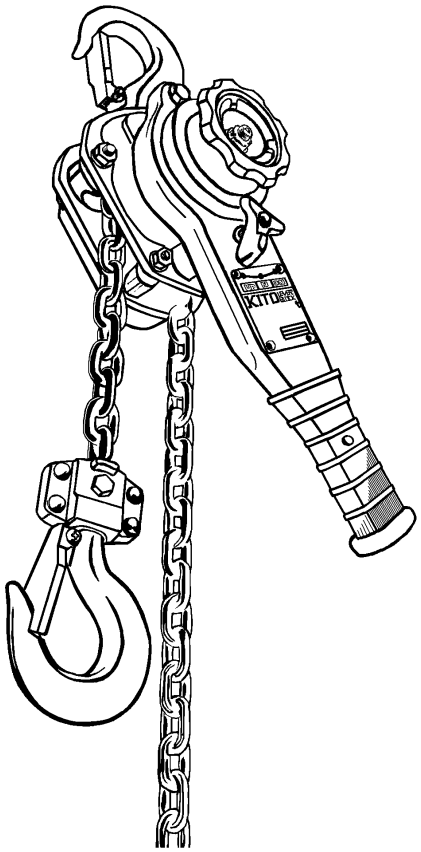
OM-L5ZZZZ-KCE-03

# Owner's (Operator's) Manual
# and
# Safety Instructions

## Manually Lever Operated

## Chain Hoist Model L5



**WARNING**

This equipment must not be installed, operated or maintained by any person who has not read and understood all the contents of this manual. Failure to read and comply with the contents of this manual can result in serious bodily harm or death, and/or property damage.

KITO

Fill in the following product informaition for identification and future reference to avoid referring to the wrong manual for information or instructions on installation, operation, inspection, maintenance, or parts.

Model Code: _____

Serial Number: _____

Date of Purchase: _____

Dealer: _____

# Table of Contents

# 1. Important Information and Warnings

1.1. Regarding This Instructions Manual

This manually lever-operated chain hoist model L5 is designed to align a load from horizontal or slant direction, lift and fasten it by using manual force under normal working conditions, not intended to transport a person.

The following symbols are used in this manual to identify the degree or level of hazard seriousness.

**DANGER**

This symbol indicates an imminently hazardous situation which, if not avoided, ***will*** result in ***death or serious injury***, and property damage.

**WARNING**

This symbol indicates a potentially hazardous situation which, if not avoided, ***could*** result in ***death or serious injury***, and property damage.

**CAUTION**

This symbol indicates a potentially hazardous situation which, if not avoided, ***may*** result in ***minor or moderate injury***, or property damage.

Even the caution situations may result in serious injury or death depending on conditions. Therefore, notice should be taken whenever encountering them.

**Always keep this manual in a convenient place for operator's reference.**

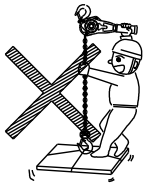
1.2. Prohibited Practices

1.2.1. General

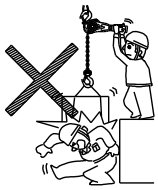
Improper usage or negligent maintenance of the hoist may result in dangerous situations arising such as a lifted load dropping. Before installing, operating or maintaining, read and comply with both this manual for the safety and operation instructions, and notes for all the equipments.

KITO will not be held liable for any malfunction, lack of performance or accident if the product is being used in conjunction with any other equipment. If the product is to be used for unintended purposes, please confirm with your dealer in advance.

**DANGER**

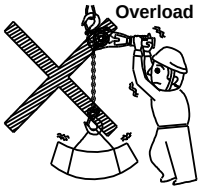


- Do **NOT** use the hoist to support, lift or transport people.



- Do **NOT** go under a lifted load or its path, and do not move the lifted load over people.

**WARNING**




- Do **NOT** lift more than the rated load.

- Do **NOT** modify the product or its accessories.

**⚠ CAUTION**

- Before moving the load, warn all people in the vicinity.
- Do **NOT** operate the hoist unless the contents of this operating manual and the warning labels are fully understood.

1.2.2. Prior to Operation

**⚠ CAUTION**

- This manual is intended for the operator who will use the hoist. Prior to operation, all of the safety and operating instructions must be fully understood.

**⚠ WARNING**

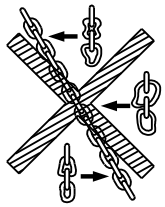
- Do **NOT** use a deformed or scarred hook.
- Replace components only with KITO approved parts.

**⚠ CAUTION**

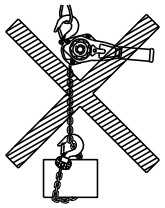
- Make sure that the nameplate is readable.
- Before operation, make sure to perform all inspections given in **4.1 Inspection Classification**.
- Use a proper hoist for your purpose, capacity and lift.
- Ensure to check that the hook latches are **NOT** deformed or scarred, and are moving smoothly.
- Ensure to check that the brake and free chaining functions properly work.
- Ensure to check that the load chain is well-lubricated.
- Ensure to avoid welding sparks on the hoist and load chain.

1.2.3. Operation

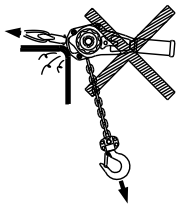
**⚠ WARNING**



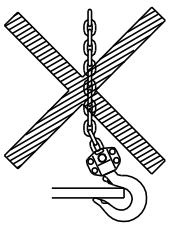
- Do **NOT** use the hoist with deformed or scarred load chain.



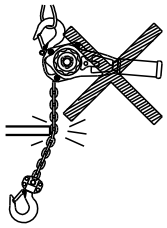
- Do **NOT** use the load chain as a sling.



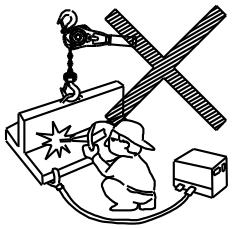
- Do **NOT** use the hoist as a fulcrum.



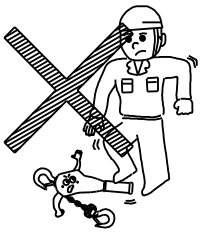
- Do **NOT** support a load on the tip of the hook.



- Do **NOT** impede the chain on any surface e.g. a steel plate.



- Do **NOT** perform welding or cutting operation on the load being suspended.



■ Do **NOT** use the hoist by stepping on

■ Do **NOT** extend the lever by attaching a pipe to it.

- Do **NOT** swing a lifted load.
- Do **NOT** use the load chain as an earth for welding.
- Do **NOT** lift excessively until the bottom yoke comes into contact with the hoist body.
- Do **NOT** lower excessively until the chain stopper comes into contact with the hoist body.
- Do **NOT** use a damaged hoist or one having abnormal sounds.
- Do **NOT** use a hoist with the loose lever grip.
- Do **NOT** leave a lifted load unattended for a long time.
- In lowering mode, do **NOT** pull the no-load-side chain which could cause a hazardous situation arising the lever revolving.

**⚠ CAUTION**

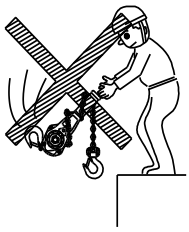
- Ensure to place a load properly on the middle of the hook saddle.
- Before lifting, ensure to eliminate load chain slack to avoid a shock load.

1.2.4. After operation

**⚠ CAUTION**

- After operating, ensure to put a load down securely to avoid dropping it.

**⚠ WARNING**



- Do **NOT** drag or throw the hoist when carrying it.

1.2.5. Inspection and Maintenance

**⚠ CAUTION**

- Ensure that competent people periodically conduct inspections and maintenance corresponding to **4 Inspection** and **0 Maintenance** otherwise please confirm with your dealer.

**⚠ WARNING**

- Do **NOT** extend or weld the load chain.

1.2.6. Others

**⚠ CAUTION**

- In case of use in special environments such as salt water, seawater, acidic, alkaline or explosive atmospheres, confirm with your dealer in advance.

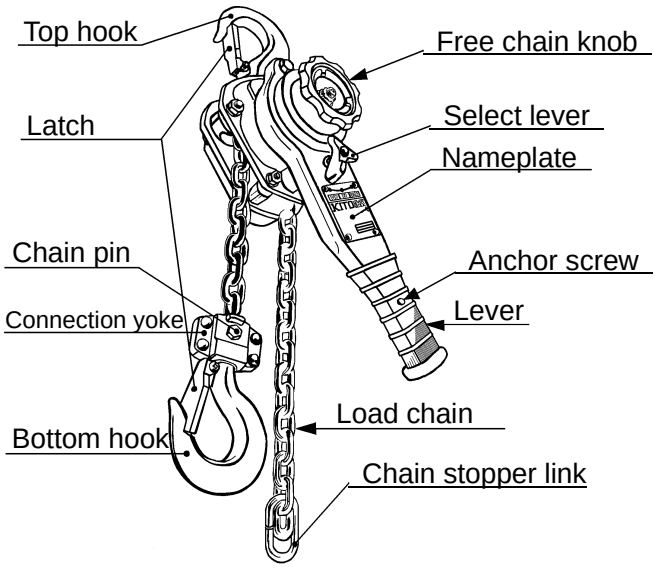
**⚠ WARNING**

- Do **NOT** use the hoist which is out of order or under repair.
- Do **NOT** use the hoist with warning labels or tags missing.

## 2. Technical Information

2.1. Specifications

2.1.1. Schematics




2.1.2. Operating Conditions and Environment

Temperature Range: -40° to +60°C (-40° to +140°F)

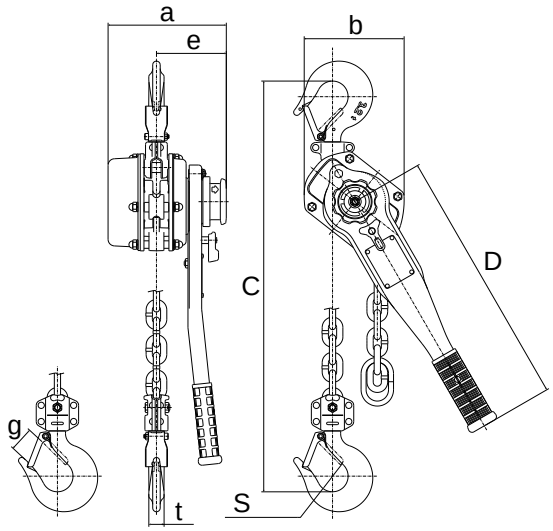
Humidity: 100% or less, this is not an underwater device.

Material: No special materials such as sparkless and asbestos.

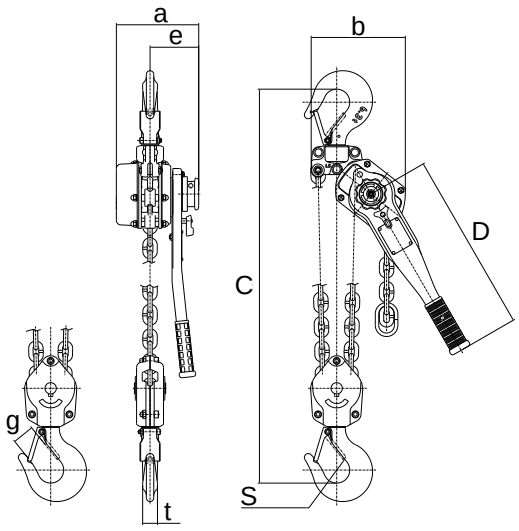
**Table 2-1 Hoist Specifications**

| Capacity (tonnes) | Product Code | Standard Lift (m) | Pull to Lift Rated Load (N)(kgf) | Load Chain Diameter x Pitch (mm) | Chain Fall Lines | Test Load (tonnes) | Net Weight (kg) | Weight for Additional One Meter of Lift (kg) |
|---|---|---|---|---|---|---|---|---|
| 3/4 | LB008 | 1.5 | 265(27) | 5.6×15.7 | 1 | 1.1 | 5.7 | 0.7 |
| 1 1/2 | LB015 | 1.5 | 314(32) | 7.1×19.9 | 1 | 2.3 | 8.0 | 1.1 |
| 2 1/2 | LB025 | 1.5 | 363(37) | 8.8×24.6 | 1 | 3.8 | 11.2 | 1.7 |
| 3 | LB030 | 1.5 | 343(35) | 10×28.0 | 1 | 4.5 | 15.0 | 2.3 |
| 6 | LB060 | 1.5 | 353(36) | | 2 | 7.5 | 26 | 4.7 |
| 9 | LB090 | 1.5 | 382(39) | | 3 | 11.3 | 40 | 7.0 |

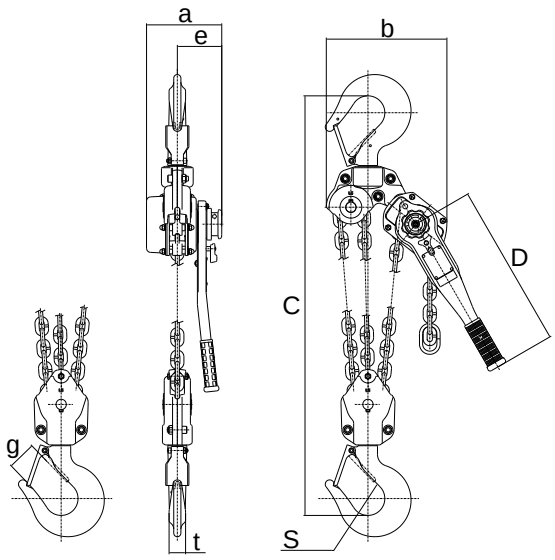
2.2. Dimensions




Up to 3 tonnes




6 tonnes




9 tonnes

**Table 2-2 Hoist Dimensions**

Units: mm

| Hoist Code | a | b | C | D | e | g | s | t |
|---|---|---|---|---|---|---|---|---|
| LB008 | 114 | 119 | 280 | 245 | 97 | 23.5 | 35.5 | 14 |
| LB015 | 159 | 126 | 335 | 265 | 100 | 32 | 42.5 | 19 |
| LB025 | 173 | 150 | 375 | 265 | 102 | 36.5 | 47 | 21 |
| LB030 | 190 | 159 | 395 | 415 | 112 | 39 | 50 | 24.5 |
| LB060 | 190 | 217 | 540 | 415 | 112 | 50 | 60 | 34 |
| LB090 | 190 | 304 | 680 | 415 | 112 | 72.5 | 85 | 41.5 |

## 3. Operation

3.1. Introduction

Operating a heavy load may result in hazardous situations. Before operating, read and comply with all of the information in this clause and **1.2 Prohibited Practices**.

Before operating the hoist, secure the workplace as follows:

- Ensure to arrange the workplace to work smoothly.
- Ensure to keep a good view to monitor the operation, otherwise arrange watch personnel.

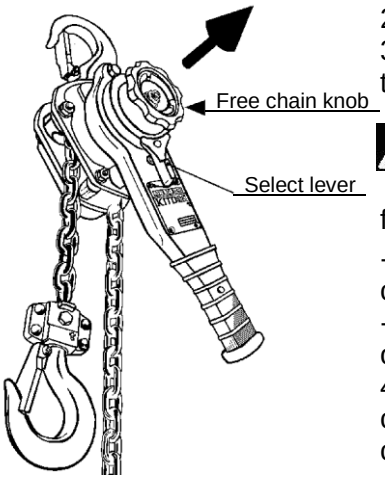
3.2. Free Chaining

**DANGER** Do **NOT** operate the hoist in free chaining mode under a load.

3.2.1. Features

- Free chaining can freely feed the load chain as the brake is released under no load situations.
- Pulling the free chain knob moves the internal spring to release the mechanical brake and to pull the load chain in either direction to its needed length.

3.2.2. How to Operate




1. Set the select lever to the neutral ('N') position.
2. Pull the free chain knob upwards.
3. In this mode, the load chain can be pulled through the hoist to its required length.

**CAUTION** Do **NOT** pull the load chain suddenly in free chaining mode.

- Excessive pulling may make a brake and can not feed the chain.
- In this case, reset the hoist (see 4), make some lowering operations, and then start over.

4. To reset the hoist for load operation, turn the free chain knob clockwise with the load-side chain pulled lightly. The knob will come into contact again to operate the hoist with the lever.

3.3. Load Operation

3.3.1. Features

Operating the lever with the select lever set to the lifting ('UP') or the lowering ('DN') position, the hoist performs as follows:

- In lifting mode, the tightened mechanical brake rotates as one and supports a load on the pawls when the lever stops.
- In lowering mode, lever operation un-tightens the mechanical brake and lowers the load chain, and when the lever stops, the mechanical brake is tightened and supports the load instantly.
- In lifting and lowering, braking always acts.

3.3.2. How to Operate

**DANGER** Do **NOT** operate the free chain knob in lifting or lowering.

**CAUTION** Before operating, make sure that the hoist is out of the free chaining mode and the select lever position meets your operation demands.

The following table shows select lever position and lever operation for lifting and lowering.

**Table 3-1 Hoist & Lever Operation**

| Hoist Operation | Select Lever | Lever Operation |
|---|---|---|
| Lifting | UP | Clockwise |
| Lowering | DN | Counterclockwise |

**CAUTION** Under no load conditions, in the case that the load chain does not lower against your lowering operation, operate the lever with the load-side chain pulled lightly. (This is a standard aspect.)

3.4. Load Signal (as option)

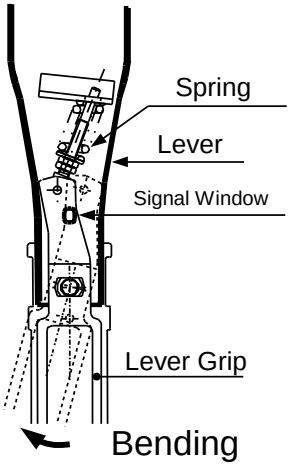
This load signal is designed as an overload detecting device to warn an operator that an excessive load has been applied which could cause a hazardous situation.

**DANGER**

- Disregarding the overload sign could cause bodily harm or damage to the hoist. Do **NOT** lift an overload. Warn all the people in the vicinity and remove the causes.

**CAUTION**

- Do **NOT** leave dust or foreign objects in the load signal.
- Disassembling the hoist or changing the signal setting will invalidate your product warranty. Contact your dealer for disassembly or repair.
- Excessive impact on the lever may result in a malfunctioning signal or damage to the components.
- Using the hoist recklessly may cause the load signal to work improperly.




3.4.1. Features

- Lifting pull is transmitted to the lever through the spring inside the lever.
- A pull over the designed (in response to 100 to 120 % of the rated capacity) compresses the spring and bends the lever.
- Then the color of the signal window on the lever changes to warn the operator of an overload.
- The signal colors are identified as shown in the following table.

**Table 3-2 Signal Warning**

| Signal Color | Load Status | Instructions |
|---|---|---|
| Green | Safe load | Continue operation |
| Red | Overload | Do not continue operation |

3.4.2. How to Operate

1. Operate the hoist by holding the lever grip in the middle.
2. The following events of the load signal warn you of an overload.
   - The lever grip is bent.
   - The lever clicks.
   - The signal window changes from green to red.
3. Stop lifting and lower immediately when an overload is detected.
4. Reset the grip into its straight position (back in place) before operation commences.

## 4. Inspection

To maintain continuous and satisfactory operation, a regular inspection procedure must be initiated to replace worn or damaged parts before they become unsafe.

### 4.1. Inspection Classification

Inspection intervals must be determined by the individual application and are based on the type of service to which the hoist will be subjected and the degree of exposure to wear, deterioration or malfunction of the critical components.

The type of service to which the hoist is subjected can be classified below.

- **Normal Service** – service that involves operation with randomly distributed loads within the rated load limit, or uniform loads less that 65% of rated load for not more than 15% of the time.
- **Heavy Service** – service that involves operation within the rated load limit which exceeds normal service.
- **Severe Service** – service that involves normal or heavy service with abnormal operating conditions.

The three general classifications are herein designated as DAILY, FREQUENT and PERIODIC, with respective intervals between inspections as defined below.

**DAILY Inspection** - visual examinations by the operator or other designated people before daily operation

**FREQUENT Inspection** – visual examinations by the operator or other designated people with intervals per the following criteria:

- Normal service – monthly
- Heavy service – weekly to monthly
- Severe service – daily to weekly

Records are not required.

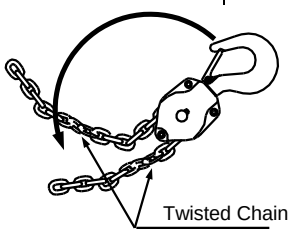
**PERIODIC Inspection** – visual inspection by a designated people with intervals per the following criteria:

- Normal service – yearly
- Heavy service – semiannually – 6 months
- Severe service – quarterly – 3 months

Records are to be kept for continuing evaluation of the condition of the hoist.

4.2. Daily Inspection

**Table 4-1 Daily Inspection Methods and Criteria**

| Item | Method | Criteria | Action |
|---|---|---|---|
| Nameplate, Warning Tag | Visual | Should be affixed properly and readable. | Replace. |
| Function – Lifting | Set the select lever to 'UP' and make lifting operation with the load-side chain pulled slightly. | Moving the lever forwards and backwards should make clicking sounds. | Repair or replace as necessary. |
| Function – Lowering | Set the select lever to 'DN' and make lowering operation with the load-side chain pulled slightly. | Moving the lever only backwards, not forwards, should make clicking sounds. | Repair or replace as necessary. |
| Function – Free Chaining | Set the select lever to 'N' and pull the free chain knob upwards into free chaining mode to adjust the chain length. | - The chain should be pulled smoothly.<br>- The free chain knob should be easily pulled or reset. | Repair or replace as necessary. |
| Hooks – Condition | Visual, Function | - Should be not deformed.<br>- Should turn smoothly. | Replace |
| Hooks – Latches | Visual | Should be not deformed or scarred. | Replace |
| Load Chain | Visual | - Should be free of severe rust.<br>- Should be coated with lubricant.<br>- Should not be deformed or scarred. | Replace<br>Clean/Lubricate<br>Replace |
| Others | Visual | - Nuts, split pins, grip or screws should not be loose or missing.<br>- Hoist should not be scarred or damaged.<br>- Chain stopper link at no-load side should not be missing or deformed.<br>- Bottom hook on multiple chain fall line models should not be capsized.<br>  <br><br>Capsized Hook and Chain<br>Double Fall Models | Replace.<br>Correct all chain irregularities as shown in the following picture. |

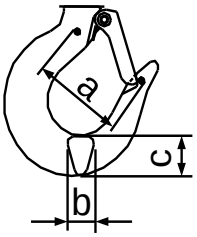
4.3. Frequent Inspection

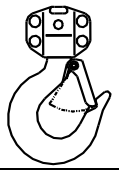
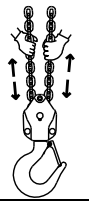
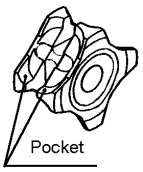
Evaluation and resolution of the results of the frequent inspections shall be made by a designated person so that the hoist is maintained in safe working condition.

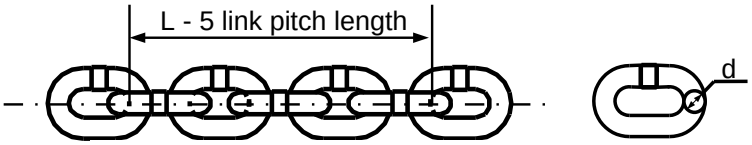
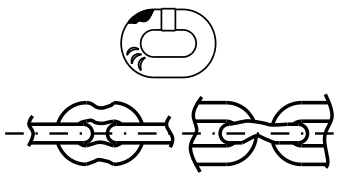
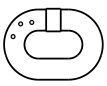
**WARNING** Do **NOT** use components beyond the stated criteria or KITO-unauthorized parts.

In addition to the daily inspections, perform the following checks.

**Table 4-2 Frequent Inspection Methods and Criteria**

<table>
<tr><th>Item</th><th>Method</th><th>Criteria</th><th>Action</th></tr>
<tr><td colspan="4">Put the hoist under a light load and check the following items of “Function - ……”</td></tr>
<tr><td>Function – Lifting</td><td>Set the select lever to ‘UP’ and lift the load operation 20 to 30 cm.</td><td>Moving the lever forwards and backwards should make clicking sounds.</td><td>Repair or replace as necessary.</td></tr>
<tr><td>Function – Lowering</td><td>Set the select lever to ‘DN’ and lower the load operation 20 to 30 cm.</td><td>Moving the lever only backwards, not forwards, should make clicking sounds.</td><td>Repair or replace as necessary.</td></tr>
<tr><td>Function – Abnormal Sounds</td><td>Auditory</td><td>Should have no damped clicking or irregular sounds.</td><td>Repair or replace as necessary.</td></tr>
<tr><td>Function – Pull</td><td>Function</td><td>Should not be extremely heavy.</td><td>Repair or replace as necessary.</td></tr>
<tr><td>Function – Braking</td><td>Function</td><td>Should not slip.</td><td>Repair or replace as necessary.</td></tr>
<tr><td>Hooks – Stretch</td><td>Measure<br>  <br><br><table><tr><th>Measured when new (mm)</th><th>Discard limit</th></tr><tr><td>a:<br>b:<br>c:</td><td>Over the measured<br>5 % or more reduction<br>5 % or more reduction</td></tr></table></td><td>Record the following sizes, a, b and c at the time of purchase.</td><td>Replace</td></tr>
<tr><td>Hooks – Abrasion</td><td><table><tr><th rowspan="2">Capacity (tonnes)</th><th rowspan="2">a* (mm) Nominal</th><th colspan="2">b (mm)</th><th colspan="2">c(mm)</th></tr><tr><th>Standard</th><th>Discard</th><th>Standard</th><th>Discard</th></tr><tr><td>3/4</td><td>44</td><td>14.0</td><td>13.3</td><td>19.6</td><td>18.6</td></tr><tr><td>1 1/2</td><td>55</td><td>19.0</td><td>18.1</td><td>25.7</td><td>24.4</td></tr><tr><td>2 1/2</td><td>63</td><td>21.0</td><td>20.0</td><td>29.0</td><td>27.6</td></tr><tr><td>3</td><td>67</td><td>24.5</td><td>23.3</td><td>31.0</td><td>29.5</td></tr><tr><td>6</td><td>90</td><td>34.0</td><td>32.3</td><td>41.0</td><td>39.0</td></tr><tr><td>9</td><td>111</td><td>41.5</td><td>39.4</td><td>52.0</td><td>49.4</td></tr></table><br>*These values are nominal since the dimensions are not controlled to a tolerance. The measurements at the time of purchase become the reference ones. Subsequent measurements are compared to these references to make determinations about hook deformation/strectch.</td><td></td><td>Replace</td></tr>
<tr><td>Hooks – Deformation, Scars</td><td>Visual<br>  </td><td>- Should not be significantly twisted or deformed.<br>- The shank portions of the hook should be evenly worn.<br>- Should have no deep scars.<br>- Should have no loose or missing rivets, bolts or nuts.<br>- Should have no welding sparks.</td><td>Replace</td></tr>
<tr><td>Hooks – Swivel</td><td>Visual, Function<br>  </td><td>The hook should rotate.</td><td>Replace</td></tr>
</table>

| Item | Method | Criteria | Action |
|---|---|---|---|
| Hooks –<br>Hook Latches | Visual, Function<br>  | - Should be held in place on the tip of the hook.<br>- Should move smoothly.<br>**WARNING** Do **NOT** use the hook with the latch missing. | Replace the hook latch |
| Hooks –<br>Idle Sheave<br>(bottom hook on double fall hoist) | Visual, Function<br>  | **WARNING** Make sure to avoid having your fingers caught.<br>Should rotate smoothly.<br>(If not, idle sheave or axle may be deformed or worn.) | Replace the idle sheave and axle. |
| Hooks –<br>Idle Sheave | Visual<br>  <br> | Pockets of idle sheave should be free of wear or scars. | Replace the idle sheave and axle. |

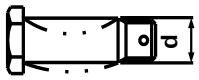
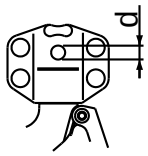
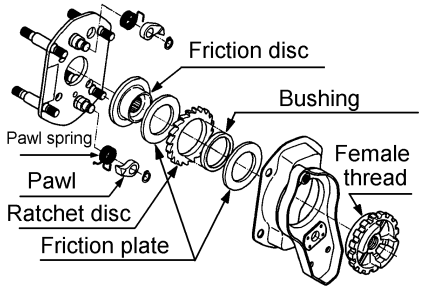
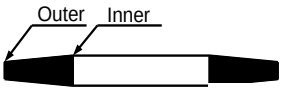
| | | | |
|---|---|---|---|
| Load Chain –<br>Wear | Measure<br>  <br><br>Notice: If wear on the load chain is found, make sure to check that on the load sheave. | | Replace |
| Load Chain –<br>Rust | Visual | Should be free of significant rust.<br>**WARNING** Make sure to lubricate the load chain frequently. | Replace |
| Load Chain –<br>Deformation, Scars | Visual<br>  | - Should be free of deformation (such as twist.)<br>- Should be free of deep scars or dents. | Replace |
| Load Chain –<br>Welding Sparks | Visual<br>  | Should be free of welding sparks.<br>**WARNING** Make sure to avoid welding sparks on the hoist. | Replace |

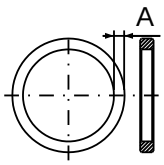
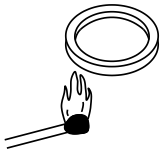
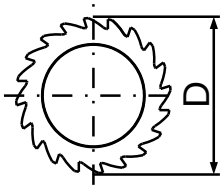
| Capacity (tonnes) | L dimension (mm) | | d dimension (mm) | |
|---|---|---|---|---|
| | Standard | Discard | Standard | Discard |
| 3/4 | 79.0 | 81.3 | 5.6 | 5.1 |
| 1 1/2 | 100.0 | 102.9 | 7.1 | 6.4 |
| 2 1/2 | 124.0 | 127.6 | 8.8 | 7.9 |
| 3, 6, 9 | 141.0 | 145.1 | 10.0 | 9.0 |

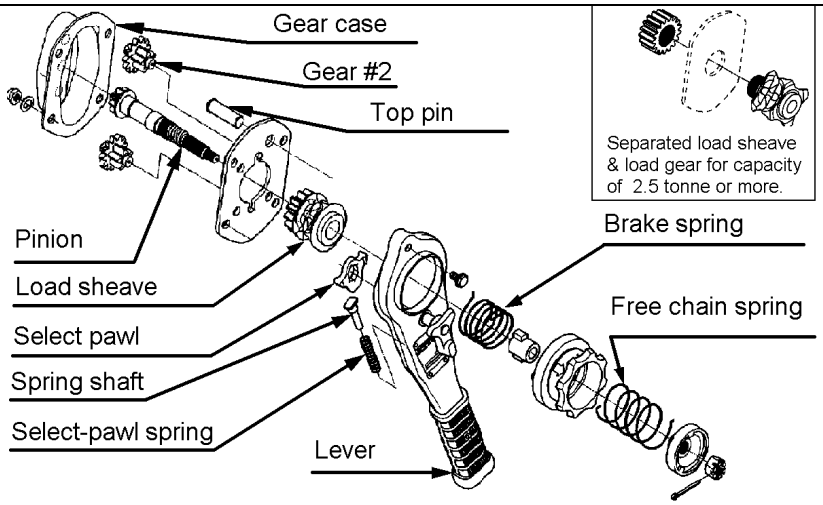
4.4. Periodic Inspection

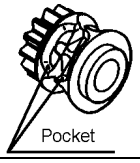
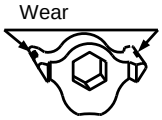
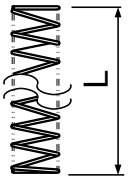
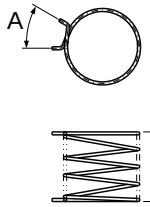
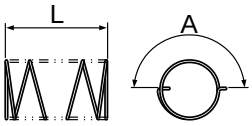
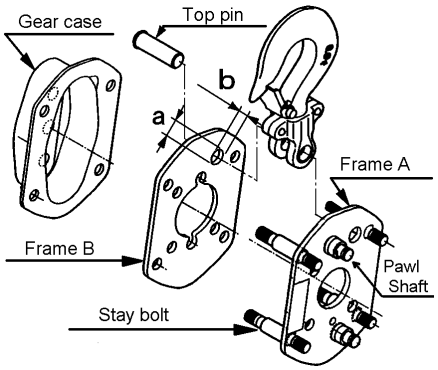
In addition to the frequent inspections, perform the following checks.

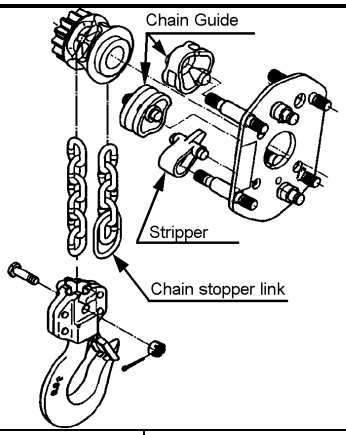
**Table 4-3 Periodic Inspection Methods and Criteria**

<table>
<tr><th>Item</th><th>Method</th><th>Criteria</th><th>Action</th></tr>
<tr><td>Chain Pin – Deformation</td><td rowspan="2">Visual, Measure<br>  <br></td><td rowspan="2">- Significantly deformed pin should be discarded.<br>- Should be free of scars or deformation on the thread.<br><table><tr><th rowspan="2">Capacity (tonnes)</th><th colspan="2">d dimension (mm)</th></tr><tr><th>Standard</th><th>Discard</th></tr><tr><td>3/4</td><td>6.8</td><td>6.5</td></tr><tr><td>1 1/2</td><td>8.7</td><td>8.3</td></tr><tr><td>2 1/2</td><td>10.8</td><td>10.3</td></tr><tr><td>3, 6, 9</td><td>12.1</td><td>11.5</td></tr></table></td><td>Replace.</td></tr>
<tr><td>Chain Pin – Wear</td><td>Replace.</td></tr>
<tr><td>Chain Pin – Rust</td><td>Visual</td><td>Should be free of significant rust.</td><td>Replace.</td></tr>
<tr><td>Yoke – Hole Deformation</td><td>Measure<br>Check the diameters of the top pin and chain pin hole.<br>  <br></td><td></td><td>Replace the hook set.</td></tr>
<tr><td colspan="4"><table><tr><th rowspan="3">Capacity (tonnes)</th><th colspan="4">Diameter (mm) for</th></tr><tr><th colspan="2">Chain pin</th><th colspan="2">Top pin</th></tr><tr><th>Standard</th><th>Discard</th><th>Standard</th><th>Discard</th></tr><tr><td>3/4</td><td>7.1</td><td>7.6</td><td>12.2</td><td>12.7</td></tr><tr><td>1 1/2</td><td>8.9</td><td>9.4</td><td>12.2</td><td>12.7</td></tr><tr><td>2 1/2</td><td>11.0</td><td>11.5</td><td>14.2</td><td>14.7</td></tr><tr><td>3</td><td>12.3</td><td>12.8</td><td>16.2</td><td>16.7</td></tr><tr><td>6, 9</td><td>12.3</td><td>12.8</td><td>16.4</td><td>16.9</td></tr></table></td></tr>
<tr><td>Braking System – Components</td><td colspan="3">  <br></td></tr>
<tr><td>Braking System – Friction Surface</td><td>Visual</td><td>- Should free of scars or gouged flaws on the braking surface of the Friction Disc, Friction Plate, Ratchet Disc, Female Thread.<br>- The braking surface of the above -mentioned parts should not be excessively worn with the tool marks erased and surface lustered.</td><td>Replace</td></tr>
<tr><td>Braking System – Friction Plate</td><td>Measure<br>  <br></td><td>- Should have uniform thickness. The plate with the outer thinner than the inner should be discarded.<br>- Should be free of scars or cracks.<br><table><tr><th rowspan="2">Capacity (tonnes)</th><th colspan="2">Thickness of Friction Plate (mm)</th></tr><tr><th>Standard</th><th>Discard</th></tr><tr><td>All</td><td>3.5</td><td>3.0</td></tr></table></td><td>Replace.</td></tr>
</table>

<table>
<tr><th>Item</th><th>Method</th><th>Criteria</th><th>Action</th></tr>
<tr><td>Braking System – Bushing Wear</td><td>Measure<br> 
</td><td>Should have uniform thickness of A dimension.<br><table><tr><td rowspan="2">Capacity (tonnes)</td><td colspan="2">A dimension (mm)</td></tr><tr><td>Standard</td><td>Discard</td></tr><tr><td>All</td><td>4.0</td><td>3.0</td></tr></table></td><td>Replace.</td></tr>
<tr><td>Braking System – Bushing Lubrication</td><td>Visual<br>Heat with a match flame.<br>  </td><td>Should be so lubricated that lubricant oozes off the surface.<br>WARNING Even for repair or assembly, soak the bushing in turbine oil for a day before reuse.</td><td>Soak the bushing in turbine oil for a day.</td></tr>
<tr><td>Braking System – Ratchet Disc</td><td>Measure<br> 
</td><td><table><tr><td rowspan="2">Capacity (tonnes)</td><td colspan="2">D dimension (mm)</td></tr><tr><td>Standard</td><td>Discard</td></tr><tr><td>3/4</td><td rowspan="3">64</td><td rowspan="3">61</td></tr><tr><td>1 1/2</td></tr><tr><td>2 1/2</td></tr><tr><td>3, 6, 9</td><td>74</td><td>71</td></tr></table></td><td>Replace</td></tr>
<tr><td>Braking System – Pawl</td><td>Visual<br> 
</td><td>As shown in the left picture, the side of the pawl should not be worn.</td><td>Replace</td></tr>
<tr><td>Braking System – Pawl Spring</td><td>Visual<br>  </td><td>Should not be deformed or scarred.</td><td>Replace</td></tr>
<tr><td>Braking System – Female thread</td><td>Visual</td><td>The cogs should be free of significant deformations.</td><td>Replace</td></tr>
<tr><td>Braking System – Rust</td><td>Visual</td><td>All parts should be free of rust.</td><td>Replace</td></tr>
</table>

<table>
<tr><td>Lifting system– Components</td><td> 
</td></tr>
</table>

<table>
<tr><th>Item</th><th>Method</th><th>Criteria</th><th>Action</th></tr>
<tr><td>Lifting system – Load Sheave</td><td>Visual<br>  <br></td><td>Should be free of wear in the pockets or scars on the rising parts.</td><td>Replace</td></tr>
<tr><td>Lifting system – Cogs</td><td>Visual</td><td>Should not be chipped, unevenly worn or scarred.</td><td>Replace</td></tr>
<tr><td>Lifting system – Pinion</td><td>Visual</td><td>A deformed pinion should be discarded.</td><td>Replace</td></tr>
<tr><td>Lifting system – Lever</td><td>Visual</td><td>Should be free of loose caulking, bends or cracks.</td><td>Replace</td></tr>
<tr><td>Lifting system – Select Pawl</td><td>Visual<br>  <br></td><td>As shown in the left picture, the sides of the pawl should not be worn.</td><td>Replace</td></tr>
<tr><td>Lifting system – Spring Shaft</td><td>Visual</td><td>Should be free of deformation (such as bend.)</td><td>Replace</td></tr>
<tr><td>Lifting system – Select-pawl Spring</td><td>Measure<br>  <br></td><td><table><tr><th>Capacity (tonnes)</th><th>L dimension (mm) Minimum</th></tr><tr><td>3/4</td><td rowspan="3">37</td></tr><tr><td>1 1/2</td></tr><tr><td>2 1/2</td></tr><tr><td>3, 6, 9</td><td>42</td></tr></table></td><td>Replace</td></tr>
<tr><td>Lifting system –Brake Spring</td><td>Measure<br>  <br></td><td><table><tr><th rowspan="2">Capacity (tonnes)</th><th rowspan="2">L dimension (mm) Minimum</th><th colspan="2">A angle (°: degree)</th></tr><tr><th>Standard</th><th>Discard</th></tr><tr><td>3/4</td><td rowspan="3">30</td><td rowspan="3">30</td><td rowspan="3">45</td></tr><tr><td>1 1/2</td></tr><tr><td>2 1/2</td></tr><tr><td>3, 6, 9</td><td>30</td><td>25</td><td>40</td></tr></table></td><td>Replace</td></tr>
<tr><td>Lifting system –Free Chain Spring</td><td>Measure<br>  <br></td><td><table><tr><th rowspan="2">Capacity (tonnes)</th><th colspan="2">L dimension (mm)</th><th colspan="2">A angle (°: degree)</th></tr><tr><th>Standard</th><th>Discard</th><th>Standard</th><th>Discard</th></tr><tr><td>3/4</td><td rowspan="3">66</td><td rowspan="3">59</td><td rowspan="3">180</td><td rowspan="3">165</td></tr><tr><td>1 1/2</td></tr><tr><td>2 1/2</td></tr><tr><td>3, 6, 9</td><td>71</td><td>64</td><td>180</td><td>165</td></tr></table></td><td>Replace.</td></tr>
<tr><td>Body – Components</td><td>  <br><br>Figure 4-1 Body Components</td><td></td></tr>
</table>

<table>
<tr><th>Item</th><th>Method</th><th>Criteria</th><th>Action</th></tr>
<tr><td>Body –<br>Frame A, B<br>Stay Bolts<br>Top Pin Hole<br>Pawl Shafts</td><td>Visual</td><td>- Should be free of major deformation or significant scars.<br>- Should be free of loose caulking.<br>- Should be free of cracks on the welding parts.<br>- The maximum of a, b as shown in Figure 4-1 should be 0.5 mm.<br>- The bearing holes should not be deformed.</td><td>Replace.</td></tr>
<tr><td>Body –<br>Gear Case</td><td>Visual</td><td>- Should be free of major deformation or significant scars.<br>- The bearing holes for the gear #2 and the pinion should not be deformed.</td><td>Replace.</td></tr>
<tr><td>Body –<br>Top Pin</td><td>Measure<br> 
</td><td>Should be free of significant deformation.
<table>
<tr><th rowspan="2">Capacity (tonnes)</th><th colspan="2">d dimension (mm)</th></tr>
<tr><th>Standard</th><th>Discard</th></tr>
<tr><td>3/4</td><td rowspan="2">12</td><td rowspan="2">11.4</td></tr>
<tr><td>1 1/2</td></tr>
<tr><td>2 1/2</td><td>14</td><td>13.3</td></tr>
<tr><td>3, 6, 9</td><td>16</td><td>15.2</td></tr>
</table></td><td>Replace.</td></tr>
<tr><td>Others –<br>Components</td><td colspan="2"> 
</td><td></td></tr>
<tr><td>Others –<br>Stripper</td><td>Visual</td><td>Should be free of cracks or deformation on the tip.</td><td>Replace.</td></tr>
<tr><td>Others –<br>Chain Stopper Link</td><td>Visual</td><td>Should not be open or significantly deformed.</td><td>Replace.</td></tr>
<tr><td>Others –<br>Chain Guide</td><td>Visual</td><td>Should be free of damage or significant deformation.</td><td>Replace.</td></tr>
</table>

| Item | Method | Criteria | Action |
|---|---|---|---|
| Preoperational Checks | Before reuse, reassemble properly the hoist in accordance with 0 Maintenance in this manual and perform the following the checks. | | |
| Checks under No Load – Lifting | Function, Auditory<br>Set the select lever to 'UP' and make lifting operation with the load-side chain pulled slightly. | - The lever should be operated smoothly.<br>- Moving the lever forwards and backwards should make clicking sounds. | Repair or replace as necessary. |
| Checks under No Load – Lowering | Function, Auditory<br>Set the select lever to 'DN' and make lowering operation with the load-side chain pulled slightly. | - The lever should be operated smoothly.<br>- Moving the lever only backwards, not forwards, should make clicking sounds. | Repair or replace as necessary. |
| Checks under No Load – Free Chaining | Function<br>Set the select lever to 'N' and pull the free chain knob upwards into free chaining mode to adjust the chain length. | - The chain should be pulled smoothly.<br>- The free chain knob should be easily pulled or reset. | Repair or replace as necessary. |
| Checks under the rated load | Function<br>Lift and lower the rated load from 20 to 30 cm. Check the functions in accordance with "Function - ……" of 4.3 Frequent Inspection. | See "Function - ……" of 4.3 Frequent Inspection. | See "Function - ……" of 4.3 Frequent Inspection. |

Maintenance

4.5. General

Improper maintenance may result in death or serious injury. Have only a trained or competent people maintain the hoist, or contact your dealer.

**CAUTION**

- Do **NOT** use the hoist which is under maintenance.
- Perform all inspections given in **4 Inspection** if any irregularity of the hoist is found after operation.
- Do **NOT** store the hoist under a load.
- Remove any dirt or water on the hoist.
- Store the hoist in a dry and clean area.

**Lubrication**

- Always ensure that the load chain, the chain pin, the axel base of select lever, the top pin, the hook necks and the hook latches are well oiled. Refer to **2.1.1 Schematics**.
- Load chain - The load chain is one of the most critical parts of the hoist. Ensure to lubricate the load chain well with rust preventive oil equivalent to ISO VG32.
- Others - Lubricate the contacting parts as instructed in the following sections.

4.6. Disassembly, Assembly and Adjustment

**WARNING**

- Perform proper disassembly or assembly in accordance with this manual.
- The friction plates are dry ones. Do **NOT** lubricate them.
- Do **NOT** extend the load chain, i.e. add extra links.
- Remove old grease from the disassembled parts.
- Replace components only with KITO approved parts.
- To reassemble, apply new grease, and use a new split pin and snap ring.

Note: The following symbols in this manual indicate the recommended lubricants.

G1: JIS K2220 general class 1, No.2 grease (Cup Grease 1-2, NIPPON OIL)

G2: JIS K2246 General Class 1, No.1 (NP-9), Lubricating oil type long-term rust preventive oil (Antirust Terami LN-H, ENEOS)

G3: Moly Speed Grease No. 2 (SUMICO LUBRICANT)

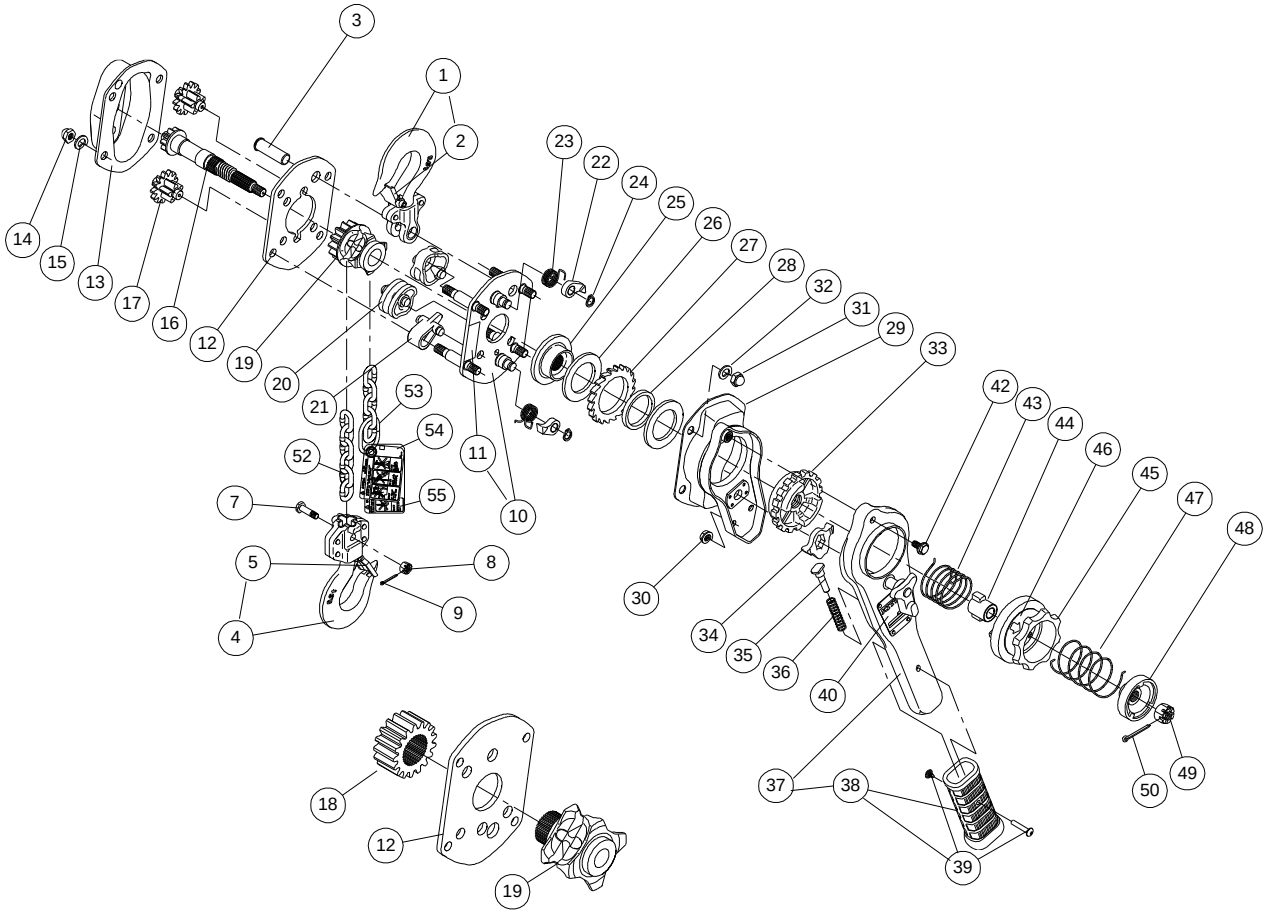
4.7. Tools

To disassemble or reassemble the hoist, prepare for the following tools.

**Table 5-1 Tools**

| # | Tools | For |
|---|---|---|
| 1 | Snap ring pliers | Opening a snap ring |
| 2 | Socket wrenches 12, 14 mm | Slotted nuts |
| 3 | Hex keys 4, 5, 10, 12 mm | Socket head cap screws |
| 4 | Wrenches 10, 12, 13, 14, 17 mm | Bolts and nuts |
| 5 | Philips screwdriver | Machine screws |
| 6 | Pliers | Split pins |
| 7 | Soft-face (plastic) hammer | |

4.8. Components




Exclusive for 2 1/2 & 3 tonnes

| Fig. # | Part # | Part Name | Fig. # | Part # | Part Name | Fig. # | Part # | Part Name |
|---|---|---|---|---|---|---|---|---|
| 1 | 1001 | Top Hook Set | 19 | 116 | Load Sheave | 36 | 223 | Select-pawl Spring |
| 2 | 1071 | Latch Assembly | 20 | 161 | Chain Guide | 37 | 5211 | Lever Assembly |
| 3 | 163 | Top Pin | 21 | 162 | Stripper | 38 | 231 | Grip |
| 4 | 1021 | Bottom Hook Set | 22 | 155 | Pawl | 39 | 232 | Binding Screws |
| 5 | 1071 | Latch Assembly | 23 | 158 | Pawl Spring | 40 | 800 | Nameplate |
| 7 | 41 | Chain Pin | 24 | 188 | Snap Ring | 42 | 221 | Hex Cap Screw |
| 8 | 49 | Slotted Nut | 25 | 153 | Friction Disc | 43 | 207 | Brake Spring |
| 9 | 96 | Split Pin | 26 | 151 | Friction Plate | 44 | 203 | Cam Guide |
| 10 | 5101 | Frame A Assembly | 27 | 152 | Ratchet Disc | 45 | 5201 | Free Chain Knob Assembly |
| 11 | 806 | Nameplate F | 28 | 154 | Bushing | 46 | 810 | Nameplate U |
| 12 | 102 | Frame B | 29 | 5214 | Brake Cover Assembly | 47 | 205 | Free Chain Spring |
| 13 | 5103 | Gear Case Assembly | 30 | 281 | Flange Nut | 48 | 208 | Spring Holder |
| 14 | 181 | Domed Cap Nut | 31 | 184 | Domed Cap Nut | 49 | 183 | Slotted Nut |
| 15 | 182 | Spring Lock Washer | 32 | 185 | Spring Lock Washer | 50 | 187 | Split Pin |
| 16 | 111 | Pinion | 33 | 160 | Female Thread | 52 | 841 | Nickel-plated Load Chain |
| 17 | 112 | Gear #2 | 34 | 218 | Select Pawl | 53 | 45 | Chain Stopper Link |
| 18 | 114 | Load Gear | 35 | 222 | Spring Shaft | 54 | 931 | Warning Tag LKA |
| | | | | | | 55 | 932 | Warning Tag LKB |

4.9. Disassembly

Proceed as follows:

4.9.1. Free Chain Knob

1) Pull out (50) Split Pin and remove (49) Slotted Nut.
2) Remove (48) Spring Holder, (47) Free Chain Spring, (45) Free Chain Knob Assembly, (43) Brake Spring and (44) Cam Guide from (16) Pinion.

4.9.2. Lever

1) Remove (31) Domed Cap Nut and (32) Spring Lock Washer that fix (29) Brake Cover Assembly to (10) Frame A Assembly, and then remove (29) Brake Cover Assembly.
2) While holding (37) Lever Assembly horizontally by hand, turn (33) Female Thread counterclockwise and remove the lever assembly from the hoist.
3) Remove (42) Hex Cap Screw and (30) Flange Nut, and separate (37) Lever Assembly and (29) Brake Cover Assembly.
4) Remove (33) Female Thread from (29) Brake Cover Assembly.
5) Remove (34) Select Pawl, (35) Spring Shaft and (36) Select-pawl Spring from (37) Lever Assembly.

4.9.3. Brake

1) Remove the parts from (16) Pinion in the following order, (26) Friction Plate (outer), (27) Ratchet Disc, (28) Bushing, (26) Friction Plate (inner) and (25) Friction Disc.
2) Remove (24) Snap Ring from the pawl shaft with snap ring pliers, and remove (22) Pawl and (23) Pawl Spring.

4.9.4. Gears

1) Remove (14) Domed Cap Nut and (15) Spring Lock Washer, and detach (13) Gear Case Assembly.
2) Remove (17) Gear #2, (16) Pinion, (18) Load Gear.
   Note: For capacity 1 1/2 tonnes or less, the load gear and (19) Load Sheave are as one, and the load gear will not be detached.
3) Pull out (3) Top Pin and remove (1) Top Hook Set.

4.9.5. Load Chain

1) Remove (12) Frame B, (20) Chain Guide and (21) Stripper.
2) Remove (52) Load Chain from (19) Load Sheave.
3) Remove (9) Split Pin, (8) Slotted Nut and (7) Chain Pin from yoke part of (4) Bottom Hook Set, and remove (52) Load Chain.
4) Remove (19) Load Sheave.

4.10. Assembly

**WARNING**

- Inspect and replace any worn or damaged parts according to Section 4 Inspection.
- Secure all nuts and bolts firmly.
- Also secure all split pins.

Proceed as follows:

4.10.1. Lever

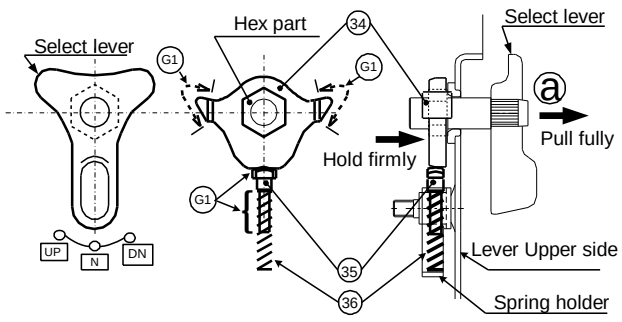
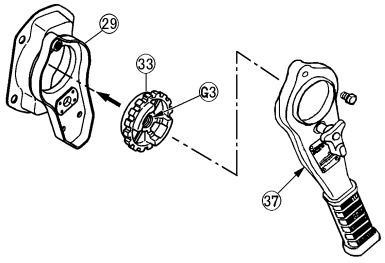



Figure 5-1 Internal Lever Assembly

1) Set the select lever on the lever upper side to 'N' position.
2) With the select lever pulled in the 'a' direction, as shown in Figure 5-1, insert the hex part of the select lever into (34) Select Pawl.
3) Apply (G1) grease lightly to the pawl of (34) Select Pawl.
4) Apply (G1) grease lightly to the part of (35) Spring Shaft as shown in Figure 5-1.
5) Insert (35) Spring Shaft into (36) Select-pawl Spring and attach them into the spring holder.




**WARNING** Do **NOT** apply oil to the friction side of the female thread.

**CAUTION** Ensure to clean the friction side of the female thread.

Figure 5-2 Lever Assembly

Refer to Figure 5-2, proceed as follows:

1) Apply (G3) grease lightly to the thread of (33) Female Thread.
2) Attach the friction side of (33) Female Thread to (29) Brake Cover Assembly and set (37) Lever Assembly on them.
3) Secure it with (42) Hex Cap Screw and (30) Flange Nut.

4.10.2. Lever Grip

**CAUTION**

New glue accompanies the lever grip when it is ordered for repair. Read and comply with its instruction manual and remove dirt such as water, oil and rust from the part glue-applied on the lever.

**Applying glue**

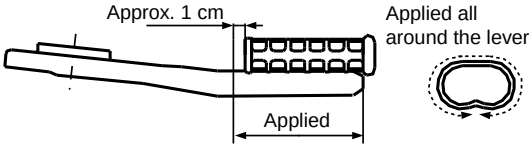



Figure 5-3 Applying Glue to Lever

1) Make a quick and even application of the glue on the four sides of the lever as shown in Figure 5-3.
2) As instructed below, attach (38) Grip to the lever within 10 seconds after applying the glue. (Note: It will be difficult to attach if the glue dries or hardens.)

**Fitting**

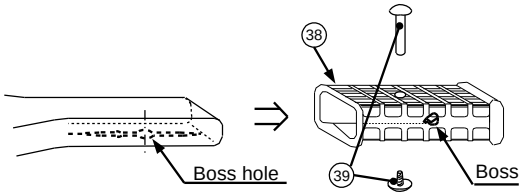


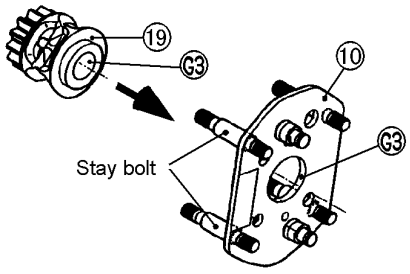

Figure 5-4 Fitting Grip onto Lever

Refer to Figure 5-4, proceed as follows:

1) Place (38) Grip with its inside boss downwards.
2) Insert the boss of (38) Grip until it completely fits into the boss hole of the lever.
3) Tighten (39) Binding Screws firmly.

4.10.3. Load Sheave & Chain

1) Attach (4) Bottom Hook Set to (52) Load Chain with (8) Slotted Nut and (7) Split Pin.




**CAUTION** Use a new split pin.

2) Apply (G3) grease to the inner parts of the bearing hole of (10) Frame A Assembly and (19) Load Sheave as shown in Figure 5-5.
3) Attach (19) Load Sheave to (10) Frame A Assembly at the stay-bolt longer side of the frame. Note: Face the side of the load sheave where it has no gear or serration.

Figure 5-5 Load Sheave Attachment to Frame A Assy

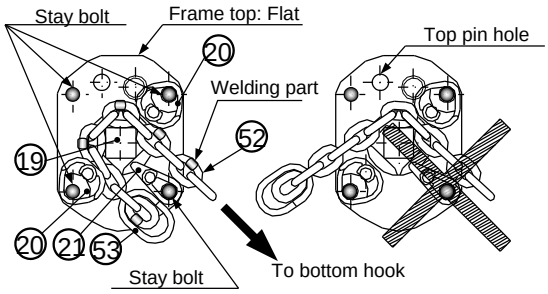



Figure 5-6 Load Chain Reeving Direction

1) Set (52) Load Chain to (19) Load Sheave as shown in Figure 5-6, and attach (20) Chain Guide and (21) Stripper. Refer to Figure 5-6.

**CAUTION**

■ Keep (53) Chain stopper link in parallel with the frame and set (52) Load chain with its welding part directed outwards.
■ Reeve (52) Load chain through (19) Load sheave and (20) Chain guide.

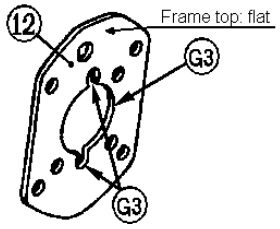



Figure 5-7 Frame B

Refer to Figure 5-7, proceed as follows:
1） Apply (G3) grease to the bearing part of (12) Frame B.
2） Make sure of proper fitting before attaching (12) Frame B To the stay bolts.

**CAUTION**

Make sure to set the flat parts of (10) Frame A Assembly and (12) Frame B in the same position with the holes for the top pin arranged.

4.10.4. Chain stopper link

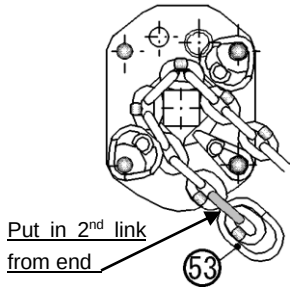


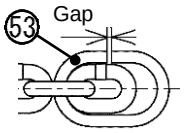

Figure 5-8 Chain stopper link B

Refer to Figure 5-8, proceed as follows:
■ If the no-load side of the load chain is disengaged from the load sheave by free chaining and excessive rewinding, you are exposed to an extremely dangerous state. To avoid this, attach a （53）chain stopper link.

**DANGER**

When attaching the （53）chain stopper link afresh, be sure to use new one and attach it to the second link of the load chain from the no-load side. If attached to the end link, it may be deformed or fractured, failing to prevent disengagement of the load chain.

■ The gaps when the link is closed shall be as per table.




| Capacity (tonnes) | 3/4 | 1 1/2 | 2 1/2 | 3、6、9 |
|---|---|---|---|---|
| Gap（mm） | 1±1 | 2±1 | | |

4.10.5. Top Hook

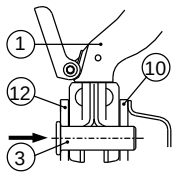



Figure 5-9 Top Hook Attachment

Refer to Figure 5-9, proceed as follows:
1) Fit (1) Top hook set between (10) Frame A Assembly and (12) Frame B.
2) Insert (3) Top Pin from the side of (12) Frame B to fasten (1) Top Hook Set.

4.10.6. Gears

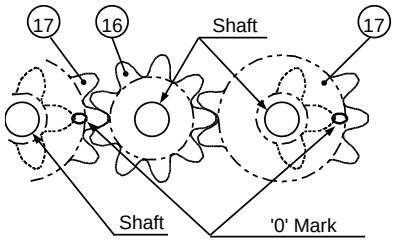



Figure 5-10 Gears

Refer to Figure 5-10, proceed as follows:

1) For capacity of 2 1/2 tonnes or more, attach (18) Load Gear to the serration part of (19) Load Sheave.

Note: Make sure that the load sheave is inserted to the load gear completely. If necessary, use a plastic hammer.

2) Insert (16) Pinion into (19) Load Sheave and arrange the pinion with (17) Gear #2 as shown in Figure 5-9.

**CAUTION** If '0' mark alignment on two of the gear #2 do not match to Figure 5-9, the gears will not rotate.

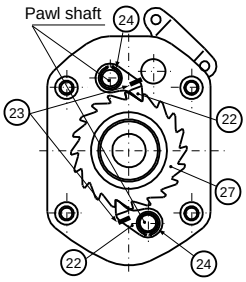
3) Apply (G1) grease to gear cogs and shafts of e.g. (16) Pinion, (17) Gear #2 and (18) Load Gear.

**CAUTION** Apply grease good enough to the cogs. (approx. 20 g for 3/4 tonne, 30 g for 1 1/2 & 2 1/2, 60 g for 3 or more)

4) Set (13) Gear Case Assembly over the gears and fix it firmly to the stay bolts with (14) Domed Cap Nut and (15) Spring Lock Washer.

**CAUTION** Fit the rims of (12) Gear Frame B and (13) Gear Case in right direction.

4.10.7. Brake



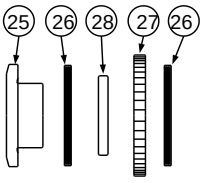

Refer to Figures 5-11 and 5-12 proceed as follows:

1) Apply (G2) grease to the pawl shaft and (22) Pawl.

**CAUTION** For (22) Pawl, just coat it with the grease, **NOT** too much.

2) Fasten two sets of (23) Pawl Spring and (22) Pawl with (24) Snap Ring.
3) While holding two pawls outwards, set (25) Friction Disc, (26) Friction Plate, (28) Bushing, (27) Ratchet Disc and (26) Friction Plate properly in this order.

Figure 5-11 Pawl Shaft and Pawl




**CAUTION**

- Make sure that the pawl spring fits into the pawl.
- Make sure that the pawl comes into good contact with the ratchet disc.
- The friction plates are dry ones. Do **NOT** apply oil to them.
- Make sure that (28) Bushing has sufficient oil. If the bushing oil is not enough, soak the bushing in turbine oil for a day and wipe extra oil for reuse.

Figure 5-12 Disc, Plate, Bushing Order

4.10.8. Lever & Body

1) Attach the lever assembled in 4.10.1 to the previously-assembled bake.
   Ensure to fit the rims of (10) Frame A assembly and (29) Brake Cover Assembly in right direction.
2) Fit (29) Brake Cover Assembly and (10) Frame A Assembly by screwing (33) Female Thread of the lever assembly clockwise to the thread of (16) Pinion until making clicking sounds.
3) Fasten (29) Brake Cover Assembly firmly to the stay bolts with (14) Domed Cap Nut and (15) Spring Lock Washer.

**CAUTION**

To eliminate a clearance in the brake section, perform the following procedures before moving to the next step.

(1) Set the select lever to 'N' position.
(2) Turn (33) Female Thread clockwise to tighten the brake lightly with (52) Load Chain at the hook side held by hand firmly without (19) Load Sheave's rotation.

Insufficient hold of the chain makes clicking sounds. Even in this case, the clearance is eliminated. After tightening, make sure that the female thread will not rotate counterclockwise.

4) To attach (44) Cam Guide to (16) Pinion, set a boss of the guide slightly to the right from the center of (33) Female Thread's boss as shown in Figure 5-13.
5) Apply (G3) grease lightly to the side of (44) Cam Guide.

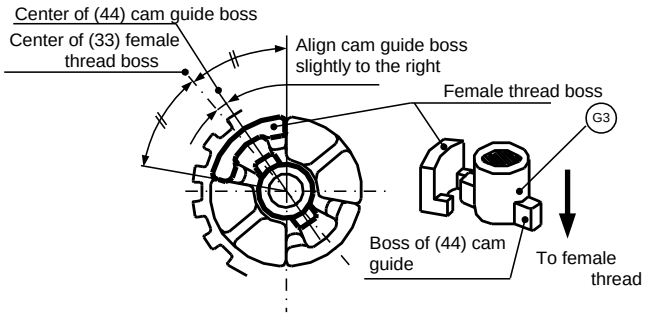
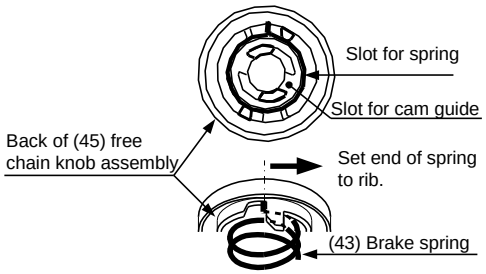
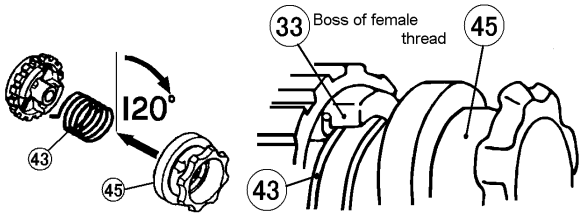



Figure 5-13 Cam Guide




6) Set (43) Brake Spring (silver color) into the slot of the back of (45) Free Chain Knob Assembly.
Note: As shown in Figure 5-14, set the end of the spring to the rib of the knob.

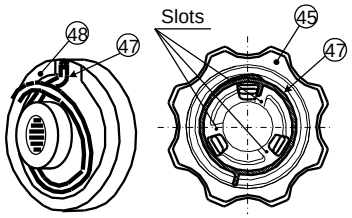
Figure 5-14 Cam Guide and Brake Spring




7) Fit the other end of (43) Brake Spring to the boss of the female thread.
8) Hold the load chain in the hook side firmly to prevent (19) Load Sheave from rotating.
9) Turn (45) Free Chain Knob Assembly 120° **clockwise** while pressing it lightly on (33) Female Thread.

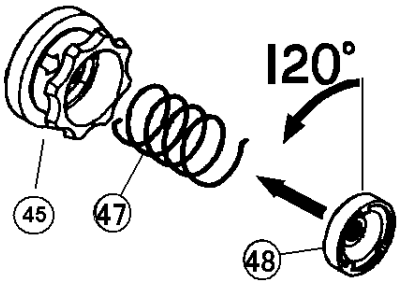
Figure 5-15 Brake Spring, Free Chain Knob & Female Thread Assembly

Note: As the free chain knob turns, the cam parts of (44) Cam Guide fit into the slots of the knob to set the knob down.




10) With (45) Free Chain Knob Assembly pressed, hook the outward-projecting end of (47) Free Chain Spring onto the slot at the back of (48) Spring Holder, and hook the other end (inward-projecting) of the spring onto the slot of (45) Free Chain Knob Assembly.

Figure 5-16 Free Chain Knob Assembly




11) Turn (48) Spring Holder 120° **counterclockwise** while pressing it lightly towards (45) Free Chain Knob Assembly to insert it along the pinion serration.
Note: (47) Free Chain Spring raises (48) Spring Holder. Hold and do not loosen it.
12) With (48) Spring Holder held, fasten it with (49) Slotted Nut and (50) Split Pin.
13) Set the select lever to 'N' position and pull the free chain knob into the free chaining mode. Ensure to perform the free chaining operation.

Figure 5-16 Free Chain Knob and Spring Holder

**CAUTION**

If the free chaining can not be performed, the hoist has been misassembled. Ensure to reassemble in accordance with this instruction.

## 4.11. Preoperational Checks

**CAUTION**

After assembly, ensure to perform the preoperational checks with the following points before reuse.

1) Check defects in appearance, any parts left to be installed.
2) Ensure that the hoist operates properly under no load conditions before checking the hoist under a load.
3) Perform lifting and lowering operations under no load and check the following items.
   - Should be free of irregular clicking sounds in lifting or abnormal sounds
   - Should be free of difficult pull to lift
   - Should be free of brake slipping

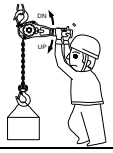
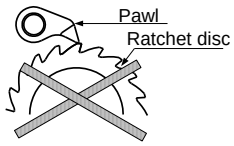
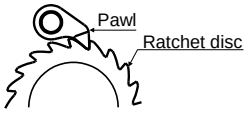
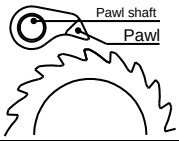
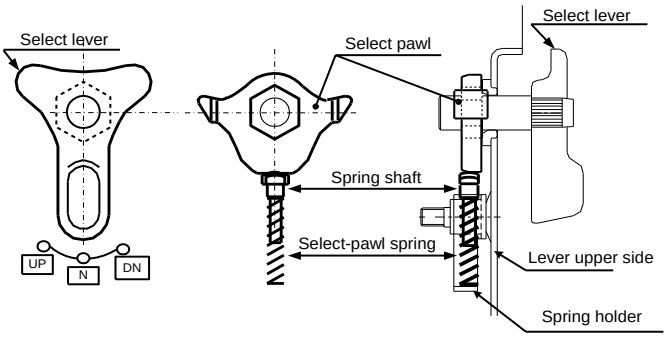
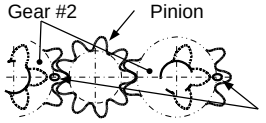
## 5. Troubleshooting

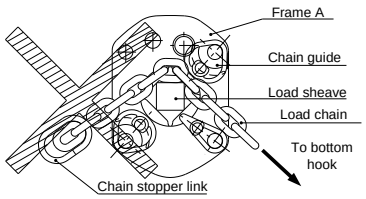
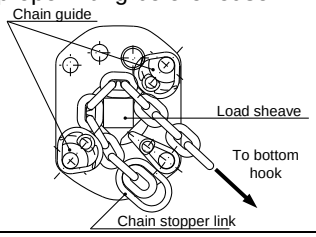
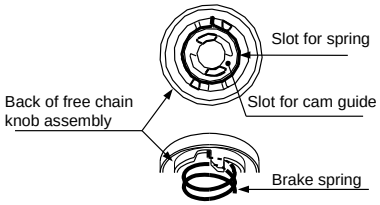
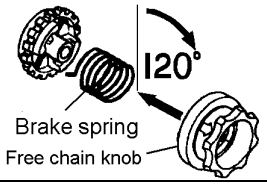
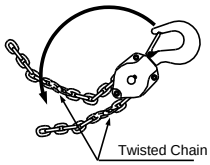
**WARNING**

- Read and comply with the instructions in this manual and use the hoist properly.
- If a defect is found in the hoist, stop using it immediately and check for the cause of the defect.
- Ensure that competent people conduct repairs, otherwise please contact your dealer.
- Replace components only with KITO approved parts.

| Symptom | Cause | Remedy |
|---|---|---|

1）Lifting

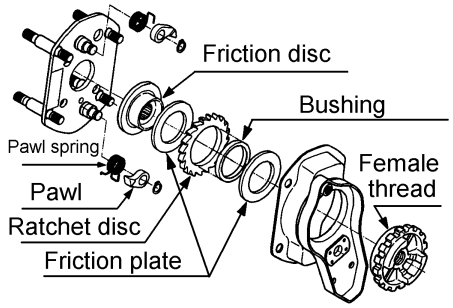
| | | |
|---|---|---|
| **CAUTION**<br>  | Checking sounds from the hoist is a critical inspection point. Note the sounds of the hoist in operation.<br>■ For lifting, moving the lever forwards and backwards should produce clicking sounds.<br>■ For lowering, moving the lever only backwards, not forwards, should produce clicking sounds. | |
| Hoist will not lift<br><br>-Slight clicking | Improper assembly of ratchet disc, i.e. incorrect contact with the pawl caused by its wrong side fitting.<br>  | Reassemble the pawl and ratchet disc properly and ensure to check click sounds before reuse.<br>  |
| Hoist will not lift<br><br>-Not clicking | Faulty pawl contact<br>-The pawl or pawl shaft clogged with dust or oil caused by a long-term negligent maintenance may make poor contact for the pawl and ratchet disc.<br>-Faulty pawl spring may cause this symptom. | Perform periodic overhauls.<br>Faulty contact:<br>  |
| | Improper select-lever fitting<br>-Missing select-pawl spring<br>-Assembly in wrong direction<br>-Clogged with rust<br>  | Reassemble it properly and ensure to check click sound of the select lever before reuse. |
| | Loose select-pawl spring | Perform periodic overhauls. |
| Hoist will not lift<br><br>-Impossible lever operation | Improper assembly of gear #2<br>-Mis-located '0' mark | Reassemble it properly and ensure to check smooth operation before reuse.<br>**CAUTION** Ensure to set the '0' marks of the gear #2 as shown.<br>  |

| Symptom | Cause | Remedy |
|---|---|---|
| Hoist will lift intermittently<br><br>-Slight or irregular clicking | Poor pawl movement caused by faulty pawl spring<br>-The spring is loose or damaged. | Perform periodic overhauls. |
| | Mis-assembly of pawl spring | Reassemble it properly and ensure to check clicking sound of the pawl before reuse. |
| During operation, hoist idles or load drifts | Poor contact of load sheave and load chain caused by improper chain-reeving as shown<br>  <br> | Reassemble it properly and ensure to check proper lifting before reuse.<br>  <br> |
| Hoist will not lift under no load | Mis-assembly of brake spring<br>-Insufficient angle to set the spring will cause a poor braking.<br>  <br> | Reassemble it properly.<br>**CAUTION** Turn the free chain knob 120° clockwise and set the brake spring.<br>  <br> |
| Hoist will not lift all over the way | Capsized hook | Reset the capsized hook.<br>  <br><br>Capsized Hook and Chain<br>Double Fall Models |

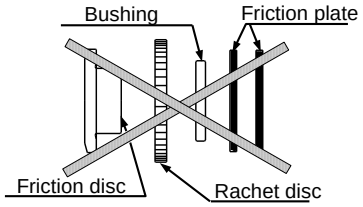
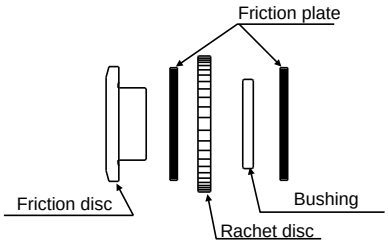
2）Lowering

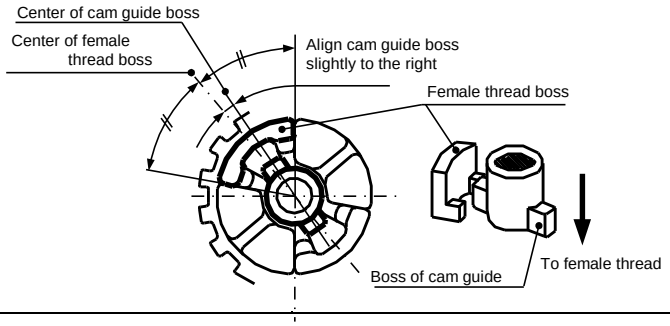
**CAUTION**

-Faulty braking may cause improper lowering.
-The friction method is a dry one. Do **NOT** apply oil to friction surfaces.

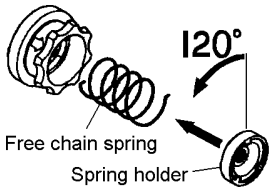



| | | |
|---|---|---|
| Load will not go down | Excessively tightened brake<br>-The hoist under a load left for a long period<br>-A shock during operation | Set the select lever to 'DN' position and reset the brake by pulling harder on the lever. |
| | -Brake tightened by rust | Replace the rusty components and Perform periodic overhauls. |
| Load drops when lowering starts. | A foreign object between friction surfaces. | Remove the object and clean the surfaces. Replace if the surfaces are scarred. |
| | Brake slip caused by significant rust | Replace the rusty component and perform periodic overhauls. |

| Symptom | Cause | Remedy |
|---|---|---|
| Load drifts or slips when lowering starts. | Mis-assembly of friction plates, i.e. friction plates at the same side as shown or one lost   | Reassemble it properly as shown in the following picture and ensure to check hoist functions before reuse.   |
| | Cracked friction plate caused by overload | Replace the friction plate and use the hoist properly within rated capacity. |
| Load drifts or slips when lowering, continued | A foreign object between friction surfaces. | Remove the object and clean the surfaces. Replace if the surface is scarred. |
| | Friction plate wear<br>-Caused by very frequent and long term use. | Perform periodic overhauls. |
| | Mis-assembly of female thread and cam guide<br>-Attaching cam guide without tightening female thread may cause an un-tightened brake. | Reassemble it properly.<br>**CAUTION**<br>Secure the female thread firmly before attaching cam guide. |




3) Free chaining

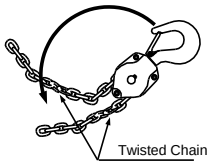
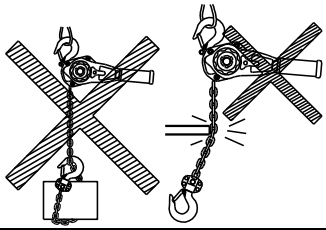
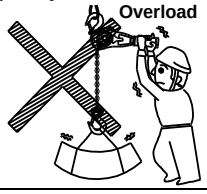
| | | |
|---|---|---|
| Free chain knob does not rise | Damaged or deformed friction plate | Perform periodic overhauls. |
| Load chain is not pulled in free chain mode | Load chain pulled with free chain knob held | Pull the load chain without holding the free chain knob. |
| | Load chain pulled with excessive force and brake engaged | Pull the load chain with less force |
| | Mis-assembly of free chain spring<br>-Twisted with excessive angle | See the symptom of “Hoist will not lift under no load.” |
| Load drops when select lever is set in free chain mode | Mis-assembly of free chain spring<br>-Poorly tightened brake caused by insufficient twist angle. | See the symptom of “Hoist will not lift under no load.” |
| Hard to reset the hoist out of free chain mode | Mis-assembly of free chain spring<br>-Insufficient twist angle | Reassemble it properly.   |

| Symptom | Cause | Remedy |
|---|---|---|

4) Load chain

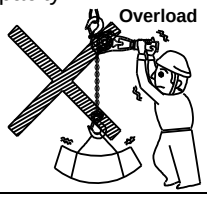
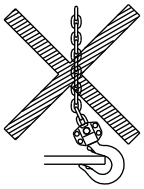
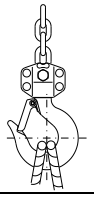
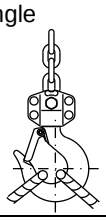
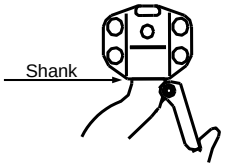
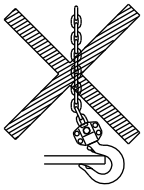
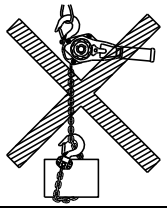
**CAUTION**

-The load chain is one of the most critical parts of the hoist. Ensure to maintain the chain carefully including proper handling, good maintenace and inspection.
-Replace a chain pin when the load chain is replalced.

| | | |
|---|---|---|
| Load chain wear | Lack of lubricant<br>-Caused by high frequent and long term use | Keep the load chain lubricated. |
| Deformed or scarred load chain | Twisted load chain caused by mis-assembling | Reeve the load chain into hoist properly. Replace as needed. |
| | Capsized hook | Reset the capsized hook. Replace as needed.<br>  <br><br>Capsized Hook and Chain<br>Double Fall Models |
| | Contact with load or an obstacle<br>  | Replace as needed.<br>Do **NOT** use the load chain as a sling. |
| | Extended pitch of load chain caused by overload | Replace as needed.<br>**WARNING** Do **NOT** lift over the rated capacity.<br>  <br> |
| Rusty load chain | Lack of lubricant<br>Exposed to rain<br>Exposed to seawater or chemicals | Handle and maintain the hoist properly corresponding to your operating conditions.<br>**CAUTION** Keep the hoist hooked indoors when out of use.<br>  <br> |
| Broken load chain | Caused often by a combination of the three symptoms as mentioned above and shock load | **WARNING** A broken load chain could result in death or serious injury. Ensure to maintain the chain carefully including proper handling, good maitenace and frequent inspection. |

| Symptom | Cause | Remedy |
|---|---|---|

5) Hooks

| | | |
|---|---|---|
| **CAUTION** To prevent the hooks from being damaged, handle them properly in accordance with this manual. | | |
| Stretched hook | Overload<br>-Hook will begin to deform gradually under a load over the double rated capacity. | **WARNING** Stretched hook warns you about overload. Do **NOT** lift over the rated capacity.<br>  |
| | Support on tip of hook<br>  | Support a load in the middle of the hook saddle<br>  |
| | Improper slinging, sling size used to hook, or suspension angle<br>  | -Use a sling suitable for your operation.<br>-Use the sling with suspension angle of 120 degrees or less |
| Bend shank or neck of hook<br>  | Support on tip of hook<br>  | **WARNING** Ensure to support a load in the middle of the hook saddle, otherwise the hook could be damaged. |
| Twisted hook | Attaching load chain around load<br>  | Do **NOT** use the load chain as a sling.<br>  |
| Broken hook latches | Hook deformed by overloading<br>Improper sling size used to hook<br>Sling hooked on latch | Perform proper hooking |

## 6. Warranty

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

KITO warrants that KITO's Products, when shipped, shall be free from defects in workmanship and/or materials under normal use and service and KITO shall, at the election of KITO, repair or replace free of charge any parts or items which are proven to have said defects, provided that all claims for defects under this warranty shall be made in writing immediately upon discovery and, if there is anything within one(1) year from the date of purchase of KITO's Products by Purchaser and provided, further, that defective parts or items shall be kept for examination by KITO or its authorized agents or returned to KITO's factory or authorized service center upon request by KITO.

KITO does not warrant components of products provided by other manufacturers. However to the extent possible, KITO will assign to Purchaser applicable warranties of such other manufacturers.

Except for the repair or replacement mentioned above which is KITO's sole liability and purchaser's exclusive remedy under this warranty, KITO shall not be responsible for any other claims arising out of the purchase and use of KITO's Products, regardless of whether Purchaser's claims are based on breach of contract tort or other theories, including claims for any damages whether direct, indirect incidental or consequential.

This warranty is conditional upon the installation, maintenance and use of KITO's Products pursuant to the product manuals prepared in accordance with content instructions by KITO. This warranty shall not apply to KITO's Products which have been subject to negligence, misuse, abuse, misapplication or any improper use or combination or improper fittings, alignment or maintenance.

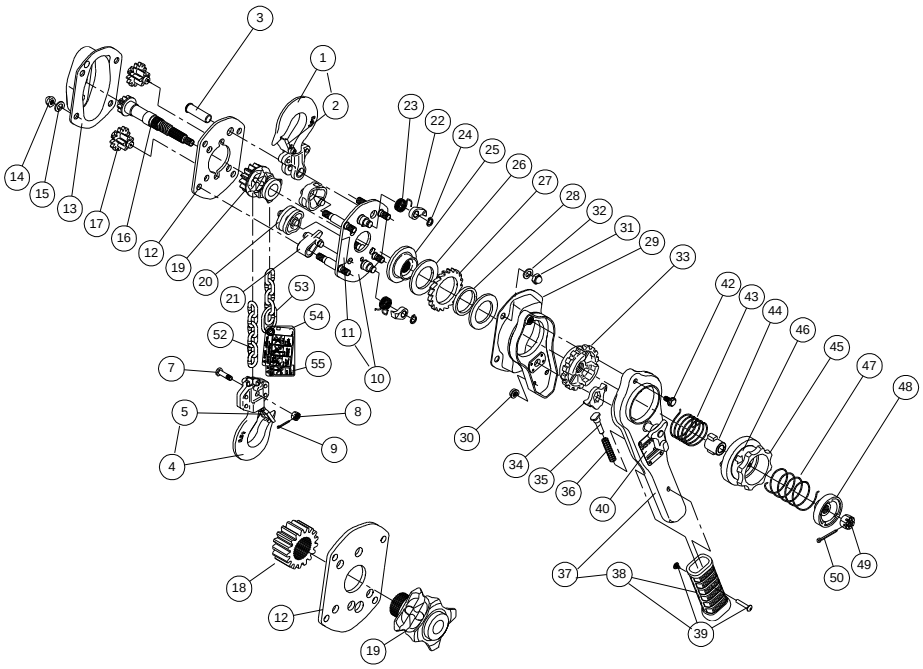
KITO shall not be responsible for any loss or damage caused by transportation, prolonged or improper storage or normal wear and tear of KITO's Products or for loss of operating time.

This warranty shall not apply to KITO's Products which have been fitted with or repaired with parts, components or items not supplied or approved by KITO or which have been modified or altered.

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

# 7. Repair Part List

## 7.1. Up to 3 tonnes

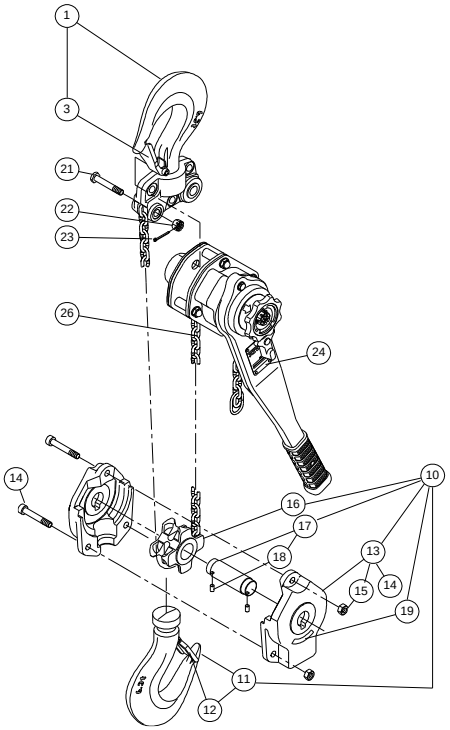


Exclusive for 2 1/2 & 3 tonnes

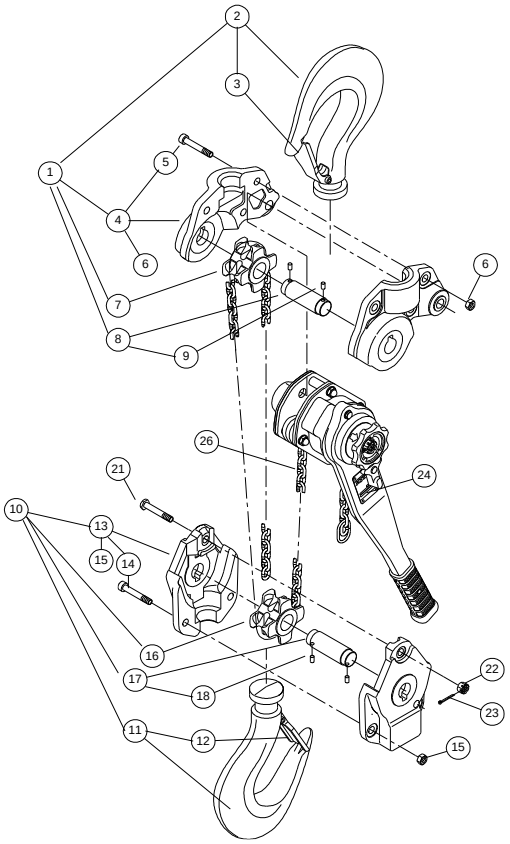
| Fig. # | Part # | Part Name | Parts per Hoist | Capacity (tonnes) | | | |
|---|---|---|---|---|---|---|---|
| | | | | 3/4 | 1 1/2 | 2 1/2 | 3 |
| 1 | 1001 | Top Hook Set | 1 | L5BC008-1001 | L5BC015-1001 | L5BA025-1001 | L5BC030-1001 |
| 2 | 1071 | Latch Assembly | 1 | L5BA008-1071 | L5BA016-1071 | L5BA025-1071 | L5BA032-1071 |
| 3 | 163 | Top Pin | 1 | L5BA008-9163 | L5BA016-9163 | L5BA025-9163 | L5BA032-9163 |
| 4 | 1021 | Bottom Hook Set | 1 | L5BC008-1021 | L5BC015-1021 | L5BA025-1021 | L5BC030-1021 |
| 5 | 1071 | Latch Assembly | 1 | L5BA008-1071 | L5BA016-1071 | L5BA025-1071 | L5BA032-1071 |
| 7 | 41 | Chain Pin | 1 | L4BA008-9041 | C3BA015-9041 | L5BA025-9041 | L4BH030-9041 |
| 8 | 49 | Slotted Nut | 1 | C3BA005-9049 | C3BA010-9049 | C3BA020-9049 | |
| 9 | 96 | Split Pin | 1 | J1PW01-016010 | J1PW01-020012 | J1PW01-020014 | |
| 10 | 5101 | Frame A Assembly | 1 | L5BA008-5101 | L5BA016-5101 | L5BA025-5101 | L5BA032-5101 |
| 11 | 806 | Nameplate F | 1 | C3BA005-9806 | | | |
| 12 | 102 | Frame B | 1 | L5BA008-9102 | L5BA016-9102 | L5BA025-9102 | L5BA032-9102 |
| 13 | 5103 | Gear Case Assembly | 1 | L5BA008-5103 | L5BA016-5103 | L5BA025-5103 | L5BA032-5103 |
| 14 | 181 | Domed Cap Nut | 4 | J1ND002-30080 | | | |
| 15 | 182 | Spring Lock Washer | 4 | J1WS012-20080 | | | |
| 16 | 111 | Pinion | 1 | L5BA008-9111 | L5BA016-9111 | L5BA025-9111 | L5BA032-9111 |
| 17 | 112 | Gear #2 | 2 | L5BA008-9112 | L5BA016-9112 | L5BA025-9112 | L5BA032-9112 |
| 18 | 114 | Load Gear | 1 | ———— | | L5BA025-9114 | L5BA032-9114 |
| 19 | 116 | Load Sheave | 1 | L5BA008-9116 | L5BA016-9116 | L5BA025-9116 | L5BA032-9116 |
| 20 | 161 | Chain Guide | 2 | L5BA008-9161 | L5BA016-9161 | L5BA025-9161 | L5BA032-9161 |
| 21 | 162 | Stripper | 1 | L5BA008-9162 | L5BA016-9162 | L5BA025-9162 | L5BA032-9162 |
| 22 | 155 | Pawl | 2 | L4BA008-9155 | | L5BA025-9155 | L4BA030-9155 |
| 23 | 158 | Pawl Spring | 2 | L5BA008-9158 | L5BA016-9158 | L5BA025-9158 | L5BA032-9158 |
| 24 | 188 | Snap Ring | 2 | J1SS000-00009 | | | J1SS000-00011 |
| 25 | 153 | Friction Disc | 1 | L5BA008-9153 | | | L5BA032-9153 |
| 26 | 151 | Friction Plate | 2 | L5BA025-9151 | | | L5BA063-9151 |
| 27 | 152 | Ratchet Disc | 1 | L4BA008-9152 | | | L4BA015-9152 |
| 28 | 154 | Bushing | 1 | L4BA008-9154 | | | L4BA015-9154 |
| 29 | 5214 | Brake Cover Assembly | 1 | L5BA008-5214 | L5BA016-5214 | L5BA025-5214 | L5BA032-5214 |
| 30 | 281 | Flange Nut | 2 | J1NF002-10060 | | | J1NE002-10080 |
| 31 | 184 | Domed Cap Nut | 4 | J1ND002-30080 | | | |
| 32 | 185 | Spring Lock Washer | 4 | J1WS012-20080 | | | |
| 33 | 160 | Female Thread | 1 | L5BA008-9160 | | | L5BA032-9160 |
| 34 | 218 | Select Pawl | 1 | L4BA008-9218 | | | L4BA015-9218 |
| 35 | 222 | Spring Shaft | 1 | L2BA008-9221 | | | L3BA015-9222 |
| 36 | 223 | Select-pawl Spring | 1 | L2BA008-9223 | | | L2BA015-9223 |
| 37 | 6211 | Lever Assembly | 1 | L5BA008-6211 | L5BA016-6211 | | L5BA032-6211 |
| 38 | 1231 | Grip | 1 | L5BA008-1231 | L4BA008-1231 | | L4BA015-1231 |
| 39 | 232 | Binding Screws | 1 | L5BA008-9232 | | | L5BA032-9232 |
| 40 | 800 | Nameplate | 1 | L5BC008-9800 | L5BC015-9800 | L5BC025-9800 | L5BC030-9800 |
| 42 | 221 | Hex Cap Screw | 1 | L4BA008-9221 | | | L4BA015-9221 |
| 43 | 207 | Brake Spring | 1 | L4BA008-9207 | | | L4BA015-9207 |
| 44 | 203 | Cam Guide | 1 | L5BA008-9203 | | | L4BA015-9203 |
| 45 | 201 | Free Chain Knob | 1 | L4BA008-9201 | | | L4BA015-9201 |
| 46 | 810 | Nameplate U | 1 | L5BA008-9810 | | | |
| 47 | 205 | Free Chain Spring | 1 | L4BA008-9205 | | | L4BA015-9205 |
| 48 | 208 | Spring Holder | 1 | L5BA008-9208 | | | L5BA032-9208 |
| 49 | 183 | Slotted Nut | 1 | C3BA020-9049 | | | |
| 50 | 187 | Split Pin | 1 | J1PW01-020014 | | | |
| 52 | 841 | Nickel-plated Load Chain | 1 | KAQN056J0000 | KAQN071J0000 | KAUN088-0000 | KAQN100J0000 |
| 53 | 45 | Chain Stopper Link | 1 | L5BA008-9045 | L5BA016-9045 | L5BA025-9045 | L5BA032-9045 |
| 54 | 931 | Warning Tag LKA | 1 | L4BR008-9931 | | | |
| 55 | 932 | Warning Tag LKB | 1 | L4BR008-9932 | | | |

7.2. Exclusive Parts

6 tonnes




9 tonnes

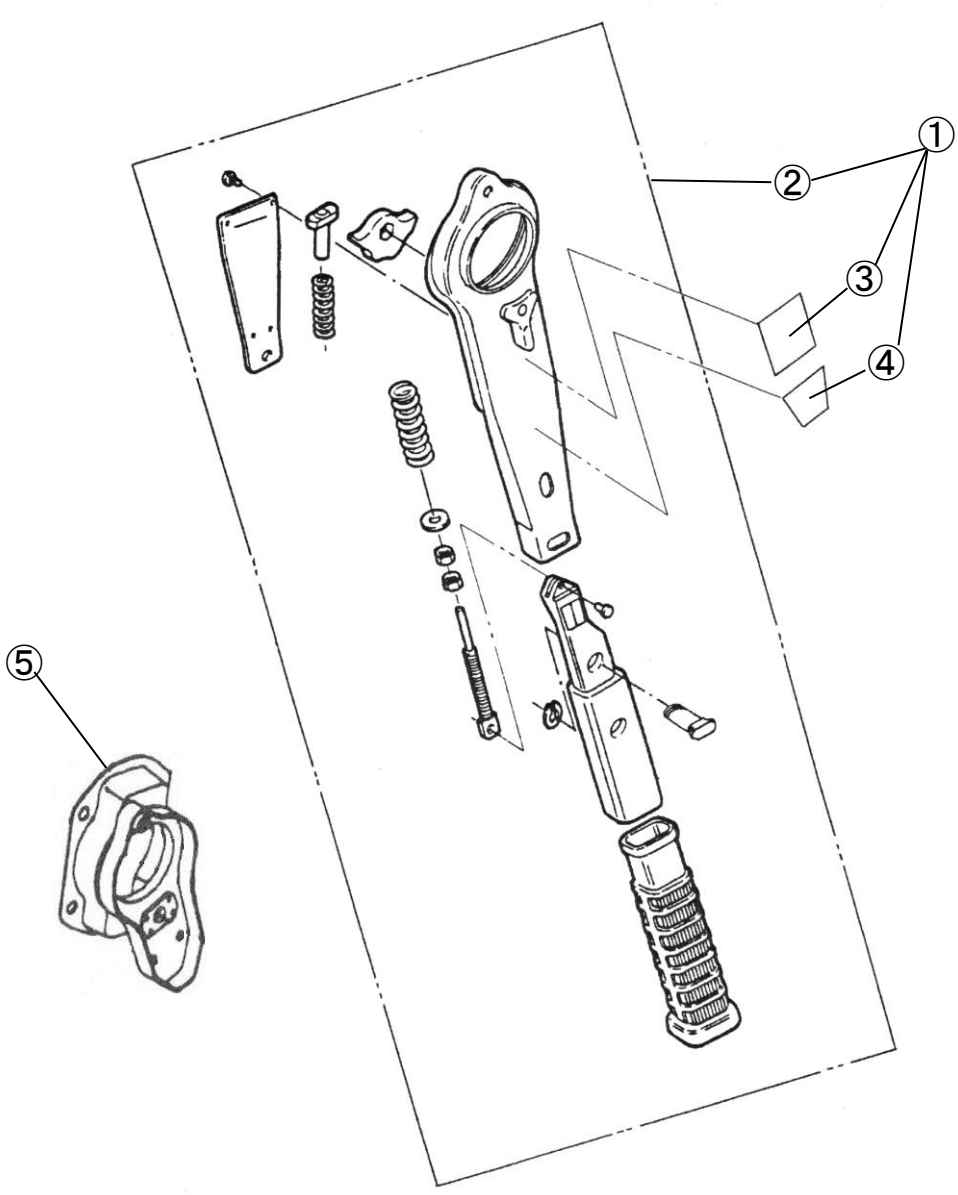



Note: These basic bodies are the same as 3 tonnes.

| Fig. # | Part # | Part Name | Parts per Hoist | Capacity (tonnes) | |
|---|---|---|---|---|---|
| | | | | 6 | 9 |
| 1 | 1001 | Top Hook Set | 1 | L5BC060-1001 | L5BC090-1001 |
| 2 | 2001 | Hook Assembly | 1 | ———— | L5BC090-2001 |
| 3 | 1071 | Latch Assembly | 1 | L5BA063-1071 | L5BA090-1071 |
| 4 | 2011 | Top Hook Yoke A & B Assembly | 1 | ———— | L5BA090-2011 |
| 5 | 81 | Socket Bolt | 3 | ———— | J1BE1-1204040 |
| 6 | 82 | Lever Nut | 3 | ———— | C2BA400-9074 |
| 7 | 51 | Idle Sheave | 1 | ———— | L5BA063-9051 |
| 8 | 53 | Shaft Assembly | 1 | ———— | L4BA060-9053 |
| 9 | 83 | Shaft Stopper Pin | 2 | ———— | L4BA060-9083 |
| 10 | 1021 | Bottom Hook Set | 1 | L5BC060-1021 | L5BC090-1021 |
| 11 | 2001 | Hook Assembly | 1 | L5BC060-2001 | L5BC090-2001 |
| 12 | 1071 | Latch Assembly | 1 | L5BA063-1071 | L5BA090-1071 |
| 13 | 1031 | Bottom Hook Yoke Assembly | 2 | L5BA063-9031 | L5BA090-9031 |
| 14 | 81 | Socket Bolt | 2 | ———— | J1BE1-1204040 |
| | | | 3 | J1BE1-1003232 | ———— |
| 15 | 82 | Lever Nut | 2 | ———— | C2BA400-9074 |
| | | | 3 | C2BA200-9074 | ———— |
| 16 | 51 | Idle Sheave | 1 | L5BA063-9051 | |
| 17 | 53 | Shaft Assembly | 1 | L4BA060-9053 | |
| 18 | 83 | Shaft Stopper Pin | 2 | L4BA060-9083 | |
| 19 | 805 | Nameplate C | 1 | C3BA030-9805 | ———— |
| 21 | 41 | Chain Pin | 1 | L4BH060-9041 | |
| 22 | 49 | Slotted Nut | 1 | C2BA020-9049 | |
| 23 | 96 | Split Pin | 1 | J1PW01-020014 | |
| 24 | 800 | Nameplate | 1 | L5BC060-9800 | L5BC090-9800 |
| 26 | 841 | Nickel-plated Load Chain | 1 | KAQN100J0000 | |

7.3. Optional Parts

Lever assembly for load signal type




| Fig.# | Part# | Part Name | Parts per Hoist | Capacity (tonnes) | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 3/4 | 1 1/2 | 2 1/2 | 3 | 6 | 9 |
| 1 | 5211 | Lever Set | 1 | Y3SC008-5211 | Y3SC015-5211 | Y3SC025-5211 | Y3SC030-5211 | Y3SC060-5211 | Y3SC090-5211 |
| 2 | 6211 | Lever Assembly | 1 | Y3SC008-6211 | Y3SC015-6211 | Y3SE025-6211 | Y3SC030-6211 | | |
| 3 | 800 | Name Plate With Rivets | 1 *1 | Y3SC008-9800 | Y3SC015-9800 | Y3SC025-9800 | L5BC030-9800 | L5BC60-9800 | L5BC090-9800 |
| 4 | 801 | Name Plate B | 1 | Y3SS008-9801 | | | | | |
| 5 | 5214 | Brake Cover Assembly | 1 *2 | Y3SE008-5214 | — | — | — | | |

*1. Four rivets are also supplied to fasten the nameplate.
*2. Since Brake Cover Assembly is exclusive for LOAD SIGNAL 3/4 tonne, their standard Brake Cover Assembly needs to be exchanged for LOAD SIGNAL installation.

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