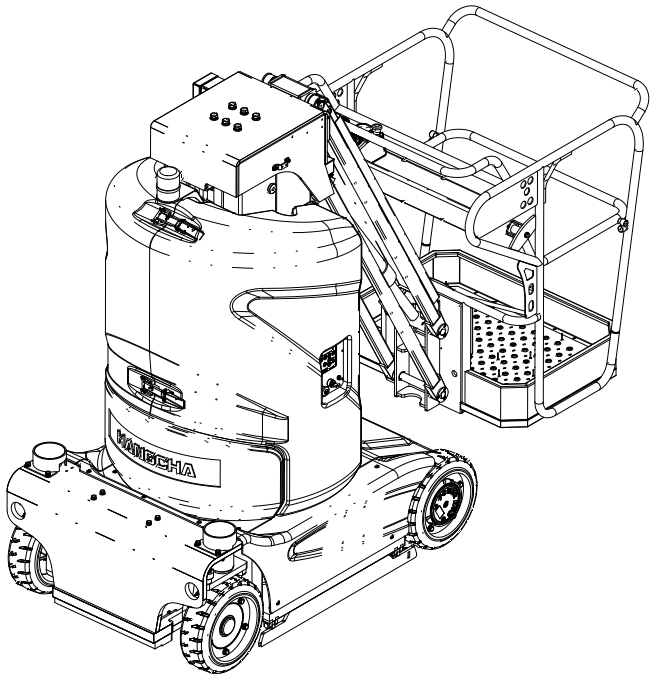
HV Series

Vertical Mast A Lift

HV110D

OPERATION AND MAINTENANCE MANUAL



HANGCHA GROUP CO.,LTD

1/2022

Key Points

Before operating the machine, be sure to read, understand and comply with these safety rules and operating instructions. Only trained and authorized personnel are allowed to operate the machine. This manual should be kept as part of the machine and always with the machine. If you have any questions, please contact HANGCHA group.

Catalog

Owners, users and operators:

Thank you for choosing and using our machine. Our primary concern is the safety of users, which needs our joint efforts to achieve better. We think that as the user and operator of the equipment, if you can comply with the following requirements, it will be of great help to the safe use of the equipment:

1 Comply with user rules, workplace rules and government laws and regulations.

2Read, understand and abide by the instructions in this manual and other manuals of this machine.

3 Carry out good safety work routine inspection according to routine.

4 Only trained / certified operators or experienced and knowledgeable supervisors can operate the machine.

If there are ambiguous contents in this manual or you think it should be added，please contact us.

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DANGER

Failure to comply with the instructions and safety rules in this manual will result in death or more serious injury

Cannot operate, unless:

☑ You have understood and practiced the rules for safe operation of the machine in this operation manual.

1 Avoid dangerous situations.

Know and understand the safety rules before proceeding.

2 Always perform a pre-operation check.

3 Always perform pre-use functional tests.

4 Check the workplace.

5 Use the machine only according to its design intent.

☑Read, understand and comply with the manufacturer's instructions and safety rules, safety operation manual and machine labels.

☑Read, understand and comply with user safety rules and workplace regulations.

☑Must read, understand and comply with all applicable government laws and regulations.

☑ You are properly trained to operate the machine safely.

Classification of hazards:

The symbols, color standards and symbols used in product labeling of HANGCHA GROUP are as follows:

Safety warning sign——Used to indicate the existence of potential personal injury. Observe all safety messages after the sign to avoid possible injury or death of personnel.

危 险

Red sign——It is used to indicate that there is an emergency and dangerous situation. If it is not avoided, it will lead to death or serious injury.

警 告

Orange sign——It is used to indicate that there is a potential dangerous situation. If it is not avoided, it will lead to death or serious injury.

当 心

Yellow with safety warning sign——It is used to indicate that there is a potential dangerous situation. If it is not avoided, it may cause slight or moderate personal injury.

当 心

Yellow without safety warning sign——It is used to indicate that there is a potential dangerous situation, which may lead to property loss if not avoided.

注 意

Green sign——It is Used to prompt operation or maintenance information。

safety regulations

Conditions related to equipment use

□ The ground of the workplace must be flat and firm，with free overhead equipment and sufficient distance between it and high-voltage lines.

□ The ambient temperature should be between -20℃～40℃.Altitude≤1000m.

□ Ambient humidity≤90%.

□ Power Supply: AC 110-230V±10%，50-60Hz.

Design purpose

The purpose of this machine is limited to the lifting of personnel and their tools and materials to aerial workplaces.

Safety sign maintenance

Replace any lost or damaged safety signs so that the operator can keep safety in mind.

Use neutral soap and water to clean safety signs.

Do not use solvent based cleaners, as such cleaners may damage the materials of safety signs.

Personnel requirements

Only trained and qualified personnel can operate this machine. Always wear a safety belt and helmet when working at high altitude.

If you have a history of motion sickness, cramps or acrophobia, you must not operate this machine.

Do not take drugs or drink alcohol before the operation, as this will affect the operator's alertness and coordination. Operators should consult a medical practitioner during medication to determine whether the machine can be safely operated.

⚠ shock hazard

The machine is not insulated and does not provide shock protection when in contact with or near electrical wires.

Maintain a sufficient safe distance from power lines and electrical equipment in accordance with applicable government laws and regulations and as described in the table below.

voltage	gap required
0~300V	No touching
300V~50KV	3.05m
50KV~200KV	4.60m

200KV-350KV	6.10m
350KV-500KV	7.62m
500KV-750KV	10.67m
750KV-1000KV	13.72m

Consideration should be given to the effect of strong winds or gusts on the movement of the platform, the swing and relaxation of the wires.

Keep away from the machine if it comes into contact with a live wire. Before cutting off the power, do not touch or operate the machine by people on the ground or platform.

Don't operate the machine during lightning or storm.

Do not use the machine as a ground wire during welding.

Do not touch the electriferous controller.

⚠ Tipping hazard

Personnel, equipment and materials on the platform shall not exceed the maximum bearing capacity of the platform.

Maximum bearing capacity

Maximum number of personnel (indoor) 2 person

Maximum number of personnel (ouutdoor) 1 person

Maximum working load of platform 210kg

Work area safety

The platform can be lifted only on solid and flat horizontal ground. Objects that increase wind load cannot be installed on the equipment.

When the platform is raised, the driving speed shall not exceed 0.5km/h.

The tilt alarm can not be used as a level indicator. Only when the machine is seriously tilted, the tilt alarm of the chassis and platform will sound.

If the tilt alarm sounds:

Lower mast and jib. Move the machine to a solid level ground. If the tilt alarm sounds when lifting the platform, lower the mast and jib very carefully.

For outdoor machines, when the wind speed may be greater than 12.5m/s, the platform cannot be raised. If the wind speed exceeds 12.5m/s after lifting, the platform should be lowered immediately and the machine can not be operated.

Follow the maximum allowable manual force and the maximum number of passengers when raising the platform.

Do not operate the machine in strong winds or gusts. The surface area of the platform or load cannot be increased. Increasing the area exposed to the wind will reduce the stability of the machine.

Do not use the platform controller to release the platform when the platform is stuck or other nearby objects hinder its normal movement. All personnel must leave the platform before attempting to release the platform using ground control.

In the folded state, it is necessary to be very careful and reduce the speed when the machine is running on uneven terrain, gravel, unstable or smooth surface, near the hole and steep slope.

In the lifting state, the machine can not be driven in uneven terrain, unstable or other dangerous conditions.

A machine cannot be used as a crane.

Do not push or pull any object outside the platform.

Maximum manual force			
model	Applicable occasions	Maximum manual force	Maximum number of members
HV110D	outdoor	200N	1
	indoor	400N	2

Limit switches cannot be changed or disabled.

Do not change or damage any parts that may affect the safety and stability of the machine.

Do not replace the key parts that affect the stability of the machine with parts of different weights or specifications.

Make sure all tires are in good condition. Do not modify or alter the platform without the written permission of the manufacturer. Installing additional devices on platform, skirting board or

guardrail for placing tools or other materials will increase the weight and surface area of the platform or increase the load.

It is not allowed to use the battery whose weight is less than the original battery. The battery not only plays a counterweight role in the chassis, but also is very important to maintain the stability of the machine. The weight of each battery must reach 220kg.

Do not place, tie or hang loads on any part of the machine.

Do not place the ladder or scaffold in the platform or close to any part of the machine.

Only evenly distributed tools and materials that can be safely moved by people on the platform can be transported.

Do not use the machine on moving surfaces and vehicles.

Make sure all tires are in good condition and the nuts are properly tightened.

Do not use the forearm to push the machine or other things.

Do not attach the jib or platform close to the adjacent building.

Do not tie the platform or platform to an adjacent member.

Do not place the load outside the platform guardrail.

⚠ Danger of crushing

Do not put your hands or arms close to the mast and do not touch the falling mast.

Do not stand under the platform.

When using the controller to operate the machine on the ground, please maintain normal judgment and planning.

Keep a safe distance between the operator, the machine and stationary objects.

⚠ Danger of operating on slopes

Do not drive the machine on slopes that exceed the machine's slope and side slope ratings.

The slope rating is only applicable to machines in the retracted state.

model	Maximum slope rating in retracted state	Maximum side slope rating in retracted state
HV110D	25%	10%

Note: Slope ratings are subject to ground conditions and traction.

⚠ Danger of falling

During operation, the personnel on the platform must wear full-body safety devices and fasten them to the approved rope fixing points with safety belt hook. Only one hook can be tied to each rope anchor point.

Keep the platform floor free of debris.

The entrance railings must be closed before operating the equipment.

Do not enter the platform unless the platform guardrail is secure and reliable.

Do not climb or sit on the platform guard. Stand steadily on the platform floor at all times.

When the platform is lifted, you cannot climb down from the platform.

Do not leave the platform when lifting. In case of electric control failure, the ground personnel should use the manual lowering function to lower the platform before leaving.

Be careful when entering and leaving the platform to ensure that the jib has been lowered to the lowest position. When entering or leaving the platform, face the platform and keep "three-point contact" with the equipment with both hands and one foot, or both feet and one hand.

⚠ Danger of collision

Users must follow the rules of the laws and regulations of employers, workplaces and governments on the use of personal protective equipment.

When starting or operating the machine, pay attention to the sight range and the existence of blind spots.

The device can release the brake only when it is on a level ground.

Check the work area to avoid overhead obstacles or other possible hazards.

When grasping the platform guard, be careful of the danger of squeezing.

Only when there are no people or obstacles in the area under the platform, can the platform be lowered.

Irrelevant personnel must leave the equipment beyond 1.8m to ensure the safety of rotary operation.

Limit travel speed based on ground conditions, congestion, slope, personnel location, and any other factors that may cause a collision.

Do not operate the machine on the route of any crane or mobile overhead machinery unless the crane controller is locked or precautions are taken to prevent any potential collision.

When operating the machine, do not drive dangerously or play。

⚠ Danger of physical injury

Do not operate the machine when hydraulic oil or air leaks. Hydraulic oil or air leaks may penetrate or burn the skin.

Incorrect contact with any component under the lid can result in serious injury. Only trained maintenance personnel can examine and repair the compartment.Recommendation: Inspections should be carried out by the operator only during pre-operation inspections. All compartments must be closed and locked during operation.

⚠ Danger of explosion and fire

Charge the machine in an open, ventilated place away from flames and sunlight.

Do not use or charge the machine where flammable or explosive gases or particles may be present.

⚠ Danger of machine damage

Do not use damaged or malfunctioning machines.

A thorough pre-operation inspection of the machine and testing of all functions shall be carried out prior to each change of work. The damaged or malfunctioning machine should be marked immediately and stop operation。

Ensure that all maintenance operations have been carried out in accordance with the provisions in this manual.

Ensure that all labels are properly placed and easily identifiable and that this manual is kept in the manual box on the platform.

⚠ Danger of component damage

Do not use the machine as a ground wire during welding.

⚠ Safety of storage battery

⚠ Danger of burning

The battery contains acidic substances, so you should wear protective clothing and glasses when using the battery.

Avoid spillage or contact with acidic substances in the battery. Use soda and water to neutralize spilled acid substances in storage batteries.

The battery box must be kept perpendicular to the ground.

Do not expose to the rain to charge the battery.

⚠ Danger of explosion

Sparks, flames and lighted cigarettes are prohibited from approaching the battery. The battery can release explosive gas.

The housing should remain open during the entire charging process.

Do not touch battery terminals or cable clips with tools that may cause sparks.

⚠ Danger of component damage

Do not use any battery charger larger than 24V to charge the battery.

⚠ Danger of electric shock/burn

Only connect the battery charger to the grounded AC three wire power socket.

Check cables, cables and wiring daily for damage. Replace damaged items before operation.

Avoid electric shock due to contact with battery terminals. Take off all the rings, watches and other accessories.

⚠ Danger of tipping

Do not use a battery that weighs less than the original battery. The battery not only plays a counterweight role in the chassis, but also is very important to maintain the stability of the machine. Each battery must weigh 220kg.

⚠ Danger of pollution

Waste batteries must be disposed of in accordance with government regulations.

Lock after each use

1 Choose a safe parking location, which can be on solid level ground, free of obstacles and away from heavy traffic.

2 Lower jib and mast to loading position.

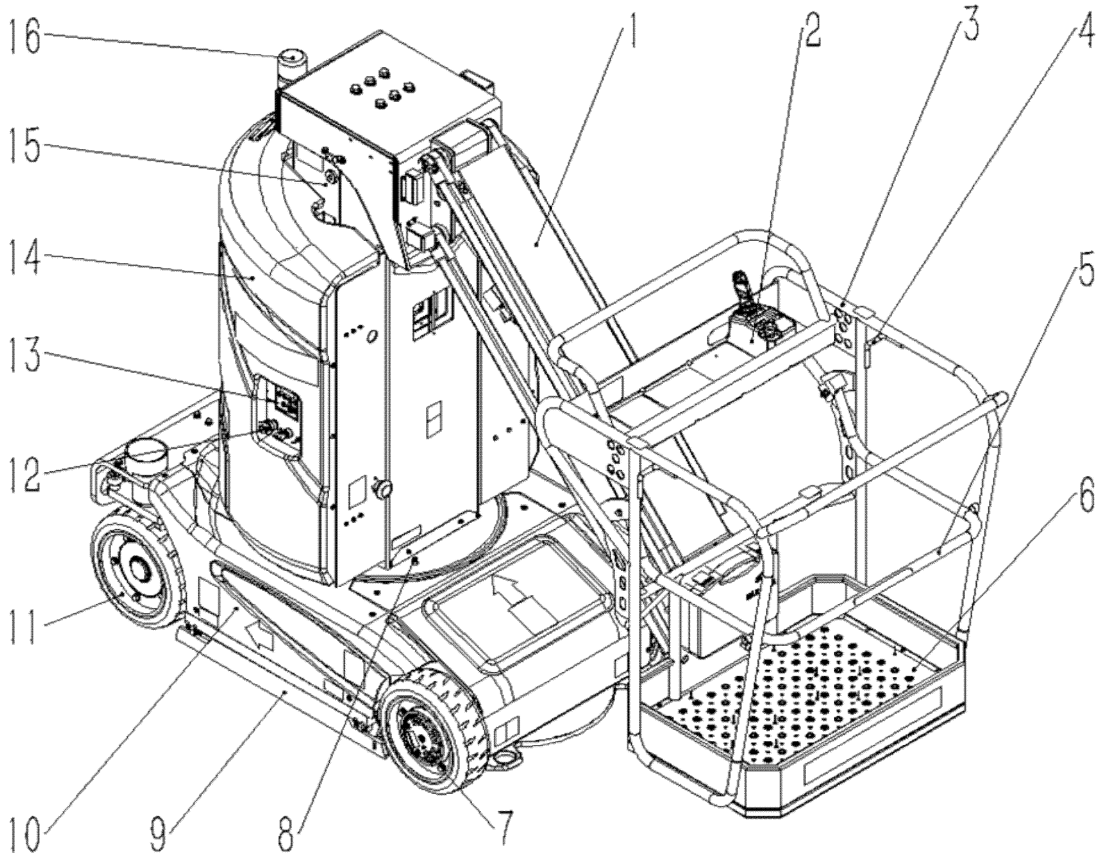
3 Rotate the turntable to the platform between the two non-steering wheels.

4 Turn the key switch to the "off" position and unplug the key to avoid unauthorized use.

5 Push the red emergency stop button inward to the "off" position.

6 Chock the wheel with a wedge.

Legend

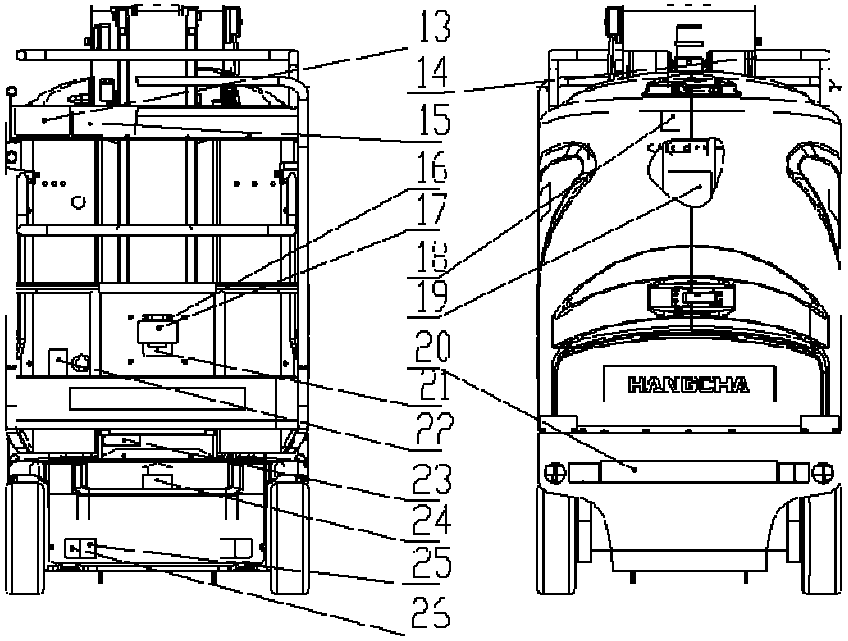


1Forearm	9Pit protection device
2Platform controller	10 Chassis
3Platform guardrail	11Steering wheel
4Safety hook	12Red emergency stop button
5Platform entrance middle column	13Ground controller
6 Platform	14Hydraulic power unit (inside the housing)
7Driving wheel	15Mast
8 Mast emergency lowering handle	16Work indicator lamp

Label

Use the pictures below to verify that the labels on the machine are easy to identify and properly positioned.

The following table is a detailed list of the number and description of labels.



Item	Description	Item	Description
1	Platform Operating Instructions	14	Forbidden Change or Remove Limit Switch
2	Safety Anchor	15	Read Manual before Operation
3	Tipping Risk	16	Notice Head Guard
4	Risk of Crushing and Falling	17	Manual Location
5	Model LabelHV110D	18	Anti-Pinch
6	Rated Load Description	19	Risk of Explosion and Fire
7	Forklift Location	20	Typeface
8	Tire Load	21	Forbid Standing People
9	Front	22	Main Power Switch
10	Sputter Hazard	23	Emergency Descent
11	Pre-operation Inspection	24	No Stampede
12	Emergency Operating Instructions	25	Lifting
13	Tilt Risk &Tilt Alarm	26	Bundle location

Product performance parameters (Only for reference)

Parameter item	Unit	
Length	m	2.61
Width	m	1
Height	m	2
Ground clearance	mm	60
Ground clearance (pit protection device	mm	19
Machine weight	kg	2930
Maximum working height	m	11.22
Maximum platform height	m	9.22
Maximum horizontal extension	m	7.89
Maximum Loading Capacity	kg	210
Wheelbase	m	1.22
Turning radius of inner wheel	m	0.5
Turning radius of outer wheel	m	4.5
Maximum allowable lateral force	N	400
Working platform length	m	0.65
Working platform width	m	0.93
Tire diameter	mm	381
Tire width	mm	127
Hydraulic system pressure	MPa	16
System voltage(DC)	V	24
Battery	V/Ah	24/240
Charger current	V/A	24/30
Driving speed (fast)	km/h	4.5
Driving speed (working state)	km/h	0.5
Climbing ability	%	25
Maximum allowable wind speed	m/s	12.5
Maximum allowable inclination	2.5°	

Controller

Ground controller

1. LED display

Diagnostic reading device and battery charging indicator

2. Red emergency stop button

3. Key switch

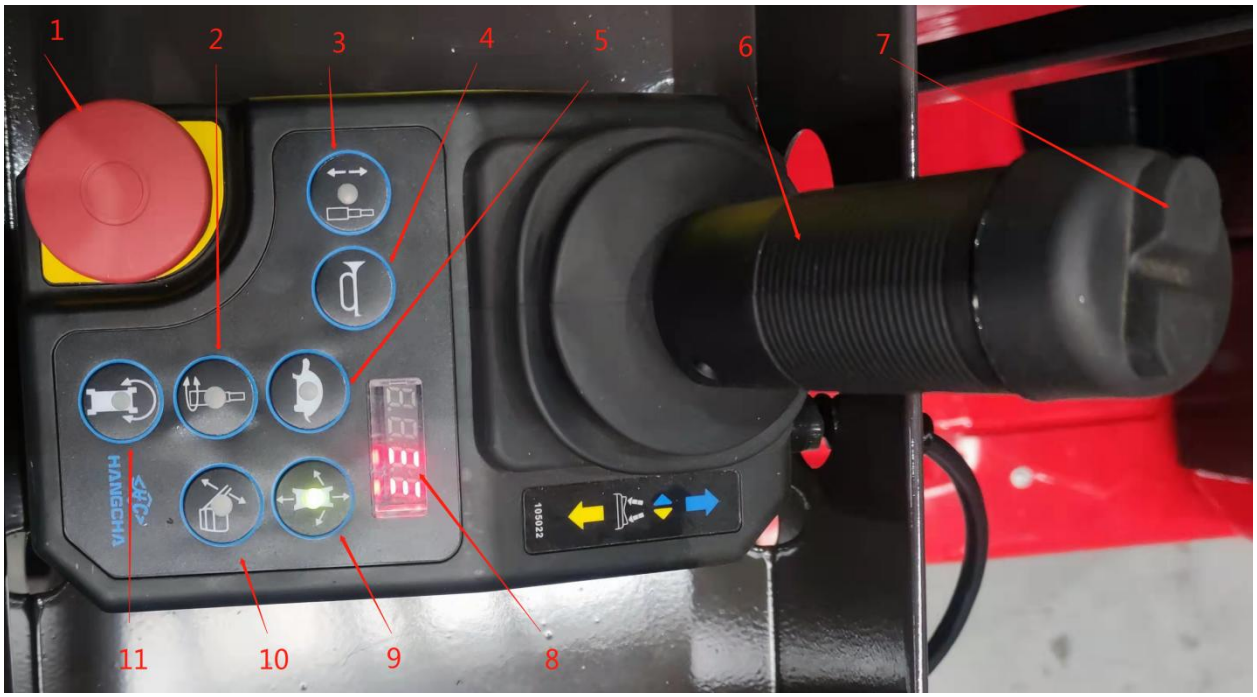
Turn the key switch to the right "platform" icon position, platform controller will run; Turn the key switch to the middle "OFF" position, the machine will be closed; Turn the key switch to the left "chassis" position and the ground controller will operate.

4. Overload alarm indicator light

5. Function selection switch

Turn the switch up for swing arm lifting, switch center for mast lifting, switch down for mast rotation.

Platform controller



1. Red emergency stop button
2. Table rotation function button
3. Mast lifting button
4. The horn button
5. Low speed button
6. Control handle
7. Thumb stick switch
8. LED display
10. Swing arm function button
11. Optional function reservation buttons

Platform controller

1 Red emergency stop button

Push the red emergency stop button inward to the "off" position to stop all functions, and rotate the red emergency stop button clockwise to the "on" position to operate the machine.

2 Turntable rotation button

Press the button to activate the turntable rotation function.

3 Mast lifting function selection button

Press this button to activate the mast lifting function.

4 Press the horn button

Press the horn button, the horn will beep, release the horn button, the horn will stop beeping.

5 Running low speed button

The speed limit is low speed after this button is pressed.

6 Control handle

Mast lifting function: press and hold the function enable switch on the platform control handle to enable the mast lifting function, move the control handle in the direction indicated by the blue lead, and the mast will be raised. Move the control handle in the direction indicated by the yellow arrow and the mast will descend.

Swing arm lift function: Press the function enable switch on the platform control handle to enable the forearm lift function. Move the control handle in the direction indicated by the blue arrow and the forearm will rise. Move in the direction indicated by the yellow arrow to control hand disease and the forearm will descend.

Drive function: Press the function enable switch on the platform control handle to enable the drive function. Move the control handle in the direction indicated by the red arrow on the control panel and the machine will move in the direction indicated by the yellow arrow on the chassis. Move the control handle in the direction indicated by the white arrow on the control panel and the machine will move in the opposite direction indicated by the yellow arrow on the chassis.

Turntable rotation function: push the handle left or right to realize the turntable rotation function.

7 Thumb rocker switch

To activate the steering function, press the thumb stick switch in either direction.

8 LED Display

Diagnostic reading device and battery charge indicator.

9 Drive function select button

press this button to activate the drive function.

10 Swing arm function button

press the button to activate the lifting/falling function of the forearm.

11 Optional function reservation button

Inspection before operation

Cannot operate unless：

☑You have understood and practiced the rules for safe operation of the machine in this operation manual.

1Avoid dangerous situations.

2 Always perform a pre-operation check.

Know and understand the safety rules before proceeding.

3 Always perform pre-use functional tests.

4 Check the workplace.

5 Use the machine only according to its design intent.

Basic principle

It is the operator's responsibility to perform pre-operation inspection and routine maintenance.

The operation inspection is a very intuitive inspection process, which is performed by the operator before each job change. The purpose of the inspection is to find out whether the machine has obvious problems before the operator performs the function test.

Pre operation inspection can also be used to determine whether routine maintenance procedures are required. The operator can only perform routine maintenance items specified in this manual.

Please refer to the list on the next page and check each item.

If damage or any unauthorized change from the factory condition is found, mark the machine and stop using it.

Only qualified maintenance technicians can repair the machine according to the manufacturer's regulations. After the repair, the operator must perform the pre-operation check again before continuing the function test.

Regular maintenance and inspection shall be carried out by qualified maintenance technicians according to the specifications and manual provided by the manufacturer.

Inspection before operation

□Ensure that the manual is complete, easy to read and stored in the manual box in the platform.

□Ensure that all labels are clear, legible and properly positioned. Refer to the "labels" section。

□ Check for hydraulic oil leaks. Is the hydraulic oil level appropriate. Refer to the “maintenance”section.

□Check whether the battery fluid is leaking and the liquid level is suitable. Add distilled water as required. Refer to the “maintenance”section.。

Check the following parts or areas for damage, improper installation, missing parts and unauthorized changes：

□Electrical components, wiring and cables

□Hydraulic hoses, connectors, hydraulic cylinders and hydraulic valve blocks

□Battery pack and its connection

□Drive motor

□Sliders between masts

□Tires and wheels

□Chain and sprocket

□Masts

□Limit switches, alarms and horns

□Nuts, bolts and other fasteners

□Platform entrance door

□Indicator lights and alarms (if equipped)

□Platform control lever

□Pit protection device

Check the whole machine to find out：

□Cracks in welds bead or structural components

□Dents or damage of the machine

□Ensure that all structural and other key components are complete, all relevant fasteners and pins are in correct position and tightened

Workplace inspection

Cannot operate unless:

☑You have understood and practiced the rules for safe operation of the machine in this operation manual.

1 Avoid dangerous situations.

2 Always perform a pre-operation check.

Know and understand the safety rules before proceeding.

3 Always perform pre-use functional tests.

4 Check the workplace.

5 Use the machine only according to its design intent.

Basic principle

Workplace inspection helps the operator decide whether the workplace can ensure the safe operation of the machine. The operator should do this work before moving the machine to the workplace.

It is the operator's responsibility to understand and remember the hazards in the workplace and to be aware of and avoid these problems when moving, installing and operating the machine.

Workplace inspection

Be careful and avoid the following dangerous situations：

- A steep slope or cave
- Protrusions, ground obstacles or debris
- Inclined surface
- Loose or smooth surface
- Aerial obstacles and high voltage wires
- Dangerous place
- A surface support that is not sufficient to withstand the full load exerted by the machine
- Wind and weather conditions
- Unauthorized personnel
- Other possible unsafe conditions

functional testing

Cannot operate unless:

☑You have understood and practiced the rules for safe operation of the machine in this operation manual.

1 Avoid dangerous situations.

2 Always perform a pre-operation check.

Know and understand the safety rules before proceeding.

3 Always perform pre-use functional tests.

4 Check the workplace.

5 Use the machine only according to its design intent.

Basic principle

Functional testing is used to detect faults before starting to use the machine.

The operator must follow the step-by-step instructions to test all functions of the machine.

It is forbidden to use the machine in trouble. If a fault is found, the machine must be marked and out of service. Only qualified maintenance technicians can repair the machine according to the manufacturer's regulations.

After the maintenance, the operator must perform the pre operation inspection and function test again before starting to use the machine.

1 Select a solid, level and obstacle free test area.

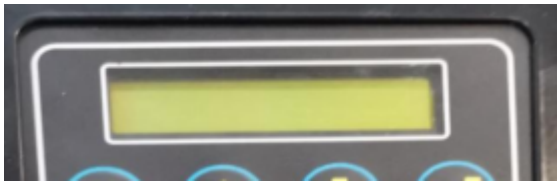
2 Make sure the battery pack is connected.

On the ground controller

3 Pull the red emergency stop button on the ground to the "on" position, and turn the red emergency stop button on the platform clockwise to the "on" position.

4 Turn the key switch to the ground controller.

5 Observe the LED diagnostic reading device on the platform controller.



⊙Result: the LED should be as shown above.

Test emergency stop

6 Push the ground red emergency stop button inward to the "off" position.

⊙Result: No function can run.

7 Pull the red emergency stop button on the ground to the "on" position, and turn the red emergency stop button of the platform clockwise to the "on" position.

Test equipment function

8 Do not press and hold any function enable button, move the action selection switch up and down.

⊙Result: No action

9 Press and hold the mast lifting / turntable rotation function selection button, and move the action selection switch up and down.

⊙Result: the mast lifting / lowering function operates and the alarm sounds.

10 Press and hold the mast lifting / turntable rotation function selection button, and move the action selection switch up and down.

⊙Result: the turntable rotation function runs, and the alarm sounds.

11 Press and hold the up and down function enable button of the small arm, and move the action selection switch up and down.

⊙Results: the lifting / lowering function of the jib is in operation。

Test on platform controller

Emergency stop

12 Push the platform red emergency stop button to the "off" position

⊙Result: All functions will not run.

13 Pull the red emergency stop button on the ground to the "on" position, and turn the red emergency stop button on the platform clockwise to the "on" position.

⊙Result: LED diagnostic reading device indicator light will be bright

Test the horn

14Press the horn button.

⊙Result: the horn will sound.

Test function activation and device function

15 Do not press and hold the function enable switch on the control handle.

16 Slowly move the control handle in the direction indicated by the blue arrow, and then move it in the direction indicated by the yellow arrow.

⊙Result: All functions will not run.

17 Press the forearm lifting function selection button.

18 Press and hold the function enable switch on the control handle.

19 Slowly move the control handle in the direction indicated by the blue arrow.

⊙Results: the forearm should be raised.

20 Release the control handle.

⊙Result: the platform should stop rising.

21 Press and hold the function enable switch and slowly move the control handle in the direction indicated by the yellow arrow.

⊙ Results: the forearm should be lowered. When the jib is lowered, the lowering alarm should sound.

22 Press the mast lifting / slewing function selection button.

23 Press and hold the function enable switch on the control handle. Slowly move the control handle in the direction indicated by the bluearrow.

⊙Results: the mast should be raised and the pit protection device should be deployed.

24 Release the control handle.

⊙Result: mast should stop rising.

25 Press and hold the function enable switch and slowly move the control handle in the direction indicated by the yellow arrow.

⊙ Results: the mast should be lowered. When the mast is lowered, the lowering alarm should sound.

26 Press and hold the function enable switch on the control handle. Press the thumb rocker switch at the top of the control handle in the direction indicated by the blue arrow on the control panel.

⊙Result: the turntable turns left.

27 Press the thumb rocker switch at the top of the control handle in the direction indicated by the yellow arrow on the control panel.

⊙Result: the turntable turns right.

Test steering

28 Press the drive function selection button.

29 Press and hold the function enable switch on the control handle.

30 Press the thumb rocker switch at the top of the control handle in the direction indicated by the blue arrow on the control panel.

⊙Result: the steering wheel should turn in the direction indicated by the blue arrow on the control panel.

31Press the thumb rocker switch in the direction indicated by the yellow arrow on the control panel.

⊙ Result: the steering wheel should turn in the direction indicated by the yellow arrow on the drive chassis.

Test drive and brake functions

32 Press and hold the function enable switch on the control handle.

33 Slowly move the control handle in the direction indicated by theblue arrow on the control panel until the machine begins to move, then return the handle to the center position.

⊙Result: The machine should move in the direction indicated by the yellow arrow on the chassis, and then stop suddenly.

34 Press the function on the control handle to enable the switch.

35 Slowly move the control handle in the direction indicated by the white arrow on the control panel until the machine begins to move, then return the handle to the center position.

⊙Results: The machine should move in the opposite direction as indicated by the yellow arrow on the chassis, and then stop suddenly.

Note: the brakes must be able to stop the machine on any incline that can be climbed.

Test the limited driving speed

36 Press the mast lifting / slewing function selection button.

37 Press and hold the function enable switch on the control handle to lift the mast about 20 cm.

38 Press the drive function selection button.

39 Press and hold the function enable switch on the control handle and slowly move the control handle to the full drive position.

⊙Results: the maximum driving speed should not exceed 14 cm / s when the platform is raised.

□ Results: when the driving speed exceeds 14cm / s, please mark the machine immediately and stop running.

40 Lower the mast and lift the jib about 1m above the ground.

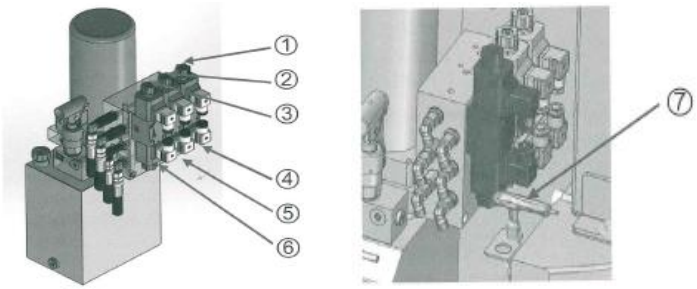
41Press the drive function button, press and hold the function on the control handle, and then use the switch to slowly move the control handle to the full drive position.

⊙Results: the maximum driving speed should not exceed 14cm / s when the platform is raised.

¤Results: when the driving speed exceeds 14cm / s, please mark the machine immediately and stop running.

42 Lower the forearm to the folded position.

Test manual function



1.Right steering valve
2.Rotary table right turn valve
3.Mast lifting valve
4.Left steering valve
5.Rotary table left turn valve
6.Jib lifting valve 7.wrench

Mast lifting / lowering

43 Open the cover.

44 Find the mast lifting valve.

45 Insert the handle into the manual operation hole of the pump.

46 Press and hold the button on the mast lifting valve with a wrench, and swing the handle up and down at the same time.

⊙Result: mast should be lifted.

47 Activate the mast lifting function and lift the mast about 60 cm.

48 Pull out the emergency lowering pull on the chassis.

⊙Result: mast should be lowered without alarm.

Rotation of turntable

49 Find the turntable left turn valve.

50 Insert the handle into the manual operation hole of the pump.

51 Use a wrench to hold down the button above the rotary table left turn valve and swing the handle up and down at the same time.

⊙Result: the turntable turns left.

52 Find the turntable right turn valve.

53 Press and hold the button above the rotary table right turn valve, and swing the handle up and down at the same time.

⊙Result: the turntable turns right.

Jib lifting / lowering

54 Find the jib lifting valve.

55 Press and hold the button above the jib lifting valve with a wrench, and swing the handle up and down at the same time.

⊙Results: the forearm should be lifted.

56 Activate the lifting function of the jib, and lift the jib about 1m above the ground.

57 Turn the valve on the boom cylinder counterclockwise.

⊙Results: the forearm should be lowered without alarm.

Turn

58 Find the left turn valve.

59 Insert the handle into the manual operation hole of the pump.

60 Press and hold the button above the left steering valve with a wrench, and swing the handle up and down at the same time.

⊙Result: the wheels turn left.

61 Find the right turn valve.。

62 Press and hold the button above the right steering valve and swing the handle up and down at the same time.

⊙Result: the wheels turn right.

Note: the cover can't be opened at special position, so manual operation can be used after removing the cover.

Operating instructions

Cannot operate unless:

☑You have understood and practiced the rules for safe operation of the machine in this operation manual.

1 Avoid dangerous situations.

2 Always perform a pre-operation check.

Know and understand the safety rules before proceeding.

3 Always perform pre-use functional tests.

4 Check the workplace.

5 Use the machine only according to its design intent.

Basic principle

This machine is a self-propelled hydraulic lifting equipment equipped with a working platform on the mast mechanism. The vibration generated by the machine is not dangerous to the operator standing on the working platform. This machine can be used to load workers and their tools to a certain height from the ground, or to a certain working area above the machine or equipment.

The operation instruction section provides specific instructions for all aspects of machine operation. It is the operator's responsibility to follow all safety rules and instructions in the operation and maintenance manual.

It is not safe or even dangerous to use this machine for other purposes except to lift people and their tools and materials to thehigh altitude workplace.

Only trained and authorized personnel can operate the machine. If more than one operator uses the same machine at different times in the same work shift, they must be qualified operators and follow all the safety rules and instructions in the operation and maintenance manual, which means that each new operator should carry out pre operation inspection, function test and workplace inspection before using the machine.

Emergency stop

1Push the red emergency stop button of the ground or platform controller to the "off" position to stop all functions.

2Repair any operation function must be performed when pressing the red emergency stop button.

Emergency operation

Mast descent

3 Pull the emergency descent control button outward.

Forearm descent

4Turn the valve on the forearm cylinder counterclockwise.

Rotating turntable

5Find the turntable left/right turn valve.

6The handle is inserted into the pump's manual operation hole.

7Press and hold the button on the left / right turn valve of the turntable with a wrench, and swing the handle up and down at the same time.

Operate on the ground

8Turn the key switch to the ground controller

9Pull the red emergency stop button on the ground to the "on" position, and turn the red emergency stop button on the platform clockwise to the "on" position.

Adjust platform position

10Press and hold the appropriate function button.

11Turn the function switch.

Note: drive and steering functions cannot be used through the ground controller.

Operate on the platform

12Turn the key switch to the platform controller.

13Pull the red emergency stop button on the ground to the "on" position, and turn the red emergency stop button of the platform clockwise to the "on" position.

14Make sure the battery is connected before operating the machine.

Adjust platform position

Mast

15Press the mast lifting / slewing function selection button.

16Press and hold the function enable switch on the control handle.

17Move the handle according to the mark on the control panel.

18 利 Use the thumb rocker switch located at the top of the control handle to turn the turntable.

Forearm

19Press the forearm lift function button.

20Press the function on the control handle to enable the switch.

21Move the handle according to the mark on the control panel.

Turn

22Press the drive function selection button.

23Press and hold the function enable switch on the control handle.

24Use the thumb rocker switch located at the top of the control handle to turn the steering wheel.

Drive

25Press the drive function selection button.

26Press and hold the function enable switch on the handle.

27Increase speed: slowly move the control handle away from the center position.

Reduce the speed: slowly move the control handle to the center position.

Stop: return the control handle to the center position or release the function enable switch.

Use the platform controller and the direction arrow on the chassis to determine the direction of the machine travel。

When the platform is raised, the movement speed of the machine is limited.

The state of the battery will affect the performance of the machine.

When the battery indicator light flashes, the driving speed and function speed of the machine will decrease.

Manual operation

Lifting mast

28Open the cover on the side opposite the controller.

29Find the mast lifting valve.

30Insert the handle into the manual operation hole of the pump.

31Press and hold the button on the mast lifting valve with a wrench, and swing the handle up and down at the same time.

Lifting Forearm

32Find the Forearm lifting valve.

33Use a wrench to hold down the button on the small boom lift valve while swinging the handle up and down.

Turn

34Find the left/right steering valve.

35Insert the handle into the manual operation hole of the pump.

36Use a wrench to hold down the button above the left / right steering valve while swinging the handle up and down.

⚠ Driving on a slope

Determine the machine's slope and side slope ratings and slope.

Maximum slope rating，retracted position 25%

Maximum side slope rating，retracted position 10%

Note: slope ratings are limited by ground conditions and traction.

Press the drive speed select button to select the fast drive speed mode.

Determine the slope：

Measure the slope with digital inclinometer or follow the steps below。

You need the following tools:

Woodworking ruler

Straight wood block with a length of at least 1m

Tape measure

Place the block on the slope.

At the end of the downhill, place the Woodworking ruler on the upper edge of the block and lift the end of the block until it is level.

Keep the block level and measure the distance from the bottom of the block to the ground.

Divide the tape distance (raise height) by the length (travel) of the wood block, and multiply by 100.

For example：

Travel=3.6m

Elevated height =0.3m

0.3m ÷ 3.6m = 0.083 × 100 = 8.3%

If the slope exceeds the maximum slope or side slope rating, the machine must be lifted or transported up and down the slope. Please refer to the transportation and lifting section.

Description of battery and charger

Observe and obey:

☑Do not use external chargers or booster batteries.

☑Charge the battery in a well - ventilated place.

☑Charge with the correct AC input voltage indicated on the charger.

☑Only use batteries and chargers approved by Hangcha.

Instructions for filling and charging dry batteries

1Open the cover during battery charging.

2Remove the battery ventilation cover from the battery vent and remove the plastic seal.

3The battery electrolyte is added to each battery until the level passes through the electrode plate.

Do not add to the maximum liquid level before charging the battery. Excessive charging can cause the battery electrolyte to overflow during charging. Use soda water to neutralize spilled battery acid.

4Install the battery ventilation cover.

5Press the emergency stop button.

6Connect the charger plug to the AC power supply for charging. The charge cannot be interrupted.

7Check whether the charging indicator is full.

8Remove the battery ventilation cover, check the battery electrolyte level, if necessary, add enough distilled water to go beyond the plate, do not add too much.

Charge the battery

1 Open the cover.

2Press the emergency stop button.

3Remove the battery vent cover and check the battery electrolyte level. If necessary, only add enough distilled water to cover the plate. Do not add too much.

When the electrolyte temperature is above 40 ℃, do not charge the battery until the electrolyte cools down.

4 Clean and replace the battery vent cover.

5 Connect the charger plug to the AC power supply to charge. Charging cannot be interrupted at the beginning. A charging cycle takes about 10 hours, and the battery power must reach 70% - 80%.

6 The charger indicates that the battery is full.

7 Remove the battery vent cover and check the battery electrolyte level. If necessary, only add enough distilled water to cover the plate. Do not add too much.

8 Clean and replace the battery vent cover.

9 Disconnect the charger plug from the AC power supply.

10Close and lock the cover.

11Pull the red emergency stop button to the “on” position。

Transportation and lifting instructions

Observe and obey：

☑When using the crane to lift the machine, please maintain normal judgment and planning to control the movement of the machine.

☑Only qualified personnel with high-altitude lifting operation can load and unload the machine.

☑ Transport vehicles must be parked on level ground.

☑ When loading the machine, the transport vehicle must be fixed to prevent movement.

☑ Make sure the vehicle capacity, loading surface, chain or belt is sufficient to support the weight of the machine. Please refer to the nameplate for machine weight.

☑ The machine must be on a level or in place before releasing the brake.

☑ Only personnel with forklift operation qualifications can use forklift loading and unloading machines.

☑ Ensure crane lifting capacity, loading surface, belts or ropes are sufficient to support the weight of the machine. Please refer to the serial number nameplate.

Ensure transportation safety

Before transportation, turn the key switch to the off position and then take the key.

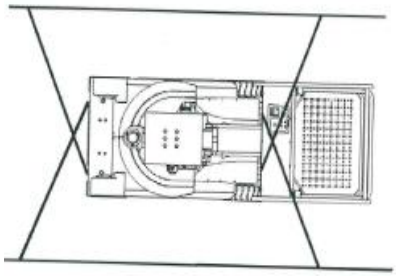
Check the machine thoroughly to prevent loose or unfixed parts.

Fixed chassis

The machine is fixed on the transport surface through the fastening part on the chassis.

Use at least four chains or belts.

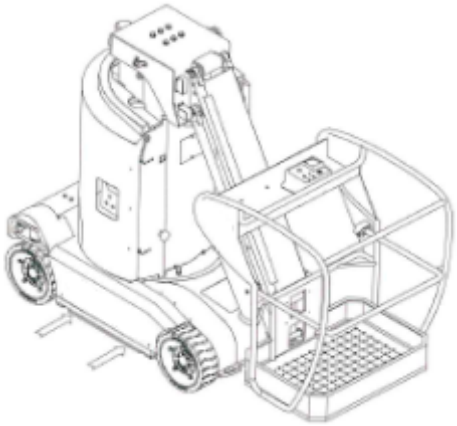
Ensure that the chain or belt used has sufficient load strength.



Lift the machine with a forklift

Make sure that the controller and cover are fixed safely and reliably. Remove all moving parts from the machine.

Fully lower the platform and the platform must remain closed during all shipment.



Put the forklift foot in the correct position.

Drive forward to insert the fork completely into the slot.

Lift the machine 15cm and tilt the fork slightly back to keep the machine stable.

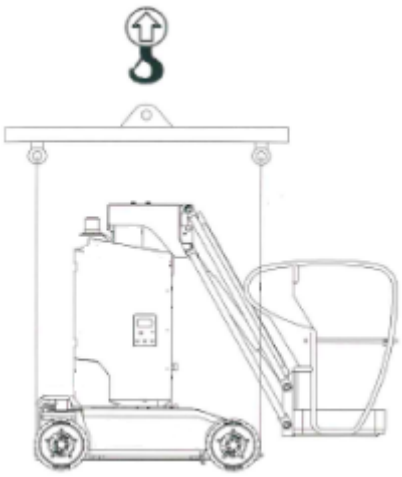
When lowering forks, ensure machine level.

Lifting guidance

Completely down. Remove all moving parts from the machine.

Only attach the rigging to the specified lifting points on the machine, with two lifting points at each end of the machine.

Adjust rigging to avoid damaging the machine and keep the machine level.



Long term storage instructions

Machines that have not been used for a long time should be properly stored.

The ambient temperature should be in the range of - 20 ℃~40 ℃.

Ambient humidity ≤ 90%

1 When the machine is parked indoors, it should choose a solid and flat ground. If it is parked outdoors, it should be covered with dustproof cloth to avoid rain and dust.

2 Before long-term storage, it is necessary to maintain the equipment, repair the damaged parts, and thoroughly clean them to keep them in good technical condition.

3 The arrangement and layout of machines in the parking area shall ensure that the entry and exit of any equipment is not affected by other equipment.

4 Storage of battery:

Remove the battery and place it in a dry and ventilated place. Keep its surface clean and dry. It is strictly forbidden to place any object on the battery.

When removing the battery, first cut off the negative wire, and then cut off the positive wire: when installing, first connect the positive wire, and then connect the negative wire.

The battery should be charged once a month.

5 Rust proofing：

Before storage, according to the size of the surface of the antirust paint off area to determine the use of paint repair or machine repaint repair method.

Before using the equipment which has been stored for a long time, all the contents of daily inspection should be completed, and the equipment should be maintained according to the storage time.

Maintenance

Observe and obey:

☑The operator can only perform the routine maintenance items specified in this manual.

☑According to the requirements specified by the manufacturer, regular maintenance and inspection shall be completed by qualified maintenance technicians.

Maintenance symbol legend

Use the following symbols in this manual to help express the relevant meanings in the usage instructions. When one or more symbols appear in front of the maintenance procedure, the meaning is as follows.

 Indicates that a tool is required to perform the operation.

 Indicates that a new part is required to perform the operation.

 Indicates that the operation must be performed through the service provider.

Pre-delivery preparation reports

Pre-delivery preparation reports include all types of inspection items.

Prepare the report before delivery for each inspection, and save it as required after filling it out.

Maintenance schedule

There are daily, quarterly, semi annual, annual and biennial maintenance inspections that must be carried out according to the schedule. The product maintenance plan and pre delivery preparation report are divided into five sub items of ABCDE. The steps of each inspection are shown in the table below.

Inspection cycle	Inspection items
Daily or every 8 hours	A
Quarterly or 250 hours	A+B
Every half year or 500 hours	A + B + C
Every year or 1000 hours	A + B + C + D

Maintenance inspection report

Maintenance inspection report includes all kinds of inspection items.

The maintenance inspection report should be prepared for each inspection and kept for at least 4 years after the completion of the inspection, or implemented according to the laws and regulations issued by the employer, workplace and government.

Pre-delivery preparation reports

Basic principle

The distributor is obliged to complete the preparation before delivery.

Pre delivery preparation is a priority before each product is delivered. The purpose of this check is to find out whether there are obvious problems with the equipment before it is used.

Damaged and modified equipment is never allowed to be used. In case of any damage or inconsistency with the delivery of the equipment, the machine must be marked and stopped immediately.

Equipment repair must be performed by a certified technician in accordance with the manufacturer's specifications.

Maintenance checks must be performed by a certified technician in accordance with the manufacturer's specifications and the requirements of this manual.

Explain

Use the operating manual on the equipment.

Pre delivery preparation consists of operation inspection, maintenance project and function test.

Record the results in the form, and fill in the corresponding form after each item is completed according to the instructions in the operation manual.

If the result of any inspection is “N” stop the equipment, repair and recheck. Mark the position of “R” after completion.

legend

Y =Yes，finished

N = No，unfinished

R = Repaired

Pre-delivery preparation	Y	N	R
Operation check completed			
Maintenance project completed			
Function test completed			

Model	
Serial number	
Date	
Owner	
Inspection unit (to be	
Signature of inspector	

Title of inspector	
Inspection company	

Maintenance inspection report

Model	
Serial number	
Date	
Chronometer	
Owner	
Inspection unit (to be	
Signature of inspector	
Title of inspector	
Inspection company	

Explain

▪ Use one report per inspection.

▪ Select the appropriate checklist based on the items to be checked.

□Daily or every 8 hours	A
□Quarterly or every 250 hours	A+B
□Every six months or every 500 hours	A + B + C
□Per year or every1000 hours	A + B + C + D

▪ ick the appropriate place after each check.

▪ Step by step learning how to check.

▪ If the inspection result is “N”, mark and stop working until repair and recheck. After repair, tick the “R”position。

Illustration

Y = accept

N = Not accepted

R = Repaired

Checklist A	**Y**	**N**	**R**
A-1 Check manuals and stickers			
A-2 Inspection before operation			
A-3 Hydraulic oil level			
A-4 functional testing			

40 hours later			
A-5 Maintenance after 30 days			

Checklist B	Y	N	R
B-1 Battery			
B-2 wires			
B-3 Tires and hubs			
B-4 Emergency stop			
B-5 Lubricate the chain and			
B-6 Key switch			
B-7 horn			
B-8 Actuator brake			
B-9 Driving speed in retracted			
B-10 Driving speed in lifting			
B-11 Working light			
B-12 Alerts in operation			
B-13 Hydraulic oil analysis			
B-14 Hydraulic ventilation			
B-15 Tension the lifting chain			
B-16 Check the chain condition			

Checklist C	Y	N	R
C-1 Platform overload system			
C-2 Replace the hydraulic tank			

Checklist D	Y	N	R
D-1 Hydraulic oil			

Checklist step A

A-1

Inspection manual and label

The key to safe operation is to keep the operation and maintenance manual intact. Every device has a manual, which is stored in the box of the platform. The manual with fuzzy handwriting or missing pages can not provide enough information to ensure safe operation.

In addition, make sure that all safety labels are in good condition. The label warns the operator of the hidden danger of using the machine. It also provides users with operation and maintenance information. Fuzzy labels will not serve as a warning and may lead to dangerous operating environment.

1 Check and ensure that the operation and maintenance manual is in the manual box of the platform.

2Check the manual to make sure the handwriting is clear and there is no missing page.

⊙Results: the manual was matched with the model, and all the handwriting of the manual was clear without missing pages.

¤Results: the manual does not match the model, or the handwriting of the manual is fuzzy or missing pages. Stop the machine before replacing the manual。

3 Open the label inspection chart and carefully check whether the label is blurred or damaged.

⊙Results: all the labels were in readiness, clear and complete.

¤Results: the label was missing, blurred or damaged. Stop the machine before replacing the label.

4 After the manual is used, the object will return to its original position.

Tip: if you need to replace the manual or label, please contact Hangcha company or Hangcha dealers.

A-2

Check before operation

It is very important to complete the pre operation inspection for the safe operation of the machine. The pre operation inspection is completed by visual inspection before the machine is running. This inspection is used to find out whether there are obvious problems in the machine before the function test, and can also be used to decide whether to carry out routine maintenance procedures.

Refer to the "pre operation inspection" section of this manual for complete inspection procedures.

A-3

Check the hydraulic oil level

It is very important to operate the machine that the hydraulic oil level is in the right position. If the hydraulic oil is in an improper position, the hydraulic components may be damaged. Through

daily inspection, the inspector can determine the change of hydraulic oil level, which can indicate the problems existing in the hydraulic system.

注 意 Execute this program when the platform is in a collapsed state.

1 Open the cover.

2 Unscrew the filler cap and wipe the oil gauge dry.

3 After reinstallation, open the oil cap again and observe the hydraulic oil level.

4 If the oil level is too low, add hydraulic oil.

注 意 Factory hydraulic oil specification: L-HV46

Customers should choose the right hydraulic oil according to the ambient temperature.For example: L-HV32 or L-HV68。

A-3

Perform functional tests

It is very important to complete the function test for the safe operation of the machine. Function test is used to find out whether the machine has function defects before it works. Defective machines cannot be used. Once a functional defect is found, mark the machine immediately and stop using it.

Refer to "function test" in this manual for complete inspection procedure

A-5

30-days maintenance

30-days maintenance is a one-time maintenance after the first 30 days or 40 hours of machine operation. After this step is completed, continue to check the maintenance items on the list.

Carry out the following maintenance steps：

▪B-3 Tires and hubs

Checklist step B

B-1

Check the battery

This inspection is conducted every 250 hours or once a quarter, whichever comes first.

Good battery condition is very important for the performance and operation safety of the machine. Incorrect electrolyte level and damaged cables or connectors can cause damage and dangerous conditions to machine parts.

Danger of electric shock

Operation with an electrical charge can result in serious bodily injury or death. Remove all rings, watches and other accessories while operating.

Danger of physical injury

The electrolyte of the battery is corrosive. Avoid touching the spilled electrolyte by hands or other parts of the body to avoid injury. Use baking soda water and water for the spilled electrolyte.

1 Wear protective clothing and goggles.

2 Open the cover.

3 Ensure that the battery cable joint is not corroded.

Tips: adding terminal protection device and coating anti-corrosion glue can avoid the corrosion of battery connector cable.

4 Find the battery pack and make sure all the batteries are fixed and connected properly.

5 Open the battery cover and check the electrolyte level line. If the distilled water is 3mm lower than the bottom, it is necessary to replenish the distilled water with a catheter. Don't overdo it.

6 Clean the electrolyte spilled around the ventilation cover.

B-2

Check the wires

This inspection is conducted every 250 hours or once a quarter, whichever comes first.

Keeping wires in good condition is very important for safe operation and good machine performance. Failure to find and replace burned, scratched, corroded or bent wires will lead to unsafe operation environment and damage of machine parts.

Danger ofelectric shock / explosion

Contact with thermal or electrical conductors may cause serious casualties. Do not wear rings, watches and other jewelry.

1 Open the cover.

2 Turn the key switch to the ground control position, pull the red emergency stop button on the ground to the "on" position, and turn the red emergency stop button on the platform clockwise to the "on" position.

3 Lift forearm to about 2.5m above the ground.

4 Turn the key switch to the off position and push the emergency stop button on the ground and platform controls to the off position.

5 Disconnect the ground wire of the chassis battery.

6 Remove the cover from the drive wheel end of the chassis.

7 Check the drive motor area for burned, scratched, corroded, bent or loose wires.

8 Install the cover on the drive wheel end of the chassis.

9 Install the ground wire of the battery in the chassis and tighten it to contact the ground.

10 Check the battery area for burned, scratched, corroded, bent or loose wires.

11 Check the area below for burned, scratched, corroded, bent or loose wires.

- Ground controller
- Battery
- Oil pump and hydraulic valve group accessories wire

12 Turn the key switch to the ground control position, pull the red emergency stop button on the ground to the "on" position, and turn the red emergency stop button on the platform clockwise to the "on" position.

13 Lower forearm about 0.5m above the ground.

14 Turn the key switch to the off position and push the emergency stop button on the ground and platform controls to the off position.

15 Check the area below for burned, scratched, corroded, bent or loose wires.

- Mast cable
- Platform controller
- Wires connected to the platform

16 Check the insulation of all wires between ground control, platform control and level sensor for wear.

17 Close the cover.

B-3

Check tires and hubs

This inspection is conducted every 250 hours or once a quarter, whichever comes first.

Keeping tires and wheels in good condition is essential for safe operation and good performance. Failure of tires and hubs may cause the machine to tip over. If not found in time and repair can also cause damage to the parts.

1 Check the tread and side of the tire for scratches, cracks, punctures and other abnormal wear.

2 Check the hub for damage, bending and cracking.

3 Check all bolt torques.

Torque for unlubricated bolts	88N·m
Torque for lubricated bolts	66N·m

B-4

Check the emergency stop function

This inspection is conducted every 250 hours or once a quarter, whichever comes first.

Normal emergency stop function is essential for safe operation of the machine. Abnormal red emergency stop button will not cut off the power supply and stop all functions of the machine, thus leading to dangerous situation.

As a safety function, in addition to the red emergency stop button function on the platform, the selection and operation of the ground controller are prior to the platform controller

1 Turn the key switch to the ground control, pull the red emergency stop button on the ground to the "on" position, and turn the red emergency stop button on the platform clockwise to the "on" position.

2 Press the red emergency stop button of ground controller to the off position.

⊙ Result: Result: there was no movement of the machine.

3 Turn the key switch to the platform control, pull the red emergency stop button on the ground to the "on" position, and turn the red emergency stop button on the platform clockwise to the "on" position.

4 Press the platform controller red emergency stop button to the off position.

⊙ Result: there was no movement of the machine.

Note: the red emergency stop button of the ground controller can stop all operations of the machine, even if the key switch is switched to the platform controller.

B-5

Cleaning and lubrication of mast

Good cleaning and lubrication is very important to the performance and operation safety of the machine, which needs to be carried out more frequently under harsh working conditions.

1 Lifting platform to maximum height.

2 Visual inspection of debris or foreign matter inside and outside the mast. If necessary, clean with mild cleaning solvent.

3 Lubricate the bearing between the sprocket and the sprocket shaft with grease in the lifting state.

4 Lubricate the chain and sprocket with oil gun.

5 Lubricate the guide rail between masts with grease in the lifting state.

Additional equipment is required to perform this process. Do not lean the ladder or scaffold against the machine during maintenance.

The implementation of this procedure requires personnel with certain maintenance skills and appropriate tools. Failure to comply with the requirements may result in serious injury or death.

B-6

Test key switch

This inspection is conducted every 250 hours or once a quarter, whichever comes first.

The correct key switch action and response is very important for the safe operation of the equipment. The key switch can switch the machine, and the machine is operated by the ground controller or platform controller. A failed key switch may cause dangerous operation.

1 Pull the red emergency stop button on the ground to the "on" position, and turn the red emergency stop button on the platform clockwise to the "on" position.

2 Turn the key switch to platform control.

3 Check the functions in the ground controller.

⊙ Result: there was no movement of the machine.

4 Turn the key switch to ground control.

5 Check the functions in the platform controller.

⊙ Result: there was no movement of the machine.

6 Turn the key switch to the off position.

7 Check the functions in the ground and platform controllers.

⊙ Result: there was no movement of the machine.

B-7

Test the car horn

This inspection is conducted every 250 hours or once a quarter, whichever comes first.

The horn is used to warn the ground personnel by the control personnel on the platform. The horn with abnormal function cannot remind the ground personnel of danger or unsafe condition.

1 Turn the key switch to the platform control, pull the red emergency stop button on the ground to the "on" position, and turn the red emergency stop button on the platform clockwise to the "on" position.

2 Press the horn button in the platform controller.

⊙Result: the horn sounds.

B-8

Test drive brake function

This inspection is conducted every 250 hours or once a quarter, whichever comes first.

The correct brake action is very important to the operation safety. The brake should be stable without delay, bump and abnormal noise. There is no difference in the appearance of the wheels before and after the brake release.

To complete the brake function test, the machine must be on a solid, level and barrier free ground to ensure that the machine is in a retracted state and the extension platform is fully retracted.

1 Draw a reference test line on the ground.

2 Turn the key switch to the platform control, pull the red emergency stop button on the ground to the "on" position, and turn the red emergency stop button on the platform clockwise to the "on" position.

3 Lower the platform to the folded position.

4 Press the drive function select button.

5 Select a point on the machine (e.g. touch point on the wheel) as a mark to visually cross the reference test line.

6 Turn the machine to the highest speed and release the handle at the moment when the reference point crosses the ground test line.

7 Measure the distance between the reference point and the test line.

⊙ Result: the machine stops within the specified braking distance. No movement is required.

¤ Result: the machine does not stop within the specified braking distance.

Note: the brakes must be effective within the allowable climbing capacity of the machine.

8 Replace the brake and repeat the above process from step 1.

Maximum braking distance	
Maximum braking distance	61cm±30cm

B-9

Test drive speed - folded state

This inspection is conducted every 250 hours or once a quarter, whichever comes first.

Normal drive function is essential for safe operation. Drive functions should respond quickly and smoothly to the operator. Delay, turbulence and abnormal noise should not occur during normal operation.

Drive speed tests must be performed on solid, horizontal, and obstruction-free ground.

1 Draw two lines with a distance of 12.2 meters on the ground as the starting line and the finishing line.

2 Turn the key switch to the platform control, pull the red emergency stop button on the ground to the "on" position, and turn the red emergency stop button on the platform clockwise to the "on" position.

3 Lower the platform to the folded position.

4 Press the drive function selection button.

5 Select a point on the machine (such as a spot on a wheel) as a reference for visually crossing the start and finish lines.

6 Drive the machine to maximum speed and start timing when the reference point crosses the starting line.

7 Keep driving at full speed and record the time to cross the end line. The time is less than 10 seconds.

B-10

Test drive speed - lifting status

This inspection is conducted every 250 hours or once a quarter, whichever comes first.

Normal driving function is very important for operation safety. The driving function should respond to the operator quickly and smoothly. There is no delay, bumping and abnormal noise during normal operation and driving.

Drive speed tests must be performed on solid, horizontal, and obstruction-free ground.

1 Draw two lines with a distance of 12.2 meters on the ground as the starting line and the finishing line.

2 Turn the key switch to the platform control, pull out the red emergency stop button on the ground to the "on" position, and turn the flush red emergency stop button clockwise to the "on" position.

3 Press the rotary table / mast lift function selection button.

4 Press and hold the function enable switch.

5 Lift the mast about 20cm.

6 Press the drive function selection button.

7 Select a point on the machine (such as a contact point on a wheel) as a reference for visually crossing the start and end lines

8 Drive the machine to the maximum speed and start timing when the reference point crosses the starting line.

9 Keep driving at full speed and record the time to cross the end line. The time is less than 87 seconds.

10 Lower the mast to the folded position.

11 Press the jib lifting / lowering function selection button.

12 Press and hold the function enable switch.

13 Lift the forearm to keep the platform about 1.0 m above the ground.

14 Press the drive function selection button.

15 Select a point on the machine (such as a contact point on a wheel) as a reference for visually crossing the start and end lines.

16 Drive the machine to maximum speed and start timing when the reference point crosses the starting line.

17 Keep driving at full speed and record the time to cross the end line. The time is less than 87 seconds.

18 Lower the forearm to the folded position.

B-11

Test working indicator light

This inspection is conducted every 250 hours or once a quarter, whichever comes first.

Work indicator lights are used to alert ground personnel and operators that equipment is in operation.

Turn the key switch to the ground control, pull the red emergency stop button on the ground to the "on" position, and rotate the red emergency stop button on the platform clockwise to the "on" position.

2 Activate the function of machine on the ground controller.

⊙ Result: Work indicator light flashes.

3 Turn the key switch to the platform controller.

4 Activate the function of machine on the platform controller.

⊙ Result: Work indicator light flashes.

Note: the work indicator light only works when the machine function is activated on the ground or platform.

B-12

Test run alert

This inspection is conducted every 250 hours or once a quarter, whichever comes first.

Operation alarm is used to alert ground personnel and operators that equipment is in operation.

1 Turn the key switch to the ground control, pull the red emergency stop button on the ground to the "on" position, and turn the red emergency stop button on the platform clockwise to the "on" position.

2 Lift the platform about 35cm.

⊙ Results: the alarm sounds when the platform rises.

3 Lower the platform to the retracted position.

⊙ Result: the alarm sounds as the platform descends.

4 Turn the key switch to the platform controller.

5 Press the turntable slewing / mast lifting function selection button.

6 Press and hold the function enable switch and push the handle forward and backward.

⊙ Result: the alarm sounds.

7 Press the drive function selection button.

8 Press and hold the function enable switch and push the handle forward and backward.

⊙ Result: the alarm sounds.

9 Press and hold the function enable switch, press and hold the thumb button on the handle.

⊙ Result: the alarm sounds.

B-13

Perform hydraulic oil analysis

This inspection is conducted every 250 hours or once a quarter, whichever comes first.

Changing or testing hydraulic oil is very important for good machine performance and service life. Dirty hydraulic oil and oil suction filter will affect the performance of the machine, continuous use will cause damage to parts. This operation should be carried out more frequently under bad working conditions.

Before replacing the hydraulic oil, use the oil separator to verify whether it is necessary to replace it.

If the hydraulic oil has not been replaced for two years, it should be inspected once every quarter, and the hydraulic oil should be replaced if the inspection is unqualified.

Refer to D-1, test or replace hydraulic oil.

B-14

Check the hydraulic tank cap ventilation system

This inspection is conducted every 250 hours or once a quarter, whichever comes first.

The hydraulic tank cap with smooth exhaust is very important to achieve good mechanical properties and service life. Dirty or clogged exhaust cover may lead to poor performance of the machine, and the bad working environment should be checked frequently.

1 Open the cover.

2 Remove the exhaust cap from the hydraulic tank.

3 Ventilation check.

⊙ Results: Air can pass through the exhaust cap.

⌑ Results: If air cannot pass through the exhaust cap, clean or replace the exhaust cap. Continue with step 4.

Note: when checking the tank cap for ventilation and exhaust, the air should be able to pass freely.

4 Carefully clean the oil tank exhaust cap with mild solvent and dry it with low pressure compressed air. Repeat step 3.

5 Install the hydraulic tank vent cap.

6 Install the cover.

B-15

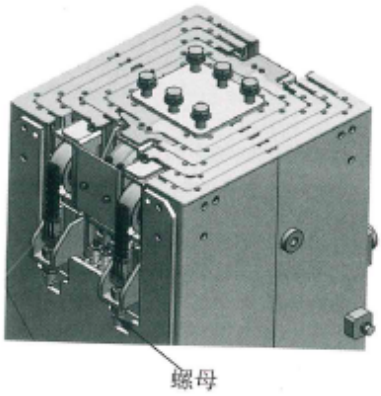
Check and adjust the lifting chain

Holding the chain in good condition is essential for safe operation and good machine performance. The direct result of chain wear is lengthening of the entire chain.

Visually measure the stretch rate of used transport chains every three months. The mast attached to the elongated chain will be in a lower position, causing the upper surface of each mast to be uneven when the machine is in the retracting state. If this problem is serious it can damage the sprocket.

If the chain is loose or damaged, please stop using the equipment immediately and contact the dealer as soon as possible.

Each section of the transport chain is associated with three masts.



1 When adjusting the chain length, please select the mast to be raised. As shown in the figure above, tighten the nut to make the upper mast move upward. After adjusting the chain length, tighten the double nuts together.

2 When two chains pull the same mast, they bear the lifting weight at the same time. If one chain fails, the other chain will play a very important role in safety. Therefore, when adjusting the length of the chain, the two chains should be as tight as possible. The method to judge the tightness of the chain is: in the lifting state of the platform, press the chain by hand to compare the tension.

B-16

Check the condition of the chain

Holding the chain in good condition is essential for safe operation and good machine performance.

Equipment required：

●Standard Toolkit ●Goggles ●Gloves

●Place obstacles around the work area

Professional tools and auxiliary tools must be used according to regulations. Always wear the necessary safety clothing.

Preliminary process

If there is disassembly operation, it should be carried out on completely disconnected equipment and must be entrusted to personnel who have received necessary technical training.

In addition to the safety instructions in this manual, the laws and regulations applicable to the prevention of safety accidents should also be observed.

All precautions must be taken prior to work before access to the machine for maintenance.

After completion of the work, all covers and safety devices must be completely put back and can be used normally.

Lubrication

The chain must be lubricated at least every 250 hours or every 6 months. The frequency of application depends on the surrounding environment, and the conditions and frequency of use must ensure that an adequate amount of lubricant is present in the chain.

If the chain is exposed to corrosive fluids, immediately clean the chain and lubricate it.

Note: Lubricating the chain requires telescopic operation of the mast.

Remove any foreign material from the chain before using the new lubricant.

When cleaning the chain, please observe the environmental regulations.

Check the condition of the chain

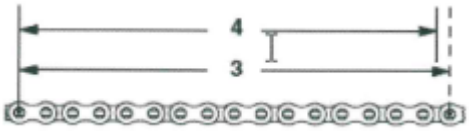
To do the following, perform a full stretch out and draw back action。

- Check whether the lifting chain is clean.
- Check whether there are foreign bodies on the chain and guide plate。
- Check the chain for signs of corrosion.

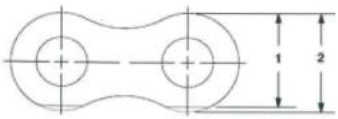
Chains with any of the following defects must be replaced.

- Check chain extensibility.
- The chain length of 12 sections is not allowed to exceed 2% of the original chain length.
- Use the appropriate method to measure the value of length (3). Compare this to the value length (4) indicated in the table below.

Model	Chain width (2)	Length of 12 chains (4)
LH0822	12.08mm	152.40mm
LH0844	12.08mm	152.40mm
LH0866	12.08mm	152.40mm
LH1066	15.1mm	222.96mm



- Check the external wear of rollers andsplit links。
- The size of external wear shall not exceed 2% of the original chain width (2), as shown in the table above.
- Use the appropriate method to measure the value of (1).

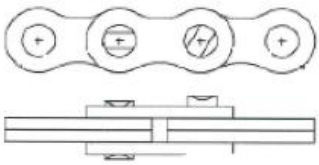


- Check that no wires or components are damaged or missing.
- Check whether the chain is distorted, deformed or damaged.

distort crack

damage fold

- Check the connection point of the chain plate (the center line must be parallel).



Replace the chain

The chain must be replaced every 7 years.

For further comments and suggestions, please contact the after-sale service department.

Checklist step C

C-1

Test platform overload system

This inspection is performed every 500 hours or 6 months, whichever comes first. Check immediately when the machine is overloaded.

Frequent testing of the platform overload mechanism is crucial to the safe operation of the machine. Continued incorrect operation of the platform will cause the system to be unable to sense the overload information of the platform, and the stability of the machine will be affected, leading to the tipping of the equipment.

⚠警告 Complete this test on a solid level ground.

1 Turn the key switch to the platform control, pull the red emergency stop button on the ground to the "on" position, and turn the red emergency stop button on the platform clockwise to the "on" position.

2 Confirm the maximum load of the tested equipment.

3 Use a suitable lifting device to safely and reliably place the weight equivalent to the maximum load of the equipment in the center of the platform.

⊙ Results: there was no alarm sound and the system was normal.

¤ Result: the alarm sounds. Calibration platform overload system.

4 Then add a weight with a maximum load of 25% on the platform.

⊙ Result: the alarm sounds. The system function is normal.

¤ Result: alarm sound does not sound, calibration platform overload system.

5 Test all functions on the platform controller.

⊙ Result: all functions on the platform controller do not work.

6 Turn the key switch to ground controller.

7 Test all functions on the ground controller.

⊙ Results: All functions on the ground controller can't work.

8 Use suitable hoisting device to safely and reliably remove the loaded heavy block.

⊙ Result: the alarm did not sound. The system function is normal.

¤ Result: Alarm sound, calibration platform overload system.

9 Test all functions on the ground controller.

⊙ Result: all functions on the ground controller work.

10 Turn the key switch to platform controller.

11 Test all functions on the platform controller.

⊙Result: all functions on the platform controller work.

C-2

Replace the hydraulic tank exhaust cap

This inspection is performed every 500 hours or half a year, whichever comes first.

The hydraulic tank is a ventilated tank. There is an air filter inside the exhaust cover, which may be blocked with the increase of time. If the exhaust cover fails or is improperly installed, once impurities enter the hydraulic system, it may cause damage to the components. The exhaust cover should be checked frequently in bad working environment.

1 Open the cover.

2 Take out the exhaust cap of hydraulic oil tank.

3 Replace the new hydraulic tank exhaust cover.

4 Install the cover.

Checklist step D

D-1

Test or replace the hydraulic oil

This inspection is conducted every 1000 hours or every year, whichever comes first.

Changing or testing hydraulic oil is very important for good machine performance and service life. Dirty hydraulic oil and oil suction filter will affect the performance of the machine, continuous use will cause damage to parts. This operation should be carried out more frequently under bad working conditions.

Before replacing the hydraulic oil, use the oil separator to verify whether it is necessary to replace it

If the hydraulic oil has not been replaced for two years, it should be inspected once every quarter, and the hydraulic oil should be replaced if the inspection is unqualified.

Note: this operation should be carried out when the machine is retracted.

1 Open the cover.

2 Disconnect the battery pack from the machine.

Danger of electric shock/burn

Operation in a live circuit may cause serious injury or death. Remove rings, watches and other accessories during operation.

3 Remove the cover and find a suitable place to place the cover.

4 Place a suitable container at the hydraulic tank drain.

5 Locate and unscrew the hydraulic tank vent cap.

6 Unscrew the oil plug and place the oil in a suitable container.

⚠警 告 Danger of physical injury

The sprayed hydraulic oil can penetrate the skin. Slowly loosen the hydraulic connector to gradually reduce the oil pressure. Don't let the oil spray out.

7 Clean the spilled hydraulic oil and use it correctly.

8Clean the hydraulic tank with mild solvent and air dry thoroughly.

9 Install the oil plug. The torque is as follows:

Torque specification	
Oil drain plug torque	5 N·m

10 Fill the oil tank with hydraulic oil, be careful not to overflow.

11 Start the oil pump to fill the whole hydraulic system with hydraulic oil and eliminate the air in the hydraulic system.

⚠警 告 Danger of component damage

Operation without oil may cause damage to the hydraulic pump. When filling the hydraulic system, carefully empty the oil tank to avoid cavitation of the hydraulic system.

Electric system fault diagnosis and correction

Code	**Fault**	**Restricted action**	**Corrective action**
01	Initialization Fault	Disables All Motion	ECU may fail. Replace ECU.

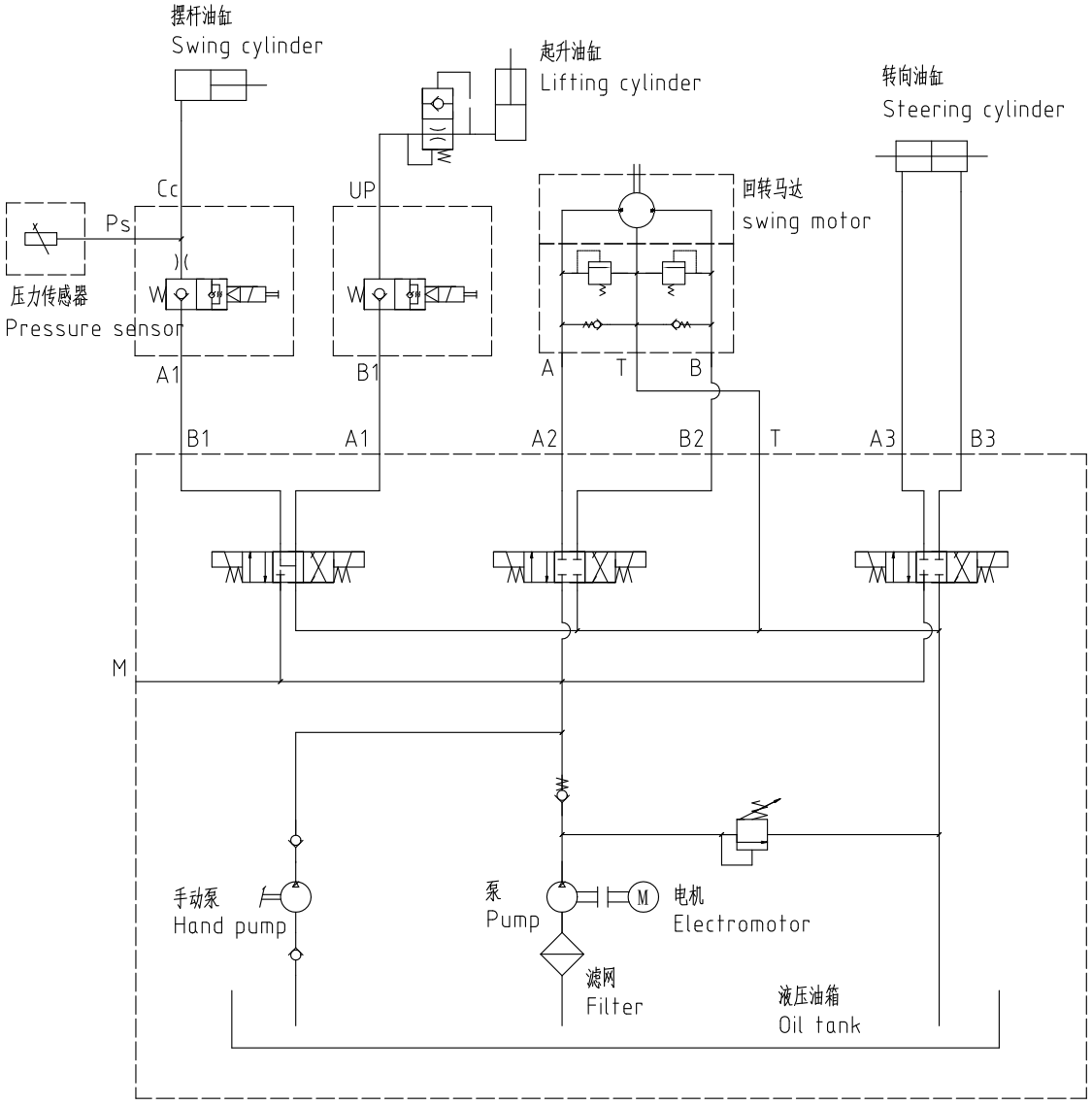
02	Communication Fault	Disables All Motion	Check whether the communication cable is plugged in. Replace ECU and PCU if the cable is connected.
03	Invalid Option setting Fault	Disables All Motion	Set the correct platform configuration parameters.
12	Chassis Toggle Switch ON at power-up Fault	Disable Chassis Control	Check the harness of the chassis lifter and check that the switch is stuck.
18	Pothole Guard Fault	Disable Lifting and Driving	Check that the Pothole guard is expanded and check the Pothole guard switch. Check the Pothole guard wiring harness with the descend in place detection switch.
31	Pressure Sensor Fault	Disables All Motion	Check the pressure sensor and the wire harness of pressure sensor. Meanwhile, check and confirm that the correct platform mode has been selected.
32	Angle Sensor Fault	Disables All Motion	Check the Angle sensor and the wire harness of Angle sensor. Meanwhile, check and confirm that the correct platform mode has been selected.
42	Platform Left Turn Switch ON at power-up Message	Diagnostic Message Only	Make sure the left-turn button has been pressed before the power is turned on. If so, please consider changing the handle and PCU.
43	Platform Right Turn Switch ON at power-up Message	Diagnostic Message Only	Make sure the right-turn button has been pressed before the power is turned on. If so, please consider changing the handle and PCU.
46	Platform Joystick Enable Switch ON at power-up Fault	Disable Platform Control	Make sure the Function Enable Switch has been pressed before the power is turned on. If so, please consider changing the handle and PCU.
47	Platform Joystick not in neutral at power-up Message	Lift Slows to Elevated Speed	Make sure it is in the middle position before power on. If it is, please consider changing the handle and PCU. Check whether the middle parameter of the handle has been set through the Lab View. If set, consider replacing the handle and PCU.

52	Forward Coil Fault	Disable Lifting and Driving	Check that the wire harness connected to the solenoid valve adapter has been inserted tightly, and check whether the solenoid valve has been short-circuited or disconnected.
53	Reverse Coil Fault	Disable Lifting and Driving	Check that the wire harness connected to the solenoid valve adapter has been inserted tightly, and check whether the solenoid valve has been short-circuited or disconnected.
54	Lift Up Coil Fault	Disable Lifting and Driving	Check that the wire harness connected to the solenoid valve adapter has been inserted tightly, and check whether the solenoid valve has been short-circuited or disconnected.
55	Lift Down Coil Fault	Disable Lifting and Driving	Check that the wire harness connected to the solenoid valve adapter has been inserted tightly, and check whether the solenoid valve has been short-circuited or disconnected.
56	Right Turn Coil Fault	Disable Lifting and Driving	Check that the wire harness connected to the solenoid valve adapter has been inserted tightly, and check whether the solenoid valve has been short-circuited or disconnected.
57	Left Turn Coil Fault	Disable Lifting and Driving	Check that the wire harness connected to the solenoid valve adapter has been inserted tightly, and check whether the solenoid valve has been short-circuited or disconnected.
68	Low Voltage Fault	Disable All Motion	Check the battery voltage and charge it. Check for tight battery connections.
80	Over 80% Load Warning	Warning Only	The platform load is close to the rated weight. It is not recommended to increase the load.
90	Over 90% Load Warning	Warning Only	The platform load is very close to the rated weight. It is recommended not to increase the load.
99	Over 99% Load Warning	Warning Only	The platform load has reached the rated weight, it is not recommended to increase the load.
OL	Overloaded Platform Fault	Disable All Motion	Platform overload, removing excess weight.

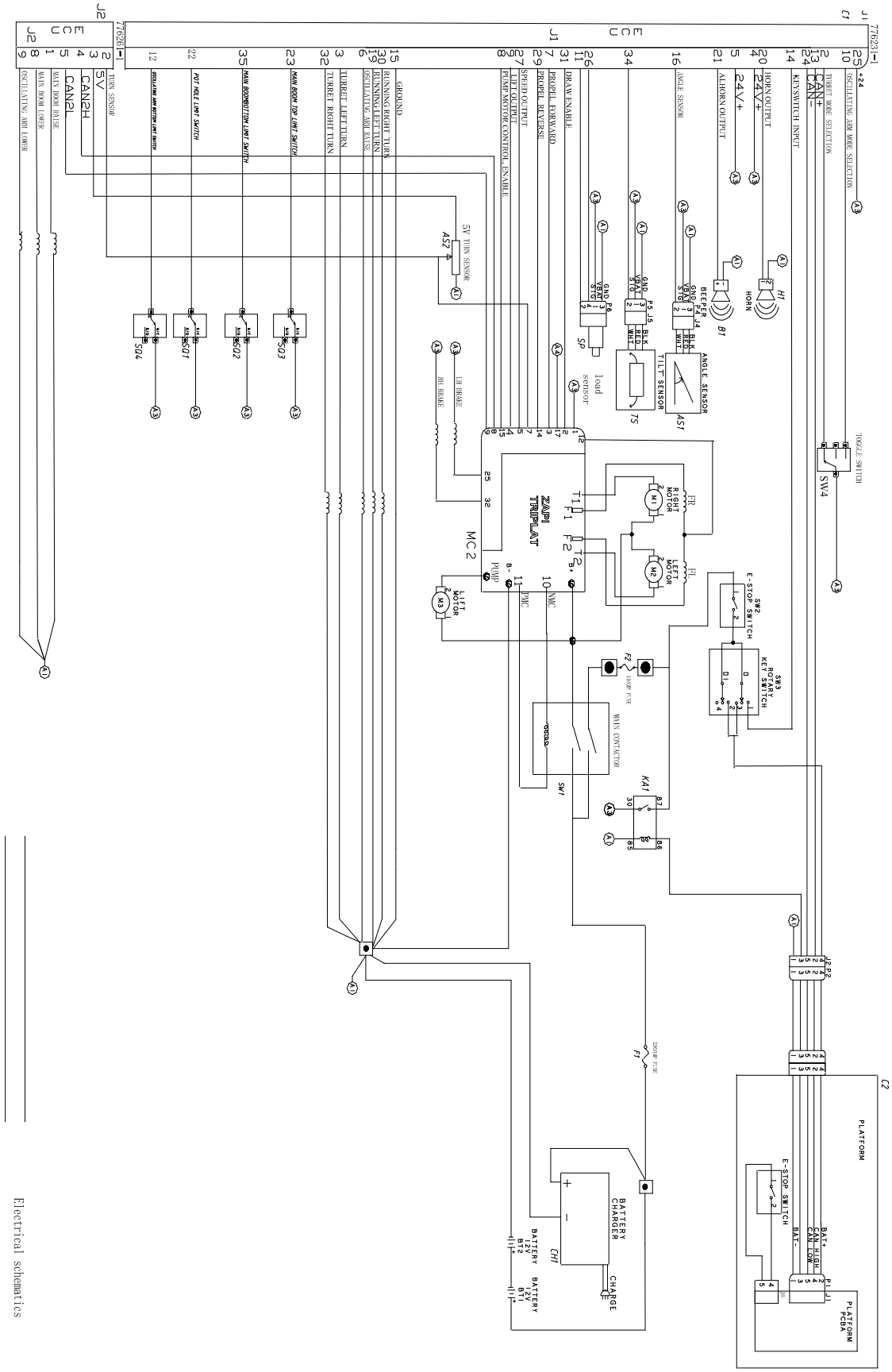
LL	Machine Tilted Beyond Safe Limits Fault	Disable Lifting and Driving	If the platform is already tilted, make sure the platform is level before operating. If the platform is horizontal, check that the wiring harness of the horizontal switch is properly connected and that the horizontal switch is faulty.

Schematic

Hydraulic Schematic



Electrical Schematic



Maintenance record sheet

Maintenance record sheet

Maintenance record sheet
