

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

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

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

ELEPHANT ELECTRIC CHAIN HOIST

OPERATION MANUAL

This Manual is applied to all the models.
(No. 2)

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

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

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

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

Osaka, Japan

CONTENTS

	page
Chapter 1 PRECAUTIONS ON INSTALLATION OF THE ELECTRIC CHAIN HOIST	
1. 1. Confirmation of your chain hoist on delivery	1
1. 2. Use of your chain hoist under specific conditions.....	1
1. 3. Power supply.....	2
1. 4. Checking of your chain hoist and its surroundings.....	2
1. 4. 1. Load chain	2
1. 4. 2. Fixing the chain bucket	3
1. 4. 3. Overwinding limit switch for upper and lower limits	4
1. 4. 4. Swinging of the chain hoist in normal conditions	5
1. 4. 5. Removal of air from the gear case	5
1. 4. 6. Preventing your chain hoist from being exposed to rain.....	6
1. 5. Precautions for the chain hoist with trolley	6
1. 5. 1. Trolley's width adjusting collars.....	6
1. 5. 2. Installation of the chain hoist on a curved traversing rail	7
1. 5. 3. Traversing rail.....	8
Chapter 2 PRECAUTIONS DURING OPERATION	
2. 1. Avoid overloading.....	10
2. 2. Safety latch	10
2. 3. Slinging	10
2. 3. 1. Lifting sling	10
2. 3. 2. Safe and sure slinging	10
2. 4. Lifting after completion of slinging	11
2. 5. Side pulling	12
2. 6. Double hoisting.....	12
2. 7. Plugging	13
2. 8. Inching and collision of cargo in travelling	14
2. 9. Handling of the pendant push-button panel and its cord	15
2.10. Keep away from under any hanging cargo.....	15
2.11. Never leave any cargo hanging on the chain hoist	16
2.12. Condition of the load chain	16
2.13. Precautions for the chain hoist with trolley during operation	17
2.13. 1. Never pull the trolley by pulling the cord	17
2.13. 2. Hand chain of the geared trolley	17
2.13. 3. Halt the trolley before it hits the stopper	17

CHAPTER 1 PRECAUTIONS ON INSTALLATION OF THE ELECTRIC CHAIN HOIST

1. 1. Confirmation of your Chain Hoist on Delivery

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

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

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

Table 1 Attachments and Documents

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

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

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

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

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

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

1. 3. Power Supply

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

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

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

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

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

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

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

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

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

★ From unpacking through the end of installation work

1. 4. 1. Load Chain

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

Remove all the wires before operating your chain hoist.

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

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

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

(Refer to Fig. 1.)

Fig. 1



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

Some grease is applied on the load chain when your machine is shipped from our factory. Please take care to keep the load chain from foreign substances like mud. With the double fall type there are possibilities that the bottom hook will pass between the two load chains and result in their kinking. Avoid using the chains in kinked condition. In this case, passing the bottom hook in the opposite direction between both the chains restores them to normal conditions. (Refer to Figs 2 and 3.)

Fig. 2

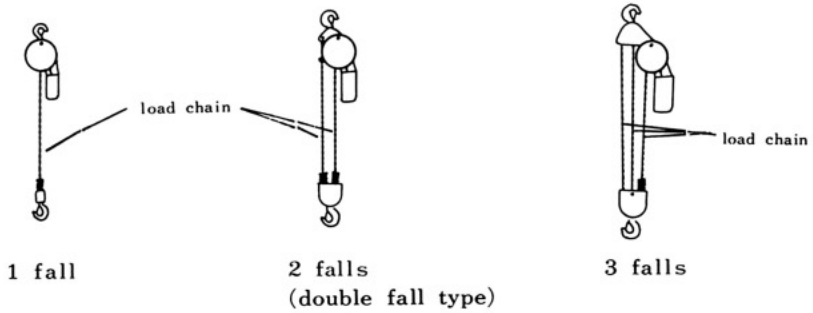
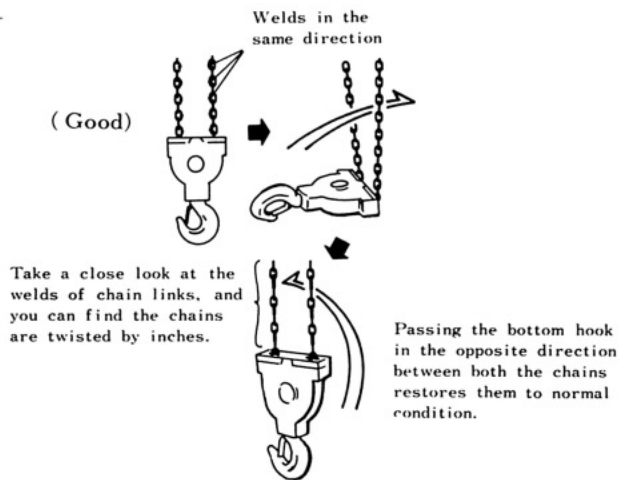


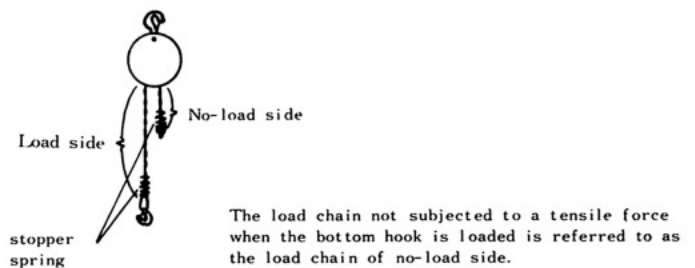
Fig. 3



1. 4. 2. Fixing the Chain Bucket

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

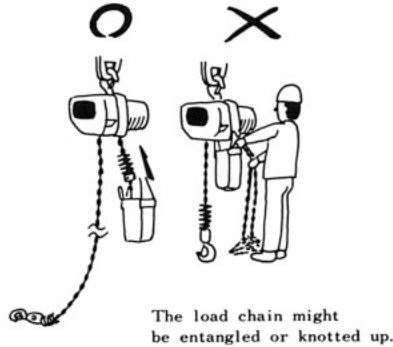
Fig. 4



The chain bucket should be fixed to the chain hoist with the load chain of no -load side coming out 50 cm or less from the chain hoist. (Refer to Fig. 5.)

This assures sure housing of the load chain in the chain bucket as well as easy installation of the bucket.

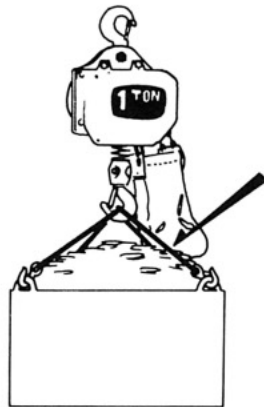
Fig. 5



Be careful to fix the chain bucket so that it may hang right under the body of the chain hoist.

If the bucket is pushed upward by hanging load as shown in Fig. 6, the load chain will dangerously overflow the bucket or be unable to pass smoothly through the body of the chain hoist.

Fig. 6



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

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

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

The switch has considerably long service life.

But if it is used too often in normal operation, it might cause serious accidents when it gets out of order and ineffective.

The built-in overwinding limit switch of the chain hoist should be set to function only in an emergency by installing another limit switch available on the market.

Inspect the limit switch before starting the work by operating the chain hoist in the lifting and lowering mode several times without any load (or without hanging any careo).

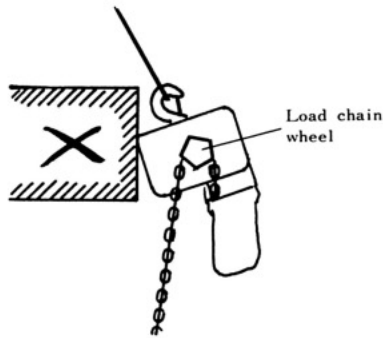
I. 4. 4. Swinging of the Chain Hoist in Normal Conditions

The body of the chain hoist is designed to be used hanging right under the hook or trolley and swings a little as the polygonal load chain wheel, which is the part to transmit driving power to the load chain, spins. Don't prevent this natural swinging.

Operating the chain hoist with its body caught by something or directly fixed to something without using the hook impedes the above-mentioned swinging and results in extra power dangerously imposed upon each one of important parts. (Refer to Fig. 7.)

Use the chain hoist hanging perpendicularly in normal condition.

Fig. 7



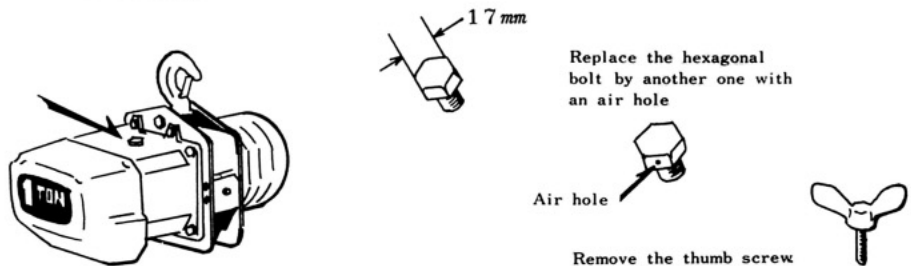
I. 4. 5. Removal of Air from the Gear Case

A thumb screw or hexagonal bolt with side-to-side dimension of 17 mm is provided on the top of the gear case as shown in Fig. 8 for the model, the reduction gear section of which is oil-lubricated.

Remove the thumb screw or hexagonal bolt after installing the chain hoist. For the model that has a hexagonal bolt on the top of its gear case, replace the bolt with another hexagonal bolt with an air hole, which comes in a small vinyl bag.

The hexagonal bolt with an air hole serves to ventilate the gear case in response to the temperature change inside the gear section, thereby preventing the packing from deteriorating due to a high pressure.

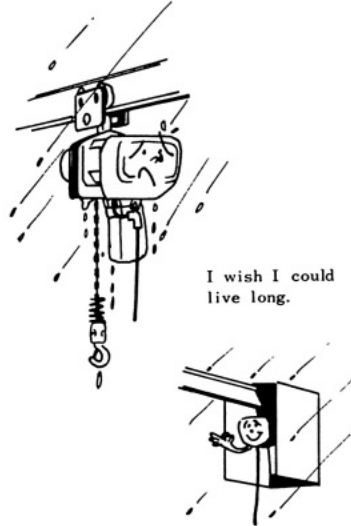
Fig. 8



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

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

Fig. 9



1. 5. Precautions for the Chain Hoist with Trolley

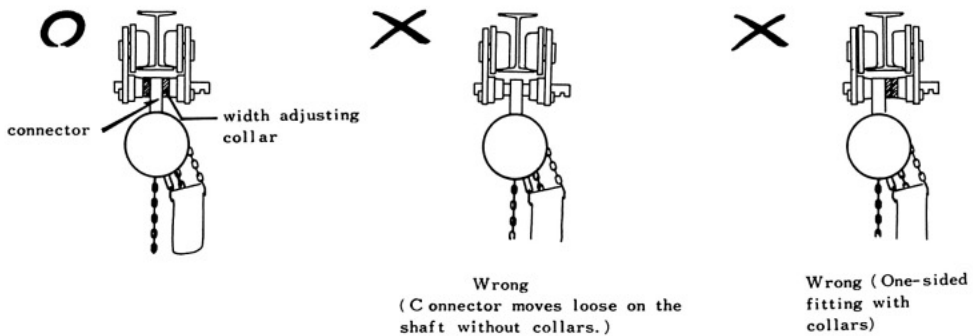
★From unpacking through the end of installation work

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

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

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

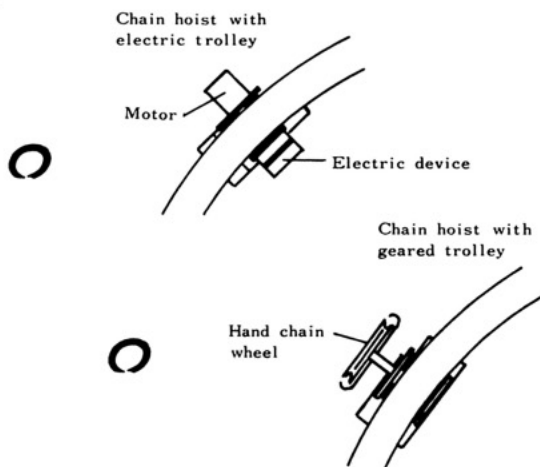
Fig. 10



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

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

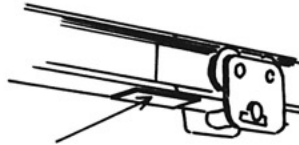
Fig. 11



I. 5. 3. Traversing Rail

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

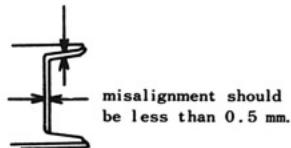
Fig. 13



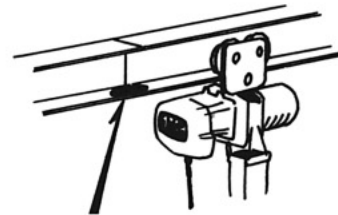
Take note of the thickness of fishplate.

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

Fig. 14



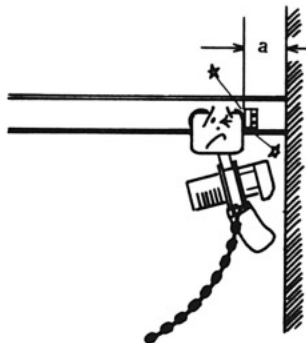
misalignment should be less than 0.5 mm.



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

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

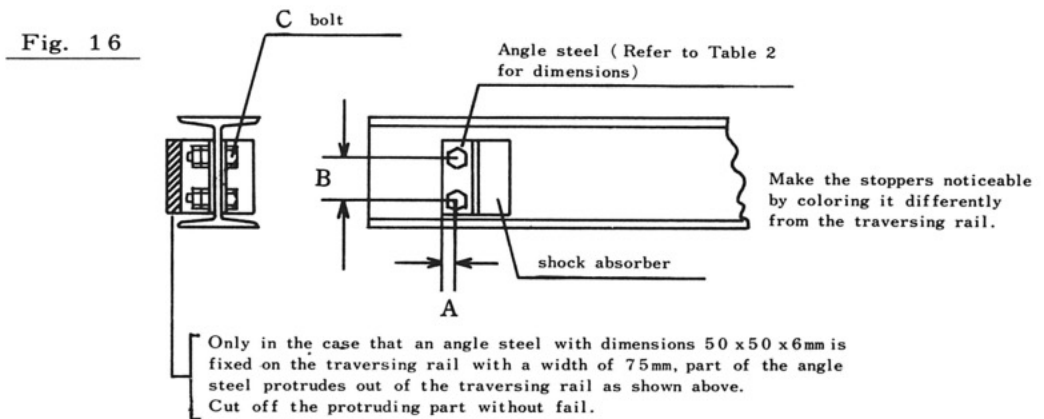
Fig. 15



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

Table 2 stopper

Traversing rail dimensions (mm)	150x75	200x100	250x125	350x150	450x175
Angle steel (mm)	50x50x6			65x65x6	
A (mm)	22			30	
B (mm)	70	105	110	190	280
C (mm)	M 12	M16	M16	M20	M20



CHAPTER 2 PRECAUTIONS DURING OPERATION

2. 1. Avoid Overloading

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

2. 2. Safety Latch

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

Fig. 17



2. 3. Slings

2. 3. 1. Lifting Sling

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

2. 3. 2. Safe and Sure Slings

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

Fig. 18



Improper 1



Improper 2



Improper 3

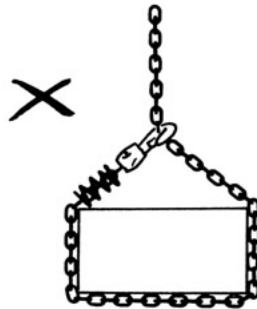
Explanations for Fig. 18

Improper location of the sling on the bottom hook

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

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

Fig. 19



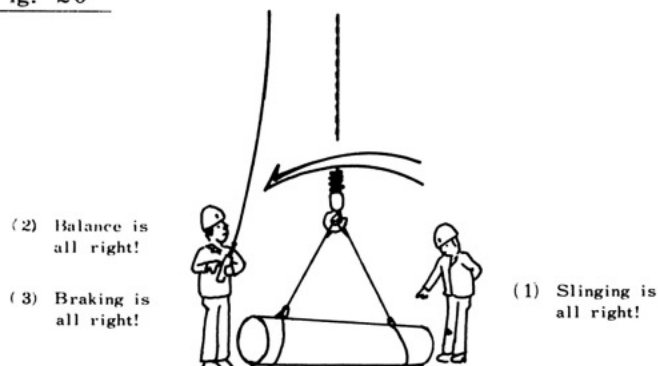
2. 4. Lifting after Completion of Slinging

When lifting the load up after completion of slinging:

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

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

Fig. 20



2. 5. Side Pulling

Side pulling is very dangerous, so never do that.

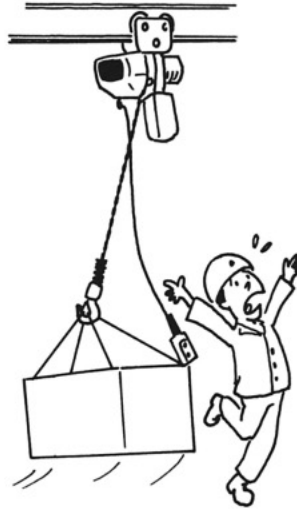
With side pulling, the load, dragging on the ground, might start moving fast abruptly and some skew tension might be put on the chain hoist support. (Refer to Figs. 21 and 22)

Be sure to hoist the load with the chain hoist right above its center of gravity.

Fig. 21



Fig. 22

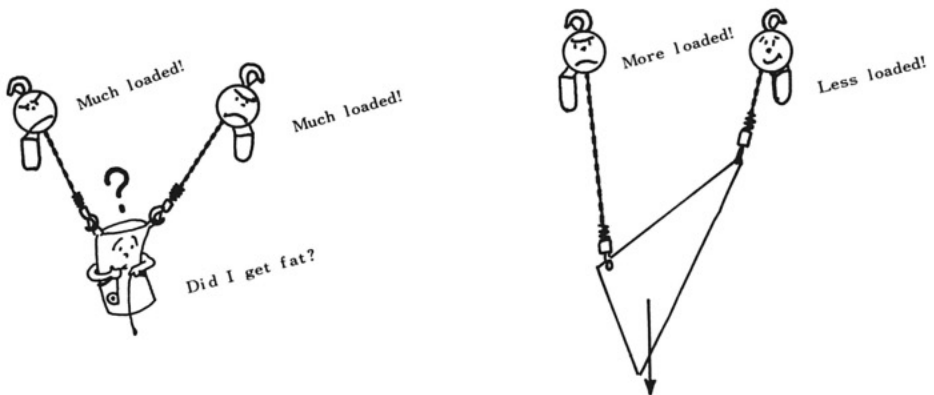


2. 6. Double Hoisting

Avoid hoisting a single cargo with two chain hoists.

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

Fig. 23

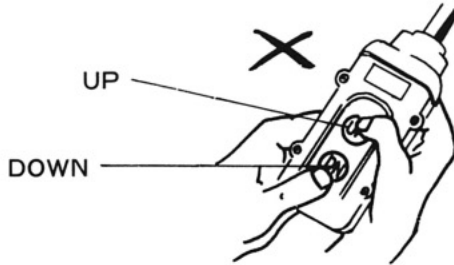


2. 7. Plugging

Never press the UP and DOWN push-buttons alternately at too short intervals. (Refer to Fig. 24)

This could put on the chain hoist a momentary load more than two times the hanging load, thereby greatly shortening the service life of the chain hoist and load chain.

Fig. 24



For Reference

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

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

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

Fig. 25

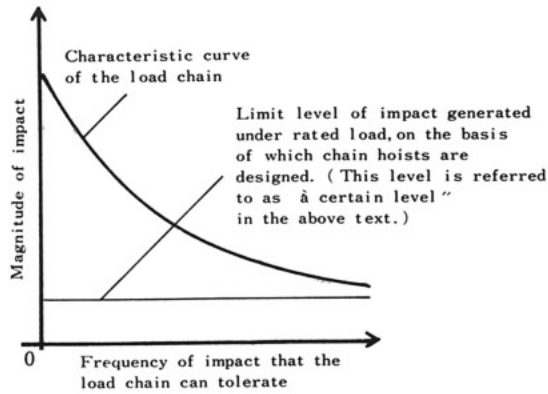


Fig. 26 Tension of the load chain in normal operation

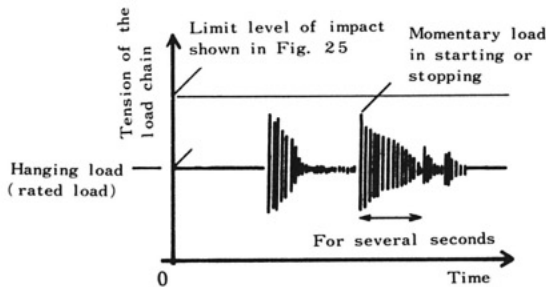
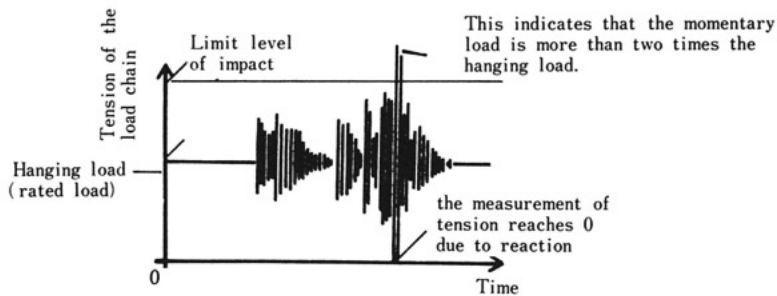


Fig. 27 Tension of the load chain in plugging



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

2. 8. Inching and Collision of Cargo in Travelling

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

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

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

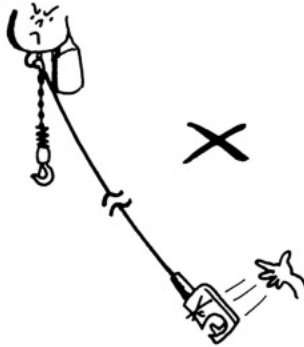
Press down each push-button fast and securely so that its contacts may touch each other well enough.

★ Dual-speed type electric chain hoist

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

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

Fig. 28

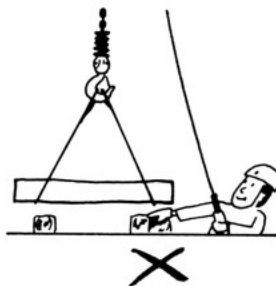


Never use any pendant push-button panel that has been cracked, heavily stained, or lacks some component part. This could lead to electric shock or malfunction.

2. 10. Keep away from under Any Hanging Cargo

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

Fig. 29



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

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

Fig. 30



2. 12. Condition of the Load Chain

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

Fig. 31



Oil the entire load chain as frequently as possible.

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

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

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

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

If you need them, contact your dealer.

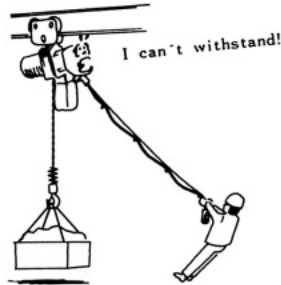
Never fail to oil even these load chains for prolonged wear-resisting life. Oiling or no oiling means the difference of more than several tens of times in service life of the load chain.

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

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

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

Fig. 32

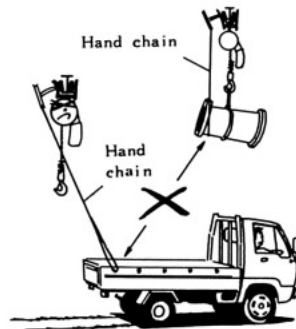


2. 13. 2. Hand Chain of the Geared Trolley

The hand chain of the geared trolley can be caught and pulled tightly by a hanging cargo, hooks on the loading body of a truck, etc. to cause deformation and dropping of the trolley.

Pay good attention to the hand chain of the geared trolley. (Refer to Fig. 33)

Fig. 33



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

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

Fig. 34

