

Maintenance Manual

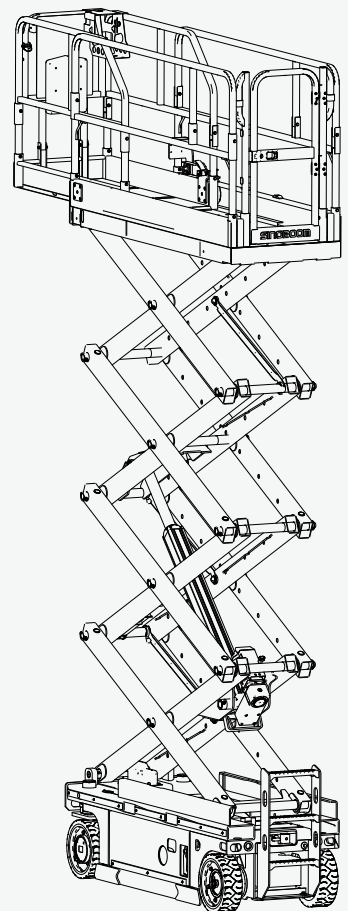
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Translated version

0808E All (0808E All/2732E All) *0109500100 to current*



GB **CE** **ANSI** **SA**®

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.

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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 operation 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.**

Applicability

The manual applies to the following models and serial numbers:

Model	Metric Trade Name	Imperial Trade Name	Serial No.
0808E All	0808E All	2732E All	0109500100 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.

Manual Revision History:

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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.



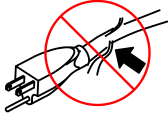
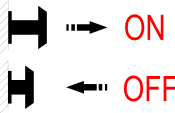
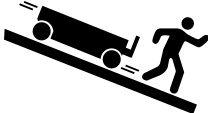
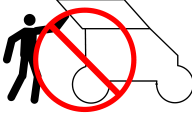
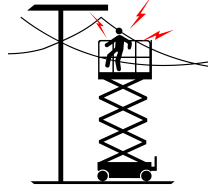
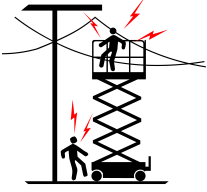
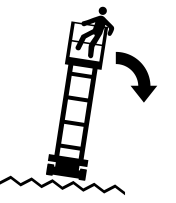
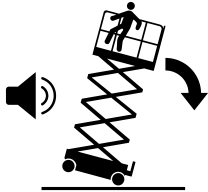
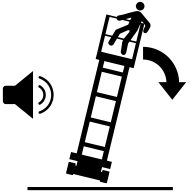
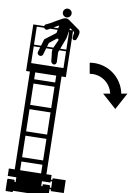
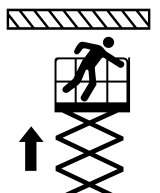
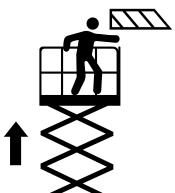
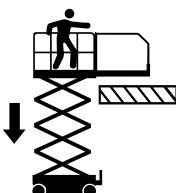
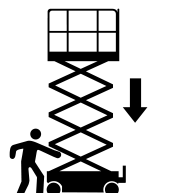
CAUTION

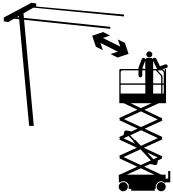
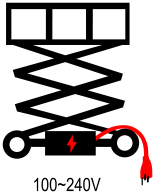
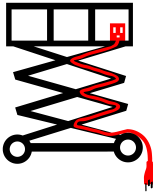
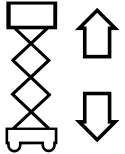
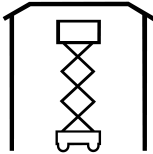
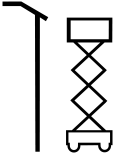
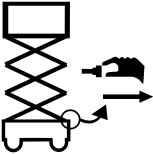
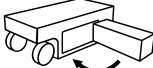
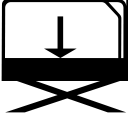
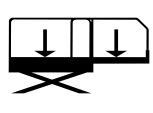
Indicates an imminently hazardous situation that, if not avoided, could result in minor or moderate injury or machine damage.

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	 Chemical burns hazard	 Chock the wheels
 Refer to the Operation Manual	 Add lubricant	 Crushing hazard – safety shoes required	 Wind	 Alarm sounding
 Replace with tires of the same specification	 Do not use damaged power cords	 Temperature	 Horn	 Noise level
 Press the directional-control valve	 Release the brake	 Pull out – ON Press – OFF	 Collision hazards - never release the brake on slope	 Engage the safety strut
 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  Fall hazard – never climb on platform guardrails	Collision hazard – keep head clear of overhead obstacles when raising platform  Fall hazard – never climb on scissor arms	Crushing hazard – keep hands clear from overhead obstacles when raising platform  Keep a safe distance from power lines	Collision hazard – keep the platform clear of obstacles below when lowering the platform  Battery charging plug	Crushing hazard – keep hands away from scissor arms when lowering the platform  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			

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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.

2.3 MAINTENANCE SAFETY

- 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/or maintenance work, make sure the machine is turned off, and remove the key. An "Out of Service" warning sign can be placed next to the ground controls and platform controls, or the main power switch can be pressed 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 carrying out maintenance work on electrical components always press (shut off) the main power 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.

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 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 oil, and avoid allowing it to be spilled on the ground.
- After maintenance is completed, immediately wash off any oil that may have come into contact with your skin.

Welding and Grinding Operation Hazards

WARNING



- Welding, grinding and polishing operations must follow the appropriate local safety procedures.
- Before performing welding, grinding and polishing operations, turn off the machine's power, and ensure that all wires or cables are connected correctly.
- Do not use the machine as a ground wire during welding and grinding operations.
- 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 place tools or other metal objects across the two terminals of the battery.
- 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 abnormal operation can be detected as early as possible.

2. After maintenance, all maintained parts must be checked for abnormal operation, 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.

3 TECHNICAL CHARACTERISTICS

3.1 MACHINE SPECIFICATIONS

Table 3-1

Item	Metric	Imperial
Product Category		
Battery type	Maintenance-free lead-acid battery	
Travel drive type	AC motor	
Dimensions		
Maximum platform height, indoor	8.1 m	26 ft 7 in
Maximum platform height, outdoor	6 m	19 ft 8 in
Maximum working height, indoor	10.1 m	33 ft 2 in
Maximum working height, outdoor	8 m	26 ft 3 in
Maximum horizontal reach	0.9 m	3 ft
Overall length	2.46m	8 ft
Overall width	0.83 m	2 ft 8.7 in
Overall height (with guardrails folded)	1.96 m	6 ft 5 in
Overall height (with guardrails not folded)	2.36 m	7 ft 9 in
Wheelbase	1.88 m	6 ft 2 in
Wheel track	0.7 m	2 ft 3.6 in
Ground clearance (with pothole protection retracted)	0.1 m	4 in
Ground clearance (with pothole protection extended)	0.025 m	0.98 in
Platform dimensions (L×W×H)	2.3 m×0.8 m×1.1 m	7 ft 6.5 in×2 ft 7.5 in×3 ft 7 in
Performance		
Rated platform capacity	250 kg	551 lb
Rated capacity - platform extension	120 kg	265 lb
Maximum number of occupants (indoor/outdoor)	2 persons/1 person	
Travel speed (stowed)	0 – 4 km/h	0 – 2.5 mph
Travel speed (elevated)	0 – 0.5 km/h	0 – 0.3 mph
Platform lifting time (unloaded)	40 - 45 s	
Platform lowering time (unloaded)	40 - 45 s	

Table 3-1 (continued)

Item	Metric	Imperial
Gradeability (2WD)	25 %	
Maximum allowable inclination (front-rear/left-right)	3°/1.5°	
Turning radius (inner/outer)	0.61 m/2.2 m	2 ft/7 ft 2.6 in
Tire size (diameter×width/type)	Φ380×125 mm/solid	15*5 in
Maximum operating noise level	72 dB	
IP rating	IP 54	
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	
Battery specifications (voltage, capacity, rate of discharge)	24 V, 220 Ah, 20 hr (lead-acid battery)	
System voltage	24 VDC	
Control voltage	24 VDC	
Charger (input voltage/output current)	100 – 240 V AC/36 A	
Drive motor (voltage/power) – AC	24 V/0.7 kW	
Weight		
Gross weight (indoor/outdoor)	2265 kg	4994 lb
Ground Bearing Data		
Maximum tire load	900 kg	1984 lb
Ground pressure	1075 kPa	156 psi
Environment		
Maximum allowable lateral force (indoor/outdoor)	400 N/200 N	90 lbf/45 lbf
Maximum allowable wind speed (indoor/outdoor)	0 m/s/12.5 m/s	0 mph/28 mph
Maximum allowable altitude	1000 m	3280 ft
Allowable ambient temperature range	-10°C – 40°C	14°F – 104°F
Maximum allowable relative humidity	90 %	

Table 3-1 (continued)

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

Note:

- a) The platform height plus the operator height (assumed to be 2 m/6 ft 7 in) equals the working height.
- b) In different areas, lubricants should be added in accordance with the ambient temperature.
- c) In cold weather, auxiliary devices are needed to start the machine.
- d) The ground bearing data is approximate, without considering different options, thus it is applicable only when taking an adequate safety factor into account.
- e) 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).
- f) 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.

3.2 FUNCTION SPEED

Table 3-2

Item	Parameter
Raise the platform	40 - 45 s
Lower the platform	40 - 45 s
Travel in high gear – stowed	24.5 – 30 s
Travel in low gear – stowed	49 – 60 s
Travel – operating	65 – 79 s
Braking distance	S≤0.55 m (S≤1.8 ft)

- a) The function speed depends on the start and end point of the movement rather than the controls/ switches.
- b) The drive speed test results will vary with tires of different specifications.
- c) All speed tests should be conducted from the platform controller. Test results will differ if tested from the ground controller.

Test requirements:

Raise the platform: With the platform unloaded, raise the platform (with the scissor arms from fully retracted position to fully raised position). Perform this maneuver for two times.

Lower the platform: With the platform unloaded, lower the platform (with the scissor arms from fully raised position to fully retracted position). Perform this maneuver for two times.

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

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

Travel – operating: The test shall be done on a level surface. Push the drive joystick to 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 in high gear – stowed” 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 some models with special configuration in Japan, the machine cannot travel while elevated to operating position.

3.3 SPECIFICATIONS OF MAJOR COMPONENTS

Table 3-3 AC Drive Reducer (PN.204020003084)

Electric motor	
Rated power	0.87 kW
Rated voltage	15 V
Rated current	51 A

**Table 3-3 AC Drive Reducer (PN.204020003084)
(continued)**

Rated speed	1960 rpm
Rated output torque	4.2 Nm (3.1 ft-lb)
Reducer	
Rated output torque	500 Nm (368.5 ft-lb)
Reduction ratio	1:50.62
Brake	
Rated voltage	24 ± 10% VDC
Rated power	48 W
Rated torque	30 Nm (22 ft-lb)

**Table 3-4 Maintenance-free AGM Battery
(PN.203100000017)**

Model	EVGC6A-A
Rated voltage	6 V
Rated capacity (at room temperature of 25°C)	200 Ah (10 hr) 170 Ah (3 hr)

**Table 3-4 Maintenance-free AGM Battery
(PN.203100000017) (continued)**

Standard charge current	60 A
Voltage at end of discharge by 80 %	5.7 V

3.4 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	1486	3276
Scissor assembly	759	1673
Platform assembly	261	575
Solid tire	30	66
Drive reducer	36	79
Left chassis compartment	62	137
Right chassis compartment	56	124
Wheel carrier	21	46
Steering electric actuator	15	33
Lift electric actuator	107	236
Maintenance-free lead-acid battery (cell)	30	66
Note: The weight of certain components will vary with the machine's option configuration.		

3.5 TORQUE SPECIFICATIONS

Special Torque Requirements

Please refer to the table below for special torque requirements:

Table 3-6 Special torque requirements

No.	Description	Torque value
1	Tire mounting bolt	130 Nm (96 ft-lb)
2	Drive motor and reducer mounting bolt at front wheel	51 Nm (37.6 ft-lb)
3	Bearing housing fastening nut at rear wheel	130 Nm (96 ft-lb)
4	Cable fastening nut M8	9 – 11 Nm (6.6 – 8.1 ft-lb)
5	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 3-7 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)

Table 3-7 Fastener torque specifications – metric (continued)

Nominal diameter (mm)	Pitch (mm)	Class 8.8	Class 10.9	Class 12.9
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 3-8 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)
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 3-9 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)

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 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 <i>Inspection and Preventive Maintenance Schedule</i>	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, 11	1, 2, 5, 11	1, 2, 5, 8, 11
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, 11	1, 2, 5, 11	1, 2, 5, 11
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
Electrical system			
Electrical harness, connectors	1, 2	1, 2	1, 2
Battery	1, 2, 6, 9, 11	1, 2, 6, 9, 11	1, 2, 6, 9, 11
Electrolyte	6	6	6
Charging function	3	3	3
Electric actuator	1, 2, 3, 5, 6, 11	1, 2, 3, 5, 6, 11	1, 2, 3, 5, 6, 11
Instruments, gauges, switches, lamps, horn	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
Emergency stop button (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

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

Item	Interval		
	Before each delivery ¹ or quarterly ²	Semiannually ³	Annually ⁴
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
Other			
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. Correctly lubricated			

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.

Some maintenance work may require the machine to be in a state other than the ones described in 1-3 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**).

Electrical Wiring

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

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.

Battery

Clean the battery with a non-metallic brush and sodium bicarbonate aqueous solution, then rinse it with clean water. After cleaning, allow the battery to dry completely, and apply anti-corrosion compound to the battery terminals.

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, peeling, 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.

5 PLATFORM COMPONENTS

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

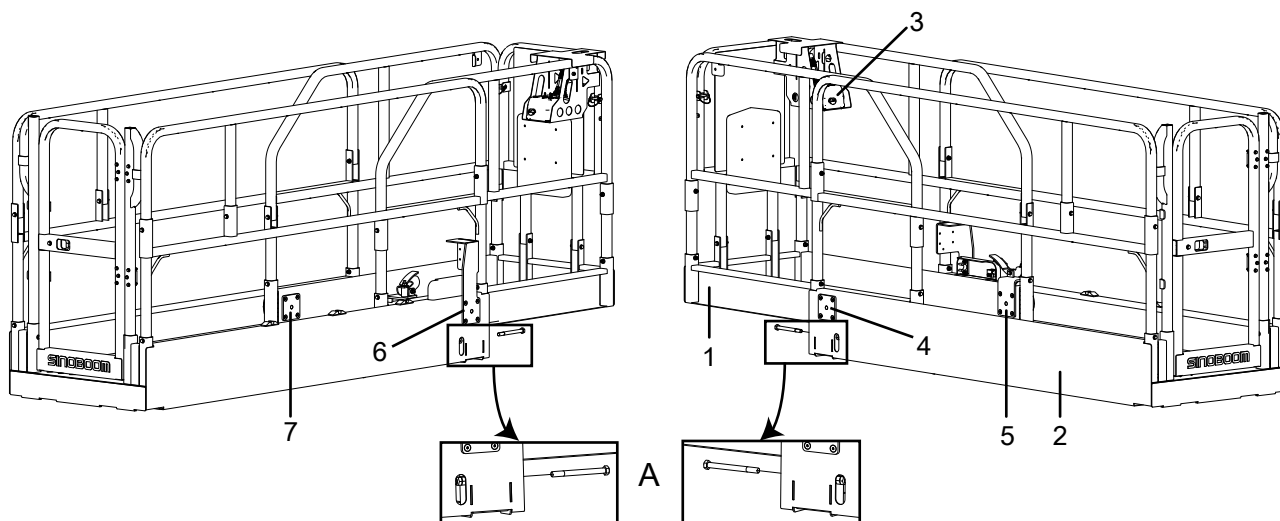


Fig. 1 Platform Components

Table 5-1

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

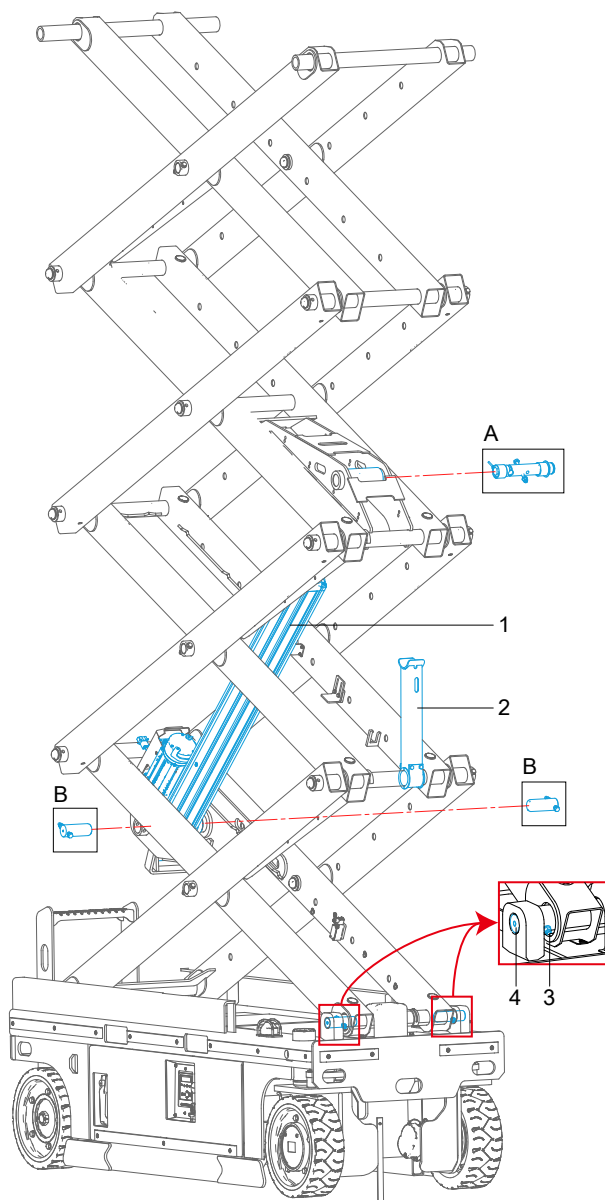


Fig. 1 Scissor Arm Components

Table 6-1

A. Electric actuator upper end installation (including weighing sensor and fasteners)		
B. Electric actuator lower end installation (including pivot pin and fasteners)		
1. Lift electric actuator	2. Safety strut	3. Scissor arm assembly fasteners
4. Pivot pin		

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. Use suitable lifting equipment to support the scissor arm assembly.
5. Remove the fasteners securing the scissor arm assembly on both sides of the chassis.
6. Use tools to pull out the pivot pin securing the scissor arm assembly with the chassis.
7. With the assistance of the lifting equipment, horizontally remove the scissor arm assembly from chassis chute slowly and carefully place it at a suitable position.

Installation

For installation, follow the disassembly procedure in reverse order.

1. Raise the scissor arm appropriately until the lift electric actuator 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 harness connections on the lift electric actuator.
5. Use suitable lifting equipment to support the two ends of the lift electric actuator.
6. Remove the fasteners securing the lift electric actuator upper end to the scissor arm, and then remove the weighing sensor.
7. Remove the fasteners at the pivot pin connecting the lift electric actuator lower end with the scissor arm, and knock out the pivot pin with a brass rod and mallet.
8. Slowly remove the lift electric actuator with the aid of the lifting equipment.
9. Slowly lower the scissor arm to stowed position with the aid of the lifting equipment.

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 ELECTRIC ACTUATOR

WARNING

If the electric actuator has a malfunction, please contact Sinoboom aftersales staff.

WARNING

When disassembling the electric actuator, use caution to prevent it from falling and getting damaged.

Installation

For installation, follow the disassembly procedure in reverse order.

Check Screw Nut of Lift Electric Actuator for Wear

The lift electric actuator is critical for the normal operation and safety of the machine, and keeping using a lift electric actuator with worn-out screw and nut may lead to component damage or dangerous operation. It is recommended to check the screw and nut of lift electric actuator for wear every quarter or every 250 hours of operation.

With the machine unloaded, monitor the current of electric motor controller while the lift electric actuator is operating at constant speed:

1. Start the machine.
2. Take any one of the power lines from U, V, or W phases of the electric motor connected with the lift electric actuator as the test subject.
3. Perform the lifting movement (the scissor arm from fully retracted to fully extended) twice, and record the lifting current values, taking the average as the test value.

4. Perform the lowering movement (the scissor arm from fully extended to fully retracted) twice, and record the lowering current values, taking the average as the test value.
5. Compare the test values with the normal current values to determine the degree of wear on the screw nut of the lift electric actuator.
 - If the test value is lower than $(1+10\%)$ normal current, the screw nut of lift electric actuator is operating normally. Carry out spot inspection at specified interval.
 - If the test value is equal to or higher than $(1+10\%)$ normal current but lower than $(1+20\%)$ normal current, the screw nut of lift electric actuator has minor wear and can be used for another period of time. But the spot inspection interval should be halved.
 - If the test value is equal to or higher than $(1+20\%)$ normal current, it means that the screw nut of lift electric actuator has worn out, and at this time, the platform lifting will be disabled, but platform lowering will be allowed. Replace the screw nut of the lift electric actuator immediately.

Table 6-2 Normal current of electric motor controller for lifting and lowering movements

Item	Parameter
Lifting current	160 A
Lowering current	80 A

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7 CHASSIS COMPONENTS

7.1 TRAVEL DRIVE AND STEERING DEVICE

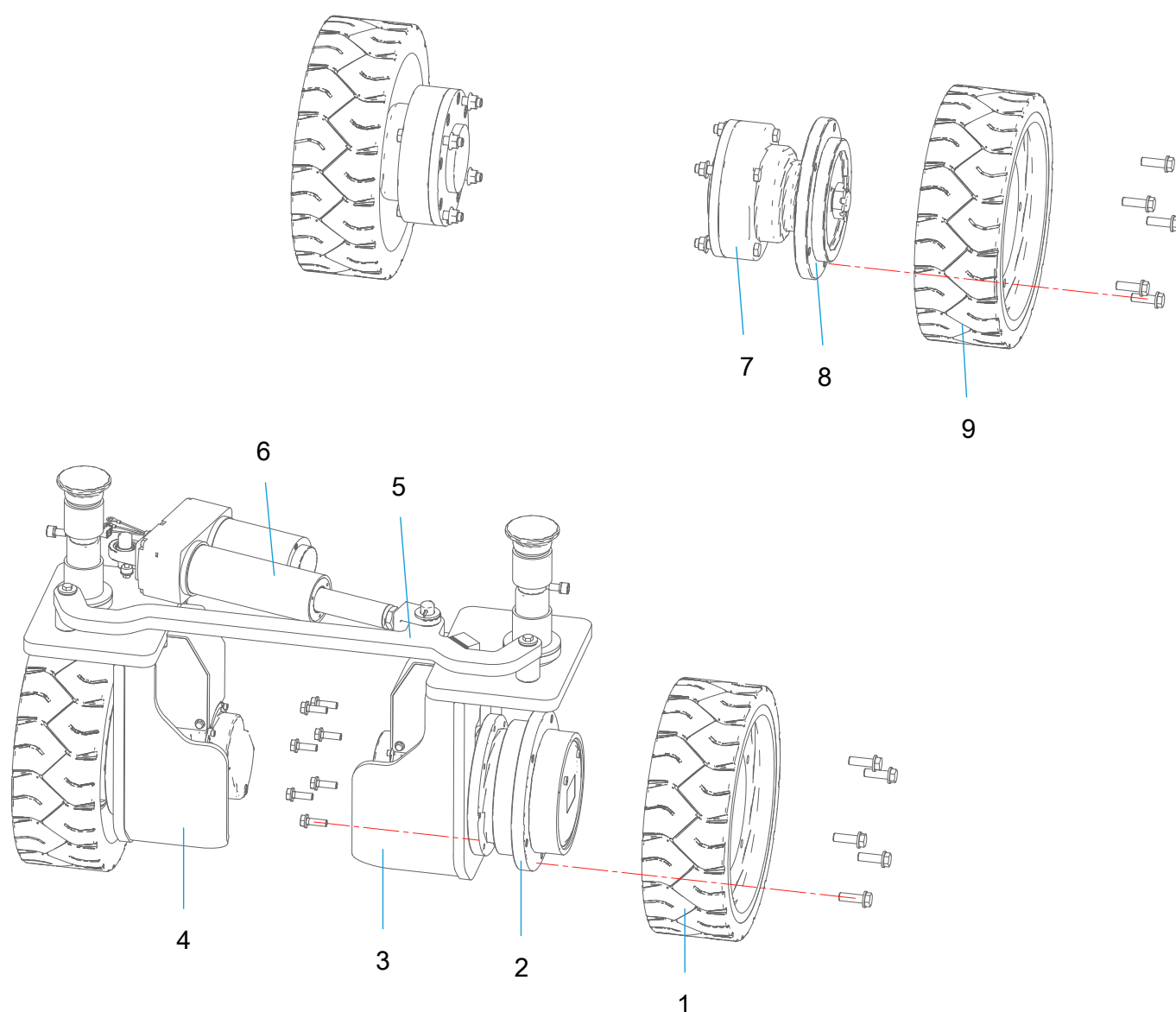


Fig. 1 Travel Drive and Steer Device Components

Table 7-1

1. Front tire	2. Drive motor & reducer	3. Right wheel carrier
4. Left wheel carrier	5. Steering connecting rod	6. Steering electric actuator
7. Bearing housing	8. Wheel disc	9. Rear tire

Drive 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 drive motor and reducer.
6. Use suitable lifting equipment to support the drive motor and reducer.
7. Remove the fasteners of the drive motor and reducer installed on the wheel carrier, and slowly move the drive 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 drive 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 Electric Actuator



WARNING

If the electric actuator has a malfunction, please contact Sinoboom aftersales staff.

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 harness connections on the steering electric actuator.
4. Support the steering electric actuator with suitable lifting equipment.
5. Remove the cotter pin, gasket and pivot pin securing the steering electric actuator with the steering connecting rod.

6. Remove the bolts, stop pin and pivot pin securing the steering electric actuator to the chassis.
7. Slowly remove the steering electric actuator with the aid of the lifting equipment.



WARNING

When disassembling the electric actuator, use caution to prevent it from falling and getting damaged.

Installation

1. Place a jack of sufficient capacity under the chassis to support the chassis.
2. Align the mounting hole on the steering electric actuator with that on the chassis.
3. Secure the steering electric actuator to the chassis using the bolts, stop pin and pivot pin.
4. Install the cotter pin, gasket and pivot pin securing the steering electric actuator with the steering connecting rod.
5. Reconnect the electrical harness.

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. Press the power-off switch/pull out the power-off handle and disconnect all power sources (such as battery charger) from 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 fasteners in an alternating sequence, then remove the wheel.
6. Align the mounting holes of the new wheel with the corresponding mounting holes on the hub, fit the flat surface of the gasket to the mounting surface (if gaskets are used). After applying Loctite 272 threadlocking adhesive to the bolts, install the bolts in sequence, and tighten the bolts diagonally to the torque specified in **Torque Specifications**.
7. Remove the jack as needed after installation.

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.

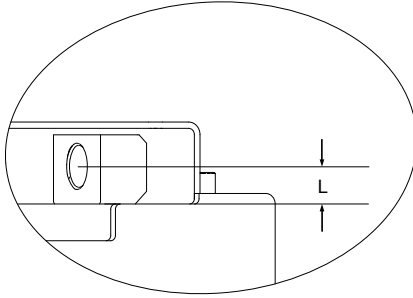


Fig. 2

L = 68 mm (2.7 in)

7.4 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 ELECTRICAL SYSTEM

Four 6 V lead-acid batteries in series connection are used to supply power to the drive motor and reducer, steering electric actuator and lift electric actuator 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.

8.1 CHANGE THE CHARGING CURVE

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

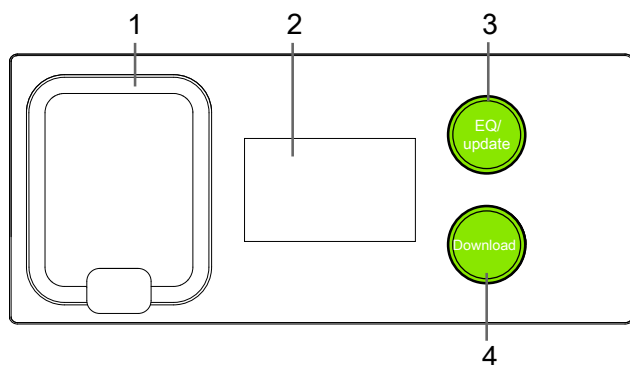


Fig. 1

Table 8-1

SN	Description
1	USB interface
2	OLED display
3	EQ/update key
4	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 for 3 sec and "OK" prompt appears; this means the charging curve has been changed.
4. Repeat the steps above if you wish to change the charging curve again.

Table 8-2 Chart of Battery Charging Curve Codes

Battery part number (PN)	Charging curve code		
	SC: 1000170*	SC: 1000853*	SC: 1000799*
203100000048	b48	203	12
203100000017	b04, B12	146	27
203100000032	146	B12	31
203100000033	263	263	/
203100003091 203100003227	232	202 (1524)** 306 (3624)	13 (1524)** 22 (3624)**

Table 8-2 Chart of Battery Charging Curve Codes (continued)

Battery part number (PN)	Charging curve code		
	SC: 1000170*	SC: 1000853*	SC: 1000799*
203100003092 203100003229	288	303 (3624)** 288 (4840)**	22
203100003090 203100003228	252	303	22
203100003102	159 (1524)** b71 (3024)**	204 (1524)** 304 (3624)**	14 (1524)** 16 (3624)**
203100003103 203100003104	b71	304	16
203100003200	159	204	14
203100003155	b47	/	/
203100003114	b25	307 (3024)** 308 (3624)**	3
203100003115	b91	307 (3024)** 308 (3624)**	3
*: refers to the code of supplier for the charger; **: the numbers in brackets refer to the model of the charger.			

8.2 ELECTRICAL SYMBOLS

Table 8-3

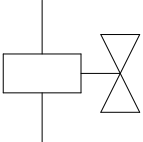
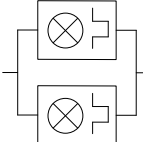
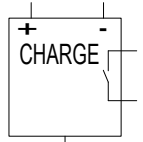
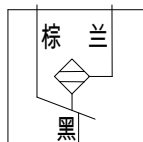
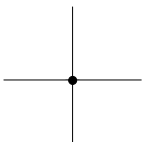
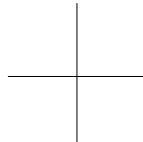
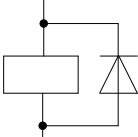
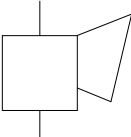
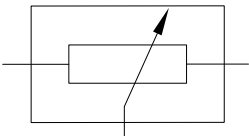
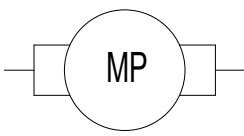
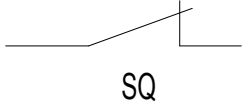
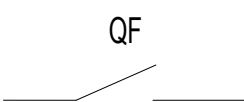
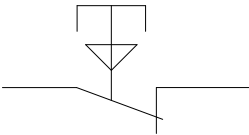
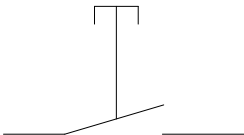
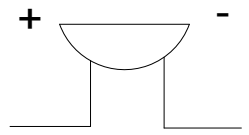
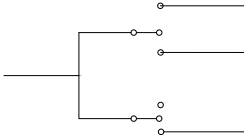
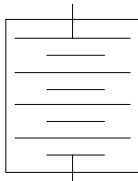
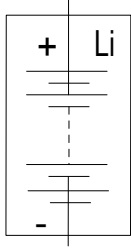
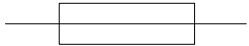
Symbols	Description	Symbols	Description
	Solenoid coil		Warning light
	Charger		Level switch
	Two lines, connected		Two lines, not connected

Table 8-3 (continued)

Symbols	Description	Symbols	Description
	Relay		Horn
	Sensor		Pump-controlled motor
	Limit switch		Power-off switch
	Emergency stop button		Button
	Buzzer		Key switch
	AGM battery		Lithium battery
	Fuse		

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9 TROUBLESHOOTING GUIDE

9.1 MACHINE FAULTS AND SOLUTIONS

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

Table 9-1 Machine Faults and Solutions (Sinoboom Control System)

Code	Description	Restricted functions	Recommended solution
1	System Initialization Failure	All functions	Possible ECU error, please consider replacing the ECU.
2	System Communication Failure	All functions	Check the connection of the communication line for the upper and lower platforms. If this does not solve the problem, please try replacing the PCU or the ECU.
4	Drive Heartbeat Lost	All functions	Check the connections between the MC and ECU, check that the configuration options of the MC in the ECU are correct. If this does not solve the problem, please try to replace the MC.
6	Multi-angle Sensor Heartbeat Lost	All functions	Check whether the wiring between the multi-angle sensor terminal and the ECU terminal is disconnected. Also check that the multi-angle sensor terminal configuration options are correct. If this does not solve the problem, please try replacing the multi-angle sensor.
7	Platform Highest Position Warning OH	Lift and travel	Check the communication lines for short or open circuits, and check whether the relevant parameter settings are correct.
9	GPS Communication Fault	All functions	Check the communication line between the GPS and ECU. If the problem still exists, check the connection or replace the GPS module.
10	Indoor Models – Activating Outdoor Mode Fault	All functions	Switch outdoor mode to indoor mode
12	Power-up ECU Key Fault	Limits all operations on the ECU	Check whether any ECU buttons have been pressed or pushed-down. If this does not solve the problem, please try to replace the ECU.
15	Tilt Detection Sensor Heartbeat Lost	Prompt only	Check whether the wiring between the tilt sensor terminal and the ECU terminal is disconnected. Also check if the tilt sensor bus has complete data. If this does not solve the problem, please try to replace the tilt sensor.
16	Tilt Detection Sensor Fault	Prompt only	Check if the tilt sensor is faulty, if not, try to replace the tilt sensor.
17	Weighing Sensor Heartbeat Lost	Prompt only	Check whether the wiring between the weighing sensor terminal and the ECU terminal is disconnected. Also check if the weighing sensor bus has complete data. If this does not solve the problem, please try to replace the weighing sensor.

Table 9-1 Machine Faults and Solutions (Sinoboom Control System) (continued)

Code	Description	Restricted functions	Recommended solution
18	Pothole Guard Fault	Lift and travel	Carry out checks in the following sequence: • Check whether the pothole guard plate is deployed into its normal operating position; • Check whether the pothole guard plate limit switch and its wiring are in good operating condition; • Check whether the lower limit switch and its wiring are in good operating condition, and check whether the lower limit device is functioning normally.
20	BMS Fault	Lift and travel	Check the connection of the communication line between the ECU and BMS. If this does not solve the problem, please contact Sinoboom aftersales staff.
21	Lithium Battery Excessive Discharge Temperature Fault 1	Alarm only	Discharge Temperature Level-1 Fault: Inform the BMS factory to check battery temperature, or contact the Sinoboom aftersales staff.
22	Lithium Battery Discharge Current High Fault 1	Alarm only	Discharge Current High Fault 1: Inform the BMS factory to check battery current, or contact the Sinoboom aftersales staff.
23	Lithium Battery Total Voltage Low 1	Lift limited, travel restricted to low speed	Total Voltage Low Fault 1 Inform the BMS factory to check battery voltage, or contact the Sinoboom aftersales staff.
24	Lithium battery Cell Voltage Low Fault 1	Lift limited, travel restricted to low speed	Cell Voltage Low Fault 1: Inform the BMS factory to check battery voltage, or contact the Sinoboom aftersales staff.
25	Total Machine Voltage Low 2	Lift and travel	Cell Voltage Low Fault 2: Inform the BMS factory to check battery voltage, or contact the Sinoboom aftersales staff.
26	Large Difference in Voltage	Lift and travel	Inform the BMS factory to check battery voltage, or contact the Sinoboom aftersales staff.
27	Large Difference in Temperature	Lift and travel	Inform the BMS factory to check battery temperature, or contact the Sinoboom aftersales staff.
28	Discharge Current High 2	Lift and travel	Discharge Current High Fault 2: Inform the BMS factory to check battery current, or contact the Sinoboom aftersales staff.
29	Discharge Temperature High 2	Lift and travel	Discharge Temperature Fault 2: Inform the BMS factory to check battery temperature, or contact the Sinoboom aftersales staff.
30	Temperature Sampling Fault	Alarm only	Please contact Sinoboom aftersales staff.
31	Pressure Sensor 1 Fault	All functions	Check whether the sensor and its wiring are in normal operating state. Check that the ECU sensor configuration options are correct. If this does not solve the problem, please try replacing the sensor.
32	Angle Sensor Fault	All functions	Check whether the sensor and its wiring are in normal operating state. Check that the ECU

Table 9-1 Machine Faults and Solutions (Sinoboom Control System) (continued)

Code	Description	Restricted functions	Recommended solution
			sensor configuration options are correct. If this does not solve the problem, please try replacing the sensor.
35	Relay Adhesion Fault	All functions	Check if the relay can be engaged/disengaged normally, or contact SINOBOOM aftersales staff.
36	Low Voltage Pre-alarm Value	Lift	Models with lithium battery: the battery charge $\leq 15\%$, charge the battery immediately. Models with lead-acid battery: the system voltage is lower than the set low voltage pre-alarm value, charge the battery immediately.
42	Left turn button of the handle was pressed when turning on the power.	Alarm only	Check whether the left turn button has been erroneously pushed or pressed. If this does not solve the problem, please try replacing the handle or PCU.
43	Right turn button of the handle was pressed when turning on the power.	Alarm only	Check whether the right turn button has been erroneously pushed or pressed. If this does not solve the problem, please try replacing the joystick or PCU.
46	Platform Enable Switch ON at Power-up	Limits all operations on the PCU	Check whether any enable switches have been pressed or pushed-down erroneously. Check whether the zero parameter settings are correct. If this does not solve the problem, please try replacing the handle or PCU.
47	Joystick Not In Neutral at Power-up	Lift and travel	Check whether the handle is in the zero position (vertical position). Check whether the zero position parameter settings are correct. If this does not solve the problem, please try replacing the handle or PCU.
50	Input-output Comparison Error	Lift and travel	Check whether the circuits at each sensor end and ECU end are open or short-circuited. Check whether the relevant parameters are turned on or off. If this does not solve the problem, please try to replace the ECU.
60	Level Inclination Switch Short Circuit to Ground	Prompt only	Check if external signal switch is working abnormally; if this does not solve the problem, please try to replace the external signal switch.
62	Lower Limit Switch Short Circuit to Ground	Prompt only	Check if external signal switch is working abnormally; if this does not solve the problem, please try to replace the external signal switch.
64	Pothole Switch Short Circuit to Ground	Prompt only	Check if external signal switch is working abnormally; if this does not solve the problem, please try to replace the external signal switch.
68	Low voltage alarm	All functions except lowering movement	That battery charge is less than 10%, charge the battery immediately. If the problem is not solved after fully charging the battery, please try to replace the battery.
80	Over 80 % Load Warning	Alarm only	This indicates that at the platform load has exceeded 80 % and is approaching the maximum load capacity. Please try not to increase the load.

Table 9-1 Machine Faults and Solutions (Sinoboom Control System) (continued)

Code	Description	Restricted functions	Recommended solution
81	Driver Alarm	Lift and travel	Check the specific fault code of the driver alarm and determine the specific cause based on the fault code.
82	Left Brake Coil Fault	Lift and travel	Check whether the coil terminal wiring is correct. If this does not solve the problem, please check the coil itself for open or short circuit. If this does not solve the problem, please try replacing the motor controller.
83	Right Brake Coil Fault	Lift and travel	Check whether the coil terminal wiring is correct. If this does not solve the problem, please check the coil itself for open or short circuit. If this does not solve the problem, please try replacing the motor controller.
84	Motor Does Not Return Brake Release Signal	Lift and travel	Check whether the wiring between the controller and the motor is correct.
93	BMS System Fault	Lift and travel	Check the lithium battery fault code, and contact Sinoboom aftersales personnel.
CL	Anti-collision switch warning	Lift and travel	This alarm will be generated if the platform contacts an obstacle during lifting triggering the proximity switch. If the proximity switch is not triggered but still generates an alarm, please try replacing the proximity switch.
Ft	Foot Pedal Not Depressed Alarm	Limits all operations on the PCU	This alarm will occur when using the handle to operate the machine for travel and lifting movements without depressing the foot pedal. If the alarm still occurs if the foot pedal is depressed while operating the handle, please check whether there is a problem with the foot pedal switch.
LL	Machine Tilt Alarm	Lift and travel	Check whether the machine is tilted. If this alarm sounds when the machine is level, please check the level sensor and its wiring.
OL	Overloaded Platform Fault	All functions	This indicates that the platform load has exceeded the limit, please remove excess load immediately.
HE	Indoor and outdoor travel switch calibration error	Lift and travel	Carry out checks in the following sequence: - Check the installation position of the indoor and outdoor travel switches to ensure that the triggering position is within 0.6 m (1.97 ft) below the outdoor limit height; - Check whether the angle sensor is correctly installed; - Try carrying out height calibration again. If the above methods still do not solve the problem, please try to replace the indoor and outdoor travel switches.
PL	Overloaded Platform Warning	Lift and travel	This indicates that the platform load has exceeded the limit, please remove excess load immediately.

Table 9-1 Machine Faults and Solutions (Sinoboom Control System) (continued)

Code	Description	Restricted functions	Recommended solution
SL	Machine Sleep Mode	Lift and travel	Means that the machine has entered the sleep mode. Please operate the travel/lift switch button on the PCU to exit the sleep mode.
ID	Indoor Mode Height Limit Exceeded and Enable Pressed Alarm	Prompt only	
LF	Angle Change During Emergency Lowering	Prompt only	Indicates the angle is changing too fast during emergency lowering. Reduce the travel distance of the tie rod.
EP	Unmatched PCU for Country Selection	Prompt only	Replace the PCU of upper structure, or change Country Selection.

9.2 CHARGING FAULTS AND SOLUTIONS

Table 9-2 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	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	Hardware overcurrent or overvoltage	1. Disconnect and reconnect AC power supply, and check whether the fault is cleared; 2. Check the battery for damage.
E06	Output overvoltage	1. Cycle power to the machine, and check whether the fault is removed; 2. Check the battery for damage.

Table 9-2 Charging Faults and Solutions (SC: 1000853) (continued)

Fault code	Fault description	Solution
E20(E07)	Hardware fault	1. Cycle power to the machine, and check whether the fault is removed; 2. Check the battery for damage.
E21(E08)	PFC 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.
E23	Internal communication fault	Cycle power to the machine, and check whether the fault is removed.
E24(E11)	Auxiliary power fault	Cycle power to the machine, and check whether the fault is removed.
E25(E12)	Output short circuit	1. Cycle power to the machine, and check whether the fault is removed; 2. Check the battery for damage.
E26(E13)	Output overcurrent/ overpower	1. Cycle power to the machine, and check whether the fault is removed; 2. Check the battery for damage.
E27(E14)	Charging curve error	1. Check if the right charging curve has been selected; select the right charging curve and then charge the battery; 2. Select the correct curve, power off the machine to turn off the display screen, and then power on the machine again to check if charging is normal.

9.3 BASIC TROUBLESHOOTING

Table 9-3

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. • Check if the power-off handle or power-off switch is disconnected.
Machine communication fault	CAN equipment offline	• Check whether the leads between the power supply and communication are inserted incorrectly or loosely. • 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 plug of the ground/platform controller is wired incorrectly, or whether the connection is not secure.
No response to ground controller operations	The ground/platform control selector switch is not turned to the ground control position	• 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	Ground/platform control selector switch is not turned to the platform control position	• 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	Electric actuator fault/weighing sensor data error	• Check if the electric actuator drive is powered on and has any alarm.

Table 9-3 (continued)

Fault	Cause	Solution
using the ground controller		- Check whether the wiring between the motor starter and the motor is normal. - Check if the weighing sensor harness is properly connected.
The platform cannot be lowered using the platform controller while no alarm is present	Staged lowering limit	Reset the handle and perform lowering again.
With the unloaded machine in a level position and the platform in its lowest position, the platform cannot be raised using the ground controller	Height calibration error/electric actuator fault	- Check if the electric actuator drive is powered on and has any alarm. - Check whether the wiring between the motor starter and the motor is normal. - Repeat the height calibration.
In indoor mode and with no load, the platform cannot be lifted to its maximum height	The upper limit travel switch is set incorrectly	- 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	The weight sensor has not been calibrated/this is the first lifting/lowering	Re-calibrate the load coefficient.
Forward traveling function fails without warning	Forward traveling function is malfunctioning	- Check if the motor controller is powered on normally and has any fault prompt. - Check whether the drive motor is wired normally. - Check whether the ground controller has normal travel speed setting.
Reverse travel function fails without warning	Reverse traveling function is malfunctioning	- Check if the motor controller is powered on normally and has any fault prompt. - Check whether the drive motor is wired normally. - Check whether the ground controller has normal travel speed setting.
Traveling at high speed failed while the scissor arms fully lowered and without alarm	Lower level switch not functioning properly	- Check if the limit switch is installed properly. - Check if the drive motor controller is malfunctioning.
The machine is overloaded but no overload alarm is present	Load calibration fault/weighing sensor fault	- Perform weight calibration again - Check the wiring of the weighing sensor for any abnormalities. - Check whether the weighing sensor is normal.

Table 9-3 (continued)

Fault	Cause	Solution
No continuous machine travel possible after tires installed (machine travels intermittently)	Insufficient battery level/ 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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10 FUNCTIONS AND CONTROLS

10.1 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 (from the ground to the platform floor) shall be: 2.0 m – 2.3 m (6 ft 6.7 in – 7 ft 7 in).

10.2 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 button 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.

10.3 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 button 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.

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.

10.4 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.

10.5 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.

10.6 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:

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 "OL", 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.

10.7 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.

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.

10.8 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.

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11 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.

11.1 SINOBROOM MAIN CONTROL SYSTEM

This section is applicable to machines configured with Sinoboom main control system and right chassis door 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

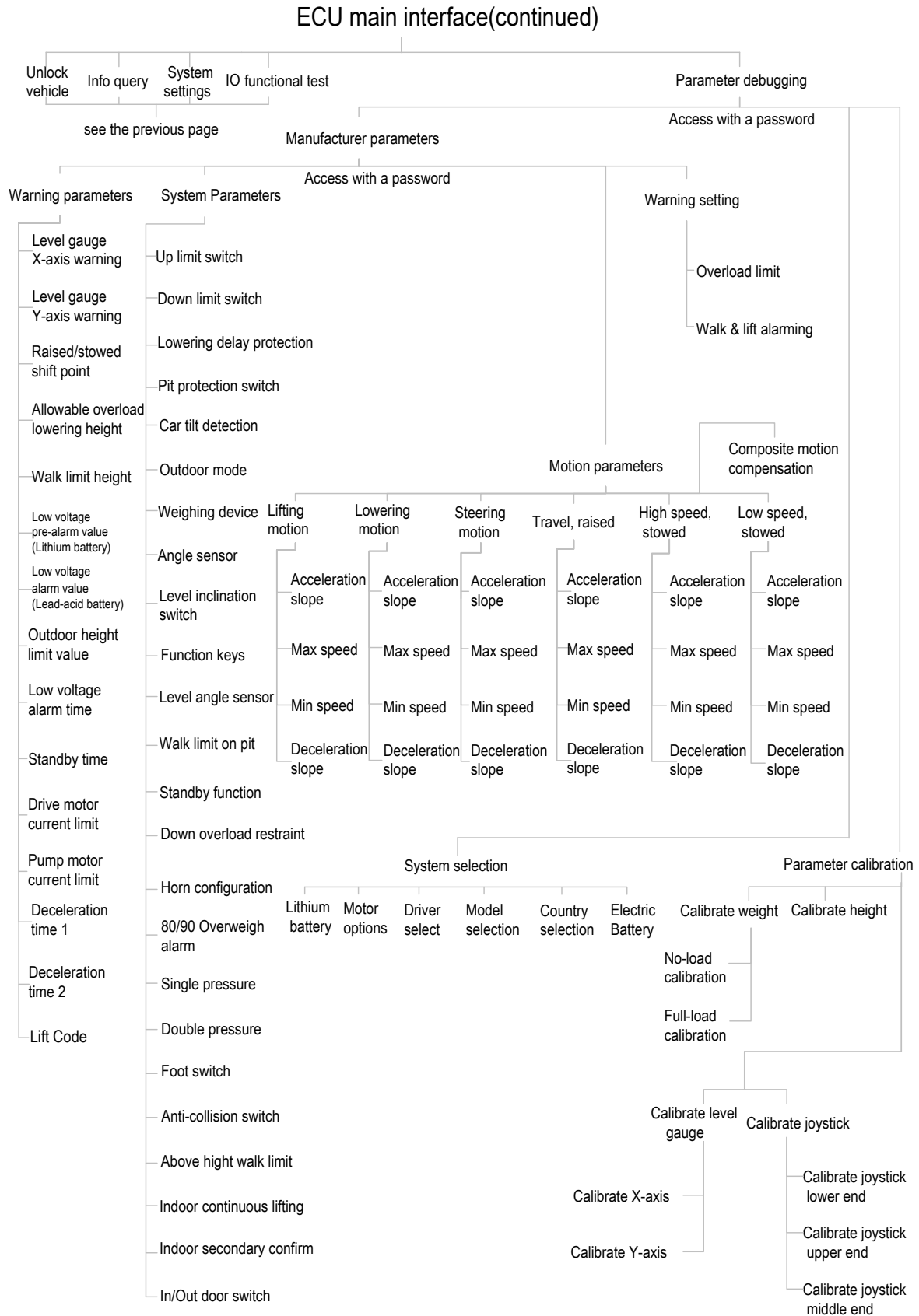


Fig. 2 System interface (continued)

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.

Brake release

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.

Brake release
succeeded

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
Outdoor mode	ON (depend on models)	ON	ON	ON	ON	ON
Weighing device	ON	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.

Calibrate joystick
middle end

Fig. 6

- 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.

- Enter the ECU menu selection mode.
- 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.

Calibrate joystick
upper end

Fig. 5

- 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.

- 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.

Calibrate joystick
lower end

Fig. 7

- 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

- 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. Enter the ECU menu selection mode, then select and enter No-load Calibration interface, press the Enter key to start automatic calibration.

No-load calibration

Fig. 8

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

No-load calibration complete

Fig. 9

6. Return to the Weight Calibration interface through 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 the Full-load calibration interface, then press the Enter key to start automatic calibration.

Full-load calibration

Fig. 10

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

Full-load calibration complete

Fig. 11

5. 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. Make sure that no heavy objects are placed on the platform.
3. Enter the ECU menu selection mode, then select and enter the Calibrate Height interface and press the Enter key.

Calibrate height

Fig. 12

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

Height calibration done

Fig. 13

6. 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.

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12 APPENDIX

12.1 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.

12.2 INSPECTION AND PREVENTIVE MAINTENANCE SCHEDULE

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.

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).

Table 12-1 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, 11	1, 2, 5, 11	1, 2, 5, 8, 11
Pivot pins, retaining rings and fasteners	1, 2	1, 2	1, 2
Chassis assembly			
Chassis	2	2	2

Table 12-1 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	150	150	150
Traveling and steering components	1, 2, 5	1, 2, 5	1, 2, 5
Bearings	1, 2, 5, 11	1, 2, 5, 11	1, 2, 5, 11
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
Electrical system			
Electrical harness, connectors	1, 2	1, 2	1, 2
Battery	1, 2, 6, 9, 11	1, 2, 6, 9, 11	1, 2, 6, 9, 11
Electrolyte	6	6	6
Charging function	3	3	3
Electric actuator	1, 2, 3, 5, 6, 11	1, 2, 3, 5, 6, 11	1, 2, 3, 5, 6, 11
Instruments, gauges, switches, lamps, horn	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
Emergency stop button (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
Other			
Operation Manual in the manuals compartment	10	10	10

Table 12-1 Inspection and Preventive Maintenance Schedule (continued)

Item	Interval		
	Before each delivery ¹ or quarterly ²	Semiannually ³	Annually ⁴
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 12-1 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. Correctly lubricated			

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