The Specification

EK15A-189LI Series -3 Wheel Electric Forklift

Note: Before using please read this manual and the various warning label!

EKKO Material Handling Equipment Manufacturing,

Contents

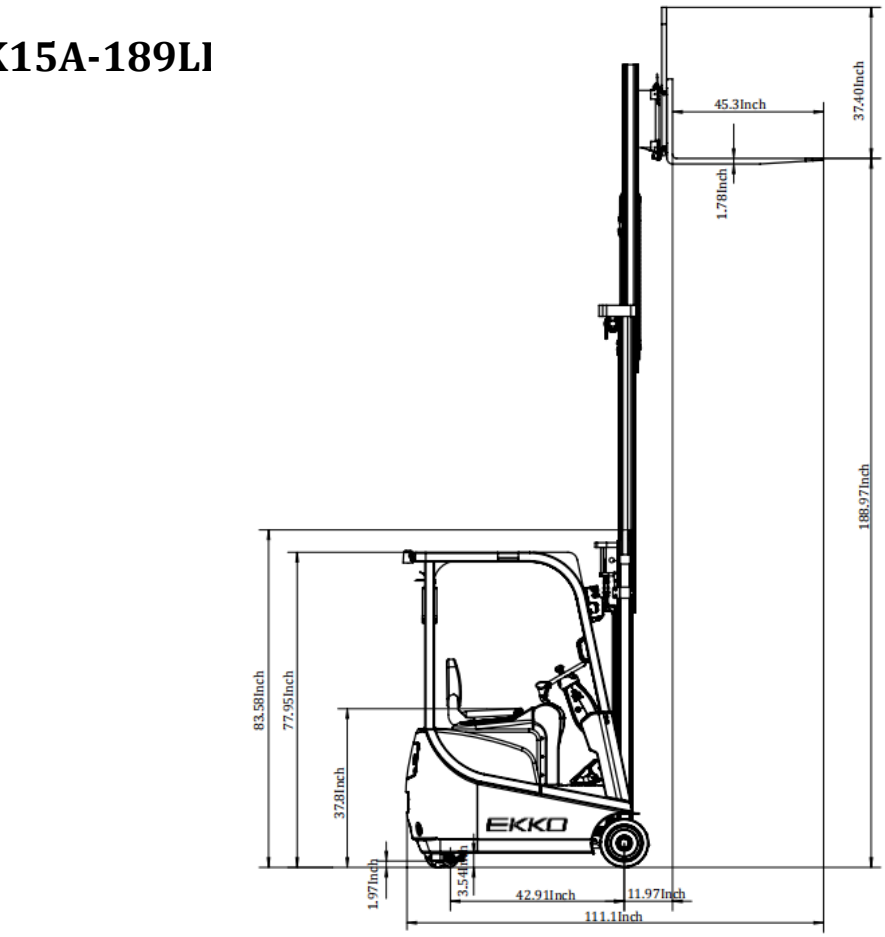
I. Introduction

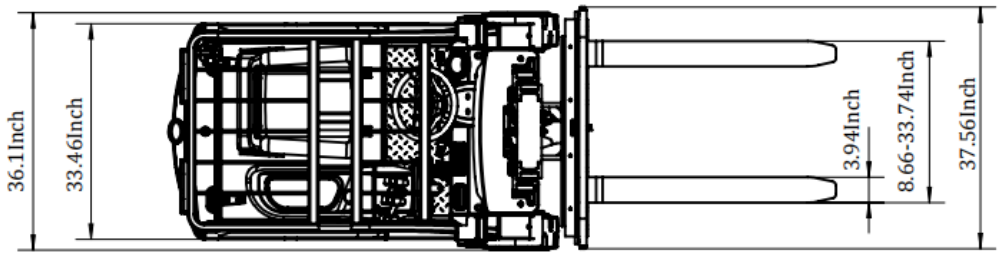
1.1 Summary

This manual combines the whole EK15A-189LI 3300lb three-wheel counterbalanced electric forklift (hereinafter referred to as "forklift").

1.2 Parameter

EK15A-189LI



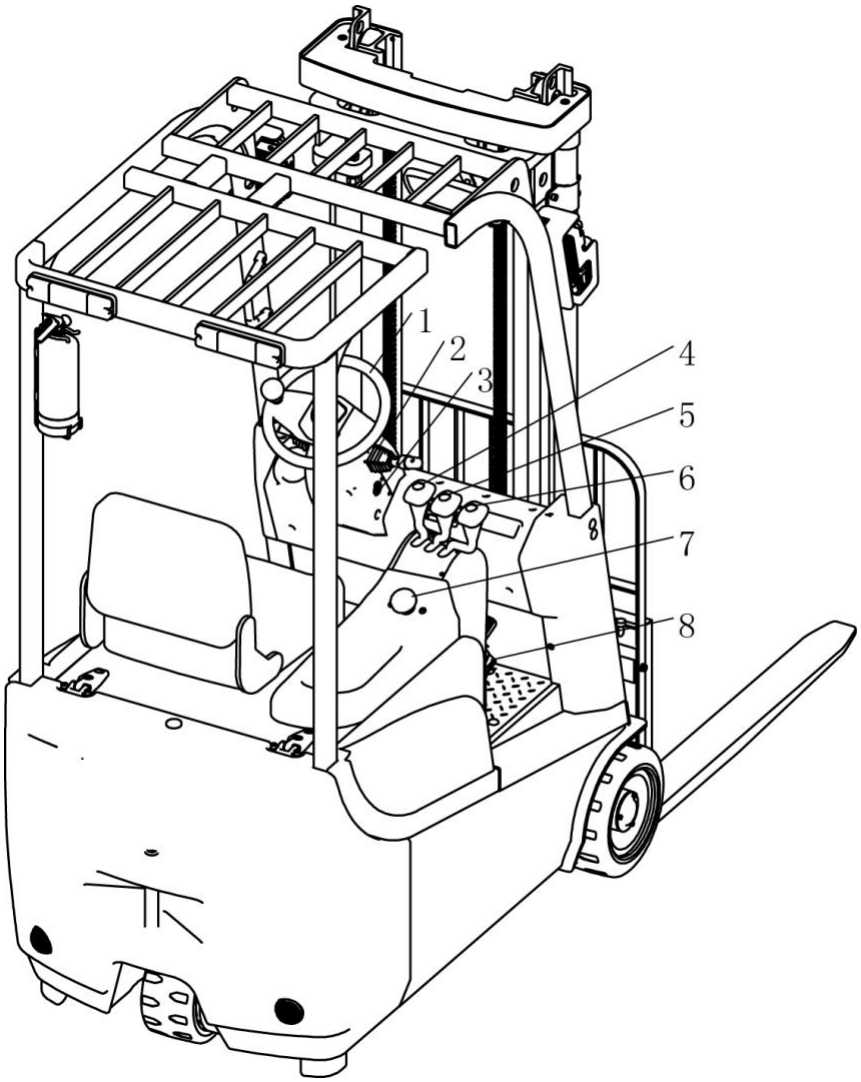


Model		EK15A-189LI
Load capacity		Power
Operator type		Seat
Load capacity	(lbs)	3300
Load center distance	(in)	23.6
Wheel base	(in)	43
Lifting height	(in)	189
Lowered mast height	(in)	83.54
Mast/Fork carriage tilt forward/backward	(°)	2/5
Overall length	(in)	106.6
Overall width	(in)	36.1
Fork size, Thickness/Width/Length	(in)	1.4/4/45.2
Fork adjust width	(in)	8.7-29
Turning radius	(in)	53
Max gradient performance, laden/unladen	(%)	6/8
Lift speed, laden/unladen	(in/s)	4/5.5
Lowering speed, laden/unladen	(in/s)	5.3/4.7
Charger		24V/50A
Driving Motor		AC 24V/2.0kw
Lifting Motor		24V/2.5kw
Battery voltage		24V/350AH--LI(Side）
Service Weight	(lbs)	5560

II. Structure and working principle

2.1 Basic structure

The power source for this forklift is lead acid industrial batteries. This Forklift uses electric and hydraulic system to control, driving, lifting and lowering, mast tilt forward and backward, steering and other movements. The basic structure shown in FIG.



1. .Steering wheel 2. Combination Switch 3. Key Switch 4. .Lifting handle

5..Tilting handle 6. Side shift handle,7.Emergency stop switch 8.Accelerator

2.2 Working principle

2.2.1 Walking system

The batteries provide energy to forklift for driving. With a frequency conversion system, it converts DC into AC, by controlling the AC motor drive on drive wheels. AC motors through the gear box converts the high-speed low torque into a low speed high torque, and ultimately by the drive wheel to perform the action. Driving speed is controlled by frequency control motor with an accelerator control.

Gear box is filled with enough gear box oil at straight from the factory. Under normal circumstances, the gear box oil should be checked every 1000 hours.

If there is ever abnormal sound in within the gear box during use, the user should immediately stop the forklift to determine whether the bearing or gear short of fluid or is damaged. Continue to use only after refill or replacement.

2.2.2 Steering system

The steering of this forklift is controlled by the steering wheel through the steering reduce gear unit, led by a steering sensor sending unit, sending a signal to the steering motor. The steering column also has a steering shaft to tilt back and forth at a 2- and 5-degree angle, to meet diverse needs positioning of the load.

2.2.3 Braking system

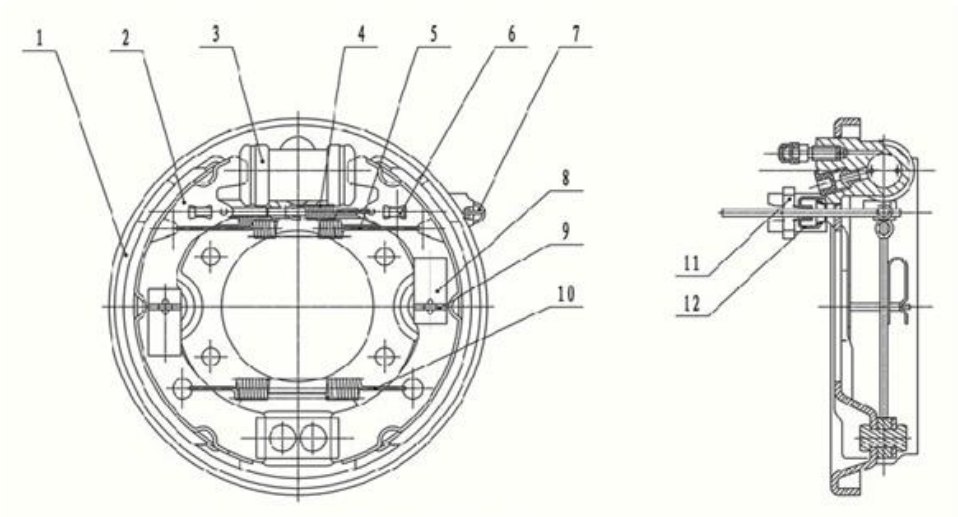
The braking system on this forklift is combined with both the braking system and the parking brake.

Braking meaning stopping or slowing down the truck during operation, by compressing the foot brake.

When the brake cylinder is compressed, the same force of the main brake line suppresses the brake drums until the top of brake pads compresses the fixing

pins, the brake pads will move to the rotation direction of brake drum. The friction between brake drum and friction plate is then increased.

Double brake pads are mounted on both sides of the drive axle. Brake consists of two groups of brake pads, brake cylinder and regulator. One end of the brake pad is in contact with the fixed pin, and the other end is in contact with the adjusting calipers. The returning spring and compression spring rod suppress the parking brake lever unit. In addition, the brake is also assembled with a parking brake mechanism and automatic adjustment device.



Brake

1. Left baseboard 2. Brake shoe 3. Brake cylinder 4.adjustable Spring 5.return spring 6. Hand brake adjusting mechanism 7.hand brake return spring 8.spring tab letting 9.pressure lever 10.tension spring 11.pull rod stop block 12.Jaw dust cover

The parking brake should always be used for parking, to prevent accidents caused by slippage and secure the forklift. Also equipped with a limit switch on the parking brake, the control circuit is closed under a parking state. The parking brake must be released before starting to drive, only after that the control circuit can be switched on. The parking brake has adjustable elastic functions.

2.2.4 Operating system

The main working part of the forklift is the forks. The forks recognize the loading, unloading, stacking and short-distance transportation for pallets or cargo.

The forks are mounted on the carriage, by chain drive or inner mast moving up and down, the carriage and forks lifts the goods off the ground or to be stacked on racks. The chain transmission and inner mast overall movement are achieved by the extension of the lift cylinder. Forklift operation process is achieved by extending of the control cylinders (including tilt action).

Cylinder movement is controlled by a physical valve stem, and the oil pressure is provided by the hydraulic pump.

The controlled safety valves in the lifting cylinders and tilt cylinder will slow down the speed of mast lifting, lowering or tilting to ensures safety.

2.3 Electrical principle

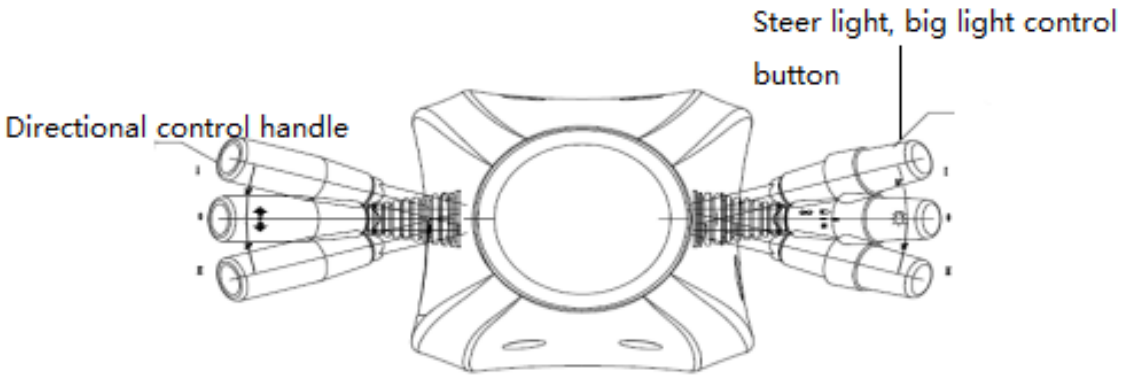
2.3.1 Electrical system

The forklift electrical system includes driving and operation control, and lighting. The forklift implements Curtis Instrument Controllers and i.e. CURTIS1232 AC control assembly.

The controller has the indicator for power display, slowing down of mast lifting, parking and hour meter display function. When the battery power is may be low, the power meter will cut off the control circuit of pump motor to protect its battery life. The forklift will not lift however can still drive, which means the forklift should be charged immediately.

The hydraulic pump motor is a DC motor therefore not recommended for long continuous operations. The lifting movements should have intervals, should not be continuous, otherwise it can cause the motor to overheat

Special Note: If the forklift is used for a continuous period, the pump motor may lack performance. The lack of performance is that the starter may not lift properly. The latter one is represented as no lifting with the multi-way valve control lever, pump motor will keep turning. If this occurs the forklift should be turned off. Disconnect the battery and allow time to dissipate the overload.



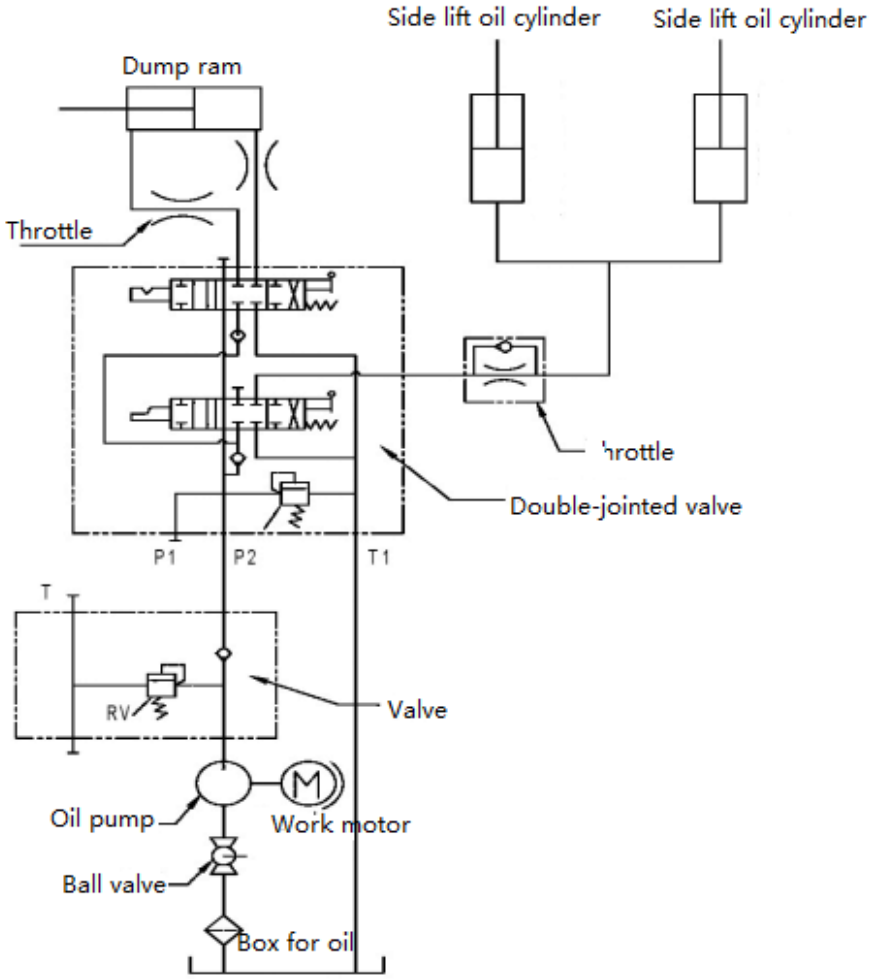
The forklift is equipped with front headlights, rear lights, reversing warning horn and other safety and lighting devices.

The switch groups

2.4 Hydraulic principle

Pump motor driven gear pump provides hydraulic power; Two lifting cylinders are responsible for the forklift; a tilt cylinder is for the mast tilt movements. The oil-way for Lift-lower and tilt is controlled by two handles on the double valve, the lifting and lowering action is controlled by a single-acting oil-way on the passage double valve, while tilt motion is controlled by a double-acting oil-way on the double valve passage. The hydraulic system pressure for this forklift is adjusted only on double valve, which is set at to factory specifications. If you're not our after-sales dealer or professional repair staff, it is not allowed to adjust, to avoid accidents and warranty.

Hydraulic principle FIG.



III、Safety operation and matters needing attention

3.1 General rule

3.1.1 The operator must have a forklift operation certificate or qualification which proved by the relevant departments of the training before driving a forklift.

3.1.2 The operator must read the instructions before use and understand the use and operations of this forklift.

3.1.3 Forklift must never to be used to carry passengers.

3.1.4 Operators should pay close attention to the environment, including other pedestrians and nearby structures.

3.1.5 Without the manufacturer's approval, no one shall modify, add or remove the any parts off the equipment.

3.2 Storage and transportation

3.2.1 Transporters should be qualified and pay attention of shipment:

①Front and rear wheels should be wedged, use of parking system, to prevent from sliding in the process of transportation;

② Use of straps, must be placed on the frame or structure of the forklift;

③ When the forklift is being used, keep the forklift truck's center of gravity in the intermediate position of the forks 24” load center.

3.2.2 If the forklift fails to work, it should be parked in a dry ventilated area:

① Shut off all ignition, emergency switch, and unplug the power connector from battery;

② Pull the parking system, front and rear wheels with wedged blocks;

③ If discontinued for a long period without use, the battery should be charged every 15 days.

3.3 Check before using

3.3.1 New forklifts should be checked for any damages during transit, please don't be put into use if there are signs of damage, and promptly get in touch with the dealer for proper process.

3.3.2 New forklifts from our factory are all properly inspected with all lubricating oil, hydraulic oil, and batteries are filled to manufacturer specifications.

3.3.3 All forklifts are equipped with batteries and charger. The batteries are charged before leaving our facility. Before use, it is always recommended to pay

attention to battery meter which whether a charge is required. Every day before use, or before charging, you should open the battery covers to check the water level, if it is ever lower than recommend, please add only distilled water into the battery's cells.

3.4 Operation specification

Before operating the forklift, please get familiar with the dashboard functions of each switch/button.

3.4.1 Start, run and parking:

① Insert the key into the key switch, turn to the right, the emergency power safety switch should be lifted upwards to engage power.

② Lift the forks at least 10cm from the ground to ensure no structure interference.

③ Begin to disengage the parking system.

④ According to your desired direction, push the lever either forward or reverse.

⑤ Start accelerating by stepping on the accelerator pedal slowly, until the desired speed.

⑥ In case of an emergency or urgent need to stop, quickly cut off the power supply by pressing down on the red emergency power switch.

⑦ When driving into a turn, reduce speed, where possible.

⑧ Forklift gradeability is 8%, so during an uphill slope, keep into consideration when climbing the gradient to accelerate the pedal to maximus the upward force.

⑨ Forklift in the process of downhill, let loose of the accelerator pedal, in order to obtain the reverse braking current, if the reverse current can't control the downhill braking speed. Please then apply the brake pedal at the same time, to ensure safety.

10) When not driving, always maintain the foot on the pedal of the brakes.

Put the pallet fork in the lowest position, keep hands in the forklift, press the safety switch, pull out the key.(Note never leave without using the brake lever forklift).

3.4.2 The steering wheel angle adjustment

According to the individuals operating comforts. The steering wheel angle can be adjusted . Adjustment method is as follows: Loosen the left hand of direction column, adjust the steering wheel to the right position, then lock regulating handle.

3.4.3 Accelerator pedal operation

Determine the forklift direction either forward or reverse. Toggle left side handle in place, right on the foot pedal accelerator to drive forward or backward. Continue pressing down on the pedal to desired forklift speed. Never pressed down the foot accelerator completely down unless as necessary in a incline.

3.4.4 Brake pedal operation

When the forklift needs to be parked or to slow down, you can either lift off the accelerator foot pedal or press on the foot brakes to slow down or stop.

3.4.5 The using of emergency power safety switch

If the forklift ever loses control or there is a malfunction, please press the red emergency switch on the right console to immediately shut off. Determine the fault or reason of loss of control. If all is safe and secure continue use by pulling the red button upwards to engage in full functions.

3.4.6 The use of reversing beeper

For the safety of operations and pedestrians, this forklift is equipped with reverse beeper to allow others of your reverse movement. Also recommended to press the horn while reversing or around obstructed corners from line of sight of others.

3.4.7 The operation of the control handles

Hydraulic control handles are for hydraulic diverse needs, there are two functions including with the following functions:

(1) Forklift lever: a. fork to ascend (pull); b. fork to descend (push)

(2) Tilt lever: a. back tilt (pull); b. forward (push)

Each handle is used to operate a hydraulic circuit. Each handle has a micro switch that will start the hydraulic pump motor rotating at the same time, the output pressure of hydraulic oil, is related to each hydraulic component. In order to ensure the safety of hydraulic system pressure, the hydraulic valve block is equipped with pressure relief devices. The control valve will automatically disburse the overflow.

Note: the pressure of the hydraulic valve block device, cannot be adjusted.

3.4.8 Battery capacity indicator

The battery capacity meter is located on the dashboard to display battery reading and can also use to determine electricity time statistics (cumulative hour).

3.4.9 Handling stacking operation

(1) How to transport the goods and stack loads

Driving the forklift with load always required to drive with ease and caution, slowly. Forks should always be parallel to the ground. Inserted the forks into the pallet with the load center of minimum of 24" from backrest. When the forks are completely inserted into the pallet lift the forks off the ground to a minimum height without obstruction to maneuver. Always maneuver a forklift with loads at a minimum height to protect others and the loads with the mast tilted back.

（2）The weight on load

When ready to pile one load on top of the other. Pull up to the goods to be stacked then lift the forks to the desired height. Move close to the pile of deceleration, then line up the load you currently have on the fork with the load to be stacked on top of. Adjust and raise the mast to the vertically, slowly drive the forklift forward to pile on top. Use the hydraulic control lever slowly. Once centered then tilt the forks parallel, then lower the load on top of each other. After the load is stacked then carefully maneuver the forks out of the load.

3.5 Safe Operation Rules

3.5.1 Requirements for drivers: The forklift must be operated by a trained and certified operator.

3.5.2 Drivers' rights, obligations and responsibilities: They are familiar of the operations of this forklift, the operator must be clear of his rights and obligations; and is familiar with the contents of the relevant operating instructions. Safety gear should always be recommended.

3.5.3 Prohibit unauthorized personnel to operate: the driver is responsible for the vehicle at work. They must prevent unauthorized persons from driving or operating this truck. It is forbidden to use the vehicle to transport or lift personnel.

3.5.4 Malfunctions and defects: If there is any malfunction or defect for the forklift, they must immediately inform management. If the forklift cannot be safely operated (e.g.: wheel wear or brake failure), then all use of this forklift must be fully inspected for repairs before operation.

3.5.5 Safe operation and environmental protection: inspection and maintenance must be performed in accordance with the time intervals on the maintenance list.

Forklift parts cannot be changed without being a certified technician, especially safety devices. The operating speed of the forklift is not allowed to change.

To ensure the safety and reliability of the operation of this forklift, spare parts should be EKKO's spare parts to ensure reliability. The old parts, such as oils and fuels must be handled in accordance with the relevant environmental protection rules.

3.5.6 Hazardous area: Hazardous area usually refers to the following range: forklift or its load lifting devices (e.g. fork or accessories) is dangerous for personnel when running or lifting, or the ongoing regional transport loads. Typically, this range extends to the load or vehicle accessories landing area.

3.5.7 Risk environment: When working in high-risk environment, you must have a safety gear for protection.

The vehicle was not specially designed for the high-risk environment.

3.5.8 Safety devices and warning signs: Safety devices, warning signs and warning notes described in the previous operating instructions must be taken seriously.

3.5.9 Driving in public places: the vehicle is forbidden to drive in public places other than specific areas.

3.5.10 Distance between forklifts: Always operate the forklift with caution that that another forklift in front of you could suddenly stop at any time, so please keep an appropriate distance.

3.5.11 Headroom: When the headroom is below the cargo or mast, it is prohibited in using this truck.

3.5.12 The use in the elevator and loading platform maneuvering: if there is sufficient loading capacity, that does not affect the operation of the forklift, and agreed by the operator of the forklift, lift and loading platform that can be used for v transportation. Before entering the elevator or loading station, driver must personally identify the area and weight load of area. The loads must be placed in front and occupy an appropriate place, when the forklift enters the elevator, so as not to contact with the walls of the elevator.

3.5.13 With access and working area: The vehicle must be operated on the specified channel, all the non-related personnel must leave the work area, and cargo should be stacked in designated places.

3.5.14 Operations Management: traveling speed must be adapted to local conditions. When through the corners, narrow passage, swing doors and closed place, the vehicle must slow down. Drivers must be able to visually an adequate braking distance between the vehicle and the vehicle in front, and he must remain in control of his vehicle. Sudden stop (unless urgent needs), rapid U-turn, chased each other in the channel is not allowed in not smooth places. It is forbidden to operate while the body is lean outside.

3.5.15 Visibility: The driver must look in the direction of travel, to ensure that the front situation is clearly visible. When the vehicle is backing up with the carriage of goods blocked the line of sight, there is must be a second person walk in front of the vehicle to give appropriate guidance and warnings.

3.5.16 via the ramp: Only known ramp was allowed to go through. While the ramp should be clean, non-slip, and the vehicle technical specification includes the ramp. The goods on the forks must face uphill. It is forbidden to turn back, move diagonally or park on the ramp. The driver must slow down when going through the ramp, and prepare to brake at any time.

3.5.17 ground load: Remember to check the load pressure of the body weight or wheels on the ground does not exceed the capacity of the ground, when the vehicle is in operation.

3.5.18 Vehicle Change: any possible changes or modifications for rated load, stability or safe operation of the vehicle, must obtain prior written approval from origin manufacturers or its successor. After vehicle manufacturer check and approve the changes, nameplates, labels and markings of Operation and Maintenance Manual must be modified as well.

IV. Maintenance and Service Manual

4.1 Repair and maintenance of safety procedures

Maintenance technician: The maintenance and service should only be performed by special personnel trained by the manufacturer. After the technician sent by after-sales department of the manufacturer completed maintenance and servicing work, they should sign on the service log.

Cleaning Operation: Flammable liquid cannot be used for cleaning the forklift. Before cleaning, take safety precautions to prevent electric sparks (e.g. sparks caused by short circuit). When operating the accumulator, connectors on it must be disconnected. Use soft air suction or compressed air, non-conductive and anti-static brushes to clean electric and electronic components.

Operation of Electric System: Operation on the electric system should only be performed by specially trained personnel. Before performing any operation on the electric system, precautions must be made to prevent electric shock. When operating the accumulator, connectors on it must be disconnected.

Installation: When repairing or replacing hydraulic components, electric and electronic components, make sure to install them back to their original positions.

Wheels: Quality of the wheels has significant effect on stability and driving performance of the stacker. Modification on wheels can be performed only with the approval from the manufacturer. When replacing wheels, ensure that the stacker is levelled as delivery state(wheels must be replaced in pairs, i.e. replace right wheel together with left one).

Lifting chain and rollers: Chain and rollers will be worn quickly without good lubrication. Perform periodic lubrication according to following maintenance table. Shorten the lubrication period under adverse operation conditions (such as in dusty and hot environment).

Hydraulic oil pipe: The oil pipe must be changed every 6 years. When change the hydraulic assembled parts, the oil pipe should be also changed.

4.2 Routine Maintenance (Before every shift)

4.2.1Check the liquid level of electrolyte in the accumulator.

The liquid level will be higher when being recharged.

4.2.2 Check every pole, every cable and their covers.

4.2.3 Check if the accumulator box is secured.

4.2.4 Check the forklift for oil leakage.

4.2.5 Check the chain, rollers, fork, oil pipes and horn.

4.2.6 Check the brake.

4.2.7 Check the wear and tear of drive wheels and loading wheels.

4.3 Professional Maintenance Manual

It is very important for safe operation of the forklift to perform overall professional maintenance. Failure in performing maintenance according to specified interval may cause malfunction of the forklift, and potential risk to human and equipment.

Maintenance periods listed in this manual apply to single shift a day under normal operation conditions. If using in dusty environment, the ambient temperature varies remarkably or in multi-shift situation, the maintenance period has to be shortened.

Maintain the stacker according to following maintenance list. Maintenance periods are as follows:

W1 = Every 50 work hours, but at least once a week.

M3 = Every 500 work hours, but at least once every three months

M6 = Every 1000 work hours, but at least once every six months

M12 = Every 2000 work hours, but at least once every 12 months

Additional operations should be performed in trial run period:

(In initial 50 – 100 working hours or after two months)

— Check the nuts on the wheels, and tighten them if necessary.

— Check the hydraulic components for leakage, and tighten them if necessary.

—Replace the hydraulic filter.

List of maintenance

		Time interval of maintenance				
		Standard: ●	W	M	M	M
		Cool storage: #	1	3	6	9
Chassis & Main frame	1.1	Check all bearing parts for damages		●		
	1.2	Check all bolt connections		●		
Driver	2.1	Check the drive system for noise and leakage		●		
	2.2	Check oil level in drive system		●		
	2.3	Replace lubricant oil			#	●
Wheels	3.1	Check for wear and tear		●		
	3.2	Check the bearings and make sure they fit well with the wheels		●		
Steering system	4.1	Check the steering control		●		
Braking system	5.1	Check the performance and adjust accordingly	#			
	5.2	Check reset function of the air spring, and check for leakage and damages		●		
	5.3	Check the brake disk for wear		●		
	5.4	Check the connection of brake and adjust if necessary		●		
Lifting Mechanism	6.1	Check performance and wear, and adjust accordingly		●		
	6.2	Visually inspect the loading wheels for blockage		●		
	6.3	Check fork tips and pallet support for wear and damages	#			
Hydraulic system	7.1	Check performance	#			
	7.2	Check all connections for leakage and damages	#			
	7.3	Check the cylinder for leakage and damages and if the accessories are safe and	#			
	7.4	Check the oil level.	#			
	7.5	Replace hydraulic oil and the filter element			#	●
	7.6	Check the pressure regulator valve			#	●
Electric system	8.1	Check performance		●		
	8.2	Check all cable connections for safety, reliability and damages		●		
	8.3	Check if the amperage of fuses is proper				
	8.4	Check if the switches and release cam mechanism is secure and functions		●		
	8.5	Check the connectors and replace worn parts if necessary				
Motor	9.1	Check the carbon brush for wear		●		
	9.2	Check safety of additional devices of motor		●		
	9.3	Use a vacuum to clean motor frame. Check the commutator for wear		#		
Accumulator	10.	Check the density of acid liquid, capacity and voltage of the accumulator	#			
	10.	Check the safety devices on terminals and the grease	#			
	10.	Clean the connector of accumulator and check the connection.	#			
	10.	Check the cable for damages, replace if necessary		●		
Lubricant oil	11.	Grease the stacker according to time table for filling up lubricant	#			
	12.	Check the grounding connection of electric system				●
	12.	Check the travelling speed and braking distance				●

General Test	12.	Check the lifting and lowering speed				●
	12.	Check the safety device and switch off devices		●		
Trial	13.	Perform trial run under rated load		●		
	13.	The stacker is proved to be safe and reliable to personnel after completion of	#			

4.4 Maintenance, Recharging and Replacement of the accumulator

The forklift must be parked in a safe location before any operation on the accumulator.

4.4.1 Maintenance Technician

Only qualified technician can perform operations on the accumulator such as recharging, maintenance and replacing. Before operation carefully read instruction manuals including operation manual, replenishment preparation and recharging requirements.

4.4.2 Fire Prevention Measures

Never smoke or use open fire when perform operations on the accumulator. The accumulator should be away from flammable material at least two meters when storage or recharging. The location for accumulator storage should be well ventilated and equipped with firefighting devices.

4.4.3Maintenance of the Accumulator

1) Keep the nuts on every battery cell dry and clean. Tighten every terminal and cable end and brush them with grease to prevent corrosion. Naked cable ends and terminal posts should be covered with a skid-proof insulating cover.

2) Every two cells should be well-connected. Check the nuts on each pole, if loose, tighten the nuts.

3) Keep the surfaces of accumulator clean and dry. After the completion of recharging, clean spilled acid with cotton yarns or brush. And clean with wet towel if necessary.

4) Over recharging and over discharging should be avoided, and fast charging and insufficient recharging are also not allowed. Otherwise life span of the accumulator may be affected.

5) Do not put conductive objects including metal tools on the accumulator, or short circuit or even explosion may be caused.

6) Never spill any hazardous liquid or solid material on surfaces of the accumulator. When using a densimeter or a thermometer, make sure the surface is clean and clear.

7) Recharge the discharged accumulator in time. Delayed recharging may damage the accumulator. Do not delay recharging more than 24 hours. Recharging of the accumulator may not work outdoors in cold weather. In this case, move it indoors to perform recharging.

8) If the accumulator will not be in use for a long time, it should be recharged and discharged once every month and it should be fully recharged every time.

9) During recharging or using, the liquid level of electrolyte lowers because of water evaporation, so pure water should be added. It is not allowed to add electrolyte with a specific weight of 1.280.

10) If individual cell fails, identify the cause and repair the cell immediately. Replace the cell when it cannot be repaired.

11) The site for recharging should be well ventilated. It is prohibited to smoke or use open fire, avoiding the risk of hydrogen explosion.

12) The electrolyte in accumulator is toxic and corrosive. For this reason, always wear working suit and protection glasses to protect your body from contacting the electrolyte in accumulator.

13) If your clothes, skin or eyes are spilled with acid liquid in accumulator, flush with large amount of clean water. For skin and eyes, flush with large amount of clean water and also seek doctor's treatment immediately. Acid spillage must be neutralized and treated immediately.

14) The weight and dimensions of the accumulator have remarkable effect on stability of the stacker. Therefore do not modify the type of accumulator without approval from the manufacturer.

15) Never discharge in large current, for example, performs travelling and lifting simultaneously.

4.4.4 Disposition of worn-out accumulators

Worn-out accumulators should be recycled according to local regulations, and stored in specified zone or cast-off treatment zone. These works should be done by qualified specialized companies.

4.4.5 Specification of the accumulator

Battery		Charger	
Rated power：24V	Rated capacity：350Ah(EK13A) 400Ah(EK15A)	Input：AC115/230 50Hz	Output ：DC24V50A
Rated power：24V	Rated capacity：350Ah Li-ion (EK15A-189)	Input：AC115/230 50Hz	Output ：DC24V50A

Uninsulated terminal poles on the accumulator should be protected with an insulated cover. When connecting the accumulator and socket, make sure to stop the forklift and put the switch at position “0”.When replace or install the accumulator, make sure the accumulator is fixed securely in battery box.

4.4.6 Storage, transportation and installation of the accumulator

The forklift must be parked on the level ground steadily. To prevent short circuit, naked cable ends and the terminal posts should be covered with insulated covers. When pulling out the accumulator, properly arrange removed accumulator's connectors and cables without blocking access of the accumulator.

When install or remove the accumulator with a crane, make sure the load capacity is sufficient (weight of the accumulator is marked on both the nameplates of the accumulator and the stacker.) The crane must pull vertically to prevent the battery box from being damaged. The hooks of the crane should be safe and secure. Never let the hooks fall on an individual battery .

— Press emergency stop switch and turn the power supply switch to OFF position

— Remove the connectors of accumulator cables.

—Connect the lifting device to lifting holes.

—Lift out the accumulator from the top and move away with handling equipment.

Perform installation in reverse order of above steps. It is noticeable to put the accumulator in right position and connect the cables securely. After reinstalling the accumulator, always check all cable connections and connectors for obvious damage.

4.4.7Capacity indicator of the accumulator

Capacity indicator of the accumulator the status of accumulator discharging is indicated on the indicator with 10 bar graphs, each bar represents 10 percent of increment. As the consumption of accumulator capacity, the lighting bars will fall down from the top.

Preset “Warning” marks will appear when remaining capacity of accumulator meets following conditions: When the remaining capacity of the standard accumulator is 30 percent, “Warning” mark will appear and you can recharge the accumulator.

Preset “Warning” mark and a flashing “Stop” mark will appear when remaining capacity of accumulator meets following conditions: When the remaining capacity of standard accumulator is 20%, “Stop” mark will appear and keep lighting. When the “Stop “mark keeps lighting, lifting

Capacity sufficient

Recharging needed

Low battery

If the indicator shows low battery when lifting loads for a not very long period, lifting function can only be performed after recharging the accumulator to at least 70% of capacity.

4.4.8 Recharging

The EK15A-189LI is supplied with a special charger for recharging.

A:Read the instruction manual carefully before recharging.

B:The batteries should be recharged in well-ventilated areas. Make sure no metal objects placed on the accumulator. Check all cables connection and connectors for obvious defects. Observe strictly all safety instructions, e.g. replenishment of the accumulator and preparation for recharging.

C:Hydrogen will be precipitated in the charging process. So the accumulator room should be well-ventilated, and the hydrogen content shall be strictly controlled to ensure safety.

D:For the safety of the cooperation, the forklift should be added protective cover before using.

E:EK15A-189Li-ion Must use Li-ion Charger specially designed by our company

Balanced Recharging

After using for a period, voltage and concentration may vary from battery to battery. Balanced recharging will eliminate the differences so that the performance of each cell becomes uniformed. In following cases, balanced recharging is necessary: Voltage of an individual cell is frequently below 1.7V; large current occurs during discharging, for example, when using the driving motor and lifting motor simultaneously; for accumulators that are not recharged in time after discharging:

Over discharged accumulators and those are not in use for a long time.

a、Recharge with a current of 0.1I5A.

b、When the voltage up to 2.5V, and there occur bubbles in the electrolyte, continue recharging at a reduced current of 0.05I5A.

c、Recharge the accumulator to full capacity and stop recharging for half an hour, and then continue recharging with further-reduced current of 0.025I5A for an hour.

d、Stop recharging again for half an hour and continue recharging with a current of 0.025I5A for an hour.

e、Repeat step D until bubbles occurs intensely and instantly when switching on the charger.

Perform balanced recharging to accumulator once a month in normal use.

V、 Service Manual

5.1 Troubleshooting

Fault	Cause	Repair measures
The stacker can not move	- Connectors on accumulator are not connected - Electric lock is in position "0" - Emergency stop switch is not turned on. - The accumulator capacity is in used up - The control lever is not in drive rage F - fuse blown	- Check the connectors on accumulator, connect them if necessary - Turn the Electric lock in position 1 - Turn on the emergency stop switch. - Check the capacity of accumulator, recharge if necessary - Turn the control lever to drive rage F - Check fuse FU01 and FU1
Loads can not be lifted up	- The stacker is not operating - Low hydraulic oil level - fuse blown - The accumulator has only 20/30% of capacity - The UP switch is in bad contact or damaged.	Do as methods in "The stacker can not move" table. - Check hydraulic oil - Check fuse FU02 and FU2 - Recharge the accumulator. - Check UP switch and replace if necessary.
Loads can not be lowered down	- Dirty oil blocks control valve. - The solenoid valve for lowering is not opened or is damaged	- Check hydraulic oil and clean control valve. Replace the oil if necessary. - Check or replace the valve for lowering
It can not stop when lifting up	- The UP switch is damaged.	- Disconnect power supply and replace the UP switch
Moving in one direction	- The sensitive switch and the connecting cable are not well-contacted.	- Check the sensitive switch in control lever and the connecting cable.
The stacker travels very slowly.	- The accumulator capacity is insufficient.Orthe electromagnetic brake is tight. Or the related cables are not well-contacted.	- Check the capacity indicator, the brake and related cables.

If above steps still cannot solve problems, please contact after-sales service department of the manufacturer and have the problems solved by specially trained technicians.

5.2 Preparation before repair

To prevent possible accidents during maintenance and repair work, following preparations must be done:

— Park the stacker safely.

— Press the emergency stop switch and disconnect the connectors on accumulator.

5.3Check hydraulic oil level

— Get the stacker ready for maintenance or repairing.

— Open the cover of electric unit.

— Check hydraulic oil level in oil tank.

Check the hydraulic oil level only after the fork and main frame are lowered to their lowest position.

5.4 Use Preparation after maintenance or repairing

Use the forklift only after following operations have been completed.

— Clean the forklift

— Check the brake.

— Check the emergency stop switch.

— Check the horn.