Finkbeiner®

Operation Manual
(translation of original document)

EHB702

Before installation, commissioning and operation of the lift this documentation needs to be regarded imperatively!
Keep this documentation at site of the lift.

EC – DECLARATION OF CONFORMITY

Manufacturer: Walter Finkbeiner GmbH
Alte Poststrasse 9 - 11
D-72250 Freudenstadt

Machine: Electro- hydraulic mobile lifting system for commercial vehicles

Type: **EHB 702**

including accessory

Serial number/ year of manufacture: _____/_____

Herewith the manufacturer confirms that above named machine is compliant to the following directives:

2006/42/EG	Machinery directive
2006/95/EG	Low voltage directive
2004/108/EG	Electromagnetic Compatibility (EMC) directive

Source of information for the harmonised directives:

DIN EN 1493:1998/A1:2008	Car lifts
DIN EN 60204-1:2006	Safety of machinery
DIN EN 61000-3	Electro-magnetic compatibility
DIN EN ISO 14121:2007	Safety of machinery – risk evaluation

Authorised representative for documentation:

Günther Obmann
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Signatory:

Günther Obmann, operations manager

Freudenstadt, den 29.12.2009
Walter Finkbeiner GmbH

ppa. Obmann

0 Table of content

1 General

FINKBEINER products are based on decade-long experience in the manufacture of vehicle lifts. The most modern procedures in areas such as construction, production and quality assurance ensure the highest reliability and longevity.

1.1 Delivery of the equipment

Before the equipment leaves our plant, it is subjected to careful inspection to ensure that it reaches you in perfect condition and with complete equipment according to your order.
To prevent later reclamations we ask the customer to carefully check the condition and completeness of the delivered equipment.

1.2 Warranty and liability

Our “General Sales and Delivery Conditions“ basically apply. Warranty and liability claims for personal or material damage are specifically excluded, if they arise one or more of the following causes:

- Improper use of the lift.
- Improper assembly, commissioning, operation, maintenance and repair of the lift.
- Operation of the lift with defective safety equipment or improperly attached or non-functional safety and protective equipment.
- Non-compliance to the notes in this operation manual regarding transport, storage, assembly, commissioning, operation and inspection of the lift.
- Arbitrary constructional changes to the lift.
- Arbitrary changes of parameter settings (e.g. pressure control valve).
- Insufficient supervision of wearing parts.
- Non-use of original spare parts of the manufacturer.
- Catastrophic incidences caused by force majeure.

1.3 Environment protection

The lift is operated with hydraulic oil. In case of a defect the oil may leak out. Regard the oil does not get into the hydrologic cycle.

The operator of the lift is responsible for the compliance with the legal local environment regulations at disposal of waste such as packing material and oil.

1.4 Disposal

The operator of the lift is responsible for the complete removal and disposal of the lift in compliance with all local legislation and regulations.

1.5 Origin, property rights

1.5.1 Made in Germany

The lift’s country of origin is the Federal Republic of Germany.

1.5.2 © Copyright Walter Finkbeiner GmbH

This operation manual or extracts thereof may only be copied, translated or made accessible to third parties with the express written permission of the manufacturer.

1.5.3 Trade mark ®

Finkbeiner® Is a international registered trademark.

1.5.4 Patent rights

International patent rights have been registered and accorded to FINKBEINER lifts.

1.5.5 Technical changes

Technical changes to the images and technical information reserved for progress purposes.

2 Safety

2.1 Risk information

DANGER

Highest hazard level. Indicates a hazardous situation which will result in death or severe physical injury if not observed.

WARNING

Second hazard level. Indicates a possibly hazardous situation which could result in death or severe physical injury if not observed.

CAUTION

Third hazard level. Indicates a possible situation which could result in light physical injury or damage to material assets if not observed.

Environment information

Information

Explanations, tips and background information.

➢ **Call to action**

2.2 Intended use

- The lift exclusively serves to lift vehicles by the vehicle frame or by the wheels depending on the applied equipment.
- The lift is suitable for work under the lifted load.
- The lift is not designed for personal transportation.
- The lift is not designed for permanent outside use, in moist surroundings or in washing areas. Please observe the protection type applicable to moisture and dust; see master data.
- Observe the admissible temperature range for operation of the lift; see master data.
- The lift is not designed for application under corrosive or aggressive environmental influences.
- The lift is not designed for application within explosion-hazardous areas.
- The rules and regulations applicable to the installation site must be observed in addition to the safety instruction contained in the operation manual.

A further use or one over and above the described purposes is not considered as intended.

2.3 Operation duties

- The lift may only be operated in safe, perfect and reliable condition.
- Damages of the lift to be prevented respectively to be removed immediately.
- Recurring maintenance or inspection periods must be complied with.
- Service and repair on the lift must be conducted by an authorized expert only.
- Spare parts must comply with technical requirements specified by the manufacturer; this is only guaranteed for original parts.
- Operation only by adult and authorized persons instructed in the handling of the lift.
- Operation only by persons who are familiar with the operation of the lift and who have read and understood the operation manual.
- The safety- and hazard-conscious work by personnel must be monitored at occasional intervals.
- All safety and information plates on the lift must be maintained in readable condition.
- The operator may only authorize suitable persons with repairs to the lift. Suitable persons are persons who are able to professionally remove faults due to their professional knowledge, experience, training and their technical skills. They must be familiar with the operation manual of the lift and the applicable safety regulations and requirements of the respective operating country.

2.4 General safety notes

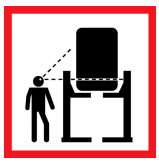
DANGER
Personal injury or damage to material assets at misuse.
➢ Carefully read and observe this operation manual!

DANGER
Personal injury when entering the danger zone of the lift.
- The operation person must not stand underneath the load during movement or within the danger zone of the lift and has to observe sufficient safety clearance towards the moving parts of the lift.

DANGER
Personal injury at unauthorised entering the danger zone of the lift.
- The operation person has to observe that no persons are staying within the danger zone of the lift.

DANGER
Personal injury at unauthorised use of the lift.
- After termination of the lifting or lowering process the main switch needs to be switched-off and secured against unauthorised use.
- At failures of the lift immediately take the lift out of operation and secure it against re-commissioning.

DANGER
Personal injury by non-compliance of escape routes.
- The specified local regulations on escape routes have to be observed for commissioning and operation of the lift.



DANGER
Unattended operation of the lift can result in severe accidents.
- The operation person has to supervise constantly the lift and the lifted load and has to stop the operation immediately if anything is working not correctly.

DANGER
Excessive wind speeds can cause the lifted vehicle to fall.

- The lift may be used outdoors only when the wind speeds are below the admissible data (see chart below).
- If wind freshens up immediately lower the lifted vehicle to the ground.

Type of vehicle	Weight of veh.	Maximal admissible wind speed
Cars, vans, light commercial vehicles	1 - 10t	14m/s = 6 Beaufort
Buses	10 - 15t	20m/s = 8 Beaufort
Trucks and heavy duty vehicles	> 15t	24m/s = 9 Beaufort

WARNING
Hazard of injury by falling or squeezing.

- Do not climb onto the lift or the lifted vehicle.
- Conveyance of persons on the lift or in the lifted vehicle is prohibited.

WARNING
Hazard of material damage by insufficient space conditions.

- Maintain sufficient safety distances between the lift and walls, ceilings or other fixed boundaries.
- The operation person has to ensure that no obstacles are within the danger zone of the lift.

WARNING
Unsafe positioning of the lift can cause crashing of the lifted vehicle.

- The lift may be used on an even and sufficiently stable floor only.

CAUTION
Hazard of injury.

- Wear suitable protective clothing according to the applicable safety regulations.

3 Technics

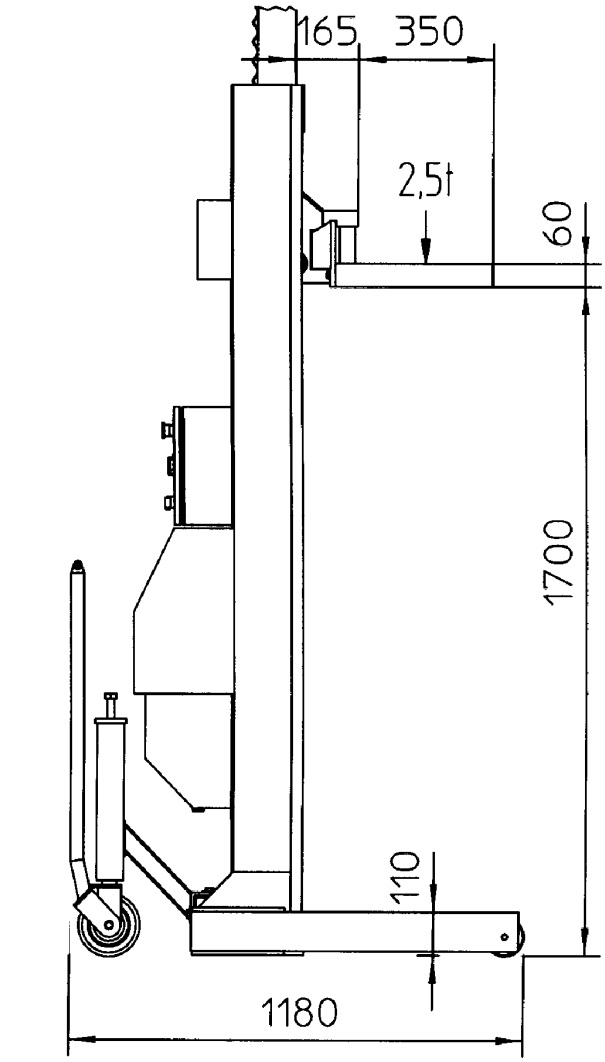
3.1 Master data sheet

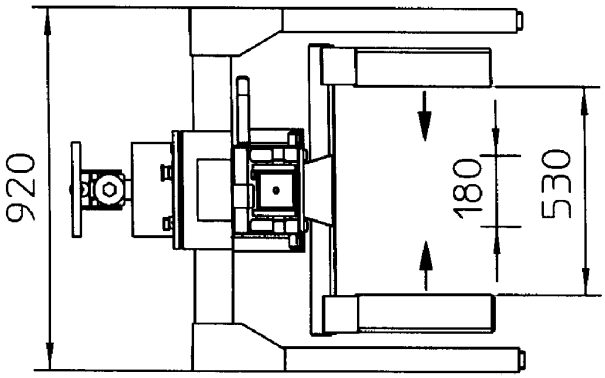
Description of machine:	Electro-hydraulic column lift equipment to lift vehicles at the wheels or at the chassis; synchronisation with safety shut-off, additional safety by mechanical locking device at each column.
Lift type:	EHB702V11
Capacity per column:	2,5 t
Load support:	Wheel fork adjustable for wheel sizes 3.50R13 – 14.5R20, resp.diameter 340 – 1100 mm Length of fork: 350 mm Version „Hymer“
Lifting height:	1700 mm (effective)
Lifting-/ lowering time:	appr. 90 sec.
Operation:	Up/ Down at every column Operation modes: Common / Single
Cable connection:	Cable connection from column to column, length of cables 10 m. Power supply cable with plug, 10 m, at master column.
Control:	Synchronisation in cycle steps, system deviation max. 3 mm. Supervision of all operation functions.
Drive:	Electro-hydraulic Motor 0.75 kW per column
Connection:	400 V / 3 Ph+PE / 50 Hz, 16 A
Control voltage:	24 V
Operating pressure at nominal load:	160 bar Pressure relief valve adjusted to 165 bar
Weight:	420 kg per column
Protection class:	IP 65
Admissible temperature range:	-5° bis 50℃
Admissible ground inclination:	1°
Noise level:	< 70 dB(A)
Hydraulic oil:	HLP ISO-VG 32
Surface treatment:	Powder coating

3.2 Safety equipment

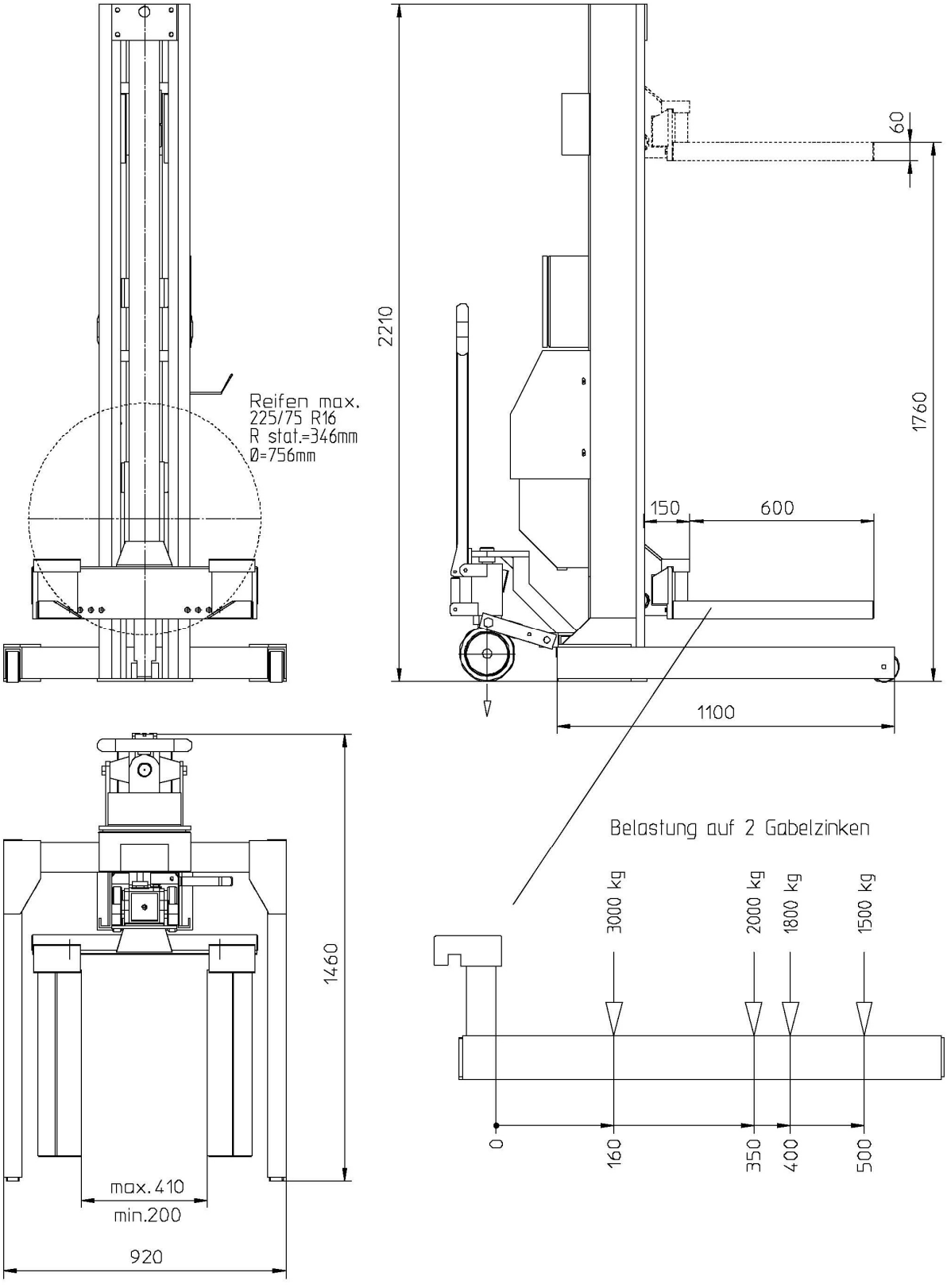
- Relay controlled synchronisation with cycle steps.
- Supervision of synchronisation which stops movement if system deviation limit is exceeded.
- Lockable main switch at master column: protection from unauthorised use.
- Emergency Stop at each column: Immediate Stop of movement.
- Dead-man's control: when releasing the operation buttons the corresponding movement stops.
- Thermo switch inside motor: protection from overheating of motor.
- Hydraulic check valve: protection from unintended lowering.
- Pressure relief valve: protection from exceed pressure.
- Mechanical lock: additional protection from unintended lowering.
- Rear wheel jack: brake to prevent column to roll away.

3.3 Dimensions EHB702





3.4 Dimensions EHB702 version „Hymer“



4 Labels on the lift

Manufacturer nameplate

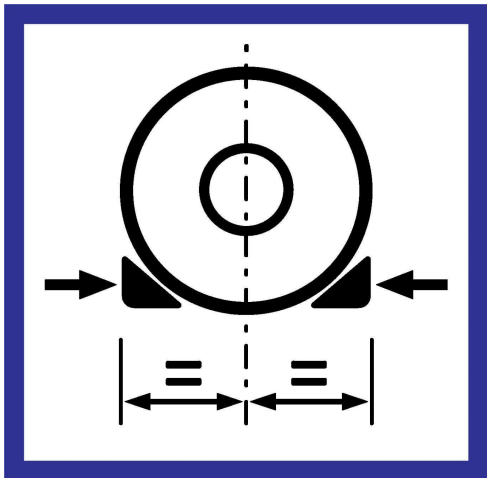
Finkbeiner®

Alte Poststrasse 9 - 11
D-72250 Freudenstadt
www.finkbeiner.eu

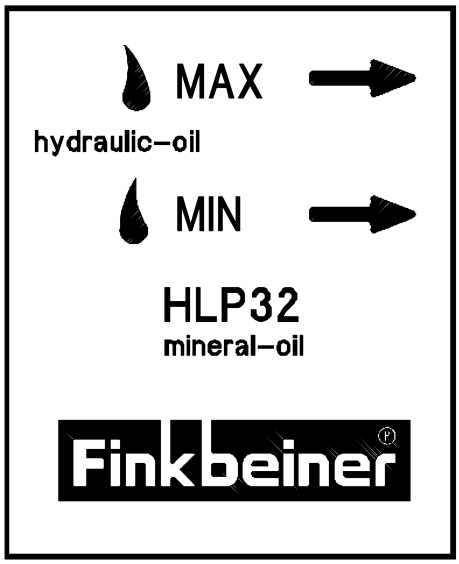
Typ: EHB702 Type:	Serien-Nr.: Serial-No.:
Baujahr: Year:	Tragkraft: Capacity:
Druck: Pressure:	Gewicht: Weight:
Motoranschluss: Operat. Voltage:	
Steuerspannung: Control Voltage:	
Made in Germany	

High voltage warning

Wheel fork



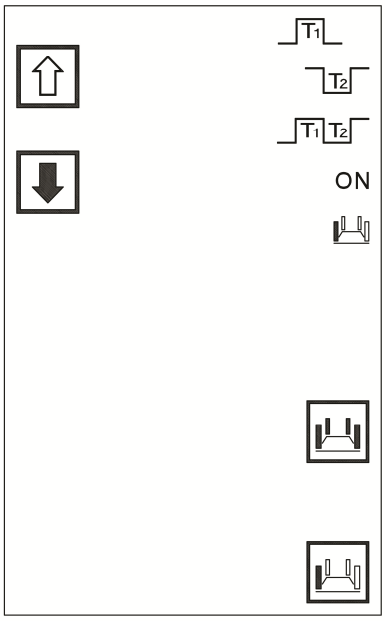
Oil level



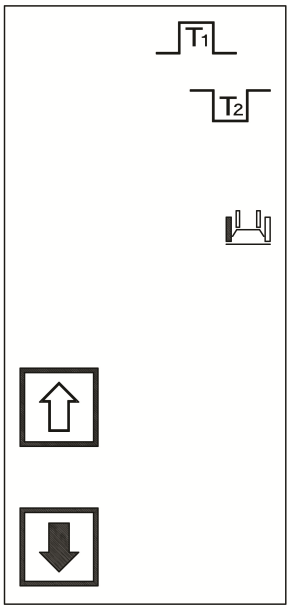
Capacity

2,5 t

Control box master column



Control box slave column



Security advices

Short operation instructions

Short operation instructions – Mobile Column Lift EHB / GAB

Installation

- Locate columns on a level and sufficient load-bearing surface.
- Plug together columns by interconnect cables from column to column in a circuit around the vehicle.

Operation

- Operation only by adult and authorised persons instructed in the handling of the lift.
- Plug-in power supply plug into prescribed mains (clockwise phase sequence!).
- Switch-on main switch, press START-button.
- Press UP respective DOWN.

Load support

- Do not exceed admissible capacity of the lift.
- Attach columns at the wheels respective pick-up points specified by vehicle manufacturer; always two columns at one common axle.
- Check safe lifting of the vehicle immediately after load pick-up.

To regard during operation

- The operating person must not stand underneath the load during operation and has to observe sufficient safety clearance towards the moving parts of the lift.
- The operating person has to pay attention that the movement area of the lift is free from any obstacles and that no persons stay therein.
- The operating person has to supervise constantly the lift and the lifted load and has to stop operation immediately if anything is working not correctly.
- Do not ride on the lifted vehicle or on the load attachments.
- Do not climb up the lift or the lifted vehicle.
- After operation the main switch has to be switched-off and locked against unauthorised use.
- Regard Operation Manual of the lift.

5 Commissioning

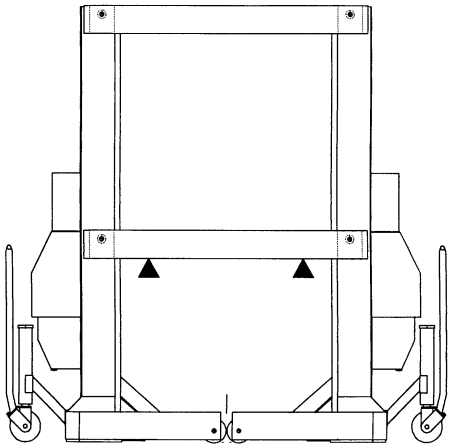
ENVIRONMENT INFORMATION
Environmental hazard through hydraulic oil leakages.

- Do not tilt the lift, oil can leak out.
- Remove packing material according to regulations.

5.1 Loading with fork lift truck

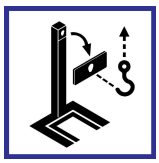
WARNING
Damaged packing wood or material can result in crashing of the lift.

➢ Before loading check if package unit is free of damage.



- Column package to be lifted only at the points marked by arrows; the inside distance of the fork tines should be minimum 500 mm.

5.2 Loading with crane



- Columns may be loaded individually only.
- Lift the column on the front top steel plate by chain.
- When using a carrying strap avoid damage of strap by sharp edges.

5.3 Unloading from container

- The columns are shipped in vertical position and are connected by wooden or steel beams.
- Remove packing material before unloading.
- Move columns individually out of the container

.

5.4 Electrical connection

- If lift has been delivered without power supply plug (country-specific) mount appropriate plug to power supply cable.

WARNING
Hazard of material damage by wrong operation voltage.

- Take care that lift is connected to the prescribed power supply (see manufacturer nameplate).

- Connect power supply plug into appropriate mains.
- Clockwise phase sequence required. Turning direction if incorrect can be changed as follows:

  Unplug lift from mains, open plug and change phase connections L1 and L2. Close plug correctly again.
- If the lift is used at some other location or at use of an electrical extension cable the phase sequence may be incorrect and needs to be checked again.

6 Detailed operation instructions

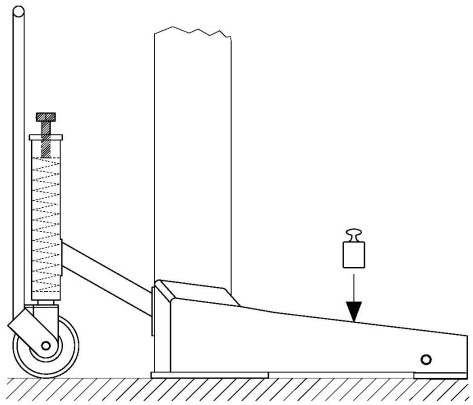
➢ Imperatively regard the “General Safety Notes“ within this documentation.

6.1 Moving of columns

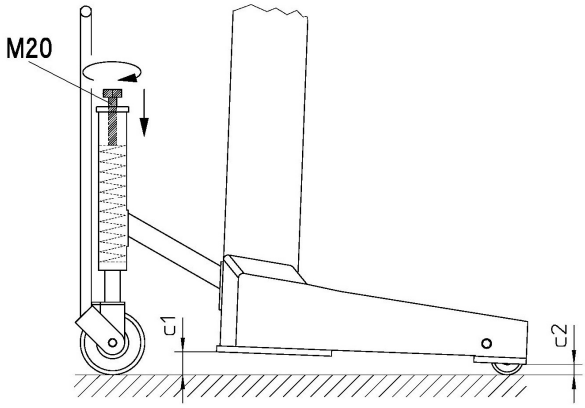
CAUTION
Hazard of tipping over

- Only travel the column unloaded and on even ground.
- Wereby the lifting carriage may not be lifted.

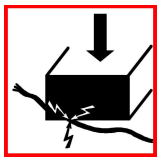
6.1.1 Wheel jack, spring-loaded (standard)



Column lowered



Column lifted
Max. ground clearance:
C1 = 27 mm
C2 = 25 mm



CAUTION
Hazard of damage of connection cables

Before lowering make sure that no cables are underneath the column.

➢ Turn the hexagon screw (SW30) clockwise as long as the column gets ground clearance and can be moved.

Information

- With the hexagon screw (SW30) ground clearance can be adjusted.
- Wheel jack is self-lowering under load.
- Under load the column must lower completely to the ground.
- Adjust ground clearance as small as possible.

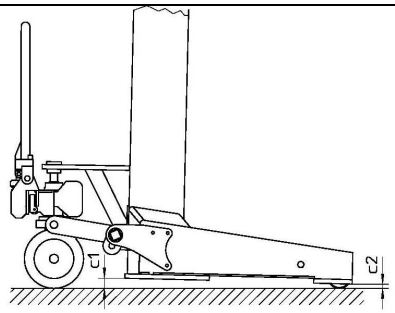
Information

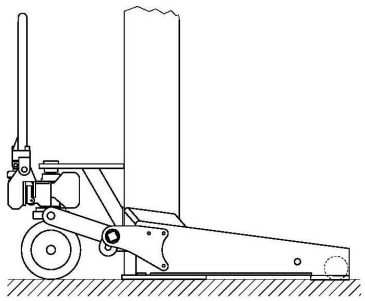
- If drawbar stands upright the integrated brake is active securing the column against unintended rolling.

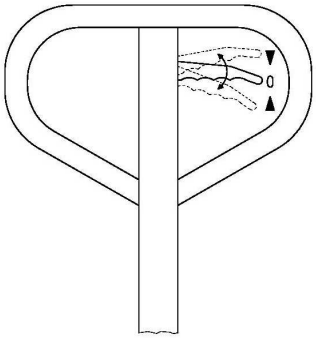
➢ To move the column, swing drawbar to the rear.

➢ After moving the column put drawbar upright again.

6.1.2 Hydraulic travelling device (option)







Position of operating lever:
Top: Lowering
Central: Drive position
Bottom: Lifting

Maximum ground clearance:
C1 = 90 mm
C2 = 25 mm

➢ Lift up column by operating lever of hydraulic travelling device until the column is freely moveable.

CAUTION
Crushing hazard when lowering the travelling device.

- Do not crush feet underneath base frame when lowering.

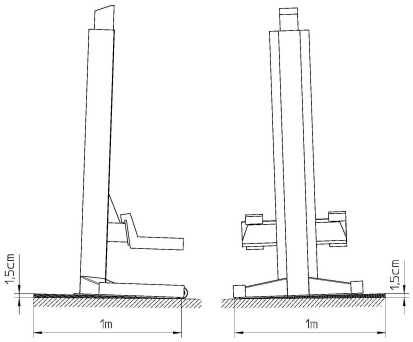
➢ Lower the travelling device completely to ground after movement of column.

6.2 Installation

- Position columns on a level and sufficiently stable floor; quality of concrete at least B25.

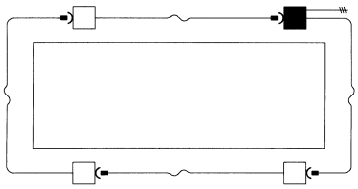
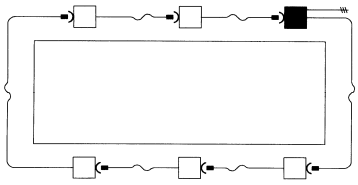
DANGER
The positioning of the lift on inadmissibly tilting floors can cause the vehicle to fall.

- Always position the columns vertically.



- The maximum admissible floor tilt is 1°.

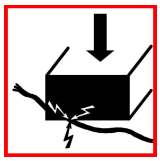
➢ Position the columns at the vehicle (always 2 columns per axle).

	Example: lift with 4 columns • The master (black) can be located at every position.
	Example: lift with 6 columns • The master (black) can be located at every position.

Information

- One master column is suitable to be operated with up to 5 slave columns (at 400 V / 3 Ph / 50 Hz).

6.3 Cable connection



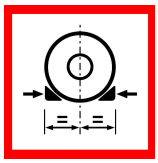
CAUTION
Hazard of damage of connecting cables by inappropriate use.

- Always lock plugs in the sockets.
- Do not pull on the connecting cables or on power supply cable.
- Do not bend or twist connecting cables.
- When rolling up regard minimum bending diameter of 300 mm.
- Before movement of columns always unplug connecting cables, roll them up and place them on the hooks provided.
- Protect connecting cables from damage.
- Do not drive vehicle over cables.
- When removing the connecting cable pull plug out in a straight line and not at an angle.
- Always close sockets at columns if no plugs are inserted.

6.4 Load support

CAUTION
Hazard of property damage on vehicle and lift.

- Only lift the vehicle at the wheels specified by the vehicle manufacturer, particularly when lifting vehicles with twin wheel axes or trailing axles.
- When positioning the column to the vehicle observe no overhanging car body parts such as mirrors will be damaged.



DANGER
Hazard of vehicle to fall by wrong support.

- Observe admissible wheel sizes.
- Position column exactly to the wheel centre.

DANGER
Hazard of vehicle to fall by wrong support.

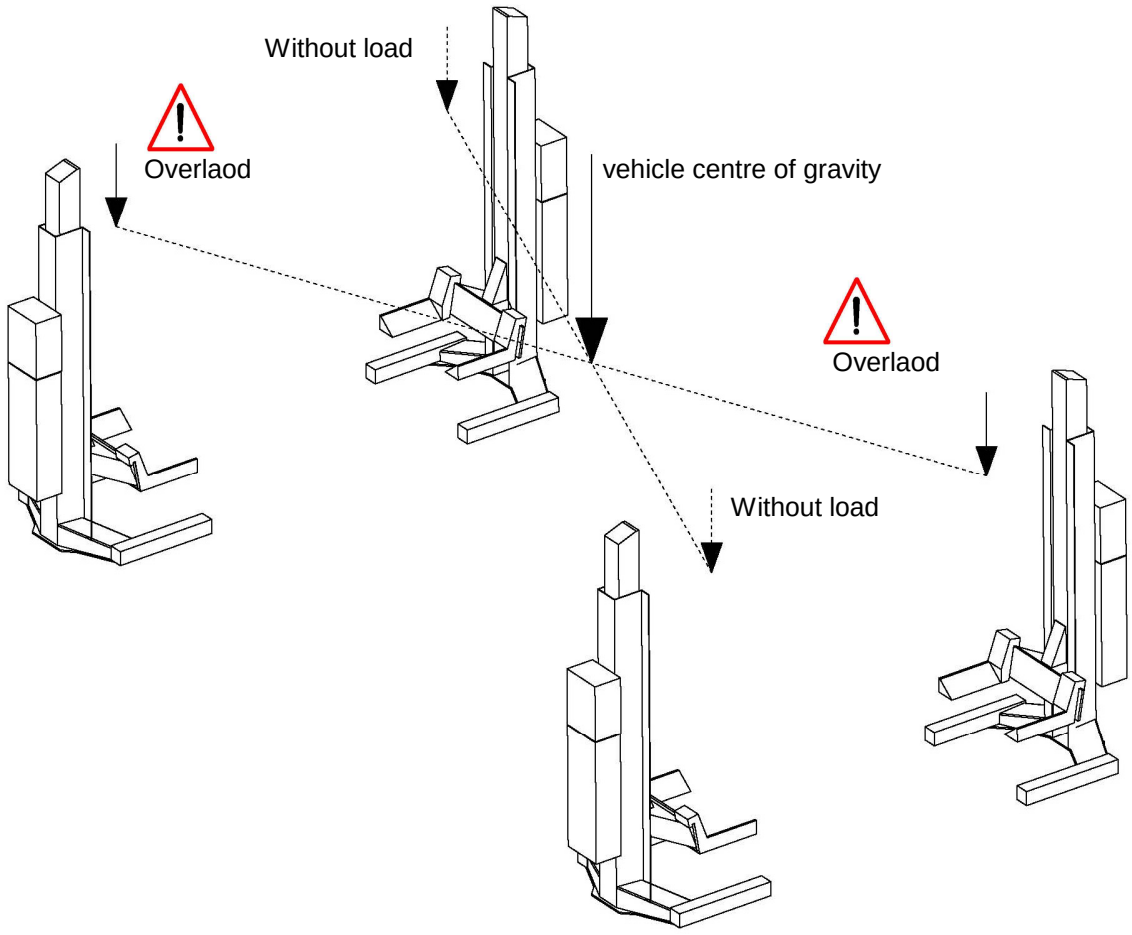
- Do not lift vehicles with defective wheels or tyres with insufficient air pressure.
- The fork tines must lie close to the underside of the wheel, so that, should the tyre lose air, there is no danger of the tyre to slip through.

DANGER
Hazard of vehicle to fall by wrong support.

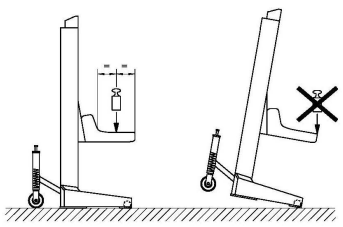
- Engage the column as far under the tyre as possible.
- Do not lift with the outside tip of the wheel fork; the wheel fork should encompass at least 2/3 of the tyre width.

DANGER
Hazard of vehicle to fall by overloading the columns (see following pic.)

- It is prohibited to cause height differences between the columns, for example in individual operation.



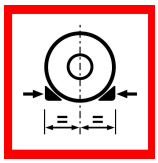
This lift is too low



- Lift the load so that it cannot slip
- Lift the load so that the load centre is more or less at the centre of the fork tines.

6.4.1 Wheel fork

- The width of the wheel fork is manually adjustable and can be adapted to the respective wheel size without the use of additional reducers.
- To adjust, lift the front of the individual fork tine and adjust on the support plate, until the rear stud engages in the support plate.



DANGER
Hazard of vehicle to fall by wrong support.

- Adjust wheel forks centrally, not one-sided displaced.

➢ Adjust wheel forks according to the respective wheel size.

➢ Position the columns at the vehicle.

➢ Join columns to one another using the connecting cable around the vehicle.

➢ Lock the plugs in the sockets.

6.5 Operation

- Connect power supply plug into appropriate mains (clockwise phase sequence!).
- Switch-on main switch at master column.
- Press the START- button, the green START- lamp now illuminates.
- Select operation mode at selector switch: Common or Single operation, optional pair operation.

Information common operation

- Common operation from any column possible.
- Common operation is indicated by the green “common cycle“ lamp at the master column.
- Common operation is only possible if all columns are within the same “cycle”. For that either all columns have to be within the YELLOW cycle, or all columns within the BLUE cycle. That’s the case if on all columns either all YELLOW or all BLUE cycle lamps illuminate.
- Different cycles (yellow/ blue) can be adjusted in Single operation mode by lifting resp. lowering.
- In common operation the synchronization control is regulating the speed of the individual columns, in order to keep always synchronized movement also at un-even load distribution. Thereby the movement of the columns to be re-adjusted is shortly interrupted.
- When releasing the push-button UP/ DOWN in common operation, the movement is interrupted if all columns are within the common cycle.

Information single operation

- In Single mode lifting and lowering is possible from each column.
- When operating several columns simultaneously, no different ways of movement are possible at one time. Only the movement of the push-button, that was pressed first, will be carried out.
- Single mode is shown by a RED blinking lamp at each column.
- When releasing the push button UP/ DOWN in common operation, the movement is interrupted immediately.

- The EMERGENY-STOP push-button at each column switches off immediately the complete lift set.
- The activated EMERGENY-STOP push-button is locked and needs to be released to operate the lift.

6.6 Lifting and lowering

DANGER
Hazard of vehicle to fall by non-prescribed lifting and lowering.

- Inclined lifting / lowering of the vehicle, such as in single operation mode, is prohibited.
- It is prohibited to block operating elements such as UP / DOWN switches or to bypass their function.

DANGER
Hazard of vehicle to fall by defects at the vehicle.

- If the lifted vehicle gets into a inclined side position due to such as defective air-suspension, the vehicle needs to be levelled in single mode before further lowering operation.

DANGER
Hazard of vehicle to fall by non-prescribed lifting and lowering.

- Inclined and one-side lifting / lowering of the vehicles, such as in pair operation mode, is prohibited.

CAUTION
Hazard of damage to material assets

- Before lowering remove all obstructions underneath the vehicle.
- Close doors of vehicle before lowering so that they can not hit lift columns.
- Adequate overhead clearance is required to raise the vehicle to the desired height. Ensure sufficient room height for the lift and the lifted vehicle.

➢ For lifting and lowering press the corresponding push button.

➢ Raise the vehicle off floor approx. to a height of 5 centimetre and check safe contact of load support immediately.

7 Cleaning

The lift should be cleaned regularly to ensure value retention and to prevent possible failures. Competent cleaning may also be a prerequisite for the retention of warranty claims for possible damages caused by corrosion.

- Regularly remove all dirt such as:
  - road salt
  - sand, stones, soil
  - dust
  - water, also in amalgamation with diverse environmental influences
  - diverse aggressive sediments

How often the lift should be cleaned depends on the use, the location and the environmental influences. Weekly cleaning is recommended in unfavourable conditions.

- Do not clean with aggressive of abrasive substances.
- Do not use high-pressure blaster to clean the lift.
- Remove all dirt carefully with a sponge or brush.
- Regard no residues of detergents remain on the lift.
- Dry the lift after cleaning with a cloth and spray it with wax or oil spray.

8 Inspection and maintenance

8.1 Inspection and maintenance by the operator

DANGER
Danger to live by working with a defective lift.

- Defective parts that may cause a dangerous situation immediately have to be repaired or replaced.

8.1.1 Daily inspection

➢ Check the lift for visible damage and leakage.

8.1.2 Monthly inspection

➢ Check painting of the lift and repair if required:

Damages by external impacts immediately have to be repaired. If the damage is not repaired the powder painting may be subverted extensive and permanently destroyed. Whet the damaged spots (120 grain), clean and degrease it, and apply suitable paint.

➢ Visual check of welds; at crack or fraction immediately put the lift out of service.

➢ Check the safety devices of the lift (see chapter “safety devices“).

➢ Check on load support: corrosion, deformations, cracks of wheel forks or support brackets, function of guide wheels.

➢ Check on travelling device: condition of wheels at front and at rear, function of wheel brake at rear wheel jack.

DANGER
Danger to life by electrocution.

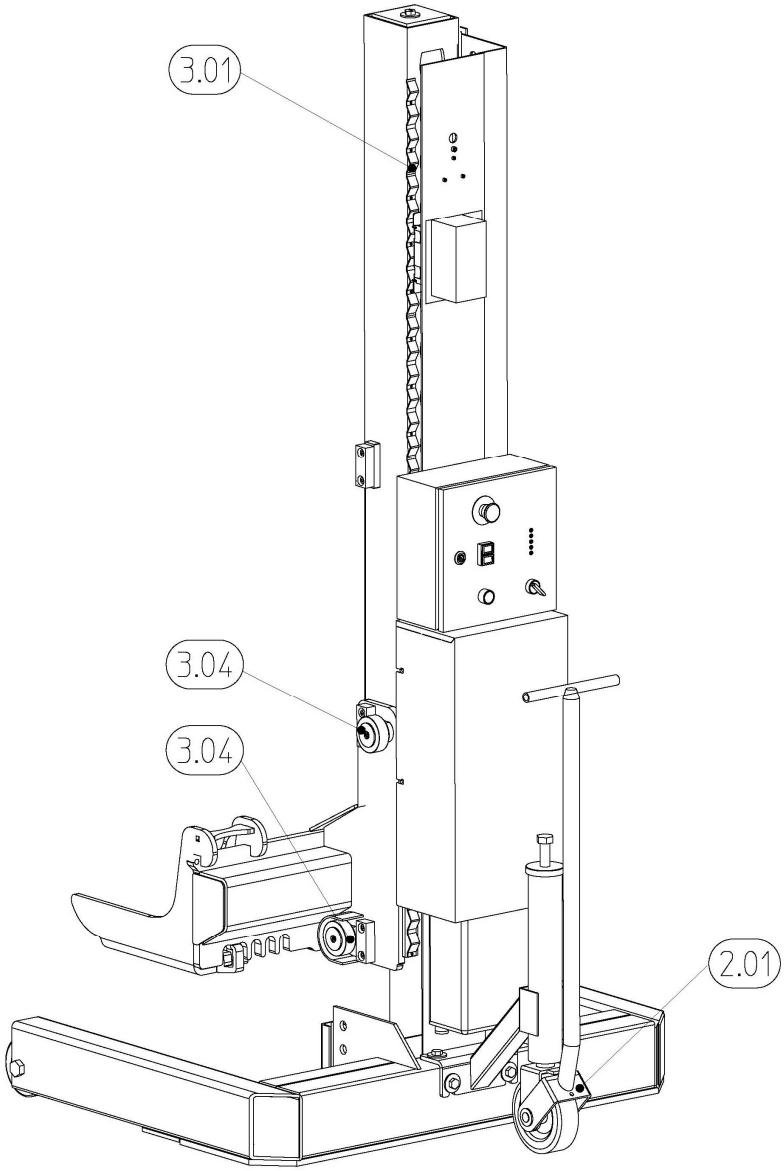
➢ Disconnect the lift from the power supply before working on the electrics.

➢ Check operation elements, cables and plug connections for damage.

➢ Check oil level of oil tank and refill oil if required.

- Oil to be used: see chapter “oil change”

8.1.3 Annual inspections



- Grease switch cams (3.01, carriage rollers (3.04, 4 pcs.) and flat spring on wheel jack (2.01) with multipurpose grease.

Instruction

At multi-shift operation or if the lift is used in wet areas, the maintenance rate must be reduced.

8.1.4 Oil change

- An oil change should be performed at least every 2 years.

  Quantity required: approx. 9 liter

  Use following oil: HLP ISO-VG 32, filtrated to 5 Micrometer.

➢ Lower the lift completely to the floor.

➢ Drain the oil tank.

➢ Re-fill oil up to the marking (see decal on oil tank).

➢ When changing the oil regard no dirt or water can enter into the hydraulic system of the lift.

Information

If the lift is used in multi-shift operation, in wet surroundings or under high UV radiation an oil change every year is recommended.
Not sufficient filtered oil may cause malfunction or defects at hydraulic components.

Environment information
Environmental hazard through hydraulic oil leakages.

Observe the appropriate environmental regulations when disposing of hydraulic oil.

8.2 Inspection and maintenance by customer service

Yearly

- Visual and function inspection by a competent expert with entry in the Inspection Log.
  Differing maintenance intervals to be regarded according the country-specific regulations.

9 Failures

9.1 Prevention of possible failures

- Always keep your lift clean to enable proper and safe work.
- Follow the maintenance instructions.
- Protect the electrical control cabinet and the power unit of the lift from moisture.
- Do not clean the lift with pressure or steam.
- Keep electrical control cabinet of lift closed.
- Do not apply corrosive substances to the lift.
- Do not perform welding on the lift or handle welding torches in its vicinity.

9.2 Behaviour during failures

Failures of the lift can be causes by simple errors. Inspect the lift according to the instructions listed below. If the error cannot be removed after checking the specific causes, please contact the responsible customer service.

DANGER
Danger to live by working with a defective lift.

- Shut down the lift and secure the main switch with a padlock until competent repairs have been carried out.
- The lift may only be returned into operation if it is in perfectly safe condition.

9.3 Possible failures and fault repair

DANGER
Danger to life by electrocution.

➢ Disconnect the lift from the power supply before working on the electrics.

Fault	Possible cause	Fault repair
After pressing Start- button, no LED illuminates.	No power supply.	Check power supply.
	Main switch not ON or defective.	Check main switch.
	Emergency Stop pressed or defective.	Check emergency switch at each column.
	Connection cables not plugged right.	Plug and lock connection cables, make sure that ring around the vehicle is closed.
	Connection cables defective.	Check connection cables.
	Plugs or sockets defective.	Check plugs and sockets.
	Transformer fuses defective.	Check fuses or change.
	Transformer defective.	Change transformer.
	Control board(s) not plugged in right.	Plug in and lock control boards.
	Control board(s) defective.	Change control board(s).
After pressing Start- button, the LED „ON“ is illuminated, but not LED „T1T2“.	Columns are not in common control cycle.	Re-establish common control-cycle at each column with operation SINGLE until lamps are all yellow or all blue and green COMMON CYCLE - lamp at master column illuminates.
	Master control board defective.	Change master control board.
Column doesn´t lift.	Motor- rotation incorrect.	Change phase rotation by exchanging phases L1 and L2 at plug of power supply.
	Cable connection to valve „lifting“ (hydraulic diagram pos. 13) or valve defective.	Check cable connection, clean or change valve.

Column doesn´t lower.	The carriage has lowered into the mechanical lock, locking latch does not open. Cable to solenoid of locking latch resp. the solenoid itself is defective. Cable to lowering valve (hydraulic.circuit diagram pos. 12) resp. valve solenoid itself is defective.	Lift UP the carriage until lock is released. Check or replace cable resp. solenoid,. Check cable, clean or replace valve.
Lifting only possible until load is off floor.	One or several columns overloaded.	Do not exceed admissible capacity (see manufacturer nameplate).
When lowering the carriage doesn't lower completely to ground.	Wheel fork clings to the tyre.	Free tyre. Place adjustable fork tines more narrow towards the tyre.
Lift does not operate after observing the above mentioned points.	Electrical or hydraulical failure.	Repairs by qualified service personnel.

9.3.1 Locating defective column

9.3.1.1 Check of master column

- Plug-in the grey interconnect cable of the master column into it's own socket; you now got a complete lift system with closed circuit consisting just of the master column.
- Check all function in single and common operation mode.

If master column does not work → see "fault repair on the defective column", otherwise see next chapter.

Check of master and slave column

- Connect the master with one slave column; you now got a complete lift system with closed circuit consisting of one master and one slave.

If the first slave column does not work → see "fault repair on the defective column".

If first slave column is operative:

- Extend the system successively by one further slave column, until the defective slave column is located → see next chapter.

9.3.2 Fault repair on the defective column

DANGER
Danger to life by electrocution.

- The components within the control box are live wired, if main switch is activated.

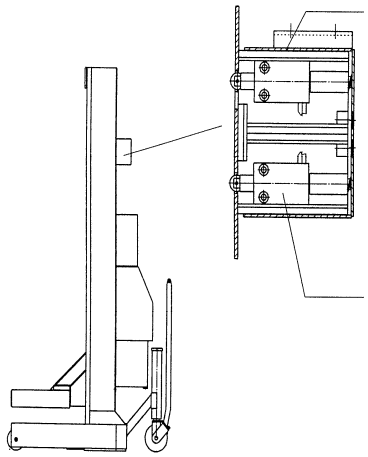
Master

- ➢ Plug-in the grey interconnect cable of the master column into it's own socket.
- ➢ Check the power supply (fuses at user's side).
- ➢ Check fuses inside control box of master column.
  - Green LED on circuit board should be on, if not replace fuse.
  - Yellow LED on circuit board should be on, if not replace fuse.
  - Fuses of transformer.
- ➢ Check connections inside of plugs / sockets as well as the interconnect cable for contact or damage.
- ➢ Replace slave circuit board (identical in all columns).
- ➢ Replace master circuit board
- ➢ Check the roller limit switches and switch cam → see chapter "check of limit cycle switches and switch cam".

Slave

- ➢ Connect the defective slave column with the master, the cable circuit needs to be closed.
- ➢ Replace the slave board by a slave board from an operative slave column.
- ➢ If slave column is operative now: slave board defective, to be replaced.
- ➢ Check connections inside of plugs / sockets as well as the interconnect cable for contact or damage.
- ➢ Check the roller limit switches and switch cam → see chapter "check of limit cycle switches and switch cam".

Check of limit cycle switches and switch cam



- The limit cycle switches with their corresponding yellow and blue LED control lamps should act regularly through while lifting / lowering. If there are interruptions of the cycles or the cycles are activated just very shortly, proceed as follows:

  - Remove cover panel above control box.
  - Check if both switches are moving freely inside the housing, hereto carefully pull at cable of switch; when releasing the spring-acted switch will return to the initial position. If required clean and lubricate the parts to get fee movement.
  - Check the position of the limit cycle switches: at top and at bottom position of the carriage the yellow LED should be on, i.e. the top limit switch (T1) needs to be activated.
  - Check if the switch cam on the carriage is damaged, deformed or dirty; all switch cams should be on one line and may not stand out. If required clean or replace.

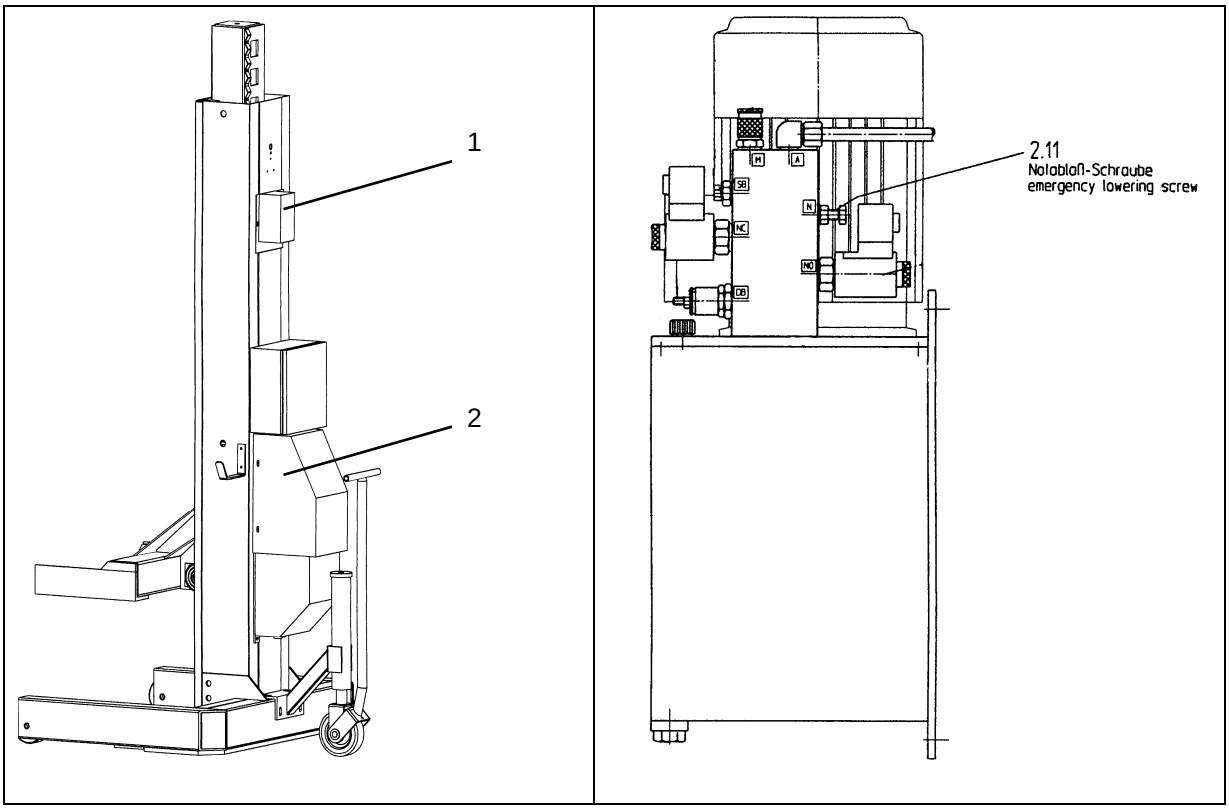
9.4 Emergency lowering – lowering during failure

In case of power blackout or any electrical defects the lift can be lowered without electrical power.
This procedure may only be performed by an authorised, trained and competent technician.

DANGER
Hazard of vehicle to fall by non-prescribed emergency lowering.

- Observe the vehicle do not get into a dangerous inclined position.
- Lower the columns individually within small increments.

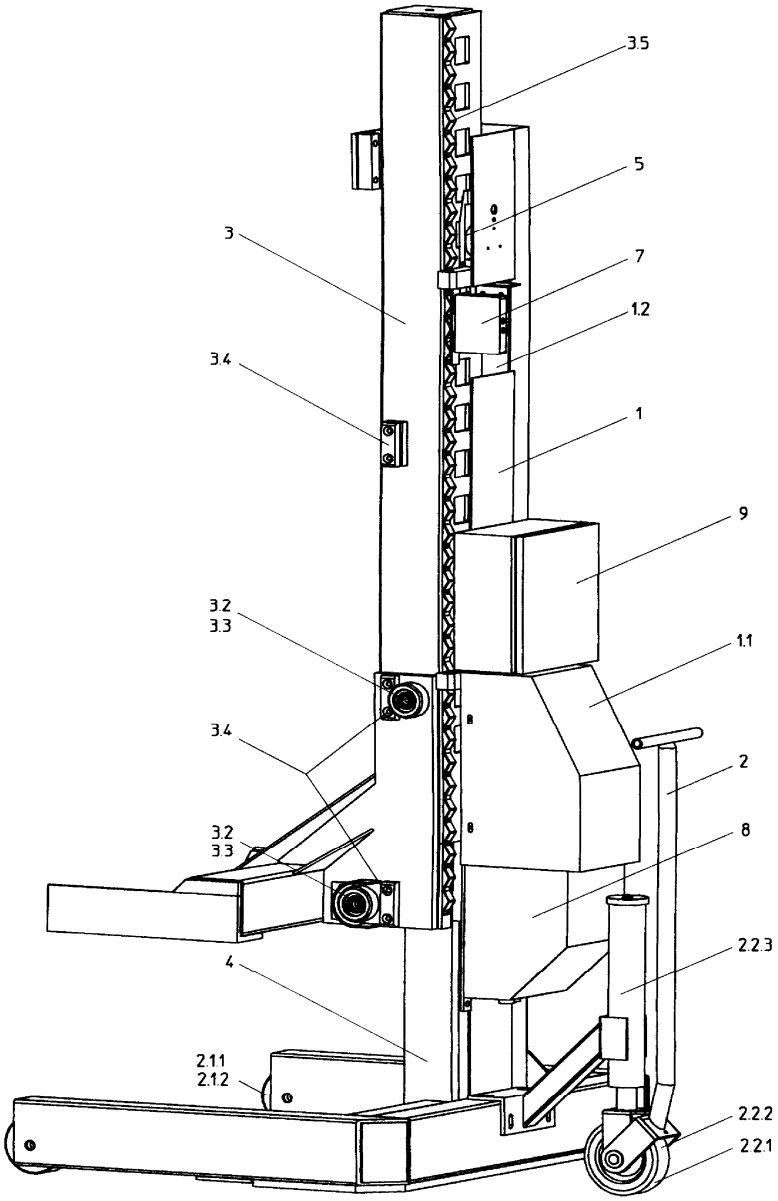
- Remove cover panels above and below the control box to get access to the mechanical locking device and the hydraulic power unit.



- Pull back and thus open locking latch such as with a screw driver which you insert into the hole of the locking latch. Keep locking latch open. If locking latch cannot be opened being under load slightly raise the lift carriage with a lifting tool.
- Open the counternut behind the emergency lowering screw (2.11) at valve block.
- Carefully open the emergency screw (2.11) counterclockwise until the carriage begins to lower. Turning the screw clockwise stops the movement.
- Lower the columns one by one, within small increments.
- Close all emergency lowering screws and fix all counternuts.
- Switch-off the main switch and secure the lift against unauthorized use until lift has been repaired.

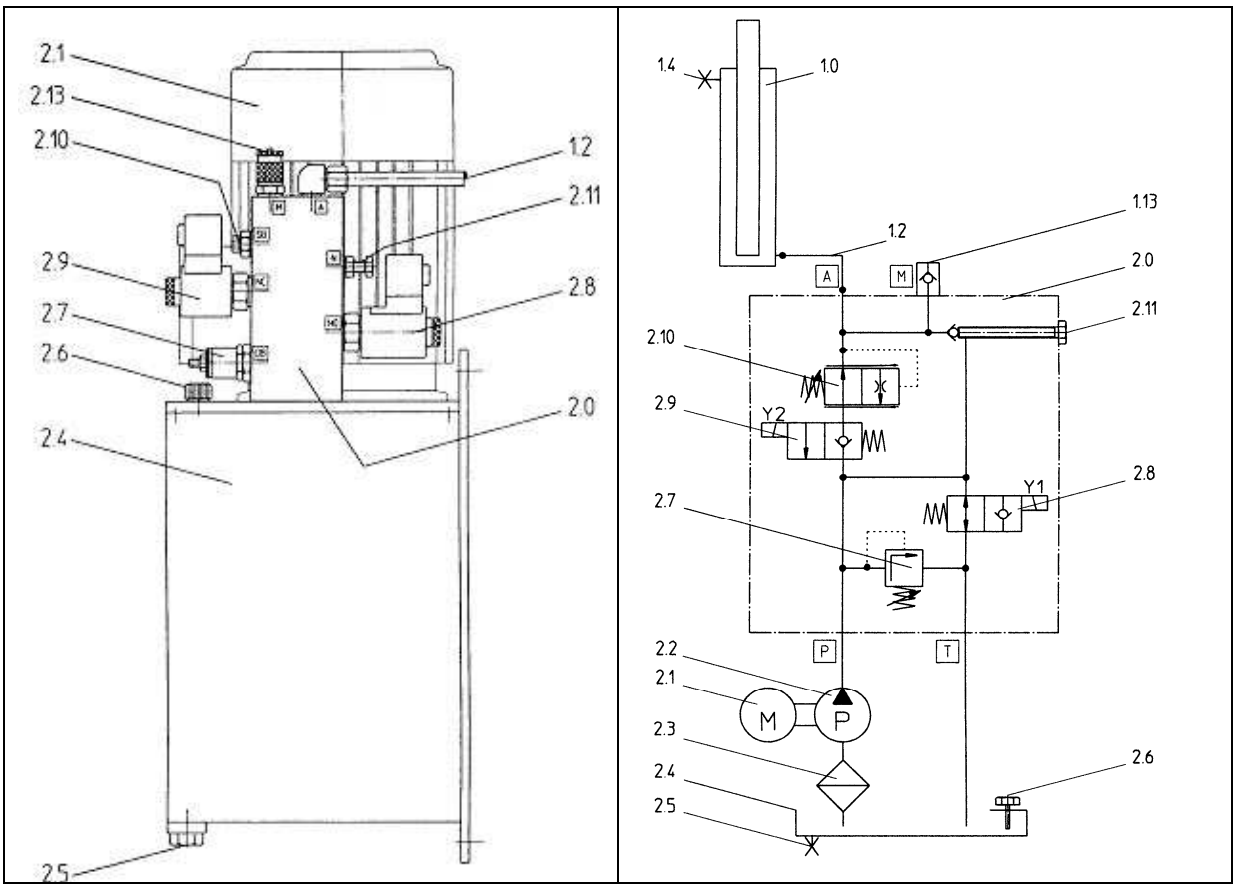
10 Spare parts lists and circuit diagrams

10.1 Overview mechanical parts with spare parts list



Pos.	Description	Quantity	Article number
1	column	1	
1.1	cover hydraulic unit	1	7060153002-RAL7015
1.2	Cover limit switch	1	7020141003-S-RAL7015
2	rear wheel jack, complete	1	A032100005-KPL-702
2.1.1	Front wheel	2	7020201010
2.1.2	Bearing front wheel	4	6204-2RS
2.2.2	Flat spring	1	A032126004
2.2.3	Spring	1	D409
3	carriage	1	
3.2	axle carriage roller with grease nipple	4	7020323003-KPL
3.3	carriage roller complete with slide bearing	4	7020321003-KPL
3.4	plastic slide guide	6	7020301054-FR
3.5	switch cam	7	7060318002
4	hydraulic cylinder	1	See hydraulics
5	locking device	1	
	locking latch	1	7020501006
	solenoid	1	HT-D 70-N 24VDC
	spring	1	VD145DJ
7	roller switch incl. housing complete	1	706070100003-KPL
	roller limit cycle switch	2	XCMN2102L2
	spring	2	D165A
	housing for limit cycle switches	1	706070100007
8	hydraulic power unit	1	See hydraulics
9	control box (see chapter electrics)	1	See electrics

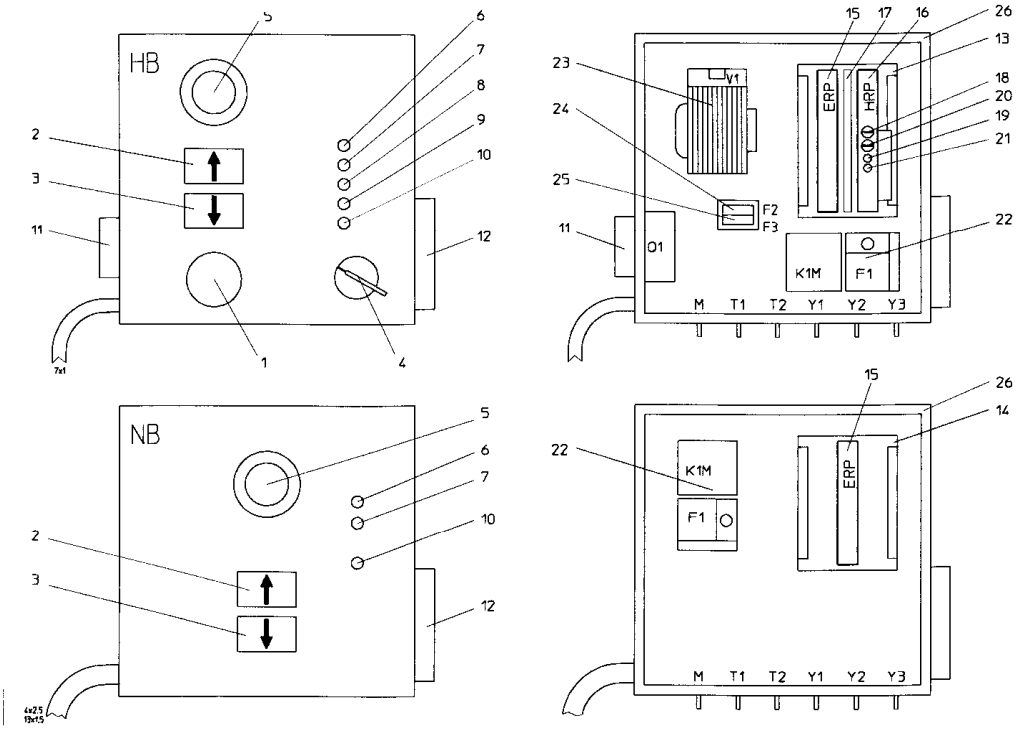
10.2 Overview hydraulics with spare parts list



Pos.	Description	Quantity	Article number
1.0	Hydraulic cylinder without pipe	1	7020400003
1.2	Hhydraulic pipe	1	H-RO706.5-1
1.4	Bleeding screw	1	
2.0	Valve block	1	7060803206
2.1	Electric motor 0,75kW	1	M07403B14164
2.2	Gear pump 1,7ccm	1	ZAPU1,7
2.3	filter	1	WT1089
2.4	Oil tank steel	1	7060803016-RAL7015
2.7	Pressure relief valve	1	VENDB DBT1
2.8	Valve lifting	1	VEN2/2S024NO
2.9	Valve lowering	1	VEN2/2S024NC
2.10	Current regulating valve	1	69007829-03

10.3 Overview electrics

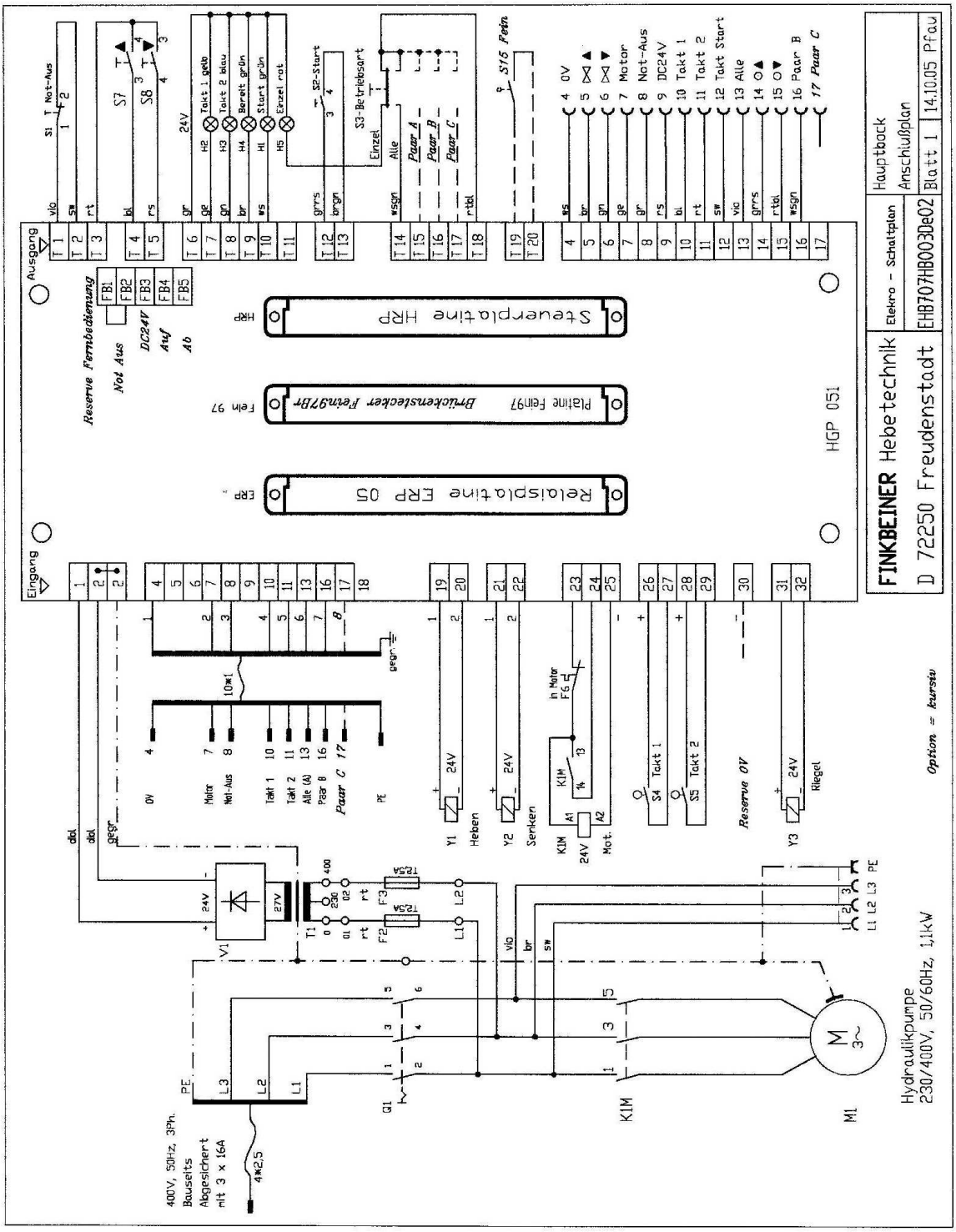
Master column



Slave column

Pos.	Name
1	sStart button
2	Up- button
3	Down- button
4	selection switch operation mode
5	emergency stop
6	LED yellow, cycle 1
7	LED blue, cycle 2
8	LED green, common cycle
9	LED green, control voltage on
10	LED red, blinking on single mode
11	main switch, lockable
12	socket
13	base circuit board (master)
14	base circuit board (slave)
15	control circuit board (slave)
16	control circuit board (master)
17	bridge control board
18	fuse F7 on master control board
19	LED green on master control board (fuse F7)
20	Fuse F8 on master control board
21	LED yellow on master control board (fuse F8)
22	motor contactor
23	transformer with rectifier
24	fuse F2 for transformer, control voltage
25	fuse F3 for transformer, control voltage
29	control box
30	connection cable slave with plug
31	power supply cable at master column
32	connection cable master with plug
M	cable to motor
T1	cable to cycle switch S1
T2	cable to cycle switch S2
Y1	cable to lifting valve
Y2	cable to lowering valve
Y3	cable to solenoid of mechanical lock

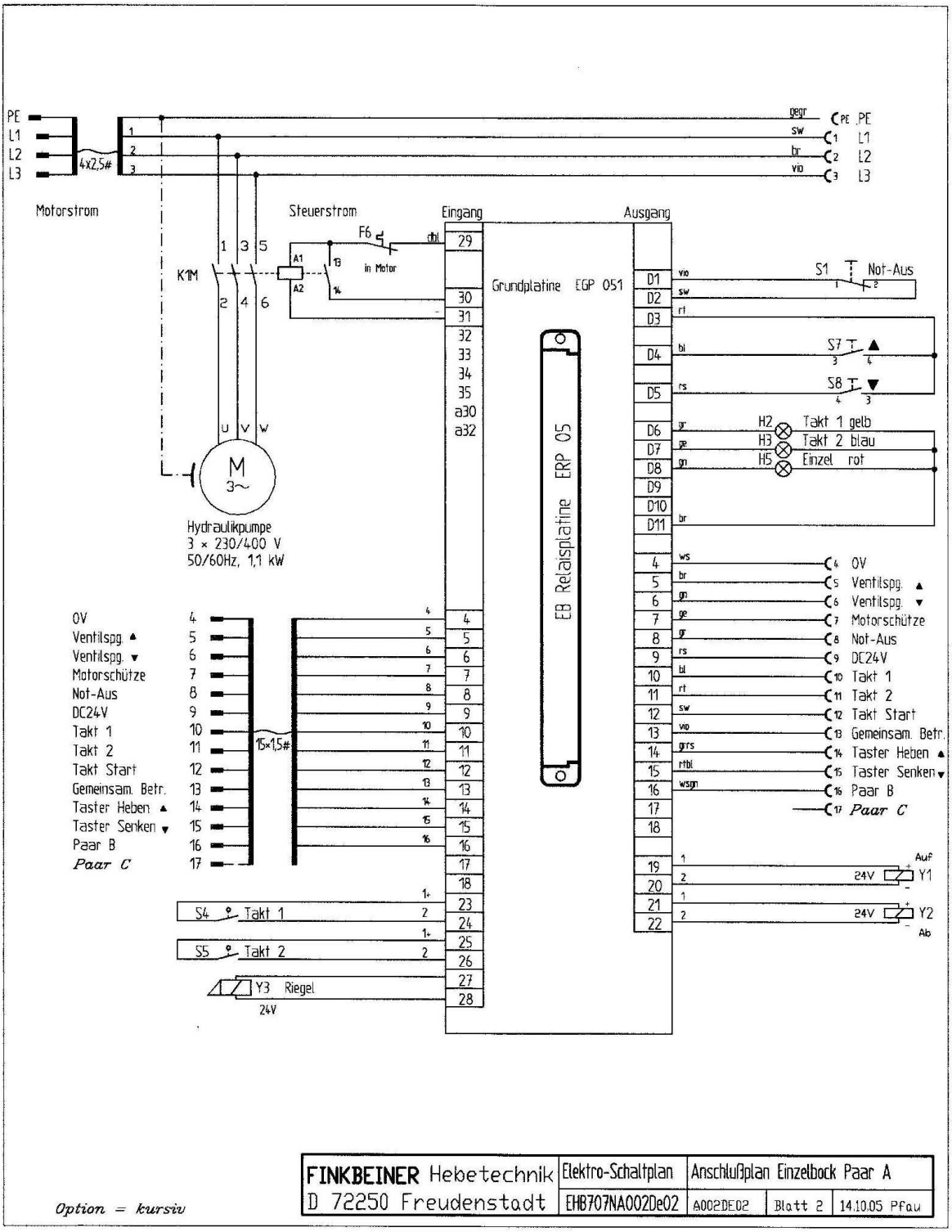
10.3.1 Electrical circuit diagram master column



10.3.2 Spare parts list master column

Pos.	Description	Quantity	Article number
	control box		
	base circuit board	1	GRPL-HGP05-KPL
	control circuit board master	1	STPL-HRP071-KPL
	control circuit board slave	1	STPL-ERP05-KPL
	bridge board	1	STPL-FEIN97BR
	LED-circuit board with 5 LED	1	STPL-6LED00KPL-5
F6	Motor protection relay		LR2K0308
F2/ F3	fuse M2.5	2	SI2,5MT5x20
F7	fuse M1.6A on control circuit board master	1	SI1,6MT5x20
F8	fuse M6.3A on control circuit board slave	1	SI6,3MT5x20
H1/ H4	LED green	2	67S4600
H2	LED yellow	1	67S4550
H3	LED blue	1	67S4605
H5	LED red flashing	1	LD599ROT
K1M	motor contactor	1	LP4K0610BW3
Q1	main switch	1	P1-25/EA/SVB
S1	emergency-stop switch	1	ZB4BT4
S2	START-switch	1	ZB4BW37
S3	selection switch 2 positions	1	ZB4BJ2
S4/ S5	roller limit switch	2	XCMN2102L2
S7	up/down push button with plastic cover	1	ZB4BA9112
T1/ V1	transformer	1	EG15VA150
Y1	solenoid valve NO 24V DC		See hydraulics
Y2	solenoid valveNC 24V DC, with emergency lowering screw		See hydraulics
Y3	solenoid for mechanical lock	1	HT-D 70-N 24VDC
M1	electric motor		
	interconnect cable grey 10m with plug	1	KAB-706-VERB
	plug housing (16 pol.)	1	MHO16L32
	plug inset (16 pol.)	1	JCSEM16
	socket housing (16 pol)	1	7132516280
	socket inset	1	JCSEF16
	power supply cable, 4x2.5, 10m with plug	1	KAB-706-ZUL

10.3.3 Electrical circuit diagram slave column



Spare parts list slave column

Pos.	Description	Quantity	Article number
	control box		
	base slave board	1	GRPL-EGP05
	control circuit board slave	1	STPL-ERP05-KPL
	LED-circuit board with 3 LED00	1	STPL-6LED00KPL-3
F6	Motor protection relay	1	LR2K0308
H2	LED yellow	1	67S4550
H3	LED blue	1	67S4605
H5	LED red flashing	1	LD599ROT
K1M	motor contactor	1	LP4K0610BW3
S1	emergency-stop switch	1	ZB4BT4
S4/ S5	roller limit switch	2	XCMN2102L2
S7	up/down push button with plastic cover	1	ZB4BA9112
Y1	solenoid valve NO 24V DC		See hydraulics
Y2	solenoid valveNC 24V DC, with emergency lowering screw		See hydraulics
Y3	solenoid for mechanical lock	1	HT-D 70-N 24VDC
M1	electric motor		
	interconnect cable black 10m with plug	1	KAB-706-RING-10M-PUR
	plug housing	1	MHO16L32
	plug inset	1	JCSEM16
	socket housing	1	7132516280
	socket inset	1	JCSEF16

11 Accessory

11.1 Remote control / Fine- operation

DANGER
Hazard by unintended operation of the remote control.

- Re-place resp. hang up the remote control handset thus unintended operation is eliminated.
- Protect remote control handset from damage.

DANGER
Hazard by FINE-operation of lift throughout a distance of more than 10 centimetres.

- FINE-operation throughout a distance of more than 10 centimetres is prohibited.
- After FINE-operation always check if all columns are levelled.
- Adjust possible cycle differences in single mode, check equal heights of columns.

DANGER

- During operation it is prohibited to stay under the load or in the hazardous area of the lift.

➢ Turn key-switch clockwise and keep it in this position.

➢ Press UP or DOWN push button.

Information FINE-operation

- When releasing the UP/DOWN push button the movement of the lift is interrupted immediately.

12 Inspection log

12.1 Information on inspection log

This Inspection Log contains respective forms as proof for the once-off, regular and special safety inspections (dependent on the respective operating country). Please leave them in the Inspection Log.

12.2 Checklist on technical inspection

- General condition of lift
- Condition of paint
- Short operation instructions
- Further labels
- Safety devices:
    - Main switch
    - Emergency stop
    - Operation elements
    - Check valve
    - Pressure relief valve
    - Mechanical locking device
    - Synchronisation system
- Function of cycle switches
- Condition of cam switches
- Column (deformation, cracks)
- Carriage (deformation, cracks)
- Load support (deformation, cracks)
- Travelling device front / rear: function of wheel brake
- Condition of cover panels
- Level of hydraulic oil
- Condition of hydraulic hoses
- Condition of electrical cables and connections
- Condition of control panel
- Functional inspection of lift with nominal load (vehicle)
- Completeness of operating manual incl. inspection log
- Entry in inspection log
- Attach inspection label on lift
- Write inspection report

12.3 Inspection results before first commissioning by the competent person

type: **EHB702**

The lift has been tested in operation und function; thereby no failures were ascertained.

There are no objections to commission the lift.

The Competent Person

ppa. Guenther Obmann

Employed at:

Walter Finkbeiner GmbH
Alte Poststrasse 9-11
72250 Freudenstadt

12.4 Inspection results on a regular verification

Above mentioned lift was subjected to a regular / special inspection***)**

Inspection scope:

_____

_____

The following deficiencies were ascertained:

_____

_____

Pending partial inspections:

_____

Further operation is / is not objected ***)**
Verification is / is not required. ***)**

The authorized expert / competent person

_____ _____
Place, date signature authorized expert / competent person

_____

_____

adress / stamp of authorized expert / competent person

Operator

Deficiencies noticed: _____
signature operator

Deficiencies repaired (date): _____ _____
signature operator

***) Delete non-applicable**

Above mentioned lift was subjected to a regular / special inspection***)**

Inspection scope:

_____

_____

The following deficiencies were ascertained:

_____

_____

Pending partial inspections:

_____

Further operation is / is not objected ***)**
Verification is / is not required. ***)**

The authorized expert / competent person

_____ _____
Place, date signature authorized expert / competent person

_____

_____

adress / stamp of authorized expert / competent person

Operator

Deficiencies noticed: _____
signature operator

Deficiencies repaired (date): _____ _____
signature operator

***) Delete non-applicable**

Above mentioned lift was subjected to a regular / special inspection***)**

Inspection scope:

_____

_____

The following deficiencies were ascertained:

_____

_____

Pending partial inspections:

_____

Further operation is / is not objected ***)**
Verification is / is not required. ***)**

The authorized expert / competent person

_____ _____
Place, date signature authorized expert / competent person

_____

_____

adress / stamp of authorized expert / competent person

Operator

Deficiencies noticed: _____
signature operator

Deficiencies repaired (date): _____ _____
signature operator

***) Delete non-applicable**

Above mentioned lift was subjected to a regular / special inspection***)**

Inspection scope:

_____

_____

The following deficiencies were ascertained:

_____

_____

Pending partial inspections:

_____

Further operation is / is not objected ***)**
Verification is / is not required. ***)**

The authorized expert / competent person

_____ _____
Place, date signature authorized expert / competent person

_____

_____

adress / stamp of authorized expert / competent person

Operator

Deficiencies noticed: _____
signature operator

Deficiencies repaired (date): _____ _____
signature operator

***) Delete non-applicable**

Above mentioned lift was subjected to a regular / special inspection***)**

Inspection scope:

_____

_____

The following deficiencies were ascertained:

_____

_____

Pending partial inspections:

_____

Further operation is / is not objected ***)**
Verification is / is not required. ***)**

The authorized expert / competent person

_____ _____
Place, date signature authorized expert / competent person

_____

_____

adress / stamp of authorized expert / competent person

Operator

Deficiencies noticed: _____
signature operator

Deficiencies repaired (date): _____ _____
signature operator

***) Delete non-applicable**

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