P&R Industries S.A.

Lift K_ 3_
Sr. no._ _ _ _
Yr of mf.: 200_
CE

Operator's Manual

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1 Declaration of Conformity

P&R Industries S.A.

EC declaration of conformity: CE

The present declaration conforms to the requirements of the EN 45014 standard

We, P & R Industries S.A., Corso Elvezia 25 - 6900 Lugano - Switzerland

herewith declare that the automotive lifts of type KN 32, KH 32, KN 35 and KH 35

- have been inspected by BUREA VERITAS. The lift models have successfully passed the tests and inspections of the CE type-test homologation.
- are in conformity with the following directives and standards:

➢ 98/37/EC (06/98)	EC directive on machines and their harmonisation by EC member states
➢ 73/23/EEC (02/73)	EC directive on low-voltage electric equipment and their harmonisation by EC member states
➢ 89/336/EEC (05/89)	EC directive on electromagnetic compatibility and their harmonisation by EC member states
➢ EN292-1 (12/91)	Safety of machines - Fundamentals, general design principles - Part 1: Terminology, technology
➢ EN292-2 (12/91)	Safety of machines - Fundamentals, general design principles - Part 2: Technical principle and specifications
➢ EN60204-1 (4/98)	Safety of machines - Electric equipment of machines - Part 1: General regulations

- and that the automotive lifts of type KN 32 and KH 32 are also in conformity with the following standard:

➢ EN1493 (12/98)	Automotive lifts

Inspection authority:

Bureau Veritas,
17 bis, Place des Reflets - La Défense 2
92400 Courbevoie
France

Lift model	No. of certificate of type test homologation
KN 32	0062.150X.0489.01.08
KH 32	0062.150X.0489.01.08
KN 35	0062.150X.0490.01.08
KH 35	0062.150X.0490.01.08

The products specified in the present declaration are designed and manufactured in line with the models presented to the CE type test.

Lugano, 6 July 2007

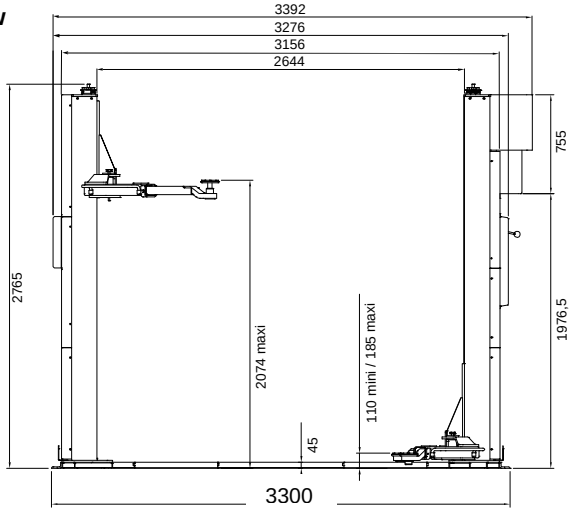
P&R Industries S.A.
Jörg Hellmich
Managing Director

2 Technical Data

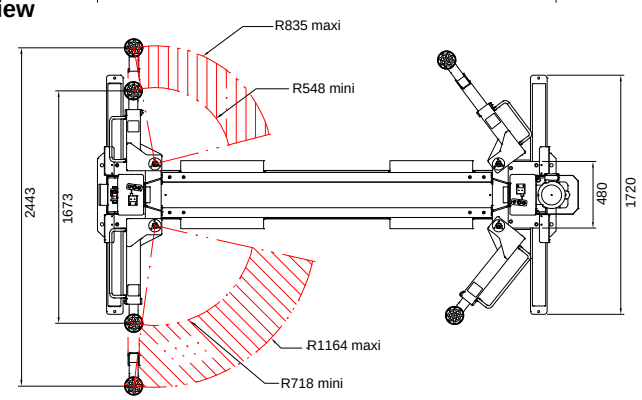
	KN32	KH 32	KN35	KH 35
Rated load capacity	3200 kg		3500 kg	
Lifting time (approx.)	40 seconds			
Drive rating	2.2 kW			
Power consumption	2.3 kW			
Electric power supply	230/400 V 3PE 50/60 Hz			
Pick-up pad diameter	120 mm			
Oil tank	11 litres			
Hydraulic circuit:				
Calibration pressure	205 bars		215 bars	
Nominal pressure	185 bars		205 bars	
Weight of lift: gross / net	875 / 815 kg	940 / 880 kg	875 / 815 kg	940 / 880 kg
Max. noise level at operator's workplace	75 bB(A)			
Ambient temperature range	0 up to +50 °C			
Relative humidity range (w/o condensation)	30 - 95 %			

KH 32 / KH 35

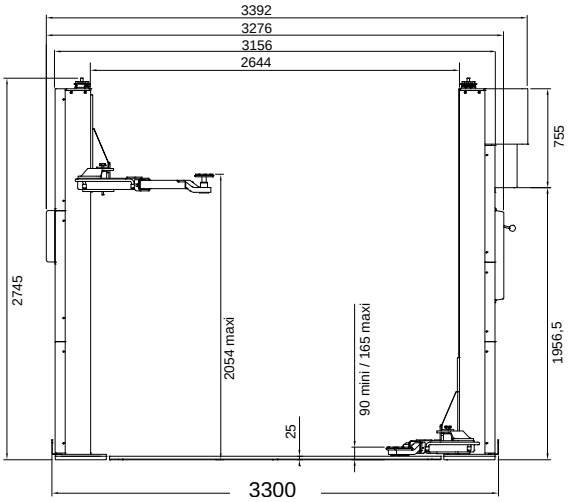
Front view

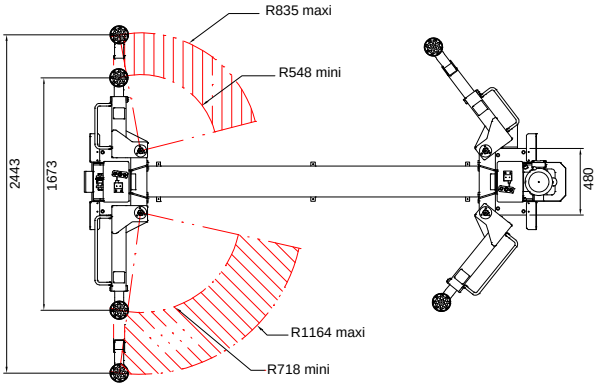


Top view



KN 32 / KN 35



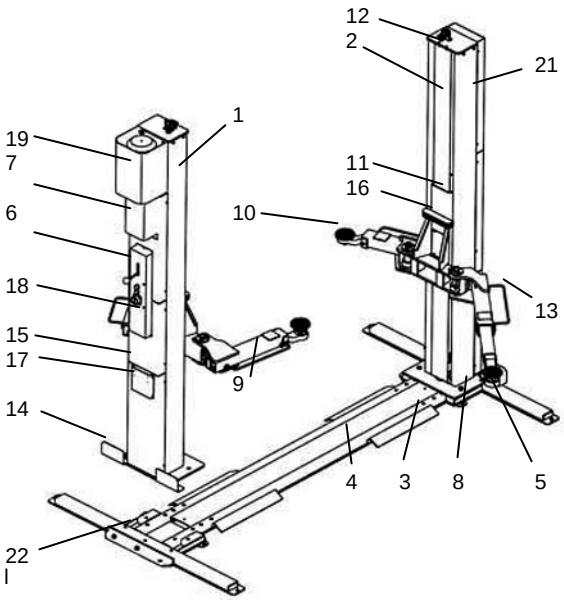


All dimensions are specified in mm

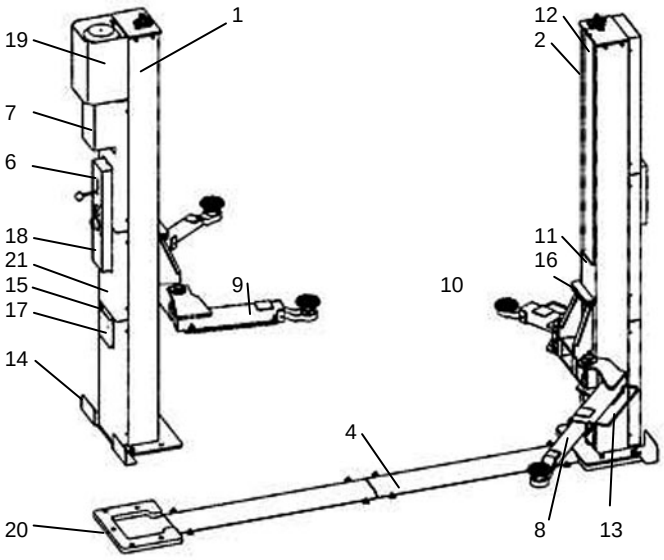
3 Overview

No.	Designation
1	Primary column
2	Secondary column
3	Drive-on ramp
4	Cover plate
5	H-shaped base frame
6	Control unit
7	Hydraulic unit
8	Base plate
9	Supporting arm
10	Pick-up pad
11	Lifting carriage
12	Inside cover of column (tape)
13	Foot guard bracket
14	Foot guard
15	Storage compartment for operator's manual
16	Door stop
17	Nameplate
18	Safety rules
19	Cover of hydraulic unit
20	U-shaped base plate
21	Column cover

Lift KH 32 and KH 35



Lift KN 32 and KN 35



4 Identification of Lift (Nameplate)

When you specify the lift type, the serial number and possible accessories, the after-sales service of your authorised distributor will be able to respond more quickly to your service requirement.

The following information is given on the nameplates:

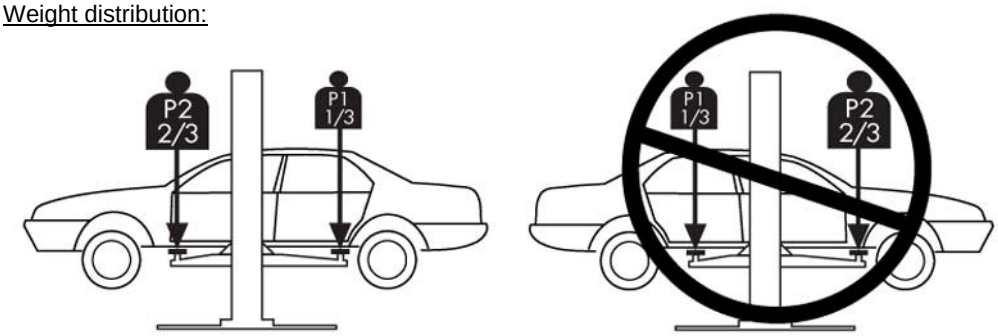
P&R Industries S.A. - Corso Elvezia 25 - 6900 Lugano - Switzerland
Phone: +41 91 922 04 26 Fax: +41 91 922 04 27
Model **K 32**
Year of manufacture 200_
Serial number _____

Rated load capacity (kg)	3200
Supply voltage (V)	230 / 400
Power consumption (kW)	2.3
Drive rating (kW)	2.2
Phases	3 PE
Frequency (Hz)	50 / 60
Nominal hydraulic pressure (bar)	180

P&R Industries S.A. - Corso Elvezia 25 - 6900 Lugano - Switzerland
Phone: +41 91 922 04 26 Fax: +41 91 922 04 27
Model **K 35**
Year of manufacture 200_
Serial number _____

Rated load capacity (kg)	3500
Supply voltage (V)	230 / 400
Power consumption (kW)	2.3
Drive rating (kW)	2.2
Phases	3 PE
Frequency (Hz)	50 / 60
Nominal hydraulic pressure (bar)	180

Weight distribution:



5 Scope of Application

The present operator's manual is an integral part of the product.

Please read thoroughly the warnings and instructions given in the present manual as they supply important information regarding **safe use** and **maintenance.**

Keep the manual within reach for future consultation.

The automotive lifts KN 32, KN 35, K H 32 and KH 35 are designed to lift passenger cars and light trucks the maximum weight of which must not exceed the weight specified on the nameplate of the lift. They are ideally suited for maintenance and repair of motor-vehicles.

⚠ **Attention**

The lifts are designed for inside use. They must not be used outdoors.

Load distribution on the pick-up pads (Fig. 1) is

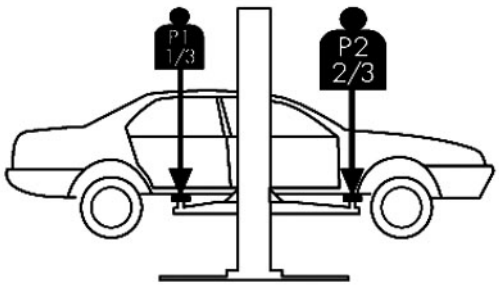
- reversible for lifts KN 32 and KH 32: the heavier load (P2) can be placed either on the long arms or on the short arms P1 (1/3) - P2 (2/3) of maximum admissible load
- not reversible for lifts KN 35 and KH 35: the heavier load (P2) must be placed on the short arms only P1 (1/3) - P2 (2/3) of maximum admissible load

The minimum distance between two pick-up pads (track) must not be less than 1000 mm (Fig. 2).

If this distance is inferior to the one specified, load capacity will be lower.

Fig. 1

KN 32 + KH 32 only



KN 32, KH 32,
KN 35 + KH 35

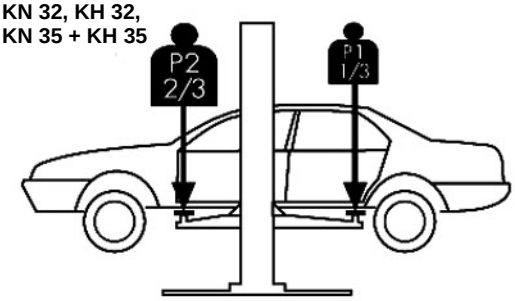
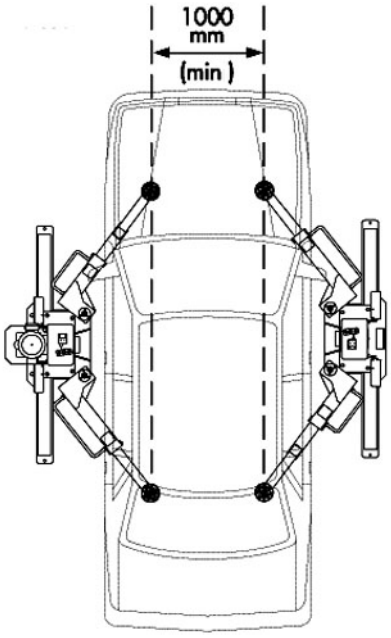


Fig. 2



Lift

Load distribution must be in line with the guide-lines specified in this chapter. Anyway is it recommended to centre the load as much as possible relative to the axis of the columns.

⚠ **Attention**

Make sure that dismounting or mounting of mechanical components of the vehicle does not change its stability.

⊘ **Attention**

The use of the lift is prohibited in a potentially combustible or inflammable atmosphere.

⚠ **Attention**

Never lift the load when the four pick-up pads are not properly positioned under the jacking points as specified by the car manufacturer. It is also mandatory to verify that the four arms are properly locked before lifting the load: otherwise this might cause a dangerous instability of lift and vehicle.

⊘ **Attention**

Never use the lift for washing a car.

⊘ **Attention**

It is prohibited to use the lift under conditions not expressly stated in this manual. It is particularly prohibited to lift human beings. The manufacturer cannot be held responsible for any damage whatsoever caused by improper, erroneous or unreasonable use.

6 Safety Rules

The operator must read the operation manual and become familiar with the icons provided on the lift. The use of the lift is strictly reserved to qualified and authorised personnel.

It is prohibited:

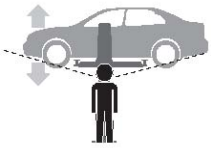
- to climb the load or the arms when lifted from bottom position.
- to stay in the vehicle or on the lift during lifting or lowering.

It is prohibited to stay under the lift when raising or lowering. The area where the load and pick-up pads/arms are lifted or lowered must not be hindered by any obstacle whatsoever. Children and animals must be kept strictly out of the lift area and environment.

It is prohibited to lift one side of the vehicle only.

It is prohibited to make any changes or amendments to the lift and its safety devices.

The operator must avoid any risk of crushing feet.



The operator must observe the arms during lifting and lowering of the lift.

The operator must make sure never to jeopardise the stability of the lift when mounting or dismounting any components.

⚠ **Attention**

Any intervention, even if minor, on the electric system must be carried out by qualified personnel (see relevant legislation).

7 Transport

Transport must be carried out in line with the instructions given below:

- Protect the control unit and the hydraulic unit against weather and avoid any sudden temperature changes.
- As the lift has major dimensions and weight, handling must be effected on pallet, or with a suitable fork-lift truck where the forks are placed under the jacking points provided for this purpose (Fig. 3).

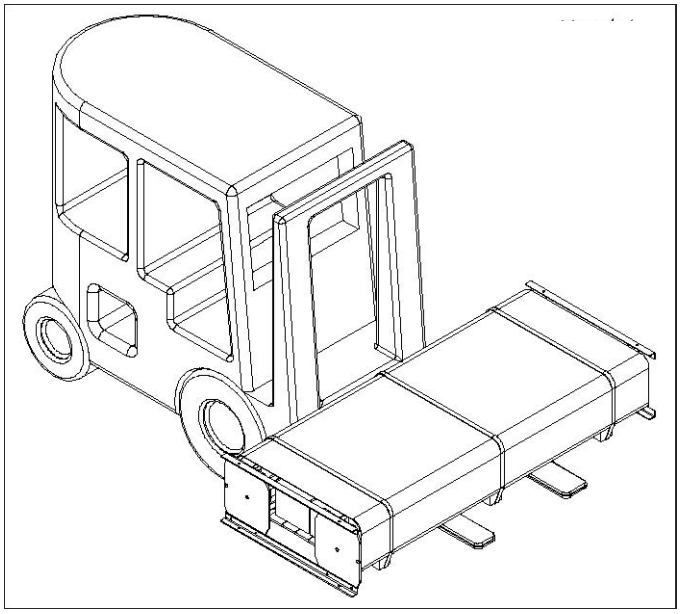


Fig. 3

8 Unpacking

Unpack the lift in the presence of the forwarding agent.

Having removed the packing make sure the different components of the lift are all intact by checking that no part be visibly damaged (arms, columns, control unit, accessory box, etc.).

If any damage is noticed, specify it on the forwarding agent's receipt, do not use the lift and immediately contact your authorised distributor.

The packing elements (films, plastic bags, polystyrene, cardboard boxes, nails, screws, wooden pieces, etc.) must be kept out of the reach of children because of potential risks.

Dispose of polluting and biologically non degradable material only in special places provided for this purpose. Make sure to observe relevant national laws and standards.

9 Site of Installation

⚠ **Attention**

When choosing the site of installation, make sure to meet the relevant Health and Safety at Work regulations on working environment.

⚠ **Attention**

The service technician of your authorised distributor must be informed about the position of any supply lines in the ground (electricity, compressed air, water, etc.) which might be damaged when he drills the holes for fastening the lift, if so required.

The operator must be able to observe lift and lift environment from the control unit.

The presence of any unauthorised persons, animals and any objects which could be a potential source of danger is prohibited in the lift environment.

The installation site of reinforced concrete must be able to support any loads transmitted during operation (Fig. 4). Concrete quality (pressure resistance) must be 250 kg/cm^2 minimum.

The site must be plane and level (+/- 0,5 cm) all over the installation area.

A suitable floor covering is allowed. The thickness of the concrete slab at the site of installation must ensure that the anchor bolts are perfectly seated and that there is a proper density for at least 14 cm for lifts KH 32 and KH 35, or 18 cm for lifts KN 32 and KN 35 (Fig. 5).

If the lift is to be installed on an upper floor, a construction expert or architect must be consulted.

Free space at both sides of the columns should be 800 mm minimum (Fig. 7).

Fig. 4 - **Charges transmitted to the site of installation**

Lift	Mx	My	F
KN 32	1 315 200	879 086	1945
KH 32	1 315 200	879 086	2000
KN 35	1 438 500	480 750	2092
KH 35	1 438 500	480 750	2147

M = tilting motion specified in kg/mm

F = force specified in daN (1 daN = 1.02 kg)

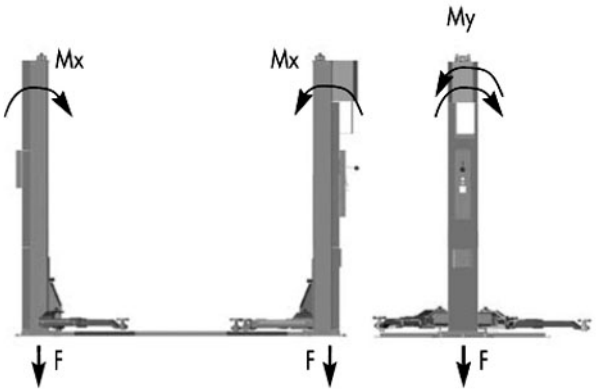
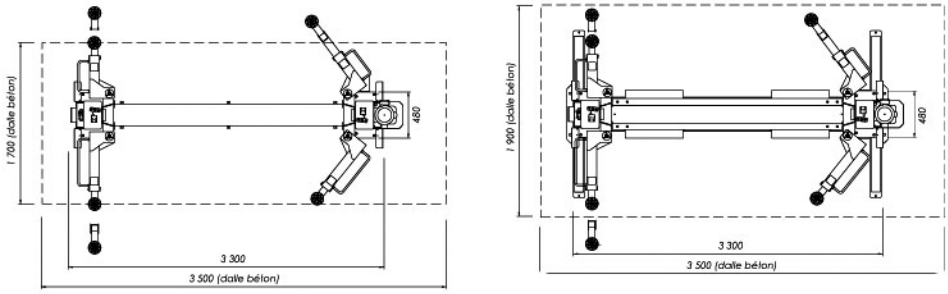


Fig. 5

KN 32 and KN35
Thickness of installation site = 180 mm minimum
(concrete foundation slab)

KH 32 and KH 35
Thickness of installation site = 140 mm minimum
(concrete foundation slab)



Dimensions are specified in mm

Fig. 6

Installation plan

Supply lines above ground at the level of the hydraulic unit are recommended. If supply lines are to be laid in the ground, provide cable ducts to protect the electric cables.

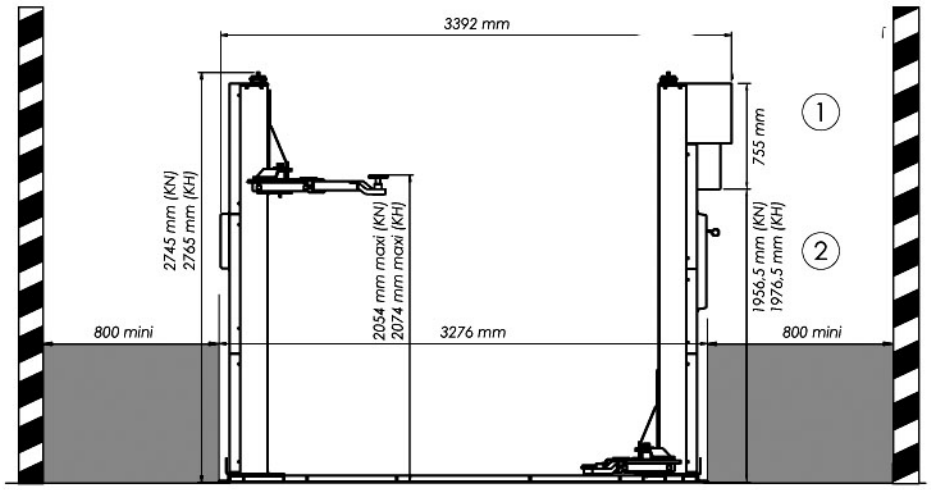
Power supply is 230 or 400 V 3 ph PE 2.3 kW, cable 4x2.5 mm^2 H07RNF: This cable type is to be used when cable length is less than 10 m and for 400 V supply voltage. Otherwise consult your local electrician.

No.	Description
1	Hydraulic unit
2	Controls

The primary column (with components 1 and 2) can be installed at the left-hand or right-hand side. It is recommended to install it at the right-hand side in the drive-on direction most frequently used.

Free space around lift

Free space around lift



10 Installation & Setting into Operation

(exclusively reserved to service technicians of authorised distributor)

⚠ **Attention**

Setting into operation of the lift is reserved to qualified personnel able to ensure and certify proper operation of the lift and all the mechanical and electric safety devices.

ABSOLUTELY AVOID THAT SETTING INTO OPERATION IS ACCOMPLISHED BY PERSONNEL NOT PROPERLY TRAINED.

Installation and setting into operation of the electric and hydraulic equipment, safety systems and accessories are described in the following paragraphs. Make sure to observe the sequence of operations in order to ensure proper operation of the lift and so as not to jeopardise the safety of persons.

⚠ **Attention**

Any damage resulting from not meeting the following instructions cannot be attributed to the lift manufacturer who declines any responsibility in this case. Warranty will also no longer apply.

10.1 H-shaped base frame (model KH)

- Assemble the H-shaped base frame, which is supplied disassembled in 5 components, using 16 bolts M10x35 (Fig. 7 + 8).

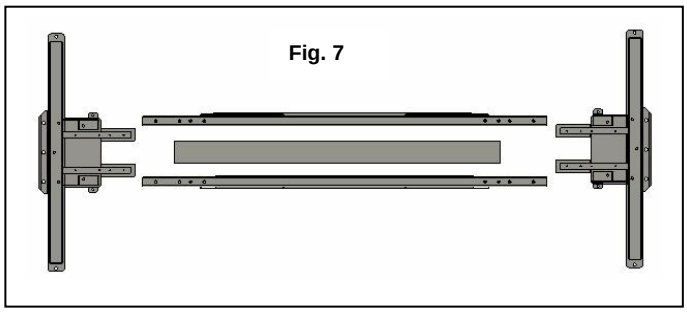


Fig. 7

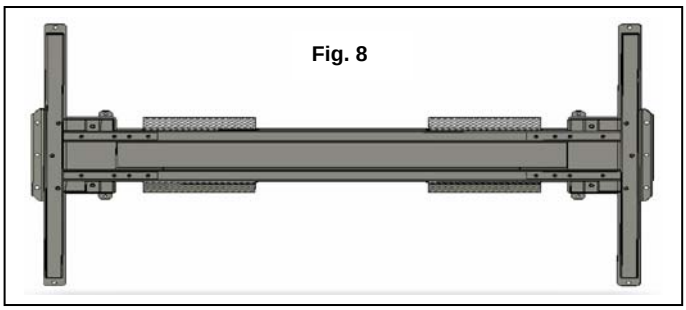


Fig. 8

10.2 Positioning the U-shaped base plates (model KN)

- Position the two U-shaped base plates to an outside clearance of exactly 3150 mm (Fig. 9). In order to facilitate positioning of the two U-shaped base plates it is inevitable to draw auxiliary lines on the ground.

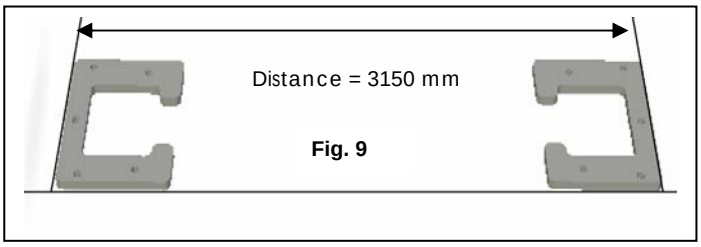


Fig. 9

10.3 Fitting the pulleys of the synchronising cable

- Take in hand one of the two pulley holders of the synchronising cable (Fig. 10), making sure that the locking plate be in right-hand position. Route the shorter cable clip of the synchronising cable in the direction of the arrow as shown in Fig. 10.
- Insert the pulley holder into the column and fit the spacers, the springs and the compression plate (Fig. 11 and 12).
- Tighten the locking nut M18 of the pulley holder with 5 turns (Fig. 11).
- Fit the fastening bracket of the slack cable control switch (Fig. 12) with the two screws M4x8 to the column.

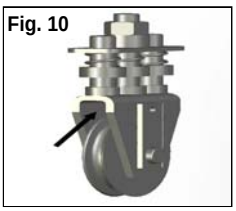


Fig. 10

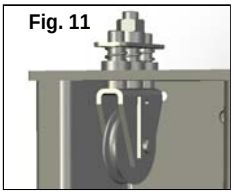


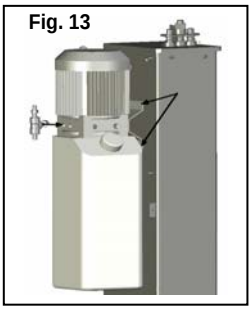
Fig. 11

Fig. 12

10.4 Identification of columns

- Identify the columns by the notches of the mechanical safety system:
  - the primary column is provided with one notch control cable pulley

Fig. 13



10.5 Fitting the hydraulic unit

- Tighten the 4 elastic connectors on the primary column (Fig. 13).
- Fit the hydraulic unit on the elastic connectors using the 4 nuts M8.
- Carefully screw the hydraulic T union to the hydraulic unit (Fig. 13).

10.6 Installing the columns

- Place a piece of wood (from the packaging) to secure the lifting carriages at 10 cm from the base plate.
- Use suitable handling equipment to place the primary and secondary columns in vertical position on the H-shaped base frame (KH version), or on the two U-shaped base plates (KN version). Make sure that the two cylinders be properly engaged with each column base.

10.7 Fastening to ground

- Using a plummet make sure each column is perfectly vertical. Otherwise put shims supplied with the lift under the lift base.

10.7.1 Drilling ground holes

- To fasten the lift to the ground use a percussion drilling machine taking into account the table below:

Lift type	Drill dia.	Drill depth	Original anchor bolts		Tightening torque	Min. distance to slab edge	Figure
			Qty.	Type			
KH	12 mm 16 mm	100 mm 140 mm	4 10	12x100 16x150	60 Nm 100 Nm	55 mm 85 mm	14 A 14 B
KN	16 mm	150 mm	10	16x200	100 Nm	85 mm	15 C

10.7.2 -Fitting the anchor bolts

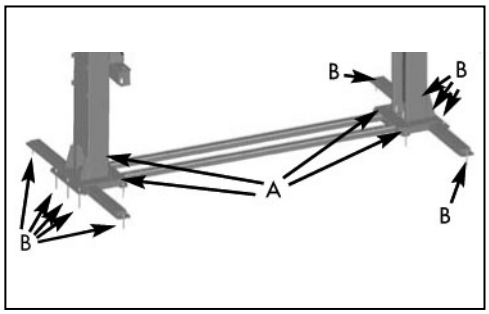


Fig. 14

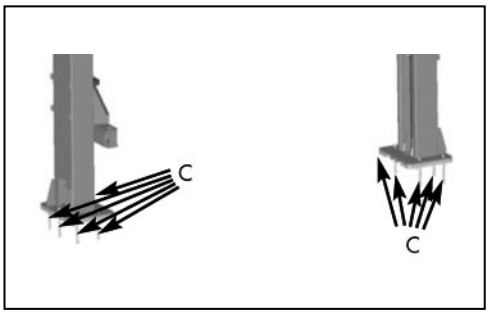


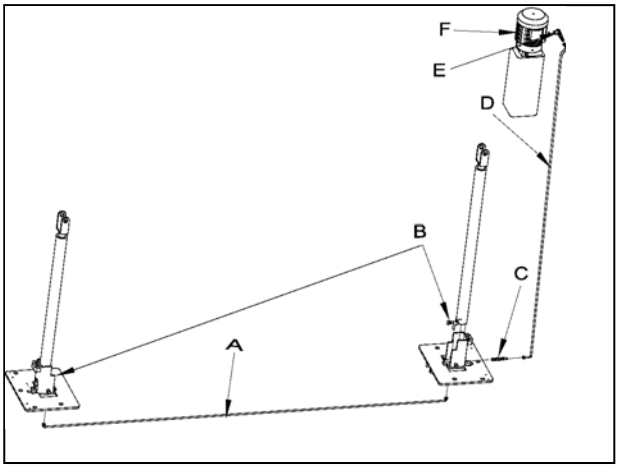
Fig. 15

- To fasten the lift to the ground use a torque wrench of 100 Nm capacity and a hammer and proceed as follows:
- Insert the anchor bolts into the relative holes (see table above) and drive in with smart blows of a hammer.
- Tighten each nut with the torque wrench set as specified in the table above. If this value cannot be achieved, the hole is too big and thickness or resistance of the reinforced concrete is not sufficient.

10.8 Routing the hydraulic lines

- Position the line of approx. 2.70 m length between the two columns (Fig. 16, item A) and screw the line unions (Fig. 16, item B) onto each hydraulic cylinder.
- Screw the hydraulic union (Fig. 16, item C) with the seal added onto the cylinder of the primary column.
- Screw the union of the line of approx. 2.50 m length (Fig. 16, item D) onto the cylinder (Fig. 16, item C). Route upwards the other end of this line through the guide brackets of the primary column.
- Screw the other union of this line to the T union on the hydraulic unit (Fig. 19, item F).
- Fill the oil supplied with the lift into the tank of the hydraulic unit (11 litres).
- Put the dipstick in the place of the tank plug.

Fig. 16



10.9 Electrical connection

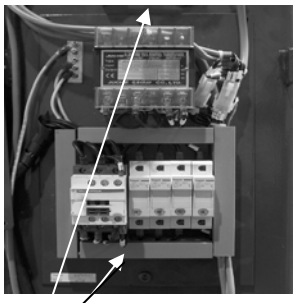
⚠ **Attention**

Any intervention, even if minor, on the electric system must be carried out by qualified personnel (see relevant legislation).

10.9.1 Fitting electric safety devices

- Fit the control unit (Fig. 17) and the bracket (Fig. 18).
- Fit the micro-switch on each bracket at the top of each column (Fig. 19)

Fig. 17



Notch of primary column

Fig. 18

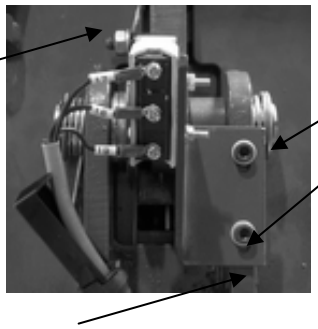
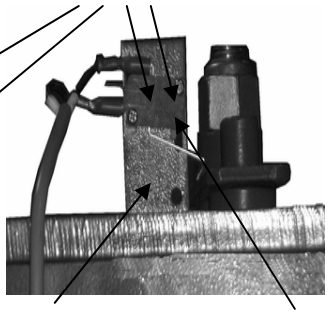


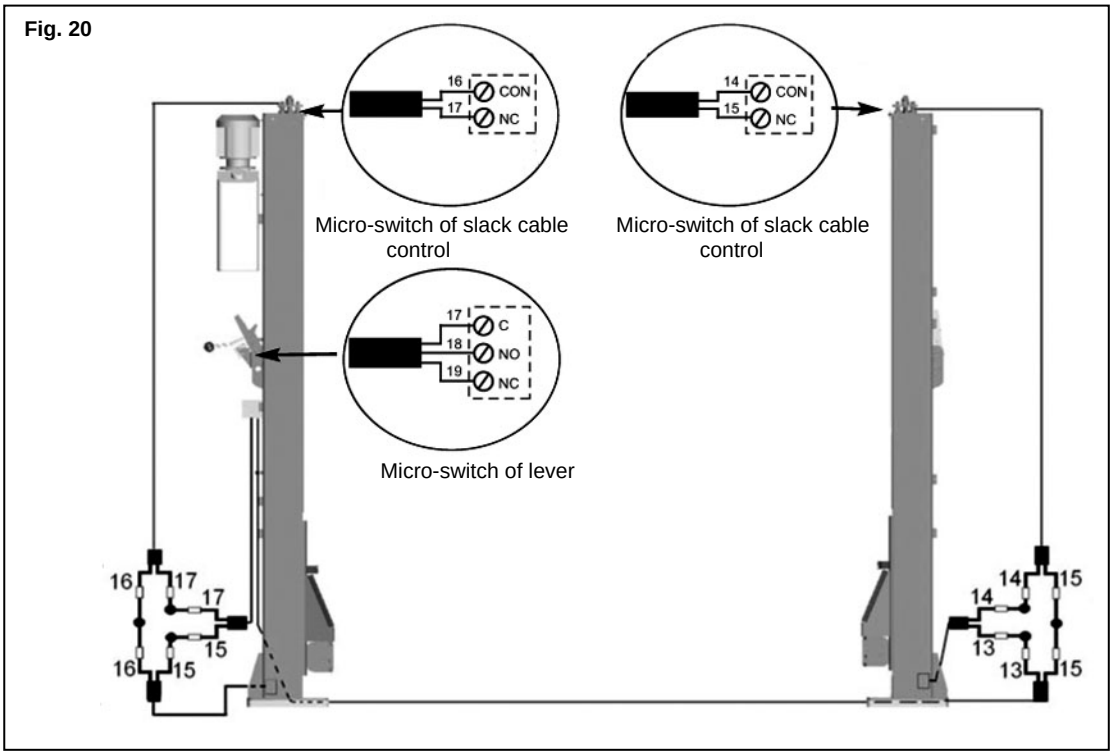
Fig. 19 Screws



10.9.2 Wiring electric safety devices

- Proceed as specified in Fig. 20 to connect the electric cables to the control unit:

Fig. 20



10.9.3 Wiring the hydraulic unit

- Connect the two wires marked 0 and 21 on the connector of the solenoid valve.
- Fit the connector (Fig. 24) of the solenoid lowering valve with its screw.
- Connect the two wires marked 23 and 25 to the right-hand terminals of the electric motor (Fig. 25, items A)

Fig. 21

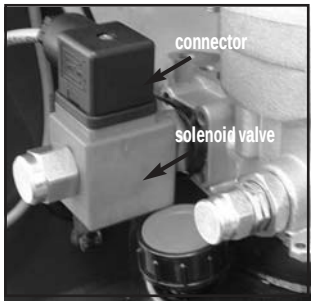
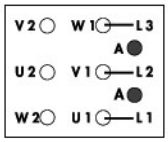


Fig. 22



10.10 Connecting the hydraulic unit to mains supply

Attention

Any intervention, even if minor, on the electric system must be carried out by qualified personnel (see relevant legislation).

The configuration of power supply depends on the following parameters:

- Power consumption of the hydraulic unit and connection to mains supply so that voltage drops at full load be less than 4 per-cent (10 per-cent during starting phase) as referred to nominal voltage specified on the nameplate.
- The user has to:
  - connect the main switch of the control unit to a connector box (in line with applicable local standards) the electric line of which is provided with a residual-current protective device (RCD) and protected against over-current.
  - connect the electric circuit of the lift to ground.
- Prior to connection of the control unit to mains supply proceed as follows:
- Make sure installed power and mains fuses are designed for the purpose (16 amp fuses). The lift normally operates at 400 V and connections are provided for this voltage.
  In case of 230 V supply proceed as follows:
  - Disconnect the wire on the 400 V terminal in the transformer and reconnect on the 230 V terminal.
  - Remove the cover of the terminal box on the motor.
  - Untighten the M5 locking nuts of the terminal strip et change their position (Figures 23 and 24).
  - Re-tighten the M5 locking nuts and re-place the covers of the terminal box.
- In order to avoid any danger from mains supply, tighten the cover of the control unit before connecting the control unit to mains.
- To prevent use of the lift by unauthorised personnel, lock the key-operated main switch of the control unit.
- Have the control unit connected to mains supply.

Fig. 23

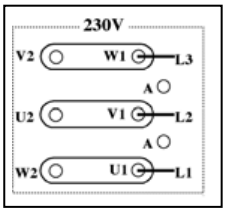
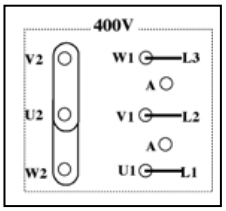


Fig. 24



Attention

Correct ground connection is of fundamental importance for proper operation of the lift. NEVER ground to gas, water, phone or other lines which are not specifically designed for grounding.

10.11 Installing the synchronising cables

It is compulsory to position the lifting carriages at same level, engaged with the gear rack teeth and at the middle of their travel to carry out this operation step.

- Take the short cable clip coming out of the upper pulley and route it through the two lower pulleys up to the carriage on the opposite side.
- Fit the short cable clip to the fastening plate using the nut M16 (Fig. 25).
  Proceed analogously with the synchronising cable of the opposite column.
- Pull downwards the long cable clip coming out of the upper pulley, route it through the fastening plate of the lifting carriage. Fit the long cable clip on the fastening plate using the nut M16 (Fig. 25).
  Proceed analogously with the synchronising cable of the opposite column.

10.12 Installing the notch control cable

- In order to facilitate this operation, raise the lifting carriages to top-most position.
- Insert the cable end into the notch control cable clip of the primary column and tighten the clip.
- Route the other end of this cable through the pulleys up to the notch cable clip of the secondary column (Fig. 25).
  NOTE: The control cable passes inside each column.
- Screw the mechanical safety lever on the notch of the primary column.
- Adjust cable tension with the clip of the primary column such that the two notches disengage from their gear rack simultaneously when the lever is pulled. Make sure that the micro-switch of the mechanical safety lever (Fig. 18) is properly activated when the lowering lever is pulled fully downwards.

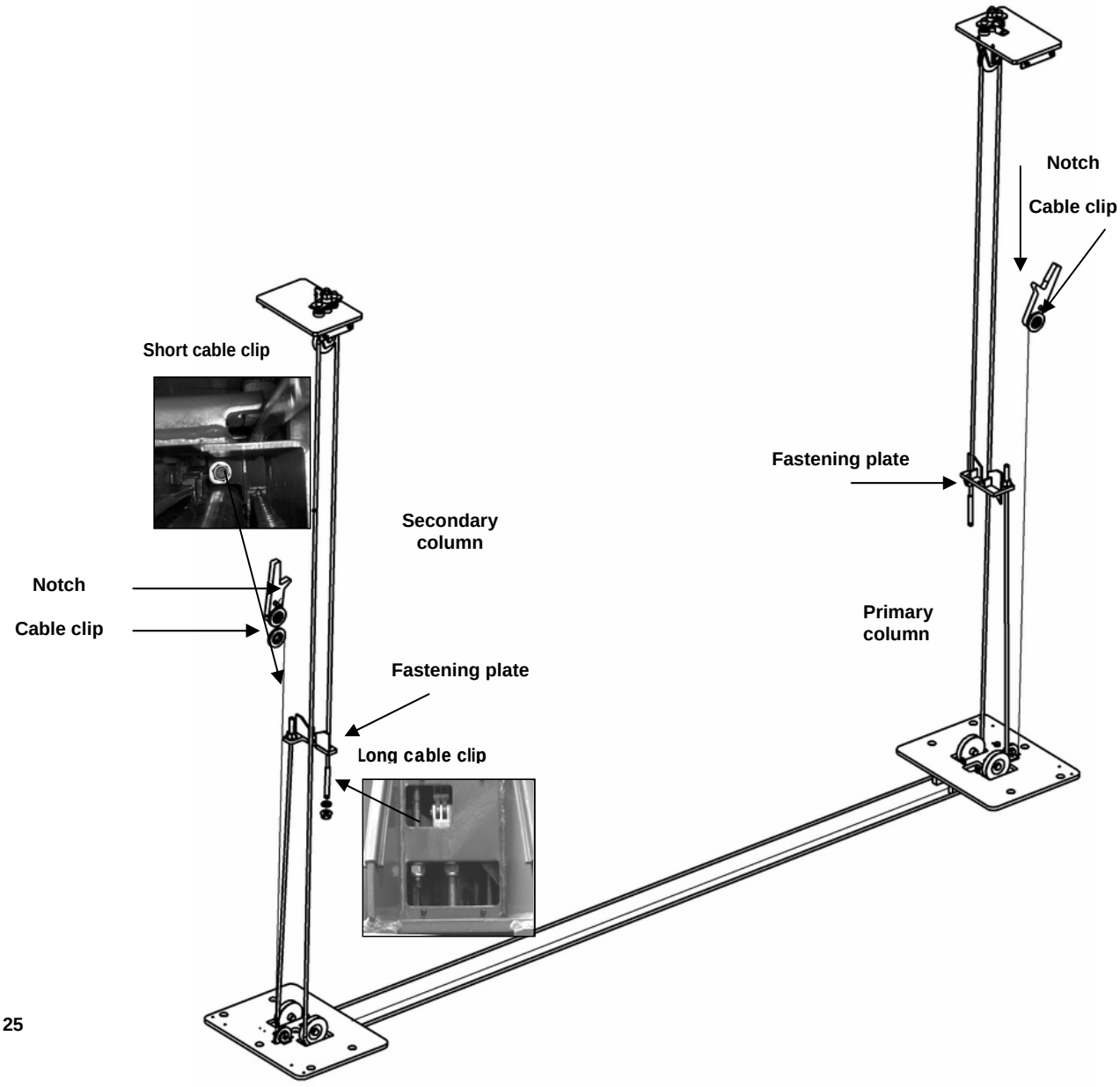


Fig. 25

10.13 Mounting the supporting arms

- Engage the arms of each lifting carriage so that the foot guard brackets be at the outside.
- Add the elements of the arm lock in the following order:
  A pinion
  B gear ring
  C spring
  D split pin
  E unlocking pin
  F plastic knurl
  G screw M8x80
- Tighten the split pin on the arm with the three screws M10x20.

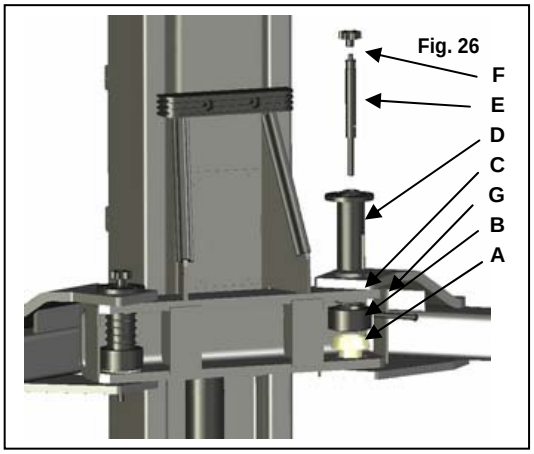


Fig. 26

10.14 Fitting the lifting chains and the safety chains

- Check fastening of the four fastening nuts M16 of the lifting chains and the four fastening nuts M16 of the safety chains.

10.15 Electric circuit

- When the hydraulic unit is connected to mains supply and the main switch is set to "1", the controls are active.
- Push on the UP button for some seconds and check correct direction of rotation of the motor. If the movement is not in the direction of the arrow on the motor, change two of the 3 phases of the power cord. Check a second time.
- Check all the functions of the control unit and make sure they correspond to the meaning of the icons.

10.16 Hydraulic circuit

To set the hydraulic unit into operation, proceed as follows:

- Set the main switch to "1" to connect the control unit to mains.
- Lift and lower to final positions for several times and this without any load added.
- Make sure there is no leakage of the hydraulic system at the unions.
- Check the hydraulic oil level in the tank is correct when the lifting carriages are in bottom position.
- Check the hydraulic lines are correctly positioned and there is no friction with any stationary part.


Fig. 27

To adjust the calibration pressure of the hydraulic circuit

- Install a pressure gauge (Fig. 27) on the union designed for pressure measurement.
- Press on the UP button to raise the lifting carriages to the mechanical top limit stop.
- Keep the button pressed for some more seconds after the lifting carriages have contacted the limit stop and read the pressure from the gauge.
- If this pressure does not correspond to the calibration pressure of the hydraulic circuit as indicated under "TECHNICAL DATA", adjust it using the adjusting screw (Fig. 28, arrow) of the pressure limiter behind the cap nut.
- Add the plastic cap (orange colour) on the cap nut in order to seal the pressure limiter.

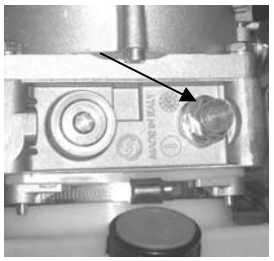


Fig. 28

10.17 Slack cable control (synchronising cables)

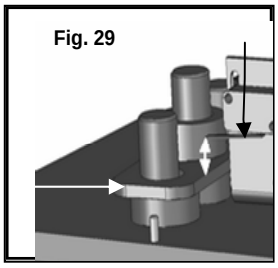


Fig. 29

- Position the lowest part of the actuator (black arrow, Fig. 29) of the slack cable control switch at 5 mm from the bottom plate.

Checking correct operation of slack cable control

This check is done with no load added to the lift.

- Push the UP button and release it when the lifting carriages at approximately 15 cm from ground.
- Place a piece of wood about 10 cm thick under one of the lifting carriages.
- Push the DOWN button located behind the notch cover so that one of the two synchronising cables slackens.

All lift controls must be inactive when carriage levels differ by more than 5 cm. If not, re-place the defective part.

10.18 Chain fracture control (lifting chains)

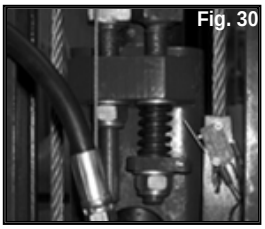


Fig. 30

Each lifting carriage is equipped with two chains:
- a lifting chain
- a safety chain

Each of the safety chains is equipped with a micro-switch (Fig. 30) controlling its tension. When the safety chain is excessively tensioned, this means that the lifting chain of this column is broken, or abnormally released.

- In order to check chain fracture control of the lifting chains proceed as follows:
- Raise the cam manually up to the top limit stop (Fig. 33).
- Make sure the cam actuates the micro-switch and that all controls of the lift are inactive. If not, adjust the bracket of the micro-switch accordingly so that it is actuated.
- Proceed analogously with the chain fracture control on the opposite column.

10.19 Arm locks

Each pinion must engage with the relative gear ring as soon as the lifting carriages lift from ground. If one of the pinions has not engaged, the red ring becomes visible (Fig. 34).

- Adjust the arm lock device accordingly.
- Lifting carriage in bottom position: pull the end of each arm, verifying that the stop screw prevents the arm from moving outwards. Otherwise, re-place the arm to home position and tighten the stop screw.

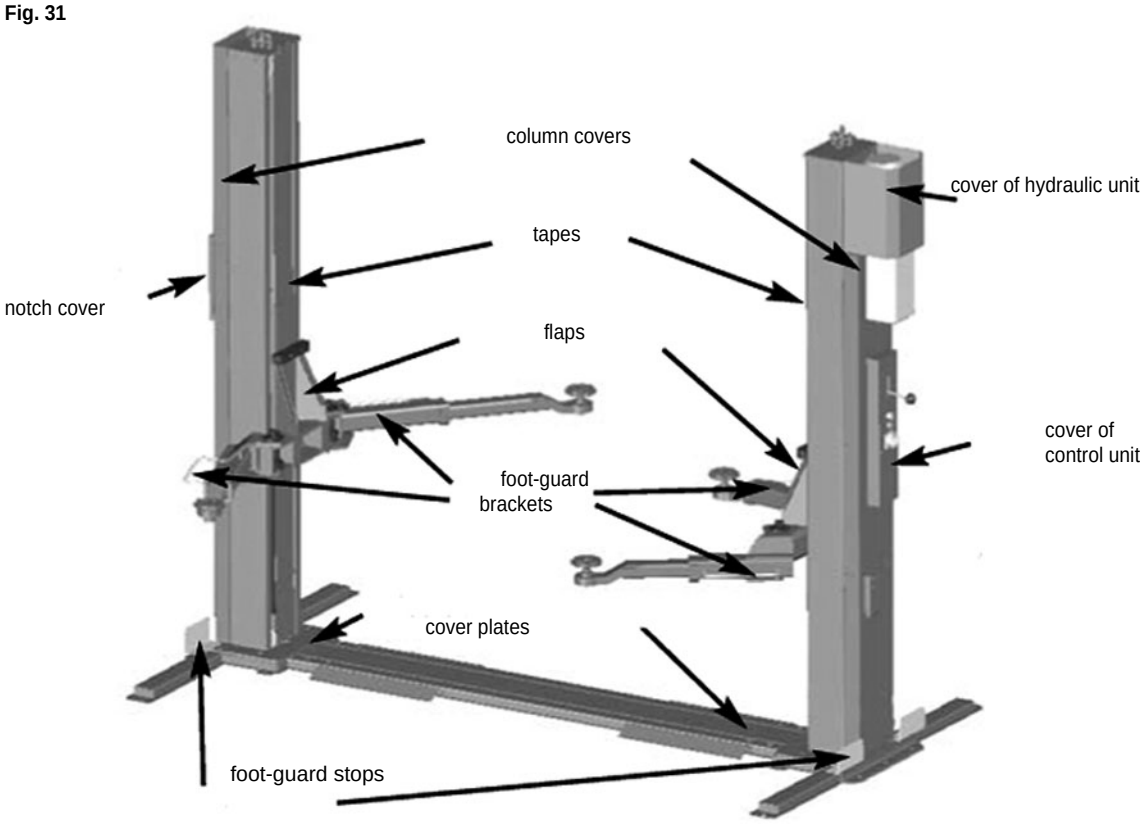
10.20 Levelling of lifting carriages

- Carry out 5 complete cycles (lifting/lowering) with a vehicle so that the cables have correctly stretched.
- Remove the vehicle from the lift.
- Raise the lifting carriages to the topmost position against the mechanical stop.
- Tighten the lower nuts of the threaded end of each cable alternately until tension of both cables be identical.
- Carry out a cycle with no load added, approaching the arms to each other to check whether they are at same level.
- If necessary, readjust cable tension.
- If the lifting carriages are at same level, the mechanical safety notches must engage simultaneously.
- Carry out several cycles with load added, taking care the vehicle be centred relative to the longitudinal axis of the lift.
- In case of failures, carry out another adjustment.

10.21 Installing accessories

Once all checks and adjustments are completed, put in place the parts and accessories as shown in Fig. 31:

Fig. 31



- the six column covers and the notch cover.
- the two flaps and fasten with the screws M5x8.
- the cover of the hydraulic unit and fasten with the nuts M6
- the control unit cover in the two hinges with the screws M4x8
- the 4 foot guard bracket and lock it using the two split pins 2.5x25.
- the 4 foot guards (stops) and fasten with the screws M8x10.

- the 2 protective covers (tape) inside each column, proceeding as follows:
- fit the two hooks in the upper column plate with the nuts M5
- insert the tape into the lifting carriage
- suspend the tape from two hooks
- fit the tape to the base plate with the 2 screws M4x6
- tension the cover by tightening the 2 hook nuts.

10.21.1 KH version

- Add the cover to the H-shaped base frame.
- Add the four ramps to the H-shaped base frame.

10.21.2 KN version

- Fit the two covers on ground between the two columns, using the 8 anchor bolts M8x10 (KN)

10.22 Periodic general inspections

Following relevant national law or standards (where applicable) the owner of a workshop is responsible to have

- a test of lift condition carried out
- a function test at maximum useful load carried out
- a function check and adjustment of safety devices carried out

Those tests and checks must be carried out every 12 months from the date of first setting into operation in line with relevant national law and standards.

10.23 Test book

Following relevant national law or standards (where applicable) the owner of a workshop is responsible to provide and keep a test book in which the results of general periodic inspections and/or other tests (e.g. general tests after first setting into operation, overload test, etc.) must be noted down, including any comment the service technician has to make.

11 Safety Controls

There are 7 different safety controls.

Type of safety control	Composition and location	Actions
Foot guard (foot protection)	The device consists of: - a metal plate at both sides of the base of each column - a metal bracket at the side of each arm	Prevents a foot from being caught under the lifting carriage(s) or arm(s)
Mechanical notch system	The mechanism basically consists of a notch fitted to each of the columns and a gear rack on each lifting carriage	This notch and gear rack assembly allows to stop accidental lowering (within 80 mm height) in case of leakage of the hydraulic circuit, or fracture of a circuit component
Hydraulic parachute device	This device consists of a parachute valve on each hydraulic cylinder	This valve is designed to restrict lowering speed in case of hydraulic line failure. It is set such that lowering speed does not exceed nominal speed times 1.5
Arm locks	This device consists of a gear ring at the end of each arm which engages with the pinion of the lifting carriage.	This device is enabled automatically as soon as the lifting carriages leave their bottom position in order to prevent arms from displacing
Mechanical synchronisation control	This device consists of two synchronising cables connecting each of the lifting carriages	The cables prevent misalignment of a lifting carriage with respect to the other one in case of non-uniform distribution of the load in transverse direction
Electric slack cable control (synchronising cables)	This device consists of a micro-switch in the bottom connecting plate.	The device allows to control synchronising cable tension and stops any movement of the lift when it detects cable slackness
Electric chain fracture control (lifting chains)	This device consists of a micro-switch fitted at the bottom of each column	The device allows to stop any lift movement when one of the lifting chains is broken, or abnormally released.

12 Controls

The components have the following functions

1. Key-operated main switch:
   to connect the lift to mains supply, turn the switch to "1",
   to disconnect mains supply, turn to "0".
2. UP button:
   when pressing this push-button and lowering the lever 4, the lifting carriages will raise.
   This is a "dead-man control" which means as soon as it is released lifting stops immediately.
3. DOWN button
   when pressing this push-button and lowering the lever 4, the lifting carriages will lower.
   This is a "dead-man control" which means as soon as it is released lowering stops immediately.
4. Mechanical SAFETY lever:
   when lowering this lever, the mechanical safety notches unlock, hence lifting or lowering is enabled.
   In case the lever cannot be lowered, this means the notches have engaged.
   Press simultaneously on the UP and DOWN buttons so that the carriages raise to release the lever.

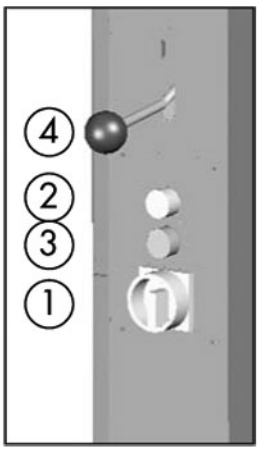


Fig. 32

13 Periodic Maintenance

Attention

The spare parts list does not authorise the operator to carry out any repair on the lift, except when expressly stated in the present manual, but should only enable him to make clear indications to the service technician of the authorised distributor to allow quickest possible repair.

Attention

Only original spare parts supplied by the authorised distributor may be used. Otherwise the lift manufacturer declines any responsibility and warranty will become null and void.

Attention

No modification of settings of the hydraulic pressure-relief valve is allowed. The manufacturer declines any responsibility in case of damage resulting from such intervention on the pressure-relief valve and warranty will become null and void.

Attention

Prior to any maintenance or adjustment disconnect the lift from electric power supply. Also make sure that all mobile components be safely blocked.

Attention

Do not dismount or modify any part of the lift - such intervention is exclusively reserved to service technicians of the authorised distributor.

Warning

Keep the lift and the lifting area perfectly clean.

Never use compressed air, water jets, solvents, aggressive detergents for lift finish or components to eliminate dirt or otherwise clean the lift.

When cleaning the lift make sure to avoid dust as much as possible.

At any rate unauthorised personnel is not allowed to carry out maintenance work.

In order to guarantee proper operation of the lift, follow the instructions given below when cleaning the lift or carrying out periodic maintenance work once a week and when visually checking the safety devices of the lift for proper operation.

Cleaning and periodic maintenance work must be carried out in consideration of the following instructions:

- Cleaning and maintenance work must be carried out taking utmost security measures to ensure the lift is mechanically safe.
- Set the main switch to "0" and disconnect the electrical circuit between control unit and mains supply.
- Check the hydraulic oil level in the hydraulic unit:
  - lower the lifting carriages to bottommost position
  - check the oil level of the hydraulic unit using the dipstick. If necessary, top up with suitable oil (see table below).
  Top up through the filler plug.
- Change the hydraulic oil in the tank approximately every 1000 working hours (11 litres).
- Make sure there is no dirt in the oil tank. New oil must be filtered.
- Check there is sufficient lubricant in each of the columns at the position of the plastic carriage guides. If the lubricant film is too thin, add lubricant using a brush.
- Check there is sufficient oil on the lifting chains and on the safety chains. If the oil film is too thin, add oil using an atomiser.

Oil and lubricant specification:

Brand	Hydraulic oil	Chain oil	Lubricant
TOTAL	AZOLLA 32	CHAINELUB	-
ELF	OLNA DS 32	MOTO CHAINELUB	-
ESSO	NUTO 7132		-
BP	BARTRAN 32		-
MOLYKOTE	-		BR 2 (1 kg box)

- Check with utmost care the hydraulic lines to make sure there is no damage, or abrasion, caused by friction with mobile parts of the lift, cutting edges, or foreign bodies.
  If such damage or abrasion is noticed, call the service technician of your authorised distributor.
- Clean the lift using a non-aggressive detergent for finish and look for foreign bodies which might make safety devices (mechanical, or electric ones) inoperative.
- Check proper fastening of the screws and nuts and in particular of the anchor bolts of the columns.
- Check the condition of the rubber pads. Replace them when split, damaged, or worn out.
- Reset the lift into operation by setting the main switch to "1" and check:
  - the condition of the 2 synchronising cables by carrying a complete lifting and lowering cycle without load. If any defect is noticed, inform the service technician of your authorised distributor.
  - the tension of the two synchronising cables by proceeding as follows:
  1. Raise the carriages to approx. 1 m.
  2. Approach the arms to each other to make sure they are at same level.
  3. If there is a difference of more than 10 mm, call the service technician of your authorised distributor. If there is a difference of more than 50 mm, set the main switch to "0" and call the service technician of your authorised distributor.

14 Operation

The lift may be operated by authorised personnel only. It would be highly dangerous for personnel to use the lift when not familiar with the information supplied in the present manual.

14.1 Operation of the lift

14.1.1 Positioning the vehicle on the arms

Fig. 33

- Make sure the gross vehicle weight does not exceed the rating given on the nameplate. Load distribution must be such as indicated in the chapter "Scope of Application". The values indicated in this chapter must by no means be exceeded so as not to endanger the operator.
- Make sure the vehicle be centred relative to the longitudinal axis of the lift and the jacking points of the vehicle chassis be properly positioned relative to the pick-up pads (Fig. 33).
- Make sure the arms do not contact directly the vehicle chassis. Prior to starting any lifting motion, check again that all pick-up pads are properly positioned under the jacking points.
- Check correct locking of the arm locks prior to lifting the vehicle.
- Make sure there is no risk in lifting the load and check after the load has been lifted by a few centimetres that the vehicle is properly and safely positioned.

⚠ **Attention**

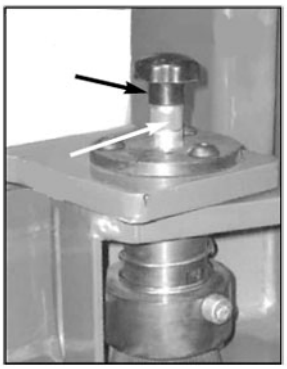
It is mandatory to lift the vehicle by the jacking points provided for this purpose by the car manufacturer and only using accessories supplied by the lift manufacturer.

⚠ **Attention**

During lifting and lowering motions check that movement is smooth and not jerky and that the load is always stable. If the vehicle is not stable, or if lift operation seems abnormal, stop immediately. If possible, lower the vehicle to ground using utmost scrutiny. Check and correct, if necessary, the position of the vehicle. If it continues to be instable, set the main switch to "0" and call the service technician of your authorised distributor.

14.1.2 Lifting the vehicle

Fig. 34



- Connect the control unit to mains by setting the main switch to "1".
- Pull the SAFETY lever and press the UP button. Make sure that each pinion engages with the relative gear ring as soon as the lifting carriages loose ground contact. If one of the pinions has not engaged with the gear ring, the red ring (Fig. 34, bottom arrow) on top of the guide shaft (Fig. 34, top arrow) of the pinion becomes visible. In that case lower the carriages again and re-position the arm in question.
- Release the SAFETY lever and the UP button as soon as the working level has been reached.
- Set the main switch to "0".

14.2 Lowering the vehicle

- Connect the control unit to mains by setting the main switch to "1", pull the SAFETY lever and press the DOWN button to lower the lift to the desired level.
- In case the lever cannot be lowered, this means the notches have engaged. Press simultaneously on the UP and DOWN buttons so that the carriages raise to release the lever. Then lower the vehicle.
- Set the main switch to "0".

14.3 Emergency stop

- In order to stop any movement of the lift in case of emergency (failure or defect), set the main switch to "0" and lock it using the key.

14.4 Warning to use the lift

- During any movement of the lift it is prohibited for any person to stay under the vehicle, to climb the lift or climb inside of the vehicle. No object (e.g. tools) must hinder the movement of lifting carriages and arms until they have reached their final position.
- In case of trouble, set the main switch to "0". Inspection of the lift is reserved to authorised and qualified personnel only. Prior to any maintenance or repair lock the main switch using the key and disconnect from mains supply, if necessary.

15 Emergency Lowering

15.1 Lowering of lift in case of failure of power supply

If there is no emergency power supply, or power generator, proceed as follows for emergency lowering of the lift:

- Set the main switch to "0".
- Operate the pump lever of the hydraulic pump (Fig. 35) in order to raise the lifting carriages and disengage the mechanical safety notches.
- Leave the SAFETY lever pulled down (Fig. 32) in order to disengage the mechanical safety notches.
- Untighten and remove the cap nut of the hydraulic solenoid valve for lowering (Fig. 35).

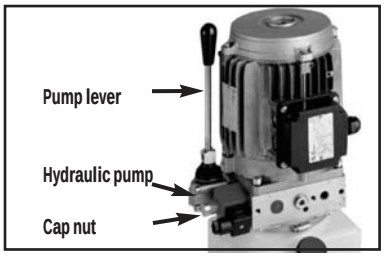


Fig. 35

- Slowly and carefully untighten the knurl of the hydraulic solenoid valve (Fig. 36, arrow) to enable the lifting carriages to lower slowly. When the knurl is re-tightened, lowering stops. When the operation is completed, re-tighten the knurl and fit the cap nut.
  NB: If lowering is interrupted after a short moment, this means the mechanical safety notches have engaged. Please contact the service technician of your authorised distributor.

Fig. 36

⚠ **Warning**

During emergency lowering it is mandatory to mark the dangerous area in line with national standards and to prohibit access to anybody. The authorised and qualified personnel carrying out the emergency lowering must be extremely careful. They must check that every movement is smooth and make sure the load is always stable.

If the vehicle is not very stable, interrupt lowering at once!

15.2 Resetting lift into operation after misalignment of lifting carriages

- If the lifting carriages are misaligned, the lift is stopped and all controls are made inoperative.

Such misalignment could be caused if:

– an obstacle hinders lowering of the lifting carriages or the arms: remove the object which hinders lowering.

– a mechanical safety notch remains engaged: check condition and adjustment of the notch control cable (Fig. 25).

– load is not uniformly distributed: refer to the above chapter "lowering of lift in case of failure of power supply".

– a synchronising cable has slackened without apparent reason: press simultaneously on the UP and DOWN buttons in order to tension the cable again (Fig. 25).

– a synchronising cable, or a lifting chain, is damaged: set main switch to “0” and lock. Have the damaged parts replaced.

- If the failure continues, contact the service technician of your authorised distributor.

16 Putting on Stock

If the lift is put on stock for a long time, disconnect the supply lines, empty the tank(s) containing liquids and protect any part likely to be damaged by or suffer from dust.

17 Disposal

If the decision is made that the lift will no longer be used, remove the hydraulic unit from the control cabinet in order to make the lift inoperative.

- Make inoperative any part likely to represent a hazard.
- Classify all material according to recycling conditions.
- Dispose of the different materials, scrap metal and electronic waste by supplying them to relative waste disposal centres. Make sure to observe relevant national laws and standards, in particular the European Directive of Waste Electronic and Electric Equipment where applicable.
- Special waste must be dismounted and divided into homogenous lots and then disposed of in line with national law and standards.

18 Oil Information and Warnings

18.1 Disposal of used oil

Never pour used oil into sewer, gutter or flowing water. It must be kept in special tanks which have to be forwarded to special disposal companies.

18.2 Loss and leakage

Cover any oil spilt on the ground with earth, sand or any other absorbing material. The polluted area must be cleaned using an oil solvent, making sure no fume is produced. Any residues must be eliminated in line with national standards.

18.3 Preventive actions

- Avoid contact with the skin.
- Avoid fume to build up, or to escape into the environment.
- Take the following preventive actions:
  - Avoid any splashing;
  - Wash frequently using soapsuds; do not use any products to irritate skin, or solvents aggressive to the skin;
  - Do not dry hands using dirty or greasy cloth;
  - Change clothes when greasy, at any rate at the end of the work;
  - Do not smoke, or eat with dirty or greasy hands
- Wear the following protections:
  - Protective gloves resistant against mineral oil, felted inside;
  - Safety goggles in case of splashes;
  - Apron resistant to mineral oil;
  - Protective screens in case of splashes.

18.4 Mineral oil: first aid measures

- Ingestion: contact medical emergency service and inform them of all details about the type of oil ingested.
- Inhalation: in case of exposure to strong concentration of oil fumes or fog, take the injured to the open air and to the next medical emergency centre.
- Eyes: Rinse thoroughly with water and quickly contact the medical emergency centre.
- Skin: Wash in soapsuds.

19 Fire Protection

To choose the best fire extinguisher, refer to the table below:

Dry material		**Inflammable liquids**		**Electric equipment**	
Water atomiser	**YES**	Foam	**YES**	Powder	**YES**
Foam	**YES**	Powder	**YES**	CO^2	**YES**
Powder	Yes*	CO^2	**YES**		
CO^2	Yes*				

YES*: to be used only when more efficient means are not available, or for small fires.

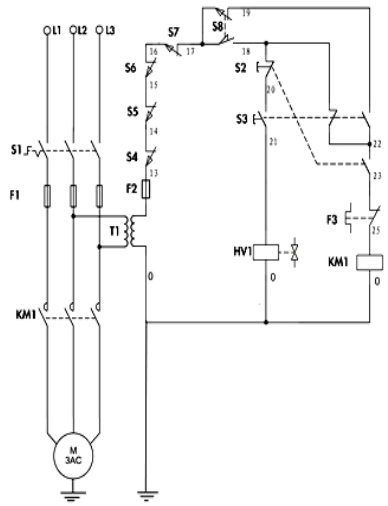
⚠ **Attention**

The statements made above are general statements only and should be used as a general guide-line to the user only. Possible use of each type of fire extinguisher must be clarified with the manufacturer.

20 Trouble Shooting

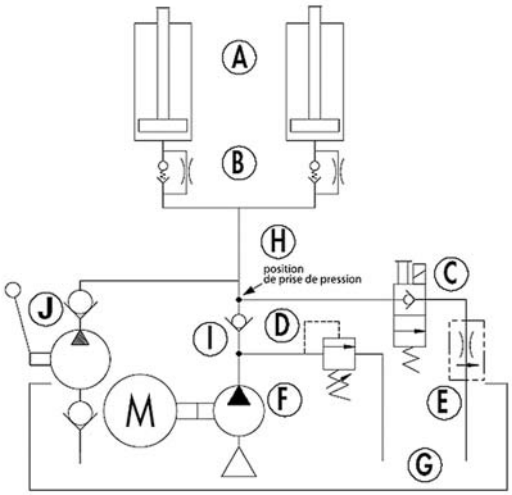
Failure	**Cause**	**Remedy**
Oil leakage	• Hydraulic union disconnected. • Hydraulic line burst, or defective union.	• Tighten the hydraulic union. • Replace hydraulic line or union.
The lift does not respond to any control, or remains blocked during an operation.	• No connection to mains supply. • Mains supply disconnected. • Fuses damaged / blown. • Thermal cut-out has responded. • Transformer is damaged. • Slack cable control of the synchronising cables has responded to misalignment of the lifting carriages, or chain fracture control of the lifting chain has responded to abnormal tension of the lifting chain.	• Connect control unit to electric mains supply. • Check mains supply. • Replace fuses. • Wait for the thermal cut-out to cool down and repeat operation. • Replace transformer. • Make sure no obstacle hinders the carriages from lowering. Tension the synchronising cables or the lifting chains, if necessary.
Upon simultaneous operation of the UP button and the SAFETY lever, the lift starts, but stops at once whereas the motor continues running.	• Insufficient oil level. • Load too heavy. • Incorrect setting of hydraulic pressure-relief valve. • Hydraulic solenoid valve open, dirty, or defective. • Hydraulic pump, or non-return valve, defective.	• Ensure correct oil level. • Check load. • Check hydraulic pressure (Fig. 27). • Close, clean, or replace solenoid valve (Fig. 36). • Replace hydraulic pump, or non-return valve.
Upon simultaneous operation of the DOWN button and the SAFETY lever, the lift does not lower.	• The lifting carriages have not been raised sufficiently before descending. • The notch control cable is slack, or broken.	• Push simultaneously on UP and DOWN buttons to disengage the mechanical safety notches. • Remove the 2 plastic covers over the mechanical safety notches, operate the hydraulic pump, disengage the notches by hand, keep them in this position using a wedge, lower the lift, then remove the wedges. Correct cable tension, or replace cable. Re-place the plastic covers.
The motor is running, but the lift does not respond to simultaneous operation of the UP button and the SAFETY lever.	• Phases wrongly connected to mains supply. • Hydraulic solenoid valve is open, dirty or defective. • Hydraulic pump, or non-return valve, defective.	• Change phases in the connection to mains supply. • Close, clean, or replace solenoid valve (Fig. 36). • Replace hydraulic pump, or non-return valve.

21 Electrical Diagram



Mark	Designation
F1	16 Amp fuse
F2	5 Amp fuse
F3	Thermal cut-out integrated in motor
S1	Main switch
S2	UP button
S3	DOWN button
S4	Chain fracture switch / secondary column
S5	Slack cable control contact / secondary column
S6	Chain fracture switch / primary column
S7	Slack cable control contact / primary column
S8	Contact of mechanical safety lever
T1	Transformer 230 V / 400 V - 24 V
KM1	Power relay 24 VAC
HV1	Hydraulic solenoid valve for lowering 24 VAC
M1	3 ph motor 230 V / 400 V

22 Hydraulic Diagram



Mark	Designation	Qty
A	Hydraulic cylinder: dia. 60 (ext.)	2
B	Parachute valve (1.2 mm opening)	2
C	Solenoid valve 24 VAC	1
D	Pressure-relief valve	1
E	Flow controller (7 l/min)	1
F	Hydraulic pump: 4.8 cm^3	1
G	Hydraulic tank:11 litres	1
H	Union for pressure measurement (1/4"BSPT-JIS BO203)	1
I	Non-return valve	1
J	Emergency pump	1
M	Electric motor	1

23 Installation Report

Lift model: K_ 3_ Serial no._____ Installation date: _____

Inspections to be carried out by the service technician of your authorised distributor in the presence of the operator	Chapter of OM	Location on lift					Inspection made (Tick off)
		Primary column	Secondary column	Carriage & arms	Ground connection	Connection mains/ primary column	
1 Intactness of the individual parts of the lift	3	•	•	•	•		
2 Nameplate and stickers in place	3 & 6	•					
3 Min. distance of 80 cm between surrounding enclosures (wall, partitions ..) and base plates	9	•	•				
4 Voltage of electric mains supply	9					•	
5 Cross-section and type of power cord	9					•	
6 Electric protection (fusing)	10					•	
7 Oil level of hydraulic unit	10	•					
8 Leakage and pressure of hydraulic circuit , plastic cover to be fitted	11	•	•		•		
9 Fastening and laying of notch control cable	10	•	•		•		
10 Fastening and laying of synchronising cables	10	•	•	•	•		
11 Tension of synchronising cables and levelling of lifting carriages	10			•			
12 Tightening of 8 chain nuts along the thread	10	•	•	•			
13 Laying of hydraulic lines and electric cables	10	•	•	•	•		
14 Operation of emergency descent	16	•					
15 Tightening of screws, nuts and anchor bolts of columns	10	•	•	•	•		
16 Operation of chain fracture control	10	•	•				
17 Operation of slack cable control	10	•	•				
18 Installation and operation of arm locks	10			•			
19 Installation of foot guards	10	•	•	•			
20 Fitting of covers / tapes	10	•	•		•		
21 Operation of controls (incl. emergency controls)	10 & 15	•					
22 Cleaning of lift installation site	14	•	•	•	•	•	
23 Lifting of one or several vehicles	5 and 10	•	•	•	•	•	
24 Instruction into operation and handing over of operation manual	14	•	•	•	•	•	
25 Instruction into maintenance work (lubrication ..)	13	•	•	•	•	•	
26 Storage of operation manual	3	•					

Comments, if any, have to be written onto the service order of the technician - The operator has to enter them into the test book.

Authorised distributor		Customer	
Name of company, address, phone (or stamp)		Name of company, address, phone (or stamp)	
Name of technician	Signature of technician	Name	Signature

24 Report of Periodic Maintenance

Lift model: K_ 3_ Serial no._____ Installation date: _____

Inspections to be carried out by the service technician of your authorised distributor	Chapter of OM	Location on lift					Inspection made (Tick off)				
		Primary column	Secondary column	Carriage & arms	Ground connection	Connection mains/ primary column	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
1 Intactness of the individual parts of the lift	3	•	•	•	•						
2 Nameplate and stickers in place	3 & 6	•									
3 Replacement of hydraulic oil (every 1000 h)	13	•									
4 Oil level of hydraulic unit	13	•									
5 Leakage and pressure of hydraulic circuit	10	•	•		•						
6 Condition, fastening and laying of chains	10	•	•								
7 Condition, fastening and laying of notch control cable	10	•	•		•						
8 Condition, fastening, laying & adjustment of synchronising cables, levelling of carriages	10	•	•	•	•						
9 Condition and synchronous engaging of mechanical safety notches	10	•	•								
10 Condition, laying and fastening of hydraulic lines and electric cables	13	•	•	•	•	•					
11 Condition of pivots, pins, rings and pulleys	10	•	•		•						
12 Condition, fastening of arms, inspection of proper locking against displacement	10			•							
13 Presence of pins, circlips and pivot locking pins	10	•	•	•	•						
14 Condition of pick-up pads (arms)	13			•							
15 Condition and fastening of foot guards	10	•	•	•							
16 Cleaning and lubrication in general	13	•	•	•	•	•					
17 Operation of chain fracture control	10	•	•								
18 Operation of slack cable control	10	•	•								
19 Operation of emergency descent	15	•									
20 Tightening of screws, nuts, column anchor bolts	13	•	•	•	•						
21 Condition and operation of controls	14	•	•								
22 Lifting of one or several vehicles	5 & 14	•	•	•	•	•					
23 Cleaning of lift	13	•	•	•	•	•					
24 Storage of operation manual	3	•									

Comments, if any, have to be written onto the service order of the technician - The operator has to enter them into the test book.

Company name of authorised distributor	Year 1	Year 2	Year 3	Year 4	Year 5
Name and signature of technician					
Inspection date					

25 Maintenance Schedule

Following this maintenance schedule will enable the operator to meet relevant legislation and standards (periodic tests to be carried out before setting into operation, and general inspection to be carried out every 12 months)

	Date	Operation	Comment	Resetting into operation		Authorised distributor or approved control agency		
				Yes	No	Name of company	Name of technician	Signature of technician
Year 1		Installation Periodic tests Setting into operation General inspection						
Year 2		General inspection						
Year 3		General inspection						
Year 4		General inspection						
Year 5		General inspection						
Year 6		General inspection						
Year 7		General inspection						
Year 8		General inspection						
Year 9		General inspection						
Year 10		General inspection						

P&R Industries S.A.
Corso Elvezia 25 - 6900 Lugano - Switzerland
Phone: +41 91 922 04 26
Fax: +41 91 922 04 27
E-mail: sales @pandr-industries.com
www.pandr-industries.com
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