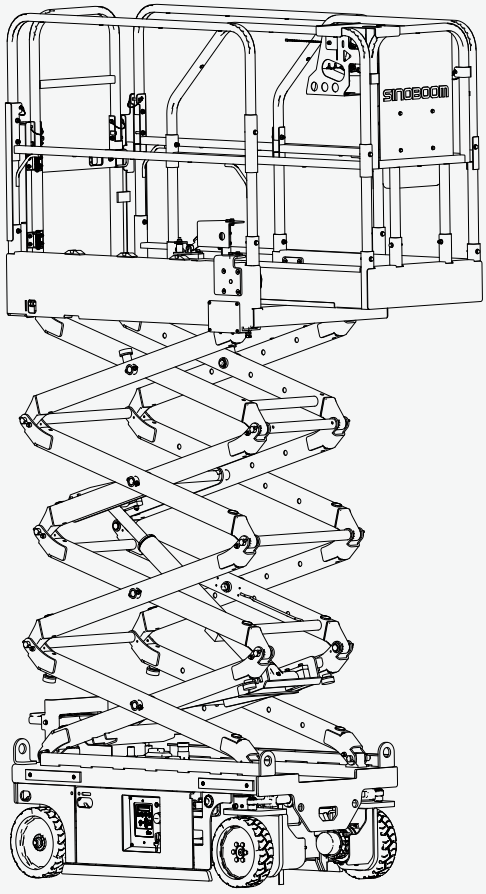
Maintenance Manual

Manual No: 501091110002-EN
Manual Version: B
October 2025
Translated Version

0407E/1330E *0110600100 to current*

0407EN/1530EN *0109000100 to current*

0607EN/1930EN *0109100100 to current*



SINOBOOM

⚠ WARNING

Operating, servicing and maintaining this vehicle or equipment can expose you to chemicals including engine exhaust, carbon monoxide, phthalates and lead, which are known to cause cancer and birth defects or other reproductive harm. To minimize exposure and avoid breathing exhaust, do not idle the engine except as necessary, service your vehicle or equipment in a well-ventilated area and wear gloves or wash your hands frequently when servicing.

For disposal, please comply with local regulations.

SINOBOOM

星邦智能

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To Users

Thank you for choosing and using the machinery of **Hunan Sinoboom Intelligent Equipment Co., Ltd.**

Use this machine only to transport tools to work locations and for performing tasks on the work platform. Only authorized personnel who have received appropriate MEWP training may operate this machine. Before using the machine, carefully read and fully understand this manual and strictly follow its relevant instructions. Different countries, regions, or governments may have equipment relevant regulations that conflict with this manual. The stricter safety regulations should be followed. Our company will not be liable for any adverse consequences arising from the failure to operate and use the machine in accordance with this manual or other relevant regulations.

This manual provides necessary safety precautions and maintenance instructions for users. This manual covers the basic configuration information of one or more models. Please refer to the information applicable to your machine model. Treat this manual as an integral part of the machine and keep it with the machine at all times. This manual may not be copied, distributed, sold, or altered without written permission from Sinoboom.

Due to continuous improvement and upgrading of product design and different product models covered, some charts and textual content in the manual may be not applicable to your machine. Our company reserves the right to revise the contents of this manual due to technological improvements. Changes will be made without prior notice. Contact Sinoboom to obtain the most current version of the manual.

Please go to www. sinoboom. com to download your desired Operation Manual, Maintenance Manual and Parts Manual.

If you have any questions, contact **Hunan Sinoboom Intelligent Equipment Co., Ltd.**

Manual Revision History:

Version	Date	Description
A	October 2024	Original issue
B	October 2025	Revised the Electrical Schematic Diagram, added Adjust Emergency Lowering Handle and description of model 0407E.

Applicability

The manual applies to the following models and serial numbers:

Model	Metric Trade Name	Imperial Trade Name	Serial No.
0407E	0407E	1330E	0110600100 to current
0407EN	0407EN	1530EN	0109000100 to current
0607EN	0607EN	1930EN	0109100100 to current

Note:

- Check the machine model and serial number on the machine nameplate. The location of the nameplate can be found in the ***Decals Diagram*** section of the Operation Manual.
- Product model numbers are indicated on the nameplates to distinguish products with different main technical parameters.
- Product trade names (product commercial codes) are used for marketing purposes and machine decals for the differentiation of products with different main technical parameters. Product trade names are categorized as metric and imperial trade names: metric trade names are applicable to regions/countries using the metric system or as specifically requested by customers; imperial trade names are applicable to regions/countries using the imperial system or as specifically requested by customers.

CONTENTS

1 SAFETY WARNING SYMBOLS AND SIGNS

The safety warning symbols used on the machine and in the manuals have the following meanings:

Safety warning symbol. This symbol is used to alert you to potential hazards. Observe all safety instructions following a symbol to avoid possible injuries.

⚠ DANGER

Indicates an imminently hazardous situation that, if not avoided, *will* result in death or serious injury.

⚠ WARNING

Indicates an imminently hazardous situation that, if not avoided, *could* result in death or serious injury or serious damage to the machine.

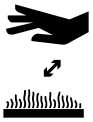
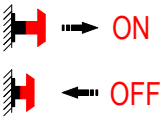
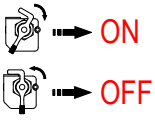
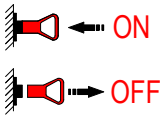
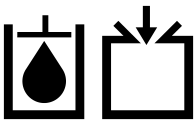
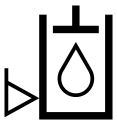
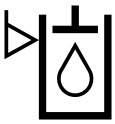
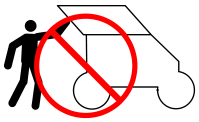
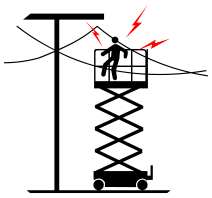
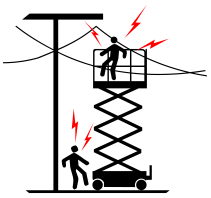
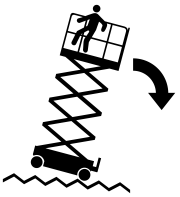
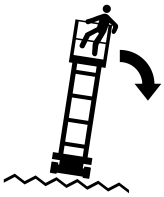
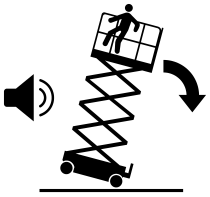
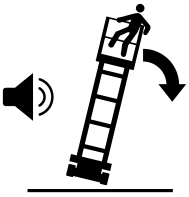
⚠ CAUTION

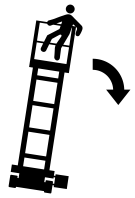
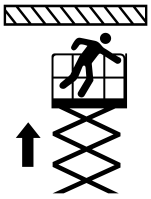
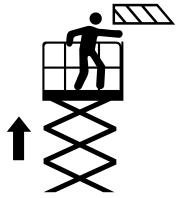
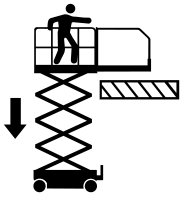
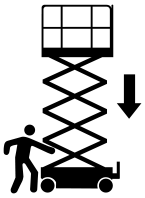
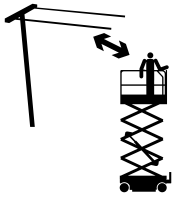
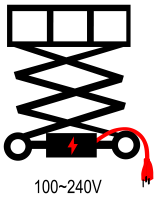
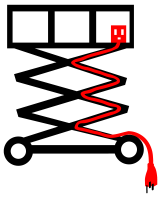
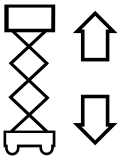
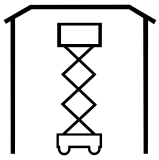
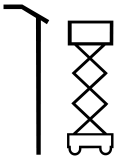
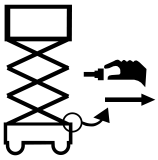
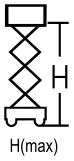
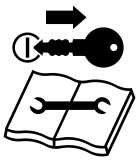
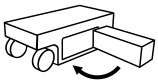
Indicates an imminently hazardous situation that, if not avoided, *could* result in minor or moderate injury or machine damage.

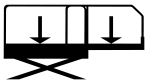
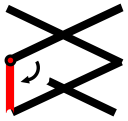
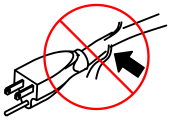
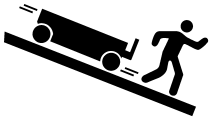
NOTICE

Indicates information directly or indirectly related to personal safety, machine damage, or property loss.

The safety signs used on the machine and in the manuals have the following meanings:

 Refer to the Maintenance Manual	 Anchor point only for 1 person	 Wind speed	 Dangers of chemical burns	 Chock the wheels
 Refer to the Operation Manual	 Add lubricant	 Crushing hazard – safety shoes required	 Danger of hot, high-pressure fluid spray	 Wind
 Press the directional-control valve	 Repeatedly operate the manual brake release valve	 Release the brake	 Alarm sounding	 Horn
 Burn hazard	 Keep a safe distance from high temperatures	 Pull out – ON Press – OFF	 Turn right – ON Turn left to mid position – OFF	 Insert – ON Pull out – OFF
 Hydraulic oil filler	 Hydraulic oil level low	 Hydraulic oil level high	 Temperature	 Replace with tires of the same specification
 Only qualified maintenance personnel may access the compartment	 Electrocution hazard on platform	 Electrocution hazard on the ground and platform	 Tipping hazard – avoid uneven ground	 Tipping hazard – avoid uneven ground
 Tipping hazard – never use machine in strong, gusty winds	 Tipping hazard – never use machine in strong, gusty winds	 Tipping hazard – never push or pull objects outside the platform	 Tipping hazard – never suspend objects from the platform	 Tipping hazard – never place ladders and scaffolding on the platform

 Tipping hazard – never leave the door open	 Collision hazard – keep head clear of overhead obstacles when raising platform	 Crushing hazard – keep hands clear from overhead obstacles when raising platform	 Collision hazard – keep the platform clear of obstacles below when lowering the platform	 Crushing hazard – keep hands away form scissor arms when lowering the platform
 Fall hazard – never climb on platform guardrails	 Fall hazard – never climb on scissor arms	 Keep a safe distance from power lines	 Battery charging plug	 Platform power plug
 Platform up and down movement	 Indoor use	 Outdoor use	 Emergency lowering handle position	 Maximum platform height
 Only qualified maintenance personnel may perform maintenance work	 Wear protective clothing and safety goggles	 Lateral force	 Electrocution hazard	 Battery explosion hazard
 No smoking or open flames/sparks	 No smoking or open flames/sparks	 Lifting point	 Lashing point	 Tire ground pressure
 Forklift pocket position	 Close the chassis compartment	 Tool or weight	 Fast/high speed	 Slow/low speed

 Platform load capacity	 Respective load capacity of main platform and platform extension	 Engage the safety strut	 Do not use damaged power cords	 Collision hazards - never release the brake on slope
 Noise level				

2 MAINTENANCE SAFETY PRECAUTIONS

2.1 GENERAL

This chapter covers safety precautions that must be taken when servicing the mobile elevating work platform. Before carrying out any repair work, maintenance personnel must carefully read and understand all warnings and precautions, and follow the instructions in this manual when performing maintenance on the mobile elevating work platform.

⚠ WARNING

It is forbidden to alter or modify the machine or any components without the written permission of Hunan Sinoboom Intelligent Equipment Co., Ltd.

2.2 INSTRUCTIONS BEFORE MAINTENANCE

Requirements for Maintenance Personnel

Maintenance personnel is responsible for maintaining the machine so that it can be operated safely and normally. Before performing inspection and maintenance work on this machine, maintenance personnel should read, understand and comply with all applicable regulations and requirements of employers, local authorities, and governments related to the operation of this machine. Maintenance personnel must also read and fully understand this manual.

Maintenance personnel shall:

- obtain appropriate qualification and authorization
- be experienced professional technicians or engineers
- be licensed electricians to install and connect high-voltage electrical equipment;
- be familiar with the machine and its associated risks
- receive appropriate training, including but not limited to training on the use of special equipment
- be familiar with the safety precautions and related operating procedures for maintenance work on this machine.

NOTICE

- *Only authorized personnel who have received appropriate training and obtained qualifications may repair this machine.*
- *Individuals who have consumed alcohol or medication, who experience physical or mental fatigue or are unwell may not carry out any work on the machine.*

Precautions before Maintenance

Before and during inspection and maintenance procedures personnel shall use caution and take measures to avoid dangerous situations. Those measures include, but are not limited to, the following:

1. Always park the machine on level, firm ground for maintenance, and ensure that the maintenance area is clean and unobstructed.
2. Choose appropriate safety equipment.
   - Maintenance personnel must identify risks in conjunction with inspection and maintenance work, and select appropriate safety equipment that is suitable for the type of work and the work place conditions, such as safety helmets, protective masks, protective gloves, goggles, protective clothing, safety belts and safety shoes.
   - Before carrying out inspection and maintenance work, check that the safety equipment is in good condition and is used correctly.
   - Safety equipment must be inspected regularly and needs to be replaced in case of damage.
3. Choose appropriate repair tools.
   - Before conducting any inspection and/or maintenance work, maintenance personnel shall prepare appropriate tools as required for the type of work, such as wrenches, screwdrivers, pliers, multimeter, pressure gauge, lubrication device, jack and lifting equipment.
   - Verify that the load capacity of jacks or lifting equipment is suitable for the planned task. Refer to the ***Weight of Major Components*** section to select a device with sufficient load capacity.

- Service tools must be kept clean and in good condition.

4. After the machine is parked, use blocks (such as triangular wedges) to secure the wheels to prevent the machine from moving accidentally.
5. Do not perform inspection and/or maintenance work after the machine has been started.
   - Before performing inspection and maintenance work, make sure the machine has turned off, remove the key and press the power-off switch to the “OFF” position. An “Out of Service” warning sign can be placed next to the ground controller and platform controller to prevent unrelated personnel from inadvertently starting the machine.

> **⚠ WARNING**
>
> **Inadvertently starting the machine during inspection or maintenance may cause machine damage and/or personal injury.**

   - If inspection or maintenance work must be carried out while the machine is running at least two people should work together. One person must be close to the turntable control panel or platform control panel so as to be able to turn off the machine any time if necessary while a second person carries out inspection or maintenance work, both persons shall maintain close contact with each other at all times.
6. Before maintaining electrical components, always switch the power-off switch to the “OFF” switch.
7. The machine should be cleaned before carrying out inspection and/or maintenance work. Avoid letting dust or debris enter internal machine components during the maintenance process, as this can affect the machine's performance.

The above listed requirements must be adhered to strictly during maintenance/inspection work. In addition, all other appropriate measures must be taken to ensure safety during maintenance work, taking account of the working environment.

2.3 MAINTENANCE SAFETY

Unsafe Maintenance Hazards

⚠ WARNING

- Before performing any adjustment or service operations, power off all control units and ensure that all moving parts are safely secured and cannot move unintentionally.
- Before performing any adjustment or service operations, ensure that the scissor arms are stowed, and do not carry out maintenance with the scissor arms raised. If maintenance must be carried out with the scissor arms raised, take appropriate protective measures to avoid dangerous conditions.
- When lifting or moving heavy components of the machine, use equipment with sufficient capacity for assistance, and it should be operated by professionals with the qualifications. The lifting or moving operation shall be done gently, and pay attention to objects on the ground to prevent tripping or falling. Lift the components smoothly and at a constant speed to avoid vibration or shock, and do not allow the components to overturning or remain suspended for a long time. After moving, do not place heavy components at an unstable position.
- Before vertical lifting, ensure that all components of the assembly are securely fastened with screws. It is strictly forbidden to unscrew the fasteners of the components in the assembly.
- When machine parts are lifted by other equipment, ensure that there are no persons under and/or around the equipment.
- When striking brass rods with a mallet, make sure to wear eye protection.
- If you need to replace parts, use only original parts specified by Sinoboom. Parts replaced during maintenance should be the same or equivalent to the original machine's components.

⚠ WARNING

- Do not wash the machine with water. The machine contains electronic components such as solenoid valves and sensors, which may fail or operate erratically after water ingress. If it is necessary to wash with water, turn off the main power switch before proceeding. Only turn the power back on after ensuring the machine is completely dry.
- Make sure the machine is turned off before using flushing equipment (such as a high-pressure water gun) to clean the machine. Do not direct water or steam ejected from the flushing equipment at electrical components, as this may cause short - circuits or electrical shocks.
- After maintenance is completed, thoroughly clean up any spilled hydraulic oil, and avoid allowing it to be spilled on the ground.
- After maintenance is completed, immediately wash off any hydraulic oil that may have come into contact with your skin.
- Waste hydraulic fluids, fuels, coolants and refrigerants must be recycled or disposed as per local regulations.

High Temperature and High Pressure Hazards

⚠ WARNING

- While the machine is in operation or after running for a period of time, components may generate high surface temperatures, which can cause burns upon contact. Do not touch any hot parts!
- It is forbidden to repair or tighten hydraulic hoses or seals while the machine is operating or when the oil system is under pressure.
- Before loosening or disassembling hydraulic parts (especially the counterbalance valve on the cylinder), the hydraulic pressure of all hydraulic lines should be released and the hydraulic oil should completely cool down.
- After the hydraulic pressure has been released, take protective measures first, and then disassemble the hydraulic components slowly to prevent the hydraulic oil from splashing and causing injuries.
- Never check for hydraulic leakages by hand. Use a piece of cardboard or stiff paper to locate leaks, and wear gloves to protect your hands from spraying hydraulic fluid.
- Do not operate the machine in case of hydraulic or air leaks. Oil or air leakage from the hydraulic system may penetrate and burn the skin.
- Never plug hydraulic leaks by hand. If there is a leak, the pressure of the hydraulic system should be released first, maintenance/repair should be carried out after the hydraulic oil has cooled down.
- If the machine is equipped with a radiator, do not attempt to unscrew the radiator cap or touch the radiator when the coolant temperature is high.
- If injury occurs due to high temperature and/or high pressure, seek immediate medical attention. If treatment is not carried out immediately, serious complications may result.

⚠ WARNING

Welding and Grinding Operation Hazards

⚠ WARNING

- When performing welding operations on the machine body or using this machine to transport personnel for external structural work (such as welding, grinding, or polishing), all applicable local safety procedures must be followed.
- If welding on the machine body, disconnect both the positive and negative battery terminals first, and ensure proper grounding of the structure to be welded.
- Before performing welding, grinding and polishing operations on external structures, turn off the machine's power, and ensure that all wires or cables are connected correctly.
- When conducting welding, grinding, or similar operations on external structures, never use the machine as a ground connection.
- Always make sure that all power tools are placed completely within the perimeter of the platform. Do not hang the cords of power tools on the guardrail of the platform or in any work area outside the platform, and do not hang the power tools directly by their cords.

Fire and Explosion Hazards

⚠ WARNING

- Do not operate the machine, charge the battery or refuel the machine in places where potentially flammable or explosive gases may be present.
- Refueling and charging should be carried out in a well-ventilated place without flames, sparks, and other hazards that may cause fire or explosion.
- For engine-powered machines, do not refuel the machine while the engine is running.
- Never spray ether or other starting agents into glow-plug-equipped engines (engine-powered machines).
- The electrolyte in the battery can produce explosive gases. Avoid any actions that may produce flames or sparks near the battery. Never touch the battery terminals or cable clamps with tools that can generate sparks.
- Never reverse the positive and negative terminals of the batteries.
- Only approved non-flammable cleaning solutions should be used on the machine.
- In case the machine catches fire, do not use the "water drenching method"; use a "dry powder extinguisher" to extinguish the fire.

Battery Hazard

⚠ WARNING

- Be sure to read and adhere to the battery manufacturer's recommendations on proper battery use and maintenance procedures.
- Individuals without adequate professional qualification should not repair and maintain the battery system, otherwise this may cause personal injury or damage to the battery system.
- Individuals without adequate professional qualification should not modify parameters, signal lights, etc. during the operation of the battery system, otherwise this may cause personal injury or damage to the battery system.
- When the BMS issues an alarm, do not use the machine. Ensure that the fault has been resolved before the machine can be used.
- Always wear goggles, protective gloves and protective clothing, and remove all rings, watches and other accessories before servicing the battery. Contact with live circuits may result in death or serious injury.
- Before replacing the battery, be sure to select an appropriate number of personnel and suitable lifting methods.
- It is forbidden to modify or dismantle the battery system without approval to avoid serious accidents.
- When maintaining electrical components, the battery should be disconnected.
- Do not short-circuit the battery terminals by connecting them with tools or other metal objects.
- The battery charger can only be connected to a grounded three-wire AC power outlet. Make sure the charger is working properly before charging. Do not connect the battery directly to a power outlet.
- If the battery becomes hot, deformed, leaks, emits an unusual smell, or produces smoke during

⚠ WARNING

use, stop using the battery immediately and report to the relevant maintenance personnel promptly.

- Batteries contain sulfuric acid and can produce explosive mixtures of hydrogen and oxygen. Keep any materials (including cigarette/smoking materials) that can cause sparks or flames away from batteries to prevent explosion.
- It is strictly prohibited to expose the battery to extremely high temperatures or to throw it into a fire.
- Never touch the battery terminals or cable clamps with tools that can generate sparks.
- Never charge the battery in direct sunlight. The battery should be charged in a well-ventilated place.

⚠ CAUTION

- Avoid spilling battery acid or allowing it to come into contact with unprotected skin. If battery acid spills, use water mixed with bicarbonate (baking soda) to neutralize the acid. In case of contact with battery acid, rinse the acid off immediately with plenty of water and seek medical attention promptly.
- Always keep the battery upright. If the battery is placed on its side or at an angle, liquid may spill from the battery.
- Discarded batteries can be hazardous, and must not be treated like regular waste. If you need to discard them, please contact a battery recycling company.

NOTICE

- Please use the charger provided by the manufacturer to charge the battery.
- The charging process must be completed in full. Frequent intermittent charging can damage the battery.
- The battery is only suitable for use with the equipment it was provided with at the time of manufacture. Do not use the battery for other purposes.
- Do not reverse the positive and negative terminals of the battery for use.
- Do not short-circuit the positive and negative terminals of the battery system.
- Do not place objects or tools on the battery to prevent short circuiting it.
- Do not strike, throw, step on, or hit the battery with sharp objects.
- Do not immerse the battery in water, acidic, alkaline or salty solutions, and protect the battery from rain.
- The battery should be fully charged immediately after each use of the machine. During charging, keep the power-off switch closed.

NOTICE

Battery over-discharge (continued use of battery with levels of less than 10 %) or battery under-voltage caused by long-term non-charging (battery with levels of less than 10 % not charged for more than three days), resulting in battery capacity attenuation and failure, are not covered by the warranty.

2.4 CONSIDERATIONS AFTER MAINTENANCE

1. Check the machine functions so that faults such as oil leakage or poor operation can be detected as early as possible.

2. After maintenance, all maintained parts must be checked for abnormal operation, oil leakage, loose bolts and other problems.
3. The safety protective device needs to be restored or reinstalled, and if necessary, be recalibrated.
4. After maintenance, clear up the tools and equipment for maintenance, remove the replaced parts and loose objects, and clean up the site.
5. Record inspections and maintenance as required.

NOTICE

All maintenance work must include a verification that the machine is operating properly.

⚠ WARNING

- **Waste liquids must not be dumped or disposed of randomly. Waste liquids shall be discharged into appropriate containers.**
- **Waste hydraulic fluids, fuels, coolants and refrigerants must be recycled or disposed as per local regulations.**

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3 TECHNICAL CHARACTERISTICS

3.1 MACHINE SPECIFICATIONS

Table 3-1 0407E Specifications

Item	Metric	Imperial
Product Category		
Battery type	Maintenance-free lead-acid battery	
Travel drive type	DC motor	
Dimensions		
Maximum platform height, outdoor	3.8 m	12 ft 5.6 in
Maximum working height, outdoor	5.8 m	19 ft
Maximum horizontal reach	0.6 m	2 ft
Overall length (ladder unfolded)	1.58 m	5 ft 2.2 in
Overall length (ladder folded)	1.47 m	4 ft 9.9 in
Overall width	0.78 m	2 ft 6.7 in
Overall height (guardrails folded)	1.55 m	5 ft 1 in
Overall height (guardrails unfolded)	1.91 m	6 ft 3.2 in
Wheelbase	1.14 m	3 ft 8.9 in
Wheel track (front/rear)	0.69 m/0.71 m	2 ft 3.2 in/2 ft 4 in
Ground clearance (with pothole protection retracted)	0.061 m	2.4 in
Ground clearance (with pothole protection extended)	0.02 m	0.75 in
Platform dimensions (L×W×H)	1.41 m×0.76 m×1.1 m	4 ft 7.5 in×2 ft 5.9 in ×3 ft 7.3 in
Performance parameters		
Rated platform capacity	230 kg	507 lb
Rated capacity – extending platform	120 kg	265 lb
Maximum number of occupants (indoor/outdoor)	2 persons/1 person	
Travel speed (stowed)	0 – 4.0 km/h	0 – 2.49 mph
Travel speed (elevated)	0 - 0.5 km/h	0 - 0.31 mph
Platform lifting time (rated load)	20 - 23 s	
Platform lowering time (rated load)	25 - 30 s	
Gradeability (2WD)	25 %/14 °	
Maximum allowable inclination (front-rear/left-right)	3°/1.5°	

Table 3-1 0407E Specifications (continued)

Item	Metric	Imperial
Turning radius (inside/outside)	0.1 m/1.48 m	3.9 in/4 ft 10.3 in
Tire (spec/type)	φ280x76 mm/solid	φ11 in×3 in
Maximum operating noise level	72 dB	
IP rating	IP54	
Maximum total vibration on the platform	2.5 m/s²	
Maximum whole body vibration value (WBV)	0.5 m/s²	
Power		
Drive × steer	2 WD × 2 WS	
Power unit motor (voltage/power)	24V DC, 2.2 kW	
Hydraulic tank capacity	4 L	0.9 gal (UK)/1.05 gal (US)
Hydraulic system pressure	16.5 MPa	2393 psi
Battery specifications (voltage, capacity, discharge time) – lead-acid battery	24 V, 120 Ah, 20 hr	
System voltage	24 VDC	
Control voltage	24 VDC	
Charger (input voltage/output current)	100 – 240 V AC/15 A	
Drive motor (voltage/power)	24 V DC/0.4 kW	
Weight		
Gross weight (indoor/outdoor)	920 kg	2028 lb
Ground Bearing Data		
Maximum tire load	500 kg	1102 lb
Ground pressure	1000 kPa	145 Psi
Environment		
Maximum allowable lateral force (indoor/outdoor)	400 N/200 N	90 lbf/45 lbf
Maximum allowable wind speed (indoor/outdoor)	0/12.5 m/s	0/28 mph
Maximum allowable altitude	1000 m	3280.8 ft
Allowable ambient temperature range (lead-acid battery)	-10℃~40℃	14℉~104℉
Allowable ambient temperature range (lithium battery)	-20℃~40℃	-4℉~104℉
Maximum allowable ambient relative humidity	90 %	

Table 3-1 0407E Specifications (continued)

Item	Metric	Imperial
Storage environment	Store at -20℃ to 50℃ (-4℉ to 122℉) in a well-ventilated environment with 90 % relative humidity (max.) (20℃ [68℉]), protected from rain, sun, corrosive gas, flammable or explosive materials.	
Conforming standards	CE	

Table 3-2 0407EN Specifications

Item	Metric	Imperial
Product Category		
Battery type	Maintenance-free lead-acid battery	
Travel drive type	DC motor	
Dimensions		
Maximum platform height, indoor	4.3 m	14 ft 1.3 in
Maximum platform height, outdoor	3.8 m	12 ft 5.6 in
Maximum working height, indoor	6.3 m	20 ft 8 in
Maximum working height, outdoor	5.8 m	19 ft
Maximum horizontal reach	0.6 m	2 ft
Overall length (ladder unfolded)	1.58 m	5 ft 2.2 in
Overall length (ladder folded)	1.47 m	4 ft 9.9 in
Overall width	0.78 m	2 ft 6.7 in
Overall height (guardrails folded)	1.55 m	5 ft 1 in
Overall height (guardrails unfolded)	1.91 m	6 ft 3.2 in
Wheelbase	1.14 m	3 ft 8.9 in
Wheel track (front/rear)	0.69 m/0.71 m	2 ft 3.2 in/2 ft 4 in
Ground clearance (with pothole protection retracted)	0.061 m	2.4 in
Ground clearance (with pothole protection extended)	0.02 m	0.75 in
Platform dimensions (L×W×H)	1.41 m×0.76 m×1.1 m	4 ft 7.5 in×2 ft 5.9 in ×3 ft 7.3 in
Performance parameters		
Rated platform capacity	230 kg	507 lb
Rated capacity – extending platform	120 kg	265 lb
Maximum number of occupants (indoor/outdoor)	2 persons/1 person	
Travel speed (stowed)	0 – 4.0 km/h	0 – 2.49 mph
Travel speed (elevated)	0 - 0.5 km/h	0 - 0.31 mph
Platform lifting time (rated load)	20 - 23 s	
Platform lowering time (rated load)	25 - 30 s	

Table 3-2 0407EN Specifications (continued)

Item	Metric	Imperial
Gradeability (2WD)	25 %/14 °	
Maximum allowable inclination (front-rear/left-right)	3°/1.5°	
Turning radius (inside/outside)	0.1 m/1.48 m	3.9 in/4 ft 10.3 in
Tire (spec/type)	φ280x76 mm/solid	φ11 in×3 in
Maximum operating noise level	72 dB	
IP rating	IP54	
Maximum total vibration on the platform	2.5 m/s²	
Maximum whole body vibration value (WBV)	0.5 m/s²	
Power		
Drive × steer	2 WD × 2 WS	
Power unit motor (voltage/power)	24V DC, 2.2 kW	
Hydraulic tank capacity	4 L	0.9 gal (UK)/1.05 gal (US)
Hydraulic system pressure	16.5 MPa	2393 psi
Battery specifications (voltage, capacity, discharge time) – lead-acid battery	24 V, 120 Ah, 20 hr	
System voltage	24 VDC	
Control voltage	24 VDC	
Charger (input voltage/output current)	100 – 240 V AC/15 A	
Drive motor (voltage/power)	24 V DC/0.4 kW	
Weight		
Gross weight (indoor/outdoor)	920 kg	2028 lb
Ground Bearing Data		
Maximum tire load	500 kg	1102 lb
Ground pressure	1000 kPa	145 Psi
Environment		
Maximum allowable lateral force (indoor/outdoor)	400 N/200 N	90 lbf/45 lbf
Maximum allowable wind speed (indoor/outdoor)	0/12.5 m/s	0/28 mph
Maximum allowable altitude	1000 m	3280.8 ft
Allowable ambient temperature range (lead-acid battery)	-10℃~40℃	14℉~104℉

Table 3-2 0407EN Specifications (continued)

Item	Metric	Imperial
Allowable ambient temperature range (lithium battery)	-20℃~40℃	-4℉~104℉
Maximum allowable ambient relative humidity	90 %	
Storage environment	Store at -20℃ to 50℃ (-4℉ to 122℉) in a well-ventilated environment with 90 % relative humidity (max.) (20℃ [68℉]), protected from rain, sun, corrosive gas, flammable or explosive materials.	

Table 3-3 0607EN Specifications

Item	Metric	Imperial
Product Category		
Battery type	Maintenance-free lead-acid battery	
Travel drive type	DC motor	
Dimensions		
Maximum platform height, indoor	5.55 m	18 ft 2.5 in
Maximum platform height, outdoor	4.6 m	15 ft 1.1 in
Maximum working height, indoor	7.55 m	24 ft 9.2 in
Maximum working height, outdoor	6.6 m	21 ft 7.8 in
Maximum horizontal reach	0.6 m	2 ft
Overall length (ladder unfolded)	1.58 m	5 ft 2.2 in
Overall length (ladder folded)	1.47 m	4 ft 9.9 in
Overall width	0.78 m	2 ft 6.7 in
Overall height (guardrails folded)	1.63 m	5 ft 4.2 in
Overall height (guardrails unfolded)	1.99 m	6 ft 6.3 in
Wheelbase	1.14 m	3 ft 8.9 in
Wheel track (front/rear)	0.69 m/0.71 m	2 ft 3.2 in/2 ft 4 in
Ground clearance (with pothole protection retracted)	0.061 m	2.4 in
Ground clearance (with pothole protection extended)	0.02 m	0.75 in
Platform dimensions (L×W×H)	1.41 m×0.76 m×1.1 m	4 ft 7.5 in×2 ft 5.9 in ×3 ft 7.3 in
Performance		
Rated platform capacity	230 kg	507 lb
Rated capacity – extending platform	120 kg	265 lb
Maximum number of occupants (indoor/outdoor)	2 persons/1 person	
Travel speed (stowed)	0 – 4.0 km/h	0 – 2.49 mph
Travel speed (elevated)	0 - 0.5 km/h	0 - 0.31 mph

Table 3-3 0607EN Specifications (continued)

Item	Metric	Imperial
Platform lifting time (rated load)	24 - 28 sec	
Platform lowering time (rated load)	25 - 30 s	
Gradeability (2WD)	25 %/14 °	
Maximum allowable inclination (front-rear/left-right)	3°/1.5°	
Turning radius (inside/outside)	0.1 m/1.48 m	3.9 in/4 ft 10.3 in
Tire (spec/type)	φ280x76 mm/solid	φ11 in×3 in
Maximum operating noise level	72 dB	
IP rating	IP54	
Maximum total vibration on the platform	2.5 m/s²	
Maximum whole body vibration value (WBV)	0.5 m/s²	
Power		
Drive × steer	2 WD × 2 WS	
Power unit motor (voltage/power)	24V DC, 2.2 kW	
Hydraulic tank capacity	4 L	0.9 gal (UK)/1.05 gal (US)
Hydraulic system pressure	16.5 MPa	2393 psi
Battery specifications (voltage, capacity, discharge time) – lead-acid battery	24 V, 120 Ah, 20 hr	
System voltage	24 VDC	
Control voltage	24 VDC	
Charger (input voltage/output current)	100 – 240 V AC/15 A	
Drive motor (voltage/power)	24 V DC/0.4 kW	
Weight		
Gross weight (indoor/outdoor)	1100 kg	2425 lb
Ground Bearing Data		
Maximum tire load	555 kg	1224 lb
Ground pressure	1000 kPa	145 Psi
Environment		
Maximum allowable lateral force (indoor/outdoor)	400 N/200 N	90 lbf/45 lbf
Maximum allowable wind speed (indoor/outdoor)	0/12.5 m/s	0/28 mph
Maximum allowable altitude	1000 m	3280.8 ft

Table 3-3 0607EN Specifications (continued)

Item	Metric	Imperial
Allowable ambient temperature range (lead-acid battery)	-10℃~40℃	14℉~104℉
Allowable ambient temperature range (lithium battery)	-20℃~40℃	-4℉~104℉
Maximum allowable ambient relative humidity	90 %	
Storage environment	Store at -20℃ to 50℃ (-4℉ to 122℉) in a well-ventilated environment with 90 % relative humidity (max.) (20℃ [68℉]), protected from rain, sun, corrosive gas, flammable or explosive materials.	

Note:

1. The platform height plus the operator height (assumed to be 2 m/6 ft 7 in) equals the working height.
2. The ground bearing information is approximate, without considering different options. It is applicable only when taking an adequate safety factor into account.
3. Different regions should use hydraulic oil, engine oil, coolant, fuel, lubricating oil, etc., that are suitable for the environmental temperature requirements.
4. In cold weather, auxiliary devices are needed to start the machine.
5. Rated platform load capacity refers to the maximum allowable load on the platform, including the weight of persons, materials, tools, accessories and other objects. The mass of one person shall be taken as 80 kg (176 lb).
6. It is recommended not to use a lead-acid battery with an ambient temperature below 0 °C (32 °F); otherwise the battery capacity will decay rapidly, and battery life will be affected.
7. The hydraulic tank capacity is the maximum volume of the tank.

3.2 FUNCTION SPEED

Table 3-4

Item	Parameter
Raise the platform (0407E&0407EN)	20 – 23 s
Raise the platform (0607EN)	24 – 28 s
Lower the platform (0407E&0407EN)	25 – 30 s
Lower the platform (0607EN)	25 – 30 s
Travel – high-speed mode (3.6 – 4 km/h/2.2 – 2.5 mph)	27 – 30 s
Travel – turtle mode (1.8 – 2 km/h/ 1.1 – 1.2 mph)	54 – 60 s
Travel – low-speed mode (0.45 – 0.55 km/h/0.28 – 0.34 mph)	65 – 80 s

Table 3-4 (continued)

Item	Parameter
Braking distance	S ≤ 0.55 m (1.31 ft)

Note:

1. The function speed depends on the start and end point of the movement rather than the controls/ switches.
2. The travel speed test results will vary with tires of different specifications.
3. All speed tests should be conducted from the platform controller. Test results will differ if tested from the ground controller.
4. All tests should be conducted with the hydraulic oil temperature higher than 20 – 30 ℃ (68 – 86 ℉). If the hydraulic oil temperature is too low, the test results will be affected.

Test requirements:

Raise the platform: Place a load that matches the machine's rated capacity on the platform, raise the platform (with the scissor arms from fully retracted position to fully raised position). Perform this maneuver for two times.

Lower the platform: Place a load that matches the machine's rated capacity on the platform, lower the platform (with the scissor arms from fully raised position to fully retracted position). Perform this maneuver for two times.

Travel – high-speed mode : The test shall be done on a level surface. With the machine in stowed position, switch to high-speed mode, and push the travel joystick to the maximum travel distance to drive the machine forward and reverse for 30 m (98.4 ft) respectively for two times.

Travel – turtle mode : The test shall be done on a level surface. With the machine in stowed position, switch to turtle mode, and push the travel joystick to the maximum travel distance to drive the machine forward and reverse for 30 m (98.4 ft) respectively for two times.

Travel – low-speed mode : The test shall be done on a level surface. With the machine in operating position, push the travel joystick to the maximum travel distance to drive the machine forward and reverse for 10 m (32.8 ft) respectively for two times.

Braking distance : As described in the "travel – high-speed mode" test requirements, once the machine reaches the maximum travel speed, immediately release the joystick (starting timing) until the machine stops. Perform this maneuver for two times.

Note: For models with special configuration, the machine cannot travel while elevated to operating position.

3.3 WEIGHT OF MAJOR COMPONENTS

⚠ WARNING

- **Never attempt to move heavy components without the assistance of mechanical equipment.**
- **Never place heavy components at an unstable position.**

Table 3-5

Component	Metric (kg)	Imperial (lb)
Chassis assembly	390	860
Scissor assembly – 0407E&0407EN	230	507
Scissor assembly – 0607EN	280	617
Platform assembly	190	419
Solid tire	8	17.6
Wheel carrier	14	30.9
Travel motor	16	35.3
Left chassis compartment	30	66
Right chassis compartment	35	77
Power unit	12	26.5
Lift cylinder	32	70.5
Steering cylinder	9	20
Lead-acid battery (cell)	36	79
Lithium battery (cell)	26	57
Note: The weight of certain components will vary with the machine's option configuration.		

3.4 PRESSURE SETTINGS

Table 3-6

Movement	Maximum pressure
Lift and Lower the Platform	19 MPa (2756 psi)
Steering	11 MPa (1595 psi)

3.5 OIL SPECIFICATIONS

NOTICE

- *Please choose suitable oil according to the ambient temperature and local regulations; the use of unsuitable oil will damage the machine components.*
- *Oils of different grades or viscosities should not be mixed. When refilling oil, the oil being added must be of the same grade and viscosity as that of the oil currently in use in the machine.*
- *To fill with oil with a different grade or viscosity, the remaining oil in the circuit must be drained out completely.*
- *The oil recommendations in this manual are for general operating conditions. For special environments or special operating requirements please contact Sinoboom for special oil.*

⚠ WARNING

- **Before refilling oil, wait until the temperature of the machine drops to room temperature, otherwise it may cause splashes, burns or other personal injury.**
- **The use of inferior oils is strictly prohibited. Using inferior oil may damage the machine, and faults caused by this are not covered by Sinoboom's warranty.**

Hydraulic Oil

Factory-filled hydraulic oil is usually based on the ambient temperature of the delivery place or as specified by customers. If the factory-filled hydraulic oil is not applicable for the machine operating environments, change to other hydraulic oil suitable for actual operating environment. The following table shows the recommended hydraulic oil grade for different ambient temperature ranges:

Table 3-7

Ambient temperature range	Hydraulic oil grade
> 40℃ (104℉)	HM-68
0℃ – 40℃ (32℉ – 104℉)	HM-46
-15℃ – 25℃ (5℉ – 77℉)	HV-32
-22℃ – 25℃ (-7.6℉ – 77℉)	L-HS32
< -22℃ (-7.6 ℉)	AE-VX

3.6 TORQUE SPECIFICATIONS

Special Torque Requirements

Please refer to the table below for special torque requirements:

Table 3-8 Special torque requirements

No.	Description	Torque value
1	Tire installation	400 Nm (295 ft-lb)
2	Drive motor installation (at the wheel carrier)	59 Nm (44 ft-lb)
3	Brake installation (at the chassis weldment)	59 Nm (44 ft-lb)
5	Cable fastening nut M8	9 – 11 Nm (6.6 – 8.1 ft-lb)
6	Cable fastening nut M10	18 – 23 Nm (13.2 – 17 ft-lb)

Fastener Torque Specifications

Torque metric bolts to the values specified in the table below unless special torque requirements are stated in this manual or other instructions.

Table 3-9 Fastener torque specifications – metric

Nominal diameter (mm)	Pitch (mm)	Class 8.8	Class 10.9	Class 12.9
5	0.8	7 Nm (5 ft-lb)	9 Nm (7 ft-lb)	10 Nm (7 ft-lb)
6	1	12 Nm (9 ft-lb)	15 Nm (11 ft-lb)	18 Nm (13 ft-lb)
8	1.25	30 Nm (22 ft-lb)	35 Nm (26 ft-lb)	42 Nm (31 ft-lb)
	1	30 Nm (22 ft-lb)	37 Nm (27 ft-lb)	45 Nm (33 ft-lb)
10	1.5	55 Nm (41 ft-lb)	75 Nm (55 ft-lb)	85 Nm (63 ft-lb)
	1.25	56 Nm (41 ft-lb)	77 Nm (57 ft-lb)	87 Nm (64 ft-lb)
	1	60 Nm (44 ft-lb)	80 Nm (59 ft-lb)	92 Nm (68 ft-lb)
12	1.75	95 Nm (70 ft-lb)	125 Nm (92 ft-lb)	150 Nm (111 ft-lb)
	1.5	100 Nm (74 ft-lb)	130 Nm (96 ft-lb)	155 Nm (114 ft-lb)
	1.25	105 Nm (77 ft-lb)	135 Nm (100 ft-lb)	160 Nm (118 ft-lb)
14	2	150 Nm (110 ft-lb)	200 Nm (148 ft-lb)	230 Nm (170 ft-lb)
	1.5	165 Nm (122 ft-lb)	210 Nm (155 ft-lb)	250 Nm (184 ft-lb)
16	2	230 Nm (170 ft-lb)	300 Nm (221 ft-lb)	360 Nm (266 ft-lb)
	1.5	250 Nm (184 ft-lb)	320 Nm (236 ft-lb)	380 Nm (280 ft-lb)
18	2.5	320 Nm (236 ft-lb)	420 Nm (310 ft-lb)	500 Nm (369 ft-lb)
	1.5	360 Nm (266 ft-lb)	470 Nm (345 ft-lb)	550 Nm (406 ft-lb)
20	2.5	450 Nm (332 ft-lb)	600 Nm (443 ft-lb)	700 Nm (516 ft-lb)
	1.5	500 Nm (369 ft-lb)	650 Nm (479 ft-lb)	770 Nm (568 ft-lb)
22	2.5	600 Nm (443 ft-lb)	800 Nm (590 ft-lb)	980 Nm (723 ft-lb)
	2	650 Nm (479 ft-lb)	850 Nm (627 ft-lb)	1050 Nm (774 ft-lb)
24	3	750 Nm (553 ft-lb)	1050 Nm (774 ft-lb)	1250 Nm (923 ft-lb)
	2	800 Nm (590 ft-lb)	1100 Nm (811 ft-lb)	1300 Nm (959 ft-lb)
27	3	1150 Nm (848 ft-lb)	1500 Nm (1106 ft-lb)	1800 Nm (1327 ft-lb)
30	3.5	1500 Nm (1106 ft-lb)	2000 Nm (1475 ft-lb)	2400 Nm (1770 ft-lb)

Unless special torque requirements are specified in this manual or other instructions, torque Unified Thread Standard bolts (label: UNC) to the values specified in the table below.

Table 3-10 Fastener torque specifications – Unified Thread Standard (UNC)

Nominal diameter (in)	Opposite nut size (s)	Class 5	Class 8
1/4-20	7/16"	10 Nm (7 ft-lb)	14 Nm (10 ft-lb)
5/16-18	1/2"	21 Nm (15 ft-lb)	29 Nm (21 ft-lb)
3/8-16	9/16"	37 Nm (27 ft-lb)	51 Nm (38 ft-lb)

Table 3-10 Fastener torque specifications – Unified Thread Standard (UNC) (continued)

Nominal diameter (in)	Opposite nut size (s)	Class 5	Class 8
7/16-14	5/8"	60 Nm (44 ft-lb)	82 Nm (60 ft-lb)
1/2-13	3/4"	90 Nm (66 ft-lb)	130 Nm (96 ft-lb)
9/16-12	13/16"	130 Nm (96 ft-lb)	180 Nm (133 ft-lb)
5/8-11	15/16"	178 Nm (131 ft-lb)	250 Nm (184 ft-lb)
3/4-10	1-1/8"	315 Nm (232 ft-lb)	445 Nm (328 ft-lb)
7/8-9	-	509 Nm (375 ft-lb)	715 Nm (527 ft-lb)

Unless special torque requirements are specified in this manual or other instructions, torque Unified Thread Standard bolts (label: UNF) to the values listed in the table below.

Table 3-11 Fastener torque specification – Unified Thread Standard bolts (UNF)

Nominal diameter (in)	Opposite nut size (s)	Class 5	Class 8
1/4-28	7/16"	11.5 Nm (8 ft-lb)	16 Nm (11 ft-lb)
5/16-24	1/2"	23 Nm (17 ft-lb)	32 Nm (24 ft-lb)
3/8-24	9/16"	41 Nm (30 ft-lb)	58 Nm (43 ft-lb)
7/16-20	5/8"	65 Nm (48 ft-lb)	92 Nm (68 ft-lb)
1/2-20	3/4"	100 Nm (74 ft-lb)	145 Nm (107 ft-lb)
9/16-18	13/16"	145 Nm (107 ft-lb)	200 Nm (148 ft-lb)
5/8-18	15/16"	200 Nm (148 ft-lb)	280 Nm (207 ft-lb)
3/4-16	1-1/8"	350 Nm (258 ft-lb)	495 Nm (365 ft-lb)
7/8-14	-	560 Nm (413 ft-lb)	780 Nm (575 ft-lb)

Hydraulic Hose Torque

The hydraulic hoses must be installed with the following torques.

Table 3-12 Hydraulic Hose Torque

Metric thread	L (light-duty)	S (heavy-duty)
M12 × 1.5	19 ± 1 Nm (14 ± 1 ft-lb)	
M14 × 1.5	26 ± 2 Nm (19 ± 2 ft-lb)	
M16 × 1.5	40 ± 3 Nm (30 ± 2 ft-lb)	
M18 × 1.5	50 ± 4 Nm (37 ± 3 ft-lb)	
M20 × 1.5	-	60 ± 4 Nm (44 ± 3 ft-lb)
M22 × 1.5	70 ± 5 Nm (52 ± 4 ft-lb)	-
M24 × 1.5	-	85 ± 6 Nm (63 ± 4 ft-lb)
M26 × 1.5	90 ± 6 Nm (66 ± 4 ft-lb)	-

Table 3-12 Hydraulic Hose Torque (continued)

Metric thread	L (light-duty)	S (heavy-duty)
M30 × 2	120 ± 8 Nm (89 ± 6 ft-lb)	140 ± 10 Nm (103 ± 7 ft-lb)
M36 × 2	150 ± 12 Nm (111 ± 9 ft-lb)	180 ± 12 Nm (133 ± 9 ft-lb)
M42 × 2	-	260 ± 16 Nm (192 ± 12 ft-lb)
M45 × 2	240 ± 15 Nm (177 ± 11 ft-lb)	-
M52 × 2	250 ± 16 Nm (184 ± 12 ft-lb)	280 ± 18 Nm (207 ± 13 ft-lb)

Hydraulic Fitting Torque

The hydraulic fittings with metric thread must be installed with the following torques.

Table 3-13 Hydraulic Fitting Torque – Metric

Thread size	Installed with aluminum	Installed with steel	
	ED, O-ring + Circlip	ED, O-ring + Circlip	O-ring seal
L (light-duty)			
M10×1	18 ± 1 Nm (13 ± 1 ft-lb)	20 ± 2 Nm (15 ± 2 ft-lb)	18 ± 1 Nm (13 ± 1 ft-lb)
M12 × 1.5	30 ± 2 Nm (22 ± 2 ft-lb)	35 ± 2 Nm (26 ± 2 ft-lb)	30 ± 2 Nm (22 ± 2 ft-lb)
M14 × 1.5	42 ± 3 Nm (31 ± 2 ft-lb)	48 ± 4 Nm (35 ± 3 ft-lb)	35 ± 2 Nm (26 ± 2 ft-lb)
M16 × 1.5	55 ± 4 Nm (41 ± 3 ft-lb)	60 ± 4 Nm (44 ± 3 ft-lb)	40 ± 3 Nm (30 ± 3 ft-lb)
M18 × 1.5	75 ± 5 Nm (55 ± 4 ft-lb)	75 ± 5 Nm (55 ± 4 ft-lb)	45 ± 3 Nm (33 ± 4 ft-lb)
M22 × 1.5	90 ± 6 Nm (66 ± 4 ft-lb)	130 ± 8 Nm (96 ± 6 ft-lb)	60 ± 4 Nm (44 ± 3 ft-lb)
M27 × 2	120 ± 8 Nm (89 ± 6 ft-lb)	185 ± 12 Nm (136 ± 9 ft-lb)	100 ± 7 Nm (74 ± 5 ft-lb)
M30 × 2	140 ± 8 Nm (103 ± 6 ft-lb)	245 ± 15 Nm (181 ± 11 ft-lb)	135 ± 8 Nm (100 ± 6 ft-lb)
M33 × 2	180 ± 10 Nm (133 ± 7 ft-lb)	320 ± 20 Nm (236 ± 15 ft-lb)	160 ± 10 Nm (118 ± 7 ft-lb)
M42 × 2	240 ± 15 Nm (177 ± 11 ft-lb)	450 ± 25 Nm (332 ± 18 ft-lb)	210 ± 13 Nm (155 ± 10 ft-lb)
M48 × 2	280 ± 20 Nm (207 ± 15 ft-lb)	540 ± 30 Nm (398 ± 22 ft-lb)	260 ± 15 Nm (192 ± 11 ft-lb)
S (heavy-duty)			
M12 × 1.5	33 ± 2 Nm (24 ± 2 ft-lb)	43 ± 3 Nm (32 ± 2 ft-lb)	35 ± 2 Nm (26±2 ft-lb)
M14 × 1.5	42 ± 3 Nm (31 ± 2 ft-lb)	50 ± 4 Nm (37 ± 3 ft-lb)	45 ± 3 Nm (33 ± 2 ft-lb)
M16 × 1.5	55 ± 4 Nm (41 ± 3 ft-lb)	75 ± 5 Nm (55±4 ft-lb)	55 ± 4 Nm (41 ± 3 ft-lb)
M18 × 1.5	75 ± 5 Nm (55±4 ft-lb)	95 ± 6 Nm (70 ± 4 ft-lb)	70 ± 5 Nm (52 ± 4 ft-lb)
M22 × 1.5	90 ± 6 Nm (66 ± 4 ft-lb)	140 ± 8 Nm (103 ± 6 ft-lb)	100 ± 10 Nm (74 ± 7 ft-lb)
M27 × 2	120 ± 8 Nm (89 ± 6 ft-lb)	185 ± 12 Nm (136 ± 9 ft-lb)	160 ± 10 Nm (118 ± 7 ft-lb)
M30 × 2	140 ± 8 Nm (103 ± 6 ft-lb)	245 ± 15 Nm (181 ± 11 ft-lb)	210 ± 13 Nm (155 ± 10 ft-lb)
M33 × 2	180 ± 10 Nm (133 ± 7 ft-lb)	320 ± 20 Nm (236 ± 15 ft-lb)	260 ± 15 Nm (192 ± 11 ft-lb)
M42 × 2	240 ± 15 Nm (177 ± 11 ft-lb)	450 ± 25 Nm (332 ± 18 ft-lb)	330 ± 20 Nm (243 ± 15 ft-lb)
M48 × 2	280 ± 20 Nm (207 ± 15 ft-lb)	540 ± 30 Nm (398 ± 22 ft-lb)	420 ± 25 Nm (310 ± 18 ft-lb)

The hydraulic pipe fittings with British Standard Pipe (BSP) thread must be installed with the following torques.

Table 3-14 Hydraulic Fitting Torque - British Standard Pipe (BSP)

Thread size	Installed with aluminum	Installed with steel	
	ED, O-ring + Circlip	ED, O-ring + Circlip	O-ring seal
L (light-duty)			
G1/8A	20 ± 1 Nm (15 ± 1 ft-lb)	20 ± 1 Nm (15 ± 1 ft-lb)	-
G1/4A	35±2 Nm (26±2 ft-lb)	40 ± 2 Nm (30 ± 2 ft-lb)	-
G3/8A	50 ± 3 Nm (37 ± 2 ft-lb)	75 ± 5 Nm (55 ± 2 ft-lb)	-
G1/2A	75 ± 5 Nm (55 ± 2 ft-lb)	95 ± 6 Nm (70 ± 4 ft-lb)	-
G3/4A	120 ± 8 Nm (89 ± 6 ft-lb)	185 ± 12 Nm (136 ± 9 ft-lb)	-
G1A	180 ± 10 Nm (133 ± 7 ft-lb)	320±20 Nm (236±15 ft-lb)	-
G1-1/4A	240 ± 15 Nm (177 ± 11 ft-lb)	450 ± 25 Nm (332 ± 18 ft-lb)	-
G1-1/2A	280 ± 20 Nm (207 ± 15 ft-lb)	540±30 Nm (398±22 ft-lb)	-
S (heavy-duty)			
G1/4A	40 ± 3 Nm (30 ± 2 ft-lb)	43 ± 3 Nm (32 ± 2 ft-lb)	-
G3/8A	55 ± 3 Nm (41 ± 2 ft-lb)	85 ± 5 Nm (63 ± 4 ft-lb)	-
G1/2A	80 ± 5 Nm (59 ± 4 ft-lb)	120±8 Nm (89±6 ft-lb)	-
G3/4A	120 ± 8 Nm (89 ± 6 ft-lb)	185 ± 12 Nm (136 ± 9 ft-lb)	-
G1A	180 ± 10 Nm (133 ± 7 ft-lb)	320±20 Nm (236±15 ft-lb)	-
G1-1/4A	240 ± 15 Nm (177 ± 11 ft-lb)	450 ± 25 Nm (332 ± 18 ft-lb)	-
G1-1/2A	280 ± 20 Nm (207 ± 15 ft-lb)	540±30 Nm (398±22 ft-lb)	-

The hydraulic pipe fittings with Unified Thread Standard (UNC/UNF) thread must be installed with the following torques.

Table 3-15 Hydraulic Fitting Torque - Unified Thread Standard (UNC/UNF)

Thread size	Installed with aluminum	Installed with steel
	O-ring seal	O-ring seal
L (light-duty)		
7/16-20	21 ± 2 Nm (15 ± 2 ft-lb)	21 ± 2 Nm (15 ± 2 ft-lb)
9/16-18	34 ± 2 Nm (25 ± 2 ft-lb)	35 ± 2 Nm (26 ± 2 ft-lb)
11/16-12	40 ± 3 Nm (30 ± 2 ft-lb)	50 ± 4 Nm (37 ± 3 ft-lb)
3/4-16	50 ± 3 Nm (37 ± 2 ft-lb)	65 ± 4 Nm (48 ± 3 ft-lb)
7/8-14	75 ± 5 Nm (55 ± 4 ft-lb)	110 ± 8 Nm (81 ± 6 ft-lb)
1-1/16-12	110 ± 8 Nm (81 ± 6 ft-lb)	140 ± 10 Nm (103 ± 7 ft-lb)
1-5/16-12	160 ± 10 Nm (118 ± 7 ft-lb)	210 ± 15 Nm (155 ± 11 ft-lb)
S (heavy-duty)		
7/16-20	21 ± 2 Nm (15 ± 2 ft-lb)	23 ± 2 Nm (17 ± 2 ft-lb)
9/16-18	34 ± 2 Nm (25 ± 2 ft-lb)	40 ± 3 Nm (30 ± 2 ft-lb)

Table 3-15 Hydraulic Fitting Torque - Unified Thread Standard (UNC/UNF) (continued)

Thread size	Installed with aluminum	Installed with steel
	O-ring seal	O-ring seal
11/16-12	40 ± 3 Nm (30 ± 2 ft-lb)	65 ± 4 Nm (48 ± 3 ft-lb)
3/4-16	50 ± 3 Nm (37 ± 2 ft-lb)	80 ± 6 Nm (59 ± 4 ft-lb)
7/8-14	75 ± 5 Nm (55 ± 4 ft-lb)	125 ± 10 Nm (92 ± 7 ft-lb)
1-1/16-12	110 ± 8 Nm (81 ± 6 ft-lb)	185 ± 15 Nm (136 ± 11 ft-lb)
1-5/16-12	160 ± 10 Nm (118 ± 7 ft-lb)	280 ± 20 Nm (207 ± 15 ft-lb)

4 MAINTENANCE INSTRUCTIONS

4.1 INSPECTION AND PREVENTIVE MAINTENANCE SCHEDULE

This section provides safety and other vital information for machine operators. To extend the service life of the machine and ensure safe operation, all necessary inspections and maintenance work must be completed before the machine is put into service.

It is crucial to develop and adhere to a comprehensive inspection and preventive maintenance program. This manual outlines the regular inspections and maintenance procedures recommended by Hunan Sinoboom Intelligent Equipment Co., Ltd. Consult your national, regional or local regulations for aerial work platforms. The frequency of the inspection and maintenance must be increased as required by environmental conditions, requirements and frequency of usage.

Pre-delivery Inspection

The pre-delivery inspection shall be performed by qualified Sinoboom technicians.

A pre-delivery inspection shall be performed before each sale, lease or rental delivery.

Refer to the ***Inspection and Preventive Maintenance Schedule*** for items requiring a pre-delivery inspection. Refer to the corresponding section of this manual to perform inspection and maintenance procedures.

Pre-operation Inspection

A pre-operation inspection must be performed before each start or restart of work, change of operator, and after each maintenance operation. Refer to the pre-operation inspection section of the Operation Manual for detailed information. The Operation Manual must be entirely read and understood before performing the pre-operation inspection.

Regular Inspections

Regular inspections shall be performed by qualified Sinoboom technicians.

Regular inspections must be performed after the machine has been in service for 3 months or 250 hours, whichever comes first, or if it has been out of service for more than 3 months. The frequency of the inspection and maintenance must be increased as required by environmental conditions, requirements and frequency of usage.

The items included in the regular inspections are identical to the pre-delivery inspection.

Annual Inspection

An annual machine inspection must be performed once a year and no later than 13 months from the date of the previous annual inspection. Hunan Sinoboom Intelligent Equipment Co., Ltd. recommends this task be performed by a factory-trained service technician, a person recognized by Sinoboom as one who, by qualification, certificate and training, has successfully demonstrated the ability and proficiency to service, repair and maintain the Sinoboom model in question.

Refer to the ***Inspection and Preventive Maintenance Schedule*** for items requiring annual inspection, and refer to the corresponding section of this manual to perform inspection and maintenance procedures.

Preventive Maintenance

Preventive maintenance procedures shall be performed by qualified Sinoboom technicians. The frequency of the inspection and maintenance must be increased as required by environmental conditions, requirements and frequency of usage.

Refer to the ***Inspection and Preventive Maintenance Schedule*** for items requiring a preventive maintenance. Refer to the corresponding section of this manual to perform inspection and maintenance procedures.

Responsible Persons and Qualifications for Performing Inspection and Maintenance

Table 4-1

Inspection Type	Inspection Frequency	Primary Responsible Persons	Service Qualifications
Pre-operation Inspection	Before starting/restarting work, change of user, after each maintenance activity.	User or operator	Properly trained user or operator
Pre-delivery Inspection	Before each sale, lease or rental delivery	Owner, dealer or user	Qualified Sinoboom technician
Regular Inspections	In service for 3 months or 250 hours (whichever comes first) or out of service for more than 3 months	Owner, dealer or user	Qualified Sinoboom technician
Annual Inspection	Once a year and no later than 13 months from the date of the previous annual inspection	Owner, dealer or user	Factory-trained service technician
Preventive Maintenance	At intervals specified in the ***Inspection and Preventive Maintenance Schedule***	Owner, dealer or user	Qualified Sinoboom technician

Inspection and Preventive Maintenance Schedule

Perform inspection and preventive maintenance for the items in the table below at the specified intervals. Maintenance and inspection intervals are calculated based on the months of service or the “accumulated operating hours” (cumulative working time) displayed on the ground controls (whichever comes first).

Inspection intervals are based on the use of the machine under normal operating conditions. The intervals should be shortened accordingly when operating in harsh environmental conditions.

Table 4-2 Inspection and Preventive Maintenance Schedule

Item	Interval		
	Before each delivery[1]or quarterly[2]	Semiannually[3]	Annually[4]
Platform assembly			
Platform	1	1	1
Guardrails and floor	2	2	2
Access gate	1, 2, 3	1, 2, 3	1, 2, 3
Pedal for platform extension	1, 2, 3	1, 2, 3	1, 2, 3
Platform wear pads (at the connection with scissor arm) and fasteners	1, 2	1, 2	1, 2
Safety belt anchorage point	1, 2, 7	1, 2, 7	1, 2, 7
Scissor arms assembly			
Scissor arms	1, 2	1, 2	1, 2

Table 4-2 Inspection and Preventive Maintenance Schedule (continued)

Item	Interval		
	Before each delivery[1] or quarterly[2]	Semiannually[3]	Annually[4]
Safety strut	1, 2, 3	1, 2, 3	1, 2, 3
Bearings	1, 2, 5, 12	1, 2, 5, 12	1, 2, 5, 8, 12
Pivot pins, retaining rings and fasteners	1, 2	1, 2	1, 2
Chassis assembly			
Chassis	2	2	2
Chassis wear pads (at the connection with scissor arm)	1, 2, 5	1, 2, 5	1, 2, 5, 8
Tires	1, 2	1, 2	1, 2
Wheel nuts	1[50]	1[50]	1[50]
Traveling and steering components	1, 2, 5	1, 2, 5	1, 2, 5
Bearings	1, 2, 5, 12	1, 2, 5, 12	1, 2, 5, 12
Chassis compartment at both sides	1, 2, 3	1, 2, 3	1, 2, 3
Ladder	1, 2, 5	1, 2, 5	1, 2, 5
Drive motor	1, 5, 6	1, 5, 6	1, 5, 6
Brake and brake release device	1, 5, 6	1, 5, 6	1, 5, 6
Lift motor	1, 2, 3, 6	1, 2, 3, 6, 13	1, 2, 3, 6, 13
Gear pump	1, 2, 3, 6	1, 2, 3, 6	1, 2, 3, 6
Hydraulic system			
Hydraulic pump	1, 2, 3, 6	1, 2, 3, 6	1, 2, 3, 6
Hydraulic cylinder	1, 2, 3, 5, 6, 12	1, 2, 3, 5, 6, 12	1, 2, 3, 5, 6, 12
Hydraulic valves	1, 2, 3, 5, 6	1, 2, 3, 5, 6	1, 2, 3, 5, 6
Hydraulic hoses, pipelines and fittings	1, 2, 6	1, 2, 6	1, 2, 6
Hydraulic tank	1, 2, 3, 5, 6	1, 2, 3, 5, 6	1, 2, 3, 5, 6
Hydraulic tank air filter	1, 5, 6	1, 5, 6, 11	1, 5, 6, 11
Hydraulic oil filter	1, 5, 6	1, 5, 6	1, 5, 6, 11
Hydraulic oil	5, 6	5, 6	5, 6, 11
Electrical system			
Electrical harness, connectors	1, 2	1, 2	1, 2
Battery	1, 2, 6, 9, 12	1, 2, 6, 9, 12	1, 2, 6, 9, 12
Electrolyte	6	6	6
Charging function	3	3	3
Instruments, gauges, switches, lamps, horn, contactor, relay	1, 3	1, 3	1, 3

Table 4-2 Inspection and Preventive Maintenance Schedule (continued)

Item	Interval		
	Before each delivery[1] or quarterly[2]	Semiannually[3]	Annually[4]
Functions and controls			
Platform controller	1, 3, 4, 7, 10	1, 3, 4, 7, 10	1, 3, 4, 7, 10
Ground controller	1, 3, 4, 7, 10	1, 3, 4, 7, 10	1, 3, 4, 7, 10
Function control lock, secondary guarding device and brake	1, 3, 10	1, 3, 10	1, 3, 10
Emergency stop switch (ground and platform)	1, 3, 10	1, 3, 10	1, 3, 10
Limit switches and power-off switch	1, 3, 10	1, 3, 10	1, 3, 10
Overload limit function	1, 3, 10	1, 3, 10	1, 3, 10
Tilt alarm	1, 3, 10	1, 3, 10	1, 3, 10
Pothole protection device	1, 3, 10	1, 3, 10	1, 3, 10
Emergency lowering device	1, 3, 10	1, 3, 10	1, 3, 10
Drive function	1, 3, 10	1, 3, 10	1, 3, 10
Braking function	1, 3, 10	1, 3, 10	1, 3, 10
Others			
Operation Manual in the manuals compartment	10	10	10
All decals/labels complete, clear and secure	10	10	10
Annual inspection date of the machine	/	/	10
No unapproved changes or additions	10	10	10
All safety publications taken into account	10	10	10
General structural components and weldments	2	2	2
All fasteners, pins, protective guards and covers	1, 2	1, 2	1, 2
Greasing and lubricating according to specifications	10	10	10
Functional test of all systems	10	10	10
Paint and appearance	5	5	5
Inspection date stamped on the chassis	/	/	10
Notify Sinoboom of machine ownership (change)	/	/	10

Table 4-2 Inspection and Preventive Maintenance Schedule (continued)

Item	Interval		
	Before each delivery[1]or quarterly[2]	Semiannually[3]	Annually[4]
Note: [1] Before each sale, lease or shipment delivery; [2] In service for 3 months or 250 hours; or out of service for more than 3 months; [3] In service for 6 months or 500 hours; [4] Once a year and no later than 13 months from the date of the previous annual machine inspection; [50] The first inspection shall be performed once the machine reaches 50 hours in service for the first time. This occurs only once in the service life of the machine. [250] The first inspection shall be performed once the machine reaches 250 hours in service for the first time. This occurs only once in the service life of the machine. [NO.1] Before the machine is put into service for the first time			
Inspection activity (numerical codes): **1.** Check for correct installation (accurate position, firmly installed, tightened to the specified torque) **2.** Check for damage (cracks, cracked welds, deformation, wear, corrosion, excessive wear, gouges, abrasions and exposed threads) **3.** Check for normal function **4.** Check for normal return to neutral or “off” position (self-resetting switches return to neutral or “off” position after released) **5.** Clean and free of foreign objects **6.** Check for correct level, sealing and leaks **7.** Labels complete, clear and secure **8.** Check for appropriate dimensions/tolerances **9.** Fully charged **10.** Verify/perform **11.** Replace the oil or filter element **12.** Correctly lubricated **13.** Inspect the carbon brush			

4.2 GENERAL MAINTENANCE INSTRUCTIONS

Safety and Operating Standards

The following precautions should be taken before carrying out adjustment and repair work on the machine:

1. Disconnect the power source to prevent inadvertent start up of the machine and tag the machine accordingly.
2. All controls should be turned off to avoid accidental actuation of the control system.
3. If possible, lower the work platform to the lowest position. If this is not possible, secure the work platform to prevent it from falling.
4. Before loosening or removing hydraulic components, the oil pressure in the hydraulic lines should be released.

Some maintenance work may require the machine to be in a state other than the ones described in 1 - 4 above. Such work should be carried out in accordance with the specific safety measures listed in the Operation Manual and this manual.

Safety of personnel always has the highest priority, also when performing maintenance work on the machine. Always take the weight of components into consideration, and never attempt to move heavy parts without the assistance of mechanical equipment. Never place heavy objects in an unstable position. Before lifting any machine components, ensure the parts are sufficiently supported.

Cleaning

1. To extend the service life of the machine it is crucial to prevent dirt or impurities from entering critical components of the machine. A number of protective measures have been taken to prevent such ingress. Protective plates, covers, seals, and filters are installed to keep intake air, fuel and oil clean. Such protective devices must be serviced/maintained at prescribed intervals to ensure their proper function.
2. When air, fuel, or oil lines are disconnected, their adjacent areas, openings and fittings should be cleaned. Openings should be covered immediately to prevent foreign objects from entering.
3. During repair or maintenance, all components should be cleaned and inspected, make sure all pipes/tubes and openings are unobstructed. Cover all parts to keep them clean. All parts must be clean before installation. New parts should be stored in containers before use.

Components Disassembly and Installation

1. A safe and appropriate plan for the installation of machine components should be developed based on this manual, taking the site conditions into account.
2. Personnel carrying out disassembly and installation work must be appropriately qualified and must be able to use safety equipment correctly.
3. Before carrying out installation work, qualified personnel should inspect the ground, concealed foundations and anchors, or review reliable documentation verifying that the manufacturer's requirements are met.
4. Wind speed at the installation site must not exceed 8.3 m/s (18.6 mph).
5. Before installation, check the site conditions such as power supply and ground conditions to make sure the installation requirements are met.
6. All components should be inspected prior to installation to verify they are in good condition.
7. High-strength bolts should be tightened in strict accordance with the requirements of this manual.
8. Requirements for the acceptance of onsite machine installation work:
    1) Relevant inspections and functional tests should be carried out to confirm that the components have been installed correctly, that specific functional requirements are met and that all safety devices are operating properly.
    2) Static and dynamic load tests should follow and comply with the relevant standards.
    3) Before putting the machine into service, a qualified person shall issue a handover certificate confirming the integrity of the machine. All test/inspection results should be recorded and an inspection report should be prepared (including the inspector’s name, title, company, and inspection date).
9. Disassembly work should meet the same safety requirements as installation work.
10. If lifting tools are required to dis-assemble the machine, use the correct lifting points, lifting equipment and additional tools. Only use tested and certified tools and equipment.
11. If the lifting gear strands have to be attached at an angle of less than 90° when lifting a component exercise special caution since the eye bolt or similar bracket cannot provide adequate lateral support.
12. If components are difficult to be removed check that all nuts, bolts, cables, brackets, wiring, etc. have been removed, and that adjacent components are not obstructing the removal.

Components Disassembly and Reassembly

When disassembling or reassembling components, follow the steps one by one. If assembly/disassembly of a certain component has not been completed, do not proceed with another component. Always check the disassembly/assembly operation to make sure nothing is missing. No adjustments (unless recommended) may be made without prior approval.

Storage

Please follow the recommendations below to ensure best performance of the cylinders and to avoid corrosion during long-term storage (indoor/outdoor):

- The machine should be stored in stowed position with the wheels aligned.
- Fully raise and lower the platform, and steer left and right to the full steering angle twice a week in order to keep the respective cylinder components lubricated.

Disposal of Structural Components

- Major structural components that no longer meet the requirements for safe use due to corrosion, wear or other reasons should be repaired, reinforced, or replaced and discarded.
- Load-bearing structural components that are permanently deformed and cannot be repaired must be replaced and discarded.
- Load-bearing structural components that have lost overall stability and cannot be repaired must be replaced and discarded.
- Cracks in structural components or welds should be analyzed to understand the cause. The components/welds should be reinforced as appropriate considering the load and the characteristics of the cracks. Continued use is only allowed if the structural component/weld meet the original design requirements; otherwise they should be discarded.

Pressure-fit and Mating Parts

When assembling pressure-fit and mating parts, use anti-seize or molybdenum disulfide-based compounds to lubricate the mating surface.

Bearings

1. Cover bearings that have been removed from the machine to keep the bearing clean from dust and abrasives. Use non-flammable cleaning solvent to clean bearings and allow them to dry in a shaded area. Compressed air may be used but the bearings should not be rotated.
2. If the races and balls (or rollers) display pits, notches or burn marks, the bearing should be replaced and discarded.
3. If the bearing is still serviceable, apply a coat of oil and wrap it in clean paper (or wax paper). Do not unwrap reusable bearings or new bearings until they are ready for installation.
4. Lubricate new or serviceable bearings before installation. When pressing the bearing into the retainer or bore, pressure should be applied only to the outer race. If the bearing is to be installed on a shaft, pressure should be applied only to the inner race.

Gaskets

Check if the opening in the gasket is aligned with the opening in the component that is to be sealed.

Bolt Use and Torque Requirements

NOTICE

Self-locking fasteners such as nylon inserts and thread locking nuts must not be reinstalled after removal.

1. Always use a new self-locking fastener when installing locking fasteners. Use bolts of appropriate lengths. If a bolt is too long it may be pressed against the adjacent part before being properly tightened. If the bolt is too short it is likely to not have enough thread area to properly secure the parts. Replacement bolts must be of the same or equivalent size as the original bolt.
2. In addition to the specific torque requirements provided in this manual, standard torque values should be used on heat-treated bolts, studs, and steel nuts in accordance with recommended factory practice (see ***Fastener Torque Specifications***).

Hydraulic Pipeline and Electrical Wiring

When unplugging or removing hydraulic hoses and electrical wires from the machine, the hydraulic hoses and electrical wires and their sockets should be clearly marked so that their reinstallation will be correct.

Hydraulic Hose and Fitting Tightening Procedures

The following requirements apply when installing hydraulic hoses and fittings:

1. Before installation, check the seals on hoses and fittings, and replace the seal or even the hose assembly and the fitting if the seal is found to be damaged or oil spills out of the seal. Clean hoses and fittings before installation.
2. If a seal is to be replaced, lubricate the replacement seal before installation.
3. To install a hose nut and fitting, align the fitting, hose and hose nut, and tighten the nut with the torque specified in ***Hydraulic Hose Torque*** and ***Hydraulic Fitting Torque*** . If the tightening torque of a fitting or hose exceeds the specified value its seal cannot be reused.
4. After installation, test all machine functions and check to ensure the hose, fitting and related components are free from leaks.

Application of Insulating Silicone Grease to Electrical Connections

Insulating silicone grease should be applied to all electrical connections for the purpose of:

- Avoiding oxidization of the connecting points between the male pin and female pin.
- Avoiding electrical failure due to low conductivity between the pins in humid environments.

The following instructions should be observed when applying insulating silicone grease to the electrical connections. This procedure applies to all plug connections installed outside the distribution cabinet. The silicone grease is not suitable for the connectors with a sealed outer surface.

1. Prior to the machine assembling, apply silicone grease around the male and female pins of the connectors to prevent oxidization. A grease syringe may be used for this procedure.

NOTICE

Oxidization that is allowed to progress over a certain period will increase the resistance of the connectors and eventually lead to electrical failure.

2. Silicone grease should be applied to each electrical cord that is exposed outside the connectors to prevent short circuit. Silicon grease should also be applied to the connecting points of male and female connectors. Sealing measures should also be applied to other connectors that may be subject to water ingress, such as around strain relief clamps.

NOTICE

Due to the higher conductivity of cleaning solvents compared to water, situations of water ingress are especially likely to occur when cleaning the machine with a pressure washing method.

3. The connectors between battery and charger should be sealed with silicone grease at each contact point.

NOTICE

Solidifying sealants can also be used to prevent short circuits and help maintain cleanliness, but they will make it more difficult to remove the pins later on.

Lubrication

The relevant components should be lubricated at defined intervals using the lubricant of the quantity, type and grade as recommended in this manual. If the recommended lubricant is not available, contact your local supplier who can help you obtaining the recommended lubricant or a satisfactory alternative.

Hydraulic System

1. Contaminants are the primary hazard for the hydraulic system. Contaminants can enter the hydraulic system in various ways, such as improper use of hydraulic oil, moisture, grease, metal chips, sealing elements and sand entering the system during maintenance, or cavitation of the hydraulic pump due to insufficient system preheating or leakage in the pump supply (suction) lines.
2. Oil that appears clouded indicates a high moisture or air content, which contributes to organic growth, leading to oxidation or corrosion. In such case, drain the oil from the hydraulic system, and fill with clean hydraulic oil after rinsing the hydraulic system.
3. Check the filter frequently for the presence of metal particles. Because hydraulic components are designed and manufactured to very tight tolerances, even a small amount of contaminants entering the system can cause wear or damage to hydraulic components and lead to malfunctions. Hydraulic system filters should be inspected, cleaned or replaced as needed at required intervals.
4. Keep the hydraulic system clean. After disconnecting the hydraulic lines, seal the tube ports immediately to prevent contaminants from entering the hydraulic system. If signs of metal or rubber particles are found in the hydraulic system, the hydraulic oil should be drained immediately and the entire system flushed.

NOTICE

Metal particles may appear in the hydraulic oil or filter of a new machine due to wear of new hydraulic components.

5. Disassemble or reassemble parts on clean workbenches. Clean all metal parts using a non-flammable cleaning solvent. Lubricate parts as needed to facilitate assembly.
6. Hydraulic oils of different brands or types should not be mixed. Different oils may contain different essential additives or may have different viscosity. It is recommended to use high-quality mineral oil with a viscosity suitable for the temperature of the environment the machine is operating in.
7. Unless otherwise expressly stated in this manual, the filter element must be replaced at least once a year or every 1000 working hours; the replacement interval should be shorter in harsh working conditions. If hydraulic oil needs to be changed, use hydraulic oil meeting or exceeding the type and specification requirements in this manual. If hydraulic oil of the same type as that supplied with the machine is not available, consult your local supplier to help you select the appropriate hydraulic oil. Do not mix petroleum-based oils with synthetic oils.

8. Take all precautions to keep the hydraulic oil clean. If hydraulic oil must be poured from the original container into another container, ensure that the second container is kept clean and does not contain any contaminants. Make sure to clean the filter screen, and replace the filter element when changing the hydraulic oil.
9. After the machine is shut down, take proper preventive maintenance measures, thoroughly check all hydraulic components, piping, fittings, etc., and perform a function test for each system before putting the machine into service again.

Pins and Composite Bearing

1. The connecting pins should be removed and inspected in case any of the following defects is found:
   - Excessively tilted joint
   - Noise originating from the joint during operation.
2. The composite bearing should be replaced in any of the following conditions:
   - Frayed or separated fiber on the sleeve surface
   - Cracked or damaged sleeve housing
   - Bearing moved or rotated into the housing
   - Debris embedded in the sleeve surface.
3. Replace the pivot pin if any of the following is detected (properly clean the pivot pin before inspection):
   - Wear in the bearing area
   - Flaking, pealing, scratches or abrasions on the pivot pin surface
   - Corroded pivot pin in the bearing area
4. Reassemble the connecting pin and composite bearing
   - Blow off the dirt and debris on the housing. Remove any foreign objects on the bearing and housing.
   - Clean the bearing and pivot pin with a cleaning agent to remove all grease and oil. The composite bearing uses dry coupling which does not require lubrication.
   - During installation and operation, inspect the pivot pin to ensure that there are no burrs, nicks or abrasions that could damage the bearing.

4.3 MAJOR MODIFICATION AND REPAIR

A major modification/repair is a modification/repair of the entire machine or its components that affects the stability, strength or performance of the machine.

Each major modification/repair to the machine by the machine owner/company should be recorded using the ***Major Modification/Repair Record*** in the attachment to this manual. This record should be retained until the machine is taken out of service or as required by the machine owner/company.

Major modifications/repairs to the machine must be performed by a qualified service technician. The machine must be inspected and verified after major modifications/repairs, the inspection items include but are not limited to all items in the ***Inspection and Preventive Maintenance Schedule*** . Once inspection and verification are complete the machine can be put back into service.

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5 PLATFORM COMPONENTS

The figure below shows platform components. Your machine may have different platform components due to different configuration.

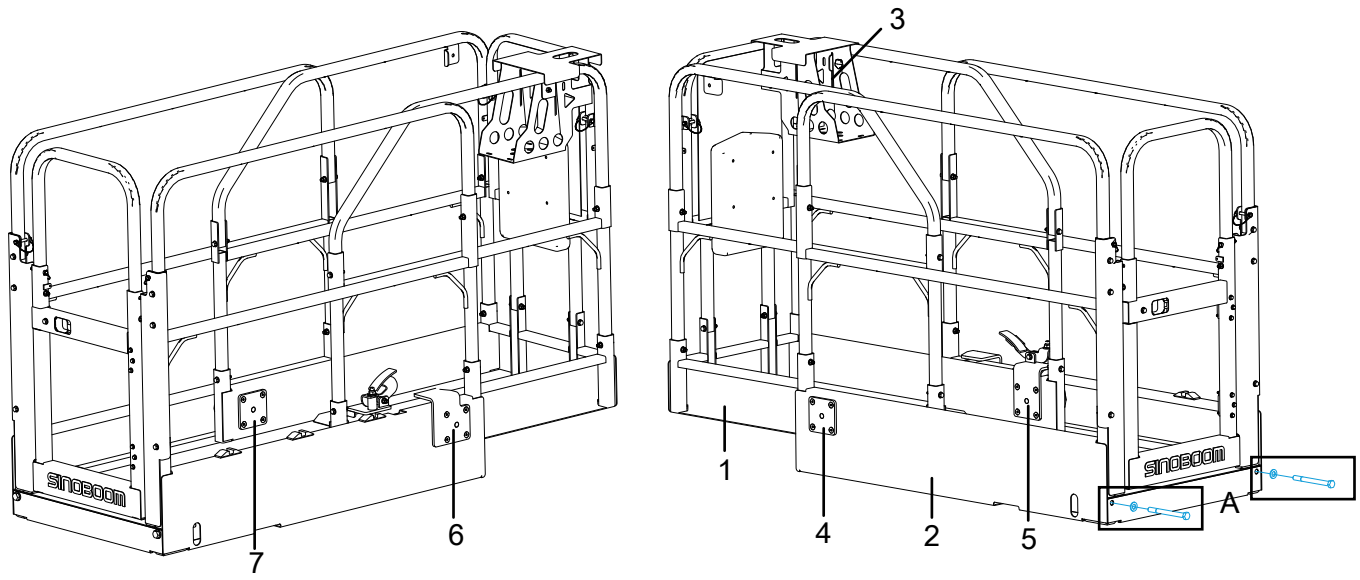


Fig. 1 Platform Components

Table 5-1

A: Platform wear pad fixed end installation (including bolts, gaskets and nuts)		
1: Platform extension	2: Main platform	3: Platform controller
4, 5, 6, 7: Pulley support		

5.1 PLATFORM CONTROLLER

Disassembly

⚠ WARNING

Before performing such disassembly tasks, disconnect the battery and disconnect the charger from the AC outlet. Contact with live conductors may result in serious injury or death.

1. Make sure the machine is in stowed position.
2. Turn off the machine and press the emergency stop button at the platform controller and ground controller.
3. Mark and disconnect the harness connections in the platform controller.
4. Remove the fastening bolts on the bottom of the platform controller.
5. Carefully remove the platform controller.

Installation

For installation, follow the disassembly procedure in reverse order.

5.2 PLATFORM ASSEMBLY

The platform assembly is composed of the main platform and platform extension. The platform assembly shall be disassembled and installed as follows:

Disassembly

1. Make sure the machine is in stowed position.

2. Remove the platform controller from the platform.
3. Mark and disconnect the harness connections on the platform assembly.
4. Use suitable lifting equipment to support the work platform.
5. Remove the mounting fasteners from the platform wear pad fixed end.
6. With the assistance of the lifting equipment, slowly lift the platform slightly and push the platform so that the wear pad at the mobile end gets to the chute notch at the bottom of the platform.
7. Slowly remove the platform assembly with the aid of the lifting equipment.

Installation

For installation, follow the disassembly procedure in reverse order.

5.3 PLATFORM EXTENSION

Disassembly

1. Extend the platform appropriately, and ensure that the platform extension is effectively supported.
2. Use suitable lifting equipment to support the work platform.
3. Remove the mounting screws on the 4 pulley supports of the platform assembly.
4. Remove the pulley supports.
5. With the assistance of lifting equipment, slowly remove the platform extension from the platform assembly.

Installation

For installation, follow the disassembly procedure in reverse order.

6 SCISSOR ARM COMPONENTS

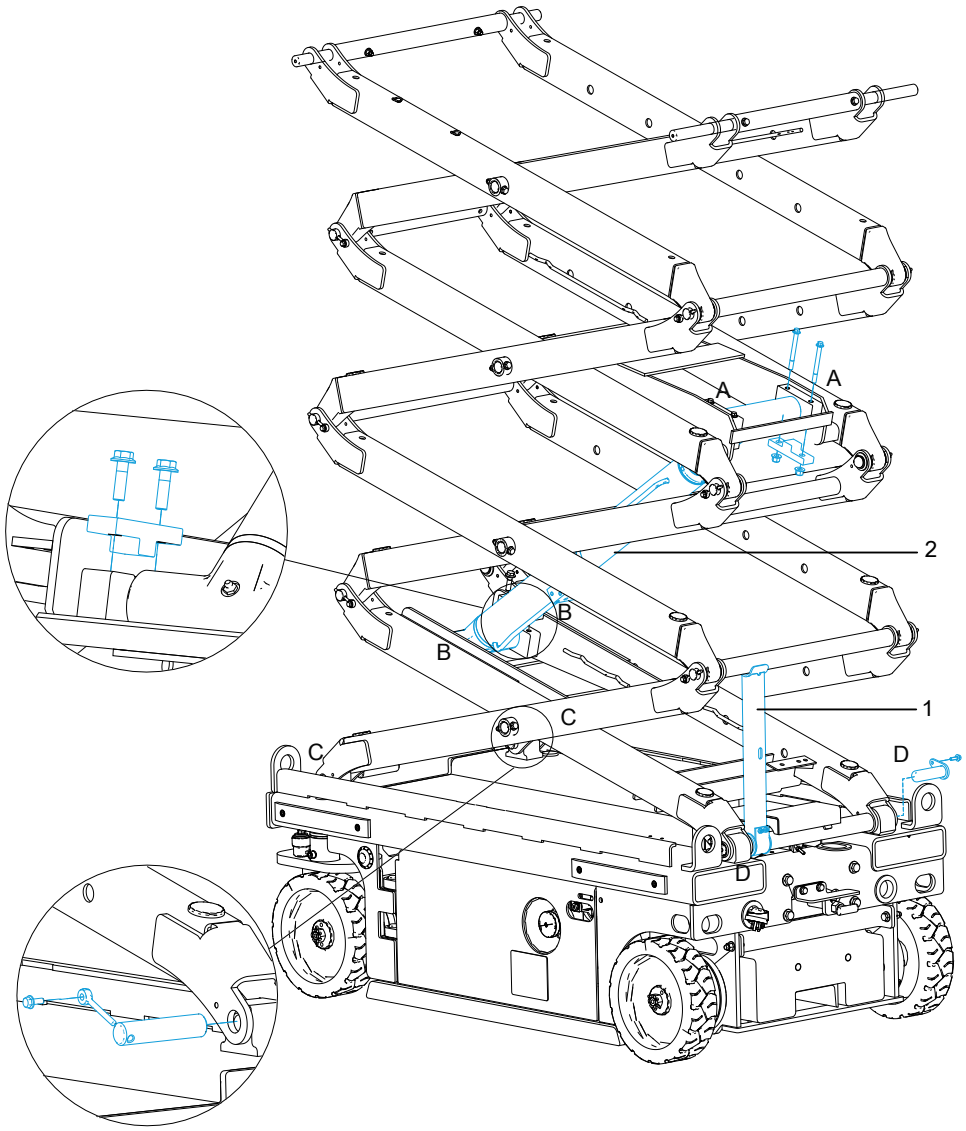


Fig. 1 Scissor Arm Components

Table 6-1

A. Cylinder upper end installation (including bolts, nuts, and pressing plate)		
B. Cylinder lower end installation (including bolts and pressing plate)		
C. Scissor arms sliding end installation (including bolts, nuts and shaft)		
D. Scissor arms fixed end installation (including bolts, nuts and shaft)		
1. Safety strut	2. Lift cylinder	

6.1 DISASSEMBLY AND INSTALLATION

Disassembly

1. Make sure the machine is in stowed position.
2. Remove the platform assembly.
3. Mark and disconnect the harness connections on the scissor arm assembly.
4. Mark and disconnect the hydraulic pipelines on the scissor arm assembly and collect the hydraulic oil in the pipelines with a suitable vessel. Plug the lines and the ports.
5. Use suitable lifting equipment to support the scissor arm assembly.
6. Remove the fasteners securing the fixed end of scissor arm assembly on both sides of the chassis.
7. Remove the fasteners securing the sliding end of scissor arm assembly on both sides of the chassis.
8. Use tools to pull out the shaft securing the scissor arm assembly with the chassis.
9. With the assistance of the lifting equipment, lift the scissor arm assembly slowly until the scissor arm bottom leaves the chassis, remove the scissor arm assembly, and carefully place it at a suitable position.

Installation

For installation, follow the disassembly procedure in reverse order.

6.2 SAFETY STRUT

⚠ WARNING

If you need to work under the raised scissor arms, make sure that the safety strut sets up and provides effective support.

1. Start the machine from the ground and raise the platform so that the safety strut can be fully erected.
2. Erect the safety strut and lower the platform as to ensure that the safety strut provides effective support.
3. Lower the platform until the upper scissor sleeve contacts the safety strut.

6.3 LIFT CYLINDER

⚠ WARNING

- **Before loosening or disassembling hydraulic parts, the hydraulic pressure of all hydraulic lines should be released and the hydraulic oil should completely cool down.**
- **Disassemble the hydraulic components slowly to prevent the hydraulic oil from splashing and causing injuries.**

1. Raise the scissor arms appropriately until the lift cylinder is accessible and can be easily removed.
2. Erect the safety strut and ensure that the safety strut provides effective support.
3. Use suitable lifting equipment to support the scissor arm assembly to prevent it from falling during the disassembly process.
4. Mark and disconnect the hydraulic pipelines on the lift cylinder and collect the hydraulic oil in the pipelines with a suitable vessel. Plug the lines and the ports.
5. Support the two ends of the lift cylinder with suitable lifting equipment.
6. Remove the bolts and nuts at the connecting shaft between the lift cylinder upper end and the scissor arm, and then remove the pressing plate.
7. Remove the bolts at the connecting shaft between the lift cylinder lower end and the scissor arm, and then remove the pressing plate.
8. Slowly remove the lift cylinder with the aid of the lifting equipment.
9. Slowly lower the scissor arm to stowed position with the aid of the lifting equipment.

⚠ WARNING

When disassembling the cylinder, use caution to prevent it from falling and getting damaged, and also to avoid impacts that could lead to high-pressure oil leaks.

Installation

For installation, follow the disassembly procedure in reverse order.

7 CHASSIS COMPONENTS

7.1 TRAVEL DRIVE AND STEERING DEVICE

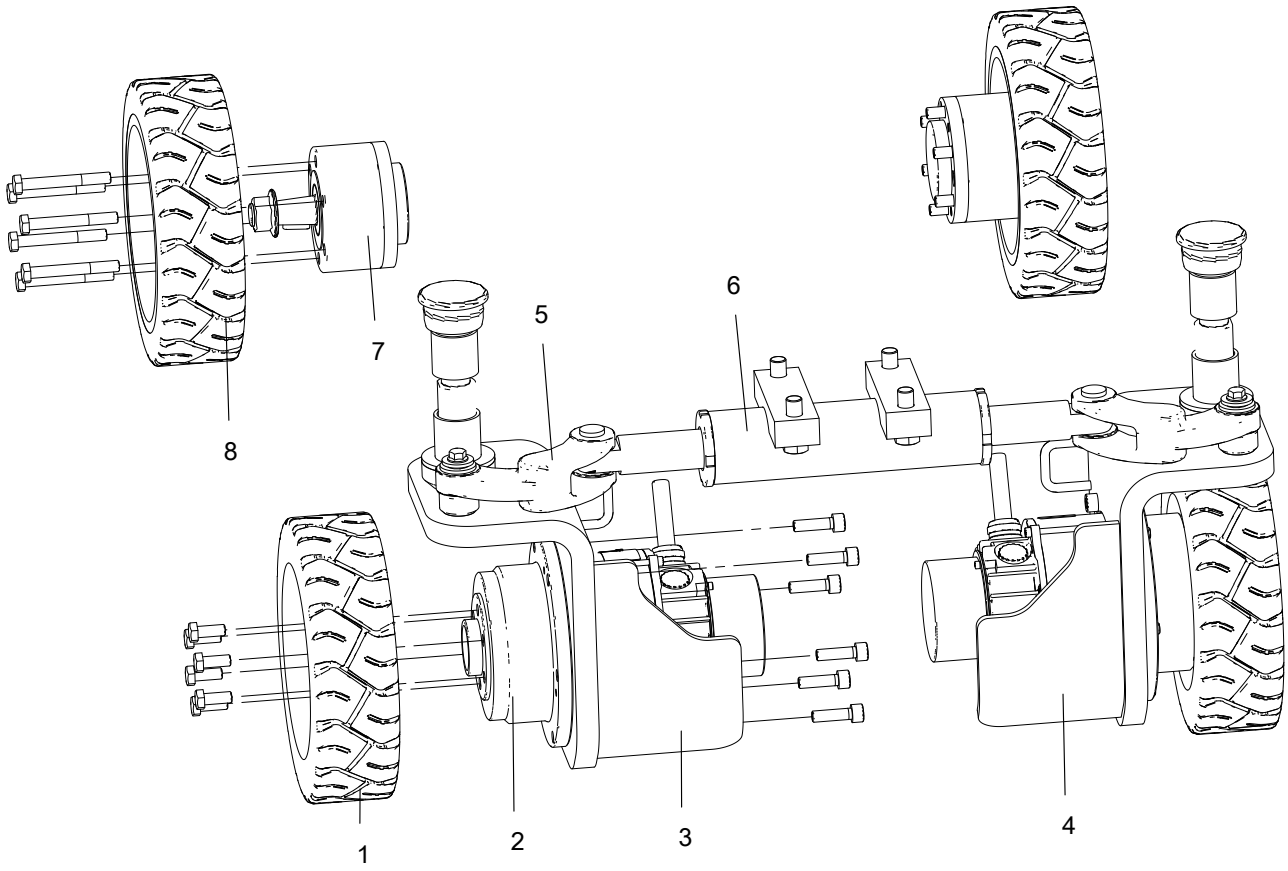


Fig. 1 Travel Drive and Steer Device Components

Table 7-1

1. Front tire	2. Travel motor & reducer	3. Right wheel carrier
4. Left wheel carrier	5. Steering connecting rod	6. Steering cylinder
7. Bearing housing	8. Rear tire	

Travel Motor and Reducer

Disassembly

1. Make sure the machine is in stowed position.
2. Press the power-off switch/pull out the power-off handle and disconnect all power sources (such as battery charger) from the machine.
3. Place a jack of sufficient capacity under the chassis side to be worked on, and support the chassis.
4. Remove the tire and wheel assembly.
5. Mark and disconnect the harness connections on the travel motor and reducer.
6. Use suitable lifting equipment to support the travel motor and reducer.

7. Remove the fasteners of the travel motor and reducer installed on the wheel carrier, and slowly move the travel motor and reducer out with the assistance of lifting equipment.

Installation

1. Place a jack of sufficient capacity under the chassis side to be worked on, and support the chassis.
2. Align the mounting holes on the travel motor and reducer with that on the wheel carrier.
3. Fit the flat surface of the gasket to the mounting surface (if a gasket is required), apply Loctite 272 threadlocking adhesive, then install the bolts one by one.
4. Tighten the bolts to the specified torque with a torque wrench.
5. Reconnect the electrical harness.
6. Install the tire and wheel assembly as needed.

Steering Cylinder

⚠ WARNING

- **Before loosening or disassembling hydraulic parts, the hydraulic pressure of all hydraulic lines should be released and the hydraulic oil should completely cool down.**
- **Disassemble the hydraulic components slowly to prevent the hydraulic oil from splashing and causing injuries.**

1. Make sure the machine is in stowed position.
2. Place a jack of sufficient capacity under the chassis to support the chassis.
3. Mark and disconnect the hydraulic pipelines on the steering cylinder and collect the hydraulic oil in the pipelines with a suitable vessel. Plug the lines and the ports.
4. Support the steering cylinder with suitable lifting equipment.
5. Remove the retainer ring and pivot pin securing the steering cylinder with the steering connecting rod.
6. Remove the bolts securing the steering cylinder to the chassis.
7. Slowly remove the steering cylinder with the aid of the lifting equipment.

⚠ WARNING

When disassembling the cylinder, use caution to prevent it from falling and getting damaged, and also to avoid impacts that could lead to high-pressure oil leaks.

Installation

1. Place a jack of sufficient capacity under the chassis to support the chassis.
2. Align the mounting hole on the steering cylinder with that on the chassis.
3. Apply Loctite 272 threadlocking adhesive, and then install the bolts one by one.
4. Tighten the bolts to the specified torque with a torque wrench.
5. Reinstall the retainer ring and pivot pin securing the steering cylinder with the steering connecting rod.
6. Connect the hydraulic hoses.

7.2 TIRE ASSEMBLY

Check Tires and Rims

Maintaining the tires and rims is essential for the normal and safe operation of the machine. The machine may tip over if a tire or a rim fails, so check the tires and rims each time before operating the machine and repair defective tires and rims in a timely fashion.

This machine is equipped with solid tires that do not need to be inflated.

- Check each tire for cuts, cracks, punctures and abnormal wear. Replace the tire if necessary.
- Check each rim for damage, deformation or cracked welds. Replace the rim if necessary.

Check Wheel Nuts

The wheel nuts should be tightened before the machine is put into service for the first time and after each tire is removed. Check and tighten the wheel nuts to the specified torque every 3 months or 250 operating hours.

Replacement Requirements

⚠ WARNING

- **The tires and rims on the machine have been designed and selected according to the overall performance and load stability requirements of the machine. Therefore, the model specifications, rim width, installation center surface, diameter, etc. must not be changed, otherwise this could lead to an unstable and hazardous condition.**
- **Wheel-specific nuts must be used that match the wheel bolts. The wheel nuts must be installed and maintained with the proper tightening torque to prevent loose rims, broken bolts and wheels loosening from the axle. Be sure to only use nuts that match the mounting angle of the rim holes.**

Hunan Sinoboom Intelligent Equipment Co., Ltd. recommends the replacement tire be of the same size, ply rating and brand as the original tire. For the tire part numbers of specific machine models, please refer to the Parts Manual of the corresponding machine. If you choose not to use the replacement tires recommended by Hunan Sinoboom Intelligent Equipment Co., Ltd., the following specifications should be adhered to:

- The ply rating/rated load capacity and size should be the same as the original tire or superior to it.
- The tire tread contact width should be the same as or superior to the original tire.
- The wheel diameter, width, offset dimensions and weight must be the same as the original tires.
- The replacement tire must be approved for the application by the tire manufacturer (including intended purpose, maximum travel speed, maximum tire load, etc.).
- Due to size differences between different tire brands, both tires on the same axle should be of the same brand.

NOTICE

Unless specifically approved by Sinoboom, do not replace foam-filled tires with pneumatic tires.

Replace Tire and Wheel Assembly

⚠ WARNING

Tighten the wheel nuts to the specified torque to prevent the wheel from loosening. Use a torque wrench to tighten the nuts. If no torque wrench is available use a socket wrench to tighten the nuts and then immediately have a service station or dealer tighten the nuts to the specified torque. Over-tightening will cause the nuts to break or permanently deform the bolt holes in the rims.

The correct steps to replace a tire and wheel assembly are as follows:

1. Make sure the machine is in stowed position.
2. Turn the power-off switch to the OFF position/pull out the power-off handle, and disconnect all power sources (such as battery charger) connected to the machine.
3. Use a jack with sufficient load capacity to lift the frame to an appropriate height so that the tire and wheel assembly is off the ground.
4. Use suitable lifting equipment to safely support the tire and wheel assembly.
5. Remove the cotter pin and slotted nut and the tire successively.
6. Fit the new tire to the original mounting position, mount the slotted nut and tighten it to the required torque in the ***Torque Specifications*** .
7. Install the cotter pin and bend it to the locking position.
8. Remove the jack as needed after installation.

NOTICE

The disassembled cotter pin cannot be reused and must be replaced with a new one.

7.3 CHASSIS WEAR PADS

The chassis wear pads connecting with the scissor arm is essential for the safe operation of the machine. As a friction pair will develop between the wear pad and the grooved steel surface of chassis while the platform is elevating or lowering. Improper wear pads or continued use of extremely worn wear pads may result in component damage and unsafe operation. It is recommended to check the chassis wear pad thickness once a year or after 1000 hours of operation.

1. Raise the platform appropriately to perform the following measurement.

2. As shown below, measure the distance from the bottom surface of each wear pad at the scissor arm sliding end to the center of the mounting axle hole.
3. Compare the measured value with the reference distance (L) below. If the difference is greater than 3 mm (0.118 in) (i.e. the wear extent of wear pad exceeds 3 mm [0.118 in]), replace the wear pad immediately.

NOTICE

If the wear pad on one side is excessively worn, the wear pads on both sides must be replaced together.

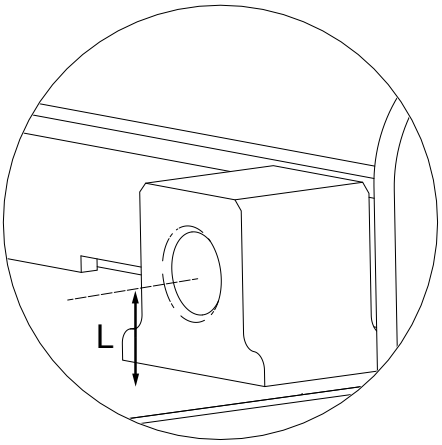


Fig. 2

L=30 mm (1.2 in)

7.4 POWER UNIT

Disassembly

⚠ WARNING

- **Before loosening or disassembling hydraulic parts (especially the counterbalance valve on the cylinder), the hydraulic pressure of all hydraulic lines should be released and the hydraulic oil should completely cool down.**
- **Disassemble the hydraulic components slowly to prevent the hydraulic oil from splashing and causing injuries.**

1. Open the right chassis door and locate the power unit.
2. Mark and disconnect the harness connections in the power unit.
3. Mark and disconnect the hydraulic lines from the power unit and collect the hydraulic oil from the lines with a suitable container. Plug the lines and the ports.
4. Dismount the fasteners at the bottom of power unit.
5. Slowly remove the power unit with the aid of the lifting equipment.

Installation

For installation, follow the disassembly procedure in reverse order.

7.5 BATTERY

⚠ WARNING

- **Before removing the battery, the charger power supply and the entire machine's operating power must be cut off.**
- **The battery case may only be disassembled by qualified/authorized personnel; improper work may result in system damage.**

1. Place the machine in a ventilated and spark-free environment.
2. Open the left chassis compartment to locate the battery.
3. Mark and disconnect the wire harness connection on the negative terminal of the battery, then disconnect the wire harness connection on the positive terminal of the battery.
4. After securing the battery with slings, remove the battery from the machine using suitable lifting equipment.

8 HYDRAULIC SYSTEM

The machine's hydraulic system can be viewed as consisting of two parts: one part is used for the steering function, the other part for the platform lifting/lowering functions.

The motor drives the hydraulic pump that transfers hydraulic oil to the function valve blocks, which are equipped with directional valves for the control of different movements. To protect components and to avoid overpressure, the valve blocks are equipped with overflow valves.

Proper maintenance of the hydraulic system is essential for the proper and safe operation of the machine. Failure to maintain the hydraulic components in a timely fashion may lead to component damage, which can affect the safe operation of the machine.

8.1 FUNCTION VALVES

Lift Control Valve (PN.202040003901)

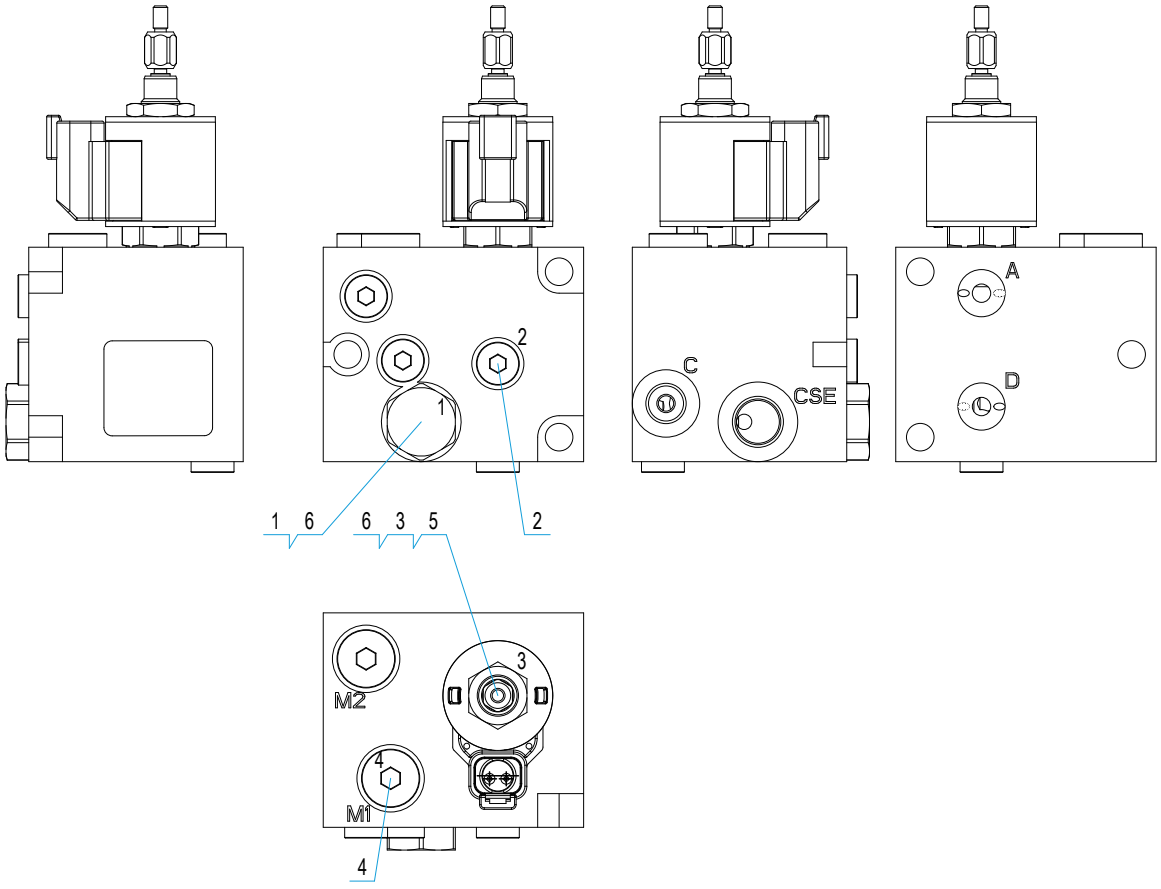


Fig. 1

Table 8-1

No.	Name	Torque	Function
1	Check valve	27.1 Nm (20 ft-lb)	Keep the fluid flowing in one direction
2	Damper	4 Nm (3 ft-lb)	\

Table 8-1 (continued)

No.	Name	Torque	Function
3	Solenoid valve	22.7 Nm (17 ft-lb)	Lower the platform
4	Damper	4 Nm (3 ft-lb)	\

Lift Control Valve (PN.202040003902)

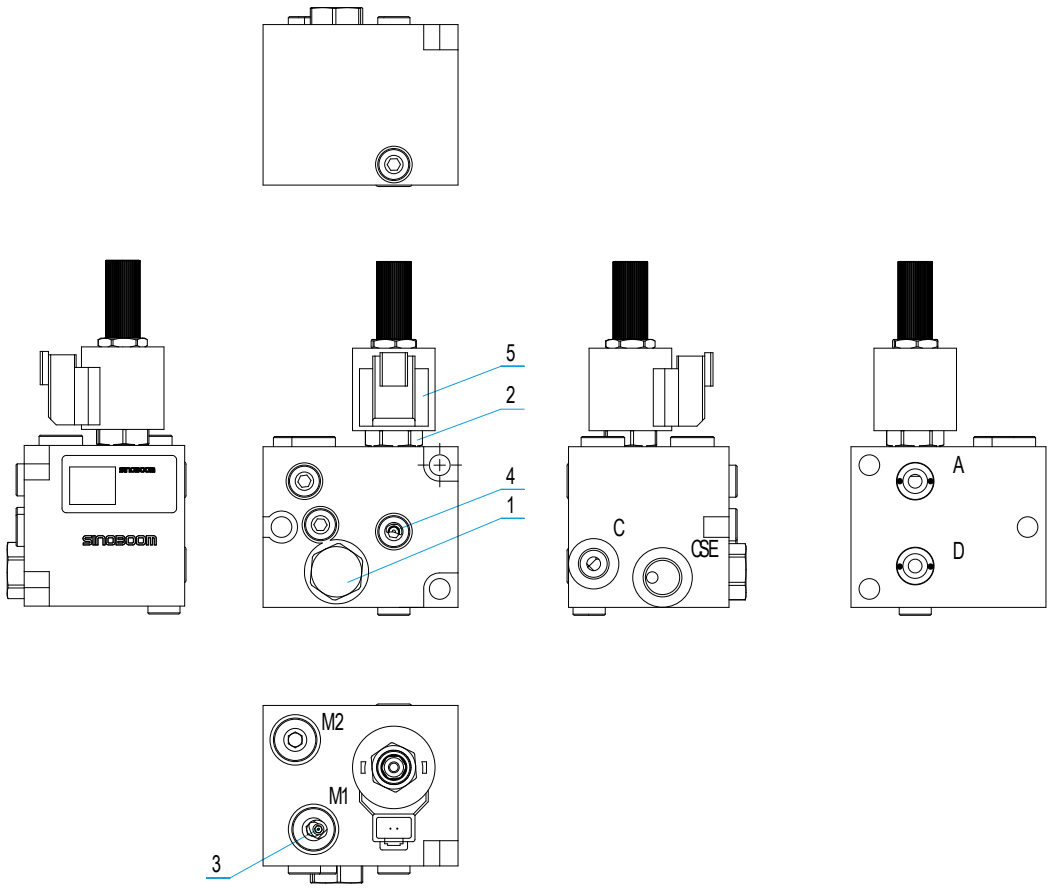


Fig. 2

Table 8-2

No.	Name	Torque	Function
1	Check valve	27 Nm (20 ft-lb)	Keep the fluid flowing in one direction
2	Solenoid valve	27 Nm (20 ft-lb)	Control platform lowering
3	Damper	2 Nm (1.5 ft-lb)	\
4	Damper	2 Nm (1.5 ft-lb)	\

8.2 POWER UNIT

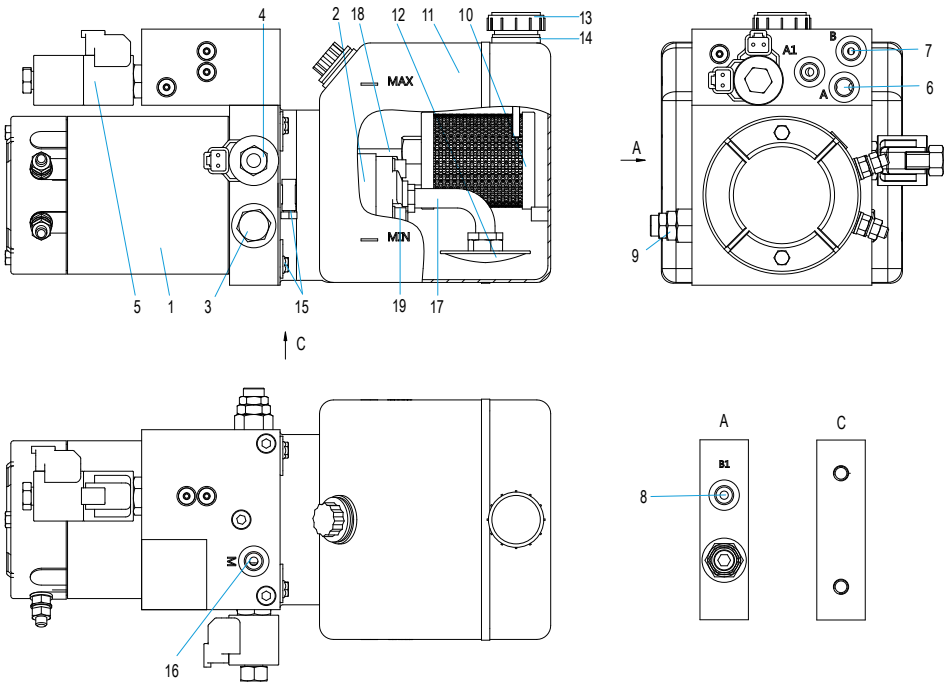


Fig. 3 Diagram of Power Unit (SC: 1000106)

Table 8-3 Description of Power Unit Structure

1. DC motor	**2.** Gear pump	**3.** Check valve
4. 2-position 4-way solenoid valve	**5.** 3-position 4-way solenoid valve	**9.** Overflow valve
10. Oil return filter	**11.** Hydraulic tank	**12.** Suction filter screen
13. Air filter	**14.** Oil drain port	**15.** Hydraulic tank fasteners (bolt, clamp)
16. Pressure measuring port	**17.** Oil suction tube	**18.** Oil return tube
19. Hydraulic pump fasteners		

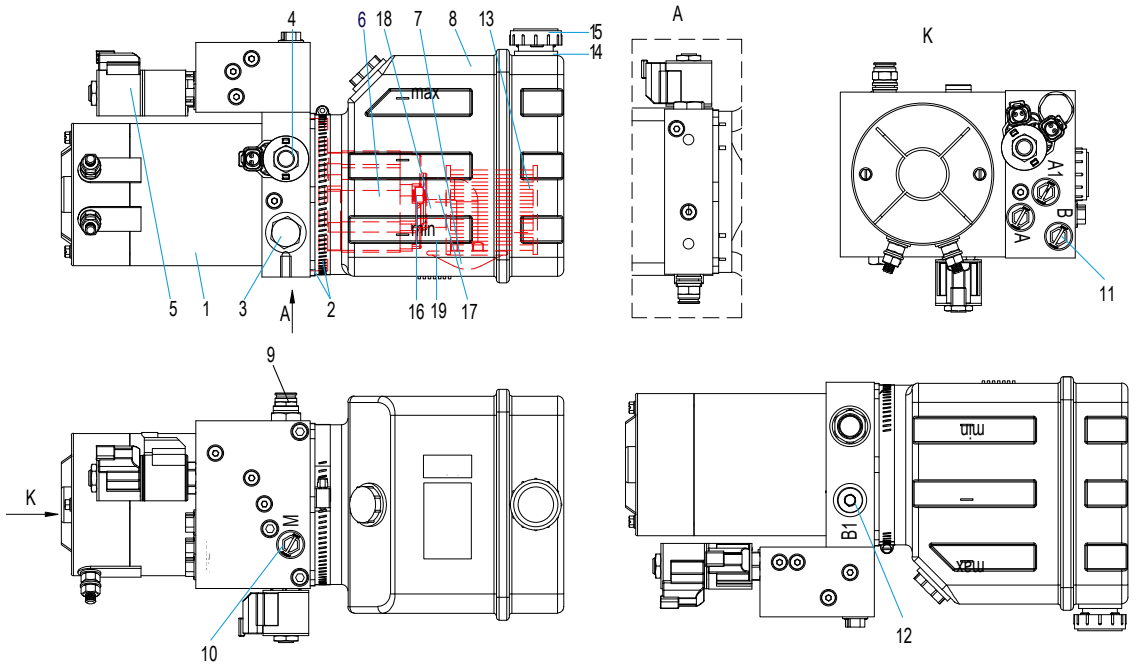


Fig. 4 Diagram of Power Unit (SC: 1000631)

Table 8-4 Description of Power Unit Structure

1. DC motor	**2.** Hydraulic tank fasteners (screw, clamp)	**3.** Check valve
4. 2-position 4-way solenoid valve	**5.** 3-position 4-way solenoid valve	**6.** Gear pump
7. Suction filter screen	**8.** Hydraulic tank	**9.** Overflow valve
10. Pressure measuring port	**13.** Oil return filter	**14.** Oil drain port
15. Air filter	**16.** Hydraulic pump fasteners	**17.** Oil suction tube
18. Return filter tube	**19.** Oil return tube	

Function Valves

The function valves shown in the power unit assembly above serve the following purposes:

Table 8-5

No.	Description	Installation torque	Function
3	Check valve	/	Keep oil flowing in one direction
4	2-position 4-way solenoid valve	34 Nm (25 ft-lb)	Controls platform up/down movements
5	3-position 4-way solenoid valve	9 Nm (7 ft-lb)	Controls wheel steering left/right
9	Overflow valve	27 Nm (20 ft-lb)	Prevents system overpressure

Regulate the Pressure of System Overflow Valve

⚠ WARNING

This procedure must be performed using the platform controller on the ground, instead of on the platform.

1. Use a pressure gauge (range of 25 MPa [3626 psi]) to connect to the pressure test connector on the pressure diagnostic port of the power unit.
2. Turn the ground/platform control selector switch at the ground controller to the platform control position.
3. Pull out the emergency stop buttons on the ground controller and platform controller.
4. Perform a steering action using the platform controller handle to turn the wheels into position. Record the pressure reading on the pressure gauge at this time.
5. If the pressure value is correct (for the specified pressure value of steering, please refer to the ***Pressure Settings***), the system overflow valve requires no pressure adjustment.
6. If the measured values do not match the specified values, the pressure of the system overflow valve needs to be adjusted as follows:
   - Use a wrench to hold the overflow valve and loosen the nut.
   - Adjust the overflow valve pressure with a wrench. Turn clockwise to increase overflow valve pressure, turn counterclockwise to decrease the overflow valve pressure. Repeat until the pressure gauge reads the specified value.
   - Hold the overflow valve with a hex wrench and tighten the nut on the valve.
   - Repeat Step 4 to verify the pressure.

NOTICE

If the pressure value does not change, the hydraulic pump needs repair or replacement.

⚠ WARNING

- **Regulating the pressure improperly may cause machine damage and even serious injury. Do not set the pressure to values beyond the specified range.**
- **After all valves have been properly regulated, be sure to verify the values to avoid potential mistakes.**
- **The hydraulic pump is not equipped with an overflow valve. Overpressure may result in damage. When adjusting the pressure, please be careful not to overpressurize the pump.**
- **All pressure-relief valves have been well regulated before the delivery of machine, so never modify the pressure unless authorized.**

7. Remove the pressure gauge.

Hydraulic pump

Inspection

Perform inspection on the hydraulic pump as per the instructions in ***Regulate the Pressure of System Overflow Valve*** .

Disassembly

⚠ WARNING

- **Before loosening or disassembling hydraulic parts (especially the counterbalance valve on the cylinder), the hydraulic pressure of all hydraulic lines should be released and the hydraulic oil should completely cool down.**
- **Disassemble the hydraulic components slowly to prevent the hydraulic oil from splashing and causing injuries.**

1. Open the right chassis door and locate the power unit.
2. Remove the power unit and place it in a suitable location.
3. Remove the hydraulic tank from the power unit.
4. Remove the oil suction pipe connected to the hydraulic pump.
5. Remove the hydraulic pump fasteners, and slowly remove the hydraulic pump from the valve block.

NOTICE

Extra care should be taken during disassembly to avoid damaging component surfaces.

Installation

For installation, follow the disassembly procedure in reverse order.

Hydraulic Tank

Air Filter

It is recommended to clean the hydraulic tank air filter every 3 months or after 250 hours of operation, and replace it every 6 months or after 500 hours of operation. The replacement interval should be shorter in harsh operating environments.

The steps to check and clean the air filter are as follows:

1. Turn off the machine.
2. Open the right door of the chassis, locate the air filter on the top of the hydraulic tank.
3. Remove the air filter.
4. Check the hydraulic tank air filter: air should pass through the air filter smoothly.
5. If the air cannot pass through the air filter smoothly, clean the air filter with a neutral solvent and dry it using an air gun.
6. Check the air filter again, repeat as necessary until the air passes through the filter smoothly.
7. Install the air filter back onto the tank.
8. Clean up any hydraulic oil that was spilled during the process.
9. Start the machine from the ground.
10. Check the return filter and related components for leakage.

Suction Filter Screen

It is recommended to replace the suction filter screen every year or after 1000 hours of operation. The replacement interval should be shorter in harsh operating environments.

NOTICE

Remove the hydraulic tank before replacing the suction filter screen.

Every time the hydraulic oil is replaced, the suction filter screen should also be replaced.

Return Filter

The return filter of the hydraulic oil tank cannot be replaced separately. Instead, the complete filter needs to be replaced.

It's recommended to replace the hydraulic tank return filter every year or after 1000 operating hours. The replacement interval should be shorter in harsh operating environments.

NOTICE

Remove the hydraulic tank before replacing the hydraulic tank return filter.

8.3 HYDRAULIC OIL

Check the Oil Level

Maintaining the hydraulic oil at a proper level is essential for the normal operation of the machine. If the hydraulic oil level is too high, oil will overflow from the tank during operation. If the hydraulic oil level is too low the oil pump will suck in air during operation, which will lead to component damage.

1. Make sure the platform is in stowed position.
2. Open the right chassis door and visually inspect the side of the hydraulic tank. The hydraulic oil level should be even with the "MAX" scale line of level indicator in the tank.
3. If necessary, fill the tank through the oil filler with suitable hydraulic oil according to the ***Oil Specifications*** , never overfill the tank.
4. Check the hydraulic tank and fittings for leakage.

Check the Cleanliness of the Hydraulic Oil

Check the hydraulic oil. If any of the following conditions are observed the hydraulic oil must be replaced.

- The hydraulic oil is milky white and cloudy.
- The hydraulic oil is black.
- Check a small sample of the hydraulic oil using a bright source of light to see if there are reflections of metal particles or rub the hydraulic oil with two fingers to locate metal particles.
- The hydraulic oil has an unusual smell.

Change the Hydraulic Oil

It is recommended to change the hydraulic oil every year or after 1000 hours of operation. The replacement interval should be shorter in harsh operating environments.

1. Turn off the machine and make sure the hydraulic oil has cooled to room temperature.
2. Open the right chassis door and locate the power unit.
3. Remove the power unit and place it in a suitable location.
4. Unscrew the hydraulic tank air filter and allow the hydraulic oil to drain from the drain port into a suitable container.
5. After all hydraulic oil has been drained completely, install the air filter.
6. Remove the fasteners on the side of the hydraulic tank, then remove the hydraulic tank from the power unit.

NOTICE

Be extremely careful while removing the hydraulic tank; the inside of the hydraulic tank and other components that are mounted to the power unit may get damaged.

7. After cleaning the inside of the tank with a neutral solvent, drain the solvent.
8. Replace the suction filter screen. After the hydraulic tank is dry, reinstall it to the power unit.
9. Reinstall the power unit assembly into its position on the chassis.
10. Fill the tank through the oil filler with suitable hydraulic oil according to the ***Oil Specifications*** , never overfill the tank.

8.4 ADJUST EMERGENCY LOWERING HANDLE

NOTICE

Perform this operation with the platform in an unloaded state.

1. Start the machine and raise the platform so that the safety strut can be fully erected.
2. Erect the safety strut and lower the platform as to ensure that the safety strut provides effective support.

⚠ WARNING

Do not place your hands or other parts of your body under the platform while it is being lowered.

3. Pull out the emergency lowering handle located on the rear of the chassis.
4. Measure the distance from the end of the handle to the mounting nut.
5. If the measured distance is less than or equal to 3 mm (0.12 in), proceed to step 7. If the measured distance is greater than 3 mm (0.12 in), proceed to step 6.
6. Adjust the mounting nut so that the distance from the mounting nut is no more than 3 mm (0.12 in).
7. Start the machine, raise the platform to leave enough space for the safety strut, and then erect the safety strut.
8. Pull the emergency lowering handle outward 2 to 3 times to ensure normal operation.

8.5 LUBRICATE CYLINDER TRUNNIONS

The cylinder is connected to other components via trunnions at both ends. These connection points are typically equipped with grease fittings. It is recommended to lubricate these areas every 3 months or after 250 hours of operation.

NOTICE

If there is no grease fitting on the trunnion, lubrication is not required.

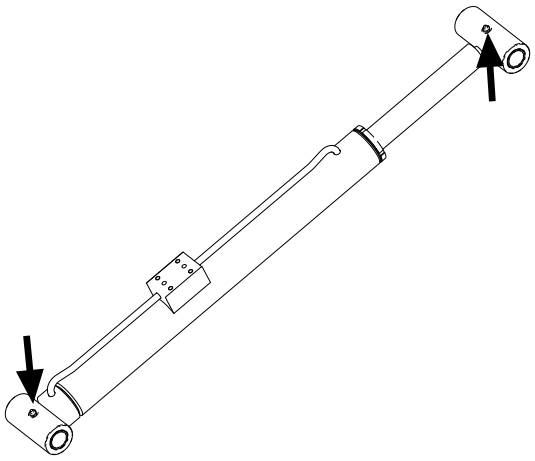


Fig. 5 Grease Fitting Diagram

1. Locate the grease fitting on the cylinder.
2. Remove the grease fitting cap and wipe away any dust from the fitting and surrounding area using a clean cloth.
3. Connect the grease gun securely to the fitting and slowly inject grease until a small amount seeps out from the bearing area.
4. Disconnect the grease gun and wipe off any excess grease around the fitting and bearing.
5. Replace the grease fitting cap, reinstall it securely, and ensure a proper seal.

8.6 CYLINDER DRIFT INSPECTION

A drift of the cylinder is normal within a certain range. In order to ensure normal operation of the machine, it is recommended to conduct a drift inspection on the platform every 3 months or after 250 hours of operation to determine whether a drift inspection of the cylinder is required.

Raise the platform to the highest position, and place a weight equivalent to the rated load on the platform to measure the drift from the platform to the ground with the machine powered off. If the platform drifts down more than 50 mm (1.97 in) in 10 minutes, perform a cylinder drift inspection as per the following procedures.

1. Place the machine in an environment with stable ambient temperature.
2. Raise the platform to the highest position, and place a weight equivalent to the rated load on the platform.
3. Measure drift at the cylinder piston rod with a calibrated dial indicator.
4. The maximum allowable drift for cylinders with different bores is shown in the table below. If the measured value is less than the maximum allowable drift, the cylinder is operating normally. If the measured value is greater than the maximum allowable drift the cylinder is not operating normally. Contact qualified service technicians for inspection and repair.

Table 8-6 Maximum allowable drift for different cylinder bore diameters

Cylinder bore diameter (mm/in)	Maximum allowable drift in 10 minutes (mm/in)
76/3	0.66/0.026
89/3.5	0.48/0.019
102/4	0.38/0.015
127/5	0.22/0.009

Table 8-6 Maximum allowable drift for different cylinder bore diameters (continued)

Cylinder bore diameter (mm/in)	Maximum allowable drift in 10 minutes (mm/in)
152/6	0.15/0.006
178/7	0.13/0.005

NOTICE

The data is based on a cylinder leakage value of 6 drops per minute. Since the hydraulic oil expands and contracts depending on temperature, the tolerance for the cylinder drift is up 7/10000 or 0.07 % for each temperature change of 1°C.

8.7 HYDRAULIC SYMBOLS

Table 8-7

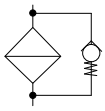
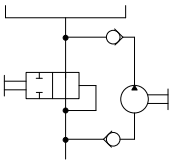
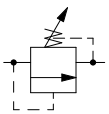
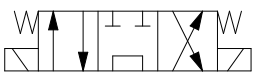
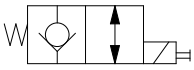
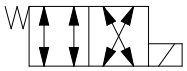
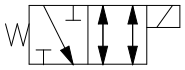
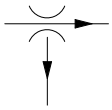
Symbols	Description
	Filter
	Hydraulic motor
	Manual brake release valve
	Overflow valve
	3-position 4-way solenoid directional valve
	2/2-way solenoid directional valve with manual override

Table 8-7 (continued)

Symbols	Description
	2-position 4-way solenoid directional valve
	Directional valve for traveling at high and low speed
	Priority flow valve
	Check valve

8.8 HYDRAULIC SCHEMATIC DIAGRAM

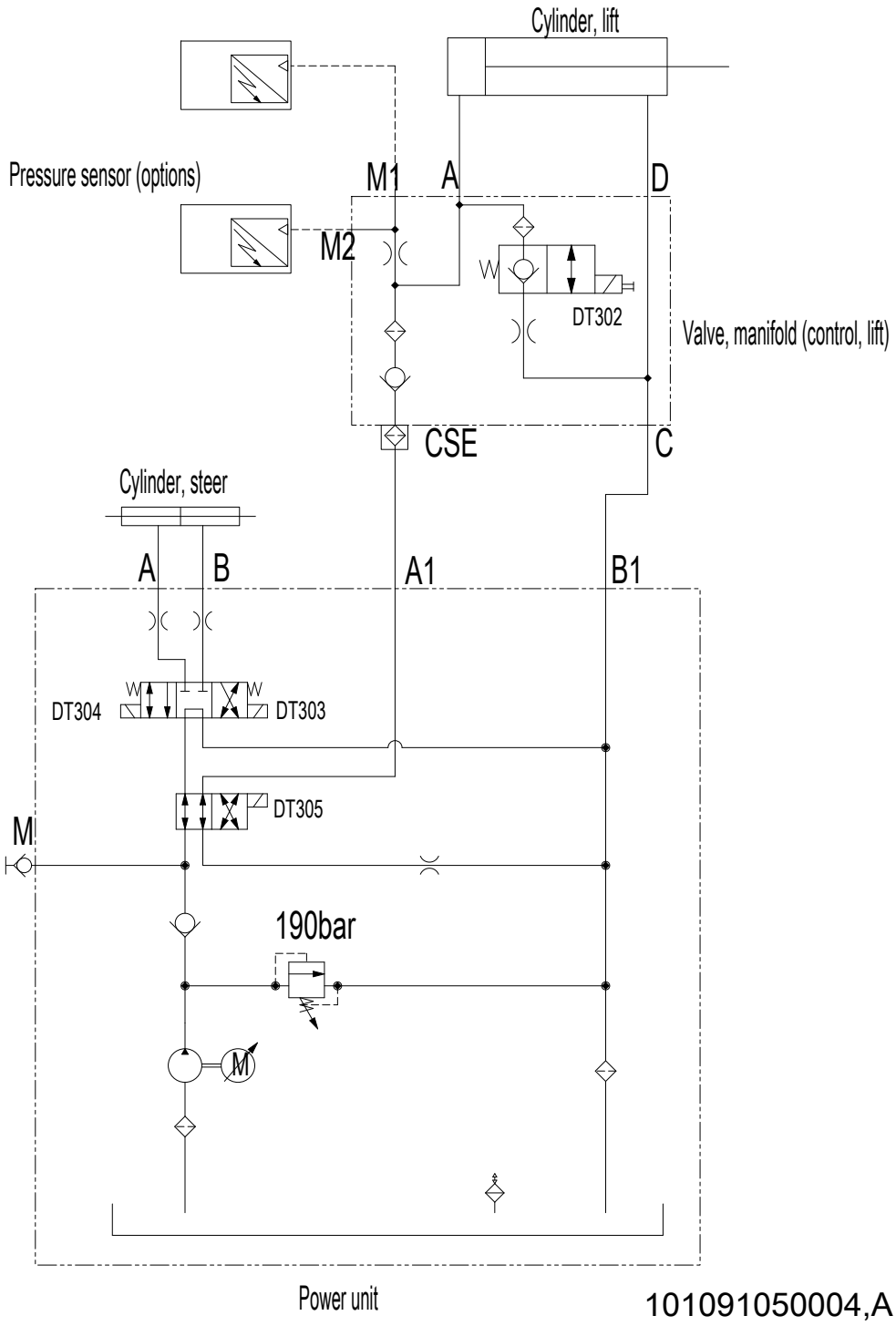


Fig. 6 Hydraulic Schematic Diagram

9 ELECTRICAL SYSTEM

Two 12 V lead-acid batteries in series or one 24V lithium battery are used to supply power to the drive motor and the lift motor to enable traveling, steering and platform lifting/lowering movements.

The batteries are charged via an external power source. A circuit breaker is used to protect the control system.

Proper maintenance of the electrical equipment is essential for the proper and safe operation of the machine. Continued operation of the machine with damaged or corroded electrical components may lead to unsafe situations or severe injuries.

9.1 BATTERY MAINTENANCE

There are three types of batteries that may be used in this machine: Lead-acid battery, maintenance-free lead-acid battery, and lithium battery. The latter two types do not require maintenance.

Maintenance-free lead-acid battery

- Check the cables and fixing nuts monthly for looseness.
- Check the battery housing quarterly for bulging, leaking, or cracking.
- Clean the terminals quarterly to prevent oxidation (wipe with baking soda and apply petroleum jelly or special antioxidant grease). Disconnect the battery before cleaning. And take appropriate protective measures for hands and face.
- Do not leave the battery in a discharged state when storing, otherwise it will shorten its life.

Maintenance-required Lead-acid Battery

Inspection

The battery condition will affect machine performance and operation. The following checks should be performed on the battery at specified intervals.

Daily maintenance

- Check the battery level. The battery should be charged immediately after each discharge or if the SOC is less than 20 %.
- Check electrolyte level. The electrolyte level should be checked after each charging. If the level is low, add water in time.

Weekly maintenance

- Check the wiring harness retaining nuts between the battery cells. Make sure that the retaining nuts are tightened with the correct torque. Refer to the ***Torque Specifications*** section for the tightening torques.
- Inspect the battery wire harness connections. Make sure that the battery harness connections are firmly secured and are free from corrosion. Positive and negative terminals must not be reversed.

> ***NOTICE***
>
> *Improper connection may result in reduced performance and damaged terminals, melting, or even fire.*

- Check whether the inside and outside paint of the battery box shows any damage. If any damage is found, repair the paint immediately to protect the outer box insulation and to prevent corrosion.
- Check the battery compartment for accumulation of water. Clean up any accumulated water immediately.
- Clean the area around the battery. Regularly clean the top of the battery, terminals, and connection points with a mixture of baking soda and water using a cloth or brush. After cleaning, promptly dry with a cloth and apply a thin layer of Vaseline or use terminal protectors. Do not allow the cleaning solution to enter the battery's interior.

> ***NOTICE***
>
> *Adding terminal protectors and anti-corrosion sealants will protect the battery terminals and cables from corrosion.*

Monthly maintenance

- After charging, check and record the voltage of all battery cells or battery pack.
- Check and record the specific gravity of electrolyte and temperature of all battery cells after charging. If there is obvious difference between the measured values of battery cells or between the measured value and previous value, contact professional after-sales staff for inspection and maintenance.

1. Before conducting the inspection, fully charge the battery and let it sit for 24 hours, allowing the battery cells to balance.
2. Wear protective clothing, protective gloves and protective glasses.
3. Remove the battery vent cover.
4. Top up the hydrometer and drain it two or three times, then take a sample of the battery electrolyte.
5. Measure the specific gravity of all battery cells in sequence and note down the readings.
6. If the ambient temperature is above 27 °C (80 °F), add 0.004 to the specific gravity reading for every increase of 5 °C (40 °F). If the ambient temperature is below 27 °C (80 °F), subtract 0.004 from the specific gravity reading for every decrease of 5 °C (40 °F).
   - Result 1: if the specific gravity reading of all battery cells is 1.250 or higher, and the reading difference between any two cells is less than 0.050 proceed with the next step.
   - Result 2: if the specific gravity reading of one or more battery cells is below 1.250, it indicates that the battery is running low and needs charging. After charging, measure the specific gravity reading; if it meets Result 1 proceed with the next step.
   - Result 3: If the specific gravity reading difference between any two cells in the battery pack exceeds 0.050, equalize the battery pack and let it sit for 6 hours before measuring the specific gravity again. If the readings match Result 1 proceed to the next step.

NOTICE

If Result 1 cannot be achieved even after several attempts the battery may be malfunctioning.

7. Check the battery electrolyte level. Make sure the electrolyte level is correct. Add distilled water as needed.
8. Install the battery vent cover.

Annual maintenance

- Check the insulation resistance of the machine and battery.

Add Fluid

NOTICE

- *For lead-acid batteries (requiring maintenance), the electrolyte level should be checked after each charging. If the level is low, add water in time.*
- *The water shall be added after charging. Adding water before charging may cause acid overflows during charging, adversely affecting the usage and service life of battery.*
- *The deionized water or distilled water added shall have a conductivity ≤ 30 μS/cm.*
- *The specific gravity of electrolyte of a new AGM battery added with water shall be 1.27 - 1.29 kg/L.*
- *If excess deionized water has been added, suck it out.*
- *If excess deionized water has been added and electrolyte overflows result, dilute the electrolyte overflows with clear water and suck it dry with a straw.*

Without automatic liquid refilling system

1. Pour the deionized water or distilled water into a measuring glass, and prepare a injector or funnel.
2. Wear rubber gloves, goggles and other protective equipment.
3. Open the filling plug to check the current level. If the electrolyte level of cell is lower than the minimum level, add water immediately.

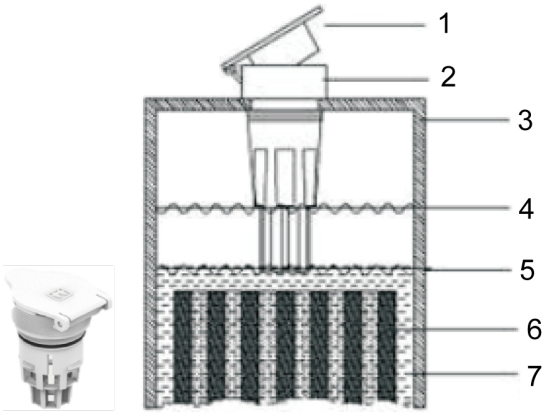


Fig. 1 Electrolyte level diagram

Table 9-1 Electrolyte Level Description

Serial number	Description
1	Flip-top cap
2	Filling plug
3	Battery housing
4	Maximum level
5	Minimum level (adding fluid is required at this level)
6	Electrode plate
7	Electrolyte

4. Use the injector or funnel to add water to the battery until the electrolyte level rises to between the maximum level and minimum level.

Equipped with automatic water refilling system (with water refilling device)

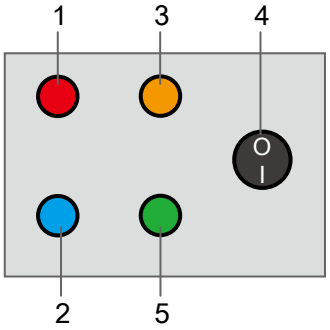


Fig. 2 Diagram of water refilling device panel

Table 9-2 Description of water refilling device panel

Serial number	Description
1	Power indicator (red)
2	Undervoltage indicator (blue)
3	Operating indicator (orange)
4	Switch of water refilling device

Table 9-2 Description of water refilling device panel (continued)

Serial number	Description
5	Saturation indicator (green)

- During normal operation, the power indicator (red) and operating indicator (orange) illuminate steadily;
- If the undervoltage indicator (blue) lights up, stop using the water refilling device and charge the water refilling device.
- When the water refilling device is fully charged, the saturation indicator (green) will light up. Please unplug the charging plug, and the water refilling device can continue to work.
- Position and status of the water refilling device switch:
  - “O” : The switch of water refilling device is in the "OFF" position (off state)
  - “I” : The switch of water refilling device is in the “ON” position (on state).

1. Check if the water refilling device is energized and works normally, and if the water refilling bucket has enough deionized water or distilled water.
2. Before water refilling, visually check the pipelines of the water refilling system to eliminate abnormity and damage.
3. Pull down the latch on the female joint, connect the male joint and unlocked female joint, and then release the latch after connection. Connect the male joint and female joint of water refilling device and automatic water refilling system.

Fig. 3 Diagram of male joint and female joint connection

Table 9-3 Description of male joint and female joint connection

No.	Description
A	Male joint
B	Female joint
C	Male joint and female joint connected

Note: The common diameters of male and female joints are 6mm and 100mm respectively. Ensure the male joint size, female joint size, and filling hose inner diameter are properly matched.

4. Set the switch #4 of water refilling device to the "ON" position to initiate automatic water refilling, and the operating indicator (orange) will illuminate steadily during the process.
5. During the automatic water refilling process, observe the red rotating wheel on the water refilling tube to determine if there is enough deionized water or distilled water in the water refilling bucket, to prevent idle running after the water refilling bucket has running out of water, otherwise the water refilling device may be damaged.

Fig. 4 Red rotating wheel

6. After the white buoy on the automatic water refilling valve floats up to the top, water refilling has been completed. To stop automatic filling, set switch #4 to the "OFF" position.

Fig. 5 Diagram of white buoy position

Table 9-4 Description of white buoy position

No.	Description
A	Water refilling completed
B	Water refilling uncompleted

Equipped with automatic water refilling system (without water refilling device)

1. Pour enough deionized water or distilled water into the water refilling bucket, and connect the water hose to the water outlet. Place the water refilling bucket above the battery stably, ensuring the vertical distance between the battery upper surface and the bucket ≥ 3 m.

Fig. 6 Connect the water hose to the water outlet

2. Pull down the latch on the female joint, connect the male joint and unlocked female joint, and then release the latch after connection. Connect the male joint and female joint of water refilling bucket and automatic water refilling system for automatic water refilling. Observe the water flow in the water hose to determine if the water refilling system operates normally.

Fig. 7 Diagram of male joint and female joint connection

Table 9-5 Description of male joint and female joint connection

No.	Description
A	Male joint
B	Female joint
C	Male joint and female joint connected

Note: The common diameters of male and female joints are 6mm and 100mm respectively. Ensure the male joint size, female joint size, and filling hose inner diameter are properly matched.

3. During the automatic water refilling process, observe the red rotating wheel on the water refilling tube to determine if there is enough deionized water or distilled water in the water refilling bucket, to prevent idle running after the water refilling bucket has running out of water, otherwise the water refilling device may be damaged.

Fig. 8 Red rotating wheel

4. After the white buoy on the automatic water refilling valve floats up to the top, water refilling has been completed.

Fig. 9 Diagram of white buoy position

Table 9-6 Description of white buoy position

No.	Description
A	Water refilling completed
B	Water refilling uncompleted

NOTICE

- *After initial water refilling, check and verify if the battery has been refilled successfully, to prevent refilling failure due to error in water refilling valve model.*
- *Check the water refilling system each quarter to prevent refilling failure of certain cell caused by water refilling valve or pipeline damage.*

Equalization

Equalization is the deliberate process of overcharging the flooded/wet battery after it has been fully charged. Equalize the battery only when its specific gravity is low (less than 1.25) or its specific gravity exceeds the scope (more than 0.030) after the battery is fully charged.

NOTICE

- *Equalization can only be performed on flooded/ wet batteries. Do not balance other types of batteries.*
- *To prevent battery damage, the battery must be equalized after a storage period of up to three months from the date of delivery.*

1. Check the electrolyte level to ensure that it meets the specified requirements.
2. Verify that all vent caps are properly secured to the battery.
3. Set the charger to equalization mode.
4. Charge the battery in equalization mode. The battery will bleed air in the equalization process (forming bubbles).
5. Remove the vent cap every hour to measure the specific gravity of all battery cells, stop charging in equalization mode if the specific gravity doesn't increase any further.

Storage

- Fully charge the battery before placing the machine into storage.
- The battery should be stored in a cool and dry environment (temperature 10℃ - 25℃/50 - 77℉, RH < 90 %). Charge the battery every 3 months using the charger provided by the manufacturer.
- Switch off the power-off switch and the emergency stop switch to eliminate potential hazards associated with electrical leakage.
- The battery will self-discharge gradually during storage. Monitor the specific gravity or the voltage every 4 - 6 weeks. The equivalent values of the state of charge, specific gravity and open - circuit voltage are shown in the following table.

Table 9-7

State of charge (%)	Specific gravity	Open - circuit voltage (V)		
		Battery cell	6 V	12 V
100	1.277	2.122	6.37	12.73
90	1.258	2.103	6.31	12.62
80	1.238	2.083	6.25	12.50
70	1.217	2.062	6.19	12.37
60	1.195	2.040	6.12	12.24
50	1.172	2.017	6.05	12.10
40	1.148	1.993	5.98	11.96
30	1.124	1.969	5.91	11.81
20	1.098	1.943	5.83	11.66
10	1.073	1.918	5.75	11.51

- Recharge the battery in quick charging mode when the battery level is 70 % or lower.
- Recharge the battery before use after taking it out of storage.
- Storage in hot environments (above 32℃/90℉): Avoid exposing the battery to heat sources during storage since the battery self-discharges faster at higher temperatures. If it's necessary to store the battery at higher temperatures monitor the specific gravity or voltage more frequently (approximately every 2 to 4 weeks).
- Storage in cold environments (below 0℃/32℉): Avoid storing the battery in locations that may be exposed to freezing temperatures since the battery may freeze if not fully charged. If the battery is to be stored in cold environments it must be fully charged.

NOTICE

Do not store the battery longer than 6 months in hot or cold environments.

Lithium Battery

The battery condition will affect machine performance and operation. The following checks should be performed on the battery at specified intervals.

Daily maintenance

- Check the battery level. The battery should be charged immediately after each discharge or if the SOC is less than 20 %.

- Charging operations must be supervised by professionals. During the charging process, ensure that the plug and socket are in good contact, that the charging equipment is functioning normally, and that all connection points of the battery pack are in good contact. If any abnormalities occur, they must be repaired before charging can proceed.
- Before charging and discharging, check the battery voltage, temperature, and pressure differences displayed on the BMS monitor to ensure that all values are within the normal range.
- If there is a significant amount of dust, metal shavings, or other debris on the battery pack cover and post, clean it promptly using compressed air; avoid using water or wet objects for cleaning.
- During charging and discharging, prevent water or other conductive objects from splashing onto the battery cover and post, such as when exposed to heavy rain.
- Estimate the required charging and discharging time based on the actual usage state of the battery or battery pack. Pay attention to any abnormalities in the battery or battery pack towards the end of the charging and discharging cycles, such as voltage differences.

Regular maintenance

- Check the voltage data on the BMS display against the actual battery voltage every month to ensure the accuracy of the BMS voltage collection; if they do not match, calibration is necessary, with the difference between the collected voltage and the actual voltage not exceeding 5mV 。
- Check the temperature collection data against the actual temperature value of the BMS every month, with the difference between the collected data and the actual temperature value not exceeding 3°C, to ensure that the battery will not be charged or discharged when the temperature is too high or too low.
- Check the current collection data on the BMS against the actual current values every month; the difference should not exceed 1% to prevent the battery from being charged or discharged by overcurrent.
- Check the conductive strip, voltage collection terminal and other nodes every month for looseness, falling, rust or deformation to ensure that the series and parallel wiring harnesses used in the battery pack are firm and reliable.
- Check for any cracks, deformation, loose post, or bulging in the battery case every month.
- Verify the reliability of the charging equipment every month, ensuring that it follows the voltage and current adjustment signals from the BMS to prevent overcharging.
- Check the discharge protection devices every month, such as high-speed fuses, DC contactors, relays, and air switches, to ensure that the battery pack can be quickly disconnected from the main circuit in case of short circuits or over-currents.
- Test the communication and execution functions of high-voltage electrical equipment of the electric motor controllers every month to ensure that all high-voltage electrical equipment can stop power supply in time when the BMS sends a cut-off signal, and prevent the battery from being over-discharged.
- Check the insulation resistance status every month between the battery pack and the machine body to ensure that the resistance values meet Chinese national standards (≥500Ω/V) to prevent any leakage.

9.2 CHANGE THE CHARGING CURVE

Charger (SC: 1000170)

Note: The charging curve of the charger for lithium batteries does not require any settings, so the following instructions apply to the charger for lead-acid batteries only.

Description of Charger Panel

The charger panels may vary with charger models, so check the model of charger used on your machine to determine the right charger panel for reference.

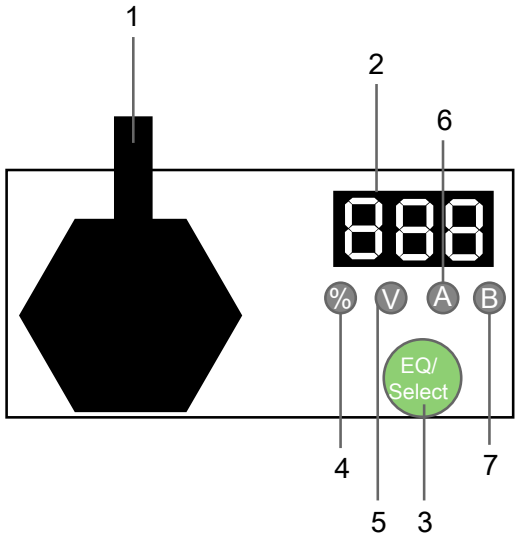


Fig. 10 Charger Panel – Models 2430/2436/3548

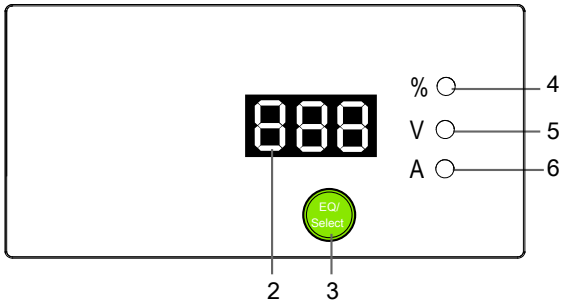


Fig. 11 Charger Panel – Model 1524

Table 9-8

No.	Description
1	Battery program update interface (if equipped)
2	Digital display
3	EQ/Select key
4	Capacity indicator light
5	Charging voltage indicator
6	Charging current indicator
7	Battery voltage indicator

Change the curve:

NOTICE

Determine the right charging curve code based on the battery and charger models used on your machine, refer to ***Chart of Battery Charging Curve Codes*** *.*

1. Press and hold the EQ key for 5 sec to enter the charging curve selection interface, with the current charging curve code displayed on the screen.
2. Press the EQ key to change the charging curve code.
3. After selecting the charging curve code, press and hold the EQ key for 5 sec until the selected charging curve code flashes quickly, and the charging curve will be set.
4. Repeat the steps above if you wish to change the charging curve again.

Enter EQ mode manually:

1. Press and hold the EQ key for 10 sec until the letters EQ flash rapidly on the screen; this means the charger enters the EQ mode.
2. To exit the EQ mode, press and hold the EQ key for 10 sec until the word OFF flashes rapidly on the screen, this means the charger will exit the EQ mode.

Charger (SC: 1000799)

Note: The charging curve of the charger for lithium batteries does not require any settings, so the following instructions apply to the charger for lead-acid batteries only.

Description of Charger Panel

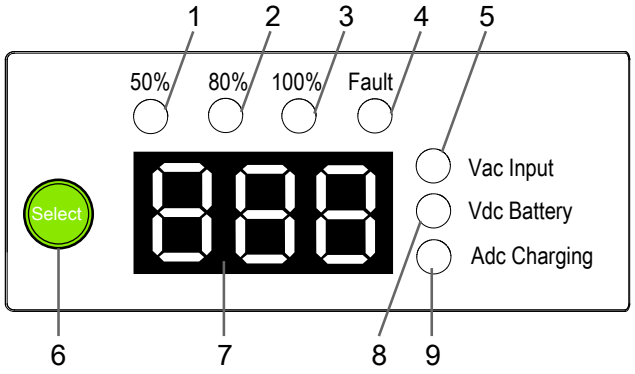


Fig. 12

Table 9-9

No.	Description
1	Charging level indicator
2	Charging level indicator
3	Charging level indicator
4	Fault code indicator
5	Utility supply voltage indicator
6	Select key
7	Digital display
8	Battery voltage indicator
9	Charging current indicator

Change the curve:

NOTICE

Determine the right charging curve code based on the battery and charger models used on your machine, refer to ***Chart of Battery Charging Curve Codes*** *.*

1. Press the Select key, the screen will display the current charging curve code.
2. Keep holding the Select key for 5 sec until the current charging curve code flashes continuously.
3. Press the Select key to change the charging curve code.

4. After selecting the charging curve code, press and hold the Select key for 5 sec until the selected charging curve code flashes continuously; this means the charging curve has been set successfully. Press the Select key again, the screen will display the current charging curve code.
5. Repeat the steps above if you wish to change the charging curve again.

Charger (SC: 1000853)

Note: The charging curve of the charger for lithium batteries does not require any settings, so the following instructions apply to the charger for lead-acid batteries only.

Description of Charger Panel

The charger panels may vary with charger models, so check the model of charger used on your machine to determine the right charger panel for reference.

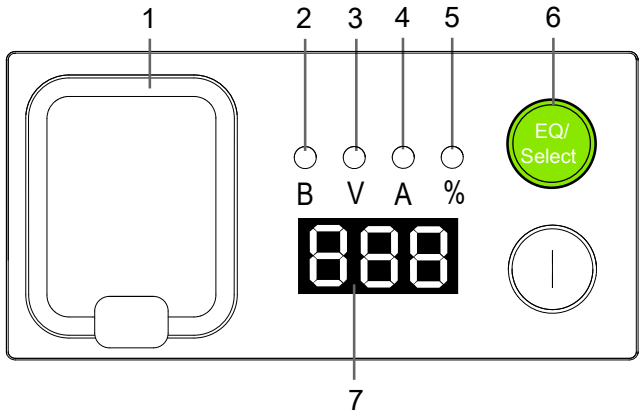


Fig. 13 Charger Panel – Model 4840

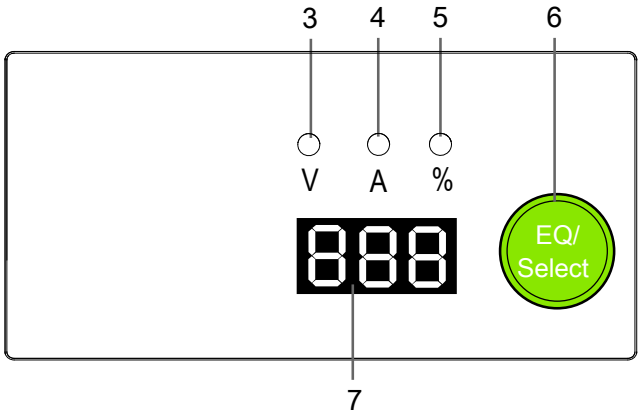


Fig. 14 Charger Panel – Model 1524

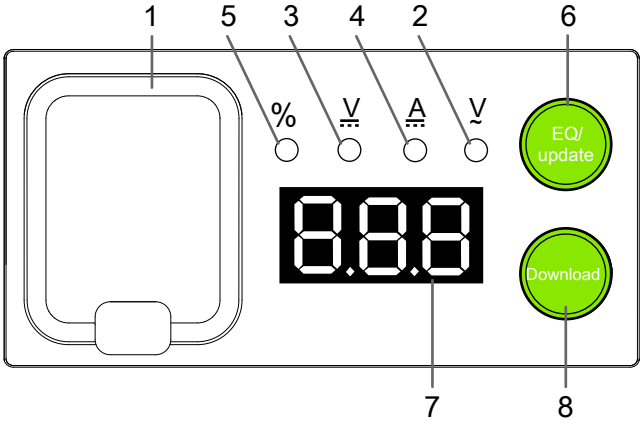


Fig. 15 Charger Panel – Model 2436

Table 9-10

No.	Description
1	USB interface
2	Utility supply voltage indicator
3	Output voltage indicator
4	Output current indicator
5	Battery charge indicator
6	EQ/Select key EQ/update key
7	Display screen
8	Download key

Change the curve:

NOTICE

Determine the right charging curve code based on the battery and charger models used on your machine, refer to ***Chart of Battery Charging Curve Codes*** *.*

1. Press and hold the EQ key for 5 sec to enter the charging curve selection interface, with the current charging curve code displayed on the screen.
2. Press the EQ key to change the charging curve code.
3. After selecting the charging curve code, press and hold the EQ key for 5 sec until the selected charging curve code flashes 3 times consecutively; this means the charging curve has been set. The screen displays the current charging curve code for 5 sec and then enters loop display status.
4. Repeat the steps above if you wish to change the charging curve again.

Table 9-11 Chart of Battery Charging Curve Codes

Chart of Battery Charging Curve Codes										
Battery part number (PN)	**1524****			**3024****		**3624****			**3548****	**4840****
	1000170*	**1000853***	**1000799***	**1000170***	**1000853***	**1000170***	**1000853***	**1000799***	**1000170***	**1000853***
2031000000-48	b48	203	12	/	/	/	/	/	/	/
2031000000-17	/	/	/	b04, B12	/	/	146	27	/	/
2031000000-32	/	/	/	146	/	/	B12	31	/	/
2031000000-33	/	/	/	/	/	/	/	/	263	263
2031000000-78	/	/	/	b04	/	/	146	/	/	/
2031000000-79	/	/	/	146	/	/	B12	/	/	/
2031000000-80 2031000000-76	b48	203	/	/	/	/	/	/	/	/
2031000030-91 2031000032-27	232	202	13	232	/	232	306 (two in series, two in parallel)	22 (two in series, two in parallel)	/	/
2031000030-92 2031000032-29	/	/	/	288	/	288	303	22	288	288
2031000030-90 2031000032-28	/	/	/	252	/	/	303	22	/	/
2031000031-02	159	204	14	b71	/	/	304	16	/	/

Table 9-11 Chart of Battery Charging Curve Codes (continued)

Chart of Battery Charging Curve Codes										
Battery part number (PN)	**1524****			**3024****		**3624****			**3548****	**4840****
	1000170*	**1000853***	**1000799***	**1000170***	**1000853***	**1000170***	**1000853***	**1000799***	**1000170***	**1000853***
				(two in series, two in parallel)			(two in series, two in parallel)	(two in series, two in parallel)		
2031000031-03 2031000031-04	/	/	/	b71	/	/	304	16	/	/
2031000032-00	159	204	14	/	/	/	/	/	/	/
2031000031-55	b47	b47	/	/	/	/	/	/	/	/
2031000031-14	/	/	/	b25	307	b25	308	3	/	/
2031000031-15	/	/	/	b91	307	b91	308	3	/	/

* refers to the supplier code (SC) of the charger;
** refers to the charger specifications.

9.3 ELECTRICAL SYMBOLS

Table 9-12

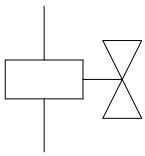
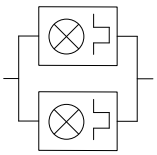
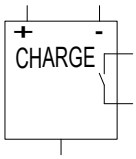
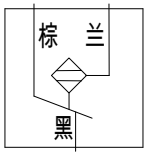
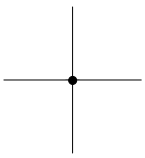
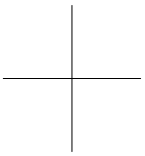
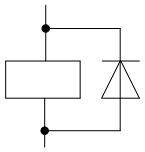
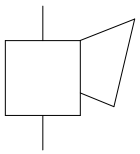
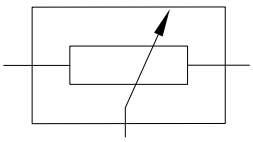
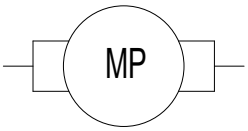
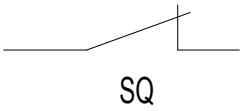
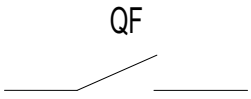
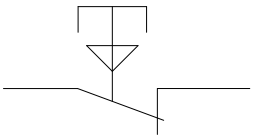
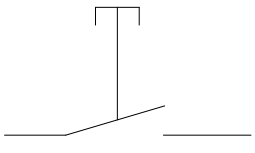
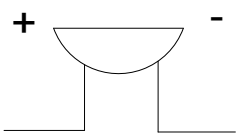
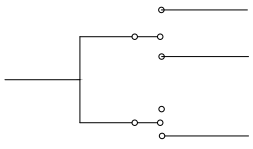
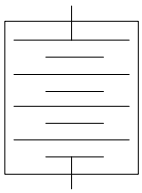
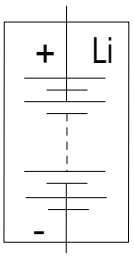
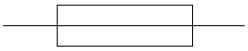
Symbols	Description	Symbols	Description
	Solenoid coil		Warning light
	Charger		Level switch
	Two lines, connected		Two lines, not connected
	Relay		Horn
	Sensor		Pump-controlled motor
	Limit switch		Power-off switch
	Emergency stop switch		Button
	Buzzer		Key switch

Table 9-12 (continued)

Symbols	Description	Symbols	Description
	AGM battery		Lithium battery
	Fuse		

9.4 ELECTRICAL SCHEMATIC DIAGRAM

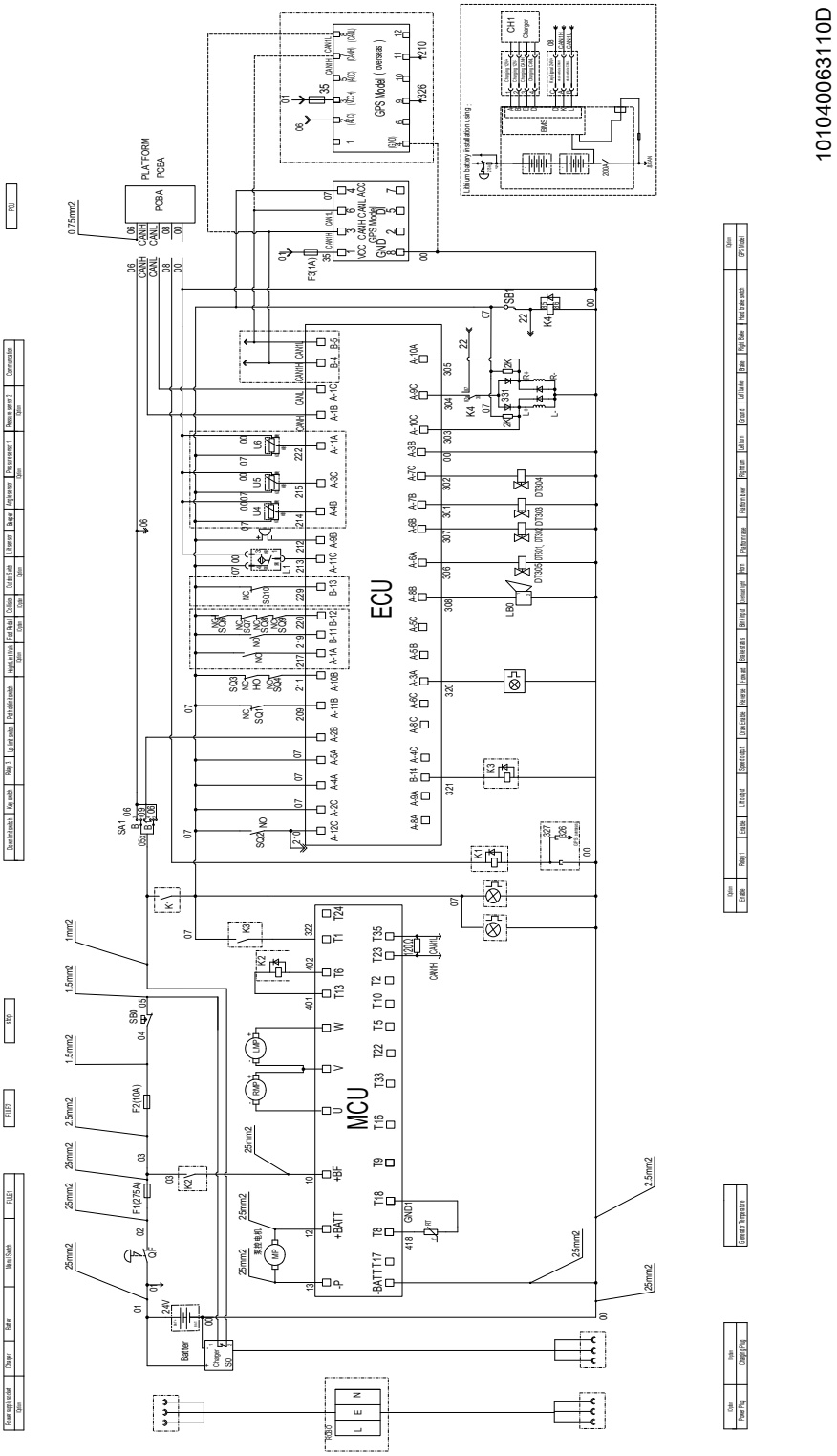


Fig. 16 Electrical Schematic Diagram (Except China)

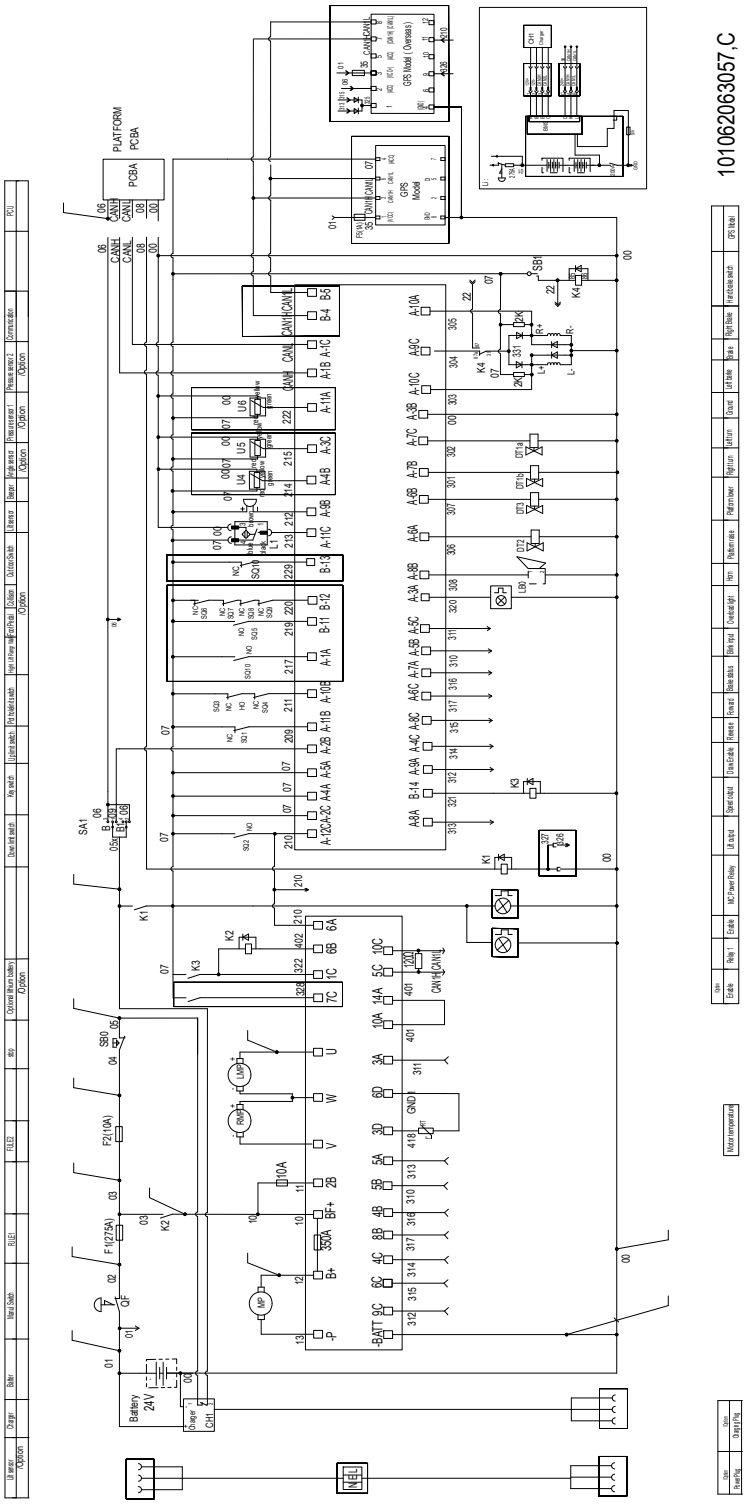


Fig. 17 Electrical Schematic Diagram (ZAPI electric motor controller)

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10 TROUBLESHOOTING GUIDE

10.1 CHARGING FAULTS AND SOLUTIONS

Table 10-1 Charging Faults and Solutions (SC: 1000799)

Fault code	Fault description	Solution
E01	Error in battery terminal connection	Inspect the battery connections.
E02	Abnormal utility supply (voltage or frequency out of working scope)	Check and confirm that the utility supply is within 90 – 240 V.
E03	Abnormal battery temperature	Check whether the battery terminal is working normally.
E04	Excessively high internal temperature	Place the charger in a well-ventilated site, and ensure the surface is free of foreign matters.
E05	Excessively high battery voltage	Check whether the input battery voltage is suitable for the charger.
E06	Communication line not connected	Check whether the communication line at the charger interface is properly connected.

Table 10-2 Charging Faults and Solutions (SC: 1000853)

Fault code	Fault description	Solution
E01	Battery fault	**1.** Check whether the battery terminal is working normally; **2.** Check the battery condition; **3.** Check if the correct charging curve has been selected.
E02	Abnormal AC input	**1.** Check whether the AC power cable is connected properly with the charger; **2.** Make sure that the AC plug is firmly inserted into the outlet; **3.** Check whether the power supply voltage is normal.
E03	Charger overtemperature cutoff	**1.** The charger's internal or ambient temperature is too high. The charger will shut down and enter the overheat protection mode. Put the charger in a well-ventilated environment; **2.** Disconnect the charger, and wait for 15-30 min before reconnecting.
E04	Battery overtemperature/low-temperature cutoff	When the battery temperature exceeds the preset value, the charger will stop output to prevent battery damage due to overtemperature or charging below freezing. After the battery temperature returns to normal, the charger will restart automatically and charge the battery.
E05	Excessively high output current/short circuit	**1.** Check whether the charger output interface is short-circuited;

Table 10-2 Charging Faults and Solutions (SC: 1000853) (continued)

Fault code	Fault description	Solution
		2. Cycle power to the machine, and check whether the fault is removed.
E06	Excessively high battery voltage	Cycle power to the machine, and check whether the fault is removed.
E07	Hardware fault	Cycle power to the machine, and check whether the fault is removed.
BMS(E09)	CAN communication fault	1. Check whether the CAN wiring is normal; 2. Test 12V activation voltage; 3. Check if the right charging curve has been selected; select the right charging curve and then charge the battery.

10.2 FAULTS DESCRIPTION

The machine has a display screen at the ground controller and platform controller respectively for displaying machine fault codes.

Fault code	Fault name	Solution	Movement disabled
01	Main System Fault	System Initialization Error: ECU may be faulty, replace ECU.	All movements
02	Communication Fault Between Platform Controller and Ground Controller	ECU System Communication Error: 1. Check the communication cable and other wiring connections between platform and chassis. 2. If the problem persists, it's recommended to replace the PCU or ECU.	All movements
04	Motor Drive Heartbeat Lost	1. Check whether the connections between the MC and the ECU is correct. 2. Check whether the configuration options of the MC in the ECU are correct. 3. If the problem persists, please try to replace the MC.	All movements
06	Level Inclination Sensor Heartbeat Fault	Multi-angle Sensor Heartbeat Lost: 1. Check if there is an open circuit in the wiring between the angle sensor end and the ECU end. 2. If the circuit is normal, check whether the angle sensor has correct configuration option. 3. If the problem persists, try to replace the angle sensor.	All movements
09	GPS Communication Heartbeat Lost	GPS Communication Fault: 1. Check the communication cable and other wiring connections between GPS and ECU. 2. If the problem still exists, check the binding relationship or replace the GPS module.	All movements

Fault code	Fault name	Solution	Movement disabled
10	Indoor/Outdoor Mode Error	Indoor models are prohibited from using outdoor mode, otherwise an alarm will be triggered. To clear the alarm, please switch to indoor mode.	Alarm only
12	Chassis Control Button Fault	Upward and Downward Toggle Switch Fault: **1.** Check whether the toggle switch or button on the ECU is accidentally triggered or pressed. **2.** If the toggle switch or button status is normal, inspect the wiring connections between the toggle switch and the ECU buttons. **3.** If the problem persists, please try to replace the ECU.	Ground control
18	Pothole Guard Fault	Pothole Guard Fault: **1.** Check whether the pothole guard plate is properly deployed during operation. **2.** If the pothole guard can deploy normally, inspect the pothole guard limit switch and its wiring for proper functioning. **3.** If the issue persists, examine the lower limit switch and its wiring for any faults.	Lifting and travel
20	BMS Communication Fault – Lithium Battery	BMS Comm. Fault: **1.** Check the communication cable and other wiring connections between ECU and BMS. **2.** If this does not solve the problem, please contact Sinoboom aftersales staff.	Lifting and travel
30	GPS Level I Alarm	Please contact Sinoboom aftersales staff.	Alarm only
31	Pressure Sensor 1 Fault	Pressure Sensor 1 Fault: **1.** Check if the sensor and its wiring are normal. **2.** Check whether the configuration options of sensor in the ECU are correct. **3.** If this does not solve the problem, please contact Sinoboom aftersales staff.	All movements
32	Angle Sensor Fault	Angle Sensor Fault: **1.** Check if the sensor and its wiring are normal. **2.** Check whether the configuration options of sensor in the ECU are correct. **3.** If this does not solve the problem, please contact Sinoboom aftersales staff.	All movements
35	Pressure Sensor 2 Fault	Pressure Sensor 2 Fault: **1.** Check if the sensor and its wiring are normal. **2.** Check whether the configuration options of sensor in the ECU are correct. **3.** If this does not solve the problem, please contact Sinoboom aftersales staff.	All movements

Fault code	Fault name	Solution	Movement disabled
36	Low Battery Level Pre-alarm	Low Battery Level Alarm: Battery level is low, charge the battery.	Lift limited, travel restricted to low speed
38	GPS Level II Pre-alarm	Please contact Sinoboom aftersales staff.	Alarm only
39	GPS Level II Alarm	Please contact Sinoboom aftersales staff.	Lifting
40	GPS Level III Pre-alarm	Please contact Sinoboom aftersales staff.	Alarm only
41	GPS Level III Alarm	Please contact Sinoboom aftersales staff.	All movements
42	Platform Left Turn Button Error	Platform left turn switch ON at power-up error: **1.** Check whether the joystick's left turn button has been erroneously pushed or pressed. **2.** If the button is normal, try replacing the joystick or PCU.	Alarm only
43	Platform Right Turn Button Error	Platform right turn switch ON at power-up error: **1.** Check whether the joystick's left turn button has been erroneously pushed or pressed. **2.** If the button is normal, try replacing the joystick or PCU.	Alarm only
45	Dual Oil Pressure Differential Excessive Alarm	**1.** Check if the sensor and its wiring are normal. **2.** Check whether the configuration options of oil pressure sensor in the ECU are correct. **3.** If the problem persists, try to replace the oil pressure sensor.	Lifting and travel
46	Platform Enable Switch Fault	Joystick enable switch ON at activation error: **1.** Check whether the joystick's enable switch has been pressed or pushed down. **2.** If the enable switch is normal, check whether the zero parameter settings are correct. **3.** If this does not solve the problem, please try to replace the joystick or PCU.	Platform control
47	Platform Joystick Center Offset	Joystick Not in Zero Position Error at Startup: **1.** Check whether the joystick is in the zero position (vertical position). **2.** Check whether the zero position parameter settings are correct. **3.** If this does not solve the problem, please try to replace the joystick or PCU.	Lifting and travel
50	Input-Output Comparison Error	Input-output comparison error: **1.** Check whether the wiring between each sensor end and ECU end are open or short-circuited. **2.** Check whether the relevant parameters are turned on or off. **3.** If the problem persists, please try to replace the ECU.	Lifting and travel

Fault code	Fault name	Solution	Movement disabled
52	Forward Coil Fault	Forward coil (solenoid valve) error: **1.** Check whether the wiring of the coil is normal. **2.** Check the coil for open/short circuit. **3.** If the problem persists, please try to replace the solenoid valve.	Lifting and travel
53	Reverse Coil Fault	Reverse coil (solenoid valve) error: **1.** Check whether the wiring of the coil is normal. **2.** Check the coil for open/short circuit. **3.** If the problem persists, please try to replace the solenoid valve.	Lifting and travel
54	Lift Up Coil Fault	Lift coil (solenoid valve) error: **1.** Check whether the wiring of the coil is normal. **2.** Check the coil for open/short circuit. **3.** If the problem persists, please try to replace the solenoid valve.	Lifting and travel
55	Lift Down Coil Fault	Lowering coil (solenoid valve) error: **1.** Check whether the wiring of the coil is normal. **2.** Check the coil for open/short circuit. **3.** If the problem persists, please try to replace the solenoid valve.	All movements
56	Right Turn Coil Fault	Right turn coil (solenoid valve) error: **1.** Check whether the wiring of the coil is normal. **2.** Check the coil for open/short circuit. **3.** If the problem persists, please try to replace the solenoid valve.	Lifting and travel
57	Left Turn Coil Fault	Left turn coil (solenoid valve) error: **1.** Check whether the wiring of the coil is normal. **2.** Check the coil for open/short circuit. **3.** If the problem persists, please try to replace the solenoid valve.	Lifting and travel
68	Low Battery Voltage Fault	Total Voltage Low Fault 2: **1.** Check whether the wiring between the battery and ECU is normal. **2.** Check the voltage between the battery and ECU. **3.** Charge the battery.	All movements
80	Over 80% Load Warning	Over 80% load warning: This indicates that the platform load is approaching the maximum load capacity. Please try not to increase the load.	Alarm only
81	Driver Fault Alarm	Right drive motor short circuit error: **1.** Check if the motor and its wiring are normal. **2.** Check the motor for short circuit.	Lifting and travel

Fault code	Fault name	Solution	Movement disabled
82	Left Brake Coil Fault	Left brake coil error: **1.** Verify the tightness of the coil terminal connections. **2.** If the connections are normal, check whether the coil is open or short-circuited.	Lifting and travel
83	Right Brake Coil Fault	Right brake coil error: **1.** Verify the tightness of the coil terminal connections. **2.** If the connections are normal, check whether the coil is open or short-circuited.	Lifting and travel
84	Brake Signal Not Feedback from Driver	Check whether the wiring between the controller and the motor is correct.	Lifting and travel
93	BMS System Fault	BMS system fault: **1.** Check the communication cables for short/open circuit. **2.** Check relevant parameter settings.	Lifting and travel
94	Lower Limit Switch Calibration Error	Check the installation of the lower limit switch and perform height recalibration again.	Lifting and travel
CH	Ground Control Mode	Reminder only. The ground/platform control selector switch is currently in the ground control position. Related functions can only be operated in ground control position, and platform control inputs will be invalid. To exit the ground control mode: turn the ground/ platform control selector switch to platform control position.	Reminder only.
CL	Lifting Guarding Warning	Lifting guarding switch warning: **1.** Lifting guarding device triggered – platform raised and obstacle detected, activating the limit switch. To clear the alarm: lower the platform to clear obstruction. **2.** If alarm persists without limit switch activation, verify proper operation of the limit switch.	Lifting and travel
Ft	Foot pedal not depressed	Foot pedal not depressed: Footswitch not engaged – operating handle without depressing the footswitch triggers the alarm. To clear the alarm: depress and hold the footswitch before operating the handle. If alarm triggers when foot switch is depressed, inspect foot switch functionality.	Platform control
HE	Indoor and outdoor limit switch calibration error	Check the installation of the indoor and outdoor limit switch and perform height recalibration again.	Lifting and travel
Ld	Elevated Travel Limit	Check whether the elevated travel limit configuration is turned on in the ECU.	Travel function
LF	Angle Value Abnormal Alert During Descent	**1.** Check if the angle sensor values in the ECU are normal.	All movements

Fault code	Fault name	Solution	Movement disabled
		2. Inspect for any abnormalities during platform descent.	
LL	Machine Tilt Fault	**1.** Excessive tilt angle – machine inclination in the operating position exceeds the maximum allowed tilt. To clear the alarm: lower the platform to non-operating position. **2.** If the actual tilt angle is within permissible range, check the level switch and its wiring.	Travel and lifting
LO	Indoor/Outdoor Mode Switch Error	Indoor/outdoor mode selector switch operated in the operating position. To clear the alarm: return the switch to its original position.	Lifting and travel
OL	Overloaded Platform Fault	**1.** Overload in operating position – platform load exceeds the maximum allowable load in operating position. To clear the alarm: immediately reduce load. **2.** If the load on the platform does not exceed its rated load capacity, check if the weighing sensor and its wiring are normal.	All movements
PL	Overloaded Platform Warning	**1.** Overload in non-operating position – platform load exceeds the maximum allowable load in non-operating position. To clear the alarm: immediately reduce load. **2.** If the load on the platform does not exceed its rated load capacity, check if the weighing sensor and its wiring are normal.	All movements
SL	Standby mode	Machine in standby mode To exit the standby mode: turn the ground/platform control selector switch to platform control position.	All movements

10.3 BASIC TROUBLESHOOTING

Table 10-3

Fault	Cause	Solution
Machine has no power	Machine is not powered on.	• Check whether the ground/platform control selector switch is in the center position. • Check whether the emergency stop button on the platform controller or ground controller has been pressed down • Check whether the platform controller is malfunctioning. • Check whether the ground controller is malfunctioning
Machine communication fault	CAN equipment offline	• Check whether the power supply cable or communication cables are inserted incorrectly or loosely.

Table 10-3 (continued)

Fault	Cause	Solution
		• Check whether the plug pins of the connecting cable between the platform and chassis are wired incorrectly, or whether the connection is not secure. • Check whether the platform controller is malfunctioning. • Check whether the controller plug of the ground/platform controller is wired incorrectly, or whether the connection is not secure.
No response to ground controller operations	/	• Check whether the ground/platform control selector switch has been set to the ground control position. • After the software was re-downloaded to the ground controller, the system was not reset (power off/restart). • Check whether the ground controller is malfunctioning
No response to platform controller operations	/	• Check whether the ground/platform control selector switch has been set to the platform control position. • After the software was re-downloaded to the platform controller, the system was not reset (power off/restart). • Check whether the platform controller is malfunctioning.
A tilt alarm occurs with the machine in level position.	Level sensor error	• Check whether the level sensor is inserted incorrectly or loosely. • Check whether the level sensor is malfunctioning.
With the unloaded machine in a level position, the platform cannot be lowered using the ground controls.	Lowering valve malfunction	• Check whether the digital input plug is inserted properly and firmly • Check whether the wiring of the plug switch is malfunctioning • Check whether the lowering valve is malfunctioning or whether the lead is connected properly.
The platform cannot be lowered using the platform controller; no alarm present.	Staged lowering function	• Reset the handle and perform the lowering operation again.
With no load and the platform in its lowest position, the platform cannot be raised using the ground controls.	Height calibration is wrong/the lift valve is malfunctioning	• Check whether the digital input plug is inserted properly and firmly • Check whether the wiring of the plug switch is malfunctioning • Check whether the lifting valve is malfunctioning or whether the lead is not connected. • Repeat the height calibration.

Table 10-3 (continued)

Fault	Cause	Solution
In indoor mode and with no load, the platform cannot be lifted to its maximum height.	The height has not been calibrated/the travel switch is incorrectly set.	• Carry out height calibration. • Change the settings of the travel switch.
The platform has not reached its maximum height but stops rising further.	The upper limit travel switch is set incorrectly/the machine is in outdoor mode.	• Check the calibration status of the upper limit travel switch • Check whether the machine is in outdoor mode.
An overload alarm is present despite the fact that there is no load on the platform.	No weight calibration has been carried out yet/first time lifting.	• Calibrate weight
Forward traveling function fails without warning	Forward traveling function malfunction	• Check whether the PWM plug of the ground controller is inserted correctly and firmly. • Check whether the forward valve has been connected wrongly or is malfunctioning. • Check whether the ground controller is malfunctioning
Reverse traveling function fails without warning	Reverse traveling function malfunction	• Check whether the PWM plug of the ground controller is inserted correctly and firmly. • Check whether the reverse valve has been connected wrongly or is malfunctioning. • Check whether the ground controller is malfunctioning
The machine is overloaded but no overload alarm is present.	Pressure sensor malfunction	• Perform pressure sensor calibration • Check the wiring of the pressure sensor for any abnormalities. • Check whether the pressure sensor is malfunctioning.
No continuous machine travel possible after tires installed (machine travels intermittently).	Battery level low/incorrect calibration	• Re-calibrate parameters • Check the battery level
Parameters after setting could not be saved successfully after several attempts.	Saving error	• Check whether the set parameters are within the threshold values. • Check whether the ground controller is malfunctioning. • Software error, program needs to be upgraded

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11 FUNCTIONS AND CONTROLS

11.1 MACHINE POSITIONS

The machine positions/states covered in this manual are stowed position, transport position, operating position, and non-operating position. Each position is described in detail below:

- **Stowed position:** the scissor arms are fully retracted.
- **Transport position:** the scissor arms and the platform extension are fully retracted.
- **Operating position (elevated):** the scissor arms are elevated until disengaged from the down limit switch.
- **Non-operating position:** the scissor arms are not disengaged from the down limit switch.

Note: When the scissor arms are disengaged from the down limit switch, the platform height range (from the ground to the platform floor) shall be: 1.5 – 1.8 m (4 ft 11 in – 5 ft 10 in)

11.2 DRIVE FUNCTION

Driving at a speed that is appropriate for the given circumstances is essential for ensuring machine safety. The drive function should respond quickly and smoothly to the operator's control inputs. Travel operation should be normal, without vibration, impact, and abnormal noise across the full controllable speed range. To ensure proper functioning of the drive system and to check its condition, it is recommended to check the drive functions every 3 months or every 250 hours of operation.

Select a flat, level, unobstructed and solid surface to perform the following tests with the stowed platform carrying one person:

1. Mark two straight lines on the ground at a distance of 30 m (98.4 ft) from each other as the test start and stop lines.
2. Start the machine.
3. Set the machine to travel and steer mode and high travel speed mode. Press and hold the enable switch on the joystick and push the joystick forward to the full drive position.
4. Ensure the machine is traveling at the maximum travel speed when the front wheel touches the test start line, start timing.
5. Stop the timer when the front wheel touches the test stop line.
6. Calculate the travel speed using the measured data, and compare it with the specified maximum travel speed in stowed position.

NOTICE

If the result exceeds the maximum stowed travel speed by 10 % or more, turn off and tag the machine, and contact a qualified service technician for inspection and repair.

11.3 BRAKING FUNCTION

Proper functioning of the brakes is essential for the safe operation of the machine. The brakes should respond to the operator's control inputs quickly and smoothly without any abnormal noise. To ensure proper brake functioning and to check their condition, it is recommended to check the brakes every 3 months or every 250 hours of operation.

Ensuring the machine's braking distance is within the normal range is an important indicator of the braking function being normal. Select a flat, level, unobstructed and solid surface to perform the following tests with the stowed platform carrying one person:

1. Verify that the machine's brakes have not been released.
2. Mark a test line on the ground as a reference.
3. Start the machine.
4. Set the machine to travel and steer mode and high travel speed mode. Press and hold the enable switch on the joystick and push the joystick forward to the full drive position.
5. Ensure the machine is traveling at high speed when the front wheels touch the test start line, then release the joystick quickly.
6. Measure the horizontal distance between the test line and the contact point between the front wheel and the ground, which is the braking distance.
7. Compare the measured distance with specified braking distance at full travel speed.

NOTICE

If the measured distance exceeds the specified maximum braking distance, immediately lower the platform to the stowed position, turn off and mark the machine, and contact a qualified service technician for inspection and repair.

11.4 POTHOLE PROTECTION DEVICE

Function of pothole protection device: when the platform rises to a certain height, the pothole protection device will extend to a vertical position and move close to the ground. When the machine is driven into a pothole the plate on the pothole protection device will support on the ground and prevent the machine from tipping over. It is recommended to check the pothole protection device every 3 months or after 250 hours of work.

Select a flat, level, unobstructed and solid surface to perform the following tests:

1. Start the machine.
2. When raising the platform from the stowed position to the operating position, the pothole protection devices on the left and right sides of the chassis should be fully extended to be perpendicular to the ground.
3. Forcefully push the pothole protection device from the outside inwards – it should not be flipped.
4. When the platform is lowered to the non-operating position, the pothole protection device will be retracted.
5. Place a 50 mm (2 in) high wooden block under the pothole protection device on the left side of the chassis.
6. Raise the platform to the operating position, the buzzer will sound, and the display will show the pothole protection fault code “18”, the platform lift and traveling/steering functions will be disabled, and only platform lowering will be permitted.
7. Lower the platform to the stowed position and remove the wooden block from under the pothole protection device on the left side of the chassis.
8. Perform the same test from step 5 on the pothole protection device on the right side of the chassis.

NOTICE

If the pothole protection device is found to be not working properly during the test, immediately lower the platform to the stowed position, turn off and tag the machine, and contact a qualified service technician for inspection and repair.

11.5 TILT PROTECTION FUNCTION

The proper functioning of the tilt sensing system is essential for the safe operation of the machine. It is recommended to check the tilt sensing system every 3 months or after 250 hours of operation.

Select a flat, level, unobstructed and solid surface to perform the following tests:

1. Start the machine.
2. Drive the machine so the two wheels on the left (or right) side travel on a slope with an angle greater than 1.5°.
3. From the ground using the platform controller, lift the platform to operating position. Once the machine has reached the operating position, the buzzer sounds, the display shows the machine tilt fault code "LL", the lifting and driving functions are restricted, and the platform can only be lowered.
4. After lowering the platform to a non-operating position, drive the machine off the slope.
5. Drive the machine so that the two front (or rear) wheels are positioned on a slope with an angle greater than 3°.
6. From the ground using the platform controller, lift the platform to operating position. Once the machine has reached the operating position, the buzzer sounds, the display shows the machine tilt fault code "LL", the lifting and driving functions are restricted, and the platform can only be lowered.
7. After lowering the platform to a non-operating position, drive the machine off the slope.

NOTICE

If during the test it is found that the machine's movements are not restricted as expected, lower the platform to the stowed position, shut down the machine, tag it accordingly, and contact qualified maintenance technicians for inspection and repair.

11.6 OVERLOAD LIMIT FUNCTION

The rated load capacity of the platform is clearly specified in the ***Machine Specifications*** section of this manual, and if the platform is overloaded, the overload limit system will restrict the machine’s operation.

The overload limit function is essential for the safe operation of the machine. Any malfunction may affect the stability of the machine. It is recommended to check the overload limit function every 3 months or after 250 hours of operation.

Select a flat, level, unobstructed and solid surface to perform the following tests with no load on the platform:

For models not equipped with pressure sensor

1. Start the machine.
2. Fully raise and lower the platform twice from the ground controller to ensure that the machine displays no obvious vibration or abnormalities, and is properly lubricated.
3. After lowering the platform to the stowed position, gradually apply load to the platform based on the machine's rated load capacity.
4. As long as the weight on the platform is less than or equal to the rated load capacity the platform can be lifted to its highest position.
5. When the platform load weight exceeds 1.25 times the platform's rated load capacity, the platform lifting action is restricted. Once the excess load is removed, lifting will resume normal.

NOTICE

If during the test it is found that the machine's movements are not restricted as expected, lower the platform to the stowed position, shut down the machine, tag it accordingly, and contact qualified maintenance technicians for inspection and repair.

NOTICE

Low temperature will increase the viscosity of hydraulic oil; thicker oil will significantly impact the pressure detection. If the temperature difference between the place of delivery and the manufacturer's facilities is ≥ 10° C (50° F), or if the temperature of the hydraulic oil is less than 15° C (59° F) the machine may not be able to lift a platform that is loaded to the rated capacity.

For models equipped with pressure sensor

1. Start the machine.
2. Fully raise and lower the platform twice from the ground controller to ensure that the machine displays no obvious vibration or abnormalities, and is properly lubricated.
3. As long as the weight on the platform is less than or equal to the rated load capacity the platform can be lifted to its highest position.
4. After lifting the platform to the non-operating position, gradually apply load to the platform according to the rated load capacity of the platform. When the platform load weight is greater than 1.2 times of the rated platform load, the buzzer will sound, the display shows the platform overload fault code "PL", the lifting and travel functions will be restricted, but the platform is only allowed to lower. After the excess load is removed, all functions will be resumed.
5. After lifting the platform to the operating position, gradually apply load to the platform according to the rated load capacity of the platform. When the platform load weight is greater than 1.2 times of the rated platform load, the buzzer will sound, the display shows the platform overload fault code "OL", and all functions will be disabled. After the excess load is removed, all functions will be resumed.

NOTICE

If during the test it is found that the machine's movements are not restricted as expected, lower the platform to the stowed position, shut down the machine, tag it accordingly, and contact qualified maintenance technicians for inspection and repair.

NOTICE

Low temperature will increase the viscosity of hydraulic oil; thicker oil will significantly impact the pressure detection. If the ambient temperature difference between the place of end customer and that of the machine manufacturer is ≥ 10℃ (50°F), or if the hydraulic oil temperature is lower than 15℃ (59° F), the actual rated load will be smaller than the standard rated load and an alarm will be triggered (the "OL" symbol appears on the platform or the ground controller screens). Please re-calibrate the weighing sensor.

11.7 STAGED LOWERING FUNCTION

In order to reduce the risk of crushing and collision with obstacles while lowering the platform, the machine is equipped with a staged lowering function to be used while lowering the platform from the platform controls. It is recommended to check the staged lowering function every 3 months or after 250 hours of operation.

Note: Some models with special configurations do not have this feature.

Select a flat, level, unobstructed and solid surface to perform the following tests:

1. Start the machine and raise the platform to the highest position.
2. Activate the platform lift mode from the ground using the platform controller, press and hold the enable button on the joystick and pull the joystick back. The platform will lower.
3. Once the platform is lowered to the non-operating position, the machine will stop lowering automatically.
4. Release the joystick to the neutral position.

5. Repeat step 2 to re-activate the platform lowering function, the platform will continue lowering 5 sec later.

NOTICE

If during testing it is found that the staged lowering function is not working, immediately lower the platform to the stowed position, turn off and mark the machine, and contact a qualified service technician for inspection and repair.

11.8 EMERGENCY LOWERING FUNCTION

When the power unit fails, the emergency lowering function can be used to lower the platform into place. It is recommended to check the emergency lowering function every 3 months or after 250 hours of operation.

Test the emergency lowering function as per the ***Emergency Lowering*** section in the Operation Manual.

NOTICE

If the emergency lowering function is found to not be working properly, immediately lower the platform to the stowed position, turn off and tag the machine, and contact a qualified service technician for inspection and repair.

12 CONTROL SYSTEM

⚠ DANGER

All operations in this section must be performed by authorized and qualified personnel who have undergone professional training by Sinoboom. Not meeting this requirement may lead to personal injury or death. Our company will not be liable for any adverse consequences arising from the failure to operate and use the machine in accordance with this manual.

⚠ WARNING

Unsafe Operation Hazard

- **The machine has been programmed before delivery. It's forbidden to modify the system settings and/or update the software without authorization from Sinoboom.**

  Due to different machine configurations, certain descriptions below may not apply to your machine. If questions arise during operation of the machine in accordance with the manual please hold the operation and contact Sinoboom after sales personnel in time.

- **Not operating the machine properly may result in death, serious injury or machine damage.**

NOTICE

Controllers, sensors, etc. are precisely adjusted and have received protective treatment before delivery. Therefore, persons who have not been professionally trained and authorized by Sinoboom may not disassemble the respective housings, otherwise moisture and dust ingress may affect proper functioning of these devices.

12.1 SINOBOOM MAIN CONTROL SYSTEM (WIDE PANEL)

This section is applicable to machines configured with Sinoboom main control system and right chassis compartment with wide panel.

System Interface

Pull out the emergency stop button at the ground controller to the ON position and turn the key switch to ground control position. Press the Enter key on the main interface of the ground controller to enter the ECU menu selection mode. Select and enter different function interfaces by pressing the PgUp /PgDn keys. The system interface is described in the figure below:

Note: some interfaces can only be accessed with a password (the password can only be provided to personnel professionally trained and authorized by Sinoboom).

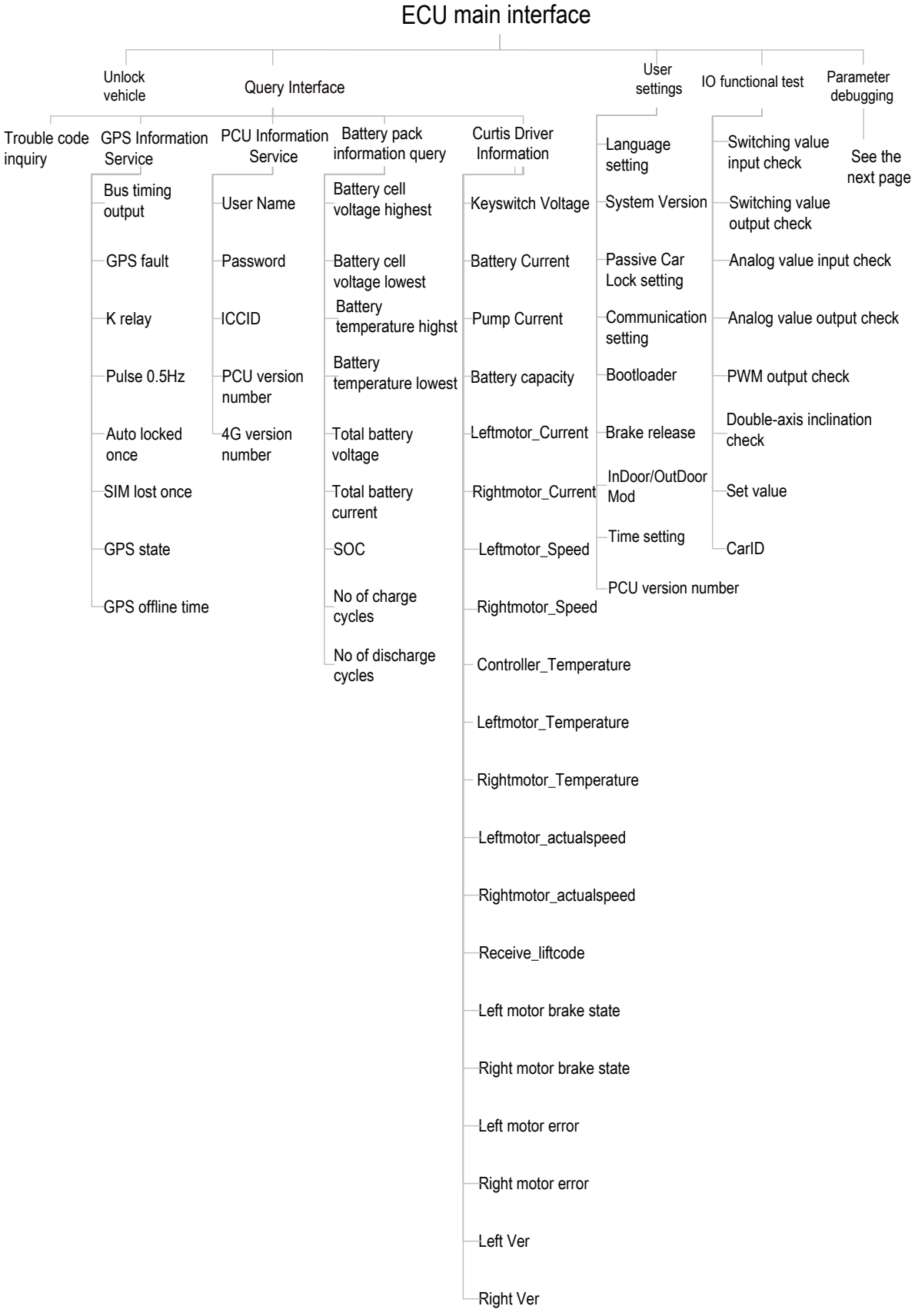

Fig. 1 System interface

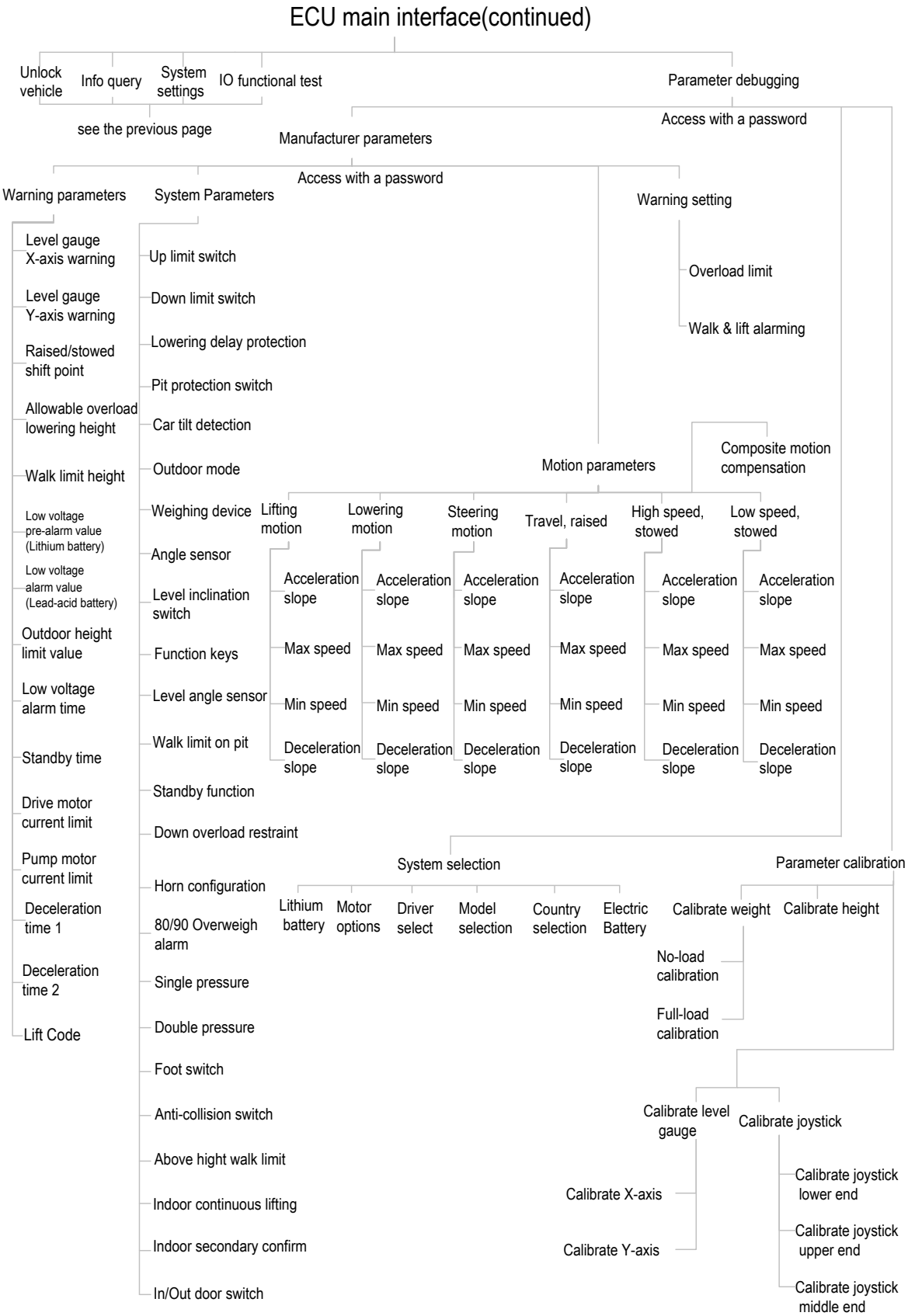

Fig. 2 System interface (continued)

Update the Program

⚠ WARNING

Updating the program will restore the system parameters set by the original owner/user/ Sinoboom to the original parameters set by the control system manufacturer. Updating the program without prior authorization from Sinoboom is strictly forbidden. Please contact SINOBOOM after-sales personnel if you wish to update the program.

1. Prepare a 4 - 32 GB USB flash drive in FAT32 file system format.
2. Upload the ECU program to the root directory of the USB flash drive: ECU_MAIN.bin.

   Note: Please contact Sinoboom after-sales personnel if you wish to obtain the program.
3. Turn off the machine, and insert the USB flash drive into the program updating port (protected by a rubber plug) at the back of ECU.
4. Press and hold the Esc key on the ECU panel while powering on the machine. Release the Esc key 5 sec after power-on; the program will be updated automatically.
5. After the program is updated, power off the machine.

Check Program Version

After entering the ECU menu selection mode, select and enter the System Settings interface, then select System Version to identify the current program version.

Query Interface

In the Query Interface, users can query GPS information, PCU information, battery pack information, Curtis driver information and fault code information (for fault code causes and solutions please refer to ***Fault Codes*** section).

Brake Release

Only electric models are equipped with a brake release function.

1. Place the machine on firm and level ground and secure the wheels with chocks to prevent the machine from moving inadvertently.
2. Make sure that the machine is stowed and has no loose or unfixed parts, and there are no people or tools in the platform and no obstacles in the surrounding passage.
3. Enter the ECU menu selection mode, then select and enter the “Brake Release” interface and press the Enter key for 5 sec.

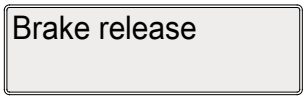

Fig. 3

4. The buzzer will sound, and the message “Brake Is Released” will be shown on the display, indicating that the brakes have been released successfully.

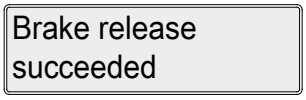

Fig. 4

5. The machine can now be towed or dragged by external force.
6. Return to the main interface by pressing the Esc key, and power off the machine as needed. The setting will reset automatically after power-off and restart.

User Selection Setting

- Users can select the applicable country, driver, motor, model, and battery brand for the machine in the System Selection menu of Parameter Debugging.
- The lithium battery of the machine can be configured (if necessary) in the System Selection menu of Parameter Debugging.
- The parameters (weight, height, level gauge and joystick) of the machine can be calibrated in the Parameter Calibration menu of Parameter Debugging.

Country Selection

1. After entering the ECU menu selection mode, select and enter the Country Selection interface, press PgUp key or PgDn key until the desired country is displayed, and press the Enter key for confirmation.
2. Select one country to open the corresponding configurations for the country. See the table below for the configurations for each country.

Item	China	Korea	Japan	EU	US & Australia	Abroad
Single/dual pressure sensor	OFF	Dual pressure	Dual pressure	Dual pressure	Dual pressure	Dual pressure
Outdoor mode	ON (depend on models)	ON	ON	ON	ON	ON
Weighing device	OFF	ON	ON	ON	ON	ON
Angle sensor	ON (depend on models)	ON	ON	ON	ON	ON
Overload descent limit	OFF	ON	ON	ON	ON	ON
Travel limit on pothole	OFF	ON	ON	OFF	OFF	OFF
Foot switch	OFF	ON	ON	OFF	OFF	OFF
80/90 overload alarm	OFF	OFF	OFF	OFF	OFF	OFF

Note: The “Abroad” in Country Selection screen of Sinoboom control system refers to countries/regions except China, Korea, Japan, EU, US and Australia.

3. Return to the main interface by pressing the Esc key, and power off the machine as needed.

Joystick Calibration

NOTICE

The joystick calibration includes calibrating the joystick upper end, middle end and lower end. Please perform the calibration with the ECU panel within one cycle as per the following procedure.

1. Enter the ECU menu selection mode.
2. **Calibrate joystick upper end:** push the joystick to the uppermost end and hold it, select and enter Calibrate Joystick Upper End (as shown in the figure below), then press and hold the enter key. Once “OK” is displayed in the lower right corner of the screen, the joystick upper end is successfully calibrated. Press the Esc key to return to the Joystick Calibration interface.

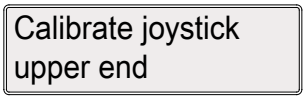

Fig. 5

3. **Calibrate joystick middle end:** push the joystick to the middle position and hold it, select and enter Calibrate Joystick Middle End (as shown in the figure below), then press and hold the enter key. Once “OK” is displayed in the lower right corner of the screen, the joystick middle end is successfully calibrated. Press the Esc key to return to the Joystick Calibration interface.

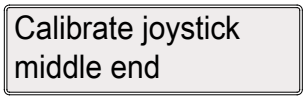

Fig. 6

4. **Calibrate joystick lower end:** push the joystick to the lowermost end and hold it, select and enter Calibrate Joystick Lower End (as shown in the figure below), then press and hold the enter key. Once “OK” is displayed in the lower right corner of the screen, the joystick lower end is successfully calibrated.

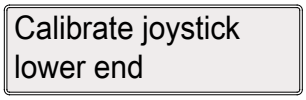

Fig. 7

5. Return to the main interface by pressing the Esc key, and power off the machine as needed.

Weight Calibration

NOTICE

- *To ensure the accuracy of the weight calibration, a height calibration must be performed in advance.*
- *Weight calibration includes no-load and full-load calibration. Please complete the calibration using the ECU panel within one cycle as per the following procedures.*

- **No-load calibration**

1. Lower the platform to the stowed position. Make sure there is sufficient overhead space to allow the platform to be lifted to the maximum height safely.
2. Perform the outrigger leveling operation to ensure the machine is level (only for model 1323 and model 1623).
3. Make sure that no heavy objects are placed on the platform.
4. Enter the ECU menu selection mode, then select and enter No-load Calibration interface, press the Enter key to start automatic calibration.

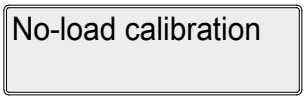

Fig. 8

5. The platform will raise and lower twice automatically: it will raise to the highest position and lower to the stowed position.
6. Once the screen displays “No-load Calibration Complete “, the no-load calibration was successful.

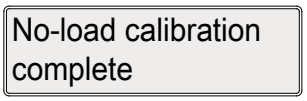

Fig. 9

7. Return to the Weight Calibration interface through the Esc key.

- **Full-load calibration**

1. Lower the platform to the stowed position. Make sure there is sufficient overhead space to allow the platform to be lifted to the maximum height safely.
2. Perform the outrigger leveling operation to ensure the machine is level (only for model 1323 and model 1623).
3. Place heavy objects on the platform that have the same weight as the rated load of the machine.
4. Select and enter the Full-load calibration interface, then press the Enter key to start automatic calibration.

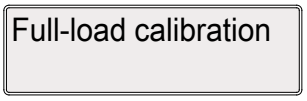

Fig. 10

5. The platform will raise and lower twice automatically: it will raise to the highest position and lower to the stowed position.
6. When the screen displays “Full-load calibration complete! “, the full-load calibration was successful.

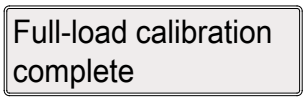

Fig. 11

7. Return to the main interface by pressing the Esc key, and power off the machine as needed.

Height Calibration

1. Lower the platform to the stowed position. Make sure there is sufficient overhead space to allow the platform to be lifted to the maximum height safely.
2. Perform the outrigger leveling operation to ensure the machine is level (only for model 1323 and model 1623).
3. Make sure that no heavy objects are placed on the platform.
4. Enter the ECU menu selection mode, then select and enter the Calibrate Height interface and press the Enter key.

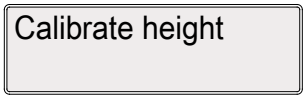

Fig. 12

5. The platform will automatically raise to the highest position, and then lower to the stowed position.
6. When the screen displays “Height Calibration Done”, the height calibration was successful.

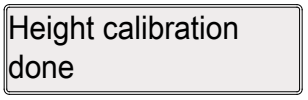

Fig. 13

7. Return to the main interface by pressing the Esc key, lower the platform to the stowed position, and power off the machine as needed.

Parameters Setting

DANGER

Modifying the options in the parameter settings (including alarm parameters, functional configurations, speed parameters, and alarm settings, etc.) must be carried out only by authorized and qualified personnel who have undergone professional training by Sinoboom. Not meeting this requirement bears significant risks.

Warning Parameters

In the Warning Parameters menu of Parameter Debugging, the following parameters can be set: level gauge X-axis warning, level gauge Y-axis warning, raised/stowed shift point, allowable overload lowering height, low speed limit height, low voltage pre-alarm value, low voltage alarm value, outdoor height limit value, low voltage alarm time, standby time, drive motor current limit, pump motor current limit, deceleration time 1, deceleration time 2 and motor serial number.

Note:

- The input angle setting value needs to be multiplied by 10. For example, if the input value is 20, the actual angle value is 2°.
- The height setting value is in decimeter (dm).
- The input voltage setting value needs to be multiplied by 10. For example, if the input value is 20, the actual voltage value is 2 volts (V).
- The setting value of low voltage alarm time is in seconds (s); the setting value of the standby time is in minutes (min).

System Parameters

In the System Parameters menu of Parameter Debugging, the following can be set: up and down limit switches, pit protection switch, lowering delay protection, car tilt detection, outdoor mode, weighing device, angle sensor, level inclination switch, function keys, level angle sensor, walk limit on pit, standby function, dual pressure, single pressure, down overload restraint, horn configuration, foot switch, anti-collision switch, 80/90 overweight alarm, above height walk limit, indoor continuous lifting, indoor secondary confirm and in/out door switch.

Motion Parameters

In the Motion Parameters menu of Parameter Debugging, the speed parameters of lifting motion, lowering motion, steering motion, raised travel speed, high speed (stowed) and low speed (stowed) can be set.

12.2 DTC-K500 MAIN CONTROL SYSTEM

This section is applicable to machines configured with DTC-K500 main control system.

System Interface

Pull out the emergency stop button to ON position and turn the key switch to Ground control position. Press the Enter key on the ECU panel while powering up the machine to enter the ECU menu selection mode. Select and enter different function interfaces by pressing the PgUp key/PgDn keys. The system interface is described in the figure below:

Note: some interfaces can only be accessed with a password (the password can only be provided to personnel professionally trained and authorized by Sinoboom).

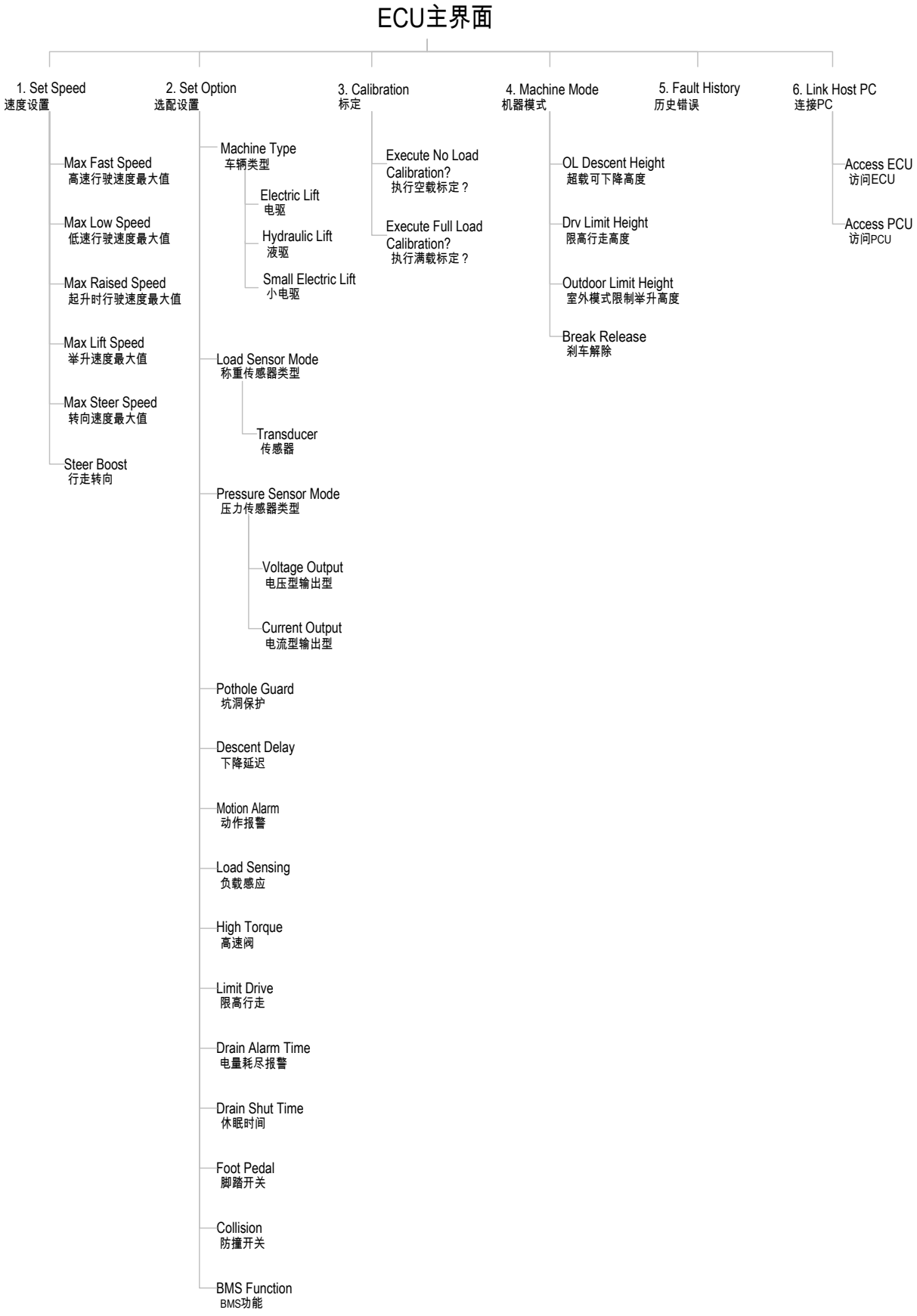

Fig. 14 System interface

Check Program Version

When the machine is powered on, the screen will display the current program version in the first 2s of startup.

Update the Program

⚠ WARNING

Updating the program will restore the system parameters set by the original owner/user/ Sinoboom to the original parameters set by the control system manufacturer. Updating the program without prior authorization from Sinoboom is strictly forbidden. Please contact SINOBOOM after-sales personnel if you wish to update the program.

Set Speed

In the “1.Set Speed” menu, the Max Fast Speed, Max Low Speed, Max Raised Speed, Max Lift Speed, Max Steer Speed and Steer Boost can be set.

Set Option

- In the “2.Set Option” menu, the Machine Type, Load Sensor Mode and Pressure Sensor Mode can be selected.
- In the “2.Set Option” menu, the Drain Alarm Time, Drain Shut Time can be set.
- In the “2.Set Option” menu, the Pothole Guard, Descent Delay, Motion Alarm, Load Sensing, High Torque, Limit Drive, Foot Pedal, Collision and BMS Function can be switched on or off. However, the Pothole Guard, Load Sensing and Motion Alarm functions are switched on by default. Even if these functions are turned off manually, they will return to the default ON state when the machine is powered on again.

Brake Release

Only electric models are equipped with a brake release function.

1. Place the machine on firm and level ground and secure the wheels with chocks to prevent the machine from moving inadvertently.
2. Make sure that the machine is stowed and has no loose or unfixed parts, and there are no people or tools in the platform and no obstacles in the surrounding passage.
3. After entering the ECU menu selection mode, select and enter “Brake Release” interface, and press the Enter key for 5s.

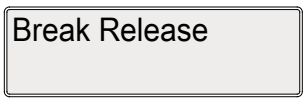

Fig. 15

4. When the screen displays “Brake is Released” and the horn sounds, the brake release is successfully done.

Fig. 16

5. The machine can now be towed or dragged by external force.
6. Return to the main interface by pressing the Esc key, and power off the machine as needed. The setting will reset automatically after power-off and restart.

Calibration Setting

Joystick Calibration

Ensure the joystick is in neutral position before power-on.

Weight and Height Calibration

NOTICE

- *The height calibration will be carried out automatically while the weight calibration is performed.*
- *Weight calibration includes no-load and full-load calibration. Please complete the calibration using the ECU panel within one cycle as per the following procedures.*

No-load calibration (& height calibration)

1. Lower the platform to the stowed position. Make sure there is sufficient overhead space to allow the platform to be lifted to the maximum height safely.
2. Make sure that no heavy objects are placed on the platform.
3. After entering the ECU menu selection mode, select and enter Calibration interface, and press the Enter key for confirmation.

Fig. 17

4. When the screen displays “Execute No Load Calibration?”, press the Enter key for 5s to start automatic no-load calibration.

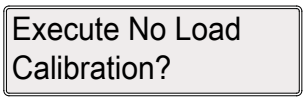

Fig. 18

5. The platform will raise and lower for three times automatically: it will raise to the highest position and lower to the stowed position. (the first, second and third ascending and descending movements are for height calibration, static calibration and dynamic calibration respectively).
6. When the screen displays “No Load Calibration Complete!”, the no-load calibration (& height calibration) is successfully done.

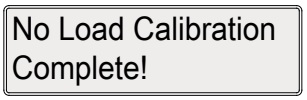

Fig. 19

7. Return to the Calibration interface by pressing the Esc key.

Full-load calibration

1. Place heavy objects on the platform that have the same weight as the rated load of the machine.
2. Select and enter Execute Full Load Calibration? interface, and press the Enter key for 5s to start automatic full-load calibration.

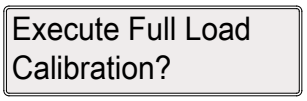

Fig. 20

3. The platform will raise and lower for three times automatically: it will raise to the highest position and lower to the stowed position. (the first, second and third ascending and descending movements are for height calibration, static calibration and dynamic calibration respectively).
4. When the screen displays “Sensors Have Been Changed!”, the full-load calibration is successfully done.

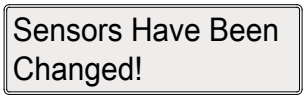

Fig. 21

5. Return to the main interface by pressing the Esc key, and power off the machine as needed.

Machine Mode Setting

Set OL Descent Height

1. Ensure that the space above the platform allows the platform to be safely lifted to the maximum height and the machine is horizontally positioned.
2. After entering the ECU menu selection mode, select and enter “OL Descent Height” interface.

Fig. 22

3. Raise the platform to a certain height (the desired OL descent height) with the ground controller.
4. After pressing the Enter key for 5s, the system will return to the previous interface. Then the OL descent height is set successfully, and the current height is set as the OL descent height.
5. Return to the main interface by pressing the Esc key, lower the platform to the stowed position, and power off the machine as needed.

Set Drive Limit Height

1. Ensure that the space above the platform allows the platform to be safely lifted to the maximum height and the machine is horizontally positioned.
2. After entering the ECU menu selection mode, select and enter “Drv Limit Height” interface.

Fig. 23

3. Raise the platform to a certain height (the desired drive limit height) with the ground controller.
4. After pressing the Enter key for 5s, the system will return to the previous interface. Then the drive limit height is set successfully, and the current height is set as the drive limit height.

5. Return to the main interface by pressing the Esc key, lower the platform to the stowed position, and power off the machine as needed.

Set Outdoor Limit Height

1. Ensure that the space above the platform allows the platform to be safely lifted to the maximum height and the machine is horizontally positioned.
2. After entering the ECU menu selection mode, select and enter “Outdoor Limit Height” interface.

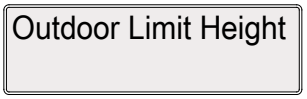

Fig. 24

3. Raise the platform to a certain height (the desired outdoor limit height) with the ground controller.
4. After pressing the Enter key for 5s, the system will return to the previous interface. Then the outdoor limit height is set successfully, and the current height is set as the outdoor limit height.
5. Return to the main interface by pressing the Esc key, lower the platform to the stowed position, and power off the machine as needed.

Check Fault History

1. After entering the ECU menu selection mode, select and enter “5.Fault History” interface.

Fig. 25

2. Press the Enter key to view fault history (10 faults can be viewed. For the causes and solutions of fault codes, please refer to).
3. To clear fault history, press the Enter key for 5s in the interface displaying fault history, and the screen will display “Clear Fault History?”. Then press the Enter key for 5s again to clear fault history. If not, skip this step and proceed to the next step.

Fig. 26

4. Return to the main interface by pressing the Esc key, and power off the machine as needed.

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13 APPENDIX

13.1 MAJOR MODIFICATION AND REPAIR RECORD

Major Modification and Repair Record			
Model			
Serial No.			
Date	**Modified/Repaired Item**	**Machine Status after Change**	**Technician**

Major Modification and Repair Record			

Note:

1. A major modification/repair is a modification/repair of the entire machine or its components that affects the stability, strength or performance of the machine.
2. A major modification/repair to the machine should be documented using the form below. This record should be retained until the machine is taken out of service or as required by the machine owner/company.
3. The machine must be inspected and verified after major modifications/repairs, with the inspection items including but not limited to all items in the Inspection and Preventative Maintenance Schedule. Once inspection and verification are complete the machine can be put back into service.

13.2 INSPECTION AND PREVENTIVE MAINTENANCE SCHEDULE

Perform inspection and preventive maintenance for the items in the table below at the specified intervals. Maintenance and inspection intervals are calculated based on the months of service or the “accumulated operating hours” (cumulative working time) displayed on the ground controls (whichever comes first).

Inspection intervals are based on the use of the machine under normal operating conditions. The intervals should be shortened accordingly when operating in harsh environmental conditions.

Table 13-1 Inspection and Preventive Maintenance Schedule

Item	Interval		
	Before each delivery[1] or quarterly[2]	Semiannually[3]	Annually[4]
Platform assembly			
Platform	1	1	1
Guardrails and floor	2	2	2
Access gate	1, 2, 3	1, 2, 3	1, 2, 3
Pedal for platform extension	1, 2, 3	1, 2, 3	1, 2, 3
Platform wear pads (at the connection with scissor arm) and fasteners	1, 2	1, 2	1, 2
Safety belt anchorage point	1, 2, 7	1, 2, 7	1, 2, 7
Scissor arms assembly			
Scissor arms	1, 2	1, 2	1, 2
Safety strut	1, 2, 3	1, 2, 3	1, 2, 3
Bearings	1, 2, 5, 12	1, 2, 5, 12	1, 2, 5, 8, 12
Pivot pins, retaining rings and fasteners	1, 2	1, 2	1, 2
Chassis assembly			
Chassis	2	2	2

Table 13-1 Inspection and Preventive Maintenance Schedule (continued)

Item	Interval		
	Before each delivery[1] or quarterly[2]	Semiannually[3]	Annually[4]
Chassis wear pads (at the connection with scissor arm)	1, 2, 5	1, 2, 5	1, 2, 5, 8
Tires	1, 2	1, 2	1, 2
Wheel nuts	1[50]	1[50]	1[50]
Traveling and steering components	1, 2, 5	1, 2, 5	1, 2, 5
Bearings	1, 2, 5, 12	1, 2, 5, 12	1, 2, 5, 12
Chassis compartment at both sides	1, 2, 3	1, 2, 3	1, 2, 3
Ladder	1, 2, 5	1, 2, 5	1, 2, 5
Drive motor	1, 5, 6	1, 5, 6	1, 5, 6
Brake and brake release device	1, 5, 6	1, 5, 6	1, 5, 6
Lift motor	1, 2, 3, 6	1, 2, 3, 6, 13	1, 2, 3, 6, 13
Gear pump	1, 2, 3, 6	1, 2, 3, 6	1, 2, 3, 6
Hydraulic system			
Hydraulic pump	1, 2, 3, 6	1, 2, 3, 6	1, 2, 3, 6
Hydraulic cylinder	1, 2, 3, 5, 6, 12	1, 2, 3, 5, 6, 12	1, 2, 3, 5, 6, 12
Hydraulic valves	1, 2, 3, 5, 6	1, 2, 3, 5, 6	1, 2, 3, 5, 6
Hydraulic hoses, pipelines and fittings	1, 2, 6	1, 2, 6	1, 2, 6
Hydraulic tank	1, 2, 3, 5, 6	1, 2, 3, 5, 6	1, 2, 3, 5, 6
Hydraulic tank air filter	1, 5, 6	1, 5, 6, 11	1, 5, 6, 11
Hydraulic oil filter	1, 5, 6	1, 5, 6	1, 5, 6, 11
Hydraulic oil	5, 6	5, 6	5, 6, 11
Electrical system			
Electrical harness, connectors	1, 2	1, 2	1, 2
Battery	1, 2, 6, 9, 12	1, 2, 6, 9, 12	1, 2, 6, 9, 12
Electrolyte	6	6	6
Charging function	3	3	3
Instruments, gauges, switches, lamps, horn, contactor, relay	1, 3	1, 3	1, 3
Functions and controls			
Platform controller	1, 3, 4, 7, 10	1, 3, 4, 7, 10	1, 3, 4, 7, 10
Ground controller	1, 3, 4, 7, 10	1, 3, 4, 7, 10	1, 3, 4, 7, 10
Function control lock, secondary guarding device and brake	1, 3, 10	1, 3, 10	1, 3, 10

Table 13-1 Inspection and Preventive Maintenance Schedule (continued)

Item	Interval		
	Before each delivery[1]or quarterly[2]	Semiannually[3]	Annually[4]
Emergency stop switch (ground and platform)	1, 3, 10	1, 3, 10	1, 3, 10
Limit switches and power-off switch	1, 3, 10	1, 3, 10	1, 3, 10
Overload limit function	1, 3, 10	1, 3, 10	1, 3, 10
Tilt alarm	1, 3, 10	1, 3, 10	1, 3, 10
Pothole protection device	1, 3, 10	1, 3, 10	1, 3, 10
Emergency lowering device	1, 3, 10	1, 3, 10	1, 3, 10
Drive function	1, 3, 10	1, 3, 10	1, 3, 10
Braking function	1, 3, 10	1, 3, 10	1, 3, 10
Others			
Operation Manual in the manuals compartment	10	10	10
All decals/labels complete, clear and secure	10	10	10
Annual inspection date of the machine	/	/	10
No unapproved changes or additions	10	10	10
All safety publications taken into account	10	10	10
General structural components and weldments	2	2	2
All fasteners, pins, protective guards and covers	1, 2	1, 2	1, 2
Greasing and lubricating according to specifications	10	10	10
Functional test of all systems	10	10	10
Paint and appearance	5	5	5
Inspection date stamped on the chassis	/	/	10
Notify Sinoboom of machine ownership (change)	/	/	10

Table 13-1 Inspection and Preventive Maintenance Schedule (continued)

Item	Interval		
	Before each delivery[1]or quarterly[2]	Semiannually[3]	Annually[4]
Note: [1] Before each sale, lease or shipment delivery; [2] In service for 3 months or 250 hours; or out of service for more than 3 months; [3] In service for 6 months or 500 hours; [4] Once a year and no later than 13 months from the date of the previous annual machine inspection; [50] The first inspection shall be performed once the machine reaches 50 hours in service for the first time. This occurs only once in the service life of the machine. [250] The first inspection shall be performed once the machine reaches 250 hours in service for the first time. This occurs only once in the service life of the machine. [NO.1] Before the machine is put into service for the first time			
Inspection activity (numerical codes): **1.** Check for correct installation (accurate position, firmly installed, tightened to the specified torque) **2.** Check for damage (cracks, cracked welds, deformation, wear, corrosion, excessive wear, gouges, abrasions and exposed threads) **3.** Check for normal function **4.** Check for normal return to neutral or “off” position (self-resetting switches return to neutral or “off” position after released) **5.** Clean and free of foreign objects **6.** Check for correct level, sealing and leaks **7.** Labels complete, clear and secure **8.** Check for appropriate dimensions/tolerances **9.** Fully charged **10.** Verify/perform **11.** Replace the oil or filter element **12.** Correctly lubricated **13.** Inspect the carbon brush			

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