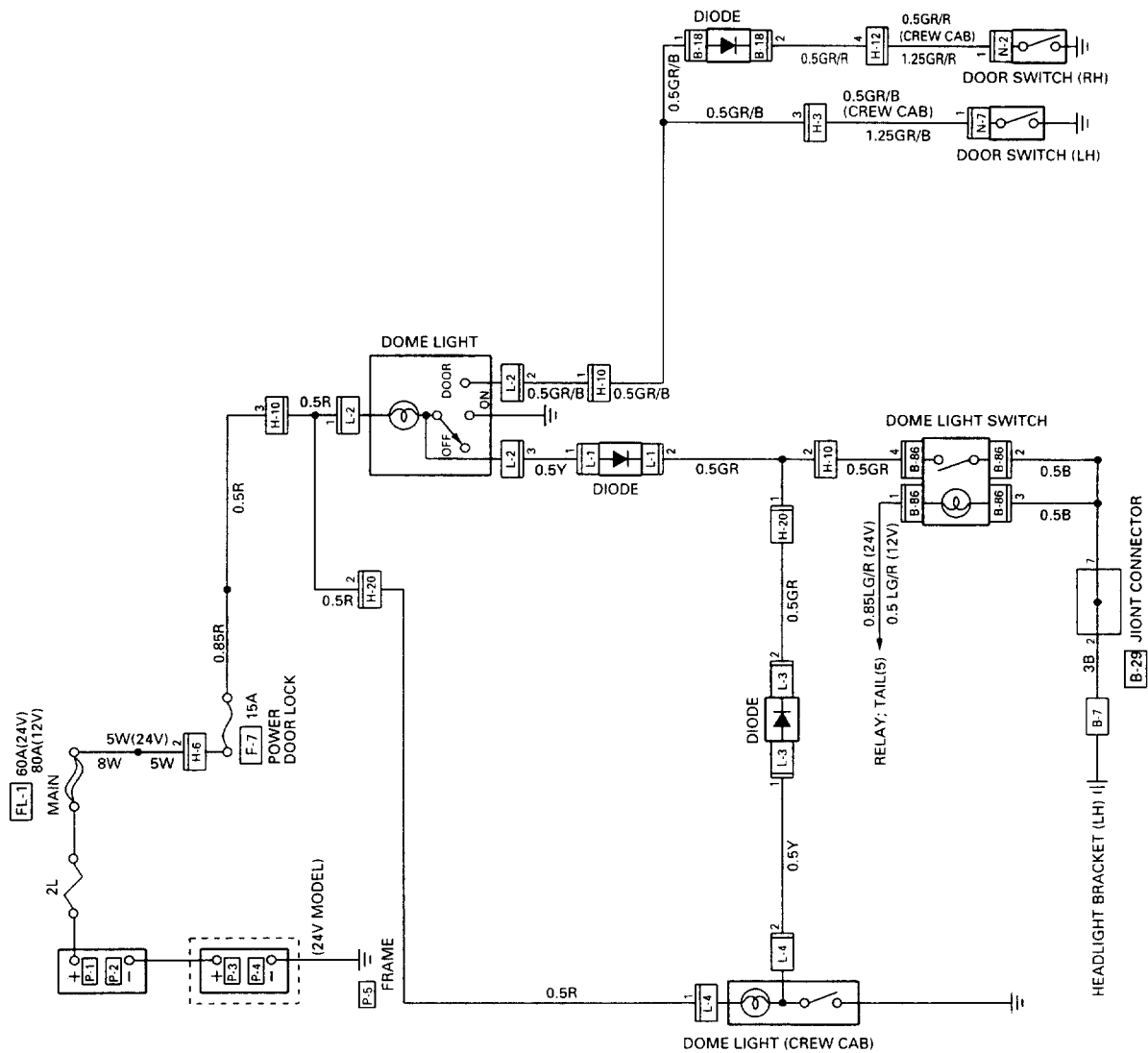
PARTS LOCATION - EXCEPT 24 VOLT A/T



PARTS LOCATION - FOR 24 VOLT A/T



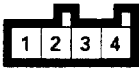
CIRCUIT DIAGRAM – EXCEPT 24 VOLT·A/T



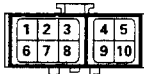


CONNECTOR LIST

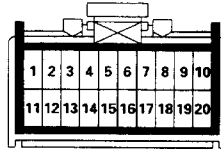
B-18



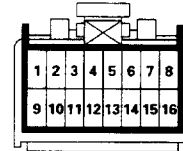
B-29



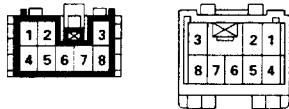
B-47



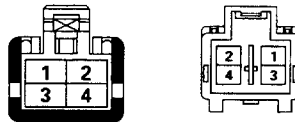
B-48



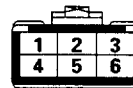
B-54



B-67 B-86



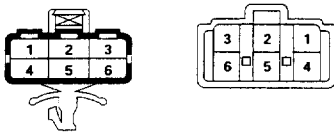
B-83



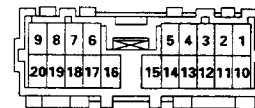
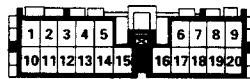
E-10 J-49



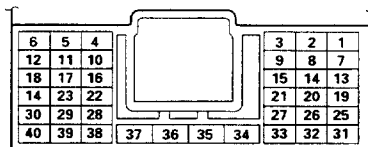
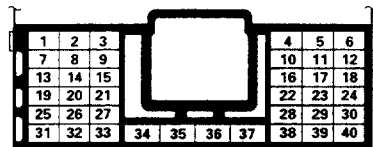
H-3



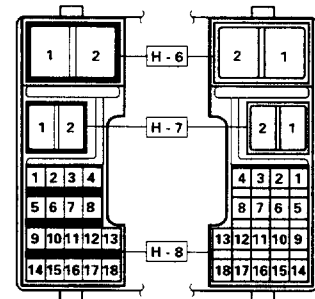
H-4



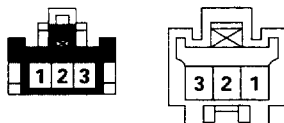
H-5



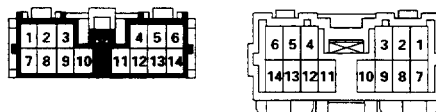
H-6 H-7



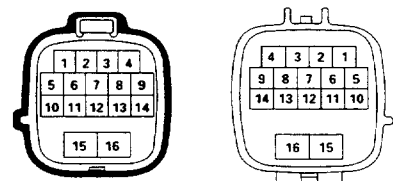
H-10 L-2



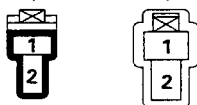
H-12



H-14



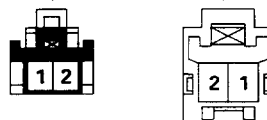
H-20



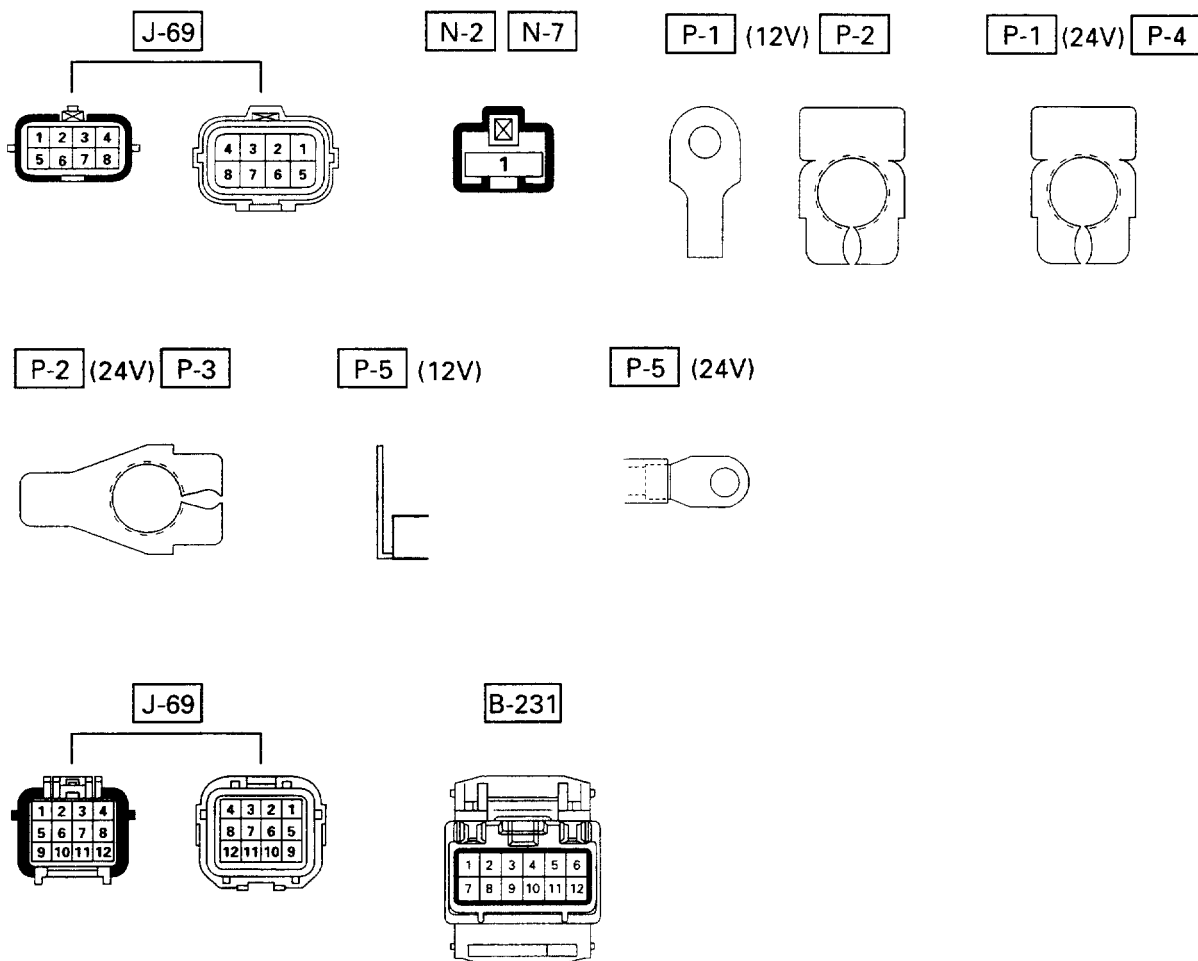
L-1 L-3



L-4 L-6



CONNECTOR LIST



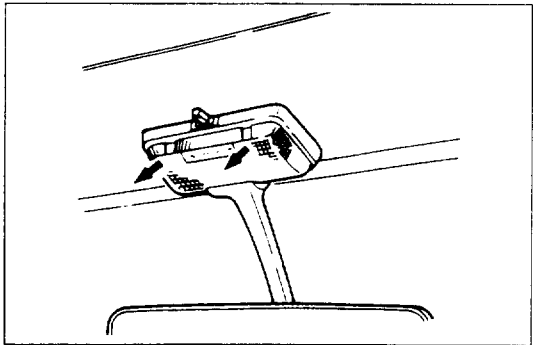
STARTER SWITCH KEY CYLINDER SWITCH

Refer to "START AND CHARGING" in this section.

BACKUP LIGHT SWITCH

Refer to "HORN, BACKUP LIGHT AND BACKUP BUZZER" in this section.

DOME LIGHT BULB



REMOVAL

Preparation:

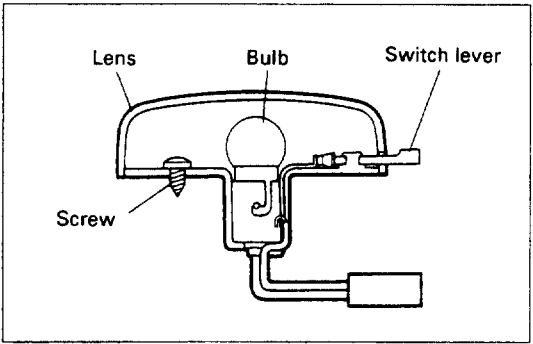
Disconnect the battery ground cable.

1. **Lens**
Hold the lens and pull it downward.
2. **Bulb**



INSTALLATION

To install, follow the removal steps in the reverse order.



DOME LIGHT BULB (FOR CREW CAB)

REMOVAL

Preparation:

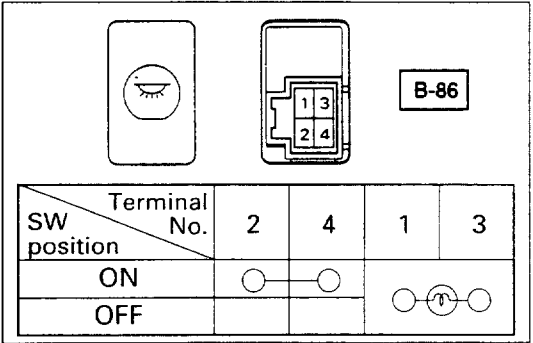
Disconnect the battery ground cable.

1. **Lens**
Hold the lens and pull it down.
2. **Bulb**



INSTALLATION

To install, follow the removal steps in the reverse order.

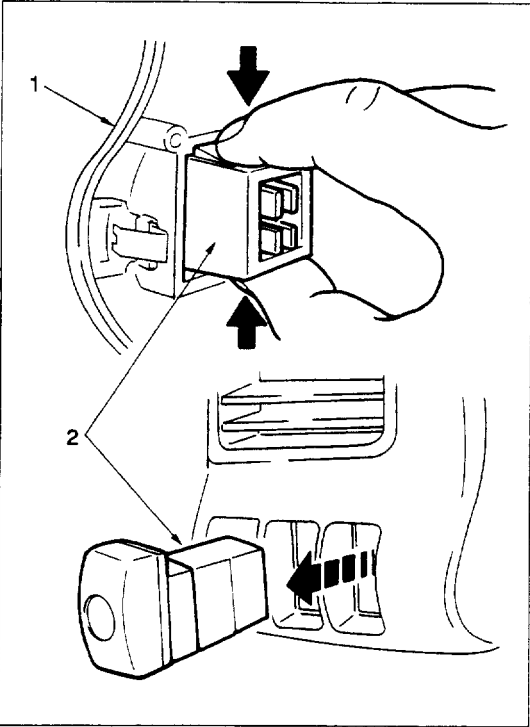


DOME LIGHT SWITCH

INSPECTION

Check the continuity between the dome light switch connector terminals.

Repair or replace the switch when the result of inspection is found abnormal.



REMOVAL

Preparation:

Disconnect the battery ground cable.

1. Meter cluster

Refer to the "METER AND WARNING/INDICATOR LIGHT" in this section.

2. Dome Light Switch

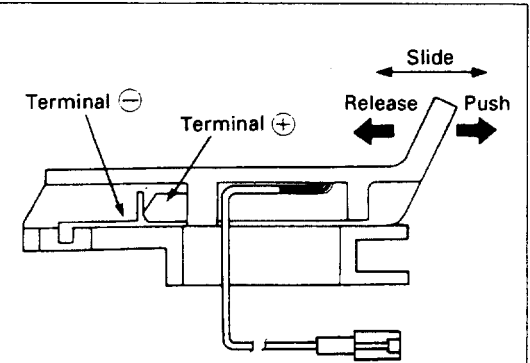
Release the lock pushing the switch from the back side of the meter cluster.



INSTALLATION

To install, follow the removal steps in the reverse order noting the following point.

1. Push the switch with your fingers until locks securely.



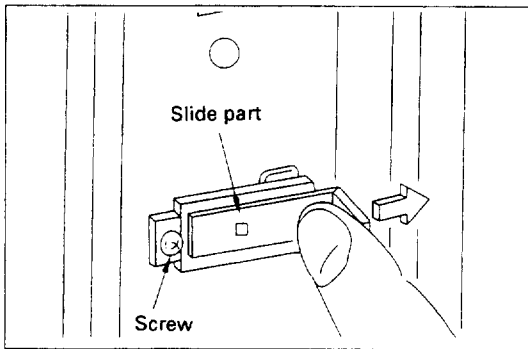
DOOR SWITCH

INSPECTION

Check to see if there is any continuity between the terminals and the body while operating the door switch.

Repair or replace the switch, when the result of inspection is found abnormal.

SW operation	Connector No.	
	N-2	N-7
Terminal No.	1	Body
Push		
Release		



REMOVAL

Preparation:

Disconnect the battery ground cable.

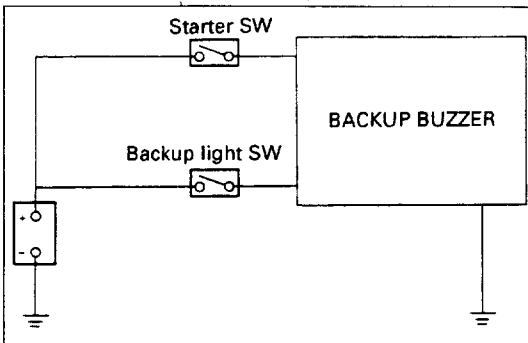
1. Door Switch

- 1) Remove the screw.
- 2) Disconnect the connector of the switch.



INSTALLATION

To install, follow the removal steps in the reverse order.



BACKUP BUZZER

Warning function	Operative conditions
Warning to reverse driving	When the transmission shift lever is engaged to the reverse position.



INSPECTION OF THE BUZZER CIRCUIT

Disconnect the backup buzzer connector, measure the continuity and voltage between the harness side connector terminals.



B-83



Harness side

Terminal No.	Wire color	Connected to	Item to be checked	Connecting terminal	Checking conditions	Standard
2	B	Ground	Continuity	2-Ground	–	Continuity
5	R/L	Backup light SW (Inhibitor SW)	Voltage	5-Ground	· Starter SW ON · Backup light SW (Inhibitor SW) ON	Approx. battery voltage
6	B/Y	Fuse F-12 (10A)		6-Ground	· Starter SW ON	Approx. battery voltage

POWER DOOR LOCK

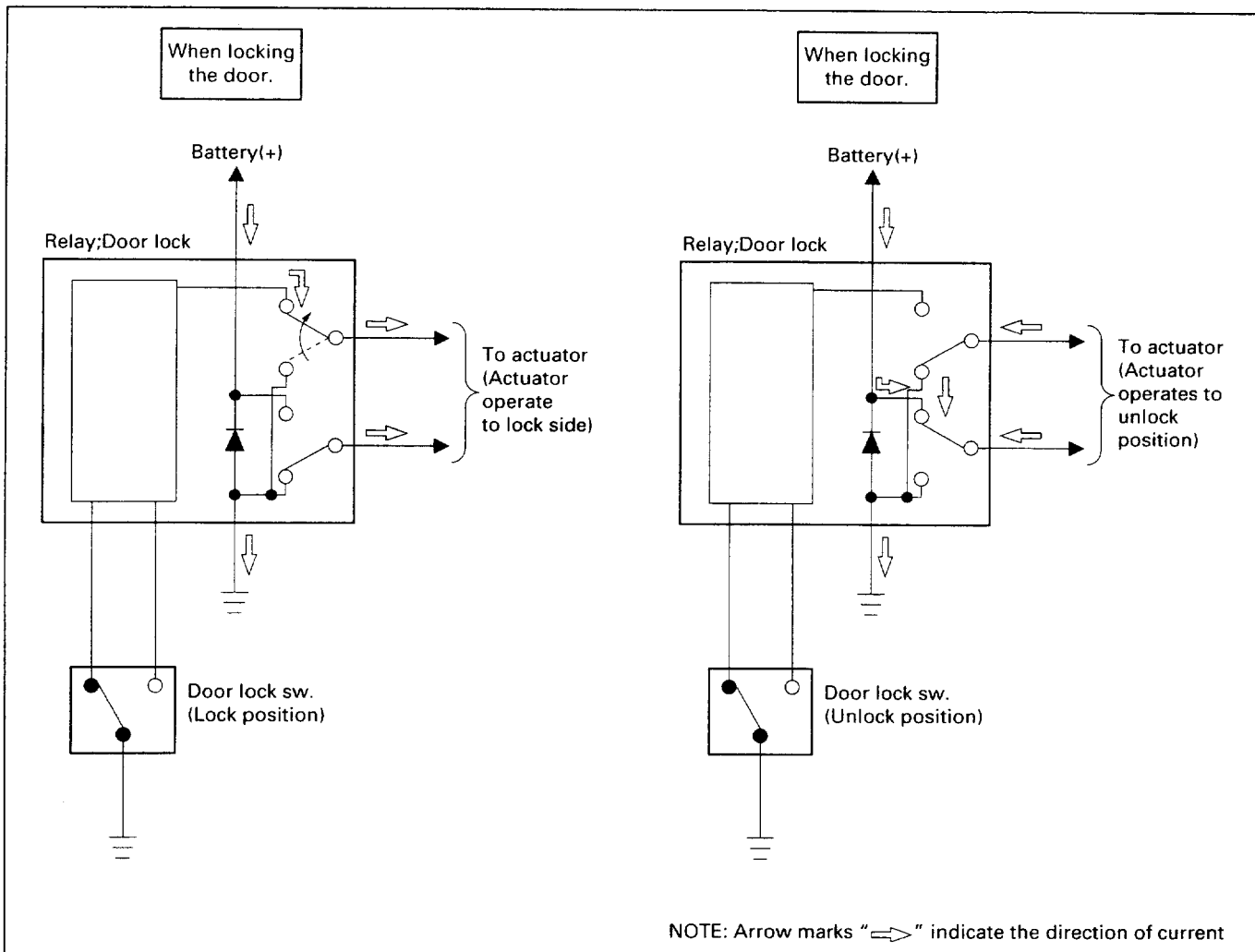
GENERAL DESCRIPTION

The circuit consists of the door lock switch, actuator for the front passenger door, rear doors and the door lock controller.

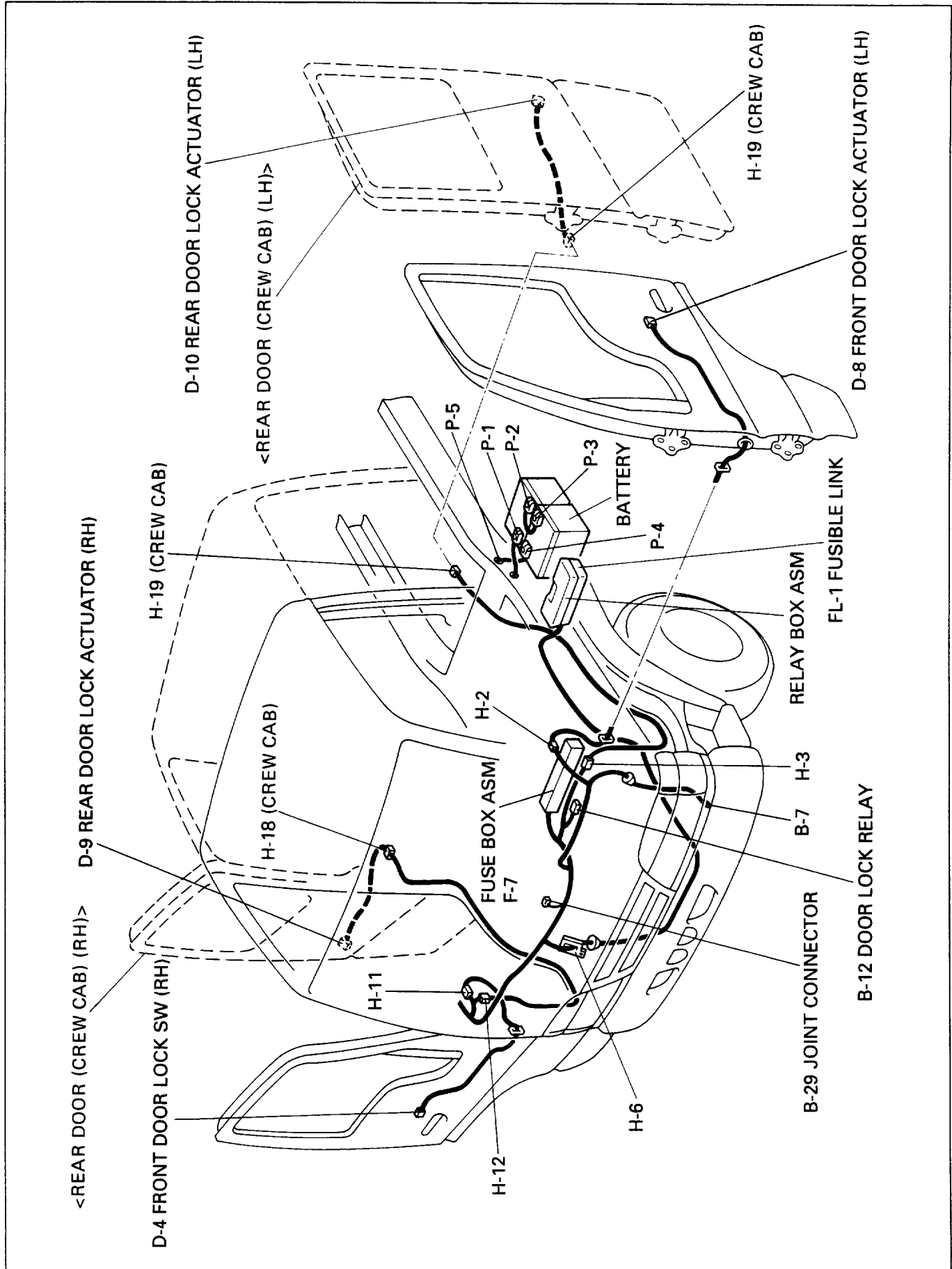
The door lock controller is always provided with battery voltage. The key or the inside lock knob on the driver's door can activate the lock mechanism of all the doors.

When the driver's door lock switch is turned on, current flows for about one second to the door lock actuator of each door connected in parallel with the controller to activate the actuator to lock and unlock the doors.

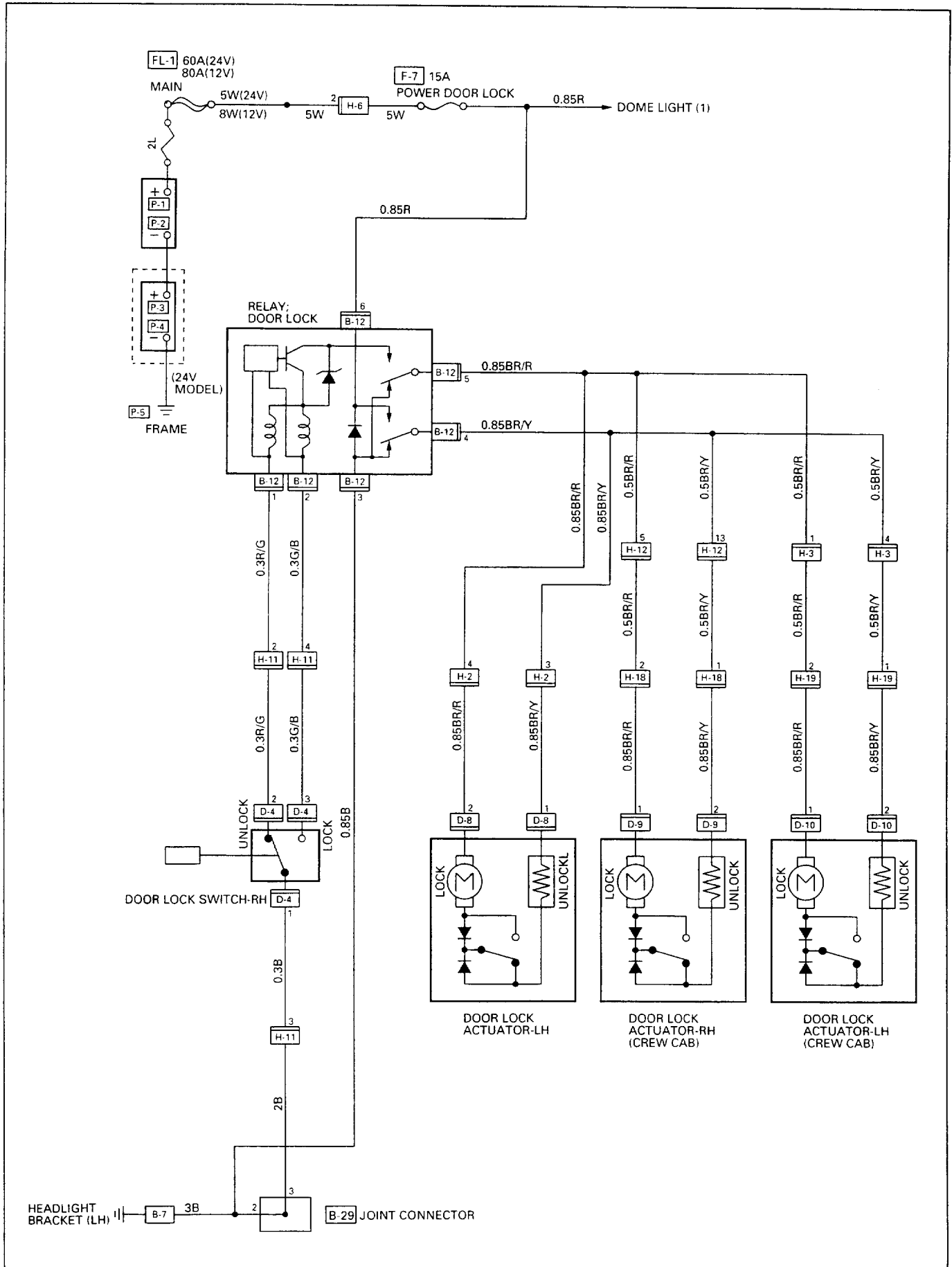
OPERATION OF DOOR LOCK CONTROLLER



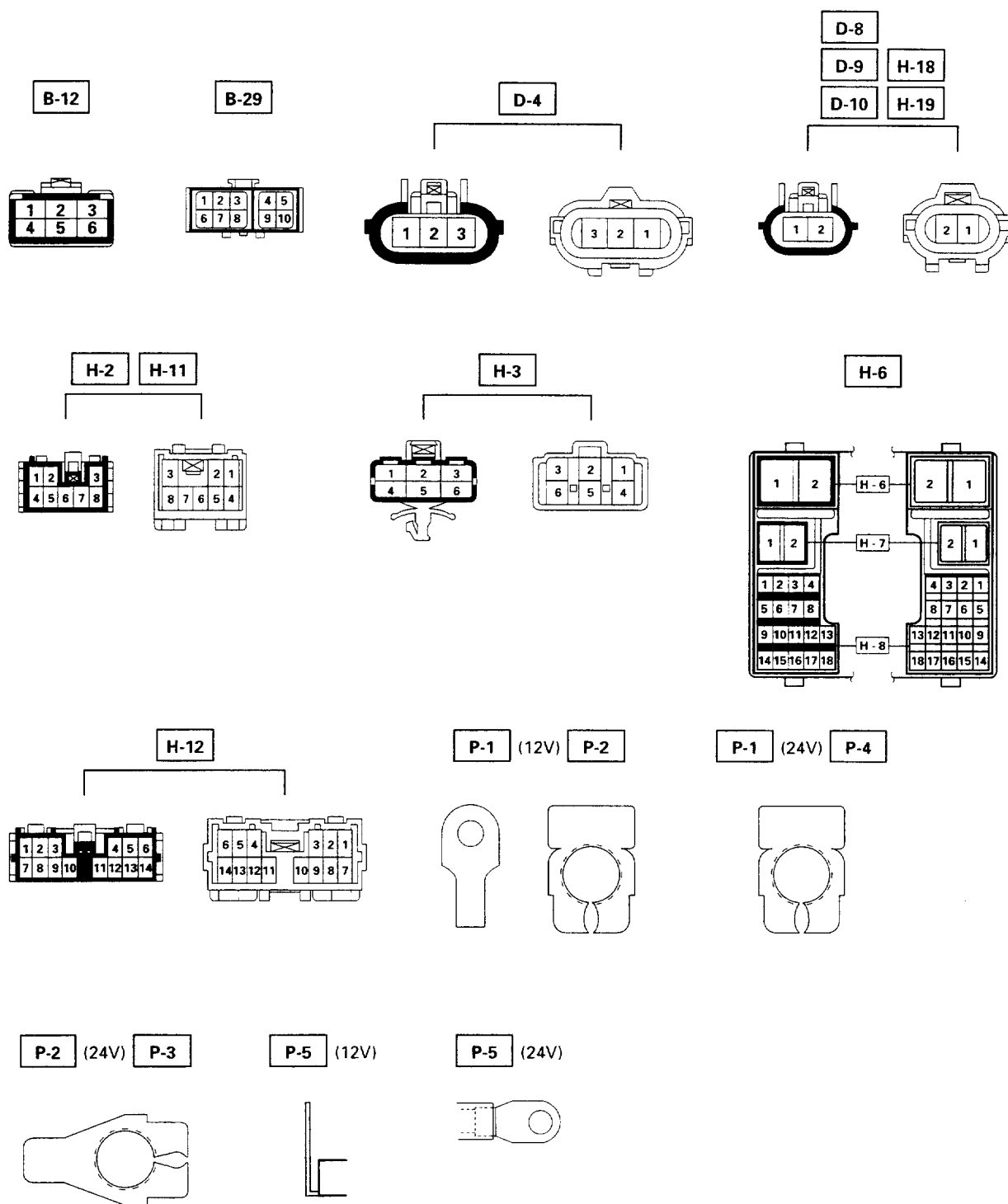
PARTS LOCATION



CIRCUIT DIAGRAM



CONNECTOR LIST

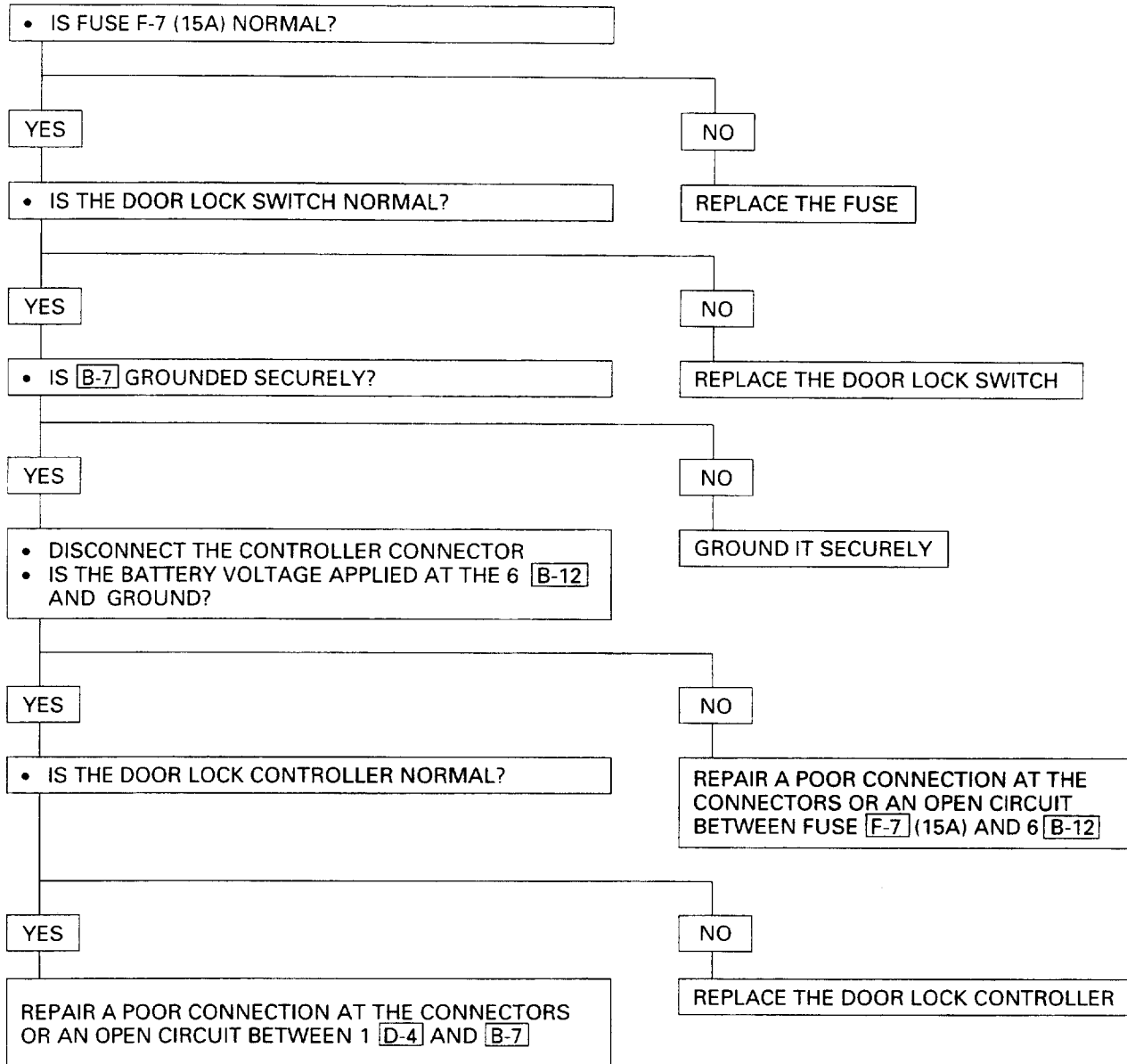


DIAGNOSIS

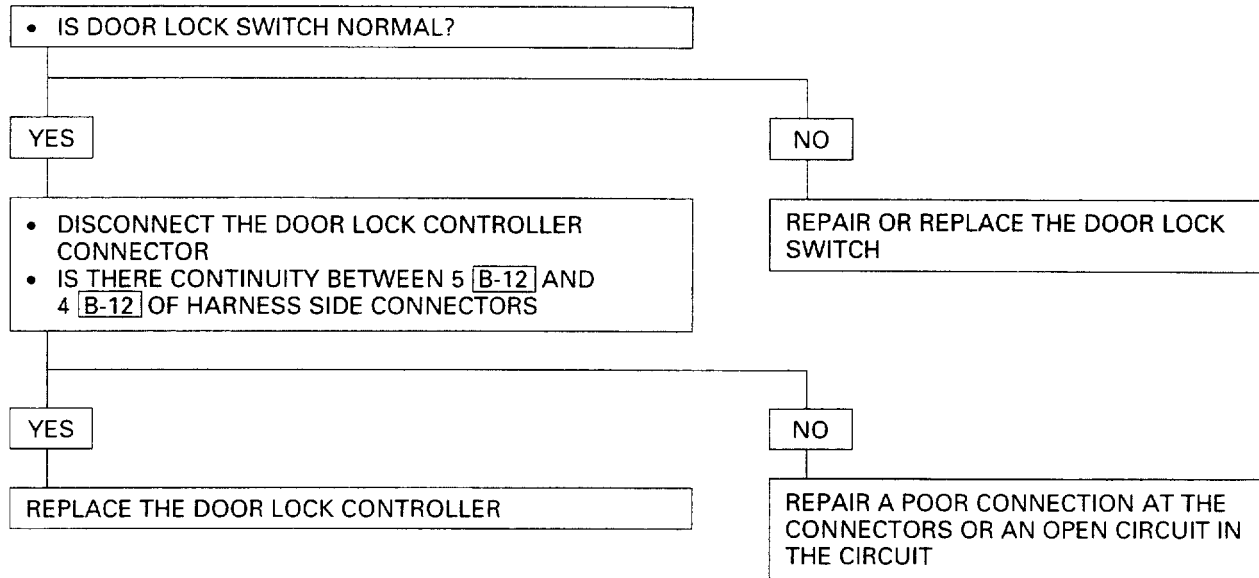
QUICK CHART FOR CHECK POINT

Trouble mode \ Check point	Fuse F-7 (15A)	Door lock controller	Door lock sw (Driver side)	Door lock actuator			
				Front (Passen- ger side)	Rear (RH)	Rear (LH)	Cable harness
1. All the doors do not lock and unlock	○ (1)	○ (2)					○ (3)
2. All the doors do not get locked (or unlocked)		○ (1)					○ (2)
3. Driver side door does not get locked (or unlocked)			○ (1)				○ (2)
4. Front passenger side door does not get locked (or unlocked)				○ (1)			○ (2)
5. Rear door-RH side does not get locked (or unlocked)					○ (1)		○ (2)
6. Rear door-LH side does not get locked (or unlocked)						○ (1)	○ (2)

NOTE: Figure in parenthesis “()” indicates the order of inspection.

1. ALL THE DOORS DO NOT LOCK AND UNLOCK

2. ALL THE DOORS DO NOT GET LOCKED (OR UNLOCKED)



3. DRIVER SIDE DOOR DOES NOT GET LOCKED (OR UNLOCKED)

REPLACE THE DOOR LOCK SWITCH

4. FRT PASSENGER SIDE DOOR DOES NOT GET LOCKED (OR UNLOCKED)

5. RR DOOR-RH SIDE DOES NOT GET LOCKED (OR UNLOCKED)

6. RR DOOR-LH SIDE DOES NOT GET LOCKED (OR UNLOCKED)

REPLACE THE DOOR LOCK ACTUATOR



INSPECTION OF THE DOOR LOCK CIRCUIT



Check the voltage and the continuity between the controller harness side connector terminals.

B-12

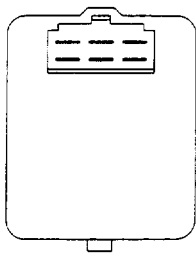


Harness side

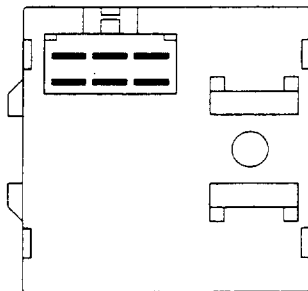
Terminal No.	Wire color	Connected to	Item to be checked	Connecting terminal	Checking conditions	Standard
1	R/G	Door lock SW (Unlock)	Continuity (Resistance)	1-Ground	Driver seat side door Unlock	Continuity
					Lock	No continuity
2	G/B	Door lock SW (Lock)		2-Ground	Driver seat side door Unlock	No continuity
					Lock	Continuity
3	B	Ground		3-Ground	—	Continuity
4	BR/Y	Actuator (Unlock)		4-5	—	Continuity (There is some resistance)
5	BR/R	Actuator (Lock)		5-4	—	Continuity (There is some resistance)
6	R	Fuse F-7 (15A)	Voltage	6-Ground	—	Battery voltage

DOOR LOCK CONTROLLER

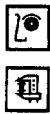
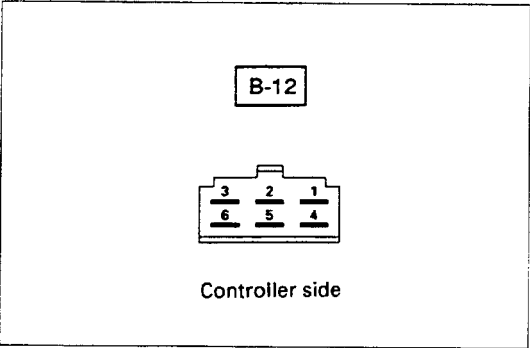
The door lock controller sends out to each door lock actuator the lock/unlock signals received from door lock switch of driver seat side.



For 12 Volt



For 24 Volt



INSPECTION

Remove the connector of the door lock controller, and check the continuity and the voltage between the controller side connector terminals.

(Connect the ⊕ terminal of the battery to 6 [B-12] and the ⊖ terminal to 3 [B-12])

- 3 [B-12] – 5 [B-12]Continuity
- 3 [B-12] – 4 [B-12]Continuity

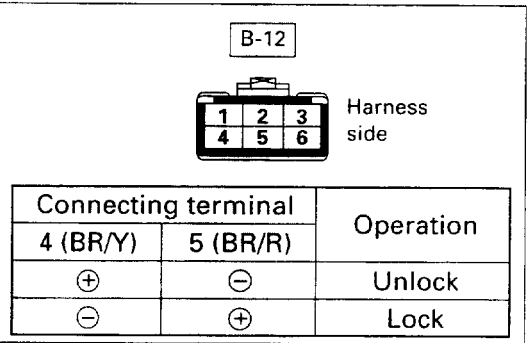
(Then, ground 2 [B-12])

5 [B-12].....Voltage for approx. 1 second

(Disconnect the ground of 2 [B-12], and ground 1 [B-12] .)

4 [B-12].....Voltage for approx. 1 second

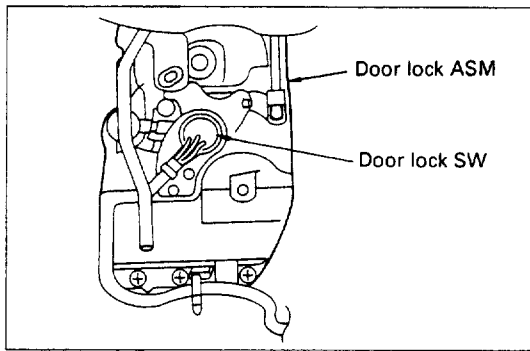
Replace the controller when the result of inspection is found abnormal.



DOOR LOCK OPERATION TEST

After confirming that there is continuity between the harness side connector terminals 4 [B-12] and 5 [B-12] of the door lock controller, apply battery voltage to each of the terminals to conduct the operation test.

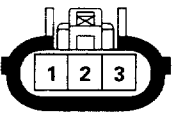
When the door lock will not operate, check the door lock actuator for any trouble.



DOOR LOCK SWITCH (DRIVER SEAT SIDE)

The door lock switch on the driver's door is connected with the door lock cylinder and the inside lock knob with a rod. The switch sends lock/unlock signals to the door lock controller.

D-4



Switch side

Operation \ Terminal No.	1	2	3
Lock	○	○	○
Unlock	○	○	



INSPECTION

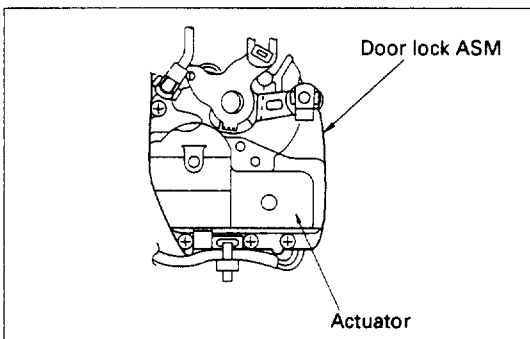
Check to see if there is any continuity between the connector terminals of the door lock switch.

Replace the switch when the result of inspection is found abnormal.



REMOVAL AND INSTALLATION

Refer to Section 10 "CAB" for "DOOR LOCK ASSEMBLY (front and rear)".



DOOR LOCK ACTUATOR

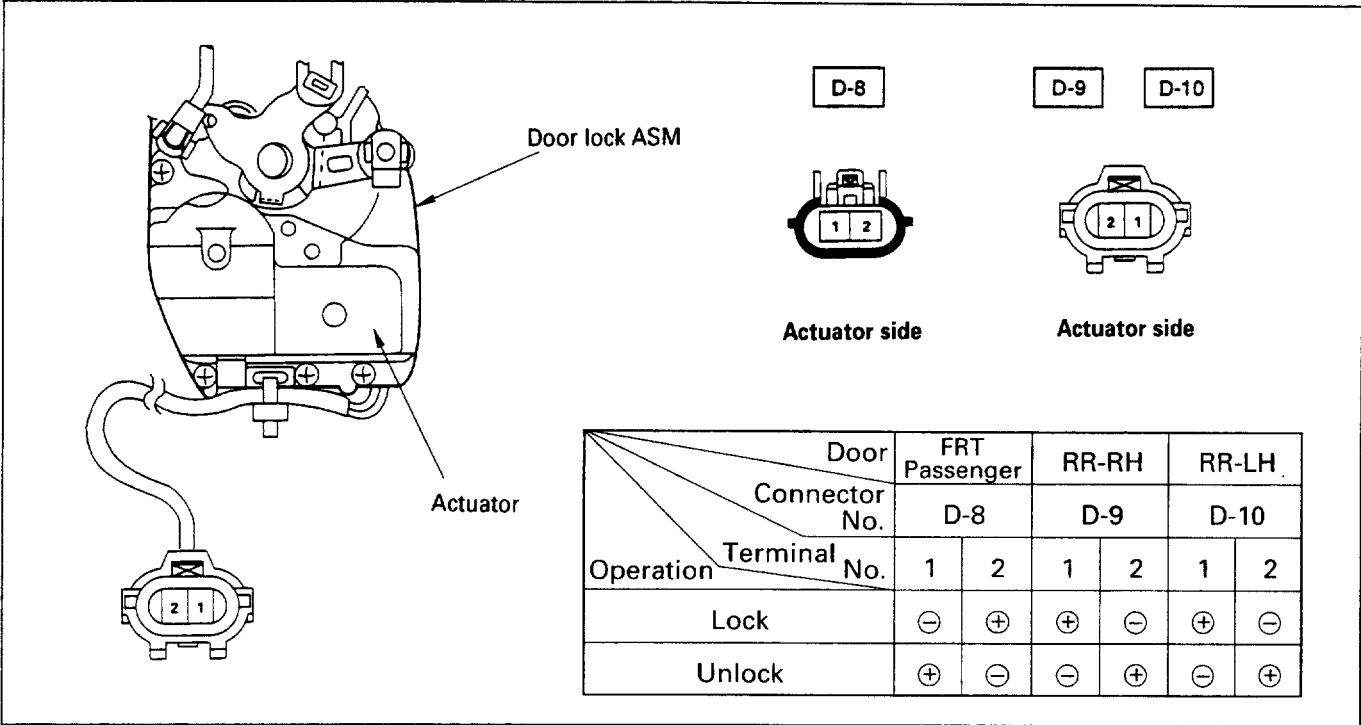
Receiving forward or reverse current from the door lock controller, the door lock actuator locks or unlocks the door with the rod connected to the door lock mechanism.



INSPECTION OF THE DOOR LOCK ACTUATOR

Apply the battery voltage to the connector terminals of the door lock actuator to check the operation.

When the door lock actuator is checked on the vehicle and there is no continuity, and when the door lock actuator itself is checked and no trouble is found, check the circuit between the door lock actuator and the door lock controller for any failure.



REMOVAL AND INSTALLATION

Refer to Section 10 "CAB" for "DOOR LOCK ASSEMBLY (Front and rear)".

POWER WINDOW

GENERAL DESCRIPTION

The circuit consist of the starter switch, power window switch for each of the windows and power window motor.

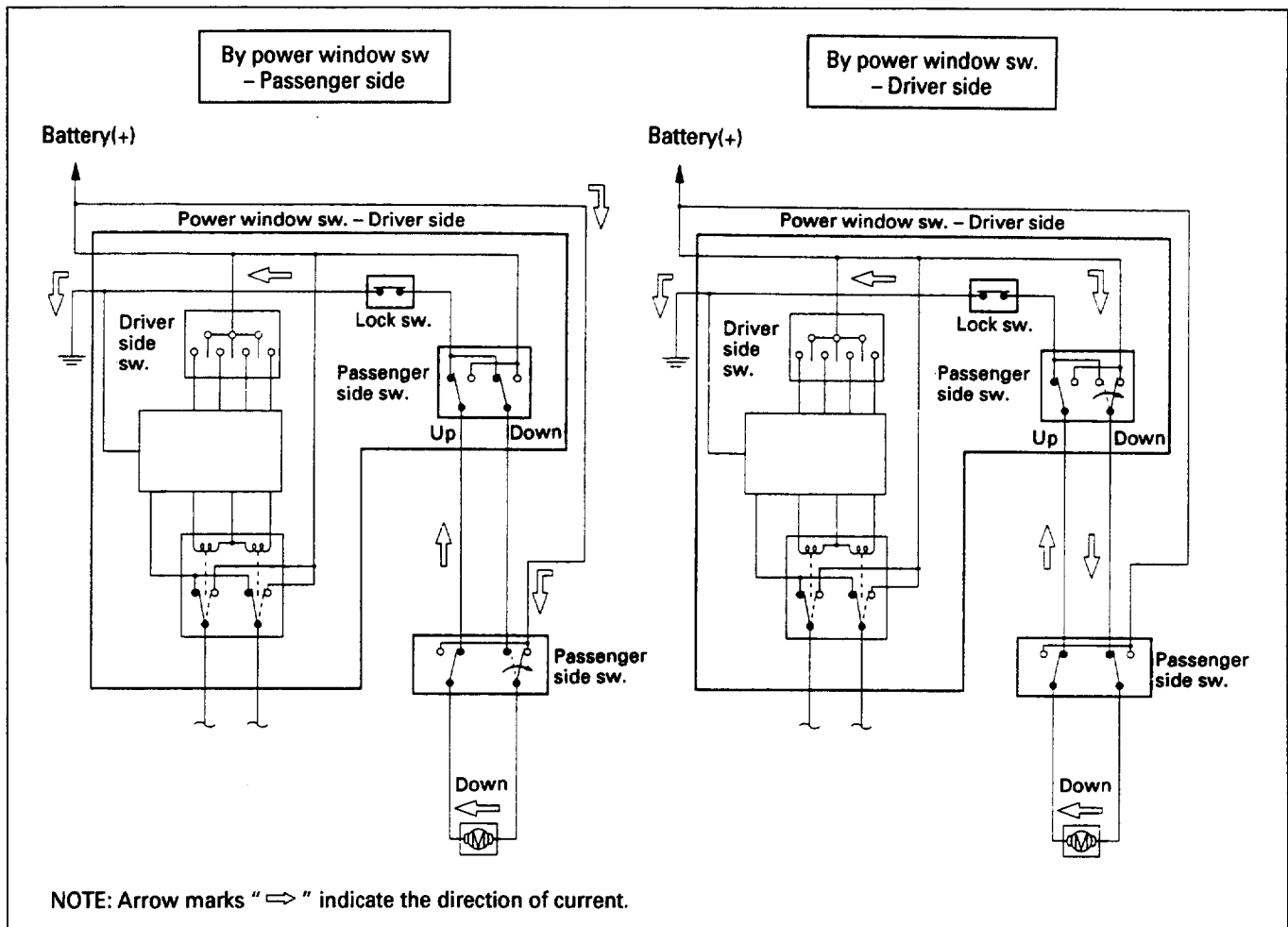
When the starter switch is turned on, the battery voltage is applied to each of the power window switches through the circuit breaker and the power window relay on the circuit.

By operating the switches of each window to select "UP" or "DOWN", the revolving direction of the power window motor changes to open or close the window.

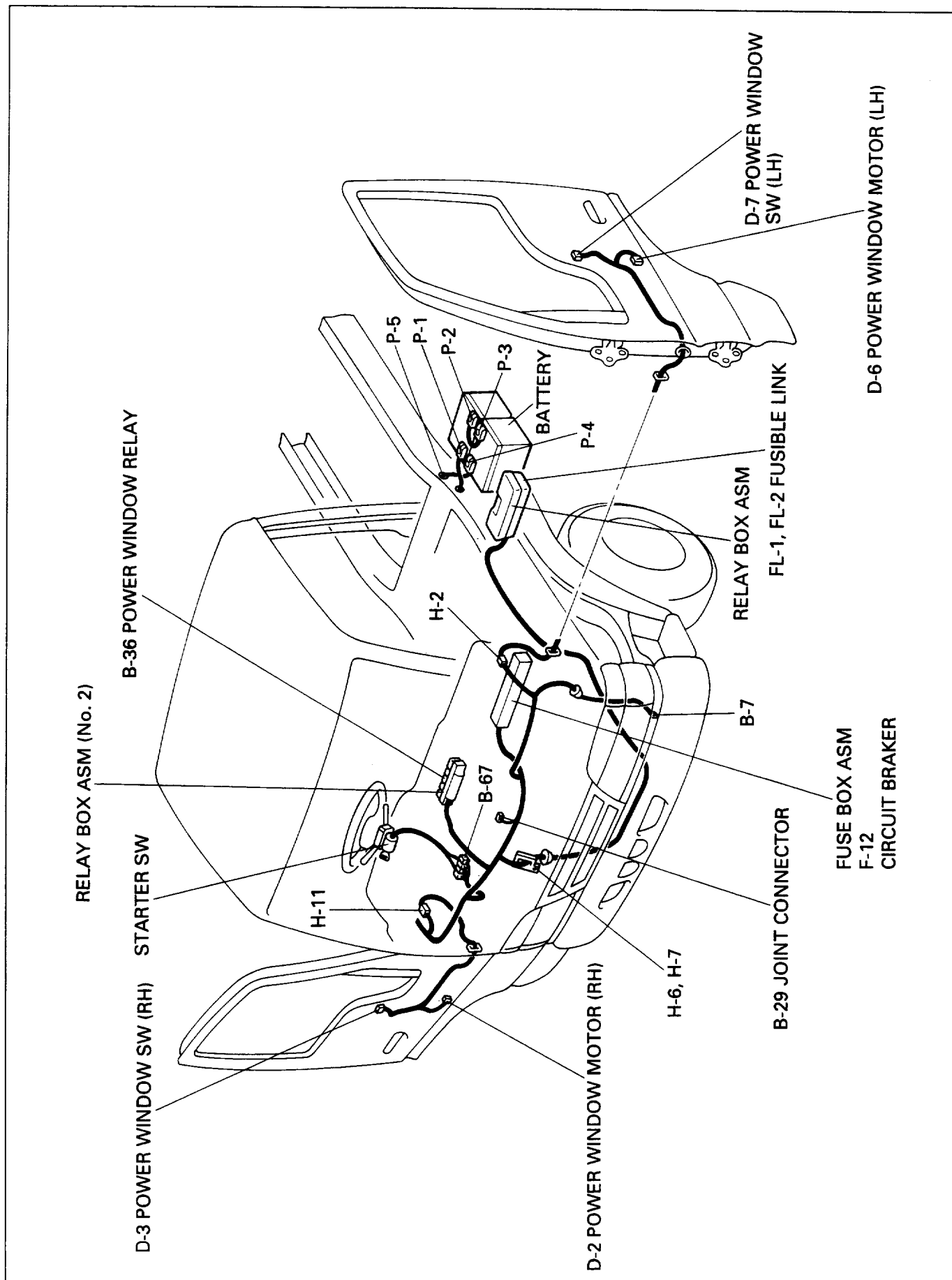
The driver's power window switch has a built-in one-touch operating circuit which allows to automatically open the window by operating the switch to the AUTO position.

When the driver's power lock switch at the driver side is depressed, the power source to the passenger's power window switches will be shut off and passenger's power window motor will not operate if the switch is operated.

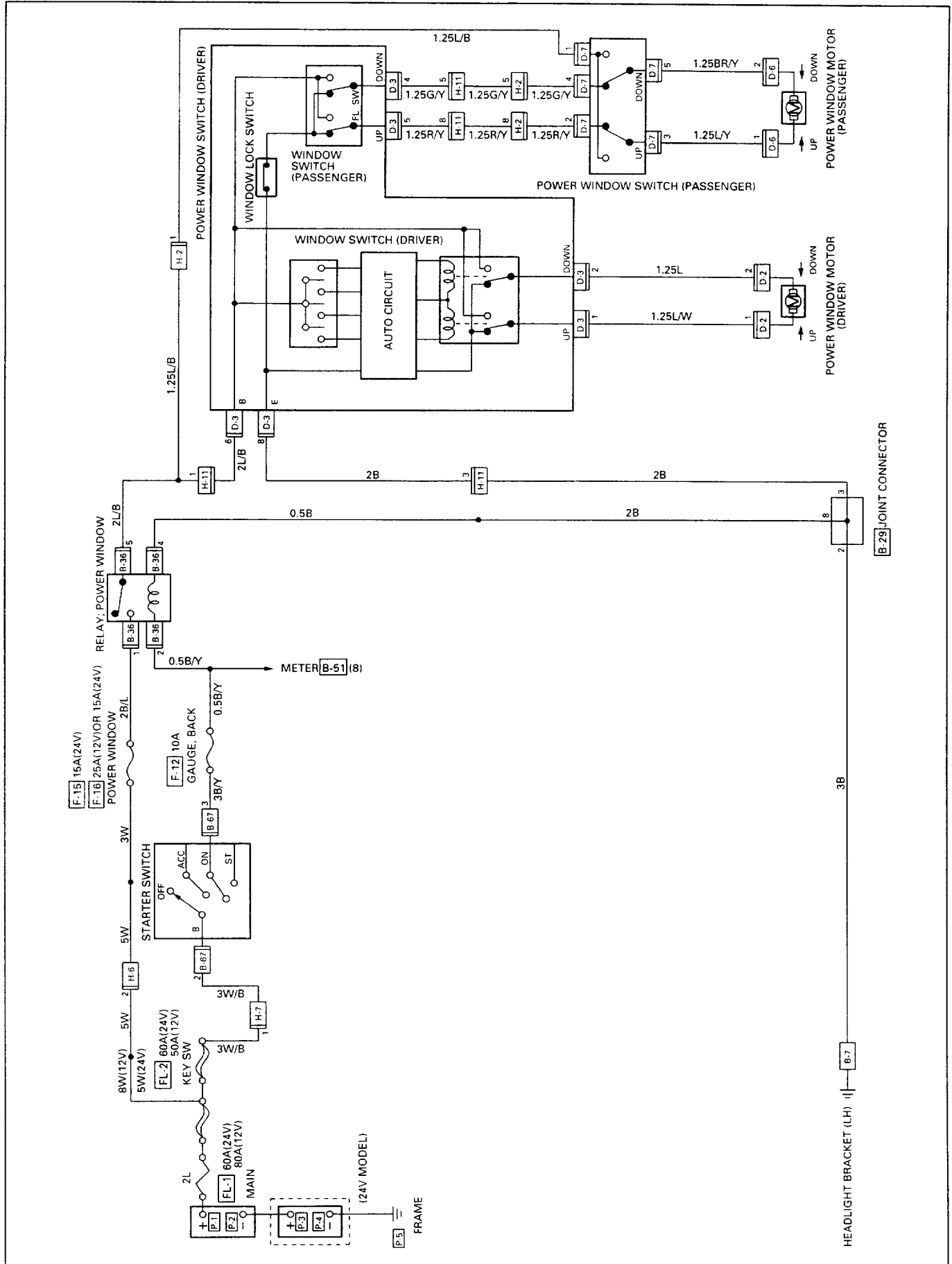
OPERATION OF PASSENGER SIDE WINDOW



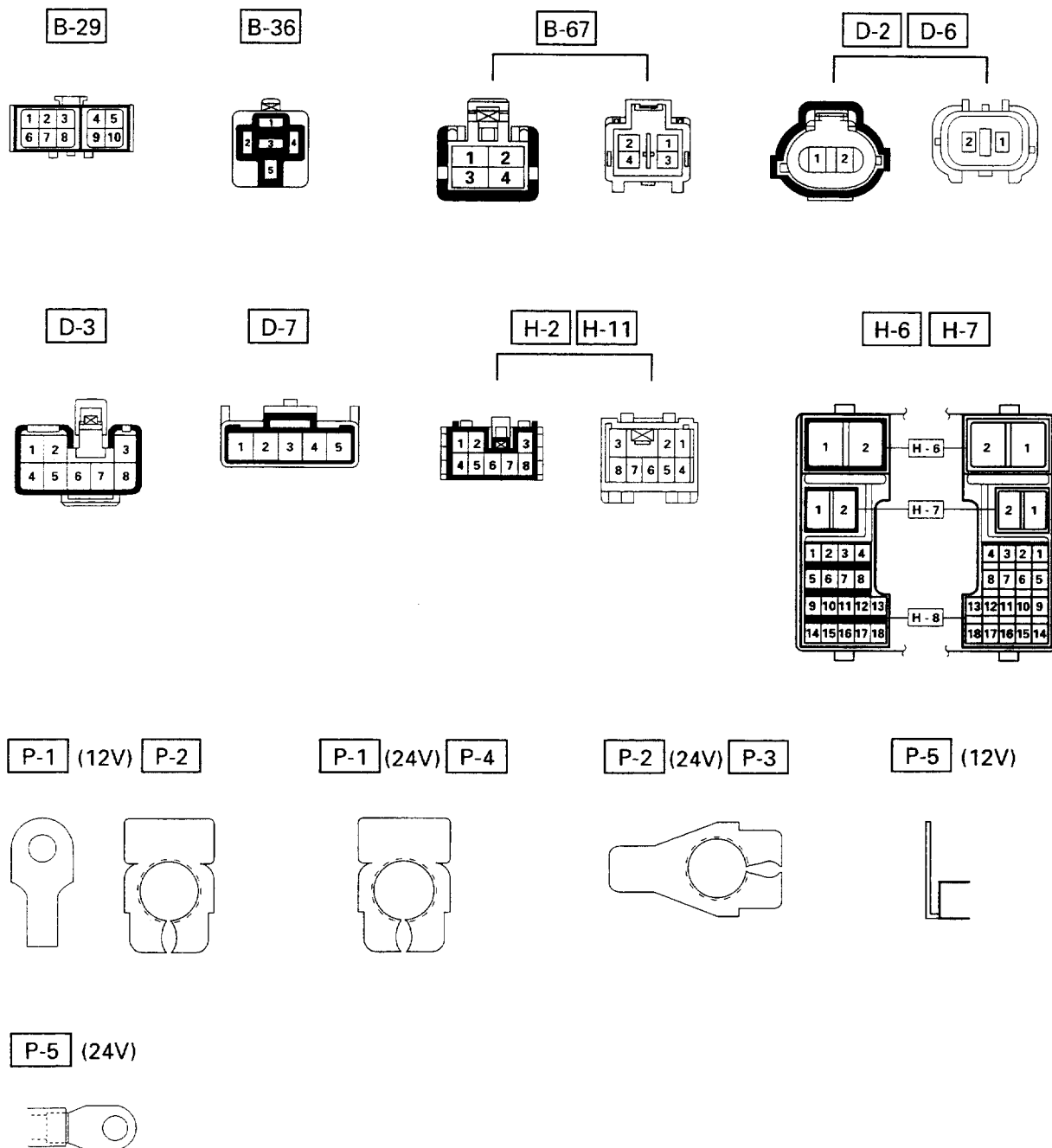
PARTS LOCATION



CIRCUIT DIAGRAM



CONNECTOR LIST

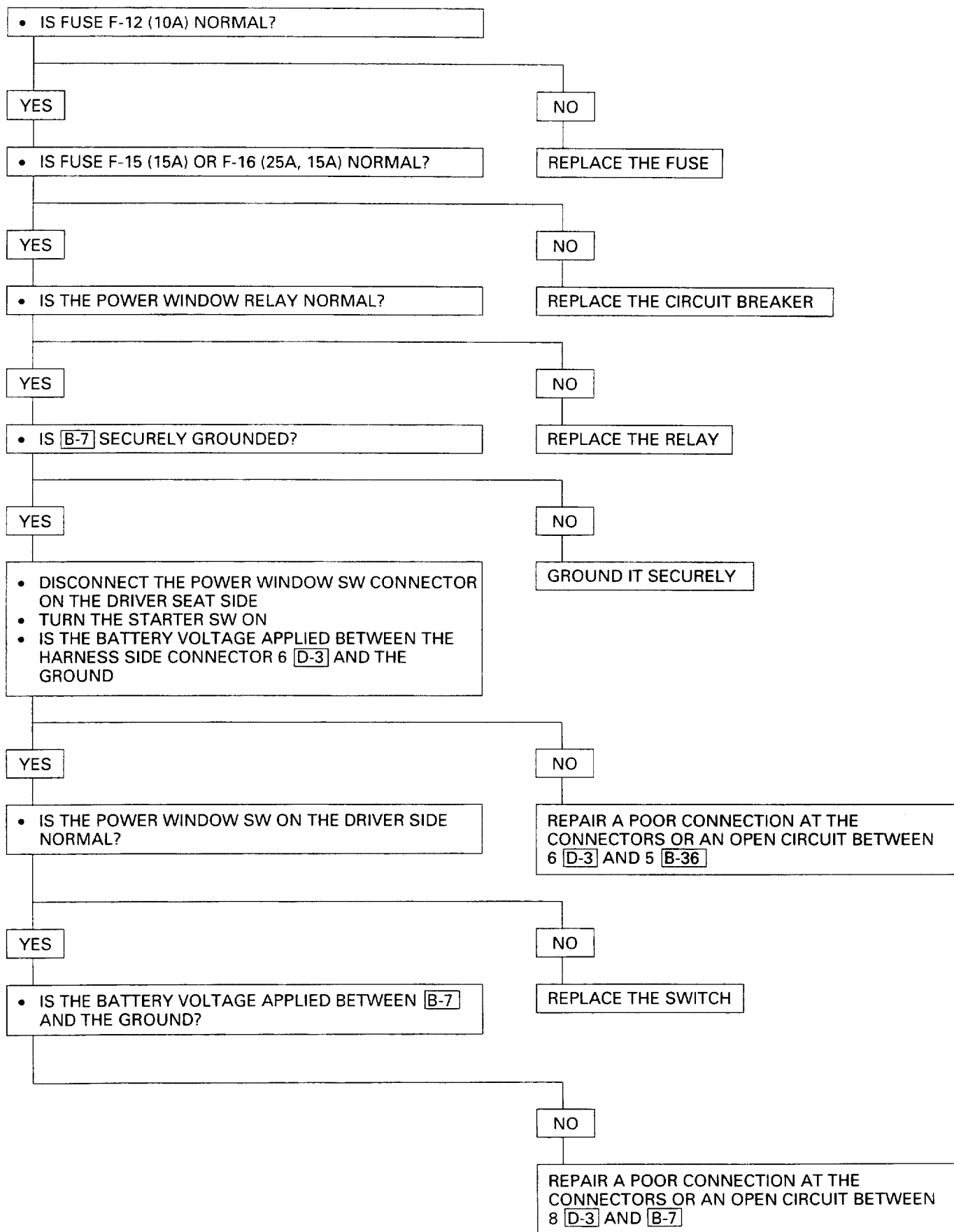


DIAGNOSIS

QUICK CHART FOR CHECK POINT

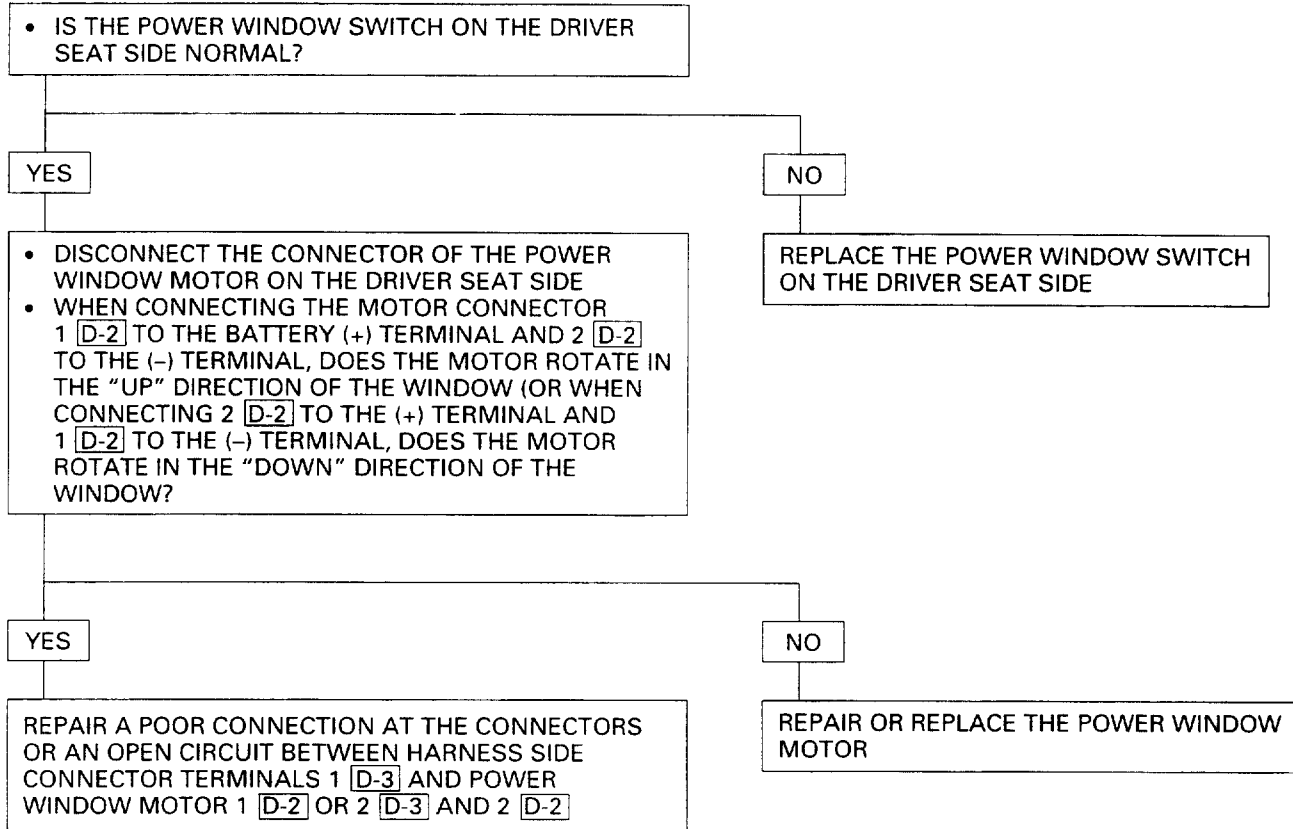
Trouble mode \ Check point	Fuse F-12 (10A)	Fuse F-15 (15A) F-16 (25A, 15A)	Power window relay	Power window SW		Power window motor		Cable harness
				Driver side	Passen- ger side	Driver side	Passen- ger side	
All windows do not operate	○ (1)	○ (2)	○ (3)	○ (5)				○ (4)
Lock SW does not function				○ (1)				
Driver side window								
Window does not operate				○ (1)		○ (2)		○ (3)
One-touch operation does not operate				○ (1)				
Window operates in only one direction				○ (1)				
Front passenger side window								
Window does not operate				○ (2)	○ (1)		○ (3)	○ (4)
Window does not operate when operating the driver side SW				○ (1)				○ (2)
Window does not operate when operating the passenger side SW					○ (1)			○ (2)
Window operates in only one direction when operating the driver side SW				○ (1)				○ (2)
Window operates in only one direction when operating the passenger side SW				○ (2)	○ (1)			○ (3)

NOTE: Figure in parenthesis “()” indicates the order of inspection.

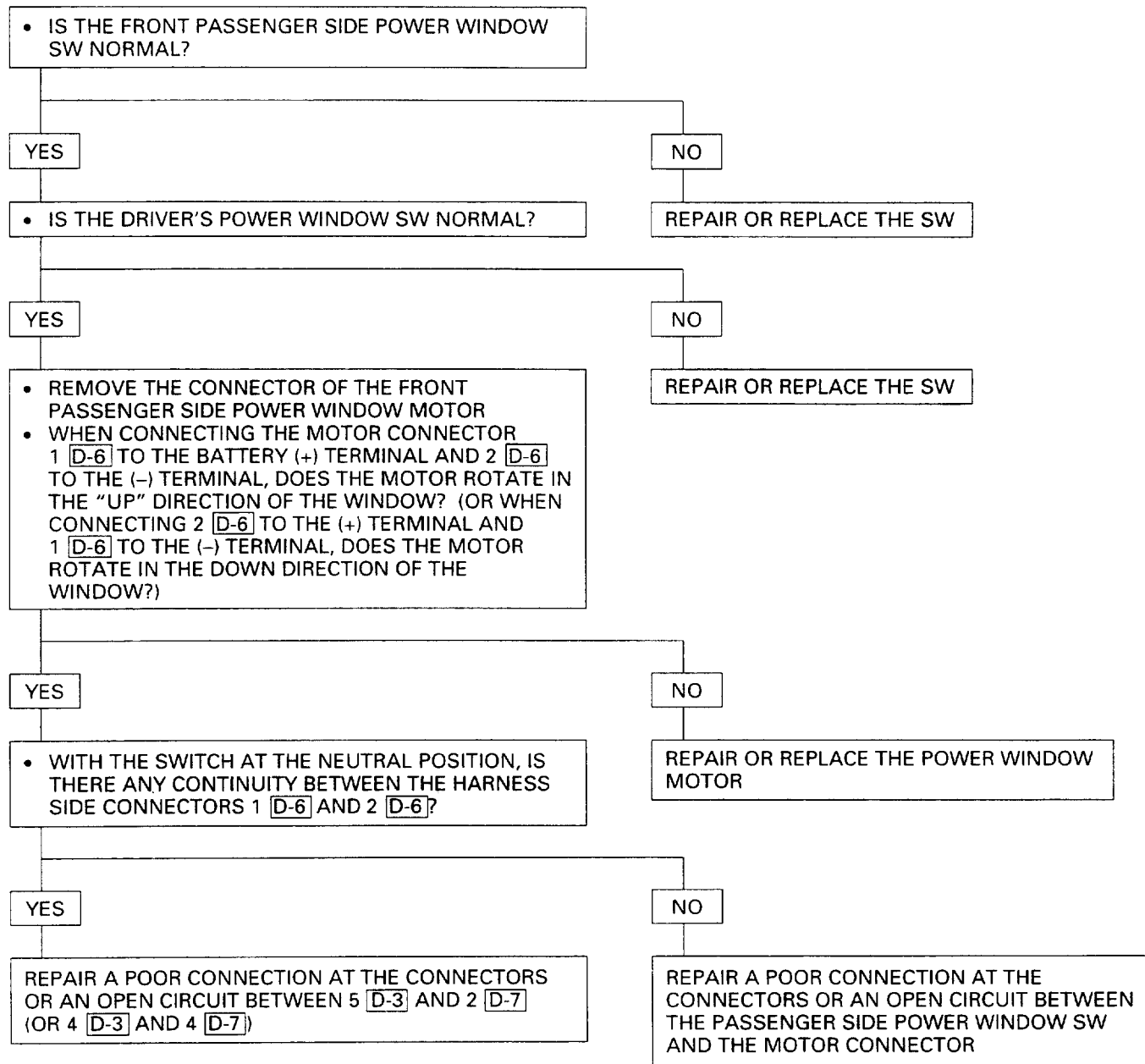
ALL WINDOWS DO NOT OPERATE

LOCK SW DOES NOT FUNCTION

REPAIR OR REPLACE THE POWER WINDOW SW
ON THE DRIVER SEAT SIDE

WINDOW ON THE DRIVER SIDE DOES NOT OPERATE

WINDOW ON THE FRONT PASSENGER SIDE DOES NOT OPERATE



STARTER SWITCH

Refer to "START AND CHARGING" in this section.

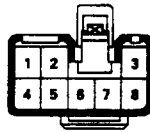
POWER WINDOW SWITCH-DRIVER SIDE



CIRCUIT INSPECTION

Disconnect the switch connectors to check the voltage and the continuity between the harness side connector terminals.

D-3



Harness side

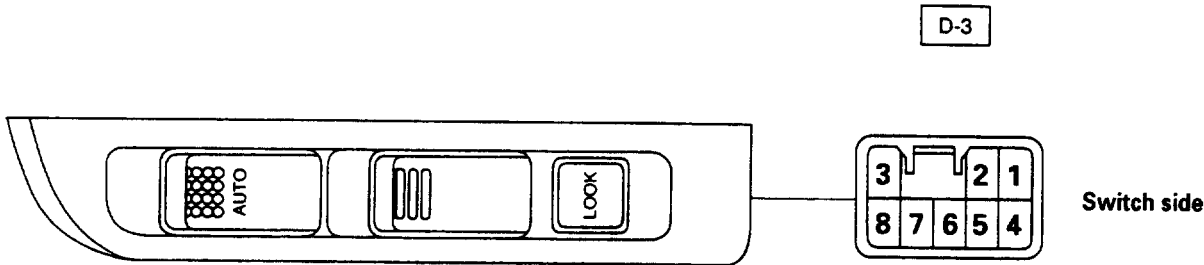
Terminal No.	Wire color	Connected to	Item to be checked	Connecting terminal	Checking conditions	Standard
1	L/W	Driver seat side motor	Continuity (resistance)	1-2	-	Continuity
2	L					
4	G/Y	Passenger side power window SW		4-5		
5	R/Y		5-4			
6	L/B	Power window relay	Voltage	6-Ground	Starter SW "ON"	Battery voltage
8	B	Ground	Continuity (resistance)	8-Ground	-	Continuity



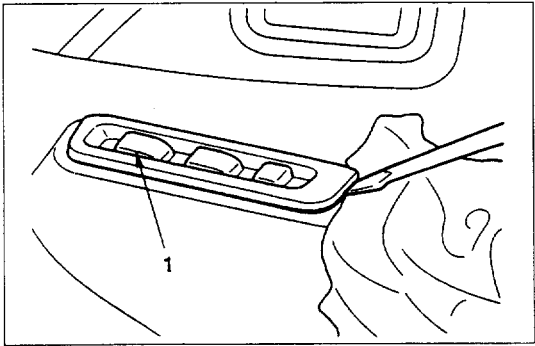
INSPECTION

Check the continuity between the connector terminals of the switch.

Repair or replace the switch when the result of inspection is found abnormal.



Window		Driver side				Passenger side			
SW position	Terminal No.	6	1	2	8	6	5	4	8
UP		○	○	○	○	○	○	○	○
OFF			○		○		○		○
DOWN		○		○		○		○	
LOCK	UP	○	○	○	○	○	○		
	OFF		○		○		○	○	
	DOWN	○		○		○		○	



REMOVAL

Preparation:
Disconnect the battery ground cable.

1. **Switch**
- 1) Insert the screw driver to the cut off portion to remove the switch.
 - 2) Disconnect the connector



INSTALLATION

To install, follow the removal steps in the reverse order.

POWER WINDOW SWITCH-PASSENGER SIDE



CIRCUIT INSPECTION

Disconnect the switch connectors to check the voltage and the continuity between the harness side connector terminals

D-7



Harness side

Terminal No.	Wire color	Connected to	Item to be checked	Connecting terminal	Checking conditions	Standard
1	L/B	Power window relay	Voltage	1-Ground	· Turn "ON" the starter SW	Battery voltage
2	R/Y	Driver side SW	Continuity (Resistance)	2-Ground	· Turn "OFF" the passenger side SW at the driver side SW	Continuity
			Voltage	2-Ground	· Turn "ON" the starter SW · Turn to "UP" the passenger side SW at the driver side SW	Battery voltage
3	L/Y	Passenger side motor	Continuity (Resistance)	3-5	-	Continuity
4	G/Y	Driver side SW	Continuity (Resistance)	4-Ground	· Turn "OFF" the passenger side SW at the driver side SW	Continuity
			Voltage	4-Ground	· Turn "ON" the starter SW · Turn to "DOWN" the passenger side SW at the driver side SW	Battery voltage
5	BR/Y	Passenger side motor	Continuity (Resistance)	5-3	-	Continuity

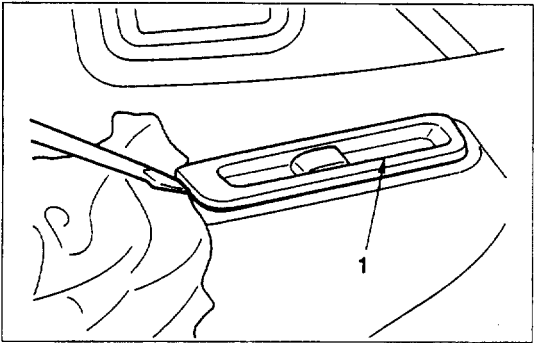
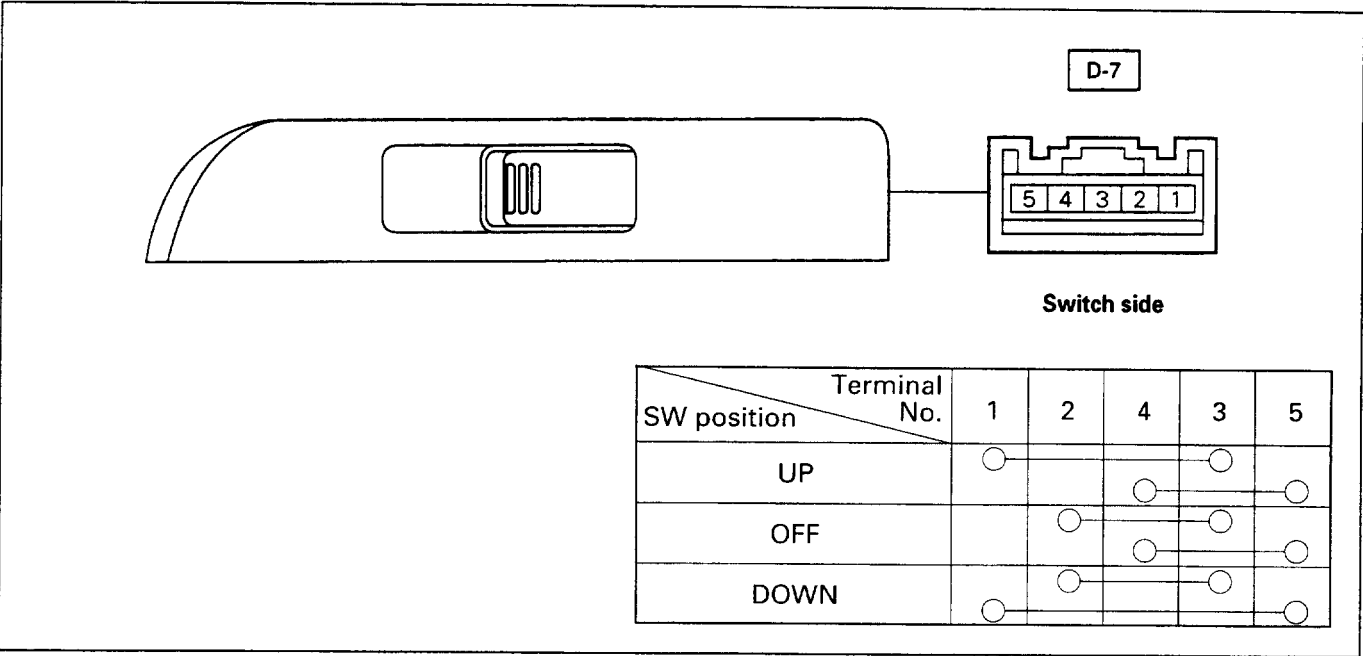


INSPECTION

Check the continuity between the connector terminals of the switch.



Repair or replace the switch when the result of inspection is found abnormal.



REMOVAL

Preparation:

Disconnect the battery ground cable.

1. Switch

- 1) Insert the screw driver to the cut off portion to remove the switch.
- 2) Disconnect the connector.



INSTALLATION

To install, follow the removal steps in the reverse order.

DRIVER SEAT SIDE POWER WINDOW MOTOR

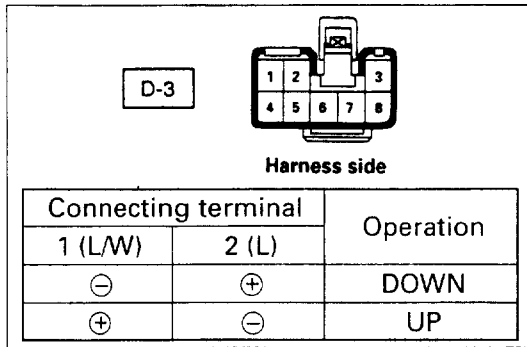


INSPECTION

Before checking to see if the motor functions correctly, be sure to check the circuit through the connector **D-3** of the driver's power window switch.

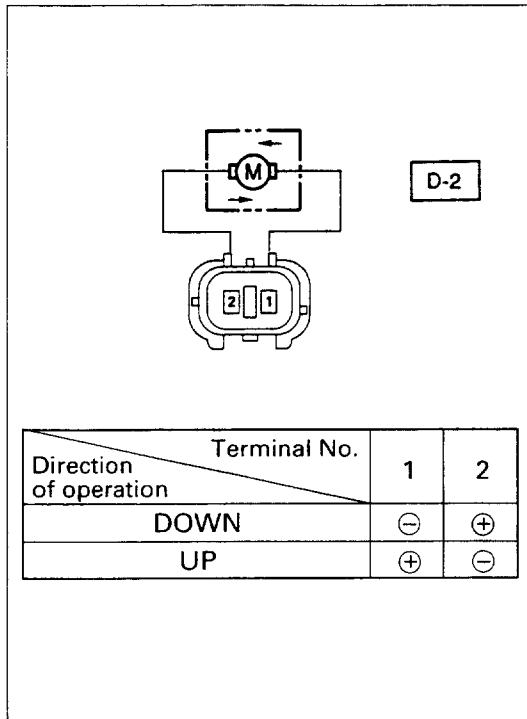
If the motor does not operate smoothly, either the motor or the circuit between the switch and the motor is defective.





1. Circuit inspection of the driver side window switch

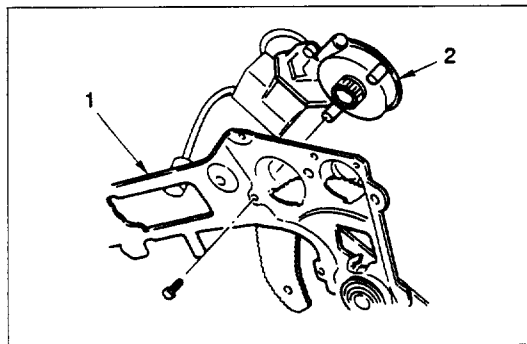
Disconnect the switch connector and apply battery voltage to the harness side connector terminals to check its function.



2. Inspection of the driver seat side motor

Remove the motor connector and apply battery voltage to the motor side connector terminals to check its function.

Replace the motor when the result of inspection is found abnormal.



REMOVAL

Preparation:

Disconnect the battery ground cable.

1. Window Regulator Assembly

Refer to Section 10 "BODY" for Window Regulator and Glass.

2. Power Window Motor

Remove three screws.



INSTALLATION

To install, follow the removal steps in the reverse order.

FRONT PASSENGER SEAT SIDE POWER WINDOW MOTOR



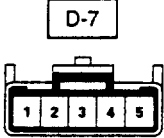
INSPECTION

Before checking to see if the motor functions correctly, be sure to check the circuit through the front passenger's switch connector **D-7** and the driver's power window switch connector **D-3**.

If the motor does not operate smoothly, either the motor or the circuit between the switch and the motor is defective.

1. Circuit inspection of the front passenger seat side window

Disconnect the switch connector and apply battery voltage to the harness side connector terminals to check its function.

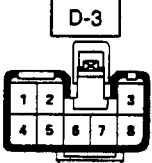


D-7
Harness side

Connecting terminal		Direction of operation
3 (L/Y)	5 (BR/Y)	
⊖	⊕	DOWN
⊕	⊖	UP

2. Circuit inspection of the driver seat side switch

Disconnect the switch connector and apply battery voltage to the harness side connector terminals to check its function.



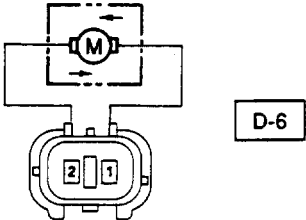
D-3
Harness side

Connecting terminal		Direction of operation
4 (G/Y)	5 (R/Y)	
⊕	⊖	DOWN
⊖	⊕	UP

3. Inspection of the front passenger window motor

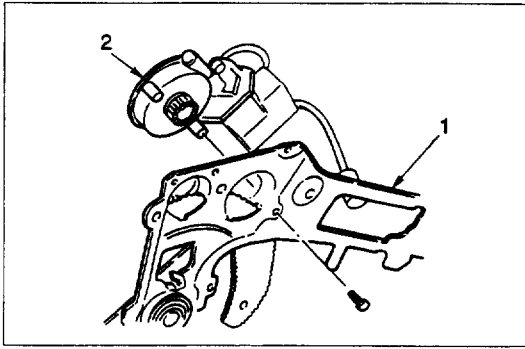
Disconnect the motor connector and apply battery voltage to the motor side connector terminals to check its function.

Repair or replace the motor when the result of inspection is found abnormal.



D-6

Direction of operation \ Terminal No.	1	2
DOWN	⊖	⊕
UP	⊕	⊖



REMOVAL

Preparation:

Disconnect the battery ground cable.

1. Window Regulator Assembly

Refer to Section 10 "BODY" for Window Regulator and Glass.

2. Power Window Motor

Remove three screws.



INSTALLATION

To install, follow the removal steps in the reverse order.

A/T ECU (ELECTRONIC CONTROL UNIT)

GENERAL DESCRIPTION

The circuit consists of the starter switch ECU, pattern select switch, inhibitor switch, kickdown switch, idle switch, tacho sensor, vehicle speed sensor, throttle sensor, full throttle switch, dropping resistor OD switch and the relay.

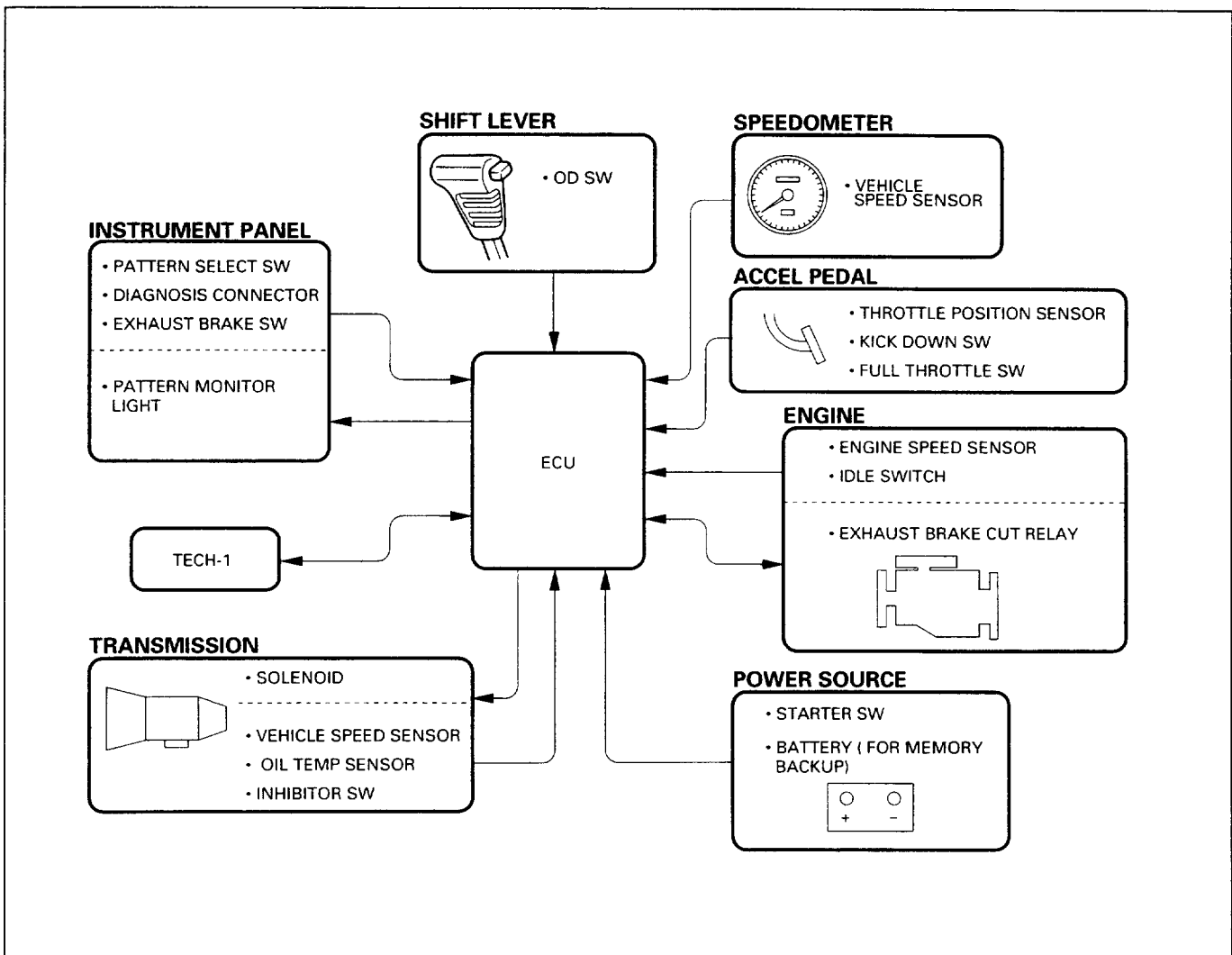
ECU, the key component of A/T ECU, judges where to shift speed and where to lock up shifting by the electric signals delivered from each one of the switches and sensors, and send controlling signals to respective solenoids.

The controllable items are speed shift pattern, speed shift, lock-up, oil pressure for each line and exhaust brake operative timing.

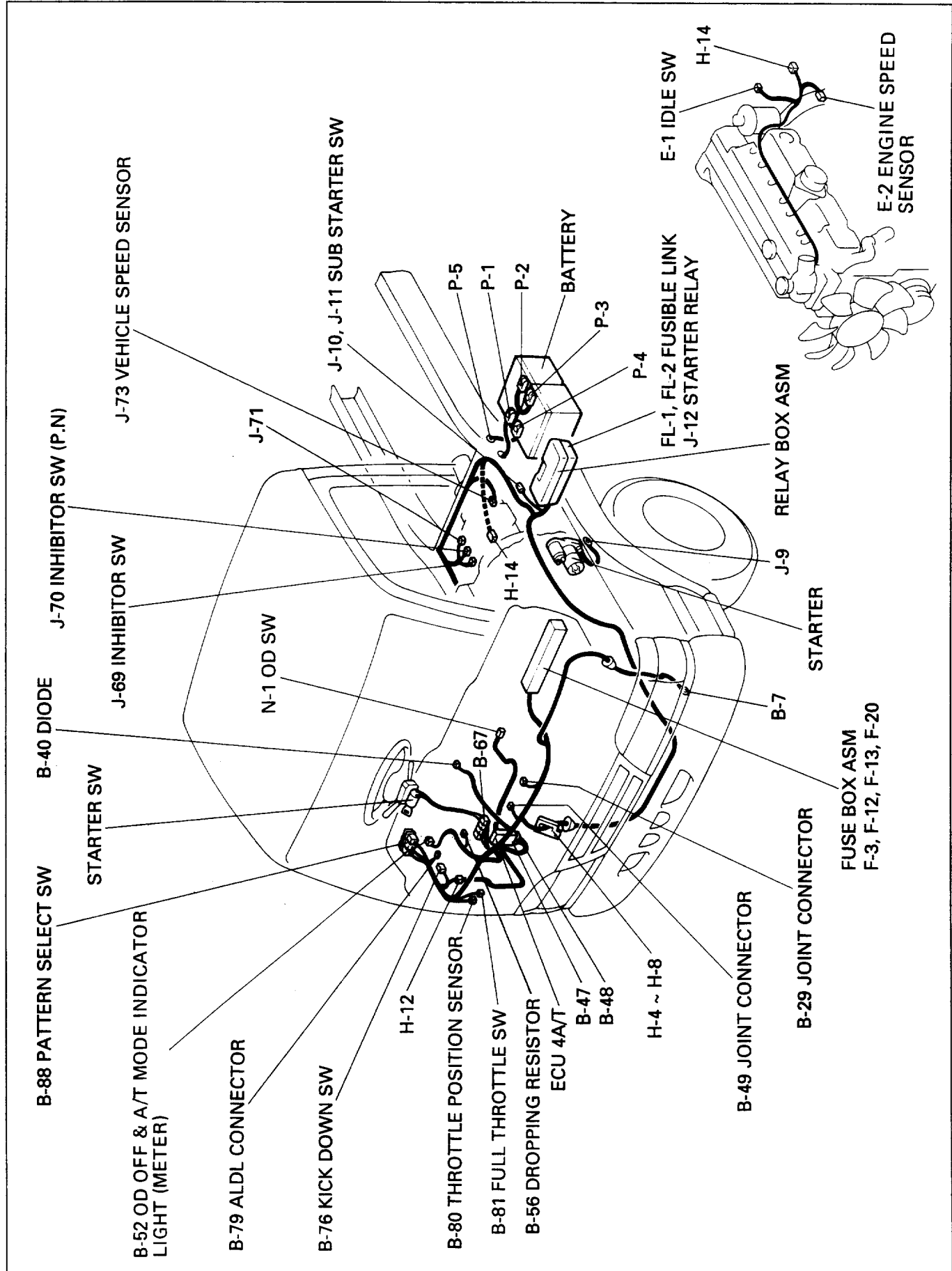
ECU also has TECH-1 diagnosis controlling function.

For details, refer to section 1A1 and 7A2 "AUTOMATIC TRANSMISSION".

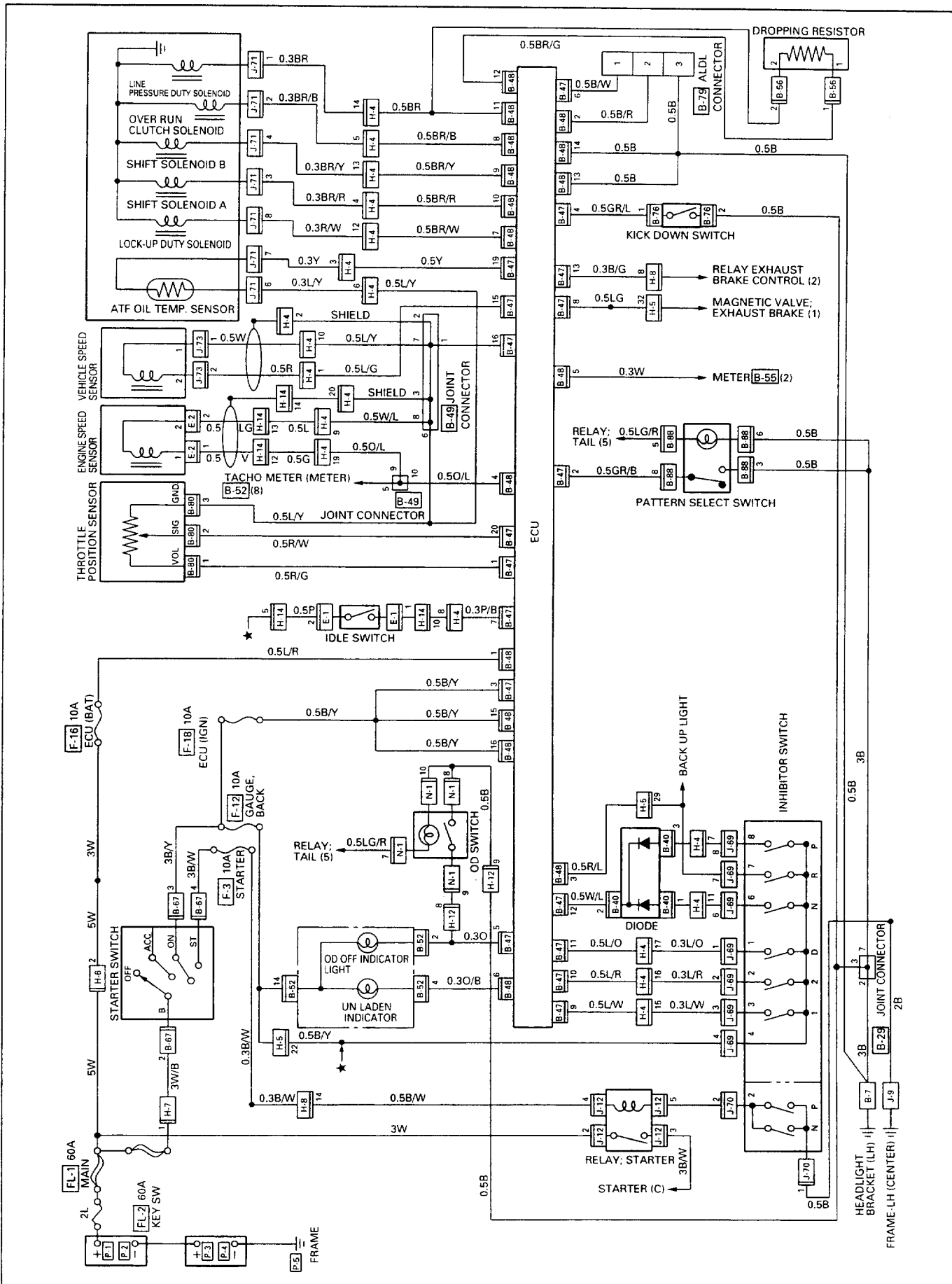
ECU OUTPUT AND INPUT DIAGRAM



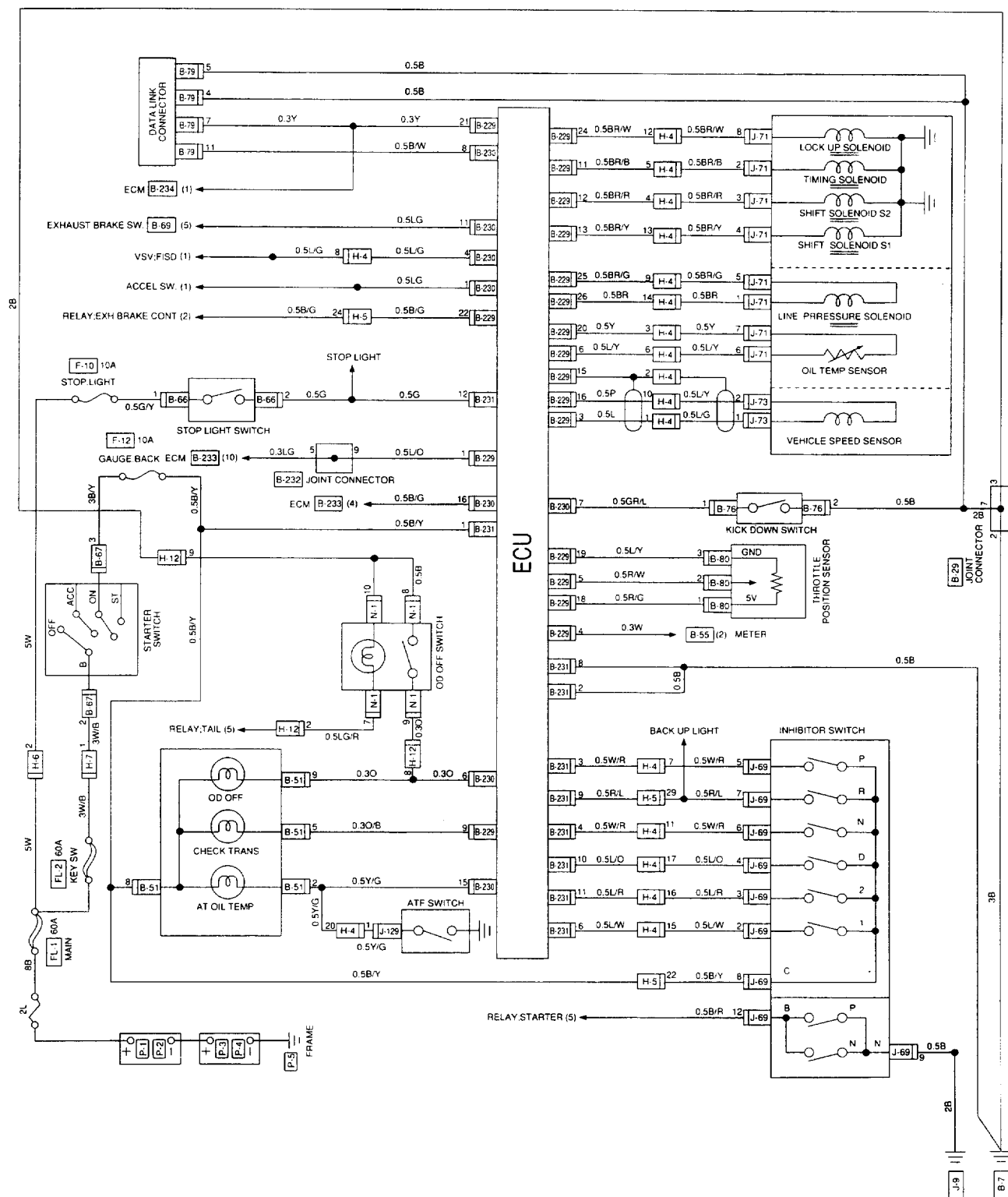
PARTS LOCATION



CIRCUIT DIAGRAM - FOR 4HF1 ENGINE MODEL

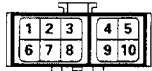


CIRCUIT DIAGRAM - FOR 4HE1 ENGINE MODEL

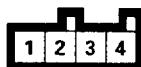


CONNECTOR LIST

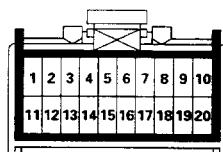
B-29 B-49
B-232



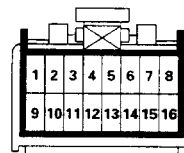
B-40



B-47



B-48



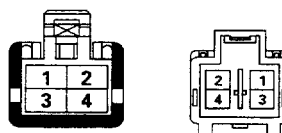
B-51



B-56



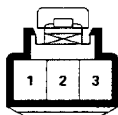
B-67



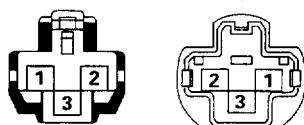
B-76



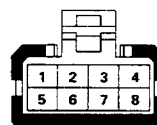
B-79



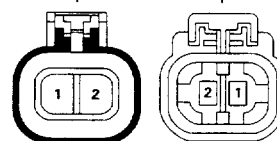
B-80



B-88



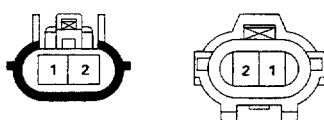
E-1



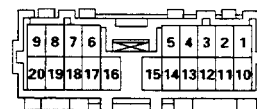
E-2

J-70

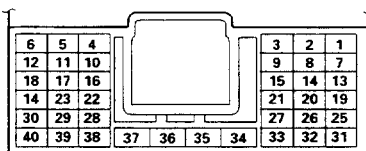
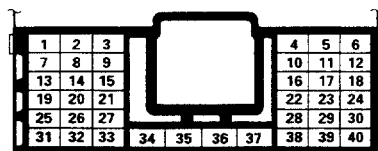
J-73



H-4



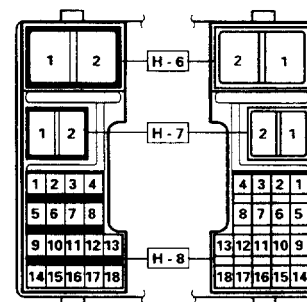
H-5



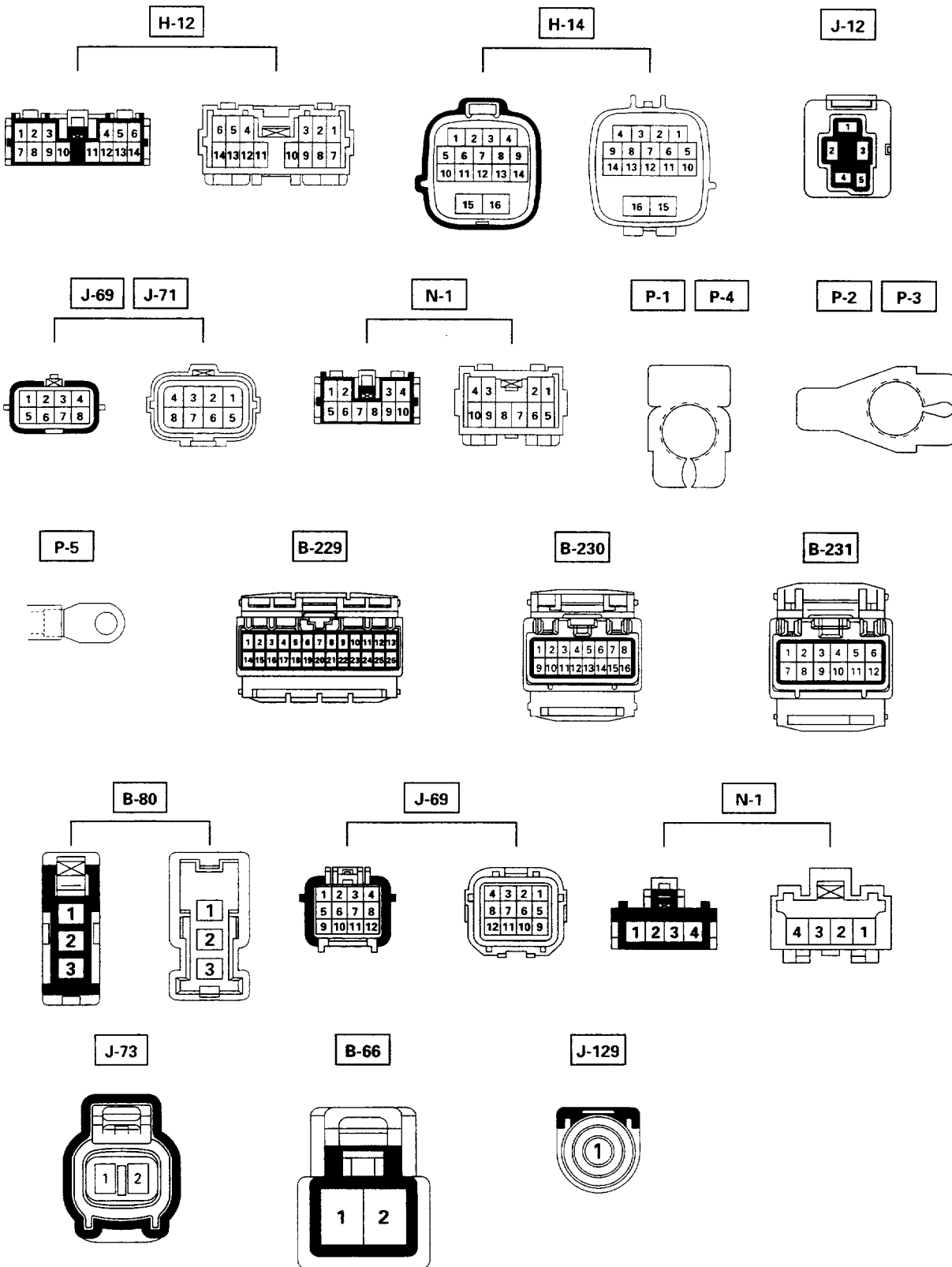
H-6

H-7

H-8



CONNECTOR LIST

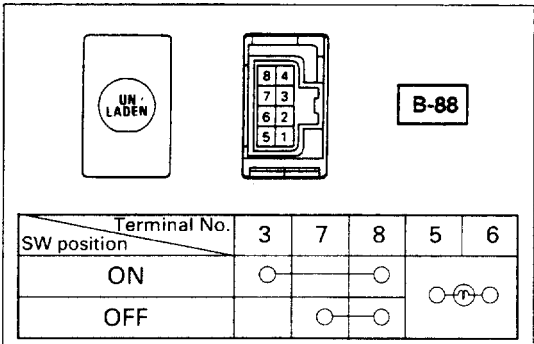


**STARTER SWITCH
STARTER RELAY**

Refer to “START AND CHARGING” in this section.

STOPLIGHT SWITCH

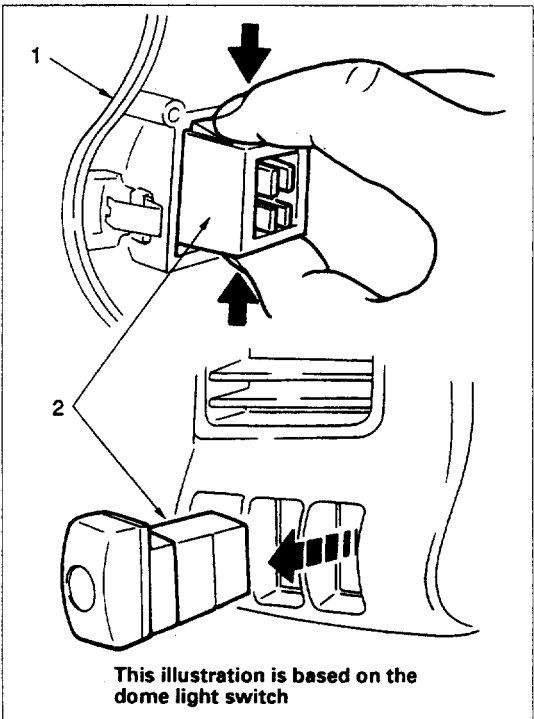
Refer to “TURN SIGNAL LIGHT, HAZARD WARNING LIGHT AND STOPLIGHT” in this section.



INSPECTION

Check the continuity between the connector terminals of the switch.

Repair or replace the switch when the result of inspection is found abnormal.



REMOVAL

Preparation:

Disconnect the battery ground cable.

1. Meter cluster

Refer to the “METER AND WARNING/INDICATOR LIGHT” in this section.

2. Pattern Select Switch

Release the lock pushing the switch from the back side of the meter cluster.



INSTALLATION

To install, follow the removal steps in the reverse order noting the following point.

1. Push the switch with your fingers until locks securely.

MEMO

WINDSHIELD WIPER AND WASHER

GENERAL DESCRIPTION

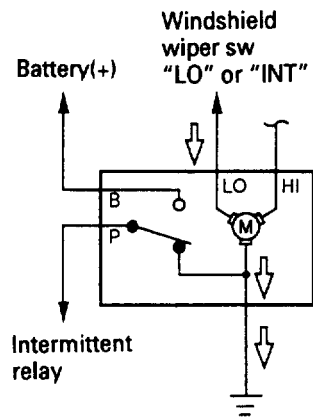
The circuit consists of the starter switch, windshield wiper & washer switch, wiper motor, washer motor and the intermittent relay.

When the wiper & washer switch is turned on with starter switch on, the battery voltage is applied to the wiper motor to activate the wiper.

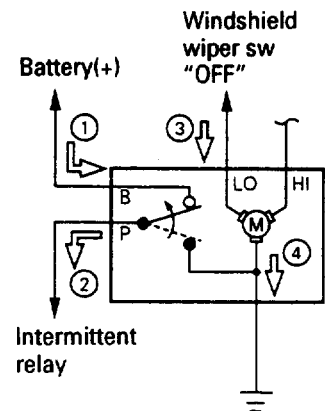
The washer motor squirts glass cleaning fluid while the washer switch is being pushed. The intermittent relay is used to control motion of the wiper.

OPERATION OF WINDSHIELD WIPER MOTOR (When wiper "LO" or "INT" position)

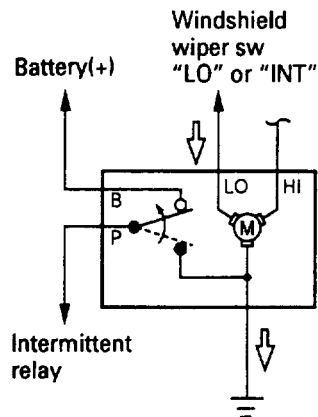
1. Condition of wiper switch is "LO" or "INT" position (Wiper motor is starting to operate)



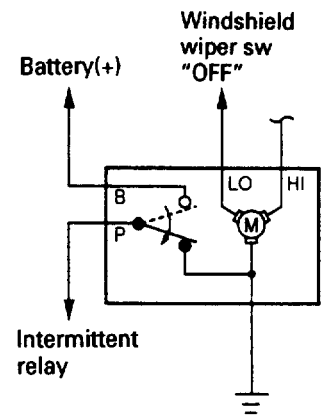
3. Condition of wiper switch is just "OFF" (Wiper motor is still operating until auto-stop position)



2. Condition of wiper motor is operating

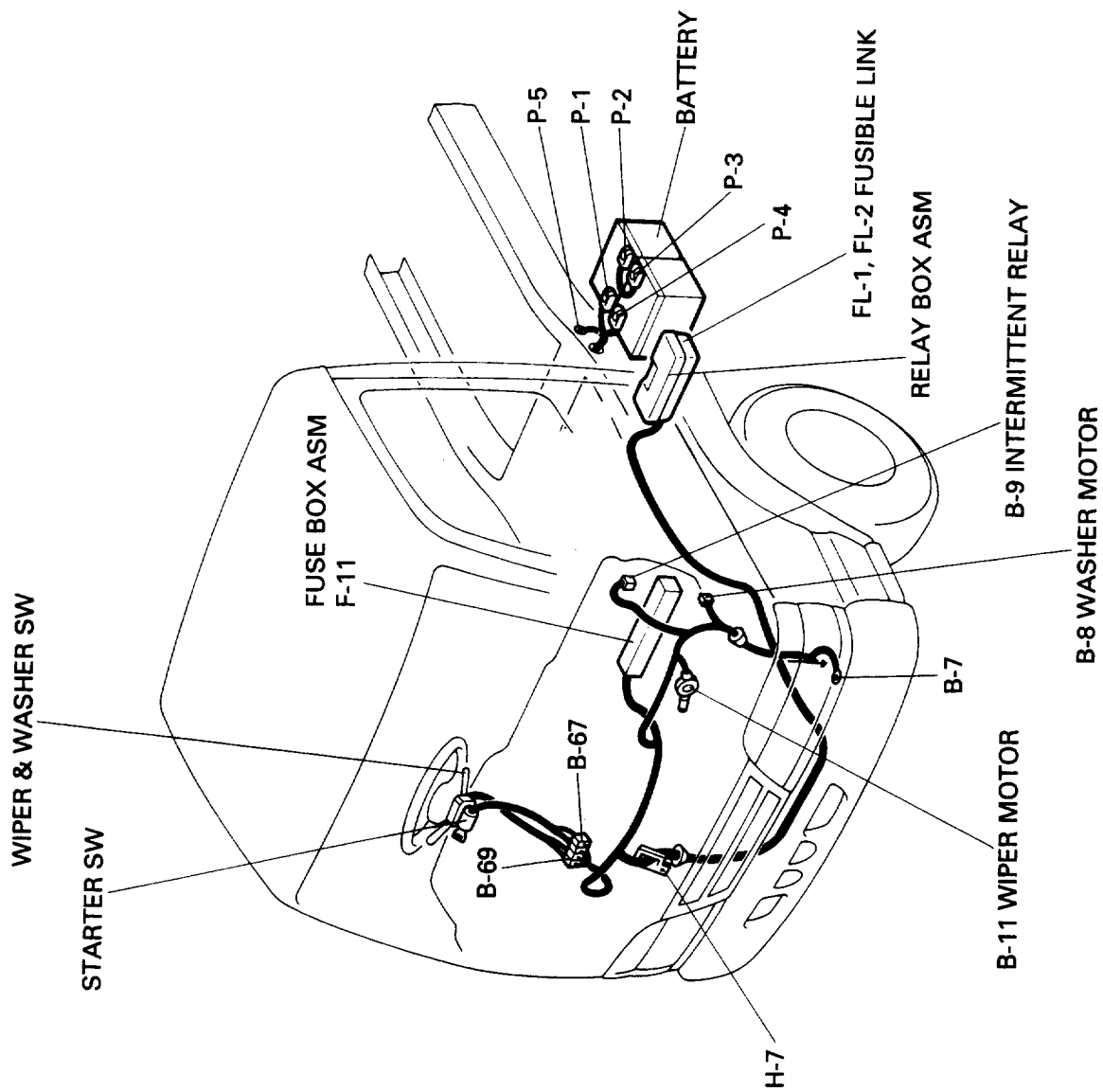


4. Wiper motor stops at auto-stop position

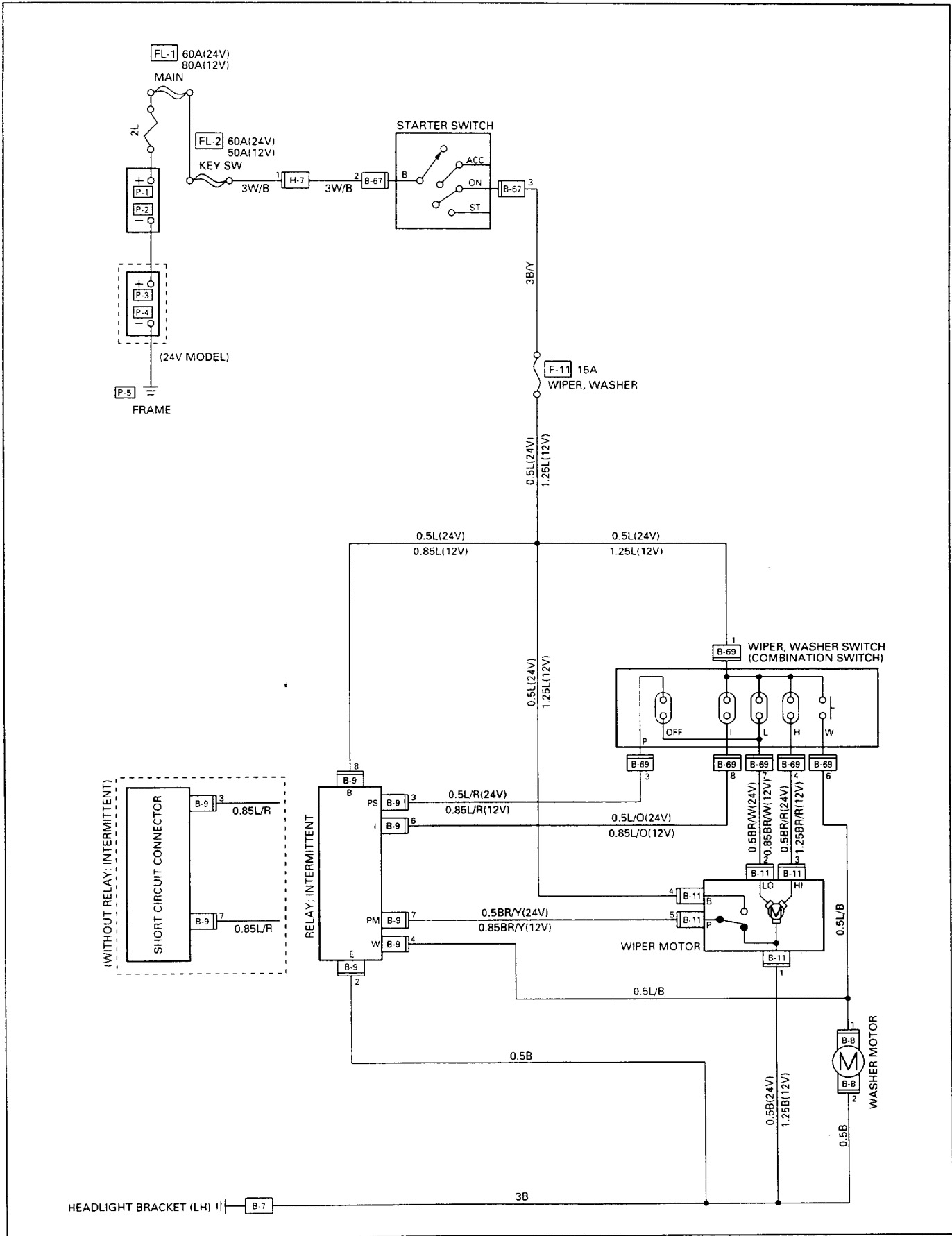


NOTE: Arrow marks "⇨" indicate the direction of current

PARTS LOCATION

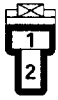


CIRCUIT DIAGRAM

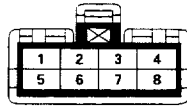


CONNECTOR LIST

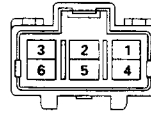
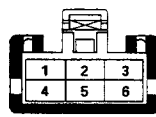
B-8



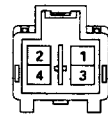
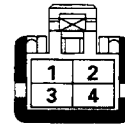
B-9



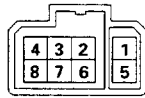
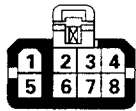
B-11



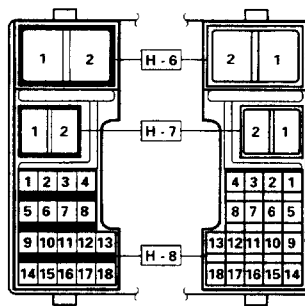
B-67



B-69



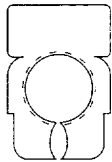
H-7



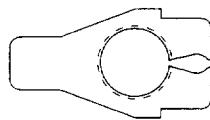
P-1 (12V) P-2



P-1 (24V) P-4



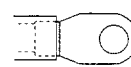
P-2 (24V) P-3



P-5 (12V)



P-5 (24V)



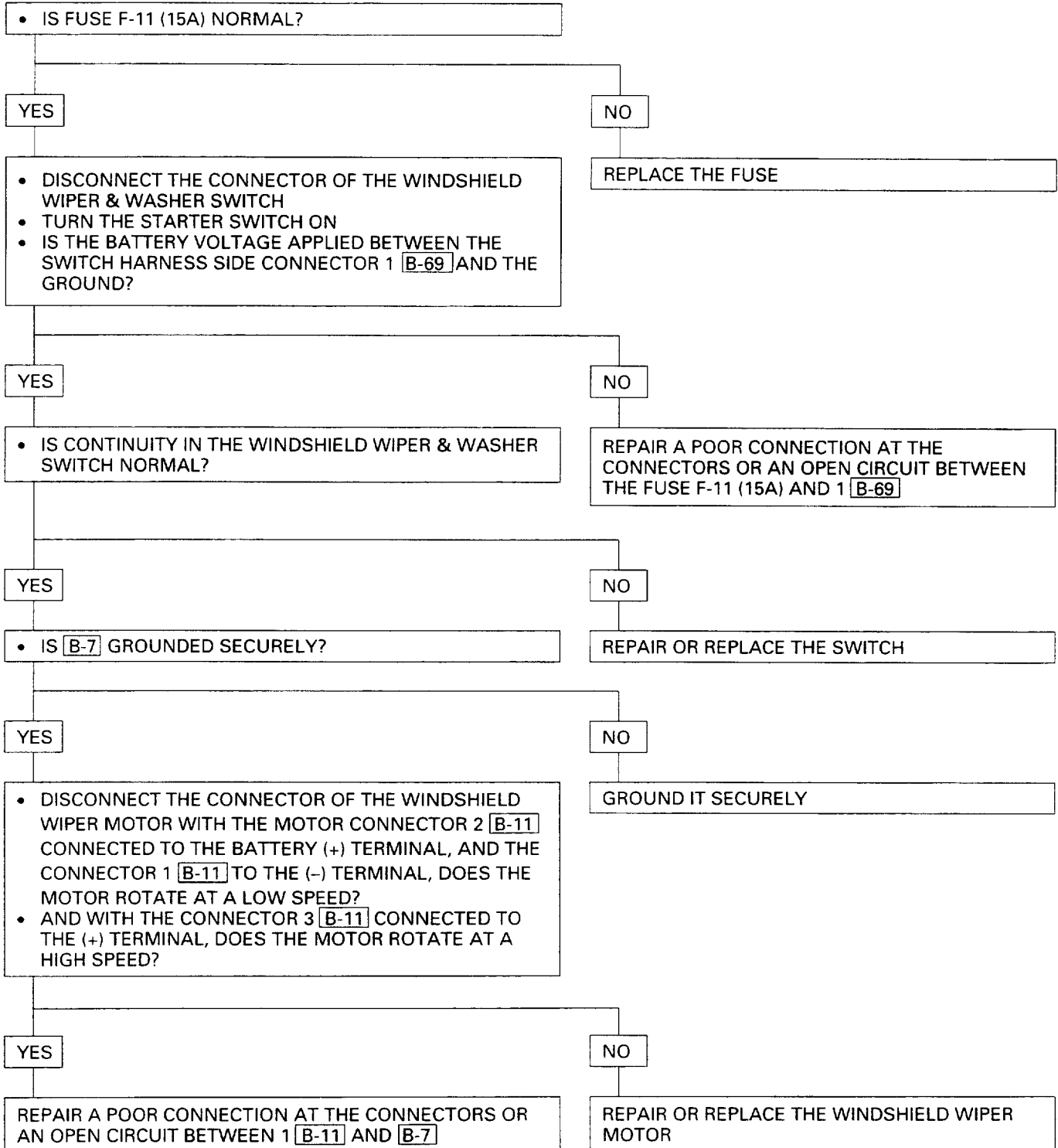
DIAGNOSIS

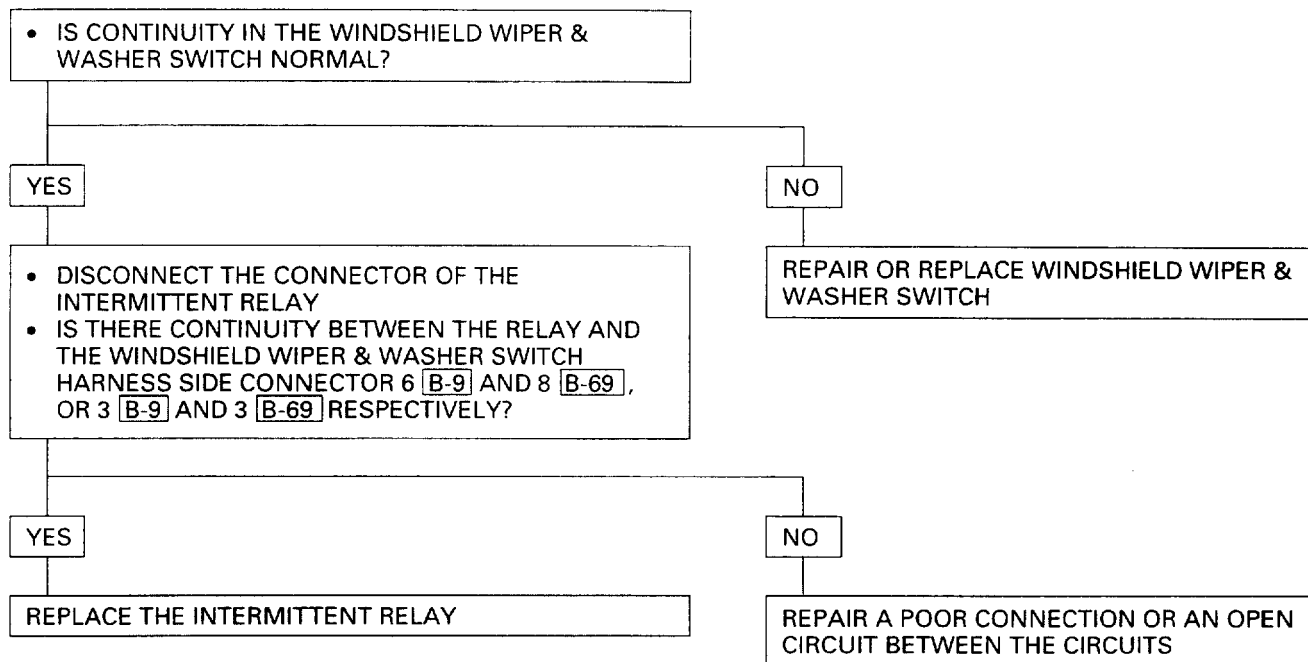
QUICK CHART FOR CHECK POINT

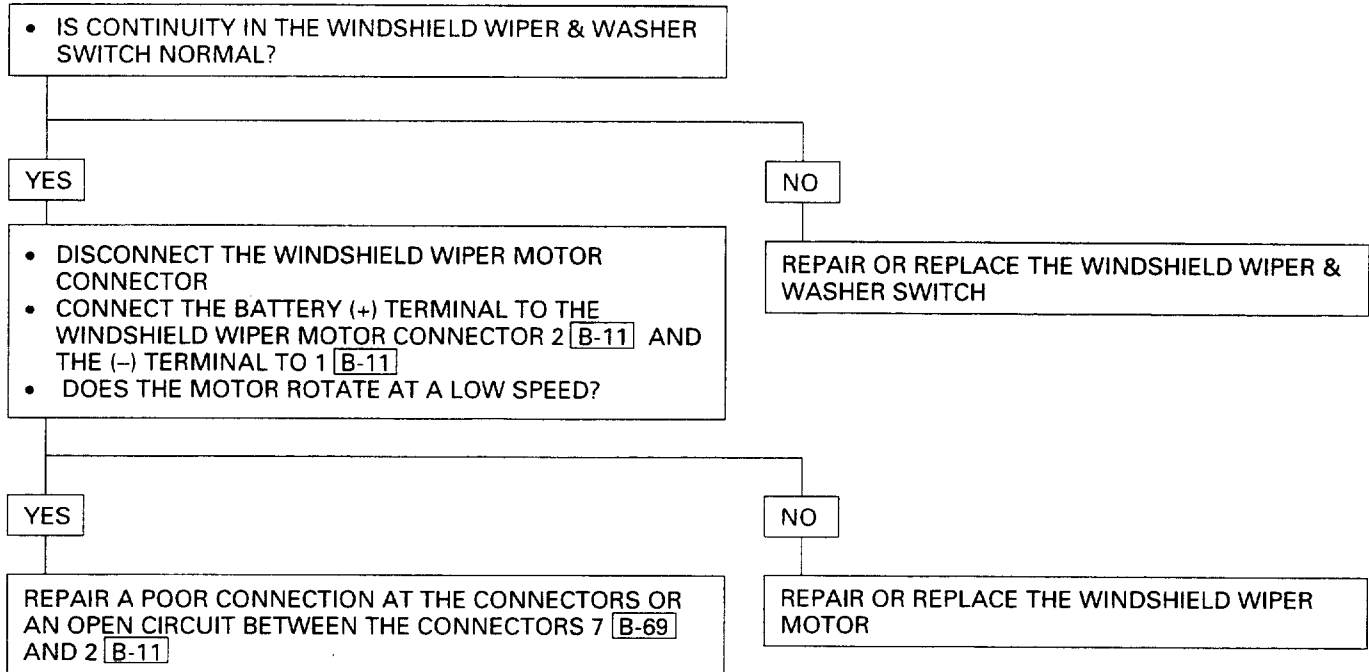
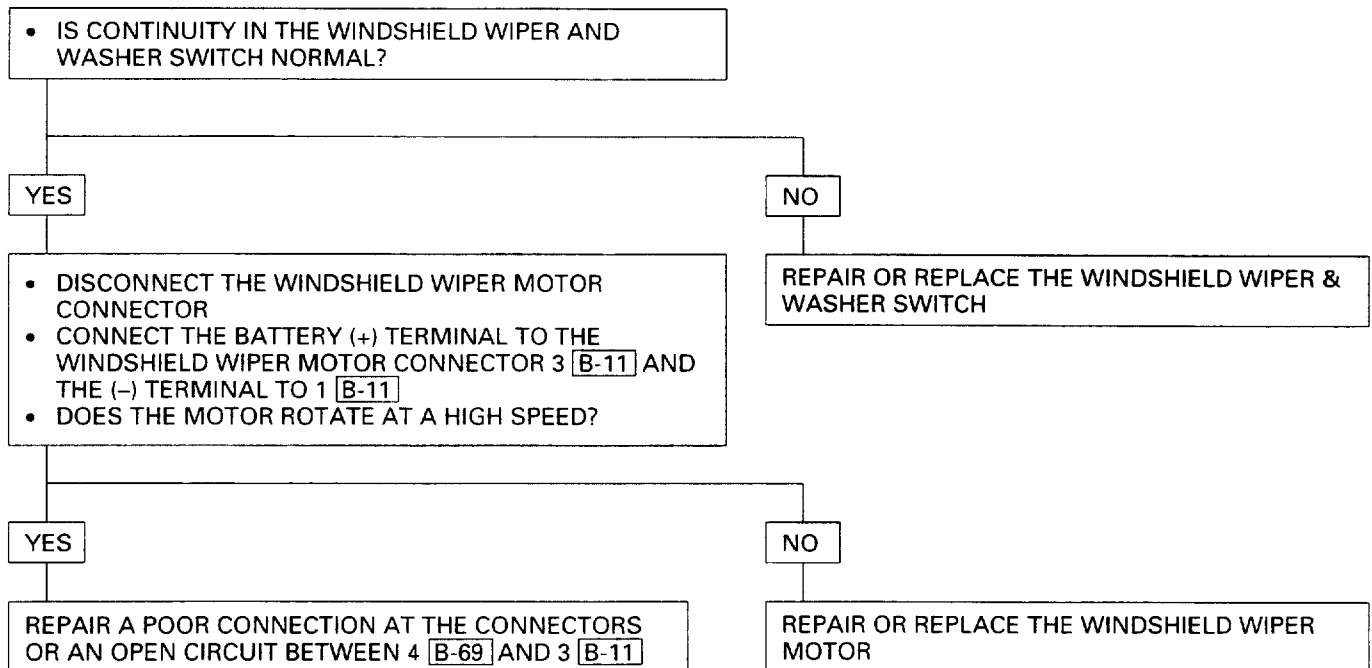
1. WINDSHIELD WIPER AND WASHER

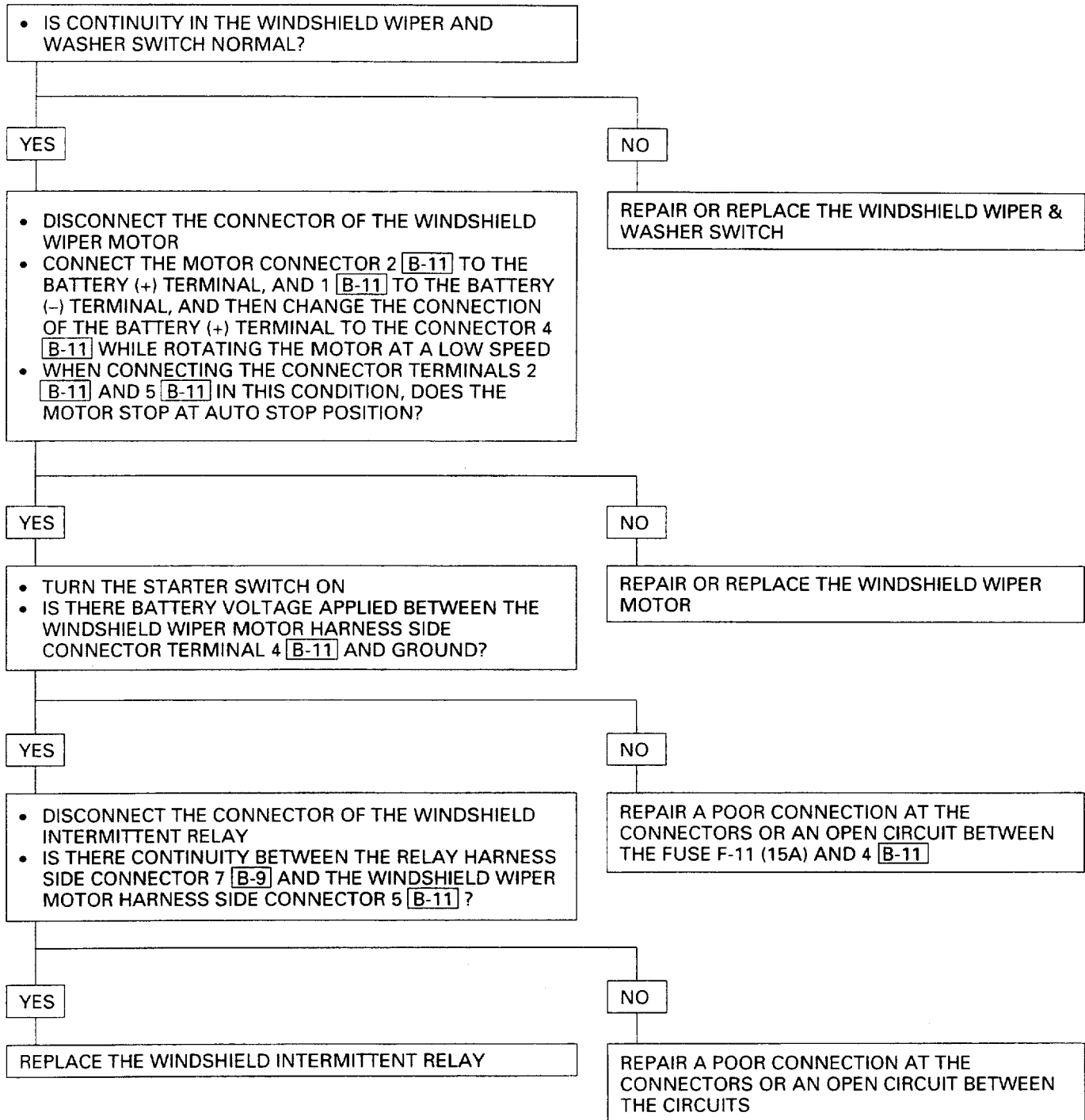
Check point Trouble mode	Fuse F-11 (15A)	Wiper & washer SW	Inter- mittent relay	Wiper motor	Washer motor	Cable harness
1. Windshield wiper does not operate at any switch position	○ (1)	○ (3)		○ (4)		○ (2)
2. Windshield wiper does not operate at "INT" position		○ (1)	○ (3)			○ (2)
3. Windshield wiper does not operate at "LO" position		○ (1)		○ (3)		○ (2)
4. Windshield wiper does not operate at "HI" position		○ (1)		○ (2)		○ (3)
5. Auto-stop function of the windshield wiper motor does not operate		○ (1)	○ (4)	○ (2)		○ (3)
6. Rotation of the windshield wiper motor does not stop		○ (1)		○ (2)		
7. Windshield washer motor does not operate		○ (1)			○ (3)	○ (2)

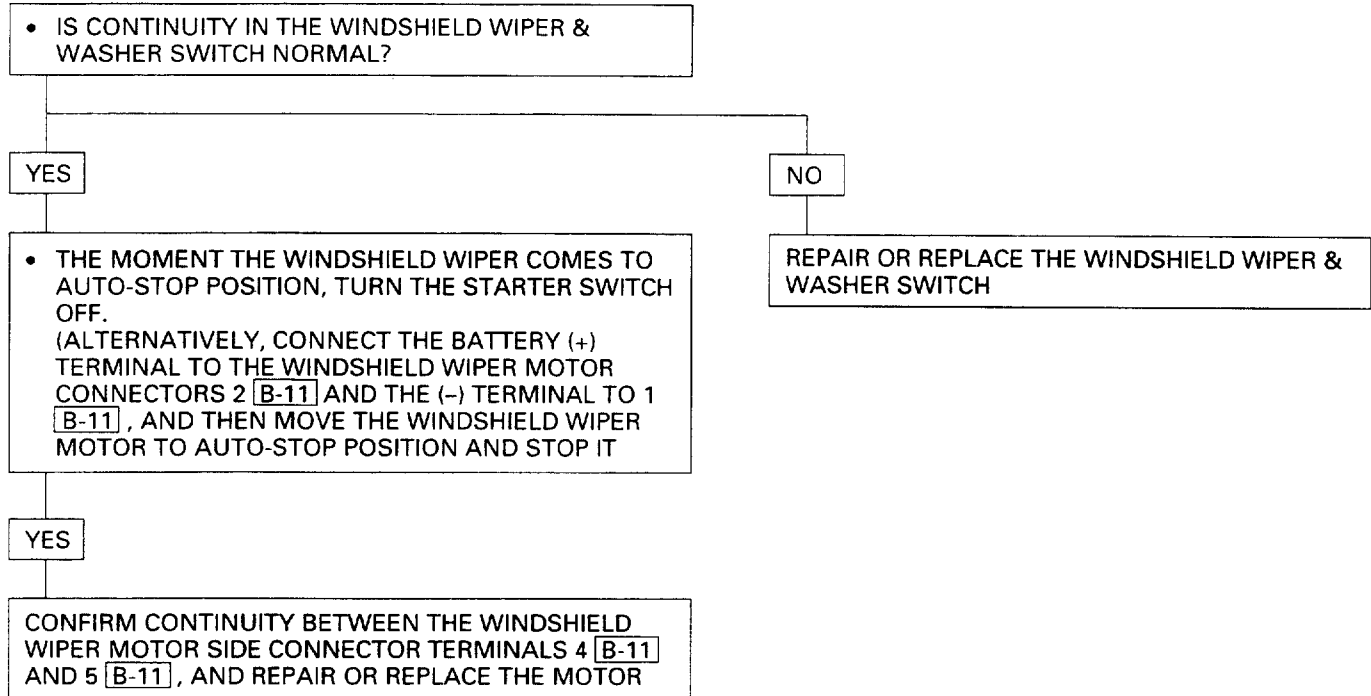
NOTE: Figure in parenthesis "()" indicates the order of inspection.

1. WINDSHIELD WIPER DOES NOT OPERATE AT ANY SWITCH POSITION

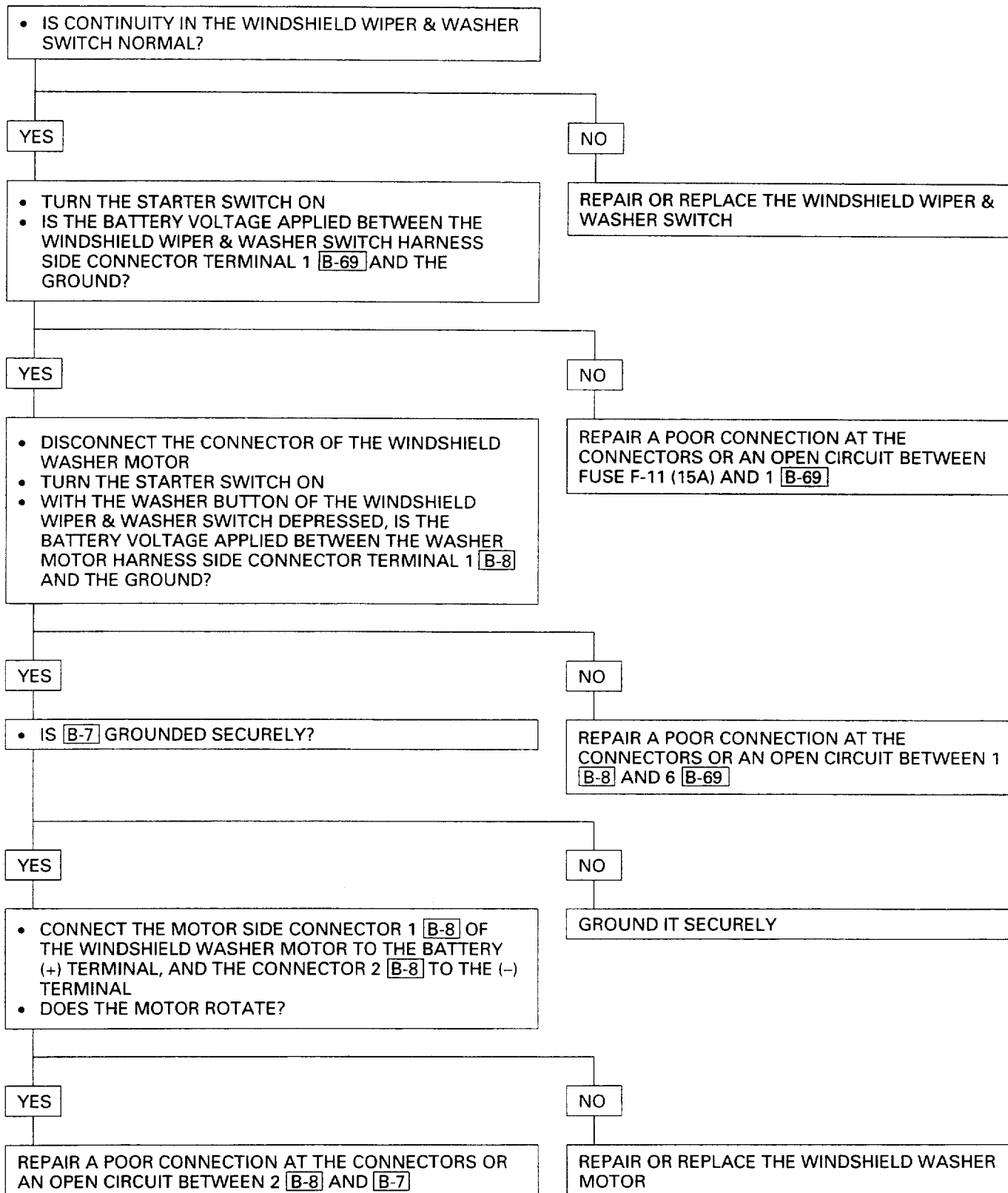
2. WINDSHIELD WIPER DOES NOT OPERATE AT "INT" POSITION

3. WINDSHIELD WIPER DOES NOT OPERATE AT "LO" POSITION**4. WINDSHIELD WIPER DOES NOT OPERATE AT "HI" POSITION**

5. AUTO-STOP FUNCTION OF THE WINDSHIELD WIPER MOTOR DOES NOT OPERATE

6. ROTATION OF THE WINDSHIELD WIPER MOTOR DOES NOT STOP

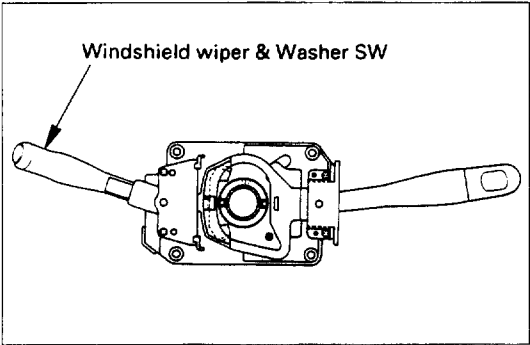
7. WINDSHIELD WASHER MOTOR DOES NOT OPERATE



STARTER SWITCH

Refer to "START AND CHARGING" in this section.

WINDSHIELD WIPER & WASHER SWITCH



With the starter switch on, the windshield wiper and washer switch controls the start and stop operation as well as the change of operating speeds.

Both the windshield washer motor and the wiper motor jointly operate while the washer button is pushed.



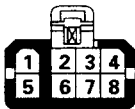
INSPECTION



Check the continuity between the connector terminals of the switch.

Repair or replace the switch when the result of inspection is found abnormal.

B-69



Switch side

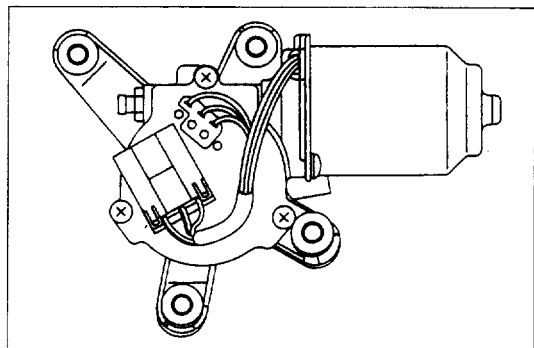
Washer SW	Wiper SW	Terminal No.					
		3	7	1	4	8	6
OFF	OFF						
	INT						
	LO						
	HI						
ON	OFF, INT LO, HI						



REMOVAL AND INSPECTION



Refer to "HEADLIGHT, FOG LIGHT AND CORNERING LIGHT" in this section.



WINDSHIELD WIPER MOTOR



INSPECTION

1. Operation in low speed

With the motor connector terminal 2 [B-11] connected to the battery (+) terminal and the connector 1 [B-11] to the (-) terminal, check to see if the motor rotates in low speed.

2. Operation in high speed

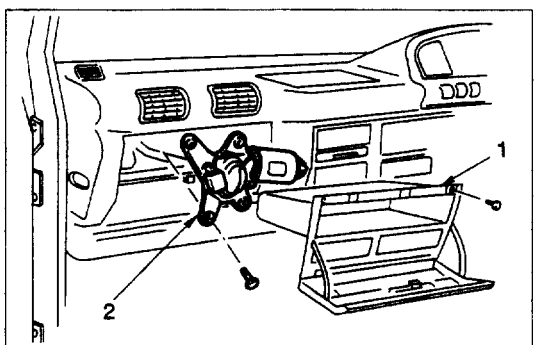
With the motor connector terminal 3 [B-11] connected to the battery (+) terminal and the connector 1 [B-11] to the (-) terminal, check to see if the motor rotates in low speed.

3. Stop operation

After stopping the windshield wiper in the position on the way by confirming the operation at the low speed in item No. 1.

When the connectors 2 [B-11] and 5 [B-11] are connected, while connecting the motor connector terminal 4 [B-11] to the battery (+) terminal, check to see, if the motor rotates at low speed and stops at the auto-stop position.

Repair or replace the motor when the results of the above inspections are found abnormal.



REMOVAL

Preparation:

Disconnect the battery ground cable.

1. Glove Box

Refer to "GLOVE BOX" of section 10 "BODY".

2. Windshield Wiper Motor

- 1) Disconnect the connector.
- 2) Remove four screws.
- 3) Remove the ball joint between crank arm and wiper link.



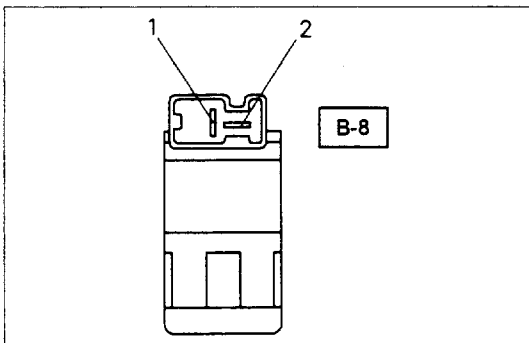
INSTALLATION

To install, follow the removal steps in the reverse order, noting the following points.

- **Windshield Wiper Motor**
When the crank arm is removed from the windshield wiper motor, tighten the motor shaft nut with the specified torque.

Shaft nut torque	N·m (kg·cm/lb·in)
	17 (170 / 147)

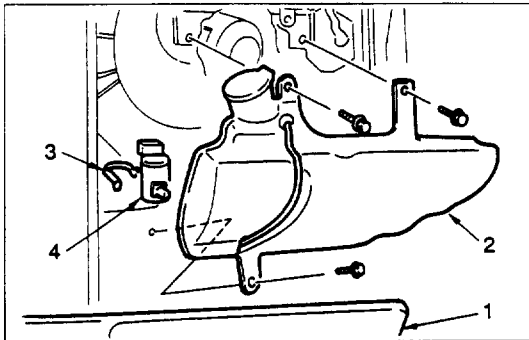
- Temporarily fit the motor by using one of the four wiper motor fixing screws.
- Put the crank arm ball joint in the wiper link hole and fix them together while pulling the wiper link.



INSPECTION

With the battery (+) terminal connected to the washer motor connector terminal 1 [B-8] and the (-) terminal to the connector 2 [B-8], check to see if the cleaning fluid pushes out.

Replace the tank/motor when the result of inspection is found abnormal.



REMOVAL

Preparation:

Disconnect the battery ground cable.

1. Instrument Panel Under Cover

Refer to "INSTRUMENT PANEL" of section 10 "CAB".

2. Washer Tank

- 1) Disconnect the washer motor connector.
- 2) Disconnect the washer hose.
- 3) Remove three fixing screws.

3. Clip Band

4. Windshield Washer Motor

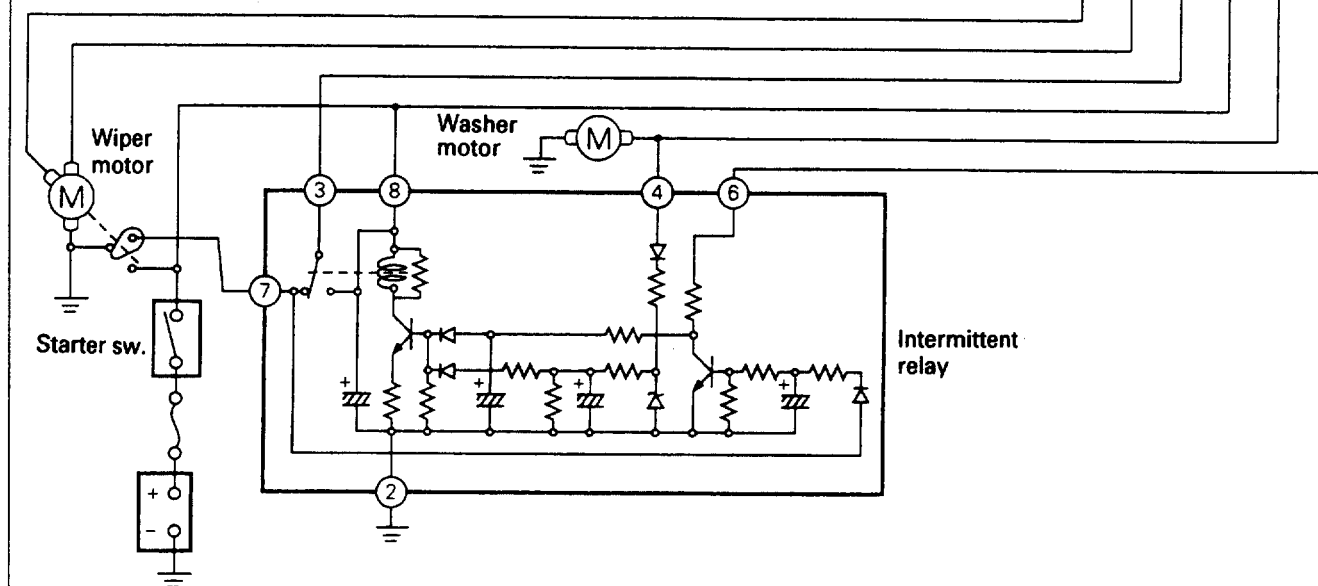
Hold the motor and pull it out from the washer tank.

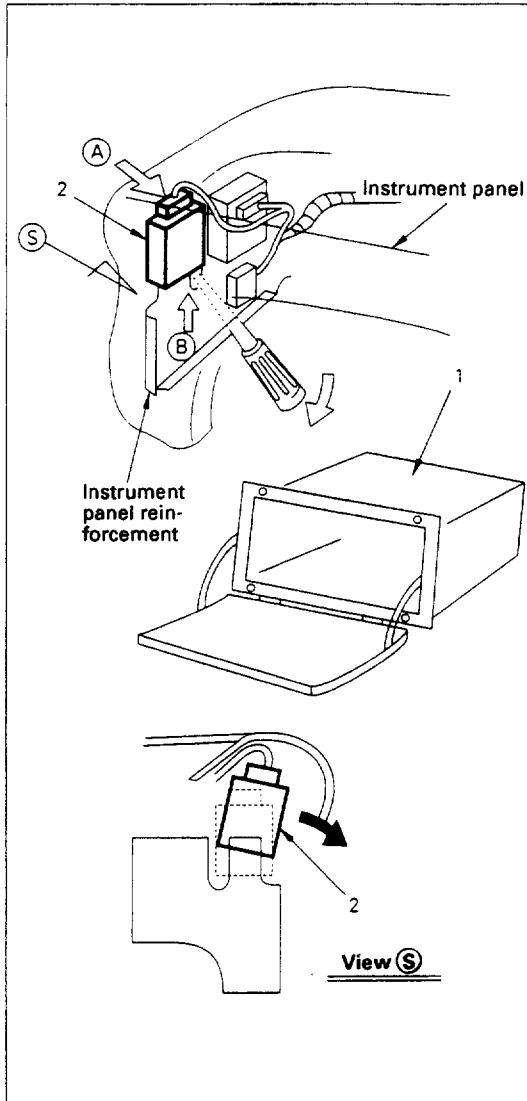


INSTALLATION

To install, follow the removal steps in the reverse order.

Terminal NO.	4	7	3	1	6	8
SW. position						
OFF		○	○			
INT		○	○	○		○
LO		○		○		
HI	○			○		





REMOVAL

Preparation:

Disconnect the battery ground cable.

1. Glove Box

Open the lid and remove the four screws.

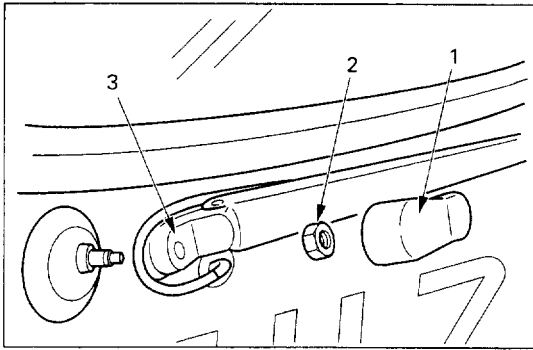
2. Intermittent Relay

- 1) Press (A) position with your finger and pry up (B) position with the tip of a screw-driver.
- 2) When the relay moves up by about 2/3 of its size, tilt and take off the relay to avoid interference with the instrument panel.
- 3) Disconnect the connector.



INSTALLATION

To install, follow the removal steps in the reverse

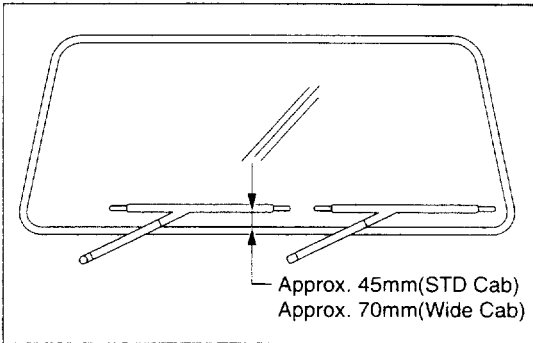


880LX002

WINDSHIELD WIPER ARM/BLADE

REMOVAL

1. Cover
2. Wiper Arm Nut
3. Wiper Arm/Blade



880LX001

INSTALLATION

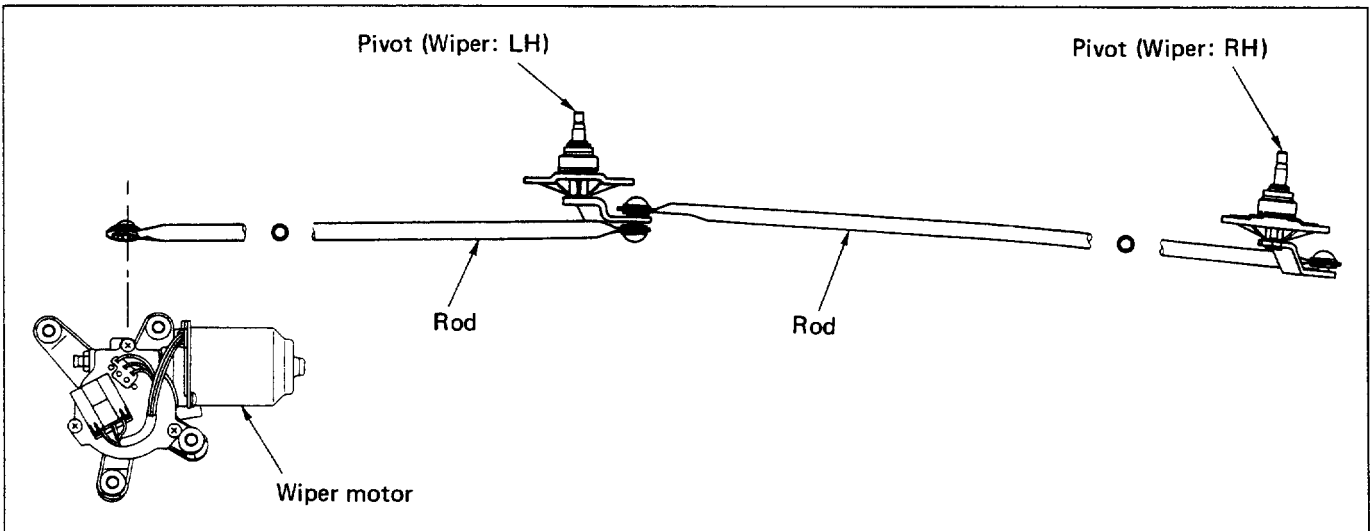
To install, follow the removal steps in the reverse order, noting the following points.

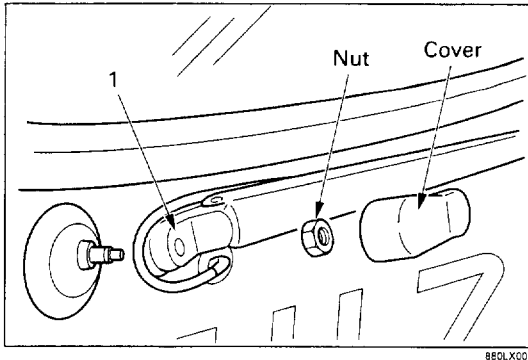
- 1) Before installing the wiper arm/blade to the shaft, confirm that the motor stops at the auto-stop position.
- 2) Set the wiper arm/blade so that the tips of both blades are positioned as shown in the illustration.
- 3) Tighten the wiper arm nut to the specified torque.

Wiper arm nut torque	N·m (kg·cm/lb-in)
17 (170 / 147)	

WINDSHIELD WIPER LINKAGE

LOCATION OF ROD AND PIVOT





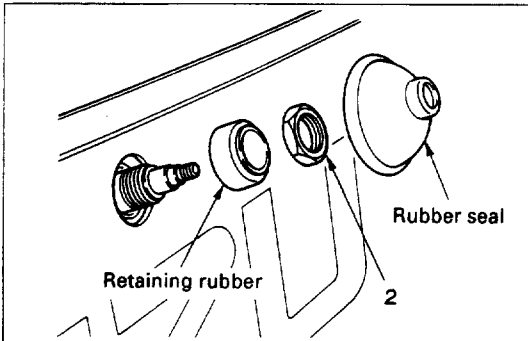
REMOVAL

Preparation:

Disconnect the battery ground cable.

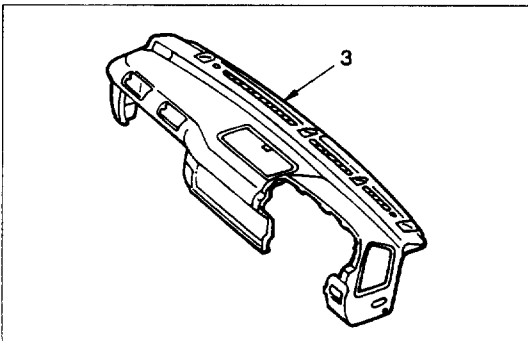
1. Wiper Arm & Blade

Remove the cover, nut and wiper arm & blade.



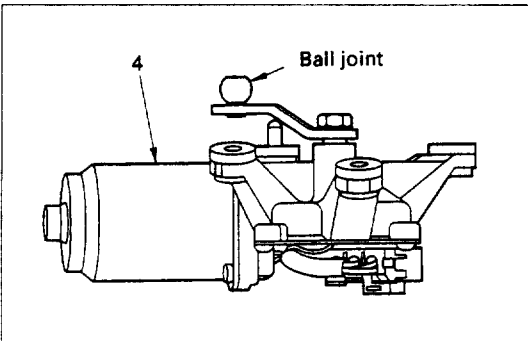
2. Pivot Nut

Remove the rubber seal, nut and retaining rubber.



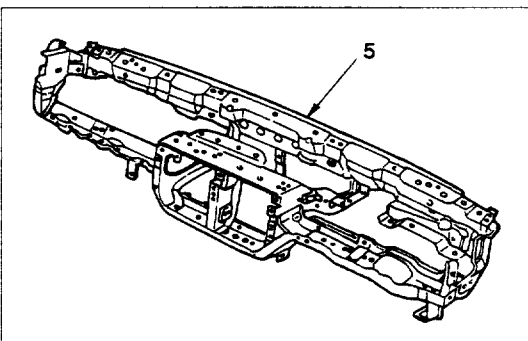
3. Instrument Panel Assembly

Refer to "INSTRUMENT PANEL" of section 10 "CAB".



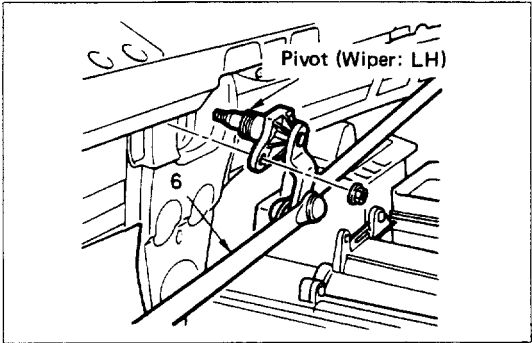
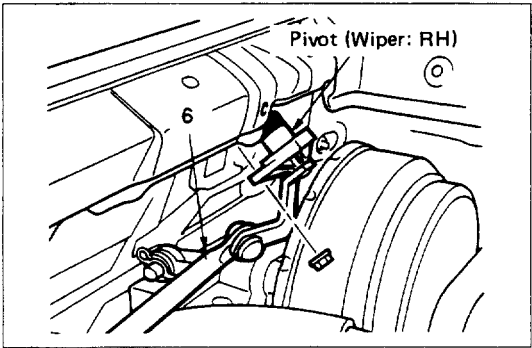
4. Wiper Motor

- 1) Remove four screws.
- 2) Disconnect the ball joint between the crank arm and the wiper link.



5. Instrument Panel Reinforcement

Refer to "INSTRUMENT PANEL" of section 10 "CAB".



6. Wiper Link Assembly

Remove two retaining nut from right hand side of pivot.

Remove two retaining nut from left hand side of pivot.



INSTALLATION

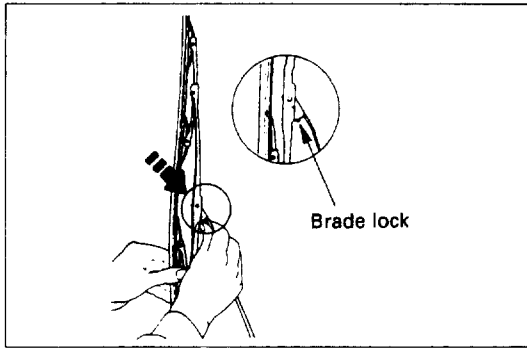
To install, follow the removal steps in the reverse order, noting the following points.

- Temporarily fit the wiper motor by using one of the four wiper motor fixing screw.
- Put the crank arm ball joint in the wiper link hole and fix them together while pulling the wiper link.
- Fit the motor with four screws.
- Tighten the pivot nut with the specified torque.

Pivot nut torque	N·m (kg·cm/lb·in)
8 (80 / 70)	

- Tighten the wiper arm nut with the specified torque.

Wiper arm nut torque	N·m (kg·cm/lb·in)
17 (170 / 147)	



WIPER BLADE RUBBER



REMOVAL

1. Wiper Blade

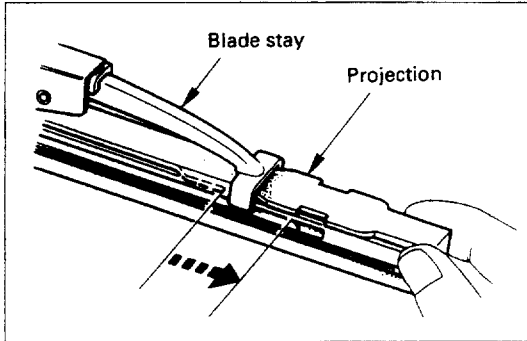
Push the wiper blade lock while pulling the wiper blade in the arrow direction.

NOTE:

When the wiper blade has been removed, wrap the tip of the wiper arm with cloth, to avoid damaging the glass.

2. Wiper Blade Rubber

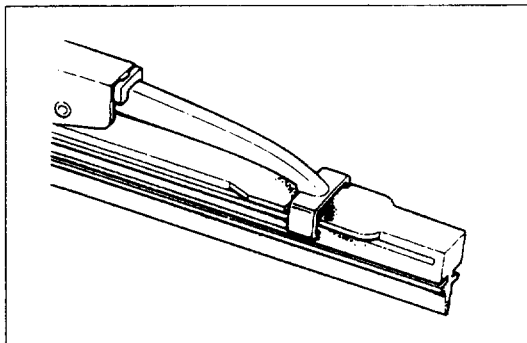
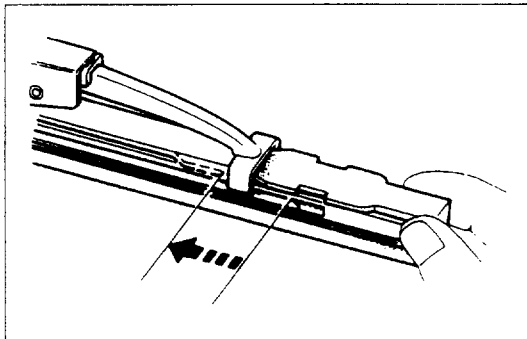
- 1) Pull the end of rubber and remove the projection from the click of the blade stay.
- 2) Pull the rubber out in the same direction.



INSTALLATION

2. Wiper Blade Rubber

Install the click of the blade stay in the groove of the new rubber and slide it in. Complete installation by pushing the click.



Finally, check that the click of the stay has caught in the hole of the rubber.

1. Wiper Blade

AUDIO AND CIGAR LIGHTER

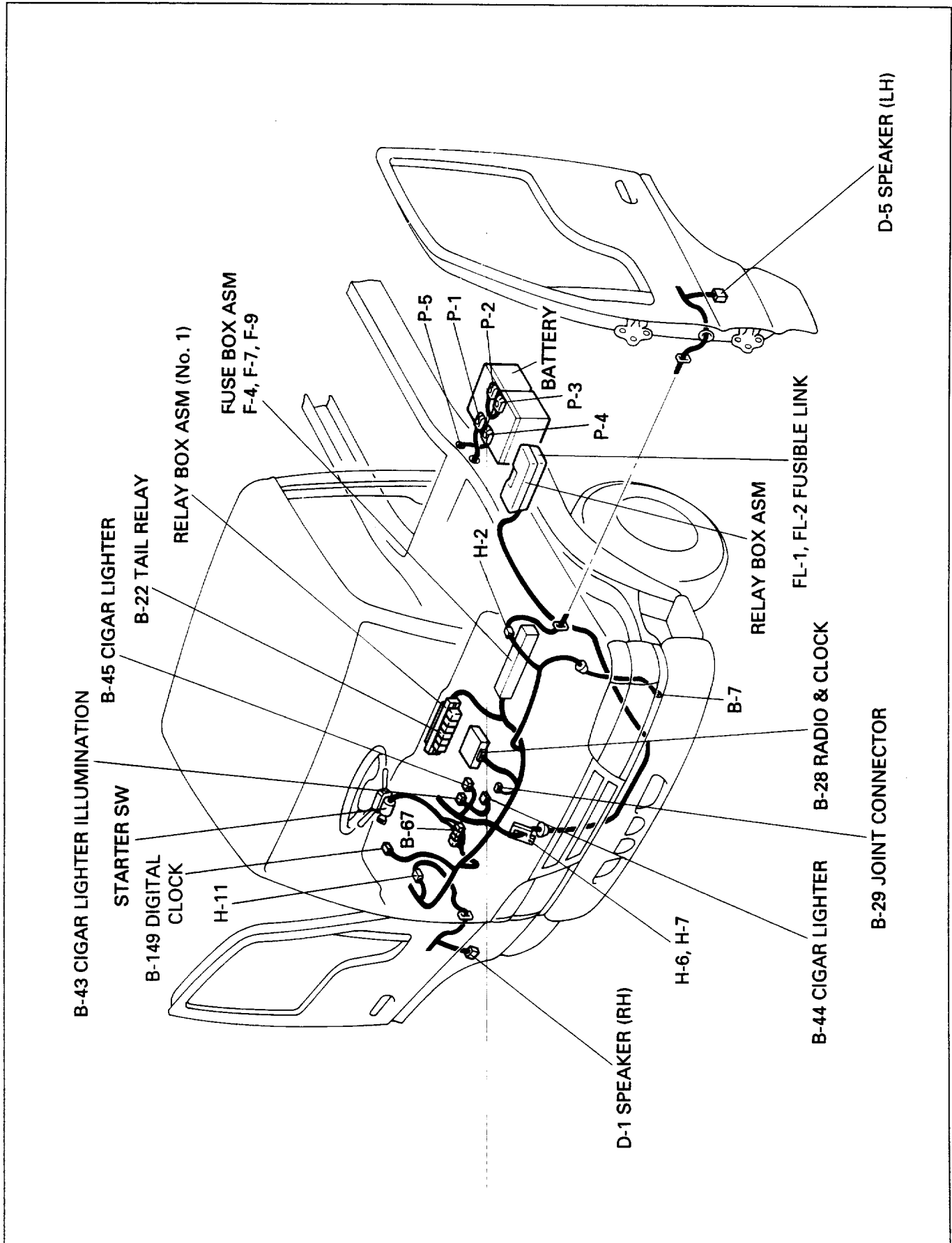
GENERAL DESCRIPTION

The circuit consists of the starter switch, radio, cigar lighter and the relay.

The audio circuit is designed for the current to flow through the receiver circuit when the radio switch is turned on with the starter switch in "ACC" or "ON". Current runs through the memory circuit of the audio regardless of the position of the starter switch.

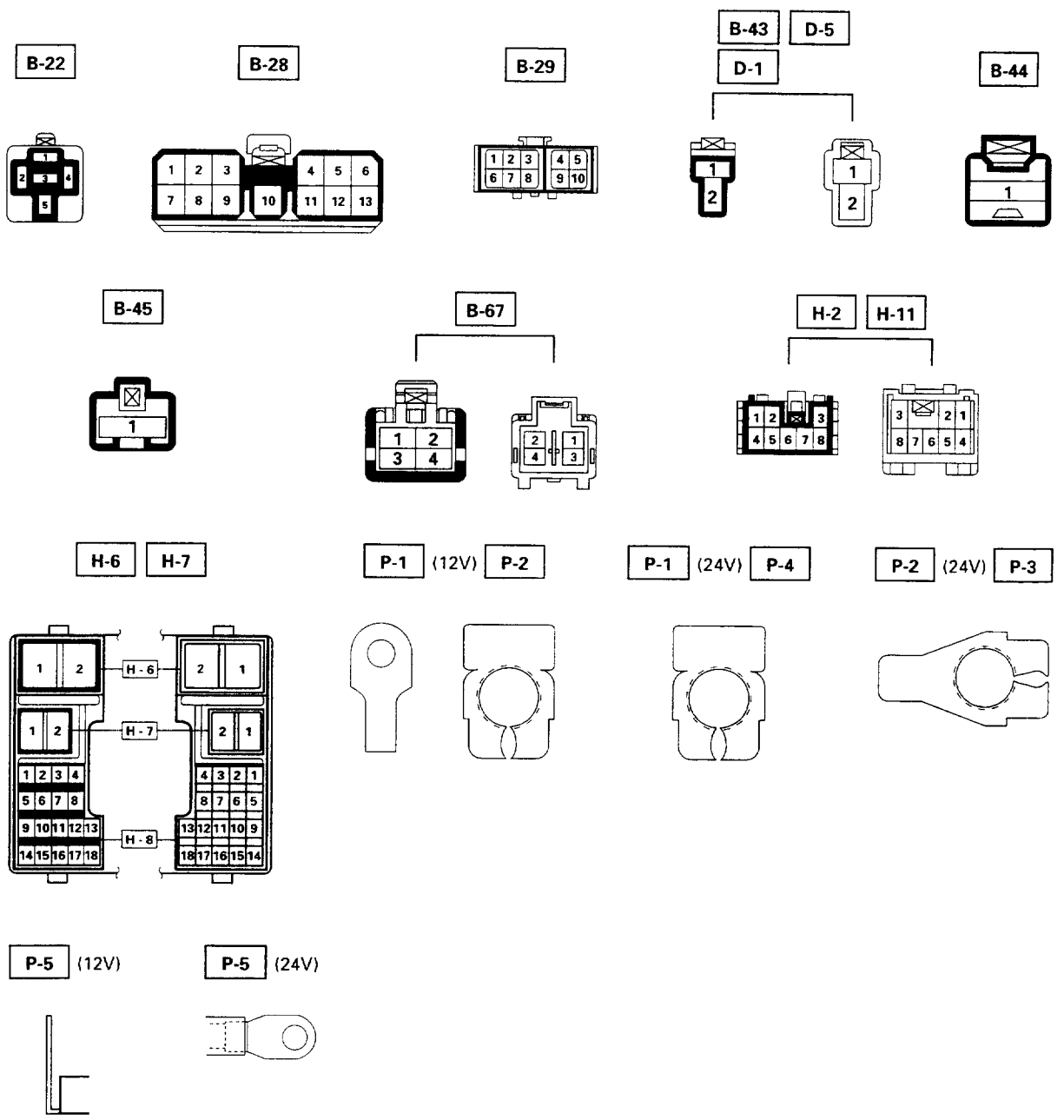
When the cigar lighter is pushed in with the starter switch at either "ACC" or "ON" position, a circuit is formed in the cigar lighter case to heat the lighter coil. The cigar lighter is spring back to its original position after the lighter coil is heated.

PARTS LOCATION



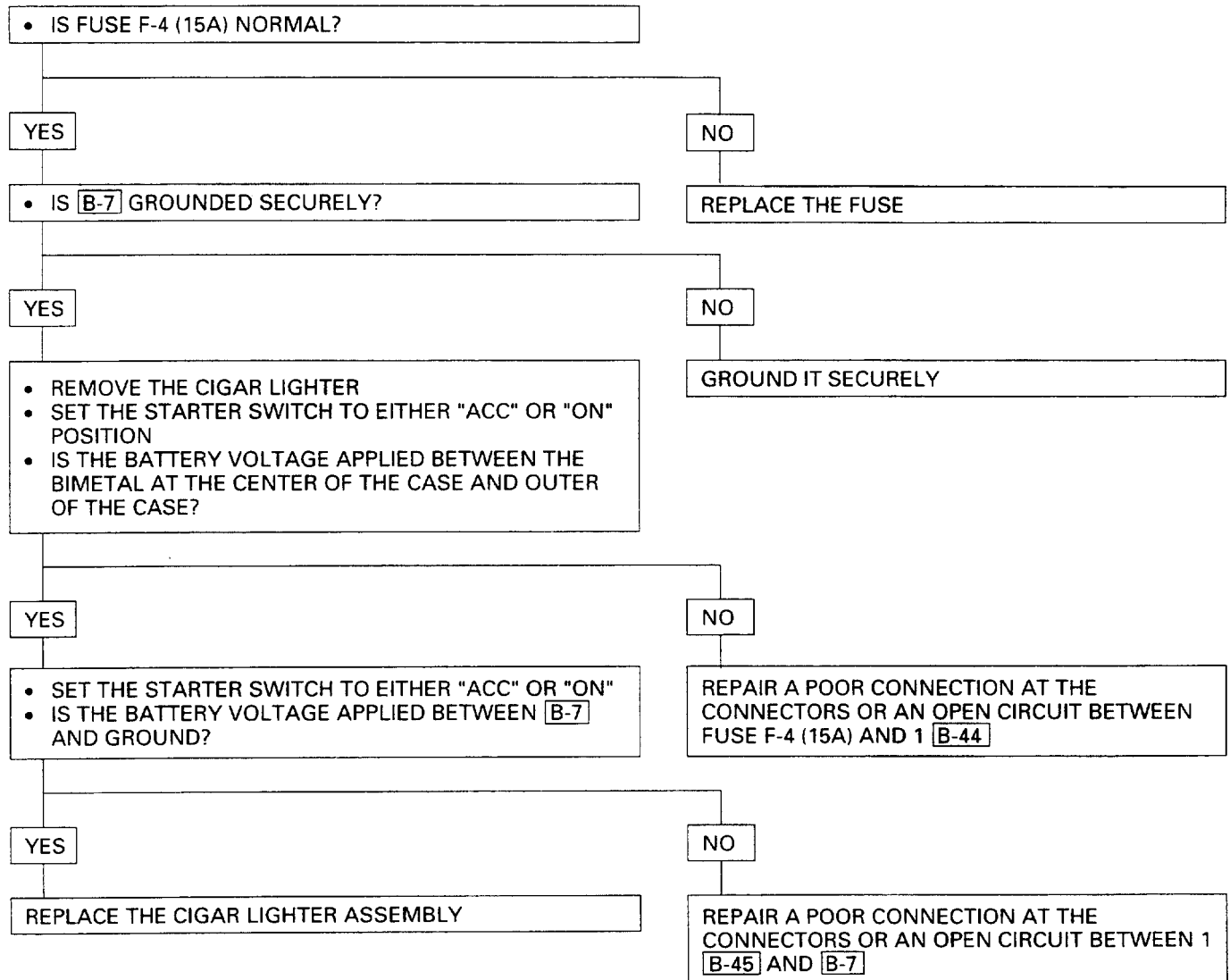


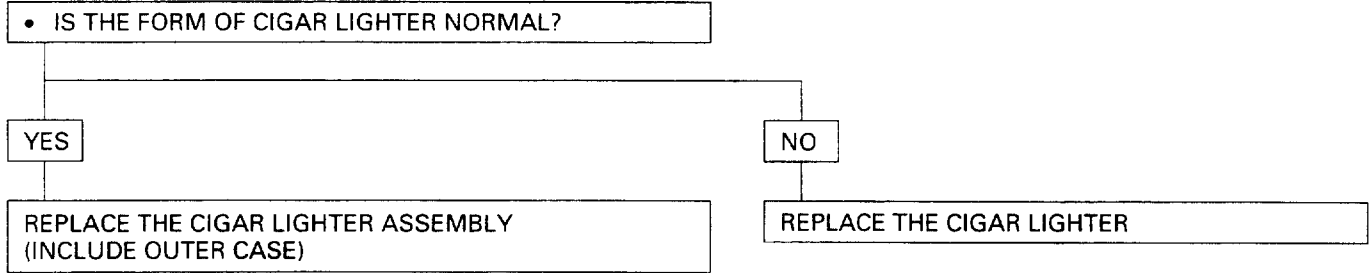
CONNECTOR LIST



DIAGNOSIS

1. CIGAR LIGHTER DOES NOT HEAT SUFFICIENTLY



2. THE CIGAR LIGHTER DOES NOT SPRING OUT AFTER BEING HEATED

STARTER SWITCH

Refer to "START AND CHARGING" in this section.

RADIO

REMOVAL

Preparation:

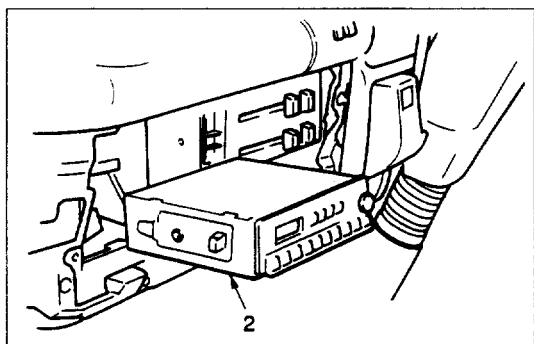
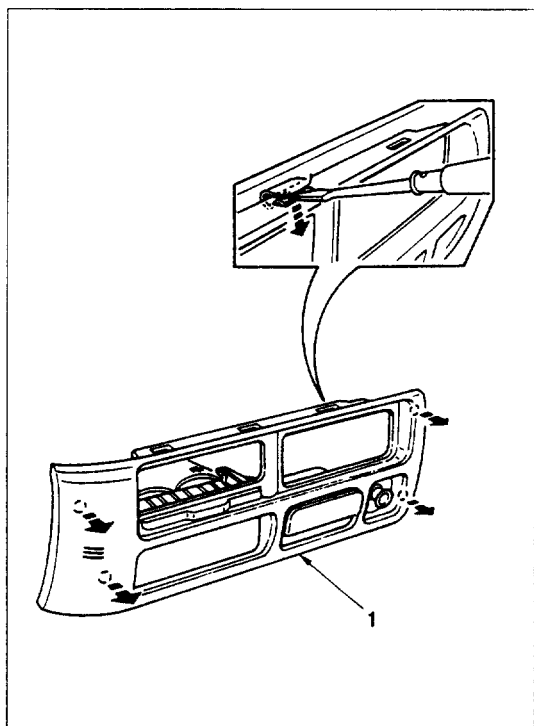
Disconnect the battery ground cable.

1. Center Cluster

- 1) Pull it to remove. Pry off three clips by the tip of screwdriver.
- 2) Remove the cigar lighter power source and its illumination connector.

Note:

To remove the center cluster, do not force to pry off three clips at upper portion of the center cluster.



2. Radio

- 1) Remove two radio fixing screws.
- 2) Disconnect the connector and feeder plug.

INSTALLATION

To install, follow the removal steps in the reverse order.

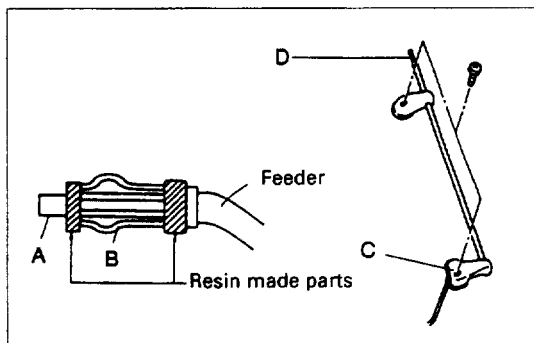
ANTENNA

INSPECTION

The metal A is connected to the pole D at the top of the antenna through the core of the feeder.

The metal B is fitted in the feeder shielding the core, and grounded at the screw C to avoid the core hampered by noise.

Defective grounding would cause noise.



In checking, measure the following three points with the circuit tester in the range of "resistance x 1 (Ω)"

Between A and B

No continuity (No reading at the indicator) → Normal

Continuity (A bite in the feeder. The core grounded) → Lower reception

Between B and C

Continuity (Indicator reading: 0Ω) → Normal.

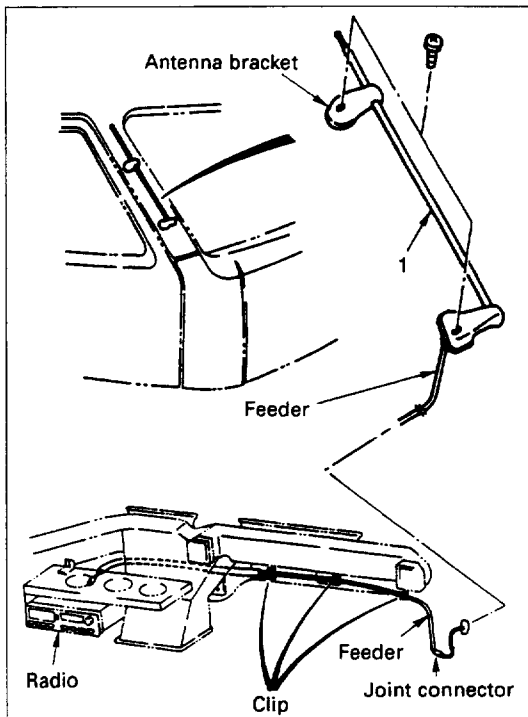
No continuity (Shielded core disconnected or defective grounding at the screw → Hampered by noise)

Between A and D

Continuity or no continuity

There are some antenna feeders and relay feeders with a condenser built in their connections.

Measuring resistance between the two points does not result in correct judgment. Connect temporarily another normal antenna to the radio and check to see if its reception is audible. Most antenna now available are slide type. Rust at the screw C and the cab panel where grounded would lead no continuity, followed by lower reception. Keep this portion clean to avoid rust.



REMOVAL

Preparation:

Disconnect the battery ground cable.

1. Antenna

- 1) Disconnect the joint connector.
- 2) Remove the upper and lower side antenna bracket.
- 3) Pull out the antenna feeder.

NOTE:

For easier fitting, tie the lead wire to the end of the antenna feeder in advance.



INSTALLATION

To install, follow the removal steps in the reverse order.

SPEAKER



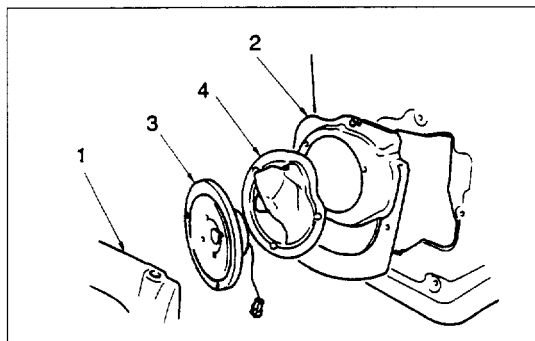
INSPECTION

1. With the circuit tester set to the range of $\times 1 (\Omega)$, connect the circuit tester probes (red and black) to the (+) and (-) terminals of the speaker.
2. When the speaker is normal, a low buzzing sound is heard.
3. When the speaker is defective, no sound is heard. However, the distortion or chattering of the sound cannot be identified.

When the speaker is installed to the vehicle, disconnect the connectors before checking.

When no sound is heard, the following are considered as the cause.

- The speaker wiring is disconnected at the speaker terminals.
- The speaker body is defective.
- There is an open circuit somewhere in the speaker harness on the vehicle side.
- The speaker harness on the vehicle side is grounded or caught up.



REMOVAL

Preparation:

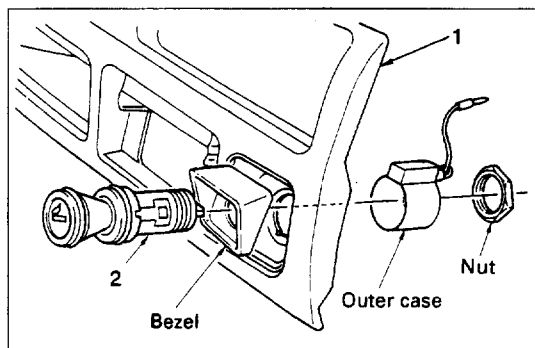
Disconnect the battery ground cable.

1. **Door Pad**
Refer to "FRONT DOOR TRIM PAD" of section 10 "BODY"
2. **Speaker Panel**
Disconnect the speaker connector.
3. **Speaker**
4. **Water proof sheet**



INSTALLATION

To install, follow the removal steps in the reverse order.



CIGAR LIGHTER



REMOVAL

Preparation:

Disconnect the battery ground cable.

1. Center Cluster

Refer to "RADIO" in this section.

2. Cigar Lighter Assembly

Remove the nut, then remove cigar lighter assembly, bezel and outer case.



INSTALLATION

To install, follow the removal steps in the reverse order.

METER AND WARNING/INDICATOR LIGHT

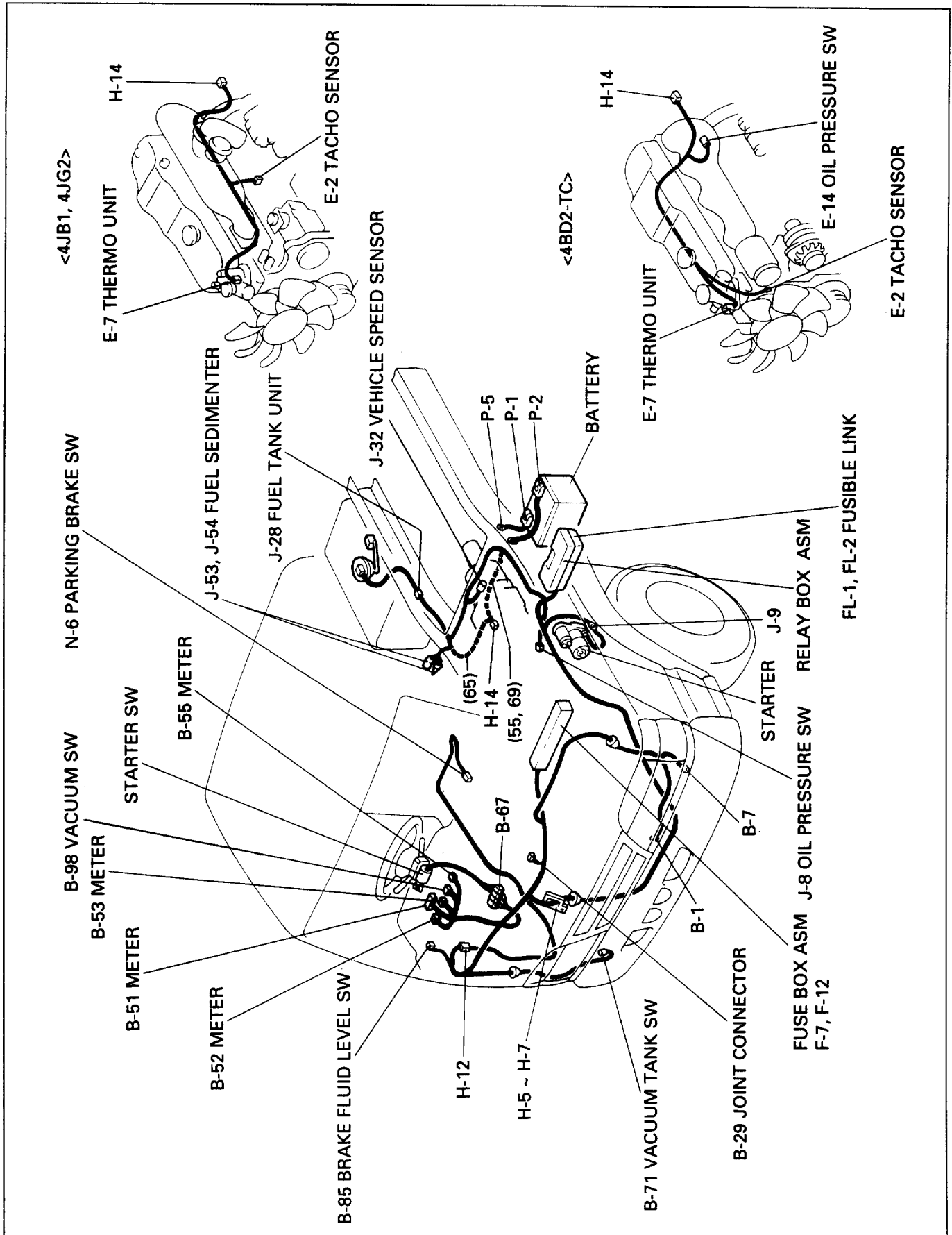
GENERAL DESCRIPTION

The circuit consists of the starter switch, meter assembly, vacuum tank switch, seat belt switch, oil pressure switch, fuel sedimentor switch, brake fluid switch, parking brake switch, vehicle speed sensor, fuel tank unit, thermo unit and engine speed sensor.

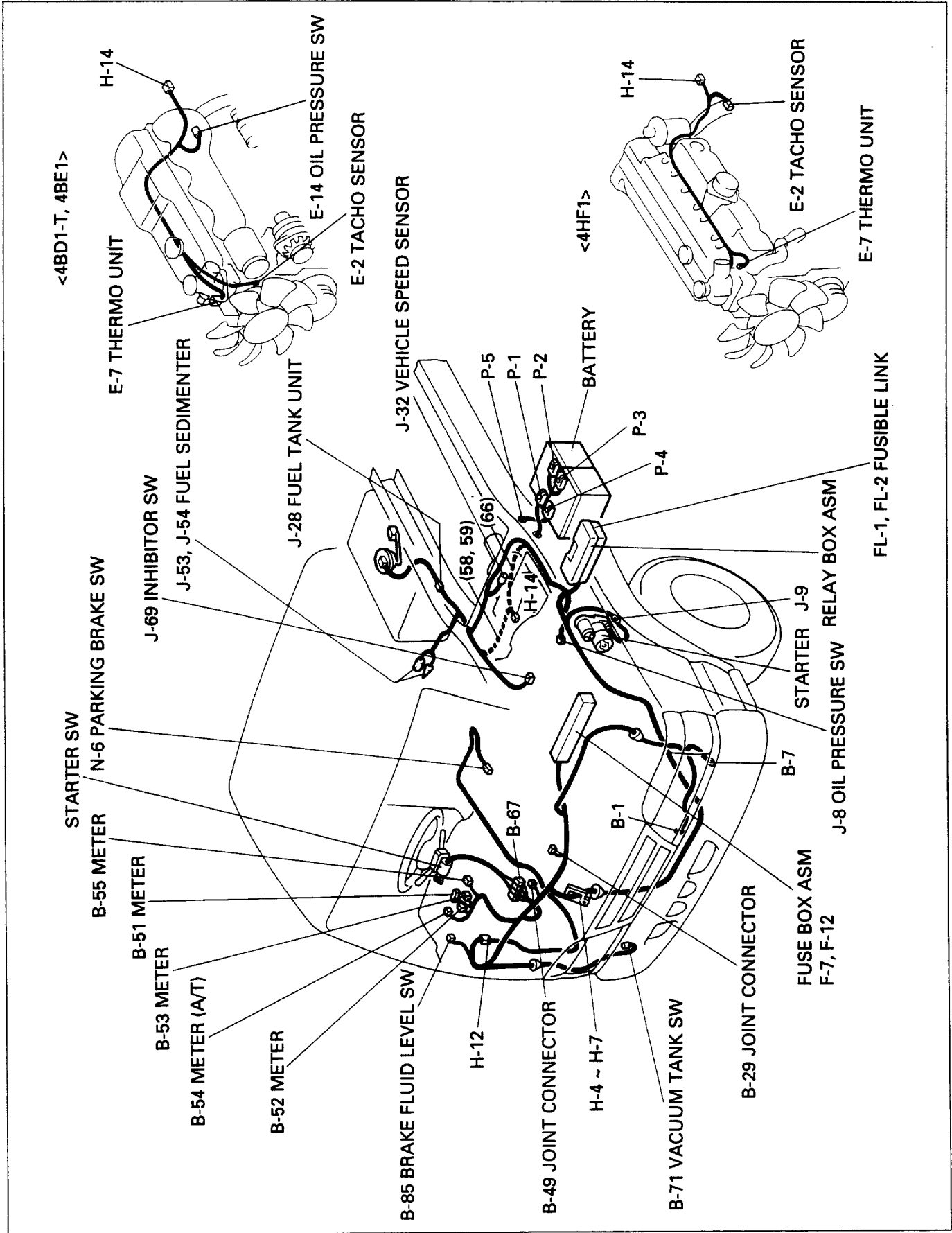
The meter assembly contains the speedometer, tachometer, fuel meter, thermometer and the warning/indicator light.

The meter warning/indicator lights and their bulb sockets are a unit, they are installed from the back of the speedometer assembly.

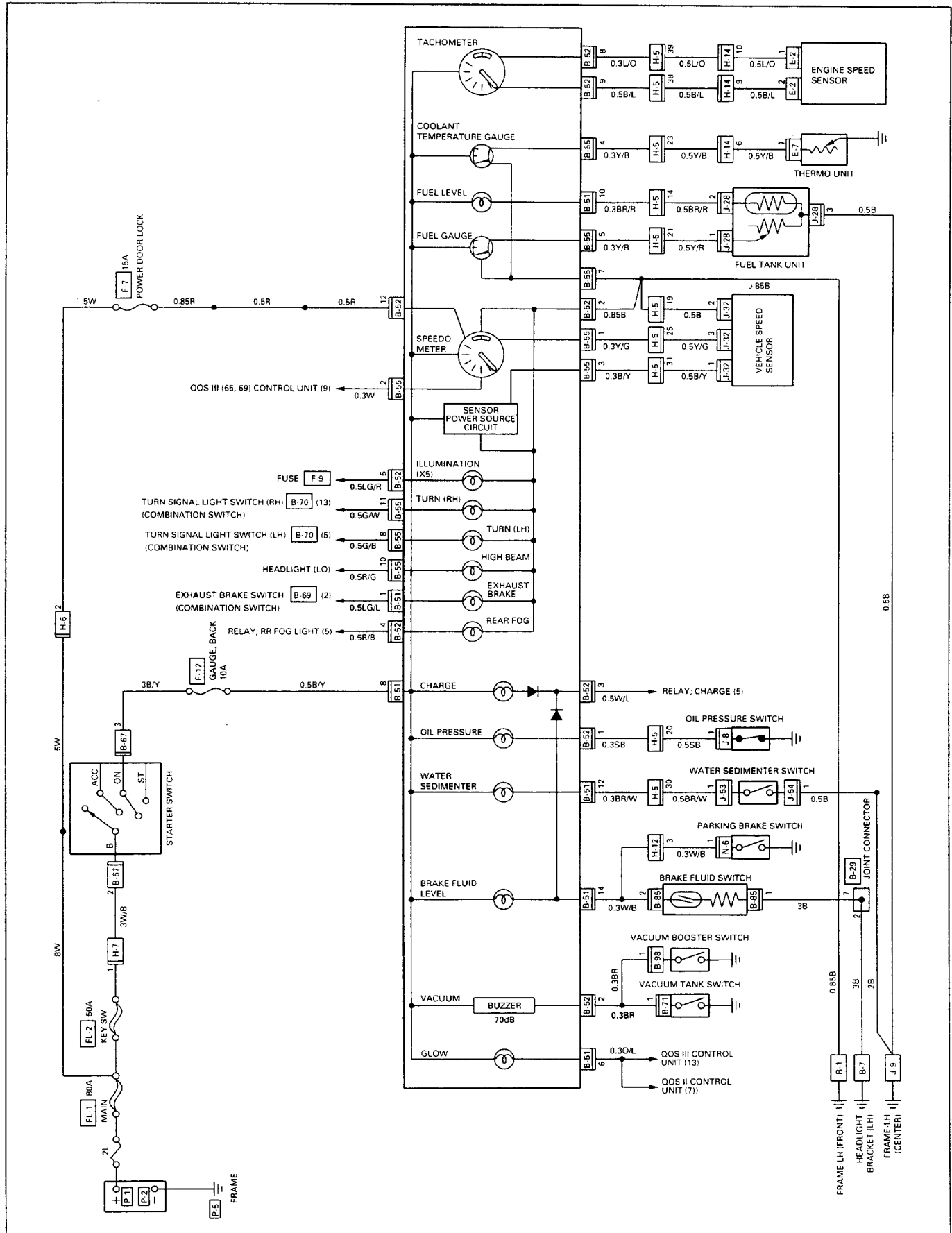
PARTS LOCATION-FOR 12 VOLT



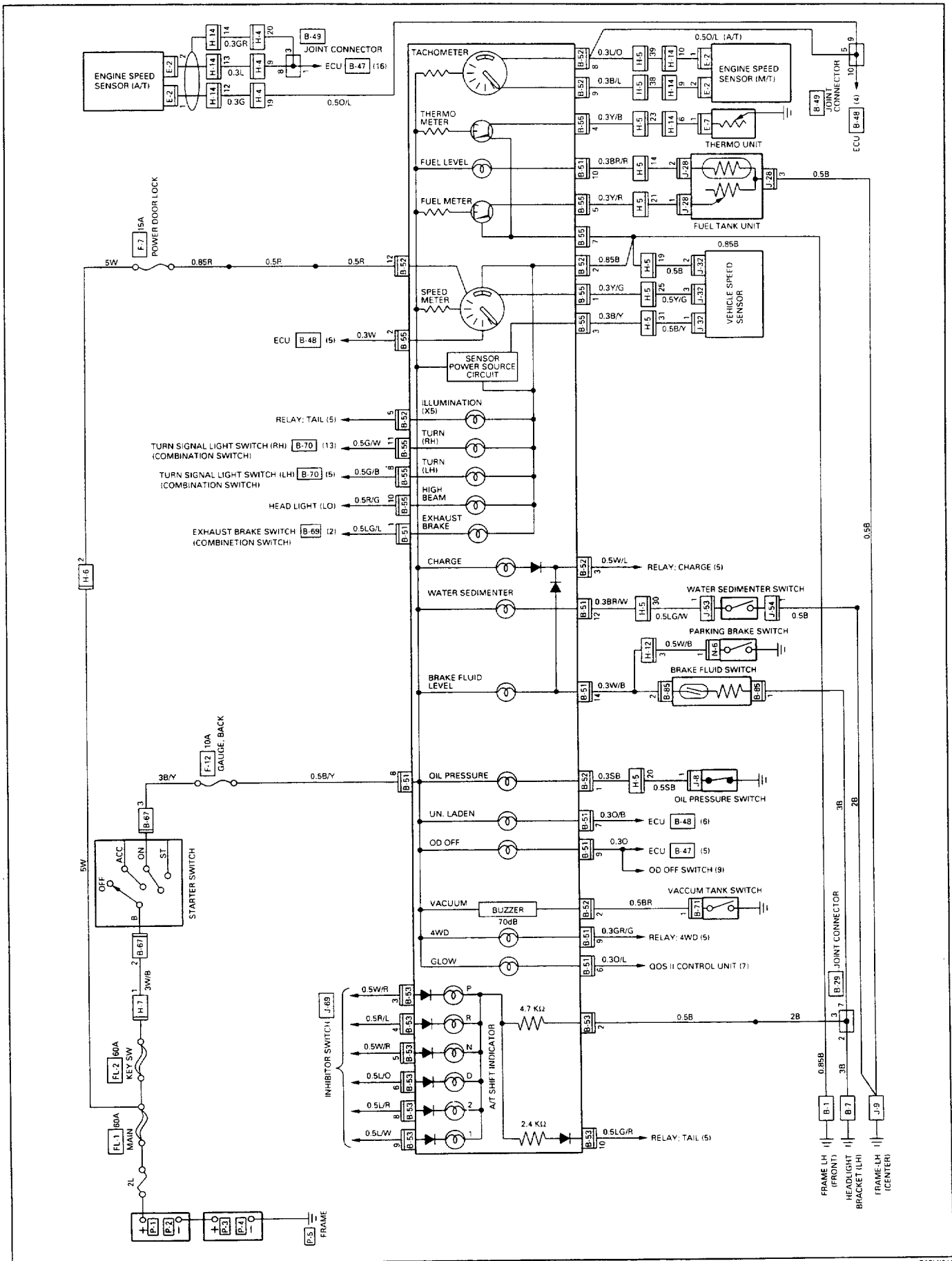
PARTS LOCATION - FOR 24 VOLT



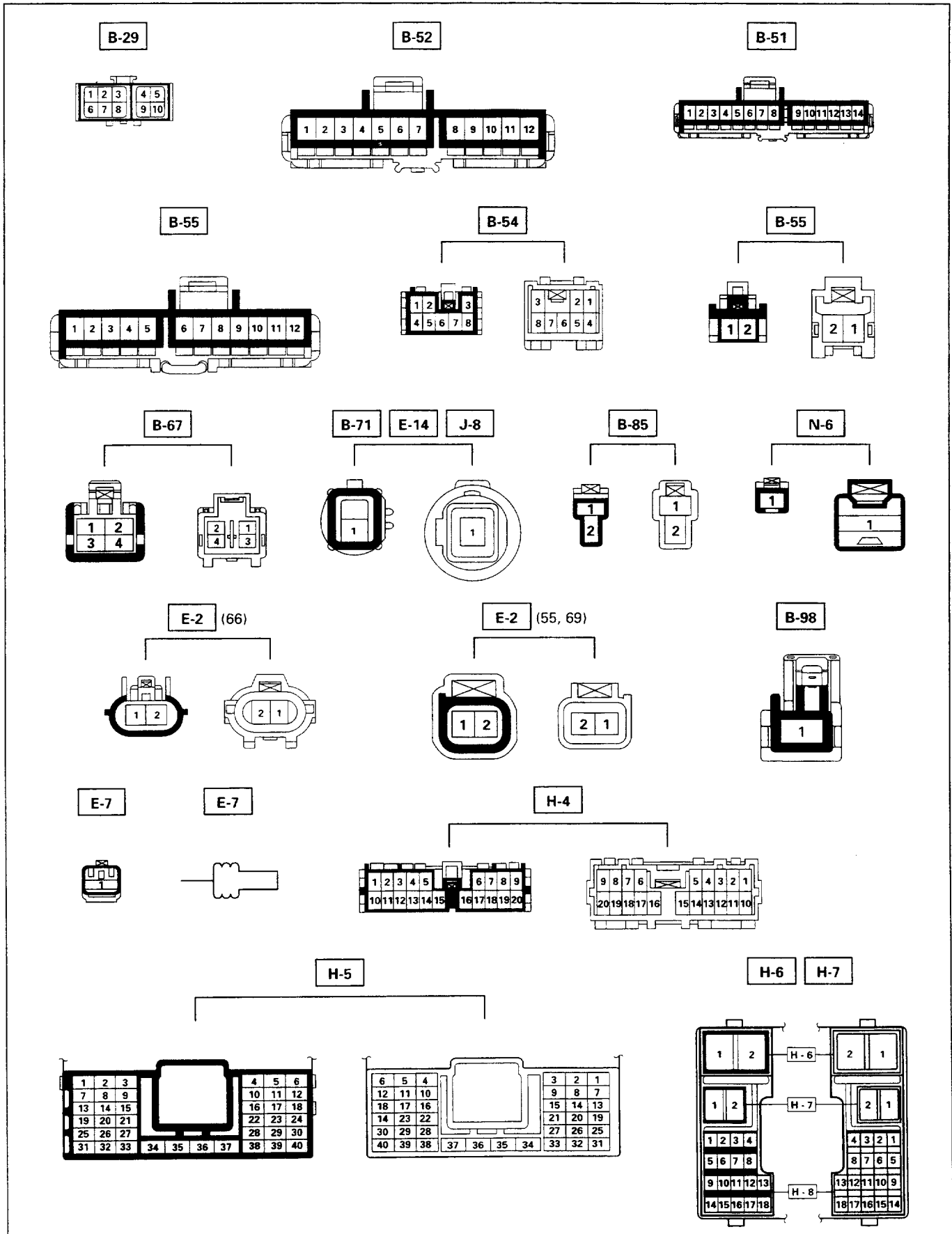
CIRCUIT DIAGRAM - FOR 12 VOLT



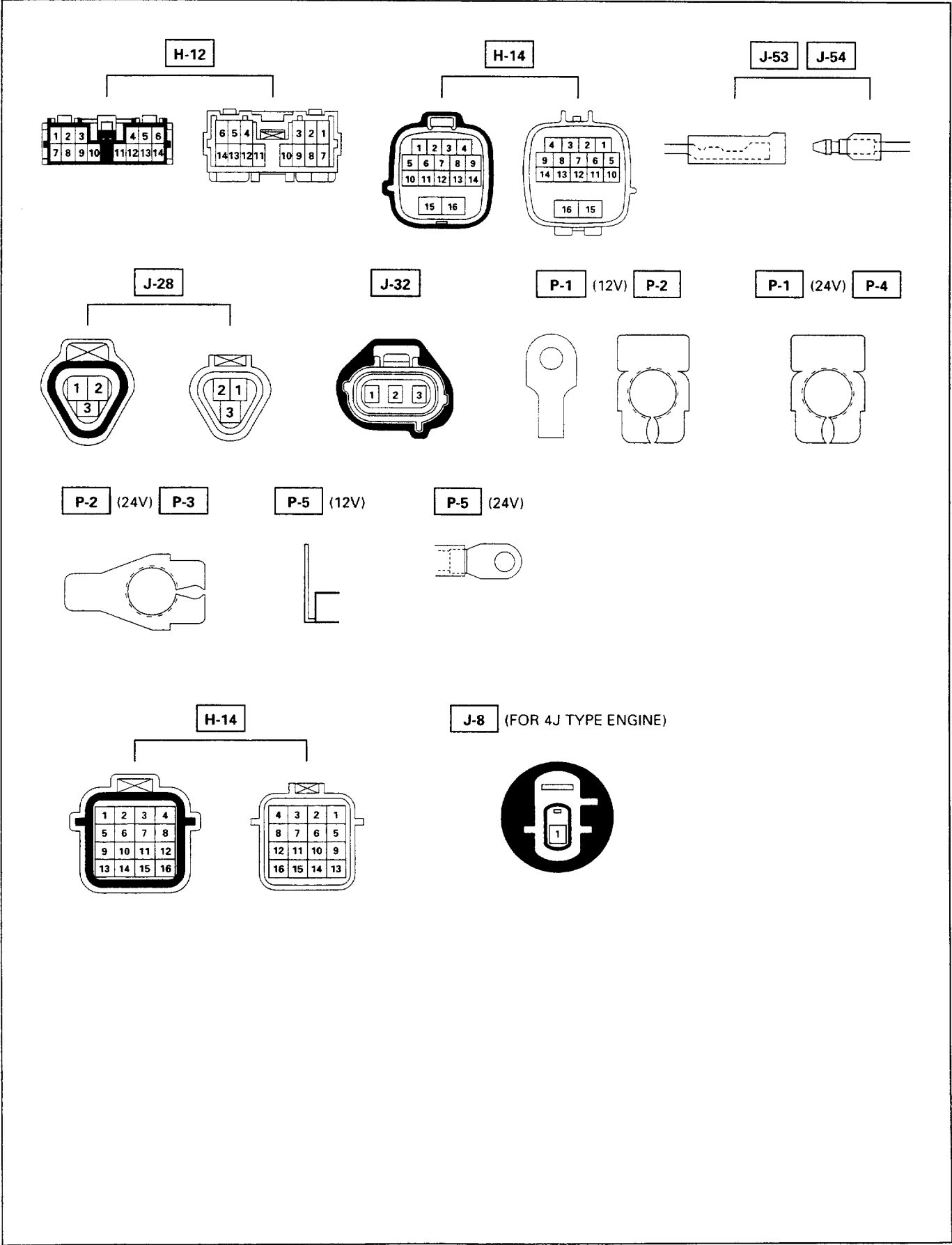
CIRCUIT DIAGRAM - FOR 24 VOLT



CONNECTOR LIST



CONNECTOR LIST



DIAGNOSIS

QUICK CHART FOR CHECK POINT

1. SPEEDOMETER

Trouble mode \ Check point	Speedometer	Vehicle speed sensor	Cable harness
1-1 Speedometer and odometer do not function	○ (3)	○ (1)	○ (2)
1-2 Speedometer does not function (odometer is normal)	○ (1)		
1-3 Odometer does not function (Speedometer is normal)	○ (1)		
1-4 Speedometer needle fluctuates (May be wide fluctuation)	○ (3)	○ (1)	○ (2)
1-5 Speedometer needle jumps erratically	○ (3)	○ (1)	○ (2)

NOTE: Figure in parenthesis "()" indicates the order of inspection.

2. TACHOMETER

Trouble mode \ Check point	Tachometer	Engine speed sensor	Cable harness
2-1 Tachometer does not function	○ (3)	○ (1)	○ (2)
2-2 Tachometer needle fluctuates (May be wide fluctuation)	○ (3)	○ (1)	○ (2)
2-3 Tachometer needle jumps erratically	○ (3)	○ (1)	○ (2)

NOTE: Figure in parenthesis "()" indicates the order of inspection.

3. COOLANT TEMPERATURE GAUGE

Trouble mode \ Check point	Meter ASM	Thermo-meter	Thermo unit	Thermo stat	Cable harness
3-1 Coolant temperature gauge needle does not move	○ (3)	○ (4)	○ (2)		○ (1)
3-2 Coolant temperature gauge reading is too low (or high)	○ (4)	○ (5)	○ (3)	○ (1)	○ (2)
3-3 Needle overshoots (or goes up to the "H" range)	○ (3)	○ (4)	○ (1)		○ (2)

NOTE: Figure in parenthesis "()" indicates the order of inspection.

4. FUEL GAUGE

Trouble mode \ Check point	Meter ASM	Fuel gauge	Fuel tank unit	Cable harness
4-1 Fuel gauge needle does not move	○ (3)	○ (4)	○ (2)	○ (1)
4-2 Even when the tank is filled up with fuel, the needle does not reach "F"	○ (3)	○ (4)	○ (2)	○ (1)
4-3 When the tank is not full of fuel, the needle overshoots (or goes to "F")	○ (3)	○ (4)	○ (2)	○ (1)

NOTE: Figure in parenthesis "()" indicates the order of inspection.

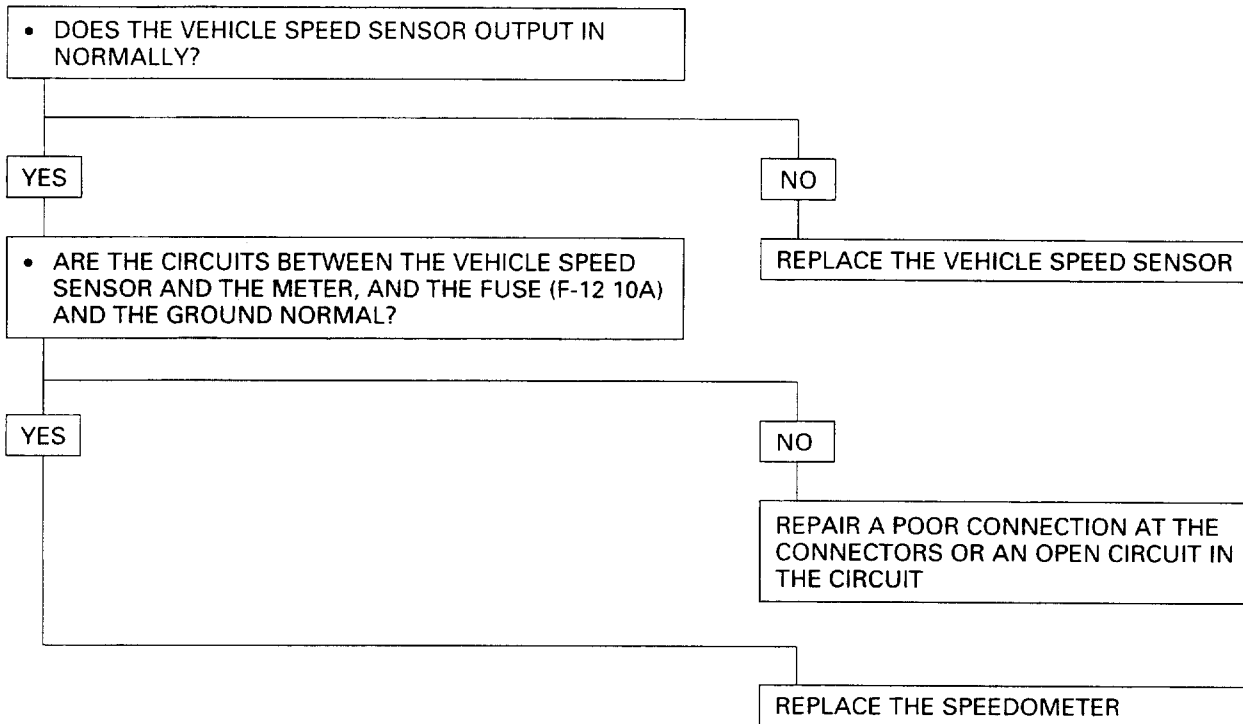
5. WARNING/INDICATOR LIGHT

Trouble mode \ Check point	Light bulb	Parking brake SW	Brake fluid SW	Oil pressure SW	Fuel tank unit	Vacuum SW	4WD SW	Sedimentor SW	Seat belt SW	Cable harness
5-1 When the parking brake lever is pulled, the indicator light does not light up.	○ (2)	○ (1)								○ (3)
5-2 Even when the parking brake lever is released, the indicator light does not go off.		○ (1)								○ (2)
5-3 While the engine operating, the oil pressure warning light does not go off.				○ (2)						○ (1)
5-4 Even when the tank is full with fuel, the fuel warning light lights up.					○ (1)					○ (2)
5-5 Even when the tank is empty, the low fuel warning light does not light up.	○ (1)				○ (2)					○ (3)
5-6 Even when the transfer lever is shifted to 4WD position, the indicator light does not light up.	○ (2)						○ (1)			○ (3)
5-7 Even when the float in the water sedimentor goes up above the drain warning level, the indicator light does not light up.	○ (2)							○ (1)		○ (3)
5-8 Even when the brake fluid is lower than specified level, the level warning light does not light up.	○ (1)		○ (2)							○ (3)
5-9 Even when the vacuum tank is empty vacuum warning buzzer does not sound						○ (1)				○ (2)

NOTE: Figure in parenthesis "()" indicates the order of inspection.

1. SPEEDOMETER

1-1. SPEEDOMETER AND ODOMETER DO NOT FUNCTION



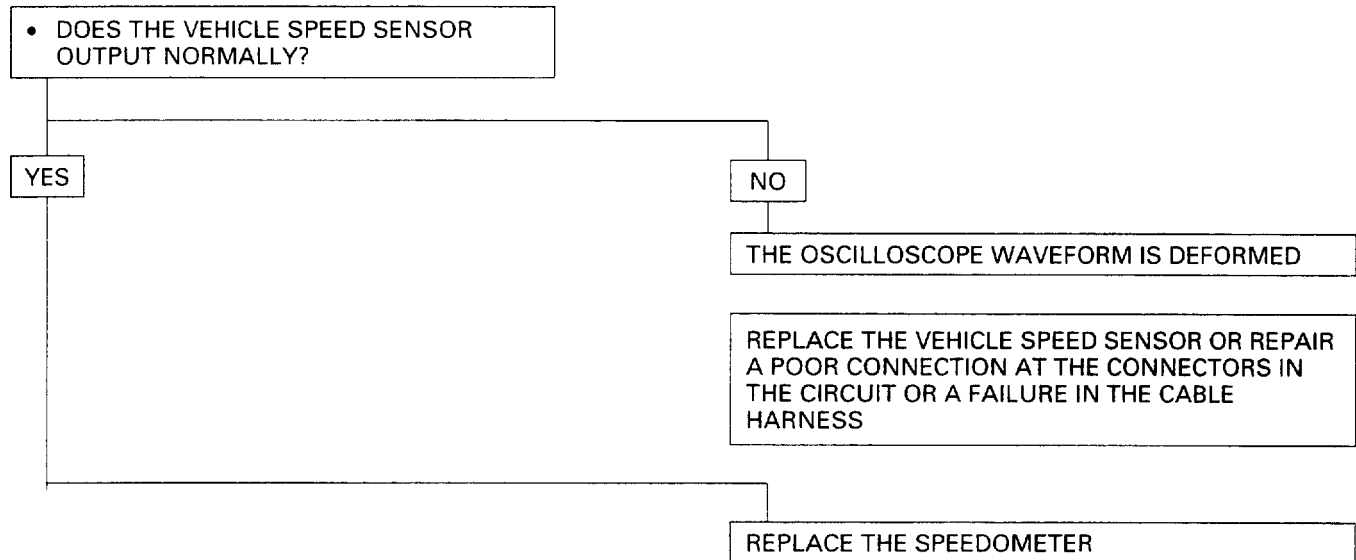
1-2. SPEEDOMETER DOES NOT FUNCTION (ODOMETER IS NORMAL)

REPLACE THE SPEEDOMETER ASSEMBLY

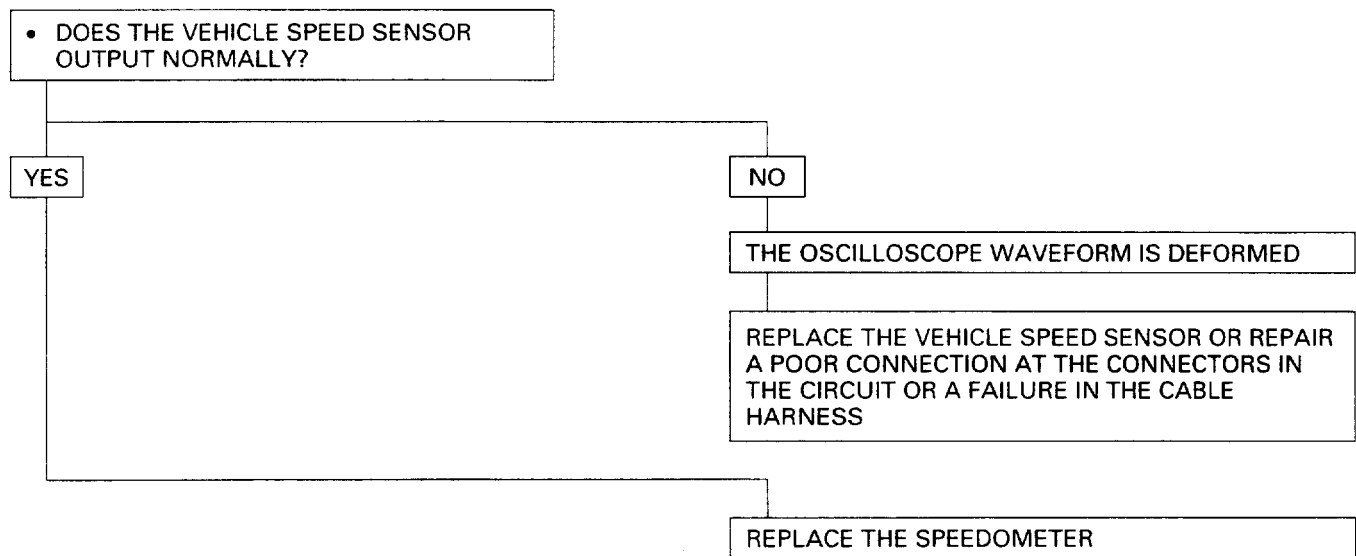
1-3. ODOMETER DOES NOT FUNCTION (SPEEDOMETER IS NORMAL)

REPLACE THE SPEEDOMETER ASSEMBLY

1-4. SPEEDOMETER NEEDLE FLUCTUATES (MAY BE WIDE FLUCTUATION)

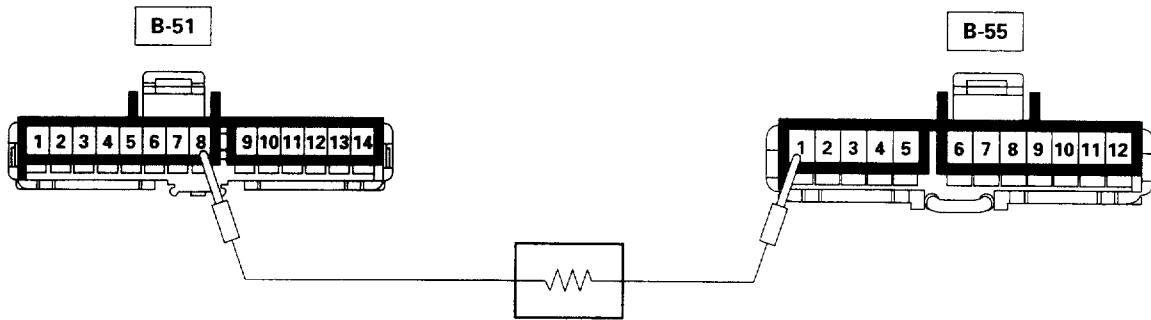


1-5. SPEEDOMETER NEEDLE JUMPS ERRATICALLY



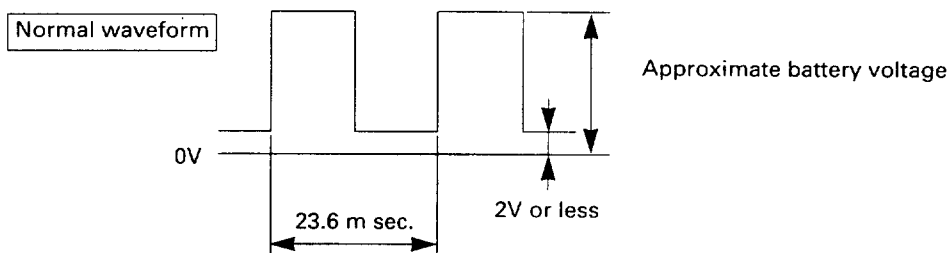
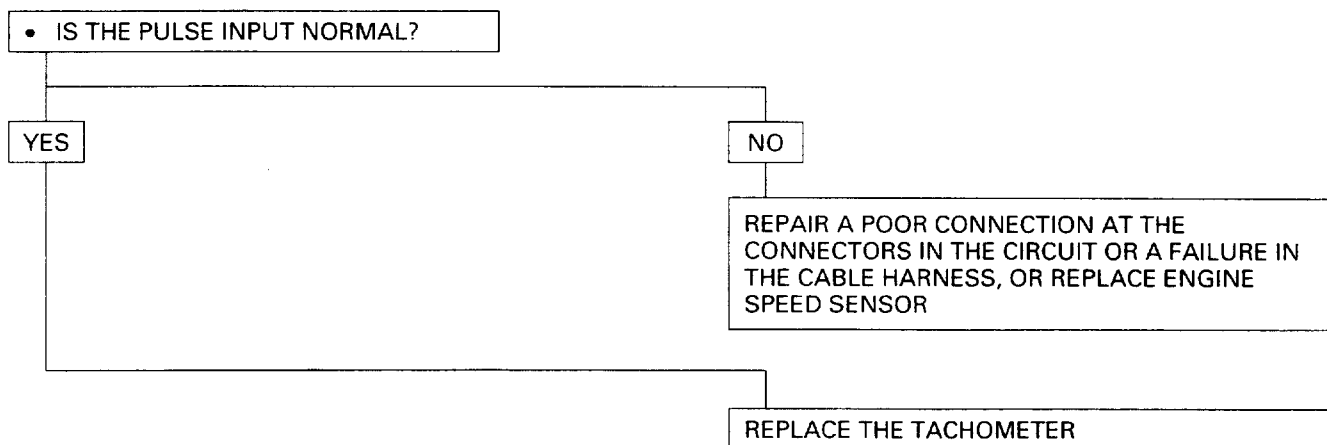
Inspection of waveform by oscilloscope

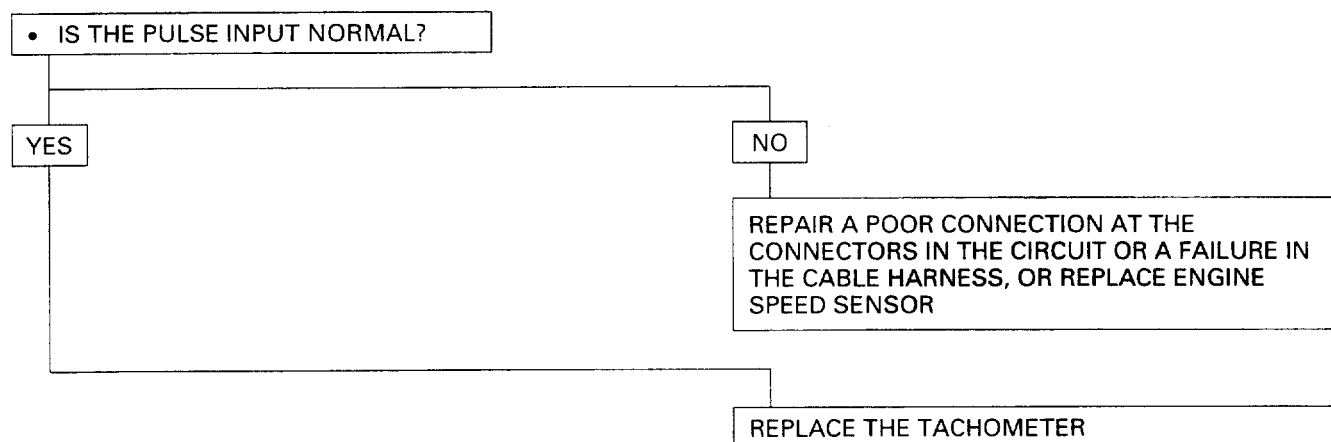
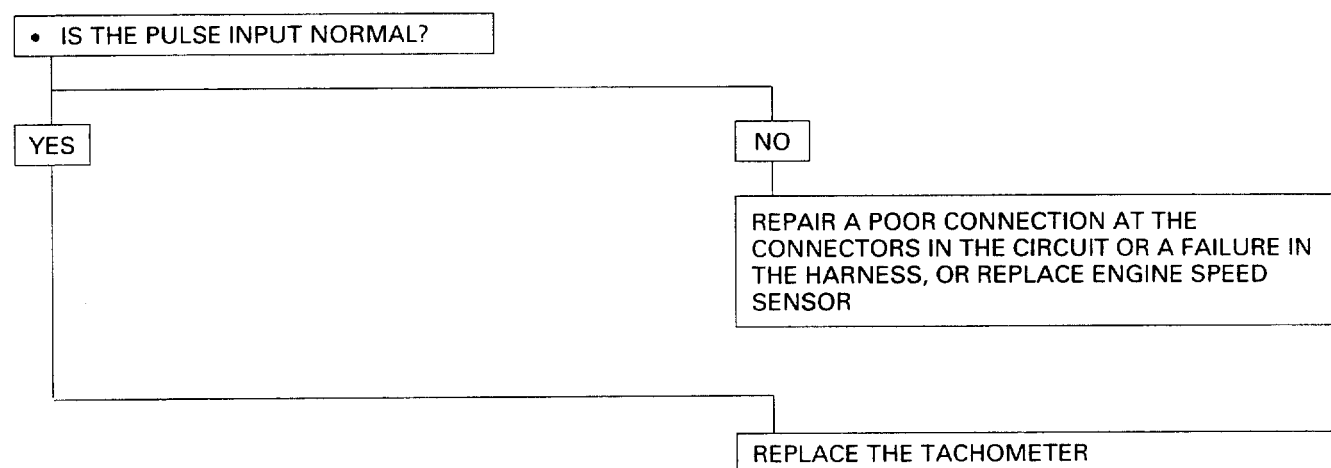
1. Connect a resistance of 1.3 to 5k ohm (1.4W or more) between the harness side connectors 8 **B-51** and 1 **B-55** of the meter.



825LX002

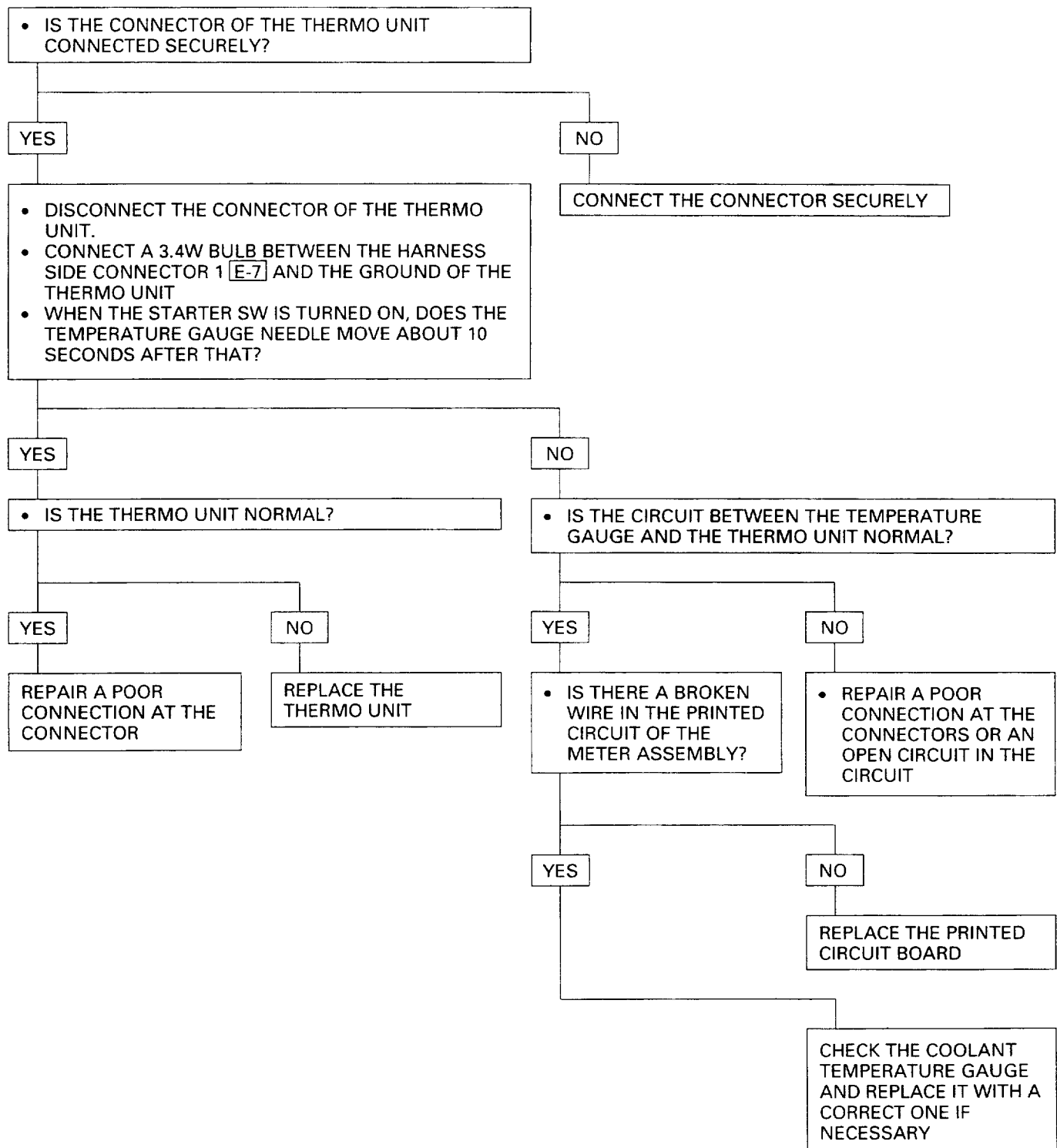
2. Install a speedometer tester.
2. Turn on the starter SW.
3. Check the waveform at the time when the vehicle speed is at 60 Km (37 mph)

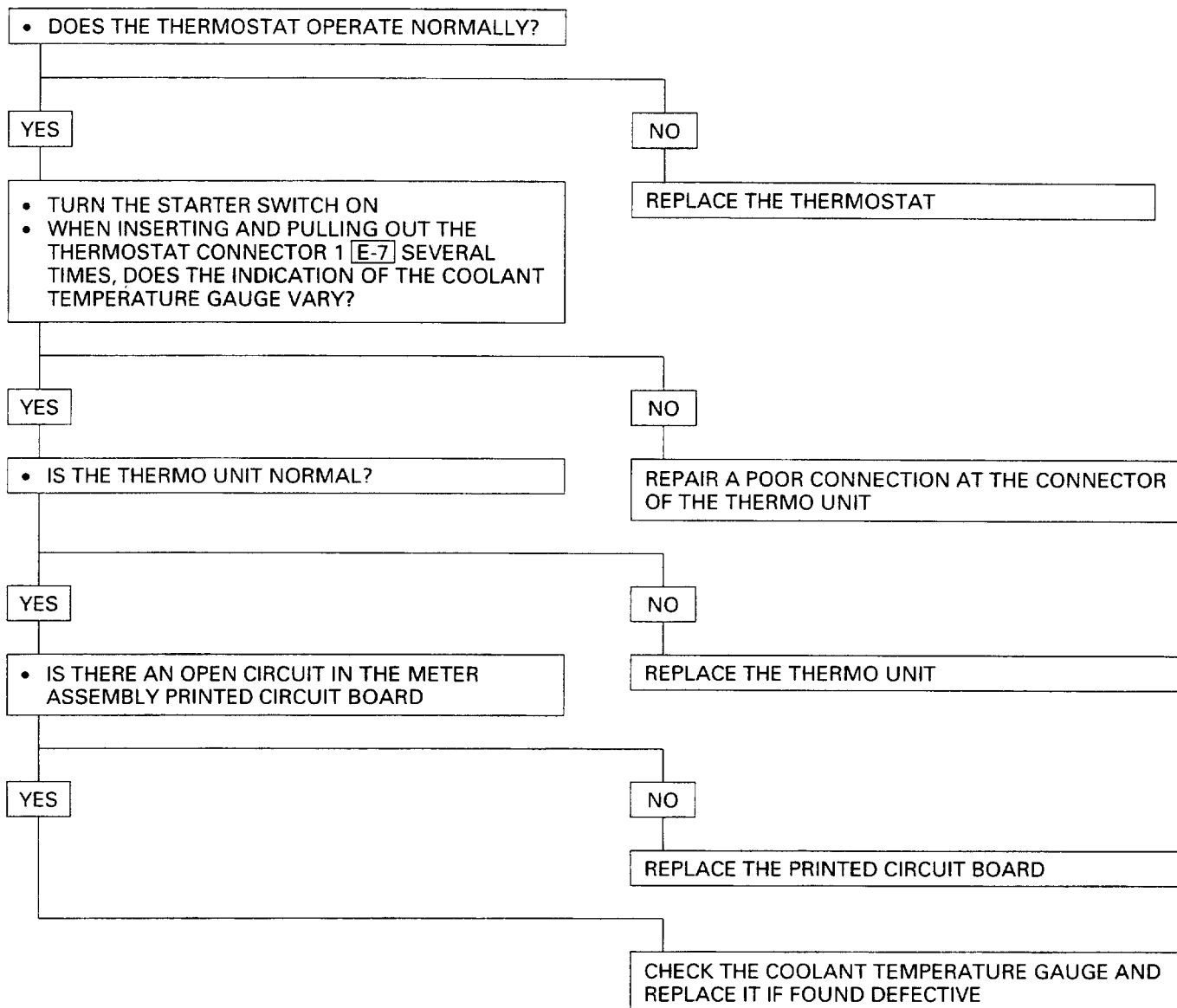
**2. TACHOMETER****2-1. TACHOMETER DOES NOT FUNCTION**

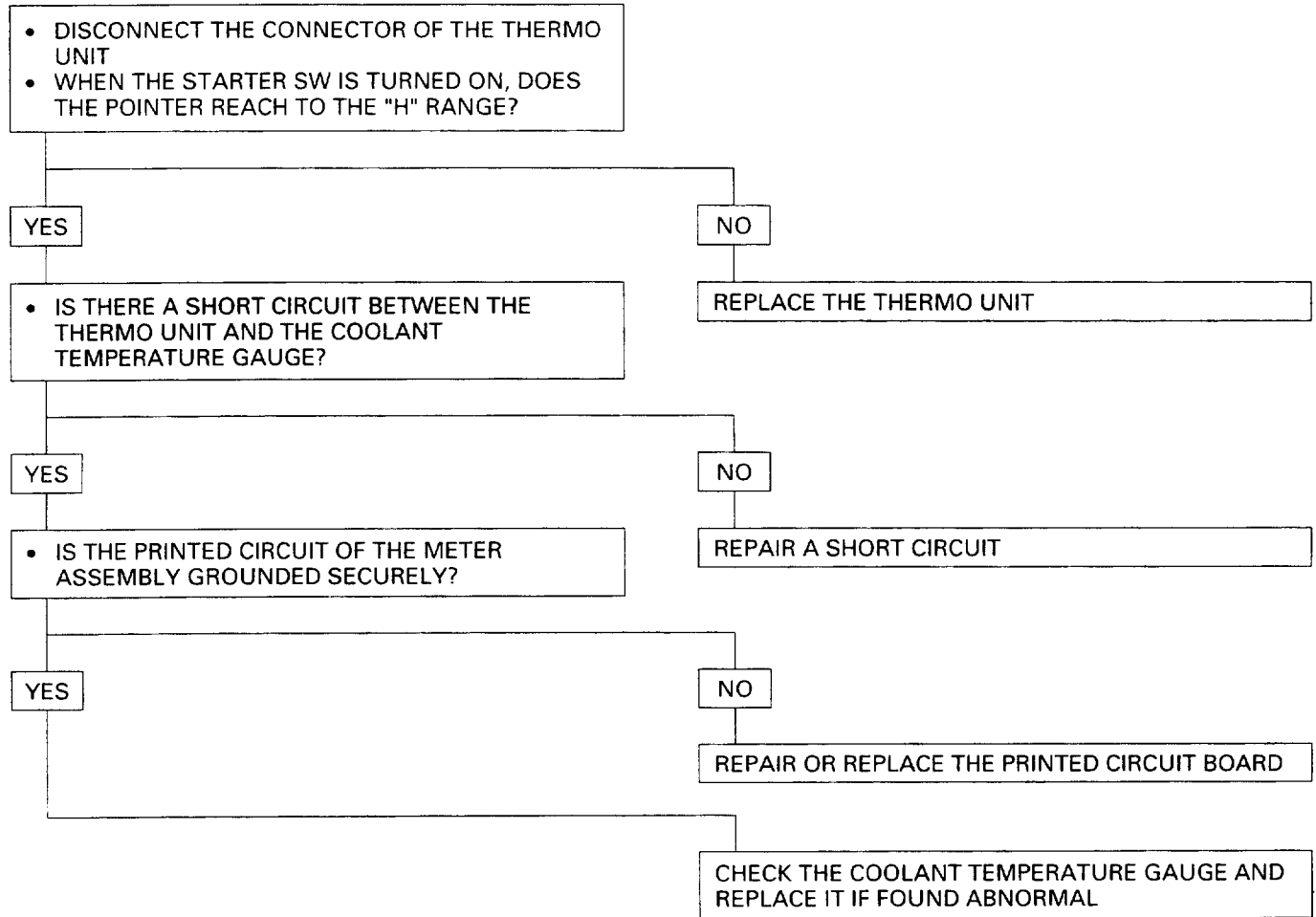
2-2 TACHOMETER NEEDLE FLUCTUATES (MAY BE WIDE FLUCTUATION)**2-3 TACHOMETER NEEDLE JUMPS ERRATICALLY**

3. COOLANT TEMPERATURE GAUGE

3-1 COOLANT TEMPERATURE GAUGE NEEDLE DOES NOT MOVE

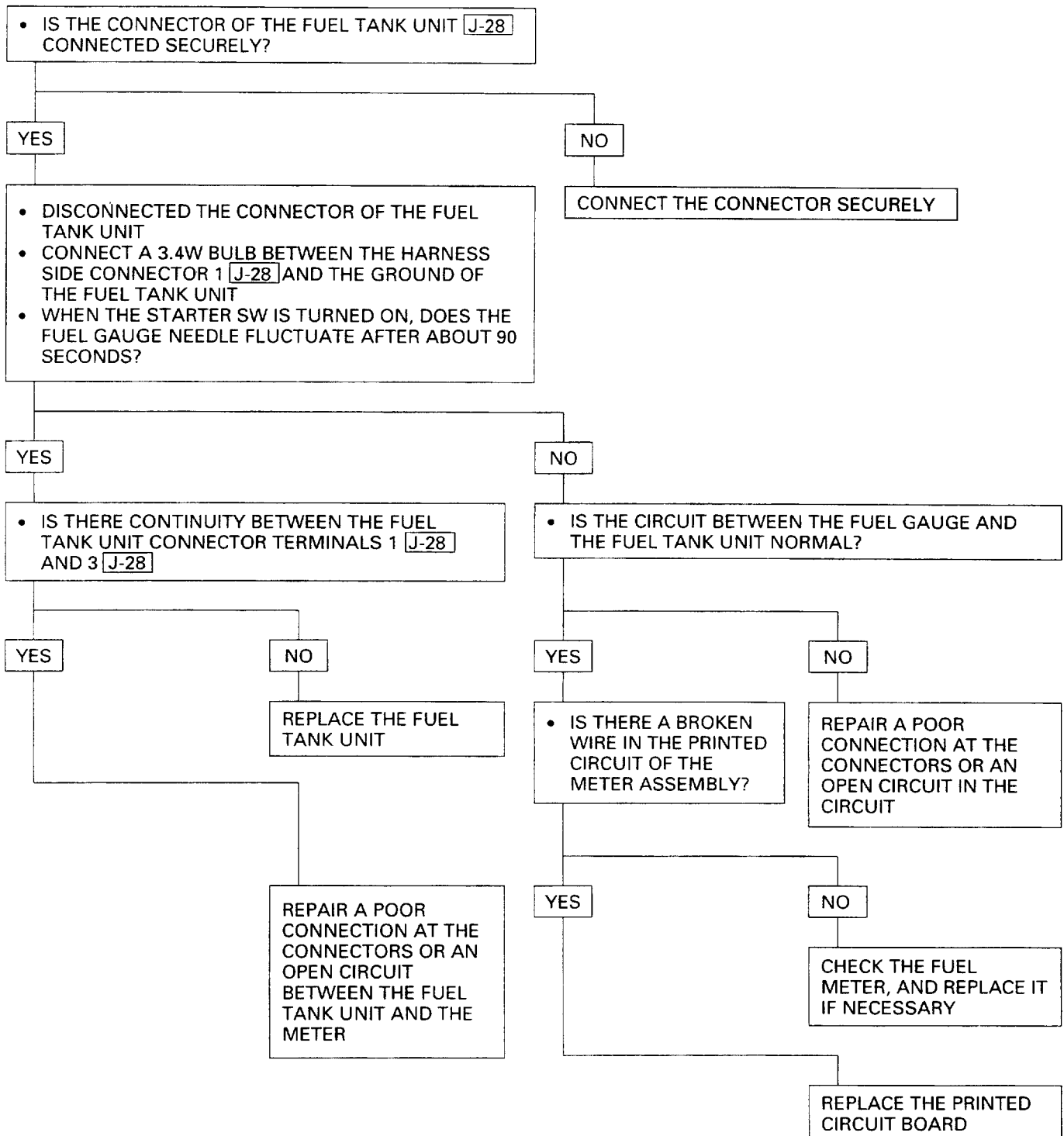


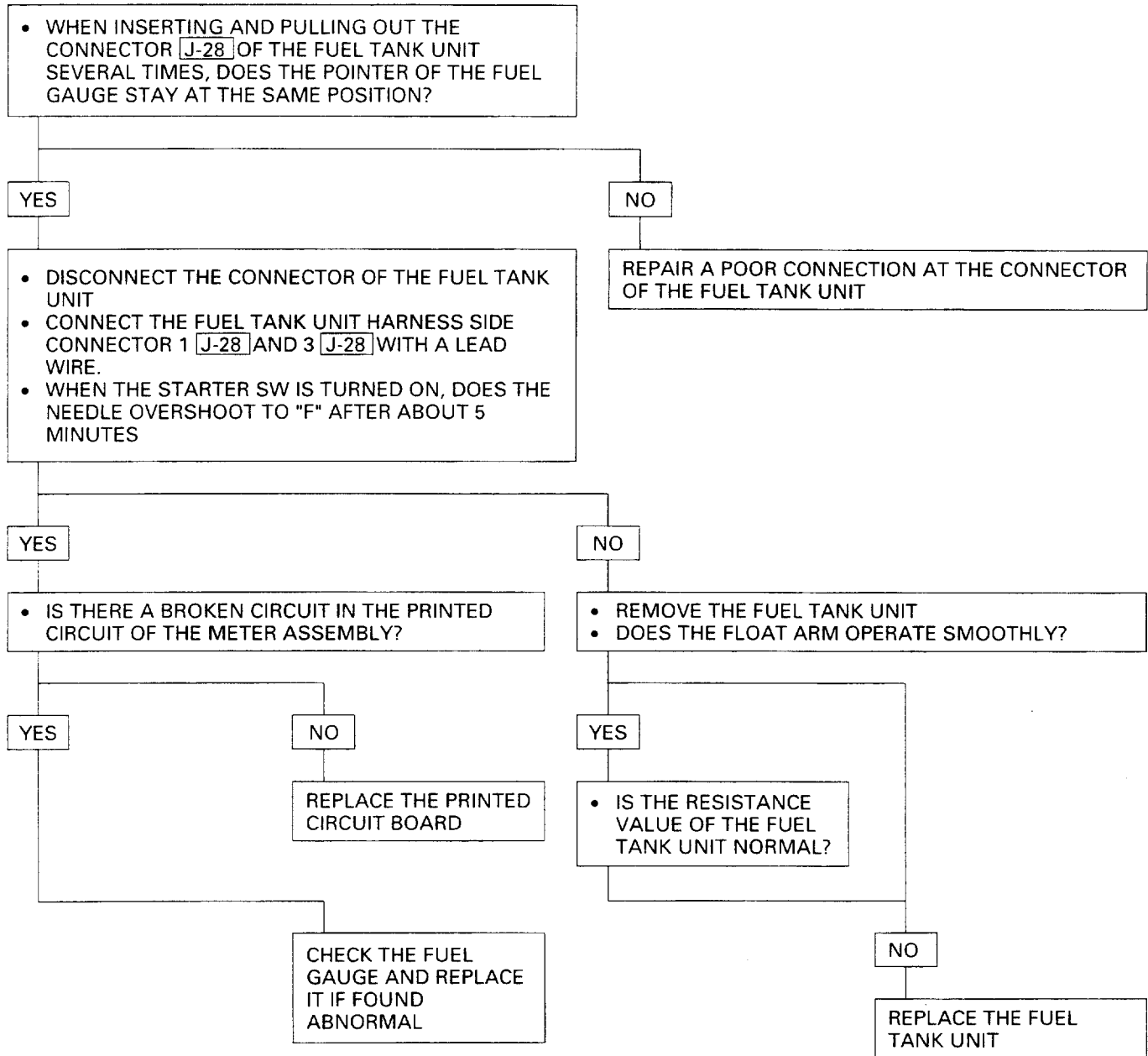
3-2 COOLANT TEMPERATURE GAUGE READING IS TOO LOW (OR HIGH)

3-3 NEEDLE OVERTHOOTS (OR GOES UP TO THE "H" RANGE)

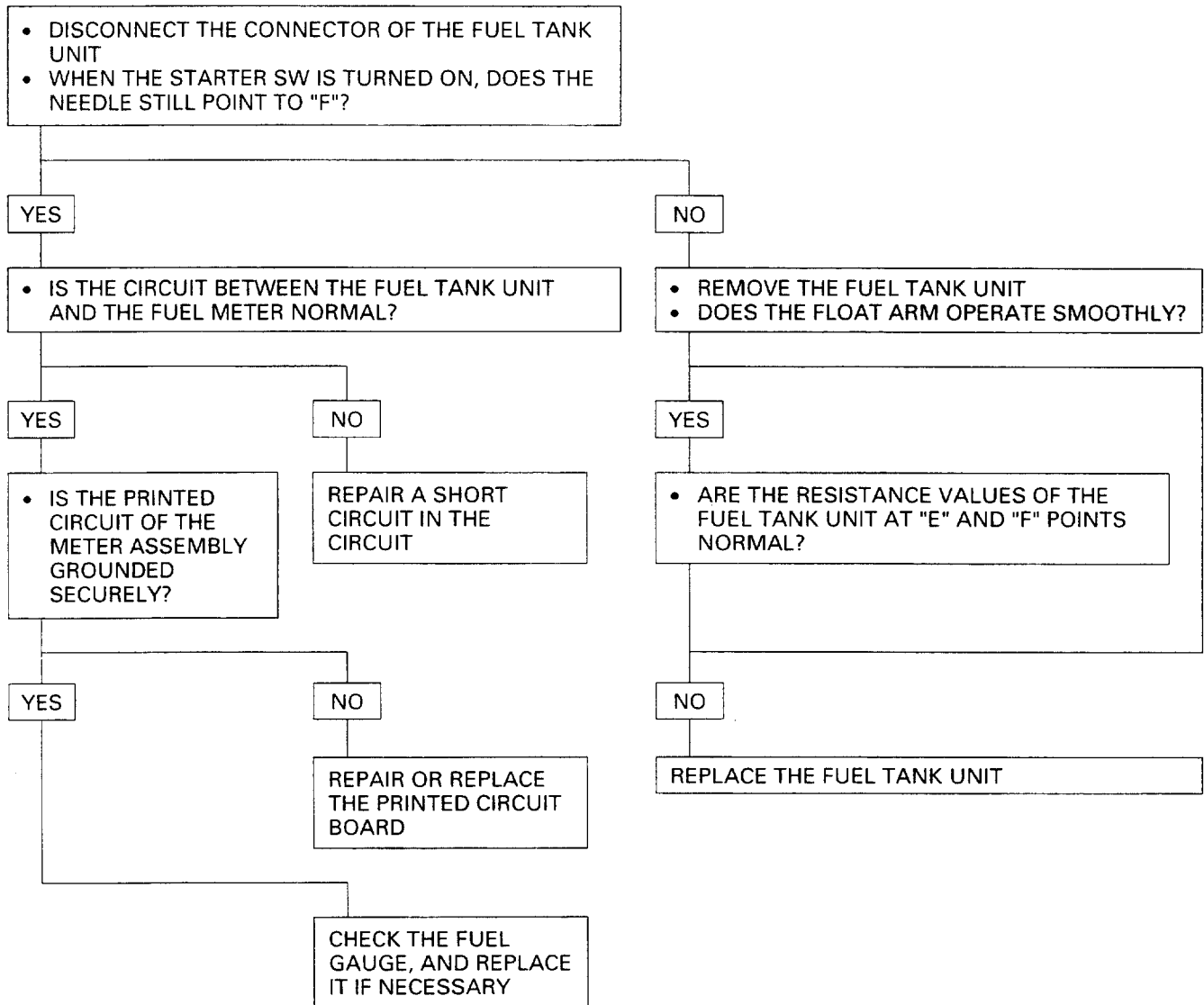
4. FUEL GAUGE

4-1. FUEL GAUGE NEEDLE DOES NOT MOVE



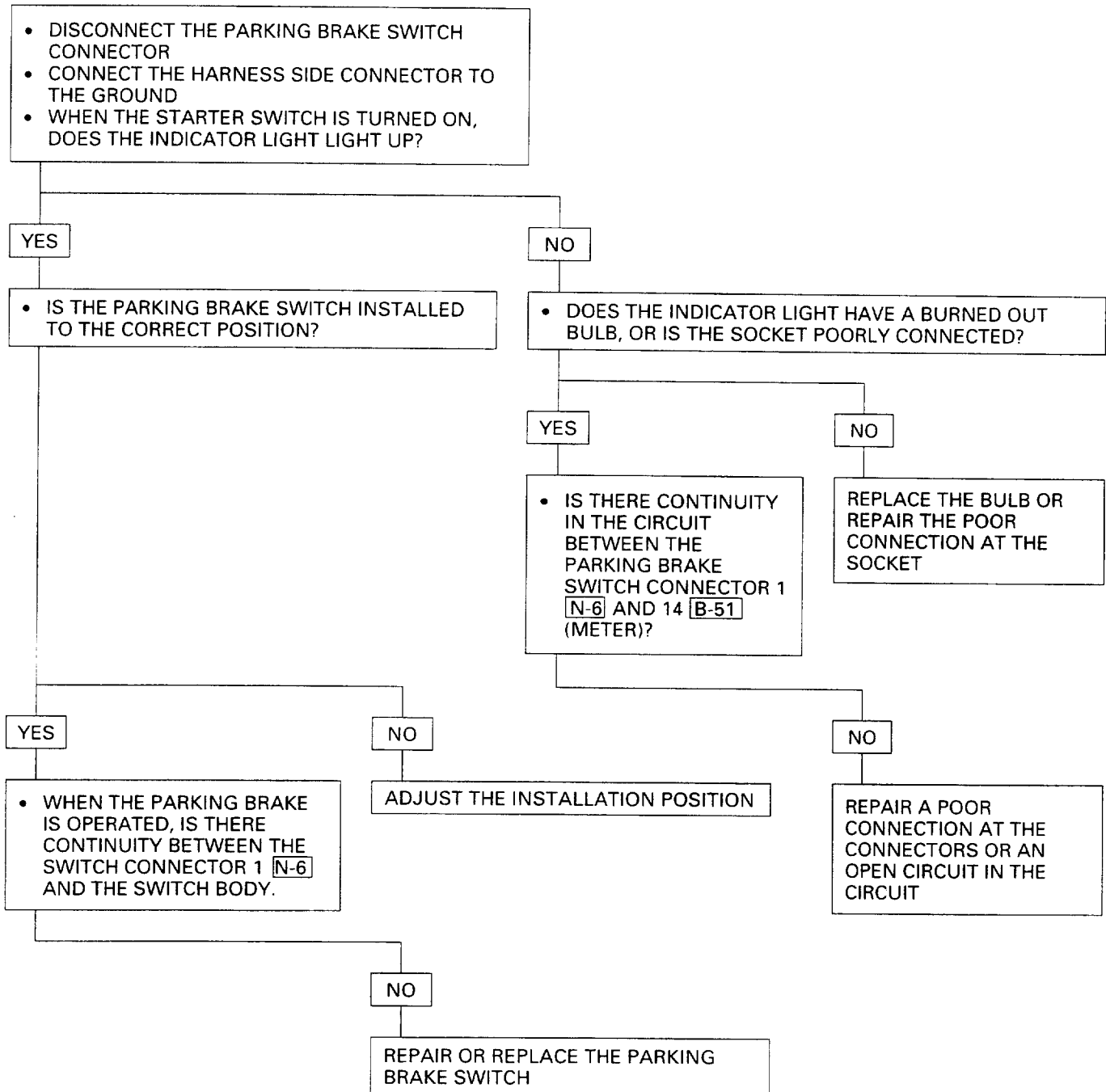
4-2 EVEN WHEN THE TANK IS FILLED UP WITH FUEL, THE NEEDLE DOES NOT REACH "F"

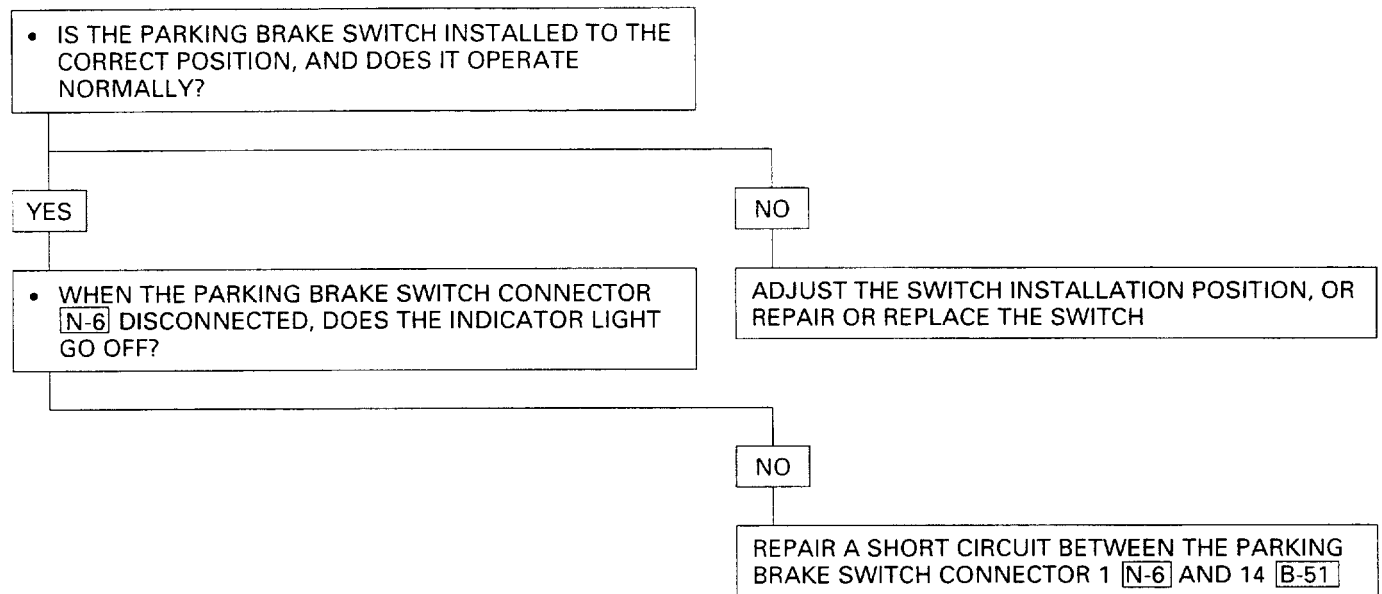
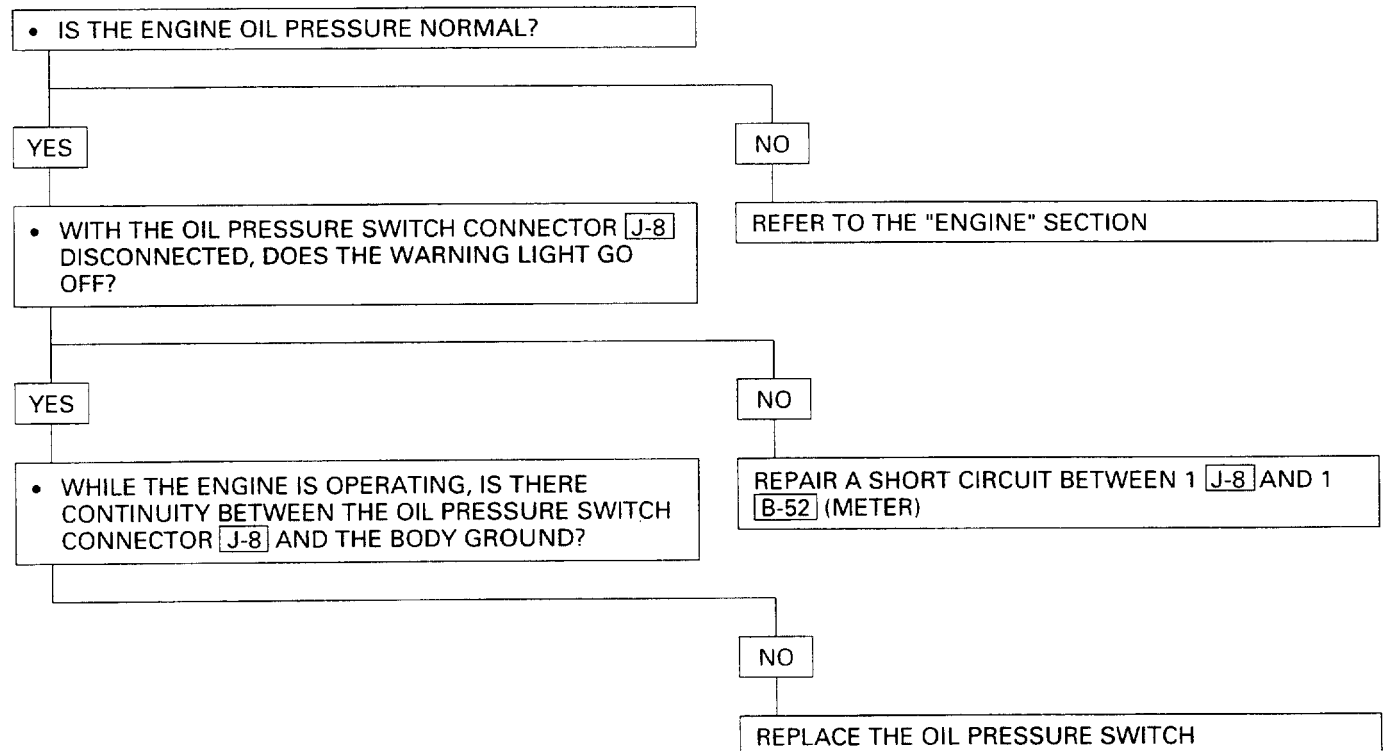
4-3 WHEN THE TANK IS NOT FULL OF FUEL, THE NEEDLE OVERSHOOTS (OR GOES UP TO "F")

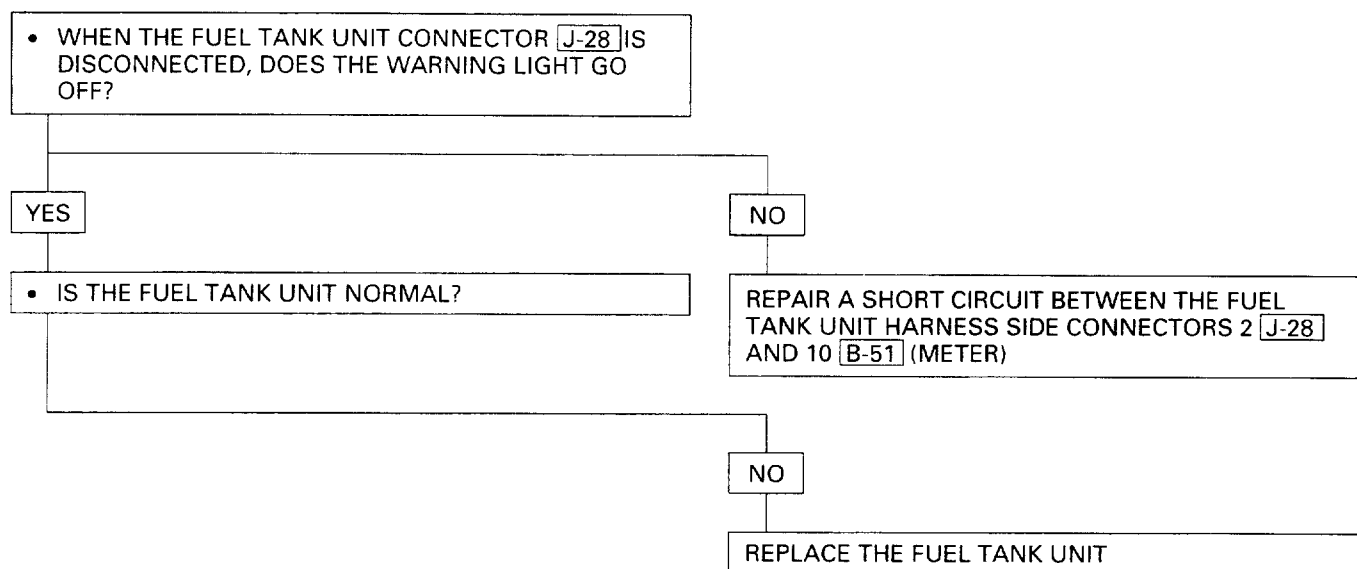
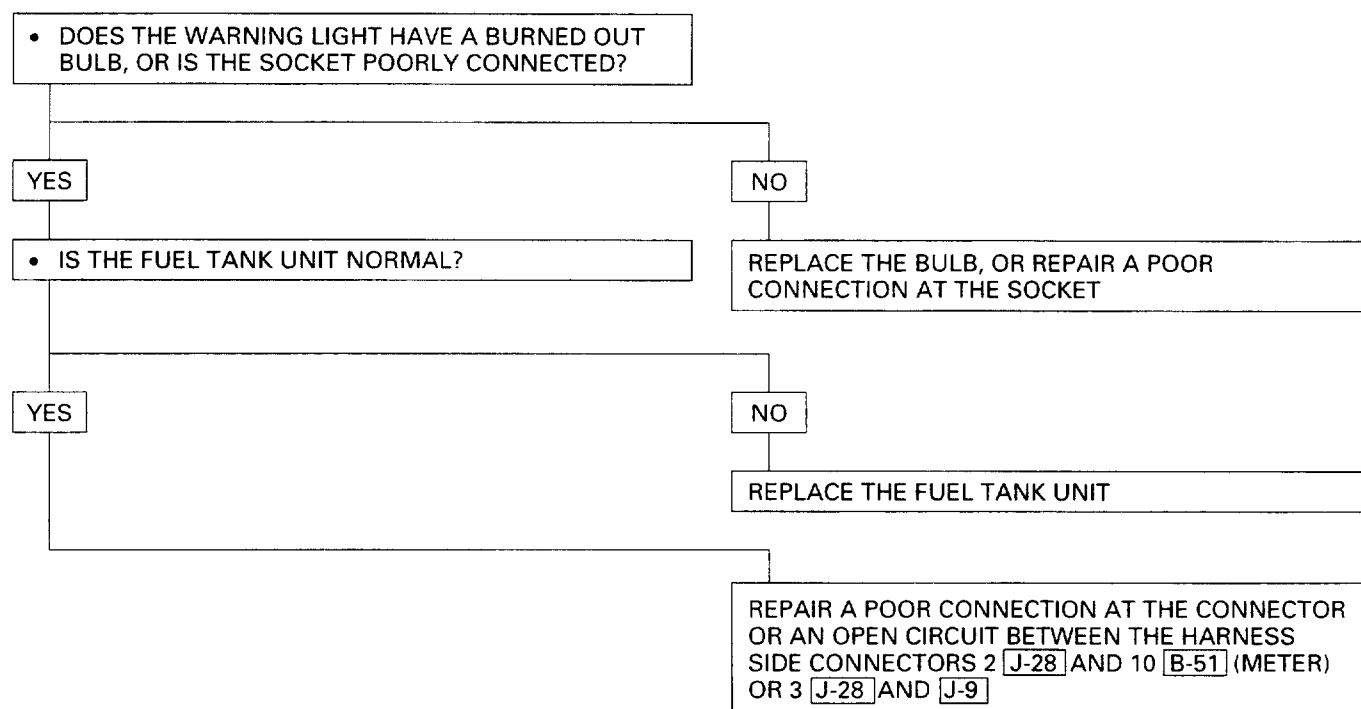


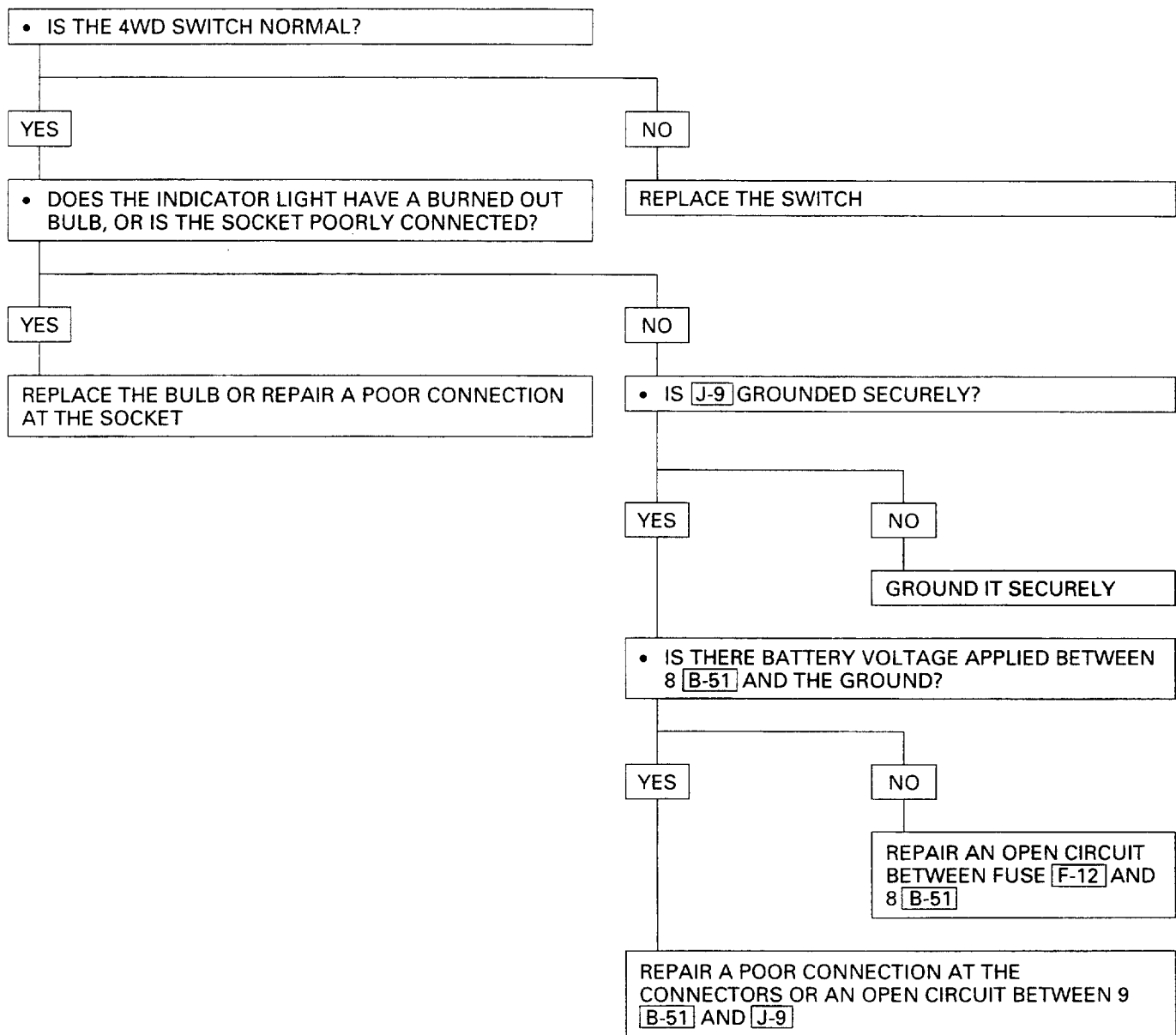
5. WARNING/INDICATOR LIGHT

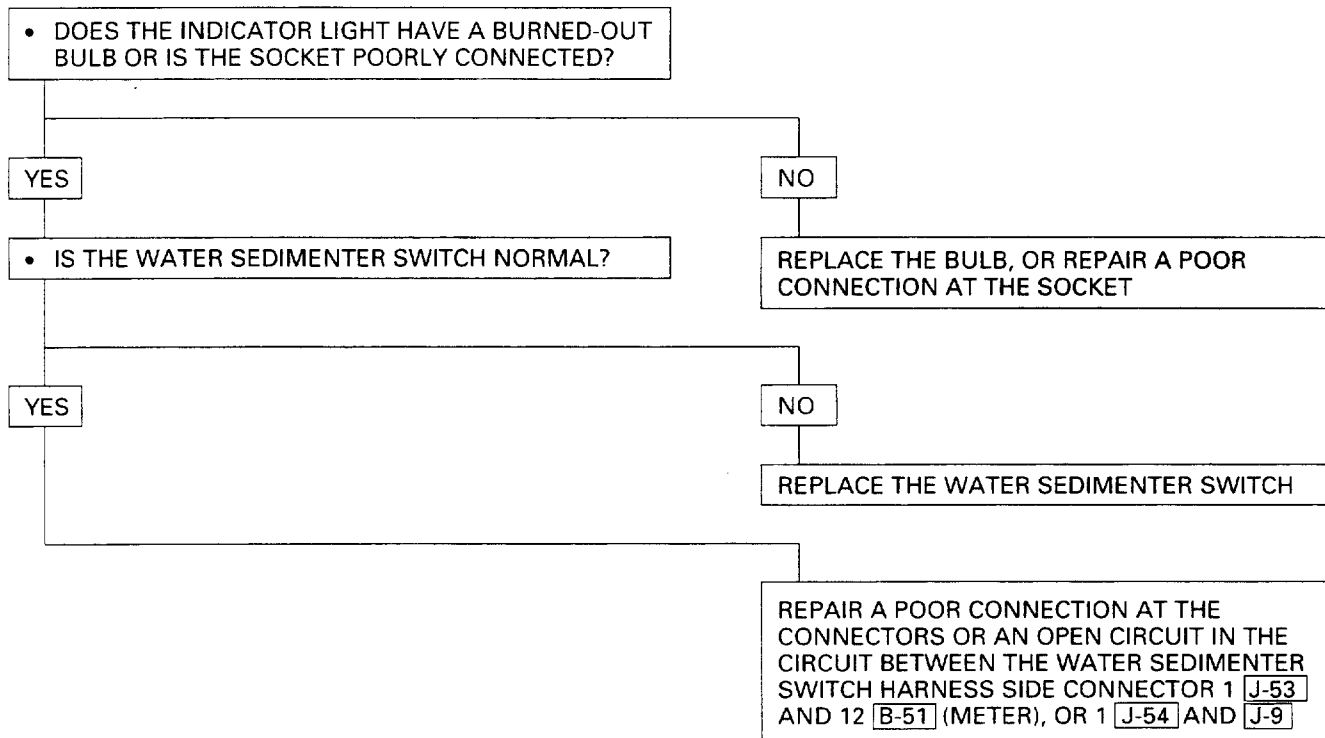
5-1 WHEN THE PARKING BRAKE LEVER IS PULLED, THE INDICATOR LIGHT DOES NOT LIGHT UP

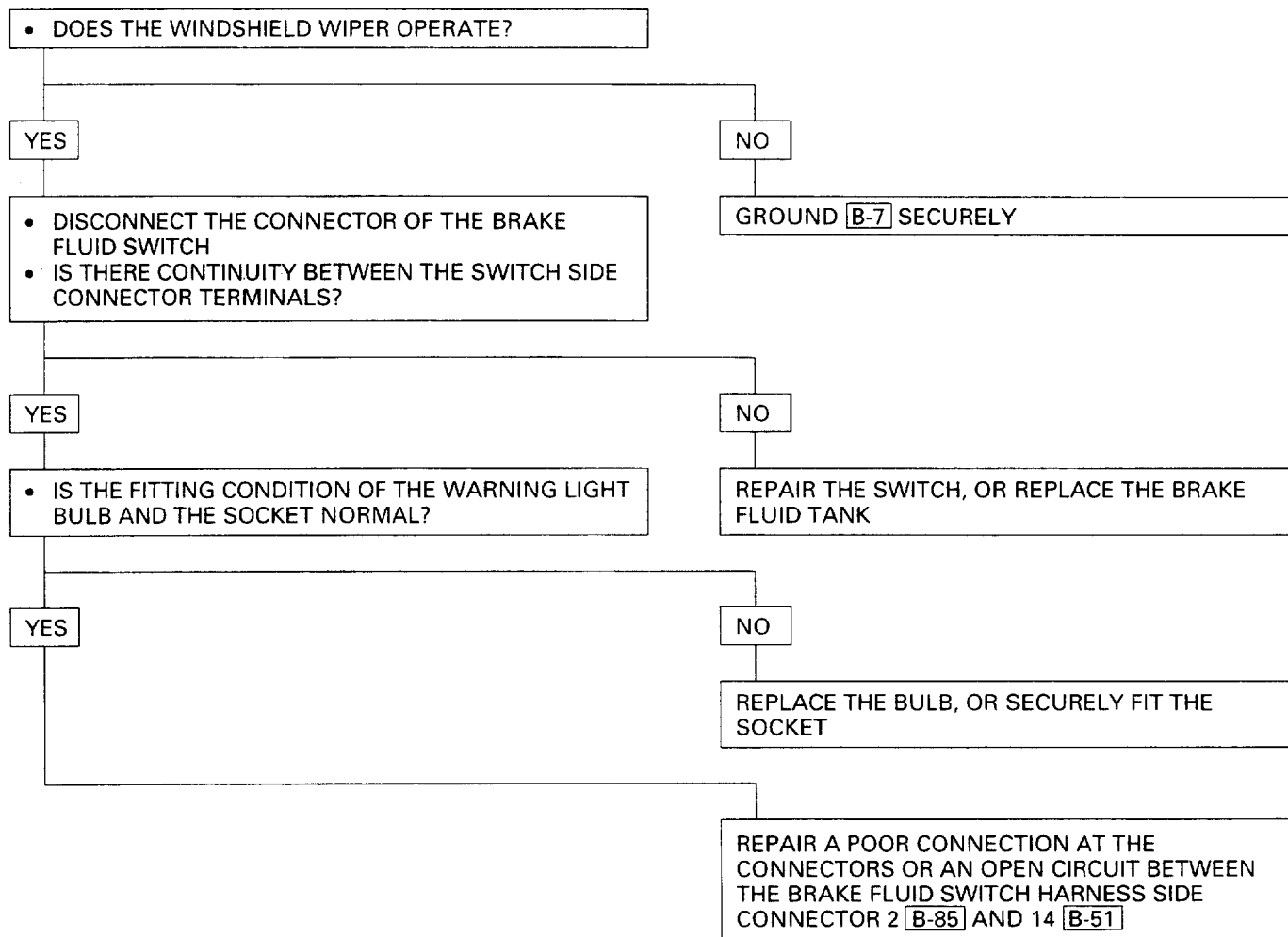


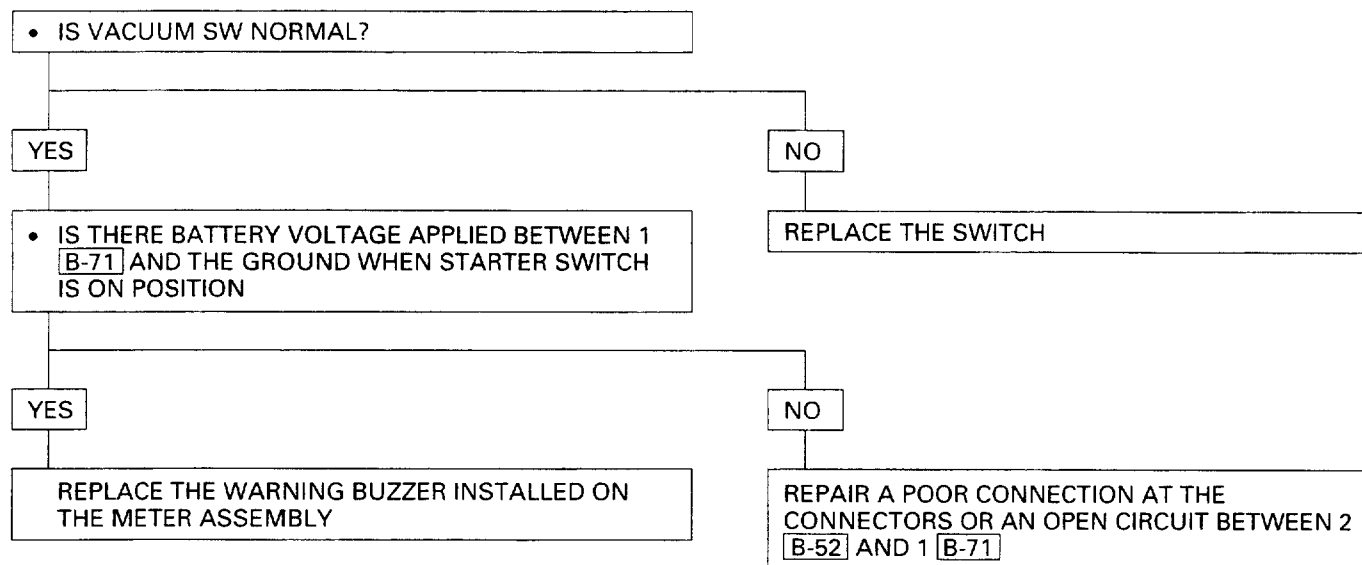
5-2 EVEN WHEN THE PARKING BRAKE LEVER IS RELEASED THE INDICATOR LIGHT DOES NOT GO OFF**5-3 WHILE THE ENGINE IS OPERATING, THE OIL PRESSURE WARNING LIGHT DOES NOT GO OFF**

5-4 EVEN WHEN THE FUEL TANK IS FULL WITH FUEL, THE FUEL WARNING LIGHT LIGHTS UP**5-5 EVEN WHEN THE FUEL TANK IS EMPTY, THE LOW FUEL WARNING LIGHT DOES NOT LIGHT UP**

**5-6 EVEN WHEN THE TRANSFER LEVER IS SHIFTED TO 4WD POSITION ,
THE INDICATOR LIGHT DOES NOT LIGHT UP**

5-7 EVEN WHEN THE FLOAT IN THE WATER SEDIMENTER GOES UP ABOVE THE DRAIN WARNING LEVEL, THE INDICATOR LIGHT DOES NOT LIGHT UP

5-8 EVEN WHEN THE BRAKE FLUID IS LOWER THAN SPECIFIED LEVEL, THE LEVEL WARNING LIGHT DOES NOT LIGHT UP

5-9 VACUUM WARNING BUZZER DOES NOT SOUND

STARTER SWITCH

Refer to "START AND CHARGING" in this section.

TURN SIGNAL LIGHT SWITCH

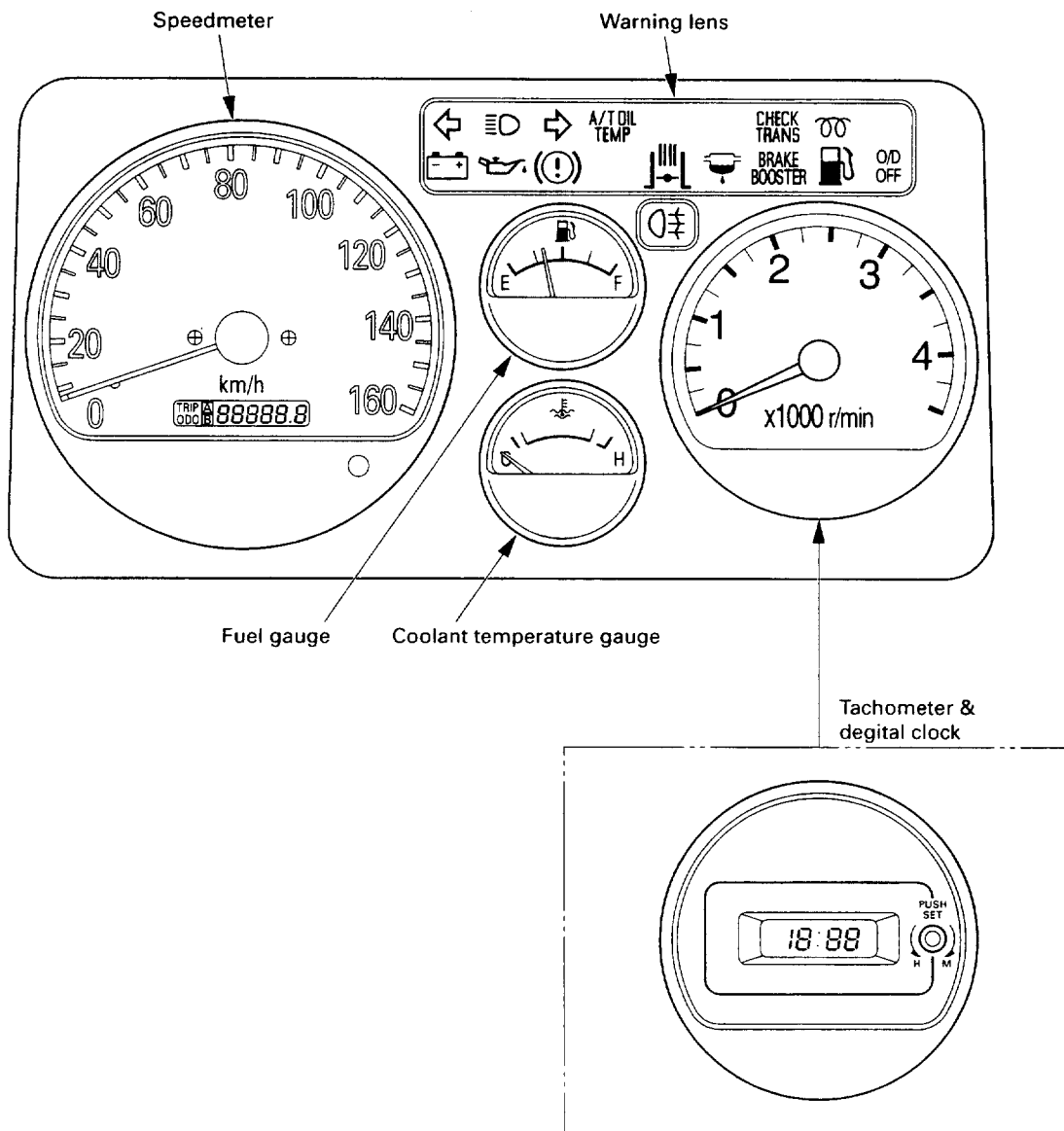
Refer to "TURN SIGNAL LIGHT, HAZARD WARNING LIGHT AND STOPLIGHT" in this section.

EXHAUST BRAKE SWITCH

Refer to "EXHAUST BRAKE" in this section.

METER ASSEMBLY

LAYOUT FOR GAUGES, WARNING, INDICATOR AND ILLUMINATION LIGHTS



825LX006

NOTE: The calibration and the red zone of tachometer are various depending on the models fitted.

BULB LOCATION FOR WARNING LENS

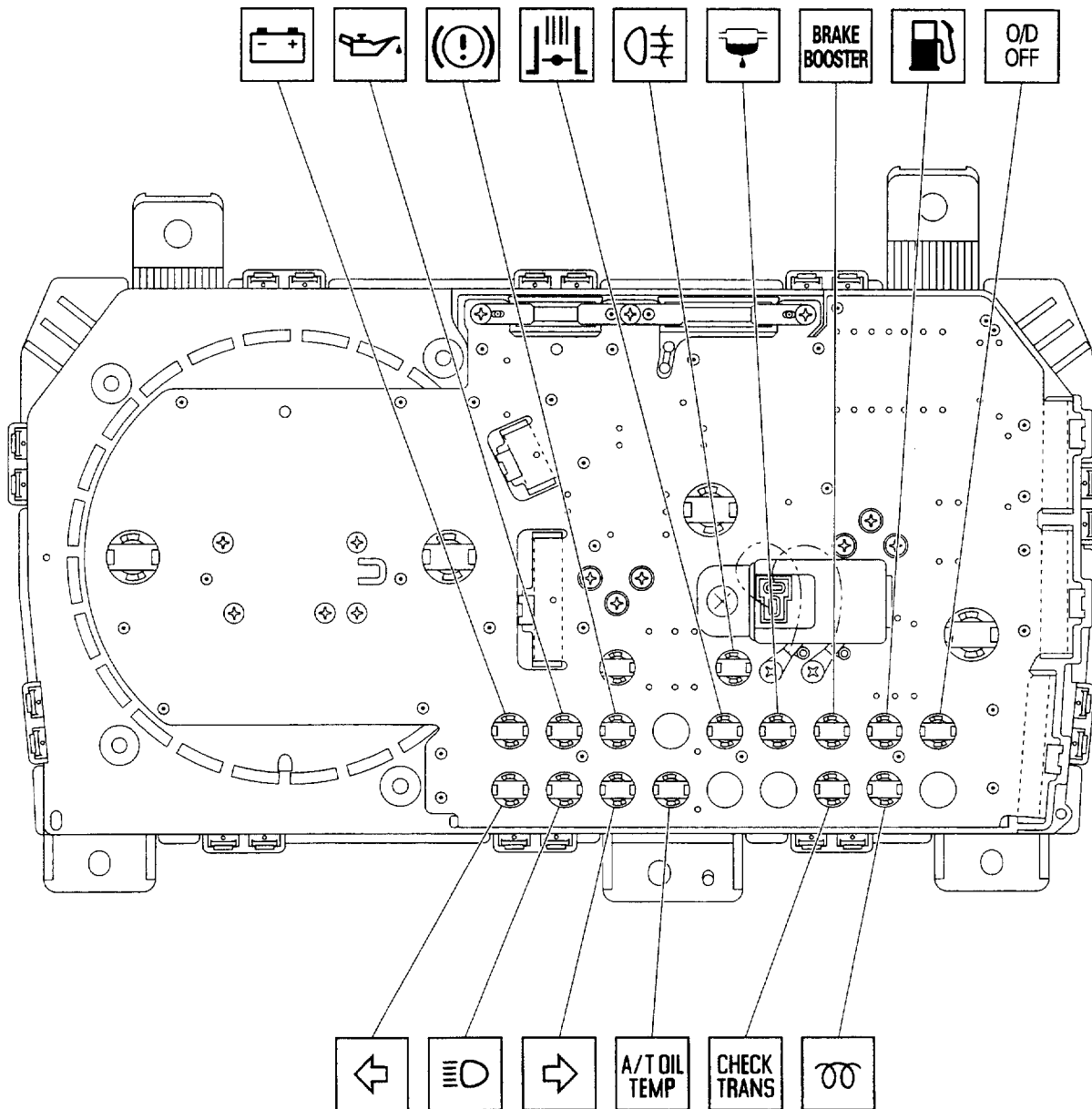
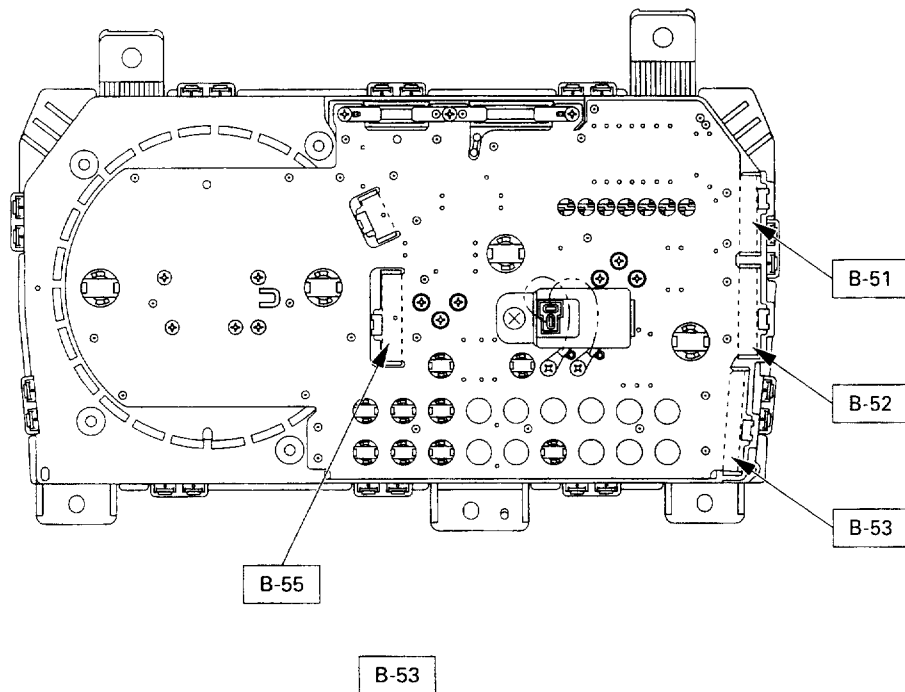


TABLE FOR METER CONNECTOR TERMINAL CONNECTIONS



Terminal No.	Connected to	Terminal No.	Connected to
1	—	6	A/T Shift indicator D4
2	Ground	7	A/T Shift indicator D3
3	A/T Shift indicator P	8	A/T Shift indicator 2
4	A/T Shift indicator R	9	A/T Shift indicator 1
5	A/T Shift indicator N	10	Illumination (+)

B-51

Terminal No.	Connected to
1	Exh. Brake
2	—
3	—
4	—
5	Check trans
6	Glow
7	—
8	IGN (F-12) (+)
9	o/d off
10	Fuel low
11	—
12	Sedimentor
13	Low coolant
14	Brake

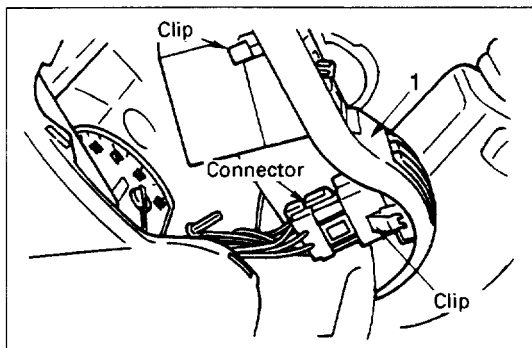
B-55

Terminal No.	Connected to
1	Speed pulse input
2	—
3	Power output (sensor)
4	ECT unit (GAGE)
5	Fuel tank unit (GAGE)
6	—
7	Ground
8	Turn signal (LH)
9	—
10	Beam (+) (F-7)
11	Turn signal (RH)
12	—

B-52

Terminal No.	Connected to
1	Oil pressure
2	Vacuum SW
3	Charge
4	Parking
5	Illumination (+)
6	—
7	—
8	Signal (tacho)
9	Ground (tacho)
10	Ground
11	—
12	+B (F-8)

ECT - Engine Coolant Temperature

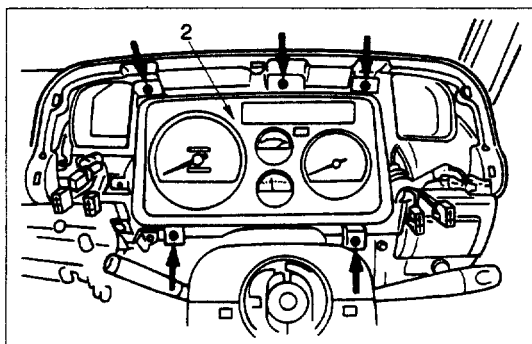


REMOVAL

Preparation:

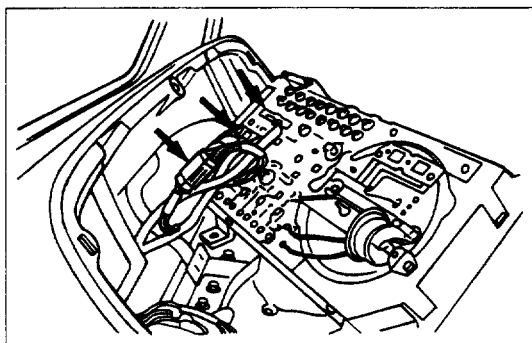
Disconnect the battery ground cable.

1. Meter Cluster



2. Meter Assembly

Remove the five screws.

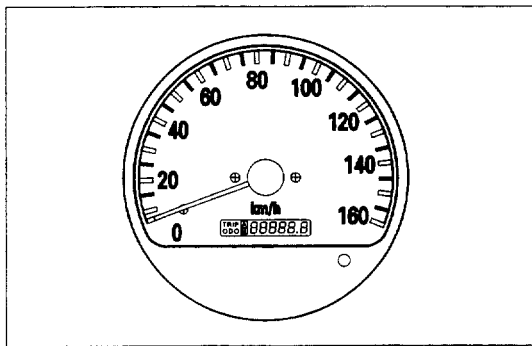


Disconnect the meter connectors.



INSTALLATION

To install, follow the removal steps in the reverse order.



825LX008

SPEEDOMETER

The speedometer is made up of the cross coil type ammeter (movement) that displays indications, the stepper motor that drives and adds up the odometer and trip meter, and the driving circuit (printed circuit board) that makes exchanges between the pulse signals and the current.

Tester display speed	Meter display permissible level
20 km/h	17.5 - 22.5 km/h
40	37.5 - 42.5
60	57.5 - 62.5
80	77.5 - 82.5
100	97.6 - 103.4
120	117.6 - 123.4
140	137.6 - 143.4



ON-VEHICLE SERVICE

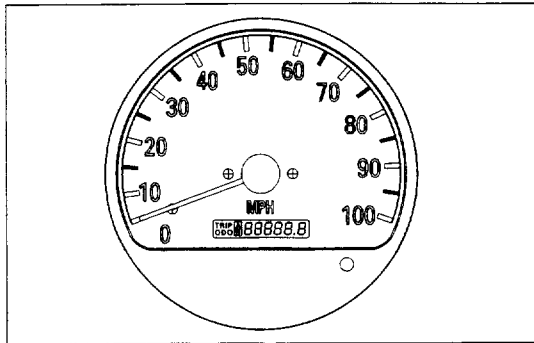
Check the meter display accuracy and the operation of the odometer with the speedometer tester.

NOTE:

Inappropriate tire inflation may affect the accuracy of the odometer.

(To conduct this test, refer to the tester manufacturer's instruction manual.)

Since the meter display permissible levels above are specifications solely for the meter, they are to be used as reference values when conducting on-vehicle service.



825LX007

Tester display speed	Meter display permissible level
20 MPH	18.3 - 21.7 MPH
40	38.3 - 41.7
60	58.3 - 61.7
80	78.8 - 82.8

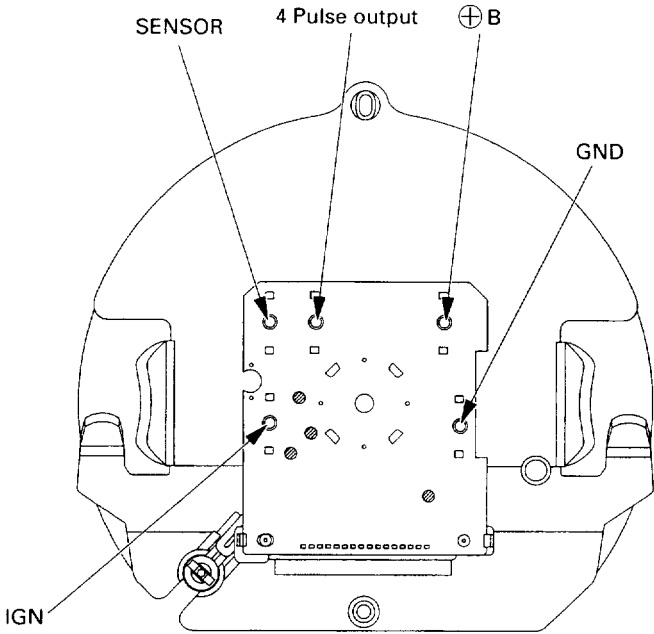


INDIVIDUAL INSPECTION

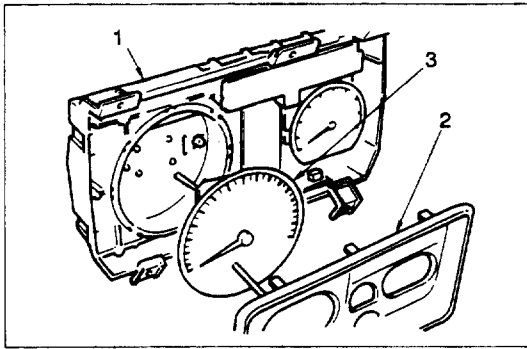


Remove the speedometer from the meter assembly and measure the resistance and the current consumption between each terminal.

Replace the speedometer when the result of inspection is found abnormal.



Terminal symbol	Resistance value
IGN-GND	$58 \pm 20\text{k}\Omega$
SEN-GND	$70 \pm 20\text{k}\Omega$
4P-GND	∞



REMOVAL

Preparation:

Disconnect the battery ground cable.

1. Meter Assembly

Refer to "METER ASSEMBLY" in this section.

2. Meter Glass

Remove it by pushing the catches with your finger.

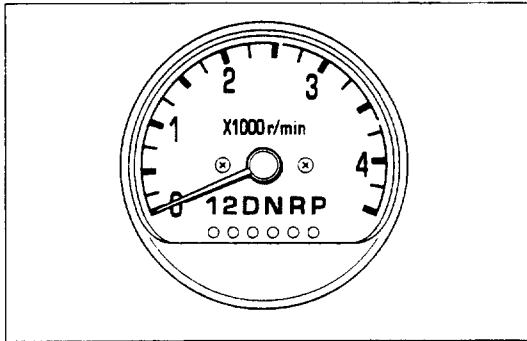
3. Speedometer

Remove four screws securing the meter at the back side.



INSTALLATION

To install, follow the removal steps in the reverse order.



TACHOMETER

The tachometer is made up of the cross coil type ammeter (movement) that displays indications, and the drive circuit (printed board) that makes exchange between the pulse signals and the current.

Tester display speed	Meter display permissible level
500	400 - 500
1000	800 - 1050
2000	1800 - 2050
3000	2800 - 3050
4000	3800 - 4050



ON-VEHICLE SERVICE INSPECTION

1. Set up the tune-up tester to the engine.
2. Start the engine and compare the readings displayed by the tachometer and the tester.

When the difference between these two readings differs largely from the specified value, replace it with a correct one.

NOTE:

Since the meter display permissible levels above are specifications solely for the meter, they are to be used as reference values when conducting on-vehicle inspection.



INDIVIDUAL INSPECTION

Remove the tachometer from the meter assembly and measure the resistance value and the current consumption between each terminals.

Replace the tachometer when the result of inspection is found abnormal.

1. Resistance value

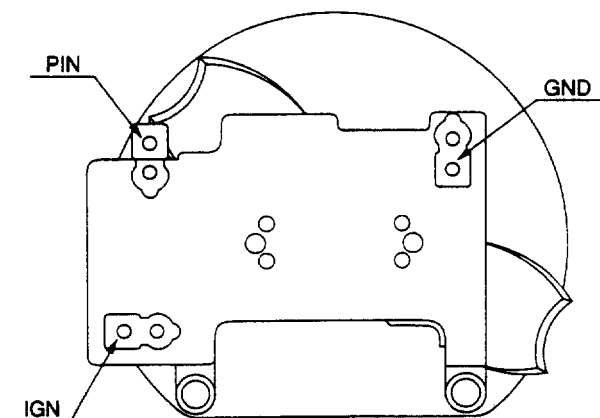
Use the analog type circuit tester. (Range: 1K)

For 12 Volt tachometer

Tester Terminal symbol	terminal	Red (+)	Black (-)	Black (-)	Red (+)
IGN-GND		IGN	GND	IGN	GND
		∞		$30 \pm 5k\Omega$	
PIN-GND		PIN	GND	PIN	GND
		$33 \pm 5k\Omega$		500~1000k Ω	

For 24 Vol tachometer

Tester Terminal symbol	terminal	Red (+)	Black (-)	Black (-)	Red (+)
IGN-GND		IGN	GND	IGN	GND
		∞		$30 \pm 5k\Omega$	
PIN-GND		PIN	GND	PIN	GND
		$33 \pm 5k\Omega$		500~1000k Ω	



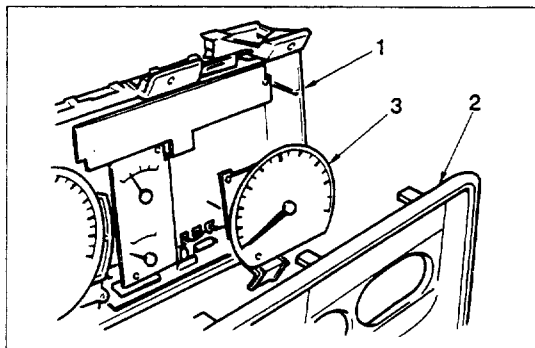
Tachometer (Back side)

2. Current value

Use the analog type circuit tester.

Since the current consumption fluctuates as the power voltage varies, check to be sure that the voltage applied is $12 \pm 1V$ or $24 \pm 1V$.

Voltage	Connecting terminal	Current consumption	Remarks
12Volt	IGN-GND	$12 \pm 1V$ (when $12 \pm 1V$ applied)	No signal input
24Volt		$24 \pm 1V$ (when $24 \pm 1V$ applied)	No signal input



REMOVAL

Preparation:

Disconnect the battery ground cable.

1. Meter Assembly

Refer to "METER ASSEMBLY" in this section.

2. Meter Glass

Remove it by pushing the catches with your finger.

3. Tachometer

Remove three screws securing the meter at the back side.

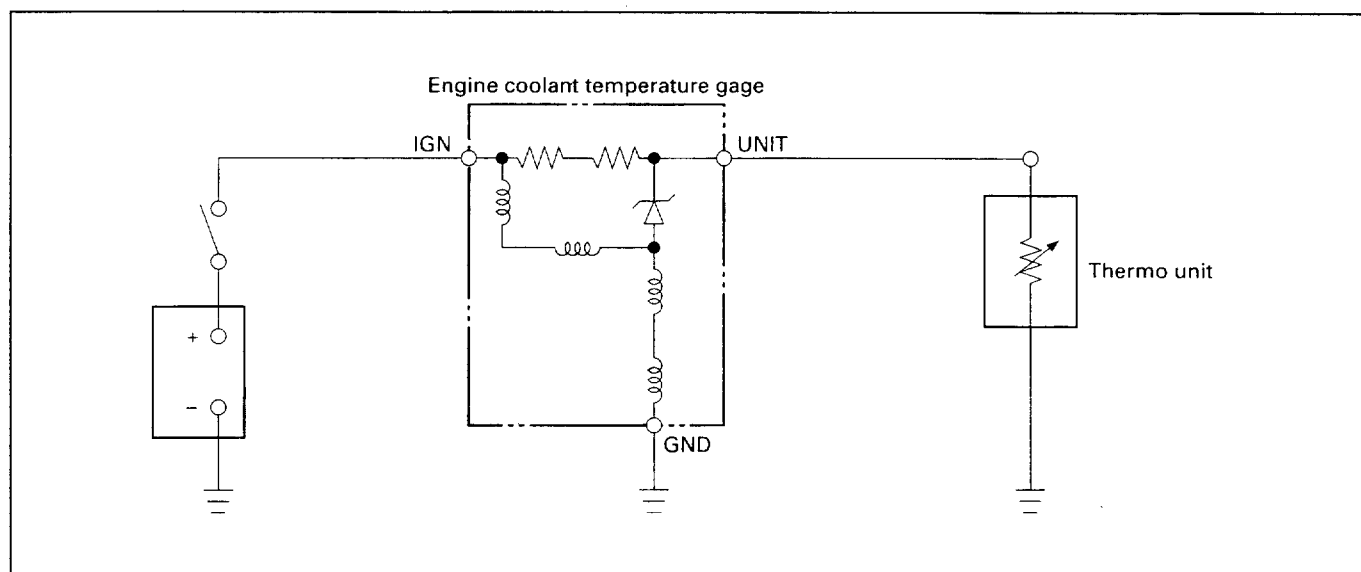


INSTALLATION

To install, follow the removal steps in the reverse order.

COOLANT TEMPERATURE GAUGE

CIRCUIT DIAGRAM



825LX001

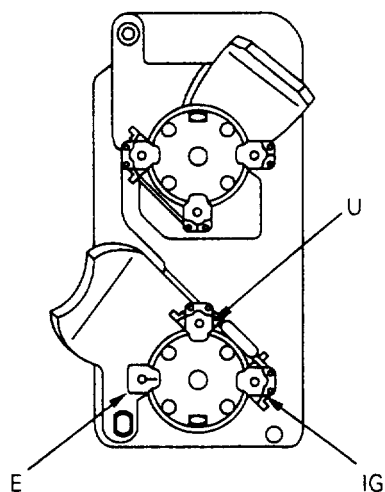


INSPECTION

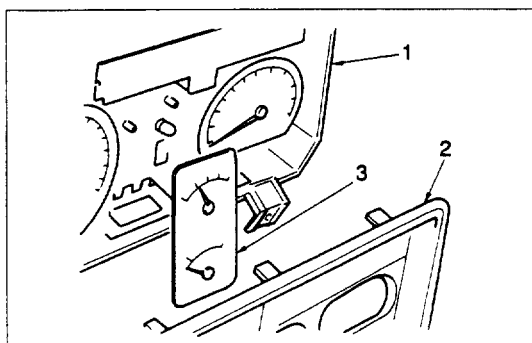
Remove the coolant temperature gauge from the meter assembly, and measure the resistance value between each terminal.

Replace the coolant temperature gauge when the result of inspection is found abnormal.





Terminal symbol	Resistance value
IG-U	$169\Omega \pm 10\%$
U-E	$333\Omega \pm 10\%$
IG-E	$242\Omega \pm 10\%$



REMOVAL

Preparation:

Disconnect the battery ground cable.

1. Meter Assembly

Refer to "METER ASSEMBLY" in this section.

2. Meter Glass

Remove it by pushing the catches with your finger.

3. Coolant Temperature Gauge

Remove six screws securing the meter at the back side.

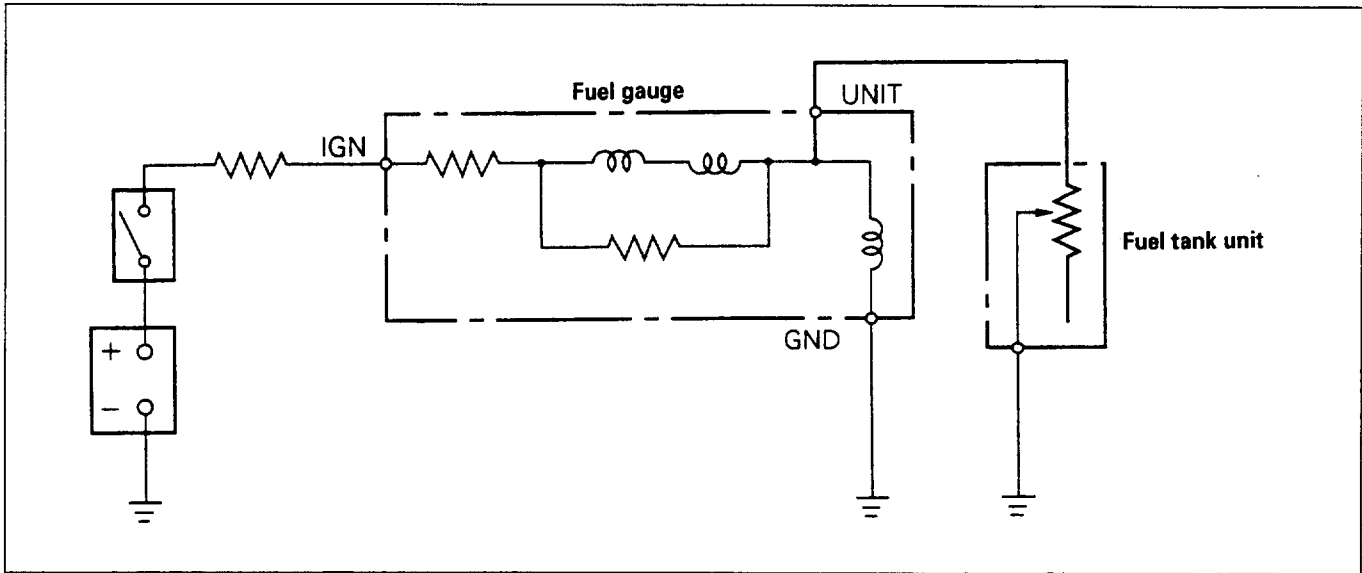


INSTALLATION

To install, follow the removal steps in the reverse order.

FUEL GAUGE

CIRCUIT DIAGRAM

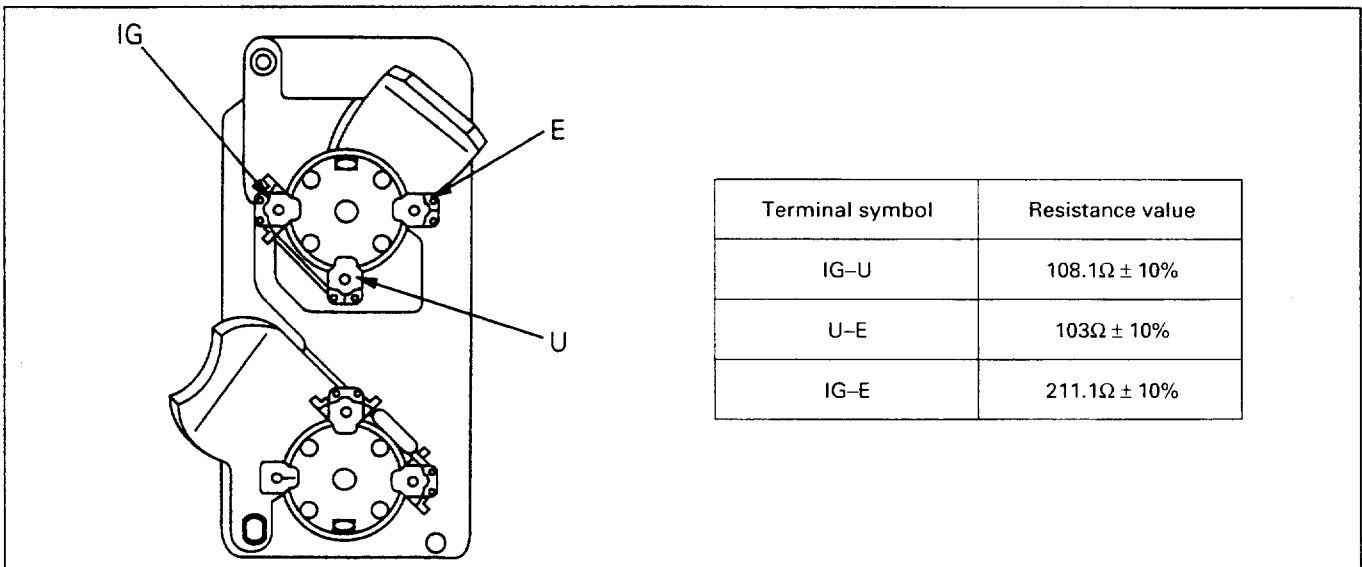


INSPECTION



Remove the fuel gauge from the meter assembly, and measure the resistance value between each terminal.

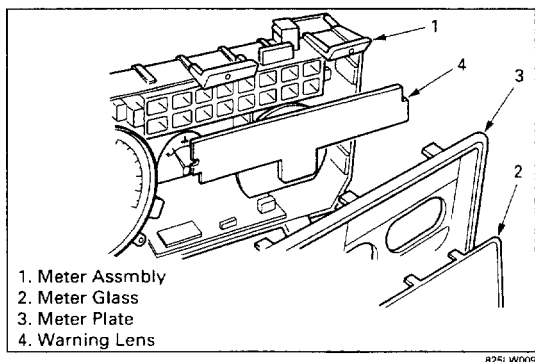
Replace the meter when the result of inspection is found abnormal.



REMOVAL AND INSTALLATION



Refer to the "COOLANT TEMPERATURE GAUGE" in this section.



WARNING LENS



REMOVAL

Preparation:

Disconnect the battery ground cable.

1. Meter Assembly

Refer to "METER ASSEMBLY" in this section.

2. Meter Glass

Remove it by pushing the catches with your finger.

3. Meter Plate

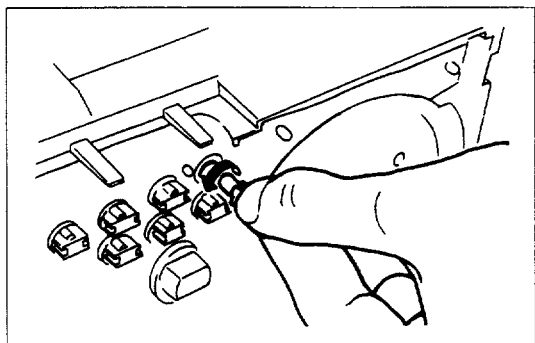
Remove it by pushing the catches with your finger.

4. Warning Lens



INSTALLATION

To install, follow the removal steps in the reverse order.



WARNING LIGHT BULB, INDICATOR LIGHT BULB AND ILLUMINATION LIGHT BULB.



REMOVAL

Preparation:

Disconnect the battery ground cable.

1. Meter Assembly

Refer to "METER ASSEMBLY" in this section.

2. Socket and Bulb

Hold the bulb socket by hand and rotate it counterclockwise to remove them from the meter body.

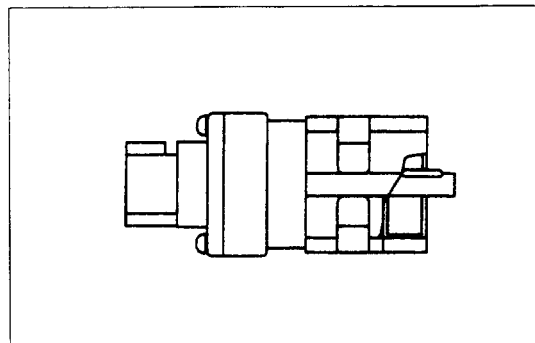
3. Bulb

Pull out the bulb from the socket.



INSTALLATION

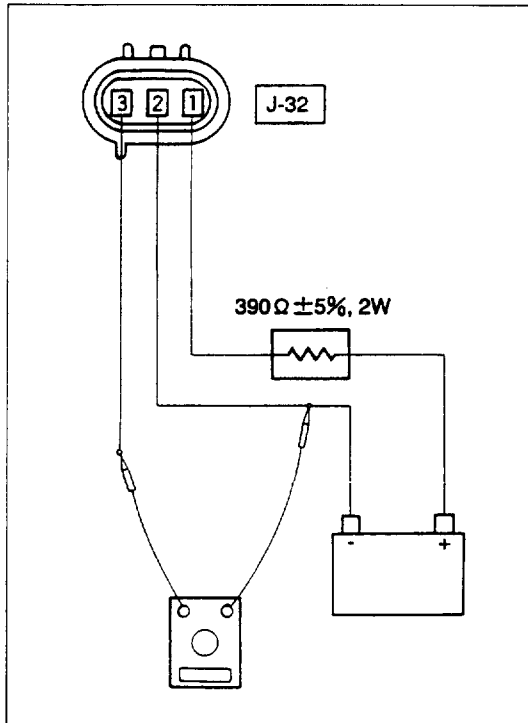
To install, follow the removal steps in the reverse order.



VEHICLE SPEED SENSOR

The vehicle speed sensor is installed on the rear portion of the transmission or transfer case.

The number of pulses generated is four pulses per one rotation of the pinion shaft.



INSPECTION

1. Connect a resistance of $390\Omega \pm 5\%$, 2W between connector terminal 1 [J-32] and battery (+) terminal and connect the connector terminal 2 [J-32] to the battery (-) terminal.



CAUTION

Be extremely careful not to connect the battery (+) terminal to the connector 3 [J-32].

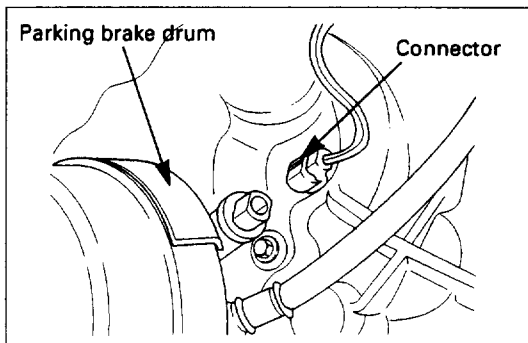
This may damage the vehicle speed sensor.



2. Rotate the shaft of the vehicle speed sensor slowly and measure the voltage between 3 [J-32] and 2 [J-32] with a digital tester.

The voltage, with one rotation of shaft, fluctuates four times in the following range: 10 to 14V \leftrightarrow 24 or less.

Replace the sensor when the result of inspection is found abnormal.



REMOVAL

Preparation:

Disconnect the battery ground cable.

1. Vehicle Speed Sensor

Disconnect the connector.



INSTALLATION

1. Tighten the vehicle speed sensor to the specified torque.

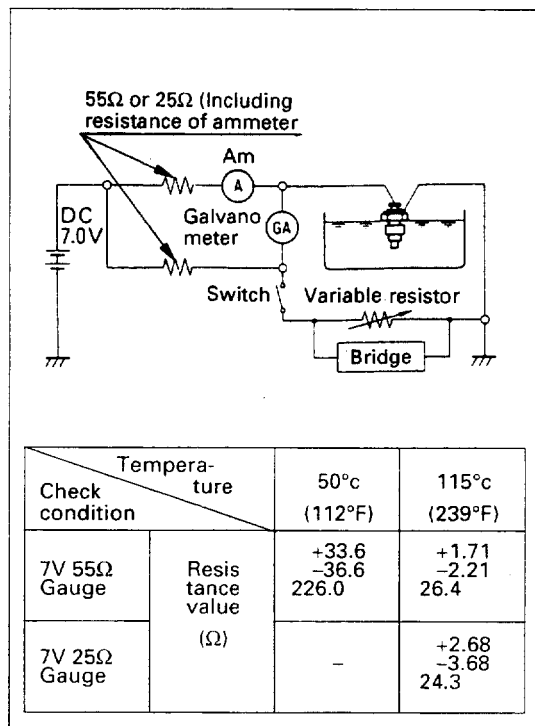
Vehicle speed sensor torque	N·m (kg·m/lb·ft)
	25 (2.5/18)



CAUTION:

Tightening must be made at the hexagonal part of the sensor.

To tighten the connector itself would cause damage.



THERMO UNIT



INSPECTION

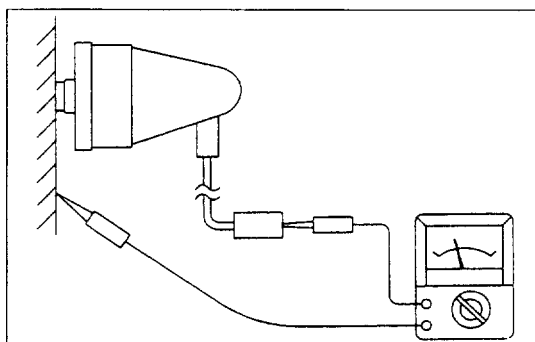
The thermo unit is thermistor type and must be inspected under the conditions as shown in the left chart.

1. Put the deviation of the galvanometer to 0 by using the variable resistor, switch the thermo unit off and then measure the resistance of the resistor through the bridge.

Confirm that the resistance is continuously variable in any other points than those shown in the left chart.

2. Dip the thermo unit into 80 - 90°C (176 - 194°F) water and confirm that there is no bubble continuously coming out of inside of the unit.

Replace the unit when the result of inspection is found abnormal.



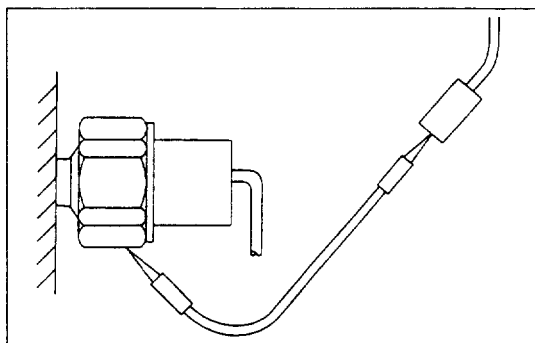
OIL PRESSURE SWITCH



INSPECTION



Check the continuity between the switch terminal and the body ground with the starter switch is OFF position. Replace the switch when the result of inspection is found abnormal.

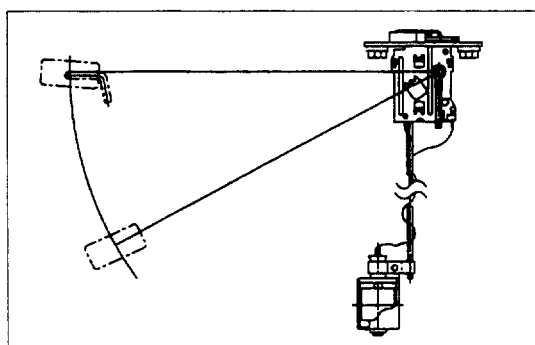


CIRCUIT INSPECTION

1. Start the engine
2. When disconnecting the oil pressure switch connector then connecting the harness side connector to the ground, check to see if the oil pressure warning light lights up. When the light will not light up, check the circuit between the meter and the oil pressure switch, and repair an open circuit if necessary.

FUEL TANK UNIT

The tank unit varies the internal resistance according to the float position (fluid level) to operate the fuel meter needle. Also available is the build-in switch type to warn the driver of low fuel level (about 5 liters left in the tank) by illuminating the fuel warning light.

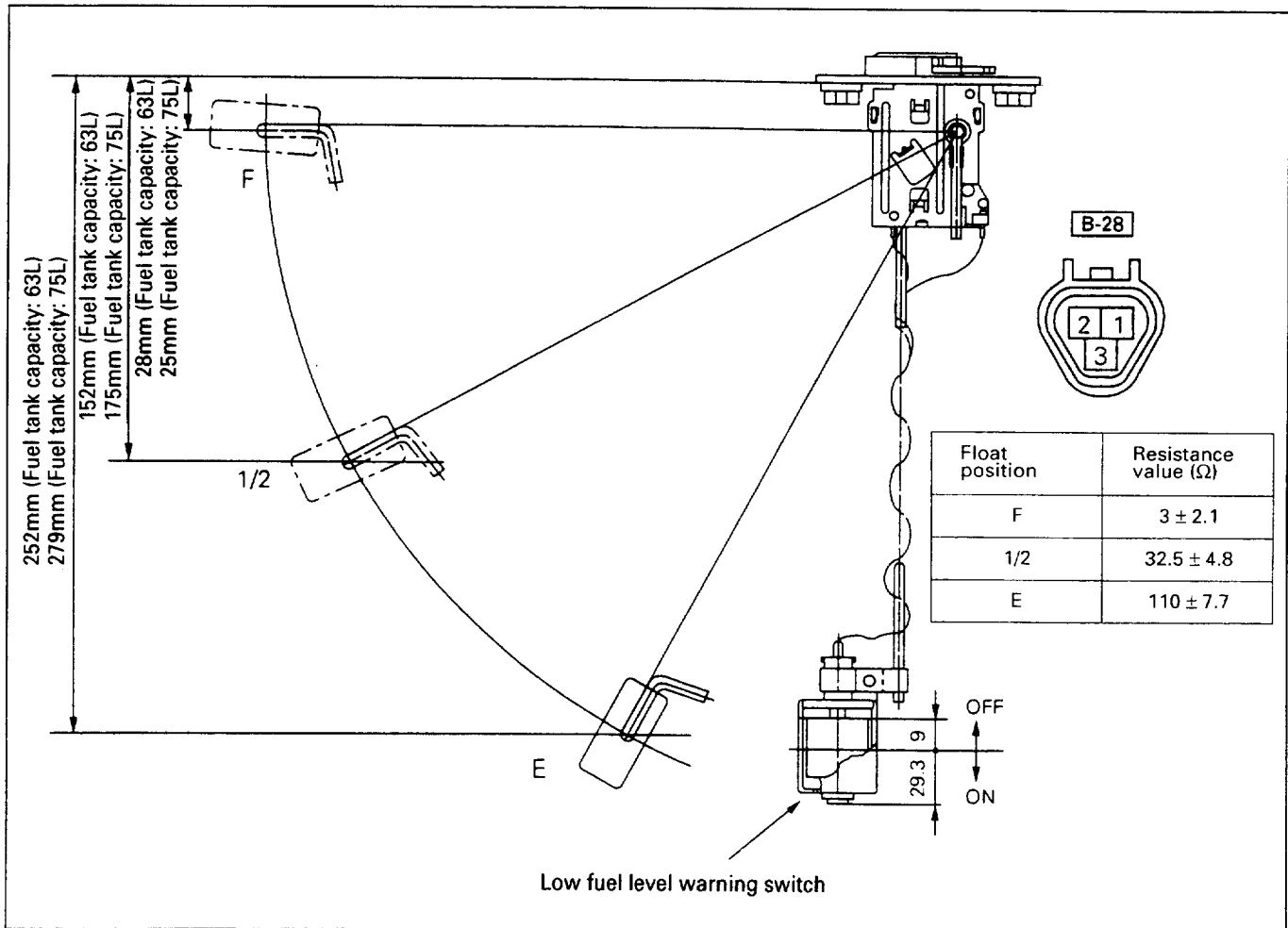




INSPECTION

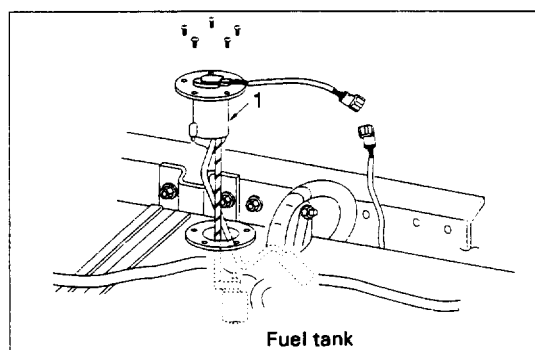
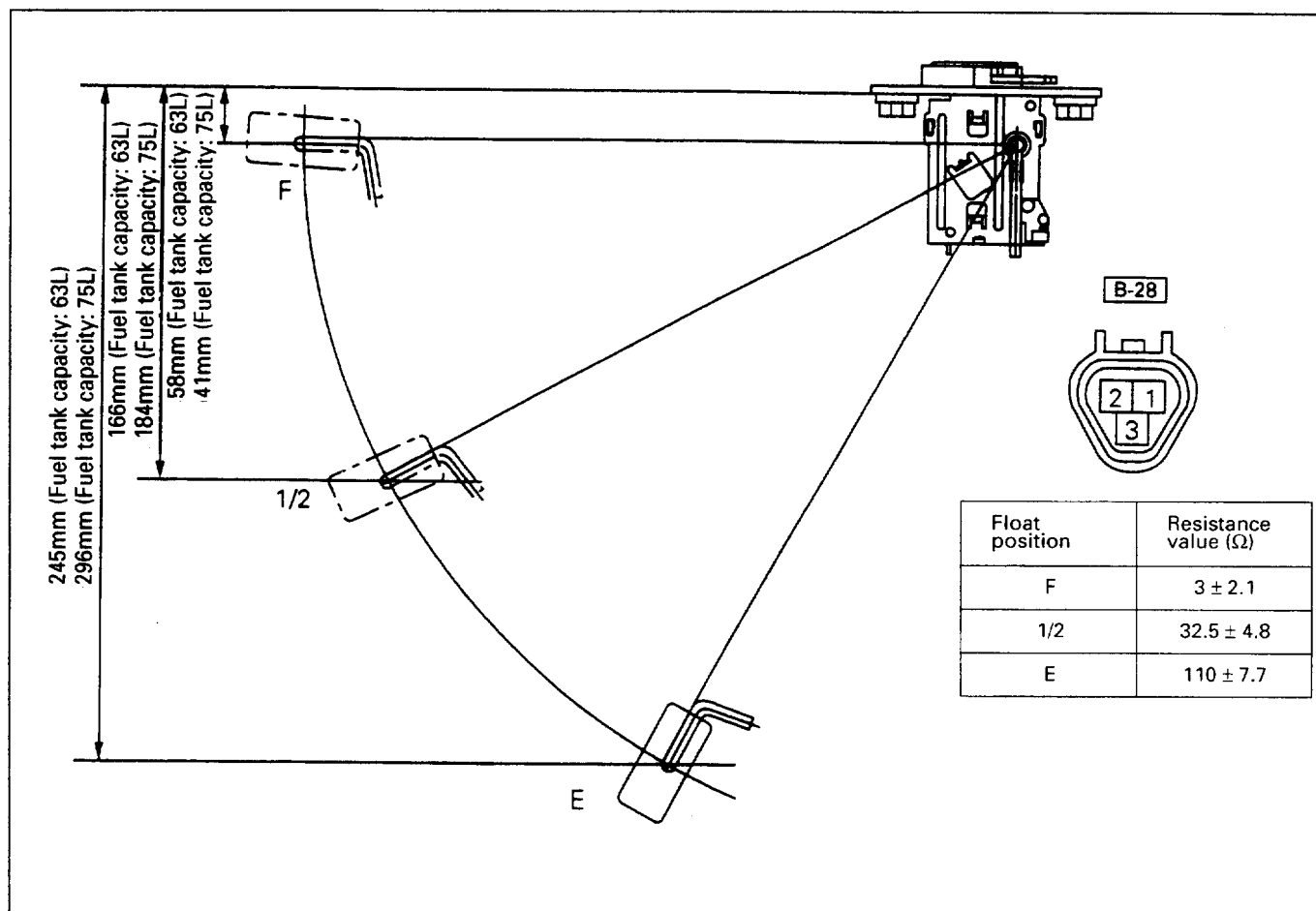
(Level Switch type of warn low fuel level)

1. Check the resistance between the connector terminals 1 [J-28] and 3 [J-28] while shifting the float from "E" to "F" point.
2. Check if the low fuel warning switch turns on and off at the specified positions. If found defective, replace the fuel tank unit.



(Float type of warn low fuel level)

1. Check the resistance between the connector terminals 1 **J-28** and 3 **J-28** while shifting the float from "E" to "F" point.
2. Check if the low fuel warning light turns on when the float is at "E" position. If found defective replace the fuel tank unit.

**REMOVAL****Preparation:**

Disconnect the battery ground cable.

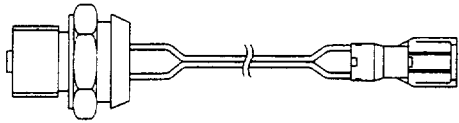
1. Fuel Tank Unit

- 1) Disconnect the connector.
- 2) Remove five screws.

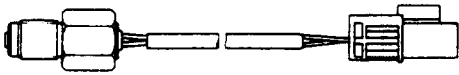
**INSTALLATION**

To install, follow the removal steps in the reverse order.

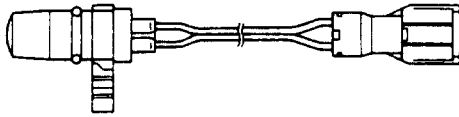
4J Series engine



4B Series engine



4H Series engine



ENGINE SPEED SENSOR



INSPECTION

Measure the resistance value between the engine speed sensor connector terminals.

Replace the engine speed sensor when the result of inspection is found abnormal.

4J Series engine = 1.36 - 1.86 K Ω

4B Series engine = 0.24 - 0.36 K Ω

4H Series engine = 0.57 - 0.86 K Ω



REMOVAL

Preparation:

Disconnect the battery ground cable.

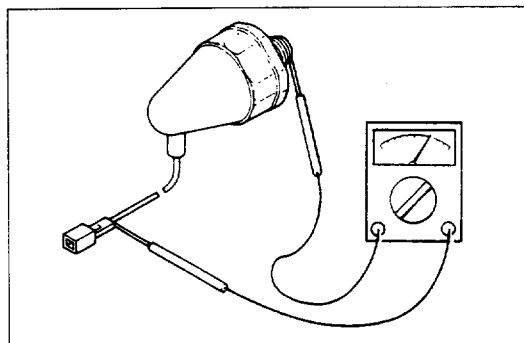
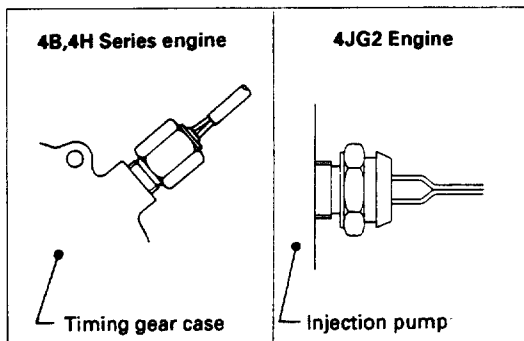
1. Engine Speed Sensor

- 1) Disconnect the connector.
- 2) Remove the engine speed sensor.



INSTALLATION

To install, follow the removal steps in the reverse order.

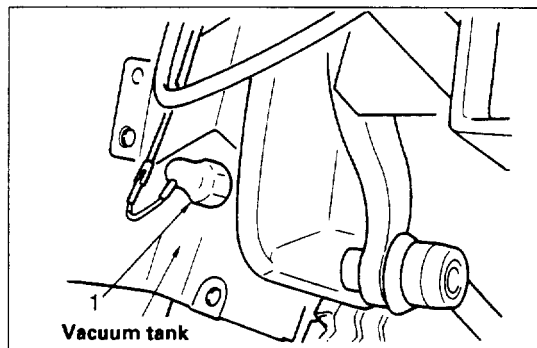


VACUUM SWITCH



INSPECTION

When the pressure value is below 250 \pm 30mm Hg (33.3 \pm 4.0 kPa), check to see if there is continuity between the terminal and the ground. If no continuity, replace the switch with a normal one.



REMOVAL

Preparation:

Disconnect the battery ground cable.

1. Vacuum Switch

- 1) Disconnect the connector.
- 2) Remove the vacuum switch.



INSTALLATION

Apply liquid gasket to the screw portion of the switch to prevent vacuum leak.

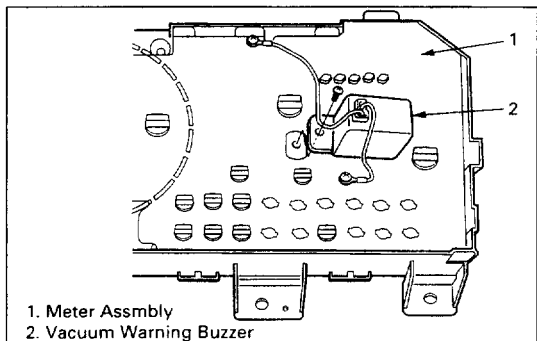
VACUUM WARNING BUZZER



INSPECTION

Apply battery voltage to the buzzer connector terminals to check the buzzer sound.

Replace the buzzer when the result of inspection is found abnormal.



REMOVAL

Preparation:

Disconnect the battery ground cable.

1. Meter Assembly

Refer to "METER ASSEMBLY" in this section.

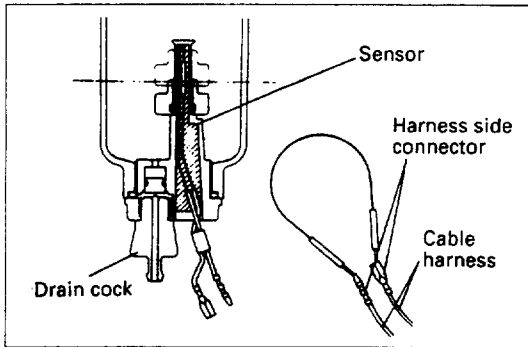
2. Vacuum Warning Buzzer

- 1) Disconnect the connector.
- 2) Remove the buzzer fixing screw.



INSTALLATION

To install, follow the removal steps in the reverse order.

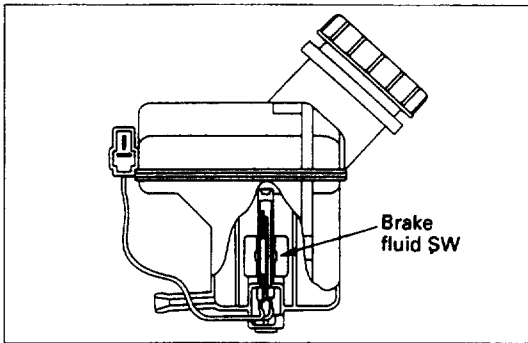


WATER SEDIMENTER SWITCH

INSPECTION

1. When the float in the water sedimeter is above the drain warning level, confirm if there is continuity between the switch connector terminals.
2. Turn the starter switch on, disconnect the water sedimeter connector and connect the harness side connector terminals. Then confirm that the sedimeter warning light turns on.

If found defective, replace the switch or repair a poor connection or an open circuit between the connector terminals.



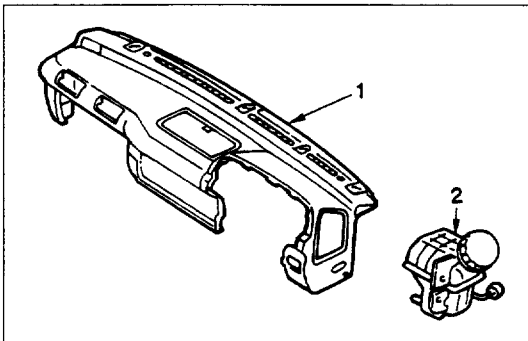
BRAKE FLUID SWITCH

INSPECTION

1. Confirm there is continuity between the switch connector terminals when the brake fluid in the tank is between 60 - 75 cc level.
2. Turn the switch on, disconnect the brake fluid switch connector and connect the harness side connector terminals.

Then confirm that brake warning light turns on.

If found defective, replace the tank, or repair a poor connection or an open circuit between the connector terminals.



REMOVAL

Preparation:

Disconnect the battery ground cable.

1. **Instrument Panel Assembly**
Refer to "INSTRUMENT PANEL" of section 10 "CAB".
2. **Brake Fluid Tank (Brake Fluid Switch)**
 - 1) Disconnect the switch connector.
 - 2) Remove four fixing nuts.
 - 3) Drain brake fluid in the tank.
 - 4) Disconnect the tubes.

CAUTION:

Be very careful not to allow the brake fluid to come in contact with painted surfaces or resin parts surfaces.



INSTALLATION

- To install, follow the removal steps in the reverse order, noting the following points.
- 1. Bleed the air from brake and clutch fluid pipe line.
 - 2. Check to see if the brake fluid level in the tank within specified level.
 - 3. Check to see if brake warning light comes on when starter switch is turned on and then warning light go off after the engine running.

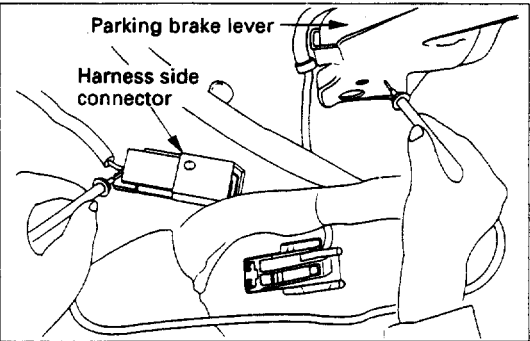
PARKING BRAKE INDICATOR LIGHT

The parking brake indicator light is connected in series with the parking brake switch installed to the parking brake lever bracket.

The light comes on when the parking brake lever is pulled, and goes out when the parking brake lever is fully released.

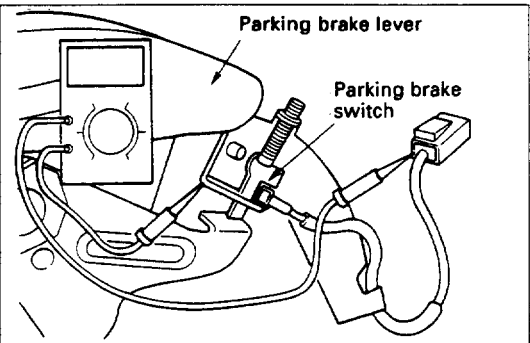
NOTE:

The parking brake indicator light illuminates to warn the driver that the parking brake is on. This light does not indicate the condition of the operability of the parking brake.



CIRCUIT INSPECTION

- 1. Disconnect the parking brake switch connector.
 - 2. Connect the harness side connector terminal to the ground.
 - 3. Check to see if the indicator light comes on with the starter switch "ON".
- Check the bulb or the harness when the result of inspection is found abnormal.



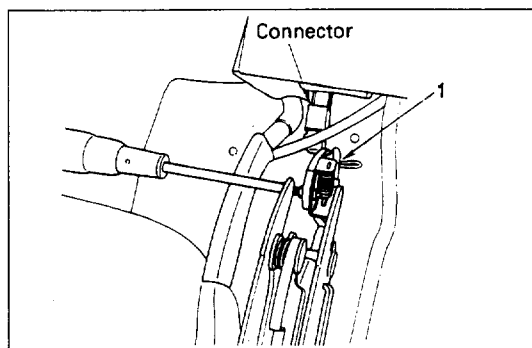
PARKING BRAKE SWITCH

INSPECTION

- 1. Disconnect the parking brake switch connector.
- 2. Check to see if there is any continuity between the switch terminal and the body ground with the circuit tester connected between them.

When parking brake applied	Continuity
When parking brake released	No continuity

Repair the parking brake switch or replace it when the result of inspection is found abnormal.



REMOVAL

Preparation:

Disconnect the battery ground cable.

1. Parking Brake Switch

- 1) Disconnect the connector.
- 2) Remove the fixing screw.



INSTALLATION

To install, follow the removal steps in the reverse order.

HEATER AND AIR CONDITIONING

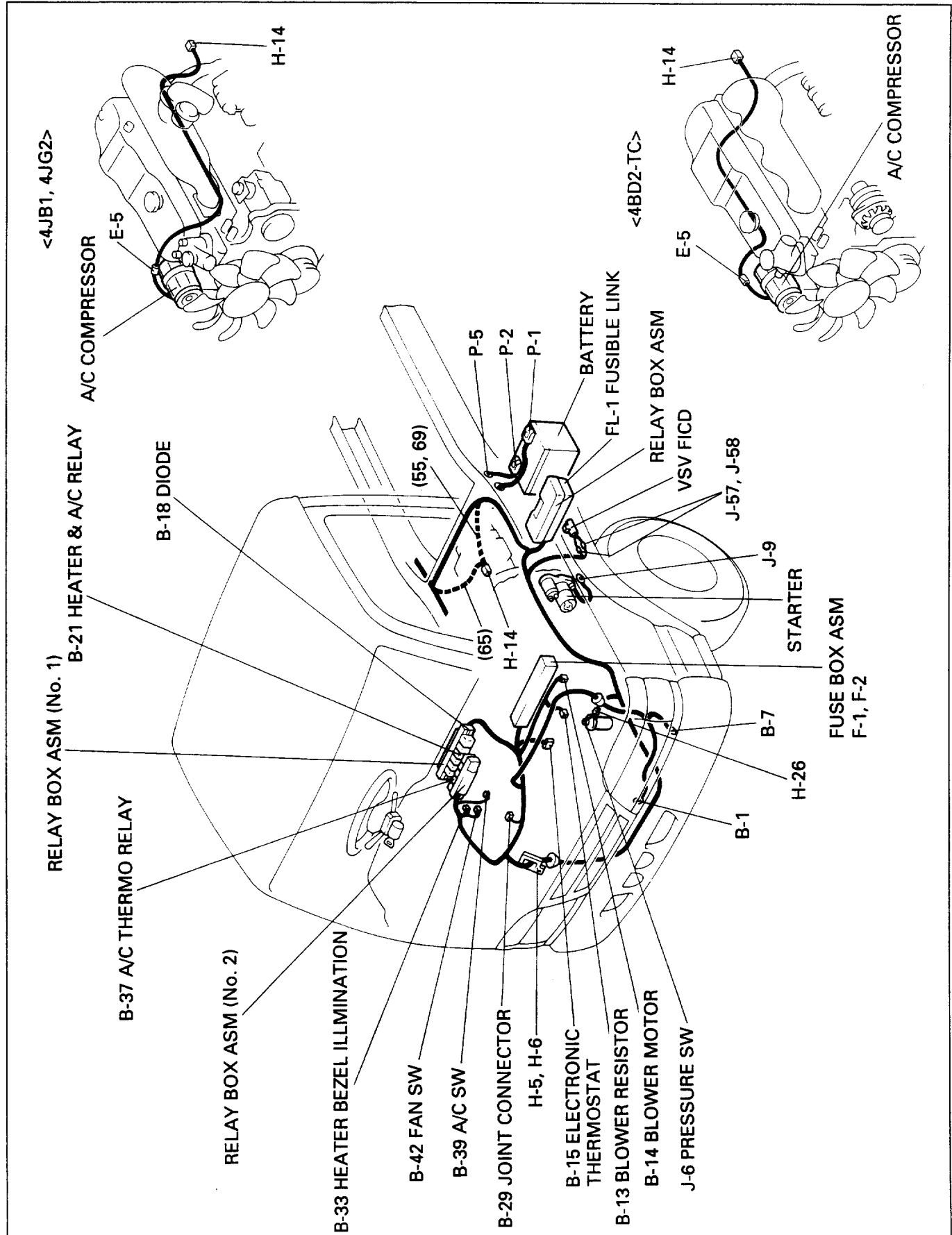
GENERAL DESCRIPTION

The air conditioning consists of compressor, evaporator, condenser, A/C switch, fan switch, etc. When the engine is rotating, the A/C starts to work with both the A/C and fan switches "ON", followed by the engagement of the magnetic clutch. It stops to work when either the fan switch or the A/C switch turns "OFF". In addition to the switches, the A/C has the function of temporary stop of its operation by the sensing system in the A/C cycle, such as:

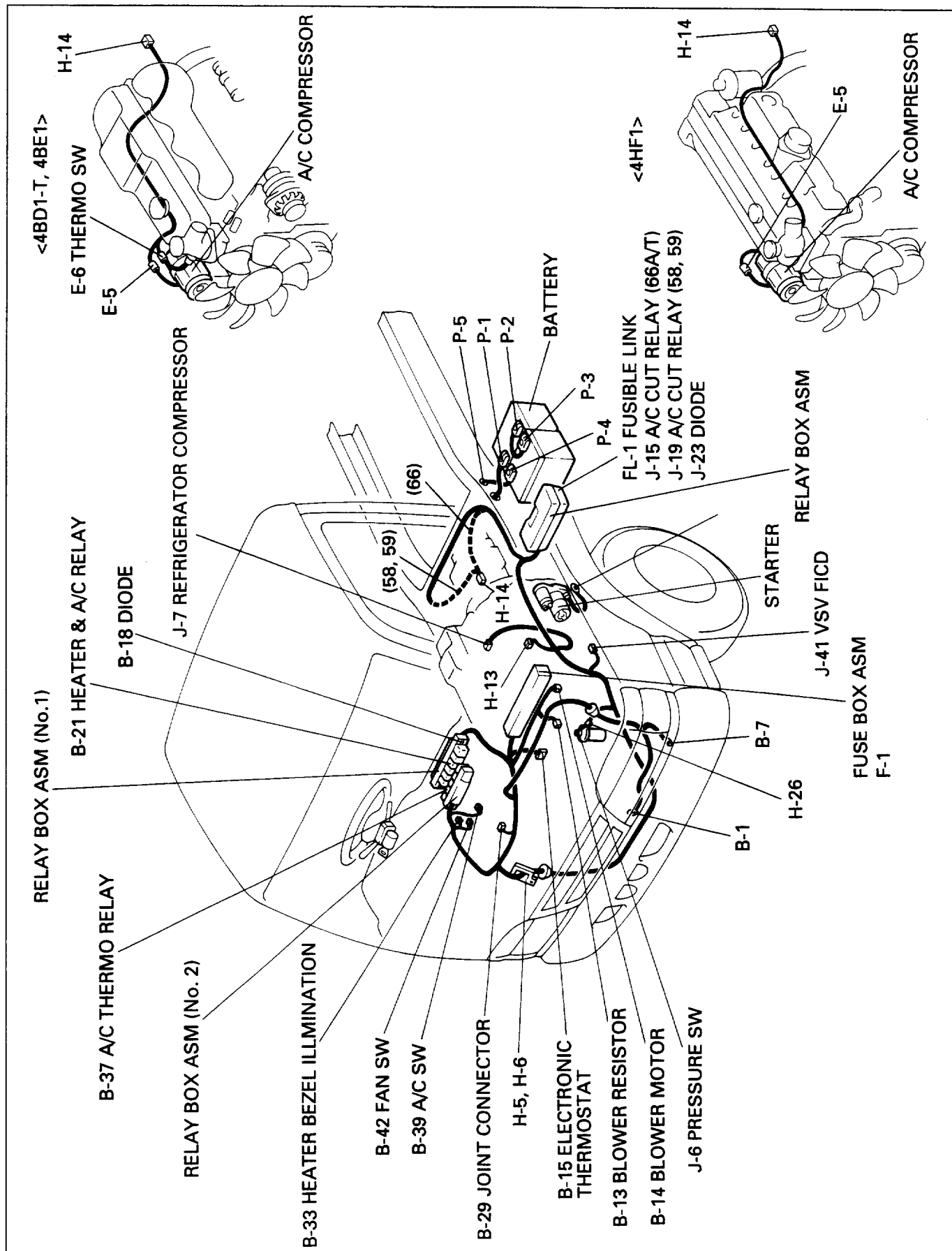
- sensing abnormal rise of the refrigerant pressure by means of the pressure switch.
- sensing temperature of the blowing-off air by means of the thermo switch preventing the evaporator from freezing.
- sensing the coolant temperature by the thermo switch (available for limited models only).

When fan control knob (fan switch) is put on with temp. Control lever being in the "FULL HOT" position (FULL HOT switch on) ceramic heater within heater unit generates heat, raising a heater blow-off temperature to enhance heating performance.

PARTS LOCATION- FOR 12 VOLT

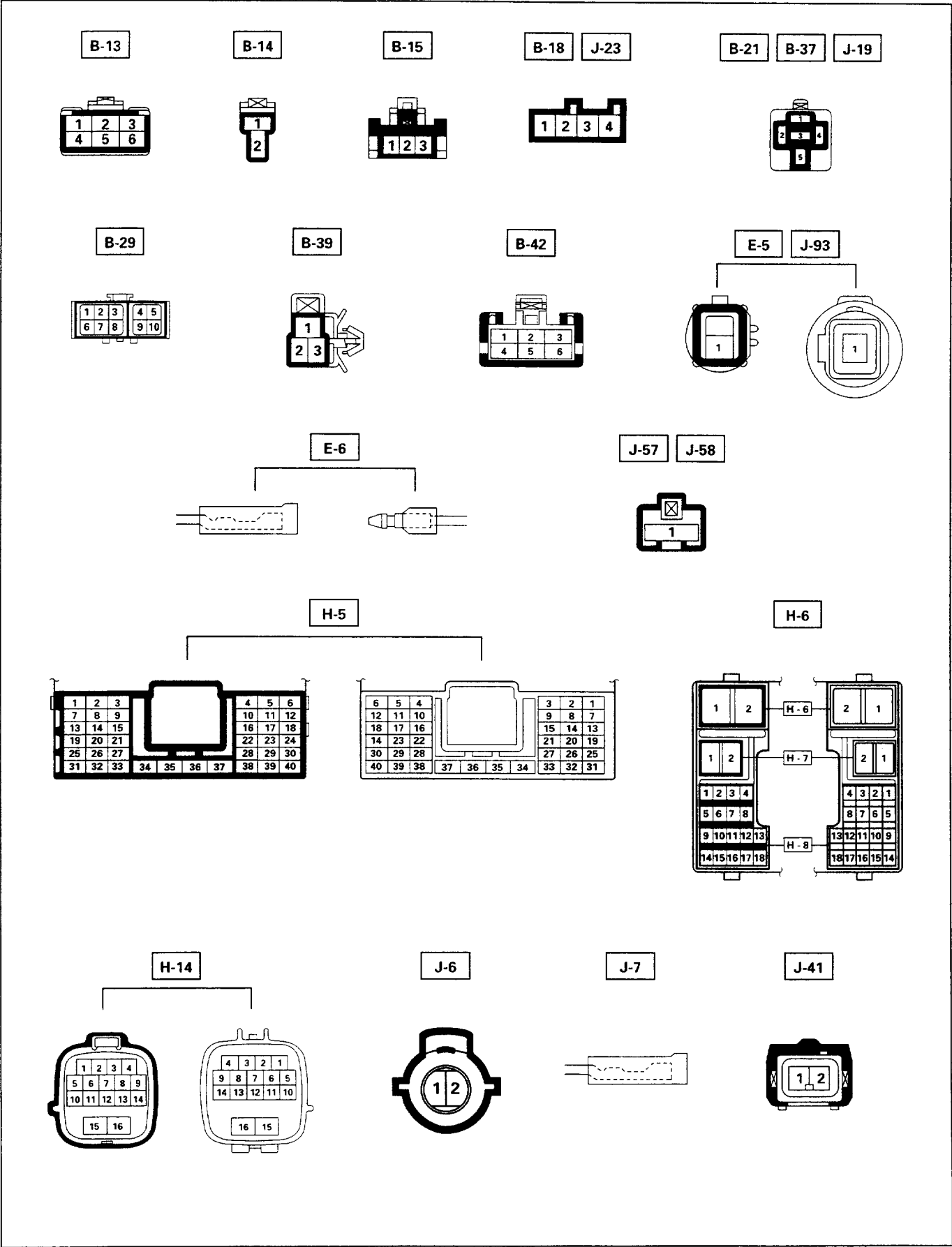


PARTS LOCATION- FOR 24 VOLT

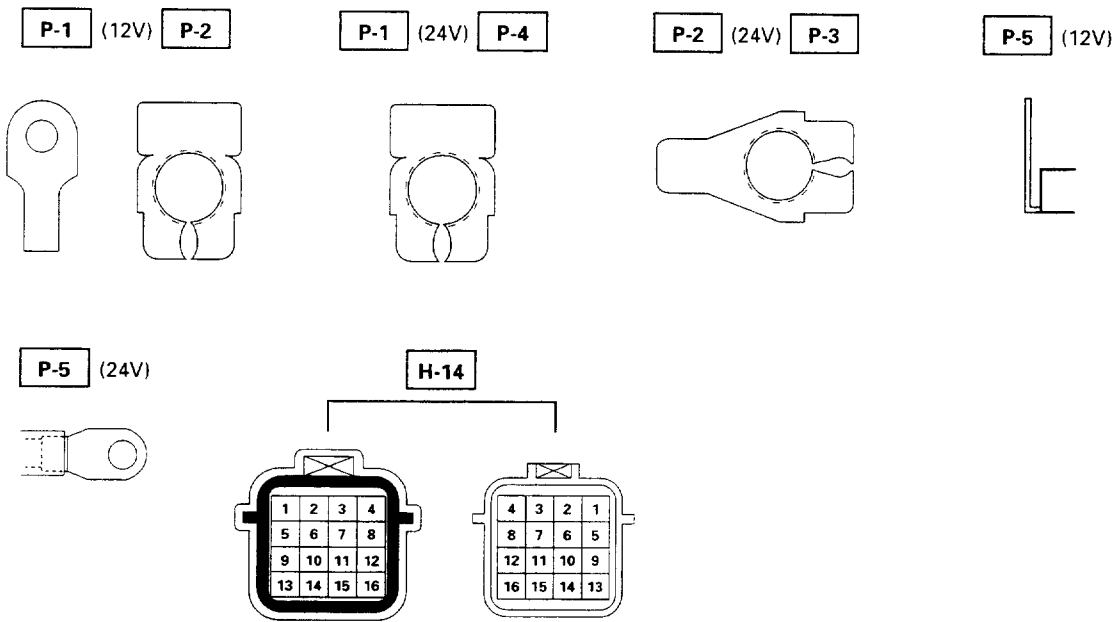




CONNECTOR LIST



CONNECTOR LIST



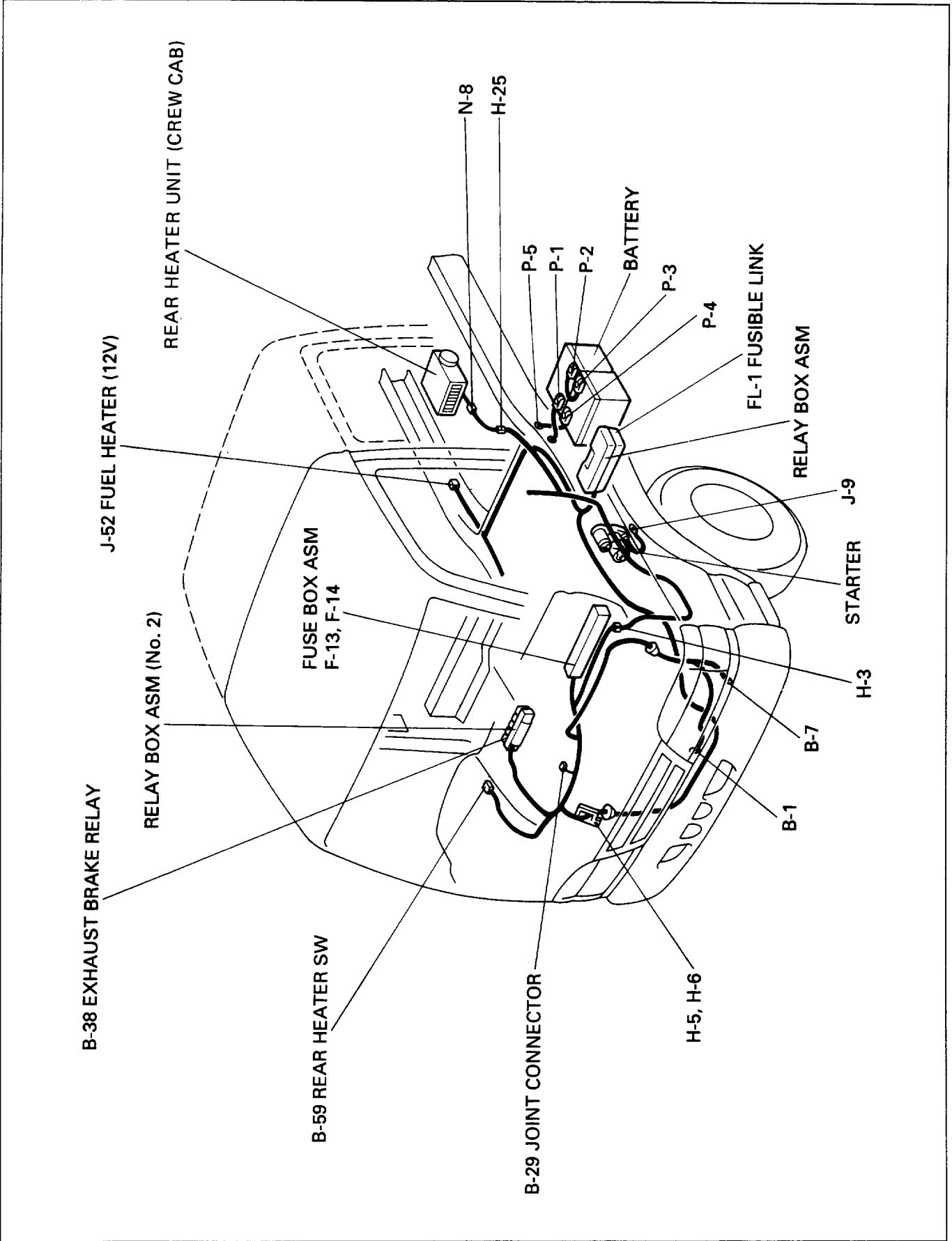
FUEL HEATER AND REAR HEATER

GENERAL DESCRIPTION

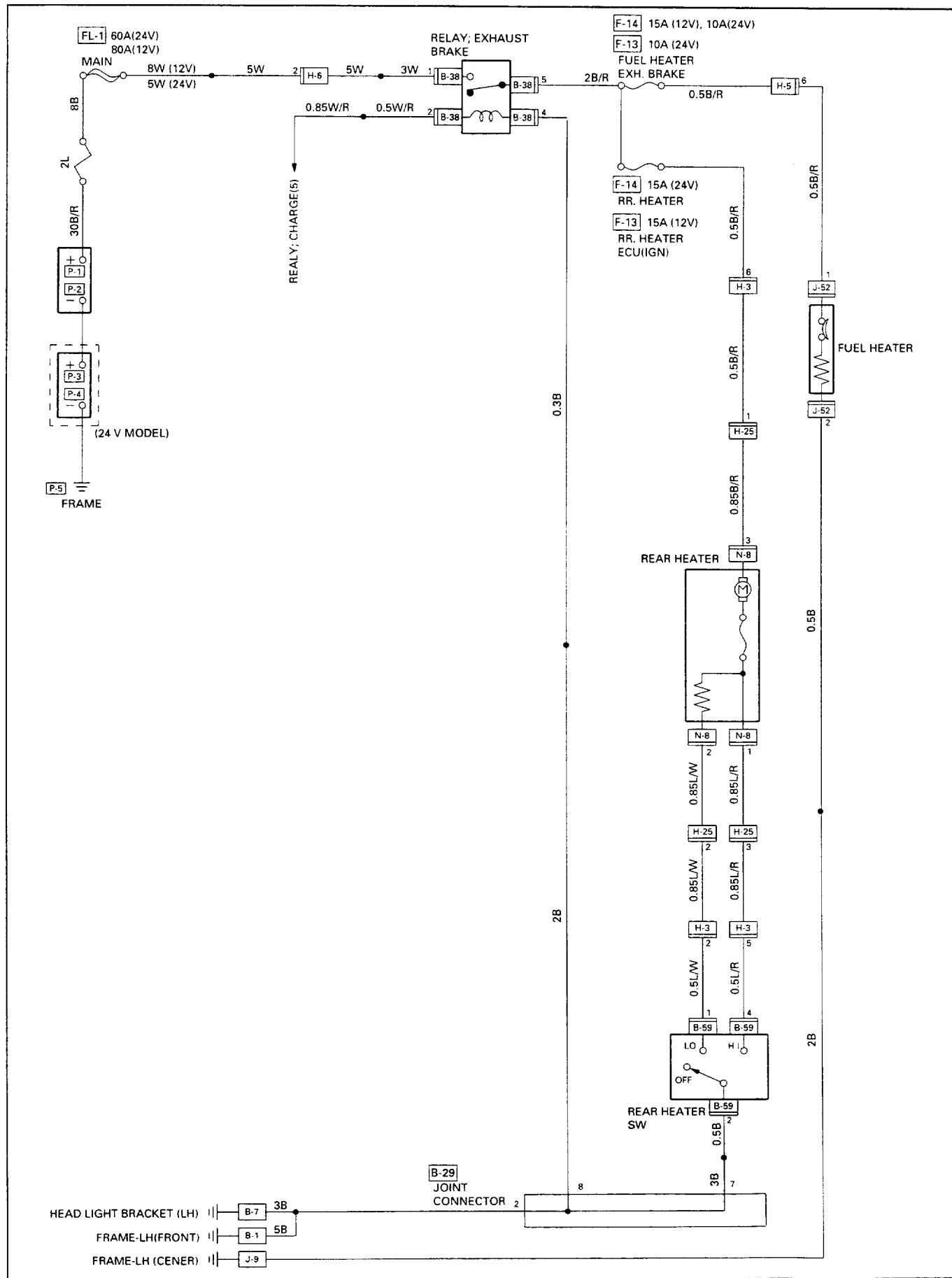
The circuit consists of fuel heater, rear heater, rear heater switch and the exhaust brake relay.

The fuel heater circuit is always in "ON" position when the generator is charging and its temperature is automatically controlled by the circuit breaker built in the fuel heater.

PARTS LOCATION

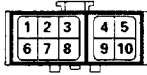


CIRCUIT DIAGRAM

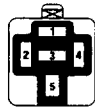


CONNECTOR LIST

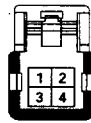
B-29



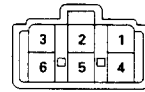
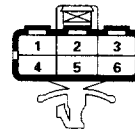
B-38



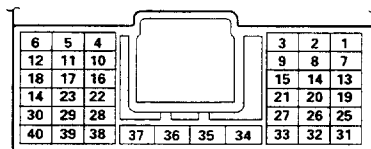
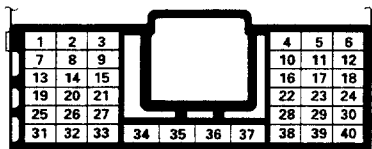
B-59



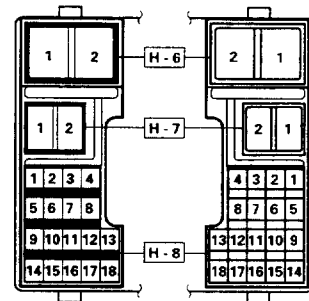
H-3



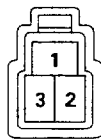
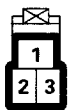
H-5



H-6



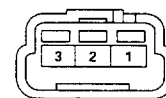
H-25



J-52

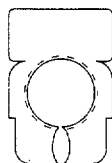
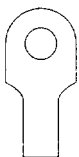


N-8



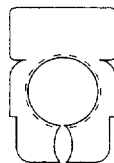
P-1 (12V)

P-2



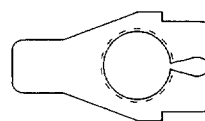
P-1 (24V)

P-4



P-2 (24V)

P-3

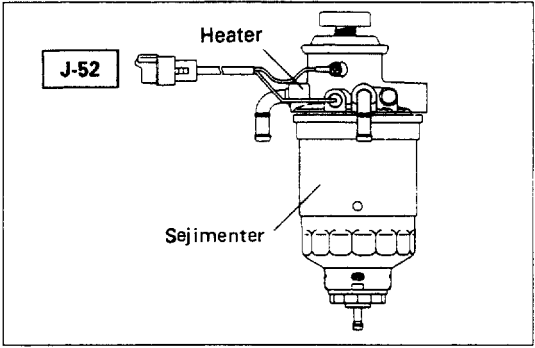


P-5 (12V)



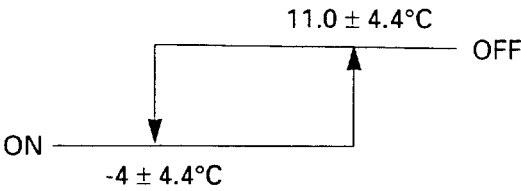
P-5 (24V)





FUEL HEATER

Characteristic of fuel heater

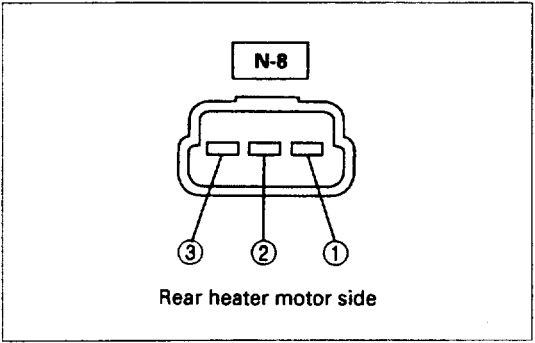


Terminal No.	1	2	4
SW position			
OFF			
LO	○	○	
HI		○	○

REAR HEATER SWITCH

INSPECTION

Check the continuity between the connector terminals while operating the switch.
Replace the switch when the result of inspection is found abnormal.



REAR HEATER MOTOR

INSPECTION

Disconnect the rear heater connector.
Connect the battery positive terminal to the No. 3 terminal of the rear heater motor side connector and negative to the No. 2. Check to see if rear heater motor operates low-speed correctly.
Connect the battery positive terminal to the No. 3 terminal of the rear heater motor side connector and negative to the No. 1. Check to see if rear heater motor operates high-speed correctly.
Replace the rear heater motor when the result of inspection is found abnormal.

4WD TRANSFER (VACUUM CONTROL)

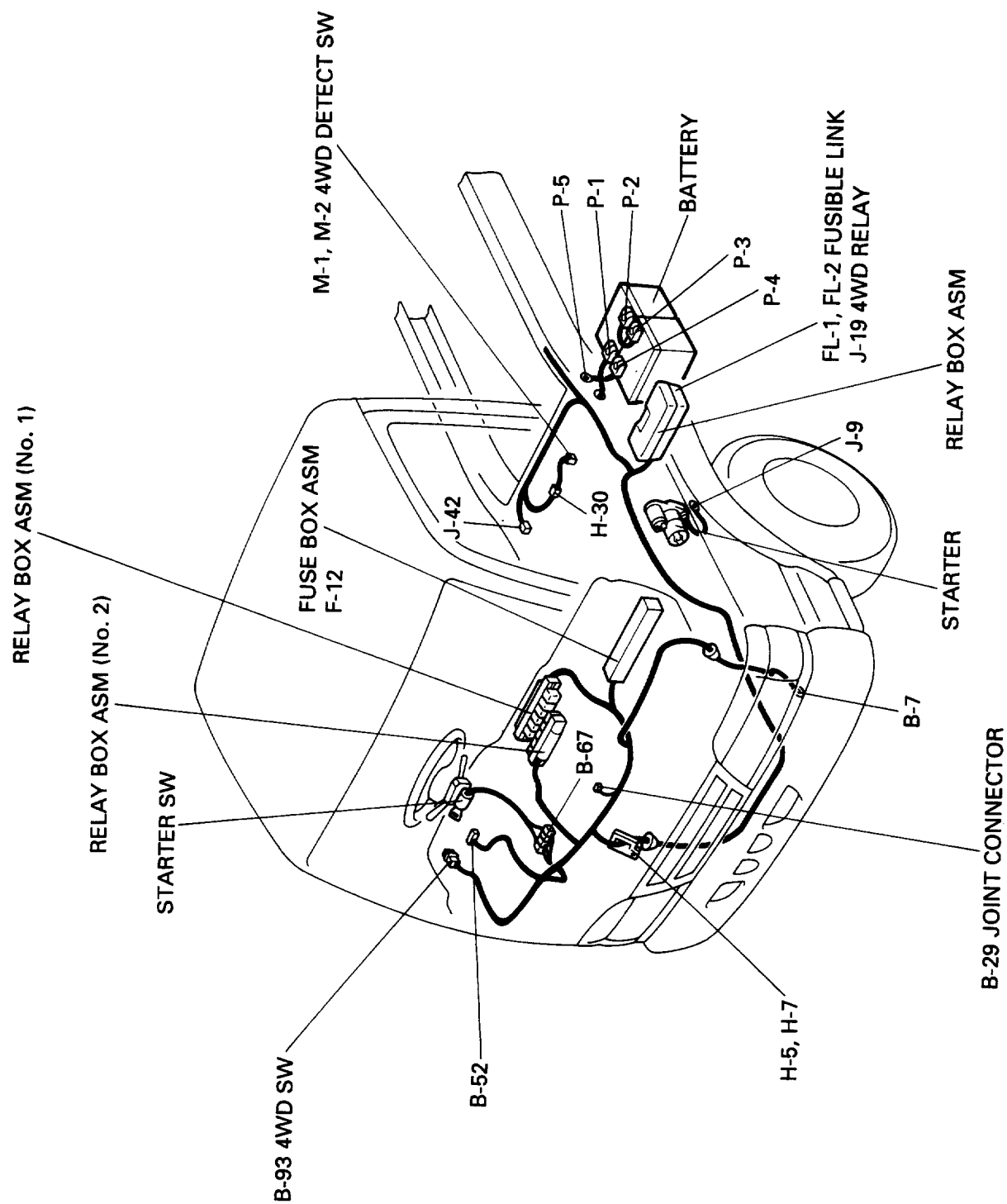
GENERAL DESCRIPTION

The circuit consists of the starter switch, 4WD switch, 4WD detect switch, 4L switch, vacuum switching valve, 4WD indicator light, neutral switch and the relay.

When the 4WD switch is turned on to drive in the 4WD mode, the vacuum switching valve for the transfer control is activated through the 4WD relay, and the transfer shift rod connected to the vacuum actuator is shifted to the 4WD side to turn on the 4WD detect switch. At the same time, the indicator light in the meter lights on to tell that the mode is transferred to 4WD mode.

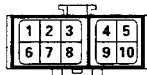
However, when running in the normal mode (2WD), the 4WD switch is not operated. Accordingly, no current flows through the 4WD vacuum switching valve for the transfer control, with the 4WD detect switch left in the "OFF" condition (2WD mode).

PARTS LOCATION



CONNECTOR LIST

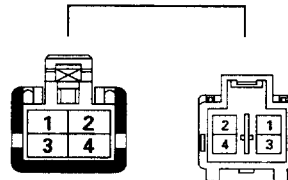
B-29



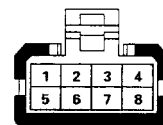
B-51



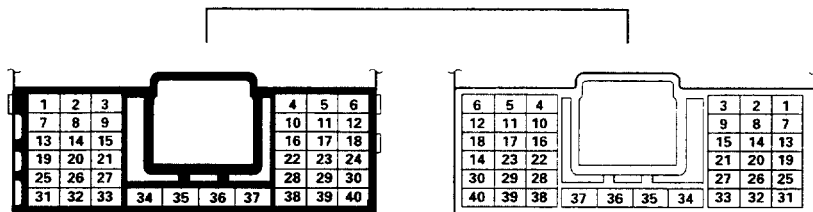
B-67



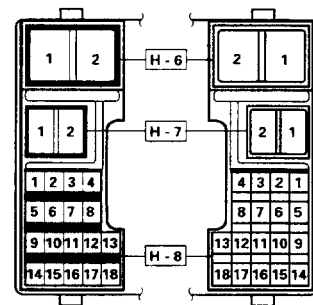
B-93



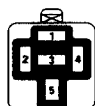
H-5



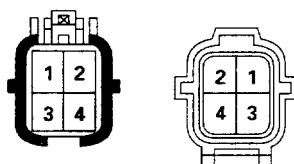
H-7



J-19



J-42



J-43

J-44

J-46

J-45



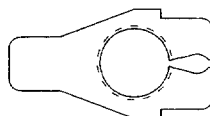
P-1

P-4

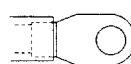


P-2

P-3



P-5



STARTER SWITCH

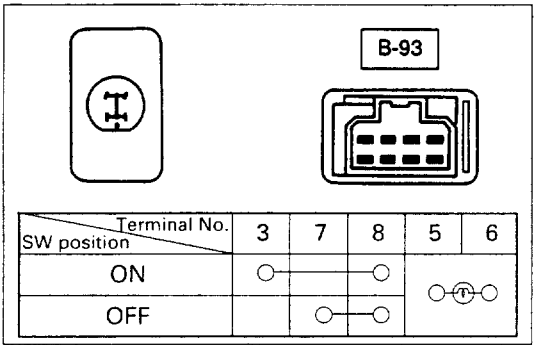
NEUTRAL SWITCH

Refer to "START AND CHARGING" in this section.

4WD INDICATOR LIGHT

Refer to "METER AND WARNING/ INDICATOR LIGHT" in this section.

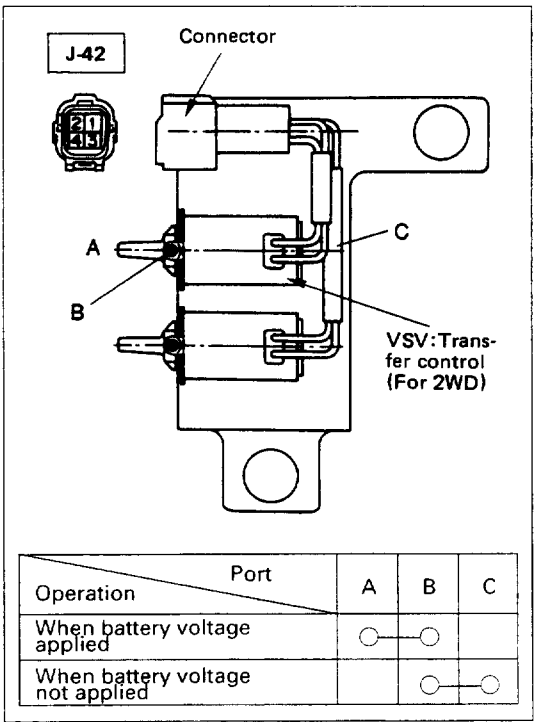
4WD SWITCH



INSPECTION

Check the continuity between the connector terminals while operating the switch.

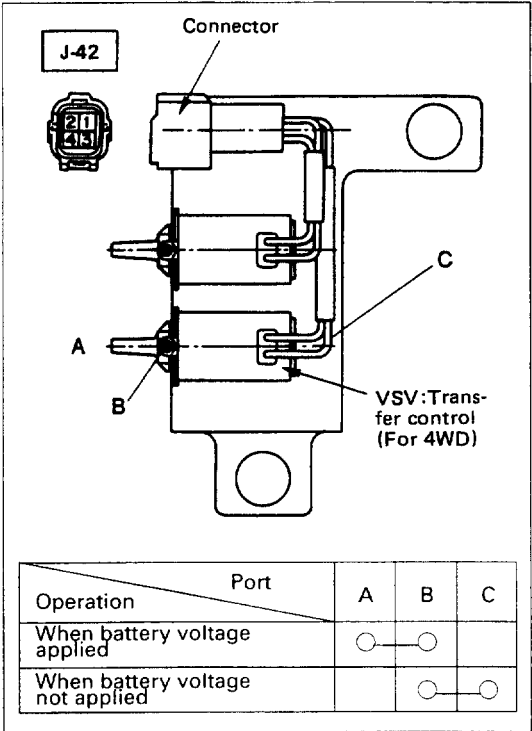
Replace the switch when the result of inspection is found abnormal.



VACUUM SWITCHING VALVE: TRANSFER CONTROL (FOR 2WD)

INSPECTION

Connect the vacuum switching valve connector terminal No. 1 to the battery (+) terminal and terminal No. 3 to the (-) terminal and then check the continuity among each port.

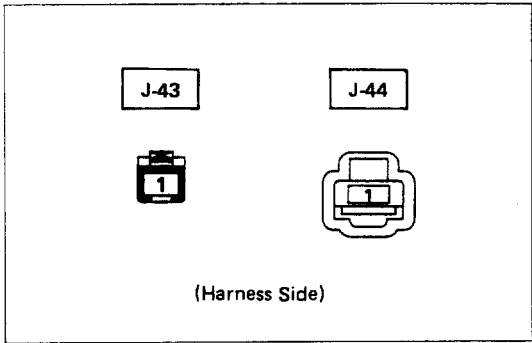


**VACUUM SWITCHING VALVE:
TRANSFER CONTROL (FOR 4WD)**



INSPECTION

Connect the vacuum switching valve connector terminal No. 2 to the battery (+) terminal and terminal No. 4 to the (–) terminal and then check the continuity among each port.



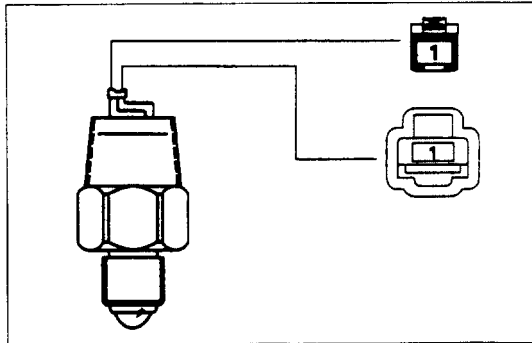
4WD DETECTIVE SWITCH



**INSPECTION OF THE 4WD WARNING
LIGHT CIRCUIT**

1. Disconnect the 4WD switch connectors.
2. Connect the harness side connector terminals.
3. Check to see if the indicator light comes on with the starter switch "ON".

Check the bulb or harness when the result of inspection is found abnormal.



INSPECTION

1. Shift the transfer lever to the 4H (4L) position.
2. Check to see if there is continuity between the 4WD switch connectors.

Replace the switch when the result of the inspection is found abnormal.

LGCEL-WE-9981RH

You are requested to order this manual using the manual number that is shown above.

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