

Operating Manual

Series Tow Tractors

(KLB30)

Jiangsu King-lift Equipment.,Ltd.

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Notice: Before using this vehicle, each operator should read and comprehend this operating manual, as well as the related warning labels that are attached on the vehicle. The illustrated picture is only for reference, the benchmark is based on the real product.

Preface

Welcome to use electric tow tractor made in King-lift company, China. This vehicle is made by special sectional material as designed compact as durable and easily-operated. For the sake of your safety and proper operation, please read and comprehend this operating manual, as well as the related warning labels that are attached on the vehicle, before using the forklift.

Notice: All the parameters of the manual is subject to this edition of this manual, King-lift company reserves the right to update its own products. The update will not be informed any more; please contact king-lift company if wanna know the latest parameters of products.

Notice: The forklift vehicle manufactured by King-lift company, under the terms of China Special Equipment safety surveillance, is only specially used in the indoor zones of factory, tourist attraction, pleasure ground, and so on.

Contents

1. Use Range
2. Operation Procedure
3. Safety Norm
4. Battery
5. Regular Failure & Troubleshooting
6. Upkeep & Maintenance
7. Electrical Schematic Diagram

1. Use Range

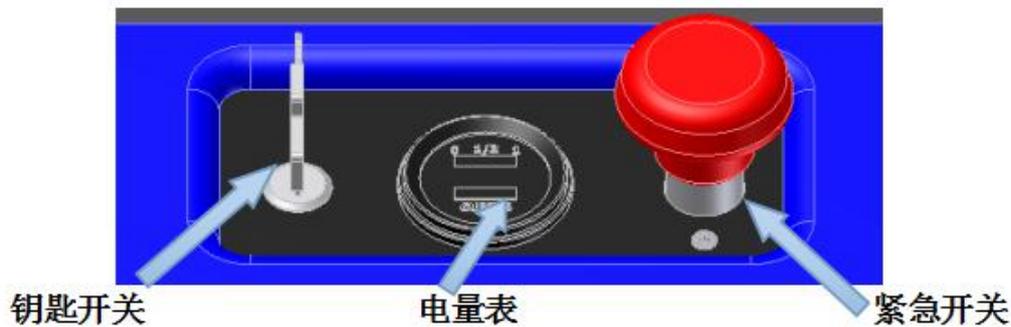
Series electric tow tractors are warehousing forklifts designed specially for moving goods on even ground.

2. Operation Procedure

Start

Please operate by the procedure as follows, otherwise, the forklift will not work:

1. Ensure the plug inserts the power socket firmly.
2. Switch on emergency-switch, key-switch is at turn-on.
3. Ensure battery pack is of sufficient electric quantity.



Key switch

Coulometer

Emergency Switch

Attention !

Long-term operation by low electric potential will reduce battery life. Do not start the forklift before the completion of battery charging.

4. Steer at the correct direction, slowly accelerate the speed to the optimal speed

Notice !

Don't operate those tow tractors that are dysfunctional and unsafe. First, check the following safety functions before everyday work.

- a) Check if horn is normal to work
- b) Check if steering is normal to work
- c) Check if brake is normal to work

Braking

1. The tow tractor performs braking as the control handle steers at the top or the lowest.

2. It operates electric braking when direction-switch turns to the reverse while normal travelling.

3. Let it go back to neutral gear by loosening the travel-direction-switch to stop the travel of the forklift.

Turning

1. The turning is controlled by the steering handle, the steering angle is on anywhere from left 90° to right 90°
2. Should not go forcibly through a barrier that is in front of the forklift, may turn the steering handle to bypass it forwards or backwards.

Notice !

Wheels are not allowed to slip.

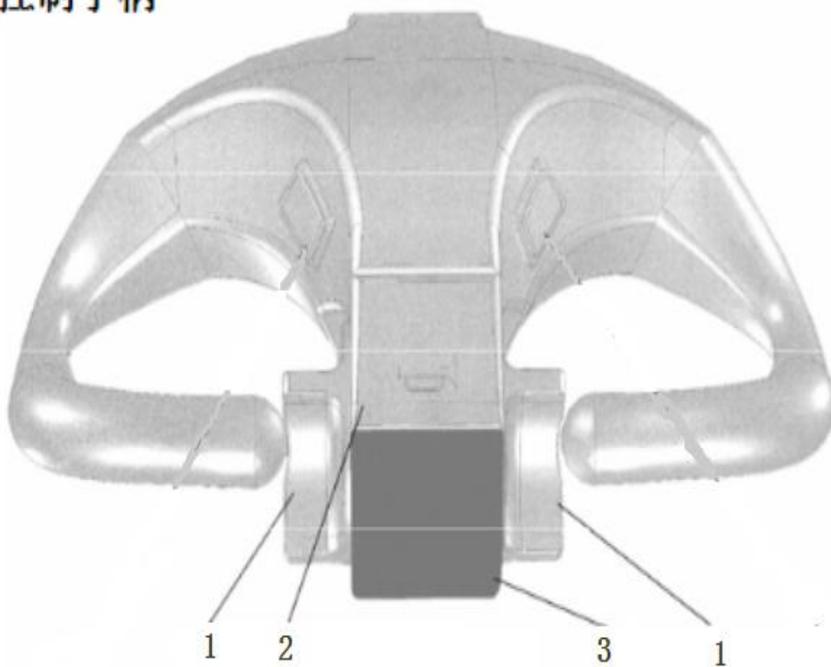
If the operator's hands and shoes are oily, easily makes misoperation to cause the tow tractor out of control, so must wipe and dry the hands and shoes before driving the vehicle.

Parking

1. Release direction switch
2. Release the steering handle that will be back itself to the braking status.
3. Lower the forks to the lowest and release oil pressure out of hydraulic system.
4. Turn Key-switch to turn-off

Control Handle

控制手柄



- 1 前进/后退 旋钮
- 2 喇叭按钮
- 3 肚皮开关

1. Forward/backward Knob 2. Horn Button. 3 Belly Switch

1. Don't permit to operate the vehicle without authorization.
2. Please keep the key away with you when you leave .

3. Safety Norm

Summary

- 1、 all safety switches and devices must be checked in advance every day before using the tow tractor and ensure these safety facilities are normal to work.
- 2、 Check to ensure all the warning labels and rated parameter plates are normal as

attached on the vehicle.

3、 It doesn't allow to use the tow tractor under the circumstance that the tow tractor gets something broken, or there is fault which affects the safety.

4、 There should be professionals who are charge in maintaining, repairing and fixing the tow tractor.

Tow Tractor Operation

Tow Tractor may work and tow freely within a certain altitude scope. Specially manufactured is the tow tractor which is used for refrigeration house. Based on the design and manufacture of tow tractor, some working occasions are inappropriate as below:

1、 There is inflammable and explosive dust or gas in the air of work site.

2、 The tow tractor is used to transport or elevate a person.

The responsibility of tow tractor operator

1、 The tow tractor operator cannot operate the forklift without training and recognition.

2、 Abide by this operating manual, as well as the local legal regulation of safety, and traffic rules.

3、 It is prohibitive to operate the tow tractor when the operator's hands and feet are oily.

Work Site

1、 the tow tractor only able to be operated on even solid road such as concrete or pitch road. Do not operate on oily area, in case of slipping of travel wheels.

2、 Ensure the ground or floor has sufficient load capacity that can load the total amount of weight of tow tractor, namely the aggregate weight of the tow tractor and the goods plus the operator.

3、 Operating Guidance in the process of Travel:

(a) Avoiding sudden braking or turning at a fast travel speed.

(b) Slow down if the road is slippery, in case of idling or rollover of tow tractor.

4、 Someone is needed to direct you around if your sight is confined, ensure safety.

5、 Keep a certain safety distance from front vehicle, persons, and objects.

6、 Honk horn if excessive speed.

7、 tow tractor is prohibited from transporting person.

8、 Ensure the elevator has sufficient load capacity for the whole weight of tow tractor, before entering into.

9. Goods Towing

(a) keep distance from the persons around you when towing

(b) The transported goods keeps symmetric, compares the left side to the right; it is not allowed to transport the unstable and unsafe.

(c) It only allows tow truck work at the range of pulling force

(d) Be more discreet when loading or off-loading those which are higher and heavier.

10. Matters of Parking

- (a) Banned from parking on ramp
- (b) Parking at an appointed place
- (c) Banned from parking on the emergency exit
- (d) Banned from parking at busy work place.
- (e) Shut off power supply after towing truck.

4. Battery

Replacement of Battery

Only replace the battery by those that are of the same model and the same weight. (the weight of battery affects the performance of the stability & the braking of forklift .)

Notice !

Banned from modifying the weight and size, otherwise the centre gravity of vehicle body will be affected. The overweight and short-weight of battery will affect the stability & the braking of forklift, the weight has to be in accordance with the nameplate that is attached on forklift.

1、 the sequence of the taking out of the battery that is with low electric quantity:

- (a) Pull out the plug of power supply
- (b) Open the housing of forklift case
- (c) Unplug the plug of battery out of the plug of vehicle body.
- (d) Pull the battery pack out of the pallet truck by a proper battery hook.

2、 the sequence of the replacement of the battery:

- (a) Use a lift hoist to hang up the battery that is of sufficient electric quantity to put in the battery case.
- (b) Plug the plug of battery into the plug of vehicle body.
- (c) Close the housing of battery case.

Charging

Banned from smoking and open fire when charging. May use an automatic charger to charge the battery.

Notice!

The electrolyte of battery contains dilute sulphuric acid that is corrosive, flush by water and soap as soon as it splashes onto human skin, please contact and see a doctor if it splashes into human eye. Must wear protective goggles and gloves when check the battery.

3、 Charging Preparation

Must charge the battery within 24 hours after use.

- (a) Turn key switch to turn-off condition after parking, pull out the key.
- (b) Ensure the favourable ventilation above the battery, open the vent caps of

battery.

(c) Unplug the plug of power supply, plug the plug of charger into the plug of power supply of battery.

(d) Switch on alternating current and start charging by the charger.

Notice!

Keep favourable ventilation when charging, especially in close zone. During the process of charging, battery produces hydrogen, oxygen that triggers explosion so long as mixing with open fire and electric sparks.

Cut off charging power supply before unplugging the plug of power supply.

4、Charging Period

During the process of charging, the following methods by which we can draw a conclusion whether the battery charged is sufficient to electric quantity.

(a) The specific gravity of electrolyte of battery keeps stable in more than 2~3 hours.

(b) The surface of battery electrolyte produces bubble, the colour of electrolyte has been become clear from milky white.

The above conditions indicate the electric capacity of battery has been sufficient by charging.

5、After the completion of battery charging

(a) Power off alternating power supply, as well as charger.

(b) Unplug the charger plug from the plug of battery.

(c) Turn key switch to turn-off position, plug the power-supply plug of battery into the vehicle-body plug of battery.

(d) Close the vent caps of battery.

The sufficient-electric-capacity battery comparison table between its temperature and its specific gravity of electrolyte as below:

| Temperature °C | Specific Gravity g/cm ³ |
|----------------|------------------------------------|
| -15 | 1.31 |
| 0 | 1.30 |
| +15 | 1.29 |
| +30 | 1.28 |
| +45 | 1.27 |

Add acid liquor or distilled water to adjust if inconformity to the specific gravity out of the table.

Upkeep of Storage Battery

1、 In order to keep the use life of storage battery, the battery should be charged fully before come into use, undercharged battery may not to be used.

2、 Storage battery avoids overcharge and over-discharge as much as possible, overcharge and over-discharge heavily affect the use life of storage battery.

3. Keep clean to the electrolyte solution's pore plug & vent lids, take them off or open them when charging, fit them on or close them when charging completion. Keep clean and dry to the surface, connecting wire and screws of storage battery. Use

cotton yarn that is dipped in with acid liquor to wipe it off if sulfuric acid attached. Attention ! don't let alkaline liquor into the battery.

4. After the charging completion, must check the acid liquor's height of storage battery, in time make up for the distilled water and keep the acid liquor's height. Normally, banned to make up for adding dilute sulphuric acid.

5. It is a must to charge battery in time after using battery, no more than 24 hours to commonly place the battery without charging.

6、 Keep favorable ventilation when charging, banned from smoking.

7、 Storage battery must to be charged by the way of equalizing charge under the circumstances as follows.

(a) Normally-used storage battery (equalizing charge once three months)

(b) Unused storage battery of long-term laying aside

(c) There are "delayed batteries" arrayed in battery pack (delayed batteries means their voltage are lower than other batteries' during the process of charging and discharging, or those batteries that have been repaired, because of their faults. At this moment, equalizing charging only individually proceeds on delayed battery.

8、 Method of equalizing charging

(a) First, proceed on ordinary charging

(b) Stop charging for one hour at the fully charged status, then charge again for one hour by the charging of $0.25C_5$

9、 When storage battery stops using, proceed on replenished charging once a month during placed period.

10、 Storage battery should avoid direct sunlight, no less than 2 meter close to heat source.

11、 Avoid any liquid and harmful material to contact, any metallic debris cannot be dropped into battery.

5. Troubleshooting

| Serial | Faults | Reasons | Troubleshooting |
|--------|---|---|-----------------------|
| 1 | Tow tractor cannot travel (contactor doesn't work) | ①the fuse of pilot circuit is burnt | replaced |
| | | ②poor contact or broken of the switch of power supply | Repaired and replaced |
| | | ③ the fuse protector of main circuit has burnt | replaced |
| | | ④ poor contact or broken of electrical lock switch | repaired and replaced |
| | | ⑤loosening or falling off of Battery pack | fasten |
| | Tow tractor cannot travel (contactor work) | ① side magnetic brake of drive wheel is not engaged, the vehicle is in the state of braking | Repaired and replaced |

| | | | |
|---|---|--|--|
| | | ② poor contact of contactor terminal | Repaired and replaced |
| | | ③ faults of MOSFET tube circuit board | Repaired and replaced |
| 2 | Tow tractor can travel forwards (or backwards) | ① poor contact or burnt | Repaired and replaced |
| | | ② faults of circuit board | Repaired and replaced |
| 3 | Tow tractor cannot stop during travel | contactor terminal is broken, or moving contact cannot go back to home position | Cut off power supply to replace contactor terminal |
| 4 | Brake failure | ① construction bolt of microswitch is loosening or damaged | adjust and fix the bolt, or replace microswitch |
| | | ② the wiring of electromagnetic brake is loosening, or electromagnetic brake is broken | fasten the bolt or repair the side magnetic brake |
| | | ③ the pad of electromagnetic brake is worn out | replace the pad |
| 5 | Steering gets stuck | ① the bearing of steering gear is broken | Replace the bearing |
| | | ② grease shortage and more dust of the bearing of steering gear | rinse the bearing |
| 6 | the drive wheel steers clumsily, with noise, the engine is overloaded | ① the gear and bearing got stuck by foreign matter | rinse and replace the bearing |
| | | ② there is clearance during bearing installation, or the jump ring falls off | Reinstall, adjust the clearance |
| | | ③ the bearing of front wheel is broken | replace the bearing |
| 7 | the voltage of battery goes down (after charging) | ① some individual batteries are worn out | Repair and replace |
| | | ② liquor surface of battery is low | add electrolyte |
| | | ③ electrolyte has debris | replace electrolyte |

Notice: banned from self - maintenance without authorization and training

6、Upkeep & Maintenance

Regular upkeep once per 500-hour operation of tow tractor; the efficiency, use life and safety of tow tractor reply on routine upkeep. The replaced parts should be supplied by the original manufacturer KING-Lift to ensure the quality. Recommend the end users to contact the agent of the product or the persons who are in charge of after-service of King-lift company, in order to ensure your tow tractor to perform safer and more economical.

Safety Rule of Maintenance Work

The maintenance is only worked on by those who have systematically studied the maintenance.

1. Keep the maintaining site clean and sanitary
2. Don't bring loose item and valuables with your body during maintenance

Attention !

During the process of maintaining the electrical system of tow tractor, please take off

wrist watch, earrings and metal ornaments, in case that it could be short-circuited or burnt when metal contacts the electrical elements.

3、 First unplug the plug of power supply, then shut off power supply before the maintenance of tow tractor.

4、 Must turn key-switch to turn-off and press down emergency switch before opening the rear cover.

5、 Don't use hand to contact directly before checking the oil leakage of vehicle body, in case of scalding.

6、 the temperature of the oil inside transmission gear or hydraulic system may be high, must cool down the tow tractor before replacing the gear oil or hydraulic oil, in case that the oil temperature is so high that the oil burns.

7、 Please abide by some relevant legal rules, protect environment, store and discharge the oil material in accordance with some stipulations, it is prohibited from discharging it into sewer pipes.

8、 Please cut off power supply if vehicle body needs welding, in case that the electric current goes into the storage battery.

Some maintenance work could be accomplished by users.

Daily maintenance & safety check

1. It is duty for a tow tractor operator to keep routine maintenance and check.

2、 It affects the safety and reliability of tow tractor without routine maintenance, that could result in accidents occurred.

3、 Immediately stop using the tow tractor, in addition, engaging in fixing, as soon as detecting its problem or finding out its faults.

4、 In order to keep the vehicle in good using status, it is necessary to check and maintain the vehicle every day, the crucial checking is as follows:

| Serial | Component checked | Checking content |
|--------|-------------------|---|
| 1 | Operating control | Check if it is normal to work |
| 2 | Horn | Check if it is normal to work |
| 3 | Steering | Check if it is normal to work |
| 4 | Coulombmeter | Check if it is normal to work |
| 5 | Drive Device | Check if there is abnormal noise or oil leakage |
| 6 | Clutch, Brake | Check if it works, or with poor contact |
| 7 | Transmission | Check if they are normal to work |
| 8 | Vehicle wheels | Check if they are damaged after wiping off oil dirt & metal chips |
| 9 | Chassis frame | Check if they are damaged after wiping off oil dirt |

Clean up tow tractor

Proceed on regular cleaning per week, it is crucial to ensure its reliability. Please unplug the socket of power supply before cleaning, in case of short circuit that will

damage the electrical system.

Clean away the exterior of vehicle:

1. Clear away the attachment attached on the vehicle per day to keep its flexible rotation.
2. Must blow off the dust on the motor by air-compressor when cleaning up the electrical elements, it is by no means to use damp cloth to wipe off the dust on the electrical wiring.
3. Must replenish grease oil on some related parts after the completion of cleaning up.

Attention !

Electrical elements cannot be flushed by high-pressure water, to avoid short circuit by unable to destroy the electrical elements on electric board.

七、 Electrical Schematic diagram

