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

**ER** SERIES

125kg through 5t capacity

Approved by CSA

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*ALWAYS KEEP THIS MANUAL FOR YOUR REFERENCE.*

 **KITO** CORPORATION

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# 1. DEFINITIONS

**⚠ DANGER** : indicates an imminently hazardous situation which, if not avoided, **will** result in **death or serious injury**.

: indicates a potentially hazardous situation which, if not avoided, **could** result in **death or serious injury**.

**⚠ WARNING**

: indicates a potentially hazardous situation which, if not avoided, **may** result in **minor or moderate**

**⚠ CAUTION**

**injury**. It may also be used to alert against unsafe practices.

Capacity : The measuring weight in this manual is indicated in metric tons. The values from 125 to 500 are indicated in kg, whereas all other values are indicated in t(tonne).

## 2. INTENDED PURPOSE

KITO electric chain hoist is designed for vertically lifting, lowering and horizontally carrying loads by means of switching the pendant push button under normal atmospheric conditions of the workplace.

## 3. BEFORE USE

### 3.1 Safety summary

Danger exists when heavy loads are transported, particularly when the equipment is not being used properly or is poorly maintained. Because accidents and serious injury could result, special safety precautions apply to the operation, maintenance and inspection of the KITO electric chain hoist ER series.

**⚠ WARNING**

**NEVER** use a hoist for lifting, supporting or transporting people.

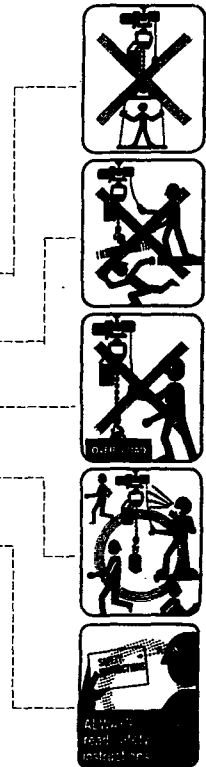
**NEVER** lift or transport loads over or near people.

**NEVER** lift more than the rated capacity which is shown on the hoist name plate.

**ALWAYS** let people around you know when a lift is about to begin.

**ALWAYS** read the operation and safety instructions.

Remember proper rigging and lifting techniques are the responsibility of the operator. Check all applicable safety codes, regulations and other applicable laws for further information about the safe use of your hoist.



## 3.2 Safety instructions

### **⚠ WARNING**

#### 3.2.1 Before use

- ALWAYS** allow the instructed (trained in safety and operation) people to operate the hoist.
- ALWAYS** check the hoist before daily use according to the "Daily inspection" (Refer to 7.3.2).
- ALWAYS** make sure that the chain length is long enough for the intended work.
- ALWAYS** check that the hook latches work properly and replace missing or broken hook latches (Refer to 7.3).
- ALWAYS** check the brake before use (Refer to 7.3).
- ALWAYS** use two hoists which each has Capacity equal to or more than the load to be lifted whenever you must use two hoists to lift a load.
- ALWAYS** use KITO original chains or authorized chains.
- ALWAYS** check and keep the surface of the load chain oiled.
- NEVER** use a hoist without a hoist name plate.
- NEVER** use a modified or deformed hook.
- NEVER** use a hoist in explosive atmosphere.



#### 3.2.2 While operation

- ALWAYS** make sure that the load is properly seated in the hook.
- ALWAYS** tighten the slack out of the chain and sling when starting a lift to prevent a sudden loading.
- ALWAYS** avoid excessive inching operation.
- ALWAYS** make sure the hoist motor completely stops before reversing.
- ALWAYS** use a hoist within the "Duty rating", ED% or time rating.
- NEVER** operate unless the load is centered under the hoist.
- NEVER** use the hoist chain as a sling.
- NEVER** use a twisted, kinked, damaged or stretched load chain.
- NEVER** swing a suspended load.



- NEVER** support a load on the tip of the hook.
- NEVER** contact the load chain over an edge.
- NEVER** weld or cut a load suspended by a hoist.
- NEVER** use the hoist chain as a welding electrode.
- NEVER** operate a hoist if chain jumping or excessive noise occurs.
- NEVER** use the capsized load chain.
- NEVER** use the friction clutch or limit switch regularly, which may cause several damage to the hoist and cause serious injury.
- NEVER** pull the push button cord.



### 3.2.3 After operation

- NEVER** leave a suspended load unattended.

### 3.2.4 Maintenance

- ALWAYS** let the qualified service personnel inspect the hoist periodically (Refer to 7.3.3).
- ALWAYS** oil the load chain (Refer to 7.2).
- NEVER** splice, add and weld a load chain for extension.
- NEVER** touch live electrical parts.
- NEVER** adjust the friction clutch.

### 3.2.5 Others

- ALWAYS** consult the manufacturer or your dealer if you plan to use a hoist in an excessively corrosive environment (salt water, sea air and/or acid, explosive environment or other corrosive compounds, etc.).

## 4. MAIN SPECIFICATIONS

### 4.1 Specifications

The following specifications are common to all KITO ER series electric chain hoists, Capacity 5t or less.

Table 4-1 Specifications

Item		Specification		
Working temperature range (°C)		-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 & Chain fall	Capacity (kg or t)	Nominal diameter (mm)	Pitch (mm)	Chain fall
	125(H) 250(S)	5	15.0	1
	250(H) 500(L), 500(S)	6.3	19.0	1
	1(L), 1(M), 1(S)	8	24.0	1
	1.5(S), 2(L), 2(M), 2(S)	10	30.0	1
	2.5(S)	11.2	34.0	1
	3(C)	10	30.0	2
	3(L), 3(S)	12.5	38.0	1
	5(L)	11.2	34.0	2

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

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

(3) For larger Capacity hoists (7.5t and larger), refer to the ERML-9806-MC manual.

(4) The letters (L), (M), (S) and (H) show low, medium, standard and high speed models respectively.

## 4.2 Mechanical classification (Grade) and life

Safety and life for electric chain hoists are guaranteed only when the said equipment is operated in accordance with the prescribed grade.

KITO electric chain hoists ER series are designed for grade 1Am, 2m in the FEM regulations (FEM 9.511) and M4, M5 in the ISO regulations (ISO 4301) shown in Table 4-2. The grades are provided in Table 4-3 to Table 4-6. Average daily operating time and total operating time are determined by load distribution.

Table 4-2

CODE	Capacity (kg or t)	GRADE	
		FEM	ISO
ER001H	125	2m	M5
ER003S	250	2m	M5
ER003H	250	2m	M5
ER005L	500	1Am	M4
ER005S	500	2m	M5
ER010L	1	1Am	M4
ER010M	1	1Am	M4
ER010S	1	2m	M5
ER015S	1.5	2m	M5
ER020L	2	1Am	M4
ER020M	2	1Am	M4
ER020S	2	2m	M5
ER025S	2.5	1Am	M4
ER030C	3	1Am	M4
ER030L	3	1Am	M4
ER030S	3	1Am	M4
ER050L	5	1Am	M4
ER075S	7.5	1Am	M4
ER100L	10	1Am	M4
ER100S	10	1Am	M4
ER150S	15	1Am	M4
ER200S	20	1Am	M4

Table 4-3 1Am(FEM)

Load spectrum (Load distribution)	Definitions	Cubic mean value	Average daily operating time(h)	Total operating time(h)
1 (light)	Mechanisms or parts thereof, usually subject to very small loads, seldom to maximum loads.	$k \leq 0.50$	2 - 4	6300
2 (medium)	Mechanisms or parts thereof, usually subject to small loads, but rather often to maximum loads.	$0.50 < k \leq 0.63$	1 - 2	3200
3 (heavy)	Mechanisms or parts thereof, usually subject to medium loads and frequently to maximum loads.	$0.63 < k \leq 0.80$	0.5 - 1	1600
4 (very heavy)	Mechanisms or parts thereof, mainly subject to maximum or almost maximum loads.	$0.80 < k \leq 1.00$	0.25 - 0.5	800

Table 4-4 2m(FEM)

Load spectrum (Load distribution)	Definitions	Cubic mean value	Average daily operating time(h)	Total operating time(h)
1 (light)	Mechanisms or parts thereof, usually subject to very small loads, seldom to maximum loads.	$k \leq 0.50$	4 - 8	12500
2 (medium)	Mechanisms or parts thereof, usually subject to small loads but rather often to maximum loads.	$0.50 < k \leq 0.63$	2 - 4	6300
3 (heavy)	Mechanisms or parts thereof, usually subject to medium loads and frequently to maximum loads.	$0.63 < k \leq 0.80$	1 - 2	3200
4 (very heavy)	Mechanisms or parts thereof, mainly subject to maximum or almost maximum loads.	$0.80 < k \leq 1.00$	0.5 - 1	1600



Table 4-5 M4(ISO/JIS)

state of loading / load rate	Definitions	Nominal load spectrum factor (Km)	Total running time (h)	Total operating time(h)
1 (light)	ISO; Mechanisms subjected very rarely to the maximum load and, normally, to light loads	0.125	-	6300 / 6400
	JIS; Use at about 1/3 of rated load usually and at rated load rarely	-	2 - 4	
2 (medium / middle)	ISO; Mechanisms subjected fairly frequently to the maximum load but, normally, to rather moderate loads	0.25	-	3200
	JIS; Use at about 1/3 to 2/3 of rated load usually and at rated load at times	-	1 - 2	
3 (heavy)	ISO; Mechanisms subjected frequently to the maximum load and, normally, to loads of heavy magnitude	0.50	-	1600
	JIS; Use at 2/3 of rated load or over usually and at rated load many times	-	0.5 - 1	
4 (very heavy)	ISO; Mechanisms subjected regularly to the maximum load	1.00	-	800
	JIS; Use at rated load or near load almost all the time	-	0.25 - 0.5	

Table 4-6 M5(ISO/JIS)

state of loading / load rate	Definitions	Nominal load spectrum factor (Km)	Total running time (h)	Total operating time(h)
1 (light)	ISO; Mechanisms subjected very rarely to the maximum load and, normally, to light loads	0.125	-	12500
	JIS; Use at about 1/3 of rated load usually and at rated load rarely	-	4 - 8	
2 (medium / middle)	ISO; Mechanisms subjected fairly frequently to the maximum load but, normally, to rather moderate loads	0.25	-	6300 / 6400
	JIS; Use at about 1/3 to 2/3 of rated load usually and at rated load at times	-	2 - 4	
3 (heavy)	ISO; Mechanisms subjected frequently to the maximum load and, normally, to loads of heavy magnitude	0.50	-	3200
	JIS; Use at 2/3 of rated load or over usually and at rated load many times	-	1 - 2	
4 (very heavy)	ISO; Mechanisms subjected regularly to the maximum load	1.00	-	1600
	JIS; Use at rated load or near load almost all the time	-	0.5 - 1	

## 4.3 Special features

### (1) Motor brake

The motor brake is unique with the pull rotor braking structure and its powerful braking force enables the hoist to support the load surely. Non-asbestos material is used in the motor brake.

### (2) Hook and hook latch

The hook is drop-forged from the special carbon steel and will not fracture but will open gradually when overloaded. In addition, the hook is equipped with a hook latch which acts to keep the load captive in the hook under slack load conditions.

### (3) Limit switch

An electric limit switch mechanism is employed to prevent overwinding.

Refer to table 4-1 to make sure which models are equipped with the limit switch as a standard or optional feature.

#### (a) Upper limit switch

The hoist is automatically stopped instantly in case of overlifting.

#### (b) Upper /lower limit switch

The hoist is automatically stopped instantly in case of overwinding.

### (4) Friction clutch

The friction clutch mechanism, originally developed by KITO, enables the motor to idle when excessively overloaded or overwinded. Thus the mechanism prevents damage due to overload or overwind. Non-asbestos material is used in the friction clutch.

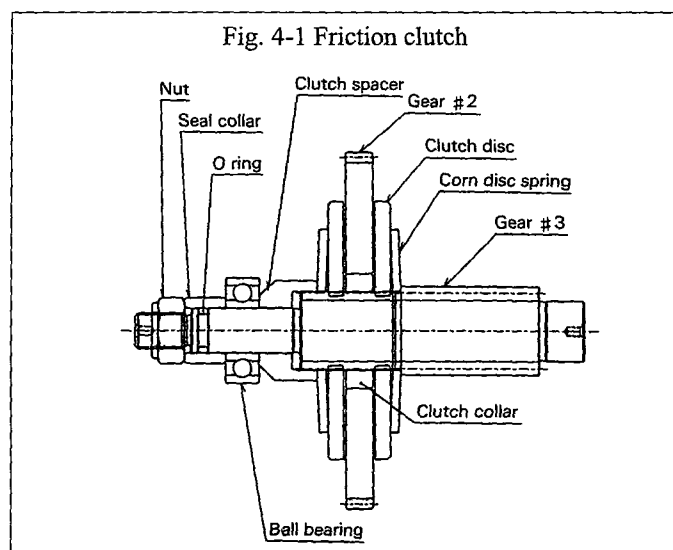
### (5) Emergency stop device

This device is an option for the electric chain hoist, a standard for the electric chain hoist with motorized trolley.

The mushroom type button, in red at the uppermost position on the pendant switch, is used stop the hoist and trolley in an emergency situation. When pressed, power to the equipment is shut off and the button locks automatically. Turn it to the right to release the locks and to enable re-start.

## ▲ CAUTION

The set value (1.25 times or more) may change if loads over the WLL are lifted often.



## 5. PREPARATION AND CHECKING BEFORE USE

### 5.1 Assembly of the electric chain hoist - Hook Suspension

#### **▲ WARNING**

**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

Remark : For large Capacity hoists (7.5t and larger), refer to the ERML-9806-MC manual.

The chain container stores the load chain when a load is lifted. The installation procedure is as shown in Fig.5-1, Fig.5-2 and Fig.5-3. Check that the stopper is properly attached to the 3rd link from the no load side end, and also for 030C and 050L(D), attach the stopper to the 6th link from the load side end for the upper limit switch; to the 8th link for the upper-lower limit switch. Feed the chain into the container from the free end, avoiding twists and links. To avoid lumping and twisting, **NEVER** put all the chain into the container at once. Lumped or twisted chain may activate the limit switch (in case of the hoist equipped with limit switch) and stop the hoist during lowering.

Additionally, each chain container indicates the maximum length of the 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 can not be stored in the container, and limit switch will not operate properly. Determine the length of load chain 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".

#### 1. Plastic chain container

For B size

Hold the chain container and chain container spring against the hoist in the orientation shown in Fig.5-1, and slide the socket bolt through all holes on the chain container, chain guide A and spring until protruding on the other end.

For C,D size

Hook the chain container suspender on the spring pin on the no load side of chain guide A.

Turn the chain container suspender until fitting inside the opening on chain container P as shown in Fig.5-2, and press upward until fitting snugly against the upper inside surface of chain container P as shown in the figure.

Slide the socket bolt through the hole on chain container P and tightly lock on the other end with the lever nut.

Note : Make sure the socket bolt passes underneath the chain container suspender and securely locks both chain container P and the chain container suspender in place.

Hold the chain container spring over the chain container P, caring about the direction of the spring, and put the plain washers on both side of the spring and lock on the chain guide A with the socket bolt and the lever nuts.

**▲ CAUTION**

Remove the chain container P when you put down the hoist on the ground.

2. Chain container

Install to the hoist body as shown Fig 5-3.

Fig 5-1 Attachment of chain container P with name plate K :

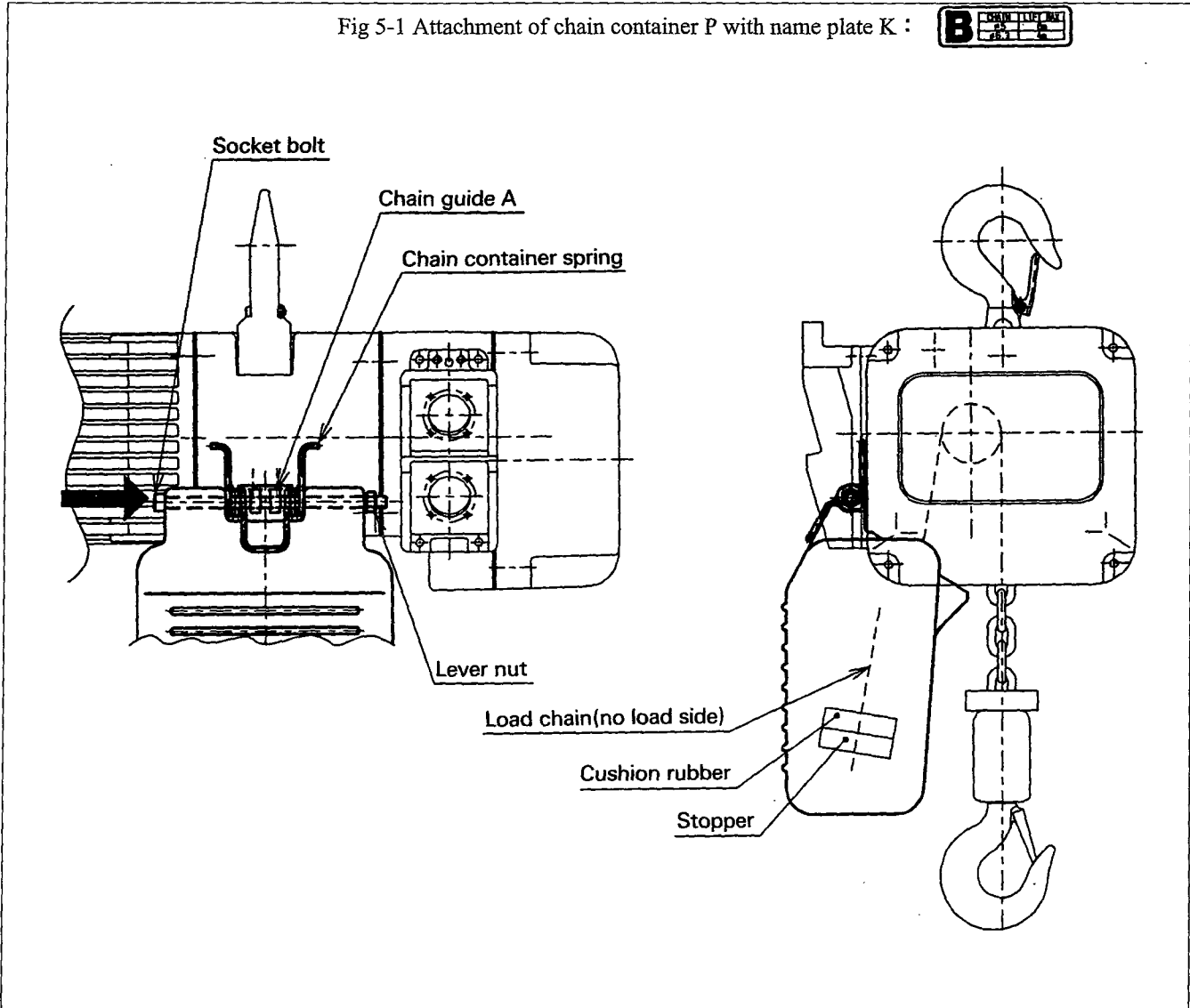


Fig 5-2 Attachment of chain container P with name plate K **C** or **D**

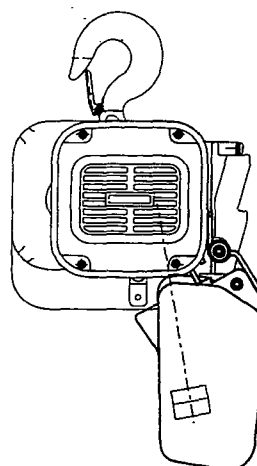
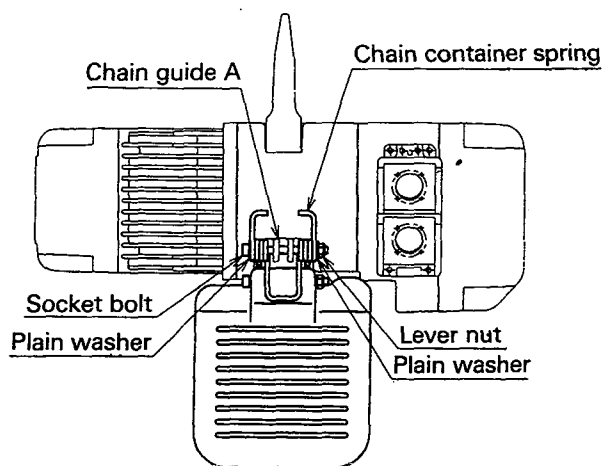
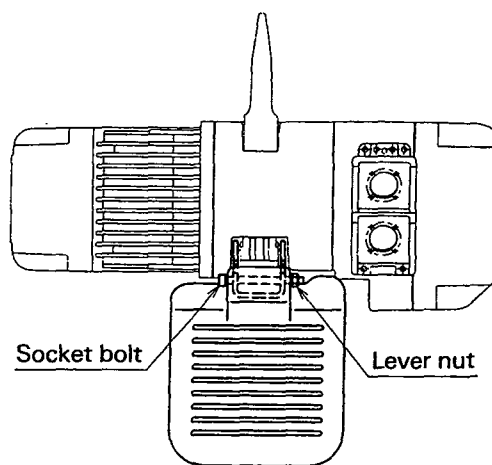
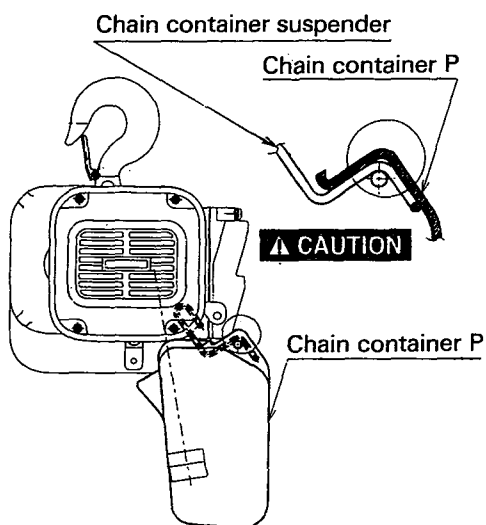
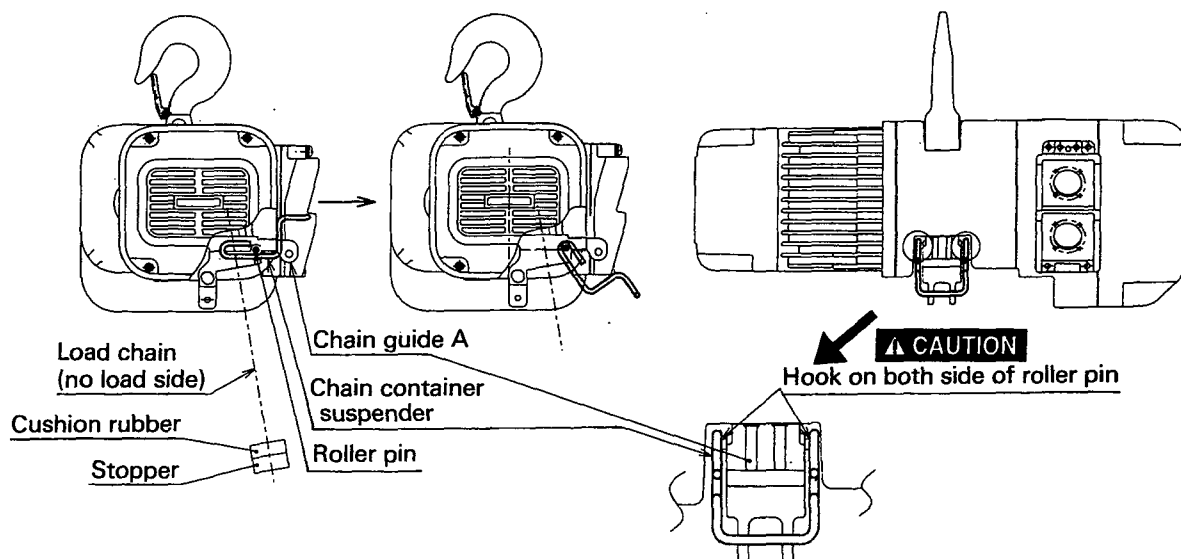
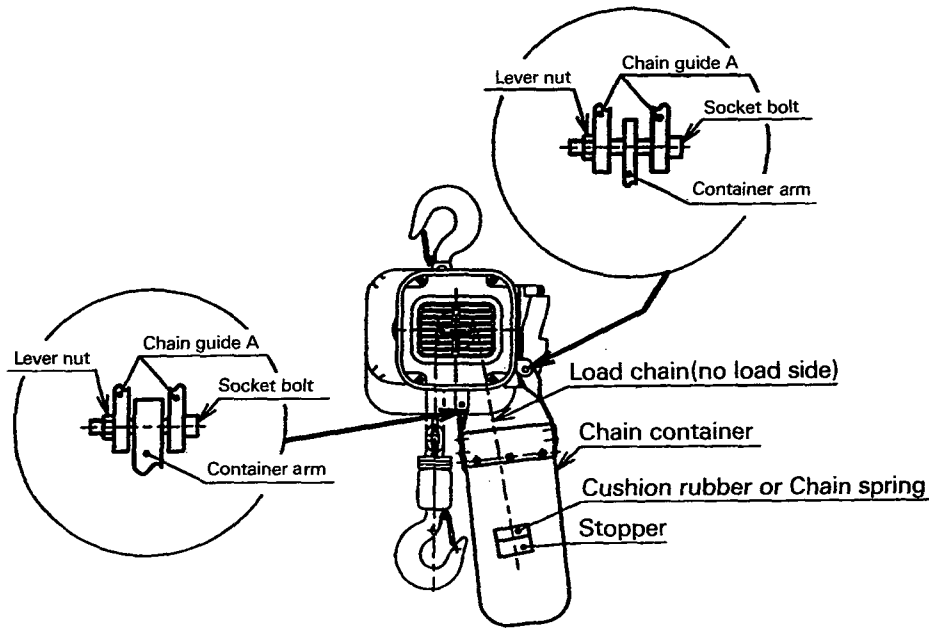


Fig 5-3 Attachment of chain container



If a chain container is not used, remove the stopper from the free end of the chain and secure to the 13th, 15th or 25th link from the free end as shown in Fig.5-4. Then attach the end link to the chain guide A with the chain end suspender except the 5t capacity with the end link directly attached to the chain guide A.

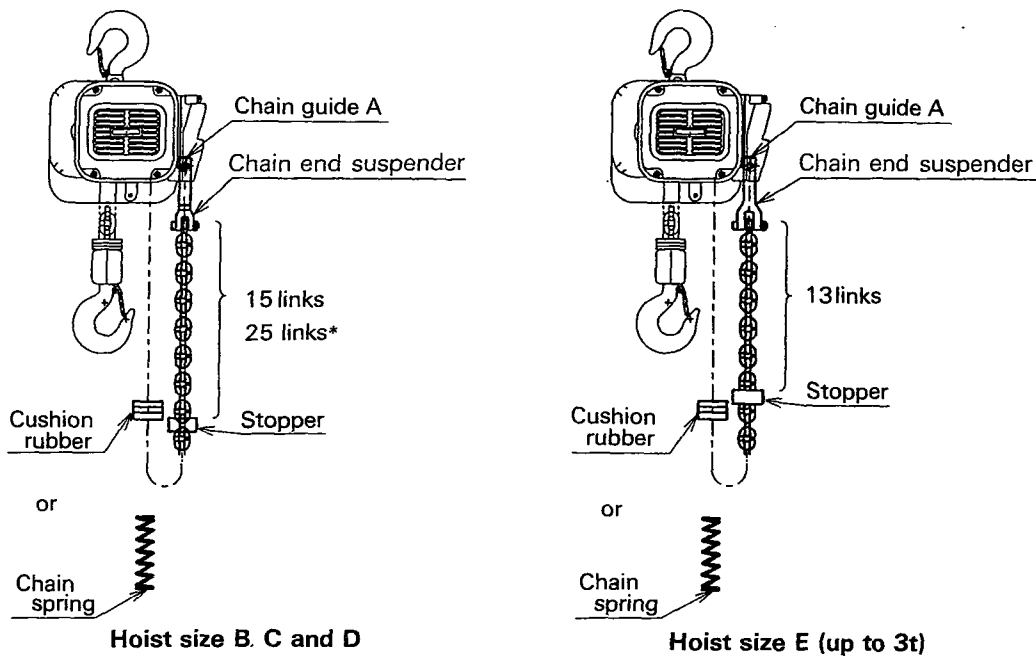
**CAUTION**

Using the lock nut (U nut), tighten it properly. Prevent deformation of the chain guide A caused by screwing it too much.

When a chain container is used, the stopper is attached to the 3rd link from the free end of the load chain.

Therefore, the lift is slightly shorter when a container is not used.

Fig 5-4 Attachment of chain to hoist body — No chain container



\*For 125kg capacity with the upper-lower limit switch and dual speed, attach the stopper to the 25th link.

(2) Lubricating the gear case

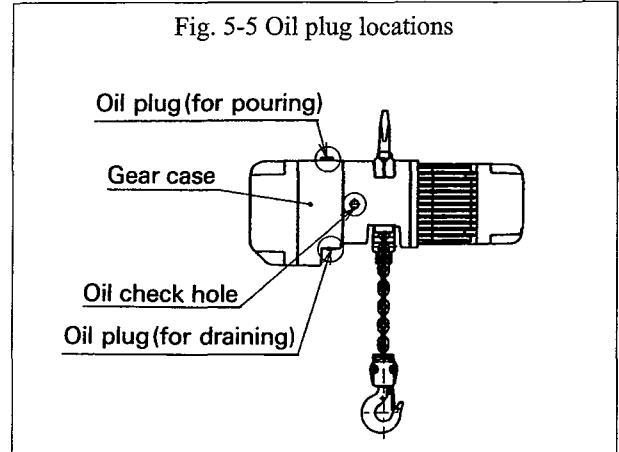
Remark : For larger WLL hoists (7.5t and larger), refer to the ERML-9806-ME manual.

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. 5-5)

Table 5-1 Gear oil quantity

Hoist Size	CODE	Oil quantity (liters)
ER-B	ER001H, ER003S, ER005L	0.7
ER-C	ER003H, ER005S, ER010L, ER010M	1
ER-D	ER010S, ER015S, ER020L, ER020M, ER030C	1.7
ER-E	ER020S, ER025S, ER030L, ER030S, ER050L	3



**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

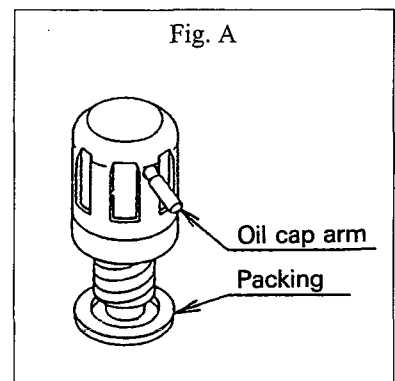
- a) KITO standard oil : Bonnoc M260 (NIPPON OIL)
- b) Recommended oil : Meropa 320 (TEXACO)
- c) Recommended oil : Meropa 320 (CALTEX)

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

- a) KITO standard oil : Farm Gear B (NIPPON OIL)
- b) Recommended oil : Meropa No.68 (TEXACO)

Remark : For hoist applications in temperatures below -20°C, contact KITO or authorized KITO dealer for special instructions regarding gear oil.

- ◆ Handling the oil cap for the mechanical brake combined with friction clutch  
 In case of the mechanical brake combined with friction clutch, attach the oil cap packed with the hoist as shown in Fig.A to the side of the gear casing.  
 Before hooking up the hoist, pull the oil cap arm to expose a few mm of the inner part of it or pull off it to maintain the air path to the outside of the gear casing.  
 When transferring the hoist, unhook the hoist and push it back into the original position because inclining the hoist too much while transferring may cause oil leakage.





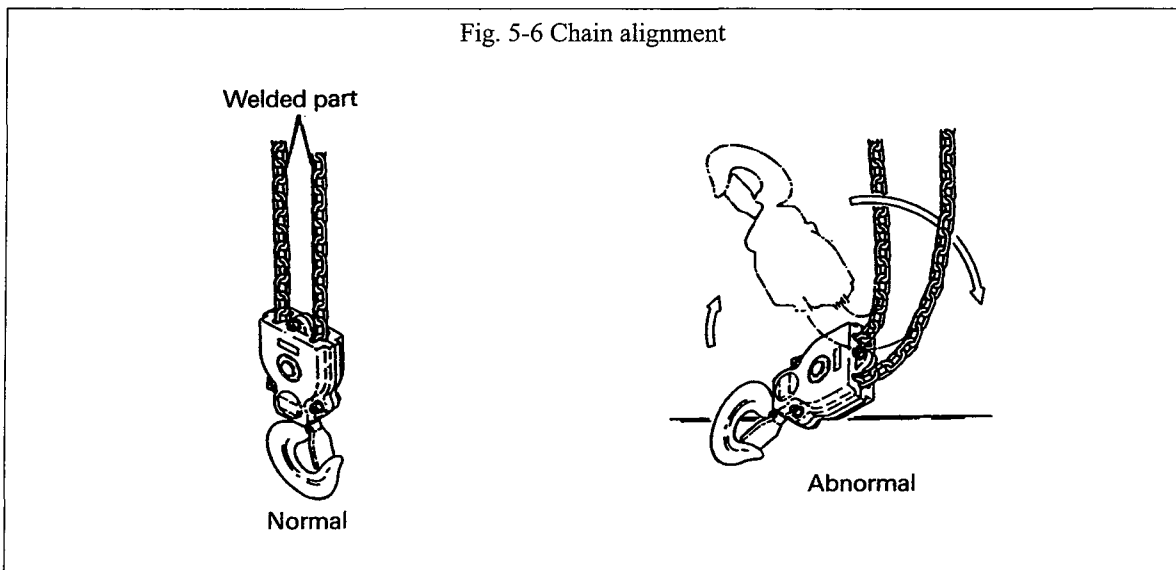
(3) Lubricating the load chain

To lubricate the chain, lightly coat the chain with machine oil or gear oil. Regular lubrication will help prevent wear and corrosion, which will extend the service life of the chain. Be sure oil is applied to surfaces of the chain.

(4) Checking chain alignment

Remark : For larger capacity hoists (7.5t and larger), refer to the ERML-9806-MC manual.

ER series hoist have double chain fall models for 3t or 5t capacity. Ensure that the bottom hook on the double fall models is not capsized. If it is capsized, restore it to normal and make sure the welds on the chain links are in alignment. Never try to suspend a load on a hoist with twisted chain.



**⚠ CAUTION**

Check for twisting in the chain.

## 5.2 Assembly of the electric chain hoist with motorized trolley

For the following four items (1), (2), (3) and (4), refer to the same items in 5.1 "Assembly of the electric chain hoist - Hook Suspension".

- (1) Attaching the chain container
- (2) Lubricating the gear case
- (3) Lubricating the load chain
- (4) Checking chain alignment
- (5) Assembling trolley and connecting with hoist

Remark : For larger Capacity hoists (7.5t and larger), refer to the ERML-9806-MC manual.

### (a) Assembling trolley

- 1) Insert the suspension shaft to side plate G and lock it with the suspension shaft bolt, slotted nut and split pin. Securely bend both branches of the split pin after insertion.
- 2) Insert the fixing shaft to side plate G and lock it with the split pin. Securely bend both branches of the split pin after insertion.
- 3) Insert the suspension shaft with the inner adjusting spacers as shown in Table 5-2.
- 4) Insert the suspension shaft and fixing shaft into the suspender T attached to hoist body. Make sure the nameplates of the hoist and trolley are facing in the same direction.
- 5) Insert more spacers into the suspension shaft and insert the suspension shaft and fixing shaft onto side plate S.
- 6) Put the outer adjusting spacers on the suspension shaft. Insert the shaft stopper pin into suspension shaft and also insert split pin into shaft stopper pin. Insert shaft stopper pin so that split pin is to the left when seen from the front side of trolley switch box.

Table 5-2 Adjusting spacer arrangement for Low Head Suspension

		Number of Adjusting Spacers																																																			
Capacity(t)	Beam flange width (in)	Number of Adjusting Spacers																																																			
		(mm)	58	64	73	75	82	90	98	100	102	106	110	113	119	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
1	Thin spacer	Inner	1+2	2+3	4+4	1+0	1+2	2+3	0	1+0	1+2	2+2	2+3	3+4	4+4	4+1	5+1	2+2	3+3	4+4	4+1	1+1	2+2	2+3	3+0	4+4	4+1	1+1	1+2	4+4	5+0	2+3	3+4	1+1	1+2	4+0	1+1	1+2	2+2	2+3	3+3	1+1	1+2	2+2	2+3	3+0	4+0	4+1	4+2				
		Outer	5	3	0	7	5	3	8	7	5	4	3	1	0	3	2	4	2	0	3	6	4	3	5	0	3	6	5	0	3	3	1	6	5	4	6	5	4	3	2	6	5	4	3	5	4	3	2				
	Thick spacer	Inner	0			1+1			1+2			2+2			2+3		3+3		3+4		3+3		3+4		0		0+1		1+1		2+2		2+3		3+3			4+4		4+5													
		Outer	3			3			1			0			2		1		0		3		2		3		2		9		8		7		5		4		3			1		0									
	Fixing spacer	Inner	0																																																		
		Outer	2																																																		
	Thick spacer L	Inner	0			1+1																																															
		Outer	2			0																																															
	2	Thin spacer	Inner	1+2	2+3	3+4	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+4	1+4	1+1	1+2	4+4	1+0	2+3	3+3	4+1	1+1	4+4	4+1	5+1	4+3	2+3	3+3	4+1	1+2	2+2	2+3	3+3	3+4	4+4	4+1	5+1				
			Outer	5	3	1	8	7	6	5	4	2	0	7	6	5	4	2	4	3	6	5	4	2	0	3	6	5	0	7	3	2	3	6	0	3	2	1	3	2	3	5	4	3	2	1	0	3	2				
		Thick spacer	Inner	0			1+1			1+2			2+2			3+2		0		1+1		1+2		2+2		2+3		3+3		3+4		4+4			4+5																		
			Outer	3			1			0			1		0		9		7		6		5		4		3		2		1			0																			
Fixing spacer		Inner	1+1																																																		
		Outer	0																																																		
Thick spacer L		Inner	0			1+1																																															
		Outer	2			0																																															
3		Thin spacer	Inner	1+2	2+3	3+4	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+4	1+4	1+1	1+2	4+4	1+0	2+3	3+3	4+1	1+1	4+4	4+1	5+1	4+3	2+3	3+3	4+1	1+2	2+2	2+3	3+3	3+4	4+4	4+1	5+1				
			Outer	5	3	1	8	7	6	5	4	2	0	7	6	5	4	2	4	3	6	5	4	2	0	3	6	5	0	7	3	2	3	6	0	3	2	1	3	2	3	5	4	3	2	1	0	3	2				
		Thick spacer	Inner	0			1+1			1+2			2+2			3+2		0		1+1		1+2		2+2		2+3		3+3		3+4		4+4			4+5																		
			Outer	3			1			0			1		0		9		7		6		5		4		3		2		1			0																			
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		Outer	0																																																		
	Thick spacer L	Inner	0			1+1																																															
		Outer	2			0																																															
	5	Thin spacer	Inner	0	1+0	1+1	1+2	2+2	3+3	0	1+0	1+1	2+2	3+3	4+0	4+1	1+1	2+2	2+3	3+0	4+4	4+1	5+1	4+3	4+4	1+0	2+3	3+4	1+1	1+2	4+4	1+1	1+2	2+2	2+3	3+3	5+1	1+2	2+2	2+3	4+3	4+4	4+0	4+1	5+1								
			Outer	8	7	6	5	4	2	8	7	6	4	2	4	3	6	4	3	5	0	3	2	1	0	7	3	1	6	5	0	6	5	4	3	2	5	4	3	1	0	4	3	2									
		Thick spacer	Inner	0			0+1			1+1			1+2			1+1		1+2		2+2		3+3		4+4		5+5		5+6		6+6			6+7																				
			Outer	3			2			1			0			1		0		10		9		7		5		3			2		1			0																	
Fixing spacer		Inner	1+1																																																		
		Outer	0																																																		
Thick spacer L		Inner	0			1+1																																															
		Outer	2			0																																															

Remarks : (1) Description for inner spacers  
 For example, 0+1  
 0 : the number of spacers on the left side of the shaft  
 1 : the number of spacers on the right side of the shaft

(2) Adjustment of trolley width  
 Refer to (b) of 5.2 on the 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) Spacer arrangement example

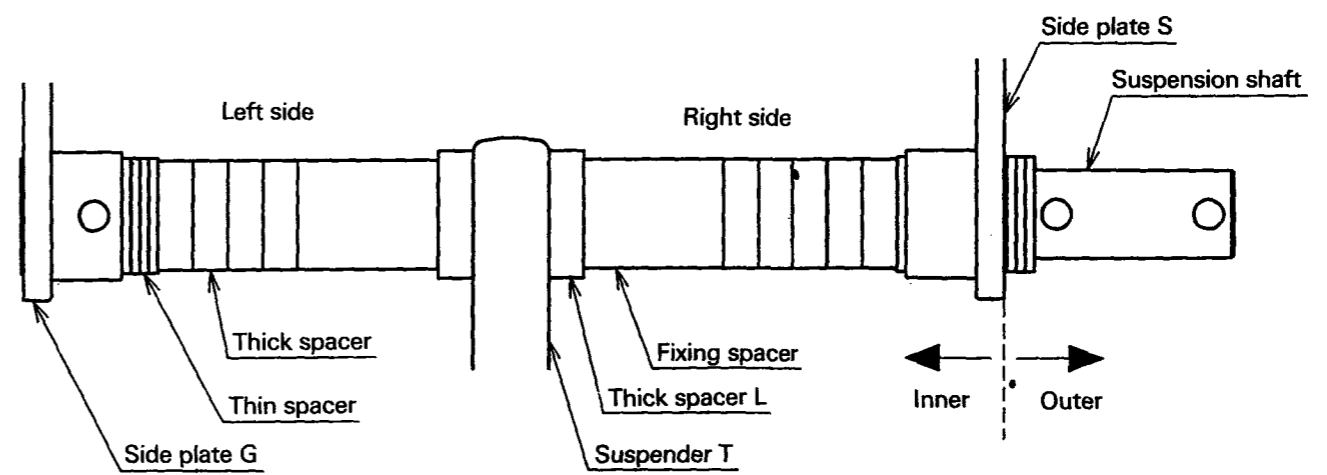


Table 5-2 Adjusting spacer arrangement for Lug Suspension

		Number of Adjusting Spacers																																																						
Beam flange 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					
	Capacity(t)	Part Name	(mm)	58	64	73	75	82	90	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
5	Thin spacer	Inner	0										1+0	1+1	1+2	2+2	3+3	0	1+0	1+1	2+2	3+3	4+0	4+1	1+1	2+2	2+3	3+0	4+4	4+1	5+1	4+3	4+4	1+0	2+3	3+4	1+1	1+2	4+4	1+1	1+2	2+2	2+3	3+3	5+1	1+2	2+2	2+3	4+3	4+4	4+0	4+1	5+1			
		Outer	8										7	6	5	4	2	8	7	6	4	2	4	3	6	4	3	5	0	3	2	1	0	7	3	1	6	5	0	6	5	4	3	2	5	4	3	1	0	4	3	2				
	Thick spacer	Inner	0										1+1			1+2	2+2		2+3	2+2	2+3		3+3	4+4		5+5		6+6			6+7	7+7			7+8																					
		Outer	5										3			2	1	0	1	0	10	9	7		5		3			2	1			0																						

Note: The arrangement for 1t to 3t is compatible with the low head suspension. Refer also to Table 5-2 for low head suspension.



















































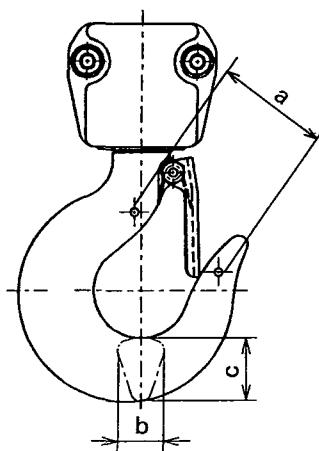





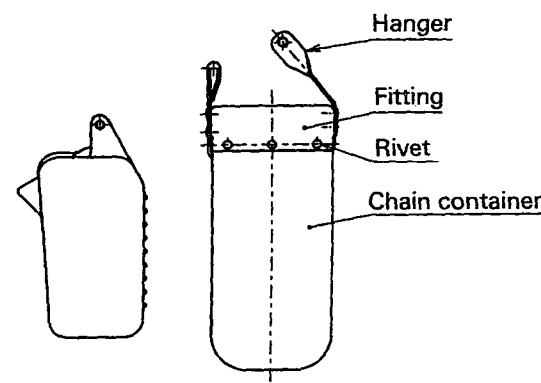






Class	Item	Inspection method	Discard limit/criteria	Remedy																																												
Hoist & Trolley	(2) Hook wear	Measure "b" and "c" with slide calipers.	<b>NEVER</b> use the hook if dimension "b" or "c" becomes less than 90% of normal.	Replace with new hook if worn.																																												
			 <table border="1" data-bbox="730 795 1455 1108"> <thead> <tr> <th rowspan="2">Capacity (kg or t)</th> <th colspan="2">b (mm)</th> <th colspan="2">c (mm)</th> </tr> <tr> <th>Normal</th> <th>Discard</th> <th>Normal</th> <th>Discard</th> </tr> </thead> <tbody> <tr> <td>125(H), 250(S), 250(H), 500(L), 500(S)</td> <td>17.5</td> <td>16</td> <td>23.5</td> <td>21</td> </tr> <tr> <td>1(L), 1(M), 1(S)</td> <td>22.5</td> <td>20</td> <td>31</td> <td>28</td> </tr> <tr> <td>1.5(S)</td> <td>26.5</td> <td>24</td> <td>36.5</td> <td>33</td> </tr> <tr> <td>2(L), 2(M), 2(S)</td> <td>29</td> <td>26</td> <td>40</td> <td>36</td> </tr> <tr> <td>2.5(S)</td> <td>31.5</td> <td>28</td> <td>43.5</td> <td>39</td> </tr> <tr> <td>3(L), 3(S), 3(C)</td> <td>34.5</td> <td>31</td> <td>47.5</td> <td>43</td> </tr> <tr> <td>5(L)</td> <td>42.5</td> <td>38</td> <td>56</td> <td>50</td> </tr> </tbody> </table>	Capacity (kg or t)	b (mm)		c (mm)		Normal	Discard	Normal	Discard	125(H), 250(S), 250(H), 500(L), 500(S)	17.5	16	23.5	21	1(L), 1(M), 1(S)	22.5	20	31	28	1.5(S)	26.5	24	36.5	33	2(L), 2(M), 2(S)	29	26	40	36	2.5(S)	31.5	28	43.5	39	3(L), 3(S), 3(C)	34.5	31	47.5	43	5(L)	42.5	38	56	50	
	Capacity (kg or t)	b (mm)			c (mm)																																											
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125(H), 250(S), 250(H), 500(L), 500(S)	17.5	16	23.5	21																																												
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2(L), 2(M), 2(S)	29	26	40	36																																												
2.5(S)	31.5	28	43.5	39																																												
3(L), 3(S), 3(C)	34.5	31	47.5	43																																												
5(L)	42.5	38	56	50																																												
(3) Hook neck deformation	Check visually.	<b>NEVER</b> use bent hook.	Replace with new hook.																																													
(4) Hook swivel operation	Rotate hook.	Hook turns smoothly.	Replace with new hook if it dose not turn smoothly.																																													
(5) Upper / lower fitting damage	Check visually.	No damage or deformation. Rivets, bolts and nuts have not loosened or become detached.	Replace with new fittings if damaged or deformed.																																													

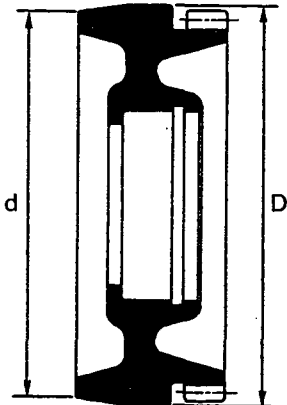


Class	Item	Inspection method	Discard limit/criteria	Remedy
Hoist & Trolley	(6) Rotation of idle sheave	Turn idle sheave by lifting the load chain up and down, as illustrated.	The idle sheave rotates smoothly. 	Inspect and repair if rotation is not smooth.
	(7) Chain container damage	Check visually.	Attachment screws, pins, hangers, fittings, machine screws, chain containers, etc., are not loosened or become detached or damaged. 	Replace with new chain container if damaged.
	(8) Chain container capacity	Measure the chain length.	No foreign matter or dust.	Remove any foreign matter and dust. If the load chain length exceeds the following length in the table, <b>ALWAYS</b> use the larger optional steel chain container.

WLL (kg or t)	125(H) 250(S)	500(L)	250(H) 500(S)	1(L) 1(M)	1(S)	1.5(S) 2(L) 2(M)	2(S)	2.5(S)	3(C)	3(L) 3(S)	5(L)
Chain length (m)	P 6 S 6 L 12	4 — 8	6 8 15	4 8 8	6 8 15	4 — 12	— 12 18	— 8 12	— — 6	— 6 8	— 4 6

P : Plastic container  
S : Small container  
L : Large container

Class	Item	Inspection method	Discard limit/criteria	Remedy																													
	1. Power supply fitting																																
	(1) Messenger wire tension	Check visually.	Wire dose not sagexcessively.	Tighten to proper tension.																													
	(2) Condition of cable hanger	Check visually.	Cable hangers are attached at equal intervals so that cable does not twist. Free of damage and moves smoothly.	Replace defective hangers with new ones.																													
Hoist & Trolley	2. Traversing unit																																
	(1) Trolley inclination	Run trolley with light load suspended.	Trolley is not tilted when running. If tilted, a wheel may be worn incorrectly.	Adjusting titled trolley																													
	(2) Bolts and screws loosening	Check visually.	Each of fitting points are not loosened.	Fasten tightly.																													
	(3) Missing snap rings	Check visually.	No snap rings are missing.	Insert snap rings if missing.																													
	(4) Wheel abrasion	Measure with slide calipers.	Abrasion of tread and flange do not exceed limits on the table shown below.	Replace with new wheels if limit is exceeded.																													
																																	
			<table border="1"> <thead> <tr> <th rowspan="2">Capacity (kg or 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> </thead> <tbody> <tr> <td>125kg to 1</td> <td>95</td> <td>91</td> <td>91.5</td> <td>87.5</td> </tr> <tr> <td>1.5 to 2</td> <td>110</td> <td>105</td> <td>106</td> <td>101</td> </tr> <tr> <td>2.5, 3</td> <td>125</td> <td>118</td> <td>121</td> <td>114</td> </tr> <tr> <td>5(L)</td> <td>140</td> <td>132</td> <td>135</td> <td>127</td> </tr> </tbody> </table>	Capacity (kg or t)	Tread outside diameter : D		Tread inside diameter : d		Standard	Limit	Standard	Limit	125kg to 1	95	91	91.5	87.5	1.5 to 2	110	105	106	101	2.5, 3	125	118	121	114	5(L)	140	132	135	127	
Capacity (kg or t)	Tread outside diameter : D		Tread inside diameter : d																														
	Standard	Limit	Standard	Limit																													
125kg to 1	95	91	91.5	87.5																													
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2.5, 3	125	118	121	114																													
5(L)	140	132	135	127																													

Class	Item	Inspection method	Discard limit/criteria	Remedy														
Hoist & Trolley	(5) Side plate deformation	Check visually or with slide calipers, as necessary.	No obvious deformation must be evident.	If damaged obviously, replace it with a new side plate.														
	(6) Suspension shaft deformation and abrasion	Check visually or with slide calipers as necessary.	<b>NEVER</b> use a suspension shaft if bent. <b>NEVER</b> use a suspension shaft if its diameter is worn down 10% or more.	Replace with new suspension shaft.														
	(7) Movement of joint fittings	Move electric chain hoist back and forth and right and left.	Joint fittings move smoothly.	If the movement is not smooth, supply oil to the top pin.														
	(8) Side roller wear	Check visually or with slide calipers, as necessary.	Compact part of the side roller is not worn to exceed limit dimensions on the table shown below.	Replace with new rollers if abrasion exceeds limit.														
		Move rollers by hand.	Rollers rotate smoothly.	Supply oil to roller shafts occasionally.														
		<table border="1"> <thead> <tr> <th rowspan="2">Capacity (kg or t)</th> <th colspan="2">Outside diameter (mm)</th> </tr> <tr> <th>Standard</th> <th>Limit</th> </tr> </thead> <tbody> <tr> <td>125kg to 1</td> <td>38</td> <td>37</td> </tr> <tr> <td>1.5 to 3</td> <td>43</td> <td>42</td> </tr> <tr> <td>5(L)</td> <td>55</td> <td>54</td> </tr> </tbody> </table>			Capacity (kg or t)	Outside diameter (mm)		Standard	Limit	125kg to 1	38	37	1.5 to 3	43	42	5(L)	55	54
Capacity (kg or t)	Outside diameter (mm)																	
	Standard	Limit																
125kg to 1	38	37																
1.5 to 3	43	42																
5(L)	55	54																
	(9) Split pins damaged for shaft stopper pins and missing split pins	Check visually.	Split pins are not damaged by rust or wear.  Split pins should not be missing.	Replace with new pins if thinned.  Insert split pins if missing.														

## 8. TROUBLESHOOTING

Situation	Cause	Explanation	Remedy
Moves in the reverse direction.	Reversed connection.	Connect correctly two lead wires of three wires for power supply.	See 5.3 "Trial run".
Won't move.	(1) Blown power circuit fuse or the power circuit breaker is switched off. (2) Blown control circuit fuse. (3) Disconnection of power cable or; disconnection of push button cord (5) Voltage drop (6) The emergency stop button was pushed. (7) Trouble in the internal wiring (loose contact, disconnection) (8) Damaged contact in electromagnetic contactor	Replace the fuse. Check current rating is correct. Replace the fuse or reset the breaker switch as necessary. Replace the fuse. Check current rating is correct and replace fuse as necessary/ Check for disconnection in cable or cord which are subjected to frequent bending, and repair disconnected point. Check voltage with a tester, and check connecting condition at the power source. Turn the emergency stop button to the right to release. Check internal wiring and repair where necessary. Replace the electromagnetic contactor.	If motor hums and does not rotate, stop operation immediately.
Won't stop.	Welded contacts in electromagnetic contactor	Replace the electromagnetic contactor.	
Brake slips.	Abrasion of motor brake	Check and repair the motor brake.	
Load fails to rise.	(1) Trouble with the friction clutch (2) voltage drop	Contact KITO or an authorized KITO dealer. Check voltage with a tester, and check connecting condition at the power source.	If motor hums and does not rotate, stop operation immediately.
Abnormal sound come from load chain	(1) Trouble with the friction clutch (2) Worn load sheave	Supply oil to load chin. Replace the load sheave.	Wear limit for chain link diameter at the gearing part of chain is 10%. Total wear limit for every 5 links pitch is 3%.
The trolley does not stop immediately	Loose trolley motor brake	Check and repair the motor brake.	Keep braking time to less than 1 second.
The trolley wheels slip.	(1) Tilted rail (2) Excessive oil on tread of traversing rail	Check and correct rail tilting. Wipe off oil.	Slightly grease the tread for better result.
Electric shock	(1) Improper grounding work (2) Accumulated foreign matter or moisture on electric parts	Provide correct grounding. Remove foreign matters or dry whole electric parts completely.	Ground equipment according to local laws. The traversing rail may serve as a grounding conductor when four conductors cable is not used for power supply to the motorized trolley. Be sure to ground the rail in this case.
Oil leak	(1) No oil plug (2) Loose fitting or oil plug (3) No plug packing (4) Worn or deteriorated oil packing	Attach the normal oil plug. Fasten the plug tightly. Attach normal packing. Replace with new packing.	

## 9. WARRANTY

KITO Corporation ("KITO") extends the following warranty to the original purchaser ("Purchaser") of new products manufactured by "KITO" (KITO's Products).

- (1) "KITO" warrants that KITO's Products, when shipped, shall be free from defects in workmanship and/or materials under normal use and service and "KITO" shall, at the election of "KITO", repair or replace free of charge any parts or items which are proven to have said defects, provided that all claims for defects under this warranty shall be made in writing immediately upon discovery and, in any event, within one (1) year from the date of purchase of KITO's Products by "Purchaser" and provided, further, that defective parts or items shall be kept for examination by "KITO" or its authorized agents or returned to KITO's factory or authorized service center upon request by "KITO".
- (2) "KITO" does not warrant components of products provided by other manufacturers. However to the extent possible, "KITO" will assign to "Purchaser" applicable warranties of such other manufacturers.
- (3) Except for the repair or replacement mentioned in (1) above which is "KITO"'s sole liability and purchaser's exclusive remedy under this warranty, "KITO" shall not be responsible for any other claims arising out of the purchase and use of KITO's Products, regardless of whether "Purchaser"'s claims are based on breach of contract, tort or other theories, including claims for any damages whether direct, indirect incidental or consequential.
- (4) This warranty is conditional upon the installation, maintenance and use of KITO's Products pursuant to the product manuals prepared in accordance with content instructions by "KITO". This warranty shall not apply to KITO's Products which have been subject to negligence, misuse, abuse, misapplication or any improper use or combination or improper fittings, alignment or maintenance.
- (5) "KITO" shall not be responsible for any loss or damage caused by transportation, prolonged or improper storage or normal wear and tear of KITO's Products or for loss of operating time.
- (6) This warranty shall not apply to KITO's Products which have been fitted with or repaired with parts, components or items not supplied or approved by "KITO" or which have been modified or altered.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES. EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.

