

PRODUCT MANUAL



Beauway Tail-Lift

Anhui Beauway Co., Ltd. is a high-tech enterprise specializing in the manufacture of "automobile hydraulic tailgate" products.

Preface

Thank you for your trust and support in the Biaowil brand! At the same time, we sincerely hope that you carefully read and understand this manual before using the Biaowil Tailboard, so that you can use it correctly and safely. This will greatly help extend the service life of the tailboard and make it your true helper.

The Biaowil tailboard adopts the most popular five cylinder fully automatic balancing hydraulic system technology, and its hydraulic system has intelligent storage and memory function for relative positions. This product is the latest generation of on-board transportation and loading and unloading tools in China, carefully designed and continuously improved through the joint efforts of all staff of Biaowil Company. It is very convenient to install, operate, and use. Our company has a complete range of products suitable for installation on various types of trucks and trailers with main bodies, meeting the needs of different industries. Sometimes, the tailboard can also be used as a fixed or movable platform to adjust the height difference between the truck and warehouse cargo platform. Sometimes, it can also be directly used to replace the closing of the car tailgate.

This manual will focus on introducing the main structure, working principle, operating methods, safety precautions for use, maintenance

and upkeep, fault analysis and solutions, etc. of the tailboard.

The warranty period for the Biaowil tailboard products is one year (in special circumstances, the contract shall prevail), and lifelong maintenance services are provided to all Biaowil tailboard users.

The warranty form and product warranty certificate for the Biaowil tailboard are both attached at the end of this manual. If your tailboard malfunctions during use and cannot be used normally, please refer to the relevant content in the manual to preliminarily determine the cause and location of the malfunction, and then follow the "Fault Analysis and Solution" provided by us for handling.

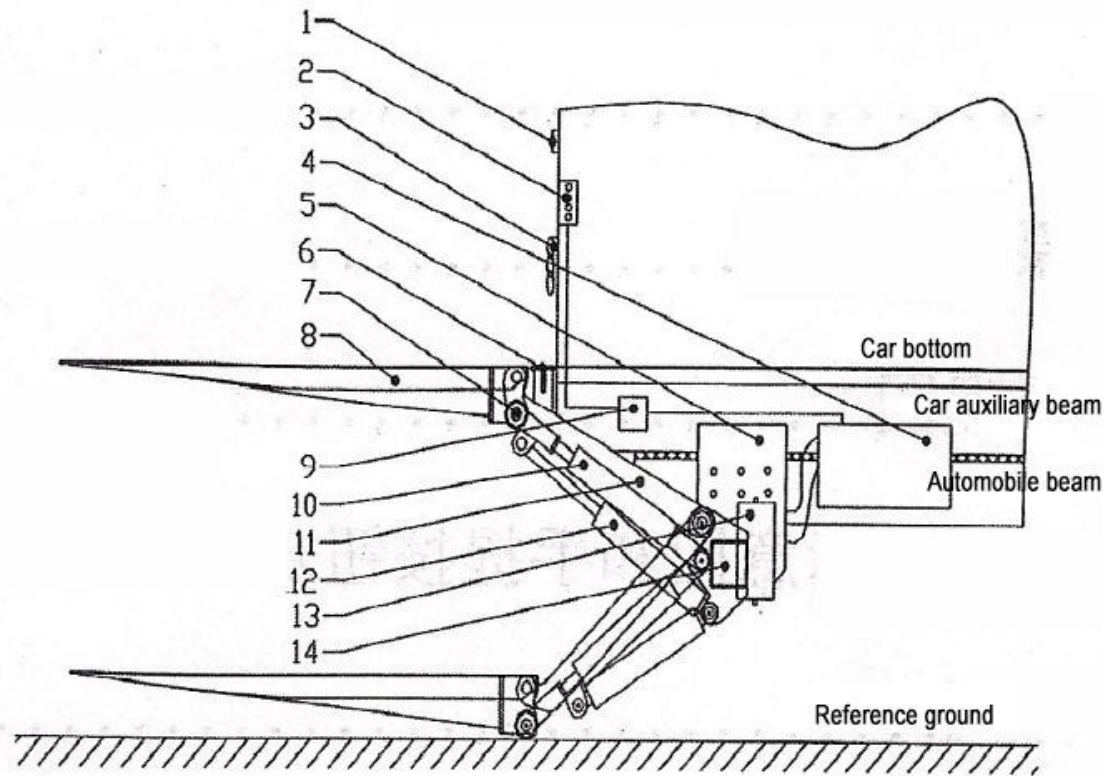
(Our company follows a sustainable development strategy and reserves the right to make improvements to the content of this manual without prior notice.)

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1. Main Structure

The tailboard mainly consists of a panel, bracket, oil cylinder, electric control box, handheld button, power unit, etc. (See Figure 1-1)



- 1-防撞胶垫 2-手提按钮 (车厢内) 3-安全链及挂钩 4-动力单元 5-定位夹板
6-过桥 7-滚轮 8-面板 9-电控箱 10-翻板油缸 11-U型支架 12-升降油缸
13-平衡油缸 14-横梁

Figure 1-1: Schematic diagram of tailboard structure

The panel is welded from patterned steel plates with good anti slip performance and cold stamped ribbed plates that are crisscrossed vertically and horizontally; The bracket is mainly connected by a crossbeam, a U-shaped bracket, and its accessories through a pivot pin; The oil cylinder consists of a left and right lifting oil cylinder, a good down flipping plate oil cylinder, and a single balance oil cylinder (their assembly positions may vary depending on the model). The entire

tailboard is lifted and lowered by two lifting oil cylinders, flipped up and down by two flipping plate oil cylinders, and slowly tilted towards the ground when the plate root touches the ground by one balance oil cylinder, until it is tightly against the ground; The electric control box consists of a box body, operation buttons, power switch, 10A fuse tube, etc. (see Figure 2-3): the power unit consists of an oil pump, DC motor, motor starter, overflow valve, one-way valve, unloading valve, electromagnetic directional valve, filter screen, oil tank, etc. (Figure 2-1).

2. Working Principles

2.1 Hydraulic Schematic Diagram(see Figure2-1)

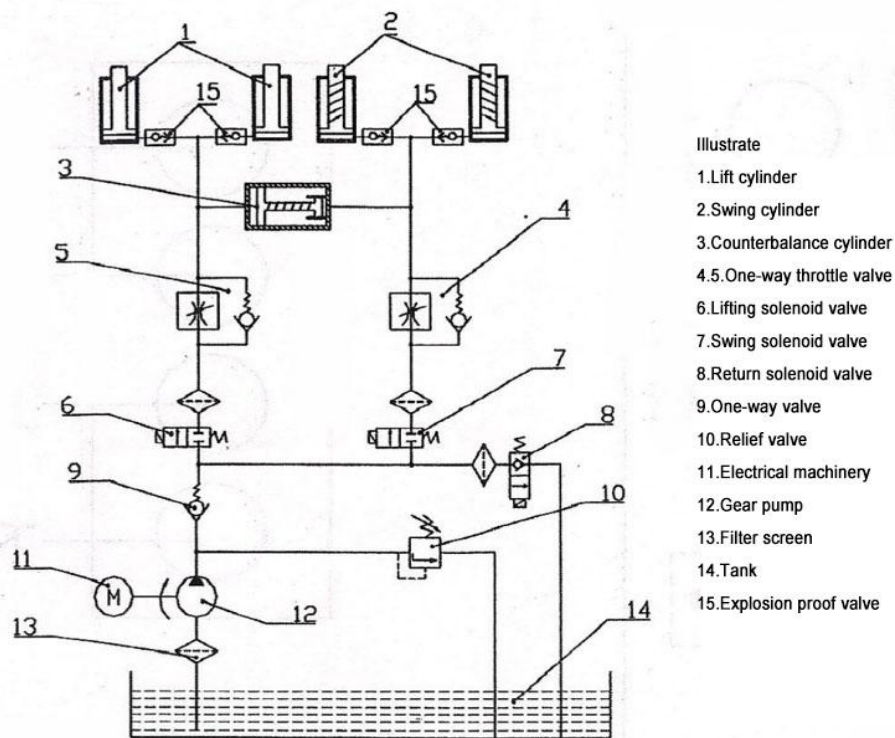


Figure 2-1 Hydraulic schematic diagram

2.2 Electrical Schematic Diagram(see Figure2-2)

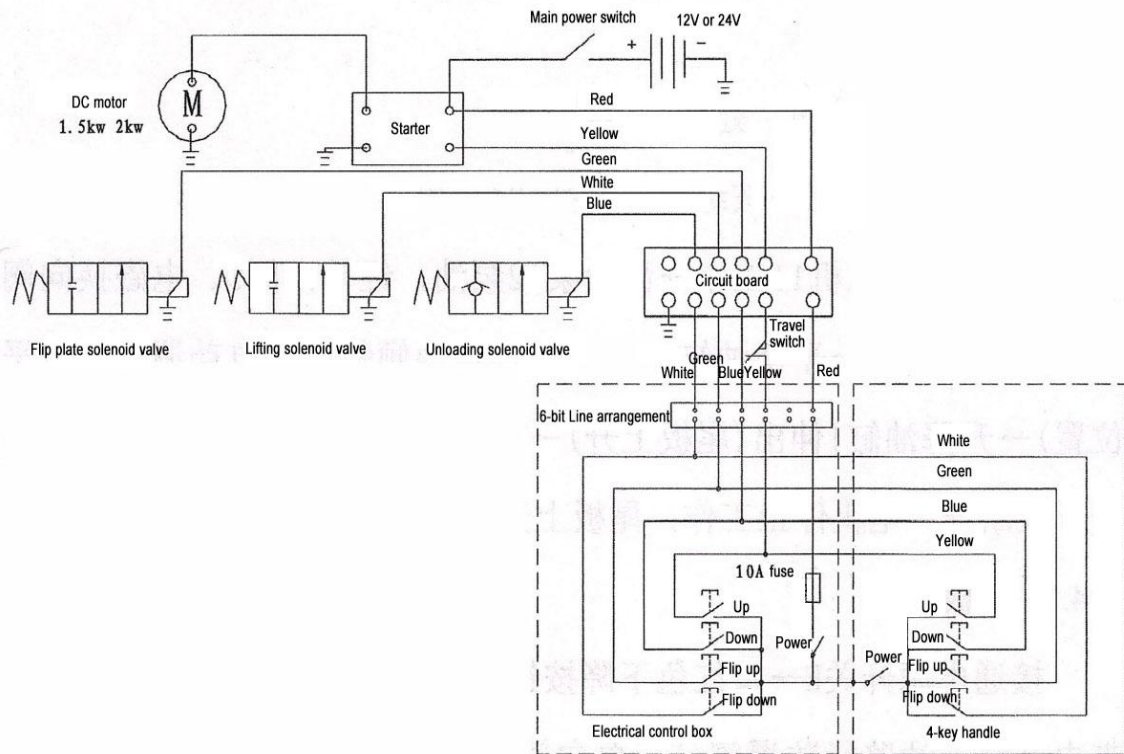


Figure 2-2 Electrical schematic diagram

2.3 Electrical Control Box(see Figure 2-3) and Handheld Press Schematic

Diagram (see Figure 2-4)

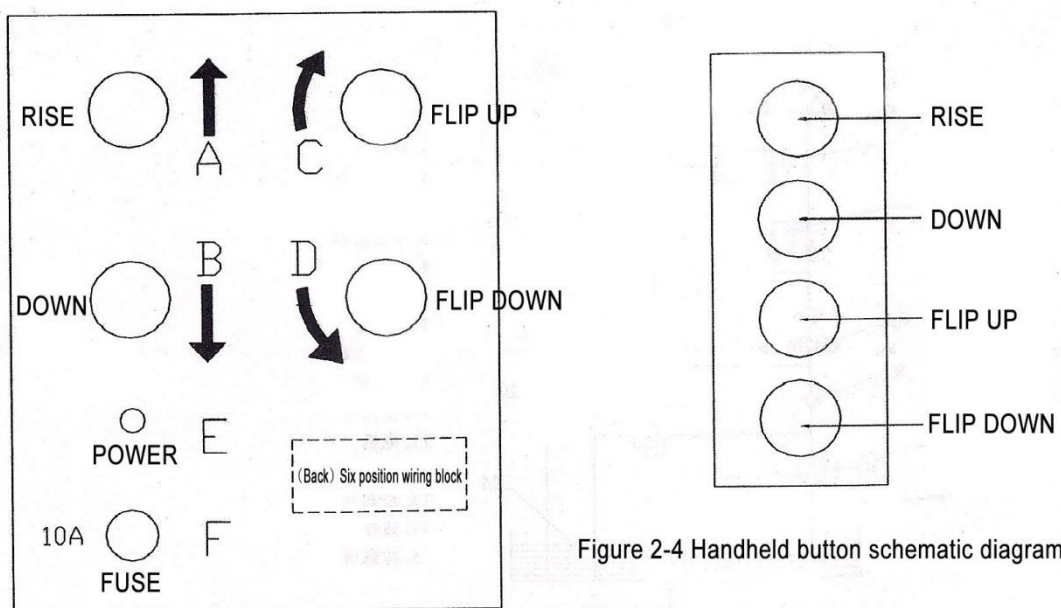


Figure 2-3 Electrical control box layout diagram

Figure 2-4 Handheld button schematic diagram

2.4 Operating principle

(1) Tailboard rising

When the tailboard is tightly against the ground and in a tilted state:

Turn on the power switch E → press the green up button A → the motor starter is energized and closed → the lifting solenoid valve 6 is energized, the motor 11 works → the gear pump 12 pumps oil, and it passes through the one-way valve 9 → the electromagnetic reversing valve 6 → the one-way throttle valve 5 → and the balance oil cylinder 3 for fine adjustment (the tailboard is automatically adjusted from the tilted position to the horizontal position). The lifting oil cylinder 1 extends (the tailboard rises to be level with the bottom of the carriage) → The travel switch disconnects → and the motor stops working. The tailboard rises to this point.

(2) Tailboard Falling

Turn on the power switch E → press the red descent button B → lift solenoid valve 6 → return solenoid valve 8, open circuit → oil path explosion-proof valve 15 → one-way valve 5 → lift solenoid valve 6 → return solenoid valve 8 → return oil tank 14 (lift cylinder 1 contracts under the gravity of the panel, and the tailboard descends).

(3) Tailboard flipping up

Turn on the power switch E → Press the yellow flip up button C → Swing solenoid valve 7 and motor 11 work with electricity. → Gear pump 12

pumps oil through one-way valve 9 → swing solenoid valve 7 → one-way throttle valve 4 → explosion-proof valve 15 → and flow into swing cylinder 2 → Swing cylinder 2 extends (tail plate flips up).

(4) Tailboard flipping down

Turn on the power switch E → Press the white flip button D → The swing solenoid valve 7 and the return solenoid valve 8 work simultaneously with electricity → The oil circuit passes through explosion-proof valve 15 → one-way throttle valve 4 → swing solenoid valve 7 → return solenoid valve 8 → and flows back to the oil tank 14 (the swing cylinder 2 retracts the tailboard and flips downwards under the gravity of the panel).

3. Operation Method

The entire tailboard operation process is divided into four parts: falling board operation, ascent operation, descent operation, and closing board operation.

Open the electrical control box door and you will see the control buttons and their markings as shown in Figure 2-3. This manual takes the operation of the electrical control box as an example. The four position handheld buttons installed inside the carriage are marked with "Up", "Down", "Flip Up", and "Flip Down". They have the same function and operation method as the corresponding buttons on the electrical control box.

3.1 Board Falling Operation

Remove the safety chain, connect the main power switch between the power supply and the electrical control box. Open the door of the electrical control box, and then connect the power switch E. Press the white flip down button D without releasing it. The panel of the tailboard starts to flip down under the combined action of the internal spring tube and gravity of the swing oil cylinder. When the panel flips down to a horizontal state, quickly release the flip down button D and press the red lower button B. The panel stops flipping down and only descends, After descending to the bottom of the panel, continue to press and hold the red descent button B without releasing it, so that the board tip slowly and completely lands on the ground. Finally, release the red descent button B, and the board landing work is completed.

3.2 Ascent Operation

Press and hold the green up button A, lift the top of the board first, and the panel will shift from a tilted state to a horizontal plane. Then, the panel will remain horizontal and rise off the ground until it is level with the bottom plate of the carriage (note: there is a travel switch positioning after the rise is in place, and button A will not work). Release the green up button A, and the ascent operation is complete.

3.3 Descent Operation

Press and hold the red descent button B, and the panel will begin to

descend (at this time, the panel should be kept horizontal, otherwise the flipping adjustment should be carried out) until the bottom roller of the panel touches the ground, and the panel tip continues to slowly flip down to fully land. Release the red descent button C, the descent operation is complete.

3.4 Board Closing Operation

Press and hold the green up button A without releasing it to raise the tailboard to the limit position (usually referring to the same horizontal plane at the bottom of the carriage). Release button A, then press the yellow flip up button C, flip the tailboard up until it is close to the anti-collision rubber pad, then release button C, disconnect the power switch E, close the electrical control box door, and finally cut off the main power switch (remember: after work is completed, be sure to cut off the main power switch!), fasten the safety chain, and the board closing operation is completed.

4. Safety Precautions for Use

1. The tailboard must be operated and maintained by a dedicated person (generally referring to the driver of the vehicle) after training. Non-skilled personnel are not allowed to operate it without authorization.
2. No personnel are allowed to enter the work area while working on the tailboard. Pay attention to the safe operating distance.(see Figure 4-1)

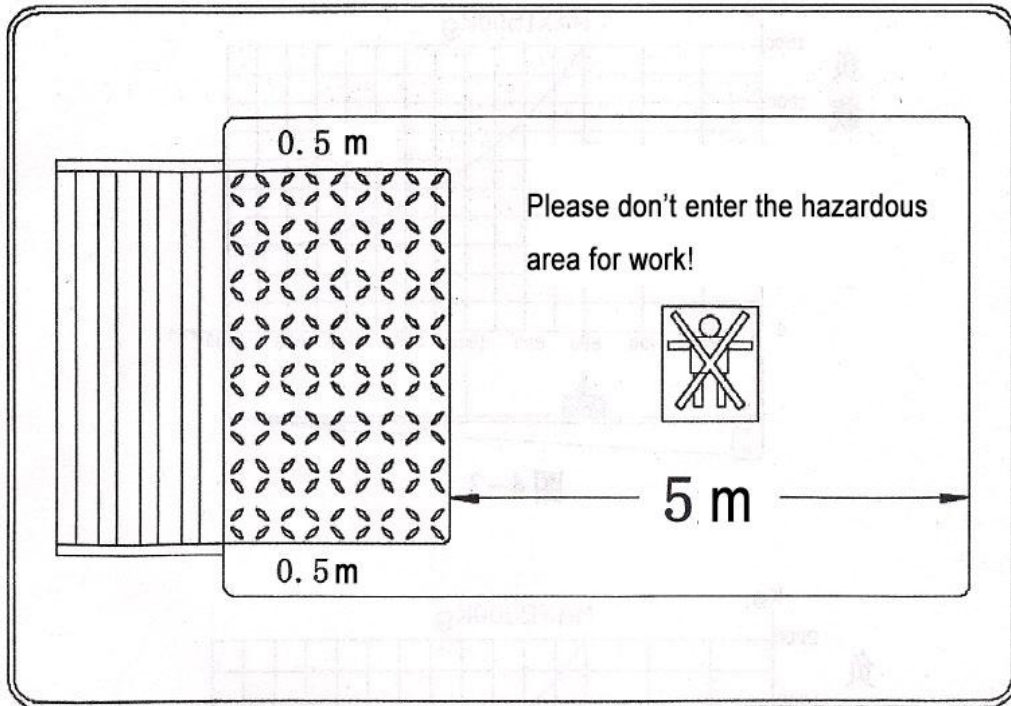


Figure 4-1 Schematic diagram of safe operating distance

3. Load and unload goods as close to the root of the panel as possible. Products of different tonnage should be loaded according to their corresponding load curve and not overloaded. The load curves for 1 ton, 1.5 ton, and 2 ton are shown in Figures 4-2, 4-3, and 4-4, respectively. Please refer to the label paper on the back of the tailboard for specific operations.

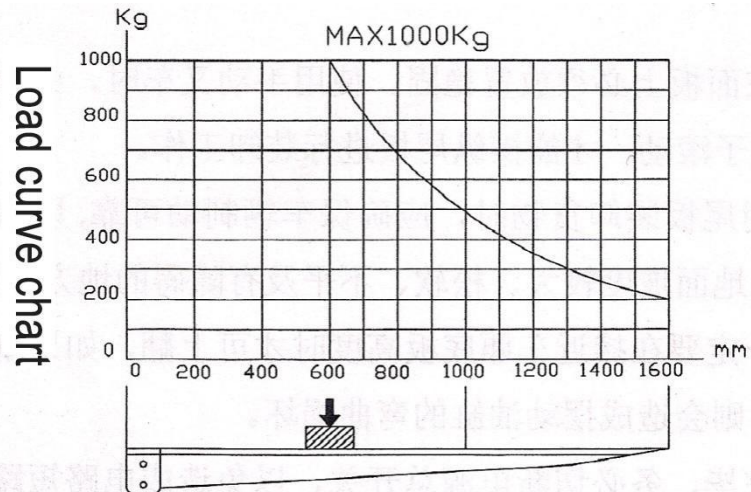


Figure 4-2

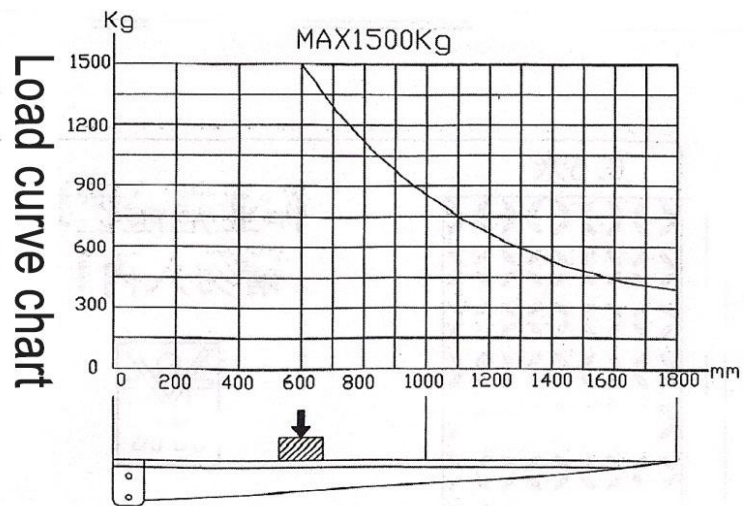


Figure 4-3

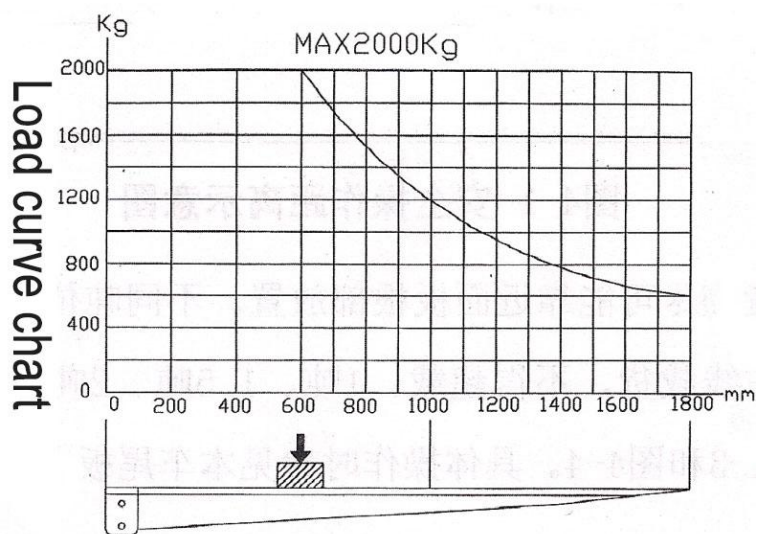


Figure 4-4

4. The goods must be placed firmly on the panel. When using a manual forklift, the forklift must be depressurized and the wheels must be prevented from rolling in order to operate the tailboard for loading and unloading work.

5. When using the tailboard to load and unload goods, ensure reliable braking of the vehicle to prevent sudden sliding. It is prohibited to use tailboards in areas with steep slopes, looseness, unevenness, and obstacles on the ground.

6. The panel must be flipped up close to the height of the car floor. If the tailboard is flipped up just after leaving the ground, it will cause bending and damage to the swinging oil cylinder

7. After work is completed, be sure to cut off the main power switch to avoid causing short circuit accidents or other electrical faults, and even fire.

5. Maintenance and Upkeep

1. There are a total of 14 grease fittings on the entire tailboard. Butter should be injected every half month to lubricate the rotating parts of the shaft pin. The distribution of grease fittings is shown in Figure 5-1.

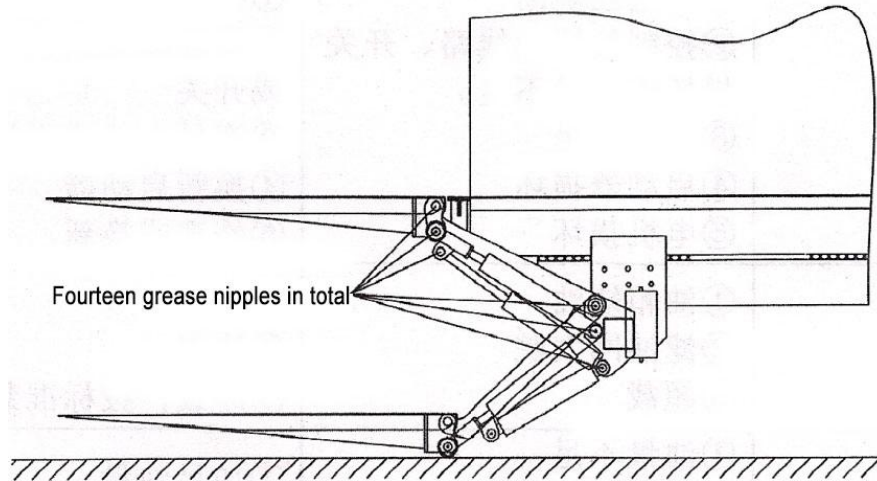


Figure 5-1 Schematic diagram of grease fittings distribution

2. Change the hydraulic oil every six months, and the hydraulic oil used is generally 68 # or 46 #. (Similar imported oils are better).
3. A routine inspection should be carried out on the tailboard once a week to check for cracks in the welding parts under stress, for any movement of the rotating shaft pins, and for any looseness, damage, or oil leakage in the hydraulic pipelines. Whether the contacts of the circuit are in good condition, whether the buttons are normal, and whether the wires are damaged. If any damage occurs, it should be replaced or the damaged area should be wrapped up in time. If there are any questions, please consult our company in a timely manner.
4. Rinse the soil, sand, stones, and other foreign objects attached to the tailboard(especially moving parts) with clean water in a timely manner. When loading corrosive substances such as acid and alkali, the tailboard should be prevented from being corroded by the corrosive substances.
5. After the wheel rolls are worn, they should be replaced in a timely manner to better protect the tailboard.

6. Fault analysis and Solutions

Common faults	Reasons	Solutions
Oil leakage	<ul style="list-style-type: none"> ① Loose joints ② Pipeline rupture ③ Damaged sealing ring 	<ul style="list-style-type: none"> ① Tighten the joint ② Replace with a new pipeline ③ Replace the sealing ring with a new one
The motor does not rotate	<ul style="list-style-type: none"> ① Blown fuse ② Control buttons, circuits, and switches are damaged or have poor contact. ③ Insufficient electricity ④ Damaged starter ⑤ Motor damage 	<ul style="list-style-type: none"> ① Replace with a new fuse ② Repair or replace buttons, circuits, or switches ③ Sufficient power or battery replacement ④ Replace the starter with a new one ⑤ Repair or replace with a new one
The motor rotates but the tailboard does not rise	<ul style="list-style-type: none"> ① Lack of fuel in the fuel tank ② The oil filter is too dirty ③ Overloading 	<ul style="list-style-type: none"> ① Cheer up ② Cleaning ③ Unloading, loading and unloading according to standards
The motor rotates but the tailboard does not flip up	<ul style="list-style-type: none"> ① Insufficient oil quantity ② Failure or damage of the flipping electromagnetic directional valve ③ There is a malfunction in the relevant control circuit 	<ul style="list-style-type: none"> ① Add enough oil ② Cleaning, repairing, or replacing ③ Check the wiring and repair it
Tailboard does not descend	<ul style="list-style-type: none"> ① Damaged unloading valve or lifting solenoid valve ② There is a malfunction in the relevant control circuit 	<ul style="list-style-type: none"> ① Repair or update ② Check the wiring and repair it
Tailboard does not flip down	<ul style="list-style-type: none"> ① Damaged unloading valve ② The flipping electromagnetic directional valve is damaged ③ There is a malfunction in the relevant control circuit 	<ul style="list-style-type: none"> ① Repair or update ② Repair or update ③ Check the circuit and repair it
The tailboard cannot automatically stop when raised to the horizontal position of the carriage	<ul style="list-style-type: none"> ① Travel switch damaged ② The travel switch is intact, but the installation screws are loose 	<ul style="list-style-type: none"> ① Update ② Tighten the screws
Flip up when the tailboard rises	<ul style="list-style-type: none"> ① The flipping electromagnetic field is faulty 	<ul style="list-style-type: none"> ① Cleaning, repairing, or updating

Flip down when the tailboard descends	①The flipping electromagnetic field is faulty	①Cleaning, repairing or updating
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If your tailboard malfunctions and cannot be used normally. Please refer to the table above to preliminarily determine the cause and location of the malfunction, and then follow the methods we provide for handling. If you are still unable to troubleshoot, please contact our company promptly.

7. Installation technical parameters

Major Parameters

Model: BW-PP15/130S(SL)

Board Size: Width 2300mm*Height 1800mm (Can be customized according to the cabin size)

Rated Load: 1500kg

Maximum Lifting Height: 1300mm

System Pressure: 16MPa

Working Voltage: 12V/24V (DC)

Average Lifting Speed: 80mm/s

Whole Machine Weight: 460kg (board material: high-strength steel)
415kg (board material: aluminum alloy)

Installation Diagram

BW-PP15/130S(SL) (Unit: mm)

A Min 320 Max 580

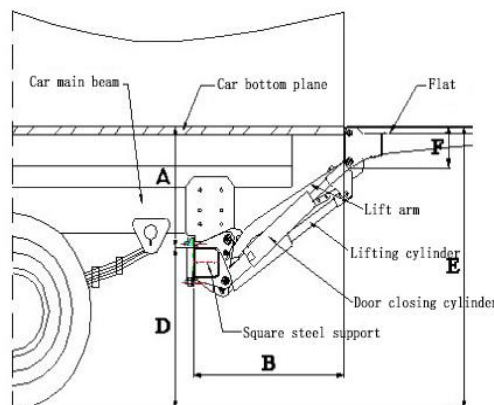
B Min 605 Max 813

D Max 720

E Max 1300

F Max 180

Beam width Max 800



The installation positioning mainly refers to 5 parameter values shown in Figure A, B, C, D, E, and F

8. Transportation information and installation

Due to the heavy equipment, transportation is mainly carried out by water and land. The installation shall be carried out by the purchaser according to our installation drawings.

9.Others

1) During loading and unloading, the maximum lifting height shall not exceed 3 meters above the ground;2) Rotary, with a maximum lifting height not exceeding 2 meters;3) The vertical speed of the platform shall not exceed 0.15 meters per second4) Loading and unfolding speed:The closing and opening speed of the platform's angle shall not exceed $10^\circ/\text{s}$, unless there are regulations that automatically prevent the platform from moving when encountering obstacles without causing harm;In the case of platform loading and/or deployment operations, any part of the tail crane is below 1.5 meters from the ground (a horizontal hard surface), and the speed measured at the fastest moving edge can reach 0.7 meters per second, provided that the operator has sufficient visibility of the movement.When closing and/or opening the tailgate elevator, the speed of any other power movement of unprotected accessible components shall not exceed 0.3 meters per second.5) Swinging speed: No control device installed on the platform, or any control device that can be used by operators on the platform, shall cause the platform to swing at an angular speed exceeding $4^\circ/\text{s}$.4. Prevent unauthorized operations: The electronic control box is locked and unlocked through a key or password.5. The driver of the vehicle should be able to confirm that the tail lift has been stored in its normal driving position and there should be an indication in the driver's cabin. The manufacturer of the tail

lift should provide at least one signal.

Attachment 1

Biaowil Tailboard Quality Assurance Certificate

Dear user:

Thank you for choosing the Biaowil tailboard. In order to ensure our service is satisfactory to you, please read this warranty carefully and keep it properly.

Instructions for use:

1. The warranty certificate is a warranty certificate, which must be stamped with the seal of the final direct distributor.
2. Our company provides a one-year free warranty for the rear panel of the car under normal use due to manufacturing quality issues. In special circumstances, the sales contract shall prevail.

The main components include: DC relay, electromagnetic directional valve, high-pressure gear pump, DC motor, hydraulic cylinder, high-pressure oil pipe, bracket, crossbeam, panel, etc;

The vulnerable parts include: spring control wire, roller, operation button, anti-collision rubber pad, chain, shaft pin copper sleeve, etc., all of which are within the warranty scope.

3. The following situations are not within the scope of free services:

- (1) Exceeding the warranty period.
- (2) Damage caused by improper use. Such as panel overload deformation, spring wire compression fracture, shaft pin damage without lubricating oil, manual damage to operation buttons, and loss of accessories.
- (3) Damage caused by self repair, self modification, or disassembly without our company's permission.

User Name		Tel	
Address			

License plate number		Vehicle model	
Product Model		Product number	
Specifications/Parameters		Purchasing date	
Anhui Biaowil Machinery Manufacturing Co., Ltd Address: No. 3 Xingyuan Road, Industrial Concentration Zone, Duanyuan Town, Huaibei City, Anhui Province Phone: 4008080285 Handling person: (seal)		Agent: Address: Phone: Handling person: (seal)	

STUB

User Name		Tel	
Address			
License plate number		Vehicle model	
Product Model		Product number	
Specifications/Parameters		Purchasing date	
Anhui Biaowil Machinery Manufacturing Co., Ltd Address: No. 3 Xingyuan Road, Industrial Concentration Zone, Duanyuan Town, Huaibei City, Anhui Province Phone: 4008080285 Handling person: (seal)		Agent: Address: Phone: Handling person: (seal)	

Attachment 2

Product Qualification Certificate

Agent Name:

Address:

Tel:

License plate number		Model	
Nameplate number		Certificate number	
Discharge Date		Installing Date	
Warranty reasons			

Solutions			
Holder		Date	
Maintenance personnel		Date	

Remarks:

1. The warranty period for this product is 1 year.
2. During the warranty period, any malfunctions caused by non-human error (determined by our company's official staff) will be repaired free of charge.
3. During the warranty period, if one of the following situations occurs, repairs should be charged:
 - 1) We are unable to provide this guarantee and valid purchase vouchers.
 - 2) Malfunctions and damages caused by incorrect use and improper self repair.
 - 3) Faults or damages caused by other unavoidable external factors.
 - 4) Damage caused by improper use of equipment, water ingress, or other added solutions
 - 5) Damage caused by using power sources and hydraulic oil that do not meet the standards.
 - 6) Vulnerable parts are not covered by the warranty.
4. Only the above warranties are made, and no other express or implied warranties are made (including implied warranties of merchantability, reasonableness and suitability for a specific application, etc.). Whether in contract, civil negligence, or otherwise, our company is not responsible for any special, incidental, or indirect damages.

Anhui Biaowil Machinery Manufacturing Co., Ltd

Attachment 3

Warning labels

