FUSE ARRANGEMENT

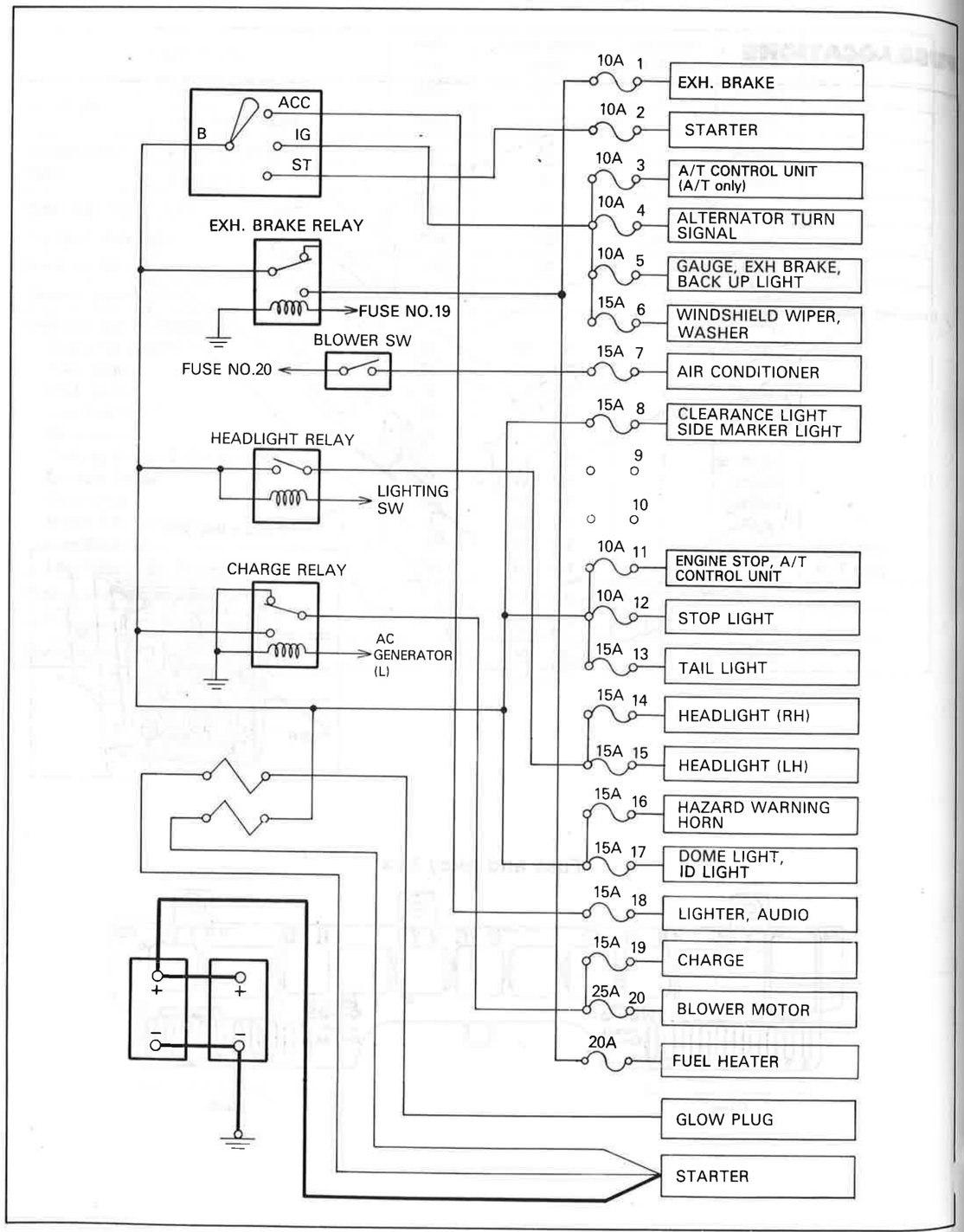


Figure 33. Fuse Arrangement

RELAYS

RELAY LOCATIONS

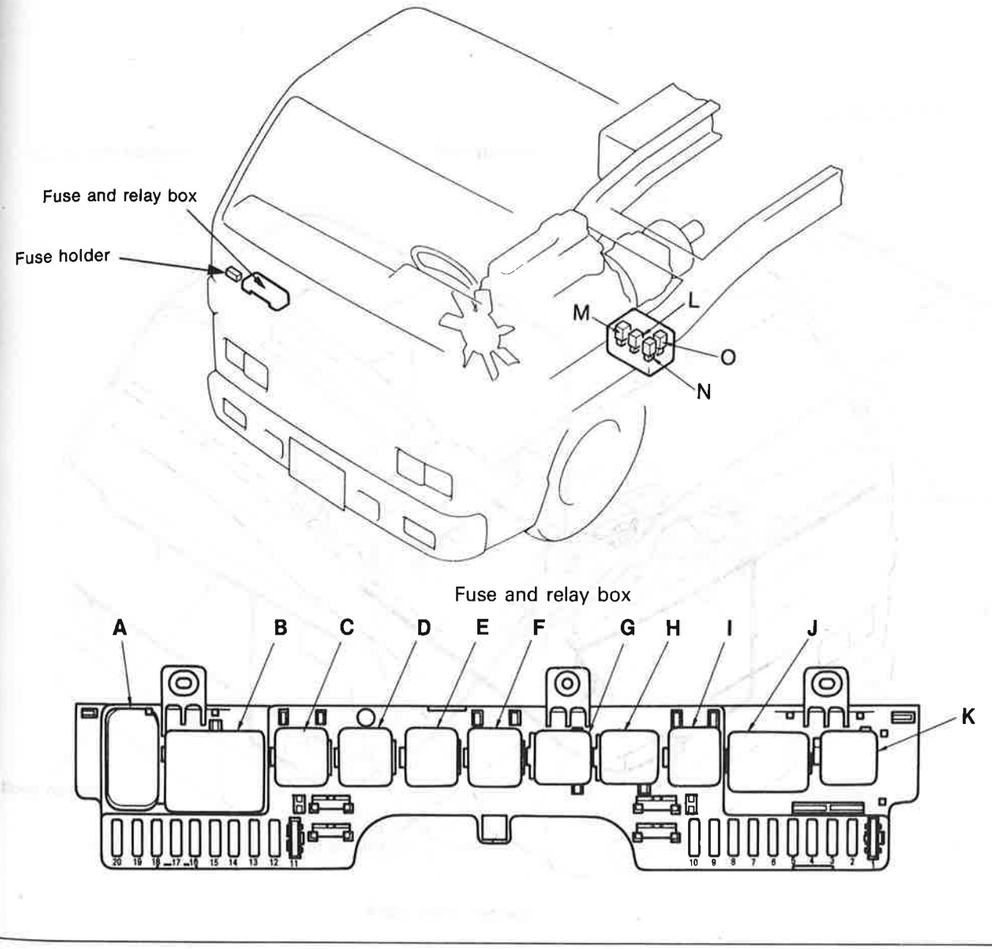


Figure 34. Relay Locations

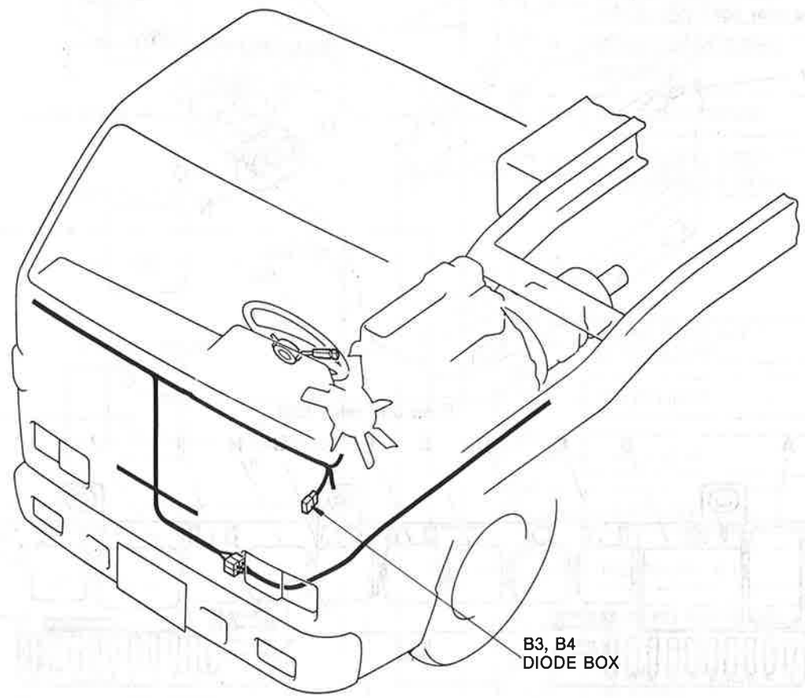
RELAY LIST

No.	A	B	C	D	E	F	G	H	I	J	K
Usage	Horn	Wiper	ID Light	Charge	Dimmer	Exh. brake	Tail	Head light	Engine warm cut	Flusher unit	Side marker

No.	L	M	N	O
Usage	Glow plug I	Starter	Glow plug II	Exh. brake control

DIODES

DIODE LOCATIONS



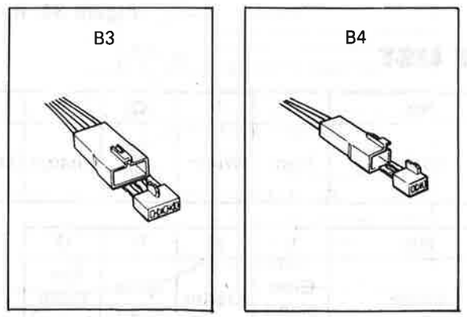


Figure 35. Diode Locations

HARNESS

MAIN HARNESS ROUTING

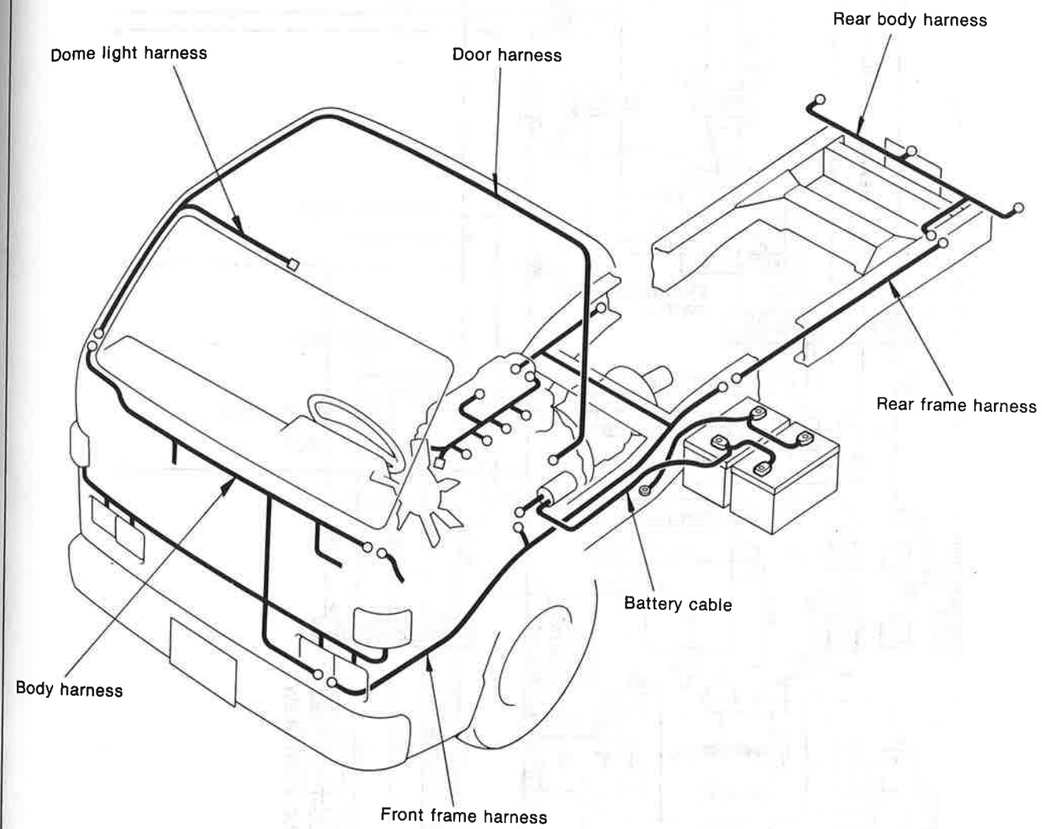


Figure 36. Main Harness Routing

SYSTEM REPAIR

STARTING. ENGINE STOP

CIRCUIT DIAGRAM (M/T-1)

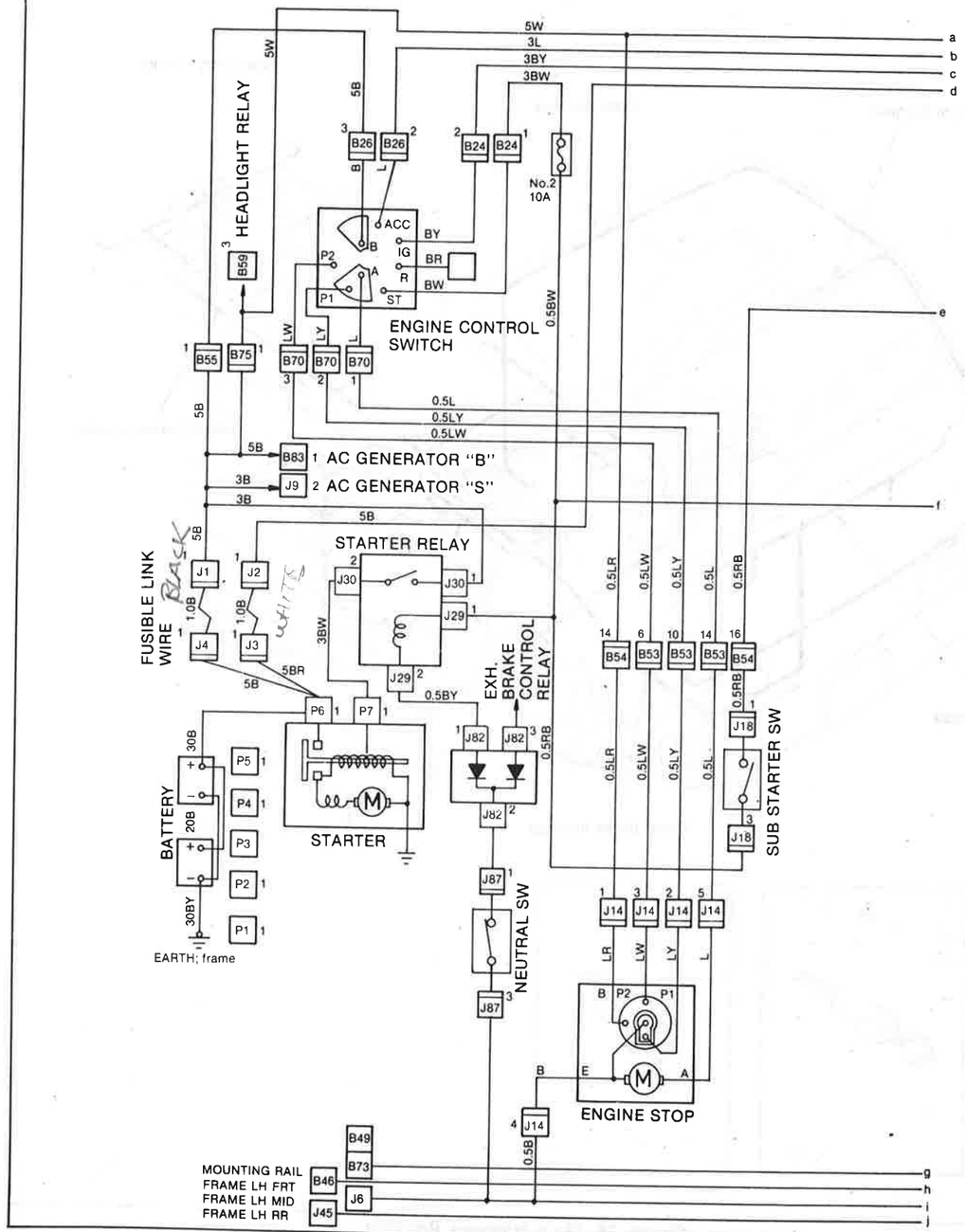


Figure 37. Circuit Diagram (M/T-1)

CIRCUIT DIAGRAM (M/T-2)

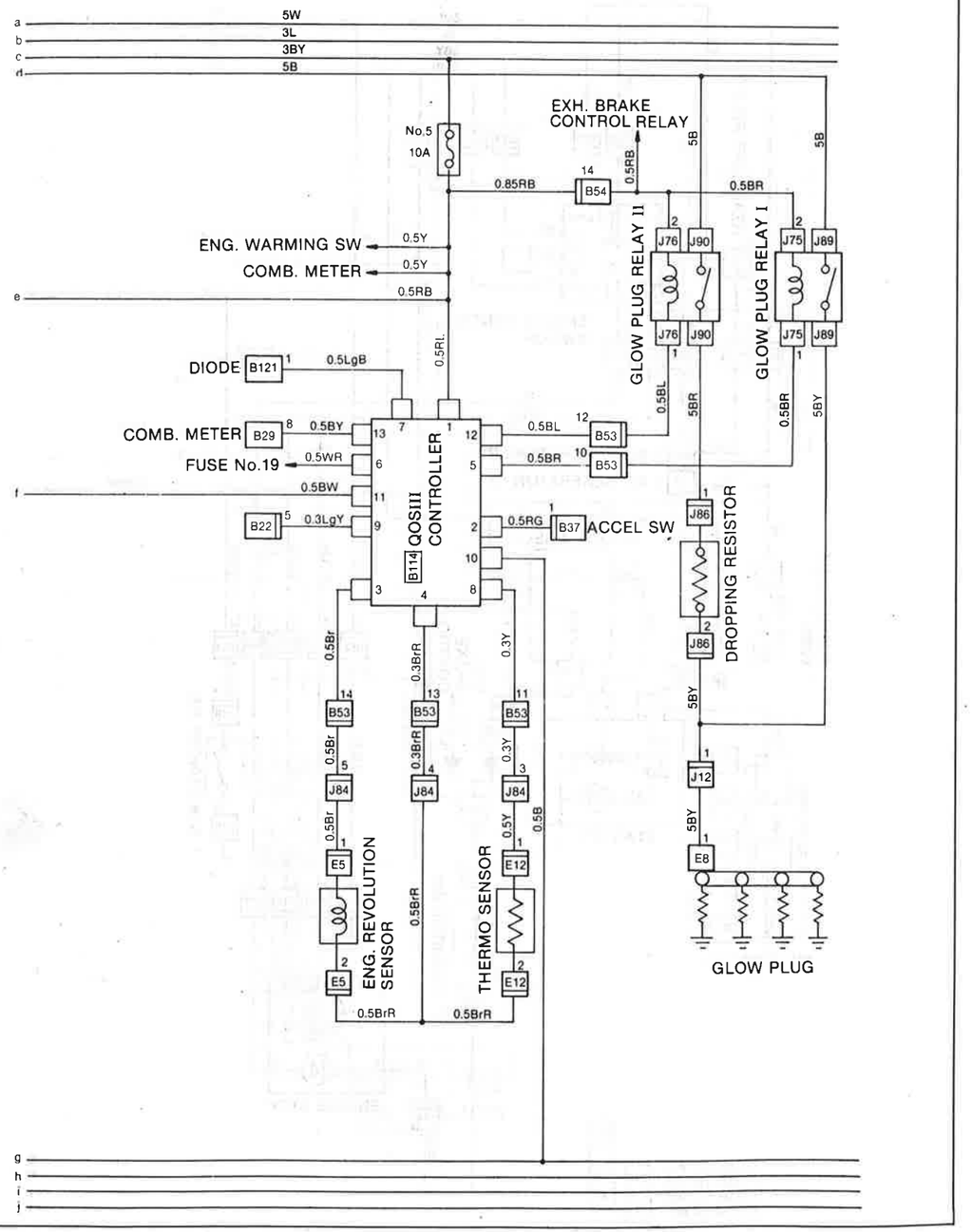


Figure 38. Circuit Diagram (M/T-2)

CIRCUIT DIAGRAM (A/T-1)

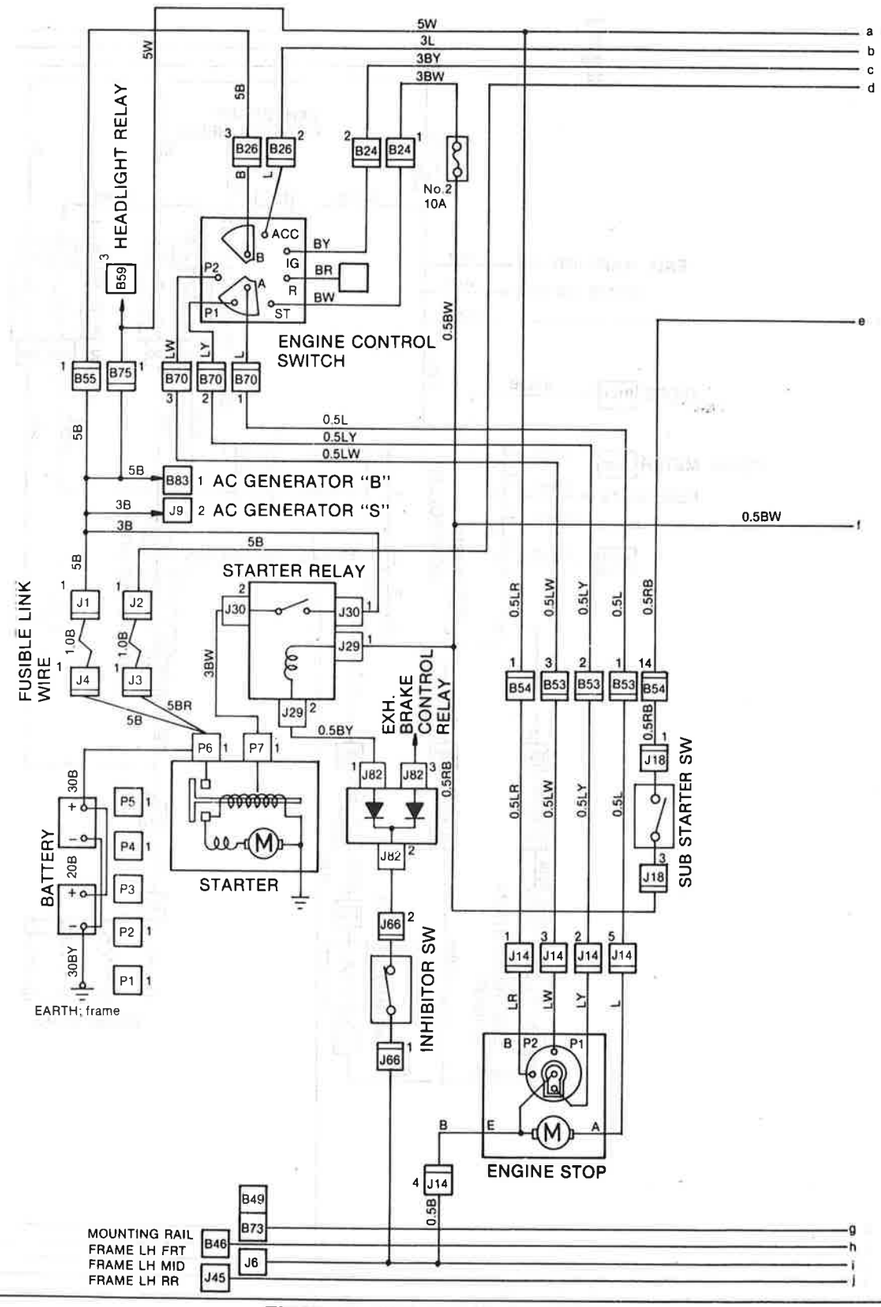


Figure 39. Circuit Diagram (A/T-1)

CIRCUIT DIAGRAM (A/T-2)

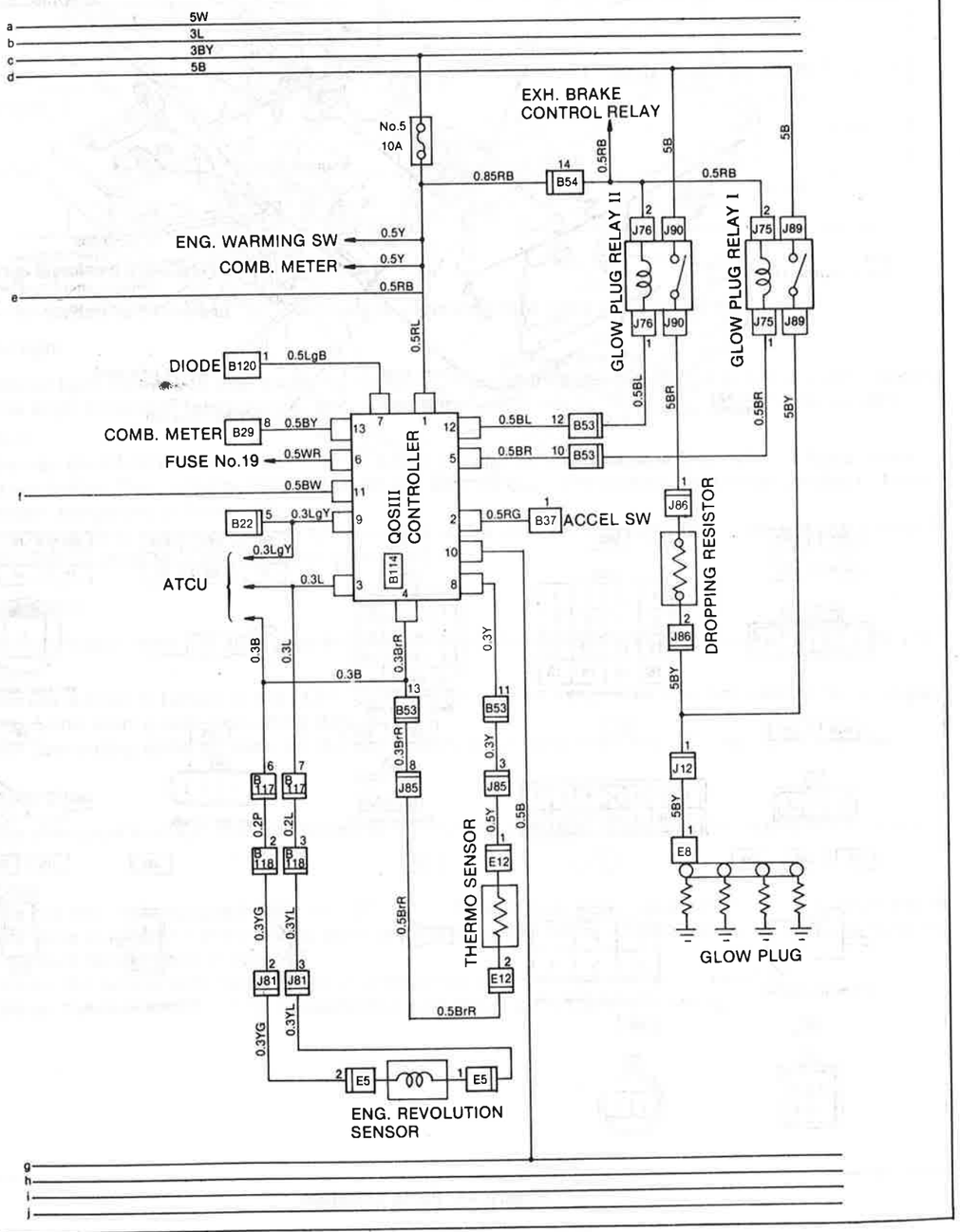


Figure 40. Circuit Diagram (A/T-2)

PARTS LOCATION

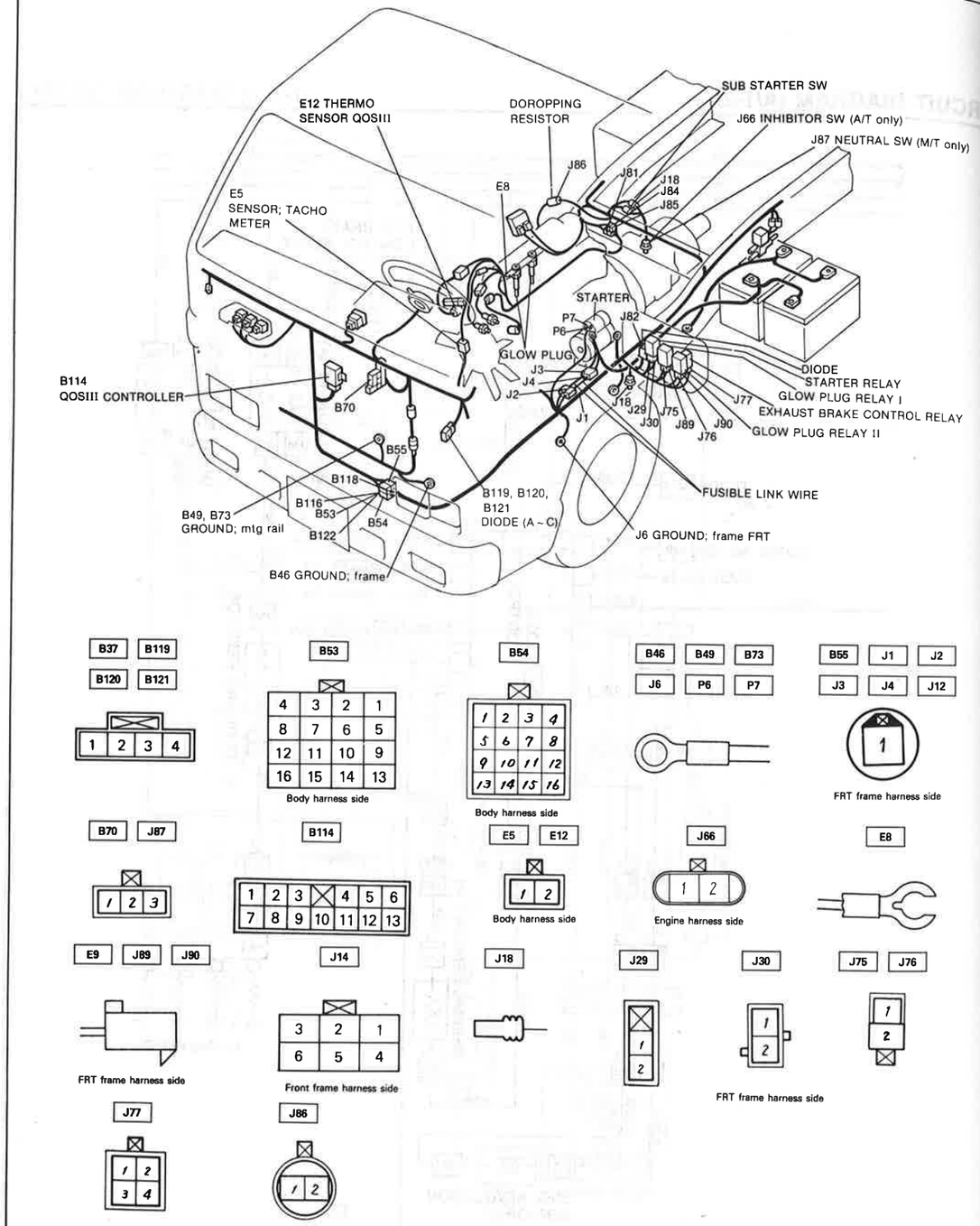


Figure 41. Parts Location

SYSTEM FUNCTION

Key Switch

Key switch has the function to start engine as well as the other functions to switch power source, to stop engine and to lock steering etc.
The following table shows the key switch connections.

Connector	B26		B24			B70			Locking device	
Terminal / Key position	3	2	2		1	1	2	3		
	B	ACC	ON	R	ST	B1	P1	P2	Key inserted	ACC→LOCK
Key pulled out	LOCK					o	o		Lock	
Key inserted	ACC	o				o	o		Lock	Free
	ON	o	o			o		o	Free	
	START	o		o	o	o		o		

Preheating System (QOSIII)

When the key switch is turned to "ST" before the indicator light goes out (Figure 43).

Indicator light

The indicator light remains lit over a varying period of time required to activate the quick preheater according to the engine coolant temperature, and informs the driver when the engine is ready for starting.

(Operation)
When the key switch is turned to the "ON" position, it supplies a signal to activate the indicator timer inside the controller. The indicator light is turned and kept on over a necessary time (ti) according to the engine coolant temperature (figure 44).
When the key switch is turned to the "ST" position while the indicator light is on, the indicator timer is cancelled immediately and the indicator light goes out.

Quick preheater

The quick preheater heats the glow plug instantly by supplying a large amount of current to the glow plug.

(Operation)
When the key switch is turned to the "ON" position, it supplies a signal to the controller to activate glow plug relay I and start quick preheating (figure 42).
The quick preheating ends as soon as the key switch is returned from the "ST" to "ON" positions.

Quick after-glow

The quick after-glow sustains the high temperature, obtained by quick preheating, for a predetermined period of time.

(Operation)
When the key switch is returned from the "ST" to "ON positions, it supplies a signal to the controller to reactivate glow plug relay I and activate quick after-glow over a period of time (td_1 or td_2) according to the engine coolant temperature (figure 44).
td_1: When the accelerator pedal is not depressed or when the engine is not running.
td_2: When the accelerator pedal is depressed and when the engine is running.

After-glow

The after-glow sustains the temperature over a period of time following the quick after-glow by supplying a normal current to the glow plug.

(Operation)
When the charge relay goes on, it activates the after-glow timer in the controller. This causes glow plug relay II to start and maintain after-glow continuously for 360 seconds (ta) (figure 42).
Both glow plug relay I and II go off, however, when the vehicle speed sensor and the engine revolution sensor detect the vehicle speed over 18km/h (11 mph) and engine revolution over 1650rpm respectively (figure 42).
Only glow plug relay II is reactivated and after-glow is continued when the vehicle speed and the engine revolution drop to 9km/h (5.6 mph) and 300rpm respectively (figure 42).
Glow plug Relay II goes off when the engine coolant temperature rises above 40°C (104°F) and remains off even if the coolant temperature drops below that level.

When the key switch is turned to "ST" after the indicator light goes out (Figure 43)

When the indicator light goes off, it sends a signal to the controller to postpone activation of glow plug relay I and activate quick after-glow for a period of time (td_1) according to the engine coolant temperature (figure 44).

Otherwise, the preheating system operates the same as when the key switch is turned to "ST" before the indicator light goes out.

When the key switch is left in the "ON" position (Figure 43)

When the indicator light goes off, it sends a signal to the controller to postpone activation of glow plug relay I and activate quick after-glow for a period of time (td_1) according to the engine coolant temperature (figure 44).
Preheating is ended then.

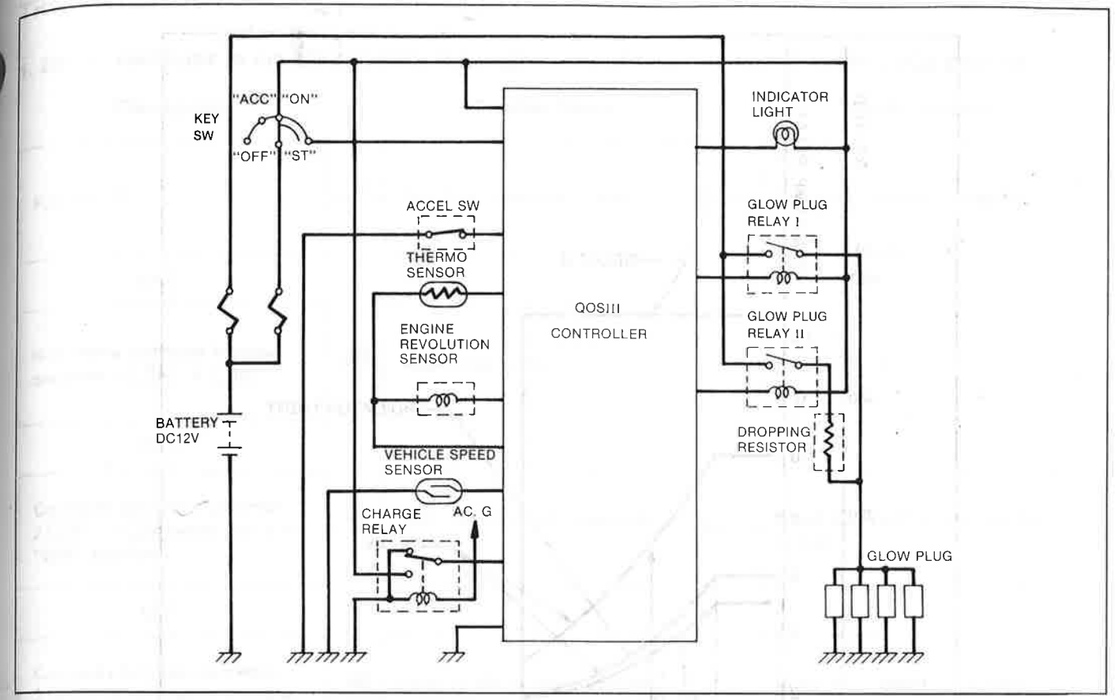


Figure 42. Block Chart of QOSIII System

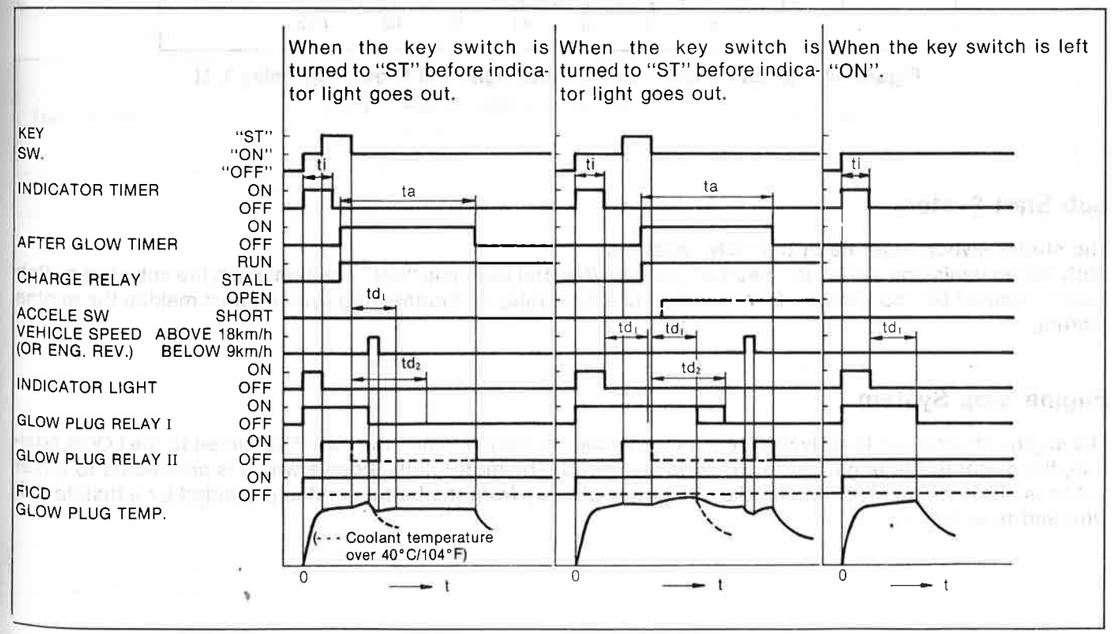


Figure 43. Timing Chart of QOSIII System

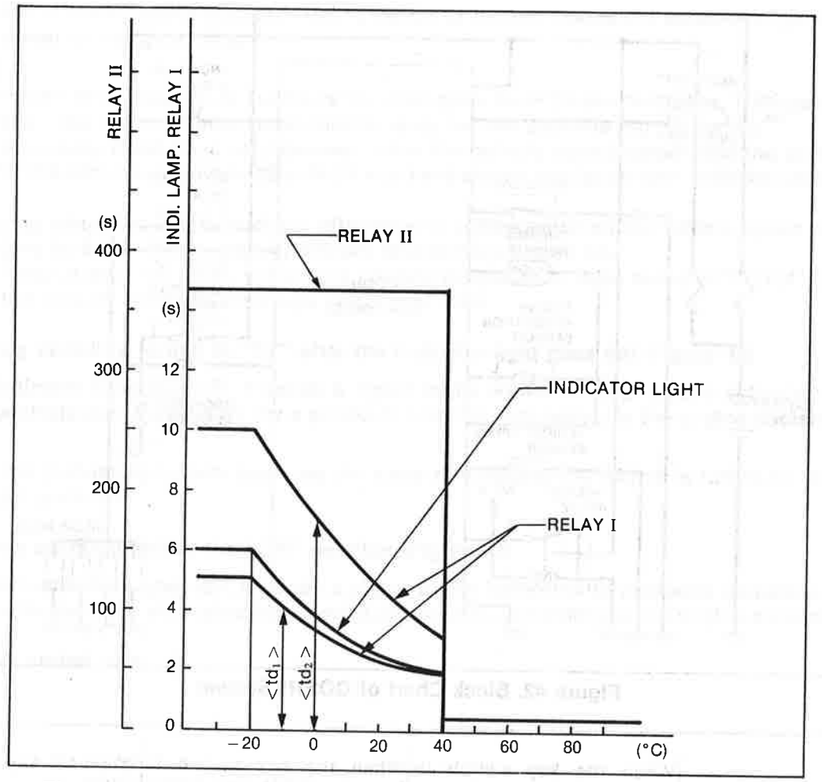


Figure 44. Operating Chart of Indicator light and Glow Plug Relay I, II

Sub Start System

The starter switch must be in the "ON" position.
With the transmission switch is "Neutral" position (Neutral switch is "ON" position) push the sub-start switch button, located behind the cab. This operate the starter relay and preheating system, thus making the engine starting.

Engine Stop System

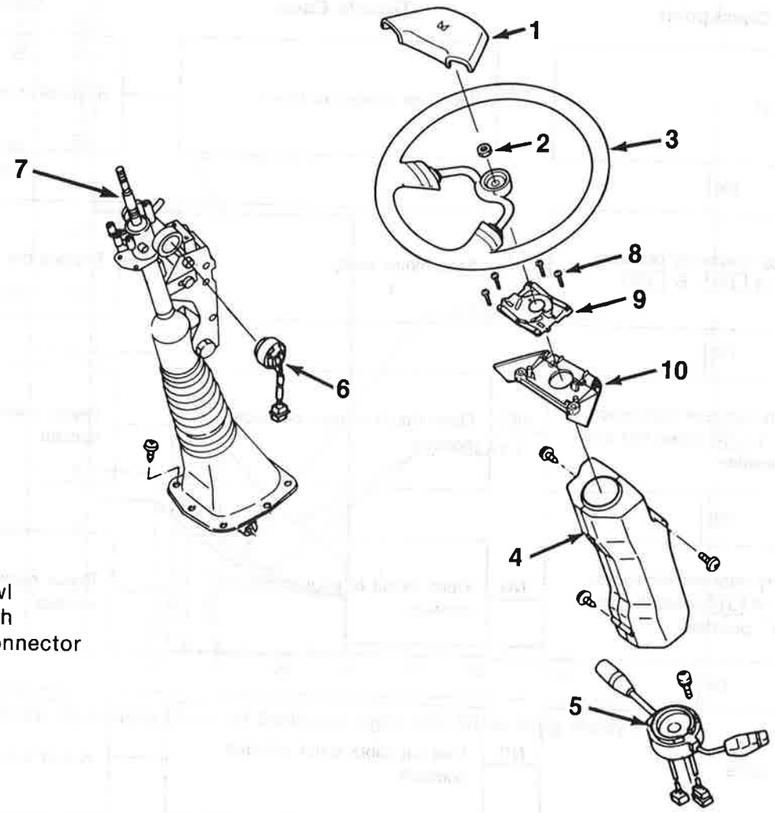
The engine stop circuit is activated by the engine control switch. When the switch is turned to the LOCK position, the motor in the engine stop circuit is energized. The motor pulls a cable which is connected to a fuel cut lever. The engine stop circuit takes its power directly from the battery and is protected by a fusible link wire and fuse No. 11.

TROUBLESHOOTING

1. Engine continues to run after operate the engine control switch is turned to the LOCK position

Checkpoint		Trouble Cause	Countermeasure
Fuse No. 11	NG	Poor fuse contact or blown	Reinstall or replace the fuse No.11
OK ↓			
Stop motor continuity between connector 4 [J14] - 5 [J14]	NG	Stop motor faulty	Replace the stop motor
OK ↓			
Continuity between connector 2 [J14] - 4 [J14] when key is in "OFF" position	NG	Open circuit or poor connector contact	Repair open circuit or connector contact
OK ↓			
Continuity between connector 3 [J14] - 4 [J14] when key is in "START" position	NG	Open circuit or poor connector contact	Repair open circuit or conector contact
OK ↓			
Fuel cut cable	NG	Fuel cut cable is not adjusted correctly	Adjust the cable

ON-VEHICLE SERVICE
KEY SWITCH AND COMBINATION SWITCH



1. Horn Button
2. Nut
3. Steering Wheel
4. Left and Right Cowl
5. Combination Switch
6. Key Switch and Connector
7. Steering Shaft
8. Screw
9. Boss Plate
10. Cover

Figure 45. Key Switch and Combination Switch

Remove or Disconnect

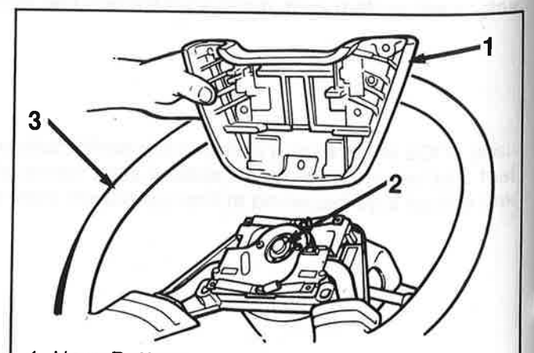
1. Horn Button (Figure 46)

Pull out the horn button (1) by hand.

2. Nut

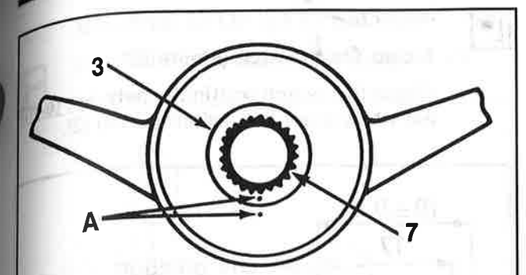
3. Steering Wheel (Figure 47)

- Apply a setting mark across the steering wheel and shaft to ensure reassembly of the steering wheel in the original position.
- Pull the steering wheel upward to remove it.



1. Horn Button
2. Nut
3. Steering Wheel

Figure 46. Removing Horn Button



3. Steering Wheel
7. Steering Shaft
A. Reference Marks

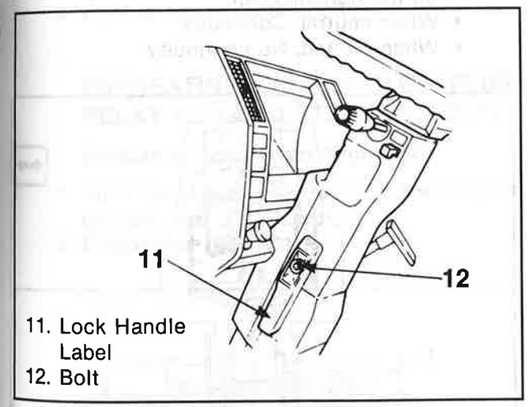
Figure 47. Apply Setting Marks

4. Cowl (Figure 48)

- Pull out the lock handle label (11).
- Remove the lock handle by turning the bolt (12) clockwise, as the bolt has left thread.

5. Combination Switch (Figure 49)

- Remove the four (4) bolts.
- Pull the combination switch upward to remove it.



11. Lock Handle Label
12. Bolt

Figure 48. Removing Lock Handle

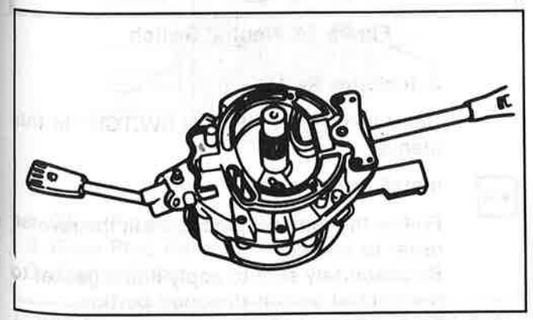
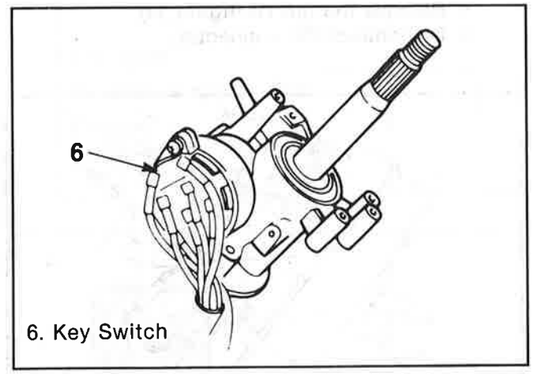


Figure 49. Combination Switch

6. Key Switch (Figure 50)

- Remove the three (3) bolts to disconnect the connector (6).
- Remove the key switch from the steering shaft.



6. Key Switch

Figure 50. Removing Key Switch

Install or Connect

1. Key Switch

2. Combination Switch

3. Cowl

4. Steering Wheel (Figure 47)

Apply Multipurpose type grease to the contact ring to prevent wear and noise.

Install the steering wheel on the shaft by aligning setting marks applied at removal.

5. Nut

Tighten

- Steering wheel nut (2) to 55 N•m (41 ft.lbs.).

6. Horn Button

SUB START SYSTEM

Remove or Disconnect

1. Sub Start Switch

- Remove the relay box cover.
- Remove the nut (1) (figure 51).
- Disconnect the connector.

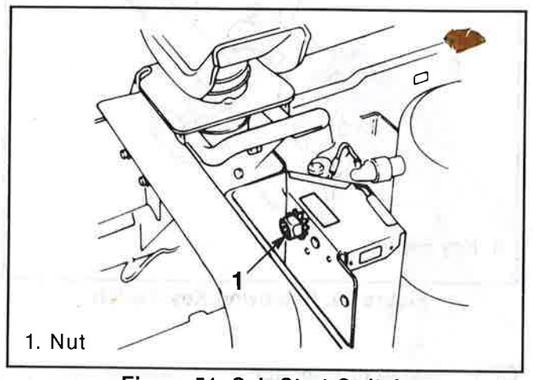


Figure 51. Sub Start Switch

2. Neutral Switch

- Disconnect the connector.
- Remove the neutral switch from the transmission (figure 52).

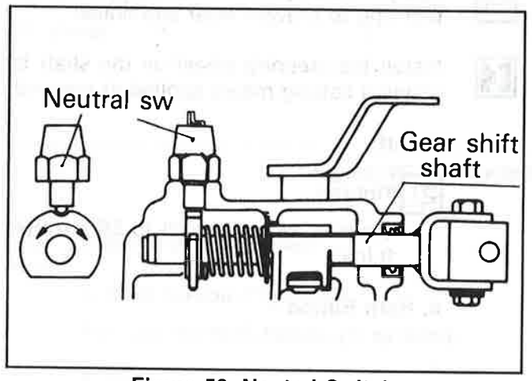


Figure 52. Neutral Switch

3. Inhibitor Switch

Refer to "7A2 INHIBITOR SWITCH" in this manual.

Inspect

1. Sub Start Switch (Figure 53)

Check the switch continuity between terminal when push the switch button (2).

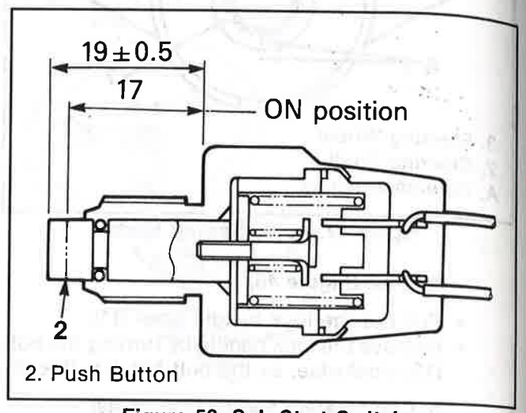


Figure 53. Sub Start Switch

2. Neutral Switch (Figure 54)

Check the switch continuity when installed on the transmission.

- When neutral: Continuity
- When shifted: No continuity

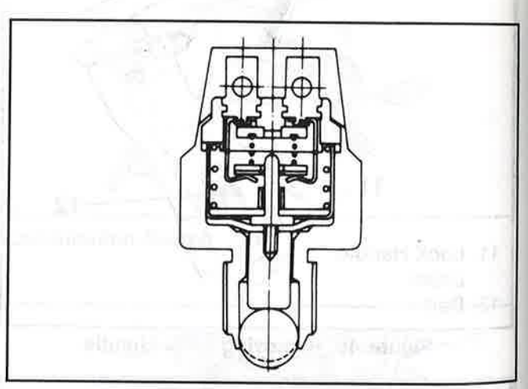


Figure 54. Neutral Switch

3. Inhibitor Switch

Refer to "7A2 INHIBITOR SWITCH" in this manual.

Install or Connect

Follow the removal procedure in the reverse order to install.
Be absolutely sure to apply liquid gasket to the neutral switch threaded portion.
This will prevent oil leakage.

ENGINE STOP SYSTEM

Fuel Cut Cable Adjustment (Figure 55)

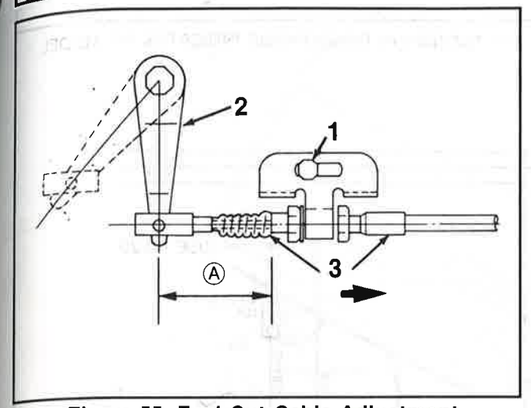


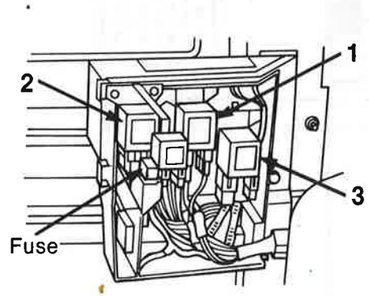
Figure 55. Fuel Cut Cable Adjustment

1. Turn the key switch to LOCK position.
2. Loosen the fuel cut cable adjusting bolt (1).
3. Hold the fuel cut lever (2) in the fully shut position and pull the cable (3) in the direction of the arrow to remove slack from distance Ⓐ.
4. Tighten the adjusting bolt (1).

PREHEATING SYSTEM: GLOW PLUG RELAY I, II AND STARTER RELAY

Remove or Disconnect (Figure 56)

1. Push the tang lock flat and pull the relay an upward.
2. Disconnect the connector.



1. Glow Plug Relay I
2. Glow Plug Relay II
3. Starter Relay

Figure 56. Glow Plug Relay I, II and Starter Relay

Inspect

1. Glow Plug Relay I, II and Starter Relay (Figure 57)

Check continuity between terminals.

Condition \ Terminal No.	ⓐ	ⓑ	ⓒ	ⓓ
Resistance approx. 80Ω			○—○	
Continuity when applying battery voltage between ⓒ and ⓓ	○—○			

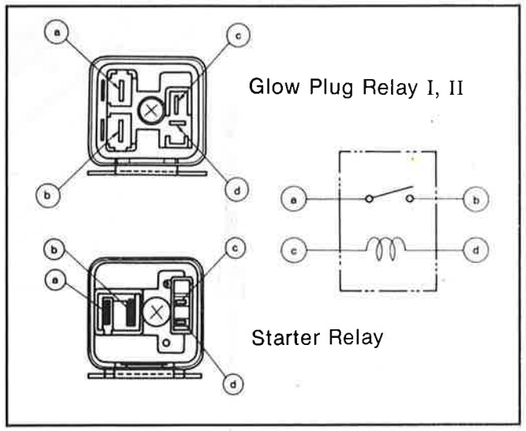


Figure 57. Glow Plug Relay I, II and Starter Relay

2. Dropping Resistor

Check resistance between terminal.
Resistance 0.21 ~ 0.25Ω at 25°C (77°F).

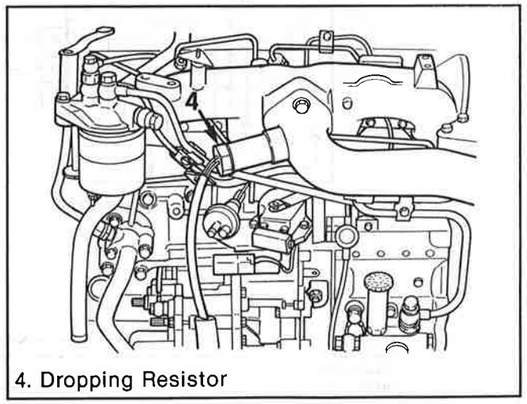


Figure 58. Dropping Resistor

CHARGING

CIRCUIT DIAGRAM

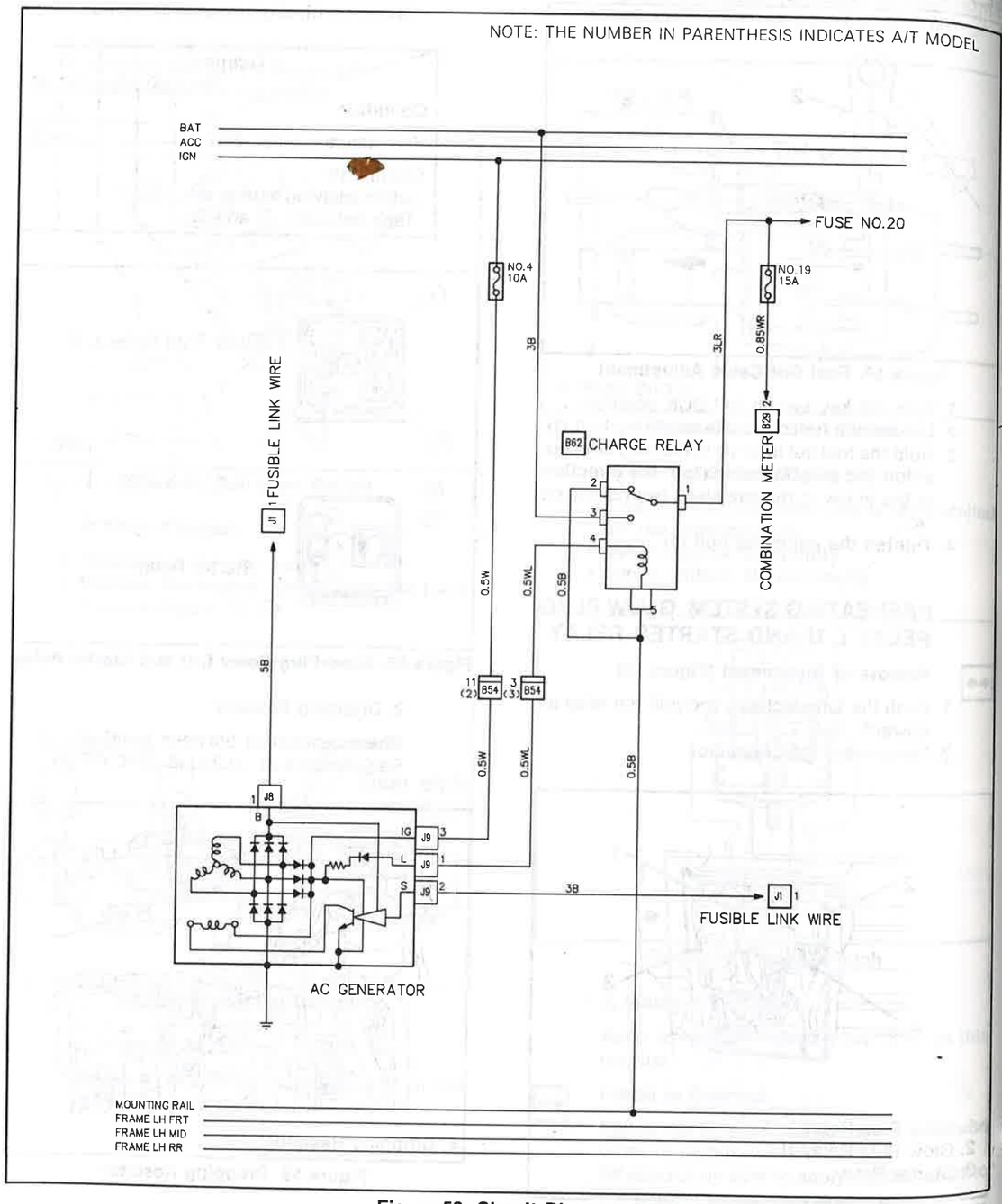
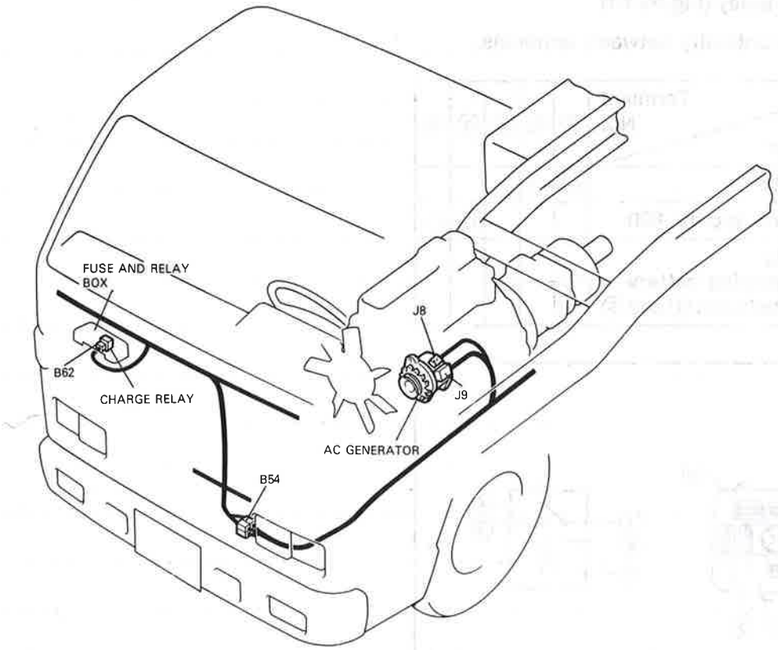


Figure 59. Circuit Diagram

PARTS LOCATION



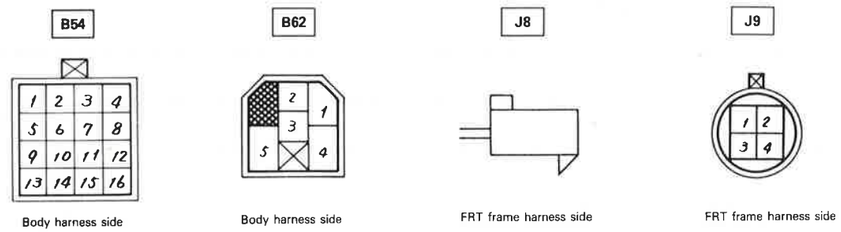


Figure 60. Parts Location