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Instruction Manual

Heavy Duty Static Scissor Tables

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GENERAL

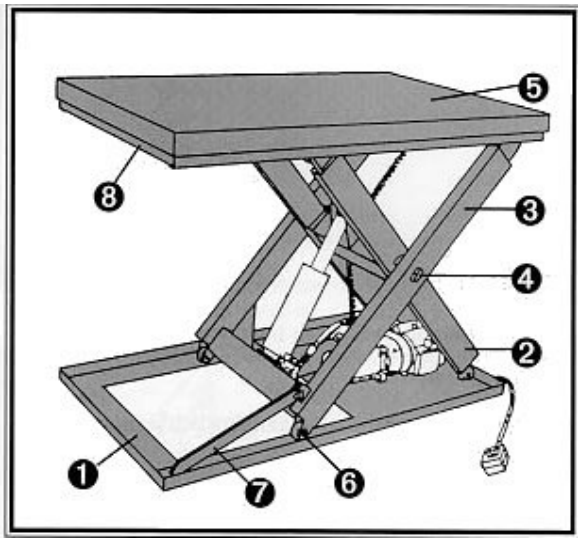
The “ELEVATION” lifting table is an electro hydraulic lifting table for materials handling. The lifting
table can be included as an important component in a modern materials handling system or consist of an autonomous unit at a workplace.
Correctly positioned it increases the production flow and rationalises materials handling. The “ELEVATION” lifting tables are available for the most diverse applications, loads and dimensions.
The “ELEVATION” lifting tables comply with the safety regulations as per 950101 Council directive
89/392/EEC, Council directive 73/23/EEC.

DESIGN

The lifting table is of the single tabletop type. It is used during pallet handling in order to level out minor differences in height. The lifting table is available with one or two cylinders.
The design of the lifting table can be described according to the following divisions:
* Mechanical construction
* Hydraulic system (see page 6)
* Electrical system (see page 6)

Mechanical construction

The base frame (1) should be securely anchored to the floor or recessed in a pit. This ensures the prerequisite for stable and reliable working conditions.
The inner and outer supports (2 and 3) are connected with a shaft housed in a sliding bearing (4). The inner support is in fixed connection at the bottom edge to the base frame with a shaft housed in a sliding bearing, while the top edge supports the table top (5) via a roller housed in a sliding bearing.
The outer support is in fixed connection with the table at the top edge with a shaft housed in a sliding bearing. At the bottom end the support runs along the base frame by means of a roller housed in a sliding bearing (6).
This construction with roller at one end and anchorage at the other end ensures that a stable contact is always guarantied as the lifting height is changed.
During adjustment and repair work the support legs must be secured by means of the locking piece (7).
The table is surrounded by a pinch protection (8) for safety reasons.
”



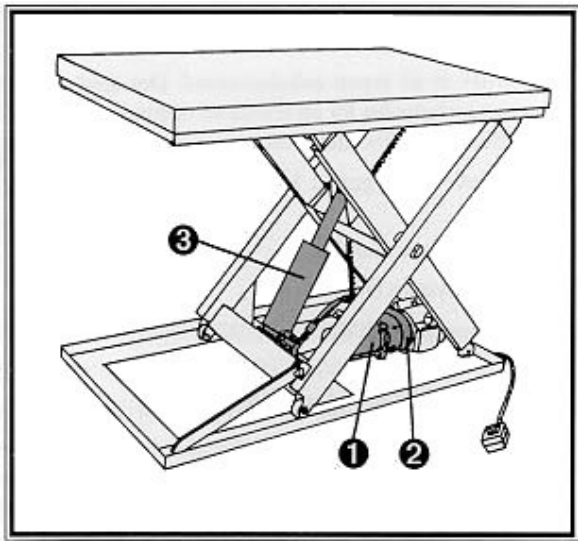
ELEVATION” lifting table, mechanical design.

The mechanical design consists of the following main parts:
1 Base frame
2 Inner support
3 Outer support
4 Shaft housed in sliding bearing
5 Table top
6 Roller housed in sliding bearing
7 Locking piece
8 Pinch protection

Hydraulic system

The hydraulic system consists of the following main parts:
* Hydraulic tank with return oil filter (1)
* Hydraulic pump (2)
* Hydraulic cylinder (3)

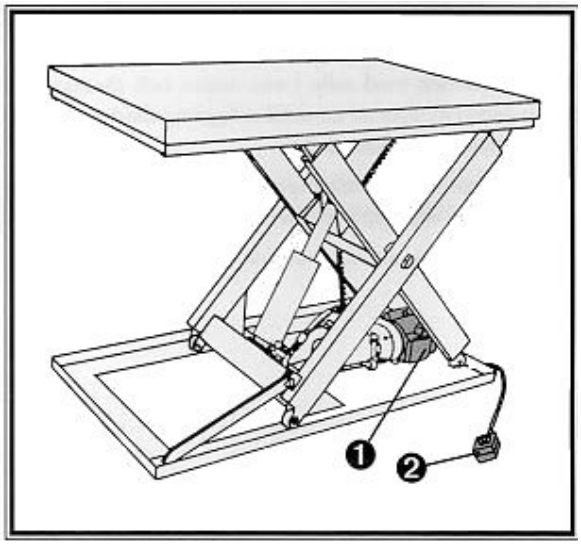
There are also a number of valves such as an overflow valve, non return valve and a pipe burst valve. Between all these components the hydraulic oil is transported in a hydraulic hose.



Components in the hydraulic system.

Electrical system

The electrical system consists of the following main parts:
* Electric motor (1)
* Junction box containing contactor and terminal block.
* Push button box for operating (2)
* Limit switch
* Pinch protection switch
* Coil for lowering valve

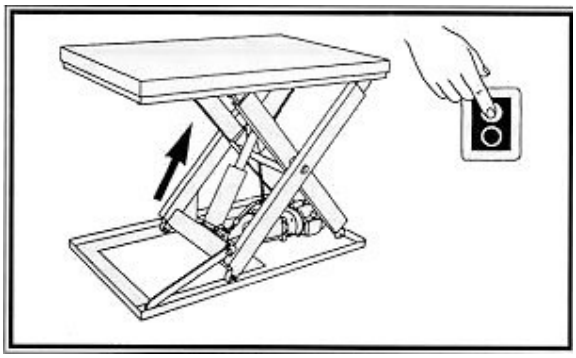


Components in the electrical system.

FUNCTION AND HANDLING DESCRIPTION
Lifting and lowering is controlled with the push button box.
NOTE! The lifting table must not be loaded over the maximum lifting capacity.

Lifting function

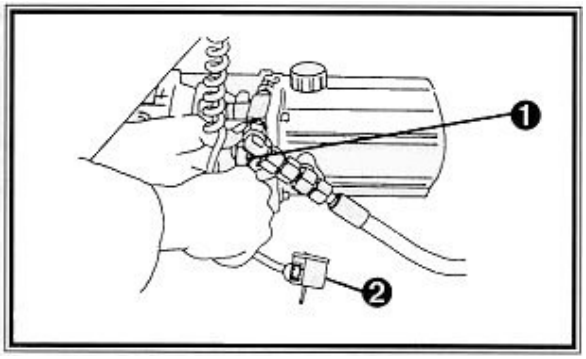
By pressing the ”UP” button the table goes up.
This takes place in that the electric motor starts and drives the hydraulic pump. This pumps hydraulic oil to the hydraulic cylinder under a high pressure. The piston in the hydraulic cylinder is thereby forced to move upwards, whereby the table if lifted as long as the button on the push button box is pressed. As soon as the button is released the movement stops in that the motor stops driving the hydraulic pump, a so-called dead-man’s grip.



Operating of ”ELEVATION” lifting table.

Lowering function

The table is lowered when the ”DOWN” button on the push button box is pressed.
This activates an electro magnetic lowering valve. The hydraulic oil flows out from the cylinder whereby the pressure in this is reduced. The force of the piston in the hydraulic cylinder is no longer sufficient to hold the table up, and therefore the table is lowered down as long as the button is pressed.
In the event of a power cut the lowering valve cannot be operated as normal. In order for the table to be lowered the lowering valve is provided with an emergency lowering device.

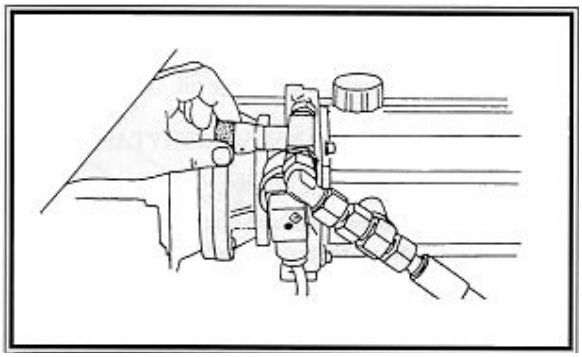


Emergency lowering device.

By screwing out the screw sleeve (1) (after the coupler plug (2) has been removed) the table can be lowered to the required position.

Regulation of the lowering speed

The lowering speed, i.e. how quickly the table is to lower down, can be regulated with an adjustment device on the non return valve.
The more the adjusting screw is screwed in the slower the table lowers down. For quicker lowering the screw is screwed out.
The lowering speed must not exceed 0.15 m/s.
Operating of ”ELEVATION” lifting table.

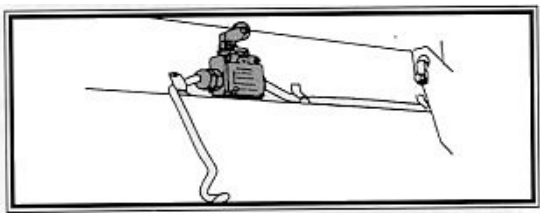


Regulation of lowering speed

Safety devices

SAFETY SWITCH

To ensure personal protection from pinch injuries there is a pinch frame on the lifting table with a number of mechanically operated safety switches. These are placed on the inside of the pinch frame and break the current to the valve coil as soon as the position of the pinch frame in relation to the table changes, for example if someone should place a foot between the floor and the pinch frame when the table is approaching its bottom position.

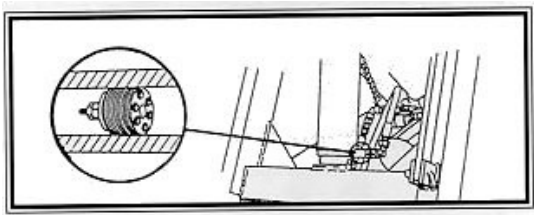


Safety devices - safety switch

In the event of a fault on a switch or their cables the table cannot be lowered (unless the emergency lowering device is used).

PIPE BURST VALVE

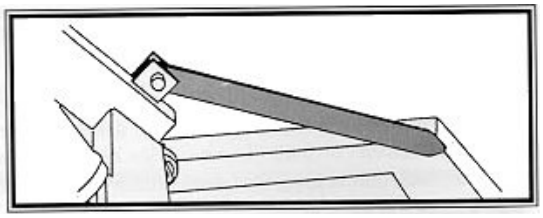
There is a valve in the hydraulic cylinder's outlet pipe which has the purpose of preventing oil leaving the hydraulic cylinder in the event of sudden leakage. The table can therefore not lower down if such a pressure drop should occur in the hydraulic system.



Safety devices - pipe burst valve

LOCKING PIECE

In order to lock the table in lifted position, e.g. in connection with service work, there are several locking pieces which should be folded out before such work is begun.

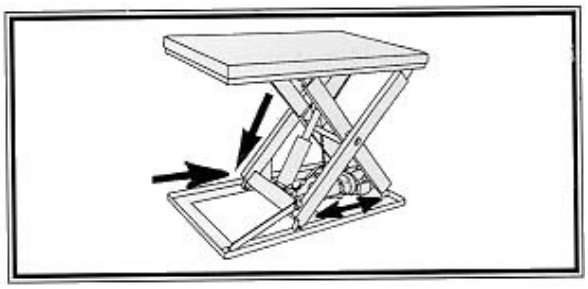


Safety devices - lock piece.

PINCH RISK!
THERE IS A PINCH RISK AT THE SUPPORTS.
SEE DIAGRAM.

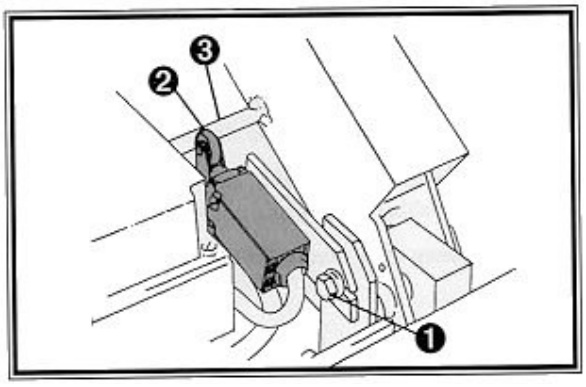
Limit switch

In the standard version the lifting table is provided with a limit switch, which is placed so that it breaks the current to the electric motor when a required end position is reached, e.g. when the lifting height is level with a loading platform.
An additional limit switch can be installed if it is necessary to arrange another limit position.



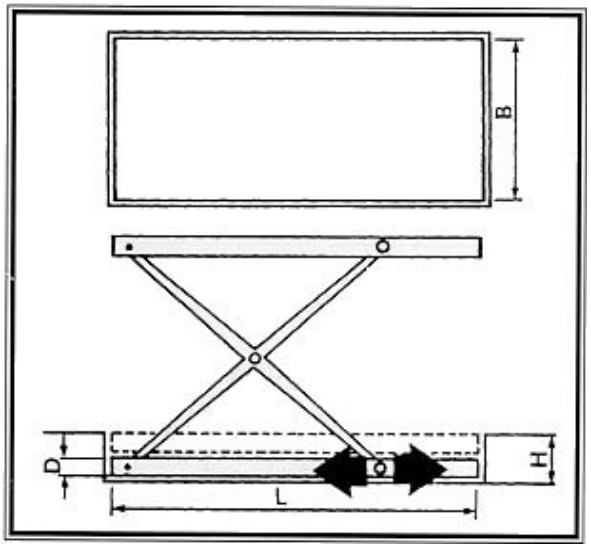
ADJUSTMENT OF LIMIT SWITCH

1. Run the table up to the required limit position.
2. Release the screw (1) and turn the switch until the roller (2) is in contact with the break-in (3), and then tension the screw (1).
3. Test the function by running up the table, whereby it should stop in the set limit position. If not, adjust the contact of the roller.



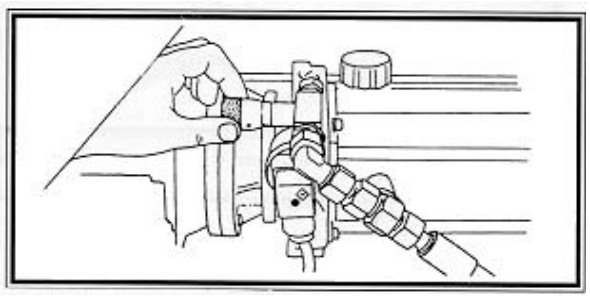
INSTALLATION DESCRIPTION

The lifting table can be installed directly on the floor or recessed in a pit, so that the top edge of the lifting table is level with the floor.
If the pit is outdoors it should be well drained.
The pit should preferably be fitted with angle irons, e.g. 50x50x5 mm.
* When placed in a pit the size of this should exceed the size of the table as per the following:
Length (L): + 30 mm
Width (W): + 20 mm
Height (H): + 5 mm
D = 100 mm
* Make sure that the under layer is completely level before starting the installation.
* When positioning the short side to the loading platform place the support leg fixtures to the loading platform.
* Before starting the installation check the equipment for any damage that may have occurred during transport.



IMPORTANT!
THE ELECTRICAL INSTALLATION MUST BE CONDUCTED BY AN AUTHORISED ELECTRICIAN.

1. Place the lifting table in the pit or on the floor.
2. Connect the external electrical connections to the mains as per the wiring diagram. (The lifting table's internal wiring is completed at the factory.)
3. Check that the lifting table functions and that the upper limit switch and pinch protection frame's safety switches function.

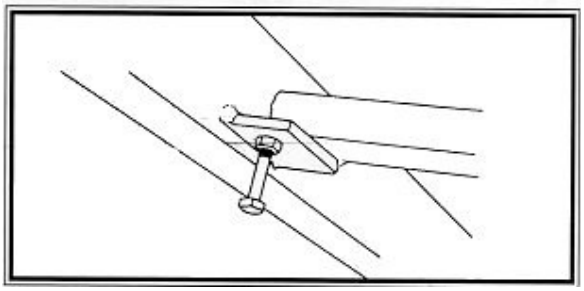


Checking the lowering speed.

4. Check the lowering speed. This is adjusted prior to delivery to max. 0.15 m/s. The lowering speed must not exceed this value.

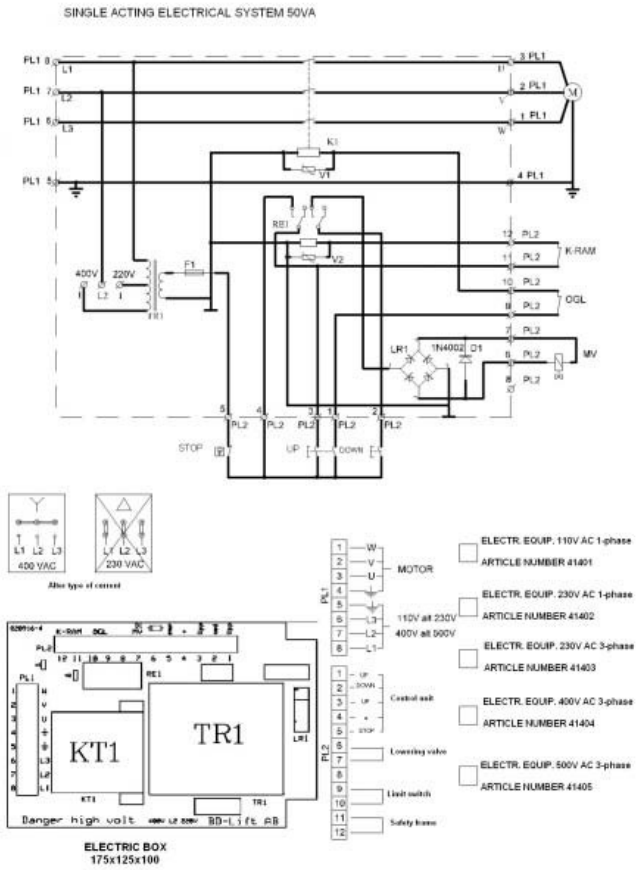
5. Screw secure the base at all four corners with 12 mm expander bolts.

6. Fine adjust the height of the table with the adjusting screws on the inner support's cross member on the wheel side



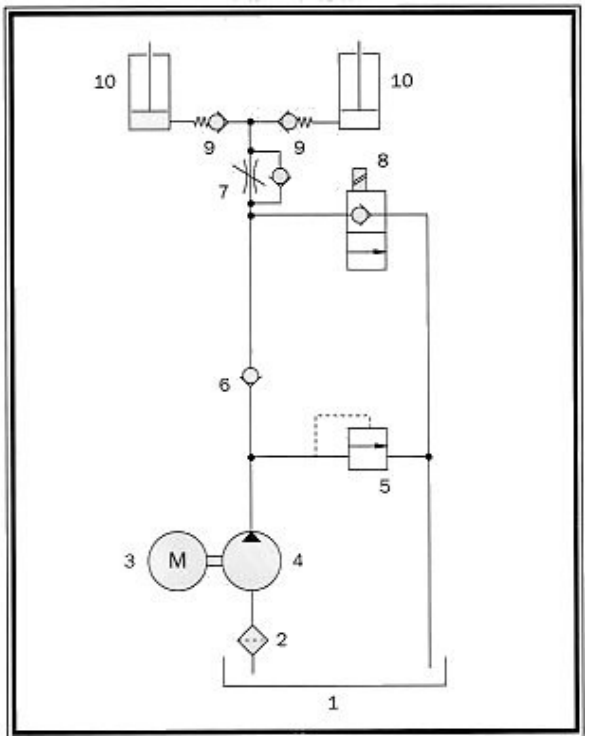
Adjusting screw for adjustment of table height.

The electrical design consists of the following main parts:
K1 Contactor DIL 00-40, 24 volt coil
1 Push buttons Up - Down
2 Terminal block
3 Limit switch Up
4 Pinch protection switch in table
5 Solenoid valve
6 Motor



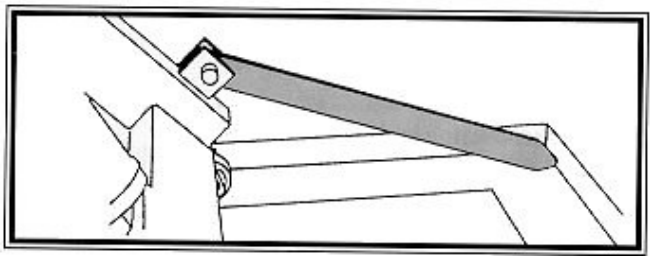
Tr Transformer 380 volt primary/24 volt secondary
The hydraulic design consists of the following main parts:

1 Tank
2 Suction filter
3 Motor
4 Pump
5 Overflow valve
6 Non return valve
7 Check valve
8 Lowering valve
9 Hose burst valve
10 Cylinder



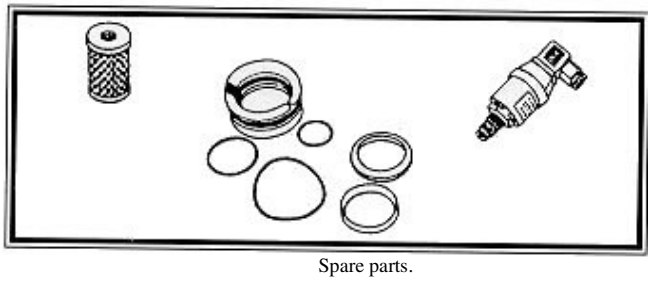
CARE AND MAINTENANCE

The lifting table is designed to ensure a minimum of maintenance. All bearing points have permanently lubricat bearings and do not require lubricating.



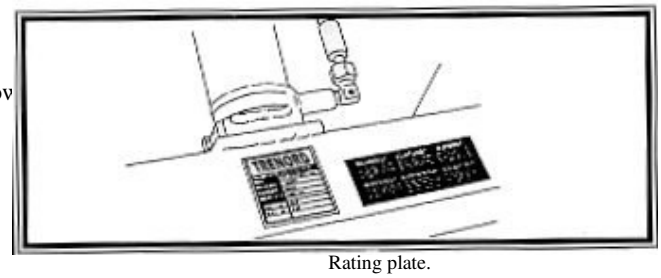
Safety devices - lock piece

NOTE!
DURING ALL REPAIR WORK THE LOCKING PIECES MUST ALWAYS BE FOLDED DOWN AND REST AGAINST THE BASE FRAME'S ANGLE IRONS.



Spare parts.

* The return oil filter in the hydraulic tank should be replaced once a year, in connection with which the hydraulic oil is also changed.
* In the event of heavy use a permanent stock of the follov spare parts is recommended:
- Return oil filter
- Gasket set for hydraulic cylinder
- Lowering valve

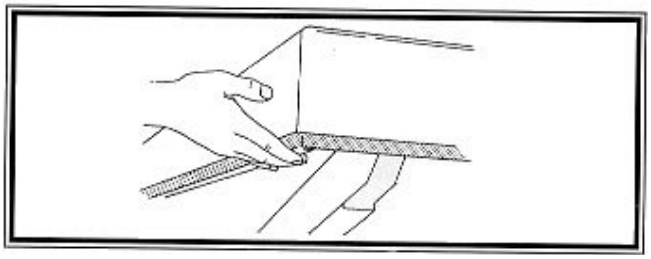


Rating plate.

* When ordering spare parts indicate the machine number. This is on the rating plate on the cross member under the hydraulic cylinder.

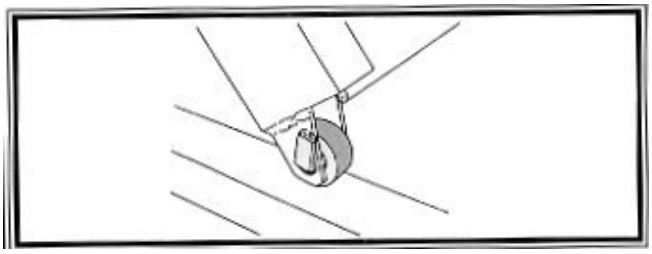
Daily inspection

1. Check the oil level in the container and replenish if necessary. Use hydraulic oil of the best quality, viscosity class ISO 46, e.g. Castrol Hyspin AWS 46, BP Bartran 46, or the like. For outdoor use BP Bartan SHF F-46 or the like is recommended.



Checking of pinch protection frame

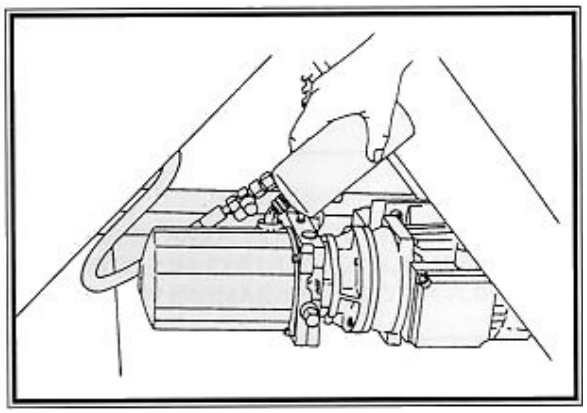
2. Check that the pinch protection frame function.
3. Check all screw unions so that no screws are loose.
4. Check the hydraulic unit and cylinder for oil leakage.
5. Check that all the wheels are undamaged and rotate freely.
6. Check all visible cables to make sure they are not clenched or otherwise damaged.



Checking of wheels

Refilling oil

The oil should be refilled:
* After renovation of the hydraulic cylinder.
* After replacement of the return oil filter.
* If the table does not lift properly and this has been confirmed to be a result of insufficient oil.
* When ever a low oil level is confirmed.
1. Run up the table as far as it goes.
2. Open the filler cap on the oil tank.
3. Fill the tank half full with oil.
4. Run down the table to its lower position with the cap off. Any excess oil will now run out.
5. Replace the cap and run up the table to its top position.



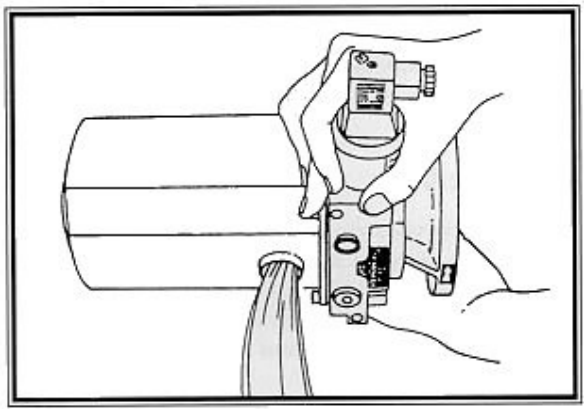
Replenishment of hydraulic oil.

The motion should be smooth and without jerks. A jerking motion implies that there is too little oil.

OIL CHANGE!
HYDRAULIC OIL MUST ONLY BE CHANGED BY AUTHORISED PERSONNEL.

Changing of return oil filter

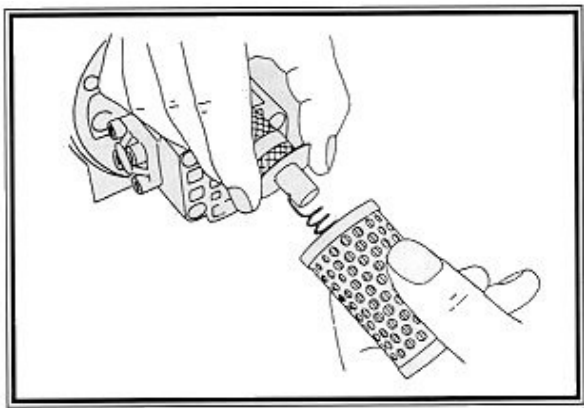
The return oil filter is placed in the tank for the hydraulic oil. The filter should be changed at the same time as the oil is changed.
1. Remove the hydraulic oil hose from the tank. Remove the coupler plug from the solenoid valve and remove the screws which hold the pump to the motor.
2. Lift out the tank and empty it of oil.
3. Remove the hex screws which hold the pump to the tank.



Emptying of hydraulic oil

4. Pull out the filter. Clean the tank and the pump.
5. Insert a new filter. Remember to hook on the spring.
6. Assemble the pump and tank with the hex screws.

NOTE! Make sure that the O-ring is correctly positioned in its groove and that the groove is well cleaned!
7. Replace the pump and tank. Screw tight and connect the hydraulic hose and coupler plug.
8. Fill up with new oil as per above and check the function and that no oil leakage has occurred.



Changing of return oil filter

TROUBLE SHOOTING SCHEDULE
TROUBLE SHOOTING MUST ONLY BE CONDUCTED BY AUTHORISED PERSONNEL.

FAULT REASON PROCEDURE
The table does not lift when “Up button” is pressed.
Hydraulic unit´s phases incorrectly connected. Switch phases.
Insufficient volume of hydraulic oil. Top up with oil
Limit switch defective. Replace limit contact
Lowering valve not tight or defective. Clean or replace valve

The table does not lift when the “Up button” is pressed and the motor hums faintly
Cable break Replace cable
Defective contactor Replace contactor
Fuse Blown Replace Fuse

The table lowers unintentionally

Oil leakage Check and repair hoses and screw unions
Lowering valve not tight Replace lowering valve
The hydraulic cylinder´s gaskets are not tight Replace gaskets in cylinder

Oil leakage at vent hole in top of the cylinder

The hydraulic cylinder´s gaskets are not tight Replace gaskets in cylinder

The table does not lower when the “Down button” is pressed

Check that the valve is not completely closed Open the valve NOTE! max lowering speed 0.15 m/s.
Check switch in the pinch protection frame Replace defective switch
The lowering valve´s coil has burned out Replace coil
Break in cable to pinch protection frame Replace cable
The check valve is open too much so that the Reduce the lowering speed hose burst valve closed when table is loaded

FAULT-TRACING
IF THE TABLE DOES NOT LIFT PROPERLY, CHECK THE FOLLOWING POINTS: CHECK ACTION

1. Motor voltage and fuses Change the fuse if it is blown.

2. Direction of rotation of motor If the motor runs in the wrong direction, change two phases. NB! It is important that the motor does not run for too long in the wrong direction, the pump can be damaged.

3. The table does not lift max load Adjust the pressure on the valve. Adjust according to the max load to be lifted. Test the pressure with a manometer.

4. The table does not lift to max Check the oil level in the tank. Fill up with recommend oil. NB! The tank should not be filled when the tables is raised If necessary, bleed the system for air when connecting the hose.

5. Oil leakage Tighten the hose connections. Change cylinder seals or cylinder.

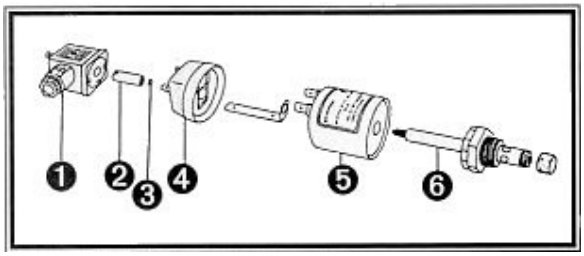
IF THE TABLE DOES NOT LOWER PROPERLY, CHECK FOLLOWING POINTS: CHECK ACTION

1. Feed voltage and fuses Change the fuse if it is blown.
2. Function of safety frame The switches can be affected. Straighten and adjust. When the safety equipment is activated and the circuit broken the circuit must be activated again by raising the table a little.
3. Adjust the lowering speed If the speed is too fast the safety valve can shut down. (reduce the oil flow).
4. The table sinks Clean or change the valve

REPAIR INSTRUCTIONS

NOTE!
DURING ALL REPAIR WORK THE LOCKING PIECES MUST ALWAYS BE FOLDED DOWN AND REST AGAINST THE BASE FRAME'S ANGLE IRONS.

When ordering spare parts please indicate the machine number. This is on the rating plate which is placed on the cross member under the hydraulic cylinder.



Parts of the lowering valve

Cleaning / replacement of lowering valve

1. Remove the coupler plug (1).
2. Remove the valve from the hydraulic pump.
3. Remove the valve and wash the parts in washing naphtha, and make sure that no damage has occurred on any part. If so, the valve should be replaced with a new valve.
4. Assemble the valve.
NOTE! Make sure that the small washer (3) (ø 5 mm) is in the screw sleeve (2).
5. Fit the valve on the hydraulic pump and test the function of the lifting table. If the fault remains try replacing the valve with a new one.

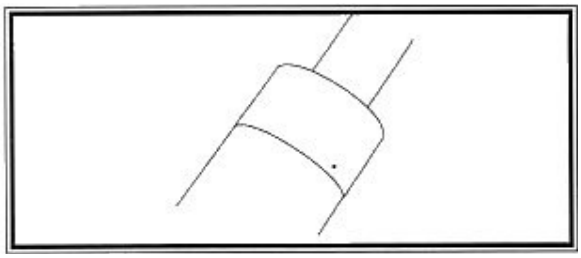


Diagram A. Vent hole on the hydraulic cylinder

Renovation of hydraulic cylinder

One sign that the hydraulic cylinder needs renovating is that the lifting table lowers unintentionally. Another indication of leaking gaskets is that oil leaks out at the vent hole on the top of the cylinder. This is because the oil has passed up through the gaskets and collected over the piston. When the piston goes up in the cylinder the oil is then pressed out through the vent hole (display A).
1. Lock the lifting table with the lock piece.
2. Release the top shaft for the cylinder attachment (display B).
3. Unscrew the guide for the cylinder top and pull up the piston rod with the guide and piston (display C).
4. Clean the cylinder internally with washing naphtha and if necessary also the piston. Wipe the parts with non flocking dry paper. Observe absolute cleanliness and make sure that no dirt particles come in contact with the parts.
5. Remove the old gaskets and replace with new one.
6. Assemble the parts in the reverse order.
7. Fill up with new oil and test the function (see "Replenishment of oil" on page 12).

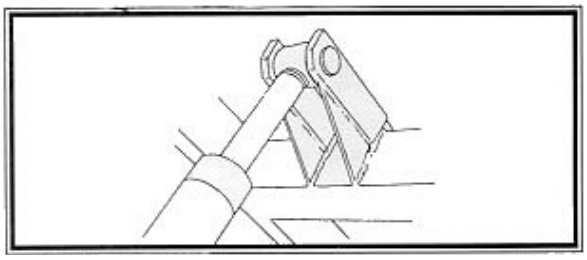


Diagram B. Attachment of the hydraulic cylinder, upper shaft.

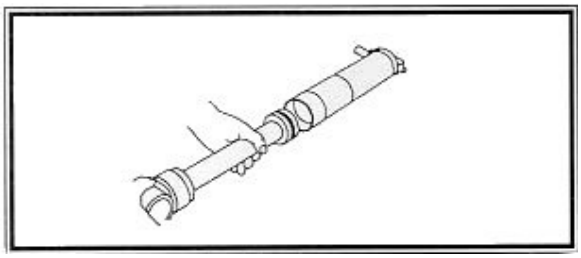
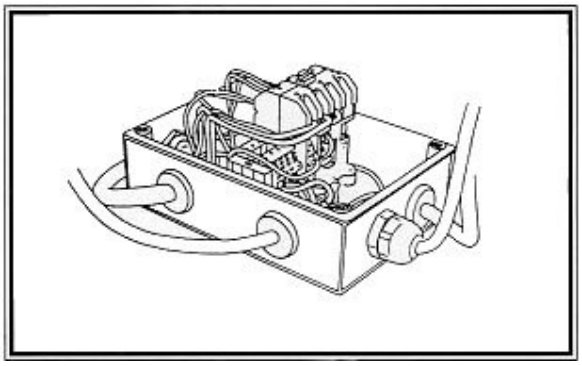


Diagram C. Dismantling of the hydraulic cylinder

The lowering valve consists of the following main parts:
1 Coupler plug
2 Screw sleeve
3 Washer, 5 mm
4 Plactic casing
5 Coil
6 Valve body

Replacement of contactor

When replacing the contactor make sure that the new contactor is connected identically as the old contactor. A good tip is to note the cable colours and their relative positions.



Contactor

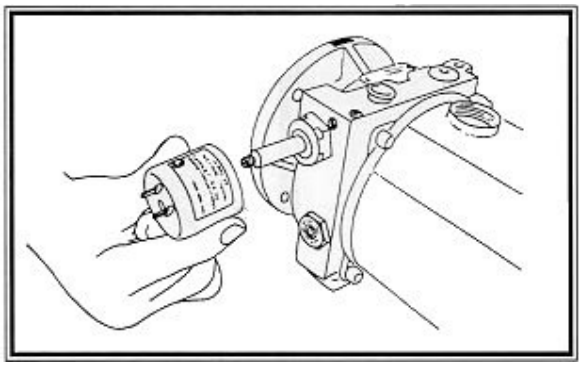
Replacement of the lowering valve's coil

The lowering valve's coil should be replaced if the lifting table does not lower when the "Down button" is pressed and this is evaluated to be because the coil has burned out.

1. Release the coupler plug (1) from the valve.
2. Release and remove the screw sleeve (2).
3. Remove the plastic casing (4).
4. Remove the coil (5) and replace with a new one.

NOTE: Do not forget the small washer (3) (ø 5 mm) in the screw sleeve (2).

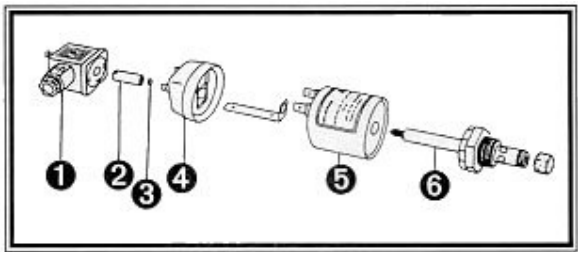
5. Assemble the parts in the reverse order.



Lowering valve´s coil

The lowering valve consists of the following main parts:

1 Coupler plug
2 Screw sleeve
3 Washer, 5 mm
4 Plastic casing
5 Coil
6 Valve body



Parts of the lowering valve

INSTALLATION

Electrical installation must be done by an authorised person. The main circuit control unit should have an emergency stop according to EEN 60204. If an extra control is required it must be connected in series. That installation takes a 6-core cable.

LOCK THE TABLE!
During installation, repair and maintenance under or beside raised tables, the table must be in locked position.
1. Unpacking
Check the packaging for any signs of damage. Electrical cable for connection is on one of the shortsides of the lift table.

2. Be careful!
Don't lift by the safety frame. Deformation and other damages can occur. (The table will raise but not lower).

3. Connect the plug. Supply cable for incoming current is 4-core and consists of 3-phases and 1 earth. (Plug connector and main circuit breaker are not included).

4. Switch on the supply. Push the raise button on the controller. If the motor runs but the table does not rise, change 2 phases. (NB! It is important that the motor does not go the wrong way for too long).

5. LOCK THE TABLE.
Unpack the control unit.

6. Remove the tape blocking the "UP" button.
(Only on tables with integral power pack and low closed height which makes access to the control unit difficult).

RATED CURRENT

400V 3-phase standard
In=Rated current
A=Installation fuse

OIL RECOMMENDATIONS

STATOIL Hydraway HMA46, alt. Hydol 32
SHELL Tellus 32
BP Bartran 32
MOBIL Mobil DTE 13
CASTROL Hyspin AWH, alt. Hyspin HVA 32

AT TEMP, BELOW -20 C
Hydrauloil from manufacturer.
NB! Differences in quality might occur although all oils meet the same specifications.

Type hydraulic unit:	230V 3-phase	400V 3-phase	500V 3-phase	110V 1-phase	230V 1-phase
	kW In A	Kw In A	kW In A	kW In A	kW In A
HPI Micro	0,75 4,3 10	0,75 2,5 10	0,75 2,0 10	0,75 11,2 25	0,75 5,4 16
HPI Mini	2,2 8,5 20	2,2 5,0 10	2,2 4,0 10	2,2 21,0 50	2,2 10,6 20
HPI Mini	4,0 18,5 32	4,0 10,5 20	4,0 8,5 20		

INSTALLATION one the floor or in a pit.

Double, triple vertical scissors and low profile lift tables with high lifting heights (970mm), must be securely fixed to the ground or the floor with expanderbolts or similar.

PIT DRAWING

A. The length of the pit = the length of the table + 30mm
B. The width of the pit = the width of the table + 30mm
C. The depth of the pit = the collapsed height of the table + 5mm
D. Tubes for incoming pipes dia. 60mm

ASSEMBLY

1. The base frame of the tables are as standard not self supporting. It is therefore important that the floor is level and that the bottom of the pit is level and well drained where necessary.
2. Raise and lock the table. Connect up the permanent cables.
3. Place the table in the pit. Ensure the table is in its correct position. Turn the fixed side of the table in the direction in which the material is to be loaded.
4. Electrical installation is to be done by an authorized electrician. Adjust the lowering speed. Test the safety frame on all sides. Adjust if necessary.
5. Recommendation - the control unit should be installed 1,5 meter from the working surface, in order to see the movement of the table clearly.
6. After all tests and installation work have been completed, fix the table in the pit with expander bolts or similar.

TRANSPORT DAMAGE

Carefully check goods and packaging on receipt!

• Try to check goods on receipt. If there is any damage the transporter will take the relevant details.
• If damages are discovered when unpacking and assembling, report immediately to the transporter's local office.
• Remember that the receiver should always report to the transporter if the goods are damaged, irrespective of who is paying freight costs!

WARRANTY AND DELIVERY TERMS

General delivery terms in accordance with NL 92.

CONDITIONS OF DELIVERY

All products are delivered test run including oil. Electrical equipment is as standard 400/24V (415/240V) with 24V on the control unit, magnetic coil and safety frame.
Paint: Blue = RAL 5012, Yellow = RAL 1003, Red = RAL 3020.

SAFETY REGULATIONS

Our lift tables comply with all European safety regulations, e.g. AFS 1994:48 in Sweden, BS 5323 in Great Britain.
The mark on our products confirms they are manufactured in accordance with applicable CE directives.
There is a built in safety function in the safety frame. If the safety frame is touched on its way down, the table stops immediately . To continue lowering, the table has to be raised a little bit to be able to lower again.
Our lift tables are always delivered with a control unit of the "dead man" type, which means that when the up or down button is released the table will stop immediately. The control unit is equipped with emergency stop and lock.

Employee and employer must see to it that the risk of trapping does not occur during installation. It is the obligation of the **employer** to see to it that lift tables are used by competent personnel and that checking and maintenance of lifting equipment is made frequently.
1. That max load of the lifting equipment is not exceeded. That the load is fixed - must not be moving.
MAX LOAD = LOAD EVENLY DISTRIBUTED!
2. Check the action of the safety frames and the distance around the equipment to eliminate the risk of trapping.
3. Warning signs, required by law, must be displayed.
4. Check for damage due to overloading.
5. Check for oil leakage and possible continued seepage.
6. Check for oil leakage and grease as necessary.
7. Clean the lift tables. (Wheel tracks)

8. The main circuit breaker must be accessible to competent personnel. Lifting equipment must not be used by unauthorized personnel.
9. When the load is wheelborne, or there is a likelihood that the load may start to roll, the platform should be fitted with an autorise stop.
10. Lift tables for use in outside areas must be equipped with anti-slip platform surfaces (e.g. tearplate), in accordance with safety regulations.
11. Tilting platforms must include a fixed method of retaining the load.
12. Whenever personnel, other than the operator, are travelling on the platform ensure that the necessary safety equipment is fitted (e.g. guardrails etc.)
13.Personnel may only ride on the platform if that is their intended purpose and this is clearly marked on the table.