



# **Mobile Column Lift Set**

**Capacity 8200kg (18000Lbs)/ Each Column**

**Item No. 167219B**

**Service Manual**



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## 1. PRE-CHECKING

Before any trying to solve the error occurred, check the following first:

a) Check the battery voltage.

If it is under 21.6V (battery indicator [22] is yellow or red) , charge the battery first .

b) The columns shall be in pairs (1#--2#, 3#--4#).

Columns in odd number, or be exchanged will cause error.

c) Adding or taking away columns shall be operated only when all the lifting forks on ground (in **RESET** status) and always in pairs.

d) Position the columns correctly

Pair of columns shall be on same axle of the vehicle.

e) Release every EMERGENCY button on each column.

f) While turning on the power switches, the control box switch of main column (1#) shall be the last one.

g) The vehicle loaded shall not exceed the capacity of each column (7.5 ton)

*If the error is still there after checking, please try to solve it referring with the trouble –shooting and examples in next chapter.*

## 2. 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, referring to lubricating instructions.
	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 min.).
	Safety valve not properly adjusted	Have valve adjusted. Contact service people 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 error occurs again, contact the service people.
	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 error occurs again, contact the service people.
Column Does not Lower	Catching pawl not disengaged from locking system.	Raise column approximately 2" and then lower. (Battery shall be charged fully first)
	The elec.-magnetic lowering valve on the hydraulic unit does not open.	No power for solenoid or lowering valve is faulty. Contact the service people.
	Dirty lowering valve.	Have the valve cleaned or replaced by service people.
	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 error occurs again, contact the service department.
	The anti-explosion valve blocked	Release the nut connecting from pipe to cylinder a little to leak some oil. Then raise the lift again.
Column Lowers by itself.	The cylinder seal is damaged, oil leaks continually.	Have seals or cylinder replaced by service people.
	Leaks in the oil line couplings.	Tighten couplings and coupling nuts.
	Dirty or damaged non-return valve.	Clean or replace the valve by the service people.
	Dirty or damaged lowering or correction valve.	Clean or replace the valves by the service people.

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.
Height Reading not Zero	Sensor zero point not correct	Do encoder alignment
No Control Power	Fuse blown.	Check and replace the fuse. 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 to OFF and ON again to re-start.

FAULT	POSSIBLE CASE	REMEDY
No Power ( Indicator is off)	Battery power switch is off.	Turn the switch on
	Main fuse blown.	Replace fuse.
	Main switch OFF.	Set power switch ON.

### Some error samples

1. All lifting forks are on ground but at least one reading is around 180. Press **UP** buttons without responds (not moving).

Reason:

The zero position of that 180 reading encoder is not correct.

The PLC considers the height difference is too much to block the movement.

Solution:

Do the **encoder alignment** as described in next chapter.

2. *While raising or lowering, one column keeps moving but others stop.*

Reason:

The teeth belt on that column is away from the encoder.

The height / encoder data is not changing while moving.

Solution:

Open the upper cover. Turn the encoder so that the reading is almost same as the actual height. Then put the belt on the encoder. Choose SINGLE/WHEEL to lower or to raise that column to the same height of the others. Choose ALL to lower down to ground. Do ENCODE ALIGNMENT again.

3. *While the columns are on top position, press DOWN button not moving.*

Reason:

At least one column height reading is around 0/zero.

The PLC considers the height difference is too much to block the movement.

Solution:

Open the upper cover. Turn the encoder so that the reading is almost same as the actual height (about 170). Then put the belt on the encoder. Choose SINGLE/WHEEL to lower or to raise that column to the same height of the others. Choose ALL to lower down to ground. Do ENCODE ALIGNMENT again.

4. *Height readings are OK but UP or DOWN buttons no response.*

Reason:

The small antenna circle is broken.

The PLC considers the emergency button is pressed.

Solution:

1) Open the control box cover.

2) In sequence 1#--2#--3#--4#, press UP button to check the I0.0 on PLC. If I 0.0 is ON, the small antenna or the emitter of this column or of previous column is in error.

3) Change part in error with a new one.

NOTE:

1) In new version, there is a small green LED on the elec. Board.

If the green LED is not lighted, there must be the error.

2) In newest version, there is another red LED on the elec. board also.

If the red LED is not lighted, the small emitter is in error.

5. *Pressing UP button on one column, the motor runs a few then stop. The fork does not rise up. Pressing other UP button on other columns, all columns can rise up normally.*

Reason: The battery on that column in error is less charged or almost used up.

Solution:

Charge the battery fully.

If error repeats, check the connecting cables of the batteries. If still exists the error, change the pair of battery with new ones.

### 3. 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 5<sup>th</sup>)
3. Press DIRECT down button [8] to choose ENCODER ALIGNMENT. See LCD screen 13<sup>th</sup>
4. Press ENTER button [17].
5. In this screen, the numbers on bottom line is the zero height code of each column. If anyone is not between 3 and 7, adjustment shall be done. LCD screen 14<sup>th</sup>.
6. To adjust, please open the upper cover on the column. Then separate the strip from the gear of the sensor. (Fig. 3-1)
7. Turn the gear to increase or decrease the reading on the corresponding column. The best value is 5. Value between 3 and 7 is acceptable.
8. Put on the strip again. Check again the readings. If OK, put back the upper cover .

**USER MENU**  
OPERATOR MENU  
DIAGNOSTICS MENU  
RELEASE PASSWORD

LCD screen 5<sup>th</sup>

Set of Unit  
Special Terms  
Operation Prompts  
**Encoder Alignment**

LCD screen 13<sup>th</sup>

1. Forks move onto floor  
2. Readings must be 3, 5 or  
1 mm:    3    5    1  
             1    1    3

LCD screen 14<sup>th</sup>



Fig. 3-1

#### 4. MANUALLY LOWER DOWN THE COLUMNS

If under some situation, the lifts need EMERGENCY (no power / battery) lowering, please do following steps carefully.

##### A. EMPTY COLUMNS TO LOWER DOWN

1. Take off the covers of the column (Fig 4-1)
2. Screw off the tap on the T-connector.(Fig 4-2a, 4-2b)



Fig 4-1

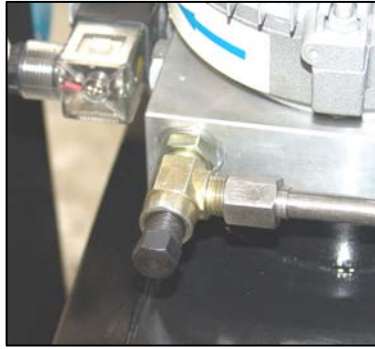


Fig. 4-2a



Fig. 4-2b

3. Put on the oil quick connector.(Fig.4-3)
4. Connect the hose to the hand pump(Fig. 4-4a,4-4b,4-4c)

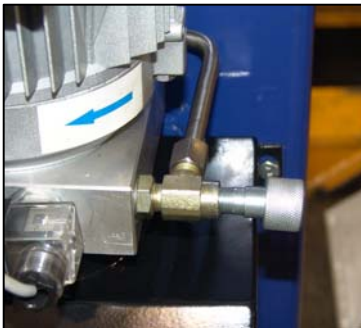


Fig 4-3

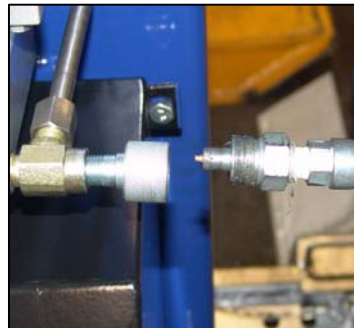


Fig.4-4a

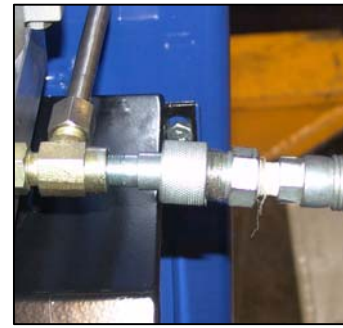


Fig. 4-4b



Fig 4-4c



Fig.4-5a



Fig. 4-5b



5. Take off the elec. coil of the valve.( Fig. 4-5a, 4-5b)
6. Lift up the carriage a little ( 1/8 ") by hand pumping (Fig 4-6a, 4-6b)
7. Pull back the lock-tongue by hand ( Fig 4-7)

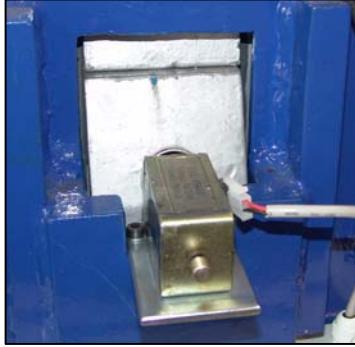


Fig. 4-6a



Fig.4-6b



Fig.4-7

8. Put the magnet on the pin of the BALANCE valve ( right one) ( Fig. 4-8)



Fig. 4-8

9. The carriage will lower down slowly.
10. As soon as the magnet is pulled out, the carriage will stop.
11. Repeat the above steps for other columns.

## B. COLUMNS WITH VEHICLE TO LOWER DOWN

Because the vehicle is heavy, it is better to rest the vehicle on the safety jack stands then to pull out the columns for maintenance.

1. Put the safety jack stands under the vehicle. (Fig. 4-9a & 4-9b)
2. Do the steps 1-9 in above part A to one column.
3. After the vehicle is rest on that jack stand, pull out the magnet.
4. Do the steps 1-9 in above A again to the another column which is opposite to the first column ( same axle of the vehicle)
5. Pull out magnet after the vehicle is rest on the jack stand.
6. Repeat steps to other columns until the vehicle is totally rest on the stands.
7. Then lower all the columns in the way of above part A.



Fig. 4-9a



Fig. 4-9b

**SUGGESTION:**

1. It is important that keep the vehicle in a upright position ( not inclined)
2. It is important to lower the vehicle one axle by another axle within height difference of 2")
3. It is better to lower the vehicle one column by another within height difference of 2")
4. If the T-connector is not there (in old model), the connector shall be changed first.



Fig. 4-10a (w/o T-connector)

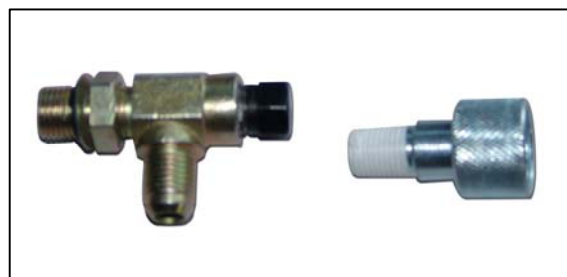


Fig. 4-10b quick connector & T-connector

## 5. CHANGE CYLINDER OF THE COLUMN

1. Take off the covers on the column (Fig. 5-1)
2. Take off the hose holder also.(Fig. 5-2a, 5-2b)



Fig 5-1



Fig.5-2a



Fig. 5-2b

3. Loose the lower end nut on the oil pipe.(Fig.5-3)
4. Loose the other end of the pipe (Fig. 5-4a)
5. Take off the pipe.(Fig. 5-4b)



Fig.5-3



Fig.5-4b



Fig. 5-4b

6. Take off the wheel guide of the teeth cable.( Fig. 7-5a, 7-5b)

7. Pull out the moving end of teeth cable.



Fig. 5-5a



Fig. 5-5b



Fig. 5-6

8. Screw off the bolt on the top of the carriage. (Fig. 5-6)  
9. Lift up the carriage by a forklift (Fig 5-7a, 5-7b)  
10. While lifting, pull the teeth cable by hand ( Fig 5-8)



Fig 5-7a



Fig.5-7b



Fig.5-8

11. Rest the carriage on the lock ( Fig. 5-9)  
12. Move the cylinder backwards. ( Fig 5-10)  
13. Screw off the pipe connector ( Fig. 5-11)

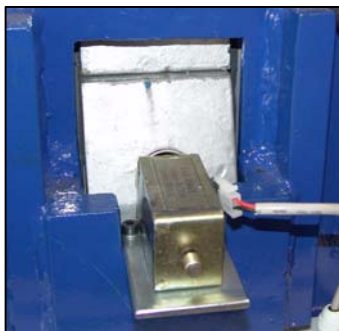


Fig. 5-9



Fig. 5-10

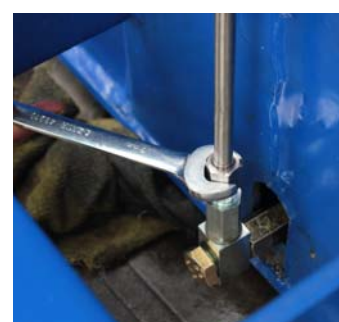


Fig. 5-11



14. Screw off the extension pipe also ( Fig. 5-12a ,b)



Fig. 5-12a



Fig. 5-12b

15. Pull out the lower end of the cylinder. (Fig 5-13).



Fig. 5-13



Fig. 5-14

16. Using the forklift to lift up the cylinder (Fig. 5-14)
17. Put down the cylinder.
18. Change it with the new cylinder.
19. Back up all the steps above.

**NOTE :**

In re-installing, it is necessary to lift up the carriage a little in order to pull back the lock-tongue by hand. And while lowering, the lock-tongue is kept pulling back. The teeth cable shall be carefully put through the wheel guide and the carriage.

## 6. CHANGE THE BEARING OF THE ROLLER

1. Open the upper cover of the column.(Fig. 6-1)



Fig. 6-1



Fig. 6-2

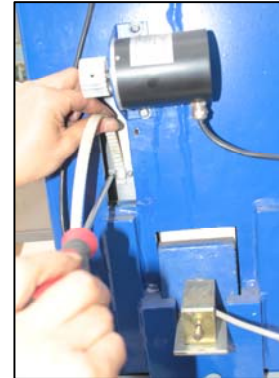


Fig. 6-3

2. Take off the wheel guide of the teeth cable. (Fig. 6-2)



Fig. 6-4



Fig. 6-5

3. Pull out the teeth cable. (Fig. 6-3)
4. Screw off the bolt on the top of the carriage. (Fig. 6-4)
5. Take away the limit bar on the top of the column.(Fig. 6-5)
6. Lift up the carriage by a forklift. (Fig. 6-6)
7. Take out the carriage totally then sit it on ground.



Fig. 6-6



Fig. 6-7



Fig. 6-8

8. Take off the four rollers by hand. (Fig. 6-7)
9. Screw off the plastic rubber plate. (Fig. 6-8)
10. Take out the worn bearing. (Fig. 6-9)



Fig. 6-9



Fig. 6-10

11. Put a new bearing into the roller. (Fig. 6-10)
12. Screw on the plastic rubber plate.
13. Put on the roller on its shaft again.
14. Grease the rubber plate.
15. Do the same for other three rollers
16. Lift the carriage up then put it back into the column.
17. Put everything back into its position.
18. Do above steps for other carriages.