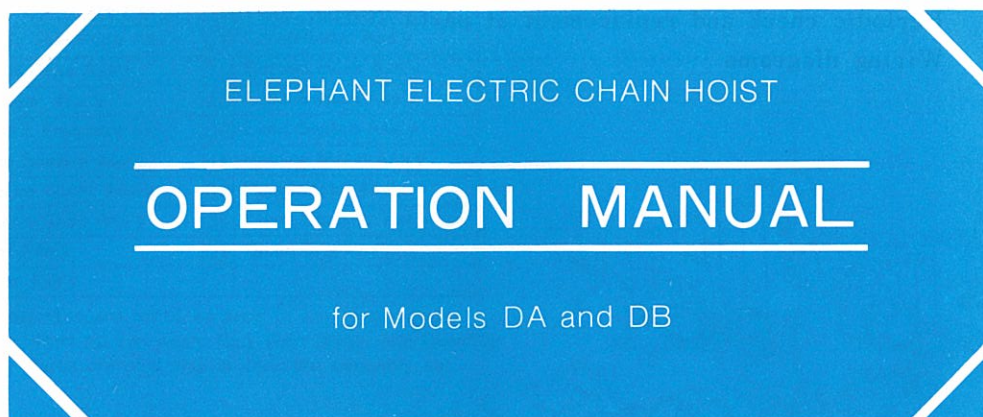


Please read this manual without fail before you install
your chain hoist.



ELEPHANT CHAIN BLOCK CO., LTD.

Osaka, Japan

(No.2)

CONTENTS

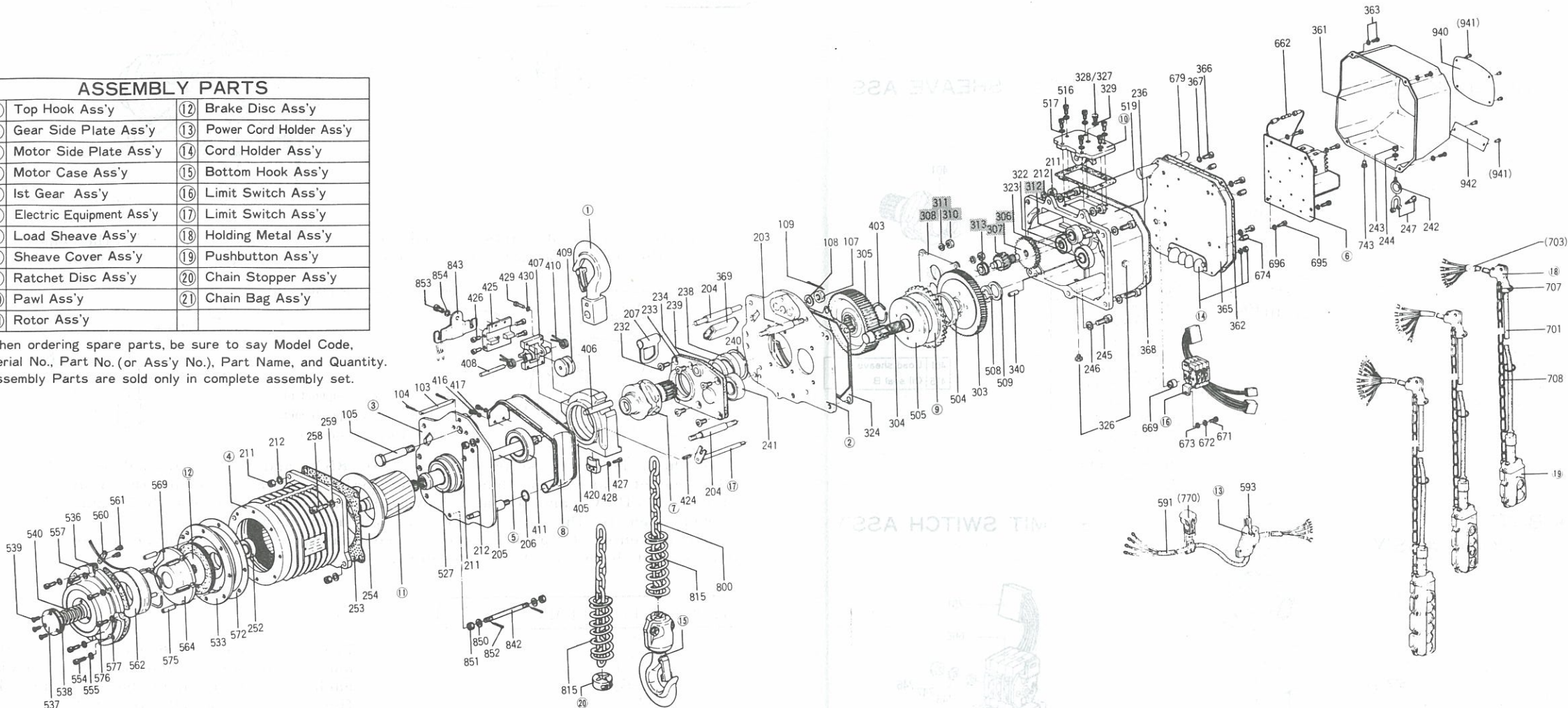
	page
Exploded view and parts names.....	1
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Points to note for power supply	3
Checking before starting your daily work	4
Periodic check and replacement of parts	5
Wiring diagrams	8

EXPLODED VIEW AND PARTS NAMES

ASSEMBLY PARTS

① Top Hook Ass'y	⑫ Brake Disc Ass'y
② Gear Side Plate Ass'y	⑬ Power Cord Holder Ass'y
③ Motor Side Plate Ass'y	⑭ Cord Holder Ass'y
④ Motor Case Ass'y	⑮ Bottom Hook Ass'y
⑤ 1st Gear Ass'y	⑯ Limit Switch Ass'y
⑥ Electric Equipment Ass'y	⑰ Limit Switch Ass'y
⑦ Load Sheave Ass'y	⑱ Holding Metal Ass'y
⑧ Sheave Cover Ass'y	⑲ Pushbutton Ass'y
⑨ Ratchet Disc Ass'y	⑳ Chain Stopper Ass'y
⑩ Pawl Ass'y	㉑ Chain Bag Ass'y
⑪ Rotor Ass'y	

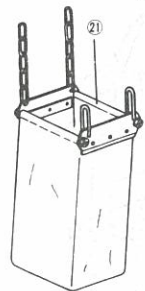
When ordering spare parts, be sure to say Model Code, Serial No., Part No. (or Ass'y No.), Part Name, and Quantity. Assembly Parts are sold only in complete assembly set.



103	Top hook stopper pin
104	Cotter pin
105	Top hook pin
107	Hex. nut
108	Spring washer
109	Cotter pin
203	Stay bolt (A)
204	Stay bolt (B)
205	Stay bolt (C)
206	O ring
207	Hanger, holding metal
211	Hex. nut
212	Spring washer
232	Sunk bolt w/hex. hole & seal
233	Flange B

234	Packing, Flange B
236	Gear case
238	Ball bearing 2
239	Oil seal A
240	Snap ring
241	Ball bearing 3
242	Eye bolt
243	Hex. nut
244	Spring washer
245	Bolt w/hex. hole
246	Spring washer
247	Shackle
252	Ball bearing 7
253	Packing, Motor case
254	Plate for locating
258	Bolt w/hex. hole

259	Spring washer
303	DA-2nd gear DB-4th gear
304	DA-3rd gear DB-5th gear
305	DA-4th gear DB-6th gear
322	Ball bearing 4
323	Ball bearing 5
324	Packing, gear case
326	Oil plug
327	Oil plug
328	Air-hole bolt
329	Packing, air hole bolt
340	Spring pin
361	Electric Component Case
362	Packing, electric component case
363	Hex. bolt w/cross hole & washer



365	Electric component board
366	Bolt w/hex. hole
367	Spring washer
368	Adiabatic packing
369	Protection rubber of lead wire
403	Snap ring
405	Chain guide
406	Anti-rotation pin
407	Roller board
408	Roller pin
409	Roller
410	Intermediate stick spring
411	Ball bearing
416	Bolt w/hex. hole
417	spring washer

420	Stripper
424	Corrugated spring pin
425	Holding board for spring
426	Bolt w/hex. hole
427	Bolt w/hex. hole
428	Spring washer
429	Bolt w/hex. hole
430	Spring washer
504	Bush for ratchet disc
505	Disc hub
508	Split ring
509	Stopper ring
516	Bolt w/hex. hole & seal
517	Spring washer
519	Packing, pawl board

527	Ball bearing 6
533	Bearing support
536	Packing, brake stator
537	Spring cover
538	Packing, spring cover
539	Bolt w/hex. hole
540	Brake spring
554	Bolt w/hex. hole
555	Spring washer
557	Brake stator
560	Cord pressing metal
561	Bolt w/hex. hole
562	Brake coil
564	Moving core
569	Snap ring
572	Packing, bearing support

575	Corrugated spring pin
576	Bolt w/hex. hole
577	Spring washer
591	Cabtyre cord
593	Shackle
662	Fuse
669	Joint pipe
671	Bolt w/hex. hole
672	Spring washer
673	Plain washer
674	Hex. stay pin
679	Glass tube
695	Bolt w/hex. hole
696	Spring washer
701	Pushbutton cord

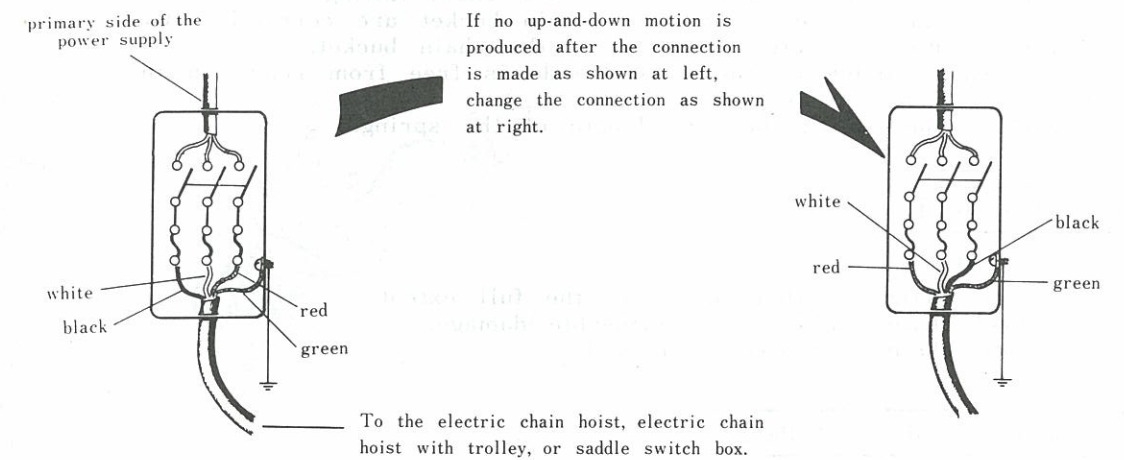
703	Bush
707	Shackle
708	Suspension chain
743	Plug
(770)	Cable hanger
800	Load chain
815	Stopper spring
842	Chain bag support pin
843	Chain bag support metal
850	Plain washer
851	Hex. nut
852	Cotter pin
853	Bolt w/hex. hole
854	Spring washer

940	Nameplate
(941)	Rivet
942	Nameplate (Type)
PARTS FOR DB-TYPE	
306	2nd gear
307	3rd gear
310	Hex. nut
311	Spring washer
308	Center plate
312	Ball bearing 1 O
313	Ball bearing 1 I

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.

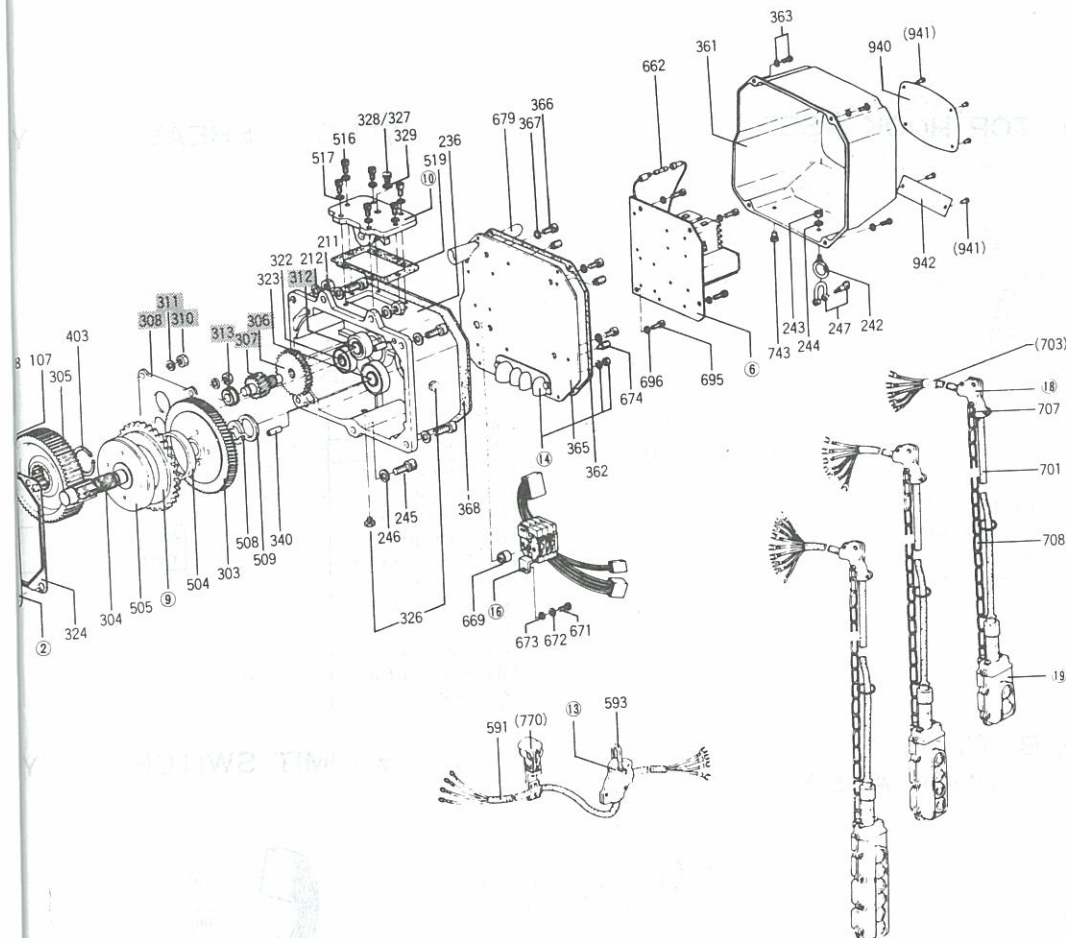


* POWER SWITCH AND FUSE

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 -

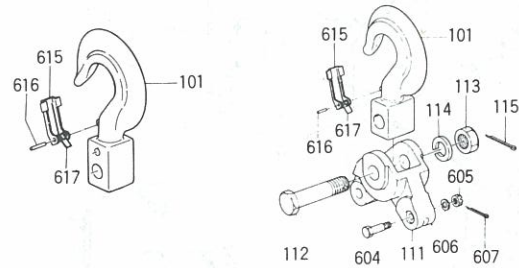
Models	lifting motor (kw) (3 phase 200V)		power switch capacity (A)	fuse capacity (A)
	50Hz	60Hz		
0.25	0.37	0.45	15	10
0.5 · 1W	0.67	0.8	20	10
1S · 2W	1.25	1.5	20	15
1.5 · 2S · 2.5	2.5	3.0	30	30
3 · 5 · 7.5				
10	2.5 × 2 units	3.0 × 2 units	60	50



420 Stripper	527 Ball bearing 6	575 Corrugated spring pin	(703) Bush	940 Nameplate
424 Corrugated spring pin	533 Bearing support	576 Bolt w/hex. hole	707 Shackle	(941) Rivet
425 Holding board for spring	536 Packing, brake stator	577 Spring washer	708 Suspension chain	942 Nameplate (Type)
426 Bolt w/hex. hole	537 Spring cover	591 Cabtyre cord	743 Plug	
427 Bolt w/hex. hole	538 Packing, spring cover	593 Shackle	(770) Cable hanger	
428 Spring washer	539 Bolt w/hex. hole			
429 Bolt w/hex. hole	540 Brake spring	662 Fuse	800 Load chain	
430 Spring washer	554 Bolt w/hex. hole	669 Joint pipe	815 Stopper spring	
	555 Spring washer	671 Bolt w/hex. hole	842 Chain bag support pin	PARTS FOR DB-TYPE
504 Bush for ratchet disc	557 Brake stator	672 Spring washer	843 Chain bag support metal	306 2nd gear
505 Disc hub	560 Cord pressing metal	673 Plain washer	850 Plain washer	307 3rd gear
508 Split ring	561 Bolt w/hex. hole	674 Hex. stay pin	851 Hex. nut	310 Hex. nut
509 Stopper ring	562 Brake coil	679 Glass tube	852 Cotter pin	311 Spring washer
516 Bolt w/hex. hole & seal	564 Moving core	695 Bolt w/hex. hole	853 Bolt w/hex. hole	308 Center plate
517 Spring washer	569 Snap ring	696 Spring washer	854 Spring washer	312 Ball bearing 10
519 Packing, pawl board	572 Packing, bearing support	701 Pushbutton cord		313 Ball bearing 11

EXPLODED VIEW AND PARTS NAMES (ASSEMBLY PARTS)

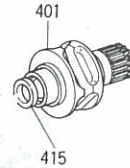
1 TOP HOOK ASS'Y



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

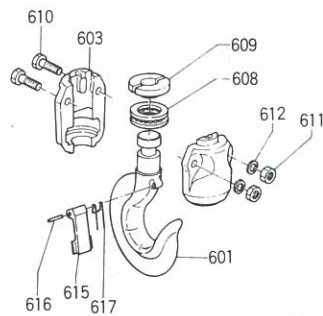
101	Top hook
111	Arm
112	Connecting bolt
113	Hex. nut
114	Spring washer
115	Cotter pin
604	Chain anchorage bolt
605	Hex. nut
606	Spring washer
607	Cotter pin
615	Safety latch
616	Safety latch pin
617	Safety latch spring

7 LOAD SHEAVE ASS'Y

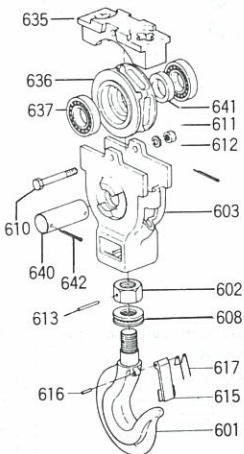


401	Load sheave
415	Oil seal B

15 BOTTOM HOOK ASS'Y

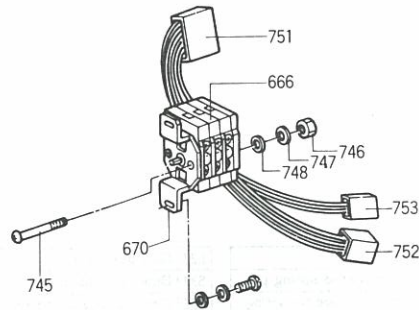


601	Bottom hook
603	Bottom hook cover
608	Thrust bearing
609	Bottom split ring
610	Hex. bolt
611	Hex. nut
612	Spring washer
615	Safety latch
616	Safety latch pin
617	Safety latch spring



601	Bottom hook
602	Bottom hook nut
603	Bottom hook cover
608	Hex. bolt
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
637	Bearing
640	Idle sheave pin
641	Idle sheave collar
642	Cotter pin

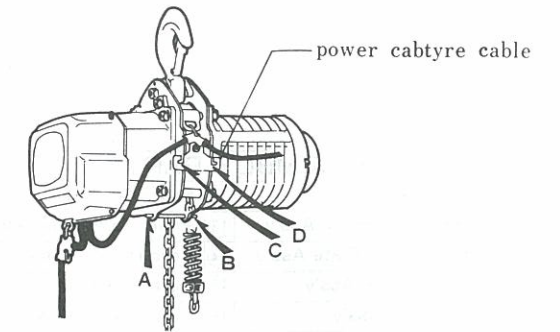
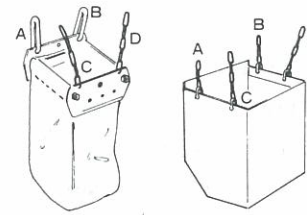
16 LIMIT SWITCH ASS'Y



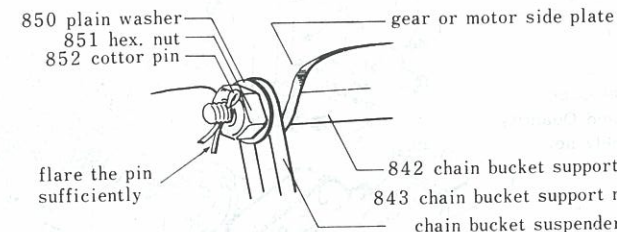
666	Rotary switch
670	Rotary switch board
745	Pan head small screw w/cross hole
746	Hex. nut
747	Spring washer
748	plain washer
751	Receptacle 6P w/wire
752	Receptacle 4P w/wire
753	Receptacle 2P w/wire

INSTALLATION OF THE CHAIN BUCKET

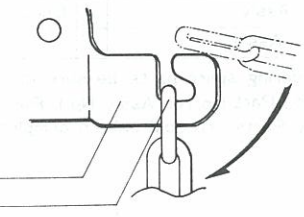
HANGING TYPE CHAIN BUCKET



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

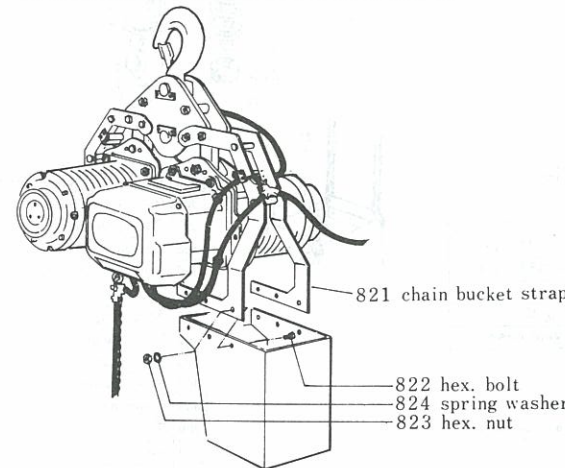


How to install the chain bucket at part D (or C)



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.

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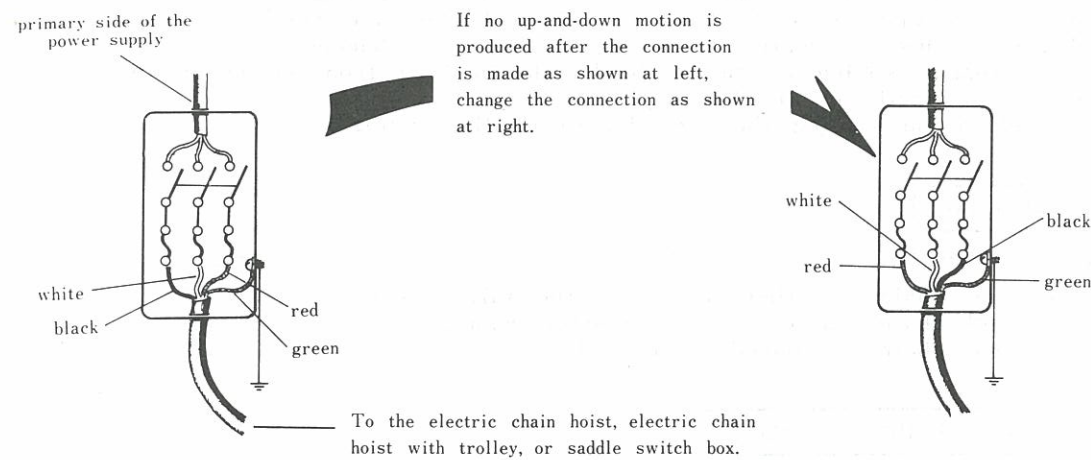
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POINTS TO NOTE FOR POWER SUPPLY

* 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 -

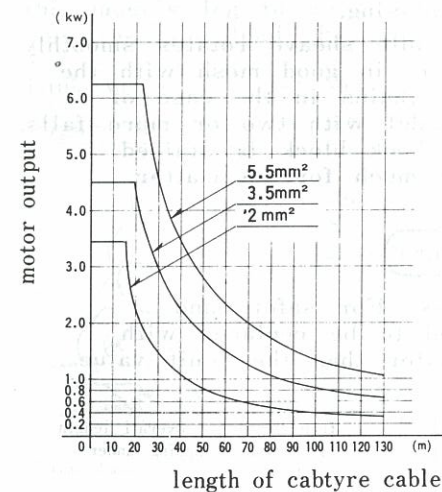
Models	lifting motor -(kw) (3 phase 200V)		power switch capacity (A)	fuse capacity (A)
	50Hz	60Hz		
0.25	0.37	0.45	15	10
0.5 · 1W	0.67	0.8	20	10
1S · 2W	1.25	1.5	20	15
1.5 · 2S · 2.5 3 · 5 · 7.5	2.5	3.0	30	30
10	2.5 × 2 units	3.0 × 2 units	60	50

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.

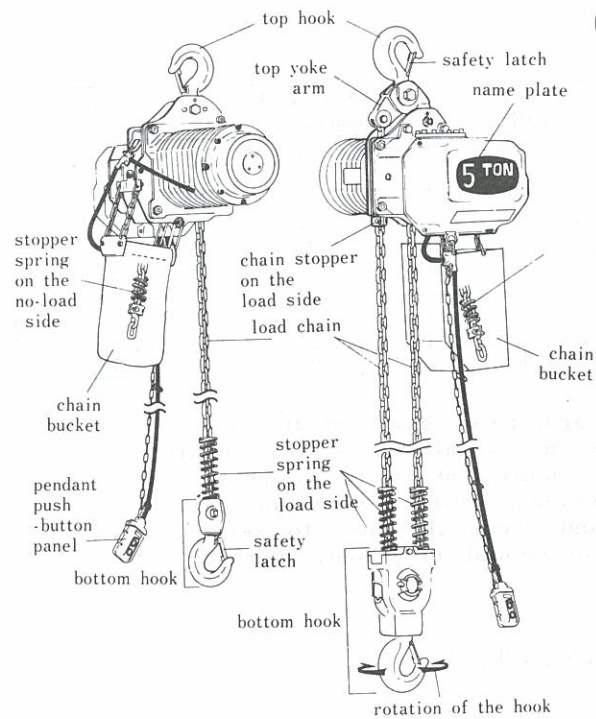
* THICKNESS OF THE POWER SUPPLY CABTYRE CABLE *



The thickness of the power supply cabtyre 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 cabtyre cable length for sectional area of 2mm², 3.5mm², and 5.5mm² 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

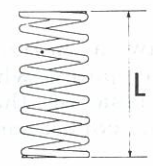
- Check to see if:
- * The safety latch is in order and functions perfectly.
 - * The hook rotates lightly and smoothly.
 - * The hook and its associate parts exhibit any visible damage or deformation.
 - * The bolts and nuts are loose or missing.
 - * The idle sheave rotates smoothly and is in good 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.)

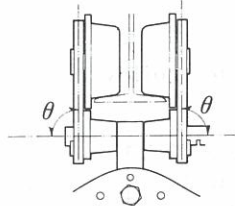
6. LOAD CHAIN

- 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 θ 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.)

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Figure 1

361 electric c

363 hex. bolt
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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

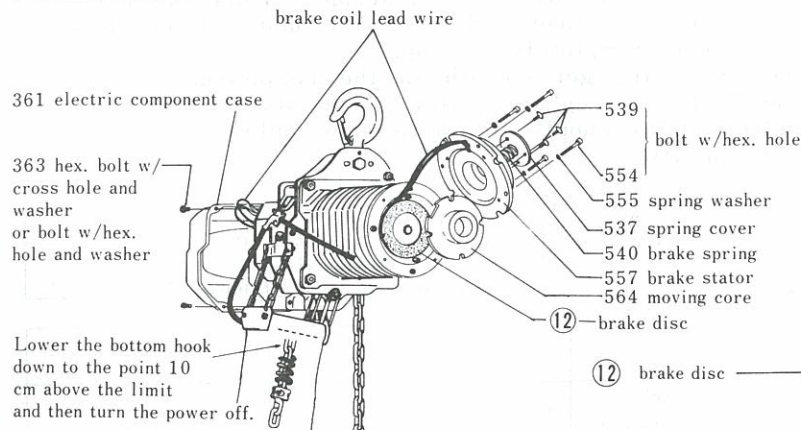
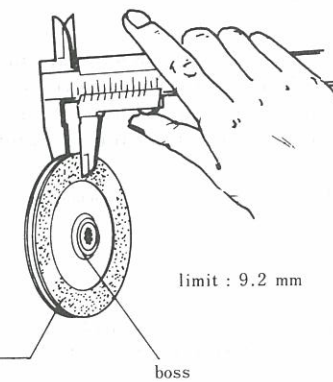


Figure 2



* 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.

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. Replace 540, 537, and 539 in this order.

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

Figure 3

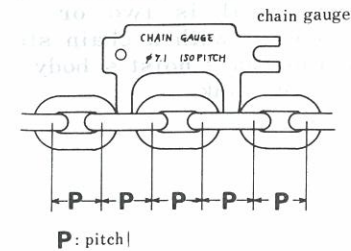


Figure 4

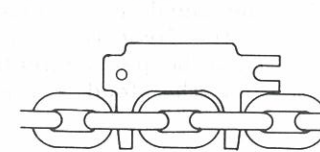
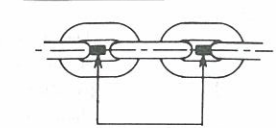


Figure 5



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.

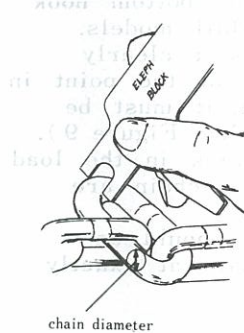
* Pitch measurement with a chain gauge *

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.

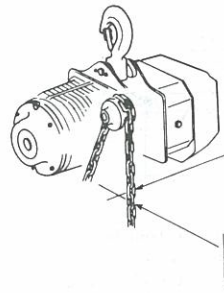
Replacement of the Load Chain * POINTS TO PAY ATTENTION *

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.

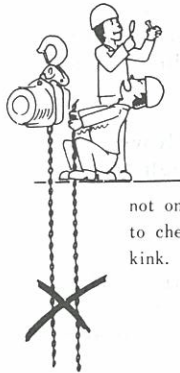
The welded joints of the links which are perpendicular to the chain hoist's body must face opposite to the load sheave (See Figure 7).

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

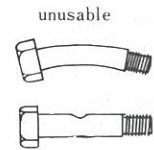
-- this check is not needed for any model with a single load chain

Figure 8



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

Figure 9



unusable

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.

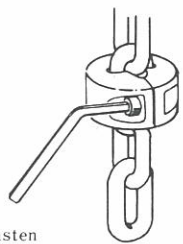
For 2-fall models (Figure 8) it is easier to carry out the check after lifting the hook block as close to the upper limit as possible, and after laying the bottom hook block on the ground for 3-fall models.

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.

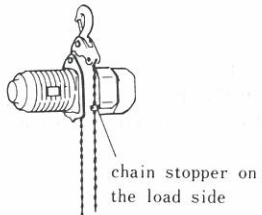
Figure 10



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).

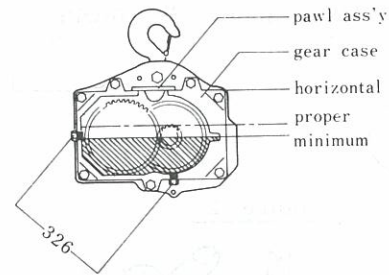
The chain stopper is also provided on the load side only for 2-fall models; and it must be secured to the link specified for each model in Table 2.

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)

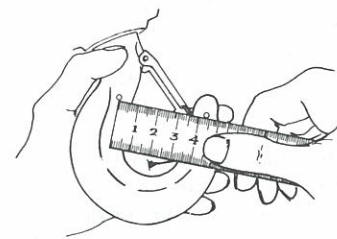
	0.25	0.5, 1W	1S, 2W	1.5, 2S, 2.5, 3, 5, 7.5	10
single speed type	0.75	0.8	1	3	3 x 2
dual speed type	0.75	0.8	1.3	3.5	-

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)

PER

Table 5 Dis pro (cer

It is ve It must

* Flaw,

Hooks sh be replac

Figure 1

Table 6 Wear

* Idle she -- One-fa

Figure 15



Check the of shaded

PERIODIC CHECK AND REPLACEMENT OF PARTS

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

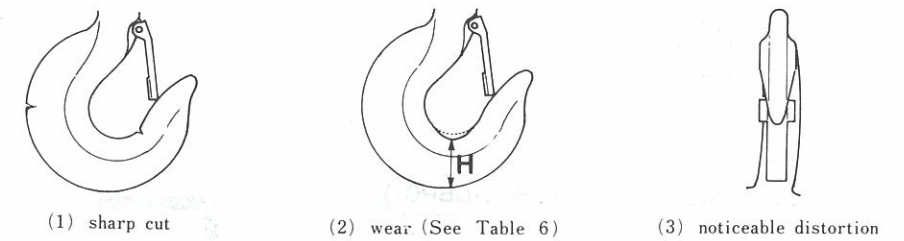


Table 6 Wear limit of hooks

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



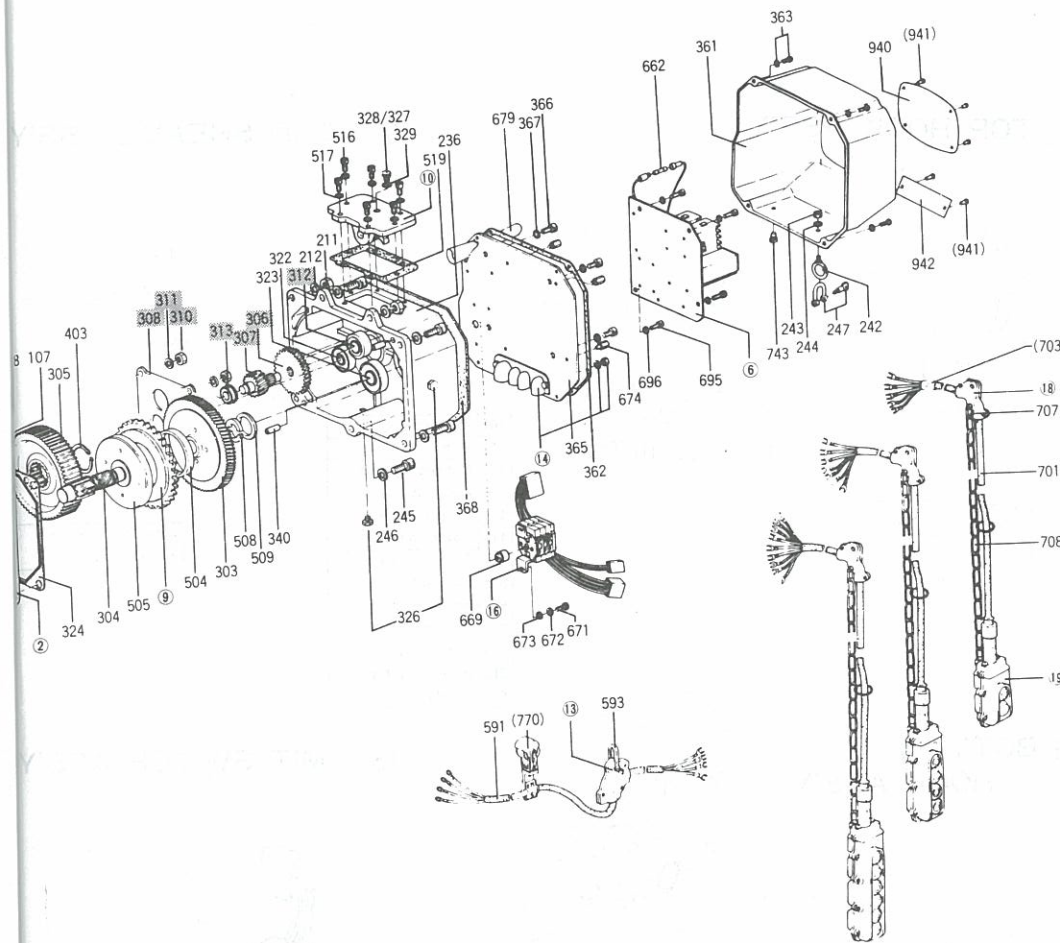
Check the shape of shaded areas.

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.



420 Stripper	527 Ball bearing G	575 Corrugated spring pin	703 Bush	940 Nameplate
424 Corrugated spring pin	533 Bearing support	576 Bolt w/hex. hole	707 Shackle	941 Rivet
425 Holding board for spring	536 Packing, brake stator	577 Spring washer	708 Suspension chain	942 Nameplate (Type)
426 Bolt w/hex. hole	537 Spring cover	591 Cabtyre cord	743 Plug	
427 Bolt w/hex. hole	538 Packing, spring cover	593 Shackle	770 Cable hanger	
428 Spring washer	539 Bolt w/hex. hole			
429 Bolt w/hex. hole	540 Brake spring	662 Fuse	800 Load chain	
430 Spring washer	554 Bolt w/hex. hole	669 Joint pipe	815 Stopper spring	
	555 Spring washer	671 Bolt w/hex. hole	842 Chain bag support pin	
504 Bush for ratchet disc	557 Brake stator	672 Spring washer	843 Chain bag support metal	PARTS FOR DB-TYPE
505 Disc hub	560 Cord pressing metal	673 Plain washer	850 Plain washer	306 2nd gear
508 Split ring	561 Bolt w/hex. hole	674 Hex. stay pin	851 Hex. nut	307 3rd gear
509 Stopper ring	562 Brake coil	679 Glass tube	852 Cotter pin	310 Hex. nut
516 Bolt w/hex. hole & seal	564 Moving core	695 Bolt w/hex. hole	853 Bolt w/hex. hole	311 Spring washer
517 Spring washer	569 Snap ring	696 Spring washer	854 Spring washer	308 Center plate
519 Packing, pawl board	572 Packing, bearing support	701 Pushbutton cord		312 Ball bearing IO

PERIODIC CHECK AND REPLACEMENT OF PARTS

(TROLLEY)

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
manufacture'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

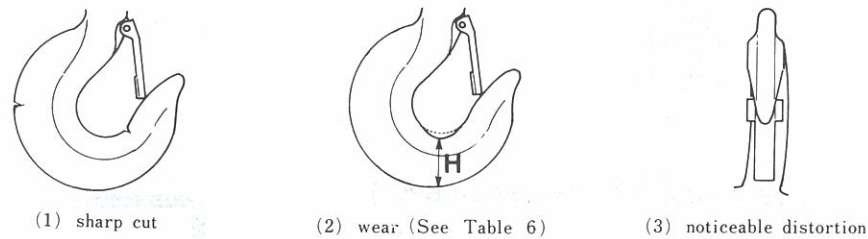


Table 6 Wear limit of hooks

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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)

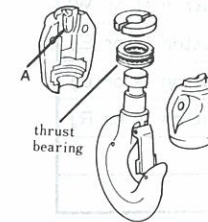
Be sure to grease up every rotating part when reassembling the idle sheave.

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

points to observe for bottom hooks

*** Thrust bearing ***

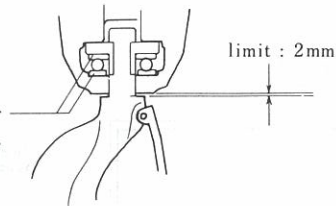
Figure 16



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.

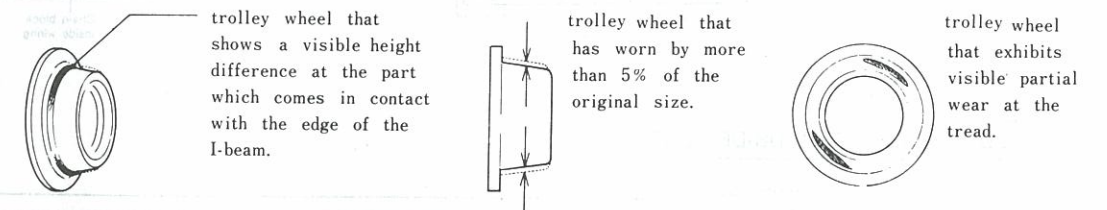


TROLLEY

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.

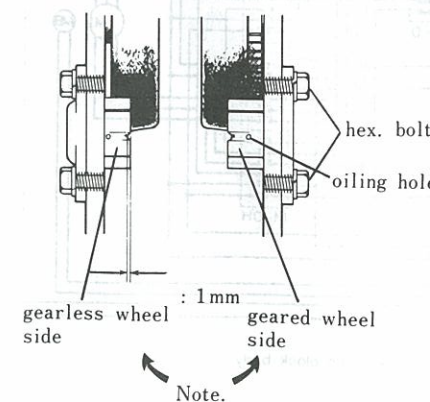
Figure 18



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

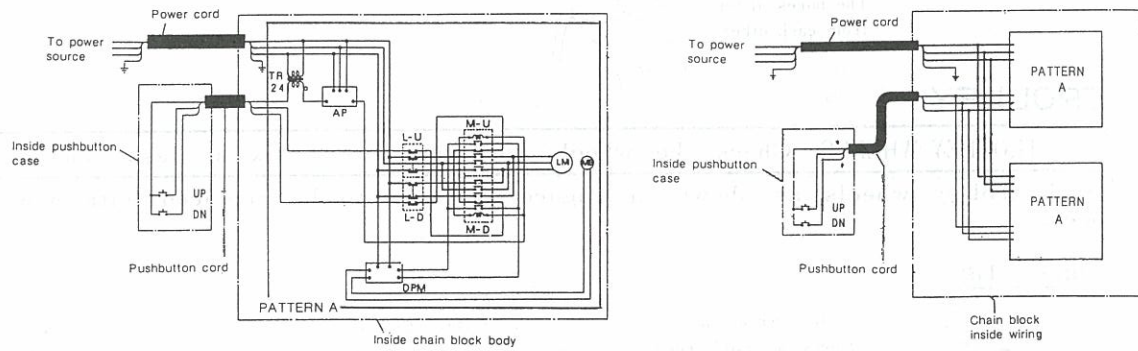


Side-rollers undergo gradual wear where they come in contact with the lower flange of the I beam. Those showing wear of over 1 mm must be replaced. Those whose rotation is not smooth owing to rust or dirt must be dismantled and cleaned. Remove the two hex. bolts shown in Figure 19. Then remove the rollers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

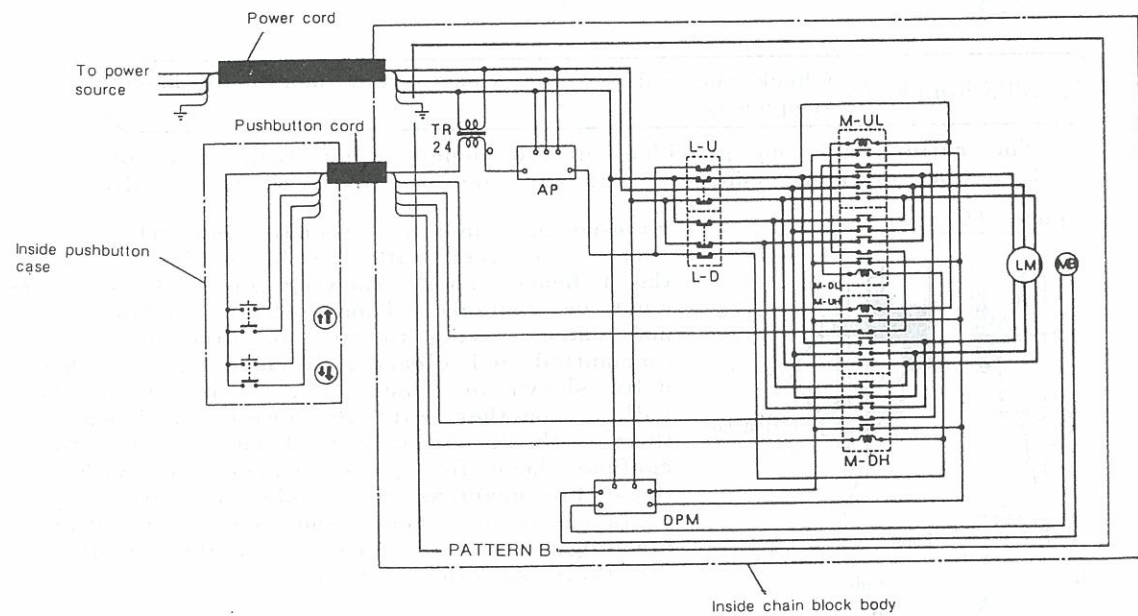
WIRING DIAGRAMS

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. cohtactor (Pushbutton N or R)
M-UH	Magn. contactor (Pushbutton ↑↑)	LM	Lifting motor
M-UL	Magn. contactor (Pushbutton ↑↑)	TM	Traversing motor

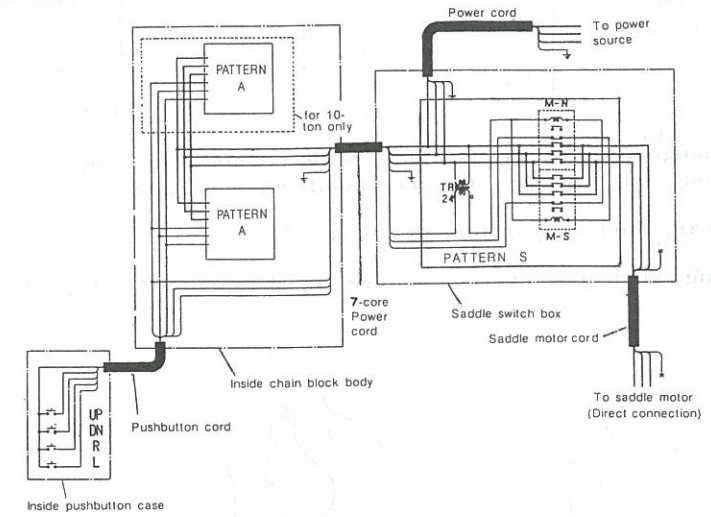
DA 2-PUSHBUTTON (DA-DAG-DAP)



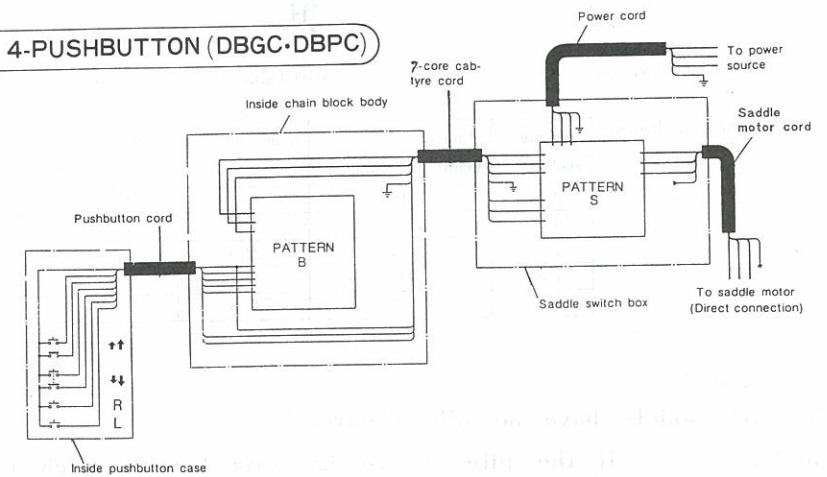
DB 2-PUSHBUTTON (DB-DBG-DBP)



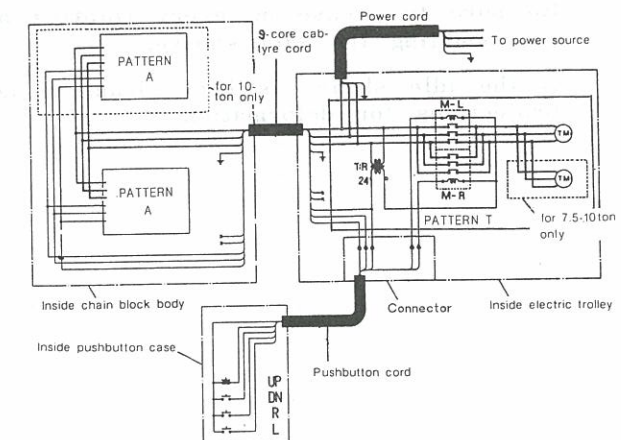
DA 4-PUSHBUTTON (DAGC-DAPC)



DB 4-PUSHBUTTON (DBGC-DBPC)

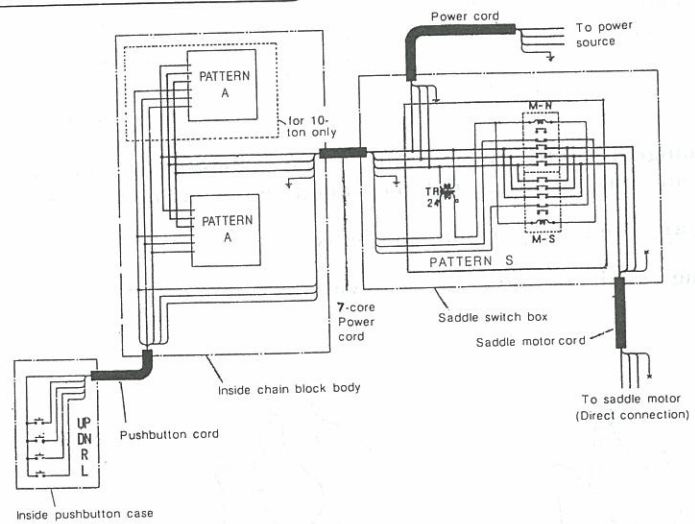


DA 4-PUSHBUTTON (DAM)

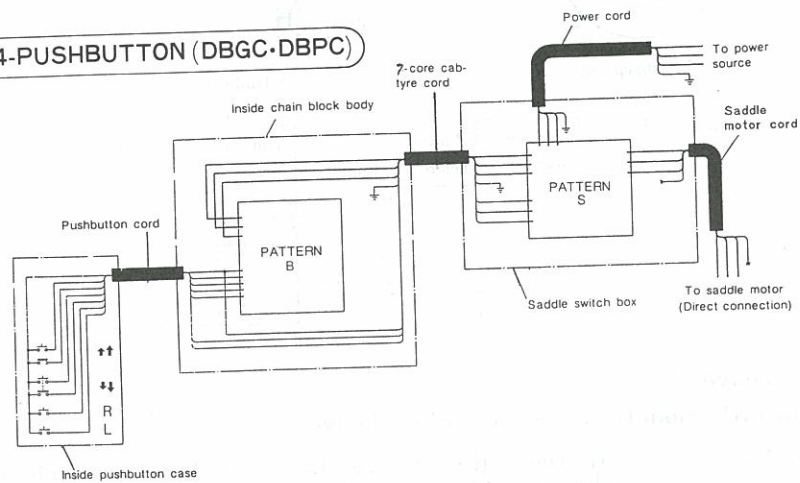


n DN)
 n ↓↓)
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 S or L)
 J or R)

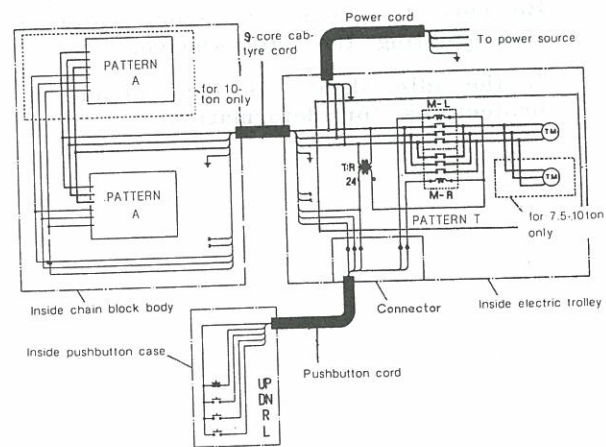
DA 4-PUSHBUTTON(DAGC-DAPC)



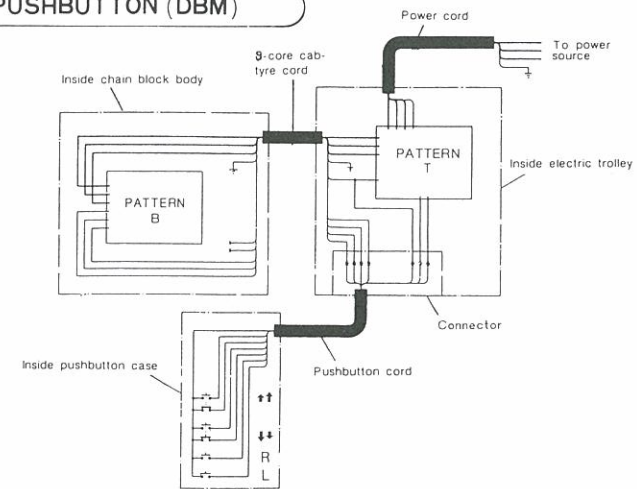
DB 4-PUSHBUTTON (DBGC-DBPC)



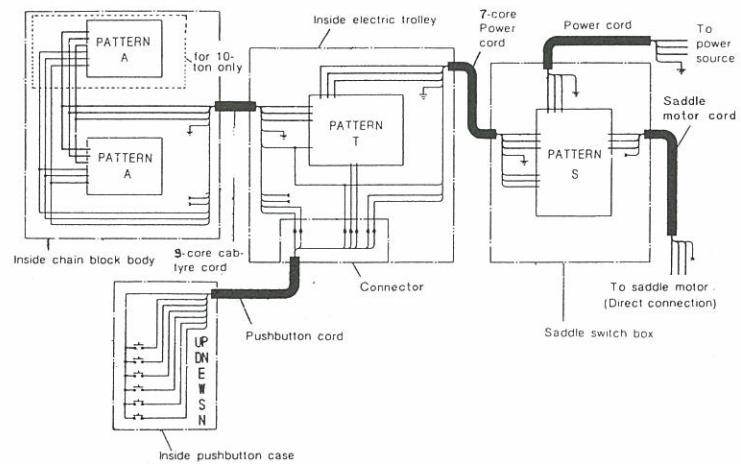
DA 4-PUSHBUTTON (DAM)



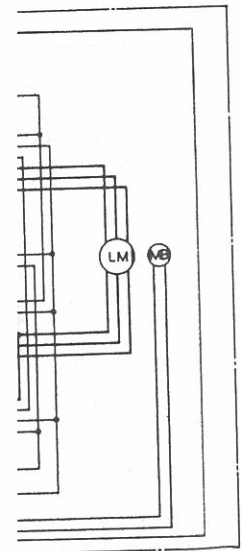
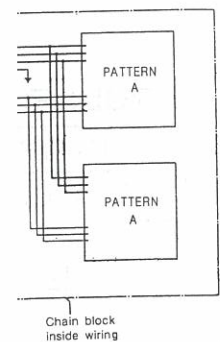
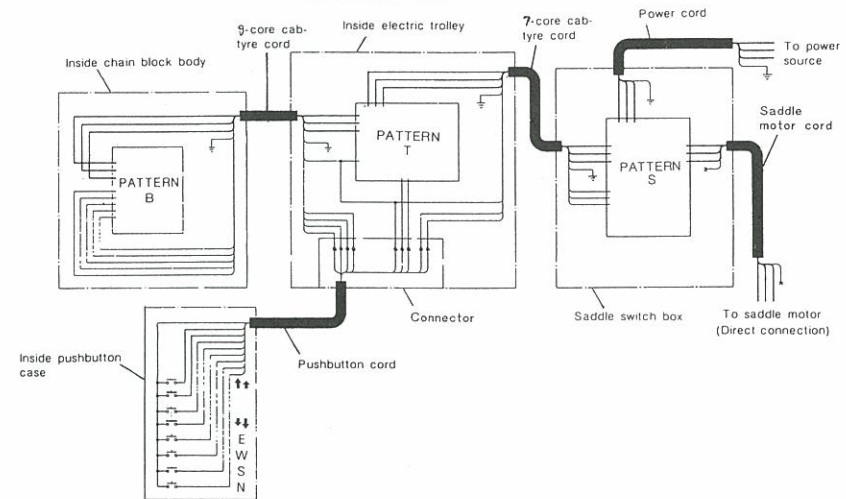
DB 4-PUSHBUTTON (DBM)



DA 6-PUSHBUTTON (DAMC)



DB 6-PUSHBUTTON (DBMC)



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

You are prohibited from riding on the ELEPHANT ELECTRIC CHAIN HOISTS.

Keep to the regulations concerning with the electric chain hoists in your country.

ELEPHANT ELECTRIC CHAIN HOIST

OPERATION MANUAL

This Manual is applied to all the models.

(No. 2)

★ This manual contains the minimum number of items we would ask you to understand and put into practice so that you can make the best use and safely operate your electric chain hoist.

Please read this manual in addition to the operation manual for your model (separate volume) before installing your Electric chain hoist.

★ Please be sure to keep this Manual, operation manual for Your Model, and Inspection Certificate of Electric Chain Hoists for future use.

————ELEPHANT CHAIN BLOCK CO., LTD. ————

Osaka, Japan

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CHAPTER 1 PRECAUTIONS ON INSTALLATION OF THE ELECTRIC CHAIN HOIST

1. 1. Confirmation of your Chain Hoist on Delivery

★ Make sure you have received the same electric chain hoist as you specified.
Make sure the following items printed on the case are as specified.

1 Model	
2 Power Source	Single Phase 100V, Three Phases 200V, etc.
3 Rated Load Capacity	0.5t, 1t, 3t,etc.
4 Type of Trolley (If Provided)	Plain Trolley, Geared Trolley, etc.
5 Lifting Height	3 m, 6 m, etc.
6 Push-Button Number (Single-Speed or Dual-Speed Type)	4-Button Type, 6-Button Type, etc.
7 Pendant Push-Button Panel Cord Length	3 m, 6 m, etc.
8 Power Cord Length	5 m (If not specified)

★ Check if there have been any damage caused during transportation.
★ Refer to Table 1 to make sure you have received the prescribed attachments and documents.

Table 1 Attachments and Documents

Overall Operation Manual (this Manual)	1 copy
Operation Manual for Your Model	1 copy
Inspection Certificate of Electric Chain Hoist	1 copy
Chain Gauge	1 piece
Chain Bucket	Required number
Cable Hanger (for messenger wire)	✓

✓ 3 pieces of cable hangers are attached only when your chain hoist is the one with trolley.

If there should be any problem with the above-mentioned asterisked items, please contact your dealer at once.

1. 2. Use of Your Chain Hoist under Specific Conditions

Your electric chain hoist should not be used in the environment that is exposed to a possible danger of explosion. Please consult your dealer when you use your chain hoist under specific conditions, such as high temperature (hotter than 40°C), low temperature (colder than -20°C), high humidity (more than 90%), or chemical effects, etc.

Under low-temperature conditions you have to allow much more for capacity particularly, considering that metal gets fragile.

I. 3. Power Supply

Please refer to detailed explanations on power supply in the Operation Manual for Your Model.

The performance of the electric chain hoist greatly depends on the conditions of power source and power supply, and the use of the chain hoist under extremely bad conditions of power source and power supply will lead to immediate trouble with it or could cause overheating of power supply materials, resulting in fire.

And grounding work of the third kind (earthing) is essential, which requires qualified person(s) in charge of electrical engineering work. If you continue to use your chain hoist in one particular place instead of using it in different locations, we would like you to ask a special electrical engineering firm for power supply work.

If you use your chain hoist in some different places we would like you to fully understand the items mentioned in the Operation Manual for Your Model.

When you ask your local special electrical engineering firm for power supply work, please show them the items mentioned in the Operation Manual for Your Model.

Their understanding of the properties of your electric chain hoist will assure proper power supply work.

Please prepare for a test some cargo corresponding to the rated working load of your electric chain hoist.

After the power supply work is completed, voltage drop and others should be measured and thereby checked in test operation.

I. 4. Checking of Your Chain Hoist and Its Surroundings

★ From unpacking through the end of installation work

I. 4. 1. Load Chain

The load chain is, in some cases, bound together with wires or the like to prevent it from possible tangles and kinks in a package.

Remove all the wires before operating your chain hoist.

Remove all the pieces of wires, vinyl and notice tags, etc.

to prevent them from being caught into the body of the electric chain hoist.

Please avoid using the load chain left knotted up or entangled.

(Refer to Fig. 1.)

Fig. 1



Remove tangles and knots from the load chain before operating your machine.

Some grease is applied on the load chain when your machine is shipped from our factory. Please take care to keep the load chain from foreign substances like mud. With the double fall type there are possibilities that the bottom hook will pass between the two load chains and result in their kinking. Avoid using the chains in kinked condition.

In this case, passing the bottom hook in the opposite direction between both the chains restores them to normal conditions. (Refer to Figs 2 and 3.)

Fig. 2

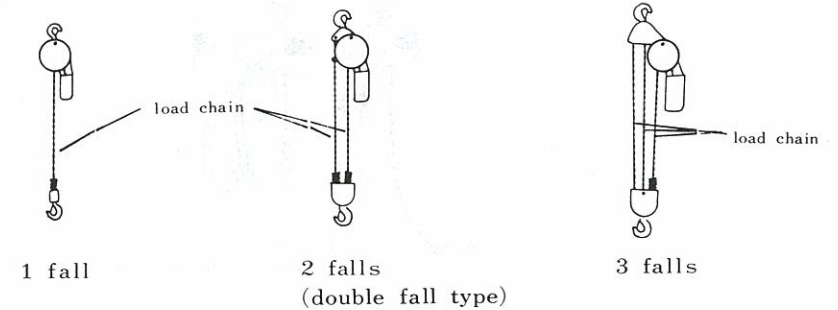
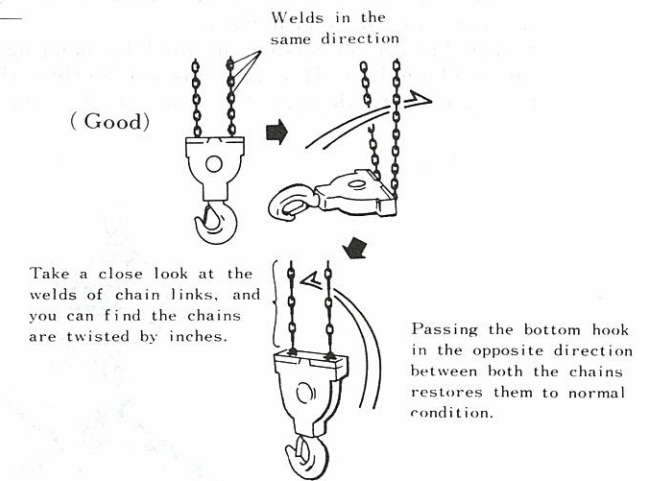


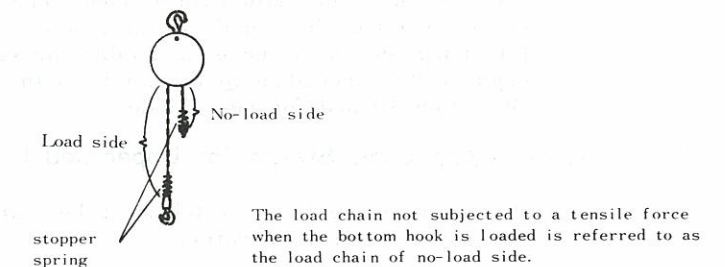
Fig. 3



I. 4. 2. Fixing the Chain Bucket

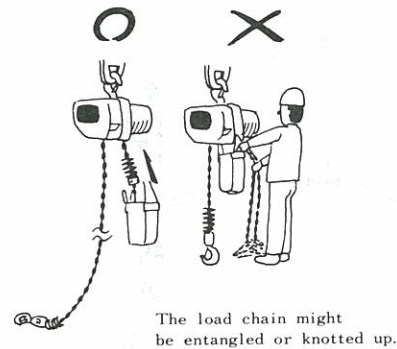
The chain bucket should be fixed without fail. Without the chain bucket, the load chain of no-load side might be caught by hanging load or something, resulting in dangerous situation. (Refer to Fig. 4.)

Fig. 4



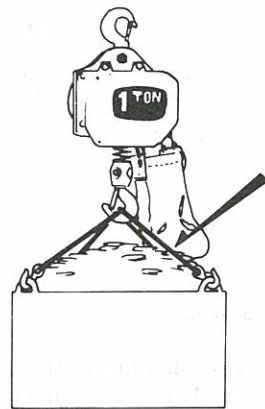
The chain bucket should be fixed to the chain hoist with the load chain of no-load side coming out 50 cm or less from the chain hoist. (Refer to Fig. 5.) This assures sure housing of the load chain in the chain bucket as well as easy installation of the bucket.

Fig. 5



Be careful to fix the chain bucket so that it may hang right under the body of the chain hoist. If the bucket is pushed upward by hanging load as shown in Fig. 6, the load chain will dangerously overflow the bucket or be unable to pass smoothly through the body of the chain hoist.

Fig. 6



And it is also dangerous in the case that the chain bucket is too small compared with the total length of the load chain. When you have replaced the load chain with a longer one, you should confirm that the bucket matches the length of the new one. Please refer to the chart for fixing the chain bucket and table for selecting the optimum size of chain bucket according to the total length of the load chain in the Operation Manual for your Model.

1. 4. 3. Overwinding Limit Switch for Upper and Lower Limits

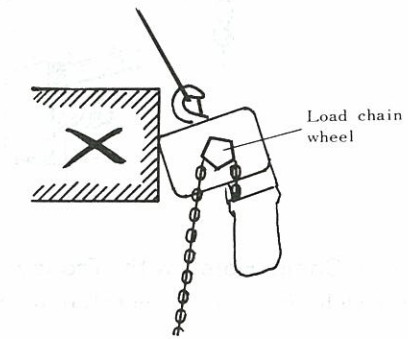
The overwinding limit switch must be installed to work in an emergency, but not in normal operation.

The switch has considerably long service life. But if it is used too often in normal operation, it might cause serious accidents when it gets out of order and ineffective. The built-in overwinding limit switch of the chain hoist should be set to function only in an emergency by installing another limit switch available on the market. Inspect the limit switch before starting the work by operating the chain hoist in the lifting and lowering mode several times without any load (or without hanging any careo).

1. 4. 4. Swinging of the Chain Hoist in Normal Conditions

The body of the chain hoist is designed to be used hanging right under the hook or trolley and swings a little as the polygonal load chain wheel, which is the part to transmit driving power to the load chain, spins. Don't prevent this natural swinging. Operating the chain hoist with its body caught by something or directly fixed to something without using the hook impedes the above-mentioned swinging and results in extra power dangerously imposed upon each one of important parts. (Refer to Fig. 7.) Use the chain hoist hanging perpendicularly in normal condition.

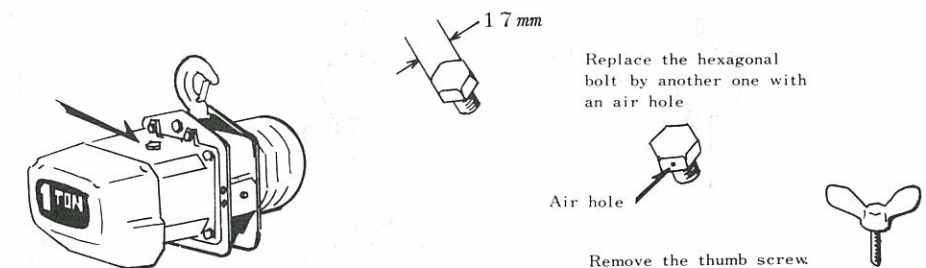
Fig. 7



1. 4. 5. Removal of Air from the Gear Case

A thumb screw or hexagonal bolt with side-to-side dimension of 17 mm is provided on the top of the gear case as shown in Fig. 8 for the model, the reduction gear section of which is oil-lubricated. Remove the thumb screw or hexagonal bolt after installing the chain hoist. For the model that has a hexagonal bolt on the top of its gear case, replace the bolt with another hexagonal bolt with an air hole, which comes in a small vinyl bag. The hexagonal bolt with an air hole serves to ventilate the gear case in response to the temperature change inside the gear section, thereby preventing the packing from deteriorating due to a high pressure.

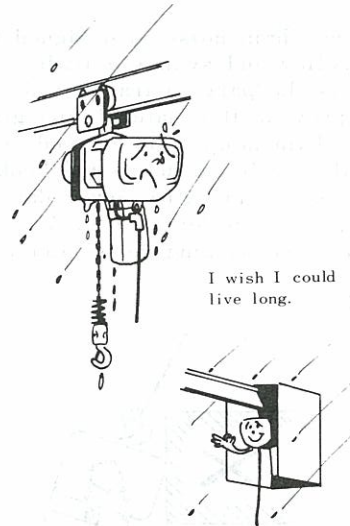
Fig. 8



1. 4. 6. Preventing Your Chain Hoist from Being Exposed to Rain

Exposing your chain hoist to rain makes its service life extremely short. The chain hoist is designed to be safely operated even in the rain, but it won't be safely operated if the grounding work of the third kind (Earthing) is neglected or is not completely performed. In order to prolong its service life, some refuge(covering) or other should be provided for the whole body of the chain hoist, if it is installed in the open air, to be completely protected from the rain. (Refer to Fig. 9) Take care to prevent rain water from pouring into the chain bucket, in the refuge.

Fig. 9



1. 5. Precautions for the Chain Hoist with Trolley

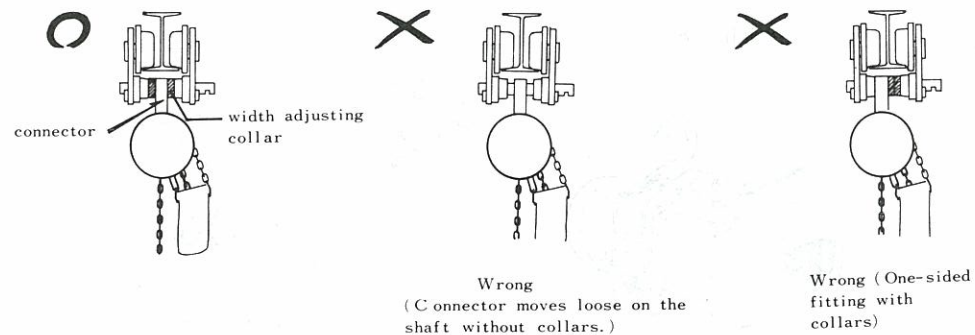
★From unpacking through the end of installation work

1. 5. 1. Trolley's Width Adjusting Collars

The trolley is designed to be capable of being installed on several types of traversing rails with different widths by moving the adjust collars.

Fit both sides of the connector to hang the electric chain hoist with the same number of adjust collars. Such wrong installation as shown in Fig. 10 might result in serious accidents.

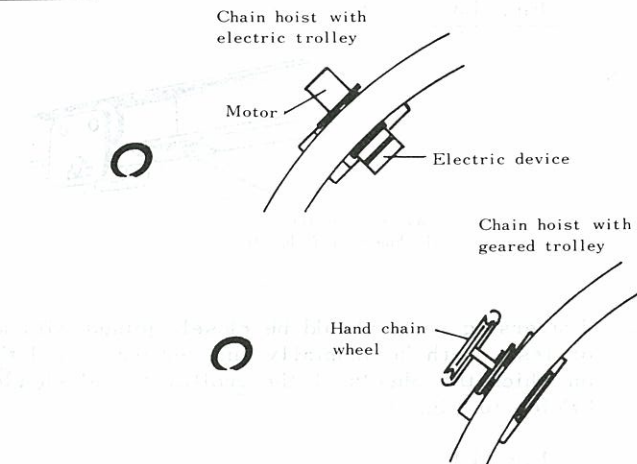
Fig. 10



1. 5. 2. Installation of the Chain Hoist on a Curved Traversing Rail

If you install your electric chain hoist with electric trolley or geared trolley on a curved traversing rail, set them with the motor or hand chain wheel of trolley being outside the curve. Installing them with the motor or hand chain wheel being inside the curve could cause damage to the traversing rail and trolley's wheel gear. In the case of a traversing rail curving in both directions, install the chain hoist so that it may be in such a posture as shown in Fig. 11 at a curve with shorter radius. (Refer to Fig. 11)

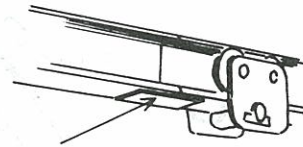
Fig. 11



I. 5. 3. Traversing Rail

- The part of the traversing rail in direct contact with the wheels of the trolley should not be coated with paint, and if it rusts too much, get the rust off.
- Joint of the traversing rail:
 1. Traversing rails had better be joined together close to the rail support.
 2. When you weld a fishplate on the bottom of the rail as shown in Fig. 13, take note of the thickness of fishplate. Too thick fishplates welded on the rail might catch the trolley, preventing it from passing the joints.

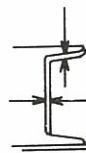
Fig. 13



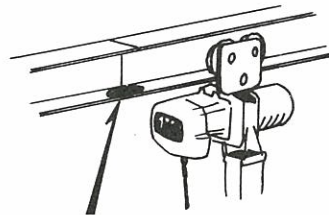
Take note of the thickness of fishplate.

3. Traversing rails should be closely joined with a tolerance of 0.5 mm or less, both horizontally and vertically, and the part of the rail on which the wheels of the trolley travel should be machineground. (Refer to Fig. 14)

Fig. 14



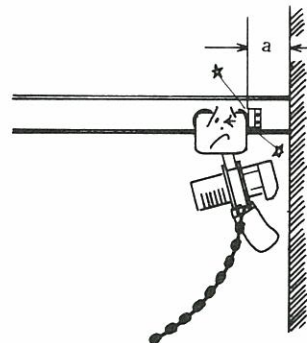
misalignment should be less than 0.5 mm.



The shaded part of the rail should be machine-ground to be much smoother.

- Accidental release-preventive stopper for the end of the rail:
 1. Fix the stopper with enough space left as indicated by 'a' in Fig. 15 so that the electric chain hoist may not hit against a wall or something even if it should strike against the stopper at a high speed and swing forward.

Fig. 15

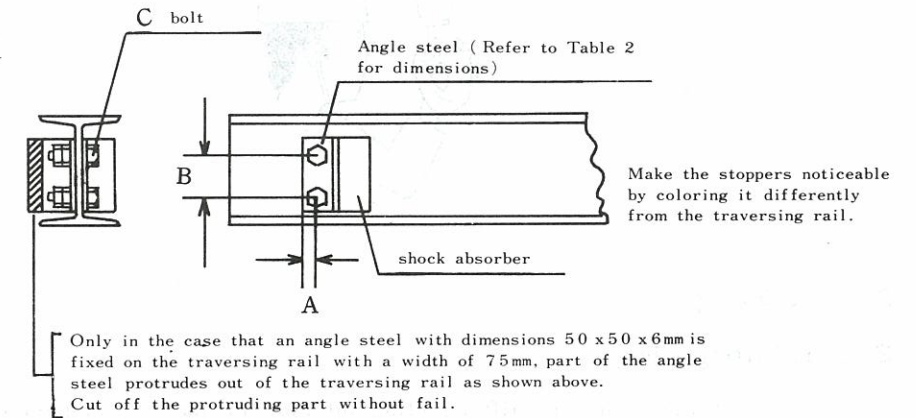


2. Fix the stopper firmly enough to stand impact and then provide it with a shock absorber. (Refer to Table 2 and Fig. 16)
- Never use the chain hoist mistakenly installed so that its trolley may always strike against the stopper and thereby get stopped.

Table 2 stopper

Traversing rail dimensions (mm)	150x75	200x100	250x125	350x150	450x175
Angle steel (mm)	50x50x6			65x65x6	
A (mm)	22			30	
B (mm)	70	105	110	190	280
C (mm)	M 12	M 16	M 16	M 20	M 20

Fig. 16



CHAPTER 2 PRECAUTIONS DURING OPERATION

2. 1. Avoid Overloading

Never overload your chain hoist or never put any greater load on your chain hoist than its rated load capacity. Keep this in mind and keep to the regulations on the rated load capacity indicated on each chain hoist.

2. 2. Safety Latch

Always keep the safety latch (accidental release-preventive device for lifting slings, etc., which is attached to the top & bottom hooks) in good condition so that it may properly function. Be sure to use it when slinging any cargo. (Refer to Fig. 17)

Fig. 17



2. 3. Slings

2. 3. 1. Lifting Sling

Avoid using any lifting sling inferior in quality. Inspect every lifting sling you are going to use before the beginning of operation.

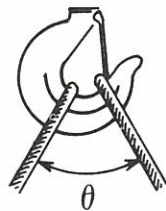
2. 3. 2. Safe and Sure Slings

Perform slinging carefully using a lifting sling adequate both in capacity and in length. Note the load capacity of each lifting sling well enough, and at the same time make sure the sling is not improperly hooked as shown in Fig. 18.

Fig. 18



Improper 1



Improper 2



Improper 3

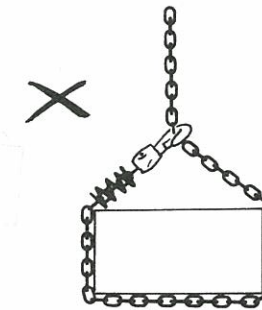
Explanations for Fig. 18

Improper location of the sling on the bottom hook

1. When a cargo is lifted with the sling improperly located on the hook, it might get out of position while carrying the cargo, causing impact load. Get the cargo down and sling it up again.
2. The angle between the two wire ropes of the sling, indicated by θ in Fig. 18, is too large, not only the load imposed on the sling increases but the latch might be damaged or the cargo might fall. For proper location, change the slinging points of the cargo, or if there is enough hanging margin, replace the sling by a longer one. Sling the cargo up with the angle θ being 60° or less.
3. The sling is too thick for the latch to be back in normal position. Change the sling. It would be advisable for you to use slings with metal fittings. (Ask your dealer. Many kinds of lifting slings are available to improve operational efficiency.)

Avoid binding up the load directly with the load chain irrespective of whether the load is hard or soft. The load chain is comparatively weak against the tension of abnormal direction. (Refer to Fig. 19)

Fig. 19



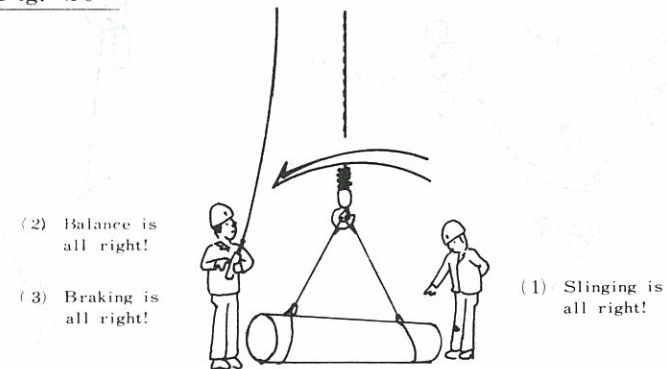
2. 4. Lifting after Completion of Slings

When lifting the load up after completion of slinging:

- ★ First, check the slinging condition with the load chain and lifting sling stretched tight.
- ★ Next, check the balance of the load kept floating only inches above the ground.
- ★ Then, check sure the proper braking of the electric chain hoist by repeatedly winding the load several tens of centimeters up and down several times.

Make it a rule to perform the above-mentioned three important checks before lifting the load high up in the air. (Refer to Fig. 20)

Fig. 20



2. 5. Side Pulling

Side pulling is very dangerous, so never do that. With side pulling, the load, dragging on the ground, might start moving fast abruptly and some skew tension might be put on the chain hoist support. (Refer to Figs. 21 and 22) Be sure to hoist the load with the chain hoist right above its center of gravity.

Fig. 21

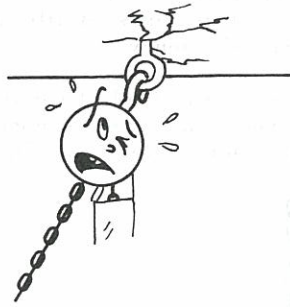


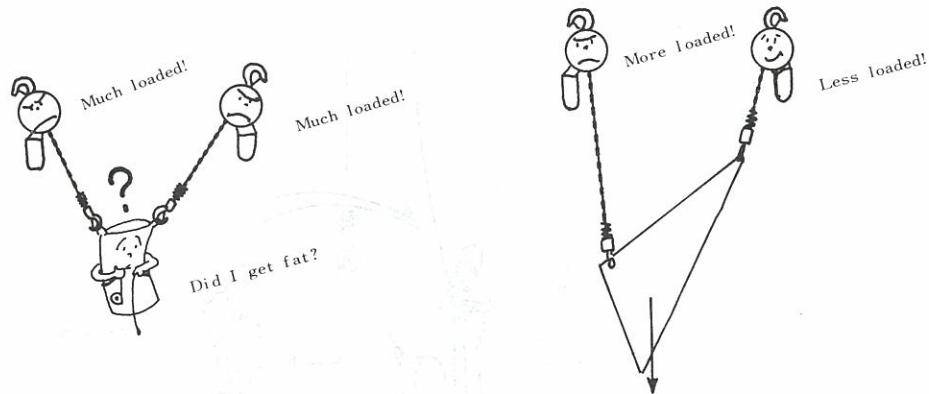
Fig. 22



2. 6. Double Hoisting

Avoid hoisting a single cargo with two chain hoists. Double hoisting, if the load chains are at a wide angle with the vertical line or the center of gravity of the cargo is located extremely close to either one of the two hoisting points as shown in Fig. 23, puts on both or either one of the two chain hoists a more load than is expected. Besides the above-mentioned, a variety of dangers are supposed to be caused by double hoisting, such as unexpected travelling of the trolley, etc. So, never do double hoisting.

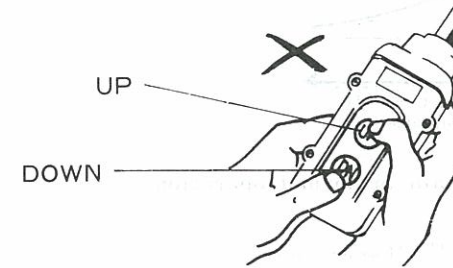
Fig. 23



2. 7. Plugging

Never press the UP and DOWN push-buttons alternately at too short intervals. (Refer to Fig. 24) This could put on the chain hoist a momentary load more than two times the hanging load, thereby greatly shortening the service life of the chain hoist and load chain.

Fig. 24



For Reference

The load chain never suffers fatigue failure due to any momentary load within a certain level even if it is frequently subjected to the load; but it could encounter fatigue failure depending on the magnitude of the momentary load and the number of times of load application if the load exceeds a certain level and is repeatedly put on it. (Refer to Fig. 25) Durability of the load chain and hoisting speed are properly determined after repeated tests so that under normal conditions of use and the rated load the momentary load may stay within the above-mentioned level, but the load chain could suffer fatigue failure from repeated overloading or operation of giving impact to the hanging cargo.

When an impact load is put on the load chain (a small impact load is put on the load chain in usual operation of starting and stopping the chain hoist), the tension of the load chain, as shown in Fig. 26, changes in a short cycle.

When a second impact is given before the first one starts waning, the change of residual tension, in some cases, overlaps another change, which could bring about an extraordinary magnitude of momentary tension as shown in Fig. 27. The change of tension of the load chain almost wanes in a few seconds, but in plugging, another impact is given before the change of tension caused by the previous impact wanes out, which may possibly put an extremely large momentary load on the load chain.

Fig. 25

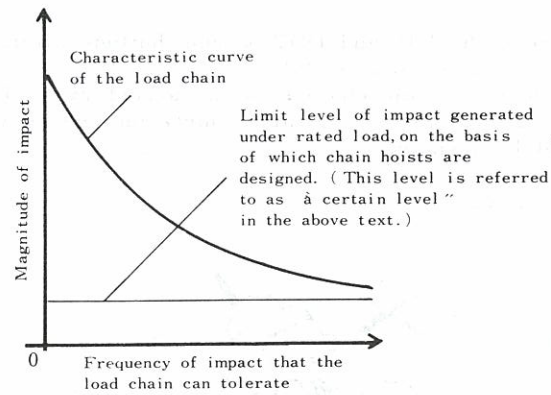


Fig. 26 Tension of the load chain in normal operation

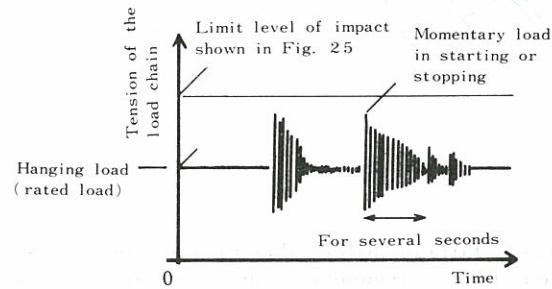
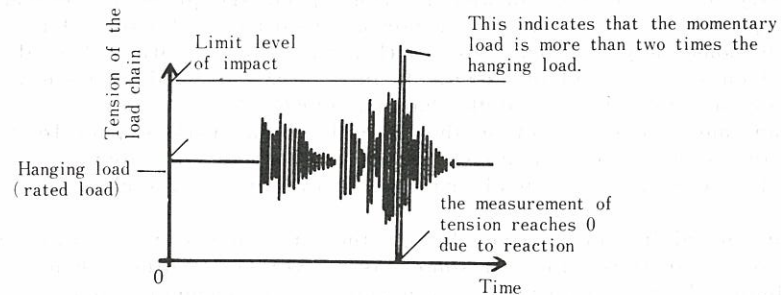


Fig. 27 Tension of the load chain in plugging



When lifting a cargo weighing more than 60% of the rated load capacity of your electric chain hoist, never put it in plugging operation. And when the work you are going to do is expected to need plugging with a certain load (X kg) hanging, you should use an electric chain hoist with a rated working load capacity of more than $X \times 1.7$ kg.

2. 8. Inching and Collision of Cargo in Travelling

Inching (Operation of momentary switching on and off by repeated pressing on the push-button for inch-by-inch hoisting, lowering or travelling) and collision of a hanging cargo in travelling should be avoided, because they generate on the load chain a greater momentary load than the one in normal use.

Inching also shortens the service life of the contacts of electric parts. If it is needed to frequently inch the cargo up and down for exact positioning, etc., use a dual-speed type electric chain hoist.

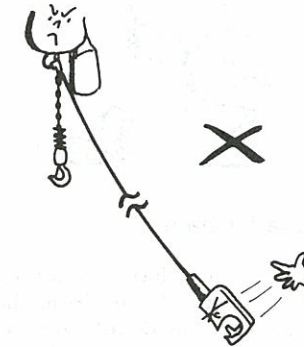
2. 9. Handing of the Pendant Push-Button Panel and Its Cord

Press down each push-button fast and securely so that its contacts may touch each other well enough.

- ★ Dual-speed type electric chain hoist
The push-buttons of a dual-speed type electric chain hoist are of two-step type: the 1st step for Low Speed and the 2nd step for High Speed.

After operation be careful to release the pendant push-button panel right under the chain hoist. This will prevent accidental damage to the panel or malfunction. (Refer to Fig. 28)

Fig. 28

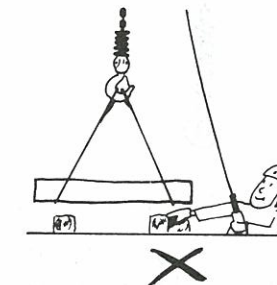


Never use any pendant push-button panel that has been cracked, heavily stained, or lacks some component part. This could lead to electric shock or malfunction.

2. 10. Keep away from under Any Hanging Cargo

Never stand nor put your arms and legs under any cargo hung by the electric chain hoist. (Refer to Fig. 29)

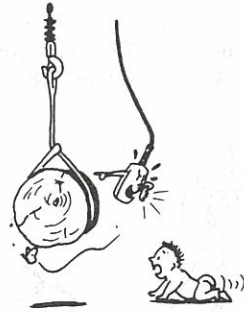
Fig. 29



2. 11. Never Leave Any Cargo Hanging on the Chain Hoist

The chain hoist operator should never leave the operating position while lifting a cargo with the electric chain hoist. When a cargo is up on the chain hoist, some qualified person or other in charge of operation should be responsible all the time for the safety of the cargo and its surroundings (Refer to Fig. 30)

Fig. 30



2. 12. Condition of the Load Chain

Make sure that the load chain is not knotted or entangled. Remove tangles or knots, if any, from the load chain before use. Also remove kinks, for the double or more fall type chain hoist, from the load chains before use. (Refer to Figs. 1 to 3) Pay close attention to the oiled condition of each load chain and when any load chain has got insufficiently oiled, oil it at once. (Refer to Fig. 31)

Fig. 31



Oil the entire load chain as frequently as possible.

Use most suitable oil depending upon the installation location of your chain hoist:

Use oil with low viscosity in the location where sand, mud, iron powder, or other foreign matter is liable to adhere to the load chain.

Use grease in the location that must not be stained with oil drop. (Waste oil, if foreign matters, such as iron powder and dust, are removed from it, which is not volatile can also be used for conditioning of the load chain.)

Various kinds of load chains subjected to rust-preventive treatment are available to be provided for the location on the coastal area where rusting is greatly accelerated.

If you need them, contact your dealer.

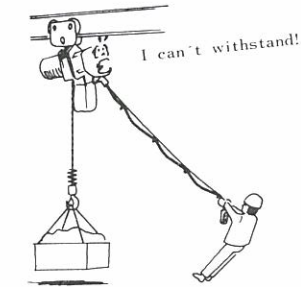
Never fail to oil even these load chains for prolonged wear-resisting life. Oiling or no oiling means the difference of more than several tens of times in service life of the load chain.

2. 13. Precautions for the Chain Hoist with Trolley During Operation

2. 13. 1. Never Pull the Cord of the Pendant Push-Button Panel when Moving the Trolley

Never move the trolley by pulling the cord. (Refer to Fig. 32)

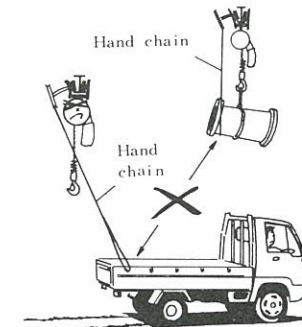
Fig. 32



2. 13. 2. Hand Chain of the Geared Trolley

The hand chain of the geared trolley can be caught and pulled tightly by a hanging cargo, hooks on the loading body of a truck, etc. to cause deformation and dropping of the trolley. Pay good attention to the hand chain of the geared trolley. (Refer to Fig. 33)

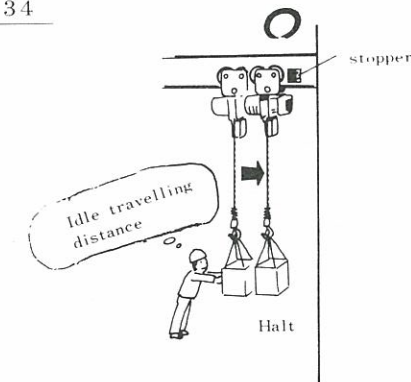
Fig. 33



2. 13. 3. Halt the Trolley before It Hits the Stopper

Never allow the trolley to hit the accidental release-preventive stopper. (Refer to pages 17 and 18) Operate the trolley with due care, especially near the stopper, so that it may halt automatically before it hits the stopper. (Refer to Fig. 34)

Fig. 34



- Before assembling the trolley, this manual should be thoroughly read.
- This manual should be surely handed over to the users.
- The users of the electric trolley should thoroughly read this manual.

**3 -PHASE ELECTRIC TROLLEY
MODELS MAF, MAS & MB (Type)
OPERATION MANUAL (No. 2)**

- Thank you for your purchase of our product.
- It is quite important that you carefully read this operation manual before using our product.
- This manual should be kept close to the unit concerned, as the maintenance and inspection works absolutely require it.
- Please consult distributors of our products about the inspection requiring dismantling and assembling of the unit.
- For proper operation of the unit, please carefully read also the operation manual of the electric chain hoist.



ELEPHANT CHAIN BLOCK CO., LTD.



Osaka JAPAN


I) SAFE OPERATING PRACTICES

Improper operation of the electric trolley will possibly cause a dangerous situation such as falling of lifted loads, electric shock and so on. Carefully read this manual for proper operation before setting-up, installation, operation, maintenance and inspection of the electric trolley.


Do not begin to operate it before you have got familiar with its knowledge, safety information and all the special cares.


The cautions in handling the unit are classified into two levels in this manual;


 WARNING	This symbol is used to indicate that a death or serious injuries will be caused in all probability to the user or persons around when the products are improperly used.
 CAUTION	This symbol is used to indicate that damage may be caused to the user or persons around or only material loss will occur when the products are improperly used.

Even the matters indicated  "Caution" may bring a serious result depending on the situation. Strictly observe both the notices as they contain very important matters.

Examples of the symbol:

-mark indicates that there are warning/cautious matters. In a sketch a concrete warning ("caution for electric shock" in case of the symbol on the left) is described.



-mark indicates actions to be prohibited. In a sketch or nearby a concrete warning is described.

-mark indicates that any action will be required or directed. In a sketch a concrete warning ("request for connecting an earth" in the case of the symbol on the left) is described.

※The manual must be kept in place where the operator can read it whenever he needs.


1 . General


WARNING


- The unit should be operated only by those who are familiar with the manual and contents of the instructing plate. 
- The unit should be operated only by those who are formally qualified having completed training for operation of the crane, handling of the lifting slings, etc. according to the regulations in your country. The employer should kept unauthorized persons from operating the unit.
- The operation manual of the electric chain hoist should be also read. 
- Inspection before operation and periodic inspection must be by all means carried out.

2. Installation and Setting-up

WARNING



- The installation work should be performed only by the specialized contractor or experienced technician. 
- The electric trolley should not be installed in a place deviated from the provision where it is, for example, exposed to rain or water.

- Carry out an earth connection. Furthermore, an earth-leakage circuit breaker should be fitted to the electric line. 

- Attach a stopper to the ends of the traverse and travel rails. 
- Make sure that a location on which the electric trolley is installed has a sufficient strength.

3. Operation and Handling

WARNING

- Do not lift loads which exceed the rated load. 
 - ※The rated load is indicated on the nameplate of the electric trolley body.
- Do not get on a suspended load and do not use the electric trolley to lift, support or transport persons.
- Do not operate the electric trolley when somebody stays in an area where a suspended load is moved.
- Do not move a load over persons.
- Do not leave a suspended load unattended.
- Do not allow your attention to be diverted from operating the electric trolley.
- Do not use the electric trolley for the oblique pulling.
 - ※First move the electric trolley to right over a load and then lift it.
- Do not use the electric trolley for the earth lifting (for example, lifting objects fixed under the ground).
- Do not carry out turnover of a suspended load.
 - ※Turnover should be done by means of a device specialized in that purpose (Such a turning device is available from us).
- Make sure before operation that the push-buttons properly function. Do not operate the electric trolley when the push-buttons are in disorder.
- Immediately stop operating the electric trolley when it moves in other direction as commanded by the push-button switch.
- Make sure before operating the electric trolley that the brake properly functions.
- Do not operate the electric trolley when the brake is in disorder. 
- Do not use an electric trolley which was damaged or causes abnormal sound and/or vibration.
- The traversing rail must be grounded.

CAUTION

- Do not use the electric trolley at voltages other than the rated voltage in your country.
 - Do not operate the electric trolley by plugging (abrupt reversing) or frequent inching.
 - Do not have the suspended load caught on other structures or cables.
 - Do not have the push-button cord caught on other structures, or do not pull it strongly.
 - Do not have the electric chain hoist or the trolley hit against stoppers or other structures.
 - Never use the electric trolley at a load time rate and with a starting frequency exceeding the rated values.
 - Do not use the electric trolley with name plates and labels attached to the body removed or left unclear.
- Always keep the push-button kit clean so that dust, sands and the like will not be deposited on it.
 - In the case of double electric trolleying, two electric trolleys should be operated in a synchronized manner.



4. Maintenance, Inspection and Modification

WARNING

- Never make modifications to the electric trolley and its accessories.
 - Never use parts other than genuine ones made by us.
- Before carrying out the maintenance, inspection or repair do not fail to turn the power source off.
 - Only specialists authorized by the employer may carry out the maintenance, inspection or repair.
 - Carry out the maintenance, inspection or repair with the electric trolley unloaded (e.g. without loads).
 - When any disorder is found in the maintenance or inspection, immediately make repair before re-operating the electric trolley.



CAUTION

- Whenever carrying out the maintenance, inspection or repair, set up a warning plate indicating "Under working" ("Under Inspection" or "Passing the current prohibited", etc.).



Notice:

- Inspections requiring dismantling and assembling of the unit should be carried out by dealers of our products.

SPECIFICATION

Table 1

Rated load		250kg-2ton	2.5ton-5ton	7.5ton & 10ton
Motor output	MAF & MAS types	0.4kW	0.75kW	0.75kW×2
	MB type	0.1kW : 0.4kW	0.19kW : 0.75kW	0.19kW : 0.75kW×2
Insulation		E-class		
Time rated		MAF & MAS types : 30 minutes MB type : 15/30 minutes		
Operating voltage		24V		

INSTALLATION AND SETTING-UP

WARNING

- Refrain from installing the electric trolley by yourself and leave the installation work to the care of a specialized contractor.
- ※ Otherwise you might be wounded by electric shock or the electric trolley fallen.
- Do not fail to conduct an earthing. Furthermore, a leakage circuit breaker should be installed in the electric path.
- ※ Conduct earthing and fitting of the said breaker in accordance with regulations valid in your country.
- ※ Above measures are absolutely necessary for avoiding an accident by electric shock.



Concerning the installation, consult us or a distributor of our products.

Electric wiring

- Leave the electrical work to the care of a specialized contractor, who should properly carry out the work observing this instruction manual.
- Carry out the electrical work in accordance with the technical standards on the electrical equipment and regulations for the internal wiring in your country.
- Before connecting the power source to the electric trolley, make sure whether its voltage complies with the applicable source for the electric trolley.
- Connecting the power cable

Earthing and fitting of the leakage circuit breaker

CAUTION

- Do not fail to conduct an earthing. Furthermore, a leakage circuit breaker should be installed in the electric path.
- The power source must be connected via the switch cabinet (main circuit breaker).
- When the electric trolley is not used, the switch cabinet should be cut off for preventing risks.

CAUTIONS ON INSTALLATION

Use the electric trolley, paying attention to the following ;

⚠ CAUTION

- Never use the unit in an atmosphere laden with explosive gases. Otherwise a fire may be caused by electric sparks.
- Never lift loads exceeding the rated load.
- ※ Otherwise the chain hoist may be damaged or loads may fall down, as is quite dangerous.
- Never work by pulling of loads.
- ※ Otherwise the side-plate of the trolley may open, leading to its falling down. Even though the trolley may not fall down, the electric chain hoist may be disordered.

- For both preventing and detecting leakage, a leakage circuit-breaker must be installed.
- ※ The installation should be carried out by contractors authorized by electric companies or by a servicing agent authorized by the manufacturer.
- The traveling rail has to be earthed. For better conductivity, the faces of the traveling rail and wheels must be free from paint, oil, dust etc.
- For power supply, use the supply cables with capacity specified by the manufacturer (Refer to the operation manual of the electric chain hoist).
- ※ Pay a special attention to the power supply when the unit is used far away from the power source by making use of extended cords and the like, because the unit may not be able to normally operate due to the voltage drop and furthermore the unit or the extended cords may be burnt due to heating-up caused by the reduced torque.
- The leakage may be caused depending on conditions of a place where the unit is used.
- ※ Do not use the unit in a steamy atmosphere or outdoors in rain.
- Use the unit in a range of the time rated.
- ※ Operating the unit exceeding the time rated may cause the motor to be rapidly heated, resulting in burning of the motor and electrical parts.

HOW TO CONNECT THE 3-PHASE ELECTRIC CHAIN HOIST WITH THE 3-PHASE ELECTRIC TROLLEY

- The 3-phase electric trolley can be used by directly connecting the 3-phase electric chain hoist or suspending it.

HOW TO CONNECT L-TYPE CHAIN HOIST WITH THE TROLLEY

⚠ WARNING

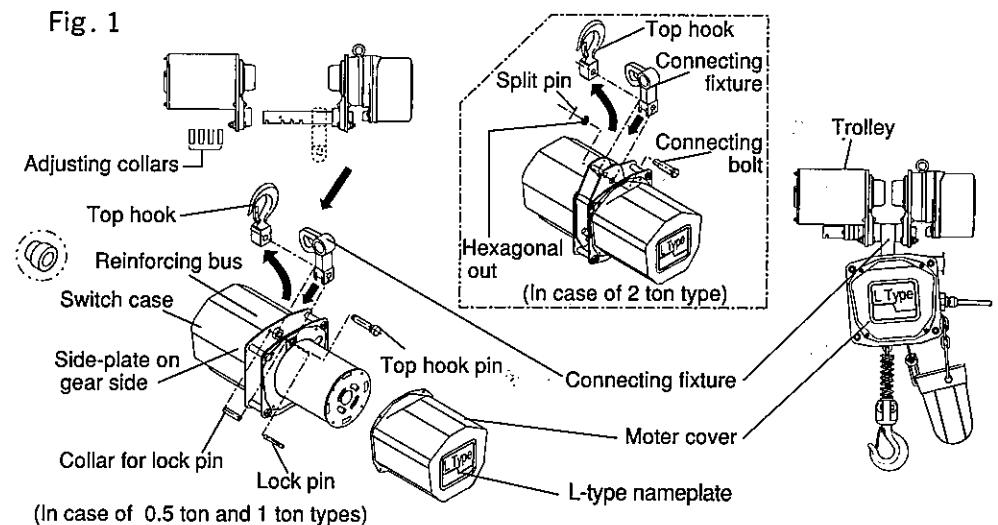
- Fit all the connecting fixtures without fail and properly make the connection; otherwise, the trolley and loads may fall down, as is quite dangerous.
- ※ Properly assemble the electric trolley and the trolley.

1. Direct connection for 0.5 ton and 1 ton types (common to electric, geared and plain trolleys)

- (1) Remove the motor cover of the electric trolley. (The motor cover is fixed by 4 bolts with washers.)
- (2) Remove the top hook pin by pulling it out.
- (3) Take the connecting fixture out of the trolley and attach it to the top hook pin of the electric trolley.
- (4) In the case of attaching the connecting fixture without dismantling the trolley, it is convenient for the connecting work to take the locking pin and the collar for the locking pin out of the body of the electric trolley and to attach them to the top hook pin of the electric trolley (for 0.5 ton and 1 ton only). (When the reinforcing bush fell out, it has to be again attached to the side plate on the gear side. The locking pin and the collar for the locking pin taken out of the body should be surely re-fitted to their original positions.)
- (5) Attach the motor cover to its original position.
- (6) Finally assemble all the components except the top hook to complete the connection work.


2. Direct connection for 2 ton type (common to electric, geared and plain trolleys)

- (1) First remove the split pin with a hexagonal nut for the connecting bolt of the electric chain hoist and then remove the top hook by pulling the said bolt out.
- (2) Mount the connecting fixture for the trolley onto the connecting bolt of the electric chain hoist and lock the nut to fit the split pin to the plate.



HOW TO MOUNT THE ELECTRIC CHAIN HOIST CONNECTED WITH ELECTRIC TROLLEY ONTO THE RAIL

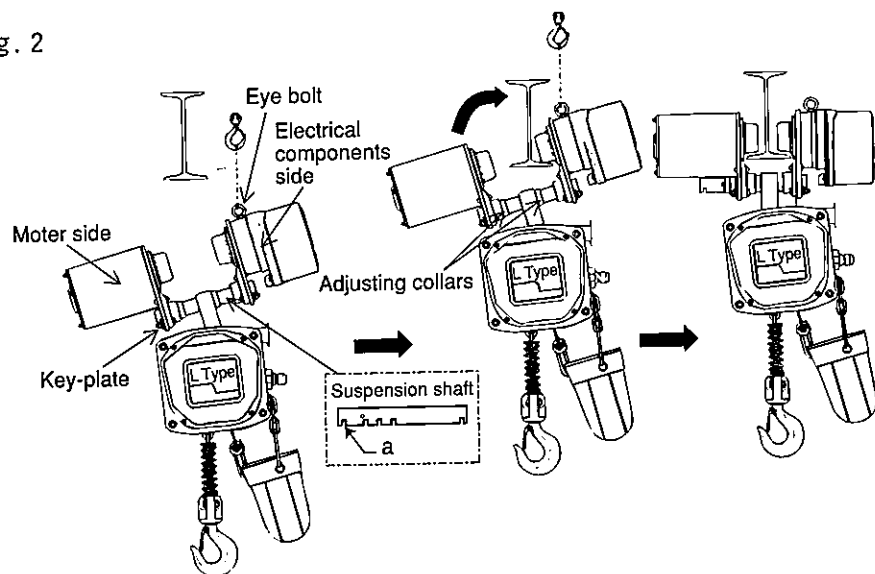
WARNING

- Fit all the connecting fixtures without fail and properly make the connection; otherwise, the trolley and loads may fall down, as is quite dangerous. 
- ※ Setting with the key-plate fitted to (a) should be regarded temporary only and the trolley may fall when the electric trolley is used in such a setting. Never operate the assembly or leave it in such a setting.
- ※ When adjusting the width by adjusting collars, be sure to insert them equally on either side of the connecting fixture. Inserting the collars together on one side only may unevenly load the trolley, causing an accident of its falling down.

● How to mount the electric trolley onto the rail

- (1) After completion of the connecting work of the electric trolley and the trolley, adjust the rail width of the trolley by using adjusting collars. (Mounting work can be easily done by means of a unique suspension shaft of our make, that is, by lifting the assembly with the side-plate on the motor side temporarily fitted to (a).)
- (2) Lift the assembly by an electric trolley and the like by slinging the eyebolt fitted to the trolley.
- (3) Mount onto the rail tread the wheels first on the side of the electrical components and then those on the motor side after removing the key-plate temporarily fitted to (a). (Be careful when removing the key-plate that the motor side should not slip down.)
- (4) Firmly refit all the bolts and nuts loosened to their former positions.

Fig. 2



CONNECTING THE ELECTRIC CHAIN HOISTS TYPES FA & FB TO THE TROLLEY

- In cases of both direct and hanging connections, the electrical components of the trolley should be on the side of the chain bucket of the electric chain hoist.

Fig. 3 DIRECT CONNECTION

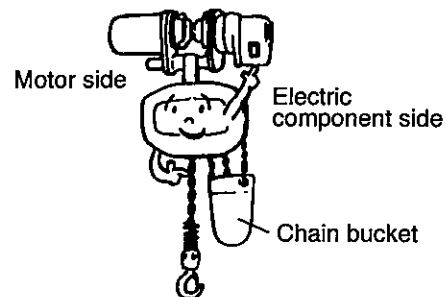
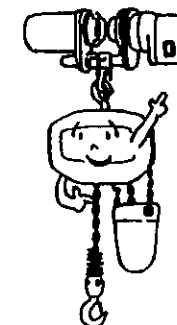



Fig. 4 HANGING

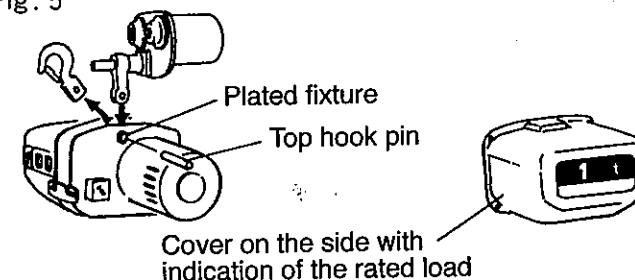


WARNING

- Fit the round fixtures connecting the electric trolley without fail and properly make the connection; otherwise, the trolley and loads may fall down, as is quite dangerous. 
- ※ Properly assemble the electric trolley and the trolley.

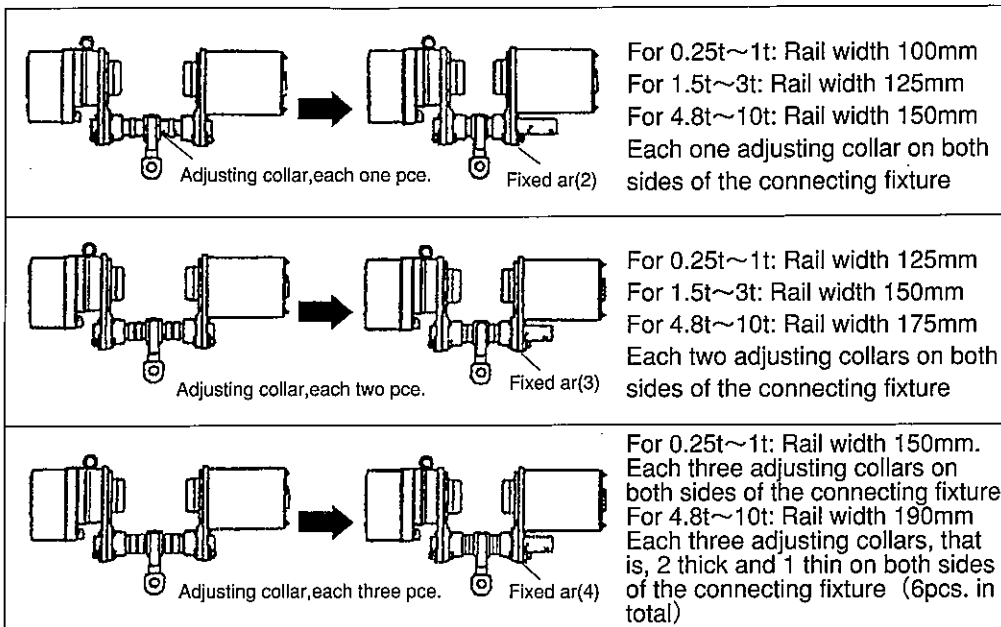
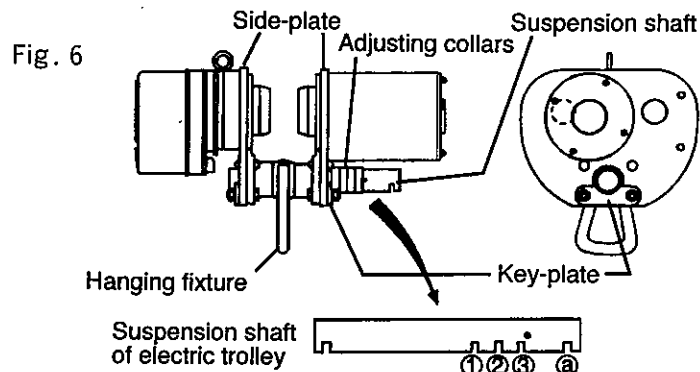
- In case of the direct connection, remove once the top hook pin to remove the top hook and instead fit the connecting fixture on the trolley to the electric chain hoist to fix it with the top hook pin.
- Remove the cover on which the rated load is indicated (fixed with 4 spring-washer bolts) and pull out the black top hook pin to remove the top hook. Not only the top hook but also 2 plated round fixtures are mounted on the top hook pin. These 2 fixtures must be again refitted, having set a connecting fixture of the trolley instead of the top hook.; otherwise, the electric chain hoist may fall down, as is quite dangerous. Careful and proper assembling is required. When all the components except the hook are reassembled, the direct connection is finished.

Fig. 5



HOW TO ADJUST THE TROLLEY TO THE RAIL WIDTH

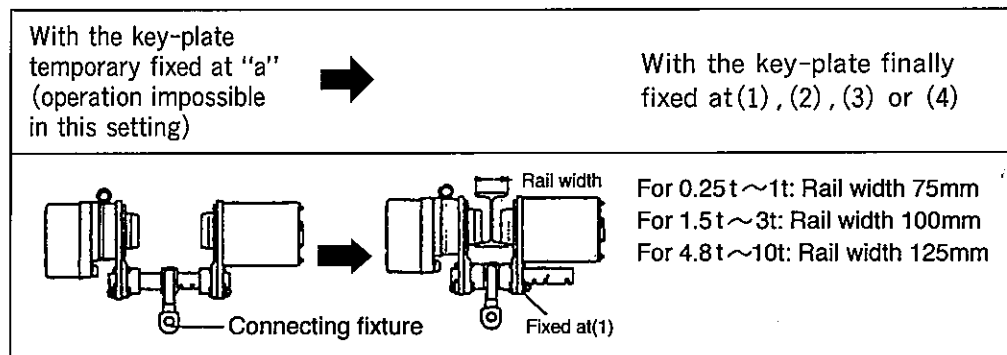
The key slot "a" among those on the suspension shaft of the trolley is made to enable the fitting to be easily carried out and it is possible to expand the side-plate distance by temporary setting of the key-plate at the slot "a" as the sketches on the left side in Table 2 to make fitting from the underside (Do not forget to insert the same number of pieces of adjusting collars on both sides of the connecting fixture).



⚠ WARNING

- Setting with the key-plate fitted to "a" should be temporary only and the trolley may fall when the unit is used in such a setting. Never operate or leave it in such a setting.
- Insert the same number of pieces of adjusting collars on both sides of the connecting fixture. If they are inserted on one side only, a load is not uniformly applied, causing a dangerous situation such as abnormal movement of the trolley or its falling, etc.

Table 2



WIRING

● 4-point push-buttons

- (1) Connect the two cables from the 3-phase electric trolley (cables with 4-point and 6-point plug respectively) to the electric chain hoist. As to the fitting of the connectors, refer to the operation manual included in the package of the push-button cord.
- (2) Connect the push-button cord (with 15-point plug) to the electric trolley.
- (3) Connect the power cable to the power source to complete the wiring (standard length of the power cable: 0.5m). To extend the power cable, remove the cover for the electrical components and properly attach a crimp-style terminal to a power cable with a required length (with 4 core wires).

● 4-point push-buttons (Connecting to the types DA & DB)

- (1) When the electric trolley and the electric chain hoist are together purchased, they will be delivered with the internal wiring completed.
- (2) When the electric trolley is separately purchased, refer to the wiring diagram included in the operation manuals of the types DA & DB or consult a dealer of our products.

● Fit the push-button cord as shown in the following sketch:

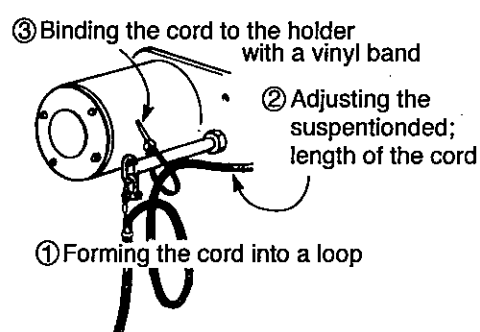
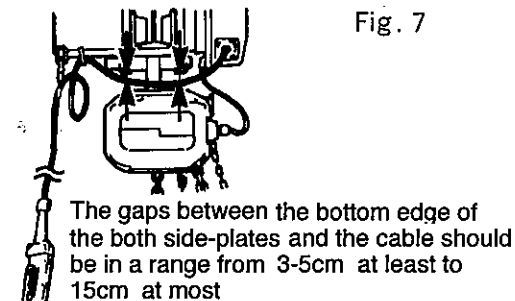
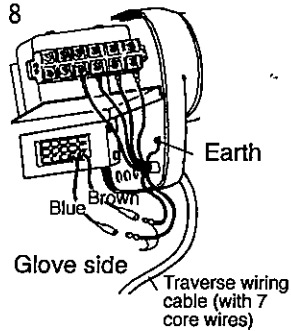


Fig. 7



●6-point push-buttons

Fig. 8



Covered crimp-style terminal: Properly crimp it by a crimping tool commercially available (which is not included in the standard set) Connecting steps other than 7 core wires are same as with 4-point push-buttons.

- (1) Remove the case for the electrical components for the electric trolley to remove the power cable.
- (2) Instead prepare a traversing wiring cable (with 7 core wires) with a required length and connect its 4 core wires by means of crimp-style terminals to the position where the power cable removed as per the paragraph (1) is connected. The 2 wires out of 3 core wires are to be connected to the shorter wires in brown and in blue respectively connected to the socket of the trolley. Make connection by using a covered crimp-style terminal of which plug is inserted into the female terminal connecting the black wire from the socket by using a crimp-style terminal. Connections to gray and purple wires are not necessary.
- (3) Assemble the case for the electrical components as before.

- (4) Connect the cables from the electric trolley (cables with 4-point and 6-point plug respectively) to the electric chain hoist. As to the fitting of the connectors, refer to the operation manual of the push-buttons.
- (5) Connect the push-button cord (with 15-point plug) to the electric trolley.
- (6) Four wires connected as per the paragraph (2) out of 7 core wires are for power supply and earth, and remaining 3 wires for operation (The wire connected to the black wire is common).

As to the control of the saddles, refer to the operation manual of the switch box for the saddles, model SBA. When the power source is put on after completion of the wiring and the push-button is pressed, it may happen that the traversing (trolley) is possible but the lifting/lowering (chain hoist) is not possible. It means that the the negative-phase prevention mechanism for the chain hoist is actuated. In this case, exchange 2 wires each other out of 3 wires except the earth wire in the power source box connecting the power cable (Refer to also the operation manual of the electric chain hoist).

OPERATIONAL CAUTIONS

 WARNING	<ul style="list-style-type: none"> ● Avoid sudden reverse operation (plugging) by push-buttons. ※ Such an operation causes a great instantaneous load exceeding double the lifted load, shortening the lifetime of the body and the chains.
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● Avoid an inching operation.

The inching may badly affect the mechanical lifetime and shorten the lifetime of connecting elements, electrical parts, motors and the like. Furthermore, the inching may cause the lifted load to be swung, as may lead to a big accident. Neither inching nor plugging operation should be allowed.

CAUTIONS ON INSTALLING THE ELECTRIC TROLLEY

⚠ WARNING

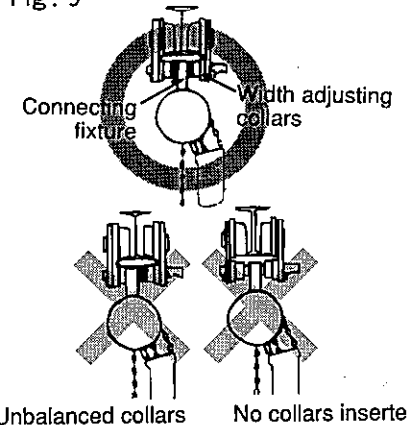
- When adjusting the width, be sure to insert the adjusting collars equally on either side of the connecting fixture. Inserting the collars together on one side only may unevenly load the trolley, causing an accident of its malfunction or falling down.



1 How to fit the trolley to the traversing rail

- The trolley can be fitted to the rail, being adjusted to several different widths of the traversing rail by shifting adjusting collars only.
- Insert the same number of pieces of adjusting collars on both sides of the suspension (connecting) fixture of the electric trolley.
- Avoid improper setting shown in Fig. 9 (marked with X) which may result in serious accidents

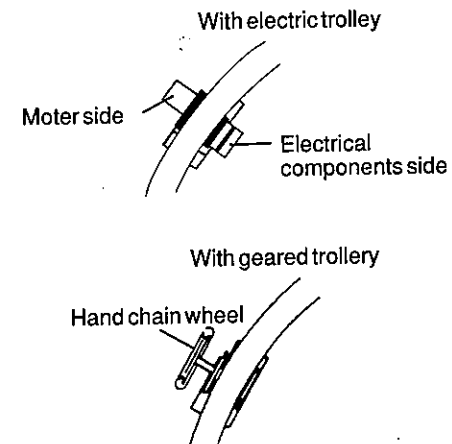
Fig. 9



2 How to fit the trolley to the curved traversing rail

- (1) In the case that the electric trolley or the electric trolley with a geared trolley is fitted to the curved traversing rail, its motor or hand chain wheel side should be outside the rail curve.
- (2) If they are inside the rail curve, the traversing rail or the wheel gear of the trolley may be possibly damaged.
- (3) In the case that the traversing rail has curves in both the right and left directions, the trolley should be fitted in such a manner that the above-mentioned instruction applies to a smaller curve (Refer to Fig.10).

Fig. 10



3 Traversing rail and stoppers

⚠ WARNING

- For avoiding eventual falling of the electric trolley and the trolley, mount a stopper at the rail ends.
- Avoid stopping the trolley by hitting it against a stopper.

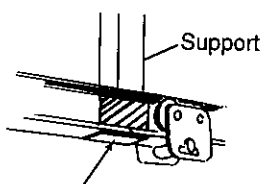


A portion of the traversing rail contacting trolley wheels should not be painted but be polished when it is rusted.

● Joints of the traversing rail

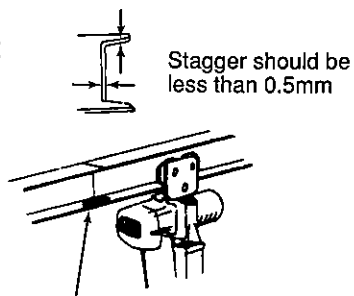
- (1) Joints of the traversing rail should be located in the vicinity of supports for the rail.
- (2) In the case that a backing plate is welded on the side or bottom of the rail (See Fig. 11), a plate with suitable thickness must be selected.
 - ※ If too thick a plate is attached, the trolley will hit it and be unable to pass through the point in the worst case.
- (3) Staggered joints must be aligned within 0.5mm in both horizontal and vertical directions. The portions on which the trolley wheels travel should be finished by a grinder (See Fig. 12).

Fig. 11



Pay attention to the thickness of backing plates.

Fig. 12



Rail joints should be finished by a grinder.

● Anti-falling stoppers at the rail ends

- (1) For avoiding that the electric trolley will hit a wall, etc. even when it hits the stoppers with a higher speed or the electric trolley swings, a distance (a) shown in Fig. 13 should be sufficiently wide.
- (2) The stoppers should be firmly secured so as to withstand the impact and be covered with a shock-absorbing material like rubber, etc. (See Table 3).

※ Avoid such installation and operation as the trolley always stops by running against the stopper.

Do not pull the push-button cord.

Do not traverse the trolley by pulling the push-button cord (Fig. 14).

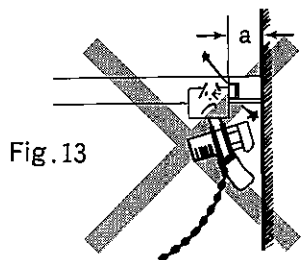
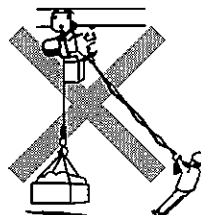


Fig. 13

Undue burden on a cord

Fig. 14



● Stop the trolley before it hits against the stopper.

- (1) On controlling the traversing of the trolley, operate the trolley so as to stop the trolley of itself before it hits against the stopper (Fig. 15).

Fig. 15

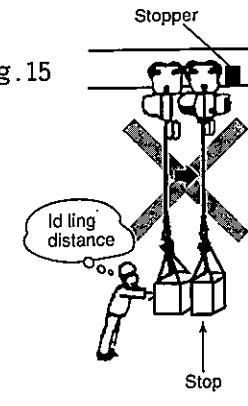
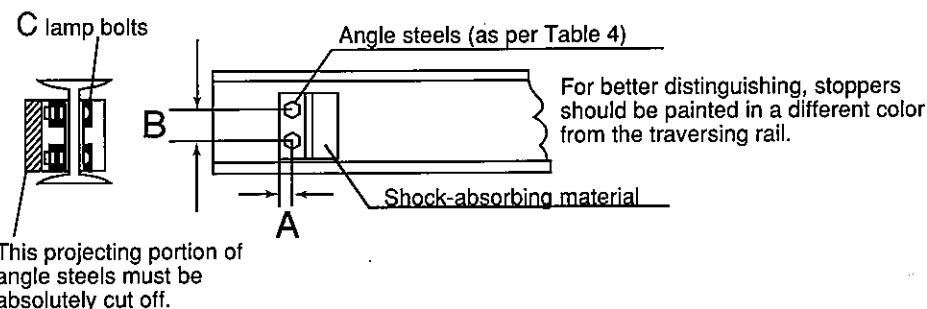


Table 3 Stoppers

Dimension of the traversing rail (mm)	150×75 200×100	250×125	350×150	450×175
Angle steels (mm)	L50×50×6	L65×65×6	L75×75×6	L90×90×7
A (mm)	20	30	35	45
B (mm)	50			
C (mm)	M16			

Fig. 16



DAILY INSPECTION

For daily operation, be sure to carry out the following check prior to operation.

- In cases of any abnormality, stop operating the unit and take proper counter-measures before using it again.
- Consult a dealer of our products when it is not possible to take proper measures.
- ※ As to details refer to the operation manual of the electric chain hoist.

Monthly inspection

- Carry out the voluntary inspection more than once in a month.
- If there is any abnormality discovered by the inspection, take appropriate measures against it.
- ※ As to details refer to the operation manual of the electric chain hoist.

Annual inspection

- Carry out the voluntary inspection more than once in a year.
 - If there is any abnormality discovered by the inspection, take appropriate measures against it.
- ※As to details refer to the operation manual of the electric chain hoist.

PROCEDURES FOR MAINTENANCE AND INSPECTION

⚠ WARNING



- Before doing maintenance, inspection and repair work, be sure to switch OFF the power source.
- Maintenance, inspection and repair work should be done by persons with specialized knowledge, or else, you should ask a dealer of our products.
- Make it a rule to carry out maintenance, inspection and repair in non loading (hoisting no loads) condition.
- If any abnormality is found in the maintenance and inspection, do not use the unit.

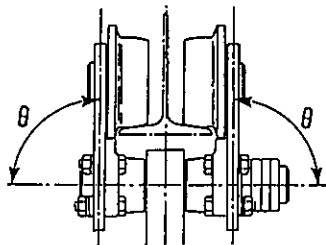
※As to details refer to the operation manual of the electric chain hoist.

INSPECTION OF THE TROLLEY AND ITS LIFETIME

● Bent side-plates

- Two side-plates should be free from deformation.
- The angle shown in Fig.17 should be right angle.
- Supply oil if there is abnormal sound caused by lack of oil in making traverse movement.
- There should be no missing or looseness of the bolts, nuts, etc.
- The wheel with gear cut on it should not have dust in the geared portion.

Fig.17



● Wear of trolley wheels

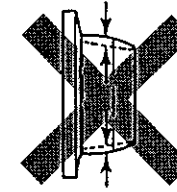
Trolley wheel as described below should be replaced with new one.

Fig.18



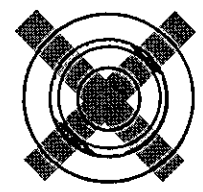
There is such a visible, obvious gap in the portion which is in contact with the edge of I-beam.

Fig.19



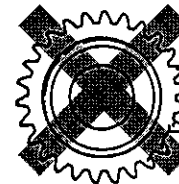
The wheel gets more than 5% wear-out from the original configuration.

Fig.20



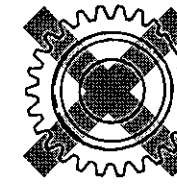
The wheel having partial wear on the tread surface (visible degree).

Fig.21



The gear of geared wheel has been worn out and/or damaged in visible degree.

Fig.22



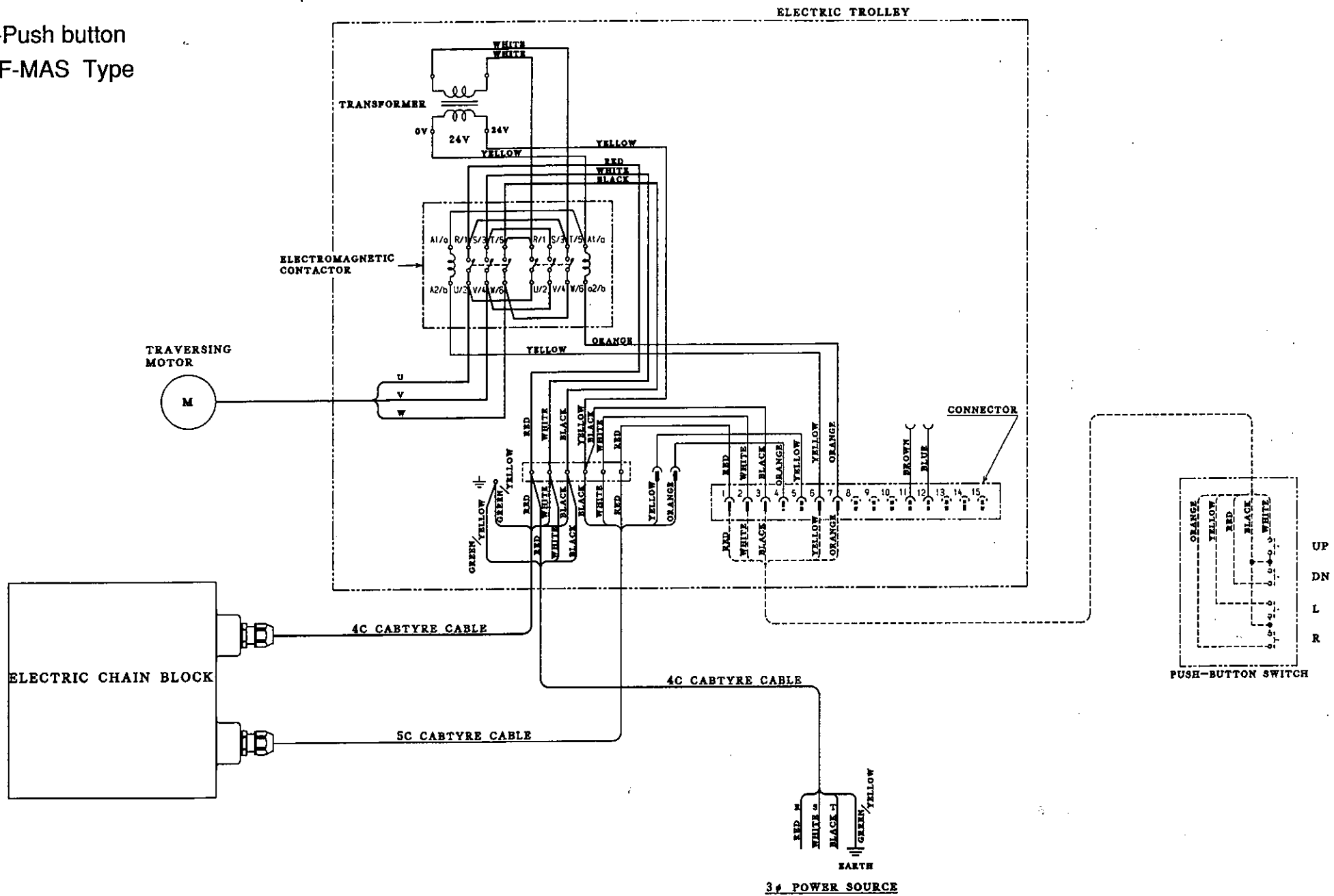
A tooth or some teeth of the geared wheel have been broken off.

OVERALL OPERATION (to be finally checked)

- Check that the electric trolley moves according to directions from the push-button switch.
- Make sure a distance the trolley travels until it stops, having released the push-button.
- Check that any abnormal sound is not caused in traversing movement.
- Check the gear for greasing and sticking of dust etc. on it.
- Make sure that bolts, nuts etc. at each position are not loose.

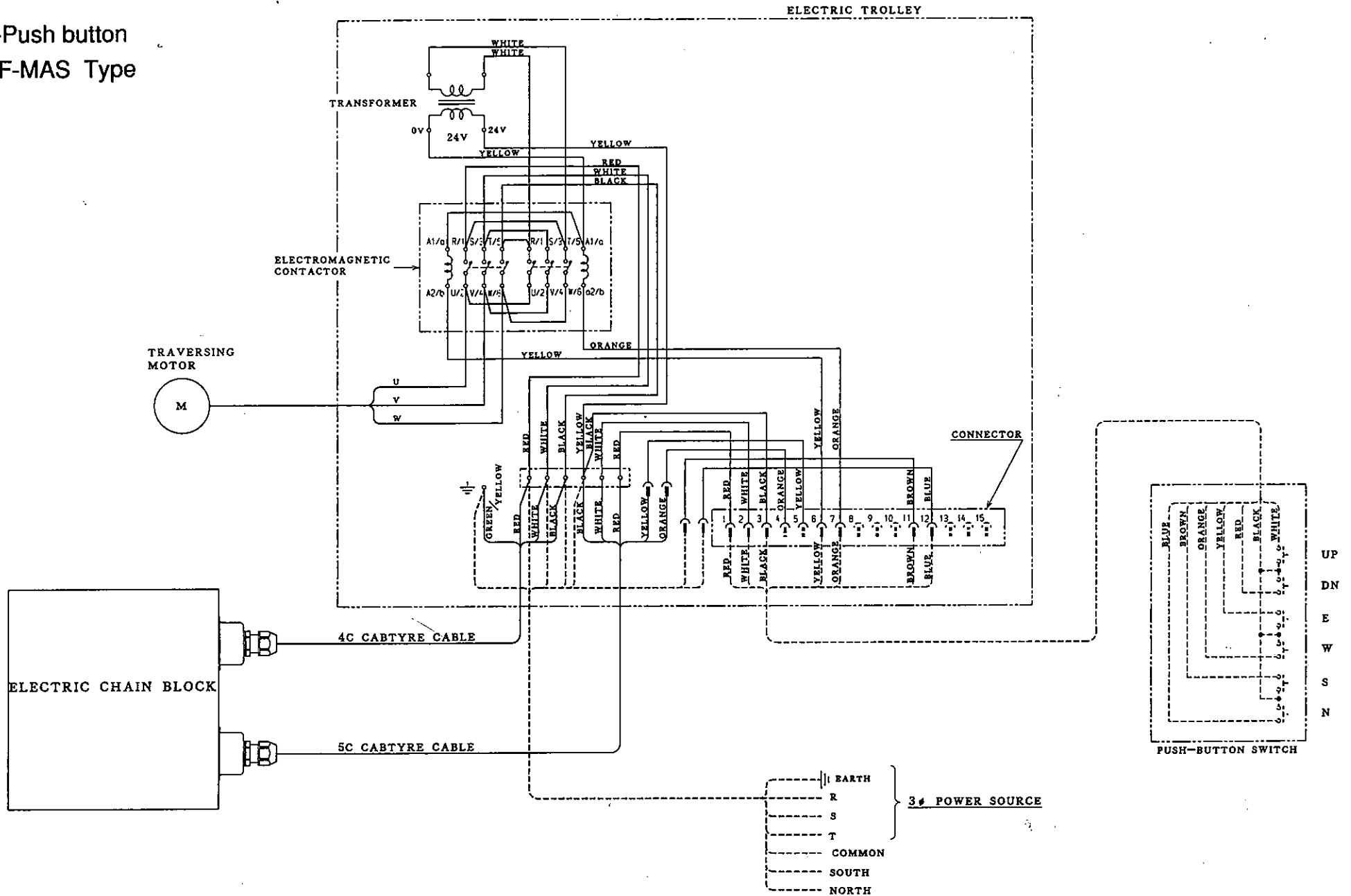
WIRING DIAGRAM

4 -Push button
MAF-MAS Type



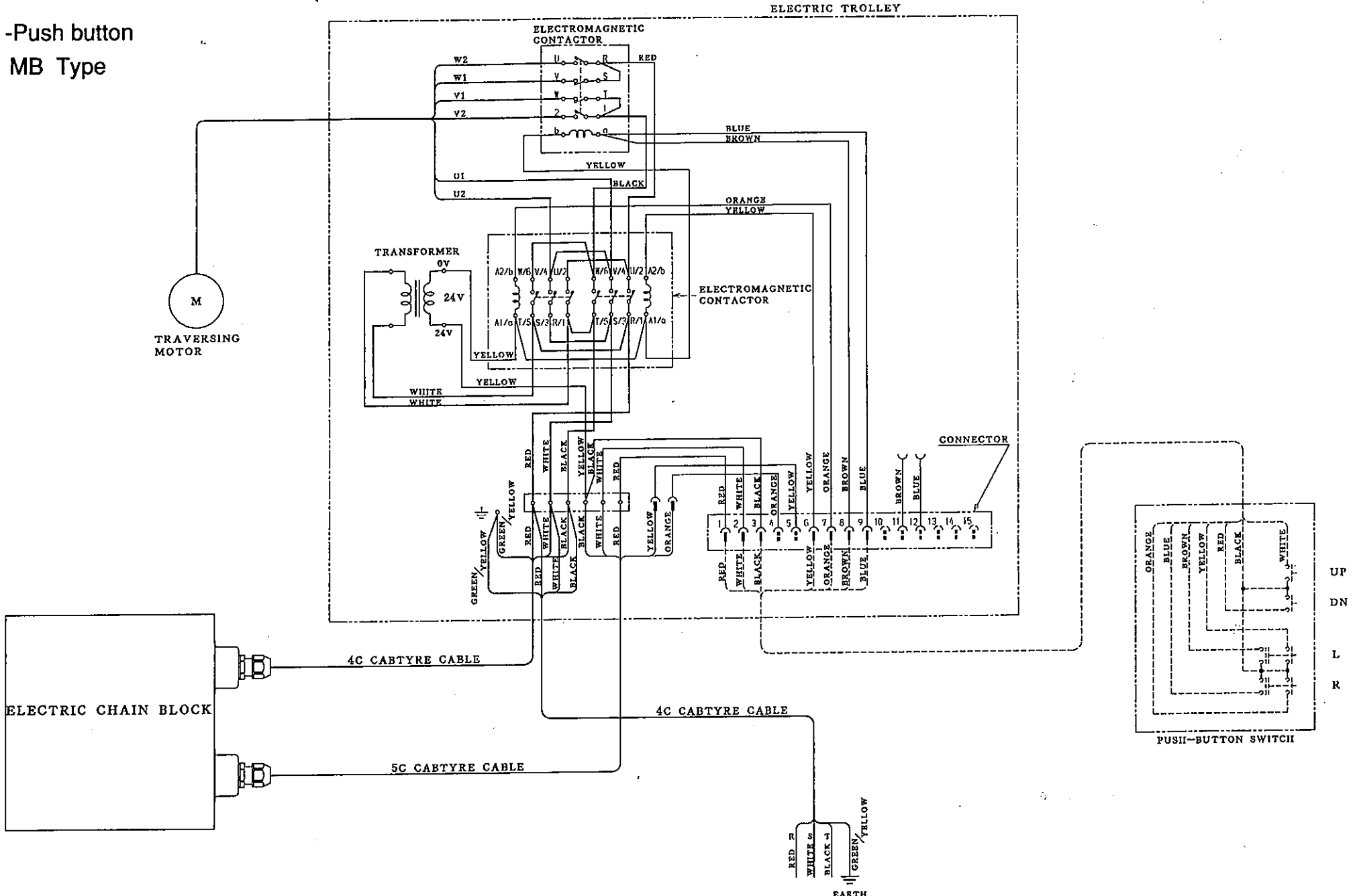
WIRING DIAGRAM

6 -Push button
MAF-MAS Type



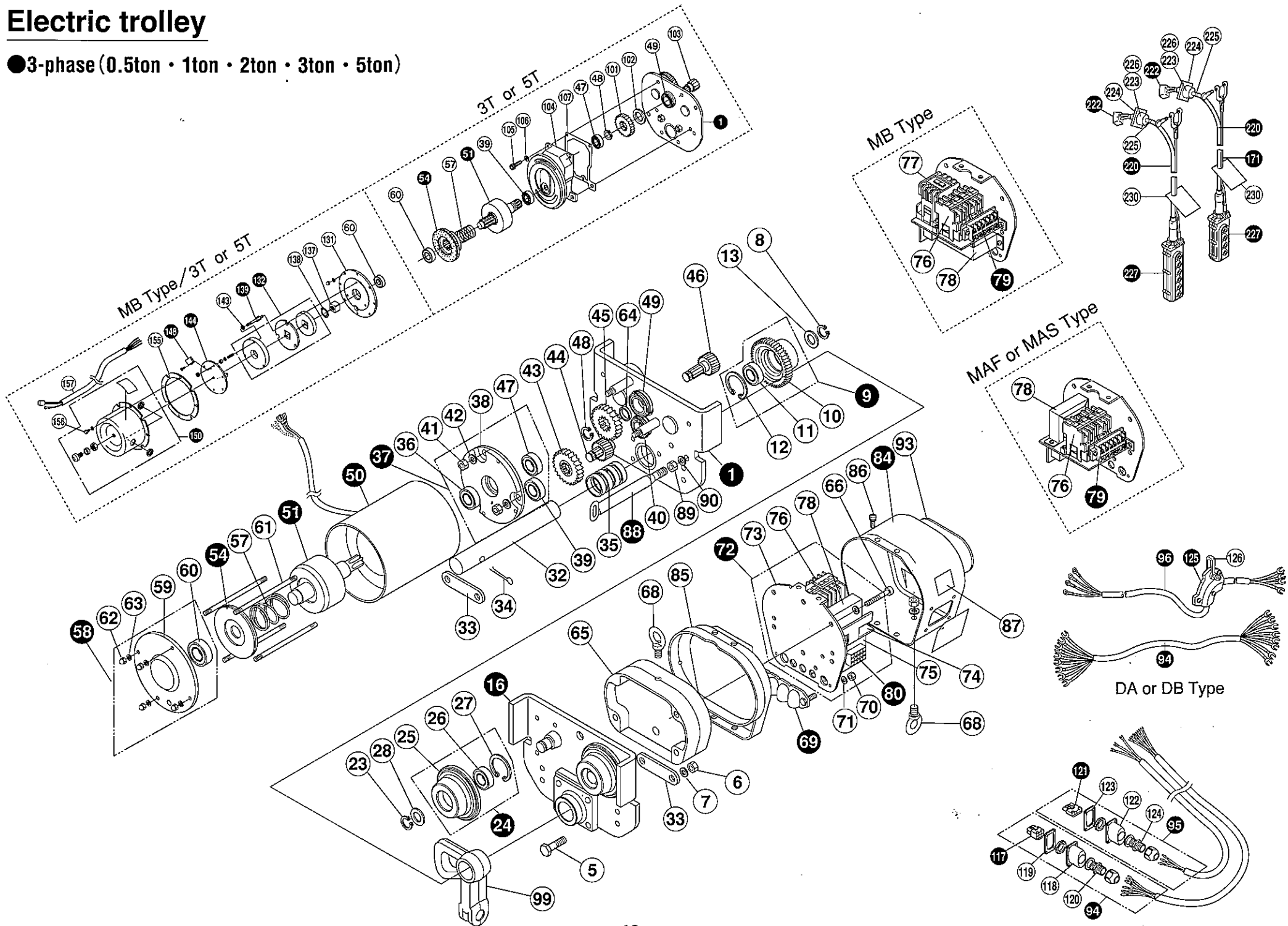
WIRING DIAGRAM

4 - Push button
MB Type



Electric trolley

●3-phase (0.5ton • 1ton • 2ton • 3ton • 5ton)



Electric trolley

●3-phase (0.5ton · 1ton · 2ton · 3ton · 5ton)

- ① Gear side plate set
- ⑤ Hex bolt
- ⑥ Hex nut
- ⑦ Spring washer
- ⑧ Snap ring
- ⑨ Gear wheel set
- ⑩ Gear wheel
- ⑪ Ball bearing
- ⑫ Snapring
- ⑬ Washer
- ⑯ Plain side plate set
- ⑳ Snap ring
- ㉑ Plain wheel set
- ㉒ Plain wheel
- ㉓ Ball bearing
- ㉔ Snap ring
- ㉕ Washer
- ㉖ Suspension shaft
- ㉗ Key plate
- ㉘ Cotter pin
- ㉙ Adjust collar
- ㉚ Ball bearing
- ㉛ Flange set
- ㉜ Flange
- ㉝ Ball bearing
- ㉞ Ball bearing
- ㉟ Hex nut
- ㊱ Spring washer
- ㊲ 2rd.gear
- ㊳ 3rd.gear(For low speed)
- ㊴ 4th.gear(For low speed)
- ㊵ 5th.gear
- ㊶ Ball bearing
- ㊷ Snap ring
- ㊸ Ball bearing
- ㊹ Motor case set
- ㊺ Rotor set
- ㊻ Brake drum set
- ㊼ Brake spring
- ㊽ Brake cover set
- ㊾ Brake cover
- ㊿ Ball bearing
- ① Stay bolt
- ② Hex cap nut
- ③ Spring washer
- ④ Collar(For 5th. gear)
- ⑤ Side cover
- ⑥ Bolt w/hex.hole
- ⑦ Eye bolt
- ⑧ Cord holder set
- ⑨ Hex nut
- ⑩ Spring washer
- ⑪ Electric equipment panel set
- ⑫ Electric equipment panel
- ⑬ Electric equipment holder
- ⑭ Socket panel
- ⑮ Magnetic contactor
- ⑯ Magnetic contactor
- ⑰ Transformer
- ⑱ 6P-terminal block set
- ⑳ Housing socket set
(pushbutton side)
- ㉑ Switch case set
- ㉒ Rubber band
- ㉓ Screw W/cross hole
- ㉔ Warning label
- ㉕ Push button hanger set
- ㉖ Hex nut
- ㉗ Spring washer
- ㉘ Name plate
- ㉙ Coupling cable set for control
- ㉚ Coupling cable set for power
- ㉛ Power cord set
- ㉜ Connector
- ㉝ 2nd gear
- ㉞ Washer
- ㉟ 3rd gear(For low speed)
- ⑩ Gear case
- ⑪ Bolt W/hex.hole
- ⑫ Spring washer
- ⑬ Packing

The goods has passed rigid inspection by us ahead of delivery in accordance with our standard in terms of test load and all other respects in good and satisfactory condition.

Inspector *Toshiyuki Morie*



ELEPHANT CHAIN BLOCK CO., LTD.

**180 Iwamuro 2-chome, Osaka-Sayama-City,
Osaka Postal code 589-8502, JAPAN
Phone : 072-365-7778 Fax : 072-365-7869**