Air Chain Hoist

OPERATION MANUAL

&

PARTS LIST

II 3G Ex h IIA T4 Gc
II 3D Ex h IIIB T135°C Dc

SERIES:

- ☐ YSA-025
- ☐ YSA-050
- ☐ YSA-100
- ☐ YSA-200
- ☐ YSA-320
- ☐ YSA-630

CHENG DAY MACHINERY WORKS CO .,LTD.

SAFETY ALERT SYMBOL AND ALERT SIGNS

Please read this manual carefully and follow its instructions.

The SAFETY ALERT SYMBOL (⚠), WARNING , CAUTION , and NOTE carry **VERY IMPORTANT** messages.

This **SAFETY ALERT SYMBOL** is used to call your attention to items or operations that could be dangerous to you or other persons using this equipment. Please read these messages and follow these instructions carefully.

WARNING

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

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury, damage or destruction of the equipment and others.

NOTE: **NOTE** indicates a special instruction in operation or maintenance.

CONTENTS

Important

- Before installing or operating the air hoist, carefully read and understand all of the Instructions in this manual in order to avoid accidents as a consequence of incorrect Handling.
- All of the people who will install, operate or maintain the hoist, should read this manual.
- After reading, keep this manual available for maintenance and inspections.
- Be sure to abide by trade associations, local and national rules and regulations relating to safety.
- Strictly obey the contents described in this manual.

I. WARNING-READ THESE INSTRUCTIONS

If the hoist is not used correctly, a serious accident may occur, such as dropping the load or the hoist itself.

Observe the following instructions for safe operation.

- The following safety precautions should be posted in a conspicuous location.

1. General Handling

- Anyone who operates the hoist must know and observe the safety rules and regulations.
- Do not operate the hoist unless the contents of this manual and warnings on the caution plate are completely known.
- Only allow qualified people to operate the hoist.
  Do not operate the hoist without being qualified and familiar with the safety rules, etc.
- Install the hoist properly and carefully.
- Be sure to check the hoist before each shift, and inspect it periodically.

2. Operation and Handling

- Never lift a load greater than the rated capacity of the hoist.
- Never use the hoist for lifting or lowering people, and never stand on a suspended load.
- Never operate the hoist if it is damaged or has a malfunction.
- Never operate the hoist with the load chain in any of the following conditions:
  ① Twisted, kinked or deformed.
  ② When elongation or reduction of diameter exceeds the service limits.
  ③ Checked, damaged or corroded.
  ④ Improperly engaged on the chain wheel.
- Never carry loads over people.
- Be certain there are no objects in the way of the load or hook when moving the hoist.
- Always stand clear of the load.
  Never walk under a suspended load, and keep out of its area of projection.
  Never place hands, feet, etc., under or between suspended loads.
- Never leave a load suspended for any extended period.
- Never use the load chain as a sling.
- Never use the load chain as a ground for welding.
  Do not attach a welding electrode to the hoist or sling chain.
- Never use the upper and lower limits switches as a means of stopping the hoist-these are emergency devices only.
- Before each shift, check the hoist for wear or damage.

Check brakes, load chain, limits switches, etc.

- Stretched, worn or damaged hooks should be discarded.
  Do not attempt to repair it, just replace it with the new hook.
  Do not use the hook with a damaged or malfunctioning hook latch.
- Be sure that all slings are correctly positioned on, or attached to the load hook.
- Never splice the hoist chain by inserting a bolt between links or by any other means.
- Do not force a load chain or hook into place by hammering, and never insert the point of the hook into a chain link.
- Always operate the hoist carefully during lifting and lowering operations.
  Do not start suddenly, do not stop suddenly, and do not reverse the hoist suddenly.
- Never lock the pull rope or push button switches.
  The hoist must be operated by the operator himself/herself at all time.
- Never operate the hoist when the bottom hook assembly is not centered under the hoist.
  Do not pull the load at an angle. Move the hoist over the loads center of gravity before lifting the load.
- Ease the slack out of the load chain when starting to lift.
  Do not jerk the hoist or snatch the load. Slowly take up the slack in the load chain.
- Always keep the load chain clean and well lubricated.
  Do not drag the load chain or hook on the floor.
- Be careful the suspended load does not touch the nearby structure or power line, etc.
- Be careful the hoist or trolley does not collide with the I-beam stopper or the structure.
- Do not swing load or bottom hook assembly when moving the hoist.
- When moving a load with the trolley, do not push the load chain but push the load itself.
  Do not pull the load.
- Pay attention to the load at all times when operating the hoist.
- Keep the bottom hook assembly overhead when not in use.
- Do not operate the hoist if you are not physically fit to do so.
  The operator must have good hearing, vision and depth perception.
- Do not use more than one hoist at a time to lift a load.
- Properly secure an outdoor hoist before leaving it unattended.
- Be sure to protect the hoist from rain and water.

3. Maintenance and alterations

- Never alter the hoist or its accessories.
- Be sure to shut off the air supply before performing any maintenance work on the hoist.
- Periodically, inspect the hoist thoroughly and replace worn or damaged parts.
- Always employ qualified or well trained personnel for inspection and maintenance.
- Only use genuine parts.
- Follow the lubrication instructions.
- Never operate the hoist without lubricator and filter.
- The air pressure must never exceed 6 bar(6 kgf/cm^2, 85 psi). Use an inline FRL with air pressure regulator.
- Do not do anything if you have any questions about the hoist, please do not hesitate to contact the dealer from whom you purchased the hoist, or the nearest dealer shop.

II. Specifications

Model		YSA-025	YSA-050	YSA-100	YSA-200	YSA-320	YSA-630
Capacity (ton)		0.25	0.5	1	2	32	6.3
Fall no.		1	1	1	2	1	2
Load chain (mm)		§ 6.3×19.1	§ 6.3×19.1	§ 7.1×20.2	§ 7.1×20.2	§ 13×36	§ 13×36
Standard lift (m)		3					
Working air supply pressure		4-6 bar					
Motor (kw)	6 bar	1.5	1.5	2	2	3.5	3.5
	4 bar	0.8	0.8	1.0	1.0	1.8	1.8
Loaded lifting speed (m/min)	6 bar	18	11	7.6	3.8	4.8	2.4
	4 bar	8	5	3.4	1.7	2.2	1.1
Air consumption (m^3/min)	6 bar	2	2	2	2	4	4
	4 bar	1	1	1	1	2	2
Insulation protection		IP55					
Brake type		Disk type brake					
Limit switch		Upper/Lower limit					
Air inlet (in)		1/2″	1/2″	1/2″	1/2″	3/4″	3/4″
Level of noise (dB)	Load	85	85	85	85	90	90
	No Load	82	82	82	82	87	87
Main line air supply (in)		3/4″	3/4″	3/4″	3/4″	2″	2″

Remarks:

- Contact an authorized dealer for information on using the hoist outside the working temperature or humidity range.
- Intended use: This hoist has been designed for vertically lifting and lowering loads under normal atmospheric conditions.
- Noise levels are measured at a distance of 1m horizontally from the hoists during normal operation.
- Load tests duty cycle according to FEM 2m.

III. Checks and Caution before installation

Checks before installation

- Check the delivered hoist is what you ordered (check the name plate)
- Check there was no damage to the hoist during transportation.
- Check the pressure of the available air supply corresponds to the working air pressure of the hoist.

CAUTION

- Do not install and leave the hoist outdoor.
  If it is necessary to use the hoist outdoor, be sure to make a shelter with a roof for housing the hoist.
- Under hostile environments such as high temperatures, high humidity, acidic, corrosive and/or extremely dusty atmospheric conditions, the mechanical parts of the hoist may be seriously damaged (for example, corroded).
  Under such conditions frequently check the hoist and replace worn / corroded parts immediately.
- Never use the hoist at a temperature below -10℃.

IV. Installation

1. Accessories

- In case of using Toggle cord control type (Pull rope):
  Referring to Fig. 1, attach control handle to Control lever by using Control chain and Carabiner.
  Clamp Carabiner to prevent it disengaging from Control chain.
- In case of using Pendant control switch:

  ① Pendant control type (hand control)

  - Guide the strain-relief cable through the eye on the Pendant control type and secure using the cable clamp.
  - Push the one-eye clamps onto the hose end.
  - Attach the hoses to the hose nipples.
  - The one-eye clamps must lie in the middle of the hose nipple clamping range. The best clampi characteristics are achieved in this range.

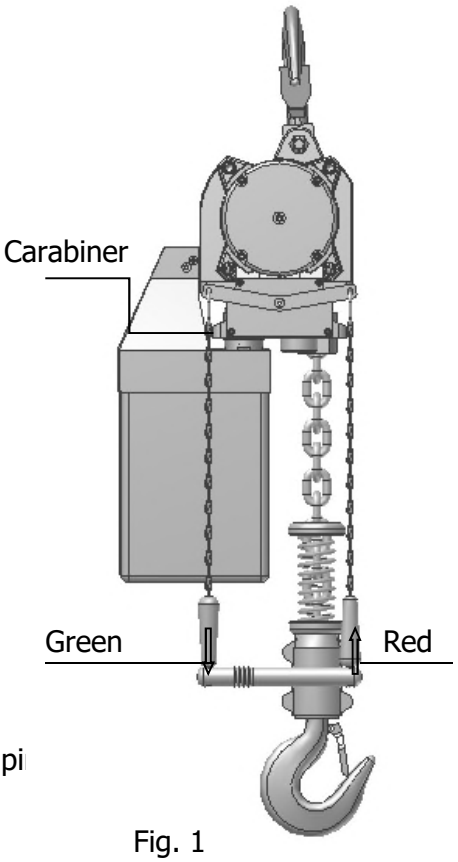


Fig. 1

  ② Control vale (on motor)

  - Remove the hose adapter (secured via central bolt).
  - Attach the hoses to the corresponding nipples (Fig. 2).
  - Secure the hoses using the one-eye hose clamps and crimping tool.
  - Secure the strain-relief cable.

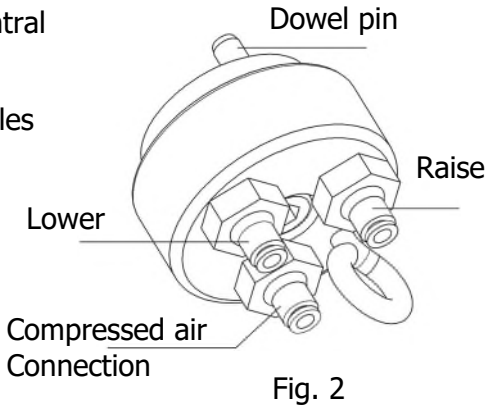


Fig. 2

2. Installation

The supporting structure of the air hoist must form a rigid mounting.
Vibration damages the chain and can lead to chain fracture.
Furthermore, external vibration must on no account be transmitted to the hoist (lifting gear). (e.g. from the suspended load).

- Provide a suitable working platform.
- Attach the hoist at the suspension hook (or suspension eye) to the beam trolley or a stationary fixing.
- Ensure that the hook safety catch closes automatically.
- Attach the hoist securely at the suspension hook or suspension eye.

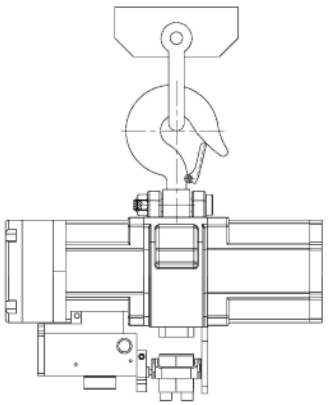


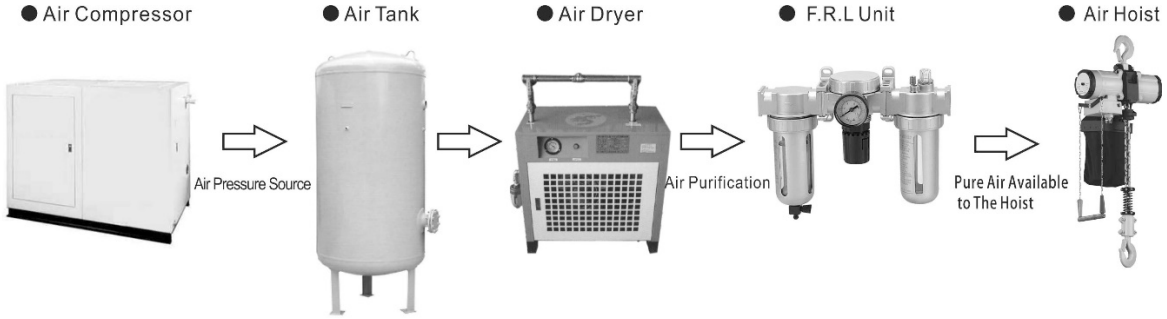
Fig. 3

3. Before Air Connection

- Check that sufficient compressed air supply volume at the required working air pressure range is available to the hoist at all times.
  (See Chapter II "Specifications".)
  Check air supply line, hoses and fittings are of large enough internal diameter to prevent air starvation or low air pressure which will result in hoist under-performance.
- The main air hose must be over than 2 inch.
- Before connecting the air hose or pipe to the hoist, be sure to flush out or blow it out to prevent the invasion of foreign matter (dust, etc.) into the air motor.
- Compressed air supplied to the hoist should be free from moisture or foreign matter. Install an air filter to ensure a clean & dry air supply.
- The hoist is designed to operate within a working pressure range of 4~6 bar (4~6kgf/cm^2)
  Regulate the working pressure to a maximum of 6 bar.
  If necessary, use an air regulator for reducing air pressure.
- Install a lubricator to feed lubricant to air motor.
  See chapter IX "1.Lubrication". (Do not operate the hoist without lubricant.)
- Connect the air filter, regulator and lubricator as close to the hoist as possible.
- When the air hose is connected to the hoist, pour about 10 drops of lubricant into the connecting port of the hoist. (See Chapter IX "1.(6) Recommended Lubricants".)
- Install a dump valve (drain valve) at the lowest point in the piping.

4. Air Flow System

- Compressor: need to fit air storage volume, based on capacity.
- Air Filter : must clean up the air filter regularly to make sure clear air for hoist inside operating.
- Regulator : adjust to 8 kg/ cm^2, no less than 6.5 kg/cm^2 when hoist is working.
- Lubricator : 2 drops per minute basically, suggest to use ISO VG32 lubricant or equal. Based on lubricator's size, need to fill up lubricant to prolong life-span of components.
- Air inlet Specification: 0.25ton ~2ton use 1/2", 3.2ton~6.3ton use 3/4".
- Main air line needs to match working air pressure 4~6(kg/cm^2). Pressure drop will affect lifting speed.
- Air source comes from specific hose of compressor instead of manifolds to prevent air insufficient.
- Appropriate distance between hoist and F.R.L. unit is within 4 meters to let air and lubricant can enter the hoist efficiently.



F.R.L. unit (drops/MIN)						
pressure	6BAR					
Lift(m)	YSA-025	YSA-050	YSA-100	YSA-200	YSA-320	YSA-630
3	2	2	2	2	2	2
6	2	2	2	2	2	2
10	7	7	8	8	9	9
20	8	8	9	9	10	10
30	10	10	11	11	12	12
40	10	10	11	11	12	12
50	11	11	12	12	13	13
60	11	11	12	12	13	13

F.R.L. : Air Filter, Pressure Regulator, Lubricator
There are different sizes of F.R.L. unit, based on actual use condition, please make sure the lubricant is enough.

V. Checks after Installation and Test Run

1. Load Chain

● In the case of multiple Load chain falls to a common bottom hook assembly, ensure that the under hook assembly has not capsized through the Load chain falls as this will cause the Load chain to become twisted. (See Fig. 4). Before operation, check for and correct any twisting of the Load chain.

WARNING

Using the hoist when the Load chain is twisted could result in damage to the hoist or failure of the Load chain, causing personal injury/death.

Ensure that the Load chain is not twisted and correctly aligned along the entire length of the load chain falls.

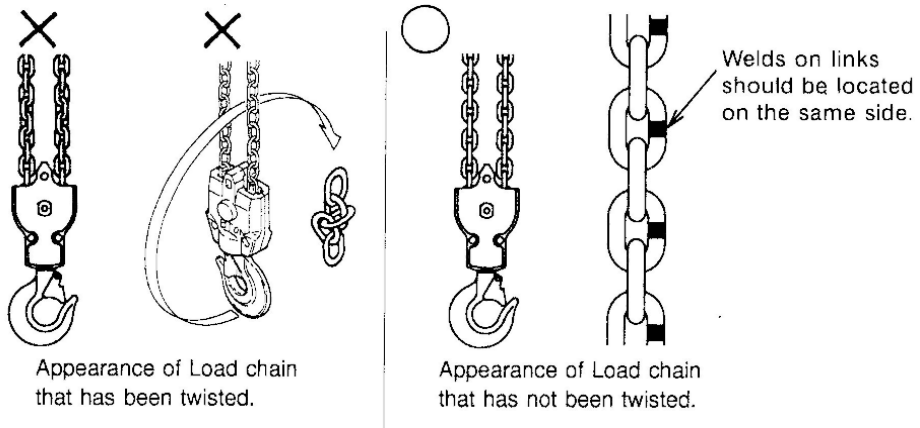


Fig. 4

Check the welds on Load chain are faced away from the center of Chain wheel (See Fig. 5).

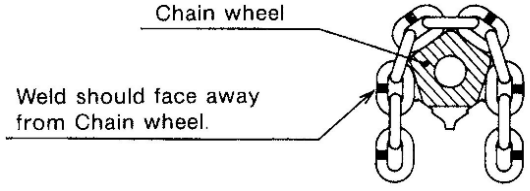


Fig. 5

2. Hoisting Operation

After installation but before lifting operations commence, repeat up/down operations of the hoist (unloaded) several times at low speed, then go to the full-speed operation. Adjust the speed by controlling the pulling force on pull control ropes (for Pendant control operation, adjust the speed of the hoist by the degree of control lever movement exerted).
At this point, check the lubricant to Air motor. (See Chapter IX "1.Lubrication".)

- Toggle cord control Type
  Pull down Red grip (marked ⇧) of Control handle.
  If the Bottom hook travels downwards, the Control chain is incorrectly attached to the incorrect side of the Control lever. Correct by attaching to the other side of the Control lever.
- Pendant Control Type
  Push the button ⇧ on the push button switch panel.
  If the Bottom hook travels downwards, the hose is incorrectly connected to the PC Hose manifold.
  Reconnect the PC hoses correctly onto the corresponding PC manifold hose connection points and recheck to confirm correct UP/DOWN operation in accordance with the control handle markings.

3. Hoisting and Lowering Limit Switches

After checking Control handle or Pendant control for correct operation, slowly raise the Bottom hook to the upper limit. In this position the Travel Limit Control lever is pushed up by Bottom hook so that the hoist motor and chain travel is stopped automatically.
Next, slowly lower the Bottom hook to the lower limit. The Travel Limit Control lever in this position is lifted up by Load chain Stop device connected to the Load chain free end so that the hoist motor and Load chain travel is stopped automatically.
Ensure these operations are carefully performed (See Fig. 6).

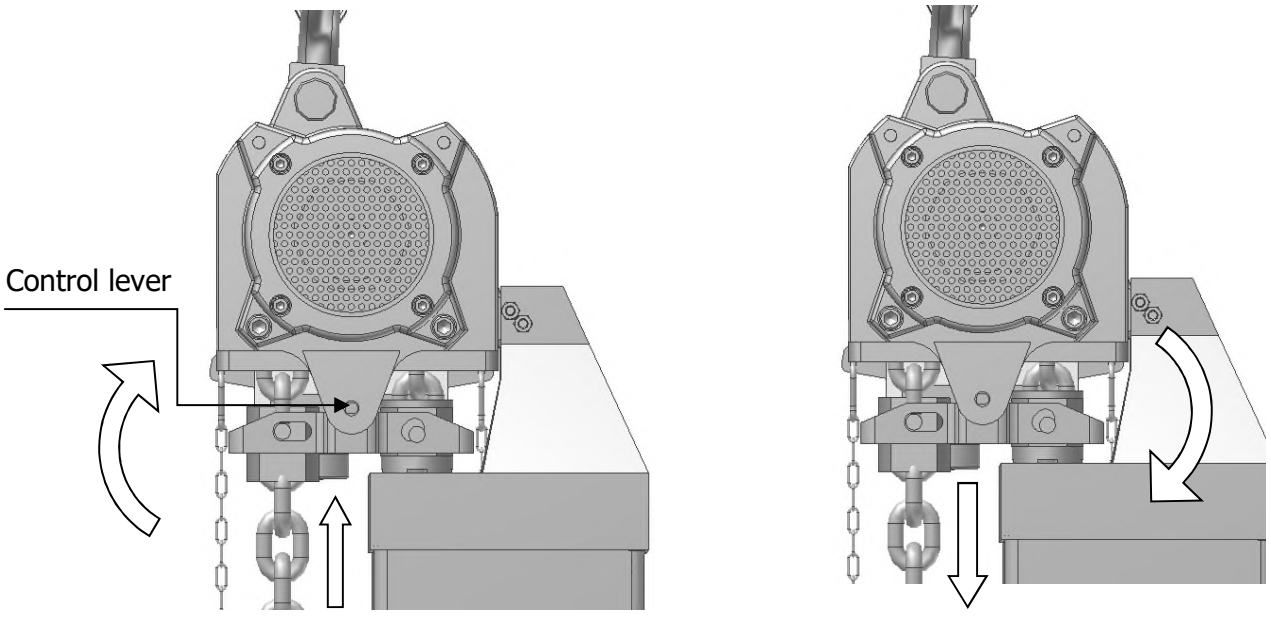


Fig. 6

4. Load Test

- Lift the rated load a few inches off the floor and check the function of the hoist braking system to stop and hold the load without excessive drift.
- In case of using the hoist with the trolley, traverse the trolley over the entire length of I-beam with a rated load suspended a few inches off the floor. Check the condition of I-beam and ensure the trolley runs smoothly. Ensure the air supply hose length is adequate to reach the travel limits.
- Lift 125% of the rated load and check the operation.
  This test should be performed as a safety check to verify the safe condition of the hoist, I-beam, etc.


Fig.7

5. Emergency stop device (Push Button)

This button is used to stop the hoist in an emergency situation. It is a red, mushroom type button, located in the uppermost position on the pendant. When pressed, power to the equipment is switched off and the button locks automatically.
Turning it to the right will release the lock and to enable re-starting. (See Fig.7)

VI. OPERATION-Proper Operation and Caution

CAUTION : Only allow trained and authorized people to operate the hoist.

1. Never exceed the rated load of the hoist.

- Never lift a load greater than the rated load.

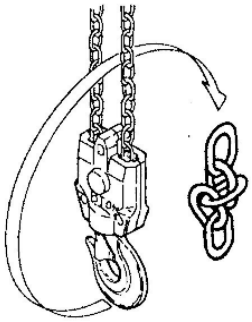
※ Otherwise, the hoist may be damaged or the suspended load could fall resulting in fatal injury and / or serious damage to property.

2. Before operating the hoist, check the condition of the Load chain.
See Chapter VI. Load chain & Chapter IX 2.(2) Inspection of Load Chain and Service Limit.

- Never operate the hoist if the Load chain is twisted, kinked, damaged or worn.

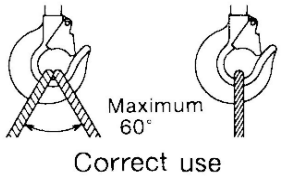
※ Otherwise, the hoist may be damaged or the Load chain could break resulting in fatal injury.

- Do not operate the hoist if the Load chain is damaged or unlubricated.


Never twist!

3. Proper sling to hook engagement.

Position the slings in the center of the Load hook saddle.

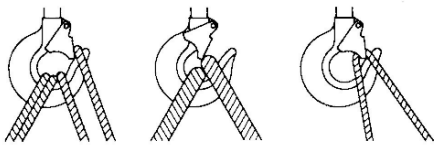


Correct use

- Incorrect attachment of the slings can result in a load disengagement accident resulting in fatal injury or serious damage.
- Never use the Load chain as a sling.

※ Otherwise, the Hook and Load chain could be damaged and result in a fatal accident or serious damage.

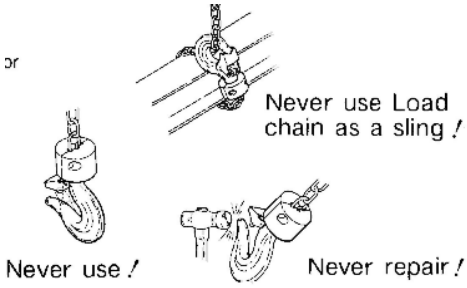
Correct use



Incorrect use

- Discard the Hook if stretched or damaged. Do not attempt to repair it; replace with a new Hook.
  When the Hook Safety latch is damaged o malfunctions do not use the hoist until replaced.

※ Otherwise, the sling may slip from Hook or the suspended load may drop.



- Use the appropriate sling according to the safe WLL required and shape of the load.

4. Centralize the hoist over the load centre of gravity point before lifting

- Do not lift or pull a load at an angle or off-centre.

※ Otherwise, the load may slip on the floor or swing resulting in potential danger of damage or injury.
Damage to the hoist may also occur.

5. When starting to lift, stop hoist once as Load chain becomes tensioned.

Carefully take up the slack in the Load chain.
Thereby, lift-off shock will be reduced preventing the hoist from damage.

- Check the condition of the sling after lift-off.
- Check the balance of the load by slightly moving or lifting the load.

6. Carefully lift and lower the load without swinging.

- Do not lift or lower with the load swinging.
  Even if there is no load, do not swing the Bottom hook.

※ Otherwise, the load chain may be damaged or the suspended load could disengage and fall.

- Ensure that the Bottom hook or the suspended load does not make contact with any surrounding structure, etc.

7. Stop lifting or lowering before upper or lower limit switches are activated.

- Never use the upper and lower limit switches as a means of stopping the hoist.

※ Otherwise, the Control lever may become worn or deformed, causing failure in an emergency.

8. Only utilize one hoist for hoisting and lowering.

- Do not lift any single load with 2 or more hoists.

※ Multiple air hoist operating speeds are not identical and cannot be exactly synchronized and therefore uneven loading will occur on the different hoists which could result in a dangerous hoist failure under such uneven overload conditions.

9. Carefully traverse the trolley to prevent the load from swinging.

- When moving the load with the trolley, do not push the Load chain but push the load itself.
  Do not pull the load.
- Do not pull the trolley by pulling the hoist Control chain (Pull rope type) or Control tube (Pendant control type).

※ Otherwise, the hoist operating controls could be damaged.

- When traversing the trolley, be careful that the trolley does not collide with the I-beam stopper.
  Otherwise, excessive shock may cause the suspended load to drop or the hoist to be damaged.

10. Correct hoist operating procedures

- Do not reverse the hoist suddenly.
  When reversing, stop lifting or lowering once.
  Do not start suddenly, do not stop suddenly.

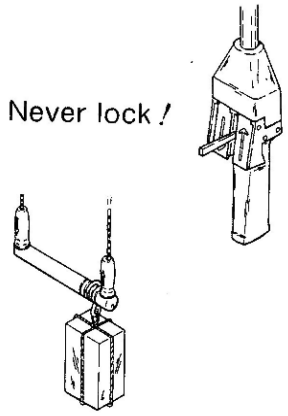
※ Otherwise, shock may occur and the hoist may be damaged.

- Smooth operation for lifting and lowering is very important.
- Never lock the Pull rope or pendant handle controls.

※ Otherwise, the hoist Emergency stop cannot be operated if necessary.

- After operation, do not let go of Pull rope or the pendant operating handle until such are motionless and in their normal position below the hoist.

※ Otherwise, the Pull rope or pendant control handles may swing and cause damage to persons or property on impact.



11. Do not leave load in suspension

- Never leave a load suspended or unattended.

※ This is a potentially serious hazard for any person near the suspended load.

12. Carefully choose a safe position for operation and check the surroundings.

- Never walk under a suspended load or in the travelling area of the load.
- Never stand on a suspended load.
- Never carry a load over people.
- Before operating the hoist, ensure that no one is in the chain load path or travelling area of the loaded hoist.

13. Operation/maintenance in hazardous environments

- This manual states that these Air Chain Hoist models are in compliance with European Community Directive 2014/34/EU for equipment intended for use in potentially explosive atmospheres
- Ex marking
  
  II 3G Ex h IIA T4 Gc
  II 3D Ex h IIIB T135°C Dc
- Non-compliance with any of these Special Conditions could result in ignition of explosive atmospheres.
- Refer to specification supplied with the Air Chain Hoist for proper filtering and lubrication in air supply line.
- Proper lubrication and maintenance are required to prevent premature component failures. Follow the recommendations in the lubrication and maintenance sections of the manual supplied with the hoist or trolley.
- Air pressure above 8 bar at the inlet may result in a source of ignition caused by premature failure of bearings or other components due to excessive speed, output torque or force.
- Do not operate the hoist or trolley with the air pressure at the inlet below 3 bar. Low air pressure to the hoist or trolley may cause the brake to partially engage during operation resulting in elevated temperatures.
- The entire hoist system, from the trolley or load hook to the bottom hook, the control pendant and the payload shall be earth grounded at all times to prevent ignition hazards from electrostatic discharge. A resistance to earth of less than 1 Ohms is required. Do not disconnect or insulate any grounding or strain relief cables. When using a nonconductive sling or harness or a nonconductive link or barrier an independent ground must be applied.
- Never use a pneumatic hoist or trolley when there is any possibility that a gas in Group C (acetylene, carbon disulfide, and hydrogen, as defined in EN 50014), hydrogen sulfide, ethylene oxide, light metal dusts or dusts sensitive to impact may be present. These atmospheres cause a high probability of explosion.
- Do not allow hard contact of the bottom block, hook, load chain or pendant control against other objects. The impact of any hoist or trolley component beyond normal use may cause an ignition hazard from sparks.
- The maximum expected surface temperature of the hoist or trolley is 135° C measured during brake malfunction. Inspect the hoist or trolley for air leaks and proper brake engagement, prior to operation.
- Check for abnormally elevated temperatures during operation that may be an indication of overload or potential failure of bearings, brake or other mechanical components.
- If elevated temperatures or elevated vibration levels are detected shut the hoist and/or trolley off and discontinue its use until it can be inspected and/or repaired.
- Do not use a pneumatic hoist or trolley that exhibits rust or rust films that may come in contact with aluminum, magnesium or their corresponding alloys.
- Do not perform maintenance or repairs in an area where explosive atmospheres are present.
- Do not clean or lubricate a pneumatic hoist or trolley with flammable or volatile liquids such as kerosene, diesel or jet fuel. A potentially explosive atmosphere may be created.
- Hoists and trolleys with ATEX certification are intended for general industrial material handling use in conformance to their labeled designation and these special conditions. Special assessments, for other specific applications requiring increased protection, should be requested by written inquiry to Manufacturer.

※ To safely use this product, all instructions given in the accompanying literature, in addition to ll conditions, notices and warnings given herein, must be followed.

VII. Checks before Operation (At the beginning of each shift)

Be sure to execute the following checks at the beginning of each shift.
If any problem is observed, do not use the hoist until the problem has been corrected.
Never operate the hoist if damaged or malfunctioning.

1. Check before Operation

(1) Check that the Load chain is not twisted, kinked, damaged, or worn.
Wear or damage on the chain cannot be detected by casual observation alone.
See Chapter V 1. Load Chain & Chapter IX 2. (2) Inspection of Load Chain and Service Limit.

(2) Keep Load chain clean and well lubricated.

(3) Check Load hook is not stretched or damaged and Hook latch is in the normal position.

(4) Check the Chain wheel in Bottom hook block operates smoothly (See Fig. 8).

(5) Check the support bearing of Bottom hook is not damaged, and rotates easily and smoothly.

(6) Check the trolley wheels track on the rails properly and the wheels and rails are not worn.

(7) Check the lifting sling is not damaged or worn and properly engaged into the Bottom hook.

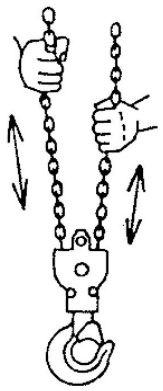


Fig. 8

2. Unloaded Operation check

(1) Check the operating controls can be easily operated and the up/down operations are correct as indicated.

- Check hoisting speed can be changed from low to high speed by varying the pulling force on the rope control or by the lever movement on the pendant control levers.

(2) Check the Load chain travels freely and smoothly into and out of the Bottom hook Chain wheel [multi chain fall hoists] & the hoist and there is no noise indicative of binding or other malfunctions.

(3) Check Upper and Lower limit switches function correctly.
See Chapter V 3. Hoisting and Lowering Limit Switches.

(4) Check the hoist is not abnormally noisy or vibrating.

3. Check under Load

(1) Lift the rated or near the rated load a few inches off the floor and check the ability of braking system to stop and hold the load without excessive drift.

(2) Check the Load chain travels smoothly into and out of the Bottom hook Chain wheel & hoist and there is no audible clicking or other evidence of binding or malfunction.

(3) Check the hoist is not abnormally noisy or vibrating.

VIII. Periodic Inspections

Be sure to periodically inspect the hoist for safe operation.

- Before inspection, shut off the air supply completely.
- Prepare an Inspection Schedule of critical inspection items.

- Monthly inspection
  Inspect the hoist at least once a month. Correct and repair any problems which are detected.
  The required interval for inspection depends on the operating environment, operating frequency, and loading conditions of the hoist.
  Therefore, make the inspection interval shorter according to your operating conditions.
- For inspection items and methods, See Chapter IX 2. Inspection.
- Annual Inspection – Disassembly is required
  Completely disassemble the hoist at least once a year for inspection and maintenance.
  Correct and repair any problems which are detected.
- Inspect the hoist annually or every 1000 hours of operation, whichever is sooner.

If daily operation time exceeds 5 hours, inspect the hoist at six monthly intervals. However, the required interval for inspection also depends on the operating environment and loading condition of the hoist.
Therefore, make the inspection interval shorter according to your operating conditions.

- For inspection items and methods, see Chapter IX 2. Inspection.
- Service Limit of parts
  If any components are found to be worn beyond their service limit in the monthly, annual, or other inspections, dispose of such immediately and replace with new, genuine components.
  For the monthly and annual inspection items refer to the Inspection Manual.

IX. Maintenance and Inspection

1. Lubrication

(1) Air motor

- To optimize the Air motor life & performance continuously lubricate the air supply using an inline lubricator as part of an inline Filter/Regulator/Lubricator unit in the air supply line.
- The lubricant feed rate is 6~8 drops per 1 m^3 of air whilst the motor is running at full free speed.
- Periodically check the oil level in the lubricator, and replenish if necessary.
  Do not allow the oil level to go below the indicated line.
- Periodically drain the water captured in the air filter bowl.

(2) Reduction Gear System

- The reduction gear system has been greased before shipment.
- Replace grease in the reduction gear system when the hoist is disassembled for maintenance or inspection. Daily lubrication is not required.
- Required quantity of grease is 150 cm^3 (150 mL).
  Lubrication volume is 50 cm^3 (50 mL) respectively in each of the two gear stages, and 50 cm^3 (50 mL) in the space between the internal gear and casing.

(3) Load Chain

- Always keep the Load chain and the chain anchor pin clean and well lubricated.
- Before installation, load test or initial operation, be sure to lubricate the Load chain.
  Even when operating with no load, lubricate the Load chain.
- Periodically coat the Load chain with lubricant to minimize wear on the Load chain and load sheave.
  Inadequately lubricated Load chains will wear prematurely and become a potentially danger risk.
- Determine the lubrication interval according on the operating frequency and the loading conditions.
- Before reapplying lubricant, completely clean the Load chain.
- Continuously monitor the condition of the Load chain and reapply lubricant when necessary,
- Use heavy gear oil for Load chain lubrication e.g. Shell Omala Oil 680, etc.

(4) Hook Block, Load Hook

- Each, time the hoist is disassembled for inspection, maintenance, or replacement of the Load chain, lubricate the support bearing (Steel balls) in the Bottom hook.

(5) Brake Part

- Whenever the hoist is disassembled for inspection, maintenance or repair. clean the inner brake mechanism and reapply lubricant.
  For lubricating position, see Chapter IX 2.(3) Inspection of Brake and Service Limit.

- For Brake lubrication, use lithium saponified silicon grease corresponding to the No, 2 class of NLGI (National Lubrication Grease institute) e.g. Molykote Grease 33.

(6) Recommended Lubricants
The following table shows the recommended lubricants.

Always use the same type or equivalents recommended by the lubricant manufacturer.

Manufacturer	Air motor (Lubricator)	Reduction gearing (Incl. bearing of reduction gear)	Other bearings
Esso	Arox 22 Teresso 32	Lithtan EPO	Beacon EP2
Mobil	Almo oil no. 525	Mobilux EPO	Mobilux EP2
Shell	Tellus Oil C32 Torcula Oil 32	Alvania Grease EPRO	Alvania Grease EP2

2. Inspection

CAUTION

- Shut off the air supply before inspection.
- Disassemble the hoist on a well illuminated work bench.
- Always use genuine parts for replacement.
- Always employ qualified, competent and well trained personnel for inspection and maintenance.

(1) Inspection of Hook end Service Limit

■ If any of the following conditions apply to the inspected Hook, never reuse such Hook and always replace with a new Hook.

Replace the Hook / Safety Latch under these conditions

- Hook opening is visibly stretched, or opening dimension is greater than the specified Service Limit.
- Hook is deformed or cracked.
  Carefully check for any bends or cracks on the hook shank.
- Replace the hook if the wear on the hook saddle, where the lifting sling rests, exceeds the Service Limit.
- Hook latch is damaged or malfunctioning.

■ Major Dimensions of Hook and Wear Limit
For hook opening dimensions A and B, measure Hook before use as a reference for later inspections.

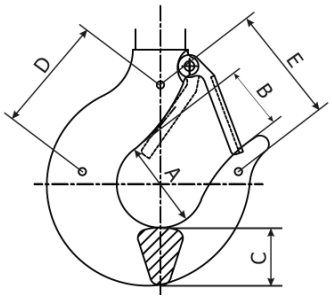
(mm)

Model		A	B	C		D		E	
		Standard dimension	Standard dimension	Standard dimension	Service Limit	Standard dimension	Service Limit	Standard dimension	Service Limit
YSA - 025	Top hook	32	30	29	27	50	55	50	55
	Bottom hook	32	30	29	27	55	60.5	55	60.5
YSA - 050	Top hook	32	30	29	27	50	55	50	55
	Bottom hook	32	30	29	27	55	60.5	55	60.5
YSA - 100	Top hook	32	30	29	27	55	60.5	55	60.5
	Bottom hook	32	30	29	27	55	60.5	55	60.5
YSA - 200	Top hook	40	38	41	38	70	77	70	77
	Bottom hook	40	38	41	38	70	77	70	77
YSA - 320	Top hook	47	44	48	45	90	99	90	99
	Bottom hook	47	44	48	45	90	99	90	99
YSA - 630	Top hook	51	48	60	56	114	125	114	125
	Bottom hook	51	48	60	56	114	125	114	125

(2) Inspection of Load Chain and Service Limit

Clean Load chain using solvent so any damage can be located.
The Inspection should be carried out on each link of Load chain.
Never use acidic solvents.

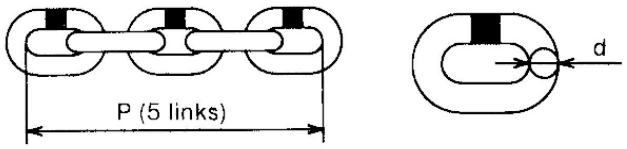
■ Never use Load chain having any one of the following defects.
Replace it with a new Load chain.
Never repair Load chain.



- Flaws or cracks.
  It is also important to check the links and chain free-end links which are connected to the hoist body and the links connected to the Bottom hook attachment (Hook holder).
- Deformed or corroded.
- Stretch and elongation exceeding the service limit.
- Reduction of diameter exceeding the service limit.

■ Limit of Elongation and Wear

For dimensions P and d, measure the entire working length of the Load chain.
Pay special attention to the links which continuously run over the load sheave. Measure these links when the load is at the upper or lower travel limit. If the hoist is always used for the same lifting distance, wear on these links will be about two to four times greater than the rest of the chain links.
For dimension P, measure the lengths of 5 links by tensioning the Load chain as shown in the figure below.



	Standard dimension mm		Service Limit mm	
	d	P	d	P
YSA - 250	6.3	95.5	5.9	97.4
YSA - 050				
YSA - 100	7.1	101	6.7	103
YSA - 200				
YSA - 320	13	180	12.3	183.5
YSA - 630				

- When any number of links in the working length reaches or exceeds the service limit, replace the entire chain.

■ Replacement Parts and Maintenance after Inspection

- Never use a new Load chain with a worn Load sheave or Bottom hook sheave [multi chain fall hoists].
  Replace the Load chain, Load sheave & Bottom hook sheave at the same time.
- See Chapter XI Replacement of Load Chain.
- Only use genuine replacement case hardened chain [see SANS 3077] & replacement parts.
- Always coat the Load chain with the recommended lubricant after inspection or upon replacement.
  See Chapter IX 1. Lubrication.

(3) Inspection of the Brake and Service Limit

Disassemble the brake and inspect the brake lining and brake component parts.

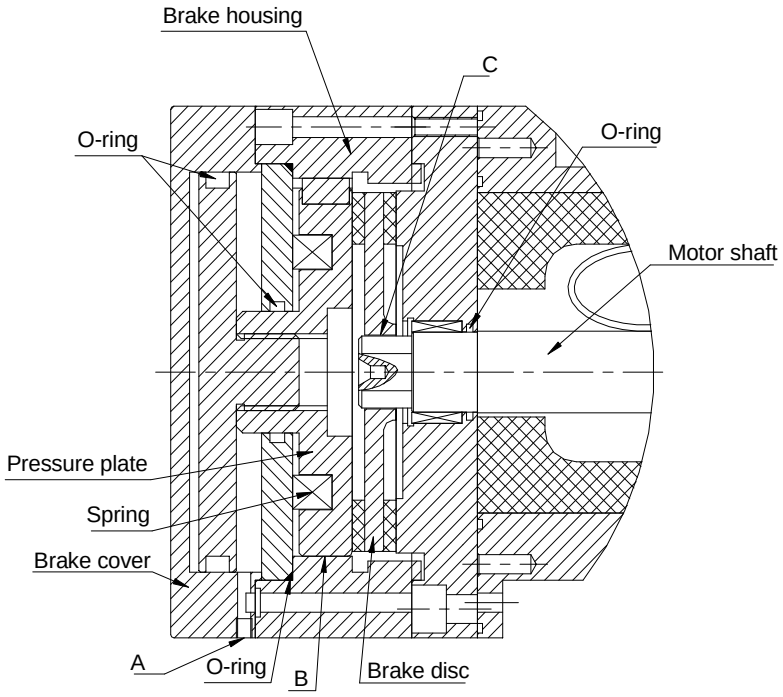
■ Disassembly of Brake

For details see Chapter XII 1. Disassembly Procedures.

a) Loosen Cap screws sequentially by 1/6 turns, and remove Brake cover.
b) Check to ensure that the grease from the reduction gear system has not leaked through the Oil seal when removing the Brake disc from the Brake housing.
c) If grease leakage is found, remove the Brake housing.
   Loosen cap screws sequentially by 1/6 turns.
d) Clean each part thoroughly.

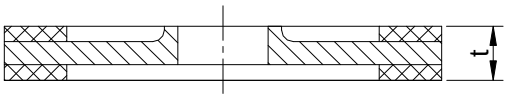
NOTE:

- Never use solvent when cleaning the Motor shaft Oil seal.
- Remove any oil deposit on the brake lining using a cloth wetted with solvent.
- Be careful to prevent solvent or foreign matter from entering the air circuit passages of the brake.



- Inspect all of the brake mechanism parts checking for cracks, flaws, deformation and wear. In particular, check the following:
- Does the level of wear on the brake lining exceed the service limit?
- Are the brake springs tension deteriorated or are the springs cracked, broken or distorted?
- Are there any pressure marks or cracks visible at point C i.e. the connection between the brake disc and motor shaft?
- Is the brake air exhaust hole on the Brake cover A open?
- Are there flaws, deformation or wear on the motor shaft Oil seal?
- Are there any flaws on the motor shaft surface where the Oil seal seats?

- Wear Limit of the Brake Lining



Model	Standard Dimension mm	Service Limit mm
YSA-250	11.4	8.3
YSA-050		
YSA-100	11.4	8.3
YSA-200		
YSA-320	14	10
YSA-630		

- Worn Brake parts
  - Replace cracked, flawed, deformed or worn parts.
  - Replace the Motor shaft Oil seal if oil has leaked through from the air motor side. Remove any oil deposit on the lining, etc., by using a cloth wetted with solvent. If the Motor shaft is worn or damaged replace it with a new one.
  - Replace the Brake disc if the level of wear on the lining exceeds the service limit. Even if the wear level is close to the service limit replacement is recommended.
  - Replace all of the Brake springs as a set at the same time as replacing the Brake disc.
  - If it is necessary to replace the brake springs only then always replace all the Brake springs as a complete set.

- Assembly
  - See Chapter XII 2. Reassembly for assembly procedure.
  - Apply Molykote Grease 33 to the sliding surface of the O-ring, sliding surface B of the Brake pressure plate & Brake housing, and on the Motor shaft engagement section C between the Brake disc and Motor shaft before assembly. See Chapter IX 1. Lubrication.
  - Thinly coat the sliding surface B of the Pressure plate and engagement area part C of the Motor shaft with grease.
  - The Brake is a self-adjusting system so therefore Brake adjustment is not required.

(4) Inspection of the Load Sheave

- Are there any visible indentations or rounded link-pocket shoulders on the Load sheave?
- Is there any deformation or cracks on the splined areas and connecting surfaces of the sheave shafts.
- Are the Bearings damaged or worn?
  Those which do not rotate smoothly (feels rugged when manually rotated) are beyond their service limit.
- Replace the Load sheave at the same time as replacing the Load chain.

(5) Inspection of Hook attachments and Bottom hook Assembly

- YSA-025, YSA-050, YSA-100, YSA-200
  - Are there any deformations, cracks, indentations or damage visible on the Hook attachments?
    Carefully check the condition of the profile where the Load chain is attached.
    Is there any wear or indentations on the Hook bearing steel balls raceway surface ?
  - Are there any pressure marks, deformation, flaws, cracks, or corrosion on the Load chain anchor pin?
  - Is Ring deformed?
    Is there any play when Ring is fitted In the groove?
  - Are there any cracks on the hook Thrust Bearing?

- YSA-320, YSA-630
  - Is there any deformation or cracks on the Bottom hook Assembly casing?
    Carefully check the part where Hook holder is attached.
  - Is there any wear or indents on the raceway surface of Steel ball in Hook holder?
  - Are there any cracks on Thrust Bearing?
  - Are Bolts loose?

(6) Inspection of Casing (Main body Case)

- Are there any flaws, cracks, or deformation?
  Carefully check the part where Top hook and Chain guide is attached.
- Has Bolt, which fixes the dead end of Load chain (end link on the non-loading side). dropped or is it loose?
- Are Boles loose?

(7) Inspection of Chain Guide

- Are there any flaws. cracks. deformation or corrosion?
  Carefully check the contact areas of the Casing and the chain anchor pm is fixed.
- Is there excessive wear on the contact surface from Load chain?
- Are there any pressed marks, deformation. flaws, cracks or corrosion on the chain anchor pin?
  Is Split pen in place?
- Is Bolt for fixing Chain guide loose?

(8) Inspection & Checks of the Operating Controls

- Toggle Pull Type
  - Is the control Pull rope /control chain twisted or broken?

- Does the Control lever on the main valve return to the neutral position after the Control rope is released?

- Pendant Control Type
- Are the Control hoses damaged, or the air hose connections loose?
- Is the control hose Protection tube broken or bent?
- Do the handle operating levers return to the neutral position after being released?
- Is the Pendant control handle damaged?
- Is the Pendant handle & hoses Support wire and attachments in good condition and securely attached?

(9) Inspection of Main Air Valve (Main Valve)

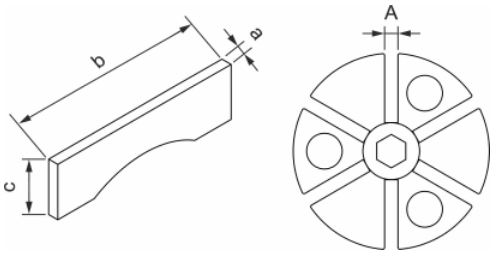
- Is there any deformation or cracks on the Control lever [Toggle Control type]?
- Are all of the mounting capr screws securely tightened?
- Does the Control lever instantly return to the neutral position after release from up/down position?
- Is the Main air Valve housing damaged?

Note: If the Air Strainer mesh in the main air supply hose connection is clogged this will reduce the hoist performance so clean this hose connection periodically.

(10) Inspection of the Air Motor

- Replace the following parts if damaged or beyond the following service limits:
- Vanes are warped, seized, cracked or worn beyond their service limit – see table below. End surfaces of the Rotor are gouged, worn or seized on the motor end plates.
- The vane slot of thr Rotor is worn beyond the service limit or is narrower than the standard dimension.
- The Rotor is cracked, or there is damage/deformation on the contacting surfaces between the Rotor and Coupling.
- The motor End plates are scored, seized, or the surface is rough due to wear.
- Abnormal wear, damage or corrosion is found in the Cylinder.
- Bearings are damaged, worn, or do not rotate smoothly.
- The exhaust silencer is clogged.

- Wearing Limit of Vane and Rotor

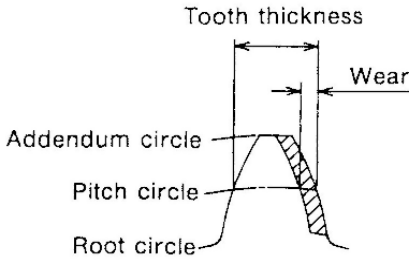


Model	Standard dimension				Service Limit			
	A	a	b	c	A	a	b	c
YSA-025	5	4.8	45	19.2	5.4	4.5	44.5	18.6
YSA-050	5	4.8	76	19.2	5.4	4.5	75.5	18.6
YSA-100	5	4.8	85	21.1	5.4	4.5	84.5	20.5
YSA-200								
YSA-320	6	5.8	110	30.3	6.4	5.5	109.5	29.7
YSA-630								

(11) Inspection of the Motor Coupling

- Are there any cracks, visible indentations or deformation on the internal hexagon surfaces?

(12) Inspection of Reduction Gears



- Are there any shavings, burrs, marks, or deformation on the engagement areas of the gear teeth ?
- Are any parts visibly cracked?
- Are any Bearings damaged or worn?
  Bearings which do not rotate smoothly are beyond their service limit.
- The wear limit of the Gear teeth on the pitch circle should be within 10% of the original.
  dimension of tooth thickness.
  However, the wear limit for the first stage of gear teeth should be 5 %.

(13) Inspection of the Chain Bucket

- Is there excessive wear on the fabric area of the Chain bucket?
- Are the mounting bolts tight & secure?
- Is there any dirt or foreign matter in the Chain bucket?
- The Chain bucket should be large enough to accommodate the entire length of the Load chain.

(14) Inspection of the Trolley

- For details refer to the Instruction Manual of the Beam Trolley.
- Are the mounting bolts for the I-beam stopper plate tight & secure?
- Check to see that the trolley wheels track on the rail properly and do not "crab" or bind. Is the beam excessively worn?
- Are the trolley wheels or the guide rollers damaged or worn?
- Check all the supporting components, hangers & brackets are not deformed, cracked or worn.

(15) Inspection of Lifting Slings

- Is the sling rope / chain kinked, worn or damaged?
- Is the sling chain worn (reduction of diameter) or cracked?
  Is the pitch of the sling chain stretched?
- Is the sling hook, shackle, or ring deformed, cracked or worn?

(16) General Operation Inspection

After completing the inspections described in the previous sections, reassemble the whole unit according to Chapter XII 2. Reassemble and inspect as the following functions as follows:

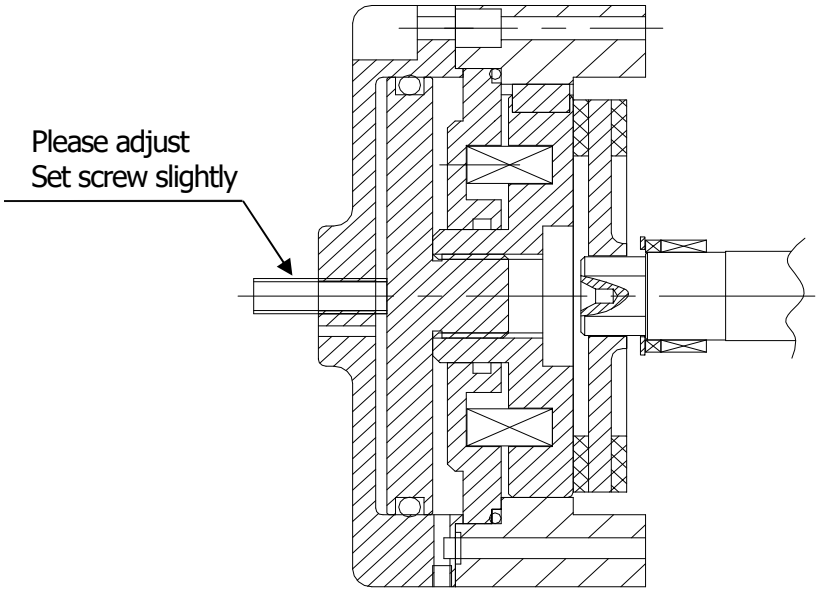
■ Idling

- Check the Toggle or Pendant controls can be easily operated and up/down operations are correct as indicated.
- Check the hoisting speed can be varied by controlling the degree of movement of the Toggle or Pendant control levers.
- Check the Load chain travels freely and smoothly into and out of the hoist & Bottom hook chain wheel and there is no noise indicative of binding or other malfunctions.
- Check Upper and Lower limit chain travel shut-off device functions correctly.
  See Chapter V 3. Hoisting and Lowering Limit Control Device.
- Check the hoist is not abnormally noisy or vibrating during free running in either Up or Down direction.

■ Rated Load Test

- Check for malfunctions while lifting and lowering.
  Operate the hoist at least twice through the full lifting range.
- Lift the rated load a few inches off the floor and check the brake is able to stop and hold the load without excessive drift.
- Check that the Load chain travels freely and smoothly into and out of the hoist & Bottom hook Chain wheel and there is no audible clicking or other evidence of binding or malfunction.

- Check the hoist is performing to is performing to specification.
- Check the hoist is not abnormally noisy or vibrating under loaded opeartion.
- Be alert for any unusual visible or audible sign / noise which may indicate a defect.
- Do not operate the hoist until all defects have been determined and corrected.
- When hoist down, Slippage ≧velocity x1% as standard. If it's over 1%, please adjust set screw slightly.



3. Adjusting the Overload Protection Mechanism

The adjustment method described below is conducted with the hoist carrying a test load.

DANGER:

If the overload protection is set too high, impermissibly high stresses may arise if a load exceeding the permissible load carrying capacity is attached.

- Unload the hoist
- Detach the gearbox cover (1) from the gearbox in order to gain access to the threaded pins (2) with lock nuts (3) them. Refer to the drawing below.

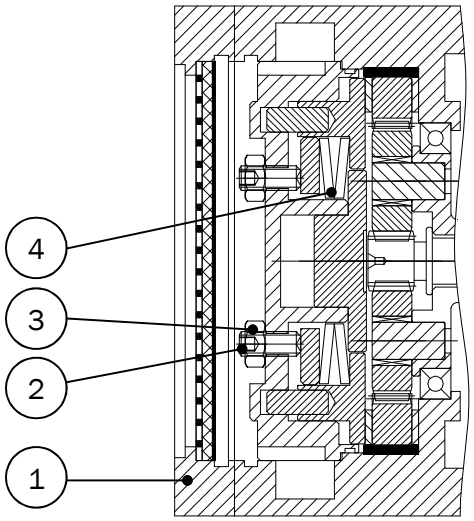
ADJUSTING THE SET LIMIT VALUE

- Loosen the lock nuts. Ensure that the threaded pins are not turned.
- During each readjustment adjust the threaded pins to the same degree in order to adjust the disc springs tension evenly: turning clockwise - limit value is increased, turning anti-clockwise - limit value is reduced.
- Secure the threaded pins with the lock nuts. Do not turn the threaded pins any more as the setting will be altered.
- Check the limit value to confirm the correct setting.
- Install the gearbox cover.

RESETTING THE LIMIT VALUE

- Loosen the lock nuts. Screw out the threaded pins - anti-clockwise - until the disc springs (4) are completely free of pre-tension.
- Then loosely screw in the threaded pins by hand, clockwise, to the stop point [back off the lock nuts sufficiently beforehand].
- The required limit value is at least 110% of the WLL load-carrying capacity and is set at approx.
  2 turns.
  Screw in the three threaded pins sequentially a 1/2 turn at a time. With this pre-adjustment after reassembly, first let the safety clutch take effect for approx. 5 seconds by running the bottom hook to the maximum Up position with the motor running for the 5 second period. Then lower the hook and free-run the hoist for approx. 10 seconds without a load so that the exhaust air can cool the Overload Prevention Mechanism.

- Secure the threaded pins in their position with the lock nuts, Hold the threaded pins tightly in the process.
- Load test the hoist and confirm that the limit value is at the correct setting.
- Install the gearbox cover.
- The adjusting and inspection result arrived at during the load test performed by qualified personnel must be entered in the lifting gear inspection log.



4. Storing the Hoist

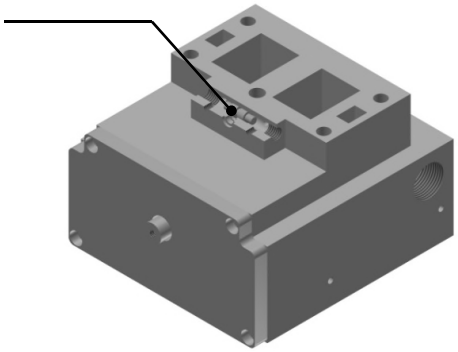
If the hoist is to be stored for a long time, flush rust-proofing oil, E.g. Shell Ensis Fluids SDB ,etc., through the air inlet port and run the hoist at low speed for several seconds. Store the hoist in a dry location.

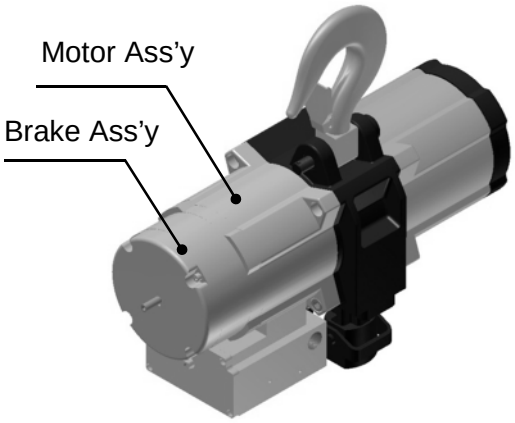
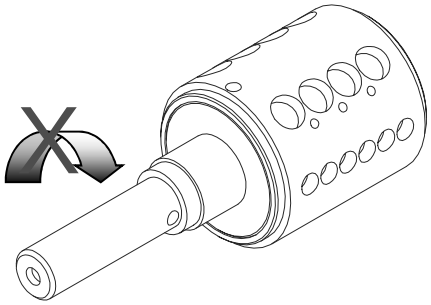
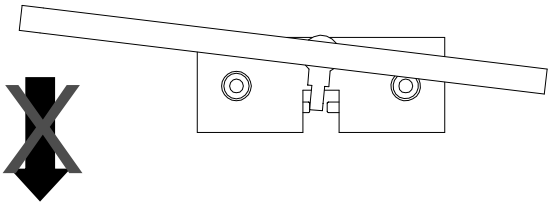
5. Troubleshooting

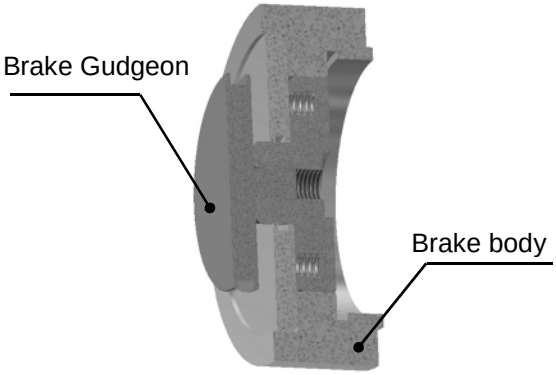
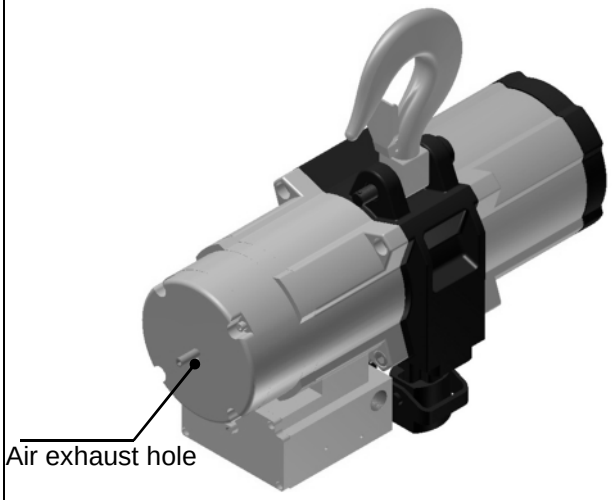
CAUTION : If a malfunction occurs during the operation of the hoist, stop operation immediately and take the necessary steps to rectify the problem.

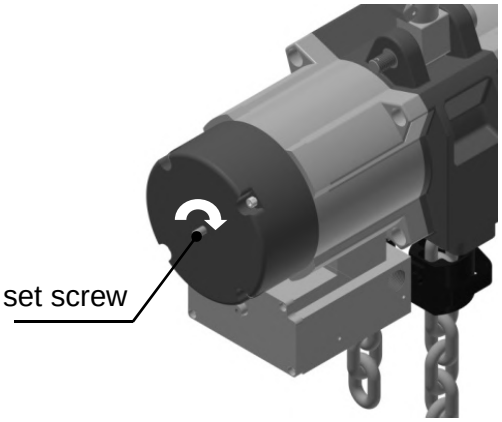
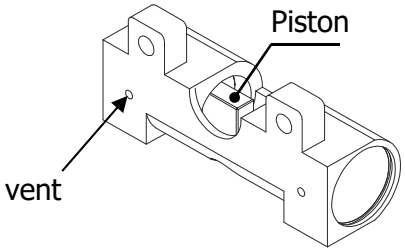
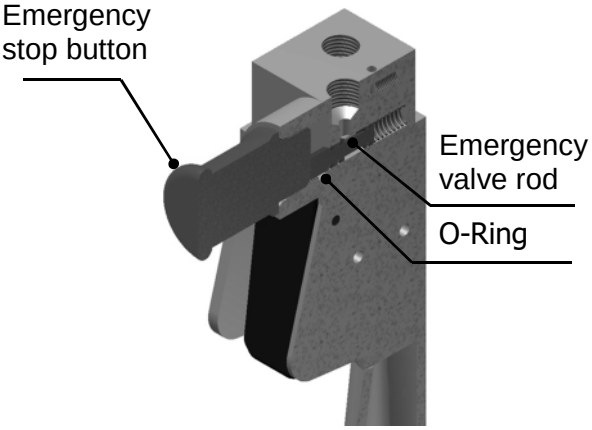
The following table shows probable causes and solutions of common malfunctions.

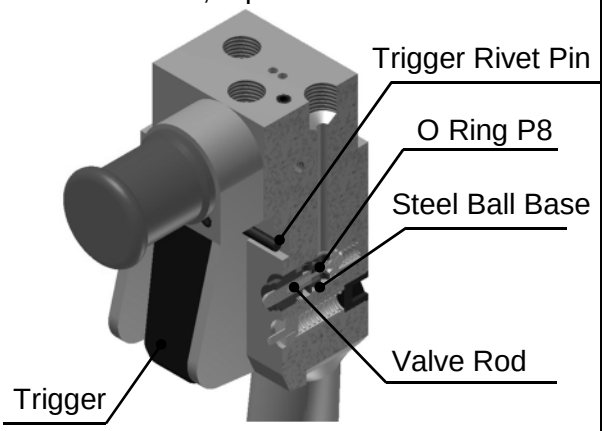
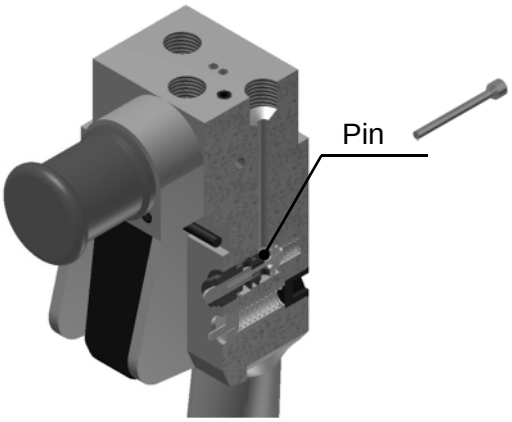
Malfunction	Main Causes	Solution
Air Motor does not run. Slow rotation or no rotation of the Air Motor.	● Insufficient air pressure. ● Supplied air volume is insufficient. ● Inner diameter of the main air supply hose / piping is too small. ● The mesh strainer in the main air supply connection at the air inlet port is clogged. ● Silencer is dirty & blocked. ● Dirt, scale or rust in the Air Motor. ● Vanes are swollen in the rotor due to moisture absorption or long term storage. ● Vanes are burned due to unlubricated operation. ● Vanes are worn or damaged. ● The main air valve is stuck. ● Control lever is bent or damaged. ● Brake does not release. ● Reduction gearing is seized or incorrectly assembled. Check all gears, bearings, etc., for wear & damage.	● Increase air pressure. ● Increase compressor capacity. ● Replace pipe with a larger inside diameter pipe / hose. ● Clean mesh strainer. ● Replace Silencer. Clean Motor then lubricate. Clean air filter and replace filter element. ● Replace Vanes. Discharge drain water from air filter. Or clean air filter and replace filter element. ● Clean the Air Motor and replace Vanes, etc, as required. Refill the oil lubricator and clean the lubricator bowl. ● Replace Vanes. ● Disassemble and check the valve, o-rings, seals, springs, etc,. ● Replace Control lever. ● Clean air circuit of the brake. Thereafter test airflows out of the port. ● Disassemble and check. Replace the worn or damaged parts.
Brake does not work or hold the load in suspension. Brake slips excessively under load. Brake does not release.	● Lining & brake springs are worn. ● Oil on lining. ● Air exhaust hole on the brake cover is blocked. ● Main air valve does not return to the neutral position.	● Replace Brake disc & spring set. ● Clean. Replace the motor shaft oil seal if required. ● Clean. See Chapter IX 2.(3) Inspection of Brake and Service Limit. ● Check the operating control system, e.g., bent Control lever. Disassemble & check Air Valve.

Malfunction	Main Causes	Solution
If a malfunction occurs during the operation of the hoist, stop operation immediately and take the necessary steps to rectify the problem.	● Shuttle Valve inside of the Direction valve jammed	● Take the Shuttle Valve apart, check the O-ring. If O-ring is damaged, replace the new one. ● Check if Set Screw is damaged. Replace a new one if it's damaged. Shuttle Valve 
	● Supplied air volume is insufficient.	● Refer to Air consumption table. (page 3). ● Check air compressor specification. The volume flow rate of compressed air (free air delivery F.A.D) should be equal to YSA Air consumption. 
	● Insufficient air pressure.	● Increase air pressure to above 4bar. 

Malfunction	Main Causes	Solution
If a malfunction occurs during the operation of the hoist, stop operation immediately and take the necessary steps to rectify the problem.	● Inner diameter of the main air supply hose / piping ● Dirt, scale or rust in the Air Motor.	● Refer to the specification table from the operation manual for supply hose size. ● Refer to “XI. Disassembly” from the operation manual. ● Clean Motor then lubricate. Clean air filter and replace filter element. 
	● Vanes are worn or damaged	● Check IX. Maintenance and Inspection from operation manual. Table of Inspection of the Air Motor ● Wearing Limit of Vane and Rotor (page 20)
	● Direction valve does not work well.	● Check if Sleeve clockwise and counterclockwise works smoothly. ● If turn 360° unsmooth, replace sleeve. 
	● Limit is stuck	● Clean and reassembly up & down limit Ass’y parts ● If O-ring damaged, replace it as well. 

Malfunction	Main Causes	Solution
If a malfunction occurs during the operation of the hoist, stop operation immediately and take the necessary steps to rectify the problem.	● Needle Bearing on Motor End & Front Cover damaged. ● Brake Gudgeon is stuck.	● Refer to “XI. Disassembly” from the operation manual, replaces new needle bearing. ● Apart brake rear cover. ● Check if Brake Gudgeon & Brake Spring worn out or damaged. ● Check if Brake Gudgeon fits to brake body well. 
Brake does not work	● Brake lining is worn ● Air exhaust hole on the brake cover is block	● Replace new lining ● IX. Maintenance and Inspection from operation manual : Wear Limit of the Brake Lining. ● Clean. See Chapter IX 2.(3) Inspection of Brake and Service Limit. 

Malfunction	Main Causes	Solution
Brake does not work	● Brake Lining is worn. There is an increase in the braking gap which causes poor braking force.	● Tighten up set screw clockwise with Allen key. In the meantime the hoist does not work if pushing button switch. ● Turn set screw counterclockwise 60°~66°with Allen key. Then push button switch, hoist stops slipping. 
Direction valve does not work	● Direction valve Ass'y is stuck.	● Apart valves body from direction valve Ass'y. ● Put in air to arrow (as below figure) with air gun. ● If Sleeve does not work, apart those parts from direction valve Ass'y. ● Check if inside components and O-ring are damaged. And replace damaged parts. ● Keep inside direction valve is clean and re-assembly it. 
Pendant control issue	● Emergency stop does not work	● Apart emergency stop button ● Take Emergency Valve Rod out ● Check if O-ring on the Emergency Valve Rod is damaged 

Malfunction	Main Causes	Solution
Pendant control issue	● Air-Leakage of pendant control	● Take Trigger Rivet Pin apart and remove Trigger ● Take Valve Rod out. ● Take Bush out from handle. ● Check if O Ring P8 on the bush is damaged ● Check if Steel Ball Base is damaged or worn off. If so, replace a new one. 
	● Unable to press trigger down	● Take Trigger Rivet Pin apart and remove Trigger ● Take Valve Rod out. ● Check if pin is damaged or worn off. If so, replace a new one. 

X. Replacement of the Load Chain

Chain link wear or damage cannot be detected by casual observation and therefore the Load chain should be inspected as per the procedure in Chapter IX 2.(2) Inspection of Load Chain & Service Limit.

Only fit genuine replacement chain.

For Single Load chain fall models : YSA-025,YSA-050,YSA-100,YSA-320:- (See Fig. 9)

-1) Remove the old Load chain by removing the Chain stopper & Spring and run the chain slowly out of the hoist.

> **CAUTION :**
> Shut off the air supply after removing the old Load chain.

Procedure for installing the new Load chain

-2) Loosen the Brake cover cap screws sequentially by 1/6 turns, and remove the Brake cover. Remove the Pressure plate, Cylinder cover, and Brake piston together from the Brake housing to access the Motor shaft.

-3) Pass a steel wire through the Chain guide around the Load sheave until the wire exits the hoist on the opposite side of the Chain guide.
Attach the steel wire to the first link of the new Load chain [this link will become the end link on the free-end of the chain below the Chain Stopper after the Load chain is fed through– see Fig.9].

-4) Pull the Load chain into the Chain guide by pulling the steel wire through the hoist [see point 5.].
The first link must be a standing link (the link must be perpendicular to the Load sheave).

NOTE : The link weld must face away from the Load sheave.
Check the subsequent standing links also have their weld facing outwards.

-5) Rotate the Motor shaft by hand to feed the Load chain through the hoist.

-6) When the first link emerges out of the hoist body, guide it through the Control lever and then attach the spring & Chain stopper to this free end of the Load chain.

-7) Fit the shut-off Spring and Bottom hook securely to the load side of the Load chain.

> **WARNING :**
>
> Make certain there are no twists on the non-loading side of the Load Chain between Chain wheel and the end link. Using the hoist when the Load chain is twisted could result in damage to the hoist or the Load Chain breaking, causing personal injury.

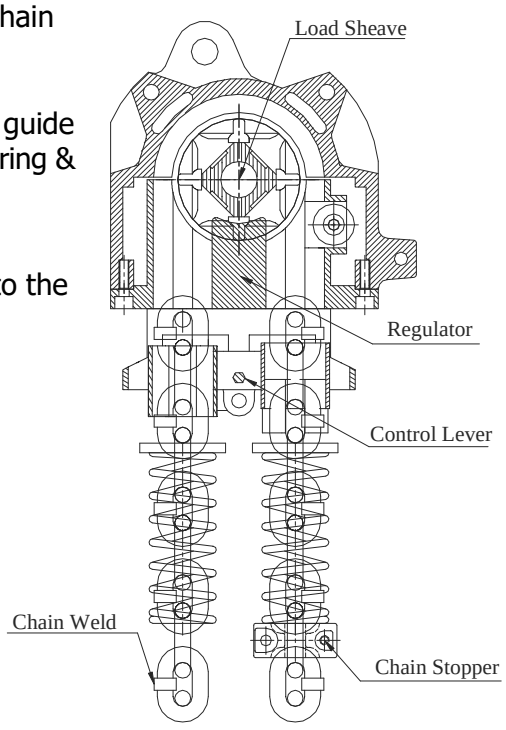


Fig. 9

-8) Clean the brake parts and inspect them before reassembling.

-9) Lubricate Load chain according to Chapter IX 1. Lubrication.

-10) Run the Bottom hook up and down several times under power with no load to make certain that the Load chain is running smoothly over the Load sheave.
There must be no apparent binding or jumping of the load chain or abnormal noises evident.
For Double Load chain fall hoists models: YSA-200, YSA-630 (See Fig. 9 & 10)

WARNING : The replacement chain for the double Chain fall hoist must have an odd number of links.

-1) Remove the old Load chain and feed the new Load chain through Chain wheel in the same Manner as steps -1)~-7) for Single Chain Fall Hoist (YSA-025, YSA-050, YSA-100, YSA-320).
Attach the Spring & Chain stopper to the non- load side end link.

WARNING : Make certain there are no twists in the non-load side of the Load chain between the Bottom hook Chain wheel and the end link. Using the hoist when the Load chain is twisted could result in damage to the hoist and/or the Load chain breaking resulting in personal injury.

-2) Pass a steel wire through the Bottom hook Housing around the Chain wheel .
Attach the end link of the Load chain on the loading side to the steel wire.

-3) Ensure the Load chain is straight, then feed the Load chain through the Bottom hook housing by pulling through the steel wire.

NOTE:
The first link must be a standing link [the link must be perpendicular to the Bottom hook chain wheel].
Note the position of the link weld on all standing links – see Fig. 10.

-4) Whilst ensuring the Load chain on the load sideis straight, fix the end link to the Top hook by using the chain Pin and Split pin provided.
Be sure to bend the ends of the Split pin after installation.

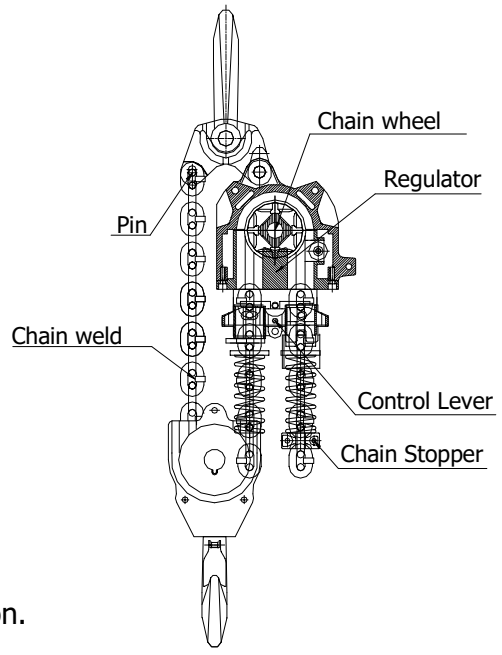


Fig. 10

WARNING : Ensure that the Load chain falls going into and out of the Under hook Assembly are not twisted which could otherwise result in damage to the hoist and/or the Load chain breaking.
See Chapter V 1. Load Chain.

-5) Clean the brake parts and inspect them before reassembling.
-6) Lubricate the Load chain according to Chapter IX 1. Lubrication.
-7) Run the unloaded Bottom hook up and down several times under power and ensure that the Load chain is running smoothly over the Bottom hook Chain wheel.

4. Method (See Fig. 11)

WARNING : The replacement Load chain for the double chain fall hoist must have an odd number of links.
When replacing the Load chain keep your hands clear of all moving parts including the Load chain and hook.
Always shut off the air supply before removing or fixing the end link of the Load chain, or loosening or tightening the hook securing pin.

-1) ●For Single Chain Fall Hoists: YSA-025, YSA-050, YSA-100, YSA-320
Disconnect the end link of the Load chain from the Bottom hook assembly.

●For Double Chain Fall Hoists: YSA-200, YSA-630
Remove the Top hook Load chain securing Pin, disconnect the end link of the Load chain from the Chain guide, and withdraw the Load chain from the Bottom hook Assembly.

●Do not remove the Load chain from the hoist.

-2) Using an abrasive wheel, etc., cut a portion of the second link from the end (i.e. the first flat link) as shown in Fig. 11.

NOTE:
Do not distort the link in any manner, Otherwise the Load chain will not pass over the Load sheave.

-3)Connect the new Load chain to the old Load chain by hooking the end of the new Load chain onto the cutaway link. The first link of new Load chain must be a standing link [link perpendicular to the Load sheave].

NOTE:
The weld must face away from the centre of the Load sheave. Ensure that all of the subsequent standing links also have the weld facing outwards.

Slowly operate the hoist in the lifting direction, feeding out the old Load chain and feeding in the new Load chain over the Load sheave and through the hoist.

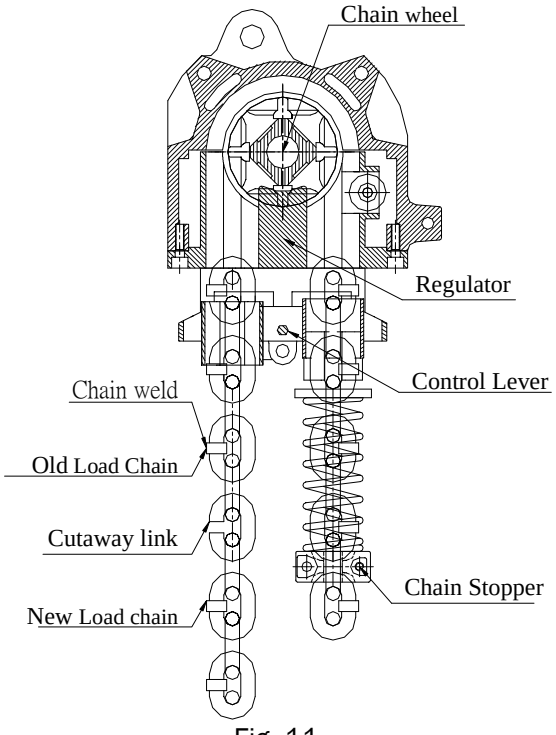


Fig. 11

圖

-4) When the end link of the new Load chain comes out of the hoist , pass it through the middle of the Control lever , then slide the Spring onto the chain and attach the Chain stopper. Now fix the end link onto the free chain end support lug on the hoist body using the securing pin & nut taking care not to twist the chain in the process.

WARNING : Ensure that the Load chain on the non-load side of the Load chain between the hoist and the end link is not twisted.

-5) Single Load chain fall Hoists: YSA-025, YSA-050, YSA-100, YSA-320

Slide the Spring onto the Load chain and then insert the end link on the load side of the Load chain into the Bottom hook attachment and fix with the Pin[Model YSA-320 only] and tighten all hook attachment cover bolts securely.

-6) Double Load chain fall Hoists: YSA-200, YSA-630 (See Fig. 10)

① Pass a steel wire through the Bottom hook Assembly Hook and attach the end link on the load side of the Load chain onto the steel feed wire.

② Ensure that the Load chain is straight, then feed the Load chain through the Bottom hook Assembly by pulling the steel feed wire through the Assembly.

NOTE:
The first link must be a standing link [link perpendicular to the Bottom hook Chain wheel].

③ Fix the end link into the Top hook bracket securing point using the securing Pin and Split pin ensuring that the ends of the Split pin are bent over after installation.

WARNING : Ensure that the Load chain between the hoist and the Bottom hook Assembly is not twisted.
If the hoist is used with the load chain in a twisted state the Load chain could break and cause serious/fatal injury and /or damage to property.

-7) Lubricate the Load chain according to Chapter IX 1. Lubrication.

-8) Run the Underhook Assembly up and down several times under power with no load to ensure that the Load chain is running smoothly over the Bottom hook Chain wheel.

XI. Disassembly

CAUTION

- Shut off and disconnect the air supply before dismounting, disassembly or reassembly of the hoist.
- Dismount the hoist from it suspended position before disassembly or reassembly.
- Careless mistakes during maintenance may cause damage to the hoist or personal injury. Therefore, take care during maintenance.
- Only allow competent, qualified or well trained personnel to perform maintenance.
- Whenever clamping a part in a vice, always use copper-covered vice jaws to protect the surface of the part and help prevent distortion.

1. Procedures of Disassembly

Refer to the exploded view drawings and disassemble the hoist according to the following procedure:

-1) Remove the hoist from the supporting structure / suspension device.

-2) Remove the Load chain .

① Remove the Load chain free end securing screw and disconnect the end link from the hoist body.

② Suspend the hoist about 1.5 m above the floor level and connect an air supply hose. Pressure of the air supply should be between 4~6 bar [4-6 kgf/cm^2/ 60~85 psi].

③ Slowly operate the hoist in the lowering direction and remove the free end side of the Load chain from the hoist.

CAUTION : Stand clear of the hoist as the Load chain will drop out of the Chain hoist as the end links disengage from the Load sheave.

④ After shutting off the air supply, disconnect the hose and lower the hoist onto the floor.

-3) Remove the Load chain bucket .

-4) In the case of dual Load chain fall Hoists YSA-200,YSA-630:
Remove the Top hook Load chain securing Pin and disconnect the end link from the Top hook frame.

-5) If the hoist is a Pendant control model, remove the entire Pendant control handle [see Page 50].

-6) Remove the Hex Recess Bolt & Spring Washer (see items 1&2 on Page 39 Direction Valve Assembly), then remove the Direction Valve Body Cover (item 3 on Page 39).

-7) Remove the Valve Body see (item 6 on Page 39).

-8) Remove the Steering Yoke, Parallel Pin & Retaining Ring (see items 17,18 &19 on Page 39).

-9) Remove the Sleeve Assembly (see items 20~27 on Page 39).

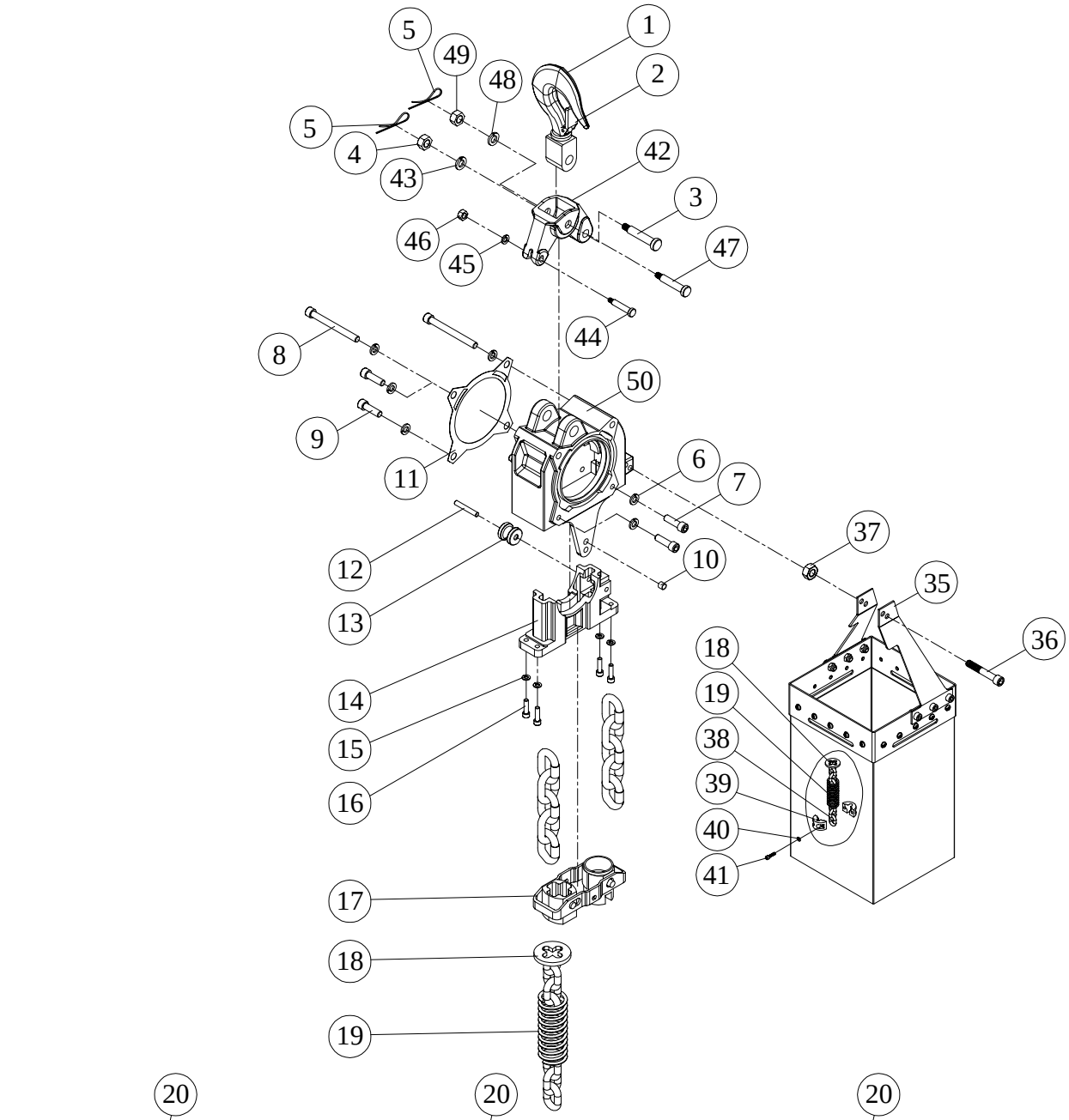
NOTE : Do not remove the Gasket (see item 51 on Page 39) except when the O-ring (see item 28 on Page 39) or the Gasket itself needs to be replaced. The Hex Recess Bolts are sealed with sealant (see item 35 on Page 39). Do not remove them unless necessary.

-10) Remove the Bottom Hook Cover Set Ass'y (item 20 on page 30).

-11) Place the Hoist on its side on a worktable with the Direction Valve Body facing outwards.
-12) Remove Top Hook Ass'y (item 1~5,44~51 on page 30).
-13) Remove Guide Tube Ass'y / Collision Block (item 17 on page 30).
-14) Remove Spring Washer & Hex Recess Bolt(item 6~9 on page 30).
-15) Loosen off Lock Nut & Set Screw of Motor Brake Ass'y (items 1 & 2 on page 35), then remove the Air Motor Ass'y.
① Remove the Air Motor Ass'y and ensure that the Direction Valve Body is now facing upwards.
② Loosen & remove the Hex Recess Bolt and Spring Washer (item 3, 4 on page 34) from the Motor Brake Ass'y.
③ Remove the Motor Brake Ass'y (items1~14,37,39,on page 354).
④ Loosen & remove the Hex Recess Bolt and Spring Washer (item 15, 4 on page 35) from the Brake Body.
⑤ Remove the Brake Body, Brake Disc and Gasket (items 18, 19, 38 on page35).
⑥ Remove Retaining Ring (item 20 on page 35) on each end of the Rotor shaft.
⑦ Disassemble the Air Motor Ass'y (item 21~35 on page 35).
-16) Remove Set Screw and Bearing (item 6 & 7 on page 44) to disassemble the Gear Box Ass'y and Housing Ass'y.
-17) Remove the Chain Regulator from the Housing Ass'y (items 12~16 on page 30).
-18) Position the Gear Box Cover (item 45 on page 44) facing upwards and remove the Hex Recess Bolt & Spring (items 46 & 47 on page 44).
-19) Remove the Gear Box Cover (items 41~45 on page 44) from the Gear Case Cover (item 48 on page 44).
-20) Remove the Nut (item 40 on page 44) from the Disc spring Real Cover.
-21) Using an L-shape wrench loosen the three Set Screws sequentially (item 39 on page 44) to separate the Disc Spring Real Cover (item 39 on page 44) from the Gear Case Cover.
-22) Remove the Disc Spring parts from the Gear Case Cover (items 30~36 & 38 on page 44).
-23) Remove the Internal Gear A Ass'y (items 21~29 on page 44).
-24) Remove the Load Sheave from the Gear Case Cover (items 1~20 on page44).

XII. **Parts List**

HOUSING & HOOKS ASSEMBLY'S



HOUSING & HOOKS ASSEMBLY'S PARTS LIST

NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT					
			025	050	100	200	320	630
01	209302K	Top Hook	1					
	209342K				1			
	209343K					1		
	209345K						1	
	209348K							1
02	400487	Safety Latch Ass'y	2		2			
	400488					2		
	400489						2	
03	208841	Top Hook Pin	1					
	200489				1			
	200093					1		
	216854						1	
	200095							1
04	400084	Nut <M12×1.75>	1		1			
	400085	Nut <M16×1.5>					1	
	400086	Nut <M20×2.0>						1
05	400610	Cotter Pin	1					
	400633				1	2	1	2
06	400095	Spring Washer <M8>	6					
	400096	Spring Washer <M10>			6			
	400097	Spring Washer <M12>					6	
07	400013	Hex. Recess Bolt < M8×1.25×25>	2					
	400431	Hex. Recess Bolt <M10×1.5×30>			2			
	400023	Hex. Recess Bolt <M12×1.75×35>					2	
08	408443	Hex. Recess Bolt <M8×1.25×110>	2					
	408617	Hex. Recess Bolt <M10×1. 5×130>			2			
	408442	Hex. Recess Bolt <M12×1.75×160>					2	
09	400013	Hex. Recess Bolt < M8×1.25×25>	2					
	400431	Hex. Recess Bolt <M10×1.5×30>			2			
	400451	Hex. Recess Bolt <M12×1.75×40>					2	
10	405571	DU Lubricated Bearing <Ø12×Ø10×10>	1		1			
	405580	DU Oil Impregnated Bearing <Ø12×Ø10×10>					1	
11	402624	Gasket	1					
	402629				1			
	402634						1	
12	200995	Compressing Wheel Axle	1					
	200714				1			
	216853						1	

HOUSING & HOOKS ASSEMBLY'S PARTS LIST

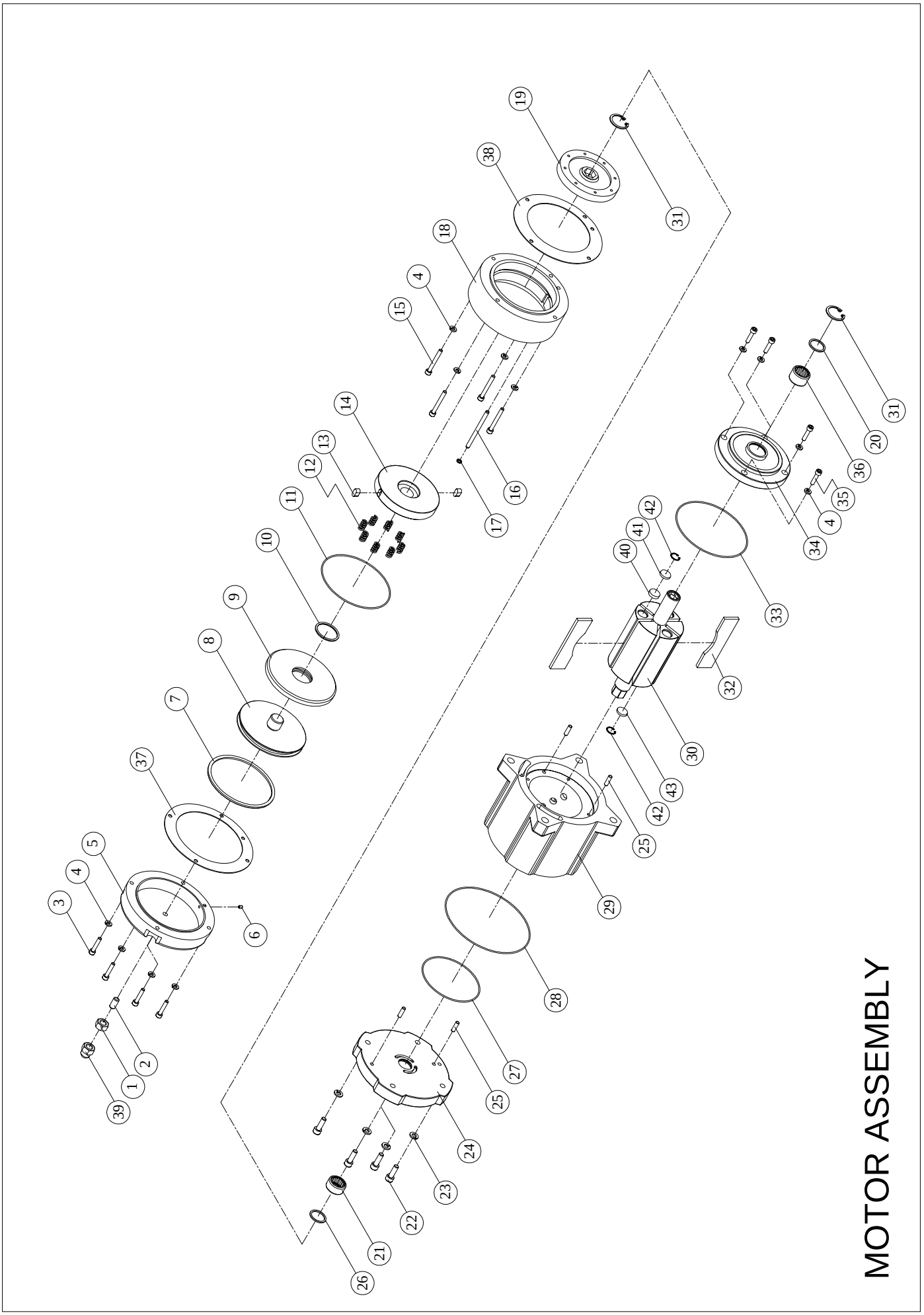
NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT					
			025	050	100	200	320	630
13	200996	Chain Pressing Roller	1					
	200715				1			
	216852						1	
14	200997	Chain Regulator	1					
	200717				1			
	216851						1	
15	400094	Spring Washer <M6>	4		4			
	400095	Spring Washer <M8>					4	
16	400007	Hex. Recess Bolt <M6×1.0×20>	4					
	400008	Hex. Recess Bolt <M6×1.0×25>			4			
	400014	Hex. Recess Bolt <M8×1.25×30>					4	
17	201173	Collision Block	1					
	201137			1				
	200992				1			
	216905	Guide Tube Ass'y					1	
18	200310	Stopper Plate Ass'y	2		2			
	216848	Stopper Plate <Ø70×t8>					2	
19	400231	Limit Spring <Ø6-Ø37×25×120>	2		2	3		
	404158	Limit Spring <Ø6-Ø58×Ø46×100>					2	3
20	209298	Bottom Hook Cover Set Ass'y	1					
	200020			1				
	200021K				1			
	200057K					1		
	216912						1	
	217006							1
21	400088	Lock Nut <M8×1.25>	2			3		
	400087	Lock Nut <M6×1.0>			4			
	400089	Lock Nut <M10×1.5>					4	3
22	209299	Bottom Hook Cover Set	2					
	200102K			2				
	200096K				2			
	200097K					2		
	216913						2	
	217007							2
23	408340	Hex. Recess Bolt <M8×1.25×30>	2					
	400008	Hex. Recess Bolt <M6×1.0×25>			4			
	400015	Hex. Recess Bolt <M8×1.25×40>				2		
	400018	Hex. Recess Bolt <M10×1.5×40>					4	
	400020	Hex. Recess Bolt <M10×1.5×50>						2

HOUSING & HOOKS ASSEMBLY'S PARTS LIST

NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT					
			025	050	100	200	320	630
24	200131	End Spacer	1		1			
	200132					1		
	200133						1	
	200134							1
25	400157	Thrust Bearing <2904>	1		1			
	400158	Thrust Bearing <2905>				1		
	400159	Thrust Bearing <51106>					1	
	400160	Thrust Bearing <51207>						1
26	200127	Load Brake Gear Spacer	2		2			
	200128					2		
	200129						2	
	200130							2
27	209496K	Bottom Hook	1					
	209351K			1				
	209352K				1			
	209353K					1		
	209357K						1	
	209358K							1
28	407470	Parallel Pin <Ø12×40>					1	
29	400014	Hex. Recess Bolt <M8×1.25×30>				1		
	400020	Hex. Recess Bolt <M10×1.5×50>						1
30	200108	Sprocket				1		
	217008							1
31	200114	Sprocket Axle				1		
32	400212	Spring Pin <Ø5×16L>				1		
33	400171	Needle Bearing <HK 25/26>				1		
34	400699	Bearing <6213 Z>						2
35	208779	Chain Bucket	1	1				
	208780				1			
	209467					1		
	209454						1	
	209468							1
36	408487	Hex. Recess Bolt <M5×0.8×80>	2					
	408470	Hex. Recess Bolt <M6×1.0×80>			2			
	405017	Hex. Recess Bolt <M6×1.0×60>				2		
	408384	Hex. Recess Bolt <M8×1.25×70>					2	
37	400646	Lock Nut <M5×0.8>	2					
	400087	Lock Nut <M6×1.0>			2			
	400088	Lock Nut <M8×1.75>					2	

HOUSING & HOOKS ASSEMBLY'S PARTS LIST

NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT					
			025	050	100	200	320	630
38	408723	Chain <Ø6.3>	3.5	3.5				
	408724	Chain <Ø7.1>			3.5	7		
	408725	Chain <Ø13.0>					3.5	7
39	200200	Chain Stopper	2		2			
	200202						2	
40	400094	Spring Washer <M6>	2		2			
	400095	Spring Washer <M8>					2	
41	400007	Hex. Recess Bolt <M6×1.25×20>	2		2			
	400013	Hex. Recess Bolt <M8×1.25×25>					2	
42	209459	Hook Bracket				1		
	209491	Hook Bracket						1
43	400097	Spring Washer <M12>	1		1			
	400098	Spring Washer <M16>					1	
	400099	Spring Washer <M20>						1
44	209494	Connecting Pin <Ø16×57>				1		
	200178	Connecting Pin <Ø19×72>						1
45	400095	Spring Washer <M8>				1		
	400097	Spring Washer <M12>						1
46	400088	Lock Nut <M8×1.25>				1		
	400091	Lock Nut <M12×1.75>						1
47	200489	Top Hook Pin <Ø18×95>				1		
	209493	Connecting Pin <Ø25×127>						1
48	400097	Spring Washer <M12>				1		
	400098	Spring Washer <M16>						1
49	400084	Nut <M12×1.75>				1		
	400085	Nut <M16×1.5>						1
50	200994	Housing	1					
	200713				1			
	216850						1	


MOTOR ASSEMBLY

MOTOR ASSEMBLY B.O.M

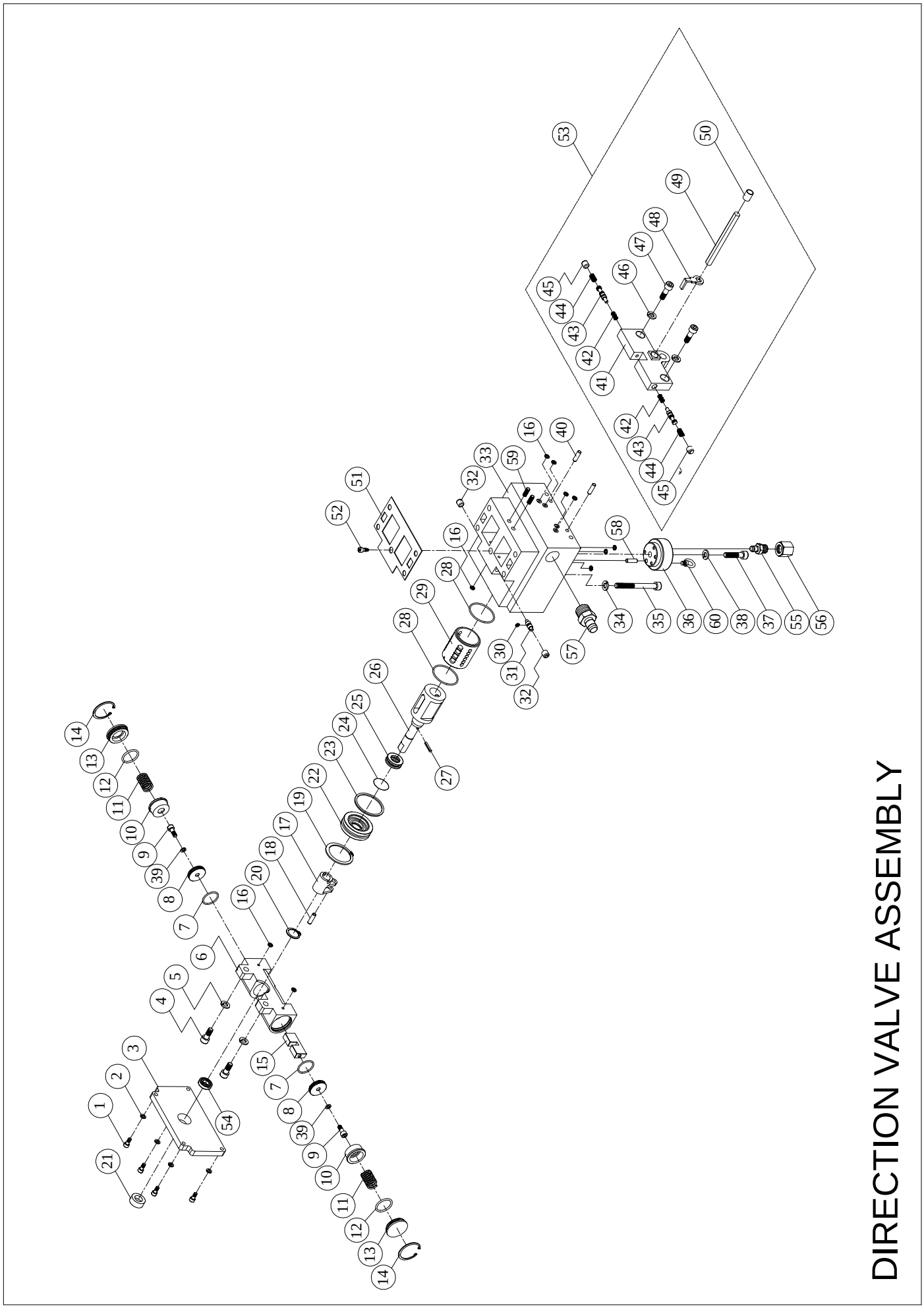
NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT					
			025	050	100	200	320	630
01	400080	Nut <M6×1.0>	1					
	400081	Nut <M8×1.25>			1			
	400082	Nut<M10×1.5>					1	
02	408453	Set Screw <M6×1.0×20>	1					
	404909	Set Screw <M8×1.25×25>			1			
	404910	Set Screw <M10×1.5×35>					1	
03	405020	Hex. Recess Bolt <M5×0.8×25>	4					
	400008	Hex. Recess Bolt <M6×1×25>			4			
	400418	Hex. Recess Bolt <M6×1×30>					4	
04	400093	Spring Washer <M5>	12					
	400094	Spring Washer <M6>			12		12	
05	106899	Brake Back Cover	1					
	106349				1			
	106203						1	
06	408445	Set Screw <M5×0.8×6>			1		1	
07	404454	O Ring <P-70>	1					
	404447	O Ring <P-90>			1			
	404434	O Ring <P-115>					1	
08	106902	Brake Gudgeon	1					
	106549				1			
	106204						1	
09	106903	Baffle	1					
	106348				1			
	209392						1	
10	404455	O Ring <P-26>	1					
	404448	O Ring <P-30>			1			
	404433	O Ring <P38>					1	
11	404520	O Ring <G-80>	1					
	404483	O Ring <S-100>			1			
	404308	O Ring <G-125>					1	
12	408526	Brake Spring	8					
	408523				8			
	408668						8	
13	400958	Key <5×5×10>	2					
	400962	Key <6×6×12>			2			
	405922	Key <8×8×15>					2	
14	106901	Ramp Plate	1					
	106548				1			
	106202						1	
15	405027	Hex. Recess Bolt <M5×0.8×45>	4					
	405023	Hex. Recess Bolt < M6×1.0×45>			4			
	408301	Hex. Recess Bolt < M6×1×50>					4	

MOTOR ASSEMBLY B.O.M

NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT					
			025	050	100	200	320	630
16	106554	Iron Tube <Ø4×Ø6×75>			1			
	106208	Iron Tube <Ø4×Ø6×86>					1	
17	404435	O Ring <P-6>	2		1		1	
18	106795	Brake Body	1					
	106359				1			
	106206						1	
19	106904	Brake Disc	1					
	106551				1			
	106207						1	
20	404525	Oil Seal <Ø26×Ø20×4t>			1			
	404506	Oil Seal <Ø25×Ø32×4t>					1	
21	405691	Needle Bearing <HK1216.2RS>	1					
	405690	Needle Bearing <HK2018.RS>			1			
	405696	Needle Bearing <HK2518.RS>					1	
22	400007	Hex. Recess Bolt <M6×1.0×20>	4					
	400008	Hex. Recess Bolt <M6×1.0×25>			4			
	400013	Hex. Recess Bolt <M8×1.25×25>					4	
23	400094	Spring Washer <M6>	4		4			
	400095	Spring Washer <M8>					4	
24	108028	Motor End Cover	1					
	108030				1			
	108034						1	
25	400213	Spring Pin <Ø6×16>	4					
	400554	Spring Pin <Ø8×15>			4			
	407489	Spring Pin <Ø10×20>					4	
26	404525	Oil Seal <Ø26×Ø20×4t>			1			
	404506	Oil Seal <Ø25×Ø32×4t>					1	
27	404466	O Ring <S-67>	1					
	404457	O Ring <S-80>			1			
	404449	O Ring <S-105>					1	
28	404467	O Ring <S-125>			1			
	404497	O Ring <S-160>					1	
29	108023	Motor Housing	1					
	108024			1				
	108025				1			
	108026						1	
30	108770	Rotor	1					
	108771			1				
	108772				1			
	108773						1	

MOTOR ASSEMBLY B.O.M

NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT					
			025	050	100	200	320	630
31	404203	Retaining Ring <IR-18>	2					
	404204	Retaining Ring <IR-26>			2			
	404192	Retaining Ring <IR-32>					2	
32	108769	Vanes	6					
	108768			6				
	108767				6			
	108766						6	
33	404456	O Ring <S-85>	1					
	404449	O Ring <S-105>			1			
	404484	O Ring <S-130>					1	
34	108027	Flange	1					
	108029				1			
	108033						1	
35	400002	Hex. Recess Bolt <M5×0.8×12>	4					
	400006	Hex. Recess Bolt <M6×1×16>			4			
	400008	Hex. Recess Bolt <M6×1×25>					4	
36	405691	Needle Bearing <HK1216.2RS>	1					
	405690	Needle Bearing <HK2018.RS>			1			
	405696	Needle Bearing <HK2518.RS>					1	
37	402623	Gasket	1					
	402628				1			
	402633						1	
38	402622	Gasket	1					
	402627				1			
	402632						1	
39	406414	Cap Nut <M6×1.0>	1					
	406415	Cap Nut <M8×1.25>			1			
	406429	Cap Nut <M10×1.5>					1	
40	209148	Grease Gauze	3					
	209151				3			
	209118						3	
41	209149	Grease Chamber Cover	3					
	209153				3			
	201269						3	
42	404201	Retaining Ring <R-10>	6					
	404202	Retaining Ring <R-14>			6			
	404196	Retaining Ring <R-18>					6	
43	209150	Grease Chamber Cover	3					
	209152				3			
	207252						3	



DIRECTION VALVE ASSEMBLY

DIRECTION VALVE ASSEMBLY B.O.M

NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT					
			025	050	100	200	320	630
01	400001	Hex. Recess Bolt <M4×0.7×12>	4		4			
	400002	Hex. Recess Bolt <M5×0.8×12>					4	
02	400092	Spring Washer <M4>	4		4			
	400093	Spring Washer <M5>					4	
03	200991	Direction Valve Body	1		1			
	216903						1	
04	400006	Hex. Recess Bolt <M6×1.0×16>	2		2			
	400012	Hex. Recess Bolt <M8×1.25×20>					2	
05	400094	Spring Washer <M6>	2		2			
	400095	Spring Washer <M8>					2	
06	200888	Valves Body	1		1			
	216891						1	
07	404425	O Ring <P-20>	2		2			
	404430	O Ring <Ø25×2>					2	
08	200895	Piston	2		2			
	216894						2	
09	400003	Hex. Recess Bolt <M5×0.8×16L>	2		2			
	408446	Hex. Recess Bolt <M6×1×16>					2	
10	200894	Spacer <Ø26.5×11>	2		2			
	216893	Spacer <Ø33×14>					2	
11	408524	Compression Spring	2		2			
	408518						2	
12	404442	O Ring <S-24>	2		2			
	404429	O Ring <Ø25×2.6>					2	
13	200889	Cylinders Cover	2		2			
	216892						2	
14	404185	Retaining Ring <R-30>	2		2			
	404191	Retaining Ring <R-37>					2	
15	200885	Connecting Plate	1		1			
	216895						1	
16	404435	O Ring <P-6>	10		10		6	
17	200877	Steering Yoke	1		1			
	216884						1	
18	407474	Parallel Pin <Ø5×15>	1					
	407471	Parallel Pin <Ø5×16>			1			
	407469	Parallel Pin <Ø6×20>					1	
19	400388	Retaining Ring <R-42>	1		1			
	400199	Retaining Ring <R-52>					1	

DIRECTION VALVE ASSEMBLY B.O.M

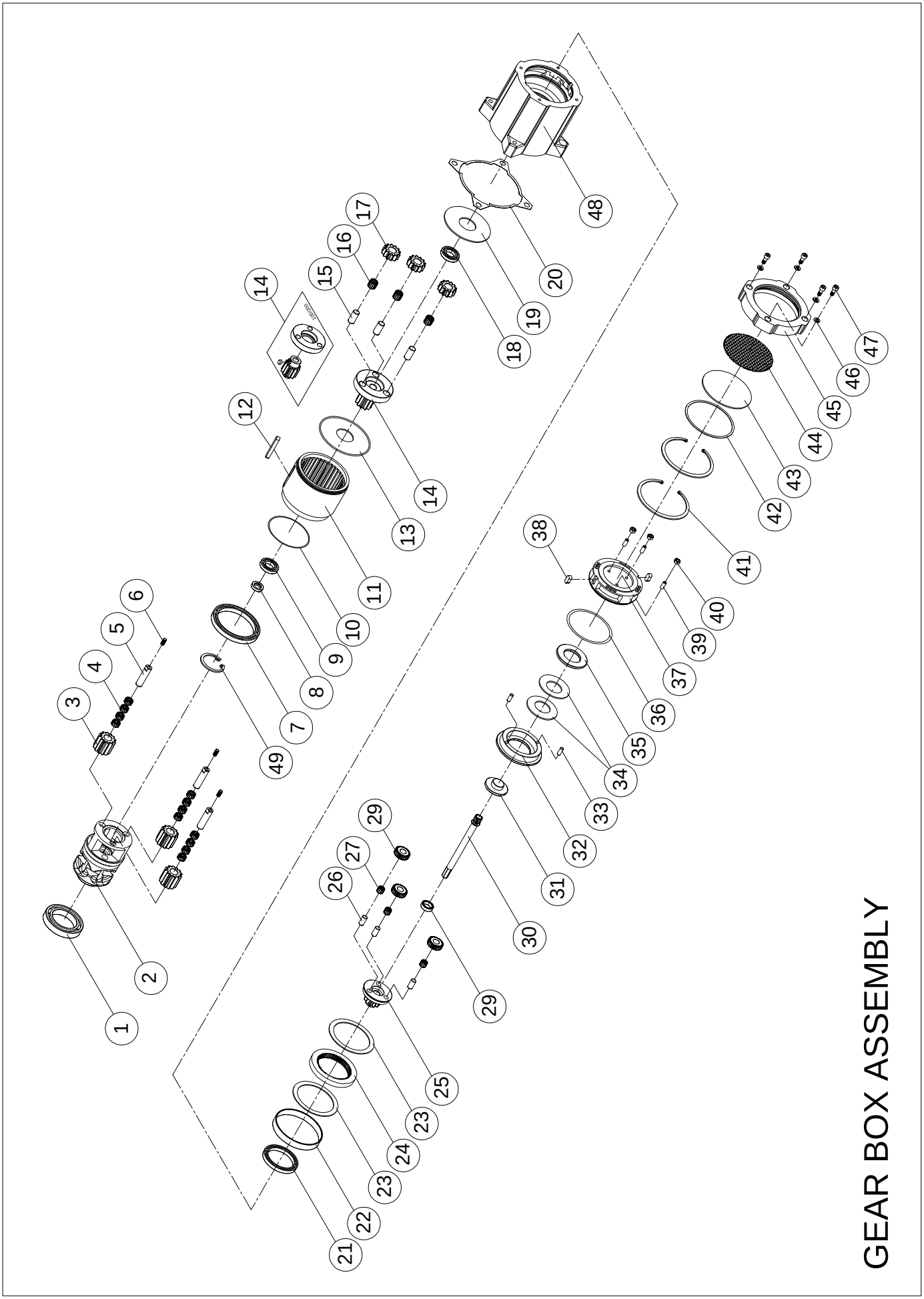
NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT					
			025	050	100	200	320	630
20	400188	Retaining Ring <S-10>	1		1			
	404001	Retaining Ring <S-14>					1	
21	269313	Spacer Sleeve <Ø23×Ø14×8>					1	
22	200886	Bearing Cover	1		1			
	216888						1	
23	404443	O Ring <S-39>	1		1			
	404464	O Ring <S-46>					1	
24	404438	O Ring <P-11>	1		1			
	404437	O Ring <P-16>					1	
25	400830	Thrust Bearing <51102>	1		1			
	400157	Thrust Bearing <2904>					1	
26	201152	Sleeve <Ø31×82.5>	1					
	201132	Sleeve <Ø31×93>		1				
	200868	Sleeve <Ø31×110>			1			
	216882	Sleeve <Ø38×134>					1	
27	407481	Parallel Pin <Ø4×19>	1		1			
	407485	Parallel Pin <Ø3.9×24>					1	
28	404444	O Ring <S-34>	2		2			
	404427	O Ring <Ø42×Ø46×Ø2>					2	
29	201153	Cylinder Sleeve	1					
	201133			1				
	200878				1			
	216886						1	
30	404458	O Ring <S-3>	1					
	404422	O Ring <P-4>			1		1	
31	201136	Shuttle Valve	1					
	216902				1		1	
32	408615	Set Screw <SBPPS8-10>	2					
	408657	Set Screw <SBCT10-12>			2		2	
33	201151	Direction Valve Body	1					
	201134			1				
	200879				1			
	216887						1	
34	400094	Spring Washer <M6>	4		4			
	400095	Spring Washer <M8>					4	
35	408414	Hex. Recess Bolt <M6×1.0×90>	4		4			
	408443	Hex. Recess Bolt <M8×1.25×110>					4	

DIRECTION VALVE ASSEMBLY B.O.M

NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT					
			025	050	100	200	320	630
36	201135	Plug Adapters	1					
	216889				1		1	
37	400007	Hex. Recess Bolt <M6×1.0×20>	1					
	400014	Hex. Recess Bolt <M8×1.25×30>			1			
	400017	Hex. Recess Bolt <M8×1.25×35>					1	
38	400094	Spring Washer <M6>	1					
	400095	Spring Washer <M8>			1		1	
39	400093	Spring Washer <M5>	2		2			
	400094	Spring Washer <M6>					2	
40	407472	Parallel Pin <Ø6×15>	2		2		2	
41	200899	Limit Frame End Plate	1		1		1	
42	404428	O Ring <P-5>	6		6		6	
43	216901	Limit Compressing Block	2		2		2	
44	408519	Limit Spring	2		2		2	
45	404901	Set Screw <M10×1.5×10>	2		2		2	
46	400094	Spring Washer <M6>	2		2			
	400095	Spring Washer <M8>					2	
47	400006	Hex. Recess Bolt <M6×1.0×16>	2		2			
	400013	Hex. Recess Bolt <M8×1.25×25>					2	
48	200897	Limit Cam	1		1			
	201389						1	
49	200688	Control lever	1					
	200689			1				
	200898				1			
	216898						1	
50	405561	DU Oil Impregnated Bearing <Ø12×Ø10×15>	1		1		1	
51	402621	Gasket	1					
	402626			1				
	402631				1			
	402636						1	
52	216885	Stay Bolt <M5×0.8×11>	1		1		1	
53	269246	Limit Switch Ass'y	1					
	269247			1				
	200896				1			
	216897						1	
54	405643	Bearing <6900ZZ>	1		1			

DIRECTION VALVE ASSEMBLY B.O.M

NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT					
			025	050	100	200	320	630
55	300810	Connector	3					
	300912				3		3	
56	406426	Nut 1/4H	3		3		3	
57	408670	Straight Connector	1					
	300910			1	1			
	300911						1	
58	400615	Parallel Pin <Ø5×12>	1					
	407472	Parallel Pin <Ø6×15>			1		1	
59	408452	Set Screw <M5×0.8×8>	12		12		13	
60	408669	Eye Bolt <M4×0.7>	1					
	404803	Eye Bolt <M6×1.0>			1		1	


GEAR BOX ASSEMBLY

GEAR BOX ASSEMBLY B.O.M

NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT					
			025	050	100	200	320	630
01	405606	Bearing <6908ZZ>	1					
	405593	Bearing <6910ZZ>			1			
	407860	Bearing <6013ZZ>					1	
02	209146	Load Sheave	1					
	200719				1			
	216856						1	
03	201112	4th Gear <M2×9T>	3					
	200723	4th Gear <M2.5×12T>			3			
	216858	4th Gear <M3×12T>					3	
04	405609	Needle Roller and Cage Assemblies <KT81113>	6					
	405598	Needle Roller and Cage Assemblies <KT121610>			9			
	405583	Needle Roller and Cage Assemblies <KT162010>					12	
05	201111	Lock Pin <Ø8×43>	3					
	200722	Lock Pin <Ø12×50>			3			
	216857	Lock Pin <Ø16×60>					3	
06	408407	Set Screw <M4×0.7×4>	-		3		3	
07	405607	Bearing <6813ZZ>	1					
	405596	Bearing <6814ZZ>			1			
	405581	Bearing <6820ZZ>					1	
08	404461	Oil Seal <Ø10×Ø25×7t>	1					
	404450	Oil Seal <Ø13×Ø22×5t>			1			
	404424	Oil Seal <Ø15×Ø30×7t>					1	
09	405608	Bearing <6804>	1					
	405597	Bearing <16004>			1			
	405582	Bearing <16005>					1	
10	404463	O Ring <G-70>	1					
	404311	O Ring <G -85>			1			
	404301	O Ring <G-105>					1	
11	201139	Internal Gear B <M2×33T>	1					
	200725	Internal Gear B <M2.5×38T>			1			
	216860	Internal Gear B <M3×37T>					1	
12	405960	Key <5×5×50>	2					
	405959	Key <7×7×65>			2			
	400375	Key <10×8×70>					2	
13	404456	O Ring <S-85>	1					
	404449	O Ring <S-105>			1			
	404309	O Ring <G-130>					1	

GEAR BOX ASSEMBLY B.O.M

NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT					
			025	050	100	200	320	630
14	210384	Reduction Gear Frame B	1					
	204890				1			
	231688						1	
15	220901	Lock Pin	3					
	200729				3			
	216863						3	
16	405609	Needle Roller and Cage Assemblies <KT8113>	3					
	405598	Needle Roller and Cage Assemblies <KT121610>			6			
	405584	Needle Roller and Cage Assemblies <KT162017>					3	
17	201120	3rd Gear <M2×9T>	3					
	200739	3rd Gear <M2.5×12T>			3			
	216864	3rd Gear <M3×12T>					3	
18	405608	Bearing <6804>	1					
	405597	Bearing <16004>			1			
	405611	Bearing <6906>					1	
19	201141	Oroglas / Plexiglas	1					
	200862				1			
	216881						1	
20	402625	Gasket	1					
	402630				1			
	402635						1	
21	405604	Bearing <6810>	1					
	405599	Bearing <6813>			1			
	405585	Bearing <6814>					1	
22	405603	DU Lubricated Bearing <Ø80×Ø85×16.4>	1					
	405601	DU Lubricated Bearing <Ø105×Ø110×14>			1			
	405587	DU Lubricated Bearing <Ø120×Ø125×18>					1	
23	201140	Friction Disk	2					
	200742				2			
	216865						2	
24	201142	Internal Gear A	1					
	201156			1				
	200749				1			
	216870						1	
25	231685	Reduction Gear Frame A	1					
	231686				1			
	202400						1	

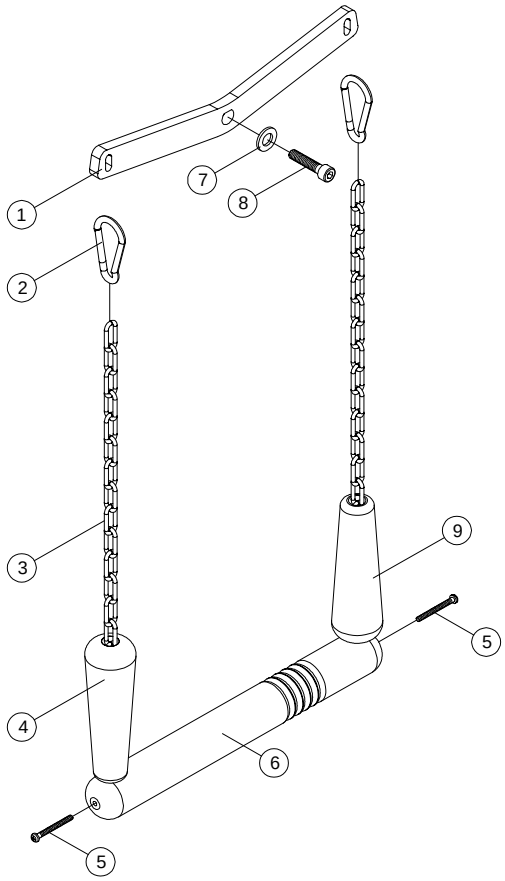
GEAR BOX ASSEMBLY B.O.M

NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT					
			025	050	100	200	320	630
26	201115	Gear Rivet Pin	3					
	200747				3			
	216868						3	
27	405605	Needle Roller and Cage Assemblies <KT6910>	3					
	405600	Needle Roller and Cage Assemblies <KT101310>			3			
	405586	Needle Roller and Cage Assemblies <KT121613>					3	
28	201116	2nd Gear	3					
	201148			3				
	200748				3			
	216869						3	
29	405592	Needle Bearing <HK 1010>	1					
	408054	Needle Bearing <HK 1312>			1			
	405610	Needle Bearing <HK 1512>					1	
30	201638	1st Gear <M1×18T>	1					
	209147	1st Gear <M1×15T>		1				
	200724	1st Gear <M1.25×15T>			1			
	216859	1st Gear <M1.5×10T>					1	
31	201122	Disk Spring Plug	1					
	200804				1			
	216872						1	
32	201123	Spring Frame	1					
	200805				1			
	216873						1	
33	407474	Parallel Pin <Ø5×15>	2					
	407469	Parallel Pin <Ø6×20>			2			
	407466	Parallel Pin <Ø8×20>					2	
34	408527	Disc Spring <Ø40×Ø20.4×t1>	2					
	408525	Disc Spring <Ø63×Ø31×t1.8>			2			
	408517	Disc Spring <Ø41×Ø80×t3>					2	
35	201124	Cone Spring Washer	1					
	200806				1			
	216874						1	
36	404457	O Ring <S-80>	1					
	404449	O Ring <S-105>			1			
	404465	O Ring <S-120>					1	
37	201125	Disk Spring Real Cover	1					
	200807				1			
	217003						1	

GEAR BOX ASSEMBLY B.O.M

NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT					
			025	050	100	200	320	630
38	400958	Key <5×5×10>	2					
	400971	Key <7×7×16>			2			
	405963	Key <10×8×20>					2	
39	408454	Set Screw <M5×0.8×15>	3					
	408453	Set Screw <M6×1.0×20>			3			
	400583	Set Screw <M8×1.25×20>					3	
40	400633	Nut < M5×0.8>	3					
	400080	Nut <M6×1.0>			3			
	400081	Nut <M8×1.25>					3	
41	400914	Retaining Ring <R-90>	2					
	400916	Retaining Ring <R-110>			2			
	404157	Retaining Ring <R-130>					2	
42	201130	Gasket	1					
	200829				1			
	216879						1	
43	201129	Non-Woven Cloth	2					
	200819				2			
	216878						2	
44	201128	Grids	1					
	200818				1			
	216877						1	
45	201127	Gear box Cover	1					
	200809				1			
	216876						1	
46	400094	Spring Washer <M6>	4		4			
	400095	Spring Washer <M8>					4	
47	400007	Hex. Recess Bolt <M6×1.0×20>	4		4			
	400012	Hex. Recess Bolt <M8×1.25×20>					4	
48	201143	Gear Case Cover	1					
	200863				1			
	217002						1	
49	400388	Retaining Ring <R-42>	1					

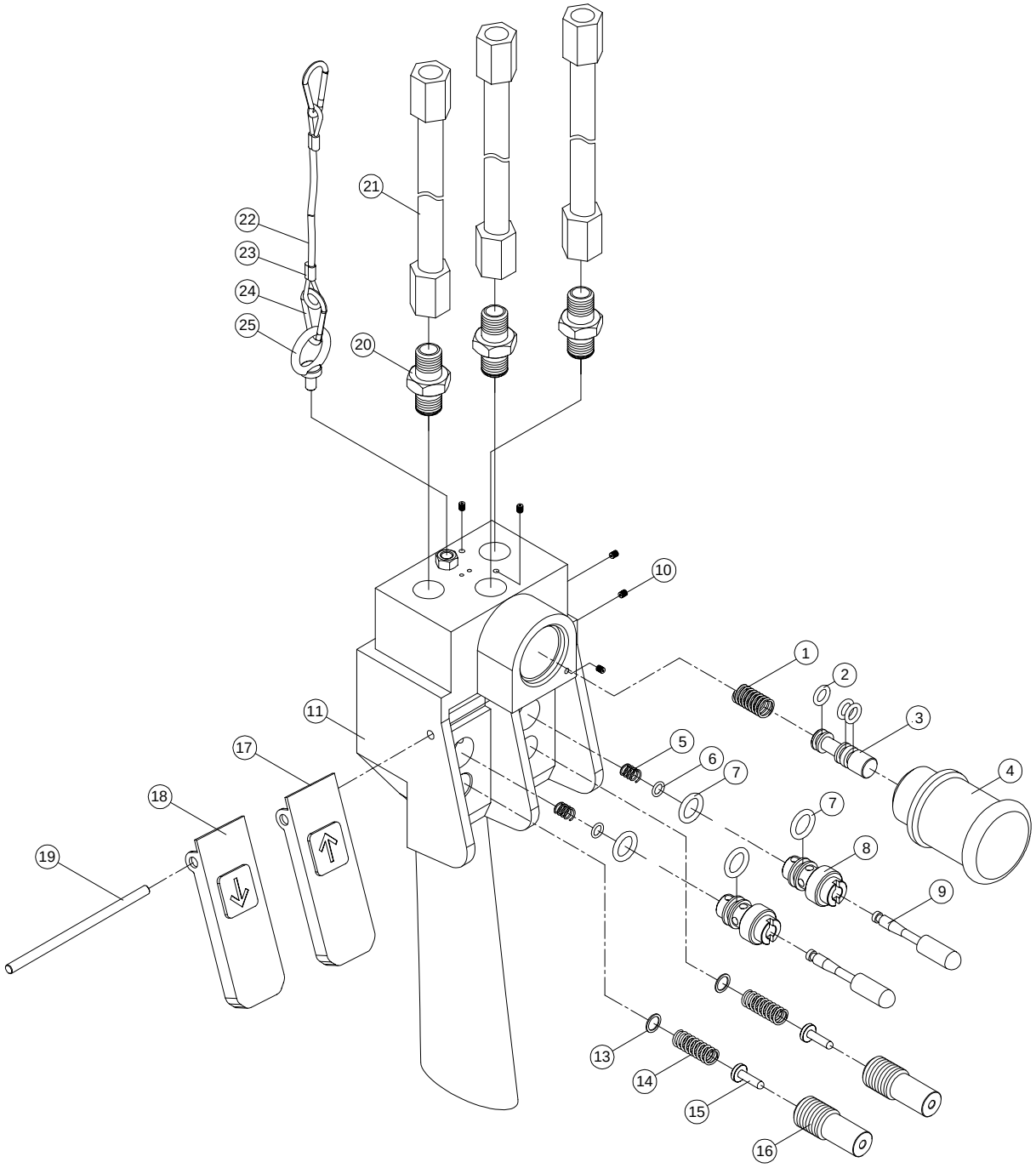
CONTROL ROD ASSEMBLY



CONTROL ROD ASSEMBLY B.O.M

NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT					
			025	050	100	200	320	630
1	201103	Control Rod	1		1			
	201102						1	
2	400841	Shackle	2		2		2	
3	400531	Chain <Ø2.4×Ø22.2×9.5-2M>	2		2		2	
4	270025B	Handle <green>	1		1		1	
5	408541	Crossed Screw tap <3/6" ×1 1/4>	2		2		2	
6	201105	Shaft Bar	1		1		1	
7	400669	Flat Washer <Ø21×Ø11×2.0t>	1		1			
	400665	Flat Washer <Ø25×Ø14×2.0t>					1	
8	408608	Hex. Recess Bolt <M5×0.8×16L>	1		1			
	408357	Hex. Recess Bolt <M6×1.0×20L>					1	
9	270025F	Handle <red>	1		1		1	

PUSH BUTTON SWITCH ASSEMBLY'S (optional)



PUSH BUTTON SWITCH ASSEMBLY'S PARTS LIST (optional)

NO.	PARTS CODE	DESCRIPTION	Q'TY REQ'D EACH UNIT
1	408519	Emergency (Spec Compress Spring)	1
2	404428	O Ring <P5>	3
3	216840	Emergency Valve Rod	1
4	300679	Emergency Stop Button	1
5	408638	Conical Spring	2
6	404458	O Ring <S-3>	2
7	404481	O Ring <S-10>	4
8	217210	Bush [T]	2
9	216896	Valve Rod [T]	2
10	408452	Set Screw <M5 ×0.8 × 8L>	6
11	312449	Pendant Handle Housing [T]	1
13	404190	Retaining Ring <R-7>	2
14	408516	Spring Compressing	2
15	216845	Spring Compressing Block	2
16	217119	Spring Frame	2
17	209321	Trigger [up]	1
18	209322	Trigger [down]	1
19	407465	Trigger Rivet Pin	1
20	300912	Hose Connector <1/4T×1/4H>	3
21	312446	Braided Oil Hose <1/4" 2B×NJ2-3M>	3
22	403443	Wire Rope <Ø2-3M>	1
23	300294	Aluminum Coupler	2
24	400841	Shackle	2
25	404803	Eye Bolt < M6×1.0>	1

ATTESTATION ◆ ATTESTATO ◆ ATESTACIÓN ◆ BESCHEINIGUNG ◆ ATTESTATION

Product Service

Attestation of Conformity

No. M8A 004703 0027 Rev. 00

Holder of Attestation: **CHENG DAY MACHINERY WORKS CO., LTD.**
No.173, Wen Chiu Rd.
Dajia Dist.
437 Taichung City
TAIWAN

Product: **Lifting equipment**
Air Chain Hoist, Air Trolley

This Attestation of Conformity is issued on a voluntary basis according to Council Directive 2006/42/EC relating to machinery. It confirms that the listed equipment (not Annex IV equipment) complies with the principal protection requirements of the directive and is based on the technical specifications applicable at the time of issuance. It refers only to the particular sample submitted for conformity assessment. For details see: www.tuvsud.com/ps-cert

Test report no.: 615202300601

Date, 2024-09-12

Li Taiwei

(Taiwei LI)

This Attestation does not replace the regulatory EU Declaration of Conformity (DoC) and does not allow for CE marking. After preparation of the necessary documentation and establishing compliance to requirements of all applicable directives, the manufacturer may sign a DoC and apply the CE marking. The DoC is issued under the sole responsibility of the manufacturer.

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Product Service

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No. M8A 004703 0027 Rev. 00

Model(s):

1) YSA-x series (Air Chain Hoist)
x denote to capacity: 025, 050, 100, 200, 320, 630, 1000, 1600, 2000, 2500, 2500T, 3750, 3750T, 5000, 5000T, 025E, 050E, 100E, 150E, 200E, 300E, 600E, 025Ex, 050Ex, 100Ex, 200Ex, 320Ex, 630Ex, 1000Ex, 1600Ex, 2000Ex, 2500Ex, 2500TEx, 3750Ex, 3750TEx, 5000Ex, 5000TEx;

2) YSMA-x series (Air Chain Hoist)
x denote to capacity: 250, 300, 400, 600, 800, 1000, 1200;

3) AT-x series (Air Trolley)
x denote to capacity: 100, 200, 320, 630, 1000, 1600, 2000, 2500, 3750, 5000, 100Ex, 200Ex, 320Ex, 630Ex, 1000Ex, 1600Ex, 2000Ex, 2500Ex, 3750Ex, 5000Ex

Trade name: **Black Bear, U-MEGA, Yong Sheng**

Black Bear U-MEGA Yong Sheng

Parameters:

Rated capacity:	See below
Rated power:	See below
Rated supply pressure:	See below

Remark: To ensure the accuracy and consistency of the tests, we will use the YSA-320 model test machine with serial number 2024020320. This primary test machine will serve as the benchmark equipment for all tests.

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No. M8A 004703 0027 Rev. 00

Model	Capacity (ton)	6bar/4bar Power (kW)	6,bar / 4bar, Speed, m/min
YSA-025	0.25	1.5/0.8	18/8
YSA-050	0.5	1.5/0.8	11/5
YSA-100	1	2/1.0	7.6/3.4
YSA-200	2	2/1.0	3.8/1.7
YSA-320	3.2	3.5/1.8	4.8/2.2
YSA-630	6.3	3.5/1.8	2.4/1.1
YSA-1000	10	3.5/1.8	1.6/0.7
YSA-1600	16	3.5/1.8	1.0/0.4
YSA-2000	20	3.5/1.8	0.8/0.3
YSA-2500	25	6.3/4	1.1/0.7
YSA-2500T	25	6.3/4	1.1/0.7
YSA-3750	37	6.3/4	0.7/0.4
YSA-3750T	37	6.3/4	0.7/0.4
YSA-5000	50	6.3/4	0.5/0.3
YSA-5000T	50	6.3/4	0.5/0.3
YSA-025E	0.25	1.5/0.8	18/8
YSA-050E	0.5	1.5/0.8	11/5
YSA-100E	1	1.5/0.8	6.9/3.1
YSA-150E	1.5	2/1	5.8/1.8
YSA-200E	2	1.5/0.8	3.4/1.6
YSA-300E	3.2	2/1	2.9/0.9
YSA-600E	6.3	2/1	1.45/0.5
YSA-025Ex	0.25	1.5/0.8	18/8
YSA-050Ex	0.5	1.5/0.8	11/5
YSA-100Ex	1	2/1.0	7.6/3.4
YSA-200Ex	2	2/1.0	3.8/1.7
YSA-320Ex	3.2	3.5/1.8	4.8/2.2
YSA-630Ex	6.3	3.5/1.8	2.4/1.1
YSA-1000Ex	10	3.5/1.8	1.6/0.7
YSA-1600Ex	16	3.5/1.8	1.0/0.4
YSA-2000Ex	20	3.5/1.8	0.8/0.3
YSA-2500Ex	25	6.3/4	1.1/0.7
YSA-2500TEx	25	6.3/4	1.1/0.7
YSA-3750Ex	37	6.3/4	0.7/0.4
YSA-3750TEx	37	6.3/4	0.7/0.4
YSA-5000Ex	50	6.3/4	0.5/0.3
YSA-5000TEx	50	6.3/4	0.5/0.3

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Product Service

Attestation of Conformity

No. M8A 004703 0027 Rev. 00

Model	Capacity (ton)	6bar/4bar Power (kW)	6,bar / 4bar, Speed, m/min
YSMA-250	2.5	2.8/1.2	2.3/1.6
YSMA-300	3	2.8/1.2	3.75/2.5
YSMA-400	4	3/1.5	3.4/2.4
YSMA-600	6	2.8/1.2	3.4/2
YSMA-800	8	3/1.5	1.7/1.2
YSMA-1000	10	2.8/1.2	0.9/NA
YSMA-1200	12	3/1.5	0.8/NA
AT-100	1	20	0.2
AT-200	2	20	0.2
AT-320	3.2	20	0.2
AT-630	6.3	20	0.2
AT-1000	10	12	0.7
AT-1600	16	12	0.7
AT-2000	20	12	0.7
AT-2500	25	12	1.4
AT-3750	37	12	1.4
AT-5000	50	12	1.4
AT-100Ex	1	20	0.2
AT-200Ex	2	20	0.2
AT-320Ex	3.2	20	0.2
AT-630Ex	6.3	20	0.2
AT-1000Ex	10	12	0.7
AT-1600Ex	16	12	0.7
AT-2000Ex	20	12	0.7
AT-2500Ex	25	12	1.4
AT-3750Ex	37	12	1.4
AT-5000Ex	50	12	1.4

Tested according to:

Machinery Directive 2006/42/EC Annex I
EN ISO 12100:2010
EN 14492-2:2019

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