

Rail clamp Toggle Style



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Rail clamp Instruction manual

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preface

Thank you for using the TT series rail clamp.

TRC-TT series rail clamps are an important part of the machinery.

Before use, read this instruction manual thoroughly and treat it correctly, and fully demonstrate the function of the rail clamp.

Furthermore, please keep this instruction manual for daily maintenance and inspection as it is necessary for the treatment at the time of failure.

[Ask the maker of the machine]

- Please make sure that this manual is finally delivered to the customer who uses this product (END USER).
- When assembling test of the equipment and rail clamp is completed and the rail clamp is transported to the customer as an assembly, To prevent unstable installation, install the necessary transportation fixing device. If no fixture is installed, There is a risk of injury.

General Precautions

- The illustrations in this instruction manual are intended to show COVER or minus any safety interrupts illustrate the details. It may be expressed as a state. When operating this product, make sure that the product is restored to its original state and operate with this instruction manual.
- The illustrations and photographs shown in this manual are typical examples and may differ from the products that have arrived.
- This manual is intended to improve the product, to change the specifications and to improve the usability of the instruction manual itself. You can change it appropriately.
- When ordering the instruction manual due to damage, loss, etc., please contact our distributor or the nearest sales office. Please contact the nearest sales office with the reference number on the cover page.
- If the nameplate attached to the product is scratched or damaged, contact your dealer or the nearest sales office. Please order a name plate from our sales office.
- Modification of the product by the customer is outside the scope of our guarantee, so we are not responsible.

Safety Precautions

- Before using (installation, operation, maintenance, inspection, etc.), be sure to thoroughly read this manual and all other attached documents. Please use it correctly. After learning and learning about all of the knowledge, safety information, and precautions. Please use. Once you have read it, be sure to keep it in a safe place where you can see it.
- In this manual, safety precautions are classified into "danger" and "caution".

! Danger

Failure to do so could result in a hazardous situation and could result in death or serious injury if expected.

! Caution

In the event of improper handling, a dangerous situation may occur, resulting in serious injury if expected, and only material damage is expected.

In other words, even the matters described in the "Caution" may be associated with serious consequences depending on the situation.

[Important]: It is not applicable to "danger" and "attention" I have specified.

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[Normal]

! danger

- **Do not use in an explosive atmosphere (hazardous area).**
It may cause injury or fire.
- **The work of transportation, installation, wiring, operation, operation, maintenance and inspection is carried out by qualified person or person with expert knowledge.**
It may cause electric shock, injury or fire.
- **Do not modify the product.**
It may cause electric shock, injury or fire.

! caution

- **Do not use the product outside the range described in this manual.**
It may cause electric shock, injury or fire.

[Transportation and transportation]

! caution

- **Please be careful when transporting with a forklift because there is a risk of falling or falling.**
There is a risk of injury.
- **Before lifting, check the nameplate, packing list, outline, catalog, etc. of the rail clamp and check that the rail clamp is not lifted by more than the rated load of the hoisting machine.**
Hoist Point may be damaged, fallen, damaged by conduction, or damaged.
- **Use Hoist Point for hoisting operation.**
There is a risk of injury.
Do not hoist the entire machine with the hoist point of the rail clamp after installation on the
There is a risk of injury.
- **When transporting the rail clamp (transport to the installation site or to the customer), confirm that the transport lock is attached.**
The hoisting operation may become unstable, resulting in injury.

[Unpacking]

! caution

- **After confirming everywhere, please disassemble the package.**
There is a risk of injury.
- **Please confirm the actual item on the nameplate and order form as per the order.**
If the wrong product is installed, there is a risk of injury.
- **Please check if there is any damage during transportation. Do not use damaged rail clamps.**
There is a risk of injury.

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[install]

! danger

- **Do not install the rail clamps on ceilings, walls, or inclined surfaces.**
Failure to do so may result in injury.

! caution

- **Check the indicator and do not exceed the maximum stroke.**
Failure to do so may result in injury.
- **Do not use the rail clamp shoe or rail where there are many foreign objects.**
Failure to do so may result in injury.
- **The base to be installed should have a solid structure considering the weight of the rail clamp and reaction force when braking.**
There is a risk of injury.
- **Never allow flammable materials around the rail clamps**
There is a risk of injury.
- **If it is installed in a place where people with no expertise are likely to approach it, install a safety**
There is a risk of injury.
- **Do not install or operate the hand rail clamp.**
It may cause electric shock, injury or fire.

[Wiring]

! caution

- **Wiring work should be carried out by qualified personnel or persons with specialist knowledge.**
It may cause electric shock, injury or fire.
- **Turn off the power switch, mark "Prohibit energization", and perform wiring work.**
If the wrong product is installed, there is a risk of injury or damage.
- **Be sure to connect EARTH terminal to ground according to electrical equipment standards and regulations**
There is fear of electric shock.
- **Do not operate the terminal box with the cover open. After the operation, Install the cover to the original.**
There is fear of electric shock.

! caution

- **Wiring should be done according to the electrical equipment standard and extension regulations.**
It may cause electric shock, fire or injury.
- **The voltage fluctuation should be within 110% to 85% of the rated voltage.**
Burnout may occur, resulting in ignition or normal operation, resulting in electric shock, injury, or fire.
- **Protective devices (such as earth leakage breakers) should not be installed in the rail collar. Remove**
Electric shock and burnout may cause ignition.

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[adjustment]

! caution

- **The indicator and braking torque are adjusted at the factory. Please adjust it so that there is no chatter.**
Failure to do so may result in injury.
- **Adjust the stroke in the reference range of the indicator.**
Failure to do so may result in injury.
- **Never loosen the locknuts of each adjustment bolt.**
There is a possibility that normal operation will not be possible due to vibration.

[Operation • Operation]

! danger

- **Make sure that the contact surface of the rail clamp is free of paint or foreign matter.**
Failure to do so may result in injury.
- **Check that the emergency stop function is normal.**
There is a risk of injury.
- **When a power failure occurs, turn off the power switch that is not needed.**
There is a risk of injury when auto restarting.

! caution

- **Do not use it outside the specification range when selecting the rail clamp.**
There is a risk of injury or damage.
- **Never approach or contact the operating rail clamp.**
There is a risk of injury.
- **If an error occurs, stop operation immediately.**
It may cause electric shock, injury or fire.

[Disassembly and assembly]

! caution

- **Be sure to carry out disassembly and assembly at a professional factory.**
There is a risk of injury.

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[Maintenance and Inspection]

! danger

- **Do not change the shoe material. Please use our original materials for lining.**
Failure to do so may result in injury.

! danger

- **Perform daily, monthly and annual inspections in accordance with "Daily, Monthly, Yearly"**
Failure to do so may result in injury.

[Move installation]

! danger

- **Please be sure to check the factory beforehand when moving the machine.**
Failure to do so may result in injury.
- **Secure the moving installation so that it does not move when transporting.**
If the rail klempe hoisting operation is unsafe, there is a risk of injury.

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order

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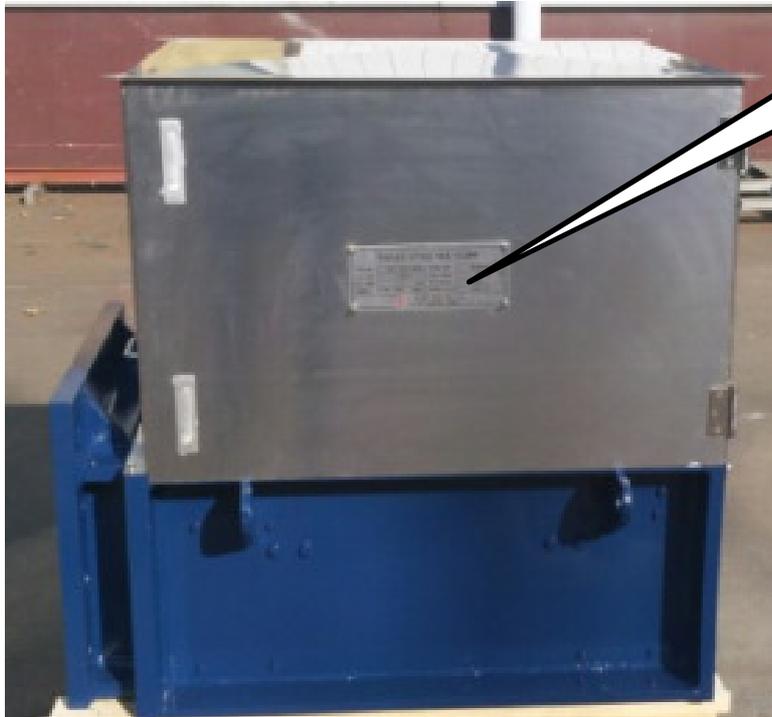
- A Daily Inspection Items
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1. Inspection upon arrival

! caution

- **When disassembling the packaging, please check the sides and disassemble the packaging.**
There is a risk of injury.
- **Please check the nameplate and order form of the actual item as it is ordered.**
If the wrong product is installed, there is a risk of injury or damage.
- **Please check if there is any damage during transportation. Do not use damaged rail clamps.**
There is a risk of injury or damage.

If there is any mistake in the above matters and structure, please contact our distributor or our sales department immediately.



Nameplate
attachment location

2. Transport instructions

! caution

- **Please be careful when transporting with a forklift because there is a risk of falling or falling.**
There is a risk of injury.
- **Before lifting, check the nameplate, packing list, outline drawing, catalog, etc and check the weight of the brake. Do not lift the brake beyond the rated load of the traction machine.**
Hoist Point may be damaged, fallen, damaged by conduction, or damaged.
- **Use hoop for hoisting operation.**
There is a risk of injury.
- **After installation on the machine, do not hoist the whole machine with the hoop hole of the brake.**
There is a risk of injury.



3. Storage Tips

Do not store the brake temporarily or for a long time with the package broken.
The brake storage location should be determined based on the following factors.

- Weather-free, damp-free place
- Greasy place
- Where there is no harmful gas or liquid
- Place where the ambient temperature is 0 °C ~ 40 °C
- Place without vibration

4. Features, Operation and Structure

4.1 Features

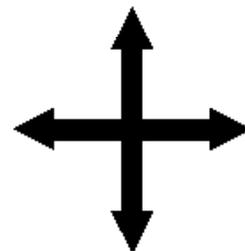
1) The Guide Roller Position Device function can compensate for tolerances generated on the rail up, down, and right.

It is designed to operate within the range of up, down, left, right $\pm 25\text{mm}$.

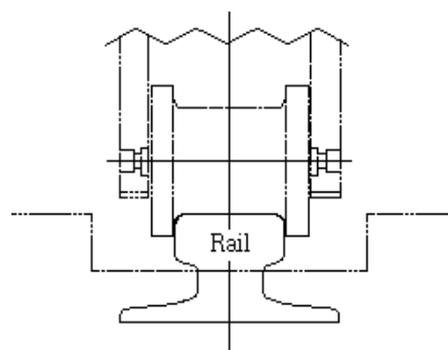


RLOAT
BLOCK & GUIDE

Vertical
 $\pm 25\text{mm}$



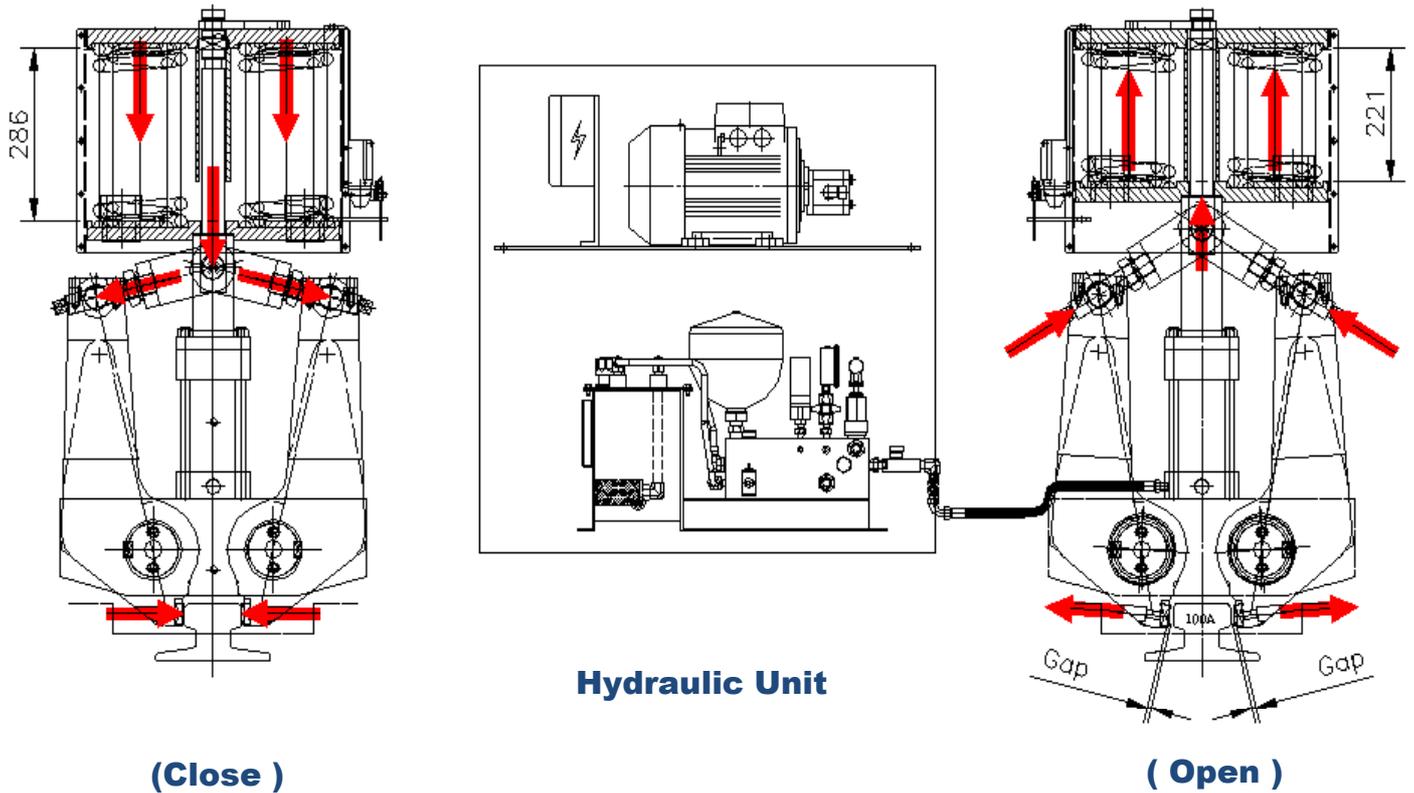
Horizontal
 $\pm 25\text{mm}$



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4.2 Operation



1) Braking action

Rail Clamp applies a hydraulic unit and a single acting cylinder.

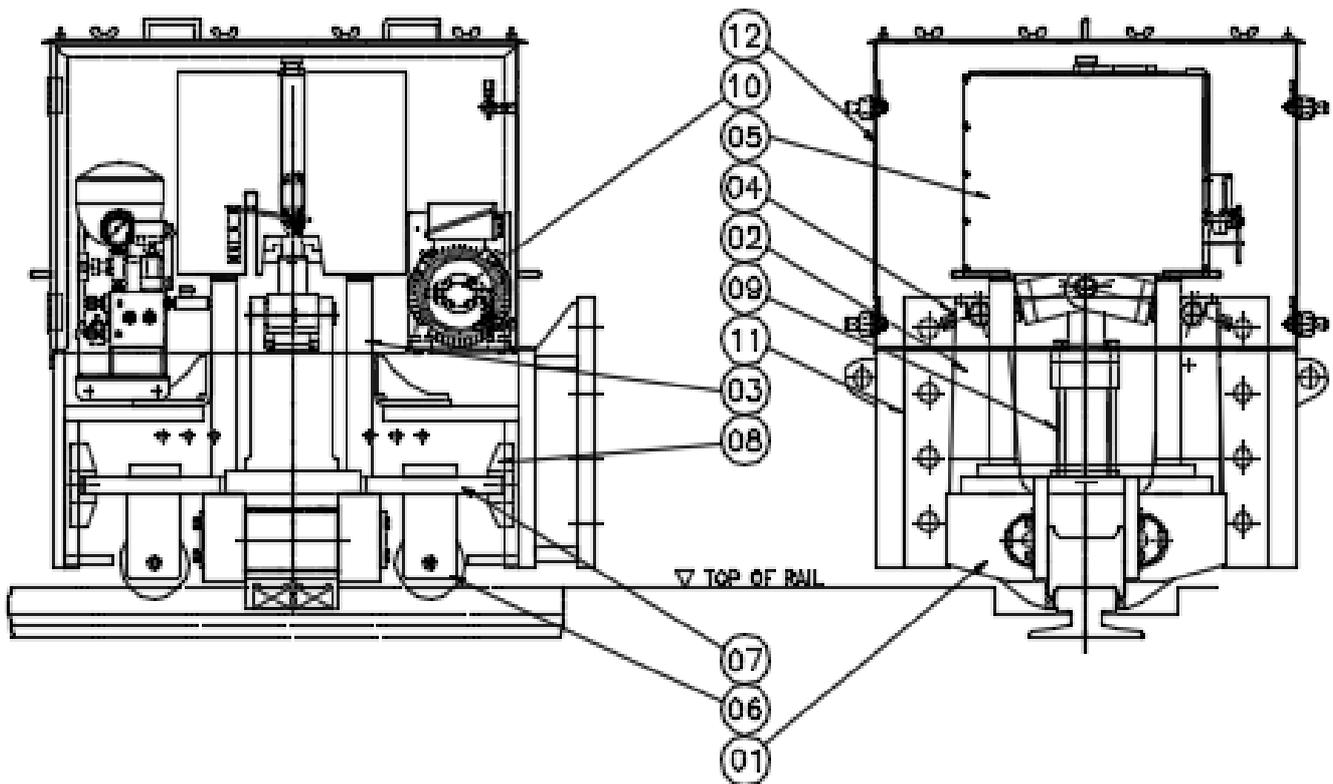
It is transmitted to Toggle Lever, and strong braking force is generated when the shoe comes in contact with the rail.

2) Open motion

When the power is ON, the Hydraulic Motor operates to overcome the spring force and the cylinder is transmitted to the rising Toggle Lever, and the gap between the shoe and the rail is generated.

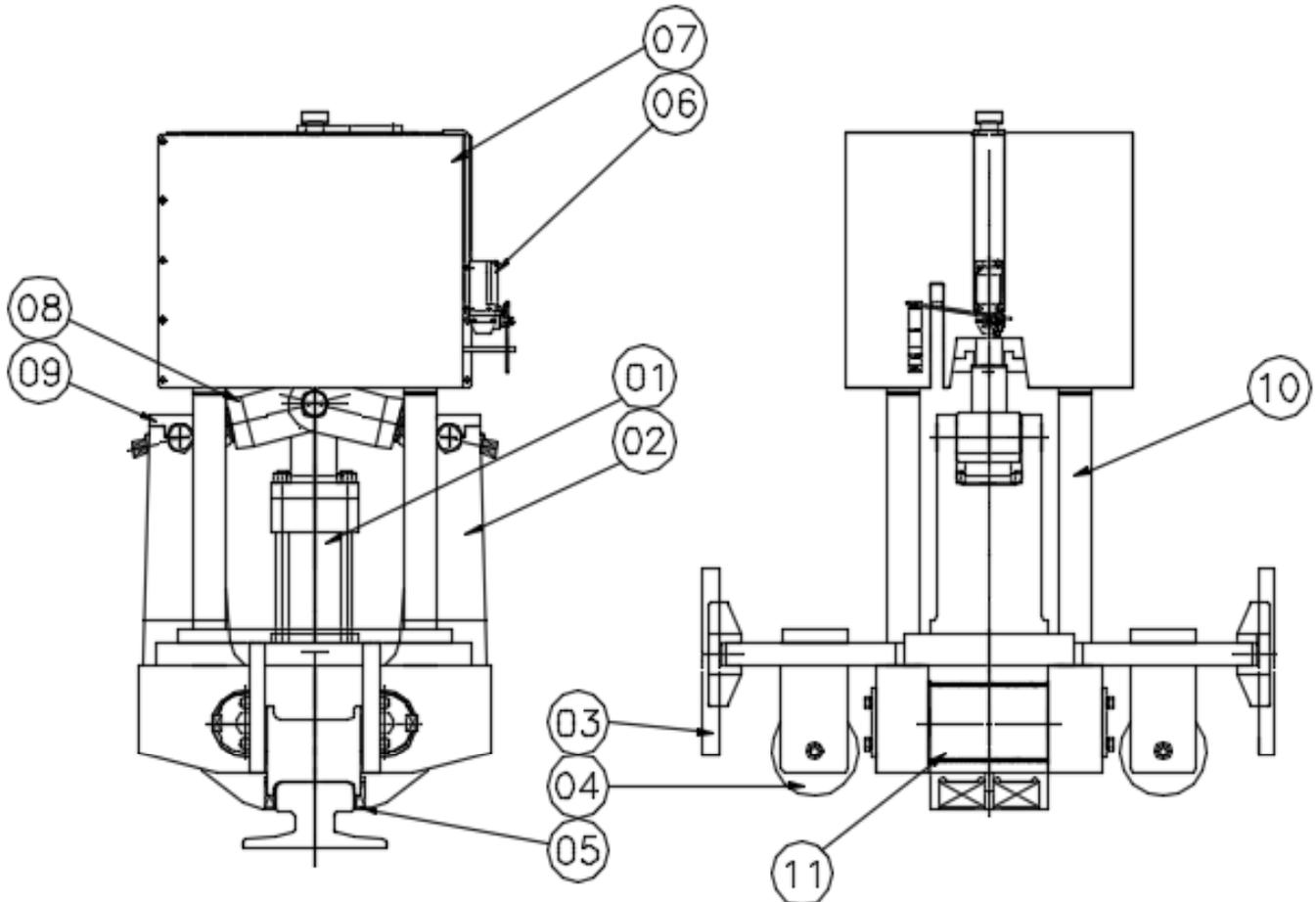
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4.3 Structure



No.	Product Name	Q'ty
1	HUB PLATE	2
2	CLAMP LEVER	2
3	SUPPORT POST	4
4	TOGGLE LINK	2
5	SPRING CHAMBER	1
6	GUIDE WHEEL ASS"Y	2
7	GUIDE WHEEL MOUNT	2
8	FLOAT BLOCK & GUIDE	1
9	HYD. CYLINDER ASS"Y	1
10	HYDRAULIC POWER UNIT	1
11	CLAMP CASE FRAME	1
12	CLAMP ENCLOSURE	1

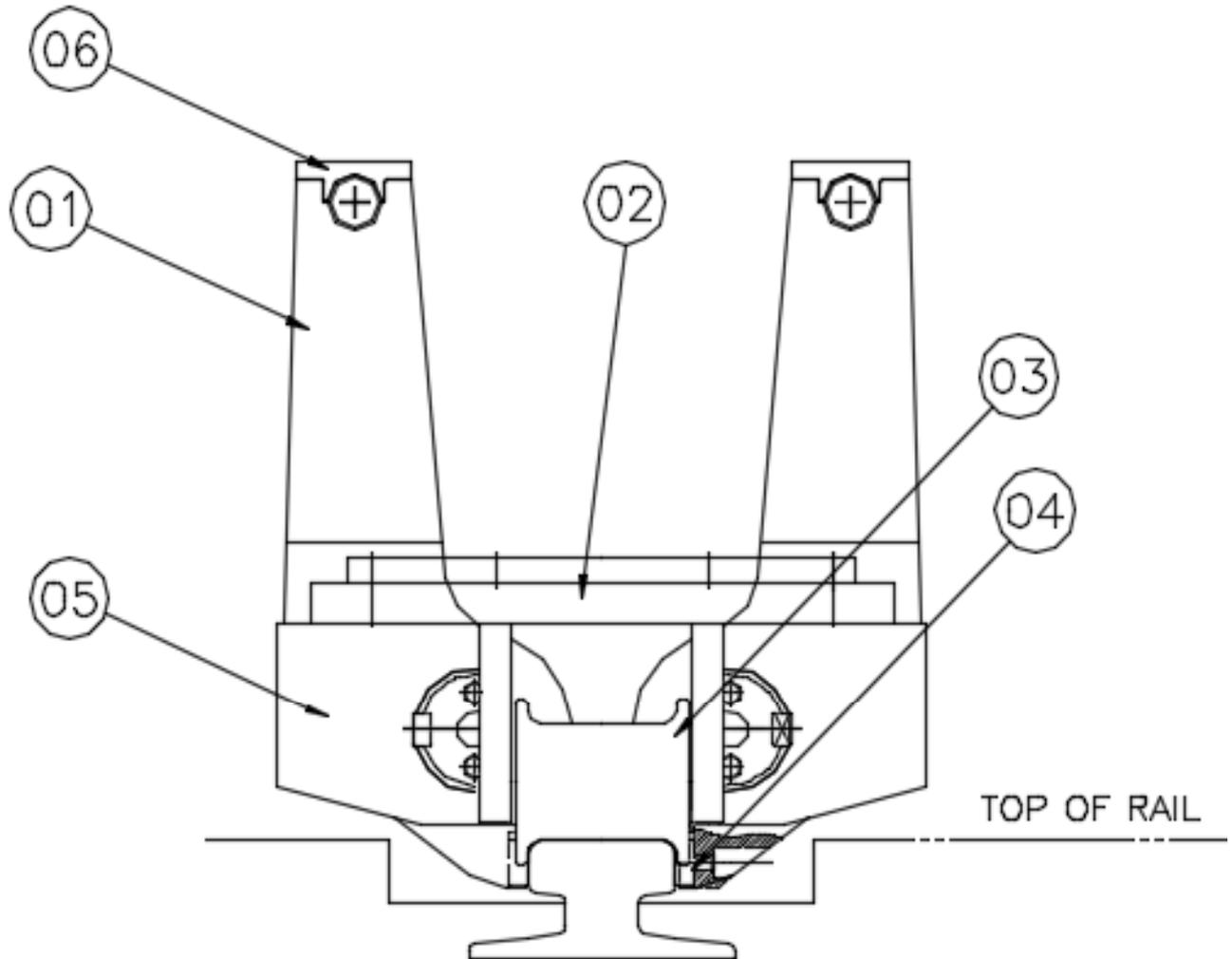
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No.	Product Name	Q'ty
1	HYD.CYLINDER ASS'Y	1
2	CLAMP LEVER	2
3	FLOAT BLOCK & GUIDE	2
4	GUIDE WHEEL ASS'Y	2
5	SERRATION SHOE	4
6	LIMIT SWITCH	1
7	SPRING CHAMBER	1
8	TOGGLE LINK	2
9	LEVER CONNECTING PIN	2
10	SUPPORT POST	4
11	LEVER ROOT PIN	2

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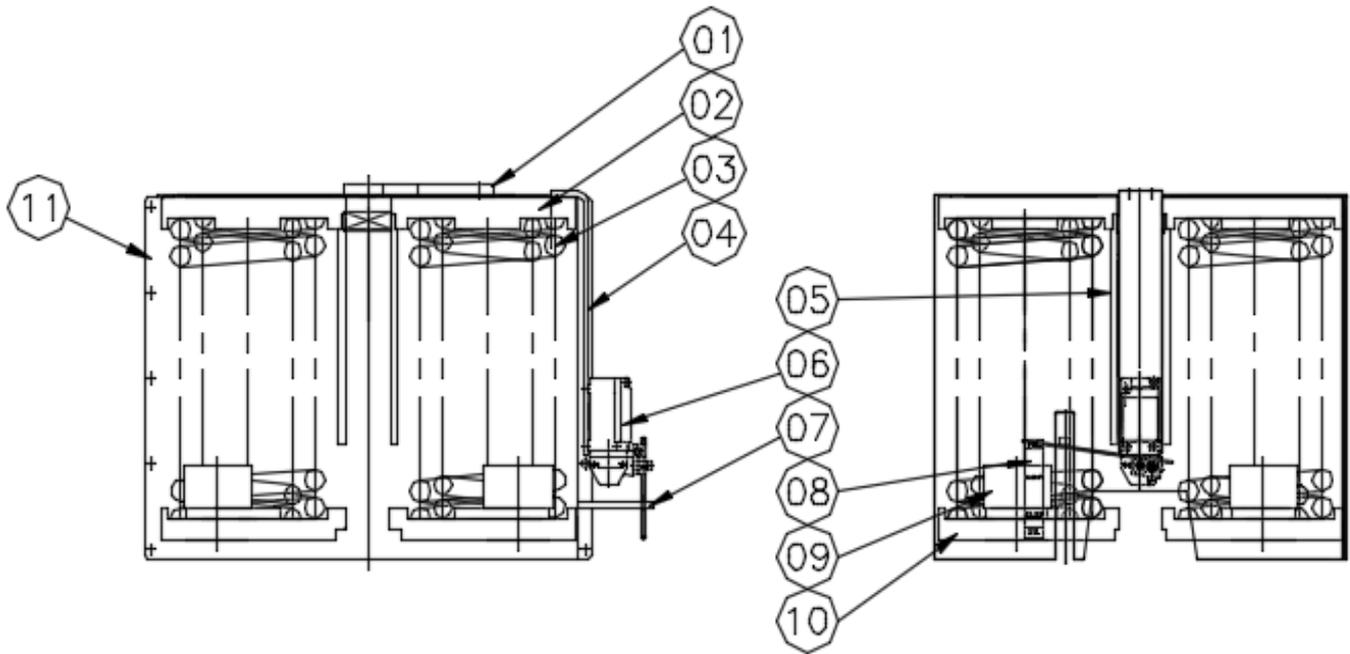
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No.	Product Name	Q'ty
1	CLAMP LEVER	2
2	GUIDE WHEEL MOUNT	2
3	GUIDE WHEEL ASS"Y	2
4	SERRATION SHOE	4
5	HIB PLATE	2
6	LEVER CAP	2

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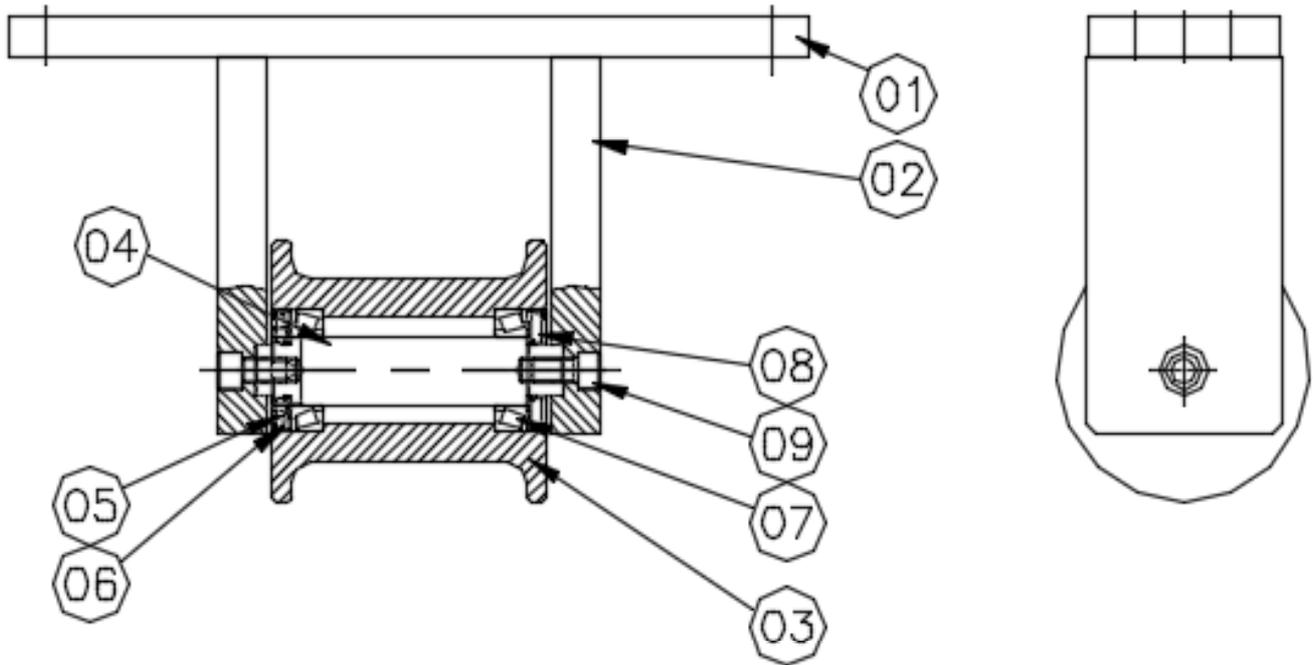
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No.	Product Name	Q'ty
1	CAGING FORK	1
2	TOP PLATE	1
3	SPRING	8
4	L/S MOUNTING BKT.	1
5	STOPPER	1
6	LIMIT SWITCH	1
7	L/S STRIKER	1
8	INDICATOR	1
9	GUIDE RING	4
10	BOTTOM PLATE	1
11	SPRING CHAMBER COVER	1

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No.	Product Name	Q'ty
1	MOUNTING PLATE	2
2	SIDE PLATE	4
3	GUIDE WHEEL	2
4	GUIDE WHEEL PIN	2
5	BEARING LOCKNUT	2
6	BEARING LOCKWASHER	2
7	TAPER ROLLER BEARING	4
8	GREASE SEAL	4
9	SOCKET HEAD CAP SCREW	4

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5. Installation

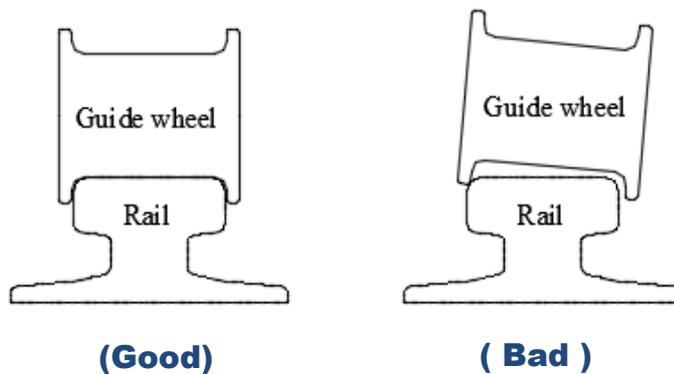
5.1 Installation Sequence

1) Open the rail clamp. (It is open when delivered.)

If it is not open, use the manual opening device to open the rail clamp.

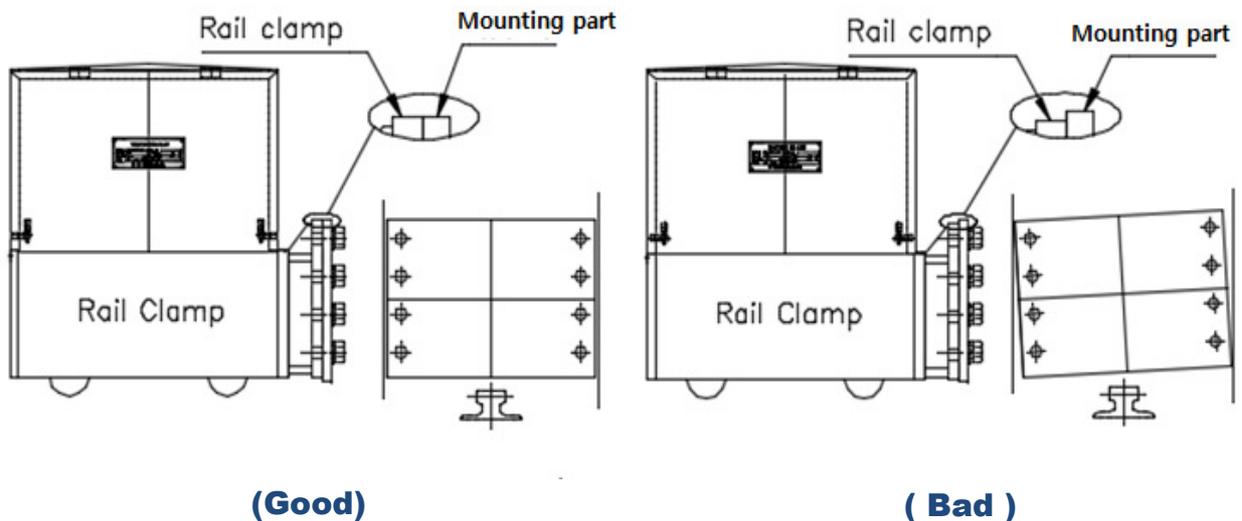
2) Install at the position where the rail clamp is installed.

In this case, it is necessary to check that the rail clamp wheel and the rail are in good contact with each



3) Tighten the mounting bolts.

After confirming that the rail clamp mounting part and the rail clamp are aligned with each other, tighten the bolts.



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Bolt tightening torque

Thread Diameter	lightening Torque Max(Nm)				
	Property Classes				
	CL 5.6	CL8.8	CL10.9	CL12.9	A2/A4 - CLASS 70 SS
M4	1.37	3.0	4.4	5	2.2
M5	2.7	5.9	8.7	10	4.3
M6	4.6	10	15	18	7.3
M8	11	25	36	43	17.7
M10	22	49	72	84	35.5
M12	39	85	125	145	61.3
M16	95	210	310	365	147.1
M20	184	425	610	710	285.1
M22	250	580	820	960	
M24	315	730	1050	1220	
M27	470	1100	1550	1800	
M30		1450	2100	245	
M33		1970	2770	3330	
M36		2530	3560	4280	

The torque values in the table are as follows.

1. Coefficient of friction (11) = 0.14 (tightening without coating (auto color) leads to a slight lubrication, additional lubrication condition overload).
2. Applied torque due to bolt-on induction stress induction stress 80% of the fiscal year (yield stress)

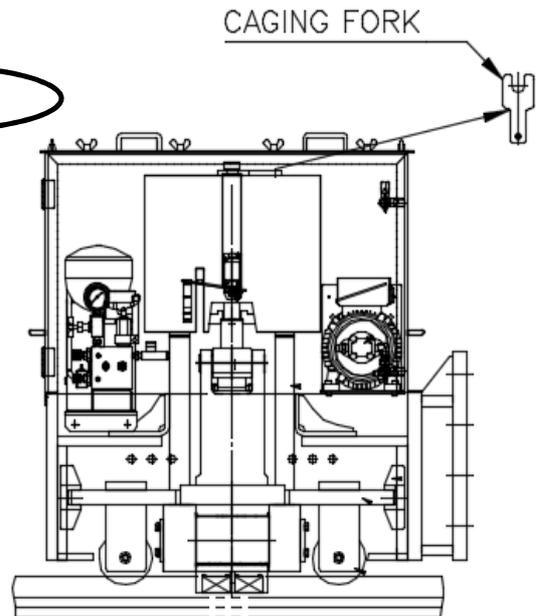
4) Rail Clamp Open

After completing the installation, turn on the power to open the rail clamp, then activate the CAGING FORK removal clamp.

CAGING FORK Rail clamp does not work when not removed.



CAGING FORK

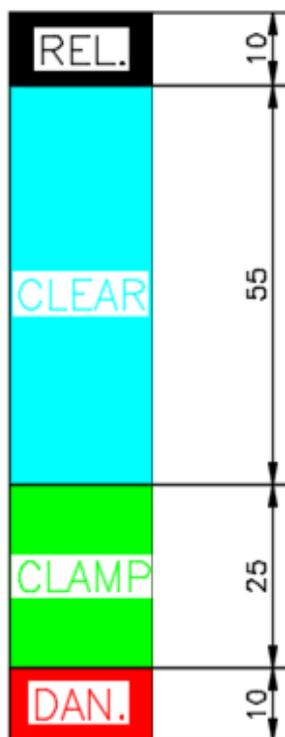


6. Adjust before use

! caution

- The indicator and spring length have been adjusted at the factory.
Please adjust it so that there is no change.
Failure to do so may result in injury.
- Adjust the stroke in the reference range of the indicator.
Failure to do so may result in injury.
- After adjustment, tighten the locknuts of each adjustment bolt.
(At this time, be careful not to turn the adjusting bolt together.)
If it is released by vibration, normal operation may not be performed and there is a risk of injury.

6.1 Description of the indicator



REL.

The rail clamp is fully open

CLEAR

The clearance area is referred to as a clamp clearance area. If the clamp is released and is in this position, the distance from the rail to the shoe remains.

CLAMP

Clamp working area.
The state where the shoe and rail are clamped when set at the point of this area.

DAN.

It is called a danger zone.
This area should be clamp adjusted.

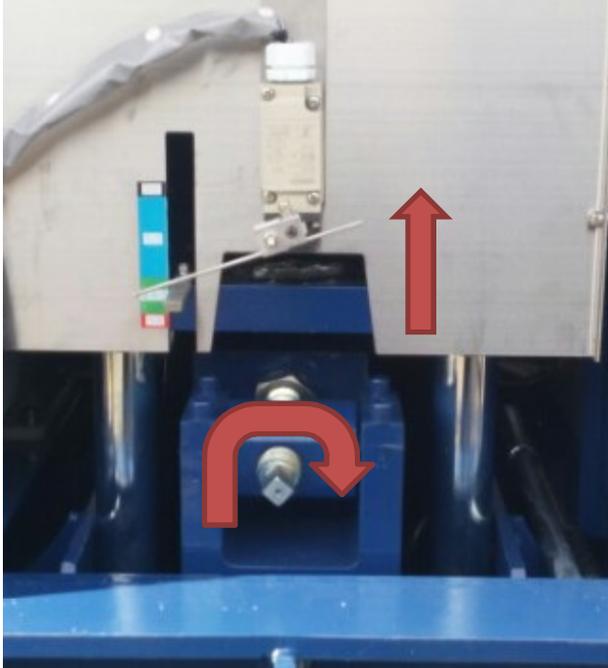
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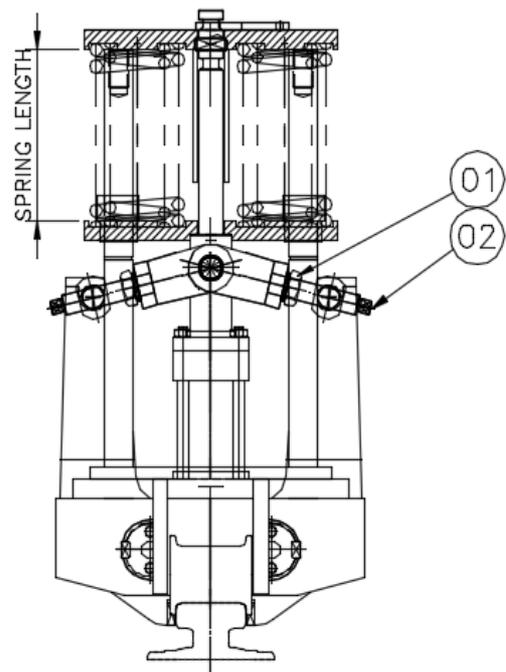
6.2 Spring adjustment

! caution

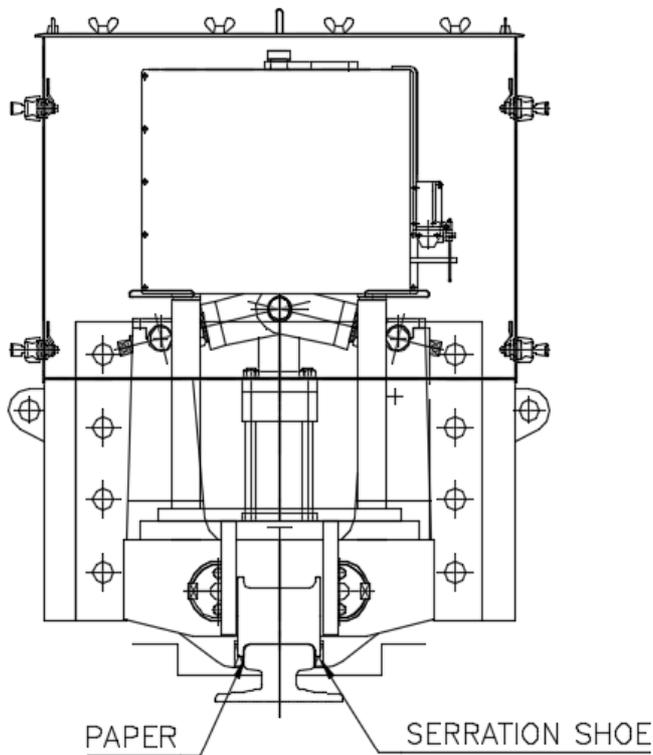
- The spring length has been adjusted at the factory. Please adjust it so that there is no change. Normal operation is not possible and there is a risk of injury.



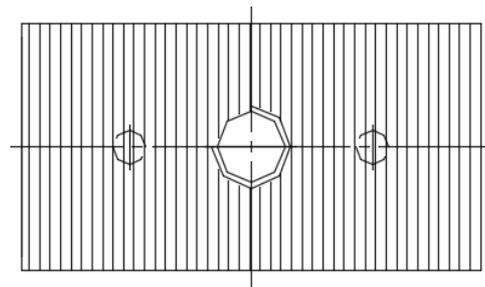
- 1) Loosen the lock nut (01) while the rail clamp is open.
- 2) Use the STUD BOLT (02) to adjust the spring length.
When adjusting, operate both sides in the same way.
- 3) Repeat the above procedure to set the spring length.
- 4) Tighten the nut after setting is completed.
 - Be careful not to turn the STUD BOLT together
 - Firmly tighten the locknuts of each adjustment bolt so that they will not loosen.
(There is a possibility that normal operation will not be done by loosening by vibration.)



6.4 Paper Test



- 1) When the clamp is installed, there is no abnormality after on-off operation test Perform Paper Test.
- 2) After opening the rail clamp, put paper between the rail and the shoe.
- 3) With the paper in the center between the rail and the shoe, turn off the clamp.
- 4) Open the clamp again and remove the paper.
- 5) Check the jaggedness of the paper shoe.



[important]

Make sure that the rails and shoe surfaces are clean.
(Proper Tset can not be done due to foreign substances.)

Make sure that the paper touches between the rail and the shoe at least 60%



7. Wiring

! danger

- **Turn off the power switch, mark "Prohibit energization", and perform wiring work.**
There is fear of electric shock.
- **Wiring, maintenance and inspection work should be carried out by a person with specialist knowledge.**
It may cause electric shock or fire.
- **Be sure to connect EARTH terminal to ground according to electrical equipment standards and station regulations.**
There is fear of electric shock.
- **Do not operate the terminal box with the cover open.**
After operation, install the cover of the terminal box round.
There is fear of electric shock.

! caution

- **Wiring should be done according to the electrical equipment standard and extension regulations.**
It may cause electric shock, fire or injury.
- **The voltage fluctuation should be within 110% to 85% of the rated voltage.**
There is fear of ignition, burnout, normal operation, electric shock, injury and fire.
- **Protective devices (earth leakage breaker, etc.) should not be installed on the brakes. Remove the installed parts.**
Electric shock and burnout may cause ignition.

8. Inspection and driving tips before commissioning

8.1 Inspection before commissioning

! danger

- **Check that the rail clamp rail and shoe contact surface are free of paint or foreign matter.**
Failure to do so may result in injury.
- **Please carry out paper test for new shoe.**
Failure to do so may result in injury.

Before commissioning, confirm the following.

- Is the power supply voltage adequate?
- Wiring not changed?
- Is the gap between the brake drum and lining appropriate?
- Is the braking spring length set to the set length?
- Is shoe installation proper?
- Did you clean the rail clamp rail and shoe surface?
If there is paint or foreign matter, wipe it with thinner.
- Is there any damage to the rail clamp rail and shoe surface?
- Are the screws and nuts on each part fastened?

Please perform commissioning and confirm the followings.

- Is the rail clamp sufficient?
- Is operation of each part normal during operation?

8.2 Driving Tips

! danger

- **When a power failure occurs, turn off the power switch that is not needed.**
There is a risk of injury when auto restarting.
- **When selecting the brake, do not use it outside the specification range.**
It may cause electric shock, injury or breakage.
- **If an error occurs, stop operation immediately.**
It may cause electric shock, injury, fire or damage.

When operating the rail clamp drive, be sure to fully understand the specified specifications and operate it correctly. Be careful not to operate in a range other than the specification range of the rail clamp, as this may cause damage to the rail clamp.

Please make sure to check the operation of the machine for which the statute has prescribed.

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9. Maintenance

! Caution

- Perform daily, monthly, and annual inspections in accordance with daily, monthly, and annual inspection instructions in this manual.
Failure to do so may result in injury.
- When disassembling and assembling, please do it at a specialized factory.
It may cause electric shock, injury or fire.

After starting operation of the rail clamp, it is necessary to adjust and inspect each part by routine inspection.

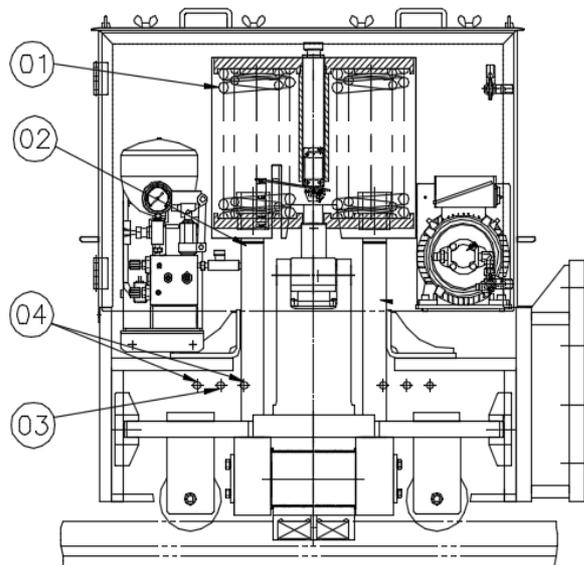
9.1 Check points

Check, work tips	daily life	weekly	monthly	Year	Remarks
● Make sure that the rail clamp guide roller contacts the rail.	○				
● Perform a paper test of the shoe and replace the shoe if the serrations are not clear			○		
● The rail clamp operation is smooth.	○				
● Check springs for cleanliness and apply grease			○		
● Check the spring length Check the position of the indicator.		○			
● Support post check and grease application			○		
● Float blk & Guide check and grease application			○		
● Check that the levers are moving smoothly and apply grease			○		
● Hydraulic oil level gauge, check pressure gauge	○				
● Check all lines and fittings for leakage.		○			
● Remove foreign matter such as upper dust of rail clamp			○		

9.2 Grease application items

No.	Product Name	Recommended Greece
1	Spring	Kadus S2V 220 2
2	Support post	Kadus S2V 220 2
3	Float blk & Guide	Kadus S2V 220 2
4	Lever	Kadus S2V 220 2

Apply grease periodically according to the inspection procedure.
When grease is applied, apply enough grease.



9.3 How to replace the shoe

- 1) Open the rail clamp.
- 2) Release the shoe fixing bolt.
- 3) Remove the shoe downwards.
- 4) Tighten the lower shoe to be replaced.
- 5) Tighten the shoe fixing bolt.

[important]

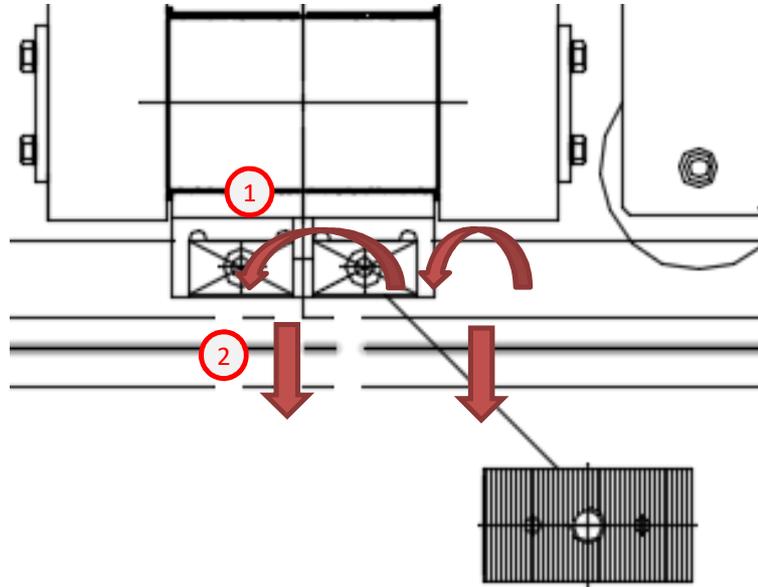
Please work after tightening CAGING FORK before replacement.

After replacing the lining, perform trial operation.

Please confirm the following.

Is the brake fully functional?

Please carry out paper test for new shoe.



10. Cause and treatment of abnormal occurrence

Problem	cause	Measures
Clamp does not work..	Hydraulic pressure does not discharge properly.	Parts replacement and repair
	Solenoid valve coil burnout	Solenoid coil exchange
	Spring breakage and tension reduction	Replace spring
	Needle valve setting incorrect	Check needle valve pump side
	Throttle check valve is locked	Throttle check valve unlocked
	Reverse motor rotation direction	Adjust the direction of rotation
Clamp does not keep open.	Lack of hydraulic oil	Check oil level gauge, replenish
	Oil line oil leakage	Replace piping line
Abrasion	Lack of hydraulic oil.	Check level gauge, supplement
	Crash of rail and shoe	Spring length, lever adjustment
Clamp jungle	Shoe's union	Adjust left and right lever
	Decrease spring setting	Spring length adjustment
	Shoe wear	Shoe replacement

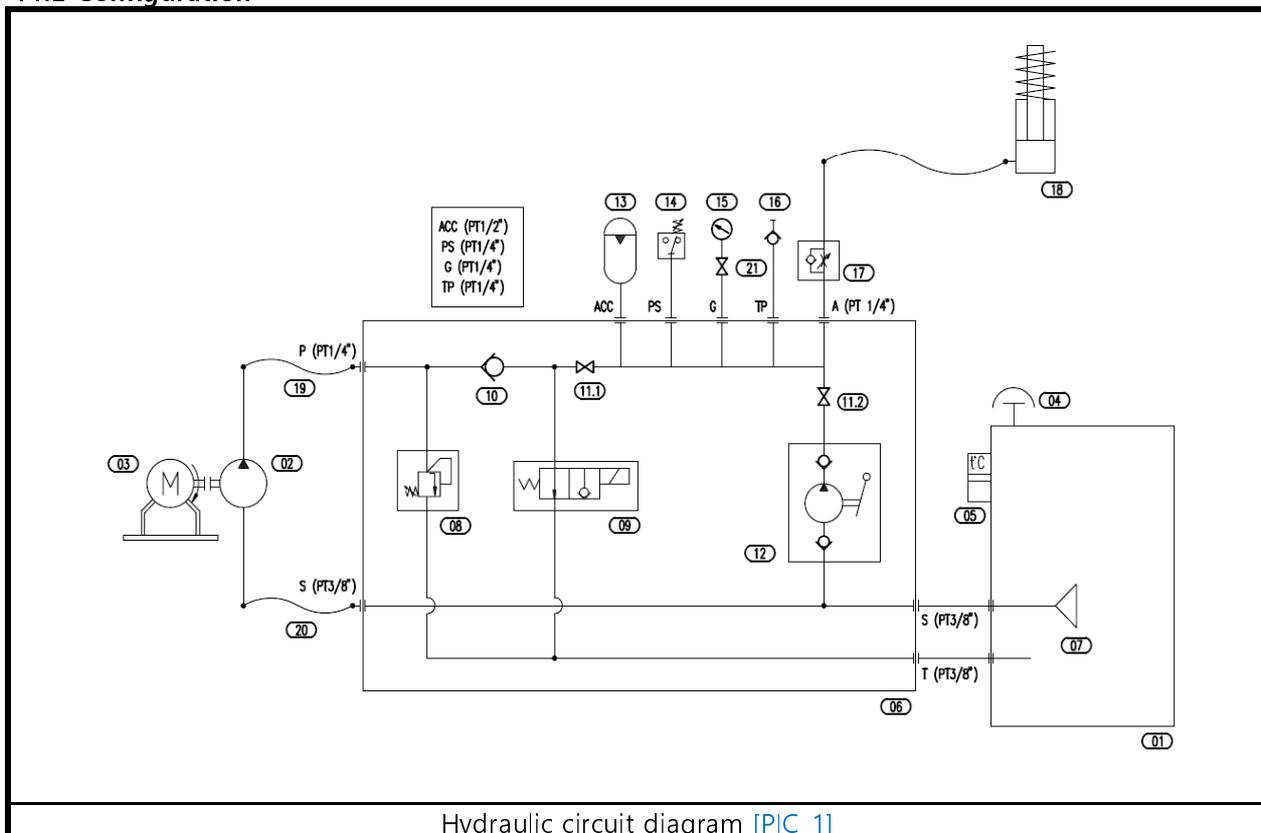
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11. Product Specifications and Configuration

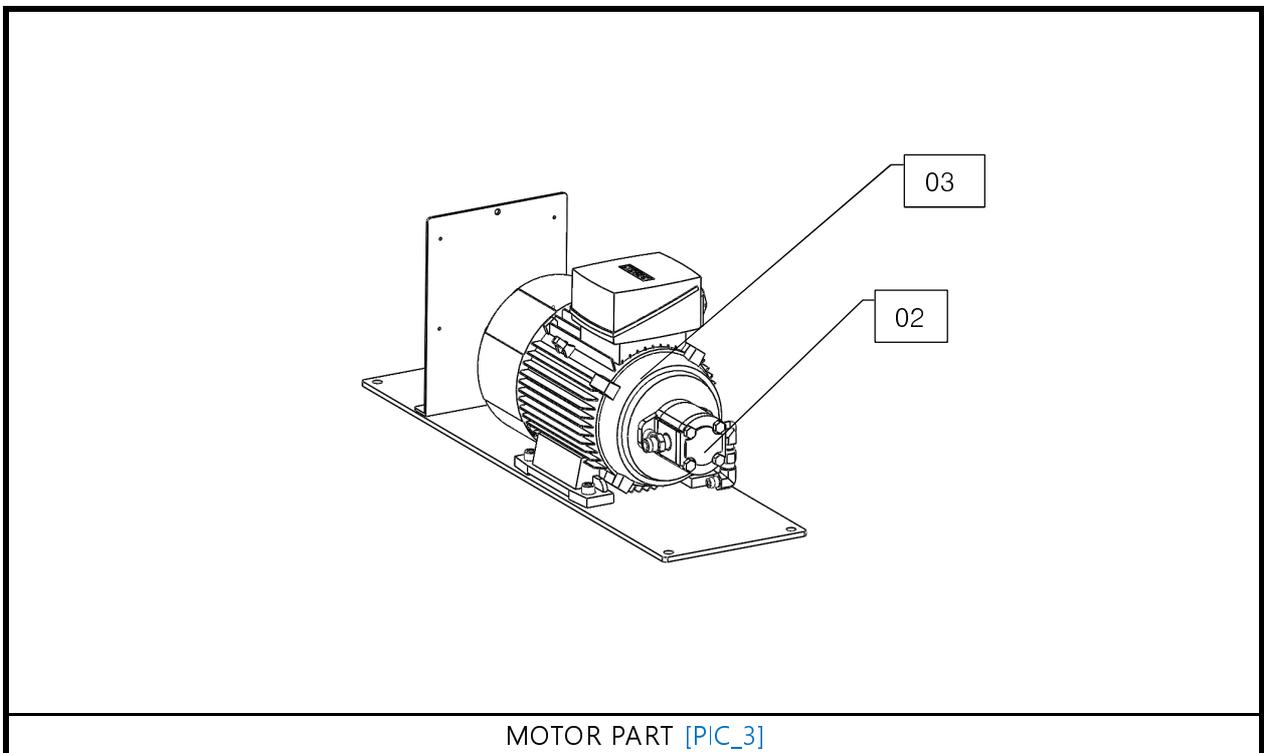
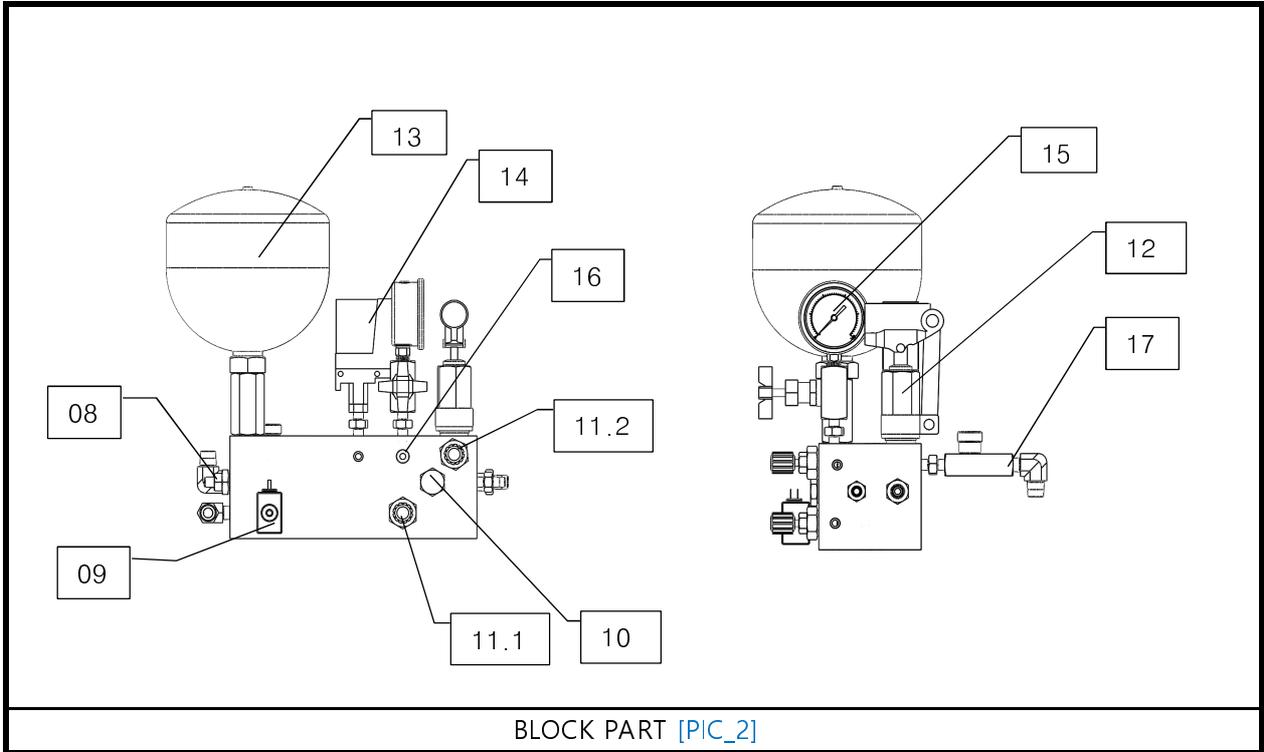
11.1 Specifications

Item	Specifications
power	3.7KW
Discharge flow rate	5.5LPM
TANK capacity	4ℓ
PUMP TYPE	GEAR
Maximum Working Pressure	210bar
Working oil specification	VG15
ACCUMULATOR Capacity	2ℓ
Operating means	MOTOR / HAND PUMP
HYD CYLINDER	Φ100-Φ70-100st
Painting specification	BLUE (5PB2 / 6) Outside / middle / top (CARBOLONE) 275μm
SOLENOID	AC220V
FILTER	100MESH

11.2 Configuration



Rail clamp Instruction manual



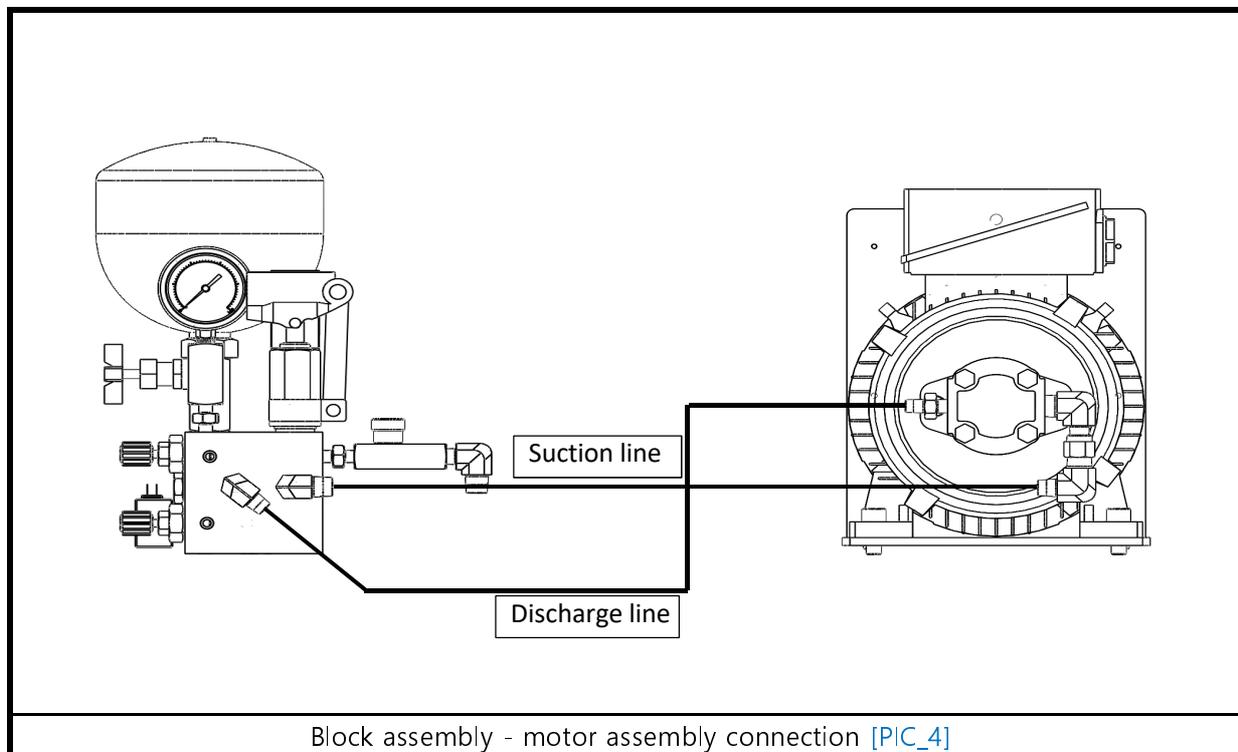
11 .3 Main product composition

Item	Product Name	Part number
02	GEAR PUMP	SAP10-3.2
03	E.MOTOR (direct connection)	3HP-4P-220/380V
08	RELIEF VALVE	RV09-23
09	SOL VALVE	SV09-21P (220V)
10	CHECK VALVE	CV09-20
11.1	NIDDLE VALVE	GA10-23 (Hand pump side)
11.2	NIDDLE VALVE	GA10-23 (Hydraulic pump side)
12	HAND PUMP	KP (8cc/stroke)
13	ACCUMULATOR	HSN 2.0 (N2: 80bar)
14	PRESSURE S/W	XMLA160D2S14
15	PRESSURE GAUGE	A63-250K
16	TEST POINT	1/4"
17	THROTTLE CHECK VALVE	F400

12. Preparation for driving and detailed parts setting

12.1 Check points before operation

- Check the amount of oil in the oil tank. Red ball at the highest point on the level gauge before installation
It must be full to be located. When the clamp release is activated, the oil will flow through the hydraulic cylinder
It is supplemented to the accumulator and the water level reaches to the lowest point.
- Check the rotation direction of the motor after the electrical connection. After confirming that
the motor is rotated as indicated by the arrow on the motor, all operations must be performed.
- Check the hose tightness between the block assembly and the motor assembly, and the hose tightness between
the hydraulic cylinder and the block assembly. Suction part -3/8 "Discharge part -1/4" Be careful not to change.
[\[PIC_4\]](#) Reference.
- Make sure the scale of the pressure gauge indicates '0bar'.



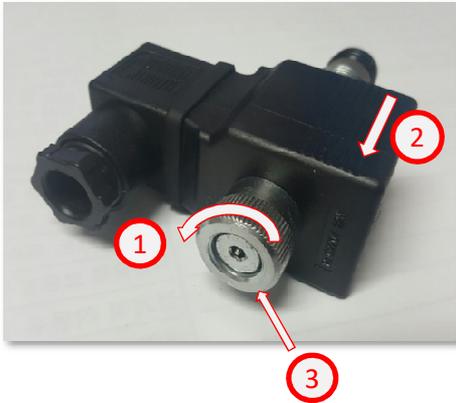
12.2 Features and settings for each part

[08. RELIEF VALVE]

- Pressure adjustment screw Clockwise rotation - Pressure rise
Pressure adjustment screw Counterclockwise rotation - Pressure drop
Factory setting: 170bar
- It restricts the maximum value of the hydraulic pressure discharged by the hydraulic pump and adjusts the pressure in the hydraulic circuit. Limiting the pressure rise above the safety limit prevents overload of the boomer and damage of the parts in the circuit.

[09. SOL VALVE]

- 220V single phase - SOLENOID ON
OFF-SOLENOID OFF
- Performs the pressure LOAD / UNLOAD in the hydraulic circuit as an electrical signal.



Coil disassembly method.

1) Loosen the fixing bolt.

Pull the coil and disassemble it.

2) Coil assembly method - reverse order of disassembly

3) Pressing the plunger part firmly with a tool allows forced loading.

[11. NIDDLE VALVE]

- NEEDLE VALVE Rotation clockwise to the end - Closed
NEEDLE VALVE Counterclockwise rotation - Open
Factory setting: Hydraulic pump operation.
- You can choose to operate the hydraulic pump / manual hand pump manually.
11.1 Closed / 11.2 Operated by manual hand pump in open setting.
11.1 Open / 11.2 Operated by hydraulic pump when closed.

[12. HAND PUMP]

- Repeated operation with up / down operation after connecting pump operation knob.
A flow rate of 8 cc is discharged per stroke. (FULL STROKE)
- Hydraulic pressure can be supplied manually by emergency operation.
100 mm of inner diameter 100 mm of cylinder Required flow rate is $78.5 \text{ cm}^2 * 10 \text{ cm} = 785 \text{ cc}$
98 times of pumping is required.

[13. ACCUMULATOR]

- Nitrogen filling amount in ACCUMULATOR: 80 bar
- When releasing the clamp, the hydraulic cylinder plays a role in increasing the time for maintaining the pressure.

[14. PRESSURE S/W]

- Factory setting pressure value: PH: 160bar PB: 142bar
- The on / off contact signal is sent by the pressure value acting on the hydraulic cylinder.
A signal to restart the pump by sensing the pressure drop threshold during clamp release.
So that the required pressure can be maintained at all times.

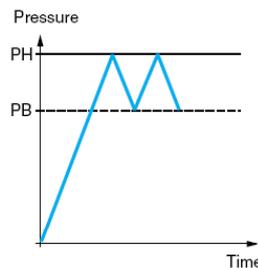
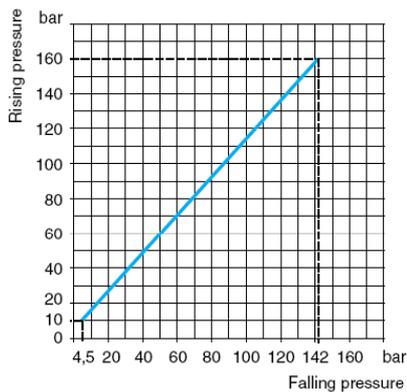


Pressure setting method

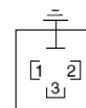
① Clockwise rotation pressure rise
Counterclockwise rotation pressure dro

Gradually increase the pressure and ②
The moment you fall, "just"
Pressure set point.

The following PH-PB pressure setting g
You can set it by reference.



Connector model
Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

[17. THROTTLE CHECK VALVE]

- Handwheel Clockwise rotation: Cylinder backward speed deceleration
Knob counterclockwise rotation: Increase cylinder propulsion speed
- The cylinder descent is driven by the spring force, so we need a device that can control its speed
A general throttle valve controls the flow rate through the valve to regulate the speed of the cylinder

13. Checking and Troubleshooting

A. Daily Inspection Items

- 1). Is the oil level of the hydraulic tank appropriate? : I see the oil level system
- 2). The discharge pressure of hydraulic PUMP
 - ① Is the operating pressure normal? : SETTING pressure
 - ② Is the pressure gauge's instructions unusually shaken?
- 3). Is there abnormal noise in the hydraulic pressure tank?
- 4). Is there leakage in equipment, piping, etc.?
- 5). ACTUATOR OPERATION
 - ① Is it operating at the specified speed?
 - ② Is it working smoothly?

B. Monthly inspection items

- 1). Analysis of Daily Inspection Records
- 2). Inspection of oil pressure tank surface
- 3). SAMPLING test of operating oil (moisture, viscosity etc.)
- 4). Check operation of ACTUATOR (operating speed, working pressure)
- 5). Leakage check on equipment, piping, and coefficient
- 6). Confirm operation of equipment that is not normally used, such as emergency equipment

C. Branch check item

- 1). Analysis of monthly inspection records
- 2). Inspection and cleanliness of AIR BREATHER
- 3). Remove dirt and debris from the top of the unit
- 4). Check the electrical connection status and operation status of relay, solenoid, etc.
- 5). Checking and checking the operation of instruments such as pressure gauge and pressure switch
- 6). Check of FLEXIBLE HOSE

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13.1 PUMP Fault and Check

broken	cause	Measures
Discharge does not occur.	Reverse direction of rotation.	Turn in the direction of rotation as specified.
	Clogging of suction pipe or filter for TANK	Clean the clog.
	Poor airtightness of suction pipe.	Inspect the connection of the pipe, fastening the screw Repair defective packing and bad.
	The viscosity of oil is too high.	Exchange with suitable viscosity oil
	Worn or damaged parts.	Replace or repair parts.
Pressure is not formed	RELIEF VALVE adjustment is incorrect	RELIEF VALVE adjustment
	Hydraulic oil is being bypassed with TANK.	Sequential verification of circuit pressure
	At least pressure GAUGE	Replace pressure GAUGE
There is a lot of noise. Pressure vibration is large.	Clogging of suction pipe or tank filter.	Clean the clog
	Blockage of the air tunnel of the oil tank.	Cleaning the AIR BREATHER
	The air in the casing is not completely exhausted.	No-load operation until the air is completely exhausted
	The pressure is exceeding the specified value.	Driving below regulated pressure
The heat is heavy.	Damage or wear of PUMP parts	Parts replacement or repair
	It is operated at a pressure higher than the specified pressure.	Adjust to regulated pressure
	RELIEF V / V to overflow	RELIEF V / V adjustment confirmation
	Part wear	OK Replace
	Hydraulic oil shortage	Hydraulic oil filling, leak check

13.2 Solenoid valve malfunction and check

broken	cause	Measures
error.	SPOOL Contamination of foreign matter in sliding part	Decomposition, washing
	Contact failure or disconnection	COIL contact and current resistance CHECK
	Damage of SPRING	SPRING exchange
Abnormal noise	SOLENOID core breakage	SOLENOID exchange
	Circuit subtraction not enough	Completely remove AIR
External LEAK	O-RING damaged or eliminated	New product exchange
	Poor mounting face	Mounting surface PITCH Surface roughness CHECK
Sol valve burnout	Is the voltage wrong or is the voltage fluctuation within the specification?	
	Is there a final MISS?	
	Is SOLENOID fully functional?	
	Is there a problem with the SOLENOID operating frequency?	
	Electronic operation V / V SPOOL is not stuck?	
Is ambient temperature, oil temperature too high?.		

13.3 Relief Valve Fault and Check

broken	cause	Measures
Pressure does not rise enough	Pressure setting is not suitable.	Inspect pressure gauge, set pressure correctly
	Poppet does not touch sheet correctly	Replace after confirming wear of poppet or seat After confirming deformation damage of SPRING for poppet, exchange Poppet decomposition dust cleaning
	There is a lot of leakage of other hydraulic equipment in the circuit.	Inspect each device in the circuit for repair or replacement
Fluctuations in pressure instability	Valve wear or seat part is not stable.	PISTON Replace the valve when the same phenomenon occurs after removing the hole dust.
	Poor pressure gauge	Pressure gauge exchange

13.4 Cylinder Failure and Inspection

broken	cause	Measures
Non-smoothness of jumping phenomenon occurrence and operation	Air mixture in operating oil	Perform Air Subtract
	Flow and control valve malfunction	Adjustment or exchange
	Piston and rod packing are not centered.	Cylinder only without load
	Piston rod packing is tight.	Apply MOS2 grease
Output (force, speed) drop	Lack of hydraulic oil	Check oil level, replenish
	Relief set pressure drop	Check, fix or replace relief valve
	Excessive operating resistance	Packing, load-head defective inspection
	Internal and external leakage	Piston and rod packing inspection, exchange
Piston packing, Such as rod packing	Poor pump	exchange
	Operational oil contamination	Causes and measures for operating oil contamination
	Damage of DUST WAIPER	Exchange inspection
	Damage to the rod surface	Repair or exchange

13.5 Motor failure and check

broken	cause	Measures
Rotation operation Impossible	Relief valve set pressure drop	Adjustment or exchange
	Lack of hydraulic oil	Replenishment
	Overheating of internal leakage or sliding parts	After disassembly, check whether each part is abnormal.
	Overload action	Check SYSTEM or connected devices
Excessive noise Occur	Operational oil contamination	Causes and measures for operating oil contamination
	Seal breakage and bearing wear around the shaft	Check exchange
	Abnormal wear or damage to internal sliding parts	Check exchange