Introduction

The bale clamp is a special attachment to the forklift for handling bales. It is specially designed to carry materials in the paper making, chemical fiber and cotton bale businesses and is widely accepted for its ability to handle nearly any type of baled supplies like paper pulp, waste paper, cotton bales, wool, hay or industrial scrap. The bale clamps designed and produced by us, testified by the market for many years, have matured and series products are being made now.

This operating manual is designed to familiarize operators with the equipment and its intended application.

The manual contains important notes concerning safe, proper and economic working with the equipment. Strict observation of these notes will help to avoid risks, reduce repair costs and down time, and increase the reliability and useful life of the equipment.

In addition to the instructions contained in this manual, all pertinent national and local codes and regulations relating to safety and environmental protection must be observed in full. This operating manual must be kept available for ready reference at the equipment's place of use.

The manual must be read and followed by all persons involved in work with or on the equipment. This work includes:

——Operating the equipment, including setting up for use, correcting trouble in use, collection and disposal of production scrap, cleaning and routine servicing, disposal of spent lubricants and other wastes.

——Inspection, maintenance and repair

——Handling

In addition to this operating manual and the safety codes and regulations in force at the place of use, standard practice relating to safe and proper working tools and machines must be observed at all times.

Contents

1 Safety

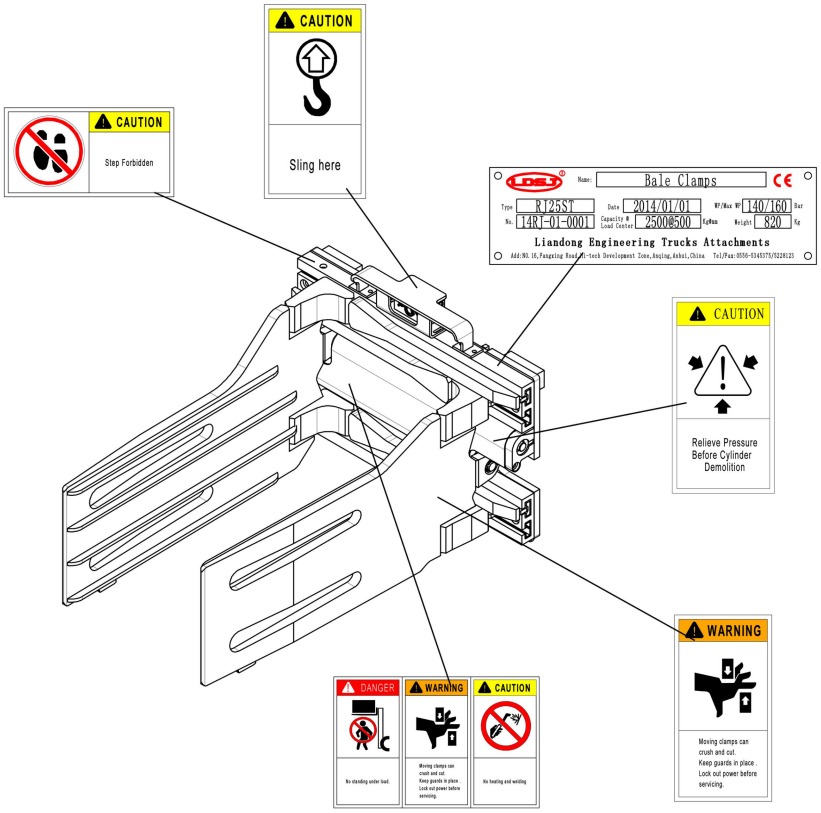
1.1 Safety notes and signs：

The following marks and symbols are used in this operating manual to highlight details holding special importance:

DANGER indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

WARNING indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

CAUTION indicates a hazard with a low level of risk which, ifnot avoided, could result in minor or moderate injury.



1.2 Organizational notes：

——Operating, maintenance and servicing/repair personnel must have read and understood the operating manual before commencing work with or on the equipment.

——All safety and danger notices on the machine and equipment must be observed.

——The machine and/or equipment must be shut down immediately in the occurrence of any safety-related change on the machine or equipment or in its workings and the fault or malfunction must be reported to the officer responsible.

——Working with and on the machine and/or equipment may only be carried out by responsible and Highly trained personnel of forklift truck, who must be of the legally required minimum age.

——Operating temperature range range of －20℃ to ＋40℃, relative humidity should be less than 85% , altitude should be less than 1000 meters, Wind speed does should be less than 5m / s.

1.3 Operator's safety notes

1.3.1 Assembly, installation and commissioning

Use exclusively suitable handling and lifting equipment of adequate load capacity（self weight of the bale clamp, as per nameplate attached）

WARNING!

KEEP CLEAR OF SUSPENDED LOADS.

1.3.2 Operation

——The machine and equipment must be inspected for visible damage and defects. Any changes occurring(on or in the machine or equipment itself and its workings)must be reported immediately to the officer responsible. The machine and equipment must be shut down immediately if conditions warrant.

——When working with the machine and equipment, we recommend running hydraulic

cylinder below 80℃, or failures may occur to the cylinder.

——When working with the machine and equipment, make sure that risk of injury to all persons due to the machine and equipment is satisfactory ruled out.

——The forklift operator must watch out for persons within his range of work and travel.

——All activities detrimental to the stability of the machine and equipment must be avoided.

——Maximum capacity always denotes lifting with two or more forks or load handling arms.

——Attention is required to the rated load capacity, maximum working pressure and load center stated on the nameplate.

——Moving, reciprocating or rotating parts of the attachment entail danger of pinching, crushing, snagging and dragging. Safe distance must be maintained at all times to prevent clothing, body parts or hair from being caught by such parts.

——Loads may only be handled when their pallets, crates, containers and packaging are in satisfactory condition.

1.3.3 Maintenance

——Mandatory regular inspection intervals, including those specified in the operating manual, must be observed. Inspection may only be carried out by authorized and qualified personnel.

——Maintenance and repair work must only be carried out when the machine and equipment is supported on a level and firm surface and is secured from rolling and tipping.

——When replacing components and assemblies, they must be fastened securely to hoisting equipment so as to eliminate all danger. Use exclusively appropriate hoisting equipment and load handling devices in satisfactory condition and of adequate capacity. Keep clear of suspended loads.

——Do not make any alterations, additions or conversions to the machine or equipment that might affect their safety unless duly authorized by the supplier. This includes fitting and

adjusting safety valves and other safety devices and welding work on supporting members.

Caution!

Unauthorized alterations to any parts and assembly or installation other than as specified in the instructions will render all guarantees null and void.

——If safety devices need to be dismantled for setting up, maintenance or repair work, they must be re-installed and checked for proper function immediately on completion of the work.

Spare parts must meet the manufacturer's technical specifications. This is assured by using exclusively original spare parts.

Caution！

All screws or bolts loosened for maintenance and repair work must be tightened at the permissible torque. Replace screws and bolts that have been retightened three times.

Note the following tightening torques which are valid for screws with connecting surfaces according to ISO4762， ISO4014， ISO4032 etc.：

Screw/bolt rating	8.8	10.9	12.9
M 10	45N.m	66N.m	77N.m
M12	77N.m	115N.m	135N.m
M16	190N.m	280N.m	330N.m
M20	385N.m	550N.m	640N.m

——Work on hydraulic equipment may only be carried out by personnel specially trained and experienced in hydraulics.

——All hydraulic pipes, hose lines and couplings must be inspected regularly for leaks and visible damage. All damage must be repaired immediately. Leaking oil can cause accidents and is a fire hazard.

1.4 General hazard notes

Serious injury to persons or damage to equipment and property may be caused as a result of:

——Improper use of the equipment

——Incorrect operation of the equipment

——Inadequate maintenance and servicing

Failure to observe the safety notes contained in the operating manual can lead to injury or even death. This applies particularly to improper use of the equipment.

Persons under the influence of drugs, alcohol or medications affecting normal responses must not be allowed to perform any work with or on the machine or equipment.

The machine and equipment must not be operated in explosion-hazard areas unless expressively designed and authorized for use in such areas.

For preventions of fire, burn, electric shock, chemical hazards (toxic exhaust, etc.), risks of electromagnetic interference, noise and other vibration, please refer to the machine manual.

2 Mounting Requirements

Before any use of the bale clamp, two hydraulic control systems and four HP oil tubes with inside diameter of 7mm(G1/4") min are to be furnished, with a one-way hydraulic lock installed inside the control valve to hold the bale from falling off in the event of any emergency like sudden failure of the forklift.

Before mounting the clamp, the user is advised to clean up the carriage and make sure the surface is free of any defect, and the surfaces where the carriage joins the upper and lower slide blocks of the clamp are lubricated. In addition, it is also crucial to confirm the compatibility between the bale clamp and the forklift in terms of their carrying capacities and verify the rated carrying capacity and center distance of the forklift after the clamp is mounted.

Rated carrying capacity

The rated carrying capacity of the bale clamp is the nominal carrying capacity defined for the clamp according to its mechanical structure. As this rated capacity does not include the nature of the loads or the operation conditions, the combined forklift-clamp carrying capacity is not stationary and is subject to the loads, the operation conditions and the combined forklift-clamp capacity at a specific height.

Real carrying capacity

The forklift vendor or manufacturer should calculate the real combined forklift-clamp capacity.

Please refer to the nameplate attached to the clamp for detailed information.

⚠ Dangerous

Do not handle any load unless you have checked the rated load on the nameplate attached to the bale clamp to make sure that the load to be handled is admissible.

Before installing the hydraulic part, make sure that the hydraulic system of the assembly is the same as shown in the hydraulic diagram of the User's Manual, and connect the part as indicated in the diagram. Make sure that the hydraulic tube is compatible with the hydraulic cylinder of the bale clamp in terms of the rated pressure, and that the rated pressure of the flexible/rigid tubes are larger than 28MPa. Make sure that the parameter settings of the safety valve are compatible with the working pressure of the hydraulic cylinder (the recommended pressure to be used is 14MPa). Verify the inlet and outlet of the hydraulic tube and make sure that they are in the same direction as the movement of the control lever. The flow and pressure of the hydraulic system are detailed in the table below:

Model	Pressure (bar)		Flow (L/min)					
			Side shift			Clamping		
	Min	Max	Min	Recommended	Max	Min	Recommended	Max
RJ**ST	35	180	4	23	40	15	38	40

Note:

① Flows lower than the min can result in malfunction of the clamp.

② Flows higher than the max can result in overheating and thereby degrade the system performance and reduce the service life of the hydraulic system.

The dimension of the forklift carriage is shown in figure 1 below (to ISO2328-2007) and detailed in the table below:

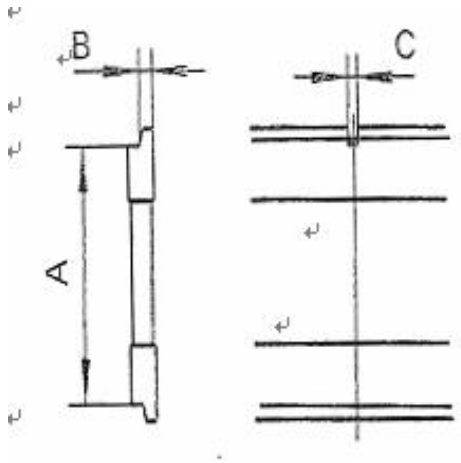


Figure 1

Installation grade	A		B		C	
	Min	Max	Min	Max	Min	Max
II	380	381	15	16	15.2	16.8
III	474.5	476	20.5	21.5	18.2	19.8
IV	595.5	597	24.5	25.5	18.2	19.8

3 Mounting Instructions

3.1 Clean up the forklift carriage and make sure it is smooth and flat on the surface and free of any damage on the central notch.

Note: Before installing the clamp on the forklift, first release the lock bolt on the lower hook and remove the lower hook

Note: You must be dismantled under the hook, you can install attachments.

3.2 Run the forklift to behind the attachment, align it, lean the gantry forward till the convex block near the upper hook is in the nearest notch between the upper crossbeam of the carriage and the convex block. Lift the carriage till it leans against the underside of the attachment

hanging board and lift the attachment 50mm off the pallet.

Note:

（1）It is possible that the attachment is not fully aligned with the carriage when the convex block on the upper hook is in the notch on the carriage crossbeam. To ensure the attachment is as near the middle part of the carriage as possible after it is mounted, please adjust the position convex block by the upper left hook according to the layout of the notches on the upper crossbeam of the carriage.

（2）The upper hook should be hung properly on the upper crossbeam of the carriage, while the convex block on the upper left hook should be in the appropriate notch on the crossbeam.

（3）It won't be possible to install the lower hook if the convex block on the upper hook is not in the notch on the upper crossbeam.

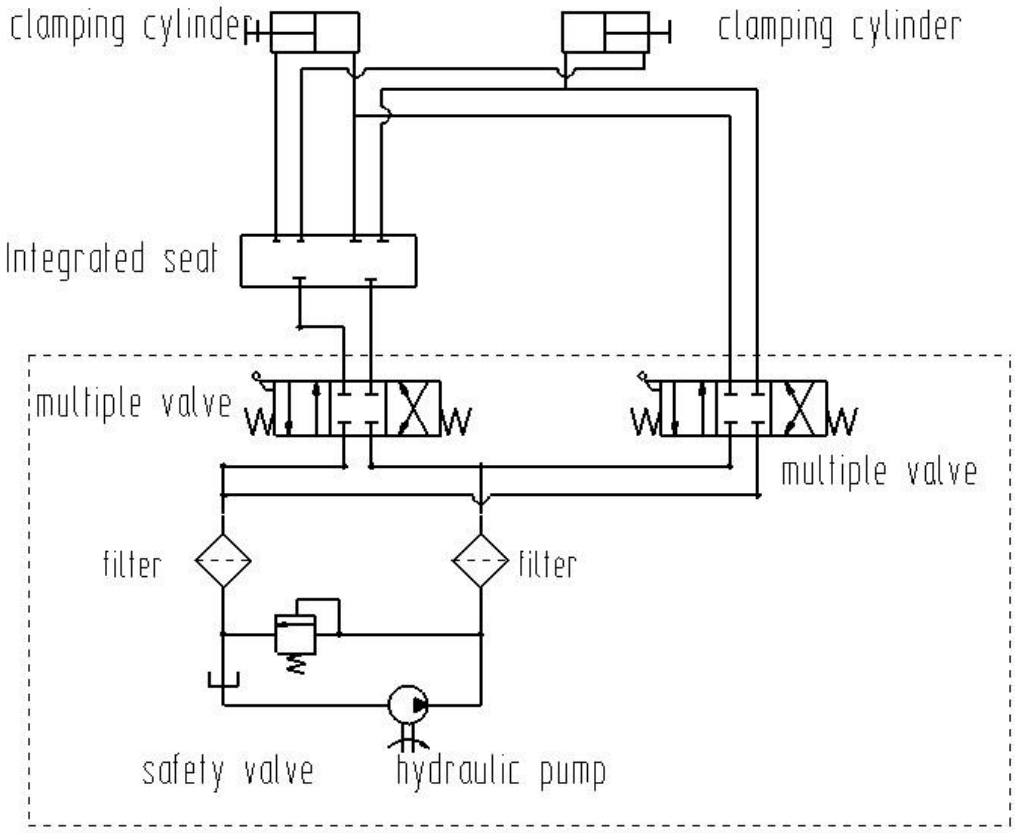
3.3 Join the lower hook to the lower crossbeam of the forklift carriage:

Install the lower hook bolt and tighten up the bolt by hand. Hit the lower hook gently as directed by the arrow till it is fully fitted with the lower crossbeam of the carriage. Finally lock up the bolt (to the moment of 144N.m～155N.m).

3.4 Connect the rubber hose:

Select a proper length of rubber hose and join it to the connector of the dividing valve of the attachment. Flush it as described below to avoid damage to the hydraulic part of the attachment. Start the forklift and operate the multi-way valve in each direction about 30s to remove the residual dirt into the rubber hose to the oil tank and filter.

3.5 The hydraulic circuit of the bale clamp mainly consists of cylinders, a hydraulic pump, a multi-way valve, a safety valve, filters and a number of oil tubes and is composed in the way shown below:



3.6 Apply a coat of lubrication grease over the surface of the four slide bars (i.e. T-bars).

⚠ Warning

When the clamp is mounted, first apply lubrication grease and debug the clamp under zero and small load to verify it rotates and clamps correctly. The clamp will not be used normally unless it is free of any abnormality.

During the inspection, please note that the multi-way valve handle of the forklift moves in the right direction that corresponds to the hydraulic movement of the attachment in conformity with the following standard:

Function	Attachment movement	Valve handle movement
Side shift	Right shift	Backward or upward
	Left shift	Forward or downward
Holding	Tighten	Backward or upward
	Release	Forward or downward

Before any normal work is started, the clamp should be preheated and should run from side to side, hold and release a number of times without load before it can start work under normal load.

Note: The direction of the hydraulic movement should be that as observed from the driver's position.

4 Operation Instructions

4.1 Pre-operation inspection

4.1.1 Before any operation, first operate the multi-way valve handle to make yourself intimate with the control functions of the handle and satisfy yourself that the handle movement complies with the foregoing Control Functions of the Handle.

4.1.2 Check that the attachment moves levelly and does not hit or cut on the rubber hose.

4.1.3 Do not start any operation and report to your upper leader any abnormality of the attachment.

4.1.4 Check the fixing nut of the cylinder and see if the locknut and split pin are securely fixed.

4.1.5 Check if there is any leakage at the joint or at the end of the piston rod.

4.1.6 Check the two arms work synchronously. If not, adjust the throttle valve as described below:

Note: It is crucial to remove the cylinder damper first.

（1）Release the locknut on the choke valve, screw the plug to the end and turn back 3 circles.

（2）Place the clamping arms to full open.

（3）Clamp and hold till one of the arms runs to its full stroke and then measure the remaining stroke of the other arm.

（4）For any non-synchronization in excess of 50mm, turn the cylinder that has first reached the bottom half a circle inward.

（5）Repeat step (2) to step (5) till the non-synchronization is limited to within 50mm.

4.1.7 Before it holds any load, have the clamping arms work a number of dry cycles and discharge the air in the system to the oil tank.

4.2 Operation

4.2.1 Make sure the load handled is not heavier than the rated carrying capacity labeled on the attachment.

4.2.2 The load should be handled along the middle part.

4.2.3 The clamping pressure is normally shop adjusted. Users of specific requirements should also select the appropriate clamping pressure to avoid damage to the surface of the load clamped.

4.2.4 Any of the following operation is deemed incompliance and should be prohibited:

☆ People on the bale handled by the forklift;

☆ Use of the attachment on any improper occasion;

☆ Load in excess of the rated settings of the attachment;

☆ One bale over the other, with the lower one being held on the clamping board only;

☆ Forward operation of the forklift at the time of any oversize load on it;

☆ External impact on the working attachment;

☆ People standing under the forklift where the bale it holds may cover when it falls;

☆ Stopping, turning, switching uphill or switchover of fuel uphill for any double-fuel forklift;

☆ Electrical connection to the clamp for welding purpose;

☆ Working against the local traffic rules;

☆ Shutdown of the forklift without landing the bale or pulling down the manual brake;

☆ Bales in contact with the ground when handled by the forklift; the load handled or the clamping board should be 50mm min above the ground at the lowest point during operation along flat ground, and 100mm min above the ground at the lowest point during operation outdoors or under poor road conditions;

☆ Use of the attachment before removal of any failure in it.

4.2.5 For energy efficiency, the clamping force should not be more than just enough to handle the load reliably.

4.2.6 Lift the load steadily to maintain stability of the forklift.

4.2.7 Operate the control lever continuously and steadily to avoid hydraulic impact that may damage the hydraulic elements and also to prevent impairment to the stability of the forklift

when the load is lifted to a certain height.

4.2.8 The operator should select the right speed of the forklift according to the following conditions: forklift stability, load weight, road condition, slope size, space, presence of any obstacle at the workplace or wind force and the like.

4.2.9 The following operations should be avoided:

☆ The forklift continues to run at high speed when the bale is lifted substantially high;

☆ The bale is not held from the middle part of the bale;

☆ Clamp before the clamping board of the bale clamp touches the bale;

☆ The attachment is hauled before the load placed on the ground is lifted from the ground, which may result in damage to the parts.

5 Maintenance Instructions

5.1 Normal requirements

5.1.1 Unless with prior written consent, the user should not modify or add any operation that may affect the operation capacity or operation safety.

5.1.2 Any user that tries to mount the attachment to the forklift by himself instead of by the manufacturer will be required to identify the forklift to distinguish it from the attachment and to indicate the correct combined forklift/attachment carrying capacity when the load is handled at its load center and lifted to the max height.

5.1.3 All nameplates and labels should be clearly identifiable during maintenance by the user.

5.1.4 The attachment should be checked for any leakage in the cylinder or oil tube, and the normal fitment of the lower hook before any work is started with the attachment every day.

5.1.5 The attachment should be checked for any flexibility in the rubber hose joint, cylinder joint and the lower hook bolt, as well as the clearance between the lower hook and the lower crossbeam per 100 service hours. Any excessive clearance should be readjusted.

5.2 Training of the operators

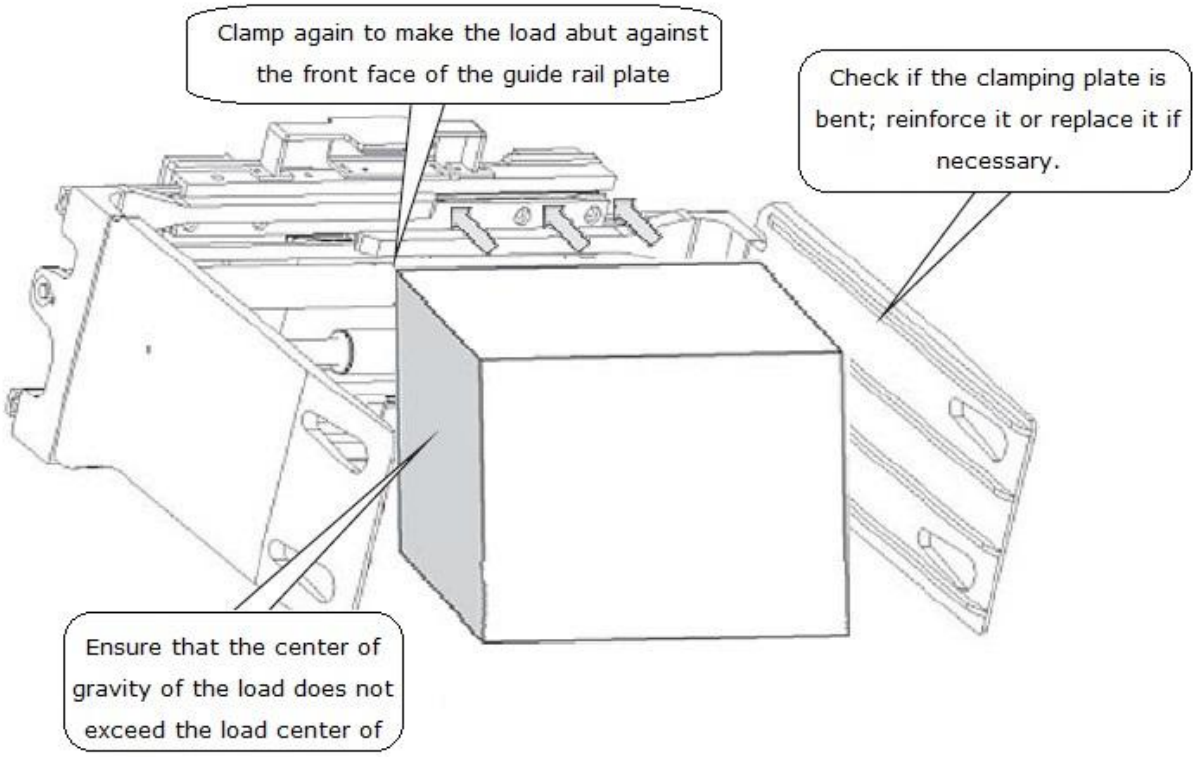
No operator is permitted to operate the forklift unless he is properly trained and duly authorized. Applicable rules should be provided for the operators in the course of trainings on forklift safety.

5.3 when maintenance operations, first you must disconnect the circuit and oil, to prevent misuse causing accidents.

5.4 altitude of Troubleshooting: When is a failure at high altitude， Make Forklift Mast down to touch the ground roll folder, the Forklift attachments will be remove from the door, and then repair, waste hydraulic oil processing should comply with local laws and regulations.

6 Failures Removal

6.1 For outward inclination of the outer layer of load

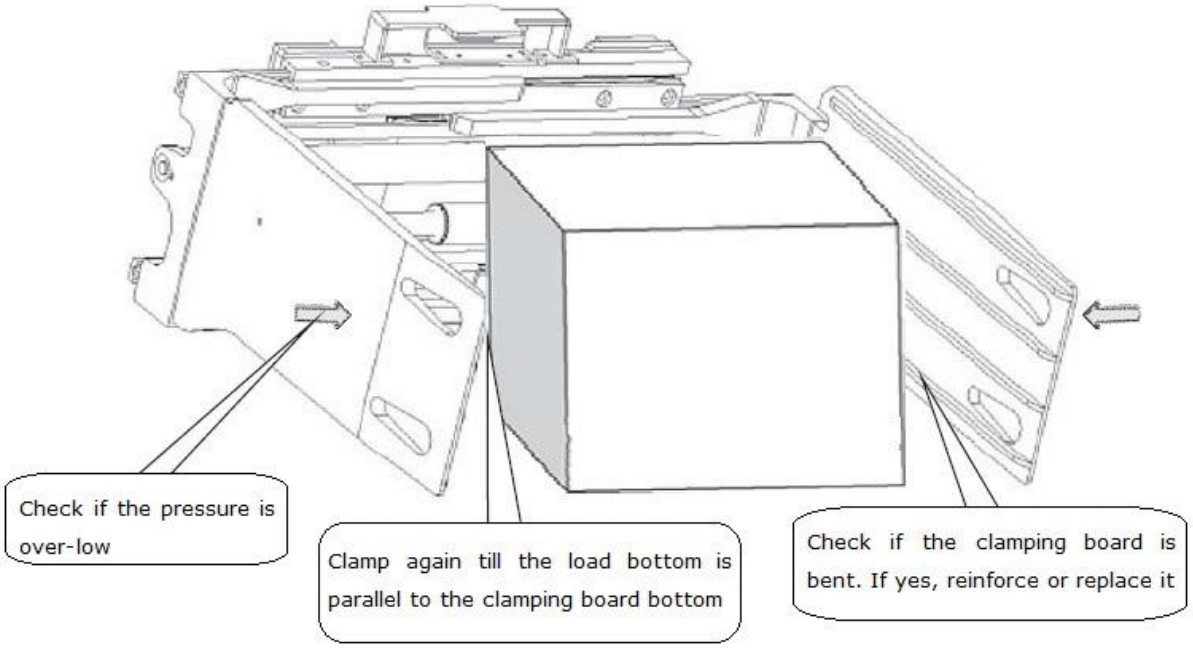


Clamp again to make the load abut against the front face of the guide rail plate.

Check if the clamping plate is bent; reinforce it or replace it if necessary.

Ensure that the center of gravity of the load does not exceed the load center of the attachment.

6.2 For out inclination of outer layer of load



Check if the pressure is over-low.

Clamp again till the load bottom is parallel to the clamping board bottom.

Check if the clamping board is bent. If yes, reinforce or replace it.

7 Special Statement

Thank you for using products of Anqing Liandong Attachments Co., Ltd. To fully protect your rights and interests, please read this statement carefully.

7.1 Warranty Period Provisions of Anqing Liandong Attachments:

(1) For brand-new products: 24 months from the date of delivery to the first carrier, or 4000 hours of product use, whichever comes first.

(2) For economy-grade and non-standard customized products: 12 months from the date of delivery to the first carrier, or 2000 hours of product use, whichever comes first.

7.2 Obligations of Buyers and End Users:

(1) To ensure the smooth implementation of the warranty for Anqing Liandong Attachments, buyers and end users must strictly comply with the provisions of the User Guide of Anqing Liandong Attachments Co., Ltd. during the installation, commissioning, operation and maintenance of the company's products.

(2) Buyers and end users may only repair the purchased attachments with the authorization of Anqing Liandong Attachments Co., Ltd., and shall not arbitrarily remove or replace any parts on the products.

(3) Any unauthorized repair, modification of products of Anqing Liandong Attachments Co., Ltd., use of parts not provided by the original Anqing Liandong Attachments Co., Ltd., or violation of the relevant provisions in the User Guide, Inspection Specifications, Operation Guide and Maintenance Manual of Anqing Liandong Attachments Co., Ltd. will result in the loss of warranty eligibility.

(4) Anqing Liandong Attachments Co., Ltd. shall not be liable for any loss, personal injury or property damage (including indirect loss or damage) that occurs after the buyer or end user has owned or started using the company's attachment products.

7.3 Notes:

(1) Anqing Liandong Attachments Co., Ltd. does not guarantee special operations that exceed the rated scope using attachment products.

(2) The warranty scope of Anqing Liandong Attachments Co., Ltd. does not include wear and tear during normal use, consumption, as well as normal or regular maintenance work.

(3) Anqing Liandong Attachments Co., Ltd. does not provide warranty for any situations beyond the content of this Warranty Policy and the relevant product clauses stated in the sales contracts of Anqing Liandong Attachments Co., Ltd