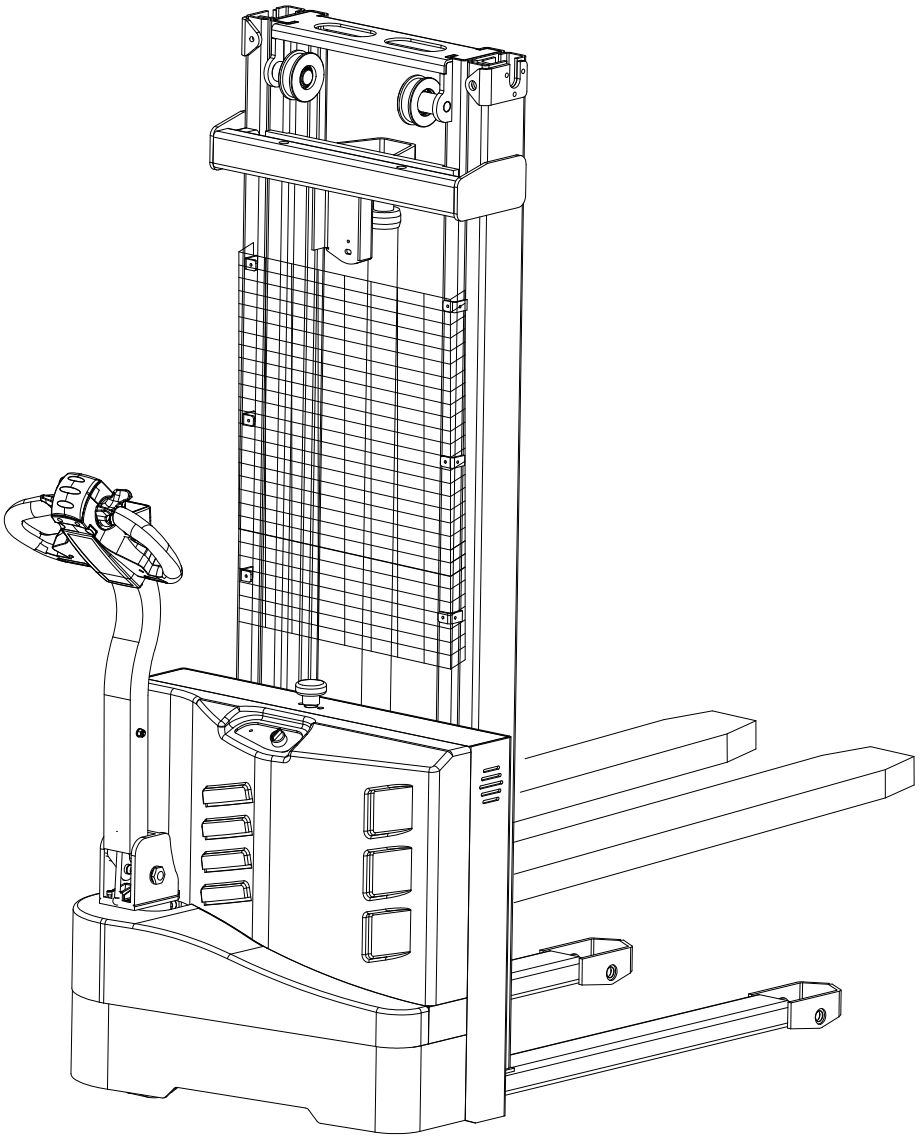
Forkover Electric Stacker
WS10S/15S-ei
Operations manual



Warning: Please read and follow all warnings before operation.
Please confirm that the safety parts are always intact.

Content

1.Foreword

This manual must be read carefully before you use the machine, to avoid economic loss and safety incidents, personal injury or death.
Proper operation and regular inspection are important factors for the economics of operation and the service life of the machine.
These important content will be described in the relevant sections below.

All information in this manual is based on the valid data of the product at the time of printing. The manufacturer reserves the right to modify the product at any time in the future without obligation to inform customers. Therefore, any changes to the product require a timely check.

Nameplate is an important proof of warranty agreement and an important basis for the free replacement of parts within warranty period. So please protect the completeness of the nameplate to make sure it is clearly visible. Failure to do so will have an impact on later claims and parts replacement.

2.Use

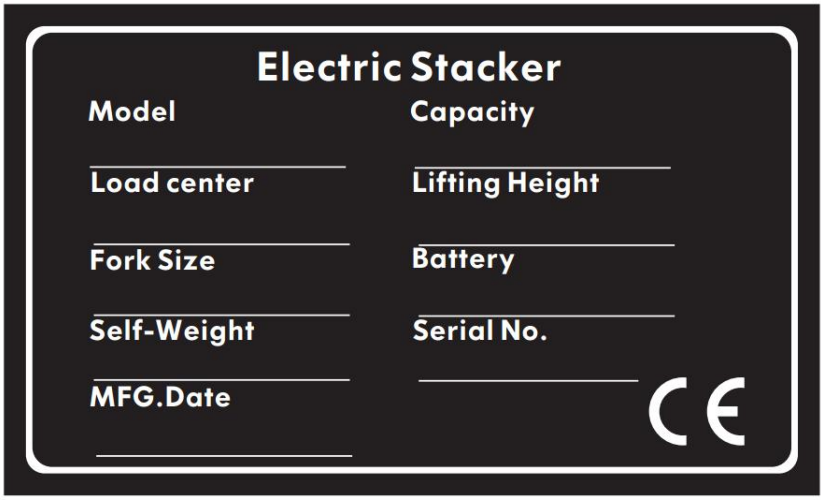
An all-electric stacker is powered by battery, and hydraulically lifts cargo for short-distance transport and cargo stacking. It is widely used in workshops, warehouses, terminals, stations, freight yards, etc. It is an ideal tool to improve efficiency and reduce labor intensity.

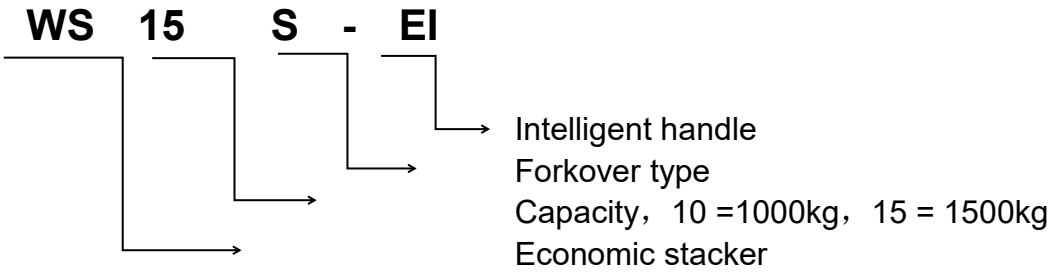
Inapplicable places:

Cold storage
Uneven ground, ground surface with sharp articles
Work site with heavy dust or iron shaving, such as brick factory, cement factory, cast iron workshop, etc.
Heavy duty working condition, where the stacker needs to work continuously, non-stop for a long time.
If there is uncertainty whether the vehicle is suitable for certain working conditions, please consult the dealer. The manufacturer reserves the right of final interpretation.

3.Technical parameters

3.1 Model and nameplate description





3.2 The basic parameters of the stacker are shown in Figure 1 and Table 1.

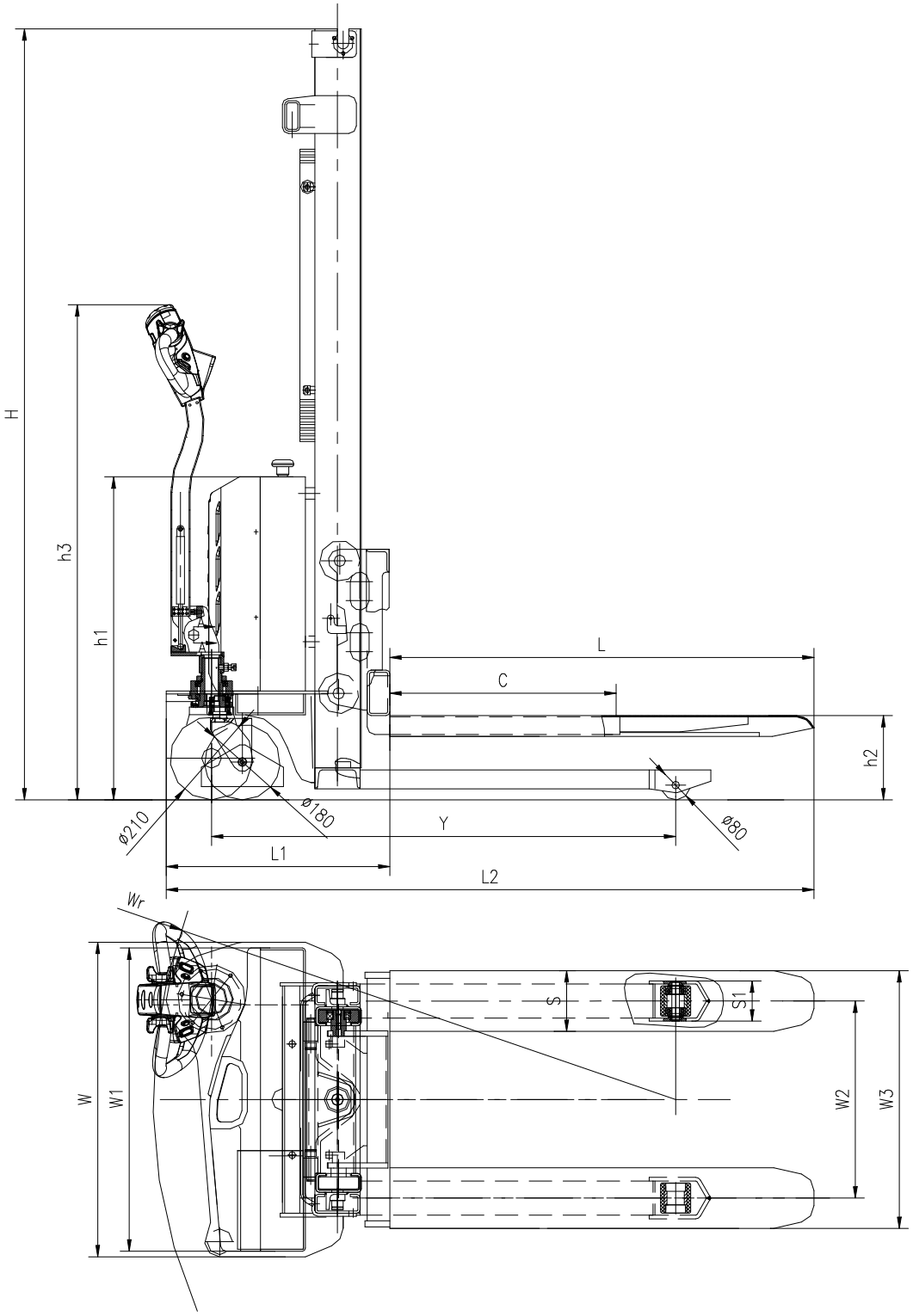


Figure 1

Table 1

Characteristics				
1.1	Model		WS10S-ei	WS15S-ei
1.2	Drive unit		Electric	Electric
1.3	Operator type		Walkie	Walkie
1.4	Capacity	kg	1000	1500
1.5	Load center distance	mm	600	600
1.6	Wheel base	mm	1231	
Weight				
2.1	Service weight(with battery)	kg	389/419/439/459/479/499	409/439/459/479/499/519
2.2	Service weight(without battery)	kg	339/369/389/409/429/449	359/389/409/429/449/469
Wheel				
3.1	Tyre type drvie wheels/load wheels		PU	PU
3.2	Size of loading wheels	mm	φ78	φ78
3.3	Size of driving whee	mm	φ210	φ210
3.3	Size of balance wheel	mm	φ180	φ180
3.4	Wheel quantity	pcs	4	4
Specifications				
4.1	Lift height	mm	1600/2000/2500/3000/3300/3500	1600/2000/2500/3000/3300/3500
4.2	Mast lower height	mm	2010/1535/1785/2035/2185/2290	2010/1535/1785/2035/2185/2290
4.3	Mast extend height	mm	2010/2490/2990/3490/3790/3990	2010/2490/2990/3490/3790/3990
4.5	Overall length	mm	1750	1750
4.7	Overall width	mm	820	820
4.8	Fork dimensions	mm	54x160x1125	54x160x1125
4.9	Width across forks	mm	560/680	560/680
4.1	Lowered height of fork	mm	90	90
4.11	Clearance	mm	30	30
4.12	Aisle width for pallets (1000 x 1200mm)	mm	2305	2305
4.13	Aisle width for pallets (800 x 1200mm)	mm	2230	2230
4.14	Min turning radius	mm	1470	1470
Performance				
5.1	Travelling speed, laden/unladen	km/h	3.5/4.0	3.5/4.0
5.2	Lifting speed, laden/unladen	mm/s	100/112	100/112
5.3	Lowering speed, laden/unladen	mm/s	92/85	92/85
5.4	Max. gradeability,laden/unladen	%	5/7	5/7
5.5	Service brake type		Electronic	Electronic
Electric engine				
6.1	Driving motor	kw	0.65	0.65
6.2	Lifting motor	kw	2.2	2.2

6.3	Battery voltage/capacity	V/Ah	12/75Ah x 2	12/75Ah x 2
6.4	Battey size	mm	(260×172×214)×2	(260×172×214)×2
6.5	Controller		STAXXA6101	STAXXA6101

4. Storage and transportation

The stacker must be placed in a horizontal position during transportation and storage, to avoid oil pillage.

The storage environment should be kept clean and dry, avoiding harsh weather conditions. The ambient temperature should not exceed 40 °C.
If the battery is not used for a long time (such as holiday, storage), it should be charged regularly, to avoid battery loss, shortened working life or even damage.

If the stacker is damaged during transportation, it mustn’t be put into use until proper maintenance is done.

5. Operation guide

5.1 Operation License

The stacker can only be operated by specially trained personnel. The operator must pass the test of the user of the equipment and have the skills of equipment operation and load handling. He also needs to be formally authorized or appointed by the equipment user or entrusting party.

If the stacker has breakdown or defects, it is strictly forbidden to be used. Relevant personnel needs to report for repair and no more use it until proper maintenance is done.

5.2 First time use

The stacker has been filled with lubricant before shipment and has been filled with hydraulic fluid in the hydraulic system.

If the stacker is equipped with two batteries, the batteries are already charged. If the battery is low, please charge it.

5.3 Operation Precautions

Please load in strict accordance with the load curve. Overloading is prohibited, to avoid mechanical damage or casualties.

The stacker can only be used on hard roads with a slope of <2.5%. It can't do lifting, lowering, stacking, or turning on slopes or roads with sharp angles. Do not use the stacker on oily floors, to avoid skidding.

When the stacker is loading and unloading, surrounding personnel should keep certain safe distance from it. When the cargo is too high or too heavy, please pay special attention.

The stacker lifting & lowering button is jog switch. Pressing means function on, and releasing means function off. In the event of emergency when stacker drives backward, operator can use belly to touch the red button on top of the handle assemble, to make the stacker reverse instantly and protect user's safety. In case of emergency where stacker must be stopped, user can lower the handle till interlock switch is no more in driving range or press emergency stop button.

When stacker is driving, forks should be placed low. When cornering or going up and down slopes, stacker needs to slow down. When forks are lifted, or order picking, stacker should move slower.

Check if battery capacity is sufficient when using. Over-discharge, power-lack will have a serious impact on battery life. If the battery is not used for a long time (over one month), it should be charged and discharged regularly.

After use, forks should be placed at the lowest position. Do not place the stacker on any slope. Cut the power and remove the key.

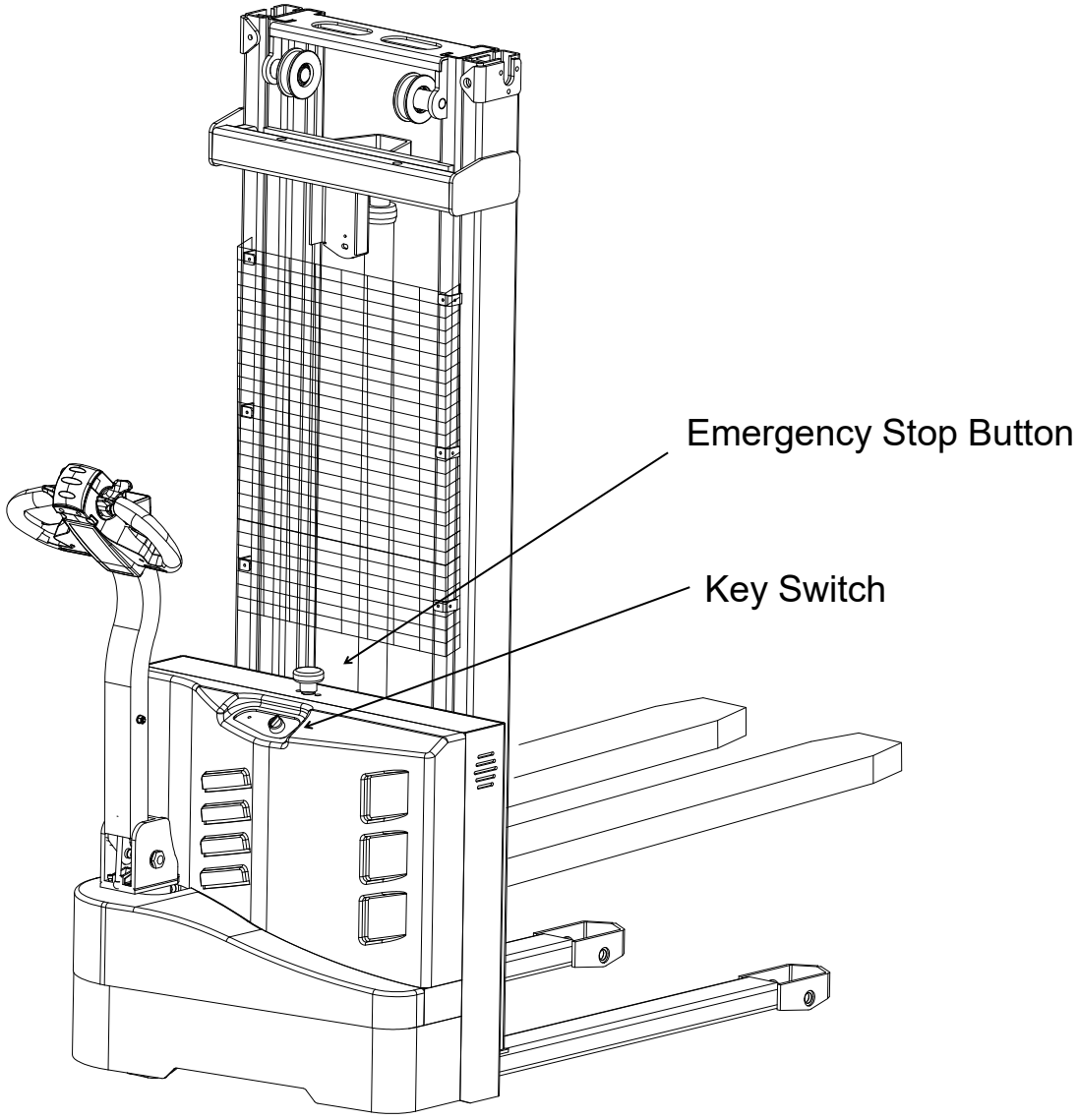
5.4 Inspection before operation

Check carefully the stacker before operation, to ensure it is not missing any parts, no damage, no abnormalities. (eg. loose bolts, cylinder oil leakage , noise while driving, abnormal deformation or other mechanical parts).

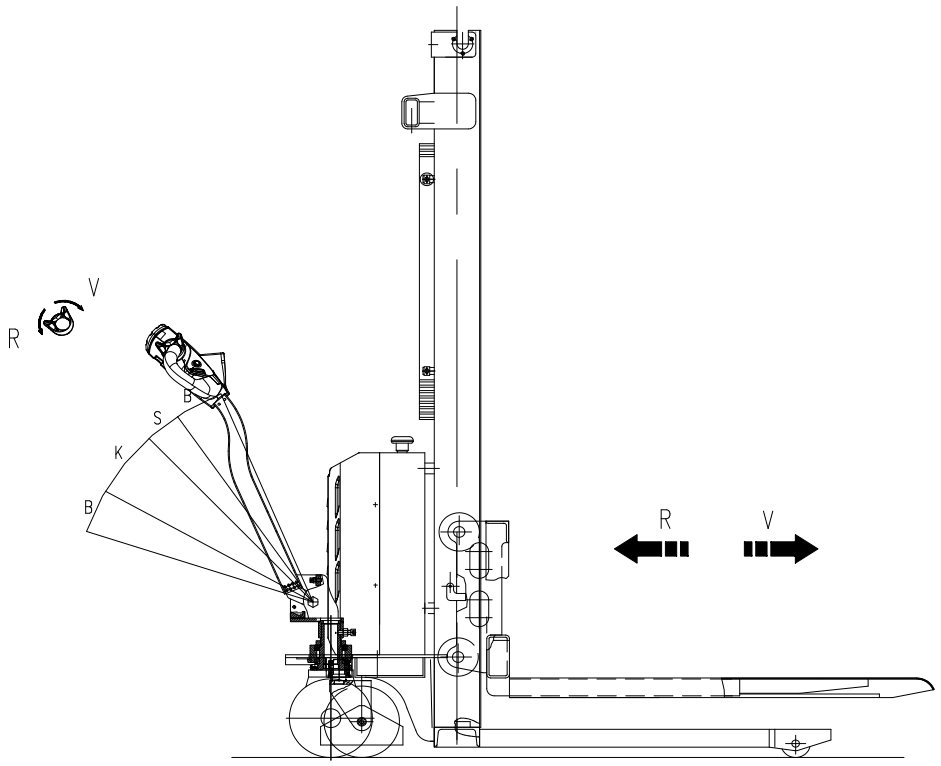
5.5 Correct operation method

5.5.1 Driving

Turn on emergency stop switch and key switch



Lower the handle to driving range.
Move the direction knob forward and back.



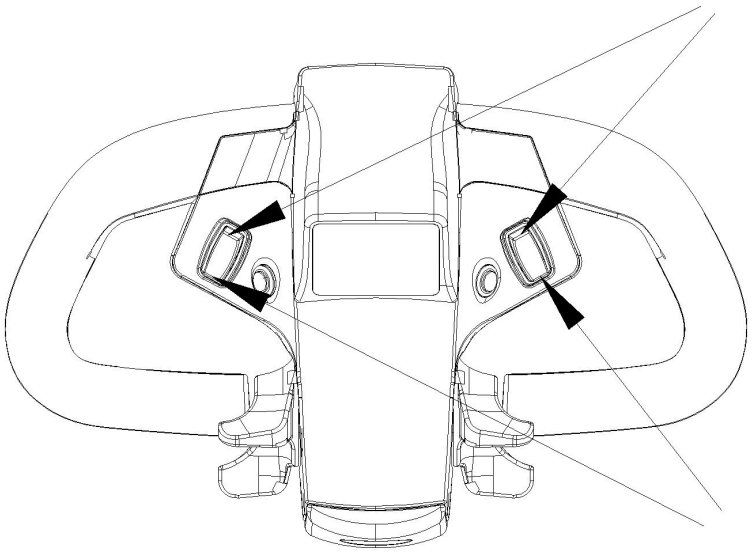
When stacker drives backwards, in case of emergency where stacker needs to be stopped instantly, user can use belly to hit the emergency reverse switch, stacker will drive forward and then stop instantly.
If the stacker is equipped with lifting speed limit function, it will automatically enter the slow driving mode when forks lift up to 500mm.

Press the turtle speed switch and stacker will enter slow driving mode.

Press the emergency reverse switch, move direction knob forward, and meantime turn on the emergency stop switch and power switch, stacker will enter upright driving mode, which means stacker can drive even when the handle is upright, and not lowered to the driving range. This driving speed is in slow mode

5.5.2 Lifting and lowering

Forks lowering



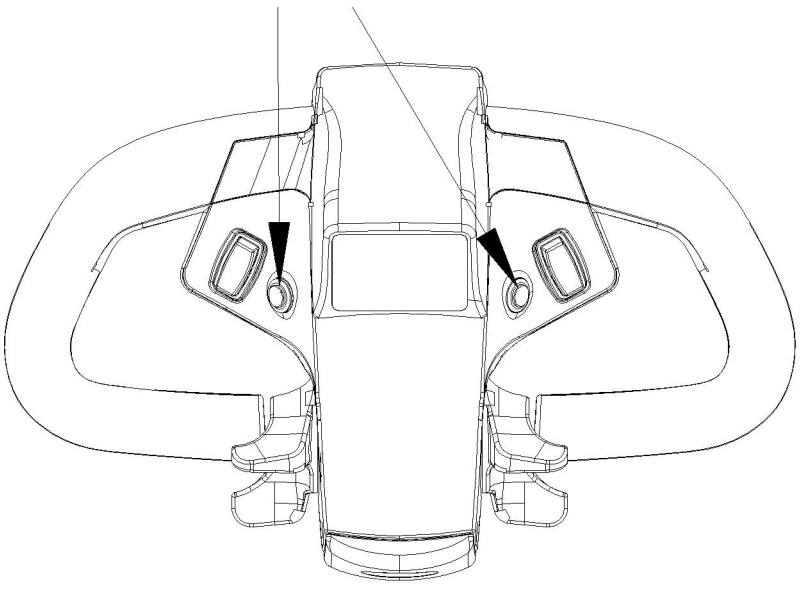
Forks lifting

Press the lifting button to lift the forks
Press the lowering button to lower the forks

5.5.3 Horn and interface

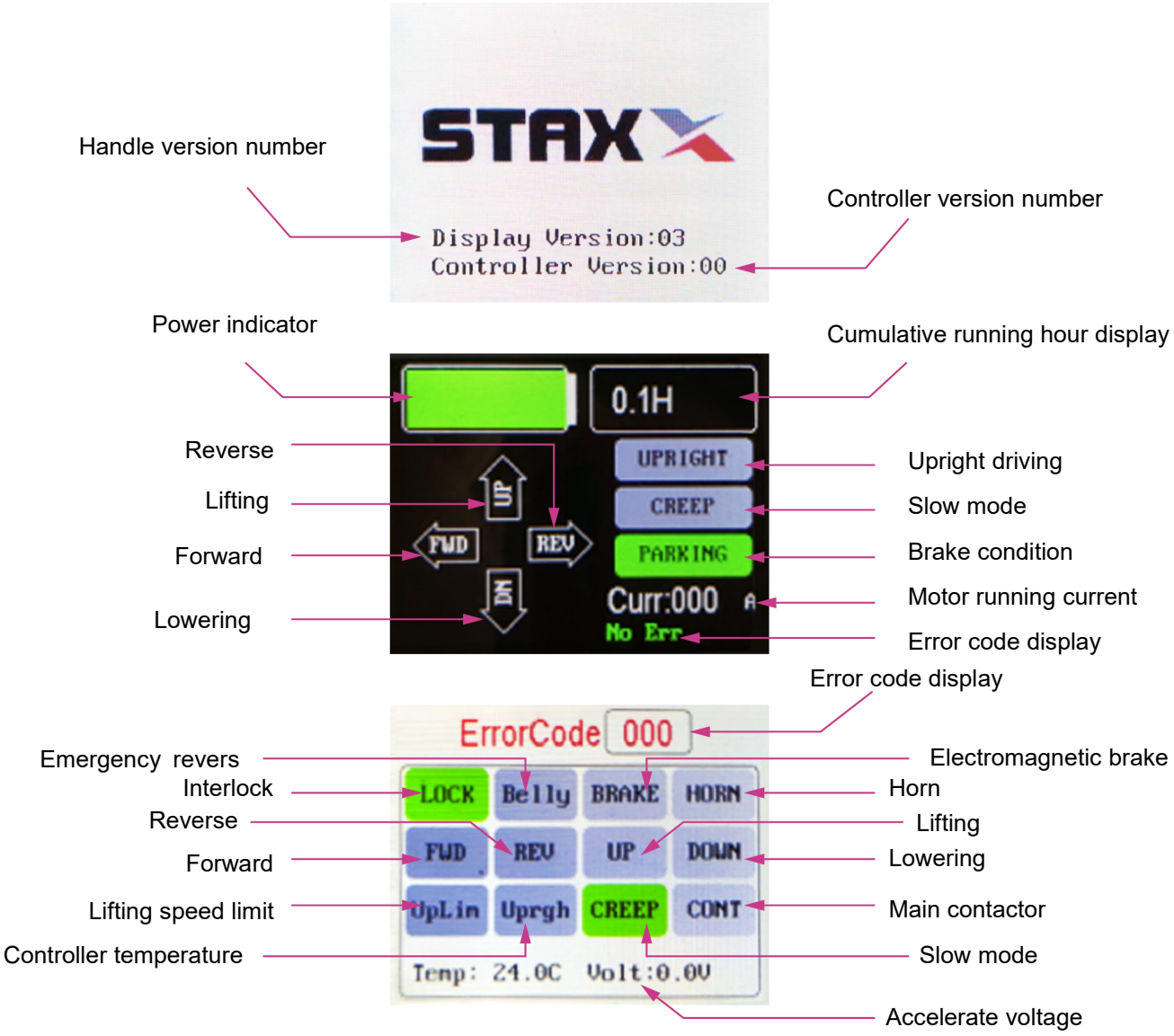
When horn button is pressed, the horn will ring, as a warning.

Horn



Switching method: Press turtle speed switch for 10s to switch between main interface and engineering interface.
Interface description

1. Correct operation steps: turn on emergency stop switch, turn on key switch, lower the handle down to the driving range, and move the direction switch forward and backward;
2. When the functions work, the icons will turn green;
3. Upright driving mode setting: press and hold the emergency reverse button, meanwhile move direction switch forward, turn on the power, to enter upright driving mode;
4. Turn on the power, keep pressing the slow mode button for 10 seconds, to enter the diagnosis menu: keep pressing the slow mode button for 10 seconds again, to return to normal operation menu:
5. Display instructions:



6. Maintenance and repair

6.1 Warning

People who are not specially trained or licensed should not repair or modify the stacker without authorization, otherwise there might be secondary damage. In such cases, damage to the stacker will not be covered by warranty. The manufacturer will not be liable for any safety accidents or affiliated damages..

The third stage maintenance can be extended to one year or longer, if the working condition of stacker is good; likewise, it should be shortened if working conditions are tough and difficult, or with heavy duty loading.

6.2 Maintenance

6.2.1 First-stage maintenance (daily inspection)

Check if the battery is fully charged (power indicated on upper left side of handle interface). Over-discharge, loss of capacity will have a serious impact on battery life.

Make sure the stacker is kept clean. Dispose of debris on all wheel parts, such as cloth strips, wires, plastic bags, etc.

Check if the stacker has any missing parts. If so, please complete the missing items.

If stacker malfunctions, please stop using it, to avoid causing more faults.

6.2.2 Second-stage maintenance (weekly inspection)

Lift forks to top position to check if hydraulic fluid in the hydraulic system is adequate and add YA-N32 hydraulic oil or similar oil if necessary.

Check if the cylinder has oil leaking
If there is oil leakage in the piston rod, seals need to be replaced. Note: Seals are wearing parts with warranty for 6 months.
If oil leaking is caused due to loose cylinder connector, tighten the connector with a wrench.

Check if mast chains are loose. If so, adjust the chains.

Interlock switch position
Normally, when handle is in vertical position, interlock switch light is on. When handle is lowered to its driving range, interlock switch light is off. If there is any abnormality, please check and repair.

Emergency stop switch
Check if the mushroom head of emergency stop switch is loose. If you can rotate it out, you need to tighten it. There is a hole in the bolt below. Use some thin article, such as an Allen key, to clamp the hole and tighten the mushroom head. This looseness might cause poor connection of emergency stop switch.

If stacker malfunctions, please stop using it and report to relative personnel, to avoid causing more faults.

6.2.3 Third-stage maintenance (half-year inspection)

Mechanical part

Masts adjustment
Check the inner masts to see if fork rack has a large gap. If so, adjust the composite rollers to eliminate the gap.
Check if the fork is tilting forward, if so, replace the fork rack or adjust the forks

Check the wearing condition of each wheel
If there is serious wearing, please change the wheels. Bad wear and tear of wheels can affect the performance of the stacker, and may cause damage to its mechanical parts.

Lubricating part
Spread on lubricating grease in the mast channels
Check if wheel lubrication bearings are worn, if so, please replace it
Spread on lubricating grease on mast chains.

Drive wheel assembly
Check if the gear is badly worn, if so, please replace it.
Replace the gear oil of the drive wheel assembly, drain the old oil, clean the tank, and add new gear oil. Recommended gear oil model is GL-5

Electrical parts

Wires
Check if all connectors are firmly placed.
Check and ensure all parts are tightened, no loosening.

Use air guns or other means to clean dust from electrical components, such as controller assembly and wires.
Check if the wires are neatly placed. Rearrange the wires if it is messy.
Check if any wires are damaged. If yes, replace the wires or repair it.

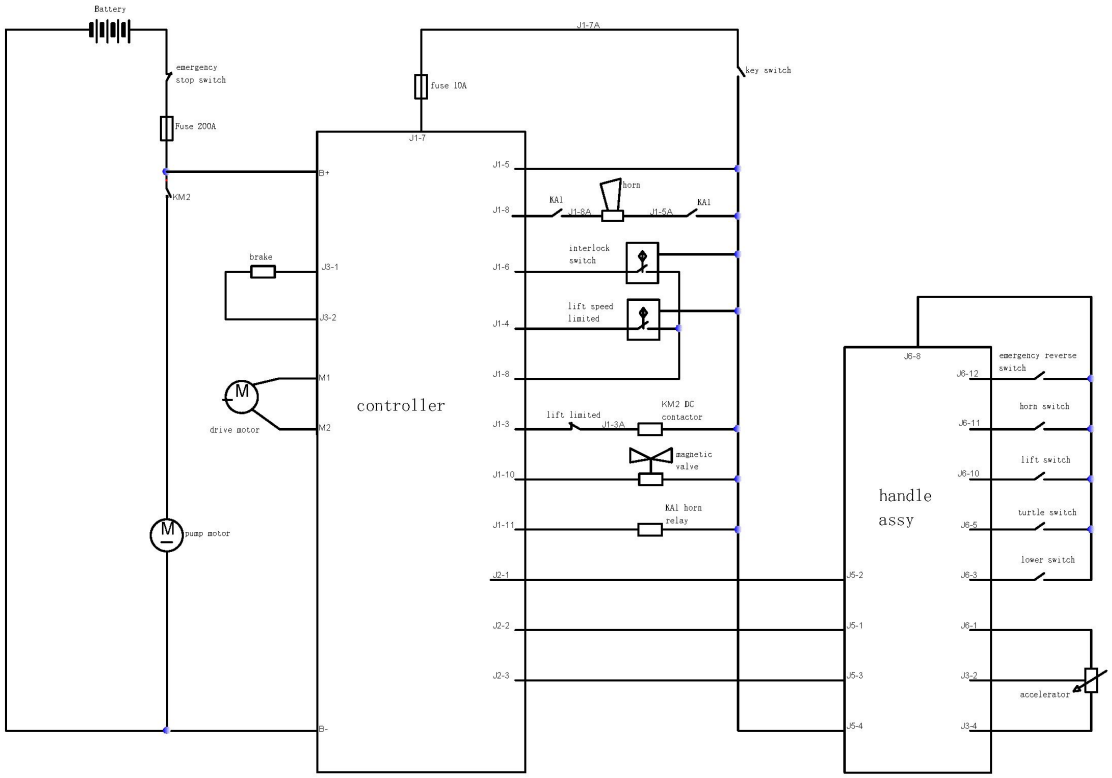
Check electromagnetic brake
Check if the electromagnetic brake fastener is loose. If so, tighten it with a wrench.
Check if the electromagnetic brake can be normally opened and closed
Check if the electromagnetic brake clearance is too big, causing failure to close.
If it is caused by wearing of brake pads, replace the brake pads,
If it is caused by dust, clean the dust, take off the dust ring, and use air gun to blow off the dust inside the electromagnetic brake (you can also uninstall it and use a brush or other means to clean the dust)
If the electromagnetic brake coil is damaged, replace the electromagnetic brake.
If it is an external line failure, please repair the external line

Hydraulic part
Replace hydraulic oil, drain the old oil, clean the tank, and add new hydraulic oil.
Recommended hydraulic oil model is YA-N32

Recommended hydraulic oil model is YA-N32

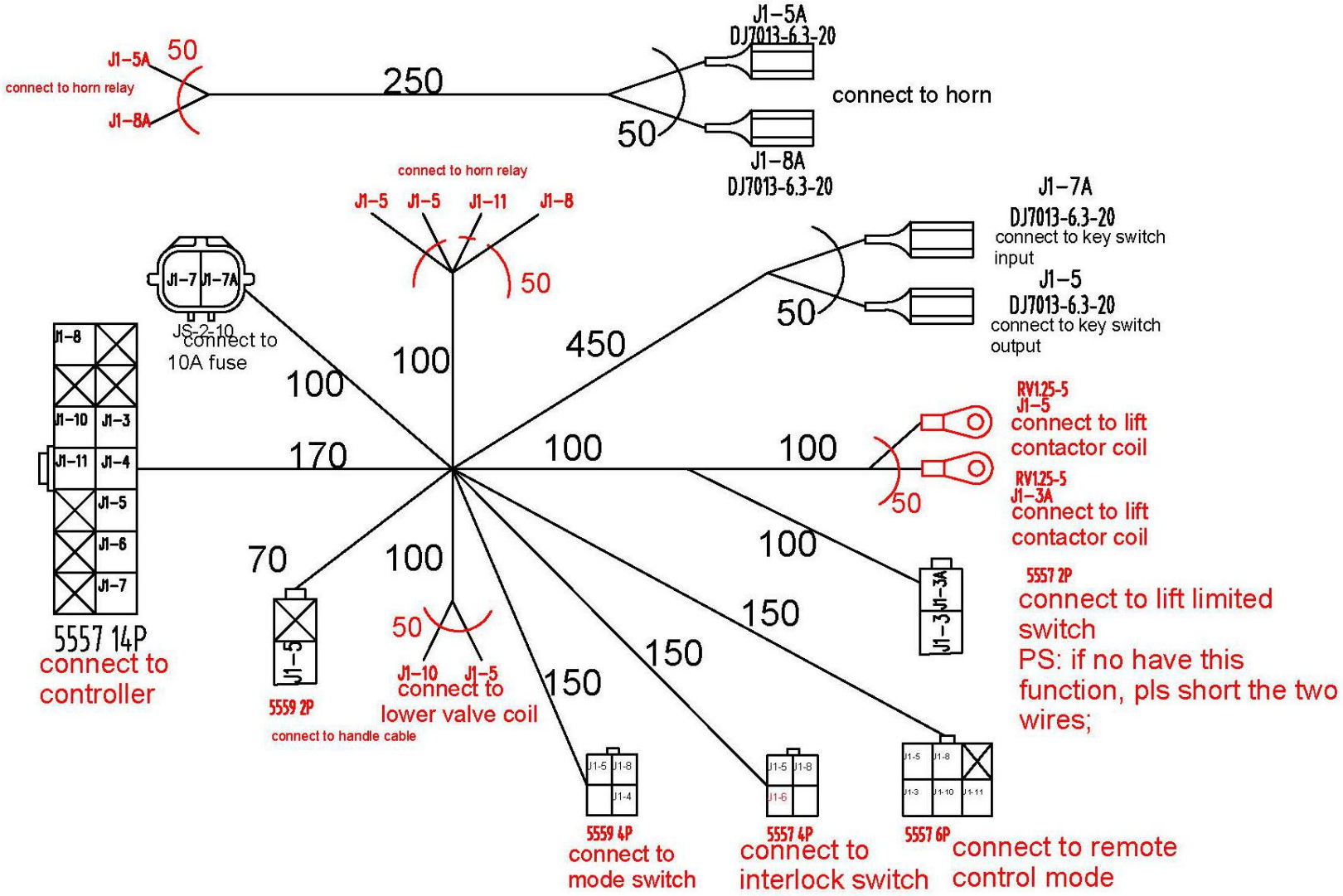
6.3 Maintenance

6.3.1 Electrical diagram

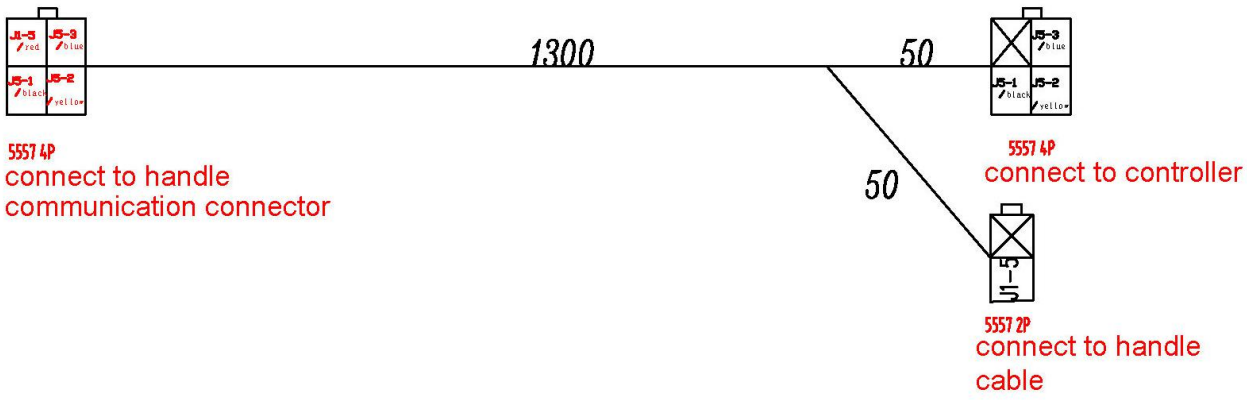


6.3.2 Wire harness diagram

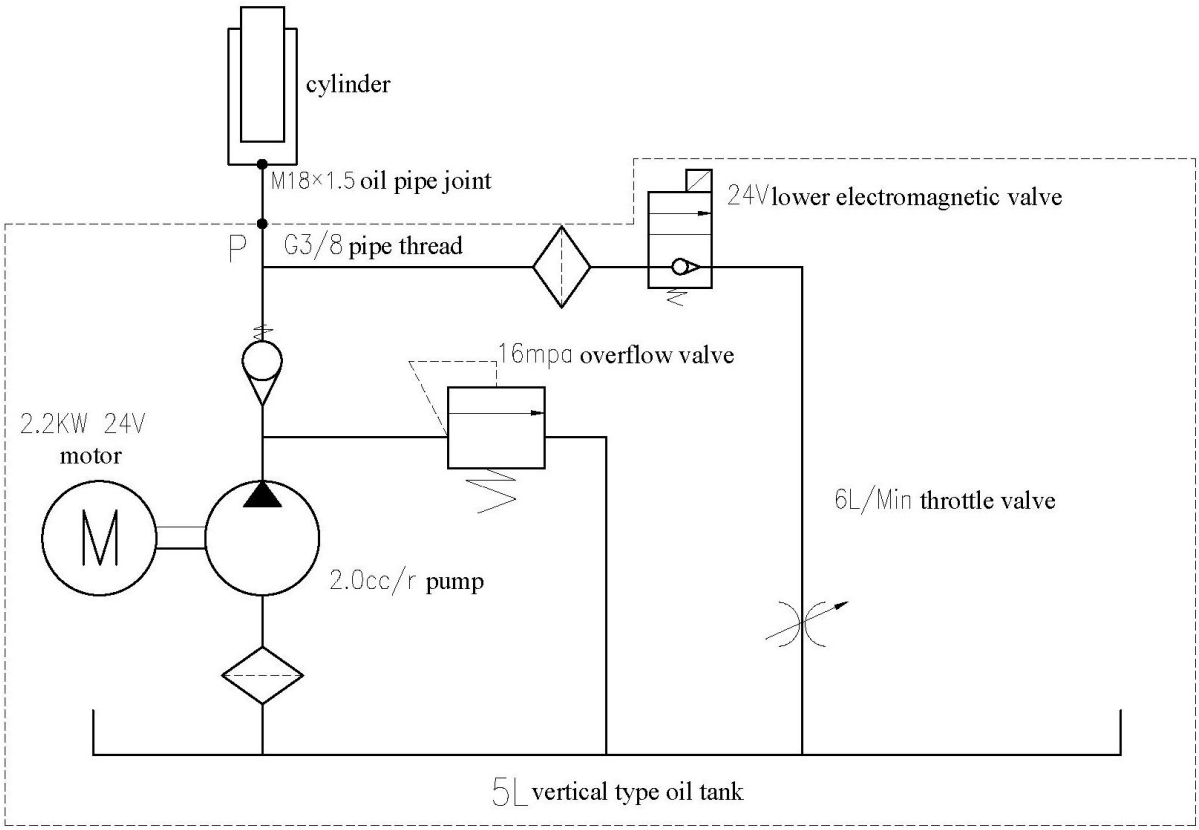
Overall wire harness


J1-5A
50
connect to horn relay
J1-8A
250
50
J1-5A
DJ7013-6.3-20
connect to horn
J1-8A
DJ7013-6.3-20
connect to horn relay
J1-5
J1-5
J1-11
J1-8
50
J1-7
J1-7A
JS-2-10
connect to
10A fuse
100
100
450
50
J1-7A
DJ7013-6.3-20
connect to key switch
input
J1-5
DJ7013-6.3-20
connect to key switch
output
J1-8
J1-10
J1-3
J1-11
J1-4
J1-5
J1-6
J1-7
170
100
100
RV1.25-5
J1-5
connect to lift
contactor coil
50
RV1.25-5
J1-3A
connect to lift
contactor coil
5557 14P
connect to
controller
70
100
100
150
150
150
J1-5
5559 2P
connect to handle cable
50
J1-10
J1-5
connect to
lower valve coil
J1-3
J1-3A
5557 2P
connect to lift limited
switch
PS: if no have this
function, pls short the two
wires;
J1-5
J1-8
J1-4
5559 4P
connect to
mode switch
J1-5
J1-8
J1-6
5557 4P
connect to
interlock switch
J1-5
J1-8
J1-3
J1-10
J1-11
5557 6P
connect to remote
control mode

Handle wire harness



6.3.3 Hydraulic schematic diagram



6.3.4 Controller Error Code

Troubleshooting

When controller detects failure, the truck stops working. LCD gives fault identification codes. The LCD uses two-digit code. Two short flashing and one long interval means 11,two short flashing, one short flashing and one long interval means 21, etc.

No	Error Code	Error	Possible Cause
1	11	Parameter error	Wrong parameter setting
2	12	Overcurrent	Motor short circuit or controller failure
3	14	M+ current 0 bit detection error	Controller failure
4	15	M- current 0 bit detection error	Controller failure
5	19	Temperature sensor failure	Temperature sensor failure or circuit disconnection
6	21	Potentiometer error	Acceleration potentiometer failure or circuit fault
7	22	Overheating current limit	Controller is overheated, causing current limit
8	23	Overheating protection	Controller is overheated, and automatically stops working
9	25	Over high temperature, current output limit	Motor over temperature, current output limit
10	26	Motor stall	Motor stall protection
11	27	Electromagnetic brake error	Electromagnetic brake is broken, causing open circuit
12	29	Motor open circuit	Motor open circuit or Motor failure
13	31	Low battery voltage, current limit	Low battery voltage causing current limit
14	32	Low battery voltage protection	Low battery voltage, truck is shut down
15	33	High battery voltage	Lithium battery with high temperature
16	35	Contactor error	Controller failure
17	38	Communication error	LCD display fault or harness fault
18	39	Controller version error	Controller version is not updated

Note: Error code might change due to updated controller versions. Please refer to the actual instructions on the controller or contact the technician.

6.3.5 Typical Troubleshooting

Electrical part

Case 1: **LCD shows Error 38**
Possible cause:
Wires from controller to LCD is faulty. LCD board failure.
Troubleshooting steps and solutions:
Check the wiring by multimeter, and see if connector has any loose contact. If yes, please fix it. If the wiring is good, then the LCD board is faulty.
Case 2: **The LCD shows blank screen**
Possible cause:
LCD board failure
Troubleshooting steps and solutions:
Replace the display board
Case 3: **All functions disabled. LCD shows normal, but stacker can not drive.**
Possible cause: interlock switch is in wrong position, or motor wiring is cut
Troubleshooting steps and solutions:
Check the position of interlock switch. Normally, when handle is upright, interlock swith light is on. Whne handle is lowered, the light is off. If the position of interlock switch is not correct, it needs to be adjusted..
Check if the motor wiring is cut, if yes, please fix it.

Mechanical part

Case 1: **Balance wheel comes out**
Possible cause: damaged bearings
Troubleshooting steps and solutions: Replace the bearings. If wheel carrier has a problem, replace it too.
Case 2: **Stacker sways or causes noise when forks are lifting or lowering.**
Possible reason: composite rollers are loose
Troubleshooting steps and solutions: Adjust the composite rollers

Cause Analysis					
Fault phenomenon	Fault definition	Troubleshooting steps	Checking possible cause of failure		Solutions
Mechanical failure		Drive wheel skidding	Check and make sure drive wheel PU wheel is in normal condition		Remove the cover, hang the stacker and remove the gasket of the balance wheel
		Abnormal noise from mast when forks lift and lower	Observe and confirm which part has big gap		Adjust the composite roller of that part
		Obvious shaking when stacker drives	Load wheel or balance wheel failure		Repair, or replace damaged parts
		Fork deformation	Overloading, improper operation, forks used for heavy load for long		Do some simple repair
		Cylinder oil leakage	Check if there are scratches on piston rod	Yes	Replace cylinder assembly
				No	Replace seals
		Tube oil leakage	Oil leakage at the joint		Tighten the bolt
			Oil leakage at tube crimping point or somewhere on the tube		Replace the tube
			Tube joint twisted		Replace the tube joint

Hydraulic part

Case 1: **Oil spurt or oil leakage from cylinder venting hole**
Possible cause: Damaged seals of cylinder piston rod
Troubleshooting steps and solutions: Replace seals of piston rod or replace cylinder assembly
Case 2: Oil leakage at the cylinder joint
Possible cause: The joint is not tightened
Troubleshooting steps and solutions: Tighten the connector with a wrench.
Tighten connector with a wrench. If problem still exists, replace the tube connector.
Case 3: **When lifting button is pressed, lifting contactor makes regular vibration and sounds.**
Possible cause: battery has no power
Troubleshooting steps and solutions: Charge the battery

Cause Analysis		Electrical failure or hydraulic pump station oil circuit failure, mechanical failure			
Fault phenomenon	Fault definition	Troubleshooting steps	Checking possible cause of failure		Solutions
Lifting failure	Driving and horn functions are normal. When lowering button is pressed, solenoid valve light is on or there is suction. Lifting is faulty	Press lift button, and no response	Press lift button, see if there is sound of inching switch	No	Dismantle handle and check position of lift switch. When you press the lift button, if it cannot touch the switch, please adjust the position of lift switch
				Yes	Use multimeter to check the lift inching switch can normally open and close. If not, lift switch is damaged, please replace it.

			Press lift button, check if there is voltage on the two wires of lifting contactor coil.	No voltage	Check lifting wires and the location of lift limit switch
				There is voltage	Lifting contactor is damaged, please replace it
		Press the lift button, there is sound of the lifting contacto opening and closing, but the hydraulic motor does not turn.	Check if there is electricity on the main inlet wire of lifting contactor	No	Check power cable and fuse
			Check if there is electricity on the main outlet wire of lifting contactor	No	Lifting contactor is damaged, please replace it
			Hydraulic motor failure		Replac parts
		Press the lift button, there is sound of the lifting contacto opening and closing continuously	Battery low power		Charge the battery
		Press the lift button, there is sound of lifting contactor opening and closing. Hydraulic motor works normally. When lift button is not pressed, the motor still keeps turning.	No hydraulic oil		Add hydraulic oil
			Check if there is fault with cross connecting shaft that connects hydraulic motor and gear pump	Falling off	Re-install
				Damaged	Replace parts
			Remove the gear pump and check if the gear pump rotates normally.	No	Replace parts
			Damaged gear pump, causing leakage	Yes	Replace parts
		Press the lift button, there is sound of lifting contactor opening and closing. Hydraulic motor works normally but no lifting. accompanied by overflowing sound. When lift button is not pressed, the motor stops turning.	Overflow valve failure		Clean overflow valve, reinstall it. If the problem still exists, replace the overflow valve
		Press the lift button, there is sound of lifting contactor opening and closing. Hydraulic motor works and lifting is normal. When lift button is not pressed, forks lower automatically.	One-way valve failure	blocked	Clean it and reinstall it
				One-way valve damaged	Replace parts
				valve damage	Replace parts
		Press the lift button, there is sound of lifting contactor opening and closing. Hydraulic motor works normally but lifting is slow. When lift button is not pressed, forks lower automatically.	Check if there is electricity on solenoid valve coil	Yes	Check the lower switch button and cable
			Solenoid valve mechanical failure	blocked	Clean it and reinstall it
			Check if solenoid valve damaged	Yes	Replace parts
		Turn on the power, forks automatically lift without any operation	Lifting contactor damage		Replace parts
			Lifting button is stuck		Repaire or replace parts
Lowering fault	Driving, lifting, horn functions are normal, lowering is faulty	Press the lowering button, there is no sound of lifting contactor opening and closing.	Press the lowering button, see if there is sound of contacting	No	Adjust the position of the lowering button inching switch so it will touch lowering button
			Lowering switch failure. Use multimeter to check if there is open circuit	Yes	Replace parts
			Press the lowerin button to check if there is voltage on solenoid valve coil	No	Repair circuits
				Yes	Replace the solenoid valve
		Press the lowering button, there is sound of lifting contactor opening and closing but forks don't lower.	The lowering solenoid valve is blocked		Clean it and reinstall it
			The lowering solenoid valve is damaged		Replace parts