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

ELECTRIC CHAIN HOIST
MODELS FA, FB, SA, FAH, FBH
FA III, FB III, SA III, FAH III, FBH III
OPERATION MANUAL

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

ELEPHANT CHAIN BLOCK CO., LTD.
Osaka, JAPAN
1) SAFE OPERATING PRACTICES

Improper operation of the electric 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 electric chain hoist.

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:

▲-mark 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 are formally qualified having completed training for operation of the crane, handling of the lifting slings, etc. according to the regulations in your country. The employer should keep 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 electric 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.
- Attach a stopper to the ends of the traverse and travel rails.
- Make sure that a location on which the electric chain hoist is installed has a sufficient strength.
- Suspend the electric chain hoist in a manner that it can freely swing about.
- Attach a chain bucket to the electric chain hoist before installing it.

3. Operation and Handling

⚠️ WARNING

- Do not lift a load which exceed the rated load.
  ※The rated load is indicated on the hook block or on the nameplate of the electric chain hoist body.
- Do not get on a suspended load and do not use the electric chain hoist to lift, support or transport persons.
- Do not stay under a suspended load.
- Do not operate the electric 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 electric chain hoist.
- Do not operate the electric chain hoist in a manner that a load and/or the hook block swings away.
- Do not stop the electric chain hoist by always making use of the upper and lower limit switches.
- Do not use the electric chain hoist for the oblique pulling.
  ※First move the electric chain hoist to right over a load and then lift it.
- Do not use the electric chain hoist for the earth lifting (for example, lifting objects fixed under the ground).
- Do not carry out turnover of a suspended load.
4. Maintenance, Inspection and Modification

⚠️ WARNING

- Never make modifications to the electric 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 electric chain hoist unloaded (e.g., without loads).
- When any disorder is found in the maintenance or inspection, immediately make repair before re-operating the electric 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

I) SAFE OPERATING PRACTICES ................................................................. 1
  1. General .............................................................................. 1
  2. Installation and Setting-up .................................................. 1
  3. Operation and Handling ...................................................... 1
  4. Maintenance, Inspection and Modification ....................... 2

II) APPLICABLE LAWS AND REGULATIONS ........................................... 3

III) DESIGNATION OF ELEMENTS OF THE UNIT & SPECIFICATIONS .... 3

IV) IDENTIFICATION OF THE PRODUCT AND CAUTIONS FOR ITS INSTALLATION ................................. 5
  1. Identification of the product ............................................. 5
  2. Caution for using the unit in unusual circumstances ........ 5
  3. Operation time .............................................................. 5

V) INSTALLATION AND SETTING-UP .................................................... 5
  1. Electric wiring ............................................................... 6
  2. Installation of the electric chain hoist ............................. 7
  3. Connecting the cable and fitting the chain bucket .......... 8
  4. Operation of the electric chain hoist equipped with a trolley 10
  5. Checking after the installation and trial operation ........ 11

VI) CAUTIONS FOR HANDLING .............................................................. 12
  1. Proper handling and cautions ........................................ 12
  2. Cautions during operation .............................................. 13
  3. Other cautions ............................................................. 13

VII) MAINTENANCE AND INSPECTION .................................................. 15
  1. General ...................................................................... 16

VIII) DAILY INSPECTION ................................................................. 16
  1. Checking before operation ........................................... 16
  2. Checking by idle operation .......................................... 17
  3. Checking by rated load operation ................................. 17

IX) PERIODIC INSPECTION BY USER .................................................. 18
  1. Monthly inspection ..................................................... 18
  2. Annual inspection ...................................................... 18
  3. Durability of elements and parts .................................. 18

X) PROCEDURES FOR MAINTENANCE AND INSPECTION ..................... 18
  1. Before making inspection ........................................... 18
  2. Checking the hook and its lifetime ................................ 19
  3. Checking the chains and their lifetime ......................... 20
  4. Checking the switch spring and its lifetime (both on load side and unload side) .................. 21
  5. Checking the chain bucket and its lifetime .................. 21
  6. Checking the chain stop bolt and its lifetime ............... 21
  7. Checking the chain stopper .......................................... 21
  8. Checking the push-button switch ............................... 22
  9. Inspecting the trolley and its lifetime ......................... 22
 10. Checking the motor brake and its lifetime ................... 22
 11. Adjustment and disassembly of over-load limiter of FAIII, FBIII, and SAIII-type electric chain hoists ......... 23
 12. Checking the nameplate and tags ................................ 24
 13. Wiring inside the body and fixing of the parts .............. 24
 14. Inspection of general functions and durability .......... 24

XI) TROUBLE-SHOOTING ................................................................. 24

XII) CRITERIA FOR USING AND CHECKING ELECTRIC CHAIN HOISTS (BASED ON JIS B 8815) ................. 26

XIII) WIRING DIAGRAM ................................................................. 28

XIV) EXPLODED VIEWS ................................................................. 30

II) APPLICABLE LAWS AND REGULATIONS

In accordance with the regulations of the laws (ordinances, rules, standards) in your country observe the provisions 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 electric 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 FA, FAII, FB, FBIII, SA, SAII TYPE ELECTRIC CHAIN HOISTS (example: with electric trolley)
IV) IDENTIFICATION OF THE PRODUCT AND CAUTIONS FOR ITS INSTALLATION

1. Identification of the product

• Make sure that the electric chain hoist delivered is in accord with your order.

1-1 Electric chain hoist

1) Type Check for the type (Nameplate as well)
2) Power supply Single phase 100V/220V or 3 phase 200V/380V (or extra voltage)
3) Rated load Check for the rated load
4) Range of lift 3m or 6m etc. (or extra height)

1-2 Trolleys (package)

1) Type Plain, Geared, or Electric trolley
2) Rated load Check for the rated load

1-3 Push-buttons (package)

1) Number of push-buttons 2, 4 or 6 etc.
2) Length of the push-button cord 2.5 m or 5.5 m (or extra height)

1-4 Power cord (package)

1) Length of the power cord 5 m (1m for the electric trolley)
   ※ Check the unit for its lifting height or cord length respectively when an extra lift or a cord with a special length is ordered.

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

List of accessories and documents.

- Operation manual of the electric chain hoist
- Operation manual of the trolley (when purchased)
- Inspection certificate of the electric chain hoist
- Chain gauge
- Chain bucket

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

2. Cautions for using the unit in unusual circumstances

⚠️ WARNING

• The electric chain hoist may not be used in an explosive environment.
   ※ Area where organic solvents or explosive dusts exist

• The electric 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 electric chain hoist is used in a special environment where low (under -10°C) or high temperatures (over 40°C), high humidity (over 90%), much acids or salts, or much chemicals dominate. Install a shelter protecting the body of the electric 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 heavier model especially in a cold condition, because metals will possibly get brittle.

3. Operation time

⚠️ CAUTION

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

<table>
<thead>
<tr>
<th>Duty cycle percentage (% ED)</th>
<th>FA, FAII, FAH, FAH III types</th>
<th>FB (4+6), FBE (4+6) types</th>
<th>SA and SA III types</th>
</tr>
</thead>
<tbody>
<tr>
<td>40%</td>
<td>40%</td>
<td>30%</td>
<td>25%</td>
</tr>
<tr>
<td>Max, starting frequency (times/hour)</td>
<td>240</td>
<td>180</td>
<td>150</td>
</tr>
</tbody>
</table>

### Table 1

<table>
<thead>
<tr>
<th>Load rate</th>
<th>Mean running time per day (hour)</th>
<th>Light</th>
<th>Middle</th>
<th>Heavy</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 0.25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 0.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Operation usually at 3/5 of rated load and occasion-ally at rated load.
Operation usually at 1/3 to 2/5 of rated load and occasion-ally at rated load.
Operation usually at 2/3 or over of rated load and occasion-ally at rated load.
Operation mostly at or nearly rated load

※ SA and SA III types should be used in a range of areas.
※ FA, FAII, FB and FBE types should be used in a range of areas.
※ The lifetime of the product is highly dependent on the load applied and the operation hour.
※ To achieve its longer lifetime the electric 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 electric 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 electric 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 electric 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 electric 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.
1. Electric wiring

Leave the electrical work to the care of a specialized contractor, who should properly carry out the work observing this instruction manual.
Carry out the electrical work in accordance with the technical standards on the electrical equipment and regulations for the internal wiring in your country.
Before connecting the power source to the electric chain hoist, make sure whether its voltage complies with the applicable source for the electric chain hoist.

1-1 Connecting the power cable

- Conduct earthing and fitting of the said breaker in accordance with regulations valid in your country.
- Make sure that a place where the electric chain hoist is installed has a sufficient strength.
- Otherwise persons might be wounded by the electric chain hoist fallen, etc.

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

- When the electric chain hoist does not operate while the breaker is put on and a push-button is pressed, the electric chain hoist is being blocked by the function of "negative protection device". 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 electric chain hoist will then properly operate. (Make sure that the S-line is connected to the earthed phase of the power source.)
- In case of the SA or SA III type electric chain hoist for single phase power source, use a plug with earth or a plug with a separate earth. Otherwise consult an electrical constructor about a main switch with ON and OFF contacts.
- Make sure if the current capacity on the plug socket side is sufficient.

1-2 Selection of the power cable

- 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 electric chain hoist will not operate properly or the power cable may be heated and burnt.
- In the case of the single phase electric chain hoist, the governor switch would make noise or be burnt to break.

If the resistance (Ohm) of the cable from the mains to the electric chain hoist or other supply lines is too high, voltage (volt) of the power source will remarkably drop, causing the electric 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 (in case of single phase, 2V).

Example:
3 phase, 200V
Voltage drop = 30.8 X L x I + A /1000

single phase, 100V
Voltage drop = 35.6 X L x I + A /1000

where, L= cable length (m), I= steady-state power consumption (A), A= cable section (mm²)

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

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

<table>
<thead>
<tr>
<th>Power Source</th>
<th>Without an Electric Trolley</th>
<th>With an Electric Trolley</th>
</tr>
</thead>
<tbody>
<tr>
<td>FA and FB</td>
<td>490kg x 0.51</td>
<td>490kg x 0.51</td>
</tr>
<tr>
<td></td>
<td>0.9 t 11</td>
<td>0.9 t 11</td>
</tr>
<tr>
<td></td>
<td>Without an electric trolley</td>
<td>7 A</td>
</tr>
<tr>
<td></td>
<td>2.6 t 23 x 5t</td>
<td>2.6 t 23 x 5t</td>
</tr>
<tr>
<td></td>
<td>10 A</td>
<td>10 A</td>
</tr>
<tr>
<td></td>
<td>With an electric trolley</td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td>239kg x 0.51</td>
<td>490kg x 0.51</td>
</tr>
<tr>
<td></td>
<td>0.9 t 11</td>
<td>0.9 t 11</td>
</tr>
<tr>
<td></td>
<td>Without an electric trolley</td>
<td>12 A</td>
</tr>
<tr>
<td></td>
<td>2.6 t 23 x 5t</td>
<td>2.6 t 23 x 5t</td>
</tr>
<tr>
<td></td>
<td>14 A</td>
<td>14 A</td>
</tr>
</tbody>
</table>
1-3 Power supply for the electric chain hoist, delivered with a trolley attached
- The power supply for use in connection with the geared trolley or plain trolley is to be done in a same manner with this operation manual.
- As to wiring between the electric trolley and the electric chain hoist when they are used as one unit, refer to the operation manual of the electric trolley.
- 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 electric chain hoist will never fall down.
- The electric 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 electric chain hoist being caused by damaged elements.

In case that the electric 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 electric 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.

**WARNING**

Operating member B (on the side without hook)  Operating member A (on the side with hook)

The electric 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. 5](image1)

fig. 4

The hoist body should freely hang down (see Fig. 5)

Make sure that vinyl bands attached to the load chain and a label showing cautions have been removed (see Fig. 6).

Furthermore, make sure that the load chain properly goes through the hoist body (see Fig. 7).

The bottom of the hoist body should be 30 cm above the ground so that the load chain can be smoothly taken in and out (see Fig. 5).

In the case of multi-falls, make sure that the load chain on the load side (on the side with hook) is not twisted by the capsized bottom hook block (see Fig. 43) (page. 17)

![Fig. 7](image2)
3. Connecting the cable and Fitting the chain bucket

**CAUTION**
- Erroneous fitting of the connectors may possibly cause the cable to be disconnected or the connectors to be damaged.
- Thoroughly read the following instructions to make proper connection.

3-1 Connecting the plug
When fastening the resin nut:
- Do by holding the cord with fingers so that it may not excessively turn.

Fig. 8

3-2 Connecting the power cable and the push-button cord (without the electric trolley)
- Designation of elements

Fig. 11

- Connecting procedure
1. Loosen the resin nut at the back of the connector case.
2. Thus, the cord can be easily moved.
3. Pull the cord out in "A" direction so that the plug may be easier inserted.
4. Before connecting the housing, place the packing at the illustrated position.
5. Insert the plug into the socket of the housing, confirming that the matching notches have been securely engaged. When connecting, the both notches may be engaged each other by simply pushing the plug into the socket, but when disconnecting, push down the back of notch on the plug side to raise the tip of the notch and to pull the plug out.
6. Bring holes of the connector case into line with those of the packing, push them together and fix them by 4 vises with spring washers. Fix also the hanging fixture for the push-buttons by 2 vises with spring washers.
7. Fasten the resin nut.
8. Remember that excessive fastening may damage the nut.
9. Don't fasten the nut by tools but with fingers only. When fastening the nut, the cord tends to turn together. Excessive turning of the cord may damage it.
10. Fasten the nut by holding the cord with other hand so that it may not turn.
11. Make setting in such a manner that the cord is not twisted 90 degrees and more than the natural state.
12. Proper setting can be easily made by turning the cord beforehand in anti-clockwise direction by approx. 90 degrees, as the cord tends to turn in clockwise direction.

(This applies also to the power cable and the push-button cord.)

6. Owing to the steps as mentioned above, the portions connected will be completely water- and dust-proofed. When the cord is strongly pulled, the cord will be, however, taken out of the case or broken. For preventing such troubles, a holding fixture for the cord is delivered with the power cable. Properly fix the holding fixture. Such a holding fixture is not set for the push-button cable, which instead has a wire as integral part. Fix the wire firmly to the hanging fixture for the push-buttons by vises with spring washers.

Fig. 12
Hanging fixture for the push-button cord
Fixing position and View of the fixture completed

Fig. 13
Holding fixture for the power cable
Fixing position and View of the fixture completed
3-3 Connecting the push-button cord in using the electric trolley

1. The electric trolley is equipped with a push-button holder shown in the figure. Screw the push-button holder with a nut in the tap hole at the right below of the side-plate on the motor side of the trolley (replacing the spring washer with the nut is required). Insert the holder up to the position where its leading end does not contact the gear wheel and the ring at its trailing end stands vertically (the leading end should reach the inner face of the side-plate on the motor side, as the insufficiently inserted holder may be deformed). Then, fasten the nut in the direction of the side-plate on the motor side to fix the holder.

Fig. 14

2. Fix the push-button cord to the ring of the holder by using the accessory shackle.

3. Connect the connector of the push-button cord to the trolley (As to connecting the cord, refer to the connecting procedure for the power cable).

4. Adjust the suspended length of the cord between the connector and the ring of the push-button holder. An excess of the push-button cord should be put together in a loop in the vicinity of the ring, because the cord with a big dip under the trolley may be possibly damaged by swinging of the suspended chain hoist. Bring the cord into loop in the vicinity of the ring and set the suspended length of the cord proper by adjusting the loop size. Bind the upper portion of the loop to the push-button holder with accessory vinyl band to complete the connection work.

Fig. 15

①Binding the cord to the hold with a vinyl band
②Adjusting the suspended length of the cord
③The gaps between the bottom edge of the both side-plates and the cable should be in a range from 3-5 cm at least to 15 cm at most.
④Forming the cord into a loop

3-4 Fitting the chain bucket

⚠️ WARNING

- Fit the chain bucket before installing the electric chain hoist.
- If the chain bucket is not fitted, the load chain on the unload 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. 16
The load chain in idle which does not undergo any tension when applying a load is called the load chain on the unload side.

⚠️ 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.

Fig. 17
• Fit the chain bucket in a state that approx. 50 cm only of the load chain on the unload side comes out of the body (See Fig. 18). It not only eases the fitting but enables also the load chain to be put into the chain bucket in quite good order.
• Keep the chain bucket being hung from the body of the electric 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. 19). Otherwise the load chain may burst out of the bucket or it can hardly pass through the electric 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. 18](image)

![Fig. 19](image)

*This portion will be pushed up.*

It may happen that chains are entangled or kinked.

### Table 3 List for the chain bucket to be selected

<table>
<thead>
<tr>
<th>Bucket No.</th>
<th>0.9 t, 1 t standard lift</th>
<th>0.9 t(W), 1 t(W) standard lift</th>
<th>2 t standard lift</th>
<th>2.8 t, 3 t standard lift</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4 and less</td>
<td>4 and less</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>8 and less</td>
<td>6 and less</td>
<td>3 and less</td>
<td>3 and less</td>
</tr>
<tr>
<td>3</td>
<td>12 and less</td>
<td>10 and less</td>
<td>5 and less</td>
<td>5 and less</td>
</tr>
<tr>
<td>4</td>
<td>18 and less</td>
<td>15 and less</td>
<td>7.5 and less</td>
<td>7.5 and less</td>
</tr>
<tr>
<td>5</td>
<td>35 and less</td>
<td>30 and less</td>
<td>15 and less</td>
<td>15 and less</td>
</tr>
</tbody>
</table>

(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 electric chain hoist equipped with a trolley

#### 4-1 How to fit the trolley to the traversing rail

- The trolley can be fitted to the rail, being adjusted to different severities across the traversing rail by shifting adjusting collars only.
- Insert the same number of pieces of adjusting collars on both sides of the suspension (connecting) fixture of the electric chain hoist.
- Avoid improper setting shown in Fig. 20 (marked with X) which may result in serious accidents.

[Fig. 20] Connecting fixture

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

In the case that the electric trolley or the electric 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. 21).

[Fig. 21] With electric trolley

4-3 Traversing rail and stoppers

#### WARNING

- For avoiding eventual falling of the electric 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. 22), a plate with suitable thickness must be selected. If too thick a plate is attached, the trolley will hit and be unable to pass through the point in the worst case.
(3) Staggered joints must be aligned within 0.5 mm in both horizontal and vertical directions. The portions on which the trolley wheels travel should be finished by a grinder (See Fig. 23).

Fig. 22
Support
Pay attention to the thickness of backing plates.

Fig. 23
Stagger should be less than 0.5 mm
Rail joints should be finished by a grinder.

- Anti-failing 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 electric chain hoist swings, a distance (a) shown in Fig. 24 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 4 and Fig. 24).

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

Fig. 24

<table>
<thead>
<tr>
<th>Table 4 Stoppers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimension of the traversing rail (mm)</td>
</tr>
<tr>
<td>Angle steels (mm)</td>
</tr>
<tr>
<td>A (mm)</td>
</tr>
<tr>
<td>B (mm)</td>
</tr>
<tr>
<td>C (mm)</td>
</tr>
</tbody>
</table>

Fig. 25

C Bolts
Angle steels (as per Table 4)

For better distinguishing, stoppers should be painted in a different color from the traversing rail.

This projecting portion of angle steels must be absolutely cut off.

5. Checking after the installation and trial operation

Make sure the following points after installation of the electric chain hoist.
(1) Checking before operation
(2) Checking by idle operation (without loads)
(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.

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
</table>
| - When an operation 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 electric chain hoist body. It is quite dangerous. |

<table>
<thead>
<tr>
<th>! WARNING</th>
</tr>
</thead>
</table>
| - Do not operate the electric 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).
- In the case of the single phase electric chain hoist, stop the operation when unusual noise could be heard from the governor switch of the motor. This results from the voltage drop.
- If the voltage is not correct, the motor could be burnt.
- 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.
- Be careful that wire chips, vinyl and a "label showing cautions", etc. will not be pulled in the electric chain hoist.
- Do not operate the electric 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. |

Fig. 26
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 formally qualified according to the regulations in your country should not be allowed to operate a crane and engage in slinging work. The employer should keep unauthorized persons from operating the unit.

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 and decide its disposal 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. 27.

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 will increase a force on the slinging tool, and may cause a broken latch and a failing 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).

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 electric 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.

Make it a rule to always check the said three items before lifting a load to higher position (refer to Fig. 29)
- If some noise could be heard from the governor switch during winching up and down of the single phase electric chain hoist, do not continue to operate it and check the following.
  ※The power cable may be too small in the diameter. It happens voltage drop or overloading on the hoist.
2. Cautions During Operation

2-1 Lifting and lowering a load

⚠️ CAUTION

- Do not swing a load during lifting and lowering.
- Do not swing away the electric chain hoist even without loads.
- Do not pull the electric chain hoist in oblique (vertical, horizontal) direction. Always move the electric chain hoist right above a load, and lift it.
- Do not lift a load by double hoisting. It is very dangerous.
- 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.

![Image of caution signs](Fig. 30, Fig. 31, Fig. 32)

🚫 CAUTION

- 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.
- The over-lifting/lowering protection device is a safety device. Thus, do not operate this unit in such a way as to activate frequently the over-lifting/lowering protection device.
- The limit switches will be worn, causing possibly that they will be inactive in an emergency.
- The over-lifting/lowering protection device cannot permanently be used and it is therefore necessary to execute the unit in such a manner that the function of the protection device incorporated in the electric chain hoist will be limited to emergency only by any suitable means, for example by installing extra limit switches in the system.
- For checking the function of the over-lifting/lowering protection device at the upper and lower limits, activate the upper and lower limit switches several times without load (no loads suspended) before commencing the work on the day.
- 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 electric 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. 33).
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. 34).
  ※ The load may hit a person, as is very dangerous.
- Do not let 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. 35).
- Do not pull the push-button switch cord to roll the trolley (Fig. 36).
  ※ 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. 37).

Fig. 34

Fig. 35

Stopper

Fig. 36

Undue burden on a cord

Idling distance

Fig. 37

Hand chain

Stop

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 6) 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 electric chain hoist, or damage a motor and electrical components.

Fig. 38
2-5 For safe operation

**WARNING**

- 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. 40).
  ※ 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. Fig. 40
  ※ 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 electric 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.

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.
  ※ A 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

**CAUTION**

- Avoid frequent inching operation.
  ※ Inch operation and collision of a load during movement will generate larger momentous tension of the load chain than that in normal use.
- Inch 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 (F4B, F6B types).
- The push-buttons of the dual speed type hoist can be pressed on two levels; the first level is for low speed hoisting and the second is for high speed hoisting.
- Our dual speed type hoist has a special circuit to keep its life long. This may cause a slow start after operating the push-button in such cases; e.g. 1. when pressed down to, the second level at a stroke, 2. when changing the speed type. This is however not a fault. Wait a little while.
- Do not make frequent change-over between the high and low speeds.
- After use, bring the push-button switch unit under the electric chain hoist before releasing it (Fig. 38) to prevent unforeseen damages or malfunction.
- Always clean the push-button switch unit so that dust, sand, etc. are not deposited on it.
- 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 a dealer of our products (An aluminum-cast casing should be earthed properly.)
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.

### VII) 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.

<table>
<thead>
<tr>
<th>Check point</th>
<th>Check items</th>
<th>WARNING!</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Chain</td>
<td>1) Pitch elongation No abnormal elongation should be found.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2) Wear Wire diameter should not be extremely worn out.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3) Deformation Free from deformation.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4) Flaws and other harmful defects Free from cracks or other harmful defects.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5) Corrosion Free from remarkable rust.</td>
<td></td>
</tr>
<tr>
<td>(2) Hook</td>
<td>1) Opening of hook No remarkable deformation should be found.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2) Deformation Free from bend and twist.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3) Flaws and other harmful defects Free from cracks and other harmful defects.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4) Movement Bottom hook should rotate smoothly.</td>
<td></td>
</tr>
<tr>
<td>(3) Body</td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2) Oilig &amp; grease up Check the necessity of adding oil, applying oil or oiling in specified places.</td>
<td></td>
</tr>
<tr>
<td>(4) Trolley</td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2) Oilig &amp; grease up Check the necessity of adding oil, applying oil or oiling in specified places.</td>
<td></td>
</tr>
<tr>
<td>(5) Push-button switch, cord</td>
<td>1) Appearance There should be no deformation, breakage, loose of screw, etc.</td>
<td></td>
</tr>
</tbody>
</table>
1-2 Make sure that there is no twist nor tangle on the load chain.

In the electric chain hoist, model with multiple load chains (FA and FB types with 2-ton and 3 ton capacity, as well as SA with 1 ton capacity), 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 wound up nearly to the upper limit position.

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

### 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 switch spring on the load side (The switch spring should be exchanged with new one, when its free length becomes shorter than the limit length for its exchange).

(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 switch spring on the unload side (The switch spring should be exchanged with new one, when its free length becomes shorter than the limit length for its exchange).

(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 saddle, 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 several times without load.)

(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.

### 3. Checking by rated load operation

In the state of hoisting the rated load, stop the hoist halfway in un-winding 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.
I) 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 electric 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". (page. 18)

2. Annual inspection

If any abnormal points are found 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 "Procedures for Maintenance and Inspection" stated below.

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 "Procedures for Maintenance and Inspection" and in "Criteria for Using and Checking Electric Chain Hoist" (chapter XII, page. 26 - 28).

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 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 electric 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?
- Does the idle wheel rotate smoothly or is it well engaged with the load chain?
- 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 wheel 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.

When the dimension shown by "A" in Fig. 46 has reached more than the limitation as specified in Table 6, 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 6 Guide for hook replacement**

<table>
<thead>
<tr>
<th>Rated load (t)</th>
<th>250kg</th>
<th>490kg • 0.5 t</th>
<th>0.9 t • 1 t</th>
<th>2 t</th>
<th>2.8 t • 3 t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value A (mm) recommended by maker</td>
<td>30±1</td>
<td>26.5±1</td>
<td>31±1</td>
<td>38±1</td>
<td>45±1</td>
</tr>
<tr>
<td>Limit value A (mm)</td>
<td>33.0</td>
<td>29.2</td>
<td>34.1</td>
<td>41.8</td>
<td>49.5</td>
</tr>
</tbody>
</table>

**Flaws, wear and bend of hook**

Fig. 47 Hooks in the condition as shown in (1)-(3) also require replacement.

1. Sharp flaw is visible.
2. Wear: In accordance with Table 7.
3. Turning (bend) is visually recognized.

**Table 7 Wear Limitation of Contact Part in sling fixtures and support structure (Unit mm)**

<table>
<thead>
<tr>
<th>Rated load (t)</th>
<th>[H] dimension of new hook</th>
<th>Limitation of dimension</th>
<th>Rated load (t)</th>
<th>[H] dimension of new hook</th>
<th>Limitation of dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>250kg</td>
<td>18</td>
<td>16.2</td>
<td>2 t</td>
<td>35</td>
<td>31.5</td>
</tr>
<tr>
<td>490kg • 0.5 t</td>
<td>19</td>
<td>17.1</td>
<td>2.8 t • 3 t</td>
<td>49</td>
<td>44.1</td>
</tr>
<tr>
<td>0.9 t • 1 t</td>
<td>25</td>
<td>22.5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Rotation and deformation of idle wheel (not provided in the type with single load chain)**

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

1. Abnormality in bearing and rotation shaft of the idle wheel.
2. Accumulation of foreign particles and abnormal wear in the pocket part of the idle wheel.
3. Deformation in the projected part of the wheel (See Fig. 48).

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

- Thrust bearing

When the rotating movement of the hook is not smooth, or when the clearance shown in Fig. 50 is over 2 mm, 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. 49, if there is visible deformation in the part pointed by the arrow [A], it should be replaced with new one.

Caution: There are large and small dimensions in inner diameter.

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. 53) 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. 51.

If the pitch gets larger than the limitation for use, the chain gauge will go through links as shown in Fig. 52.

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.

As it is shown in Fig. 54, 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 8) 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 8 Normal wire diameter and pitch (unit: mm)

<table>
<thead>
<tr>
<th>Chain hoist types</th>
<th>Normal wire diameter</th>
<th>Normal pitch</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA-0.25, SA-0.49, SA-0.49, SA-0.9W, SA-1W</td>
<td>6.3</td>
<td>19</td>
</tr>
<tr>
<td>FA-0.49, FA-0.5, FB-0.49, FB-0.5</td>
<td>7.1</td>
<td>21</td>
</tr>
<tr>
<td>FA-0.99, FA-1S, FA-1S, FA-2, FA-2, FA-3</td>
<td>7.1</td>
<td>21</td>
</tr>
<tr>
<td>FA-0.99, FA-1S, FA-1S, FA-2, FA-2, FA-3</td>
<td>7.1</td>
<td>21</td>
</tr>
</tbody>
</table>

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.
4. Checking the switch spring and its lifetime (both on load side and unload side)

Reduced free length of the switch spring

For enabling the switch spring to fully function, it should be exchanged with new one when its free length becomes shorter than the limit value specified in Table 9.

Table 9 (Common to each type of FA, FB and SA chain hoists; The switch spring is classified into three groups, that is, A on the load side, B on the unload side and C on the sub load side at 3.1 ton or 5 ton)

<table>
<thead>
<tr>
<th>Lifting capacity(t)</th>
<th>250 kg ~ 1 t</th>
<th>2 t</th>
<th>2.8 t ~ 3 t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switch spring</td>
<td>A BX2</td>
<td>A BX2</td>
<td>A BX2</td>
</tr>
<tr>
<td>Dimension(L) of new spring</td>
<td>120</td>
<td>70</td>
<td>150</td>
</tr>
<tr>
<td>Dimension(L) of worn spring</td>
<td>108</td>
<td>63</td>
<td>135</td>
</tr>
</tbody>
</table>

Bent switch spring

• A bent switch spring should be exchanged with new one.
• A switch spring which is apt to be caught by the load chain and cannot freely fall down to the hook block should be exchanged with new one.

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.
• The switch spring on the no-load side is yielded or bent. (Measure the free length of spring.)

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 double or triple load chains.)

• In case of double load chains, the end of the load chain on the load side is fixed by the chain stop bolt at lower part of the body, and in case of triple load chains, at hook block.

Pull out the chain stop bolt and check the deformation. At the time of pulling out the bolt, 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.

• It will be easier to do this work, when using double load chains (see Fig. 58), after lifting up the hook block nearly to the upper limit, or when using triple load chains, with keeping the bottom hook block stabilized to the ground.

• When the chain stop bolt 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. 59).

• In fitting the chain stop bolt to the load chain, strict caution should be taken not to have the load chain to twist.

Also, in the reuse of bolt which has passed the inspection, set it properly so that the same portion as before will get in contact with the load chain.

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.

The chain stopper on the unload side should be attached to the third link counting from the end of the unload side of the load chain (Fig. 60).
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 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.

Bend of side-plates

- Two side-plates should be free from deformation.
- The angle shown in Fig. 61 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. 62

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)

Fig. 63

Plain wheel
2. Geared wheel

Wear of side-rollers

(applicable to the electric trolley, type MT-III)

- The portion of the side-roller contacting the bottom flange of the I-beam will be gradually worn out.
- Such a side-roller as shows wear exceeding 1 mm should be replaced.
- Such a side-roller as cannot smoothly revolve due to getting rusty and/or sticking foreign matters should be dismantled and cleaned.
- Take out the two hexagonal bolts shown in Fig. 63 and remove the rollers together with the mount to clean them with kerosine etc.

When replacing parts or assembling the unit after cleaning, be careful not to mix up the side-roller on the geared wheel with one on the plain wheel. The side-rollers should be fully oiled to guarantee their smooth revolution.

10. Checking the motor brake 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 electric chain hoist in the non loading state (the state of hanging no load on the bottom hook).
(2) Lower the electric 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.

Fig. 64

When using double linings, pay attention to the direction of the notches. Do not fail to face them in the right opposite direction.

Fig. 65

Before dismantling never forget to carry out the above mentioned important instructions (1-3).
Even if the power source is OFF, do not touch any live points that are not covered.
11. Adjustment and disassembly of the overload-limiter

of FAⅢ, FBⅢ and SAⅢ-type electric chain hoists

Structure
(1) It is a rotor-slip type: the rotor and its shaft slip when overloaded.
(2) When the load cannot be lifted up because of overloading, release the pushbutton immediately. Otherwise it will cause the motor to be burnt and the linings of the slip mechanism to be heat and worn.
(3) Repeated rotor slippings will damage the hoist and make it unable to lift the rated load. Then adjusting the rotor slip mechanism or replacing the parts will be required.

How to adjust the overload-limiter
(1) Unload and make the bottom hook of the hoist free from any weight.
(2) Put off the power source.
(3) Remove the motor cover.
(4) See inside through each of the four holes of the motor bracket, to find that one blade of the lock-washer is folded on a concave of the adjustment nut. (It is to prevent loosening of the nut.)
(5) Unfold the blade with a screwdriver. (Fig. 66)
(6) Then the adjustment nut can rotate. Rotate it with a screwdriver to adjust the slip. When it is rotated clockwise, the lifting capacity will increase.
(7) In case that the rated load cannot be lifted up, rotate the nut clockwise by 2 or 3 pitches to bring the hoist back to the former overload-preventing state.

(8) In case that only half of the rated load can be lifted up, rotate the nut by further 2 or 3 pitches.
(9) Put on the power source. And do tests with some different loads for adjustment. In case that the adjustment nut is rotated clockwise too far, the slip mechanism is tightened too much, and as a result, excessive overloading will be always possible, as is quite dangerous.
(10) The hoist should be set to work with a load 125-150% of the rated load.
(11) After the adjustment is made, try to find a point where the blade of the lockwasher meets a concave of the nut adjustment, and fold the blade so that the nut will not rotate. (To do this job, be sure to put off the power source.)
(12) After making sure that the adjustment nut is locked with the lock-washer, attach the motor cover.

How to disassemble the overload-limiter
(1) Unload and make the bottom hook of the hoist free from any weight. Put off the power source and then take off the motor cover (same as the adjusting procedure).
(2) Loosen the motor setting hexagonal cap nut to remove the motor bracket, and pull out the rotor set.
(3) Unfold the folded blade of the lock-washer. Rotate the adjustment nut anticlockwise to remove it. Pull out from the rotor the lock-washer, coned disc spring, disc hub, anti-rotation pin, and the motor shaft in the said order.
(4) Clean those parts. Replace parts if damaged or worn.
Note: In case linings are replaced, the rotor must be replaced together. Replacement of linings only is not possible since they are specially processed.
(5) After checking all parts, assemble them in the order opposite to disassembling.
(6) In the process of assembling, be careful not to stain the lining sides of the disc hub and the linings with oil or grease. As to the number of coned disc springs, refer to table (10).
(7) Tighten the adjustment nut by hand, put the rotor set into the motor, attach the motor bracket, and make adjustment.
(8) As to the way of adjustment, refer to the points (1)-(12) of adjusting procedure.
12. 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 nameplate 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)

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 electric chain hoist moves according to directions from the pushbutton switch.
- Make sure a distance the hook travels until it stops, having released the pushbutton.
- 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 electric 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 9 List for trouble-shooting

<table>
<thead>
<tr>
<th>Abnormality or troubles</th>
<th>Possible causes</th>
<th>Counter-measures</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Motor does not run.</td>
<td>- Master switch on the switch cabinet is turned off. Fuses are burnt out. Breaker is actuated.</td>
<td>Check the switch cabinet and turn on the master switch.</td>
<td>Models for 3-phase</td>
</tr>
<tr>
<td></td>
<td>- Improper connection of power supply line.</td>
<td>Properly make connection of R-S-T lines of power source.</td>
<td>Models for 3-phase, equipped with negative-phase protector</td>
</tr>
<tr>
<td></td>
<td>- Power source is connected to the reverse phase.</td>
<td>Make change of R-T lines of power source</td>
<td></td>
</tr>
</tbody>
</table>

Table 10 Specification of the coned disc spring

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Number</th>
<th>Combination</th>
</tr>
</thead>
<tbody>
<tr>
<td>250kg</td>
<td>10</td>
<td>31.7x20.4x0.4</td>
</tr>
<tr>
<td>490kg</td>
<td>0.5t</td>
<td>1t, 2t, 3t, 8t</td>
</tr>
<tr>
<td>0.9t</td>
<td>41.6x25.5x0.5</td>
<td>10</td>
</tr>
</tbody>
</table>

- For structure of the coned disc springs
<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
<th>Models for single phase SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Damaged transformer, improper connection of push-buttons, electro-magnetic relays and limit switches, broken inside wiring, cords and cables.</td>
<td>Check for continuity and make repair of damaged devices and parts. Replace damaged parts with new ones.</td>
<td></td>
</tr>
<tr>
<td>Brake cannot be released.</td>
<td>Secure connection of brake. Replace a damaged brake plate. FA • FB • SA models</td>
<td></td>
</tr>
<tr>
<td>Wrong power source</td>
<td>Use correct power source as per nameplate.</td>
<td></td>
</tr>
<tr>
<td>Big voltage drop</td>
<td>Secure supply voltage as specified and use a suitable power cable. Smaller power cable may cause a sudden voltage drop on starting.</td>
<td></td>
</tr>
<tr>
<td>Extremely overloaded</td>
<td>Apply a load only up to the rated load.</td>
<td></td>
</tr>
<tr>
<td>2. The unit exhibits other movements than those directed by the push-buttons.</td>
<td>Make proper connection as per connecting diagram.</td>
<td></td>
</tr>
<tr>
<td>Inside wiring like push-buttons and electro-magnetic relays etc. are not correct.</td>
<td>Make proper connection as per connecting diagram.</td>
<td></td>
</tr>
<tr>
<td>Malfunction of directional switches</td>
<td>Check for connection. Models for single phase</td>
<td></td>
</tr>
<tr>
<td>Incorrect connection of motor starting coils</td>
<td>Make change of starting coil terminals. Models for single phase</td>
<td></td>
</tr>
<tr>
<td>3. Lifting impossible</td>
<td>Apply a load only up to the rated load.</td>
<td></td>
</tr>
<tr>
<td>Improper connection of push-buttons, electro-magnetic relays and limit switches, loose inside wiring.</td>
<td>Check for continuity and replace damaged parts with new ones. Secure connection.</td>
<td></td>
</tr>
<tr>
<td>4. Lowering impossible</td>
<td>Check for continuity and replace damaged parts with new one. Secure connection.</td>
<td></td>
</tr>
<tr>
<td>Improper connection of push-buttons, electro-magnetic relays and limit switches, loose inside wiring.</td>
<td>Check for continuity and replace damaged parts with new one. Secure connection.</td>
<td></td>
</tr>
<tr>
<td>5. Brake does not function.</td>
<td>Secure voltage as specified.</td>
<td></td>
</tr>
<tr>
<td>Big voltage drop of power source</td>
<td>Replace worn parts with new one.</td>
<td></td>
</tr>
<tr>
<td>Brake gap exceeds the limit.</td>
<td>Replace the brake coil with new one.</td>
<td></td>
</tr>
<tr>
<td>Terminals are disconnected.</td>
<td>Replace the printed board with new one.</td>
<td></td>
</tr>
<tr>
<td>Damaged rectifier</td>
<td>Make correct connection according to marking of the boards.</td>
<td></td>
</tr>
<tr>
<td>6. Reversing operation impossible</td>
<td>Replace it with new one.</td>
<td>Models for single phase SA, Models for single phase SA</td>
</tr>
<tr>
<td>7. Over-coating on stopping the lifting/lowering work</td>
<td>Replace worn parts with new one.</td>
<td>Models for single phase SA, Models for single phase SA</td>
</tr>
<tr>
<td>Brake gap reaches nearly limit (solenoid starting impossible).</td>
<td>Replace worn parts with new one.</td>
<td>Models for single phase SA, Models for single phase SA</td>
</tr>
<tr>
<td>Over-loaded</td>
<td>Apply a load only up to the rated load.</td>
<td>Models for single phase SA, Models for single phase SA</td>
</tr>
<tr>
<td>Voltage drop of power source</td>
<td>Secure voltage as specified.</td>
<td>Models for single phase SA, Models for single phase SA</td>
</tr>
<tr>
<td>Slow working speed</td>
<td>Apply a load only up to the rated load.</td>
<td>Models for single phase SA, Models for single phase SA</td>
</tr>
<tr>
<td>Over-loaded</td>
<td>Secure voltage as specified.</td>
<td>Models for single phase SA, Models for single phase SA</td>
</tr>
<tr>
<td>Voltage drop of power source</td>
<td>Apply a load only up to the rated load.</td>
<td>Models for single phase SA, Models for single phase SA</td>
</tr>
<tr>
<td>Extreme high atmospheric temperature</td>
<td>Keep the surrounding temperature under 40°C by preventing radiant heat, etc.</td>
<td>Models for single phase SA, Models for single phase SA</td>
</tr>
<tr>
<td>10. Motor does not stop on reaching the upper and lower limits of the electric chain hoist.</td>
<td>Brake gap reaches nearly limit (solenoid starting impossible). Replace worn parts with new one.</td>
<td>Models for single phase SA, Models for single phase SA</td>
</tr>
<tr>
<td>11. Abnormal sound</td>
<td>Extremely worn gears</td>
<td>Replacement of parts</td>
</tr>
<tr>
<td>Extremely worn gears</td>
<td>Extremely worn gears</td>
<td>Replacement of parts</td>
</tr>
<tr>
<td>12. Rapid wear of chains, compared with those fitted to other electric chain hoists.</td>
<td>Insufficient or no lubrication.</td>
<td>Properly lubricate as specified.</td>
</tr>
<tr>
<td>Insufficient or no lubrication.</td>
<td>Worn sprockets or sprocket guides.</td>
<td>Replace them with new one.</td>
</tr>
<tr>
<td>Over-loaded</td>
<td>Apply a load only up to the rated load.</td>
<td>Replace them with new one.</td>
</tr>
<tr>
<td>13. Chains do not well engage with sprockets.</td>
<td>Unsuitable chains</td>
<td>Replace them with new one.</td>
</tr>
<tr>
<td>Extremely worn chains, sprockets and guides.</td>
<td>Replace them with new one.</td>
<td>Models for single phase SA</td>
</tr>
<tr>
<td>14. When contacting the electric chain hoist, a shock is given.</td>
<td>Wrong grounding</td>
<td>Replace them with new one.</td>
</tr>
<tr>
<td>Extremely worn chains, sprockets and guides.</td>
<td>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.</td>
<td>Models equipped with electric trolley</td>
</tr>
<tr>
<td>Incorrect connection of printed boards.</td>
<td>Make repair of disordered points and push-buttons are not properly insulated.</td>
<td>Models equipped with electric trolley</td>
</tr>
</tbody>
</table>
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 Electric Chain Hoists" (JIS B 8815). Strictly observe them in using the electric chain hoist.

⚠️ 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 idle 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 more than 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, special care should be taken to relevant laws and regulations.

2. Criteria for check
(1) Use the electric chain hoist by checking it daily periodically.
(2) Refer to Table 8th 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 8th 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.
   (1) 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.
   (2) Check the items with the mark “O” in Table 8th.
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 8 Criteria for check

<table>
<thead>
<tr>
<th>Type of check</th>
<th>Check Items</th>
<th>Check method</th>
<th>WARNING! Check criteria device and parts out of the following criteria should be replaced or disposed as waste.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Periodic check</td>
<td>Marking (nameplates, labels)</td>
<td>Visual</td>
<td></td>
</tr>
</tbody>
</table>

Load chain
- Type: Visual
- Pitch elongation: Check visually in daily check and by measurement in periodic check.
- Wear: Check visually in daily check and by measurement in periodic check.
- Deformation: Visual
- Flaws and other harmful defects: Visual
- Corrosion: Visual
- Opening of hook: Visual
- Deformation: Visual
- Latch: Visual
- Deformation of shank: Visual
- Swiveling: Visual
- Wear and corrosion: Visual
- Flaws and other harmful defects: Visual

Hooks

Brakes and the like
- Brake linings, brake discs and brake shoes: Visually and by measurement.
- Brake screw (in mechanical braking device): Visually or by measurement.
- Pawl and ratchet wheel (in mechanical braking device): Visually or by measurement.
- Brake spring (in electro-magnetic braking device): Visually or by measurement.
- Oil seals and water-proof seals: Visual
- Chain buckets: Visual

Motors and the like
- Motors (3 phase) (Single phase magnet-motors): Visually and by measurement
- Electrical instrument (electro-magnetic contactors, relays, transformers, wiring, etc.): Visually and by manipulation

Traversing equipment (incl. Traveling equipment)
- Traversing equipment: Visually and by measurement
- Nuts, rivets, split pins, snap rings, etc. in the equipment: Visual
- Lubrication and greasing up: Visually and by measurement

Load sheave and idle sheave: After dismantling check them visually or by measurement.
Chain guide: Visually or by measurement.
Limit lever: Visual.
Bearings: Visually or by measurement.
Lubrication and greasing up: Lubrication to the specified points and replenishment.

Free from severe wear, deformation, flaws and breakage.
Free from severe wear, deformation and breakage.
Free from severe wear, deformation and breakage, and operates smoothly.
Free from harmful defects such as wear, flaws, breakage, etc.
Change of gear-case oil if contaminated.
Free from severe wear or local wear. Free from flaws and breakage.
Free from severe wear, deformation, flaws and breakage.
Free from severe wear, deformation, flaws and breakage.
Free from severe wear, deformation, flaws and breakage.
Free from severe wear, deformation and breakage.
It should be securely mounted on the hoist body and free from severe wear, deformation and breakage.
It should not be over-heated and be sufficiently insulated. (Brush and commutator should not be severely worn.
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.
There should be no abnormality in the combination of traversing equipment with the hoist body and in gears, brakes, wheels, hand chains, etc.
In daily check, the presence of nuts, rivets, 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 of the said parts
Lubrication to the specified points and replenishment.
Push-button switches and Cords

<table>
<thead>
<tr>
<th>Appearance(marking, labels)</th>
<th>Visual</th>
<th>There should be no deformation, breakage, loose screws and the like. Marking should be clear and be exchanged with new one if unreadable.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switch manipulation</td>
<td>By manipulation</td>
<td>Switches and an interlock system function properly. 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.</td>
</tr>
<tr>
<td>Grounding</td>
<td>By measurement</td>
<td>Perfectly grounded.</td>
</tr>
<tr>
<td>Reverse phase</td>
<td>By operation</td>
<td>Connection should not be in reverse phase.</td>
</tr>
</tbody>
</table>

Function and Performance

<table>
<thead>
<tr>
<th>Lifting and lowering function</th>
<th>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.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traversing function</td>
<td>Carry out traversing without load. Hoists should be smoothly traversed and should stop immediately after the operation is discontinued.</td>
</tr>
<tr>
<td>Starting</td>
<td>Visual</td>
</tr>
<tr>
<td>Speed</td>
<td>Visually and by measurement The lifting and traversing speeds at the rated load should be within indicated values.</td>
</tr>
<tr>
<td>Braking</td>
<td>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.</td>
</tr>
<tr>
<td>Protection against over-lifting(friction clutch)</td>
<td>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.)</td>
</tr>
</tbody>
</table>

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 overload 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 (1): In periodic check, the magnetic particle test prescribed in JIS G0565 or the liquid penetrant test in JIS Z2343 should be carried out when necessary.
The goods has passed rigid inspection by us ahead of delivery in accordance with our standard in terms of test load and all other respects in good and satisfactory condition.

Inspector Toshiyuki Morie

ELEPHANT CHAIN BLOCK CO., LTD.
Osaka JAPAN
Before assembling the trolley, this manual should be thoroughly read.

This manual should be surely handed over to the users.

The users of the electric trolley should thoroughly read this manual.

3-PHASE ELECTRIC TROLLEY
MODELS MAF, MAS & MB (Type)

OPERATION MANUAL (No. 2)

Thank you for your purchase of our product.
It is quite important that you carefully read this operation manual before using our product.
This manual should be kept close to the unit concerned, 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.
For proper operation of the unit, please carefully read also the operation manual of the electric chain hoist.

ELEPHANT CHAIN BLOCK CO., LTD.
Osaka JAPAN
1) SAFE OPERATING PRACTICES

Improper operation of the electric trolley 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 electric trolley.

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 **WARNING** “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:

- △-mark indicates that there are warning/cautionous 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 are formally qualified having completed training for operation of the crane, handling of the lifting slings, etc., according to the regulations in your country. The employer should kept unauthorized persons from operating the unit.
- The operation manual of the electric chain hoist should be also read.
- 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 electric trolley 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.
- Attach a stopper to the ends of the traverse and travel rails.
- Make sure that a location on which the electric trolley is installed has a sufficient strength.

3. Operation and Handling

**WARNING**

- Do not lift loads which exceed the rated load.
- ※The rated load is indicated on the nameplate of the electric trolley body.
- Do not get on a suspended load and do not use the electric trolley to lift, support or transport persons.
- Do not operate the electric trolley 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 electric trolley.
- Do not use the electric trolley for the oblique pulling.
- ※First move the electric trolley to right over a load and then lift it.
- Do not use the electric trolley for the earth lifting (for example, lifting objects fixed under 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 electric trolley when the push-buttons are in disorder.
- Immediately stop operating the electric trolley when it moves in other direction as commanded by the push-button switch.
- Make sure before operating the electric trolley that the brake properly functions.
- Do not operate the electric trolley when the brake is in disorder.
- Do not use an electric trolley which was damaged or causes abnormal sound and/or vibration.
- The traversing rail must be grounded.
CAUTION

- Do not use the electric trolley at voltages other than the rated voltage in your country.
- Do not operate the electric trolley 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 electric chain hoist or the trolley hit against stoppers or other structures.
- Never use the electric trolley at a load time rate and with a starting frequency exceeding the rated values.
- Do not use the electric trolley with name plates and labels attached to the body removed or left unclear.
- 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 electric trolleying, two electric trolleys should be operated in a synchronized manner.

4. Maintenance, Inspection and Modification

WARNING

- Never make modifications to the electric trolley and its accessories.
- Never use parts other than genuine ones made by us.
- 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 electric trolley unloaded (e.g. without loads).
- When any disorder is found in the maintenance or inspection, immediately make repair before re-operating the electric trolley.

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.

SPECIFICATION

<table>
<thead>
<tr>
<th>Table 1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated load</td>
<td>250kg-2ton</td>
</tr>
<tr>
<td>Motor output</td>
<td>MAF &amp; MAS types</td>
</tr>
<tr>
<td></td>
<td>MB type</td>
</tr>
<tr>
<td>Insulation</td>
<td>E-class</td>
</tr>
<tr>
<td>Time rated</td>
<td>MAF &amp; MAS types : 30 minutes</td>
</tr>
<tr>
<td>Operating voltage</td>
<td>24V</td>
</tr>
</tbody>
</table>

INSTALLATION AND SETTING-UP

WARNING

- Refrain from installing the electric trolley by yourself and leave the installation work to the care of a specialized contractor.
- Otherwise you might be wounded by electric shock or the electric trolley fallen.
- Do not fail to conduct an earthing. Furthermore, a leakage circuit breaker should be installed in the electric path.
- Conduct earthing and fitting of the said breaker in accordance with regulations valid in your country.

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

Electric wiring

- Leave the electrical work to the care of a specialized contractor, who should properly carry out the work observing this instruction manual.
- Carry out the electrical work in accordance with the technical standards on the electrical equipment and regulations for the internal wiring in your country.
- Before connecting the power source to the electric trolley, make sure whether its voltage complies with the applicable source for the electric trolley.
- Connecting the power cable

Earthing and fitting of the leakage circuit breaker

CAUTION

- Do not fail to conduct an earthing. Furthermore, a leakage circuit breaker should be installed in the electric path.
- The power source must be connected via the switch cabinet (main circuit breaker).
- When the electric trolley is not used, the switch cabinet should be cut off for preventing risks.
CAUTIONS ON INSTALLATION

Use the electric trolley, paying attention to the following:

CAUTION

- Never use the unit in an atmosphere laden with explosive gases. Otherwise a fire may be caused by electric sparks.
- Never lift loads exceeding the rated load. Otherwise the chain hoist may be damaged or loads may fall down, as is quite dangerous.
- Never work by pulling of loads. Otherwise the side-plate of the trolley may open, leading to its falling down. Even though the trolley may not fall down, the electric chain hoist may be disordered.

- For both preventing and detecting leakage, a leakage circuit-breaker must be installed. The installation should be carried out by contractors authorized by electric companies or by a servicing agent authorized by the manufacturer.
- The traveling rail has to be earthed. For better conductivity, the faces of the traveling rail and wheels must be free from paint, oil, dust etc.
- For power supply, use the supply cables with capacity specified by the manufacturer (Refer to the operation manual of the electric chain hoist).
- Pay a special attention to the power supply when the unit is used far away from the power source by making use of extended cords and the like, because the unit may not be able to normally operate due to the voltage drop and furthermore the unit or the extended cords may be burnt due to heating-up caused by the reduced torque.
- The leakage may be caused depending on conditions of a place where the unit is used.
- Do not use the unit in a steamy atmosphere or outdoors in rain.
- Use the unit in a range of the time rated.
- Operating the unit exceeding the time rated may cause the motor to be rapidly heated, resulting in burning of the motor and electrical parts.

WARNING

- Fit all the connecting fixtures without fail and properly make the connection; otherwise, the trolley and loads may fall down, as is quite dangerous.
- Properly assemble the electric trolley and the trolley.

1. Direct connection for 0.5 ton and 1 ton types (common to electric, geared and plain trolleys)

(a) Remove the motor cover of the electric trolley. (The motor cover is fixed by 4 bolts with washers.)
(b) Remove the top hook pin by pulling it out.
(c) Take the connecting fixture out of the trolley and attach it to the top hook pin of the electric trolley.
(d) In the case of attaching the connecting fixture without dismantling the trolley, it is convenient for the connecting work to take the locking pin and the collar for the locking pin out of the body of the electric trolley and to attach them to the top hook pin of the electric trolley (for 0.5 ton and 1 ton only). (When the reinforcing bush fell out, it has to be again attached to the side plate on the gear side. The locking pin and the collar for the locking pin taken out of the body should be surely re-fitted to their original positions.)
(e) Attach the motor cover to its original position.
(f) Finally assemble all the components except the top hook to complete the connection work.

2. Direct connection for 2 ton type (common to electric, geared and plain trolleys)

(a) First remove the split pin with a hexagonal nut for the connecting bolt of the electric chain hoist and then remove the top hook by pulling the said bolt out.
(b) Mount the connecting fixture for the trolley onto the connecting bolt of the electric chain hoist and lock the nut to fit the split pin to the plate.

![Diagram](image-url)

Fig. 1

- Adjusting collar
- Top hook
- Reinforcing bus
- Switch case
- Side-plate on gear side
- Collar for lock pin
- Motor cover
- Connecting fixture
- Split pin
- Hexagonal nut
- Connecting bolt
- Trolley

(In case of 0.5 ton and 1 ton types)
HOW TO MOUNT THE ELECTRIC CHAIN HOIST CONNECTED WITH ELECTRIC TROLLEY ONTO THE RAIL

WARNING

- Fit all the connecting fixtures without fail and properly make the connection; otherwise, the trolley and loads may fall down, as is quite dangerous.
- Setting with the key-plate fitted to (a) should be regarded temporary only and the trolley may fall when the electric trolley is used in such a setting. Never operate the assembly or leave it in such a setting.
- When adjusting the width by adjusting collars, be sure to insert them equally on either side of the connecting fixture. Inserting the collars together on one side only may unevenly load the trolley, causing an accident of its falling down.

- How to mount the electric trolley onto the rail

(1) After completion of the connecting work of the electric trolley and the trolley, adjust the rail width of the trolley by using adjusting collars.
(Mounting work can be easily done by means of a unique suspension shaft of our make, that is, by lifting the assembly with the side-plate on the motor side temporarily fitted to (a).)

(2) Lift the assembly by an electric trolley and the like by slinging the eyebolt fitted to the trolley.

(3) Mount onto the rail tread the wheels first on the side of the electrical components box and then those on the motor side after removing the key-plate temporarily fitted to (a). (Be careful when removing the key-plate that the motor side should not slip down.)

(4) Firmly refit all the bolts and nuts loosened to their former positions.

CONNECTING THE ELECTRIC CHAIN HOISTS TYPES FA & FB TO THE TROLLEY

- In cases of both direct and hanging connections, the electrical components of the trolley should be on the side of the chain bucket of the electric chain hoist.

Fig. 3 DIRECT CONNECTION  
Fig. 4 HANGING

WARNING

- Fit the round fixtures connecting the electric trolley without fail and properly make the connection; otherwise, the trolley and loads may fall down, as is quite dangerous.
- Properly assemble the electric trolley and the trolley.

- In case of the direct connection, remove once the top hook pin to remove the top hook and instead fit the connecting fixture on the trolley to the electric chain hoist to fix it with the top hook pin.

- Remove the cover on which the rated load is indicated (fixed with 4 spring washers bolts) and pull out the black top hook pin to remove the top hook. Not only the top hook but also 2 plated round fixtures are mounted on the top hook pin. These 2 fixtures must be again refitted, having set a connecting fixture of the trolley instead of the top hook.; otherwise, the electric chain hoist may fall down, as is quite dangerous. Careful and proper assembling is required. When all the components except the hook are reassembled, the direct connection is finished.

Fig. 5

Cover on the side with indication of the rated load
HOW TO ADJUST THE TROLLEY TO THE RAIL WIDTH

The key slot “a” among those on the suspension shaft of the trolley is made to enable the fitting to be easily carried out and it is possible to expand the side-plate distance by temporary setting of the key-plate at the slot “a” as the sketches on the left side in Table 2 to make fitting from the underside (Do not forget to insert the same number of pieces of adjusting collars on both sides of the connecting fixture).

![Diagram of trolley and key-plate](image)

**WARNING**

- Setting with the key-plate fitted to “a” should be temporary only and the trolley may fall when the unit is used in such a setting. Never operate or leave it in such a setting.
- Insert the same number of pieces of adjusting collars on both sides of the connecting fixture. If they are inserted on one side only, a load is not uniformly applied, causing a dangerous situation such as abnormal movement of the trolley or its falling, etc.

---

**Table 2**

<table>
<thead>
<tr>
<th>With the key-plate temporary fixed at “a” (operation impossible in this setting)</th>
<th>With the key-plate finally fixed at (1), (2), (3) or (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Diagram of connecting fixture" /></td>
<td>Rail width: For 0.25t～1t: Rail width 75mm For 1.5t～3t: Rail width 100mm For 4.8t～10t: Rail width 125mm</td>
</tr>
</tbody>
</table>

---

**WIRING**

- **4-point push-buttons**
  1. Connect the two cables from the 3-phase electric trolley (cables with 4-point and 6-point plug respectively) to the electric chain hoist. As to the fitting of the connectors, refer to the operation manual included in the package of the push-button cord.
  2. Connect the push-button cord (with 15-point plug) to the electric trolley.
  3. Connect the power cable to the power source to complete the wiring (standard length of the power cable: 0.5m). To extend the power cable, remove the cover for the electrical components and properly attach a crimp-style terminal to a power cable with a required length (with 4 core wires).
- **4-point push-buttons (Connecting to the types DA & DB)**
  1. When the electric trolley and the electric chain hoist are together purchased, they will be delivered with the internal wiring completed.
  2. When the electric trolley is separately purchased, refer to the wiring diagram included in the operation manuals of the types DA & DB or consult a dealer of our products.

- Fit the push-button cord as shown in the following sketch:

  ![Diagram of wiring setup](image)

1. Forming the cord into a loop
2. Adjusting the suspended; length of the cord
3. Binding the cord to the holder with a vinyl band

The gaps between the bottom edge of the both side-plates and the cable should be in a range from 3~5cm at least to 15cm at most.
OPERATIONAL CAUTIONS

- Avoid sudden reverse operation (plugging) by push-buttons.

* Such an operation causes a great instantaneous load exceeding double the lifted load, shortening the lifetime of the body and the chains.

CAUTIONS ON INSTALLING THE ELECTRIC TROLLEY

**WARNING**

- When adjusting the width, be sure to insert the adjusting collars equally on either side of the connecting fixture. Inserting the collars together on one side only may unevenly load the trolley, causing an accident of its malfunction or falling down.

1 How to fit the trolley to the traversing rail

- The trolley can be fitted to the rail, being adjusted to several different widths of the traversing rail by shifting adjusting collars only.

- Insert the same number of pieces of adjusting collars on both sides of the suspension (connecting) fixture of the electric trolley.

- Avoid improper setting shown in Fig. 9 (marked with X) which may result in serious accidents.

2 How to fit the trolley to the curved traversing rail

In the case that the electric trolley or the electric trolley 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.10).
3 Traversing rail and stoppers

**WARNING**
- For avoiding eventual falling of the electric trolley 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 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. 11), 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 0.5mm in both horizontal and vertical directions. The portions on which the trolley wheels travel should be finished by a grinder (See Fig. 12).

**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 electric trolley swings, a distance (a) shown in Fig. 13 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 3).
   - Avoid such installation and operation as the trolley always stops by running against the stopper.

Do not pull the push-button cord.
Do not traverse the trolley by pulling the push-button cord (Fig. 14).

---

**Stop the trolley before it hits against the stopper.**

1. On controlling the traversing of the trolley, operate the trolley so as to stop the trolley of itself before it hits against the stopper (Fig. 15).

---

**Table 3: Stoppers**

<table>
<thead>
<tr>
<th>Dimension of the traversing rail (mm)</th>
<th>150 × 75</th>
<th>200 × 100</th>
<th>250 × 125</th>
<th>350 × 150</th>
<th>450 × 175</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angle steels (mm)</td>
<td>L50 × 50 × 6</td>
<td>L65 × 65 × 6</td>
<td>L75 × 75 × 6</td>
<td>L90 × 90 × 7</td>
<td></td>
</tr>
<tr>
<td>A (mm)</td>
<td>20</td>
<td>30</td>
<td>35</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>B (mm)</td>
<td></td>
<td></td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C (mm)</td>
<td></td>
<td></td>
<td></td>
<td>M16</td>
<td></td>
</tr>
</tbody>
</table>

---

**DAILY INSPECTION**

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

- In cases of any abnormality, stop operating the unit and take proper countermeasures before using it again.
- Consult a dealer of our products when it is not possible to take proper measures.
- As to details refer to the operation manual of the electric chain hoist.

---

**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.
- As to details refer to the operation manual of the electric chain hoist.
Annual inspection

- Carry out the voluntary inspection more than once in a year.
- If there is any abnormality discovered by the inspection, take appropriate measures against it.
* As to details refer to the operation manual of the electric chain hoist.

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 loads) condition.
- If any abnormality is found in the maintenance and inspection, do not use the unit.

* As to details refer to the operation manual of the electric chain hoist.

INSPECTION OF THE TROLLEY AND ITS LIFETIME

- Bent side-plates
  - Two side-plates should be free from deformation.
  - The angle shown in Fig. 17 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. 18
  There is such a visible, obvious gap in the portion which is in contact with the edge of I-beam.

  Fig. 19
  The wheel gets more than 5% wear-out from the original configuration.

  Fig. 20
  The wheel having partial wear on the tread surface (visible degree).

  Fig. 21
  The gear of geared wheel has been worn out and/or damaged in visible degree.

  Fig. 22
  A tooth or some teeth of the geared wheel have been broken off.

OVERALL OPERATION (to be finally checked)

- Check that the electric trolley moves according to directions from the push-button switch.
- Make sure a distance the trolley travels until it stops, having released the push-button.
- Check that any abnormal sound is not caused in traversing movement.
- Check the gear for greasing and sticking of dust etc. on it.
- Make sure that bolts, nuts etc. at each position are not loose.
4-Push button
MAF-MAS Type

WIRING DIAGRAM

ELECTRIC TROLLEY

TRANSFORMER

YELLOW

RED

CONNECTOR

TRACING MOTOR

ELECTRIC CHAIN BLOCK

4C CABLE RYER CABLE

5C CABLE RYER CABLE

3# POWER SOURCE
6 - Push button
MAF-MAS Type
Electric trolley

- 3-phase (0.5ton - 1ton - 2ton - 3ton - 5ton)
## Electric trolley

### 3-phase (0.5ton - 1ton - 2ton - 3ton - 5ton)

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Gear side plate set</td>
</tr>
<tr>
<td>2</td>
<td>Hex bolt</td>
</tr>
<tr>
<td>3</td>
<td>Hex nut</td>
</tr>
<tr>
<td>4</td>
<td>Spring washer</td>
</tr>
<tr>
<td>5</td>
<td>Snap ring</td>
</tr>
<tr>
<td>6</td>
<td>Gear wheel set</td>
</tr>
<tr>
<td>7</td>
<td>Gear wheel</td>
</tr>
<tr>
<td>8</td>
<td>Ball bearing</td>
</tr>
<tr>
<td>9</td>
<td>Snapring</td>
</tr>
<tr>
<td>10</td>
<td>Plain side plate set</td>
</tr>
<tr>
<td>11</td>
<td>Plain wheel</td>
</tr>
<tr>
<td>12</td>
<td>Ball bearing</td>
</tr>
<tr>
<td>13</td>
<td>Snap ring</td>
</tr>
<tr>
<td>14</td>
<td>Washer</td>
</tr>
<tr>
<td>15</td>
<td>Suspension shaft</td>
</tr>
<tr>
<td>16</td>
<td>Key plate</td>
</tr>
<tr>
<td>17</td>
<td>Cotter pin</td>
</tr>
<tr>
<td>18</td>
<td>Adjust collar</td>
</tr>
<tr>
<td>19</td>
<td>Ball bearing</td>
</tr>
<tr>
<td>20</td>
<td>Flange set</td>
</tr>
<tr>
<td>21</td>
<td>Flange</td>
</tr>
<tr>
<td>22</td>
<td>Ball bearing</td>
</tr>
<tr>
<td>23</td>
<td>Ball bearing</td>
</tr>
<tr>
<td>24</td>
<td>Hex nut</td>
</tr>
<tr>
<td>25</td>
<td>Spring washer</td>
</tr>
<tr>
<td>26</td>
<td>Spring washer</td>
</tr>
<tr>
<td>27</td>
<td>3rd gear</td>
</tr>
<tr>
<td>28</td>
<td>2nd gear</td>
</tr>
<tr>
<td>29</td>
<td>Washer</td>
</tr>
<tr>
<td>30</td>
<td>Washer</td>
</tr>
<tr>
<td>31</td>
<td>Electric equipment panel set</td>
</tr>
<tr>
<td>32</td>
<td>Electric equipment panel</td>
</tr>
<tr>
<td>33</td>
<td>Electric equipment holder</td>
</tr>
<tr>
<td>34</td>
<td>Socket panel</td>
</tr>
<tr>
<td>35</td>
<td>Magnetic contactor</td>
</tr>
<tr>
<td>36</td>
<td>Magnetic contactor</td>
</tr>
<tr>
<td>37</td>
<td>Transformer</td>
</tr>
<tr>
<td>38</td>
<td>Transformer</td>
</tr>
<tr>
<td>39</td>
<td>6P-terminal block set</td>
</tr>
</tbody>
</table>

- Housing socket set (pushbutton side)
- Switch case set
- Rubber band
- Screw W/cross hole
- Warning label
- Push button hanger set
- Hex nut
- Spring washer
- Name plate
- Coupling cable set for control
- Coupling cable set for power
- Power cord set
- Connector
- 2nd gear
- Washer
- 3rd gear (For low speed)
- Gear case
- Bolt W/hex.hole
- Spring washer
- Packing
The goods has passed rigid inspection by us ahead of delivery in accordance with our standard in terms of test load and all other respects in good and satisfactory condition.

Inspector Toshiyuki Morie

ELEPHANT CHAIN BLOCK CO., LTD.

180 Iwamuro 2-chome, Osaka-Sayama-City,
Osaka Postal code 589-8502, JAPAN
Phone : 072-365-7778  Fax : 072-365-7869