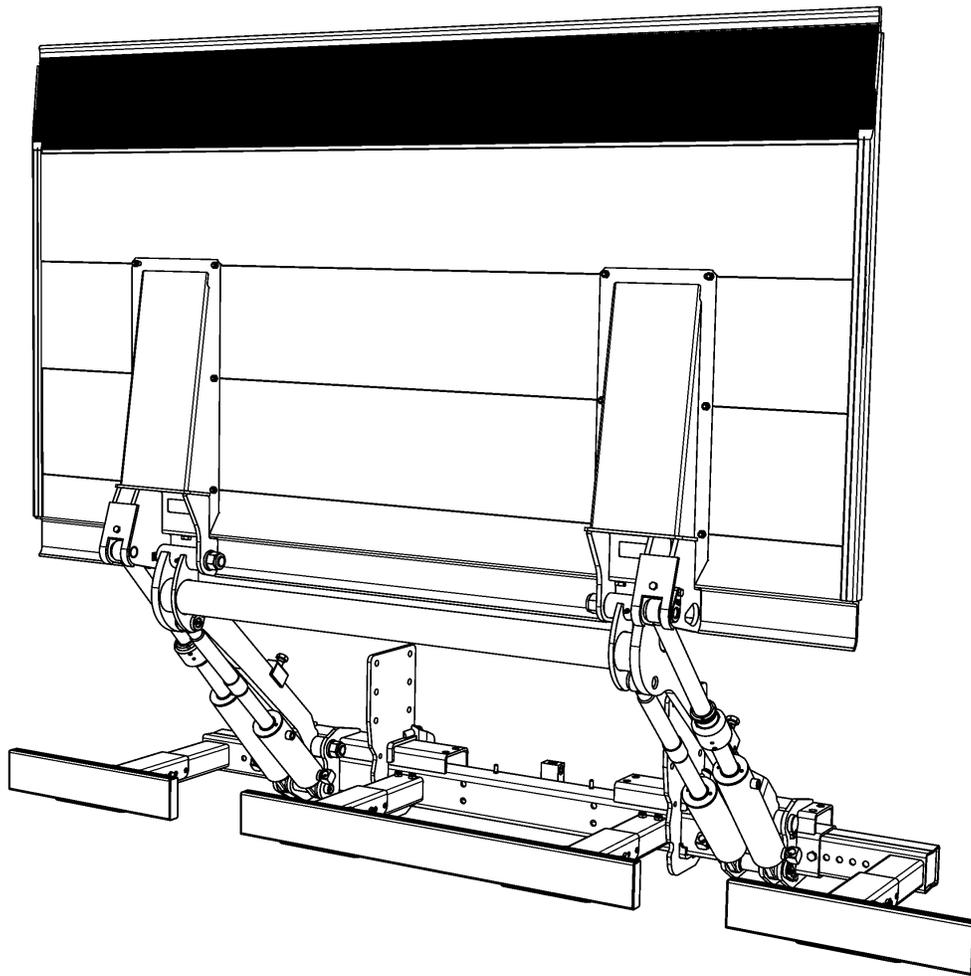

Installation Manual

Z-100 2200 lb. Liftgates



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1. CE marking



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. Waltco stands behind this guarantee.

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/Waltco 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/Waltco 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.

2. General

Technical description

The ZEPRO/Waltco-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. Waltco therefore supplies 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.

NOTE: 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

Lift naming

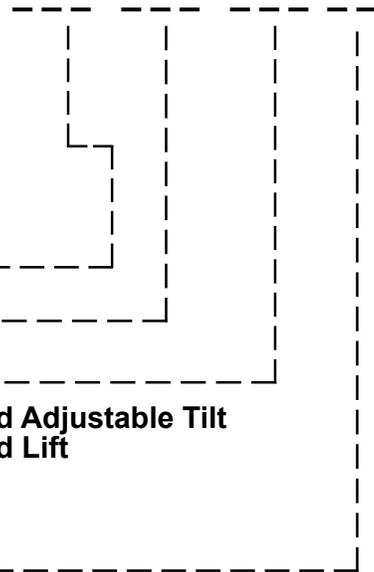
E.g Z - 100 - 110 SA

Z = Standard model

Max lift capacity x 10 (kg)

Max lift height x 10 (mm)

**Cylinder model, SA = Single Acting One Speed Adjustable Tilt
Single Acting One Speed Lift**



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-100-110 370 lbs

Lift components (part of cpl. lift chassis).

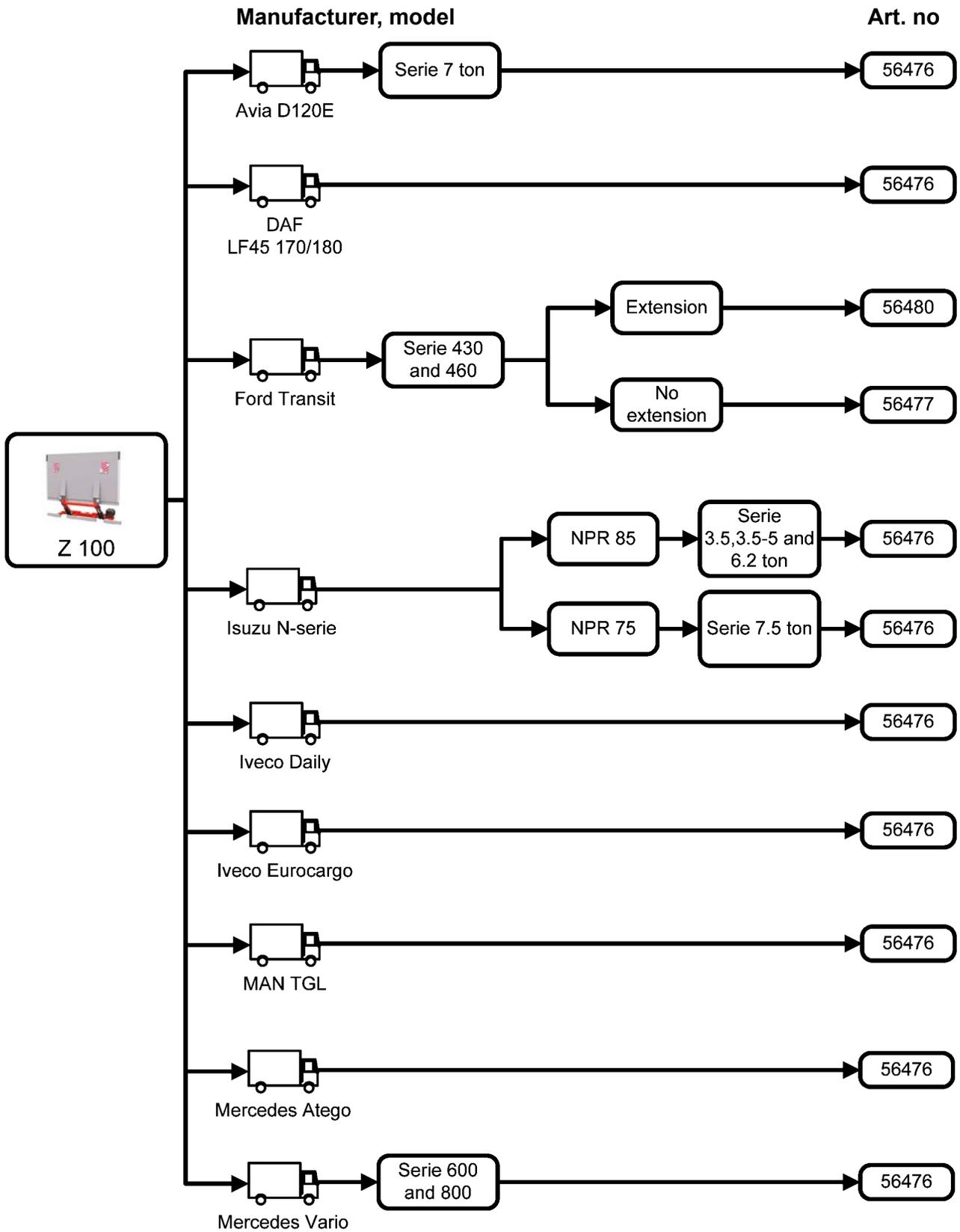
Support frame Z-100-110/130	85 lbs
Lift arm Z-100-110	75 lbs
Mounting bracket cpl.	8.8 lbs
Hydraulic unit	30.9 lbs
Lift cylinder -110	17.6 lbs/unit.
Tilt cylinder -110	26.5 lbs/unit.
Bumper bar cpl.	72.8 lbs

Aluminium platform

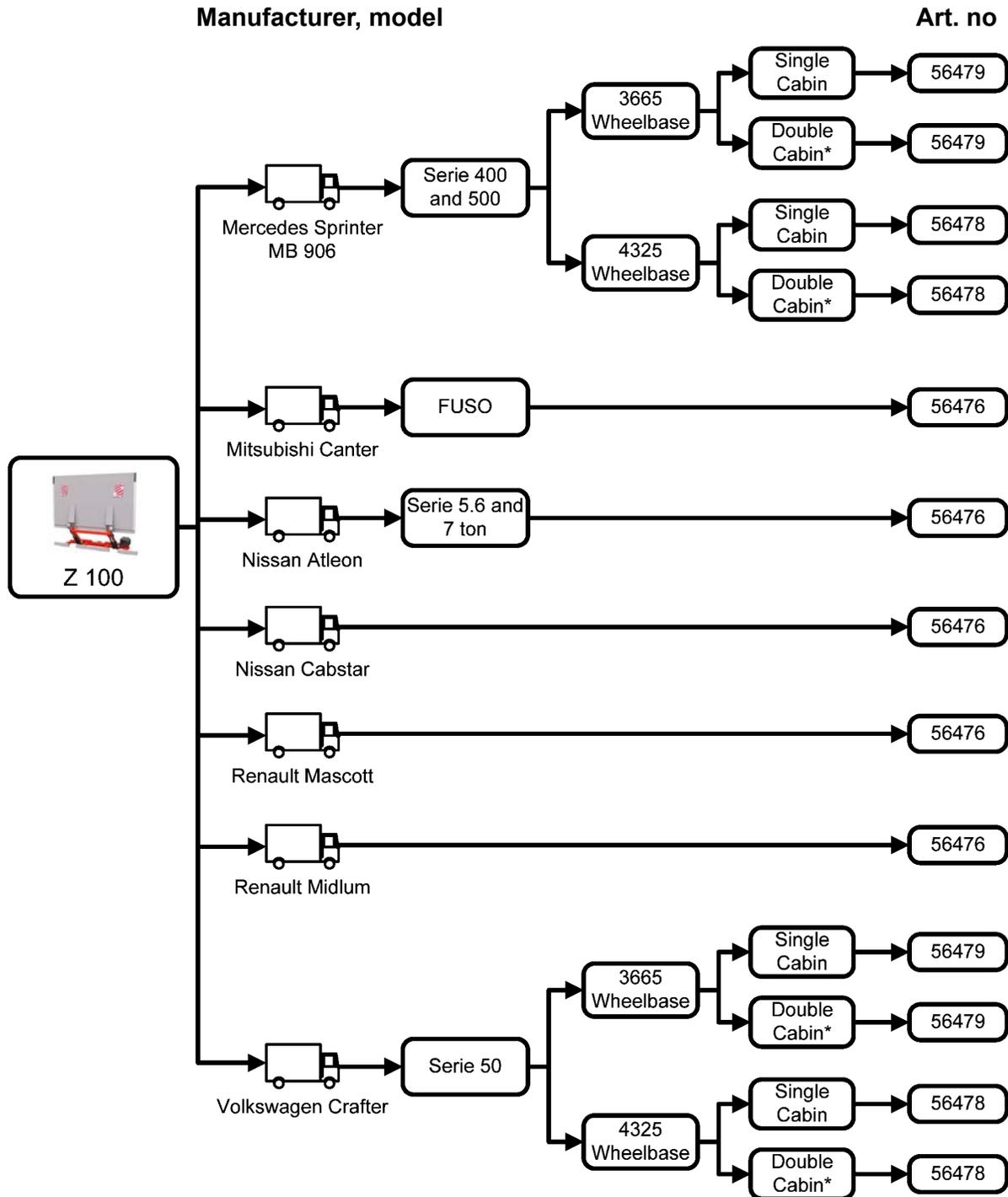
Flat 1-3/16 in Laser (PLALAS L)

Alu. platform 36x93 in	129 lbs
Alu. platform 47x93 in	172 lbs
Alu. platform 60x93 in	207 lbs

3. Mounting bracket kits



3. Mounting bracket kits



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

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! Waltco Z-100 tail-lift can only be mounted with mounting kit supplied or approved by Waltco.

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.

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

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.

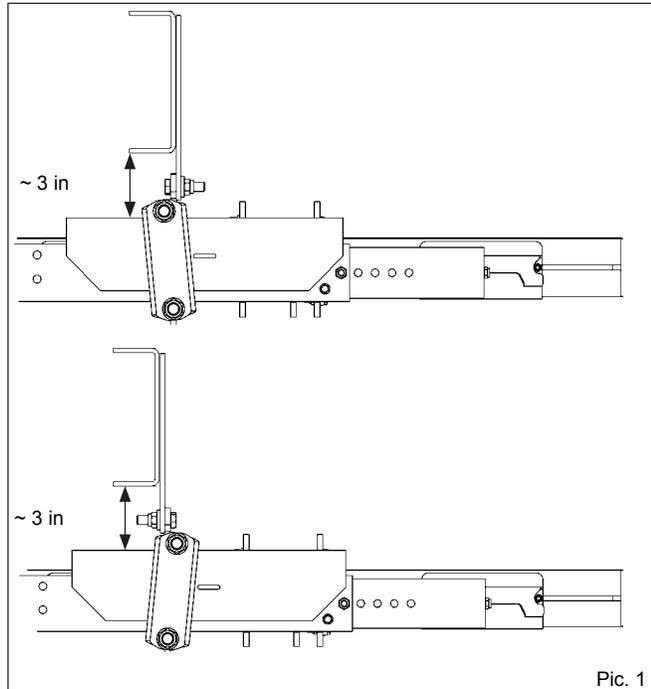
D-measure is the required space for the tail lift, measured from the back frame of the truck to the front of the lift support frame (in the direction of the travel).

Get the D-measure from tables when the C-distance is known.

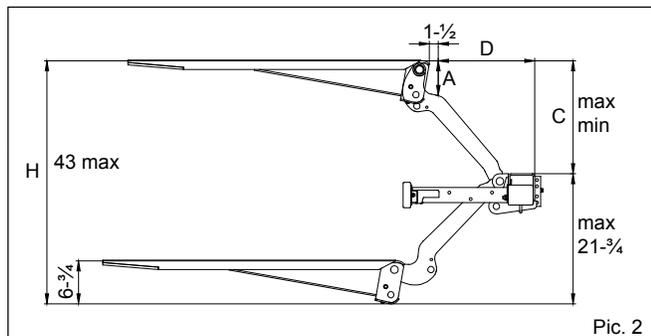
A-measure is the space the lift allows for the truck rear frame, i.e. the distance between the lift arms and the body floor level, when the lift arms are in the upper position. A-measure depends on the C-measure.

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.



Pic. 1



Pic. 2

Lift height 43 in, Z-100-110

C	A	D
21- ³ / ₄	5- ³ / ₄	17- ³ / ₄
19- ³ / ₄	5- ¹ / ₄	20
17- ³ / ₄	4- ³ / ₄	22
15- ³ / ₄	4- ¹ / ₂	23- ¹ / ₂
13- ³ / ₄	4- ¹ / ₄	24- ³ / ₄
11- ³ / ₄	4	25- ³ / ₄

5. Installation of support frame

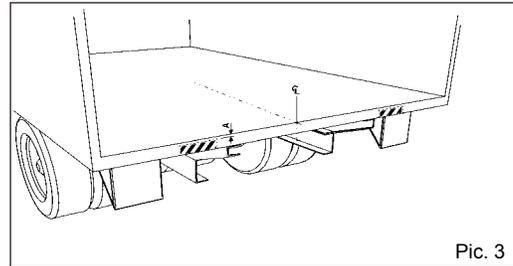
2. Fasten the jig to the rear frame

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

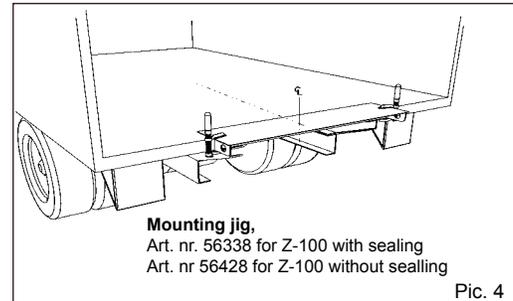
Check the A-measure, to determine if cut-outs are needed in the rear frame. (See marked area in the picture).

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.



Measures and pictures, see section 17.2

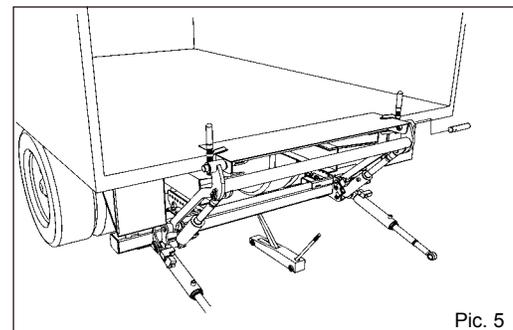


For trucks with mounting brackets kits, see separate installation instructions. See list, section 3.

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.

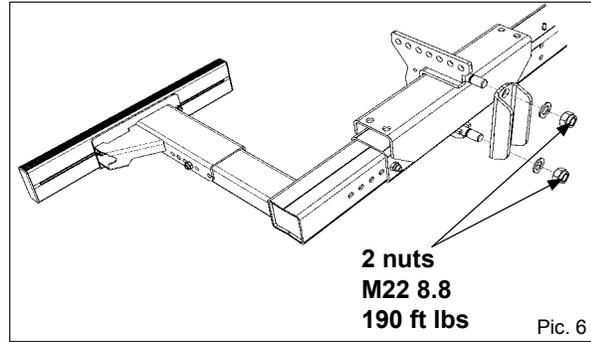


Position the support frame as required under the truck's chassis frame. eg. A wheeled jack can be used.

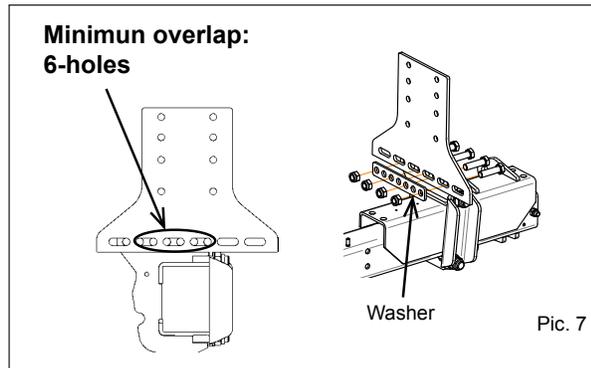
5. Installation of support frame

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.

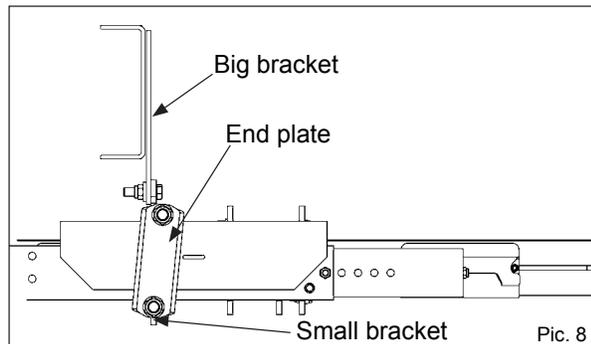


Preliminarily position the smaller bracket according to picture and fasten the two brackets to each other with screws. Use the washer between bracket and nuts. Check that there is a minimum of 6 holes overlap of the smaller bracket's row of holes.



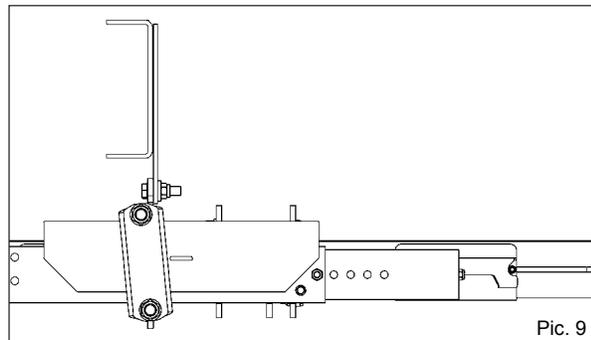
The smaller bracket can be assembled in different ways depending on the width of the truck frame. The place along the truck frame where the bracket shall be assembled is the **trucks frame width**.

1. If the width of the truck frame being below 30 in, 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 37 in 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 30-37 in, the brackets can be installed at an optional way.



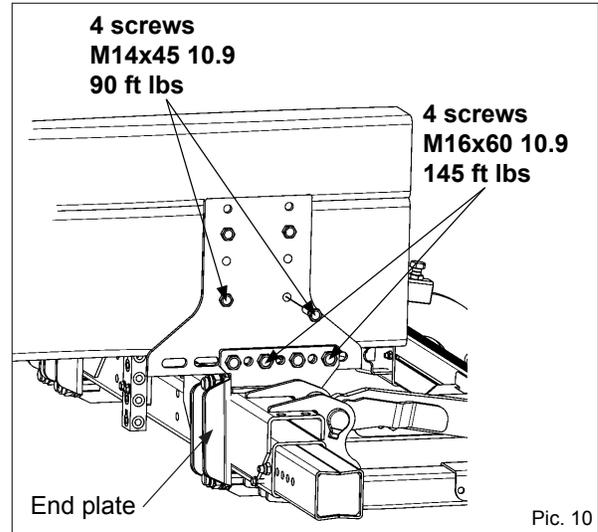
5. Installation of support frame

Check the C- and D- measures.

Position the bigger bracket at the outside of the truck chassis. Drill 9/16 in 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=90 ft lbs).

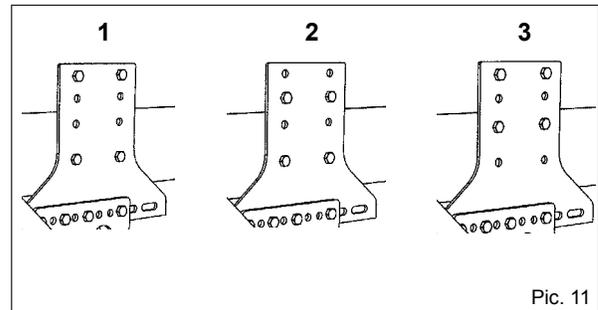
Now permanently attach the two brackets to each other. Use the M16x60 screws supplied. Minimum 4 pcs for each pair of bracket (torque=145 ft lbs).

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 =190 ft lbs)



5. Loosen the jig

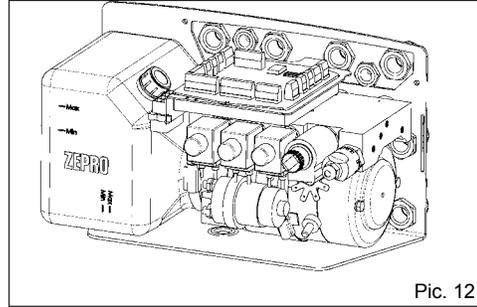
Loosen the installation jig.



6. Installation, hydraulics

The hydraulics

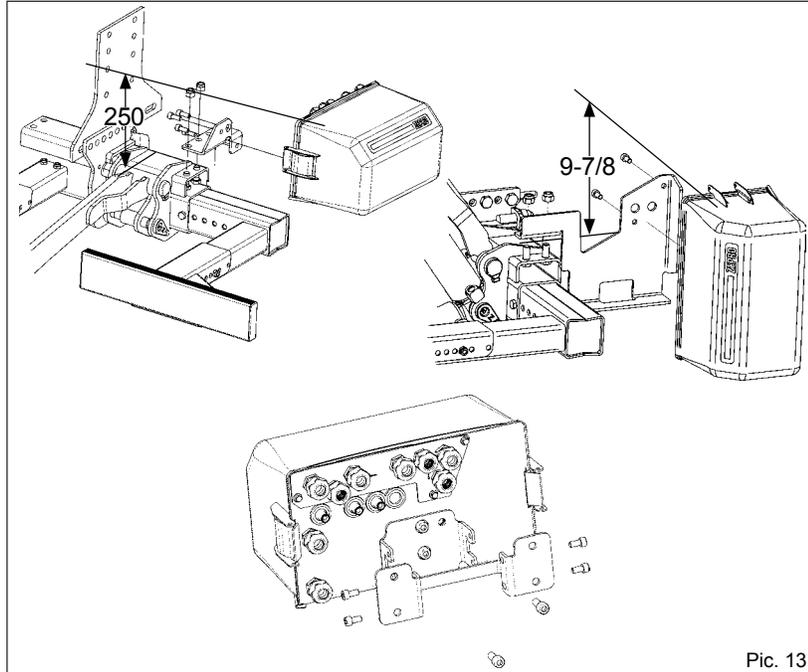
On standard lifts the hydraulic power unit and the hydraulic hoses are already mounted.
If the hydraulic power unit is not premounted it should be attached at a suitable place.



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.

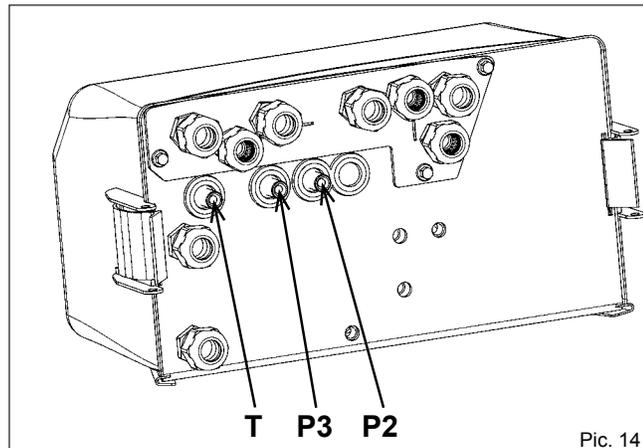


Pic. 13

Connecting the hydraulic hoses

Attach the hydraulic hoses.

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



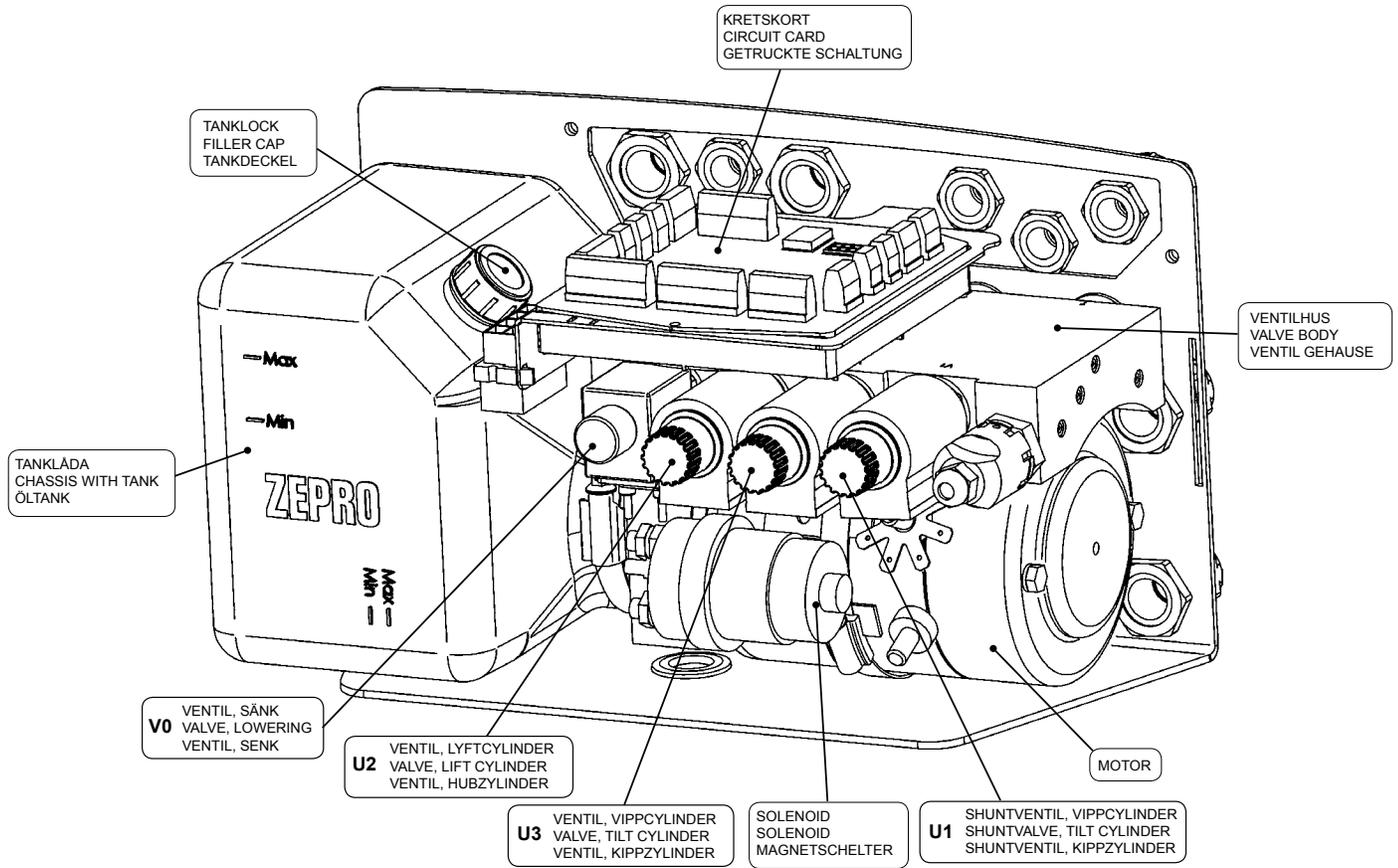
Pic. 14

6. Installation, hydraulics

Hydraulic unit with circuit card, components

Electric and hydraulic diagram, see section 16.3

Connection Unit, see section 16.4



Pic. 15

7. Electrical installation

Also refer to the truck manufacturer's electrical instructions.

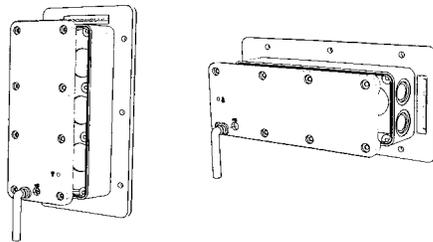
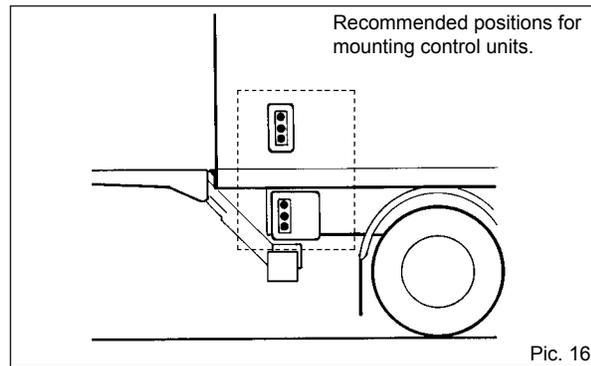
1. Mounting control units

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.



2. Connection, control cable

The control cable is connected to the circuit card in the connection unit (see electric schema).

Electric schema, see section 16.3

Install the control current cable from the dashboard of the truck according to the customer's requirements. The control current switch should be located so it is possible to be reached from the earth 10A /15A fuse between the current source and the switch.

The control current cable; 10A / 15A fuse between the current source and the switch.

The control current cable is connected to a fixed control unit. You can fasten the cable together with the battery cable to the hydraulic unit.

Spiral cable unit

If you have a spiral cable unit, its cable colors are different (see electric schema).

Spiral cable, 5-part: Art.nr. 21303

If you want an electrically heated spiral cable unit you can order a 5-part cable and use the blue conductor for earthing (the white part is nearly grey). Note that the spiral cable unit must have its fastening plate for the wall.

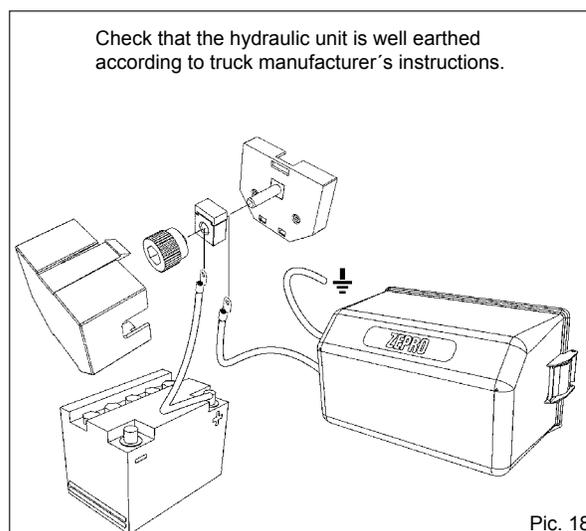
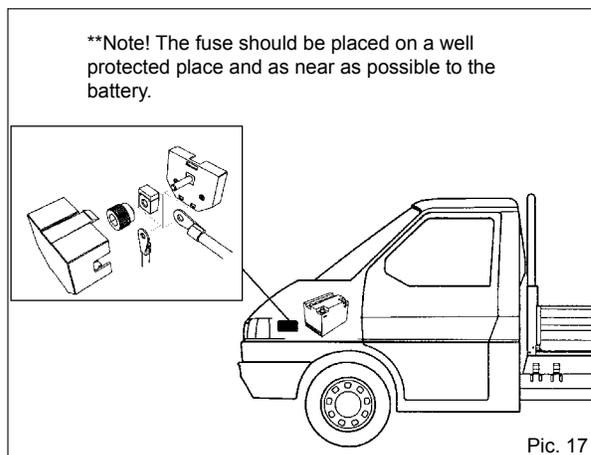
Fastening plate: Art.nr. 20302

7. Electrical installation

3. Connection, main power cable

Connect the main power cable to the + pole of the battery. The cable should be protected with a plastic sheath. It must not be fastened together with brake pipes or other electric cables of the truck. When passing through holes the cables must be protected with rubber bushings.

A 160 A (24 V) or 250 A (12 V) fuse is to be installed on the main power cable running from the battery compartment. This acts to protect the electrical systems from overloading and the risk of fire. The picture below shows proper connection.



A 160 A (24 V) or 250 A (12 V) fuse is to be installed on the main power cable running from the battery compartment.
Note! When passing through holes the cables must be protected with rubber bushings.

Alarm for open platform

The alarm has a red lamp, which lights if the platform is not pressed against the back of the truck. The arrangement is:

- *Pressure guard on the tilting system.
- *Cable to the dashboard.
- *Fuse.
- *Warning lamp 12 or 24 V

Testing

Switch the starter key on when the lift platform is tilted up and pressed against the back side. The warning lamp shall not light.

Tilt the platform out a little from the back. The lamp shall light.

Switch the start key off. The lamp turns off.

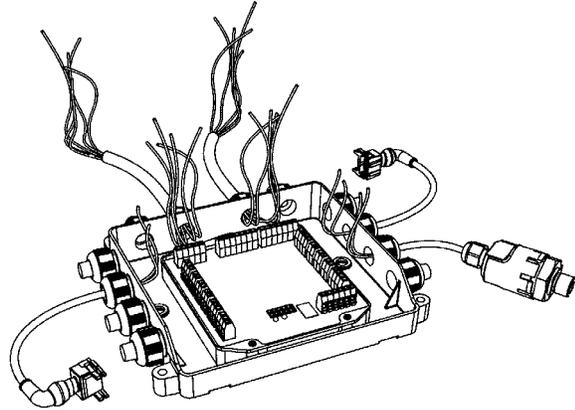
Switch the starter key on and the lamp shall light.

Shut the platform very well and the lamp turns off.

7. Electrical installation

Connection of non-original components on zepro tail lifts

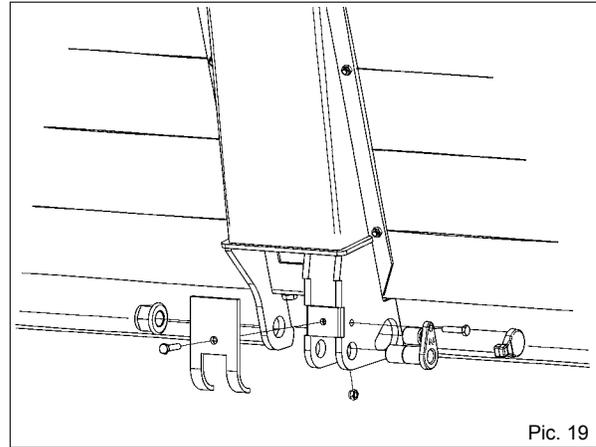
It has always been forbidden to connect foreign equipment (both electric and hydraulic) on all Zepro tail lifts. Using non-original components can affect tail lift safety. If it's really important for you to make such installations please check with the vehicle manufacturers installation instructions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



8. Mounting, platform and sealing system

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.

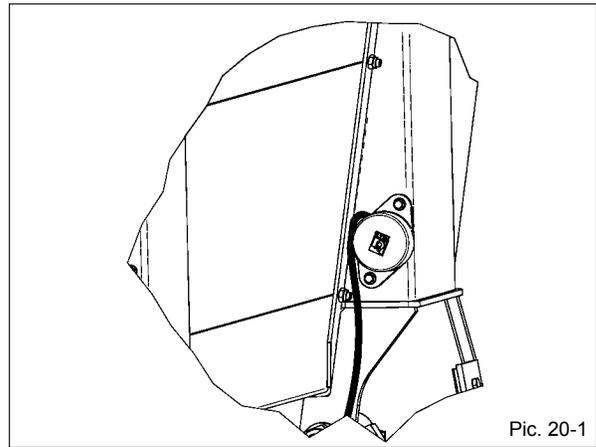


Pic. 19

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

Flat 1-3/16 in platform:

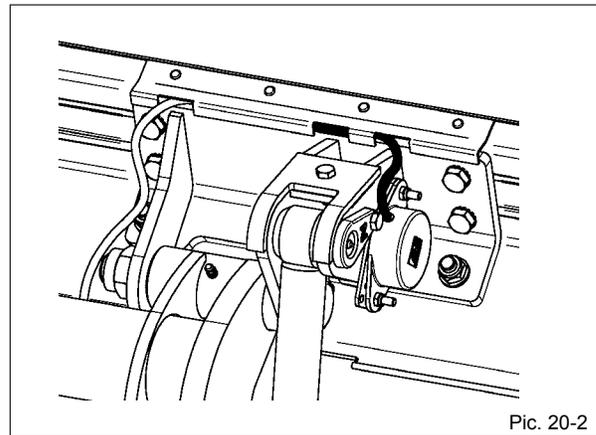
Place the angle sensor on the inside of platform bracket, pic. 20-1.



Pic. 20-1

Conical platform

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

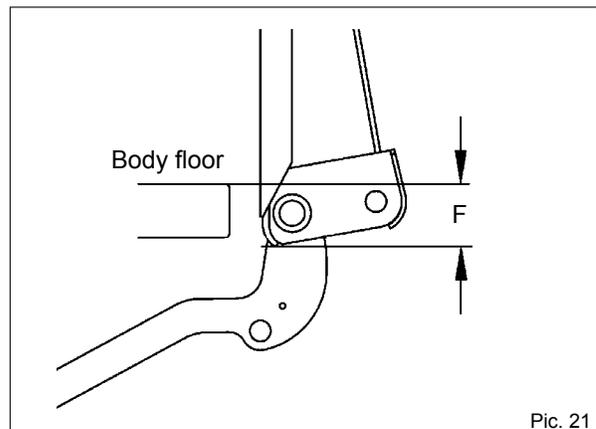


Pic. 20-2

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 1-3/16
F (in)	2-15/16

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 1-1/2 - 1-9/16 in.

Sealing system (horizontal)

Install the horizontal aluminium or steel guide bar. Self-tapping screws delivered. Drill 9/32" holes. Mitre the rubber against the side seal.

Sealing system (vertical)

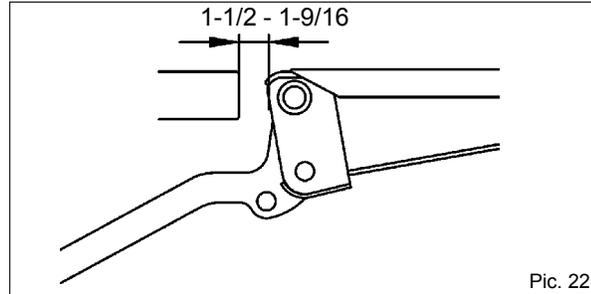
Install the profiles for the vertical sealing strips. Note the position of the lock ears.

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

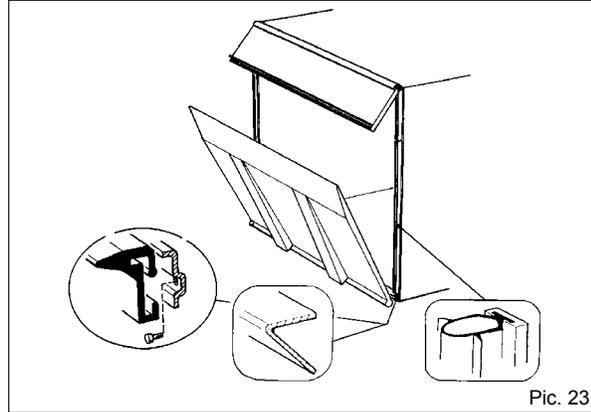
The rubber strips are locked by pressing the rails together.

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 to the 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.

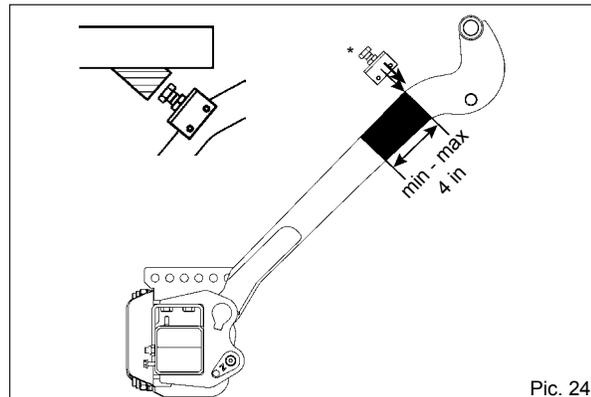
3. Mounting armstops

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.



Pic. 24

NOTE! No welding is allowed on the lift arm!!

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

Transport lock

For CE marked lifts with 2200 lb max lifting capacity and over, ZEPRO/Waltco 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.

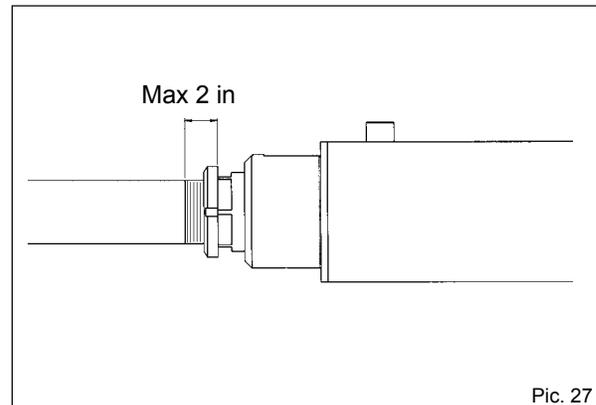
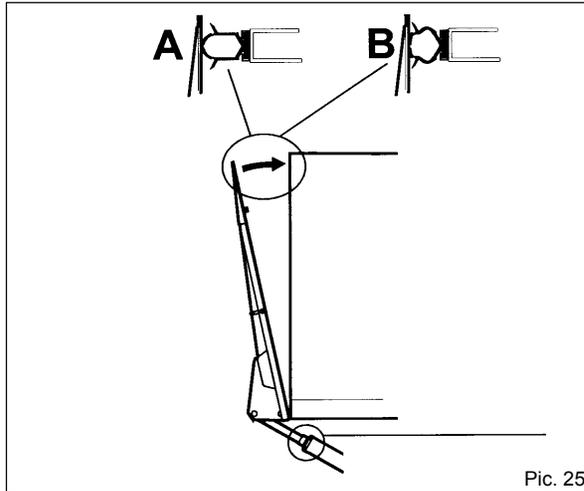
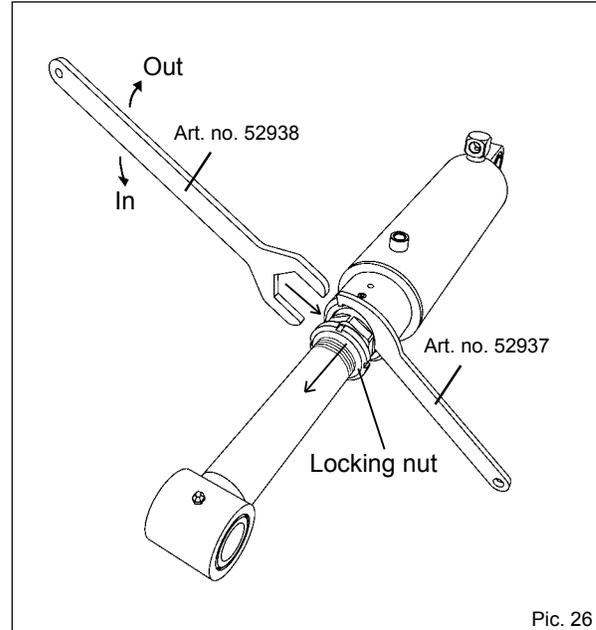
The valves are one-way valves which allow oil to flow into the cylinders but not out from them unless current has been supplied to them via the lowering valves. The platform is hence hydraulically locked under transport.

9. Tilt cylinders, adjustment

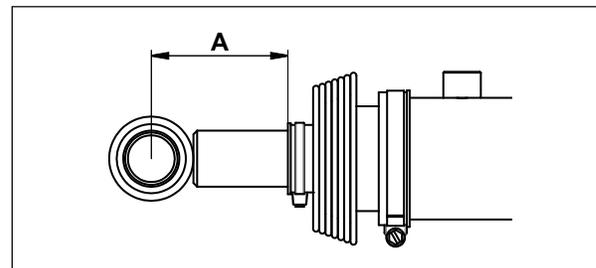
Adjustment 90° tilt angle up against the body

NOTE: 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. NOTE: 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.
- NOTE: Max. 2 in between the end of the thread and the lock nut. Lock screws torque is between 2-4 ft lbs.



Lift model	A
Z 100-110	5-7/8 ±3/16



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 10°.

NOTE! It is necessary to first adjust the 90° tilt angle up against the body before adjusting tilt down angle.

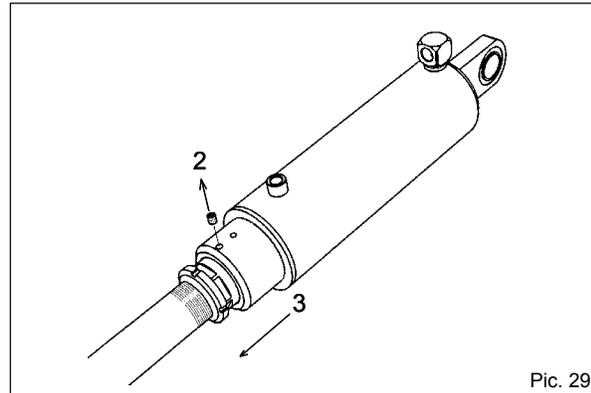
1. Run the lift up so that the lift is at the floor level, see pict 28.
2. Loosen the ring's lock screw (2). Screw the ring out in the direction of the platform (3). See pict 29.
3. Tilt down the platform to maximum 10 degrees under horizontal. As per pict 28.
4. Adjust the ring to the top of the cylinder (4).
5. Tighten the lock screw in the ring (5). See pict 30.

Reassemble rubber bellows.

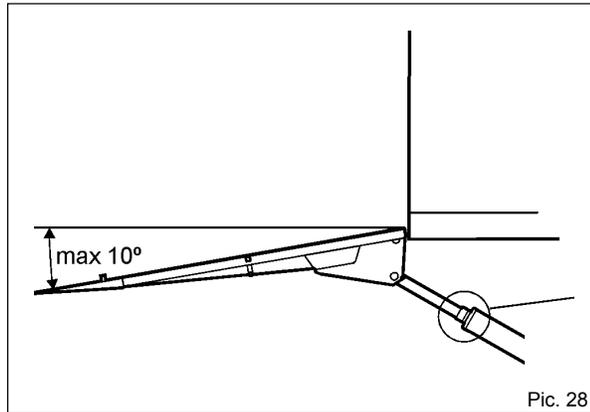
Lock screws torque is between 2-4 ft lbs.

Note! Both cylinders tilt down angle must be adjusted equally, otherwise there is the risk that the cylinders will break.

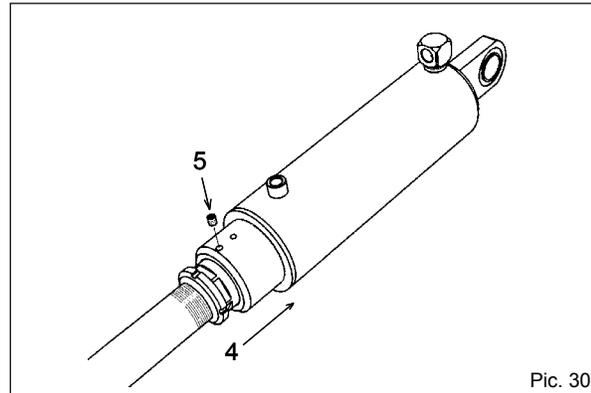
Test run all functions.



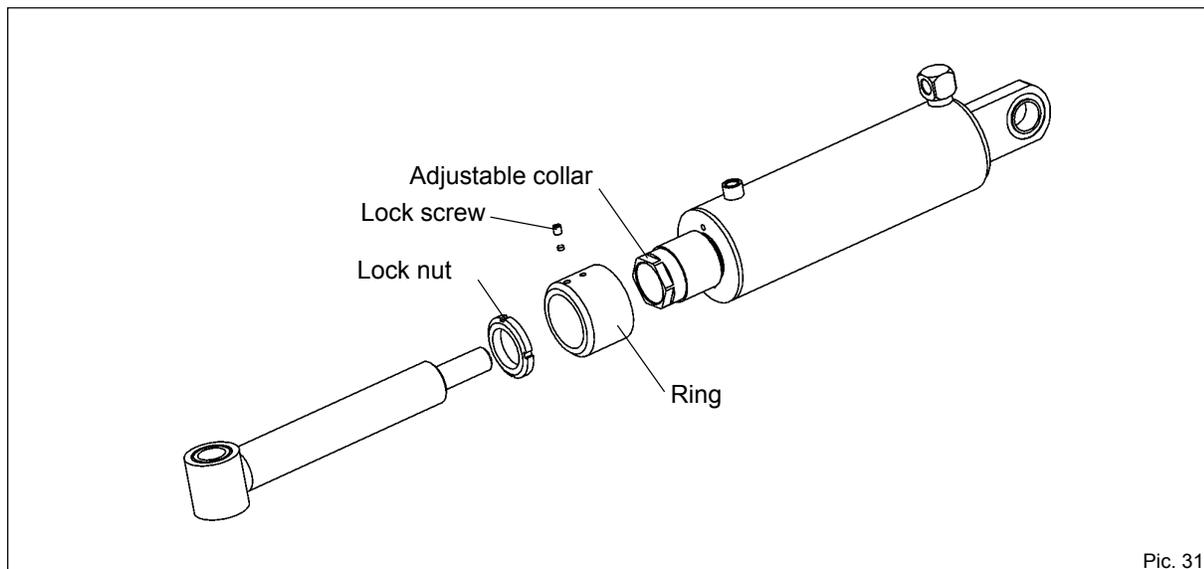
Pic. 29



Pic. 28



Pic. 30



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 curb) 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.

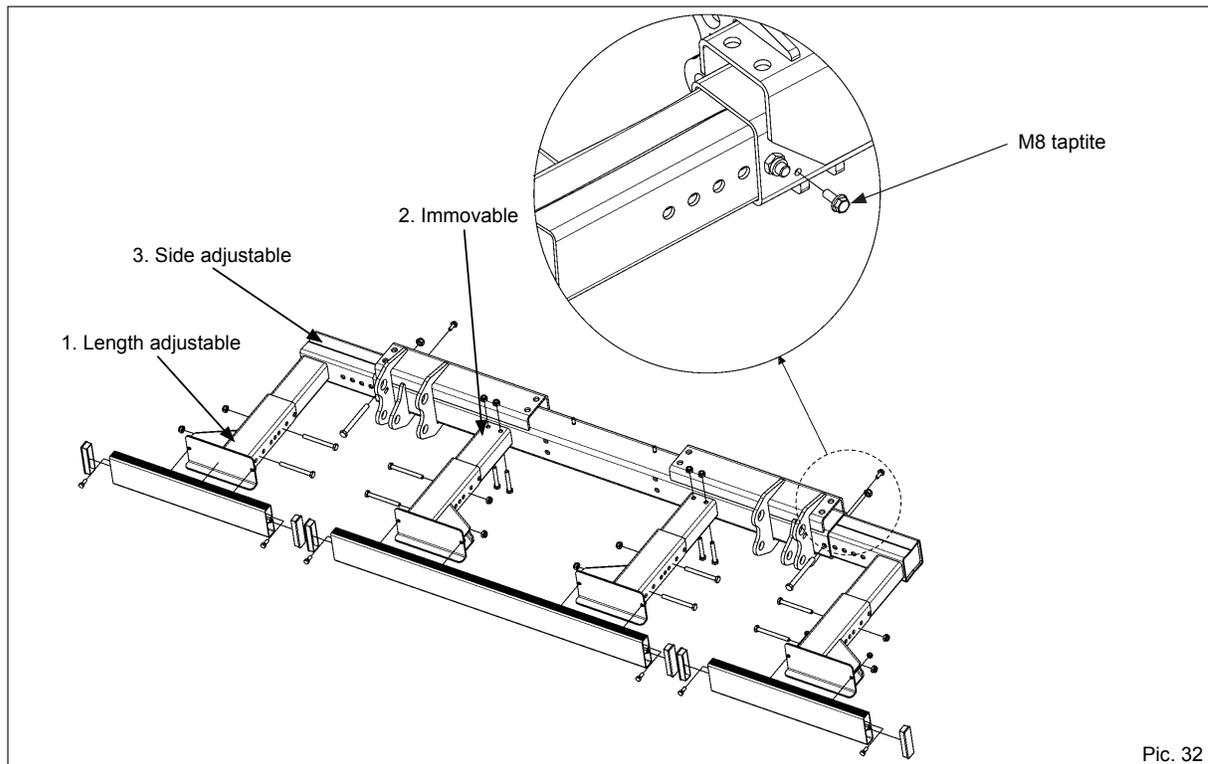
Mounting 3-part bumper bar

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 21-5/8 in between bar and ground when the vehicle is unloaded (25-9/16 in for uplifted bogey). Max 9-1/8 in horizontal distance from axis through centre point of platform bolts to bar. See pictures page 23.

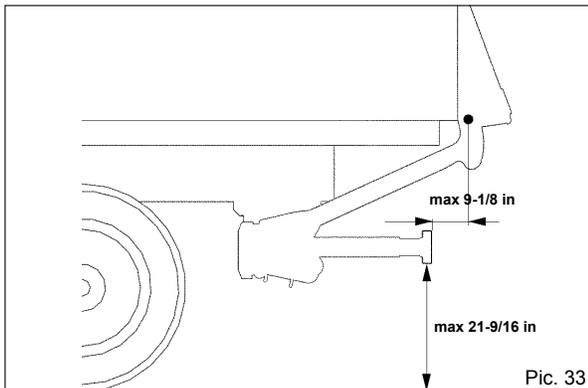
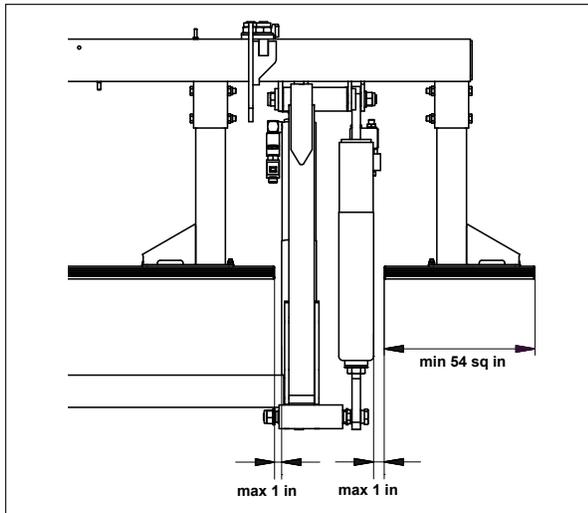
The lateral distance between bumper bar and moving parts of the tail lift must not exceed 1 in. The bumper bar must, in each case, have an effective surface area of at least 54.3in², see picture



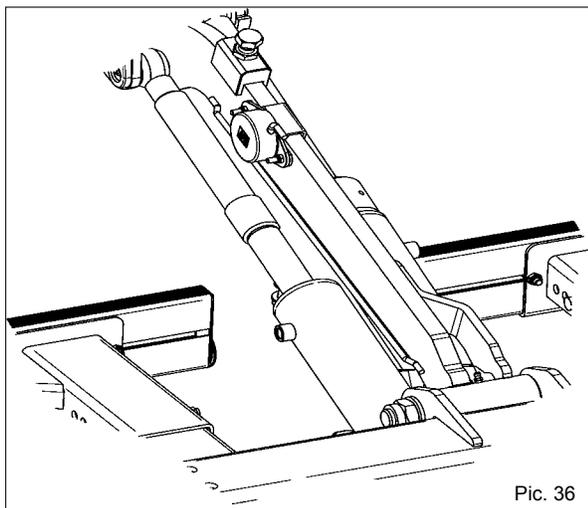
Mount each length adjustable bracket with two bolts M10x100 (8.8), each immovable bracket with two bolts M10x70 (8.8) and each side adjustable bracket with two different bolts one M12x120 and one M8 tapite (8.8) see pic. above. The tapite M8 bolt is used in order to freeze the side adjustable brackets. Tighten M10 bolts to 37 ft lbs, M12 bolts to 50 ft lbs and tapite M8 15 ft lbs

10. Mounting, other

Mount the aluminium profiles with 2 bolts M8x20 (8.8) each, tighten to 18 ft lbs. Put the bolt heads into the aluminium profile, and then position the profiles onto the brackets.

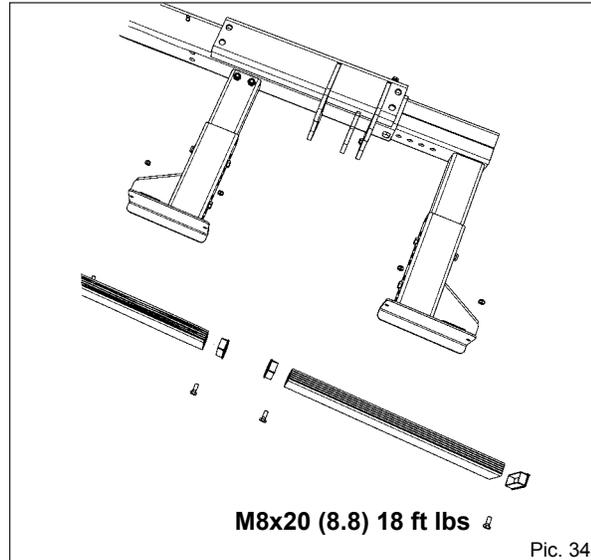


Standard, bumper bar

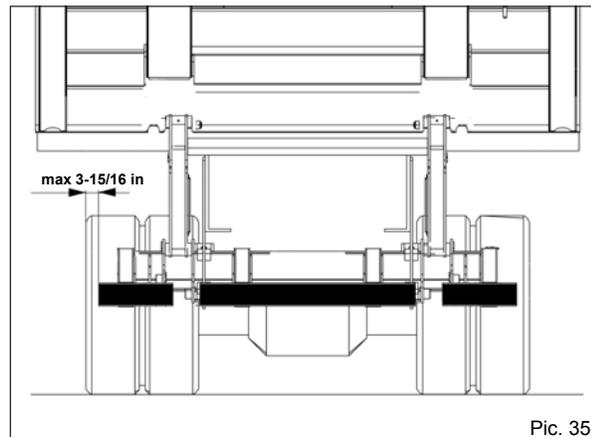


Pic. 36

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



Pic. 34

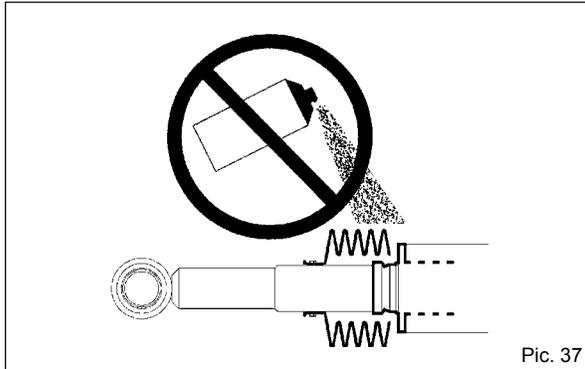


Pic. 35

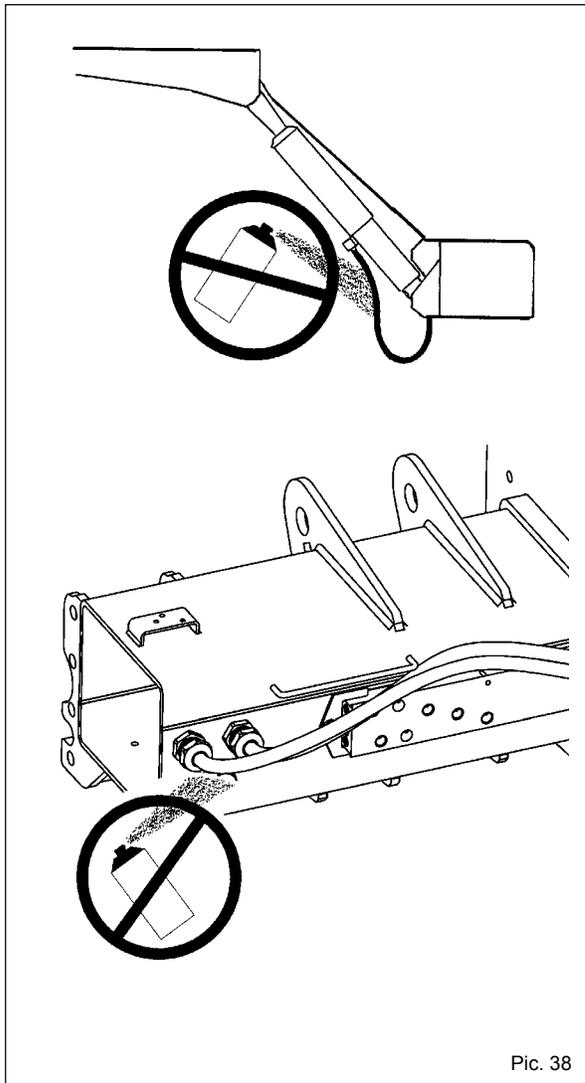
11. Important information

Repainting

NOTE: 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 exist!

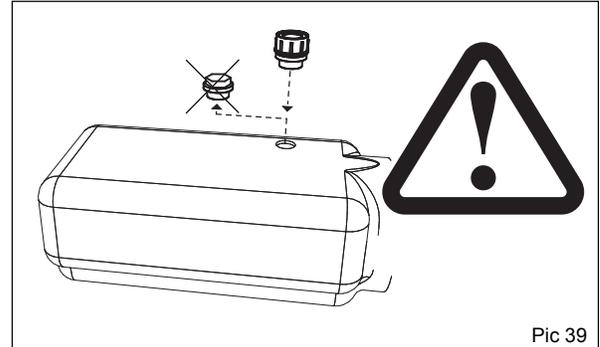


Hydraulic hoses or cables must not be painted, the paint's solvent can damage the hose's/cables rubber compound and can adversely affect durability



Replace the transport plug

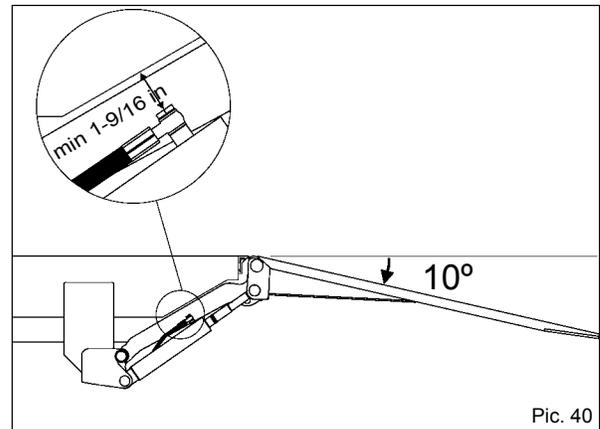
During installation the oil tank transport plug should be removed and replaced



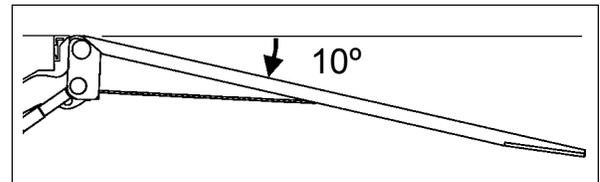
Moveable parts - free movement

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 1-9/16 in to all fixed points from this position.



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

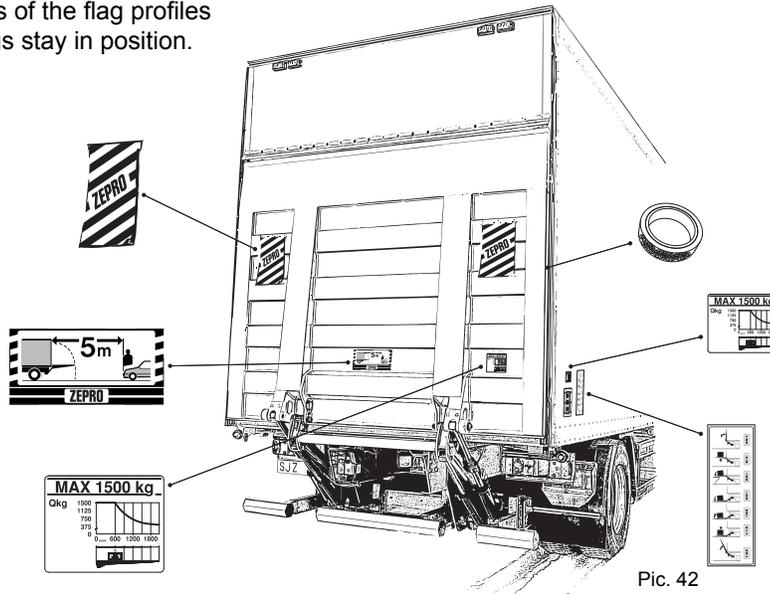


Pic. 41

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.



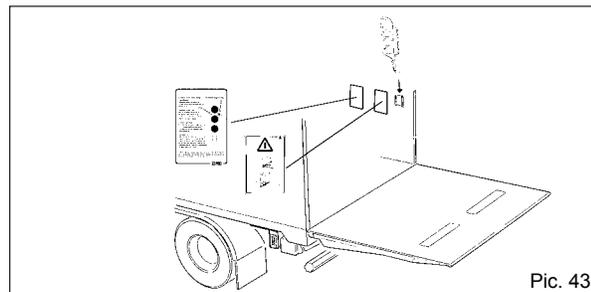
Pic. 42

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.

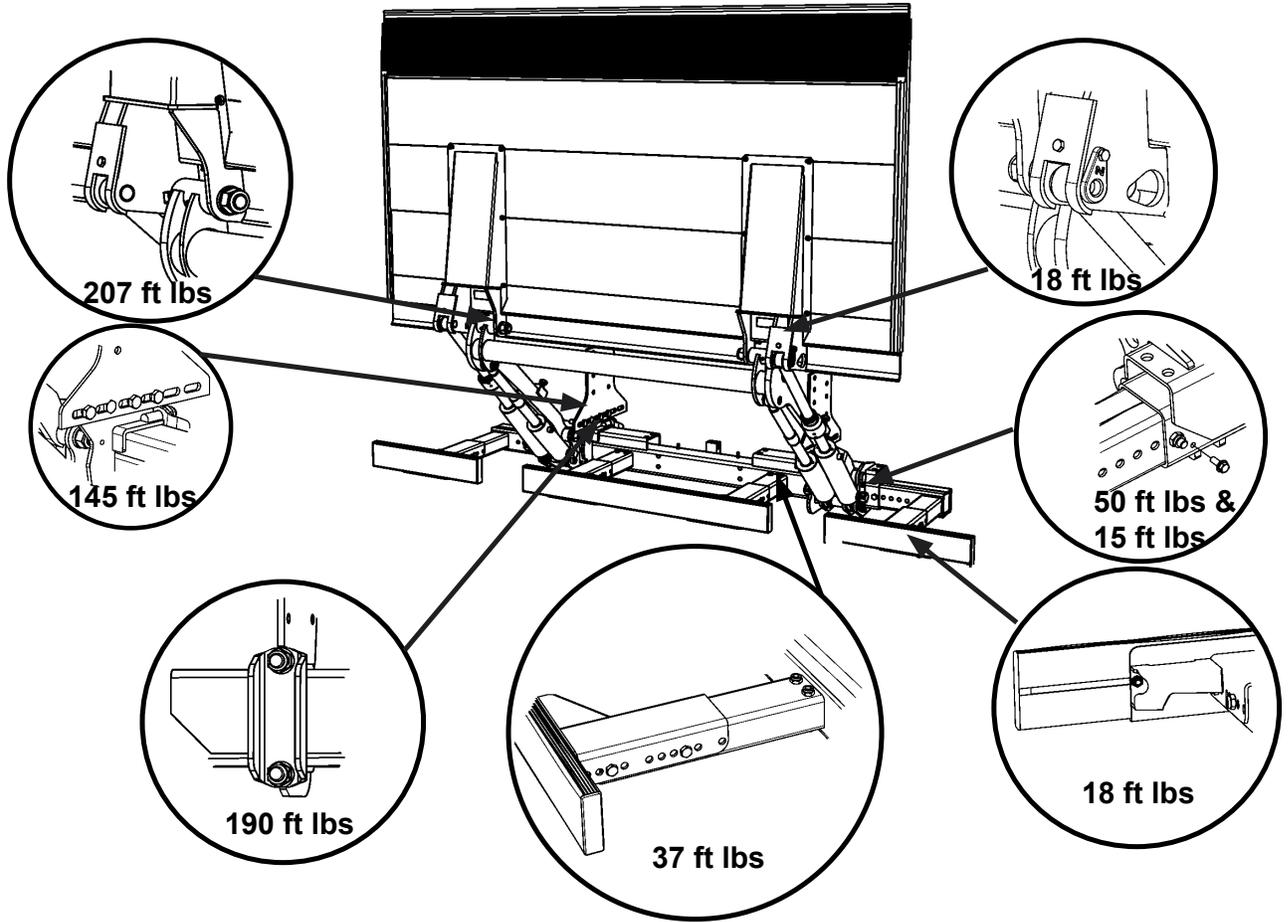
An operating instructions decal should be placed next to the main control unit.

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

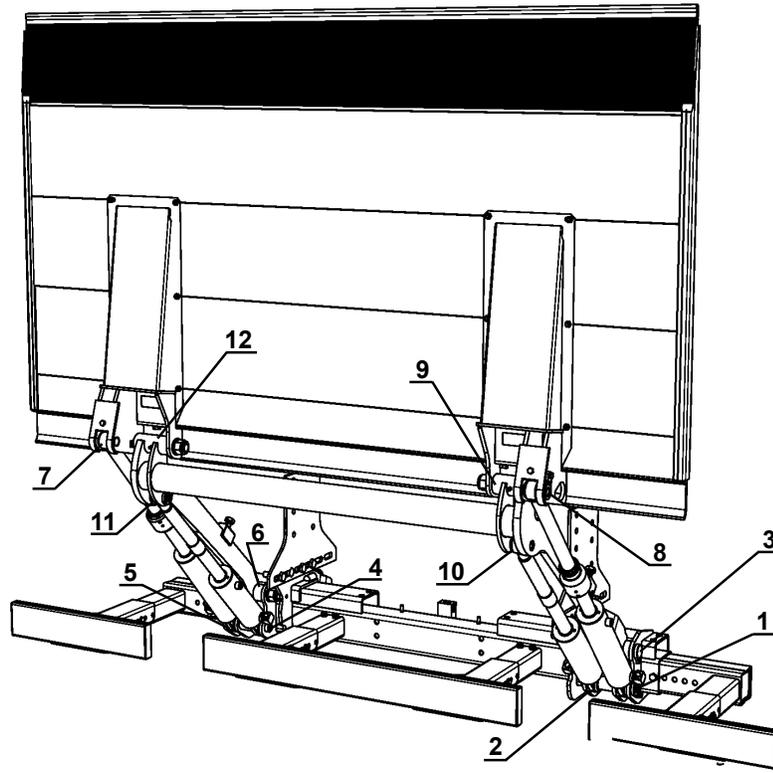


14. Maintenance, lubrication chart

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 lift cylinder, 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.

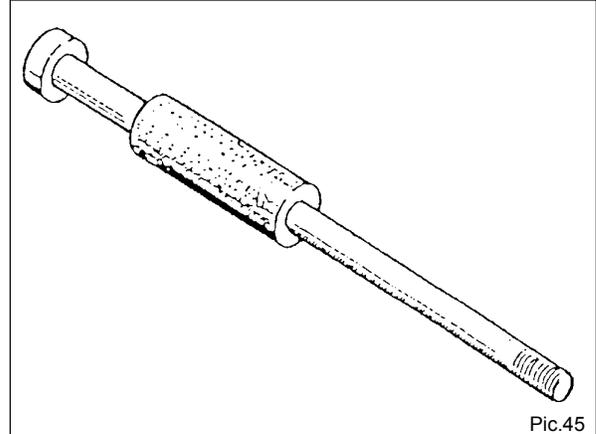


The hydraulic unit tank is filled with a mineral based hydraulic oil (art.no 21963 for 1 litre.) or a biodegradable synthetic oil (art.no 22235 for 1 litre). There is a sticker on the hydraulic unit indicating which type of oil is in the tank.

15. 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. (NOTE: 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. NOTE: 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.



16. Tables, diagrams

1. Max power consumption, Loading diagram.....	31
2. Dimensions for installation.....	32
3. Electric and hydraulic diagram	35
4. Connection unit	38

16.1 Max power consumption, Loading diagram

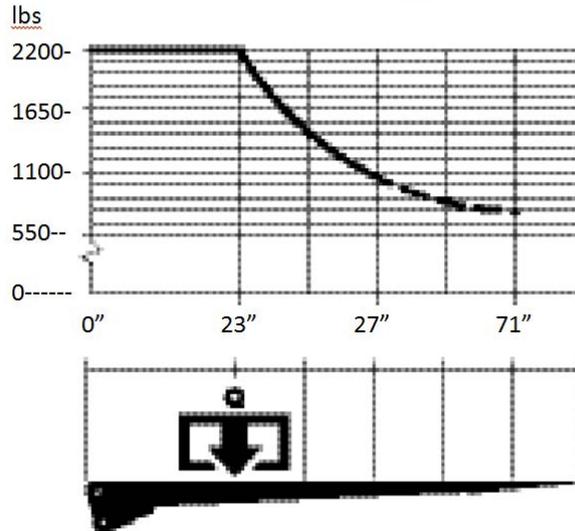
Max power consumption

Z - 100 (2900 psi)

(2900 psi)	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
Cable area:		
Control cable	.002 in ²	.002 in ²
Main cable 0-8m	.05 in ²	.05 in ²
Main cable 8-15m	.08 in ²	.05 in ²
Main cable >15m	-	.05 in ²
Power source:		
Min. capacity	140 Ah	110 Ah
Min. voltage	9 Volt	18 Volt

Loading diagram

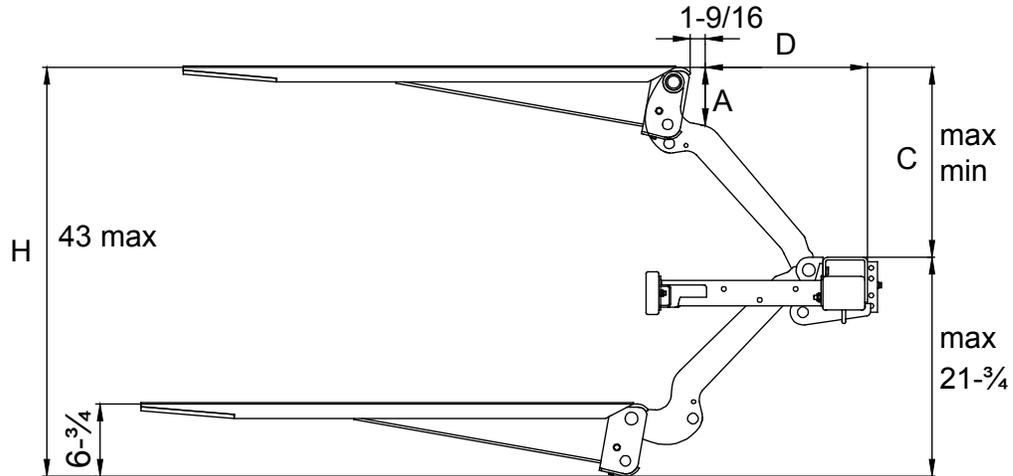
MAX 2,200 lbs



16.2 Dimensions for installation

For models with lifting height 43"

Z-100-110

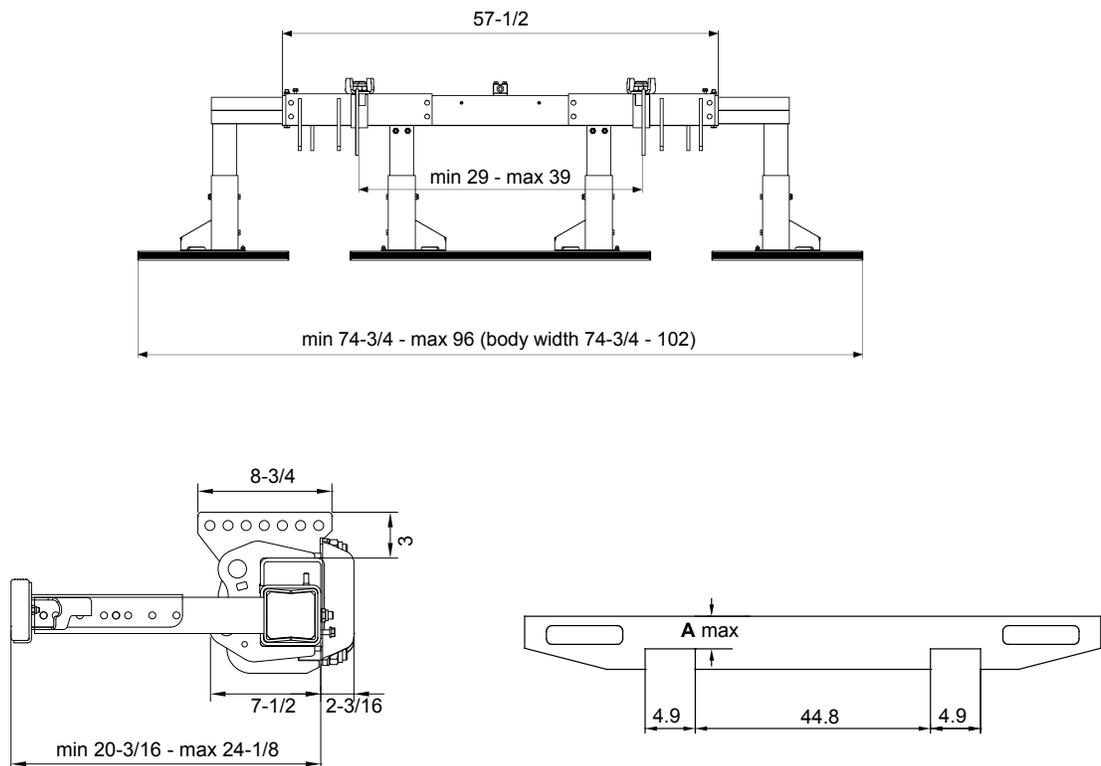
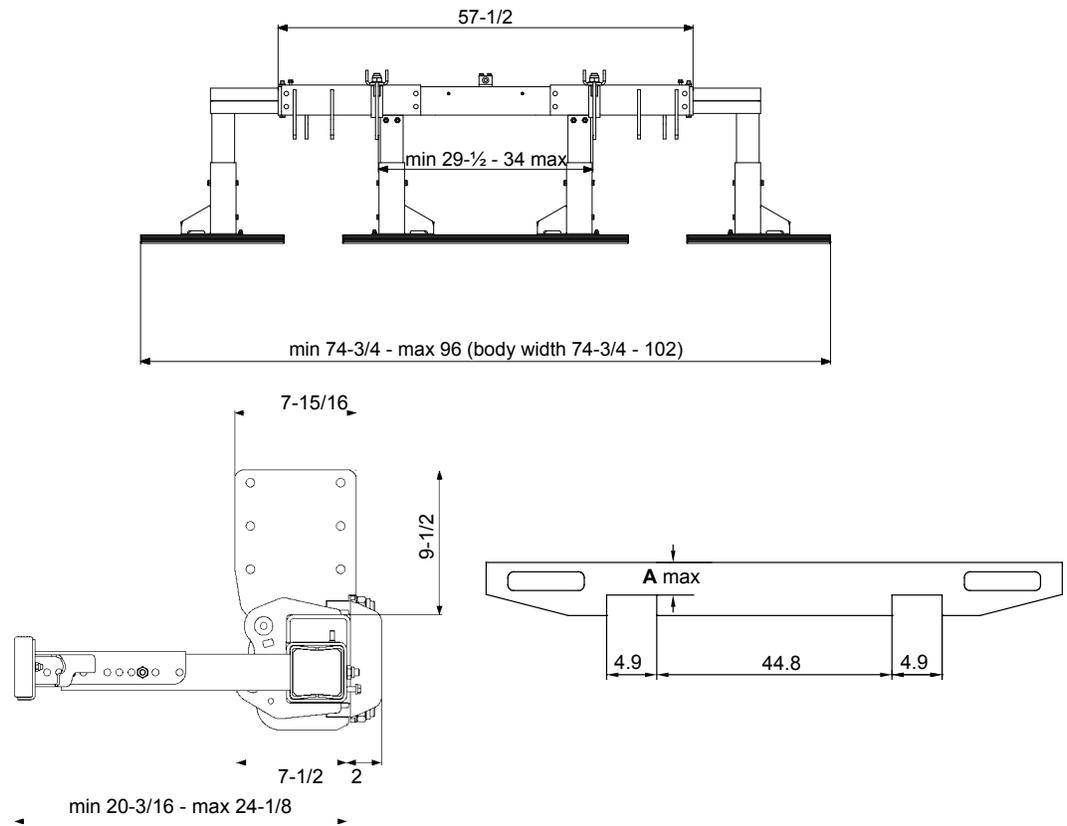


Lifting height 43"

C	A	D
21- ³ / ₄	5- ³ / ₄	17- ³ / ₄
19- ³ / ₄	5- ¹ / ₄	20
17- ³ / ₄	4- ³ / ₄	22
15- ³ / ₄	4- ¹ / ₂	23- ¹ / ₂
13- ³ / ₄	4- ¹ / ₄	24- ³ / ₄
11- ³ / ₄	4	25- ³ / ₄

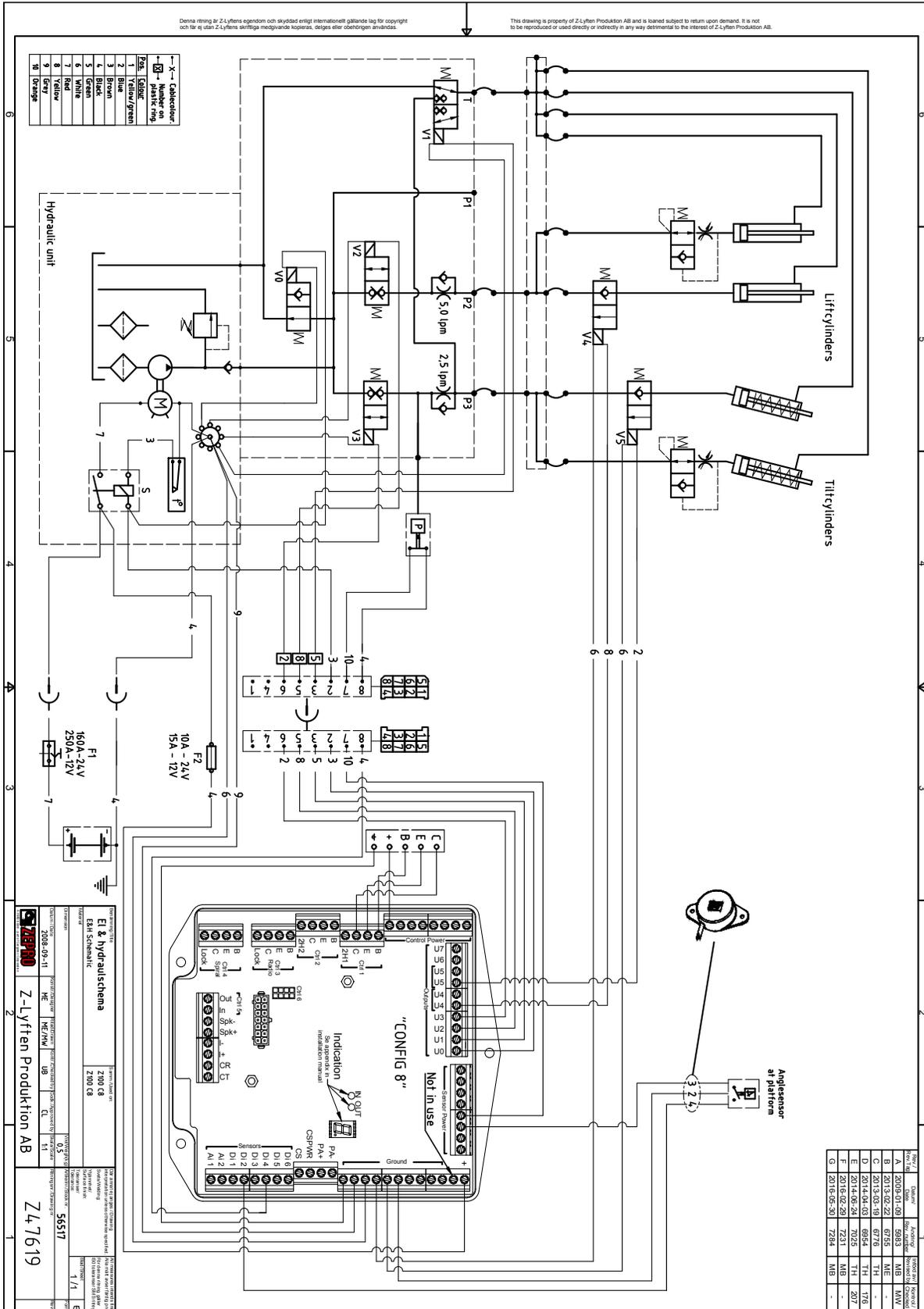
16.2 Dimensions for installation

Z-100



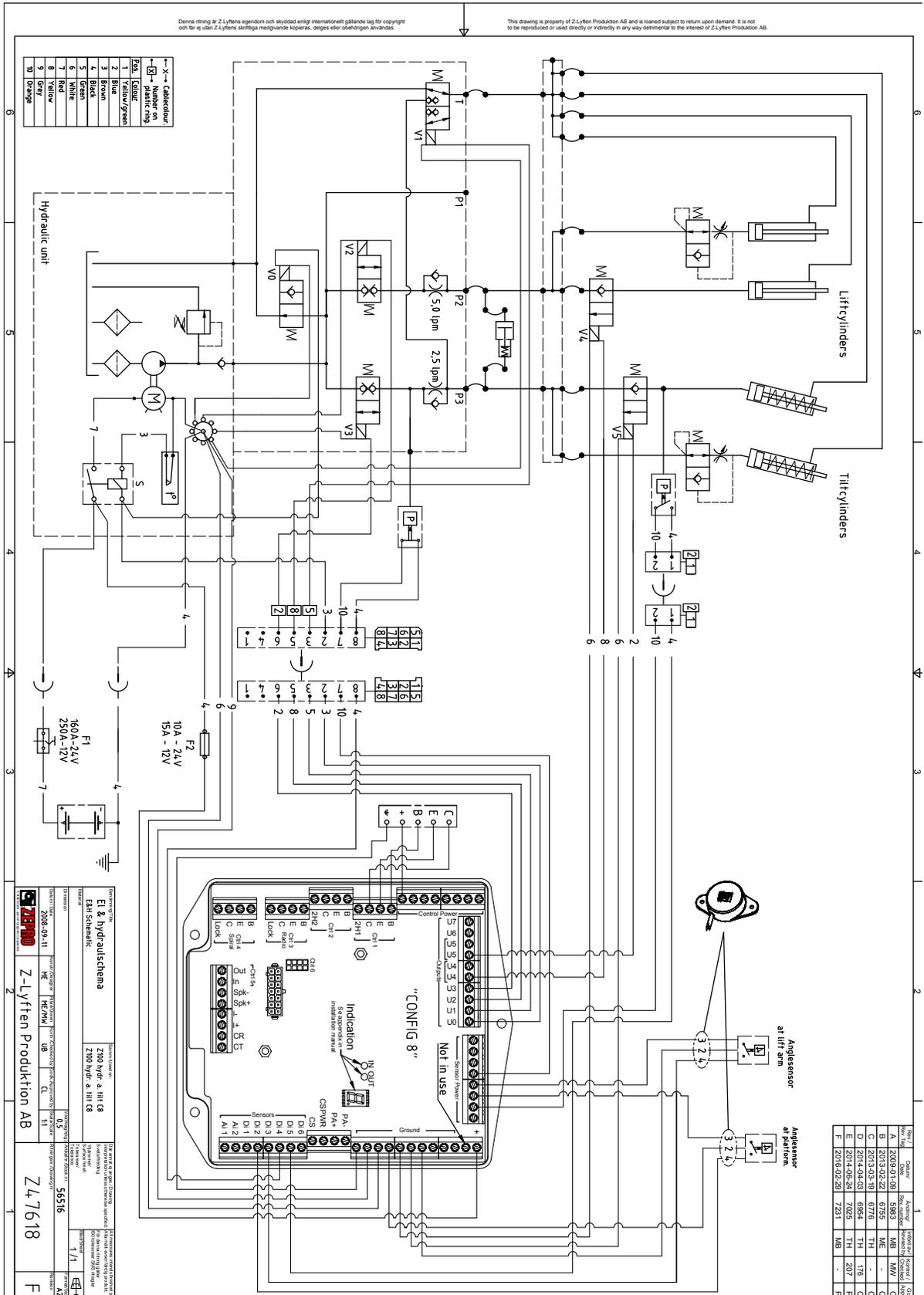
16.3 Electric and hydraulic diagram

Z-100



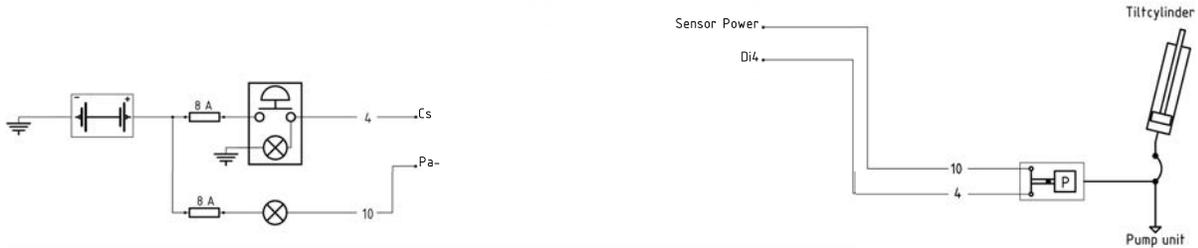
16.3 Electric and hydraulic diagram

Z-100, with hydraulic auto-tilt

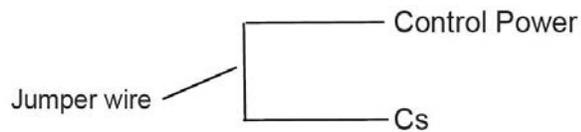


16.3 Electric and hydraulic diagram

Cabin switch, Alarm for open platform



If Cabin switch is not used, add jumper wire

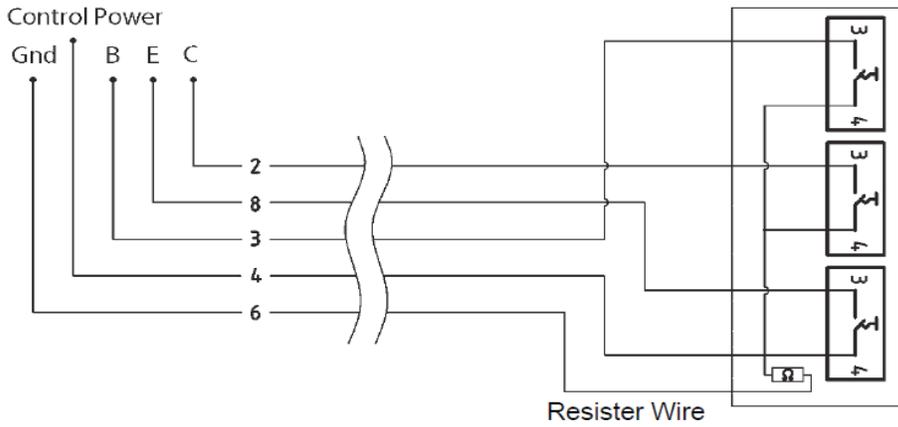


Shut-Off Switch for trailers



16.3 Electric and hydraulic diagram

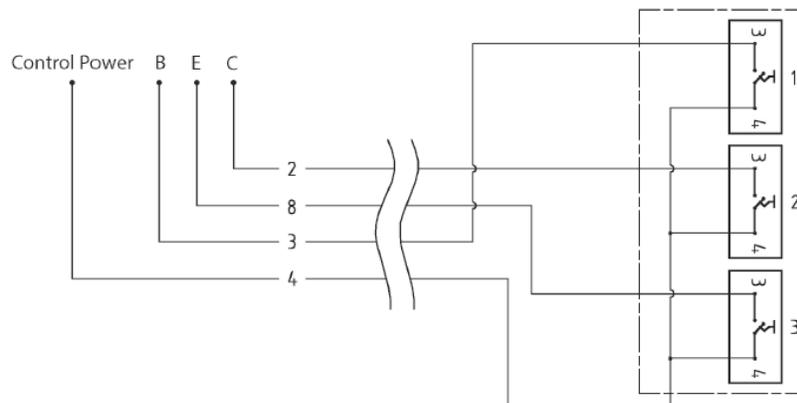
3-button control unit



NOTE:

The permanent switch control box comes with a resister heater wire, it is recommended that this wire be removed and not used.

3-button remote control unit with spiral cable

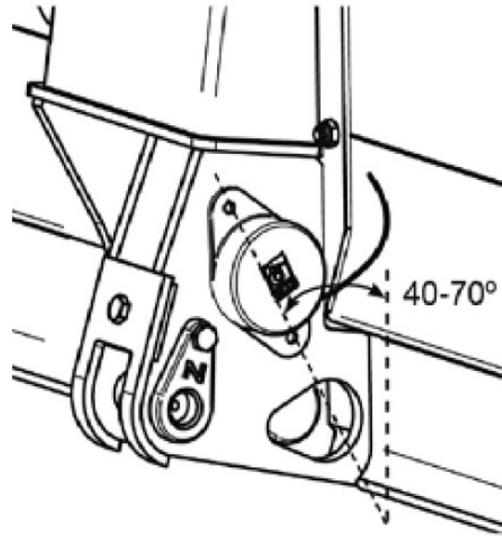
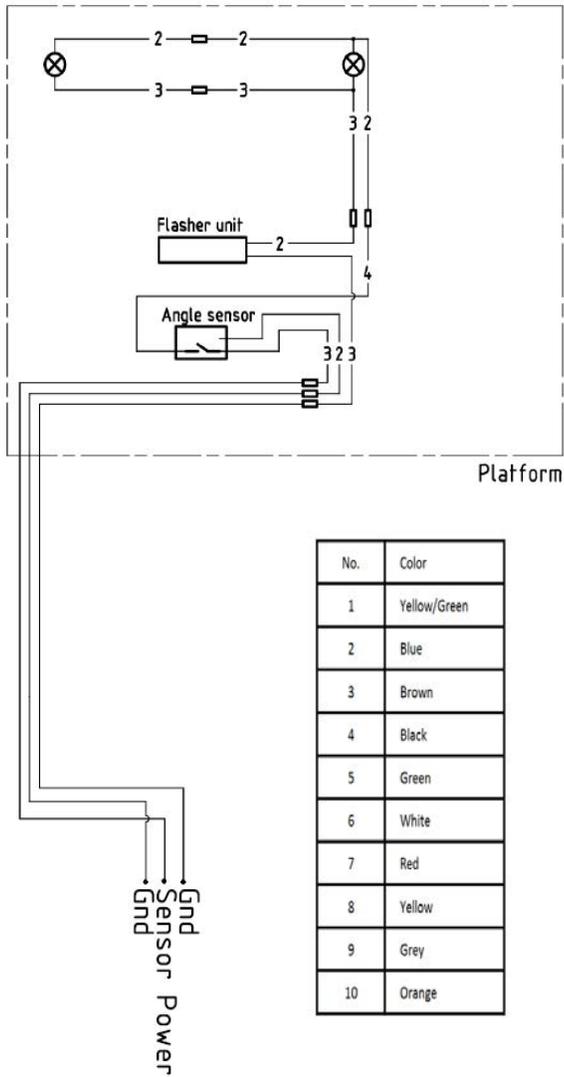


Platform Lights

Connect the platform lights as shown below. Mount the light sensor as pictured.

From closed to 45 degrees, the warning lights should be turned off.

From 45 degrees to open, the warning lights should be turned on.



16.4 Connection unit

Operating information

All the lift's functions are controlled and monitored through the connection unit and its circuit board. The circuit board is equipped with an alphanumeric 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:

- Function display
- Fault display
- Program configuration.

The flashing light indicates:

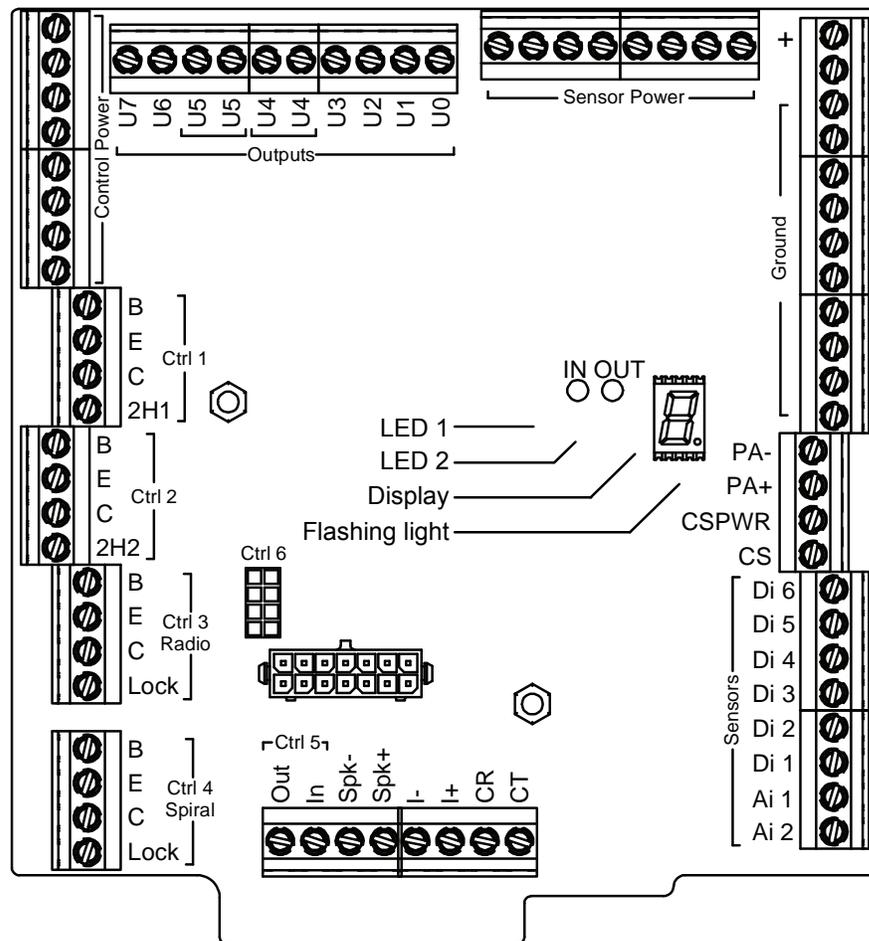
- Supply voltage
 - Off: No supply voltage
 - On: Supply voltage available but CS (cabin switch) is not active.
 - Flashing: CS (cabin switch) is active, the system is awaiting input signal.

LED 1 indicates:

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

LED 2 indicates:

- Active output, lift in operation.



16.4 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).

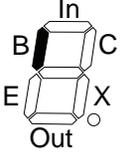
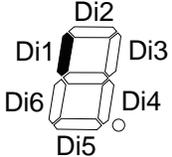
The control devices are symbolised by the figures 1-7.

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 control devices have such a short locking period that there is hardly time to see the indication.

Coil and radio 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.

16.4 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			Version number	
1.-7 (Fixed light) Active control device while operating	1-7			Fixed light (1-7) 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 that the control system is locked for a while after operation completed.	1-7			<p>Control device the control system is locked for.</p> <p>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.</p> <p>The number will stop flashing when one of the current control device's buttons are pressed.</p> <p>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.</p>	
C Sensor indication	Segment			<p>1-6 segments indicate sensors.</p> <p>On - signal in.</p> <p>Off - no signal in.</p> <p>(See electrical and hydraulics diagrams for information about the location of the sensors).</p>	

Example of sequence of information codes:

Program configuration: 01, Voltage detected: 12V, Software version: 02



16.4 Connection unit

Fault codes

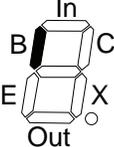
If a fault arises, the fault code is shown in the display in the form of a letter for identifying the fault, followed by numbers and/or number segments for further information, followed by sensor indication (C) in accordance with the previous page.

In fault codes E, F and U, the numbers (1-9) show which control device/output the fault code refers to.

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)
8. Control Power
9. Sensor Power

If the system discovers several faults, only the fault code for the fault with the highest priority will be shown automatically. The display is prioritised in the order in the table below, L/H, E, F, U and A. To see all faults, press and hold in button C on the control device. Then the system will browse through the list so that all faults the system has detected are seen.

When the CS is switched off, the system will browse through a list containing the five latest faults detected before the display goes off.

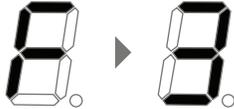
Fault codes					
Identification	Code 1	Code 2	Code 3	Information	Other
L Low battery voltage	07-35			Voltage measured	
H High battery voltage	07-35			Voltage measured	
E Control device locked	1			Fixed control device (incl. two-hand button 2h1 if they are monitored)	
	2			Fixed control device 2 (incl. 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 will flash depending on which button signal locks the control device; a fixed light indicates pressing the button for troubleshooting. Segments B, C, E or X are illuminated depending on which button locks the control device.	
F Output short-circuited/high current	0-9			Which output has short-circuited/has high current.	1-7 Control device, displayed only after the respective output/function has been active.
Output not connected/cable breakdown	0-7			Which output is not connected/ has cable breakdown.	8 Control power 9 Sensor power Displayed only after the respective output/function has been active.
A Internal fault	0-				Contact support if the lift does not function.

16.4 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.



Supply voltage

A supply voltage of between 8.0V and 15.0V is regarded by the unit as correct for a 12V system.

A supply voltage of between 18.0V and 29.0V is regarded by the unit as correct for a 24V system.

All functions on the unit cease when the supply voltage is less than 7.0V. If the supply voltage then rises to more than 7.0V, functionality is restored.

Controller 1 (together with 2h1 on certain models) allows emergency operation of the lift at voltages down to 7V or 16V. This takes place at your own risk and only works for a limited time, after which a rest period is required.

16.4 Connection Unit

Function schema (also refer to corresponding. el & hyd. diag.)

**Z 100 with circuit card
Z 100, with hydraulic auto-tilt
(config 8, art. no. 34308TL)**

<u>Function</u>	<u>Signal in</u>	<u>Signal Out</u>	<u>Notes</u>
Lift	B	U0+U0+U2*	**U2" is delayed at start of the function with 0.2 s.
Lower ¹	E	U2+U4	
Lower ²	E+Di3	U2+U4+U5	When the angle sensor "Di3" at the lift arm is activated, also the U5 is activated.
Tilt up	B+C	U0+U0+U3*	**U3" is delayed at start of the function with 0.2 s.
Tilt down ¹	C+E	U3+U5	
Tilt down ²	C+E+Di2+Di4	U1+U3+U5	
Angle sensor	Di2		Gives a signal from that the platform is tilted up 20° from horizontal plane, up to over 90°
Angle sensor	Di3	Lower ²	An angle sensor at lift arm ensures that the lift arm is let down for auto tilt.
Open platform alarm	Di4	Pa(-)	Pressure guard for dropping pressure connected to the tilt cylinders + side, sends (when in neutral mode) connected signal (+) back to Di4, which in turn sends a signal out (-) on Pa-, or provides Di4 with +signal from a tilt sensor in the foot control unit cable set to indicate 'platform open'.
Pressure transmitter	Di4		At pressure under 60 Bar the following is activated: P+/- and the function "Di4" at Tilt down ² . At 210 Bar the functions "Lift" and "Tilt up" is blocked/ cancelled.
Over load protection	Di5	Blocks/cancels lift & tilt up.	Pressure guard for rising pressure connected to tilt cylinders + side sends (when activated) +signal back to Di5 which blocks/cancels lift and tilt up functions.
Activation	Cs	Activates the circuit card.	No signal in on Cs results in blocked control unit connectors. Signal to Cs usually comes from the cabin switch, or in cases where such a switch is not used the +signal comes in on Cs bridged from+ on the nearby connector.

IMPORTANT

WARNING

Improper operation and maintenance of this liftgate could result in severe personal injury or death.

Read and understand the contents of liftgate Owner's manual and all warning and operation decals before operating and/or performing maintenance on this liftgate.

**For SAFETY information on this liftgate see
Chapter 1 of Owner's manual**