Supplementary Manual
OWNER'S (OPERATOR'S) MANUAL AND SAFETY INSTRUCTIONS FOR KITO ELECTRIC CHAIN HOIST

ER SERIES (Model ERML)

For Capacity 7.5t to 20t
Approved by CSA

This supplement manual includes information only for larger WLL hoists.
ALWAYS use this manual in combination with the original manual (OWNER'S (OPERATOR'S)MANUAL AND SAFETY INSTRUCTIONS FOR KITO ELECTRIC CHAIN HOIST : Bulletin No. ERM-9806-MC).

ALWAYS SAVE THIS BOOK FOR FUTURE REFERENCE.

KITO CORPORATION

CONTENTS

Remarks : (1) Sections written in bold type are included in this manual.

(2) Sections marked with a ☆, refer to the " Owner's (Operator's) Manual and Safety Instructions : ERM-9806-MC".

How to use this manual

This manual contains information particular to large capacity ER hoists. Be sure to use it in conjunction with the " Owner's (Operator's) Manual and Safety Instructions : ERM-9806-MC ". Where under remarks a WLL of 7.5t or larger is indicated, refer to the same numbered item in this manual.

4. MAIN SPECIFICATIONS

4.1 Specifications

The following specifications are common to an KITO electric chain hoists, model ERML larger WLL hoists from 7.5t up to 20t.

Table 4-1 Specifications

Item		Specification		
Working temperature range (℃)		-20 to + 40 (-4 to +104°F)		
Working humidity range (%)		85 or less		
Protection	Hoist	IP 55		
	Push Button	IP 65		
Electric power supply		Three phase	60Hz	220V, 440V, 575V
Chain size	Capacity (t)	Nominal diameter (mm)		Pitch (mm)
	7.5 to 20	11.2		34.3

Remarks : (1) Contact KITO or an authorized KITO dealer for information on using the hoist beyond the working temperature or humidity range.

(2) For dimensions and other details, refer to the latest catalogue.

5. PREPARATION AND CHECKING BEFORE

5.1 Assembly of the electric chain hoist alone

⚠ WARNINNG

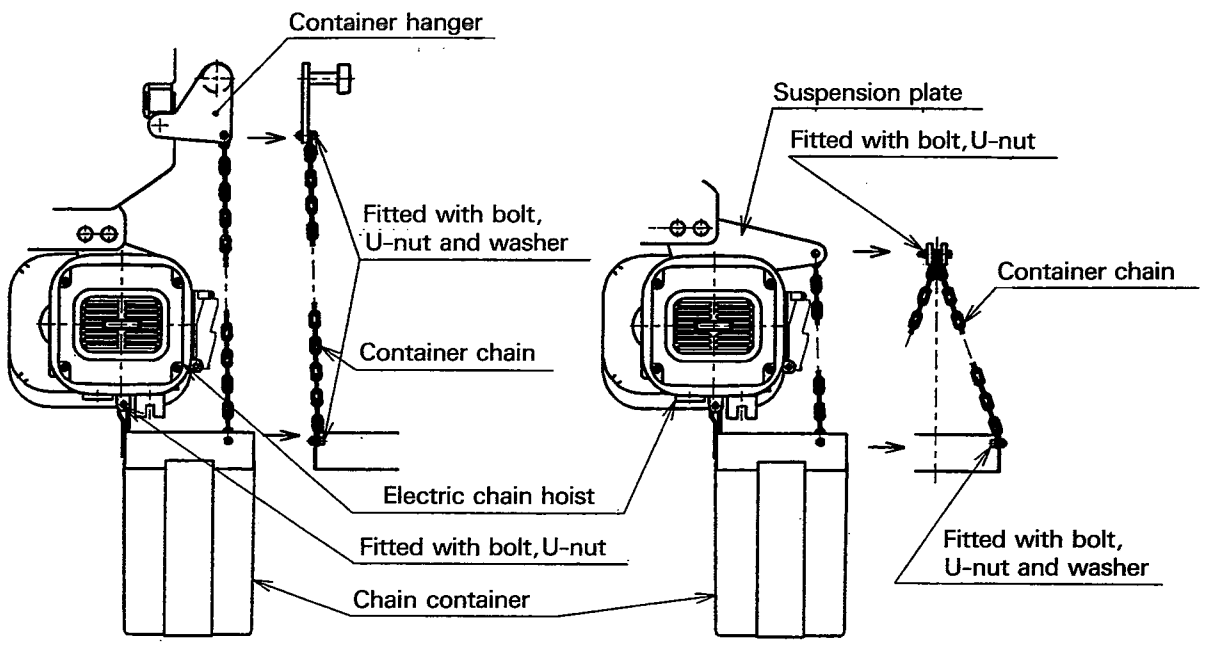
ALWAYS make sure that the supporting structures and load-attaching device are strong enough to hold the weight of the load and hoist.

(1) Attaching the chain container

The chain container stores the load chain when a load is lifted. The installation procedure is as shown in Fig. 5-1. Check that the stopper is properly attached. To place the chain in the container, feed the chain into the chain container from the end of the load chain. **NEVER** put all the load chain into the chain container at once to avoid lumping and twisting. Lumped or twisted chain may activate the limit switch and stop the hoist during lowering. Additionally, each chain container indicates the maximum length of load chain stored in the container. It is very dangerous to use a chain container with a storage capacity less than the length of the load chain. If all of the necessary chain length can not be stored in the container, the limit switch will not operate properly. Determine the required load chain length and select a chain container with proper capacity.

Remark : For the relationship between chain length and chain container, refer to the periodic inspection tables in 7.3.6 "Inspection procedure" of this "Supplement Manual (ERML-9806-MC".)

Fig 5-1 Mounting chain container



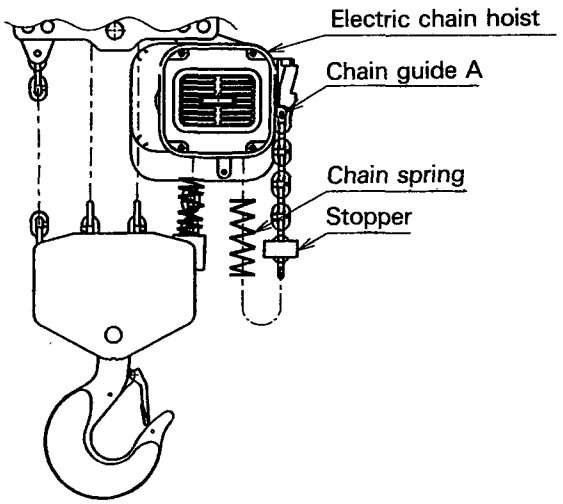
Mounting of capacity 7.5t and 10t(L) chain container

Mounting of capacity 10t(S), 15t and 20t chain container

If a chain container is not used, remove the stopper from the end of the chain, and re-attach it 13th link from the end. Then attach the end link to the chain guide A as shown in Fig. 5-2.

When a chain container is used, the stopper is positioned on the third link from the end of load chain. The lift is slightly shorter when a container is not used.

Fig. 5-2 Slack end of load chain



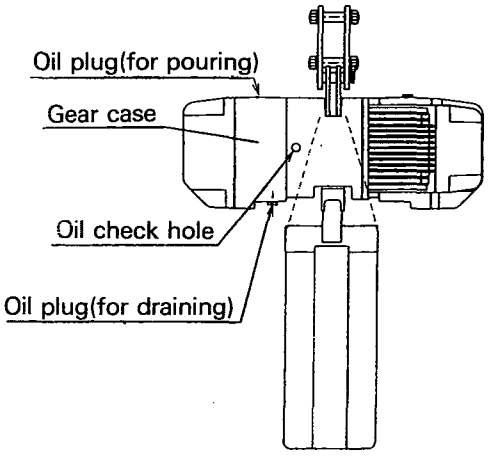
(2) Lubricating the gear case

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 by using the pot nozzle, and reinstall the plug. (Table 5-1, Fig. 5-3)

Table 5-1 Gear oil quantity

WLL (t)	Oil quantity (×NO. of bottle)
7.5, 10(L)	3.0 ℓ (1.0 ℓ ×3)
10(S), 15, 20	(*) 6.0 ℓ (1.0 ℓ ×6)

Fig. 5-3 Lubricating plugs



Note : (*) Indicates the amount of oil for two electric chain hoist bodies used in combination.

⚠ CAUTION

Gear oil is different between friction clutch and mechanical brake combined with friction clutch (option).
Use one of the below listed gear oils.

(1) Friction clutch

a) KITO standard oil : Bonnoc M260 (NIPPON OIL)

b) Recommended oil : Meropa 320 (TEXACO)

c) Recommended oil : Meropa 320 (CALTEX)

(2) Mechanical brake combined with a friction clutch (option).

a) KITO standard oil : Antoil super B (NIPPON OIL)

b) Recommended oil : Meropa No.68 (TEXACO)

Remark : For hoist applications in temperature below -20℃ (-4°F), contact KITO or an authorized KITO dealer.

(3) Lubricating the load chain

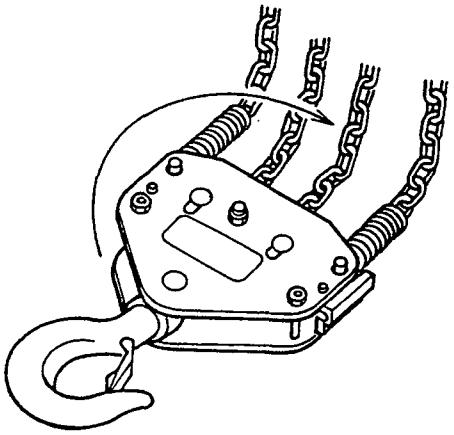
Refer to the "Owner's (Operator's) Manual and Safety Instructions : ERM-9806-MC".

(4) Checking chain alignment

Make sure that the load chain is not twisted. It is possible forthe bottom hook to become capsized as shown in Fig. 5-4.

If a load chain is used in this state, it is twisted and dangerous. **NEVER** lift or lower a load with the chains twisted. Put the bottom hook in the right position by passing the hook back through the chains.

Fig. 5-4 Chain alignment



⚠ CAUTION

Check for twisting in the chain.

5.2 Assembly of the electric chain hoist with motorized trolley

Refer to the "Owner's (Operator's) Manual and Safety Instructions : ERM-9806-MC".

(5) Assembling trolley and connecting with hoist

(a) Assembling trolley

1) Remove shaft stopper pin on the side plate S, and pull off the side plate S, adjusting spacers and the suspension plate from the suspension shaft.

2) Insert the required number of adjusting spacers on each side of the suspension plate (the number of inner adjusting spacers shown in Table 5-2).

3) Mount the side plate S and remaining spacers on the suspension shaft. Insert the shaft stopper pin into hole A in the suspension shaft as shown in Fig 5-5 and secure it with a split pin. Securely bend both branches of the split pin after insertion.

Table 5-2 Adjusting spacers arrangement on suspension shaft

Number of Adjusting																																			
WLL(t)	Beam flange width / Parts	(mm)	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
7.5 ~ 20	Thin spacer	Inner	1+1	1+2	1+2	2+3	3+3	4+4	1+1	1+2	2+2	2+3	1+1	1+2	3+3	4+4	1+1	1+2	4+4	1+1	1+2	2+2	2+3	3+3	1+1	1+2	2+2	2+3	3+4	4+0	4+0	4+1	5+1
		Outer	6	5	5	3	2	0	6	5	4	3	6	5	2	0	6	5	0	6	5	4	3	2	6	5	4	3	1	4	4	3	2
	Thick spacer	Inner	1+1	1+1	1+1	1+1	1+1	1+1	2+2	2+2	2+2	2+2	3+3	3+3	3+3	3+3	1+1	1+1	1+1	2+2	2+2	2+2	2+2	2+2	3+3	3+3	3+3	3+3	3+3	3+4	3+4	3+4	3+4
		Outer	4	4	4	4	4	4	2	2	2	2	0	0	0	0	5	5	5	3	3	3	3	3	1	1	1	1	1	0	0	0	0
	Fixing spacer	Inner	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

Remarks : (1) Take note the numbers on spacers of inner side as follows.

Example 0+1

0 : Number on side plate S

1 : Number on side plate G

(2) Adjustment of trolley width ;

Refer to (b) of 5.2 on next page.

Adjust the dimensions by appropriately increasing or decreasing the number of inner or outer adjusting spacers, without strictly adhering to the number of adjusting spacers shown in the above table.

(3) Spacers arrangement example.

Number of Adjusting Spacers

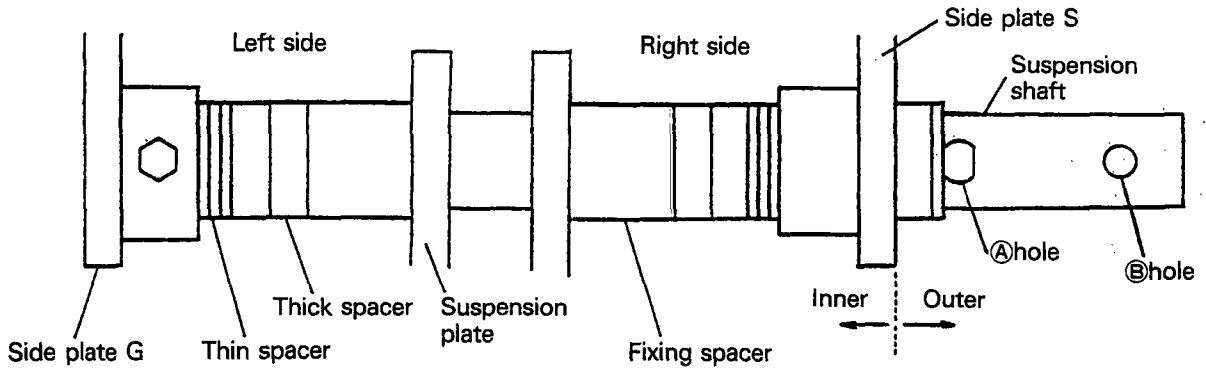
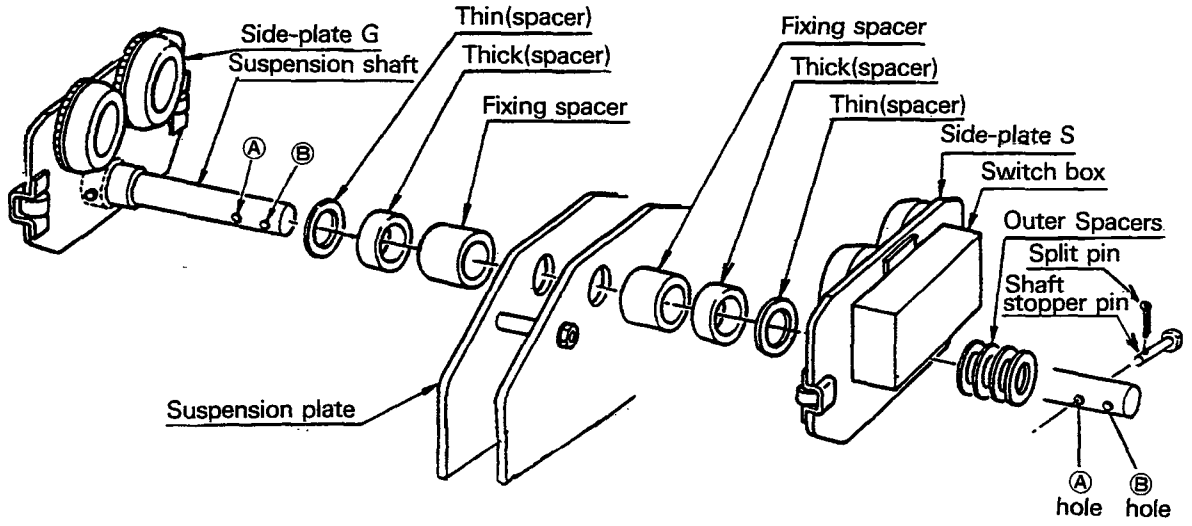


Fig. 5-5 Assembling trolley

Insert shaft stopper pin into suspension shaft from right to left, when seeing from side plate



⚠ CAUTION

NEVER use the hole B for the trolley width adjustment.

(b) Adjusting trolley width

Adjust the trolley width for the proper clearance referring to Fig.5-6.

The proper "A" dimension is measured when both side plates are spread fully outward :

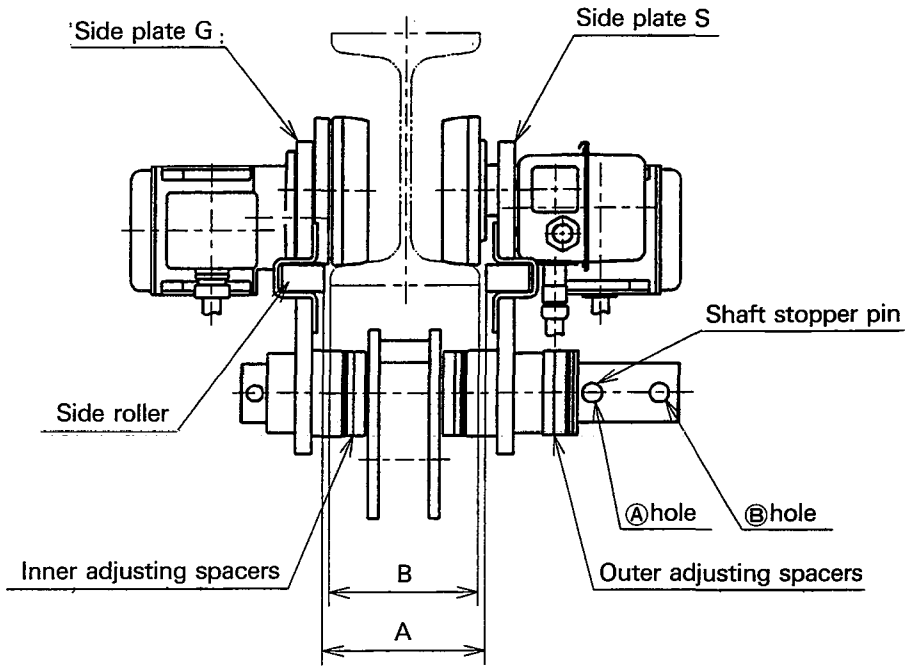
The "A" dimension must be :

Rail flange width (B) + 6 mm approximately

If necessary to obtain the above "A" dimension, increase or decrease the number of adjusting spacers regardless of the quantities Table 5-2.

After obtaining the proper "A" dimension, insert the split pin into the shaft stopper pin and securely bend both branches of the split pin.

Fig.5-6 Adjusting trolley width



Note : Adjustment for the beam flange width shall be made within the specified number of spacers as given in Table 5-2. Consult KITO or an authorized KITO dealer for any deviation. **NEVER** use this hole B for other purpose to prevent accident with strength reason.

⚠ CAUTION

The track wheels in this series of trolley are shaped differently for tapered flanges and flat flanges. Wheels for tapered flanges have a tapered tread and wheels for flat flanges have a flat tread.

Before installation, check beam flange type and wheel tread shape.

To avoid possible hazards, **NEVER** use a trolley with flat flange wheels on a tapered flange beam.

⚠ WARNINNG

NEVER use the hole B to adjust trolley width. Hole B is to be used only for installing trolley onto the beam.

(6) Mounting trolley to traversing rail

The following explanation is for 7.5t and 10t capacity trolleys.

For 15t and 20t capacity trolleys, make adjustments and assembling work in the same way after removing the connecting plates between two trolley assemblies.

(a) Mounting on the beam

1) When the trolley can be installed from the end of the beam, with the hoist attached.

a) Remove the beam end stop from an end of the beam and mount the trolley assembly onto beam.

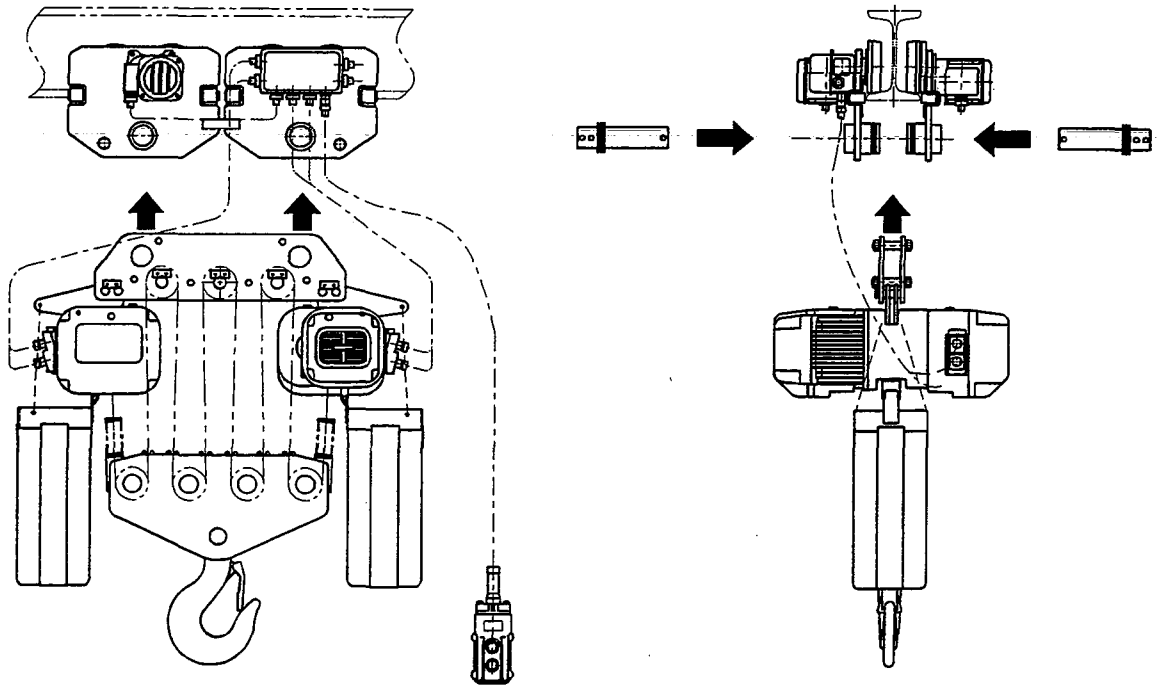
b) Install the beam end stop.

2) When the trolley can not be installed from the end of the beam.

⚠ CAUTION

Installing the trolley as assembled with an electric chain hoist, onto the beam by separating the side plate 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.

Fig.5-7 Mounting trolley and hoist separately



a) Remove the connecting shaft from the chain hoist and separate the chain hoist from the trolley.

b) Install the trolley to the beam.

aa) Remove the shaft stopper pin, side plate S, spacers and suspension plate from the suspension shaft.

bb) Mount the trolley wheels of the side plate G on the beam flange. Assemble the spacers, suspension plate, spacers and side plate S onto the suspension shaft. Push the side plate S, mount the trolley wheels of the side plate S onto the beam flange.

cc) Insert the shaft stopper pin into the suspension shaft and secure it with a split pin. Securely bend both branches of the split pin.

dd) Connect the electric chain hoist to the trolley, making sure its relative position to the trolley is correct

NEVER use this hole B for other purpose to prevent accident from strength reason.

(b) Installation of stopper onto traversing rail

Notice : If using two or more trolleys on the same beam, separate them with stoppers between every two trolleys.

The distance between stoppers depends on site requirements. Contact KITO or a KITO authorized dealer for help if required. Make sure to install stoppers at both ends of the beam.

5.3 Wiring and installation of power supply

⚠ DANGER

ALWAYS turn off the power source or breaker switch to prevent electric shock before wiring.

⚠ CAUTION

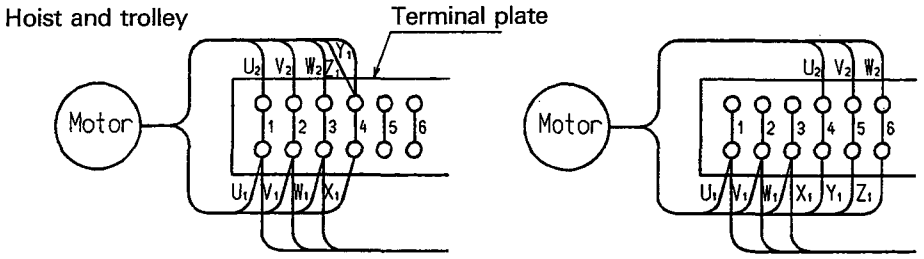
Have all wiring performed by an authorized electrician or KITO dealer.

(1) Checking and changing wiring

Check or change wiring of the electric chain hoist and motorized trolley depending on the required voltage. Make wiring referring to the following figure. In case of the equipment for 575V, It is not necessary to change those connections.

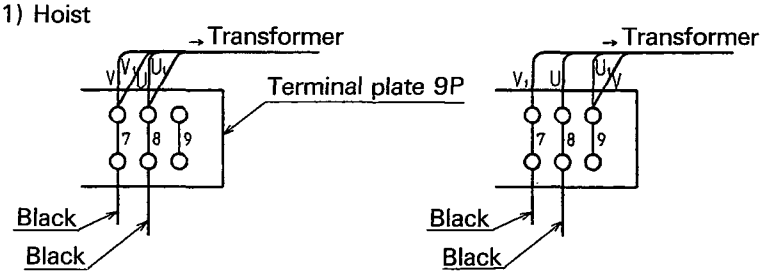
Fig.5-8

1. Motor winding

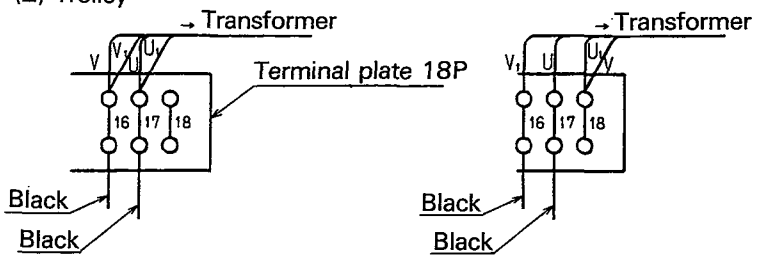


2. Transformer winding

(1) Hoist



(2) Trolley



(2) Wiring of power supply cable

①Remove the switch box cover and switch box packing.

②Install firmly the cable holder to the switch box with screw.

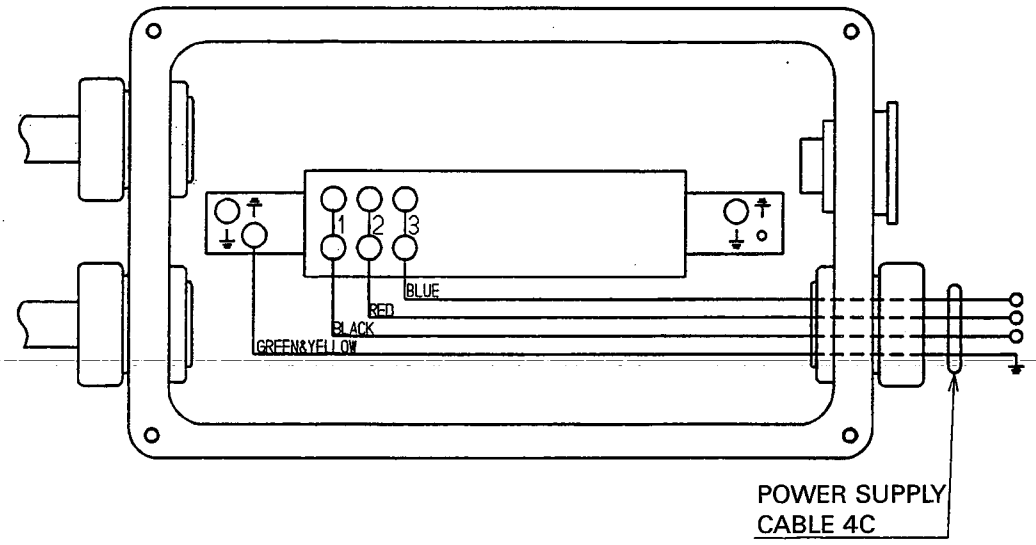
③Connect firmly red, black and blue lead wires of the cable to the terminal plate-18P referring to Fig.5-9. (Be sure to make each number of mark band of the lead wire consistently correspond to each number of the terminal plate)

④The green and yellow stripped lead wire is the ground wire. Connect the wire to the ground mark of the plate firmly.

⑤After checking if there is no mistake in wiring work, install the switch box packing and the cover of switch box.

Note : Refer to the wiring diagram attached on the inside of controller cover of the hoist and or the switch box cover of the motorized trolley if necessary.

Fig.5-9 Wiring of power supply cable (motorized trolley type electric chain hoist)



(3) Installation of power supply cable.

Install power supply cable as the following procedure.

(a) Provide messenger wire

Provide messenger wire (3 to 6 mm diameter steel cable) along the beam, make the power supply cable run with the cable hangers through the messenger wire so that it would not be twisted.

(b) Setting messenger wire to the position of wire guide (Fig 5-10)

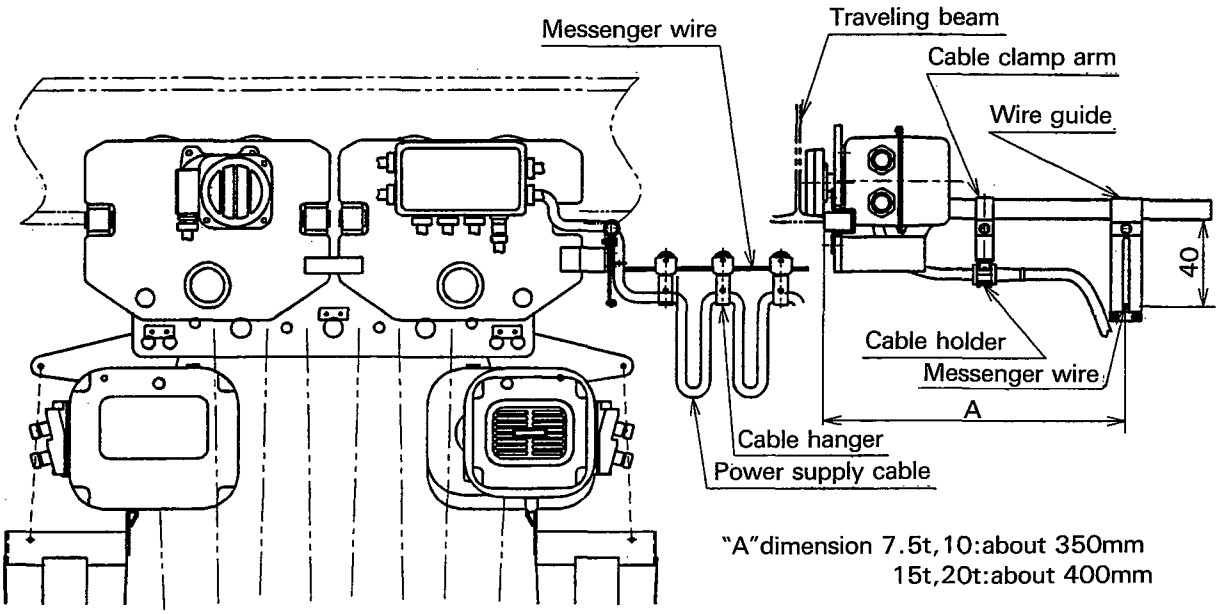
Fit cable support to the cable support arm.

When the curved beam is used, the messenger wire can not be attached to the beam. For this case, a special T type cable hanger for the curved beam should be ordered as an optional item.

The number of special T type cable hanger and the intervals of installation depend on the position and the radius of the curve.

Therefore consult KITO dealer for this matter.

Fig.5-10



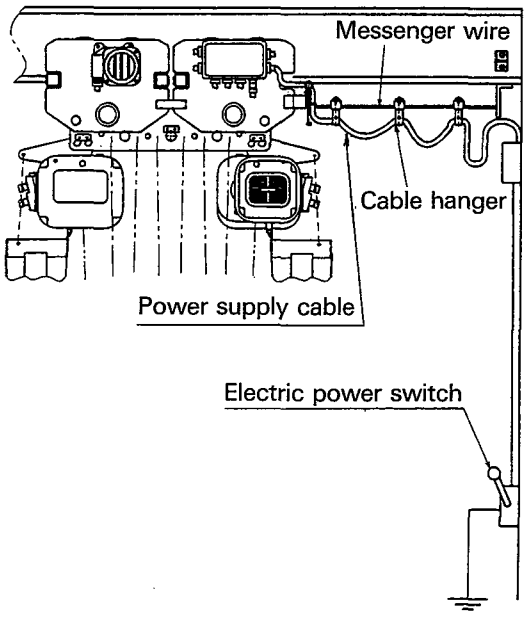
Consult KITO dealer in case the electrical power supply is by means of any other method

(4) Connection of power supply cable to electric power source

(a) Connection to electric power switch

Three wires of red, black and blue of the power supply cable should be connected to the electric power switch. Sometimes it may be required to change the connections but lead wires should be firmly connected again to the power source for better function. (See Fig. 5-11)

Fig.5-11



(b) Fuse and breaker capacity

The fuse and breaker should be chosen for each rated capacity shown in the following table for safety.

Table 5-3 Capacity of fuse and circuit breaker

① ER, ERSP, ERSG (single speed type)

Capacity (kg or t)	Motor output		Minimum size of wiring		Rating						Ordinary graduation of ammeter			Minimum size of ground wire	
	Lift				Fuse(A)			Breaker(A)							
	kW	HP	220/440V	575V	220 v	440 v	575 v	220 v	440 v	575 v	220 v	440 v	575 v	220/440V	575V
7.5, 10(L)	4.6	6.1	AWG 12	AWG 14	40	20	15	40	20	15	50	30	30	AWG 12	AWG 14
10(S), 15, 20	4.6×2	6.1×2	AWG 10	AWG 12	60	40	30	60	40	30	100	50	50	AWG 10	AWG 12

② ERM

Capacity (kg or t)	Motor output				Minimum size of wiring		Rating						Ordinary graduation of ammeter			Minimum size of ground wire	
	Lift		Travel				Fuse(A)			Breaker(A)							
	kW	HP	kW	HP	220/440V	575V	220 v	440 v	575 v	220 v	440 v	575 v	220 v	440 v	575 v	220/440V	575V
7.5, 10(L)	4.6	6.1	0.75	1	AWG 12	AWG 14	40	20	15	40	20	15	50	30	30	AWG 12	AWG 14
10(S), 15, 20	4.6X2	6.1X2	0.75X2	1×2	AWG 10	AWG 12	75	40	30	75	40	30	100	50	50	AWG 10	AWG 12

(c) Ground wire

The green and yellow stripped wire is the ground wire, which should always be connected to a suitable ground. Unless the wire is grounded, operator may sometimes feel a shock when touching any part of the hoist or chain.

Never paint the trolley running surface of the beam.

5.3 Trial run

Refer to the "Owner's (Operator's) Manual and Safety Instructions : ERM-9806-MC."

7.2 Chain replacement

Observe the procedure below when replacing the chain referring to Figs. 7-1 and 7-2. For WLL 7.5t and 10t(L) hoist, refer to 7.2.1, and for WLL 10t(S), 15t and 20t hoists, refer to 7.2.2.

7.2.1 WLL 7.5t and 10t(L)

(1) Remove the stopper from the no load side.

(2) Hook the C-link onto the end link.

(3) Hook the end link of the new chain to the C-link.

(4) Operate the hoist to lower the chain.

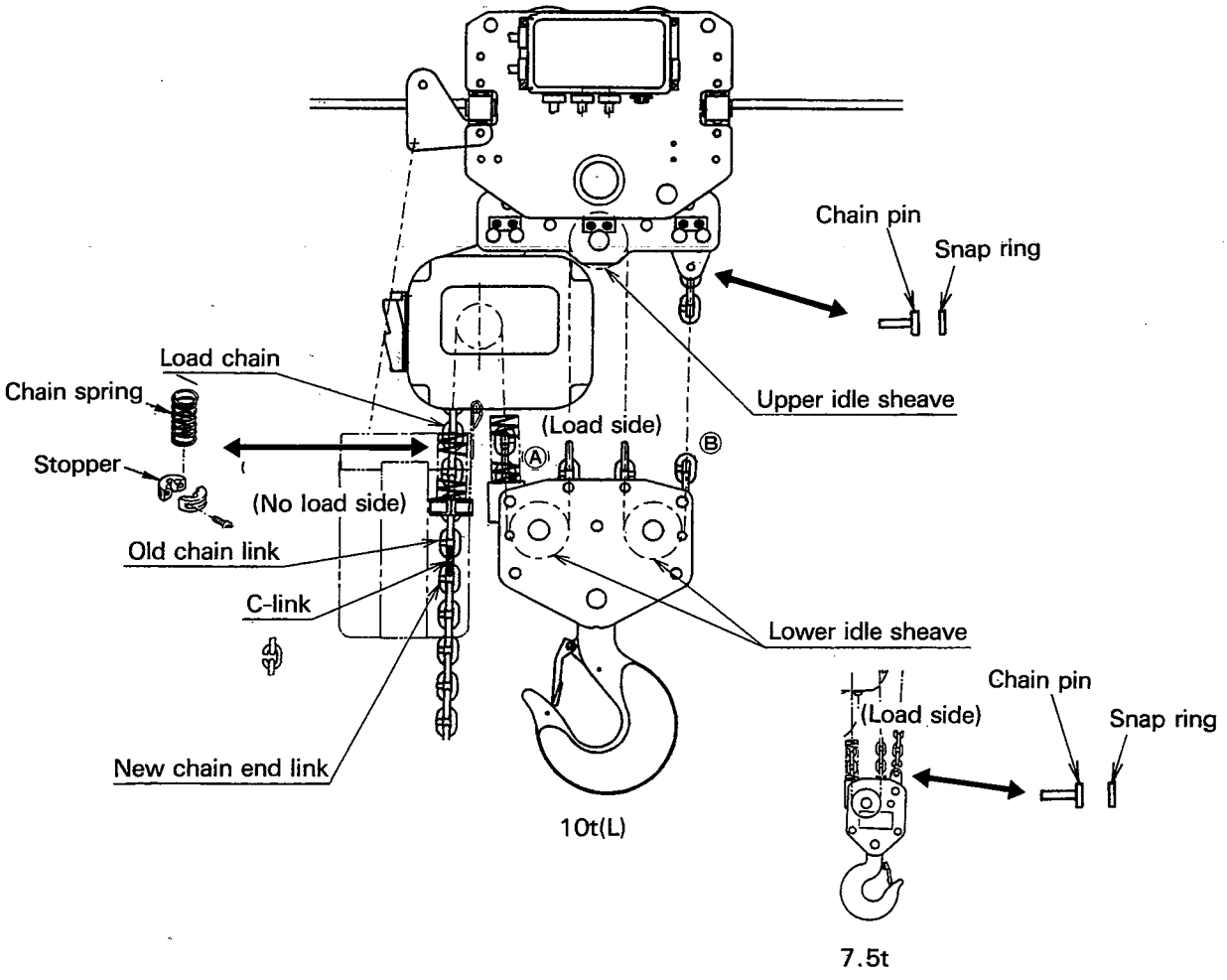
(5) Stop lowering the chain when a sufficient amount of new chain is accumulated on the load side.

(6) Pass the end link on the loaded side of the new chain as a standing link through both the lower and upper idle sheaves. Pull the chain until part (B) through part (A) as shown in Fig. 7-1. If the new chain on the load side is too short, lower some more chain, being careful not to twist or kink.

(7) Remove twist in the whole load side chain and connect the end link to the chain holder of bottom hook block with a chain pin.

(8) Attach the chain spring and stopper from the old chain to the correct link on the new chain on the no load side.

Fig. 7-1 Chain replacement



7.2.2 WLL 10t(S), 15t and 20t

(1) Remove the stopper from the no load side.

(2) Hook the C-link onto the end link.

(3) Hook the end link of the new chain to the C-link.

(4) Operate the hoist to lower the chain.

(5) Stop lowering the chain when a sufficient amount of new chain is accumulated on the load side.

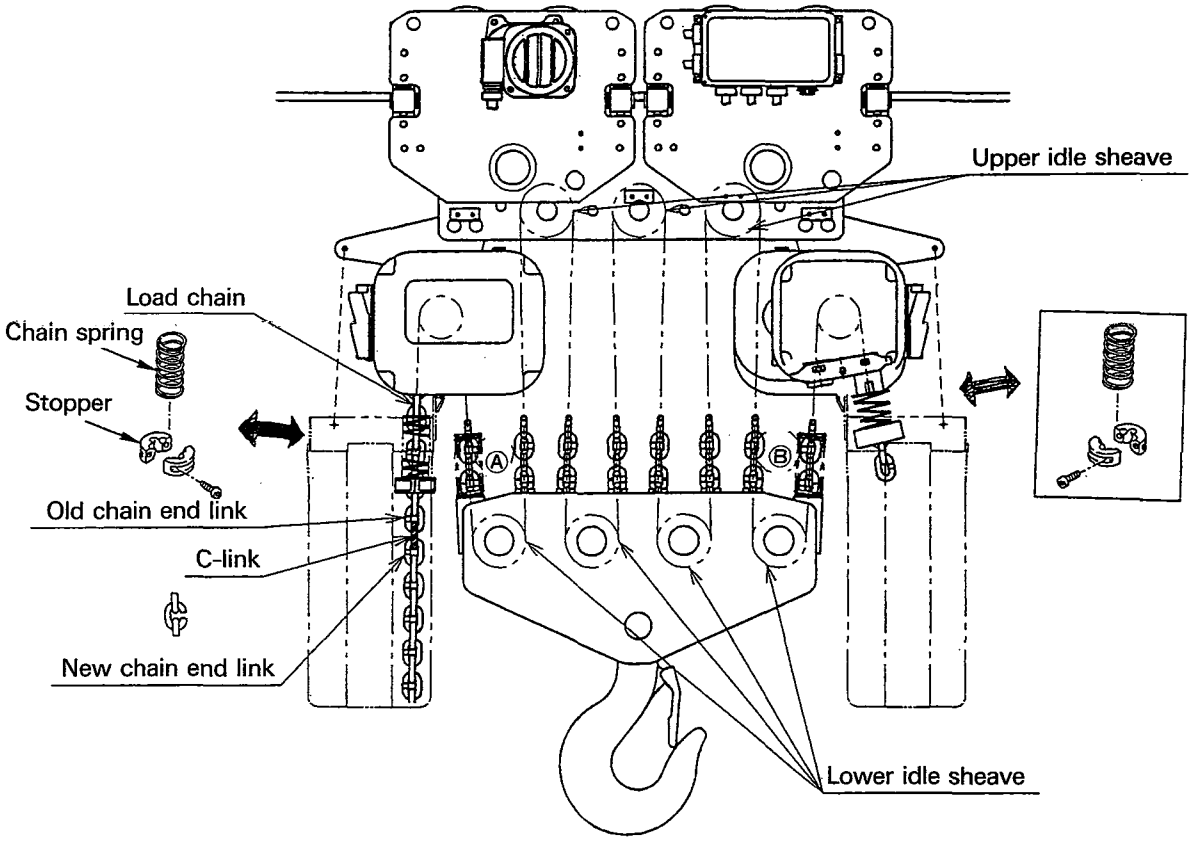
(6) Pass the end link on the loaded side of the new chain as a standing link, through both the lower and upper idle sheaves. Pull the chain until part (B) through part (A) as shown in Fig. 7-2. If the new chain on the load side is too short, lower some more chain, being careful not to twist or kink.

(7) Lift the hoist until enough of the new chain is drawn on the loaded side (no load side still with stopper) of the other hoist before stopping.

(8) Attach the stoppers and chain springs from the old chain to both end links on the no load side of the new chain.

(9) Lower both hoists till reaching each their end link.

Fig. 7-2 Chain replacement



7.3 inspection

7.3.1 Inspection classification

Refer to the "Owner's (Operator's) Manual and Safety Instructions : ERM-9806-MC "

7.3.6 Inspection procedure

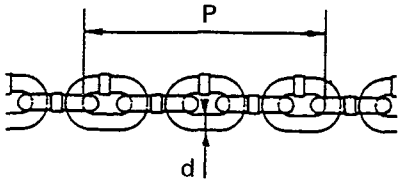
Remark : Refer to this manual and 7.3.6 "Inspection procedure" in the "Owner's (Operator's) Manual and Safety Instructions : ERM-9806-MC".

(2) Periodic inspection

Class	Item	Inspection method	Discard limit/criteria	Remedy
Hoist & Trolley	**3. Power supply, ground, insulation, control circuit**			
	(1) Control circuit fuse installation and capacity	Remove the controller cover and visually check fuse installation. Check fuse capacity.	The fuse should be securely fit in the prescribed location. As indicated on the below table.	Fit in the prescribed location. Install a fuse of the proper capacity.

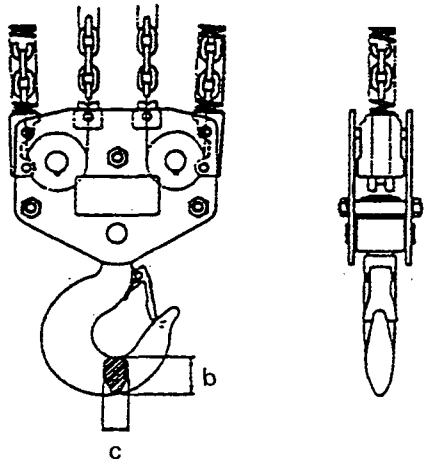
Capacity (t)	Location (inside)	Fuse capacity (Ampere)	
		ER	ERM
7.5, 10(L)	switch box	·····	2
	controller cover	3	3
10(S), 15, 20	switch box	2	2
	controller cover	3	3

Class	Item	Inspection method	Discard limit/criteria	Remedy
Hoist & Trolley	**5. Load chain** (1) Abrasion	To measure pitch with slide calipers: Measure the chain at the section that is most frequently engaged with load sheave.	Dimension (P) or (d) shall not exceed the limits presented in the table below.	If limit exceeds, **ALWAYS** ask the service personnel to run an inspection and replace the chain.



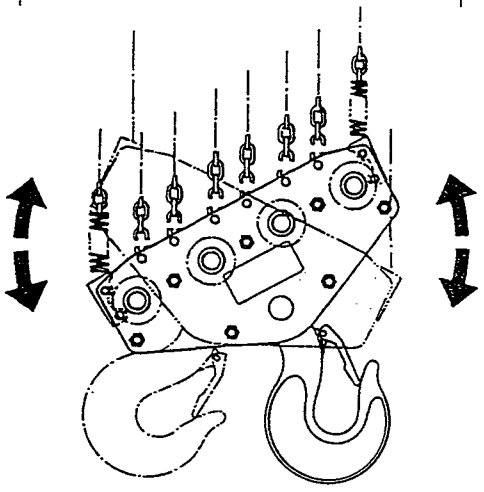
Chain size (d)	WLL (kg or t)	Number of measured links	Pitch of measured links : P		Discard limit of (d)
			Standard	Limit	
11.2	7.5, 10(L) 10(S), 15, 20	3	102.6	105.6	10.1

Class	Item	Inspection method	Discard limit/criteria	Remedy
Hoist & Trolley	(2) Hook wear	Measure "b" and "c" with slide calipers.	**NEVER** use the hook if dimension "b" or "c" becomes less than 90% of normal.	Replace with new hook if worn.



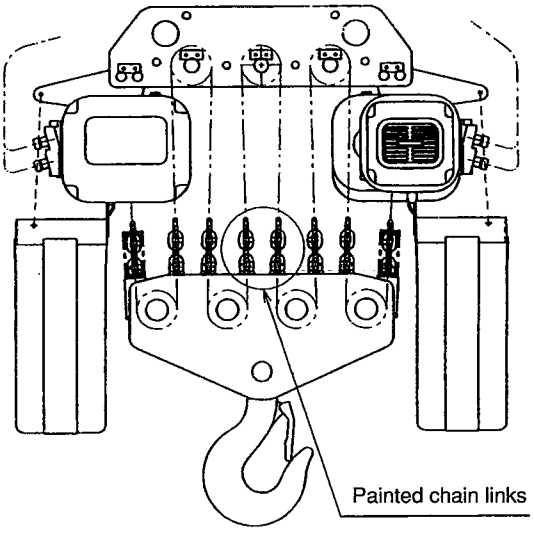
WLL (kg or t)	b(mm)		c(mm)	
	Normal	Discard	Normal	Discard
7.5, 10(L), 10(S)	73	66	48	43
15	87	78	60	54
20	99.5	90	70	63

(6) Rotation of idle sheave	Turn idle sheave by lifting the load chain up and down, as illustrated.	The idle sheave rotates smoothly.	Inspect and repair if rotation is not smooth.



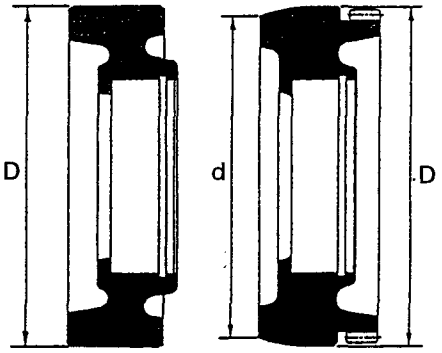
<table>
<tr><th>Class</th><th>Item</th><th>Inspection method</th><th>Discard limit/criteria</th><th>Remedy</th></tr>
<tr><td rowspan="2">Hoist & Trolley</td><td>(8) Chain container capacity</td><td>Measure the chain length.</td><td>
<table>
<tr><th colspan="2">WLL (t)</th><th>7.5</th><th>10(L)</th><th>10(S)</th><th>15</th><th>20</th></tr>
<tr><td rowspan="2">Chain length (m)</td><td>Small container</td><td>4</td><td>3</td><td>6</td><td>4</td><td>3</td></tr>
<tr><td>Large container</td><td>8</td><td>6</td><td>12</td><td>8</td><td>6</td></tr>
</table>
</td><td>If the load chain length exceeds the following length in the table, ALWAYS use the larger optional steel chain container.</td></tr>
<tr><td>(9) Load chain position for 2-hoist-equipped-model</td><td>Check the position of the painted chain links</td><td>Ensure that the pained chain links are located side by side between the two hoists. If they are located 1m or more apart, correct it.</td><td>Lower the hook to correct chain alignment until both hoist's limit switch go on.</td></tr>
</table>

For 15t



⚠ WARNINNG

For the case of high capacity models; these models use two separate hoists whose brake performance may differ slightly from one another with respect to breaking distance. After continuous use this difference may increase and the chain could move more to one side than the other.

<table>
<tr><th>Class</th><th>Item</th><th>Inspection method</th><th>Discard limit/criteria</th><th>Remedy</th></tr>
<tr><td rowspan="3">Hoist & Trolley</td><td>(4) Wheel abrasion</td><td>Measure with slide calipers.</td><td>Diameter of tread and flange do not exceed limits on the table shown below.
 

For flat rail For tapered rail
<table><tr><th rowspan="2">WLL (t)</th><th colspan="2">Tread outside diameter : D</th><th colspan="2">Tread inside diameter : d</th></tr><tr><th>Standard</th><th>Limit</th><th>Standard</th><th>Limit</th></tr><tr><td>7.5, 10, 15, 20</td><td>175</td><td>165</td><td>166</td><td>156</td></tr></table>Unit : mm</td><td>Adjusting titled trolley
Replace with new wheels if limit is exceeded.</td></tr>
<tr><td>(8) Side roller wear</td><td>Check visually or with slide calipers, as necessary.</td><td>Contact part of the side roller is not worn to exceed limit dimensions on the table below.
<table><tr><th rowspan="2">WLL (kg or t)</th><th colspan="2">Outside diameter (mm)</th></tr><tr><th>Standard</th><th>Limit</th></tr><tr><td>7.5t to 20t</td><td>55</td><td>54</td></tr></table></td><td>Replace with new rollers if abrasion exceeds limit.</td></tr>
<tr><td>Rotate rollers by hand</td><td>Rollers rotate smoothly.</td><td>Supply oil to roller shafts occasionally.</td></tr>
</table>

8. TROUBLESHOOTING

Refer to the "Owner's (Operator's) Manual and Safety Instructions : ERM-9806-MC".

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