



Mobile Column Lift Set

MSC-13K-B

Capacity 13,200lbs / Each Column

Installation - Operation – Service Manual



2016 Mar

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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 consult your distributor.

1. GENERAL INFORMATION

1.1 SPECIFICATIONS

Model #	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)

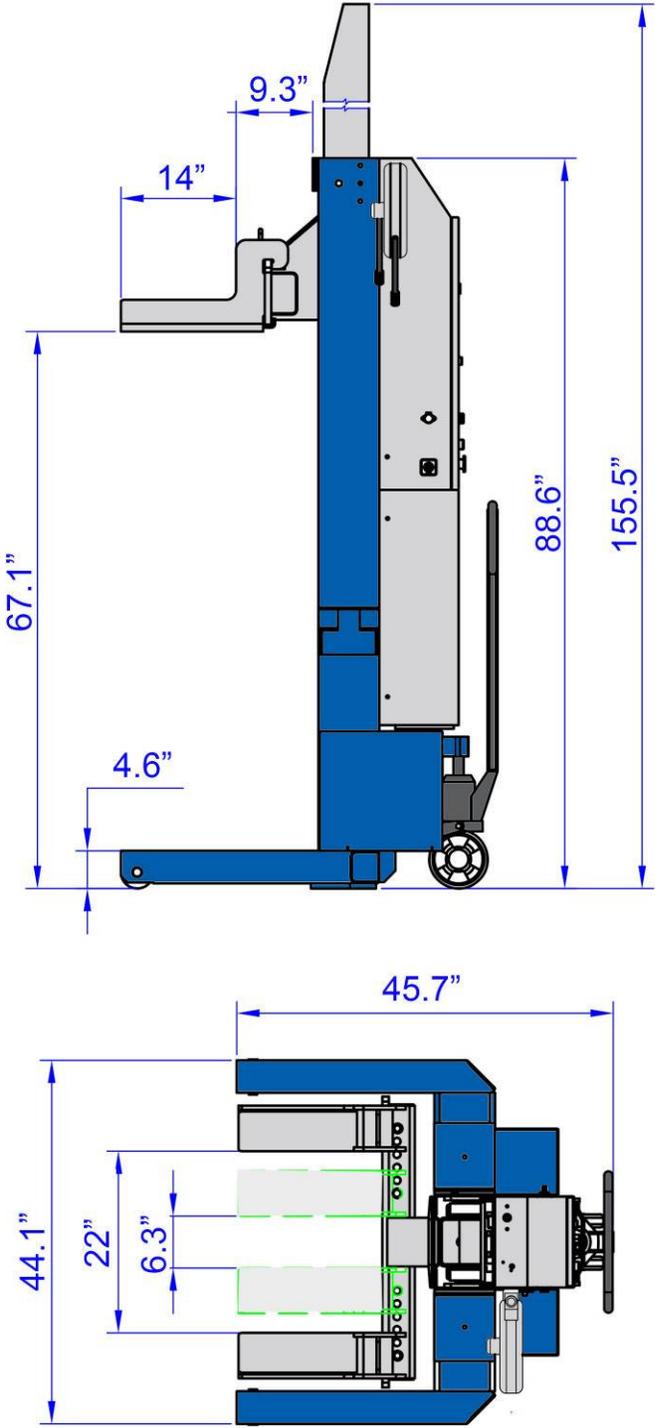


Fig.1 Mobile Column Lift Dimensions

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

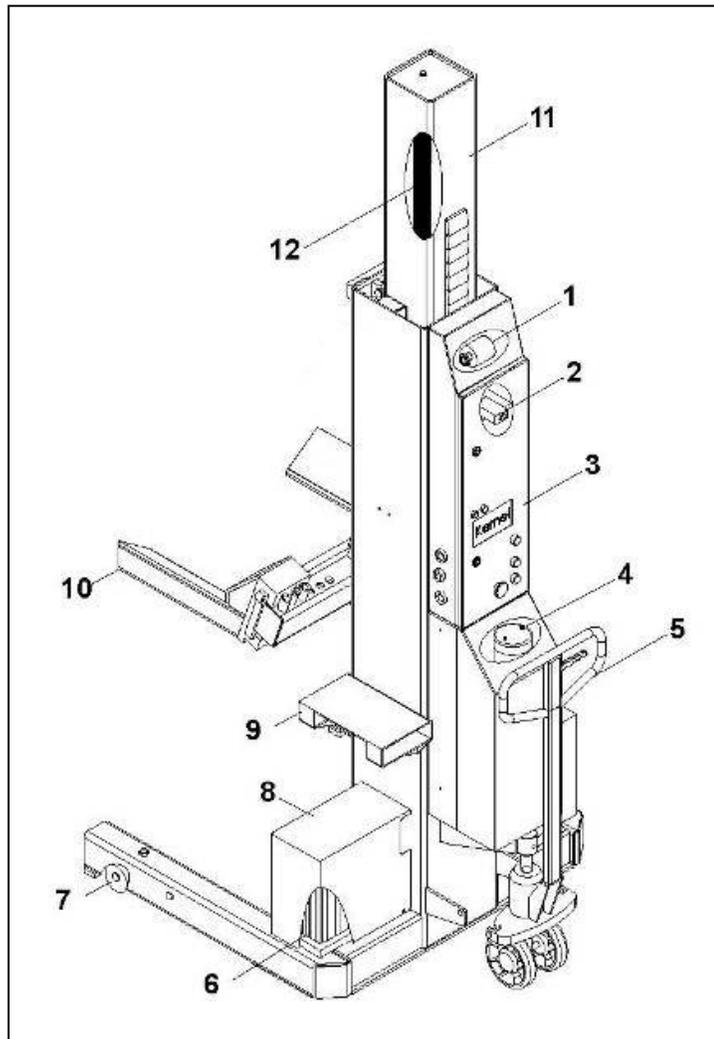


Fig.2 column components

1.4 STRUCTURE OF THE MOBILE COLUMN LIFT

- **Hydraulic Power Unit**

The hydraulic system consists of an electrically driven pump, flow control valves, safety 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 INFORMATION 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. 4

3. Lift the column then move it to the working position.
 - A. This mobile column lift can only be operated or installed indoors. When under environment of temperature within 0--40°C, moisture $\leq 85\%$, the lift will work reliable and longer time.
 - B. Never set up the lifts on a asphalt surface or hollow concrete floor. The concrete surface must be with strength of 3000psi (20Mpa) at least and min. thickness of 120mm (4.7"), and slope gradient ≤ 12 mm/m.

STEP 2. Fill the Tank

1. Take off the forklift pockets from the mobile column lift (**better**, not required).
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 , filtered at 4 micron max, about 10.5L (2.8 Gal) .(Fig. 4)
3. Put back the plug and Install the cover back on the hydraulic unit.
4. Check for oil leakage.

STEP 3. Battery Installation

1. Remove Battery Covers (Fig. 5)

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. 5)
4. Install the battery covers back on lift.
- 5.



Fig. 5 Battery Installation

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

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. 6a&b)



Fig. 6a



Fig. 6b



Fig. 6c

3. Pull up and pull down the upper and down lock button, the reel can turn aside. (Fig. 6c)
4. Fix the reel on the base by the screw. (Fig 6d)



Fig. 6d



Fig. 6e

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

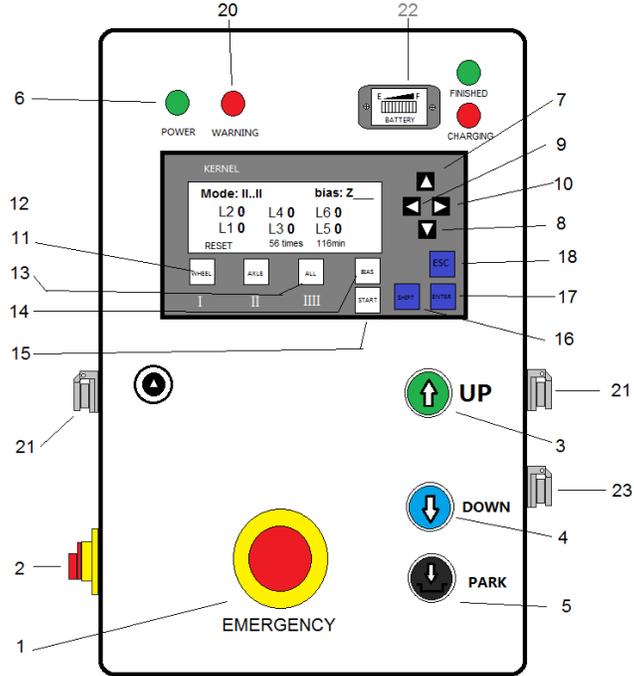
STEP 5. Pre-charging the batteries

If the newly installed batteries are not charged, please charge them before operation. Charging steps refers to chapter 5.1 on page 23

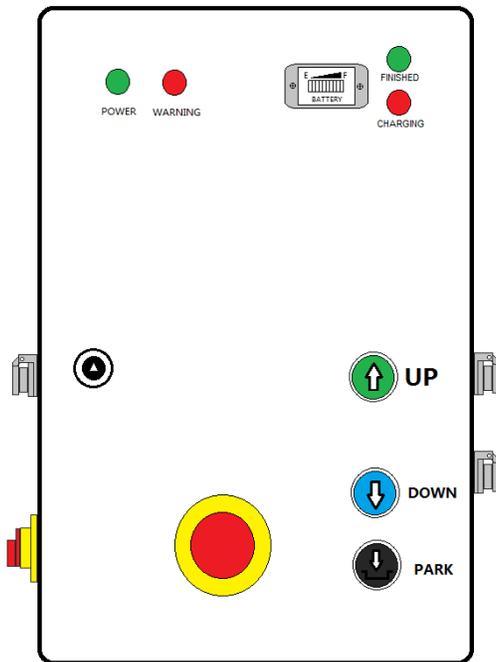
3. OPERATION INSTRUCTION

3.1 CONTROL PANEL FEATURES

The Main Control Panel controls the main power. All other functions of the lifting system are controlled by 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

3.2 CONTROL PANEL DETAILS

1. **EMERGENCY** 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.

To select between the functions: “**WHEEL**”, “**AXLE**” & “**ALL**”

14. **BIAS** button

To set the zero point of height in initialization.

15. **START** button

To start 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

3.3 POSITIONING LIFTING COLUMNS

A fully combination consists 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. 8)

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.**

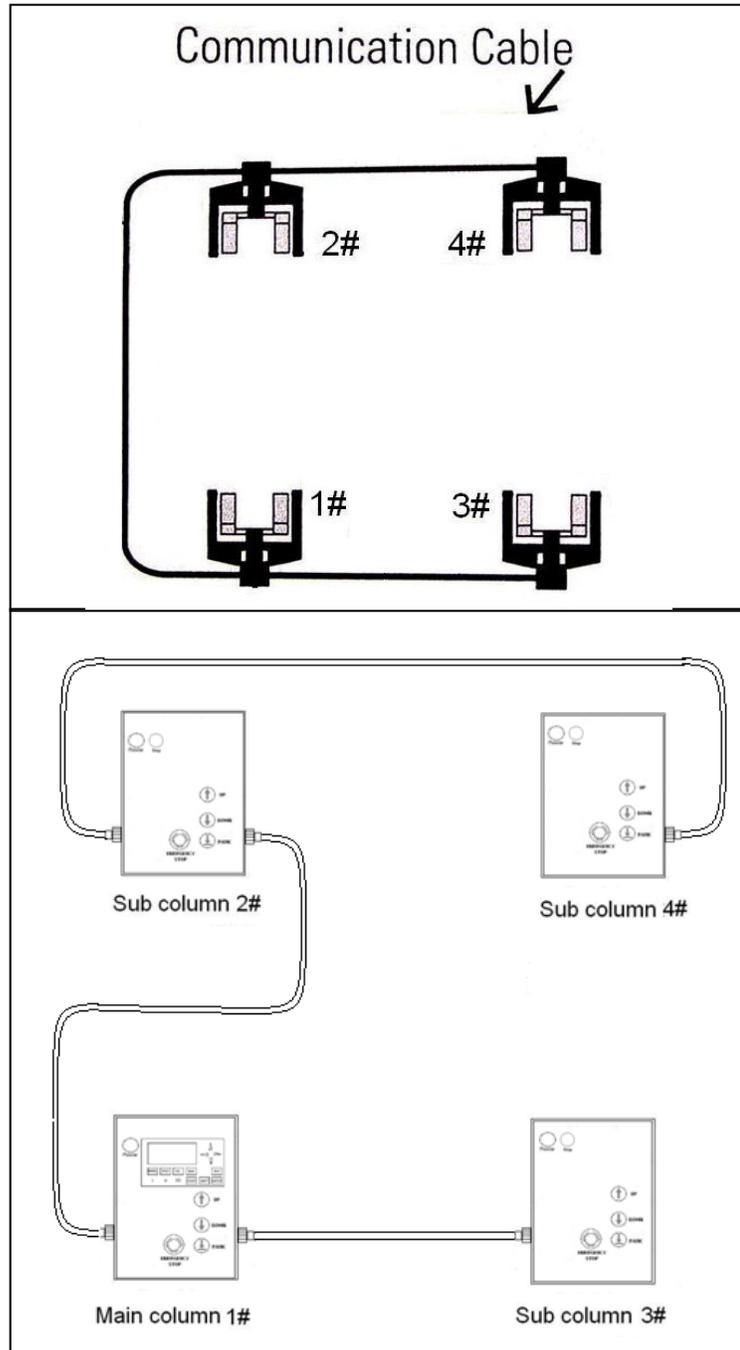


Fig. 8 Positioning Columns

3.4 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. 8.)
2. Then turn on the battery power switch of each column on the side. (Fig.9a)

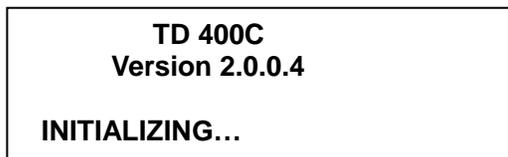


Fig. 9a

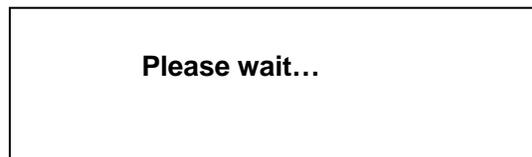


Fig.9b

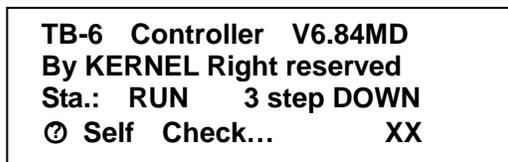
3. Set the control box power switch (Fig. 9b) on each sub column to left position (ON) first, the green Power indicators will be on.
4. Then turn on the switch (Fig. 7b) on main column to left (ON) and the LCD screen is lighted. Wait until the LCD screen changed to the 4th display, press the START button to start running of the system.



LCD screen 1st



LCD screen 2nd



LCD screen 3rd



LCD screen 4th

Note: If necessary, the lifting height / travel distance shall be changed before press START button. (See 3.5 section next)

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

6. **Operation description**

All system functions are available by press the MODE buttons when the lift columns are not in operation (non of button is pressed).

When the Mode is **ALL / Vehicle (II..II)**

-Press one button will cause all columns moving.

When the Mode is **WHEEL / Single (I)**

-Press one button will cause only that columns moving.

When the Mode is **Axle / Pair (II)**

-Press anyone button will cause only that two columns in same axle moving.

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

3.5 TRAVEL DISTANCE, HEIGHT UNIT AND UNIFORM CHANGING

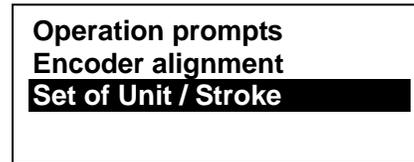
3.5.1 TRAVEL DISTANCE AND HEIGHT UNIT CHANGE

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.

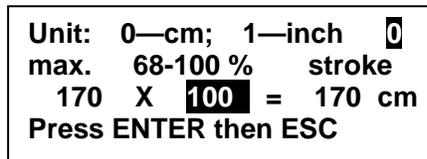
1. After power on, waiting the LCD screen to be the LCD screen 4th, then press **ESC** button to change into system menu. (LCD screen 5th)
2. When 'USER MENU' is high-lighted, press **ENTER** button to enter the sub menu of USER MENU. (LCD screen 6th)



LCD screen 5th



LCD screen 6th



LCD screen 7th

3. Press DIRECTION DOWN button to move to ' **Set of Unit/Stroke**' as in LCD screen 6th.
4. Press ENTER button again to enter the unit and travel distance modification screen. (LCD screen 7th)
5. To change the unit, using 'DIRECTION' UP and DOWN buttons to change the number on the right-up corner. '1' refers to **inch**. '0' refers to **cm**.
6. To change the travel distance, using 'DIRECTION' buttons and 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).

7. Press ENTER to confirm the modification and press ESC to exit this function to upper menu. (LCD screen 6th)
8. Press ESC button twice to get back to LCD display 4th

3.5.2 UNIFORM HEIGHT REFERENCE

After travel distance and unit modification, the screen is back to LCD screen 4th. If press **START** button at this step, the screen change to 8th or 9th.

Mode: II..II		bias: Z__	
L2 0	L4 0	L6 0	
L1 0	L3 0	L5 0	
⊙ Stop!			

LCD screen 8th

or

Mode: II..II		bias: Z__	
L2 0	L4 0	L6 0	
L1 0	L3 0	L5 0	
Reset			

LCD screen 9th

(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.

4.5.3 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 change the screen into LCD screen 11th.
2. Press **UP** button on the column to raise this single wheel to the 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 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 10th)

Mode: II..II		bias: C-_-	
1	2	0	
4	3	0	

LCD screen 10th

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 their 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 9th again.

3.6 ADJUSTING OF THE FORK DISTANCE

The portable lifting columns can be used to lift vehicles with a wheel diameter from 10" to 45". 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.10)
- 4 Make sure that the lock-pin locks into the place.

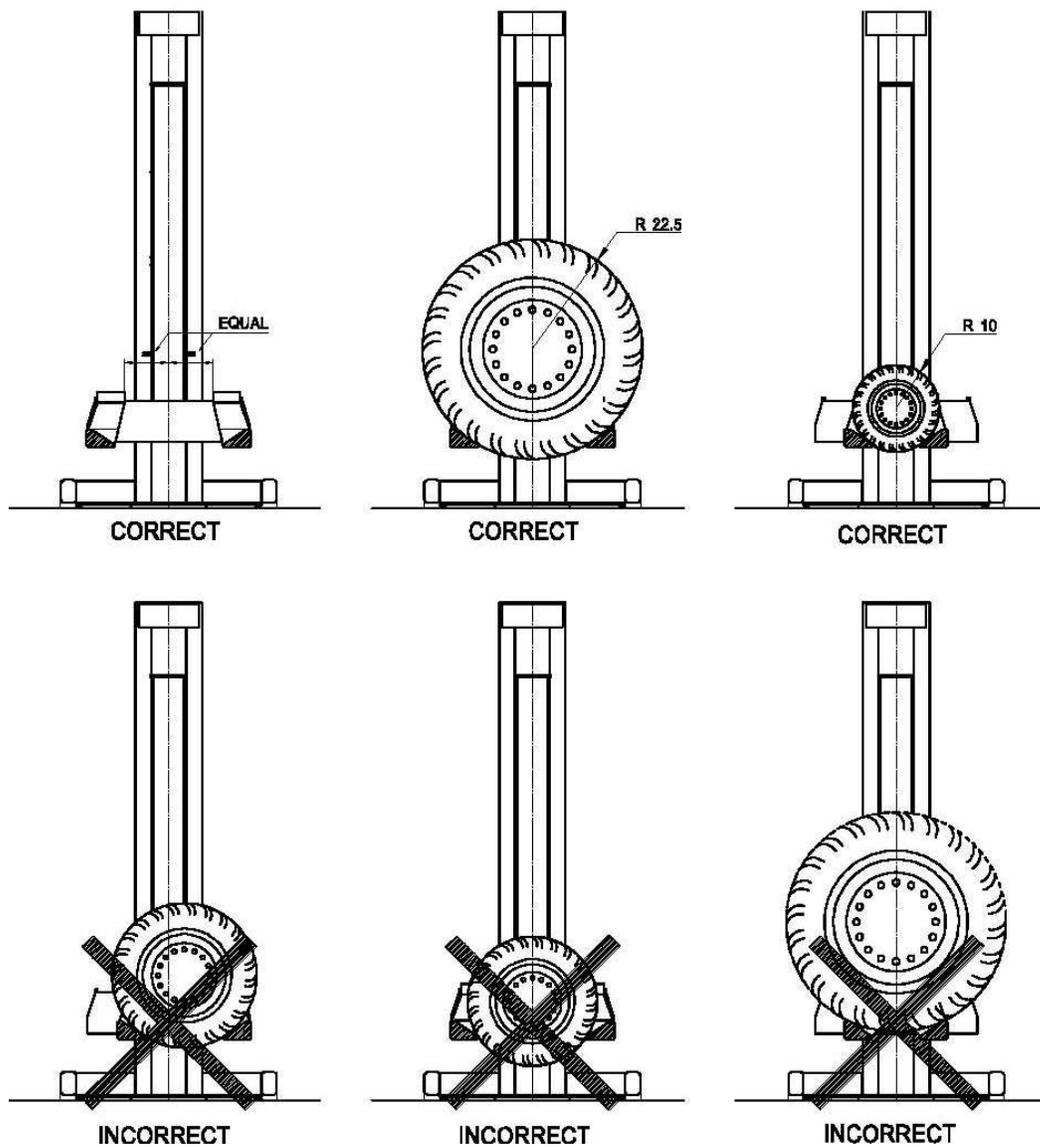


Fig.10 Adjust Forks to fit the Wheel

3.7 OPERATING THE PALLET LIFTING MECHANISM

The pallet jack mechanism is operated by means of the handle bar and the lever inside the bar. (Fig. 11)

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.

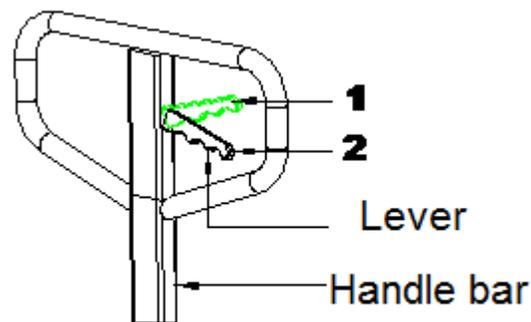


Fig. 11 Pallet Lifting

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.

Note: 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.

4. LIFTING OPERATION

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 Mobile 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.

4.1 PREPARATION & IMPORTANT NOTICE

1. Place all the four of lifting columns around the vehicle as in Fig.8.
2. Ensure that the fork of each lifting column has been adjusted as in Fig.10 correctly
3. Move the columns' forks under the wheel and lower the pallet jack.
4. Make sure that the Emergency Release buttons are unlocked on all the lifting columns.
5. Set all the power switches to left position (ON). (Main column to be the last one)
6. Press button START on the main control box to run the software.
7. Set the mode to be WHEEL / SINGLE.
Press the UP button to raise the fork of the column to touch the tire.
Repeat for other three columns.
8. If necessary, press BIAS to choose customized zero-point.
9. Set the mode to ALL / VEHICLE by pressing MODE button .

4.2 RAISING AND LOWERING ALL 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.

Once desired height has been reached, it is recommended that the lift be lowered into the mechanical locks by pressing PARK button.

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)

4.3 Explanation of message on LCD:

1. Slowing

Mode: II..II	bias: Z__		
L2 11	10	0	
	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	0
4	3	0
2	3	0
Locked by abnormal oper		

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

4.4 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 of that column to stop it.

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

4.5 OTHER MESSAGES EXPLAINING

	MESSAGE	EXPLANATION
1	PLC err, check & repower	<p>a. Communication between master and slave columns failed.(bad cable connection, antenna problem or some PLC lack of power.)</p> <p>b. Some PLC not working</p> <p>Note: must be power off for checking then power on again</p>
2	Encode err, WHEEL/AXLE!	<p>a. Some encoder is not working (not powered, bad wired or in error</p> <p>b. Bad communication(wireless model)</p>
3	Asynch! WHEEL / AXLE mode	<p>a. Too big difference in height reading (>1700mm), caused by over turning</p> <p>b. Some column not move (motor not running, carriage locked)</p> <p>c. Some encoder not turning(belt left the gear)</p>
4	24Vdc insufficient	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.
5	Locked abnormal ope. by	One button is pressed within 2' after previous button is released.
6	Stop !	<p>a. Emergency button is pressed.</p> <p>b. Communication between columns is broken.</p> <p>c. One or more column is power off.</p> <p>d. Within 2 second after button is released.</p>
7	Manual adj.! Max. <5s / time	Manually adjust column height. Maximum single operation for 5 seconds per time..
8	Reset ! xx time xx min.	<p>RESET state: one lift height is below 5 cm when in ALL mode. Lift will be back in ZERO bias.</p> <p>Free movement is possible and pair of column can be added or taken away.</p> <p>Any operation will leave this RESET state.</p>
9	Reach end of travel	One column stops after reaching its height limit. (this column will not raise when lower down)

5. 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. Then press the DOWN button again to lower all the lifting forks to ground.

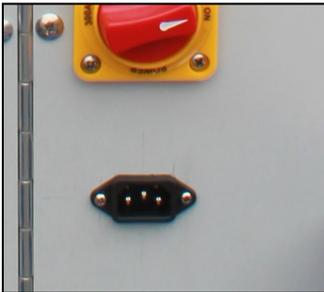
Then turn off the power switches to middle position (OFF).

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

5.1 CHARGING BATTERIES

After one day's operation or the battery indicator shows the voltage is low, it is suggested to charge the batteries. Different batteries need different charging time. Please refer to the specification of the battery provided by its manufacturer.

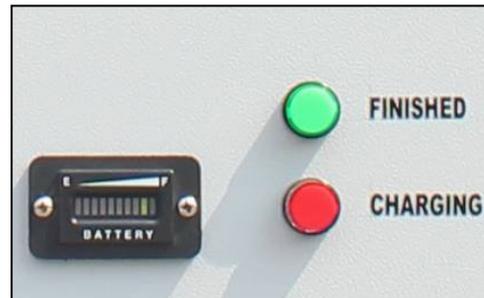
- Move the columns near the AC power supply ports on the wall.
- Connect the charger cable to the AC power supply. (Fig. 12)
- Turn the power switch to the right position (CHARGE) on each column.
- While charging, the red CHARGING indicator will be lighted. After the batteries are fully charged (about 10 hours), the green FINISH indicator will be on and red indicator will go off.



Battery Charger Socket



Switch
Fig. 12



Charger Indicator

6. 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.

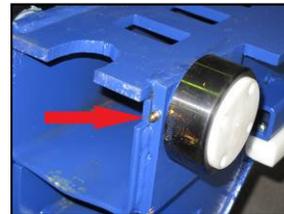
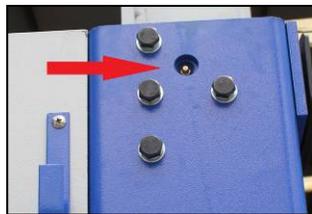
The power switch should be turned on again only for the adjustments and checks that require it.

6.1 DAILY (BY OPERATOR)

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

6.2 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.



- Check the batteries.

6.3 YEARLY (BY OPERATOR)

-Clear the filter/mesh of the electro-magnet valve pin on the motor pump.
(Refer to special steps provided following)

- Change the hydraulic oil every two years.



6.4 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.

6.5 CHANGE OIL

- Change the oil.

- (1) Lower the lift completely to floor.
- (2) Remove the oil from the tank.
- (3) Refill with approximately 10.5 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.

7. 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 (only possible after the tank has been empty).	Select single wheel mode and press the ↑ (UP) button until the lifting column rises (max. 1 minute).
	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.

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.

8. 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 6th
4. Press ENTER button .
5. In this screen, the numbers on bottom line is the zero height code of each column. If any one is not between 1 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 1 and 7 is acceptable.
8. Put on the strip again. Check again the readings. If OK, close the upper cover .

USER MENU
OPERATOR MENU
DIAGNOSTICS MENU
RELEASE PASSWORD

LCD screen 5th

Operation Prompts
Encoder Alignment
Set of Unit / Travel

LCD screen 6th

1. Forks move onto floor
2. Readings must be 3, 5 ,7 or 1
mm : 3 5 1
C-wise + 1 1 3

LCD screen 14th

9. CHANGE THE NUMBER OF COLUMNS

Normally the mobile column lift set is working with four columns. But it can work only with two columns (only 1# and 2# column) .

To take away columns (4→2), please do as following.

Step 1

Lower down all the columns to ground till '**RESET!**' appears on the screen.

Step 2

Turn off the power switch of each control units.

Step 3

Disconnect the cable between column 1#--3#, 2#--4#.

Step 4

Turn on the power switch of the control unit on desired columns (2# and 1#) again.

Step 5

After self-check, now the system is working with only two columns.

To add columns (2→4), do above steps except in Step 3 is to connect the cables from 1#--3#, 2#--4# and in Step 4 turn on all the power switches on columns.

NOTE:

To lower down all columns to ground and to wait for **RESET! APPEAR ON THE SCREEN** is necessary.

10. HAND-CONTROLLER (Optional)

As an option, the column lifts has one hand controller for every set. (Fig. 11)
The hand controller has one EMERGENCY 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.
The buttons will serve the same function as the buttons on control box. (Fig. 11)

11. BATTERY CHARGER INFORMATON

11.1 Technical Specifications

1. Input voltage: 100-120 VAC, 60Hz
2. Input power: 230W ((Max)
3. Output voltage: 24VDC (Grading adaptive)
4. Output current: Max 15A
5. Charge time: 9-11 hours (battery was discharged deeply 80%)
6. Size: 200*150*60 mm
7. Weight: 850g

11.2 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



11.3 LED Performance Indicator on the charger

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.

12. BATTERY REQUIREMENT INFORMATION

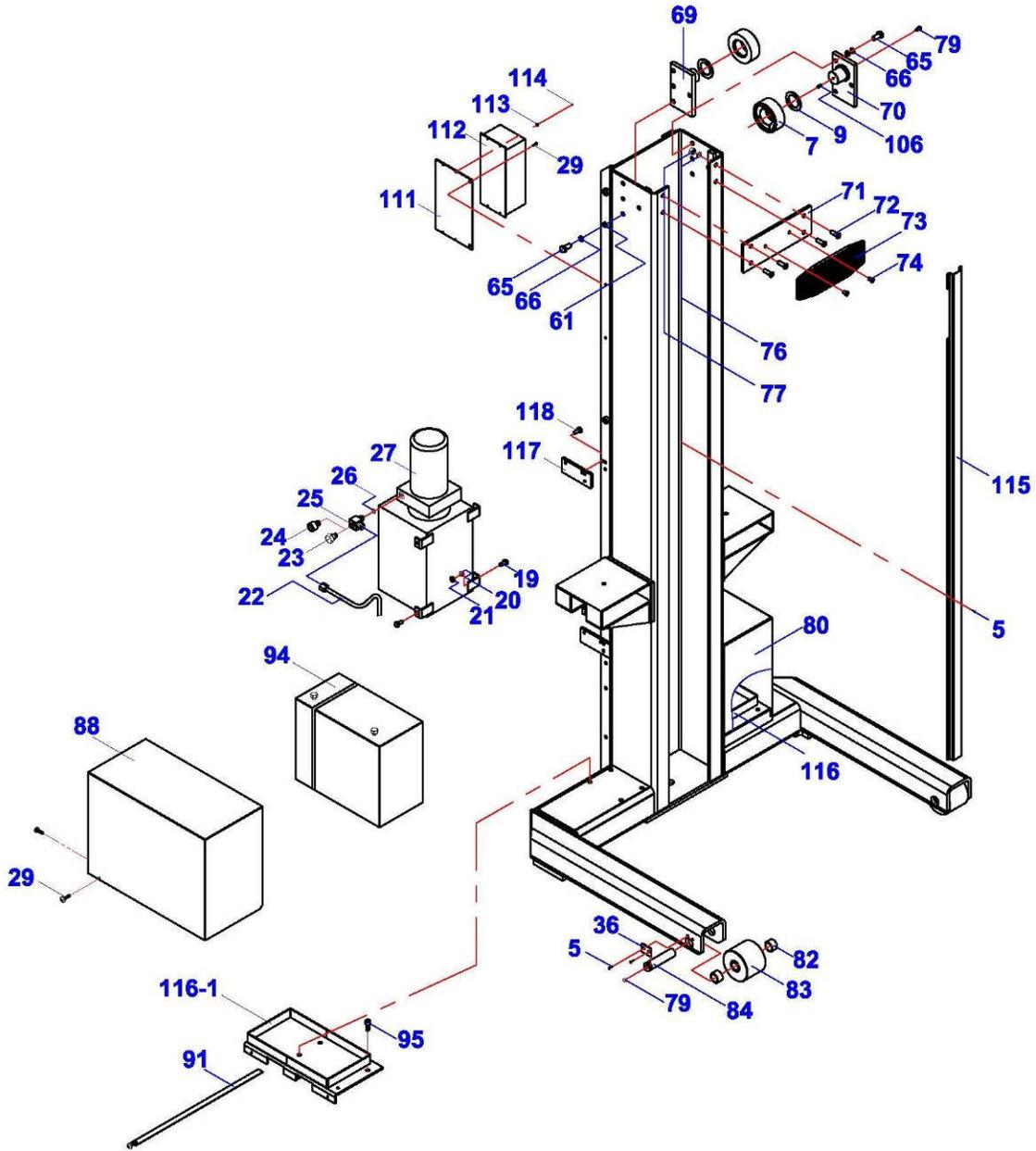
Battery Quantity:	2ea per Column - (Not included with MSC-13K-B)
Battery Dimension:	13" L x 7" W x 12" H
Battery Cover Size:	15" L x 8" W x 14" H
Battery Type:	Deep Cycle Batteries, 12VDC
Battery Rating:	120 AMP / HR
Battery Start Current:	350 CCA - 500 CCA

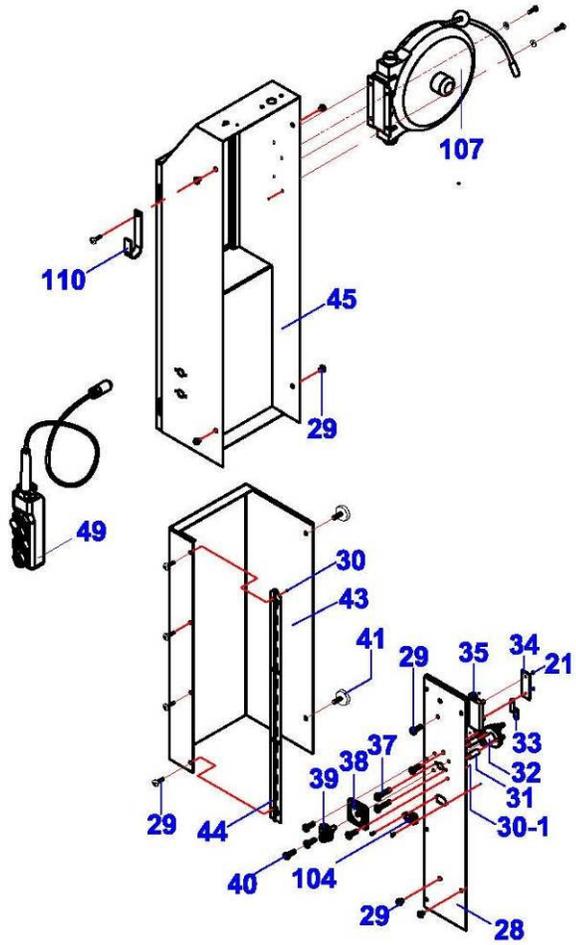
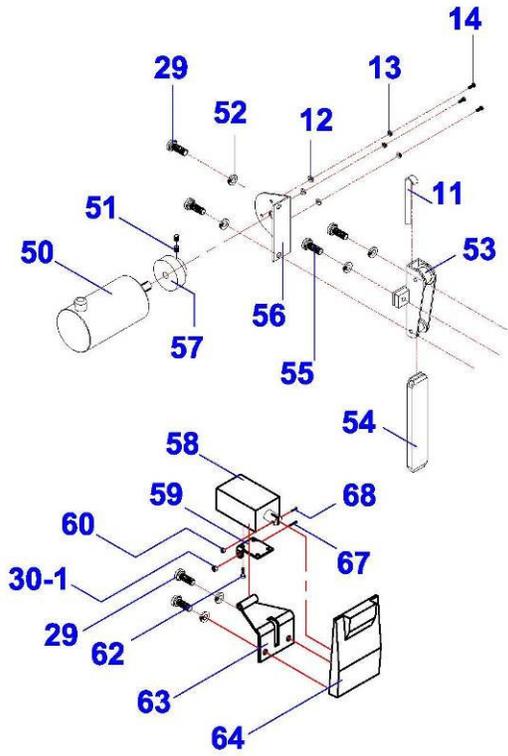
Suggestions:

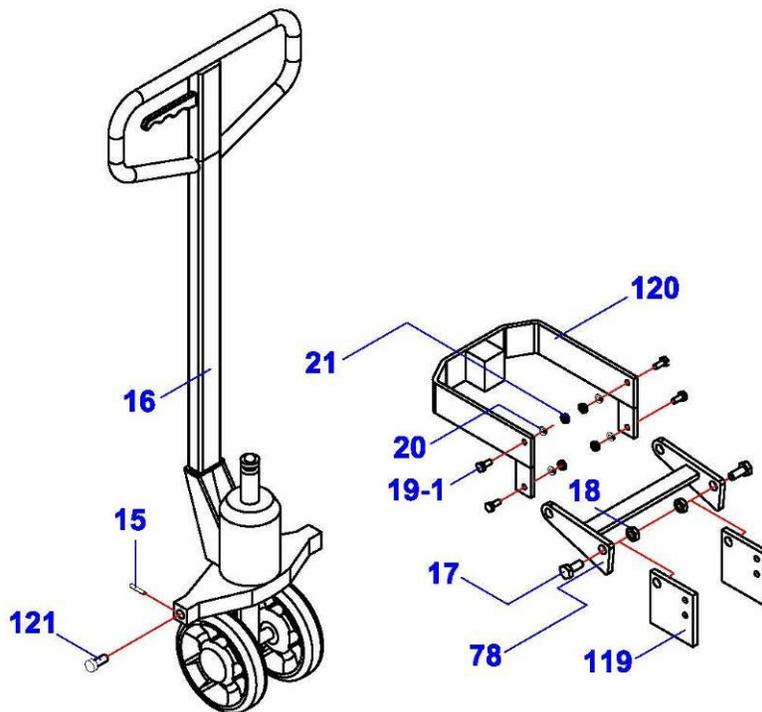
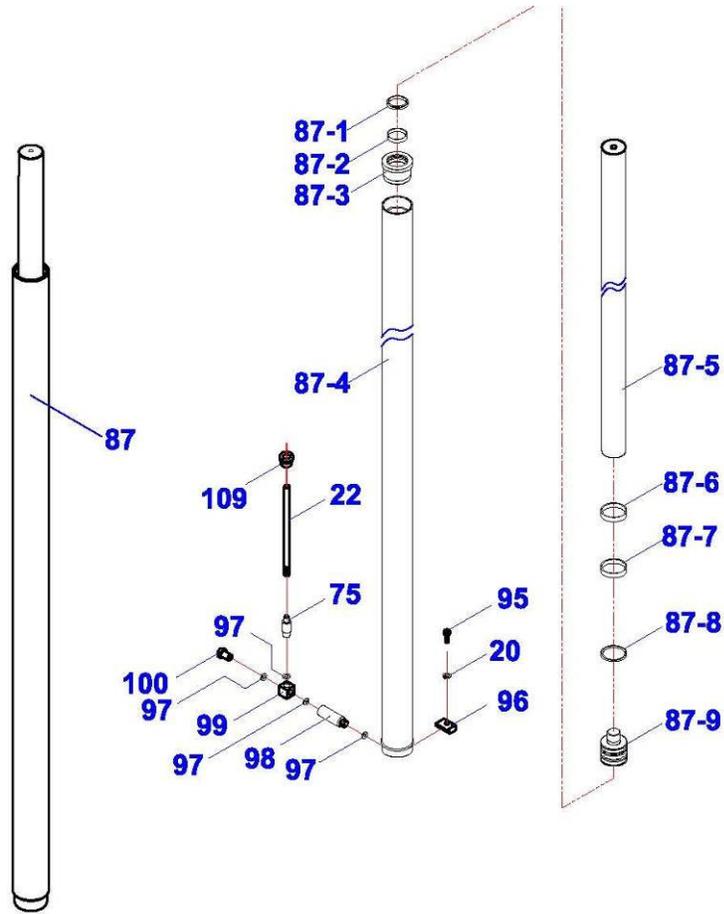
1. When "**Low voltage on**" or "**Voltage deficient**" is on the screen, lower down the vehicle, shut off the lift, then charge the batteries at once. Continue to use the batteries will short the life of batteries.
2. Charge the batteries immediately after the job is finished. This will help to prolong 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







MSC-13K Column Assembly Parts List

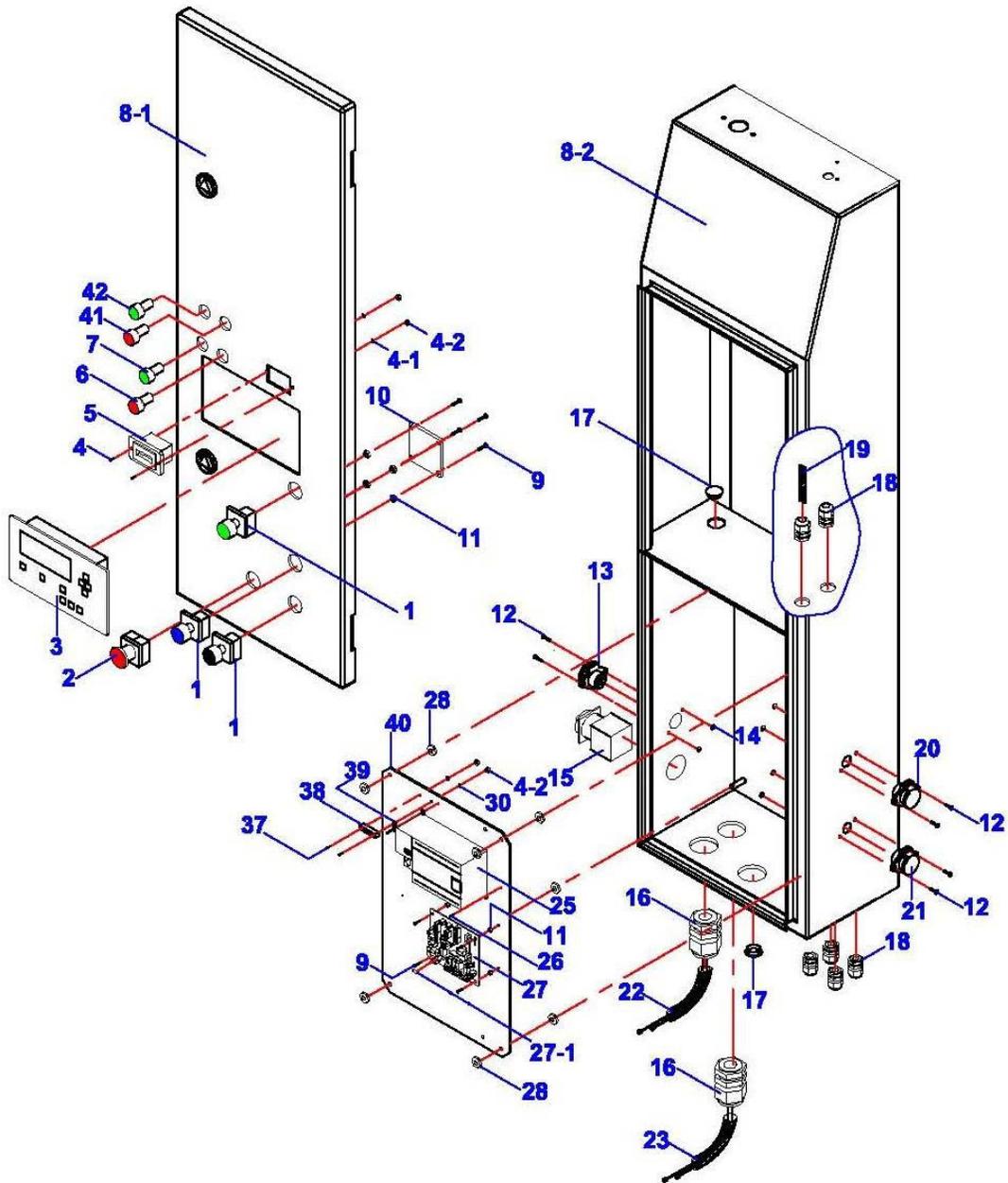
ITEM	M-CODE	DESCRIPTION	QTY
1	DJ03-02000-000	carriage	1
2	5102-12035-000	bolt	2
3	5202-00012-000	nut	2
4	DJ03-04000-000	right fork	1
5	5114-05014-000	screw	12
7	DJ02-02200-000	roller	4
9	DJ02-02004-000	washer	4
10	DJ02-00021-000	plate	1
11	DJ02-00017-000	teeth belt	1
12	5302-00004-000	flat washer	5
13	5306-00004-000	spring washer	5
14	5110-04010-000	screw	7
15	5402-05030-000	cotter pin	2
16	DJ01-15000-100	pallet lifter	1
17	5102-16035-000	bolt	2
18	5202-00016-000	nut	2
19	5102-08020-000	bolt	8
19-1	5102-08025-000	nut	4
20	5302-00008-000	flat washer	8
21	5202-00008-000	nut	12
22	DJ02-12000-000	hose	1
23	SJ03-14005-000	closer	1
24	SJ03-14002-000	quick fitting	1
25	SJ03-14001-000	T-connector	1
26	5901-00118-000	O-ring	1
27	DBZ22A-00	motor pump	1
28	DJ03-12001-000	side board	1
29	5115-06012-000	screw	35
30	5202-00006-000	lock nut	14
30-1	5202-00005-000	lock nut	5
31	DJ02-00006-A00	switch positioner	2
32	BZ22-05503-000	battery switch	1
33	BZ22-05516-000	copper bar	1
34	BZ22-05515-000	fuse	1
35	BZ22-05514-000	fuse box	1
36	SL01-00047-A00	position board	2
37	5110-06045-000	screw	2
38	DJ02-00017-A00	switch panel	1
39	DJ02-00018-A00	switch tuner	1
40	5110-05014-000	screw	4
41	5116-06012-000	hand screw	2

ITEM	M-CODE	DESCRIPTION	QTY
43	DJ03-12100-000	cover	1
44	DJ03-12002-000	hinge	1
45	QK05AS-00	control box	1
49	DJ020S-FJ4	hand controller	1
50	DJ02-00016-000	encoder	1
51	5306-04005-000	threaded pin	2
52	5306-00006-000	spring washer	6
53	DJ02-11000-000	roller frame	1
54	DJ02-00018-000	weight	1
55	5110-06020-000	screw	3
56	DJ02-00015-000	fixing frame	1
57	DJ02-00019-000	gear	1
58	DJ02-00006-000	electro-magnet	1
59	DJ02-00004-000	magnet board	1
60	5202-00004-000	lock nut	1
61	5302-00012-000	flat washer	8
62	5107-03010-000	screw	4
63	DJ03-07000-000	fixing frame	1
64	DJ03-06000-000	safety lock	1
65	5102-12025-000	bolt	8
66	5306-00012-000	spring washer	8
67	5102-05040-000	bolt	1
68	5110-04020-000	screw	1
69	DJ03-09000-000	roller (right)	1
70	DJ03-08000-000	roller (left)	1
71	DJ03-00003-000	connecting board	1
72	5114-10030-000	screw	4
73	SJ06-00004-000	rubber pad	1
74	5114-10020-000	screw	2
75	DJ02-09000-000	throttle valve	1
76	5302-00010-000	flat washer	4
77	5202-00010-000	lock nut	4
78	DJ03-11000-000	connecting frame	1
79	JP02-00007-000	nipple	6
80	DJ02-00002-A00	battery cover (left)	1
81	5102-10030-000	bolt	2
82	5603-30030-000	oil less bearing	4
83	DJ03-00001-000	roller	2
84	DJ03-00002-000	roller pin	2
85	DJ03-03000-000	left foot	1

ITEM	M-CODE	DESCRIPTION	QTY
87	DJ03-05000-000	cylinder	1
87-1	5906-00060-000	dust ring	1
87-2	DJ03-05003-000	guide belt (1#)	1
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 sleeve	1
87-7	DJ02-05005-000	guide ring (2#)	1
87-8	5903-00060-000	seal ring	1
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	screw	9
96	DJ03-00015-000	cylinder fixing board	1
97	DJ02-05007-000	combined washer	4
98	DJ03-05004-000	oil connector	1
99	DJ02-05010-000	turning connector	1
100	DJ02-05011-000	oil screw	1
101	DJ02-00011-000	pin	2
102	DJ02-00010-000	key ring	4
103	DJ02-05008-000	chain	2
104	SL02-00041-A00	power supply port	1
105	DJ03-00009-000	slider	2
105-1	DJ03-00011-000	shim	4
106	5109-08008-000	threaded pin	4
107	QK04-00006-000	cable reel	1
109	DJ02-00030-000	rubber ring	1
110	DJ02-00034-000	hook	1
111	DJ03-00012-B00	charger board	1
112	BZ22-05509-000	charger	1
113	5302-00003-000	flat washer	4
114	5110-03010-000	screw	4
115	DJ03-00007-000	guide slot	1
116	DJ03-19000-B00	battery base(left)	1
116-1	DJ03-20000-B00	battery base(right)	1
117	DJ03-01004-000		2

ITEM	M-CODE	DESCRIPTION	QTY
118	5102-08014-000	bolt	4
119	DJ03-00004-000	connecting board	2
120	DJ03-10000-000	frame	1
118	5102-08014-000	bolt	4
119	DJ03-00004-000	connecting board	2
120	DJ03-10000-000	frame	1
121	DJ03-00005-000	pin	2
122	DJ03-00013-000	cover	1

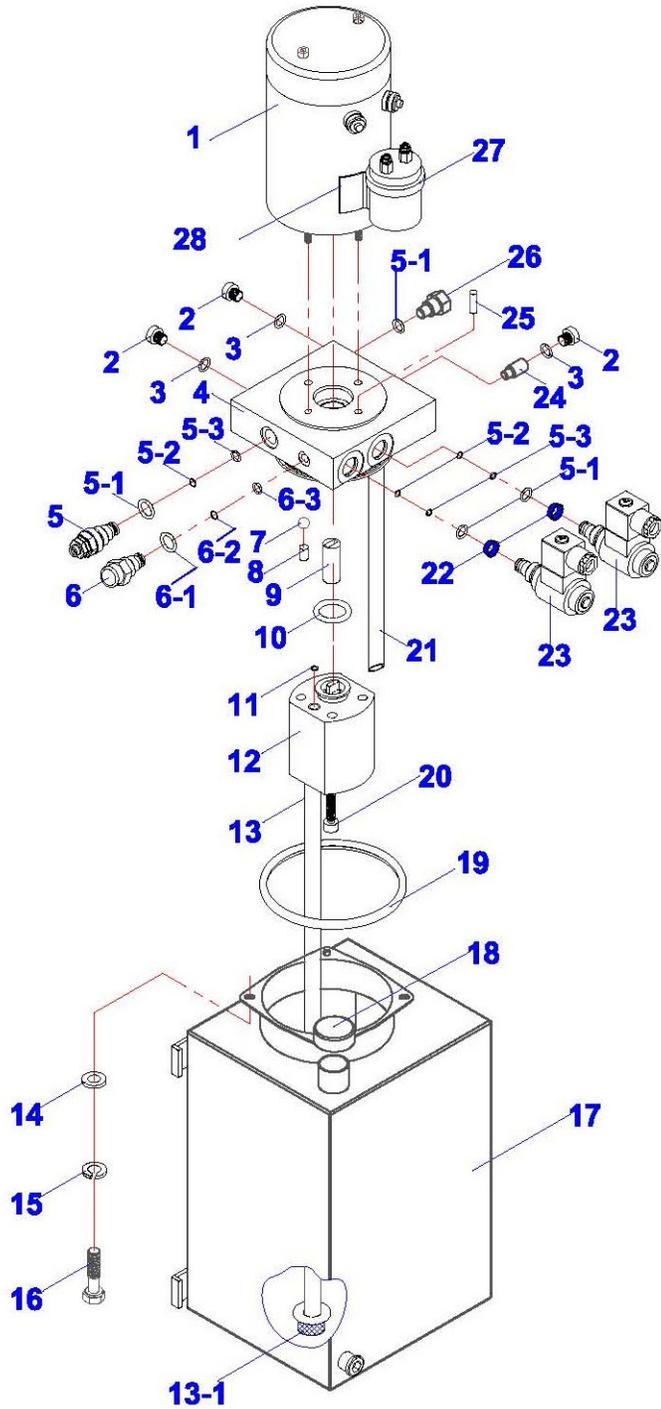
MSC-13K Control Panel Assembly



MSC-13K Control Panel Parts List

ITEM	M-CODE	DESCRIPTION	QTY
1	DJ02-20002-000	button	3
2	DJ02-20003-000	emergency button	1
3	DJ02-20010-000	screen	1
4	5110-00004-000	screw	2
4-1	5203-00004-000	spring washer	2
4-2	5202-00004-000	nut	4
5	QK04-00012-000	battery indicator	1
6	DJ02-20006-000	red lamp	
7	DJ02-20005-000	green lamp	1
8-1	DJ03-13001-000	panel (main station)	1
8-2	DJ03-13100-000	body	1
9	5110-03008-000	bolt	12
10	QK02-20200-L60	connection board	1
11	QK02-10013-000	separator	8
12	5110-03015-000	screw	6
13	QK06-50700-000	communication cable	3
14	5202-00003-000	nut	6
15	DJ04-20001-100	power switch	1
16	DT01-06023-000	cable nut	2
17	QK04-00011-000	cover	2
18	JK01-00003-000	cable nut	6
19	DJ02-00200-000	electro-magnet cable	1
20	QK04-50800-000	communication cable	1
21	QK02-50900-000	remote controller cable	1
22	QK04-30300-000	charger cable	1
23	QK04-30100-000	power supply cable	1
25	DJ02-10002-000	PLC	1
26	DJ02-10032-000	screw	2
27	QK04-13300-MZ1	PCB	1
27-1	JK01-10113-100	fuse	1
28	5202-00006-000	nut	8
30	5301-00005-000	flat washer	2
37	5110-04004-000	screw	2
38	JK01-10010-000	ground terminal	1
39	JK01-JD000-000	ground label	1
40	QK06-10001-100	bottom board	1
41	QK05-20006-H00	red changing lamp	1
42	QK05-20005-H00	green charging lamp	1

MSC-13K Power Unit Assembly



MSC-13K Power Unit Parts List

3.

ITEM	M-CODE	DESCRIPTION	QTY
1	BZ22-05001-000	DC motor	1
2	BZ01-04008-000	closer	3
3	5901-00118-000	O-ring	3
4	BZ22-04001-000	valve block	1
5	BZ20-04002-000	over-flow valve	1
5-1	5901-00160-000	O-ring	4
5-2	5901-00125-000	Circlips	3
5-3	5901-00095-000	O-ring	3
6	BZ20-04024-100	main compensating valve	1
6-1	5901-00190-000	O-ring	1
6-2	5901-00130-000	Circlips	1
6-3	5901-00130-000	O-ring	1
7	5601-00800-000	ball	1
8	5109-10010-000	threaded pin	1
9	BZ22-00003-000	joint	1
10	5901-00277-000	O-ring	1
11	5901-00925-000	O-ring	1
12	BZ01-03000-000	gear pump	1
13	BZ20-01000-000	sucking pipe	1
13-1	BZ01-01002-000	mesh	1
14	5301-00006-000	flat washer	4
15	5303-00006-000	spring washer	4
16	5101-06012-000	bolt	4
17	BZ22-02100-A00	11L tank	1
18	BZ20-02200-000	tank cover	1
19	5901-01120-000	O-ring	1
20	5105-08080-000	screw	2
21	BZ20-00001-000	return pipe	2
22	BZ01-04011-000	mesh	2
23	BZ13-04100-000	release valve	2
24	BZ20-04026-000	sub compensating valve	1
25	5402-05010-000	cotter pin	2
26	BZ20-04007-000	single-way valve	1
27	BZ22-05002-000	contactor	1
28	BZ22-05003-000	frame	1

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.

1905 N Main St Suite C, Cleburne, TX 76033
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