Installation Instructions

Tail Lift

Z 10/15/20

ZEPRO
Tel.: +46 (0)10-459 05 00
E-mail: zeprotech@hiab.com | zepro.com

55757TL
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ZEPRO

Contents

1 Introduction

1.1 Important

The following “warning markings” appear in the installation instructions and are intended to draw your attention to circumstances potentially causing unwanted situations, near misses, personal injury or damage to the product, etc.

NOTE.

Take care. Risk of damage to the product.

WARNING!

Take extra care. Risk of personal injury or damage to the product and the surroundings.

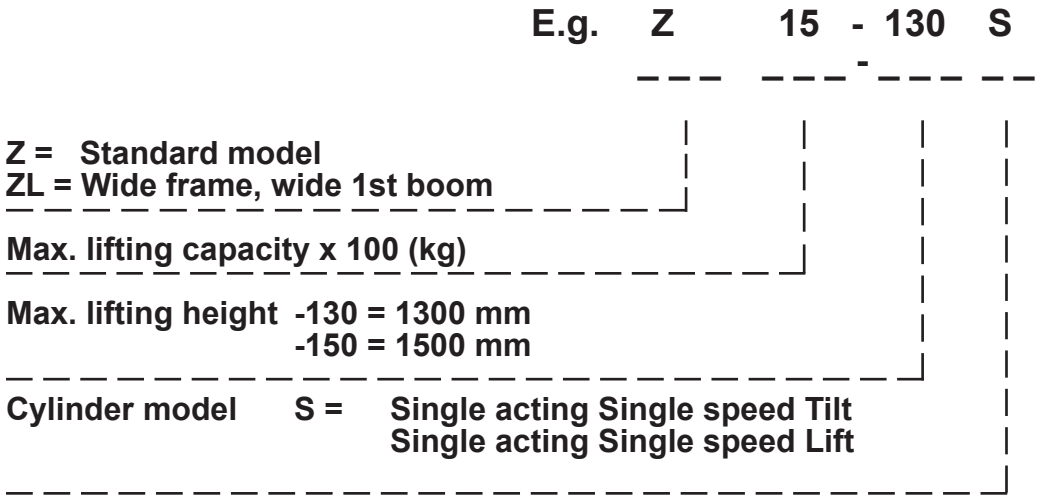
1.2 Technical support

If technical support is needed, please contact ZEPRO. Tel: +46 (0)10-459 05 04, E-mail: zeprotech@hiab.com.

Always be ready to state the tail lift’s production number to guarantee you receive the correct information. The production number is given on the identification plate located on the tail lift frame.

Image 1. Identification plate

1.3 Identification



1.4 CE marking

ZEPRO tail lifts for sale on the European market are CE marked (Conformité Européenne). The manufacturer guarantees that the product complies with the EU Machinery Directive.

Follow the installation instructions carefully. Modifications not approved in writing by the manufacturer are not permitted. Welding is not permitted.

CE

1.5 Product approval

Properly assembled, this product meets relevant requirements according to EN 1756-1:2001 + A1:2008.

1.6 Hydraulic oil

If the hydraulic oil needs to be replenished, only the oil recommended by ZEPRO is permitted to be used.

Hydraulic systems with hydraulic oil tanks without labelling are only permitted to be filled with highly refined mineral oil (art. no. 21963, 1 litre).

Hydraulic systems with hydraulic oil tanks marked with a specification for the hydraulic oil are only permitted to be filled with the oil specified on the label.

1.7 Guarantee

After installation, testing and verification, the tail lift's delivery card must be registered for the guarantee to be valid.

1.8 Repainting

IMPORTANT!
Piston rods and cylinder covers must not be painted. Among other things, this can damage the cylinder gaskets.
Boots, hydraulic hoses and cables may not be coated/painted as the solvent in the paint can damage the hoses and cables and impair durability.

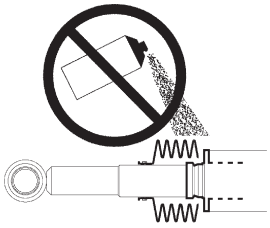


Image 2. Piston rods, cylinder covers and boots

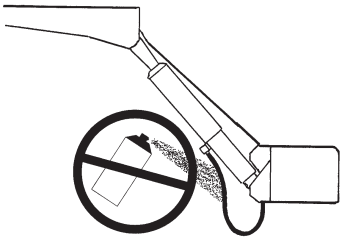


Image 3. Hydraulic hoses

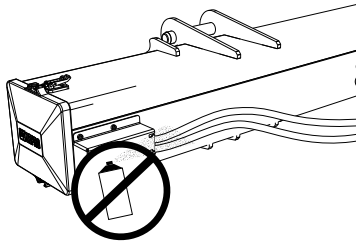


Image 4. Cables

1.9 Battery maintenance

When storing for longer than 1 week, it is recommended to disconnect the lift from the battery via the main switch or by releasing the lift's main fuse, in order to reduce the risk of the battery discharging. The length of time the vehicle can be stored without the battery charge level becoming too low depends on the condition of the battery, the charge level prior to storage and how much power other components in the vehicle take from the battery. After a period of storage, the battery must always be charged fully before operating the lift.

When installing the lift and when carrying out maintenance and repair work, when the lift is operated repeatedly without the vehicle being started and used, the battery charger must be used between operations to maintain the battery charge level.

NOTE.

The battery charger must not be connected when operating the lift. Risk of material damage.

2 Safety rules

2.1 Transport plug

NOTE.

When the lift is installed, the transport plug in the hydraulic unit must be removed and replaced with the normal tank cap supplied with the hydraulic unit.

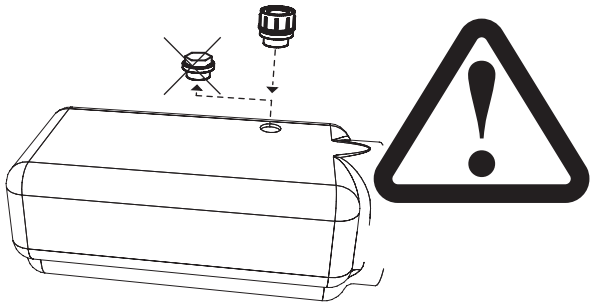


Image 5. Replace the transport plug with the normal tank cap

2.2 Moving parts - free movement

WARNING!

When the final inspection* takes place, the space occupied by the moving cylinders must be cleared and made safe. There is a risk of collision between the cylinder and the following items: subframe, truck chassis, beam for rear light (number plate) and the chassis bracket of the lift (with a short overhang).

*The final inspection must be carried out with the platform at the vehicle floor and tilted down 10°. The clearance from the closest part of the cylinder must be at least 40 mm.

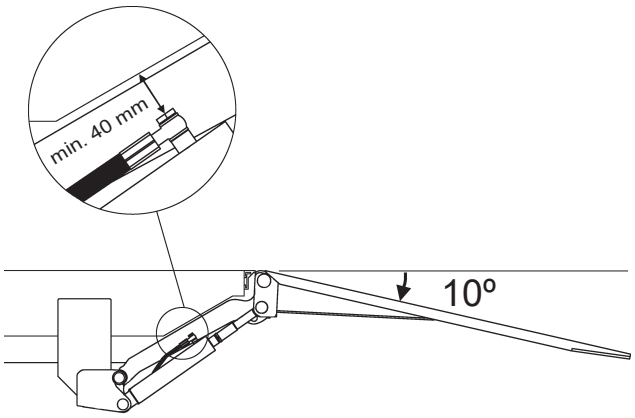


Image 6. Clearance to the closest part of the cylinder must be at least 40 mm

WARNING!

The platform must not be tilted down more than max. 10° from horizontal when people are on the platform.

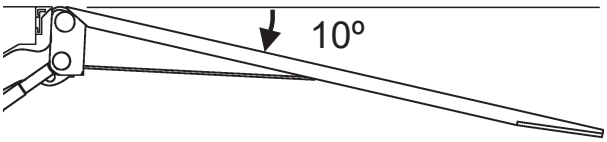


Image 7. The platform must not be tilted down more than 10° from the horizontal

2.3 Third-party equipment must not be attached

WARNING!

You must not attach equipment (electric or hydraulic) to Zepro tail lifts that has not been approved. Attaching unapproved equipment may interfere with the lift system and its safety functions. Risk of injury and damage. If it is necessary to install other equipment, check the vehicle manufacturer's body instructions and use the attachment features on the vehicle.

2.4 Installation

WARNING!

The platform must not be installed so it cannot reach ground level.

WARNING!

Zepro tail lifts are only approved for installation with Zepro assembly kits.

NOTE!

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

3 Installation workflow

3.1 Installing the support frame

- Calculating the installed dimensions
- Attaching the mounting jig to the rear beam
- Aligning the support frame
- Mounting chassis brackets
- Detaching the mounting jig

3.2 Electrical connections

- Installing the controller
- Installing the controller cables
- Installing the main power cable

3.3 Installing the platform

- Installing the platform
- Installing seals and end stops
- Installing the armstops

3.4 Installing the cylinders

- Adjusting the tilting cylinder
- Testing

3.5 Attaching stickers

4 Calculating the installed dimensions

For easier installation, it is useful to calculate and specify the necessary dimensions in advance. Determine the C dimension first, then obtain the other dimensions from the relevant table. You should try to place the lift as high as possible within the specified C dimension in the table.

4.1 C dimension

The C dimension is the distance between the top of the support frame and the vehicle floor level. This dimension governs how far the lift needs to be installed under the vehicle body (D dimension) and the space there will be between the 1st booms in the upper position and the vehicle floor level (A dimension).

4.2 D dimension

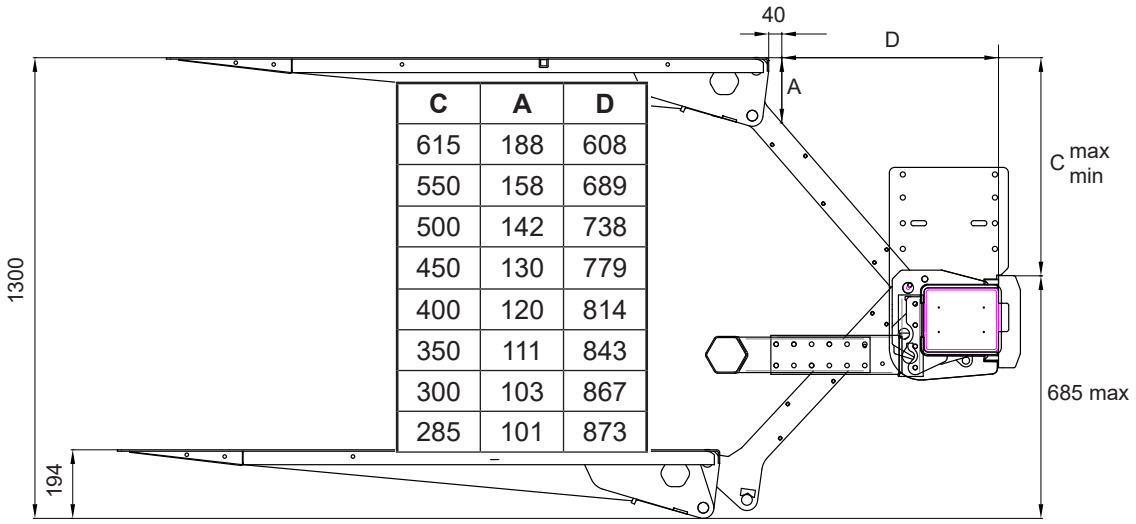
The D dimension is the space the lift needs, measured from the rear edge of the body to the front edge of the support frame (in the direction of the vehicle). Once the C dimension is determined, the D dimension can be obtained from the table.

4.3 A dimension

The A dimension is the space provided for the rear member, i.e. the space there will be between the 1st boom and the vehicle floor with the lift in the raised position. The A dimension depends on the C dimension

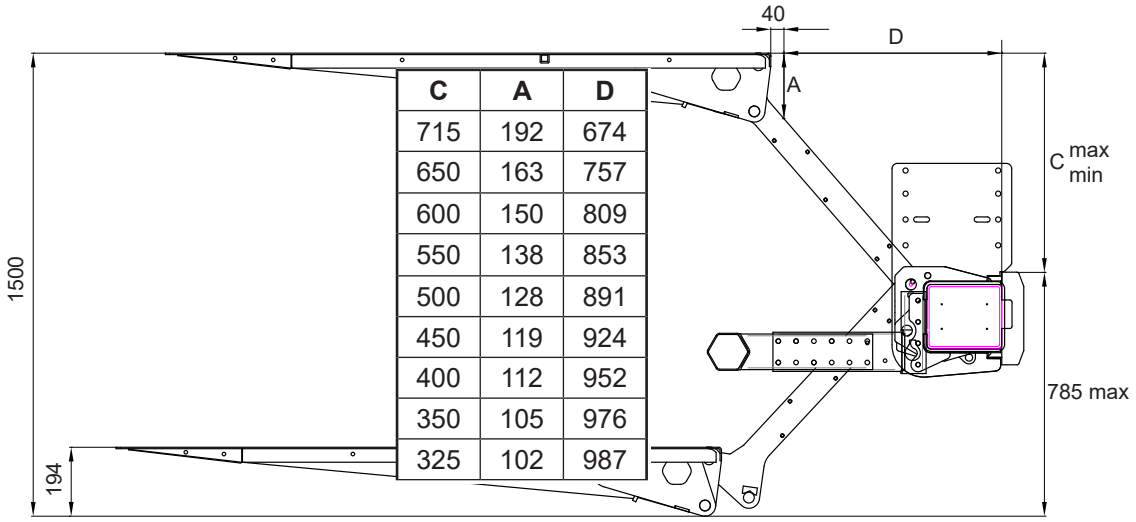
4.4 H dimension

The H dimension is the height from the ground (unloaded) to the vehicle floor level. The H dimension must not be greater than the maximum lifting height of the lift. The platform must always be able to reach ground level.



C	A	D
615	188	608
550	158	689
500	142	738
450	130	779
400	120	814
350	111	843
300	103	867
285	101	873

Image 8. Z 10/15/20 - 130



C	A	D
715	192	674
650	163	757
600	150	809
550	138	853
500	128	891
450	119	924
400	112	952
350	105	976
325	102	987

Image 9. Z 10/15/20 - 150

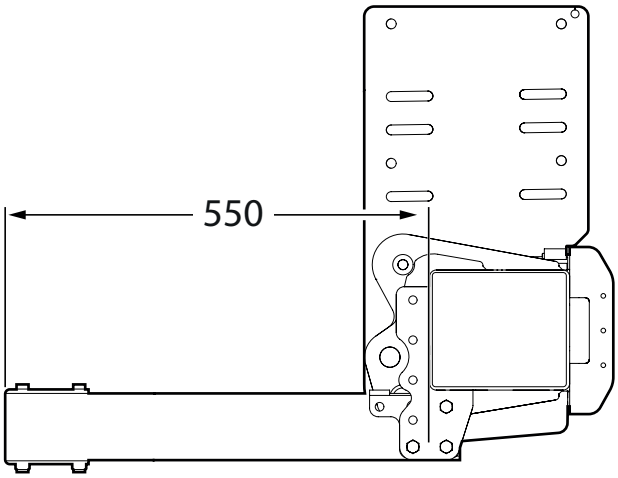


Image 10. Z 10/15/20 - 130

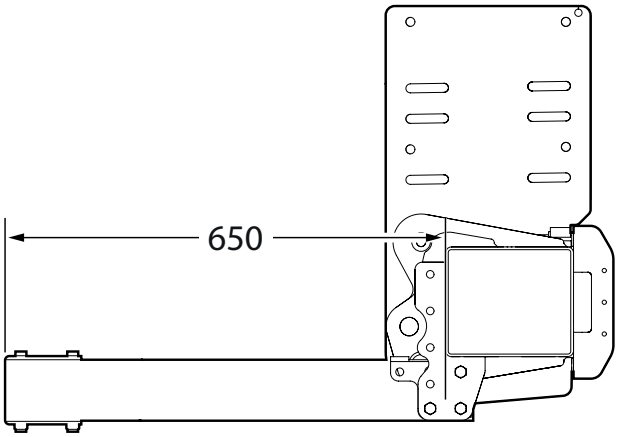


Image 11. Z 10/15/20 - 150

NOTE!
The underrun protection is included in the total length of the vehicle!

5 Rear member cut-outs

It is often necessary to create cut outs in the rear beam to provide space for the platform arms when the platform is in the uppermost position. The size of the cut outs depends on the calculated installed dimension “A”, see illustration below.

1. Measure and mark the location and depth of the cut outs on the rear beam. The two cut outs must be centred on the rear beam, i.e. both cut outs must be an equal distance from the mid-point of the beam.
2. Cut along the markings.
3. Grind away any burrs or sharp edges.

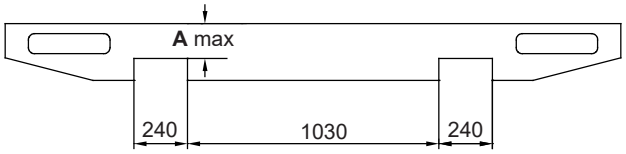


Image 12. Z 10/15/20

6 Installation

NOTE.

Also consult the vehicle manufacturer’s body instructions and Zepro’s Operator's Manual before installation.

WARNING!

Zepro tail lifts are only approved for installation with Zepro assembly kits.

6.1 Support frame

1. Measure and mark the midpoint of the rear member of the vehicle. See Image 13.
2. Bolt or spot-weld the mounting jig to the rear beam, so that both mid-points are aligned, see Image 14.
3. Position the support frame under the vehicle frame.
4. Raise the 1st booms to their highest position.
5. Attach the 1st booms to the eye of the jig, see Image 15. Use the steel platform’s normal pivots.
6. The support frame should be positioned as high as possible within the specified C dimension. Adjust the frame to the ideal height under the chassis. Use the lift's packaging and a forklift, See Image 15. The frame must be positioned parallel with the floor of the vehicle body and must not be in contact with the vehicle frame; there must be a few millimetres of play. If necessary, adjust the angle of the arms by carefully operating the lift.
7. Install the brackets on the support frame so that its opening is facing towards the front of the vehicle, and adjust the position of the frame so they are in contact with the vehicle frame.
8. Install the U-profile with associated washers and nuts, but do not tighten them. Screw the nuts alternately until the U-profile is aligned in contact with the frame, see Image 16

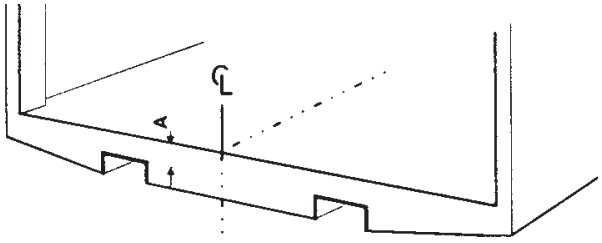


Image 13. Measure and mark the midpoint of the rear beam of the vehicle

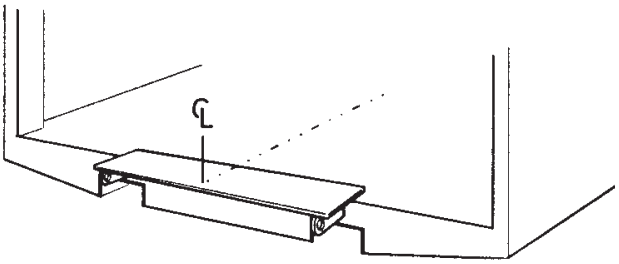


Image 14. Bolt or spot-weld the mounting jig to the rear member part. no. 51724TL for Z 10/15/20

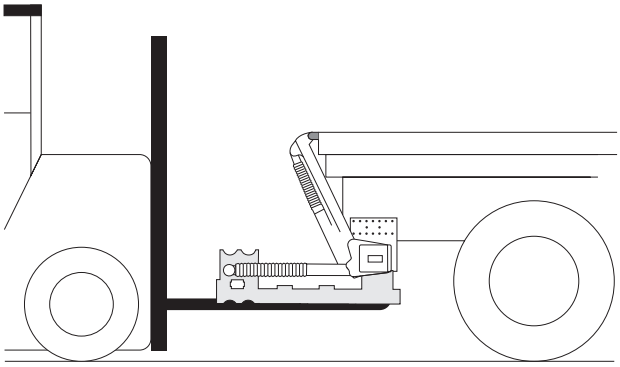


Image 15. Use the lift's packaging and a forklift.

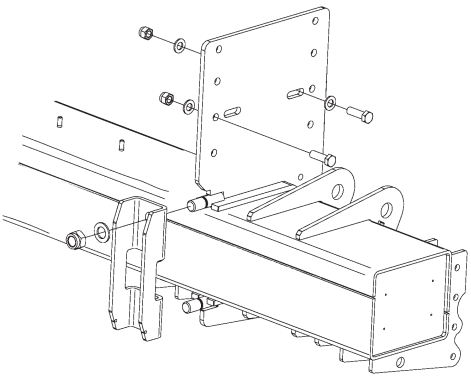


Image 16. Install the U-profile with associated washers and nuts

When installing on chassis with pre-drilled holes, go directly to point 16.

9. Install the U-profile with associated washers and nuts, but do not tighten these. Screw the bolts alternately until the U-profile is aligned in contact with the frame, see "Image 16. Install the U-profile with associated washers and nuts" on page 15.

10. When installing on a frame without pre-drilled holes, install first with a screw in the brackets' slot-shaped holes. On the mark the middle of the brackets' slot-shaped holes and then drill Ø14 mm. holes in the frame; see "Image 18. Install the frame bracket with at least 6x M14x45 10.9 bolts" on page 16

11. Bolt the brackets securely on the outside of the vehicle chassis. Use M14x45 bolts and install the associated washer and nut on the inside of the vehicle chassis. Install the bolts but do not tighten.

12. Check and perform fine adjustment regarding the position of the lift. Then tighten the bolts with a torque wrench.
Tightening torque: 120 Nm.

13. Using a torque wrench, tighten the bolts holding the U-profiles. **Tightening torque: 280 Nm.**

> **NOTE.**
>
> Note that the frame bracket needs a free space of at least 35 mm between the vehicle frame and the support frame, see Image 17.

14. Drill holes in the vehicle chassis for mounting bolts, Ø14 mm. Drill in the outer holes of each bracket. Use M14x45 bolts and install the associated washer and nut on the inside of the vehicle chassis. Installation must be performed with at least 6 bolts in the outer holes. The bolt that was installed initially in the slot-shaped hole may not be included in this figure. If necessary, this bolt can now be moved to one of the outer holes, see illustration. Then tighten the bolts with a torque wrench.
Tightening torque: 120 Nm.

15. Remove the mounting jig.

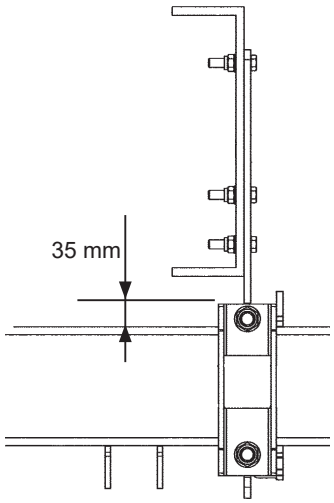


Image 17. Note that the frame bracket needs a free space of at least 35 mm between the vehicle frame and the support frame

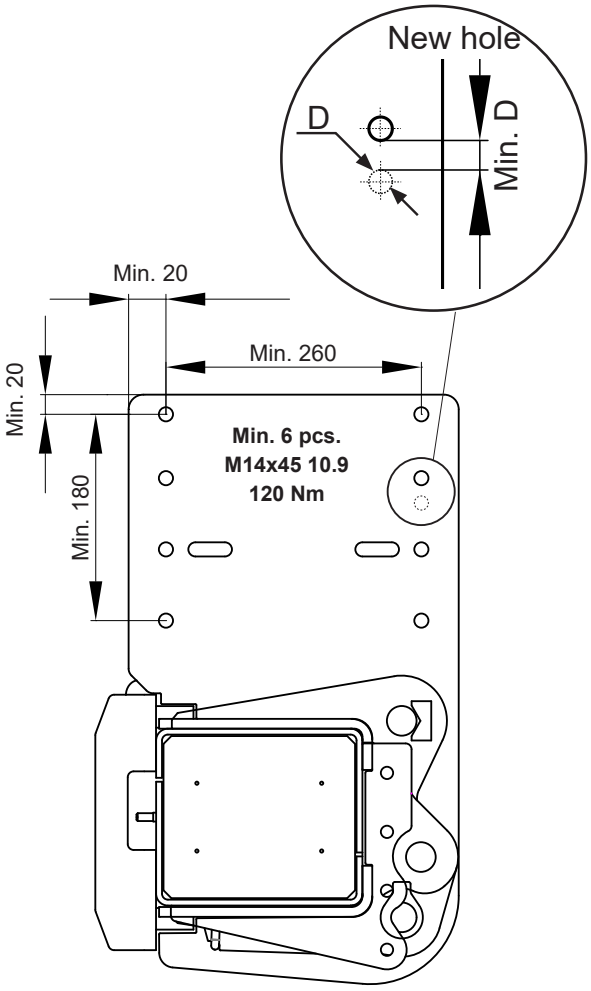


Image 18. Install the frame bracket with at least 6x M14x45 10.9 bolts

When installing on chassis with pre-drilled holes

16. Bolt the brackets securely on the outside of the vehicle chassis. Install in the slot-shaped holes with at least 6 screws. Use suitable bolts (durability equivalent to M14 10.9 or higher) and install the associated washer and nut on the inside of the vehicle chassis. Install the bolts but do not tighten. See Image 19.

17. Check and perform fine adjustment regarding the position of the lift. Then tighten the bolts with a torque wrench. **Tightening torque: Standard for selected screw.**

18. Using a torque wrench, tighten the bolts holding the U-profiles. **Tightening torque: 280 Nm.**

19. Drill holes in the vehicle chassis for mounting bolts in each bracket's two upper round holes. Use suitable bolts (durability equivalent to M14 10.9 or higher) and install the associated washer and nut on the inside of the vehicle chassis. See Image 19. Tighten the bolts with a torque wrench. **Tightening torque: Standard for selected screw.**

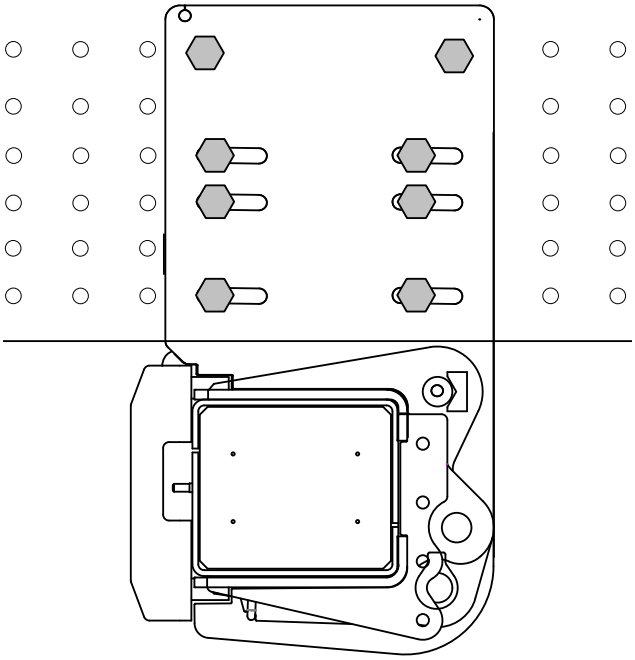


Image 19. Installing the chassis bracket on vehicle chassis with pre-drilled holes

NOTE.

Welding is not permitted on the chassis brackets.

Do not move the lift all the way to the armstops or with the platform fitted before all the bolts are fully tightened against the chassis.

Do not place the lift under load until:

- the correct number of bolts have been installed and torque-tightened.
- the vehicle body is installed to reinforce the truck chassis.

20. Remove the mounting jig.

6.2 Controllers

1. Install the primary controller on the side of the vehicle normally facing away from the traffic. The distance between the vehicle's rear edge and the centre of the controller must be 300-600 mm. Connection is performed later in section 8 if this is not already done from the factory.
2. Any additional controllers can be installed in an optional location. Connection is described later in section 8.

IMPORTANT!

The controller's cable intake must always face downwards.

Pay attention and be careful when running cables to get longer life for the cables and to reduce the risk of unnecessary downtime.

Cables must not be clamped to brake lines or the vehicle's normal electrical system.

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

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

Take care not to bend cables with too tight a radius as this can cause damage.

⚠ WARNING!
The primary controller must always be fitted on the side that is facing away from moving traffic. Fitting in any other way involves increased risk of injury.

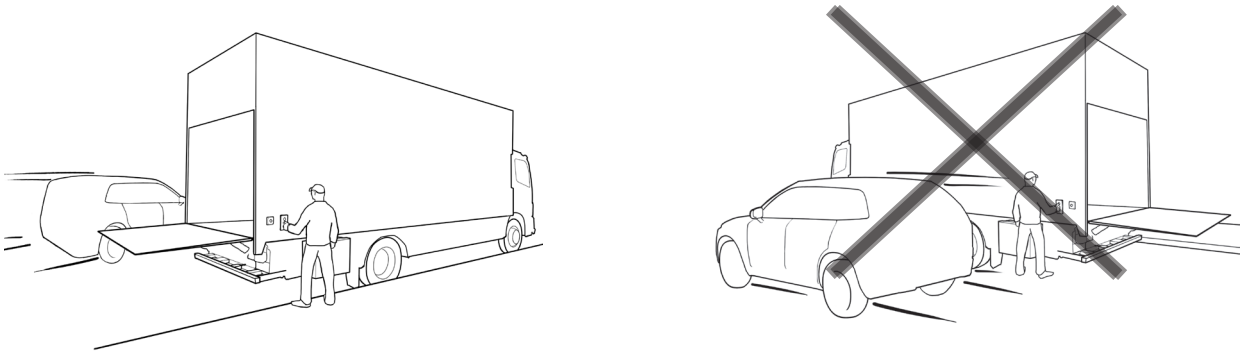


Image 20. Installing controllers

6.2.1 Controllers 3+1 (CD 1)

1. Fit the controllers in the desired locations. However, locate them such that the operator's working position is as safe as possible, and with an adequate overview of the load, tail lift and their working area.
2. The distance between the vehicle's rear edge and the centre of the controllers must be 300-600 mm. The distance between the controllers must be at least 260 mm. See Image 21.
3. Any additional controllers can be installed in an optional location.
4. Run the controller cabling to the tail lift cable grommet. Connection is described later in section 8.

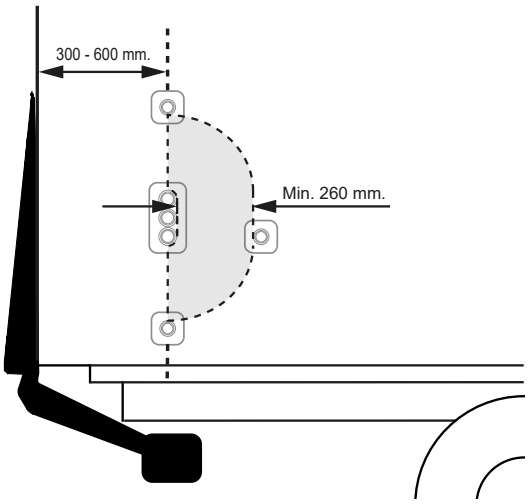


Image 21. Installing controller CD 1 with two-handed grip.

6.3 Underrun protection

6.3.1 Vehicle chassis requirements

In order to comply with the applicable underrun protection standards, there are requirements for the vehicle chassis on which the rear tail lift is mounted.

The moment of inertia in a cross-section on the current frame beam (excluding any support frame) shall not be less than 937 cm4. The cross-section of the frame beam shall therefore have at least dimensions of 220x70x4 mm, corresponding to a surface moment of inertia of 937cm4 around the x-axis. See illustration. If in doubt, contact ZEPRO for support.

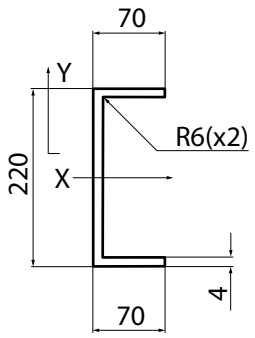


Image 22. The cross-secton of the frame beam

⚠ WARNING!

The above dimensions are the minimum permitted for the installation of underrun protection. The strength requirements for mounting the tail lift usually require larger dimensions.

6.3.2 Statutory dimensions for underrun protection

Distance between the beam and the ground when the vehicle is unloaded:

Max. 450 mm for vehicles with air suspension.

Max. 500 mm for vehicles with conventional suspension.

If the exit angle with the above setting is less than 8º, the distance between beam and ground in an unladen vehicle may be increased until the angle is 8º, but to Max. 550 mm.

Horizontal distance from the outermost part of the platform to the underrun protection: Max. 300 mm. See illustration below.

NOTE!

The underrun protection may be placed further back and lower.

NOTE!
The underrun protection is included in the total length of the vehicle!

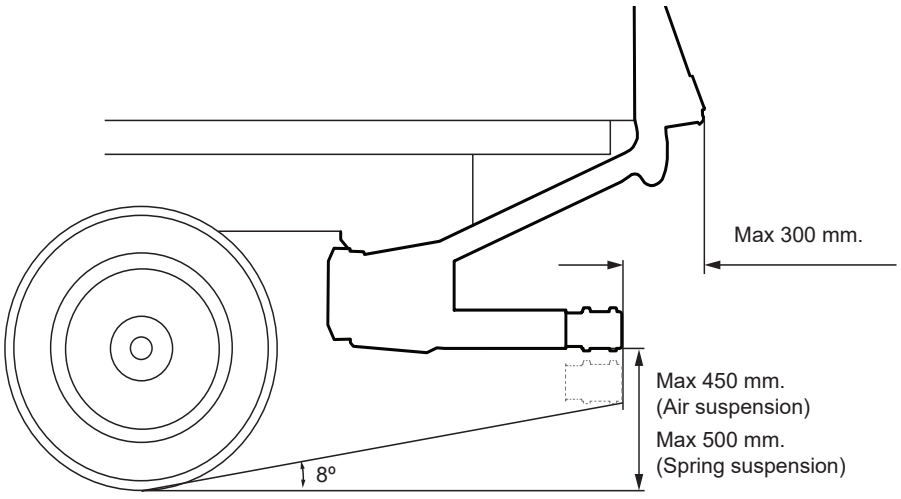


Image 23. Statutory dimensions

Horizontal distance from the outer edge of the beam to the outside of the wheel: Max 100 mm. See Image 24.

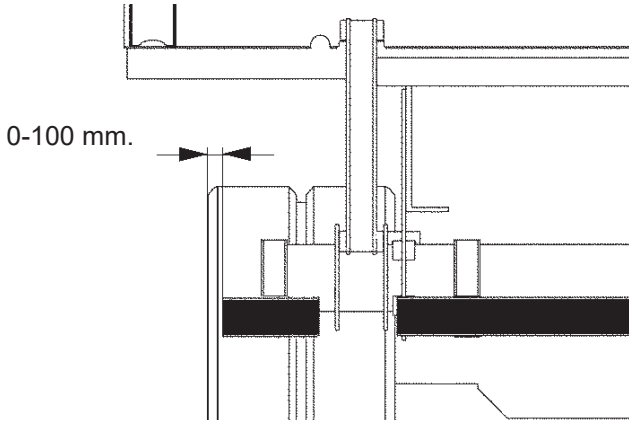


Image 24. Statutory dimensions

The lateral distance between the underrun protection and the moving parts of the tail lift must not exceed 25 mm. See Image 25.

Each of the individual parts of the underrun protection must have a surface area of at least 350 cm^2. See Image 25.

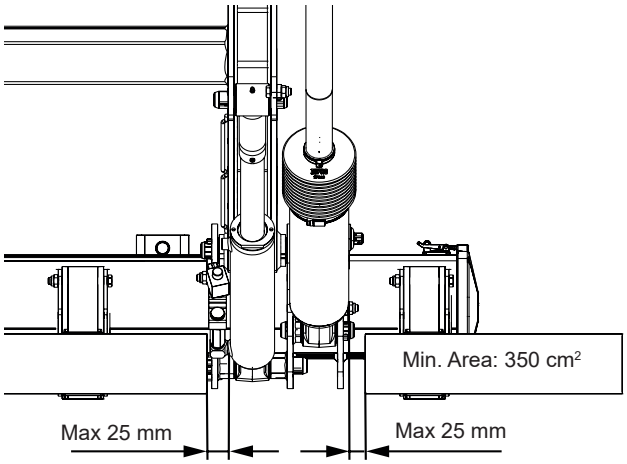


Image 25. Statutory dimensions

6.4 Adjustable underrun protection

Test the position of the underrun protection without tightening the bolts to check that the statutory dimensions are obtained. Adjust if necessary then tighten the bolts with a torque wrench.

1. Fit the inner part of each bracket at one of four heights. Select the height that meets the statutory requirements, see section "6.3.2 Statutory dimensions for underrun protection" on page 20. Use the corresponding bolts M12x100. Assemble without tightening the bolts, see Image 28.
2. Fit the outer part of each bracket at one of five positions. Select a position that meets the statutory requirements, see section "6.3.2 Statutory dimensions for underrun protection" on page 20.

> **⚠ WARNING!**
> Check carefully that there is no risk of the outer part of each bracket colliding with any part of the cylinders when using the lift's functions. In particular, check in relation to the cylinders' hose connections, especially when the outer part of the brackets are installed a long way in.

   Use the associated bolts M12x80. Assemble without tightening the bolts. See Image 28.
3. Check that the installation meets the statutory requirements, see section "6.3.2 Statutory dimensions for underrun protection" on page 20.
4. Tighten all the bolts using a torque wrench. **Tightening torque: 80 Nm.**

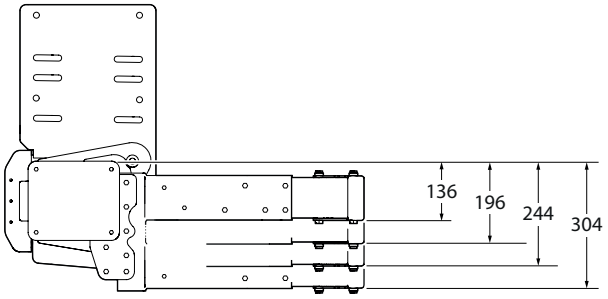


Image 26. The inner part of the brackets can be fitted at one of four heights

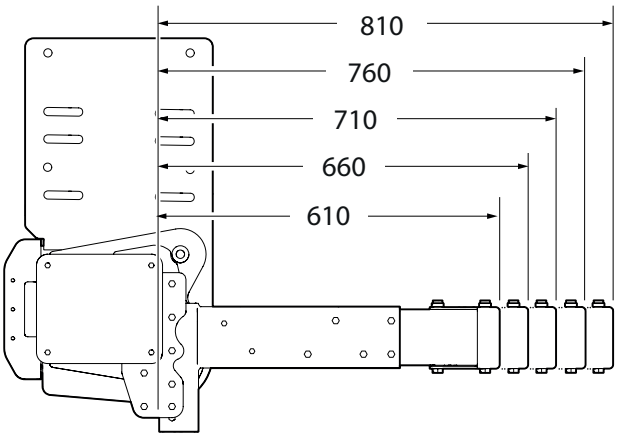


Image 27. The outer part of the brackets can be fitted in one of five positions

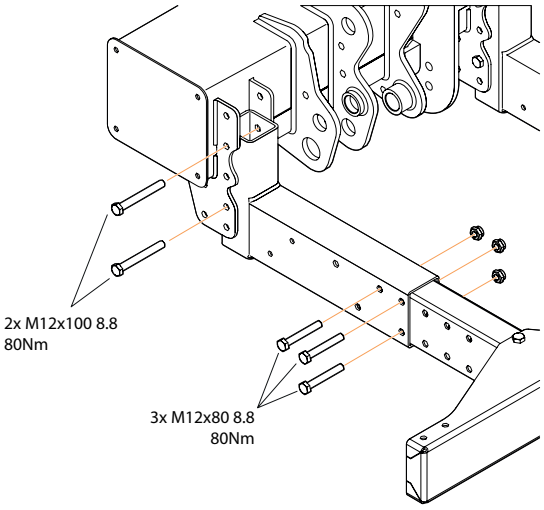


Image 28. Installing underrun protection

NOTE!
The underrun protection is included in the total length of the vehicle!

6.4.1 Fixed underrun protection

1. Install the brackets on the tail lift frame using 3 x M12x100 bolts each, without tightening them. See Image 29.
2. Install the centre sheet-metal profile using 4 x M12x110 bolts on the brackets. See Image 30. **Tightening torque 55 Nm.**
3. Tighten the bolts used to install the inner brackets in step 1. **Tightening torque 55 Nm.**
4. Install the outer sheet-metal profiles using 2 x M12x110 bolts each. See Image 31. **Tightening torque 55 Nm.**

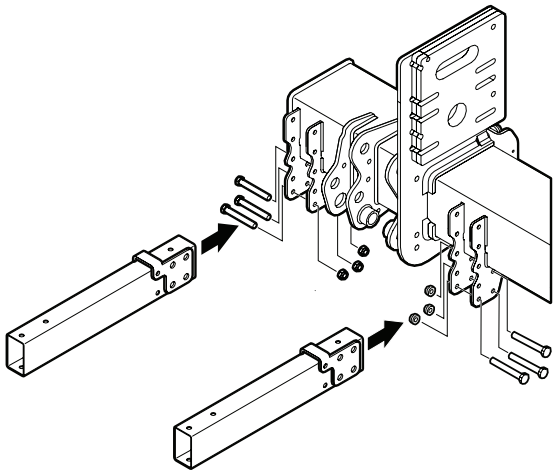


Image 29. Installing brackets on the frame

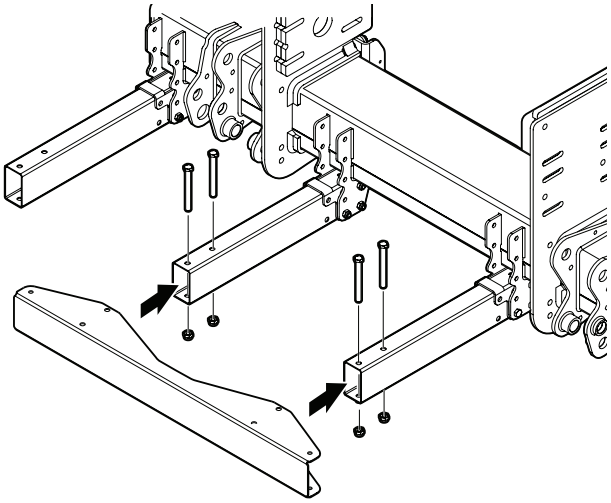


Image 30. Installing the inner sheet-metal profile

NOTE!
The underrun protection is included in the total length of the vehicle!

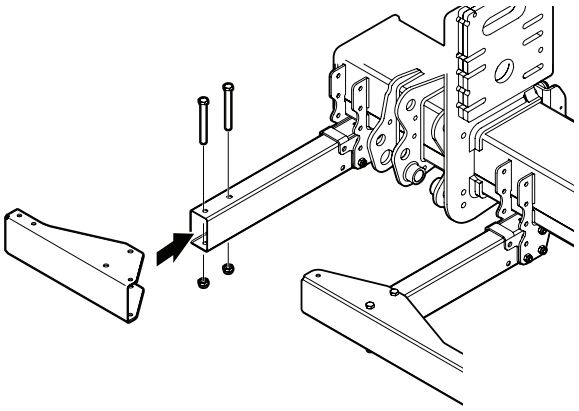


Image 31. Installing the outer sheet-metal profile

6.5 Armstops

Fit end stops between the 1st booms and the rear beam of the vehicle floor. The left and right end stops must be reached at the same time, as high up the 1st boom as possible. Installation must take place against the vehicle body.

WARNING!

It is not permitted to perform welding on the lift arm. Installation must take place against the vehicle body.

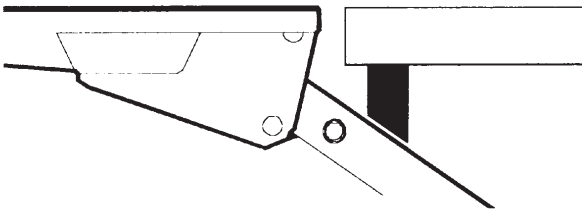


Image 32. Fit end stops between the 1st booms and the rear beam of the vehicle floor

6.6 Sealing strip (horizontal)

The track is fitted using the self-tapping screws provided.

1. Mark where to drill holes for the self-tapping screw.
2. Drill holes (Ø 7.2 mm) for the screws.
3. Fit the horizontal stop strip (steel or aluminium).
4. Fit the rubber strip in the track.

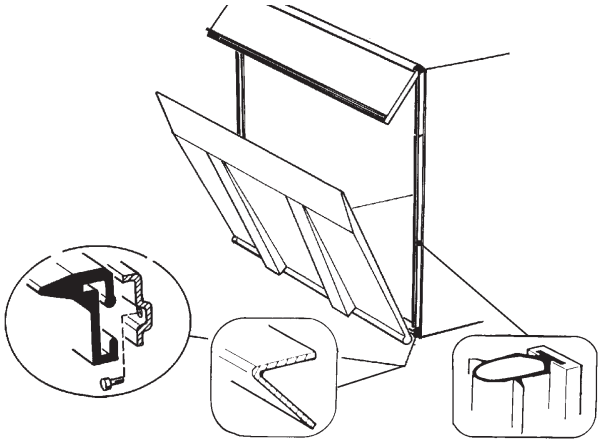


Image 33. Installing a sealing strip

6.7 Sealing strip (vertical)

1. Fit the tracks with countersunk screws, rivets or by spot welding.
2. Fit the rubber strip in the track.
3. Secure the rubber strips by swaging the tracks together at the bottom.

NOTE.

To fit an upper edge seal, create a 45° mitre against the vertical strips.

6.8 Platform

1. Check that all included components are clean, cleaning them where necessary.

2. Lubricate the bushings on the upper arm bearing, see Image 34. Use LE lubricant 4622 or the equivalent.

NOTE.

Maximum load capability of aluminium platforms is at 600 mm as standard. On Z 10 and Z15, the marking can be moved to 750 mm (see "12.1 Loading diagram" on page 46).

3. Fitting the platform to the arms. Tighten the nuts using a torque wrench, see Image 35.
   Tightening torque: 280 Nm.

4. Fit one of the tilting cylinders to the platform. Use the provided shaft and support wheel see Image 35.

   IMPORTANT!
   Make sure the cylinder is installed with the grease nipples facing up.

   Lubricate the bushings and shaft! Use LE lubricant 4622 or the equivalent.

   Tighten the bolts using a torque wrench.
   Tightening torque 280 Nm.

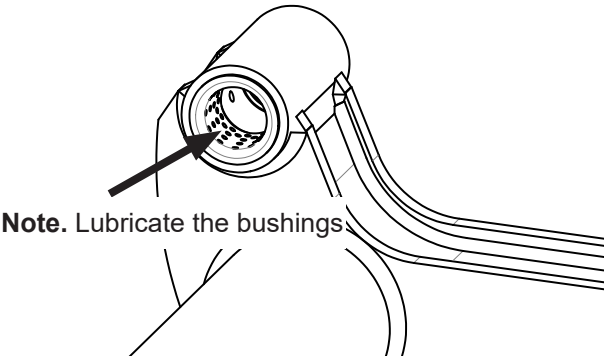


Image 34. Make sure the initially lubricate the bushings

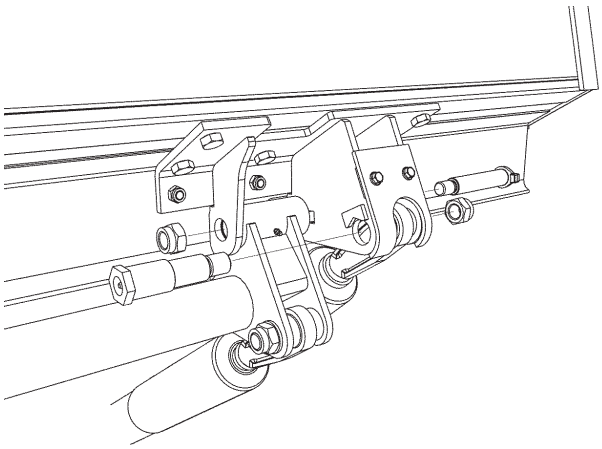


Image 35. Installing platform and tilting cylinder

5. Test the lift by carefully raising it to the vehicle floor level and tilting it to the vertical position. Check the position in relation to the rear beam and side posts of the vehicle. See Image 36.

6. The platform underhang (A), see Image 37, varies according to platform type and this should be taken into account when fitting the upper seal.

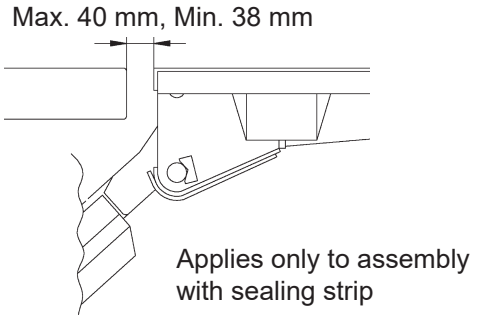
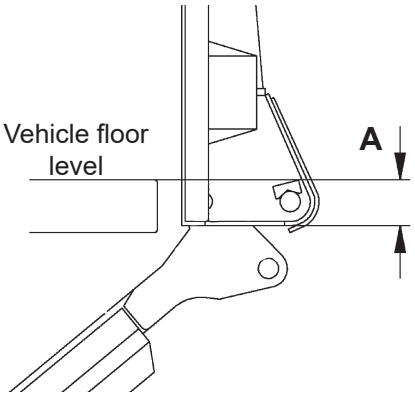


Image 36. Check the position in relation to the rear beam of the vehicle



Type	Steel	Flat 40 mm	Conical
A (mm)	70	81	77

Image 37. The platform underhang (A) varies depending on platform type.

6.8.1 Adjusting the tilt angle

NOTE.

Do not adjust the cylinders before they are fitted to the platform. The tilting cylinders are preset from the factory.

1. Close the platform to the body, see Image 38.
2. Unscrew the locking screws (pos. 1, 2, 3, see Image 39).
3. Turn the nut (pos. 4, see Image 39) to adjust cylinder length and position on the platform. Use ZEPRO tool part no. 59693 (60 mm). Always adjust both cylinders.
4. Unscrew the lock screws (pos. 5, 6, 7, see Image 40). Zepro recommends securing the screws with Loctite 243 or equivalent.

NOTE.

Must always be adjusted with full hydraulic pressure in the tilting cylinders.

Check the dimension, see. Maximum length must not exceed 33 mm, see Image 41.

WARNING!

The max. length of both cylinders must be adjusted equally to avoid unwanted bending forces.

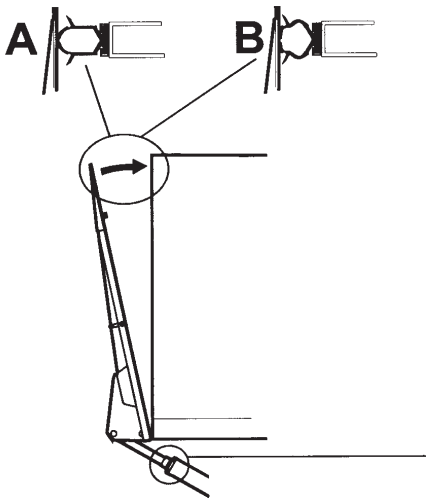


Image 38. Adjusting the fit to the vehicle body

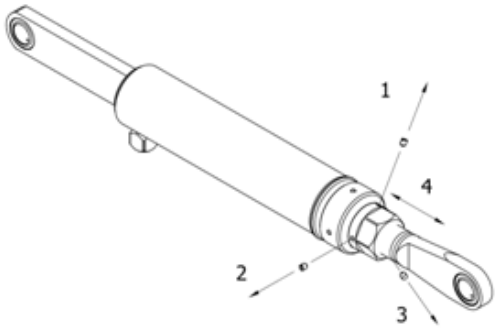


Image 39. Adjusting cylinder length

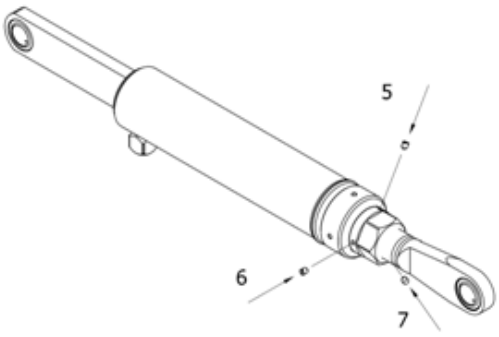


Image 40. Screw tight the lock screws

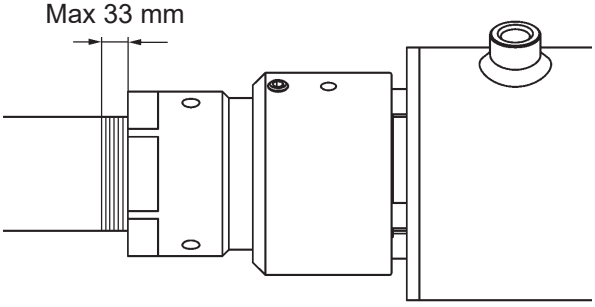


Image 41. Maximum length

6.8.2 Adjusting the downward tilt angle

NOTE.

The tilt angle must be set at 90° to the vehicle body before the downward tilt angle is adjusted (see previous page).

WARNING!

To ensure that the lift is safe and CE compliant, the downward tilt angle must be adjusted to max. 10° if persons are going to stand on the platform.

NOTE.

Do not adjust the tilting cylinders before undoing the lock screws.

1. Lift the platform to floor level and adjust to horizontal position.
2. Tilt down the platform and measure the angle (pos. 5, Image 43). Adjust to max 10º.
3. Loosen the end stop lock screw (1, 2). Screw the end stop all the way back towards the platform (3). Image 42.
4. Tilt the platform down to max. 10 degrees below the horizontal, see Image 44.
5. Tighten the lock screw in the end stop (5). See Image 43. Zepro recommends securing the screws with Loctite 243 or equivalent.

Test all functions.

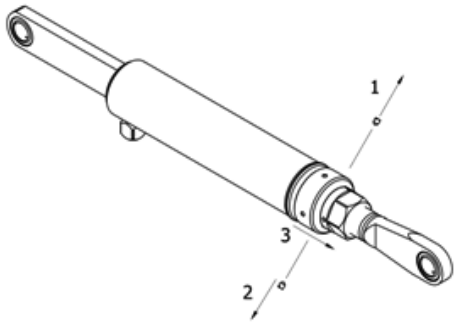


Image 42. End stop with lock screw

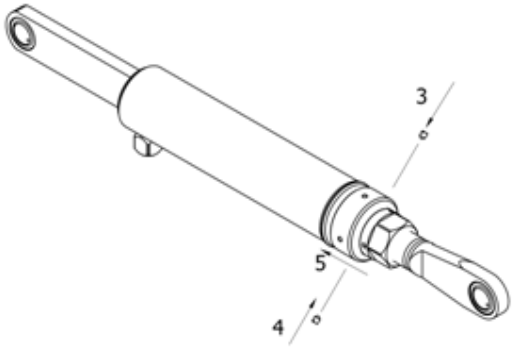


Image 43. End stop with lock screw

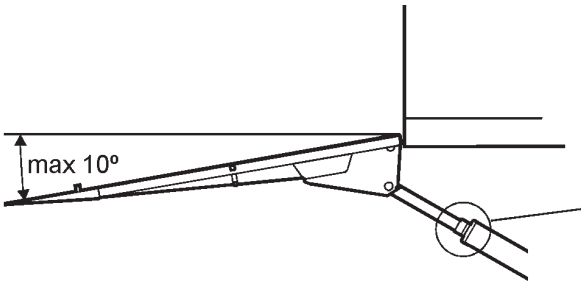


Image 44. The downward tilt angle must be adjusted to max. 10°

6.9 Purging the cylinders

Purge the lift cylinders by fully lowering the platform a few times. You may have to lift the truck to fully lower the platform.

The tilting cylinders can be purged by raising the platform fully against the vehicle body and then tilting all the way down.

6.10 Transport lock

Electric hose rupture valves serve as locks for the platform. The lock opens automatically if the down function is actuated from the controller. The valves are check valves that let fluid into the cylinders but not out before they are actuated by the flow from the lowering valve. The platform is thus hydraulically locked during transport.

7 Cable routing

7.1 General

IMPORTANT!

In order to ensure a high degree of reliability for many years to come, it is important that components such as batteries, chargers, main current and earth cables, fuses and main switches are dimensioned correctly and assembled with great accuracy. Insufficient battery power can permanently damage the electrical components in the tail lift (solenoid, electric motor, solenoid valves, relay board/ control board and more.)

Insufficient main power and/or earth cable area may result in overheating, poor performance of the electrical system and shortened life expectancy of the main electrical components.

Earth connection must be made primarily to the negative terminal of the battery. Alternatively, another well-protected earthing point, which will not increase the voltage drop, can be used. The earthing point must be so well protected that increased voltage drop due to oxidation over time can be eliminated. Risk of material damage. Warranty rights do not apply to material damage caused by insufficient earthing.

Always install a shrink hose over the cable connection when installing cable terminals.

Pay attention and be careful during all cable routing to ensure longer cable life and reduce the risk of unnecessary downtime:

- Cables must not be clamped to brake lines or the vehicle's normal electrical system.
- The cable must be protected by rubber grommets when it passes through beams or walls.
- Cables must be installed sufficiently far from, or be protected against, sharp edges so they cannot chafe or otherwise sustain damage that could lead to a short-circuit and cable fires.
- Take care not to bend cables to too tight a radius as this can cause damage.

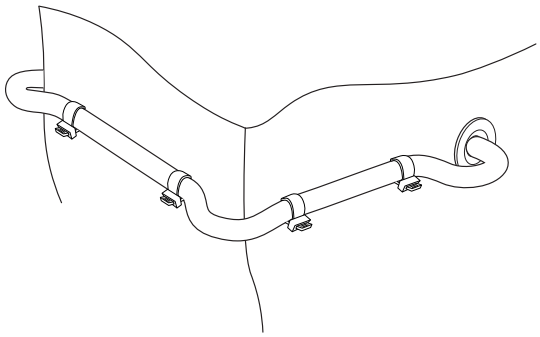


Image 45. Protect the cable against sharp edges and use cable grommets

Image 46. Always use shrink hose over the cable connection when fitting cable terminals

7.2 Sizing electrical systems

Ensure that the battery and charger capacity is sufficient for the product in question and that cable with sufficient cross-sectional area is used.

Z 10 (130 bar)

7400 (130 bar)	**24 Volt**
Pump - Motor unit	100 A
Lowering valve	0.7 A
Shift valve	2.0 A
Magnet (electric hose rupture valve)	0.75 A 0.9 A
Solenoid	
Cable area:	
Control cable	1.5 mm^2
Supply cable < 17 m	25 mm^2
Supply cable = 17-25 m	35 mm^2
Power source:	
Min. capacity	110 Ah
Min. voltage	18 Volt

Z 15/20 (170 bar)

7400 (170 bar)	**24 Volt**
Pump - Motor unit	120 A
Lowering valve	0.7 A
Shift valve	2.0 A
Magnet (electric hose rupture valve)	0.75 A 0.9 A
Solenoid	
Cable area:	
Control cable	1.5 mm^2
Supply cable < 17 m	25 mm^2
Supply cable = 17-25 m	35 mm^2
Power source:	
Min. capacity	180 Ah
Min. voltage	18 Volt

NOTE!

Make sure the tail lift has access to the minimum recommended current capacity (I_{min}).

Some vehicle models have restrictions regarding the amount of current the lift can access from the existing battery. Some vehicle models do not fully charge the battery. It may therefore be necessary to switch to a battery and sometimes also to a charger with a larger capacity.

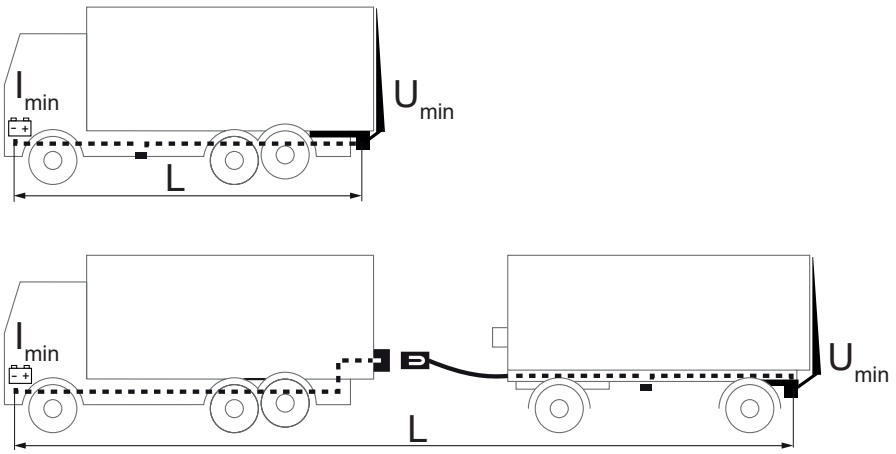


Image 47. Battery capacity and definition of the length of the earth and main power cables

7.3 Main power cable, earth cable, main fuse and main switch

Main switch should always be mounted when cab switches (CS) are not used, for example when installing on trailers. Main switches can also be installed in combination with cab switches (CS) if desired.

1. If the positive battery terminal is suitable for the main fuse of the lift, it can be used for mounting the fuse. Otherwise, secure the fuse box in a suitable, well-protected position as close to the battery as possible.
2. When using the fuse box, route the main power cable from the battery to the fuse box. Prepare the cable with cable terminals and shrink hose over the connections without connecting it. Connection is described later in section 8.
3. On tail lifts with cable-mounted quick connector for its earth connection, connect the earth cable to the quick connector.
4. Route/connect the tail lift earth cable to the negative terminal of the battery or to a well-protected earthing point.

IMPORTANT!
Earth connection must be made primarily to the negative terminal of the battery. Alternatively, another well-protected earthing point, which will not increase the voltage drop, can be used. The earthing point must be so well protected that increased voltage drop due to oxidation over time can be eliminated. Risk of material damage. Warranty rights do not apply to material damage caused by insufficient earthing.

When installing without main switch

5. On tail lifts with cable-mounted quick connector for its main power, connect the main power cable to the quick connector.
6. Route the main power cable from the tail lift to the fuse box/battery plus terminal. Prepare the cable with a cable terminal and shrink hose without connecting. Connection is described later in section 8.

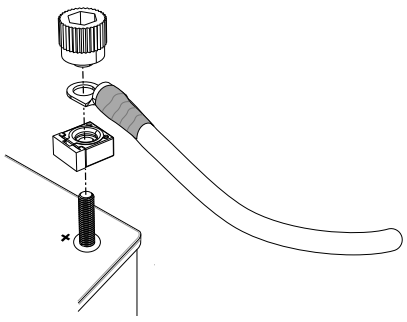


Image 48. Connection to the battery's positive terminal

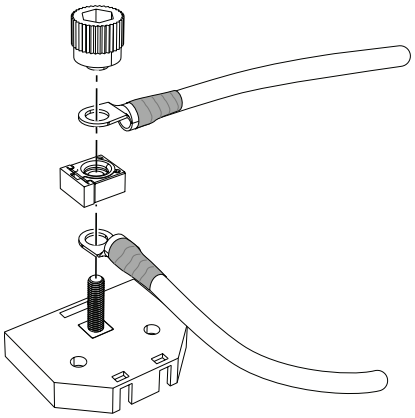


Image 49. Connection to the fuse box

7.3.1 Main power switch

1. The main power switch is installed on the bracket at the factory. Bolt the bracket to the underside of the body. Use the self-adhesive drilling template supplied.
2. Connect the main power switch cable to the quick connector on the tail lift power supply cable.
3. Connect the power supply cable to the other quick connector on the main power switch cabling.
4. Run the power supply cable from the main power switch to the fuse box / battery positive terminal. Prepare the cable with a cable terminal and shrink hose without connecting. Connection is described later in section 8.

> **IMPORTANT!**
> The positive cable to the battery and main fuse is connected later in Section 11, after the cable has been routed/installed.

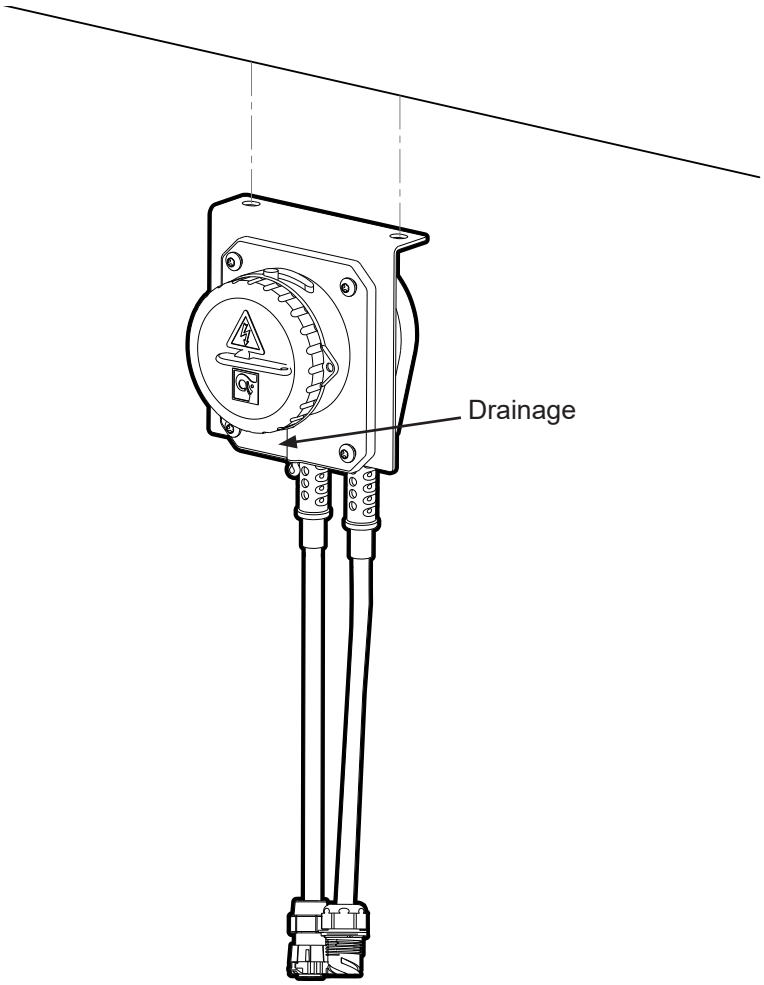


Image 50. Installing the main power switch

7.4 Control power cable

When using cab switches (CS), route the control current cable from the cab switch CS to the tail lift cable grommet. Connection is described later in section 8.

7.5 Open platform alarm

An open platform alarm must be installed in the form of a warning lamp in the cabin. Route the lamp cables to the tail lift cable grommet. Connection is described later in section 8.

7.6 Foot controller / Warning lights

If the tail lift is equipped with warning lighting/foot controls, their cabling must be routed and connected according to the following description.

1. Connect the supplied cable to the foot control/ warning lighting cable on the platform. On platforms with only foot controls, see Image 51. On platforms with warning lighting, alternatively warning lighting/foot controls, see Image 52.

2. Attach the cable with the cable clips to the platform. On platforms with warning lighting, also attach the angle sensor's cabling with the same cable clips, see Image 52.

3. Route the cable along the 1st boom and fix with cable ties according to Image 53. Then route the cable to the hydraulic unit along the front of the support frame and fix it together with the existing cabling with cable ties.

NOTE.

Route the cable between the platform and the lift arm's pipe so that it is well protected when the platform hits the ground.

Leave enough "slack" to the first cable tie so that the cable is not at risk of being damaged when the lift is operated.

4. Connect the cables to the control card, see wiring diagram in section "10.5 Connecting Open Platform Alarm" on page 41 and section "10.7 Connecting controllers" on page 43.

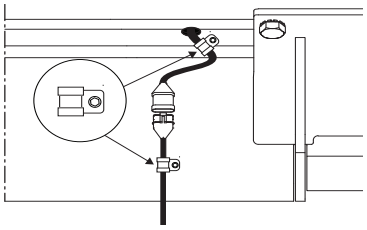


Image 51. Connection of cabling on platform with only foot controls

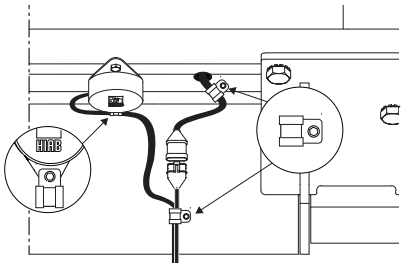


Image 52. Connection of cabling on platform with warning lighting or warning lighting and foot controls

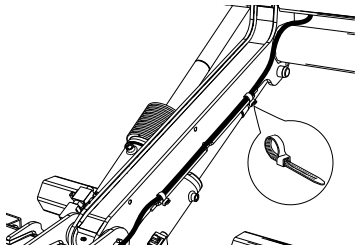


Image 53. Installing cabling

8 Connection

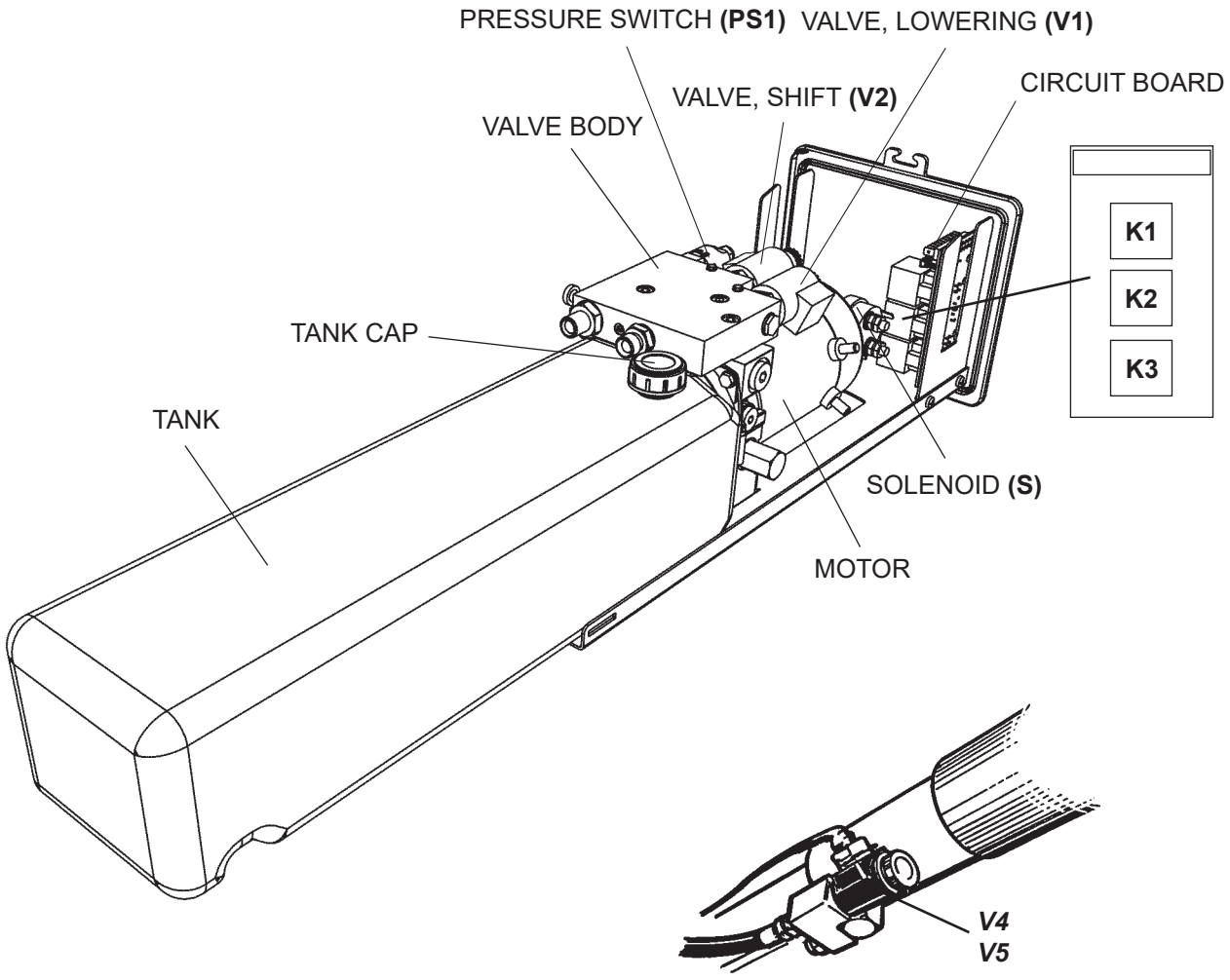
IMPORTANT!
Make sure that the control board is disconnected from the power before connecting peripheral equipment. Risk of material damage.

1. Run the cabling through the grommet.
2. Connect the relevant controller. See Section 10.7.
3. Where applicable, connect the warning lights. See Section 10.6.
4. Where appropriate, plug in open platform alarm. See Section 10.5.
5. Where appropriate, plug in cab switch (CS). See Section 10.1 - 10.2

9 Hydraulic unit

The lift's hydraulic unit is installed inside the lift's frame. For access during installation, maintenance and repair, for example, the hydraulic unit needs to be pulled a little way out of the frame.

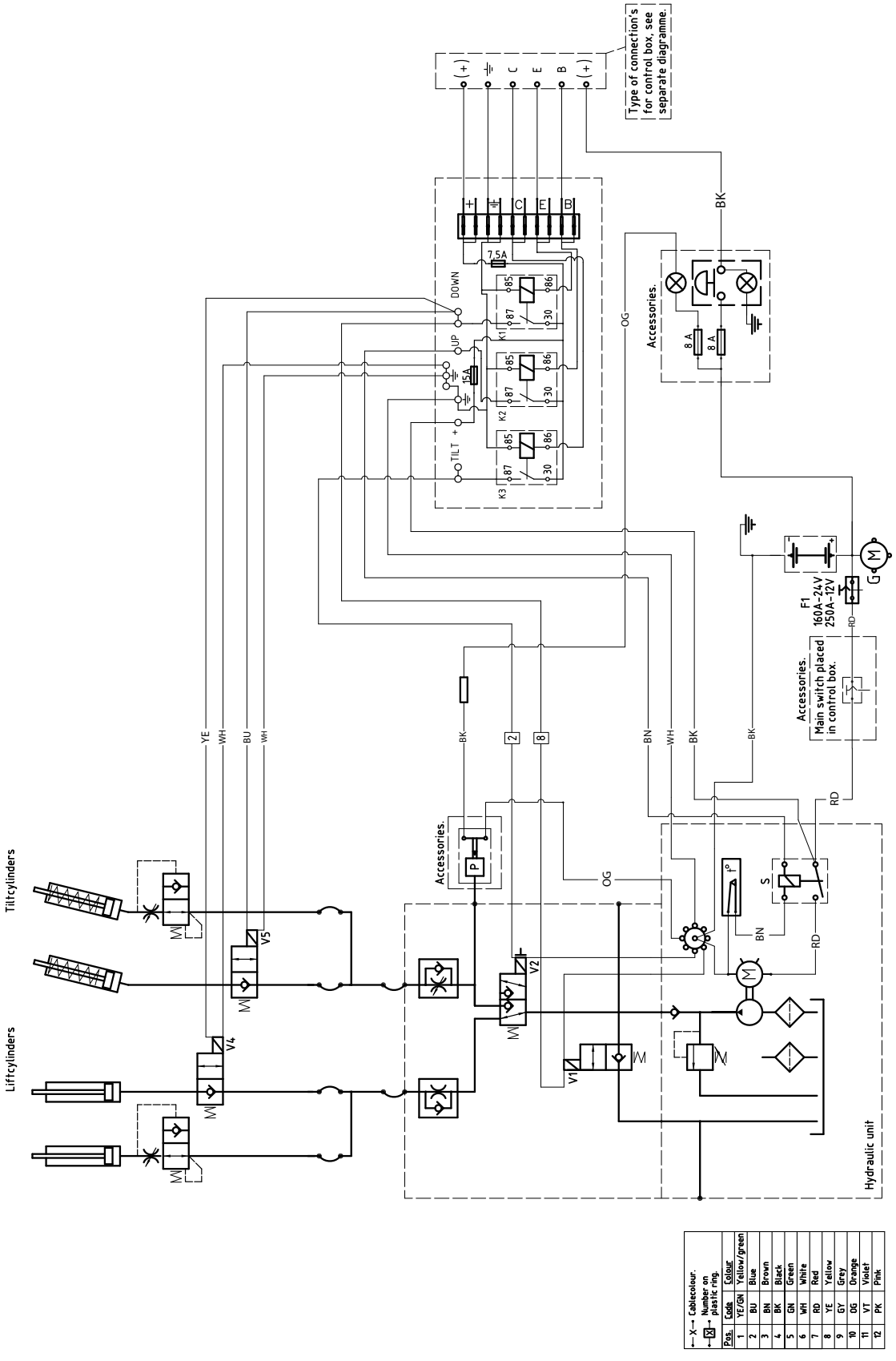
Function	Input signal	Output signal	Comment
Tilt down[1]	C+E	V1+V2+V4+V5+K1+K3	
Tilt down[2]	E+PS1	V1+V4+V5+K1	Hydraulic autotilt
Lower	E	V1+V4+V5+K1	
Raise	B	S+K2	
Tilt up	B+C	S+V2+K2+K3	



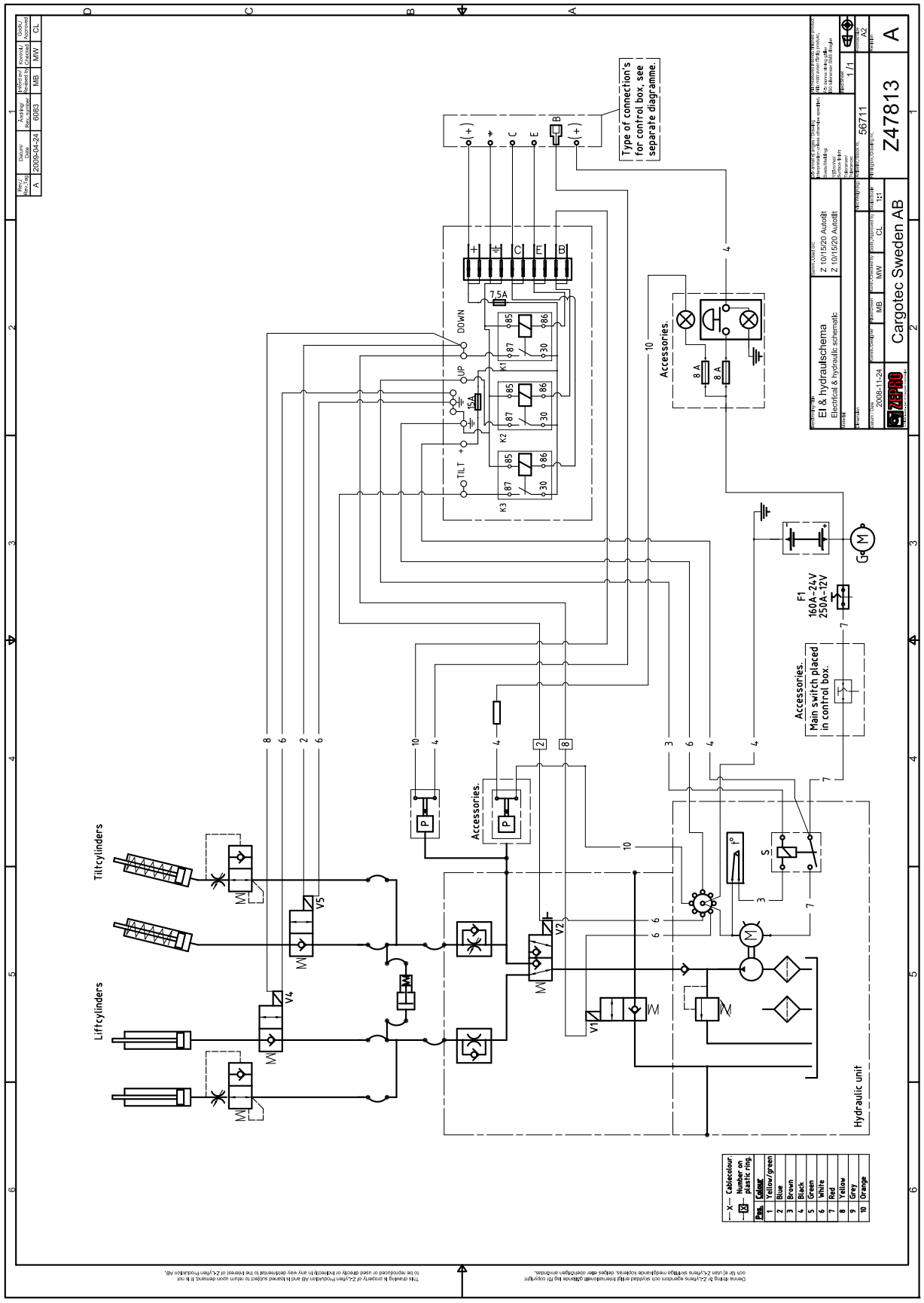
V4, hose rupture valve, lift cylinder
V5, hose rupture valve, tilting cylinder

10 Electrical and hydraulic drawings

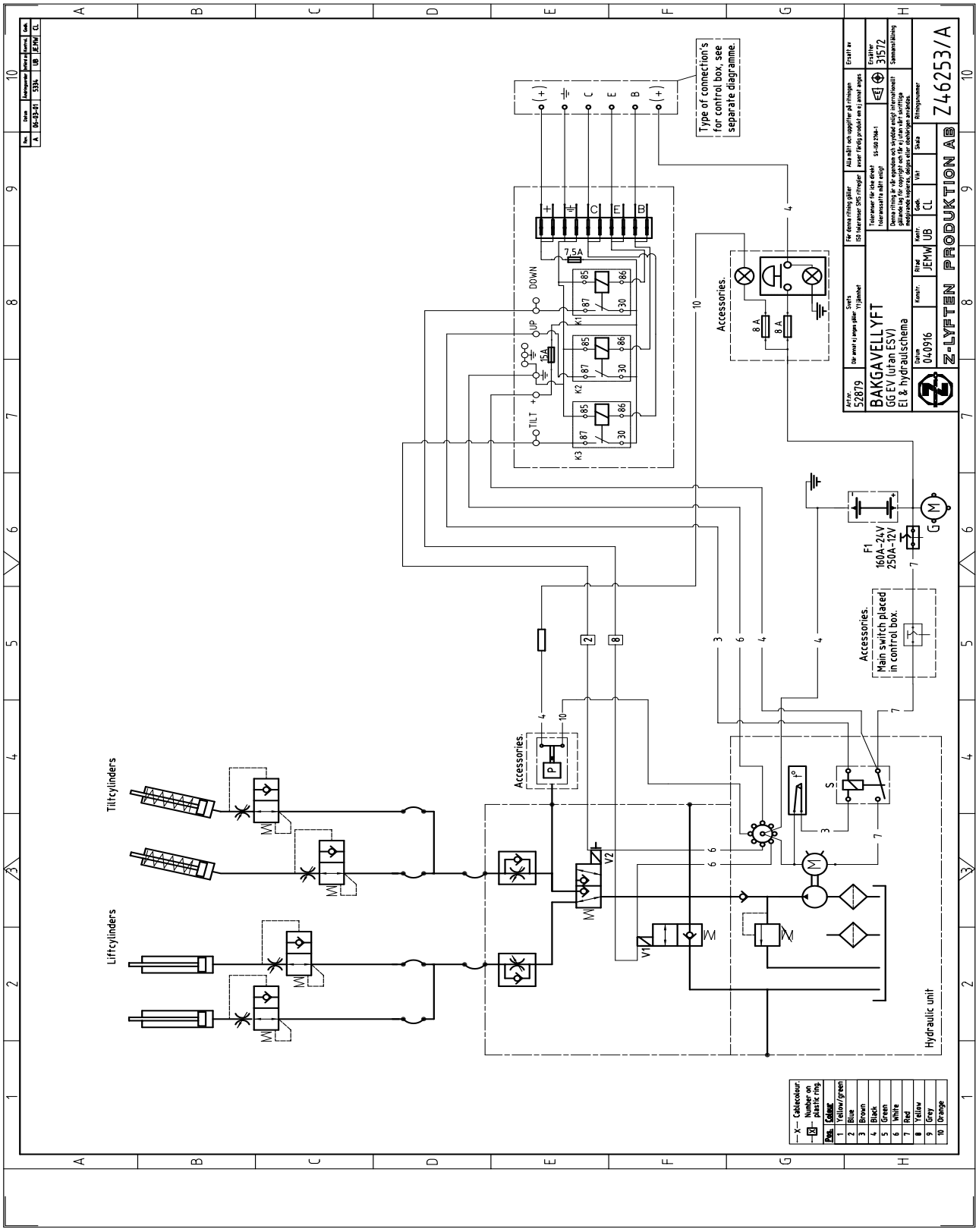
10.1 Z 10/15/20



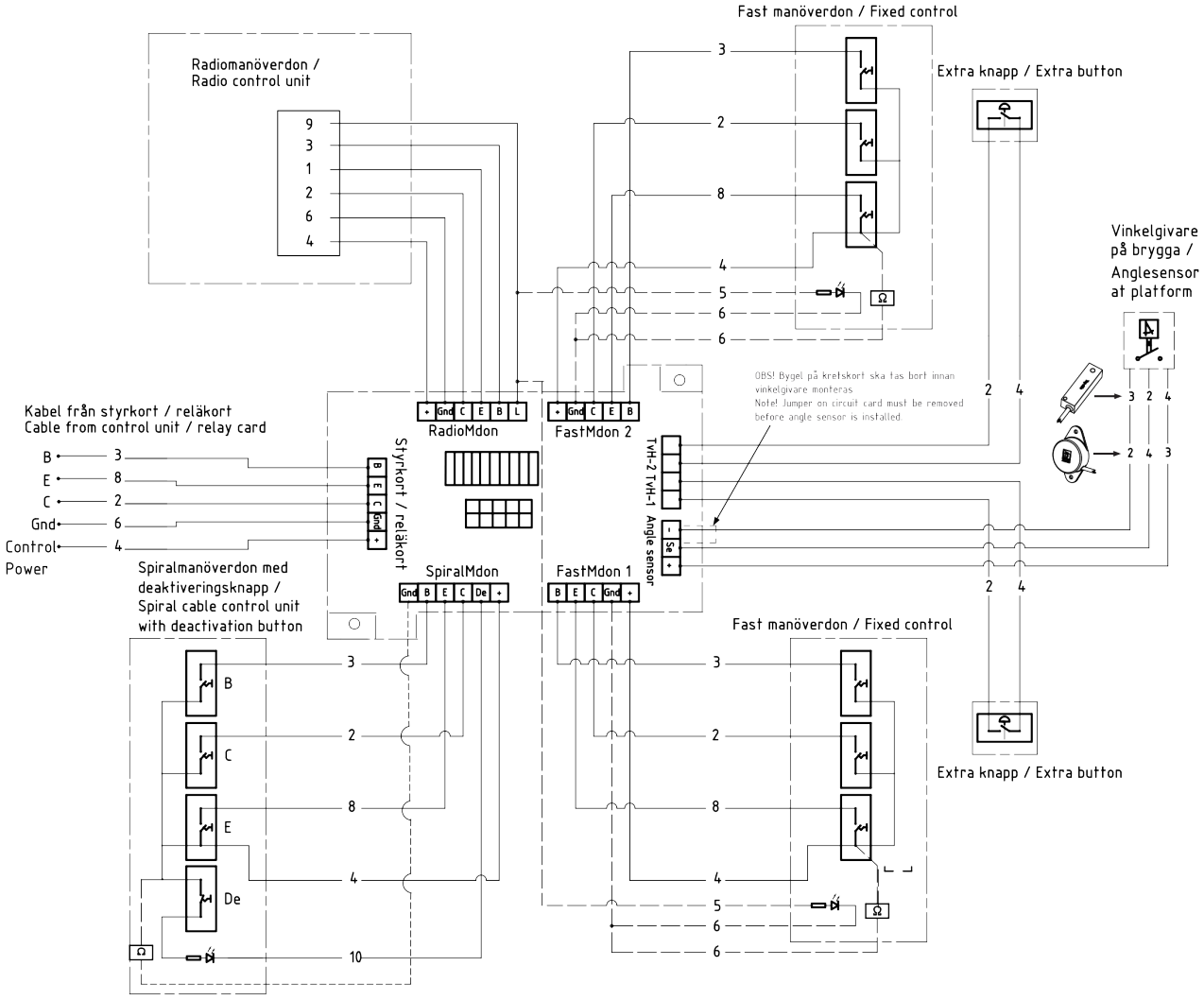
10.2 Z 10/15/20 hydraulic autotilt

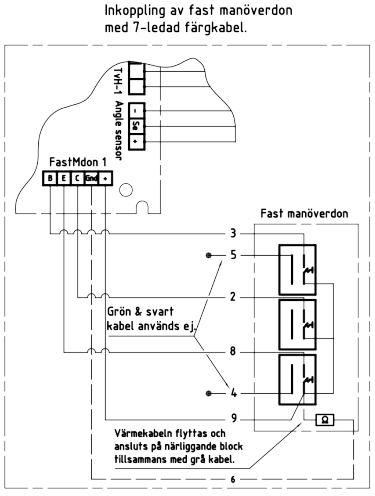


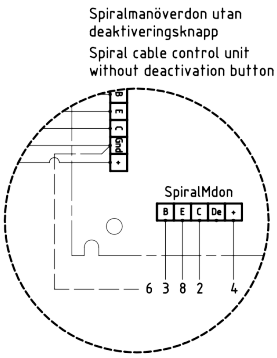
10.3 Z 10/15/20 Mechanical Hose Burst Valves

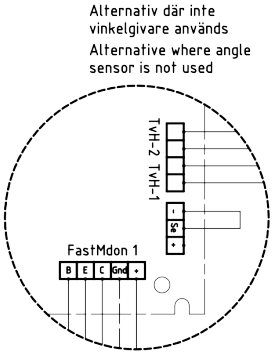


10.4 Connection to circuit board, 4 – button operation



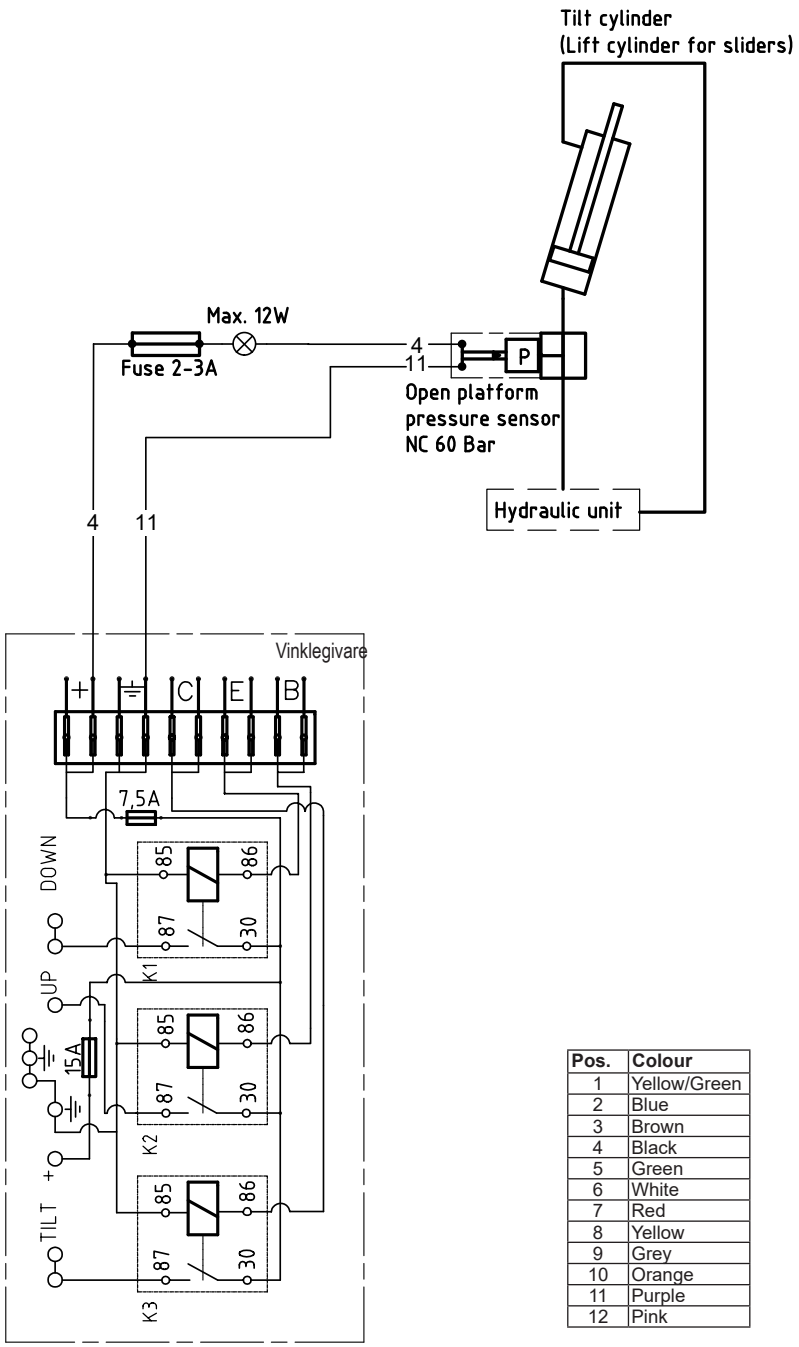






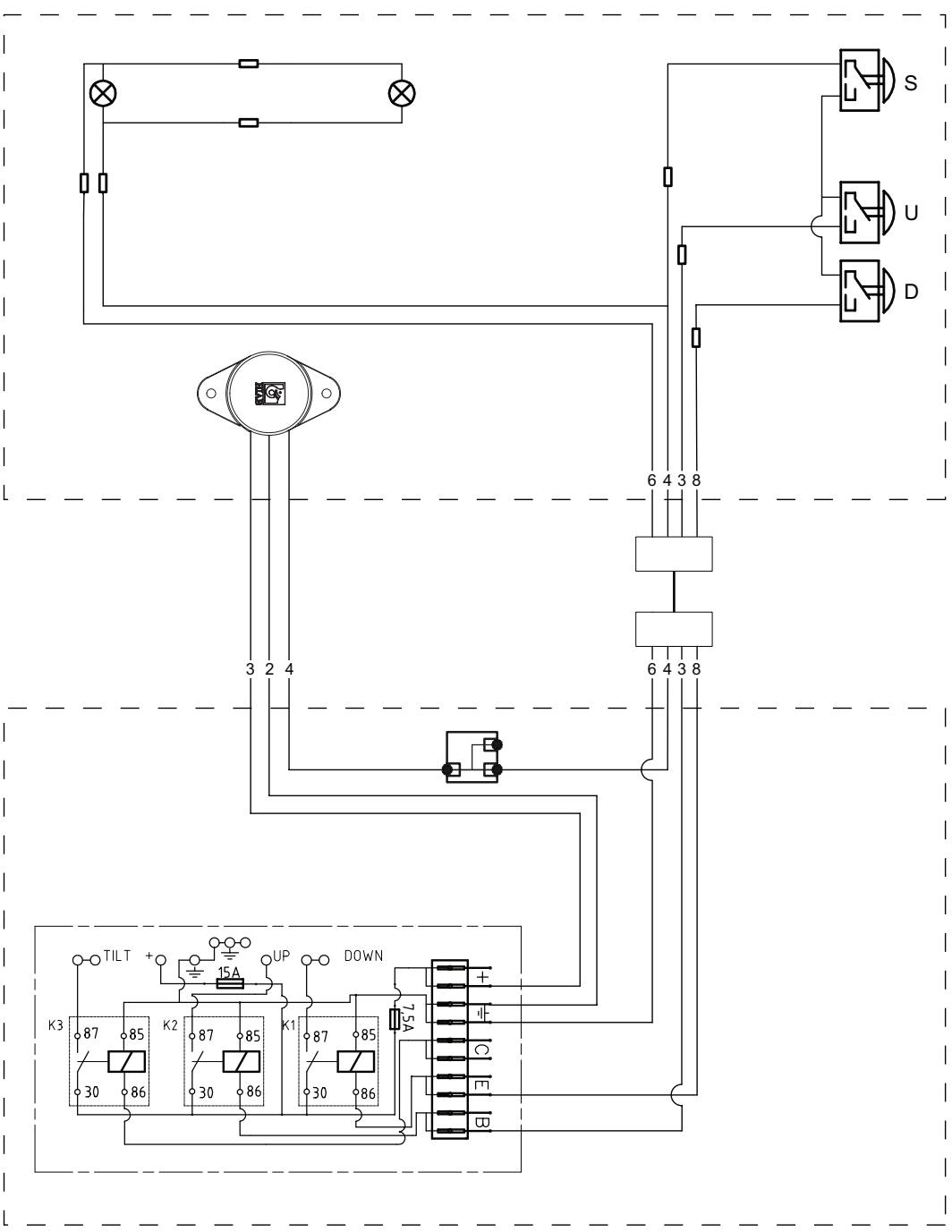
Pos.	Colour
1	Yellow/Green
2	Blue
3	Brown
4	Black
5	Green
6	White
7	Red
8	Yellow
9	Grey
10	Orange
11	Purple
12	Pink

10.5 Connecting Open Platform Alarm



Pos.	Colour
1	Yellow/Green
2	Blue
3	Brown
4	Black
5	Green
6	White
7	Red
8	Yellow
9	Grey
10	Orange
11	Purple
12	Pink

10.6 Connecting warning lighting and foot controls



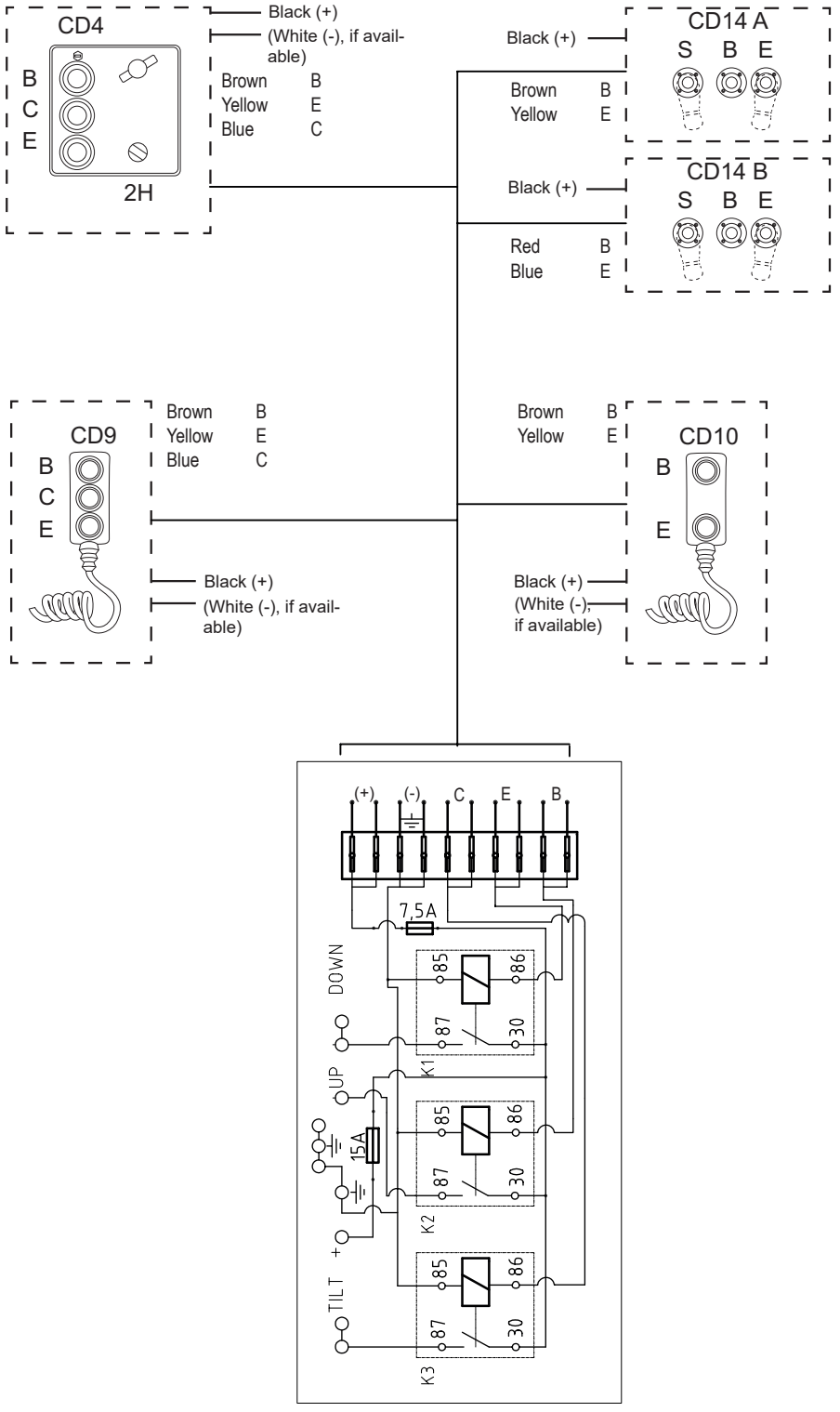
Pos.	Colour
1	Yellow/Green
2	Blue
3	Brown
4	Black
5	Green
6	White
7	Red
8	Yellow
9	Grey
10	Orange
11	Purple
12	Pink

10.7 Connecting controllers

The most commonly occurring controller (CD Control Device) models are shown below. Possible controller models vary depending on lift model, configuration and relevant market.

When installing a controller without locking function, it connects directly to the relay board, see wiring diagram in "10.1 Z 10/15/20" on page 37.

When installing a controller with locking function or when installing several controllers, a connection card is used, see wiring diagram in "10.4 Connection to circuit board, 4 – button operation" on page 40.



11 Powering up the tail lift

1. If applicable, ensure that the main switch is in the "Off" position.
2. If applicable, ensure that the cab switch (CS) is in the "Off" position.
3. When using a fuse box, connect the cable (1) to the battery's positive terminal and to the fuse box and place the fuse (2) above, see Image 54.
4. When connecting directly to the positive battery terminal, place the fuse (2) on the positive terminal, see Image 54.
5. Connect the main power cable (3) to the fuse box / positive terminal, see Image 54 - Image 55.
6. Screw tight the cable connections and fuse with the knob (4). Install the cables at 90° or 180° from each other. Install the fuse at right angles to the cables; see Image 54 - Image 55.

IMPORTANT!
The knob must bear against and centre the cable lug so that it does not come into contact with the screw. Incorrect installation can cause the fuse to be ineffective. Risk of fire in the event of a short circuit.

7. Install the fuse box cover.
8. Where fitted, set the main switch to the ON position.
9. Where fitted, set the cab switch to the ON position.

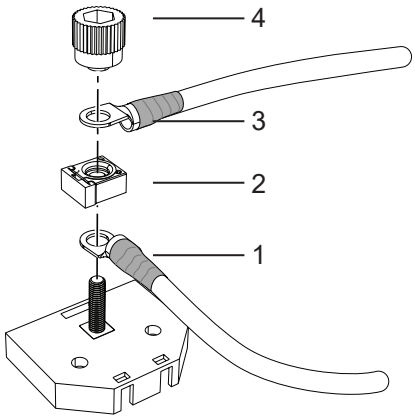


Image 54. Connection to the fuse box

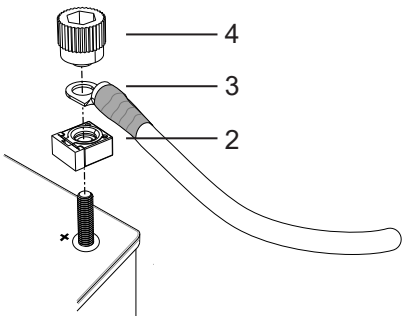


Image 55. Connection to the battery's positive terminal

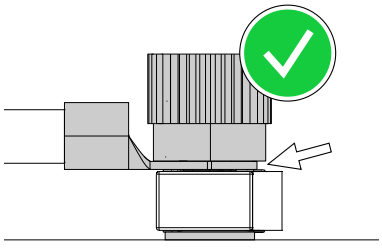


Image 56. Correct installation

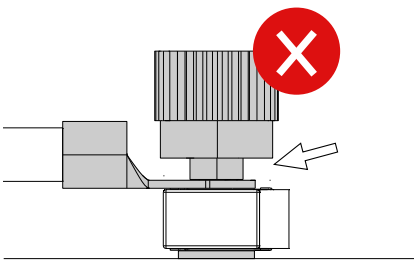


Image 57. Incorrect installation

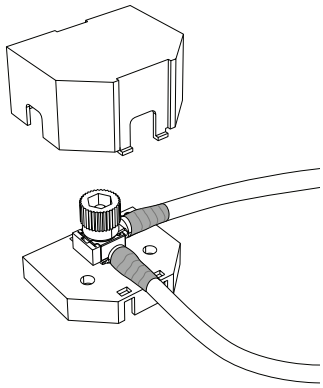


Image 58. Cover, fuse box

12 Marking

Below, an overview of the location of the different markings is shown. Image of marking and further information can be found under the each subchapter for subsequent pages.

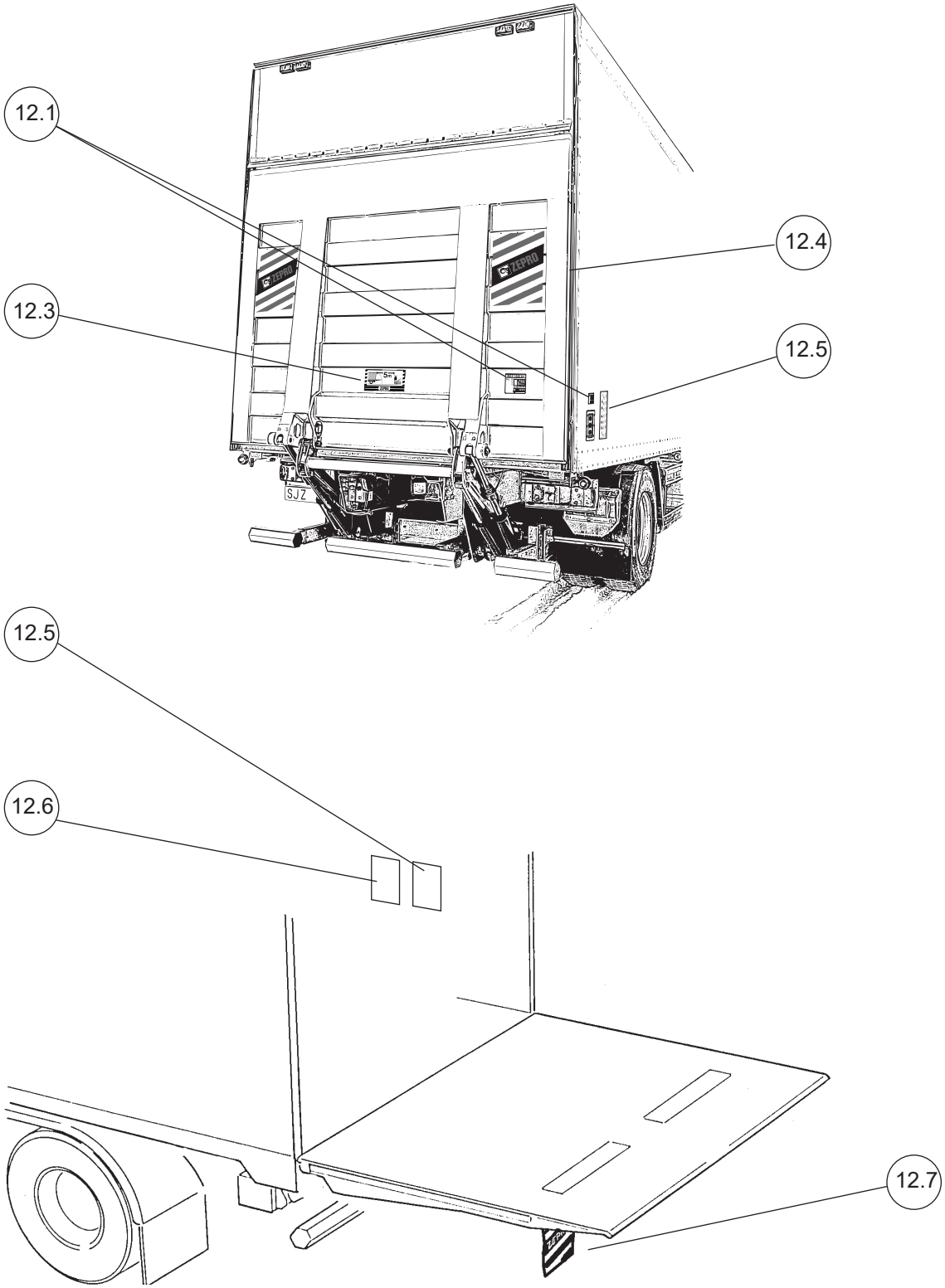


Image 59. Overview of labelling

12.1 Loading diagram

Affix the load diagram in a suitable, conspicuous place on the platform and in the vicinity of the primary controller or in the designated location on the controller (CD19).

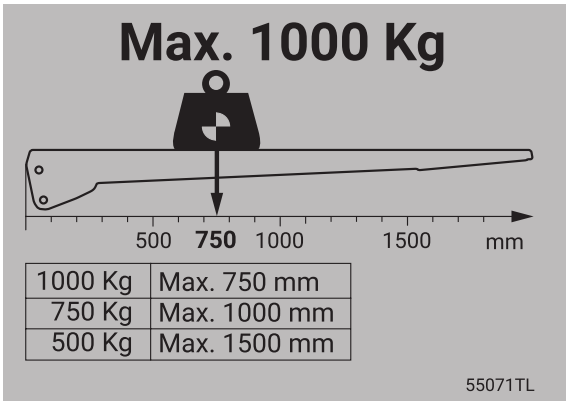


Image 60. Load diagram for load capacity 1000 kg, centre of gravity distance 750 mm.

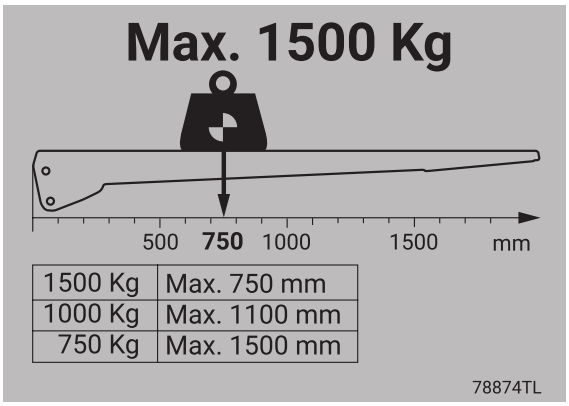


Image 61. Load diagram for load capacity 1500 kg, centre of gravity distance 750 mm.

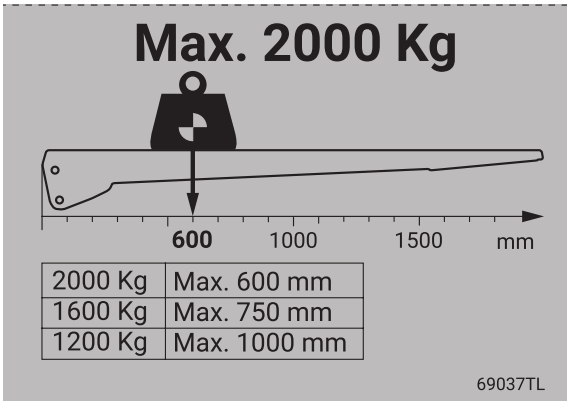


Image 62. Load diagram for load capacity 2000 kg, centre of gravity distance 600 mm.

12.2 Identification plate

The identification plate is fixed on to the tail lift's frame. Affix the corresponding sticker version of the identification plate, preferably by the cab door post to facilitate identification.

The identification plate contains the following information:

- Type of lift
- Max. permitted load in kg
- Production number
- Year of manufacture
- Address and tel. no. of manufacturer
- Country of manufacture
- Type number for approved underrun protection (RUPD)
- Type number for electromagnetic compatibility (EMC)

Image 63. Identification plate

12.3 Work area

Affix the sticker clearly visible on the rear of the vehicle.

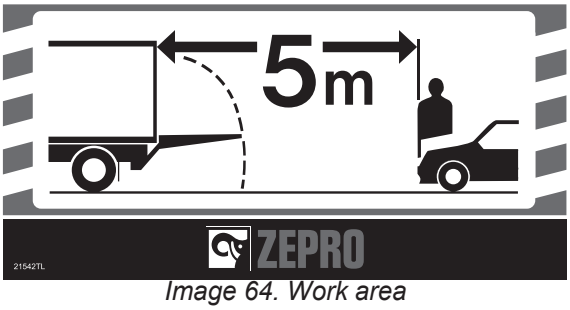


Image 64. Work area

12.4 Warning tape

Affixed along the platform edge strips to mark the platform edges in its lowered position.

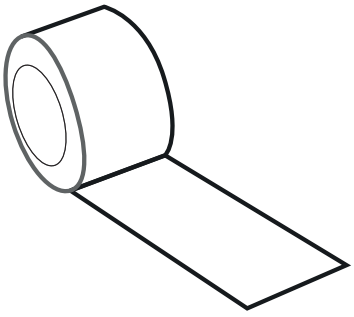


Image 65. Warning tape

12.5 Controller sticker

Affix the controller sticker next to the relevant controller. The stickers are available in standard versions and in reversed version (Option) for affixing on the opposite side of the vehicle. Make sure the stickers are affixed so the image of the vehicle/tail lift on the sticker is in the same direction as the vehicle on which it is affixed.

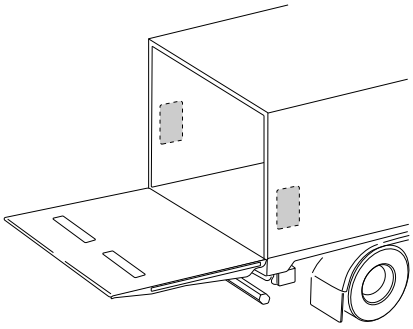


Image 66. Standard mounting

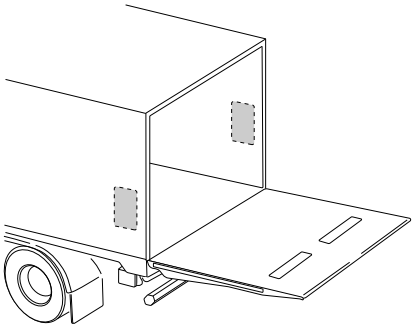


Image 67. Reversed mounting

Control device	Sticker
CD 1, 2, 9	55053TL*
CD 1,2,9 Horizontal	79854TL**
CD 4	55055TL
CD 10	77661TL

* The sticker section for 2-hand operation is delivered on the same backing paper and has to be affixed if the application has 2-hand operation. For applications without 2-hand operation, this part of the sticker is discarded.

****** Ordered separately*

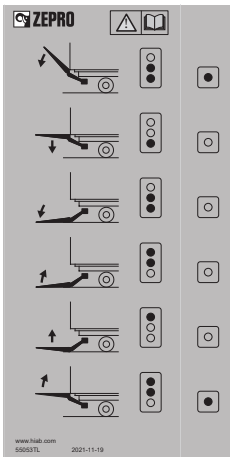


Image 68. Control device sticker for CD 1, 2, 9

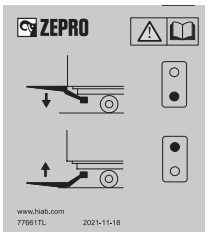


Image 69. Control device sticker for CD 10

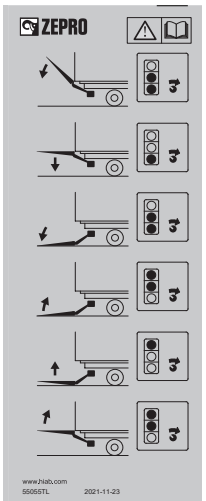


Image 70. Control device sticker for CD 4

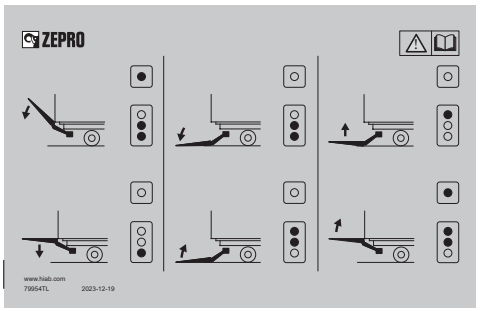


Image 71. Control device decal for CD 1 with the two-hand button mounted above the control device.

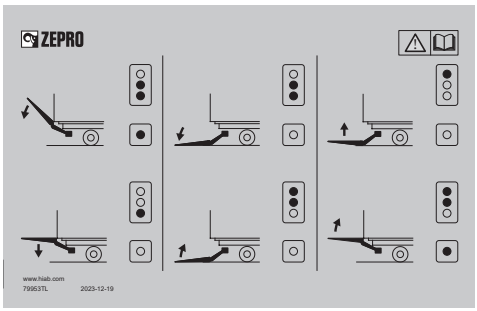


Image 72. Control device decal for CD1 with two-hand button mounted below the control device.

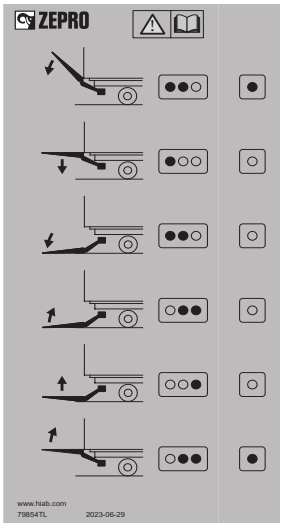


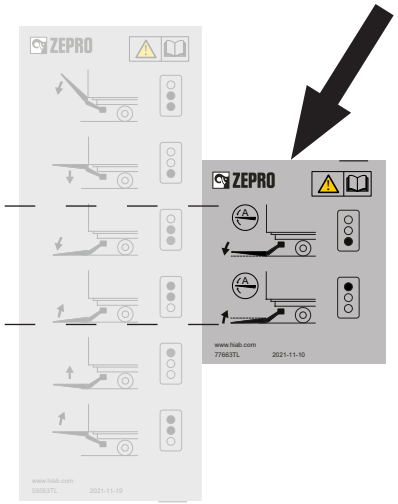
Image 73. Control device decals for CD 1, 2 and 9 for horizontal control device is ordered separately. 79854TL

12.5.1 Autotilt additional sticker

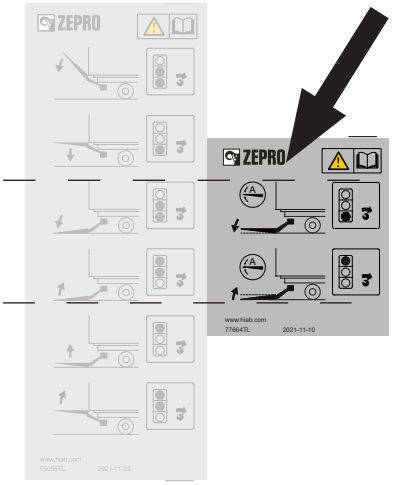
There is an additional sticker affixed next to the control device sticker on tail lifts fitted with autotilt.

The stickers are available in standard versions and in a latterally reversed version for affixing on the opposite side of the vehicle.

Affix additional autotilt stickers for CD1, CD4 and CD9 next to their respective controller stickers and align them and with the two middle symbols for the tilt down and tilt up functions.



Additional autotilt sticker for CD 1 & CD 9



Additional autotilt sticker for CD 4

Control device	Stickers
CD 1, CD 9	77663TL
CD 4	77664TL

12.6 Danger area

If one is fitted, affix the sticker on the inside of the vehicle body next to the hand control unit.

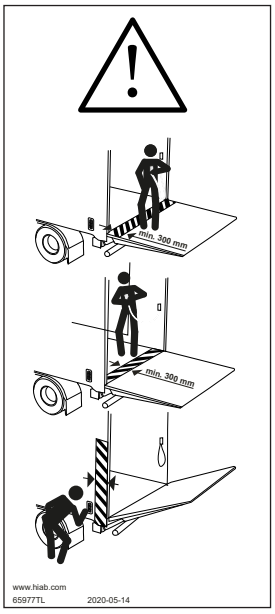


Image 74. Danger area

12.7 Warning flags

Attach warning flags as close as possible to the top and edge of the platform, where there is no risk of them coming loose when the platform is lowered to the ground. Swage the tracks together to secure the warning flags. The flags must be provided with reflective tape.

Image 75. Warning flags

13 Lubrication and fluid level check

The following lubrication points must be greased on installation. They must then be lubricated at least 4 times a year.

13.1 Lubrication

NOTE.

Use LE lubricant 4622 or the equivalent.

1. Right tilting cylinder, at lower bearing.
2. Right lift cylinder, at lower bearing.
3. 1st boom right side, at lower bearing.
4. Left lift cylinder, at lower bearing.
5. Left tilting cylinder, at lower bearing.
6. 1st boom left side, at lower bearing.
7. Left tilting cylinder, at upper bearing.
8. Right tilting cylinder, at upper bearing.
9. 1st boom right side, at upper bearing
10. Right lift cylinder, at upper bearing.
11. Left lift cylinder, at upper bearing.
12. 1st boom left side, at upper bearing.

13.2 Oil level check

Check the fluid level in the tank during maintenance, top up if necessary. The marking on the hydraulic tank indicates the type of hydraulic fluid used. Mineral hydraulic fluid, product no. 21963 (1 litre), or biodegradable synthetic fluid, product no. 22235 (1 litre).

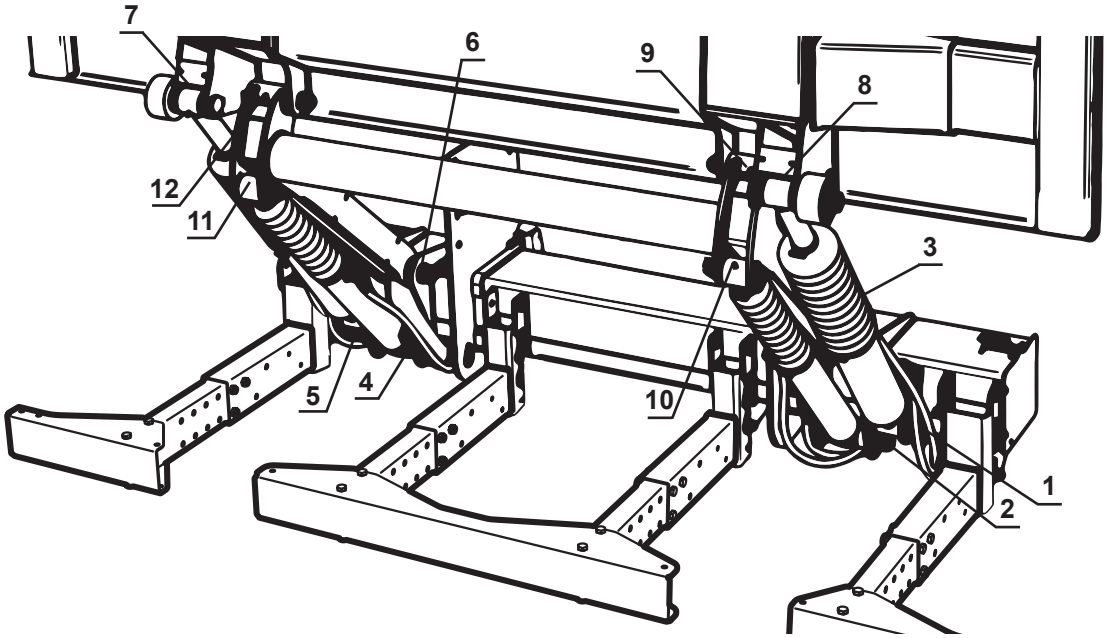


Image 76. Lubrication points

14 Testing and verification

Testing and verification of the tail lift takes place in accordance with the installation/delivery inspection. Verify that the tail lift is suitable for the vehicle in question and for the intended use.

14.1 Static load test

14.1.1 Deformation

- Position the tail lift half way up to the vehicle floor level and with the platform in the horizontal position. Measure dimensions A-B-C-D for comparison as illustrated in Image 77.
- Place a test load on the platform according to the table (for the respective tail lift model/lifting capacity).
- Remove the test load from the platform.
- Repeat the measurement of A-B-C-D and verify that there has been no deformation of the lift or its fixing.

14.1.2 Drift

- Place a test load on the platform according to the table. The tail lift must be at the same level and angle as the vehicle floor. Leave the test load for 15 minutes.
- Verify that the platform does not drift more than 15 mm on the vertical (points A and D) and no more than 2º in terms of the angle (points B and C) in relation to the floor.

14.1.3 Static load (Test load 1.25 x tail lift loading capacity). For tail lifts with load centre of 1000 mm.

Capacity	Load 500 kg	Load 1000 kg
	Distance on 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

14.1.4 Static load (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 on platform (L)	
1000 kg	940 mm	-
1500 kg	1410 mm	940 mm-
2000 kg	1875 mm	1250 mm
2500 kg	2340 mm	1560 mm

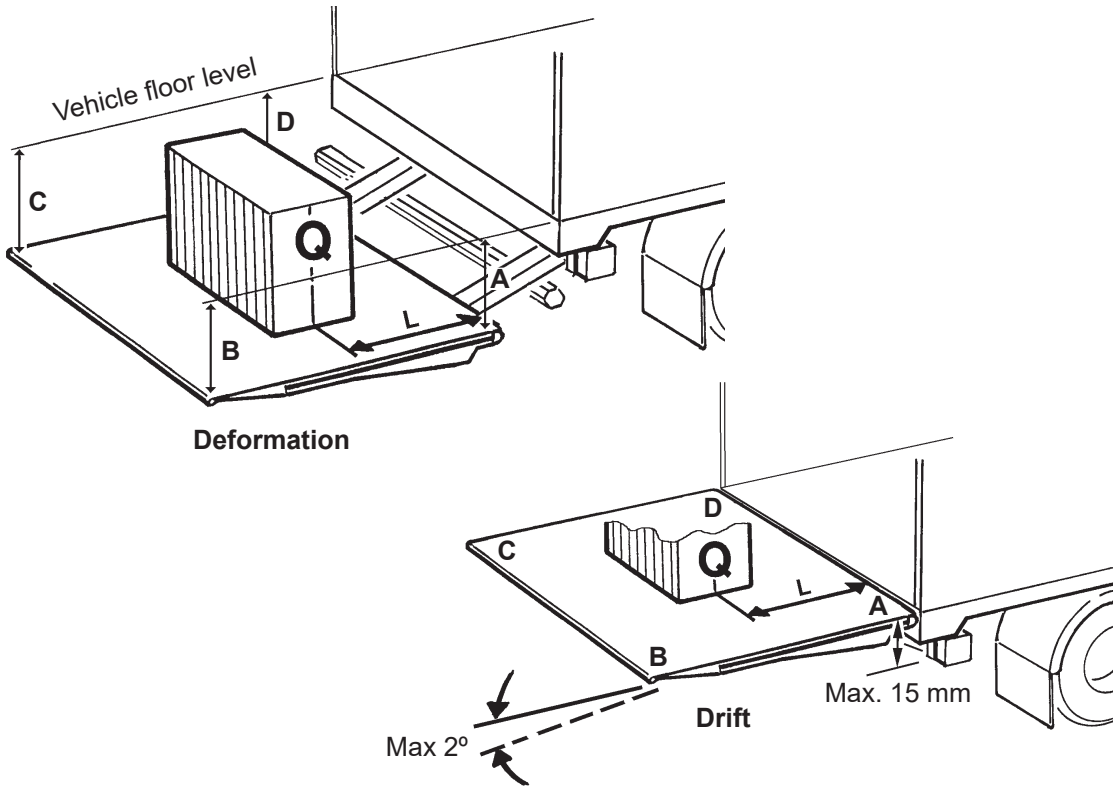


Image 77. Testing and verification

14.2 Dynamic load test.

14.2.1 Test with max. load

- Place a test load on the platform according to the table (for the respective tail lift model/lifting capacity).
- Check that the lift operates correctly in the normal range of movement, i.e. up, down, tilting at ground level and tilting at vehicle floor level.

14.2.2 Test with overload

- Place a test load on the platform according to the table (for the respective tail lift model/lifting capacity).
- The test load should be 1.25 x max. load for each lift model. Verify that the tail lift cannot lift the load when the up function is switched on (it may however be possible to tilt up the load).

14.2.3 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 on 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

14.2.4 Dynamic load (Test load 1.0 x tail lift loading capacity). For tail lifts with load centre of 750 mm.

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

14.3 Test of safety functions

The tail lift safety functions must be tested.

Check:

- That the red light in the driver’s cab turns off when the platform is completely closed against the body and that it turns on when the platform is opened.
- that the platform cannot be opened or closed without the use of two-hand operation.
- that the platform cannot be tilted more than -10 degrees when using spiral cable controller or radio controller when the platform is flush with the vehicle floor.
- That the tail lift cannot be activated if the cab switch is in the off position.
- That the tail lift cannot be activated when the main switch fuse is removed.
- That the overflow valve is activated when the lift is operated up to the vehicle floor level or end stops.
- That the tail lift cannot be lowered or tilted down if the electrical connector from the electric hose rupture valves is disconnected from the lift and tilting cylinders respectively.
- That there is a “max. load” marking on the platform and it is correctly positioned according to the loading diagram for the tail lift model concerned.
- That warning flags and reflectors are fitted and fulfil their function correctly.
- That all safety and operating stickers are affixed in their respective positions.
- That the platform’s mechanical lock is functioning correctly (where applicable).
- That the instructions for using the tail lift have been left in the driver’s cab.
- That the CE declaration of conformity has been completed.

15 Disassembly

If the tail lift has to be removed from the vehicle, for example to transfer it to another vehicle, for storage or for modification, please follow these instructions.

1. Support the platform with a crane or similar equipment that can safely carry the platform's weight (see weight info).
2. Dismantle the upper pivot of the tilting cylinders from the platform and rest the cylinders on the ground.
3. Run the tilting cylinders to their minimum stroke limit to remove pressure from the circuit.
4. Dismantle the side profiles from the platform. Loosen the grease nipples and lock screws in the platform pivots. Use the Zepro special tool for the platform pivots. Hammer outside with the sliding weight.
5. Follow the same procedures for the other side.
6. Lift off the platform.
7. Raise the 1st booms to their highest position.
8. Disconnect +12-24 V from the control card.
9. Disconnect all controllers from the control card.
10. Support the support frame from underneath, for example with a car jack.
11. Remove the support frame from the vehicle frame by loosening the bolts and carefully lowering the support frame to the ground with a car jack.

16 Specifications

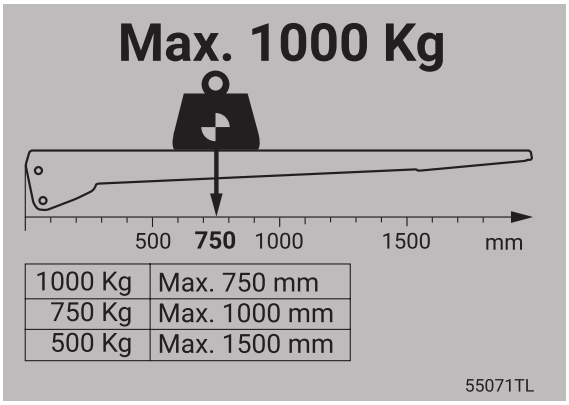
16.1 Weights

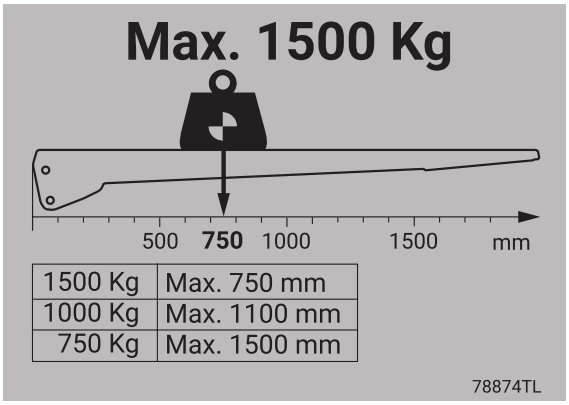
Many of the lift components are heavy, requiring the use of lifting equipment to get them in place. Make sure the weight of the components does not exceed the maximum permitted load of the lifting equipment.
The following is a list of selected components with their weight.

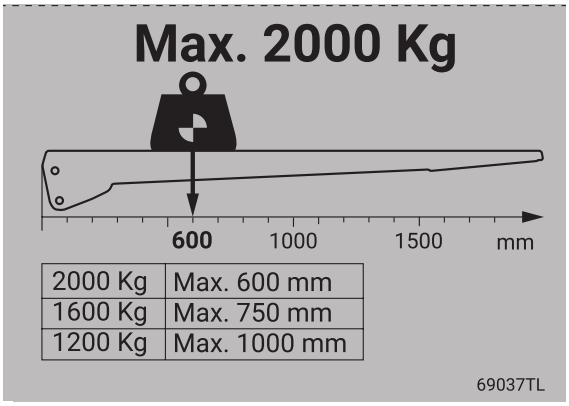
Complete Lift chassis (without platform)	
Z-10-130	315 kg
Z-10-150	328 kg
Z-15-130	315 kg
Z-15-150	328 kg
Z-20-130	317 kg
Z-20-150	330 kg
Aluminium platforms	
Plan 40 mm	
Aluminium platform 1710x2560 mm	141 kg
Aluminium platform 2010x2560 mm	160 kg
Aluminium platform 2210x2560 mm	174 kg

Lift components (included in complete lift chassis)	
Support frame Z 10/15/20	82 kg
Lift arm Z 10/15/20-130	45 kg
Lift arm Z 10/15/20-150	49 kg
3-part underrun protection cmpl (adjustable)	54 kg
3-part underrun protection cmpl (-130)	36 kg
3-part underrun protection cmpl (-150)	40 kg
Complete frame bracket Z 10/15/20	28 kg
Lift cylinder Z 10/15-130	11.4 kg each
Lift cylinder Z 10/15-150	12.5 kg each
Lift cylinder Z 20-130	12.5 kg each
Lift cylinder Z 20-150	13.5 kg each
Tilting cylinder Z 10/15/20-130	14.3 kg each
Tilting cylinder Z 10/15/20-150	15.4 kg each

16.2 Loading diagram







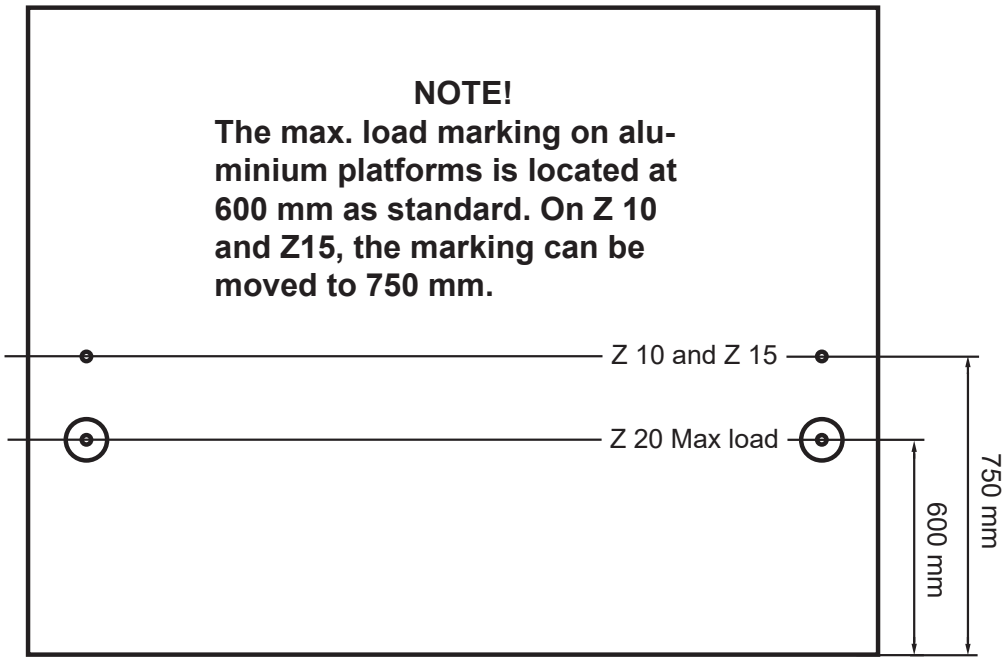
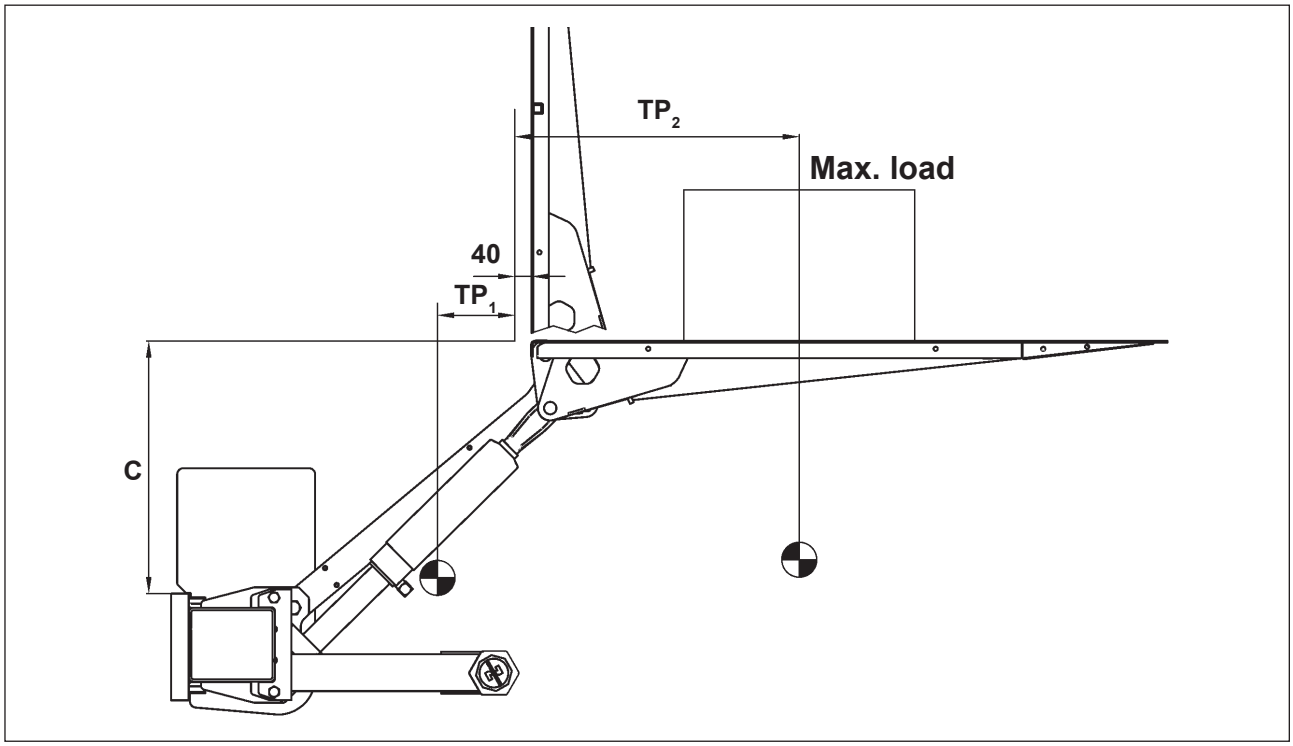


Image 78. Loading diagram

16.3 Centres of gravity



Z-15/20-130 steel platform 1700x2650 mm

	C = 285	C = 465	C = 615
TP_1(mm)	236	191	123
TP_2(mm) 1500 kg	683	788	948
TP_2(mm) 2000 kg	596	701	861

Z-15/20-150, steel platform 1700x2650 mm

	C = 325	C = 515	C = 715
TP_1(mm)	280	233	144
TP_2(mm) 1500 kg	674	781	987
TP_2(mm) 2000 kg	590	697	903

16.4 Tightening torque

NOTE!

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

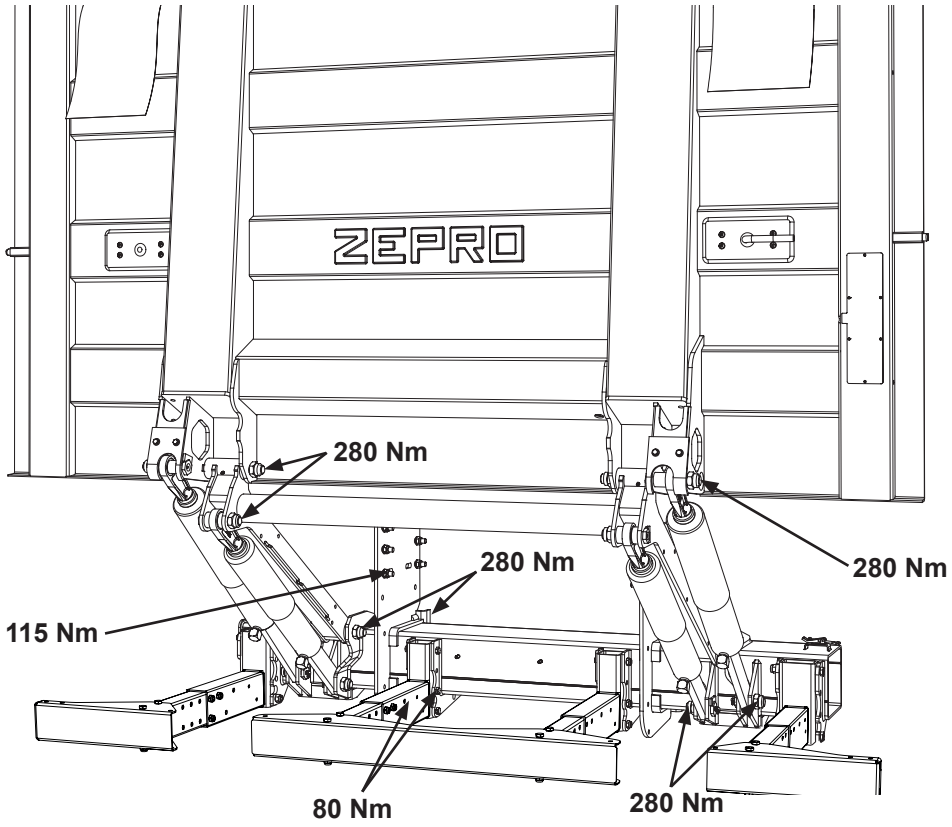


Image 79. Tightening torque

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Zepro, Del and Waltco are Hiab brands for tail lifts. Hiab is a world-leading supplier of equipment, intelligent services and digital solutions for on-road load handling. As an industry pioneer our company commitment is to increase the efficiency of our customers' operations and to shape the future of intelligent load handling.