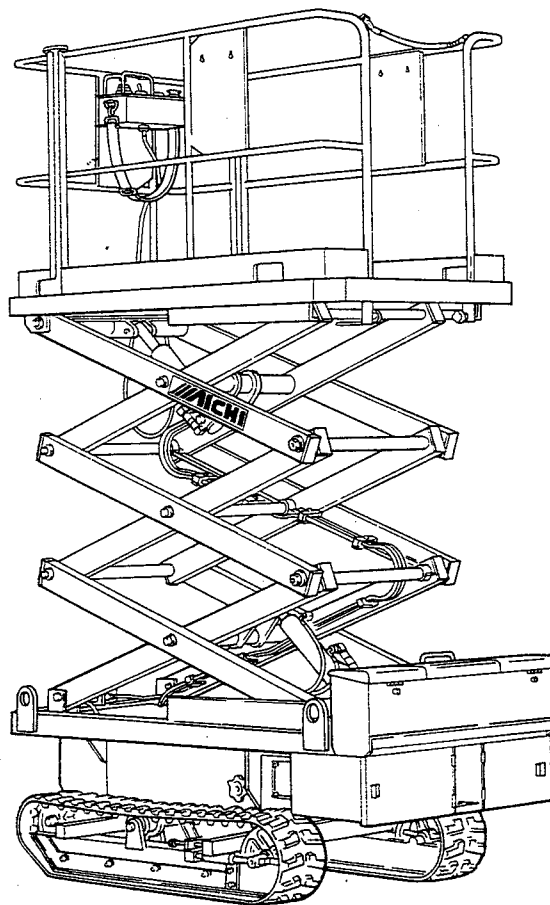


SERVICE MANUAL
SELF-PROPELLED ELEVATING WORK PLATFORM
RV-041



///NACHI
CORPORATION

1152, RYOKE, AGE0, SAITAMA, JAPAN.

F O R E W O R D

This manual describes correct adjustment, service data, precautions, that are needed for adjustment, maintenance, the most effective use, service of Self-propelled Elevating work platform RV-041

Read this manual carefully and understand the descriptions correctly. We sincerely hope that this manual assist you in your servicing work.

Please note that all specifications and designs are subject to change without notice due to modifications and improvement.

Aichi

Service Department.

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INSPECTION AND ADJUSTMENT

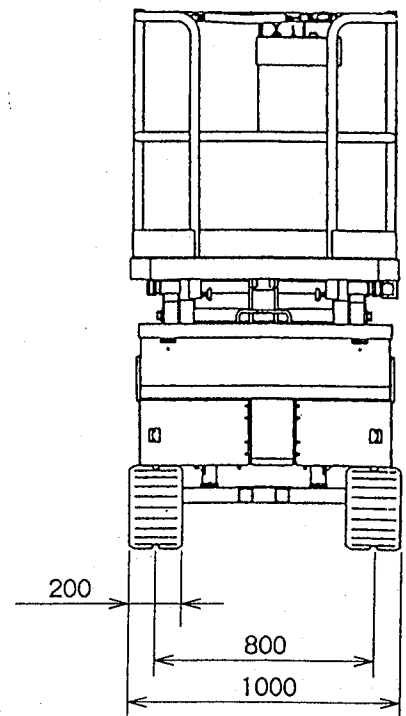
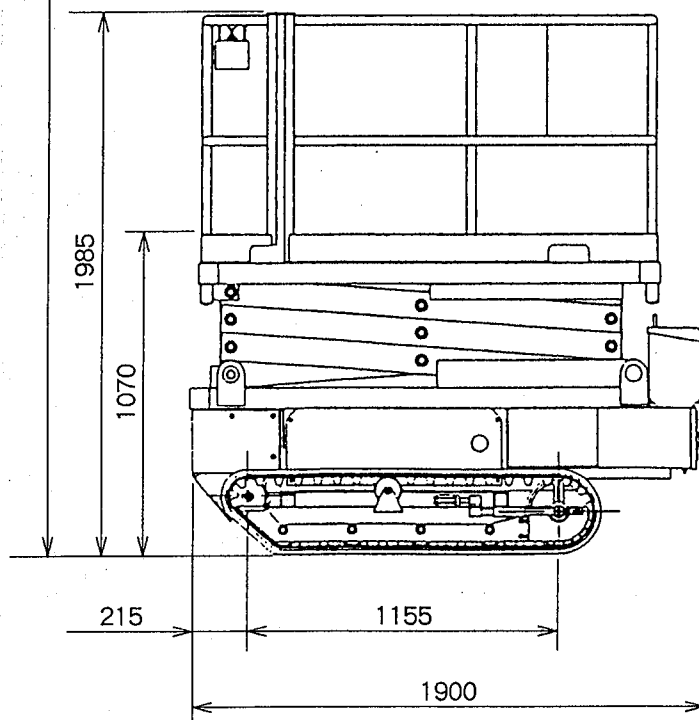
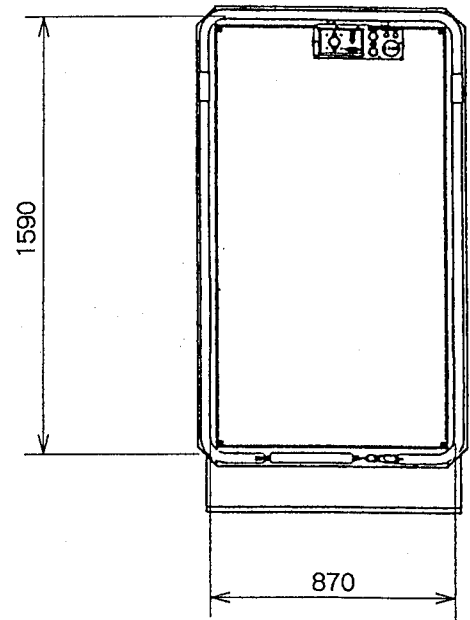
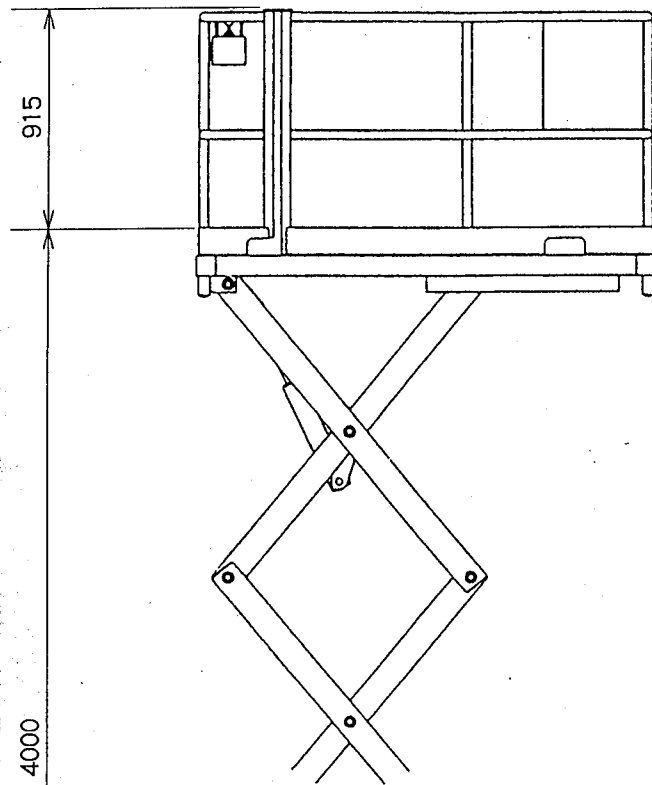
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GENERAL INFORMATION

Overall Dimensions (600-06708A)



Specifications

Model			RV - 041		
Performance	Platform floor height		Maximum	4.0m	
			Mimimum	1.07m	
	Platform rated load.		200kg		
	Aollowable slope.	When platform height is 2m or less		3°	
		When platform height is 2m and more		2°	
	Travelling speed		High	2.7km/h	
			MID	1.6km/h	
			LOW	1.0km/h	
	Lift speed		UP	24sec/str	
			DOWN	33sec/str	
Gradeability			18°		
Maximum traction			380kg		
Dimensions	Overall length			1,900mm	
	Overall width			1,000mm	
	Overall height			1,985mm	
	Tumbler distance			1,155mm	
	Crawler belt width			200mm	
	Platform size (W X L x H)			870mm x 1,590mm x 900mm	
Overall weight			910kg		
Power source	Rate output of DC motor		for Travel	1.0Kw	
			for Lift	1.4Kw	
	Battery capacity			100/5 (A/Hr) x 2	
	Rated voltage			24V	
	Battery charger	Charging mode			Semi constant voltage
		Input voltage			AC100V (AC 240V)
		Input frequency			50 or 60Hz (50 Hz)
		Out put current			20A
Rated hydraulic pressure			140kg/cm²		
Hydraulic tank capacity			3 l		

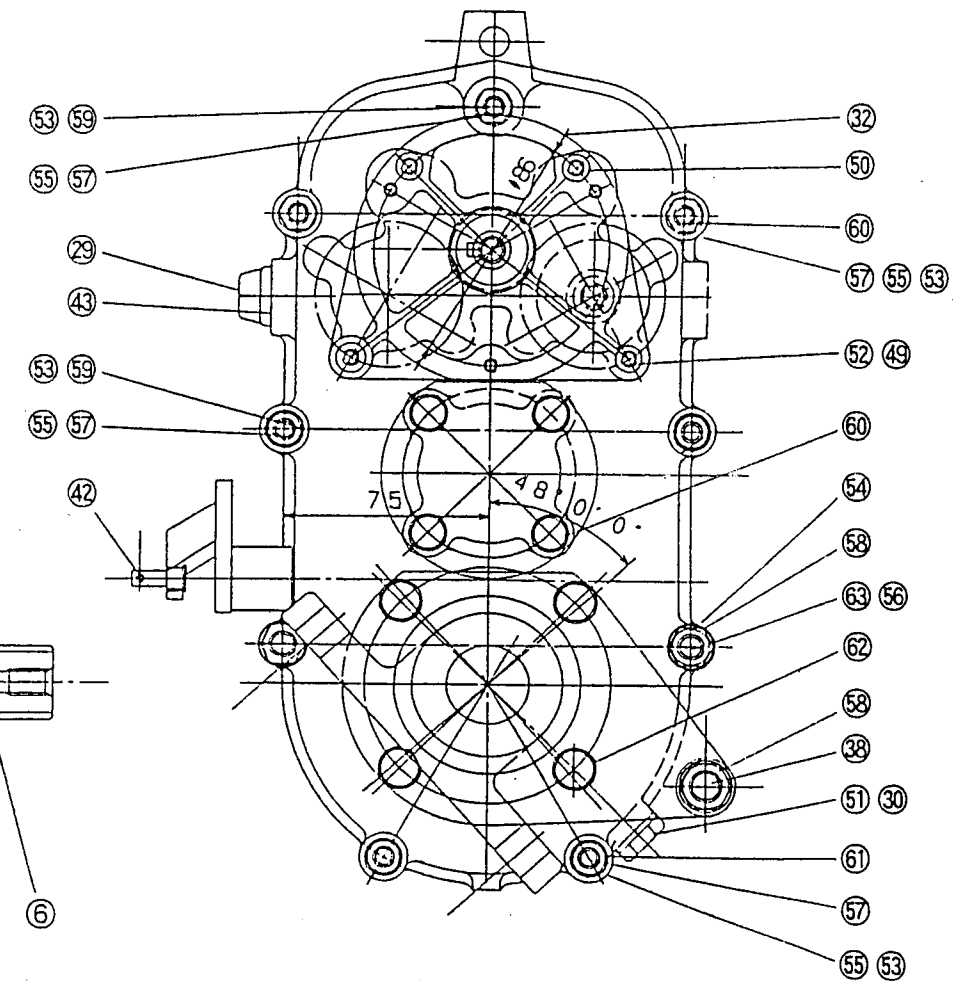
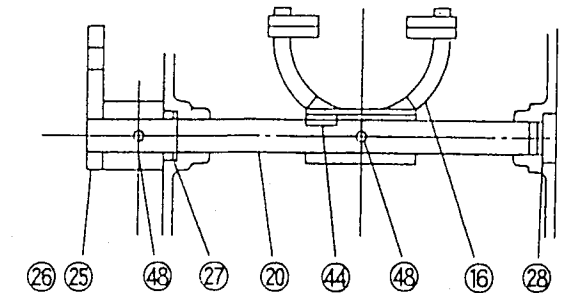
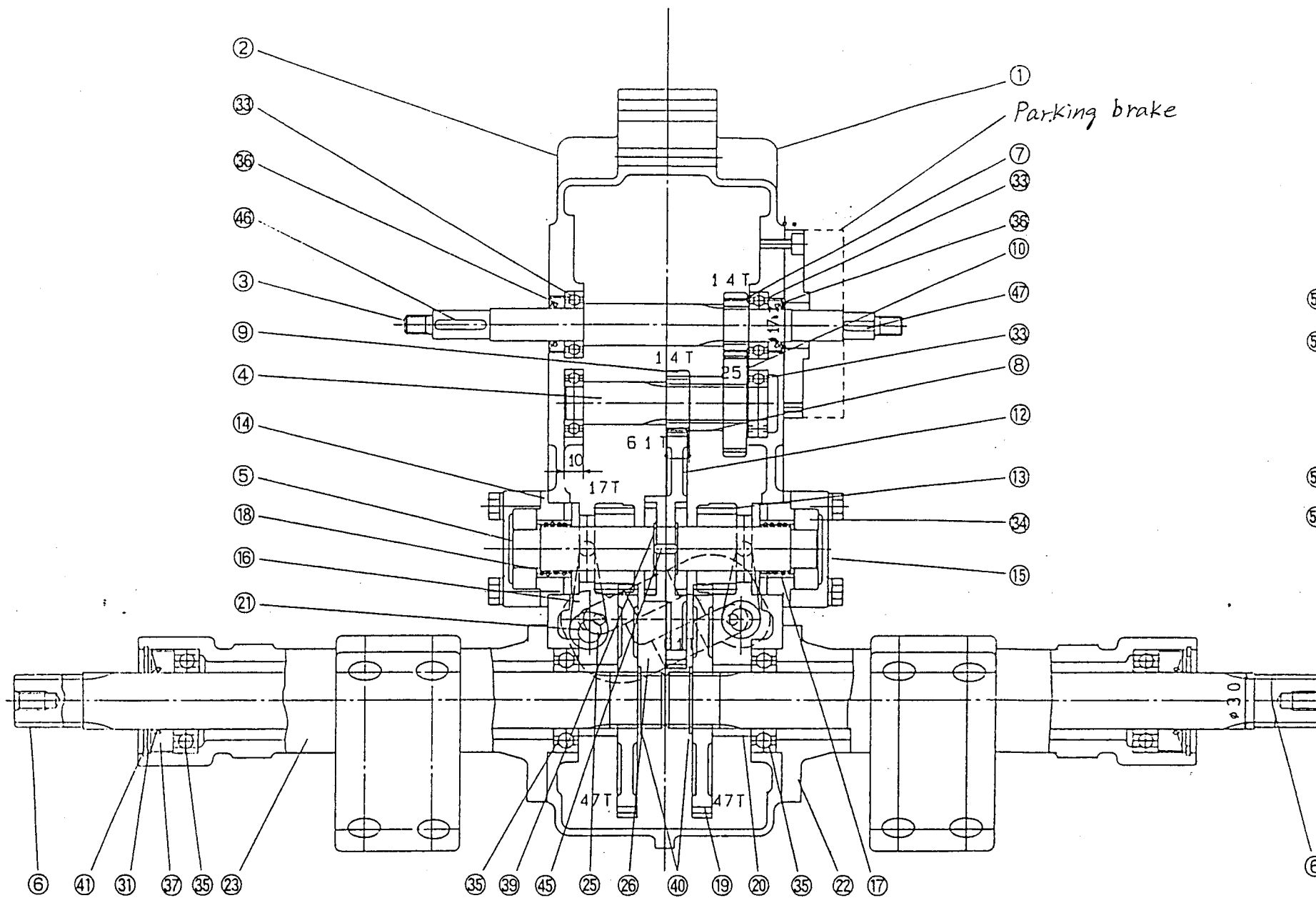
MECHANICAL AND
HYDRALULIC SECTION

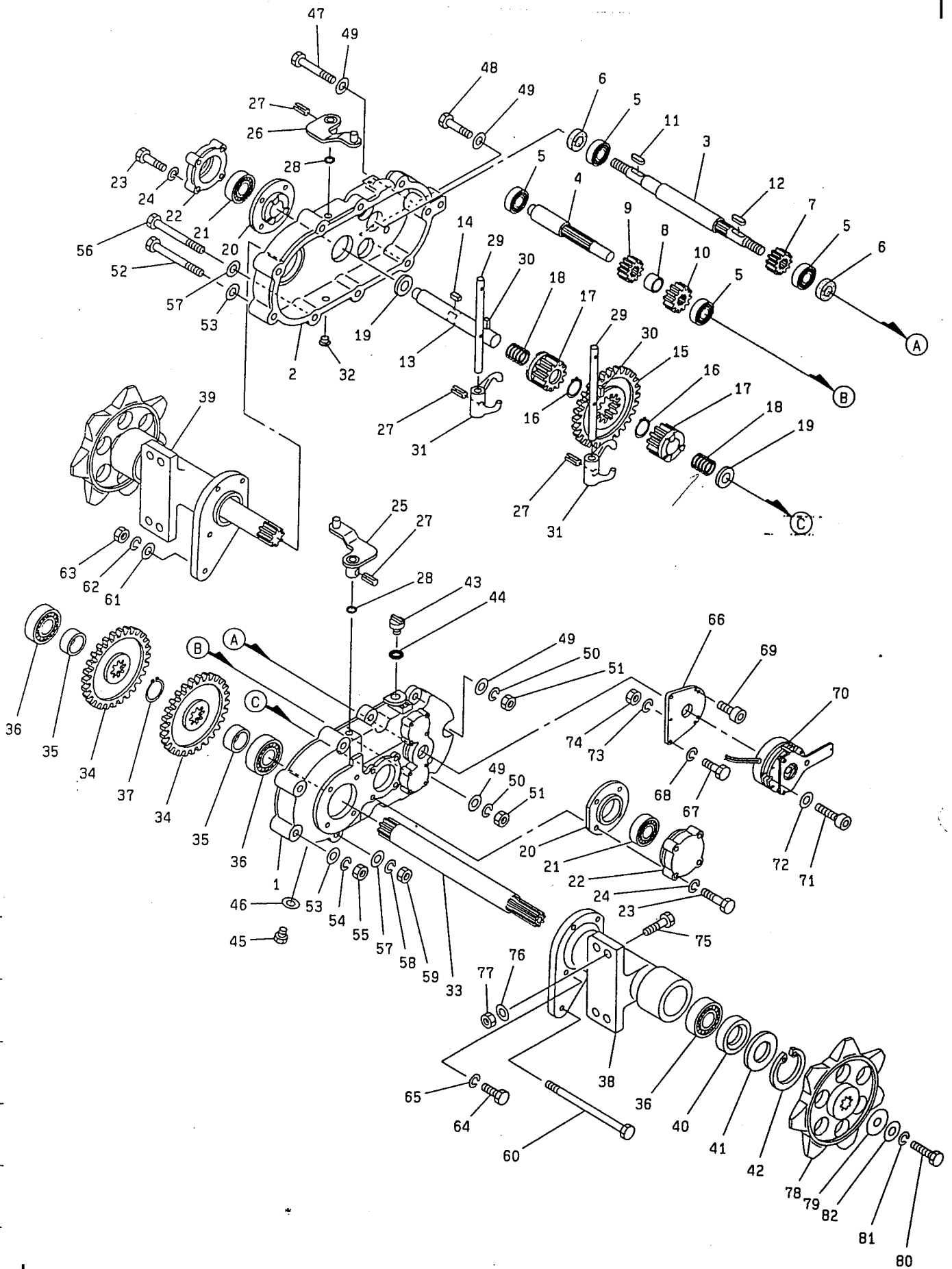
Gear box for Travel (370-02128)

The gear box reduces the rotation speed of "Travel motor" and drives "Crawler belts".

Recommended gear oil ----- Gear oil SAE90 (1.5 liters)

Oil change interval ----- Annually

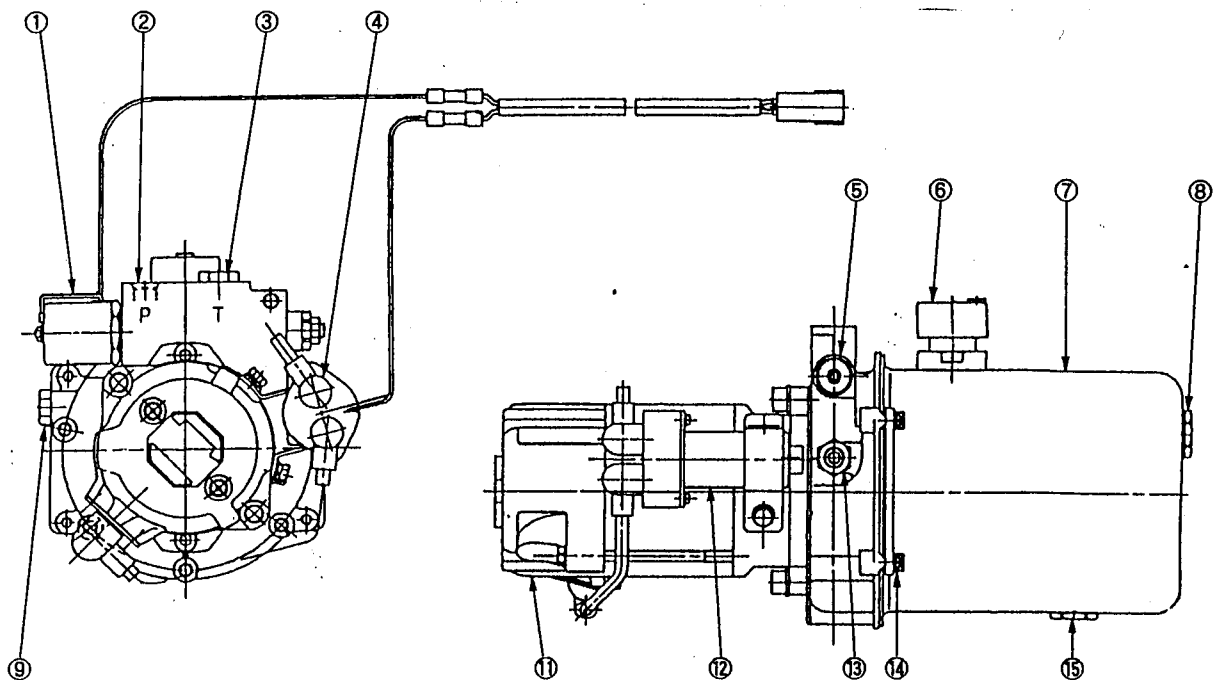




Power Unit (300-05237A)

Power Unit consists of such components as "DC motor", "Hydraulic tank", "Gear pump", "Solenoid valve", and supplies hydraulic pressure to "Lift cylinders".

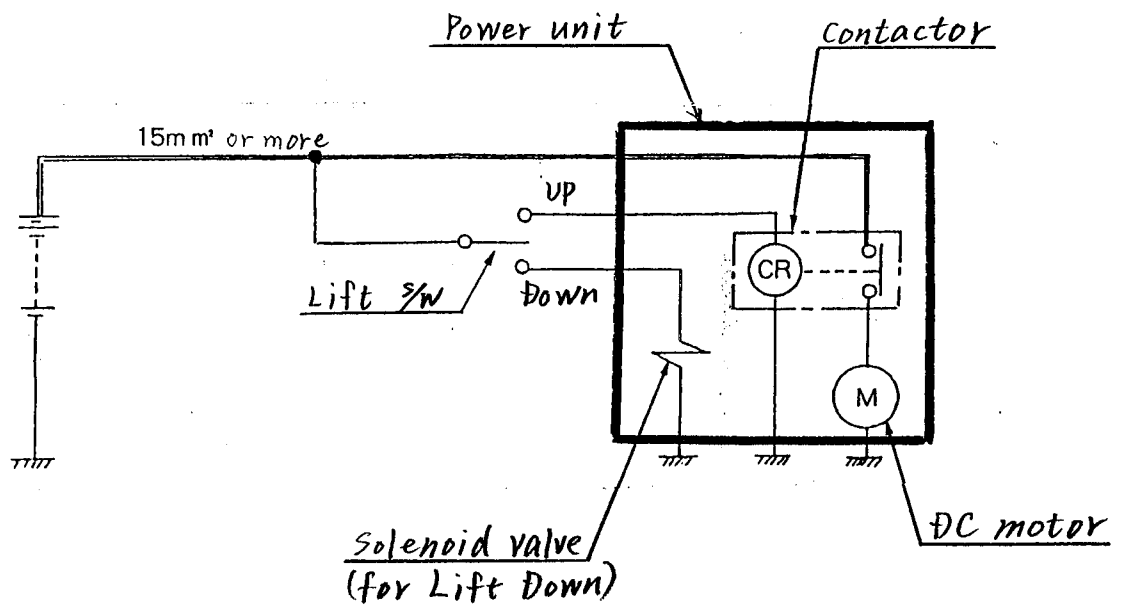
DC motor	Rated voltage	DC 24V
	Rated output	1.4 kW
Hydraulic tank	Recommended oil	Shell Tellus oil T15
	Capacity	3.0 l
Hydraulic pump	Type	Gear type
	Discharge volume	1.66 cc/rev
Relief valve setting pressure		140 kgf/cm ²



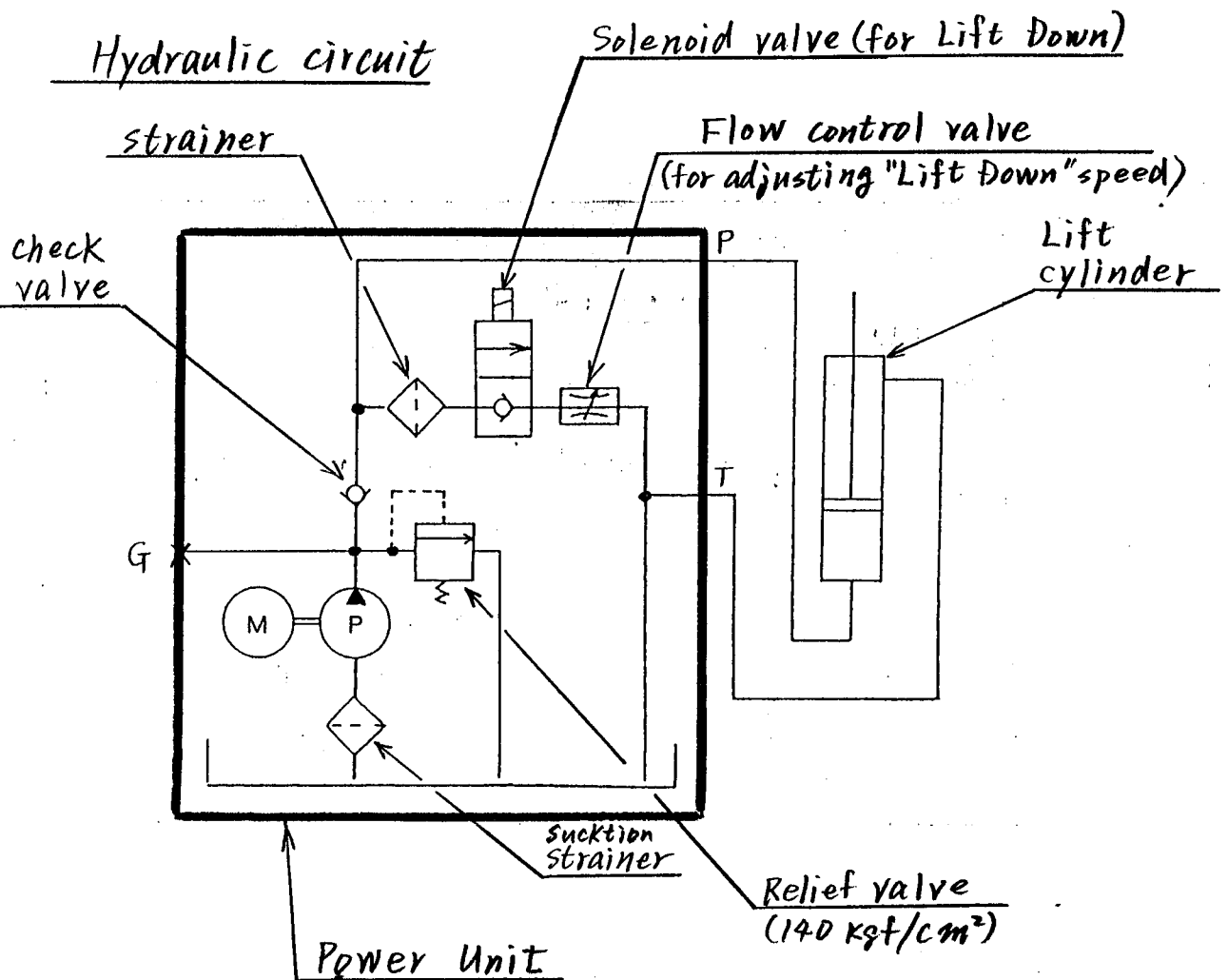
1	Solenoid valve (Lift Down)	6	Oil filler cap	11	DC motor
2	Pressure port (PF 1/4)	7	Hydraulic tank	12	Contactor
3	Tank port (PF 1/4)	8	Oil level gauge	13	Relief valve
4	Terminal B.	9	Gauge port	14	Bolt
5	Flow control valve	10	_____	15	Drain plug

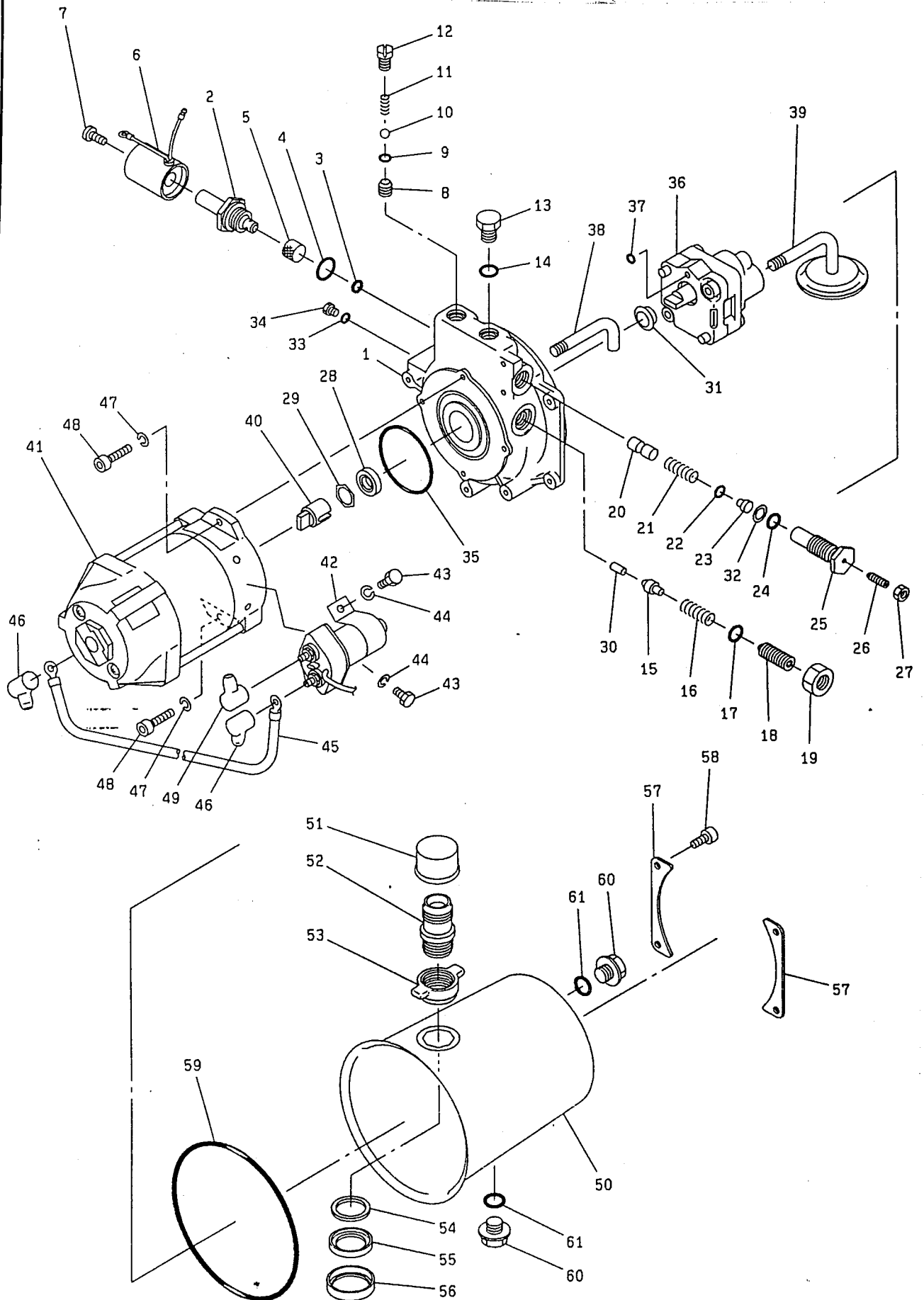
↑ for adjusting "Lift Down" speed.

Electric circuit

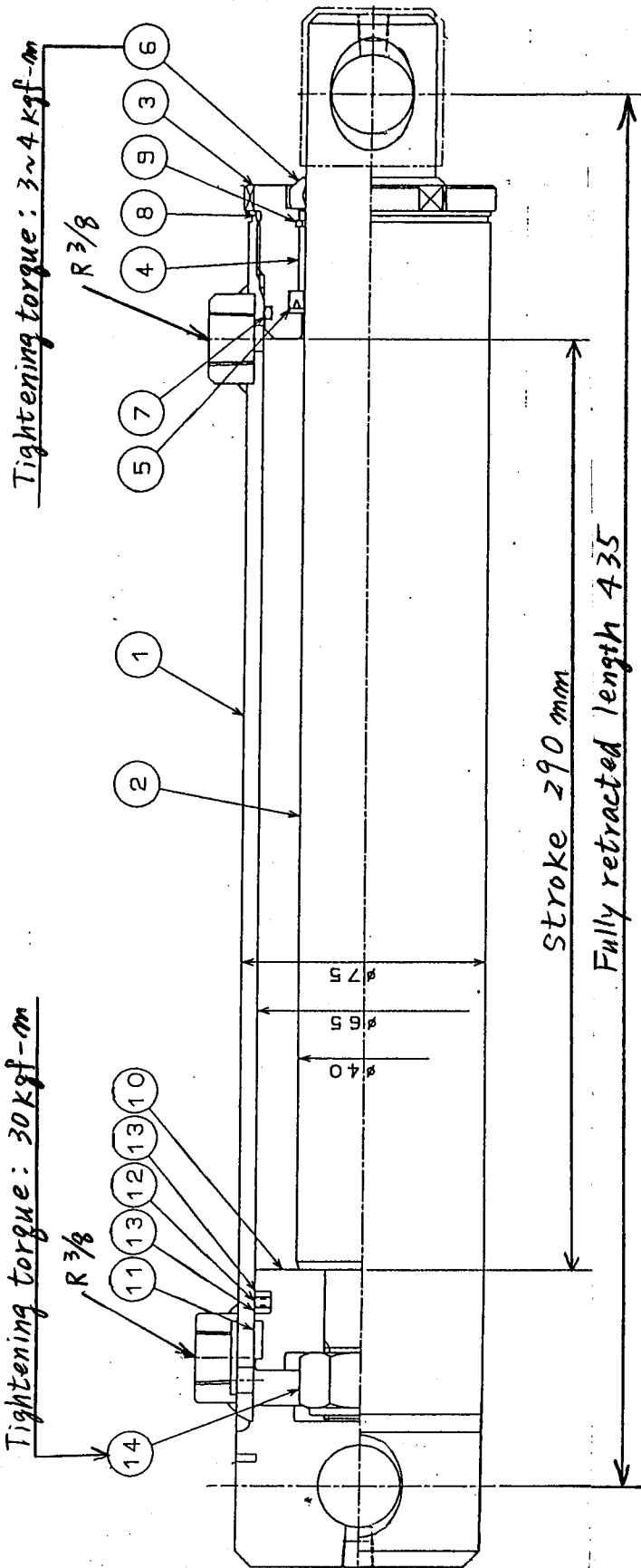


Hydraulic circuit





Lift cylinder (303-05617B)

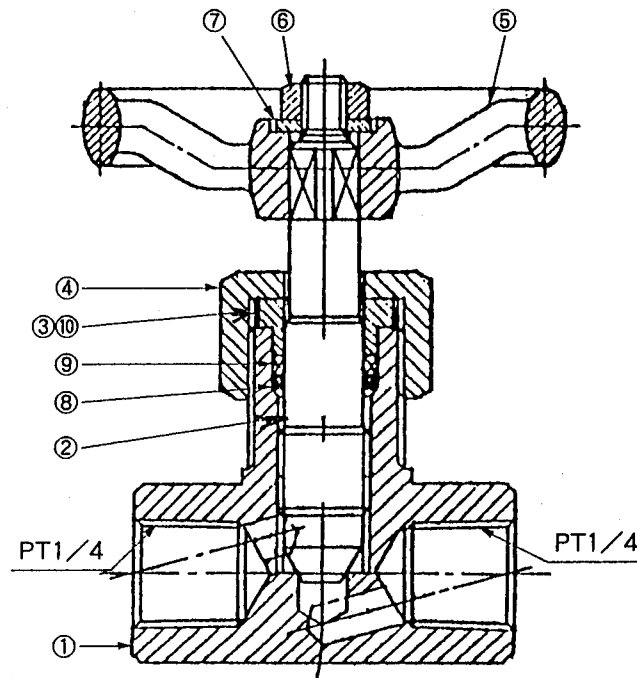


1	Cylinder tube	8	O ring
2	Piston rod	9	stop ring
3	Cylinder head	10	Piston
4	Bushing	11	Wear ring
5	U ring	12	Seal ring
6	Dust seal	13	Back-up ring
7	O ring	14	U nut

Manual bleed down valve (302-05835)

The valve (stop valve) is used for lowering platform manually in such emergency case as electric or hydraulic failure.

Rated pressure	210 Kgt/cm ²
Maximum proof pressure	315 Kgt/cm ²



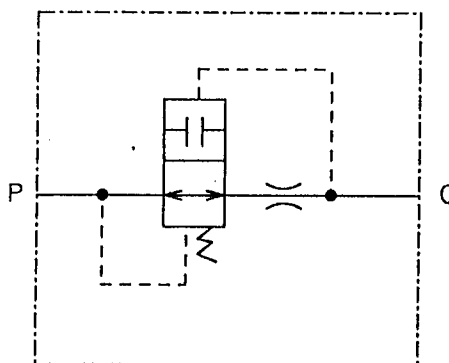
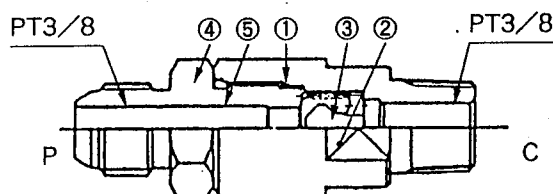
1	Body
2	shaft
3	sleeve
4	Nut
5	Handle
6	Nut
7	Washer
8	Plate
9	O ring
10	Back-up ring

Fuse Valve (302-05124)

The valve is installed on "Lift cylinder", and shuts off the hydraulic line to prevent the cylinder from being retracted suddenly in such emergency case as hydraulic line breakage.

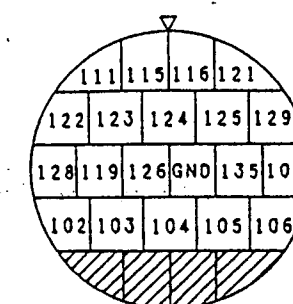
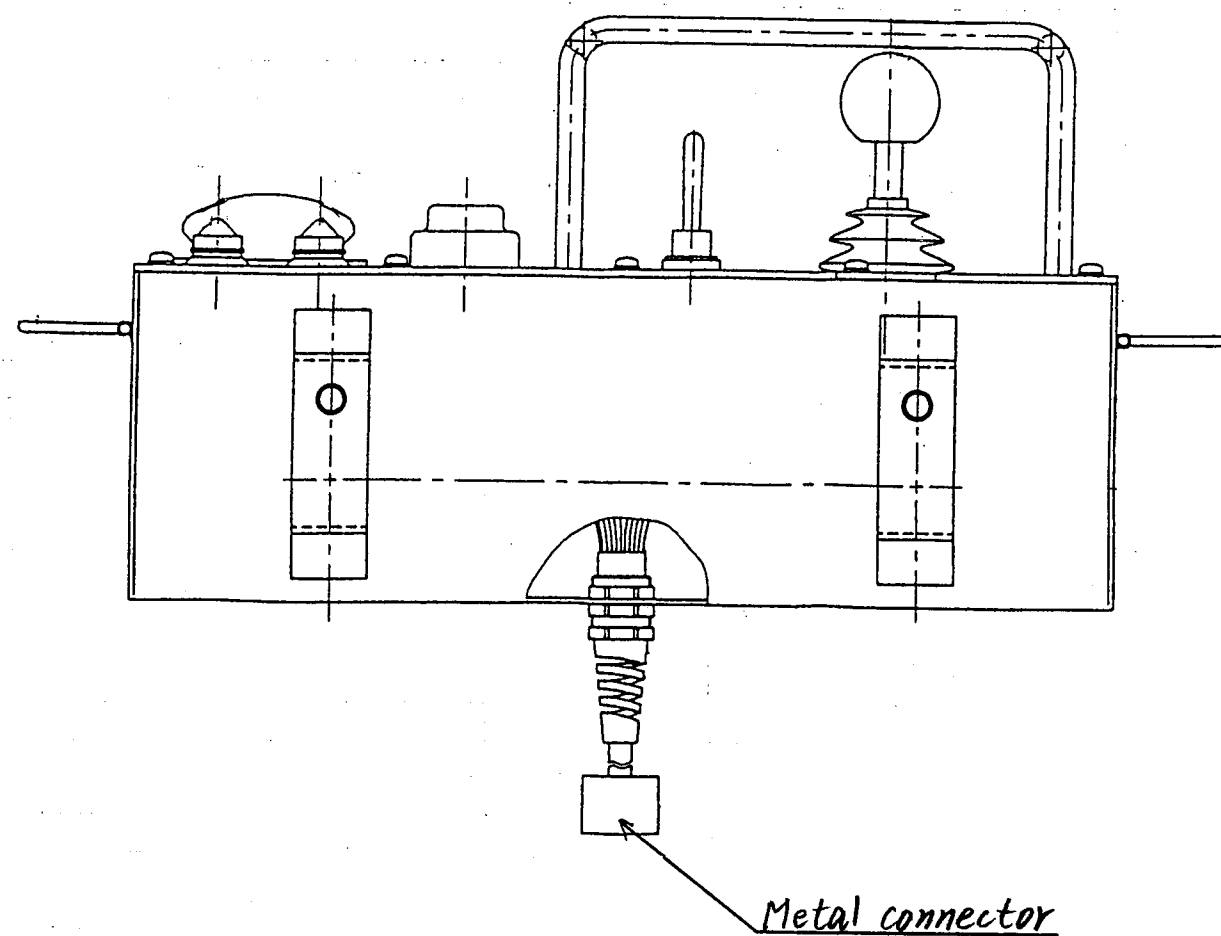
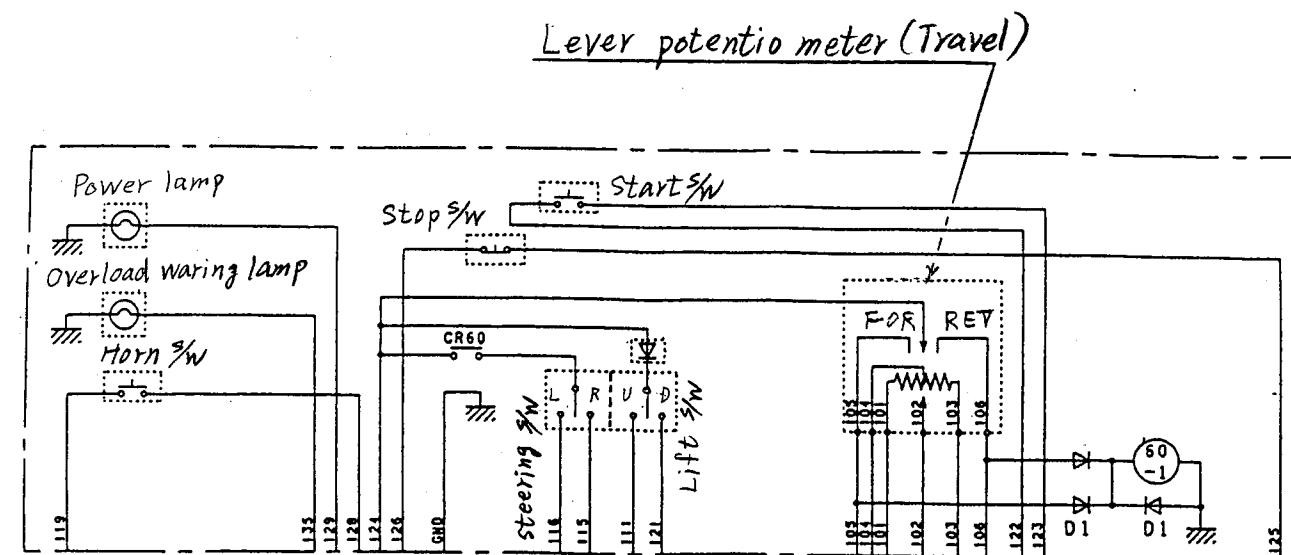
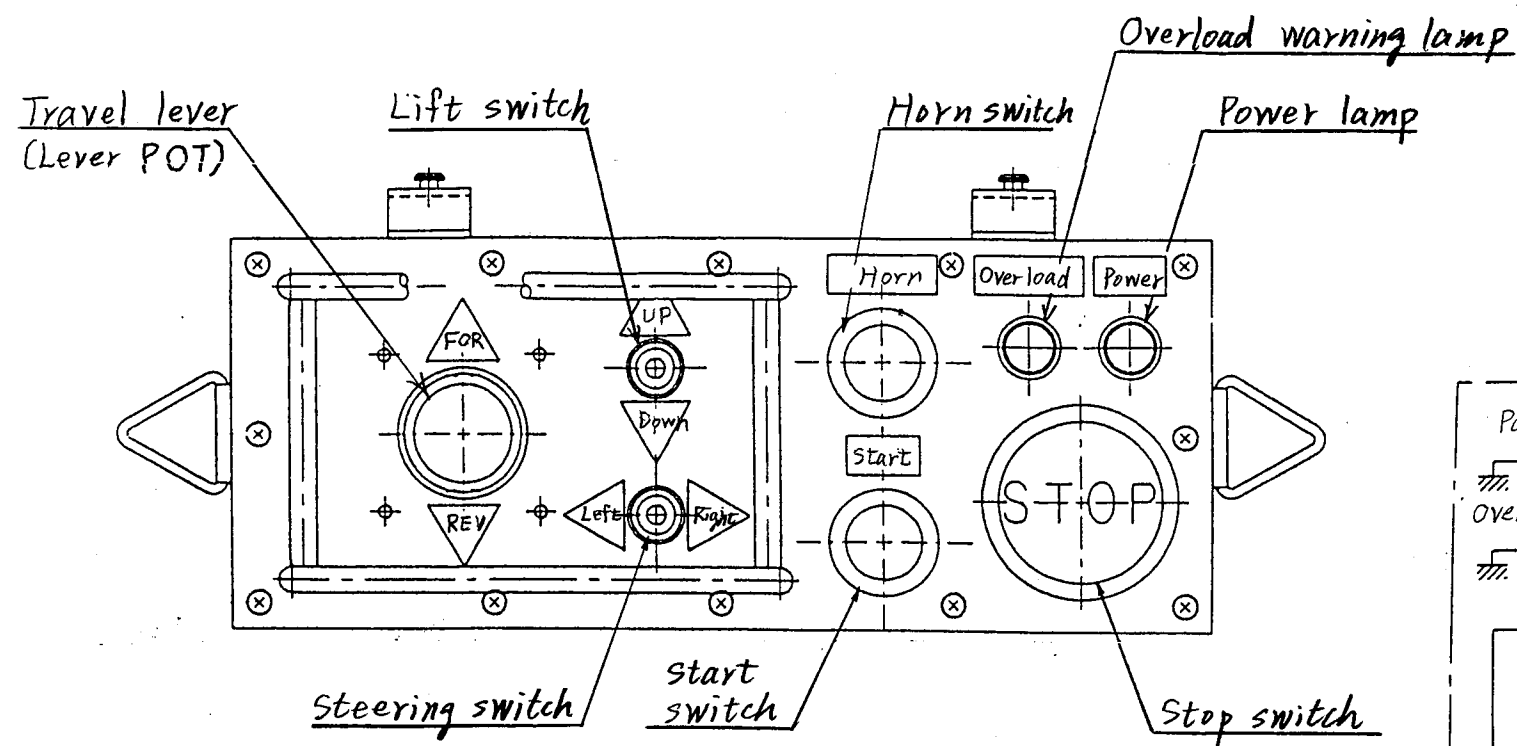
Rated pressure	210 kgf/cm ²
Rated flow	5 l/min
Shut off flow	7 ⁺² ₋₀ l/min

The valve detects the flow and shuts off, when the flow exceeds "shut off flow".



ELECTRIC SECTION

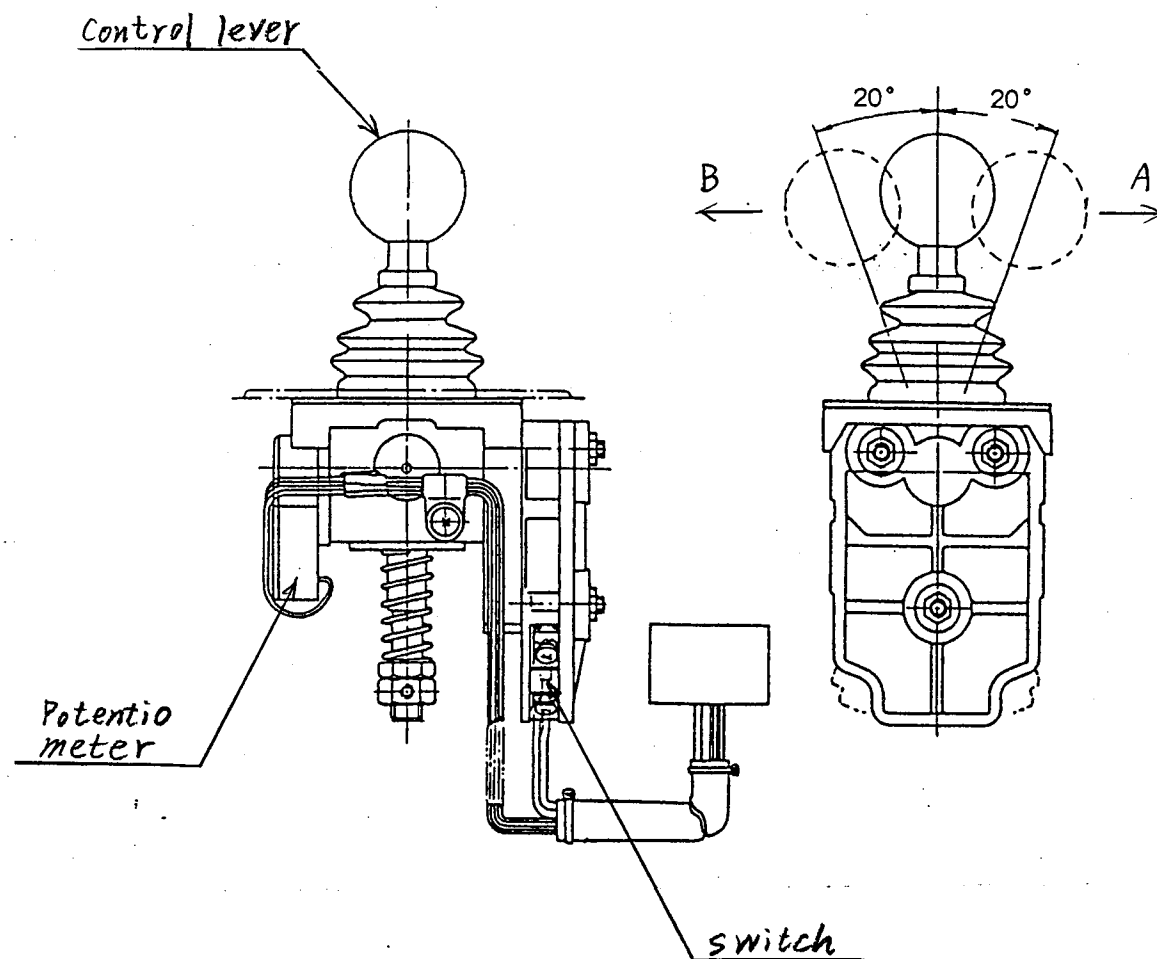
Upper control box (V04-N5021A)



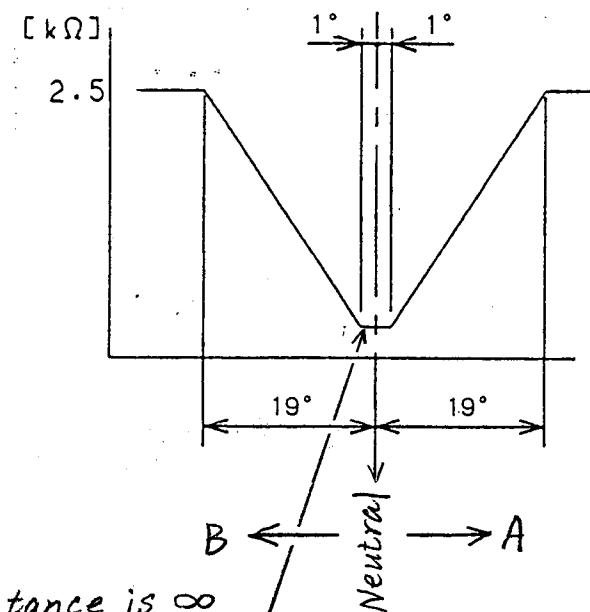
Metal connector

Lever Potentio meter (324-04523)

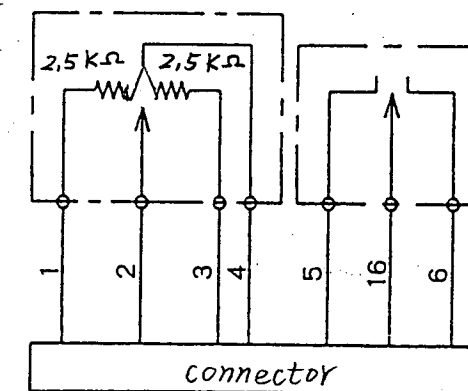
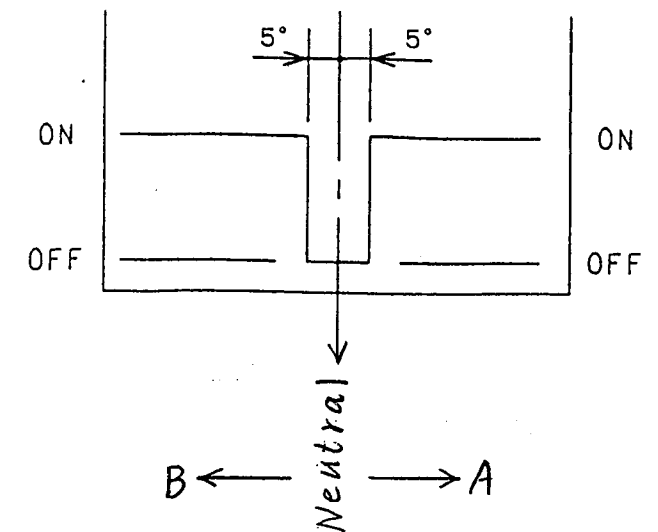
"Lever potentio meter" is installed in "Upper control box" to control "Travel motor" through "Chopper controller" installed in "Lower control box".



Resistance of Potentio meter



ON/OFF condition of Switch

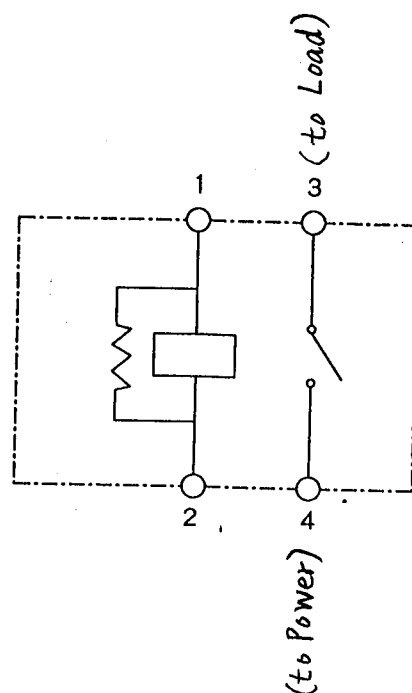
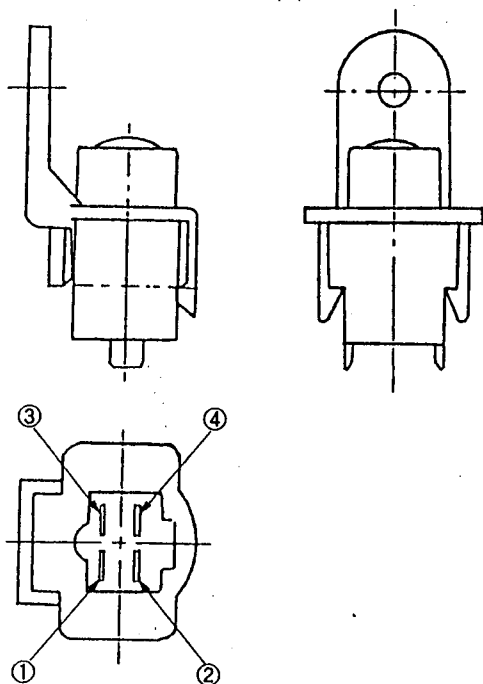


2	4	3	1
5	6	16	

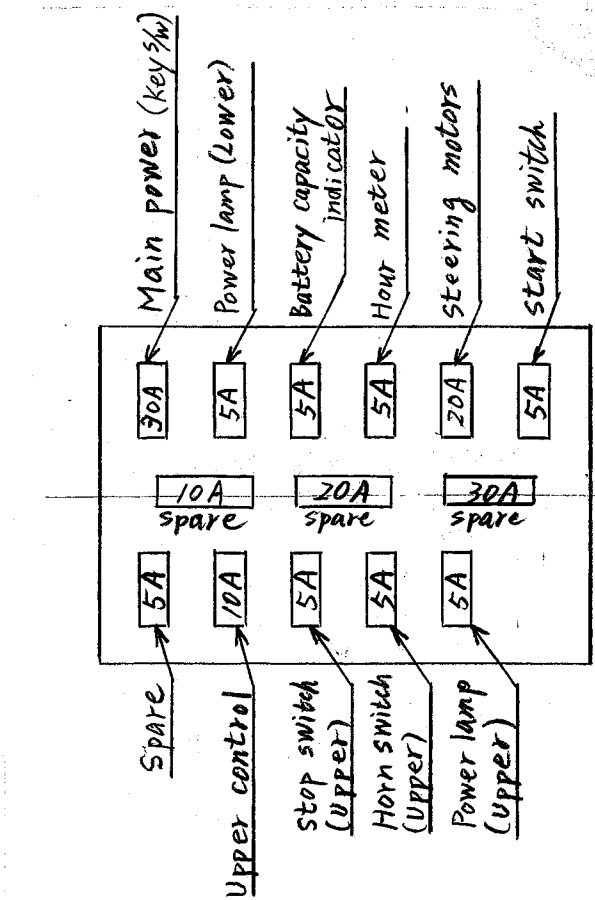
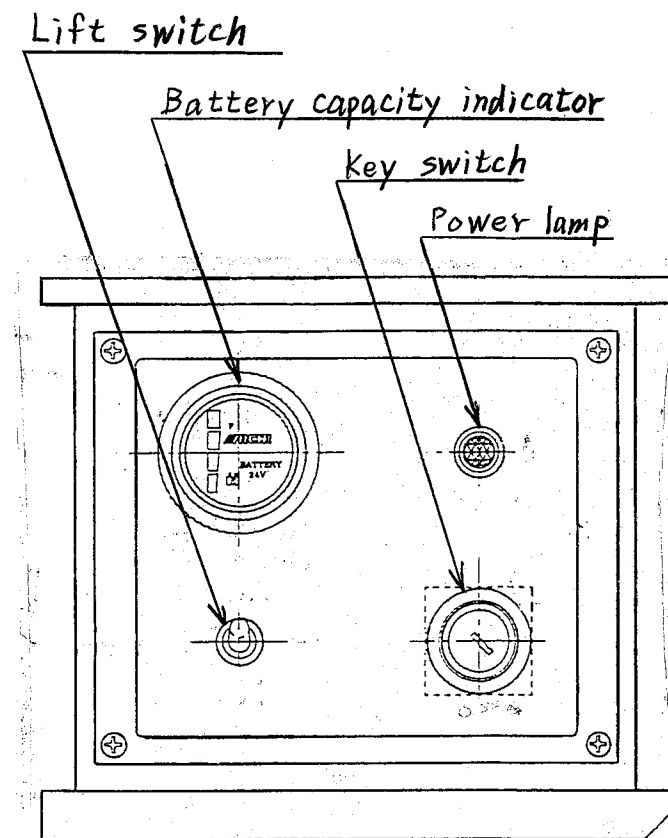
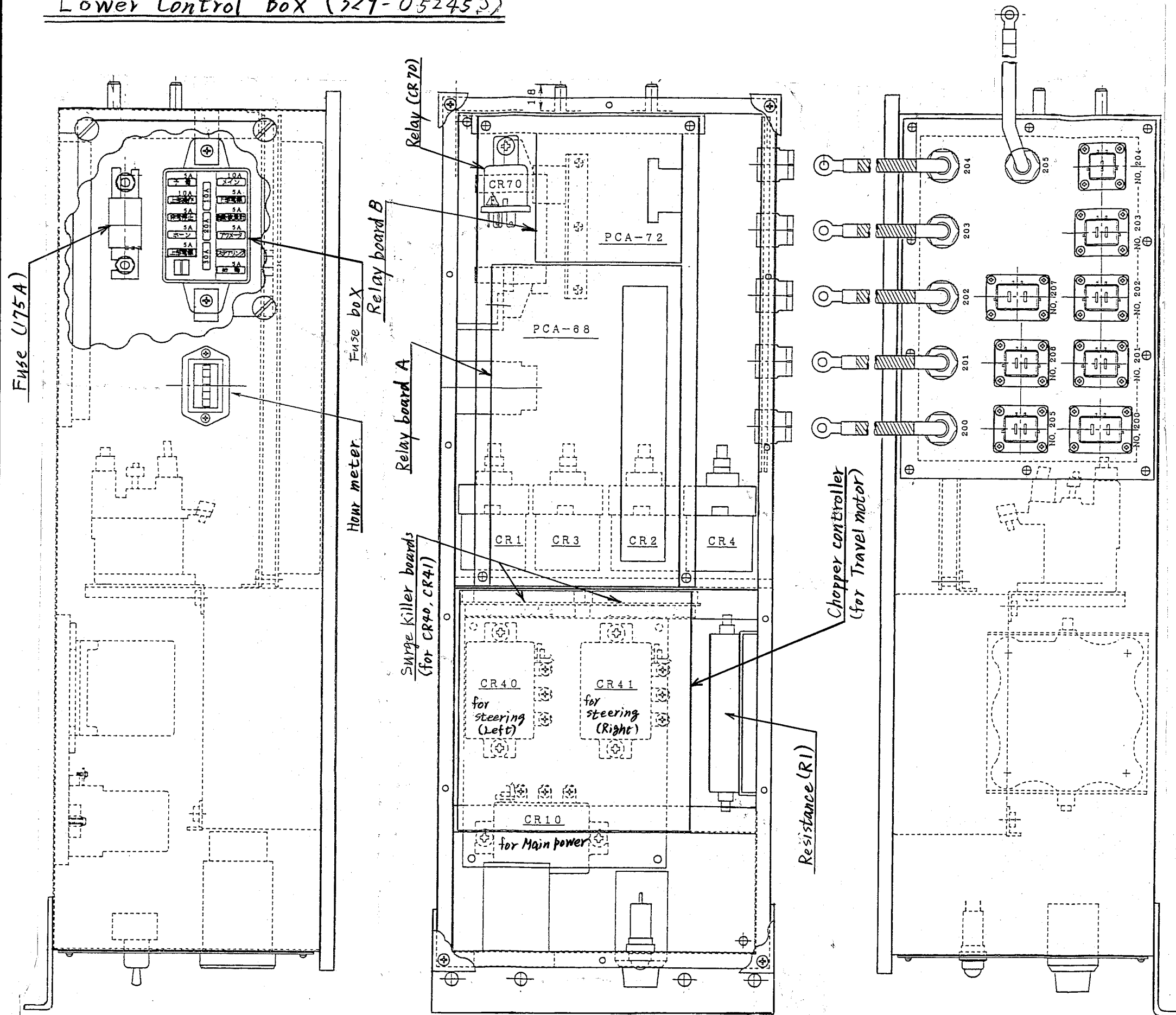
Relay (CR-60) (320-01282)

The relay is installed in "Upper control box" and supplies power (DC 24V) to "Steering switch", only when "Travel control lever" is operated.

Rated voltage	DC 24V (DC 18 ~ 32V)
Rated current	11 A

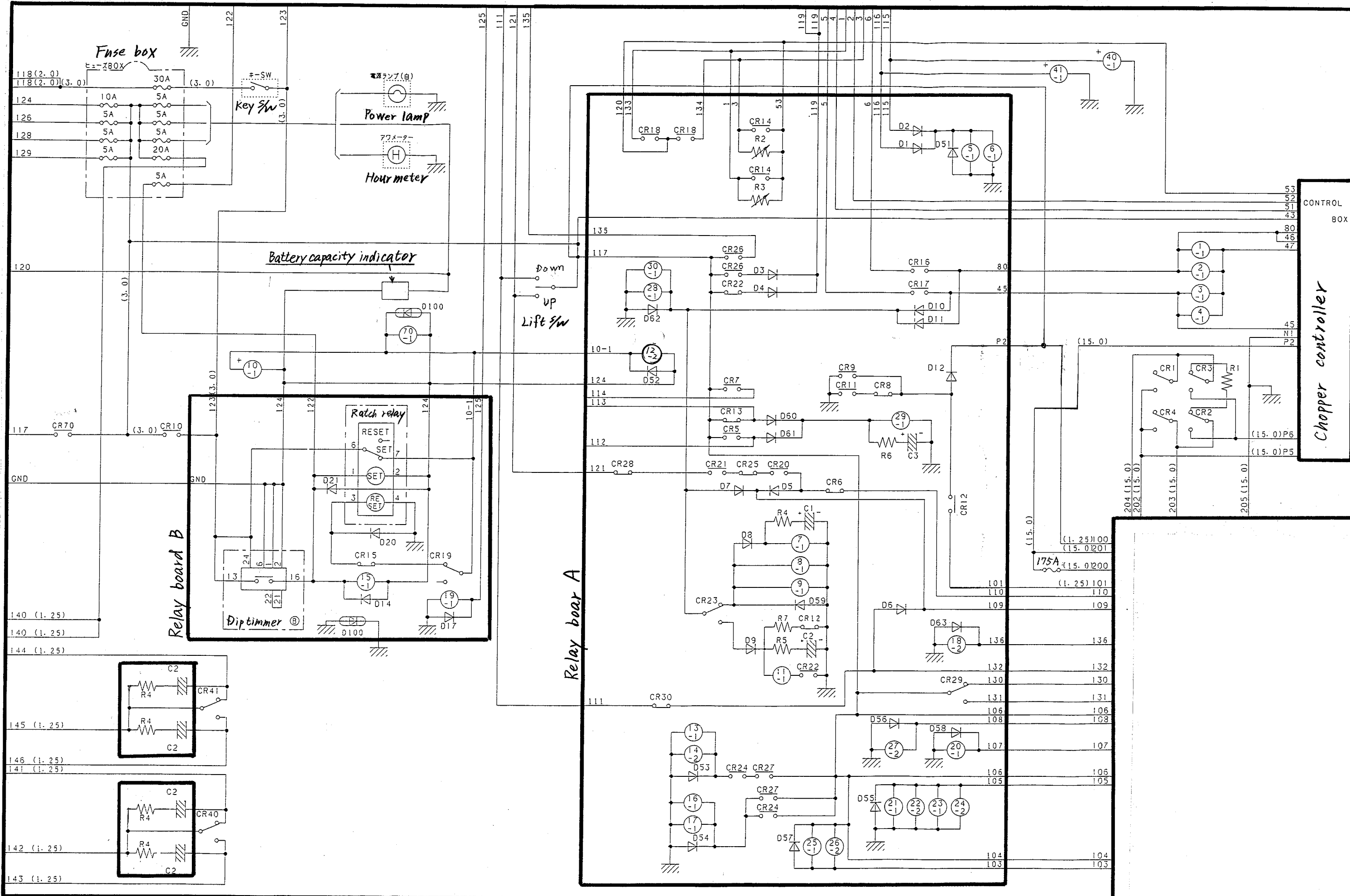


Lower Control Box (329-05245J)



Fuse box Detail

Electric Circuit of "Lower control box"



Connectors of "Lower control box" (614-06112A)

200

111	115	116	121
122	123	124	125

192 - 24108
Male (White)

201

129	128	119
126	GND	135

192 - 24306
Male (Green)

202

1	2	3
4	5	6

192 - 24606
Male (Yellow)

203

117	118	118
120	GND	

192 - 24206
Male (Gray)

204

100	101
130	131

192 - 24304
Male (Green)

205

106	107	108
109	119	136

192 - 24406
Male (Blue)

206

103	104	105
106	110	132

192 - 24106
Male (White)

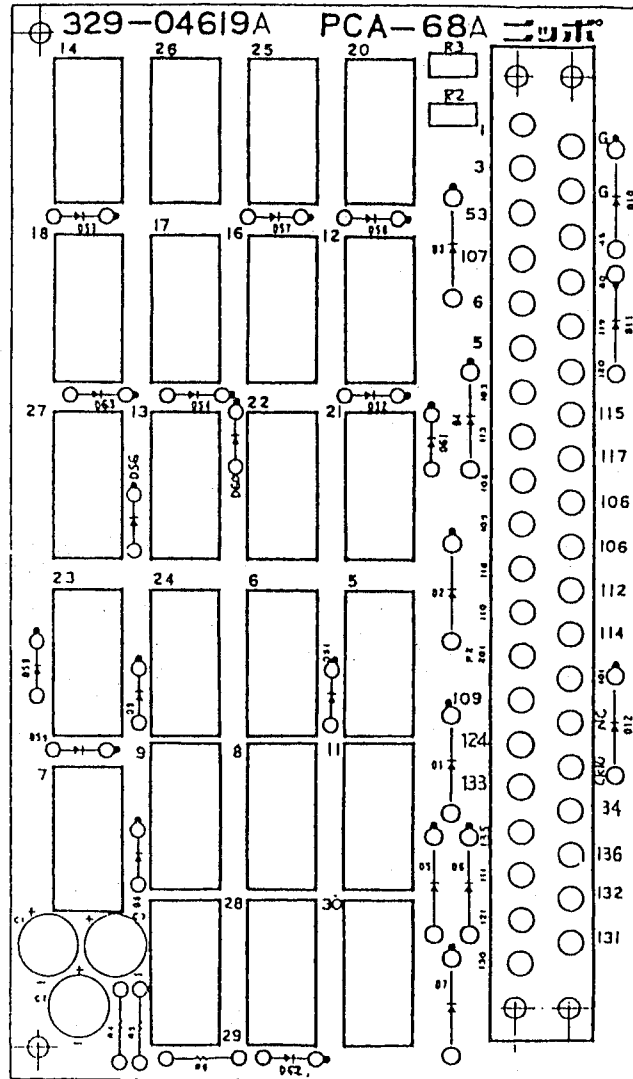
207

140	141	142	143
140	144	145	146

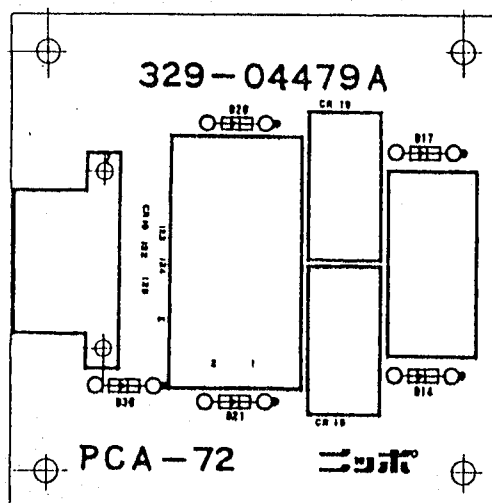
192 - 24308
Male (Green)

Relay boards A & B

the boards are installed in "Lower control box" to control electric system.



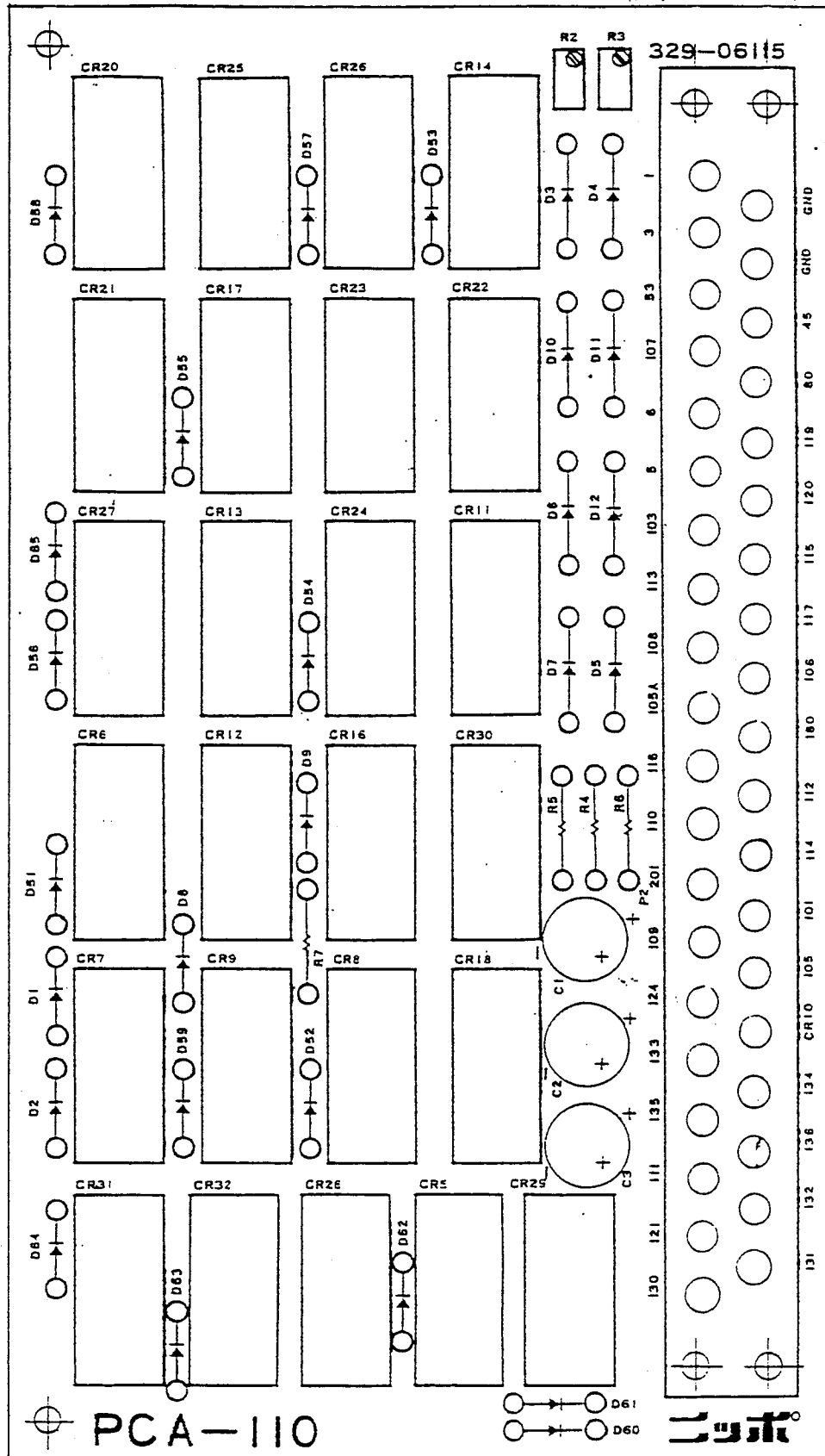
Relay board A
(Applied serial NO: ~ 343106)



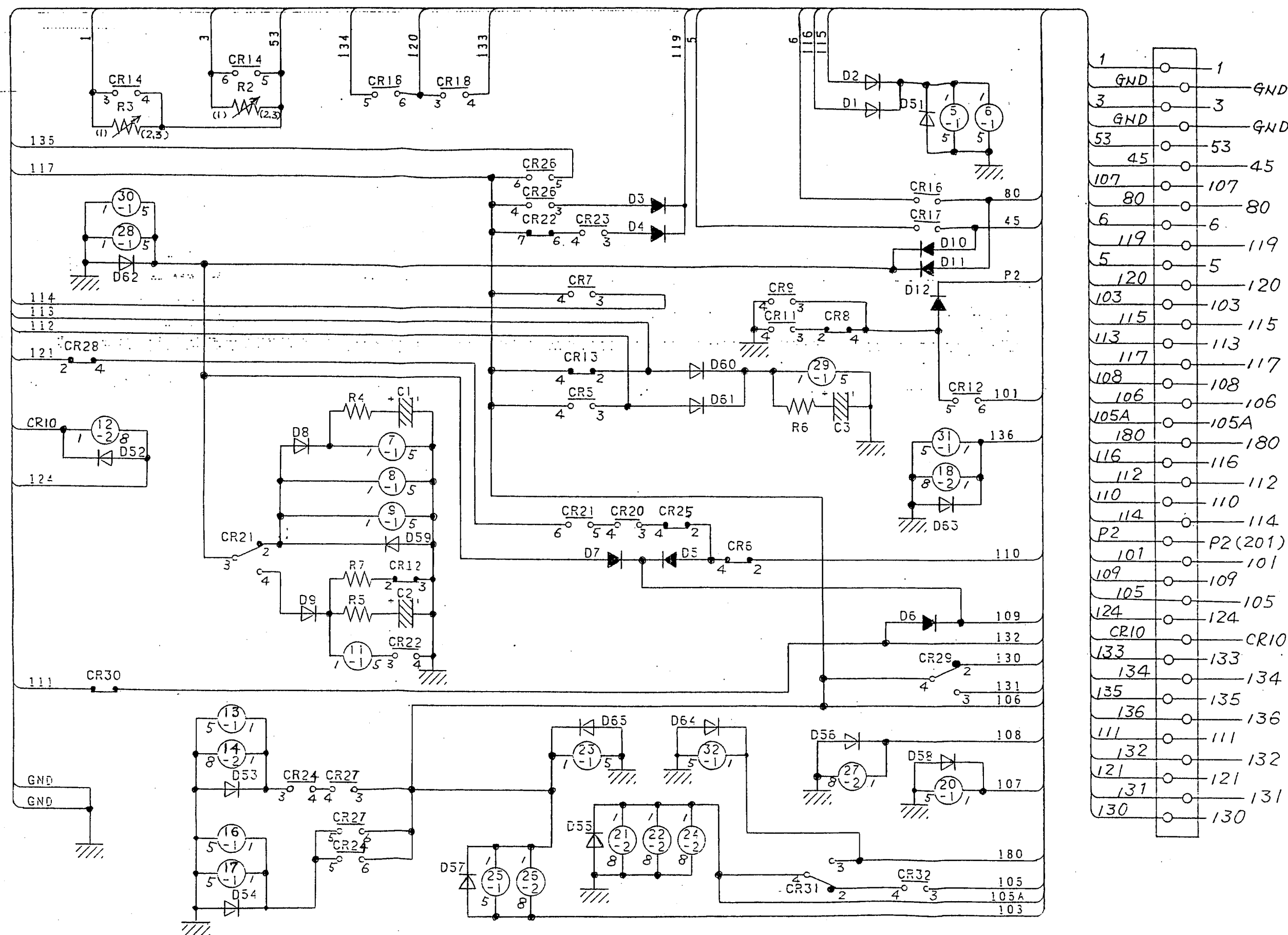
Relay board B

Relay Board A (329-06115) (Applied serial No: 343107~)

The board is installed in "Lower control box" to control "Electric system".

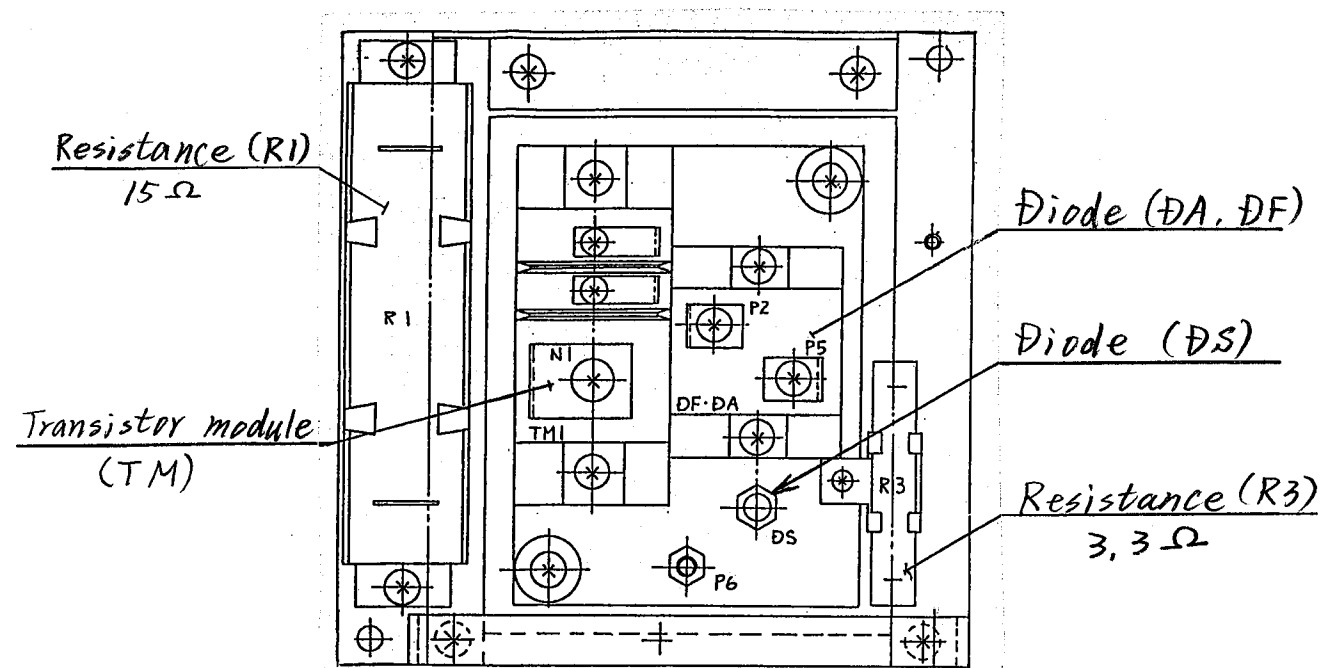
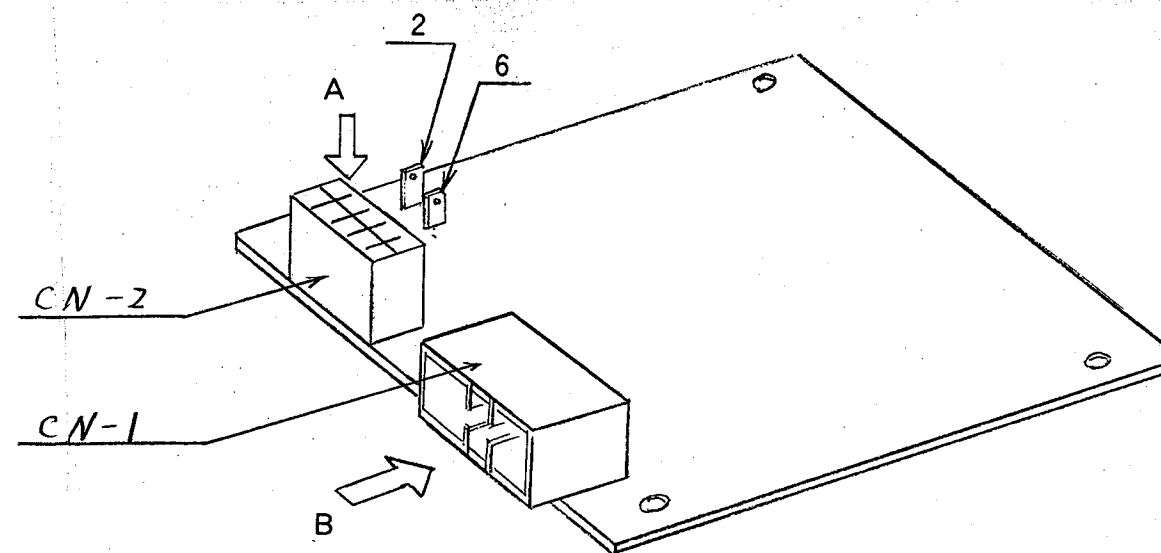
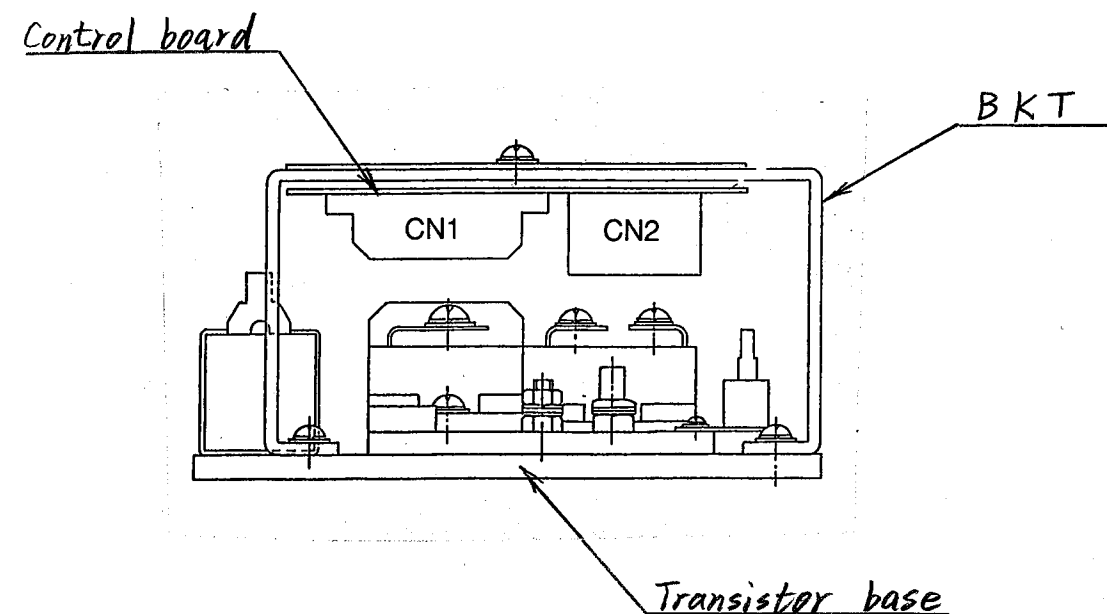


Electric Circuit for "Relay board A"



Chopper controller (329-03958A)

The "Chopper controller" is installed in "Lower control box" to drive "Travel motor".



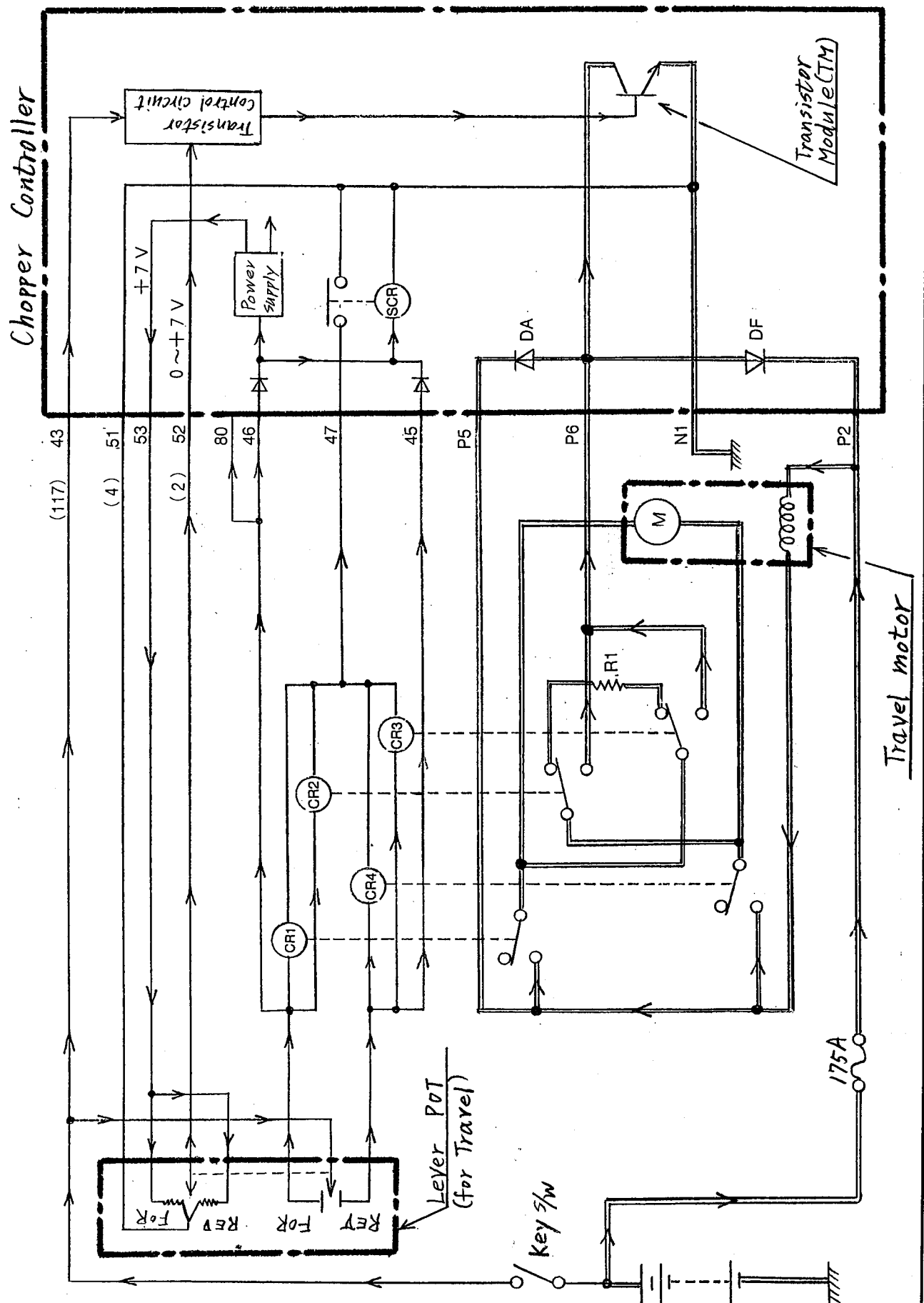
P5	P6	4	5
P2	9	10	

A view
(CN-2)

47	45	54	52	53	43
55	46	1	80	51	8

B view
(CN-1)

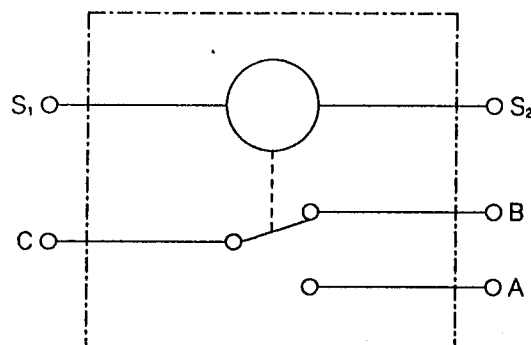
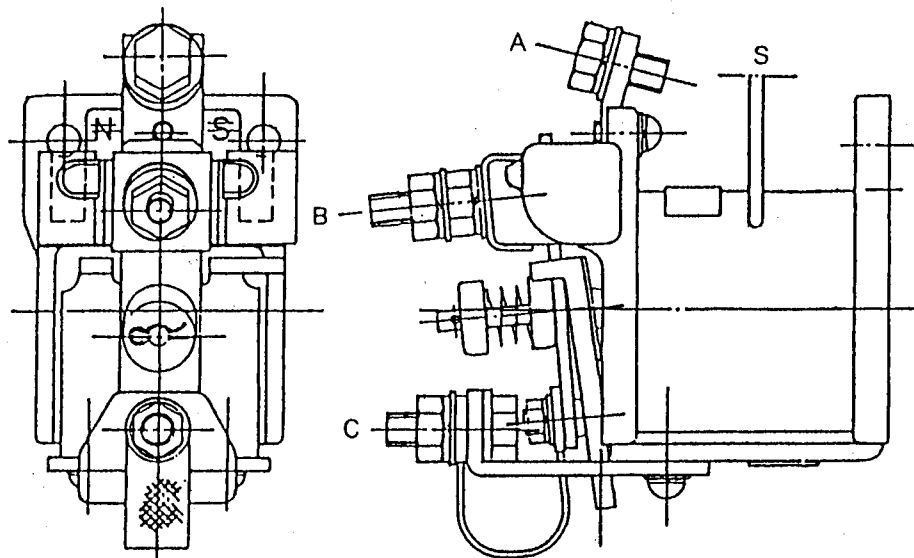
Function of "Chopper controller"



Contactor (CR1 ~ CR4) (320-01322)

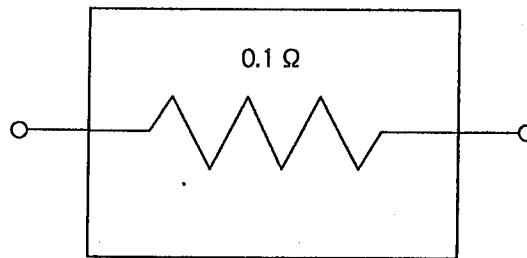
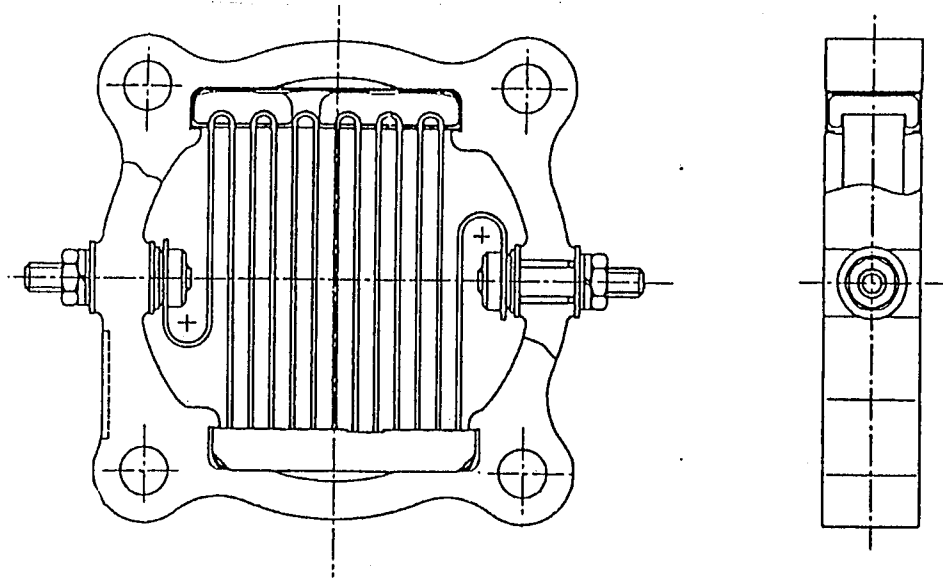
Four contactors (CR1 ~ CR4) are installed in "Lower control box" to switch over the rotating direction of "Travel motor".

Rated voltage	DC 24V
Rated current	100 A.



Resistance (R1) (321-20005)

The resistance (R1) installed in "Lower control box" is used as a "Dynamic braking system" for "Travel motor".



Relay (CR-10, CR-40, CR-41) (320-05778A)

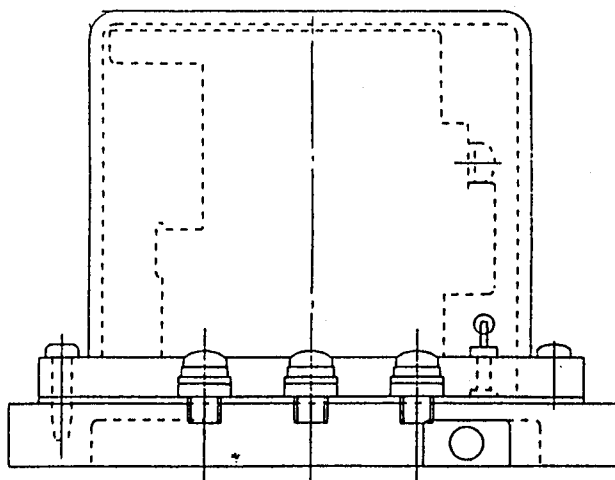
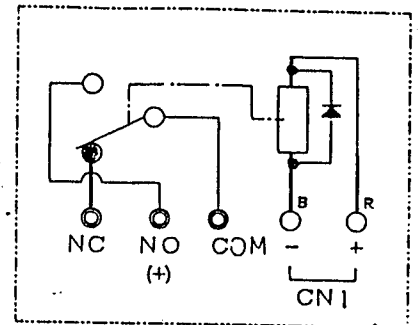
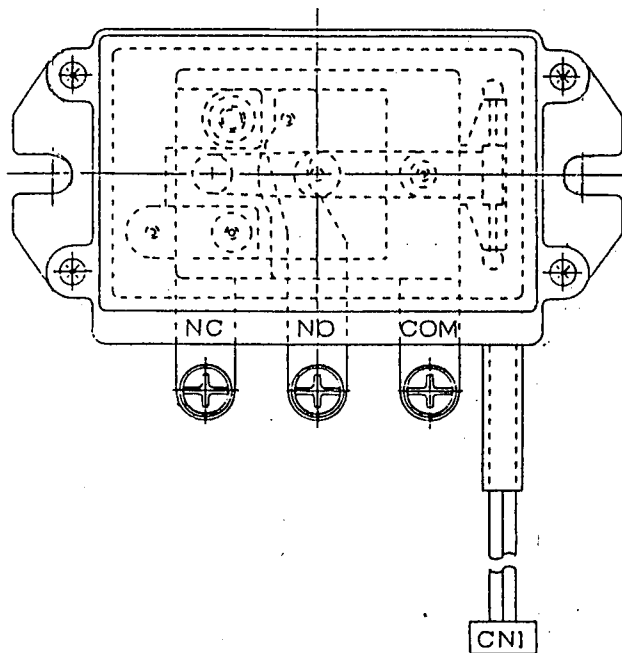
The relays are installed in "Lower control box", and functions as follows.

CR-10 ---- supplies "Main power".

CR-40 ---- actuates "steering motor (Left)".

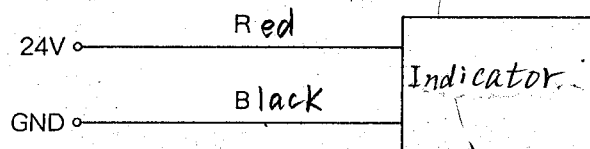
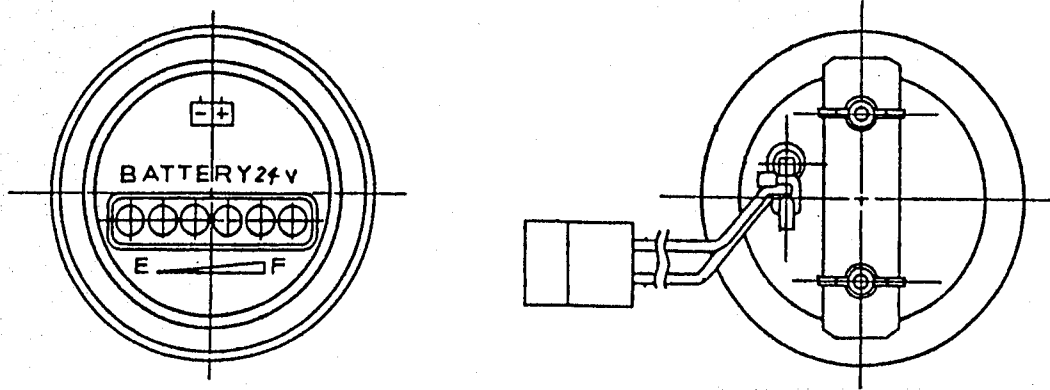
CR-41 ---- actuates "steering motor (Right)".

Rated voltage		DC 24V
Rated Current	N.O	30A
	N.C.	15A

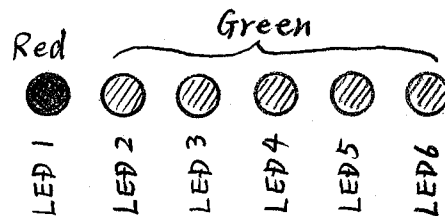


Battery Capacity Indicator (382-00633)

The indicator is installed on the control panel of "Lower control box", and shows battery capacity.



LED ON/OFF condition



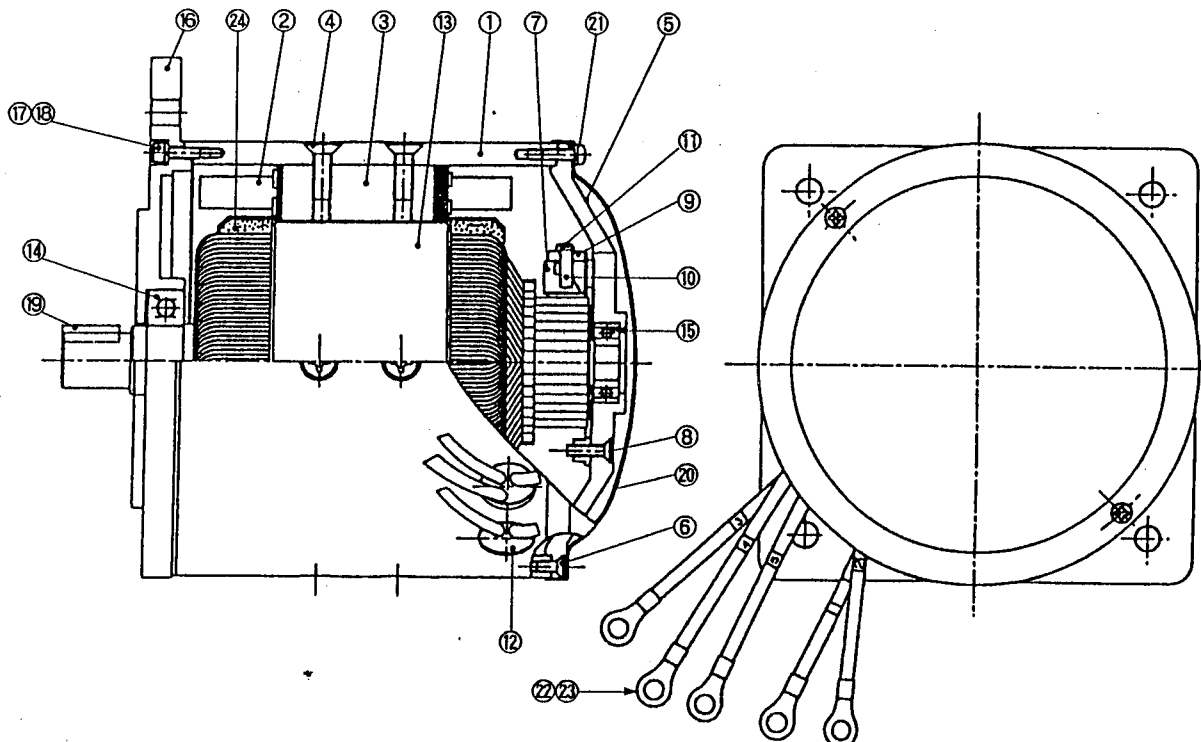
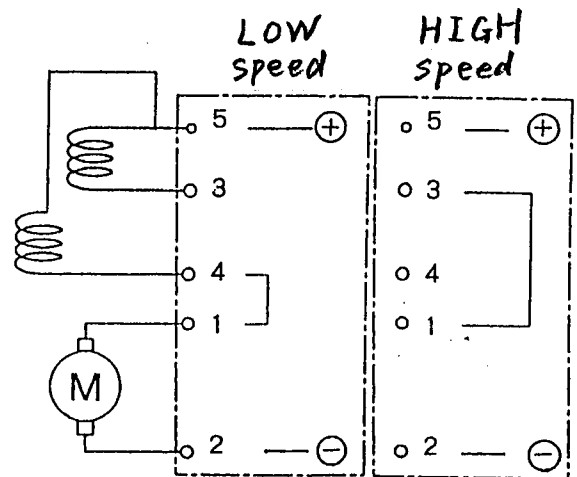
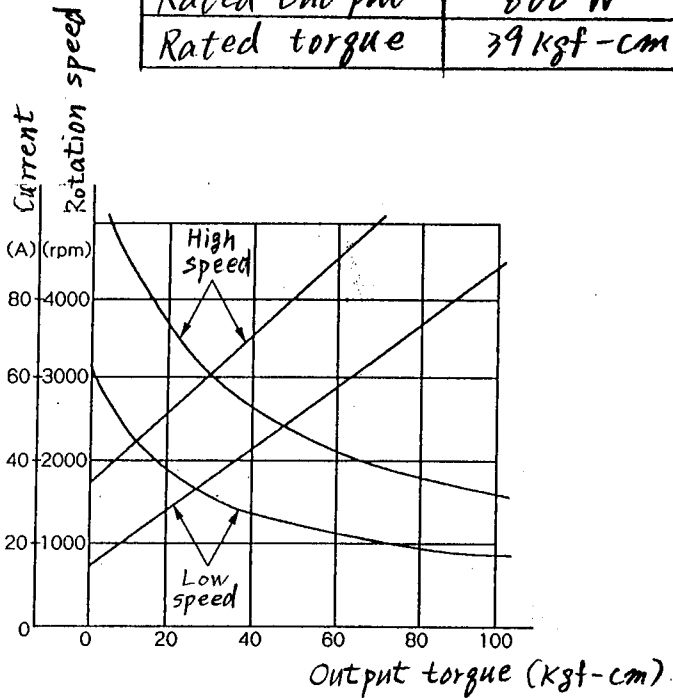
The "LEDs" on "Indicator" turns ON/OFF according to the battery voltage as shown in the table below.

Battery voltage	LED ON/OFF condition
$23,2V \pm 0,3V$ or lower	LED1 (Red) flicks. the other "Green LEDs" are OFF.
$25,0V \pm 0,3V$	LED1 to LED5 are turned on. (LED6 stays OFF.)
$26,0V$ or higher	All of the LEDs (LED1 to 6) are turned on.

Travel Motor (322-04058A)

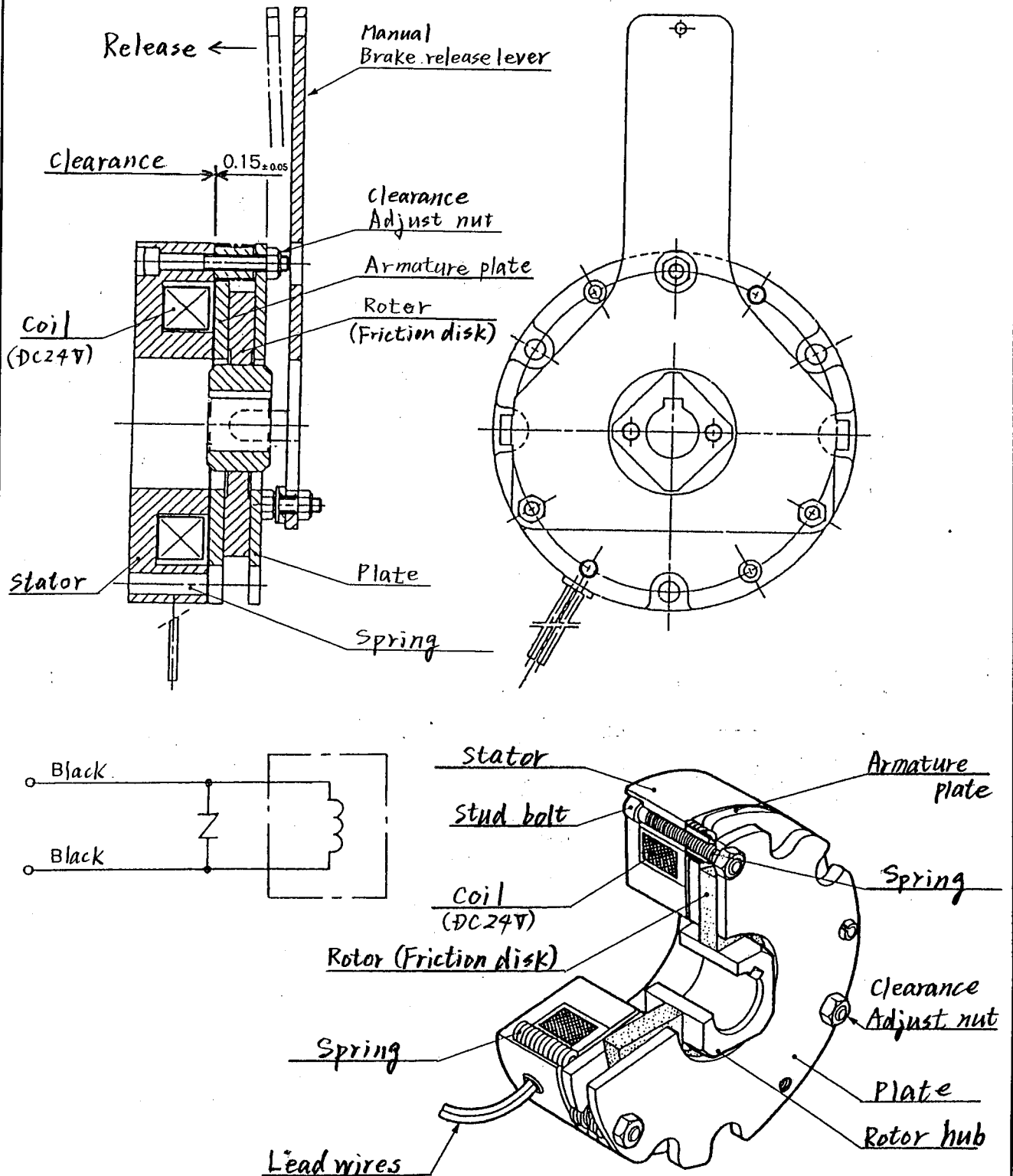
The motor drives "Crawler belts" through "V belt" and "Gear box".

	Low speed	High speed
Rated voltage	DC 24V	DC 24V
Rated current	44A	78A
Rotation speed	1,500 rpm	2,600 rpm
Rated out put	600 W	1,000 W
Rated torque	39 kgf-cm	39 kgf-cm



Parking Brake (370-01038A)

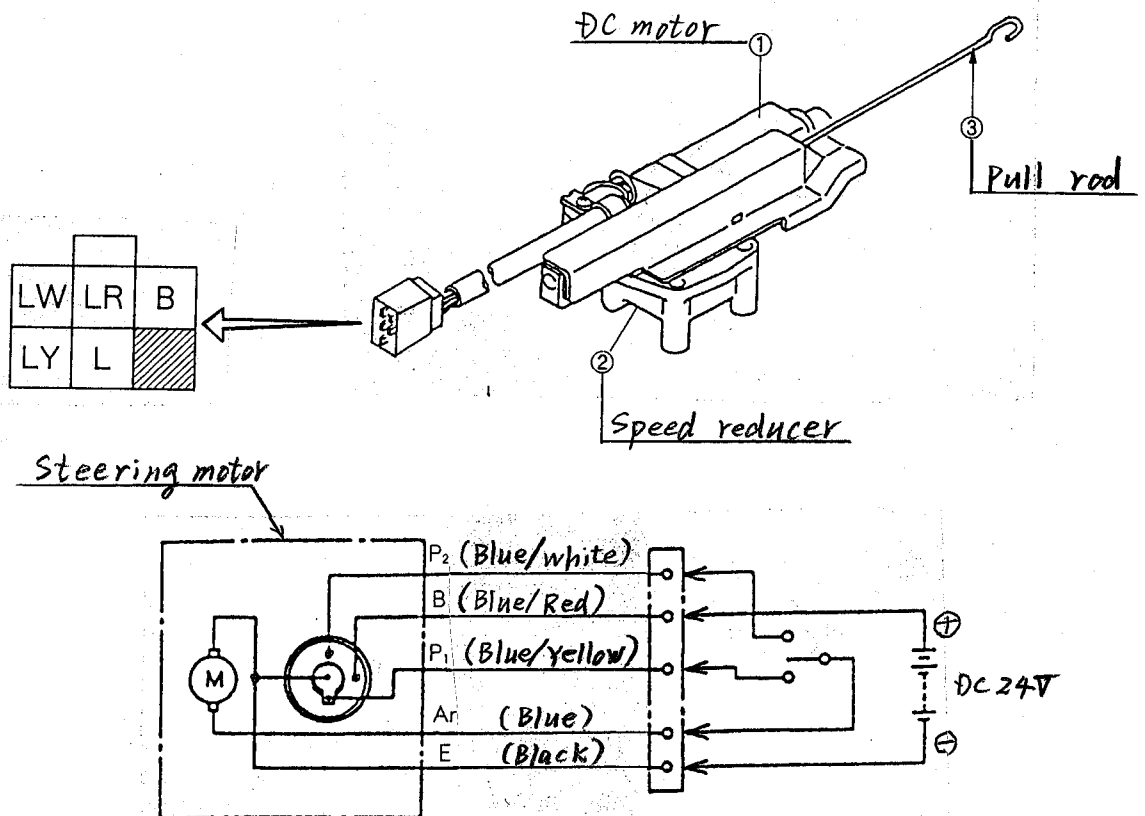
The brake is installed on the "Input shaft" of "Travel gear box" to apply parking brake by means of locking the "Input shaft".



Steering motor (V04-E0189)

Steering motor consists of "DC motor", "Speed reducer", and "Pull rod" as shown in the figure below.

Rated voltage	DC 24V (DC 20~30V)	
Rated Current	Without load	1.5 A or less
	stalled	11 A or less
Pull rod stroke	35 mm	



Inspection procedures

To check the function of "Steering motor", follows the next steps as referring the figures above.

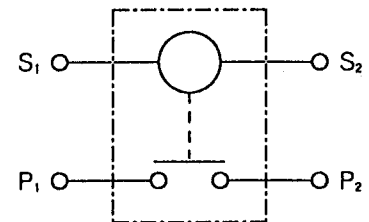
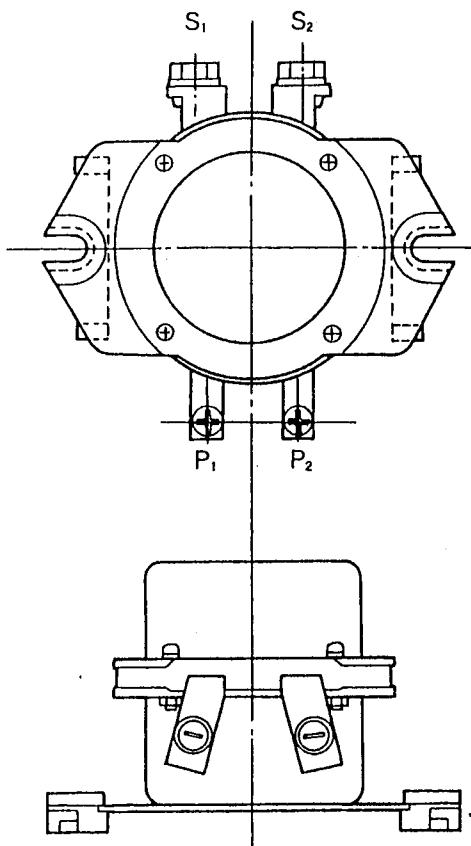
1. Connect "Battery (DC 24V)" between "Terminals" B⁺ and E⁻.
2. Set a "Jump wire" between "Terminals" Ar and P₁, and make sure the "Pull rod" is pulled in.
3. Set a "Jump wire" between "Terminals" Ar and P₂, and make sure the "Pull rod" is fed out.

Cauton: Never set "jump wires" between "Terminals" Ar, P₁, P₂ at the same time, since it causes burnt out motor.

Battery Relay (CR-50) (320-30122)

Battery relay is inserted in the "Battery ground cable" to cut off the "Main power".

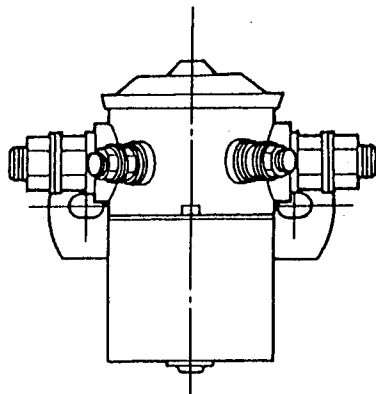
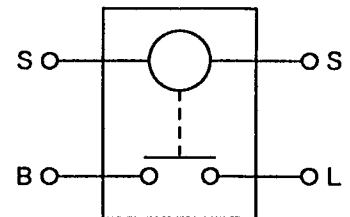
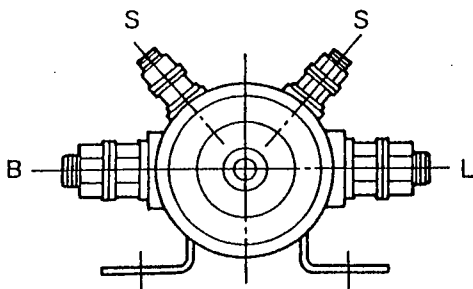
Rated voltage		DC 24 V
Rated current	for 30 seconds	800 A/DC24V
	continuous	120 A/DC24V



Contactor (CR-51, CR-52) (S32-01401)

The contactors (CR-51 and CR-52) select the "Rotation speed" (High or Low) of "Travel motor" by means of switching over the electric power lines of "Travel motor".

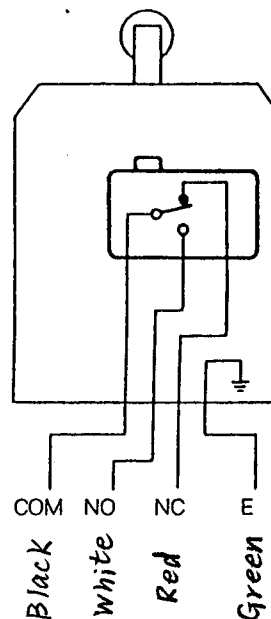
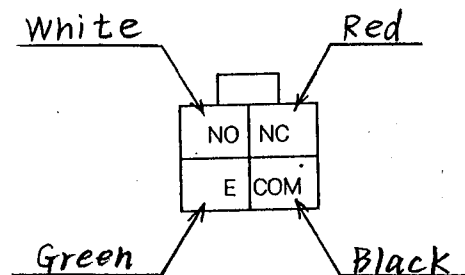
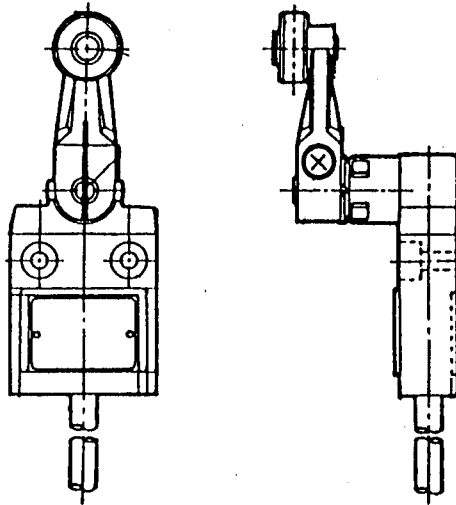
Rated voltage		DC 24V
Rated current	for 30 seconds or less	500A/DC24V
	Continuous	100A/DC24V
Coil resistance		52 Ω



Limit switch

Three limit switches are equipped on RV-041 to detect "Platform floor height" (stowed, 2meters, Maximum).

Rated voltage	DC 24V
Rated current	4A



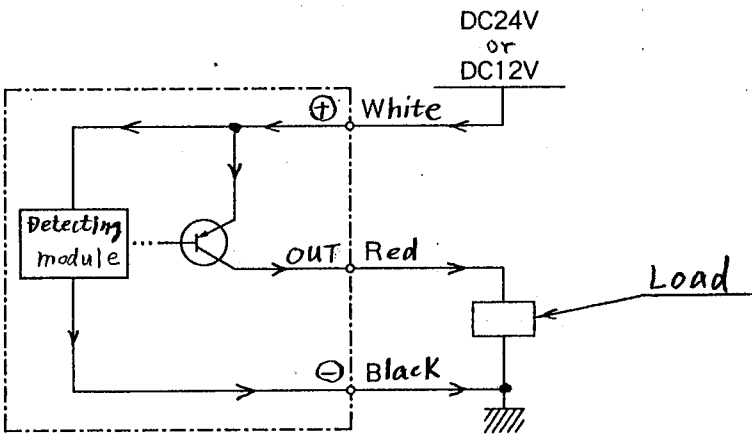
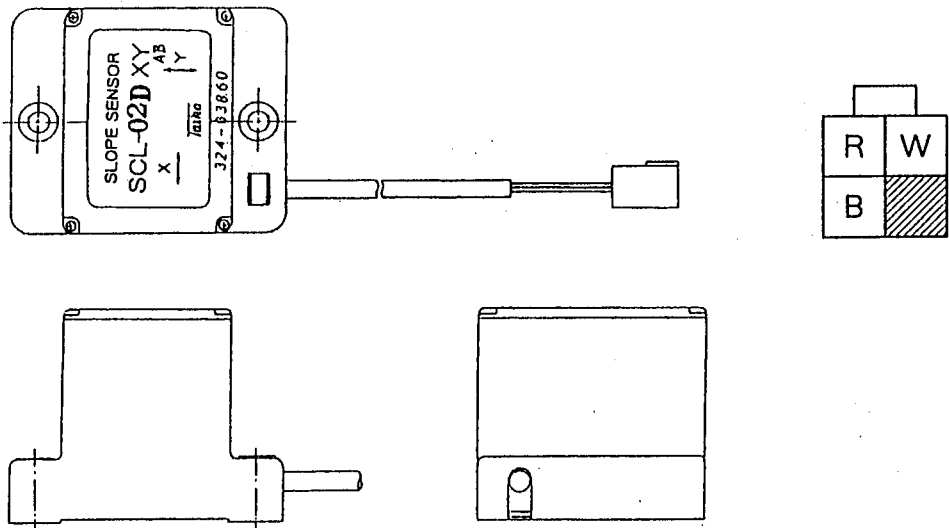
Slope sensor

2° (324-03860)

3° (324-04523)

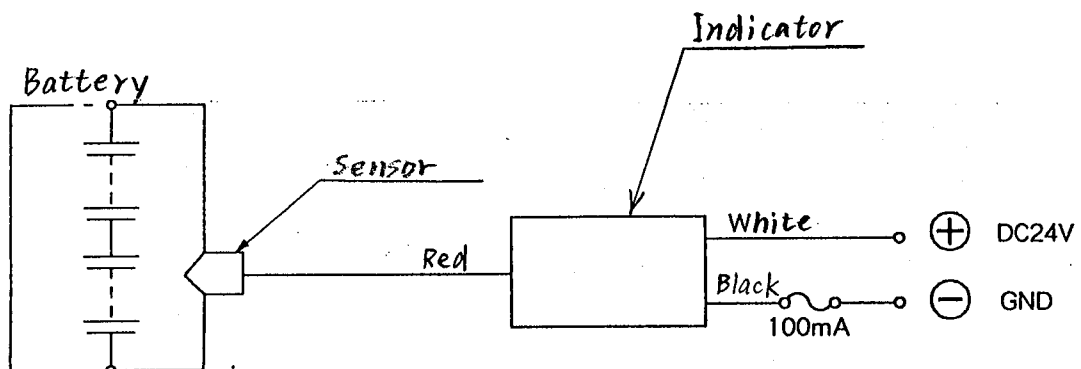
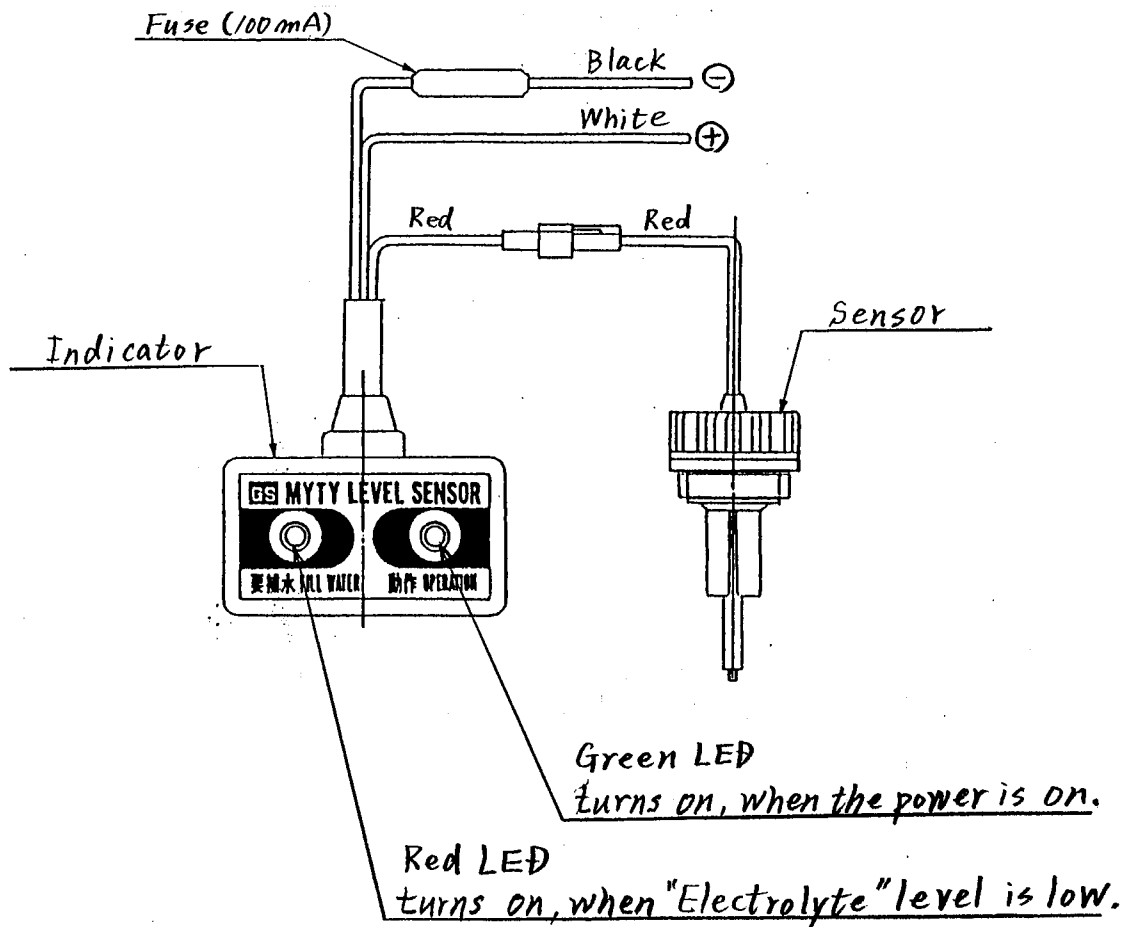
Slope sensors (2° and 3°) are installed on base frame to detect the inclination angle of equipment caused by slope.

	Slope sensor 2°	Slope sensor 3°
Rated voltage	DC12 or 24V (DC 8~30V)	←
Preset angle	2° ± 0.3°	3° ± 0.3°
Output current	150 mA	←



Battery water level indicator (382-00622A)

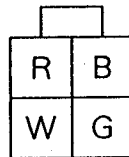
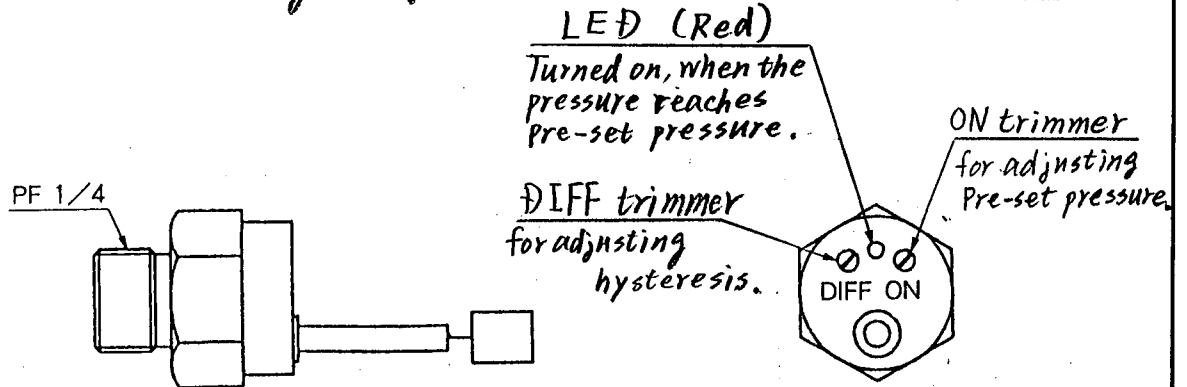
The indicator shows the "Electrolyte" level by LED installed on the indicator.



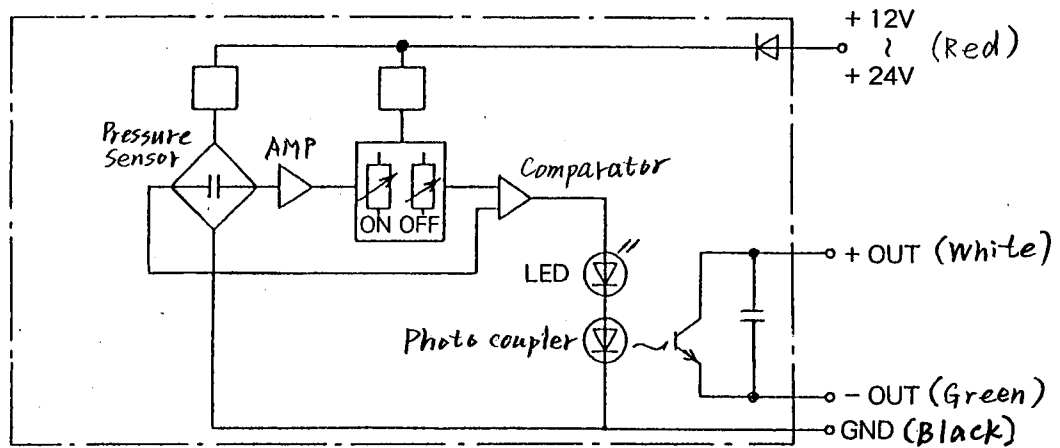
Pressure switch (312-00192E)

The pressure switch detects the pressure applied in "Lift cylinder" to actuate "Overload protect system".

Rated voltage	DC12V or DC24V (DC 9~30V)
Pressure setting range	0 ~ 250 kgf/cm ²



Connector Detail



Battery Charger (322-04046 D)

Specifications

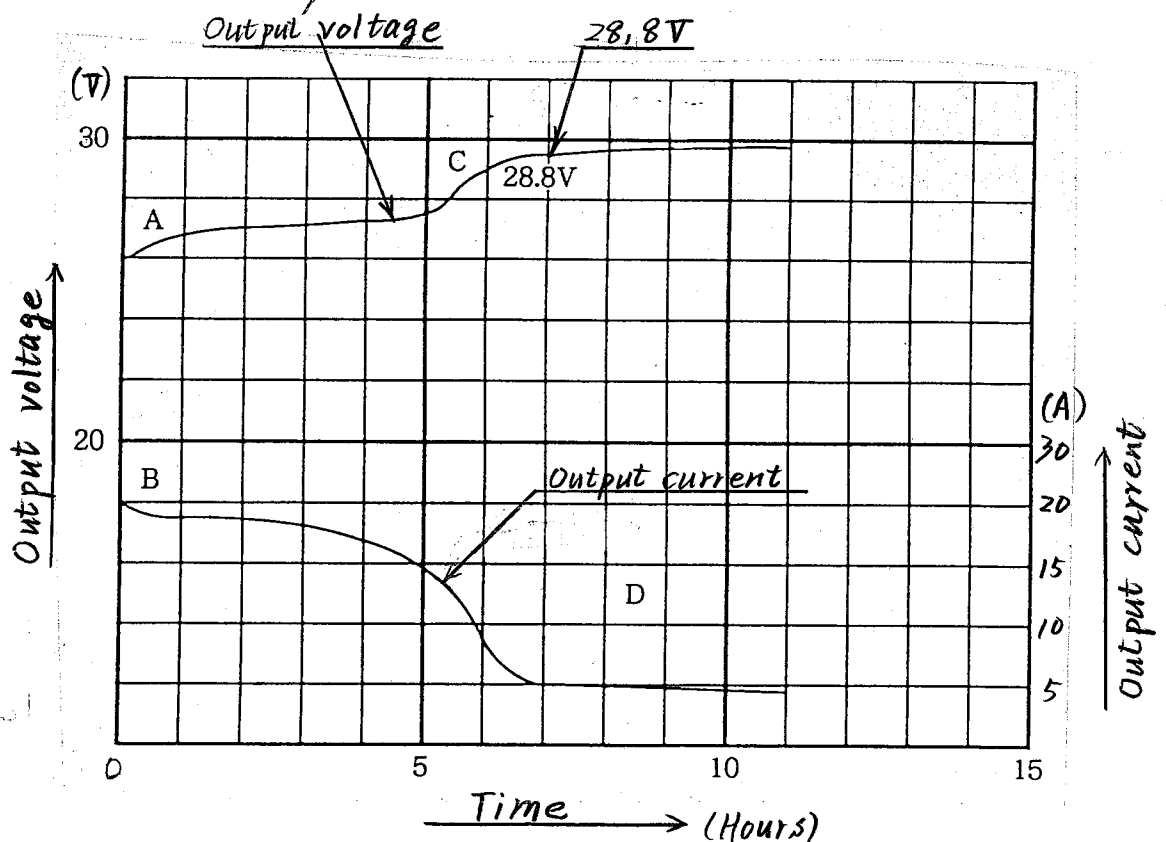
AC Input	Rated voltage	AC 100V (AC 95 ~ 110V)							
	Rated current	15A or less.							
DC Output	Rated output	DC 24V , 20A.							
Applied Battery		EB100 X 2							
Indicator lamp	charging lamp (Green)	The lamp turns on while charging, and turns off automatically, when charging cycle is completed.							
	Finish lamp (Red)	The lamp flashes when charging cycle is completed.							
Select switch	Input voltage select switch (100V/110V)	Set the switch at the position as listed below according to the AC input voltage. AC Input voltage 95~103V --> 100V AC Input voltage 102~110V --> 110V							
	Frequency select switch (50/60 Hz)	Set the switch at the position as listed below according to the AC frequency. 50 Hz → 50 Hz 60 Hz → 60 Hz							
Timmer	The timmer is automatically set according to the time it takes to charge the output voltage to 28.8V. The pre-set times are :								
	<table><tr><td>Charging time</td><td>Set hours of Timmer</td></tr><tr><td>30 minutes or less</td><td>1.5 hours</td></tr><tr><td>30 minutes to 2 hours</td><td>4.0 hours</td></tr><tr><td>2 hours or more</td><td>5.0 hours</td></tr></table>		Charging time	Set hours of Timmer	30 minutes or less	1.5 hours	30 minutes to 2 hours	4.0 hours	2 hours or more
Charging time	Set hours of Timmer								
30 minutes or less	1.5 hours								
30 minutes to 2 hours	4.0 hours								
2 hours or more	5.0 hours								

Charging Characteristic

1. At the begining, "Output voltage" is low and current is high, since the voltage of battery is low.
2. As the charging proceeds, the output voltage will increase and the current will decrease.
3. Once the output voltage reaches 28.8V, the timmer will automatically set itself according the time elapsed.

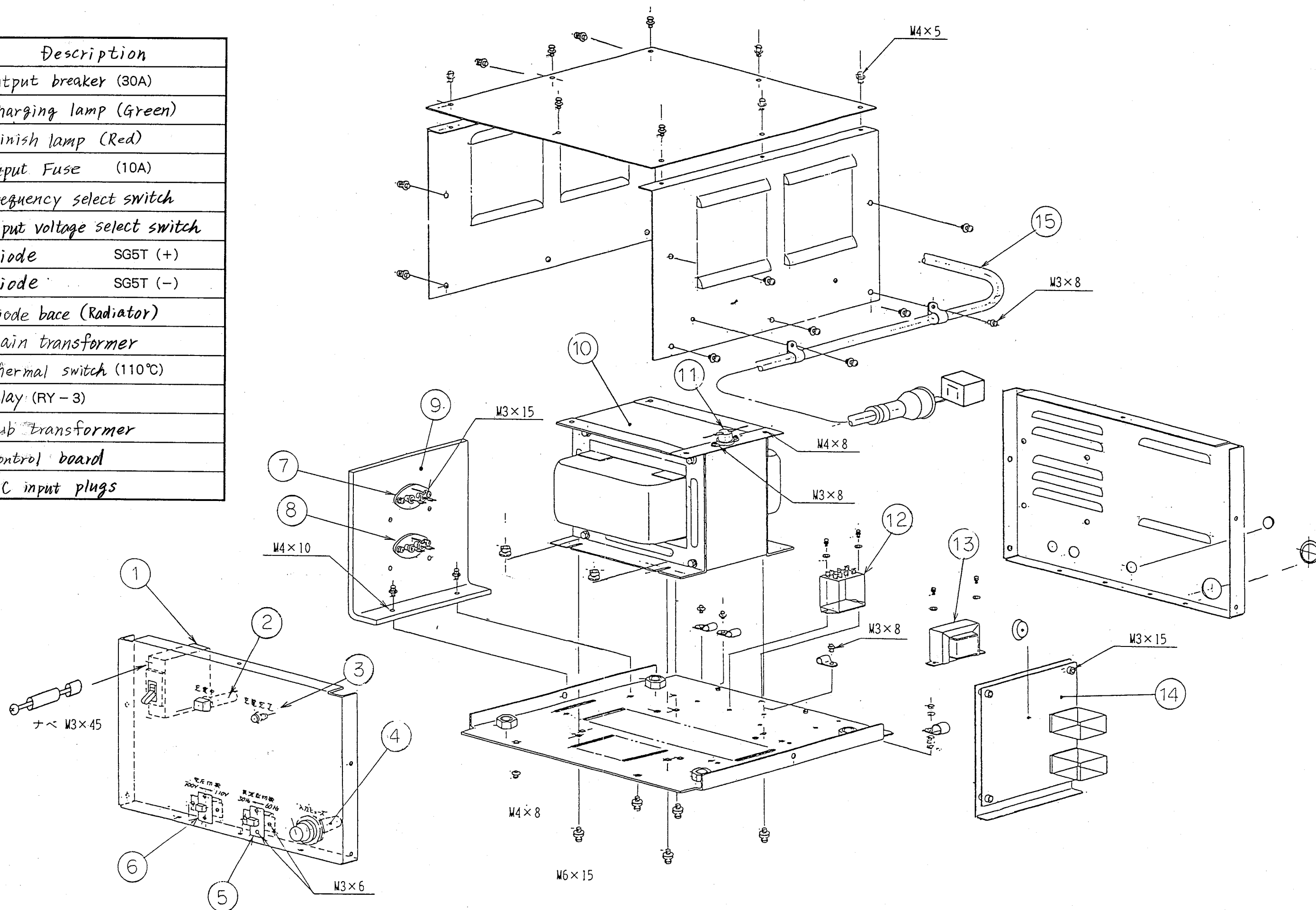
The time from the begining till the output voltage reaches 28.8V.	Set hours of timmer
30 minutes or less	1.5 hours
30 minutes to 2.0 hours	4.0 hours
2.0 houres or more	5.0 hours

4. The timmer starts, and the output current is maintained at about 4 A.
5. After the timmer set hours is passed, the charger is automatically switched off.

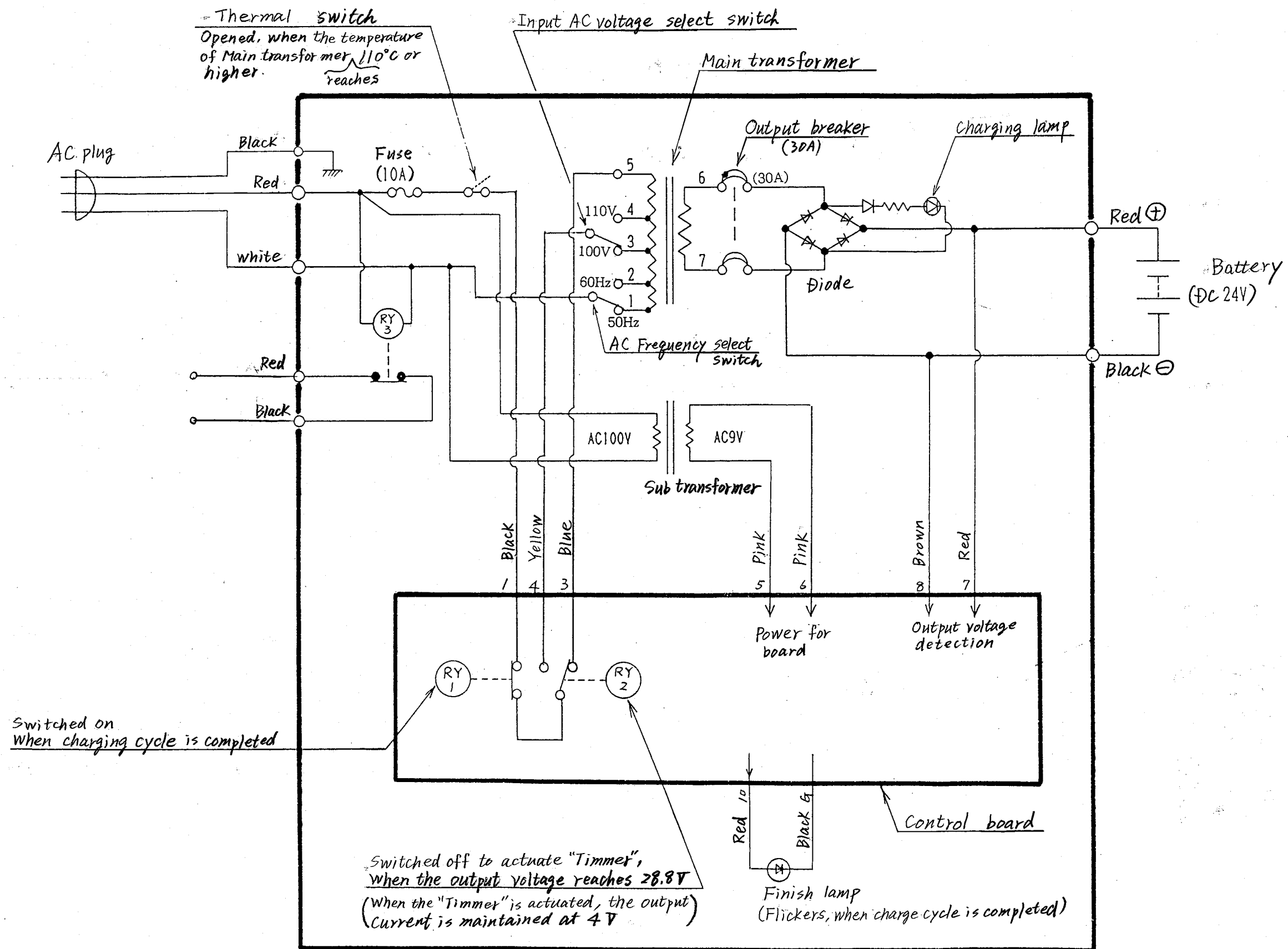


Structure

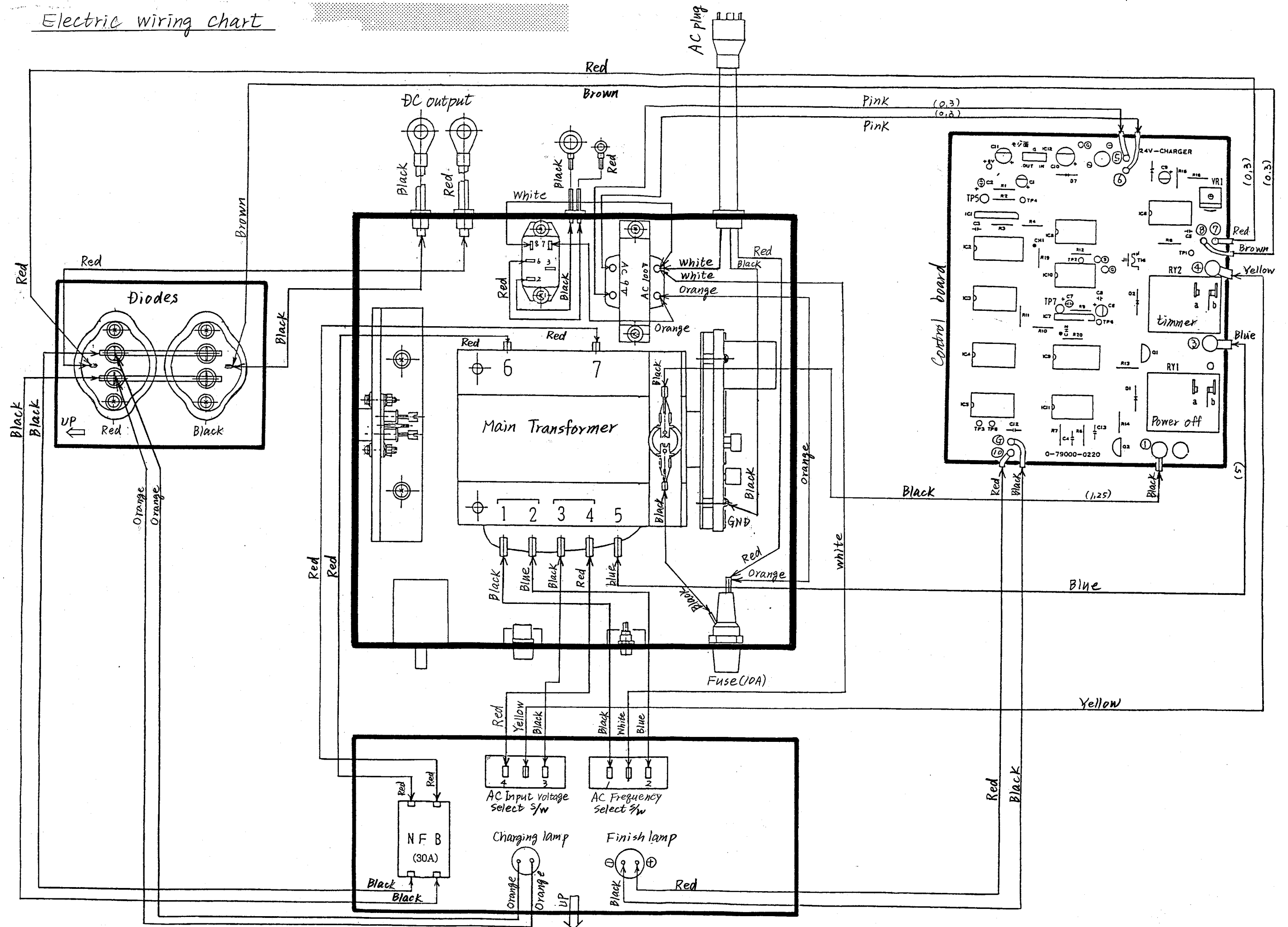
No.	Description
1	Output breaker (30A)
2	Charging lamp (Green)
3	Finish lamp (Red)
4	Input Fuse (10A)
5	Frequency select switch
6	Input voltage select switch
7	Diode SG5T (+)
8	Diode SG5T (-)
9	Diode base (Radiator)
10	Main transformer
11	Thermal switch (110°C)
12	Relay (RY-3)
13	Sub transformer
14	Control board
15	AC input plugs



Electric Circuit



Electric wiring chart

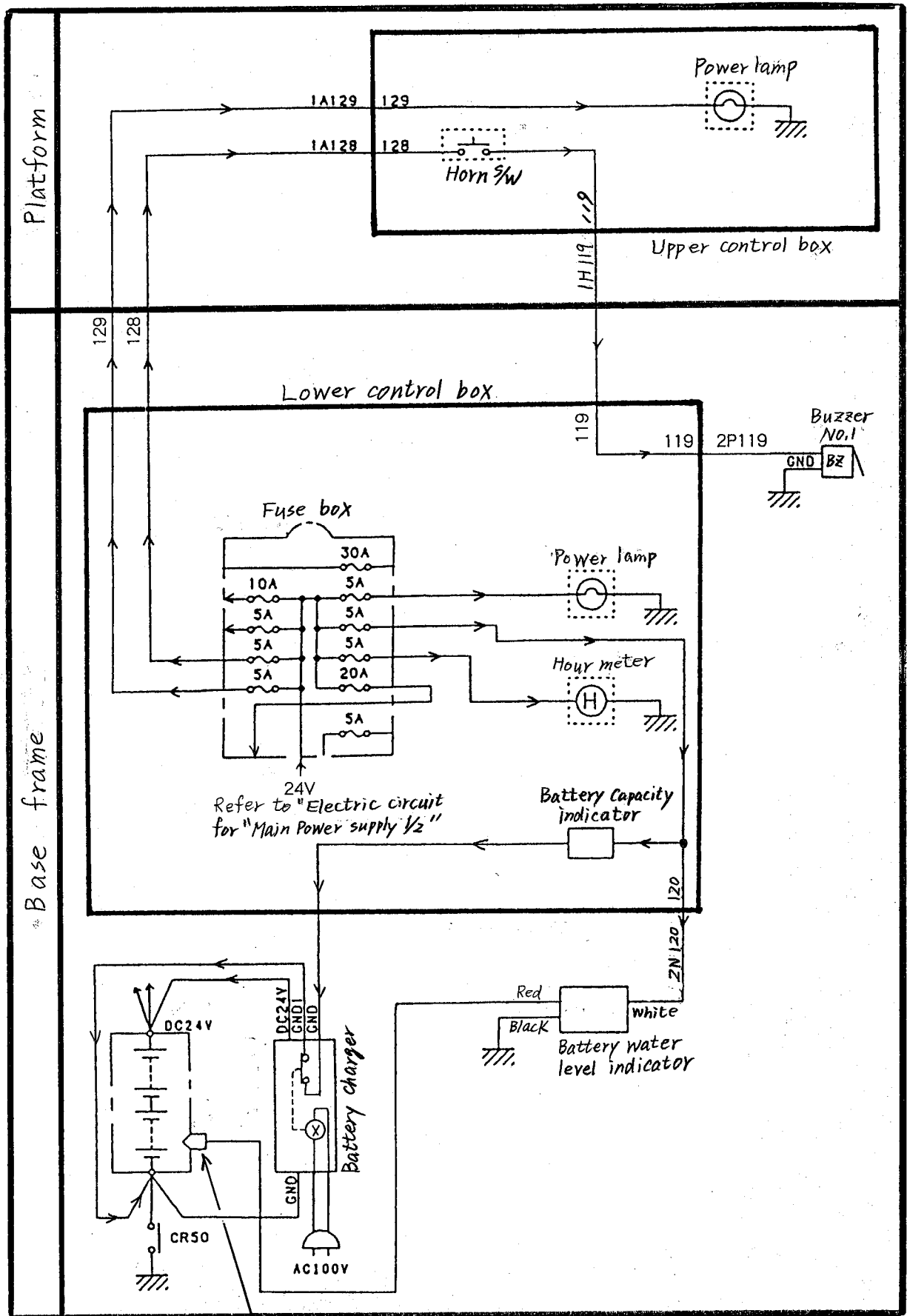


電源系電気回路図 (1/2)

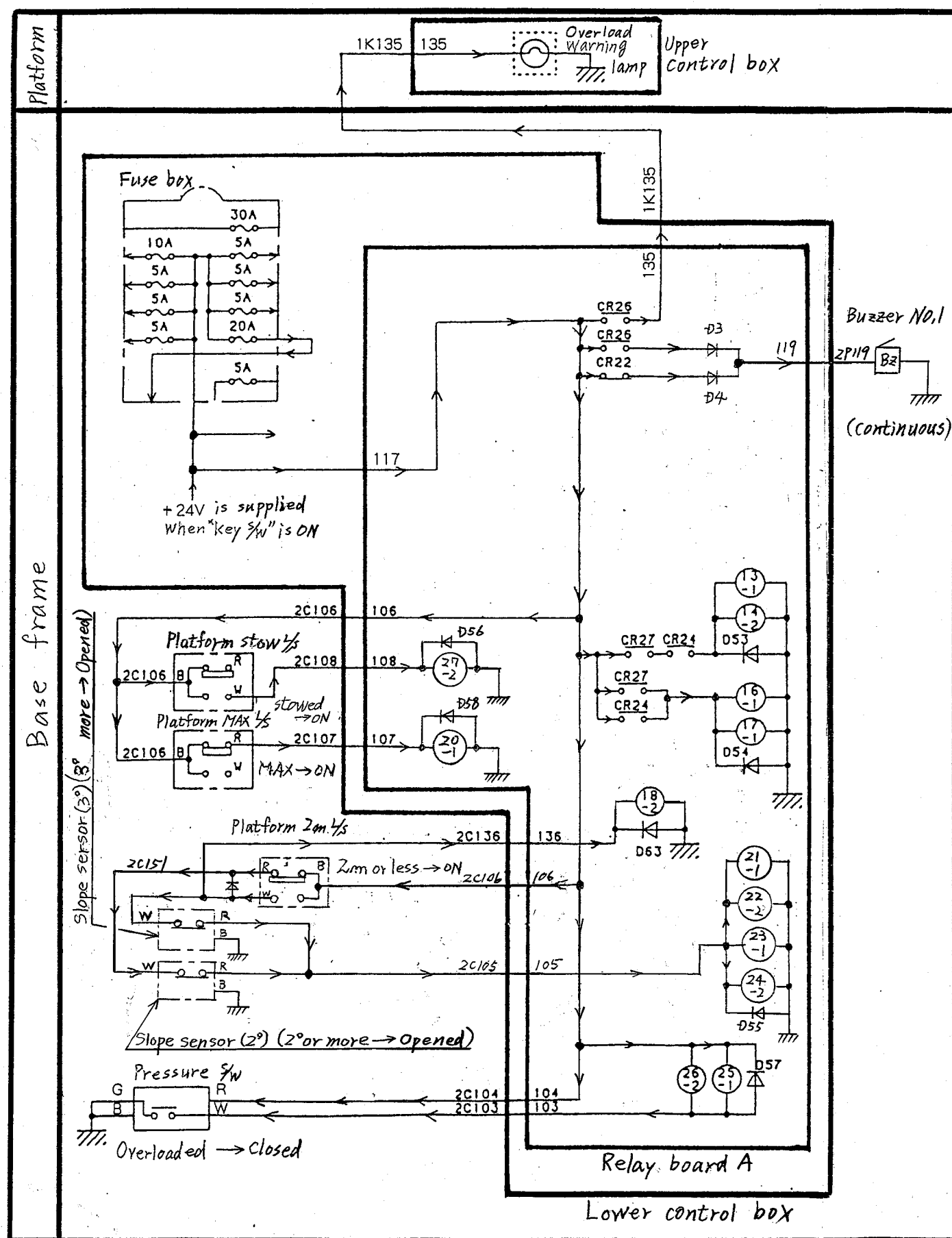


Electric Circuit for "Main Power Supply (2/2)"

電源系電気回路図 (2/2)



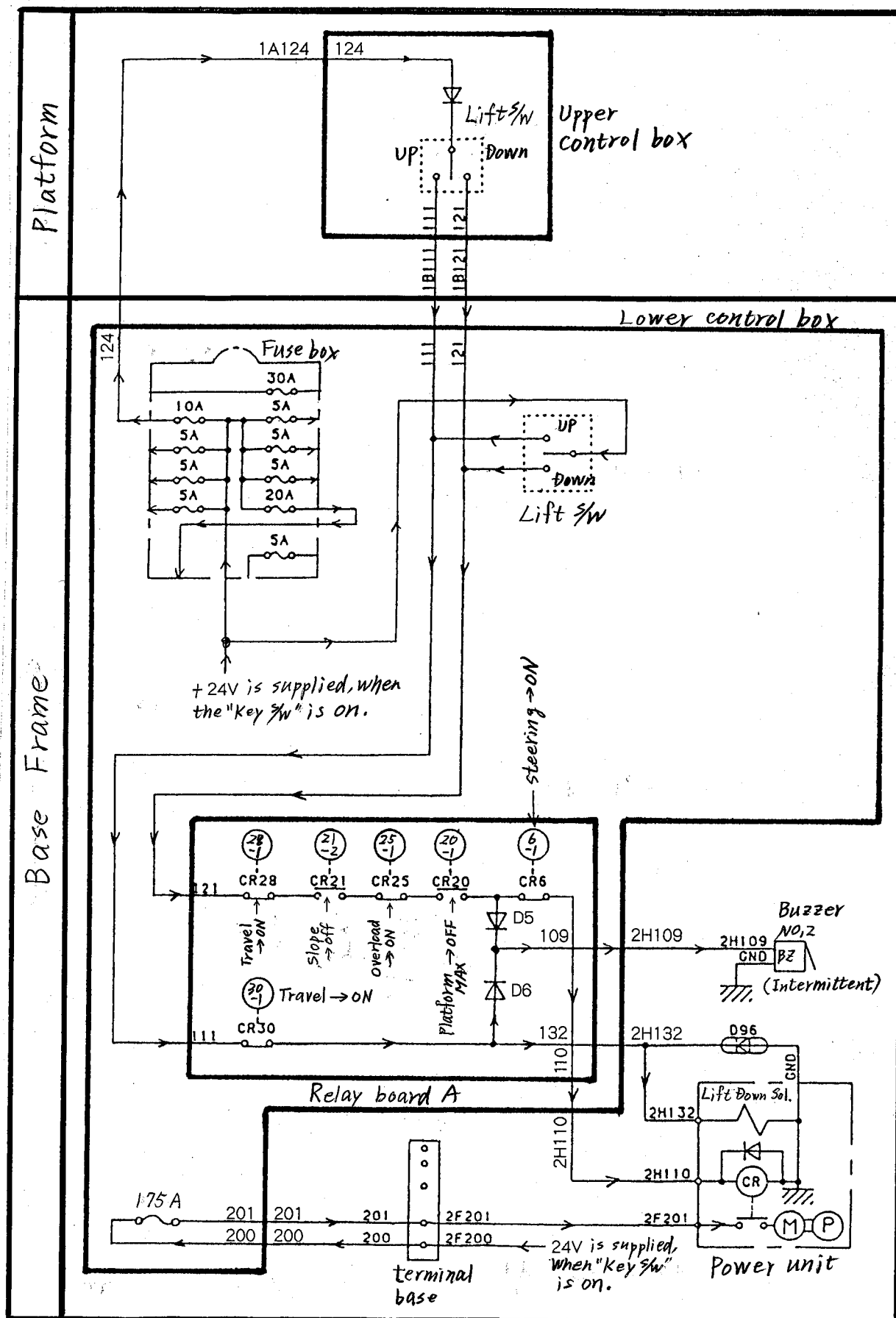
Electric Circuit for "Restriction" system



Relays' ON/OFF conditions and their function

Relay NO.	ON/OFF condition	Function
CR-20	The relay is switched off, when the platform reaches Max. height. (4 meters)	The relay prevents the platform from being elevated beyond its Maximum height by opening the electric circuit of "Lift up".
CR-27	The relay is switched on, when the platform is stowed	The relays shift the "Travelling speed" as shown on the table below in accordance with their ON/OFF conditions.
CR-13 CR-14	Platform floor height stowed ~2m 2m~	Platform floor height stowed ~2m 2m~
Slope	0°~2°	ON OFF OFF
	2°~3°	ON OFF OFF
	3°~	OFF OFF OFF
CR-16 CR-17	Platform floor height stowed ~2m 2m~	Platform floor height stowed ~2m 2m~
Slope	0°~2°	ON ON ON
	2°~3°	ON ON OFF
	3°~	ON OFF OFF
CR-18	The relay is switched off, when the platform is 2 meters or higher.	High --- High speed MID --- Mid speed Low --- Low speed stopped --- Travel operation is cancelled.
CR-21 CR-22 CR-23 CR-24	Platform floor height stowed ~2m 2m~	CR-21: Cancels "Lift UP" operation when the relay is OFF. CR-22 & CR-23: Switch over the "Parking brake" applied timing. CR-24 shifts the "Travelling speed".
Slope	0°~2°	ON ON ON
	2°~3°	ON ON OFF
	3°~	OFF OFF OFF
CR-25 CR-26	The relays are switched on, when the "Contact point" of "Pressure switch" is closed due to overloaded platform.	CR-25 The relay cancels "Lift UP" operation, when it is switched on due to overloaded platform. CR-26 The relay turns on "Overload warning lamp" and sounds "Warning buzzer", when it is switched on due to overloaded platform.

Electric Circuit for "Lift" system



Relays' ON/OFF conditions and their function

Relay NO.	ON/OFF condition				Function	
CR-28	The relay is switched on, when travelling.				The relay cancels "Lift UP" operation, when "Travelling".	
CR-21			Platform floor height			The relay cancels "Lift UP" operation, when the relay is off.
			stowed	~ 2m	2m ~	
	slope	0° ~ 2°	ON	ON	ON	
		2° ~ 3°	ON	ON	OFF	
3° ~		OFF	OFF	OFF		
CR-25	The relay is switched on, when the platform is overloaded.				The relay cancels "Lift UP" operation, when the platform is overloaded.	
CR-20	The relay is switched off, when the platform reaches the maximum height (4m).				The relay stops "Lift UP" operation, when the platform reaches to the maximum height.	
CR-6	The relay is switched on, when "steering" is operated.				The relay cancels "Lift UP" operation, when "steering" is operated.	
CR-30	The relay is switched on, when travelling.				The relay cancels "Lift DOWN" operation, when travelling.	

Refer to the following clauses to know the detailed ON/OFF condition of each relay.

- * CR-28, 30 ----- Electric Circuit for "Travel" system.
- * CR-20, 21, 25 ---- Electric Circuit for "Restriction" system.
- * CR-6 ----- Electric Circuit for "steering" system.



Relays' ON/OFF conditions and their function

Relay NO.	ON/OFF condition					Function
CR-18	The relay is switched off, when platform floor height is 2meters or higher.					The relay shifts the "Travel speed" to "Low", when the platform floor height is 2meters or higher.
CR-13 CR-14	The relay is switeched on, When the platform is stowed and the slope is less than 3°.					The relay shifts the "Travel speed" to "MID" or "LOW", when it is switched off.
CR-16 CR-17			Platform floor height			The relay cancels "Travel" operation, when it is switched off.
			stowed	~2m	2m~	
	slope	0°~2°	ON	ON	ON	
		2°~3°	ON	ON	OFF	
		3°~	ON	OFF	OFF	
CR-5	The relay is switched on, when "Steering" is operated.					The relay shift down the "Travel speed" to "MID", when "Steering" is operated.

- The "Travel speed" is automatically shifted as shown in the table below by the ON/OFF conditions of relays (CR-18, 13, 14, 16, and 17).

		Platform floor height		
		stowed	~2m	2m~
slope	0°~2°	High	MID	LOW
	2°~3°	High	MID	Stopped
	3°~	MID	stopped	stopped

High ---- High speed.

MID ---- MID speed.

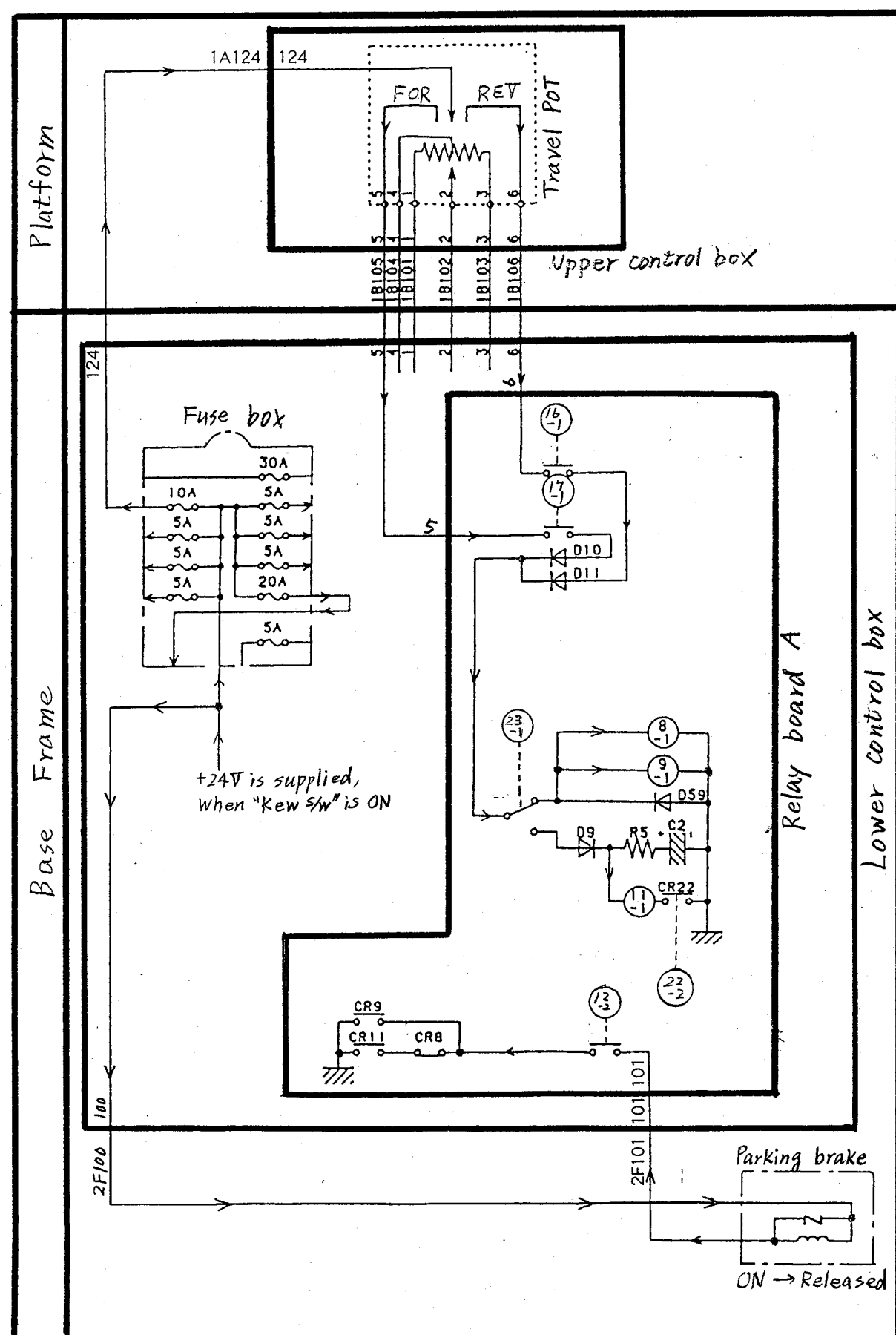
stopped --- Travel operation is cancelled.

- Refer to the following clause to know the detailed ON/OFF condition of each relay.

* CR-18, 13, 14, 16, 17 ---- Electric Circuit for "Restriction" system.

* CR-5 ---- Electric Circuit for "Steering" system.

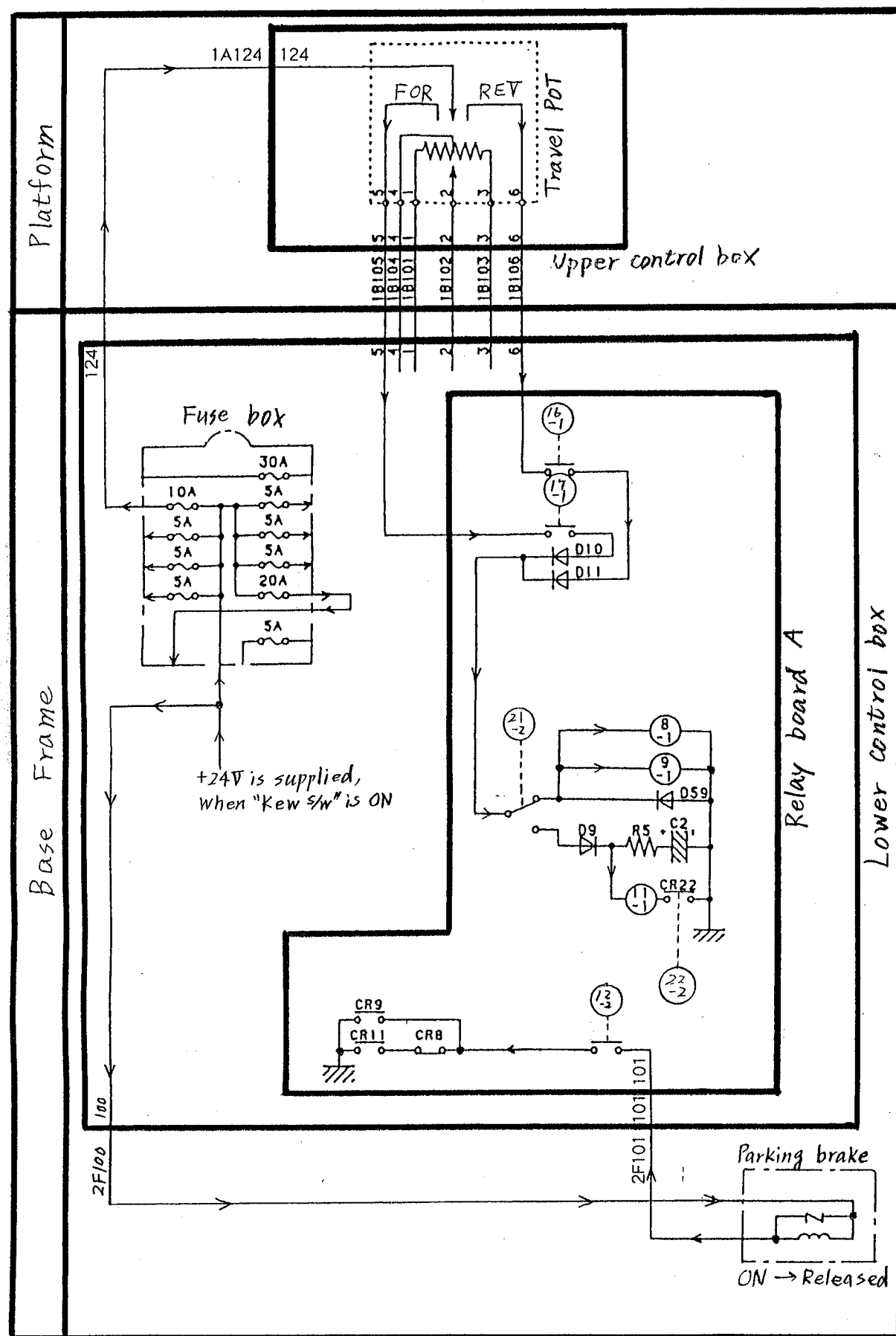
Electric Circuit for "Parking Brake" (Applied serial NO: ~ 343/06)



Relay's ON/OFF conditions and their function

Relay NO.	ON/OFF conditions				Function.
CR-16 CR-17			Platform floor height		Parking brake is not released, when the relays are off.
			stowed	~2m	2m~
	slope	0°~2°	ON	ON	ON
		2°~3°	ON	ON	OFF
		3°~	ON	OFF	OFF
CR-22 CR-23			Platform floor height		• When Relays are OFF: Parking brake is applied, just after releasing "Travel lever". • When Relays are ON: Parking brake is applied 2 seconds after releasing "Travel lever".
			stowed	~2m	2m~
	slope	0°~2°	ON	ON	ON
		2°~3°	ON	ON	OFF
		3°~	OFF	OFF	OFF
CR-12	The relay is off, when the main power is not supplied.				The "Parking brake" is not released, when the "Main power" is not supplied.

Electric Circuit for "Parking Brake" (Applied serial NO: 343107~)

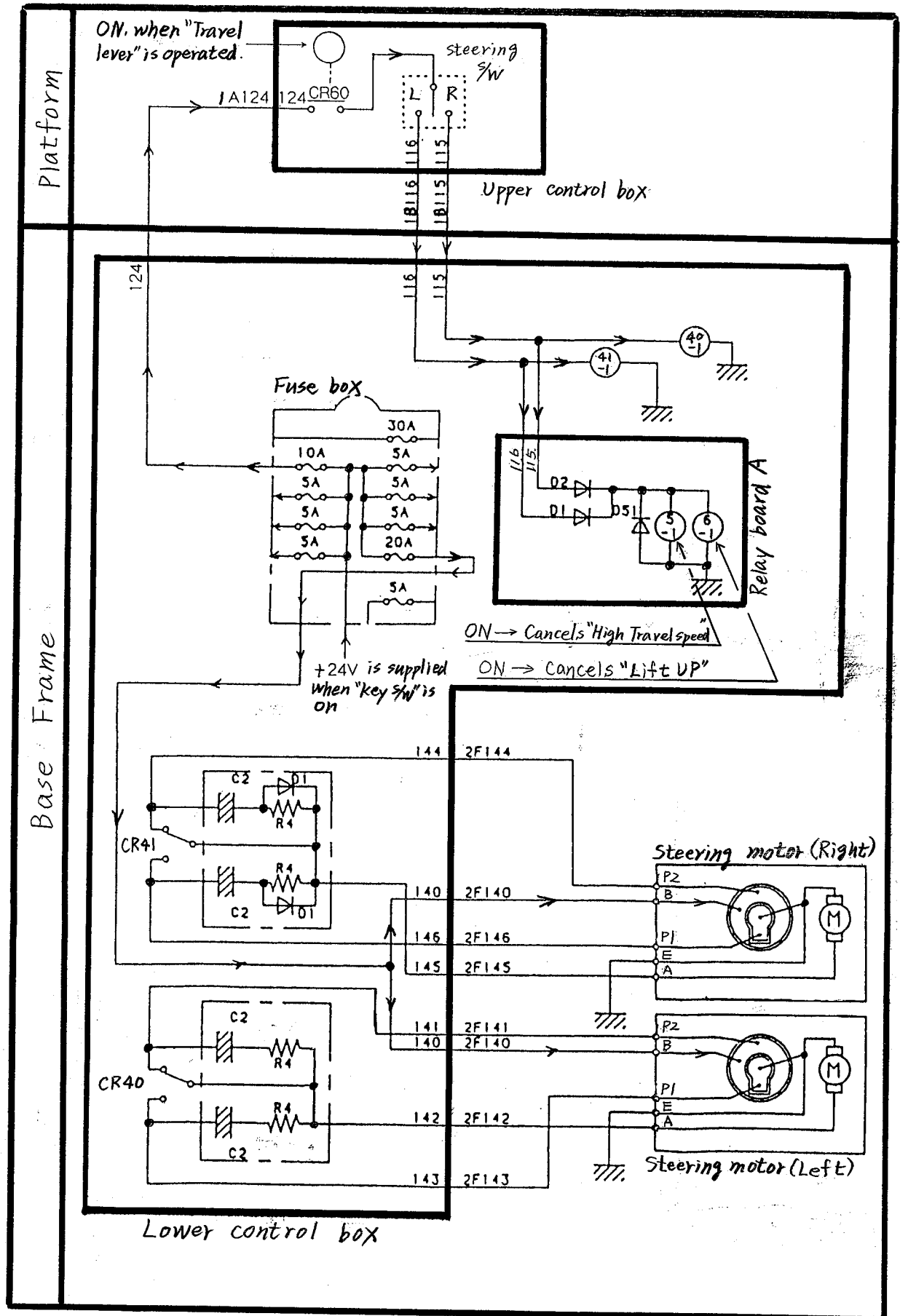


Relay's ON/OFF conditions and their function

Relay NO.	ON/OFF conditions				Function.
CR-16 CR-17	Slope		Platform floor height		Parking brake is not released, when the relays are off.
			stowed	~2m	
		0°~2°	ON	ON	
		2°~3°	ON	ON	
CR-21 CR-22	Slope		Platform floor height		• When Relays are OFF: Parking brake is applied, just after releasing "Travel lever" • When Relays are ON: Parking brake is applied 2 seconds after releasing "Travel lever"
			stowed	~2m	
		0°~2°	ON	ON	
		2°~3°	ON	ON	
CR-12		3°~	ON	OFF	The "Parking brake" is not released, when the "Main power" is not supplied.
		3°~	OFF	OFF	

Electric Circuit for "Steering" system

ステアリング系電気回路図



INSPECTION AND
ADJUSTMENT

Functions and Inspection of "Safety Device"

No.	Item	Function	Inspection Procedures	Remarks																			
1	Emergency stop switch	When the "Stop switch" is pressed, it cuts off the power (DC24V), and cancels all of the function.	Press the "stop switch" on "Upper control box", and make sure the "Power lamps" on "Upper and Lower controls" are turned off, and all of the functions are cancelled.	Stop switch																			
2.	Motion alarm buzzer	The "Alarm buzzer" sounds, when "Travel" or "Lift" operation is performed.	Perform "Travel" and "Lift" operation, and make sure the "Alarm buzzer" sounds.	Buzzer NO.2																			
3.	Manual bleed down valve	In such emergency case as electric failure, the platform can be lowered by opening "Manual bleed down valve".	1. Lift up platform to the maximum height. 2. Open "Manual bleed down valve" and make sure the platform is lowered.	Stop valve																			
4.	Overload protect system	When the platform is overloaded, "Overload warning lamp" on "Upper control box" is turned on, "Warning buzzer" sounds, and "Lift UP" operation is cancelled.	1. Load the platform with the weight of 250 ~ 270kgf. 2. Perform "Lift UP" operation, and make sure the operation is automatically stopped, and at the same time "Warning buzzer" sounds and "Overload warning lamp" is turned on. 3. Load the platform with the weight of 200kg, and make sure the "Lift UP" operation is performed smoothly.	Pressure switch Buzzer NO.1																			
5.	Lift UP restriction system.	When the equipment is set on the slope, "Lift UP" operation is automatically stopped as shown in the table below. <table border="1"><thead><tr><th>Slope</th><th>Lift UP operation</th></tr></thead><tbody><tr><td>0°~2°</td><td>No restriction</td></tr><tr><td>2°~3°</td><td>Stopped at platform floor height: 2m</td></tr><tr><td>3° ~</td><td>"Lift UP" is stopped completely, and the platform stays at stowed height.</td></tr></tbody></table>	Slope	Lift UP operation	0°~2°	No restriction	2°~3°	Stopped at platform floor height: 2m	3° ~	"Lift UP" is stopped completely, and the platform stays at stowed height.	1. Set the equipment on level ground, perform "Lift UP" operation, and make sure the platform can be raised up to the maximum height smoothly. 2. Incline the equipment about 2.5°, perform "Lift UP" operation, and make sure the operation is automatically stopped, when the platform floor height reaches about 2 meters. Also make sure the "Warning buzzer" sounds. 3. Incline the equipment about 3.5°, perform "Lift UP" operation, and make sure the "Warning buzzer" sounds, and the platform stays at stowed height.	Slope sensors (2° & 3°) Platform 2m 1/5 Platform stow 1/5 Buzzer NO.1											
Slope	Lift UP operation																						
0°~2°	No restriction																						
2°~3°	Stopped at platform floor height: 2m																						
3° ~	"Lift UP" is stopped completely, and the platform stays at stowed height.																						
6.	Maximum platform height restriction system.	When the platform reaches the maximum height, the power (DC24V) supplied to the "Power unit" is automatically cut off to restrict the maximum platform height.	Set the equipment on level ground, perform "Lift UP" operation, and make sure the "Power unit" is stopped automatically, when the platform floor height reaches about 4 meters.	Platform MAX 1/5																			
7.	Travel speed restriction system.	The "Travelling speed" is automatically shifted in accordance with the slope and platform height as shown in the table below. <table border="1"><thead><tr><th rowspan="2">Slope</th><th colspan="3">Platform floor height</th></tr><tr><th>stowed</th><th>~ 2m</th><th>2m ~</th></tr></thead><tbody><tr><td>0~2°</td><td>High</td><td>MID</td><td>LOW</td></tr><tr><td>2°~3°</td><td>High</td><td>MID</td><td>stopped</td></tr><tr><td>3° ~</td><td>MID</td><td>stopped</td><td>stopped</td></tr></tbody></table> - High speed ---- 5.5 ~ 8.0 sec/5 meters - MID speed ---- 8.5 ~ 16.0 sec/5 meters - LOW speed ---- 14.0 ~ 26.0 sec/5 meters	Slope	Platform floor height			stowed	~ 2m	2m ~	0~2°	High	MID	LOW	2°~3°	High	MID	stopped	3° ~	MID	stopped	stopped	1. Stow the platform, perform "Travel" operation on level ground, and make sure the "Travelling speed" is "High" (5.5 ~ 8.0 sec/5 meters). 2. Set the platform floor height at 1.5m, and make sure the "Travelling speed" is "MID" (8.5 ~ 16.0 sec/5 meters). 3. Set the platform floor height at 2.5m, and make sure the "Travelling speed" is "LOW" (14.0 ~ 26.0 sec/5 meters). 4. Disconnect the connector of "slope sensor (2°)", stow platform, and make sure the "Travelling speed" is "High" (5.0 ~ 8.0 sec/5 meters). 5. With disconnected "slope sensor (2°)", set platform floor height at 1.5m, and make sure the "Travelling speed" is "MID" (8.5 ~ 16.0 sec/5 m). 6. With disconnected "slope sensor (2°)", perform "lift UP" operation until it automatically stopped, and make sure the "Travel" operation is cancelled.	Slope sensors (2°, 3°) Platform 2m 1/5 Platform stow 1/5 Buzzer NO.1
Slope	Platform floor height																						
	stowed	~ 2m	2m ~																				
0~2°	High	MID	LOW																				
2°~3°	High	MID	stopped																				
3° ~	MID	stopped	stopped																				

NO.	Item	Function	Inspection Procedures	Remarks
7.	Travel speed restriction system		7. Disconnect the both connectors of "slope sensors 2° and 3°", stow platform, and make sure the "Warning buzzer sounds", and the "Travelling speed" is "MID" (8.5~16.0 sec/5 meters). 8. Connect the both connectors of "slope sensors 2° and 3°" as they were connected.	
8	Battery charger Protect system	The system cuts off the main power and cancels all of the operation, when the "AC plugs" of "Battery charger" is plugged in AC power source.	1. Plug in the "AC plugs" of "Battery charger" to AC power source. 2. Turn on "Main key switch", and make sure the "Power lamp" is not turned on.	"Power cut off relay" in "Battery charger".
9.	Extension platform restriction system (Applied only for optional "Extension platform".)	"Lift UP" operation is automatically stopped at "Platform floor height: 3 meters, when Platform is extended.	1. Extend platform, and set it at stowed position. 2. Perform "Lift UP" operation, and make sure the operation stops at "Platform floor height: 3 meters, and at the same time "Warning buzzer" sounds and "Overload warning lamp" turns on.	

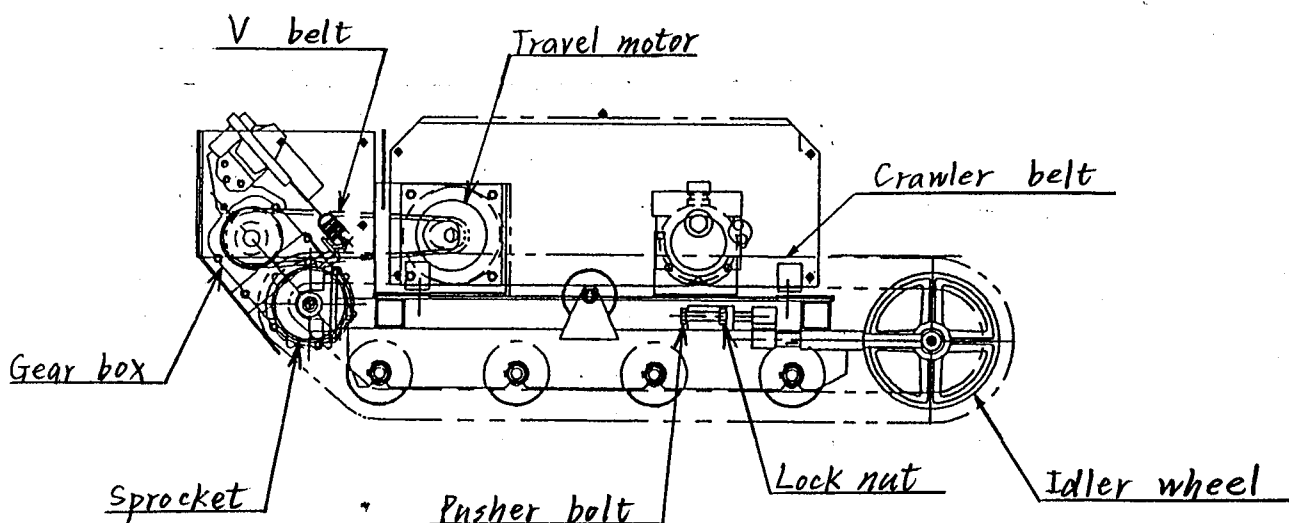
Adjustment of "Travelling mechanism"

1 Tension of V belt

No.	Adjustment procedures	Remarks
1.	Press the "V belt" by 10kgf and adjust the "Deflection" to about 10mm by shifting the position of "Travel motor".	Diagram illustrating the adjustment of V belt tension. The top part shows a side view of the gear box and travel motor connected by a V belt. The bottom part shows a top-down view of the belt between two pulleys, with a 10kgf force applied to the center, resulting in a deflection of 10mm.

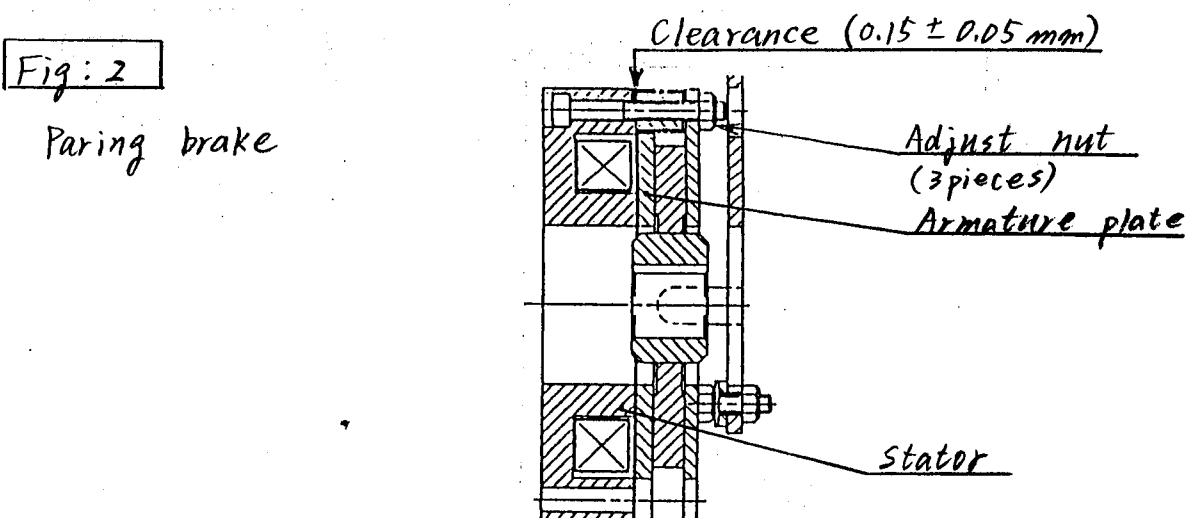
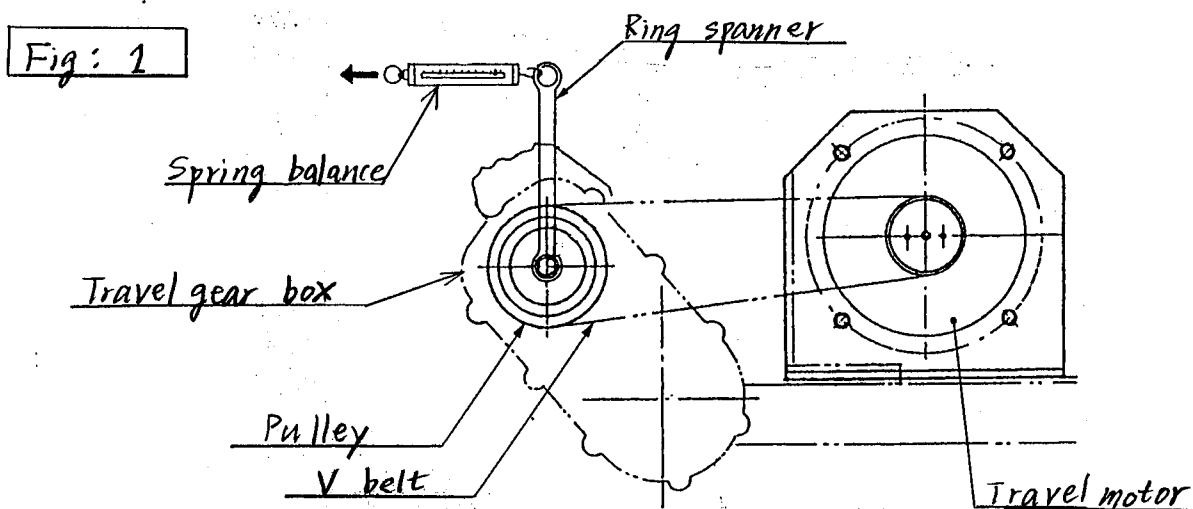
2. Tension of Crawler belts

ND.	Adjustment procedures	Remarks
1.	Adjust the "Deflection" of "Crawler belt" to 5~10mm by turning "Pusher bolt", shown in the figure below.	Diagram illustrating the adjustment of crawler belt deflection. It shows a top-down view of the belt between a sprocket and an idler wheel, with a deflection of 5~10mm indicated.



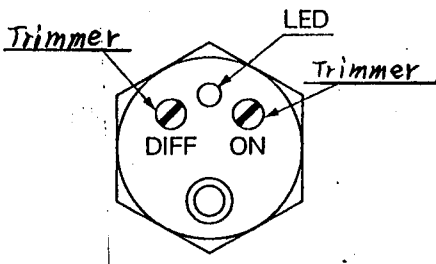
Adjustment of "Parking brake"

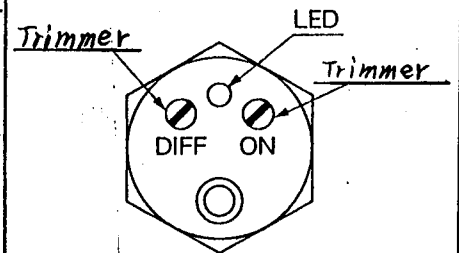
NO.	Adjustment procedures	Remarks
1.	Set a "Ring spanner" and a "Spring balance" at the "Pully anchor nut" of "Travel gear box" as shown in Fig: 1.	
2.	Pull the "Spring balance" and measure the torque, when the pulley starts turning.	Specific torque: 1.0 Kgf-m or more.
3.	In case the torque is less than 1.0 Kgf-m, adjust the "Clearance" shown in Fig-2 by turning "Adjust nuts" (3 pieces) alternately.	



Adjustment of "Overload protection" system

The system is adjusted by the trimmers installed on "Pressure switch" as follows.

NO.	Adjustment procedures	Remarks
1.	Turn the "Diff" trimmer on "Pressure switch" clock-wise until it stops.	
2.	Turn the "ON" trimmer on "Pressure switch" clock-wise about 4 full turns.	
3.	Lift up the "Platform" about 20~30cm from stowed position, and load the platform with the weights (200kgf) and (50~70kgf.).	
4.	Turn the "ON" trimmer counter-clockwise slowly, and set it at the position where "Warning buzzer" starts sounding.	
5.	Stow the platform, perform "Lift UP" operation, and make sure the "Lift UP" operation is automatically stopped and the "Warning buzzer" sounds.	In case the "Lift UP" operation does not stop, turn the "ON" trimmer counter-clockwise slightly.
6.	Stow the platform, remove the weight (50~70 kgf) only, perform "Lift UP" operation again, and make sure the platform is lifted up to its maximum height smoothly.	In case the "Lift UP" operation stops, turn the "ON" trimmer clockwise slightly.
7.	Repeat NO. 3 → 5 → 6, make sure the "Lift UP" operation is stopped when the platform is loaded with 250~270 kg, and not stopped when the platform is loaded with 200 kg only.	



Pressure switch

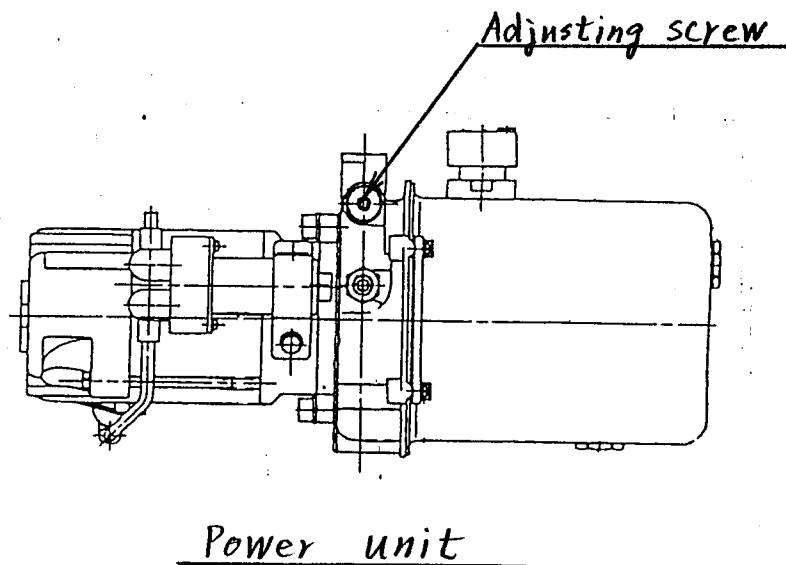
In case the "Lift UP" operation does not stop, turn the "ON" trimmer counter-clockwise slightly.

In case the "Lift UP" operation stops, turn the "ON" trimmer clockwise slightly.

Adjustment of "Lift Down" speed

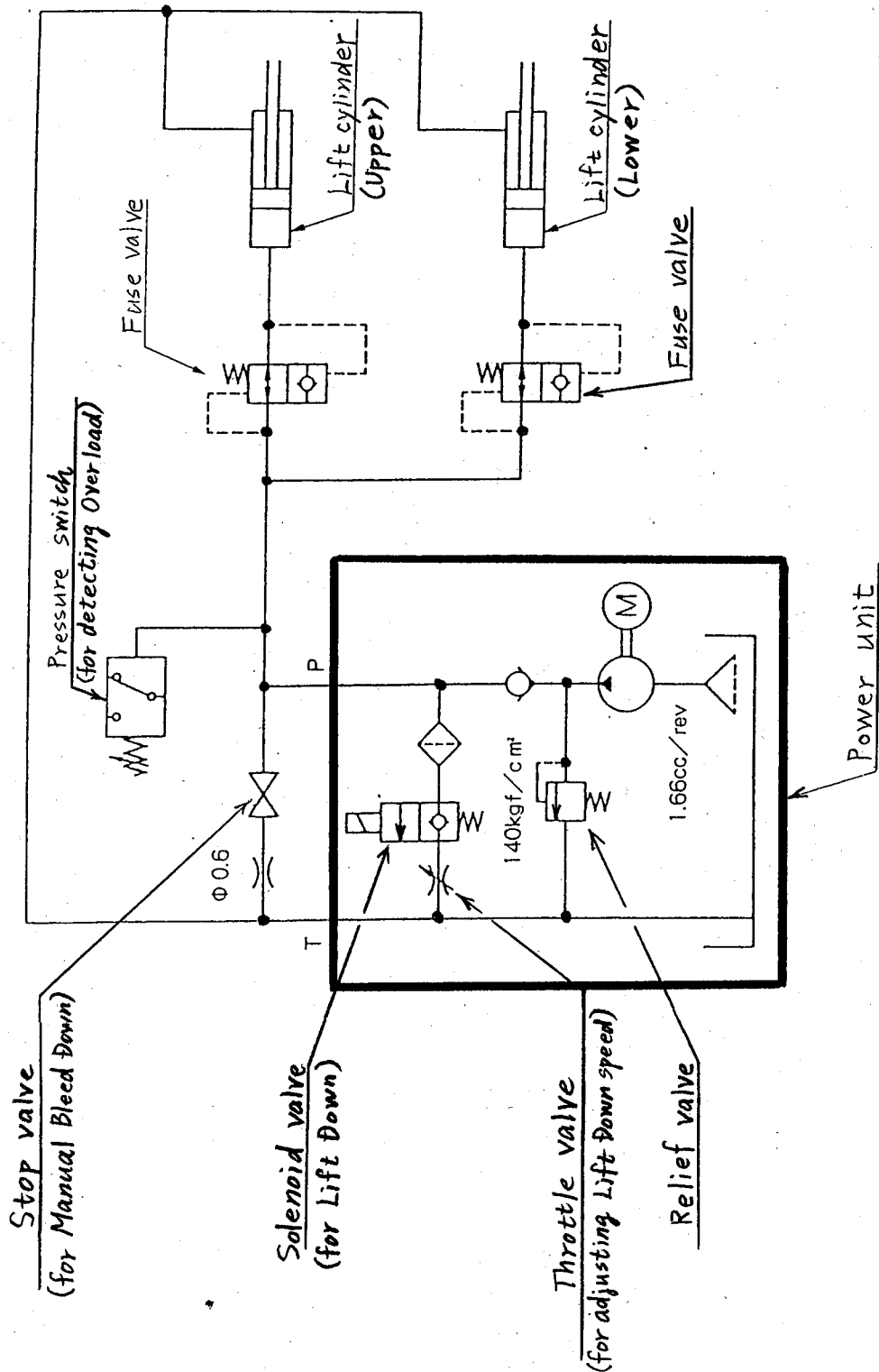
The "Lift down" speed is adjusted by "Adjusting screw" installed on "Power unit" as follows.

No.	Adjustment procedures	Remarks
1.	Load the platform with the weight (200kg), and lift up to the maximum height.	
2.	Perform "Lift down" operation, and measure the speed (seconds/stroke).	Specific speed. 33 ± 5 sec/stroke
3.	In case the speed is inadequate, adjust the "Adjusting screw" on "Power unit". The speed will be faster, when the "Adjusting screw" is turned clockwise.	

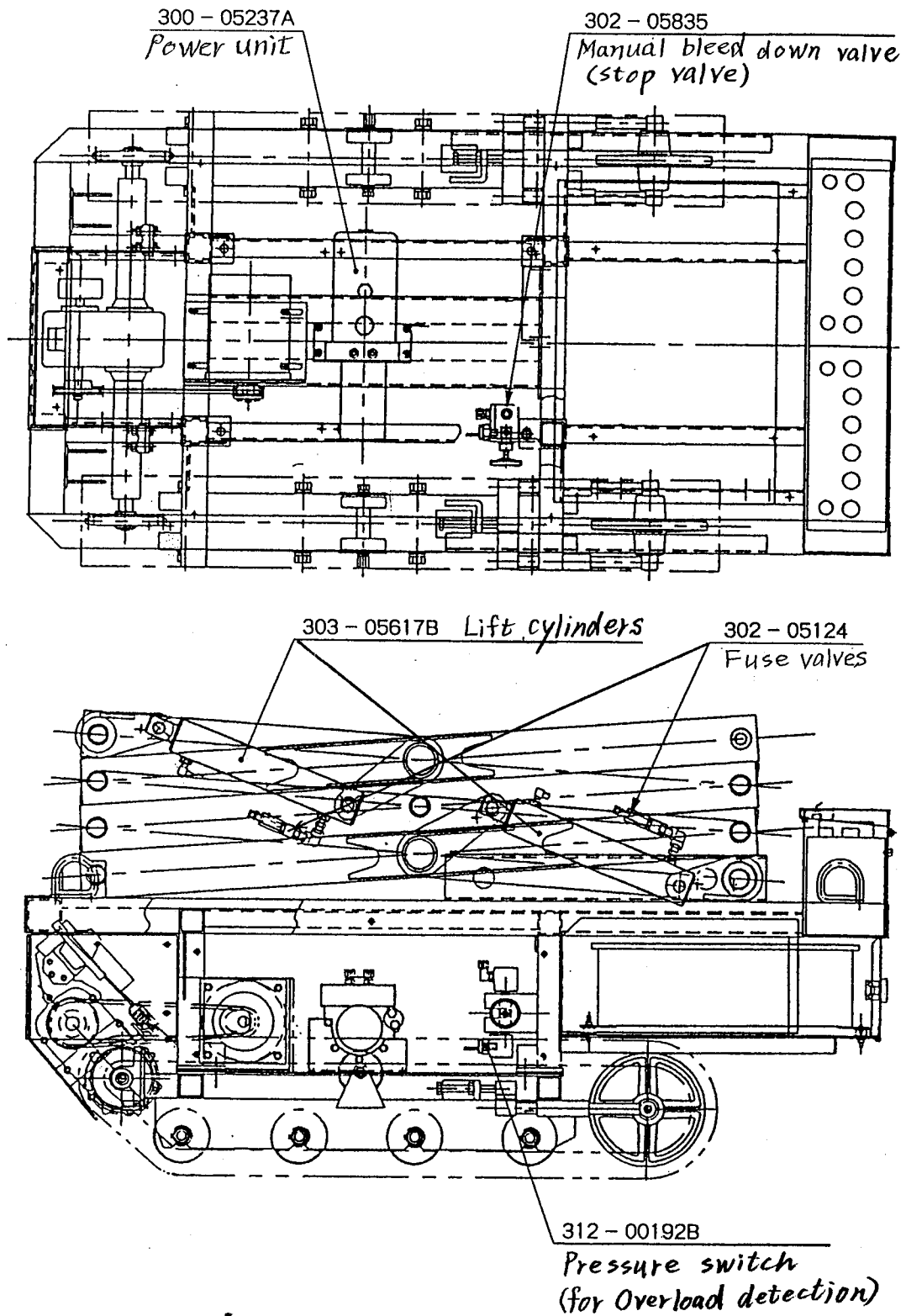


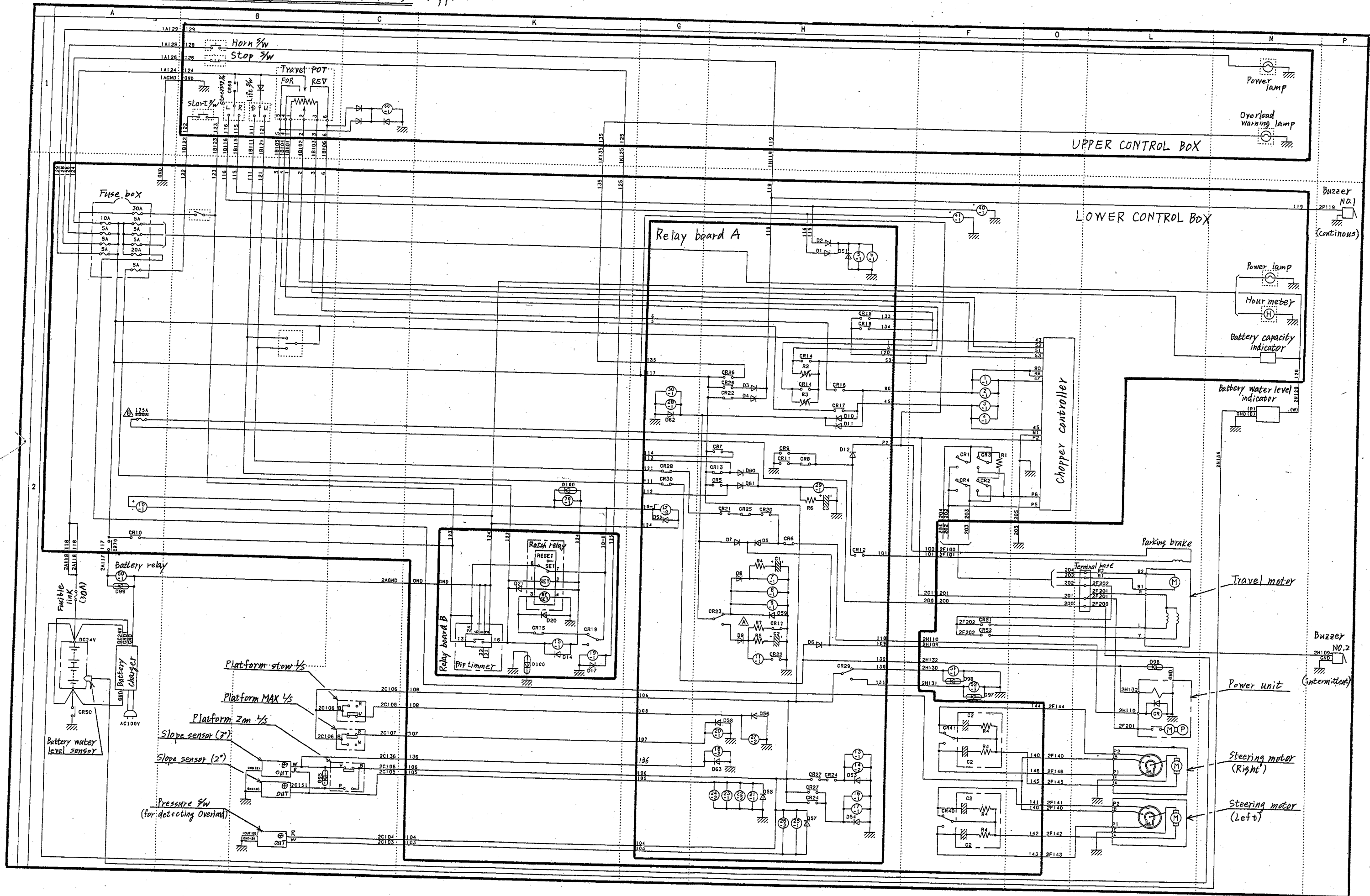
APPENDIX

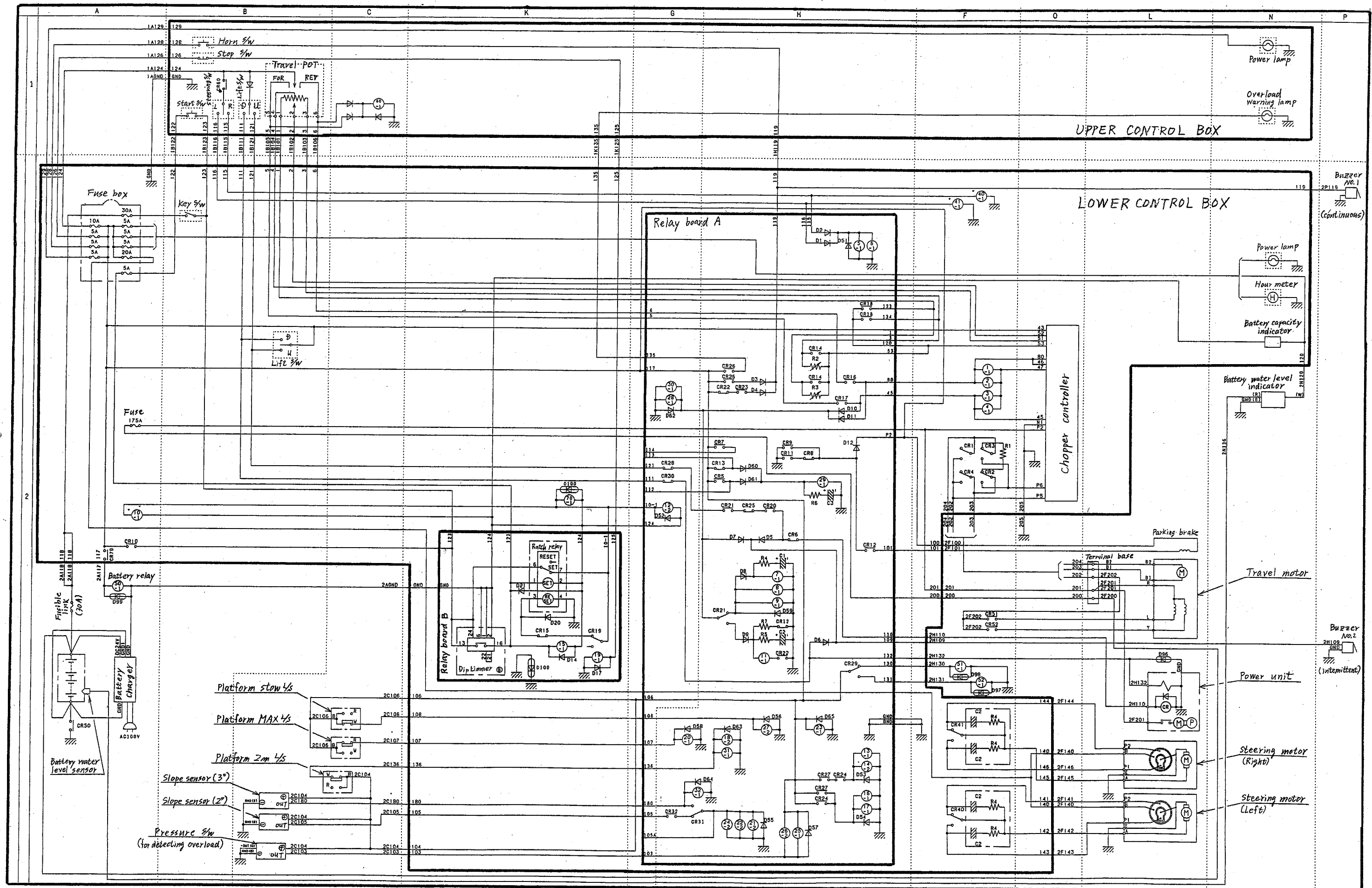
Hydraulic Circuit Diagram (601-08693B)



Locations of Hydraulic component







Electric Wiring chart (7C1-04787-3)

Applied serial NO: ~ 343106

V04-C1049 (for Extension Deck)
V04-C1043 (for STP)

2. 0x4+0. 5x16

1B111	1A129	1H119	1A128	1A126	1A125	1A124	1A123	1A122	1A121	1A120	1A119	1A118	1A117	1A116	1A115	1A114	1A113	1A112	1A111
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111	115	116	121	122	123	124	125	129	128	119	126	135	101	102	103	104	105	106
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121	116	115	111	129	125	124	123	122	101	135	GND	126	119	128	106	105	104	103	102
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111	115	116	121	122	123	124	125	129	128	119	126	135	101	102	103	104	105	106
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111	115	116	121	122	123	124	125	129	128	119	126	135	101	102	103	104	105	106
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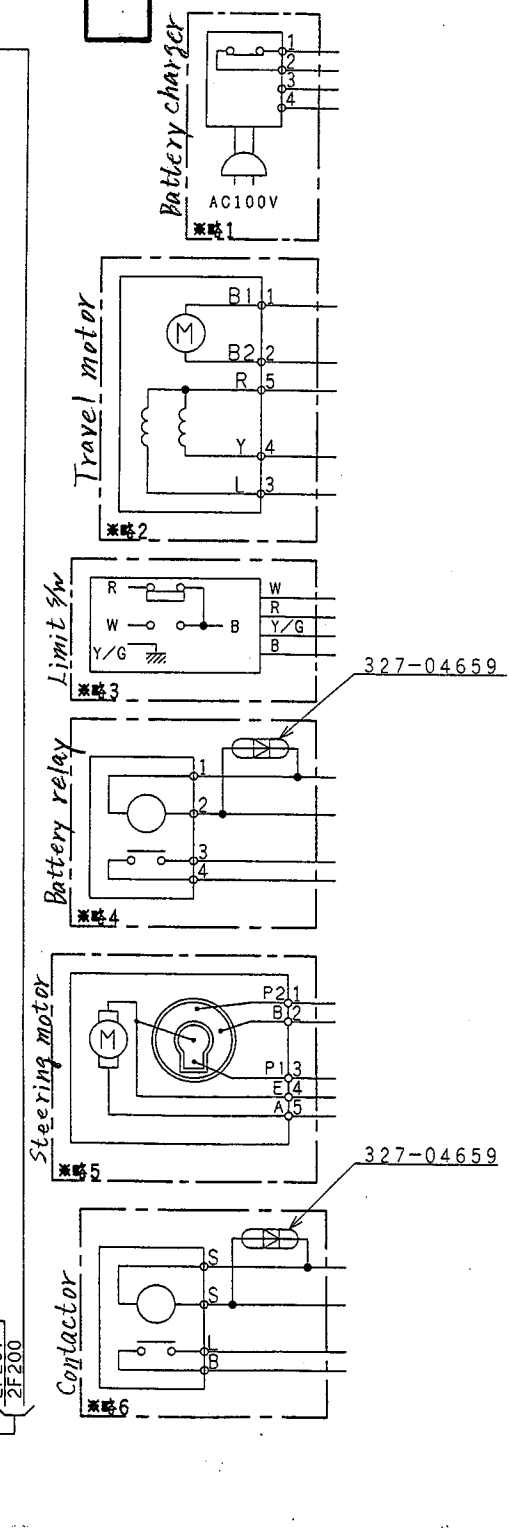
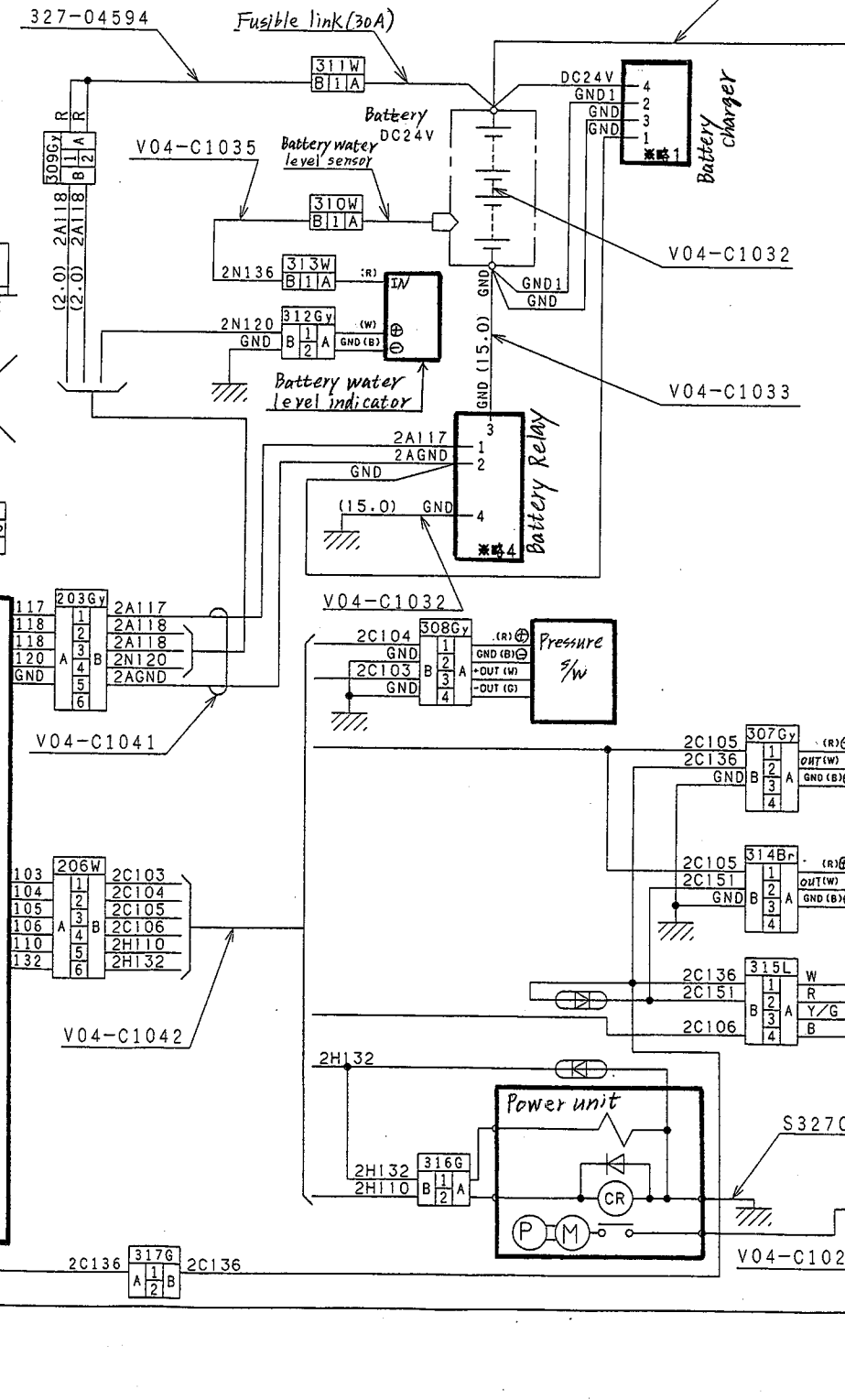
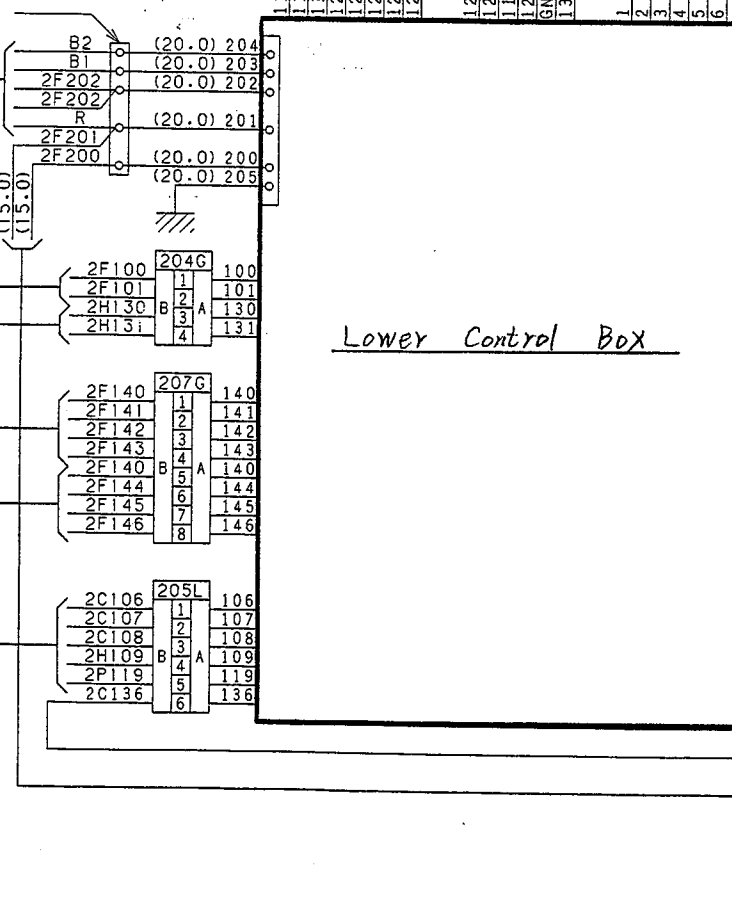
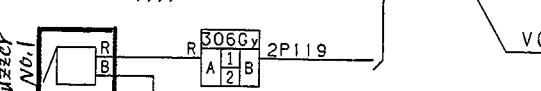
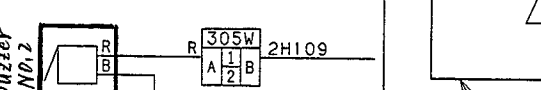
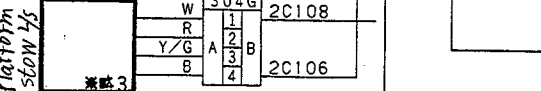
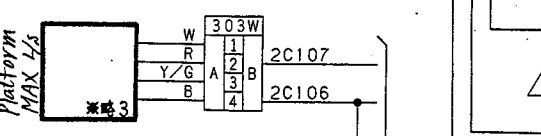
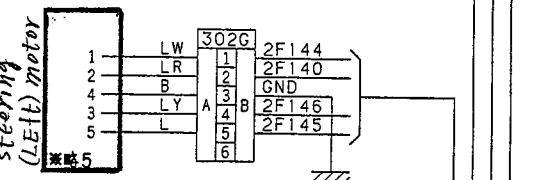
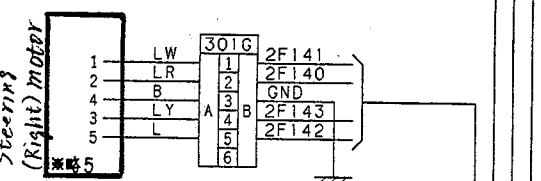
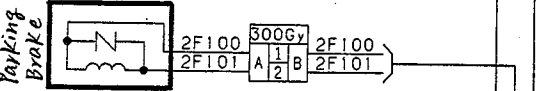
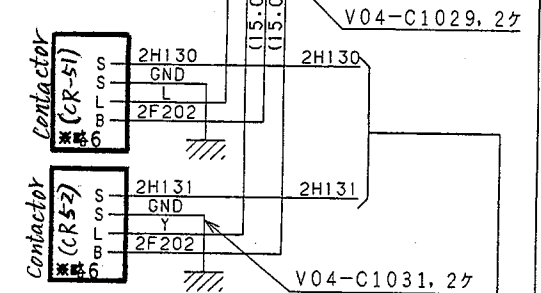
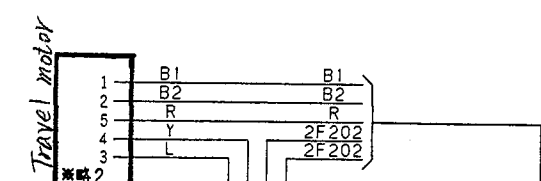
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121	116	115	111	129	125	124	123	122	101	135	GND	126	119	128	106	105	104	103	102
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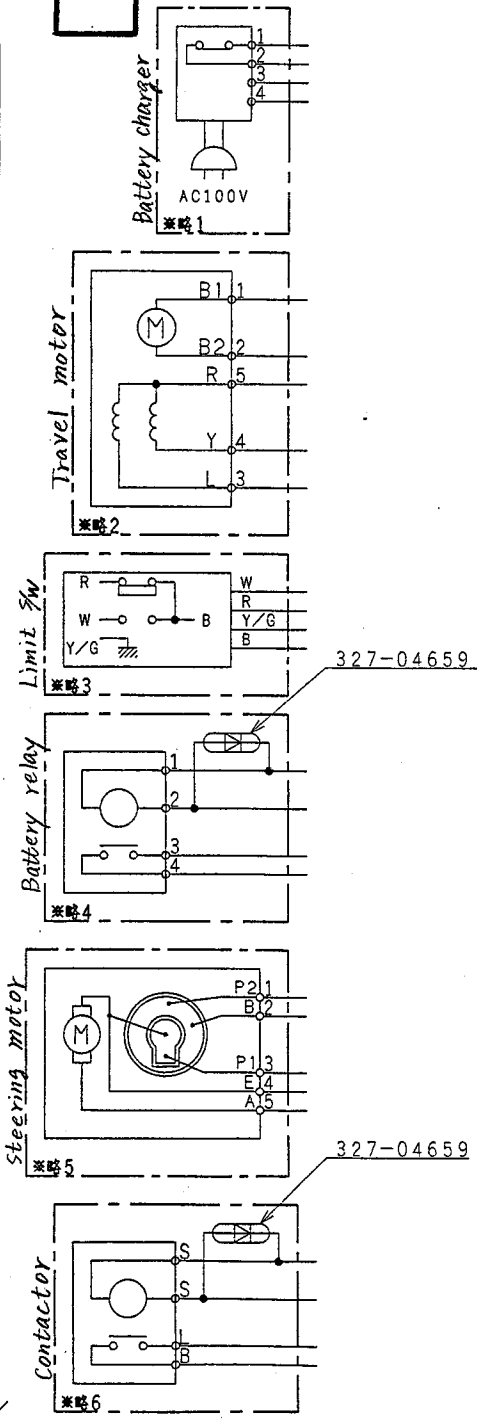
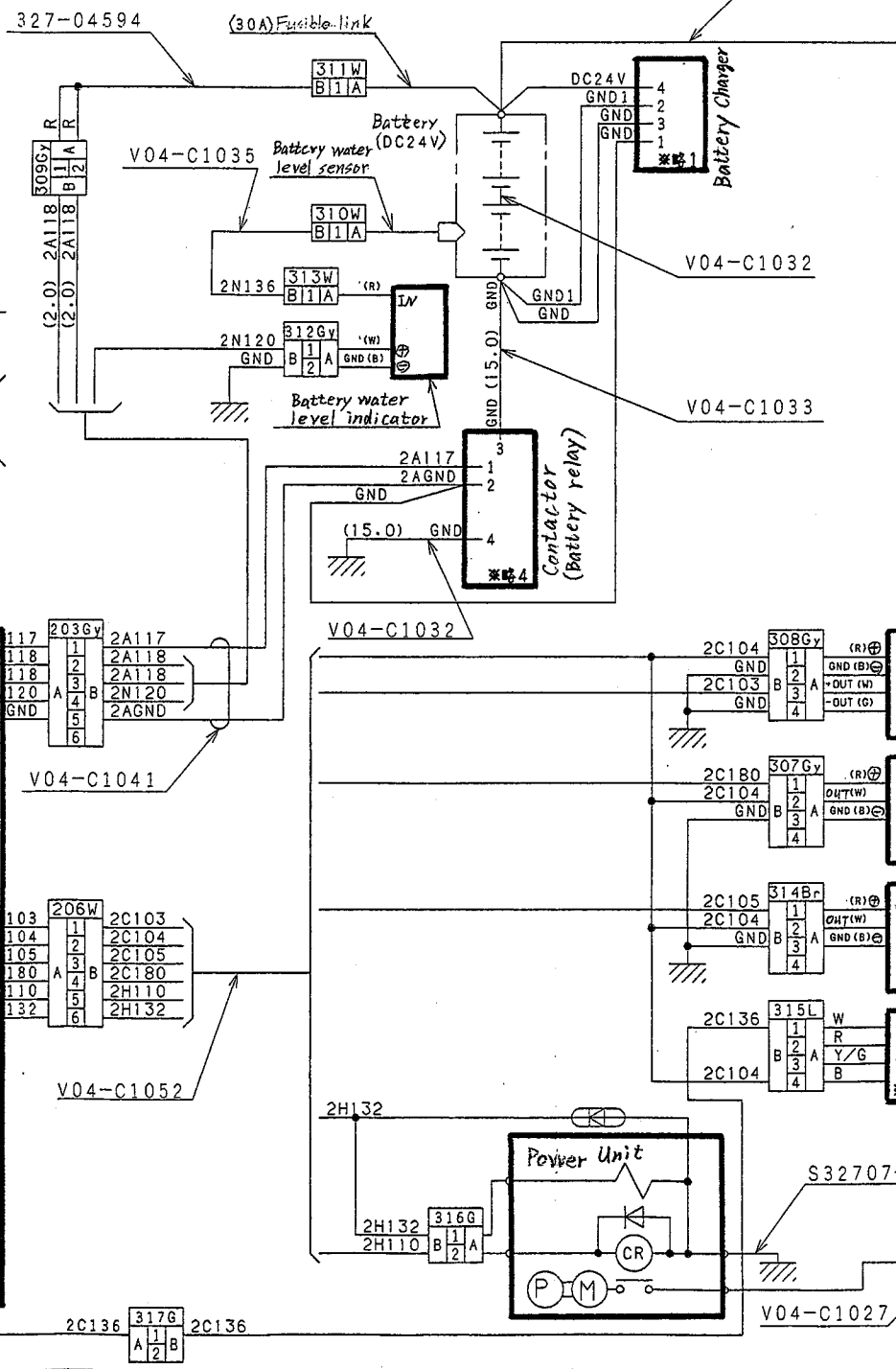
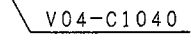
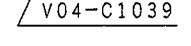
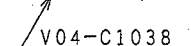
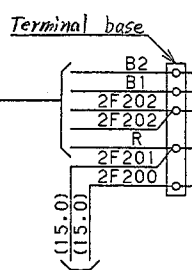
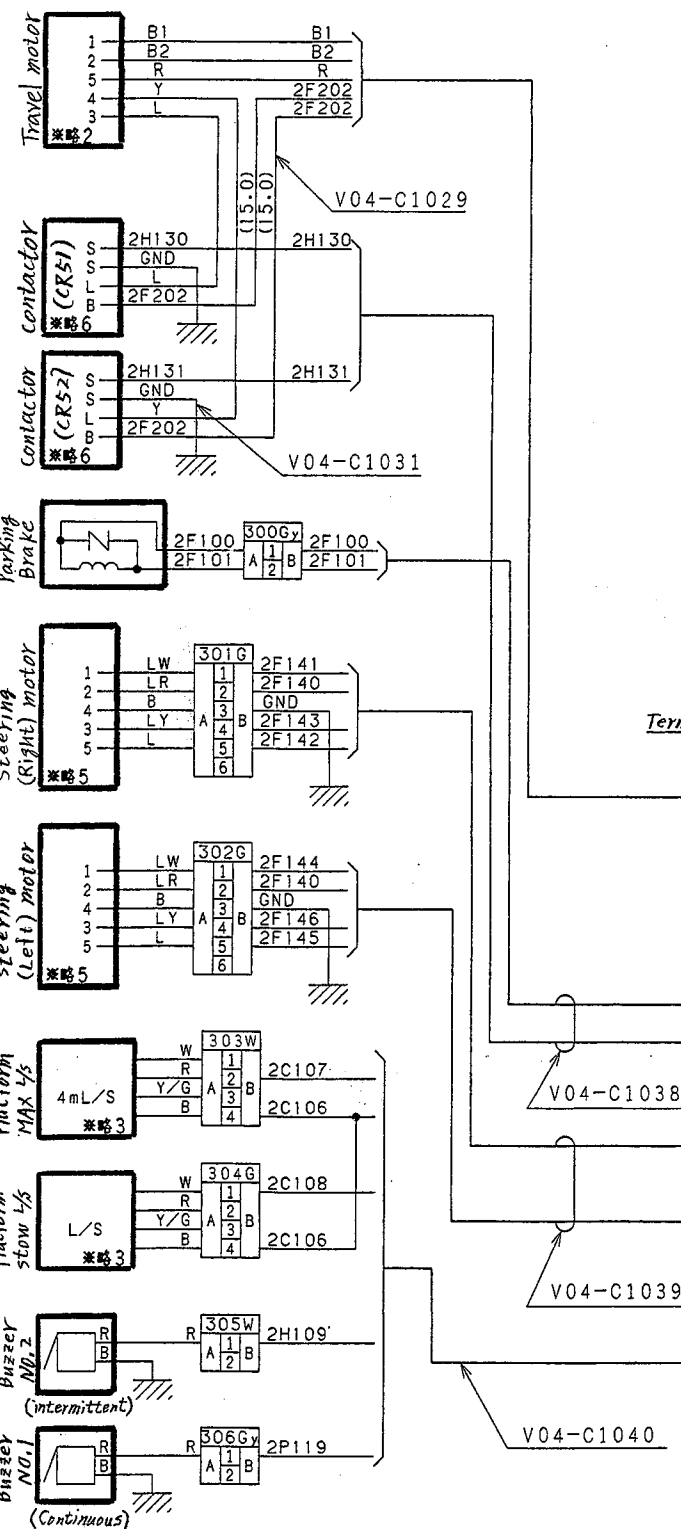
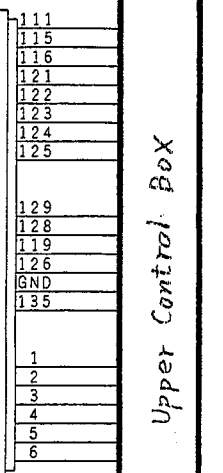
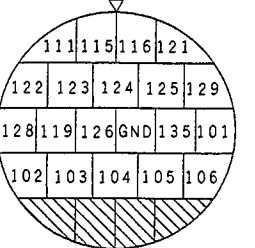
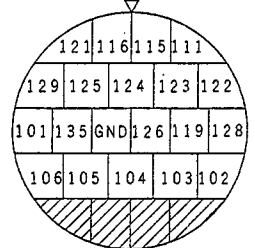
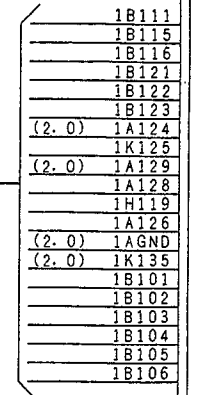
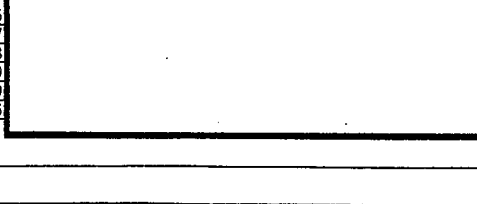
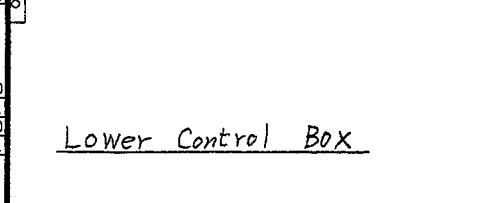
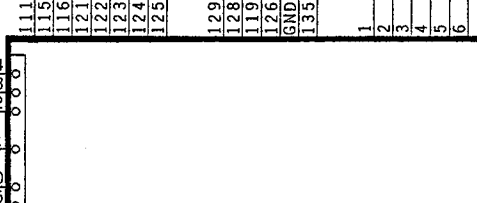
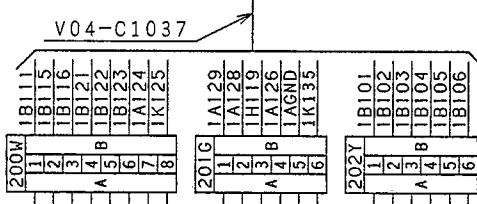
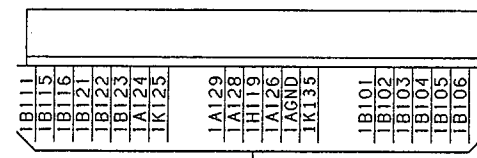
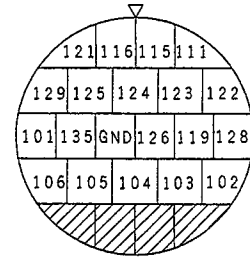
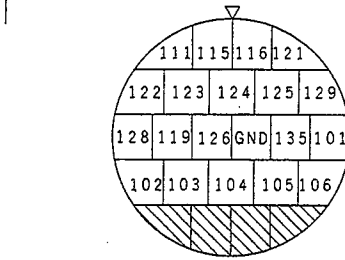
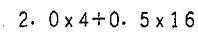
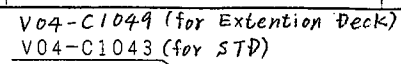
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Upper Control Box

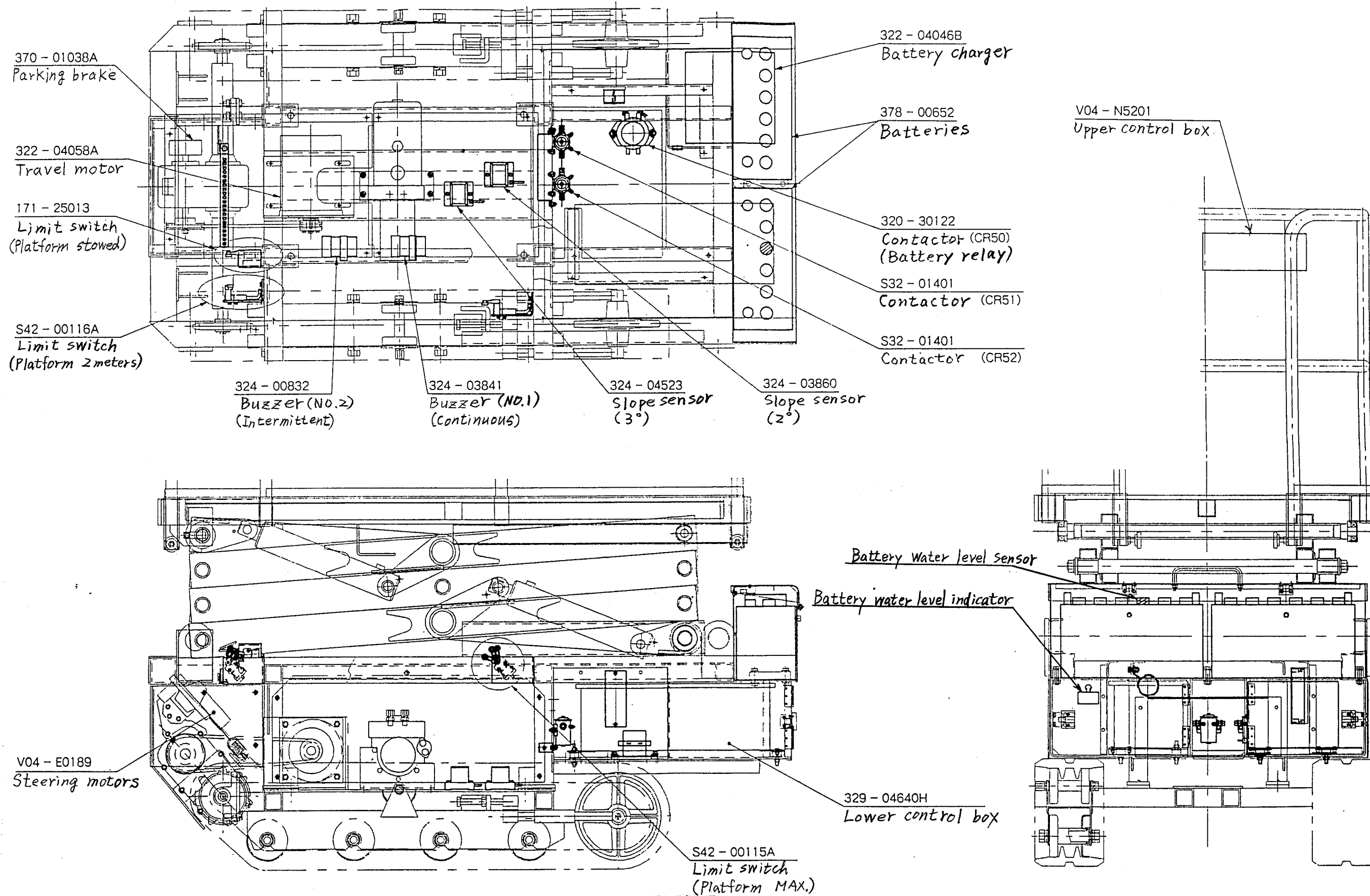


Electric Wiring Chart (7C1-04787-4)

Applied serial No : 343107 ~



Locations of Electric components



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<u>Trouble shooting</u>				
No.	Trouble	Cause	Remedy	
1	Power lamp does not turn on, and no operation is available.	1. AC plugs of Battery charger is connected to AC power source. 2. The "Fuse" for "Key 3W (30A)" or "Stop 5W (5A)" blows off. 3. The cable between "Upper and Lower control boxes" are damaged, or connectors are disconnected. 4. "Fusible link (30A)" at Battery blows off. 5. Battery is flat.	Disconnected AC plugs. Replace fuse. Repair the cable or connect connectors. Replace "Fusible link". Charge batteries.	
2.	Power lamp turns on, but no operation is available.	1. "Fuse (175A)" in Lower control box blows off.	Replace fuse.	
3.	Power lamp does not turn on, in spite of pressing "start 3W".	1. The fuse for "start 3W (5A)" blows off.	Replace fuse.	
4.	No operation is available at Upper control box.	1. The fuse for "Upper control (10A)" blows off.	Replace fuse.	
5.	"Lift UP" operation is not available.	1. Platform is overloaded. ("Warning buzzer" sounds, and "Overload lamp" turns on) 2. The machine is inclined more than 3° due to slope. ("Warning buzzer" sounds) 3. "Manual bleed down valve" is opened.	Unload the platform. Set the machine on level ground. Close the valve. Perform "Lift Up" operation to reset the valve.	
6.	"Lift down" operation is not available.	1. The "Fuse valve" on "Lift cylinder" is actuated.		
7.	Platform creeps down.	1. "Manual bleed down valve" is opened.	Close the valve firmly.	

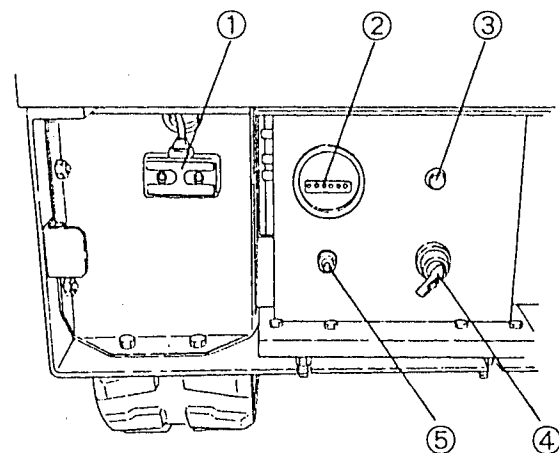
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No.	Trouble	Cause	Remedy
8.	Travel is not available	1. Platform is not stowed, and machine is inclined more than 3° due to slope. (Warning buzzer sounds) 2. Platform is raised more than 2 meters and machine is inclined more than 2° due to slope. (Warning buzzer sounds)	Lower and stow the platform. Lower the platform.
9.	"Lift UP" operation stops, when platform floor height reaches about 2 meters.	1. Machine is inclined between 2° and 3° due to slope. (Warning buzzer sounds, when platform floor height reaches to 2 meters.	Set the machine on level ground.
10.	Parking brake is not applied.	1. "Parking brake release knob" is pulled.	Press in the knob.
11.	Steering operation is not available.	1. The fuse for "steering motor (20A) blows off.	Replace the fuse.
12.	"Lift UP" operation stops, when platform floor height reaches about 3 meters. (Applied only to optional "Extended platform".	1. Platform is extended. ("Warning buzzer" sounds, and "Overload warning lamp" turns on, when "Lift UP" is stopped.	Lower platform slightly.

整番

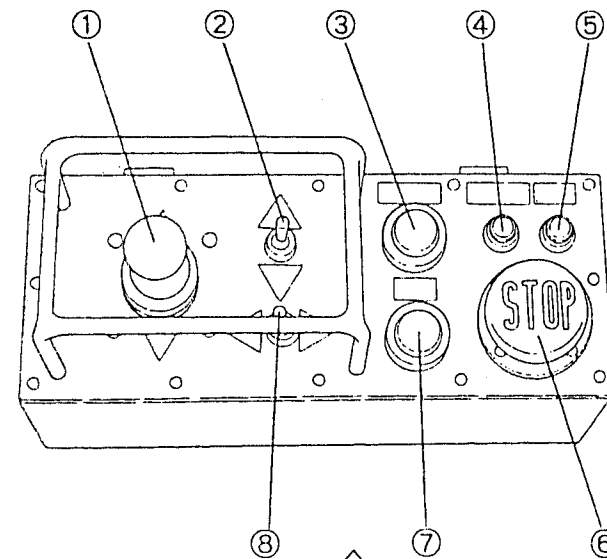
Identifications of "Control devices" and "Fuses"

Lower control

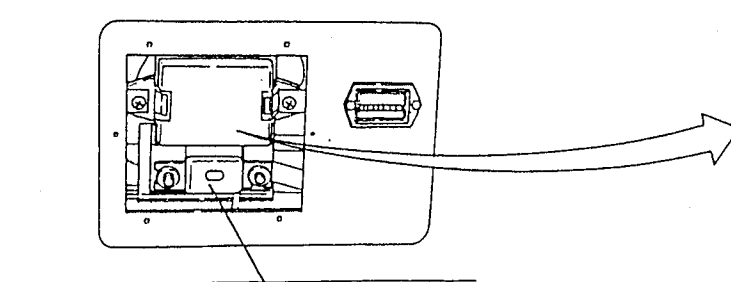
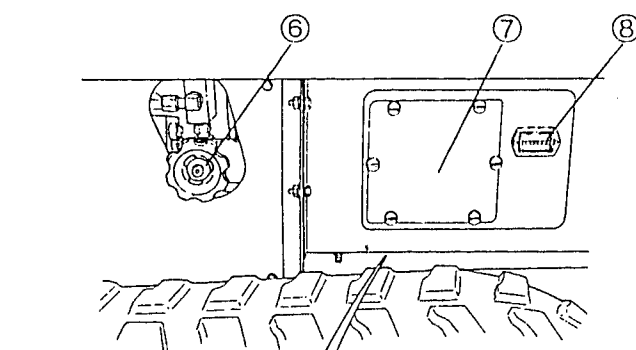
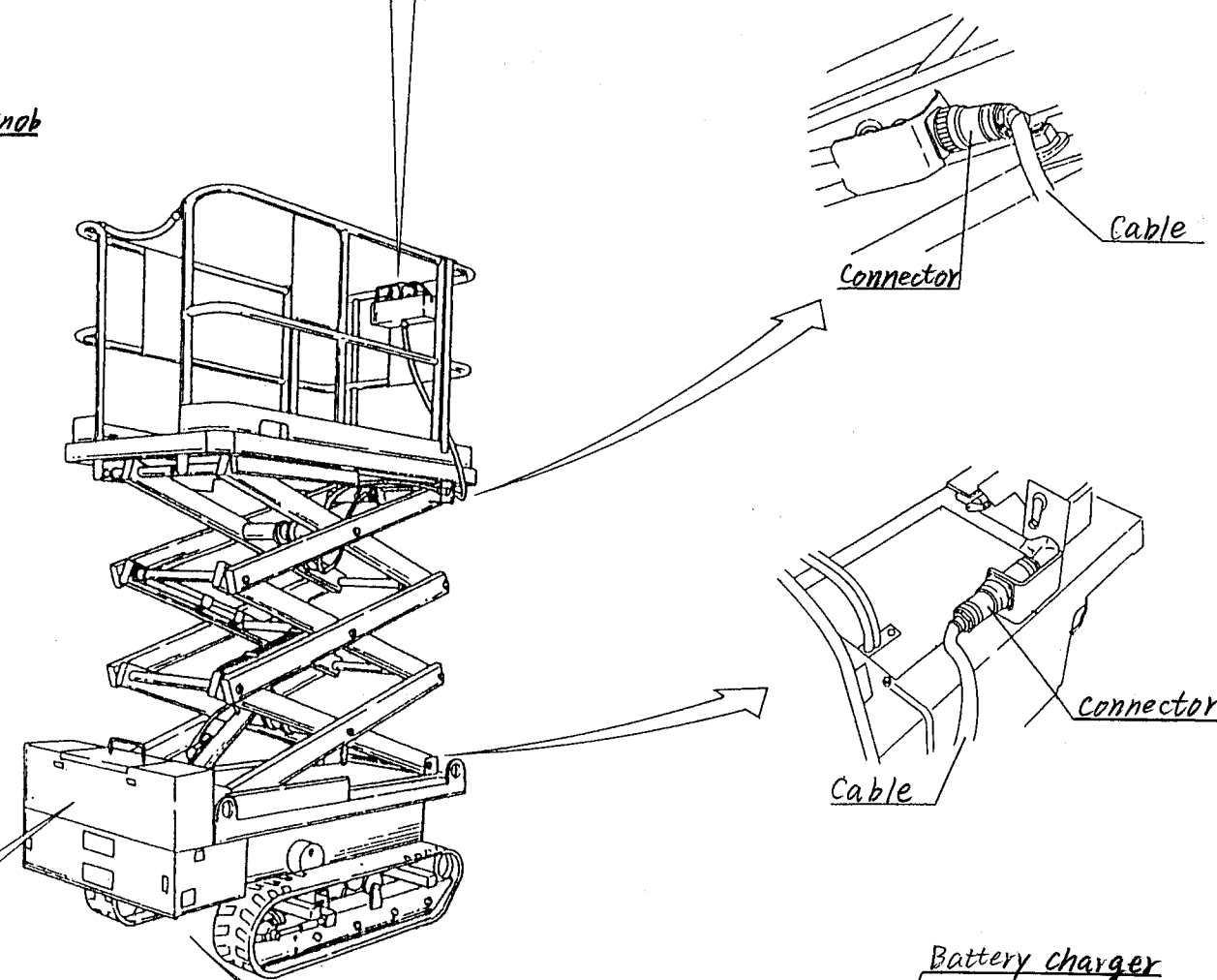
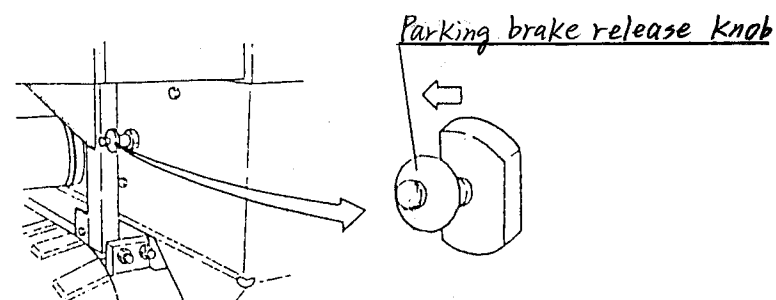


No.	Description
1	Battery water level indicator
2	Battery capacity indicator
3	Power lamp
4	Key switch
5	Lift switch
6	Manual bleed down valve
7	Fuse box
8	Hour meter

UPPER CONTROL



No.	Description
1	Travel control lever
2	Lift switch
3	Horn switch
4	Overload warning lamp
5	Power lamp
6	Stop switch
7	Start switch
8	Steering switch



ヒューズ
(150A)
200A

Spare	Main	
10 A	Upper control	30 A
5 A	stop s/w	Power lamp (Lo)
5 A	Horn s/w	B. capacity indicator
5 A	Power lamp (UP)	Hour meter
		steering motor
		start s/w

