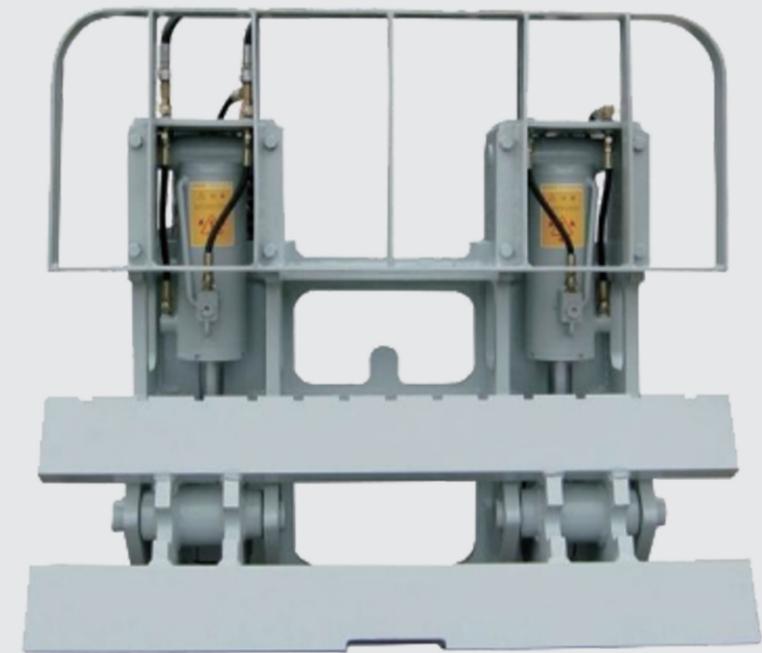




## Tipping Carriage Usre's Manual



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## Preface

The — tipping carriage is designed to flip goods using the tipping function of a tipping cylinder, enhancing transportation efficiency while reducing labor intensity and minimizing damage to goods. Our company has independently designed and manufactured this tipping carriage for many years. Through continuous improvements and technical breakthroughs in key components, as well as comprehensive testing, Now it has gradually formed a series of products.

This user manual is designed to help users understand the performance of the tipping carriage more easily, and also benefit users. It can be better operated according to the rules.

The important suggestions contained in this user manual are conducive to the safe, reliable and economical use of this tipping carriage. Therefore, users should pay full attention to this user manual to reduce dangerous accidents and shorten the time of failure

The downtime of the machine is reduced and the maintenance cost is reduced, so as to improve the reliability and service life of the tipping carriage.

This user manual is a supplement to the relevant accident prevention and environmental protection regulations of the country where it is located. It should be placed at the workplace for common use. Any person assigned to use this tipping carriage or whose work involves this tipping carriage must read and in accordance with this user manual, such personnel include:

- Operators: responsible for installation, troubleshooting and machine maintenance.
- Maintenance personnel: responsible for inspection and repair.
- Transport personnel: responsible for handling, loading and unloading.

In addition to complying with this user manual and the safety regulations of the country and specific use site, users should also comply with generally accepted safety and operating regulations in this field.

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## 1. Safety matters

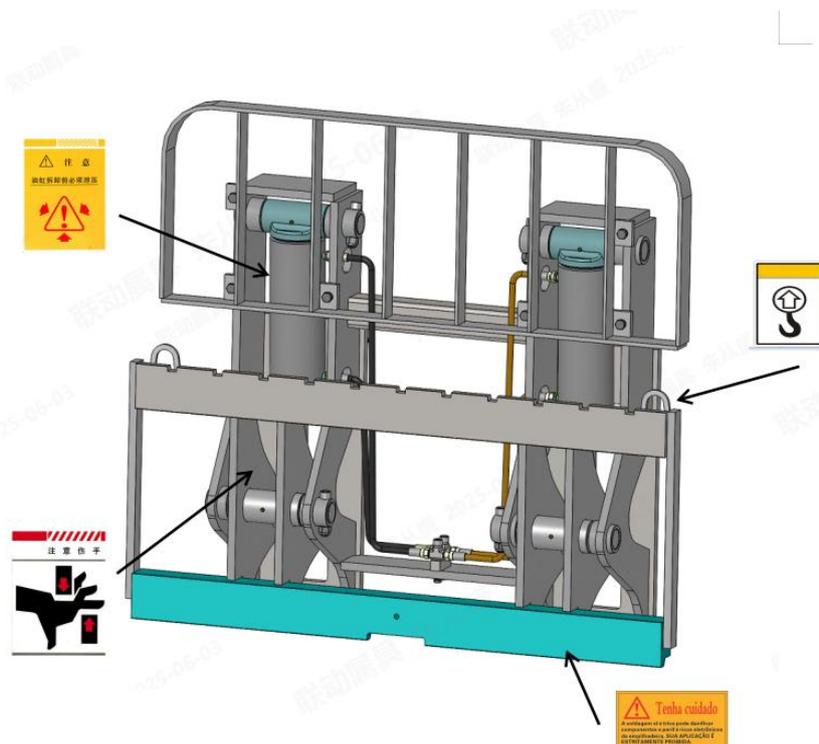
### 1.1 Safety tips and signs

This hand is designed to understand and master safety signs and danger signs so that you can better comply with safety procedures. The booklet contains the meanings of safety signs such as "Danger", "Warning" and "Attention". The specific meanings are explained as follows:

⚠ Danger is used for large, direct threat situations. If such danger cannot be avoided, it is serious casualties will be caused.,

⚠ Warning is used for potentially dangerous situations that can be created if such dangerous situations cannot be changed serious casualties.

⚠ Note: Used in potentially dangerous situations, if such dangerous situations cannot be changed, it may be possible to physical injury to personnel or property damage.



## **1.2 Management tips**

—— Users, maintenance and repair personnel must read and understand this user manual in advance.

—— Pay attention to all safety tips and danger warnings on the tipping carriage.

—— In case of any change in the overturning frame itself or the operating state of the machine involving safety problems, stop immediately, and inform the relevant departments.

—— The operation of the tipping carriage or the operation involving the operation of the tipping carriage shall be performed by a specially responsible and trained person, in addition to complying with the relevant legal minimum working age provisions.

—— The working environment temperature is  $-20^{\circ}\text{C} \sim 40^{\circ}\text{C}$ , the relative humidity should be less than 85%, and the altitude should be less than 1000 meters.

## **1.3 User safety rules**

### **1.3.1 Operation requirements of tipping carriage**

#### **1.3.1.1 Wear safety uniform and fasten seat belt.**

All operators must wear appropriate personal protective equipment, such as work clothes, helmets, safety shoes and safety gloves should also follow the following rules:

> Fasten your seat belt before work.

> Do not wear loose, damaged or oily clothes.

> No jewelry is allowed to be worn during operation, maintenance and repair.

> Clean and maintain the tipping carriage regularly according to the specifications in the manual to ensure that it can work properly.

#### **1.3.1.2 Requirements for tipping carriage operators:**

> Good physical fitness, good mental state, and the ability to read the user manual. Fatigue work and work under the influence of alcohol or drugs are not allowed.

> Do not chat with others when operating the tipping carriage and ensure that there are no undesirable persons in the working area.

>Do not use the tipping carriage to carry loads without knowing the rated load, otherwise it may damage the tipping carriage and leads to a significant danger.

 **Danger**

**Overloading can cause forklift overturning, causing forklift damage, and may cause casualties.**

>The operator is not allowed to leave the operating room when the load on the tipping carriage has not been unloaded.

>When the operator's field of vision is limited, or when working in a dangerous place, the operator must be signaled work under the direction of the machine.

>The operator must be a qualified forklift tipping carriage operator who has been professionally trained and guided.

### 1.3.2 Installation and commissioning

Only suitable and sufficiently load-bearing transportation and lifting tools are allowed (see the attached inscription for the weight of the tipping carriage plate).

 **Danger**

**Do not stand under the lifting tipping carriage.**

### 1.3.3 Operation

—— Check whether there is obvious damage or failure of the tipping carriage at least once a shift. If any abnormal situation occurs, report to relevant departments or personnel immediately, and stop work immediately to eliminate the fault in time.

—— The company recommends that the hydraulic cylinder work below 80°C, and the temperature above 80°C may cause the cylinder to fail.

—— When the tipping carriage is in operation, ensure that any potential hazards to human injury have been eliminated.

—— Abandon any working mode that is detrimental to the stability of the machine.

—— Maximum load refers to the load capacity of two forks (or additional tipping buckets) at the same time.

—— Pay attention to the rated load on the nameplate, the recommended working pressure of the system and the rated load center distance.

—— The movement, swinging and transfer of the tipping carriage will form dangerous factors due to its own compression, shearing and pulling actions. Operators should keep a certain safe distance from the tipping carriage to prevent clothing corners, hands and feet, hair and other parts from being caught in the machine and causing personal injury.

—— Only when the pallet, box, liquid container and package are intact can the goods be moved.

#### 1.3.4 Maintenance

—— The overturning frame must be re-inspected according to the specified or given re-inspection period in this user manual, and this work should be carried out by a special person.

—— Ensure that the tipping carriage is maintained and repaired on a flat and solid foundation, and ensure that there are no pits on the ground  
No gullies.

—— When replacing parts and components, attention should be paid to the firmness of lifting tools to prevent accidents. Only suitable lifting and load tools with no technical faults and sufficient bearing capacity are allowed to be used. Lifting is prohibited

Stay and work with the cargo.

—— Without the permission of the manufacturer, do not install or modify the tipping carriage in a way that is harmful to safety, and do not carry out welding work through the tipping carriage.

 **Warn**

**The consequences of modifying the components are at your own risk; if the installation is not in accordance with the requirements of this user manual, there is no warranty.**

—— If it is necessary to disassemble the parts of the tipping carriage during assembly and comprehensive maintenance, assembly and maintenance shall be carried out after work is over, it should be put back immediately and tested correctly.

—— The use of spare parts must meet the technical requirements put forward by the manufacturer, which can be guaranteed by the original equipment of our company.

**⚠ Attention**  
**When maintaining, pay attention to tightening the bolts with the given torque. After three times of tightening, all bolts should be replaced.**

Refer to ISO 4762, ISO 4014, ISO 4032, etc., and note the following bolt torque:

Bolt grade	8.8	10.9	12.9
M10	45NM	66NM	77NM
M12	77NM	115NM	135NM
M16	190NM	280NM	330NM
M20	385NM	550NM	640NM

—— The maintenance work of hydraulic parts must be carried out by personnel with hydraulic professional knowledge and experience. Please relief pressure before repairing hydraulic pressure pipes.

—— Regularly check the sealing performance and damage of all hydraulic pipes, conduits and connectors, and completely remove faults. Spilled oil may cause injury and fire.

#### **1.4 General hazard statement**

The following causes may lead to serious personal injury and property damage:

—— Improper use.

—— faulty operation.

—— Maintenance work is not sufficient.

—— Ignoring the safety tips in this user manual may lead to injury or even death.

Special attention should be paid to avoid illegal operation.

—— Do not use this tipping carriage in places where there is an explosion risk unless it is specially designed and authorized.

—— For fire prevention, heat protection, electric shock, chemical danger (toxic exhaust gas, etc.), electromagnetic interference danger, noise danger, vibration danger and other protection refer to the forklift manual.

## 2. Installation operation guide

### 2.1 Installation requirements

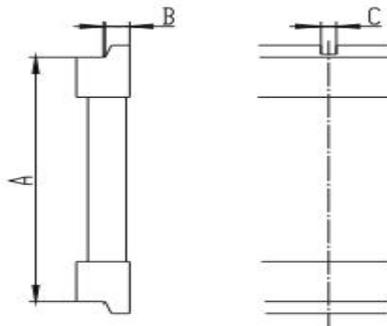
2.1.1 Before installing the hydraulic section, first confirm that the entire hydraulic system is consistent with the hydraulic principle diagram in this user manual and connect according to the diagram; verify whether the rated pressure of the hydraulic pipes matches the requirements for the tipping carriage hydraulic cylinder, where the rated pressure of both flexible and rigid hoses must be greater than 30 MPa; ensure that the safety valve parameters match the working pressure of the hydraulic cylinder (it is recommended to use a pressure of 14 MPa). Confirm the inlet and outlet directions of the hydraulic pipes to ensure they are correct the control lever moves in the same direction. Refer to the following table for the specific flow and pressure values of the hydraulic system:

model	Pressure value (Bar)		Flow value (L/min)		
	min	max	min	recommend	max
QF**F	35	160	19	38	57

① Less than the minimum flow will cause the movement to be unstable.

② Exceeding the maximum flow rate will cause overheating, which will reduce system performance and shorten the service life of the hydraulic system.

2.1.2 The forklift fork frame shall comply with ISO standard 2328, equivalent to the International Association of Industrial Vehicles (ITA) standard, see the chart for details.



Install 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

2.1.3 To comply with industrial standards, ensure that the attachment's movement direction corresponds to the operation direction of the forklift multi-way valve handle as indicated in the following table.

Controller control function table

Function	Verb	Move the handle of the multi-way valve
The cargo tipped over	Leaning forward	Move forward or downward
	Reclined	Go back or go up

## 2.2 Installation method

### 2.2.1 Install the forklift

- (1) Loosen the four nuts on the lower hook and remove the lower hook;
- (2) Clean the forklift fork rack to ensure that the surface is smooth and flat, and the central slot shall not be damaged;
- (3) Drive the forklift to the back of the tipping carriage, align it, lean the mast forward, and insert the positioning block into the middle of the crossbeam of the fork frame. The fork lift is raised to the back of the tipping carriage in the groove, and the tipping carriage is lifted to a height of 50mm above the pallet.

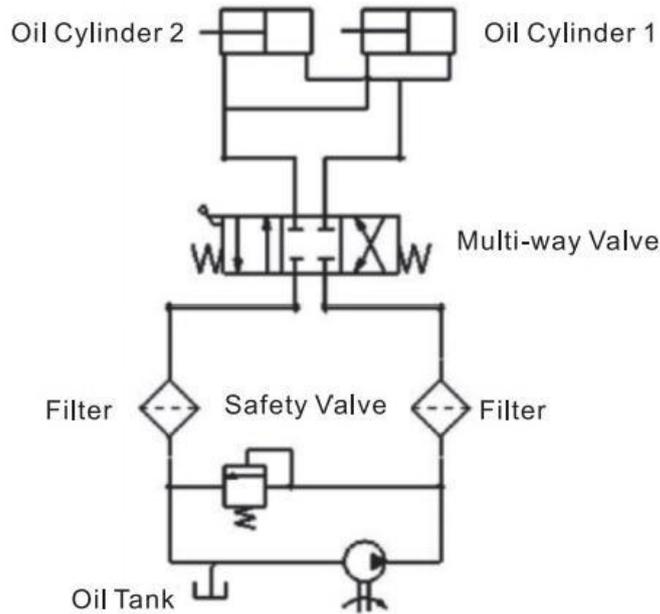
(4) Put the bolts, washers and nuts loosened just now into the lower fork of the forklift truck in the order they were loosened hanging beam.

### 2.2.2 Connect hose

Select an appropriate length of high-pressure hose and connect it to the coupling on the base of the tipping carriage. The coupling thread is M18×1.5 with a flat seal.

Hydraulic circuit of the pitch fork mainly consists of a cylinder, hydraulic pump, multi-way valve, safety valve, filter, and some oil tubes, with the

formation of hydraulic circuit is as follows.



### 2.3 Operation inspection

2.3.1 Before starting work, first operate the multi-way valve handle to understand the control functions of each handle. The operation of the handles should comply with the 'Handle Control Function Table' mentioned earlier.

2.3.2 Check whether the movement of the fixture is smooth and whether it touches or cuts the hose.

2.3.3 If the equipment is abnormal, do not perform the operation.

2.3.4 Check the cylinder fixing nut to see if the locking cap and opening pin are installed well.

2.3.5 Check whether the joint and cylinder are leaking.

2.3.6 Before tipping the cargo, the tipping carriage should be emptied and tipped several times to drain the air in the system into the oil tank.

## 3. Instructions for use

The load and load center distance shall not be greater than the range specified on the nameplate of the tipping carriage. When the load center distance is greater than the rated load center distance, the actual carrying capacity of the equipment will be reduced; after the forklift stops working, the equipment must be checked

The hydraulic circuit is depressurized so that some necessary maintenance can be done later.

The following operations are illegal and must be prohibited

★ Use a single fork to carry goods;

- ★ The load exceeds the rated value of the equipment;
- ★ The tipping function of the tipping carriage is used to scoop the goods;
- ★ Forklift overturns when turning;
- ★ The positioning block is not correctly inserted into the center slot of the crossbeam of the fork rack during installation;
- ★ Using accessories in inappropriate situations;
- ★ When the accessory is faulty, it is still used without elimination;
- ★ People can stand in the area covered by the object that may fall when the object tilts;
- ★ Weld on the fittings;
- ★ Personnel carrying on the fork or accessory;
- ★ The accessory is subjected to external force impact during operation;
- ★ The volume of goods is too large.

## 4. Common faults and troubleshooting

4.1 The fork rack cannot be overturned or unable to overturn

4.1.1 Check whether the pressure and flow of the system meet the requirements;

4.1.2 Check whether the structural parts are deformed, if the deformation has occurred, the deformation should be eliminated or the damaged parts should be replaced;

4.1.3 Check whether there is leakage in the tipping cylinder or hydraulic circuit

## 5. Daily maintenance

5.1 Before working every day, the equipment must check whether there is leakage in the cylinder or oil pipe, and whether the lower hook is cooperating normally;

5.2 Every 100 hours of use, inspect the hose connections, valve connections, cylinder connections, and securing bolts for the lower hook to ensure they are not loose; check if the gap between the lower hook and the lower crossbeam meets the requirements. If the gap is too large, it must be readjusted.

## 6. Special declaration

Thank you for using products from Anqing Lian Dong Attachments Co., Ltd. (hereinafter referred to as Lian Dong Attachments Co.). To fully protect your rights and interests, please read this statement carefully.

1. The warranty period of the forklift accessory products of the affiliated company is as follows:

- (1) 12 months from the date when the buyer receives the goods;
- (2) 1000 hours of legal working days from the date of installation of the equipment.
- (3) The above two items are comprehensively measured: the one who arrives at the deadline first shall prevail.

2. Purchasers and end users shall:

- ◆ To ensure the smooth implementation of warranty matters for Linked Attachments Co., Ltd., purchasers and end-users must strictly adhere to the company's user manual when installing, commissioning, using, and maintaining the products.
- ◆ Purchasers and end-users may only repair purchased attachments after obtaining authorization from the Linkage Attachments Company, but they must not arbitrarily disassemble or replace any components of the product.
- ◆ Any repairs, modifications, or use of non-Link Attachments Company provided parts, or any violation of the provisions in the Link Attachments Company's user guides, inspection standards, operating guidelines, and maintenance manuals, will result in the loss of warranty eligibility.
- ◆ The Associated Equipment Company shall not be liable for any loss, damage or loss to person or property (including indirect loss or damage) that occurs after the buyer or end user has owned or started to use the company's equipment.