Installation Instruction

Tail Lift

Z100-110/130

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55609TL
2020-06-15

ZEPRO

Contents

1. CE marking

CE

Since 1/1/1995 ZEPRO tail lifts sold to the European market are stamped with a CE mark. This is the manufacturer's guarantee that the product conforms to the European Machinery Directive.

The application of the European Machinery Directive is intended to harmonize product safety levels across Europe.

There are some general principals that should be made clear when performing the installation of ZEPRO lifts.

Follow the installation instructions. If it is not possible to follow the installation instructions or if modifications are required, the modifications must be approved by the manufacturer. This is a consequence of the CE marking regulations as it cannot be possible for a manufacturer to certify conformity to the Machinery Directive if the product is subsequently changed without his knowledge or approval. In order for the product's CE marking to remain applicable the forms supplied by ZEPRO must be completed in case of modification.

Welding is **not necessary** unless specifically recommended by the manufacturer.

In order to increase security, additional decals, which are diagrammatic and easily understood independent of language will be sent with the lifts.
Ensure that these decals are affixed so that the information contained on them is available for all users of the lift.

Position the control unit to ensure that the operator has a good view of the load, the working area and the loading area, whilst maintaining a safe distance from the risk zone between the platform and the body. Follow the operator’s instructions for use of the control unit and its functions.

Technical description

The ZEPRO-lift is electro-hydraulically driven. An electric motor which gets its power from the truck's ordinary battery drives a hydraulic pump which supplies oil via hoses and pipes to the working hydraulic cylinders. The system is steered by electrical valves.
The hydraulic power unit and the control system with all details is built into a separate box. Both systems are easy to reach for service and maintenance.
The platform is supported by the lift arm which is very strong and rigid. The under run protection bar is directly attached to the support frame. The platform has a non-slip surface.
The lift arm lifting work is done by lift cylinders which have built in safety valves for protection against hose breakage. The lift cylinder circuit is equipped with 1 or 2 electric safety valves, which are leakproof. These safety valves can also act as an extra transport lock for the platform. The valves are built into the cylinders.
The platform's tilt function is also provided by cylinders with similar design to the lift cylinders. Tilt cylinders can have one speed operation. The tilt cylinder circuit is also equipped with 1 or 2 electric safety valves. Lifting and tilting up and down speeds are fixed by the pump capacity. Lowering speed are controlled by a special constant flow valve. These valve give the same speed independent of the load.
The cylinder piston rods are treated with carbon nitrating which gives them very long life.
The hydraulic system is protected with a pressure regulator when lifting or tilting up.
Note! This regulator does not prevent overload at rest position or lowering.

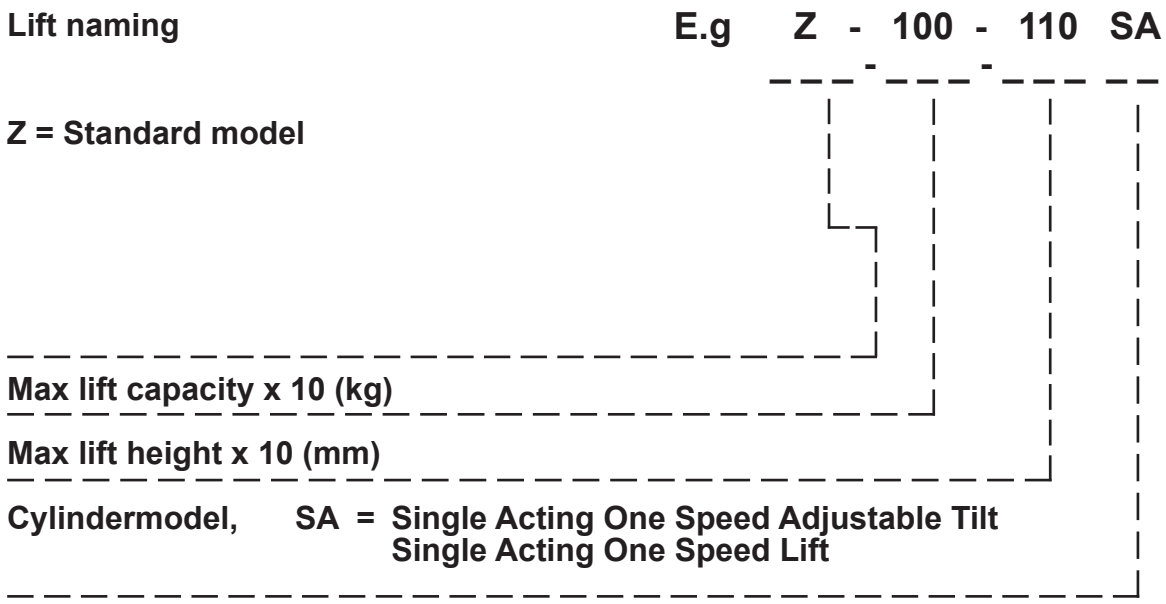
The electric power is taken from the truck's ordinary starter motor. Control current is taken from the dash board. When the control current's isolator (cabin) switch is off, the lift is "locked". Fixed control units are electrically heated to prevent condensation damage to switches.
To save current the control current should be switched off when the lift is not used.
The lift can also be operated from other, optional units.
To ensure safe operation even with very long control cables, the hydraulic unit is equipped with relays. The relays situated in the electrical connection box placed in the support frame steer current directly from the main cable to the valves and the main switch for the motor.
The electric motor is equipped with a thermostat which breaks the current if the motor becomes overheated. The motor will stop until it is cool again.
The platform can be tilted to all positions from vertical to 10° below the horizontal. It has a mechanical or electric lock which must be activating during transport.

Hydraulic oil
A tail lift should operate just as well in tropical as in arctic climates. Heat does not adversely affect the hydraulic oil, however, low temperatures are more critical. ZEPRO therefore supply a hydraulic oil that meets the demands across the temperature range. ZEPRO oil (art. no 21963 for 1 litre) is made of a highly refined mineral oil, the lubricant additive is free from zinc and gives good protection against component wear. The hydraulic oil’s low temperature properties and high viscosity index allow hydraulic system start in a very cold climate and give reliable functioning with varying temperature conditions. With ZEPRO oil the hydraulic system also receives a very good protection against corrosion.

ZEPRO also has a biologically degradable oil (art. no 22235 for 1 litre) available which is based on a synthetic base oil. This also provides very good properties at low and high temperatures. It is even liquid down to -50° C. Resistance to oxidation is extremely good which gives long lifetime with longer intervals between oil changes. Good filtration and air separation together with low density make the oil easy to pump. This minimizes risk for cavitation and development of scum. Contact us for more information.

NB. Neither ATF nor HF oil should be used in the ZEPRO hydraulic circuit as they can damage the rubber in the sealing kits and reduce their lifetime.

2. General



Weights

Some components of the tail lift must be manipulated by other lifting equipment during handling and therefore could represent hazards if their weights exceed the equipment's permitted load. The following are the ranges of weights for various heavy components.

Cpl. Lift chassis (without platform)

Z-100-110	168 kg
Z-100-130	171 kg

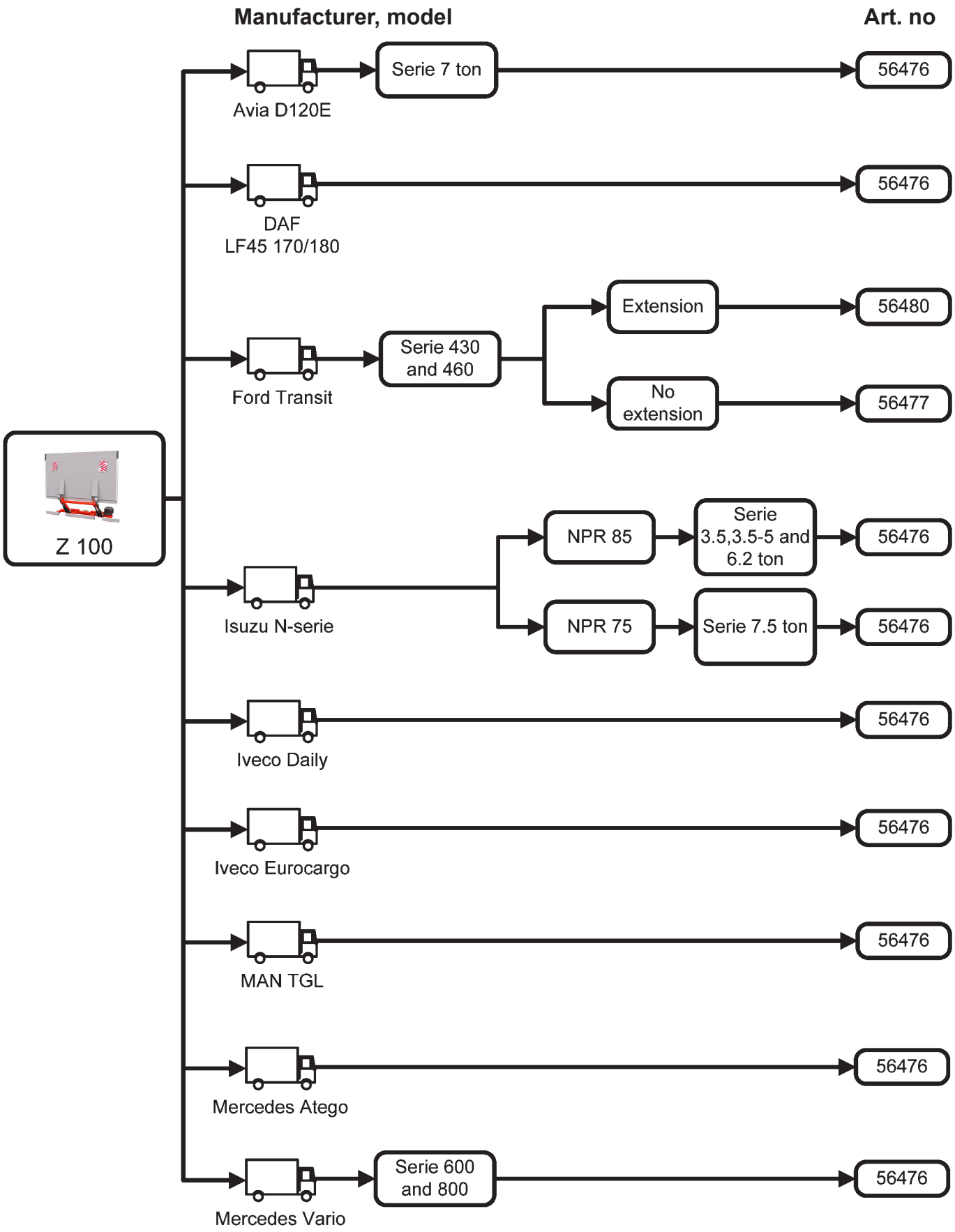
Lift components (part of cpl. lift chassis).

Support frame Z-100-110/130		38,6 kg
Lift arm Z-100-110		34,0 kg
Lift arm Z-100-130		36,5 kg
Mounting bracket cpl.		4,0 kg
Hydraulic unit		14,0 kg
Lift cylinder	-110	8,0 kg/unit.
Lift cylinder	-130	8,0 kg/unit.
Tilt cylinder	-110	12 kg/unit.
Tilt cylinder SA	-130	12 kg/unit.
Bumper bar cpl.		33 kg

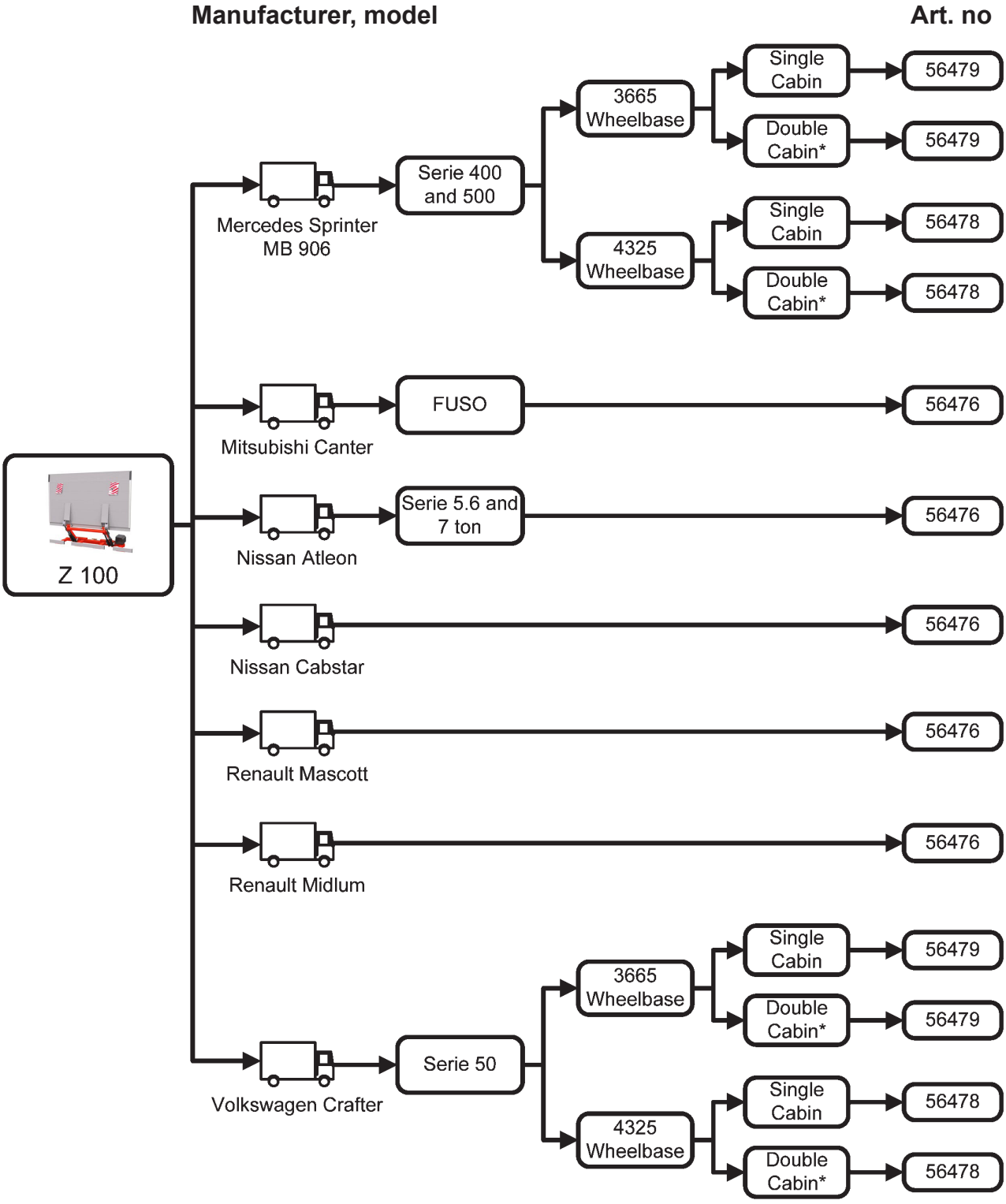
Aluminium platform
Flat 30 mm Laser (PLALAS L)

Alu. platform 1200x2200 mm	68 kg
Alu. platform 1450x2200 mm	77 kg
Alu. platform 1600x2200 mm	82 kg

3. Mounting bracket kits



3. Mounting bracket kits

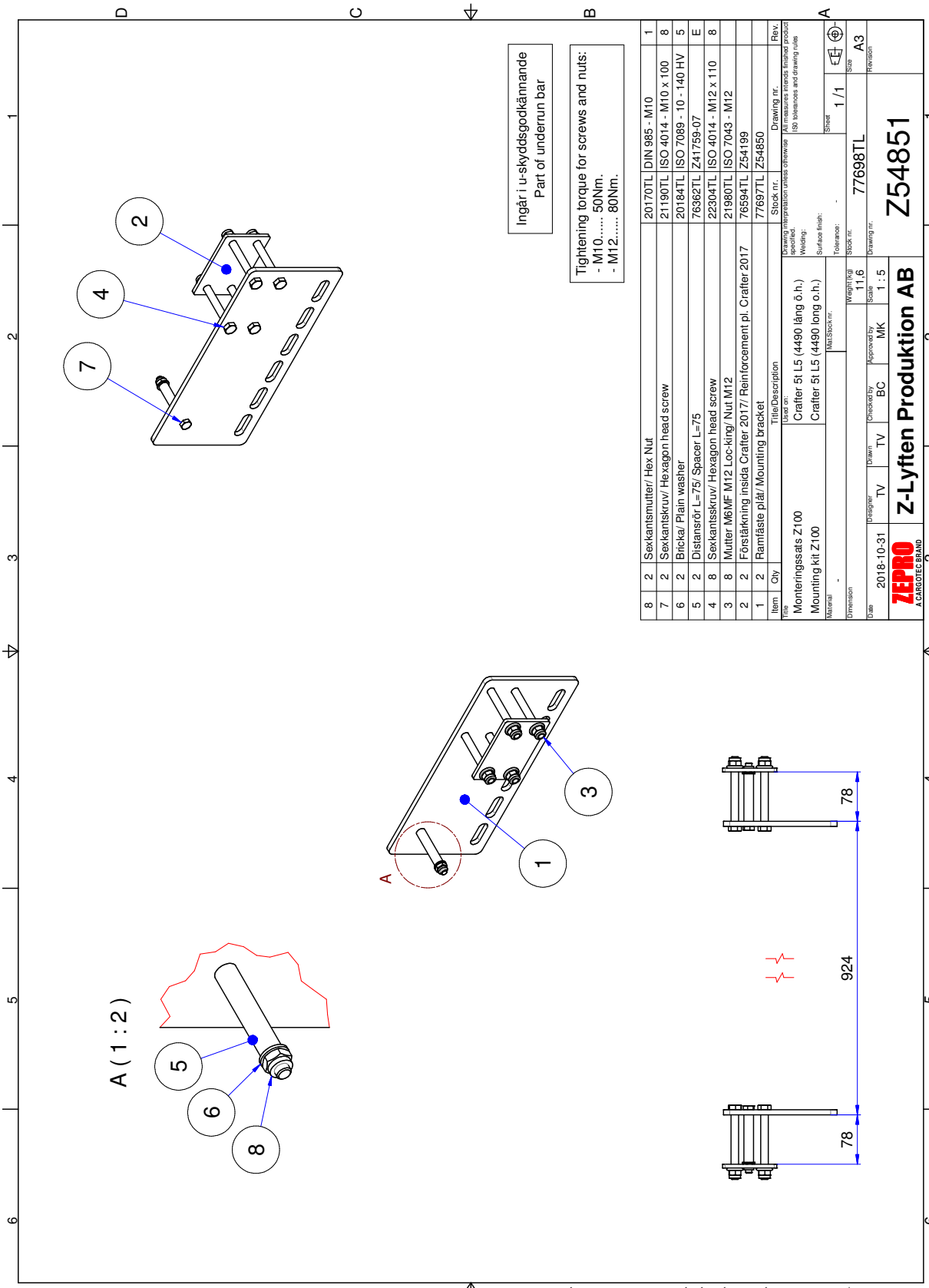


*Front axle pressure needs to be checked before using a vehicle with mounted tail lift.

3. Mounting bracket kits

77698TL Crafter 5t L5

Component Parts - Mounting kit 77698TL



Item	Qty	Title/Description	Stock nr:	Drawing nr.	Rev.
8	2	Sexkantsmutter/ Hex Nut	20170TL	DIN 985 - M10	1
7	2	Sexkantskruv/ Hexagon head screw	21190TL	ISO 4014 - M10 x 100	8
6	2	Bricka/ Plain washer	20184TL	ISO 7089 - 10 - 140 HV	5
5	2	Distansrör L=75/ Spacer L=75	76362TL	Z41759-07	E
4	8	Sexkantsskruv/ Hexagon head screw	22304TL	ISO 4014 - M12 x 110	8
3	8	Mutter M6MF M12 Loc-king/ Nut M12	21980TL	ISO 7043 - M12	
2	2	Förstärkning insida Crafter 2017/ Reinforcement pl. Crafter 2017	76594TL	Z54199	
1	2	Ramfäste plåt/ Mounting bracket	77697TL	Z54850	

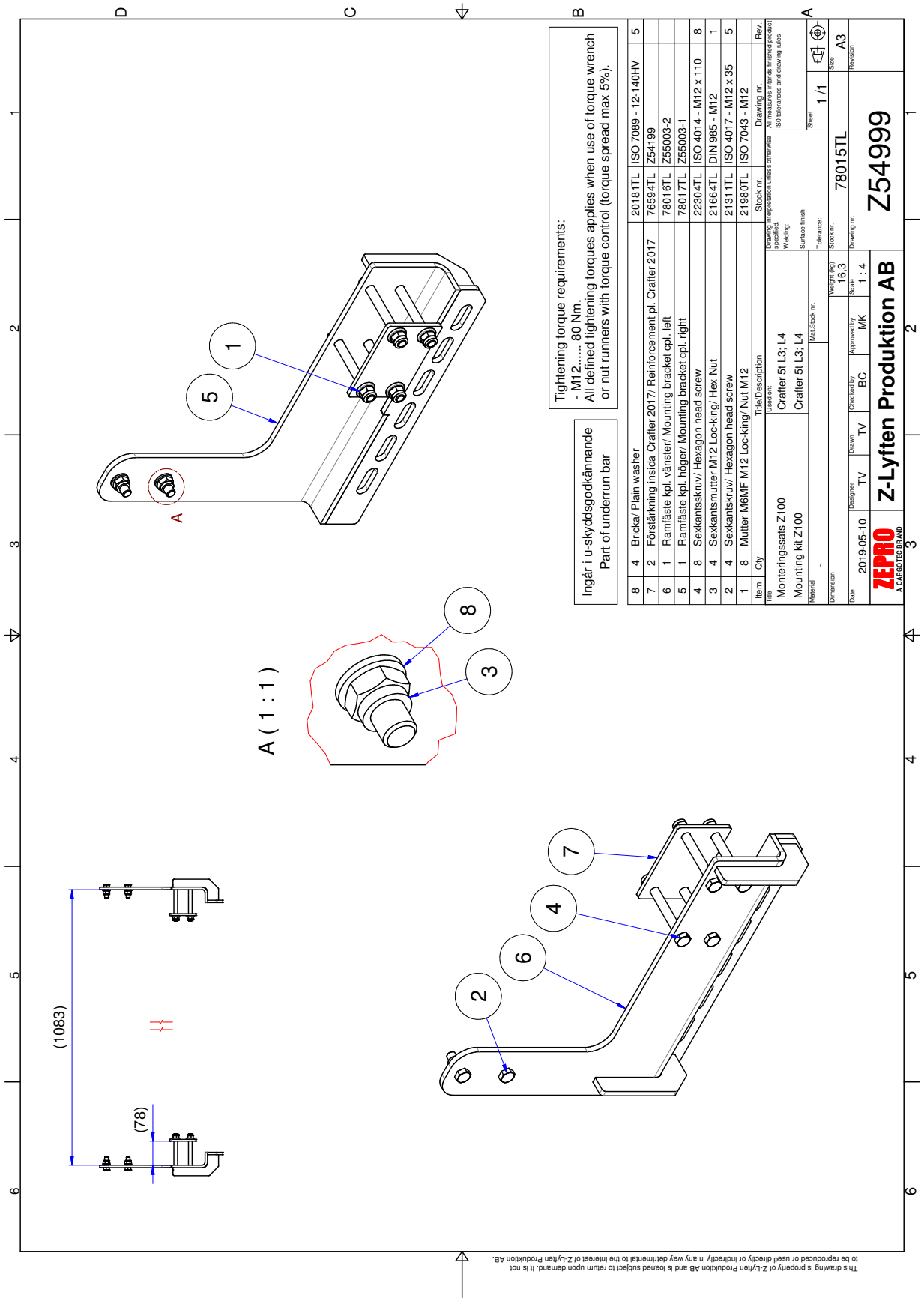
Title: Monteringssats Z100 / Mounting kit Z100
Used on: Crafter 5t L5 (4490 lång ö.h.) / Crafter 5t L5 (4490 long o.h.)
Material: -
Mat.Stock nr.:
Dimension:
Weight (kg): 11,6
Date: 2018-10-31
Designer: TV
Drawn: TV
Checked by: BC
Approved by: MK
Scale: 1 : 5
Drawing interpretation unless otherwise specified.
Welding:
Surface finish:
Tolerance: -
All measures intends finished product
ISO tolerances and drawing rules
Sheet: 1 /1
Stock nr: 77698TL
Drawing nr.: Z54851
Size: A3
Revision:

ZEPRO A CARGOTEC BRAND
Z-Lyften Produktion AB

3. Mounting bracket kits

78015TL Crafter 5t, L3, L4

Component Parts - Mounting Kit 78015TL



4. Introduction and Order of installation operations

Introduction

To make the installation easier it is wise to in advance determine the actual space available for the mounting of the lift.
First determine the C-measure and then read off the other distances from the table relevant to the tail lift model.

If a mounting bracket kit is to be used, the dimensions for installation are found in the separate installation instruction for the kit.
See a list of available mounting kits.

If standard brackets are used for the installation, the dimensions can be found in the current text and in the last section of this instruction booklet.

Order of installation operations

Installation of support frame, standard
- Determine dimensions for installation
- Fasten the jig to the rear frame
- Position the support frame
- Mounting brackets, standard
- Loosen the jig

Installation of support frame, with mounting bracket kit
- Determine dimensions for installation
- Fasten the jig to the rear frame
- See separate instruction for mounting bracket kit
- Loosen the jig

Mounting hydraulics (if not premounted)
- Install hydraulic power unit
- Connect the hydraulic hoses

Electrical installation
- Install control units
- Connection, control cable
- Connection, main power cable

Mounting platform
- Mounting platform
- Mounting sealing system
- Mounting armstop

Mounting cylinders
- Adjusting the tilt cylinder
- Test run

Mounting, other

Mounting decals

WARNING! Installation where a platform or lift arm support surface does NOT reach the ground when the platform is fully lowered is forbidden.

WARNING! Zepro tail-lift can only be mounted with mounting kit supplied or approved by Zepro.

NOTE! All specified torque values apply for use with a screw or impact wrench with torque control. Torque distribution max ± 5%.

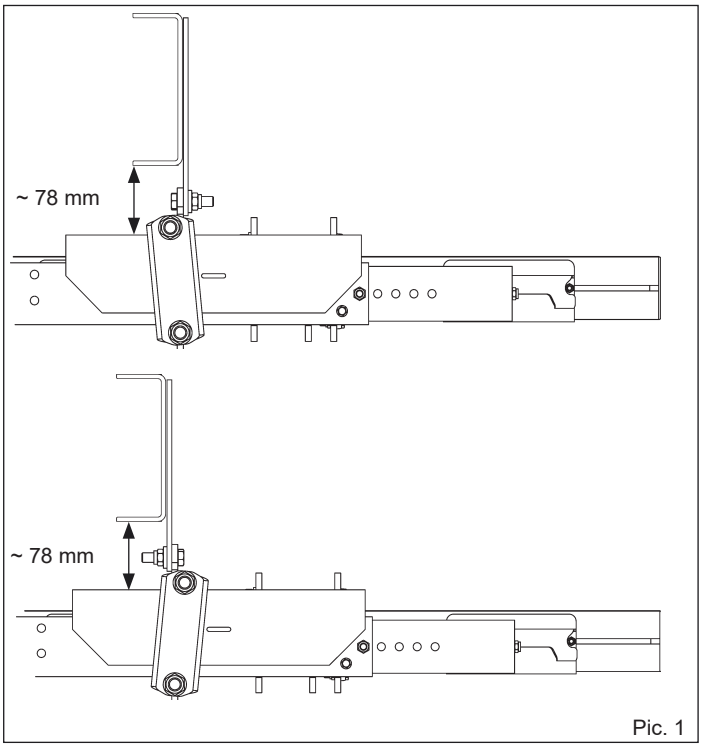
Attention! Also refer to the truck manufacturer´s instructions for auxiliary equipment.

5. Installation of support frame

1. Determine the dimensions for installation

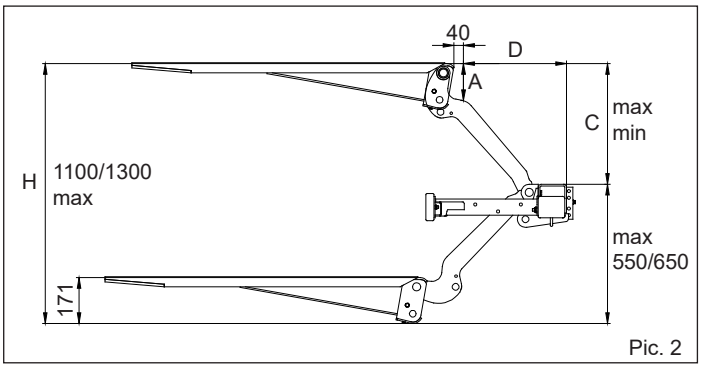
First determine the C-measure and then read off the other distances from the table relevant to the tail lift model. The support frame ought to be positioned as high as possible. Note the measures in the tables.

NB! The mounting brackets are in two pieces and should be fastened to each other above the lift support frame by using screws. NB. This will affect the space available between the lift and the truck frame.
Take this into account when calculating the C-measure.



Pic. 1

C-measure is the space between the body floor level and the top of the lift support frame.
This is the most important distance.
When the C-measure is known, the A- and D-measures may be obtained from a table. D-measure will determine the horizontal distance which is required for the tail-lift, and A-measure describes the distance between the lift arms and the body floor level.



Pic. 2

D-measure is the required space for the tail lift, measured from the back frame of the truck to the front of the lift support frame (in the direction of the travel).
Get the D-measure from tables when the C-distance is known.

A-measure is the space the lift allows for the truck rear frame, i.e. the distance between the lift arms and the body floor level, when the lift arms are in the upper position. A-measure depends on the C-measure.

H- distance is body floor height from the ground (when unloaded), and must be less than tail-lift's max lifting height.

Installation where a platform or lift arm support surface does NOT reach the ground when the platform is fully lowered is forbidden.

Lift height 1100 mm

C	A	D
550	147	449
500	133	510
450	123	559
400	115	598
350	109	631
300	103	657

Lift height 1300 mm

C	A	D
650	148	519
600	136	581
550	127	633
500	120	676
450	114	712
400	110	743
350	106	767

5. Installation of support frame

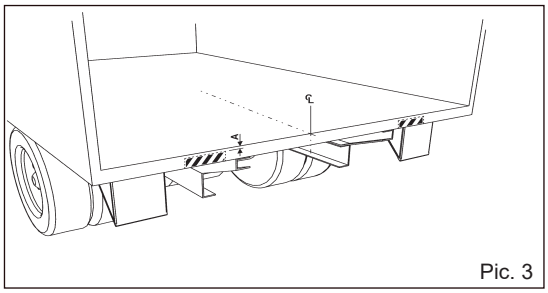
2. Fasten the jig to the rear frame

Measure out and mark the centre point of the truck's rear frame.

Check the A-measure, to determine if cut-outs are needed in the rear frame. (See marked area in the picture).

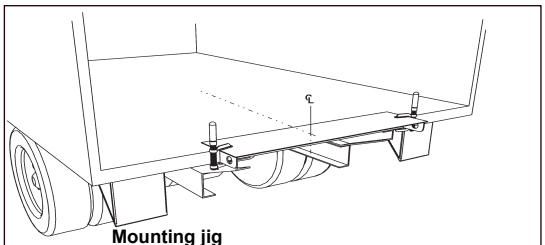
Make the cut-outs as required in the rear beam in accordance with the measures for the relevant lift model.

Fasten the jig with bolts or spot weld it to the rear frame so that the centre points line up.



Pic. 3

Measures and pictures, see section 17.2



Mounting jig
Art. no. 75162 for Z100 with sealing (AVI)
Art. no. 56338 for Z100 with sealing (PML)
Art. no. 56428 for Z100 without sealling

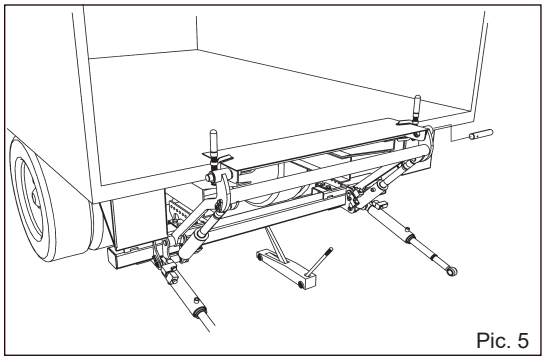
Pic. 4

For trucks with mounting brackets kits, see separate installation instructions. See list, section 3.

3. Position the support frame

Place the support frame of the lift under the truck frame and fit the lift arms to the installation jig. Use the specified platform pivot bolt.

The support frame must be parallel with the chassis frame. If it is difficult to get the support frame into the correct position, loosen a hydraulic hose from one lift cylinder to let oil or air out.



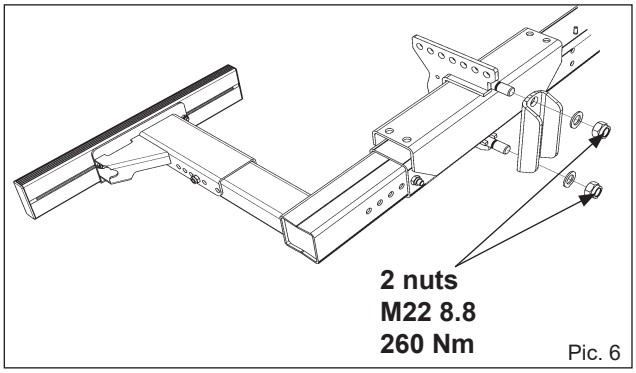
Pic. 5

Position the support frame as required under the truck's chassis frame. eg. A wheeled jack can be used.

5. Installation of support frame

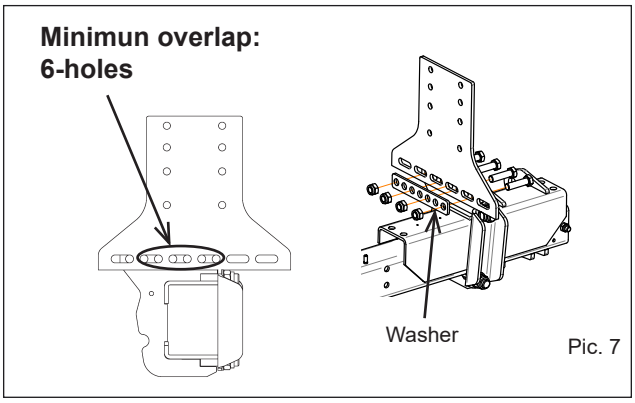
4. Mounting brackets, standard.

The mounting brackets are made up of two parts. One bigger bracket, that should be tightly fastened to the truck body frame. The smaller bracket should be mounted on the lift support frame, and can be adjusted along its width. The two brackets are to be fastened to each other, with as small displacement (forward-backward) as possible.



Pic. 6

Preliminarily position the smaller bracket according to picture and fasten the two brackets to each other with screws. Use the washer between bracket and nuts. Check that there is a minimum of 6 holes overlap of the smaller bracket's row of holes.



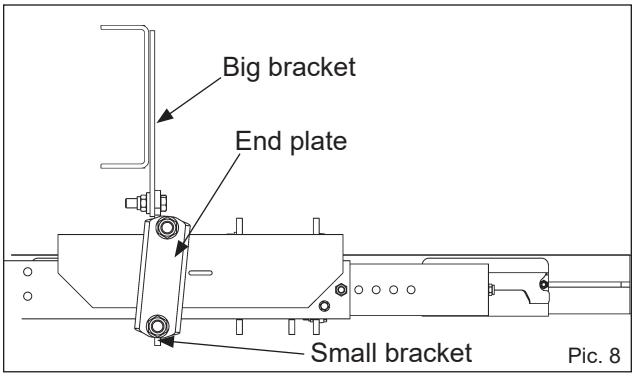
Pic. 7

The smaller bracket can be assembled in different ways depending on the width of the truck frame. The place along the truck frame where the bracket shall be assembled is the **trucks frame width.**

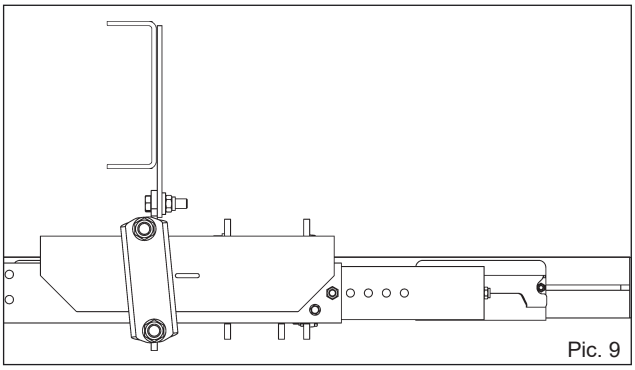
1. If the width of the truck frame being below 770 mm, the brackets shall be installed according to pic. 8 with the U-profiles end plate installed in the journey direction of the truck and the end plate leaning from the middle of the truck. (Pic. 8)

2. If the truck frames width exceeds 960 mm shall the smaller brackets be installed according to pic. 9 with the U-profiles end plate installed in the journey direction of the truck and the end plate leaning to the middle of the truck. (Pic. 9)

3. If the truck frames width lies between 770-960 mm, the brackets can be installed at an optional way.



Pic. 8

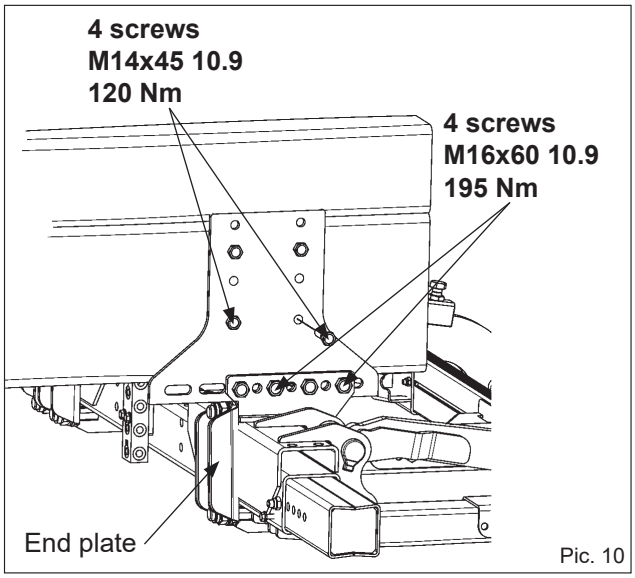

Pic. 9

5. Installation of support frame

Check the C- and D- measures.
Position the bigger bracket at the outside of the truck chassis. Drill 14 mm holes in the truck frame in the same position as the holes in the bigger bracket. Fasten the brackets securely to the frame with the M14x45 screws supplied. Fasten with a minimum of 4 bolts in each mounting bracket (see pictures below for recommended placing of bolts, 1 and 2 = recommended, 3 = avoided if possible, only if 1 and 2 don't fit). (torque=120 Nm).

Now permanently attach the two brackets to each other. Use the M16x60 screws supplied. Minimum 4 pcs for each pair of bracket (torque=195 Nm).

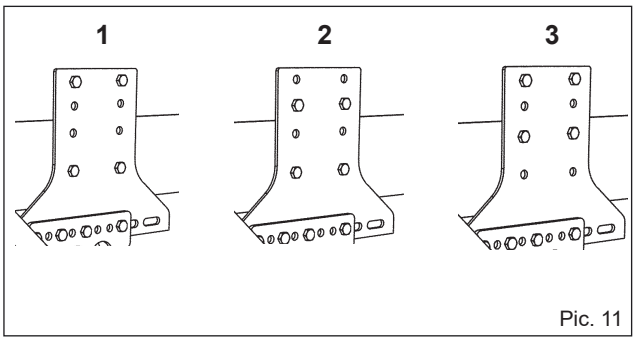
Install the U-profile end plate with the U pointing to the front of the vehicle using the washers and nuts provided (**Bag 31B**), one plate for each mounting bracket, two nuts and two washers for each plate (torque =260 Nm)



Pic. 10

5. Loosen the jig

Loosen the installation jig.

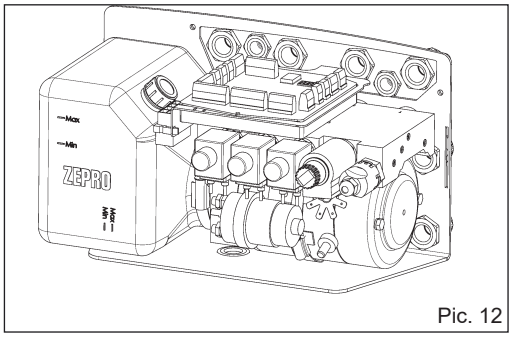


Pic. 11

6. Installation, hydraulics

The hydraulics

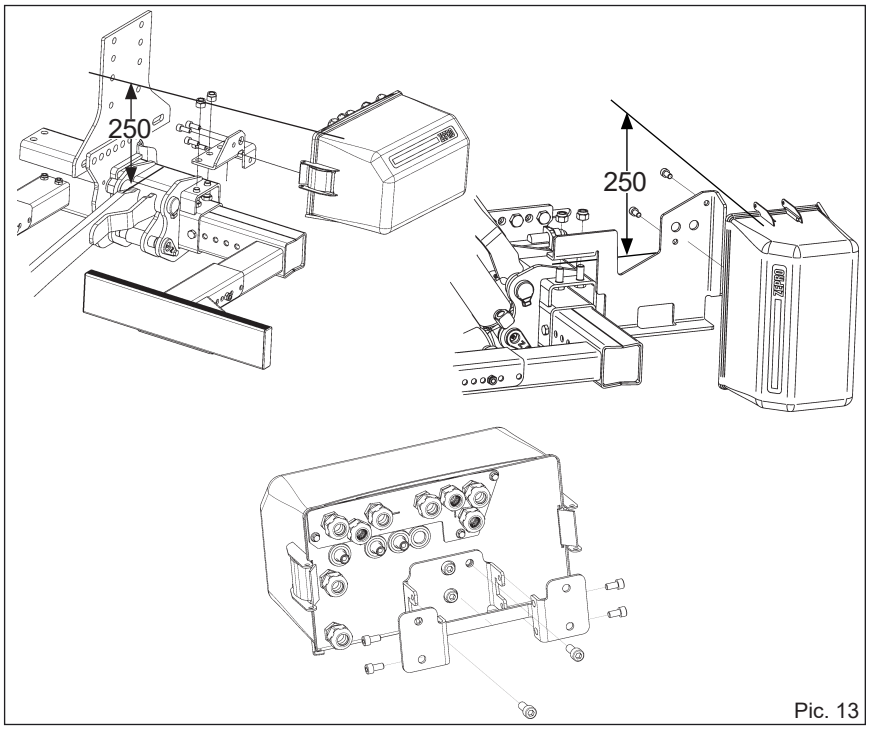
On standard lifts the hydraulic power unit and the hydraulic hoses are already mounted.
If the hydraulic power unit is not premounted it should be attached at a suitable place.



Pic. 12

Mounting the hydraulic power unit

Install the hydraulic unit on the support frame or alternatively the truck chassis frame as in the diagram.

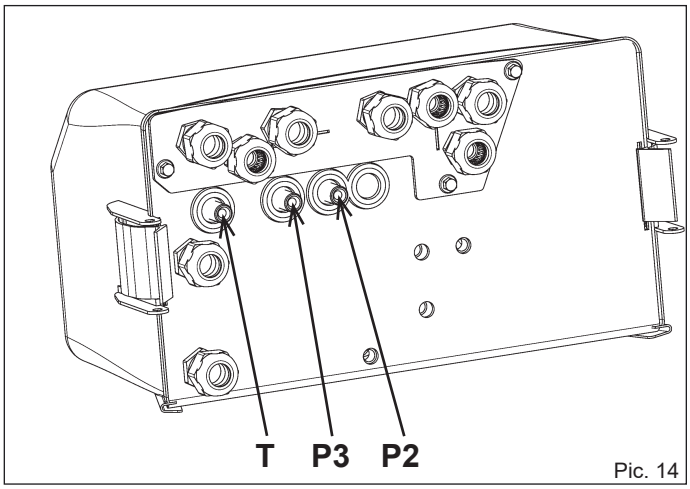


Pic. 13

Connecting the hydraulic hoses

Attach the hydraulic hoses.

P2 = Lift circuit
P3 = Tilt circuit
T = Tank/Return

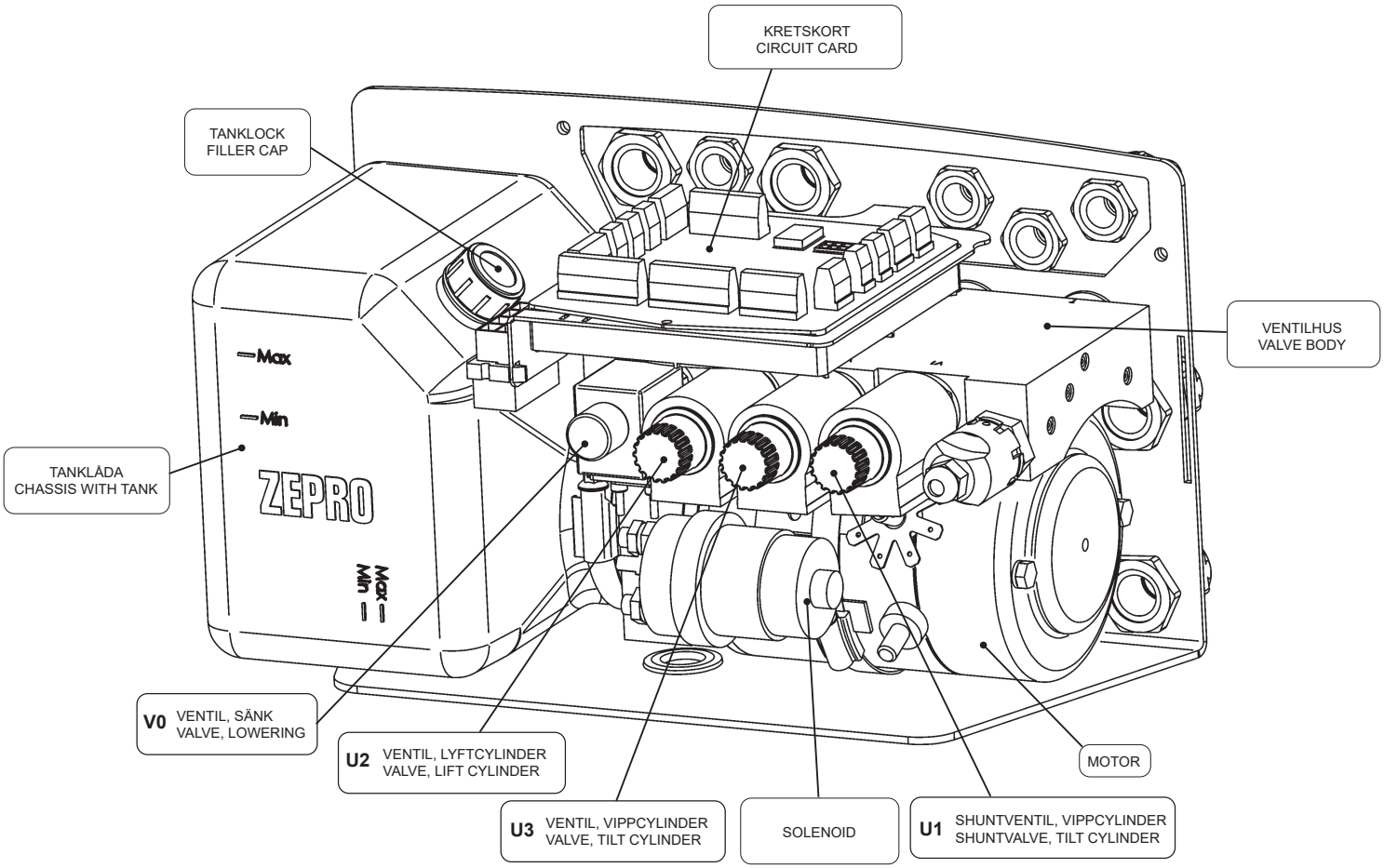


Pic. 14

Hydraulic unit with circuit card, components

Electric and hydraulic diagram, see section 17.3

Connection Unit, see section 17.4



Pic. 15

7. Electrical installation

Also refer to the truck manufacturer´s electrical instructions.

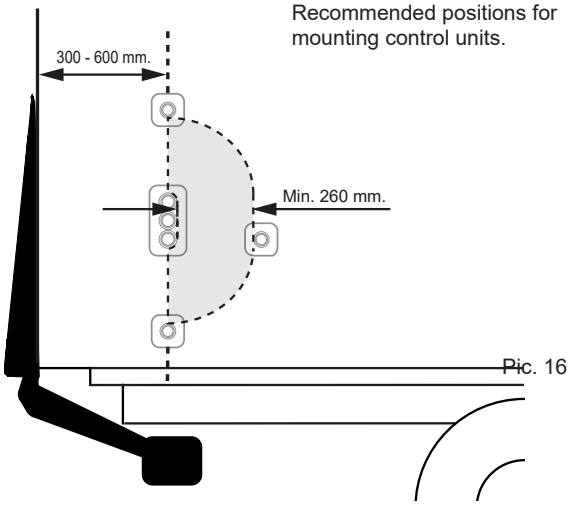
1. Mounting control units

Install control units at suitable places, but the position of the control unit should ensure that the operator has a good view of the load, the working area and the loading area, whilst maintaining a safe distance from the risk zone between the platform and the body.

If you must lead a spiral cable up through the floor you must protect it with a sheath.

Fixed control units are normally electrically heated. The heating cable must be well earthed. Note that 12V (black) and 24 V (red) have different heating cables.

Note that all cables must be connected from below so that water can't get into the control units but condensation can drain out.



Recommended positions for mounting control units.

Pic. 16

2. Cable installation, control unit

Control unit

Connect the control unit's cable to the control card. See el. & hyd. drawings on pages 36-38.

Control power cable

Route the control power cable from the vehicle cab. Connect it via control power switch/CS* on the vehicle's instrument panel (should be accessed from the ground if possible). Connect via 10A / 15A fuse according the customer's wishes to the vehicle's electrical system.

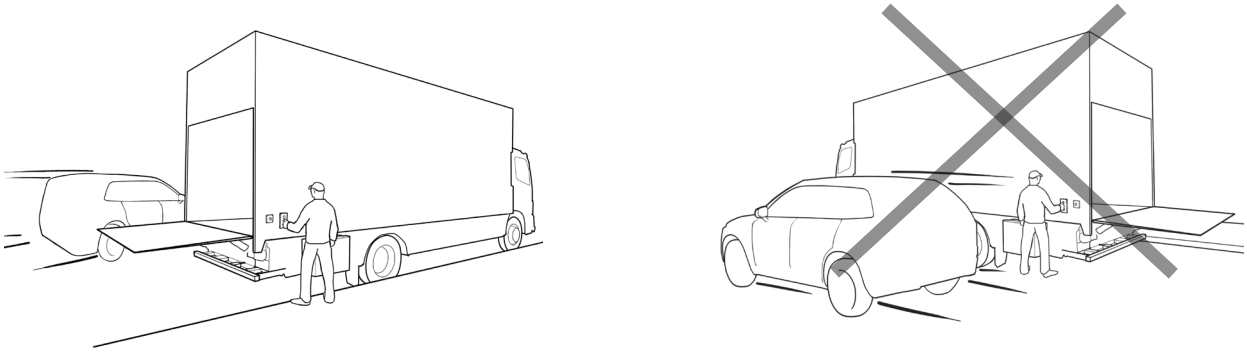
* control power switch/CS is not provided by Zepro.

Spiral cable control unit

If electric heating of the spiral cable control unit is required, a 5-core cable (part no. 21303) may be ordered. Here the blue conductor is used for earthing. (The white conductor is greyish in this cable.)
Note that the cord control unit must have a mount (part no. 20302) in order to be securely attached.
The control current cable; 10A / 15A fuse between the current source and the switch.

⚠ WARNING!

A controller must always be fitted on the side that is facing away from traffic in motion. If there is a need for a controller on the opposite side, a further controller must therefore be fitted. Fitting on the other side involves increased risk of injury.



Installing control device

7. Electrical installation

Main power cable
Cable routing

1. Route the main power cable from the lift to the battery. Route the cable through a plastic casing and ensure it is not clamped to the brake line or the vehicle's existing electrical system.

NOTE!

The cable must not be clamped to brake lines or the normal on-board electrical system.

The cable must be protected by rubber grommets when it passes through beams or walls.

The cable must be installed sufficiently far from, or be protected against, sharp edges so that it cannot chafe or otherwise sustain damage that can lead to a short circuit and cable fires.

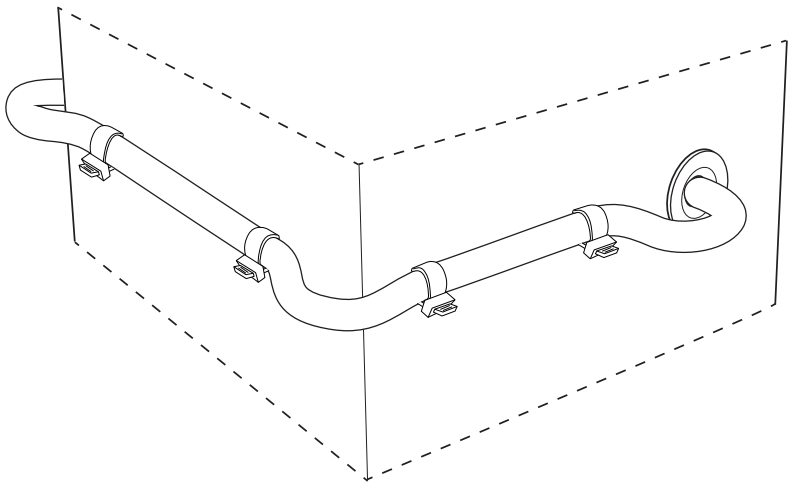
Do not bend the cable with too small a radius as this can cause damage to the cable.

In general, care must be taken when routing all the cables in order to obtain a longer cable service life and to reduce the risk of unnecessary stoppages.

NOTE.

The fuse box must be located in a well protected position as close to the battery as possible.

2. Check that the hydraulic unit is effectively earthed. Certain commercial vehicle manufacturers provide special earth connection points.
3. Connect the main power cable to the hydraulic unit, see pages 40-44.



Protect the cable against sharp edges and use cable grommets

7. Electrical installation

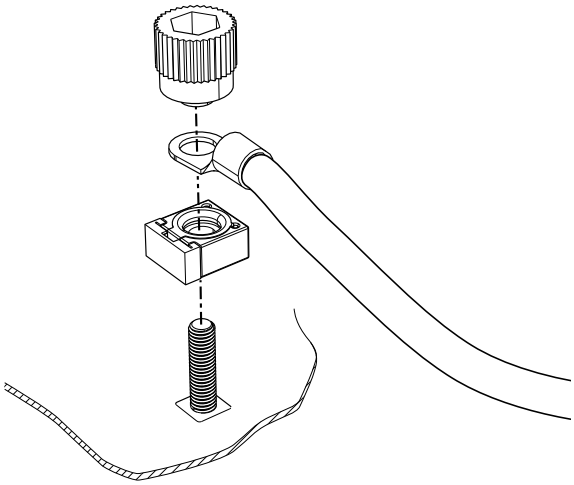
Installation of main fuse on vehicles with M8 connection point (+)

When installing the main power cable, the fuse, 150A (24V) or 250 (12V), must be installed on the vehicle's connection point (+). This is to protect the electrical system from damage and risk of fire in the event of a short circuit.

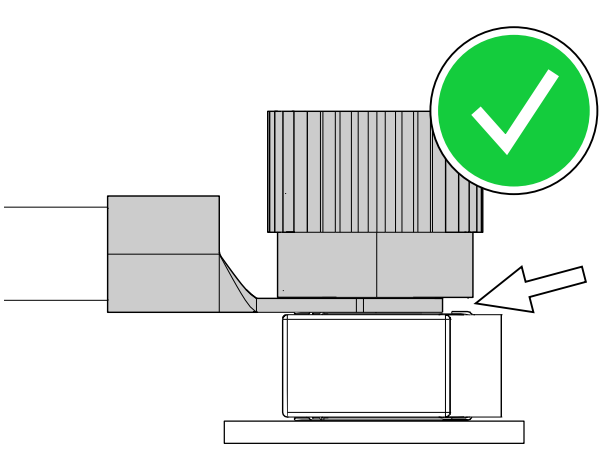
1. Place the fuse on the connection point and connect the main power cable.
   The following image showing the connection point is an example and may vary from vehicle to vehicle.
2. Secure the fuse and main power cable with the knob.

WARNING!

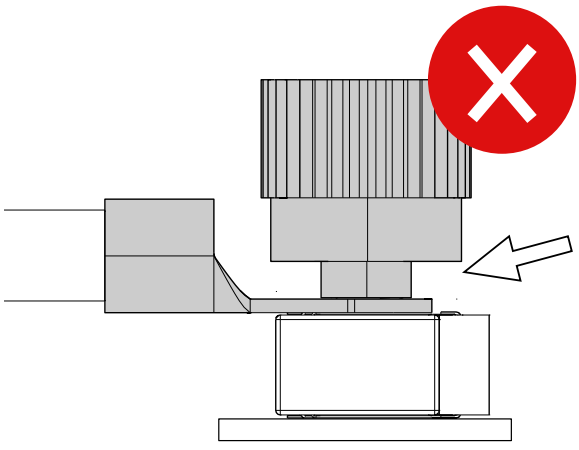
The knob must lie against and centre the cable clip so that it does not come into contact with the bolt. Incorrect installation can cause the fuse to malfunction. Risk of fire in the event of a short circuit, see image below.



Install fuse and connect main current cable



Correct installation



Incorrect installation

7. Electrical installation

Installation of main fuse on vehicles without connection point

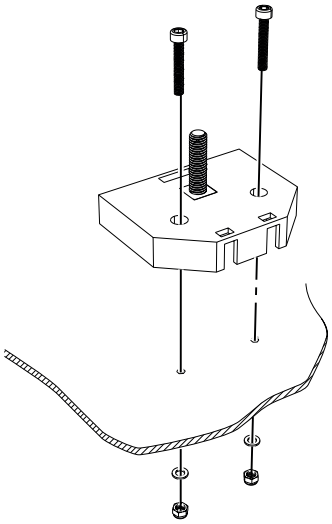
On vehicles without connection point, the following fuse box with fuse, 150A (24V) or 250A (12V) must be installed. The fuse box must be positioned well-protected as close to the battery as possible.

1. Screw the fuse box into position with the following bolts (2 x M4x25) + washers and nuts.
2. Connect the main power cable to the connection point and place the fuse on top.
3. Connect a cable from the battery's positive terminal.
4. Screw the cable connections and fuse into place with the knob. Install the cables at 90° or 180° from each other. Install the fuse at right angles to the cables.

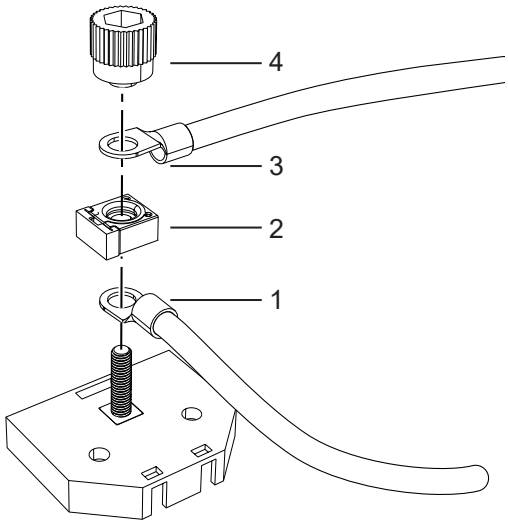
WARNING!

The knob must lie against and centre the cable clip so that it does not come into contact with the bolt. Incorrect installation can cause the fuse to malfunction. Risk of fire in the event of a short circuit.

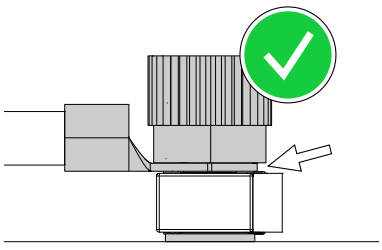
5. Install the fuse box cover.



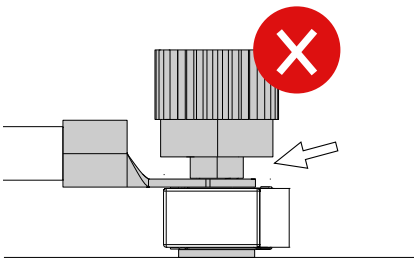
Screw the fuse holder into place



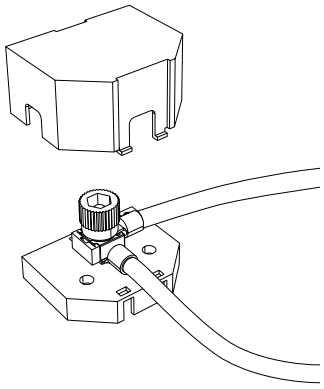
Place fuse and connect wiring



Correct installation



Incorrect installation

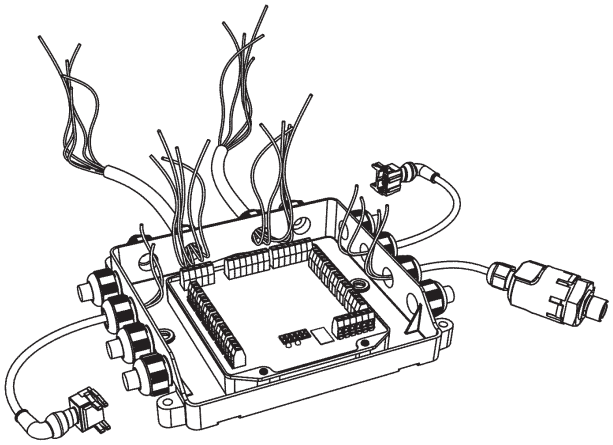


Cover fuse box

7. Electrical installation

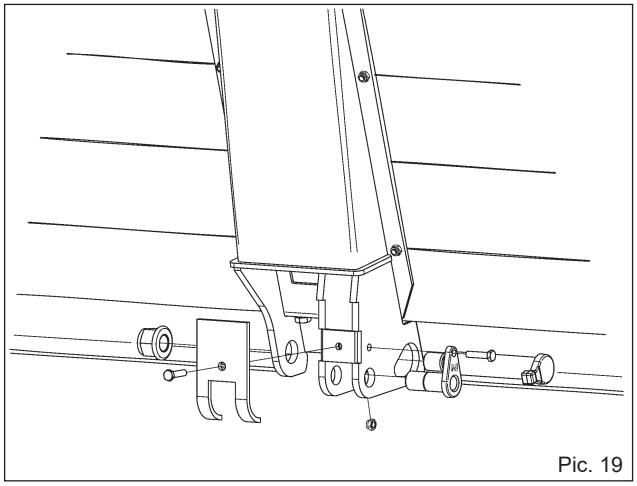
Connection of non-original components on zepro tail lifts

It has always been forbidden to connect foreign equipment (both electric and hydraulic) on all Zepro tail lifts. Using non-original components can affect tail lift safety. If it's really important for you to make such installations please check with the vehicle manufacturers installation instructions and use the trucks capabilities.



1. Attaching the Platform

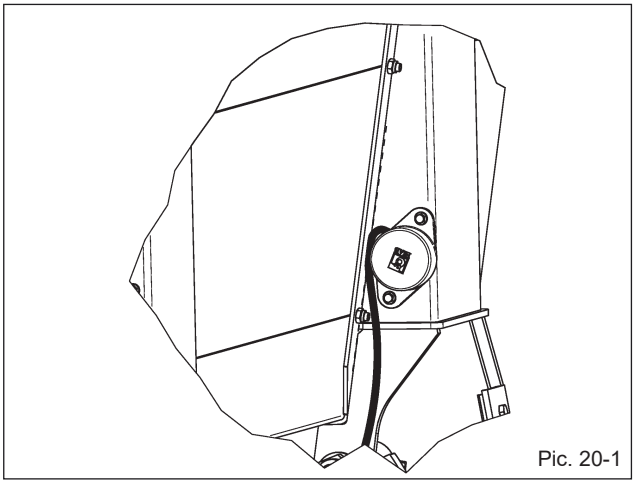
Install the platform on the lift arms and the tilt cylinders according to pictures. Use the pivot bolts and locking screws supplied.



Pic. 19

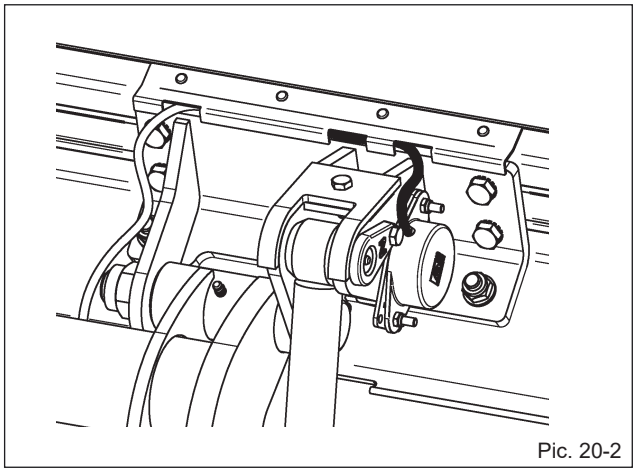
NOTE! To get the full opening speed a tilt angle sensor should be installed according to the pictures. Note! It's is important that the cable is turned in the right direction according to pictures.

Flat 30mm platform:
Place the angle sensor on the inside of platform bracket, pic. 20-1.



Pic. 20-1

Conical platform
Place the angle sensor on the outside of platform bracket, pic. 20-2.

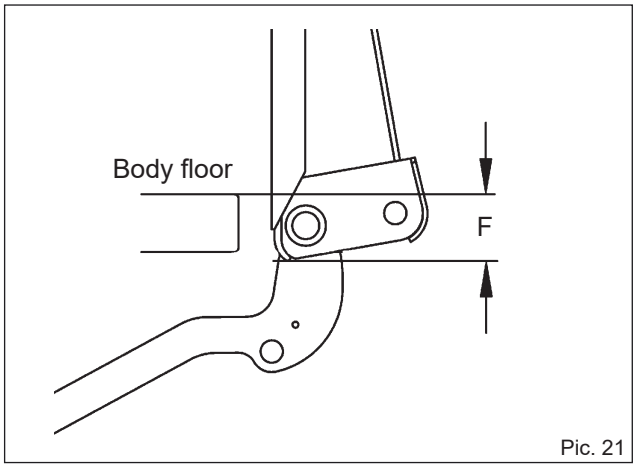


Pic. 20-2

The platforms overlap (F) is dependent on the type of platform. Please note the values below which are particularly relevant when installing a rubber seal on the body at the top of the platform.

Type	Flat 30 mm	Conical
F (mm)	74	76,5

When the platform is installed you should test to run the lift carefully. Check the platform position at the rear frame.



Pic. 21

8. Mounting, platform and sealing system

2. Mounting sealing system

Check the space between body floor and platform. The space should be 38 - 40 mm.

Sealing system (horizontal)

Install the horizontal aluminium or steel guide bar. Self-tapping screws delivered. Drill 7.2mm holes. Mitre the rubber against the side seal.

Sealing system (vertical)

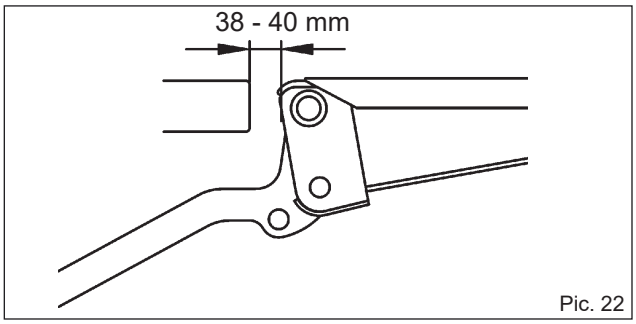
Install the profiles for the vertical sealing strips. Note the position of the lock ears.

The profiles can be fastened with screws, rivets or welding. The rubber strips are installed after the lock ears.

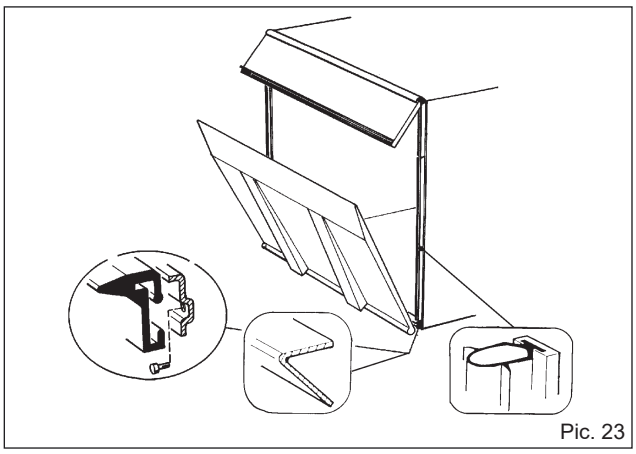
The rubber strips are locked by pressing the rails together.

If upper seal must be installed you must mitre 45 degrees to the vertical profiles for a good fit.

Test run the lift carefully and control its position in relation the to horizontal guide bar. Test run and check. Raise the platform carefully to vertical position Check the fit against the horizontal guide bar.



Pic. 22


Pic. 23

For trucks with mounting brackets, see separate installation instructions. See list, section 3.

3. Mounting armstops

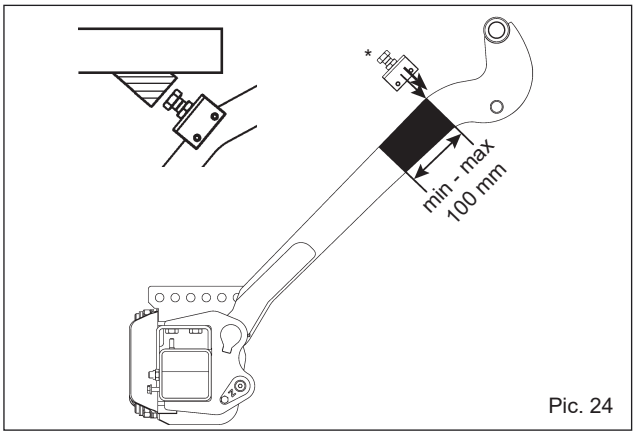
Mount armstop* as high as possible on the lift arms, in the position that the adjustment-screws get a good surface contact with the truck's rear frame.
If necessary install a stop bar to make a better contact point for the armstop.

Adjust the two screws so they meet the rear frame/ stop bar at the same time.

If the truck has a mounting bracket kit, see the separate instructions for this kit regarding the armstop installation.

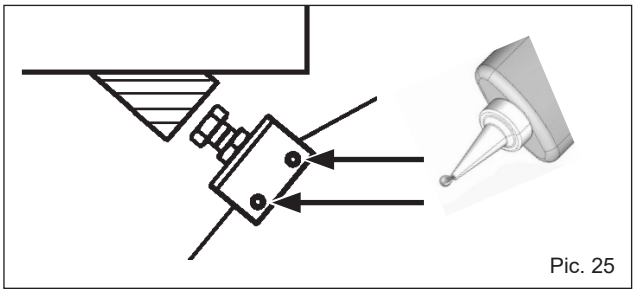
NOTE! When installing armstops, add Loctite 243, or similar, on the fastening screws. See Pic. 25.

NOTE! No welding is allowed on the lift arm.



Pic. 24

*the armstop is an optional extra-if required please order art. nr. 53869 for Z 100 models


Pic. 25

Transport lock
For CE marked lifts with 1000 kg max lifting capacity and over, ZEPRO provides platforms without transport lock. For other lifts transport locks are installed on the platforms right side.

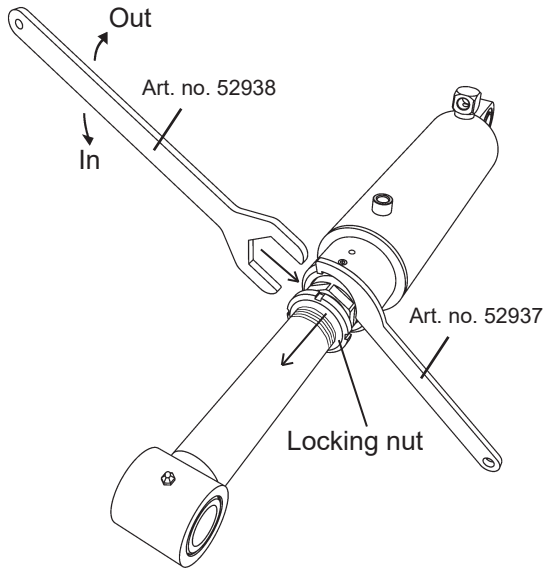
Electric safety valves can serve as transport locks for platforms. The lock opens automatically when the down function of the control unit is activated. The valves are one-way valves which allow oil to flow into the cylinders but not out from them unless current has been supplied to them via the lowering valves.
The platform is hence hydraulically locked under transport.

9. Tilt cylinders, adjustment

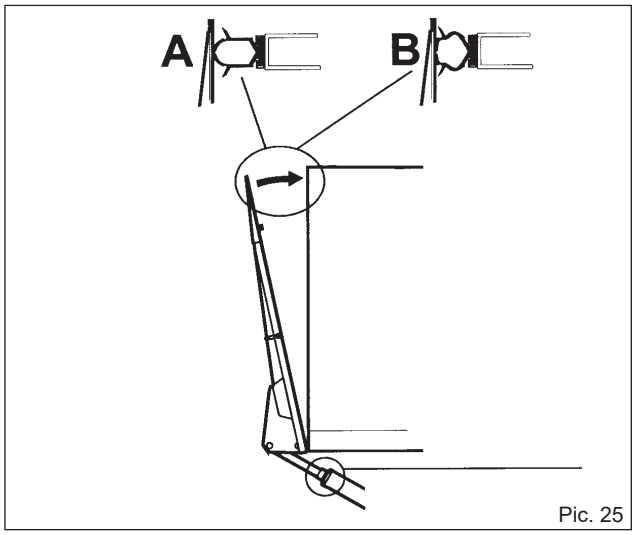
Adjustment 90º tilt angle up against the body

NB. Do not adjust the tilt cylinders before they are installed onto the platform. Tilt cylinders are pre-adjusted at the factory.

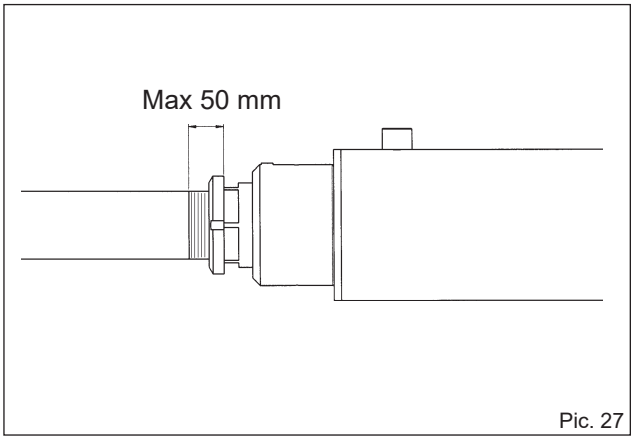
1. Loosen rubber bellows.
2. Assemble only one tilt cylinder in the platform.
3. Tilt up so that the tilt cylinders are extended as far as the geometry allows. NB. Adjustment should always be made when the tilt cylinders are fully pressurized.
4. Firstly adjust the cylinder assembled in the platform.
5. Loosen lock nut, **see pict 26** (Zepro tool 52937)**.**
6. Turn the adjustment collar (spanner width 41mm), as per pict 26 (Zepro tool 52938), so that the platform fits exactly to the body as per pict 25A.
7. Assemble the other cylinder in the platform.
8. Loosen lock nut, **see pict 26.**
9. Turn the adjustment collar, as per pict 26, so that the platform fits exactly to the body as per pict 25A.
10. Then adjust both cylinders the last bit alternately so that the platform fits exactly to the body as per pict 25 B.
11. Tighten the lock screws. Measure as per in pict 27. NB. Max. 50 mm between the end of the thread and the lock nut. Lock screws torque is between 3-5 Nm.



Pic. 26

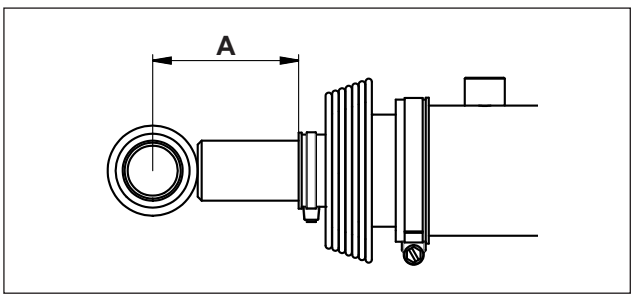


Pic. 25



Pic. 27

Lift model	A
Z 100-110	149 ±5
Z 100-130	269 ±5



9. Tilt cylinders, adjustment

Adjustment of tilt down angle.

NOTE! To have the taillift to comply with CE requirements and be safe, it is required that tilt down angle is adjusted to a maximum of 10º.
NOTE! It is necessary to first adjustment the 90º tilt angle up against the body before adjusting tilt down angle.

1. Run the lift up so that the lift is at the floor level, see pict 28.

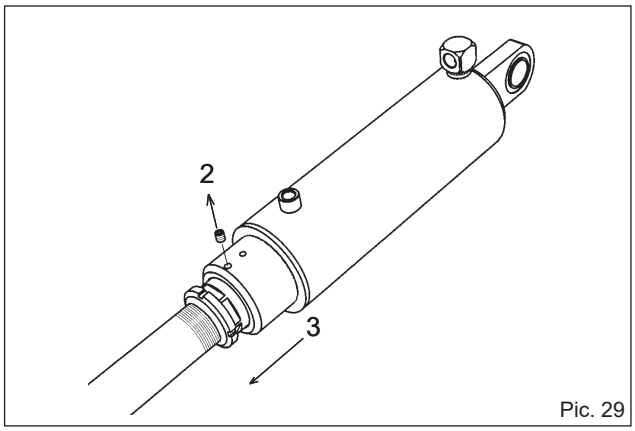
2. Loosen the ring's lock screw (2). Screw the ring out in the direction of the platform (3). See pict 29.

3. Tilt down the platform to maximum 10 degrees under horizontal. As per pict 28.

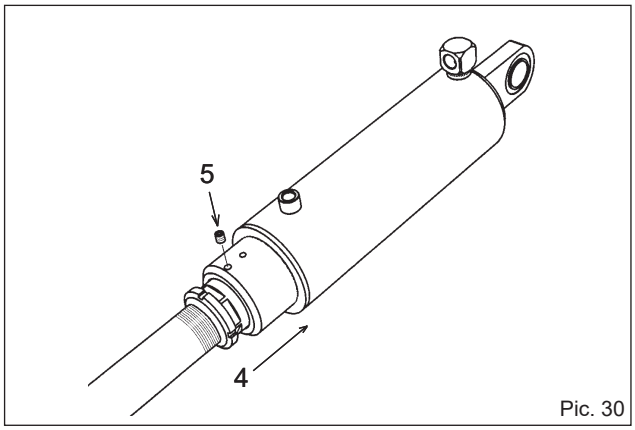
4. Adjust the ring to the top of the cylinder (4).

5. Tighten the lock screw in the ring (5). See pict 30.

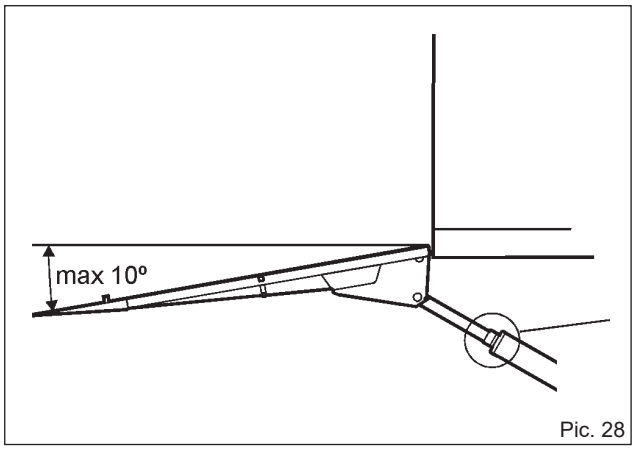
Reassemble rubber bellows.
Lock screws torque is between 3-5 Nm.
Note! Both cylinders tilt down angle must be adjusted equally, otherwise there is the risk that the cylinders will break.
Test run all functions.



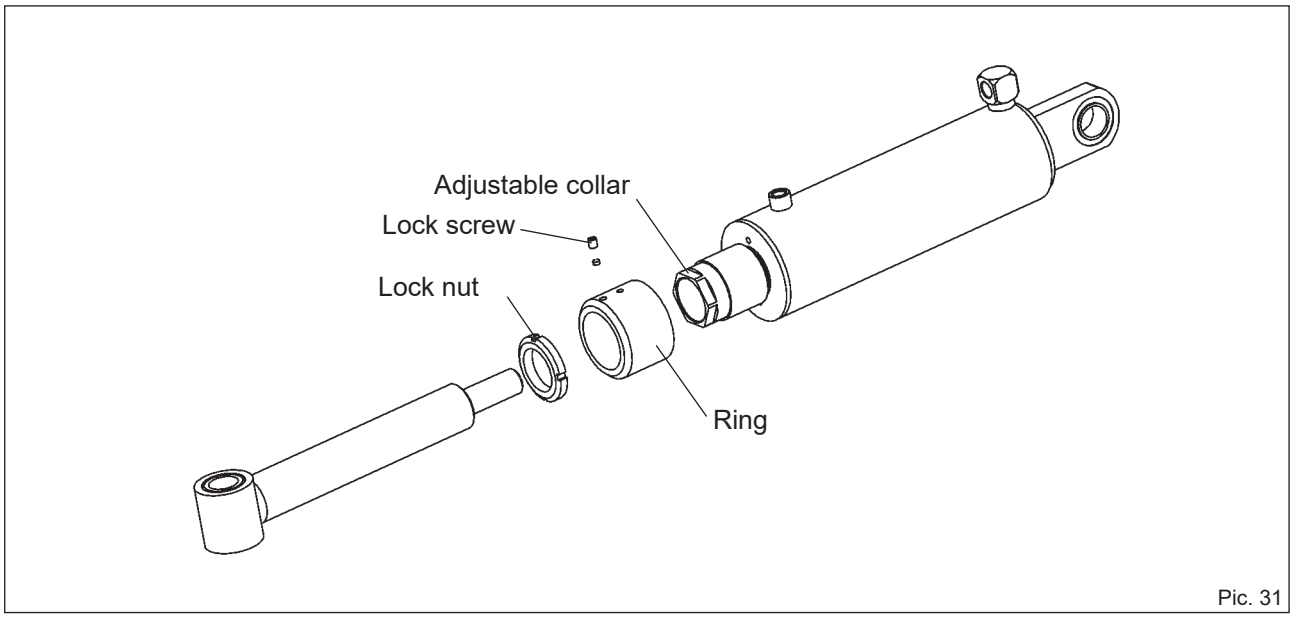
Pic. 29



Pic. 30



Pic. 28



Pic. 31

9. Mounting cylinders, adjustment, other

Bleeding the cylinders
For all lift cylinder models.
Fully lower the platform a few times. You may have to lift the truck (eg. hang over a kerb) to fully lower the platform.

Concerning tilt cylinder models
Tilt cylinders can be purged of air by closing the platform up against the vehicle body and then opening and tilting all the way down.

Mounting 3-part bumper bar

NOTE!

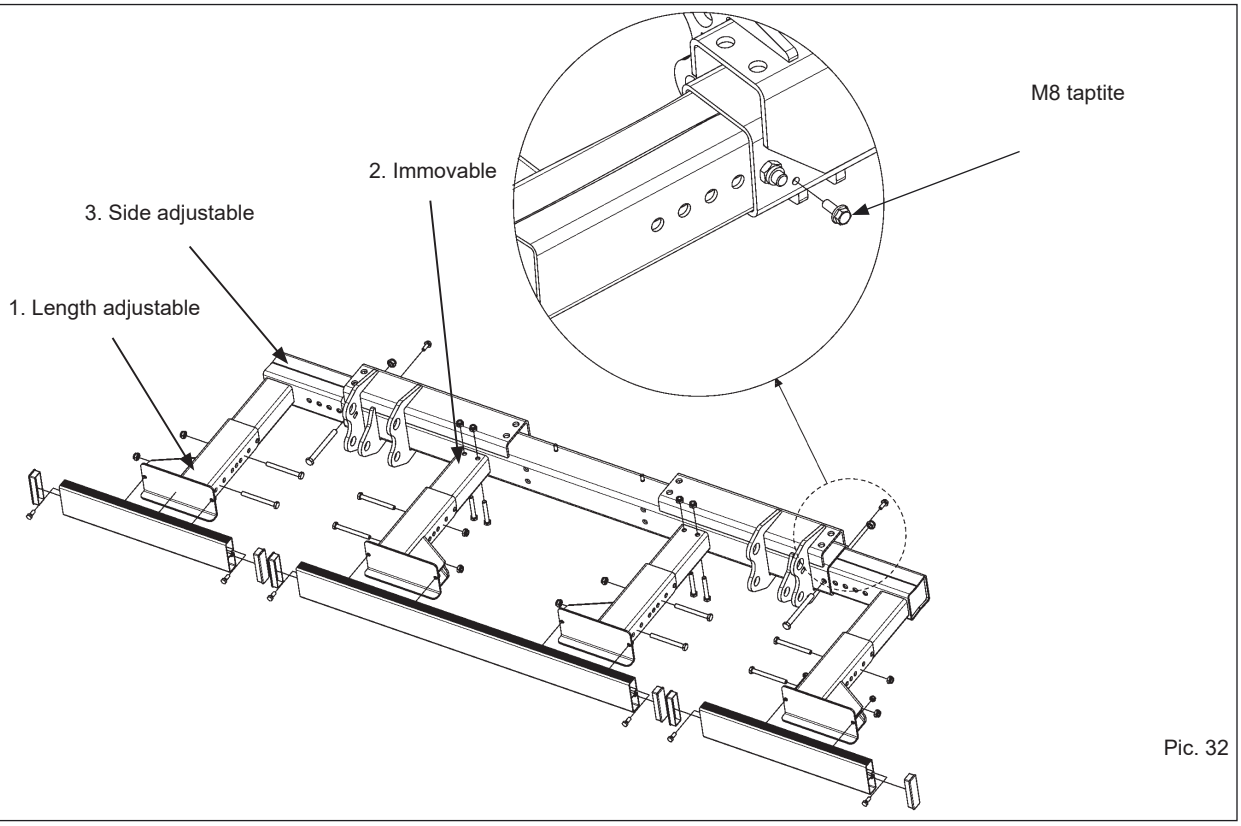
If the vehicle is less than 2200 mm wide, the ordinary outer sections of the bumper bar are replaced by special sections for vehicles with smaller width. Contact Zepro for more information.

The bumper bar contains four length adjustable (1) brackets, two side adjustable (3), two immovable (2) brackets and three aluminium profiles.

Mount the bumper bar according to the pictures.

Check that it is positioned within approved dimensions. Max 550 mm between bar and ground when the vehicle is unloaded (650 mm for uplifted bogey). Max 232 mm horizontal distance from axis through centre point of platform bolts to bar. See pictures page 23.

The lateral distance between bumper bar and moving parts of the tail lift must not exceed 25 mm. The bumper bar must, in each case, have an effective surface area of at least 350cm^2, see picture.

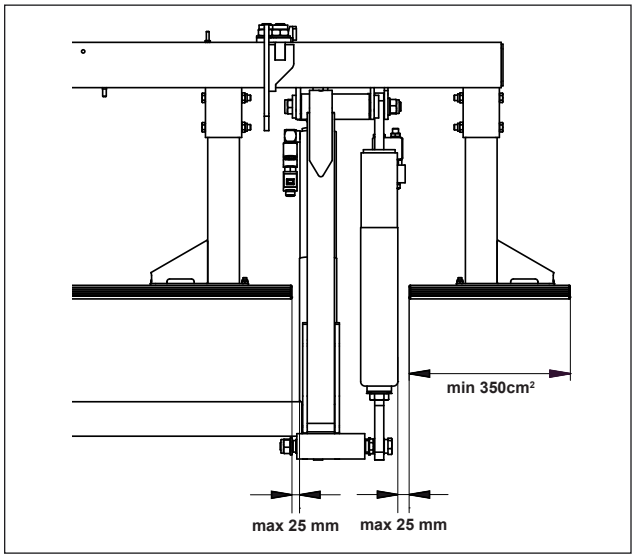


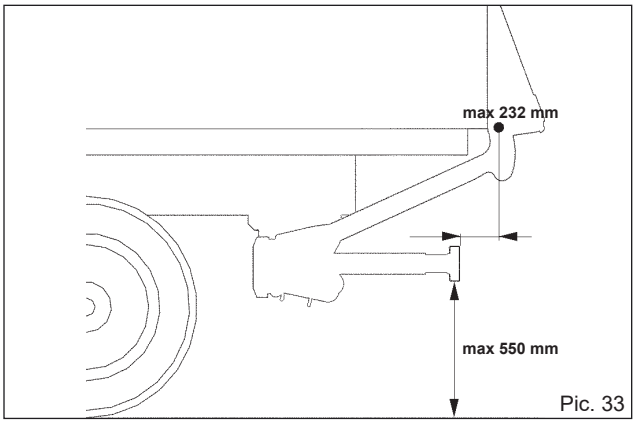
Pic. 32

Mount each length adjustable bracket with two bolts M10x100 (8.8), each immovable bracket with two bolts M10x70 (8.8) and each side adjustable bracket with two different bolts one M12x120 and one M8 taptite (8.8) see pic. above. The taptite M8 bolt is used in order to freeze the side adjustable brackets. Tighten M10 bolts to 50 Nm, M12 bolts to 70 Nm and taptite M8 20 Nm

10. Mounting, other

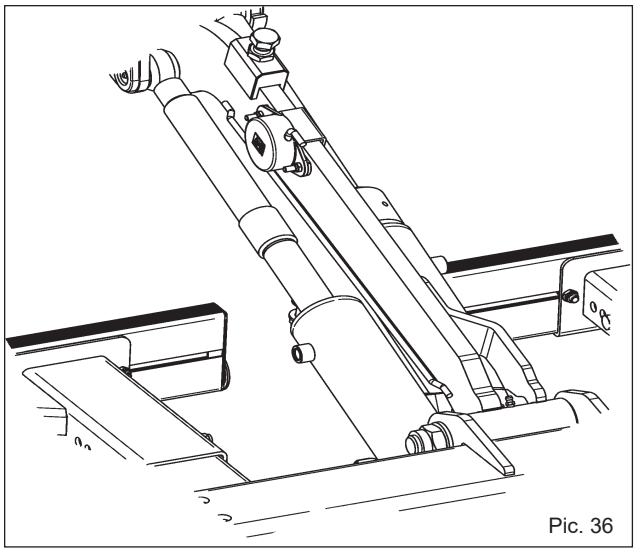
Mount the aluminium profiles with 2 bolts M8x20 (8.8) each, tighten to 25 Nm. Put the bolt heads into the aluminium profile, and then position the profiles onto the brackets.





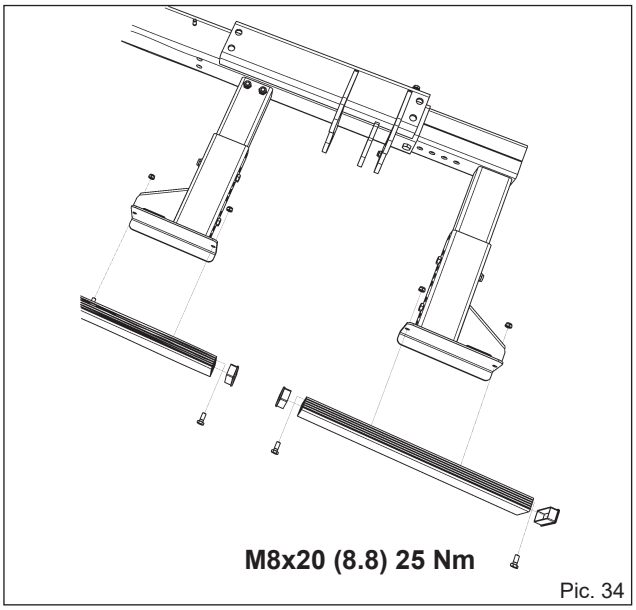
Pic. 33

Standard, bumper bar

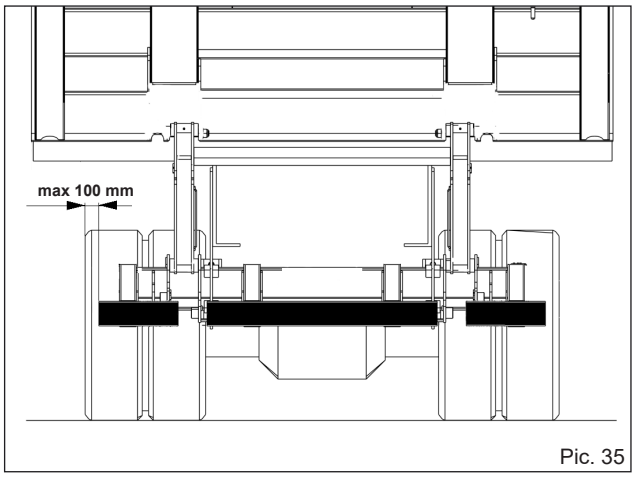


Pic. 36

If the tail lift is equipped with auto tilt must an angle switch be installed at the lift arm.



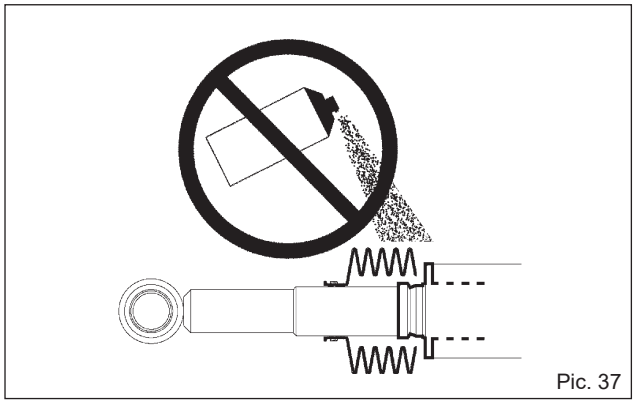
Pic. 34



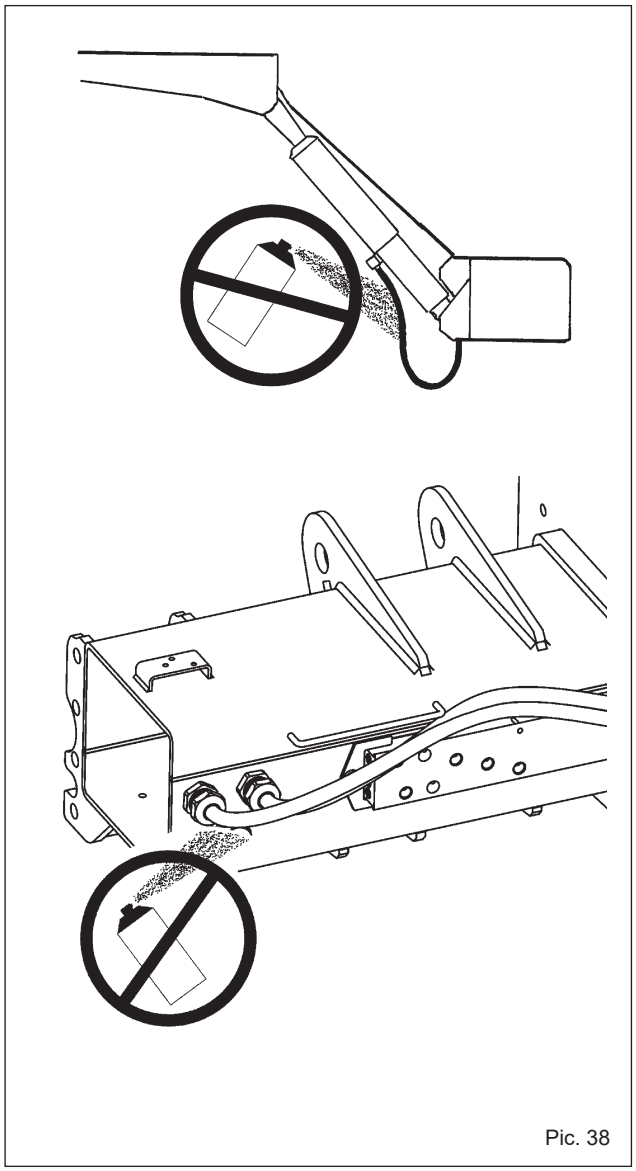
Pic. 35

11. Important information

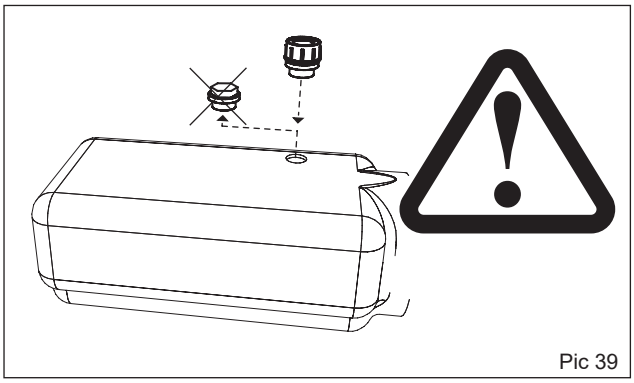
Repainting
NB. If the cylinders are to be repainted, ensure that the cylinder push rod and cover are not painted (this can damage the seals/gaskets). This also applies to rubber bellows if they exists!


Pic. 37

Hydraulic hoses or cables must not be painted, the paint's solvent can damage the hose's/cables rubber compound and can adversely affect durability

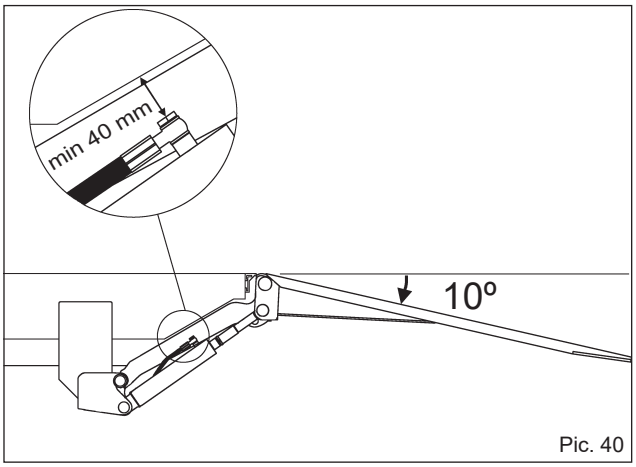

Pic. 38

Replace the transport plug
During installation the oil tank transport plug should be removed and replaced


Pic 39

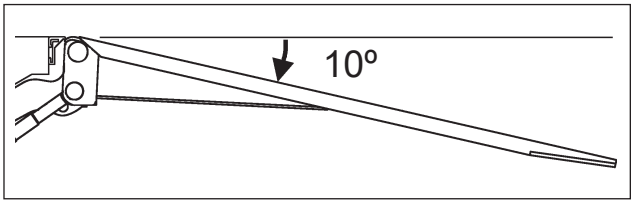
Moveable parts - free movement
When the final post-installation testing is carried out, it is important that there is sufficient clearance between the cylinders working envelopes and all fixed points. During lift operation and cylinder movement there is a risk for conflict with the sub frame, truck frame, number plate, lamp holders and even the mounting brackets when the overhang is very limited (due to lift arm angle). Hence it is important to thoroughly check all of these points on both sides.

The final test is performed with the platform at floor height tilted down 10° from the horizontal. The cylinders must have a minimum clearance of 40 mm to all fixed points from this position.



Pic. 40

Note! The platform must not be tilted down more than max 10° below the horizontal.



12. Markings, decals

The name plate is installed on the support frame of the tail lift and contains the following information:

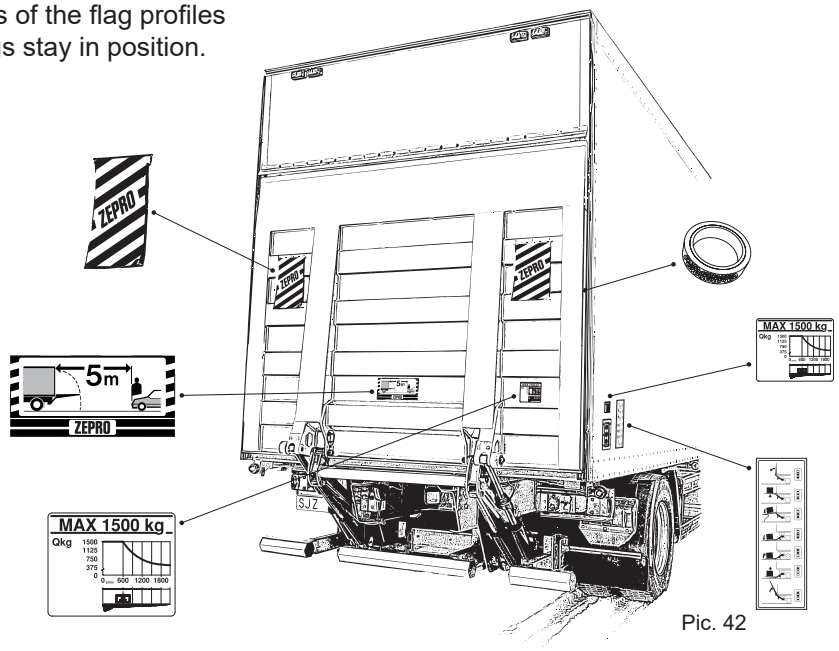
-Lift type
-Maximum permitted load in kg
-Serial number
-Year of manufacture
-Address and tel. no. of the manufacturer
-Country of manufacture
-ECE type no. for bumper bar certificate (RUPD) and EMC

Pic. 41

There is also a similar name plate in the form of a decal which is to be affixed to the cabin's door frame to ensure correct product identification.

Install the warning flags with reflecting strips, as close to the top and to the side of the platform as possible, however, ensure that the flags will not detach when the platform reaches the ground. Crimp the ends of the flag profiles so that the flags stay in position.

We suggest that you stick the yellow/black warning tape along the side edge of the platform to make it more clearly visible when in the horizontal position.



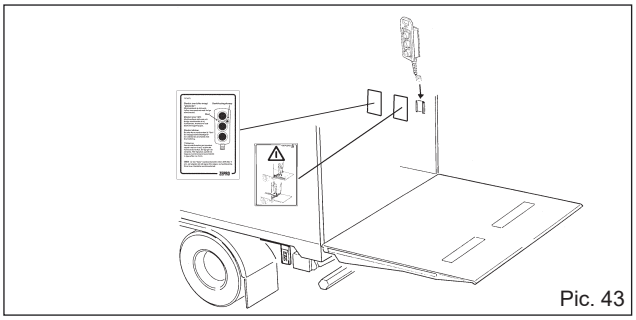
Pic. 42

A "danger area" decal is also to be placed on the platform warning drivers who are parking cars behind the vehicle that 5m are necessary to allow for platform opening and sufficient manoeuvring space for loading and unloading goods.

The loading diagram plates should be placed near the control unit and in a clearly visible position on the platform. The plate clearly indicates the nominal loading and the diagram shows the maximum permitted loading at different positions on the platform.

An operating instructions decal should be placed next to the main control unit.

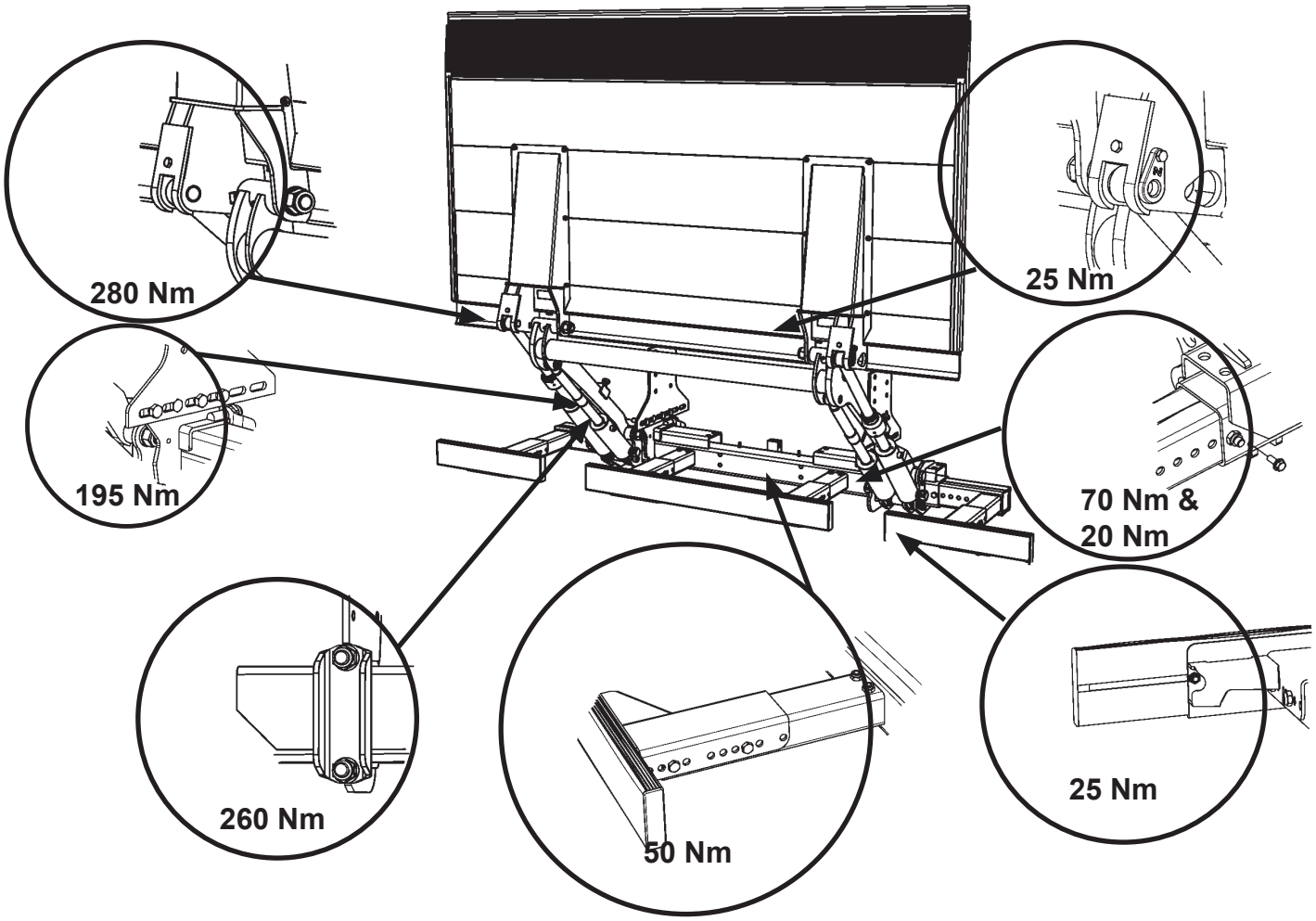
A danger zone decal, warning of the danger area between the platform and the vehicle bed is to be affixed on the inside of the vehicle body near to the spiral cable control, if installed.



Pic. 43

13. Torque values

NOTE! All specified torque values apply for use with a screw or impact wrench with torque control. Torque distribution max ± 5%.

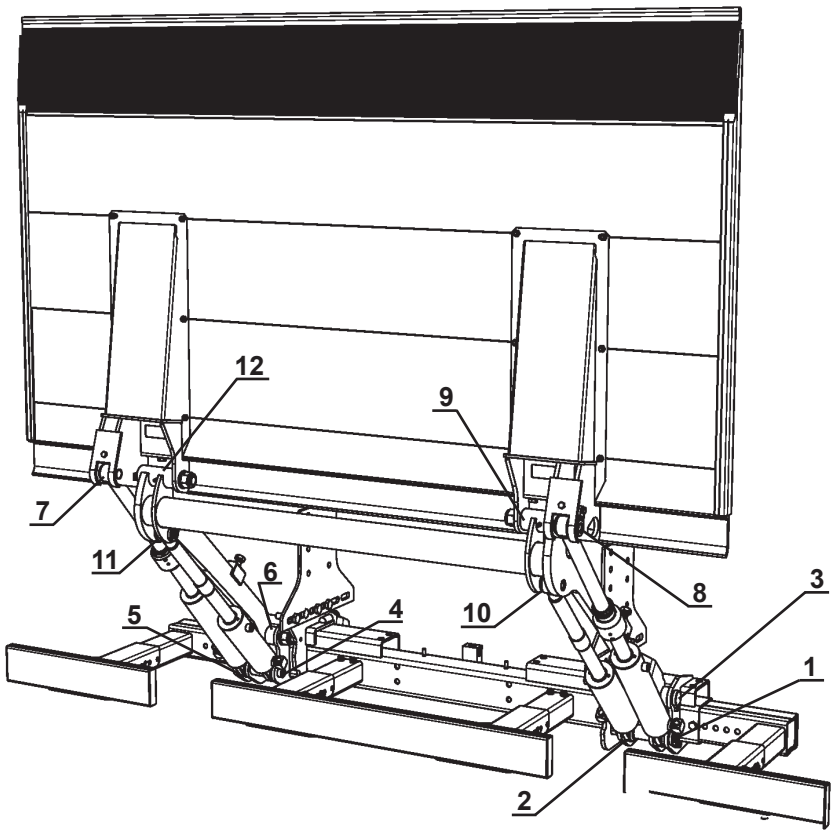


14. Maintenance, lubrication chart

Grease all bearings and platform locks with LE lubricant 4622 or equivalent.

Greasing at least 8 times / year

1. Right tilt cylinder, lower bearing.
2. Right lift cylinder, lower bearing.
3. Lift arm right side, lower bearing.
4. Left liftc ylinder, lower bearing.
5. Left tilt cylinder, lower bearing.
6. Lift arm left side, lower bearing.
7. Left tilt cylinder, upper bearing.
8. Right tilt cylinder, upper bearing.
9. Lift arm right side, upper bearing.
10. Right lift cylinder, upper bearing.
11. Left lift cylinder, upper bearing.
12. Lift arm left side, upper bearing.



The hydraulic unit tank is filled with a mineral based hydraulic oil (art.no 21963 for 1 litre.) or a biodegradable synthetic oil (art.no 22235 for 1 litre). There is a sticker on the hydraulic unit indicating which type of oil is in the tank.

15. Load testing the tail lift

Testing and verification of the tail lift.
Carried out in accordance with the installation instruction and delivery check list.

Check that the tail lift chosen corresponds to the vehicle and to its foreseen use.

Static loading test
To be carried out when installation is complete.
Deformation
Position the tail lift with the platform horizontal about half way between the ground and the vehicle floor. Measure the distances A,B,C,D as shown in the diagram. Place a test load on the platform according to the table (for the corresponding tail lift model and loading capacity). Remove the load from the platform. Repeat the measurements of A,B,C,D and check that there is no permanent deformation to the tail lift or its brackets.

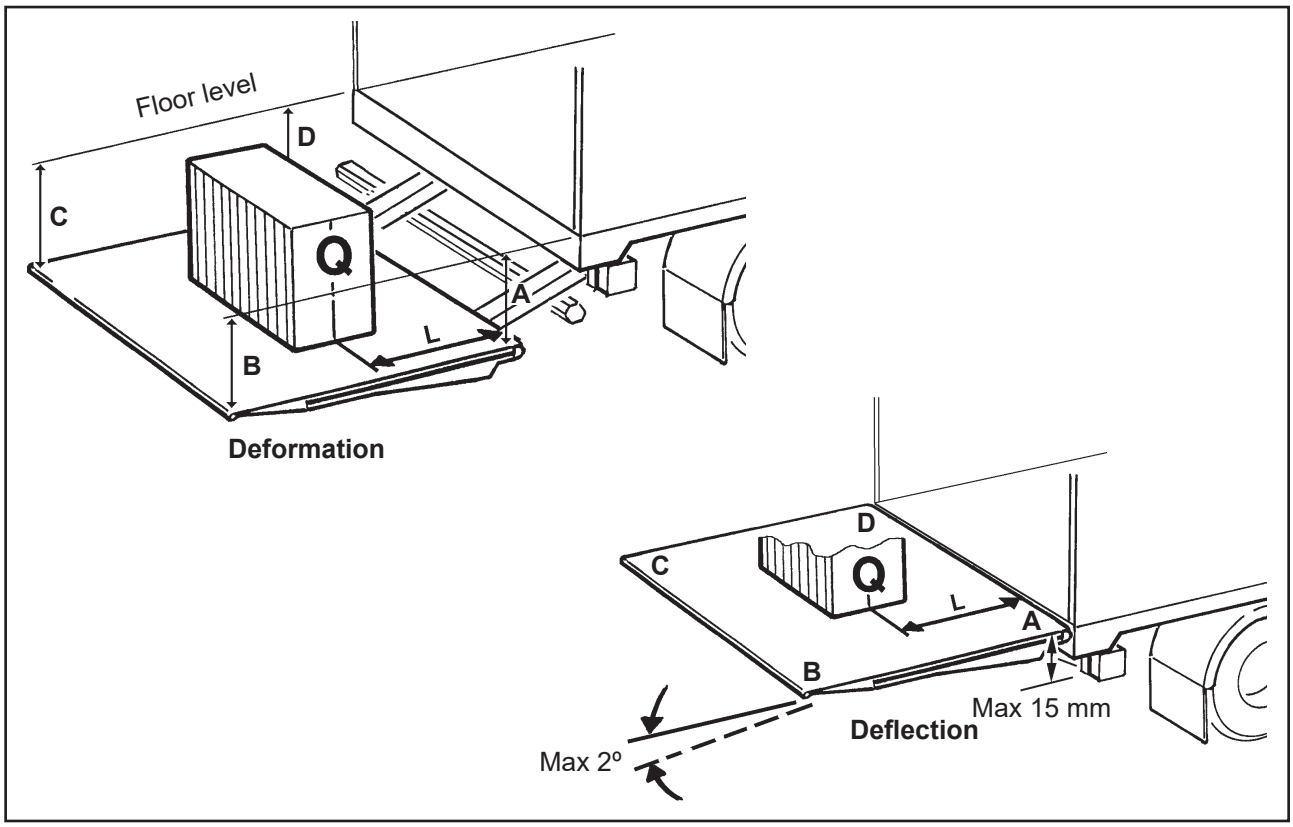
Deflection
Place a test load on the platform according to the table (for the corresponding tail lift model and loading capacity). The tail lift should be in the same level and angle as floor. Leave the test load on the platform for 15 minutes. Check that the platform´s deflection is not more than 15mm vertically (point A and D) and that it is not more than 2º in angular deflection (point B and C), in relation to floor level.

Static loading (Test load 1,25 x tail lift loading capacity). For tail lifts with load centre of 600 mm

Capacity	Load 500 kg	Load 1000 kg
	Distance out in platform (L)	
450 kg	(450 kg) 675 mm	-
500 kg	750 mm	-
700 kg	1050 mm	-
750 kg	1125 mm	-
1000 kg	1450 mm	750 mm
1500 kg	2250 mm	1125 mm
2000 kg	-	1550 mm
2500 kg	-	1875 mm

Static loading (Test load 1,25 x tail lift loading capacity). For tail lifts with load centre of 750 mm

Capacity	Load 1000 kg	Load 1500 kg
	Distance out in platform (L)	
1000 kg	940 mm	-
1500 kg	1410 mm	940 mm
2000 kg	1875 mm	1250 mm
2500 kg	2340 mm	1560 mm



15. Load testing the tail lift

Dynamic load testing
Test with nominal load
Place a test load on the platform according to the table for the respective tail lift model and lifting capacity. Check that the tail lift operates correct in the normal range of movement allowed ie. up, down, tilting at the ground level and tilting at the vehicle floor level.

Test with over load.
Place a test load on the platform according to the table for the respective tail lift model and lifting capacity. The test load should be 1,25 x the lift models max load. Check that the tail lift cannot lift this load (it may, however, be possible to operate the tilting movement). Remove the test load from the platform.

Dynamic load (Test load 1,0 x tail lift loading capacity). For tail lifts with load centre of 600 mm

Capacity	Load 500 kg	Load 1000 kg
	Distance out in platform (L)	
450 kg	600 mm	-
500 kg	600 mm	-
700 kg	800 mm	-
750 kg	900 mm	-
1000 kg	1200 mm	600 mm
1500 kg	1800 mm	900 mm
2000 kg	-	1200 mm
2500 kg	-	1500 mm

Dynamic load (Test load 1,0 x tail lift loading capacity). For tail lifts with load centre of 750 mm

Capacity	Load 1000 kg	Load 1500 kg
	Distance out in platform (L)	
1000 kg	750 mm	-
1500 kg	1125 mm	750 mm
2000 kg	1500 mm	1000 mm
2500 kg	1875 mm	1250 mm

Test of safety functions
The tail lifts safety functions must be tested
Check:

- That the red lamp in the vehicle cabin turns off when the platform is completely closed against the body and that it turns on when the platform is opened (where applicable).

- That the tail lift will not operate if the cabin switch is in the off position.

- That the tail lift cannot be operated when the main current fuse is removed (where applicable).

- That the overflow valve is activated when the lift is run up to the floor level or armstops.

- That the tail lift cannot be lowered or tilted down respectively if the electrical connector from the lift and tilt cylinders respectively electric safety valve is removed.

-That the platforms max load marking has been included and is correctly positioned according to the loading diagram for the tail lift model concerned.

- That the warning flags are installed and fulfill their function correctly.

- That all safety and operating stickers are installed in their specified position.

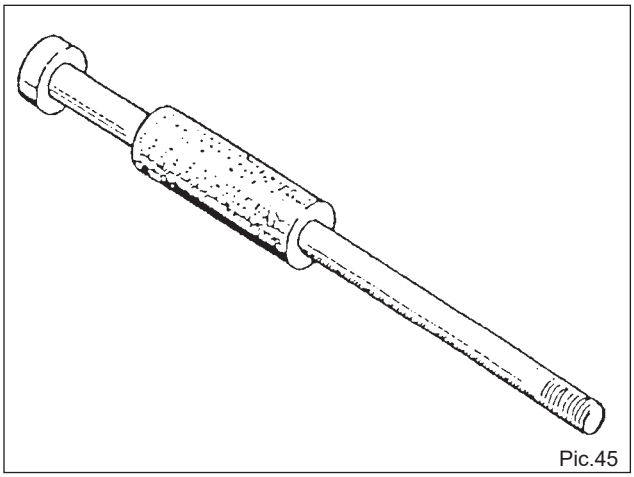
- That the platform´s mechanical lock functions correctly (where applicable).

- That the Operator´s Handbook has been left in the driver´s cabin.

- That the declaration of CE conformity has been filled in (where applicable).

16. Dismantling

1. In the event of dismantling the tail lift from the vehicle, in the case of transferring it to another vehicle, for storage or for modification please follow these instructions.
2. Support the platform by a crane or similar equipment that can safely carry the platform's weight. (NB. weight info).
3. Dismantle the tilt cylinders upper axle in the platform and rest the cylinders on the ground.
4. Run the tilt cylinders to their minimum stroke limit to remove pressure from the circuit.
5. Dismantle the tilt cylinder's lower axle at the support frame. Remove the cylinder and take away the hoses. NB. Oil can leak from the hoses and cylinder.
6. Dismantle the side profiles from the platform. Take away the grease nipples and the lock screws in the platform's axles. Screw the special tool (see diagram) into the axle. Using the sliding weight of the tool, hammer the axle out of the profile. Follow the same procedure for the other side.
Lift away the platform, lower the liftarm to the ground.
7. Unscrew the lift cylinder's upper axle at the lift arm and lower the cylinders to the ground. Take the lift cylinder's lower axle away at the support frame and remove the cylinders completely. Loosen the connected hoses.
8. Unscrew the lift arm's axles at the support frame and take away the lift arm.
9. Support the support frame from its underside with a forklift or similar equipment with sufficient loading capacity. Unscrew all bolts from the mounting brackets.
10. Check that the battery is disconnected. Unscrew the cable from the battery to the tail lift and all the cables and wires between the hydraulic unit and the control unit. Lower the support frame and remove it from the truck chassis.



Pic.45

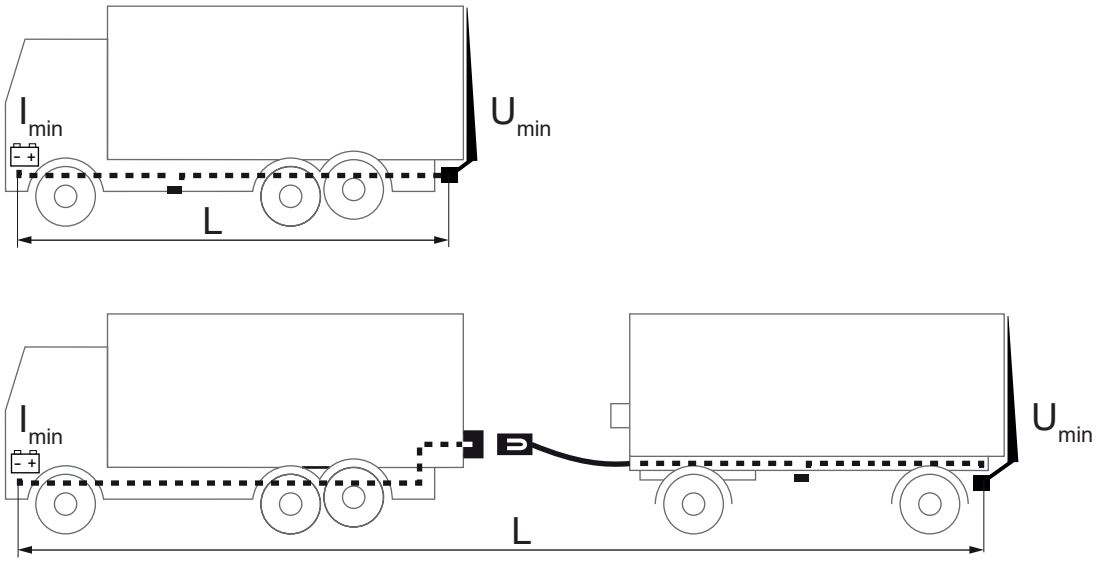
17. Tables, diagrams

17.1 Max power consumption

Max Power Consumption

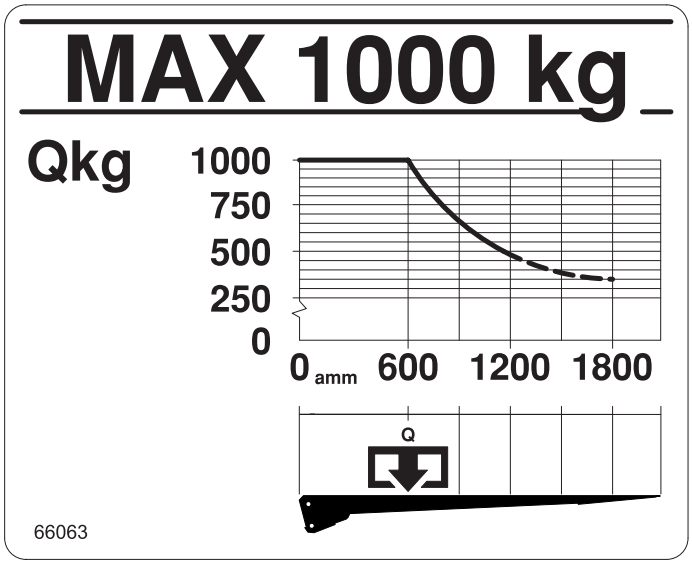
Z100 (200 bar)

5950	12 volt	24 volt
Pump - Motor Unit	200 A	90 A
Magnet (hydraulic unit)	1,5 A	0,75 A
Magnet (electric safety valve)	1,5 A	0,75 A
Solenoid	1,8 A	0,9 A
Minimum recommended cable area (apply copper cable, plus- and minuscable)		
Control cable	1,5 mm^2	1,5 mm^2
Main cable, L < 8m	35 mm^2	35 mm^2
Main cable, L = 8 - 15m	50 mm^2	35 mm^2
Main cable, L > 15m	-	35 mm^2
Battery		
Min. capacity, I_{min}	140 Ah	110 Ah
Min. voltage, U_{min} (At lift)	9 Volt	18 Volt



17.3 Loading diagram

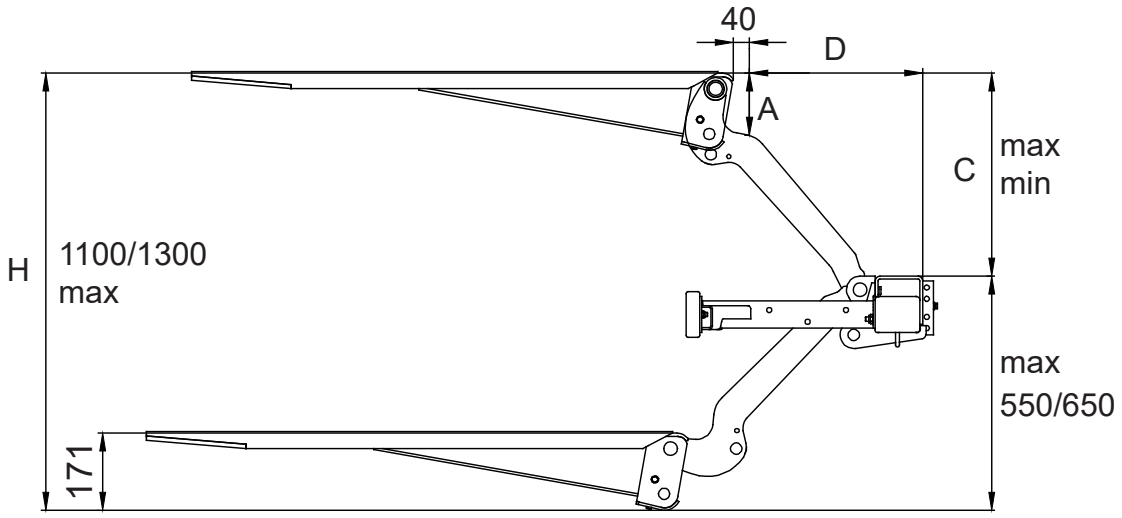
Loading diagram



17.3 Dimensions for installation

For models with lifting height 1100/1300 mm

Z-100-110, Z-100-130



Lifting height 1100 mm

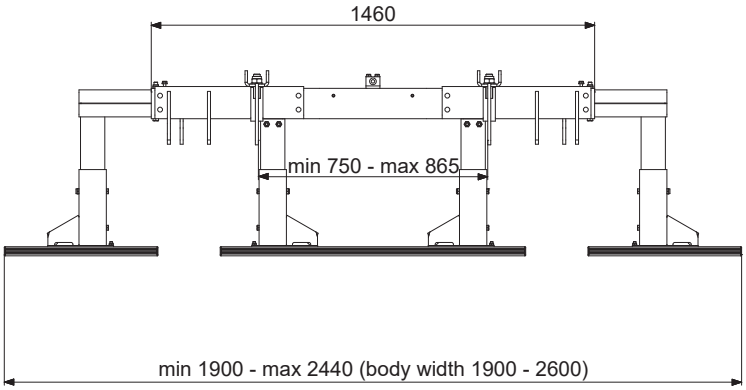
C	A	D
550	147	449
500	133	510
450	123	559
400	115	598
350	109	631
300	103	657

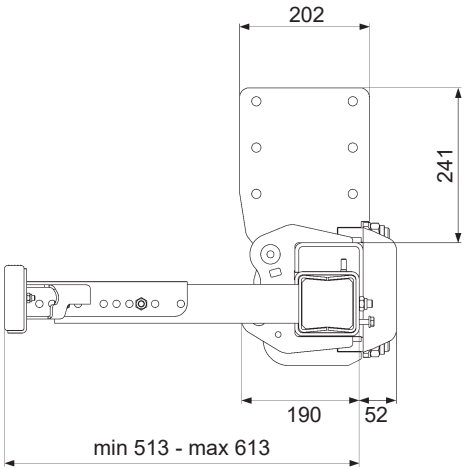
Lifting height 1300 mm

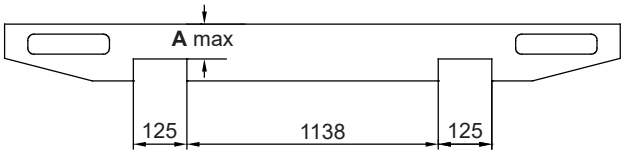
C	A	D
650	148	519
600	136	581
550	127	633
500	120	676
450	114	712
400	110	743
350	106	767

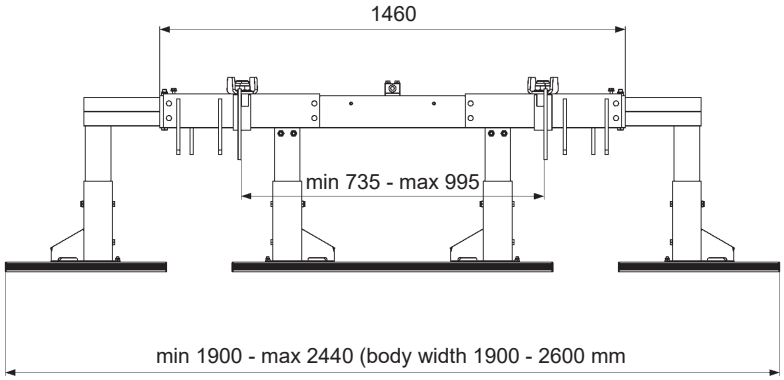
17.3 Dimensions for installation

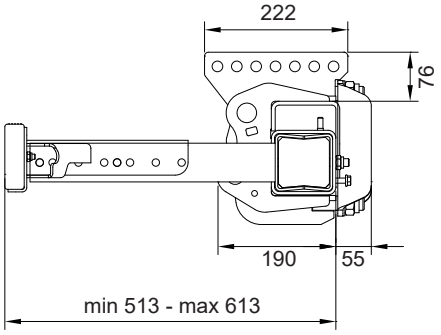
Z100-110, Z100-130

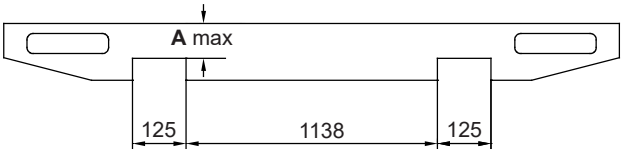






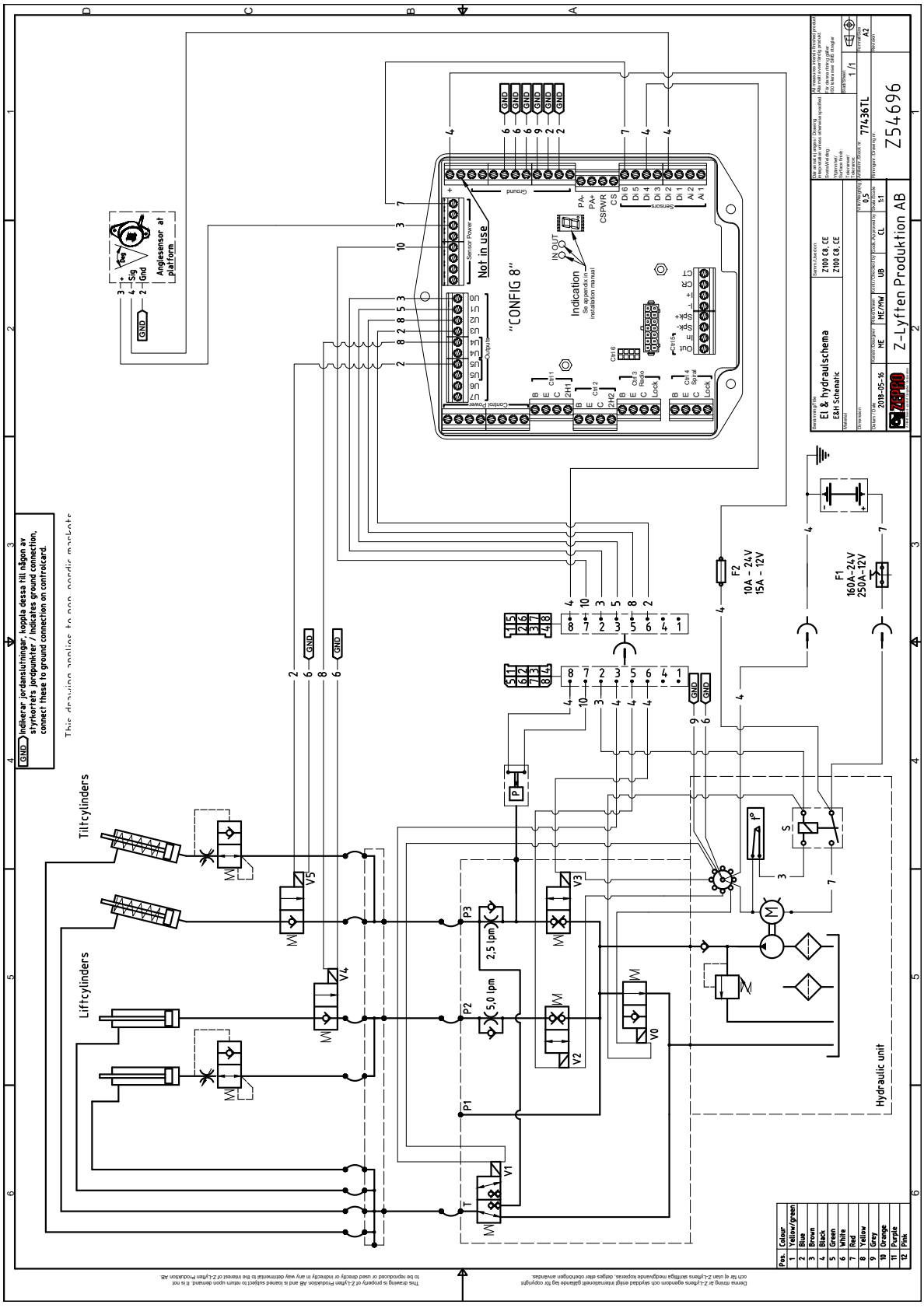






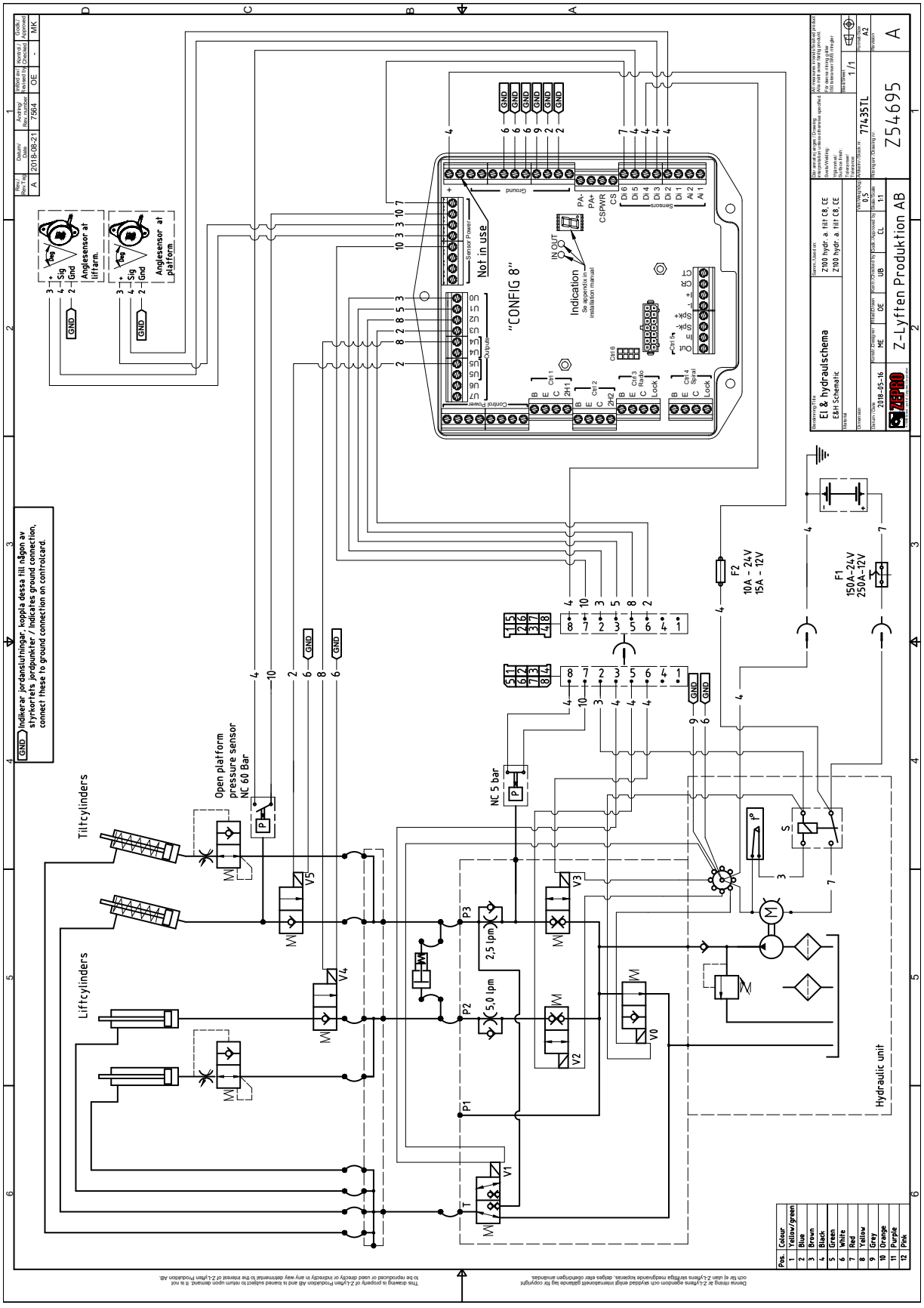
17.4 Electric and hydraulic diagram

Z-100



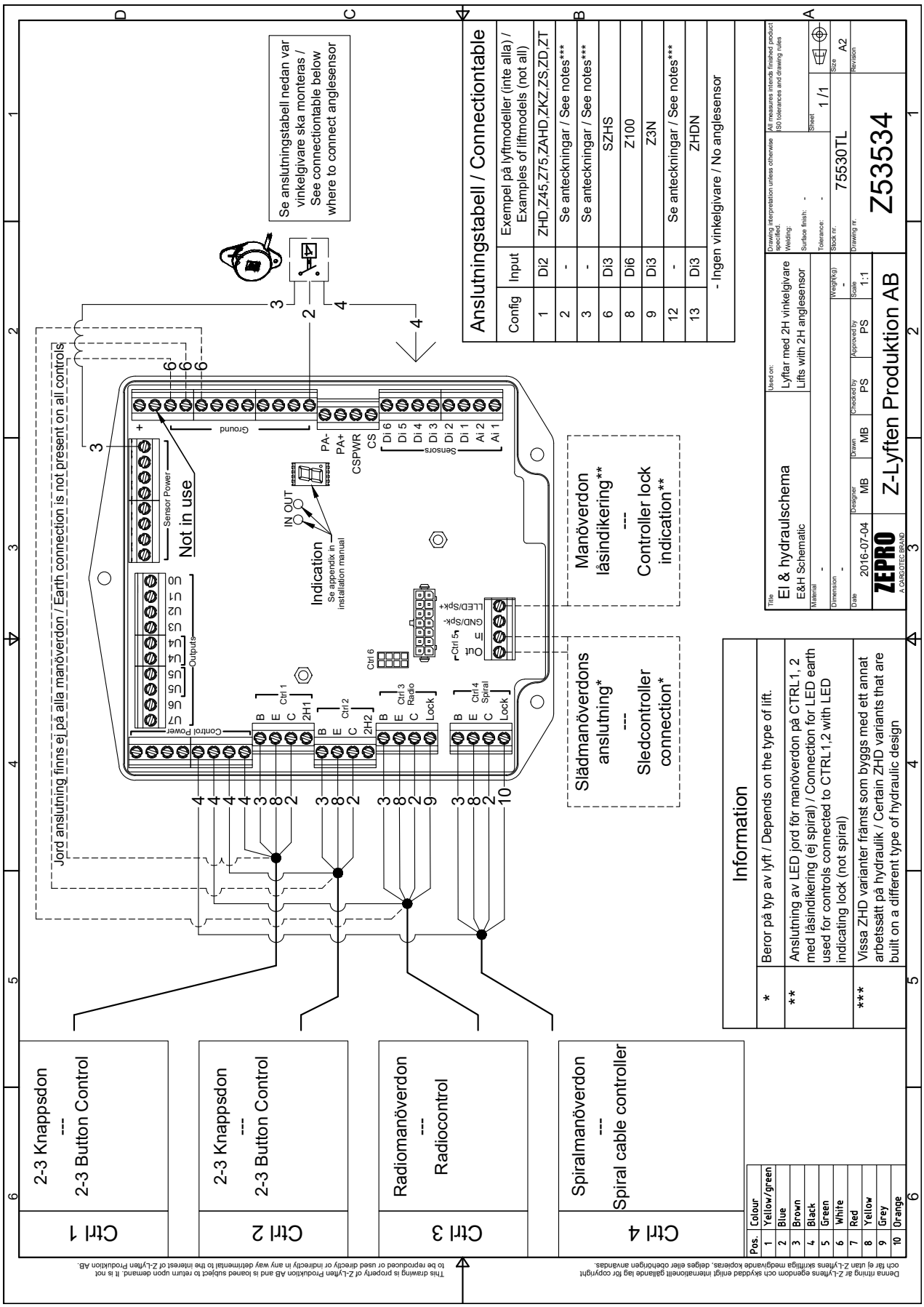
17.4 Electric and hydraulic diagram

Z-100, with hydraulic auto-tilt



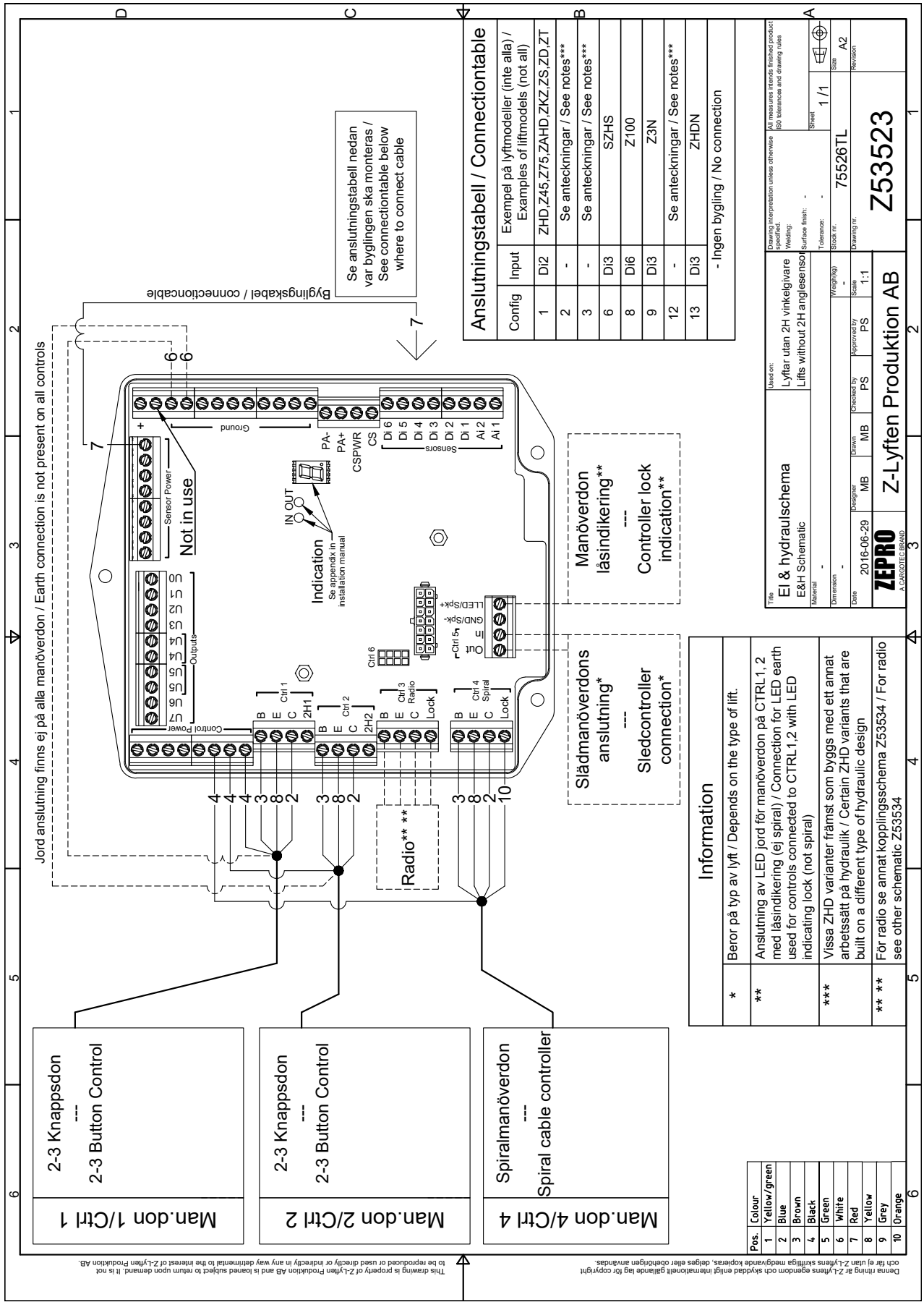
17.4 Electric and hydraulic diagram

Control unit with 2H-button (Z100 = Config 8)



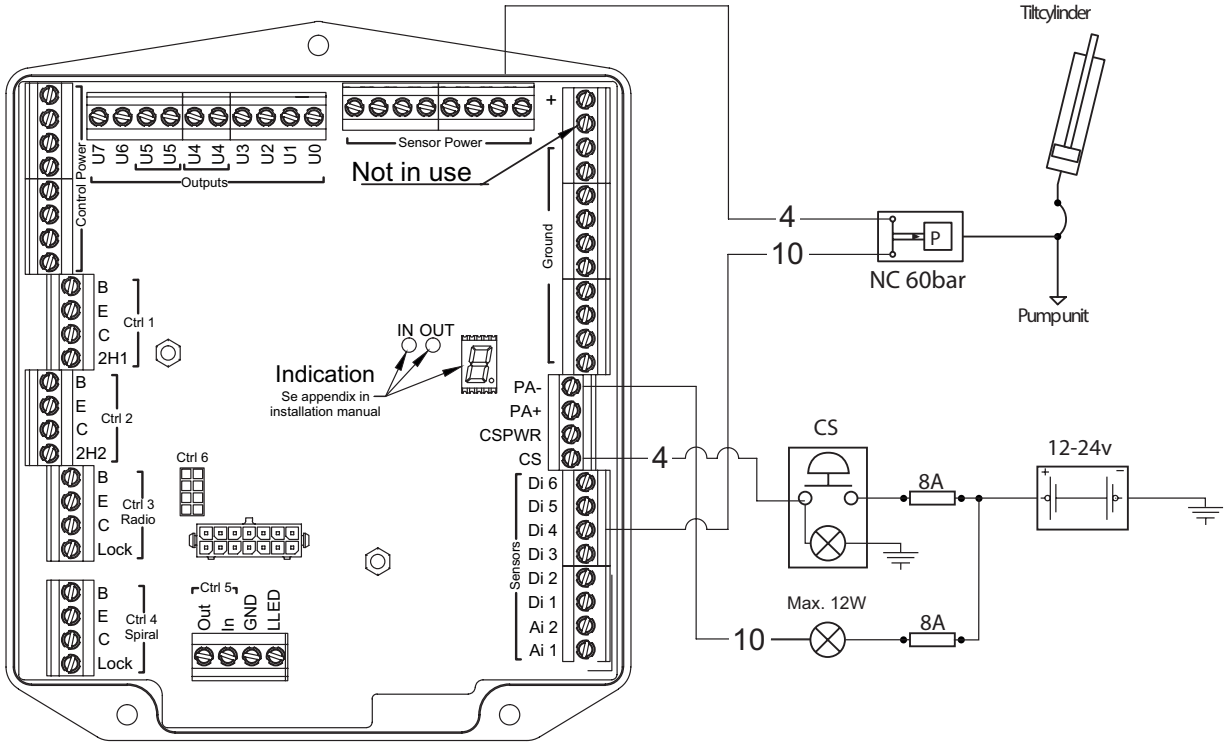
17.4 Electric and hydraulic diagram

Control unit without 2H-button (Z100 = Config 8)



17.4 Electric and hydraulic diagram

Cabin switch, Alarm for open platform



17.5 Connection unit

Power save mode

If the control card is not used for approx. 5 minutes, it goes into power save mode. Press any control button for approx. 0.5 seconds to “wake up” the control card again.

Operating information

All the lift’s functions are controlled and monitored through the control card, which is equipped with an alpha-numerical display with a flashing light and 2 red LEDS. These display current operating information. In the event of any operational disturbances, fault codes are displayed to facilitate troubleshooting.

The display indicates:

- Active control device
- Fault display
- Program configuration
- Sensors’ current status

Flashing light indicates:

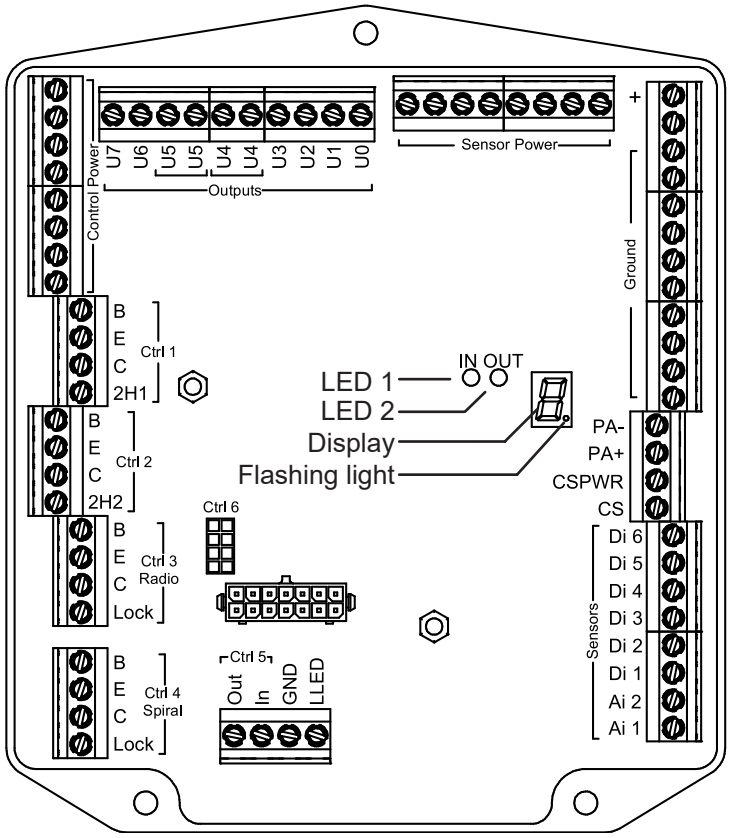
- Supply voltage
- Off: No supply voltage
- On: Supply voltage available but CS (cabin switch) is not active.
- Flashing: CS (cabin switch) is active, the system is awaiting input signal.

LED 1 indicates:

- Active input, button(s) on control device pressed.

LED 2 indicates:

- Active output (approved input signal from control device and sensors), the lift is operated.



The control card is equipped with an alphanumerical display with a flashing light and 2 red LEDS

17.5 Connection unit

Information codes

Codes are shown on the display in a sequence. First a letter for identification of information, followed by figures or segments for further information and then ending with a pause:

When the CS (cabin switch) is switched on, the current program configuration (P) is displayed first, followed by configuration number. The number of volts detected is then displayed and, after this, the current software version (J), followed by version number.

As long as no control device is used, a scrolling sequence is then displayed, with sensor indication (C), followed by 0-6 segments showing which sensors have a signal.

When a control device is used, the control device being used (1-7) is displayed, followed by which button has been pressed, segments B, C, E or X (X symbolises the 4th button on the respective control device (2h1 for fixed control device 1, 2h2 for fixed control device 2, lock knob for radio control device and coil control device).

The control devices are symbolised by the figures 1-7.

1. Fixed control device 1, including two-hand button 2h1
2. Fixed control device 2, including two-hand button 2h2
3. Radio control device, External
4. Coil control device
5. Truck slider control device
6. Radio control device, internal module
7. CS (cabin switch)

Once a button has been released, the control system for the current control device is locked for a while to ensure that no other person operates the lift from another control device. During the period the control system is locked for the current control device, its number (1-7) will flash on the display. This primarily applies to radio and coil control devices, as other control devices have such a short locking period that there is hardly time to see the indication.

Coil control devices can be equipped with a locking function. Once the control device has been used, the control system is locked for the current control device until it is unlocked manually from the respective control device's deactivation button. With some configurations, however, the coil control device can, for safety reasons, always tilt the platform down in the event of the operator getting shut inside.

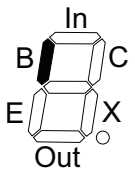
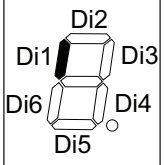
The radio control device is also equipped with a locking function. The control system can then be locked/unlocked by pressing and holding button 5. The lock's status is indicated by the locking function LED, which comes on when the lock is activated. In the event of a fault in the remote control, unlocking can be performed by turning the control power (CS) Off/On.

If the remote control is in the locked position and the lift has been unlocked by turning the control power (CS) Off/On, the lift will be locked again as soon as any button on the remote control is pressed.

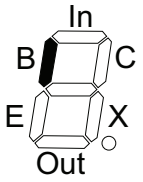
NOTE.

The lift remains locked if it loses power and is then started up again, and the number 6 flashes on the control card's display. Unlocking is performed as described above.

17.5 Connection unit

Information codes					
Identification	**Code 1**	**Code 2**	**Code 3**	**Information**	**Other**
P (Program configuration)	00–99			Cancelled configuration	
		-		Dividers	
			12/24	Number of volts detected	
J Software version	01–99	–	1-9	Version number	
1-6 (Fixed light) Active control device while operating	1-6			Fixed light (1-6) displays active control device during operation.	
		Segment B, C, E or X.		Segments B, C, E or X are illuminated depending on which button is pressed	
1-7 (Flashing) The control device to which the control system is locked for a while after completed operation.	1-7			Control device to which the control system is locked. This primarily applies to radio and coil control devices, as other control devices have such a short locking period that there is no time to see the indication. The number will stop flashing when one of the current control device's buttons are pressed. If the control card has been without voltage and receives the voltage again when the CS (cabin switch) is switched on, "7" will flash on the display and the control card is locked until the Off/On on the CS is operated. 1-6 = Ctrl 1-6 7 = CS	
C Sensor indication	Segment			1-6 segments indicate sensors. On - signal in. Off - no signal in. 0V. (See electrical and hydraulics diagrams for information about the location of the sensors).	

17.5 Connection unit

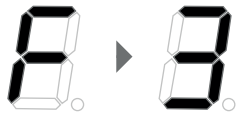
Fault codes					
Identification	**Code 1**	**Code 2**	**Code 3**	**Information**	**Other**
L Low battery voltage	07-35			Voltage measured	
H High battery voltage	07-35			Voltage measured	
E Control device locked	1			Fixed control device 1 (incl. two-hand button 2h1 if they are monitored)	
	2			Fixed control device 2 (incl. two-hand button 2h2 if they are monitored)	
	3			Radio control device, external	
	4			Coil control device	
	5			Truck slider control device	
	6			Radio control device, internal module	
	7			CS (cabin switch)	
		Segment		Segments B, C, E or X are illuminated depending on which button signal has locked the control device.	
F Output short-circuited/high current	0-9			Which output has short-circuited/ has high current. Fault code is reset automatically if the function in question is running (function verified).	1-7 U0-U7, displayed only after the respective output/ function has been active. 8 Control power 9 Sensor power
Output not connected/cable breakdown	0-7			Which output is not connected/ has cable breakdown. Fault code is reset automatically if the function in question is running (function verified).	Displayed only after the respective output U0-U7 has been active.
A Internal fault	0-				Contact support if the lift does not function.

17.5 Connection unit

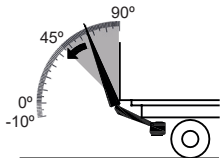
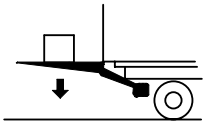
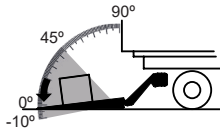
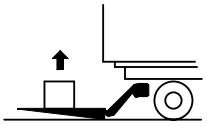
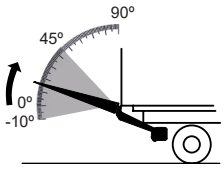
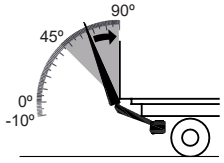
All fault codes can be reset manually by switching On/Off the CS (cabin switch). Fault codes F0-F7 and U0-U7 are reset automatically if the function in question is running (function verified). Fault codes L and H are reset automatically if the battery voltage becomes correct. Fault code E is reset automatically if the control system has not received any signal from the relevant control device for 6 minutes.

Example of sequence of fault codes:

Output No. 3 short-circuited.



Function scheme Z100, Ctrl 1, 2 & 3 (Config 8)

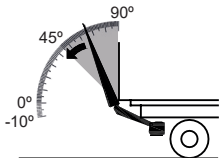
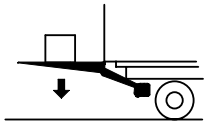
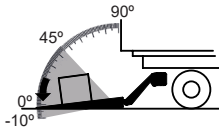
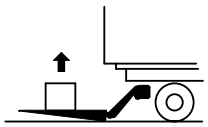
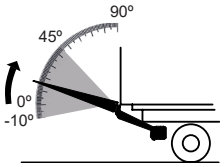
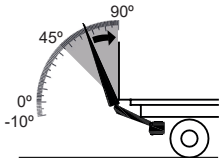
Function	Signal in		Signal Out	Notes	Figure
Open	1	C+E+2H+Di2+/Di4	U3+U5	Open from container down to approx. 45º.	
	2	C+E+Di2+Di4	U1+U3+U5		
	3	C+E+/Di2*	U3+U5		
Lower	E+/Di3		U2+U4		
Lower (Autotilt down)	E+Di3*		U2+U4+U5		
Tilt down	1	C+E+Di2+/Di4+Di6	U3+U5		
	2	C+E+Di2+Di4+Di6	U1+U3+U5		
	3	C+E+/Di2*+Di6	U3+U5		
Lift	B+/Di5		U0+U2**		
Tilt up	B+C+/Di5+Di6		U0+U3	Tilting up to approx. 45º	
Close	B+C+/Di5		U0+U3	Closing towards the container	

Sensor name with /-symbol in front = 0, i.e. no signal.

* Only a demand at the start of the movement, after sensor switching, the sensor is ignored until a retake occurs.

** 0.2 seconds of delay on signal out.

Function scheme Z100, Ctrl 4 Spiral (Config 8)

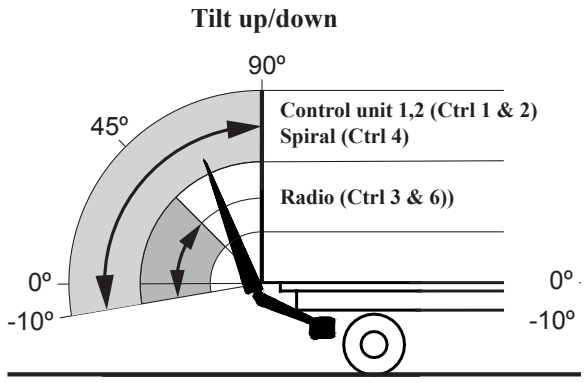
Function	Signal in		Signal Out	Notes	Figure
Open	1	C+E+Di2+/Di4	U3+U5	Open from container down to approx. 45º.	
	2	C+E+Di2+Di4	U1+U3+U5		
	3	C+E+/Di2*	U3+U5		
Lower	E+/Di3		U2+U4		
Lower (Autotilt down)	E+Di3*		U2+U4+U5		
Tilt down	1	C+E+Di2+/Di4	U3+U5		
	2	C+E+Di2+Di4	U1+U3+U5		
	3	C+E+/Di2*	U3+U5		
Lift	B+/Di5		U0+U2**		
Tilt up	B+C+/Di5		U0+U3**	Tilting up to approx. 45º	
Close	B+C+/Di5		U0+U3**	Closing towards the container	

Sensor name with /-symbol in front = 0, i.e. no signal.

* Only a demand at the start of the movement, after sensor switching, the sensor is ignored until a retake occurs.

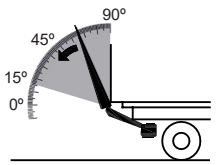
** 0.2 seconds of delay on signal out.

Limitation of the use of the control unit



Use of the control unit radio i limited by the angle of the leveler.

Sensor

Name	Position (standard)	Function	Description
Di1			Not used on this modell
Di2	Platform	Angle sensor/ Quick opening	The angle sensor is activated at tilt down for quick opening. 
Di3	Lift arm	Angle sensor	For autotilt, safety function.
Di4	Tilt cylinder	Alarm or open platform	Pressure sensor for falling pressure connected to +side of tilt cylinder. In the actuated state, returns the connection signal (+) to Di4 and resulting in output signal (-) at Pa- and also (+) signal out at Pa+.
Di5	Tilt cylinder	Pressure sensor fitted to tilt cylinder	Pressure sensor for increased pressure connected to +side of lift cylinder. In the actuated state, returns the connection signal (+) to Di5 and resulting in output signal (-) at Pa- and also (+) signal out at Pa+.
Di6	Platform	Angle sensor	Non-actuated Di6 disables Tilt up with the secondary control device so that the operator must use the two-hand button - 2H along with the primary control device in order to continue to maintain the tilt up function.
Cs	Cabin	Activation	No signal in at Cs results in blocked control device terminals. Signal to Cs usually comes from the cabin switch. In individual cases where the cabin switch is not used, the (+) signal comes in to Cs jumpered from (+) on nearby terminal.
2H	Control devices	Two hand button	Activated in connection with opening and closing of vehicle body. Used for Quick opening.

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