ZOOMLION

ZS1930E Series
ZS1530E Series
Service and Maintenance Manual

Oct 2023 Version A

Foreword

The Service and Maintenance Manual applies to the scissor lift series.

This manual describes proper inspection, servicing and maintenance. Users must fully understand and apply the contents described in this manual to maximize the performance and ensure the long-term safe and efficient use.

The manual includes the structure and schematic diagram of the main components. If it is necessary to repair and replace the components, the material code of the required replacement parts can be found in Parts Manual.

This manual should be considered a permanent part of your machine and should remain the machine at all times.

⚠CAUTION

Do not repair the parts marked with professional maintenance. Zoomlion AWP Machinery Company does not take the consequence for wrong maintenance.

⚠WARNING

The highest criterion users must keep in mind is: Safety first! Pay special attention to the safety control device for regular inspection. Do not operate the machine when the safety device fails or working abnormally. Do not modify the structure or add additional parts for more functions. Otherwise, you will be responsible for any personal injury or damage caused by the unauthorized modification.

The warranty period for the aerial work platform is as specified in this Service and Maintenance Manual. When maintenance is required, our company provides on-site service or please go to our designated maintenance point for maintenance.

Our company reserves the right to continually revise the contents of this manual with technical improvements. Any changes are subject to change without notice. Some of the pictures in this manual may not match the actual product due to design improvement, etc., but it does not affect your use. The product status is subject to the actual product.

Foreword

Symbols and their description

DANGER

Danger indicates an imminently dangerous situation. If not avoided, will result in death or serious injury.

WARNING

Warning indicates a potential hazardous situation. If not avoided, will result in death or serious injury.

NOTICE

Caution indicates a potential hazardous situation. If not avoided, will result in minor or moderate injury.

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Section 1 Maintenance Safety Instruction

SECTION 1 MAINTENANCE SAFETY INSTRUCTION

Your proper maintenance is an important prerequisite for the use of the aerial work platform. Read and understand this manual before attempting to any maintenance procedure. Conduct daily and regular maintenance in accordance with the contents and requirements of this manual. Zoomlion's marketing network throughout the world will provide you with professional consulting, maintenance and repair services. This section introduces the scope of responsibility for maintenance.

1.1 Maintenance Cycle Instruction

Daily maintenance is conducted everyday or every week, and maintenance with a period of more than one week is called regular maintenance. Maintenance work must be cycled on a regular basis and strictly follow the technical requirements and techniques in this manual.

1.2 User Responsibility

Please conduct daily and regular maintenance in accordance with the contents and requirements of this manual for good performance and personal safety. The responsibilities you must perform include but are not limited to:

a) Operate and use the machine in accordance with the Maintenance Manual.

b) Conduct daily and regular maintenance in accordance with the contents and requirements of this manual, professional technical maintenance must be performed at an authorized Zoomlion dealer service center.

c) Use formal Zoomlion accessories.

d) When the aerial work platform fails, the information should be promptly and accurately fed back to the designated service center.

e) Please provide workplace, equipment and tools for on-site service.

f) When your equipment is transferred, you must promptly inform the service centers that are transferred to and from the place of departure.

1.3 Service Center Obligation

Service centers are dedicated to providing you with a full range of after-sales services, including:

a) Professional product technical support.

b) Provide formal Zoomlion accessories.

c) Warranty service under warranty agreement.

d) Perform major abnormal faults and incident handling.

e) Provide equipment maintenance services.

1.4 Disclaimer

Zoomlion does not assume any responsibility for direct or indirect losses caused by the following actions:

a) Wrong operations or applications.

b) Unauthorized modification and parameter adjustment of the machine.

c) Do not use Zoomlion's original accessories and dedicated oils.

d) Maintenance is not performed in accordance with the contents and requirements of this manual.

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Service and Maintenance Manual

Section 2 Maintenance Requirements

SECTION 2 MAINTENANCE REQUIREMENTS

2.1 General

a) Perform necessary oil inspection and replacement. Conduct regular inspections to ensure that components are in good condition.

b) Require appropriate equipment for maintenance and repair, and obey relevant rules and instructions in Operator's manual.

c) If the safety equipment is removed during maintenance, reinstall the safety equipment and inspect it immediately after the maintenance work is completed.

d) Ensure that fuel, lubricants, and replaced parts are safely disposed of in accordance with environmental regulations.

2.1.1 Maintenance purpose

a) Prepare for operation.

b) Maintain stable performance.

c) Prevent downtime.

d) Maintain use value.

e) Reduce maintenance cost.

2.2 Precautions

2.2.1 General precautions

a) Wear working clothes for maintenance work.

b) Machine parked on a firm, level surface.

c) If you find any items that require immediate repair and adjustment, perform maintenance immediately.

d) Contact local Zoomlion service center for repairing.

e) Please use the accessories and grease specified by our company for good performance.

f) Timely replacement of consumables, such as filter element to prevent failures due to delays.

g) Please contact our local office for any difficult problems identified during inspection or maintenance.

2.2.2 Safety precautions

a) Perform all locks, turn the power switch to off position and remove the switch keys during machine inspection and maintenance.

If not comply with the rules, could result in serious injury or death.

⚠DANGER

b) Set the warning sign during maintenance.

Set DO NOT START, IN MAINTENANCE warning sign during maintenance.

c) Use clean grease.

The room where grease is stored should be kept clean and no dust, water, etc. should enter the container. Ensure that the grease used does not contain water.

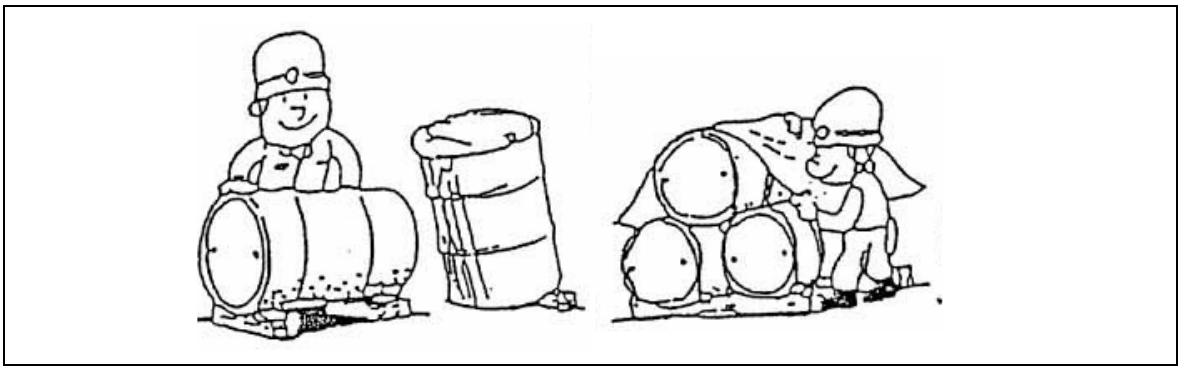

Figure 2-1 Clean grease check

d) Keep the machine clean.

Clean the machine with clean water to find oil leaks, cracks, loose connections and other abnormalities. Keep grease nipples, vents and dipsticks clean to prevent dust.

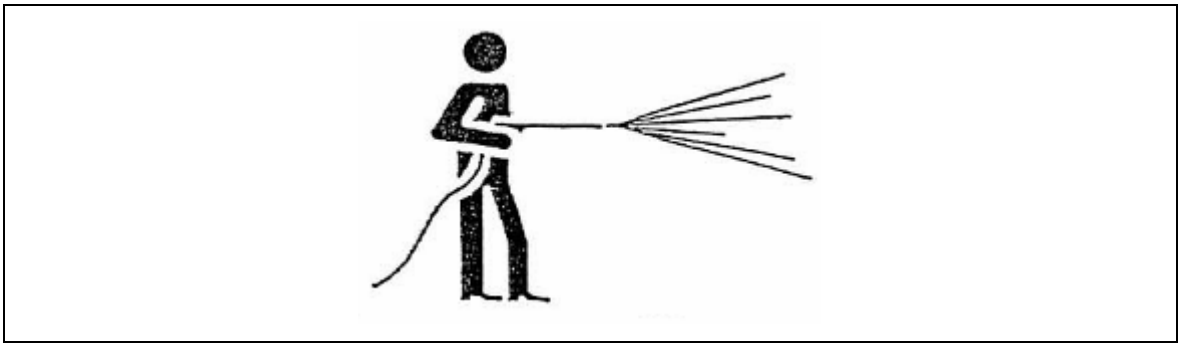

Figure 2-2 Clean the unit

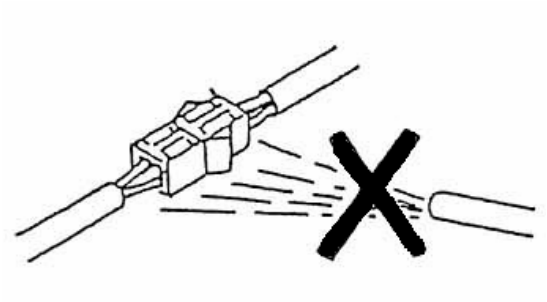

Figure 2-3 DO NOT spray water at the joint

⚠CAUTION

1. Do not spray water on electrical components and connectors while cleaning the machine.

2. Lubricate the steering knuckles after cleaning.

3. Clean the control panel with warm water containing detergent only. DO NOT use corrosive cleaning agent.

e) Clean oil stain.

When filling or replacing lubricating grease, or replacing electric cylinder parts, there may be grease overflow, which should be wiped clean in time to prevent fire.

f) Prevent dust intrusion.

Removed liner actuator and bearing seat that need lubrication must be protected by plugging or sealing cover to prevent dust intrusion.

Figure 2-4 Dust prevention

g) Clean joint surface.

Removing the O-ring or other gasket, clean the sealing surface and replace with a new seal. Apply a thin layer of oil to the seal when reassembling.

Figure 2-5 Notice internal pressure

h) Clean waste oil.

1) Place the waste oil in a container and treated as industrial waste.

2) Maintenance and parts replacement must be implemented by trained professionals.

i) Check the records.

Conduct and record regular inspections to learn the operation condition of the machine and components (Inspection should be conducted in machine's first use or initial use after long-term suspension or after repair).

2.3 Pre-delivery Inspection

It is the responsibility of the dealer to perform the Pre-delivery Preparation.

Pre-delivery Preparation is performed prior to each delivery. The inspection is designed to discover if anything is apparently wrong with a machine before it is put into service.

A damaged or modified machine must never be used. If damaged or any variation from factory delivered condition is discovered, the machine must be tagged and removed from service.

Repairs to the machine may only be made by a qualified service technician, according to the manufacturer's specification. Scheduled maintenance inspections shall be performed by qualified service technicians, according to the manufacturer's specifications and the requirements listed in the responsibilities manual.

2.4 Maintenance Intervals Instructions

All maintenance work is done intermittently that the Intermittent period is the maintenance period. Maintenance intervals are determined based on two aspects:

a) Certain running time of functional components (hours).

b) The Gregorian time (day, month, year) at which the machine is working and stored.

Maintenance intervals of Zoomlion Scissor Lifts are generally determined by the certain running time of functional components, and the special content needs to be determined in the latter way.

Table 2-1 Maintenance intervals

Maintenance Intervals	Running Time (hours)	Maintenance Intervals Instruction
Daily (D)	8	Before and after operation
Monthly (M1)	About 100	Once a month
Quarterly (M3)	About 250	Once every three months
Every 6 months (M6)	About 500	Once every six months
Annually (M12)	About 1,000	Once a year
Every two years (M24)	About 2,000	Once every 24 months

2.5 Maintenance Schedule

Table 2-2 Maintenance schedule

Items	Work Description	Maintenance					
		Daily	Monthly	Quarterly	Every 6 months	Annually	Every two years
		D	M1	M3	M6	M12	M24
2.6.1.1	Check manual and decals	★					
2.6.1.2	Pre-start Inspection	★					
2.6.1.3	Battery Inspection	★					
2.6.1.4	Check lifting liner actuator	★					
2.6.1.5	Functional test	★					
2.6.2.1	Maintenance after 30 days	▲ After using for the first time for 30 days or 50 hours					

Instruction: ★ Regular maintenance intervals ▲ Initial maintenance time

Table 2-2 Maintenance schedule

Items	Work Description	Maintenance					
		Daily	Monthly	Quarterly	Every 6 months	Annually	Every two years
		D	M1	M3	M6	M12	M24
2.6.2.2	Lubricating steering knuckles		★				
2.6.3.1	Battery maintenance			★			
2.6.3.2	Li-ion battery maintenance			★			
2.6.3.3	Inspect electrical wire			★			
2.6.3.4	Inspect the tires and wheels			★			
2.6.3.5	Inspect emergency stop function			★			
2.6.3.6	Test key switch			★			
2.6.3.7	Test the Horn			★			
2.6.3.8	Test the drive brakes			★			
2.6.3.9	Test the top drive speed - stowed position			★			
2.6.3.10	Test the drive speed (raised)			★			
2.6.3.11	Test slow drive speed - stowed position			★			

Instruction: ★ Regular maintenance intervals ▲ Initial maintenance time

Table 2-2 Maintenance schedule

Items	Work Description	Maintenance					
		Daily	Monthly	Quarterly	Every 6 months	Annually	Every two years
		D	M1	M3	M6	M12	M24
2.6.3.12	Test emergency lowering function			★			
2.6.3.13	Test safety arm support limit function			★			
2.6.3.14	Inspect tray latch components			★			
2.6.3.15	Inspect down limit switch, level sensor and pothole limit switch			★			
2.6.3.16	Test up limit switch			★			
2.6.4.1	Test platform overload system				★		
2.6.4.2	Check liner actuator ball screw wear				★		
2.6.5	Check scissor wear slider					★	
2.6.6	Lifting liner actuator adding grease						★

Instruction: ★ Regular maintenance intervals ▲ Initial maintenance time

2.6 Maintenance Inspection

2.6.1 Daily inspection

2.6.1.1 Check manual and decals

Ensuring that the operation and maintenance manual is in good condition. Each unit is stored with operation and maintenance manuals. Manuals should be stored in the platform container. Manuals with illegible or missing pages do not provide sufficient information to ensure safe operation.

Ensure that all safety decals are intact. Decal alerts the operator to the safety hazard of using the machine. It also provides operational and maintenance information to the user. Blurred decals will not serve as a warning and may result in a dangerous operating environment.

a) Check and ensure that the operation and maintenance manual is in the storage box of the platform.

b) Ensure that there is no illegible or missing pages.

   1) Result: the manual matches the model, all manuals are legible and there are no missing pages.

   2) Result: the manual does not match the model, or the manual is illegible or there are missing pages. Stop using the machine before the manual is replaced.

c) Check the Decal Inspection section in manual. Ensure the decal is legible and intact.

   1) Result: all decals are clear and complete.

   2) Result: decal is missing, illegible or damaged. Stop using the machine before the manual is replaced.

d) Put it back in the storage box after using the manual.

e) Reminder: if need to replace the manual or label, please contact Zoomlion or Zoomlion dealer.

2.6.1.2 Pre-start inspection

It is important to implement pre-start inspection for safety operation. The pre-operation check is done visually before the machine is running. This inspection is used to find out if there are obvious problems with the machine before the functional test. It could be used to decide whether to perform routine maintenance procedures.

2.6.1.3 Battery inspection

Proper battery condition is essential to good machine performance and safety operation. Improper fluid level or damaged cables and connections can result in component damage and hazardous conditions.

⚠CAUTION

Machines with sealed or maintenance-free batteries are not required for this check.

⚠WARNING

a) Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches or other jewelry.

b) Batteries fluid is highly corrosive. Avoid spilling or contacting battery acid. Neutralize battery acid spills with baking soda and water.

⚠CAUTION

Fully charge the battery before performing the following inspections.

a) Only qualified riggers should rig the machine.

b) Only certified crane operators should lift the machine and only in accordance with the applicable crane regulations.

c) Be sure that the battery retainers are tight.

d) Remove the battery vent caps.

e) Check the battery acid level. If needed, replenish with distilled water from the battery fill hole. Do not overfill.

f) Install the vent caps.

2.6.1.4 Check lifting actuator status

The lifting liner actuator can brake normally in the working position, which is very important for the safety of the operation of the machine. Excessive wear of the motor brake pad may lead to brake failure. Through routine inspection, the inspector checks the status of the liner actuator for potential problems with motor brakes.

⚠CAUTION

Conduct the inspection with platform lifted

a) Lift the device to a certain height through the ground control operation panel;

Result: The motor brake works normally and the machine stops lifting immediately and remains in the position.

b) Observe whether the liner actuator has obvious shaking or abnormal sound in the lifting process.

2.6.1.5 Functional test

Completing the functional test is very important for the safe operation. The functional test is used to find out whether the machine has functional defects before the machine works, and the defective machine cannot be used. Once a functional defect is discovered, mark the machine immediately and stop using it.

A complete inspection procedure can be found in the Functional Test section of this manual.

2.6.2 Maintenance every month

2.6.2.1 Maintenance after 30 days

30-day maintenance is a one-time maintenance after the first 30 days or 50 hours of machine operation. Continue the scheduled maintenance after this one-time maintenance.

Perform the following maintenance:

a) Tires and hubs.

2.6.2.2 Lubricate steering knuckles

Conduct this inspection every 100 hours.

a) Regular lubrication of steering knuckle is essential for good machine performance and service life. Long-term use of knuckles that are not effectively lubricated will result in damage to the parts.

b) Open the lid on the knuckle and find the greased hole at the top of the knuckle. Fill enough grease into the knuckle till the grease covering the bearing.

c) Replace the cover and repeat the above process for the other steering knuckles. Grease specifications: use 3 # general lithium-based grease.

2.6.3 Maintenance every 3 months

2.6.3.1 Battery maintenance

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

Proper battery condition is essential for good machine performance and safety operation. Improper fluid levels or damaged cables and connections can result in component damage and hazardous conditions.

⚠WARNING

Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches or other jewelry.

Batteries fluid is highly corrosive. Avoid spilling or contacting battery acid. Neutralize battery acid spills with baking soda and water.

a) Put on protective clothing and eye wear.

b) Release the battery pack latch and rotate the battery pack out and away from the chassis.

c) Be sure that the battery cable connections are free of corrosion.

d) Add terminal protectors and a corrosion preventative sealant will help eliminate corrosion on the battery terminals and cables.

e) Be sure that the battery retainers and cable connections are tight.

f) Fully charge the batteries and allow the batteries to rest 24 hours.

g) Remove the battery vent caps and check the specific gravity of each battery cell with a hydrometer.

h) Check the ambient air temperature and adjust the specific gravity for each as follows:

1) Add 0.004 from the reading of each cell for every 5.5℃/ 42℉ above 26.7℃/ 80℉.

2) Subtract 0.004 from the reading of each cell for every 5.5℃/ 42℉ below 26.7℃/ 80℉.

3) Result: all battery cells display an adjusted specific gravity of 1.277 or higher. The battery is fully charged. Proceed to step k.

4) Result: one or more battery cells display a specific gravity of 1.217 or below. Proceed to step h.

i) Perform a equalizing charge OR fully charge the battery(s). Allow the battery(s) to rest at least 6 hours.

j) Remove the battery vent caps and check the specific gravity of each battery cell with a hydrometer.

k) Check the ambient air temperature and adjust the specific gravity for each as follows:

1) Add 0.004 from the reading of each cell for every 5.5℃/ 42℉ above 26.7℃/ 80℉.

2) Subtract 0.004 from the reading of each cell for every 5.5℃/ 42℉ below 26.7℃/ 80℉.

3) Result: all battery cells display an adjusted specific gravity of 1.277 or higher. The battery is fully charged. Proceed to step k).

4) Result: the difference in specific gravity readings between cells is greater than 0.1 OR the specific gravity of one or more cells is less than 1.217. Replace the battery.

l) Check the battery acid level. If needed, replenish with distilled water to 3mm/0.04in below the bottom of the battery fill tube. Do not overfill.

m) Install the vent caps and neutralize any electrolyte that may have spilled.

n) Verify that the batteries are wired correctly.

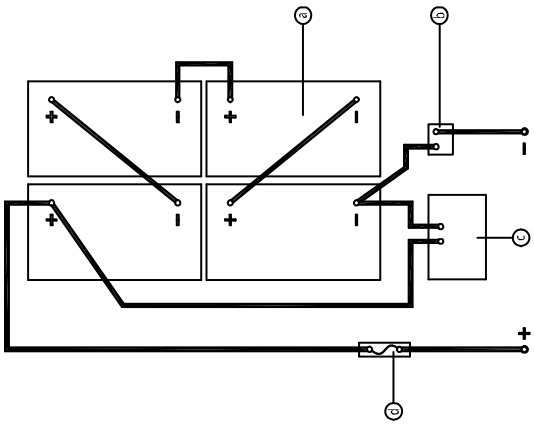

Figure 2-6 ZS1930E Battery connections

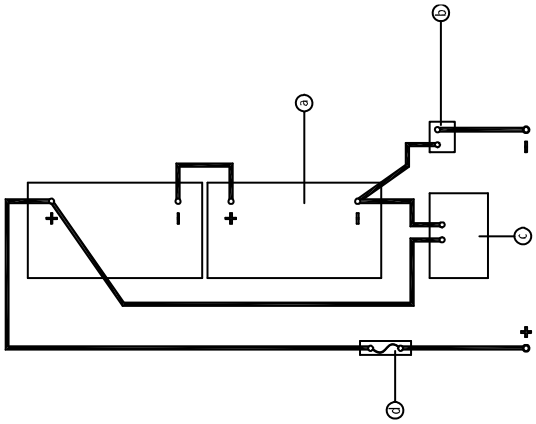

Figure 2-7 ZS1530E Battery connections

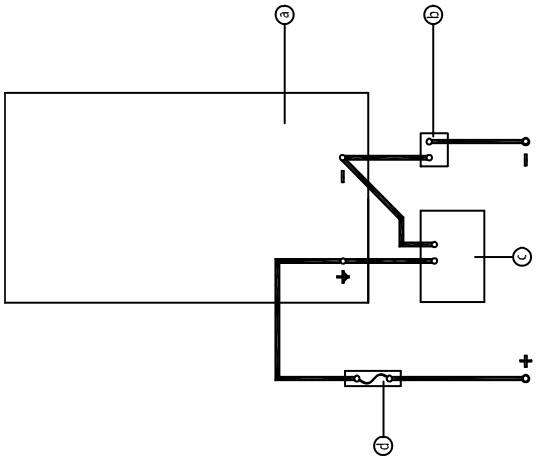

Figure 2-8 Li-ion Battery connections

Table 2-3 Code name

Code	Name	Code	Name
a	Battery/Li-ion battery	b	Main Switch
c	Charger	d	Fuse

o) Inspect the battery charger plug and pigtail for damage or excessive insulation wear. Replace as required.

p) Connect the battery charger to 110-240V 50/60 HZ AC power.

1) Result: charger operates. Charge the batteries.

2) Result: the charger's fault indicator flashes or displays a fault code. Check and correct the charger input cable, as well as the battery and charger connections, make sure the charger is operating properly and start charging the battery.

Consult Zoomlion after-sale service team for more relevant problems.

2.6.3.2 Li-ion battery maintenance

The battery system should not be used for a long time. It should be placed in a cool and dry environment (temperature below 30℃/ 86℉ and humidity less than 90%), and it should be charged with a special charger at least every three months.

⚠WARNING

The lithium battery should be charged in time when the voltage is too low, otherwise the battery will be over-discharged and the machine cannot move normally.

2.6.3.3 Inspect electrical wiring

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

Maintaining electrical wiring in good condition is essential to safe operation and good machine performance. Failure to find and replace burnt, chafed, corroded or pinched wires could result in unsafe operating conditions and may cause component damage.

⚠WARNING

Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and jewelry.

a) Inspect that if the ground wire under the chassis is missing or damaged.

b) Inspect the following areas for burnt, chafed, corroded pinched and loose wires:

   1) Ground control box interior.

   2) Battery wiring in battery tray.

   3) Platform control box interior.

c) Turn the key switch to Platform Control and pull out the red Emergency Stop button to the on position at both the ground and platform controls.

d) Raise the platform approximately 2.5m/8ft 2in from the ground.

e) Lift the safety arm, move the safety arm to the middle of the scissor bushing and rotate it down to the vertical position.

f) Lower the platform until the safety arm is in full contact with the bushing.

⚠WARNING

Keep hands away from the safety arm when lowering the platform.

g) Inspect the following areas for burnt, chafed, corroded pinched and loose wires:

   1) Scissor arm wiring.

2) ECU to platform.

3) All wire harness connectors to platform control box.

h) Lift the platform, replace the safety arm to installation position.

i) Lower the platform.

2.6.3.4 Inspect the tires and wheels

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

Maintaining the tires and wheels is essential to safe operation and good performance. Tire and/or wheel failure could result in a machine tip-over. Component damage may also result if problems are not discovered and repaired in a timely fashion.

a) Check all tire treads and sidewalls for cuts, cracks, punctures and unusual wear.

b) Check each wheel for damage, bends and cracked welds.

c) Remove the cotter pin and check the castle nut for proper torque.

Always replace the cotter pin with a new one when reinstalling.

d) Install and fasten the new cotter pin.

2.6.3.5 Inspect emergency stop function

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

Proper emergency stop function is essential to safe operation. Invalid emergency stop cannot shut off the power supply and cannot stop all functions of the machine, resulting in a dangerous situation.

When selecting and operating a ground controller, its safety functions take precedence over the platform controller.

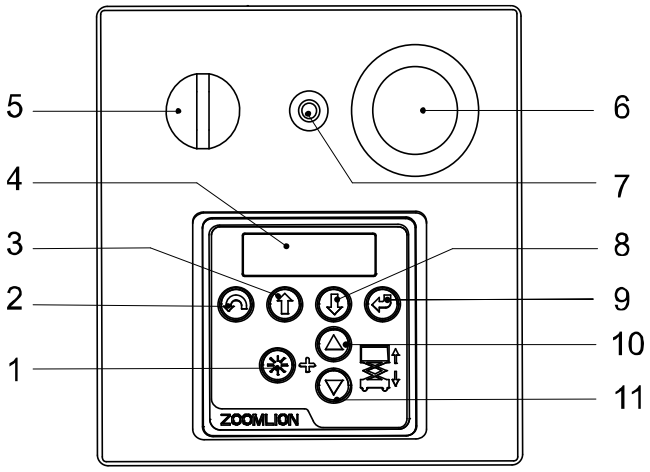

Figure 2-9 Ground control panel

Table 2-4 Ground control panel instruction

No.	Name	No.	Name
1	Lifting enable button	2	Menu escape button
3	Menu up button	4	LCD diagnostic readout
5	Key switch	6	Emergency stop switch
7	10A breaker	8	Menu down button
9	Menu enter button	10	Platform up button
11	Platform down button		

a) Turn the key switch to Ground Control and pull out the red Emergency Stop button to the on position at both the ground and platform controls,

b) Press the red Emergency Stop button to the off position at ground control.

Result: the machine has no movements.

c) Turn the key switch to Platform Control and pull out the red Emergency Stop button to the on position at both the ground and platform controls,

d) Press the red Emergency Stop button to the off position at platform control.

Result: the machine has no movements.

The red Emergency Stop button can stop all operations of the machine.

2.6.3.6 Test key switch

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

Proper key switch action and response are essential to the safe operation. The key switch can be switched by the ground controller or platform controller. Invalid key switch could result in dangerous operation.

Operator must use the platform controller on the ground when performing this step.

a) Pull out the red Emergency Stop button to the on position at both the ground and platform controls.

b) Turn the key switch to platform control.

c) Inspect the raising and lowering functions at ground control.

Result: the machine has no movements.

d) Turn the key switch to ground control.

e) Inspect the raising and lowering functions at platform control.

Result: the machine has no movements.

f) Turn the key switch to off position.

Result: the machine has no movements.

2.6.3.7 Test the horn

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

Horn is used to alert operators and ground personnel of machine proximity and motion. A malfunctioning horn cannot alert the ground personnel to a dangerous or unsafe condition.

a) Turn the key switch to Platform Control and pull out the red Emergency Stop button to the on position at both the ground and platform controls,

b) Press the horn button at the platform control.

Result: the horn should sound.

2.6.3.8 Test the drive brakes

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

Proper brake action is essential to safe machine operation. The drive brake should operate smoothly, free of hesitation, jerking and unusual noise. There is no difference in the appearance of the tire before and after the release of the brakes.

Select a test area that is firm, level and free of obstructions. Be sure the platform extension deck is fully retracted and the platform is in the stowed position.

a) Mark a test line on the ground for reference.

b) Turn the key switch to Platform Control and pull out the red Emergency Stop button to the on position at both the ground and platform controls.

c) Lower the platform to stowed position.

d) Press the drive function selection button.

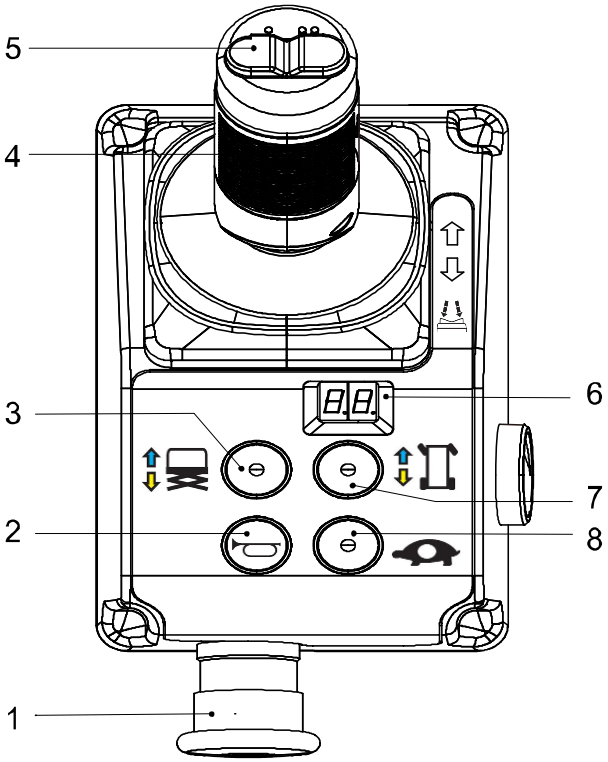

Figure 2-10 Platform control panel

Table 2-5 Platform control panel instruction

No.	Name	No.	Name
1	Emergency stop switch	2	Horn Button
3	Lift function button	4	Control handle
5	Steering thumb button	6	LED Readout
7	Drive function button	8	Drive speed button

e) Choose a point on the machine (i.e., contact patch of a tire) as a visual reference for use when crossing the test line.

f) Bring the machine to top drive speed before reaching the test line. Release the drive joystick when your reference point on the machine crosses the test line.

g) Measure the distance between the test line and your machine reference point. The maximum braking distance on flat ground is 50cm ± 10cm/20in ± 4in, the maximum braking distance on slope braking is 100cm ± 10cm/ 40in ± 4in.

1) Result: the machine will stop within the specified braking distance, passing the test.

2) Result: the machine will not stop within the specified braking distance.

The brakes must be able to hold the machine on any slope it is able to climb.

h) Replace the brake. Repeat the above process from the step a until the test qualified.

2.6.3.9 Test the top drive speed - stowed position

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

Proper drive function is essential to safe operation. The drive function should respond quickly and smoothly to operator control. Drive performance should also free of hesitation, jerking and unusual noise over the entire speed range.

Select a test area that is firm, level and free of obstructions.

a) Create start and finish lines by marking two lines on the ground 10m/32ft10in apart.

b) Turn the key switch to Platform Control and pull out the red Emergency Stop button to the on position at both the ground and platform controls.

c) Lower the platform to stowed position.

d) Press the drive function selection button.

e) Choose a point on the machine (i.e., contact patch of a tire) as a visual reference for use when crossing the test line.

f) Continue at full speed and begin to recording the time when your reference point crosses the start line.

g) Record the time when the machine reference point crosses the finish line. The time is between 10.6 ~ 12 s.

2.6.3.10 Test the drive speed - raised position

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

Proper drive function is essential to safe operation. The drive function should respond quickly and smoothly to operator control. Drive performance should also free of hesitation, jerking and unusual noise

over the entire speed range.

Select a test area that is firm, level and free of obstructions.

a) Create start and finish lines by marking two lines on the ground 10m/32ft 10in apart.

b) Turn the key switch to Platform Control and pull out the red Emergency Stop button to the on position at both the ground and platform controls.

c) Press the lifting function selection button.

d) Press and hold the function enable button on the control handle, and push the handle to raise the platform to a safe height (the bottom of the platform is about 2.4 m/7ft 10in above the ground).

e) Press the drive function selection button.

f) Choose a point on the machine (i.e., contact patch of a tire) as a visual reference for use when crossing the test line.

g) Continue at full speed and beginning timing when your reference point crosses the start line.

h) Continue at full speed and note the time when the machine reference point crosses the finish line. The time is between 75s-120s.

2.6.3.11 Test slow drive speed - stowed position

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

Proper drive function is essential to safe operation. The drive function should respond quickly and smoothly to operator control. Drive performance should also free of hesitation, jerking and unusual noise over the entire speed range.

Select a test area that is firm, level and free of obstructions.

a) Create start and finish lines by marking two lines on the ground 10m/32ft 10in apart.

b) Turn the key switch to Platform Control and pull out the red Emergency Stop button to the on position at both the ground and platform controls.

c) Lower the platform to stowed position.

d) Press the drive function selection button.

e) Choose a point on the machine (i.e., contact patch of a tire) as a visual reference for use when crossing the test line.

f) Continue at full speed and beginning timing when your reference point crosses the start line.

g) Continue at full speed and note the time when the machine reference point crosses the finish line, the time is between 20s and 24s.

2.6.3.12 Test emergency lowering function

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

The normal emergency descent function of the liner actuator is very important for operator safety and machine performance. In the case of system power failure, operate the emergency descending lever. If the descending speed is abnormally fast, it will affect the operator safety and the machine performance. Please release the emergency descending lever immediately and stop the emergency descending action.

When the emergency descent speed is abnormally accelerated, the ground operator should use the emergency descending lever to lower the working platform slowly for safety.

2.6.3.13 Test the safety arm lifting limit function

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

A good safety arm holding limit switch is very important to the mechanical performance and service life of the machine. The failure of the safety arm lift limit switch may cause damage to the machine structure and affect the mechanical performance and service life of the machine. This inspection shall be carried out regularly, and the test should be carried out on a firm, level and obstruction-free surface.

a) Turn the key switch to ground control and raise the platform to a height of 2.4m above the ground;

b) Lift the safety arm, move the safety arm to the middle of the shaft sleeve of the shearing fork, and rotate it downward to the vertical state;

c) Lower the platform height until the safety arm is in full contact with the bushing.

   Results: After the safety arm contacted with the shaft sleeve of the scissor arm, the descending action of the machine stopped immediately.

   Results: After the safety arm contacts with the shaft sleeve of the scissor arm, the machine still descends slowly and stops operation immediately. Please check whether the limit switch of the safety arm is damaged or whether the cable is disconnected.

2.6.3.14 Inspect tray latch components

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

Maintaining the module tray latch components in good condition is essential to good performance and service life. Damaged latch components may result in module trays opening unexpectedly, creating an unsafe operating condition.

a) Inspect each module tray latch and related components for wear.

b) Using light oil, apply a few drops to each of springs and to the sides of the latch mechanism.

2.6.3.15 Inspect down limit switch, level sensor and pothole limit switch

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

Proper limit switch is essential to good performance and safe operation. A faulty limit switch could cause result in reduced machine performance and a potential unsafe operating condition.

Select a test area that is firm, level and free of obstructions.

a) Down limit switch

1) Turn the key switch to ground control.

2) Raise the platform above safe working height greater than 2.4m/7ft 10in.

3) Lower the platform.

Result: platform will stop raising at the height of 2.4m/7ft 10in. Press the down button again to lower the platform. Proper down limit switch.

Result: platform does not stop raising at the height of 2.4m/7ft 10in. Check if the down limit switch and metal activates on the fixed shaft are loose. OR replace down limit switch.

⚠WARNING

Keep hands away from the safety arm when lowering the platform.

b) Tilt switch

1) Move the machine onto a grade which exceeds the rating of the level sensor. Refer to the serial label on the machine.

2) Press the lift function button, attempt to raise the platform to approximately 2.4m/7ft 10in.

Result: the ground controls LCD displays "LL", the alarm sounds. The machine is functioning properly.

Result: diagnostic display does not shows "LL", the alarm does not sound. Adjust or replace the level sensor.

c) Pothole limit switch

1) Lower the platform to stowed position. Move the machine to a level ground.

2) Place a wooden block approximately 5cm/2in tall under the right pothole guard.

3) Attempt to raise the platform to approximately 2.4m/7ft 10in.

Result: the pothole guard contacts the block and does not fully deploy. The diagnostic display shows code 18, alarm sounds. Machine functions normally:

Result: the pothole guard contacts the block and does not fully deploy. The diagnostic display does not show code 18, alarm does not sound. The machine can continue to rise. Adjust or replace the pothole limit switch.

2.6.3.16 Inspect up limit switch

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

Proper limit switch is essential to good performance and safe operation. A faulty limit switch could cause result in reduced machine performance and a potential unsafe operating condition.

Select a test area that is firm, level and free of obstructions.

a) Turn the key switch to Ground Control, and attempt to raise the platform to approximately 2.4m/7ft 10in.

b) Lift the safety arm, move the safety arm to the middle of the scissor bushing and rotate it down to the vertical position.

c) Lower the platform until the safety arm is in full contact with the bushing.

⚠WARNING

Keep hands away from the safety arm when lowering the platform.

d) Open the limit switch cover on the chassis.

e) Slightly raise the platform, restore the safety arm.

f) Use the ground controller to lift the platform while pressing the up limit switch arm to activate the up limit switch.

g) For vehicles equipped with outdoor function, another upper limit switch must be activated according to the previous step.

   1) Result: platform stops raising. The machine is functioning properly.

   2) Result: platform continues to raise. Adjust or replace up limit switch.

2.6.4 Maintenance every 6 months

2.6.4.1 Inspect platform overload system

This inspection is conducted every 500 hours or 6 months, whichever comes first. Check immediately when the machine has an overload fault.

It is very important to test platform overload mechanism frequently for safe operation. Continuous misoperations on the platform will cause that the system cannot sense platform overload. The stability of the machine will be affected and the equipment will tip over.

The platform overload system is designed to prevent the operation of the machine in the case of overload. It is composed of two or four pin type force sensors.

The force sensor can directly weigh the load on the working platform. When the load exceeds the set value, it will send a signal to the ECU and all functions of the machine will stop until the excess load is removed from the platform.

a) Move the machine to a firm and level ground;

b) Place heavy objects on the platform (264kg for ZS1530);

c) Turn the key switch to ground control.

Results: Alarm sound sounded, display OL;

Results: The alarm sound did not sound, the display did not display OL, and the platform could continue to rise. Re-calibrate the load or contact professional after-sales service personnel.

2.6.4.2 Check the wear condition of the liner actuator ball screw

This inspection should be performed every 500 hours or 6 months, whichever comes first. When the ball screw is seriously worn, the machine is in an unsafe state.

It is very important to check the wear of electric cylinder ball screw regularly for safe operation. Operating a machine with a severely worn ball screw can reduce machine performance and result in a potentially unsafe working condition.

Perform this test on a firm, level, obstruction-free surface.

a) Turn the key switch to the ground control, raise the platform to a height of about 2.4m above the ground, lift the safety arm, move the safety arm to the middle of the shaft sleeve of scissor, rotate downward to the vertical state, and lower the height of the platform until the safety arm is in complete contact with the shaft sleeve;

b) Unscrew the grease filling port or observation port on the liner actuator;

c) Check the wear of the ball screw through the feeding port or the observation port.

Results: The wear of ball screw was within the normal range.

Results: Ball screw is seriously worn. Please repair or replace the liner actuator.

2.6.5 Maintenance every year

The scissor wear-resistant slider inspection is performed every 1000 hours or every 12 months, whichever comes first.

Maintaining the condition of the scissor wear pads is essential to safe machine operation. Continued use of worn out wear pads may result in component damage and unsafe operating conditions.

Check the wear-resistant slider with the platform stowed.

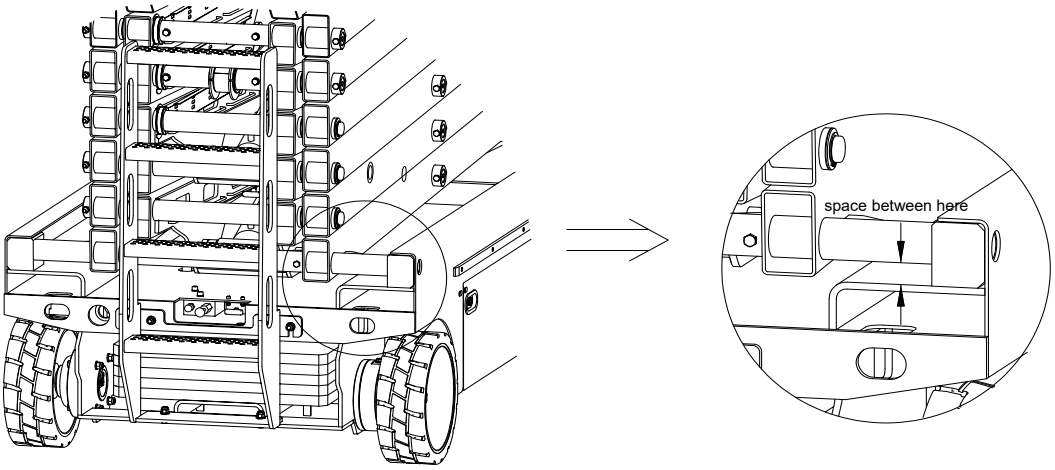

Figure 2-11 Inspection of wear pad

a) Measure the distance between the number one inner arm across tube and the chassis deck at the ground control side of the non-steer end of the machine.

1) For ZS1930 Series machines.

Result: the measurement is 39 mm/2 in or more. Proceed to step b.

Result: the measurement is less than 39mm/2 in. Replace wear pads.

2) For ZS1530 Series machines.

Result: the measurement is 36 mm/1 in or more. Proceed to step b.

Result: the measurement is less than 36mm/1 in. Replace wear pads.

b) Apply a thin layer of dry film lubrication to the area of the chassis where the scissor wear pads make contact.

2.6.6 Maintenance every 24 months

2.6.6.1 Grease the liner actuator

Good quality grease is very important to the performance and service life of electric liner actuator. Dirty or insufficient grease will affect machine performance, and even cause parts damage. This operation should be carried out more frequently under poor working conditions.

We suggest that the filling time of grease used by the machine is as follows:

Replacement cycle: 2000 working hours or once every two years.

The recommended values above are appropriate for most applications. Higher temperature, higher frequency of use and harsh working environment will accelerate the failure and evaporation loss of grease, so it should be added earlier. If the system load is small, the grease filling cycle can be extended.

It is recommended to use Mobil SHC220 high-performance and ultra-high pressure grease. This special

synthetic grease will reduce wear, rust, corrosion and adapt to normal work in high or low temperature environment. Mobil SHC220 grease can achieve very low starting torque and running torque. Its operating temperature range is -40℃~+177℃.

The grease filling amount is 50g/ time. Other brands or specifications of grease not recommended.

Do not mix different brands or types of greases. The mixing of additives in different greases may bring negative effects. Our after-sales does not solve the problem caused by grease mixing.

⚠WARNING

Raise the safety arm before adding grease, if not, serious injury or death may result.

a) Lift the scissor arm to support the safety arm;

b) Remove the screw plug of the grease filling port;

c) Fill the prescribed amount of grease into the filling mouth with the oil gun.

ZOOMLION

Service and Maintenance Manual

Section 3 Electrical System Maintenance

SECTION 3 ELECTRICAL SYSTEM MAINTENANCE

3.1 Electrical System Trouble shooting

If the platform controls LED or ground controls LCD diagnostic readout displays following codes, the fault condition must repaired or removed before resuming machine operation.

3.1.1 Fault code

Table 3-1 Fault code list

Code	Condition	Machine Reaction
01	System initialization Fault	Disable All Motion
02	System communication Fault	Disable All Motion
03	Invalid option setting Fault	Disable All Motion
04	Calibration Fault	Warning Only
05	Hardware Internal Fault	Disable Lifting and Driving
06	Hardware Version Fault	Disable Lifting and Driving
09	GPS communication Fault	Disable Lifting and Fast driving
11	MC Lift Up Speed Fault	Warning Only
12	Chassis Up or Down Switch ON	Disable Chassis Control
13	Collison Switch Fault	Disable Lifting and Driving
14	CAN communication Fault（Pump motor controller）	Disable All Motion
15	Drive Montor Communication Fault	Disable All Motion
18	Pothole Guard Fault	Disable Lifting and Driving
20	BMS Comm Fault	Disable Lifting and Driving
21	Disch Temp Fault I	Warning Only
22	Disch Current High Fault I	Warning Only

Table 3-1 Fault code list

Code	Condition	Machine Reaction
23	Total Voltage Low Fault I	Disable Lifting, and Driving Lift Slow to Drive Speed
24	Cell Voltage Low Fault I	Disable Lifting, and Driving Lift Slow to Drive Speed
25	Cell Voltage Low Fault II	Disable Lifting, and Driving
26	Sharp Diff in Voltage	Disable Lifting, and Driving
27	Sharp Diff in Temp	Disable Lifting, and Driving
28	Disch Current High Fault II	Disable Lifting, and Driving
29	Disch Temp Fault II	Disable Lifting, and Driving
2C	Total or Cell Voltage High Fault 1	Disable Lifting, and Driving on low speed
2E	Charge Current High Fault 2	Disable Lifting and Driving
2F	Total or Cell Voltage High Fault 2	Disable Lifting and Driving
2H	BMS self-check hardware Fault	Disable Lifting and Driving
31	Load Sending Sensor 1 Fault	Disable Lifting and Driving
32	Angle Sensor Fault	Disable All Motion
35	Load Sending Sensor 2 Fault	Disable Lifting and Driving
36	Battery Drain Alarm	Lift Slow to Drive Speed
37	ECU Sleep	Disable All Motion
38	SPI communication Fault	Disable All Motion
42	Platform Left Button ON	Diagnostic Message Only
43	Platform Right Button ON	Diagnostic Message Only

Table 3-1 Fault code list

Code	Condition	Machine Reaction
44	Load Sending Sensor 3 Fault	Disable Lifting and Driving
45	Load Sending Sensor 4 Fault	Disable Lifting and Driving
46	Platform Enable Button ON	Disable Platform Control
47	Joystick Not in Neutral	Lift Slow to Drive Speed
58	General Brake Coil Fault	Disable Lifting and Driving
68	Total Voltage Low Fault II	Disable All Motion
75	Motor Controller Pump Motor Fault	Disable All Motion
76	Drive Motor Fault	Disable All Motion
77	Right Drive Motor Controller Fault	Disable Lifting and Driving
80	Over 80% Load Warning	Diagnostic Message Only
88	Left Drive Motor Controller Fault	Disable Lifting and Driving
89	Motor Field Open	Disable Lifting and Driving
90	Platform Load is over 90%	Diagnostic Message Only
91	Left Motor Field Short	Disable Lifting and Driving
94	Lift Actuator Wear Warning	Disable Lifting
95	Emergency Contactor Fault	Disable All Motion
99	Over 99% Load Warning	Warning Only
0L	Overloaded Platform Fault	Disable All Motion
LL	Machine Tiled	Disable Lifting and Driving
F0	Foot Pedal Fault	Disables All Motion

3.1.2 Troubles shooting method

Table 3-2 Trouble shooting method

Code	Trouble shooting Method
01	System Initialization Fault: ECU may be malfunctioning, replace it.
02	System Communication Fault: Check communications cable connections and other wiring. If that does not resolve the problem, try replacing the PCU or ECU.
03	Invalid Option setting Fault: Set appropriate option for this lift.
04	Calibration Fault: Re-calibration the system, or check the angle and pressure sensor.
05	Hardware Internal Fault: ECU may be malfunctioning, replace it.
06	Hardware Version Fault: ECU may be malfunctioning, replace it.
09	GPS communication Fault: Check communications cable connections and other wiring. If that does not resolve the problem, try replacing the GPS module or ECU.
11	MC Lift Up Speed Fault: Check Mechanical condition.
12	Chassis Up or Down Fault: Check communications cable connections and other wiring. If that does not resolve the problem, try replacing the ECU.
13	Collison Switch Fault: Lower the platform, or check the collison switch sensor.
14	CAN communication Fault（Lift motor controller）: Check communications cable connections between lift motor controller and ECU. If that does not resolve the problem, try replacing the Lift motor controller or ECU.
15	Drive Montor Communication Fault: Check communications cable connections between Drive motor controller and ECU. If that does not resolve the problem, try replacing the Drive motor controller or ECU.
18	Pothole Guard Fault: Check that the pothole guards are extended, check the pothole limit switches. Check wires to the switches, check the down limit switch and connections.
20	BMS Communication Fault: Check communications cable connections and other wiring between ECU and BMS. If that does not resolve the problem, try replacing the BMS or ECU.
21	Disch Temp Fault I: Lower capacity or travel slowly.

Table 3-2 Trouble shooting method

Code	Trouble shooting Method
22	Disch Current High Fault I: Lower capacity or travel slowly.
23	Total Voltage Low Fault I: Restart the key, charge immediately.
24	Cell Voltage Low Fault I: Restart the key, charge immediately.
25	Cell Voltage Low Fault II: Switch off the key, charge immediately.
26	Sharp Diff in Voltage: Rest for a while, then power on to see if the fault disappears. If not, charge timely.
27	Sharp Diff in Temp: Rest for a while, then power on. If the fault disappears, the device could proper function.
28	Disch Current High Fault II: Stop operation, and power on again. If the fault disappears, lower capacity or travel slowly.
29	Disch Temp Fault II: Stop operation, and power on again after a period of rest. If the fault disappears, lower capacity or travel slowly.
2C	Total or Cell Voltage High Fault 1: Stop operation, and power on again after a period of rest.
2F	Total or Cell Voltage High Fault 2: Stop operation, and power on again after a period of rest.
2H	BMS self-check hardware Fault: Power on again, If that does not resolve the problem, try replacing the BMS.
31	Load Sending Sensor 1 Fault: Check the wiring to the sensor and then the sensor it self.
32	Angle Sensor Fault: Check the wiring to the sensor and then the sensor itself. Also check to make sure that the correct option is properly selected (or not) for load sensing.
35	Load Sending Sensor 2 Fault: Check the wiring to the sensor and then the sensor it self.
36	Limp Mode: Battery voltage is low, charge the battery.
37	ECU Sleep: Re-power.
38	SPI Communication Fault: Re-power, then check whether the fault still exists. If it is, please contact us.

Table 3-2 Trouble shooting method

Code	Trouble shooting Method
42	Platform Left Turn Switch ON at power-up Message: Ensure that nothing is holding the Joystick Toggle Switches down. If OK, consider replacing the Joystick or PCU.
43	Platform Right Turn Switch ON at power-up Message: Ensure that nothing is holding the Joystick Toggle Switches down. If OK, consider replacing the Joystick or PCU.
44	Load Sending Sensor 3 Fault: Check the wiring to the sensor and then the sensor it self.
45	Load Sending Sensor 4 Fault: Check the wiring to the sensor and then the sensor it self.
46	Platform Joystick Enable Switch ON at power-up Fault: Ensure that nothing is holding the Enable switch closed. Also check the neutral zone parameters. If OK, consider replacing the Joystick or PCU.
47	Platform Joystick not in neutral at power-up Message: Make sure that the Joystick is in the neutral (upright) position. Check the neutral zone parameter setting in the Labview Programmer. If it's OK, consider replacing the Joystick or the PCU.
68	Total Voltage Low Fault II: Check battery voltage and charge if necessary. Check the battery connections and tight or clean. Check the voltage to the ECU and PCU.
75	Lift Motor Fault: Check connections to the Pump Motor. Cycle power to the lift and if that does not resolve the issue, replace the Motor Controller.
76	Drive Motor Fault: Check connections to the motors, motor controller and contactor. In case the problem is not solved, contact a Zoomlion technician.
77	Right Drive Motor Controller Fault: Check connections to the right motors, drive motor controller and contactor. In case the problem is not solved, contact a Zoomlion technician.
80	Over 80% Load Warning: Platform is getting close to its limit of weight. Consider not adding more load.
88	Left Drive Motor Controller Fault: Check connections to the left motors, drive motor controller and contactor. In case the problem is not solved, contact a Zoomlion technician.
90	Over 90% Load Warning: Platform is getting close to its limit of weight. Consider not adding more load.
94	Lift Actuator Wear Warning: Check lift actuator for wear.

Table 3-2 Trouble shooting method

Code	Trouble shooting Method
95	Emergency Contactor Fault: Replace the Emergency Contactor.
99	Over 99% Load Warning: Platform has reached its limit of weight. Do not add more load.
0L	Overloaded Platform Fault: Remove the excess load immediately.
LL	Machine Tilted Beyond Safe Limits Fault: If the machine is tilted, find a way to make it level. If the machine is level, check the wiring to the tilt sensor and then the sensor itself.
F0	Foot Pedal Fault: Confirm whether the foot switch is pressed when powered on, if not, check whether the circuit of the foot switch is short circuit or open circuit, and whether the internal contact is stuck.

3.1.3 ECU pin definition

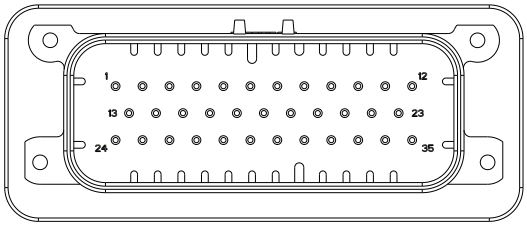

Figure 3-1 35 pin interface

Table 3-3 ECU 35 pin interface definition

Pin	Type	Function	Pin	Type	Function
1	Input	Support bar contact switch check	2	Input	Outdoor limit switch check
3	Output	Reserve	4	Power	Valve-driven power
5	Power	Valve-driven power	6	Output	Reserve
7	Output	Forward control	8	Output	Pump motor enable
9	Output	Pump motor speed control	10	Input	Left brake condition check
11	Input	Force sensor 4	12	Input	Chassis lowering control switch check
13	Communi cation	PCU communication +	14	Input	Chassis key switch
15	Power	GND	16	Input	Angle sensor
17	Input	Brake condition	18	Output	Reserve
19	Output	Left turn valve control	20	Output	Horn control

Table 3-3 ECU 35 pin interface definition

Pin	Type	Function	Pin	Type	Function
21	Output	Reserve	22	Input	Pothole switch check
23	Input	Up limit switch check	24	Communi cation	PCU communication -
25	Power	Working power	26	Input	Force sensor 3
27	Output	Drive motor speed control	28	Input	Driver fault code
29	Output	Backward control	30	Output	Right turn valve control
31	Output	Parallel valve control/ Drive motor enable	32	Output	Brake valve control
33	Input	Right brake condition check	34	Input	Tilt switch check
35	Input	Down limit switch check			

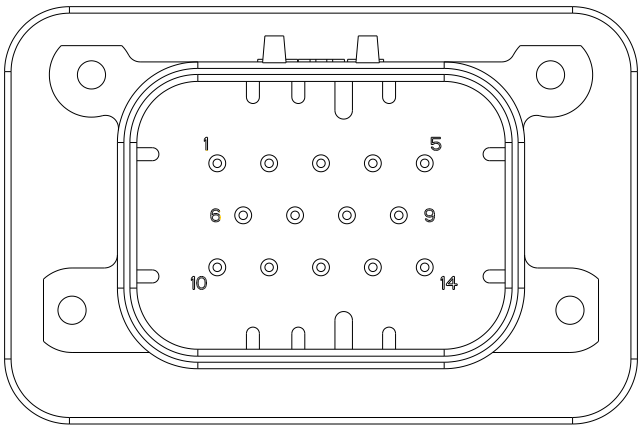

Figure 3-2 14 pin interface

Table 3-4 ECU 14 pin interface definition

Pin	Type	Function
1	Output	Alarm control
2	Input	Reserve
3	Output	Reserve
4	Communication	GPS Communication CAN-H2
5	Communication	GPS Communication CAN-L2
6	Input	Force sensor 1
7	Input	Force sensor 2
8	Output	Buzzer
9	Output	Reserve
10	Output	Reserve
11	Input	Reserve
12	Input	Reserve
13	Input	Reserve
14	Output	Emergency contactor

3.1.4 Electrical schematic

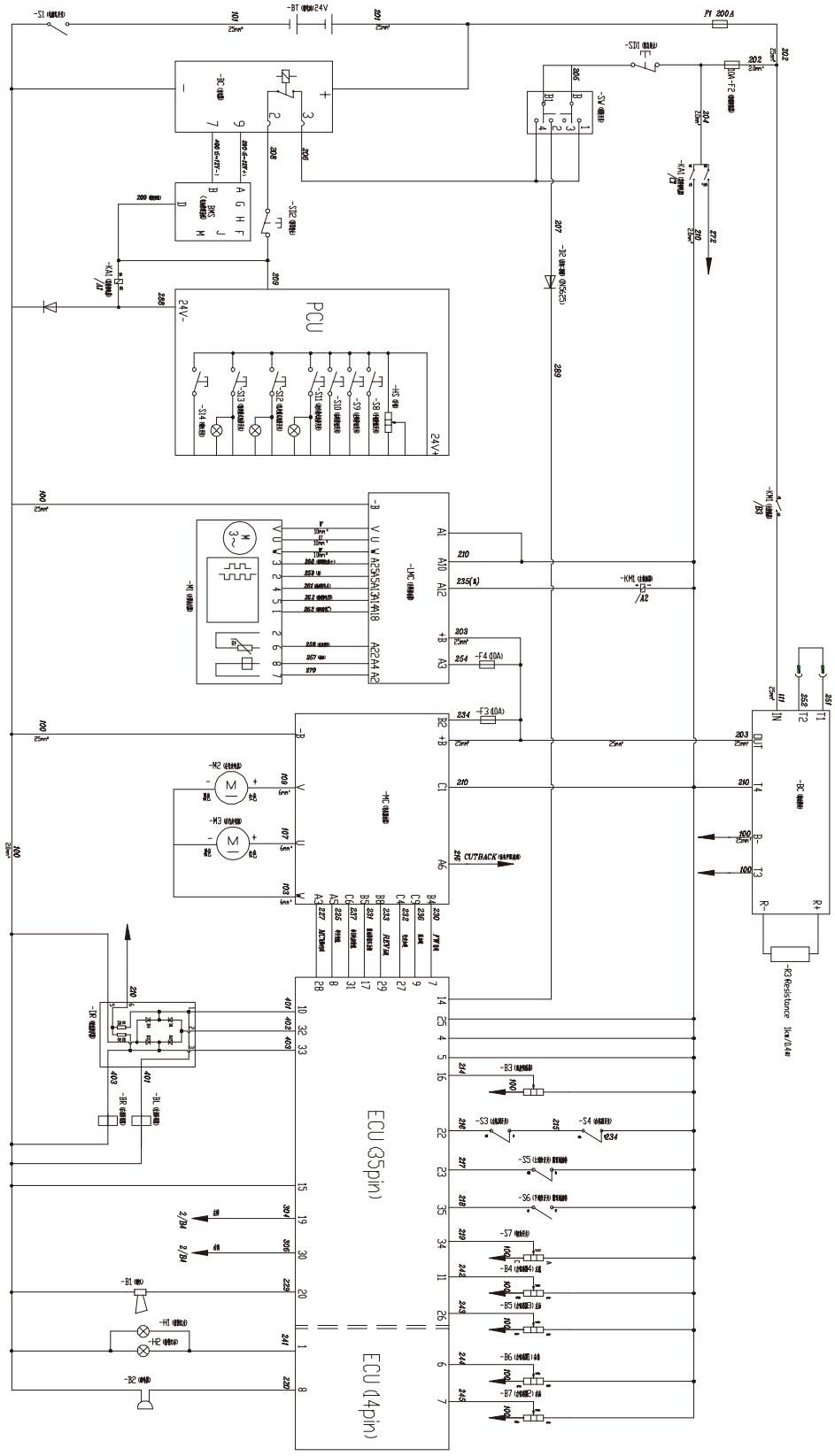

Figure 3-3 ZS1530E-Li Electrical schematic

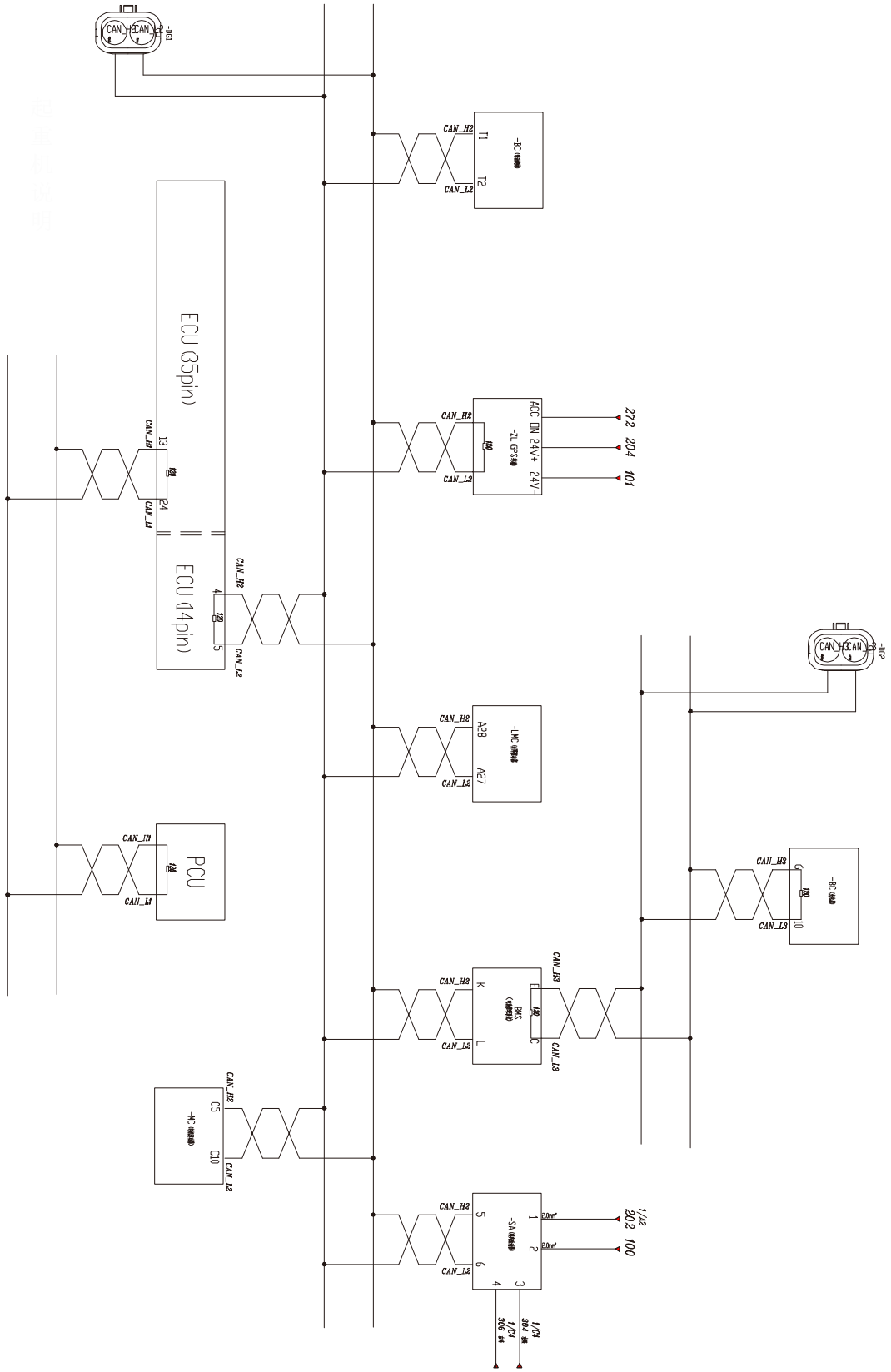

Figure 3-4 ZS1530E-Li CAN Bus

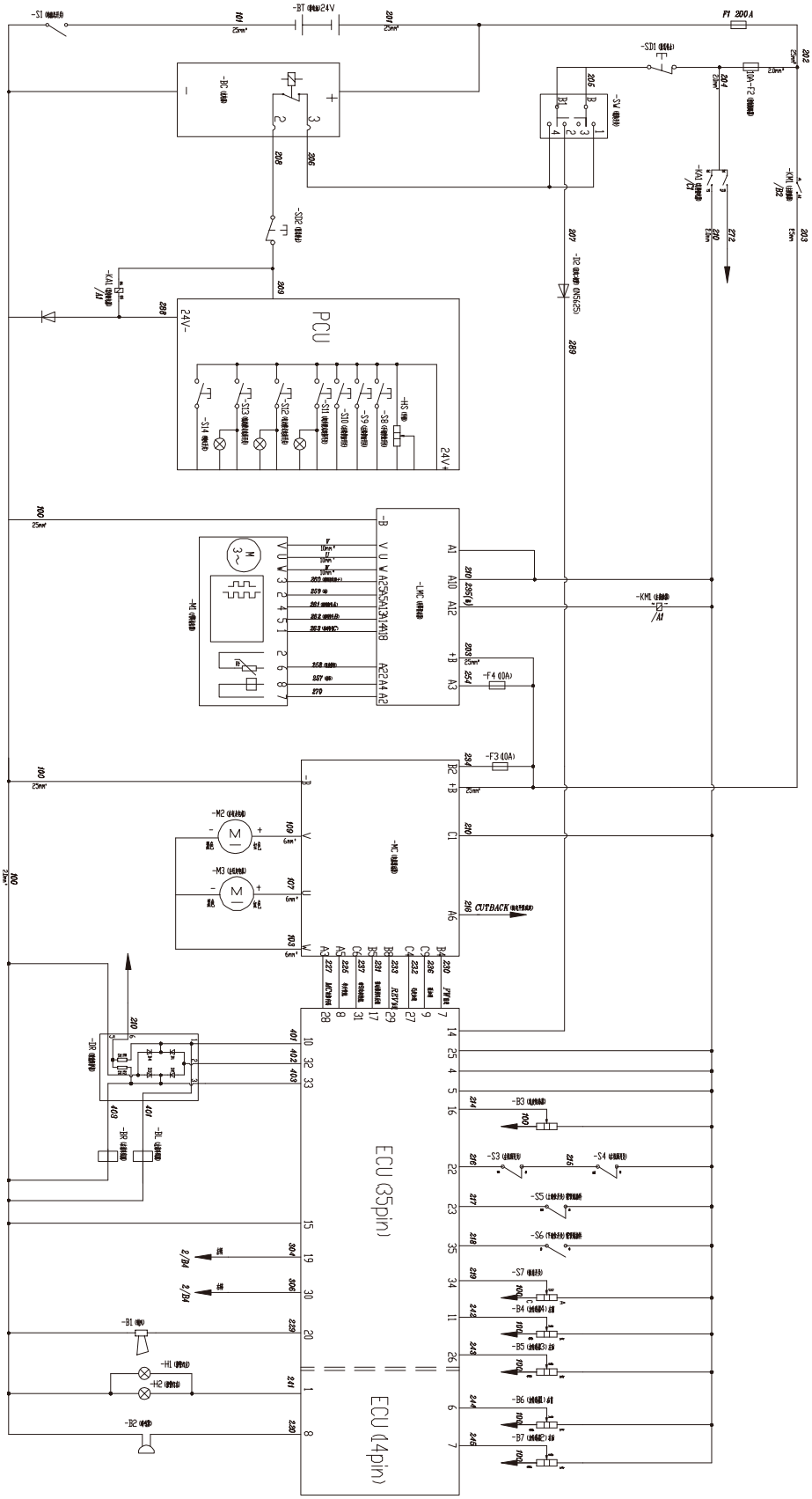

Figure 3-5 ZS1530E Electrical schematic

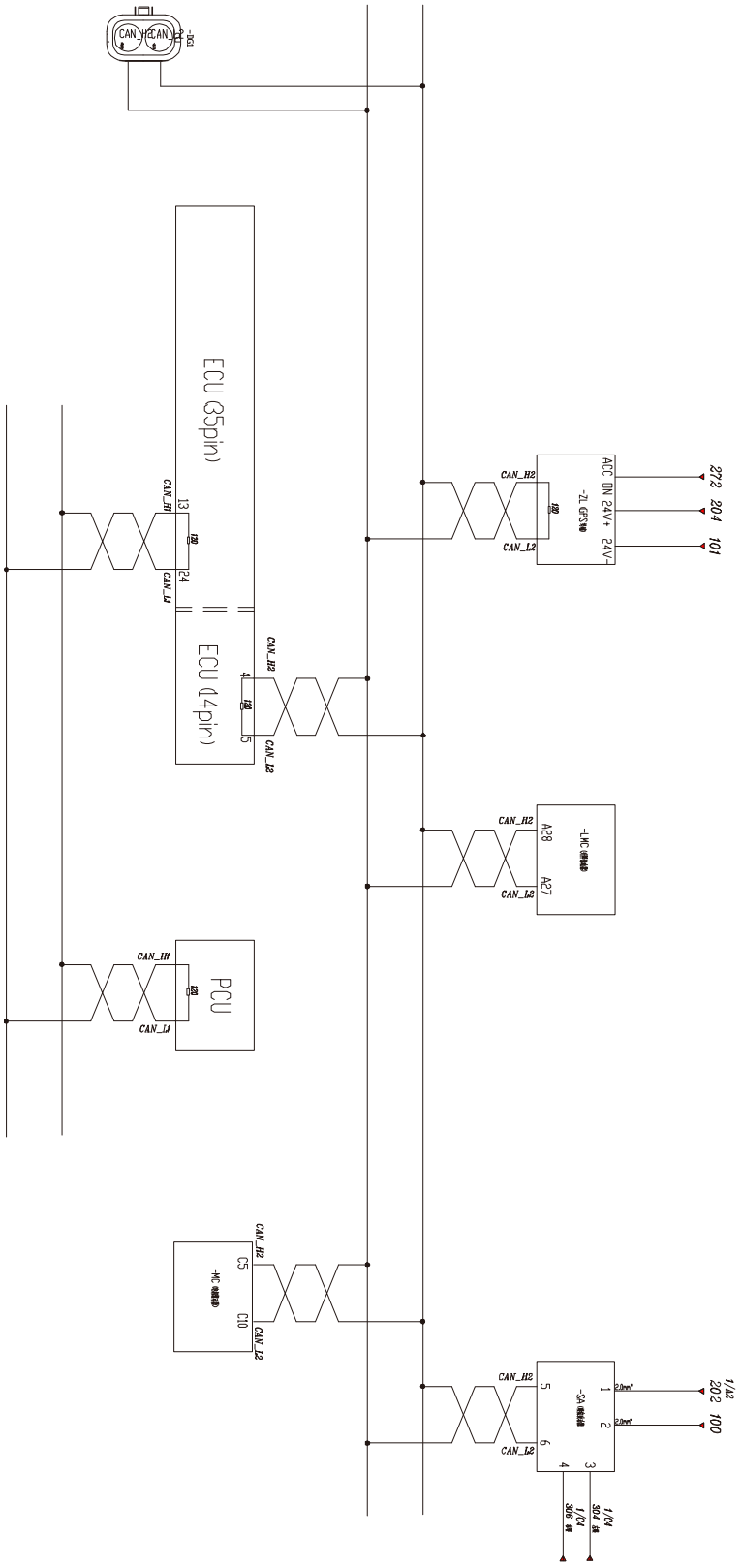

Figure 3-6 ZS1530E CAN Bus

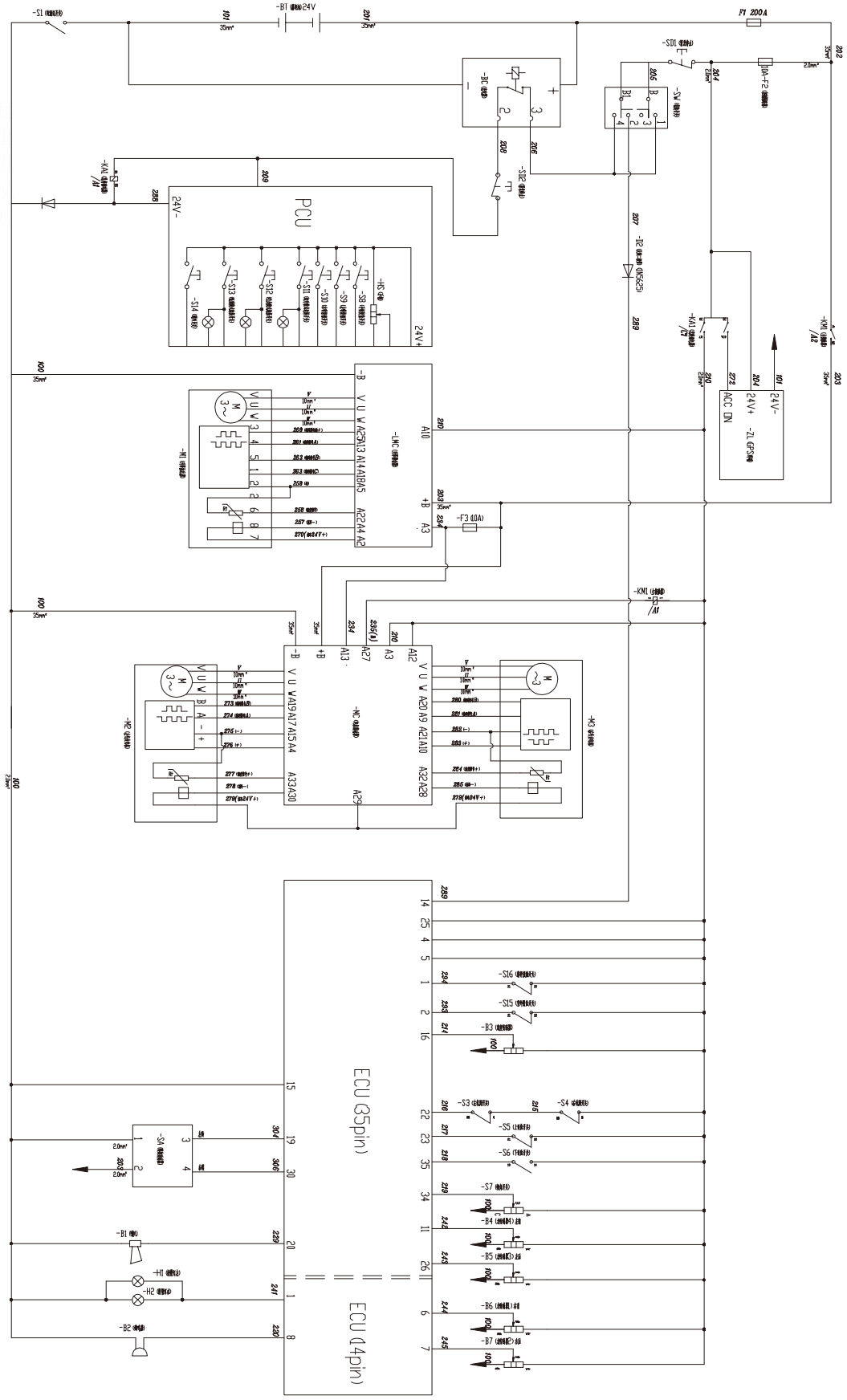

Figure 3-7 ZS1930E Electrical schematic

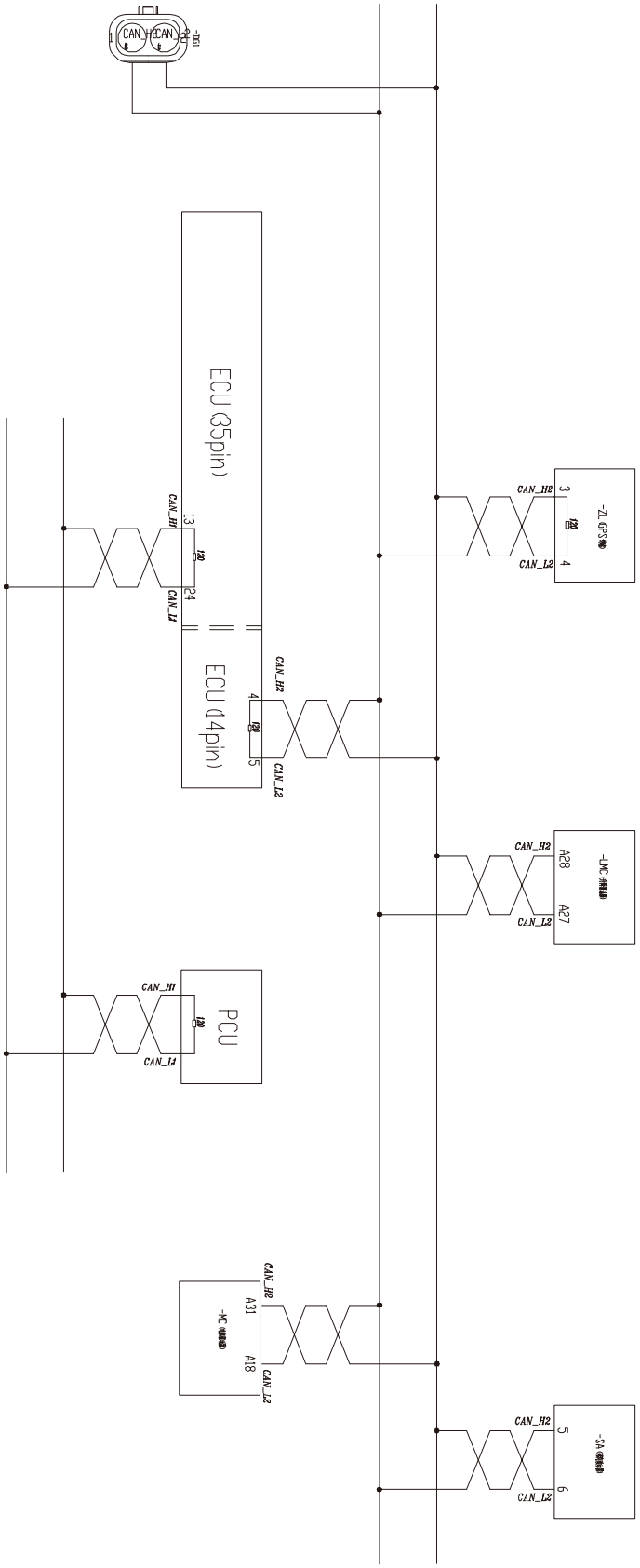

Figure 3-8 ZS1930E CAN Bus

ZOOMLION

Service and Maintenance Manual

Section 4 Common Faults Analysis

SECTION 4 COMMON FAULTS ANALYSIS

When the work platform is in use, it is necessary to inspect it in time and to repair it when necessary. The purpose of maintenance is as follows:

a) Ensuring the reliability of operations.

b) Maintaining the efficiency of the work platform.

c) Prevent downtime.

d) Maintain the value of the work platform.

e) Reduced maintenance costs.

4.1 Electrical System Fault

Table 4-1 Electrical System Fault List

No.	Fault phenomenon	Cause	Solution
1	Fault of angle sensor	1. Plug and connection of the angle sensor are loose. 2. Shift of installation position. 3. Damaged sensor.	1. Restore plug and connection. 2. Re-fixing of angle sensor. 3. Replacement of sensor.
2	Fault of force sensor	1. Plug and connection of the sensor are loose. 2. Damaged sensor.	1. Restore plug and connection. 2. Replace sensor.
3	Switch fault of pothole	1. Loose connection of left and right pothole limit switch. 2. Shift of left and right pothole protection limit switch. 3. Pothole slab cannot unfold properly.	1. Restore the connection. 2. Re-fix the left and right pothole limit switch. 3. Check the structure of the pothole slab whether it is normal or not and check whether there are any foreign matters under the pothole slab blocking the opening of the slab.

Table 4-1 Electrical System Fault List

No.	Fault phenomenon	Cause	Solution
4	The work platform is elevated to the highest position and cannot be limited	1. Loose connection of upper limit switch. 2. The position of upper limit switch is shifted and cannot be triggered properly. 3. Shift of upper limit switch trigger metal plate position. 4. Upper limit switch fault.	1. Check and restore upper limit switch connection. 2. Recalibration and re-fixing installation position of upper limit switch. 3. Recalibration and re-fixing installation position of upper limit switch trigger metal plate. 4. Replace upper limit switch.
5	Safe height limit anomaly or position shifting	1. Lower limit switch connection is loose. 2. The lower limit switch position is shifted and cannot be triggered properly. 3. Lower limit switch trigger metal plate is shifted. 4. Fault of lower limit switch.	1. Check and restore the lower limit switch connection. 2. Recalibration and re-fixing the lower limit switch installation position. 3. Recalibration and re-fixing trigger the installation position metal plate of the lower limit switch. 4. Replace the lower limit switch.
6	System communication error	1. Fault of communication lines between platform controller and ground controller. 2. Fault of work platform controller. 3. Fault of ground controller.	1. Whether CAN_H1 and CAN_L2 line on the platform and ground controller are properly connected. 2. Or replacement of the platform controller. ※ 3. Or replacement of the ground controller. ※

Table 4-1 Electrical System Fault List

No.	Fault phenomenon	Cause	Solution
7	UP and DOWN control can't start normally.	1. 300A main fuse burned down. 2. 10A breaker tripping. 3. Abnormal cable connection between platform and ground controller. 4. Fault of platform controller. 5. Fault of ground controller.	1. Replacement of the 300A main fuse. 2. Press 10A circuit breaker to restore connection. 3. Replace connection cable or plug-in of platform and ground controller. 4. Replacement of platform controller.※ 5. Replacement of ground controller.※
8	Lifting shaking	1. No grease has been added for a long time 2. Serious worn of ball screw wear	1. Add grease 2. Maintain or replace the liner actuator
9	Motor overload alarm	1. Upper limit switch failure causes the internal nut of the liner actuator touching the mechanical limit device 2. Serious wear of ball screw leads to the combination of safety nut and screw, and the current increases sharply	1. Replace upper limit switch 2. Maintain or replace the liner actuator

CAUTION

Do not dissemble or adjust when components with ※ break down. Contact the manufacturer.

NA-SE-Y

ALL ELECTRIC SCISSOR LIFTS

Service and Maintenance Manual

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