INSTRUCTION MANUAL

AIR BALANCER

EHB-270CR
EHB-450CR

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⚠ WARNING

- Never use the AIR BALANCER for lifting or lowering people.
- Supply this manual to the user.
- Read this manual before installation, operation, or maintenance.
- Keep this manual available.

ENDO KOGYO CO., LTD.

ENDO

HM-10181

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SAFETY ALERT SYMBOL AND ALERT SIGNS

Please read this manual carefully and follow its instructions.

The SAFETY ALERT SYMBOL(⚠), WARNING, CAUTION, and NOTE carry special 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 or the equipment and others.

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

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Scope of warranty and liabilities for the equipment

1. We will repair or replace the product free of charge if a failure due to manufacturing defects occurs under proper usage during the warranty period. For details, contact us or your dealer.

2. The warranty will be void in the following cases:
   1) Change in ownership.
   2) Repair, adjustment, or modification performed by a party other than the manufacturer, agents, or dealers.

3. The warranty period is one (1) year from the date of purchase except for consumables.

4. Repairs applicable to any of the following shall be charged even during the warranty period:
   1) Failure/damage caused by incorrect use.
   2) Failure/damage caused by use of non-genuine parts.
   3) Failure/damage caused by fire, earthquake, natural disaster, or other unexpected incident.
   4) Incident caused by fall, shock, negligence, or by inadequate storage.
   5) Failure/damage caused by use of parts or other equipment that are not included in this product.
   6) Replacement of consumables.
   7) Usage in violation of dangers or cautions stipulated in this Instruction Manual or the warning labels.
   8) Failure/damage caused by any reason that is not attributable to the manufacturer.

5. Warranty exclusions such as opportunity loss.
   Either during or after the warranty period, oppportunity loss, damage to anything other than our product(s), or other duties incurred on you/your customer as a result of the failure of our product(s) are outside the scope of the warranty.

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1. ⚠ Safety Instructions

If the air balancer is not used correctly a serious accident may occur, such as dropping the load or the air balancer itself.
Before installing, operating, controlling, inspecting of air balance, read and understand this instruction manual.
*Until understanding of all equipment terminology, safety information, caution and warning, do not use the air balancer.

1.1 Review of Safety Instruction

⚠ WARNING

- Do not use this air balancer or attached equipment for lifting, supporting, or transporting people or lifting or supporting loads over people.
- Before installing, operating, storing of air balancer, read and understand this instruction manual carefully to prevent the accidents by the incorrect operation.
- Keep this manual available for maintenance and inspections.
- Always check the supporting member from which the air balancer is suspended is strong enough to support the weight of the air balancer plus the weight of the rated load, etc. The customer has the responsibility for this.

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1.2 Instruction for safe operation

If there are any differences between instruction manual and the standard of your company, give the priority to stricter standards from either of both.

1.2.1 General Handling

⚠ WARNING

- Never operate the air balancer unless the contents of this manual and caution plate (warning label) are completely known.
- Never operate the air balancer nor sling a load unless you were trained in safety rules and in operating manner of the air balancer. Never allow untrained persons to do so. Never remove or deface any nameplates, caution plates or warning labels which are attached to the air balancer.
- Always check the air balancer before each shift, and inspect it periodically.
- Never operate the air balancer if you are not physically fit to do so. The operator must have good hearing, vision and depth perception.
- When instruction signs put on the push button switches such as "EQUIPMENT BEING INSPECTED" or "DO NO RUN", never operate the hoist until the sign is removed by the designated person.

1.2.2 Installation

⚠ WARNING

- Always employ specialists or well trained persons for installation.
- Never install the hoist in any environments which are out of specifications.
  For example, the air balancer should not be exposed to rain or water.
- Always install stoppers at the end of the rails for traveling or traversing.
- Always check the supporting member for the air balancer has enough strength.
- Always attach a secondary support wire rope.

⚠ CAUTION

Never operate the air balancer when the air balancer is placed on the floor.
Only operate the air balancer when it is hanging.
*Never operate the air balancer when the load chain is loose.

1.2.3 Air pressure

⚠ WARNING

Never exceed the working air pressure of 0.7MPa (7kgf/cm^2).
*If it is necessary, reduce and set the air pressure to the requirement of working air pressure by the regulator.

⚠ CAUTION

- Never use the lubricator on the air supply hose to the air balancer.
  *Using a lubricator on the air supply hose will cause the failure of control module on air balancer.
- Always locate the filter and regulator.

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1.2.4 Operation and Handling

⚠ WARNING

- Never lift a load greater than the rated capacity of the air balancer.
  *The rated load is marked on the air balancer body.
- Never stand on a suspended load.
  Also never apply and use the air balancer for transporting people.
- Never stand and walk under the suspended loads, and keep out of its area of projection.
  Never place hands, feet and etc., under or between suspended loads.
- Never operate the air balancer when anyone is in the traveling area of the load.
- Always check there are no objects in the ways of the load or the load hook when moving the air balancer.
- Never carry a load over people.
- Never leave a load suspended for any extended period.
- Always pay attention to the load at all times when operating the air balancer.
- Never swing the load or the load hook when moving the air balancer.
- Never use the stopper as a means of stopping the air balancer.
- Never pull a load at an angle.
  Never lift a load when the load hook is not over the load's center of gravity.
  *Always move the air balancer over the load's center of gravity before lifting.
- Never face the load chain to the sharp edged material.
- Never wind the load chain around the suspended load of air balancer directly.
- Never do earth suspending (lifting locked loads).
- Never turnover a suspended load.
  *Always employ special equipments in case of turn over work.
- Always check movement of the push button switches before operation.
  Never operate the air balancer if the push button switches do not move smoothly.
- Stop the air balancer immediately when up / down operations are contrary to the indications marked on the push button switches.
- Never operate the air balancer when damaged or abnormal sound / vibration occurs.
- Never operate the hoist with the load chain in any of the following conditions.
  1. Twisted, kinked, and deformed.
  2. When elongation or the reduction of diameter exceeds the service limits.
  3. Cracked, damaged and corroded.
  4. Improperly engaged on the chain wheel.
- Never perform cutting work on a load suspended by the air balancer.
- Never perform electro-welding work on a load suspended by the air balancer.
- Never use the load chain of the air balancer as a ground for welding.
- Never attach a welding electrode to the load chain of the air balancer.
- Never lift any single load with 2 or more air balancers.
- Never lock the push button switches.
  *The air balancer must be manually operated by the operator herself at all times.
- When moving a load with a plain trolley, never push the load chain of air balancer but push the load itself. Never pull the load.
- If the air supply hose or control hose are come off or cut, the load may fall down so handle the air balancer with care.

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⚠ CAUTION

- Never use the hook with a damaged or malfunctioning hook latch.
- Carry out the smooth operation of lifting up and lowering.
  Never start, stop or reverse the air balancer suddenly.
- Never keep holding stopper while operating.
- Never allow the suspended load to touch the nearby structure or power lines, etc.
- Never jerk the hose of the push button switches nor catch it on the nearby structure.
- Never allow the air balancer or trolley to collide with the I-beam stopper or the structure.
- Always check the load hook can swivel smoothly before operating the air balancer.
- Always position the slings at the center or the load hook.
- When starting to lift, stop the air balancer once as the load chain becomes tensioned.
  *Never jerk the air balancer.
  Never operate the air balancer suddenly while the load chain is slack.
- Always check the load-lifting height of the air balancer is enough for required work.
- Never leave a load suspended for any extended period.
  After the several hours, the suspended load will go down slowly.
- If the air supply is stopped, the suspended load will keep staying the height by functioning the check valve.
- While the air balancer is not used, the suspending load will slowly go down, so lower the suspended load after the operation.
- Lower the bottom hook by manual paying out when the hook could not lower automatically because of maximal stroke of the load chain.

1.2.5 Maintenance, Inspection and Alterations

⚠ WARNING

- Never alter the air balancer or its accessories.
- Always use genuine parts for replacement.
- Always shut off the air supply before carrying out maintenance, inspection or repair.
- Always employ specialists or well trained persons for maintenance, inspection and repair.
- Always remove the load from the air balancer before maintenance, inspection or repair.
- Always disassemble the air balancer on the floor.
- If any problems are detected during maintenance or inspection, never use the air balancer but correct and repair the problems immediately.
- Periodically, inspect the air balancer thoroughly and replace any worn or damaged parts.
- Stretched, worn or damaged hooks should be discarded.
  Never attempt to repair it, just replace it with a new hook.
- Always put up an instruction sign("EQUIPMENT BEING INSPECTED", "DO NOT OPEN THE VALVE",etc.) before carrying out maintenance, inspection or repair.
- Never do anything if you have any questions about the air balancer, please do not hesitate to contact you dealer or us.

⚠ CAUTION

- Follow the lubrication instructions.
- Clean the drum regularly.
  More abrasion powder of the drum occurs in the case of the chain type air balancer.
- Always hang the air balancer when carrying out test run after maintenance or repair.
  *Never operate the air balancer when the load chain of air balancer is slackened.

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2. Specification

2.1 Specification

Model	Air Pressure (MPa)	Capacity range (kg) Lifting control	Mass (kg)	Stroke (mm)	Air inlet
EHB-270CR	0.7	270	43	0.9	Rc 3/8
	0.6	230			
	0.5	190			
	0.4	150			
EHB-450CR	0.6	450	50	0.85	
	0.5	370			
	0.4	290			

<note>

- Weight of trolley is approx. 7kg and top hook is approx. 1kg.
- Depending on the choice of control module, 1kg to 11kg of control module weight must be added to total mass of air balancer.

Working conditions

Application area: Indoor and normal atmospheric condition
Temperature range: –5°C to +50°C

2.2 Labels and tags position

Warning label, name plate, tag are attached as the drawing below.
In inspection, see this figure and warning label, name plate, tag are in the right position.
*Parts has "※" will be applied with control module MS.

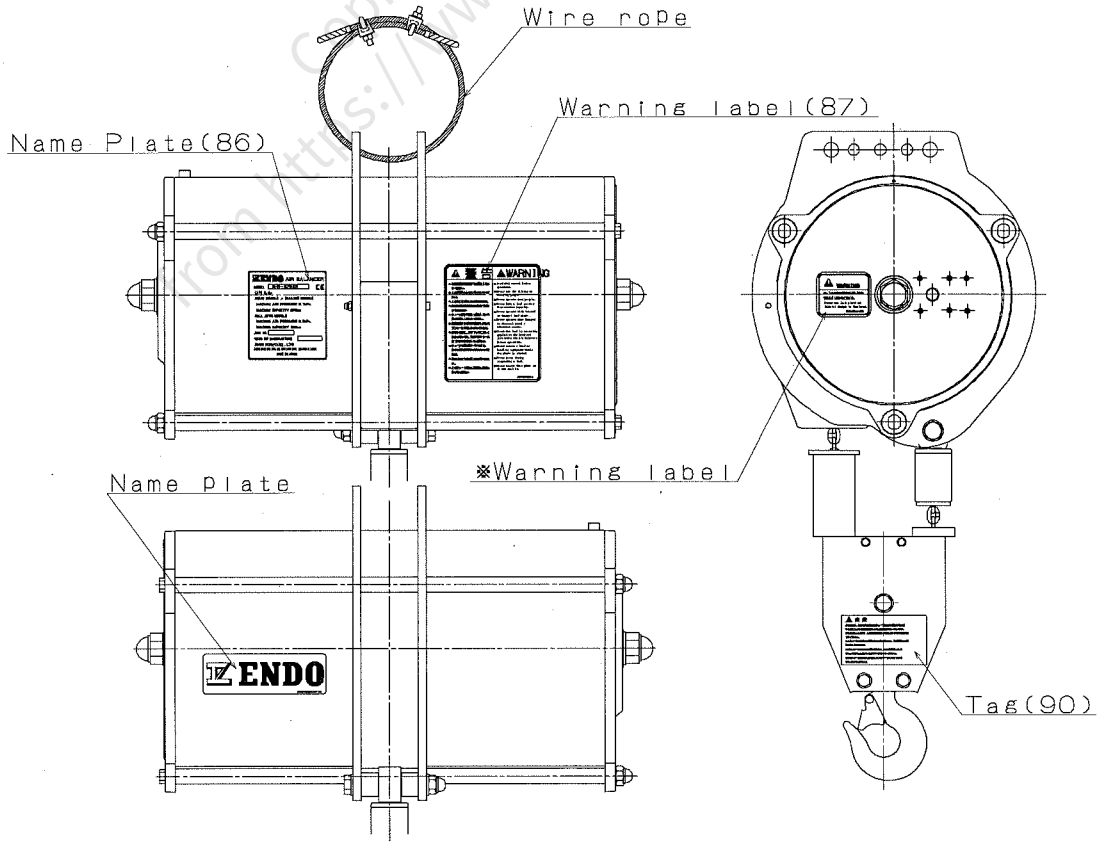

Fig.1

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3. Checks and Instructions before the Installation

3.1 Checks of the Product

- Check the delivered air balancer is what you ordered(Check the name plate)
- Check there was no damaged or deformation on the air balancer during the transportation.
- Check the pressure of the available air supply corresponds to the working air pressure of the air balancer.

3.2 Instructions on Working Condition

⚠ WARNING

- Never use the air balancer at a temperature below –5°C or above +50°C.

⚠ CAUTION

- Do not install and leave the air balancer outdoors.
  Using the air balancer outdoors could be the cause of rust inside of components.
  So if it is necessary to use the air balancer outdoors, always make a shelter with a roof for housing the air balancer.
- Under hostile environments such as high temperatures, high humidity, acidic corrosive and / or extremely dusty atmospheric conditions, the mechanical parts of the air balancer may be seriously damaged(for example, corroded). Therefore, frequently check the air balancer is maintained in normal conditions at all times.

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4. Installation

*If the accessory and the air balancer are separately delivered, attach the accessory to the main body of air balancer following the procedures before installing the accessory to the air balancer.
*For details and procedures, follow the instruction manual of accessory.

4.1 Installation

⚠ WARNING

- Always check the supporting member from which the air balancer is suspended is strong enough to support the weight of the air balancer plus the weight of the rated load, etc.
- Always attach secondary support wire rope.

- Install the air balancer properly.
- Check the top hook is correctly rigged onto the supporting member and the hook latch is correctly closed.
- Never use a supporting member that suspends the air balancer at an angle.

4.2 Checks before piping the air inlet

⚠ WARNING

- Always keep the working pressure no greater than 0.7MPa (7kgf/cm^2). If necessary, use an air regulator for reducing air pressure.
- The air balancer is designed to operate with air pressure with no greater than a working pressure range of 0.7MPa(7kgf/cm^2).

⚠ CAUTION

- Never use the lubricator for the piping of air balancer.
  *If used, it could be failure of control module by damaging components inside of air balancer.
- Never operate air balancer without filter and regulator.

- Check sufficient air can be supplied to the opening are of the air balancer. For a pipe of excessively small diameter or of greater length, the pressure drop can become large enough to prevent the specified performance.
- Use an air hose whose inside diameter is at least 9.5mm(3/8 in)
- Before connecting the air hose or pipe to the air balancer, be sure to flush or blow out with air to prevent the invasion of foreign matter (dust, etc) into the air balancer. In addition, take the same care for control hose and air chamber.
- Compressed air supplied to the air balancer should be free from moisture or foreign matter. Install an air filter to eliminate them from air supply.
- Install a dump valve (drain valve) at the lowest point in the piping.

5. Check after Installation and Test run

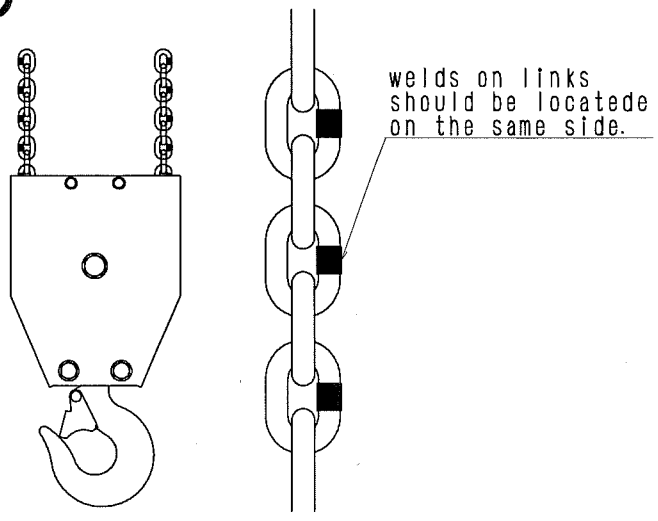
5.1 Checking Load Chain

- In case of more than one chain fall, Bottom hook may sometimes be rotated between two chain falls. This causes Load chain to be twisted. Before operation, check for and correct any twisting of Load chain.

⚠ Warning

Using the balancer when the Load chain is twisted could result in damage to the balancer or failure of the Load chain, causing personal injury or death. Be sure the Load chain is in the correct position.

○



Appearance of Load chain that has not been twisted.

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5.2 Check Lifting Operation

- Keep the working air pressure no greater than 0.7 MPa(7kgf/cm^2) .
- Check the indications marked on the push buttons correctly show the actual directions of up / down operations.

5.3 Checking the flying up prevention apparatus

⚠ WARNING

Never use the internal flying up prevention apparatus and a stopper as a means of stopping air balancer.
Use them only in emergency case of preventing the snap back of bottom hook.
If the stopper is frequently used, load chain will be worn and broke hitting by the stopper.

Check the activation of the flying up prevention apparatus by making fast rotation to the drum when no load is suspended.
To release the flying up prevention apparatus, push the lower button (or turn the regulator switch to left fully) to payout the load chain.
But if does not work, push the lower button and pull the lower hook at the same time.
This procedure will release the flying up prevention apparatus.

5.4 Check of application range

⚠ WARNING

Never use the air balancer at maximum length.

Check the stopper does not hit the main body and the internal flying up prevention apparatus does not work during the regular operation.
If the activation of the internal flying up prevention apparatus or hit of stopper is happened, readjust the speed and relocate the stopper position.

5.5 Other Checks

Operate the air balancer lifting and lowering with the load.
If the air balancer is using a trolley, run the trolley sideway.
Make sure that lifting loads stops when releasing "UP" and "DOWN" button.
If the I-beam application is using for the air balancer operation, check I beam condition and length of air hose.

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6. Checks before operation – At the beginning of each shift

> **⚠ WARNING**
> - Always execute the following checks at the beginning of each shift.
> - If a malfunction occurs during the operation of the air balancer, stop operation immediately and take the necessary steps to rectify the problem.
> Never operate the air balancer if damaged or malfunctioning.
> This is serious hazard and could result in personal injury or death.

6.1 Check before Start up

(1) Check Load chain is not twisted, kinked, damaged, or worn.
Wear or damaged on the chain can not be detected by casual or formal observation.
See "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 no cracks and wear on the hose.
(5) Check no air leakage around the body and control module.
(6) Check the trolley wheels track the rails properly and the wheels and rails are not worn.
(7) Check the lifting sling (suspension fastening) is not damaged or worn.

6.2 Check by Idling Operation

(1) Check the push buttons can be easily operated and up/down operations are correct as indicated.
(2) Check the retract control does not work.
In case the retract control works, adjust it according to the "operating adjustment" in instruction manual of accessories.

6.3 Check by Load Operation

(1) Lift related or equivalent load suspended a few inches off the floor and check whether the air balancer stops after lifting and lowering operation.
(2) Check the air balancer is not abnormally noisy or vibrating.

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7. Periodic Inspections

> **⚠ WARNING**
> - Periodically, inspect the air balancer thoroughly and replace any worn or damaged parts.
> - Always shut off the air supply before carrying out inspections.
>
> Exceptions are checks or inspections of the push button, floating operation, the safety retract control and etc., during that the air balancer should be operated.

Monthly Inspection

Inspect the air balancer at least once a month. Correct and repair any problems which are detected.

- Required interval for inspection depends on the operating environment, operating frequency and loading conditions of the air balancer.
  Therefore, make the inspection interval shorter according to your operation condition.
- For inspection items and methods, see Chapter 8, Section 8.2 "Inspection procedure".

Service Limit of Parts

If any part is found to be worn beyond its service limit in the monthly, annual, or other inspections, never reuse it.

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8. Maintenance and Inspection

⚠ WARNING

- Never alter the air balancer or its accessories.
- Always remove the load from the air balancer before maintenance, inspection or repair.
- Always shut off the air supply before carrying out maintenance, inspection, or repair. Exceptions are checks or inspections of the push button switches, floating operation and the safety retract system.
- Always employ specialists or well trained persons for maintenance, inspection and repair.
- Always disassembly the air balancer on the floor.
- Always use genuine parts for replacement.
- Replace any parts damaged or worn beyond its service limit.
- Always execute the load test after disassembling the air balancer for maintenance or inspection. See section 8.2"(6) General Operation Inspection".

8.1 Lubrication

(1) Main body

The following table shows the recommended lubricants.
Always use the same type or equivalents recommended by the oil manufacturer.

Manufacturer	Case and piston	Ball screw and thrust bearing
Exxon Mobil	Mobilux EP1	Mobilux EP2
Kyodo	Oneluber MP1	Oneluber MP1
Cosmo Oil	COSMO GREASE DYNAMAX EP No.1	COSMO GREASE DYNAMAX EP No.2
Shell	Alvania EP grease 1	Alvania EP grease 2

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(2) Control module

⚠ CAUTION

Never apply any type of lubricants to the control module.

- Control module is using the elaborated components on the air circuit, so never use the lubricator to the piping for the air balancer.
- The air supply for air balancer must be come through the air filter.
- Periodically remove drain water deposited in the air filter bowl.

(3) Load chain

- Always keep Load chain and the chain anchor pin clean and well lubricated.
- Before installation, load test or initial operation, be sure to lubricate Load chain. Even if operating with no load, lubricate Load chain.
- Periodically coat Load chain with lubricant to minimize wear on Load chain or Drum. Poorly lubricated Load chains will wear out quickly, making the hoist operation dangerous.
- Determine the lubrication interval according to the operating frequency and the loading conditions.
- Before reapplying lubricant, completely clean wire rope. Lubricate in the no-load condition.
- If a suspended load is close to the rated load, continuously monitor the condition of Load chain and reapply lubricant if necessary.
- It is recommended that the lubricant registered as H1 grade in USA guideline NSF should be applied.

8.2 Inspection

(1) Inspection of Hook and Service Limit

> **⚠ WARNING**
> Never repair the hooks.
> Always replace a stretched, worn or damaged hook with new one.

Inspection on hook opening, cracks and wear.

If any of the following conditions apply to the inspected hook, never reuse always replace with new one.

- The hook opening is visibly stretched, or the opening dimension is different from the specified.
- The hook is deformed or cracked. Carefully check for any bends or cracks on the hook shank.
- Wear on the hook saddle, where the lifting sling(suspension fastening). Rests, reaches the service limit.
- The hook latch is damaged or malfunctioning.
- Check hook rotates smoothly. Hook which does not rotate smoothly (feels rugged when manually rotated) is beyond it service limit.

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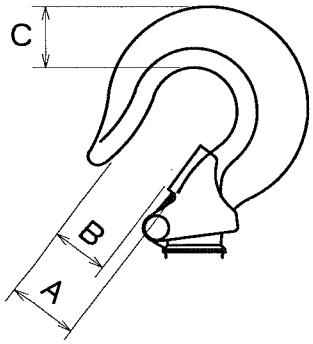
Hook opening dimension and wear limit

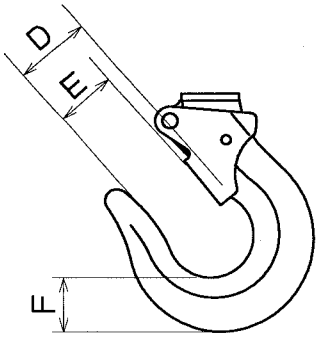
For the hook opening dimension A, B, D, E refer the standard dimension in the table right side for the inspectional standards.
Inspection of bottom hook for control module MS-AG or MS-ATC, refer to the instruction manual of accessories (HM-10087).

Upper hook



	Standard dimension	Service limit
A	25.5mm	Never exceed the standard dimension
B	23.0mm	Never exceed the standard dimension
C	22.0mm	20.7mm

Bottom hook



	Standard dimension	Service limit
D	28.0mm	Never exceed the standard dimension
E	25.0mm	Never exceed the standard dimension
F	26.0mm	24.0mm

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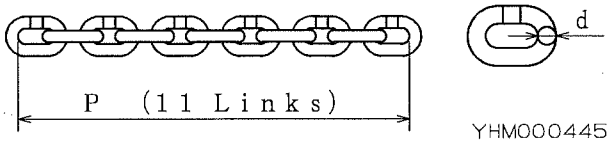
(2) Inspection of Load Chain and Service Limit

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 following defects.
Replace it with a new Load chain.
- Flaws or cracks.
- In particular, carefully check the weld on the links and end links which are connected to the main body or Load hook (Hook holder).
- Deformed or corroded.
- Stretch exceeding the service limit.
- Reduction of diameter exceeding the service limit.

■ Limit of Stretch and Wear
For dimensions P and d, measure the entire working length of Load chain.
Please perform deep inspection at the top and bottom end on actual stroke, where the chain comes into the drum. Particularly excessive wear might occur when the stroke is fixed.
For dimension P , measure the length of 11 links while testing Load chain as shown in the figure below.



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(mm)

	Standard dimension	Service Limit
d	4.0	3.6
P	132.0	134.6

■ Replacement Parts and Maintenance after Inspection
- Always use a manufacture's genuine replacement chain. Never use any other chain.
- Always coat Load chain with lubricant after inspection or upon replacement. See "Lubrication".

(3) Inspection of Chain wheel
- Are there any visible indents from Load chain on the pocket of Chain wheel?
- Is there any deformation, or cracks? Carefully check the filleted and connected sections of the shaft.
- Are Bearings damaged or worn? Those which do not rotate smoothly(feel rugged when manually rotated) are beyond their service limit
- Replace Chain wheel at the same time as Load chain.

(4) Inspection of Air balancer
- Are there any cracks on casing?
- Are there any deformation, cracks on hanger?
- Are there any cracks in mounting hole for bolt on end cap?
- Are there any deformation or cracks?
- Check for air leakage.
- Are the bolts loose?

(5) Inspection of Switch and Valve
- Check for air leakage.
- Is fitting connection loose?
- Do the push buttons correctly return to the neutral position after being pushed?
- Are the bolts loose?
- Is the hose damaged, or is the connection part loose?

(6) Inspection on Other
1. Label and tag
   Check the location of labels and tags. Is it easy to see it? If it is not, replace it.
   *Attaching position is mentioned in the chapter 2.2 「Labels and tags position」.
2. Trolley
   - Check wheels of trolley run on I-beam and H-beam or other rails properly.
   - Check the tire of trolley or I-beam and H-beam is worn or not. If so, replace the defective part.
3. The structure of supporting member.
   Are there any defects such as deformation, wear, and cracks?

(7) General Operation Inspection
After completing the inspections described in the foregoing sections, reassemble the whole unit and inspect as follows:

Idling
-Check the push button switches can be easily operated and up / down operations are correct as indicated.
- Check the air balancer is not abnormally noisy or vibrating.

Rated load test
- Check for malfunctions while lifting and lowering. Operate the air balancer at least twice through the full lifting range.
- Check the air balancer stops after the lifting and lowering operation.
- Check there is no significant reduction in the air balancer performance.
- Check the air balancer is not abnormally noisy or vibrating.

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8.3 Storing the Air Balancer

If the air balancer is to be stored for a long time, store the air balancer in a dry location.

8.4 Troubleshooting

⚠ WARNING

If a malfunction occurs during the operation the air balancer, stop operation immediately and take the necessary steps to rectify the problem.

⚠ CAUTION

Careless repairs can cause damaged to the air balancer or personal injury.
Therefore, be careful but through when making repairs.

The following shows probable causes and solutions of common malfunctions.
Contact your dealer or us if a malfunction is not listed below occurs.

Malfunction	Main causes	Solution
The air balancer does not run in the lifting direction.	Insufficient air pressure	Increase air pressure. Check for air leak around pipe fitting.
	Load over capacity of air balancer.	Check the weight of load.
	The flying up prevention works.	Replace spring which keeps ratchet.
	Ball screw and thrust bearing do not work.	Clean and lubricate ball screw and thrust bearing or replace it.
The air balancer does not hold load.	Air leak around bolt at the center of end cap	Replace O-ring between ball screw cover and end cap.
	Air leak from between end cap and casing.	Replace O-ring on end cap.
	Air leak from between piston and casing.	Replace worn piston then clean and lubricate inside of casing.

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9. Installing the Accessories

* Please refer to instruction manual for Accessories of AIR BALANCER in the case to install the Accessories.
* Please refer to instruction manual for Full auto module in the case to install the Full auto module.

9.1 Installing upper hook

9.1.1 Installing to the air balancer

1. Install upper hook to the position mentioned in Fig.2.
   Pass hex. bolt (8) through hanger, and top hook.
2. Make sure to tie the hex. bolt (8) by hex. nut (10) and U-nut (11) as mentioned in Fig 3.

Note: Do not bend or deform the bracket by overturning of bolts.

9.1.2 Installing the supporting wire

⚠ WARNING

- Always attach the supporting wire rope which are attached in the same box to the hanger of the air balancer.
It protects the operator when the upper hook of air balancer or supporting member (hanging ring) is broken.
- Always check the supporting member from which the air balancer is suspended is strong enough to support the weight of the air balancer plus the weight of the rated load, etc.
The customer has the responsibility for this.

1. Wind the supporting wire rope over the supporting member after take through the supporting wire rope (12) into the hall of bracket.
2. Make sure to clamp the supporting wire rope (12) by wire clip (13) after gathering and adjusting the length of supporting wire rope.
   In addition, give the 10Nm of torque to clamp nut of the wire clip (13).
   Please adjust the supporting wire rope in order that the drop of air balancer must be within 100mm.

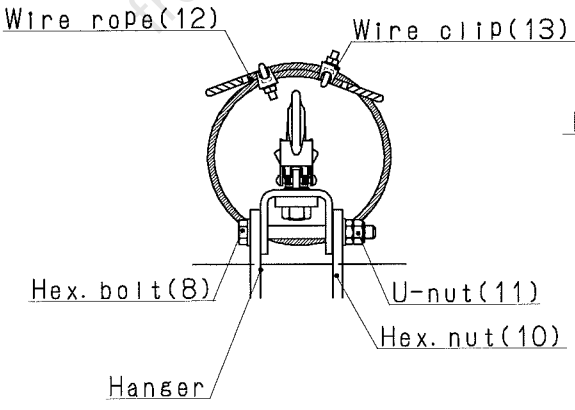

Fig.2

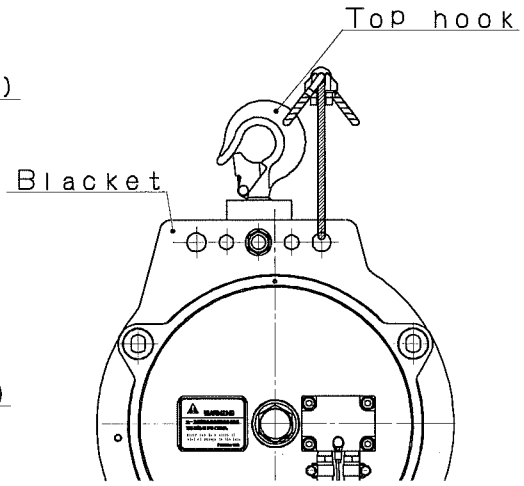

Fig.3

9.2 Installing trolley

Please refer to parts list of trolley .
Please check the correct way in accordance with the following chapters because the correct way depends on the module and beam size.

10. Load chain Assembly

⚠ WARNING

- Shut off air supply after pull out all load chain until load chain will be slack and all air inside cylinder will come out.
- Always disassemble the air balancer on the floor.

*Refer to the disassembly drawing and follow procedure below.

10.1 Replacement of chain

(1) Place the body horizontal as the chain guide (48) faces upward.

(2) Draw Chain (45) out from the body until Drum(18) stops chain-payout.

(3) Remove Cap screw(49) and remove chain guide(48)from Case(1)

(4) Make sure that the end of chain is located at left side as shown in Fig.4

(5) Remove Cap screw(46) and pull out the chain toward arrow in Fig.5.

(6) Remove chain guide(48), Plate(51), Stopper(52), Bottom hook, Stopper(75) from Chain (45). At this time, attach the wire to the end of the chain and thread it through the hook block. (Fig. 6) When the wire comes out from the chain exit, remove the chain from the wire and leave the wire through the hook block.

(7) Loosen set screw(82), and remove holder(81). Remove Pin(79) from boss (80) and remove chain from holder(81).(Fig. 7)

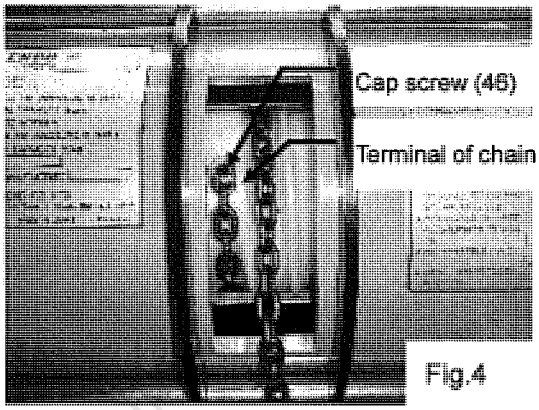

Fig.4

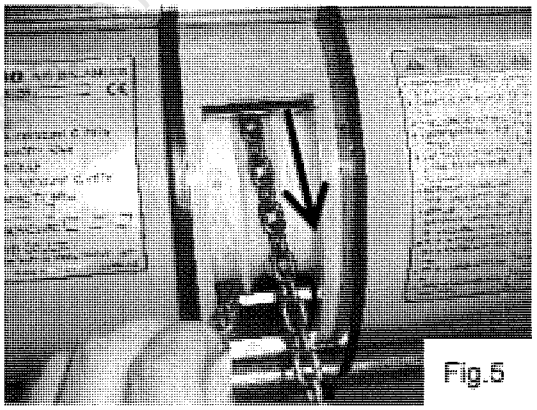
Fig.5

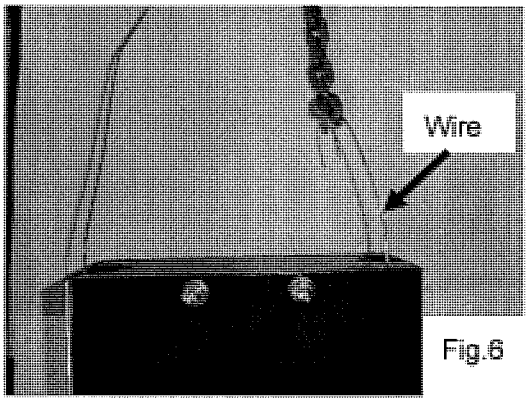

Fig.6

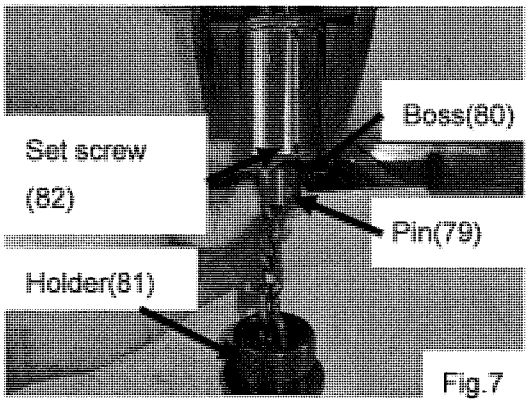

Fig.7

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10.2 Installation of chain

(1) Make sure that chain mounting portion on drum is located at left side as shown Fig. 8.

(2) Bend a wire with appropriate lengths for passing through the body inside.

(3) Pass the wire through the casing along with Drum (18) and make sure the tip of wire comes to be right side groove shown in Fig. 9.

(4) Hook a chain end at the bent portion on wire (Refer Fig 8)

(5) Pull another end of wire to wind up the chain on drum.

(6) Remove the wire from chain(45) and mount the chain on the drum with Cap screw(46) and Washer(47).
*Make sure that the welded portion always comes to be right side and faces upward. (Refer Fig.10)

(7) Pass Chain(45) through Chain guide(48) and mount Chain guide (48) on Case(1)
*Tighten U-nut (50) until Hanger(12) touches Chain guide (48)

(8) Pass the plate (51) and the stopper (52) through the chain, and attach the steel wire passed through the hook block to the chain end.
At this time, mount straight so that the chain does not twist.

(9) Pull the chain into the hook block with a steel wire. (Fig.11)
Make sure that the welded portion always comes to face outward.

(10) Pass the stopper (75) through the chain.

(11) Loosen the setscrew (82) of the eye hook assembly,and remove the holder (81).

(12) Lift the holder (81), adjust the chain terminal with the hole in the boss (80), and insert the pin (79). (Fig. 12)

(13) Attach the holder (81) to the hook holder (78) and fix it with a hexagon socket set screw (82).

(14) Lift up with a crane or the like, and make provisional piping.
Supply air at a pressure less than 0.1 MPa, slowly take up all the chain (45)

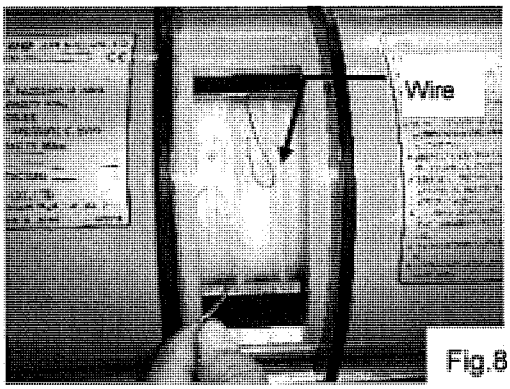

Fig.8

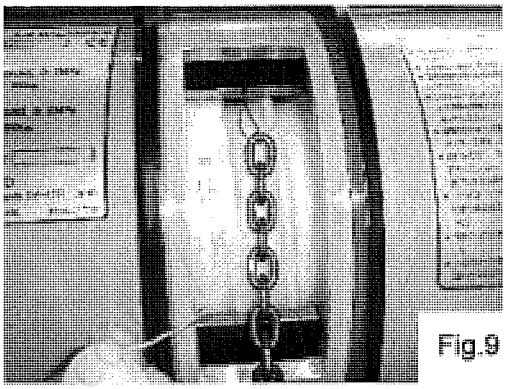
Fig.9

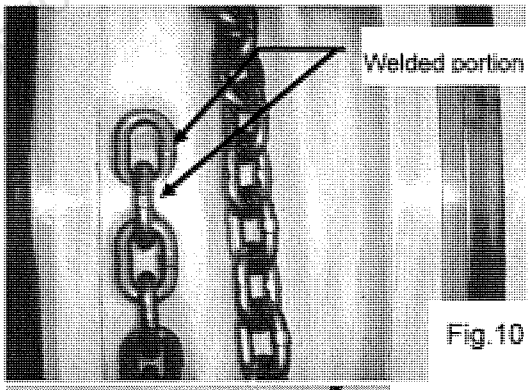

Fig.10

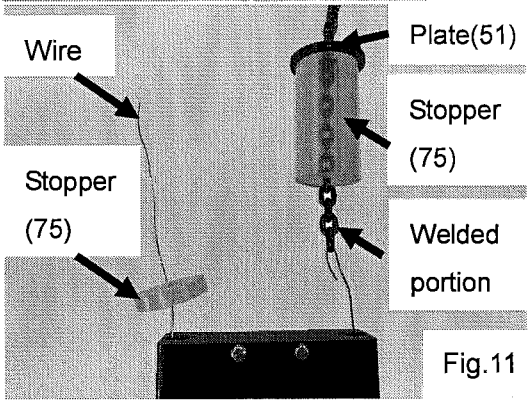

Fig.11

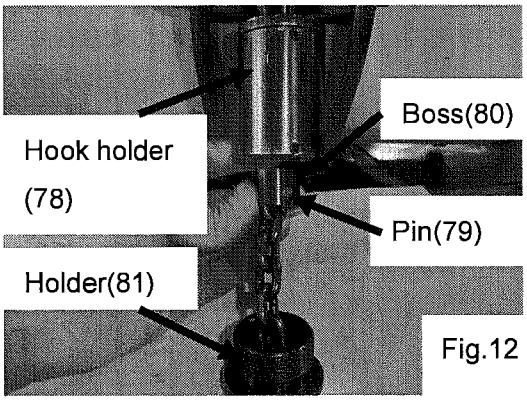

Fig.12

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11. Bottom hook replacement

（1） Loosen Hex. bolt (74), U-nut(50) and U-nut(61).

（2） Remove U-nut(72) , Washer(71) and Hex. bolt(70).

（3） Pull down and remove hook assembly from hook block.

（4） Insert new hook assembly.

（5） Adjust hole position of the holder(62), and fix Hex. bolt(70), Washer(71) and U-nut(72).
* Hex. bolt(70) Tightening torque 31N·m

（6） Fix Hex. bolt(74), U-nut(50) and U-nut(61).
* Hex. bolt(74) Tightening torque 2.7N·m
U-nut(61) Tightening torque 22N·m

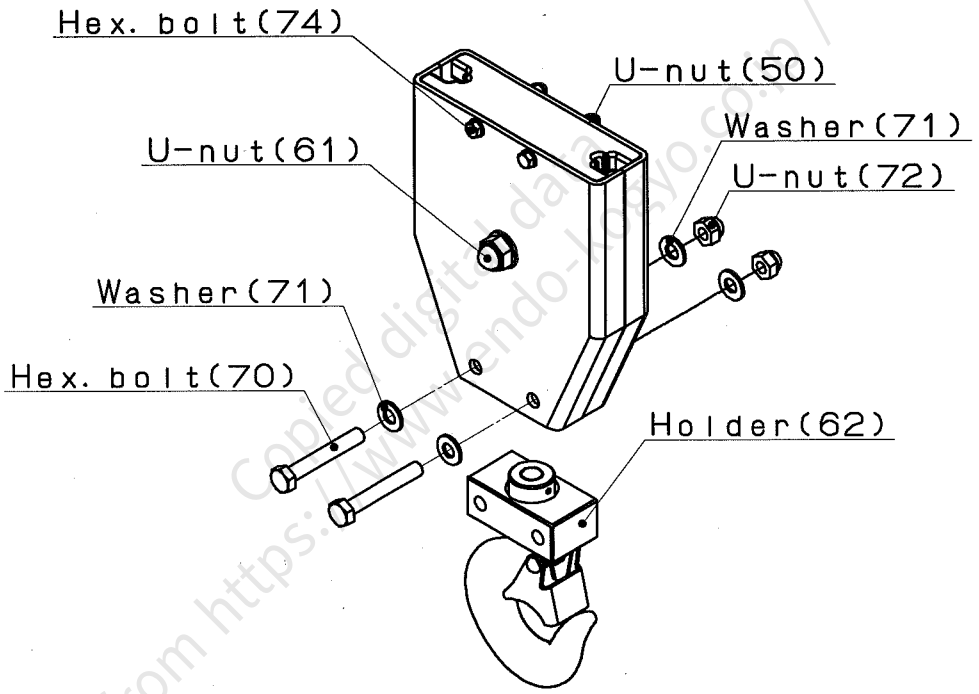

Fig.13

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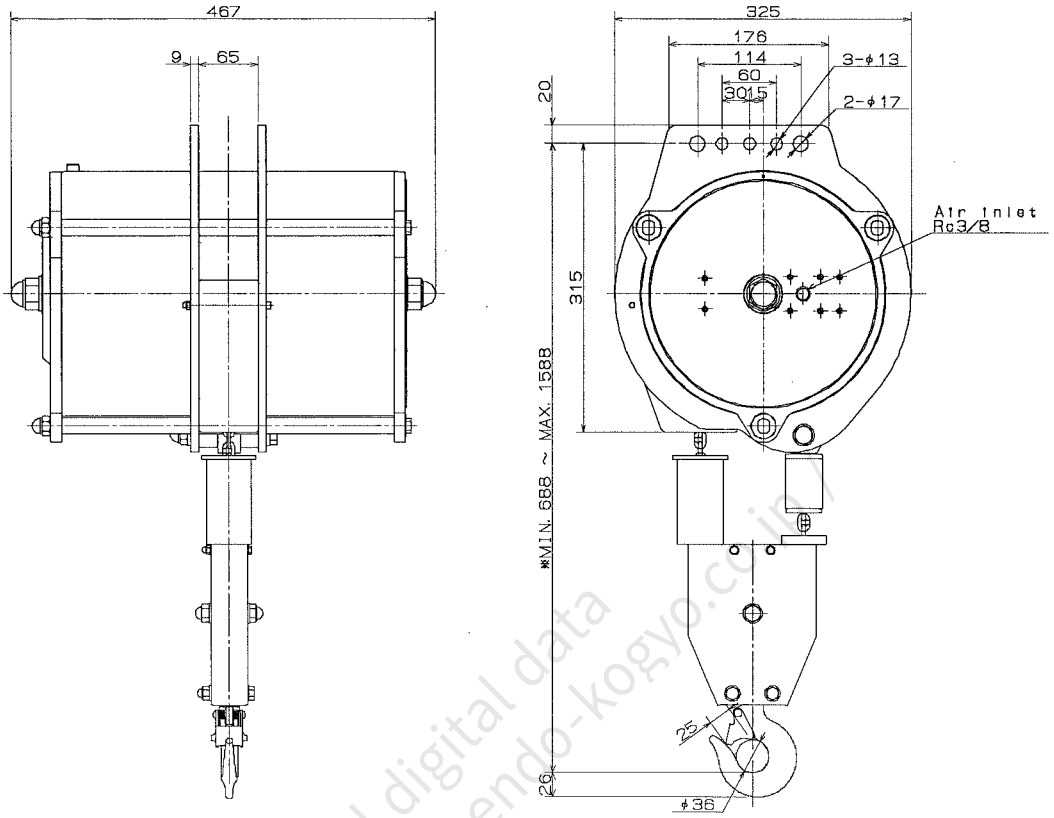
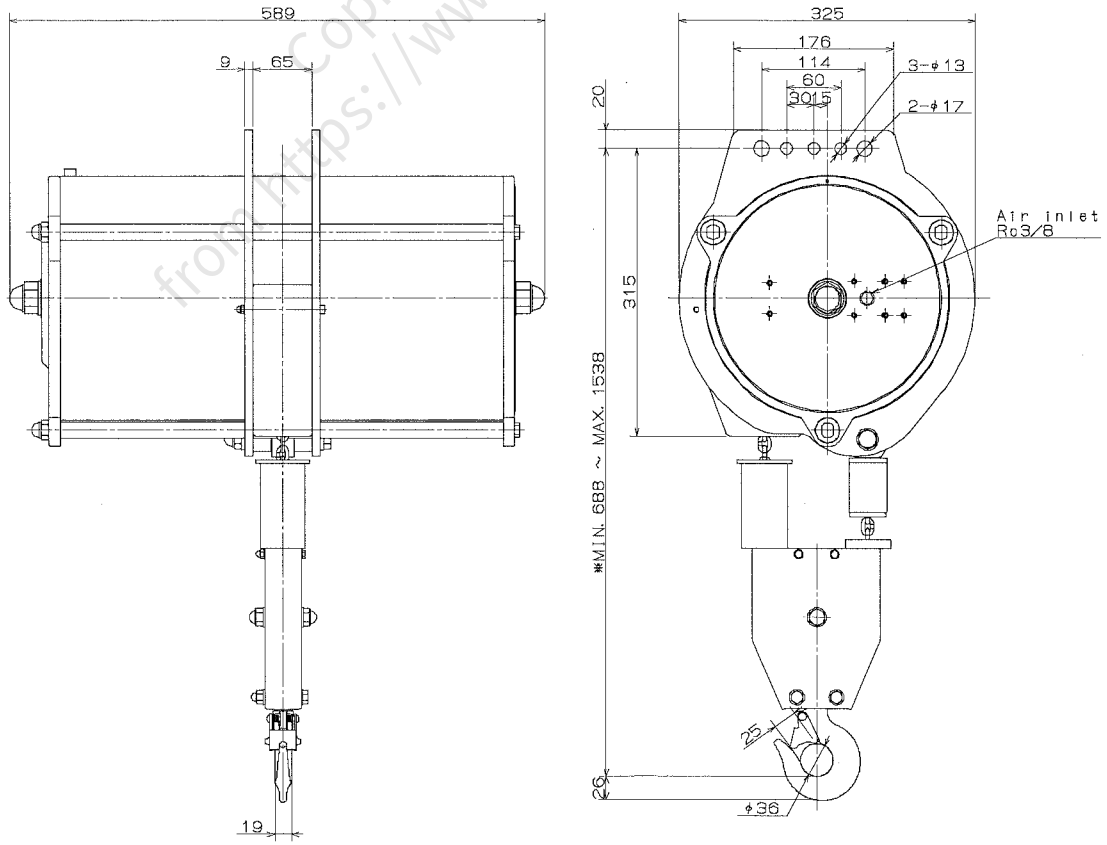
12. Dimensions of Air Balancer

・The length with the mark ※ in the figure differs ±25mm in structure.

■EHB-270CR



■EHB-450CR



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13. Parts list

Remarks when purchasing parts

- Specify the part No., part name and model name of the hoist.
- State SER. No. (product No.) clearly if attached.
- Parts without a part number cannot be supplied individually. Please purchase a set or complete unit.

■ How to read parts list

Ref No.	Part No.	Quantity	Description
-	LHP000844	1	Swivel hook assembly
-	LHP000843a	1	—Hook compl.
58	—	1	——Hook
-	LHP001674	1	——Hook latch set
59	—	1	———Hook latch
60	—	1	———Spring
61	—	1	———Rivet
62	—	1	——Nut
63	P2H200215	1	——Spring pin

The mark indicates the range of the set or the complete unit.

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■ PARTS LIST EHB-270CR

Ref. No.	Part No.	Quantity	Description	Ref No.	Part No.	Quantity	Description
1	P2H301214	1	Case	51	P2H402581	1	Plate
2	P2H200245	1	End cap	52	P2H403204	1	Stopper
● 3	KA50312400	2	O-ring	–	LHP002683	1	Hook block assembly
4	P2H301137	1	Ball screw cover	53	P2H301500	2	- Plate
● 5	KA50200420	1	O-ring	54	P2S400328	2	- Washer
6	P2H200247	1	Piston	55	P2H301501	1	- Chain wheel
● 7	P2H402349	1	Packing	56	P2H403199	1	- Bearing holder
● 8	P2H402350	1	Wear ring	57	KA40210075	1	- Retaining ring
● 9	P2H402501	1	Packing	58	KA60103022	2	- Ball bearing
● 10	P2H402502	1	Wear ring	59	P2H403200	1	- Shaft
11	KA42510314	2	Spring pin	60	KA30221000	2	- Washer
12	P2H301503	2	Hanger	61	KA25721002	2	- U-nut
13	P2H200246	1	End cap	62	P2H403201	1	- Hook holder
14	LHP001903	1	Ratchet wheel	63	KA60401010	1	- Thrust bearing
15	KA00910614	2	Cap screw	–	LHP000261	1	- Hook holder
16	P2H301139	1	Ball screw	● 64	—	1	- - Hook
17	P2H402353	1	Pin	–	LHP000213	1	- - Hook latch set
18	P2H200255	1	Drum	65	—	1	- - - Hook latch
19	KA60401140	1	Thrust bearing	66	—	1	- - - Spring
20	P2H402354	1	Plate	67	—	1	- - - Rivet
21	KA10120510	3	Machine screw	68	—	1	- - Nut
22	KA31120500	3	Spring washer	69	KA42410325	1	- - Spring pin
23	KA00910825	5	Cap screw	70	P2H403202	2	- Hex.bolt
24	KA31120800	4	Spring washer	71	KA30220800	4	- Washer
25	P2H402355	1	Shaft	72	KA25720802	2	- U-nut
26	P2H301140	1	Ratchet	73	P2H403203	1	- plate
27	P2H402356	1	Coller	74	KA00120544	2	- cap screw
28	P2S400020	1	Pin	47	KA30220500	4	- Washer
29	KA20320500	1	Hex. nut	50	KA25720502	2	- U-nut
30	P2H402357	1	Plate	75	P2H403205	1	Stopper
31	P2H402358	1	Pin	–	LHP002684	1	Eye hook assembly
32	KA30221000	1	Washer	76	—	1	- eye hook
33	KA25521002	1	U-nut	77	P2H400521	1	- Hook holder
34	P2H402359	1	Pipe	63	KA60401010	1	- Thrust bearing
35	KA00121044	1	Hex. bolt	68	—	1	- Nut
36	KA31121000	1	Spring washer	69	KA42410325	1	- Spring pin
37	P2H402360	1	Spring	78	P2H402826	1	- Hook holder
38	KA30222000	2	Washer	79	P2H402827	1	- Pin
39	KA25722001	2	U-nut	80	P2H402201	1	- Boss
40	P2H402505	3	Bolt	81	P2H402200	1	- Holder
41	KA30221200	6	Washer	82	KA16510506	2	- Set screw
42	P2H403208	6	Pipe	83	P2H403206	2	Collar
43	P2H402363	3	Pipe	84	P2H403207	1	Collar
44	KA25721202	4	U-nut	85	KA00171262	1	Hex.bolt
45	P2H301504	1	Link chain	86	P2H403211	2	Washer
46	P2B400578	1	Cap screw	87	P2H301505	1	Name plate
47	KA30220500	2	Washer	88	P2H301244	1	Warning label
● 48	P2H301345	1	Chain guide	89	P2H300777	1	Name plate
49	P2H403210	1	Cap screw	90	P2H301245	1	Tag
50	KA25720502	1	U-nut	91	KA16410610	8	Screw

We recommend that you stock parts indicated by a bullet (●).

Parts without part numbers can not be supplied separately.

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■ PARTS LIST EHB-450CR

Ref. No.	Part No.	Quantity	Description	Ref No.	Part No.	Quantity	Description
1	P2H301305	1	Case	51	P2H402581	1	Plate
2	P2H200245	1	End cap	52	P2H403204	1	Stopper
● 3	KA50312400	2	O-ring	–	LHP002683	1	Hook block assembly
4	P2H301306	1	Ball screw cover	53	P2H301500	2	- Plate
● 5	KA50200420	1	O-ring	54	P2S400328	2	- Washer
6	P2H200247	1	Piston	55	P2H301501	1	- Chain wheel
● 7	P2H402349	1	Packing	56	P2H403199	1	- Bearing holder
● 8	P2H402350	1	Wear ring	57	KA40210075	1	- Retaining ring
● 9	P2H402501	1	Packing	58	KA60103022	2	- Ball bearing
● 10	P2H402502	1	Wear ring	59	P2H403200	1	- Shaft
11	KA42510314	2	Spring pin	60	KA30221000	2	- Washer
12	P2H301503	2	Hanger	61	KA25721002	2	- U-nut
13	P2H200257	1	End cap	62	P2H403201	1	- Hook holder
14	LHP002168	1	Ratchet wheel	63	KA60401010	1	- Thrust bearing
15	KA00910614	2	Cap screw	–	LHP000261	1	- Hook holder
16	P2H301304	1	Ball screw	● 64	—	1	- - Hook
17	P2H402701	1	Pin	–	LHP000213	1	- - Hook latch set
18	P2H200272	1	Drum	65	—	1	- - - Hook latch
19	KA60401140	1	Thrust bearing	66	—	1	- - - Spring
20	P2H402702	1	Plate	67	—	1	- - - Rivet
21	KA10120510	3	Machine screw	68	—	1	- - Nut
22	KA31120500	3	Spring washer	69	KA42410325	1	- - Spring pin
23	KA00910825	5	Cap screw	70	P2H403202	2	- Hex.bolt
24	KA31120800	4	Spring washer	71	KA30220800	4	- Washer
25	P2H402355	1	Shaft	72	KA25720802	2	- U-nut
26	P2H301140	1	Ratchet	73	P2H403203	1	- plate
27	P2H402356	1	Coller	74	KA00120544	2	- cap screw
28	P2S400020	1	Pin	47	KA30220500	4	- Washer
29	KA20320500	1	Hex. nut	50	KA25720502	2	- U-nut
30	P2H402357	1	Plate	75	P2H403205	1	Stopper
31	P2H402358	1	Pin	–	LHP002684	1	Eye hook assembly
32	KA30221000	1	Washer	76	—	1	- eye hook
33	KA25521002	1	U-nut	77	P2H400521	1	- Hook holder
34	P2H402359	1	Pipe	63	KA60401010	1	- Thrust bearing
35	KA00121044	1	Hex. bolt	68	—	1	- Nut
36	KA31121000	1	Spring washer	69	KA42410325	1	- Spring pin
37	P2H402360	1	Spring	78	P2H402826	1	- Hook holder
38	KA30222000	2	Washer	79	P2H402827	1	- Pin
39	KA25722001	2	U-nut	80	P2H402201	1	- Boss
40	P2H402703	3	Bolt	81	P2H402200	1	- Holder
41	KA30221200	6	Washer	82	KA16510506	2	- Set screw
42	P2H403209	6	Pipe	83	P2H403206	2	Collar
43	P2H402363	3	Pipe	84	P2H403207	1	Collar
44	KA25721202	4	U-nut	85	KA00171262	1	Hex.bolt
45	P2H301507	1	Link chain	86	P2H403211	2	Washer
46	P2B400578	1	Cap screw	87	P2H301508	1	Name plate
47	KA30220500	2	Washer	88	P2H301244	1	Warning label
● 48	P2H301345	1	Chain guide	89	P2H300777	1	Name plate
49	P2H403210	1	Cap screw	90	P2H301245	1	Tag
50	KA25720502	1	U-nut	91	KA16410610	8	Screw

We recommend that you stock parts indicated by a bullet (●).

Parts without part numbers can not be supplied separately.

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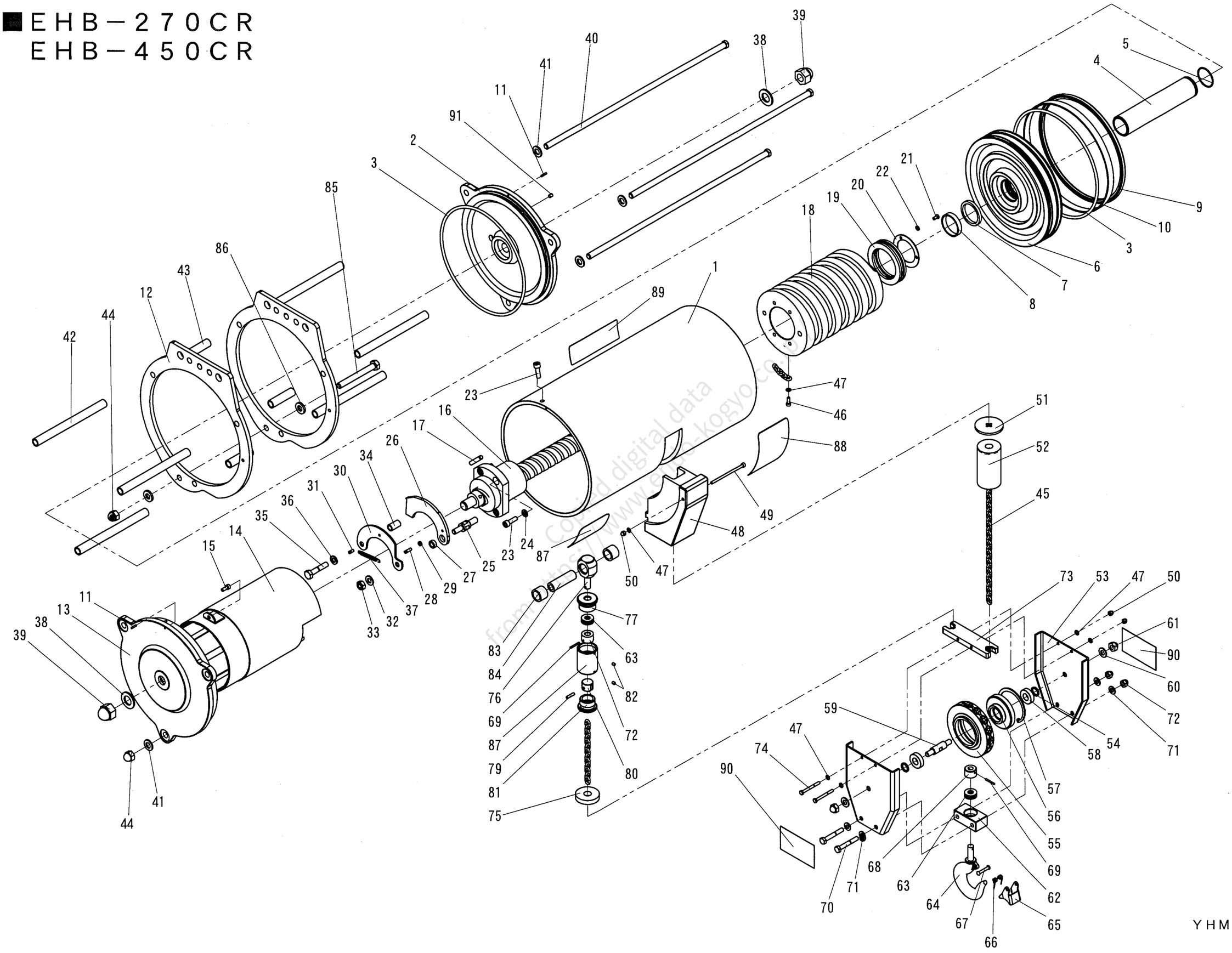
E H B − 4 5 0 C R



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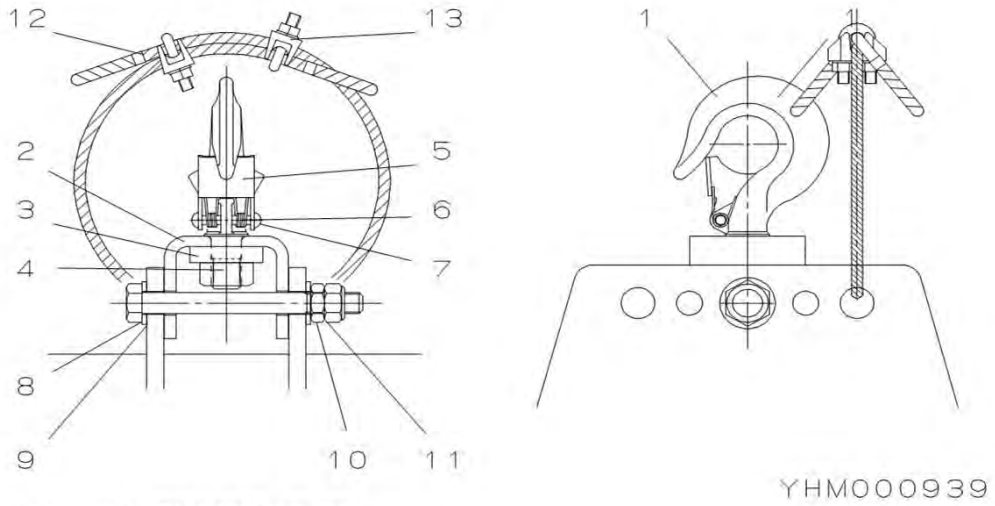
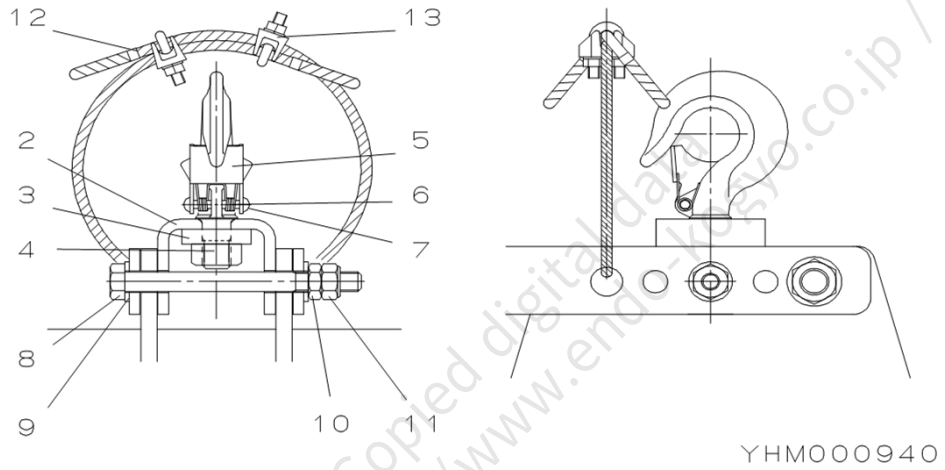
■PARTS LIST Upper hook

1.Control module:MS,MSS,MS-A,BC1



2. Control module:BC2,ABC-5P-B



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1.PARTS LIST

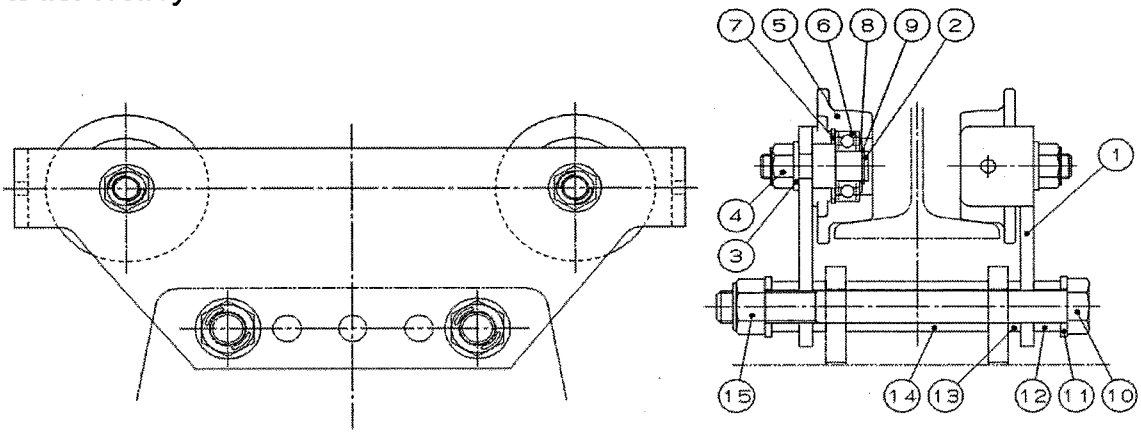
	Ref.No.	Part No.	Quantity	Descrption
	-	LHP001918	1	Hook compl.
	-	LHP001917	1	- Hook
	1	-	1	- - Hook
	2	-	1	- - Plate
	3	-	1	- - Plate
	4	-	1	- - Hex. nut
●	-	LHP000470	1	- Hook latch set
	5	-	1	- - Hook latch
	6	-	1	- - Spring
	7	-	1	- - Rivet
	8	P2H403212	1	Hex. bolt
	9	KA30221200	2	Washer
	10	KA20321200	1	Hex. nut
	11	KA25521202	1	U-nut
●	12	P2H401776	1	Wire rope
	13	P2B400261	2	Wire clip

2.PARTS LIST

	Ref.No.	Part No.	Quantity	Descrption
	-	LHP001918	1	Hook compl.
	-	LHP001917	1	- Hook
	1	-	1	- - Hook
	2	-	1	- - Plate
	3	-	1	- - Plate
	4	-	1	- - Hex. nut
●	-	LHP000470	1	- Hook latch set
	5	-	1	- - Hook latch
	6	-	1	- - Spring
	7	-	1	- - Rivet
	8	KA00171267	1	Hex. bolt
	9	KA30221200	2	Washer
	10	KA20321200	1	Hex. nut
	11	KA25521202	1	U-nut
●	12	P2H401776	1	Wire rope
	13	P2B400261	2	Wire clip

We recommend that you stock parts indicated by a bullet (●).
Parts without part numbers can not be supplied separately.

■Parts list Trolley

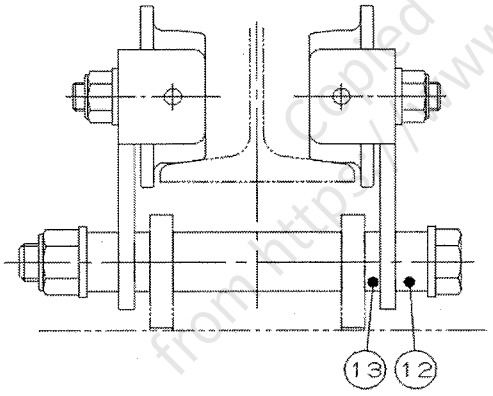


Parts list

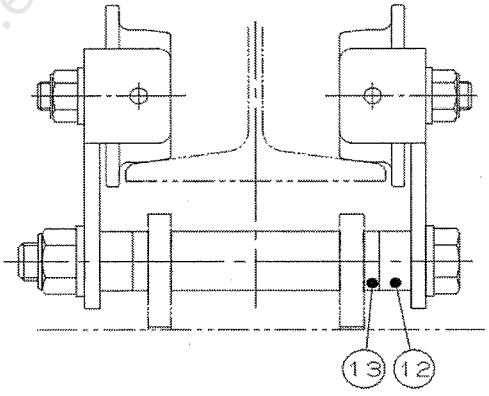
Ref. No.	Part No.	Quantity	Name	Ref. No.	Part No.	Quantity	Name
-	LHP002714	1	Trolley	8	P2H400400	4	Washer
1	P2H300936	2	plate	9	KA40110015	4	Retaining ring
2	P2B400885	4	shaft	10	P2H401996	2	Hex.bolt
3	KA30221200	4	washer	11	KA30221600	8	Washer
4	KA25521202	4	U-nut	12	P2H401997	4	Collar
5	P2B400886	4	Wheel	13	P2H403239	4	Collar
6	KA60104022	4	Bearing	14	P2H402426	2	Collar
7	KA40210035	4	Retaining ring	15	KA25521601	2	U-nut

We recommend that you stock parts indicated by a bullet (●).
Parts without part numbers can not be supplied separately.

① . Control module : MS, MSS, MS-A, BC1

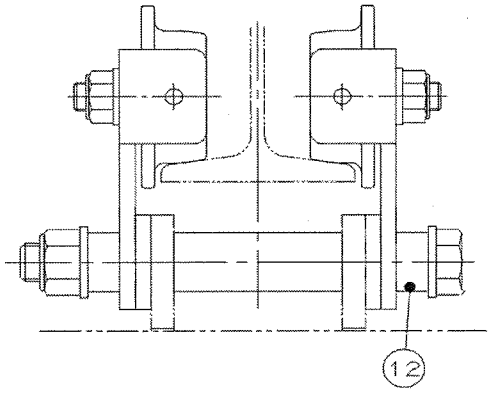


Beam width : 75mm

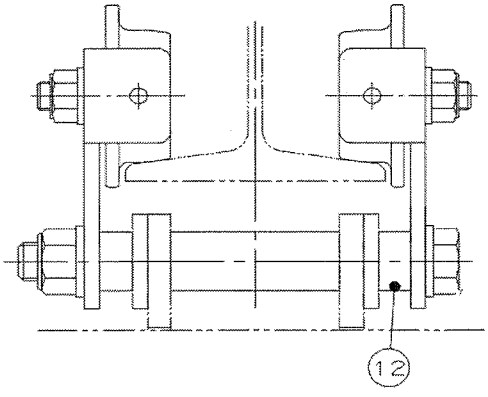


Beam width : 100mm

② . Control module : BC2, ABC-5P-B



Beam width : 75mm



Beam width : 100mm

Parts not use : Ref.No.13 / collar(4pcs)

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ENDO 遠藤工業株式会社

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