

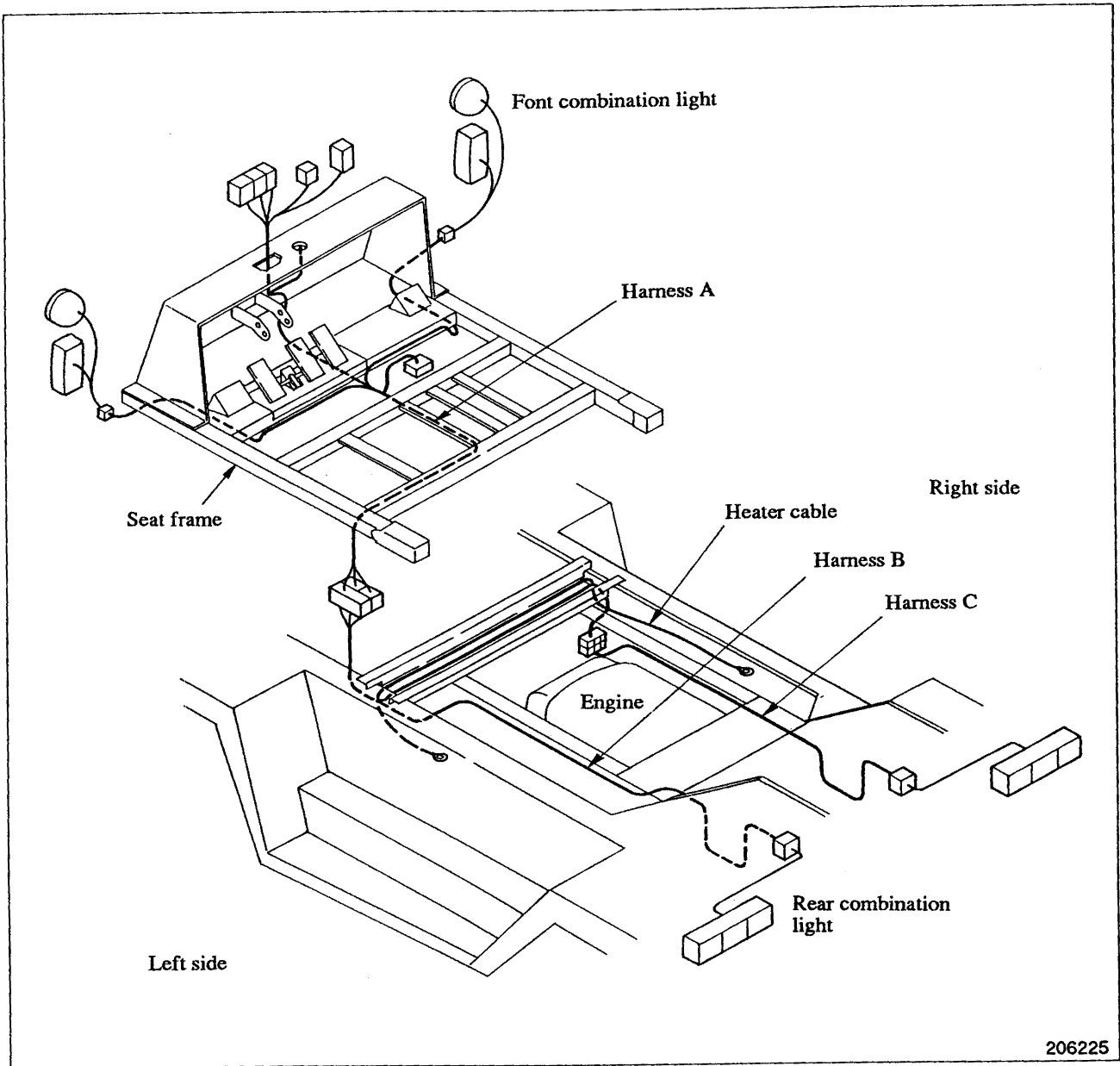
ELECTRICAL SYSTEM

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SPECIFICATIONS

Item		Truck model	FD100	FD115	FD135	FD150A
Battery	Model nomenclature — No. of batteries		95E41R — 2			
	Voltage, V		12			
	Capacity, AH		80			
Direction lever			Electric			
Console box			With central vehicle monitoring system			
Automatic transmission controller			Electronic control unit (ECU)			
Starter switch			Anti-restart type			
Lights			See Light Bulb Specifications.			

LOCATION OF COMPONENTS

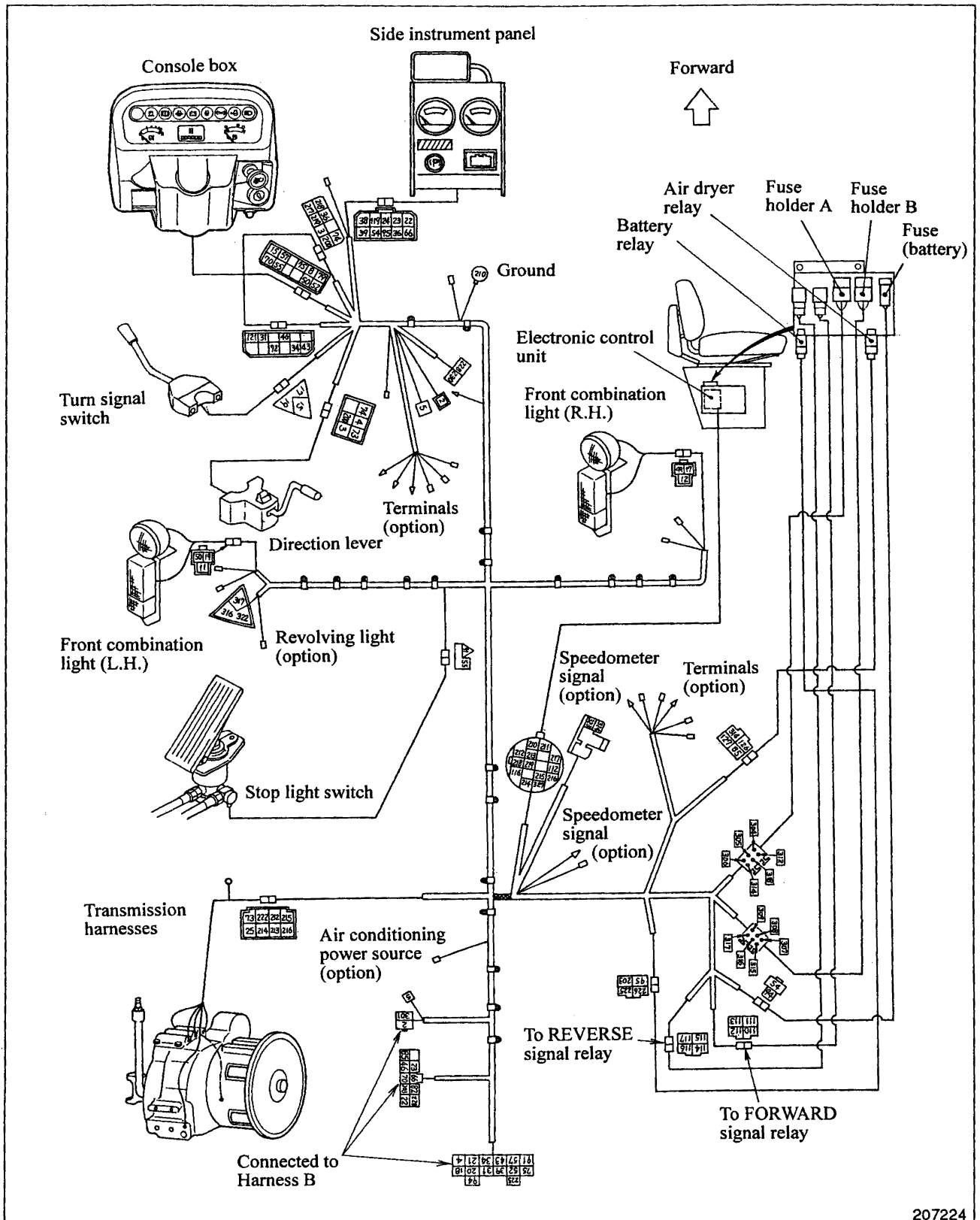


For the components to which harnesses A, B and C are connected, see the pages which follow.

CAUTION

Clamp the harnesses away from moving parts or sharp edges. Repair a frayed harnesses with vinyl tape.

Harness A



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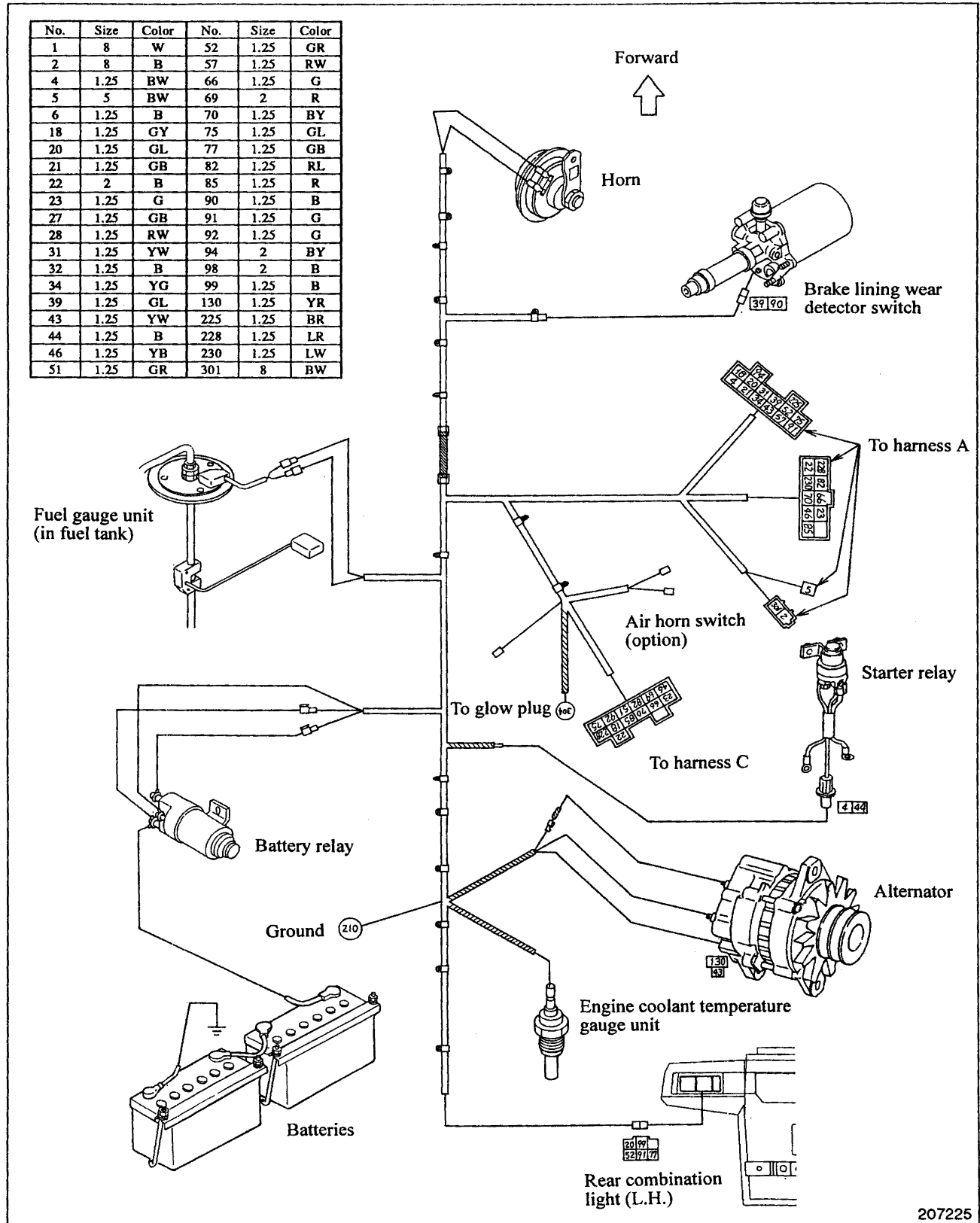
ELECTRICAL SYSTEM

Circuit numbers and color codes of harness A

No.	Wire size	Color	No.	Wire size	Color	No.	Wire size	Color
2	8	Black	72	1.25	Black	221	1.25	Green/red
3	1.25	Black/red	73	1.25	Green/yellow	222	1.25	Green/blue
4	1.25	Black/white	74	1.25	Green/blue	223	1.25	Green/red
5	5	Black/white	75	1.25	Green/blue	224	1.25	Green/yellow
8	1.25	Red	79	1.25	Red/black	225	1.25	Green/red
11	1.25	Red	82	1.25	Red/blue	226	1.25	Black
12	1.25	Red	85	1.25	Red	228	1.25	Blue/red
13	1.25	Red/white	91	1.25	Green	230	1.25	Blue/white
14	1.25	Red/white	94	2	Black/yellow	301	8	Black/white
15	1.25	Green/red	95	1.25	Black/red	304	2	Black/white
17	1.25	Green/yellow	110	1.25	Green/yellow	305	2	Black/yellow
18	1.25	Green/yellow	111	1.25	Black	306	2	Black/red
19	1.25	Green/blue	112	1.25	Red/blue	307	2	White/red
20	1.25	Green/blue	113	1.25	Black	308	2	White/black
21	1.25	Green/black	114	1.25	Green/blue	309	1.25	White/blue
22	2	Black	115	1.25	Black	312	2	Black/white
23	1.25	Yellow	116	1.25	Blue/white	313	2	Black/yellow
24	1.25	Blue	117	1.25	Black	314	1.25	Black/red
25	1.25	Yellow/red	119	1.25	Green/red	315	2	White/red
31	1.25	Yellow/white	121	1.25	Green/red	316	2	Blue
34	1.25	Yellow/green	126	1.25	Blue	317	2	Blue/white
36	1.25	Black/white	127	1.25	Black	320	2	Red/white
38	1.25	Blue	200	1.25	Blue	322	2	Blue/white
39	1.25	Green/blue	203	1.25	Green/white	323	1.25	Black/yellow
43	1.25	Yellow/white	210	1.25	Red/white	324	1.25	Black
46	1.25	Yellow/black	211	1.25	Black	327	1.25	White
49	1.25	Green/red	212	1.25	Red/yellow	328	1.25	Black
50	1.25	Green/red	213	1.25	Red/black	332	1.25	Yellow/red
52	1.25	Green/red	214	1.25	Black	334	1.25	Yellow/green
54	1.25	Green/white	215	1.25	Red/green	335	1.25	Red/yellow
55	1.25	Red	216	1.25	Black/red	336	1.25	White/red
57	1.25	Red/white	217	1.25	Black/white	338	1.25	Red/yellow
65	2	Black	218	1.25	White/red	339	1.25	Black
66	1.25	Green	219	1.25	White/black			
70	1.25	Black/yellow	220	1.25	Green/blue			

Harness B (on the left side of engine room)

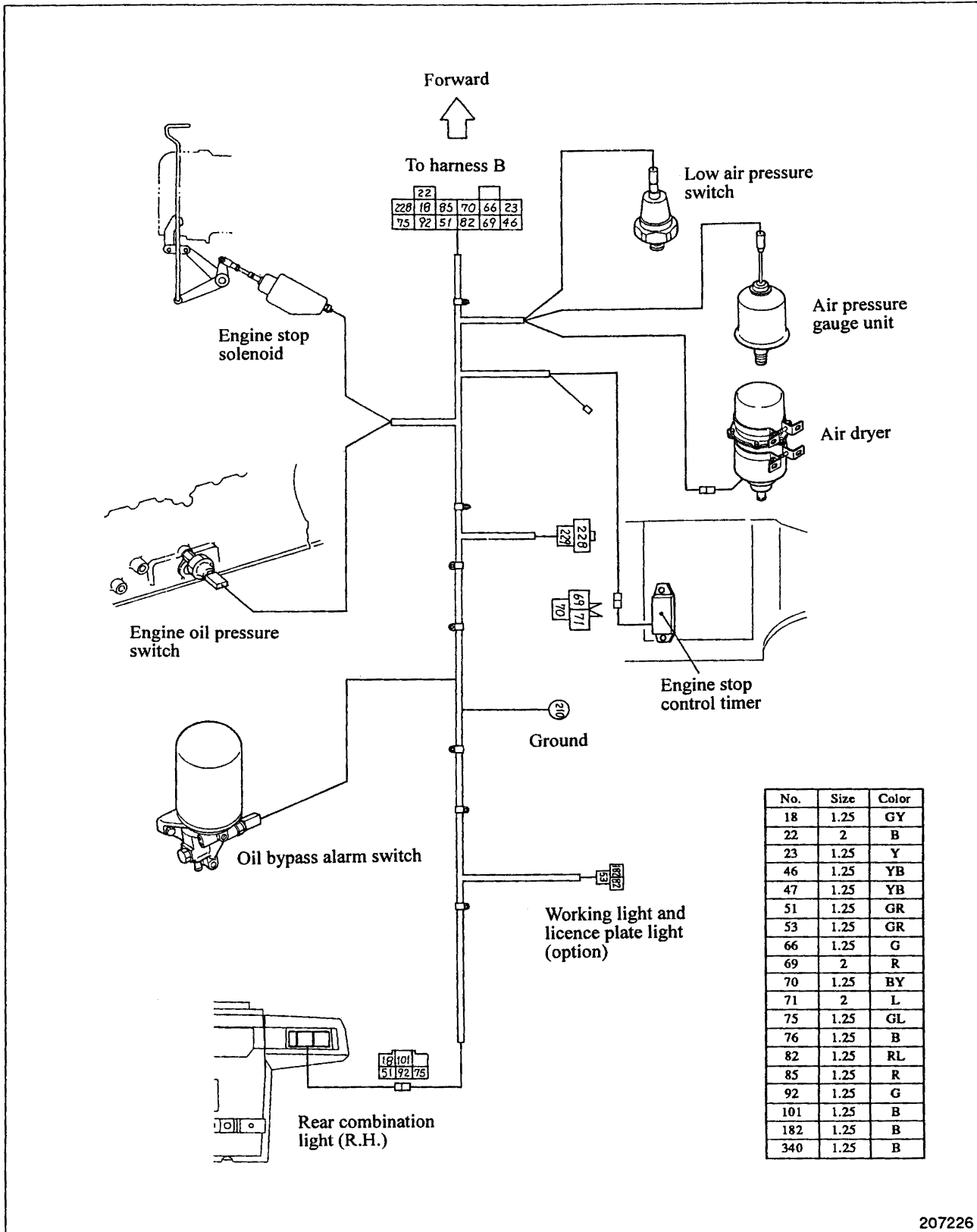
No.	Size	Color	No.	Size	Color
1	8	W	52	1.25	GR
2	8	B	57	1.25	RW
4	1.25	BW	66	1.25	G
5	5	BW	69	2	R
6	1.25	B	70	1.25	BY
18	1.25	GY	75	1.25	GL
20	1.25	GL	77	1.25	GB
21	1.25	GB	82	1.25	RL
22	2	B	85	1.25	R
23	1.25	G	90	1.25	B
27	1.25	GB	91	1.25	G
28	1.25	RW	92	1.25	G
31	1.25	YW	94	2	BY
32	1.25	B	98	2	B
34	1.25	YG	99	1.25	B
39	1.25	GL	130	1.25	YR
43	1.25	YW	225	1.25	BR
44	1.25	B	228	1.25	LR
46	1.25	YB	230	1.25	LW
51	1.25	GR	301	8	BW



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ELECTRICAL SYSTEM

Harness C (on the right side of engine room)

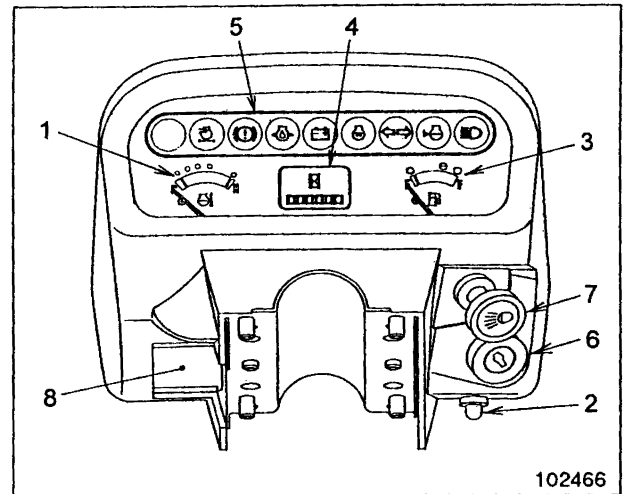


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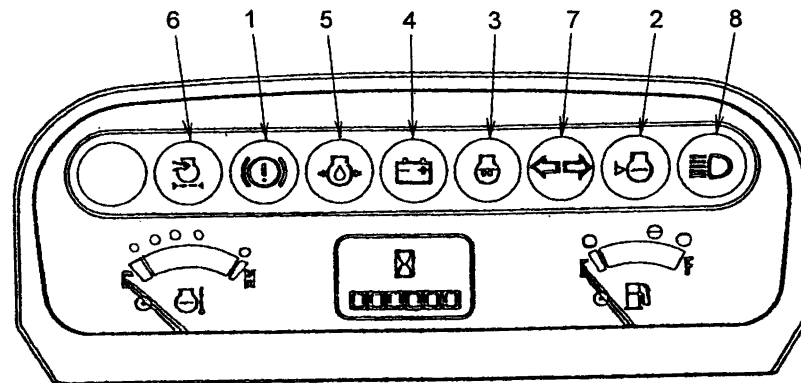
DESCRIPTION

Console Box

- 1 Engine coolant temperature gauge
- 2 Speed selector switch
- 3 Fuel gauge
- 4 Service hourmeter
- 5 OK monitor
- 6 Starter switch
- 7 Light switch
- 8 Fuse box



OK monitor



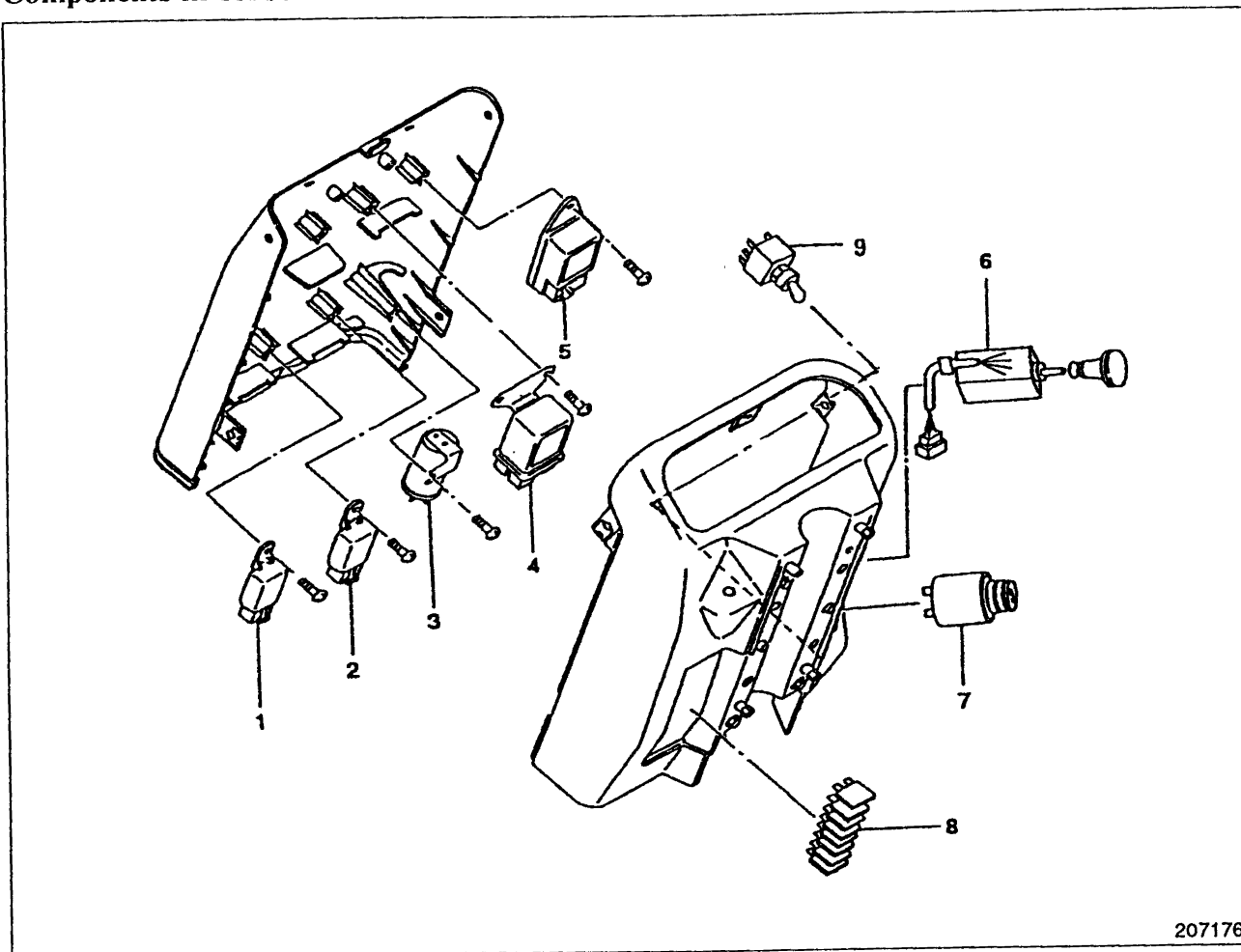
Function

No.	Indicator light	OFF	ON	Remarks
1	Brake fluid level indicator	Normal	Low	
2	Engine coolant level warning light	Normal	Low	Option
3	Glow plug indicator light	Heated	Heating	
4	Alternator not charging indicator light	Normal	Abnormal	
5	Engine oil pressure indicator light	Normal	Low	
6	Air cleaner element indicator light	Normal	Element clogged	Option
7	Turn signal indicator		Switch ON	
8	High-beam indicator light	Low beam	High beam	Option

How to check monitor indicator bulbs

The bulbs are normal if the indicator lights 1, 2 and 6 come ON when the starter switch key is turned to I (ON) position. (The indicator lights will go OFF when the engine starts.)

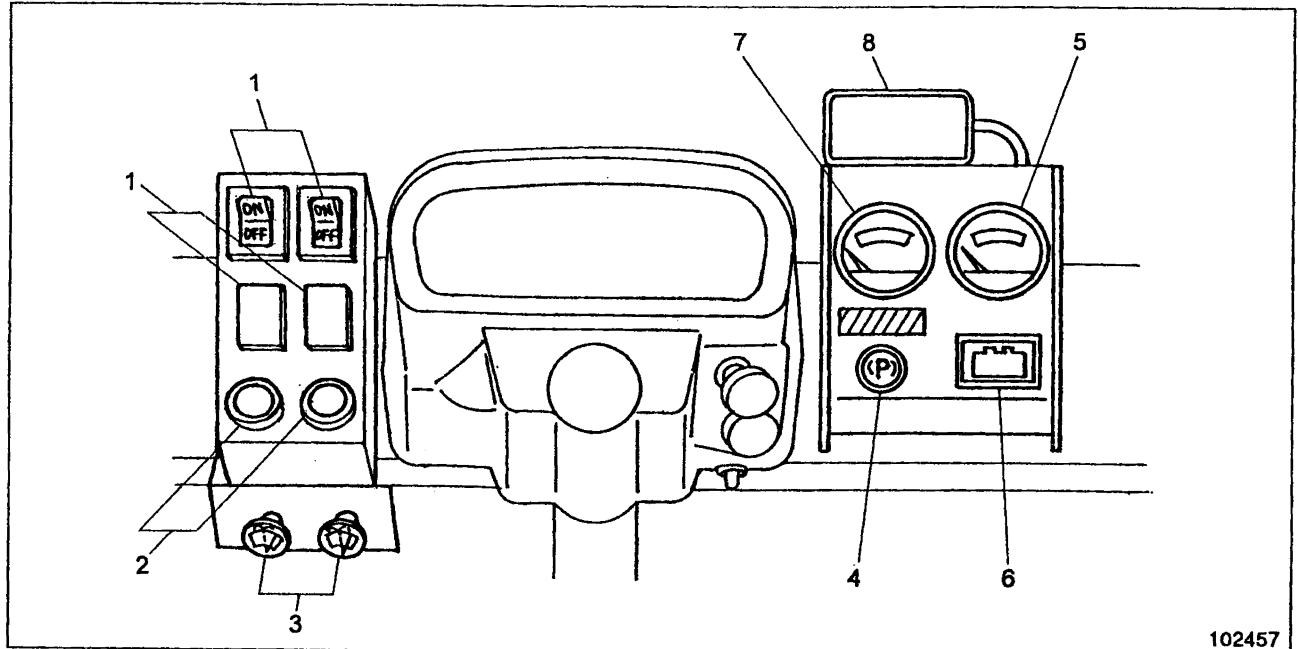
Components in console box



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- | | |
|---------------------|-------------------------|
| 1 Power relay | 6 Light switch |
| 2 Power relay | 7 Starter switch |
| 3 Turn signal relay | 8 Fuses |
| 4 Glow plug relay | 9 Speed selector switch |
| 5 Glow plug timer | |

Side Instrument Panels



- 1 Working light switches (option)
- 2 Working light indicators (option)
- 3 Windshield wiper switches (option)
- 4 Brake lining wear indicator

- 5 Brake air pressure gauge
- 6 Battery switch
- 7 Powershift transmission oil temp. gauge
- 8 Speedometer (option)

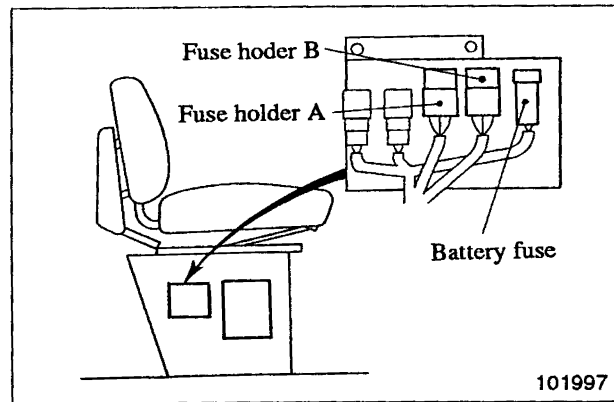
Fuses

Symbol	Amps	Circuit
A	10	Direction solenoid
B	10	Turn signals, instrument light
C	10	Spare power source
D	15	Front combination lights, head lights, tail & stop lights
E	10	Horn
F	10	Spare fuse
G	10	Tail & stop lights, vacuum buzzer
H	10	Backup lights
J	15	Spare fuse

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Optional fuses

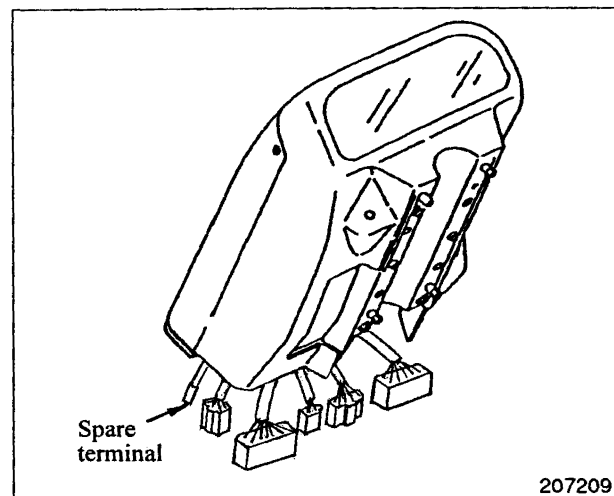
Fuse	Amps	Circuit
Battery fuse	15	
Fuse holder A	15	Working lights
	10	Revolving light
	10	Air dryer relay
Fuse holder B	15	Air conditioner
	5	Car heater
	20	Windshield wiper
	10	Cab



Spare terminals

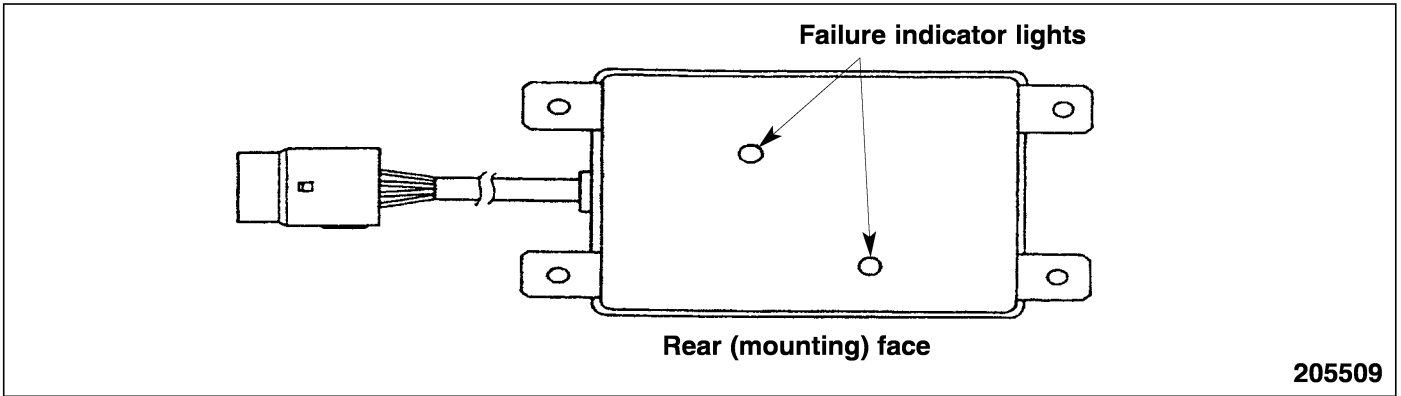
The spare terminal is extends from the fuse box in the control box.

Cord color: LG (light green)



Major Components

Electronic control unit (ECU)



The Electronic Control Unit (ECU) has a built in 1-chip micro-computer. This computer processes signals from the travel speed sensor for actuating the speed selector system.

The ECU has “self-diagnostic” failure indicator lights which come on when any problem occurs in the electrical system, thereby allowing the operator to locate the problem. It has the following fail-safe systems so that failure of power, control circuit, or other components will not endanger the operator.

NOTE

The failure indicator lights are located on the rear (mounting) face of the ECU. This makes it necessary to remove the ECU from the machine to observe these lights.

Fail-safe System

Failure	Function	LED flash pattern	Item to be checked	System restoration
Direction lever switch faulty (turns ON in both FORWARD and REVERSE positions).	In 2-speed transmission model, no shifting failure occurs but, in 3-speed transmission model, inadvertent downshifting to 2nd speed occurs while truck is running at 3rd speed.			System restores automatically after repair.
Travel speed sensor faulty.	System retains current travel speed.		Check sensor voltage.	System restores automatically after repair.
Solenoids faulty.	System turns OFF solenoid output (solenoid relay).		Check solenoid voltage.	System can be restored by resetting power switch.

NOTE: The failure indicator lights come ON and go OFF as shown below:



Solenoid Voltage Test:

Use a voltmeter set on 0 to 40 DC volts to determine if the solenoid is receiving the proper voltage to the appropriate shift or speed solenoids.

Note: 24 Volt Solenoid: Working Voltage 18 to 30 Volts.

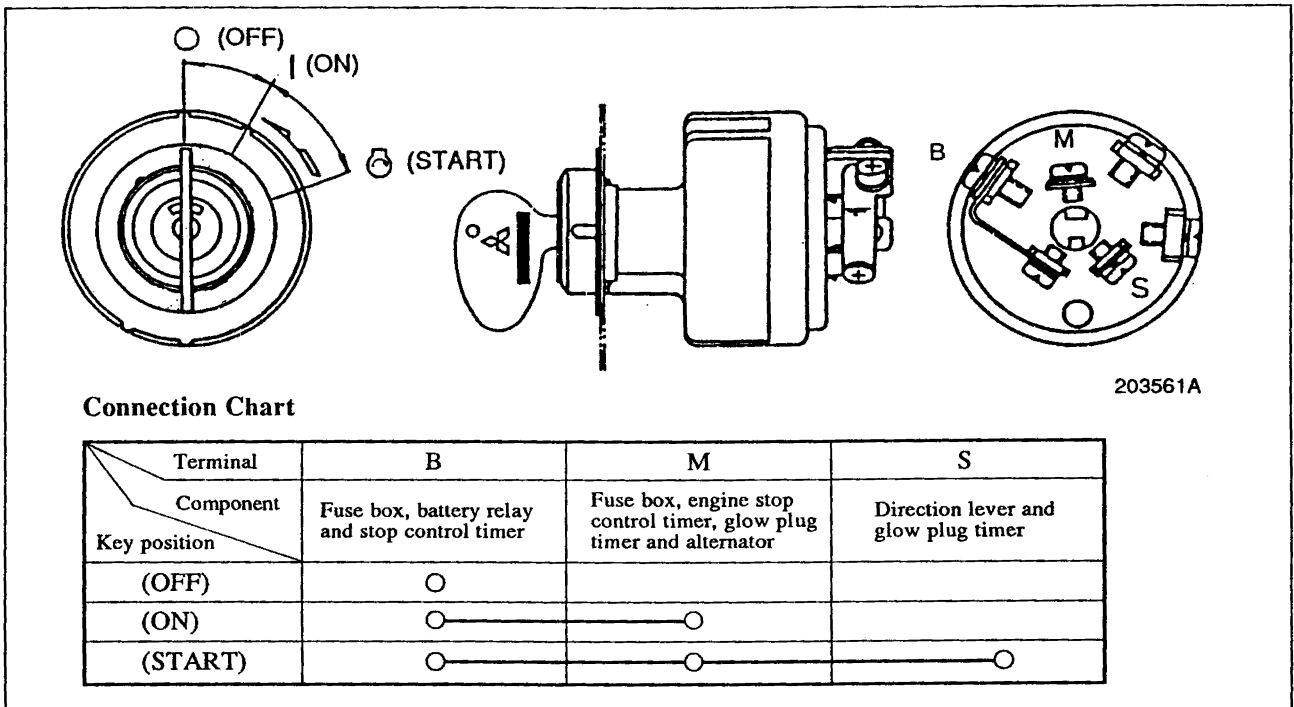
Note: SF: Forward Solenoid
 SR: Reverse Solenoid
 SH: Shift Solenoid
 S1: First Speed Solenoid
 S2: Second Speed Solenoid

		Forward			Reverse		
Solenoid	Neutral	F1	F2	F3	R1	R2	R3
SF	OFF	ON	ON	ON	OFF	OFF	OFF
SR	OFF	OFF	OFF	OFF	ON	ON	ON
S1	ON	ON	OFF	OFF	ON	OFF	OFF
S2	OFF	OFF	ON	OFF	OFF	ON	OFF

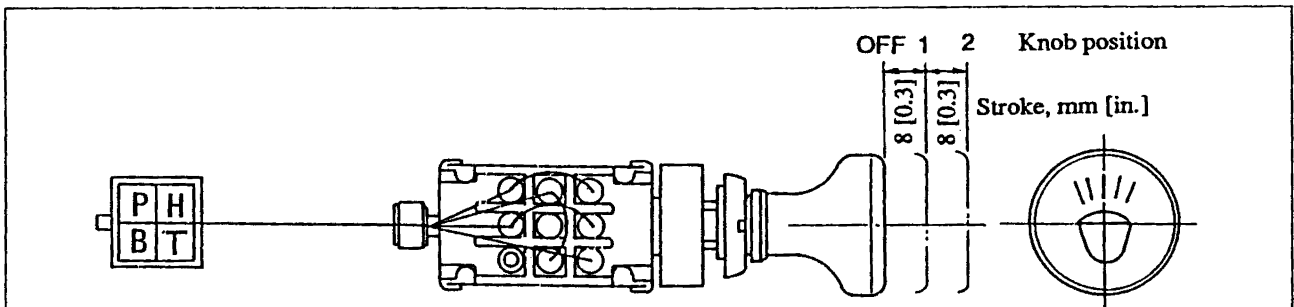
Starter switch (with anti-restart lock)

This switch has a built-in mechanical lockout. This lockout restrains the key from turning to (START) position from I (ON) position

(as when the engine is running) to help prevent damage to the starter pinion or flywheel ring gear. The I (ON) position of the switch is for operating the glow plugs.



Light switch



Connection chart

Terminal	B	T	H	P
Component	Batteries (fuses)	Tail lights, license plate light, instrument light	Head lights	Turn signals, clearance lights
Key position				
OFF				
1 position	○ ————— ○	○ ————— ○	○ ————— ○	○ ————— ○
2 position	○ ————— ○	○ ————— ○	○ ————— ○	○ ————— ○

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