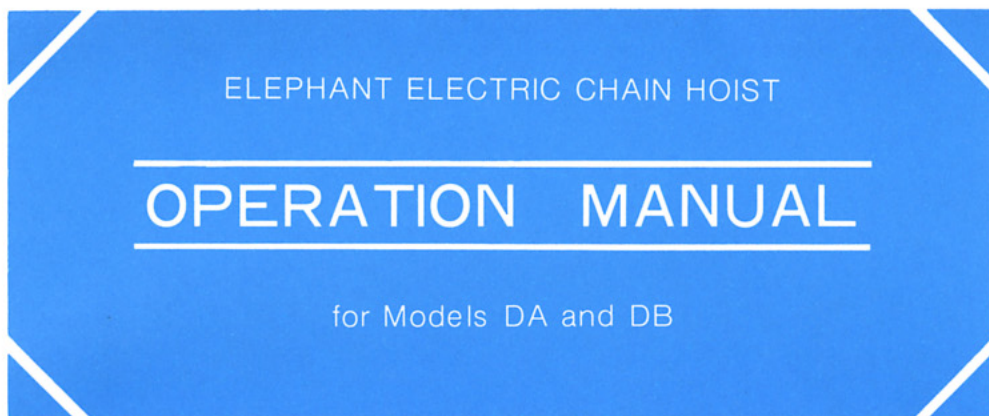


Please read this manual without fail before you install  
your chain hoist.



ELEPHANT CHAIN BLOCK CO., LTD.

Osaka, Japan

(No.2)

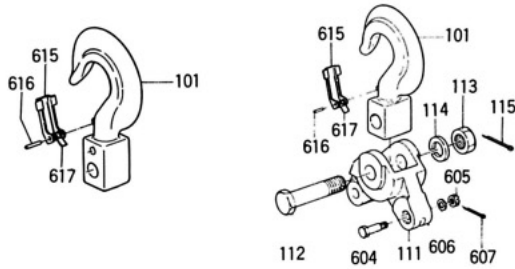
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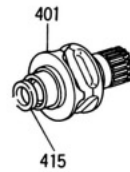
# EXPLODED VIEW AND PARTS NAMES (ASSEMBLY PARTS)

## 1 TOP HOOK ASS'Y



101	Top hook
615	Safety latch
616	Safety latch pin
617	Safety latch spring

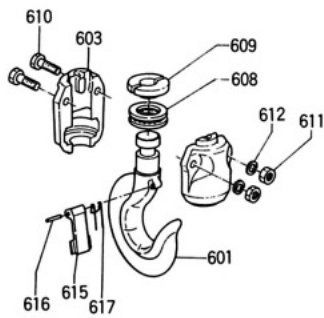
## 7 LOAD SHEAVE ASS'Y



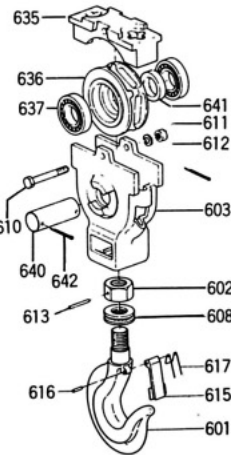
401	Load sheave
415	Oil seal B

101	Top hook
111	Arm
112	Connecting bolt
113	Hex. nut
114	Spring washer
115	Cotter pin
604	Chain anchorage bolt
605	Hex. nut
606	Spring washer
607	Cotter pin
615	Safety latch
616	Safety latch pin
617	Safety latch spring

## 15 BOTTOM HOOK ASS'Y

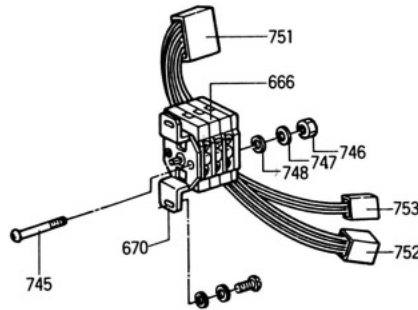


601	Bottom hook
603	Bottom hook cover
608	Thrust bearing
609	Bottom split ring
610	Hex. bolt
611	Hex. nut
612	Spring washer
615	Safety latch
616	Safety latch pin
617	Safety latch spring



601	Bottom hook	637	Bearing
602	Bottom hook nut	640	Idle sheave pin
603	Bottom hook cover	641	Idle sheave collar
608	Hex. bolt	642	Cotter pin
611	Hex. nut		
612	Spring washer		
613	Spring pin		
615	Safety latch		
616	Safety latch pin		
617	Safety latch spring		
635	Bottom hook chain guide		
636	Idle sheave		

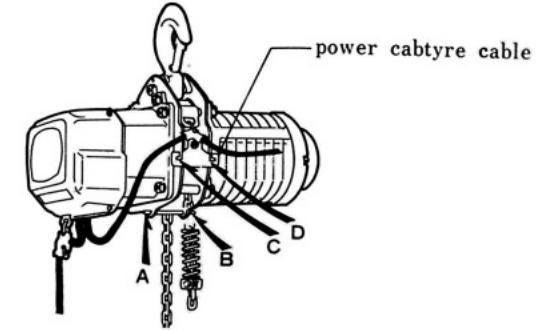
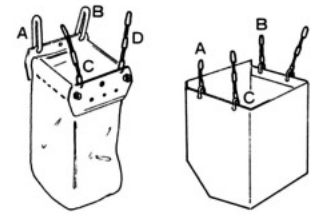
## 16 LIMIT SWITCH ASS'Y



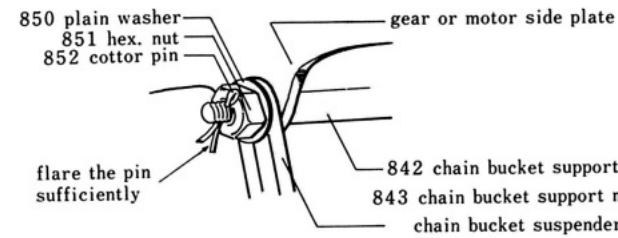
666	Rotary switch
670	Rotary switch board
745	Pan head small screw w/cross hole
746	Hex. nut
747	Spring washer
748	plain washer
751	Receptacle 6P w/wire
752	Receptacle 4P w/wire
753	Receptacle 2P w/wire

# INSTALLATION OF THE CHAIN BUCKET

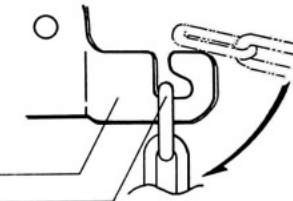
## HANGING TYPE CHAIN BUCKET



Magnified view of parts A and B after the chain bucket is installed

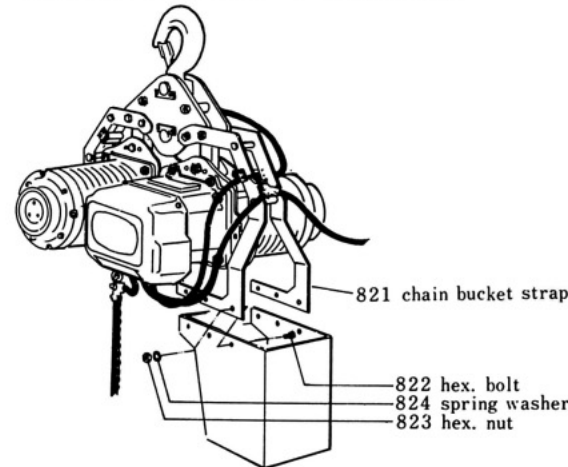


How to install the chain bucket at part D (or C)



The chain hoist is shipped with 850, 851, and 852 attached to 842. The bucket has to be hung on the main body at each of the four places (A, B, C, and D) as shown above. The cotter pin 852 must be flared open to the full to prevent it from coming off. When fastening C and D, make sure that the power cable is not passed between the suspenders.

## BOLTED TYPE CHAIN BUCKET



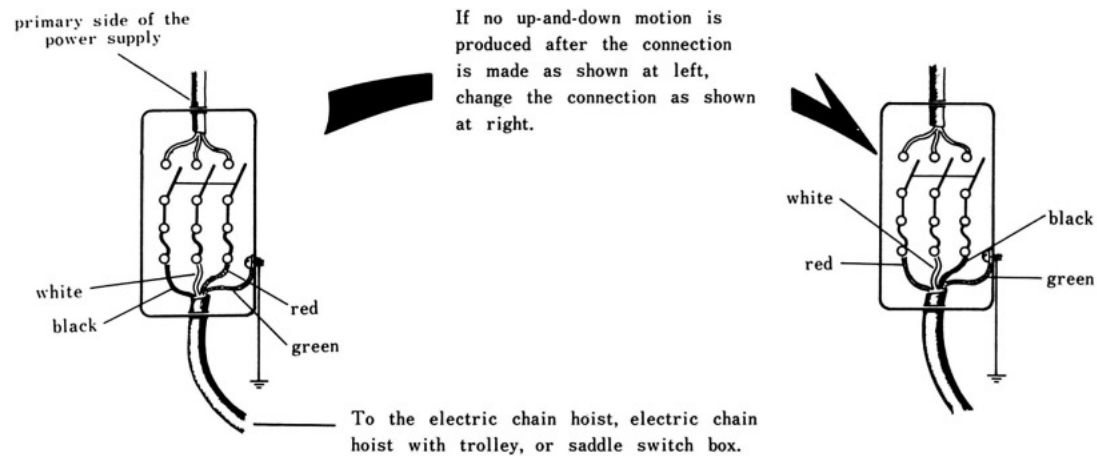
7.5 ton models are each fitted with one chain bucket and 10 ton models each with two chain buckets (The left figure shows a 10 ton model.) One bucket is secured to 821 with six sets of 822, 823, and 824. The straps 821 hold the chain bucket from outside. 822 is thrust out from the bucket and fastened with 823 and 824 on the outside.

\*\* When you change the hoist's load chain to a longer one, please contact us and ascertain that the chain bucket has enough capacity. If not, please change the chain bucket, when you change the load chain, to a proper one we propose.

# POINTS TO NOTE FOR POWER SUPPLY

## \* NEGATIVE PHASE PROTECTION \*

If the push-button control for lifting and lowering is found inoperative (or if only control of the up-and-down motion fails when the hoist is provided with electric trolley or saddle) after plugging in the hoist, the negative phase protection device is at work. This device prevents the chain hoist from operating in the opposite directions to the push button instructions, and also ensures that the overwinding limit switch to check over-lifting and over-lowering functions properly. If no up-and-down motion is produced after the chain hoist is plugging in, in accordance with the left figure below, change the connection of the black and red wires as shown in the right figure.



## \* POWER SWITCH AND FUSE

The power switch is to be used exclusively, not to be shared with any other electric apparatuses.

Electric chain hoist and electric chain hoist w/geared or plain trolley  
-2 - pushbutton type -

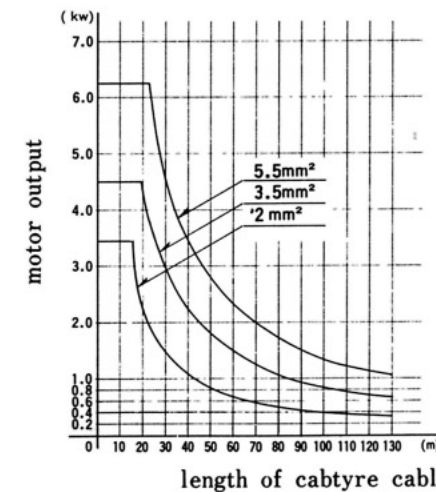
Models	lifting motor -(kw) (3 phase 200V)		power switch capacity (A)	fuse capacity (A)
	50Hz	60Hz		
0.25	0.37	0.45	15	10
0.5 · 1W	0.67	0.8	20	10
1S · 2W	1.25	1.5	20	15
1.5 · 2S · 2.5 3 · 5 · 7.5	2.5	3.0	30	30
10	2.5 × 2 units	3.0 × 2 units	60	50

Electric chain hoist with electric trolley  
-4 - pushbutton type -

Models	lifting motor	traversing motor -(kw) (3phase 200V 50Hz)	power switch capacity (A)	fuse capacity (A)
0.25	refer to the table above	0.18	20	10
0.5		0.18	20	15
1 W		0.4	20	15
1 S · 2 W		0.4	30	30
1.5 · 2 S		0.4	60	50
2.5 · 3		0.75	60	50
5		0.75	60	50
7.5		0.75 × 2 units	60	50
10		0.75 × 2 units	100	75

Both the power switch and the fuse capacities shown in the above tables may serve as standards but are not in all cases appropriate. Operate your chain hoist with a cargo equivalent to the working load hung on it (push the Lift and Traverse buttons simultaneously in the case of a 4 - pushbutton type) and check the fuse to see if it exhibits anything unusual. If the fuse should blow out, upgrade the fuse capacity by one rank.

## \* THICKNESS OF THE POWER SUPPLY CABTYRE CABLE \*

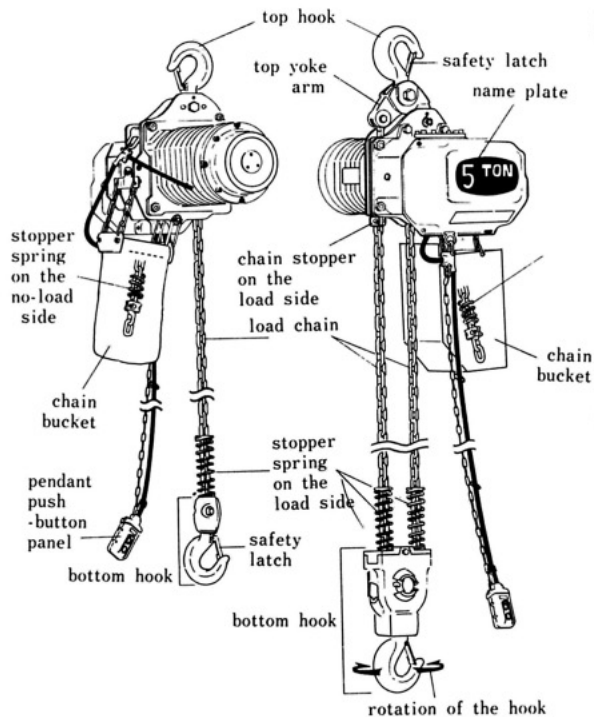


The thickness of the power supply cable, which is measured in square millimeters, needs to be proportionate to both the motor output and the length of the cable. From the left diagram you can find the relationship between the motor output and the cable length for sectional area of 2mm<sup>2</sup>, 3.5mm<sup>2</sup>, and 5.5mm<sup>2</sup> cables. Locate on the vertical axis the point corresponding to the motor output, i.e., the total output of the lifting motor and traversing motor for a 4 - pushbutton controlled electric chain hoist with electric trolley, or the output of the lifting motor for a 2 - push - button controlled model.

Then draw a horizontal line there from the left to the right and locate the point where the line meets each curve. The abscissa of the point represents the limit to the length within which the corresponding cable must be used.



# CHECKING BEFORE STARTING YOUR DAILY WORK



## 1. TOP HOOK AND TOP YOKE

Check to see if:

- \* The safety latch is in order and functions perfectly.
- \* The hook and its associate parts exhibit any visible damage or deformation.
- \* The idle sheave, if provided, rotates smoothly and is in good mesh with the load chain.
- \* The set-bolts, nuts, and cotter pins are loose or missing.

## 2. BOTTOM HOOK

Check to see if:

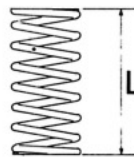
- \* The safety latch is in order and functions perfectly.
- \* The hook rotates lightly and smoothly.
- \* The hook and its associate parts exhibit any visible damage or deformation.
- \* The bolts and nuts are loose or missing.
- \* The idle sheave rotates smoothly and is in good mesh with the load chains in the case of a model with two or more falls.
- \* The hook block is stained with much foreign matter.

## 3. STOPPER SPRINGS (BOTH LOAD SIDE AND NO-LOAD SIDE)

\*Reduction in the free length of stopper springs. For safety and perfect functioning of switch springs they need to be replaced with new ones when their free length becomes smaller than the limit value shown in the table below.

single-speed type			dual-speed type		
Models [ton]	initial free length [mm]	limit [mm]	Models [ton]	initial free length [mm]	limit [mm]
0.25	95	80	0.25	95	80
0.5	135	120	0.5	135	120
1S	145	130	1S	170	150
1W	135	120	1W	135	120
1.5	170	150	1.5	195	170
2S	172	160	2S	180	162
2W	145	130	2W	170	152
2.5	172	160	2.5	180	162
3	170	160	3	195	170
5	172	160	5	180	162
7.5	172	160			
10	172	160			

free length L : overall length of a stopper spring under no load.



distortion



\* Distortion of stopper springs. Each stopper spring needs to be

replaced with a new one if so distorted that it catches on the load chain and fails to fall smoothly down to the hook block.

## 4. NAME PLATE

- \* Check the name plate to see if it is easy to read. If it is contaminated, clean it up. It is good practice to keep it always clean.

## 5. CHAIN BUCKET

Check to see if:

- \* The chain bucket is damaged. (There should be no danger of the load chain falling off.)
- \* The parts that serve to hang the chain bucket are correctly fitted.
- \* There is dust or water collected in the chain bucket.
- \* The stopper spring on the no-load side is free from reduction in the free length or distortion. (Check by measuring the free length of the spring.)

## 6. LOAD CHAIN

Check to see if:

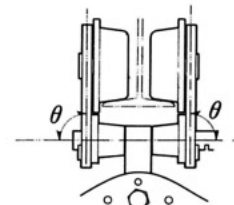
- \* The load chain is oiled enough to the full extent.
- \* The load chain exhibits any noticeable damage.
- \* The load chain is looped or kinked.

## 7. PENDANT PUSHBUTTON PANEL

Check to see if:

- \* The case exhibits any crack or fracture.
- \* Every pushbutton can be pressed smoothly or the pressed button returns upward smoothly when it is released.
- \* Every pushbutton is stained with much foreign matter.

## TROLLEY



Check to see if:

- \* The side-plates are free from deformation.
- \* The angle  $\theta$  in the figure at left is 90 degrees.
- \* The trolley produces noises when it traverses. If it produces any noise, oil the trolley.
- \* Any bolt or nut is loose or missing.
- \* The wheel, if toothed, exhibits a collection of dust at the teeth.

## ENTIRE MACHINE (FINAL CHECK)

- \* Check to see if the machine moves in the correct direction according to the instruction from the push-button panel.
- \* Check to see how long the hook moves until it stops after each pushbutton is released.
- \* Check to see if the overwinding limit switches for lifting and lowering function correctly.
- \* Check to see if the machine produces any unusual noise in each operational mode. (It is normal if the machine produces clicks during lifting but not during lowering.)

# PERIODIC CHECK AND REPLACEMENT OF PARTS

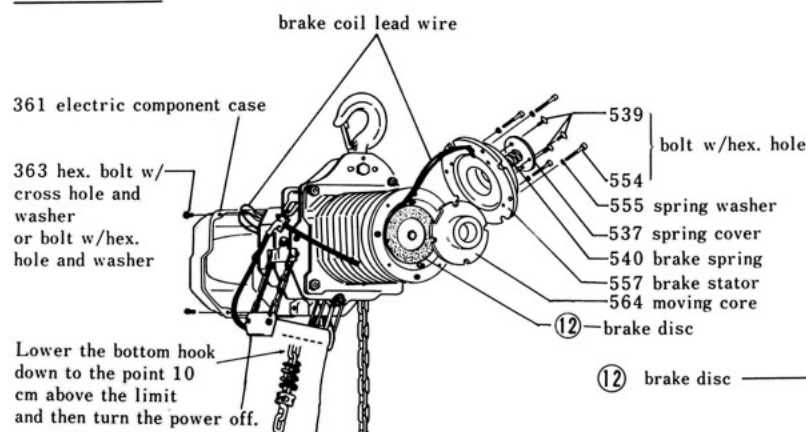
## IMPORTANT !

The periodic check requires the machine to be disassembled. Before proceeding to disassemble the machine, be sure to take the following steps for safety.

1. Unload the bottom hook.
2. Lower the bottom hook down to a height, about 10cm above the lower acting point of the overwinding limit switch.
3. Turn the power off.

1. **MOTOR BRAKE :** Check every six or less months or when the brake begins to slip.

Figure 1

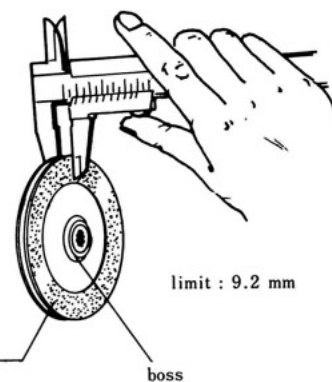


- \* Overall thickness measurement of the brake disc ass'y 12 \*
- The overall thickness of the brake disc ass'y 12 must be greater than 9.2 mm when measured as shown in Figure 2 above. Replace it with a new one if the thickness is found smaller than the limit. (initial thickness: 10mm)

### Procedure of disassembly

1. Remove 539, 537, and 540 in this order.
2. Remove 363 and 361.
3. The lead wires of the brake coil are sufficiently long to make the disassembly of the motor brake easier. It is not easy to draw them toward the motor if they are tucked in the electric component case. Therefore, adjust their position and posture so that they can be easily moved.  
Note: The crimp-type terminal of the cable does not need to be removed. Never touch any bare part of the cable, since it may hold static electricity even when the power is off.
4. Remove 554 and 555 and pull off 557 together with the cable. Be careful not to drop 564. Put 557 on the motor case, not suspending it from the lead wire of the brake coil.
5. Remove the brake disc ass'y 12 from the motor shaft, and measure its overall thickness as shown in Figure 2.
6. The ball bearing 252 has been greased. After the brake disc set is removed, visually check it to see if there is the trace of grease on it.

Figure 2



### Procedure of reassembly

1. Set the brake disc set 12 -- the one that has passed the periodic check or a new one -- on the motor shaft. Be careful then to put the set so that the side with a boss, which is shown in Figure 2, faces the motor case. (It is O.K. if the boss is invisible when the set is placed as shown in Figure 1.)
2. Set 564 in place.
3. Set 557 in place. At this time pull the brake coil lead wire firmly from the electric component side to prevent them from being caught.
4. Secure 557 with 554 and 555.
5. Fasten 361 back with 363. Take care not to have the lead wires, etc. caught.
6. Reassemble 540, 537, and 539 in this order.

## 2. LOAD CHAIN : Check every month or more frequently.

Figure 3

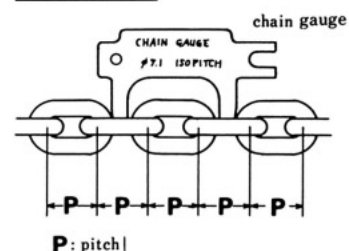


Figure 4

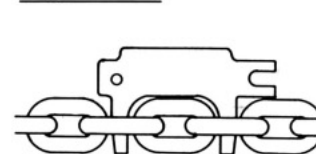
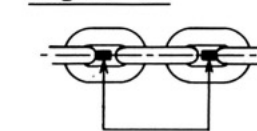


Figure 5



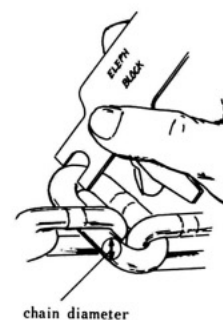
correct chain gauge position (hatched parts)  
Align the legs of the chain gauge with the center line (broken line) and insert them into the links.

### \* Pitch measurement with a chain gauge \*

Every load chain needs to be checked not in part, but to the full extent carefully. Check the chain for an increase in pitch by inserting a chain gauge at intervals of about 50cm (See Figure 3.). Where the pitch is within the allowable limit, the gauge's legs cannot go through the links (See Figure 3.). But the legs go through the links if the pitch exceeds the limit (See Figure 4.). If a pitch is found to be very close to the limit, check the neighboring pitches at shortened intervals to see if any link allows the gauge's leg to go through it. If the gauge's leg goes through any one link, the load chain must be replaced with a new one.

### \* Link chain diameter measurement with chain gauge \*

Figure 6



The load chain is dangerous if its links are slim due to corrosion. If the chain diameter of any link gets smaller than the allowable limit, replace the load chain with a new one. Set the chain gauge on a link as shown in Figure 6. If the gauge's mouth fits on the link, it indicates that the chain diameter is below the allowable limit. Replace the load chain with a new one.

Table 1 models, normal chain diameter, and pitch (mm)

models	chain dia (mm)	pitch (mm)	1 S, 2 W	7.1	21
0.25	5.6	17	1.5, 3	9.5	28.6
0.5, 1W	6.3	19	2 S, 2.5 3, 5, 7.5, 10	11.2	34

### \* Visual check of the load chain \*

Any load chain has to be replaced with a new one if exhibits any flaw, deformation, or fused foreign matter. Also, any load chain has to be replaced with a new one if it shows a noticeable indication of heat influence.

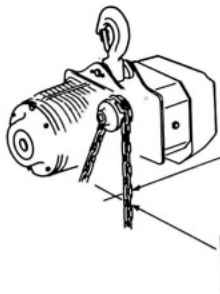
### Replacement of the Load Chain \* POINTS TO PAY ATTENTION \*

The following points must be observed when a load chain is replaced.

Continued on next page

# PERIODIC CHECK AND REPLACEMENT OF PARTS

Figure 7



The welded joints of the links being parallel to the chain hoist's body can face any way.

The welded joints of the links perpendicular to the chain hoist's body must not face the load sheave.

The welded joints of the links which are perpendicular to the chain hoist's body must face opposite to the load sheave (See Figure 7).  
If the number of load chain's fall is two or more, the first link to be secured with a chain stop pin must be perpendicular to the chain hoist's body so that the load chain may not kink.

### 3. CHAIN STOP PIN: Check every month or more frequently

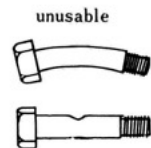
-- this check is not needed for any model with a single load chain

Figure 8



not only heavy but difficult to check the load chains for kink.

Figure 9



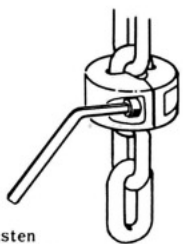
The end of the load chain on the load side is being secured to the top yoke arm with a chain stop pin for 2-fall models and to the hook block for 3-fall models. This pin is taken off and checked for deformation. This check has to be done after securing a good support for the weights of the hook block and load chains, otherwise there is a danger of their falling off.

For 2-fall models (Figure 8) it is easier to carry out the check after lifting the hook block as close to the upper limit as possible, and after laying the bottom hook block on the ground for 3-fall models. If the chain stop pin shows a clearly visible bend or deformation at the point in contact with the load chain, it must be replaced with a new one (See Figure 9). Take care not to make a kink in the load chain when the pin and load chain are restored to place.

Observe as well that if the same pin is used again, it should be placed so that it may come in contact with the load chain at exactly the same spot as before.

### 4. CHAIN STOPPER: Check every month or more frequently.

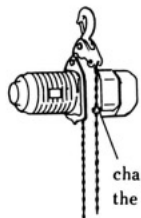
Figure 10



Fasten tight with a wrench.

Secure the stopper to the 3rd link from the end on the no-load side.

Figure 11



chain stopper on the load side

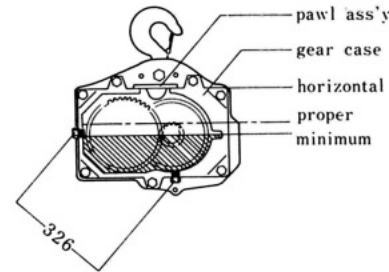
Check the chain stopper every month to make sure its bolts w/hex. hole are not loose. On the no-load side the chain stopper must be fixed to the 3rd link from the end of the load chain (See Figure 10). The chain stopper is also provided on the load side only for 2-fall models; and it must be secured to the link specified for each model in Table 2.

Table 2 Chain stopper position on the load side

1W	8th link from the end	3	9th link from the end
2W	8th link from the end	5	7th link from the end

### 5. GEAR OIL: Check every six or less months.

Figure 12



Gear oil is required to have reached at least the height of the side oil plug (326) of the gear case when the top of the gear case is horizontal.

For oil replacement unscrew the bottom oil plug (326) to drain the case, screw it back on, remove the pawl ass'y and refill the case with new oil. However, the mechanical brake does not work while the pawl ass'y is off. Therefore the replacement must be done under no load and when the motor brake has been completely set up.

The oil grows bad before the gears get smooth in the beginning. Therefore the gear oil needs to be replaced after about six month's use. After that, it is sufficient to supply the deficiency unless there is unusual change in quality.

Table 3 Gear oils recommended

Genuine oil	Shoseki AR-180
Alternatives	Shell Tonna oil T-180 Maruzen Swaway S-180 Mitsubishi Diamond Slideway 180

Table 4 Oil supply required (proper amount in liter)

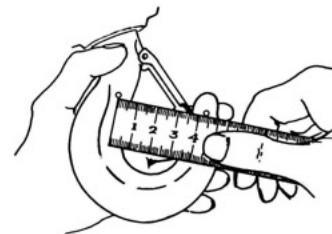
	0.25	0.5, 1W	1S, 2W	1.5, 2.5, 2.5, 3, 5, 7.5	10
single speed type	0.75	0.8	1	3	3 x 2
dual speed type	0.75	0.8	1.3	3.5	-

### 6. HOOKS: Check every month or more frequently.

Points to observe for both the top and bottom hooks

\* Measurement of the opening of each hook \*

Figure 13



The opening of a hook becomes wider if it is loaded with a weight far exceeding the working load or its tip is heavily loaded.

Hooks thus widened in opening need to be replaced with new ones because they have already lost adequate strength and impact absorbency which are essentially required of them. Each hook has two projections designed to serve for checking its opening. Measure the distance between these projections for each hook in periodic checking, and if the measurement is over the limit, replace

the hook with a new one. (See Figure 13)

Hooks have been manufactured by heat-treating hot-forged material in order for them to have the optimum characteristics. Accordingly, they are slightly different from each other in dimensions. Hence, they can be checked more correctly for their opening's size if the checking is made based on the initial value they showed before put in use. (See Table 5)



Table 5 Distance between two projections on a hook (center-to-center distance)

working load (t)	0.25	0.5	1	1.5	2	2.5	3	5	7.5	10
manufacturer's standard (mm)	40±1	47±1	54±1	70±1	70±1	70±1	75±1	90±1	120±1	120±1
measurement before use (mm)										
limit (mm)	42	49.5	57	73.5	73.5	73.5	79	94.5	126	126

or 1.05 times the measurement before use

It is very dangerous to re-use any wide-opened hook by tempering it. It must be put out of use and replaced with a new one.

**\* Flaw, wear, and distortion of hooks \***

Hooks showing such defects as shown in Figure 14 (1), (2), (3) need to be replaced.

Figure 14

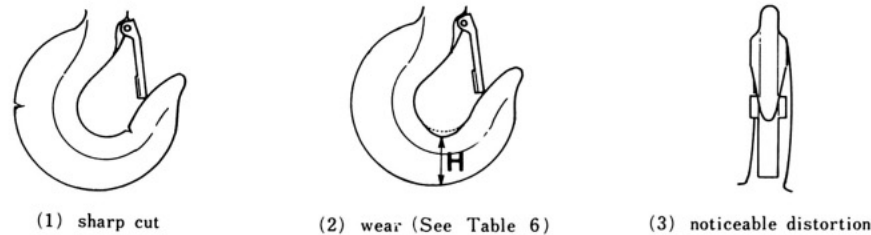


Table 6 Wear limit of hooks

working load (t)	H measured before use (mm)	limit (mm)	working load (t)	H measured before use (mm)	limit (mm)
0.25	18	16.2	2.5	35	31.5
0.5	19	17.5	3	49	44.1
1	25	22.5	5	53	47.7
1.5	35	31.5	7.5	62.5	59.3
2	35	31.5	10	62.5	59.3

**\* Idle sheave \***

— One-fall models have no idle sheave.

Figure 15



Check the shape of shaded areas.

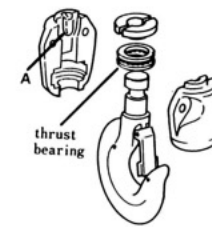
If the idle sheave is stained with much foreign matter, disassemble and clean it. Then check it to see if:  
 1. Its bearing and shaft exhibits anything unusual.  
 2. Foreign matters have collected in its pocket section.  
 3. Its projections are deformed. (See Figure 15)  
 Be sure to grease up every rotating part when reassembling the idle sheave.

If the idle sheave is kept clean, visually check its projections for deformation.

points to observe for bottom hooks

**\* Thrust bearing \***

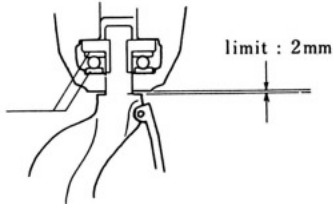
Figure 16



If the rotation of the hook is not smooth or the gap shown in Figure 17 is over 2 mm, take it apart and replace defective components with new ones. The thrust bearing alone can be replaced in some types, but be careful not to mount it upside down. The side with a larger bore must face downward. Also, if the bottom hook cover exhibits a deformation outstanding enough to be visually ascertained, at the part indicated by the arrow A in Figure 16, replace it with a new one.

Figure 17

Note:  
The bores differ from each other.

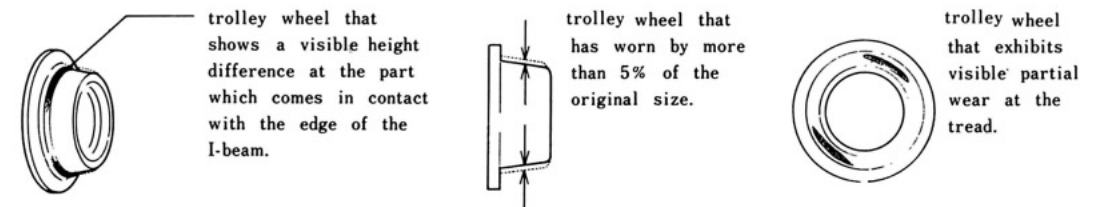


**TROLLEY**

**7. TROLLEY WHEELS: Check the wheels for wear every six or less months.**

Such trolley wheels as shown in Figure 18 need to be replaced with new ones.

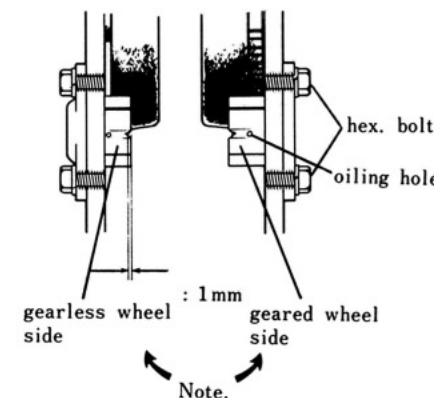
Figure 18



**8. SIDE ROLLERS: Check the rollers for wear every month or more frequently.**

— The rollers are not provided in any models other than those of a 2.5 tons or more capacity that are equipped with electric trolley.

Figure 19

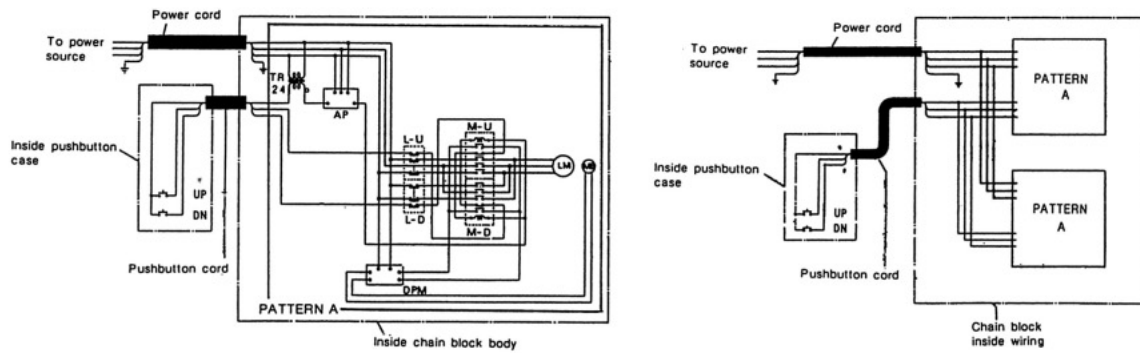


Side-rollers undergo gradual wear where they come in contact with the lower flange of the I beam. Those showing wear of over 1 mm must be replaced. Those whose rotation is not smooth owing to rust or dirt must be dismantled and cleaned. Remove the two hex. bolts shown in Figure 19. Then remove the rollers together with the cradles and wash them with kerosene, etc. Take care not to confuse those for geared wheel side in parts replacement or when re-mounting them after cleaning. Also, be sure to oil them well for their smooth rotation.

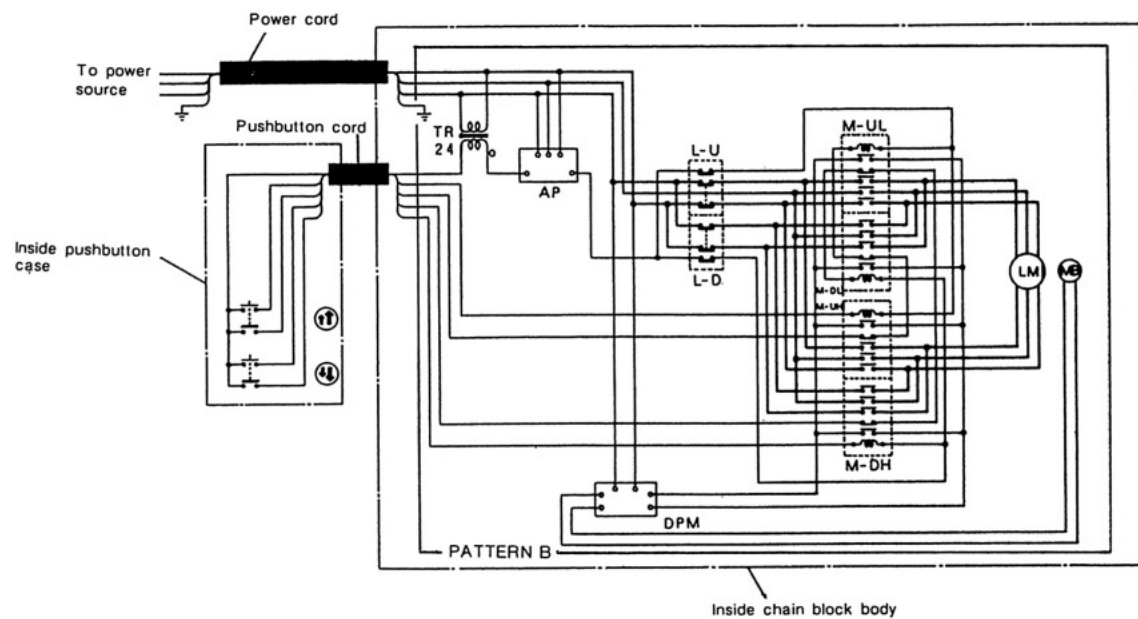
# WIRING DIAGRAMS

TR	Transformer	M-D	Magn. contactor (Pushbutton DN)
AP	Negative phase protector	M-DH	Magn. contactor (Pushbutton ↓↓)
DPM	DC power module	M-DL	Magn. contactor (Pushbutton ↓↓)
MB	DC brake	M-R	Magn. contactor (Pushbutton R or W)
L-U	Upper limit switch	M-L	Magn. contactor (Pushbutton L or E)
L-D	Lower limit switch	M-S	Magn. contactor (Pushbutton S or L)
M-U	Magn. contactor (Pushbutton UP)	M-N	Magn. contactor (Pushbutton N or R)
M-UH	Magn. contactor (Pushbutton ↑↑)	LM	Lifting motor
M-UL	Magn. contactor (Pushbutton ↑↑)	TM	Traversing motor

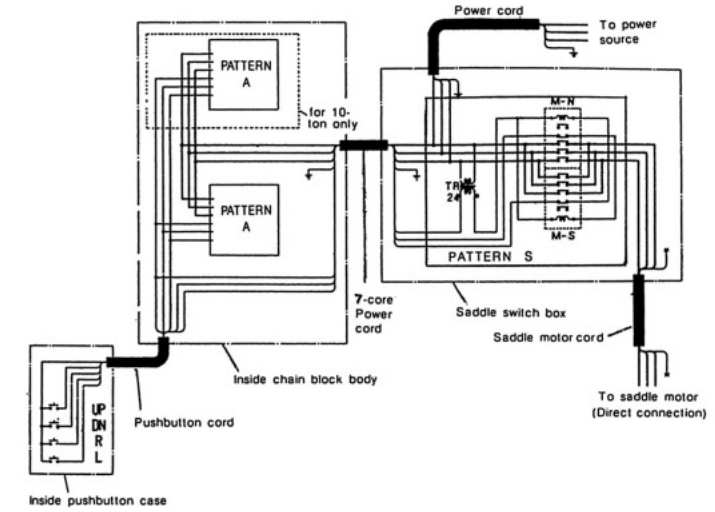
DA 2-PUSHBUTTON (DA-DAG-DAP)



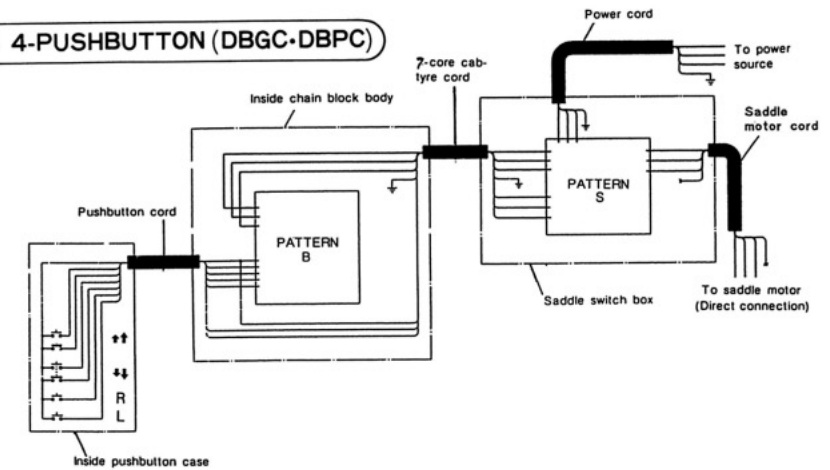
DB 2-PUSHBUTTON (DB-DBG-DBP)



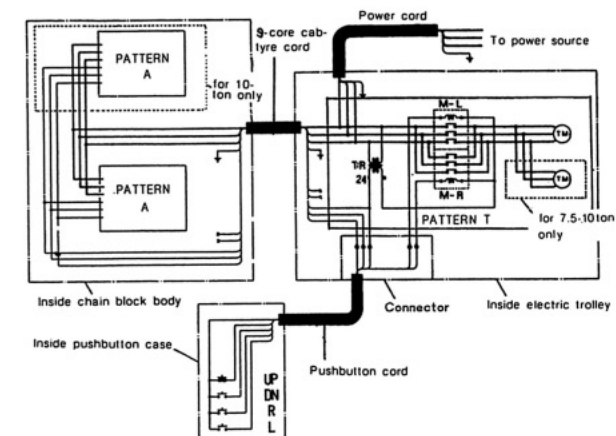
DA 4-PUSHBUTTON (DAGC-DAPC)



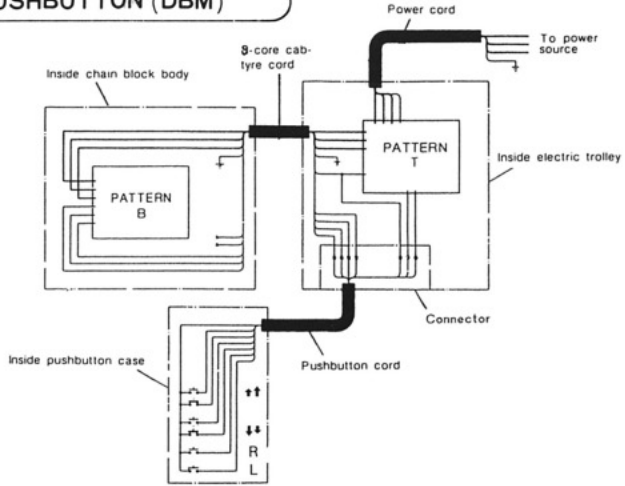
DB 4-PUSHBUTTON (DBGC-DBPC)



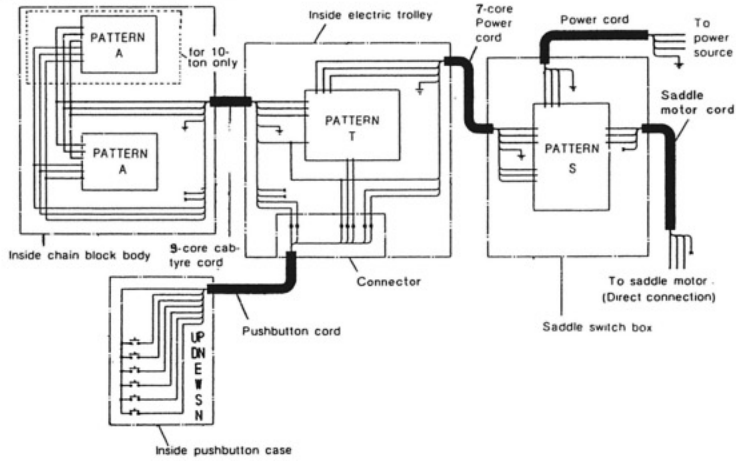
DA 4-PUSHBUTTON (DAM)



### DB 4-PUSHBUTTON (DBM)



### DA 6-PUSHBUTTON (DAMC)



### DB 6-PUSHBUTTON (DBMC)

