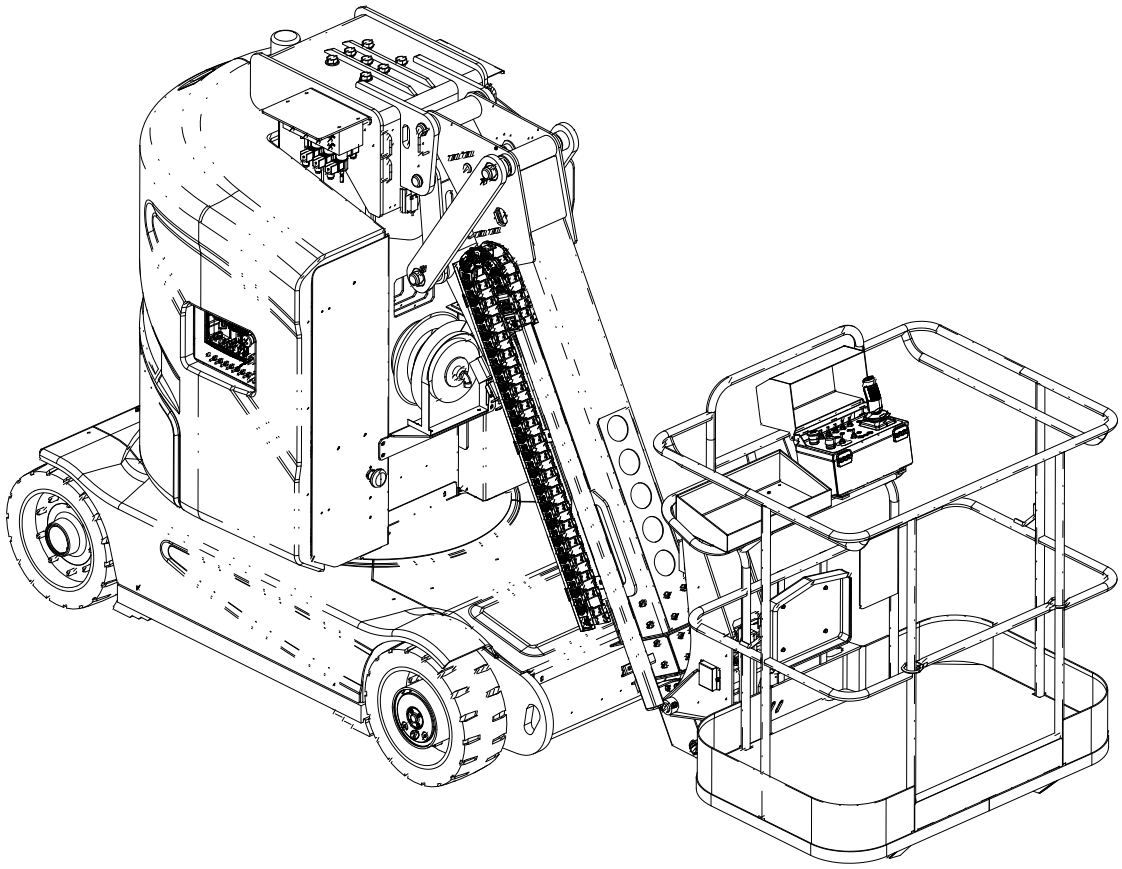
HV Series

Mast-type Aerial Work Platform

HV120AJ

Operation Manual



Hangcha Group Co., Ltd.

March 2024

Highlights

Please read, understand and follow these safety rules and operating instructions before you operate the machine. Only trained and authorized personnel are allowed to operate the machine. This manual shall always be kept with the machine as part of it. Please contact Hangcha Group if you have any questions.

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Owners, users and operators:

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

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

2. Read, understand and follow the instructions in this manual and other manuals accompanying the machine.

3. Carry out good routine safety inspections as usual.

4. The machine may only be operated by trained/certified operators or under the direction of experienced and informed supervisors.

Please contact us if there is anything ambiguous in this manual or something you think should be added.

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Hangcha Group Co., Ltd.

First Edition: March 2024

Danger

Failure to follow the instructions and safety rules in this manual will lead to death or more serious injuries

Cannot be operated 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 to the next step.

2. Always perform pre-operational inspection.

3. Always perform pre-use function test

4. Check the workplace.

5. Use the machine only according to its design intent

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

☑ Read, understand and follow the user safety rules and work site regulations.

☑ Read, understand and abide by all applicable government laws and regulations.

☑ You are properly trained to operate the machine safely.

Classification of dangers:

The symbols, color codes and symbol text used for product labels of Hangcha Group have the following meanings:


Safety warning sign — used to indicate the potential personal injury. Observe all safety tips following this sign to avoid possible personal injury or death.

Red sign - used to indicate an urgent and dangerous situation, which will lead to death or serious injuries if not avoided.

Orange sign - used to indicate a potentially dangerous situation, which will lead to death or serious injuries if not avoided.

Yellow with safety warning sign - used to indicate a potentially dangerous situation, which may cause minor or moderate personal injury if not avoided.

Yellow without safety warning sign - used to indicate a potentially dangerous situation, which may lead to property losses if not avoided.

Blue sign - used to prompt operation or maintenance information.

Safety Rules

Conditions related to equipment use

□ The ground of the workplace must be flat and solid, and there is enough distance between the overhead barrier-free equipment and the high-voltage line.

□ The ambient temperature shall be within the range of -20°C ~ 40°C; altitude ≤1000m.

□ Ambient humidity ≤90%.

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

Design purpose

The use of this machine is limited to lifting people, their tools and materials to aerial workplaces.

Maintenance of safety signs

Replace any lost or damaged safety signs to keep the operator in mind of safety at all times.

Clean the safety sign with neutral soap and clean water.

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

Personnel requirements

Only trained and qualified personnel can operate the machine. Safety belts and helmets must be worn when working at height.

People with a history of carsickness, cramps or acrophobia are not allowed to operate such machines.

Do not use drugs or drink alcohol before operation, because this will affect the alertness and coordination of operators. The operator during medication must consult a doctor to determine whether he/she can operate the machine safely.

Personal fall protection

Personal Fall Protection Equipment (PFPE) is required for operation of this machine.

Personnel on the platform must wear safety belts or use safety facilities that meet government regulations. Fasten the safety belt to the fixed anchor of the platform.

Operators must comply with the use rules of personal protective equipment, workplace specifications and government regulations.

All PFPE must comply with appropriate government regulations and must be inspected and used in accordance with the PFPE manufacturer's instructions.

The recommended personal protective equipment is listed as follows:

Anti-fall safety belt	Protective gloves	Helmet	Safety shoes

⚠Danger of electric shock

The machine is not insulated and does not provide shock protection when touching or approaching wires.

Maintain a sufficient safety distance from power lines and electrical equipment in accordance with applicable government laws and regulations and the following table.

Voltage	Required clearance
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

The influence of strong wind or gust on the movement of the platform, the swing and slack of the wires shall be considered.

If the machine comes into contact with live wires, please stay away from the machine. Do not allow personnel on the ground or platform to touch or operate the machine before disconnecting the power supply.

Do not operate the machine in case of lightning or storm.

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

Do not touch the live controller.

⚠Danger of tipping

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

Maximum bearing capacity

Maximum capacity (indoor) 2 persons

Maximum capacity (outdoor) 1 person

Maximum working load of platform 200kg

Work area safety

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

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

The tilt alarm cannot 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:

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

For machines used outdoors, the platform cannot be lifted when the wind speed may exceed 12.5m/s. If the wind speed exceeds 12.5m/s after the platform is lifted, lower the platform immediately and stop operating the machine.

Observe the maximum allowable manual force and the maximum number of passengers when lifting the platform.

Do not operate the machine in case of strong wind or gust, and do not increase the surface area of the platform or load. 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 it is trapped, stuck or blocked by other nearby objects. All personnel must leave the platform before using the ground controller to release the platform.

In the retracted state, when the machine runs on uneven terrain, gravelly, unstable or slippery surfaces, near caves and steep slopes, be very careful and slow down.

In the lifted state, the machine cannot run on uneven terrain, unstable or other dangerous conditions.

Do not use the machine as a crane.

Do not push or pull any object outside the platform.

Maximum manual operating force			
Model	Applicable occasions	Maximum manual operating force	Maximum number of members
HV120AJ	Outdoor	200N	1
	Indoor	400N	2

Do not change or disable limit switches.

Do not alter or damage any component that may affect the safety and stability of the machine.

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

Make sure that all tires are in good condition. Do not modify or alter aerial work platforms without written permission from the manufacturer.

The installation of additional devices for placing tools or other materials on the platform, skirtings or guardrails will increase the weight and surface area of the platform or increase the load.

Do not use a battery with a weight less than the original one. The battery not only plays a counterweight role in the chassis, but also is crucial to maintaining the stability of the machine. The total weight of the battery pack must reach 360kg.

Do not place, fasten or suspend loads on any part of the machine.

Do not place ladders or scaffolding in the platform, or against any part of the machine.

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

Do not use the machine on moving or active surfaces and vehicles.

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

Do not use the jib to push the machine or other objects.

Do not lean the jib or platform against adjacent buildings.

Do not tie the platform or jib to adjacent components.

Do not place the load outside the platform guardrails.

⚠ Danger of crushing

Do not put your hand or arm near the mast, and do not touch the descending mast.

Do not stand under the working platform.

When using the controller to operate the machine on the ground, please keep normal judgment and plan.

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

⚠ Danger of operation on slope

Do not drive the machine on a slope that exceeds the slope rating and side slope rating of the machine.

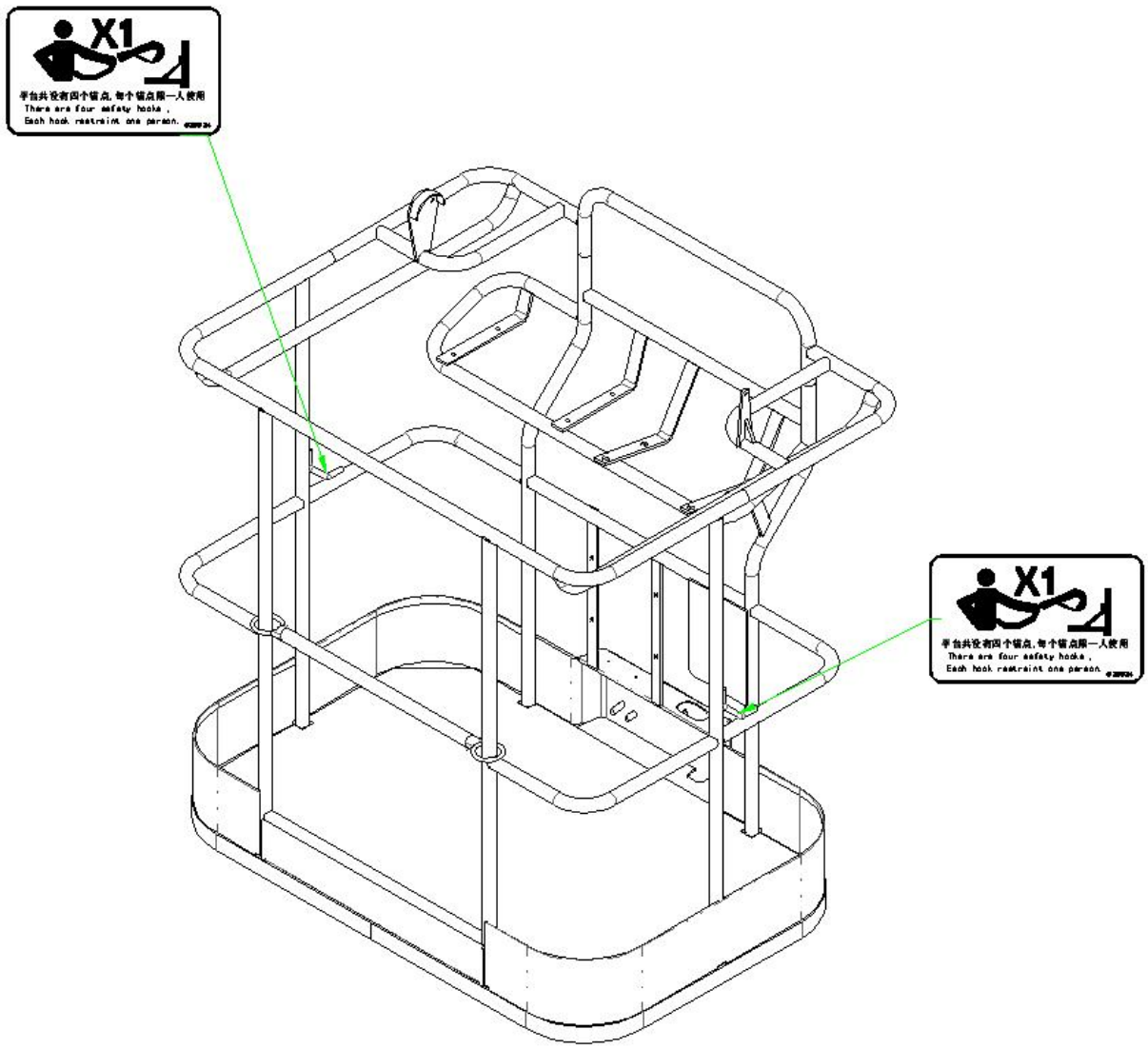
The slope rating is only applicable to the machine in the retracted state.

Model	Maximum slope rating in retracted state	Maximum side slope rating in retracted state
HV120AJ	30%	10%

Note: slope ratings are limited by ground conditions and traction

⚠ Danger of falling

During operation, personnel working on the platform must wear full-body safety devices and be attached to approved rope anchorages with safety belt hooks. Only one hook shall be attached to each rope anchorage.



Seat belt anchor position

Keep platform floor free of debris.

The entry stop lever must be closed before operating the equipment.

Do not enter the platform unless its guardrails are secure.

Do not climb or sit on the guardrails of the platform. Stand firmly on the platform floor at any time.

Do not climb down from the platform after it is lifted.

Do not leave the platform during lifting. If the electronic control fails, personnel on the platform can only leave after the ground personnel use the manual lowering function to lower the platform.

Take extra care when entering and leaving the platform, ensure that the jib has been lowered to the lowest position. When entering or leaving the platform, you should face the platform and maintain "three-point contact" with the equipment using both hands and one foot, or both feet and one hand.

⚠ Danger of collision

Users must follow the rules for use of personal protective equipment stipulated by employers, workplace and government laws and regulations.

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

The brake can only be released when the equipment is on a horizontal ground.

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

Beware of the danger of crushing when grasping the platform guardrails.

The platform can only be lowered when there are no people and obstacles in the area below the platform.

Irrelevant personnel must be 6m away from the equipment to ensure the safety of slewing operation.

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

Do not operate the machine on the route of any crane or moving overhead machinery unless the crane controller is locked or preventive measures have been taken to prevent any potential collision.

Do not drive dangerously or play with others when operating the machine.

⚠ Danger of physical injury

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

Incorrect contact with any component beneath the cover will cause serious injury. Only trained maintenance personnel can overhaul the compartment. It is recommended that the compartment be overhauled by operators only during the pre-operational inspection. All compartments must be kept closed and locked during operation.

⚠ Danger of explosion and fire

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

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

⚠ Danger of machine damage

Do not use damaged or faulty machines

Carry out a thorough pre-operational inspection of the machine, and test all functions prior to each job change. Damaged or faulty machines shall be marked immediately and stopped from operation.

Make sure that all maintenance operations have been carried out as described in this manual.

Ensure that all labels are in place and easy to identify. Ensure 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.

⚠ Battery Safety

Do not use the lithium battery pack in an environment above 40°C or below -20°C.

Do not use the lead-acid battery pack in an environment above 40°C or below -10°C.

Do not rinse the battery pack directly.

Keep the battery pack out of reach of children or other animals.

No personnel shall disassemble the battery box other than those designated by the battery pack manufacturer.

⚠ Danger of combustion

As lead-acid batteries contain acidic substances, wear protective clothing and goggles when using the battery.

Avoid the acidic substances in the battery from spilling or contacting with them. Neutralize the spilled battery acid with soda and water.

The battery box must be kept perpendicular to the ground.

Do not charge the battery in the rain.

⚠ Danger of explosion

Keep sparks, flames and lighted cigarettes away from the battery. Batteries can give off explosive gases.

The cover shall be kept open during the whole charging process.

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

⚠ Danger of component damage

The machine has a built-in charger. Do not use any battery charger greater than 48V to charge the battery.

Please turn off the power switch of the vehicle before charging.

If the battery capacity is lower than 20%, please charge it in time.

When it is not used for more than 3 months, the battery shall be recharged once a month.

⚠ Danger of electric shock/burns

Only connect the battery charger to a grounded AC three-wire power outlet.

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

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

⚠ Danger of tipping

Do not use a battery with a weight less than the original one. The battery not only plays a counterweight role in the chassis, but also is crucial to maintaining the stability of the machine. The total weight of the battery pack must reach 360kg.

⚠ Danger of pollution

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

⚠ Safety of welding and grinding on the platform

Before welding, grinding and polishing operations, please read and understand all operation and maintenance requirements in this manual and the maintenance manual:

1. Follow the welder manufacturer's recommendations regarding the proper use of welder procedures.

2. Wires or cables for welding and grinding can only be connected after the machine is powered off.

3. Operations such as welding and grinding can only be performed after the wires or cables are properly connected.

4. The machine cannot be used as a ground wire during welding.

5. At any time, it should be ensured that electric tools are completely stored on the working platform. Do not hang their wires on the guardrails of the working platform or in the work area outside the platform, or directly hang electric tools with wires.

Lock after each use

1. Choose a safe parking position, which can be a solid horizontal ground without obstacles and avoid places with busy transportation.

2. Retract the jib and lower the jib and mast to the stowage position.

3. Rotate the turntable until the platform is located between two non-steering wheels.

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

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

6. Push the main power switch inward to the "OFF" position.

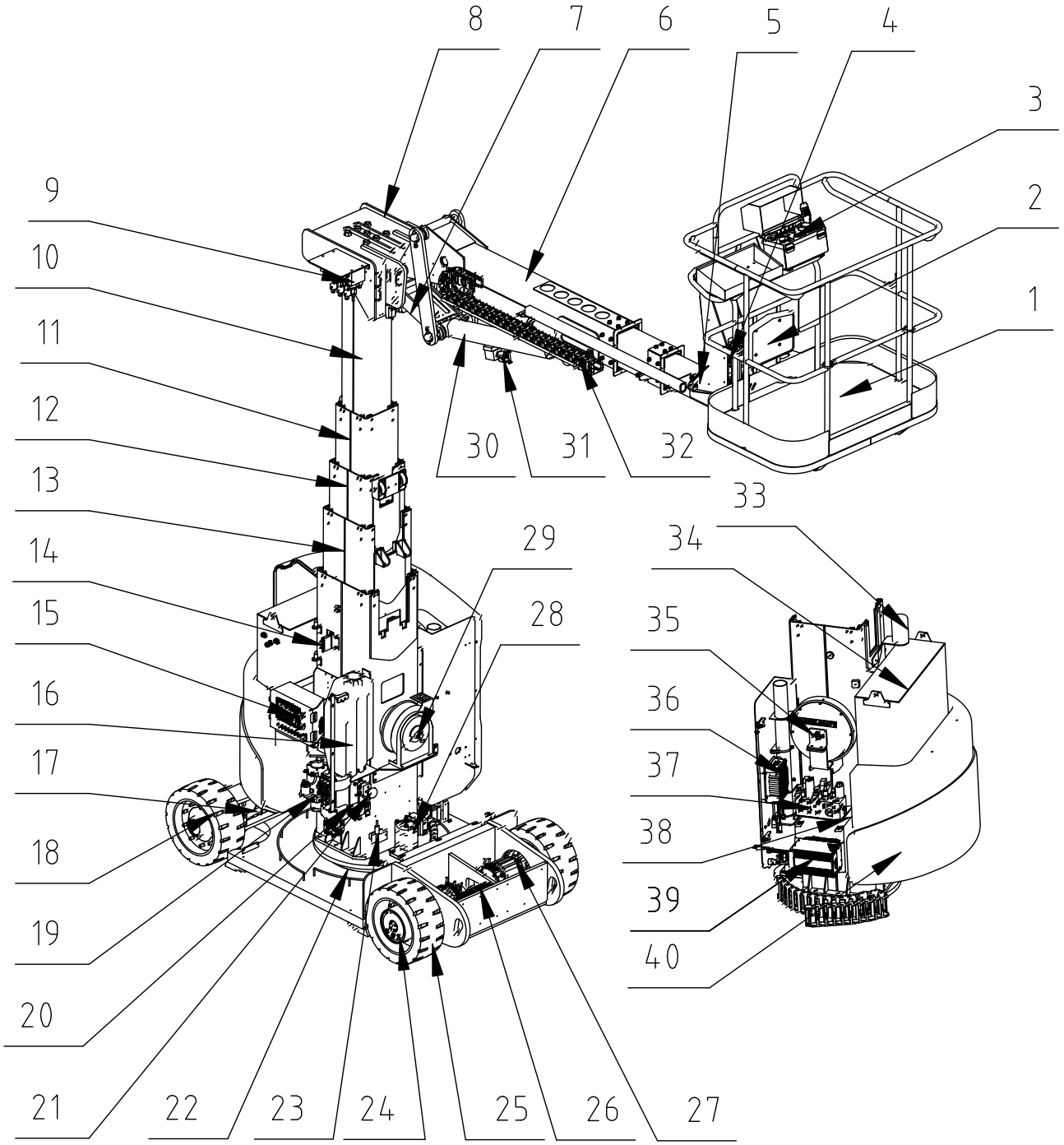
7. Chock the wheels.

Machine Overview

This manual introduces HV series aerial work platform. Users can obtain relevant information such as working height from the product model.

Name	Description
HV	Mast-type
120	Maximum operating height
A	AC drive system
J	Jib

Legend of Machine Structure



1. Working platform	2. File box	3. Platform control box
4. Weighing component	5. Leveling joint	6. Telescopic jib
7. Jib luffing mechanism	8. Mast head cover	9. Platform valve
10. Fifth-stage sleeve	11. Fourth-stage sleeve	12. Third-stage sleeve
13. Second-stage sleeve	14. First-stage sleeve	15. Ground control box
16. Hydraulic oil tank	17. Steering cylinder	18. Steering wheel
19. Main oil pump	20. Contactor	21. Main power switch
22. Slewing bearing	23. Mast explosion-proof valve	24. Travel reducer
25. Driving wheel	26. Travel drive	27. Travel motor
28. Slewing reducer	29. Cable reel (optional)	30. Luffing cylinder
31. Explosion-proof valve of luffing cylinder	32. Jib drag chain	33. Warning light
34. Battery pack	35. Hydraulic hose reel	36. DC-DC
37. Main valve	38. Manual pump	39. Charger
40. Counterweight		

Description of Machine Status

Working state: The maximum running speed of the machine is less than 0.5km/h, and the angle sensor and overload alarm are activated.

Enter the working state if any one of them is met

① The mast is lifted to the lower limit switch and disengaged.

② Extend the telescopic jib.

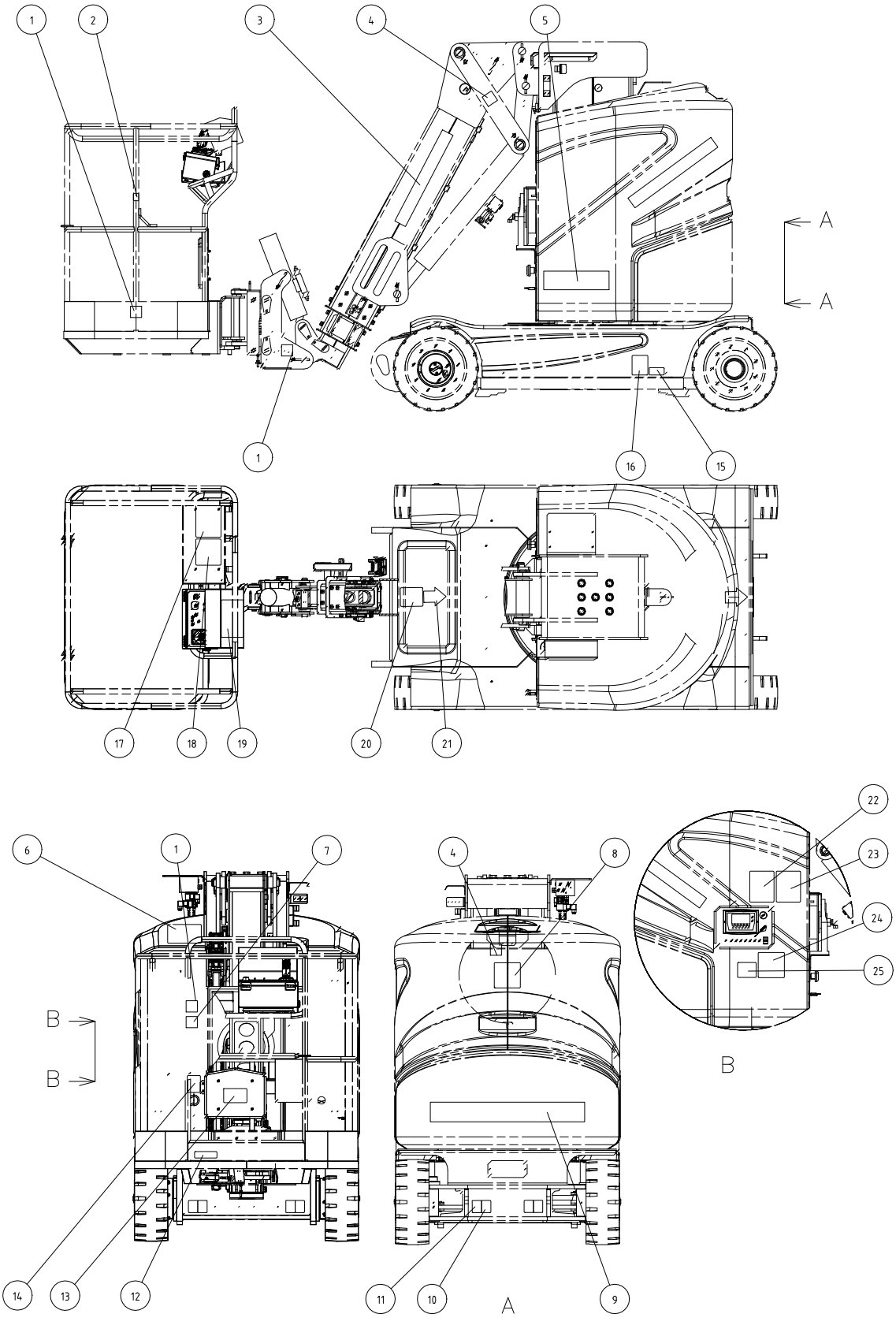
③ The jib is luffed upward to the limit switch is disengaged.

Collection state/transportation state: The machine can run at the maximum speed and climb.

The mast is lowered completely, the jib is retracted completely, and the jib is luffed downward completely.

Label

Use the following pictures to verify whether the labels on the machine are easy to identify and in the right position.



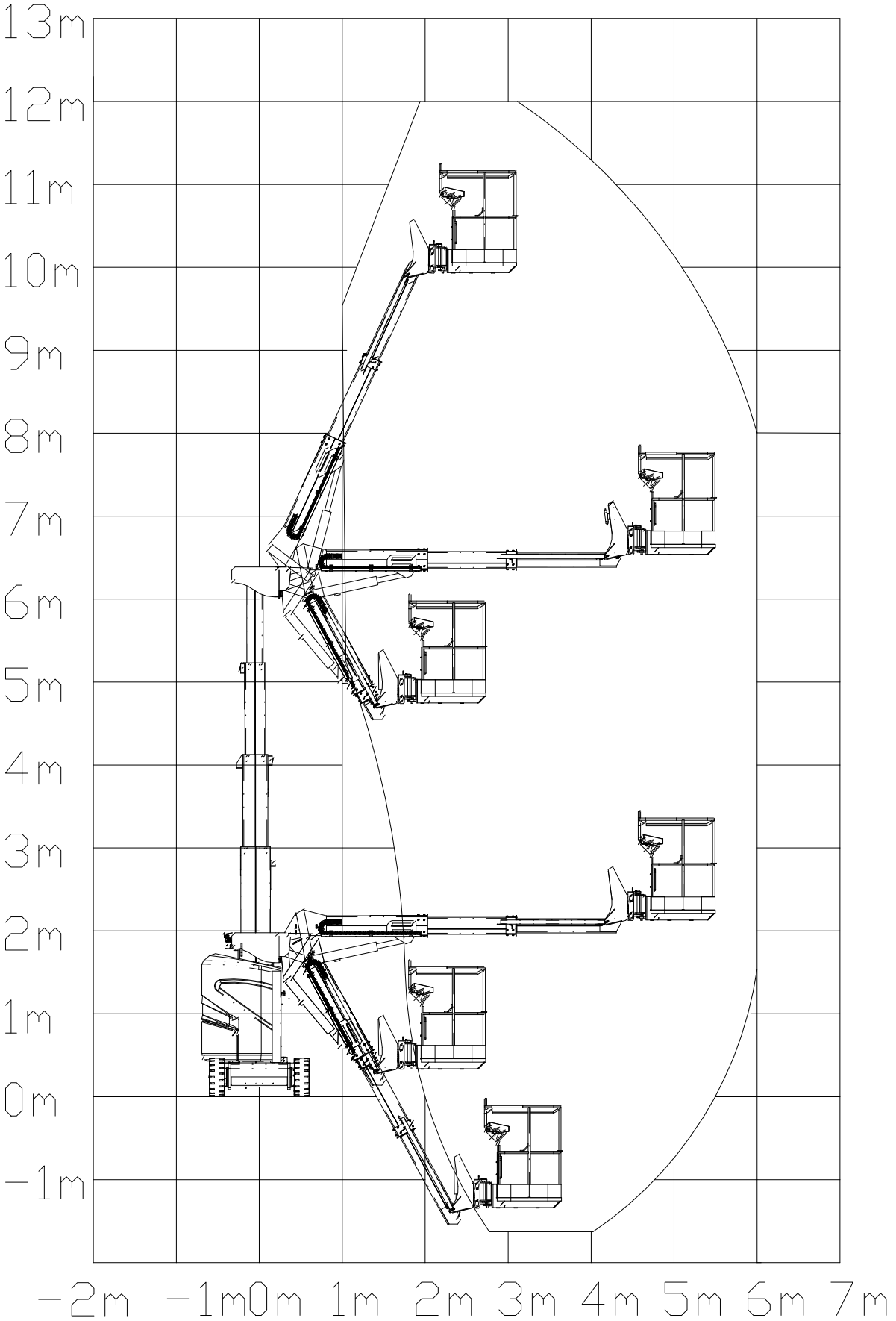
The following table is a list of label descriptions.

S/N	Name	S/N	Name
1	Label "Anti-pressure head label"	2	Safety anchor label
3	Label "Word HANGCHA"	4	Label "Anti-pinch label"
5	Type label HV120AJ	6	It is strictly prohibited to change or remove the limit switch label
7	No standing label	8	Risk labels for explosion and fire
9	Label "Word HANGCHA"	10	Lifting label
11	Binding position label	12	Emergency descent label
13	Accompanying manual label	14	Main power switch label
15	Tire load label	16	Forklift position label
17	Tipping risk label	18	Risk label of smashing and falling
19	Rated load description label	20	No trampling label
21	Label "Front"	22	Pre-operational inspection label
23	Work scope label	24	Splash hazard label
25	Consult the instruction label before operation		

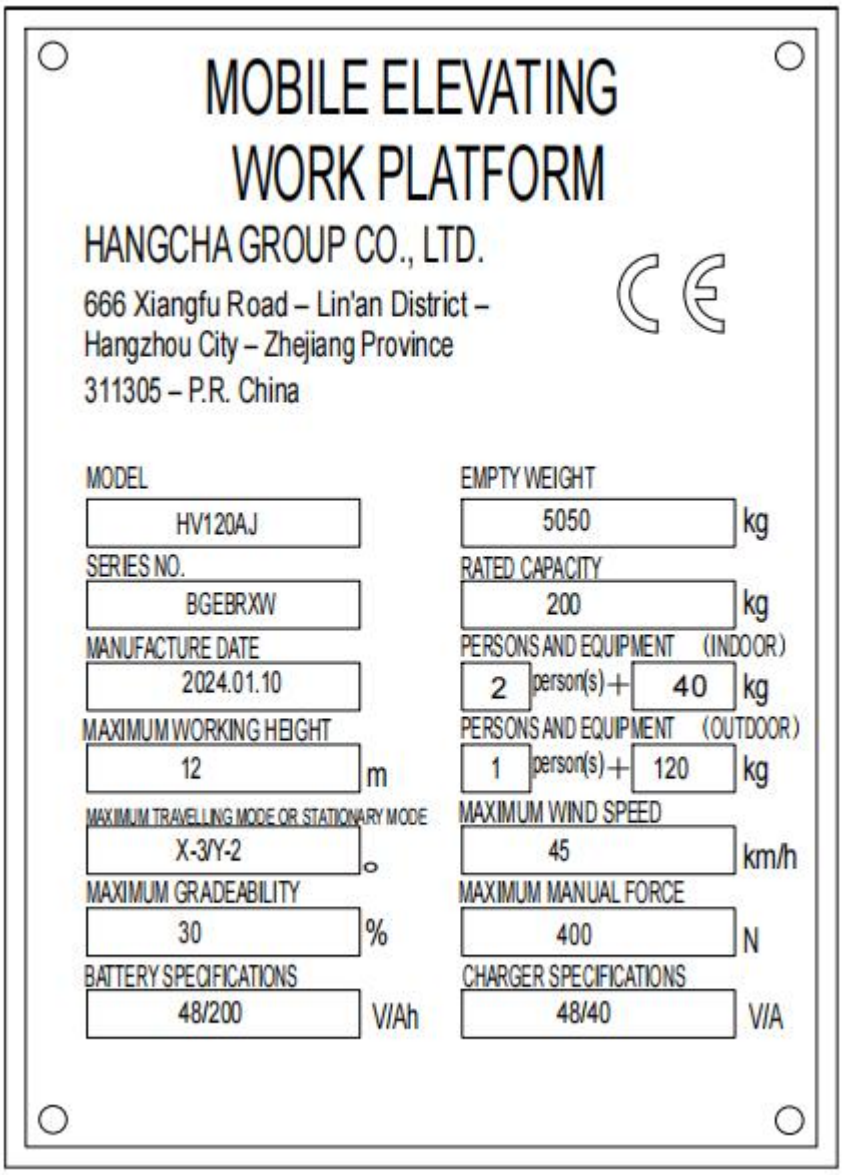
Product Performance Parameters (for Reference Only)

Parameter item	Unit	HV120AJ
Length	m	3.9
Width	m	1.2
Height	m	1.98
Ground clearance	mm	120
Ground clearance (to tipping	mm	80
Machine weight	kg	5000
Maximum working height	m	12
Maximum platform height	m	10
Maximum horizontal extension	m	5.5
Maximum crossing height	m	5.99
Maximum bearing capacity	kg	200
Wheelbase	m	1.6
Turning radius of inner wheel	m	0.75
Turning radius of outer wheel	m	2.6
Maximum allowable manual operating	N	400
Length of working platform	m	0.8
Width of working platform	m	1.2
Tire diameter	mm	454
Tire width	mm	178
Hydraulic system pressure	MPa	20
System voltage (DC)	V	48
Battery	V/Ah	48/160 (lithium battery) /200
Charger current	V/A	48/40
Running speed (rabbit speed)	km/h	6
Running speed (working state)	km/h	0.5
Gradeability	%	30
Maximum allowable wind speed	m/s	12.5
Noise level	dBA	≤80
Maximum allowable tilt angle	Longitudinal 3° transverse 2°	

Working range diagram



Machine nameplate



Controller

Ground controller

1. Multi-function display screen	2. Emergency stop switch	3. Key switch
4. Action direction switch	5. Fence tilt switch	6. Fence rotary switch
7. Turntable rotary switch	8. Jib telescopic switch	9. Jib luffing switch
10. Mast lifting switch	11. Current overload protector	

1. Multi-function display screen

It can display or query the accumulated system working time, battery capacity, fault code, real-time motor speed, etc.

2. Emergency stop switch

The function of this switch is to cut off all actions when the vehicle encounters a sudden fault:

- Press this button to stop all actions;

- Pull out the button and restart.

3. Key switch

- Turn the key switch to the "Platform" icon position on the right, and the platform controller will run;
- Turn the key switch to the "OFF" position in the middle, and the machine will be shut down;
- Turn the key switch to the "chassis" position on the left, and the ground controller will run.

4. Action direction switch

Depending on the color of the up and down arrows on the switch, toggle the switch in the intended action direction.

5. Fence tilt switch

The function of this button is to adjust the levelness of the platform or the position of the fence in the transportation state. First, turn the key switch to the chassis operation:

Adjust the fence upward

- Toggle the switch 6 upward and hold it, and push the switch 5 downward.

Adjust the fence downward

- Toggle the switch 6 and hold it, and push the switch 5 upward.

6. Fence rotary switch

This switch is used for the turntable fence. First, turn the key switch to the chassis operation:

Rotate to the right

- Toggle the switch 7 upward and hold it, and push the switch 5 upward.

Rotate to the left

- Toggle the switch 7 upward and hold it, and push the switch 5 downward.

7. Turntable rotary switch

This switch is used to rotate the Toggle. First, turn the key switch to the chassis operation:

Rotate to the right

- Toggle the switch 8 upward and hold it, and push the switch 5 upward.

Rotate to the left

- Toggle the switch 8 upward and hold it, and push the switch 5 downward.

8. Jib telescopic switch

This switch is used for the telescopic action of the jib. First, turn the key switch to the chassis operation:

Extend outward

- Toggle the switch 9 upward and hold it, and push the switch 5 downward.

Retract inward

- Toggle the switch 9 upward and hold it, and push the switch 5 upward.

9. Jib luffing switch

This switch is used for the luffing action of the jib. First, turn the key switch to the chassis operation:

Luffing upward

- Toggle the switch 10 upward and hold it, and push the switch 5 upward.

Downward luffing

- Toggle the switch 10 upward and hold it, and push the switch 5 downward.

10. Mast lifting switch

This switch is used for the lifting and lowering actions of the mast. First, turn the key switch to the chassis operation:

Luffing upward

- Toggle the switch 10 upward and hold it, and push the switch 5 upward.

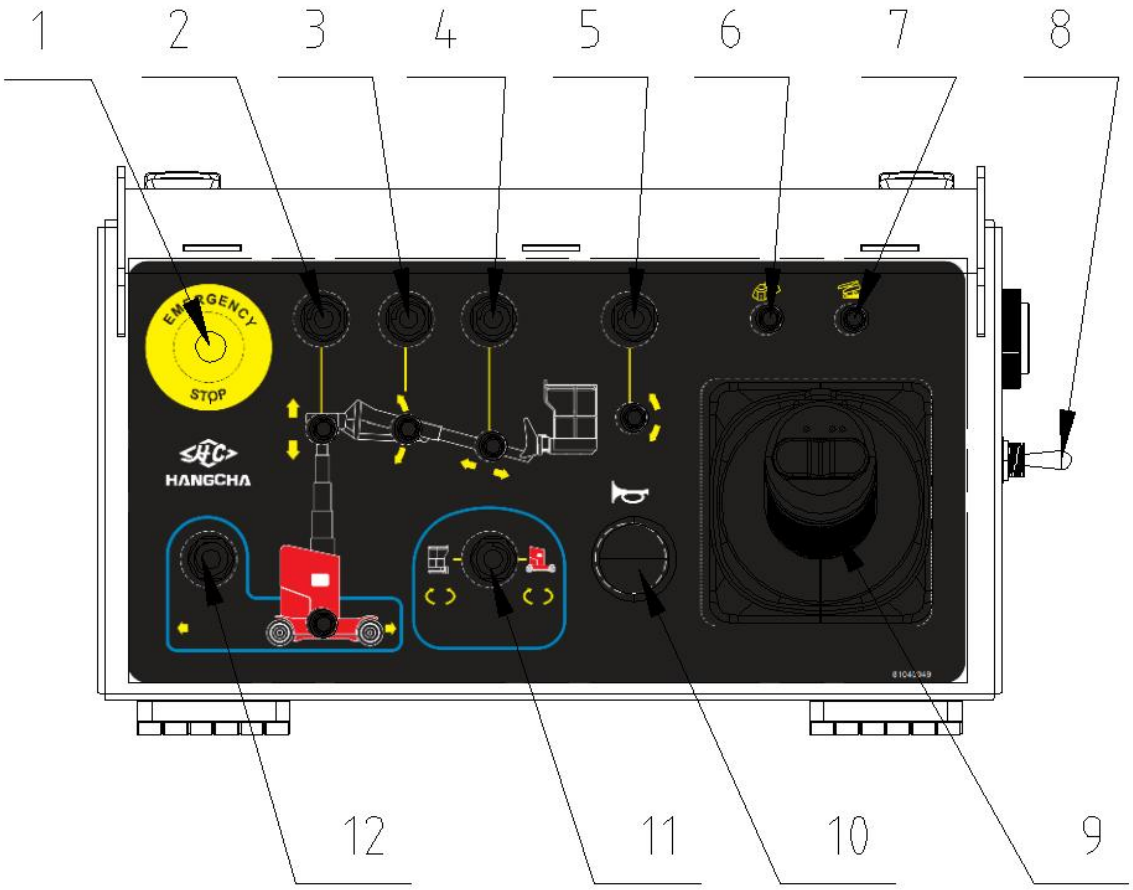
Downward luffing

- Toggle the switch 10 upward and hold it, and push the switch 5 downward.

11. Current overload protector

This component pops up when the control system current is overloaded. Cut off the circuit to protect the control system. After troubleshooting, press the circuit overload protector to reset it.

Platform controller



1. Emergency stop switch	**2. Mast lifting switch**	**3. Jib luffing switch**
4. Jib telescopic switch	**5. Fence tilt switch**	**6. Overload alarm lamp**
7. Tilt alarm lamp	**8. Bypass switch**	**9. Control handle**
10. Horn button	**11. Rotary selector switch**	**12. Travel selector switch**

1. **Emergency stop switch**

The function of this switch is to cut off all actions when the vehicle encounters a sudden fault:

- Press this button to stop all actions;

- Pull out the button and restart.

2. **Mast lifting switch**

This switch is used for the lifting and lowering actions of the mast: toggle the switch, and within 8 seconds after the corresponding indicator lights up, press the enable switch on the control handle and then push forward or pull backward the control handle to lift or lower the mast.

3. **Jib luffing switch**

This switch is used for the luffing action of the jib: toggle the switch, and within 8 seconds after the corresponding indicator lights up, press the enable switch on the control handle and then push forward or pull backward the control handle to luff the jib upward or downward.

4. **Jib telescopic switch**

This switch is used for the telescopic action of the jib: toggle the switch, and within 8 seconds after the corresponding indicator lights up, press the enable switch on the control handle and then push forward or pull backward the control lever to extend or retract the jib.

5. **Fence tilt switch**

This switch is used for the tilt action the fence: toggle the switch, and within 8 seconds after the corresponding indicator lights up, press the enable switch on the control handle and then push forward or pull backward the control handle to tilt the fence.

6. **Overload alarm lamp**

When this lamp lights up, it indicates that the platform bears more load than allowed, and the machine restricts all actions at this time. Please remove the overloaded part of load in a safe way immediately. When the overloaded part is removed, the overload alarm light will go out and the machine will resume normal operation.

7. **Tilt alarm lamp**

When this lamp lights up, it indicates that the slope where the machine is located exceeds the allowable tilt angle, and the machine is at risk of tipping. Please retract the jib first, then lower the jib and mast in turn until they are in the collection state, and move the machine to a solid horizontal ground.

- If the tilt alarm lamp lights up while lifting the platform, lower the platform very carefully.

8. **Bypass switch**

This switch is used for emergency retraction when the machine misreports a non-fatal safety fault. When the machine misreports a tilt alarm or overload alarm, all actions are restricted. Toggle the bypass switch to perform three actions: retracting the jib, luffing downward the jib and lowering the mast, so that the platform can be lowered to the ground for troubleshooting.

Only when the machine needs to be moved in case of emergency, or under special working conditions such as loading, this switch is allowed to be used, and the safety of personnel must be ensured during use. Unrestricted use may cause the machine to tip or cause casualties.

9. **Control handle**

All actions on the platform need to be realized by the control handle, and the corresponding functions of the control handle are as follows:

--Enable switch: safety switch, which needs to be pressed and held for all actions;

--Thumb button: press the left and right thumb buttons respectively to rotate the steering wheel;

--Pushing the joystick back and forth corresponds to switching of forward/backward travel and the direction of jib action; pushing the joystick left and right corresponds to the rotation of the turntable and the fence.

10. **Horn button**

When the button is pressed, the horn on the vehicle body will sound immediately to remind nearby personnel to yield.

11. Rotary selector switch

This switch is a three-position toggle switch, and the corresponding action can be selected according to the figure.

Fence rotation

--Within 8 seconds after toggling the switch leftward, press the enable switch on the control handle and then push the control handle leftward or rightward to rotate the fence.

Turntable rotation

--Within 8 seconds after toggling the switch rightward, press the enable switch on the control handle and then push the control handle leftward or rightward to rotate the turntable.

12. **Travel selector switch**

This is a self-resetting toggle switch. Toggle the switch, and within 8 seconds after the corresponding indicator lights up, press the enable switch on the control handle and then push forward or pull backward the control handle to realize the travel action of the machine.

Pre-operational Inspection

Cannot be operated 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 pre-operational inspection.

Know and understand the pre-operational inspection before proceeding to the next step.

3. Check the workplace.

4. Always perform pre-use function test.

5. Use the machine only according to its design intent.

Basic Principles

It is the responsibility of the operator to perform pre-operational inspection and routine maintenance.

Pre-operational 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 there are obvious problems with the machine before the operator performs the function test.

Pre-operational inspection can also be used to determine whether routine maintenance procedures are needed, and 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 changes different from the factory condition are found, the machine should be marked and taken out of service.

Only qualified maintenance technicians can repair the machine in accordance with the manufacturer's specifications. After maintenance, the operator must perform the pre-operational inspection again before proceeding function test.

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

Pre-operational Inspection

□ Ensure that the manual is complete, legible and stored in the manual box in the platform.

□ Ensure that all labels are clear, legible and properly located. See "Label" part.

□ Check the hydraulic oil for leakage. Check whether the hydraulic oil level is appropriate. See "Maintenance" part.

□ Check lead-acid battery fluid for leakage and proper levels. Add distilled water as needed. See "Maintenance" part.

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

□ Electrical component, wiring and cable

□ Hydraulic hose, connection, hydraulic cylinder and hydraulic valve block

□ Battery pack and its connection

□ Drive motor

□ Slider between masts

□ Tire and wheel

□ Chain and sprocket wheel

□ Mast

□ Jib

□ Limit switch, alarm and horn

□ Nuts, bolts and other fasteners

□ Platform entrance door

□ Indicator and alarm (if equipped)

□ Platform control lever

Check the whole machine for:

□ Cracks in welds or structural components

□ Dents or damages to the machine

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

Workplace Inspection

Cannot be operated 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 pre-operational inspection.

Know and understand the pre-operational inspection before proceeding to the next step.

3. Check the workplace.

4. Always perform pre-use function test.

5. Use the machine only according to its design intent.

Basic Principles

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

It is the operator's responsibility to understand and remember the dangerous matters in the workplace, which can be noticed and avoided when moving, installing and operating the machine.

Workplace Inspection

Beware of and avoid the following dangerous situations:

- Steep slope or pothole
- Protrusions, ground obstructions or debris
- Inclined surfaces
- Unstable or slippery surfaces
- Aerial obstructions and high-voltage power lines
- Hazardous locations
- Surface supports that are insufficient to withstand the full load force exerted by the machine
- Wind and weather conditions
- Presence of unauthorized personnel
- Other possible unsafe conditions

Function Test

Cannot be operated 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 pre-operational inspection.

Know and understand the pre-operational inspection before proceeding to the next step.

3. Check the workplace.

4. Always perform pre-use function test.

5. Use the machine only according to its design intent.

Basic Principles

Function test is used to discover faults before starting to use the machine.

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

It is forbidden to use a faulty machine. If a fault is found, the machine must be marked and taken out of service, and only qualified maintenance technicians can repair the machine in accordance with the manufacturer's specifications.

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

On the ground controller

1. Select a solid, horizontal and obstacle-free test area.

2. Ensure that the battery pack is connected.

3. Pull out 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 chassis controller.

5. Observe the display screen on the ground controller.

☉Result: No DTC shall be displayed on the display screen.

Test emergency stop

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

☉ Result: No function is available.

7. Pull out 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.

Test equipment functions

8. Without pressing any function enable switch, toggle the action selection switch up and down.

☉ Result: No action

9. Toggle the mast lifting function enable switch, and toggle the action selection switch up and down.

☉ Result: The mast lifting/lowering function works and the buzzer sounds at the same time.

10. Press and hold the jib luffing function enable switch, and toggle the action selection switch up and down.

☉ Result: The jib luffing function works and the buzzer sounds at the same time.

11. Press and hold the jib telescopic function enable switch, and toggle the action selection switch up and down.

☉ Result: The jib telescopic function works and the buzzer sounds at the same time.

12. Press and hold the turntable slewing function enable switch, and toggle the action selection switch up and down.

⊙ Result: The turntable slewing function works and the buzzer sounds at the same time.

13. Press and hold the fence rotation function enable switch, and toggle the action selection switch up and down.

⊙ Result: The fence rotation function works and the buzzer sounds at the same time.

14. Press and hold the fence tilt function enable switch, and toggle the action selection switch up and down.

⊙ Result: The fence tilt function works and the buzzer sounds at the same time.

Test on Platform Controller

Emergency stop

15. Push the red emergency stop button of the platform to the "OFF" position

⊙ Result: All functions will not work.

16. Pull out 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.

⊙ Result: The platform controller screen will be brightened.

Test the horn

17. Press the horn button.

⊙ Result: The horn will sound.

Test Function Enable and Device Functions

--Each action selection switch on the platform controller panel corresponds to the LED indicator shown in the figure. After the action selection switch is toggled, the corresponding function is allowed to be used within 8 seconds after the indicator lights up.

18. Do not toggle the function enable switch on the platform controller.

19. Slowly move the control handle forward and then backward.

⊙ Result: All functions will not work.

20. Toggle the mast lift function selector.

21. Press and hold down the release switch on the control handle.

22. Slowly move the control handle forward or backward.

⊙Result: The mast is raised or lowered and the buzzer sounds.

23. Release the control handle.

⊙Result: The platform stops moving.

24. Toggle the jib luffing action switch, press and hold the release switch, and slowly move the control handle.

⊙Result: The jib is lowered or raised and the buzzer sounds.

25. Toggle the jib telescoping action switch, press and hold the release switch and slowly move the control handle.

⊙Result: The jib is extended or retracted and the buzzer sounds.

26. Toggle the fence tilt switch, press and hold the release switch, and slowly move the control handle.

⊙Result: The fence tilts and the buzzer sounds.

27. Toggle the fence rotary switch, press and hold the release switch and slowly move the control handle.

⊙Result: The fence rotates horizontally and the buzzer sounds.

28. Toggle the rotary switch of the rotary table, press and hold the release switch and slowly move the control handle.

⊙Result: The rotary table rotates and the buzzer sounds.

Test steering

29. Toggle the travel selector switch and press the release switch on the control handle.

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

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

31. Press the joystick switch in the direction the yellow arrow indicates on the control panel.

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

Test the driving and braking functions

32. Toggle the travel selector switch.

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

⊙Result: The machine moves in the direction indicated by the yellow arrow on the chassis and then stops suddenly.

34. Toggle the travel selector 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.

⊙Result: The machine moves in the opposite direction indicated by the yellow arrow on the chassis and then stops suddenly.

Note: The brake must be capable of stopping the machine on any slope that can be climbed.

Test limited drive speed

36. Toggle the mast lift/lower selector switch.

37. Press and hold the release switch on the control handle to raise the mast approximately 20 cm.

38. Toggle the travel selector switch.

39. Press and hold the release switch on the control handle, and slowly move the control handle to the maximum opening.

⊙Result: The maximum driving speed with the platform raised shall not exceed 14 cm/s.

⊙ Result: Mark and stop the machine immediately if the driving speed exceeds 14 cm/s with the platform raised.

40. Lower the mast and luff the jib to about 2 meters above the ground.

41. Toggle the travel selector switch, press and hold the release switch on the control handle, and slowly move the control handle to the maximum opening.

⊙Result: The maximum driving speed with the platform raised shall not exceed 14 cm/s.

¤ Result: Mark and stop the machine immediately if the driving speed exceeds 14 cm/s with the platform raised.

42. Lower the jib to the collection position and extend it approximately 20 cm.

43. Toggle the travel selector switch, press and hold the release switch on the control handle, and slowly move the control handle to the maximum opening.

⊙Result: The maximum driving speed with the platform raised shall not exceed 14 cm/s.

¤ Result: Mark and stop the machine immediately if the driving speed exceeds 14 cm/s with the platform raised.

44. Retract the jib to the collection position.

Operating Instructions

Cannot be operated 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 pre-operational inspection.

Know and understand the pre-operational inspection before proceeding to the next step.

3. Check the workplace.

4. Always perform pre-use function test.

5. Use the machine only according to its design intent.

Basic Principles

This machine is a self-propelled hydraulic lift equipped with a working platform on the mast mechanism. The vibration generated during the operation of the machine is not dangerous to the operator standing on the platform. The machine can be used to lift workers and their portable tools to a certain height above the ground or to reach a certain working area above the machine or equipment.

The Operating Instructions 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 unsafe and even dangerous to use this machine for any purpose other than lifting people, their tools and materials to the aerial work site.

The machine should only be operated by personnel with training and authorization. If more than one operator uses the same machine at different times during the same shift, they must all be qualified operators and follow all safety rules and instructions in the Operation and Maintenance Manual, i.e., each new operator should perform a pre-operational check, functional check, and work area check before using the machine.

Emergency stop

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

2. The red emergency stop button must be pressed when repairing any operational functions.

Emergency operation

The machine is designed with a manual emergency lowering feature that allows the machine to return to the ground safely even when the battery is turned off.

Mast lowering

3. Pull up on the mast's emergency descent handle to lower the mast to the ground.

Be aware of the risk of jamming the jib as the handle is located directly under the jib.

Jib lowering

4. Pull the cable on the masthead cover to lower the jib luffing cylinder.

Turntable rotation

5. Press the appropriate valve element on the main valve and shake the hand pump to rotate the rotary table.

Return the work platform to the ground by performing the three operations listed above.

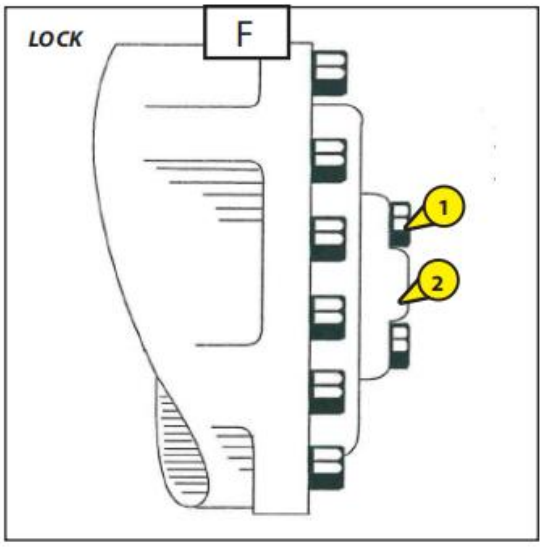
Travel release

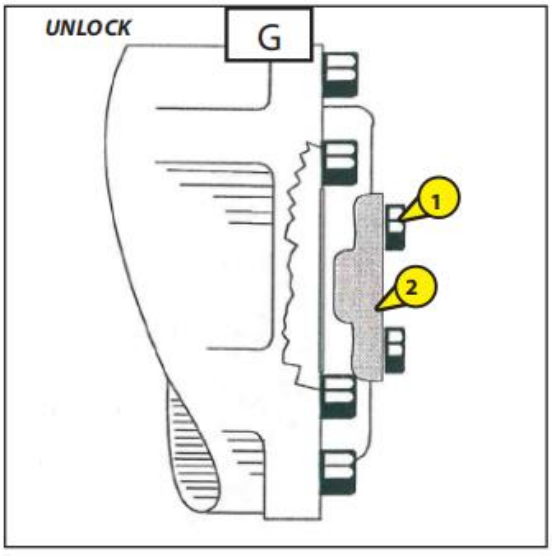
The machine has 2 steering wheels and 2 drive wheels. The drive wheels are equipped with electromagnetic brakes. The brake is engaged when the vehicle is running and is immediately released when power is removed.

The machine can be towed only for short distances and, for stability reasons, only by machines with considerable braking power: it must be connected to a tow bar.

If the vehicle needs to be towed in an emergency, first return the machine to the collection state, remove the 4 bolts in the center of the drive wheel travel reducer, install the separation cover upside down and tighten the bolts so that the drive hub of the reducer is separated. Connect the machine to the tractor and tow at a speed of no more than 12 km/h.

Replace the disconnect cover to re-engage the drive hub and re-establish braking force immediately upon completion of traction.





⚠Driving on a slope

Determine the slope and side slope ratings and grade of the machine.

Maximum ramp rating, retracted position 30%

Maximum side slope rating, retracted position 10%

Note: The ramp rating is limited by ground conditions and traction.

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

Determine the slope:

Measure the slope with a digital inclinometer or use the following method.

The following tools are required:

Carpenter's ruler

Straight wooden block, at least 1m long

Measuring tape

Place the wooden block on a sloping surface.

At the downhill end, place a carpenter's ruler on the top edge of the block and raise the end until it is level.

Hold the wood block horizontally and measure the distance from the bottom of the wood block to the ground.

Divide the tape distance (raised height) by the length of the block (stroke) and multiply by 100.

For example:

Stroke=3.6m

Raised height = 0.3m

0.3m ÷ 3.6m = 0.083 × 100 = 8.3%

The machine must be lifted or transported up and down the slope if the slope exceeds the maximum slope or side slope rating. Refer to "Transportation and Lifting".

Description of Battery and Charger

Regulations to be followed:

☑Do not use an external charger or booster battery.

☑Charge the battery in a well-ventilated area.

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

☑Only batteries and chargers approved by Hangcha can be used.

The machine is equipped with a Hangcha lithium battery pack as a standard feature, and maintenance-free lead-acid batteries and lead-acid traction batteries are available as options.

The lithium battery and the maintenance-free lead-acid battery do not require daily maintenance, and the traction battery needs to be topped up with fluid periodically.

Use of lithium batteries

Do not remove the key switch at will to forcibly disconnect the main battery system relay while the machine is in use, unless there is an emergency.

Please charge the battery in time to avoid over-discharging the battery due to the long-term self-consumption of the battery system when a low battery alarm is displayed on the screen.

If the battery becomes hot, deformed, leaks, has a strange odor, or emits smoke during use, immediately stop using the battery and place it in an open area away from people.

The battery is intended for use with the support equipment only. Do not use it for any other purpose.

Short-circuiting the battery pack output port directly with wires is prohibited.

It is strictly forbidden to immerse the battery in water, acidic, alkaline or saline solutions. It should also not be exposed to rain.

Do not use or store the battery in corrosive, explosive, or high-temperature environments (heating, near fire sources, or exposed to sunlight, etc.).

Please use a special charger when charging and avoid charging in direct sunlight. Do not recharge the battery after it is fully charged. Keep children away from the charger while it is charging.

The lithium battery system should be stored in a suitable environment (temperature less than 40 ℃ and humidity less than 90%) when not used for a long period of time. The battery capacity

should be kept above 50% and charged at least once every three months using the machine's on-board charger.

Do not apply any external force to the battery pack or allow it to fall from a great height.

Used batteries can be hazardous to humans and the environment. Please comply with workplace and local regulations when disposing of lithium batteries.

The lithium battery has an automatic protection function. The BMS will automatically turn off the contactor protection if the cell voltage is higher than 3.4V and the battery system is activated for a long time without outputting current (≤5A) for 12 hours. The battery must then be charged and activated before use.

Instructions for Filling and Charging Lead Acid Traction Batteries

1. Open the housing while charging the battery.

2. Remove the battery vent cover from the battery vent and remove the plastic gasket.

3. Fill each battery with electrolyte until the electrolyte level is above the electrode plates.

Do not fill to the maximum level before charging the battery. Excessive filling may cause electrolyte to overflow during charging. Neutralize battery acid spills with soda water.

4. Install the battery vent cover.

5. Press the emergency stop button.

6. Connect the charger plug to the AC power supply to charge the battery. Charging cannot be interrupted once it has started.

7. Check to see if it indicates a full charge.

8. Remove the battery vent cap and check the electrolyte level in the battery. If necessary, add a sufficient amount of distilled water to cover the electrode plate. Do not over-fill.

Charging the Traction Battery

1. Open the housing.

2. Press the emergency stop button.

3. Remove the battery vent cap and check the electrolyte level in the battery. If necessary, add a sufficient amount of distilled water to cover the electrode plate. Do not over-fill.

Do not charge the battery until the electrolyte has cooled down if the electrolyte temperature is above 40°C.

4. Clean and replace the battery vent cover.

5. Connect the charger plug to the AC power supply to charge the battery. Charging cannot be interrupted once it has started. The duration of a charge cycle is approximately 5 hours, and the battery capacity must be 70%-80%.

6. Charger indicates the battery is fully charged.

7. Remove the battery vent cap and check the battery electrolyte level. If necessary, add a sufficient amount of distilled water to cover the electrode plate. Do not over-fill.

8. Clean and replace the battery vent cover.

9. Disconnect the charger plug from the AC power supply.

10. Close and lock the housing.

11. Pull the red emergency stop switch to the ON position.

Transportation and Lifting Instructions

Regulations to be followed:

☑Use good judgment and a plan to control the movement of the machine when lifting it with a crane.

☑Only personnel qualified for overhead lifting should load and unload the machine.

☑Park the transport vehicle on level ground.

☑Secure the transport vehicle against movement when loading the machine.

☑Ensure that the vehicle capacity, bed and chains or belts are adequate to support the weight of the machine. Refer to the nameplate for machine weights.

☑The machine must be on a level surface or in a secure position before release of the brakes.

☑Only personnel qualified to operate the forklift can use it to load and unload the machine.

☑Ensure that the crane's lifting capacity, platform, belts or ropes are sufficient for the machine's weight. Refer to the serial number plate.

Ensure transportation safety

Before transporting, turn the key switch to the "OFF" position and remove the key.

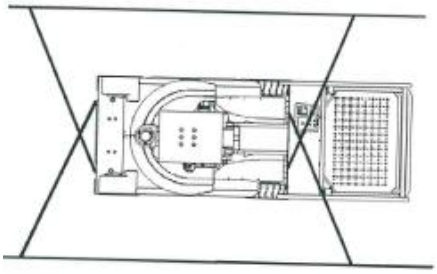
Thoroughly inspect the machine for loose or unsecured components.

Fix the chassis

Secure the machine to the transportation surface with lashings to the chassis.

Use at least four chains or belts.

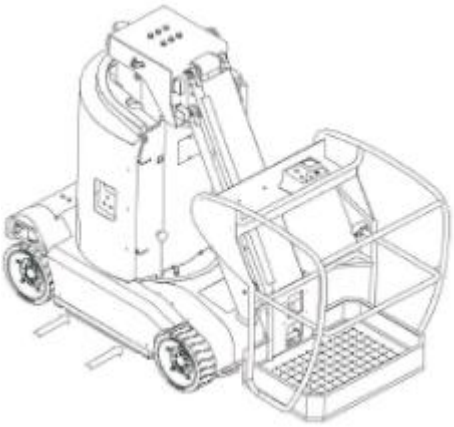
Ensure that the chain or belt used is of sufficient strength.



Lift the machine with a forklift

Make sure the controller and housing are securely fastened. Remove all moving parts from the machine.

Lower the platform completely. Keep the platform folded during transport.



Place the forklift tine in the correct position.

Drive forward and insert the forks fully into the notches.

Raise the machine about 15 cm. Tilt the forks back slightly to stabilize the machine.

Make sure that the machine is level when the forks are being lowered.

Lifting guidance

Completely lowered. Remove all moving parts from the machine.

Rigging must only be attached to the designated lifting points on the machine. There are two lifting points at each end of the machine.

Adjust the rigging to avoid damaging the machine. Keep the machine level

Long-term storage instructions

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

The ambient temperature should be within the range of -20°C ~ 40°C.

Ambient humidity ≤90%.

1. If the machine is parked indoors, select a firm and level surface; if parked outdoors, cover the machine with a dust cloth to prevent rainwater and dust from entering.
2. To keep the machine in good technical condition, it must be serviced, damaged parts repaired, and thoroughly cleaned prior to long-term storage.
3. Machines must be located in the parking lot so that access to each machine is not obstructed by other machines.
4. Storage of battery:

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

   When removing the battery, disconnect the negative lead first, then the positive lead. When installing, connect the positive lead first, then the negative lead.

   Charge the battery once a month.
5. Anti-rust treatment

   Before storage, determine the method of repairing the paint or repainting the entire machine according to the peeling area of the anti-rust paint on the outer surface.

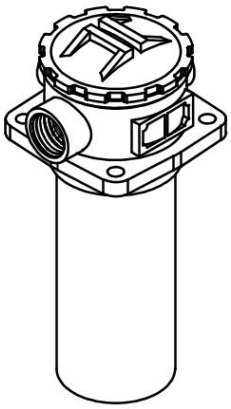
It is necessary to complete all daily inspections and maintain the equipment according to the storage time before using the equipment that has been stored for a long time.

Maintenance

Filter element

Name	Material No.	Replacement cycle
Oil return filter	GTHZ120-6000002-G00	150 hours
Filter element	GTHZ120-6000003-G00	600 hours

1



2

Lubricant

Lubrication equipment	Capacity	Recommended specification
Hydraulic oil tank	12L	L-HM32 hydraulic oil
Travel reducer	0.8L each	A80W90
Slewing bearing	Moderately	MALLEUS GL205
Boom slider	Moderately	High-temperature resistant grease
Steering wheel hub	Moderately	High-performance grease

Regulations to be followed:

☑The operator may only perform routine maintenance as specified in this Manual.

☑Scheduled service checks shall be performed by a qualified service technician according to the manufacturer's requirements.

Maintenance symbol legend

Note The following symbols are used throughout this Manual to indicate the meaning of the instructions. The meaning is as follows when one or more symbols appear before a maintenance procedure.

 Indicates that the operation requires a tool.

 Indicates that the operation requires a new part.

 Indicates that the operation requires vendor service.

Pre-delivery preparation report

The pre-delivery preparation report includes all types of inspection items.

A pre-delivery preparation report shall be prepared for each inspection and retained as required upon completion.

Maintenance schedule

Daily, quarterly, semi-annual, annual, and biennial maintenance and inspection must be performed according to the schedule. The Product Maintenance Plan and the Pre-delivery Preparation Report are divided into five sub-items: A, B, C, D, and E. Refer to the following table for the steps of each inspection.

Inspection cycle	Inspection item
Daily or every 8 hours	A
Quarterly or every 250 hours	A+B
Semi-annually or every 500 hours	A + B + C
Yearly or every 1000 hours	A + B + C + D

Maintenance inspection report

The maintenance inspection report includes all types of inspection items.

Prepare a maintenance inspection report for each inspection and retain it for at least 4 years after completion of the inspection or as required by employer, workplace, and government laws and regulations.

Pre-delivery preparation report

Basic Principles

Dealers are required to complete the pre-delivery preparation.

Pre-delivery preparation should be a priority prior to the delivery of any product. The purpose of this inspection is to determine any obvious problems with the equipment before use.

Never use damaged or modified equipment. If damage or inconsistencies with the delivery equipment are found, the machine must be marked and stopped.

The equipment must be repaired in accordance with the manufacturer's specifications by a qualified service technician.

Maintenance inspections must be performed by certified technicians in accordance with the manufacturer's specifications and the requirements of this Manual.

Description

Use the operation manual provided with the equipment.

Pre-delivery preparation consists of operational inspection, maintenance items and functional testing.

Follow the instructions in the Manual to record the results on a form and fill out the appropriate form after completing each item.

Stop, repair and recheck the equipment if the result of any check is "N". After completion, mark the R position.

Legend description

Y = Yes, completed

N = No, incomplete

R = Repaired

Evaluation

Pre-delivery preparation	**Y**	**N**	**R**
Operation check completed			
Maintenance item completed			
Functional test completed			

Model	
Serial number	
Date	
Machine owner	
Inspection unit (to be	
Signature of inspector	
Title of inspector	
Inspection company	

Maintenance inspection report

Model	
Serial number	
Date	
Cumulative duration	

Machine owner	
Inspection unit (to be	
Signature of inspector	
Title of inspector	
Inspection company	

Description

▪Use one report for each inspection.

▪Select the appropriate checklist for the inspection item.

□Daily or every 8 hours	A
□ Quarterly or every 250	A+B
□ Semi-annually or every 500	A + B + C
□ Yearly or every 1000 hours	A + B + C + D

▪Check the box after each inspection.

▪Learn how to inspect step-by-step.

▪If the inspection result is "N", mark and stop work until repaired and re-inspected; mark "R" after repair.

Legend description

Y = Accepted

N = Not accepted

R = Repaired

Checklist A	**Y**	**N**	**R**
A-1 Check manuals and labels			
A-2 Inspection before operation			
A-3 Hydraulic oil level			
A-4 Functional test			
After 40 hours			
A-5 30-day maintenance			

Checklist B	**Y**	**N**	**R**
B-1 Battery			
B-2 Wire			
B-3 Tire and hub			
B-4 Emergency stop			
B-5 Lubricate chain mast			

B-6 Key switch			
B-7 Horn			
B-8 Driving brake			
B-9 Driving speed in retracted			
B-10 Driving speed in lifting			
B-11 Working indicator			
B-12 Running alarm			
B-13 Hydraulic oil analysis			
B-14 Hydraulic oil tank			
B-15 Tension the lifting chain			
B-16 Check chain condition			

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

Checklist D	**Y**	**N**	**R**
D-1 Hydraulic oil			

Steps of Checklist A

A-1

Check manuals and labels

The key to safe operation is to follow the operating and maintenance instructions. Each device has a manual stored in the box of the platform. Manuals with illegible writing or missing pages may not provide sufficient information to ensure safe operation.

In addition, make sure that all safety signs are in good condition. Labels should be applied to alert operators to potential safety hazards when using the machine. They also provide information on how to operate and maintain the machine. Unclear labels do not serve as warnings, resulting in dangerous operating conditions.

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

2. Check the manual to ensure that the handwriting is clear and there are no missing pages.

☉Result: The manual matches the model and all manuals are legible with no missing pages.

¤Result: The manual does not match the model, or the manual is illegible or has missing pages. Stop the machine before replacing the Manual.

3. Open the label inspection diagram and carefully check that the label is not blurred or damaged.

☉Result: All labels are complete, clear and intact.

¤Result: The label is missing, blurred, or damaged. Stop the machine before replacing the label.

4. After use, return the manual to its original position.

Tip: If there is a need for replacement of the manual or label, please contact Hangcha or its dealer.

A-2

Perform pre-operational checks

Performing pre-operational checks is critical to ensuring safe operation. The pre-operational check is a visual inspection performed before the machine runs. This inspection is used to determine if there are any obvious problems with the machine before the functional test and can also be used to determine if routine maintenance should be performed.

Refer to the pre-operational check section of this Manual for a complete inspection procedure.

A-3

Check the hydraulic oil level

Proper hydraulic oil levels are critical to the operation of the machine. If the hydraulic oil level is incorrect, hydraulic components may be damaged. Daily checks allow the inspector to detect changes in hydraulic oil levels that may indicate problems with the hydraulic system. The machine adopts transparent plastic oil tank, and the oil level can be clearly seen after opening the side cover of the oil tank.

1. When the machine is in the collection state, the liquid level in the oil tank shall not be higher than the maximum liquid level line.

2. When the machine is lifted to the maximum operating height, the liquid level in the oil tank shall not be lower than the oil suction port.

3. Adjust the filling amount of hydraulic oil in the oil tank based on the above two states.

Note Specification of hydraulic oil for delivery: L-HM32

It is recommended that customers select the appropriate hydraulic oil according to the ambient temperature. For example: L-HV32 or L-HM68.

A-4

Conduct functional test

Completing the functional test is critical to safe machine operation. The function test is a pre-operational check of the machine to determine if there are any defects in the machine. Do not use

defective machines. Immediately mark and remove the machine from service when a malfunction is detected.

Refer to "Function Test" in this manual for the complete inspection procedure.

A-5

30-day maintenance

The 30-day maintenance is a one-time maintenance after the first 30 days or 40 hours of machine operation. Continue to check the maintenance items on the list after this step.

Perform the following maintenance steps:

▪B-3 Tire and hub

Steps of Checklist B

B-1

Check the lead-acid battery

This inspection shall be performed every 250 hours or every quarter, whichever comes first.

Good battery condition is essential for the performance and operational safety of the machine. Incorrect electrolyte levels and damaged cables or connectors can cause damage to machine parts and dangerous situations.

Warning Danger of electric shock

Operating while energized can cause serious personal injury or death. Remove all rings, watches, and other accessories during operation.

Warning Danger of physical injury

The electrolyte of lead-acid charging battery is corrosive. To avoid injury, do not touch the spilled electrolyte with your hands or other parts of your body. Neutralize the spilled electrolyte with baking soda water.

1. Wear protective clothing and goggles.
2. Open the housing.
3. Make sure the battery cable connector is not corroded.

Tip: To prevent corrosion of the battery connection cable, add a terminal protector and apply an anti-corrosion adhesive.

4. Locate the battery pack and make sure all battery packs are securely attached and connected normally.
5. Open the battery cover and check the electrolyte level. A pipe must be used to replenish the distilled water when it is 3 mm below the bottom surface. Do not overfill.
6. Clean up any electrolyte spillage around the vent cover.

B-2

Check the wire

This inspection shall be performed every 250 hours or every quarter, whichever comes first.

Good wire condition is essential for safe operation and machine performance. Failure to locate and replace burnt, scratched, corroded, or bent wires will result in an unsafe operating environment and may cause damage to machine parts.

Warning Electric shock/explosion hazard

Contact with heat or electrical conductors can cause serious injury. Do not wear rings, watches, or other jewelry.

1. Open the housing.

2. Turn the key switch to the ground control position, pull out 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. Raise the jib to a height of approximately 2.5 m above the ground.

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

5. Disconnect the ground wire of the chassis battery.

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

7. Inspect the drive motor area for burns, scratches, corrosion, kinking, or loose wires.

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

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

10. Inspect the battery pack area for burns, scratches, corrosion, kinking, or loose wires.

11. Check the following areas for burns, scratches, corrosion, kinking, or loose wires.

▪Ground controller

▪Battery

▪Oil pump and hydraulic manifold accessory wires

12. Turn the key switch to the ground control position, pull out 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 the jib to about 0.5 m from the ground.

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

15. Check the following areas for burns, scratches, corrosion, kinking, or loose wires

▪Mast cable

▪Platform controller

▪Wires connected to the platform

16. Inspect all wires between the ground control, platform control and level sensor for frayed insulation.

17. Close the housing.

B-3

Check tires and hubs

This inspection shall be performed every 250 hours or every quarter, whichever comes first.

Keeping tires and hubs in good condition is very important for safe operation and good performance. Failure of tires and hubs can be the cause of tipping of the machine, and if it is not discovered and repaired in time, the parts will also be damaged.

1. Inspect the tread and sidewall for scratches, cracks, punctures and other abnormal wear.

2. Inspect the hub for damage, bending, and cracking.

3. Check the torque of all bolts

Torque of steering wheel	200N·m±10%
Torque of driving wheel	250N·m±10%

B-4

Check the emergency stop function

This inspection shall be performed every 250 hours or every quarter, whichever comes first.

Normal emergency stop function is essential for the safe operation of the machine. An abnormal red emergency stop button will not cut off the power supply and cannot stop all functions of the machine, resulting in dangerous situations.

As a safety function, the selection and operation of ground controls take precedence over platform controllers except for the red emergency stop pushbutton function on the platform.

1. Turn the key switch to the ground control, pull out 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: The machine does not operate.

3. 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 red emergency stop button on the platform clockwise to the "ON" position.

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

⊙ Result: The machine does not operate.

Note: The red emergency stop button on the ground control can stop all machine operations, even if the key switch is set to the platform control.

B-5

Cleaning and lubrication of mast

Good cleaning and lubrication are very important for the performance and operational safety of the machine, and these operations must be performed more frequently in harsh working conditions.

1. Lift the platform to the maximum height.

2. Visually check the debris or foreign objects inside and outside the mast. Use a mild cleaning solvent if necessary.

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

4. Apply oil between the chain and sprocket with an oil gun for lubrication.

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

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

This procedure requires personnel with specific maintenance skills and appropriate tools. Serious injury or death may result if these instructions are not followed.

B-6

Test the key switch

This inspection shall be performed every 250 hours or every quarter, whichever comes first.

The proper operation and response of the key switches is critical to the safe operation of the equipment. The key switch allows the machine to be operated by the ground controller or the platform controller. Dangerous operation may result from a failed key switch.

1. Pull out 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: The machine does not operate.

4. Turn the key switch to ground control.

5. Check the functions in the platform controller.

⊙ Result: The machine does not operate.

6. Turn the key switch to the OFF position.

7. Check functions in the ground and platform controllers.

⊙ Result: The machine does not operate.

B-7

Test the horn

This inspection shall be performed every 250 hours or every quarter, whichever comes first.

The horn provides a sound used by personnel on the platform to warn ground personnel. Ground personnel will not be alerted to dangerous or unsafe conditions if the horn is malfunctioning.

1. 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 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 the driving brake function

This inspection shall be performed every 250 hours or every quarter, whichever comes first.

Proper braking is critical to operational safety. The brake should operate smoothly without delay, bump, or abnormal noise. There is no difference in the appearance of the wheels before and after the brake is released.

To perform the brake function test, the machine must be on a firm, level surface with no obstructions to ensure that the machine is in the retracted position and the access platform is fully retracted.

1. Draw a reference test line on the ground.

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 red emergency stop button on the platform clockwise to the "ON" position.

3. Lower the platform to the retracted position.

4. Press the drive function selection button.

5. Select a point on the machine (such as the touchdown point on the wheel) as a mark for visually crossing the reference test line.

6. Run the machine to its maximum 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 action is required.

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

Note: The brake must be effective within the machine's gradeability limits.

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-retracted state

This inspection shall be performed every 250 hours or every quarter, whichever comes first.

Proper drive function is essential for operational safety. The drive function shall respond quickly and smoothly to the operator. There shall be no delay, turbulence, or abnormal noise during normal operation.

To complete the drive speed test, the test must be performed on a firm, level surface free of obstacles.

1. Draw two lines 16 m apart on the ground as the starting and ending lines.

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 red emergency stop button on the platform clockwise to the "ON" position.

3. Lower the platform to the retracted position.

4. Press the drive function selection button.

5. Select a point on the machine (such as the touchdown point on the wheel) as a reference for visually crossing the starting and ending lines.

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

7. Keep running at full speed and record the time of crossing the ending line. The time is less than 10 seconds.

B-10

Test drive speed - lifting state

This inspection shall be performed every 250 hours or every quarter, whichever comes first.

The normal driving function is very important for operational safety. The driving function must respond to the operator quickly and smoothly, without any delay, turbulence, or abnormal noise during normal operation and driving.

The speed test must be performed on a firm, level surface with no obstructions.

1. Draw two lines 8 m apart on the ground as the starting and ending lines.

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 red emergency stop button on the platform clockwise to the "ON" position.

3. Press the function selection button of the rotary table rotation/mast lifting.

4. Press and hold the function enabling switch.

5. Lift the mast by about 20cm.

6. Press the drive function selection button.

7. Select a point on the machine (such as the touchdown point on the wheel) as a reference for visually crossing the starting and ending lines.

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

9. Keep running at full speed and record the time of crossing the ending line. The time is less than 40 seconds.

10. Lower the mast to the retracted position.

11. Press the jib lifting/lowering function selection button.

12. Press and hold the function enabling switch.

13. Lift the jib to ensure that the platform is about 2m above the ground.

14. Press the drive function selection button.

15. Select a point on the machine (such as the touchdown point on the wheel) as a reference for visually crossing the starting and ending lines.

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

17. Keep running at full speed and record the time of crossing the ending line. The time is less than 40 seconds.

18. Lower the jib to the retracted position.

B-11

Test working indicator

This inspection shall be performed every 250 hours or every quarter, whichever comes first.

The work indicator is a reminder to ground personnel and operators that the equipment is being operated.

Turn the key switch to the ground control, pull out 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.

1. Activate the functions of the machine on the ground controller.

⊙ Result: The work indicator flashes.

2. Turn the key switch to platform control.

3. Activate the functions of the machine on the platform controller.

⊙ Result: The work indicator flashes.

Note: The work indicator only works when machine functions are activated on the ground or platform.

B-12

Test running alarm

This inspection shall be performed every 250 hours or every quarter, whichever comes first.

The running alarm sound is a reminder to ground personnel and operators that the equipment is being operated.

1. Turn the key switch to the ground control, pull out 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 by about 35cm.

⊙ Result: The alarm sounds when the platform is raised.

3. Lower the platform to the retracted position.

⊙ Result: The alarm sounds when the platform is lowered.

4. Turn the key switch to platform control.

5. Press the function selection button of the rotary table rotation/mast lifting.

6 Press and hold the function enabling switch, and push the handle back and forth.

⊙ Result: The alarm sounds.

7. Press the drive function selection button.

8. Press and hold the function enabling switch, and push the handle back and forth.

⊙ Result: The alarm sounds.

9. Function release switch, press and hold the thumb button on the handle.

Result: The alarm sounds.

B-13

Perform hydraulic oil analysis

This inspection shall be performed every 250 hours or every quarter, whichever comes first.

Hydraulic fluid replacement or testing is essential for good machine performance and service life. Dirty hydraulic oil and suction filters affect machine performance. Continued use can cause damage to parts. Under severe working conditions, this operation should be performed more frequently.

Before changing hydraulic oil, verify the need for replacement with an oil separator.

If the hydraulic oil has not been changed for two years, it should be tested quarterly and changed if it fails the test.

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

B-14

Check the hydraulic oil tank respirator

This inspection shall be performed every 250 hours or every quarter, whichever comes first.

A well-ventilated hydraulic oil tank respirator is essential for good mechanical performance and service life. A dirty or clogged respirator can cause poor machine performance, and harsh work environments should be checked more frequently.

1. Open the housing.

2. Remove the respirator from the hydraulic oil tank.

3. Ventilation inspection.

⊙ Result: Air can pass through the respirator.

¤ Result: If air cannot pass through the respirator, clean or replace the respirator. Continue with step 4.

Note: Air should be able to flow freely when checking the ventilation and exhaust of the oil tank cover.

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

5. Install the respirator of the hydraulic oil tank.

6. Install the housing.

B-15

Check and adjust the lifting chain

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

The overall length of the chain will increase as a direct result of chain wear.

Visually inspect the used conveyor chain every three months to check for stretching. The mast connected to the long chain will be in a lower position, resulting in uneven tops of each mast when the machine is retracted. If this problem is severe, the sprocket will be damaged.

Warning Once the chain is found to be loose or damaged, please immediately stop using the equipment and contact the dealer as soon as possible.

Note Each chain is associated with three mast sections.

1. When adjusting the chain length, please select the mast that needs to be raised. As shown in the figure above, tighten the nut to move the previous mast section up. After adjusting the chain length, tighten the double nuts together.
2. Two chains pull the same mast and carry the weight lifted at the same time. If one chain fails, the other chain plays a very important role in safety. Therefore, when adjusting the chain length, try to keep the tightness of the two chains the same. The method to judge the tightness of the chain is to squeeze the chain by hand when the platform is lifted to compare the tension.

B-16

Check chain condition

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

Equipment required:

● Standard toolkit ● Goggles ● Gloves

●Place barriers around the perimeter of the work area

Special and auxiliary tools must be used according to regulations. Always wear appropriate safety clothing.

Preliminary procedure

If disassembly is necessary, it should be performed on completely disconnected equipment and should be entrusted to personnel who have received the necessary technical training.

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

All preventive measures must be completed prior to working on the machine. The machine can then be accessed for maintenance.

Upon completion of the work, all covers and safety devices must be completely replaced and in working order.

Lubrication

The chains must be lubricated at a minimum of every 250 hours or every 6 months. The frequency of use depends on the environment and the conditions and the frequency of use must ensure that a sufficient amount of lubricant is present in the chain links.

Immediately clean and lubricate the chain if exposed to corrosive liquid.

Note: Lubricating the chain requires extending and retracting the mast.

Remove all foreign material from the chain before applying new lubricant.

Observe environmental requirements when cleaning the chain.

Check chain condition

To perform the following operations, a complete telescoping action shall be performed.

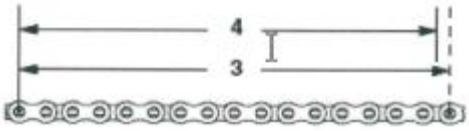
- Check to make sure the lifting chain is clean.
- Check chain and guide plate for foreign objects.
- Inspect the chain for any signs of corrosion.

Chains with any of the following defects must be replaced.

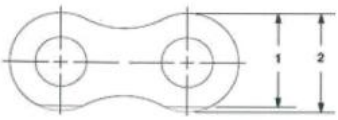
- Check the chain for elongation.
- The chain length of 12 sections must not exceed 2% of the original chain length.

- Measure the value of the length (3) by a suitable method. Compare with the value of length (4) shown in the table below.

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



- Check for external wear on rollers and chain rings.
- The size of the external wear must not exceed 2% of the original chain width (2), see table above.
- Measure the value of (1) by a suitable method.

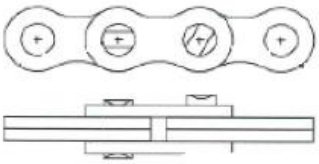


- Check to make sure that none of the lines or components are damaged or missing.
- Check to see if the link is twisted, deformed, or damaged.

Distortion Cracking

Damaged Folded

- Check the connection points of the flights (center lines must be parallel).



Replace the chain

Chains should be replaced every 7 years.

For more opinions and suggestions, please contact Hangcha's After-sales Service Department.

Steps of Checklist C

C-1

Test platform overload system

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

Frequent testing of the platform overload mechanism is very important for the safe operation of the machine. Continuous misoperation of the platform will cause the system to fail to detect the overload information of the platform, and the stability of the machine will be affected, resulting in equipment overturning.

Warning This test shall be conducted on a stable and level ground.

1. 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 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 heavy block equivalent to the maximum load of the equipment in the central position of the platform.

⊙ Result: No alarm sounds and the system is normal.

¤ Result: The alarm sounds. Calibrate the platform overload system.

4. Add a heavy block equal to 25% of the maximum load on the platform.

⊙ Result: The alarm sounds. The system functions normally.

¤ Result: The alarm does not sound and the platform overload system is calibrated.

5. Test all functions on the platform controller.

⊙ Result: All functions of the platform controller are not in operation.

6. Turn the key switch to ground control.

7. Test all functions on the ground controller.

⊙ Result: All functions on the ground controller are not in operation.

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

⊙ Result: The alarm does not sound. The system functions normally.

¤ Result: The alarm sounds and the platform overload system is calibrated.

9. Test all functions on the ground controller.

⊙ Result: All functions on the ground controller are in operation.

10. Turn the key switch to platform control.

11. Test all functions on the platform controller.

⊙ Result: All functions on the platform controller are in operation.

C-2

Replace the hydraulic oil tank filter

This inspection shall be performed every 500 hours or semi-annually, whichever comes first.

The hydraulic oil tank is equipped with an oil suction strainer at the bottom and a return filter at the top of the tank. Regular cleaning and replacement of filters is very important to ensure normal operation of the hydraulic system. In harsh environments, the filter should be checked more frequently.

1. Remove the return oil filter by unscrewing the filter mounting bolts at the top of the oil tank.

2. Unscrew the oil return filter housing, remove the filter element for replacement, and then install the oil return filter.

3. Remove the oil suction strainer from the opening at the top of the oil tank after removing the oil return filter.

4. Clean the oil suction strainer with a neutral detergent. Dry the strainer with an air gun.

5. Reinstall the oil suction strainer and oil return filter in the disassembly sequence.

Steps of Checklist D

D-1

Test or replace hydraulic oil

This inspection shall be performed every 1000 hours or once a year, whichever comes first.

Hydraulic fluid replacement or testing is essential for good machine performance and service life. Dirty hydraulic oil and suction filters affect machine performance. Continued use can cause damage to parts. Under severe working conditions, this operation should be performed more frequently.

Before changing hydraulic oil, verify the need for replacement with an oil separator.

If the hydraulic oil has not been changed for two years, it should be tested quarterly and changed if it fails the test.

Note: This operation process shall be performed with the machine retracted.

1. Open the housing.

2. Disconnect the battery pack from the machine.

Warning Electric shock/burn hazard

Working on an energized circuit can result in serious injury or death. Remove rings, watches, and other accessories during operation.

3. Remove the housing and find a proper position to place it.

4. Mark the current fluid level outside the oil tank.

5. Place a suitable container at the hydraulic oil tank drain port.

6. Locate and remove the air vent cap from the hydraulic oil tank.

7. Unscrew the oil drain plug and drain the oil into a suitable container.

Warning Danger of physical injury

The sprayed hydraulic oil may penetrate the skin. Slowly loosen the hydraulic connector and allow the oil pressure to gradually decrease. Do not allow the oil to be sprayed out.

8. Clean up spilled hydraulic oil and use it properly.

9. Clean the hydraulic oil tank with a mild solvent and dry it thoroughly.

10. Reinstall the oil drain plug. The torque shall meet the following requirements:

Torque specification	
Torque of oil drain plug	5 N·m

11. Fill hydraulic oil to the marked level in the oil tank. Be careful not to overflow.

12. Start the oil pump to fill the entire hydraulic system with hydraulic oil and remove air from the hydraulic system.

Warning Danger of component damage

Operation without oil may result in damage to the hydraulic pump. To avoid cavitation in the hydraulic system, pump the oil tank carefully when filling the hydraulic system.

Electrical Fault Diagnosis and Troubleshooting

If the electrical system fails, the corresponding DTC is displayed on the chassis panel and on the platform joystick screen. The following table lists the fault conditions corresponding to the DTC. It can help the operator or maintenance personnel to determine the fault location, then check the parts and their connecting accessories at the fault location, and decide to adjust or replace with new parts according to the inspection results.

DTC	Fault description	DTC	Fault description
E01	Upper control box not connected	E35	2A5 left traveling motor fault
E02	Platform handle fault	E36	2A6 right traveling motor fault
E03	Travel drive fault	E39	Pump motor fault
E05	BMS communication fault	E41	Rotary selector switch of lower control box platform fault
E07	Body tilt alarm	E42	Leveling selector switch of lower control box platform fault
E08	Left motor driver communication fault	E43	Rotary selector switch of lower control box turntable fault
E10	Lower control operation handle fault	E44	Lower control box mast selector switch fault
E11	Steering angle fault	E45	Luffing selector switch on the upper arm of lower control box fault
E12	Lower control operation handle neutral position fault	E46	Telescopic selector switch of lower control box fault
E13	Platform handle median value fault	E47	Jib selector switch of lower control box fault
E14	Low battery	E51	Upper control box mast selector switch fault
E16	Remote control	E52	The upper arm luffing selector

	communication fault		switch of the upper control box fault
E17	Platform overload	E53	Telescopic selector switch of upper control box fault
E19	Anti-collision switch fault	E54	Leveling selector switch of upper control box platform fault
E25	1A5 left motor controller fault	E55	Upper control traveling selector switch fault
E26	1A6 right motor controller fault	E56	Upper control jib selector switch fault
E27	Pump driver communication fault		

Maintenance Record Form

Maintenance Record Form

Maintenance Record Form
