● This manual should be surely handed over to the users.
● The users of the chain hoist should thoroughly read this manual.

NO.3

SMALL TYPE ELECTRIC CHAIN HOIST
MODEL ALPHA (α Type)
OPERATION MANUAL

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

ELEPHANT CHAIN BLOCK CO.,LTD.

Osaka, JAPAN

I) SAFE OPERATING PRACTICES

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

It is very important that not only the employer but also the operators of the chain hoist are familiar with "Safety rules" in your country.

"Procedure for slinging work" and "Working rules" of your company, etc. and that only persons who are authorized as fully trained operators of the chain hoist shall engage in the chain hoisting work. This manual is written on the assumption that only such persons as mentioned above will operate the unit.

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

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

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

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

Examples of the symbol:

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

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

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

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

1. General

⚠ WARNING

- The unit should be operated only by those who are familiar with the manual and contents of the instructing plate.

- The unit should be operated only by those who have completed required training for operation of the crane, handling of the lifting slings, etc. The employer should kept unauthorized persons from operating the unit.
- Inspection before operation and periodic inspection must be by all means carried out.

2. Installation and Setting-up

⚠ WARNING

- The installation work should be performed only by the specialized contractor or experienced technician.

- The chain hoist should not be installed in a place deviated from the provision where it is, for example, exposed to rain or water.
- Carry out an earth connection. Furthermore , an earth-leakage circuit breaker should be fitted to the electric line.

- Observe the regulations concerned in your country when the unit is used as a simple elevating device.

- Attach a stopper to the ends of the traverse and travel rails.
- Make sure that a location on which the chain hoist is installed has a sufficient strength.
- Suspend the chain hoist in a manner that it can freely swing about.
- Attach a chain bucket to the chain hoist before installing it.

3. Operation and Handling

⚠ WARNING

- Do not lift a load which exceeds the rated load.
  ※The rated load is indicated on the hook block or on the nameplate of the chain hoist body.

- Do not get on a suspended load and do not use the chain hoist to lift, support or transport persons.
- Do not stay under a suspended load.
- Do not operate the chain hoist when somebody stays in an area where a suspended load is moved.
- Do not move a load over persons.
- Do not leave a suspended load unattended.
- Do not allow your attention to be diverted from operating the chain hoist.

- Do not operate the chain hoist in a manner that a load and/or the hook block swings away.
- Do not stop the chain hoist by always making use of the upper and lower slipping mechanism.
- Do not use the chain hoist for the oblique pulling.
  ※First move the chain hoist to right over a load and then lift it.
- Do not use the chain hoist for the earth lifting.(e.g. lifting up a load fixed to the ground)
- Do not carry out turnover of a suspended load.
  ※Turnover should be done by means of a device specialized in that purpose (Such a turning device is available from us).
- Make sure before operation that the push-buttons properly function. Do not operate the chain hoist when the push-buttons are in disorder.
- Immediately stop operating the chain hoist when it moves in other direction as commanded by the push-button switch.
- Make sure before operating the chain hoist that the brake properly functions. Do not operate the chain hoist when the brake are in disorder.
- Do not use a chain hoist which was damaged or causes abnormal sound and/or vibration.
- Do not use a chain hoist with twisted, kinked ,damaged, severely worn, deformd, or elongated load chains.
- Do not apply the electric welding on a suspended load.
- Do not allow the load chain to be used as a ground for welding.
- Do not allow the load chain to be touched by a live welding electrode.

⚠ CAUTION

- Do not use the chain hoist at voltages other than the rated voltage in your country.
- Do not use the chain hoist with a damaged safety latch of the hook.
- Do not operate the chain hoist by plugging (abrupt reversing) or frequent inching.
- Do not have the suspended load caught on other structures or cables.
- Do not have the push-button cord caught on other structures, or do not pull it strongly.
- Do not have the chain hoist body or trolley hit against stoppers or other structures.
- Do not use the load chain as a sling or do not wrap the load chain around the load.
- Do not bring the load chain into contact with sharp edges.
- Do not allow a load or slinging tools to push the chain bucket up.
- Never use the chain hoist at a load time rate and with a starting frequency exceeding the rated values.
- Do not use the chain hoist with name plates and labels attached to the body removed or left unclear.

- Make sure before operation that the bottom hook smoothly revolves.
- Hang slinging tools properly on the hook.
- Stop lifting once when the load chain is properly tensioned.
- Always keep the push-button kit clean so that dust, sands and the like will not be deposited on it.
- In the case of double chain hoisting, two chain hoists should be operated in a synchronized manner.
- Make sure that the range of lift of the chain hoist is sufficient for the intended work.

4. Maintenance, Inspection and Modification

⚠ WARNING

- Never make modifications to the chain hoist and its accessories.
- Never use parts other than genuine ones made by us.
- Never do shortening or lengthening of the load chain.

- Before carrying out the maintenance, inspection or repair do not fail to turn the power source off.
- Only specialists authorized by the employer may carry out the maintenance, inspection or repair.
- Carry out the maintenance, inspection or repair with the chain hoist unloaded (e.g. without loads).
- When any disorder is found in the maintenance or inspection, immediately make repair before re-operating the chain hoist.

⚠ CAUTION

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

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

TABLE OF CONTENTS

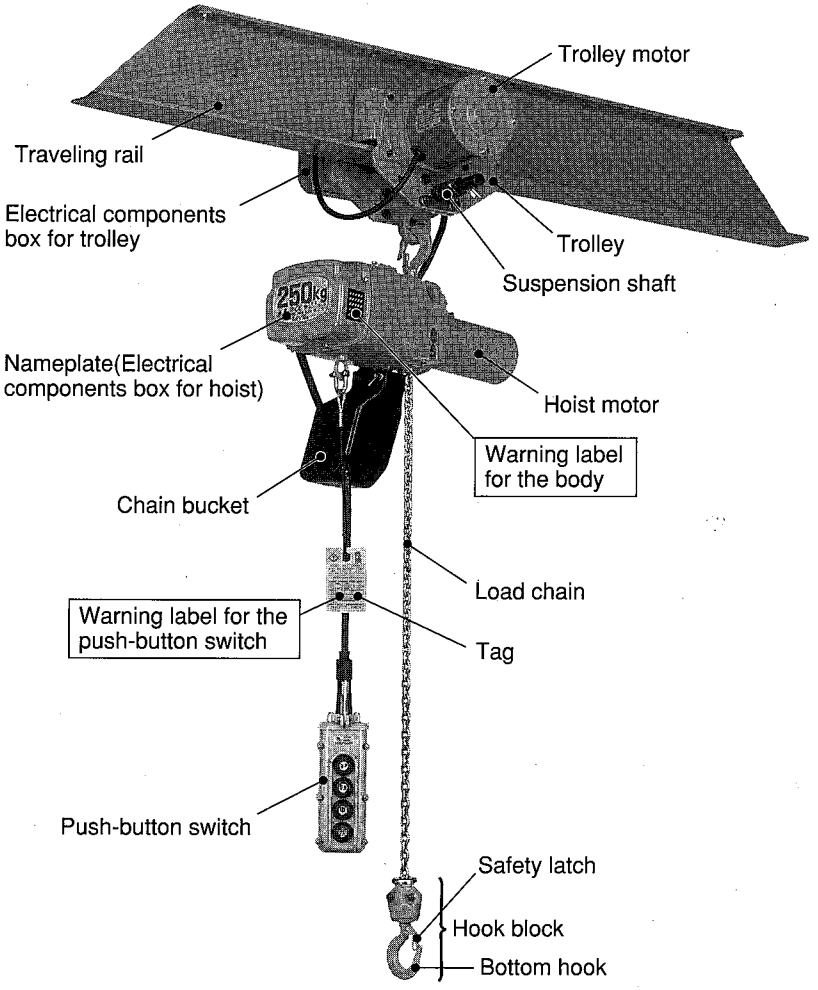
II) APPLICABLE LAWS AND REGULATIONS

In accordance with the regulations of the laws (ordinances, rules, standards) in your country observe the provisons for the "Manufacture of Cranes", "Manufacture of Handy Elevators", "Structure Standards", "Operation of Cranes" and "Slinging Work".

※It is above all advisable to investigate 1)legal obligations for installation; 2)those for usage and 3)those for inspection of the cranes and chain hoists respectively in laws (ordinances, rules, standards) in your country and to observe them.

III) DESIGNATION OF ELEMENTS OF THE UNIT

Designation of Elements of the unit of α-type Electric Hoists (An example : With Electric Trolley)



IV) IDENTIFICATION OF THE PRODUCT AND CAUTIONS FOR ITS INSTALLATION

1. Identification of the product

- Make sure that a chain hoist delivered is in accord with your order.
  Make sure that the items indicated in the casing are same as specified by you;

1–1 Electric chain hoist (purchased alone, without a trolley)

1) Type ·····(Nameplate also)
2) Power supply ·····3-phase or single phase
3) Rated load
4) Range of lift ·····3m, 6m or 15m, etc. (or extra height)
5) Type of pushbuttons ·····2–,4– or 6–buttons (Single-speed type, Dual-speed type, Variable-speed type)
6) Length of the push-button cord 3m, 6m or 15m, etc. (or extra height)
7) Length of the power supply cord 5m (1m for the electric trolley)

1–2 Trolleys (purchased with a trolley)

1) Type ·····Plain, Geared, or Electric trolley
2) Rated load

※Check the unit for its lifting height or cord length respectively when an extra lift or a cord with a special length is ordered.

- Check the unit for damages during transport and/or other damages.
- Check the goods for its complete delivery of accessories and documents concerned.

List of accessories and documents.	
Operation manual	(1)copy
Inspection certificate of the chain hoist	(1)copy
Chain gauge	(1)
Chain bucket	(1)set

Consult a dealer of our products immediately if any disorder is found.

2. Cautions for using the unit in unusual circumstances

⚠ WARNING

- The chain hoist may not be used in an explosive environment.
  ※Area where organic solvents or explosive dusts exist
- The chain hoist may not be used in areas where extremely low or high temperatures, high humidity or chemicals dominate.Consult a dealer of our products when the chain hoist is used in a special environment where low (under −10℃) or high temperatures(over 40℃), high humidity(over 90%), much acids or salts, or much chemicals dominate.
- Install a shelter protecting the body of the chain hoist against wind, rain, snow, etc. or apply a cover over it when it is used outdoors.
  ※It is necessary to employ a one rank hevier model especially in a cold condition, because metals will possibly get brittle.

3. Operation time

⚠ CAUTION

Do not use the chain hoist in a working condition that exceeds the rated duty cycle and the maximum starting frequency.

	3 phase	Single phase
Duty cycle percentage (% ED)	40%	30%
Max.starting frequency (times/hour)	240	180

Table 1

Load rate	Mean running time per day (hour)				
	0.25 or less	0.50 or less	1 or less	2 or less	
Light					Operation usually at 1/3 of rated load and occasionally at rated load.
Middle					Operation usually at 1/3 to 2/3 of rated load and occasionally at rated load.
Heavy					Operation usually at 2/3 or over of rated load and often at rated load.
Extremely heavy					Operation mostly at or nearly rated load.

- The lifetime of the product is highly dependent on the load applied and the operation hour.
- To achieve its longer lifetime the chain hoist should be operated in a hatched range of time in Table 1.
- In the following cases consult us or a distributor of our products.

1) The chain hoist will be possibly operated in a condition exceeding the hatched range.
   ※Sufficient maintenance such as periodic inspection, etc. will be necessary.
2) The chain hoist will be most likely operated in a condition considerably exceeding the hatched range.
   ※It will be necessary to select a one rank heavier model or DA series.
3) The chain hoist will be operated in a very severe and concentrated working condition.
   ※It will be caused that the motor is over-heated or the load setting for the friction clutch is reduced.

V) INSTALLATION AND SETTING-UP

⚠ WARNING

- Refrain from installing the chain hoist by yourself and leave the installation work to the care of a specialized contractor.
  ※Otherwise you might be wounded by electric shock or the chain hoist fallen.
- Do not fail to conduct an earthing. Furthermore, a leakage circuit breaker should be installed in the electric path.

※Above measures are absolutely necessary for avoiding an accident by electric shock.
※Conduct earthing and fitting of the said breaker in accordance with regulations valid in your country.

● Make sure that a place where the chain hoist is installed has a sufficient strength.
※Otherwise persons might be wounded by the chain hoist fallen, etc.

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

1. Electric wiring (Refer to wiring diagram on page 28 to page 30.

Leave the electrical work to the care of a specialized contractor, who should properly carry out the work observing this instruction manual.

● Before connecting the power source to the chain hoist, make sure whether its voltage complies with the applicable source for the chain hoist.

1–1 Connecting the power cable

⚠ CAUTION

● Conduct the connection of the power source via the switch cabinet (main circuit breaker).
● Shut off the switch cabinet while the chain hoist is not operated. (Otherwise eventual leakage current may cause electric shock or fire.)

● Make use of a power source suitable for the chain hoist model alpha, since it has two executions either for 3 phase or single phase mains.

1–2 Wiring for 3 phase mains

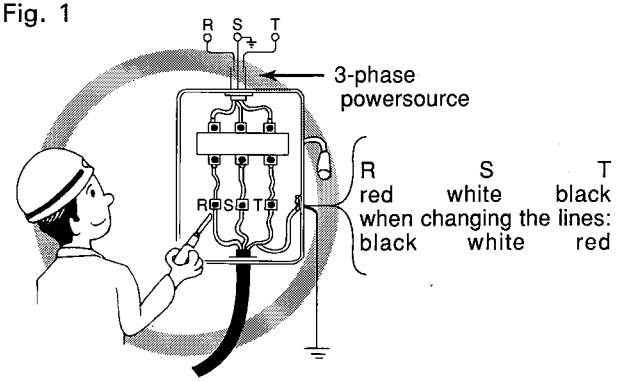
● Carry out the wiring according to Fig. 1. Connect the S line (white) of the power cable to the S line of the power source.
● Connect the yellow / green line (earth line) to the earth.

⚠ WARNING

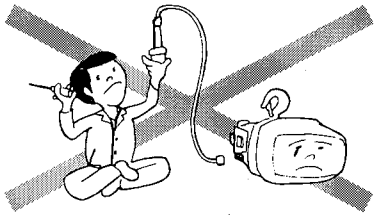
● In the case of negative phase, do not change the wiring inside the push-button switch and the main body.
※It may cause the motor or electric parts to burn or electric shocks, resulting in a very dangerous situation.

● After the breaker is put on, if the bottom hook goes down while the push button "UP" is pressed, stop pressing the button immediately. In such a case, put the breaker off and change the T-line (black) with the R-line (red) on the cable side as shown in Fig. 1.
The chain hoist will then properly operate. (Make sure that the S-line is connected to the earthed phase of the power source.)

Fig. 1



Power Cable



1–3 Wiring for single phase mains

For single phase mains, consult an electric contractor to decide in consideration to putting on and off of the master switch whether a plug with the earth or a plug separated from the earth will be used for the power cable.

1–4 Selection of the power cable

⚠ CAUTION

● Avoid to use a power cable which is too small in diameter and to connect a power cable to the mains of which voltage has been dropped.
※Otherwise the chain hoist will not operate properly or the power cable may be heated and burnt.

If the resistance (Ohm) of the cable from the mains to the chain hoist or other supply lines is too high, voltage (volt) of the power source will remarkably drop, causing the chain hoist to improperly operate or the supply lines to be burnt.Select such a supply line as its calculated value for voltage drop does not exceed a value of 4V.Calculation of voltage drop

Example: 3 phase, 200V Voltage drop = $30.8 \times L \times I \div A \div 1000$
here, L=cable length(m), I=steady-state power consumption(A),
A=cable section (mm^2)

Fig. 2: Good cable
Big in diameter = resistance per meter is small
Short in length = advantageous condition

Fig. 2

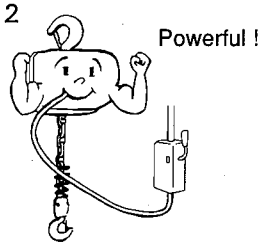


Fig. 3: Wrong cable
Small in diameter = resistance per meter is big
Long in length = disadvantageous condition

Fig. 3

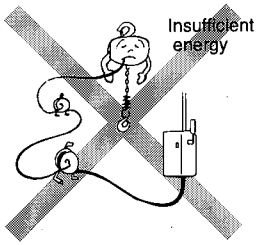


Table 2

		Steady-state power consumption
3 phase	Without an electric trolley	4A
Single phase		12A
3 phase	With an electric trolley	7A
Single phase		18A

1–5 Power supply for the chain hoist, delivered with a trolley attached

⚠ CAUTION

- When the chain hoist is purchased separately from an electric trolley or they are used together with a crane, consult a specialized contractor or a distributor of our products.
  ※As to wiring refer to the wiring diagram on page... 28~30

- Wirings inside the chain hoist and an electric trolley are beforehand completed in case that the chain hoist only or a combined set, that is, chain hoist equipped with an electric trolley or a geared trolley or a plain trolley respectively are purchased.
- In case that an alpha chain hoist for single phase equipped with an electric trolley for 3 phase is purchased, there are 4 core power lines. When the electric trolley does not move in an expected direction, two of three lines on the side of power cable should be changed, same as in Fig. 1. Never change the wiring inside the wiring box of the chain hoist body.
  ※A green power line is for earthing and it must be absolutely grounded. The chain hoist will be properly lifted and lowered even when two of three power lines are changed.
- The travel rail must be absolutely earthed.
- For better conductivity the travel face of the travel rail and the wheel face should be kept free from paint, oil and the like.

2. Installation of the electric chain hoist

⚠ WARNING

- An installation site should be prepared in such a way that the chain hoist will never fall down.
- The chain hoist should be hung down so as to freely swing away.

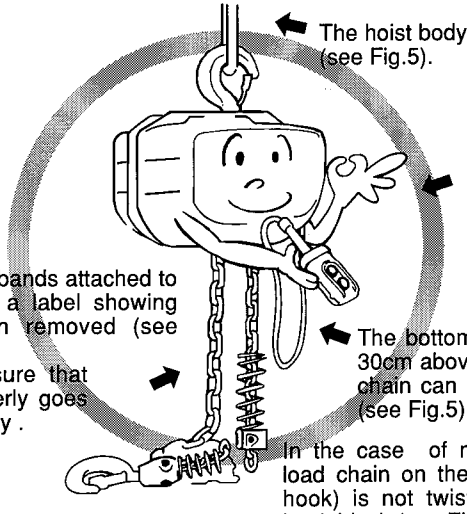
※Otherwise the fixed portions will be severely stressed and persons may be wounded by a dropped chain hoist being caused by damaged elements.

In case that the chain hoist is used only for lifting and lowering, the metal fixture to support the top hook should be properly constructed and be made of suitable material so as to secure in the lifting condition a safety factor 5 times and higher than the rated load.

2–1 Cautions before operation

Observe the following points to properly use the chain hoist before switching on and operating it. When erroneously used, the load chain and/or other elements may be damaged by a strong force of the motor.

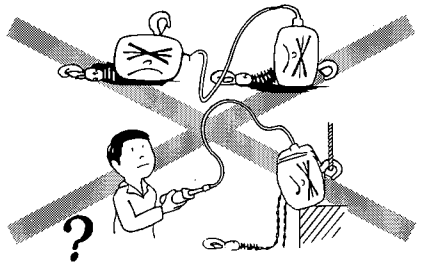
Fig. 4



⚠ WARNING

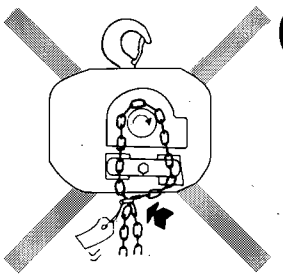
Never operate the chain hoist when it is not hung down or it is extremely tilted.

Fig. 5



The chain hoist should be operated only after vinyl bands and a "label showing cautions" have been removed.Otherwise the load chain will be improperly moved to have parts damaged.

Fig. 6



2–2 When the chain hoist is used as suspended type with hook

⚠ WARNING (1.Installation)

(1) Never install the chain hoist by yourself but by a specialized contractor.

(2) The metal fixure to support the top hook of the chain hoist should be strong enough to bear a load over 5 times of the rated load.

(3) The section of metal fixture should be shaped without sharp edges and its corner should be amply rounded. Furthermore apply a little grease to its face contacting with the hook.

(4) Make sure that the latch for the top hook is completely closed after the installation work of the chain hoist has been finished (Refer to Fig. 7).

※An accident will happen by a load or the chain hoist itself fallen down as is caused by a damaged matal fixture of which strength is not sufficient or which are worn out.

2-3 Used as Trolley-combined type

There are two ways for connecting the alpha type chain hoist with a trolley, that is, hanging the top hook of a trolley, that is, hanging the top hook of the chain hoist on the suspension fixture of a trolley mounted to the I-beam (Fig. 8(1)) or hanging the top hook of the chain hoist on the suspension axle of a trolley (Fig. 8(2)).

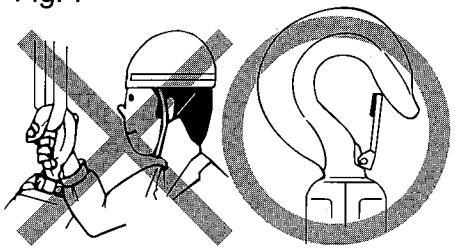
(1)When hanging on an electric trolley (single or 3 phase) for 60kg~500kg type, the chain bucket of the chain hoist should be on the side of electrical instrument of the trolley as Fig. 8(1) shows.

(2)When hanging on a geared trolley for 60kg~500kg type, the chain bucket of the chain hoist should be on the reverse side of the hand chain wheel of the trolley as Fig. 8(2) shows.

(3)When hanging on a plain trolley for 60kg~500kg type, the chain bucket may be on either side.

(4)Make sure that the latch for the top hook is completely closed.

Fig. 7



Check the safety latch for damage.

Fig. 8(1) For 60kg~500kg type electric trolley

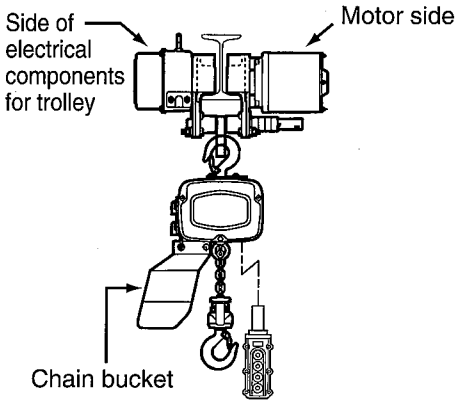
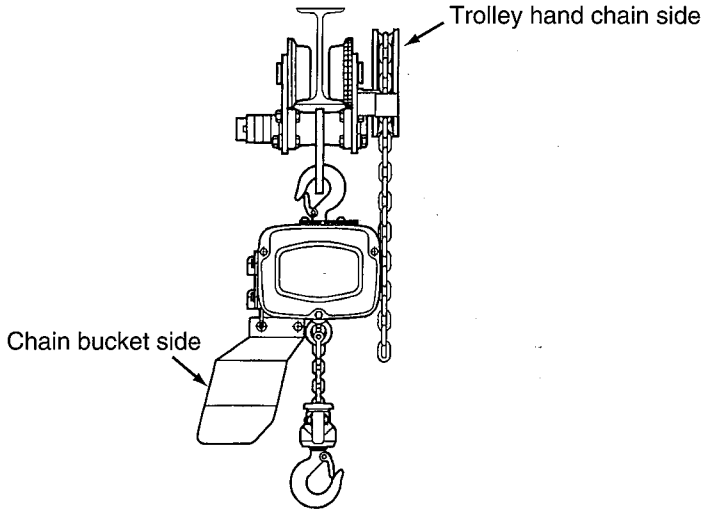


Fig. 8(2) For 60kg~500kg type geared trolley



3. Fitting of the chain bucket

⚠ WARNING (1.Installation)

● Fit the chain bucket before installing the chain hoist.

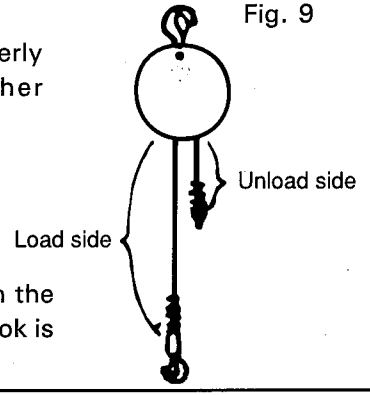
※If the chain bucket is not fitted, the load chain on the unloaded side may possibly catch a load and other objects, as is quite dangerous.

※Make sure that the chain bucket is properly fitted, because its falling from a higher position during use is quite dangerous.

Fig. 9

The load chain in idle which does not undergo any tension when applying a load is called the load chain on the unload side. Load chain on the unload side means chains on the idling side receiving on tension when bottom hook is loaded.

Fig. 9



Fit the chain bucket in a state that the load chain is lowered down till the rest of it on the unload side is approx. 10cm. Such a fitting way is not only simple but also enables the load chain to be put into the chain bucket in good order (See Fig. 12).

(1) Put the load chain on the unload side into the chain bucket and insert the hanging fixture(A) and the hooking fixtures(A) and (B) into the bucket(See Fig. 11).
(2) Insert a pin into the bucket through the pin hole, then into the hooking fixtures(A) and (B) and put a cotter pin into a hole of the said pin (Legs of the cotter pin should be bent out so as not to fall down).
(3) Insert a fixing bolt into the bucket through the hole and screw it in the hanging fixture(A) (See Fig 10).

Fig. 10
With the bucket fitted.

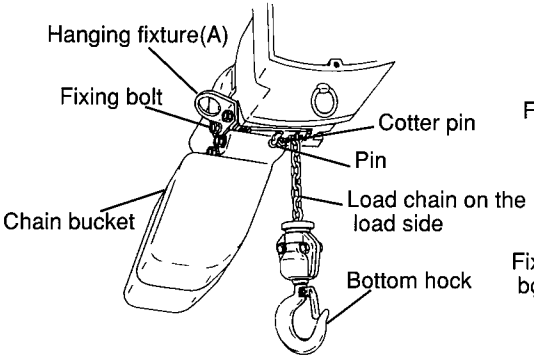
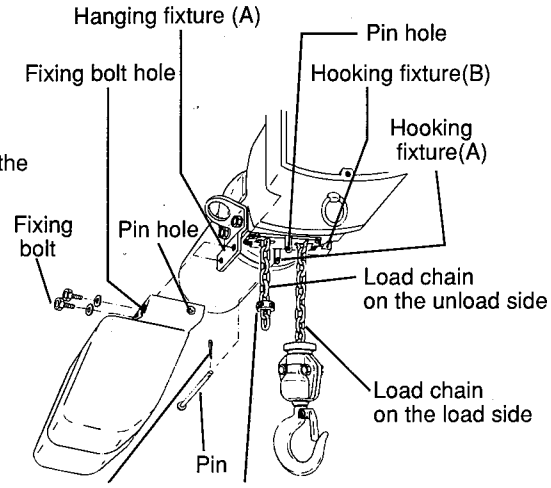


Fig. 11
Without the bucket

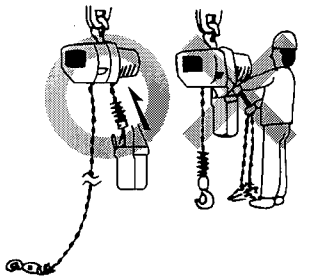


⚠ CAUTION

- The chain bucket should not be pushed up by a suspended load, etc.
- Use a chain bucket only which complies with the length of the load chain.
- Do not put the load chain at once into the chain bucket.

- Keep the chain bucket being hung from the body of the chain hoist in a natural state without undergoing any force.
- Avoid that the bucket will be pushed up by a suspended load, etc.(See Fig. 13). Otherwise the load chain may burst out of the bucket or it can hardly pass through the chain hoist, as is quite dangerous.
- It is also dangerous when the chain bucket is too small for the length of the load chain. The bucket must be also exchanged according to Table 3 when the load chain has been exchanged with a longer one.

Fig. 12



It may happen that chains are entangled or kinked.

Fig. 13

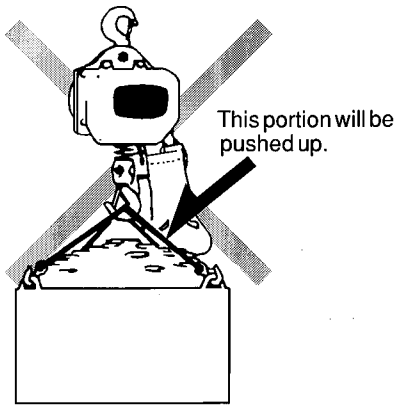


Table 3 List for the chain bucket to be selected

Bucket No.	For 60kg~250kg, standard lift (meter)	For 500kg, standard lift (meter)
A3	3 and less	—
A6	6 and less	3 and less
A15	15 and less	7.5 and less
A30	30 and less	15 and less

(Remark) The load chain will burst out of the bucket when the electric chain hoist is used in a site where much dust is floating or foreign matters may enter into the bucket. It is therefore very important to always clean the bucket and the chain and to apply oil to the chain.

4. Operation of the chain hoist equipped with a trolley

4–1 How to adjust the Alpha-type electric trolley, geared trolley and plain trolley respectively to the I-beam rail

- Adjustment of the geared trolley for the rated load of 60kg~500kg
- Adjustment of the plain trolley for the rated load of 60kg~500kg

1–1 How to adjust the trolley to the rail width of I-beam

(1) Each trolley is delivered after it has been adjusted to the minimum size, namely the rail width of I-beam specified in Table 4. For other rail widths than those shown in Table 4, adjust the trolley in the following procedure.
(2) First take out cotter pin (A) shown in fig. 14.
※Do not sever the removed pin, as it is to be refitted after adjustment.
(3) Remove adjusting collars (C) from the suspension shaft.
※Do not lose the collars, as they are to be reassembled afterwards.

(4) Unscrew the hex. nuts (B) of the key-plate.
(5) Find a rail width of I-beam as per Table 4 for which the trolley is to be adjusted, and fit corresponding number of adjusting collars (C) on both sides of the connector as Fig. 15 shows.

Table 4 The number of adjusting collars to be fitted on both sides of the connector

(pieces)

Rail width of I-beam	50mm	75mm		100mm		125mm	
Geared trolley	Unusable	0		one side	other side	one side	other side
				1	1	2	2
				2		4	
Plain trolley	0	One side	Other side	One side	Other side	One side	Other side
		1	1	2	2	3	3
		2		4		6	

⚠ WARNING

- When adjusting collars are erroneously inserted in one side only or nuts on both sides are not sufficiently tightened, the trolley may happen to fall down, causing a heavy accident. A trolley width up to 25㎜ can be adjusted with 2 pieces of adjusting collars which are to be equally inserted in both sides, namely 1 piece on each side.

(6) Make sure that a correct clearance is kept between the rail and the wheel.
(7) Fit the side-plate onto the shaft, and fasten the key-plate with the hex. nuts.
(8) Fit the remaining collars on the shaft and set the cotter pin.
(9) Hang the top hook of the Alpha-type chain hoist onto the connector of the trolley to operate the chain hoist.

Fig. 14

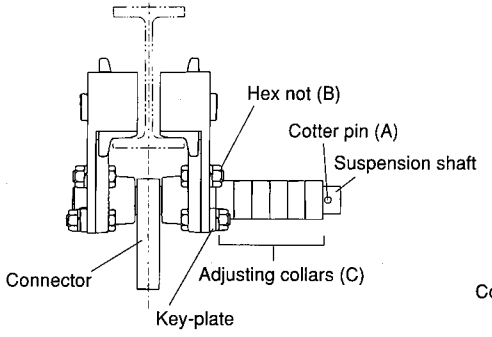
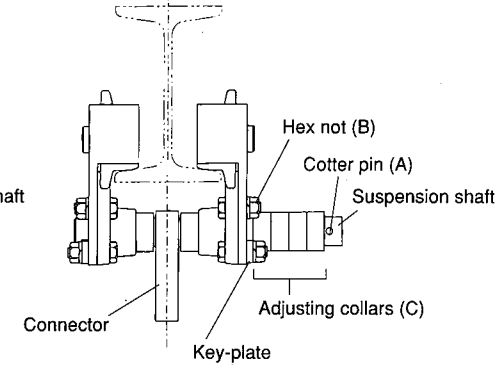
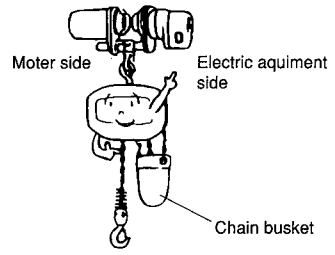


Fig. 15



- How to connect the 3-phase electric trolley to the 3-phase electric chain hoist
- How to connect the single-phase electric trolley to the single-phase electric chain hoist

- 3-phase and single-phase electric trolleys can be connected to Alpha-type 3-phase and single-phase electric chain hoists, by hooking. Direct connection cannot be done.
- Hook the electric chain hoist in the way that the chain bucket is under the electric equipment side (not motor side) of the trolley.



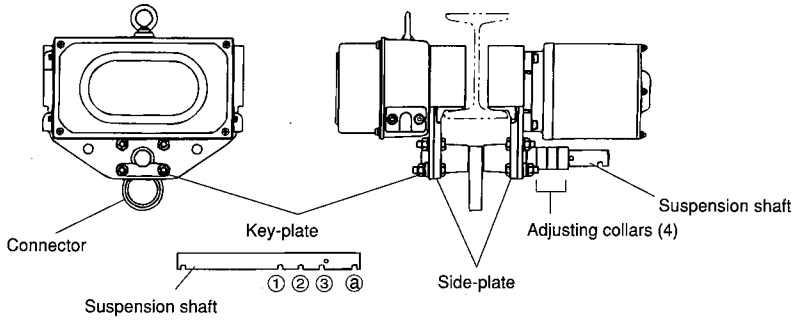
- How to adjust the 3-phase electric trolley to the I-beam rail width.
- How to adjust the single-phase electric trolley to the I-beam rail width.

1. How to adjust Alpha-type electeic trolley to the I-beam rail width.

- Adjustment of 3-phase electric trolley for the rated load of 150kg, 250kg, and 500kg
- Adjustment of single-phase electric trolley for the rated load of 60kg, 100kg, 160kg, 250kg, and 500kg

Refer to the suspension shaft in Fig. 17. And see its slot ⓐ. It is made for temporary use for setting the key-plate there. By so doing, the side-plate distance is widened as Table 5 shows, making the trolley fitted easily from the underside of the rail onto the rail.
(Do not forget to place the correct number of adjusting collars equally on both sides of the connector.)

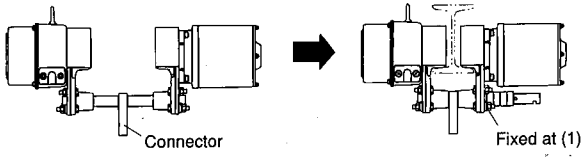
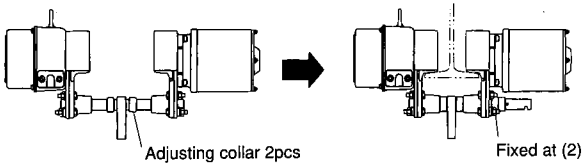
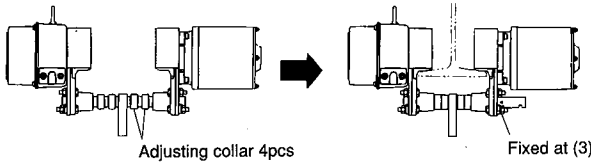
Fig. 17



⚠ WARNING

- Setting with the key – plate fitted to ⓐ should be regarded temporary only, otherwise the trolley may fall when the chain hoist is used in such a setting. Never operate the chain hoist or leave it in such a setting.

Table 5

With the key-plate temporarily fixed at ⓐ (operation impossible in this setting) →	With the key-plate finally fixed at (1)or (2) or (3) (operation possible in this setting)
	Rail width 75mm
	Rail width 100mm Each one adjusting collar on both sides of the connector
	Rail width 125mm Each 2 adjusting collars on both side of the connector

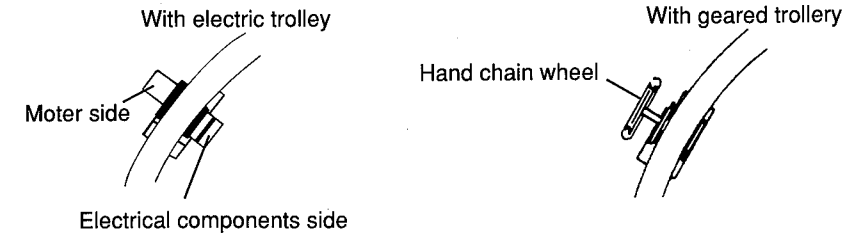
The sketches above show the structure for the electric trolley but can be applied to the geared trolley which has the same structure of the shaft as the electric trolley.

4–2 How to fit the trolley to the curved traversing rail

In the case that the electric trolley or the chain hoist with a geared trolley is fitted to the curved traversing rail, its motor or hand chain wheel side should be outside the rail curve. If they are inside the rail curve, the traversing rail or the wheel gear of the trolley may be possibly damaged.

In the case that the traversing rail has curves in both the right and left directions, the trolley should be fitted in such a manner that the above-mentioned instruction applies to a smaller curve (Refer to Fig. 18).

Fig. 18



4–3 Traversing rail and stoppers

⚠ WARNING

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

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

●Joints of the traversing rail

(1) Joints of the traversing rail should be located in the vicinity of supports for the rail.

(2) In the case that a backing plate is welded on the side or bottom of the rail (See Fig. 19), a plate with suitable thickness must be selected. If too thick a plate is attached, the trolley will hit it and be unable to pass through the point in the worst case.

(3) Staggered joints must be aligned within 0.5㎜ in both horizontal and vertical directions. The portions on which the trolley wheels travel should be finished by a grinder (See Fig. 20).

Fig. 19

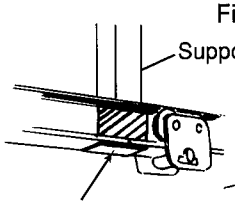


Fig. 20

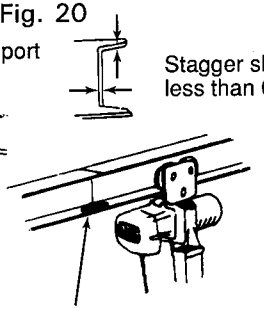
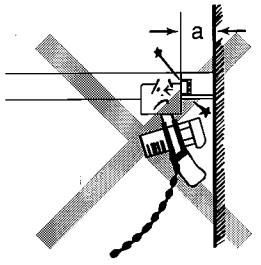


Fig. 21



●Anti-falling stoppers at the rail ends

(1) For avoiding that the electric trolley will hit a wall, etc. even when it hits the stoppers with a higher speed or the chain hoist swings, a distance(a) shown in Fig. 21 should be sufficiently wide.

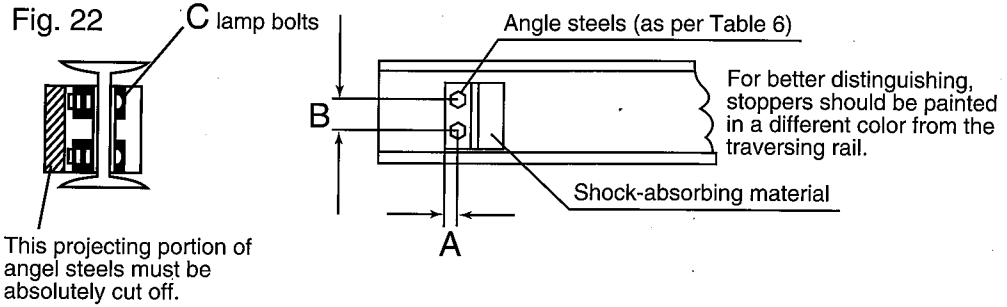
(2) The stoppers should be firmly secured so as to withstand the impact and be covered with a shock-absorbing material like rubber, etc.(See Table 6 and Fig. 22).

●Avoid such an installation as the trolley always stops by running against the stopper.

Table 6 Stoppers

Dimension of the traversing rail (mm)	150×75	200×100	250×125
Angle steels (mm)	L50×50×6		L65×65×6
A (mm)	20		30
B (mm)	50		
C (mm)	M12		

Fig. 22



5. Checking after the installation and trial operation

Make sure the following points after installation of the chain hoist.

5–1 Checking before operation

5–2 Checking by idle operation (without loads)

5–3 Checking by normal operation with a rated load

- As to the checking and the trial operation, refer to "Daily inspection" (page 16).
- When the following occurs in checking the lifting action without a load, negative phase is expected.

⚠ WARNING

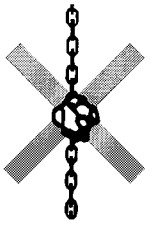
- When an operation with 3 phase power source is impossible, put the master switch off, check the power lines R and T and change each other.

※Never change the internal of the push-button switch and the wiring inside the chain hoist body. It is quite dangerous.

- Do not operate the chain hoist when the load chain is kinked, tangled or twisted.
- In the case of the multi-falls, make sure that the chain is not capsized (See page 17).
- For avoiding tangled chain (inside packaging) during transport, chains are bound with wires in some models. In this case, the wires must be completely removed before operation.(see page6)

※Be careful that wire chips, vinyl and a "label showing cautions", etc. will not be pulled in the chain hoist.

Fig. 23



- Do not operate the chain hoist in such a manner as the over-lifting protection device for "over-lifting" and "over-lowering" will be always brought in action.

※The over-lifting protection device should be regarded only as an emergency device and cannot be used forever.

After installation, measure dimensions of the opening of the bottom hook and its portion on which the wire rope is applied and record them.

※Such records will be required for comparing hook opening, wear, etc. in inspecting the bottom hook.

VI) CAUTIONS FOR HANDLING

⚠ WARNING

- The unit should not be operated by persons who have not fully understood this manual, instructions or plates on the unit.
- Persons who have not been duly trained should not be allowed to operate a crane and engage in slinging work.

1. Proper handling and cautions

1–1 Slinging tools

⚠ CAUTION

- Inspect all the tools to be used on the day before use.

※Inspect the tools conforming to laws and ordinances in your country.

- Use slinging tools most suitable for shape of loads for safety.

※For reference, safety factors for slinging chain, wire rope, and belt sling should be at least 5, 6, and 6, respectively.

1–2. Safe and reliable slinging

Be careful to choose slinging tools of proper capacity and length. Check for the

manner of slinging as well as the weight of a load. The tool should not be hung incorrectly as shown in Fig. 24.

Incorrect handling example 1

Slinging a load with a slinging tool set on an improper point of the hook will move the tool and add a dangerous shock load on it. Lower the load and remove the tool to hang the load again.

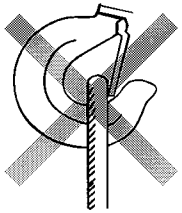
Incorrect handling example 2

Too wide a slinging angle (See Fig. 24) will increase a force on the slinging tool, and may cause a broken latch and a falling load. Change the slinging point, or use a long slinging tool if it is allowed. The slinging angle shown in the figure should be within 60° degrees.

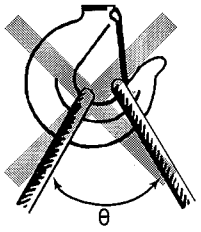
Incorrect handling example 3

The slinging tool is so thick that the latch cannot return in place. Change the tool, or use a chain sling with metal fixtures(Consult the dealer from whom you purchased the unit about proper tools for more efficient operation).

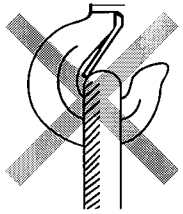
Fig. 24:



Incorrect handling example 1
(slinging tool hung on hook end)



Incorrect handling example 2
(too wide slinging angle)



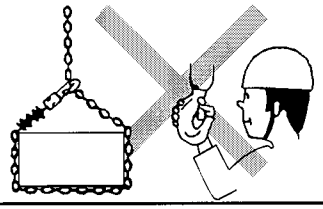
Incorrect handling example 3
(too thick slinging tool)

⚠ CAUTION

- Never wind a load chain directly around a load regardless of its weight. It is quite dangerous.
- Never use the unit with a broken latch of the hook.

※The latch should be maintained to always function properly. Check that it functions as intended in slinging work (Fig. 25).

Fig. 25

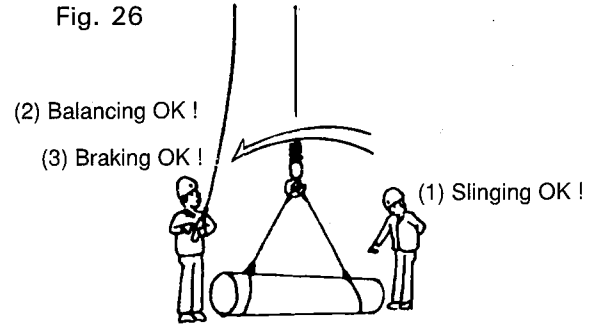


1–3 When starting lifting

After setting a slinging tool, be sure to check the following three points before lifting high.

- Check for the slinging condition with the load chain of the chain hoist or the slinging tool kept tense.
- Lift the load slightly to check a balanced lifting.
- Check that the brake of the electric chain hoist functions reliably by winching up and down for dozens of centimeters repeatedly.

Fig. 26



2. CAUTIONS DURING OPERATION

2–1 Lifting and lowering a load

⚠ WARNING

- Never lift a load beyond the rated load of the unit.
  ※It will cause damages to the unit and a load fall. It is very dangerous.
- Do not suspend and use the alpha-type electric chain hoist from bigger winching machines like a crane.
  ※Lifting a heavy load exceeding the capacity of this unit by such a crane will rupture the unit. The load and the unit will fall, resulting in a big accident.

⚠ CAUTION

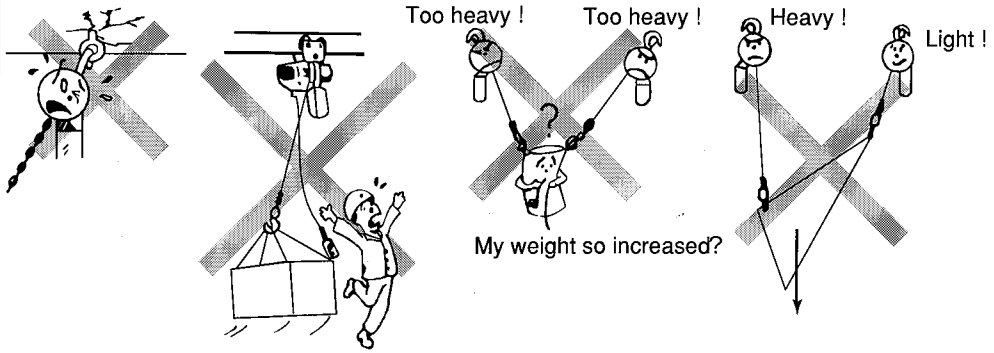
- Do not swing away a load during lifting and lowering.
- Do not swing away the electric chain hoist even without loads.
  ※The load may fall, or the chain may be damaged.
- Do not pull the chain hoist in oblique (vertical, horizontal) direction. Always move the electric chain hoist right above a load, and lift it.
  ※Oblique pulling is dangerous because a load will be pulled suddenly and strongly when it leaves the ground, and because an oblique force is imposed on the structure supporting the electric chain hoist(Fig. 27 and 28).
- Do not lift a load by double hoisting. It is very dangerous.
  ※Should you be compelled to do so , have an experienced operator work and confirm the following points (to prevent load inclination, etc.):
  ※Choose either a method of synchronizing two hoists or two-point horizontal suspension electric chain hoists.
  ※Use two hoists with the same lifting speed.

※Install a collision preventive device or the like lest the two hoists should collide.

- In lifting a load with two hoists, they will bear much larger load than expected when the load chains crosses at a large angle with the plumb line, or when the center of gravity of the load is close to either of the lifting points extremely (Fig. 29).

※In addition, abrupt running of a trolley and other risks are probable.

Fig. 27 Fig. 28 Fig. 29



- Stop lifting once when the chain becomes tense to check safety.

※The chain will less likely to be damaged because such a pause will alleviate a shock instantly imposed on the chain when a load flies.

- Never do earth lifting (e.g. hanging a load on a building structure etc.).

※An excessive force on the unit will damage its elements.

- Do not over-lift and over-lower.

※The over-lifting/lowering protection device is of a slipping structure. Frequent over-lifting and over-lowering will burden the electric chain hoist excessively. Release the push-button switch immediately. Continuing pressing the button for more than three seconds while the safety device is being slipped will cause wear and bite of brake linings.

- Do not operate this unit in such a way as to activate frequently the over-lifting/lowering protection device. It should be tested only in regular inspections.

※Even in regular inspections, be not bold enough to over-lift or over-lower at a stroke. Stop once and check for over-lift and over-lower at short distances. For adjustment of the over-lifting/lowering protection device, consult a dealer of our products.

- Do not make a load and a slinging tool hit the chain bucket.

※The chain may overflow, or the chain bucket may be damaged.

- Do not invert a lifted load. To invert it, use another electric chain hoist exclusively for inverting.

※Otherwise, an abnormally large impulse may generate.

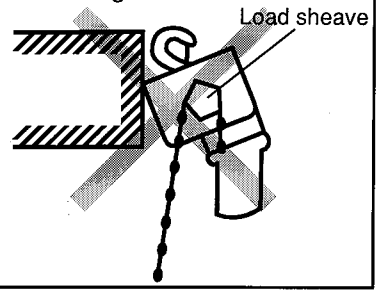
- Do not use the electric chain hoist when it touches some objects, or when it is fixed.

※Be sure that the hoist is used in a normal suspension state free from any force.

※The chain hoist is designed to be freely suspended from a hook or a trolley and to swing slightly as a polygonal sheave (an element which transfers driving force to the load chain) rotates.

※Do not obstruct this spontaneous swing; otherwise, unforeseen forces will be added on various elements, and are very dangerous(Fig. 30).

Fig. 30



2–2 Moving a load(traverse movement)

⚠ CAUTION

- Do not allow any person to pass and stay right under a suspended load and in a load traveling direction (Fig. 31).

※The load may hit a person, as is very dangerous.

- Do not leave the electric chain hoist and a trolley collide with a trolley stopper and building structures.

※The suspended load will fall.

※Pay special attention when the trolley approaches the stopper so that the trolley can stop of itself before it hits against the stopper(Fig. 32).

- Do not pull the push-button switch cord to roll the trolley(Fig. 33).

※The cord may rupture.

- Do not hang the hand chain of the geared trolley on a suspended load and the loading platform of a truck.

※If the hand chain of the geared trolley is pulled strongly while it is caught by the load and the loading platform, the trolley may deform or fall.

※Be careful in handling the hand chain of the geared trolley(Fig. 34).

Fig. 31

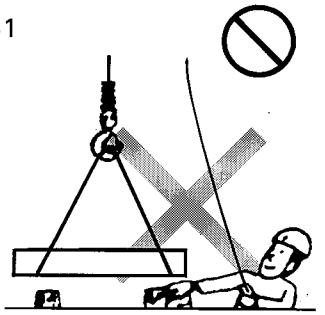


Fig. 32

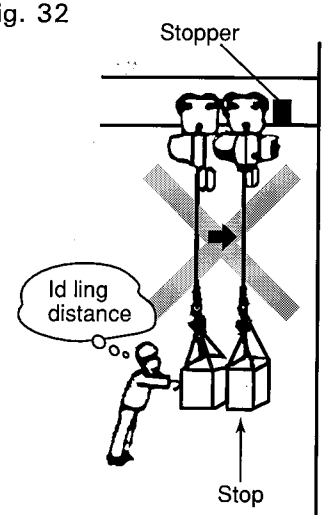


Fig. 33

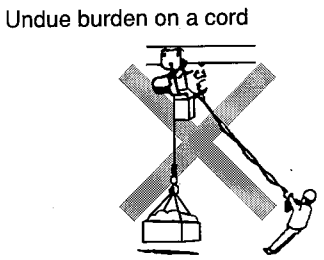
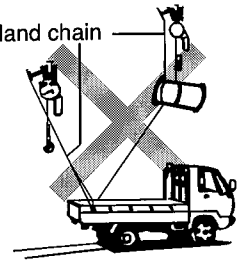


Fig. 34



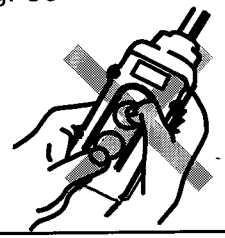
2–3 Operating the push-button switch

- Check before lifting that push-buttons function properly.
- Be sure to press push-buttons to the end.

⚠ CAUTION

- Stop the operation if the chain hoist conducts a movement in the reverse direction from the designation by the push-buttons.
  ※Check the wiring(See page 5) again, or consult the dealer of our products.
- Do not suddenly move a load to the reverse direction (plugging).
  ※Wait until the load stops and then move it to the reverse direction.
  ※Plugging will momentarily impose twice as much as load on the chain hoist, or damage a magnet motor and electrical components.

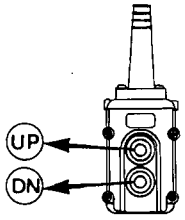
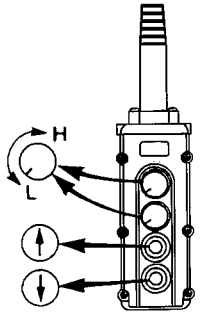
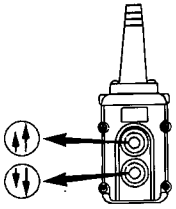
Fig. 35



2–4 Types of the push-button switch unit

There are three types of push-button switches available for the alpha-type chain hoist as in Table 7.

Table 7 Types and operation of push-button switches

Single speed type	Variable speed type	Dual speed type
Lifts and lowers at a constant speed.	Basically single speed type but equipped with speed adjustment dials. Turn the upper dial clockwise to accelerate lifting and turn the lower dial clockwise to accelerate lowering.	Lifts and lowers at the high/low speeds. Press push-buttons lightly for low speed, and press them deeply for high speed.
		

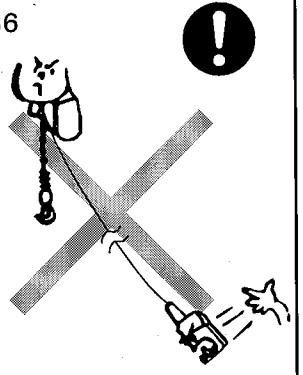
※Check for the said function of the push-button switch before hoisting a load.

⚠ CAUTION

- Avoid frequent inching operation.
  ※Inching operation and collision of a load during movement will generate larger momentous tension of the load chain than that in normal use.
  ※Inching operation will wear the brake and contacts of electrical components and overheat a motor. If frequent vertical inching operation is unavoidable for the positioning work, etc., use a hoist with the dual speed type or the variable speed type (α-SB type, α-SV type).

- After use, bring the push-button switch unit under the chain hoist before releasing it (Fig. 36) to prevent unforeseen damages or malfunction.
- Push-button switch operates at 24V for three-phase or at a specified voltage in your country for single phase.
  ※Always clean the push-button switch unit so that dust, sand, etc. are not deposited on it.

Fig. 36



※When the casing of the push-button switch unit is broken, or internal parts fall out, or foreign matters adhere to the unit, replace it with a new one to avoid electric shock or malfunction.

- A reinforced plastic casing for the push-button switch unit may deform when exposed to heat.

※Therefore, an aluminum-cast casing is preferable. For replacement, consult the dealer of our products (An aluminum-cast casing should be earthed properly.)

2-5 For safe operation

⚠ CAUTION

- Never leave a load suspended.
- Do not distract your attention from a load during operation.

※Keep any person apart from the load.

※The hoist operator should not leave the load as long as it is suspended (Fig. 37).

※While the load is lifted, a qualified operator should watch and control the safety of the load and the working site.

- Never climb and work on a suspended load.

※The suspended load is unstable, and a person or the load may fall.

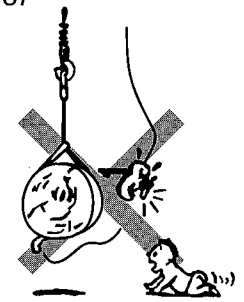
- Avoid moving a load over persons.

※It is dangerous, should it fall.

- When the chain hoist is not used, the bottom hook should be brought far above your head.

※Leaving the bottom hook low may hit workers on the head, etc.

Fig. 37



3.OTHER CAUTIONS

⚠ WARNING

- Allow only persons who have received a necessary training to operate the hoisting unit.

※It is extremely dangerous to charge untrained persons with the operation.

- Never tamper the hoisting unit for a particular use.

⚠ CAUTION

- Do not expose the hoist to rain or water during use.

※It will cause rust generation and deteriorate insulation.

※To extend the life of the hoist installed outdoors, secure a shelter for covering it completely.

※The shelter should be so designed as to check the entry of rain water into the chain bucket.

- Be sure to inspect the hoisting unit daily and regularly.
- Do not operate the unit when the load chain has either of the following problems:

1) twisted, tangled, or knotted chain
2) cracked or elongated chain
3) severely worn chain
4) chain which dose not move smoothly on sheaves
5) chain which is not lubricated

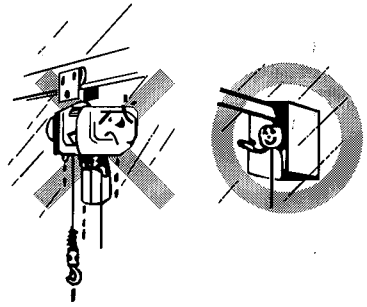
※Damages to the chain may cause falling of a suspended load.

- Do not conduct electric welding to a load while it is suspended by the electric chain hoist.

※Electric current will flow through the chain, damaging the chain or even the hoist body.

Fig. 38

Long life not expectable



- When the hoisting unit is used with cranes or handy lifts, or in ships, mines or petrochemical plants, observe relating laws and ordinances in your country.

- Lubricate the load chain before use.

Check for lubrication of the load chain regularly and apply oil as required (Fig. 39).

When the hoist is used in locations where it is often smeared and soiled with sand, dirt, iron powder and other foreign matters, use a liquid oil; where oil dripping should be avoided, use a grease. Select thus the most suitable lubricant according to a working site (Even a waste oil can be recycled if iron powder, dust, and other foreign matters are removed).

Fig. 39 Frequently lubricate the load chain for its full length.

For use in coastal areas where rust is easily generated, various load chains with rust
preventive treatment are available.

Consult the dealer from whom you purchased the hoisting unit. Even such specially treated load chains should be lubricated properly to secure a long life.

Proper lubrication will be sure to extend dozens of times the life of the chain.

VII) MAINTENANCE AND INSPECTION

1.GENERAL

To use the electric chain hoist safely, it is necessary to keep in a good condition not only the main body , but also other elements to which even higher force is imposed.

Voluntary inspection should be regularly made conforming to laws and ordinances in your country. This section will list up items of inspection, though some may not be obligatory in your country.

Inspection should also be made for support structures. A record of regular maintenance and inspection should include items required for securing the safety and dates of maintenance and inspection.

VIII) DAILY INSPECTION

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

- In cases of any abnormality, stop operating the hoisting unit and take proper counter-measure in accordance with the instruction of "Causes of Troubles & Trouble-shooting" before using it again.
- Consult a dealer of our products when it is not possible to take proper measures.

※Do not make continuous running under abnormal condition as it is very dangerous and might lead to an accident.

1. Checking before operation

＊ Check the following items before starting operation.

1–1 Carry out the following inspection by visual check.

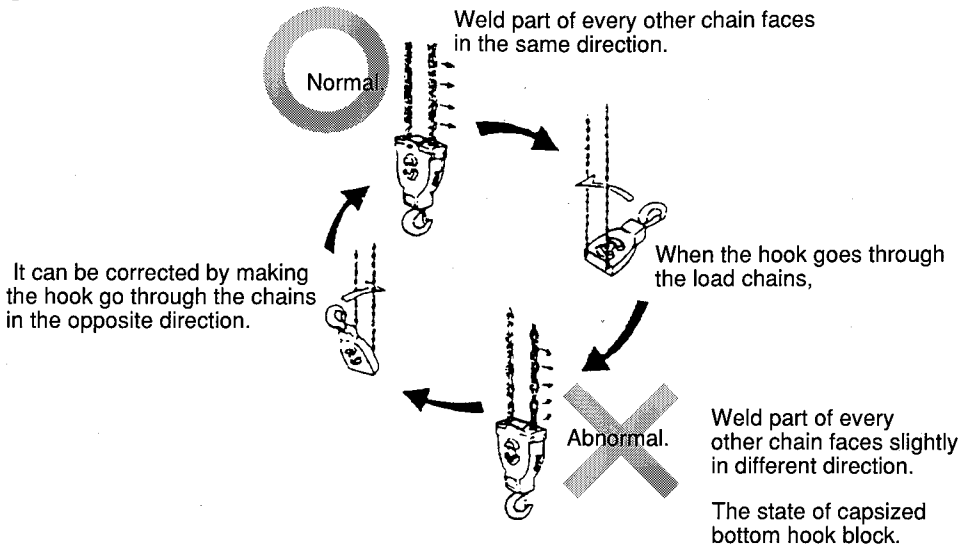
Check point	Check items	⚠ WARNING Checking criteria (Parts out of the following criteria should be replaced or disposed as waste.)
(1) Chain	1) Pitch elongation	No abnormal elongation should be found.
	2) Wear	Wire diameter should not extremely be worn out.
	3) Deformation	Free from deformation
	4) Flaws and other harmful defects	Free from cracks or other harmful defects
	5) Corrosion	Free from remarkable rust.
(2) Hook	1) Opening of hook	No remarkable deformation should be found.
	2) Deformation	Free from bend and twist.
	3) Flaws and other harmful defects	Free from cracks and other harmful defects.
	4) Movement	Bottom hook should rotate smoothly.
(3) Body	1) Bolts, nuts, screws, split pins,etc.	Bolts, nuts, screws, split pins, etc. seen from the outside should be in proper position and they should not be loose fit.
	2) Oiling & grease up	Check the necessity of adding oil, applying oil or oiling in specified places.
(4) Trolley	1) Bolts, nuts, screws, split pins etc.	Bolts, nuts, screws, split pins, etc. seen from the outside should be in proper position and they should not be loose fit.
	2) Oiling & grease up	Check the necessity of adding oil, applying oil or oiling in specified places.
(5) Push-button switch, cord	1) Appearance	There should be no deformation, breakage, loose of screw, etc.
	2) Switch operation	Marking should be shown clearly. Switches should operate correctly. Interlock should operate correctly.
(6) Power source connection	1) Negative phase	Connection should not be in reverse phase.
(7) Sling fixture	1) Wear, deformation, etc.	No abnormality is to be seen.

1–2 Make sure that there is no twist nor tangle on the load chain.

In the chain hoist model with multiple load chains (500kg) , check and see if there is any abnormal condition called capsized bottom hook block where the bottom hook goes through in-between load chains. In such case, there exists a twist in the load chain which will reduce the load sustaining capacity of the chain and may also cause damage on the body and the chain even without load if it is lifted up nearly to the upper limit position.

As it is a very dangerous condition, be sure to make correction before operation.

Fig. 40



2. Checking by idle operation

(1) Does the bottom hook rotate smoothly? Does the safety latch function in perfect manner?
With regard to the hook provided with idle sheave, does it rotate smoothly?

(2) Check if there is any dent or deformation in the buffer on the loading side.

(3) Check the whole length of the load chain if there is oil shortage or twist of the chain.

(4) Check if there is any dent or deformation in the buffer on the non loading side.

(5) Isn't there dust or water left in the bucket? Is the chain bucket properly installed?

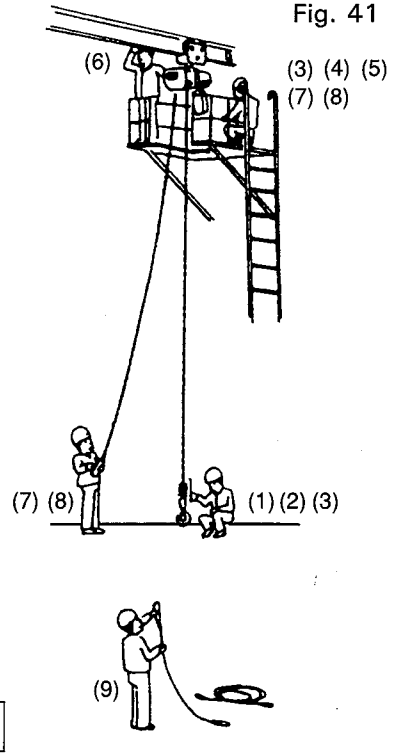
(6) Isn't there any foreign substances on the rail where wheels of trolley and crane saddles, etc. should run?

(7) When the push button switch of the electric chain hoist is manipulated, does it move in the direction as indicated on the push button switch?
Does the over-lifting protection device work properly for upper and lower limits? (Try actual operation for several times without loading.)

(8) On releasing the push button switch, the hoisting unit should make immediate stop.
Also check if there is any abnormal sound or odor. In doing this, check and see that moving of the chain is done properly with no abnormality.

(9) All the sling fixtures to be used on the day should be checked thoroughly for the existence of defects.

Fig. 41



3. Checking by rated load operation

In the state of hoisting the rated load, stop the hoist halfway in lowering the load and check the distance of movement after turning off the switch until stopping of the load.

- Normal distance to the stopping is within the length of one link.

IX) PERIODIC INSPECTION BY USER

Make it a rule to conduct a periodical voluntary inspection to ensure safe and full-functioned operation of the electric chain hoist.

- When parts replacement or adjustment work is done at the time of voluntary inspection, operate the chain hoist after confirming the instructions of "the Checking and Trial Operation After Installation" (Page 11) .
  Keep the file of the record of voluntary inspection for five years.
- Carry out the inspection after completely switching OFF the power source of the electric chain hoist and reconfirming the safety of the surrounding area.
  ※Be sure to start the inspection after the sign of "Under Inspection" is placed.
- It is recommended that a checking stand should be provided specially for the inspection.

1. Monthly inspection

- Carry out the voluntary inspection more than once in a month.
- If there is any abnormality discovered by the inspection, take appropriate measures against it. In the monthly voluntary inspection, place more importance on the following items.
  (1) Do all the important functions of the electric chain hoist operate in normal way?
  (2) Is there degradation in any of the essential parts beyond the acceptable limit?
  (3) Is the overall power supply condition kept well? It is also important to check the looseness of respective clamping bolts and nuts for support structure and the electric chain hoist.

For checking of the electric chain hoist and its power feeding condition, carry out the inspection for all the items listed in the monthly inspection table. With regard to the support structure, check it by taking consideration of required check points for each type of the crane.

As for the inspection methods and measures, refer to "the Method of Maintenance and Inspection".

2. Annual inspection

If any abnormal points are discovered through the inspection, appropriate measures should be taken.

In the annual voluntary inspection, place more importance on the following items.

Test operation of the crane with the rated load should be done to check every performance of the electric chain hoist as well as the abnormality in respective parts of the support structure.

Make the instruction manual for the inspection and carry out the inspection and maintenance in accordance with it. As for the inspection methods and measures, refer to "the Method of Maintenance and Inspection".

Carry out the monthly inspection once in every month or in shorter period, and the annual inspection once in every year or in shorter period.

Place an order for overhaul and inspection to our dealers.

3. Durability of elements and parts

⚠ WARNING

- Do not use parts and the electric chain hoist over the limit of use. In carrying out the monthly and annual voluntary inspection and the like, if any wearing parts are found in excess of the standard limit of use, they should be replaced for sure.
  ※It is very dangerous to use parts over the standard limit of use.

- Inspection methods for the limit of use are shown in "the Method of Maintenance and Inspection" and in the Check Standard and the Use Standard (Page 25~27) .

X) PROCEDURES FOR MAINTENANCE AND INSPECTION

⚠ WARNING

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

1. Before making inspection

Be sure to follow the proper inspection method to ensure safe and full-functioned operation of the electric chain hoist.

- Carry out the inspection after completely switching OFF the power source of the electric chain hoist and reconfirming the safety of the surrounding area.
- In case of making overhaul, be sure to put the electric chain hoist down on the ground.
- For replacement of spare parts, never use parts other than those specified by the manufacturer of the chain hoist.

2. Checking the hook and its lifetime

Top hook and upper suspension fixture

- Does the latch function in normal way without any abnormality?
- Is there any remarkable flaw or deformation in the hook and others as can be identified by visual check?
- Is there looseness or missing of bolts, nuts and split pins?

Hook block

- Does the latch function in normal way without any abnormality?
- Does the hook rotate smoothly?
- Is there any remarkable flaw or deformation in hooks and others as can be identified by visual check?

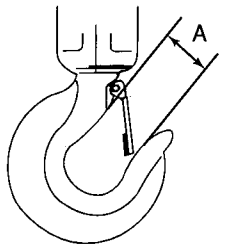
- Is there looseness or missing of bolts, nuts and the like?
- In case of hoists with more than two load chains, does the idle sheave rotate smoothly?
- Isn't there a lot of foreign particles stuck on it?

Measurement of hook opening

The opening of hook becomes wider when the load much exceeding the rated load is hung or a heavy load is applied on the tip of it.

Hook with such widened opening does not keep the required strength nor shock absorbing power as specified, therefore, it should be replaced with new one.

Fig. 42



When the dimension shown by "A" in Fig. 42 has reached more than the limitation as specified in Table 8, the hook should be replaced with new one. It is very dangerous to use such hook with widened opening again after heating and remedy. Be sure to scrap it and replace it with new one.

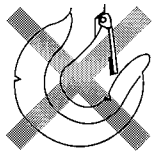
Table 8 Guide for hook replacement

Rated load	Dimension[A] (mm)	
(kg)	Specification	Limitation of dimension
60-250	24	26
500	31.5	34

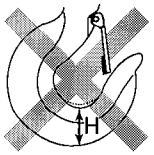
Flaws, wear and bend of hook

Fig. 43

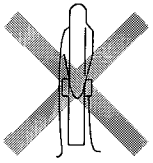
Hooks in the condition as shown in(1) – (3) also require replacement.



(1)Sharp flaw is visible



(2)Wear:in accordance with Table 6.



(3)Turning (bend) is visually recognized.

Table 9

Wear Limitation of Contact Part in sling fixtures and support structure (Unit mm)

Rated load (t)	[H] dimension of new hook	dimension of new hook
60kg~250kg	16	14.4
500kg	19	17.5

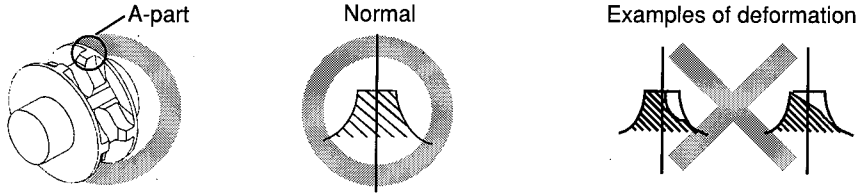
• Rotation and deformation of idle sheave (not provided in the type with single load chain)

When there is a lot of foreign particles stuck on the idle sheave, clean it up by overhaul. In doing it, check the following points.

1. Abnormality in bearing and rotation shaft of the idle sheave.
2. Accumulation of foreign particles and abnormal wear in the pocket part of the idle sheave.
3. Deformation in the projected part of the sheave(See Fig. 44) .

When it is reassembled, be sure to apply grease-up in the rotating part. When the idle sheave is kept clean, check the deformation in the projected part of the sheave by visual check.

Fig. 44 **Configuration of A-part**



Bottom hook

- Thrust bearing

Fig. 45

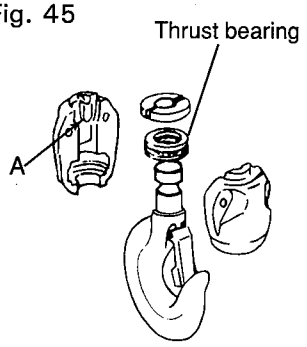
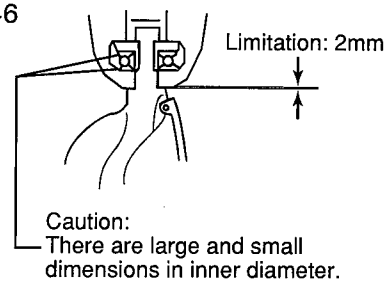


Fig. 46



When the rotating movement of the hook is not smooth, or when the clearance shown in Fig. 46 is over 2mm, it requires overhaul of the bottom hook for replacement of defective parts.

In some cases, thrust bearing can be separately replaced. Be careful in fitting it in not to take the upside down. The one with larger inner diameter is the lower side.

In Fig. 45, if there is visible deformation in the part pointed by the arrow [A], it should be replaced with new one.

3. Checking the chains and their lifetime

- Is there sufficient oiling on the whole length?
- Are there any remarkable flaws?
- Is there any knot or twist?

Measurement of pitch elongation by chain gauge

Check the load chain not partly but for the whole length in careful manner.
Insert the chain gauge in every 50 cm (see Fig. 48) and check the elongation of the pitch.

If the pitch elongation is within the limitation for use, inserted part of the chain gauge will touch the load chain and it cannot go through links as shown in Fig. 47.

If the pitch gets larger than the limitation for use, the chain gauge will go through links as shown in Fig. 48.

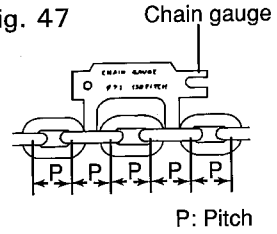
When the pitch elongation is quite near to the limitation, make the interval of measurement shorter around such spot and check if there is any single point where the chain gauge goes through.

When there is even a single spot where the chain gauge goes through it, replace it with a new load chain.

Measurement of wire diameter reduction by chain gauge

When the wire diameter of the load chain becomes very small by the effect of rust or chemicals, etc. , it is rather dangerous so it should be replaced with new one.

Fig. 47



P: Pitch

Fig. 48

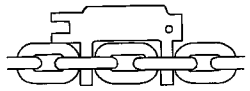
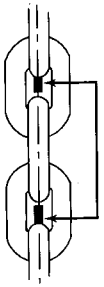
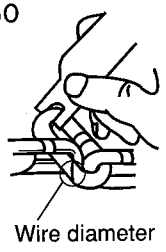


Fig. 49



Correct position of the chain guage (slant line part).
Insert it properly to meet the center line (broken line).

Fig. 50



As it is shown in Fig. 50, if the opening of the chain gauge gets engaged with the chain when it is inserted, the wire diameter is less than the limitation for use. In such case, change the load chain with new one.

Other visual inspection of load chain

When some flaws or bends are found in the load chain, or when foreign particles are deposited on it, replace the load chain with new one.

Even by a most disadvantageous measurement, if the wire diameter (see Table 10) has worn out more than 5%, scrap it as rejected.

If there are any other remarkable deformation of shape or track of heating effect that are clearly seen by visual check, it should also be replaced with new one.

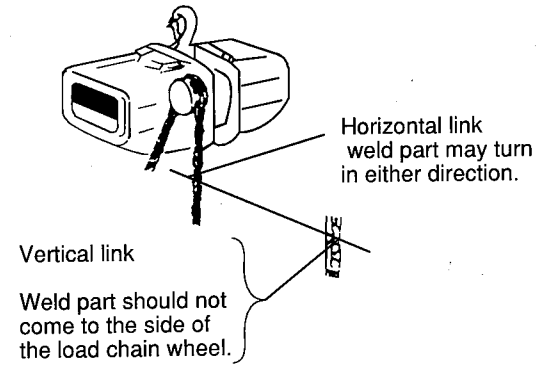
Table 10 Normal wire diameter and pitch (unit mm)

Rated load	Nominal diameter	Normal wire diameter	Normal pitch
60kg~500kg	4	4.3	12

Precautions for replacement of the load chain

- In principle, the chain should not be changed by the user. Call a dealer of our products for it.
- Take special care about the following precautions for replacement of the load chain.
- Weld part of the vertical link should always be in the opposite side (outside) of the load chain wheel. (Fig. 51)
- In the hoist with more than two load chains, the link to be fixed by the chain stop pin for prevention of twist of the load chain should be a vertical link.
- The load chain should be replaced as a whole unit. Do not change only a part of it to be connected with the old one.

Fig. 51



4. Checking the buffer and its lifetime(both loading side and non loading side)

- There should be no dent or crack in the urethane buffer.
- The flat washer for urethane buffer should not come off.

5. Checking the chain bucket and its lifetime

When the following conditions are seen, do not continue to use it. Change it with new one.

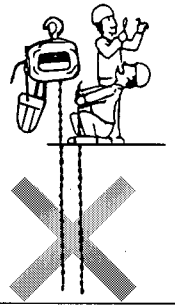
- In the case of having damage on the chain bucket.
  ※It might cause a danger of dropping the load chain.
- When the lifting lug, etc. of the chain bucket is not fitted properly.
- In the case of having dust or water left in the chain bucket.

6. Checking the chain stop bolt and its lifetime

Check the following conditions. In the case of unacceptable condition,do not continue to use it. Replace it with new one. (This is exclusively for the hoist with more than two load chains.)

- In case of two load chains, the end of the load chain on the loading side is fixed by chain stop pin at lower part of the body.
  Pull out the chain stop pin and check the deformation. At the time of pulling out the pin, if it is not done in a secured condition to fully sustain the heavy weight of the hook block and the load chain, it might cause dropping of the chain or the hook block. It requires special care.
- In case of having two load chains (see Fig. 52) ,it will be easier to do this work after lifting up the hook block nearly to the upper limit.
- When the chain stop pin is bent, or when there is visible, obvious deformation in a spot in contact with the load chain, it should be replaced with new one(See Fig. 53) .
- In fitting the chain stop pin to the load chain, strict caution should be taken not to have twist of the load chain. Also, in the reuse of pin after passing the inspection, set it properly so that the same portion will get in contact with the load chain as it formerly was.

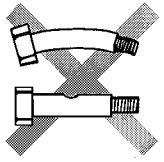
Fig. 52



It is not only heavybut also makesitdifficult to checkthe twist of the load chain.

Fig. 53

Unacceptable for use.



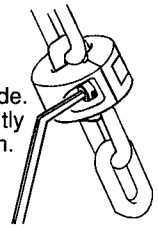
7. Checking the chain stopper

Check the following conditions. In the case of any unacceptable condition, do not continue to use it. Replace it with new one.

Monthly check and see if the bolt with hexagon socket head used for the chain stopper is not loose.

Chain stopper on the non loading side should be placed in the third link counting from the end of the non loading side of the load chain (Fig. 54) .

Fig. 54



The third link from the end, on non loading side. Fasten it sufficiently by using a wrench.

8. Checking the push-button switch

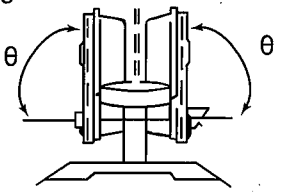
Check the following conditions. In the case of unacceptable condition, do not continue to use it. Replace it with new one.

- In the case of having cracks or fracture in the switch casing.
- In case of failure in smooth movement of the push buttons (When the pressed button is released, it will not come up smoothly) .
- After removing the cover, looseness of screws or abnormality in the lead wire is discovered.
- In case of having much of foreign particles stuck on it.

9. Inspecting the trolley and its lifetime

Check the following conditions. In the case of unacceptable condition, do not continue to use it. Replace it with new one.

Fig. 55



Bend of side-plates

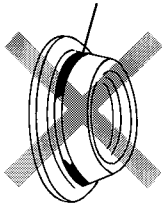
- Two side-plates should be free from deformation.
- The angle shown in Fig. 55 should be right angle.
- Supply oil if there is abnormal sound caused by lack of oil in making traverse movement.
- There should be no missing or looseness of the bolts, nuts, etc.
- The wheel with gear cut on it should not have dust in the geared portion.

Wear of trolley wheels

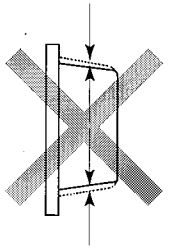
Trolley wheel as described below should be replaced with new one.

Fig. 56

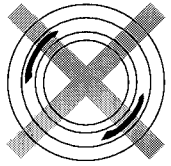
There is such a visible, obvious gap in the part which is in contact with the edge of I-beam.



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



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



10. Checking the motor brush and its lifetime

When carrying out inspection of the motor brake, be sure to observe the following instructions for the sake of safety.

(1) Put the chain hoist in the non loading state (the state of hanging no load on the bottom hook) .

(2) Lower the chain hoist down to about 10 cm before the point to actuate the safety against over-lowering in the lower limit.

(3) Switch OFF the power source.

⚠ CAUTION

- When the brush attached to the motor gets extremely worn out, or when motor makes fluctuating revolution or it generates abnormal sound, replace the brush with new one.

  ※14 mm brush is used for the motor. At the time of periodic inspection, if the brush is worn down to less than 9 mm, it requires replacement. When the wear of the brush gets worse, it may cause damage to the motor and may ultimately stop its function.

11. Checking the nameplate and tags

- Do not remove the nameplate, labels for cautions and tags.
- Is it easy to clearly read the indication on the nameplates and tags? Do not leave stain or dirt on them but always keep them clean.
- The following three items are important when placing orders for parts. Keep the note of them and be sure to give them together with parts designation and numbers (or assembly numbers) shown in the exploded view, when placing order for the parts.

(1) Type and model

(2) Rated load

(3) Fabrication number (Serial number)

12. Checking the gear Oil

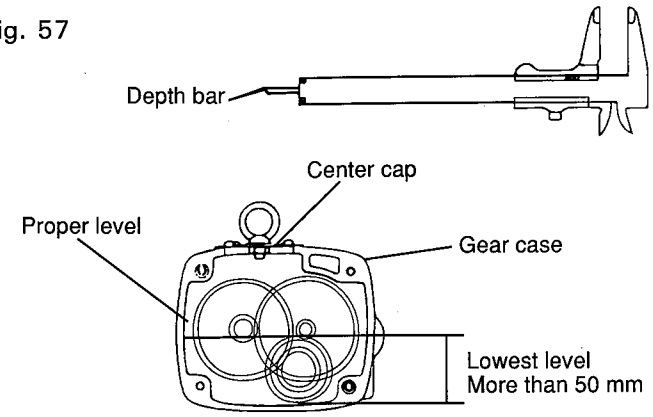
(1) Check of oil level (See Fig. 57)

Keep the top surface of the gear case level, and take out four cross-recessed screws used for fixing the center cap for oil change on the top of the gear case. Then, remove the center cap. Put the gauge deep into the hole for oil change down to the bottom and check the oil level.

Keep the oil level slightly higher than the 50 mm from the tip of the gauge.

※For the oil gauge, use a thin rod or the depth bar of vernier calipers, etc. as a substitute for the gauge (Fig. 57) .

Fig. 57



At the time of oil change, take out the body of the chain hoist from the lifting lug and drain the oil by turning it upside down with the center cap for oil change open on the top of the gear case. Next, hang the body of the electric chain hoist on the lifting lug and put appropriate amount of new oil into the gear case while keeping it level.

During the period from starting the use of the chain hoist until getting adjusted to the condition, the oil is liable to be contaminated. After the first six months from starting the use of the electric chain hoist, change the whole volume of oil with new one. After that, unless oil gets deteriorated, additional supply of oil for the shortage will be sufficient.

(2) Designated Oil

Table 11 Types of Oil

Genuine Oil	
SHELL	TONNA OIL T-68

Applicable Oil	
MOBIL	VACTRA OIL №2
CALTEX	RPM VISTAC OIL-68
BP	MACCURAT 68

(3) List of oiling places

Table 12 Oiling places

Oiling places	Gear case	Load chain	Electric trolley gearing
Type of lubricants	Lubricants for sliding face	Oil	Grease
Lubrication method	Oil-bath	Brush application	Brush application
Oil designation	Shell TONNA OIL T-68	Shell TONNA OIL T-68	DOW CORNING MOLYKOTE BR2-PLUS GREASE
Standard volume1	liter	10cc/m	25cc
Period for oil change	1 year	—	—
Amount of oil for replacement	1 liter	—	—
Period for replenishing	6 months	Before use	6 months
Amount of replenishing	Proper amount	Proper amount	Proper amount

13. Wiring inside the body and fixing of the parts

Check if the wiring inside the body is not damaged or terminals and connectors are not loose. Furthermore, check if clamping bolts for each part are not loose.

※Firmly tighten loose parts and bolts.

14. Inspection of general functions and durability

When the inspection of each element as mentioned above is completed, conduct trial operation specified in the section V-5 (Page 11) "Checking after the installation and trial operation".

- Check that the chain hoist moves according to directions from the push-button switch.
- Make sure a distance the hook travels until it stops, having released the push-button.
- Check that the over-lifting/lowering protection device functions properly for upper and lower limits.
- Check that any abnormal sound is not caused in vertical and traversing movement or traveling of the chain hoist.

XI) TROUBLE-SHOOTING

Causes for general troubles on the electric chain hoist are listed up in the following table. Consult a dealer of our products in case that other troubles than those indicated in the table.

Table 13 List for trouble-shooting

Abnormality or troubles	Possible causes	Counter-measures	Remark
1. Motor does not run.	● Master switch on the switch cabinet is turned off. Fuses are burnt out. Breaker is actuated.	Check the switch cabinet and turn on the master switch.	
	● Improper connection of power supply line	Properly make connection of R-S-T lines of power source.	Models for 3 phase
	● Power source is connected to the reverse phase.	Make change of R-T lines of power source	Models for 3 phase, equipped with negative-phase protector
	● Damaged transformer. Improper connection of push-buttons, electro-magnetic relays and limit switches. Broken inside wiring, cords and cables.	Check for continuity and make repair of damaged unit. Replace damaged parts with new ones.	
	● Brake cannot be released.	Secure connection of brake. Replace a damaged brake plate.	
	● Wrong power source	Use correct power source as per nameplate.	
	● Big voltage drop	Secure supply voltage as specified and use a suitable power cable.	Smaller power cable may cause a sudden voltage drop on starting.
	● Extremely overloaded	Apply a load only up to the rated load.	
2. The unit exhibits other movements than those directed by the push-buttons.	● Inside wiring like push-buttons and electro-magnetic relays etc. are not correct.	Make proper connection as per connecting diagram.	Models for 3 phase
	● Malfunction of directional switches	Check for connection.	Models for single phase
	● Incorrect connection of motor starting coils	Make change of starting coil terminals	Models for single phase

3. Lifting impossible	● Extremely overloaded	Apply a load only up to the rated load.	
	● Improper connection of push-buttons, electro-magnetic relays and limit switches. Loose inside wiring.	Check for continuity and replace damaged parts with new ones. Secure connection.	
4. Lowering impossible	● Improper connection of push-buttons, electro-magnetic relays and limit switches. Loose inside wiring.	Check for continuity and replace damaged parts with new one. Secure connection.	
5. Brake does not function.	● Big voltage drop of power source	Secure voltage as specified.	
	● Brake gap exceeds the limit.	Replace worn parts with new one.	
	● Terminals are disconnected.	Replace the brake coil with new one.	
	● Solenoid coil burnt out.		
	● Damaged rectifier	Replace the printed board with new one.	
	● Incorrect connection of printed boards.	Make correct connection according to marking of the boards.	
6. Brake solenoid does not function.	● Damaged rectifier	Replace the printed board with new one.	Alpha-S, Alpha-SU, Alpha-SB
	● Incorrect connection of printed boards.	Make correct connection according to marking of the boards.	
7. Reversing operation impossible	● Damaged governor switch	Replace it with new one.	
8. Over-coasting on stopping the lifting/lowering work	● Brake gap reaches nearly limit.	Replace worn parts with new one.	
	● Over-loaded	Apply a load only up to the rated load.	
9. Slow working speed	● Over-loaded	Apply a load only up to the rated load.	
	● Voltage drop of power source	Secure voltage as specified.	
10. Over-heated motor	● Over-loaded	Apply a load only up to the rated load.	
	● Voltage drop of power source	Apply a load only up to the rated load.	
	● Extremely high atmospheric temperature	Keep the surrounding temperature under 40 by preventing radiant heat, etc.	
	● Brake gap reaches nearly limit. (solenoid starting impossible) .	Replace worn parts with new one.	
11. Motor does not stop on reaching the upper and lower limits of the chain hoist.	● Limit switches do not function.	Check for connection. Correct the connection if wrong. Check limit switches for their reaction with contacts and replace them with new one if disordered.	
12. Abnormal sound	● Extremely worn gears	Replacement of parts	
	● Extremely worn chains, sprockets and guides.	Replacement of parts	
	● Insufficent lubricants	Properly lubricate depending on unit types.	
13. Rapid wear of chains, compared with those fitted to other chain hoists	● Insufficient or no lubrication.	Properly lubricate as specified.	
	● Worn sprockets or sprocket guides.	Replace them with new one.	
	● Over-loaded	Apply a load only up to the rated load.	
14. Chains do not well engage with sprockets.	● Unsuitable chains	Replace them with correct chains.	
	● Extremely worn chains, sprockets and guides.	Replace them with new one.	When replacing chains with new one, check also sprocket and guide for their worn state.
15. When contacting the electric chain hoist, a shock is given.	● Wrong grounding	Firmly connect the earth line to the earth.	
		Firmly connect the travel rail to the earth. Keep the rail face contacting the wheels free from paint, etc.	Models equipped with electric trolley
	● Electrical components like push-buttons are not properly insulated.	Make repair of disordered points and replace damaged parts with new one.	

XII) CRITERIA FOR USING AND CHECKING ELECTRIC CHAIN HOISTS (BASED ON JIS B 8815)

The following criteria are prepared with reference to "the Safety Rules for Chain Hoists(JIS B8815) , Cranes and the Like" Strictly observe them in using the electric chain hoist.

Table 14

⚠ WARNING(1. Criteria for use)

The following shall be observed in using the electric chain hoist.

(1) Make sure that the type, class and range of lift of the electric chain hoist,
etc. are fit for conditions of its use.

(2) The electric chain hoist should be used only at the rated voltage and frequency. Consult us in case that a power generator is used directly as power source.
(3) The electric chain hoist should be used under its perfectly grounded condition to avoid electric shock.
(4) The electric chain hoist should be daily checked before use, and be inspected periodically at given intervals.
(5) The electric chain hoist should not be modified without our approval. If any modification is necessary, it should be done by us.
(6) The electric chain hoist should be hung on beams and the like having sufficient strength. In the case of trolley type hoists, they should be hung on traverse rails (for example, H-shaped or I-shaped steels) having sufficient and accuracy.
(7) Before using the electric chain hoist, check whether or not the load chain is passed in a loop around the sheave wheel with the bottom hook, or twisted or kinked, and use after correcting these irregular forms.
(8) Use load chains lubricated.
(9) When the electric chain hoist is used in special conditions such as lower or higher temperatures, or corrosive atmosphere, etc. , consult us before use.
(10) Use the electric chain hoist, applying lubricants at appropriate intervals to its gears, bearings and points which are liable to wear.
(11) When the electric chain hoist is used outdoors, provide a cover to prevent water and rain.

(12) Load chains other than those specified by us should not be mounted to the electric chain hoist.

(13) The electric chain hoist should not be used with loads higher than the rated load, and not be used under such conditions as giving impulsive force to it.
(14) In inverse turn from lifting to lowering and vice versa, etc. , stop once movement and then carry out next operation. Plugging operation (sudden reverse turn) should be avoided.
(15) Avoid such an operation as to often use the over-lifting/lowering protection device.
(16) Avoid to pull a load in oblique direction.
(17) Avoid an operation to heavily swing a load.
(18) Don't pull the push-button switch cord to traverse a load suspended (horizontal pulling) .
(19) Don't fall the electric chain hoist from higher positions.
(20) Don't make electric welding of a load in suspension by the electric chain hoist.
(21) Avoid frequent inching operation.
(22) Avoid such an operation as to apply a sudden force to load chains.
(23) Don't wind load chains directly around a load.
(24) Don't hang a load on the tip of the hook.
(25) Avoid an operation of so-called earth lifting.
(26) Don't leave the electric chain hoist for many hours with a load suspended.
(27) Pay attention that any persons or their hands or legs are not right underneath a load suspended.

⚠ CAUTION (1. Criteria for checking)

The following shall be observed in using the electric chain hoist.

(1) In case of 3 phase induction motor, it should not be operated in single phase.
(2) Don't press the emergency stop button in a normal condition (option) .

(3) When the electric chain hoist is installed for the first time, make sure that the power lines are not connected in the reverse phase.

(4) To avoid a voltage drop of the electric chain hoist, it is recommendable to use power cables with bigger size.
(5) When the electric chain hoist will not be used for a long time, turn off the power source and keep it after rust preventive treatment in places where it is not subject to rain water and sea breeze.
(6) When the electric chain hoist is used with cranes, as simplified lifting devices, or in ships, mines or petrochemical plants, especial care should be taken to relevant laws and regulations.

2. Criteria for check

(1) Use the electric chain hoist by checking it daily 1) and periodically 2) .

(2) Refer to Table 15 3) which gives check items, check methods and check criteria to be used in the daily check. However, items other than those specified should be also checked, when the electric chain hoist is frequently used, or in special cases.

(3) Repair or replacement of parts should be carried out by those persons who are familiar with the function of the electric chain hoist, or ask a dealer of our products.

(4) When the electric chain hoist is repaired, check it on periodic check items given in Table 15 after its repair, and make sure that it works in a normal state.

(5) Don't use the electric chain hoist which has reached the limits of total allowable running hours.

Notes 1) Refer to checking before use.

2) Periodic check is usually made at intervals of one month, three months, six months or one year depending on the frequency of use, and consult us about the periodic check which can be also made in our factory.

3) Check the items with the mark "O" in Table 15.

Remark:

When a hoist is considered to be capable of being further use, while it has already reached the limits of allowable running hours, it may be used, having deliberated on its use with us.

Table 15 Criteria for check

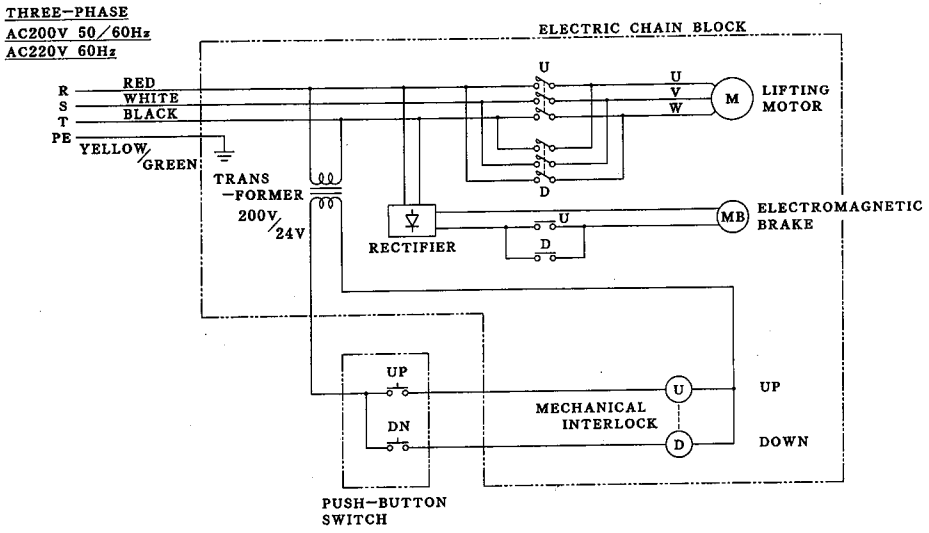
Type of check		Check items	Check method	⚠ WARNING ! Check criteria (devices and parts out of the following criteria should be replaced or disposed as waste.)
Dail check	Periodic check			
○	○	Marking (nameplates, labels)	Visual	Presence of marking. Replace them if unreadable.
Load chain				
	○	Type	Visual	Confirm the type of load chain
○	○	Pitch elongation	Check visually in daily check and by measurement in periodic check.	Don't use load chains with pitch elongation of 3% minimum (Prepare a list of standard dimensions before use.)
○	○	Wear	Check visually in daily check and by measurement in periodic check.	Don't use load chains which are worn in diameter by 5% or more.
○	○	Deformation	Visual	Free from deformation.
○	○	Flaws and other harmful defects	Visual	Free from cracks and other harmful defects
○	○	Corrosion	Visual	Free from serious rust.
Hooks				
○	○	Opening of hook	Check visually in daily check and by measurement in periodic check.	No deformation should be found when its dimensions are compared with standard dimensions (A list of major dimensions of hooks should be prepared before their use.)
○	○	Deformation	Visual	Free from bend and distortion.
○	○	Latch	Visual	Free from severe wear or deformation and operates properly.
○	○	Deformation of shank	Check visually in daily check and by measurement in periodic check.	There should be no big clearance between hook and shank.
○	○	Swiveling	Visual	It can swivel smoothly and horizontally through 360 degrees.
○	○	Wear and corrosion	Visual	Free from severe wear and corrosion.
○	○	Flaws and other harmful defects	Visual(4)	Free from cracks and other harmful defects
Body				
○	○	Frame	Visual	Free from deformation and severe corrosion.
○	○	Gear case	Visual	Free from severe deformation and corrosion.
○	○	Nuts, revets, split pins, snap rings, etc. at all the components	Visual	In daily check, the presence of nuts, revets, split pins, etc. which can be seen from outside should be checked, and nuts, rivets, snap rings, etc. should not get loose. In periodic check, abnormality of the said parts should be checked internally and externally
	○	Gears	After dismantling check them visually or by measurement.	Free from abnormal noise, wear and breakage.
	○	Load sheave and idle sheave	After dismantling check them visually or by measurement.	Free from severe wear, deformation, flaws and breakage.
	○	Chain guide	Visually or by measurement	Free from severe wear, deformation and breakage.
	○	Limit lever	Visual	Free from severe wear, deformation and breakage, and operates smoothly.
	○	Bearings	Visually or by measurement	Free from harmful defects such as wear, flaws, breakage, etc.
○	○	Lubrication and greasing up	Visually and by measurement	Lubrication to the specified points and replenishment. (Change of gear-case oil if contaminated.)
Brakes and the like				
	○	Brake linings, brake discs and brake shoes	Visually and by measurement	Free from severe wear or local wear. Free from flaws and breakage.

	○	Brake screws (in mechanical braking device)	Visually or by measurement	Free from severe wear, deformation, flaws and breakage.
	○	Ratchet and wheel (in mechanical braking device)	Visually or by measurement	Free from severe wear, deformation, flaws and breakage.
	○	Brake springs (in electro-magnetic braking device)	Visually or by measurement	Free from severe wear, deformation, flaws and breakage.
	○	Oil seals and water-proof seals	Visual	Free from severe deformation and breakage.
	○	Chain buckets	Visual	It should be securely mounted on the hoist body and free from severe wear, deformation and breakage.
Motors and the Like				
	○	Motors (3 phase or single phase) (Single phase magnet-motors)	Visually and by measurement	It should not be over-heated and be sufficiently insulated. (Brush and commutator should not be severely worn.
	○	Electrical instrument (electro-magnetic contactors, relays, transformers, wiring, etc.)	Visually and by manipulation	They should not be over-heated, be sufficiently insulated and operate smoothly. Wiring is secured, and all contacts of electrical instrument are in good order.
Traversing equipment (incl. Traveling equipment)				
	○	Traversing equipment	Visually and by measurement	There should be no abnormality in the combination of traversing equipment with the hoist body and in gears, brakes, wheels, hand chains, etc.
○	○	Nuts, revets, split pins, snap rings, etc. in the equipment	Visual	In daily check, the presence of nuts, revets, split pins, etc. which can be seen from outside should be checked, and nuts, rivets, snap rings, etc. should not get loose. In periodic check, abnormality of the said parts should be checked internally and externally.
○	○	Lubrication and greasing up	Visually and by measurement	Lubrication to the specified points and replenishment.
Push-button switches and Cords				
○	○	Appearance (marking, labels)	Visual	There should be no deformation, breakage, loose screws and the like. Marking should be clear and be exchanged with new one if unreadable.
○	○	Switch manipulation	By manipulation	Switches and an interlock system function properly.
Power source connection				
	○	Grounding	By measurement	Perfectly grounded
○	○	Reverse phase	By operation	Connection should not be in reverse phase.
Function and Performance				
○	○	Lifting and lowering function	Lift and lower without load (at rated voltage and rated frequency) .	Load chains should be smoothly wound or unwound in lifting and lowering operation. For hoists with mechanical braking system, sound of the ratchet should be heard in lifting operation. There should be no abnormality in the braking system in lowering operation.
○	○	Traversing function	Carry out traversing without load.	Hoists should be smoothly traversed and should stop immediately after the operation is discontinued.
	○	Starting	Visual	Hoists should be smoothly lifted, lowered or traversed at 90 % of the rated voltage.
	○	Speed	Visually and by measurement	The lifting and traversing speeds at the rated load should be within indicated values.
○	○	Braking	Check visually in daily check and by measurement in periodic check.	The brake should securely function and a fall distance, having cut off the motor, should be less than 1% of the lifting amount in one minute.
○	○	Protection against over-lifting (friction clutch)	Operate without load to carry out over-lifting or over-lowering.	The protection device against over-lifting should properly function. (Make sure that the friction clutch is actuated, while the motor runs at idle.)
Load				
	○	Loading	Carry out lifting, lowering or traversing at the rated load.	When hoists are operated at the rated load, rated voltage and rated frequency, there should be no abnormality in every part.
	○	Load limiter	Lifting under over-load conditions	The limiter should come to action at the preset value.
	○	Others	Visually or by measurement	There should not be any other harmful defects in use of the unit.

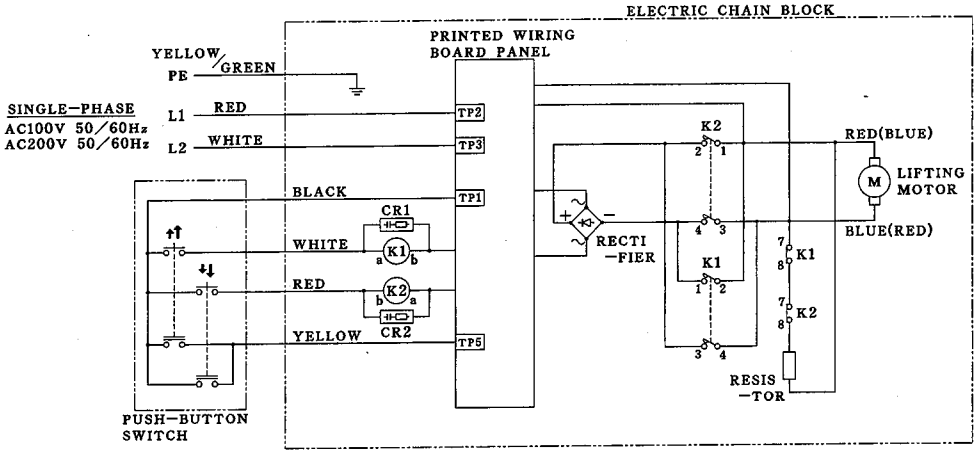
Note (4) : In periodic check, the magnetic particle test prescribed in JIS G 0565 or the liquid penetrant test in JIS Z 2343 should be carried out when necessary.

XIII) WIRING DIAGRAM

WIRING DIAGRAM FOR ELECTRIC CHAIN HOIST (3 phase)
(αC-015～αC-050 type)

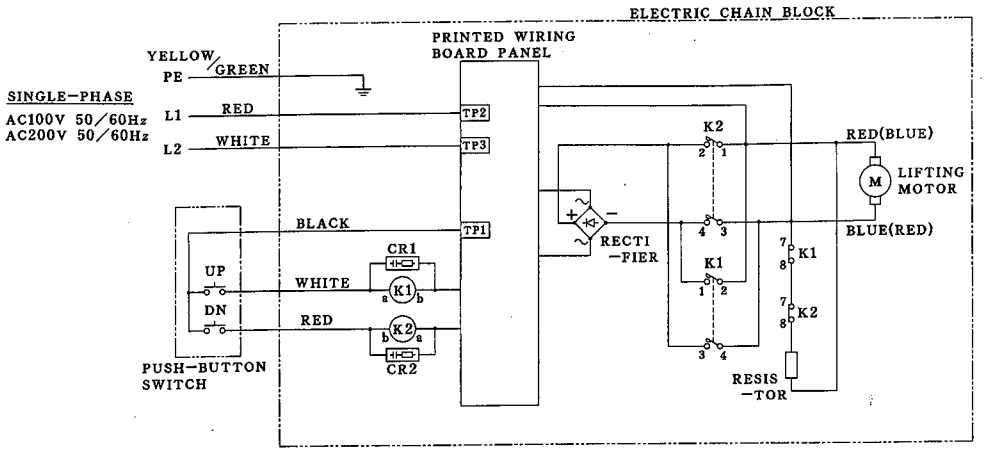


WIRING DIAGRAM FOR ELECTRIC CHAIN HOIST (Single phase)
Dual speed type
(αSB-006～αSB-050 type・αHB-006～αHB-050 type)



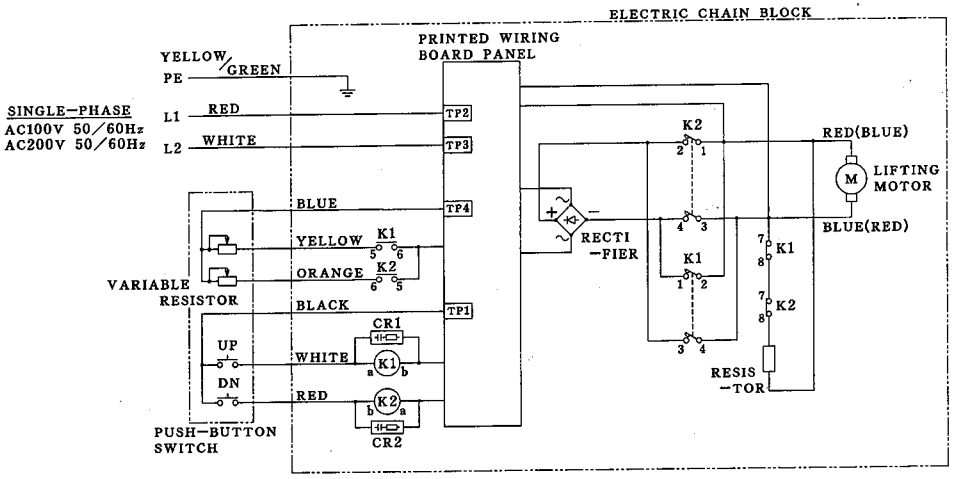
NOTE
LEAD`S COLOR IN ( ) MARKED ITEM IS FOR αSB/αHB-025,05.

WIRING DIAGRAM FOR ELECTRIC CHAIN HOIST (Single phase)
Singl speed type
(αS-006～αS-050 type・αH-006～αH-050 type)



NOTE
LEAD`S COLOR IN ( ) MARKED ITEM IS FOR αS/αH-025,05.

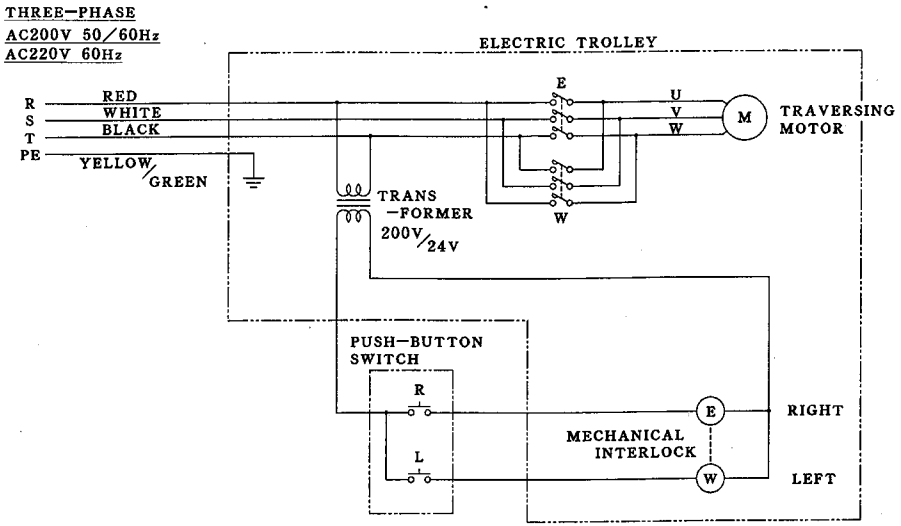
WIRING DIAGRAM FOR ELECTRIC CHAIN HOIST (Single phase)
Variable speed type
(αSV-006～αSV-050 type・αHV-006～αHV-050 type)



NOTE
LEAD`S COLOR IN ( ) MARKED ITEM IS FOR αSV/αHV-025,05.

WIRING DIAGRAM FOR ELECTRIC TROLLEY (3 phase)

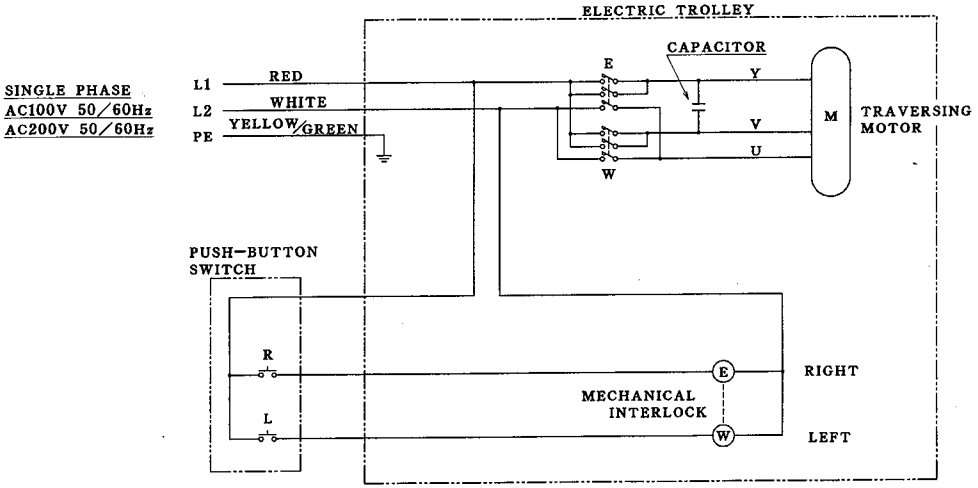
(αCM type)For 150kg～500kg



WIRING DIAGRAM FOR ELECTRIC TROLLEY (Single phase)

(MTS type)

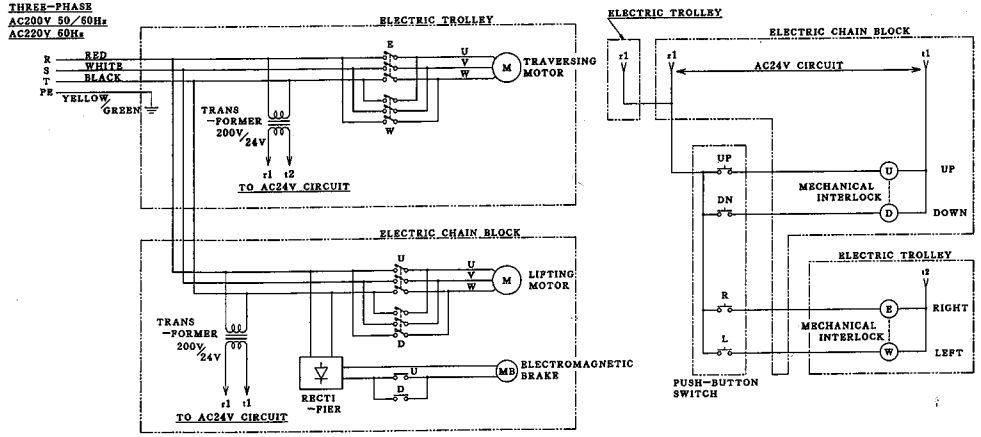
For 60kg～500kg



WIRING DIAGRAM FOR ELECTRIC CHAIN HOIST WITH ELECTRIC TROLLEY

(3 phase)

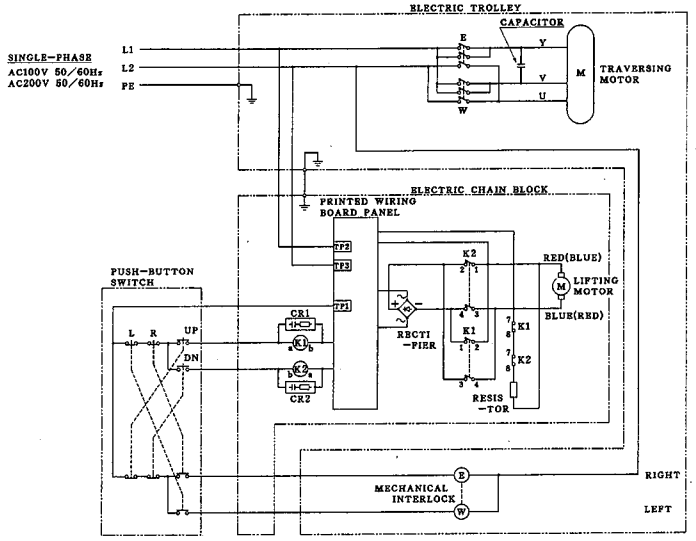
(αCM-015～αCM-050 type)



WIRING DIAGRAM FOR ELECTRIC CHAIN HOIST WITH ELECTRIC TROLLEY(single phase)

Single speed type

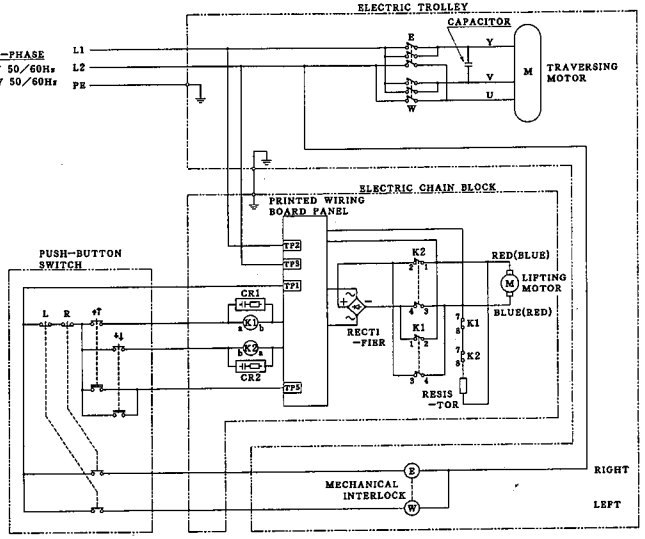
(αSM-006～αSM-050 type)(αHM-006～αHM-050 type)



WIRING DIAGRAM FOR ELECTRIC CHAIN HOIST WITH ELECTRIC TROLLEY(single phase)

Dual speed type

(αSBM-006～αSBM-050 type)(αHBM-006～αHBM-050 type)

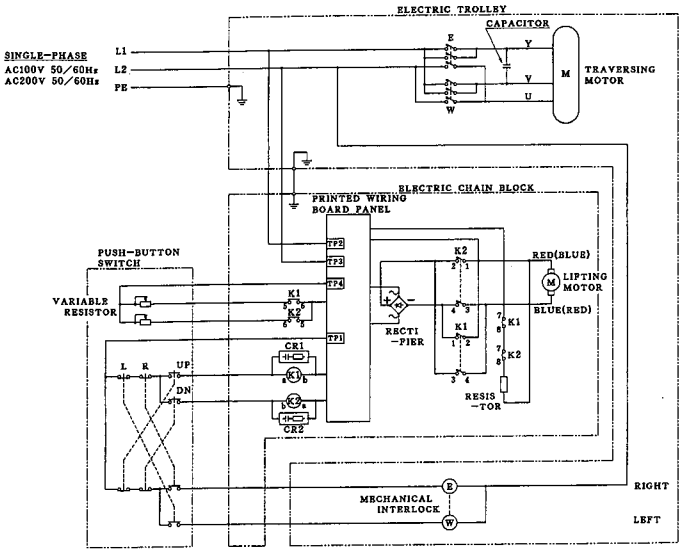


NOTE
LEAD'S COLOR IN ( ) MARKED ITEM IS FOR αSBM/αHBM-025,05.

WIRING DIAGRAM FOR ELECTRIC CHAIN HOIST WITH ELECTRIC TROLLEY(single phase)

Variable speed type

(αSVM-006～αSVM-050 type)(αHVM-006～αHVM-050 type)

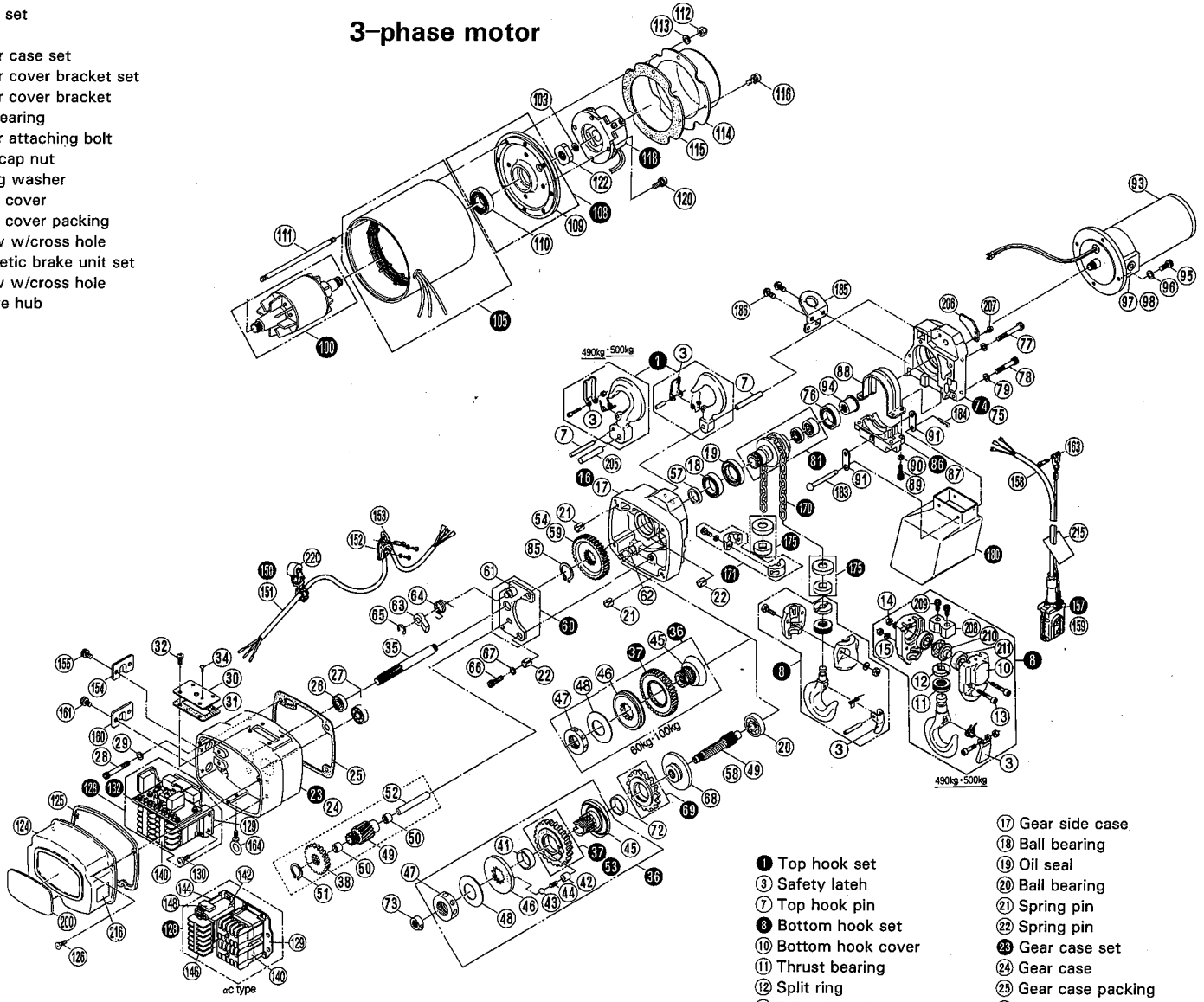


NOTE
LEAD'S COLOR IN ( ) MARKED ITEM IS FOR αSVM/αHVM-025,05.

DETAIL DRAWING

3–phase,
Single-phase (Single-speed type, Variable-speed type, Dual-speed type)

3–phase motor



- 100 Rotor set
- 103
- 108 Motor case set
- 108 Motor cover bracket set
- 109 Motor cover bracket
- 110 Ball bearing
- 111 Motor attaching bolt
- 112 Hex. cap nut
- 113 Spring washer
- 114 Brake cover
- 115 Brake cover packing
- 116 Screw w/cross hole
- 118 Magnetic brake unit set
- 120 Screw w/cross hole
- 122 Square hub

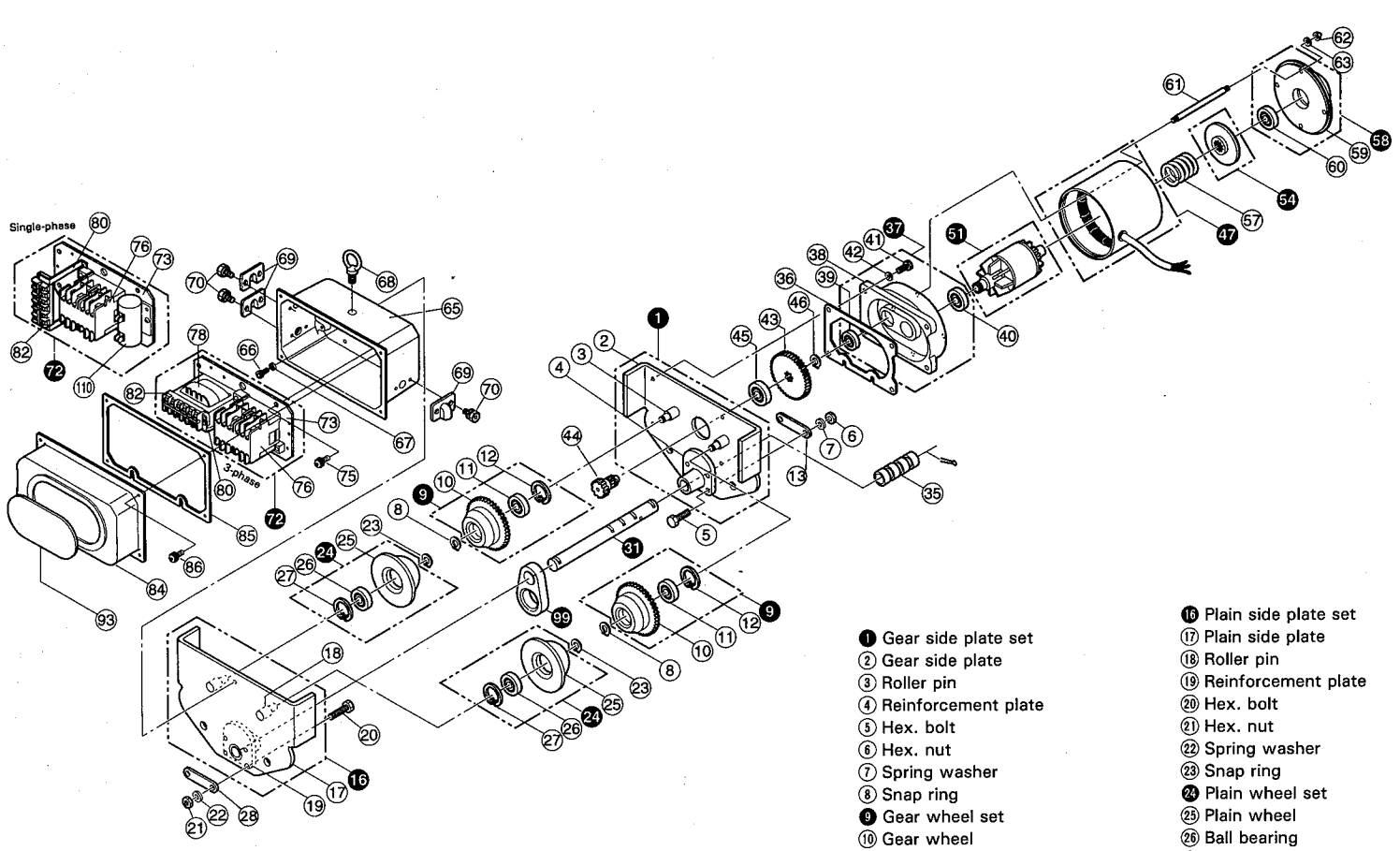
- 1 Top hook set
- 3 Safety lateh
- 7 Top hook pin
- 8 Bottom hook set
- 10 Bottom hook cover
- 11 Thrust bearing
- 12 Split ring
- 13 Bolt w/hex hole
- 14 Hex nut
- 15 Spring washer
- 16 Gear side case set
- 17 Gear side case
- 18 Ball bearing
- 19 Oil seal
- 20 Ball bearing
- 21 Spring pin
- 22 Spring pin
- 23 Gear case set
- 24 Gear case
- 25 Gear case packing
- 26 Ball bearing
- 27 Ball bearing
- 28 Bolt w/hex. hole
- 29 Spring washer

- 30 Oil plug
- 31 Oil plug packing
- 32 Screw w/cross hole
- 34 Oil plug
- 35 1st gear
- 36 Friction clutch set
- 37 2nd gear set
- 38 2nd gear (for 250 kg single-& 3-phase)
- 41 Bush (A)
- 42 Steel ball receiving pipe
- 43 Steel ball
- 44 Cam spring
- 45 Disc hub (B)
- 46 Disc hub (C)
- 47 Adjusting nut
- 48 Coned disc spring
- 49 3rd gear
- 49 3rd gear (for 250 kg single-& 3-phase)
- 50 Needling bearing (for 250 kg single-& 3-Phase)
- 51 Snap ring (for 250 kg single-& 3-Phase)
- 52 Middle shaft (for 250 kg single-& 3-Phase)
- 53 4th gear set (for 250 kg single-& 3-Phase)
- 54 4th gear
- 57 Collar for 4th gear
- 57 Collar for 6th gear (for 250 kg single-& 3phase)
- 58 5th gear (for 250 kg single-& 3phase)
- 59 6th gear (for 250 kg single-& 3phase)
- 60 Middle plate set
- 61 Inter mediate plate
- 62 Pawl pin
- 63 Pawl
- 64 Pawl spring
- 65 E-ring
- 66 Bolt w/hex. hole
- 67 Spring washer
- 68 Disc hub (A)
- 69 Ratchet wheel set
- 72 Bush (B)
- 73 Check washer
- 74 Motor side case set
- 75 Motor side case
- 76 Ball bearing
- 77 Bolt w/hex. hole
- 78 Bolt w/hex. hole
- 79 Spring washer
- 80 Fitting for terminal board
- 81 Load sheave set
- 85 Snap ring
- 86 Operating element set
- 87 Operating element
- 88 Chain guide
- 89 Bolt w/hex. hole
- 90 Spring washer

- 91 Chain bucket fitting
- 92 Single-phase motor set
- 93 Single-phase motor
- 94 Motor shaft joint
- 95 Bolt w/hex. hole
- 96 Spring washer
- 97 Carbon brush
- 98 Brush cap
- 124 Switch cover
- 125 Switch cover packing
- 126 Screw w/cross hole
- 127 Spring washer
- 128 Electric equipment set
- 129 Electric equipment setting plate
- 130 Screw w/cross hole
- 131 Spring washer
- 132 Printed circuit set
- 140 Magnetic contactor
- 142 Transformer
- 144 Fitting for terminal board
- 146 Terminal board
- 148 Rectifier
- 150 Power cord set
- 151 Power cord
- 152 Power cord holder
- 153 Shackle
- 154 Cord supporter
- 155 Screw w/cross hole
- 159 Spring washer
- 156 Pushbutton cord
- 159 Pushbutton switch
- 160 Cord supporter
- 161 Screw w/cross hole
- 163 Shackle
- 164 Eye bolt
- 170 Load chain set
- 171 Chain stopper set
- 175 Buffer set
- 180 Chain bucket set
- 183 Chain bucket hang pin
- 184 Cottor pin
- 185 Chain bucket hang fitting (A)
- 186 Hex. bolt w/cross hole
- 200 Nameplate
- 205 Top hook pin (for500kg)
- 206 Top hook pin stopper
- 207 Screw w/cross hole
- 208 Buffer (for500kg)
- 209 Bolt w/hex. hole
- 210 Idle sheave
- 211 Ball bearing
- 216 Warning tag
- 220 Cable hanger

DETAIL DRAWING (Motor trolley)

3–phase (150kg•250kg•500kg, type)
single-phase (60•100•160•250•500kg type)



- ❶ Gear side plate set
- ② Gear side plate
- ③ Roller pin
- ④ Reinforcement plate
- ⑤ Hex. bolt
- ⑥ Hex. nut
- ⑦ Spring washer
- ⑧ Snap ring
- ❾ Gear wheel set
- ⑩ Gear wheel
- ⑪ Ball bearing
- ⑫ Snap ring
- ⑬ Key plate

- ❻ Plain side plate set
- ⑰ Plain side plate
- ⑱ Roller pin
- ⑲ Reinforcement plate
- ⑳ Hex. bolt
- ㉑ Hex. nut
- ㉒ Spring washer
- ㉓ Snap ring
- ㉔ Plain wheel set
- ㉕ Plain wheel
- ㉖ Ball bearing
- ㉗ Snap ring
- ㉘ Key plate
- ㉛ Suspension shaft set

- ㉟ Adjust washer or color
- ㊱ Gear case packing
- ㊲ Gear case set
- ㊳ Gear case
- ㊴ Ball bearing
- ㊵ Ball bearing
- ㊶ Bolt w/hex. hole
- ㊷ Spring washer
- ㊸ 2nd gear
- ㊹ 3rd gear
- ㊺ Ball bearing
- ㊻ Snap ring
- ㊼ Motor case set
- ㊶ Rotor set
- ㊹ Brake disc set
- ㊼ Brake spring
- ㊽ Brake cover set
- ㊾ Brake cover
- ㊿ Ball bearing
- (61) Stay bolt
- (62) Hax. cap nut
- (63) Spring washer
- (65) Switch case
- (66) Bolt w/hex. hole
- (67) Spring washer
- (68) Eye bolt
- (69) Cord holder
- (70) Bolt w/hex. hole
- (72) Electric equipment panel set
- (73) Electric equipment panel
- (75) Screw w/cross hole
- (76) Magnetic contactor
- (78) Transformer
- (80) Fitting for terminal board
- (82) Terminal board
- (84) Switch cover
- (85) Switch cover packing
- (86) Screw w/cross hole
- (93) Name plate
- (99) Connector
- (110) Condenser

ELEPHANT CHAIN BLOCK CO.,LTD.

Subject to change without notice.

'02. 12. 500