Mobile Column Lift Set

MSC-13K-B

Capacity 13,200lbs / Each Column

Installation - Operation – Service Manual

Nov**. 2021**

INDEX

PREFACE

Prior to the operation of your lift make sure that you have read the instructions thoroughly. These instructions are found in this manual. Please note that your warranty can be voided if you do not read the manual and understand its content.

If you have any questions, concerning operation, safety or application of your lift, please contact your distributor.

1. GENERAL

1.1 SPECIFICATIONS

OEM Item # / Model #	**167215B / MSC-13K-B**
Capacity	**13,200 lbs. / Each Column**
Pressure Relief Valve	**2,030 psi Sealed Ex-Works**
Pump motor	**3HP (DC24V, Max 110Amper) / Each Column**
Battery charger power supply	**Input: 100-140 , 60Hz, single phase Output: 24VDC, Max 15Amper**
Operational Voltage	**24 VDC**
Lifting Height	**67.1"**
Column L / W / H	**45.7” / 44.1” / 88.6” (Max Ht. 155.5”)**
Fork Adjustable Range	**6.3” - 22”**
Fork length	**14”**
Lifting / Lowering Time	**75 sec/ 60 sec at load of 13,200 lbs. / each column**
Noise Level	**Max. 70 dB(A)**
Set-up	**Indoors**
Unit Weight	**1,200 lbs. per Column**
Maximum Distance between Columns	**32.8'**
Min. Concrete Surface Strength	**3000 Psi**

1.2 DIMENSIONS (mm / inch)

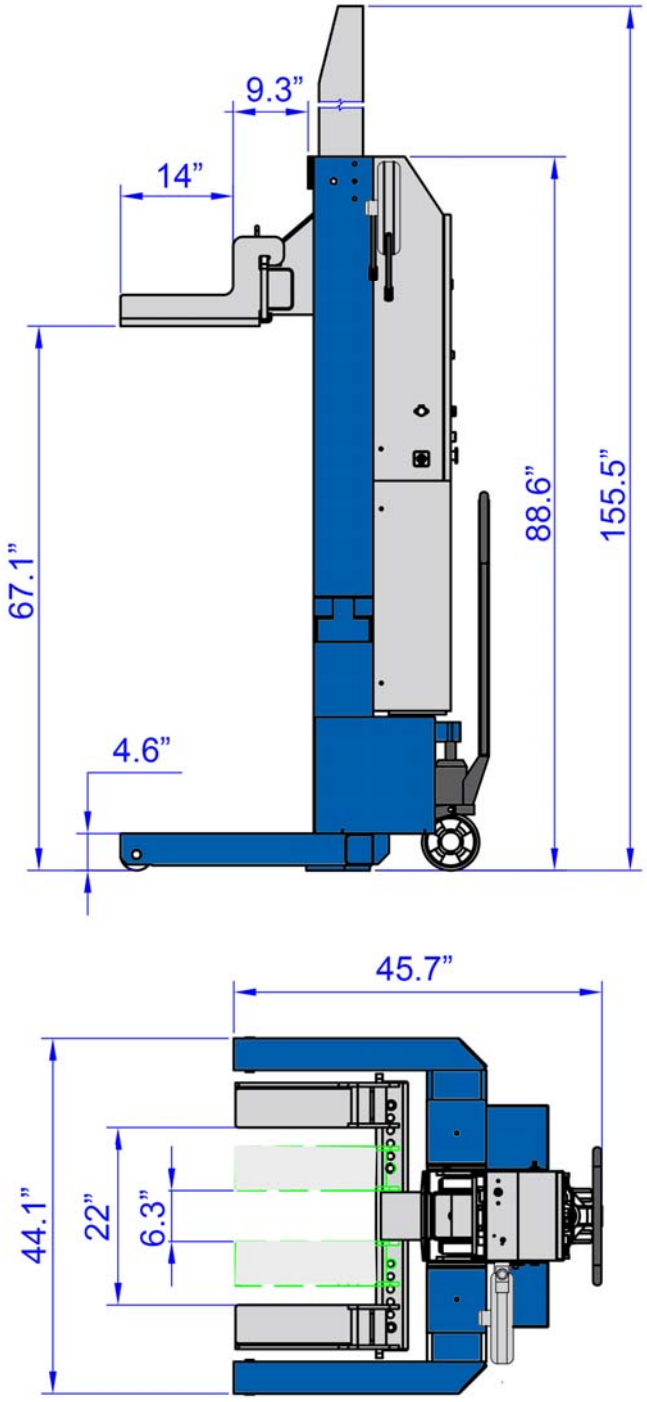


Fig.1 Mobile Column Lift Dimensions

1.3 DESCRIPTION OF THE LIFTING SYSTEM

The mobile column lift is a movable electrically driven hydraulic column lift used for lifting heavy vehicles. It is used in set of four columns. But at least two lifting columns are required to work at same time for lifting a vehicle.

The main components of the mobile column lift are shown below: (see figure 2):

1) Height sensor / encoder
2) Safety lock mechanism
3) Control case
4) Motor pump
5) Pallet jack
6) Battery (Not Included)
7) Front roller
8) Battery case
9) Forklift pocket
10) Lifting fork
11) Carriage
12) Hydraulic cylinder

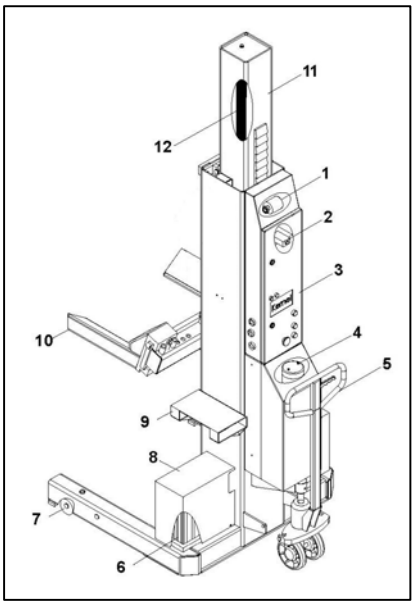


Fig.2 column components

Each lifting column has a lifting capacity of 13,200 lbs. Consequently, four columns have a total lifting capacity of 52,800 lbs.

Each column has its batteries to drive the motor pump (hydraulic power unit).

The control system on the lifting columns ensures that the columns are raised or lowered synchronically. Each lifting column is equipped with a position sensor, which transmits the height readings to the control system. The control system controls and protects the lifting system during lifting or lowering as follows:

- At a difference in distance passed in height between the lifting columns of over 3/4" (20mm) and less than 2" (50mm), an extra adjustment valve in the hydraulic system opens and remains open until the difference has been cancelled out. The adjustment happens in the lift, which has passed the largest distance.
- At a difference in distance passed in height of over 2" (50mm), lifting or lowering is interrupted in the quickest lifting column. It will stop to until the difference has been cancelled out.

In addition, the control system has been designed so that:

- Each lifting column can be operated separately
- Any pair of axles can be handled individually

1.4 STRUCTURE OF THE MOBILE COLUMN LIFT

• **Hydraulic Power Unit**
The hydraulic system consists of an electrically driven pump, flow control valves, control valves and an oil reservoir.

• **Column and Lifting Cylinder**
The column and lifting cylinder form the major part of the portable column lift. In the U-section of the column there are a guide block and rollers. The rollers enable the guide block to move along the full length of the column. The hydraulic lifting cylinder provides the lifting capacity.

• **Control Box**
The control box has all the functions controlling the use of the lifting column. The control box components and functions have been specified in GENERAL USE sections.

• **Pallet Jack Mechanism**
The two-wheel pallet jack mechanism serves to move the lifting column. The two wheels protect the lifting column from being turned over at the back when it is moved. The pallet jack mechanism lifts the column off the floor so that the column can be easily moved.

• **Mechanical Safety Lock**
If the hydraulic pressure fails while a vehicle is on the lifting system or is lifted or lowered, a mechanical safety lock ensures that it cannot drop.

The characteristic clicking of the safety lock when rising indicates that it is activated. During lowering the pawl is retracted by a solenoid magnet.

• **Adjustable Forks**
The adjustable forks are designed for different vehicles with different wheels. The forks can be adjusted manually to accommodate a wide range of tire sizes. The mechanical lock-pins prevent the forks from moving sideways under load.

2. SET-UP / INSTALLATION

Remark: Only move the lifting column with the **forklift**. Only raise the lifting column at the correct points. Damage to lifting column and /or injury to persons may occur if the lifting column is not moved in the correct manner.

2.1 UNPACKING AND HANDLING THE LIFTING COLUMN

STEP 1. Handling of Lifting Columns

1. Remove the cover from the crate or, when using a stand, remove the straps.
2. Carefully insert forklift forks into the forklift pockets. The pockets are bolted to the column before leaving factory. (Figure 3).

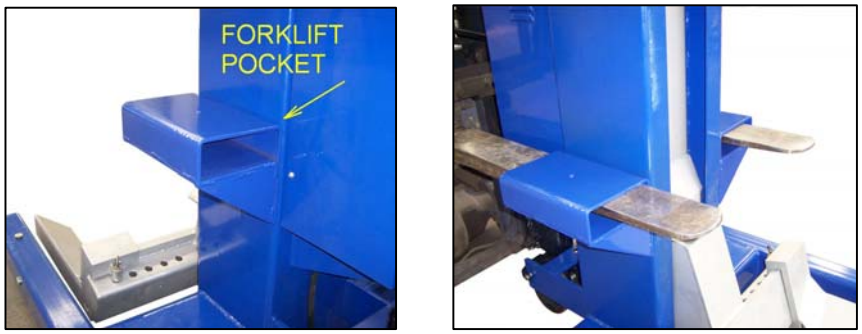


Fig. 3 Forklift Pocket on Column

Fig. 3-1

3. Lift the column then move it to the working position.

STEP 2. Fill the Tank

1. Take off the forklift pockets from the mobile column lift (**better**).
2. Remove the cover from the hydraulic unit. Remove the plug from the fill opening and fill the tank with hydraulic oil: AW32, 46 or other good grade Non-detergent hydraulic oil SAE-10, filleted at 4 micron max, about 15L (3.3 Gal) .(Fig. 3-1)
3. Install the breather cap on the fill opening.
4. Install the cover back on the hydraulic unit.
5. Check for oil leakage.

STEP 3. Battery Installation

1. Remove Battery Covers (Fig. 4)
2. Seat and fasten the batteries on the column base, secure to base using provided metal straps.
3. Connect the power cables to batteries. (Fig. 4)

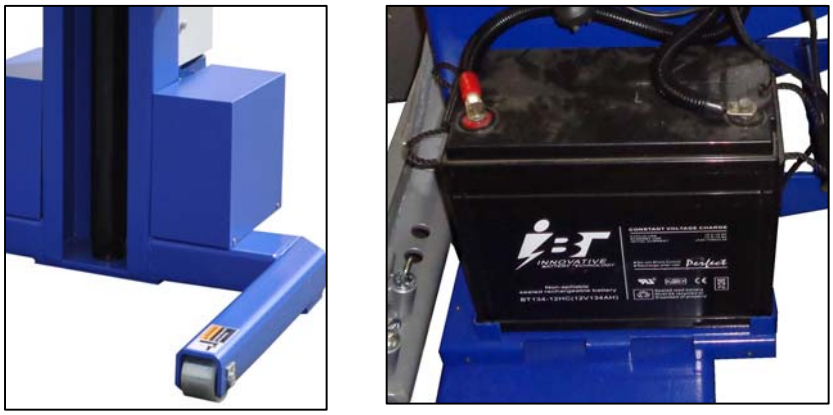


Fig. 4 Battery Installation

NOTE: Ensure to correctly connect terminals: Red/Pos. = (+), Black/Neg. = (-)

4. Install the battery covers back on lift.

STEP 4. Cable Reel Installation

1. Take out the cable reels from the carton.
2. Insert the holding frame into the base on the upper cover (Figs. 4-1a & b)

Fig4-1a

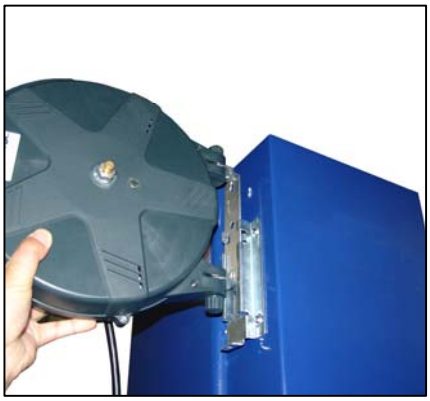


Fig. 4-1b

Fig. 4-1c

3. Pull up and pull down the upper and down lock button, the reel can turn aside. (Fig. 4-1c)

4. Fix the reel on the base by the screw. (Fig 4-1d)

Fig. 4-1d

Fig. 4-1e

5. Put the cable plug into the socket. (Fig 4-1e)
6. Repeat the above steps for the other three columns

3. CHARGING BATTERIES

After one day's operation or the battery indicator [22] shows the voltage is low, it is suggested to charge the batteries. Different batteries need different charging time. Please refer to the manual of the battery.

a) Move the columns near the AC power supply ports on the wall.

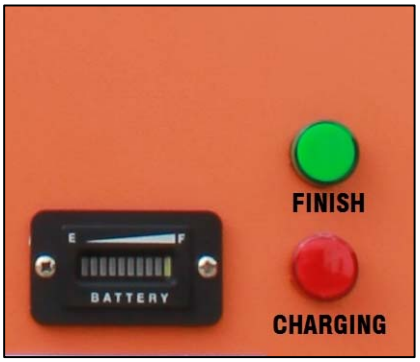
b) Connect the charger to the AC power supply. (Fig. 10)

c) Turn the power switch to the right position (CHARGE) on each column.

d) While charging, the red CHARGING indicator will be lighted. After the batteries are fully charged (about 10 hours), the green FINISH indicator will be on and red indicator will go off.

Battery Charger Socket

Switch



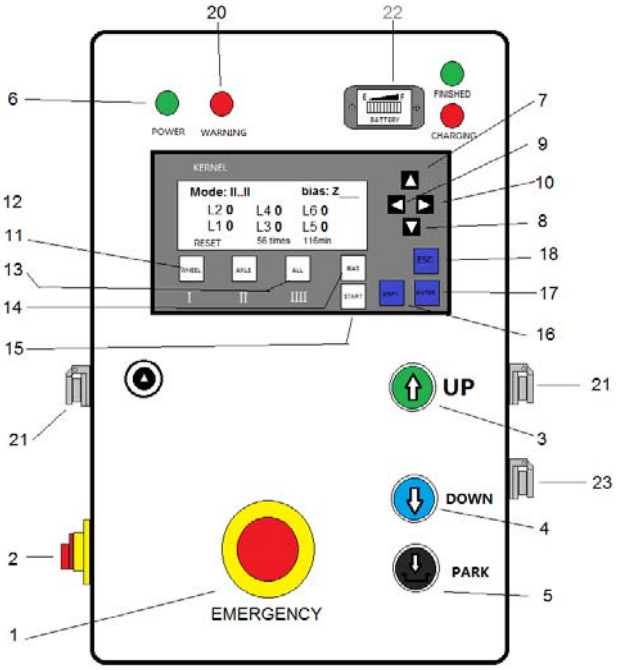
Charger Indicator

Fig. 10

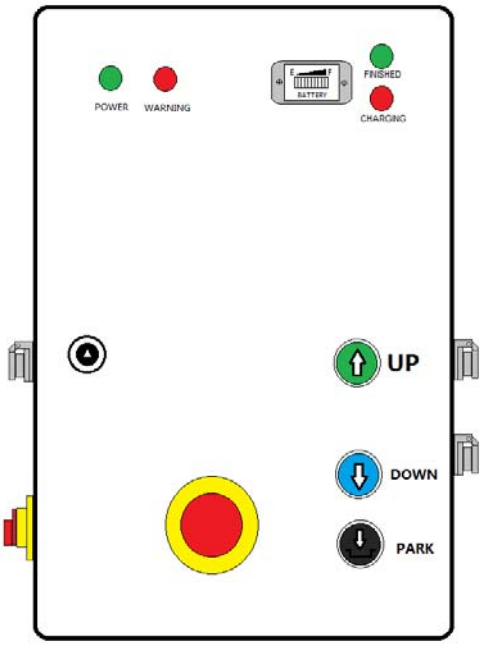
4. OPERATION INFORMATION

4.1 CONTROL PANEL FEATURES

The Main Control Panel controls the main power. All other functions of the lifting system are controlled from the Control Panels on the columns. The functions of the switches, buttons on the control system are described below.



Main Control Panel - #1 Column



Sub Control Panels - #2. #3 & #4 Columns

4.2 CONTROL PANEL DETAILS

1. EMERGENCY BUTTON
Button to stop movements (lifting or lowering) immediately.

2. POWER SWITCH
Controls the power of the control panel or charging of the batteries.

3. "⇑ (UP)" button
Controls the lifting of the columns.

4. "⇓ (DOWN)" button
Controls the lowering of the columns.

5. "⤋ (PARK)" button
Controls the locking of the columns.

6. "POWER" light.
This light will go on when the control panel is power on.

7. 8. 9. 10. CURSOR buttons.
These buttons move cursor on the screen to edit items.

11. 12. 13. MODE buttons.
These buttons serve to select between the functions: **"WHEEL", "AXLE**" & "**ALL"**

14. "BIAS" button
To set the zero point of height readings in initialization.

15. "START" button
This button starts the running of the software.

16. "SHIFT" button.
This button is for the running of the program.

17. "ENTER" button
This button serves confirming of instruction or entering sub menu.

18. "ESC" button
Serves to enter or exit from menu; or from sub menu to upper lever menu.

19. LCD SCREEN
Display the height readings of columns & information

20. "WARNING" light
This light will go on when the EMERGENCY button is pressed.

21. CABLE PORT
This port is used for communication cable connection.

22. BATTERY INDICATOR
This indicator shows the output voltage of the batteries.

23. HAND / REMOTE CONTROLLER PORT
The port is for hand/remote controller connection

24. **BATTERY SWITCH**
To connect or disconnect the DC power supply.
Also use as **column emergency switch**.

4.3 POSITIONING LIFTING COLUMNS

A fully combination consists at least of 4 lifting columns. The position of the main column **1#** should be located opposite with column **2#** loading the same axel of the vehicle. The **4#** shall be at the other end of the same axel with **3#**. (Fig. 6)

A set has a maximum lifting capacity of **52,800 lbs**. This is the maximum lifting capacity of a standard set of 4 lifting columns of **13,200 lbs. each**.

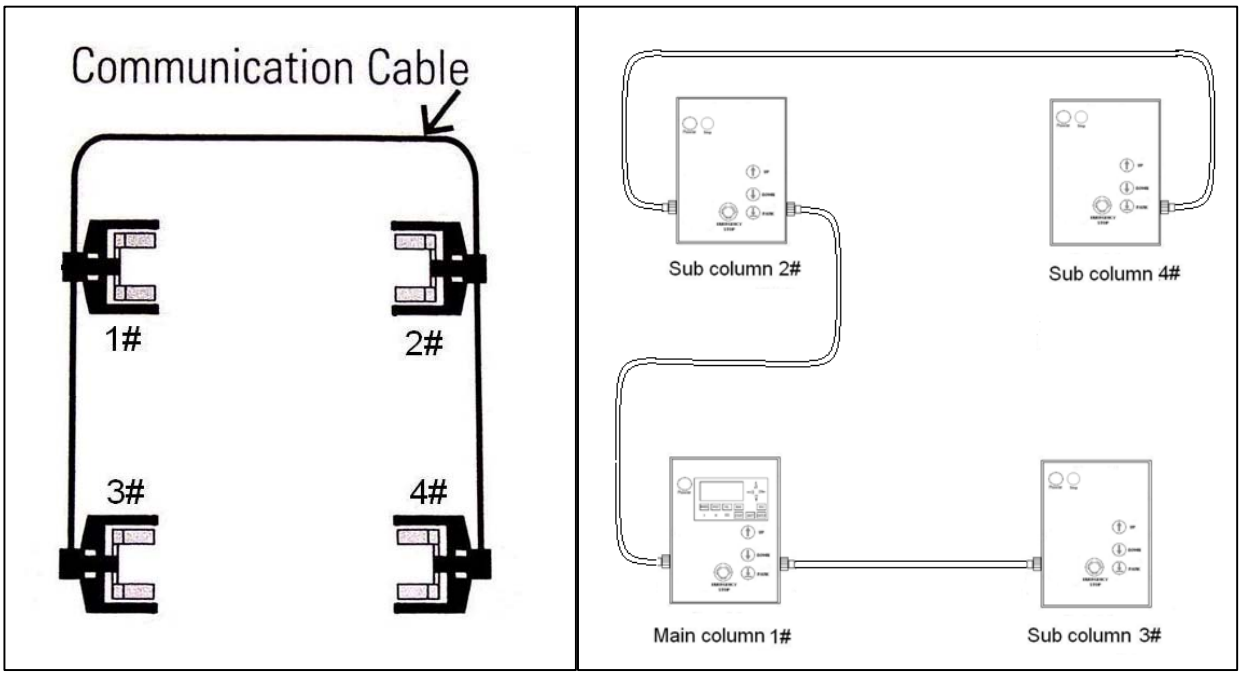


Fig. 6 Positioning Columns

4.4 DESCRIPTION OF THE MOBILE COLUMN LIFT SYSTEM

The mobile column lifts are designed in such a way as to offer maximum flexibility and convenience. A lifting system can consist of 4 lifting columns. The control system is equipped with the following features:

- Simultaneous operation of all lifting columns
- Operation of one lifting column.
- Operation of pair/axle lifting columns.

Each lifting column is provided with these control functions. But the RUNNING MODE shall be settled by the MODE buttons on the main column control box first.

The mode of the mobile column lift is set-up as following:

1. Position the lifting columns as indicated in 4.3 (Fig. 6.)
2. Then turn on the battery power switch of each column on the side. (Fig.7a)

Fig. 7a

Fig.7b

3. Set the control box power switch [2] (Fig. 7b) on each sub column to left position (ON) first, the green Power indicators [6] will be on.

4. Then turn on the switch [2] (Fig. 7b) on main column to left (ON) and the LCD screen [19] is lighted. Wait until the LCD screen changed to the 4th display, press the START [15] button to start running of the system.

TD 400C **Version 2.0.0.X** **INITIALIZING…**

LCD screen 1st

Please wait…

LCD screen 2nd

TB6 Controller VX.XX **Copyright @ Kernel** **Curr. status: RESET** **Self - Checking…**

LCD screen 3rd

TB6 Controller VX.XX **Copyright @ Kernel** **170cm 4 Lifts Z___** **Push START to confirm**

LCD screen 4th

Note: **If necessary, the lifting height / travel distance shall be changed before press SHIFT and START buttons**. (See 3.4 section)

5. Take care that the emergency stop button of each lifting column must been released.

6. **Operation description**
   All system functions are available by press the MODE buttons [11], [12], [13] when the lift columns are not in operation (non of button [3], [4], [5] is pressed).

   When the Mode is **ALL / Vehicle (II..II)**
   -Press any button 3 ⇑ , all columns are raised.
   -Press any button 4 ⇓ , all columns are lowered.
   -Press any button 5 ⇓, all columns are lowered and locked.

   When the Mode is **WHEEL / Single (I)**
   -Press one button 3 ⇑ , that column is raised.
   -Press one button 4 ⇓ , that column is lowered.
   -Press one button 5 ⇓, that column is lowered and locked.

   When the Mode is **Axle / Pair (II)**
   -Press one button 3 ⇑ , that two columns in same axle are raised.
   -Press one button 4 ⇓ , that two columns in same axle are lowered.
   -Press one button 5 ⇓, that two columns in same axle are lowered and locked.

Note: **In WHEEL or AXLE mode, the lifting or lowering will be stopped when the height difference between columns or axles is greater than 2" (50 mm)**

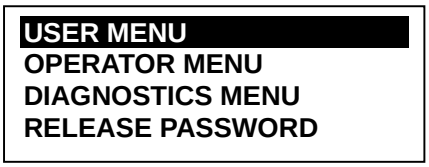
4.5 TRAVEL DISTANCE AND HEIGHT UNIT CHANGING

4.5.1 TRAVEL DISTANCE CHANGE

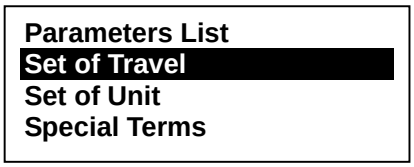
If the lifting height is less than 67" (170cm) due to low shop ceiling, the travel distance shall be set in following steps before starting the lifting operation.

1. After power on, waiting the LCD screen to be the LCD screen 4th, then press **ESC** button [18] to change to system menu. (LCD screen 5th)

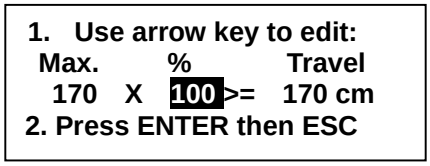
2. When 'USER MENU' is high-lighted, press **ENTER** button [17] to enter the sub menu of USER MENU. (LCD screen 6th)



LCD screen 5th



LCD screen 6th



LCD screen 7th

3. Press DIRECTION DOWN button [8] to move to '**Set of Travel**' as in LCD screen 6th.

4. Press **ENTER** button [17] again to enter the travel distance modification screen. (LCD screen 7th)

5. To change the travel distance, using 'DIRECTION' buttons [7], [8], [9] and [10] to move cursor to the percentage on the screen then change the number.
   Note: The percentage range is 60%--100%. Min. step is 2" (5cm).

6. Press **ENTER** to confirm the modification and press **ESC** to exit this function to upper menu. (LCD screen 8th)

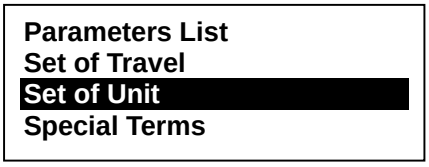
4.5.2 HEIGHT UNIT CHANGE

1. From LCD screen 6th, Use 'DIRECTION' buttons to choose '**Set of Unit**'. (LCD screen 8th)

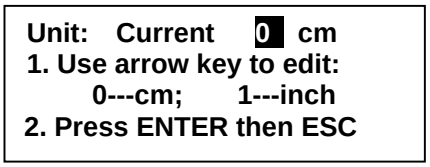
2. Press **ENTER** button [17] to enter the unit modification screen. (LCD screen 9th)

3. To change the unit, using 'DIRECTION' UP and DOWN buttons [7], [8] to change the number. '1' refers to inch. '0' refers to cm.

4. Press **ENTER** [17] to confirm the modification and press **ESC** [18] to exit this function to upper menu. (LCD screen 8th)



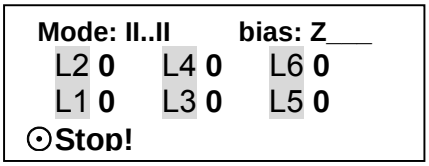
LCD screen 8th



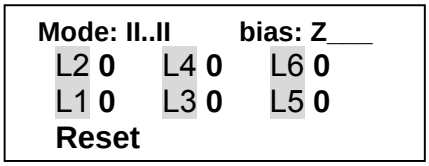
LCD screen 9th

4.5.3 UNIFORM HEIGHT REFERENCE

After travel distance and unit modification, the screen is back to LCD screen 4th. If press **START** button (15) at this step, the screen change to 10th.



or



LCD screen 10th

(Here the L1, L2, L3, L4, L5, L6 are to indicate the position of height reading of each column. They are not shown in screen in operation)

In this LCD screen 10th, the bias 'Z___' means the system height reference is in uniform height reference. The height reading is zero while the lifting fork at the bottom as it is set in factory. While in VEHICLE mode or AXLE mode, the lifts will be in same height while lifting or lowering

The right row L5 and L6 reading (0, 0) in the screen is no meaning. The software can work for 6 columns in all for cable model.

4.5.4 CUSTOMIZED HEIGHT REFERENCE

If for any reason, the height of different column shall be kept differently, (difference is greater than 2"/50 mm), the Customized height reference shall be chosen as following.

1. Press **WHEEL / SINGLE** button [11] change the screen into LCD screen 11th.

2. Press **UP** button [3] on one column to raise single column to desired height. Repeat for other three columns.

WARNING!!

In this step, the height of each column shall keep the vehicle in horizontal. Never try to rise up too much or it will cause vehicle to move, to drop. **Each pressing can only keep moving for about 5 seconds.**

3. Press **BIAS** button [14] for 2 to 4 seconds. The system changes into customized height reference system: '**C-_-**'. The LIFTING MODE will change into ALL / VEHICLE automatically. (LCD screen 12th)

LCD screen 11th

LCD screen 12th

The height of every column (4, 1, 3, 2 in the LCD12th) is memorized as the customized zero points.

Note:

1) The customized zero-point height reference can only be performed just after LCD screen 9th display. Any lifting operation (UP, DOWN, PACK) in MODE ALL or AXLE will cancel the performance and keep the reference system to be UNIFORM immediately.

2) Under customized zero-point height reference, if all columns' height are below theirs customized zero points and at least one column within 6" (150mm) to the ground, the reference will be back to uniform reference, SINGLE and the 'Z___' will be on the screen again.

3) So, to change the height reference system (also travel distance or height unit) second time, operator shall wait all lifting forks in lowest (ground) position and the LCD screen is 10th again.

4.6 ADJUSTING LIFTING FORKS

The portable lifting columns can be used to lift vehicles with a wheel diameter of R7 (9”/228mm) to R22.5 (45”/1140mm). The forks can easily slide to the correct dimension:

1 Lift lock-pin to unlock the fork.

2 Use both hands to slide the fork sideways. Adjust both forks so that they are equally spaced in relation to the centre of the column.

3 Adjust so that the forks at floor height just fit around the tire (to prevent the rim falling through, when tire becomes deflated) (Fig.8)

4 Make sure that the lock-pin locks-in to place.

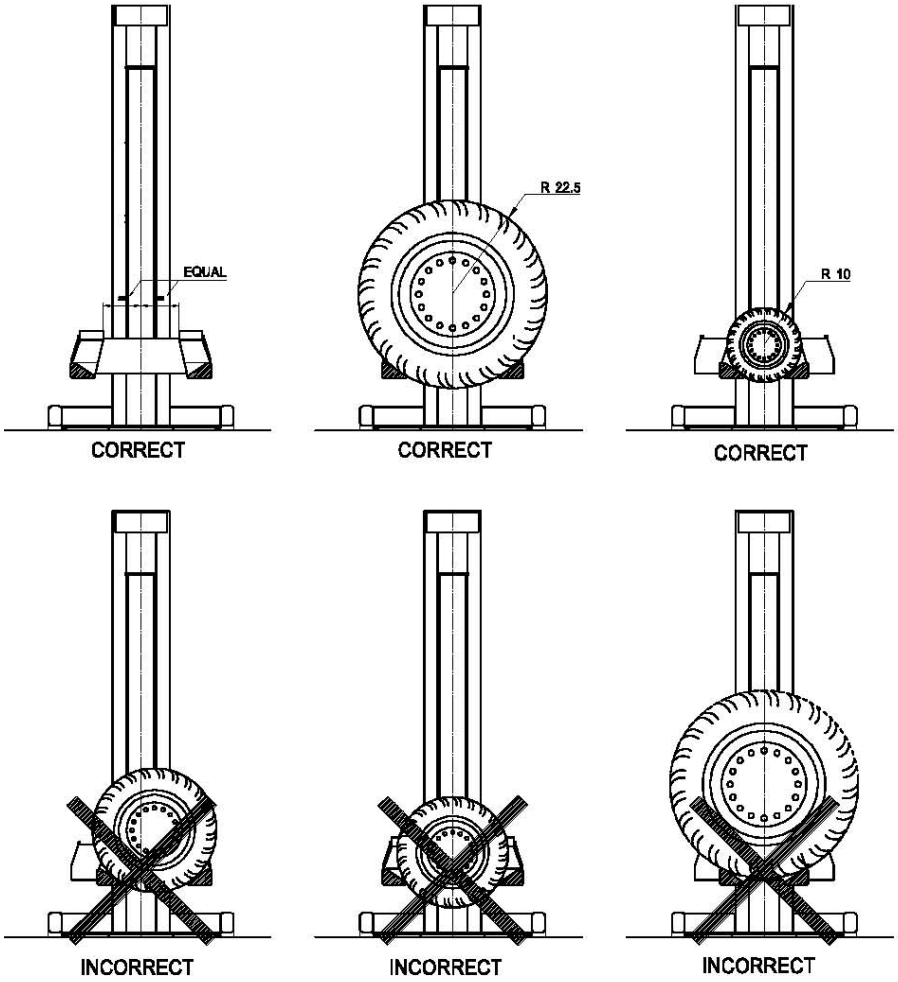


Fig.8 Adjust Forks to fit the Wheel

4.7 OPERATING THE PALLET LIFTING MECHANISM

The pallet jack mechanism is operated by means of the handle bar and the lever inside the bar. (Fig. 9)

The lever has two positions:

1 When the lever is pulled up in the upper position (1), the pallet jack mechanism can be raised by moving the handle bar up and down.

2 If hand released, the lever will be back to its neutral position. The pallet jack mechanism is lowered and the lift will sit on ground.

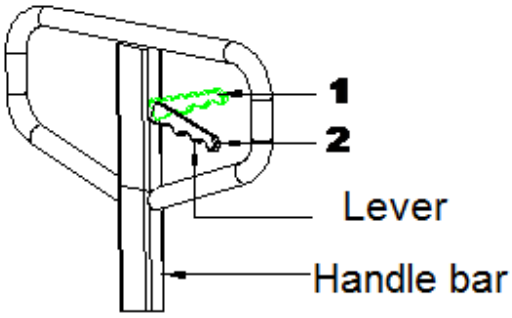


Fig. 9 Pallet Lifting

Steps to move the column lift with pallet jack:

1 Pull up the lever to position (1) and make some pumping movement with the handle bar to raise up the column lift. Then the column lift can then be relocated.

2 Release the lever to position (2) to lower down the column lift to the floor after it is right located.

<u>Note:</u> Set the pallet lifting mechanism in the lowest position, and the lever to the neutral position (2), whenever the column lift is to hoist a vehicle.

5. LIFTING OPERATION INSTRUCTIONS

The assembled lifting system must be checked for correct working and adjustments and a complete operational test should be carried out by using a typical vehicle.

Remarks:

-When using this lifting system, leave a space for a 24" (600mm) wide passage around the lifting system, which can serve as escape route.

-Before using the Portable Lifting Columns, ensure that the maximum load for each lifting column is not more than 13,200 lbs.

-Ensure that before use, the lifting system is placed vertically seen from the sides as well as from the front.

-Make sure that the pallet jack mechanism is fully lowered before lifting a vehicle.

5.1 PREPARATION & IMPORTANT NOTICE

1. Place all the four of lifting columns around the vehicle as in Fig.5.
2. Ensure that the fork of each lifting column is slid around the wheel as far as possible. (The forks shall have been adjusted as in Fig.6)
3. Move the columns' forks under the wheel.
4. Lower the pallet jack mechanism by releasing the lever inside the handle bar.
5. Make sure all of the power switches on the control boxes are set to 0 (OFF).
6. Make sure that the Emergency Release buttons are unlocked on all the lifting columns.
7. Set all the power switches to left position (ON). (Main column to be the last one)
8. Press button START on the main control box to run the software.
9. Set the mode to be WHEEL / SINGLE by pressing button [11].

10. Press the UP button to raise the fork of the column to touch the tire. Repeat for other three columns.

11. If necessary, press BIAS to choose customized zero-point.

12. Set the mode to ALL / VEHICLE by pressing button [13].

5.2 RAISING AND LOWERING ALL LIFTING COLUMNS

Press UP or DOWN button to raise or lower the vehicle to desired height. When the DOWN button is pressed, the columns will be raised up a little distance, to unlock the mechanical lock, and then lower down.

(See section 3, paragraph 3.3: Description of the portable column lift system.)

Once desired height has been reached, it is recommended but not required that the lift be lowered into the mechanical locks.

Before begin to work under the vehicle, it is recommended to support the vehicle with the safety stand before turning power switch to middle position (OFF)

5.3 Explanation of message on LCD:

1. Slowing

Mode: II..II		**bias: Z___**	
L2	**11**	**10**	**0**
	10	**10**	**0**
Slowing…			

Or

Mode: II..II		**bias: Z___**	
L2	**54**	**55**	**0**
L1	**54**	**55**	**0**
Slowing…			

Column 2# or both 1# and 2# are quick in rising or lowering, The height difference is greater than 3/4" (20mm), the column(s) will be slowed down automatically.

2. Suspending

Mode: II..II		**bias: Z___**	
L2	**28**	**30**	**0**
L1	**28**	**30**	**0**
Suspending…			

Or

Mode: II..II		**bias: Z___**	
L2	**48**	**47**	**0**
L1	**46**	**46**	**0**
Suspending…			

Both column 1# and 2# are quick in rising or lowering. The height difference is

greater than 2” (50mm), the column will be suspended automatically.

3. Times and minutes

When in ALL mode, there are **time** and **min** on the bottom line on the screen. It shows from the beginning (software installed) how many times the motors have been started how long it worked for pumping up the cylinder.

Mode: II..II	**bias: Z___**	
4	**3**	**0**
2	**3**	**0**
Reset!	**51time**	**17min**

4. Locked column

When one button is pressed down or if it is within 2 seconds just after it is released, (the red STOP light is on) , any button be pressed down, that control box of the later button will be locked.

Mode: II II	**bias: Z___**	
4	**3**	**0**
2	**3**	**0**
Locked by abnormal oper		

To unlock, any button on other column has to be pressed one time.

5.4 EMERGENCY STOP AND LOWERING

In emergency situations it is possible to stop the lifting columns manually by pushing the emergency button.

NOTE:
If the motor keeps running after EMERGENCY button is pressed down, please immediately turn off the battery switch to stop it.

Manual lowering must be performed by a qualified engineer only. (Refer to special steps provided separately)

5.5 OTHER MESSAGES

	MESSAGE	EXPLAINATION
1	Configuration error	a. Missing one or more columns. b. Columns are not in pairs. c. Add one pair of column not in RESET state.
2	PLC comm. error: L2	Communicating of column 2# failed in self- checking or running: a. Column 2# is without power or in error b. Address of column 2# is not correct.
3	Encoder comm. error: L2	Encoder of column 2# does not communicate with main PLC a. Encoder of column 2# is not working b. Address of encoder of column 2# is not correct.
4	Stop!	a. One emergency button is pressed. b. Communication between columns is broken. c. One or more column is power off. d. Within 2 second after button is released.
5	Arrive at travel end	One column stops after reaching its height limit. (this column will not raise when lower down)
6	Voltage deficient	After moving stopped, one or more columns were found battery in low voltage. The lift will not raise up any more but may lower down.
7	Reset!	RESET state. Lift is back in ZERO bias. Free movement is possible and pair of column can be added or taken away. Any operation will leave this REST state.
8	Free move, max. 5s/ step	Under RESET status, when single wheel operation is chosen. In FREE MOVEMENT, max. 5 sec. in single pressing can be carried out.
9	Too light & too slowly!	Because of light loading, lowering speed is below 10mm/s.
10	Accelerating…	System accelerates the lowering speed automatically in order to reach the floor within 4 minutes.

6. STORE THE MOBILE COLUMN LIFT

After all the work has been done on the vehicle, lower down all the lifting forks.
When one of the lifting columns touches the ground, release the DOWN button for 2 seconds.

Press the DOWN button again to lower all the lifting forks to ground. Then turn off the power switches to middle position (OFF).

Using the pallet jack mechanism, move the lifting column out of the vehicle. Position them at the storage place.

7. MAINTENANCE

All maintenance on the lifting equipment must be performed only by trained lift service person.

During inspection and maintenance the columns should be in the lowest position and the power switches should be turned off. This means that the power switches should be turned to the middle position.

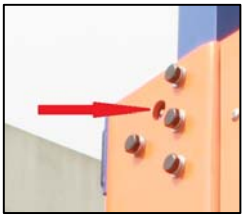
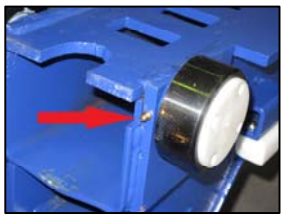
The power switch should be turned on again only for the adjustments and checks that require it.

7.1 DAILY (BY OPERATOR)

-Check for visible damage.
-Check for oil leaks in the hydraulic unit, lines and cylinder.

7.2 MONTHLY (BY OPERATOR)

-Check hydraulic fluid level, and replenish as necessary.
-Check the emergency release mechanism.
(1) Push the emergency stop button when the columns are moving. All the columns should stop immediately.
(2) To release the emergency stop button by turning it counter-clockwise, set the main switches to O and then to 1 to restore control power.
-Check the functionality of the mechanical safety locks.
-Examine the lifting system for fluid leaks and signs of damaged or worn parts.
-Examine the electrical cables and connectors for signs of damage.
-Oil the dry piston shaft.
-Grease the rollers through the nipples.

7.3 YEARLY (BY OPERATOR)

-Clear the filter/mesh of the electro-magnet valve on the motor pump (see 6.4).
-Check the DC motor contactor and change with a new one every two years.
- Change the hydraulic oil every two years.

7.4 CLEANING & CHANGE OIL (BY OPERATOR)

- Cleaning reminding

Motor pump running time (up and down) accumulates up to 300 minutes since new machine be operated first time, the software will present a special displaying (following) to remind user to do the filer clearing of the valves and hydraulic oil changing.

TB-6 Controller V6.84MD
By KERNEL Right Reserved
Run 301 min, Peri Check
Push ESC twice to go on

LCD display 18th

And also while the time reaches 3600 minutes, it will appear again.
To continue operation, just press ESC button twice.

- **Valve cleaning**

(1) Lower the carriage to ground or rest it on lock (PARK)

(2) Turn off the control case switch and the battery switch.

(3) Take off the coil on the electro-magnetic valve.

(4) Take out the valve pin.

(5) Clean the filter / mesh with compressed air.

(6) Put back the valve pin and the coil.

7.5 CHANGE OIL

- Change the oil.

(1) Lower the lift completely to floor.

(2) Remove the oil from the tank.

(3) Refill with approximately 13.5 Liters of hydraulic oil meeting AW32 or 46, filtrated to 4 Micrometer.

(4) Check the oil level in oil tanks on each column, add if necessary.

8. TROUBLE SHOOTING

FAULT	POSSIBLE CASE	REMEDY
Column Does not Lift.	Battery voltage is too low.	Charge the batteries.
	Oil level too low.	Add oil as necessary; refer to lubricating instructions on lifting column.
	Air in hydraulic pump (after the tank was empty).	Select single wheel mode and press the ⇑ (UP) button until the lifting column rises (max. 1 min).
	Safety valve not properly adjusted	Have valve adjusted, contact Service Department to check the valve.
	Pump has insufficient yield.	Replace the pump.
	Power interrupted by broken fuse in control box.	Replace the broken fuse. If the defect occurs again, contact the service department.
	Maximum height difference (more than 2"/50mm) exceeded.	Set the MODE to WHEEL/SINGLE. Raise or lower the specified column to minimize the height difference. If the defect occurs again, contact the service department.
Column Does not Lower	Battery voltage is too low.	Charge the batteries.
	Catching pawl not disengaged from locking system.	Raise column approximately 2" and then lower.
	The electrically operated lowering valve on the hydraulic unit does not open.	No power for solenoid or lowering valve is faulty. Have fault corrected by the Service Department.
	Dirty lowering valve.	Have valves cleaned or replaced by service department.
	Maximum height difference (more than 2"/50mm) exceeded.	Set the MODE to WHEEL/SINGLE. Raise or lower the specified column to minimize the height difference. If the defect occurs again, contact the service department.
Column Lowers by itself.	The cylinder seal is damaged, oil leaks continually.	Have seals or cylinder replaced by service department.
	Leaks in the oil line couplings.	Tighten couplings and coupling nuts.
	Dirty or damaged non-return valve.	Clean or replace valve.
	Dirty or damaged lowering or correction valve.	Clean or replace valve.
Column rises by itself	Welted DC motor contactor (Emergency Button can't stop it)	Change the contactor with a new one.

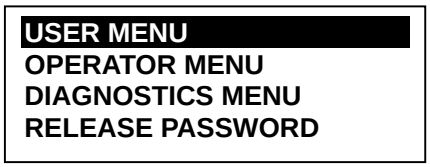
FAULT	POSSIBLE CASE	REMEDY
Column Does not Lift Properly.	Oil level in tank too low.	Add oil as necessary; refer to lubricating instructions on lifting column.
	Pump drawing-in air.	Tighten the suction filter fastening or crimp tighter.
	The steel plug has not been replaced by the breather cap	Install the breather cap
	Breather cap blocked.	Clean breather cap.
Column Height Reading not Reach Zero	Sensor zero point not correct	Do encoder alignment
No Control Power	Fuse blown.	Check the fuses F1, F2 and F3. If necessary, replace the fuse(s) in the control box. If fault occurs again, contact the Service Department.
	Power switch is OFF.	Set power switch to ON.
	Broken cable or loose connector.	Check cable and connector.
	The emergency stop button has not been unlocked.	Release the emergency button. Set the main switch(es) to OFF and ON.

FAULT	POSSIBLE CASE	REMEDY
No Power (Power Indicator are Off)	No power supply.	Have fault corrected by qualified electrician.
	Main fuse blown.	Replace fuse.
	Main switch(es) OFF.	Set power switch(es) ON.

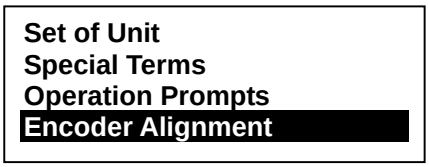
9. ELECTRO-OPTICAL ENCODER ALIGNMENT

The lifting height is detected by the sensor called encoder. The zero point of the sensor is checked in following steps.

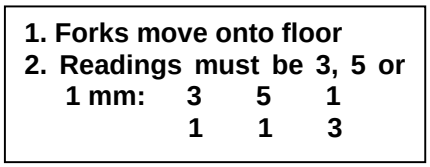
1. Lower down all the columns to bottom.
2. Press ESC button [18] to enter USER MENU. (LCD screen 5th)
3. Press DIRECT down button [8] to choose ENCODER ALIGNMENT. See LCD screen 13th
4. Press ENTER button [17].
5. In this screen, the numbers on bottom line is the zero height code of each column. If any one is not between 3 and 7, adjustment shall be done. LCD screen 14th.
6. To adjust, please open the upper cover on the column. Then separate the strip from the gear of the sensor.
7. Turn the gear to increase or decrease the reading on the corresponding column. The best value is 5. Value between 5 and 7 is acceptable.
8. Put on the strip again. Check again the readings. If OK, close the upper cover .



LCD screen 5th

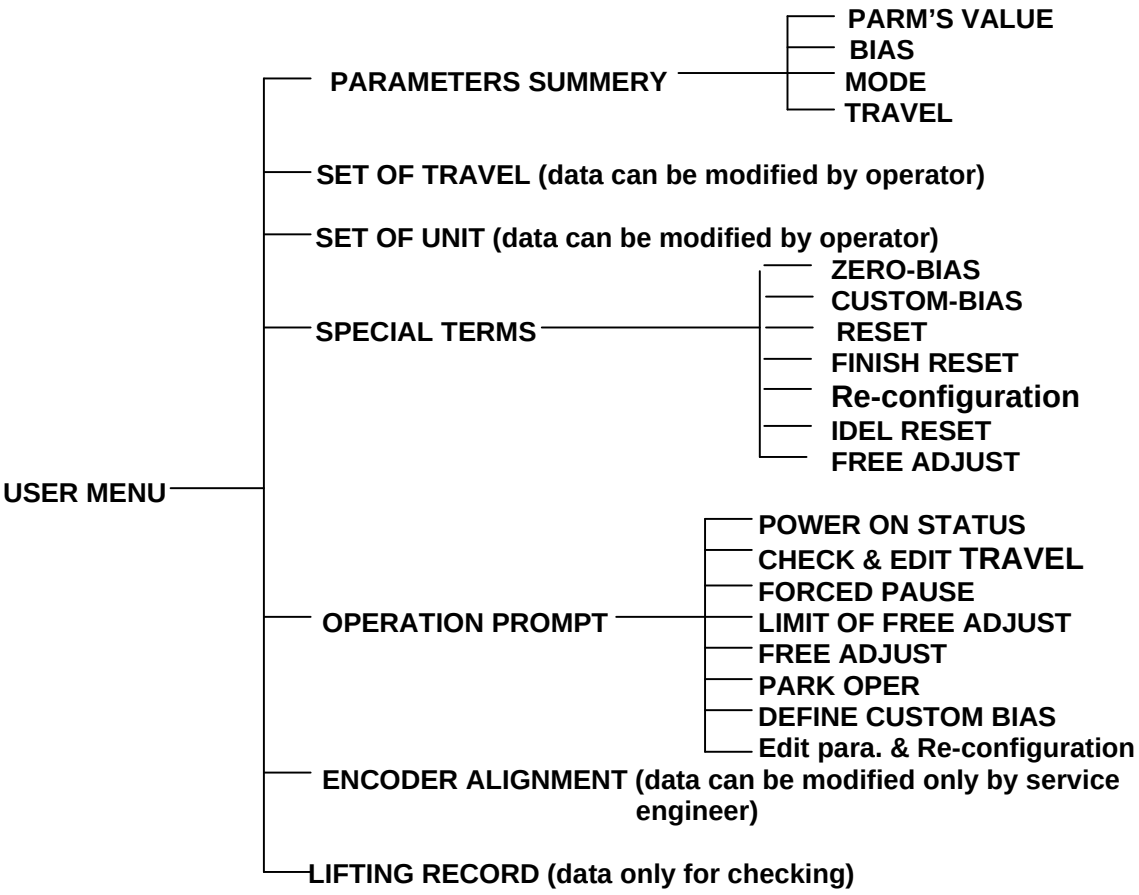


LCD screen 13th



LCD screen 14th

10. SOFTWARE MENU LIST



NOTE: Other items such as "OPETRATOR MENU", "DIAGNOSTICS MENU", "RELEASE PASSWORD" are set by the manufacturer. Customer does not need to enter to modify those specifications.

11. HAND-CONTROLLER (Optional)

As an option, the column lifts has one hand controller for every set. (Fig. 11)
The hand controller has one EMERGECY button and UP, DOWN, PARK buttons.

Fig. 11

Fig. 12

Every control box on column has a special plug port for the hand controller. (Fig.12)
Operator can put the hand controller plug into any one of the ports. (Fig.13)
The buttons will serve the same function as the buttons on control box. (Fig. 11)

Fig. 13

12. BATTERY CHARGER INFORMATON

12.1 Technical Specifications

1.	Input voltage:	100-140 VAC, 60Hz
2.	Input power:	230W ((Max)
3.	Output voltage:	24VDC (Grading adaptive)
4.	Output current:	7.0A±10%
5.	Charge time:	9-11 hours (battery was discharged deeply 80%)
6.	Size:	200*150*60 mm
7.	Weight:	850g

12.2 Panel of Charger

1. Charging indicator (*It becomes green and red charging indicator on control box panel*)
2. Power indicator
3. Output cord
4. Power input socket

12.3 LED Performance Indicator

1. After the charged is power on, the POWER INDICATOR (2#) will be on.
2. The CHARGING INDICATOR (1#) will not on only if the battery is connected. It will be red when battery is in fast charging.

   When the battery is fully charged, it goes green.

   If this CHARGING INDICATOR (1#) is flashing, the charger is in error.

13. BATTERY REQUIREMENT INFORMATION

Battery Quantity:	2ea per Column - (Not included with MSC-13K-B)
Battery Dimension:	13" L x 7" W x 12" H
Battery Cover Size:	15" L x 8" W x 14" H
Battery Type:	Deep Cycle Batteries, 12VDC
Battery Rating:	120 AMP / HR
Battery Start Current:	350 CCA - 500 CCA

Suggestions:

1. When "**Low voltage on** " or **" Voltage deficient"** is on the screen, lower down the vehicle, shut off the lift, then charge the batteries at once. Continue to use the batteries will short the life of batteries.

2. Charge the batteries immediately after the job is finished. This will help to prolong the life of the batteries.

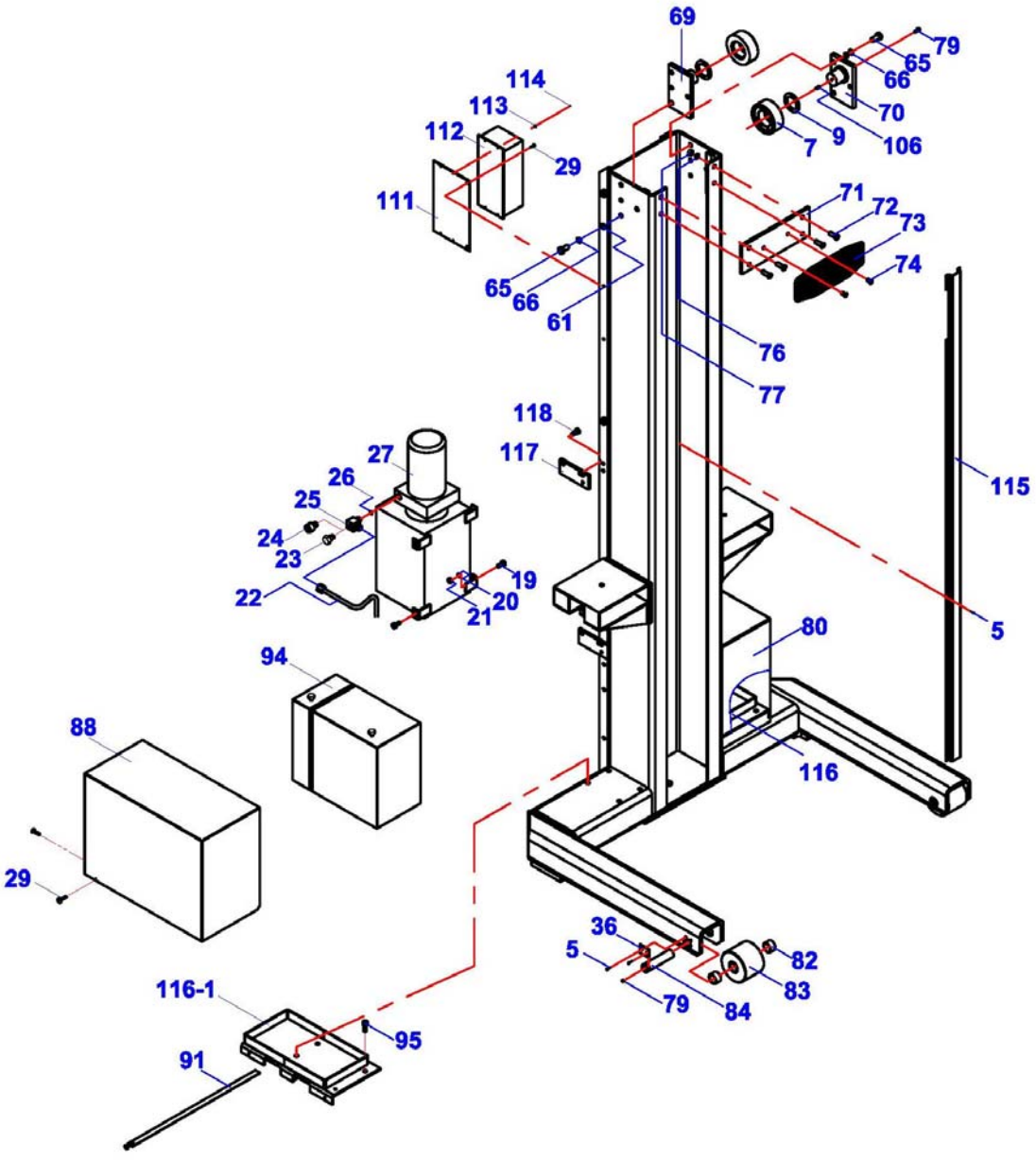
3. When in storage, the batteries shall be fully charged first. Every six months charge again. Discharge the batteries once a year at 30% then charge fully.

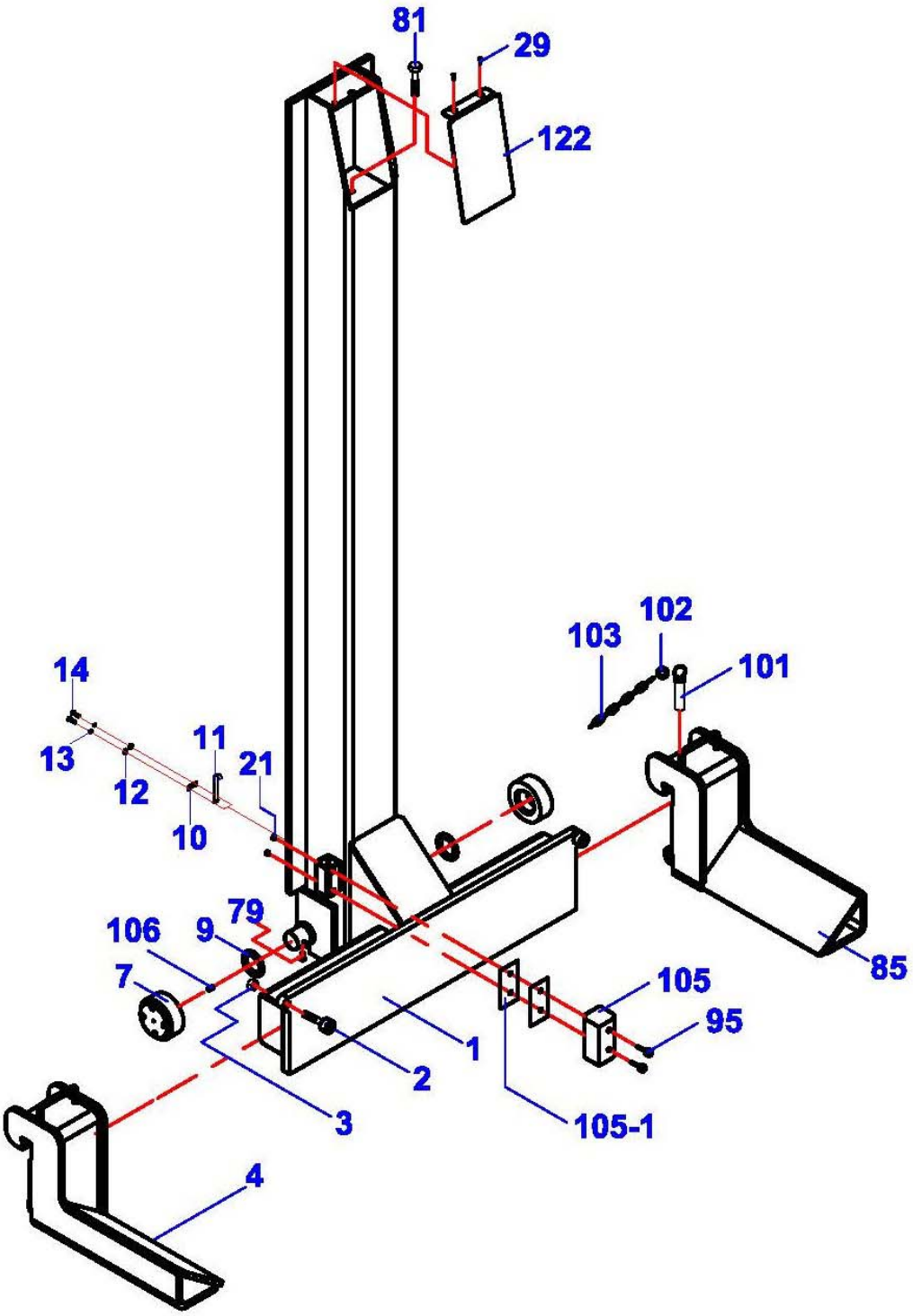
4. It is better to disconnect & remove the batteries from the lift for long period storage and keep it indoors.

5. Check the battery once a month for out looking, output voltage (open circle) and etc. to keep it in a good condition.

MSC-13K-B EXPLODED VIEWS & PARTS LISTS

MSC-13K Column Assembly

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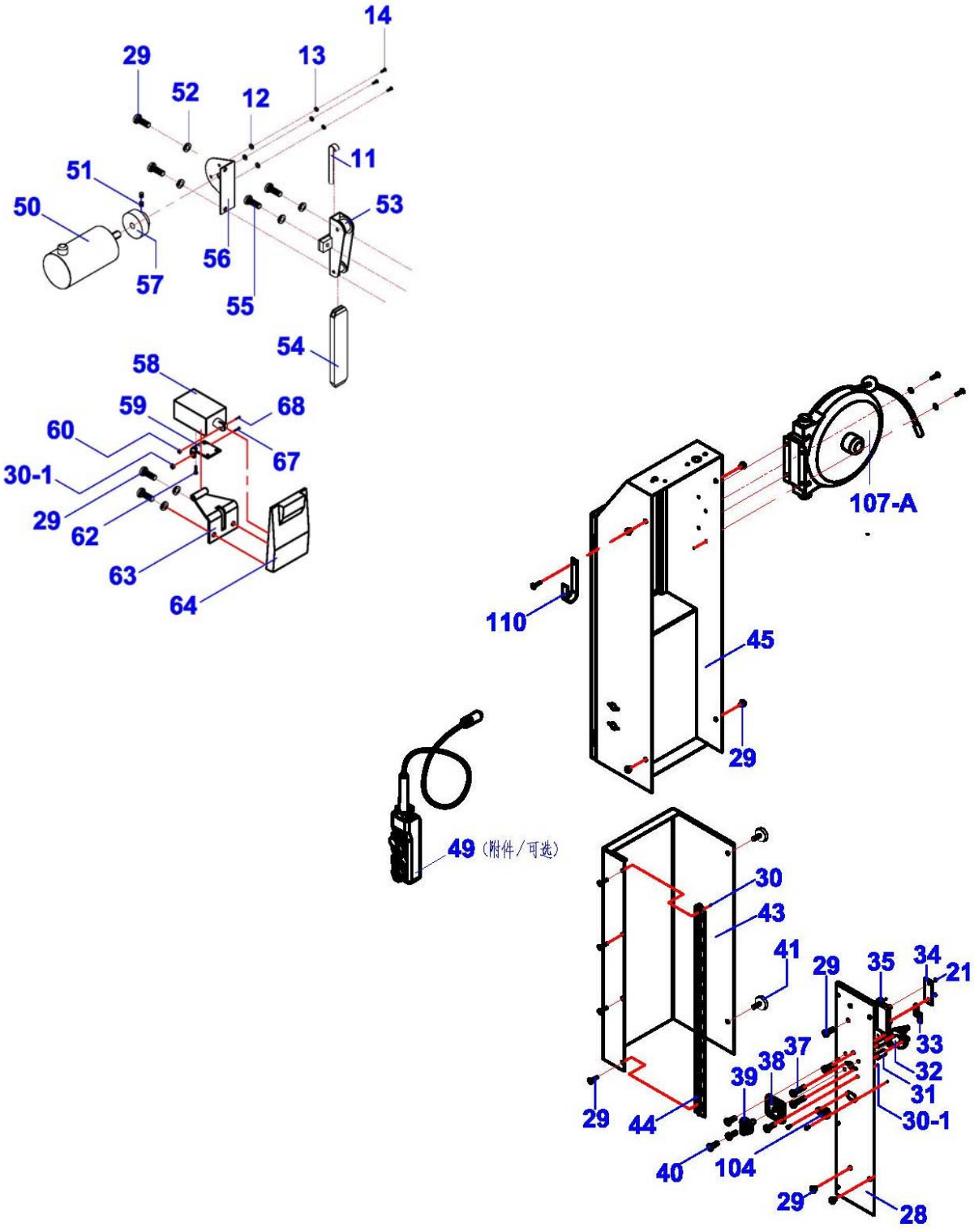
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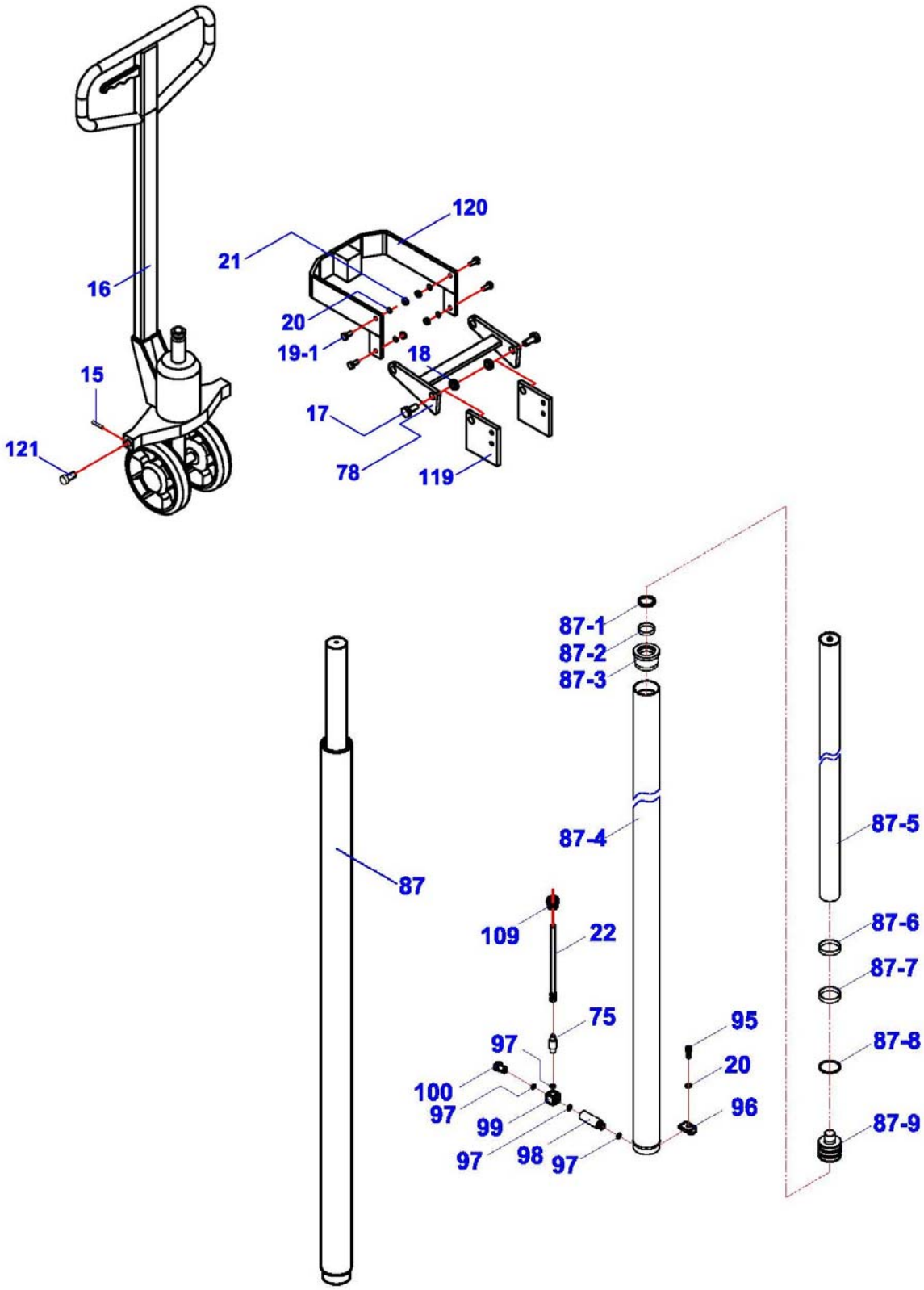
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87-7
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97
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87-8
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87-9
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98
97

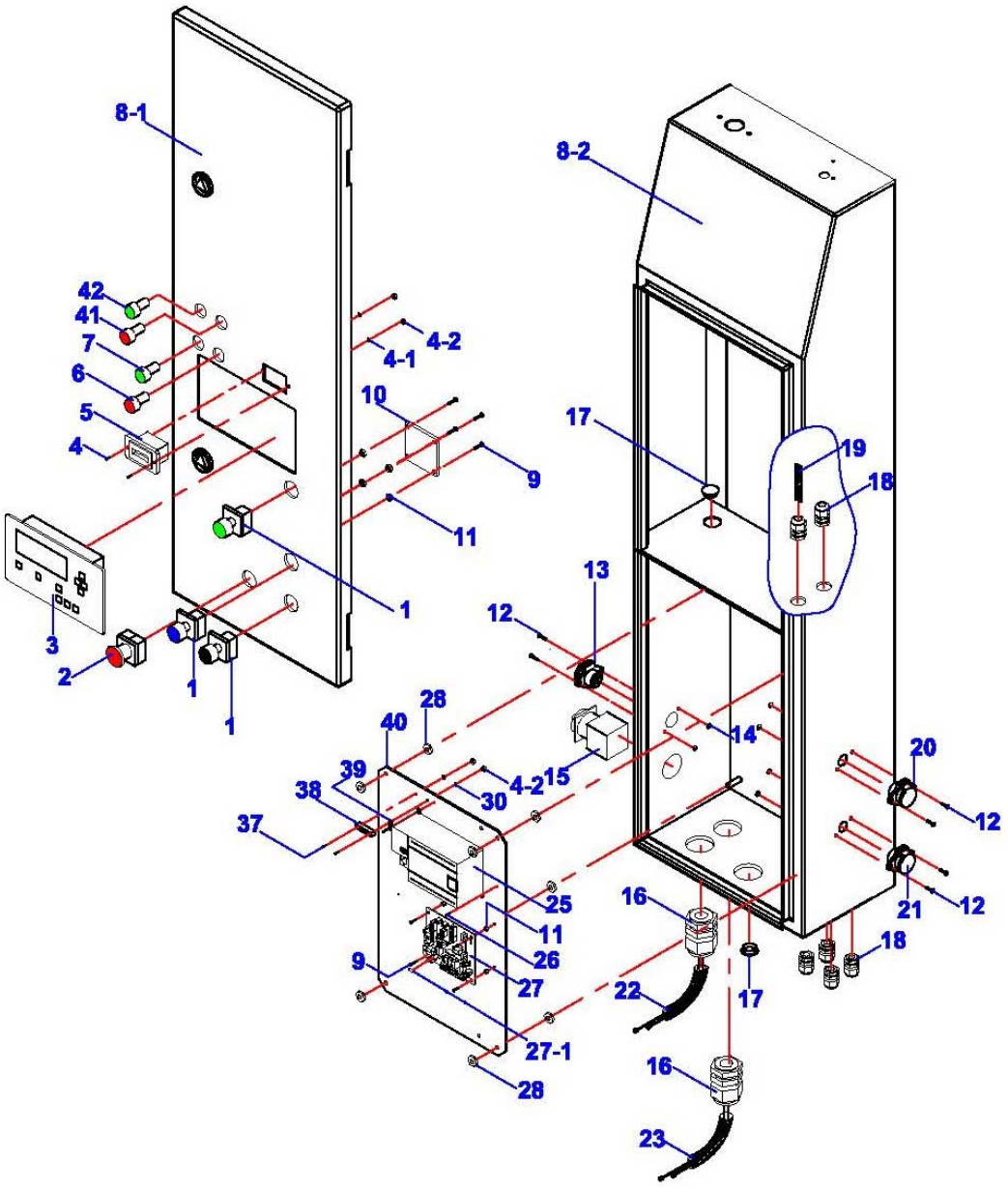
MSC-13K Column Assembly Parts List

ITEM	M-CODE	DESCRIPTION	QTY	NOTE
1	DJ03-02000-000	carriage	1	
2	5102-12035-000	bolt	2	M12*35
3	5202-00012-000	nut	2	M12
4	DJ03-04000-000	right fork	1	
5	5114-05014-000	screw	12	M5*14
7	DJ02-02200-000	roller	4	
9	DJ02-02004-000	washer	4	
10	DJ02-00021-000	plate	1	
11	DJ02-00017-000	timing belt	1	
12	5302-00004-000	flat washer	5	φ4
13	5306-00004-000	spring washer	5	φ4
14	5110-04010-000	screw	7	M4*10
15	5402-05030-000	cotter pin	2	φ5*30
16	DJ01-15000-100	pallet jack	1	
17	5102-16035-000	bolt	2	M16*35
18	5202-00016-000	nut	2	M16
19	5102-08020-000	bolt	8	M8*20
19-1	5102-08025-000	bolt	4	M8*25
20	5302-00008-000	flat washer	8	φ8
21	5202-00008-000	nut	12	M8
22	DJ02-12000-000	hose	1	
23	SJ03-14005-000	end nut	1	
24	SJ03-14002-000	connector	1	
25	SJ03-14001-000	T-connector	1	
26	5901-00118-000	O-ring	1	φ11.8*1.8
27	DBZ22A-00	motor pump	1	
28	DJ03-12001-000	side board	1	
29	5115-06012-000	screw	1	φ112*3.55
30	5202-00006-000	lock nut	2	M8*80
30-1	5202-00005-000	lock nut	2	φ10*260
31	DJ02-00006-A00	switch fixer	2	
32	BZ22-05503-000	battery switch	2	24VCD
33	BZ22-05516-000	copper bar	1	IFC-06-4
34	BZ22-05515-000	fuse	2	
35	BZ22-05514-000	fuse case	1	
36	SL01-00047-A00	plate	2	24VDC/200A
37	5110-06045-000	screw	2	
38	DJ02-00017-A00	switch panel	1	
39	DJ02-00018-A00	switch	1	
40	5110-05014-000	screw	4	M5*14
41	5116-06012-000	hand screw	2	M6*12

ITEM	M-CODE	DESCRIPTION	QTY	NOTE
43	DJ03-12100-000	cover	1	
44	DJ03-12002-000	hinge	1	
45	QK05AS-00	control unit	1	
49	DJ020S-FJ4	hand/remote controller	1	optional
50	DJ02-00016-000	encoder	1	
51	5306-04005-000	threaded pin	2	M4*5
52	5306-00006-000	spring washer	6	φ6
53	DJ02-11000-000	wheel frame	1	
54	DJ02-00018-000	weight bar	1	
55	5110-06020-000	screw	3	M6*20
56	DJ02-00015-000	fixing frame	1	
57	DJ02-00019-000	gear	1	
58	DJ02-00006-000	electric magnet	1	
59	DJ02-00004-000	magnet base	1	
60	5202-00004-000	lock nut	1	M4
61	5302-00012-000	flat washer	8	φ12
62	5107-03010-000	screw	4	M3*10
63	DJ03-07000-000	magnet frame	1	
64	DJ03-06000-000	mechanical lock	1	
65	5102-12025-000	bolt	8	M12*25（12.9 级）
66	5306-00012-000	spring washer	8	φ12
67	5102-05040-000	bolt	1	M5*40
68	5110-04020-000	screw	1	M4*20
69	DJ03-09000-000	roller pin shaft (right)	1	
70	DJ03-08000-000	roller pin shaft (left)	1	
71	DJ03-00003-000	board	1	
72	5114-10030-000	screw	4	M10*30
73	SJ06-00004-000	rubber pad	1	
74	5114-10020-000	screw	2	M10*20
75	DJ02-09000-000	safety valve	1	
76	5302-00010-000	flat washer	4	φ10
77	5202-00010-000	nut	4	M10
78	DJ03-11000-000	joining frame	1	
79	JP02-00007-000	nipple	6	M6
80	DJ02-00002-A00	battery cover (left)	1	
81	5102-10030-000	bolt	2	M10*30
82	5603-30030-000	bearing	4	φ30*30
83	DJ03-00001-000	roller	2	
84	DJ03-00002-000	roller pin	2	
85	DJ03-03000-000	left fork	1	
87	DJ03-05000-000	cylinder	1	

ITEM	M-CODE	DESCRIPTION	QTY	NOTE
87-1	5906-00060-000	dust ring	1	φ60*φ66.8*5
87-2	DJ03-05003-000	guide belt 1#	1	φ65*φ60*15
87-3	DJ03-05002-000	guide ring	1	
87-4	DJ03-05100-000	cylinder body	1	
87-5	DJ03-05200-000	piston bar	1	
87-6	DJ03-05005-000	position slot	1	
87-7	DJ02-05005-000	guide belt 2#	1	
87-8	5903-00060-000	seal ring	1	φ75*φ60*10
87-9	DJ03-05001-000	piston	1	
88	DJ02-00001-A00	battery cover (right)	1	
91	BZ22-00002-000	hose clamp	4	
95	5105-08025-000	bolt	9	M8*25
96	DJ03-00015-000	plate	1	
97	DJ02-05007-000	combined washer	4	φ16
98	DJ03-05004-000	connector	1	
99	DJ02-05010-000	swivel connector	1	
100	DJ02-05011-000	oil connector	1	
101	DJ02-00011-000	pin	2	
102	DJ02-00010-000	key-ring	4	
103	DJ02-05008-000	chain	2	
104	SL02-00041-A00	socket	1	
105	DJ03-00009-000	nylon block	2	
105-1	DJ03-00011-000	adjust shim	4	
106	5109-08008-000	threaded pin	4	M8*8
107-A	QK04-00100-M00	cable reel	1	
109	DJ02-00030-000	rubber ring	1	
110	DJ02-00034-000	hook	1	
111	DJ03-00012-B00	charger board	1	
112	BZ22-05509-100	charger	1	
113	5302-00003-000	flat washer	4	φ3
114	5110-03010-000	screw	4	M3*10
115	DJ03-00007-000	guiding slot	1	
116	DJ03-19000-B00	battery base (left)	1	
116-1	DJ03-20000-B00	battery base (right)	1	
117	DJ03-01004-000	frame	2	
118	5102-08014-000	bolt	4	M8*14
119	DJ03-00004-000	pallet jack joining	2	
120	DJ03-10000-000	frame	1	120
121	DJ03-00005-000	pin	2	121
122	DJ03-00013-000	cover	1	122

MSC-13K Control Panel Assembly

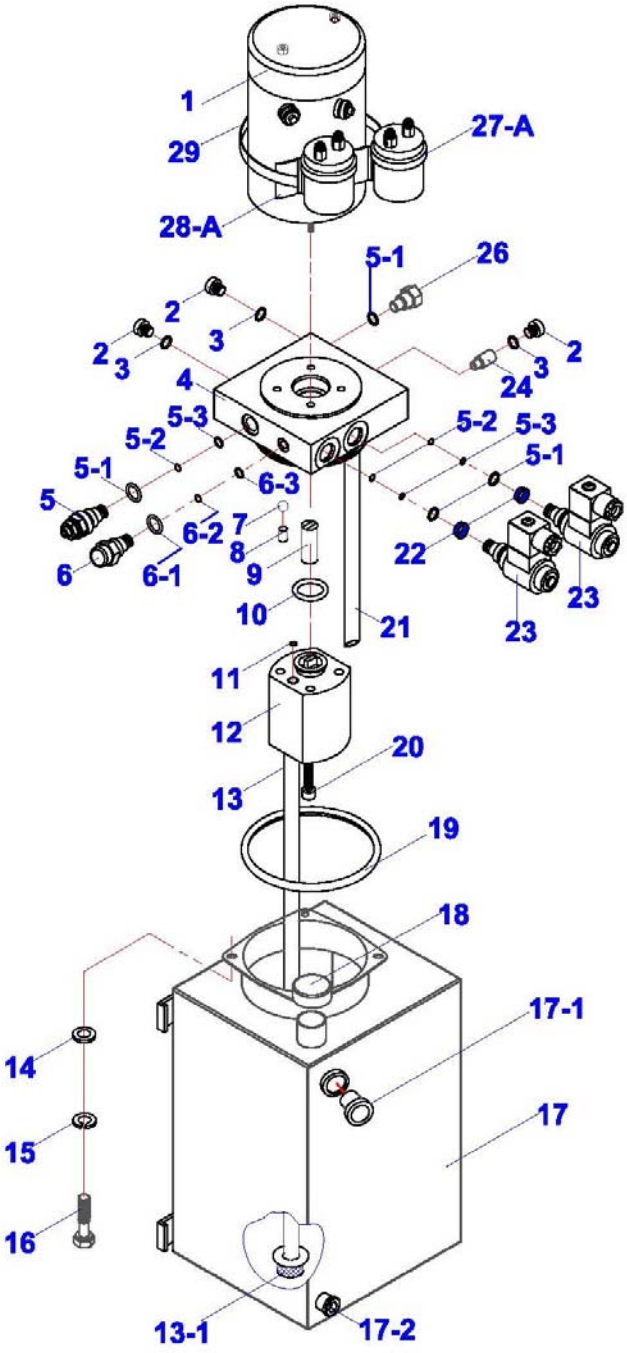


MSC-13K Control Panel Parts List

ITEM	M-CODE	DESCRIPTION	QTY	NOTE
1	DJ02-20002-000	button	3	LA42P, Green, Blue, Black
2	DJ02-20003-000	emergency button	1	LA42J Φ22/Red
3	DJ02-20010-000	screen	1	TD400C
4	5110-00004-000	screw	2	M4*12
4-1	5203-00004-000	spring washer	2	∮4
4-2	5202-00004-000	nut	4	M4
5	QK04-00012-000	battery indicator	1	
6	DJ02-20006-000	red lamp		LD56-16C Φ16/Red
7	DJ02-20005-000	green lamp	1	LD56-16C Φ16/Green
8-1	DJ03-13001-000	panel (main column)	1	
	DJ03-14001-000	panel (sub column)		
8-2	DJ03-13100-000	case body	1	
9	5110-03008-000	bolt	12	M3*8
10	QK02-20200-L70	connection board	1	
11	QK02-10013-000	separator	8	M3×10
12	5110-03015-000	screw	6	M3*15
13-A	QK06-50700-M00	communication cable	1	XS1
14	5202-00003-000	nut	6	M3
15	DJ04-20001-100	power switch	1	LW42A2-21820
16	DT01-06023-000	cable nut	2	M16
17	QK04-00011-000	hole cover	2	∮16
18	JK01-00003-000		6	M12
19	DJ02-00200-000	electro-magnet cable	1	
20-A	QK04-50800-M00	communication cable	1	XS7
21-A	QK02-50900-M00	remote controller cable	1	XS15
22	QK04-30300-000	charger cable	1	RVV2×1.5/Red,Black
23	QK04-30100-000	power supply cable	1	RVV2×1.5/Red, Black
25	DJ02-10002-000	main PLC: S7-200-224XP	1	
		sub PLC: S7-200-222		
26	DJ02-10032-000	screw	2	3.5×15
27-A	QK04-13300-MZ3	PCB	1	
27-1	JK01-10113-100	fuse 3.15A	2	∮5×20 delay
28	5202-00006-000	nut	8	M6
30	5301-00005-000	flat washer	2	Φ5
37	5110-04004-000	screw	2	M4*4
38	JK01-10010-000	ground terminal	1	5 position
39	JK01-JD000-000	ground label	1	
40	QK06-10001-100	bottom board	1	
41	QK05-20006-H00	red changing lamp	1	LAS1-AY-D/R/6V Φ16/red

ITEM	M-CODE	DESCRIPTION	QTY	NOTE
42	QK05-20005-H00	green charging lamp	1	LAS1-AY-D/G/6V Φ16/green
43	QK04-80002-FJ5	LED lamp socket	1	
44	QK04-00015-000	LED lamp power cable	1	RVV2×0.5/ red, black
45	JK01-00004-000	cable nut	2	M20
46	DJ02-00007-000	cable nut	1	M25
47	QK04-00013-M00	battery indicator cable	1	RVV2×0.5/red, black
48	JK01-00008-000	Buzzer	1	SFM-27 24VDC

MSC-13K Power Unit Assembly



MSC-13K Power Unit Parts List

ITEM	M-CODE	DESCRIPTION	QTY	NOTE
1	BZ22-05001-F00	DC motor	1	24VDC、2.2KW、110A
2	BZ01-04008-000	closer	3	9/16-18UNF
3	5901-00118-000	O-ring	3	ϕ11.8* ϕ1.8
4	BZ22-04001-F00	valve block	1	
5	BZ20-04002-000	over-flow valve	1	YF06-00 25Mp
5-1	5901-00160-000	O-ring	4	ϕ16* ϕ2
5-2	5901-00125-000	Circlips	3	ϕ12*1.5
5-3	5901-00095-000	O-ring	3	ϕ9.5* ϕ1.8
6	BZ20-04024-100	main compensating valve	1	LFR-10-M8
6-1	5901-00190-000	O-ring	1	ϕ19*2
6-2	5901-00130-000	Circlips	1	ϕ13*1.5
6-3	5901-00130-000	O-ring	1	ϕ13* ϕ1.8
7	5601-00800-000	ball	1	ϕ8
8	5109-10010-000	threaded pin	1	M10*1*10
9	BZ22-00003-000	joint	1	Φ18*53
10	5901-00277-000	O-ring	1	ϕ27.7*2.4
11	5901-00925-000	O-ring	1	ϕ9.25*1.78
12	BZ01-03000-F00	gear pump	1	2.1ml/rev, 21Mpa
13	BZ20-01000-000	sucking pipe	1	Φ18x350
13-1	BZ01-01002-000	mesh	1	
14	5301-00006-000	flat washer	4	Φ6
15	5303-00006-000	spring washer	4	Φ6
16	5101-06012-000	bolt	4	M6*12
17	BZ22-02100-A00	11L tank	1	332*190*200
17-1	DJ02-00042-000	oil level bar	1	M22*1.5
17-2	BZ20-02101-000	oil plug	1	M12*10
18	BZ20-02200-000	tank cover	1	
19	5901-01120-000	O-ring	1	ϕ112*3.55
20	5105-08080-000	screw	2	M8*80
21	BZ20-00001-000	return pipe	2	ϕ10*260
22	BZ01-04011-000	mesh	2	
23	BZ13-04100-000	release valve	2	24VCD
24	BZ20-04026-000	sub compensating valve	1	IFC-06-4
26	BZ20-04007-000	single-way valve	1	
27-A	BZ22-05002-002	contactor	2	24VDC/200A
28-A	BZ22-05003-000	frame	2	
29	BZ01-00002-000	clamp	1	29

LIMITED WARRANTY

Structural Warranty:

The following parts and structural components carry a five-year warranty:

Columns	Arms	Uprights	Swivel Pins
Legs	Carriages	Overhead Beam	
Tracks	Cross Rails	Top Rail Beam	

Limited One-Year Warranty:

Tuxedo Distributors, LLC (iDEAL) offers a limited one-year warranty to the original purchaser of Lifts and Wheel Service equipment in the United States and Canada. Tuxedo will replace, without charge, any part found defective in materials or workmanship under normal use, for a period of one year after purchase. The purchaser is responsible for all shipping charges. This warranty does not apply to equipment that has been improperly installed or altered or that has not been operated or maintained according to specifications.

Other Limitations:

This warranty does not cover:

1. Parts needed for normal maintenance
2. Wear parts, including but not limited to cables, slider blocks, chains, rubber pads and pulleys
3. Replacement of lift and tire changer cylinders after the first 30 days. A seal kit and installation instructions will be sent for repairs thereafter.
4. On-site labor

Upon receipt, the customer must visually inspect the equipment for any potential freight damage before signing clear on the shipping receipt. Freight damage is not considered a warranty issue and therefore must be noted for any potential recovery with the shipping company.

The customer is required to notify Tuxedo of any missing parts within 72 hours. Timely notification must be received to be covered under warranty.

Tuxedo will replace any defective part under warranty at no charge as soon as such parts become available from the manufacturer. No guarantee is given as to the immediate availability of replacement parts.

Tuxedo reserves the right to make improvements and/or design changes to its lifts without any obligation to previously sold, assembled or fabricated equipment.

There is no other express warranty on the Tuxedo lifts and this warranty is exclusive of and in lieu of all other warranties, expressed or implied, including all warranties of merchantability and fitness for a particular purpose.

To the fullest extent allowed by law, Tuxedo shall not be liable for loss of use, cost of cover, lost profits, inconvenience, lost time, commercial loss or other incidental or consequential damages.

This Limited Warranty is granted to the original purchaser only and is not transferable or assignable.

Some states do not allow exclusion or limitation of consequential damages or how long an implied warranty lasts, so the above limitations and exclusions may not apply. This warranty gives you specific legal rights and you may have other rights, which may vary from state to state.

8320 E Hwy 67, Alvarado, TX 76009
Ph. 817-558-9337 / Fax 817-558-9740