SATURNUS TRUCK 100

GB

SCISSORS
LIFT

Instructions and maintenance manual for

SCISSORS
VEHICHLES LIFT

Model SATURNUS TRUCK 100

Serial N° _____

Year of manufacture _____

MANUFACTURER:

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AUTHORISED SERVICE CENTRE:

PRINTING CHARACTERS AND SYMBOLS

Throughout this manual, the following symbols and printing characters are used to facilitate reading:

	Indicates the operations which need proper care
	Indicates prohibition
	Indicates a possibility of danger for the operators
⇦	Indicates the direction of access for motor vehicles on to the lift
Bold Type	Important information

	**WARNING: before operating this lift and carrying out any adjustment. read chapter 7 "installation" where the correct installation procedures for the lift are shown..**

CONTENTS

1 CHAPTER 1 – GENERAL INFORMATION

This chapter contains warning instructions to operate the lift properly and prevent injury to operators or objects.

This manual has been written to be used by shop technicians in charge of the lift (OPERATORS) and routine maintenance technicians (MAINTENANCE OPERATORS).

The operating instructions are considered to be an integral part of the machine they and must remain with the lift at all times. Read every section of this manual carefully before unpacking and operating the lift. the manual gives helpful information about::

- SAFETY OF PEOPLE

- SAFETY OF THE LIFT

- SAFETY OF LIFTED VEHICLES

The company is not liable for possible problems, damage, accidents, etc. resulting from failure to follow the instructions contained in this manual.

Only skilled technicians of AUTHORISED DEALERS or SERVICE CENTRES AUTHORISED by the manufacturer shall be allowed to carry out lifting, transport, assembling, installation, adjustment, calibration, settings, extraordinary maintenance, repairs, overhauling and dismantling of the lift.

THE MANUFACTURER IS NOT RESPONSIBLE FOR POSSIBLE DAMAGE TO PEOPLE, VEHICLES OR OBJECTS IF SAID OPERATIONS ARE CARRIED OUT BY UNAUTHORISED PERSONNEL OR THE LIFT IS IMPROPERLY USED.

Any use of the machine made by operators who are not familiar with the instructions and procedures contained herein shall be forbidden.

1.1 MANUAL KEEPING

For proper use of this manual, the following is recommended:

- keep the manual near the lift, in an easily accessible place
- keep the manual in an area protected from the damp
- use this manual properly without damaging it
- do not make changes to the manual; any changes and updating can be made only by the manufacturer.

This manual is an integral part of the lift: it shall be given to the new owner if and when the lift is resold.

1.2 OBLIGATION IN CASE OF MALFUNCTION

	**In case of machine malfunction, follow the instructions contained in the following chapters.**

1.3 CAUTIONS FOR THE SAFETY OF THE OPERATOR

Operators must not be under the influence of sedatives, drugs or alcohol when operating the machine.

	**Before operating the lift, operators must be familiar with the position and function of all controls, as well as with the machine features shown in the chapter "Operation and use".**

1.4 WARNINGS

	**Unauthorized changes and/or modifications to the machine relieve the manufacturer of any liability for possible damages to objects or people. Do not remove or make inoperative the safety devices, this would cause a violation of safety at work laws and regulations.**

	**Any other use which differs from that provided for by the manufacturer of the machine is strictly forbidden.**

	**The use of non genuine parts may cause damage to people or objects.**

DECLARATION OF WARRANTY AND LIMITATION OF LIABILITY

The manufactures has paid proper attention to the preparation of this manual. However, nothing contained herein modifies or alters, in any way, the terms and conditions of manufacturer agreement by which this lift was acquired, nor increase, in any way, manufacturer's liability to the customer.

TO THE READER

Every effort has been made to ensure that the information contained in this manual is correct, complete and up-to date. The manufacturer is not liable for any mistakes made when drawing up this manual and reserves the right to make any changes due the development of the product, at any time.

2 CHAPTER 2 – PRODUCT IDENTIFICATION

The identification data of the machine are shown in the label placed on the frame and indicated in the declaration of conformity.

LOGO	
Type:	.....
Model:	.....
Serial Number:	.....
Year of manufacturing:	.....
Capacity:	.....
Voltage:	.....
Power:	.....
Max. pressure:	.....

Use the above data both to order spare parts and in case of enquires with the manufacturer (inquiry). The removal of this label is strictly forbidden.

Machines may be updated or slightly modified from an aesthetic point of view and, as a consequence, may present features different from these shown, this without prejudicing what has been described herein.

2.1 WARRANTY CERTIFICATE

The warranty is valid for a period of 12 months starting from the date of the purchase invoice.
The warranty will end immediately when unauthorized modifications to the machine or parts of it are carried out.
The presence of defects in workmanship must be verified by the Manufacturer's personnel in charge.

2.2 TECHNICAL SERVICING

For all servicing and maintenance operations not specified or shown in these instructions, contact your Dealer where the machine was bought or the Manufacturer's Commercial Department.

3 CHAPTER 3 - PACKING, TRANSPORT AND STORAGE

Only skilled personnel who are familiar with the lift and this manual shall be allowed to carry out packing, lifting, handling, transport and unpacking operations.

3.1 PACKING

The lift is supplied disassembled into sub-assemblies, depending on the version ordered.

MAGNUS PSA 100:

- two base units, each one with base frame, boom, hydraulic cylinder and runway;
- two stepped drive-on ramps for upper floor installations, with two safety chocks and four covers for lines connection, or four standard drive-on ramps for floor-level installation;
- control desk with hydraulic unit;
- A box containing hydraulic lines, connecting lines (one for compressed air), stickers and technical documentation.

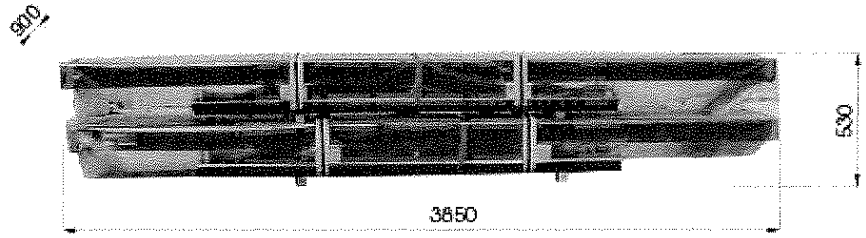
Various other optional accessories are available to suit individual customer requirements (see Magnus Accessories price list).

The lift is packed in a single box on a wooden bed, wrapped up in non-scratch waterproof material and sealed with 2 straps.
The average of the package is about 1300 kg .

3.2 LIFTING AND HANDLING

When loading/unloading or transporting the equipment to the site, be sure to use suitable loading (e.g. cranes, trucks) and hoisting equipment. Hoist and transport the components securely so that they cannot drop, taking into consideration the package's size, weight and centre of gravity and fragile parts.

Figure 1 – PACKAGE AND HANDLING



⚠	**Hoist and handle only one package at a time a**

3.3 STORAGE AND STACKING OF PACKAGES

Packages must be stored in a covered area, out of direct sunlight and in low humidity, at a temperature between *-10°C* and *+40°C*.
Stacking is not recommended: the package's narrow base, as well as its considerable weight and size make it difficult and hazardous.
If this was necessary, never stack more than three packages a time and fix them with straps, ropes

or other suitable means to ensure they are secure.

3.4 DELIVERY AND CHECKING OF PACKAGES

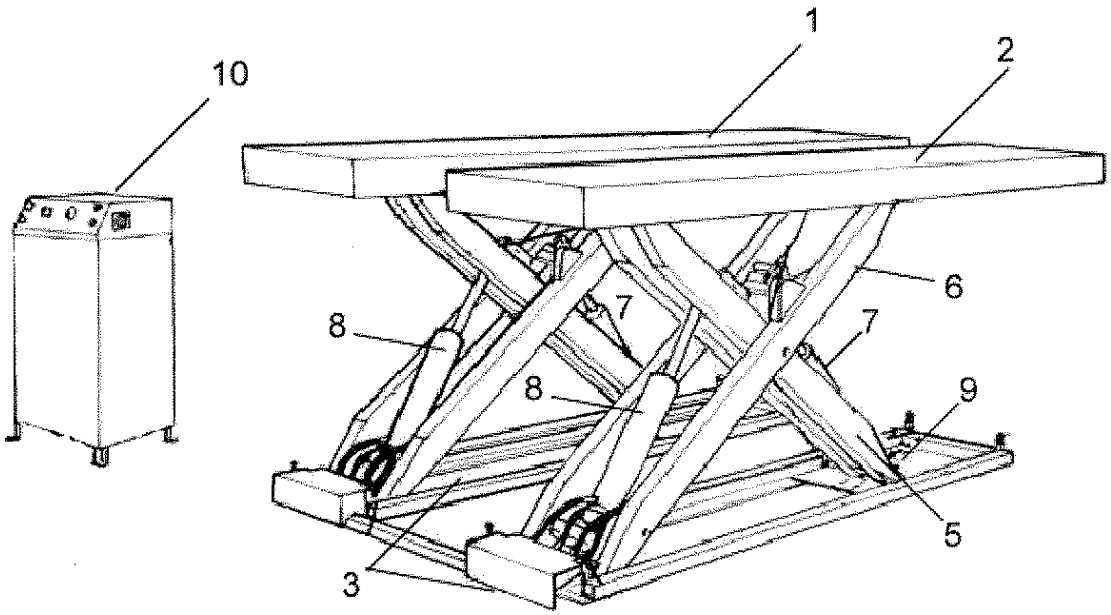
When the lift is delivered, check for possible damages due to transport and storage; verify its conformity with what is specified in the manufacturer's confirmation of order is included. In case of damage in transit, the customer must immediately inform the carrier of the problem.
Packages must be opened paying attention not to cause damage to people (keep a safe distance when opening straps) and parts of the lift (be careful the objects do not drop from the package when opening)..

4 CHAPTER 4 - PRODUCT DESCRIPTION

4.1 LIFT (Rif. Figure 2)

The lift has been designed to lift motor-vehicles and make them stand at any level between the minimum and maximum height.
The maximum lifting weight, including any additional load on the vehicle, is as specified on the serial plate.
All mechanical frames, such as platforms, extensions, base frames and arms have been built in pressure bent plant to make the frame stiff and strong while keeping a low weight.
The electro hydraulic operation is described in detail in chapter 8
This chapter describes the lift showing the principal elements, so allowing the user to be familiar with the machine
As shown in , the lift is composed of two platforms, the platform 1 (4) and the platform 2 (5) anchored to the ground by means of two base frames (3).
Platforms are linked to the base frame by means of a scissors lifting system
The lifting system of each platform is composed of two arms (8) and one cylinder (9).
Lift lowering and lifting are carried out by means of a control box (6) placed next to the lift.

Figure 2 - LIFT



4.2 CONTROL DESK

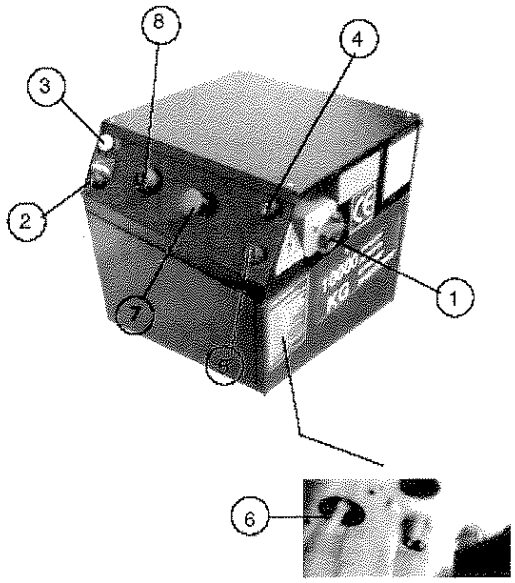
The control desk is supplied with four removable panels so that it is accessible from any side. The controls and safety features are positioned in the front panel as shown in Fig. 3

1. Lockable main switch
2. Two-function safety key: engaging of the gear racks, lowering of the last 40 cm
3. Power supply LED - ON/OFF.
4. UP push button
5. DOWN push button
6. Exclusion push button
7. EMERGENCY push button
8. Acustic signal

Note: before lowering the runways are first raised so as to disengage from the gear racks and are then lowered

Note: If there is no compressed air in the system when the DOWN key is pressed, the lift will raise.

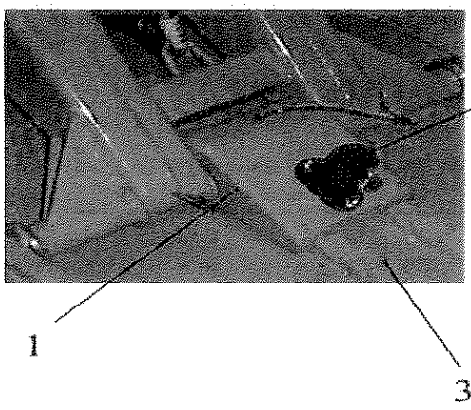
Figure 3 – CONTROL DESK



PSA 100

4.3 GEAR RACKS

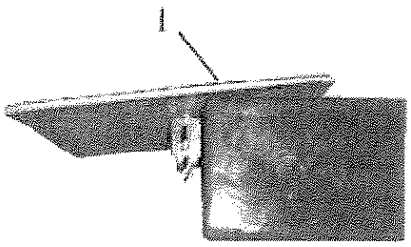
The gear racks prevent the runways from unintentionally or uncontrollably lowering in the event of a failure of the hydraulic unit or leakage of hydraulic lines. Furthermore, when the gear racks are engaged and the runways are raised, it is possible to bleed the pneumatic system. This operation is necessary when maintenance on the pneumatic system itself is required

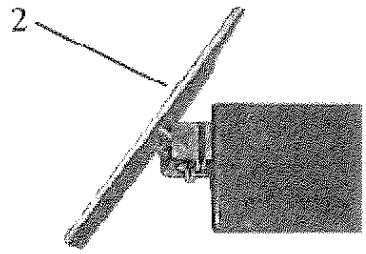


1 Upper gear rack on the boom
2 Pneumatic cylinder to disengage the gear racks
3 Lower gear rack on the base frame

4.4 SAFETY CHOCKS

The short drive-on ramps (det.1) serve as safety chocks (det.2) when the runways are lifted.





4.5 OPERATION

The SATURNUS TRUCK has an electro-hydraulic drive system. The lifting motion of the runways is accomplished with one hydraulic cylinder at each side which is fitted in the associated base frame. For the lifting motion the hydraulic unit acts directly upon the primary cylinder. This ensures that both runways are raised in synchronism. Lowering is by the own weight of the runways or of the load lifted. Each time the runways are lowered to the final bottom position the oil content in the hydraulic cylinders is automatically equalized so that when the runways are raised again they are always level with each other.

Gear racks which are pressed against suitable counterparts and safety valves are provided to prevent unintentional or uncontrolled lowering of the runways in the event of a failure of the hydraulic unit or
leakage of hydraulic lines.
A pressure relief valve, preset to 245 bar in the works, protects the hydraulic system against excess pressure.
Lifting and lowering motions as well as lowering into the gear racks (safety position) are controlled via keys on the control panel. A lockable main switch is also part of the panel. When the DOWN key is pressed, the lowering motion first stops at a height of 60 cm above the bottom position. Then the operator has to make sure that neither persons nor objects are within the working area. If so, it is possible to press the safety key key and lower the lift to the final bottom position. When the safety key is pressed a beep sound can be heard over the entire travel. This procedure has to be followed when lowering the lift-table too. It is also necessary to drive the telescoped extensions back in the runways.

At the front and back side of the runways further safety chocks are provided to prevent the vehicle from rolling off of the lift in raised positions.

5 CHAPTER 5 - TECHNICAL SPECIFICATION

5.1 SIZE AND MAIN FEATURES (Rif. Figure 4)

Capacity	10000 Kg
Maximum lifting height	1650 mm
Minimum height of lift	380 mm
Length of the lift	5800 mm
Width of the lift	2450 mm
Width of platforms	820 mm
Free width between platforms	810 mm
Lifting time	60 s
Lowering time	60 s
Noise level	70 dB(A)/1m
Total weight of the lift	3500 Kg
Working temperature	-10 °C ÷ 40 °C
Compressed air pressure	6 bar

5.2 ELECTRIC MOTOR

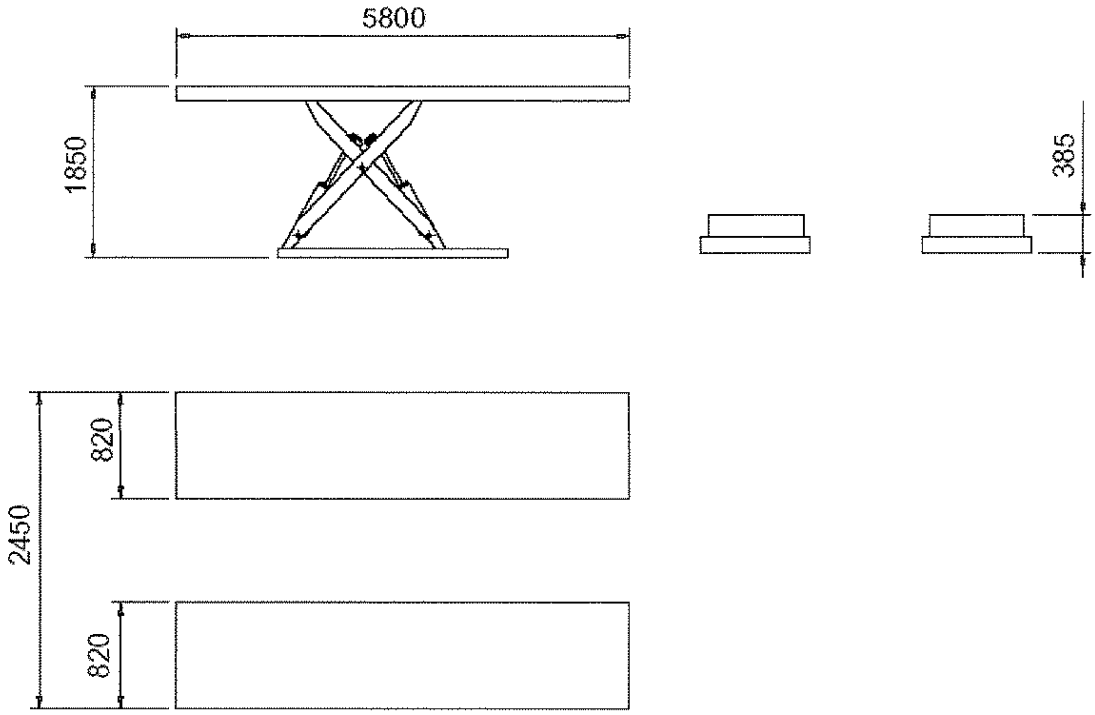
Type	90LA
Power	3 KW
Voltage	230 V / 400V (PSA 100)
Frequency	50 Hz
N° Poles	4
Speed	1400 giri/min
Motor enclosure type	B5
Insulation class	IP 54

Motor connection must be carried out referring to the attached wiring diagrams (rif. Figure 7).
The motor direction of rotation is shown in the label placed on the motor.
Note: if we have not a specific request, the lift will be provided of a three-phases motor

5.3 PUMP

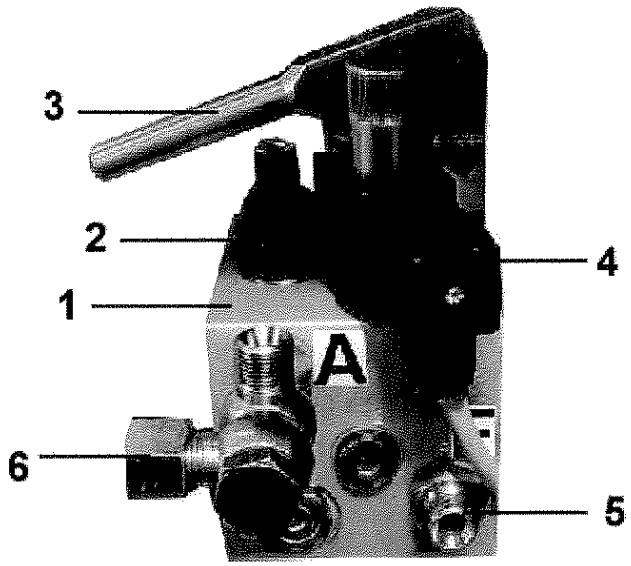
Type	Gear AP 100 / 5
Flow rate	5 cm3/g
Continuous working pressure	210 bar
Frequent working pressure	230 bar
Peak pressure	250 bar

Figure 4 – LAYOUT



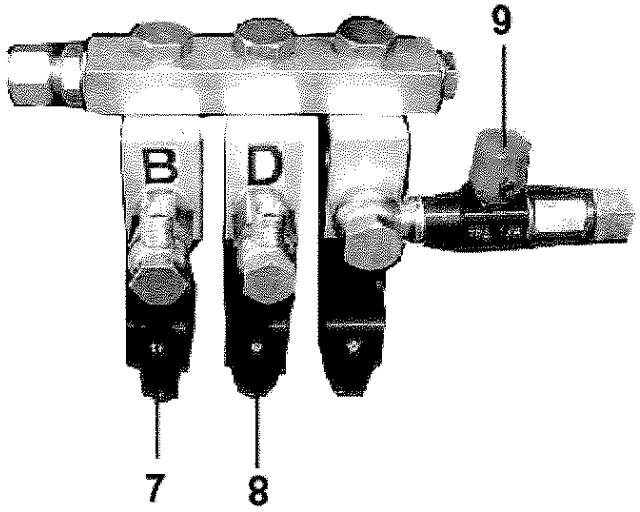
5.4 HYDRAULCI UNIT

Figure 5 –HYDRALIC BLOCK



The hydraulic block is composed by following items:

1 central block
2 max pressure valve
3 hand pump
4 lowering solenoid valve
5 return
6 delivery



The leveling valves block is made of :

7 P1 leveling solenoid valve
8 P2 leveling solenoid valve
9 Fine leveling tap

5.5 OIL

Use wear proof oil for hydraulic drive, in conformity with *ISO 6743/4* rules (HM class). *Fina HYDRAN TS 32* or equivalent oil with features similar to those shown in the table is recommended:

TEST STANDARDS	FEATURES	VALUE
ASTM D 1298	Density 20°C	0.8 kg/l
ASTM D 445	Viscosity 40°C	32 cSt
ASTM D 445	Viscosity 100°C	5.43 cSt
ASTM D 2270	Viscosity index	104 N°
ASTM D 97	Pour point	~ 30 °C

ASTM D 92	Flash point	215 °C
ASTM D 644	Neutralization number	0.5 mg KOH/g

In case where the average ambient temperature differs from *25° C* contact your local specialist oil supplier to find a suitable substitute

5.6 RECOMMENDED HYDRAULIC OIL

Recommended hydraulic oil for the lift to be used at standard temperatures (*25°C - 30°C*) is described below.
For temperatures different from those standard, contact your dealer for suitable oil.

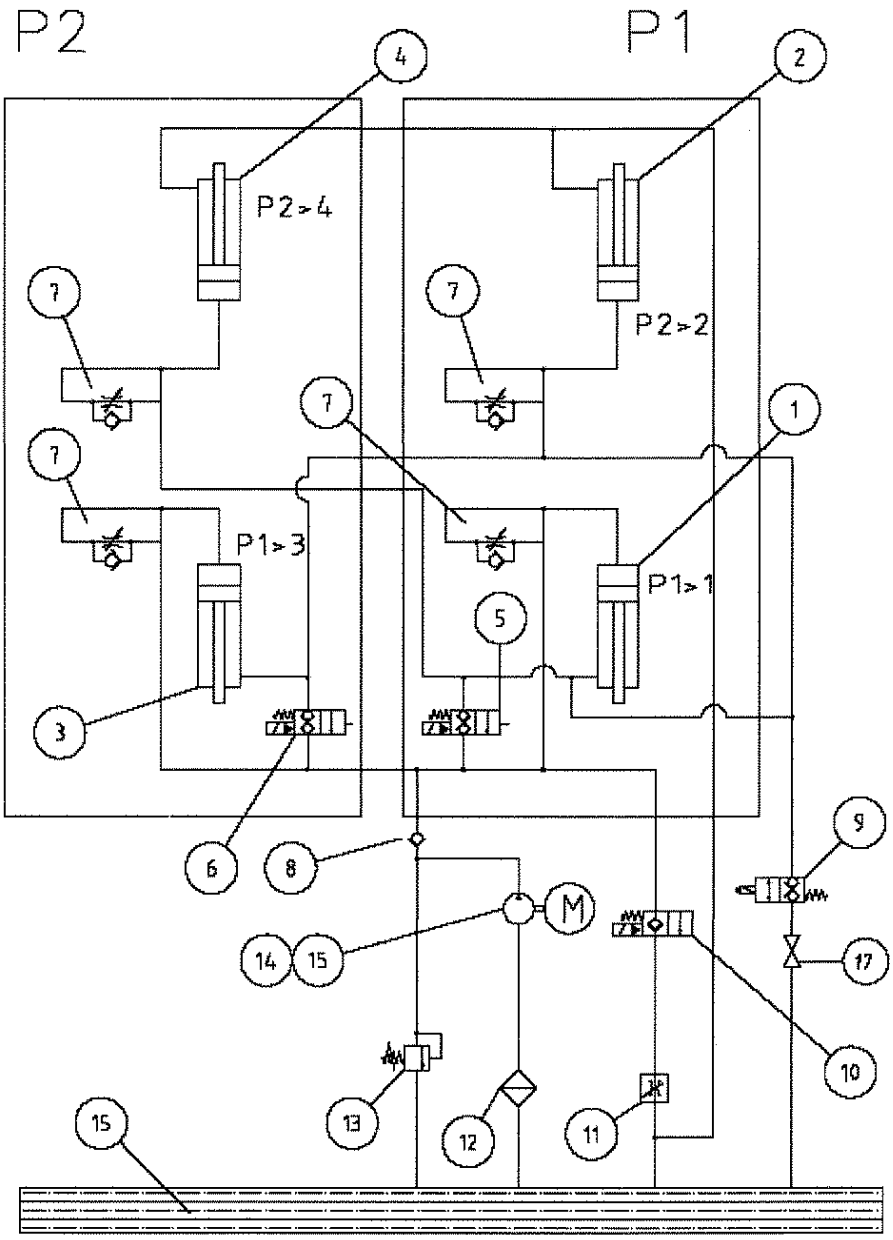
BRAND	**TYPE**
AGIP	OSO 32
API	CIS 32
BP	HLP 32
CASTROL	HYSPIN HWS 32
ELF	ELFONA DS 32
ESSO	NUTO H 32
FIAT	HTF 32
FINA	HYDRAN TS 32
IP	HYDRUS 32
Q8	HAYDYN 32
ROL OIL	LI 32
SHELL	TELLUS OIL 32
TOTAL	AZOLLA ZS 32

5.7 OIL QUANTITY REQUIRED

PSA 100	40 l

	**CHANGE HYDRAULIC OIL EVERY 5 YEARS**

Figure 6 - HYDRAULIC DIAGRAM 100



1 Cylinder 1
2 Cylinder 2
3 Cylinder 3
4 Cylinder 4
5 Leveling solenoid valve cylinders 1/3
6 Leveling solenoid valve cylinders 2/4
7 Safety valve (parachute)
8 Non return valve
9 Baric compensation valve
10 Lowering solenoid valve
11 Lowering control
12 Oil filter
13 Max pressure valve
14 Hydraulic pump
15 Tank
16 Electric motor

Figure 7a - ELECTRIC WIRING (100)

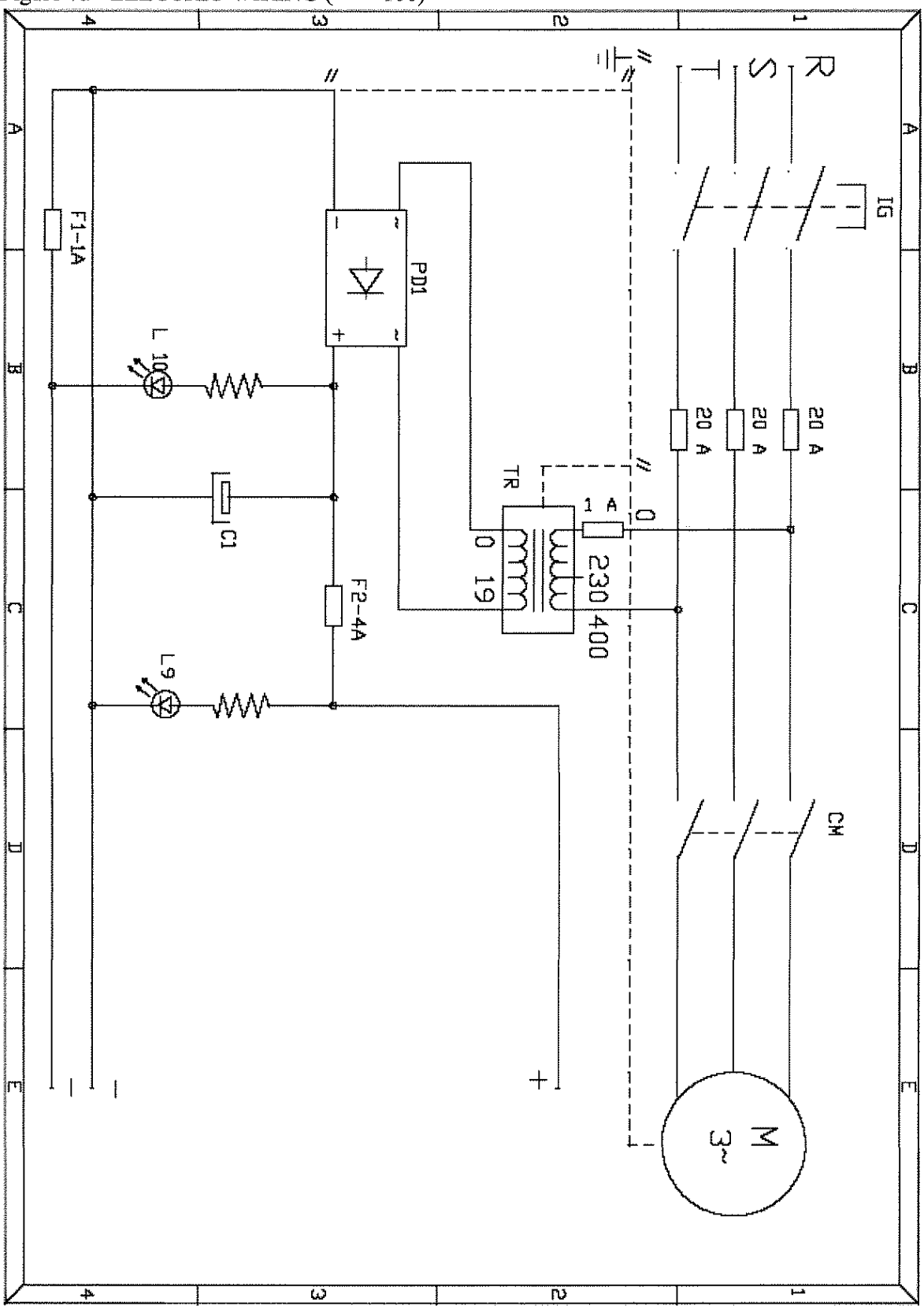


Figure 7b - ELECTRIC WIRING (100)

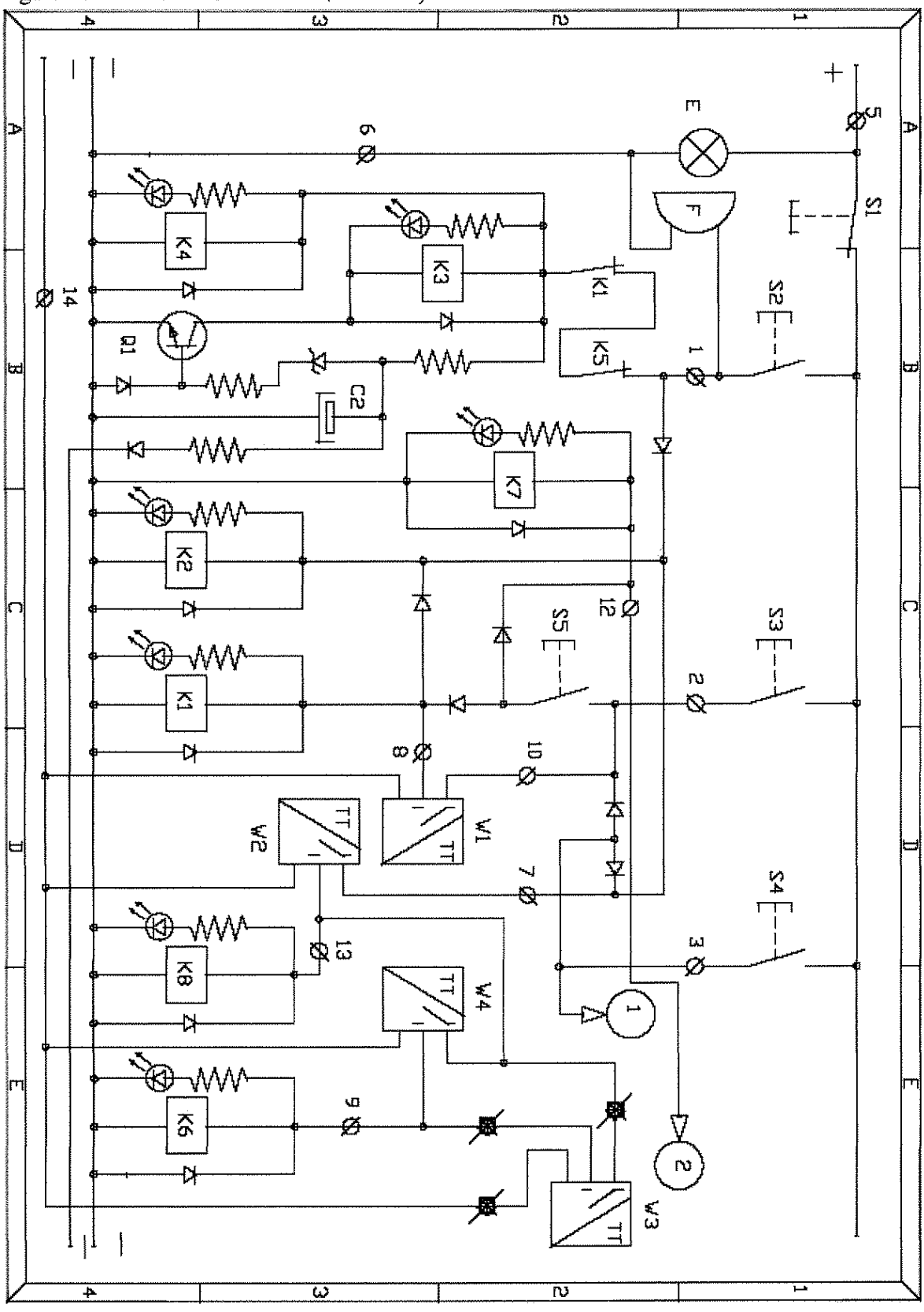
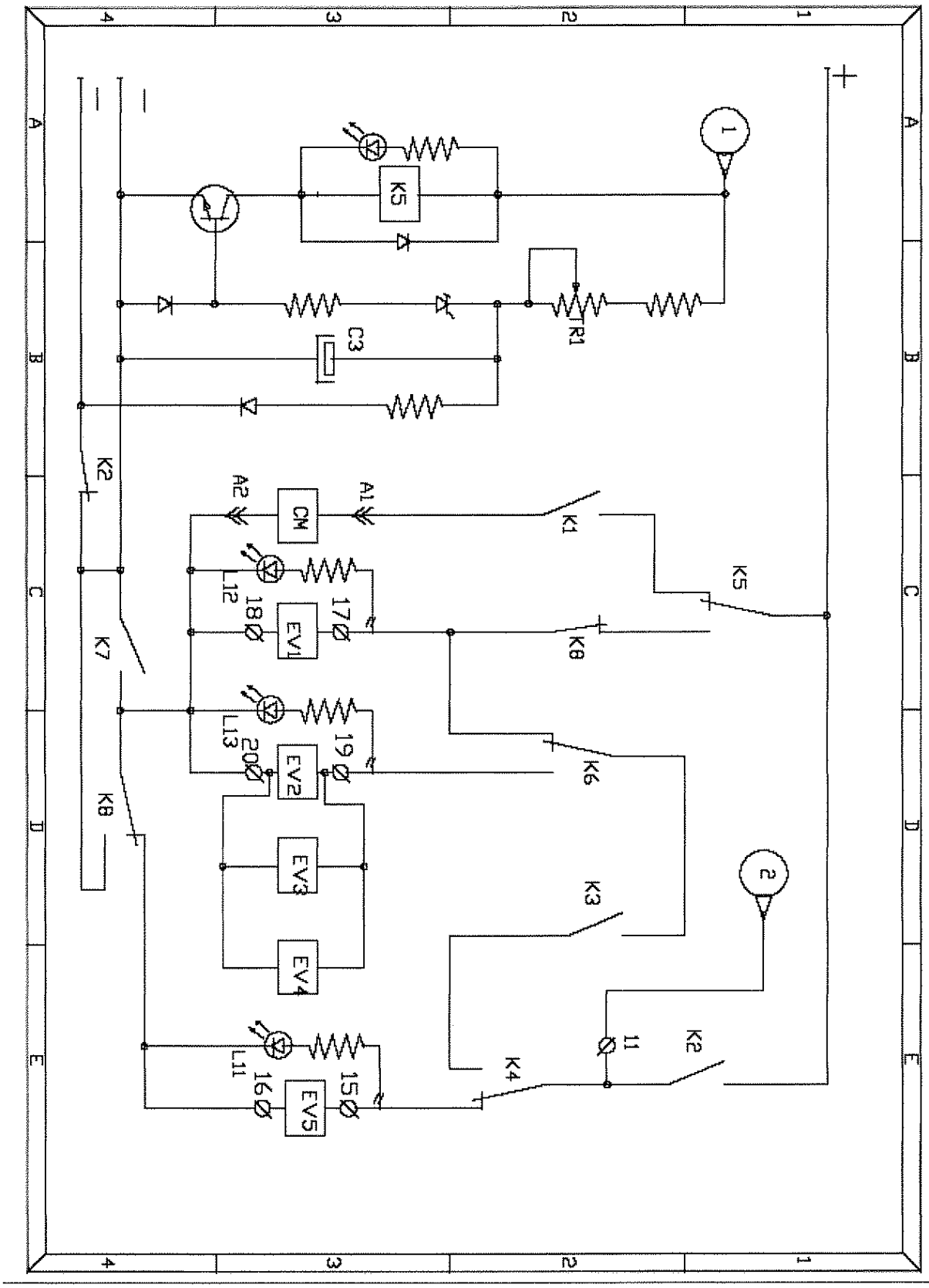


Figure 7c - ELECTRIC WIRING (100)



IG	Main switch	W4	Platform P2 leveling limit switch
CM	Motor contacts	EV1	Lowering solenoid valve
M-3	Motor	EV2	Leveling solenoid valve
TR	Transformer	EV3	Leveling solenoid valve
F1	Limit switches fuse	EV4	Fine Leveling solenoid valve
F2	Auxiliaries fuse	EV5	Air solenoid valve
PDI	Rectifier	E	Pilot lamp
C1	Condenser	F	Beeper
TR1	Trimmer	K1	Motor starting relay
S1	Emergency button	K2	Air solenoid valve consensus
S2	Safety down button	K3	Final lowering delayed relay
S3	UP button	K4	Air exclusion relay
S4	DOWN button	K5	Lifting/lowering tempor. relay
S5	Override button	K6	Leveling relay
W1	Maximum working height Limit switch	K7	Protection relay
W2	Safety Height Limit Switch	K8	Emergency stop relay
W3	Platform P1 leveling limit switch		

6 CHAPTER 6 - SAFETY

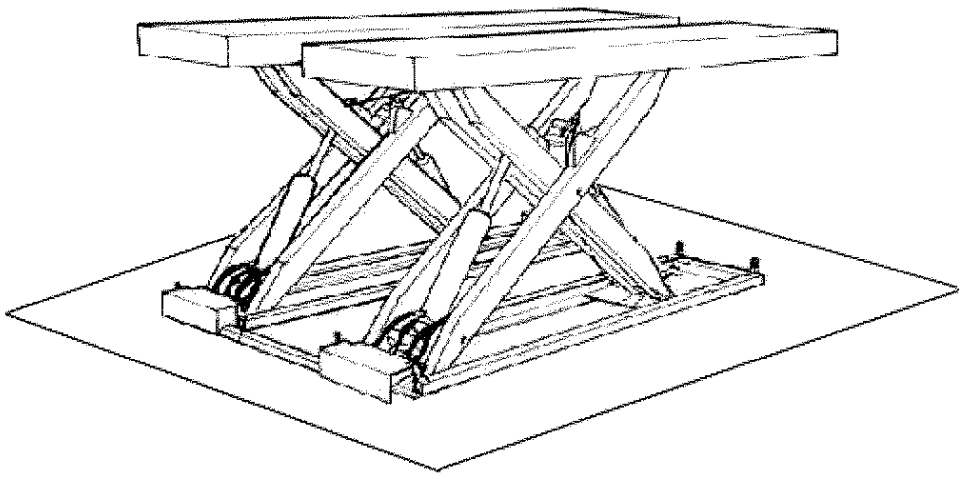
Read this chapter carefully and completely because it contains important information for the safety of the operator and the person in charge of maintenance

⊗	**the lift has been designed and built for lifting vehicles and making them stand above ground level in a closed area. any other use is forbidden, including the following operations:** **washing of vehicles whilst on the lift** **people lifting or scaffolding** **pressing** **loading of vehicle whilst on the lift** **the manufacturer is not liable for possible damage to people, vehicles or objects resulting from an improper or unauthorized use of the lift.**

For operator and people safety, the safety area shown in figure 10, must be vacated during lifting and lowering. The lift must be operated only from the operator's desk.
Operator's presence under the vehicle, during working, is only permitted when the vehicle is lifted and platforms are not running

⊗	**Never use the lift when safety devices are off-line. people, the lift and the vehicles lifted and personnel can be seriously damaged if these instructions are not followed.**

Figure 8 - SAFETY AEREA



SAFETY AREA (min. 1 metre)

6.1 GENERAL WARNINGS

The operator and the person in charge of maintenance must follow accident-prevention laws and rules in force in the country where the lift is in installed.
They must also carry out the following :

- neither remove nor disconnect hydraulic, electric or other safety devices;
- carefully follow the safety notices applied on the machine and included in the manual;
- observe the safety area during lifting;
- be sure the engine of the vehicle is switched off, the gear engaged and the parking brake put on;
- be sure only authorized vehicles are lifted without exceeding the maximum lifting capacity;
- verify that no one is on the platforms during lifting or standing.

6.2 RISKS DURING VEHICLE LIFTING

To avoid overloading and possible breaking, the following safety devices have been used:

- a maximum pressure valve placed inside the hydraulic unit to prevent excessive weight being lifted;
- a special design for the hydraulic system, in case of pipeline failure, to prevent sudden lift lowering.

6.3 RISKS FOR PEOPLE

Risks the personnel could run, due to an improper use of the lift, are described in this section.

6.4 PERSONNEL CRUSHING RISKS

During lowering of runways and vehicles, personnel must not be within the area covered by the lowering trajectory. The operator must be sure no one is in danger before operating the lift.

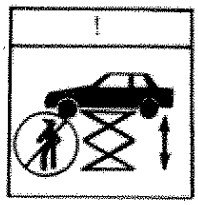


Fig. 9a

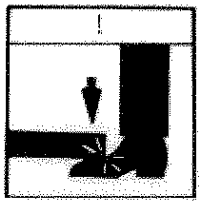


Fig. 9b

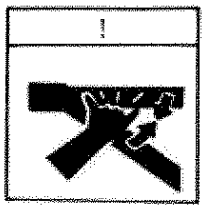


Fig. 9c

6.5 BUMPING RISKS

When the lift is stopped at a relatively low height for working, the risk of bumping against or into projecting parts occurs

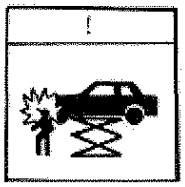


Fig. 10

6.6 RISK OF THE VEHICLE FALLING FROM THE LIFT

Vehicle falling from the lift can be caused when the vehicle is improperly placed on the platforms,

and when its dimensions are incompatible with the lift or by excessive movement of the vehicle. In this case, keep away from the immediate working area.

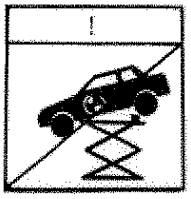


Fig. 11a

Fig. 11b

Fig. 11c

6.7 SLIPPING RISKS

The risk of slipping can be caused by oil or dirt on the floor near the lift.

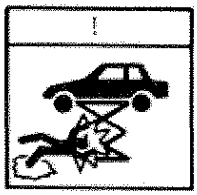


Fig. 12

	**Keep the area under and around the lift clean. Remove all oil spills.**

6.8 ELECTROCUTION RISKS

Avoid use of water, steam, solvent, varnish jets in the lift area where electric cables are placed and, in particular, next to the electric panel.

6.9 RISKS RESULTING FROM IMPROPER LIGHTING

Make sure all areas next to the lift are well and uniformly lit, according to local regulations.

6.10 RISKS OF BREAKING COMPONENTS DURING OPERATION

Materials and procedures, suitable for the designed parameters of the lift, have been used by the manufacturer to build a safe and reliable product. Operate the lift only for the use it has been designed for and follow the maintenance schedule shown in the chapter "Maintenance".

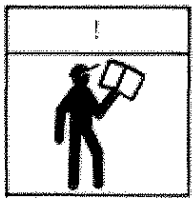


Fig. 13

6.11 RISKS FOR UNAUTHORISED USES

The presence of unauthorized persons next to the lift and on the platforms is strictly forbidden during lifting as well as when the vehicle has been already lifted

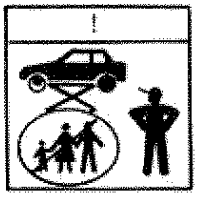


Fig. 14

	**Any use of the lift other than herein specified can cause serious accidents to people in close proximity to the lift**

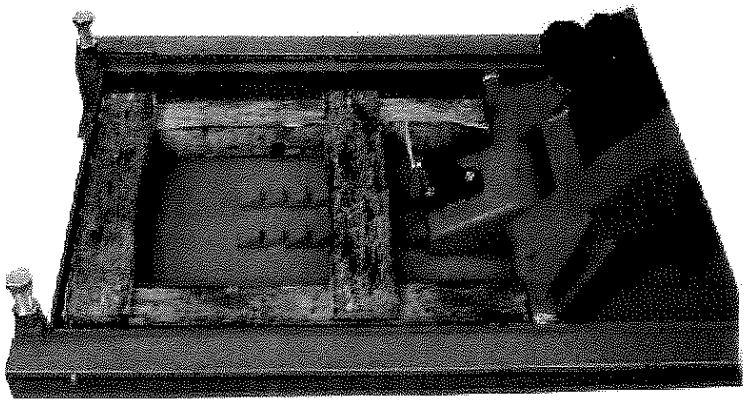
7 CHAPTER 7 - INSTALLATION

⚠	**Only skilled technicians, appointed by the manufacturer, or by authorized dealers, must be allowed to carry out installation. serious damage to people and to the lift can be caused if installations are made by unskilled personnel.**

☞	**Before carrying out any operations, remember to insert the safety piece of wood between the lower booms and the base frame** (RIF. FIG. 15).

☞	**Before compressed air connection, fill in the hydraulic cylinders with oil.**

Figure 15 - LOCKING DISPOSAL FOR LIFT ASSEMBLING



PRELIMINARY OPERATIONS

7.1 CHECKING FOR ROOM SUITABILITY

The lift has been designed to be used in covered and sheltered places.
The place of installation must not be next to washing areas, painting workbenches, solvent or varnish deposits. The installation near to rooms, where a dangerous situation of explosion can occur, is strictly forbidden. The relevant standards of the local Health and Safety at Work regulations, for instance, with respect to minimum distance to wall or other equipment, escapes and the like, must be observed.

7.2 LIGHTING

Lighting must be carried out according to the effective regulations of the place of installation. All areas next to the lift must be well and uniformly lit.

7.3 INSTALLATION SURFACE OR INSTALLATION HOLE

The lift must be placed on level floor and sufficiently resistant. The surface and foundation must be suitable for bearing maximum stress values, also in unfavorable working conditions. If in-ground/recessed installation is made, the finished size of the hole must be verified (as per drawing sent at the time of order). For installations on raised surface, compliance with the maximum carrying capacity of the surface is recommended..

	**Be sure anchor bolts are placed correctly and at right low**

Where special painting or wedges are used it is necessary to use longer anchor bolts

7.4 RUNWAY ASSEMBLY AND CONTROL DESK POSITIONING

	**Unauthorized persons are not allowed to enter during assembly.**

Most of the components of the MAGNUS are pre-assembled in the works, and the lift is factory-tested prior to delivery. It should be assembled as described below. The tools required are those usually taken along by a service technician

	**Only when the hydraulic system has been filled and bled, and the runways have been raised to the final top position, is it possible to connect the pneumatic lines**

To transport the runways to the site always use suitable hoisting means of sufficient load capacity. The same applies for the slinging means used (ropes, chains, etc.).
To prevent the runway from slipping or dropping during transport, it should be lifted according to its centre of gravity. Fig. 16 shows examples for transporting the lift.
Always pick up the runways on the underside of the base frame
At the site, position both the base frames with the runways on the foundation according to the drive-on direction of the lift (Fig. 17)
Align the runways parallel to each other and in the drive
Note: in the case of floor-level installation the runways have to be aligned with the prepared foundation recesses. They may not be perfectly parallel. This will not prevent the subsequent alignment and operation of the lift
Position the control desk at the place provided.
The standard hydraulic and pneumatic lines are designed such that the control desk can be installed approx. 2 m from the lift (approx. 1.8 m in case of floor-level installation). In special cases order lines and cables of special length (see Accessories price list)

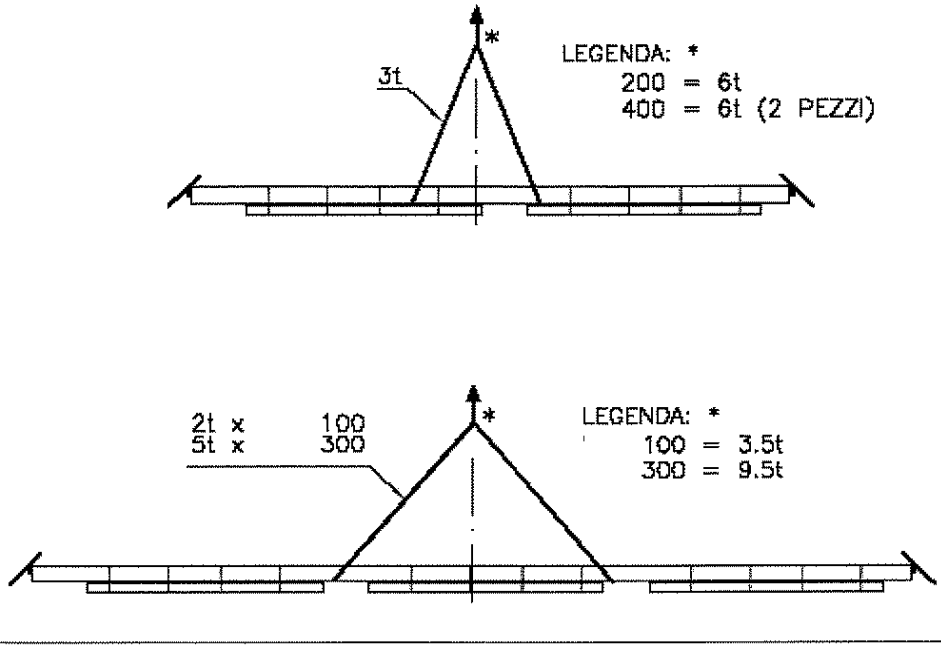


Fig. 16

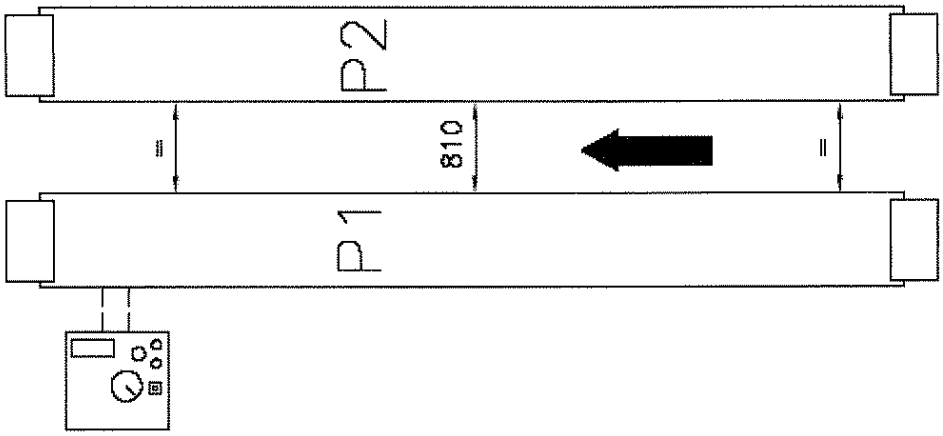


Fig. 17

7.5 HYDRAULIC CONNECTIONS

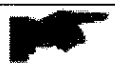
Important note
Before laying the hydraulic lines the couplings should be sealed (with adhesive tape, textiles, plastic or similar) to prevent dirt or other objects from entering the lines during installation

7.5.1 CONNECTIONS

- Raise the aligned runways one after the other to a vertical height of approx. 1.30 m from the base frame and settle them in the gear racks (runways should be on the same level as far as possible). When raising the runways take care not to damage the supply and control lines.
- Remove one of the panels of the control desk.
- Mount the pre-assembled hydraulic lines as shown in the hydraulic diagrams (Fig. 18)

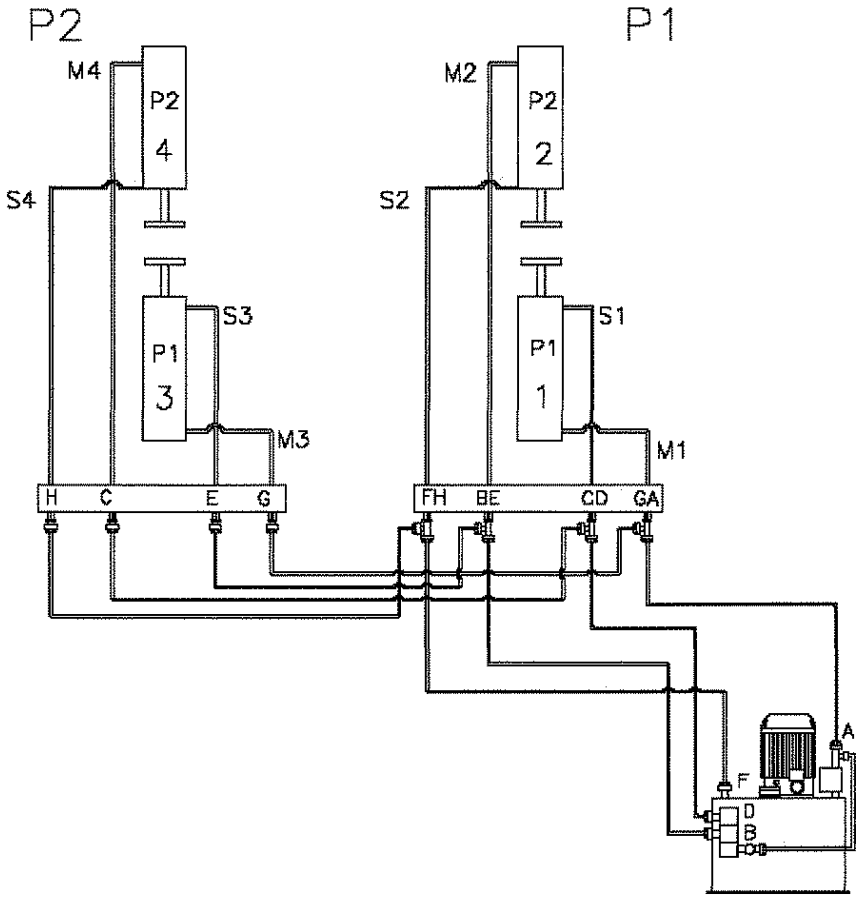
7.5.2 HYDRAULIC CONNECTION

The reference numbers are shown on the connectors in the control desk and on the hydraulic lines

	**Copper washers can only be used once.**

- Connect hydraulic pipes on hydraulic unit to correspondent connections.

Figure 18 – HYDRAULC CONNECTIONS – 100



Connections

G = GA

H = HF

Autoleveling

B = EB

D = CD

A = PRESSURE

F = RETURN

B = LEVELING

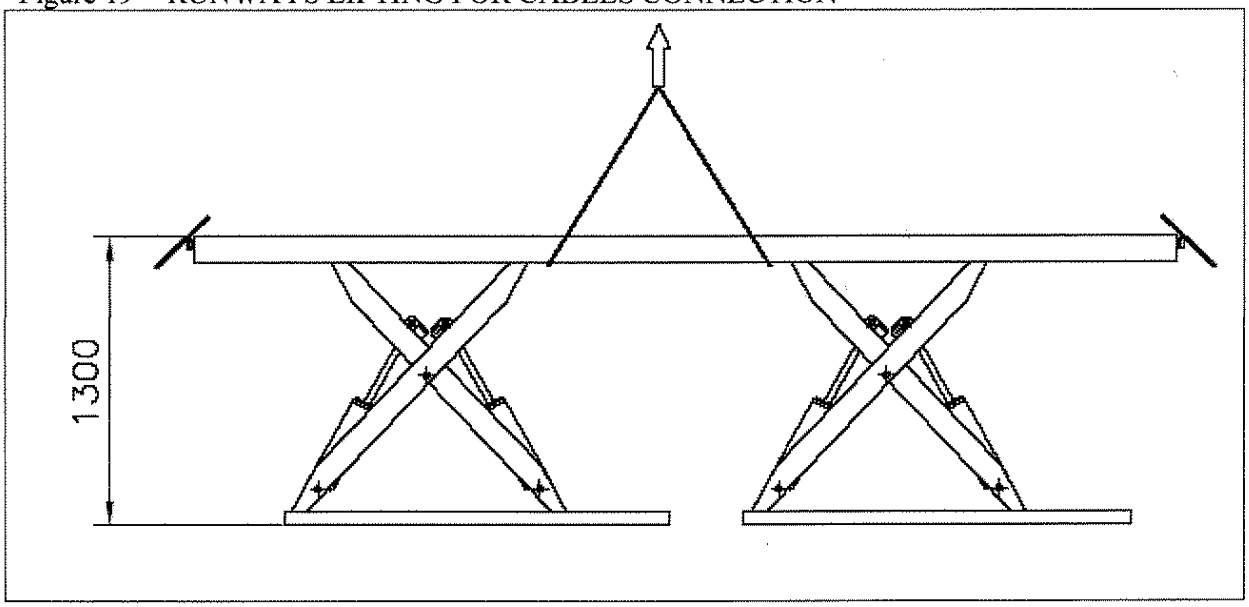
D = LEVELING

7.6 ELECTRICAL CONNECTION AND POWER CORD

	In general any work on the electrical system such as fitting of a plug and changing of connections, if necessary, must be carried out by a qualified electrician or an expert authorized to do so by the manufacturer, in line with relevant national standards and the regulations of the local power station

- Connect the power cord provided by the user in the control desk as shown in the electrical diagram. Fusing must be provided by the user before the point of connection and in line with applicable standards;
- Connect the control lines pre-fitted to the lift in the control desk as shown in the electrical diagram.
- When all the lines are connected turn on the main switch (Fig. 25, Item 1), set the SELECTION switch to the required position and check the correct direction of rotation (counterclockwise) of the motor of the hydraulic unit by pressing the UP key (Fig. 25, Item 2). If the direction of rotation is not correct, interchange the two phases of the main switch.

Figure 19 - RUNWAYS LIFTING FOR CABLES CONNECTION



7.6.1 POWER SUPPLY

In general any work on the electrical system such as fitting of a plug and changing of connections, if necessary, must be carried out by a qualified electrician in line with relevant national standards and the regulations of the local power station.

Power supply for the SATURNUS TRUCK is:

- 3ph 3KW 50 Hz 220V/380V for the PSA 20.

The power cord is protected with 20A fuses in the control desk under the control panel. The user must provide a power cord of suitable cross section and with suitable fusing up to the terminal strip in the control desk (see Electrical diagram), taking into account relevant national standards and the regulations of the local power station. Furthermore a compressed air supply has to be provided at

site

7.7 START UP

- When the hydraulic lines are connected, fill the hydraulic unit with hydraulic oil (see recommended oil,), considering that you need:
  - 40 litres for the PSA 100;

- Turn on the main switch.

- Press the UP key and raise the runway P1 (primary cylinder) until it reaches the final top position.

- Now fill the hydraulic unit with half the quantity already filled.

- To raise the runway P1 to the final top position, press the UP key (Fig. 25, Item 2) and simultaneously the RELEASE key (Fig. 25, Item 8 – having removed the front panel of the control desk) and hold it pressed until the runway P1 and also the runway P2 have been raised to the final top position. On reaching the final top position keep the keys pressed for further 10-20 seconds to completely bleed the hydraulic system.

- Press the DOWN key and lower the runways completely.

- Carry out the bleeding once more. The hydraulic system of the lift is now ready to operate.

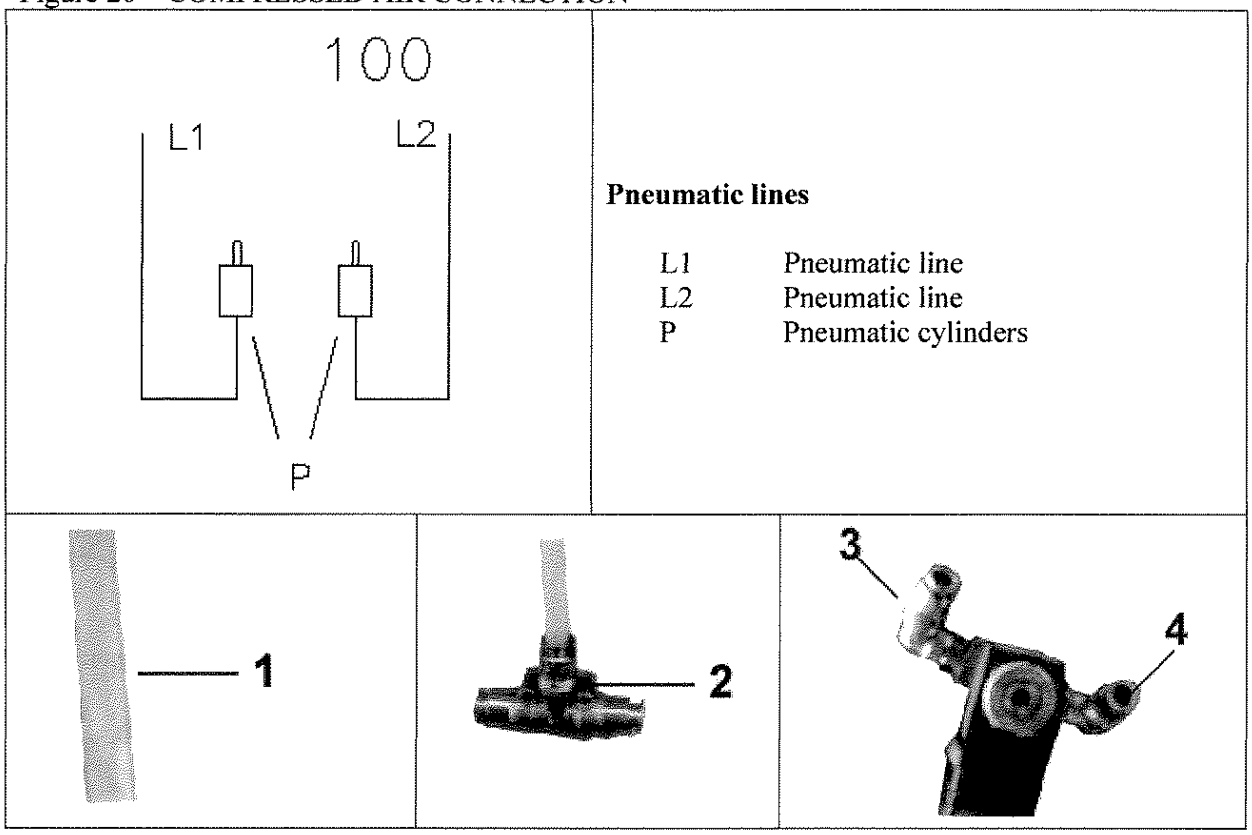
- Replace the front panel of the control desk.

7.8 CONNECTION OF PNEUMATIC LINES

The disengagement of the gear racks is carried out pneumatically. The pneumatic supply at site (to which the pneumatic system of the lift is connected) must be equipped with a servicing unit composed of water separator, air lubricator and pressure reducer. These devices can be supplied by the manufacturer on request.

- Raise the lift to the final top position.
- Connect the pneumatic pipe coming from platform P1 (fig. 20- pos.1) toT connection assembled on platform P2 (Fig.20 –pos.2).
- Coonect with a pneumatic pipe the lift to the control unit (Fig. 20 – pos. 3)
- Connect the pneumatic system of the lift to the pneumatic supply at site (fig. 20 - pos.4)
- Check the pneumatic control operations for proper performance .

Figure 20 – COMPRESSED AIR CONNECTION



7.8.1 PLATFORMS ADJUSTMENT AND LIFT BOLTING

Once cables have been connected , fix the lift to the ground as follow:

- Raise the lift at 1,6 m height from ground level.
- Check the alignment both in vertical and in horizontal direction, the parallelism and the vertical level of the runways to each other.
- Loosen the anchor bolts
- After the lift is fixed check alignment again and adjust it , if necessary

7.8 CHECKS AND INSPECTIONS

7.8.1 MECHANICAL CHECKS

- platform leveling and alignment (as per measurement showed on);
- lift fixing to the ground with 8 anchor bolts (min. recommended size $\varnothing = 16\ mm$), bolts, connectors and connections tightened.
- clean all parts of the machine;

7.8.2 ELECTRICAL CHECKS

- connections as per diagrams
- lift grounding

- operation of the following devices:
  - top position limit switch
  - bottom position limit switch

7.8.3 HYDRAULIC SYSTEM CHECK

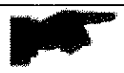
- proper oil level in the tank
- no leakage and blow-by
- cylinder operation

7.9 SET UP AND ADJUSTMENTS

7.9.1 LOAD LESS CHECK

Carry out two or three complete cycles of lowering and lifting and check:

- the lift for reaching its maximum height
- the max height limit switch for proper operation
- the lowering limit switch for proper operation;
- the horn/signaling light for proper operation during the final travel;

	**WARNING: please follow carefully the instructions in the coming paragraph for avoiding damages on the lift.**

7.9.2 CHECK WITH LOAD

Repeat checks provided for by 7.9.1 section with the vehicle loaded;
In this case some irregularities can occur; so considering that all adjustments shown are factory-made, the following can be carried out as an exception:

7.12 BOLTS AND NUTS CHECK

After carrying out the checks with load, make a visual inspection of the machine and check bolts and nuts for proper tightening.

7.13 LIMIT SWITCHES ADJUSTMENTS

	**Only skilled personnel must be allowed to carry out this operation. An improper adjustment of limit switches could cause damages to the lift, objects and people**

When the anchor bolts are fitted and the lift is connected, check the limit switches for proper performance. The lift comes equipped with various preset limit switches for monitoring the safety functions or the final positions.
The control function of the limit switches is described below

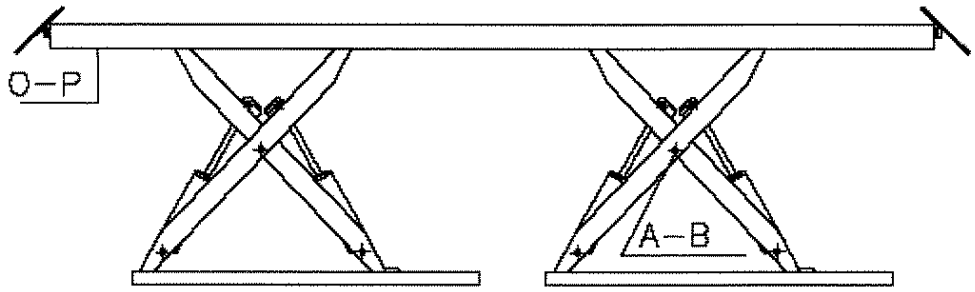


Fig. 21

Functioning and safeties devices

A Limit switch - Maximum working height of the lift
Installed on Platform P2
Lifting must be stopped 50 mm before maximum height to prevent any possible damage to hydraulic cylinders.

B Limit switch – device for automatic cut out at approx. 60 cm before the final bottom position
Installed on platform P1

O e P Limit switches - devices for alignment of the runways in case of uneven travel.
Limit switch O is installed on platform P1 and limit switch P is installed on platform P2

The connection diagram for the control and safety switches is illustrated in 5.

7.13.1 ADJUSTMENT OF MAXIMUM WORKING HEIGHT LIMIT SWITCH

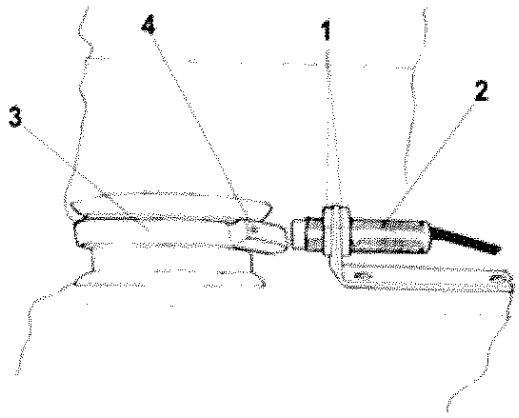


Fig. 22

- Raise the lift to the chosen height;
- Loosen the dowels (4) which fix the cam on platform P2 arms and turn the cam (3) until limit switch detects it;
- Tighten the dowels

In case the limit switch does not detect the cam presence it is necessary to settle it as following:

- Loosen nuts (1) and move the limit switch (2) closer to the cam (3), at a distance of approx 1 to 3 mm;
- Tighten the nuts.

7.13.2 CHECK AND SETTING OF SAFETY LIMIT SWICTH

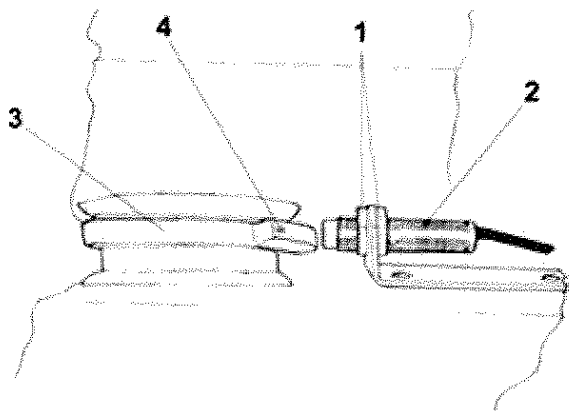


Fig. 23

- Raise the lift not higher than 600 mm;
- Loosen the dowels (4) which fix the cam on platform P1 arms and turn the cam (3) until limit switch detects it;
- Tighten the dowels firmly

In case the limit switch does not detect the cam presence it is necessary to settle it as following

- Loosen nuts (1) and move the limit switch (2) closer to the cam (3), at a distance of approx 1 to 3 mm;
- Tighten the nuts.

7.13.3 CHECK AND SETTING OF AUTO LEVELING LIMIT SWITCH

To be carried out when lift is in lowest position. Limit switches working is detectable by lamping of relais A6 led installed on hydraulic unic main board.
Keep final lowering button pushed until platforms reach lowest position and check if A6 realis is switched on.
The limit switch must be located at a distance of 1 to 3 mm from the plate installe don the platform.
The sensors are connected in parallel thus after their setting it is necessary to make a cross check between them. Move alternatively the plate of each sensor (limit switch O first and then limit switch P) and check at the same time functioning of relais A6

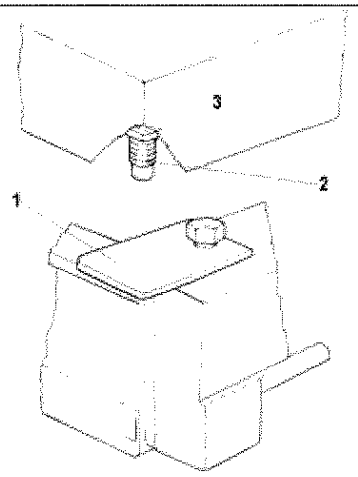


Fig. 24

If this has not happened, adjust the limit switch as follows:

- verify that the direction of lamination (1) is towards the limit switch (2);
- loosen nuts (3) of the proximity switch (2) and adjust it at a distance between 1 and 3 mm from the lamination (1);
- tighten nuts (3)

8 CHAPTER 8 - OPERATION AND USE

8.1 CONTROLS

Controls for operating the lift are:

MAIN SWITCH (1)

The function control can be set in five positions:

- **0 Position:** lift electric circuit is not powered; the switch can be padlocked to prevent the use of the lift..
- **1 Position** lift electrical circuit is powered; the lift can be operated

LIFTING BUTTON (4)

- When pressed, motor and hydraulic circuit solenoid valve operate and the lift will be raised

PILOT LAMP (3)

- Indicates the power circuit is switched on

LOWERING BUTTON (5)

- When pressed, the motor and the release hydraulic circuit solenoid valve are operated, the lift can be raised and mechanical safeties released.
  So, the motor is stopped, the lowering solenoid valve is operated and the lift can be lowered up to the safety height (600 mm from the ground)

SAFETY DOWN BUTTON (2)

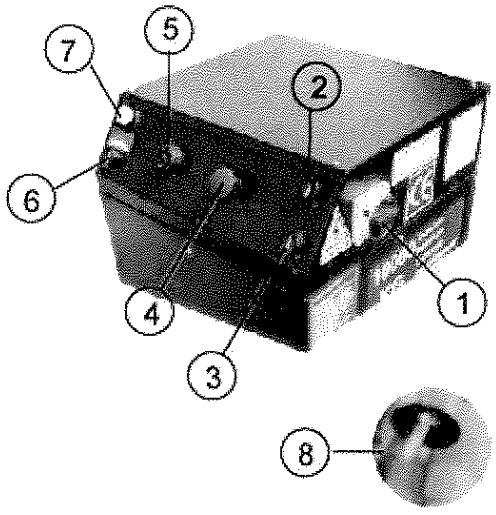
- When pressed above the safety height detection (600 mm), the horn and the lowering solenoid valve are operated and mechanical safeties are engaged.
- When pressed, the horn and, after a few seconds, the lowering solenoid valve are operated and the lift can make its final travel.

EMERGENCY BUTTON (7)

- If it is pressed, the circuit will disconnect.

EXCLUSION BUTTON (8)

Figure 25 - CONTROLS



	Be sure the safety area is free from people and objects during the final travel

Lift operation can be summarized into four steps:

8.2 VEHICLE POSITIONING

- Place the vehicle at the centre of the platform and adjust the telescopic extensions.
- Place pads under the positions indicated by the motor vehicle's manufacturer for lifting..

8.3 LIFTING

- Turn main switch (1) on position 1 and press LIFTING button (2) to lift the vehicle to the required level

8.4 STANDING

- To let the lift stand, release the LIFTING button and press the safety down button (7) 'till the required position is reached. This operation activates the beeper and a few seconds later, the lift goes in safety

8.5 LOWERING

- Press the LOWERING button (3) to carry out lowering.
- The lift will raise to release the mechanical safety locks and then it will descend to a safety height of about 600 mm.
- Be sure the safety area is free of people and objects, then press the safety down button (6) that activates the beeper and a few seconds later, the final descent.

* The raising time is adjustable by means of a trimmer TR1 placed electric switchboard

	**Warning : engage the mechanical safeties when the vehicle is left on the runways for a long period (ex. during all the night)**

8.6 MANUAL AND EMERGENCY LOWERING

⚠	**Warning : for manual lowering , mechanical safeties must be released. Be sure the working area is free of unauthorized persons during the whole operation**

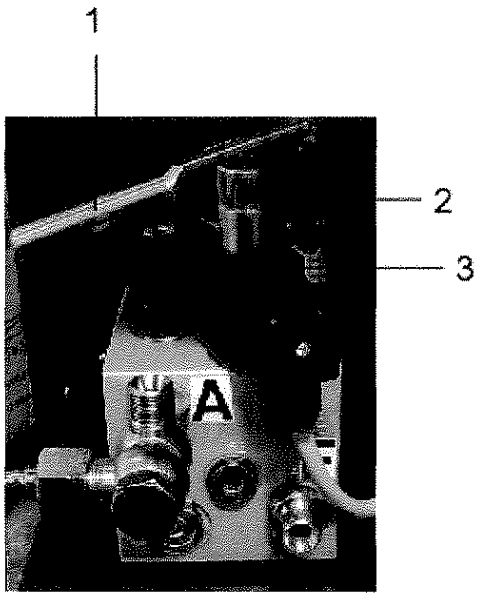


Fig. 26

If there is no power or the control box is damaged, lower the lift manually to its initial position as follows:

- Disconnect the power supply and be sure the main switch is set to «0» position;
- Open front panel of power control unit and act on manual pump (1) to disengage teh mechanical safeties ;
- unscrew the knurled nut (2) from the block of solenoid valve
- remove the magnet (3) from solenoid valve
- place the knurled nut (2) on solenoid valve and tighten;

☞	**Note : if the hand pump does not work, this must be bled as explained below**

BLEEDING THE HAND PUMP – 100

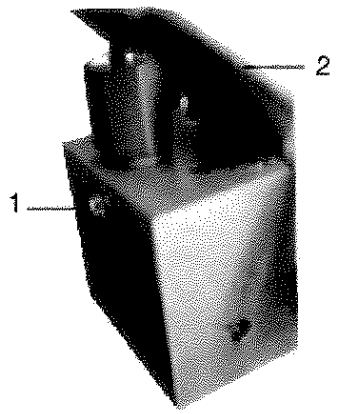


Fig. 27

1. Loose screw (1) and remove it
2. Act on lever (2) till the oil will exit from the hole of screw (1) .
3. Tighten screw (1) and pump until the lever will make resistance.

⚠	**Attention : after manual lowering of the lift, reset original conditions and take care to not invert the two magnets.** **The lift cannot be raised when the manual lowering valve is opened**

9 CHAPTER 9 - MAINTENANCE

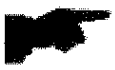
	**Only trained personnel who knows how the lift works, must be allowed to service the lift .**

To service the lift, the properly following has to be carried out:

- use only genuine spare parts as well as equipment suitable for the work required
- follow the scheduled maintenance and check periods shown in the manual
- discover the reason for possible failures such as too much noise, overheating, oil blow-by, etc.

Refer to documents supplied by the dealer to carry out maintenance:

- Refer to functional drawing of the electric and hydraulic equipment
- Refer to exploded views with all data necessary for spare parts ordering
- Refer to list of possible faults and relevant solutions..

	**Before carrying out any maintenance or repair on the lift, disconnect the power supply, padlock the general power supply switch and keep the key in a safe place to prevent unauthorized persons from switching on or operating the lift**

9.1 ORDINARY MAINTENANCE

The lift has to be properly cleaned at least once a month. Use self-cleaning clothes.

	**THE USE OF WATER OR FLAMMABLE LIQUID IS STRICTLY FORBIDDEN**

Be sure the rod of the hydraulic cylinders is always clean and not damaged since this may result in leakage from seals and, as a consequence, possible malfunctions.

9.2 PERIODIC MAINTENANCE

Every 3 months	Hydraulic circuit	▪ check oil tank level; refill with oil, if needed; ▪ check the circuit for oil leakage. • Check seals for proper conditions and replace them, if necessary;
	Foundation bolts	▪ check bolts for proper tightening
	Hydraulic pump	▪ verify that no noise changes take place in the pump of the control desk when running and check fixing bolts for proper tightening
	Safety system	▪ check safety devices for proper operation
Every 6 months	Oil	▪ Check oil for contamination or ageing. Contaminated oil is the main reason for failure of valves and shorter life of gears pumps
Every 12 months	General check	▪ verify that all components and mechanisms are not damaged
	Electrical system	▪ a check of the electrical system to verify that control desk motor, limit switches and control panel operate properly must be carried out by skilled electricians

10 CHAPTER 10 - TROUBLESHOOTING

A list of possible troubles and solutions is given below:

TROUBLE:	POSSIBLE CAUSE:	SOLUTION:
The lift does not work	The main switch is not turned on	Turn the switch on
	There is no power	Check power and restore if necessary
	The electrical wires are disconnected	Replace
	Fuses are blown	Replace
	The emergency button is pressed	Restore the button properly
The lift does not raise when the UP button is pressed (the pilot lam is ON)	The motor direction of rotation is not correct	Interchange the two phases on the main switch
	The oil in the hydraulic unit is not sufficient	Add some hydraulic oil
	The UP button is faulty	Check UP button and connection for proper operation. Replace, if needed
	The maximum height limit switch sensor is faulty	Check the max. height and relevant connection for proper operation. Replace, if needed
	The lowering valve does not close	Check and clean, if dirty, or replace, if faulty
	The suction pump filter is dirty	Check and clean if needed
	The emergency button is pressed in	Restore the push button properly
The lifting capacity is limited	The maximum pressure solenoid valve is not adjusted correctly.	Adjust correctly
	The pump is faulty	Check the pump and replace if necessary
	The oil in the tank is not enough	Fill oil in the tank
The platforms doesn't lower completely	Switch doesn't work	Check the switch and bleed the hydraulic system
	Lowering valve is faulty	Lower the lift manually (see __ manual lowering of the lift)
Platforms lower out of control	Discharging valve doesn't close properly	Check discharging valve (Fig. __, pos. 2)
	There are oil leakages in hydraulic circuit	Check hydraulic circuit
The lift does not lower when the DOWN button is pressed	The motor does not operate properly and does not release the mechanical safeties	Check the motor

	The lift goes up instead of going down -Because air solenoid valve is faulty	Replace air solenoid valve
	Because the air does not reach the circuit	Verify the compressor and air hose ability
	Because mechanical safeties limit switch are faulty	Replace the limit switch faulty
	Because electric board is faulty	Replace electric board
	The lowering solenoid valve does not discharge	Verify if it is powered and check the magneto for damages (replace if disconnected or burnt)
	The release solenoid valve is not operating	Verify if it is powered and check the magneto for damages (replace if disconnected or burnt)
	The DOWN button is faulty	Check the DOWN button and connection for proper operation. Replace, if needed
	The safety height limit switch is not correctly adjusted or it is defective	Adjust or change the limit switch
The lift-table doesn't lower in a correct way (present tugs)	Presence of air in hydraulic circuit	Bleed the hydraulic circuit
	Lowering valve is faulty	Check the valve and replace if necessary
Mechanical safeties do not work	Because the air does not reach the circuit	Check pneumatic system
	Oil missing	Check all relevant components
The lift isn't raising synchronous	Presence of air or dripping in the hydraulic circuit	Bleed the hydraulic circuit
	The cylinder gaskets can be damaged	Check and replace if necessary
	Leveling valve is dirty or faulty	Clean or replace the leveling valve