BULLETIN NO. EF2-8710-10MG

HANDLING and MAINTENANCE INSTRUCTIONS

for

EF SERIES MODEL EF2 ELECTRIC CHAIN HOIST

(3 PHASE AND SINGLE PHASE)

IMPORTANT

When assembling a hoist with trolley, follow each assembling method of the manual which was shipped with the product.

KITO

CONTENTS

The EF series electric chain hoists consist of three phase hoists both in direct current control and low voltage control and also single phase hoist both in direct current and low voltage system.
Please read thoroughly this manual beofore use.

Pre-operational cares and checks

1. Check supply voltage and electrical connection

The EF series electric chain hoists are available in several voltage ratings. Before the first test operation after installation, check to see if the supply voltage is proper and the electrical connection is correctly done.

2. Lubricating the gear case

The gear case contains oil at time of delivery. In replacing oil, untighten the draining oil plug, remove the oil and pour the specific amount of the new oil into the case, and reinstall the plug. (Table 1)

Table 1. Amount of Gear Oil

Cap (kg)	Amount of Oil (ℓ)
125-S 250-L 250-S 500-L 500-S 1000-L	0.6
1000-S 2000-L	1.0

○ Standard Gear Oil:
ANTOIL B
made by Nippon Oil Co., Ltd.

○ Recommended Gear Oil:
Meropa Lubricant No. 320
made by Texaco Oil Co., or Caltex Oil Co.

3. Install a chain container to hoist body.

A special canvas chain container is available as an option.
When the chain container is used, install it to the hoist body as shown in Fig. 1. Every chain container is indicated with the load chain capacity it can contain. Should a smaller capacity chain container be used, all of the required length of chain can not be collected in it. This is undesirable. Check the length of load chain and select a proper capacity chain container.

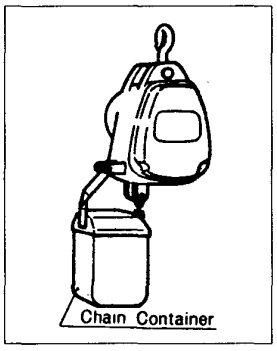


Fig. 1

4. When a chain container is not used

Mount a stopper at the ninth link from the end of load chain as shown in Fig. 2, and connect the end of the load chain to the hoist body without twist in the load chain.

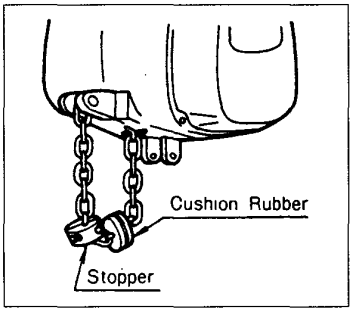


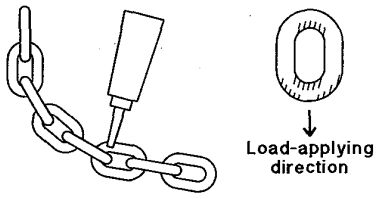
Fig. 2

5. Lubricating the load chain

Chain lubrication is a critical factor in the service life of a load chain. KITO's specified chain lubricant or equivalents to industrial general lithium grease (NLGI No.0), can provide a longer service life. Use of machine oil or gear oil requires regularly application.

Lubrication Procedures

- Vertically suspend the chain under no load conditions.
- Remove dust or water drops from the chain.
- Apply lubricant around the sections where the chain links come into contact with each other and the load sheave or idle sheave as shown in the following figures.



- After the chain lubrication is done, lift and lower without any load to spread the lubricant thoroughly.

Please consult with KITO Corporation if any of lubricants are not allowed at your site.

6. Prevent capsize in load chain

If your hoist is any of 250-L, 500-L, 1000-L and 2000-L capacities, the bottom hook is suspended by a two fold load chain. Check to see if the bottom hook is not capsized, giving a twist in the load chain as shown in Fig. 3. If the load chain is capsized, restore it to normal. Never try to suspend a load onto the twisted chain. If the load chain is not twisted, the welded part of the chain are in alignment (Fig. 3).

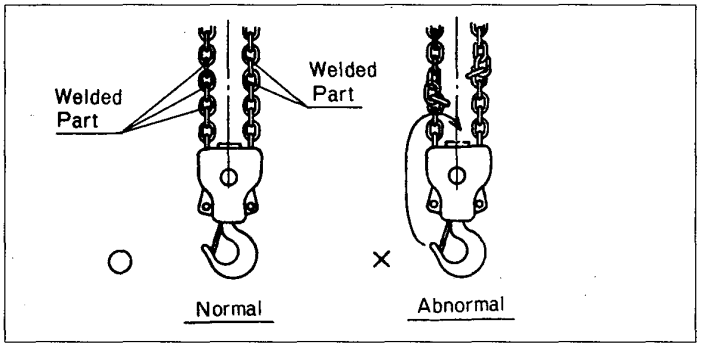


Fig. 3

7. Mounting of motorized, plain or geared trolley to beam (Mounting of electric chain hoist to the motorized, plain or geared trolley is by means of top hook)

7-1 Assembly of trolley

1) Take off stopper pin and also take off side-plate S and spacer from suspension shaft. Insert the suspension shaft into the inner adjusting spacers and the top hook, referring to Fig. 4 and Table 2.
2) Insert suspension shaft into side-plate S and put outer spacers to the outside and insert shaft stopper pin into suspension shaft and also insert split pin into shaft stopper pin. After insertion, bend securely both branches of the split pin.

Number of Adjusting spacers

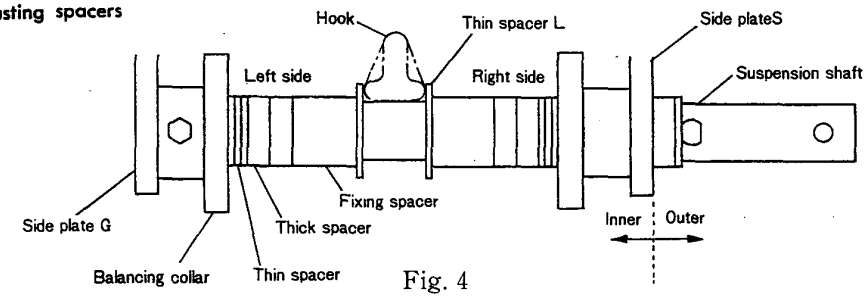


Fig. 4

Capacity	Beam Width (mm)	Parts								
		Thin spacer			Thick spacer			Fixing spacer	Collar L	Balancing Collar
		Outer	Inner		Outer	Inner		1 for each side	1 for each side ※1	1 for each side ※2
			Left	Right		Left	Right			
500kg	75	4	3	3	4	0	0	—	2	—
	100	4	3	3	2	1	1	—	2	—
	125	4	3	3	0	2	2	—	2	—
	150	8	0	0	3	1	1	2	2	2
	175	8	0	0	1	2	2	2	2	2
	200	4	4	0	0	2	3	2	2	2
	250	4	4	0	4	1	2	2	2	2
	300	4	2	2	0	3	4	2	2	2
1t	75	3	3	4	4	0	0	—	2	—
	100	4	3	3	2	1	1	—	2	—
	125	0	7	3	1	1	2	—	2	—
	150	4	3	3	0	2	2	—	2	2
	175	4	4	0	10	0	1	2	2	2
	200	4	4	0	8	1	2	2	2	2
	250	0	4	4	5	3	3	2	2	2
	300	3	4	1	0	5	6	2	2	2
2t	100	8	0	0	3	0	0	—	2	—
	125	0	4	4	3	0	0	—	2	—
	150	4	4	0	0	1	2	—	2	—
	175	4	4	0	0	1	2	—	2	2
	200	0	4	4	9	2	2	—	2	2
	250	0	4	4	5	4	4	—	2	2
	300	4	4	0	0	6	7	—	2	2

※1 One Collar L should be placed on each side, closest position to the hook.

※2 One balancing collar should be placed on each side, closest position to the frame.

CAUTION : When the trolley is mounted on other sized rail than above table. adjust trolley width according to the A ppendix on the Final page of this manual.

Table 2

7-2 Mounting of trolley onto beam

(1) Adjustment of trolley width before mounting onto beam.

Adjust the trolley width for the following proper clearance.

Adjustment of "A" dimension:

Proper"A" dimension when both side plates are spread fully outside is as follows:

Beam width (B) + approx. 6mm

Make adjustment by adding or taking out the outer spacers, without caring about the number of spacers shown in Toble 2.

Adjustment of C dimension:

Proper C dimension is approx 7-13mm. Make adjustments by adding or taking out the inner spacers on side-plate S side, without caring about the number of spacers shown in Table 2. There is a difference of spacer between the right and left side. However, this does not pose any problem. Minimum one piece of spacer is required on both sides.

After adjustment, securely insert the split pin into the shaft stopper pin and bend securely both branches of the split pin.

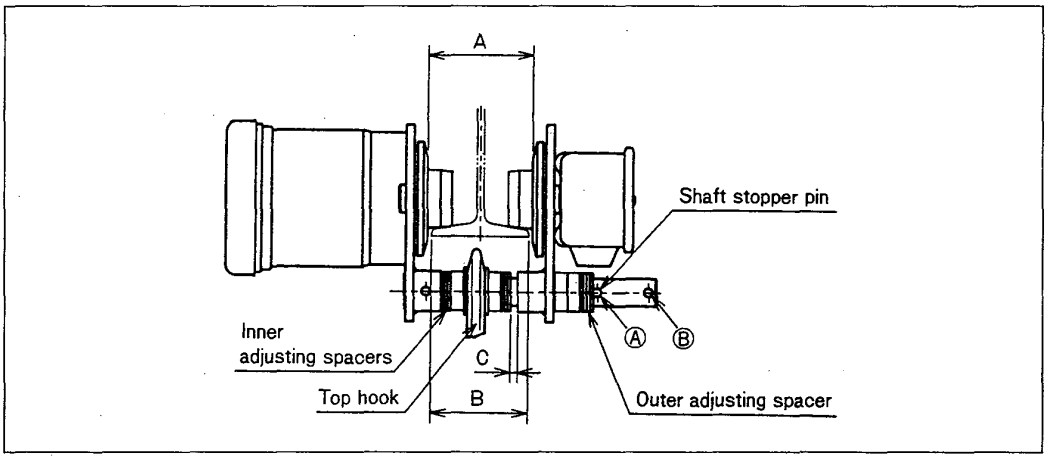


Fig. 5

Adjustment for the beam width shall be made within the specified number of spacers as given in Table 2.

Consult your nearest dealer or KITO offices for any deviation.

WARNING : Never use the hole Ⓑ to adjust trolley width. Hole Ⓑ is used only for trolley installing on rail.

(2) In case the trolley is put onto the beam flange from the open end of the beam as it is connected to the hoist.

1) Remove the stopper at the end of the beam, and put the trolley onto the beam from the end of the beam.

2) Fix the stopper onto the beam surely.

(3) In case the trolley cannot be put onto the beam from the open end of the beam as it is connected to the hoist.

Installation of the trolley, as assembled with an electric chain hoist, to the beam by separating the side plates G and S is extremely dangerous and should not be employed under any circumstances. Always install the trolley to the beam and connect the chain hoist to the trolley.

1) Remove the connecting shaft from the chain hoist and separate the chain hoist from the trolley. (Leave the top hook on the suspension shaft.)
2) Install the trolley to the beam.
   ① Take out the stopper pin from hole Ⓐ and insert it into hole Ⓑ of the suspension shaft. (Bend the split pin to an extent that it does not come off.)
   ② Life the trolley until the wheels are on the same level of the travelling surface of the beam, with the right and left side-plates spread outside, and put the wheel of side-plate G on the travelling surface of the beam.
   ③ Press the side-plate G firmly so that it may not come off the travelling surface, and at the same time push the side-plate S and put its wheel onto the travelling surface of the beam.
   ④ Take out the stopper pin from hole Ⓑ and insert it into hole Ⓐ, and bend the split pin surely.
      ※ Inserting direction of the shaft stopper pin in case of Motorized trolley shall be from right to left.
   ⑤ Connect the electric chain to the trolley by making sure of its relative position to the trolley. (See figures below.)

(4) Balance weight installiag

For a motorized trolley which needs balance weights on it in order to keep stability on even a smaller rail flange, a stopper pin or a stopper bolt for falling off prevention of the balance weight has been assembled previously at the end of the bar. If the pin or the bolt is removed temporarily for any reason, ALWAYS reassemble the pin or the bolt and fix either with a split pin or a slotted nut and a split pin.

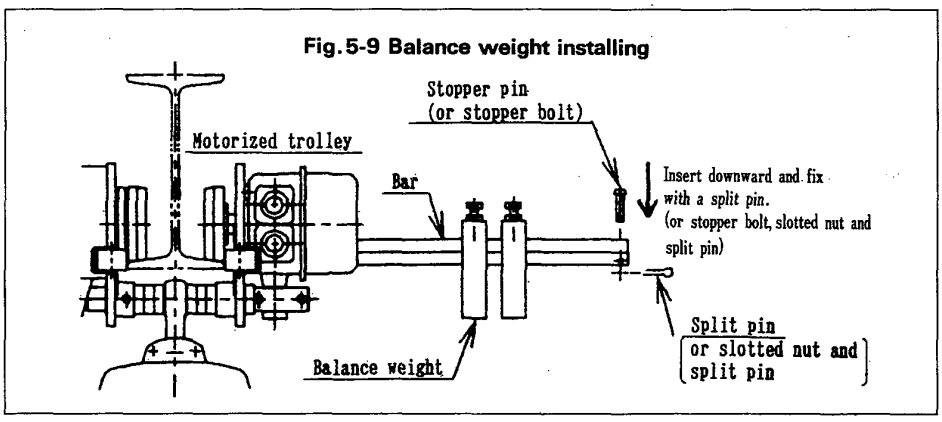


Fig. 6 Balance Weight installing

(5) When all mounting work is over.

When all the mounting work is over, check the following.

1) Make sure that the relation of the position of the trolley to that of the electric hoist is proper. (Refer to figure)
2) Make sure that the stopper for prevention of the derailing of the trolley is surely fixed on the beam.
3) Make sure that all the bolts, nuts and split pins are where they should be and are surely tightened.

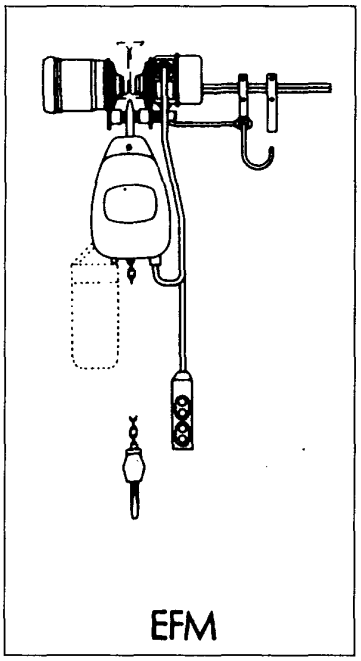


Fig. 7

7-4 Adjustment of motorized trolley braking

Braking of the motorized trolley is already adjusted before shipment from the factory. Should you, however, require stronger braking than the factory-set adjustment, certain degree of adjustment can be achieved by turning the adjusting nut provided on the motor shaft as shown in Fig. 8 in the direction clock-wise.

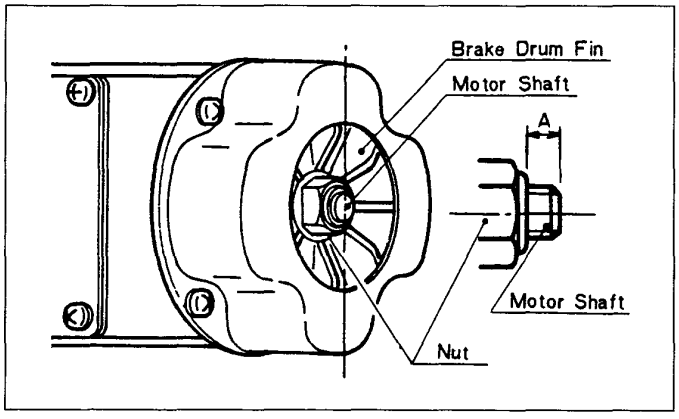


Fig. 8

(1) Adjustment for stronger braking

Hold the brake drum by the fins and turn the adjusting nut clockwise.

(2) Movable range of adjusting nut

The braking adjustable range by the adjusting nut. A dimension in Fig. 8 is 1.5 to 7mm. When A exceeds 7mm, the motor may heat up to burn. When A is less than 1.5mm, the brake may not work. Therefore braking adjustment should be made within their range.

NOTE

If the brake works too much the trolley makes a quick stop, causing the load to swing. As a result, swing of the load forces the trolley to skid on the beam and you cannot stop the trolley at the desired position This operation endangers operators, and should be avoided.

8. Electrical power supply

8-1 Installation of power supply cable

(1) Provide a messenger wire (3-6mm dia. wire) along the beam and hang the power supply cable without twisting it through the cable hangers.

(2) Install the messenger wire as shown in Fig. 9.

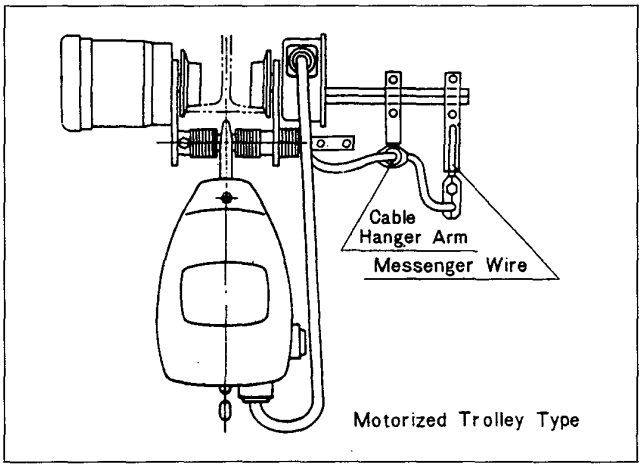


Fig. 9

* When the beam has a curve, messenger wire at the curve can not be installed. A special T type cable hanger for the curved beam section is available upon request. Consult your local dealer for proper number of hangers and spacing between them as they differ depending on the location and radius of the curve in the beam.
* Also consult your local dealer in case the electrical power supply is by means of other ways.

8-2 Electrical wiring

Kito single phase hoist can be used on single phase electric power source. Compared with conventional home electrical equipment, a big capacity's motor is used on the hoist. Consult your local electrical workers for proper wiring of the single phase hoist.

(1) Connect RED, WHITE and BLACK, in case of 3 phase, and RED, WHITE, in case of single phase, lead wires of the power supply cable to the switch in the main switch box. Cables must be securely connected for safe operations.

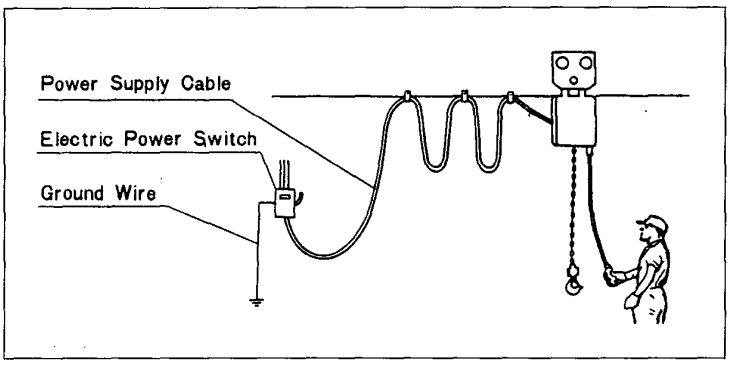


Fig. 10

(2) Ground wiring

The GREEN and YELLOW stripped wire is the ground wire, which should be always connected to a suitable ground. Unless the wire is grounded, operators may sometimes feel a shock when touchin g any part of the hoist or chain.

* Do not paint the trolley running surface of the beam when electrical grounding work is not provided on the copper conductor.

(3) Connection by means of plug (Only in case of single phase hoist)

The best way of connection to power source is use of a plug with ground wire.

9. Notes on trial operation

After initial installation of the hoist and before each day's use, perform trial operation to make sure that the hoist functions satisfactorily.

9-1 Check of voltage

Check supply voltage before daily use. Should the voltage be not within plus or minus 10% of the rated voltage when measured at the hoist, electrical devices may not function properly.

9-2 Check of control button

(1) Make sure that depression of ⬆ button lifts the load chain and depression of ⬇ button lowers the chain. (Hereinafter, the following is for three phase hoist) if the chain movement is reverse, reverse any two out of three lead wires of the cable in the electric power switch and recheck the chain movement.

TIPS FOR SAFE OPERATION

1. Friction clutch

The KITO EF series electric chain hoist is equipped with a built-in friction clutch as the overwinding protection device. This clutch eliminates complex electrical circuitry unless otherwise necessary and its simple construction reduces troubles to minimum if such happens. However, overloading or ther improper use of clutch may result in poor hoisting and retaining of the load.

1-1 Do not overload the hoist

When the hoist is overloaded in excess of the torque, the friction clutch provided slips to allow the motor by itself run free to protect the other parts. However, if the hoist is overloaded close to the slip torque and if the load is forcibly lifted with the clutch slipping, the load, once lifted, may fall. This kind of use is dangerous and must be prohibited.

The friction clutch is not an overload protection device. Always make sure before lifting that the load to be lifted is within the capacity of the hoist.

1-2 Do not overwind

When the cushion rubber hits the chain guide and when the chain is overlifted or overlowered, the friction clutch slips to make the motor run free. However, do not use this device as a means to stop the hoisting.

1-3 Do not re-adjust the setting of friction clutch

The clutch sets already to function satisfactorily before the delivery from factory:therefore, do not attempt to re-adjust the clutch setting at your end.

2. Hang precisely any loads on the hook.

As shown in the Figure 11, sling precisely. As shown in the Figure 12, if you sling any load forcibly or bind directly the load to the hook, slings may be slipped off or the hook will be deformed, which are causes of accidents. As for slings, it is recommended to use effective KITO sling-chain or polyester sling.

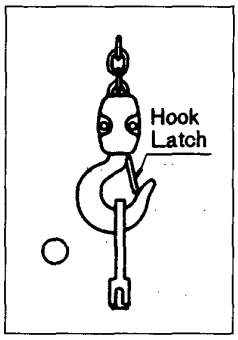


Fig. 11

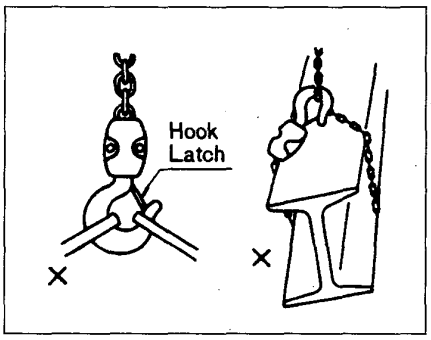


Fig. 12

3. Hook latch.

A hook latch is provided on a bottom hook to avoid a sling from slipping off the hook. Make sure before hoisting if the hook latch is correctly positioned as shown in Fig. 11.

4. Do not hoist a load with multiples of hoists.

This is dangerous. Never hoist a load with two or more hoists. If such is unavoidable, distribute the load evenly to each hoist used and do not overload any hoists.

5. Always confirm before Lifting a load that every chain fall of a double-fall-hoist can share evenly the load.

6. Always hoist load at its center of gravity.

Always hoist load at its center of gravity. If not, unbalanced load may not only slip off from the hook, but also, in case of trolley type, cocked trolley may force the beam to swing slideways.

7. Do not reverse direction of motor rotation quickly.

Always make a complete stop of the motor when you move from one operation (eg. lifting) to the next (eg. lowering). Quick reversal direction of motor rotation may cause failure or shorten the motor life.

8. Do not bump trolley against beam stopper.

A stopper is generally provided at each end of the beam to prevent the trolley run off the beam. Bumping into it may damage the trolley itself or hoist mechanism. Care must be also exercised when work is done near the stopper.

9. Do not pull push button control cord.

Do not attempt to move the trolley by pulling the push button control cord. Electrical trouble may result.

10. Cautions when welding work is done.

When welding work is done, keep the load chain and the hook away from the grounding wire of the electric welder.

11. Do not allow load to hit chain container.

When the load is suspended directly by the bottom hook without use of KITO sling chain or other devices and lifted to the full height, the load may hit and push up the chain container. This may prevent the container to house all necessary length of the load chain in it. This is dangerous. Whenever the bottom hook directly suspends the load, care must be exercised so as not to allow the load to hit the container.

12. Check capsize in load chain and correct positioning of chain.

12-1 Capsize in the load chain must be avoided at any time. Particularly capsize in load chains of double-falls type (250-L, 500-L, 1000-L, and 2000-L types) is dangerous. Correct the capsize in accordance with Fig. 3 in page 2.

12-2 The correct load chain set up is that the weld of each link face outward as shown in Fig. 13. When you replace a load chain, set it up correctly with respect to the welds.

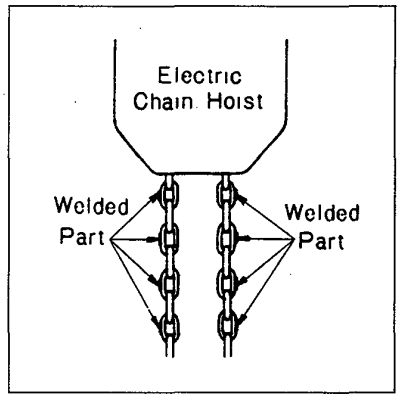


Fig. 13

13. Disassembling

In case it is necessary to disassemble the hoist for the purpose of inspection, never fail to make sure

(1) that there is no load on the hoist, and

(2) that current supply is cut.

CARE AND MAINTENANCE

1. Gear box oil

The oil in the gear box needs not to be replaced under normal use. In case the hoist is used more frequently than the normal use, it is recommended to replace the oil once in several years. Use the KITO Gear Oil or the equivalents.

Recommended equivalent : Meropa Lubricant No. 320 made by Texaco Oil Co., or Caltex Oil Co.

2. Load chain lubrication

Clean and lubricate the load chain to assure longer service life and safe operation of the chain. For further information, refer to '5. Lubricating the load chain' on Page 2.

3. Storage

1) Do not expose the hoist to rain or dew.
   Do not store it in a humid place.
2) When the hoist is installed outdoors, cover it or move it back under the roof after use.
3) To store the hook suspension type, hook it on the wall or hang it from the ceiling.

TROUBLE SHOOTING

Trouble	Cause	Remedy	Remarks
Won't move. Won't lift.	Broken fuse	Replace fuse of same rating.	Do not use copper wire as substitule. Do not use fuse of larger rating.
	Broken condensor (This phrase is only for single phase hoist)	Replace new ones	Replacing should be made as 1 pair of complete set.
	Voltage drop	Check the voltage with a voltohm meter and check wiring.	Interrupt the operation
	Discontinuity in power supply cable Discontinuity in push button control cord	Check discontinuity in the cable where cable is subject to frequent bending, and repair coble and cord.	Immediately the motor hums but does not rotate.
	Overload	Check the weight of the load	
	Slipping due to poor friction clutch performance	Replace with Kito-adjusted friction clutch.	

Trouble	Cause	Remedy	Remarks
Brake slips	Worn brake shoe	Check the brake shoe and replace it as needed.	
Snapping sound is heard.	Worm load chain Rusted load chain	Check and replace the load chain as needed.	
Trolley won't stop.	Angulation of beam Oil-stained beam Poor braking (motorized trolley)	Correct the angulation. Remove oil clean. Re-adjust.	See Fig. 8, page 6
Electrical leak	Poor grounding works	Provide correct grounding	Leak at places other than the electric chain hoist may sometimes be responsible.
	Foreign matters or moisture depositing on electrical parts.	Remove foreign matters from or dry the electrical parts.	
Oil leak	Oil plug missing	Install the regular oil plug.	If oil leak occurs at places other than oil plug. disassemble and check thoroughly for the cause and repair.
	Loose oil plug	Tighten the plug.	
	Oil plug packing missing	Use new packing.	

APPENDIX

Number of Adjusting Spacers

Beam Width	(in)	$2\frac{5}{16}$	$2\frac{1}{2}$	$2\frac{7}{8}$	3	$3\frac{1}{4}$	$3\frac{9}{16}$	$3\frac{7}{8}$	$3\frac{15}{16}$	4	$4\frac{3}{16}$	$4\frac{5}{16}$	$4\frac{7}{16}$	$4\frac{11}{16}$	$4\frac{15}{16}$	5	$5\frac{3}{16}$	$5\frac{5}{16}$	$5\frac{3}{8}$	$5\frac{5}{8}$	$5\frac{11}{16}$	6	$6\frac{1}{8}$	$6\frac{5}{16}$	$6\frac{7}{16}$	$6\frac{11}{16}$	$6\frac{7}{8}$	7	$7\frac{1}{16}$	$7\frac{1}{4}$	$7\frac{7}{8}$	8	$8\frac{7}{16}$	$8\frac{11}{16}$	9	$9\frac{1}{8}$	$9\frac{7}{8}$	10	$10\frac{1}{8}$	$10\frac{1}{4}$	$10\frac{3}{8}$	$10\frac{1}{2}$	11	$11\frac{1}{8}$	$11\frac{1}{4}$	$11\frac{3}{8}$	$11\frac{5}{8}$	$11\frac{3}{4}$	$11\frac{13}{16}$	$11\frac{7}{8}$	12
		$2\frac{5}{8}$	$2\frac{15}{16}$											$4\frac{3}{4}$							$5\frac{3}{4}$							$7\frac{1}{8}$	$7\frac{5}{16}$																									
Capacity (t) / Parts	(mm)	58	64	66	73	74	75	76	82	90	91	98	100	102	106	110	113	119	120	125	127	131	135	137	143	149	150	153	155	160	163	170	175	178	180	181	184	185	200	203	215	220	229	232	250	254	257	260	264	267	279	283	286	289	295	298	300	302	305
1/2	Thin spacer Inner	1+0	1+2	2+3	3+3	3+4	1+2	2+3	3+3	3+4	0	4+5	5+5	6+2	3+3	3+4	1+1	1+2	2+2	3+3	0	1+0	1+1	5+2	6+2	3+3	0	1+0	1+1	1+2	4+0	1+0	2+3	3+3	1+0	1+1	4+0	4+1	1+1	1+2	2+2	2+3	4+1	5+1	2+2	2+2	3+3	3+4	2+2	4+1	3+3
	Thin spacer Outer	9	7	5	4	2	7	5	4	3	10	1	0	2	4	3	6	5	4	2	8	7	6	1	0	2	8	7	6	5	4	7	3	2	7	6	4	3	6	4	4	3	3	2	4	4	2	1	4	3	2
	Thick spacer Inner	0	0	0	0	0	1+1	1+1	1+1	1+1	1+1	2+2	1+1	1+1	1+2	2+2	2+2	0	0	0	0	1+1	1+1	1+1	0+1	0+1	1+1	2+2	2+2	2+2	2+2	2+3	0	0	0	1+1	1+1	1+2	1+2	2+2	2+2	2+2	2+2	2+3	2+3	3+3	3+3	3+3	3+3	3+4	3+4	3+4
	Thick spacer Outer	4	4	4	4	4	2	2	2	2	0	2	2	1	0	0	5	5	5	5	3	3	3	4	3	3	1	1	1	1	0	7	7	7	5	5	4	4	3	3	3	2	2	1	1	1	1	0	0	0
	Thin spacer L Inner	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Fixing spacer Inner																2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Balancing collar Inner																2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1	Thin spacer Inner	1+0	1+2	3+3	3+4	1+0	1+3	3+3	3+3	3+4	4+4	1+1	1+2	2+3	7+3	3+4	0	1+1	1+1	2+2	3+3	3+4	1+1	2+2	2+3	3+0	4+0	4+1	5+1	5+2	4+0	4+1	3+2	3+4	5+1	5+2	4+4	1+1	1+2	2+2	3+2	3+3	1+1	1+2	2+2	2+3	3+0	4+0	4+1	4+1	5+1
	Thin spacer Outer	9	7	4	3	9	6	4	4	3	2	8	7	5	0	1	10	8	8	6	4	3	6	4	3	5	4	3	2	1	4	3	3	1	2	1	0	6	5	4	3	2	6	5	4	3	5	4	3	3	2
	Thick spacer Inner	0	0	0	0	1+1	1+1	1+1	1+1	1+1	1+1	2+2	2+2	2+2	1+2	2+2	2+2	2+2	2+2	2+2	2+2	2+2	0	0	0	0+1	0+1	0+1	0+1	0+1	1+2	1+2	2+2	2+2	2+3	2+3	3+3	4+4	4+4	4+4	4+4	4+4	5+5	5+5	5+5	5+5	5+5	5+6	5+6	5+6	5+6	5+6
	Thick spacer Outer	4	4	4	4	2	2	2	2	2	2	0	0	0	1	0	0	0	0	0	0	0	11	11	11	10	10	10	10	10	8	8	7	7	6	6	5	2	2	2	3	3	1	1	1	1	0	0	0	0	0
	Thin spacer L Inner	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Fixing spacer Inner																						2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Balancing collar Inner																2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2	Thin spacer Inner								0	1+0	1+1	1+2	2+2	3+3	4+4	1+0	1+1	1+2	2+2	3+3	4+0	4+1	1+1	1+2	2+2	3+3	4+0	4+1	1+1	1+3	4+4	1+0	2+3	3+4	4+2	5+1	4+4	1+0	1+1	1+2	2+3	3+3	4+1	1+2	2+2	2+3	3+0	4+0	4+0	4+1	5+1
	Thin spacer Outer								8	7	6	5	4	2	0	7	6	5	4	2	4	3	6	5	4	2	4	3	6	5	0	7	3	1	2	2	0	7	6	5	3	2	3	5	4	3	5	4	4	3	2
	Thick spacer Inner								0	0	0	0	0	0	0	1+1	1+1	1+1	1+1	1+1	1+2	1+2	1+1	1+1	1+1	1+1	1+2	1+2	2+2	2+2	2+2	3+3	3+3	3+3	3+4	3+4	4+4	5+5	5+5	5+5	5+5	5+5	5+5	5+6	6+6	6+6	6+6	6+6	6+7	6+7	6+7	6+7	6+7
	Thick spacer Outer								3	3	3	3	3	3	3	1	1	1	1	1	0	0	1	1	1	1	0	0	9	9	9	7	7	7	6	6	5	3	3	3	3	3	2	1	1	1	0	0	0	0	0
	Thin spacer L Inner								2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Fixing spacer Inner																																																		
	Balancing collar Inner																						2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

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