

# **TCR Series Air Hoist (250kg to 2 t)** **Instruction Manual**

Hook Suspended Type,  
Manual Trolley Type  
**TCRH03CS/PS/MS**  
**TCRH04CS/PS**  
**TCRH09CD/PD**  
**TCRH09CS/PS**  
**TCRH20CD/PD**

Air Trolley Type  
**TCRM04PS**

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# Introduction

Thank you for purchasing KITO Air Hoist (TCR Series).

The Air Hoist (TCR Series) is designed and manufactured for the purpose of lifting and lowering a load vertically, powered by compressed air, within a normal environment. The air trolley and manual trolley are designed and manufactured for the purpose of moving the lifted load laterally in combination with the air hoist.

The instruction manual is intended for the actual operators and maintenance engineers of the air hoist. When using the air hoist, fully understand the instruction manual together with the instruction manual for the compressor.

## ■ Disclaimer

- KITO shall not be liable for any damage incurred thereof due to natural disaster such as fire, earth quake and thunderbolt, conduct by third party, accident, willful conduct or negligence by customer, erroneous use and other use exceeding the operational condition.
- KITO shall not be liable for any incidental damage due to the use or non-use of the product such as loss of business profit, suspension of business and damage of the lifted load.
- KITO shall not be liable for any damage arising from negligence of the contents in the instruction manual and the use of the product exceeding the scope of its specification.
- KITO shall not be liable for any damage arising from the malfunction due to the combination of the product with other devices in which KITO is not concerned.
- KITO shall not be liable to supply the spare parts for the product for which it has been 15 years since the discontinuation of the product.

## ■ Restriction on Use


- The product is intended for use only in the region or the country where it was purchased. Due to the differences in regulations and standards, it is not for use outside of the region or the country where it was purchased.
- The product described herein is not designed or manufactured for transporting people. Do not use the product for that purpose.
- The product described herein is designed for the materials handling work such as lifting/lowering and traveling the load under ordinary operational condition. Do not use the product for the work other than materials handling work.
- Do not assemble the product into machinery not for materials handling, as a part of it.

## ■ Warning Indication


Improper use of air hoist causes danger such as drop of lifted load. Read this instruction manual carefully before installation, operation and maintenance. Use the product after understanding the product knowledge, safety information and precautions.

This instruction manual classifies the safety information and precautions into three categories of “DANGER”, “WARNING” and “CAUTION”.


### Description of Signal Words

 **DANGER** Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

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

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 **CAUTION** Indicates an imminently hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

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Further, the event described in CAUTION may result in serious accident depending on the situation. Both DANGER and CAUTION describe important contents. Please follow the instruction.

After reading, please keep this manual at hand for future use by the user.


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### Description of Safety Symbols



Prohibited

Means “Prohibited” or “You must not do”.


Prohibited action is shown in the circle or described near the circle.  
This instruction manual uses  as the general prohibition.

---



Mandatory

Means “Mandatory Action” or “You must do”.

Required action is shown in the circle or described near the circle.  
This instruction manual uses  as the general instruction.

---

## ■ General Matters on Handling and Control

### **WARNING**



Prohibited

Only the personnel with expertise and know-how should be allowed to disassemble and repair the air hoist.  
Do not modify the product and its accessories.

Failure to comply with these instructions may not only fail to exert the successful functions and performance of the air hoist, but cause unexpected trouble, resulting in a grave accident.



Mandatory

Understand the contents of the instruction manual sufficiently. Then operate the air hoist.  
Use the product according to the instructions on the warning labels or the tags pasted to its different parts.

Improper use of the air hoist may not only fail to exert its successful functions and performance of the air hoist, but hinder safe operations, resulting in a grave accident.

### **CAUTION**



Prohibited

When transporting the product, care should be taken not to drag, hit against an object or drop it.

Failure to comply with this instruction not only fail to exert the successful functions and performance of the air hoist due to damage on or air leak from the air hoist, but cause a grave accident.



Mandatory

Prior to using the air hoist, conduct daily inspection.  
Contact our office or our dealer for periodic inspection, repair of the air hoist and maintenance.  
Keep regular (frequent and periodic) inspection records.

Failure to comply with inspection and maintenance may not only fail to exert the successful functions and performance of the air hoist, but cause a grave accident.

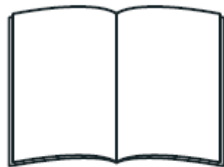
### **NOTE**

When discarding the product, disassemble it to an extent that it cannot be reused, and follow the local municipal ordinance or the rules specified by the business operator.

# Opening the Package

## ■ Checking the Product

- Make sure that the indications on the package and the packed product coincide with your order.
  - Make sure that the code indicated on the package label or the nameplate of the product body conforms to the ordered product.
  - The package includes the following items in addition to the hoist body or hoist body with air trolley.



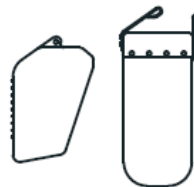
Instruction manual



Test report



Load chain grease tube



Plastic or canvas chain container

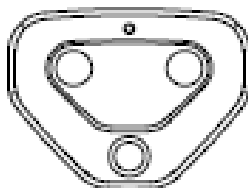


horse stem

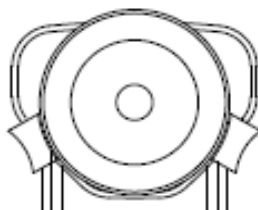
The TCRM series does not include the hose stem. The customer is requested to prepare it.

- If the manual trolley (TSP/TSG) to be combined with the air hoist has been ordered at the same time, note that it will be delivered in a separate package. (The trolley will be either the TSP or TSG type.)

(Separate package)



(TSP)



(TSG)



(Trolley combining parts: Suspender, collar, etc.)

- Make sure that the product has not been deformed or damaged due to vibrations, load shift, etc. during transportation.

## ■ Checking the Product No.

- Enter the product code, serial number, date of purchase and name of the sales shop inscribed on the nameplate attached to the product in the following table.

\* When you ask for repair or order expendable parts, let us know these information as well.

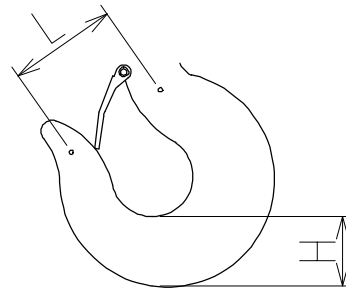
Item	Product information
Product type (Code)	
Serial No.	
Date of purchase	
Name of the sales shop	

## ■ Recording the Hook Dimensions

At the time of unpacking, enter the dimension L between the embossed marks of the hook and the hook thickness dimension H in the following table for maintenance reason.

(These numerical values are used for inspection.)

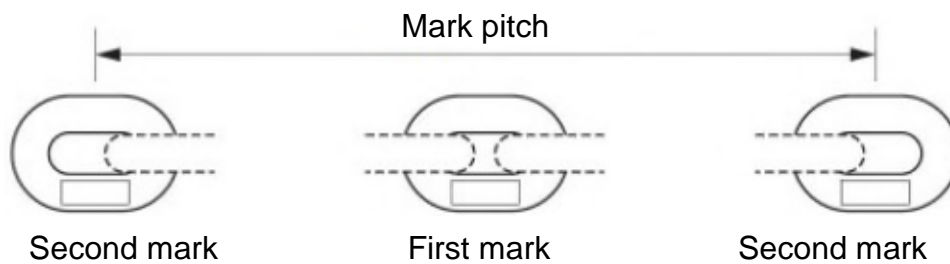
Dimension	Bottom hook
L	(mm)
H	(mm)



## ■ Checking the Marks on the Load Chain

Type marks are indicated on the load chain at equal pitches.

Seeing the following table, check that your product code is compatible with the indicated marks and load chain size.



Front side: AI-DAT

Back side: JAPAN

Front side : Original Lot No.(4 digits)

Back side : KITO

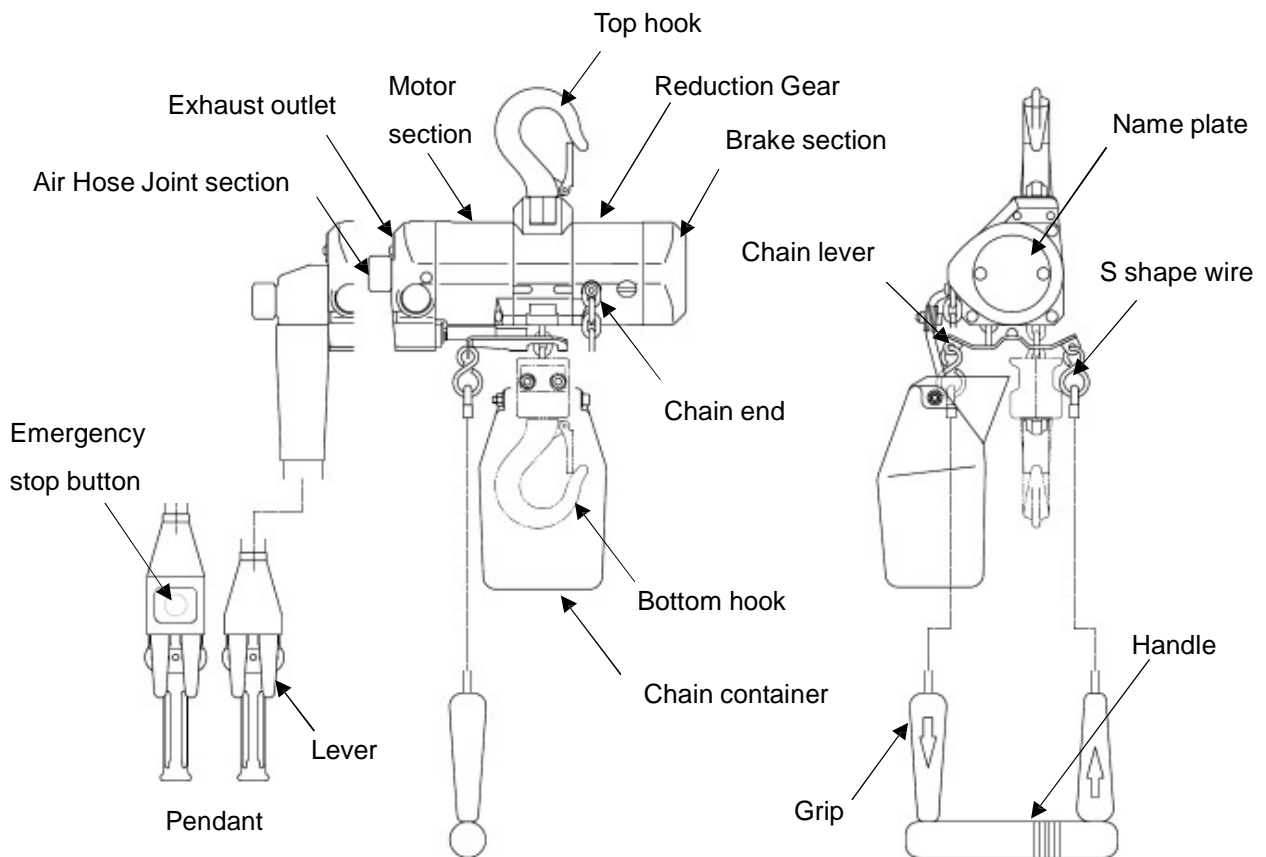
\* In the case of TCRH09CS/PS and TCRH20, only the second mark is different.

Product code	Load Chain size: diameter (mm)	Mark pitch	First mark (Front side/Back side)	Second mark (Front side/Back side)
TCRH03CS/PS/MS	4	24Links	4 digits /KITO	AI-DAT/JAPAN
TCRH04CS/PS, TCRH09CD/PD TCRM04PS	6.3	20Links	4 digits /KITO	AI-DAT/JAPAN
TCRH09CS/PS, TCRH20CD/PD	7.1	20Links	4 digits /KITO	FI-DAT/H23

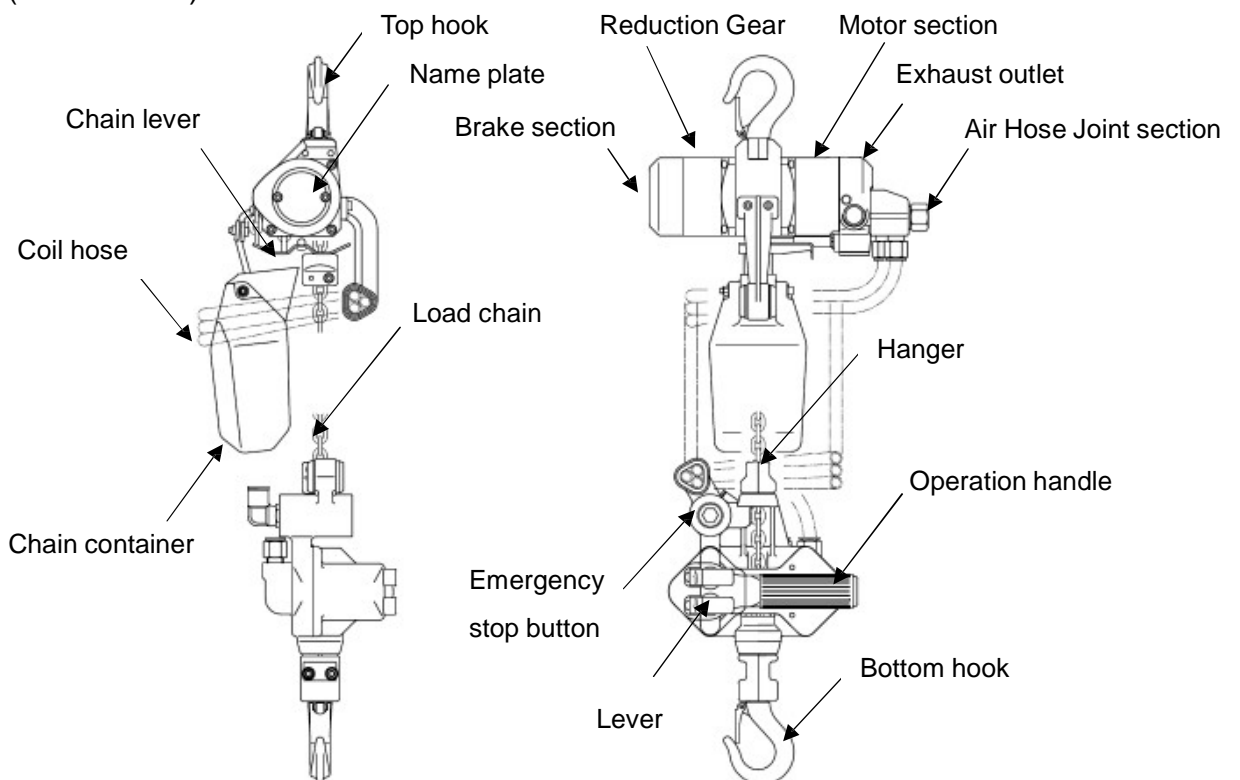
# Product Components

## ■ Hook Suspended Type

■ 250 kg (TCRH03CS/PS)

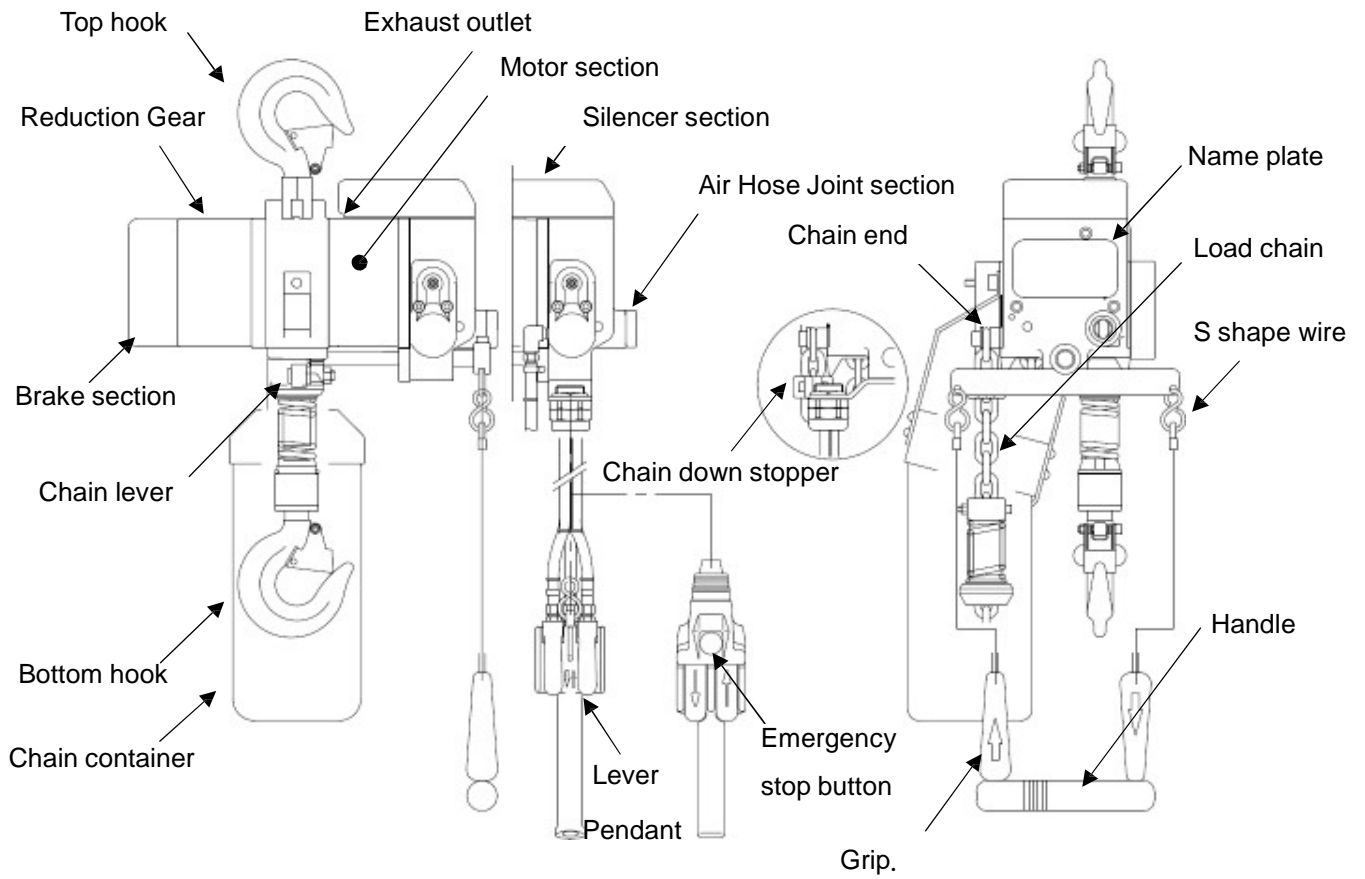


■ 250 kg (TCRH03MS)

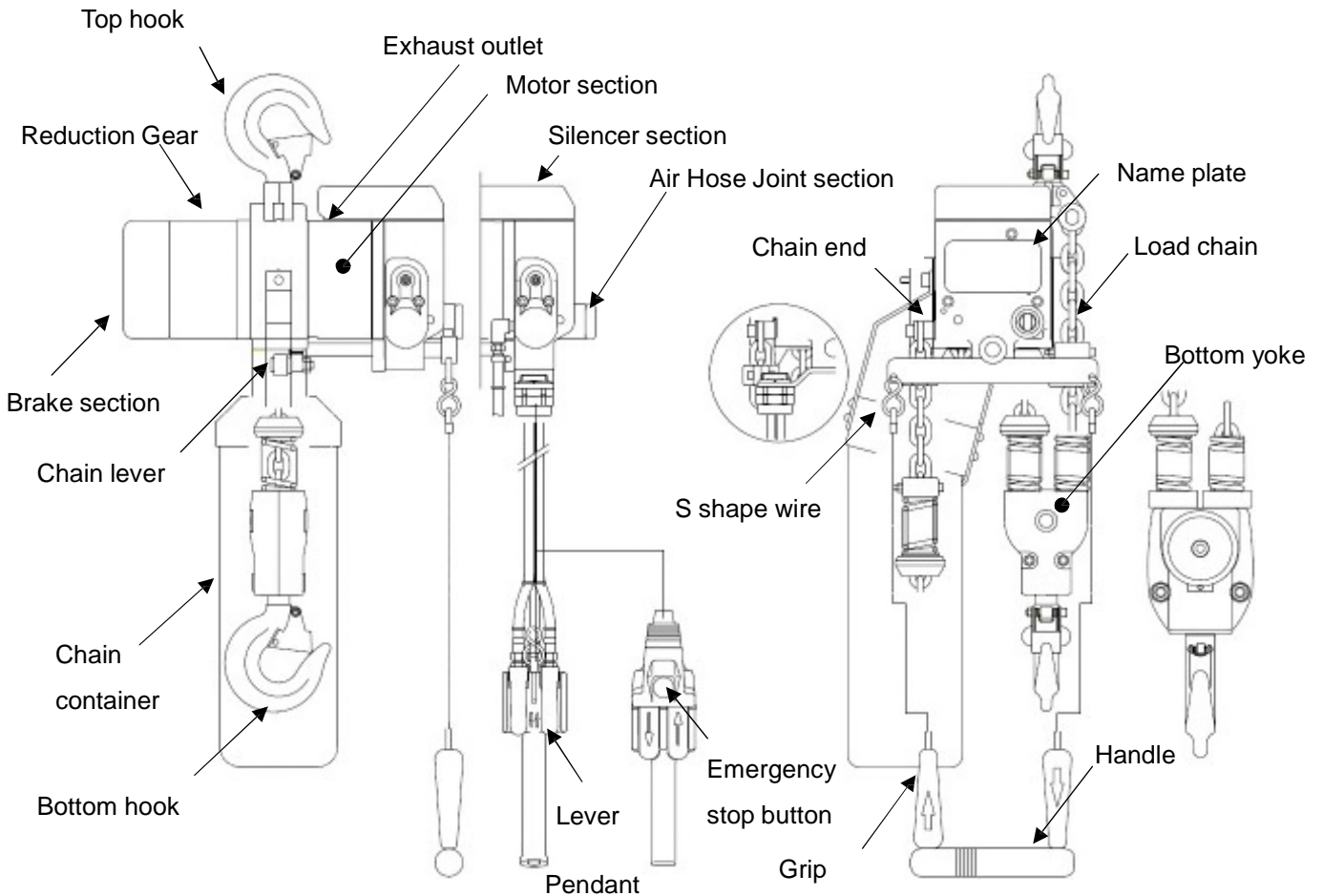




■ 490 kg – 980 kg (TCRH04CS/PS, TCRH09CS/PS)

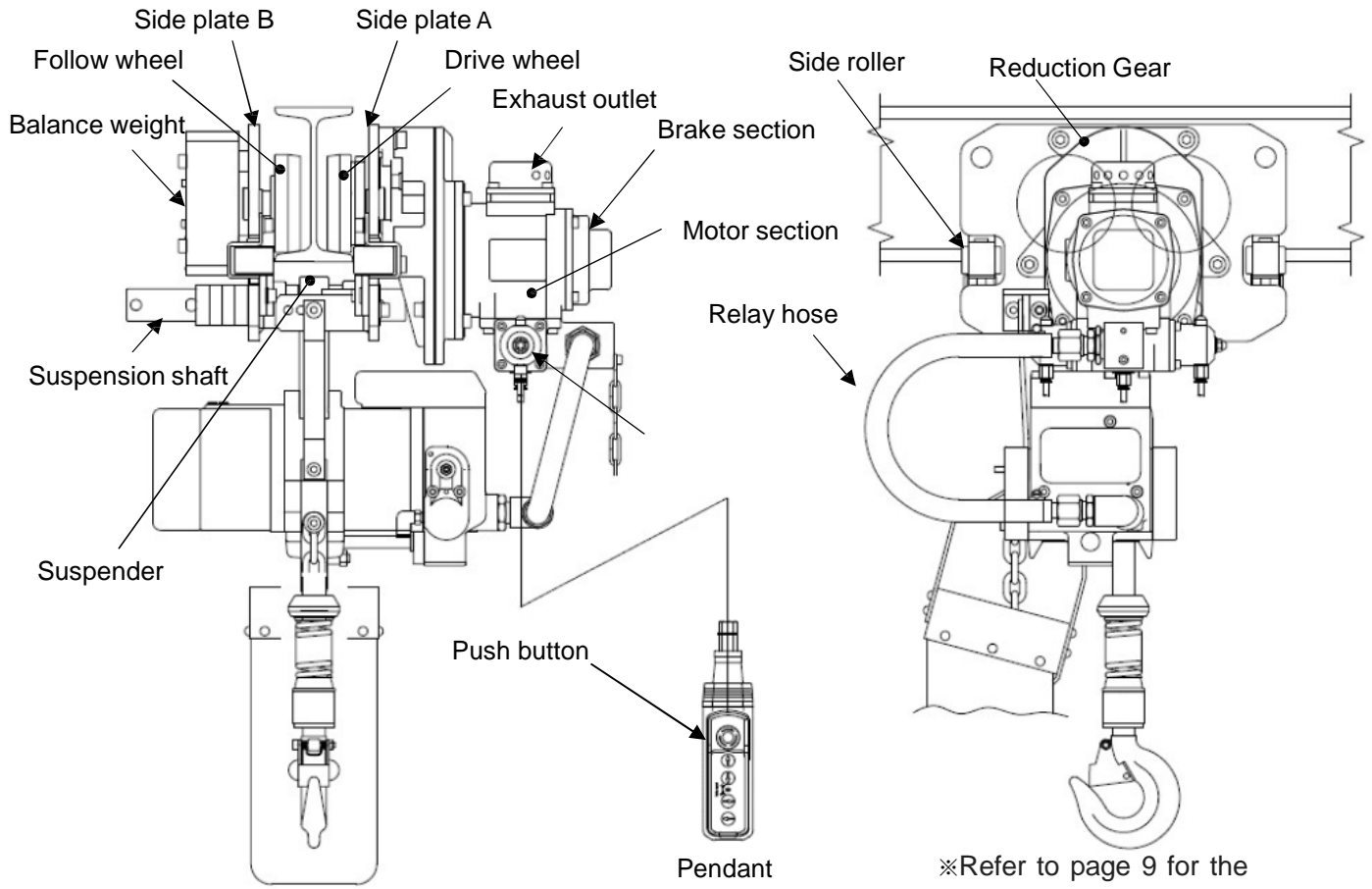


■ 980 kg - 2t (TCRH09CD/PD, TCRH020CD/PD)



# ■ Air Trolley Type

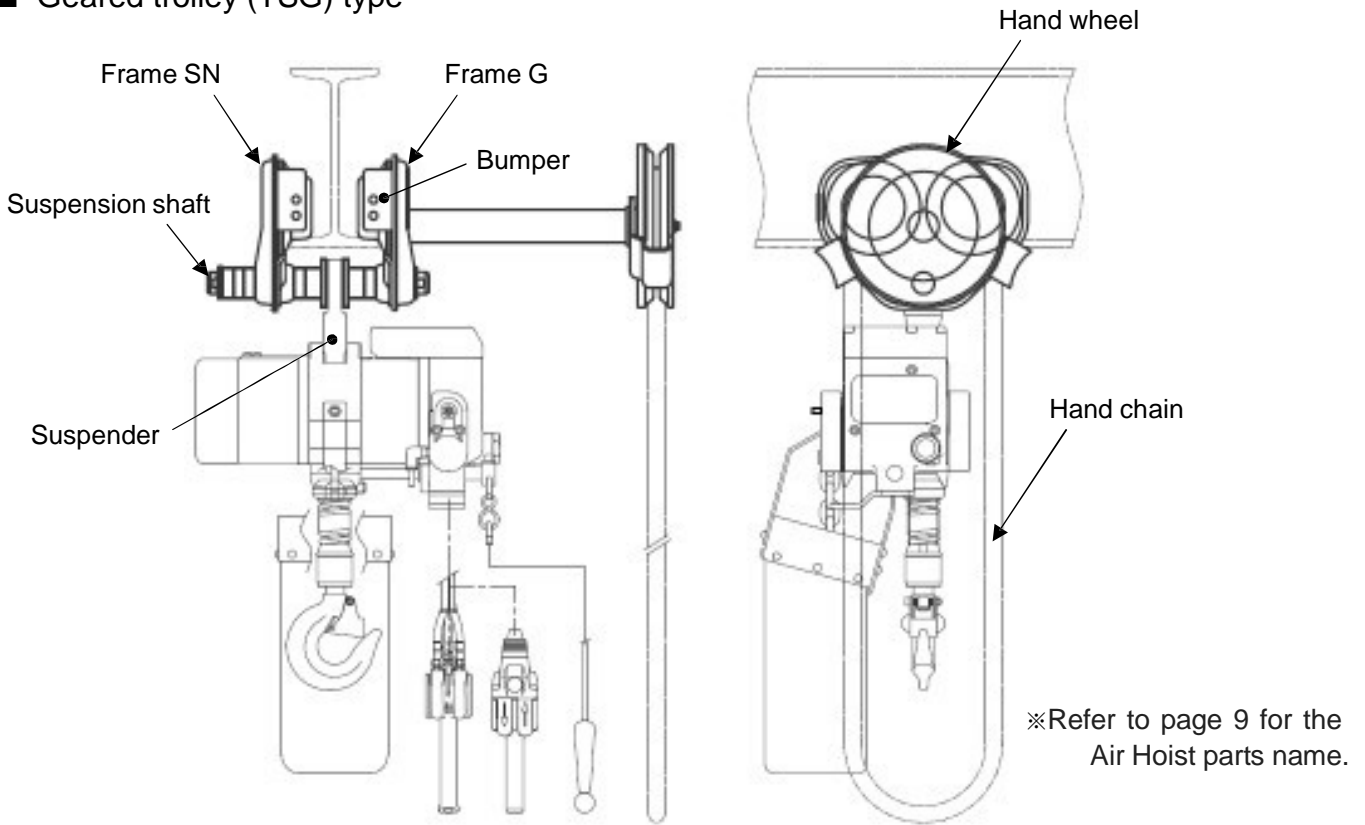
■ 490 kg (TCRM04PS)



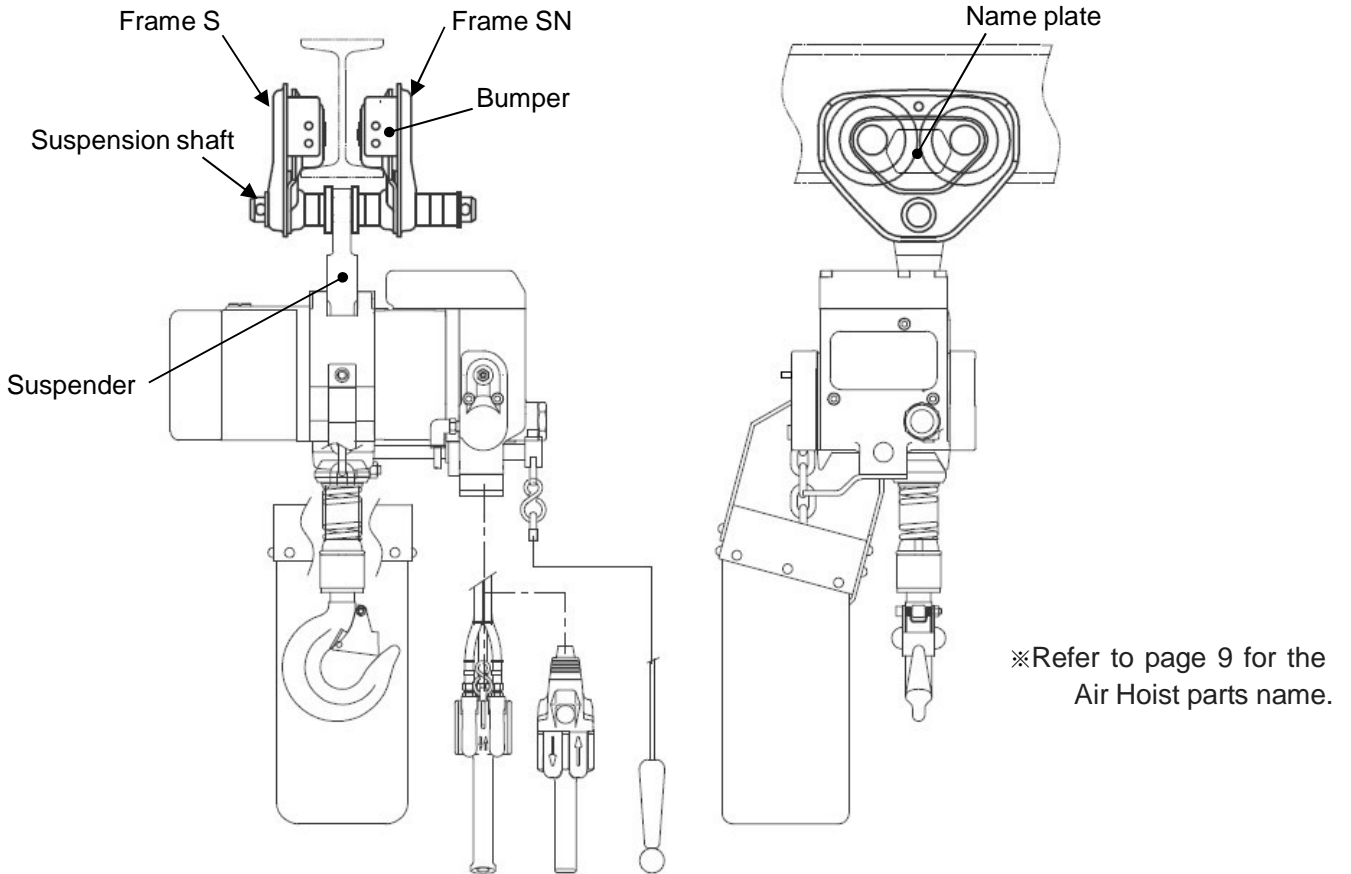
※Refer to page 9 for the Air Hoist parts name.

## Manual Trolley Type

### Geared trolley (TSG) type



### Plain trolley (TSP) type



# Product Specification and Operational Environment

## ■ Product Specification

### ■ Common specification

Service air pressure: 0.4 to 0.6 MPa

Color: KITO Yellow (Equivalent to Munsell 7.2YR6.5/14.5)

Noise level: 250kg: 82±3dB(A), 490kg-2t: 88±3dB(A)

Brake capacity: 400% or more (when the rated load is applied)

Additional function: Load limiter

(activated between over 100% up to 125% of the capacity at service air pressure of 0.6 MPa).

### ■ Hook suspended type (Single unit hoist)

Capacity	Code	Lift (m)	Operation method	Load chain diameter(mm) xNo. of falls	Speed (m/min)				Air consumption (m <sup>3</sup> /min)	Air inlet (Rc)	Net weight (kg)
					During rated loading		When unloaded				
					Lifting	Lowering	Lifting	Lowering			
250kg	TCRH03CS	3	Cord	ø 4.0 x 1	9.0	17.4	18.6	13.8	1	3/8	7
250kg	TCRH03PS	3	pendant	ø4.0 x 1	8.1	16.5	16.7	12.4	0.9	3/8	8.6
250kg	TCRH03MS	2	Hand lever	ø4.0 x 1	8.0	16.5	16.7	12.4	0.9	3/8	11
490kg	TCRH04CS	3	Cord	ø6.3 x 1	10.0	16.0	19.0	13.0	1.7	1/2	30
490kg	TCRH04PS	3	Pendant	ø6.3 x 1	10.0	16.0	19.0	13.0	1.7	1/2	31
980kg	TCRH09CD	3	Cord	ø6.3 x 2	5.0	8.1	9.6	6.4	1.7	1/2	34.5
980kg	TCRH09PD	3	Pendant	ø6.3 x 2	5.0	8.1	9.6	6.4	1.7	1/2	35.5
980kg	TCRH09CS	3	Cord	ø7.1 x 1	5.8	9.3	10.5	6.5	1.7	1/2	33
980kg	TCRH09PS	3	Pendant	ø7.1 x 1	5.8	9.3	10.5	6.5	1.7	1/2	34
2t	TCRH20CD	3	Cord	ø7.1 x 2	2.9	4.7	5.3	3.2	1.7	1/2	39
2t	TCRH20PD	3	Pendant	ø7.1 x 2	2.9	4.7	5.3	3.2	1.7	1/2	40

\* The performance values in the table above are when the service air pressure is 0.6 MPa and the pendant hose length is 2 m; the values in the table differ in other cases.

### ■ Air trolley type

Capacity	Code	Lift (m)	Operation method	Load chain diameter(mm) x No. of falls	Speed(m/min)						Air consumption (m <sup>3</sup> /min)	Applicable rail width (mm)	Minimum turning radius (mm)	Air inlet (Rc)	Net weight (kg)
					During rated loading			When unloaded							
					Lifting	Lowering	Traversing	Lifting	Lowering	Traversing					
490kg	TCRM04PS	3	Pendant	ø6.3 x 1	10.0	16.0	20.0	19.0	13.0	20.0	3.2 (1.7+1.5)	75,100,125	3500	3/4	82

\* The performance values in the table above are when the service air pressure is 0.6 MPa and the pendant hose length is 2 m; the values in the table differ in other cases.

## ■ Manual trolley type

### ■ Geared Trolley Type

Capacity	Code	Lift (m)	Operation method	Load chain diameter(mm) x No. of falls	Speed (m/min)				Air consumption (m <sup>3</sup> /min)	Applicable rail width (mm)	Minimum turning radius (mm)	Air inlet (Rc)
					During rated loading		When unloaded					
					Lifting	Lowering	Lifting	Lowering				
490kg	TCRH04CS	3	Cord	∅ 6.3 x 1	10.0	16.0	19.0	13.0	1.7	75,100,125	1300	1/2
490kg	TCRH04PS	3	Pendant	∅ 6.3 x 1	10.0	16.0	19.0	13.0	1.7	75,100,125	1300	1/2
980kg	TCRH09CD	3	Cord	∅ 6.3 x 2	5.0	8.1	9.6	6.4	1.7	75,100,125	1300	1/2
980kg	TCRH09PD	3	Pendant	∅ 6.3 x 2	5.0	8.1	9.6	6.4	1.7	75,100,125	1300	1/2
980kg	TCRH09CS	3	Cord	∅ 7.1 x 1	5.8	9.3	10.5	6.5	1.7	75,100,125	1300	1/2
980kg	TCRH09PS	3	Pendant	∅ 7.1 x 1	5.8	9.3	10.5	6.5	1.7	75,100,125	1300	1/2
2t	TCRH20CD	3	Cord	∅ 7.1 x 2	2.9	4.7	5.3	3.2	1.7	100,125,150	1500	1/2
2t	TCRH20PD	3	Pendant	∅ 7.1 x 2	2.9	4.7	5.3	3.2	1.7	100,125,150	1500	1/2

\* The performance values in the table above are when the service air pressure is 0.6 MPa and the pendant hose length is 2 m; the values in the table differ in other cases.

### ■ Plain Trolley Type

Capacity	Code	Lift (m)	Operation method	Load chain diameter(mm) x No. of falls	Speed (m/min)				Air consumption (m <sup>3</sup> /min)	Applicable rail width (mm)	Minimum turning radius (mm)	Air inlet (Rc)
					During rated loading		When unloaded					
					Lifting	Lowering	Lifting	Lowering				
250kg	TCRH03CS	3	Cord	∅ 4.0 x 1	9.0	17.4	18.6	13.8	1	[50],75,100	1100	3/8
250kg	TCRH03PS	3	Pendant	∅ 4.0 x 1	8.1	16.5	16.7	12.4	0.9	[50],75,100	1100	3/8
490kg	TCRH04CS	3	Cord	∅ 6.3 x 1	10.0	16.0	19.0	13.0	1.7	[50],75,100	1100	1/2
490kg	TCRH04PS	3	Pendant	∅ 6.3 x 1	10.0	16.0	19.0	13.0	1.7	[50],75,100	1100	1/2
980kg	TCRH09CD	3	Cord	∅ 6.3 x 2	5.0	8.1	9.6	6.4	1.7	75,100,125	1300	1/2
980kg	TCRH09PD	3	Pendant	∅ 6.3 x 2	5.0	8.1	9.6	6.4	1.7	75,100,125	1300	1/2
980kg	TCRH09CS	3	Cord	∅ 7.1 x 1	5.8	9.3	10.5	6.5	1.7	75,100,125	1300	1/2
980kg	TCRH09PS	3	Pendant	∅ 7.1 x 1	5.8	9.3	10.5	6.5	1.7	75,100,125	1300	1/2
2t	TCRH20CD	3	Cord	∅ 7.1 x 2	2.9	4.7	5.3	3.2	1.7	100,125,150	1500	1/2
2t	TCRH20PD	3	Pendant	∅ 7.1 x 2	2.9	4.7	5.3	3.2	1.7	100,125,150	1500	1/2

\* The performance values in the table above are when the service air pressure is 0.6 MPa and the pendant hose length is 2 m; the values in the table differ in other cases.

When the applicable rail width numerical value is shown in square brackets [ ], only straight rails can be used.

## ■ Operational Environment

Installation site: Indoor

Ambient temperature: -10°C to 60°C

Humidity: 85%RH

Operating atmosphere:

Place free from oil mist, corrosive gas, flammable gas, explosive gas, volatile gas and steam.

Do not operate the product in the places exposed to an organic solvent, much powder dust, much acid and salinity, and direct sunshine. \* When the Product is used in a special environment, consult us.

## CAUTION



Prohibited

An air motor lubricant is slightly discharged from the air hoist body because of the structural reason of the air hoist. Do not use in an environment accepting no oils and fats.

The discharged lubricant may damage your properties or result in an accident affecting the health of your body such as falling.

## Preparations before Daily Work

### ■ Selecting the Compressor and Removing the Drain

#### ■ Guide for selection

(For max air consumption of each air hoist, see the specifications on Page 12, 13)

$$(\text{Max air consumption} \times 10) \times \text{No. of units used} \leq \text{Compressor horsepower}$$

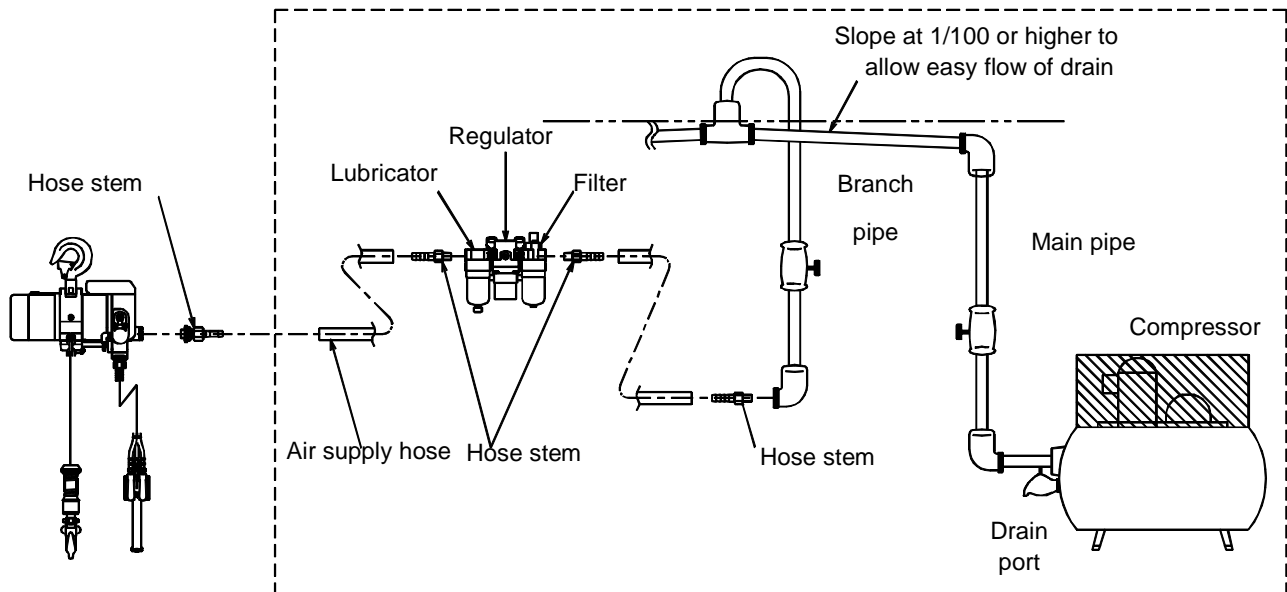
#### ■ Removing the drain

Internal accumulation of water and oil causes rust and trouble. Before and after daily work, loosen the drain valve at the lower part of the air tank of the compressor to remove internally accumulated water and oil so as to use dry clean compressed air. (For details, see the instruction manual for the compressor.)

### ■ Piping

See the following piping diagram to connect pipes. The customer is requested to prepare the devices and materials enclosed by dotted lines in the piping diagram.

Main and branch pipes should be larger than the hose size, and use as large as possible ones. If they are smaller or too long, full performance may not be exhibited due to pressure loss.



(Piping diagram)

**⚠ CAUTION**



Mandatory

Be sure to install an air filter, reducing valve and lubricator (line oiler) near the air hoist.  
The air filter, reducing valve and lubricator (line oiler) should be sized larger than the hoses.

Improper air control may not only cause trouble and malfunctioning due to rust, early wear of internal parts, but lead to bodily injury due to these factors.

Use the air filter, regulator and lubricator larger than the hose size.

The pilot type regulator is recommended. If the regulator is not the pilot type, it is recommended to use the regulator one size above in order to secure the performance.

For handling of the air filter, regulator and lubricator, follow the instructions in the manufacturer's instruction manual.

(Recommended air set)

Target product type	Air set	Type	Manufacturer
TCRH03CS	Regulator	AR425-04G	SMC Corporation
TCRH03PS	Filter	AF40-04-A	
TCRH03MS	Lubricator	AL40-04-A	
Other than the above	Regulator	AR625-06G	
	Filter	AF50-06-A	
	Lubricator	AL50-06-A	

It is recommended to use the regulator with pressure gauge in order to check the air pressure. Also, use a mounting bracket as required.

**⚠ CAUTION**



Prohibited

Do not use quick couplers to connect the hoses and pipes.  
Failure to comply with this instruction may not only fail to exert the successful functions and performance of the air hoist, but cause troubles, leading to an unexpected accident.

## ■ Preparing and Attaching the Air Supply Hose

### ■ Air hose inner diameter

- Check the purchased product type and prepare the hose with inner diameter shown in the table below.

Also, prepare hose bands suitable for the hose used.

Unit (mm)


Code	TCRH03CS	TCRH03PS	TCRH03MS	TCRH04CS	TCRH04PS	TCRH09CD	TCRH09PD	TCRH09CS	TCRH09PS	TCRH20CD	TCRH20PD	TCRM04PS
Hook suspended type/ Manual trolley combined type	9.5 or more			12.7 or more								12.7 or more
Air trolley combined type												12.7 or more

(Recommended air supply hoses)

Hose inner diameter (mm)	Manufacturer	Type	Use pressure (Mpa)
10 (9.5)	TOYOX Co., Ltd.	HIT HOSE HB-10	0-1.5
12.7	The Yokohama Rubber Co., Ltd.	HI-MID Oil Series HI-MID12	0-1.5
19		HI-MID Oil Series HI-MID19	0-1
25		HI-MID Oil Series HI-MID25	0-1

## ■ Air hose length

**⚠ CAUTION**



Mandatory

The air hose length used should be within 10 m.

Taking account of pressure loss according to the length of the air supply hose, adjust the air pressure with the regulator and use at the appropriate service air pressure (0.4 to 0.6 MPa; 0.6 MPa recommended).

Failure to adjust the service air pressure not only fails to exert successful functions and performance of the air hoist, but obstructs efficient operation.

See the following table for relations between an air flow rate and a pressure drop when the hose is 10 m long.

Hose dimension (mm)	Hose inlet pressure (MPa)	Free air flow rate through 10-m hose(m <sup>3</sup> /min)													
		0.5	0.75	1	1.25	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
9.5 (10)	0.4	0.0439	0.0987	0.1757	0.2549										
	0.5	0.0382	0.0879	0.1461	0.227	0.3306									
	0.6	0.0328	0.074	0.1326	0.1971	0.2835									
	0.7	0.0294	0.0626	0.1155	0.1732	0.2492									
12.7	0.4	0.0107	0.0249	0.0424	0.0648	0.0932									
	0.5	0.0091	0.0203	0.036	0.0541	0.078									
	0.6	0.0078	0.0173	0.0309	0.0464	0.0668	0.1184	0.1849							
	0.7	0.0071	0.0155	0.0269	0.0424	0.0588	0.0999	0.1561							
19.0	0.4	0.0001	0.0033	0.0057	0.0089	0.0124	0.022	0.0346	0.0459	0.0656	0.0857	0.1084	0.1338	0.1619	
	0.5	0.0001	0.0028	0.0047	0.0075	0.0108	0.0184	0.0288	0.0415	0.0547	0.0714	0.0904	0.1116	0.1351	
	0.6	0.0001	0.0025	0.0041	0.0065	0.0093	0.0159	0.0248	0.0355	0.0469	0.0612	0.0775	0.0956	0.1157	
	0.7		0.0016	0.0036	0.0043	0.0081	0.0144	0.0217	0.0312	0.041	0.0536	0.0678	0.0837	0.1013	
25.4	0.4			0.0014	0.0016	0.0032	0.0056	0.0085	0.0123	0.014	0.0193	0.0244	0.0302	0.0365	0.0466
	0.5			0.0012	0.0019	0.0027	0.0048	0.007	0.0103	0.0123	0.0161	0.0204	0.0252	0.0305	0.0388
	0.6			0.001	0.0017	0.0023	0.0041	0.006	0.0088	0.0106	0.0138	0.0175	0.0216	0.0261	0.0333
	0.7			0.0009	0.0014	0.002	0.0036	0.0054	0.0073	0.0092	0.0121	0.0153	0.0189	0.0228	0.0291

\* When the hose is longer than 10 m, there are proportional relations between the hose length and a pressure loss. If the hose length is 20 m, for instance, its pressure loss is twice higher than the pressure loss value in the table.



## ■ Adjusting the service air pressure

In order to maintain the performance of the air hoist, supply the appropriate service air pressure (0.4 to 0.6 MPa; 0.6 MPa recommended), taking account of pressure loss in the air supply hose connecting the air set (regulator, air filter and lubricator) and the air hoist.

### ■ Adjusting the pressure loss and service air pressure

Example: When using the TCRH03CS (250 kg) with the 10 m long air supply hose

(1) The hose inner diameter is 9.5 mm according to the table on Page 15.

(2) The maximum air consumption is 1 m<sup>3</sup>/min. according to the specification table on Page 12.

(When the table has no relevant air consumption for the maximum air consumption value of the Product, take the closest higher value.)

(3) The pressure loss is 0.1326 MPa according to the table above, based on the hose inner diameter, hose inlet pressure (when the regulator's pressure gauge indicates 0.6 MPa) and air consumption value.

(4) Since the air pressure supplied to the air hoist is reduced only by 0.1326 MPa, the supply pressure is 0.467 Mpa (=0.6-0.1326).

Adjust this reduced pressure portion finely with the regulator so as to obtain the recommended value of 0.6 MPa.

Note) Check the pressure resistance performance of the regulator and hose to adjust the supply pressure.

Hose dimension (mm)	Hose inlet pressure (MPa)	0.5	0.75	1
		9.5	0.4	0.0439
	0.5	0.0382	0.0879	0.1461
	0.6	0.0328	0.074	0.1326
	0.7	0.0294	0.0626	0.1155

## ■ Attaching the Air Hose to the Air Hose Joint

### ⚠ CAUTION



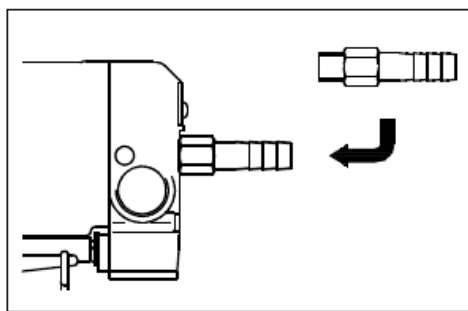
Mandatory

Attach the air supply hose firmly to a hose stem with a hose band.

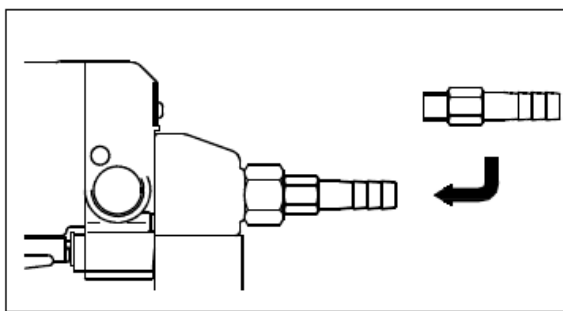
Loose connection or air leak may not only fail to exert the successful functions and performance, but detach the hose during operation, coming into contact with the worker and resulting in bodily injury.

### ■ 250 kg (TCRH03CS/PS/MS)

(1) Coil a seal tape around the threaded part of the hose stem and attach the hose stem to the air hoist body as illustrated in the following figure.

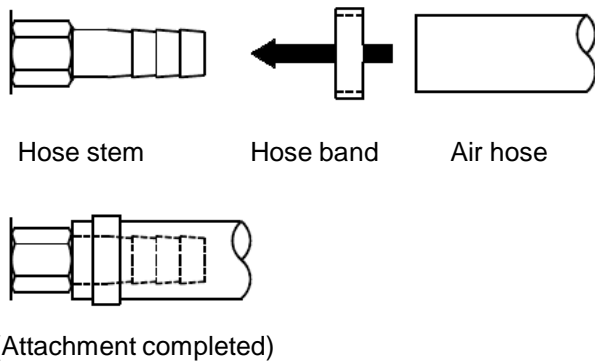


(Cord type)



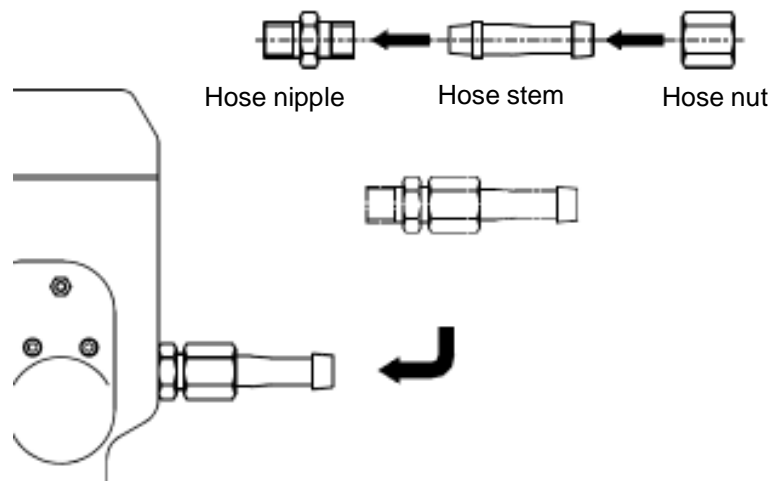
(Pendant type)

- (2) Then, insert the air hose close to the hexagonal part of the hose stem and fix it firmly with a hose band. When this is done, apply 10 drops of lubricant (see Page 19) to the hose inserting part.

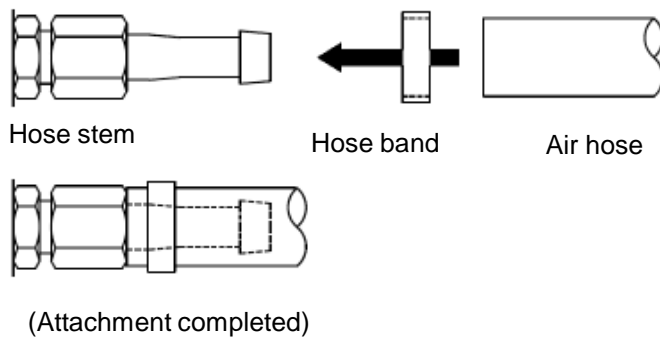


■ **Other than 250 kg**

- (1) Coil the seal tape around the threaded part of the hose nipple. Assemble the hose nipple, hose stem and hose nut as illustrated in the following figure, and attach them to the air hoist body.



- (2) Then, insert the air hose close to the hexagonal part of the hose stem and fix it firmly with a hose band. When this is done, apply 10 drops of lubricant (see the following table) to the hose inserting part.



## ■ Lubrication

### ⚠ CAUTION



Mandatory

Be sure to apply a lubricant to the load chain.

To lubricate the motor, use a lubricator (line oiler) to apply 10 to 15 drips (0.2 to 0.3 cc) of lubricant per minute.

When storing the air hoist for a long period or when using it again after long-term storage, lubricate 0.2 to 0.3 cc from the air supply hose joint, perform low-speed operation to accustom, and then, store or use it again.

Use only the specified lubricants.

Improper lubrication may not only cause trouble and malfunctioning due to rust, early wear of internal parts, but lead to bodily injury due to these factors.

(Lubricants)

Lubricant	Grade or Manufacturer	Lubricating spot	Lubrication method
EPNOC GREASE AP (N) 0	ENEOS Corporation	Load chain	Direct application
Additive turbine oil	ISOVG32-56	Air motor or Air Hose Joint section	Lubricator or Direct application

## ■ Checking the Product Components

### ■ Checking the chain end connection

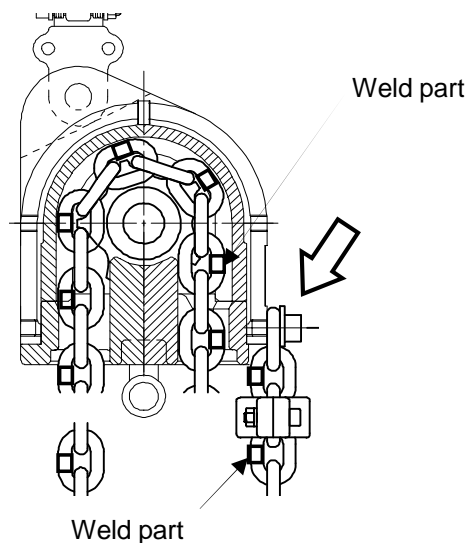
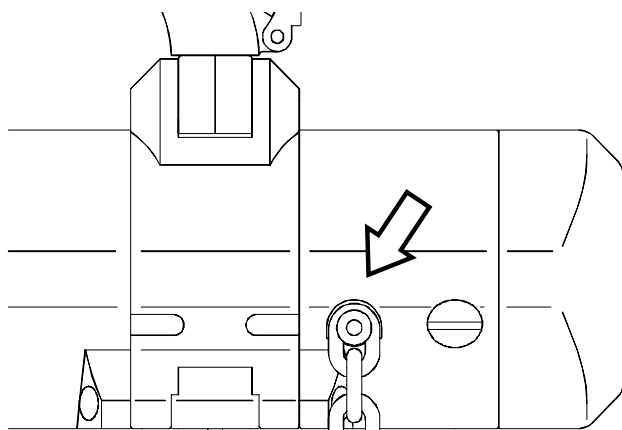
- Check that the end of chain is firmly attached to the air hoist body with a screw (M5) or bolt (M8).

Retighten the screw or bolt, if loosened.

250 kg tightening torque = 3 N·m

490 kg to 2 t tightening torque = 29 N·m

- Check that the chain is free from torsion at the chain fixing part, and that the weld zone of the vertical link is directed as illustrated in the following figure.



## ■ Checking the chain-down stopper (other than 250kg)

### WARNING



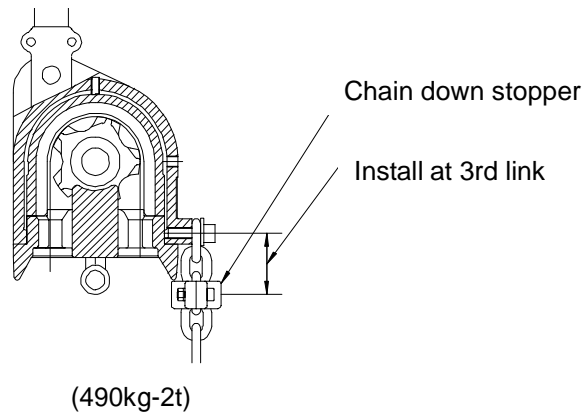
Mandatory

Be sure to attach a chain-down stopper to the specified position.

If it is not attached, the chain may come off when an overwinding prevention device is not activated by any chance, resulting in death or a grave accident due to a fall of the suspended load.

If it is attached to other than the specified position, the overwinding prevention device fails to function successfully, resulting in hoist trouble.

- Check that the chain-down stopper has been attached to the position illustrated in the following figure.



## ■ Checking the limit shaft snap pin

### ⚠ WARNING

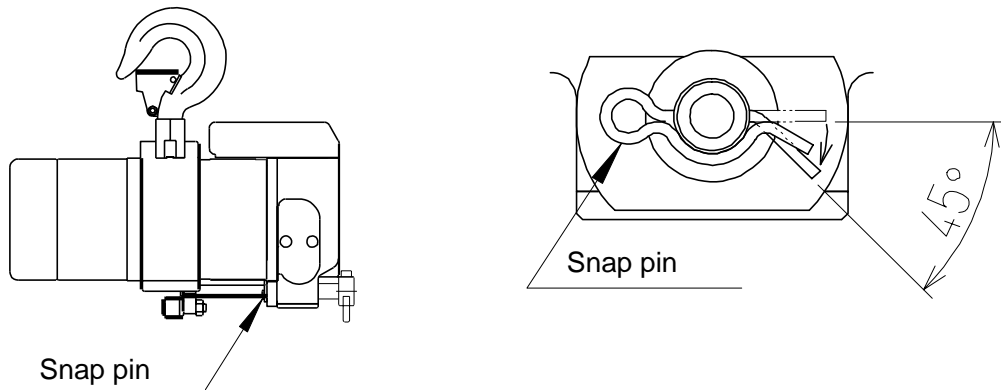


Mandatory

Make sure that a limit shaft snap pin is properly attached.

If it is not properly attached or has come off, the overwinding prevention device may fail to function successfully, damage the hoist body or break the load chain, resulting in a grave accident such as death due to a fall of the suspended load.

- Make sure that the snap pin is properly attached as shown in the following figure.



## ■ Checking the double chain type for twist

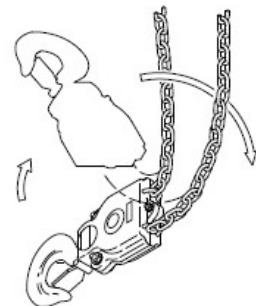
### ⚠ WARNING



Mandatory

In the double chain type, a hook block may have passed between chains, twisting them. Before using the air hoist, check the chains for any twist to use it with no twisted chains.

If used with twisted chains, they may be broken, resulting in a grave accident such as death due to a fall of the suspended load.



## ■ Attaching the Chain Container

### ■ Plastic chain container

The plastic chain container has not been attached to the air hoist body. Attach it according to the following instructions.

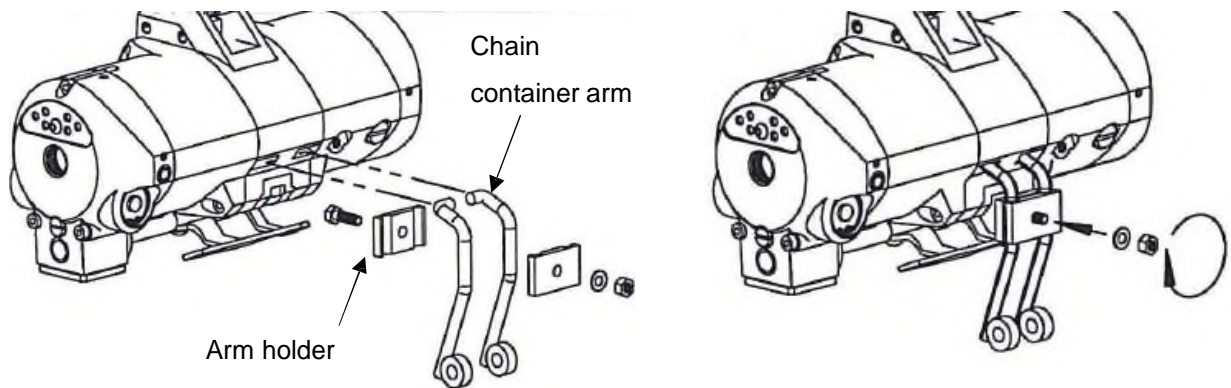
#### ■ 250 kg

Prior to tightening each mounting bolt, apply a locking agent (equivalent to Loctite 242 medium strength) to them.

After attaching the chain container, store the chain in the container without entwining it.

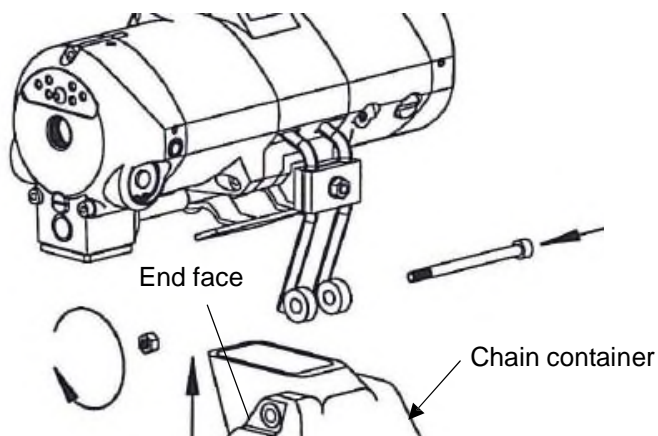
(1) Attach the container arms to the air hoist body and fix an arm holder with a hexagon head bolt (M5 x 70), plain washer and U-nut.

(Tightening torque  $T = 4 \text{ N}\cdot\text{m}$ )



(2) Cover the container arms with the container from below, put through a hexagon socket head bolt from the side and fix with a U-nut.

Tighten the U-nut only as far as the end face of the container; do not tighten it any more.



(3) After attaching the container, store the chain in the container without entwining it.

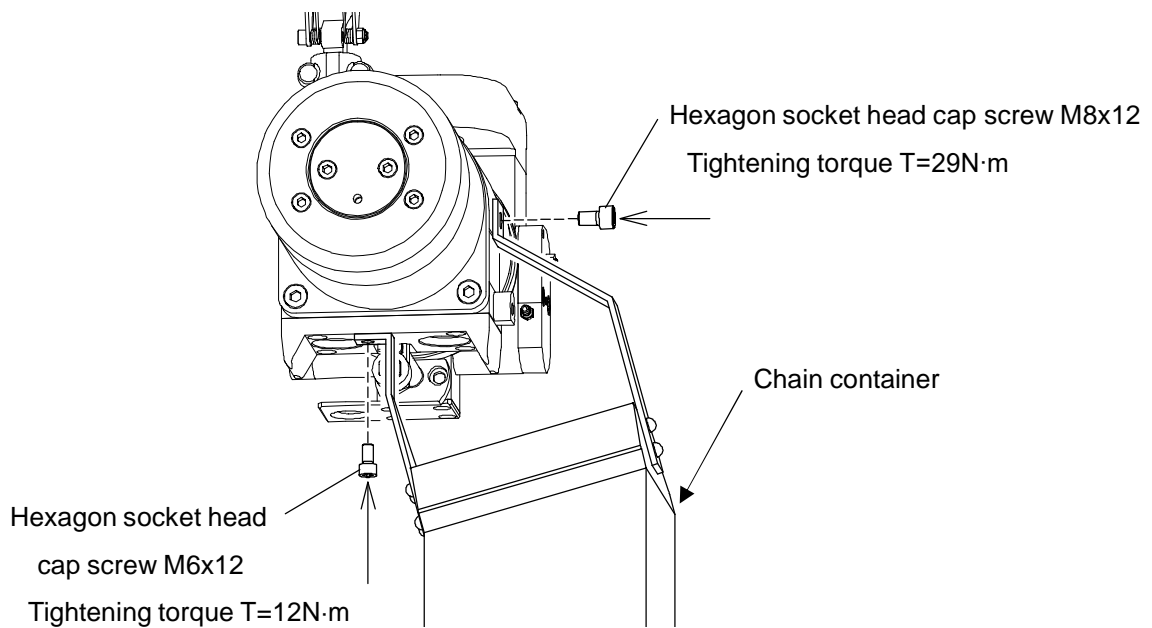
## ■ Canvas chain container

A canvas chain container has not been attached to the air hoist body. Attach it as illustrated in the following figure.

### ■ 490 kg to 2t

Prior to tightening each mounting bolt, apply a locking agent (equivalent to Loctite 242 medium strength) to them.

After attaching the container, store the chain in the container without entwining it.



## ■ Attaching the Upper Accessory

The air hoist may be used in line with the customer's intended purpose by replacing the upper accessory.

Prior to use, attach the accessory in the following procedures.

### ⚠ CAUTION



Mandatory

When replacing the upper accessory, make sure that a spring pin or hanger pin insertion hole in the wheel housing has not been worn or damaged, and that the concave part has not been deformed or cracked.

Failure to comply with this instruction may result in a serious accident such as a fall of the suspended load.

## ■ Hook suspended type (Top hook type)

When hooking the air hoist onto the structure to use it, attach a top hook.

The top hook has been attached to the air hoist beforehand upon delivery of the product. When changing from the trolley combined air hoist, however, follow the procedure below to attach the top hook.

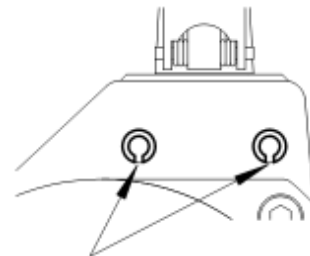
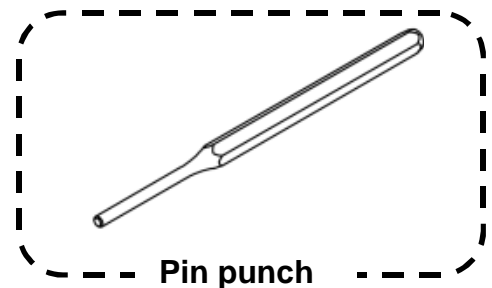
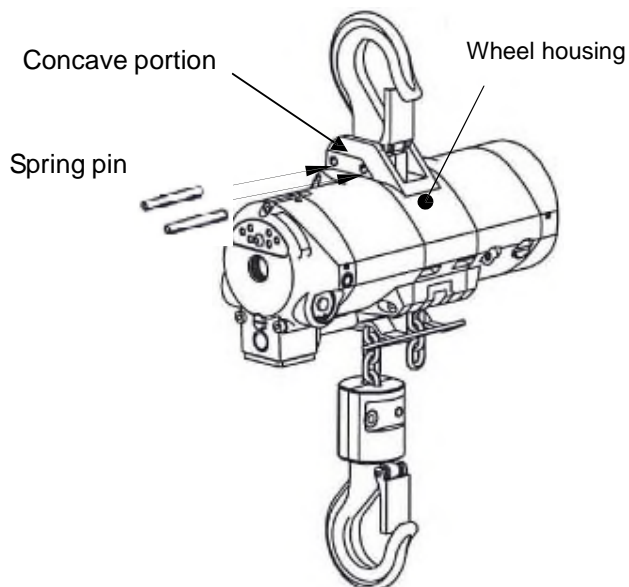
### ■ In the case of 250 kg

(1) Insert the top hook into the concave on the top of the air hoist.

(2) Drive the spring pins ( $\varnothing 6 \times 45$ , 2 pcs.) from the side in such a manner that their grooves face downward.

Use new spring pins.

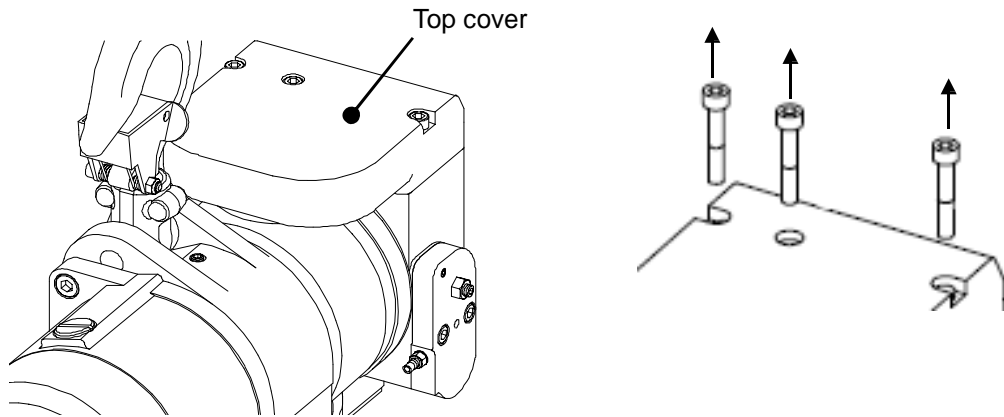
When attaching the top hook, use the pin punch (special tool, Tip diameter  $\varnothing$  is 6 mm) to remove or drive the spring pin.



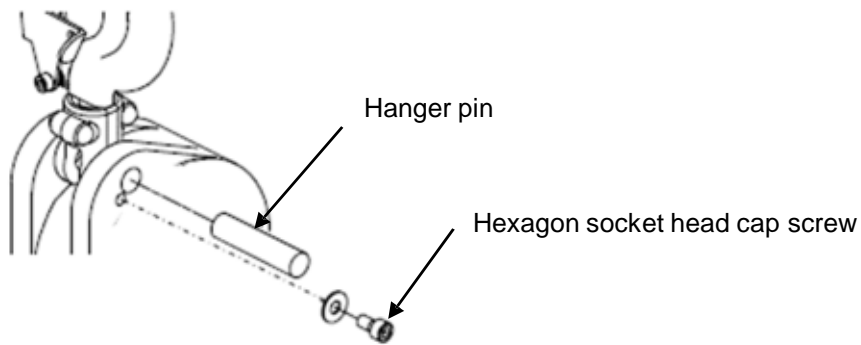


■ In the case of 490 kg to 2t

(1) Remove the hexagon socket head bolts from the top cover.



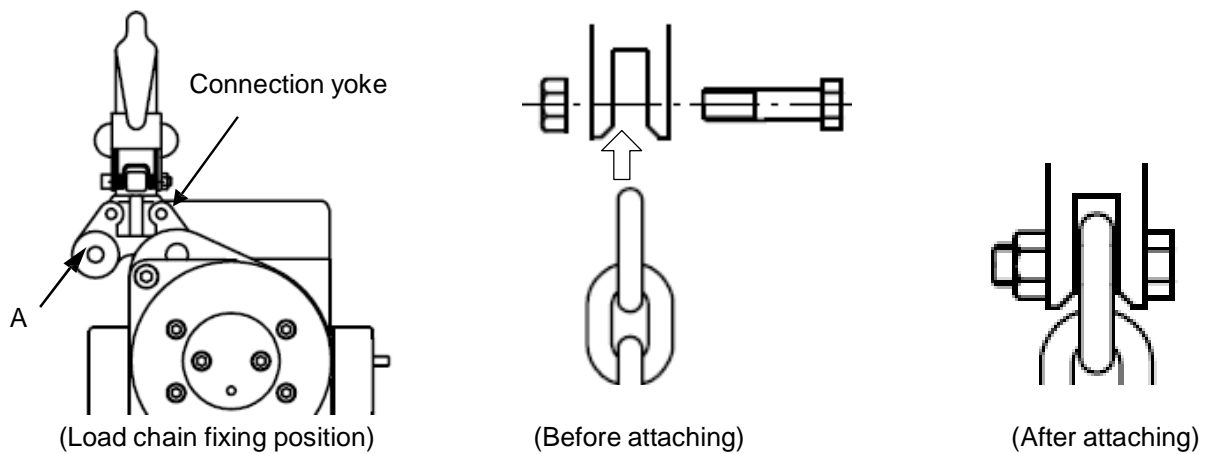
(2) Remove the top cover and hanger pin in that order.



(3) Set the top hook into the concave part, put through the hanger pin and fix with the hexagon socket head bolt and a washer.

(4) For the double fall model, attach the end of the load chain to the Part A of the connection yoke.

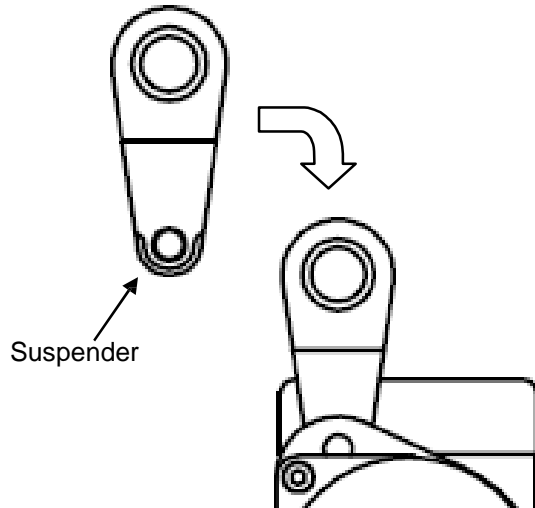
Using the bolt and U-nut attached to the top hook beforehand, fix the load chain as illustrated in the following figure.



## ■ Air trolley type

When combining the air hoist with an air motor, attach an exclusive suspender in the following procedures.

- (1) Remove the top cover and hanger pin according to Steps (1) and (2) on the previous page.
- (2) Set the exclusive Suspender in the concave part, put through the hanger pin, and fix with a hexagon socket head bolt and a washer.



## ■ Manual trolley type

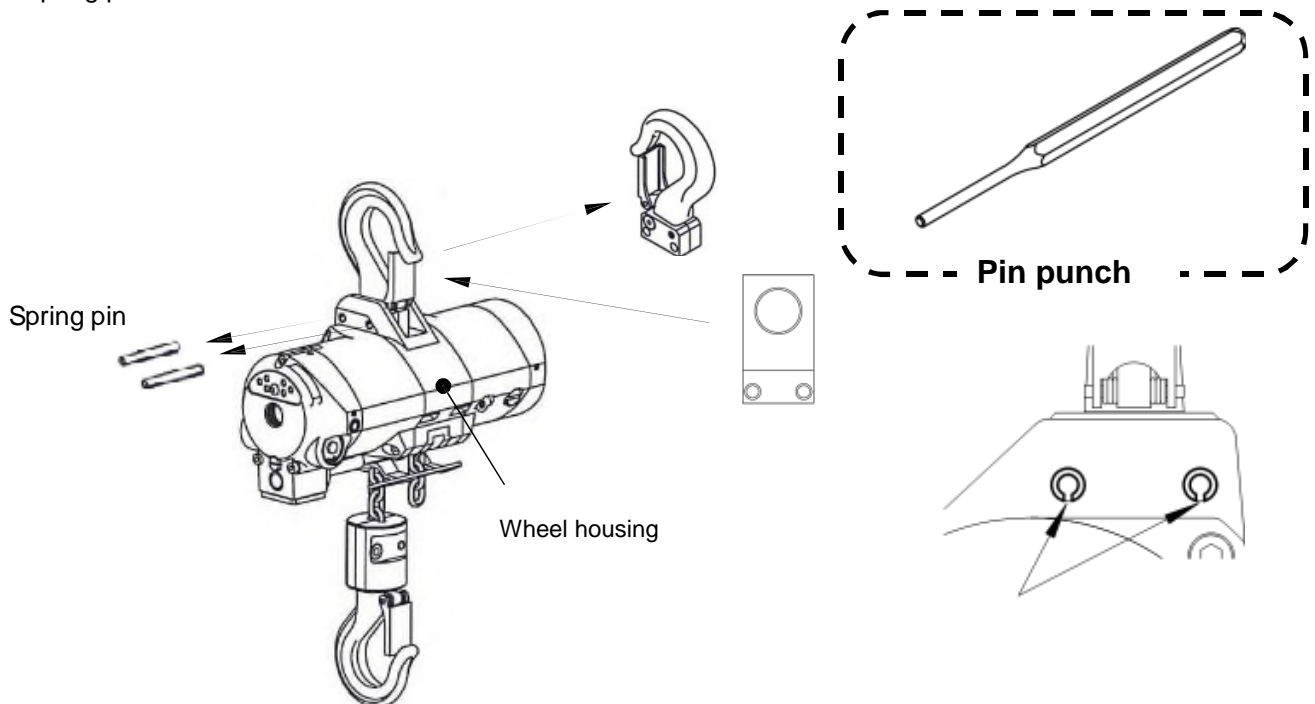
When combining the air hoist with a manual trolley, attach an exclusive suspender as illustrated in the following figure.

### ■ In the case of 250 kg

- (1) Set the suspender in the concave part on the top of the air hoist.
- (2) Drive the spring pins ( $\varnothing 6 \times 45$ , 2 pcs.) from the side in such a manner that their grooves face downward.

Use new spring pins.

When attaching the suspender, use the pin punch (special tool, Tip diameter  $\varnothing$  is 6 mm) to remove or drive the spring pin.



■ In the case of 490 kg: See the air trolley type on the previous page.

### ⚠ CAUTION



Prohibited

Do not hook the top hook of the air hoist directly onto the suspension shaft to use the air hoist. When using the air hoist with the trolley combined, use the exclusive suspender to combine.

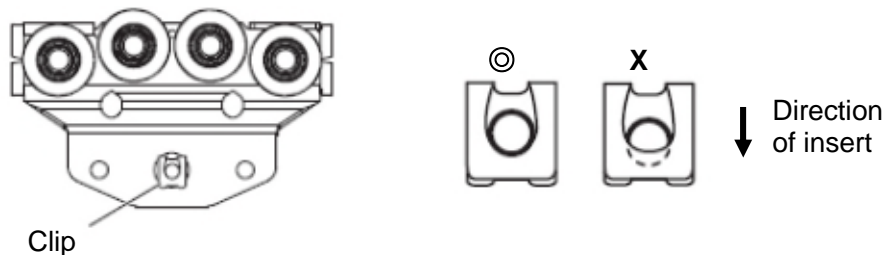
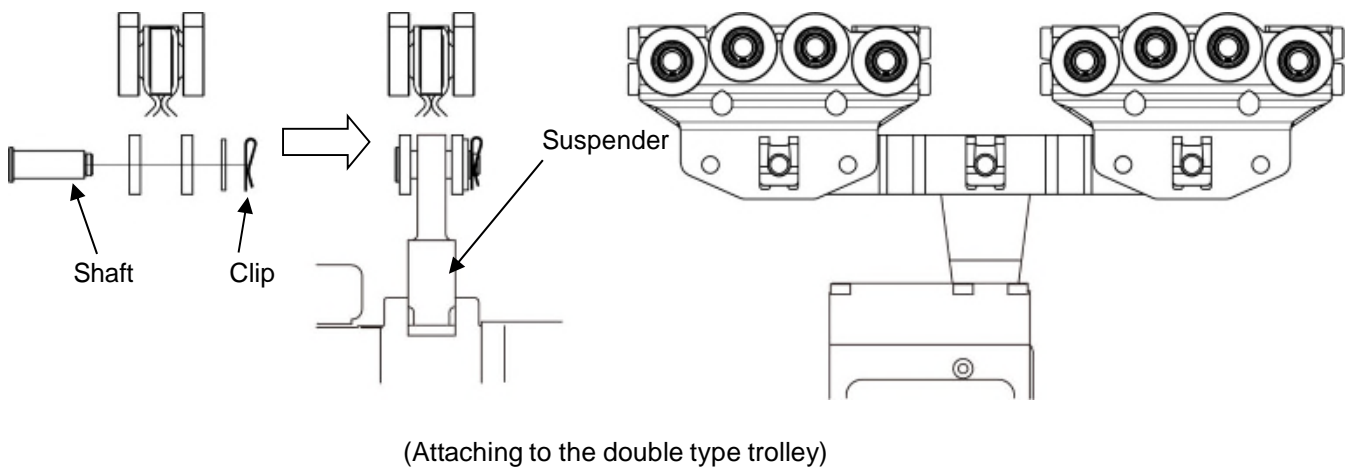
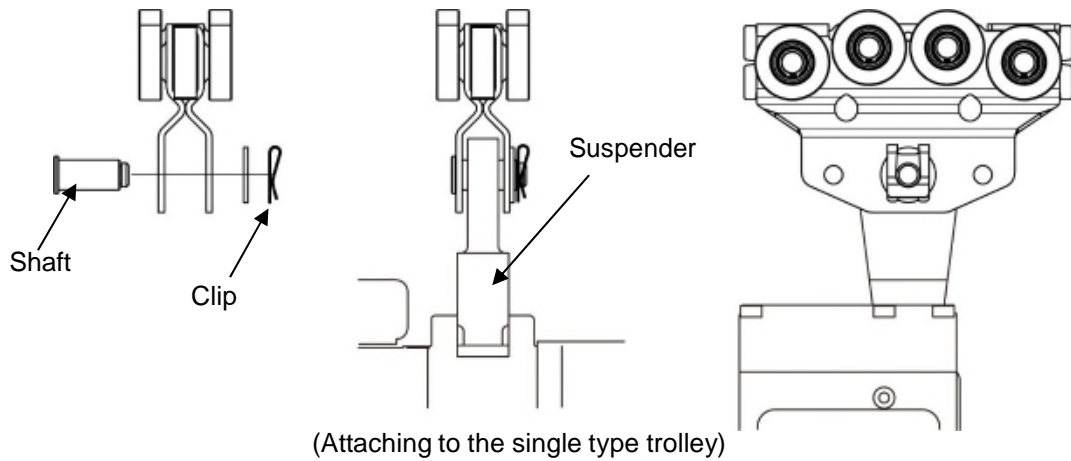
Failure to comply with these instructions may not only fail to exert the successful functions and performance of the air hoist, but hinder safe operations, resulting in a grave accident.

## ■ Combine the Light Crane System (PRO System)

When using the air hoist as a Light crane system, see Page 28 as with the manual trolley to attach an exclusive suspender to the air hoist body and combine with the trolley in the following procedure.

Remove a clip from the trolley and pull out a shaft from the trolley.

Insert the suspender of the air hoist from below, put through the shaft and secure with the clip.



### ⚠ CAUTION



Mandatory

Make sure the clip of the light crane trolley is properly secured.  
(The shaft must be inserted all the way through the clip.)

Failure to comply with this instruction may cause the pin to come off, resulting in a serious accident such as a fall of the suspended load.

## ⚠ CAUTION



Mandatory

Be sure to close the lever and secure the pin with the clip of the Light crane trolley.

Failure to comply with this instruction may cause the pin to come off, resulting in a serious accident such as a fall of the suspended load.

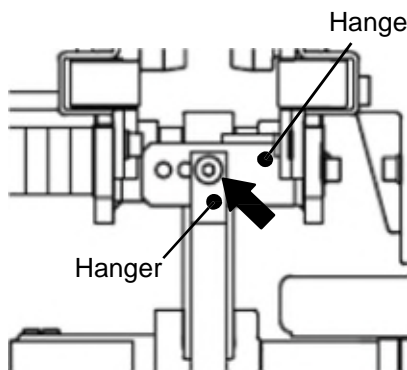
## ■ Combining with the Trolley and Adjusting the Applicable Rail Width

### ■ Air trolley type

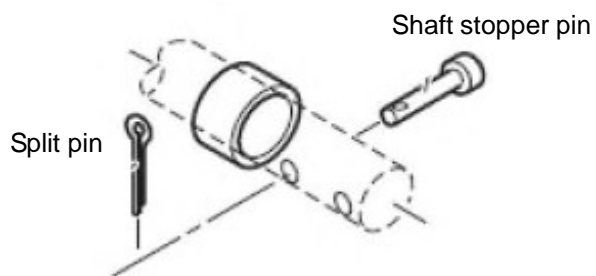
The air trolley has been combined with the air hoist body at the time of shipment. Unless otherwise specified by the customer, it has been adjusted so that it will be mounted to the narrowest-width rail among applicable rail widths for each model.

When the service rail width differs from the adjusted rail width, it is necessary to disassemble the trolley in the following procedure and adjust the side plate distance of the trolley again. Reassemble the trolley in the following procedure.

- (1) Remove a hanger bolt (M8) to separate a hanger from a hanger base.

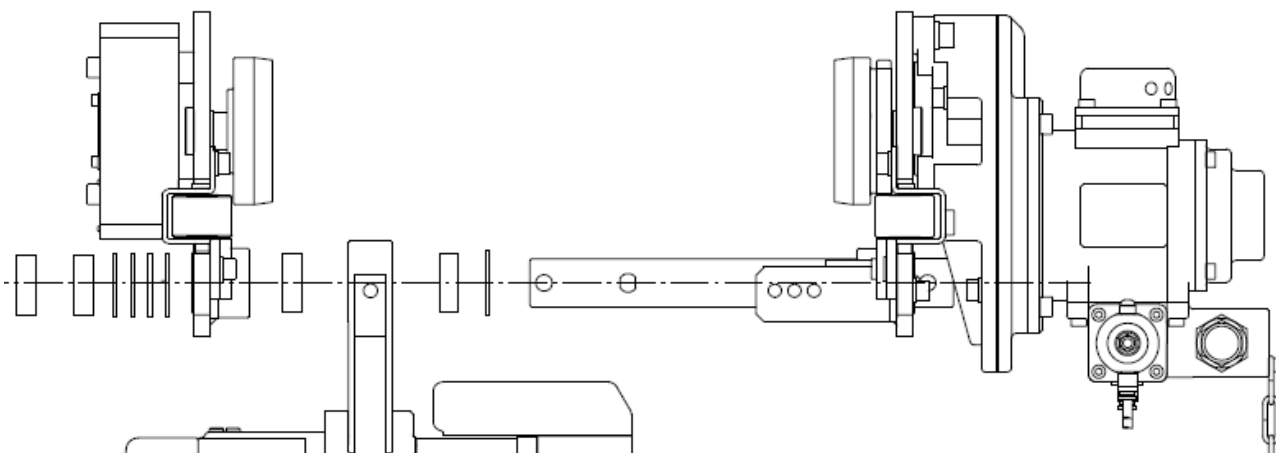


(Removing the hanger bolt)



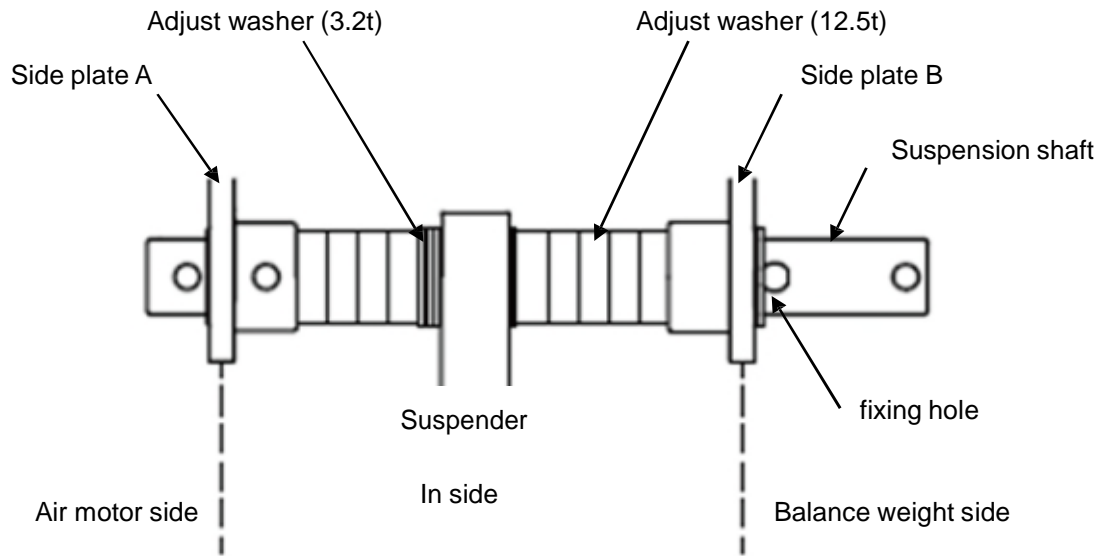
(Removing the shaft stopper pin)

- (2) Remove a split pin from the shaft stopper pin and remove the latter.
- (3) Open the side plate of the trolley to remove an adjust washer. When this is done, care should be taken not to disconnect the air supply hose connecting between the air hoist body and the trolley.



(Removing the adjust washer)

(4) Seeing the following table, replace two kinds of adjust washers according to the service rail width.



(Unit:piece)

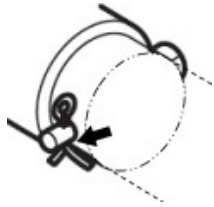
Capacity	Rail flange width		Adjust washer (12.5t)	Adjust washer (3.2t)	Adjust washer (3.2t)	djust washer (12.5t)	Adjust washer (12.5t)	Adjust washer (3.2t)
	(inch)	(mm)						
490kg	2-5/16	58	0	3	0	0	5	5
	2-1/2,2-5/8	64,66	0	2	3	0	5	3
	2-7/8,2-15/16	73,74	0	4	4	0	5	0
	3	75,76	1	1	0	1	3	7
	3-1/4	82	1	1	2	1	3	5
	3-9/16	90,91	1	2	3	1	3	3
	3-7/8	98	2		0	2	1	8
	3-15/16	100	2	1	0	2	1	7
	4	102	2	1	0	2	1	7
	4-3/16	106	2	1	1	2	1	6
	4-5/16	110	2	2	2	2	1	4
	4-7/16	113	2	2	3	2	1	3
	4-11/16,4-3/4	119	2	3	4	2	1	1
	4-15/16	125	2	4	4	2	1	0
	5	127	2	4	1	3	0	3
	5-3/16	131	2	3	3	3	0	2
5-5/16	135	2	4	3	3	0	1	
5-3/8	137	2	4	4	3	0	0	

- (5) Insert the required number of adjust washers onto the suspension shaft inside the side plate. Close the side plate and insert the remaining adjust washers onto the suspension shaft end on the balance weight side.
- (6) Insert the shaft stopper pin into a shaft fixing hole and fix with the split pin.

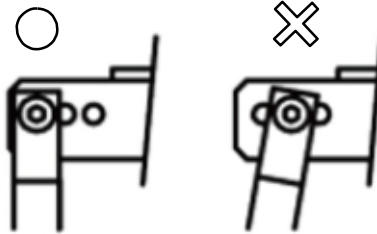
Using the new split pin, open their end properly so that it will not come off. (End angle  $70^\circ$  or more)

- (7) Finally, fix the hanger to the hanger base with the hanger bolt.

When this is done, fix the hanger as vertically as possible at one of three hole positions on the hanger base.



(Fixing with the split pin)



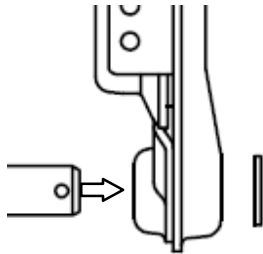
(Attaching the hanger)

## Manual trolley type

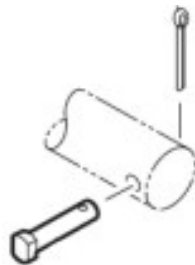
The manual trolley is packed and delivered separately from the air hoist body.

When combining the air hoist with the manual trolley for use, it is necessary to combine the hoist body with the trolley and adjust the frame distance of the trolley according to the service rail width. Assemble in the following procedure.

- (1) Insert a suspension shaft from inside the frame G or S and insert a spacer from the end of the suspension shaft.



(Inserting the suspension shaft)



(Inserting the shaft stopper pin)

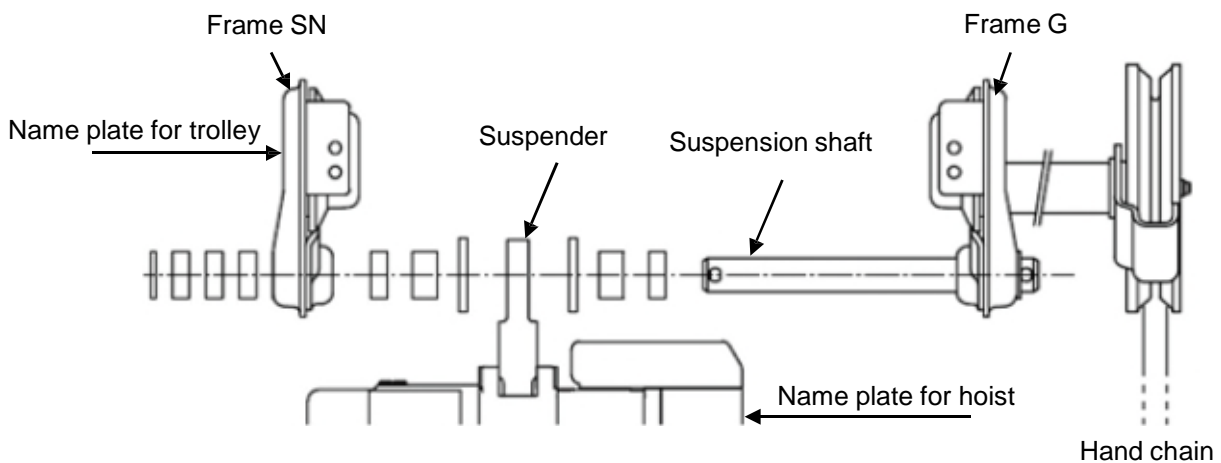


(Fixing with the split pin)

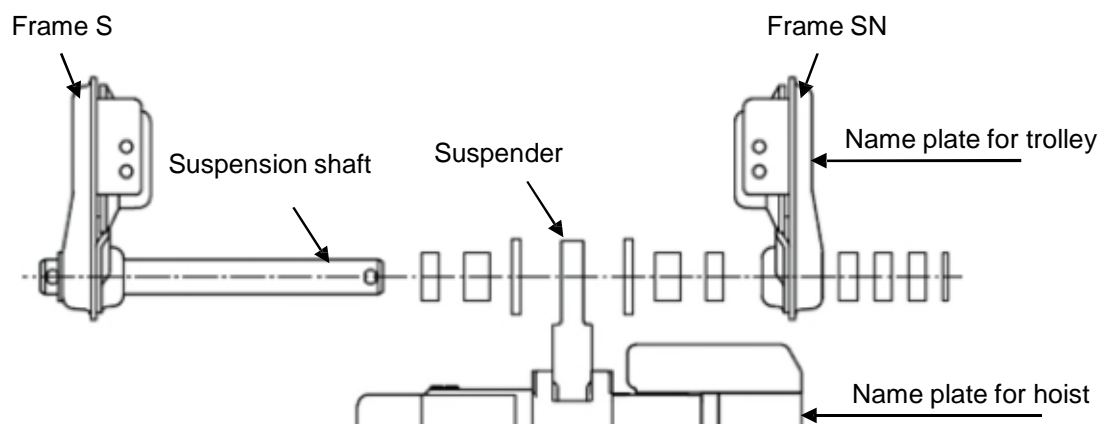
- (2) Insert the shaft stopper pin into a hole in the end of the suspension shaft and fix with the split pin.

Using the new split pin, open their end properly so that it will not come off. (End angle 70° or more)

- (3) Paying attention to the positional relationship between the nameplates of the air hoist body and trolley, check the trolley assembly direction.



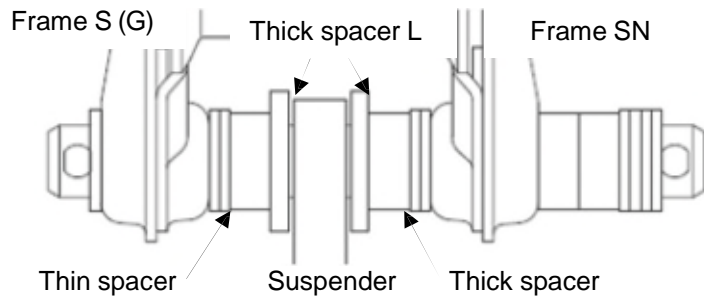
(Combination direction of the TSG geared trolley and the air hoist)



(Combination direction of the TSP plain trolley and the air hoist)

- (4) According to the following table, check the number and arrangement of different collars suitable to the rail width and insert the required number of them onto the suspension shaft.





(Unit:piece)

Capacity	Trolley	Rail width		Thin spacer	Thin spacer	Thick spacer	Thick spacer L	Thick spacer L	Thick spacer	Thin spacer	Thin spacer	Thick spacer	Thin spacer	Thin spacer *Note	
		(inch)	(mm)												
250kg 490kg	TSP	2	50	1	3	0	1	1	0	2	4	4	1	1	
		2-5/16	58	1	4	0	1	1	0	3	2	4	1	1	
		2-1/2,2-5/8	64,66	1	1	1	1	1	1	0	8	2	1	1	
		2-7/8,2-15/16	73,74	1	2	1	1	1	1	1	6	2	1	1	
		3	75,76	1	2	1	1	1	1	2	5	2	1	1	
		3-1/4	82	1	3	1	1	1	1	3	3	2	1	1	
		3-9/16	90,91	1	1	2	1	1	2	0	8	0	1	1	
		3-7/8	98	1	2	2	1	1	2	1	6	0	1	1	
		3-15/16	100	1	2	2	1	1	2	2	5	0	1	1	
		4	102	1	3	2	1	1	2	2	4	0	1	1	
	TSG	2-5/16	58	1	3	0	1	1	0	3	2	6	1	1	
		2-1/2,2-5/8	64,66	1	0	1	1	1	1	0	8	4	1	1	
		2-7/8,2-15/16	73,74	1	1	1	1	1	1	1	6	4	1	1	
		3	75,76	1	2	1	1	1	1	1	5	4	1	1	
		3-1/4	82	1	3	1	1	1	1	2	3	4	1	1	
		3-9/16	90,91	1	0	2	1	1	2	0	8	2	1	1	
		3-7/8	98	1	1	2	1	1	2	1	6	2	1	1	
		3-15/16	100	1	2	2	1	1	2	1	5	2	1	1	
		4	102	1	2	2	1	1	2	2	4	2	1	1	
		4-3/16	106	1	3	2	1	1	2	2	3	2	1	1	
980kg	TSP	2-5/16	58	1	3	0	1	1	0	3	2	6	1	1	
		2-1/2,2-5/8	64,66	1	0	1	1	1	1	0	8	4	1	1	
		2-7/8,2-15/16	73,74	1	1	1	1	1	1	1	6	4	1	1	
		3	75,76	1	2	1	1	1	1	1	5	4	1	1	
		3-1/4	82	1	3	1	1	1	1	2	3	4	1	1	
		3-9/16	90,91	1	0	2	1	1	2	0	8	2	1	1	
		3-7/8	98	1	1	2	1	1	2	1	6	2	1	1	
		3-15/16	100	1	2	2	1	1	2	1	5	2	1	1	
		4	102	1	2	2	1	1	2	2	4	2	1	1	
		4-3/16	106	1	3	2	1	1	2	2	3	2	1	1	
	TSG	4-5/16	110	1	3	2	1	1	2	3	2	2	1	1	
		4-7/16	113	1	4	2	1	1	2	3	1	2	1	1	
		4-11/16,4-3/4	119,120	1	1	3	1	1	3	0	7	0	1	1	
		4-15/16	125	1	2	3	1	1	3	1	5	0	1	1	
		5	127	1	2	3	1	1	3	2	4	0	1	1	
		2t	TSP	3-1/4	82	1	2	0	-	0	2	3	6	1	1
		3-9/16		90,91	1	4	0	-	0	3	0	6	4	1	1
		3-7/8		98	1	1	1	-	1	0	6	4	1	1	
		3-15/16		100	1	1	1	-	1	1	5	4	1	1	
		4		102	1	2	1	-	1	1	4	4	1	1	
4-3/16	106	1		2	1	-	1	2	3	4	1	1			
4-5/16	110	1		3	1	-	1	2	2	4	1	1			
4-7/16	113	1		3	1	-	1	3	3	1	4	1	1		
4-11/16,4-3/4	119,120	1		0	2	-	2	0	7	2	1	1			
4-15/16	125	1		1	2	-	2	1	5	2	1	1			
TSG	5	127	1	2	2	-	2	1	4	2	1	1			
	5-3/16	131	1	2	2	-	2	2	3	2	1	1			
	5-5/16	135	1	3	2	-	2	2	2	2	1	1			
	5-3/8	137	1	3	2	-	2	3	1	2	1	1			
	5-5/8	143	1	0	3	-	3	0	7	0	1	1			
	5-7/8,5-15/16	149,150	1	1	3	-	3	1	5	0	1	1			
	6	153	1	2	3	-	3	1	4	0	1	1			

Note) Arrange the spacers outside (right side) for the I-beam and inside (between the frame SN and collar) for the H-beam.

(5) Close the trolley frame, insert the remaining collars onto the suspension shaft, insert the shaft stopper pin into the end of the suspension shaft, and fix with the split pin. (See Step (1).)

## ■ Setting the Load Limiter

When the suspended load exceeding the rated load is lifted by mistake, the air hoist is provided with a load limiter designed to automatically stop lifting operation and inform of an overload. (Except some models)

When an overload is lifted, this load limiter is activated by sensing a pressure increase inside the air motor through its valve and finally stops lifting.

At the time of shipment, the load limiter has been set to be activated within 125% of the rated load at the air pressure of 0.6 MPa.

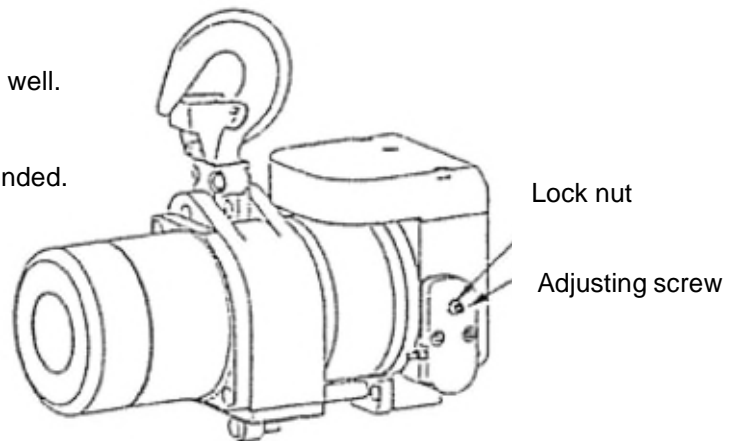
If there is a difference between your actual service air pressure and the default pressure (0.6 MPa), there may occur troubles such as “cannot lift the rated load”, “cannot activate the load limiter even under overload” because of non-conformity between the default pressure sensing point of the load limiter’s valve and the actual pressure sensing point. Accordingly, it is necessary to readjust the load limiter at actual service air pressure.

The following describes a readjustment procedure.

### ■ Readjustment method

Check a setting flow chart on the following page as well.

- (1) Prepare the rated load.
- (2) Set the service air pressure; 0.6 MPa recommended.
- (3) Loosen a lock nut.



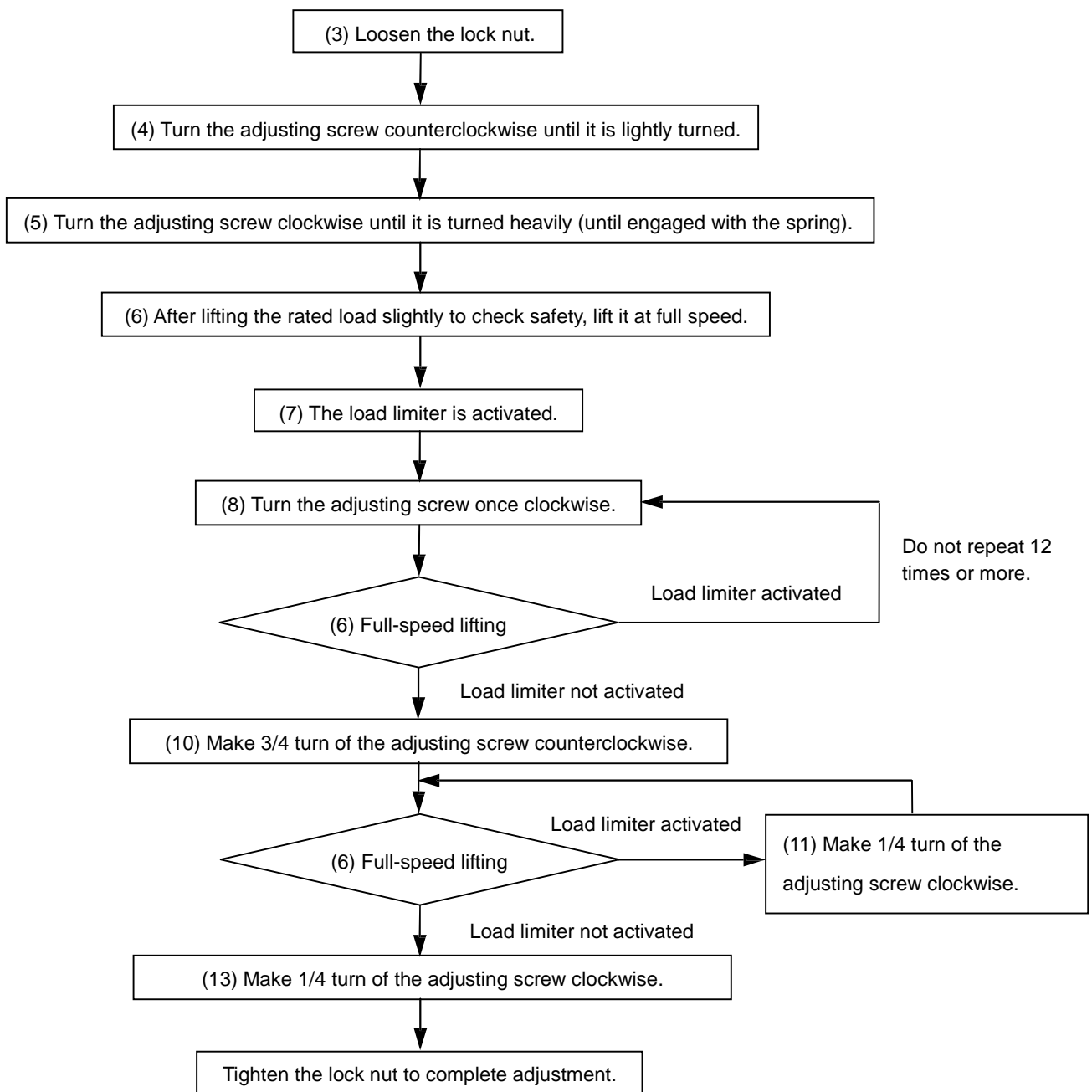
- (4) Turn an adjusting screw counterclockwise until it is lightly turned. An internal spring is now disengaged from the adjusting screw.
- (5) Using your fingers, turn the adjusting screw clockwise until it is turned slightly heavily. The adjusting screw is now engaged with the internal spring.
- (6) Lift the rated load slightly to check safety. Next, lift it at full speed.
- (7) When this is done, the load limiter is activated to stop lifting automatically.
- (8) Turn the adjusting screw once clockwise.
- (9) Repeat Steps (6) and (8) until the load limiter is not activated any more.
- (10) Once the load limiter is not activated (not automatically stopping lifting operation) any more by Step (9), make 3/4 turn of the adjusting screw counterclockwise and repeat Step (6).
- (11) If the load limiter is activated as a result of Step (10), make 1/4 turn of the adjusting screw clockwise and repeat Step (6). If it is not activated, proceed to Step (13).
- (12) Repeat Step (11) until the load limiter is not activated any more.
- (13) Once the non-activating point of the load limiter is found, make further 1/4 turn of the adjusting screw from there clockwise and tighten the lock nut to finish adjustment.

**\* After tightening, it is recommended to mark the nut so that you can see whether or not it has been loosened at the time of regular inspection.**

## ■ Disabling the setting

When lifting the suspended load equivalent to 125% of the rated load in the completion inspection, and so on, loosen the lock nut as instructed in Step (3) in the state that the load limiter has been set to be properly activated within 125% of the rated load, turn the adjusting screw 3 times clockwise and tighten the lock nut. This way, activation of the load limiter can be disabled. After completing the inspection and test, however, be sure to loosen the lock nut and turn the adjusting screw 3 times counterclockwise in the reverse order, and then, tighten the lock nut.

### Load Limiter Setting Flow Chart



## CAUTION



Mandatory

Since the operation load of the load limiter varies by the air pressure that you use, adjust the load limiter for the air pressure that you use.

The load limiter may not be operated under the low speed operation.

Adjust the load limiter for the speed that you operate.

Failure to comply with these instructions may not only fail to maintain the successful functions and performance of the air hoist, but result in a grave accident such as a fall of the suspended load.

## ■ Installing the Product

### WARNING



Mandatory

Installation of the air hoist includes high-place work. Wear a safety belt and a helmet.

Before starting installation, secure stable foothold.

Failure to comply with this instruction may result in an accident which affects physical health.

### WARNING



Mandatory

Installation (uninstallation) should be implemented by a professional contractor or personnel having expertise.

Install (uninstall) the air hoist properly according to the manual.

Once installation is completed, proceed to "Checking after Installation" (Page 40).

Failure to comply with these instructions may not only fail to maintain the successful functions and performance of the air hoist, but result in a grave accident such as a fall of the suspended load.

### WARNING



Mandatory

Attach stoppers to both ends of the travel rail for the trolley

Make sure that the structure is strong enough to install the air hoist or the trolley.

Install the air hoist to the structure where you can suspend a load equivalent to 125% of the rated load and operate without hindrance.

Failure to comply with these instructions may not only fail to maintain the successful functions and performance of the air hoist, but result in a grave accident such as a fall of the suspended load.

### WARNING



Prohibited

Do not install the air hoist in an outdoor place always exposed to rain and water splash or in a high-humidity place.

Do not install the air hoist in the moving area of another trolley or other mobile device (facility).

Do not operate the air hoist while its outer shell structural portion (body) is interfering with other object or being fixed.

Do not combine the air hoist with your traversing equipment without using our trolley.

Failure to comply with these instructions may not only fail to exert the successful functions and performance of the air hoist, but hinder safe operations, resulting in a grave accident.

## ■ Installing the hook suspended type (Single unit of hoist)

- Installation method and checking the installation site

### ⚠ WARNING



Mandatory

When using the hook suspended type (single unit of hoist), hook the air hoist properly until the hook latch of the top hook is firmly closed.

Install the air hoist in such a manner that the top hook and air hoist body can move freely. (Do not operate the air hoist in manner of restraining the top hook and air hoist body.)

Do not install the air hoist upside down.

Failure to comply with these instructions may lead to a grave accident such as death or serious injury.

## ■ Installing the trolley type

### ⚠ CAUTION



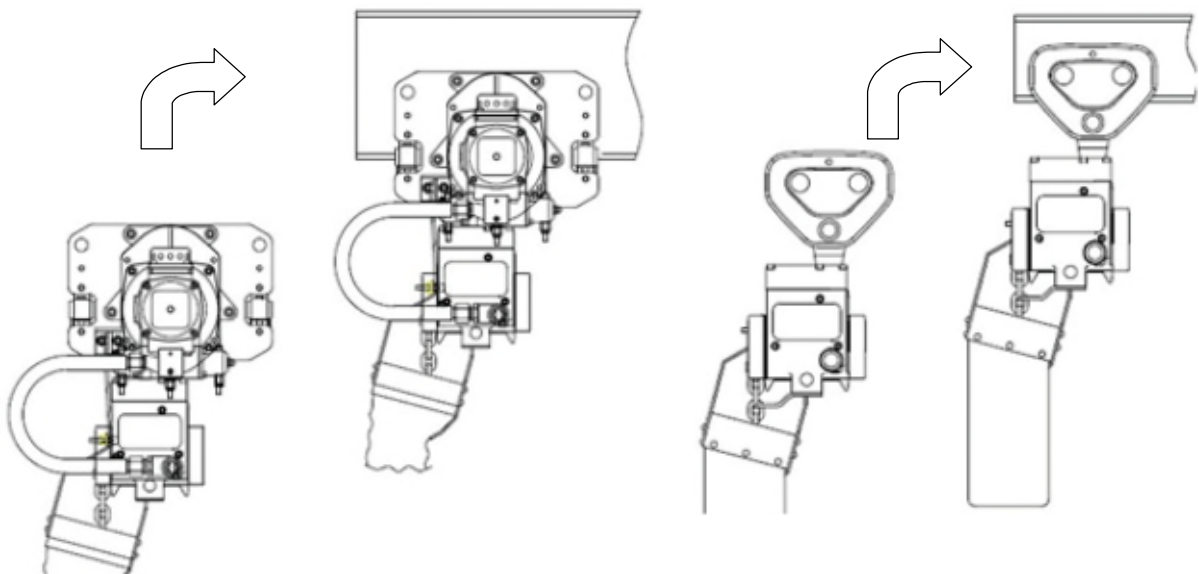
Mandatory

During installation, support the air hoist and trolley firmly so that they will not fall or tilt.

Failure to comply with this instruction may cause the product to fall, resulting in damage on properties or an accident having an effect on the health.

- Overhead installation by inserting from the end of the traversing rail

- (1) Check whether the frame distance of the trolley conforms to the applicable rail.
- (2) Check that the rail is horizontal.
- (3) Install the trolley from the end of the rail, with the air hoist combined.



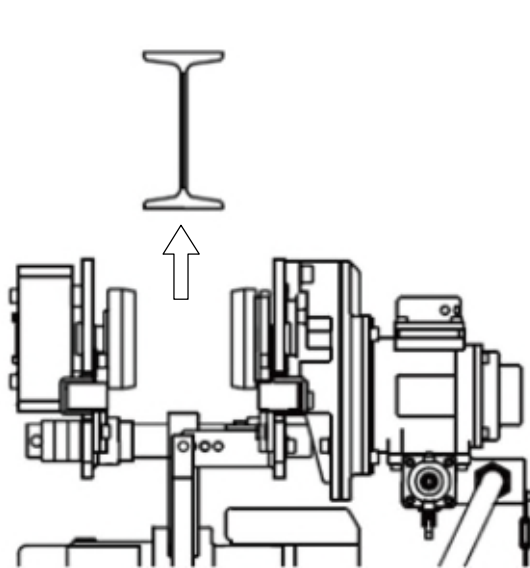
■ Overhead installation from below the rail by opening the trolley frame

(In the case of the Airl trolley type)

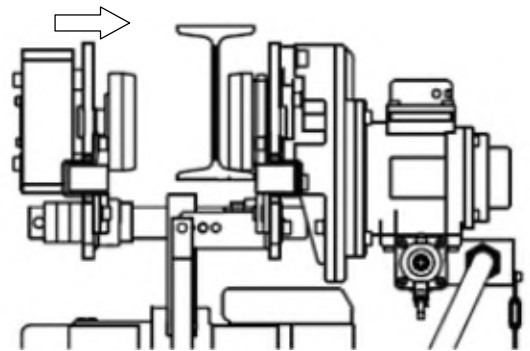
- (1) Open the trolley frame and insert from below the rail.

When this is done, support the air hoist to prevent the hoist body from falling and the trolley from tilting.

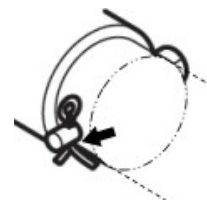
- (2) Place one-side wheel on the rail flange and close the opposite frame.
- (3) Put back the collars to their initial positions, insert a shaft stopper pin and fix with a split pin.



(Insert from below the rail)



(One-side wheel is on the rail flange)



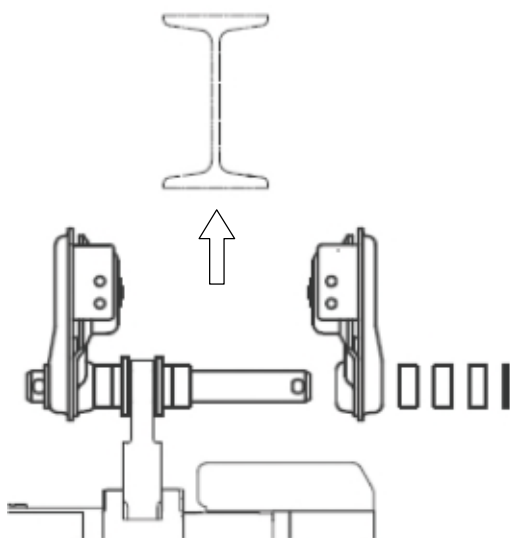
(Fix with a split pin)

(In the case of the manual trolley type)

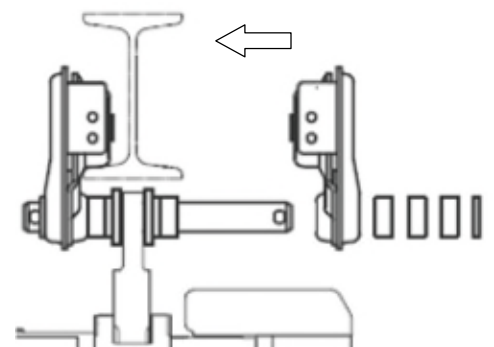
- (1) Open the trolley frame and insert from below the rail.

When this is done, support the air hoist to prevent the hoist body from falling and the trolley from tilting.

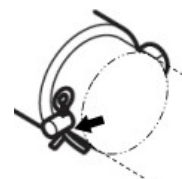
- (2) Place one-side wheel on the rail flange and close the opposite frame.
- (3) Put back the collars to their initial positions, insert a shaft stopper pin and fix with a split pin.



(Insert from below the rail)



(One-side wheel is on the rail flange)



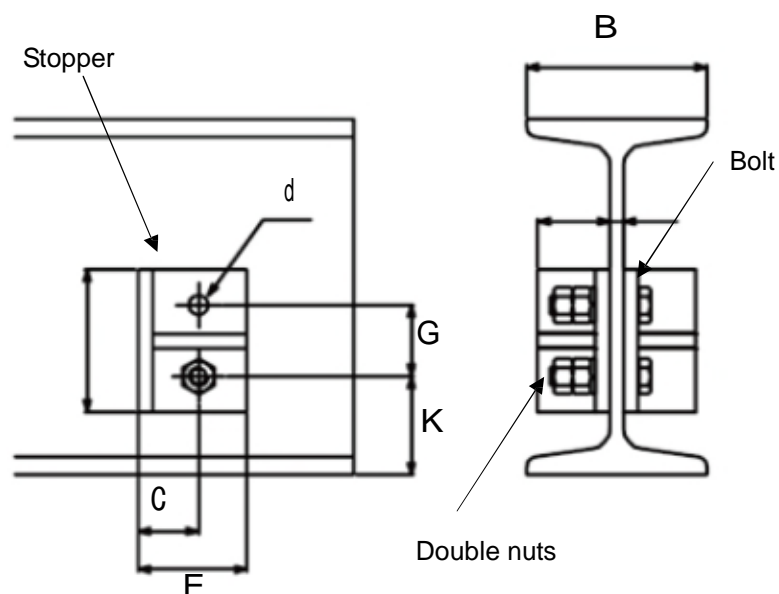
(Fix with a split pin)

## ■ Attaching the traverse stopper

### ■ In the case of the Air trolley type

Be sure to mount the stopper at the both ends of the rail to prevent drop.

When the customer wants to make the stopper by oneself, refer to the following figures.



Code	TCRM04PS		
Rail width	75	100	125
Material dimensions	L-50x50x6	L-50x50x6	L-65x65x8
H	70	70	70
E	50	50	65
F	30	42	54
G	40	40	40
C	25	25	35
K	36	38	46
d	14	14	14
Bolt size	M12x45x45	M12x45x45	M12x50x50

### ■ In the case of the manual trolley type

When using the air hoist in combination with the manual trolley, see the instruction manual for the manual trolley.

## ■ Routing the air supply hose

The product does not come with an air supply hose and hanger. Consult us when you want to use them.

## ■ Checking after Installation

Wrong assembly or installation may result in a grave accident such as death due to a hoist trouble or a fall of the suspended load. In order to avoid such a danger, check the following after installing the product.

### ■ Check items

- Check whether or not bolts, nuts, snap pins and split pins are missing and properly tightened and assembled.
- Check whether or not a pendant wire has been reliably connected, and whether or not it receives a pendant pull force so as not to apply an excessive force to the air hose when the pendant is pulled.
- Check whether or not the air supply hose has been reliably secured and supported so that no excessive force is applied.
- Check whether or not the service air pressure has been adjusted to the specified value (recommended value: 0.6 MPa).

<When using the air hoist in combination with the trolley>

- Check whether or not the air hoist is combined with exclusive fittings and the hoist body faces in the proper direction.
- Check whether or not adjustment washers, collars and spacers have been properly assembled, the trolley is free from tilt, and there are appropriate clearances among the traverse rail, trolley and side rollers (wheel flanges of the manual trolley).
- Check whether or not deviation prevention stoppers have been reliably attached to the traverse rail for the trolley.
- Check whether or not the traverse rail for the trolley is horizontal, free from damage, deformation and adhesion of foreign substances and oil, and unpainted (bare metal surface).

### ■ Operation check

After installation, check the following items.

For the single unit air hoist

Check the items listed in "Air pressure and functions" on Page 55

For the air trolley

Check the items listed in "Power source and functions of the air trolley" on Page 56

For the manual trolley

Check the items listed in "Functions of the manual trolley" on Page 56



# Operation

## WARNING



Mandatory

To use the air hoist, observe its product specifications and operational environment. Do not use the air hoist to lift, support or move a person.

If the air hoist is used beyond the limits of its product specifications and operational environment, it may not only fail to exert its successful functions and performance, but result in a grave accident.

## WARNING



Prohibited

Do not use the load chain which has been considerably elongated, abraded or deformed beyond the service limit.

Do not cut off, add or weld the load chain.

Do not use in an environment where the load chain is exposed to sparks caused by welding, etc.

Do not bring a welding rod or welding electrode into contact with the load chain.

Do not use the load chain as grounding for welding.

Failure to comply with these instructions may break the chain and result in a grave accident such as death due to a fall of the suspended load.

## WARNING



Prohibited

Do not use the hook which is disengaged from a hook latch or damaged.

Do not use the hook which does not turn smoothly.

Do not use the air hoist, if the air hoist is not reliably braked with no load applied or requires a long stopping distance.

Do not intentionally disable the overwinding prevention device and the load limiter to use the air hoist.

Failure to comply with these instructions may not only fail to exert the successful functions and performance of the air hoist, but hinder safe operations, resulting in a grave accident.

## WARNING



Prohibited

While operating the air hoist, if the chain-down stopper is activated to prevent overwinding, the peripheral parts including the load chain may have been damaged. Be sure to contact our dealer or our office and ask for inspection and repair.

Failure to comply with these instructions may not only fail to exert the successful functions and performance of the air hoist, but hinder safe operations, resulting in a grave accident.

## WARNING



Prohibited

The air hoist becomes hot during or after operation. To touch it, wait for a while after stopping and make sure that the surface temperature has dropped.

Touching the air hoist carelessly may cause burn.

## CAUTION



Mandatory

Conduct daily inspection before using the air hoist.

The maintenance engineer should regularly examine the daily inspection results to check for any abnormality.

When informed of any abnormality or trouble of the air hoist, the maintenance engineer should immediately prohibit its operation, secure safety and ask for its inspection and repair.

Failure to comply with these instructions may not only fail to maintain the successful functions and performance of the air hoist, but result in a grave accident such as a fall of the suspended load.

## CAUTION



Mandatory

Check work details and use the air hoist with sufficient rated load and lift.

Check work details and use the air hoist in a place free from any obstacles, allowing you to look over an operating range.

Operate the air hoist in a place with stable foothold free from danger of falling, tripping, sliding and tumbling.

When starting operation, inform the persons around you to that effect.

When you cannot look over the operating range, locate someone nearby to ensure safe operation.

Do not stay or operate the air hoist right below the suspended load.

Do not leave an operating position with a load suspended or look away from the suspended load.

When the product is permanently installed and repeatedly used for the same kind of work as well, check work details and ensure that the rated load is not exceeded.

Ensure that the nameplate and warning labels affixed to the hoist body are always clearly legible to the workers.

The air hoist is operated to move heavy objects.

Operation without checking safety may result in a grave accident which affects physical health of workers such as death or serious injury.

## CAUTION



Mandatory

Put on clothes which do not obstruct operation.

In order to protect a human body, put on a helmet, mask, safety shoes and gloves according to work details.

When operating or working near the air hoist, put on a protective gear such as ear plugs.

Failure to comply with these instructions may result in an accident which affects physical health.

## NOTE

In order to ensure smooth inspection, test and management of the air hoist, choose the maintenance engineers or persons responsible for hoist handling from among those qualified for hoist operation, and put up their names in an easily visible place to bring it home to the workers.

Expertise and know-how are required for disassembling, reassembling and testing the air hoist.

When conducting maintenance work such as periodic inspection and replacement of parts, contact our office or our dealer.

## ■ Operating the Cord and Pendant

Depending on the air hoist model, there are two types of operating the air hoist, cord type and pendant type. Check your model and the type of operating method to operate the air hoist in a correct manner.

### CAUTION



Prohibited

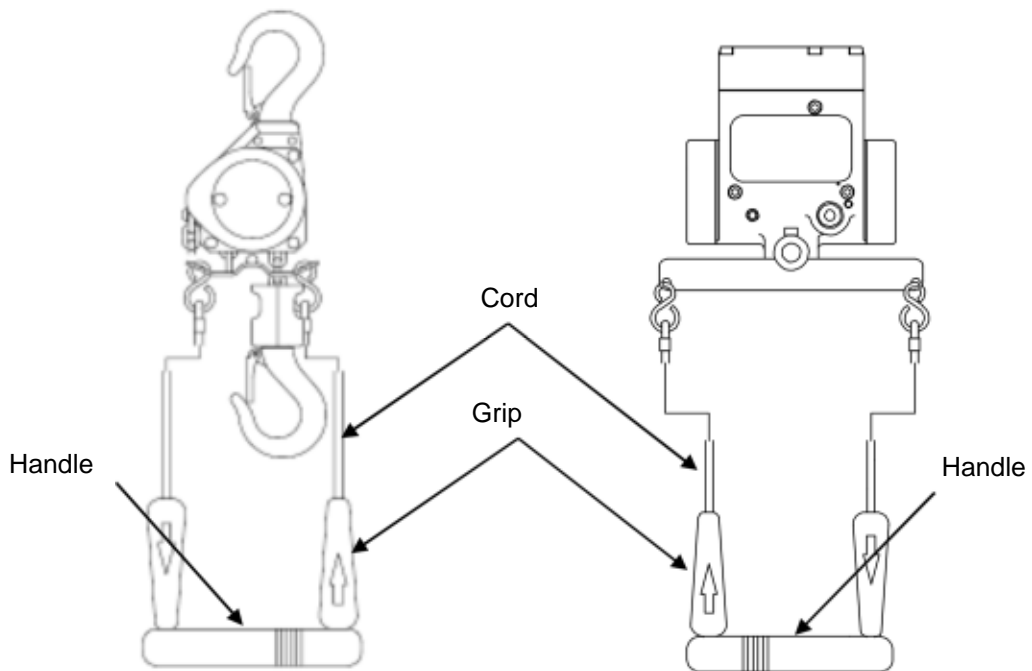
- Do not hang a cord or pendant hose on other object or pull them strongly.
  - Do not tie or bundle the cord or pendant hose in order to adjust the length,
  - Do not operate the cord or pendant hose if they are entangled.
  - Do not operate the cord or pendant hose carelessly if they are improperly attached.
  - Do not use the cord or pendant if the air hoist moves in the direction different from cord or pendant operation or does not move.
  - Do not attach a weight to the cord or tape around a pendant lever to use in the fixed state.
  - Do not pull two cords at the same time or push multiple pendant levers at the same time.
  - Do not use the cord or pendant if the air hoist does not move smoothly in response to cord or pendant operation.
  - Do not use the cord or pendant in an environment where they are splashed with a chemical, solvent and oil.
  - Do not use the emergency stop button to stop the air hoist in regular operation.
- If the air hoist is used in a wrong manner or with abnormality existing, it may not only fail to exert its successful functions and performance, but hinder safe work, resulting in a grave accident,

### NOTE

When releasing the cord or pendant after operation, do not throw them at the structure or other workers.

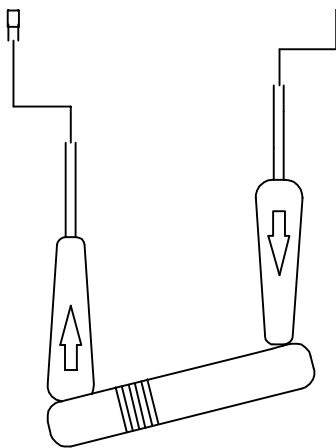
## ■ Cord type

The cord type is provided with two cords in the operating portion. Lifting or lowering operation is performed by pulling one of these cords. The air hoist is halted by releasing the handle (grip).

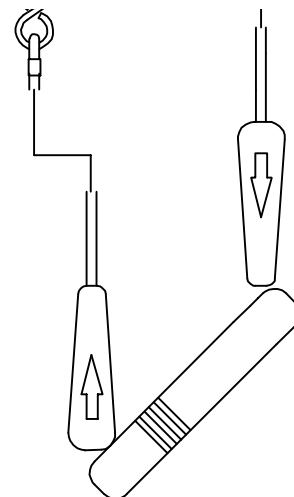


The speed is adjusted by how much you pull the cord.

As illustrated below, the speed is decreased by pulling the cord less and increased by pulling more, allowing stepless speed adjustment.



(Lift: Slow)



(Lift: Fast)

## ■ Pendant type

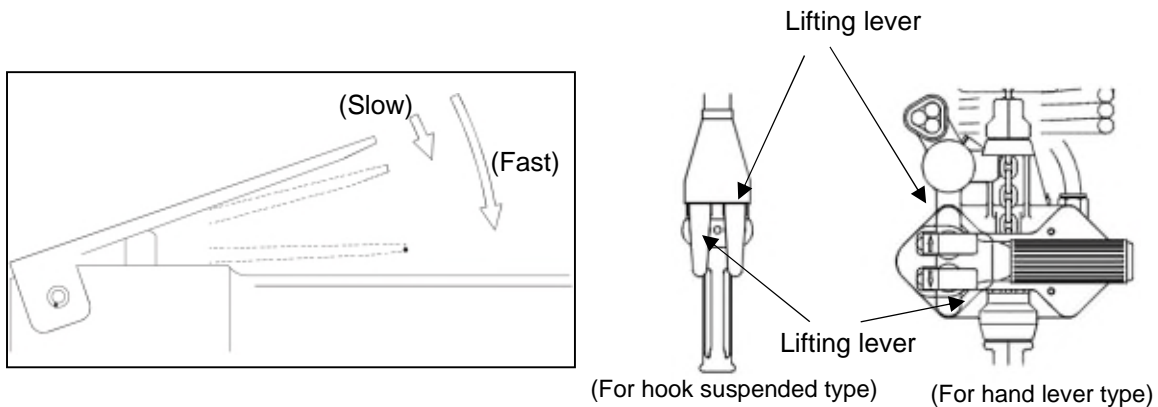
The pendant type allows lifting, lowering or traversing operation by pressing down the lever or push button in the operating portion.

There are the following three configurations, depending on the model.

### ■ For hook suspended type/ For hand lever type



The air hoist is activated by pressing down any lever of the pendant and braked to stop by releasing it. The speed is adjusted by changing the extent of pressing down the lever.


As illustrated below, the speed is decreased by pressing down the lever less and increased by pressing down more, allowing stepless speed adjustment.



## ■ Air- trolley

### Emergency Stop Button

- Press the Emergency Stop Button  deeply when carrying out an emergency stop. The button is locked at the pressed end.
- Turn the Emergency Stop Button  clockwise to cancel the lock. Press-locked button returns to the original position.

\* When the air hoist is not used, press the Emergency Stop Button  deeply to the end.

### Trolley speed adjustment knob

You can adjust the trolley speed by turning the knob with a flathead screwdriver.

L: Low speed H: High speed

\*Top speed is 0.333 m/s  
(when air pressure is 0.6 MPa)

Trolley speed





### 4-point pendant (push button)



Pressing down on the push buttons allow stepless speed adjustment of the lifting, lowering, and travel speed.

The more the button is pushed in, the faster the speed becomes.

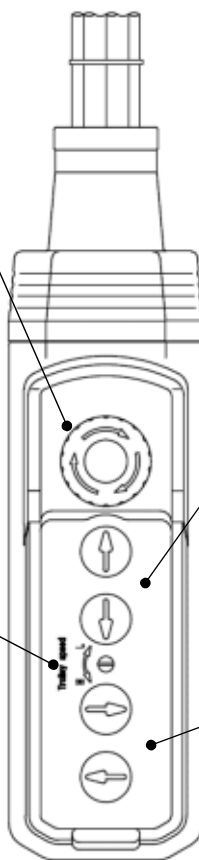
### Lift/Lower Button

- Press  button to lift the load. The air hoist stops when the button is released.
- Press button  to lower the load. The air hoist stops when the button is released.

### Travel Button

- Press  button to move the trolley to the right. The trolley stops when the button is released.
- Press  button to move the trolley to the left. The trolley stops when the button is released.

\*Left and right directions are when viewing from the trolley motor side.



(For Air - trolley)

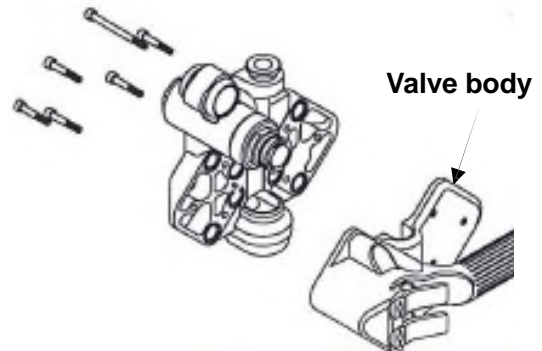
## ■ Changing the Operation Handle (Hand Lever Type)

### ■ Changing the handle direction

The hand lever type (TCRH03MS), which has integrated a hook block and an operating portion, allows you to switch an operation handle from right-handed to left-handed and vice versa in the following procedure.

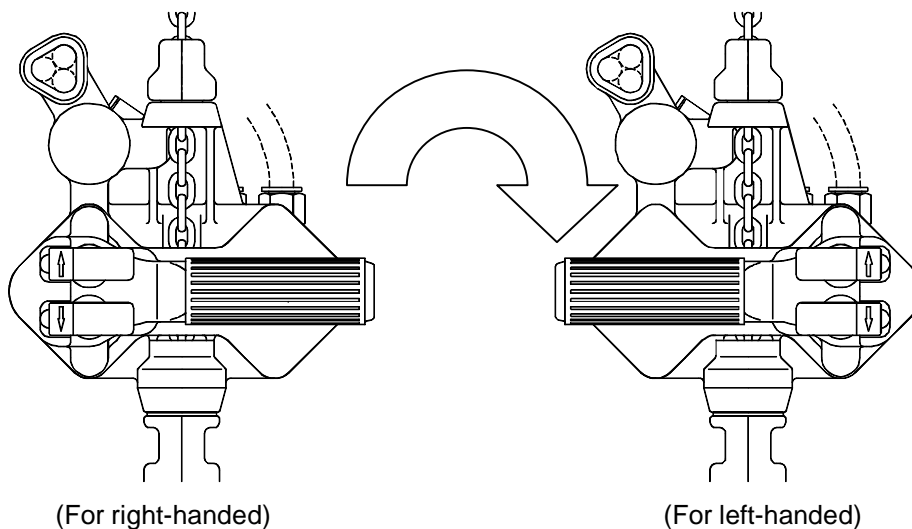
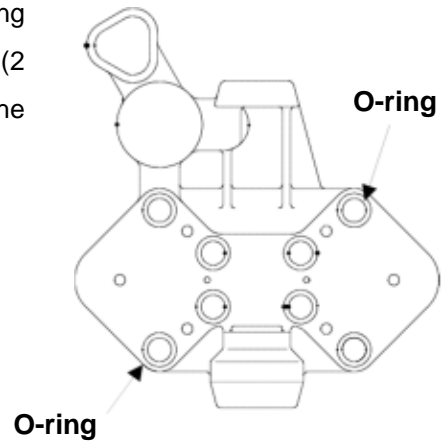
Switching procedure:

- Remove 6 bolts (M5x30x5, M5x60x1) from the back of the operation handle, followed by a valve body with grip.



- Make sure that the O-rings (8 places) on the shield mating surface are fit into the grooves, and that the spring pins (2 places) are not missing. Turn the valve body by 180° to align the spring pins and secure with the 6 bolts.

(Tightening torque: 4 N·m)



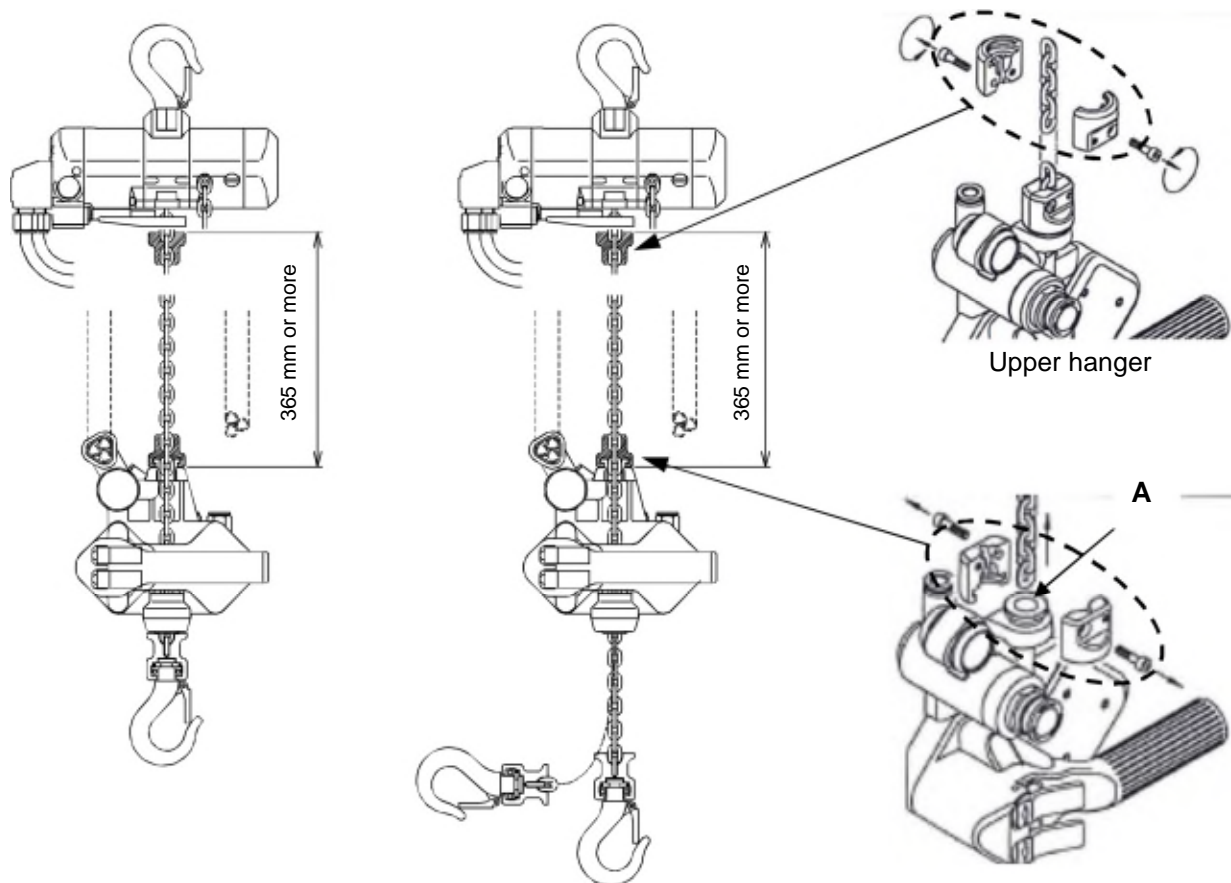
## ■ Changing the handle height

The hand lever type, which has integrated the hook block and the operating portion, can be mounted by moving the operation handle to any position of the chain.

If the operation handle is moved to the lowest position, a bottom hook is secured, allowing you to hook it on a sling and operate near the suspended load while grabbing the operation handle.

By raising the operation handle and moving away from the bottom hook, you can operate the air hoist at a position away from the suspended load. Also, the bottom hook is freed, allowing easy slinging suitable to the shape of the suspended load.

Change the handle height in the following procedure according to your purpose of use.



Operation handle at lowest position

Operation handle at middle position

Lower hanger

Changing procedure:

- Remove socket bolts from the lower hanger and detach the hanger from the chain.
- Move the operation handle to an optional position and secure the detached hanger to the chain with the socket bolts. (Tightening torque  $T = 6 \text{ N} \cdot \text{m}$ )
- If Part A (rotary joint) in the figure above is not applied with grease (NLGI No. 2 or equivalent), apply it.
- Remove socket head bolts from the upper hanger. Secure the upper hanger to the chain with the socket bolts so that the distance between the lower and upper hangers will be 365 mm or more as illustrated above. (Tightening torque  $T = 6 \text{ N} \cdot \text{m}$ )

Attach the upper hanger to a correct position because it functions as a lifting limit for protecting a coil hose against damage by overlifting.

## ■ Precautions for Operation

### ■ At the time of slinging

#### WARNING



Prohibited

- Do not hang the suspended load on the hook end or the hook latch.
- Do not lift the suspended load with the hook latch left open.
- Do not bind the suspended load with load chain directly.
- Do not operate the load chain while it is in contact with any sharp edges.
- Do not apply a load to or lift the suspended load with the load chain on the no-load side.

Failure to comply with these instructions may result in a grave accident due to a hoist trouble or a fall of the suspended load.

#### CAUTION



Mandatory

- Use slinging tools suitable to the weight and shape of the suspended load.
- Sling the suspended load so as to equally apply a load to the slinging tools, and lift it in a stable manner.
- Attach the slinging tools reliably so that the suspended load will not fall or tilt.
- Do not dare to lift the structure or any other object supposed to be difficult to lift.
- Do not use the slinging tools to reverse the suspended load. Use a special-purpose reversing device.

Improper slinging not only hinders efficient work, but results in a grave accident due to a fall of the suspended load.

### ■ At the time of lifting/lowering

#### WARNING



Prohibited

- Do not lift more than the capacity.
- Do not operate the air hoist exceeding the lifting height.
- Do not stop the air hoist with the overwinding prevention device.
- Without checking the weight of the suspended load, do not use the load limiter to check the weight.

Failure to comply with these instructions may not only cause a hoist trouble, but result in a grave accident due to a fall of the suspended load.

- 
- Do not use the air hoist in such a manner that when the suspended load is lifted, the air hoist will serve as a supporting point and apply an external force to the outer shell structural portion (body) of the hoist.
  - Do not swing the suspended load.
  - Do not lift the suspended load at a stretch with the load chain or sling slackened.
  - Do not operate the air hoist with the load chain entangled.
  - Do not perform abrupt reserving operation (plucking) halfway lifting or lowering operation.
  - Do not perform excessive inching (micromovement).

Wrong operation of the air hoist may not only cause a hoist trouble, but result in a grave accident.



 **WARNING**



Prohibited

Do not put your hand close to the chain inlets (chain separator and chain lever) at the lower part of the air hoist at the time of overlifting or overlowering.

Failure to comply with this instruction may have your finger rolled into the chain inlet or have your hand caught between the chain lever and the hoist body, resulting in bodily injury.

 **CAUTION**



Mandatory

When the load limiter is activated to stop lifting, lower the suspended load immediately and use the air hoist with the sufficient rated load to continue work.

When the overwinding prevention device is activated to stop the air hoist, lower the suspended load immediately, check its position and operate within the non-operating range of the overwinding prevention device.

Failure to comply with these instructions may not only cause a hoist trouble and hinder safe operation, but result in a grave accident.

---

Lift the suspended load directly overhead with respect to the air hoist. (Do not lift a load in an inclined direction.)

When lifting from a cargo deck, etc., do not operate the air hoist as if dropping the suspended load in the slung state.

Do not disassemble, reassemble, weld or cut off the suspended load in the lifted state.

Wrong use may not only cause a hoist trouble and hinder safe operation, but result in a grave accident.

 **CAUTION**



Mandatory

When a lifting magnet or a vacuum suction machine is used to transport the suspended load, transport it as low as possible.

Failure to comply with this instruction may result in a grave accident due to an unexpected fall of the suspended load.



Prohibited

Do not use two or more air hoists to simultaneously lift one suspended load.

Failure to comply with this instruction may result in a grave accident due to an unexpected load shift or fall of the suspended load.

The air hoist adjusts its speed with the operating cord or the pendant. It is not suitable for simultaneously lifting the suspended load at constant speed, using multiple units of them.



Mandatory

In the loaded state, the lowering speed may be 1.5 to 2 times faster than the lifting speed.

During lowering operation, pay attention to the movement and position of the suspended load, and implement low-speed operation to avoid a collision.

Failure to comply with these instructions may cause an unexpected collision, load shift and fall of the suspended load, leading to a serious accident.

## ■ At the time of traversing/traveling

### WARNING



Prohibited

Do not operate the air hoist while standing between the suspended load and the building wall.

The suspended load may sway and catch the operator against the building wall, resulting in a grave accident such as death or serious injury.

With the load suspended, do not operate or move the air hoist while moving backward.

The suspended load may sway, be pushed and fall, resulting in bodily injury.

### CAUTION



Prohibited

Do not put your hand close to a trolley wheel during operation.

The hand may be caught by the trolley wheel, resulting in bodily injury.

Do not allow the suspended load to catch other structure or wiring.

Do not operate the air hoist with the hand chain of the manual trolley left entangled.

Failure to comply with these instructions may not only fail to exert the successful functions and performance of the air hoist, but hinder safe operations, resulting in a grave accident.

## ■ At the occurrence of abnormality/trouble

### WARNING



Mandatory

When the air hoist is damaged or emits abnormal sound or vibrations, stop its use immediately, put up a notice "Out of Order" and contact the maintenance engineer.

When the power to the air hoist is shut off due to a blackout, leave the air hoist immediately, secure ambient safety and contact the maintenance engineer.

If the air hoist is used in a wrong manner or with abnormality existing, it may not only fail to exert its successful functions and performance, but hinder safe operation, resulting in a grave accident.

## ■ After daily work

### CAUTION



Prohibited

Do not finish operating the air hoist or store the air hoist in the overlifting or overlowering state.

Do not suspend operation of the air hoist for a long time or store the air hoist with the power left supplied to it.

If the air hoist requires repair, put up a notice "Out of Order" so that it will not be used by mistake.

To store the air hoist, wipe off dirt and water drops and lubricate the hook neck and the load chain.

To store the components such as the overlifting prevention device, overlowering prevention device and chain container where the load chain passes or is housed, remove dirt, foreign substances and water drops from them in a similar manner.

Failure to comply with these instructions may not only fail to exert the successful functions and performance of the air hoist, but result in a grave accident.

### NOTE

Always clean the cord and the pendant to eliminate dust, sand, oil, rubbish, and so on.

When storing the air hoist for a long period of time, periodic no-load operation is effective to prevent rusting of each part.

When lowering the air hoist down onto the floor, remove the container or prepare sleepers in order to protect it from deformation and damage.

When the air hoist is not used, lift the hook to the position which does not disturb passage of workers and other work.

Decide a storage place beforehand. It is recommended to hang the cord and the pendant on a post, etc.

# Maintenance

## ■ Daily inspection

Daily inspection is mainly conducted by the operator of the air hoist for checking its condition through visual check and no-load operation.

### ⚠ WARNING



Mandatory

Before using the air hoist, conduct daily inspection.  
If an abnormality is found during inspection, turn off the air hoist, put up a notice "Out of Order" and contact the maintenance engineer.

Failure to comply with these instructions may not only fail to maintain the successful functions and performance of the air hoist, but result in a grave accident.

### ⚠ CAUTION



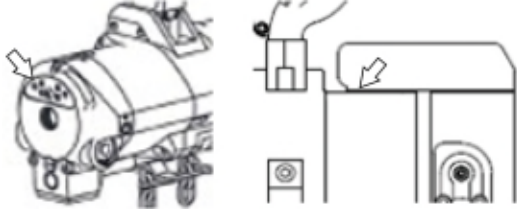
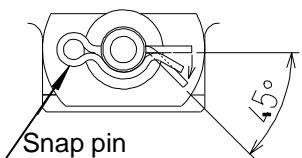
Mandatory

Disassembly/reassembly of the air hoist requires expertise and know-how.  
When maintenance is required such as replacement of parts as a result of daily inspection and regular inspection, contact our dealer or our office.

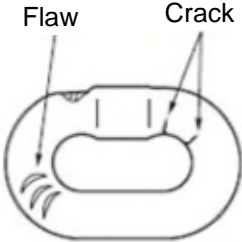
Failure to comply with these instructions may not only fail to maintain the successful functions and performance of the air hoist, but result in a grave accident.

## ■ Hoist body

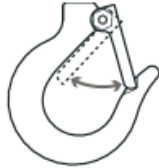


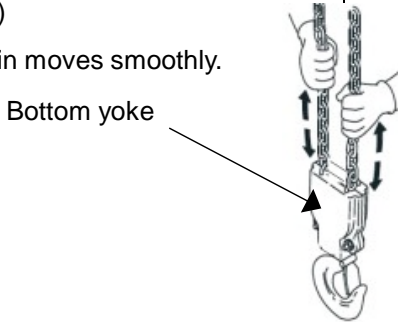
### ■ Appearance

Item	Check method	Criteria	When failed
Nameplates, labels and tags	Check visually.	No peel off. Indication can be seen clearly.	Carry out cleaning or replace with new nameplate, label and tag.
Body and each part	Check visually.	No apparent deformation, damage, flaw and crack	Replace the parts.
Exhaust section and periphery	Check visually.	Should be free from considerable adhesion of oil and clean. 	Clean the exhaust section and periphery.
Bolts, nuts, split pins and snap pins	Check visually.	Should be reliably attached without being loosened or missing. 	Fasten bolts, nuts, split pins and snap pins securely.


■ Load chain

Item	Check method	Criteria	When failed
Pitch	Check visually.	No apparent elongation	Measure the dimension and replace the part if it exceeds the criterion.
Chain diameter	Check visually.	No apparent abrasion	Measure the dimension and replace the part if it exceeds the criterion.
Deformation, flaw and entanglement	Check visually.	<ul style="list-style-type: none"> <li>- No deep notch</li> <li>- No deformation such as twist</li> <li>- No attached sputter</li> <li>- No entanglement</li> <li>- No crack</li> </ul> <div style="text-align: center;">  </div>	Replace the load chain.
Rust and corrosion	Check visually.	No apparent rust and corrosion	Apply the specified lubricant. Apply the specified lubricant.
Twist	Check visually.	No capsized link at bottom hook of double type load chain	Untwist the load chain.
Lubrication	Check visually.	To be oiled adequately	Apply the specified lubricant.
Mark pitch and indication	Check visually.	<ul style="list-style-type: none"> <li>- Should be marked at a correct position.</li> <li>- Correct indication should be marked.</li> </ul>	Replace the load chain.

■ Hook

Item	Check method	Criteria	When failed
Opening of the hook	Check visually.	No apparent opening of the hook.	Measure the dimension and replace the part if it exceeds the criterion.
Abrasion	Check visually.	No apparent abrasion	Measure the dimension and replace the part if it exceeds the criterion.
Deformation, flaw and corrosion	Check visually.	No apparent deformation, flaw and corrosion	Replace the hook.
Hook latch	Check visually and check the movement of the hook latch.	- The hook latch is mounted securely inside the hook opening. - No deformation. The hook latch moves smoothly. 	Replace the hook latch, bolt and nut.
Movement of bottom hook (Rotation)	Check visually and rotate the hook by hand.	Should rotate lightly by 360° to the right and left. 	Replace the damaged part such as the bottom hook.
Hook neck	Check visually.	 <p>The hook neck should be free from a considerable clearance (backlash).</p>	Replace the damaged part such as the bottom hook.
Free chain wheel (In the Bottom yoke)	Operation Move the load chain up and down to check movement of the free chain wheel.	- The free chain wheel rotates smoothly. (If the bearing is broken or the support shaft is deformed, the free chain wheel does not rotate smoothly.) - The chain moves smoothly. 	Replace the damaged parts such as the free chain wheel and the bearing.

■ **Peripheral parts of the body**

Item	Check method	Criteria	When failed
Spring	Check visually.	No apparent shrinkage, twist and deformation 	Replace the spring.
Limit lock Limit washer	Check visually.	No apparent deformation, damage, flaw and crack	Replace the damaged parts.
Upper/lower hanger (TCRH003MS)	Check visually.	No apparent deformation, damage, flaw and crack Hanger locking bolts should be properly tightened to reliably attach the hanger.	Replace the damaged parts. Attach the hanger reliably.
Chain lever	Check visually.	No apparent deformation, damage, flaw and crack	Replace the damaged part.
Air supply hose joint	Check visually.	Should be free from air leak and firmly fixed.	Fix firmly with a hose band.

■ **Cord or pendant**

Item	Check method	Criteria	When failed
Operating portion	Check visually. No-load operation	- No deformation, damage and no loosened screw - The cord and pendant hose joints should be free from twist, looseness and missing. - The cord, lever, and push buttons should be able to operate smoothly. - The emergency stop button should be turned on and off.	Replace the damaged parts. Remove or correct the cause of operational failure.

**■ Air pressure and functions**

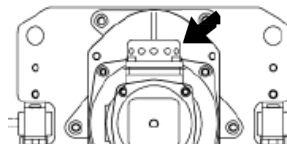
Check the following item with no load.

Item	Check method	Criteria	When failed
Air pressure	Check visually.	The operating air pressure should be 0.4 to 0.6 MPa (recommended pressure: 0.6 MPa).	Adjust to the appropriate pressure.
Lubrication	Check visually.	Lubrication should be implemented by the lubricator (line oiler) at a rate of 10 to 15 drips (0.2 to 0.3 cc) per minute.	With the lubricator, adjust a lubrication rate appropriately.
Operational check	Operate the cord or the pendant.	<ul style="list-style-type: none"> <li>- The load chain can be wound smoothly.</li> <li>- The air hoist should move in the same direction as operated on the cord or pendant (lever and push buttons).</li> <li>- When the operation is stopped, the motor stops immediately.</li> <li>- When the emergency stop button is pressed, all hoist motions stop.</li> <li>- When operating other push button while the emergency stop button is pressed, the hoist does not start operation.</li> <li>- When canceling the emergency stop</li> </ul>	Ask for inspection and repair.
Brake	Operate the cord or the pendant.	- When stopping the operation, the brake is applied immediately and bottom hook shall stop immediately.	Ask for inspection and repair.
Overwinding prevention device	Operate the cord or the pendant to run the air hoist at low speed.	Configuration of parts and routing of the chain should be appropriate for activating the device. The limit lock, bottom hook or chain should push back the chain lever at the lifting limit or the lowering limit to deactivate the device reliably.	Correct configuration of parts and routing of the chain appropriately. If the device is not deactivated reliably, ask for inspection and repair.
Abnormal sound and vibrations	Operate the cord or the pendant to check an operating sound.	No abnormal sound and vibrations	Ask for inspection and repair.

## ■ Air- trolley and manual trolley

### ■ Appearance

Item	Check method	Criteria	When failed
Nameplates, labels and tags	Check visually.	No peel off. Indication can be seen clearly.	Carry out cleaning or replace with new nameplate, label and tag.
Body and each part	Check visually.	No apparent deformation, damage, flaw and crack	Replace the parts.
Exhaust section and periphery	Check visually.	Should be free from adhesion of oil and clean.	Clean the exhaust section and periphery.
Bolts, nuts, split pins and snap pins	Check visually.	Should be reliably attached without being loosened or missing.	Fasten bolts, nuts, split pins and snap pins securely.



### ■ Power source and functions of the air trolley

Check the following item with no load.

Item	Check method	Criteria	When failed
Air pressure	Check visually.	Makes sure that the air pressure of 0.4 to 0.6 MPa has been secured. (Recommended pressure: 0.6 MPa)	Adjust to the appropriate pressure.
Lubrication	Check visually.	Lubrication should be implemented by the lubricator (line oiler) at a rate of 10 to 15 drips (0.2 to 0.3 cc) per minute.	With the lubricator, adjust a lubrication rate appropriately.
Operational check	Operate the pendant.	<ul style="list-style-type: none"> <li>- Should traverse smoothly without meandering and vibrations.</li> <li>- Should operate in the same direction as pendant (lever) operation.</li> <li>- When stopping operation, the motor stops immediately.</li> </ul>	Ask for inspection and repair.
Brake	Operate the pendant.	<ul style="list-style-type: none"> <li>- When stopping the operation, the brake is applied immediately and trolley shall stop immediately.</li> </ul>	Ask for inspection and repair.

### ■ Functions of the manual trolley

Check the following item with no load.

Item	Check method	Criteria	When failed
Operational check	Operate the hand chain to perform traversing.	Should traverse smoothly without meandering and vibrations.	Ask for inspection and repair.



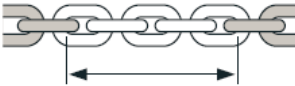
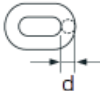
## ■ Frequent inspection

Frequent inspection should be conducted by the maintenance engineer or the person designated by the maintenance engineer, mainly through visual check and measurement. Conduct frequent inspection after checking daily inspection items. When the air hoist has not been used over one month, conduct frequent inspection before using it again.

### ■ Hoist body

#### ■ Load chain

- Check the load chain after removing the stain on the chain.
- Use the needle head caliper (point caliper) to measure the sum of pitches and chain diameter.
- Apply oil on the load chain after inspection.

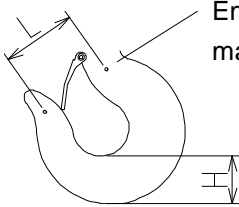

Item	Check method	Criteria	When failed
Pitch	Measure the pitch with point caliper.	The limit value of the following "Sum of pitches of five links" must not be exceeded.  Sum of pitches of five links	Replace the load chain.
Chain diameter	Measure the chain diameter (d) with point caliper.	The limit value of the following "Chain diameter of the load chain" must not be exceeded. 	Replace the load chain.

Capacity	Code		Load chain diameter	Sum of pitches of 5 links (mm)		Load chain diameter d (mm)
	Hook suspended Manual trolley type	Air trolley type		Do not exceed the limit		Do not fall under the limit
				Standard	Limit	Limit
<b>250kg</b>	TCRH03CS	-	4.0	60.5	62.3	3.6
	TCRH03PS	-				
	TCRH03MS	-				
<b>490kg</b>	TCRH04CS	-	6.3	95.5	98.3	5.7
	TCRH04PS	TCRM04PS				
<b>980kg</b>	TCRH09CD	-	7.1	106	109.1	6.4
	TCRH09PD	-				
	TCRH09CS	-				
	TCRH09PS	-				
<b>2t</b>	TCRH20CD	-	7.1	106	109.1	6.4
	TCRH20PD	-				

**<After inspecting the load chain>**

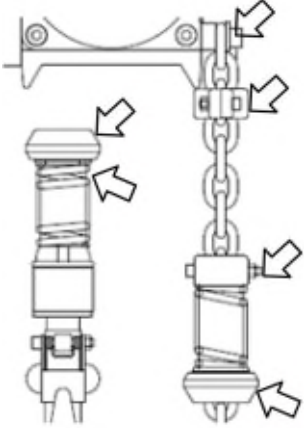
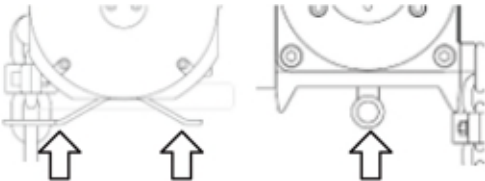
- The use of lubricant has a great effect on wear (service life) of the load chain. Use KITO's original lubricant or equivalent (industrial general-purpose lithium grease, consistency number 0).
- With no load applied to the load chain, lubricate the load sheave, link engaged with the free chain wheel, and linking part of the chain.
- After lubricating, perform lifting and lowering with no load applied to adapt the lubricant to the chain.

**■ Hook**

Item	Check method	Criteria	When failed
Opening and abrasion of the hook	Check visually and measure with vernier caliper.	Should not exceed the following service limit value. The opening dimension L should be less than "L + 2" mm, compared with the dimension of new item. The height H of the hanging part should exceed "H - 2" mm. 	Replace the hook.
Deformation, flaw and corrosion 	Check visually.	<ul style="list-style-type: none"> <li>- No deformation such as bend or twist</li> <li>- No deep cut</li> <li>- No loosened bolt or nut for hook latch, or their fall off</li> <li>- No considerable corrosion</li> <li>- No attachment of foreign matter such as sputter</li> </ul>	Replace the hook.

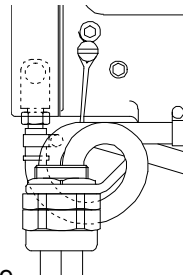
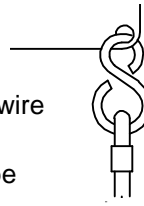
## ■ Peripheral parts of the body

Use check stand to check the air hoist from the close point.

Item	Check method	Criteria	When failed
Chain container	Check visually.	<ul style="list-style-type: none"> <li>- To be mounted to the body securely</li> <li>- No damage, tear, abrasion or deformation</li> <li>- Check no foreign matter inside the chain container.</li> </ul> <p>* Especially be careful when the air hoist is used outdoor.</p> <ul style="list-style-type: none"> <li>- The lift of the air hoist should be shorter than the allowable storage length indicated on the chain container.</li> </ul>	<p>Replace the chain container.</p> <p>Remove the foreign matter in the chain container.</p>
Chain end on the no-load side	Check visually.	<ul style="list-style-type: none"> <li>- The bolts (screws) used for securing the chain to the hoist body should be tight and not missing.</li> <li>- The chain-down stopper locking bolts should be tight and not missing.</li> </ul>	<p>Tighten with appropriate torque.</p> <p>250kg: T=3N·m 490kg-2t: T=29N·m</p>
Chain fixing part peripheral parts on the no-load side Chain-down stopper End stopper Limit lock Limit washer	Check visually.	<p>No apparent deformation, damage and crack</p> 	<p>Replace the damaged parts.</p>
Chain lever	Check visually.	<p>No apparent deformation, damage and crack</p> 	<p>Replace the damaged part.</p>
Load limiter	Check visually.	<p>The load limiter adjusting screws and lock nuts should be tight and not missing.</p>	<p>Readjust the load limiter.</p>

## ■ Cord or pendant

Item	Check method	Criteria	When failed
Operating portion/supporting portion	Check visually. No-load operation	<p>Cord type:</p> <ul style="list-style-type: none"> <li>- The S-shaped wire should not be opened.</li> <li>- The hanging part of the S-shaped wire should not be deformed.</li> <li>- The cord caulked part should not be disengaged.</li> <li>- The cord (string) should not be damaged.</li> </ul> <p>Pendant type:</p> <ul style="list-style-type: none"> <li>- The pendant hose joint should be tight.</li> <li>- The pendant hose should not be damaged.</li> <li>- The pendant hose supporting wire or the chain fixing screw should be reliably attached without looseness so that no force will be applied to the hose even if the pendant is pulled.</li> </ul>	<p>Replace the damaged parts.</p> <p>Attach the pendant hose and the supporting wire reliably.</p>



## ■ Air supply hose and joint

Item	Check method	Criteria	When failed
Appearance Attachment	Check visually.	<ul style="list-style-type: none"> <li>- The air supply hose should not be deformed or damaged.</li> <li>- The hose band, etc. should be tight at the joint to the air hoist or the trolley.</li> </ul>	<p>Replace the damaged parts.</p> <p>Attach the air supply hose reliably.</p>

## ■ Functions

Check the following item with no load.

Item	Check method	Criteria	When failed
Abnormal sound	No-load operation Check in the vicinity of the hoist body.	<ul style="list-style-type: none"> <li>- To sound no irregular noise</li> <li>- To sound no howling of motor and scraping sound of the brake</li> <li>- There should be no chain crackling sound emitted from near the chain separator (chain inlet/outlet).</li> </ul>	Ask for inspection and repair.

## ■ Air trolley and manual trolley

### ■ Appearance

Item	Check method	Criteria	When failed
Traverse rail	Check visually.	No apparent deformation and damage.	Clean and replace.
Lubrication (wheel or wheel gear)	Check visually.	Should be fully lubricated.	Lubricate the gear.
Combined status	Sway the air hoist body.	<p>&lt;Air trolley&gt; The air trolley should be combined in a well-balanced manner without tilt of the hoist body and backlash at the joint.</p> <p>&lt;Manual trolley&gt; The air hoist body should be able to be lightly swayed to the right and left.</p>	Combine properly. When there is much backlash, the joint may have been greatly abraded. Ask for inspection and repair.

## ■ Periodic inspection

Periodic inspection requires expertise and know-how.

Ask our office or our dealer for periodic inspection because it includes overhaul of the product, operation check under the rated load, and so on, requiring replacement of parts from time to time.

When asking for periodic inspection, fill in Periodic Inspection Request Sheet on the next page and contact our office or dealer.

# <Air Hoist Periodic Inspection Request Sheet>

<b>Date</b>	
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## 1. Customer Information

(1) Company name	
(2) Address	
(3) Phone	
(4) Contact person	

## 2. Product Information

(1) Product type (Code)	
(2) Serial No.	
(3) Date of purchase	
(4) Product use period	to
(5) Daily working hours	hours
(6) Annual working days	days
(7) Weight of suspended load or limits of weight	kg to kg
(8) Frequency of use (push button operation count for each work)	High Low
(9) Working atmosphere	Regular Special (gas, powder dust, oil mist, and others (      ))
(10) Working temperature	High Regular Low

Note) For Items (1) and (2), enter the code and number inscribed on the hoist's nameplate.

## 3. Questions and Inconveniences in Using the Product

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## ■ Check Sheet for Daily Inspection

Model	Code	Capacity	Serial No.	Your CTRL No.	Installation date	Location
Air hoist						

Category	Check item	Check method	Criteria	Inspection date/result				
				/	/	/	/	/
Appearance	Nameplates, labels and tags	Check visually.	No peel off. Indication can be seen clearly.					
	Body and each part		No apparent deformation, damage, flaw and crack					
	Exhaust section and periphery		Should be free from considerable adhesion of oil and clean.					
	Bolts, nuts, split pins and snap pins		Should be reliably attached without being loosened or missing.					
Load chain	Pitch		No apparent elongation					
	Chain diameter		No apparent abrasion					
	Deformation, flaw and entanglement		No deep notch, No deformation such as twist No attached sputter, No entanglement, No crack					
	Rust and corrosion		No apparent rust and corrosion					
	Twist		No capsized link at bottom hook of double type load chain					
	Lubrication		To be oiled adequately					
	Mark pitch and indication		Should be marked at a correct position. Correct indication should be marked.					
	Hook		Opening of the hook	No apparent opening of the hook.				
Abrasion		No apparent abrasion						
Deformation, flaw and corrosion		No apparent deformation, flaw and corrosion						
Hook latch		Check visually and check the movement of the hook latch. The hook latch is mounted securely inside the hook opening. No deformation. The hook latch moves smoothly.						
Movement of bottom hook (Rotation)		Check visually and rotate the hook by hand. Should rotate lightly by 360° to the right and left.						
Hook neck		Check visually. Should rotate lightly by 360° to the right and left.						
Peripheral parts of the body	Free chain wheel (In the bottom yoke)	Operation Move the load chain The free chain wheel rotates smoothly. The chain moves smoothly.						
	Spring	Check visually. No apparent shrinkage, twist and deformation.						
	Limit lock, Limit washer	No apparent deformation, damage, flaw and crack						
	Upper/lower hanger (TCRH03MS)	No apparent deformation, damage, flaw and crack Hanger locking bolts should be properly tightened to reliably attach the hanger.						
	Chain lever	No apparent deformation, damage, flaw and crack						
Cord or pendant	Air supply hose joint	Should be free from air leak and firmly fixed.						
	Operating portion	Check visually. No-load operation No deformation, damage and no loosened screw The cord and pendant hose joints should be free from twist, looseness and missing. The cord and the lever should be operated smoothly. The emergency stop button should be turned on and off.						
Air pressure and functions	Air pressure	Check visually. The operating air pressure should be 0.4 to 0.6 Mpa						
	Lubrication	Lubrication should be implemented by the lubricator (line oiler) at a rate of 10 to 15 drips (2 to 3 cc) per minute.						
	Operational check	Operate the cord or the pendant The load chain can be wound smoothly. The air hoist should move in the same direction as cord or pendant (lever) operation. When the operation is stopped, the motor stops immediately. When the emergency stop button is pressed, all hoist motions stop. When operating other push button while the emergency stop button is pressed, the hoist does not start operation. When canceling the emergency stop button, the hoist operates normally.						
	Brake	When stopping the operation, the brake is applied immediately and bottom hook shall stop immediately.						
	Overwinding prevention device	Operate the cord or the pendant to run the air hoist at low speed. Configuration of parts and routing of the chain should be appropriate for activating the device. The limit lock, swivel hook or chain should push back the chain lever at the lifting limit or the lowering limit to deactivate the device reliably.						
	Abnormal sound and vibrations	Operate the cord or the pendant to check an operating sound. No abnormal sound and vibrations						

Model	Code	Capacity	Serial No.	Your CTRL No.	Installation date	Location
Air trolley						
Geared trolley						
Plain trolley						

Category	Check item	Check method	Criteria	Inspection date/result				
				/	/	/	/	/
Appearance	Nameplates, labels and tags	Check visually.	No peel off. Indication can be seen clearly.					
	Body and each part		No apparent deformation, damage, flaw and crack					
	Bolts, nuts, split pins and snap pins		Should be reliably attached without being loosened or missing.					
	Exhaust section and periphery		Should be free from adhesion of oil and clean.					
Power source and functions	Air pressure (Air trolley)	Operate the pendant.	Makes sure that the air pressure of 0.4 to 0.6 MPa has been secured.					
	Lubrication (Air trolley)		Lubrication should be implemented by the lubricator (line oiler) at a rate of 10 to 15 drips (2 to 3 cc) per minute.					
	Operational check (Air trolley)	Operate the hand chain to perform traversing.	Should traverse smoothly without meandering and vibrations. Should operate in the same direction as pendant (lever) operation. When stopping operation, the motor stops immediately.					
	Brake (Air trolley)		When stopping the operation, the brake is applied immediately and trolley shall stop immediately.					
Functions	Operational check (Manual trolley)	Operate the hand chain to perform traversing.	Should traverse smoothly without meandering and vibrations.					



## ■ Check Sheet for Frequent Inspection

Model	Code	Capacity	Serial No.	Your CTRL No.	Installation date	Location
Air hoist						

Category	Check item	Check method	Criteria	Inspection date/result				
				/	/	/	/	/
Load chain	Pitch	Measurement	The limit value of the following "Sum of pitches of five links" must not be exceeded.					
	Chain diameter	Measurement	The limit value of the following "Chain diameter of the load chain" must not be exceeded					
Hook	Opening and abrasion of the hook	Check visually. Measurement	Should not exceed the following service limit value. The opening dimension L should be less than "L + 2" mm, compared with the dimension of new item. The height H of the hanging part should exceed "H - 2" mm.					
	Deformation, flaw and corrosion	Check visually.	No deformation such as bend or twist No deep cut No loosened bolt or nut for hook latch, or their fall off No considerable corrosion No attachment of foreign matter such as sputter					
Peripheral parts of the body	Chain container	Check visually.	To be mounted to the body securely No damage, tear, abrasion or deformation Check no foreign matter inside the chain container. The lift of the air hoist should be shorter than the allowable storage length indicated on the chain container.					
	Chain end on the no-load side	Check visually.	The bolts (screws) used for securing the chain to the hoist body should be tight and not missing. The chain-down stopper locking bolts should be tight and not missing.					
	Chain fixing part peripheral parts on the no-load side Chain-down stopper End stopper Limit lock Limit washer	Check visually.	No apparent deformation, damage and crack					
	Chain lever	Check visually.	No apparent deformation, damage and crack					
	Load limiter	Check visually.	The load limiter adjusting screws and lock nuts should be tight and not missing.					
Cord or pendant	Operating portion/supporting portion	Check visually. No-load operation	Cord type: - The S-shaped wire should not be opened. - The hanging part of the S-shaped wire should not be deformed. - The cord caulked part should not be disengaged. - The cord (string) should not be damaged. Pendant type: - The pendant hose joint should be tight. - The pendant hose should not be damaged. - The pendant hose supporting wire or the chain fixing screw should be reliably attached without looseness so that no force will be applied to the hose even if the pendant is pulled.					
Air supply hose and joint	Appearance Attachment	Check visually.	The air supply hose should not be deformed or damaged. The hose band, etc. should be tight at the joint to the air hoist or the trolley.					
Functions	Abnormal sound	No-load operation Check in the vicinity of the hoist body.	To sound no irregular noise To sound no howling of motor and scraping sound of the brake There should be no chain crackling sound emitted from near the chain separator (chain inlet/outlet).					

Model	Code	Capacity	Serial No.	Your CTRL No.	Installation date	Location
Air trolley						
Geared trolley						
Plain trolley						

Category	Check item	Check method	Criteria	Inspection date/result				
				/	/	/	/	/
Appearance	Traverse rail	Check visually.	No apparent deformation and damage.					
	Lubrication (wheel or wheel gear)	Check visually.	Should be fully lubricated.					
	Combined status	Sway the air hoist body.	<Air-motor trolley> The air-motor trolley should be combined in a well-balanced manner without tilt of the hoist body and backlash at the joint. <Manual trolley> The air hoist body should be able to be lightly swayed to the right and left.					

# Warranty

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

- 1) KITO warrants that KITO's Products, when shipped, shall be free from defects in workmanship and/or materials under normal use and service and KITO shall, at the election of KITO, repair or replace free of charge any parts or items which are proven to have said defects, provided that all claims for defects under this warranty shall be made in writing immediately upon discovery and, if there is anything within **a warranty period stated by your dealer from whom you purchased the products** from the date of purchase of KITO's Products by Purchaser and provided, further, that defective parts or items shall be kept for examination by KITO or its authorized agents or returned to KITO's factory or authorized service center upon request by KITO.
- 2) KITO does not warrant components of products provided by other manufacturers. However to the extent possible, KITO will assign to Purchaser applicable warranties of such other manufacturers.
- 3) Except for the repair or replacement mentioned in (1) above which is KITO's sole liability and purchaser's exclusive remedy under this warranty, KITO shall not be responsible for any other claims arising out of the purchase and use of KITO's Products, regardless of whether Purchaser's claims are based on breach of contract, tort or other theories, including claims for any damages whether direct, incidental or consequential.
- 4) This warranty is conditional upon the installation, maintenance and use of KITO's Products pursuant to the product manuals prepared in accordance with content instructions by KITO. This warranty shall not apply to KITO's Products which have been subject to negligence, misuse, abuse, misapplication or any improper use or combination or improper fittings, alignment or maintenance.
- 5) KITO shall not be responsible for any loss or damage caused by transportation, prolonged or improper storage or normal wear and tear of KITO's Products for loss of operating time.
- 6) This warranty shall not apply to KITO's Products which have been fitted with or repaired with parts, components or items not supplied or approved by KITO or which have been modified or altered.

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

This warranty is not applicable in Australia. Please refer to your local supplier for warranty details when this product is purchased in Australia.

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