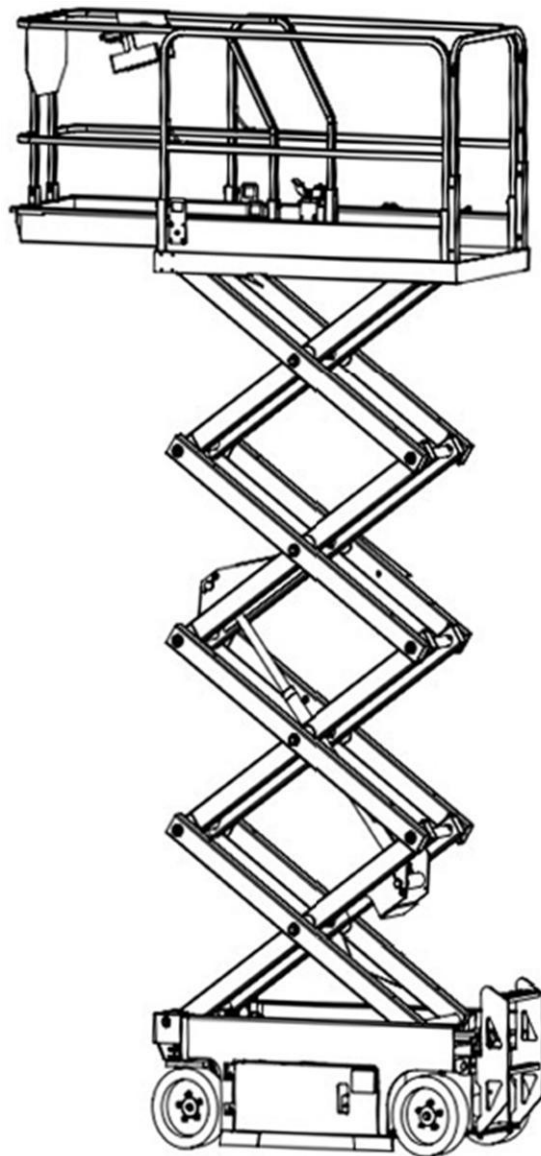




Electric Self-propelled Scissor Lift XE-Series Service Manual



Dear client,

Thank you for purchasing of this quality product!

Your new access equipment is the result of an innovative approach and the pursuit of quality. It has been designed to be functional, safe comfortable and durable with style and excellent operation features.

When your machine requires maintenance, only the spare parts must be used supplied by us in order to ensure reliability and suitability.

Before operating, please read this Service Manual thoroughly!

Instructions

For you used this product first time,

This machine will give you total satisfaction if you follow these operation and maintenance instructions carefully.

This manual is intended to help you.

The purpose of this manual is to provide the users with the essential knowledge for carrying out the procedures necessary for the proper working of the machine and for the purposes for which it is intended. All the information contained in this manual must be read and assimilated before undertaking any attempt to operate the machine.

The manual is the most important instrument. Keep it in the machine.

Remember that NO EQUIPMENT IS SAFE if the operator does not observe the safety precautions.



NOTES

- Compliance with the safety instructions concerning the machine itself, its use and its environment.
- Use within the limits of the machine.
- Correct maintenance and operation, which will affect the machine's lifetime.
- During and after the warranty period, our After Sales Department is available to provide any services you may require.
- When contacting with our After Sales Department, specify the exact machine type and its serial number.

- When ordering consumables or spare parts, use this manual and the "Spare parts" catalogue to ensure use of original parts, which is the sole guarantee of interchangeability and perfect operation.
- This instruction manual is supplied with the machine and is mentioned on the delivery note.
- When doing the maintenance procedures, most dangers determined in the Service manual are the potential risks at the same time.

Scissor Lift Specification

Model	XE65N	XE80N	XE80C	XE80W	XE100C	XE100W	XE120W	XE140W
Working height max(m)	6.5	7.8	8	8	10	10	12	14
Platform height max(m)	4.5	5.8	6	6	8	8	10	12
The min platform height (m)	0.95	1	1.13	1.13	1.13	1.25	1.38	1.4
(2) Outreach(m)	0.9	0.9	1	1	1.13	1	1	1
Lifting capacity(kg)	270	230	350	550	230	450	350	350
lifting capacity(kg) Extended platform	115	115	120	120	120	120	120	120
Platform size : Lateral length(m)	1.61	1.61	2.25	2.25	2.25	2.3	2.3	2.3
Extended length(m)	2.52	2.52	3.2	3.2	3.2	3.2	3.2	3.3
lateral width(m)	0.72	0.72	0.8	1.15	0.8	1.15	1.15	1.15
Fence height(m)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Skirting board height(m)	0.15	0.15	0.15	0.15	0.15	0.15	0.17	0.17
Stowed size: stowed length(m)	1.85	1.85	2.42	2.42	2.42	2.42	2.42	2.42
Extended length(m)	2.75	2.75	3.4	3.4	3.4	3.42	3.42	3.42
Width(m)	0.77	0.77	0.8	1.2	0.8	1.2	1.2	1.2
Height(m)	2	2.1	2.2	2.12	2.3	2.25	2.38	2.5
Folded height(m)	1.74	1.76	1.55	1.55	1.55	1.76	1.9	2
Wheel base(m)	1.32	1.32	1.85	1.85	1.85	1.85	1.85	1.85
ground clearance(m)	0.06	0.06	0.1	0.1	0.1	0.1	0.1	0.1
Ground clearance hole protection board(m) lay down	0.02	0.02	0.019	0.019	0.019	0.019	0.019	0.019
Turn diameter (inside)(m)	0	0	0	0	0	0	0	0
Turn diameter (outside)(m)	1.56	1.56	2.12	2.3	2.12	2.3	2.3	2.3
Load number max	2	2	3	3	3	3	3	3
Raised time	17	17	30	32	30	45	65	68
Lowering time	28	26	33	35	39	42	52	55
Traction speed km/h	3.8	3.8	3.4	3.4	3.4	3.4	3.4	3.4
Safe speed km/h	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

vertical tilt°	3	3	3	3	3	3	3	3
lateral tilt°	2	2	2	2	2	2	2	2
Control	Electro-hydraulic Proportional Control							
Weight (kg) CE/AUC	1235	13664	1830	1980	1960	2264	2810	3081
ANSI/CSA standard	1164	1225	1690	1800	1763	1960	2370	2690
Power source	4×6V 225Ah							
hydraulic tank Capacity (L)	15	15	15	15	15	15	25	25
Gradeability	30%	30%	30%	30%	30%	30%	25%	23%
Tire size(mm)	Solid tires356×114×254			Solid tires406×127×318				

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The Term of XE series



1. The Front Driving Wheel
2. Steering Cylinder
3. Pothole Guard Board
4. Down lift cylinder
5. Up lift cylinder
6. Inside scissor boom
7. Outside scissor boom
8. Rear brake wheels
9. Platform door
10. The platform sliding bar
11. Platform control box

2. Working Principle

1. Power supply

Mantall XE series machine Power Supply is 4 batteries, 24V, 225Ah, each one is 6V.

2. Hydraulic system

All the functions of the machine are done through the hydraulic system.

The hydraulic system is driven by a single-stage gear pump. When it is working, the motor is driving the gear pump, sending hydraulic oil to the combination valve. To ensure the pressure of hydraulic system will not accessed, there is Pressure relief valve and system relief valve.

3. Electrical System

Toggle switch (System B is pressed switch), hold on the enable switch, and move the joystick, and Joystick controller will give signal to the ground control. When the ground control receive it, will make the appropriate output voltage to the appropriate control valve, you can achieve your toggle switch function.

The machine can not lift and walk  at the same time.

4. Limit Switch

Limit switch is located in various parts of the machine. The role of the limit switch is to send the signal of the machine running to the ground

controller. While the ground controller receives the changing signals, it will control the speed at 0.8km / h or alarm or forbid the driving according to the settings of the software.

5. Control Model

The control modes of XE series: Platform control and Ground control.

On the platform model, you can control the machine driving , turning, up and down.

On the ground model: you can only make the machine go up and down.

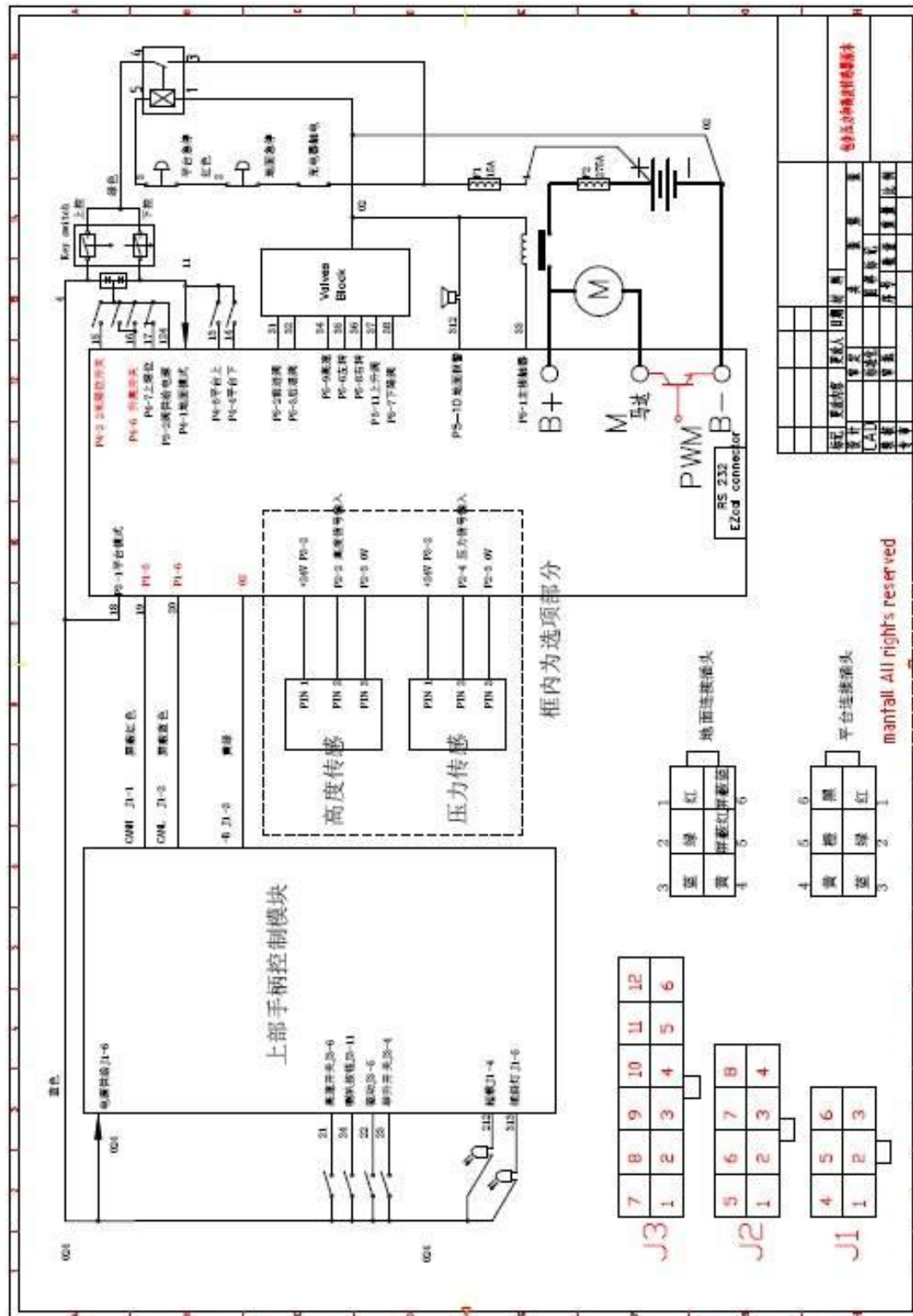
Notes: Do not shake or impact the electrical components or controller.

Do not use water to clean electrical components and controller.

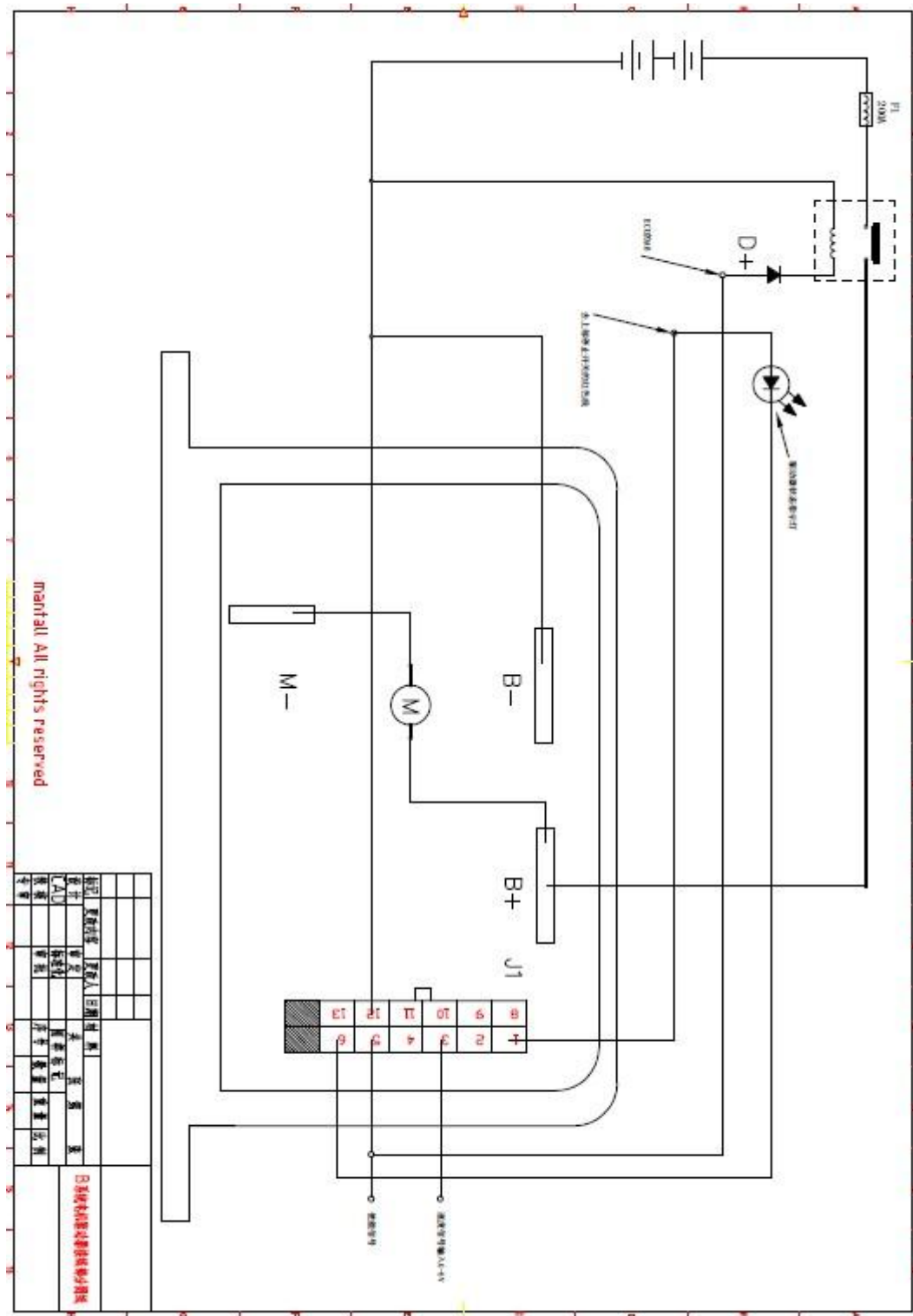
3. Control System

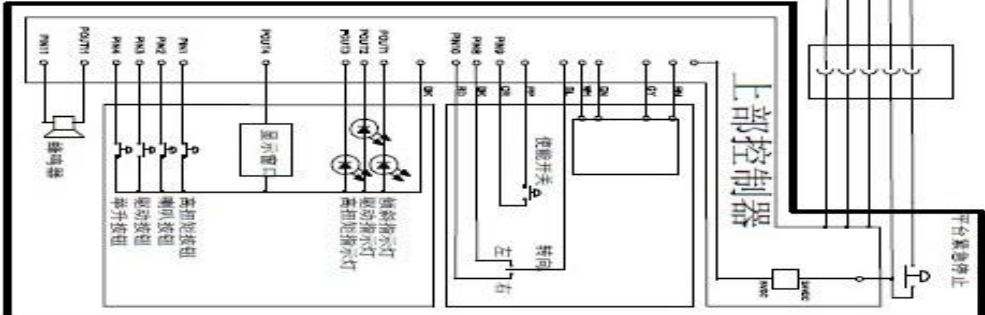
3.1 Composition of the system

3.1.1 The diagram of system A



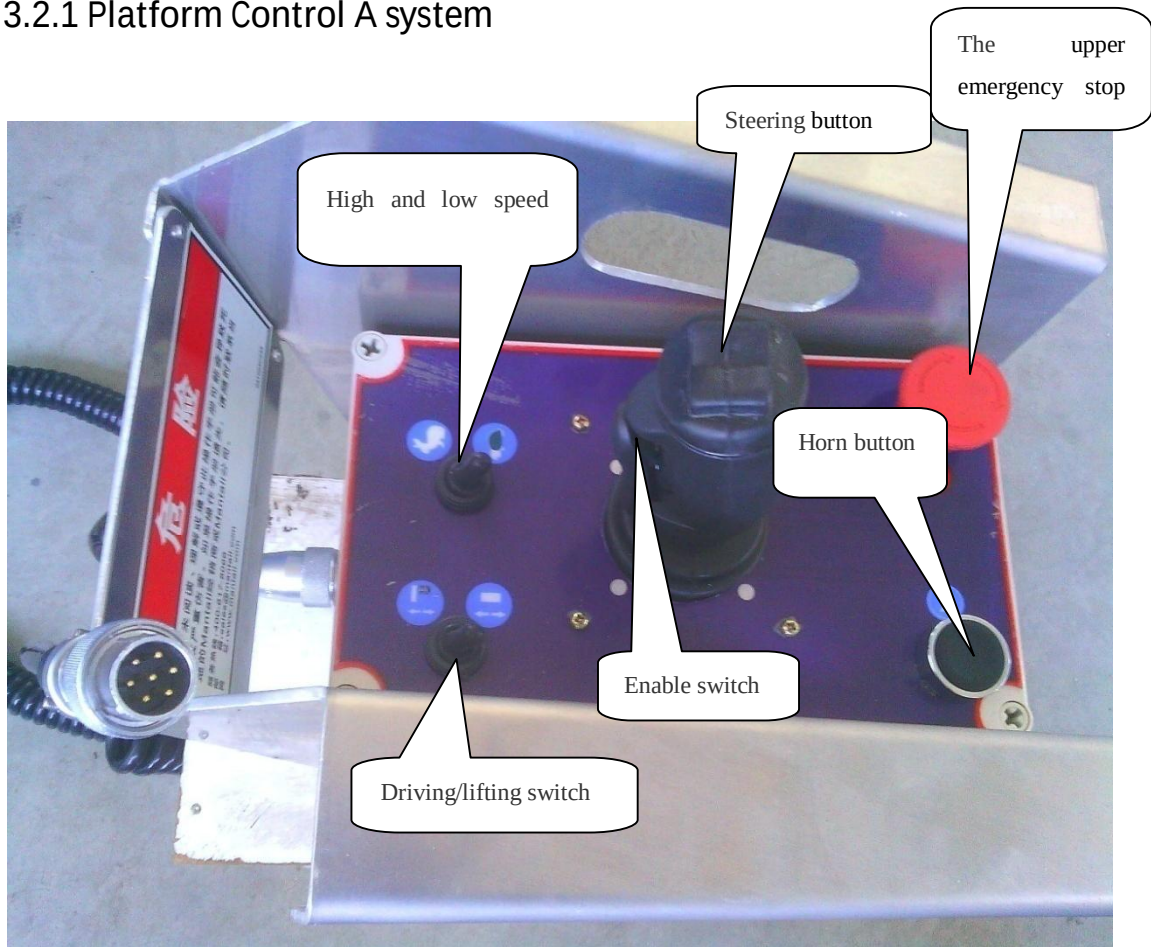
3.1.2 The diagram of system B



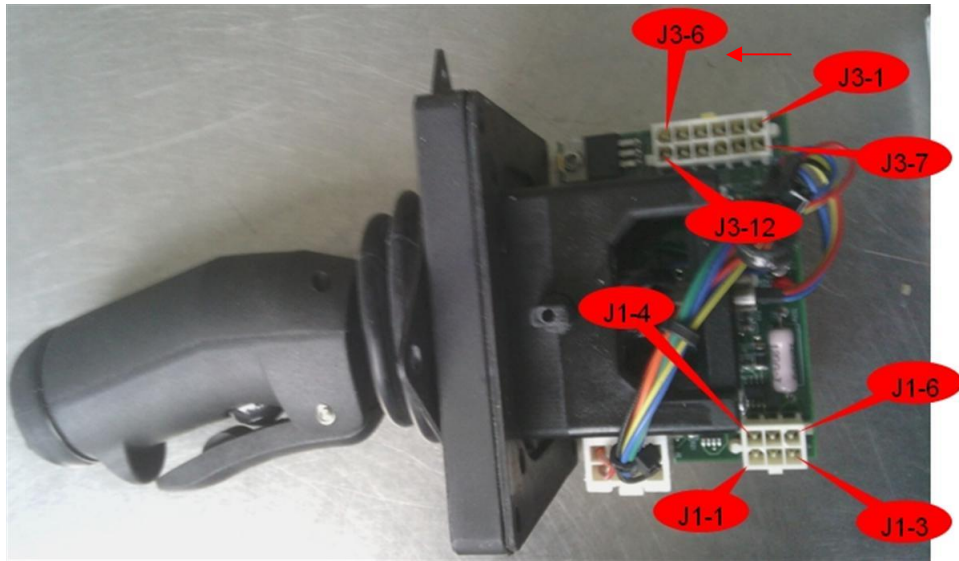


3.2 Platform Control

3.2.1 Platform Control A system

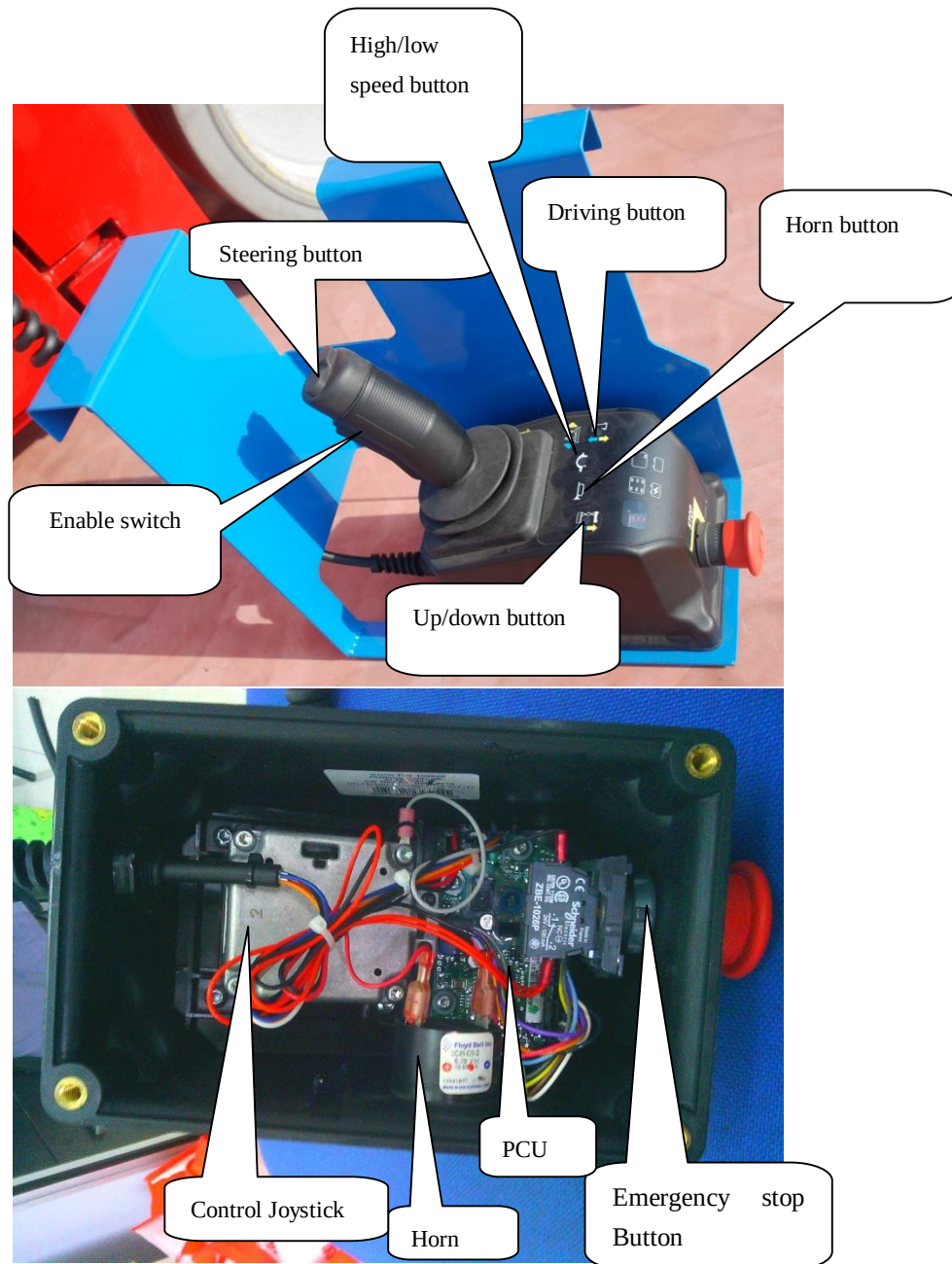


Control Joystick Dismantling

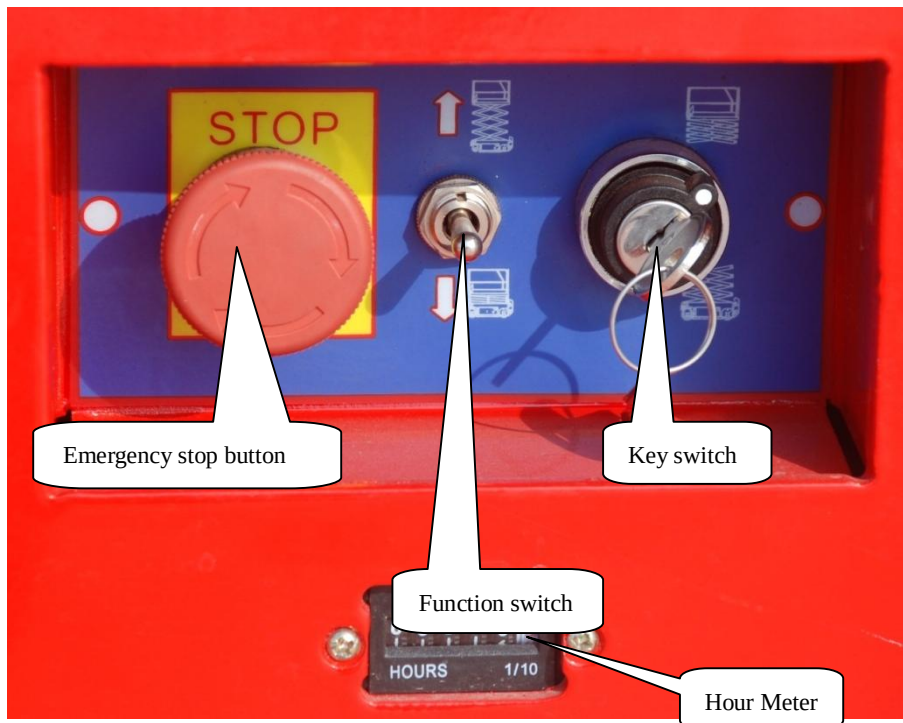
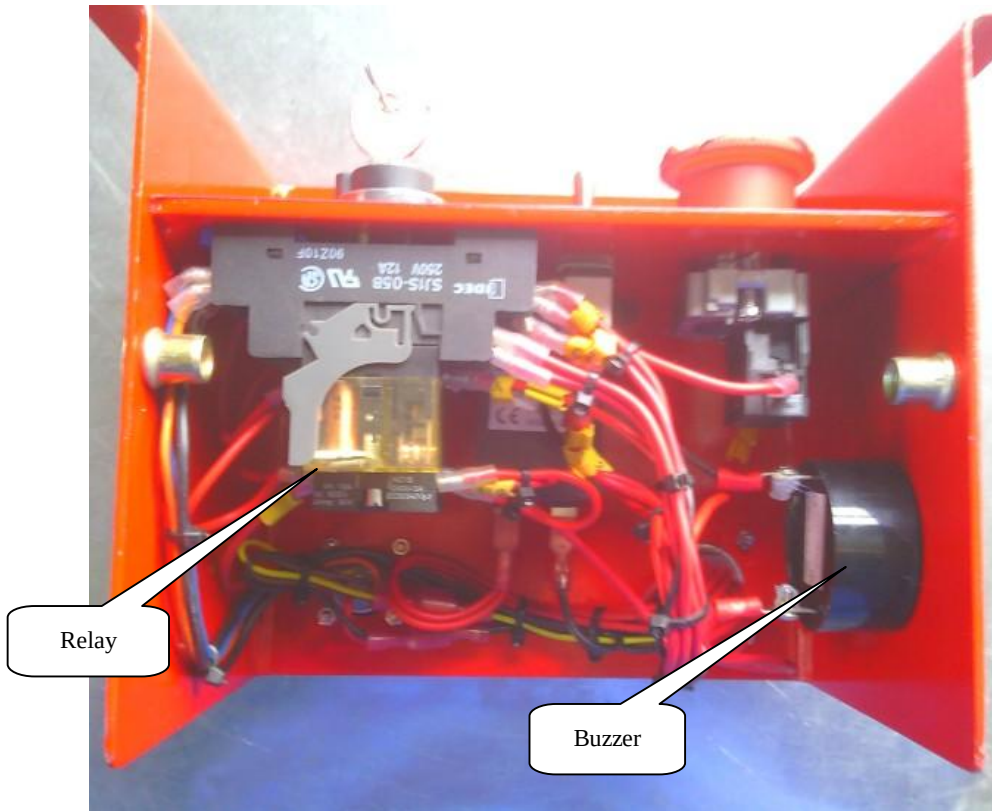


- | | |
|--|--------------------------|
| 1. J1-1 CAN high | 6. J1-6 positive power |
| 2. J1-3 negative power | 7. J3-4lift switch |
| 3. J1-4tilt light | 8. J3-5drive switch |
| 4. J1-2 CAN low | 9. J3-6high-speed switch |
| 5. J1-5low voltage indicator (CE overload indicator) | 10. J3-11horn button |

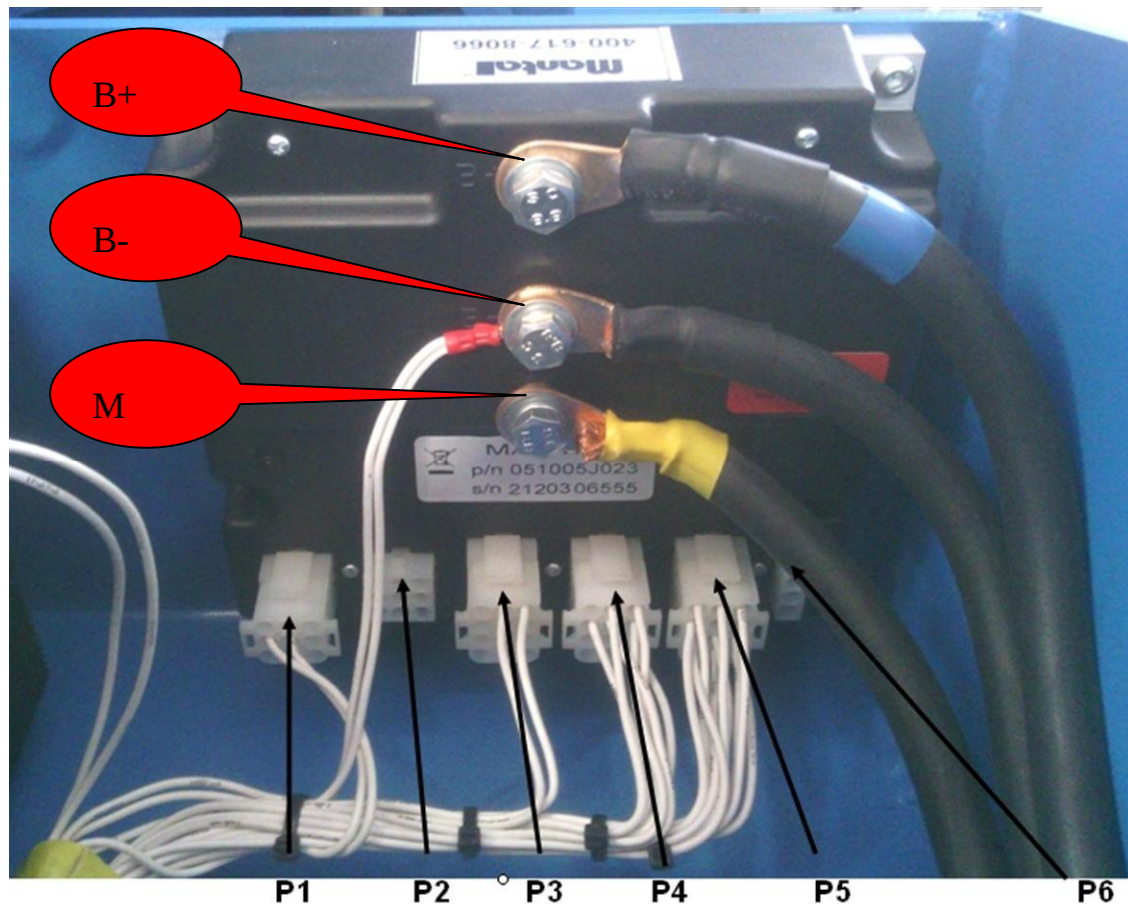
3.2.2 The platform control of system B



3.3 The Ground Control Box



3.3.1 The Function Controller of System A



Note: The system integrated the drive control, function control and inclination sensing control together.

The usage of controller I/O port

The usage of p1 port: P1-5 CAN P1-6 CAN

The usage of p2 port: not used

The usage of p3 port: P3-1platform mode

P3-2 valve which supply power

The usage of p4 port: P4-1 Ground mode

P4-2two meters safety limit

P4-4 platform up

P4-5 platform down

P4-6 lift switch

P4-7 upper limit

The usage of p5 port:

P5-1 main contactor

P5-2 forward valve

P5-3 back valve

P5-6 Turn left valve

P5-7 down valve

P5-8 Turn right valve

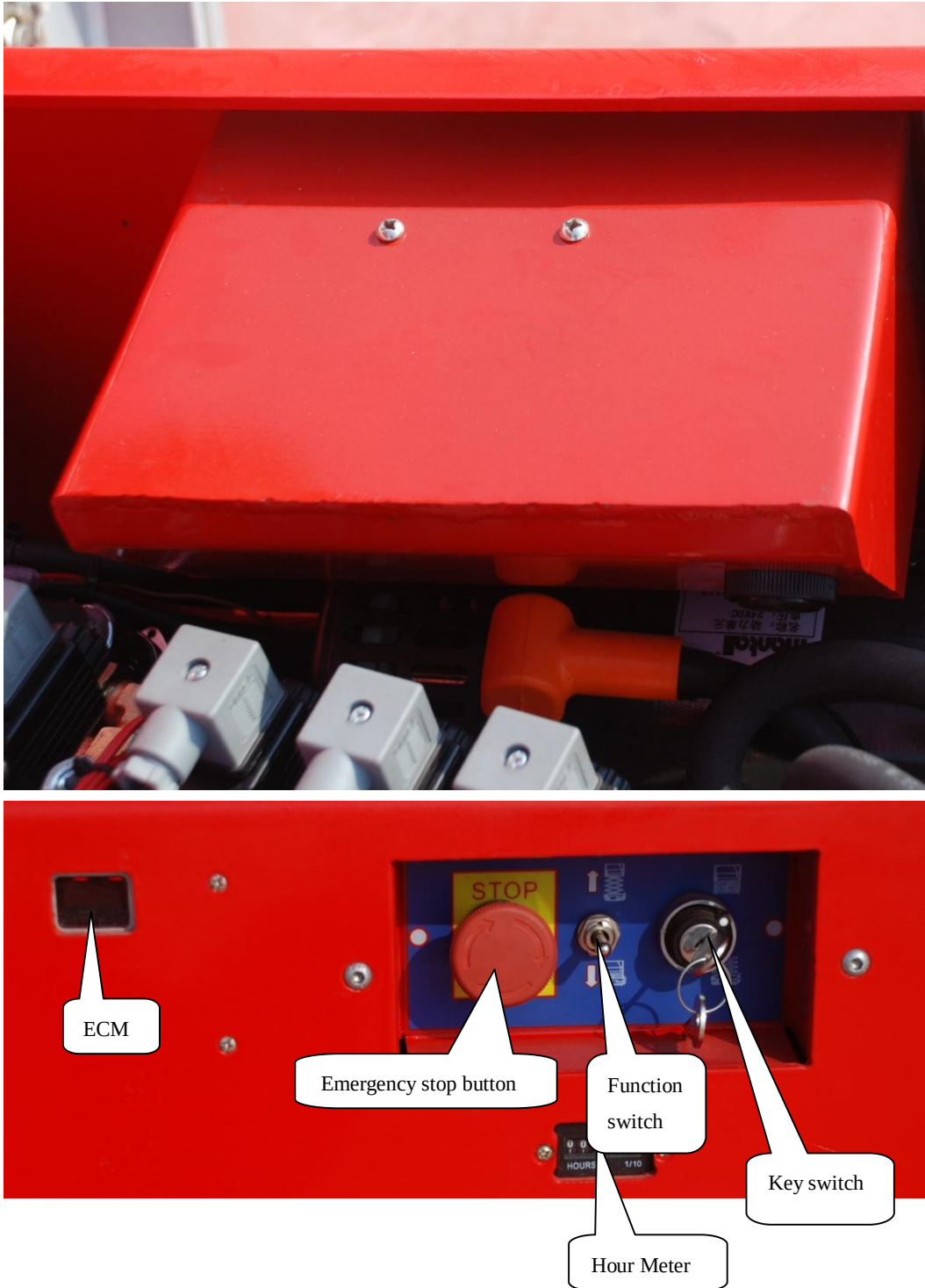
P5-9 High Speed Valve

P5-10 (Horn) alarm

P5-11 Lifting valve

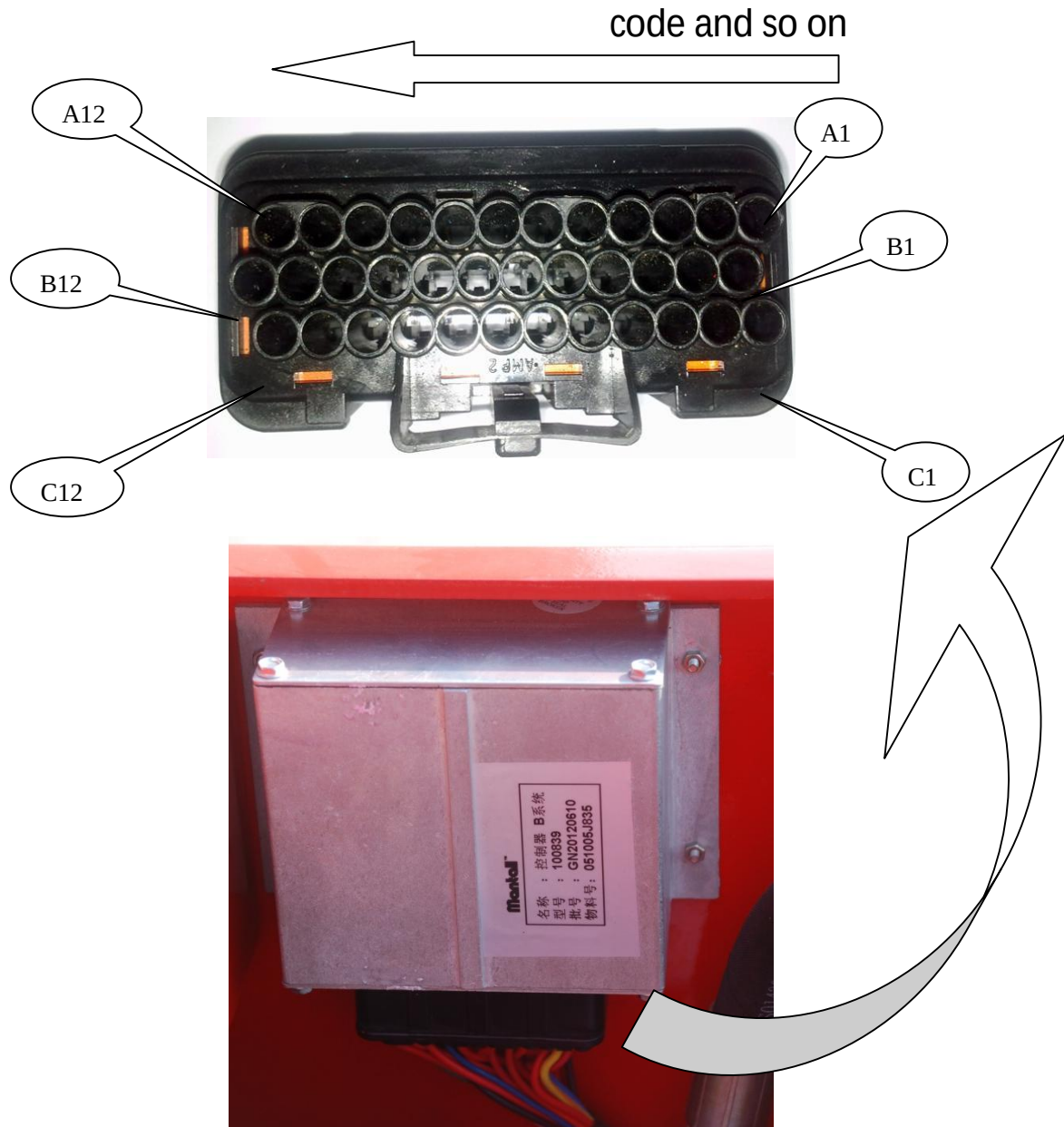
The usage of P6 port: P6 port can be used to update the software, copy the data, modify the software configuration data, correct level and check the failures of the machine.

3.3.2 Ground Control of System B



Function controller of system B (ECM)

Controller plug-ins



Controller plug-in Function Description

A2 The negative of controller	A7 Back valve line
A4 The power of controller	A8 Enable signal
A5 The output of level sensor	A9 Speed signal
A6 Up valve line	A11 The signal line of upper

control key	B11 Upper limit switch
A12 Platform	B12 Under the platform
B1 High data	C1 Low data
B3 The Negative of Power	C6 Advance valve line
B6 Down valve line	C7 Right valve line
B7 Left Valve Line	C8 High speed valve line
B9 Buzzer	C11 Level sensor input
B10 Up switch	C12 Down limit

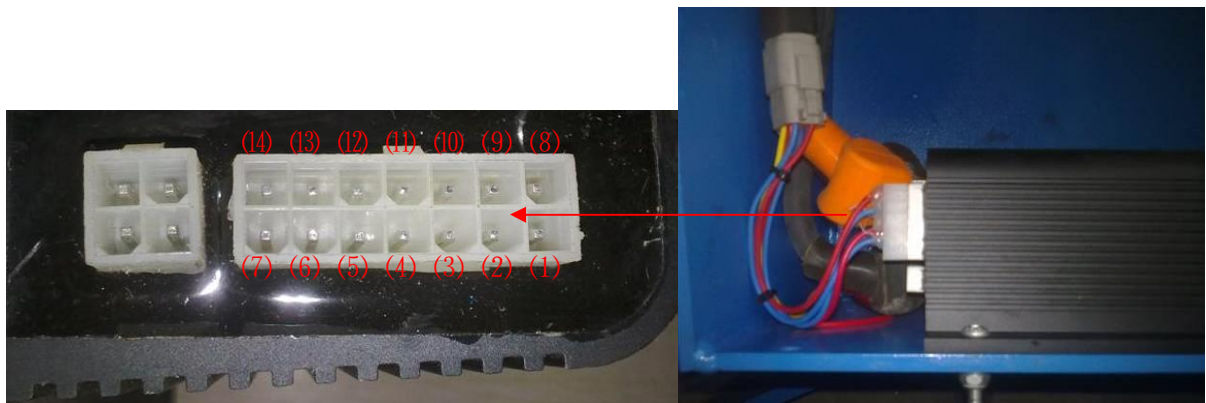
3.3.3 Fault code of system B

Fault Code	Problem	Possible Cause	Solutions
01	Inner ECM mistake	No progress in ERPOM	Replace the ECM
02	EMC/Platform contact error	control cable or platform controller failure	Find the fault of control cable and platform controller
03	The platform DIP switch Setting not sure	DIP switch setting is not correct	Change the DIP Switch Setting
12	Chassis up while starting /drop toggle close	UP/DOWN switch break down	Find the cause of UP/DOWN switch broken
18	Pothole Guard board failure	Pothole Guard board switch have some problem or Pothole guard coupling blocking	Find out the problem of Pothole Guard switch or remove the obstacle
19	Limit switch failure	limit switch failure or limit switch wire break	find out the problem of limit switch fault or check circuit wiring
42	Platform turning left switch failure	Turning left micro-switch failure	Find out the problem of turn left micro
43	Platform turn right switch	Turning right micro-switch failure	Find out the problem of turn right micro

	failure		
46	Platform driven started switch failure	platform driven started switch break down	Find out the problem of platform driven started switch
47	Platform Joystick failure	Joystick potentiometer without return	approved potentiometer set
52	Failure of the forward coil	Coil failure or coil disconnect	Find out coil failure or check the wiring connecting
53	Failure of the backward coil	Coil failure or coil disconnect	Find out coil failure or check the wiring connecting
54	Failure of the rising coil	Coil failure or coil disconnect	Find out coil failure or check the wiring connecting
55	Failure of the downing coil	Coil failure or coil disconnect	Find out coil failure or check the wiring connecting
56	Failure of the turning right coil	Coil failure or coil disconnect	Find out coil failure or check the wiring connecting
57	Failure of the turning left coil	Coil failure or coil disconnect	Find out coil failure or check the wiring connecting
58	Failure of the brake coil	Coil failure or coil disconnect	Find out coil failure or check the wiring connecting
59	series/parallel coil failure	DIP switch not correct	Find out the fault and higher DIP switch settings
68	Low battery	battery uncharged	recharge the battery
88	EMC content was cleared	The machine's electrostatic was lossed	Change the electrostatic article
LL	tilt	tilt	check machine site/level sensor cable

3.3.4 Driving controller of the system B

I

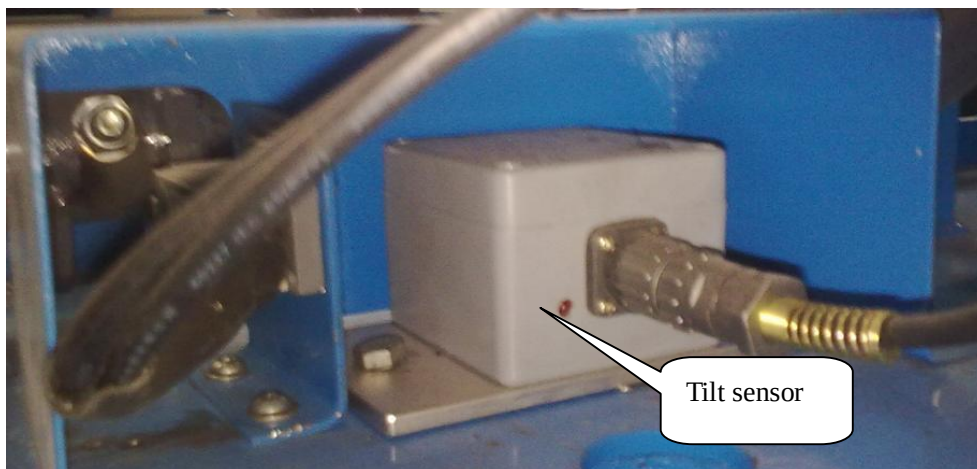


The wiring connecting of the driving controller: (1)power supply; (2)Not used; (3)Speed signal; (4)Not used; (5)Enable signal; (6)Indicator; (7)(8)(9)(10)(11)(12)(13)(14)Not used



connect B+ with the motor
D1 contactor
connect B- with the
negative power
connect M the motor A1

3.3.5 Tilt sensor of system B



Platform

4.1 Platform

Disassemble of the platform

Attention: when this program is executed, extended platform should be fully recovered and in the locked state.

1.The machine with a voltage converter: remove the battery pack from the machine.

Warning: The risk of electrocuted. Contact with the live circuits will result in death or serious injury of people. Before removing the platform , please dismantle the battery pack from the machine.

2. Put the platform in the stowed position

3. Dismantle the fastener which will disconnect the platform controller and the plug under the bottom of the platform quickly.

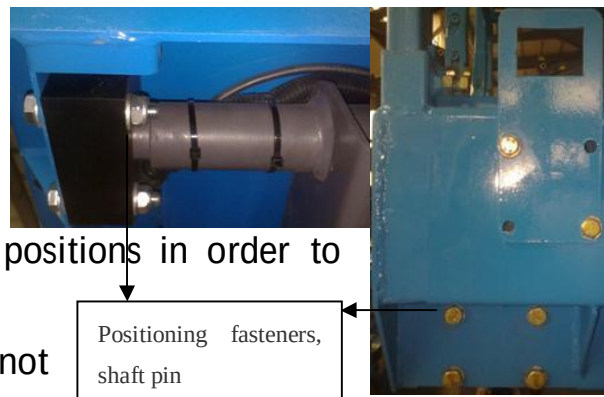
4. Turn it to disengage the plug from the platform controller.

5. Remove the lid of the AC power socket, mark the wiring and then disconnect it from the socket

6. Pull out the wire through the tube of the platform.

7. Use a belt to find two center positions in order to support the platform bar. And do not uplift it.

8. Dismantle the positioning fastener of platform shaft pin on the both



sides of the platform

9. Use the slide hammer to remove the shaft pin.



Warning: Risks of smashing and pressure.

If the support is not correct, the platform will fall.

10. Nudge the platform bar from the fixed end through the Slider-side of the other side of the platform so that to remove the slider to the platform track groove, and then raise the belt of the fixed platform bar to a certain height slowly.

(refer to the direction in the picture above)

11. Raise the platform from the machine, and put it on the device which can be used as a support.

Attention: before the platforms disassembling, please remember the installation position of the wear pad on the platform, so that it can be installed to the correct place when you install it

4.2 The extended platform

The method of disassemble the extended platform:

1. Lower the platform to the stowed position
2. Hang the extension section of the platform well with a belt
3. As shown in the figure, disassemble the set screws.
4. Raise the extension section slowly, and put it on the device which can

be used as a support.

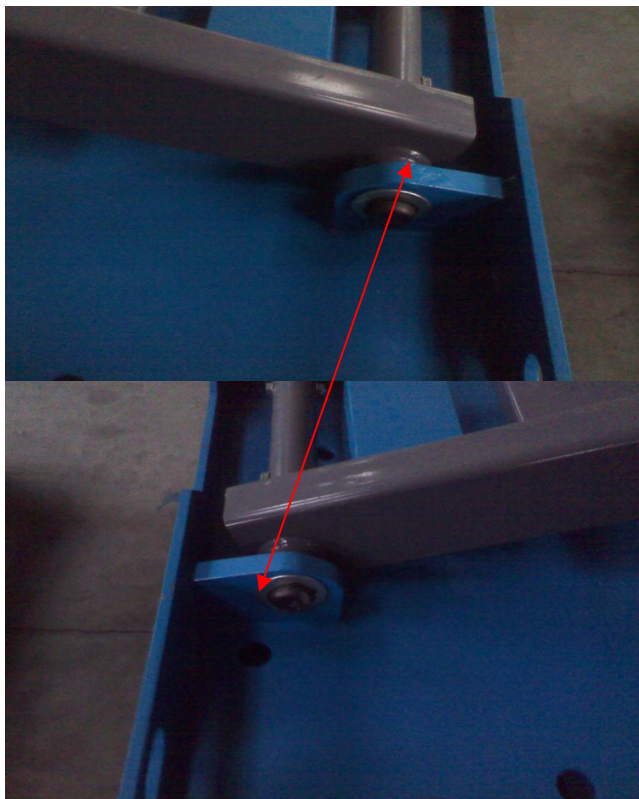


Scissor arms

5.1 The part of scissor arms



Disassembly of the boom



First disassemble the limit pin and then dismantle the circlips from the both sides of the axis. Lift the scissors arm to make sure the place where the arrow points don't bear any force. Then use a rubber hammer to knock out the axis, Finally, pull out both of the Axis.



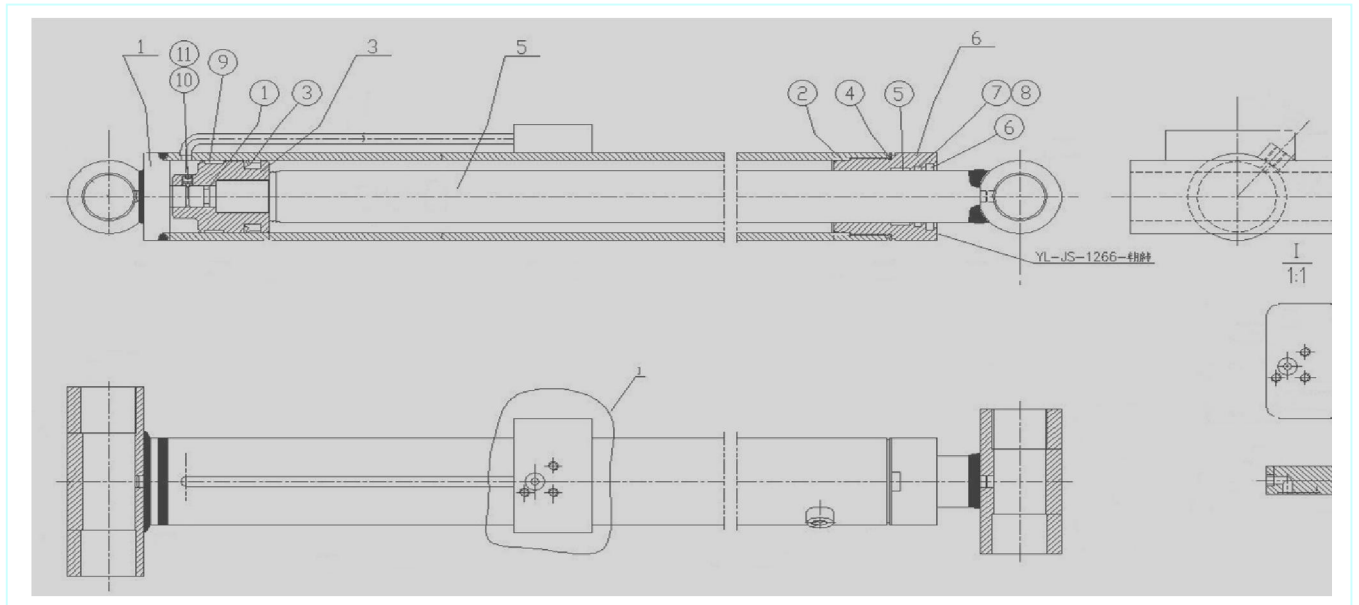
attention: If the lift cylinder is removed, the support plate can not prevent the collapse of the upper part of the boom. In this case, you must use a extra security support, or other appropriate lifting

5.2 Lift cylinder



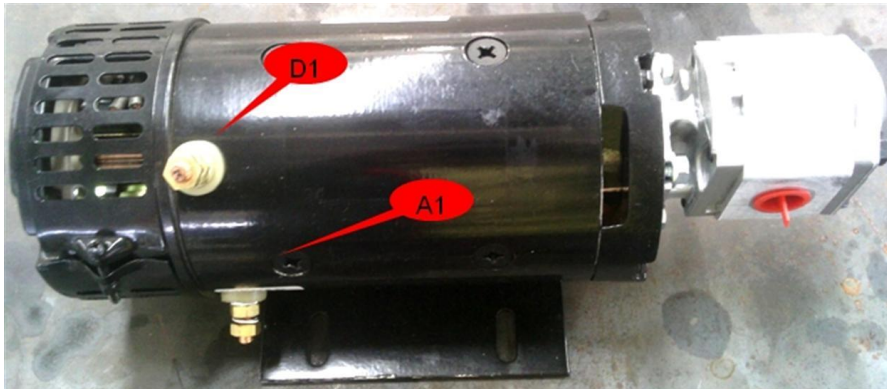
The Details of the Lift Cylinder Components

- 1.D35×3.1 O-ring
- 2.D90×2.62 O-ring
- 3.B7 (φ91×φ75×11.4) Hole sealing ring
- 4.D95×4 O-ring
- 5.φ75×φ70×14.8 support ring
- 6.LBH(φ71×φ81×61.9) dust-proof ring
- 7.D75×3.1 O-ring
- 8.φ75.5×φ71×1.4 O ring retaining
- 9.φ90×φ85×14.8 support ring
- 10.GB/T77-2100 Hexagon flat end set screwsM8×6
- 11.φ5.5 steel ball



6. Chassis components

6.1 Power unit



The power unit consists of a direct current motor with a brush and a gear pump.

Features:

1. Fast start
2. Brake in time
3. Control the speed in a wide range smoothly.
4. Compared to other types of pumps with the same flow, it possesses compact structure and small size.
5. Good self-priming performance. it can reliably achieve self-priming both in high and low speed even in the manual.
6. A wide Speed range. For drive part and gear part of the pump are basically balanced, it won't produce large inertia force at high speed.
7. The dirt in the oil has little effect on the machine, Not easily block.

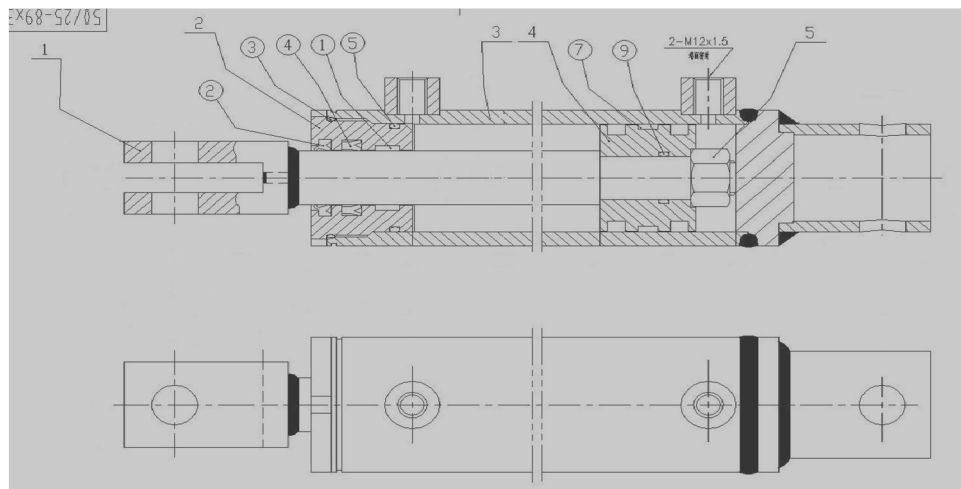
D1 is positive electrode, which connects with contactor

A1 is negative electrode, which connects with M pole of the contactor

note: Do not allow close the outlet of the valve when gear pump is on, keep the outlet valve in the open position when you start and stop it.

6.2 Steering cylinder

1.50/25-11	Welding parts of the piston rod	①D31×25×7.9 support ring
		②LBH d25×35.5×5/9 dust-proof ring
2.50/25-14	Guide sleeve	③D55×3.5 O sealing ring
3.50/25-12	welding parts of the cylinder	④B3 d25×33×11 axis sealing ring
		⑤D51×3.1 O sealing ring
4.50/25-13	piston	⑦D51×45×7.9 support ring
5.GB/T 61.82	locknut M16	⑨D24×2.62 O ring

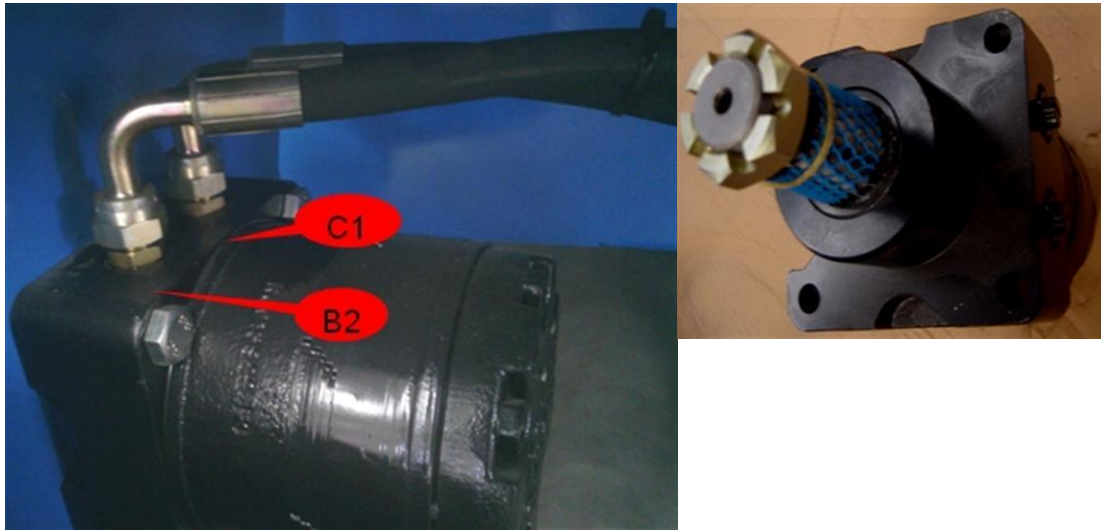


6.3 Brake



This product is a multi-plate brake. It is fully enclosed hydraulic unit, built-in spring action, and hydraulic release.

6.4 Hydraulic motor

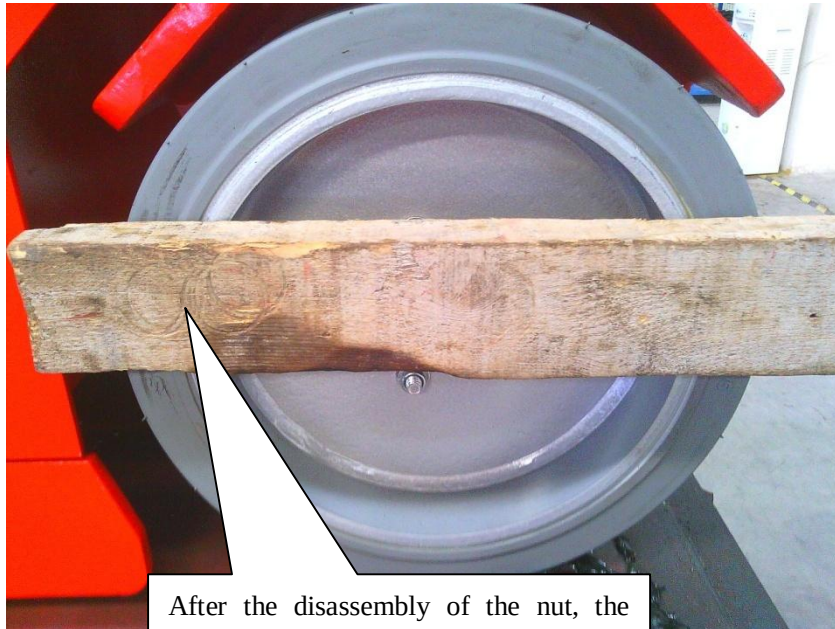
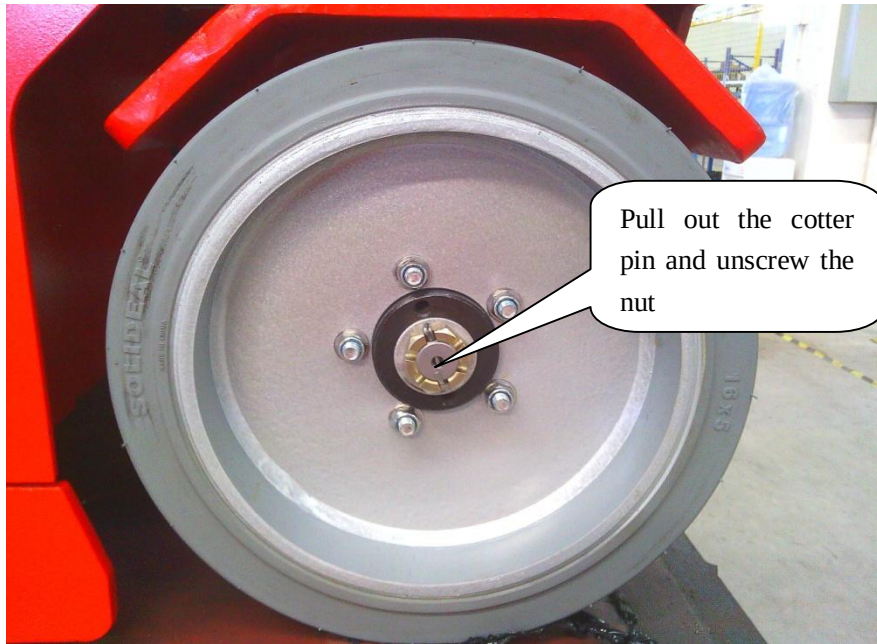


1. This product is a advanced end face with screaming cycloid hydraulic motor, and use advanced design of the inlay column stator and rotor parameters, it has characteristic of high efficiency, high working pressure, low starting pressure, stable operation, and it can obtain the same output torque and reliable shaft movable seal at both sides.

Main features

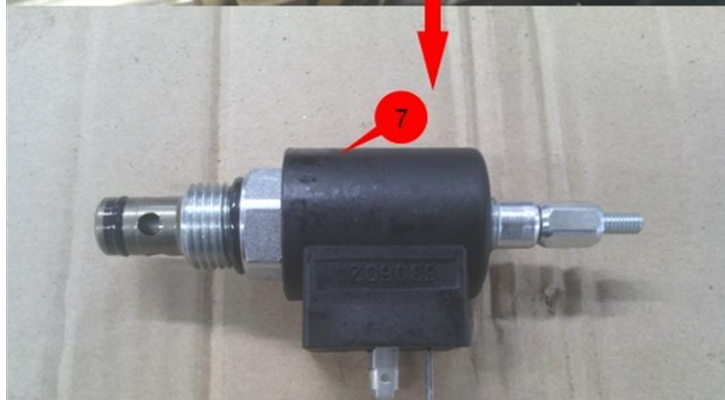
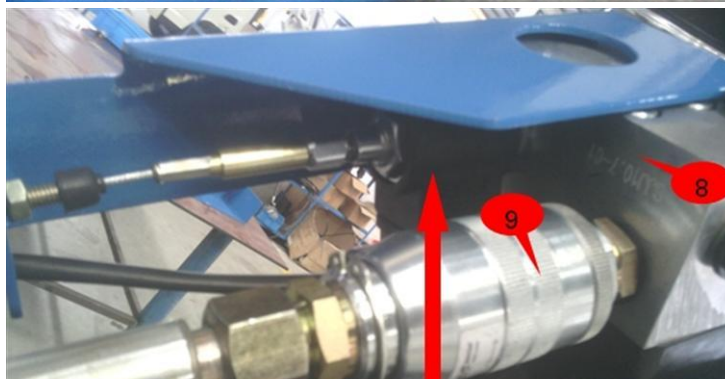
1. Advanced design of stator and rotor parameter, low starting pressure, high-efficiency, smooth low-speed operation.
2. Higher working pressure, higher output torque.
3. The advanced shaft seal design, the higher back pressure tolerance.
4. Advanced and reliable linkage shaft design, the life of the motor will be longer.
5. Advanced flow mechanism design with a high flow precision and automatic compensation of wear and tear characteristics.
6. Adopt the design of taper roller bearings support, it has large radial load capacity, and makes the motor drive the working body directly.

6.5 Disassembly of the Tire



After the disassembly of the nut, the contact surface of the wheel hub and the motor is a conical surface, you so you should pad it up with a piece of wood as the picture ,and beat and vibrate the tire right and left until the tire is enough loose to remove

6.6 Manifolds



1. High speed solenoid valve
2. Forward solenoid valve
3. Up solenoid valve
4. Leftward solenoid valve
5. Back solenoid valve
6. Rightward solenoid valve
7. Down solenoid valve
8. Slow down valve block
9. Tube type one-way throttle valve

The instruction of the interface of hydraulic manifolds



1. (P) oil inlet of the valve
- 2.(M2) test port of the System pressure
- 3.(T)oil return port of the valve
- 4.5 (AS-BS) oil steering port
- 6.(CSE) oil lifting port
7. (F) oil port to release brake
- 8.9 (B1-C2) oil port to drive the right wheel
- 10.11(C1-B2) oil port to drive the left wheel

6.7 Battery

Standard on all models: 4 battery , each 6V, 225 Ah.



Attention: the M8 flat pad and the spring pad with a torque of 20N/M must be added, when you install the battery electrode.

Check the battery

The battery in a good condition is critical to the normal functions of the machine and safe operations, inappropriate electrolyte level or damaged cables and wiring can cause damage to parts and danger situations

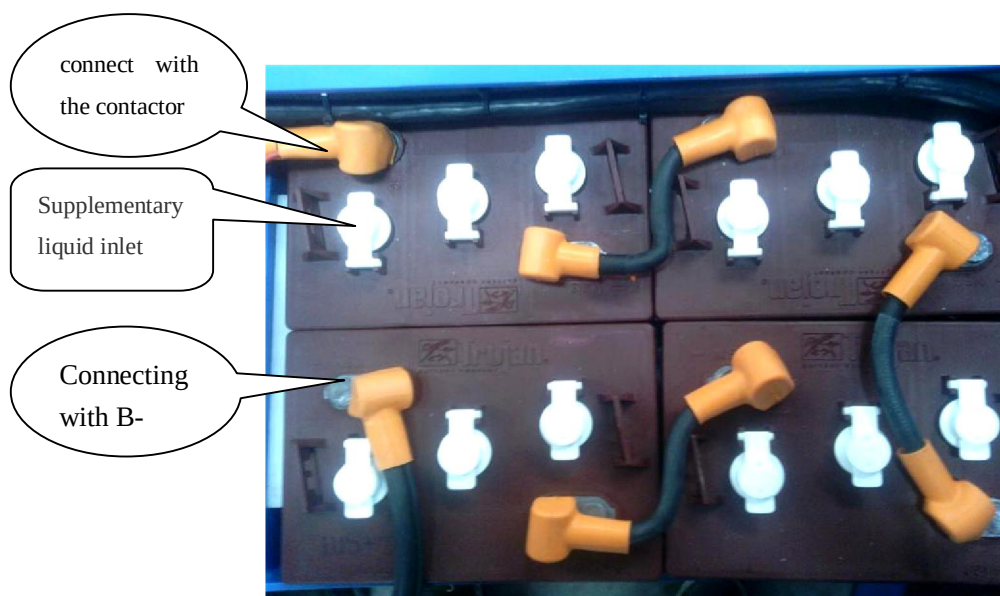
Warning: The danger of bodily injury. Batteries contain acid substances, avoid acidic substances in the battery overflow, or avoid contacting with it. You can use soda and water to neutralize spilled battery acid substances.

Warning: The risk of short-circuit burns. Contact with the electric circuit

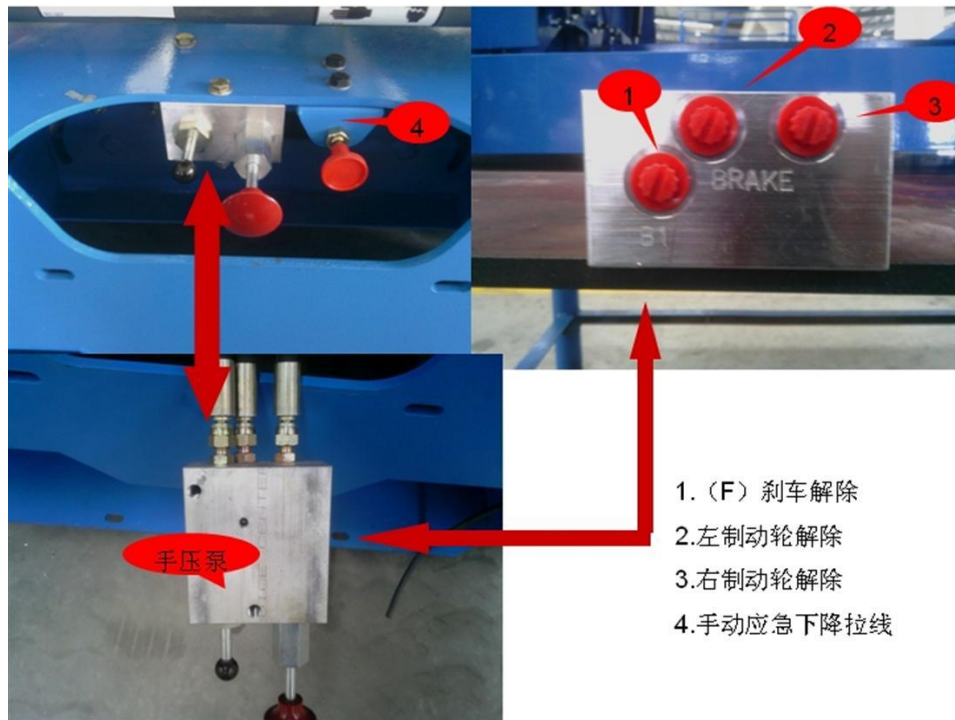
may result in death or serious injuries. Remove all rings, watches and other accessories.

Note : Check the battery after charging .

- 1 Put on protective clothing and wear protective glasses.
- 2 Remove the battery pack from the machine.
- 3 Ensure that the wiring of the battery cable is not affected by corrosion.
- 4 Make sure the battery is fixed firmly, and fasten cable wiring.
5. Remove vent cover of the battery and use a hydrometer check the proportion of each battery acid. (If the specific gravity of the battery is less than 1.026, the battery must be replaced)
6. Check the acidic liquid level in each battery. If necessary, add distilled water through the white cover at the top of the battery, do not add too much.
7. Install vent cover of the battery.
8. Check each battery and verify that the wiring is correct.



6.8 Hand pump



1. Brake release
2. Left wheel brake release
3. Right wheel brake release
4. The manual Emergency down pull line



Machine emergency move

1. Firstly, find the hand pump
2. Press the black button in
3. Compressed red button repeatedly until you can not press any more
4. To find the driving pressure release valve, Please loose the top nut , then use a Flat-blade screwdriver to screwed out of the pressure release valve.
5. The black button of Hand pump will pop up automatically when the machine normally used.
6. The driving pressure release valve must be restored to the original state.

7. Information, adjustment and inspection

7.1 Failure and Solutions

The way of failure diagnosis and emergency

1. Firstly, to determine whether is the electrical, mechanical or hydraulic failure
2. Using the process of elimination to determine the fault when the failure is unknown
3. To use the right equipment to assist in the judgment of failure, such as: multimeter, hydraulic plugs, hydraulic pressure gauge

Simple method to judge the performance of each component

1. Hydraulic pump: hydraulic test ports on the module connected to a pressure gauge to test system pressure; If the machine rising slowly or stop when only rise up about one-meter and the pump casing is very hot, then we can confirm the inside of the pump damaged.
2. ECM: self-check confirmed by its fault code; recognized by non-normal output; recognized through the exchange of law.
3. Motor Controller: recognized through the exchange method; confirmed through whether the motor is running and the voltage of wiring # 3 and # 5.
4. Motor: confirmed by measuring motor coil resistance when the power is failure.
5. Battery: by measuring the voltage, specific gravity, discharge rate

confirmed; confirmed by if the action of the machine is the voltage drop.

The voltage of good 6V battery is greater than 6.3V after fully charged

6. Lift cylinder: by replacing the manual valve to confirm whether the drop is normal or not.

7. Limit switch: wheel position is normal, switch on and off is normal (through resistance is zero when the switch is on and infinite resistance when off)

8. Coil: confirmed by measuring the resistance value, the voltage across the coil, and the magnetic when energized,

9. Operating handle: recognized by the fault code, confirmed by the failure of handle function, recognized through the exchange method

10. Charger: to confirm the charging current size, and whether the battery voltage rise to judge; judged by the ability to self-test .

A system

Failure phenomenon	Solutions
The machine can not walk after rising (walking contactor automatically disconnect)	Inspect if the Pothole Guard board is turned on or not, and the power supply of elevated switch is normal.
The machine can not be high-speed driving when on the stowed position.	Check whether the power supply of elevated switch / high-speed solenoid valve and high-speed switching button on the control handle is normal or not.
The lifting of the machine is normal but no walking (walking but no lifting)	Check whether the driving of upper control joystick and lifting switch button and power supply is normal or not.
Machine suddenly stopped without any action when driving (Turn off the power and be normal, recurring)	Check if the power wiring and battery cable is loosening or not.
Machine only has steering and down (contactor automatically disconnect when have other action)	Check if the limit switch and the power supply is normal or not
The machine has action on ground control ,but no action on the platform control	Check if the power supply of the key switch contact / six core cable / and the control handle is normal or not
The machine appears to forward constantly(such as backward / lifting)	Find the forcing function mouth of the opposite action valve to open it mandatory , only do some action to release a mandatory port, then can be released . if they can not, then need to disassemble the valve and clean it carefully

the alarm continues after the machines increased to two meters	Check if Pothole Guard board open or not.
Machine is unable to walk when in stowed position (The contactor is automatically disconnect when walking)	Check if two meters limit switch and power supply is normal or not

B system

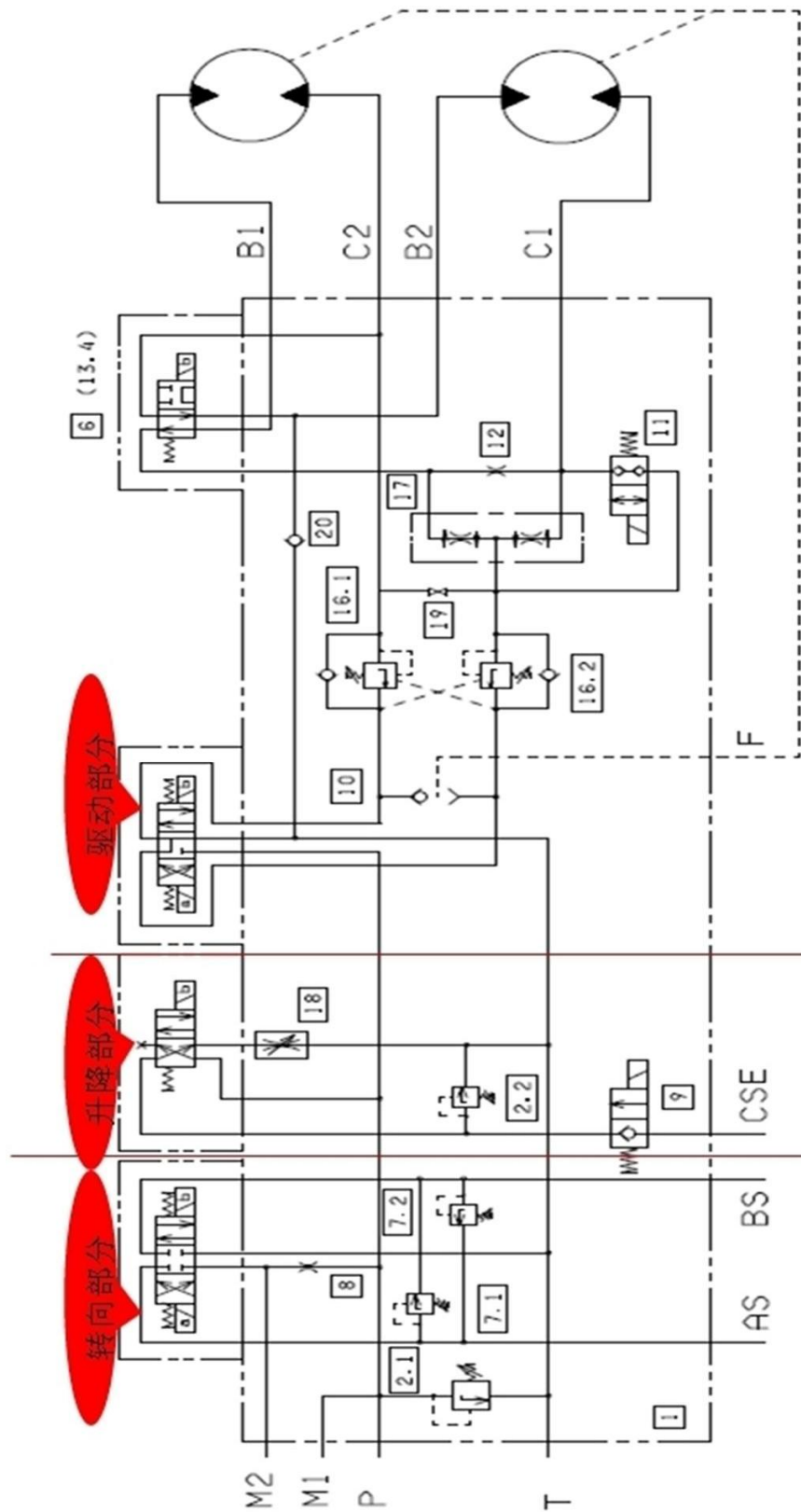
Failure phenomenon	Solutions
The machine has no action, the motor does not turn.	Find out the battery voltage is normal or not; if wiring column is loose or corrosion; if quick plug is loosing or not; if circuit breaker jump out; if the fuse fusing; if key switch failure; if ECM has fault code or power display; if motor controller is normal; confirm if the machine installed the cutting options when charging.
The machine can not rise when lifting about 1m, but the motor still running.	Check whether the system pressure is normal, whether the system relief valve is normal, whether the hydraulic pump is normal, to determine if the battery voltage is normal, to determine whether have a fault code.
The platform automatically sink after it rise up.	According to the data of the cylinder suppliers to determine whether normal, to determine if the manual lowering valve is fully closed, to determine whether the fuel tank inside leaking, to determine if manually drop valve cable is functioning properly set.
The platform can not driving and alarm after rising up	To Confirm if ECM has fault code; ensure that the floor is flat; confirm whether the level meter is normal; to confirm Pothole

	Guard Board pull down or not. To confirm down limit switch circuit is normal or not.
The machine can not drive, but the other action is normal.	To Confirm if ECM has fault code; to determine whether the operating handle in initial; to determine whether electrical circuit brake release is normal; to determine whether the brake release hydraulic circuit is normal; to confirm the platform to the ground cable is normal or not.
The machine lifting slow, other movements are normal	Whether hydraulic system pressure is normal; whether the proportion of ECM lifting speed is normal.
Driving speed of the machine is slow, other movements are normal	Ensure that the machine can be switched to the fast-driving position; whether the proportion of ECM driving speed is normal.
The machine does not rise, the other activated normal.	To Confirm whether ECM has fault code; to confirm if the ascend solenoid valve coil resistance is normal; to confirm the solenoid valve coil is safely connecting to ground; to confirm if rise solenoid valve spool is stuck in the middle; to confirm if drop solenoid valve often has power or manual wire rope adjustment is good.
The manually lower down and other features of the machine are normal, but without lowering action.	To Confirm whether ECM has fault code; to confirm if the decline solenoid valve coil resistance is normal; to confirm the solenoid valve coil is safely connecting to ground.
The machine can only go forward, not backward.	To Confirm if ECM has fault code; Confirm if back solenoid valve coil resistance is normal; to confirm the

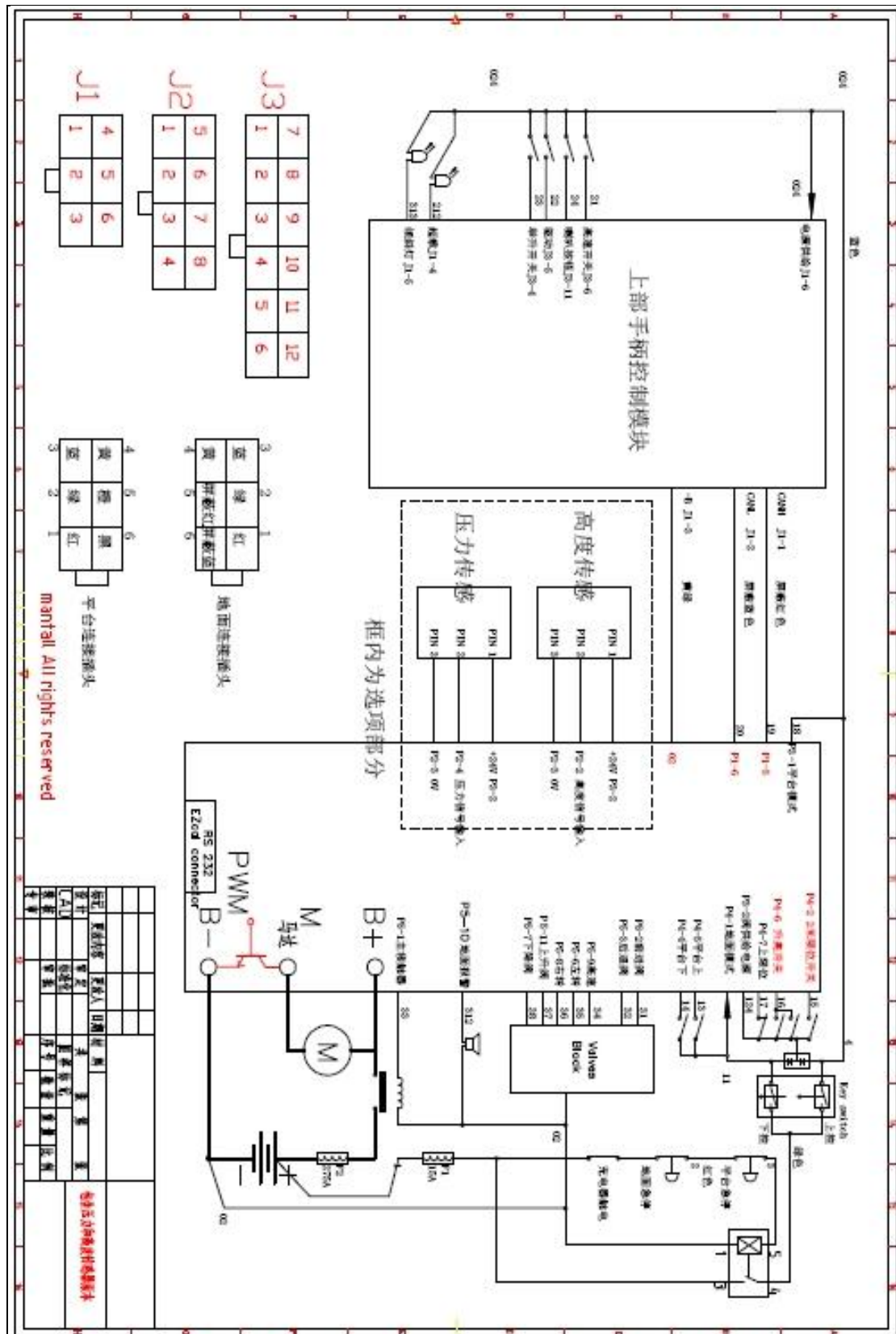
	solenoid valve coil is safely grounded; to confirm if the action is stopped after the removal of the solenoid valve Plug.
The machine can only backward, not forward.	To Confirm if ECM has fault code; to Confirm if forward solenoid valve coil resistance is normal; to confirm the solenoid valve coil is safely connecting to ground; to confirm if the action is stopped after the removal of the solenoid valve Plug
Machine forward motion back instead, or machine do backward action then go forward.	Verify that if the solenoid valve coil is inserted in the wrong wiring.
Regardless of the action of forward or backward, the machine has only the forward movement or only the back action	To Confirm if ECM has fault code; to confirm if the spool of driving solenoid valve has stuck, make sure whether the action is stopped after unplugging the solenoid valve Plug.
ECM driving high and low speed coil failure alarm - fault code 59.	If driving high and low speed coil resistance is normal; if driving high and low speed coil input voltage is normal; if driving high and low speed coil is grounded properly.
No high-speed driving and no fault code.	To confirm if the spool of driving solenoid valve has stuck; if down limit switch is normal reset.
The machine is still high-speed driving after the platform rising.	If the Pothole Guard limit switch is in the proper position; if the Pothole Guard are normal; using exchange method to eliminate the possible failure of ECM
The platform has no high-speed driving	If Pothole Guard limit switch is in the proper position; if Pothole Guard is normal; using exchange method to exclude possible failure of the ECM; if the brake release valve is normal; if the Pothole Guard is normal.
Machine Action disorder.	To Confirm if ECM has fault code; Ensure if your cables are inserted wrong.
When do the Check, electrocuted by the static electricity.	Verify that if the ground wire is properly connected to the ground.
Wheel motor automatically biased one side after running.	Confirm if the machine has the fault code; confirm if the spool is stuck.

7.2 System schematics and piping diagrams

Hydraulic schematic diagram



A system electrical control diagram



B system electrical control diagram

