

# S-CB-118 (COUNTER BALANCE STACKER)

## INTRODUCTION

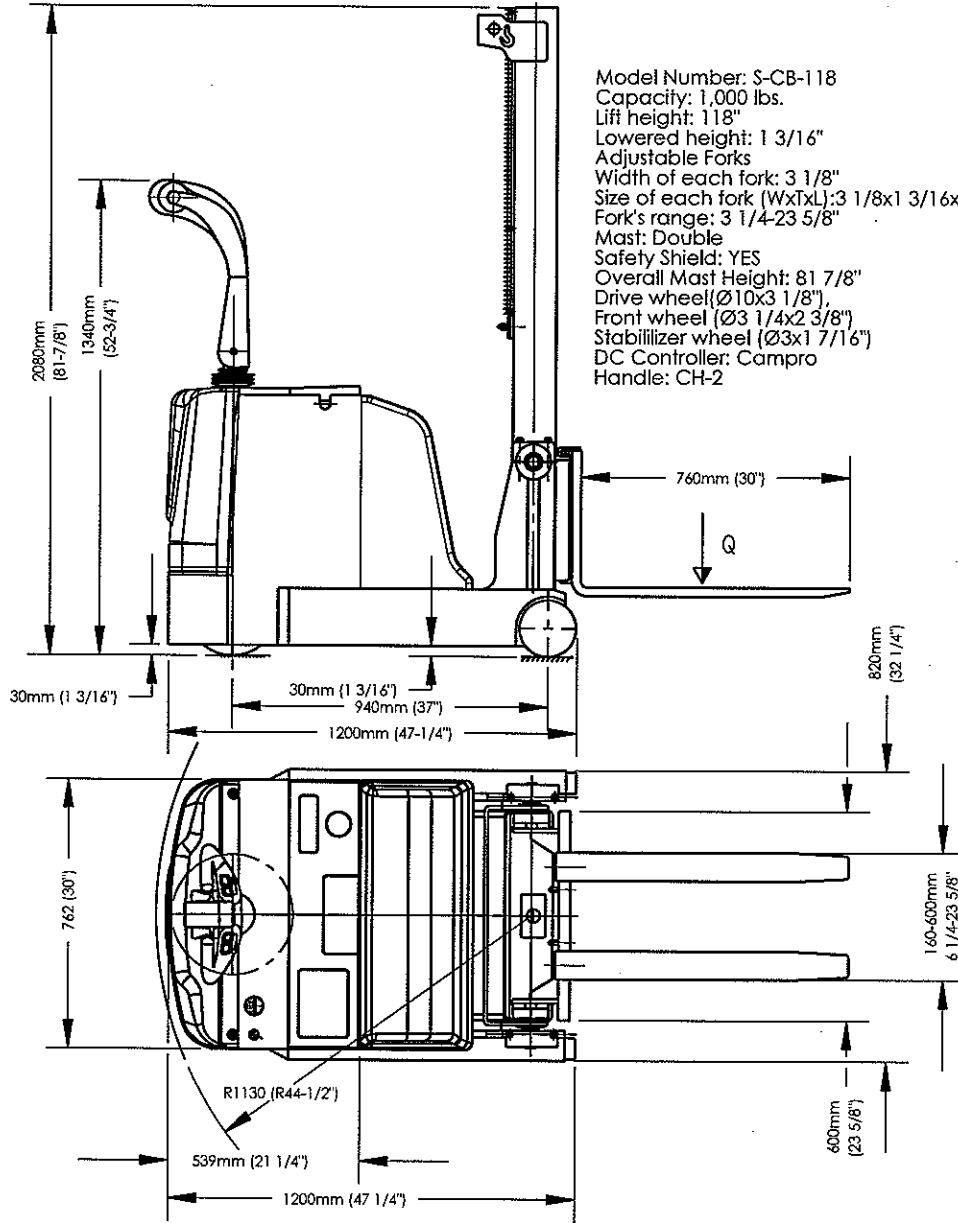
S-CB-118 series economic counter balance stacker is a compact counter balance design, efficient for material handling equipment in tightest areas. Easy to operate in factories, warehouses, & supermarkets.

## SPECIFICATION

<b>Model</b>	<b>S-CB-118</b>
<b>Load Capacity</b>	<b>1000 LBS.</b>
<b>Load Center</b>	<b>15"</b>
<b>Max Lifting Height</b>	<b>118"</b>
<b>Width of 2 forks</b>	<b>23 ½"</b>
<b>Min fork height H</b>	<b>1 3/16"</b>
<b>Length of fork L</b>	<b>30"</b>
<b>Power motor</b>	<b>24V/2.0kw</b>
<b>Drive motor</b>	<b>24V/0.7kw</b>
<b>Max lifting speed</b>	<b>3 3/8"/s</b>
<b>Drive speed</b>	<b>3.4-3.72m/h</b>
<b>Gradient when Load</b>	<b>5~7%</b>
<b>Battery</b>	<b>2 x 12V/70Ah</b>
<b>Battery charger</b>	<b>2412SRF</b>
<b>Turning Radius</b>	<b>44 ½"</b>
<b>Overall size</b>	<b>77 1/4"x 32 ¼"x 81 7/8"</b>

# S - CB - 118 - COUNTER BALANCE STACKER

OVERALL HEIGHT ON FORKS CARRIAGE WHEN UNIT IS FULLY RAISED: 3580mm (141.00')



Model Number: S-CB-118  
 Capacity: 1,000 lbs.  
 Lift height: 118"  
 Lowered height: 1 3/16"  
 Adjustable Forks  
 Width of each fork: 3 1/8"  
 Size of each fork (WxTxL): 3 1/8x1 3/16x30"  
 Fork's range: 3 1/4-23 5/8"  
 Mast: Double  
 Safety Shield: YES  
 Overall Mast Height: 81 7/8"  
 Drive wheel (Ø10x3 1/8"),  
 Front wheel (Ø3 1/4x2 3/8")  
 Stabilizer wheel (Ø3x1 7/16")  
 DC Controller: Campro  
 Handle: CH-2

<p>PROFESSIONAL AND COMMERCIAL                  THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF VESTIL MANUFACTURING CO. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT WRITTEN PERMISSION OF VESTIL MANUFACTURING CO. IS PROHIBITED.</p>	UNLESS OTHERWISE SPECIFIED		Vestil Manufacturing Co.
	DESCRIPTION:		Counter Balance Powered Lift & Powered Drive Stacker
	DRAWN BY:	DATE:	SCALE: N/A
	I. MAHMOOD	09-10-07	
COMMENTS:		DWG. NO. S-CB-118	
DO NOT SCALE DRAWING			

## **Operation**

- . Pull up the red push button of the emergency stop switch.
- . Tilt the control handle to driving position, the brake is released
- . If you release the head of control handle, this returns to the vertical start position, the truck brakes and locking brake activates.

### **Braking:**

The machine is equipped with a brake that is applied between 10-15° of the vertical position and between 85-90° of the lower position in the vertical operating of the handle. The brake can be operated at any point in the lateral operating of the handle. When you release your hand from the handle, it will resume the neutral position automatically, and the brake will be activated. Always make sure that the brake is in activated before operating the stacker. When not in use, always put the handle in the full vertical position with the brake applied and forks lowered.

### **Sounding the horn:**

A horn is located on the front side of the handle

### **The following are generally valid for the lifting and lowering procedure:**

- . The red operating button of the EMERGENCY STOP pushbutton must be pulled upwards
- . Lifting and lowering movements are initiated by pressing the pushbuttons on the handle head.

### **Lifting the load (Warning):**

- . Before taking up a load to be transported, ensure that the load doesn't exceed the carrying capacity of the truck
- . The nominal carrying capacity and lifting heights can be viewed in the bearing load diagram
- . Ensure that the load can be taken up in a compact and stable manner. Slipping or falling of the load must be avoided
- . The load must not project into the lifting frame
- . The load is taken up centrally in either the length of the width

### **Transporting the load (Warning):**

- . Raise the load only slightly to transport
- . For safety reasons (view) transport only in a forward direction
- . It is permissible to take up or set down loads on level surfaces
- . When unloaded, only move the truck with lowered forks

### **Driving on sloping surfaces (Warning):**

- . If a load is to be transported on a slope, the load must be faced slope-upwards.
- . It is not permissible to drive on slopes diagonally

**Before leaving the stacker:**

- . Park stacker on level surfaces
- . Lower the load fork completely
- . Push down emergency stop switch

**Operation environment:**

- a) Above the sea level  $\leq$  2000m
- b) Ambient temperature 32° F~120° F
- c) Ambient humidity 5%~75%RH
- D) Storage temperature -31° F~140° F
- e) Without conductive dust
- g) Without corrosive gas and steam damaged to metal and isolator
- h) Keep away from rain and snow
- I) Mounting slop  $\leq$  5 degree

## Operation

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### Driving



**Caution!**

Pedestrian controlled industrial trucks may only be operated by persons who have been satisfactorily instructed in operating the truck and have proved their ability to operate the truck to the responsible representative of the operating company.

The first driving attempts should take place on level and spacious surfaces.

**Recommendation:**

The operator who is to man oeuvre the truck and is to control the lifting mechanism should be allowed to practice, when unloaded, until they can safely operate these functions.

Only then should they undertake the loading, transporting and unloading of the transport load.



**Caution!**

The driver is responsible for the lifting truck during his working hours. He must not allow unauthorized persons to operate the truck. When leaving the machine, he must ensure that the truck is not used by an unauthorized person (remove switch key!).

**General:**



The lifting truck is equipped with an electronic impulse control.

This control enables completely jolt-free and continuous forward and reverse driving.

The driving speed can be regulated proportionally via the rotary switch on the head of the Control handle.

The control enables regenerative braking.

## Maintenance and repair

### TROUBLE SHOOTING

Fault	Cause	Remedy
No lifting function	<ul style="list-style-type: none"> <li>Faulty fuse</li> <li>Electricity supply interrupted</li> <li>No hydraulic oil</li> <li>Battery discharged</li> </ul>	<ul style="list-style-type: none"> <li>Replace control system fuse</li> <li>Replace motor fuse</li> <li>Check cable</li> <li>Battery discharged</li> <li>Refill hydraulic oil</li> <li>Re-charge battery</li> </ul>
Lifting height is no longer achieved	<ul style="list-style-type: none"> <li>Hydraulic oil level is too low</li> </ul>	<ul style="list-style-type: none"> <li>Re-fill hydraulic oil when lifting fork is lowered</li> </ul>
Jolts when lifting	<ul style="list-style-type: none"> <li>Air in the system</li> </ul>	<ul style="list-style-type: none"> <li>Open the vent screw of the lifting cylinder with lowered lifting fork and lift until oil free from air bubbles is expelled. Close the vent screw.</li> </ul>
Fork lowers self-acting	<ul style="list-style-type: none"> <li>Lowering vent leaky</li> <li>Pressure relief valve leaky</li> </ul>	<ul style="list-style-type: none"> <li>Lower with jolts at the greatest speed (lower- release lever- lower)</li> <li>Raise to end-stop with brief overflow of pressure relief valve</li> </ul>
Drive motor does not switch off	<ul style="list-style-type: none"> <li>Contactor is caught</li> <li>Impulse controller defective</li> </ul>	<ul style="list-style-type: none"> <li>Replace contactor</li> <li>Report error code to after-sales service</li> </ul>
Truck does not move	<ul style="list-style-type: none"> <li>Battery discharged</li> <li>Fuse defective</li> <li>Impulse controller defective</li> <li>Switch on the Control handle bearing defective</li> </ul>	<ul style="list-style-type: none"> <li>Re-charge battery</li> <li>Replace fuse for driving motor</li> <li>Replace control</li> <li>Report error code to after-sales service</li> <li>Replace switch</li> </ul>
Truck only moves at reduced speed	<ul style="list-style-type: none"> <li>Battery discharged</li> <li>Impulse controller defective</li> </ul>	<ul style="list-style-type: none"> <li>Re-charge battery</li> <li>Report error code to after-sales service</li> </ul>
Battery fails to charge(only with integrated charger)	<ul style="list-style-type: none"> <li>Secondary fuse in the charger unit is defective</li> <li>Battery is discharged, overload protection has triggered</li> <li>Charger unit is faulty</li> </ul>	<ul style="list-style-type: none"> <li>Replace fuse</li> <li>Replace battery</li> <li>Replace charger unit</li> </ul>

## Maintenance and repair

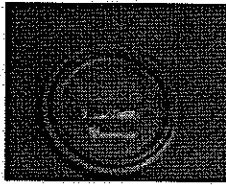
### BATTERY & BATTERY CHARGER

The batteries and battery charger are packed inside the battery pack. Follow the operating procedures to charge battery:

1. *Push down red operating button of the Emergency Stop*
2. Disconnect the battery cable connector from compartment of the stacker and then fully engaged it to the compartment of the battery charger.
3. Before connecting the battery charger to the local power supply, check and insure that the voltage of both is the same.
4. Connect the AC extension cord from the charger into the outlet of local power supply. This will automatically turn the charger on, and it will run at a rate commensurate with the requirements of the batteries. The charger will automatically control the charging procedure and when the batteries are fully charged, the charger will only supply enough current to maintain batteries charge.
5. When the charging cycle is completed, disconnect the AC plug from the stacker outlet and the power supply.
6. Remove the battery connector from charger and fully engaged it to the drive plug.

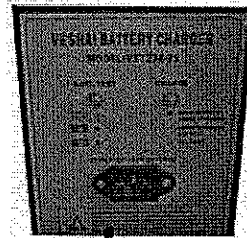
#### Battery charging

The charge status of the battery is indicated on the battery controller



The automatic charging process is started by plugging the charging cable into a socket.

Once the battery is completely charged, the charger switches off.



AC 230V / 50Hz  
AC 110V / 60Hz



## Instructions for Changing the Battery Charger

### **READ ALL INSTRUCTIONS BEFORE PROCEEDING!**

**Only qualified personnel should work on this equipment!**

**Lock out all potential energy sources before attempting this installation; turn off the unit and remove the key.**

### **Warning!**

- ! Working with or near lead acid batteries is dangerous. Batteries contain sulfuric acid and produce explosive gases. A battery explosion could result in loss of eyesight or serious burns.
- ! Do not smoke or allow a spark or flame near batteries. Charge batteries in locations which are clean, dry, and well-ventilated. Do not lay tools or anything metallic on top of any battery. All repairs to a battery must be made by experienced and qualified personnel.
- ! When working with batteries, remove personal items such as rings, bracelets, necklaces, and watches. Batteries can produce enough energy to weld jewelry to metal, causing a severe burn.
- ! Always have fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.
- ! Operating the battery with a low battery voltage can cause premature motor contact failure.
- ! Do not expose the lift or charger to rain or adverse conditions.
- ! Replace defective cords or wires immediately.
- ! Check the battery's water level frequently if this applies to your battery type.
- ! Make sure the battery charger is unplugged from 115vac source.

### **Battery Charger Operating Instructions for New Charger after Installation**

Plug the charger into a standard 115V receptacle. If an extension cord must be used, keep it as short and as large as possible. A small cord will decrease the output of the charger due to the voltage drop in the line. This will increase the charging time. It can also cause the 115V cord to overheat.

When properly connected, the charge LED will indicate the status of charge current flowing to the battery, as follows: Power LED is always green when charger is plugged in. The status light is as follows:

- Red only – the charger is providing full output to the battery.
- Yellow – the charger is “topping off” the battery.
- Green – the charger is providing a “float,” or maintenance, charge.

Remember to unplug the charger before moving the equipment. Failure to do so could cause damage to cords, receptacles and other equipment.



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Filename: Changing Charger  
4/17/07 TG  
15-126-011

VESTIL MFG. CO.

Troubleshooting:

If the unit does not operate, check all of the wiring connections to make sure they're both mechanically and electrically sound – specifically at the battery, and the motor.

A fully-charged lead acid battery in good condition at room temperature should read 12.65 volts. At 11.9 volts it is considered to be fully discharged and in need of charging. When checking battery voltage, wait at least 1½ hour after the charger has been turned off before checking the battery's voltage.

If the batteries aren't being charged by the charger, check the output charger fuse. Verify fuse is good with an ohmmeter, or close visual (ohm meter best). Fuse is a 10Amp 250 Volt; GBD 10A. If it is good, check the battery's state of charge with a voltmeter. The charger must be connected to the battery in order to read the output voltage of the battery charger. Depending on the state of charge of the batteries, the voltage should be somewhere around 27 to 28 volts dc.

If it is determined the battery charger is dead, and needs replaced, continue with the following procedure.

**Tools Required:**

10mm deep socket, or small wrench  
14mm wrench, or crescent wrench  
Regular flat bladed screw driver

### Troubleshooting:

If the unit does not operate, check all of the wiring connections to make sure they're both mechanically and electrically sound – specifically at the battery, and the motor.

A fully-charged lead acid battery in good condition at room temperature should read 12.65 volts. At 11.9 volts it is considered to be fully discharged and in need of charging. When checking battery voltage, wait at least 1\2 hour after the charger has been turned off before checking the battery's voltage.

If the batteries aren't being charged by the charger, check the output charger fuse. Verify fuse is good with an ohmmeter, or close visual (ohm meter best). Fuse is a 10Amp 250 Volt; GBD 10A. If it is good, check the battery's state of charge with a voltmeter. The charger must be connected to the battery in order to read the output voltage of the battery charger. Depending on the state of charge of the batteries, the voltage should be somewhere around 27 to 28 volts dc.

If the batteries are fully charged, and the units belly switch is not functioning the following procedure will show how to...

- A) Replace the tiller assembly which contains the belly switch and throttle controls.
- B) Troubleshoot belly switch mechanism itself.

The following tools will be required:

5mm allen wrench  
Philips bladed screw driver  
Small Regular flat bladed screw driver

**TROUBLESHOOTING GUIDE --**

**Warning:** Before performing any task, always block drive wheel off of the ground.  
*Consult the factory for problems at time of installation, or for any problems not addressed below.*

<u>Problem:</u>	<u>Possible cause(s):</u>	<u>Action:</u>
Unit doesn't move when controls are used.	Battery voltage low (<17)	Charge batteries.
	Problem with motor controller (check for LED flash code on side of controller)	Consult diagnostics page/factory
	Fuse blown	Remove back shroud and check fuses (3 fuses).
Unit will not charge	Charger malfunction	Verify output voltage on charger, will only get a reading when connected to batteries; should be approximately 28 volts.
	Bad batteries	Load test batteries
Unit will not go forward; reverse works; belly switch just kills unit (does not go forward and time out)	Broken wire, or loose connection	Locate Pin 2 on Molex connector at motor controller. Trace wiring to contactor and verify connection.
	Contactor bad, motor controller bad	When forward is depressed, there should be 24 volts on this wire from Molex connector to the contactor, if not, the motor controller may be bad; consult diagnostics page/factory. If 24 volts is present at contactor, verify ground connection. If ground is good, remove both wires and check with ohm meter; resistance should be approximately 38 ohms. If it's open or zero, the contactor should be replaced.
Unit will not go reverse; belly switch works (i.e. when the handle is in operating range and rotating throttle in reverse and the belly switch is hit, the unit moves forward and times out)	Broken wire, or loose connection, contactor bad, motor controller bad	Same as above; except locate Pin 3 on Molex connector on motor controller...and follow procedure.

<u>Problem:</u>	<u>Possible cause(s):</u>	<u>Action:</u>
Unit will not go forward, or reverse, but belly switch still functions properly.	Broken wire, or loose connection, bad motor controller,  Throttle assembly bad	Locate Pin 6 on Molex connector at the motor controller. Try to drive the unit in forward, there should be 0 to 5 volts (5 v is full throttle) at this pin. If there is voltage and the unit does not move, the motor controller may be bad, consult diagnostics page/factory. If there is no voltage, trace the wiring back towards the tiller head and check voltage on each side of connectors. Continue this until bad connection is found.  If the connections are all good, and there is no voltage coming out of throttle assembly, then the throttle assembly may be bad. Verify there is 24 volts going into the assembly, and that there is a good ground. If there is still no output voltage for pin 6, replace throttle assembly. See Fig. 1
Unit will not move forward, or reverse, and the Belly switch will not function, unit does turn on as indicated by the battery gage lighting up.	Blown fuse  Broken wire, or loose connection	Verify fuses are good, replace if blown.  Locate Pin 7 on Molex connector at the motor controller. Trace wire back up to tiller head and verify continuity all the way to the throttle assembly. Repair any loose connections.  If there is continuity up to the throttle assembly, then check the ground wire that comes off of B- on the motor controller (3 <sup>rd</sup> terminal down). Add more length to this wire if necessary, and re-terminate with a ring terminal.
Unit will not go forward; the belly switch functions; reverse works.	Broken wire, or loose connection, bad motor controller  Bad throttle assembly	Locate Pin 11 on Molex connector at the motor controller. Try to drive the unit in forward, there should be 24 volts at this pin. If there is voltage and the unit does not move, the motor controller may be bad, consult diagnostics page/factory. If there is no voltage, trace the wiring back towards the tiller head and check voltage on each side of connectors. Continue this until bad connection is found.  If the connections are all good, and there is no voltage coming out of throttle assembly, then the throttle assembly may be bad. Verify there is 24 volts going into the assembly, and that there is a good ground. If there is still no output voltage for pin 11, replace throttle assembly. See Fig. 1

<u>Problem:</u>	<u>Possible cause(s):</u>	<u>Action:</u>
Unit will not reverse; belly switch does not function; forward ok	Broken wire, or loose connection, bad motor controller	Locate Pin 12 on Molex connector at the motor controller. Try to drive the unit in reverse, there should be 24 volts at this pin. If there is voltage and the unit does not move, the motor controller may be bad, consult diagnostics page/factory. If there is no voltage, trace the wiring back towards the tiller head and check voltage on each side of connectors. Continue this until bad connection is found.
	Bad throttle assembly	If the connections are all good, and there is no voltage coming out of throttle assembly, then the throttle assembly may be bad. Verify there is 24 volts going into the assembly, and that there is a good ground. If there is still no output voltage for pin 12, replace throttle assembly. See Fig. 1
Belly switch does not function; forward ok; reverse ok	Broken wire, or loose connection, bad motor controller	Locate Pin 13 on Molex connector at the motor controller. Try to drive the unit in reverse, and hit the belly switch... there should be 24 volts at this pin. If there is voltage and the unit does not move, the motor controller may be bad, consult diagnostics page/factory. If there is no voltage, trace the wiring back towards the tiller head and check voltage, or continuity on each side of connectors. Continue this until bad connection is found.
	Bad belly switch	If the connections are all good, and there is no voltage, then the switch may be bad. Verify there is 24 volts going into the switch. If there is still no output voltage for pin 13, replace the switch.
Unit will not reverse. The unit only goes forward for about 1 second and dies when the handle is pulled down. When the handle is re-set and pulled down the unit will move forward again then die.	Stuck Switch	The belly switch is stuck on. Tap the orange assembly to see if the switch can be freed. If this doesn't work, disassemble the tiller head by removing 3 screws from bottom. Slightly loosen up the two screws that hold the switch in place, this may free the switch. If it is still stuck, contact the factory for a replacement switch.

<u>Problem:</u>	<u>Possible cause(s):</u>	<u>Action:</u>
Unit will not raise; motor does not run	Loose wire	Verify 24 volts at coil when raise is pushed, if no voltage, trace wiring back to tiller head looking for voltage on each side of the connectors until the bad connection is found.
	Bad solenoid	If voltage is present at the solenoid and the unit does not raise, remove the two wires to the coil and measure the coil resistance. It should be around 19 ohms. If it's open, or shorted replace the solenoid.
	Upper limit switch out of adjustment	Bypass upper limit switch and see if the unit raises...DO NOT TAKE IT ALL THE WAY UP... If it does raise, verify the limit switch is normally closed and will open when activated. If the limit switch is ok, try to adjust the switch accordingly so that the units raise height is approximately 7 to 8"
Unit will not raise; motor runs	Lower solenoid stuck on	Check to see if the lowering switch is stuck on. If it is, remove the tiller head via 3 screws on bottom and replace switch, or tap on switch to see if it can be freed up.
Unit will not lower	Loose wire; bad coil	Verify 24 volts at coil when lower is pushed, if no voltage, trace wiring back to tiller head looking for voltage on each side of the connectors until the bad connection is found.
		If voltage is present at the coil and the unit does not lower, remove the connector to the coil and measure the coil resistance. It should be around 39 ohms. If it's open, or shorted replace the coil.
Unit keeps blowing fuses when the raise button is pressed	Shorted solenoid for motor raise	Remove the wire to the solenoid coil on the pump motor. Measure the resistance, it should be around 19 ohms. If it is nearly zero ohms replace the solenoid.

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04/26/07

15-126-013

Problem:

Unit will not reverse; belly switch does not function; forward ok

Possible cause(s):

Broken wire, or loose connection, bad throttle assembly, bad motor controller.

Action:

Locate Pin 12 on Molex connector at the motor controller. Try to drive the unit in reverse, there should be 24 volts at this pin. If there is voltage and the unit does not move, the motor controller may be bad, consult factory. If there is no voltage, trace the wiring back towards the tiller head and check voltage on each side of connectors. Continue this until bad connection is found. If the connections are all good, and there is no voltage coming out of throttle assembly, then the throttle assembly may be bad. Verify there is 24 volts going into the assembly, and that there is a good ground. If there is still no output voltage for pin 12, replace throttle assembly.

## Maintenance and repair

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### Drive battery operating instructions

The warranty becomes invalid when the operating instructions are not adhered to, when repairs are carried out without using original spare parts, when an intervention is not authorized, when additional electrolytes (alleged improvement method).



- Observe operating instructions and display clearly in loading area.
- Work on batteries only under instruction of specially trained staff



- Wear protective glasses and clothing when working on the batteries.
- Observe the accident prevention regulations.



- Smoking is forbidden
- Do not expose the battery to naked flames, glow or sparks – risk of explosion and fire.



- Rinse any splashes of acid in the eyes or on the hands with clear water.
- Seek immediate medical assistance. Wash acid – covered clothing in water.



- Avoid risk of explosion, fire and short – circuiting.
- Caution! Metal parts of battery are constantly live, do not rest any foreign objects or tools on the battery.



- Electrolyte is very corrosive.



- Do not tilt the battery.
- Use only permitted lifting and transportation device e.g. raising harness
- Lifting hooks must not cause any damage to cells, connectors or connection cables.

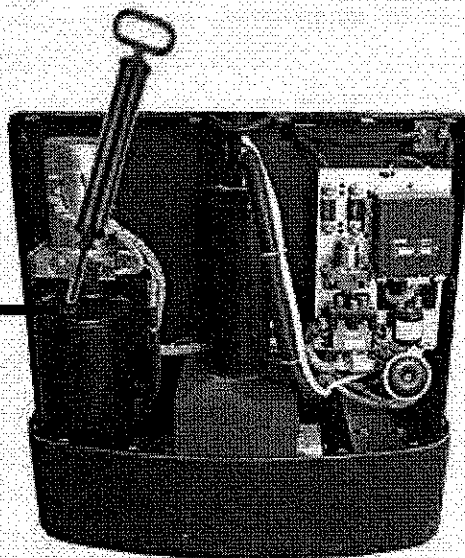


- Spent batteries with this symbol are recyclable and must be taken to the appropriate recycling point.
- Spent batteries which are not recyclable must be disposed of according to hazardous waste regulations.



## Maintenance and repair

### charging the oil



### Charging the oil

- Lower the lifting fork completely
- Depress the emergency stop and remove the key.
- Remove the dipstick
- Through the oil dipstick opening, extract the oil.
- Fill with clean hydraulic oil (see lubricant table) precisely as far as the mark.  
The required oil quantity depends on the lift height.
- Screw in the oil dipstick.
- Raise and lower the lifting fork repeatedly.
- Lower the lifting fork and loosen the vent screw on the hydraulic cylinder approx. 1 revolution.
- Raise the lifting fork completely. As soon as oil free from bubbles is expelled tighten the vent screw.  
Collect the drained oil in a cloth.
- Used oil is to be disposed of in a ecologically harmless way.



#### **Note!**

The hydraulic unit must not be switched on with an empty oil tank.  
Allowing the system to “run dry” can destroy the pump.

## **Maintenance and repair**

### **Maintenance and care of the load chains**

In normal use the load chains should be re-lubricated every 250 operating hours; in the event of heavy soiling, moisture and very high prolonged loading, re-lubrication should be effected after 100 operating hours. If subject to corrosive media the chain should be cleaned and lubricated immediately.

### **Chain lubrication, chain conservation**

Flyer chains are correctly lubricated and are in a perfect state if:

The chain is free of exterior soiling.

When touching the chain, your finger is wetted with oil. This assures that the lubrication of the chain links is sufficient.

### **Type of lubricant**

A low-viscosity mineral – machine – or engine oil or synthetic oil should be used. The viscosity of the lubricating oil is to selected so that it remains low viscose at all ambient temperatures encountered.

Under normal temperature conditions, lubricating oils with a viscosity of SAE 20 to SAE 40 would be appropriate.

### **Lubricating methods**

The lubricant can be applied by means of brush, paint brush or also using compressed air spray devices. When using spray cans, please make sure the following basic requirement is fulfilled:

- After the thinner has vaporized, a viscosity conforming to the above-mentioned recommendation (type of lubricant) must be met.

### **Cleaning the chain**

If operation leads the chain to suffer so heavily from soiling that the penetration of the lubricating oil cannot be guaranteed, the chain must be cleaned.

This is only to be effected with paraffin derivatives such as diesel fuel, petroleum, cleaner's naphtha etc.

Do not clean with steam injectors, cold cleaners or even corrosive and acidic substances. They can directly lead to chain damage.

If the chains have to be cleaned with steam injectors, please contact our customer service.

## **Maintenance and repair**

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### **◆ Chain inspections**

Chains used in lift trucks should be inspected at least once a year or every three months if exposed to severe contamination or high continuous loading stress.

**Inspection notes**-we recommend that attention be paid to the following points:

1. Noise generation
2. Surface rust
3. Linkage rust
4. Stiff links
5. Distorted pins
6. Loose link pins
7. Impermissible external wear
8. Damage
9. Broken link plates
10. Broken pins
11. Contamination
12. Stretching

Even with the optimum amount of lubrication, it is impossible to prevent a chain from stretching.

**Wear extends only to that part of the chain which is led over the chain sprocket/guide sprocket. Thus, when checking for wear, only this area need be inspected.**

According to the regulations currently in force, a chain is deemed to be worn if it has stretched by 3%.

If safety issues are particularly critical or a potential hazard is dependent on a single chain, we consider it necessary to replace it if it is stretched by even 2%.

### **Measuring procedure**

To measure elongation through wear, that part of the chain which runs over the chain sprocket/guide sprocket must be positioned in the stretched area. With the aid of a measuring rod, measure a section approximately 1 meter in length.

The number of divisions in the measured area, multiplied by the chain divisions, gives the nominal measurement.

The length extending beyond this measurement represents the wear, which is limited to a maximum of 3% over the nominal length.

An elongation through wear of 3% is reached if 33 links of the chain in use measure the same length as 34 links of a new chain.

### **◆ Chain replacement**

If two chains are used as a pair on the affected machine, both should always be changed at the same time.

The installation and removal of chains should be carried out with all the care appropriate to any item of safety equipment.

Chains may only be repaired by authorized specialist personnel.

We do not recommend the lengthening of safety-type lifting chains, since the inserted chain link will not have been pre-stretched.

Our product liability will be invalidated if a repaired chain is assembled from sections bearing different silver label numbers.

## **Maintenance and repair**

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### **◆ Temporary lay-up**

**If, for operating reasons, the vehicle is laid up for more than two months, the following instructions are to be carried out:**

- \* Place the vehicle on blocks so that all the wheels are raised from the floor. In this way, they will be prevented from becoming permanently misshapen.
- \* Clean the vehicle thoroughly.
- \* It may be necessary to support the lifting gear in a suitable manner, so as to relieve any stress on the load chains.
- \* Check the hydraulic fluid level, replenish if necessary.
- \* Grease the vehicle thoroughly.
- \* Coat all bright and moving parts with a thin film of oil and grease respectively.
- \* Store the vehicle in a dry, frost-proof, dust-free place.
- \* Do not use plastic sheeting to cover the vehicle otherwise condensation could form under it.

### **Additional operations for vehicles with integral electrical systems**

- \* Disconnect the batteries from the vehicle electrical system.
- \* Charge the batteries.
- \* Clean the top of the battery case and terminals.
- \* Grease the terminals lightly with terminal grease.
- \* Check the electrolyte level, top up if necessary (not applicable to maintenance-free or gel batteries).
- \* Recharge the batteries every 90 days; gel batteries every 6 months.
- \* Spray a suitable contact spray on unattached electrical contacts.

### **Return to service after a lay-up**

- \* Thoroughly clean and grease the vehicle.
- \* Remove the film of protective grease.
- \* Check the hydraulic fluid tank and hydraulic fluid for condensation, if necessary carry out a fluid change.
- \* Inspect hydraulic hose lines for brittleness.
- \* Test the functions of the vehicle, particularly the safety equipment.

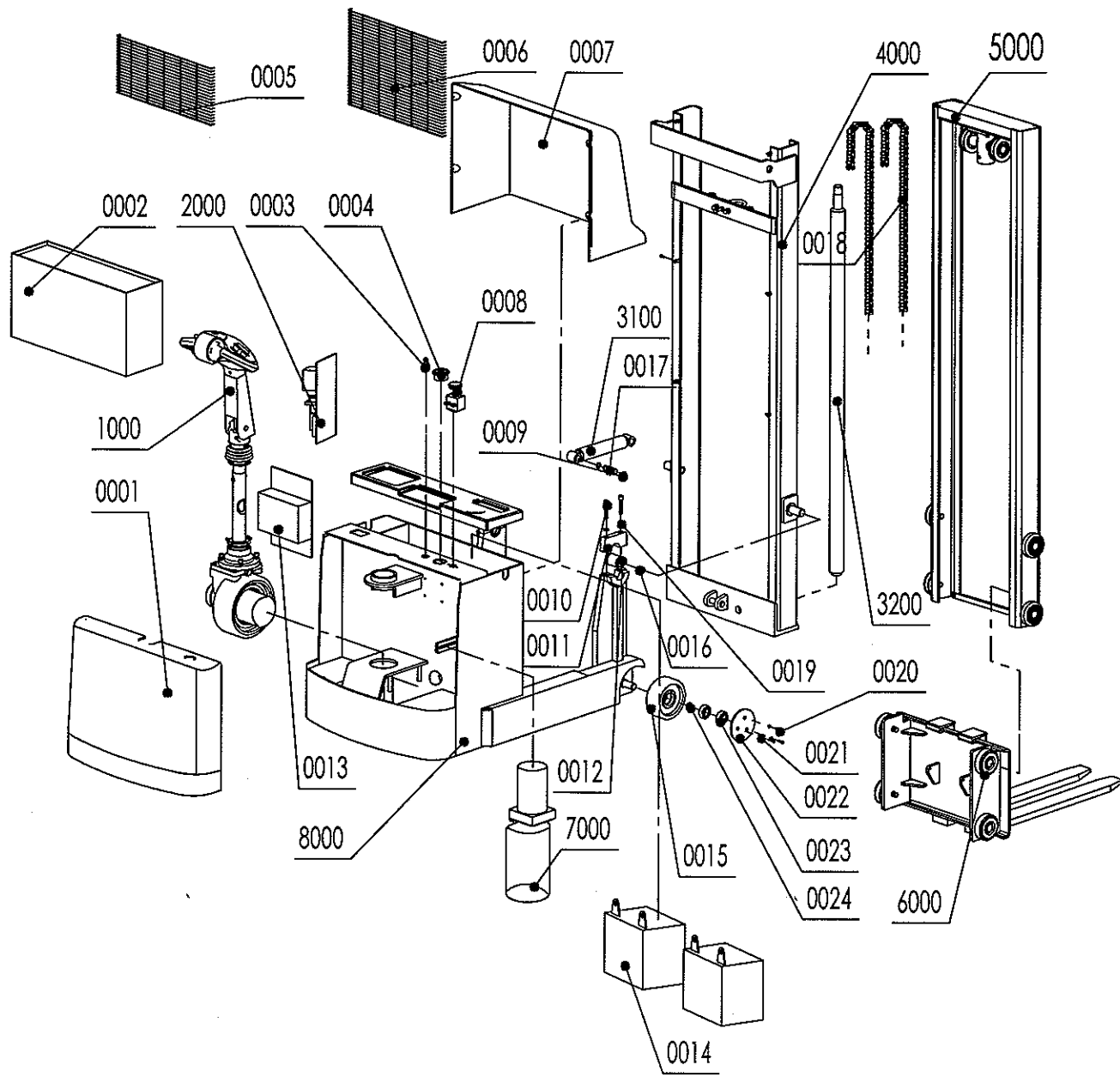
### **Additional operations for vehicles with integral batteries**

- \* Disconnect the batteries from the vehicle electrical system.
- \* Charge the batteries.
- \* Check the electrolyte level, top up if necessary (not applicable to maintenance-free or gel batteries).

### **Final withdrawal from service**

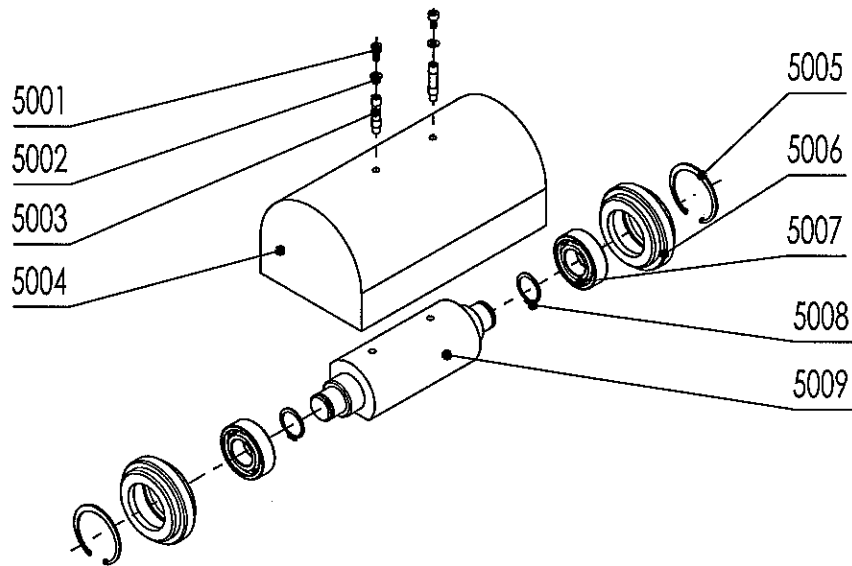
If a faulty vehicle can no longer be repaired to a condition in which it can be used as specified and in accordance with existing safety regulations, it must be finally withdrawn from service.

Having been dismantled into individual components (steel, plastics, electronics, consumables, etc.) it must be disposed of in accordance with the applicable environmental regulations.



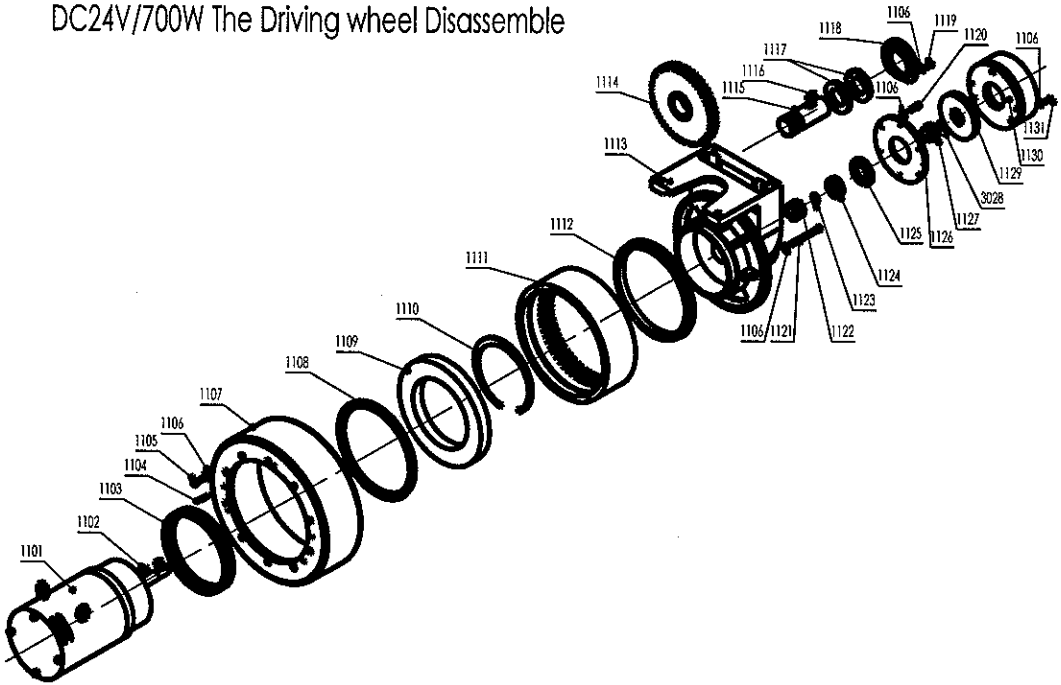
No.	Code	Name	Qty	Mark
0001	PWSR-50/16-020001	cover	1	
0002	PWSR-50/16-023000	weight box	1	
0003		key switch	1	
0004		micro swithc	1	
0005	PWSR-50/30-000001	net1	1	
0006	PWSR-50/30-000002	net2	1	
0007	PWSR-50/16-020003	front cover	1	
0008	DV24V	meter	1	
0009	GB/T894.1-86	retainer ring20	2	
0010	GB/T70.1-2000	hex cap nutM12x60	4	
0011	PWSR-50/16-020004	retainer	2	
0012	PWSR-50/16-020007	bearing base	2	
0013	PWSR-50/16-000002	charger	1	
0014	12V/70Ah	battery	2	
0015	PWSR-50/16-022002	front wheel	2	
0016	PWSR-50/16-020008	bearingφ30xφ34x50	2	
0017	PWSR-50/16-020005	connect bearing	1	
0018	GB/T1243-97	12Achain	2	
0019	GB/T93-87	spring washer12	4	
0020	GB/T819.1-2000	cross screwM5x20	6	
0021	GB95-2002	flat washer5	6	
0022	PWSR-50/16-022001	front cover	2	
0023	GB/T276-94	bearing 6205-2Z	4	
0024	GB/T894.1-1986	retaining ring	2	
1000	PWSR-50/16-010000	turing assemble	1	
2000	PWSR-50/16-070000	electric assemble	1	
3100	PWSR-50/16-061000	cylinder	1	
3200	PWSR-50/30-062000	cylinder	1	
4000	PWSR-50/30-030000	outer mast	1	
5000	PWSR-50/30-050000	inner mast	1	
6000	PWSR-50/30-040000	lifting wheel	1	
7000	PWSR-50/16-080000	power unit	1	
8000	PWSR-50/16-020000	main frame	1	

# Chain wheel assembly



Code No.	Item No.	Description	Qty.	Remark
5001	GB/T70.1-2000	Bolt M5x10	2	
5002	GB/T95-2002	Washer 5	2	
5003	PWSR-50/16-052002	Screw	2	
5004	PWSR-50/16-052003	Cover	1	
5005	GB/T893.2-86	Ring 52	2	
5006	PWSR-50/16-052004	Chain wheel	2	
5007	GB/T276-94	Bearing 6205-2Z	2	
5008	GB/T894.2-86	Ring 25	2	
5009	PWSR-50/16-052001	Axis	1	

DC24V/700W The Driving wheel Disassemble

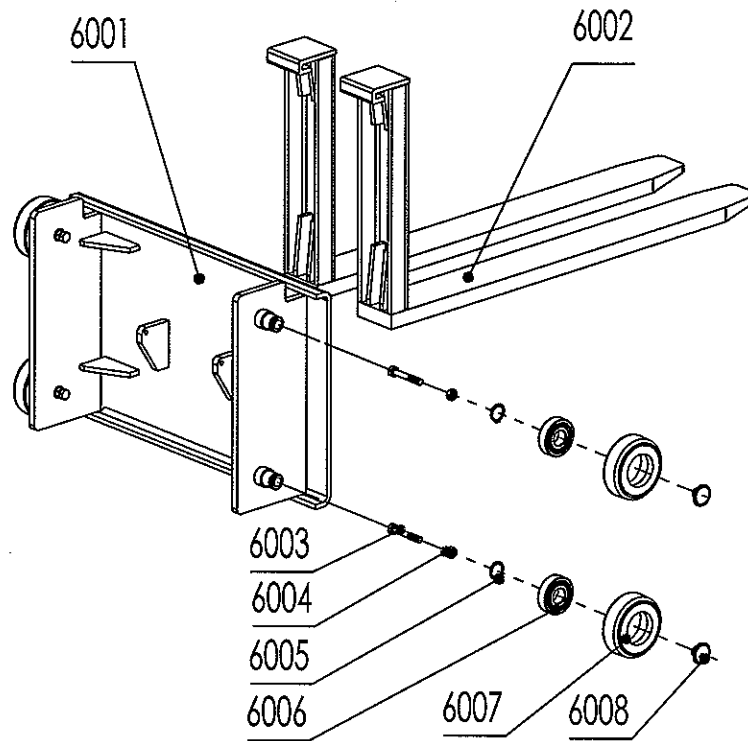




# DC24V/700W Driving wheel assembly list

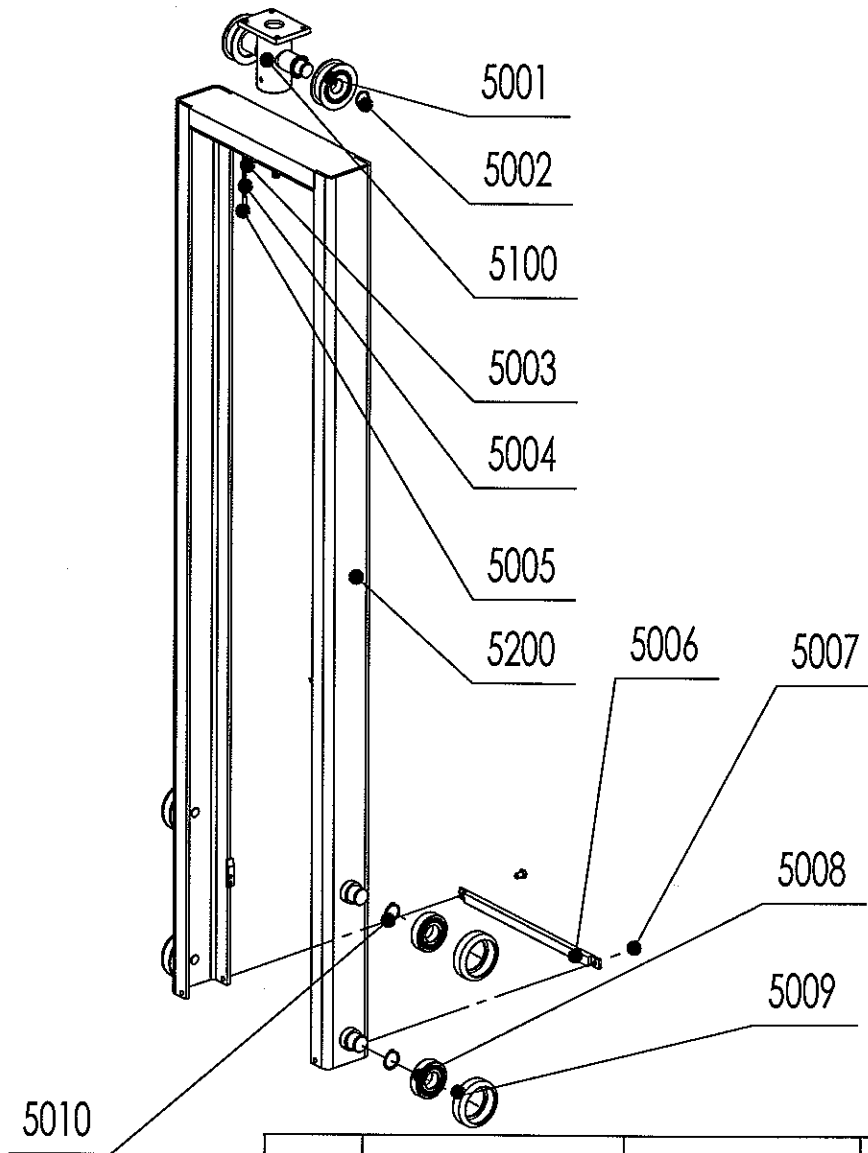
Code No.	Description	Qty	Code No	Description	Qty
1101	Electromotor DC 24V/700W	1	1119	Bolt M6×15	3
1102	Bond 5x5x18	2	1120	Bolt M6×20	3
1103	Sleeve	1	1121	Bolt M6×60	3
1104	Pin φ 5×16	2	1122	Bevel wheel	1
1105	Bolt M6×15	7	1123	Ring φ 15	1
1106	Spring washer φ 6	16	1124	Bearing 80102	1
1107	Wheel φ 250x80	1	1125	Ring	1
1108	Oil envelop φ 180×138×12	1	1126	Clutch board	1
1109	Ball bearing 16024	1	1127	Clutch chain wheel	1
1110	Spring ring φ 180	1	1128	Ring φ 14	1
1111	Wheel φ 200x61	1	1129	Attrition parcel	1
1112	O-seal φ 191×183×8	1	1130	Clutch DC24V/16W	1
1113	Wheel box	1	1131	Bolt M5×50	3
1114	Chain	1			
1115	Chain axle	1			
1116	Bond 7x8x18	1			
1117	Ball bearing 6006	2			
1118	Blocked	1			

# Lift frame assembly



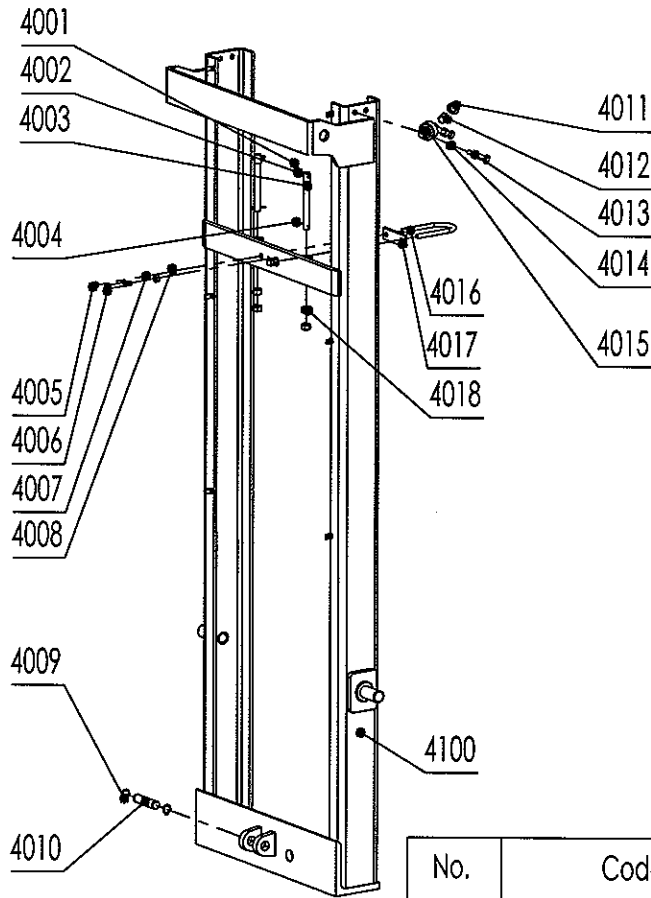
Code No	Item No	Description	Qty	Remark
6001	PWSR-50/16-041000	Lift frame weld	1	
6002	PWSR-50/16-042000	Shovel	2	
6003	GB/T5783-2000	Bolt M10x60	4	
6004	GB/T41-2000	Nut M10	4	
6005	GB/T894.1-86	Ring 25	4	
6006	GB/T276-1994	Ball bearing 6305	4	
6007	PWSR-50/16-040003	Wheel cover	4	
6008	EMS-100/16-050011	Adjustable block	4	

# Inner Mast



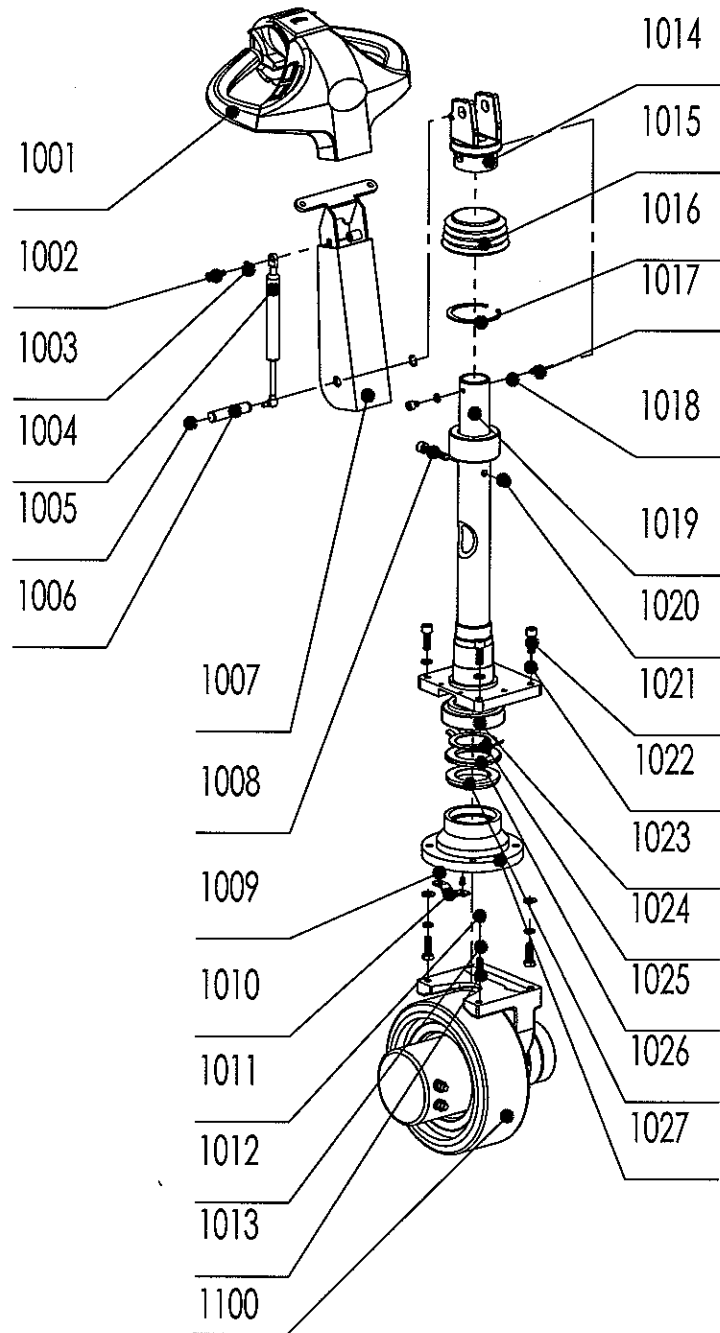
No.	code	Name	Qty	Mark
5001	GB894.1-86	retaining ringφ30	2	
5002	WS-150/25-013004	chain wheel	2	
5003	GB/T95-2000	flat washerφ8	4	
5004	GB93-1987	spring washerφ8	4	
5005	GB95-2002	hex socket cap screw	4	
5006	PWSR-50/30-050003	shaft	1	
5007	GB/T5783-86	hex nut	2	
5008	GB/T276-1994	ball bearingφ307	4	
5009	PWSR-50/30-050004	ball retainer	4	
5010	GB/T893.1-1986	retaining ringφ35	4	
5100	ES-100/30-011000	chain wheel assembly	1	
5200	ES-100/30-013000	Inner mast	1	

# Outer Mast



No.	Code	Name	Qty	Mark
4001	GB/T91-2000	slipt cotter pin	2	
4002	GB/T882-86	B pin $\phi$ 6x28	2	
4003	PWSR-50/16-050001	chain shaft	2	
4004	GB/T91-2000	slipt pin $\phi$ 2x25	2	
4005	GB/T923-1988	nut 10	2	
4006	GB/T5782-2000	hex bolt M10	1	
4007	GB/T41-2000	nutM10	2	
4008	GB95-2002	flat waser 10	2	
4009	GB/T894.1-86	retaining ring20	2	
4010	PWSR-50/16-030011	bearing	1	
4011	GB/T848-1985	flat washer $\phi$ 16	2	
4012	JH1620	bearing	1	
4013	ES-100/30-015003	adjust blof	2	
4014	GB/T41-1986	hex nutM12	2	
4015	ES-100/30-015002	wheel	2	
4016	PWSR-50/16-031001	retainer	1	
4017	PWSR-50/16-031002	washer	1	
4018	GB/T6171-2000	nutM14	4	
4020	PWSR-50/30-031000	mast welding	1	

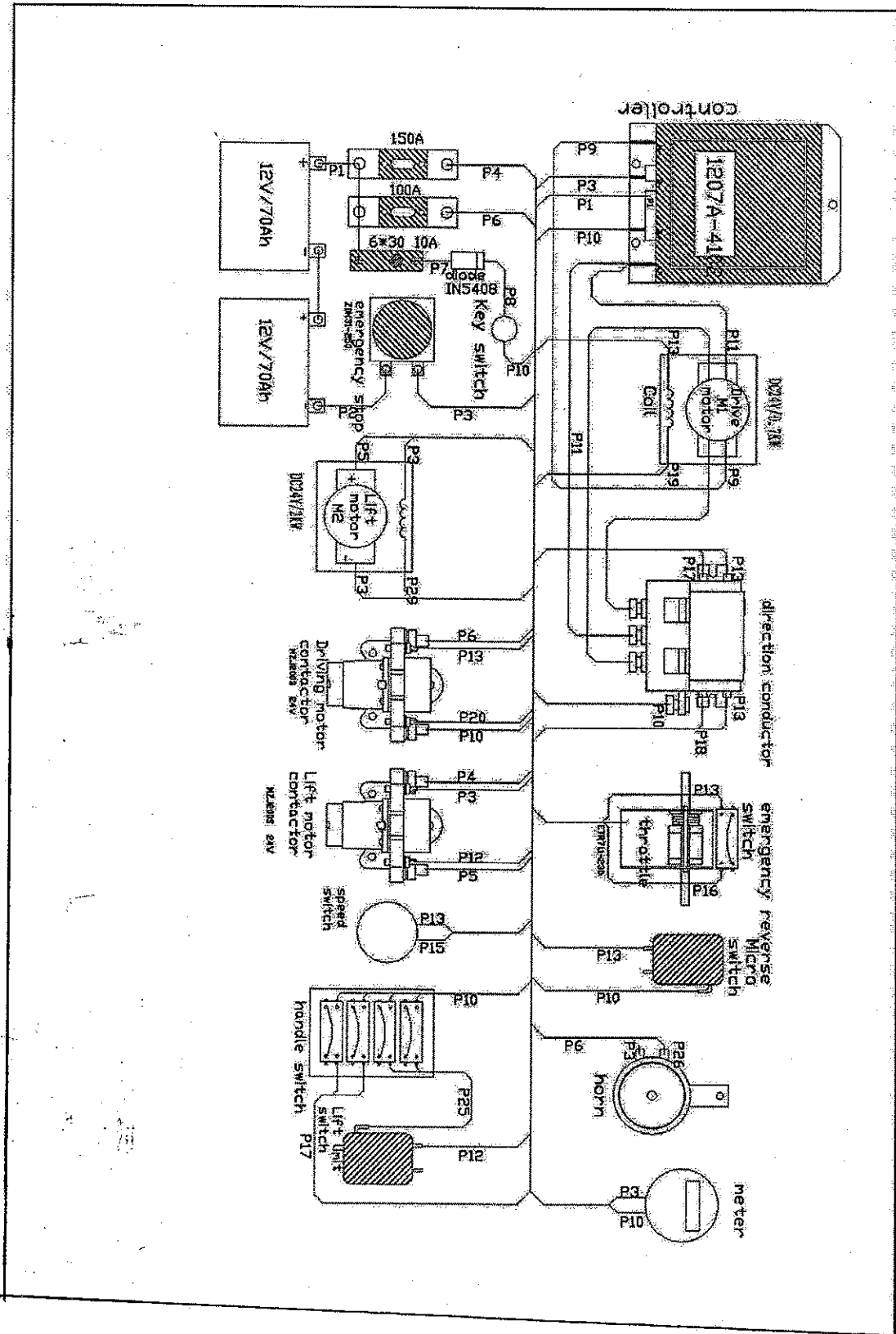
# Turning system assembly



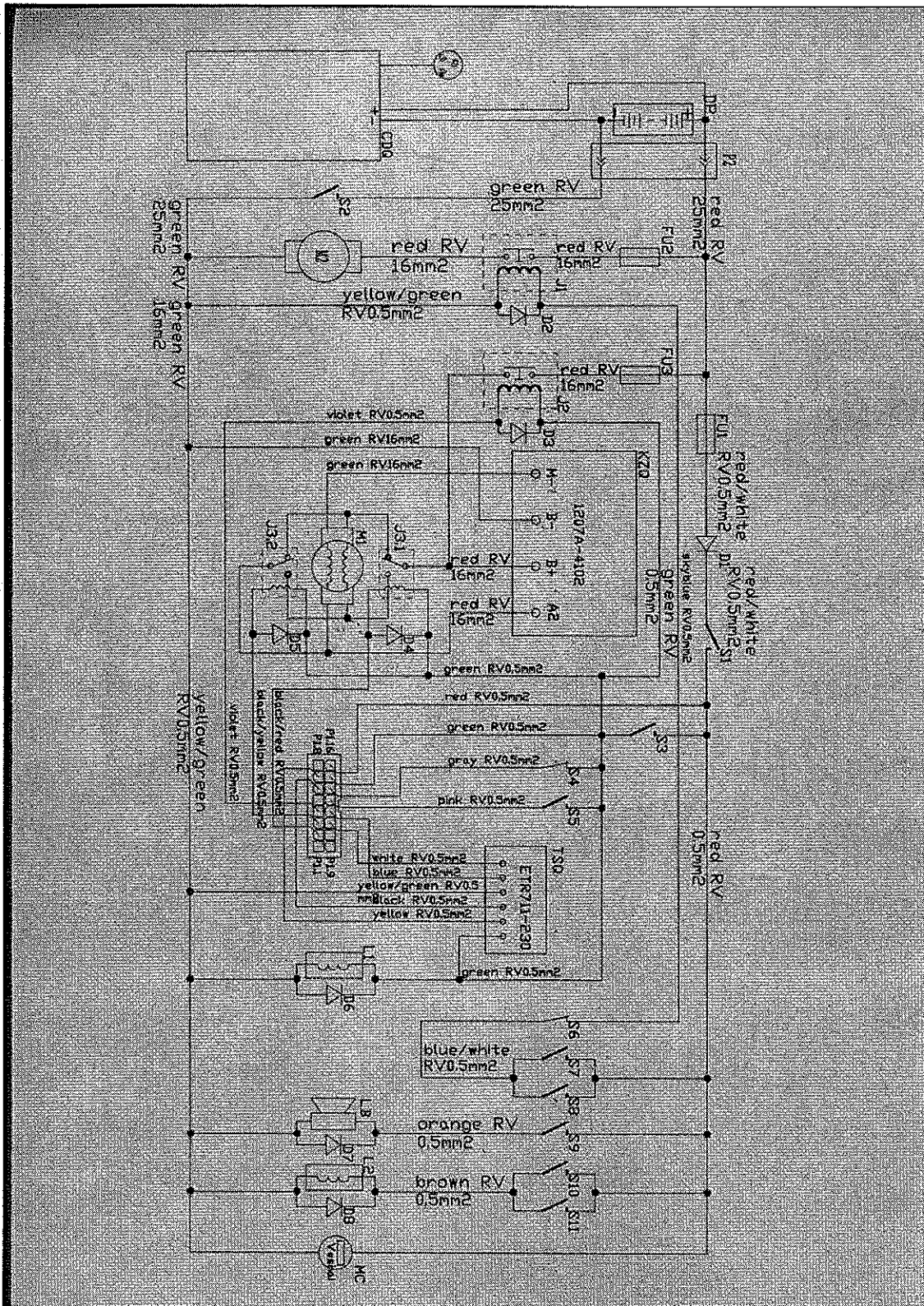
# Turning system parts list

Code No	Item No	Description	Qty.	Remark
1001	CH-2	Operate handle	1	
1002	GB/T70.1-2000	Bolt M8x25	1	
1003	GB/T93-87	Ring 8	1	
1004	PWS-100/25-022000	Spring	1	
1005	PWS-100/25-020001	Operate handle pin	1	
1006	GB/T894.1-86	Ring 16	2	
1007	PWS-100/25-021000	Joint tube	1	
1008	GB/T70.1-2000	Bolt M10x55	2	
1009	GB/T5781-2000	Bolt M4x8	2	
1010	WS-150/25-050015	Electrical wire board	2	
1011	GB95-2002	Washer 10	4	
1012	GB/T93-87	Spring ring 8	4	
1013	GB/T5781-2000	Bolt M10x30	4	
1014	PWS-100/25-020002	Operate handle seat	1	
1015	PWS-100/25-020003	Latex cover	1	
1016	GB/T893.2-1986	Spring ring 80	2	
1017	GB/T70.1-2000	Bolt M8x10	2	
1018	GB/T93-87	Spring washer $\phi$ 8	2	
1019	PWSR-50/16-010001	Driving wheel axis	1	
1020	GB/T41-2000	Nut M10	2	
1021	GB/T70.1-2000	Bolt M10x30	4	
1022	GB/T93-87	Spring washer 10	4	
1023	GB/T297-94	Bearing 33013	1	
1024	GB858-88	Washer 56	1	
1025	WPA-160-060002	Washer	1	
1026	WP-200B-060004	Nut M5x1.5	1	
1027	WPA-160-060001	Driving fixed cover	1	
1100		700W Driving wheel	1	

# Part list



# Part list



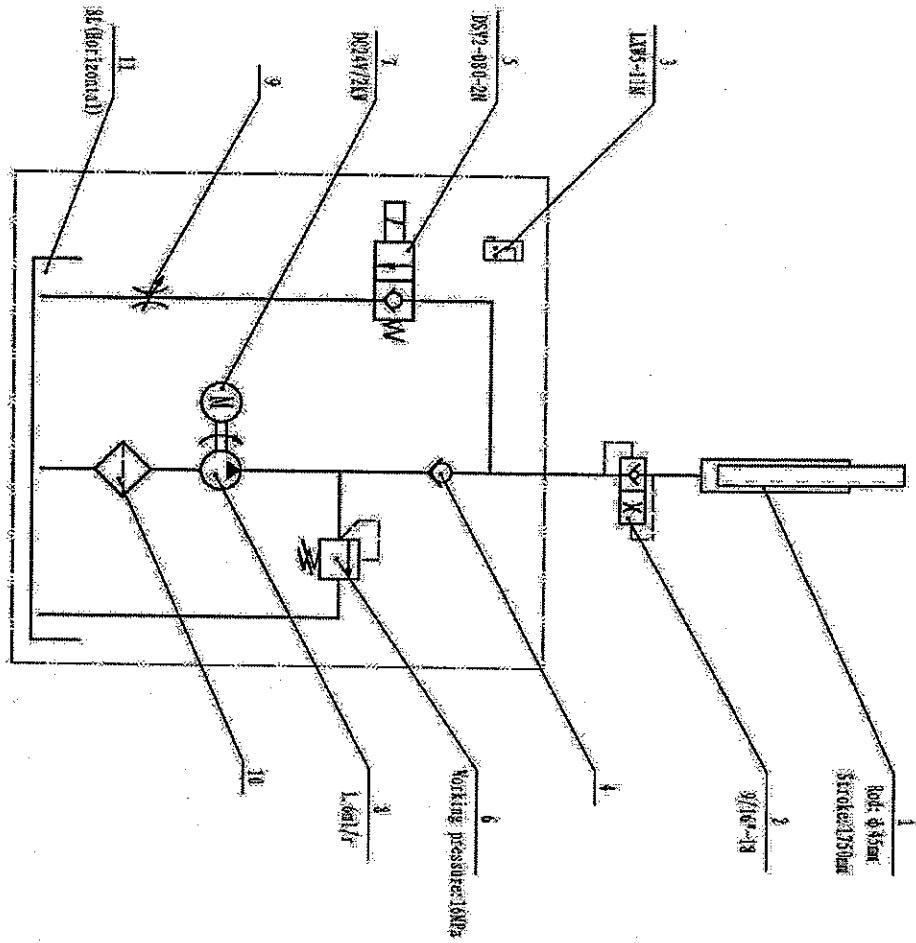


## Part list

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NO	Name	Code	Specification	Qty
1	Battery	DP	12V/70Ah	2PCS
2	Controller	KZQ	1207A-4102	1PC
3	Drive motor	M1	DC24V/0.7KW	1PC
4	Lift motor	M2	DC24V/2.0KW	1PC
5	Lift motor contactor	J1	MZJ200S 24V	1PC
6	Drive motor contactor	J2	MZJ200S 24V	1PC
7	Direction contactor	J3	DC88-1 24V	1PC
8	Control circuit fuse	FU1	Ø6X30 10A	1PC
9	Hydraulic circuit fuse	FU2	150A	1PC
10	Drive circuit fuse	FU3	100A	1PC
11	Electromagnetic clutch	L1	DC24V/28W	1PC
12	Coil	L2	DC24V/16W	1PC
13	Horn	LB	DL1216	1PC
14	Power meter	MC	DC24V	1PC
15	Throttle	TSQ	ETR711-230	1PC
16	Diode	D1	IN5408	1PC
17	Diode	D2-D5	IN4007	1PC
18	Battery charger	CDQ	24V/10A	7PCS
19	Key switch	S1		1PC
20	Emergency stop	S2	ZDK31-250	1PC
21	Micro switch	S3		1PC
22	Forward/backward switch	S4		1PC
23	Emergency reverse switch	S5		1PC
24	Lift limited switch	S6		1PC
25	Lift switch	S7,8		2PCS
26	Horn switch	S9		1PC
27	Low switch	S10,11		2PCS
28	Power plug		DC110V/200A	2PCS

# Part list



ITEM	DESCRIPTION	ITEM	DESCRIPTION
1	Lift cylinder	7	DC Motor
2	Velocity valve	8	Pump
3	Microswitch	9	Flow control valve
4	Check valve	10	Filter
5	Manual valve	11	Tank
6	Relief valve	12	

## LIMITED WARRANTY

Vestil Manufacturing Corporation (“Vestil”) warrants this product to be free of defects in material and workmanship during the warranty period. Our warranty obligation is to provide a replacement for a defective original part if the part is covered by the warranty, after we receive a proper request from the warrantee (you) for warranty service.

### Who may request service?

Only a warrantee may request service. *You are a warrantee if* you purchased the product from Vestil or from an authorized distributor AND Vestil has been fully paid.

### What is an “original part”?

An original part is a part used to make the product as shipped to the warrantee.

### What is a “proper request”?

A request for warranty service is proper if Vestil receives: 1) a photocopy of the Customer Invoice that displays the shipping date; AND 2) a written request for warranty service including your name and phone number. Send requests by any of the following methods:

<u>Mail</u>	<u>Fax</u>	<u>Email</u>
Vestil Manufacturing Corporation 2999 North Wayne Street, PO Box 507 Angola, IN 46703	(260) 665-1339 <u>Phone</u> (260) 665-7586	sales@vestil.com

In the written request, list the parts believed to be defective and include the address where replacements should be delivered.

### What is covered under the warranty?

After Vestil receives your request for warranty service, an authorized representative will contact you to determine whether your claim is covered by the warranty. Before providing warranty service, Vestil may require you to send the entire product, or just the defective part or parts, to its facility in Angola, IN. The warranty covers defects in the following original dynamic components: motors, hydraulic pumps, electronic controllers, switches and cylinders. It also covers defects in original parts that wear under normal usage conditions (“wearing parts”), such as bearings, hoses, wheels, seals, brushes, and batteries.

### How long is the warranty period?

The warranty period for original dynamic components is 90 days. For wearing parts, the warranty period is 90 days. The warranty periods begin on the date when Vestil ships the product to the warrantee. If the product was purchased from an authorized distributor, the periods begin when the distributor ships the product. Vestil may, at its sole discretion, extend the warranty periods for products shipped from authorized distributors by up to 30 days to account for shipping time.

### If a defective part is covered by the warranty, what will Vestil do to correct the problem?

Vestil will provide an appropriate replacement for any covered part. An authorized representative of Vestil will contact you to discuss your claim.

### What is not covered by the warranty?

1. Labor;
2. Freight;
3. Occurrence of any of the following, which automatically voids the warranty:
  - Product misuse;
  - Negligent operation or repair;
  - Corrosion or use in corrosive conditions;
  - Inadequate or improper maintenance;
  - Damage sustained during shipping;
  - Accidents involving the product;
  - Unauthorized modifications: DO NOT modify the product IN ANY WAY without first receiving written authorization from Vestil. Modification(s) might make the product unsafe to use or might cause excessive and/or abnormal wear.

### Do any other warranties apply to the product?

Vestil Manufacturing Corp. makes no other express warranties. All implied warranties are disclaimed to the extent allowed by law. Any implied warranty not disclaimed is limited in scope to the terms of this Limited Warranty.

