Installation Instruction

Tail Lift

Z3N / Z3NU 75-100

Z3NN / Z3NNU 75-100

Z3NW / Z3NWU 75-100

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74598TL
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ZEPRO

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1 Important information

1.1 Attention!

The following warning signs appear in the installation instructions and are intended to draw your attention to circumstances that can potentially cause problems, near misses, personal injury and/or damage to the product, etc.

⚠ WARNING!
WARNING indicates a potential hazard, which if ignored may lead to serious, life-threatening injury.

⚠ CAUTION!
CAUTION indicates a potential hazard, which if ignored, may lead to minor injuries.

IMPORTANT!
IMPORTANT indicates a risk of equipment damage.

NOTE!
NOTE refers to additional information that may help the reader understand, or perform, a given operation.

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

ZN = 3 cylinders, narrow lift arm
Z3NU = 3 cylinders, narrow lift arm u-protection
Z3NN = 3 cylinders, narrow lift arm narrow frame
Z3NNU = 3 cylinders, narrow lift arm narrow frame, u-protection
ZNW = 3 cylinders, narrow lift arm wide frame
Z3NWU = 3 cylinders, narrow lift arm wide frame, u-protection

E.g. Z3N - 75 - 110 SA

Max. lifting capacity x 10 (kg)

Max lifting height x 10 (mm)

Cylinder model, MA = Double acting adjustable tilt Single operation Lift

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

The ZEPRO warranty applies only if assembly has been carried out according to ZEPRO's assembly instructions by a ZEPRO approved bodybuilder.

After installation, testing and verification, register the tail lift’s delivery card to validate the warranty.

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.

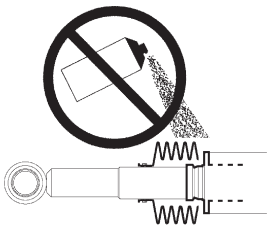


Image 2. Piston rods, cylinder covers and boots

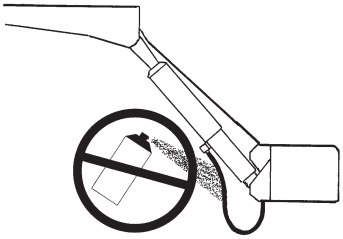


Image 3. Hydraulic hoses

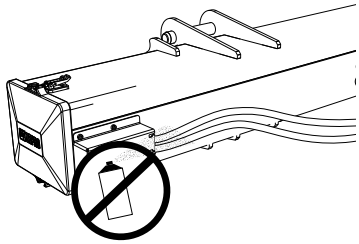


Image 4. Cables

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 the lift is operated repeatedly without starting or using the vehicle during lift installation or carrying out service and repairs, use the battery charger between operations to maintain battery charge.

IMPORTANT!
The battery charger must be disconnected when operating the lift. Risk of material damage.

2 Safety rules

2.1 Moving parts free movement

⚠ WARNING!
During final inspection*, 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). **Final inspection to 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.

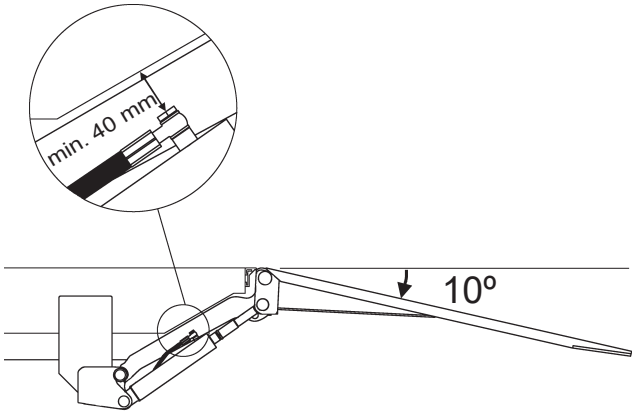


Image 5. Clearance to the closest part of the cylinder must be at least 40 mm

⚠ WARNING!
The platform may not be tilted down more than 10º from the horizontal.

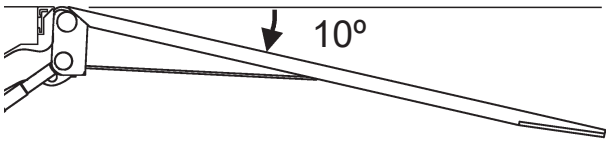


Image 6. The platform may not be tilted down more than 10º from the horizontal

2.2 Connection of third-party equipment is forbidden

⚠ WARNING!
Connecting third-party equipment (electric or hydraulic) to Zepro tail lifts is forbidden. Connecting third-party equipment could interfere with the lift's 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.

2.3 Installation

⚠ WARNING!
Installation where the platform cannot reach ground level is prohibited.

⚠ WARNING!
ZEPRO tail lifts are only approved for installation using ZEPRO assembly kits.

IMPORTANT!
All specified tightening torques apply when using torque wrench or screw/nut runner with torque control. Torque spread max ±5%.

3 Before installation

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 is not permitted to be less than 78 cm^4. For this reason, the frame beam's cross-section shall have at least dimensions of 95x50x3 mm, corresponding to a minimum surface moment of inertia of 78 cm^4 around the x-axis. See Image 7. If in doubt, contact ZEPRO for support.

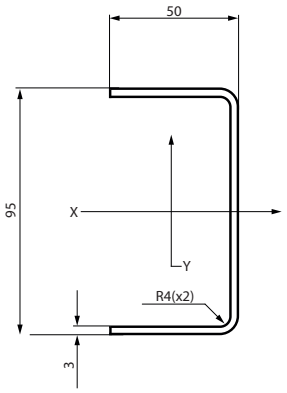


Image 7. Cross section of vehicle chassis' frame beam

⚠ 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.

3.2 Statutory dimensions

- Distance between the beam and the ground when the vehicle is unloaded: Max. 550 mm.
- Horizontal distance from the outermost part of the platform to the underrun protection: Max. 355 mm. See Image 8.

NOTE!
The underrun protection must be located further back and lower.

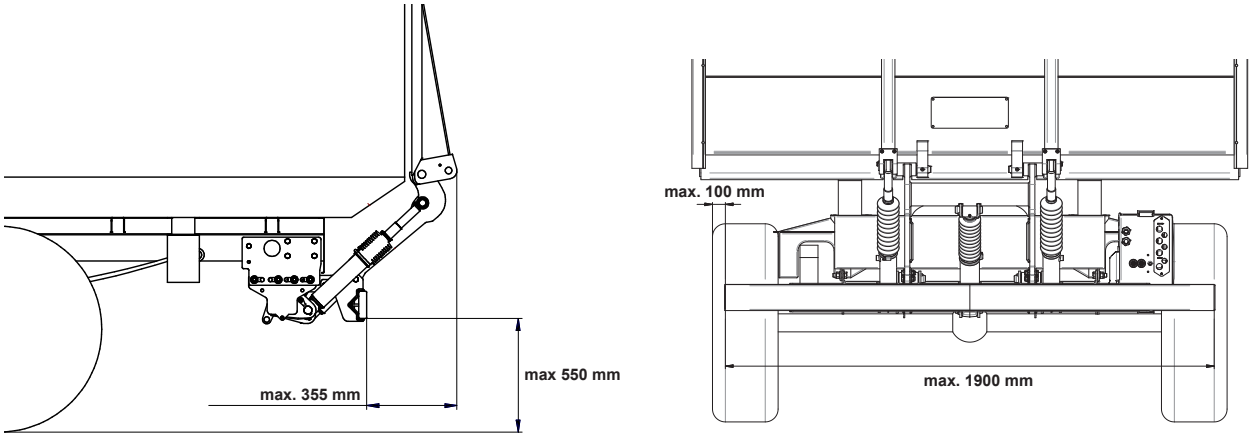


Image 8. Statutory dimensions

3.3 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.

3.3.1 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 lift arms in the upper position and the vehicle floor level (A dimension).

3.3.2 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.

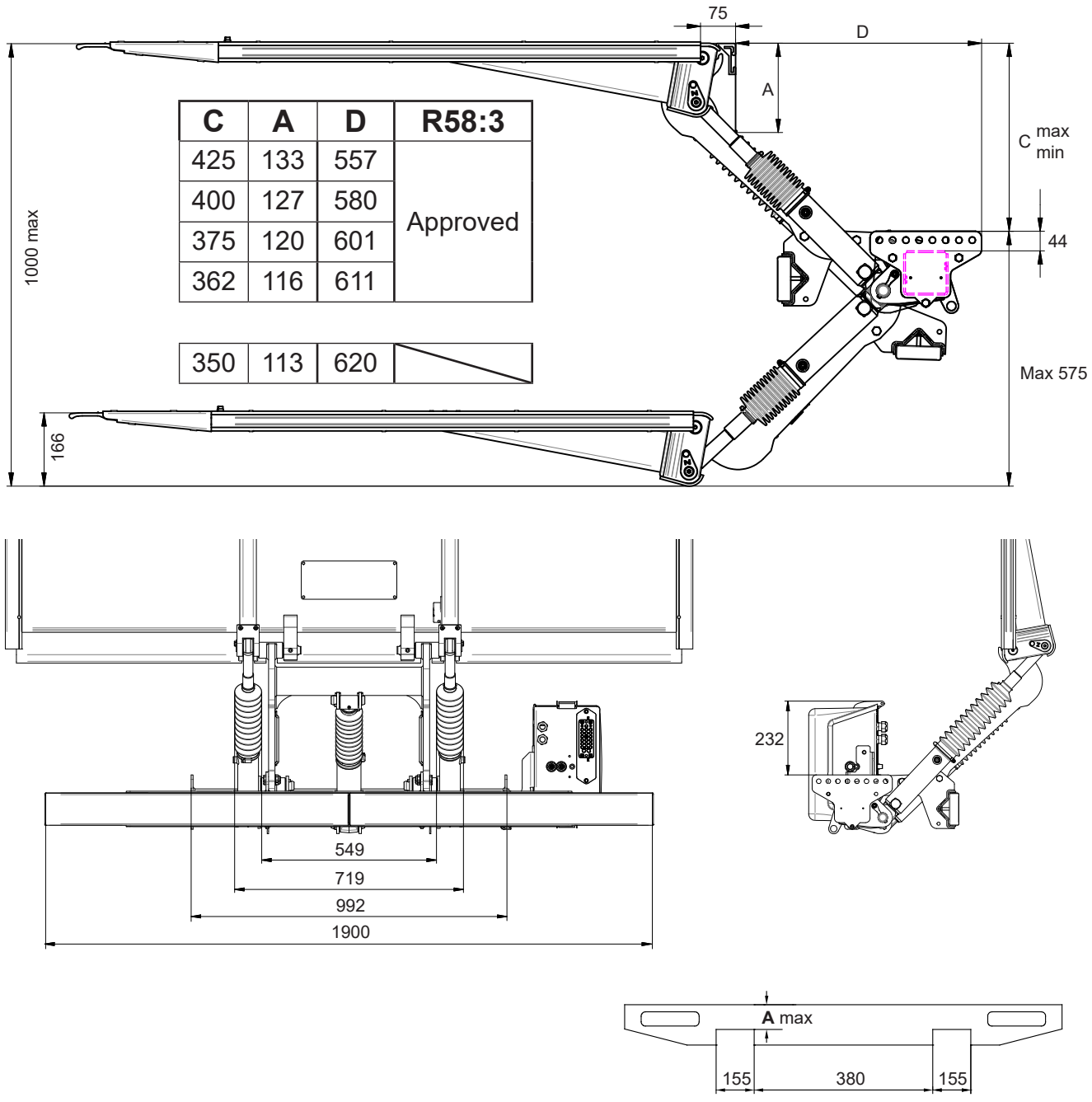
3.3.3 A dimension

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

3.3.4 H dimension

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

3.4 Z3N(U) 75-100

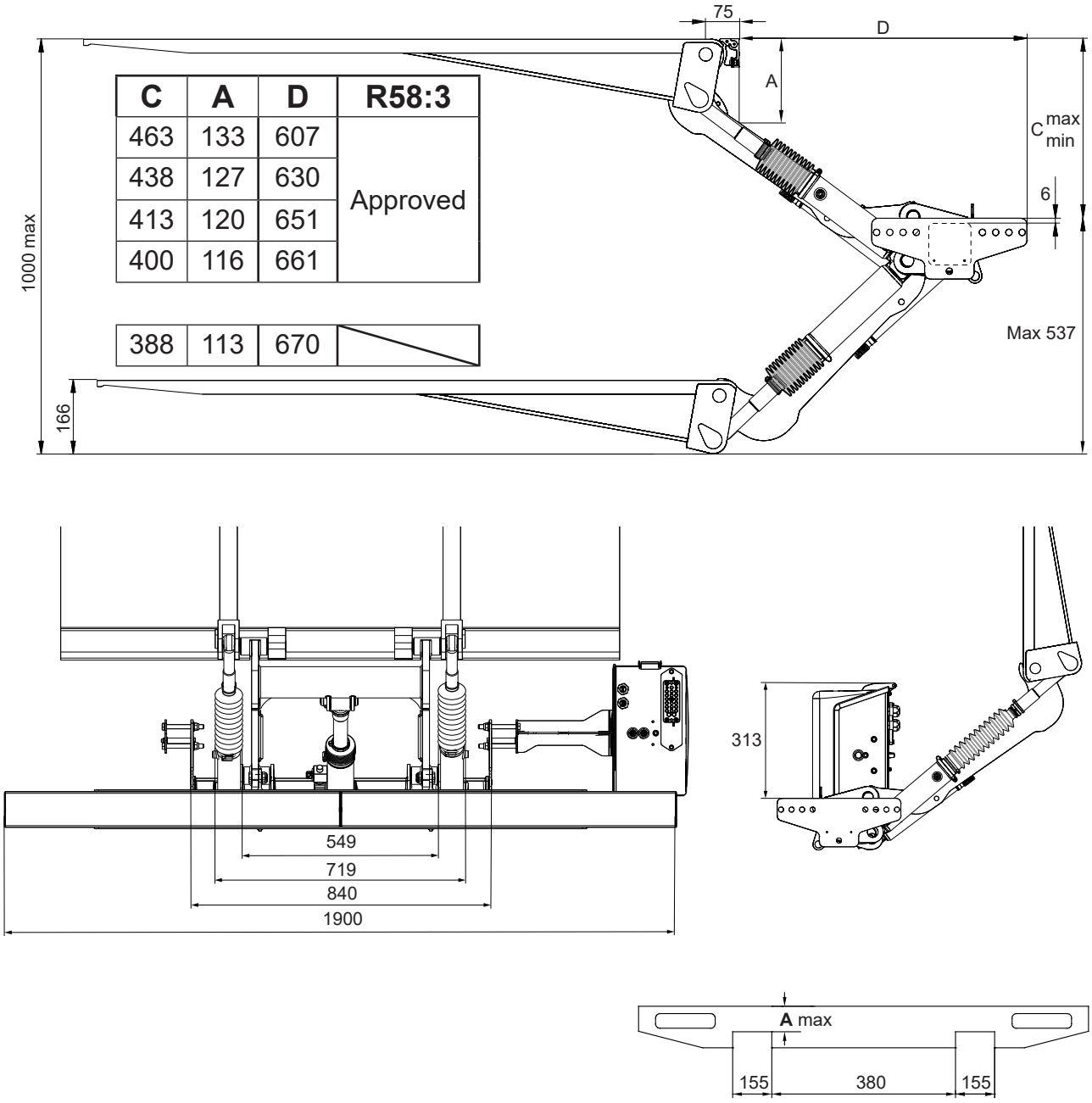


C	A	D	R58:3
425	133	557	Approved
400	127	580	
375	120	601	
362	116	611	
350	113	620	

Image 9. Installation dimensions for Z3N(U) 75-100

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

3.5 Z3NN(U) 75-100

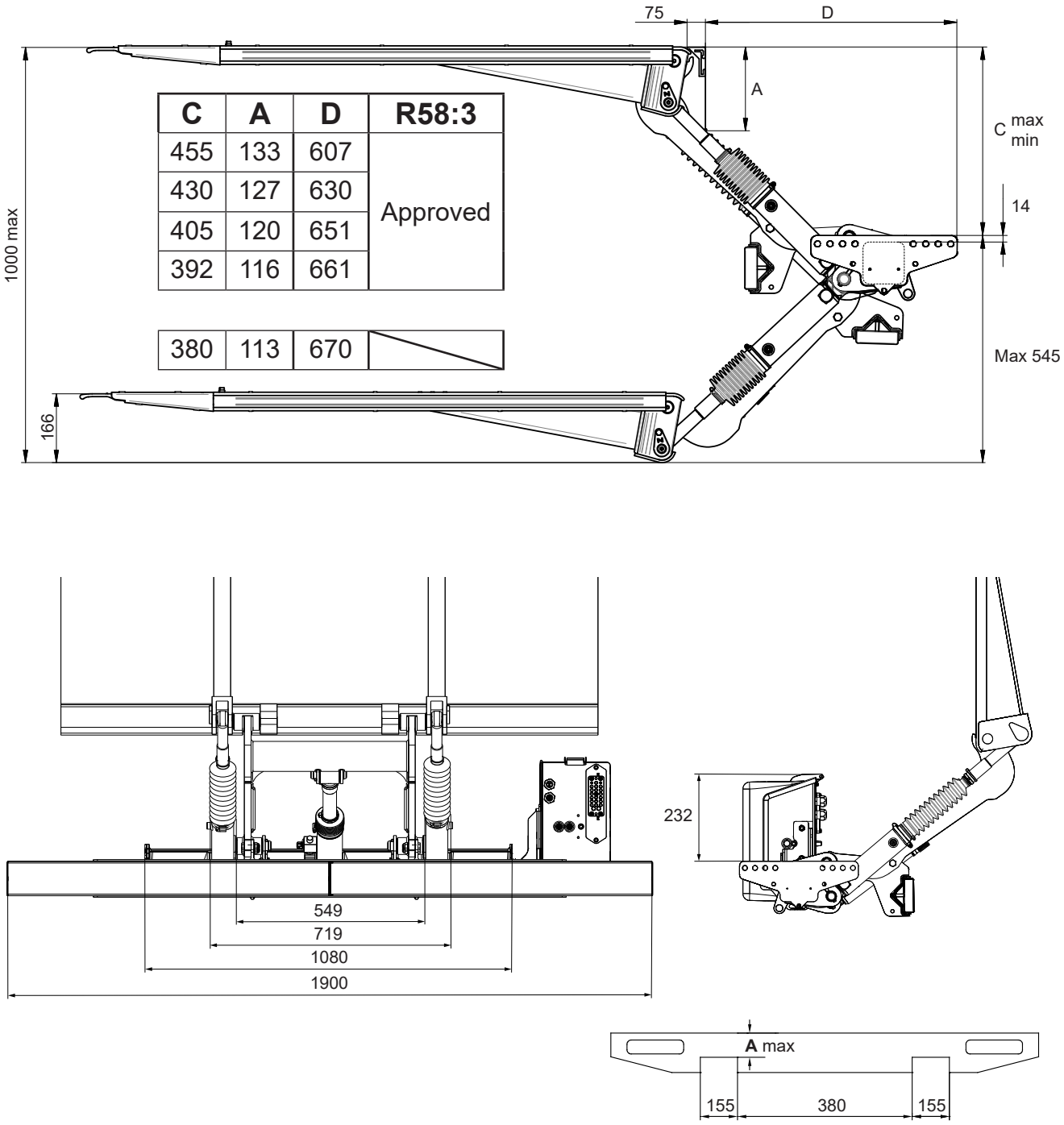


C	A	D	R58:3
463	133	607	Approved
438	127	630	
413	120	651	
400	116	661	
388	113	670	

Image 10. Installation dimensions for Z3NN(U) 75-100

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

3.6 Z3NW(U) 75-100



C	A	D	R58:3
455	133	607	Approved
430	127	630	
405	120	651	
392	116	661	
380	113	670	

Image 11. Installation dimensions for Z3NW(U) 75-100

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

3.7 Temporary connection

When the tail lift is installed, it is sometimes necessary to operate its functions in order to change the position of the cylinders and the lift arms. Temporarily connect the lift to enable the lift functions.

1. Connect a suitable control device to Ctrl 1/C1, see section 3.7.2/3.7.3.
2. Connect the tail lift's main power cable to battery +12/24V.
3. Connect the negative battery terminal to the tail lift's earth cable (GND).
4. Relay card TLC-B1: When operating, connect a cable (jumper) between an available power supply connection (+) and CS on the relay card to simulate switch CS being on. Remove the cable immediately after completed operation.

   Control card ZePRO1: When operating, connect the cable (jumper) between the CSPWR and CS on the control card to simulate that the CS switch is turned on. Remove the jumper immediately after completed operation.

⚠ WARNING!
Take great care while running the lift functions and make sure nothing gets pinched: risk of personal injury and material damage.

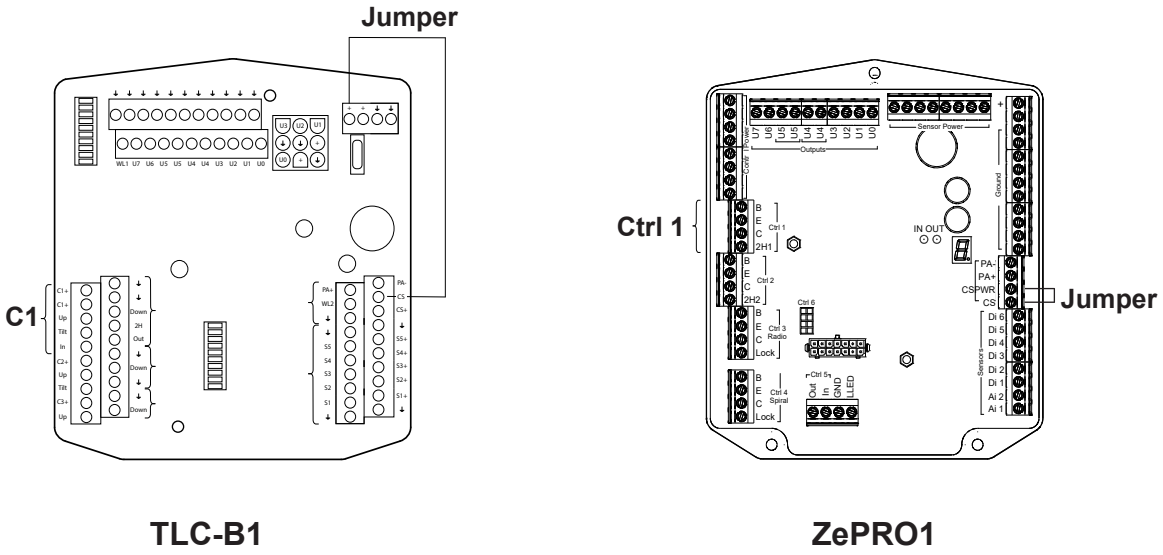


Image 12. Temporary connection

3.7.1 Battery maintenance

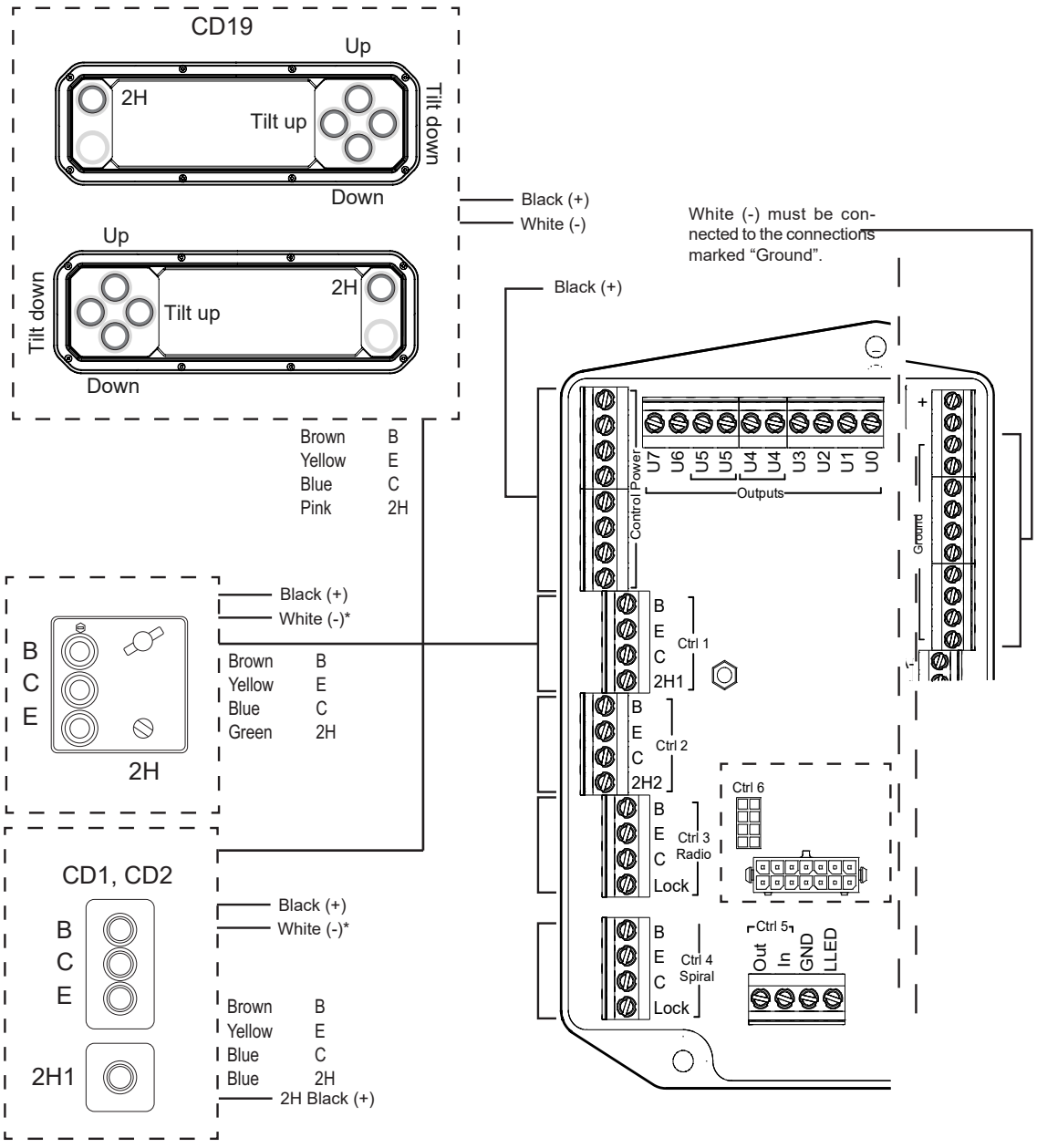
When installing the lift, when the lift is operated repeatedly, the battery charger must be used between operations to maintain the battery charge level.

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

3.7.2 Connecting the control device to the ZePRO1 control card

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

⚠ WARNING!
Make sure that the control card is disconnected from the power before connecting. Connecting more than one controller to each connection is not permitted. Risk of material damage.

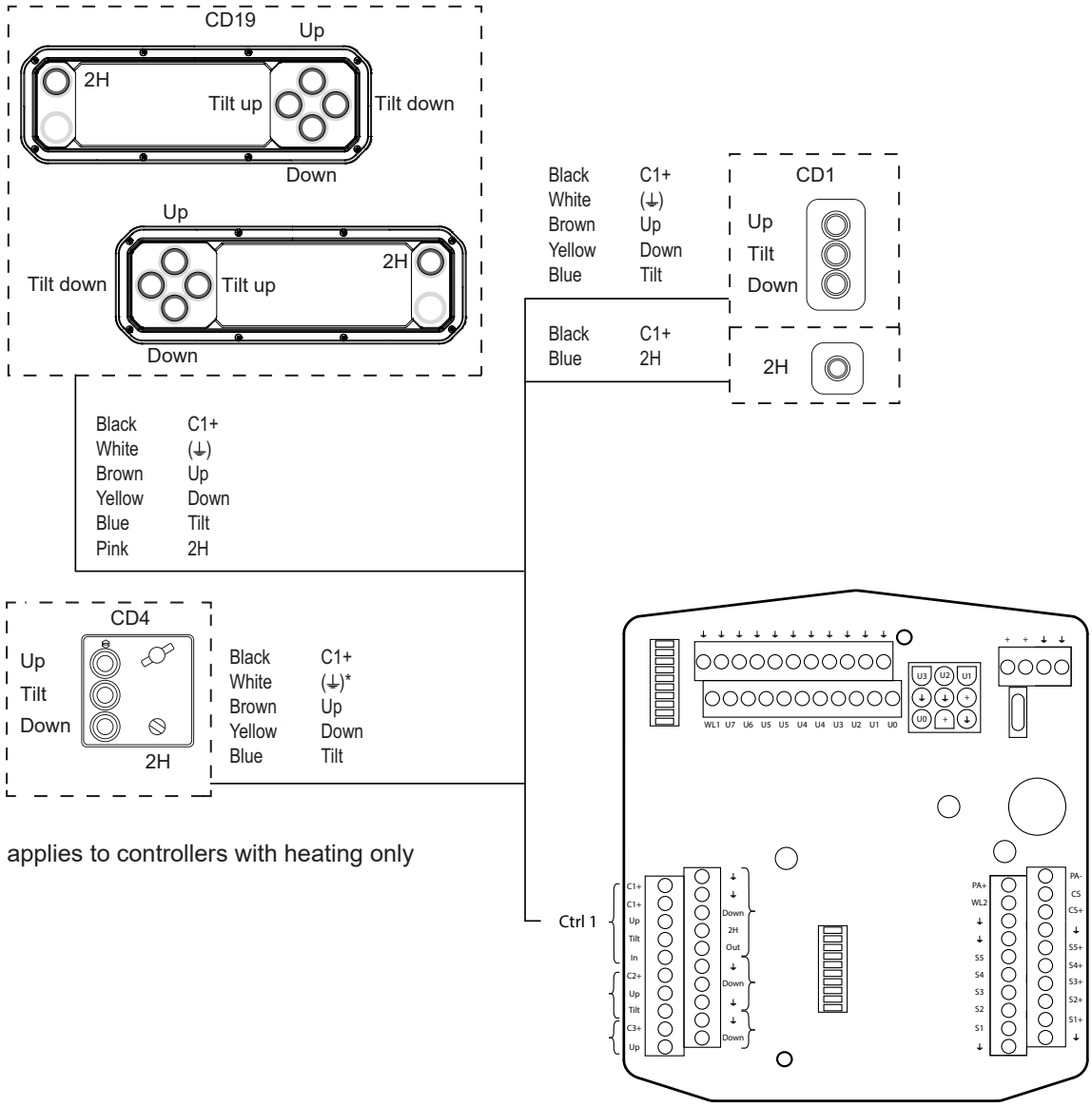


* applies to controllers with heating only

3.7.3 Connecting the control device to the TLC-B1 relay card

The connection of warning lights and the most commonly occurring controller (CD (Control Device)) models is shown below. Possible controller models vary depending on lift model, configuration and relevant market.

> **⚠ WARNING!**
> Make sure the control relay is disconnected from power before connecting. Connecting more than one controller to each connection is not permitted. Risk of material damage.



* applies to controllers with heating only

4 Installation

4.1 Frame

1. Mount the lift to the chassibracket. The number of screws and theír placement depends on the type of bracket used, see installation instruction for the mounting kit in question.
2. Measure and mark the midpoint of the vehicle's rear beam.
3. Check the A measure, if cut outs need to be done in the rear beam, see marking Image 13.
4. Do the necessary cut outs from the rear beam according to the illustrations with the installation dimensions for the respective lift model. See section 3.3
5. Attach the mounting jig, part no 74632TL för Z3N 75, to the rear beam so that the respective midpoint corresponds. Use clamps, screws or spot weld.
6. Place the lifting frame under the vehicle's frame and mount the lift arms at the eye of the jig. Use ordinary bolts for the lifting platform.

   The lifting frame must be parallel with the floor of the vehicle body.

7. Tightly screw the lifting frame into the frame attachments. If lift needs to be adjusted longitudinally in the slot.Use 4 M14x45 10.9 (120 Nm) per side.

   NOTE!
   Use washers on both sides of the fastening!.

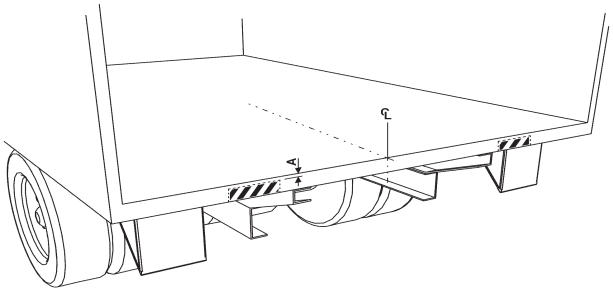


Image 13. Measure and mark the midpoint of the rear beam of the vehicle

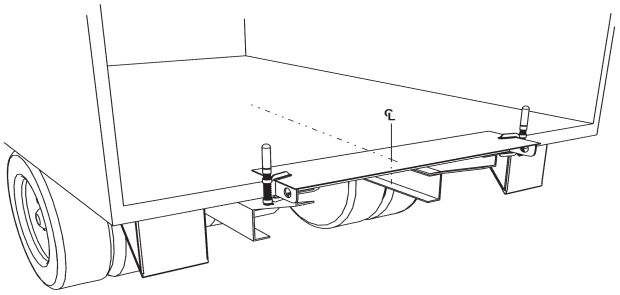


Image 14. Attach the mounting jig, part no 74632TL för Z3N 75

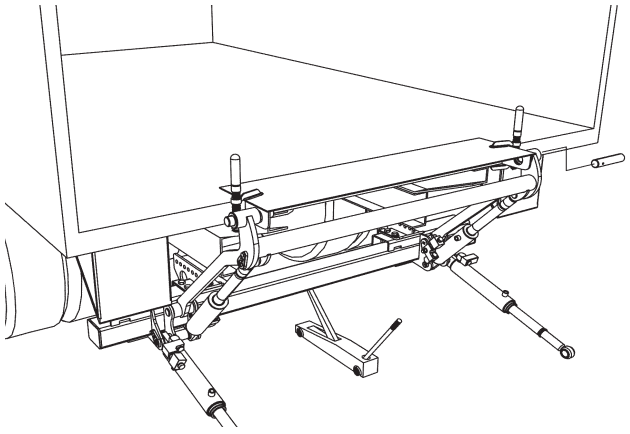


Image 15. Adjust the frame to the ideal height under the frame. A car jack is a good tool.

4.1.1 Attaching hydraulic unit, Z3N(U), Z3NW(U)

Mount the unit on the lifting frame according to the illustration. Use supplied M10x25 (50Nm).

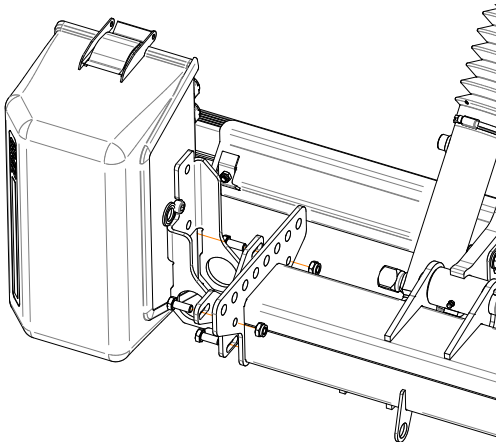


Image 16. Mount the unit on the lifting frame

4.1.2 Hydraulic unit and hydraulic hoses

The hydraulic unit is supplied with pre-connected hydraulic hoses and electric cables.

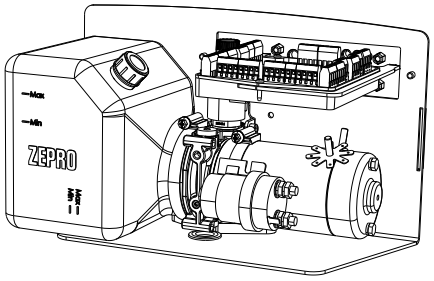


Image 17. Hydraulic unit

4.1.3 Hydraulic hoses

A = Oil return Tilt circuit.
B = ressure to lift and tilt circuit.

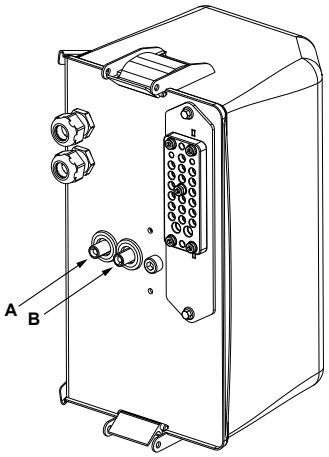


Image 18. A = Oil return Tilt circuit.
B = ressure to lift and tilt circuit.

4.2 Hydraulic unit with circuit card, detailed image

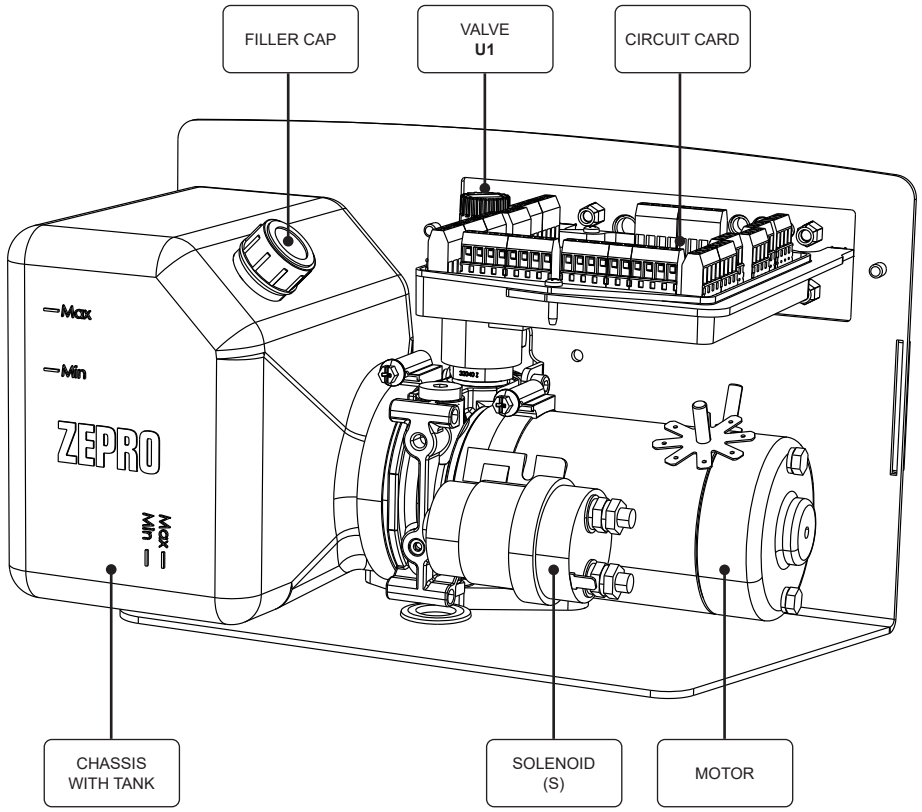


Image 19. Hydraulic unit

4.3 Installation lift platform and sealing strip

4.3.1 Lift platform

1. Check that all included components are clean, clean where necessary.
2. Lubricate the metal bushings on the upper bearing of the arms. Make sure the small holes on the inside of the bushings are filled with grease. Use Zepro lubricant or equivalent.

   NOTE!
   Carefully lubricate the metal bushings on the upper bearing of the arms. Make sure the small holes are filled with grease. After installation of the platform, the same bearings are also lubricated through the regular lubrication nipples, see section "9 Lubrication and fluid level check" on page 48
3. Fit the platform to the arms and fasten the tilt cylinders to the platform. Use the supplied shafts and locking nuts. **Tightening torque: 25 Nm.**

   NOTE!
   The tilt cylinders should be adjusted before fixing to the platform.

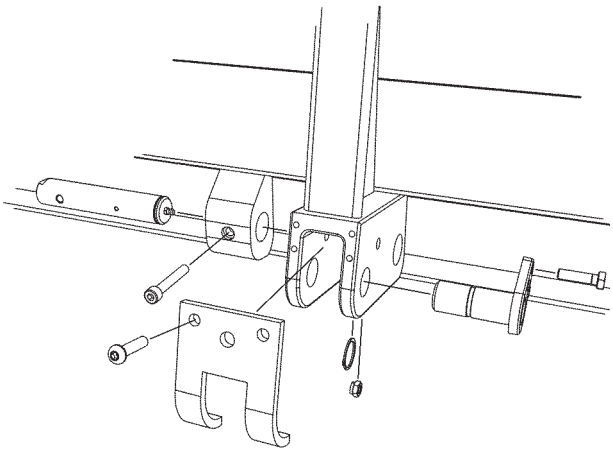
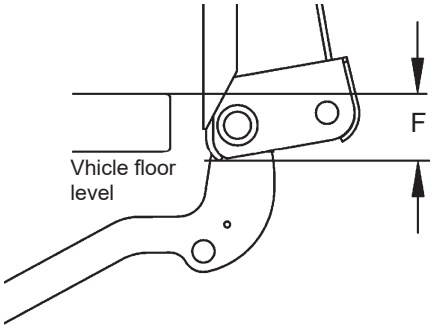


Image 20. Fit the platform with the shafts and locking nuts provided.

4. 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 21..

NOTE!
The platform underhang (F) varies according to platform type and this should be taken into account when fitting the top edge seal.



Type	Flat head 40 mm
F (mm)	75

Image 21. Fit the platform to the arms

4.3.2 Sealing strip (horizontal), surface-mounted rubber strip

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

1. Check that the distance between the vehicle floor and the platform is 75 mm..
2. Mark where to drill holes for the self-tapping screw.
3. Drill holes (Ø 7.2 mm) for the screws.
4. Fit the horizontal stop strip (steel or aluminium).
5. Fit the rubber strip in the track.

4.3.3 Sealing strip (vertical)

1. Check that the distance between the vehicle floor and the platform is 38 - 40 mm.
2. Attach the tracks with countersunk screws, pop rivets or spot welding.
3. Fit the rubber strip in the track.
4. Secure the rubber strips by swaging the tracks together at the bottom.

NOTE!
If an upper edge seal is being fitted, it must be mitred 45° to the vertical strips.

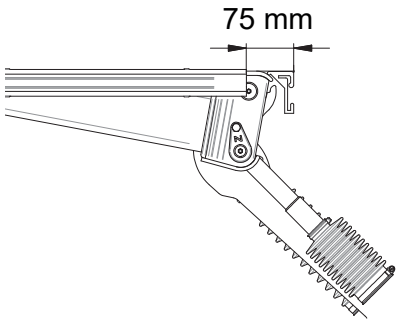


Image 22. Check that the distance between the vehicle floor and the platform is 75 mm.

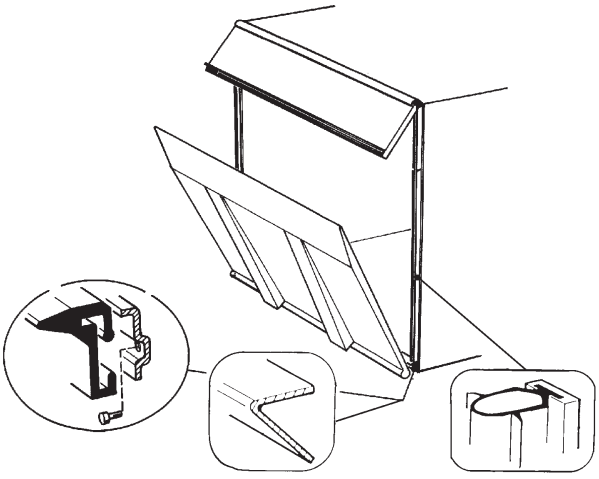


Image 23. Installing a sealing strip

4.3.4 Sealing strip, integrated rubber strip

1. Check that the distance between the vehicle bed and the platform is 38 - 40 mm.
2. Measure out and cut the stop profile and rubber trim to the desired length.
3. Mark where to drill holes for the self-tapping screws.
4. Drill holes (Ø 7.2 mm) for the screws.
5. Fit the screw and nut onto the armstop and assemble them onto the stop profile.
6. Place the armstop according to the position of the lift arm and secure by tightening its screws.
7. Screw the stop profile into the pre-drilled holes.
8. Insert and install the rubber strip in the stop profile.
9. Secure the rubber strip with the associated screw.

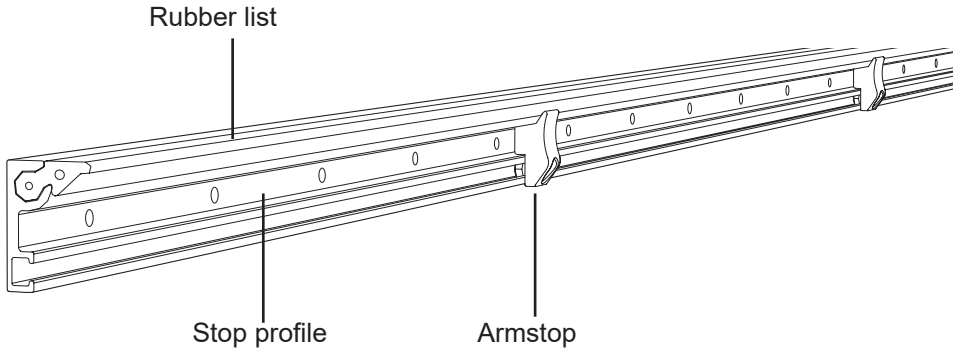


Image 24. Stop profile, overview

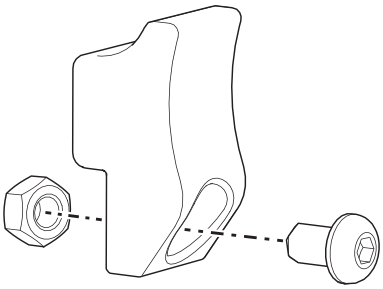


Image 25. Install screw, nut armstop

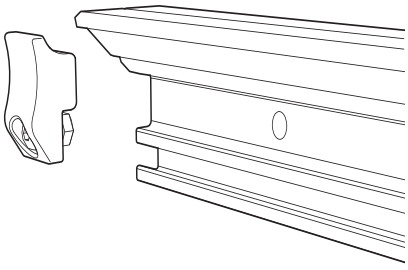


Image 26. Install the armstops

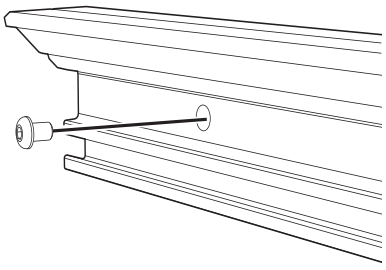


Image 27. Screw tight the stop profile

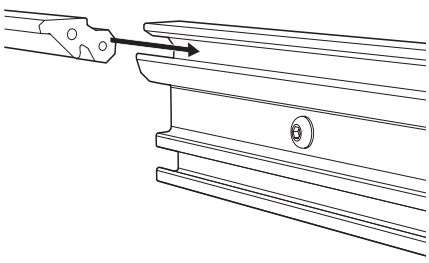


Image 28. Fit the rubber strip

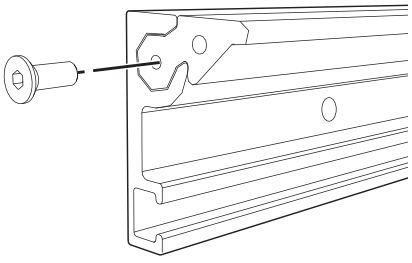


Image 29. Secure the rubber strip

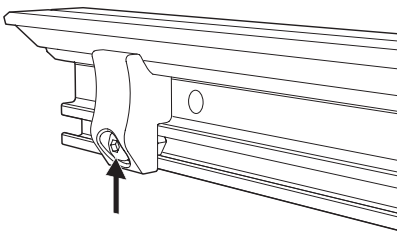


Image 30. Secure the armstop

4.3.5 Adjusting the tilt cylinder

The tilting cylinder can be adjusted in order that the platform fits the respective mounting. For vehicle bodies without rear doors the platform is adjusted against the side sealings. For vehicle bodies with rear doors the platform is adjusted so that it stops in the vertical position and that there is sufficient space between back doors and platform.

NOTE!
Before the tilt cylinder is attached to the platform, the tilt cylinder should be adjusted first.

1. Detach the rubber bellows.
2. Loosen the lock nut (Zepro tool 54598)

Turn push rod clockwise or anti-clockwise depending on the desired adjustment. See illustration.

Adjustment clockwise, the platform is lowered.
Adjustment anti-clockwise, the platform is lowered.

To ensure that the locking nut is fixed in the set position it is recommended that it is locked with Loctite 243 or equivalent.

NOTE!
Max adjustment distance is 30 mm. Do not exceed this!

3. After adjustment, tighten the locking nut. 120 Nm.

Refit the rubber bellows. Rubber bellows must be fitted so that they are against locking bolts (see illustration).

4.3.6 Purging the cylinders

For all cylinder models:
Fully lower the platform to the ground a few times to purge the lift cylinders.

You may have to lift the truck to fully lower the platform.

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

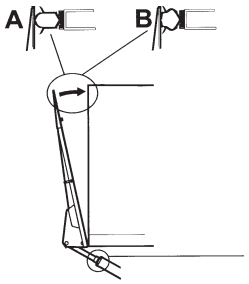


Image 31. Body without rear doors. With side seals.

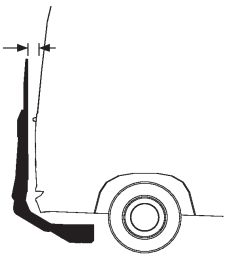


Image 32. Body with rear doors.

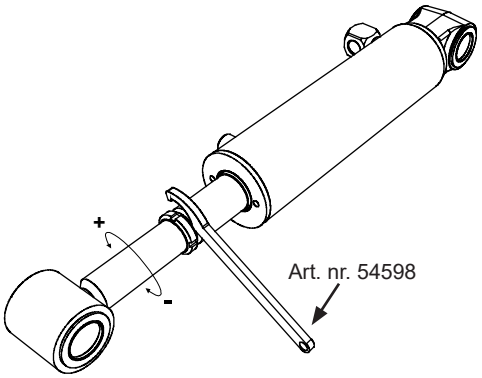


Image 33. Loosen the lock nut

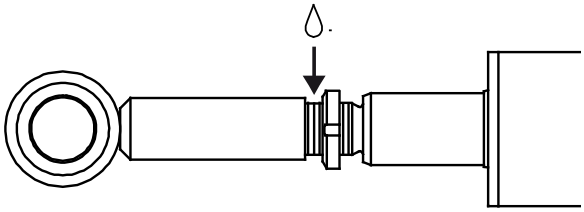


Image 34. Use loctite 243 or equivalent

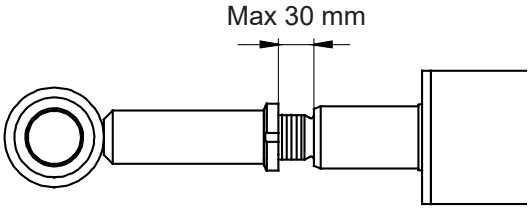


Image 35. Max adjustment distance is 30 mm.

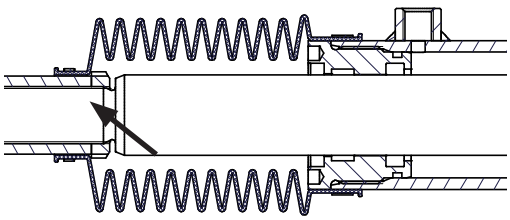


Image 36. Rubber bellows must be fitted so that they are against locking bolts

4.4 Installing the angle sensor. Applies to lifts with this equipment

1. The round angle sensor should be mounted with the cable facing downwards at 45° towards the platform. See Image 37. Drill Ø5.2 mm holes if there are no pre-drilled holes.

   NOTE!
   Make sure that the sensor is mounted in such a way that its cable connection is facing down, see Image 37.
2. Install the IFM angle sensor and the accompanying bracket over the round angle sensor using the screws supplied. See Image 38.
3. Route the cables of the angle sensors and install together with cable ties as shown below. Check that the cables are not stretched or otherwise at risk of being damaged while the platform is in motion.
4. Connect control card/relay card. See section 8.

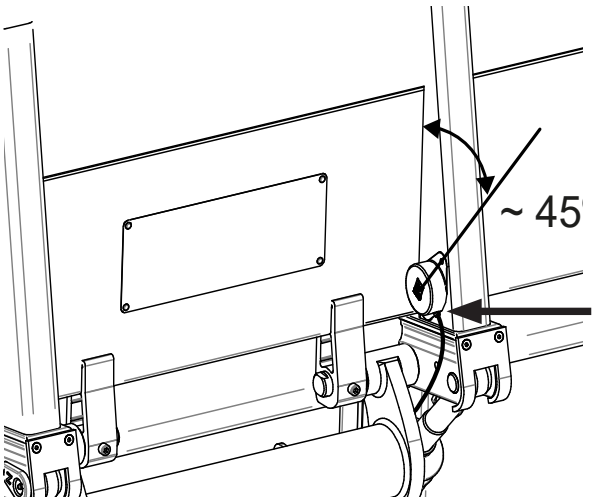


Image 37. Installing the angle sensor at an angle of 45 degrees with cable connection downwards

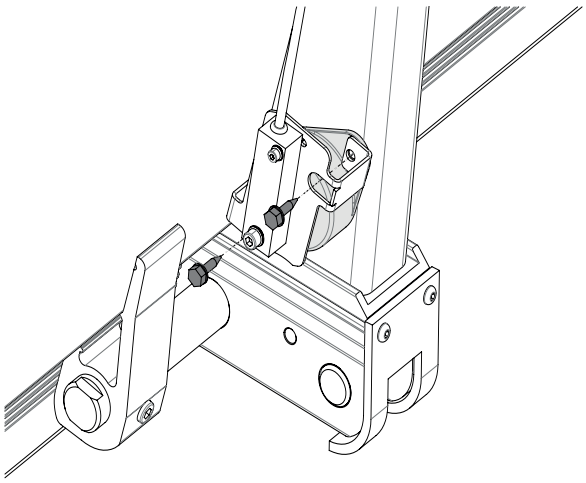


Image 38. Install the IFM angle sensor with the accompanying bracket over the round angle sensor.

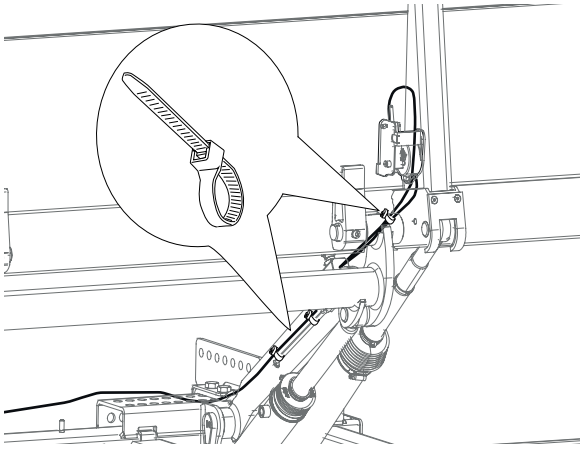


Image 39. Fasten the cable with cable ties.

4.4.1 Setup

Angle sensor IFM shall be adjusted so that the platform stops when tilting down to -10 degrees.

1. Tilt the platform downwards until it stops and measure the angle.
2. If the angle is not -10 degrees. Undo the two screws holding the IFM angle sensor but do not remove them. See Image 40.
3. Adjust the angle sensor and tighten the screws. See Image Image 40. Repeat steps 1 to 3 until the platform stops at -10 degrees.

NOTE!
When the platform is tilted downwards until it stops, 2-hand operation will be needed to tilt the platform upwards again (at the beginning of the platform's movement).

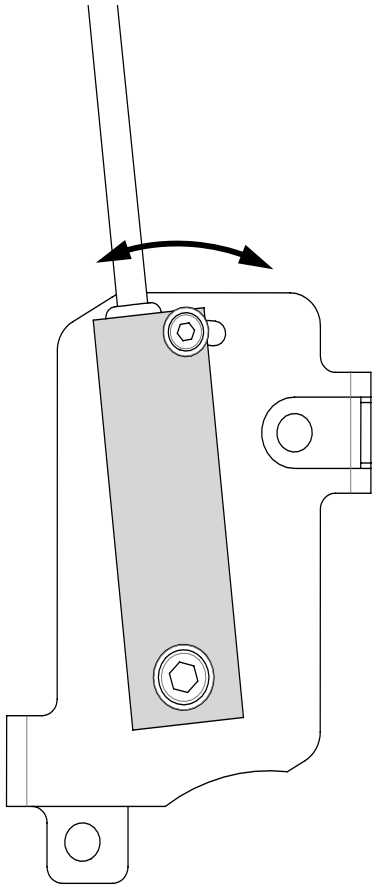


Image 40. Adjusting angle sensor.

4.5 Underrun protection

The underrun protection consists of a bracket and two aluminium profiles.

Install the underrun protection:

1. Screw the bracket firmly to the lift's arm in existing holes. Use 2 M12x45 on each side. Tightening torque 80 Nm.
2. Screw each aluminium profile in place with 2 bolts M8x40 (8.8) each. Tightening torque 25 Nm. Place the head of the screw into the aluminium rail's groove and fit into the bracket and screw tight.

Check that the statutory measurements are kept. See section 3.2. In addition, check the space for any tow bars and draw bars.

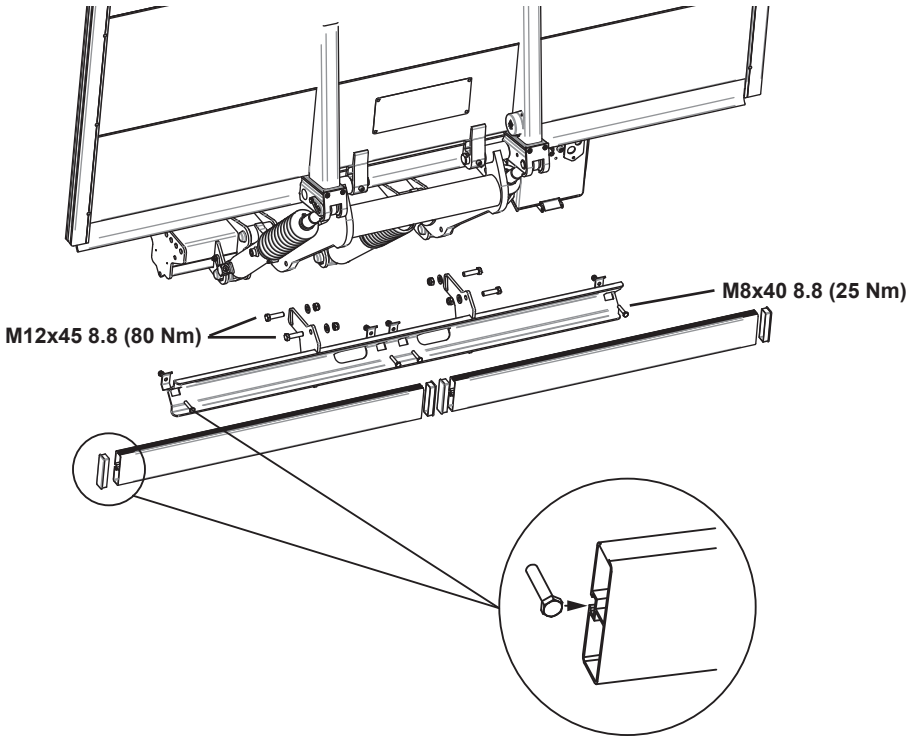


Image 41. Installing underrun protection

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

4.6 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 6 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 6.

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.
The cable must not be fastened 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.

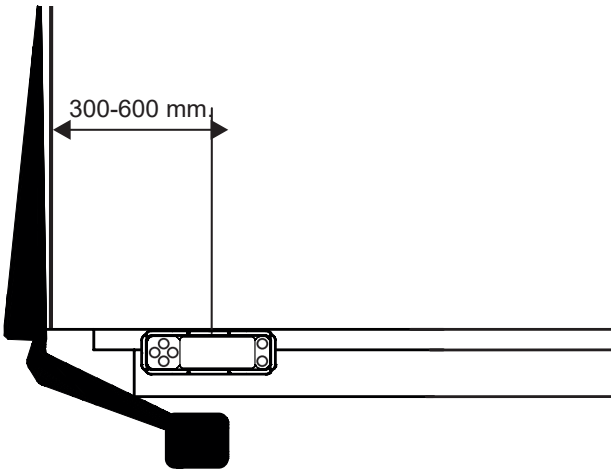


Image 42. Installing controllers

⚠ 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.

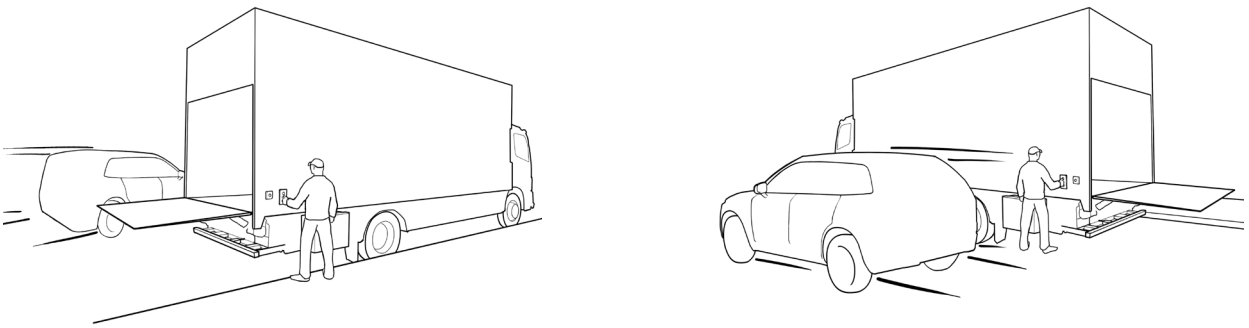


Image 43. Installing controllers

4.6.1 Controller 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 44.
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 6.

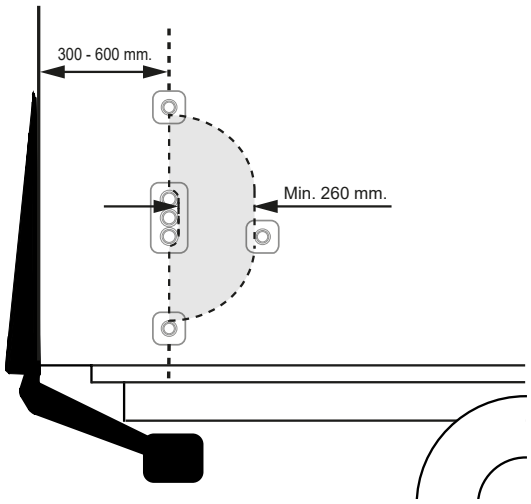


Image 44. Installing controller CD 1 with two-handed grip.

Installation on the underside of the body

The cable is usually connected to the controller and the controller bolted to the bracket at the factory. Bolt the bracket to the underside of the body. Use the self-adhesive drilling template supplied.

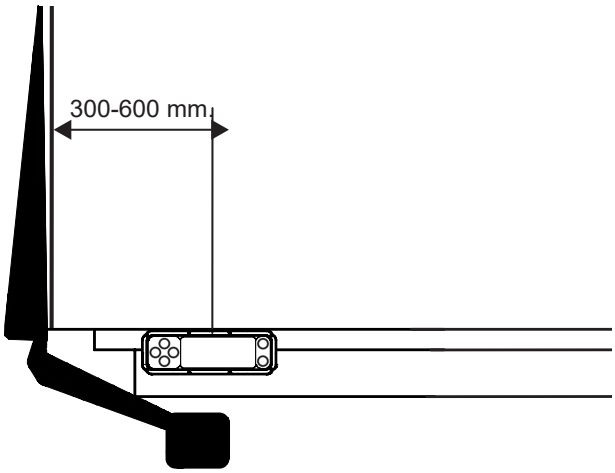


Image 45. Installing controllers

4.6.2 Connector for a hand-held controller

Installing the controller bracket

The connector is usually mounted on the bracket and connected to the lift. Bolt the bracket in the controller bracket. Use the nuts and bolts supplied.

Installation on the underside of the body

The connector is usually mounted on the bracket and connected to the lift. Bolt the bracket to the underside of the body. Use the self-adhesive drilling template supplied.

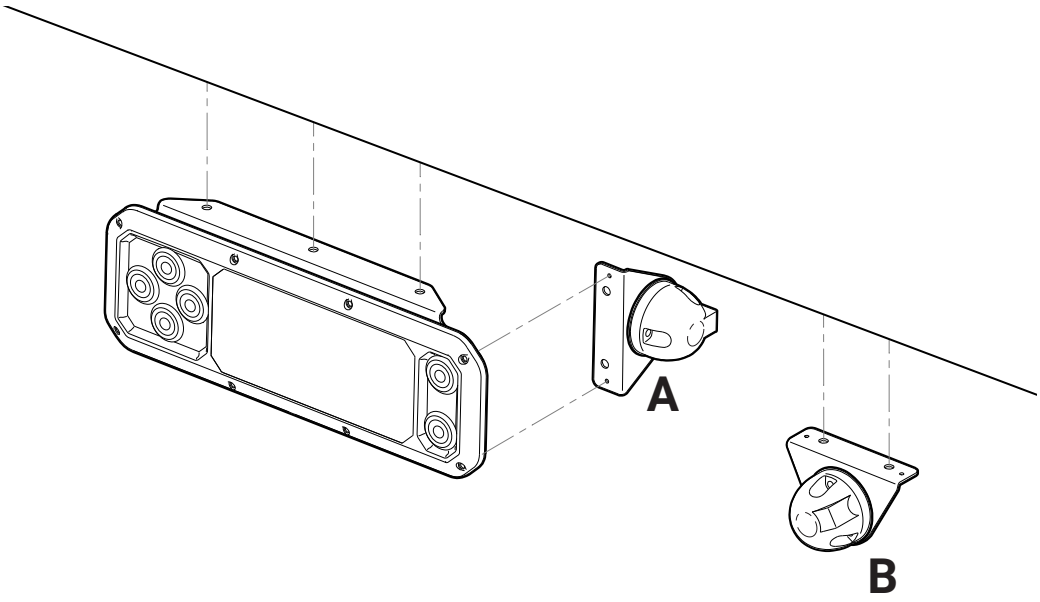


Image 46. Installing controller CD19 and the connector for a hand-held controller

5 Cable routing

5.1 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.

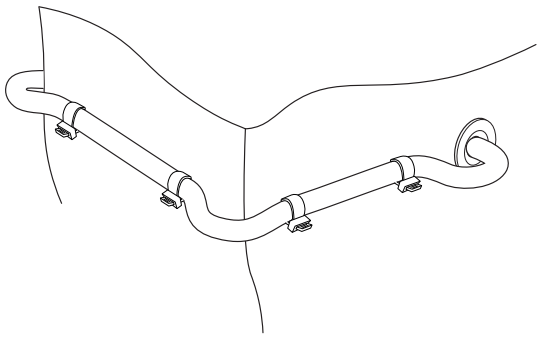


Image 47. Protect the cable against sharp edges and use cable grommets

Image 48. Always use shrink hose over the cable connection when fitting cable terminals

5.2 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.

(160 bar)

5910	12 volt
Pump - Motor unit	115 A
Magnet (hydraulic unit)	1.4 A
Magnet (electric safety valve)	1.5 A
Solenoid	1.8 A
Minimum recommended conductor cross sectional area (copper cables, plus and minus cables)	
Control power cable	1.5 mm^2
Main power cable, L < 8 m	25 mm^2
Main power cable, L = 8 - 15 m	35 mm^2
Main power cable, L > 15 m	-
Battery	
Min. capacity, I_{min} (available for lift)	140 Ah
Min. voltage during operation, U_{min} (at lift)	9 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.

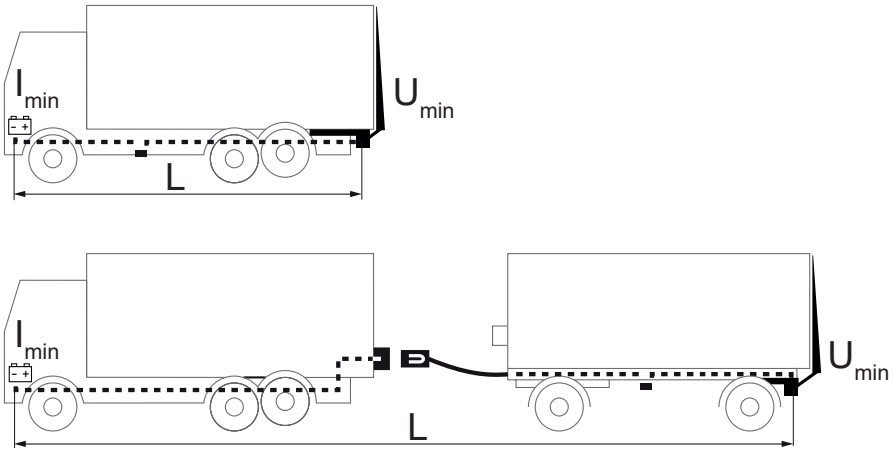


Image 49. Battery capacity and definition of the length of the earth and main power cables

5.3 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 6.
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 6.

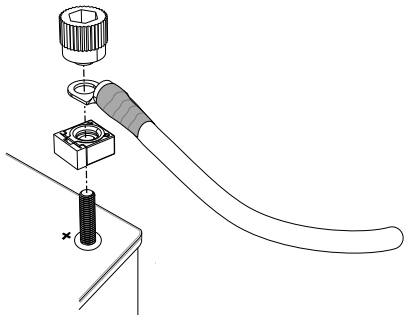


Image 50. Connection to the battery's positive terminal

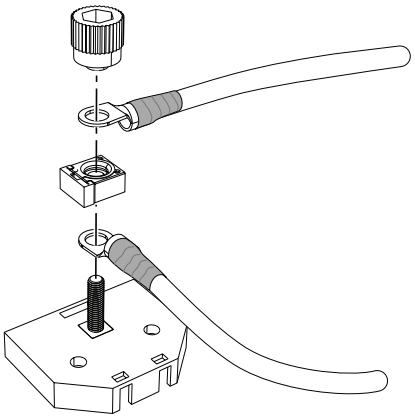


Image 51. Connection to the fuse box

5.3.1 Main power switch

1. Mount the main switch on a bracket next to controller CD 19 or in any well-protected place with universal bracket, see Image 52 and Image 53.

> **IMPORTANT!**
> The main switch drainage should always be directed downwards.

2. Connect the main switch cable to the main tail lift current cable quick connector.
3. Connect the main power cable to the second quick connector on the main switch cabling.
4. When installing the main switch and CD 19 controller on the arm attached to the tail lift, route the main switch and controller cables on the underside of the arm and fasten with cable ties.
5. Pull the main power cable from the main switch to the fuse box/battery plus pole. Prepare the cable with a cable terminal and shrink hose without connecting. Connection is described later in section 7.
6. Route the controller cabling onwards to the tail lift cable grommet where appropriate. In some cases, the controller cabling may already be connected at the factory. If not, it can be connected later in section 6.

> **IMPORTANT!**
> The positive cable to the battery and main fuse is connected later in Section 7, after the cable has been routed/installed.

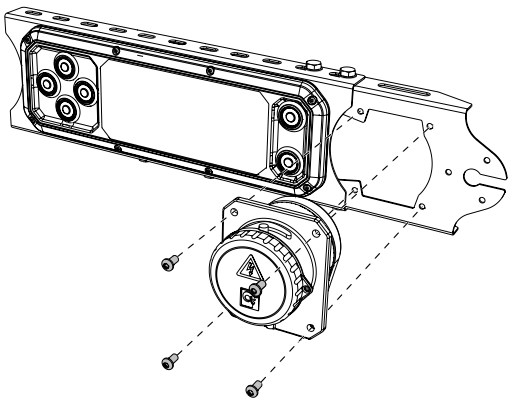


Image 52. Installation of main switch to CD 19 controller

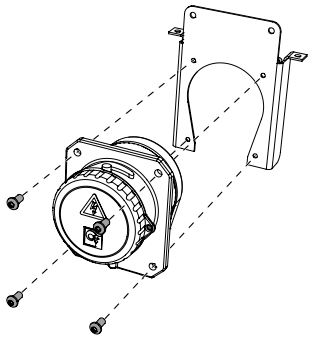


Image 53. Installation of main switch on universal bracket

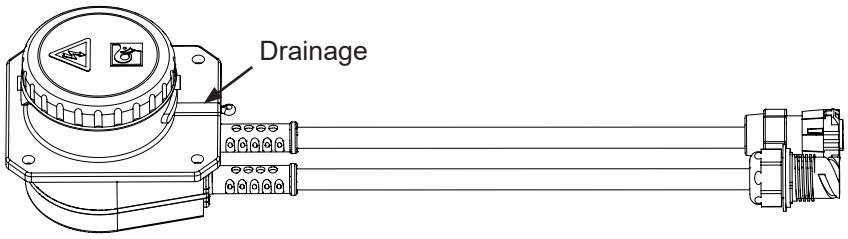


Image 54. Main power switch

5.4 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 6.

5.5 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 6.

5.6 Warning lighting and Foot controls

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

1. Connect the supplied cable to the connector on the foot control/warning lighting cable, then route the cable and secure with cable ties according to Image 56.
2. Unscrew the existing angle sensor from the platform and replace it with the angle sensor supplied with the lift.

NOTE!

Ensure that the angle sensor is fitted with the cable input in the same direction as the one that was removed.

Route the cables 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 cables is not at risk of being damaged when the lift is operated.

3. Route the cable through the cable grommet of the hydraulic unit. See section "6.1 Cable grommet" on page 35.
4. Connect the cables to the control card, see wiring diagram "6.2.4 Warning lights and foot controls (ZePRO1)" on page 39 and section"6.2.3 Warning light and foot controller (TLC-B1)" on page 38.

⚠ WARNING!

Make sure that the control card is disconnected from power before connecting peripheral equipment. Risk of damage.

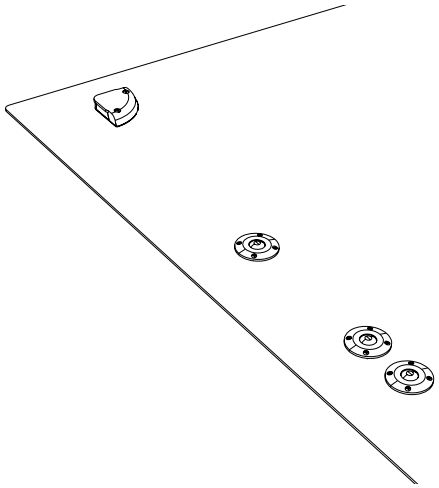


Image 55. Warning lighting and foot controls

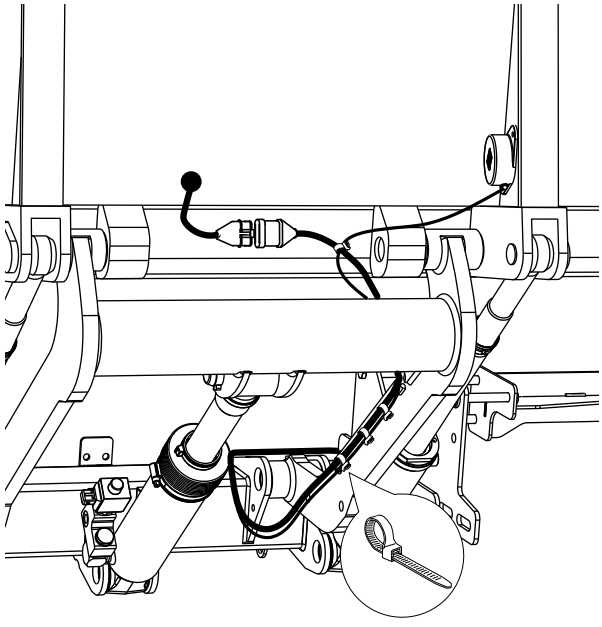


Image 56. Installing cabling

6 Connection

6.1 Cable grommet

In order to install/dismantle/adjust cables in the cable grommet, the five bolts have to be undone.

1. Loosen the five screws on the cable grommet, see Image 57. Cables can now be installed/removed/adjusted in the grommet. On installation, the cable must be installed together with existing cabling with cable ties.
2. When all cables are correctly located in the cable grommet, tighten the five bolts.
   Tightening torque: 5 Nm.

Hydraulic Unit 5910

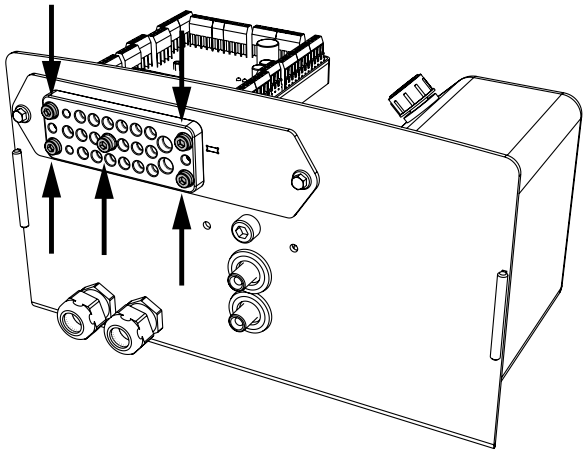


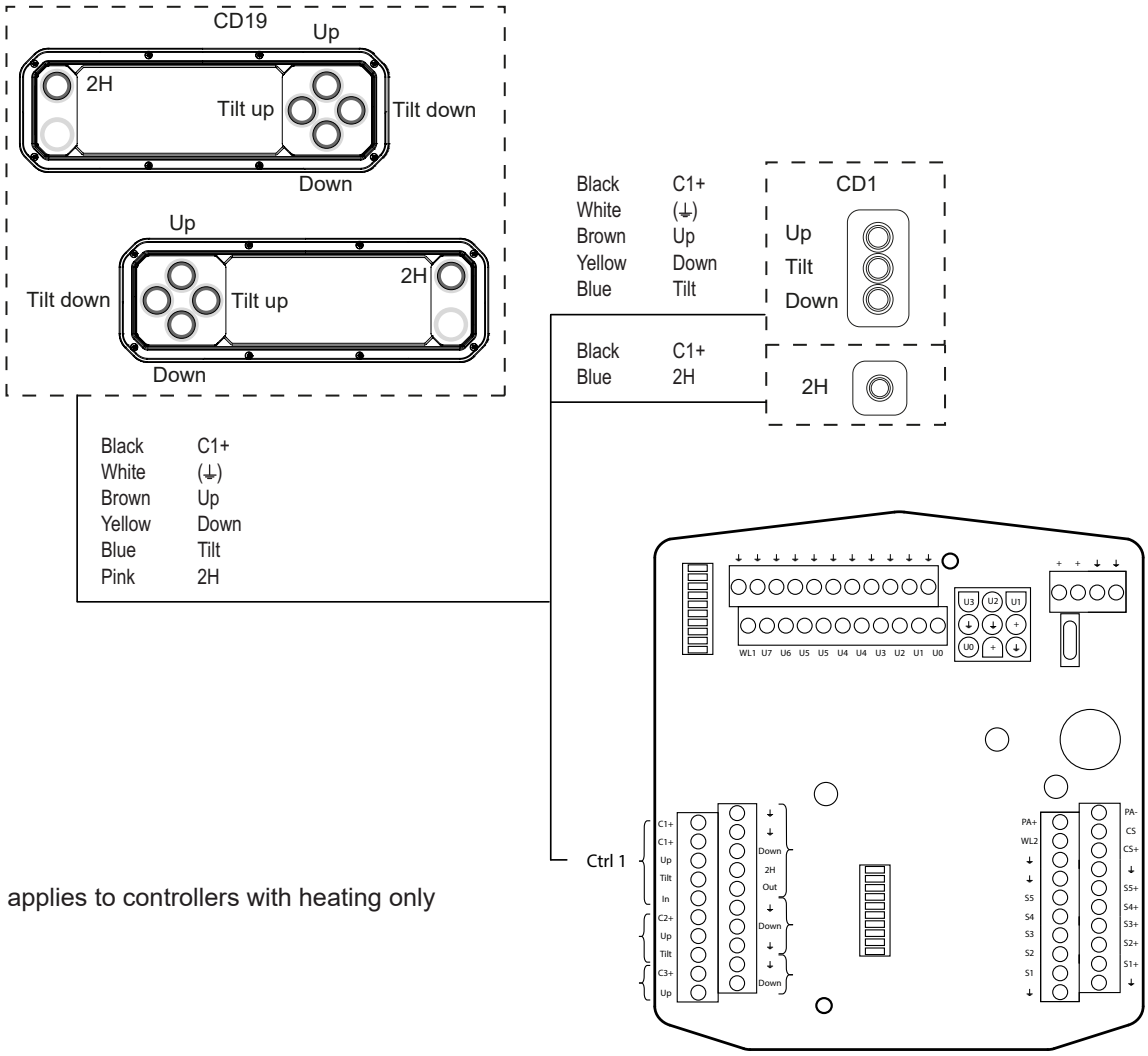
Image 57. Cable grommet's five screws

6.2 Connection

6.2.1 Connecting the control device to the TLC-B1 relay card

The connection of warning lights and the most commonly occurring controller (CD (Control Device)) models is shown below. Possible controller models vary depending on lift model, configuration and relevant market.

⚠ WARNING!
Make sure the control relay is disconnected from power before connecting. Connecting more than one controller to each connection is not permitted. Risk of material damage.

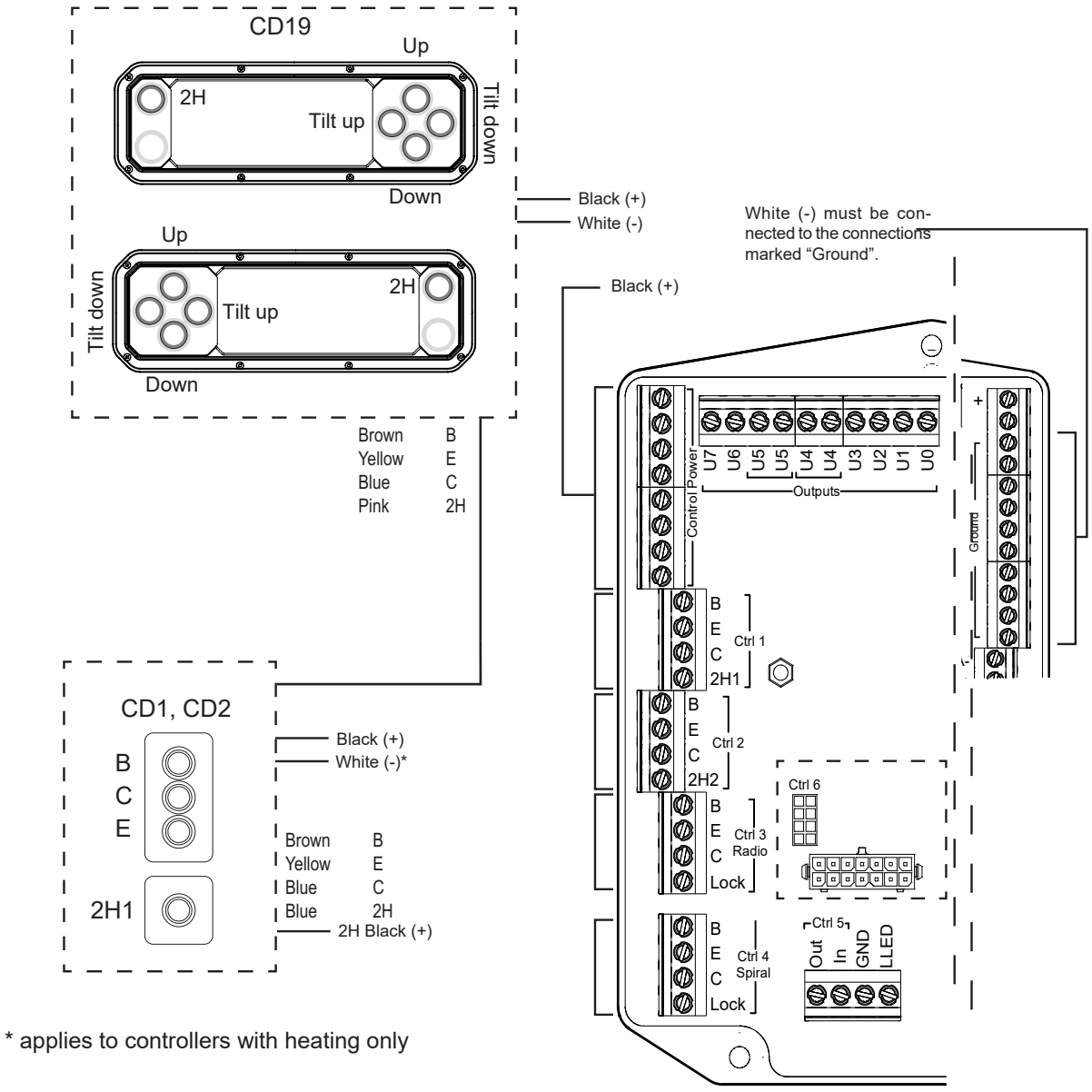


* applies to controllers with heating only

6.2.2 Connecting the control device to the ZePRO1 control card

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

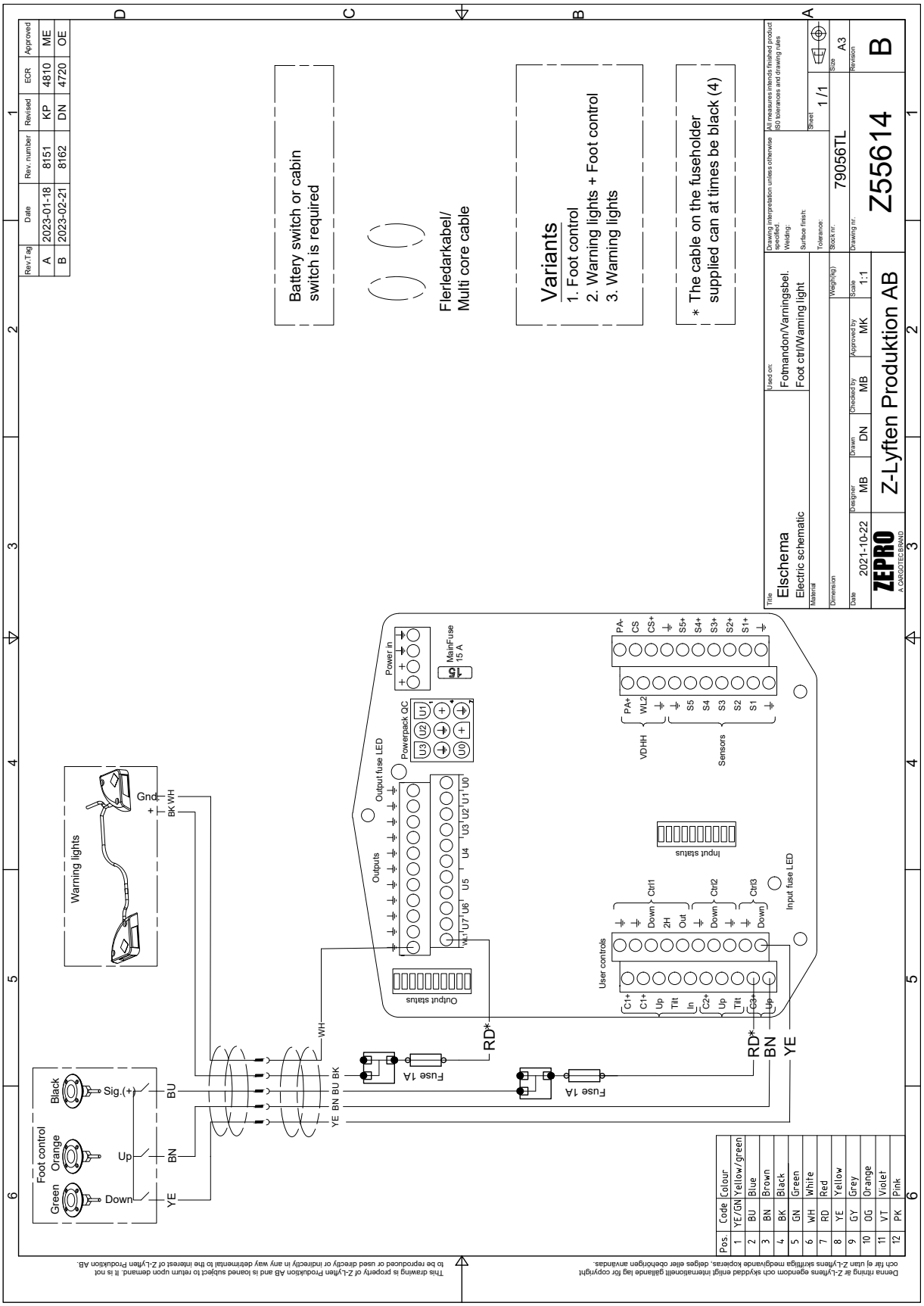
⚠ WARNING!
Make sure that the control card is disconnected from the power before connecting. Connecting more than one controller to each connection is not permitted. Risk of material damage.



* applies to controllers with heating only

6.2.3 Warning light and foot controller (TLC-B1)

Signal is required on relay card input S3 for the warning light to work. Depending on the model, this can be done by connecting angle sensors between S3 and S3+ or with jumper



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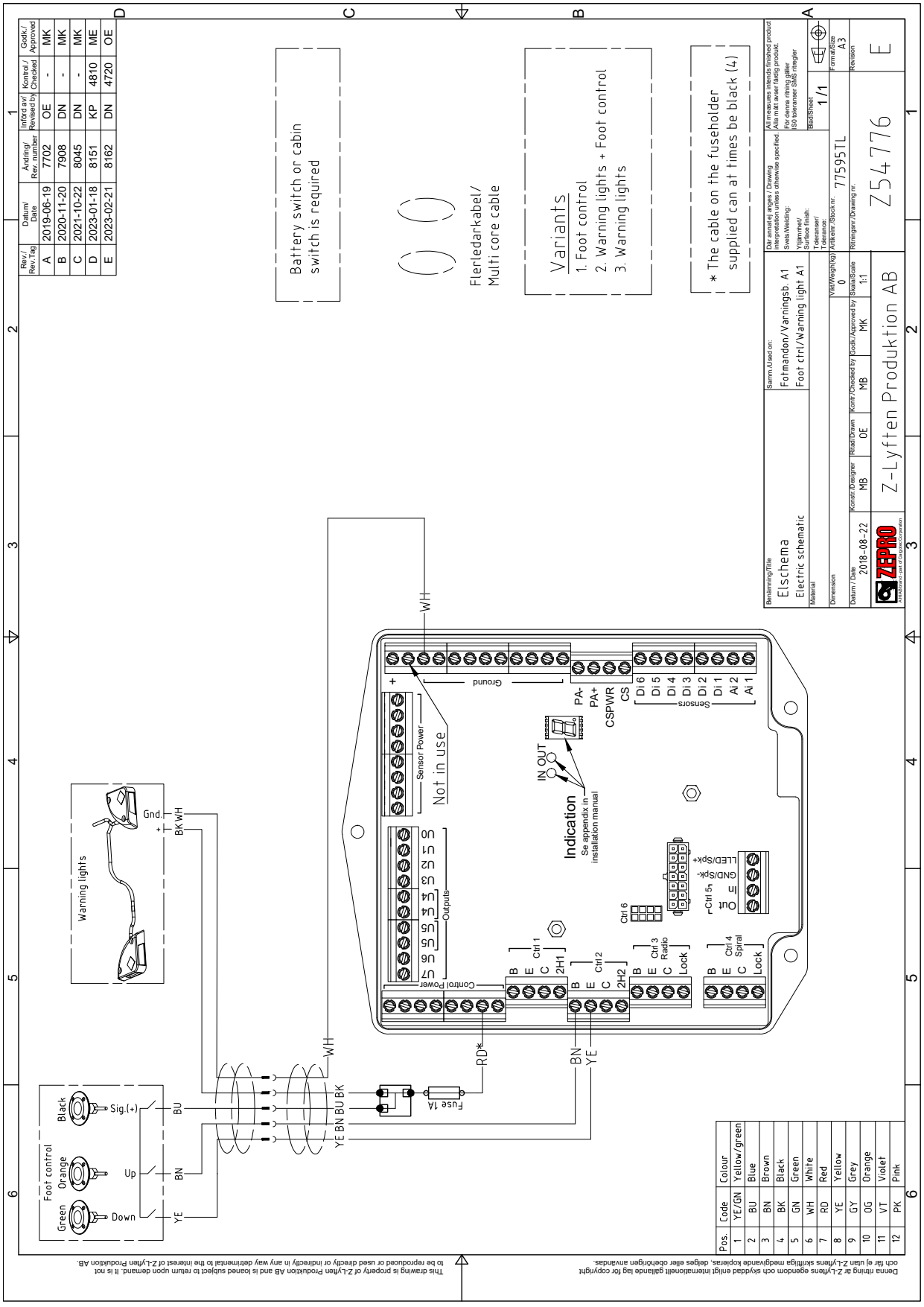
6.2.4 Warning lights and foot controls (ZePRO1)



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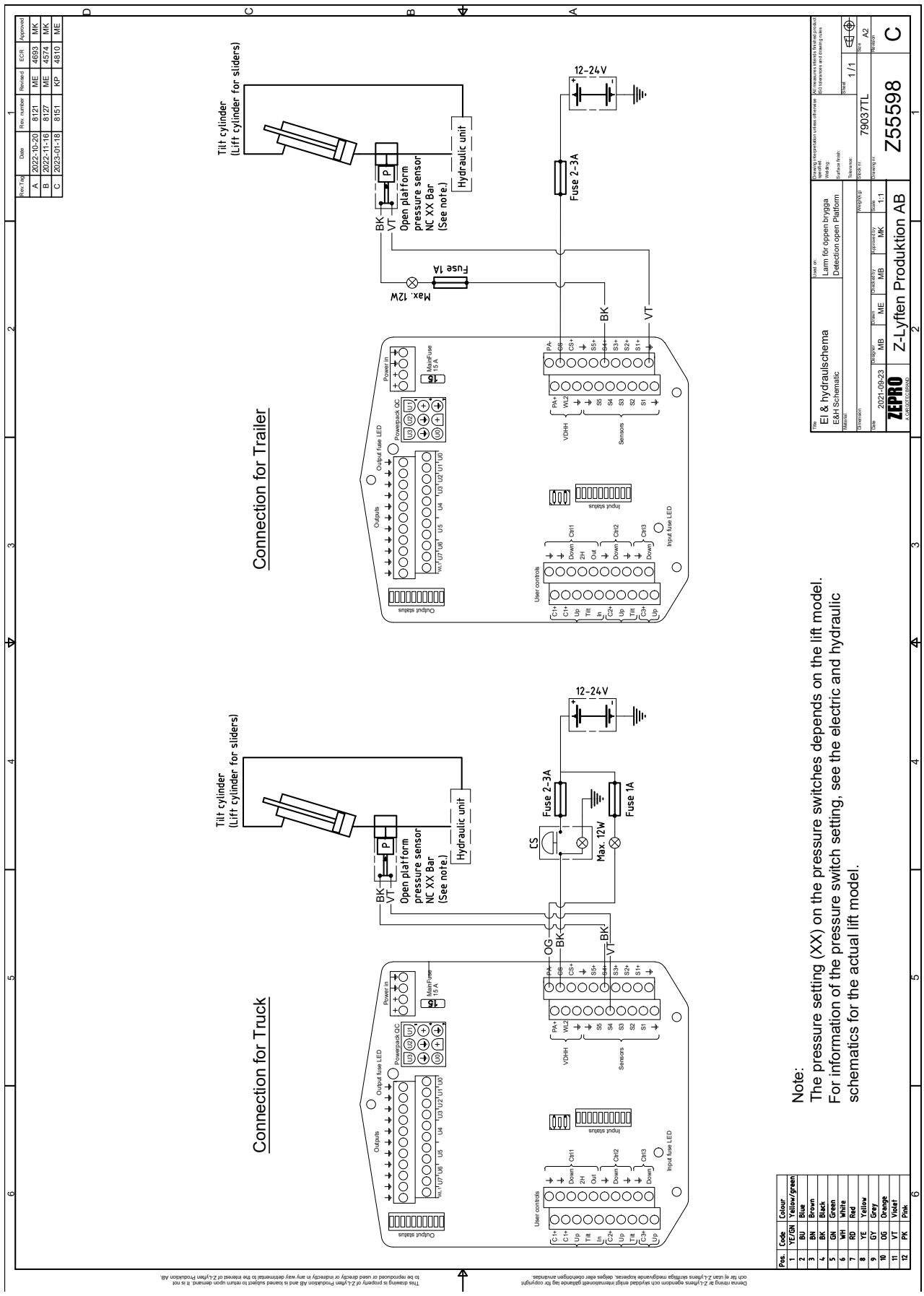
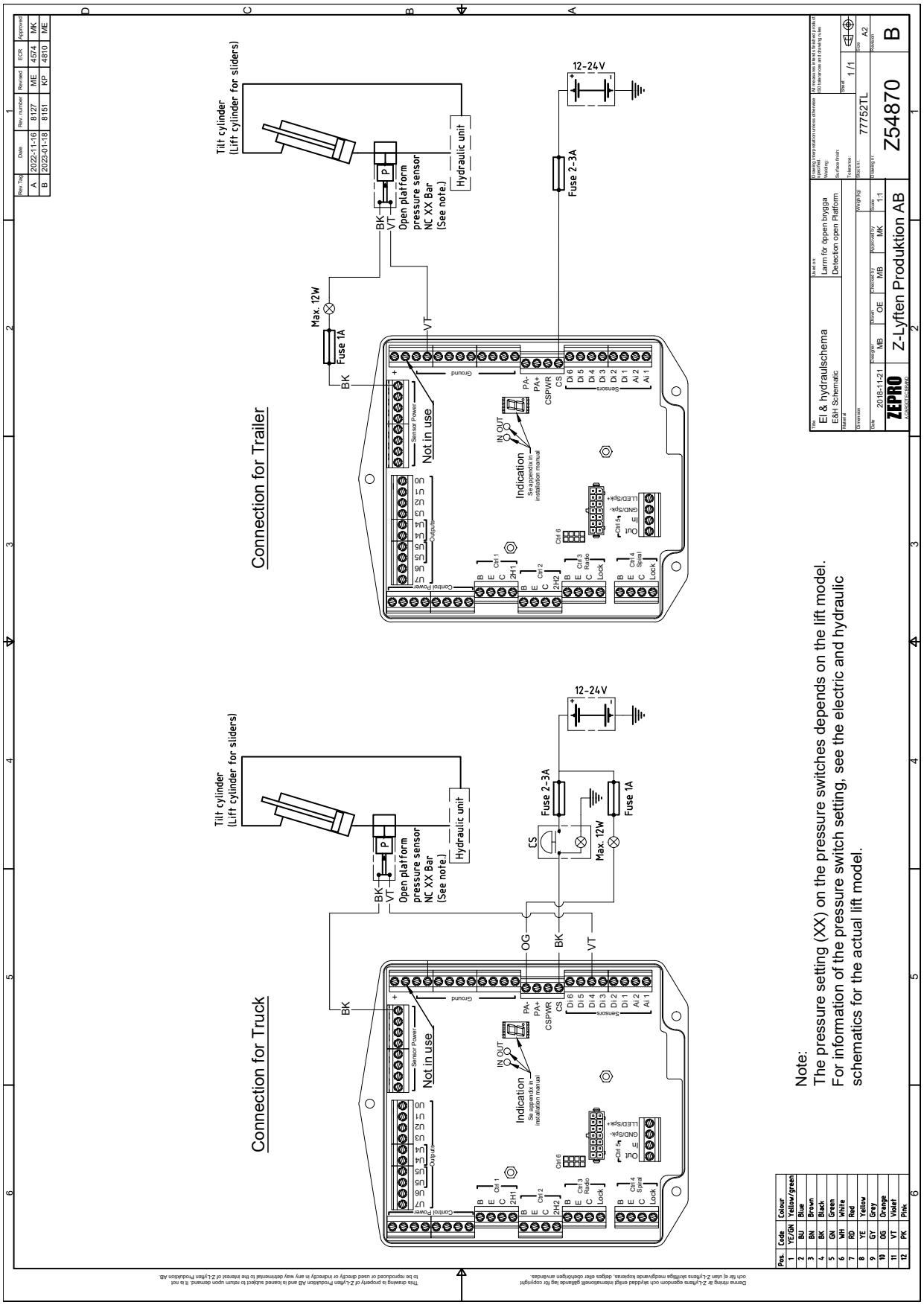
6.2.5 Cab switch and open platform alarm (TLC-B1)

Applies when installing without main switch



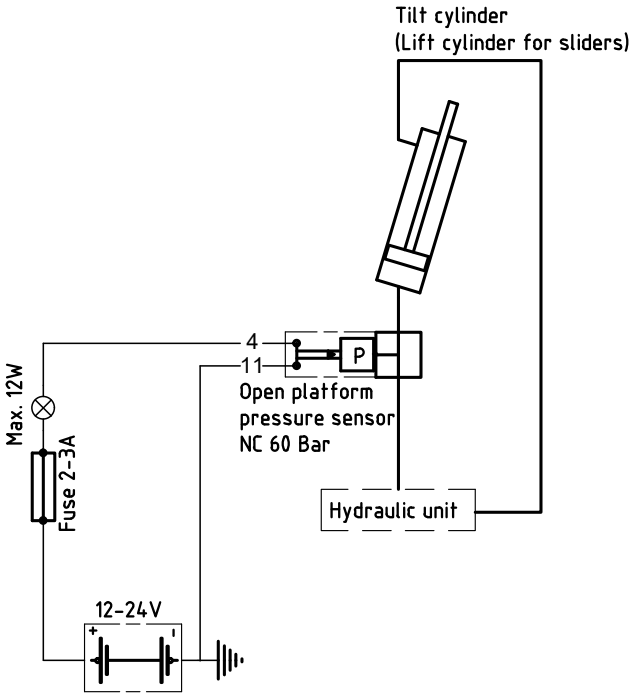
6.2.6 Cab switch and open platform alarm (ZePRO1)

Applies when installing without main switch



6.2.7 Open platform alarm

Applies when installing with main switch



7 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 58.
4. When connecting directly to the positive battery terminal, place the fuse (2) on the positive terminal, see Image 58.
5. Connect the main power cable (3) to the fuse box / positive terminal, see Image 58.
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 58.

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.

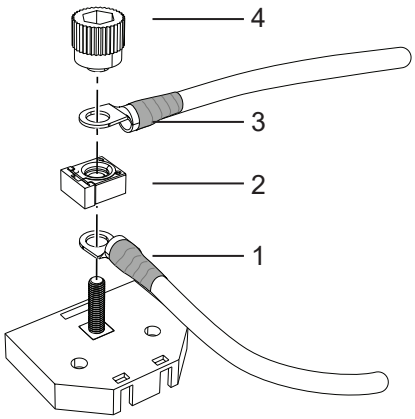


Image 58. Connection to the fuse box

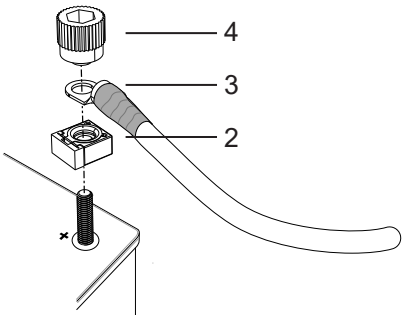


Image 59. Connection to the battery's positive terminal

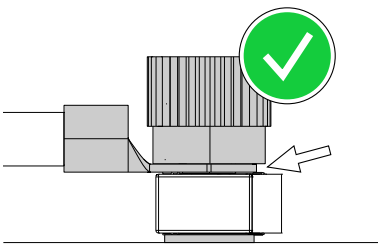


Image 60. Correct installation

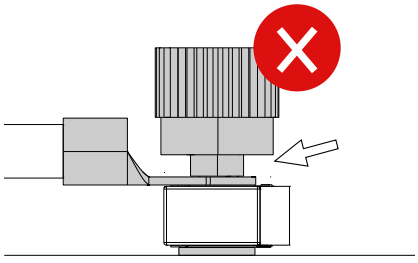


Image 61. Incorrect installation

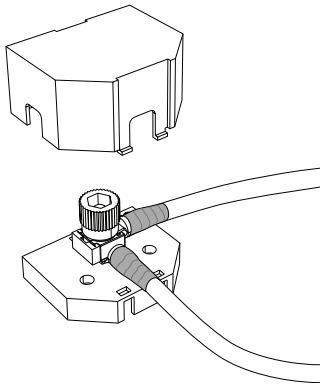
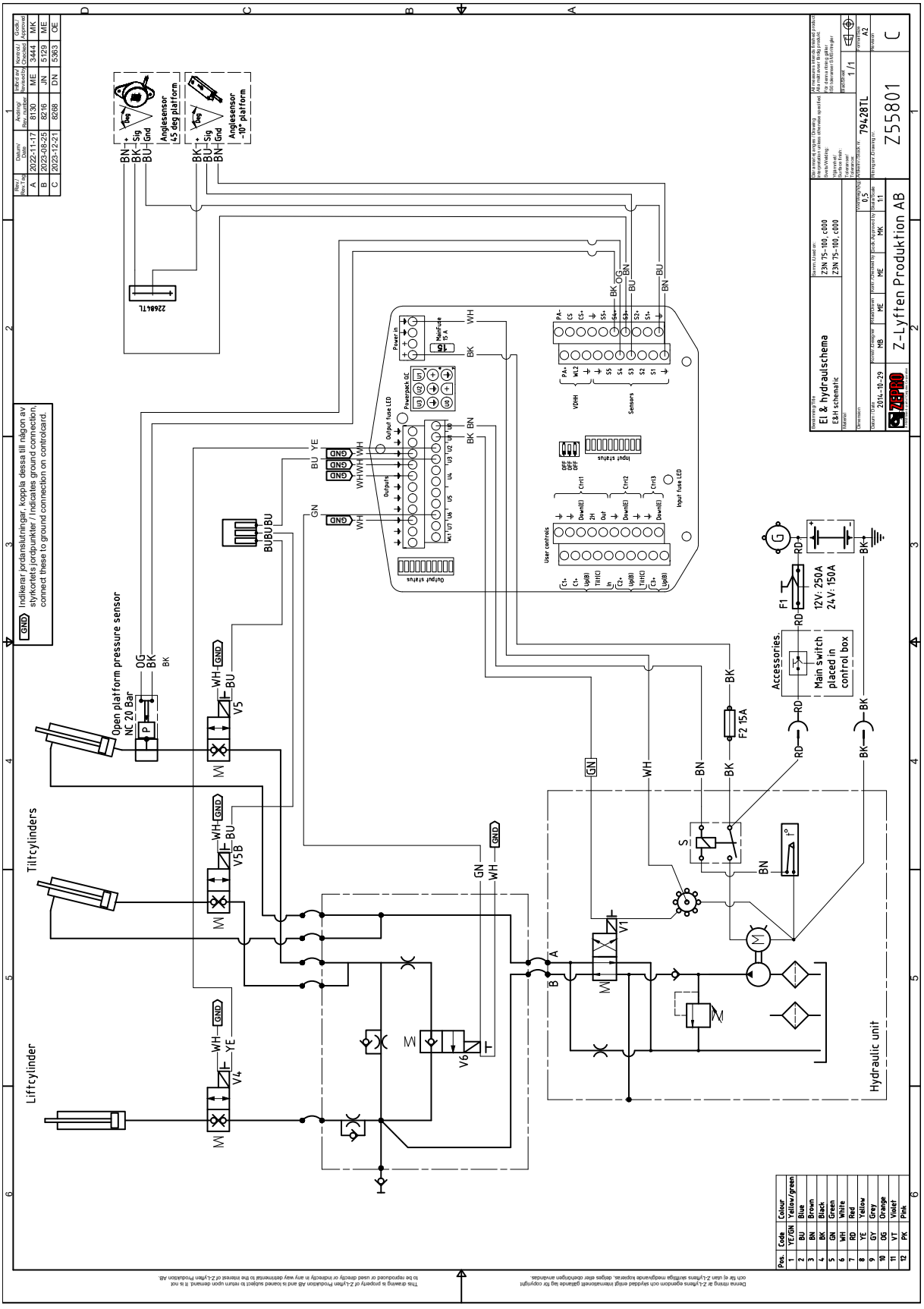


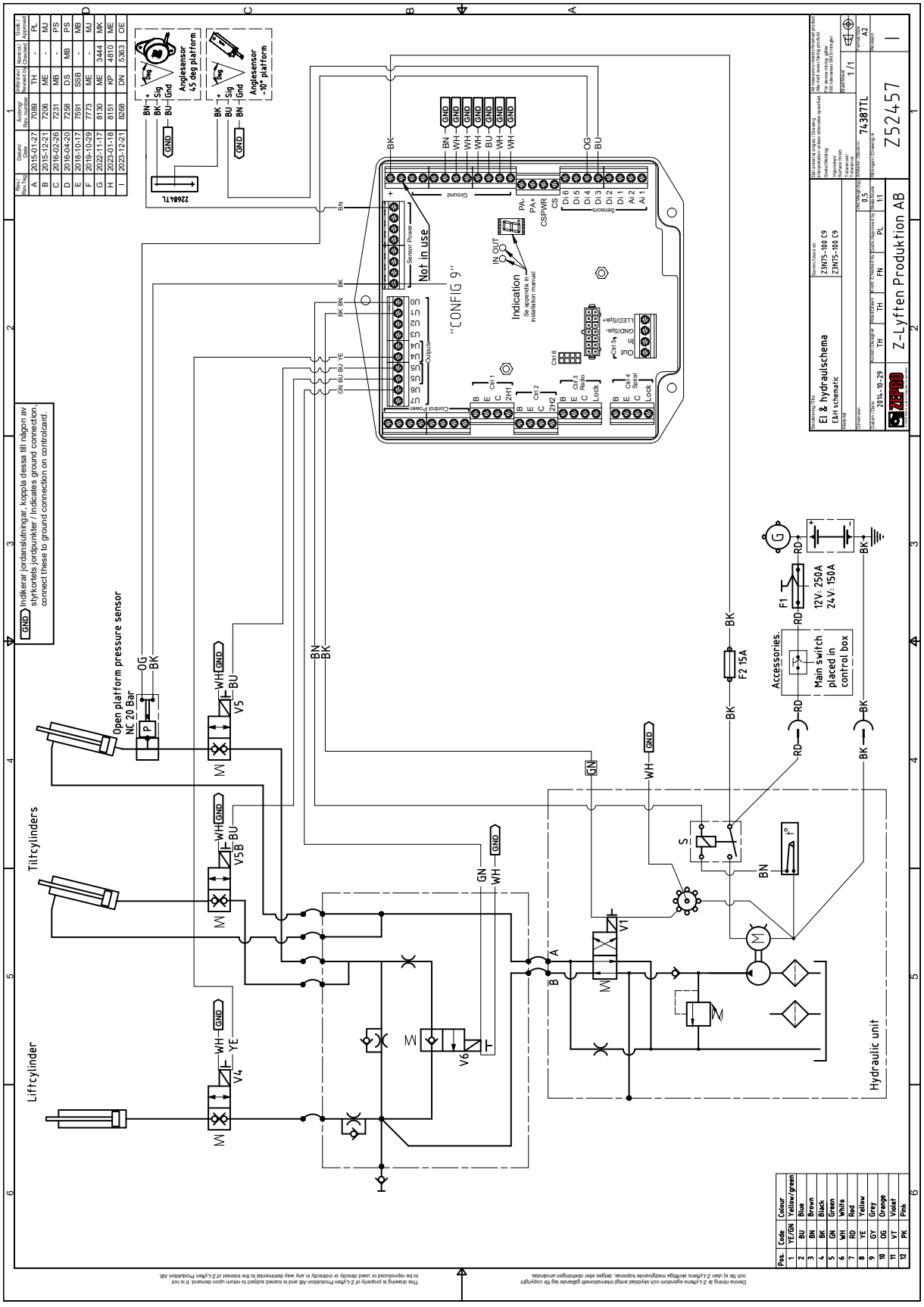
Image 62. Cover, fuse box

8 Electrical and hydraulic drawings

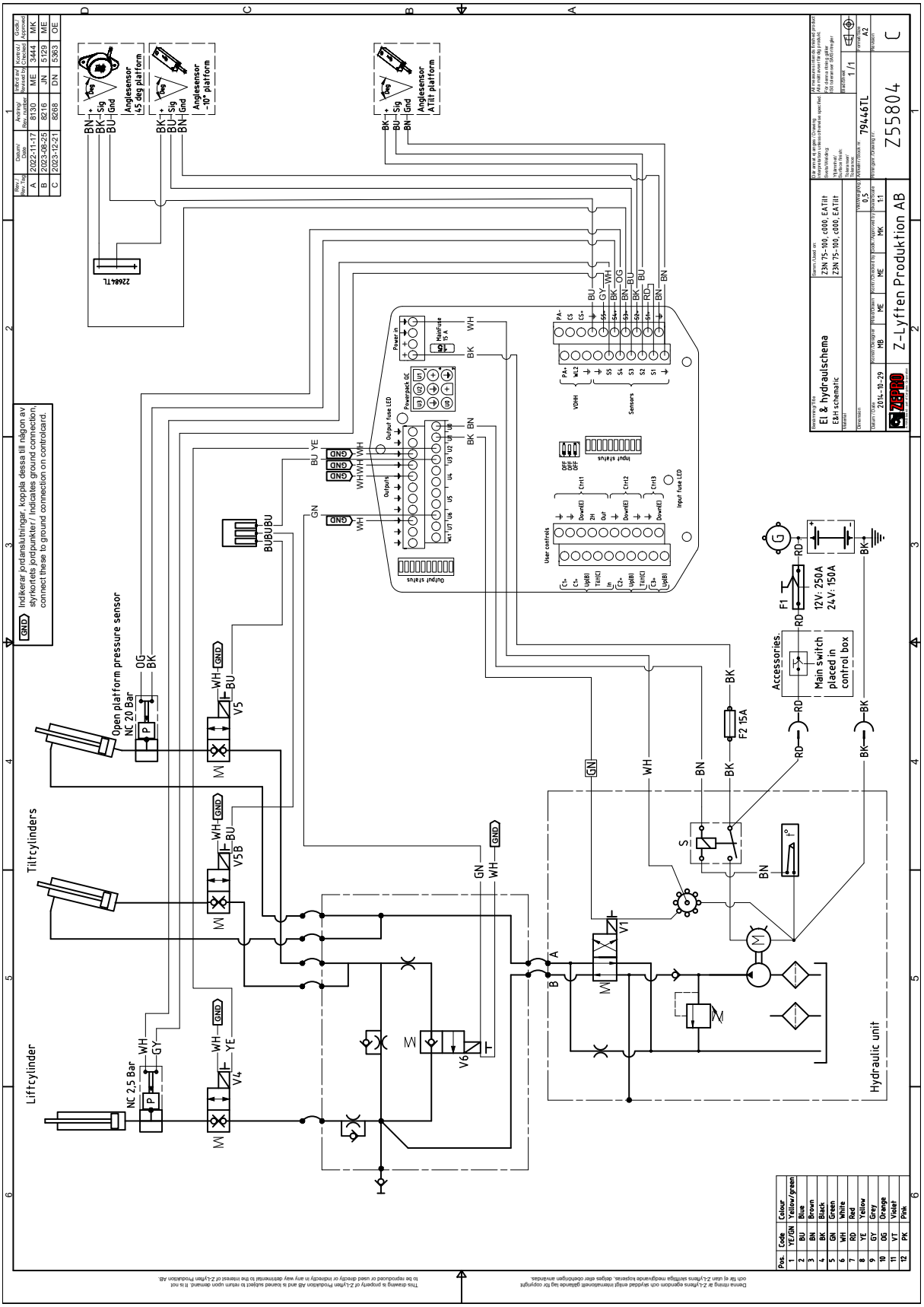
8.1 Z3N(U), Z3NN(U), Z3NW(U) 75-100 (TLC-B1)



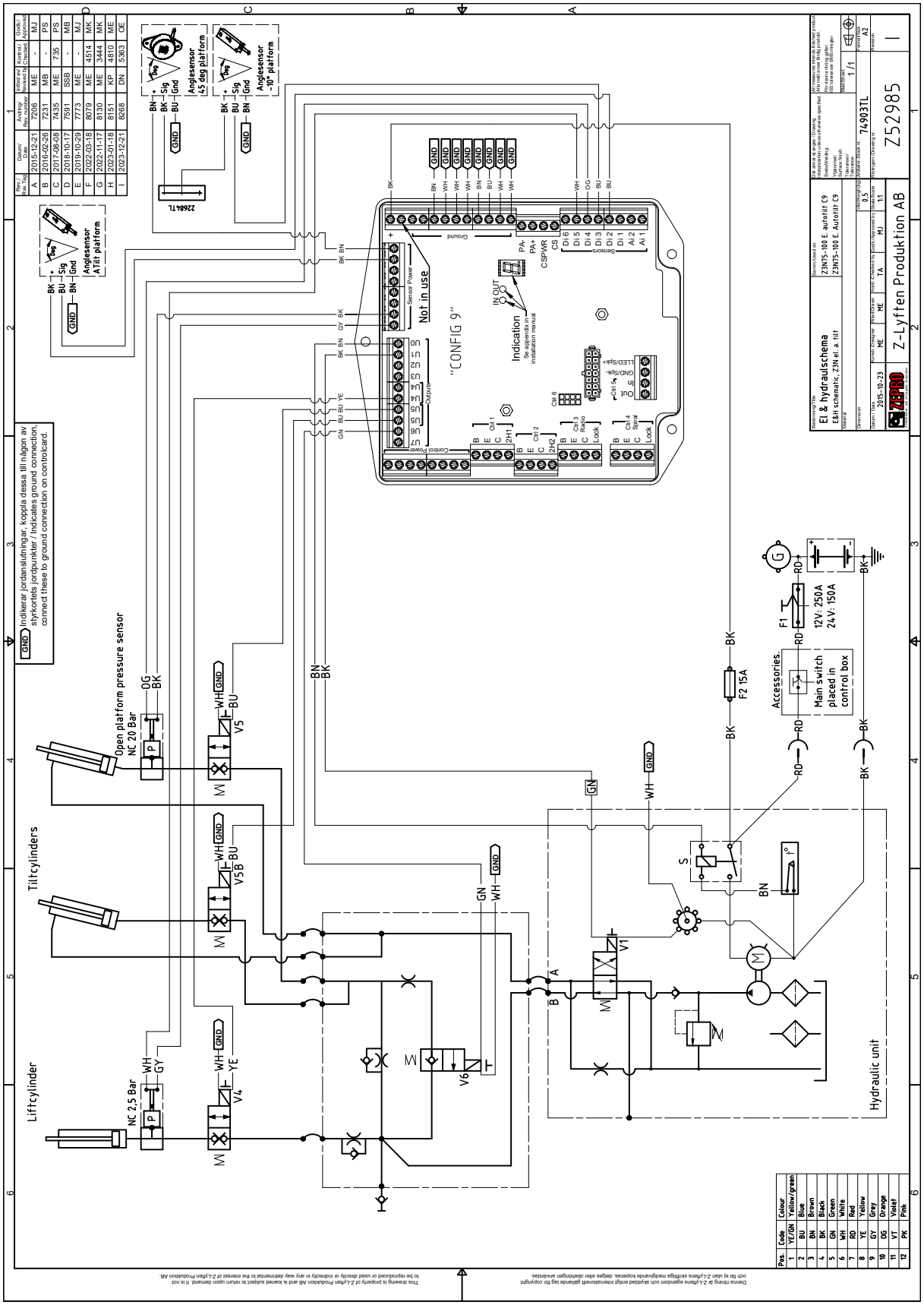
8.2 Z3N(U), Z3NN(U), Z3NW(U) 75-100 (ZePRO1)



8.3 Z3N(U), Z3NN(U), Z3NW(U) 75-100 electrical autotilt (TLC-B1)



8.4 Z3N(U), Z3NN(U), Z3NW(U) 75-100 electrical autotilt (ZePRO1)



9 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.

9.1 Lubrication

NOTE!

The lift should be lubricated with LE lubricant 4622 or equivalent..

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

9.2 Oil level check

Check the fluid level in the tank during service, 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).

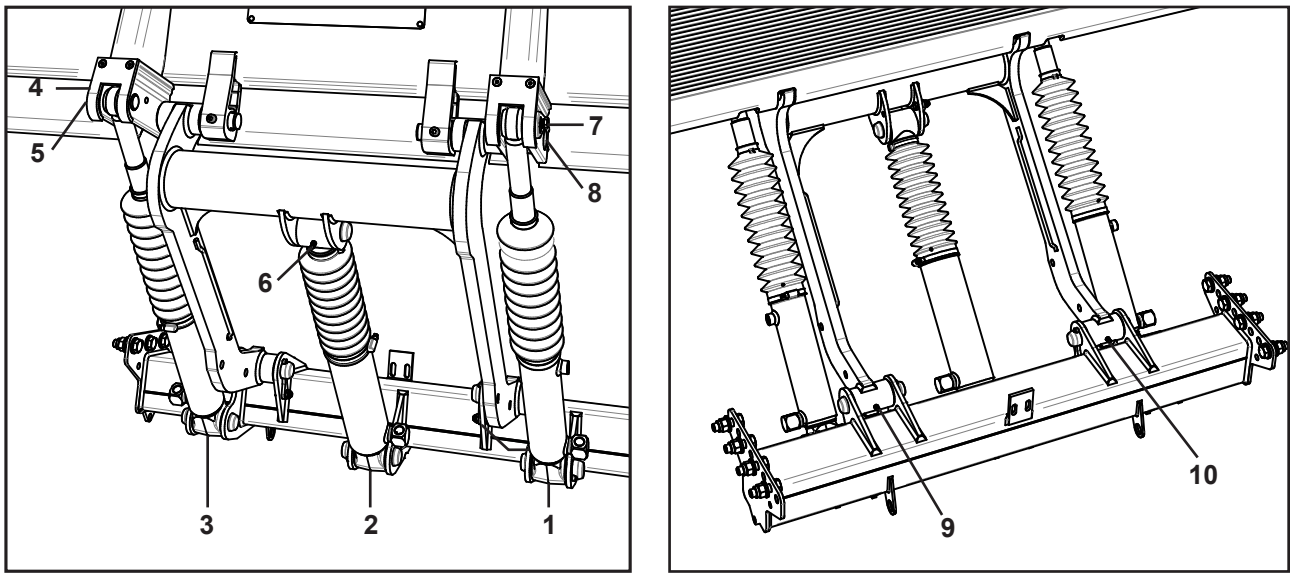


Image 63. Lubrication points

10 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.

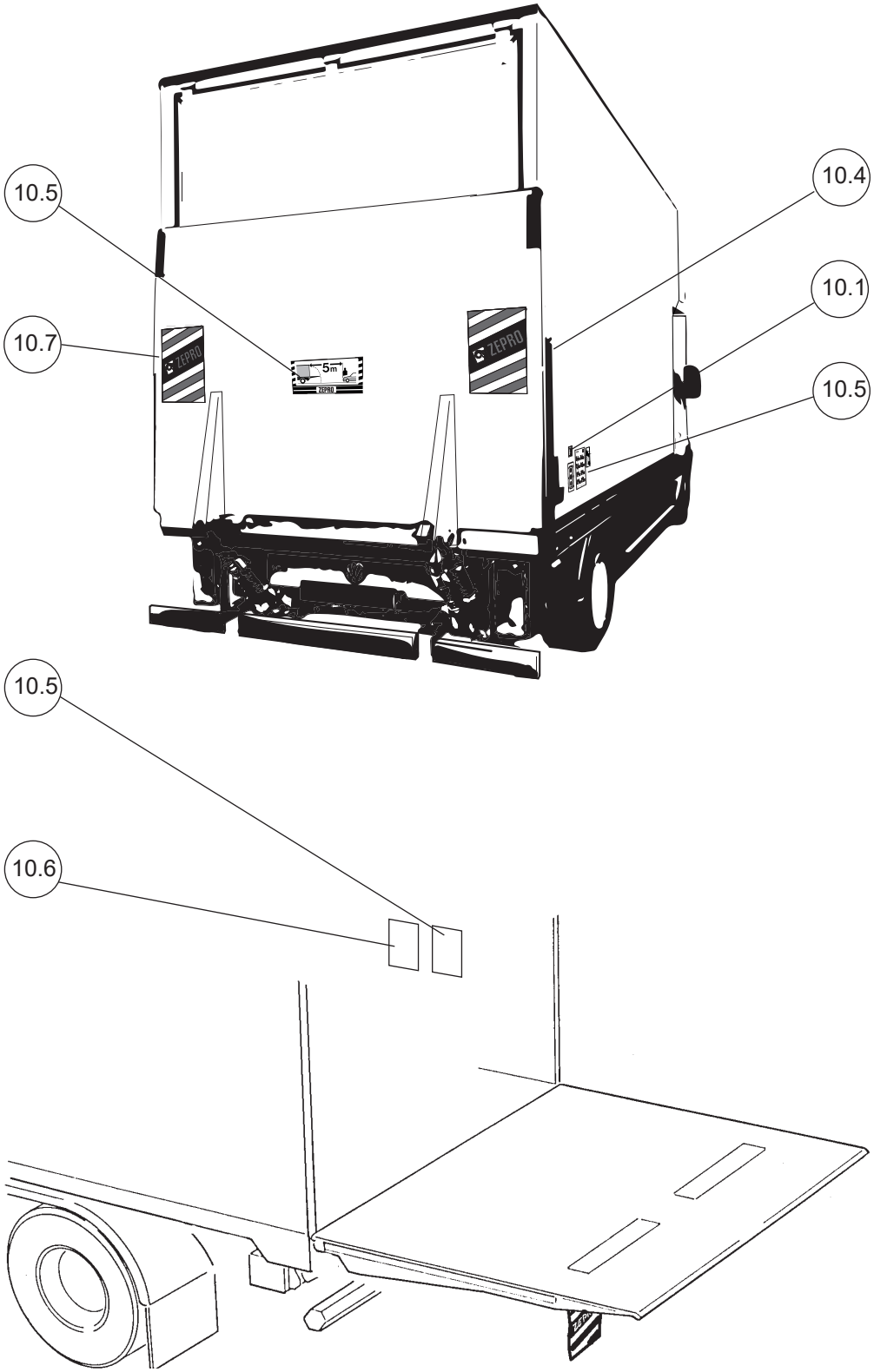


Image 64. Overview of labelling

10.1 Loading diagram

Affix the load diagrams for the appropriate lift model close to the primary controller and in a suitable clearly visible position on the vehicle body.

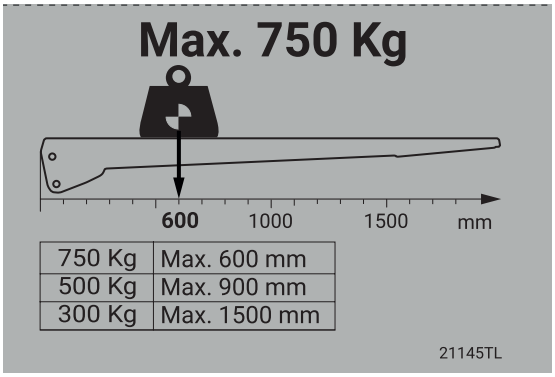


Image 65. Load diagram for load capacity 750 kg, centre of gravity distance 600 mm.

10.2 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 66. Identification plate

10.3 Work area

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

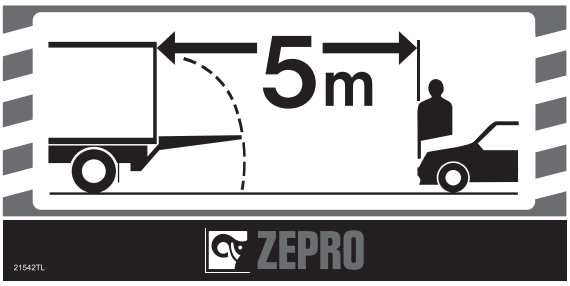


Image 67. Work area

10.4 Warning tape

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

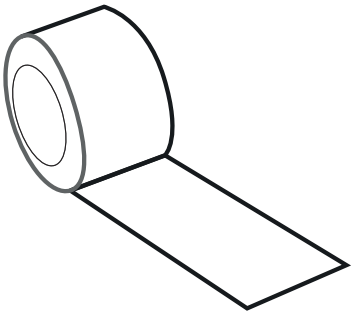


Image 68. Warning tape

10.5 Controller sticker

Affix the controller sticker next to the relevant controller. The stickers are available in standard versions and in reversed version 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.

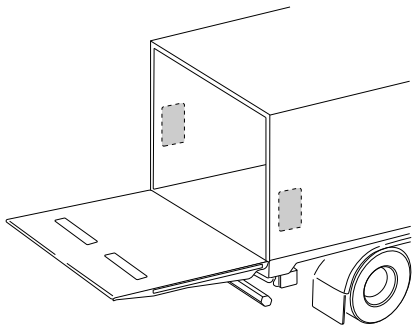


Image 69. Standard mounting

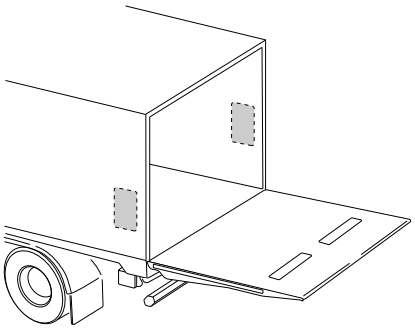


Image 70. Reversed mounting

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*

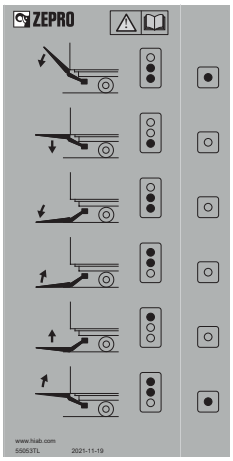


Image 71. Control device sticker for CD 1, 2, 9

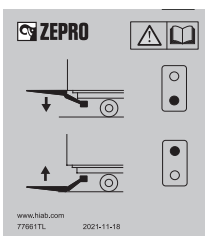


Image 72. Control device sticker for CD 10

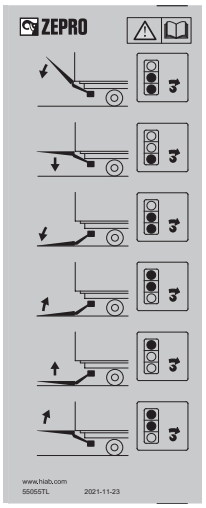


Image 73. Control device sticker for CD 4

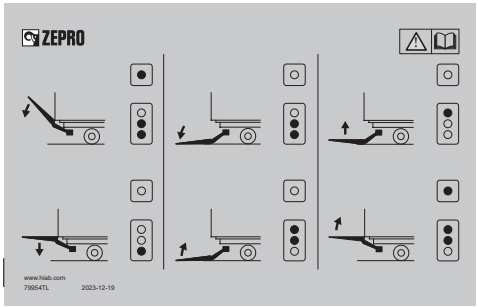


Image 74. Control device decal for CD 1 with the two-hand button mounted above the control device.

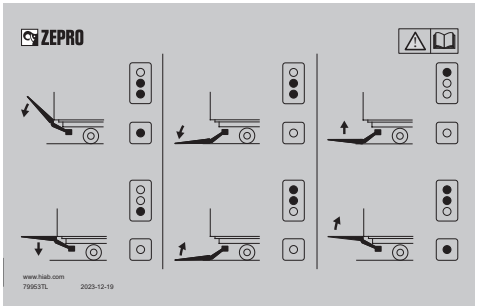


Image 75. Control device decal for CD1 with two-hand button mounted below the control device.

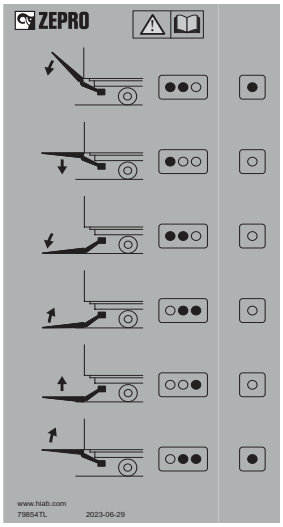


Image 76. Control device decals for CD 1, 2 and 9 for horizontal control device is ordered separately. 79854TL

10.6 Danger area

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

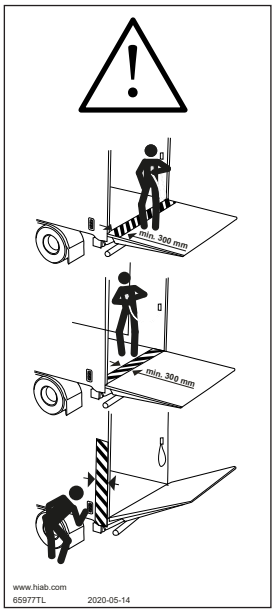


Image 77. Danger area

10.7 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 78. Warning flags

11 Testing and verification

Provning och verifiering av bakgavellyft utföres i enlighet med montage/leveranskontroll.
Verifiera att bakgavellyften överensstämmer med aktuellt fordon samt för avsett bruk.

11.1 Static load test

11.1.1 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, see Image 79.
- Place a test load on the platform according to the table for the respective tail lift model and 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.

11.1.2 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 drift is no more than 15 mm on the vertical (points A and D) and 2º in terms of the angle.

11.1.3 Static load (Test load 1.25 x tail lift loading capacity). For tail lifts with loadcentre of 600 mm

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

11.1.4 Static load (Test load 1.25 x tail lift loading capacity). For tail lifts with loadcentre of 750 mm

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

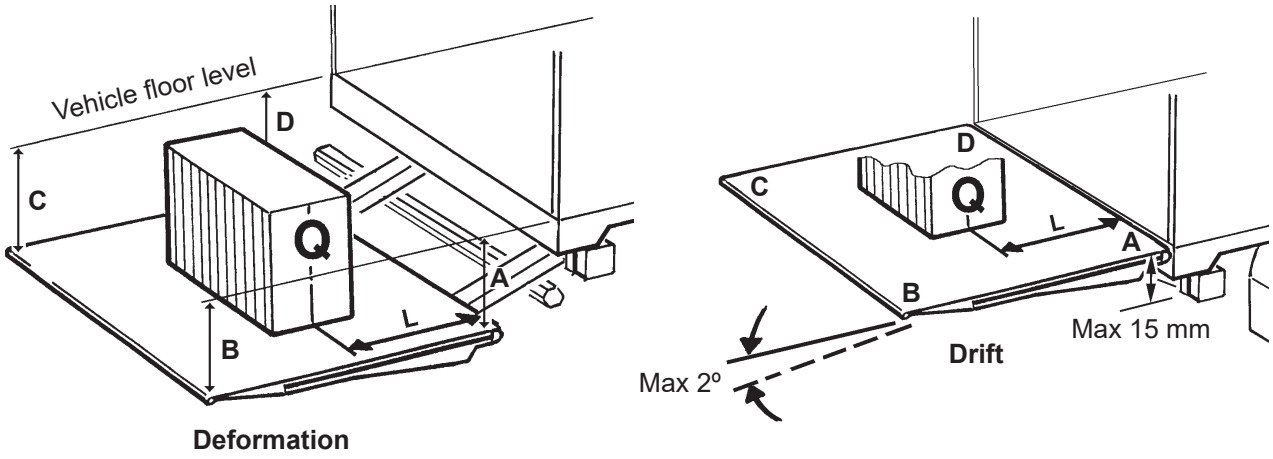


Image 79. Testing and verification

11.2 Dynamic load test

11.2.1 Test with max load

Place a test load on the platform according to the table for the respective tail lift model and lifting capacity. Check that the lift operates correctly with loads in its normal range of movements, up, down, tilting at ground level and tilting at vehicle floor level.

11.2.2 Test with owerload

Place a test load on the platform according to the table for the respective tail lift model and lifting capacity. The test load should be 1.25 x the lift model's max. load. Check that the lift gate cannot lift the load when the up function is switched on (it may however by possible to tilt up the load).

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

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

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

11.3 Test of safety functions

The tail lift functions must be tested.
Check:

- That the red light in the vehicle cabin turns off when the platform is completely closed against the body and that it turns on when the platform is opened (where applicable).
- that the 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 will not operate if the cabin switch is in the off position.
- That the tail cannot be operated when the main current fuse is removed (where applicable).
- That the overflow valve is activated when the lift is run up to the floor level or arm stops.
- That the tail lift cannot be lowered or tilted down respectively if the electrical connector from the lift and tilt cylinders' respective electricity safety valve is removed.
- That the platform's max load marking has been included and is correctly positioned according to the loading diagram for the tail lift model concerned.
- That the warning flags are installed and fulfil their function correctly.
- That all safety and operating stickers are installed in their respective position.
- That the platform's mechanical lock functions correctly (where applicable).
- That the Operator's Handbook has been left in the driver's cabin
- That the declaration of CE conformity has been filled in (where applicable).

12 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 (NB. weight info).
2. Dismantle the tilt cylinders' upper axle 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 axles. Knock them out with a hammer and suitable drift.
5. Lift off the platform.
6. Raise the lift arms to their highest position.
7. Disconnect +12-24 V from the control card.
8. Disconnect all control devices from the control card.
9. Support the support frame from beneath, for example with a car jack.
10. Remove the support frame from the vehicle chassis by loosening the bolts and carefully lowering the support frame to the ground with a car jack.

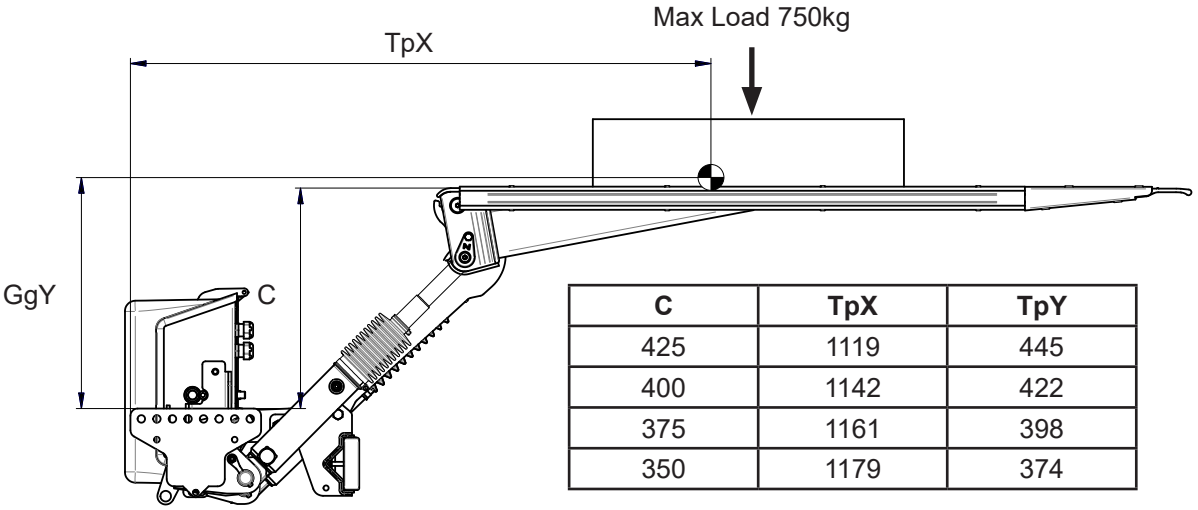
13 Specifications

13.1 Weights

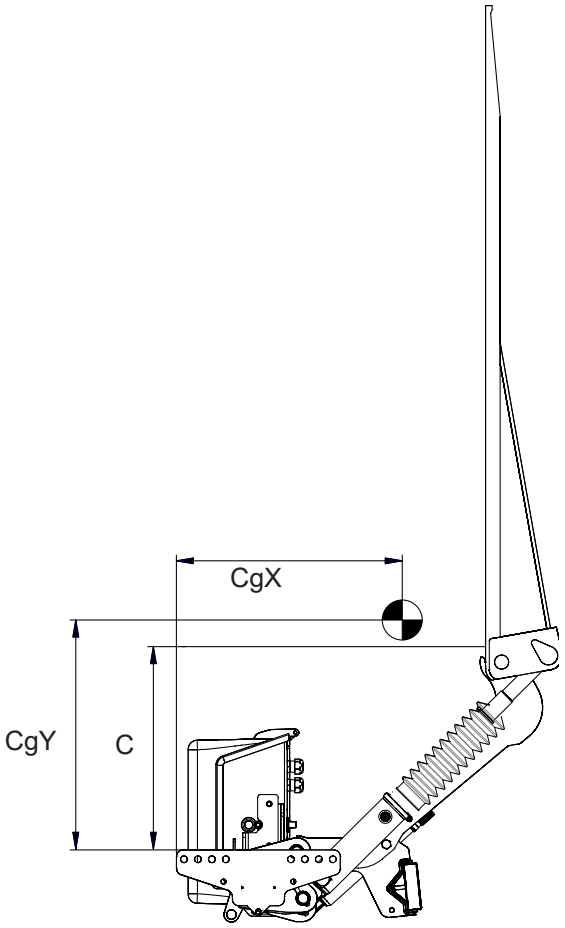
Some separate components of the lift must be manipulated by other lifting equipment during handling and therefore could represent hazards if their weights exceed the equipment's permitted load. The following are the ranges of weights for various heavy components.

Complete Lift chassis (without platform and accessories)	
Z3N 75-100	100 kg
Z3NU 75-100	112 kg
Z3NN 75-100	99 kg
Z3NNU 75-100	111 kg
Z3NW 75-100	101 kg
Z3NWU 75-100	113 kg
Aluminium platforms	
Alu. platform 1200x2160 mm	54 kg
Alu. platform 1450x2160 mm	61 kg
Alu. platform 1600x2160 mm	66 kg
Lift components (included in complete lift chassis)	
Support frame Z3N 75	20,5 kg
Support frame Z3NN 75	18,3 kg
Support frame Z3NW 75	21,1 kg
Lift arm hitch	22.8 kg
Hydraulic unit	13.0 kg
Lift cylinder -100	8.5 kg each
Tilt cylinde -100	7.9 kg each
U-protection cpl.	14,5 kg
Accessories (does not include cpl. lift chassis).	
Control device 3-button + 1-button (extra button)	0.6 kg
Sealing system B=2160mm	9.5 kg
Spiral control device 22417	0.6 kg

13.2 Center of gravity Z3N / Z3NU

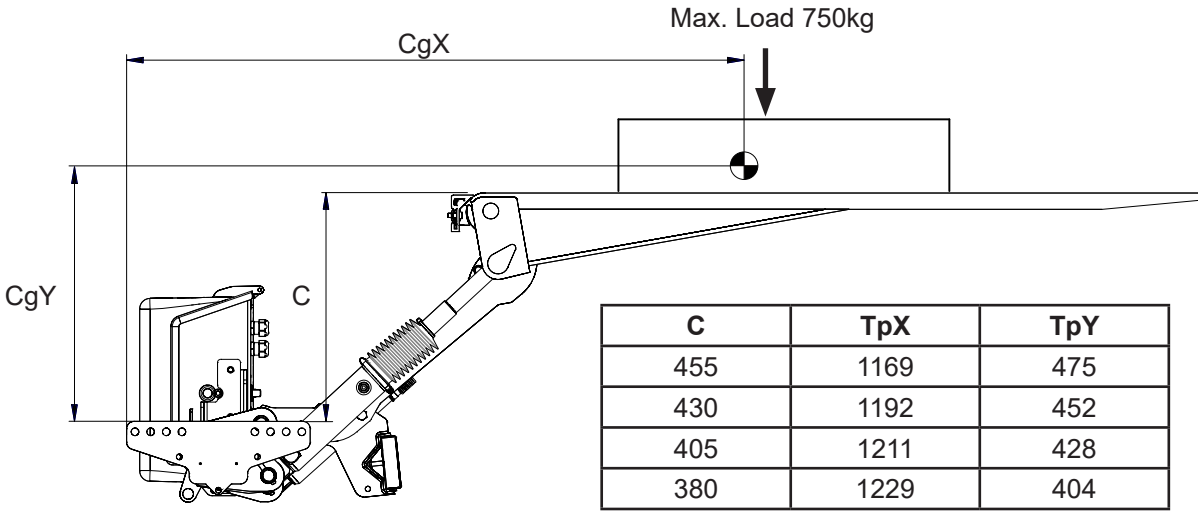


C	TpX	TpY
425	1119	445
400	1142	422
375	1161	398
350	1179	374

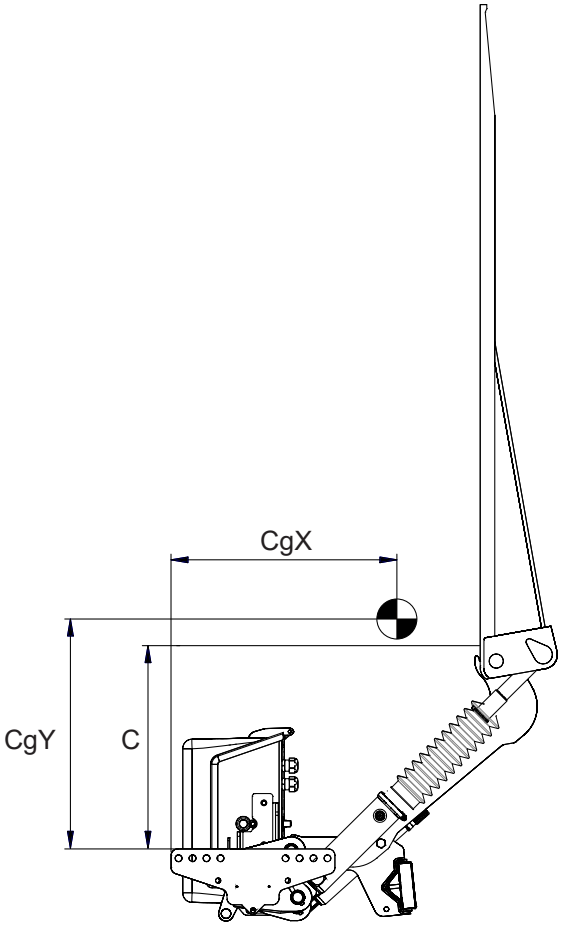


C	TpX	TpY
425	448	443
400	460	427
375	471	412
350	481	397

13.3 Center of gravity Z3NW / Z3NWU

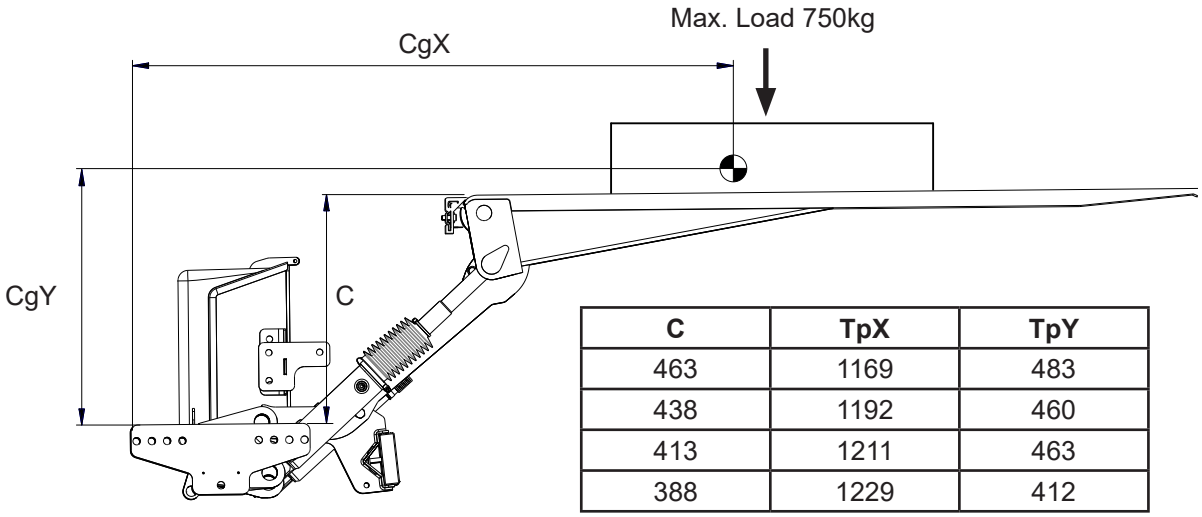


C	TpX	TpY
455	1169	475
430	1192	452
405	1211	428
380	1229	404

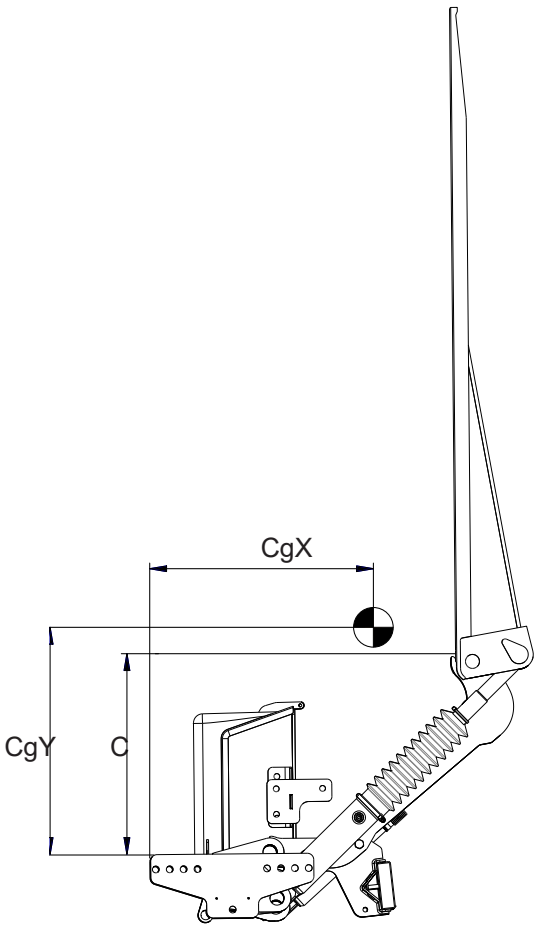


C	TpX	TpY
455	498	473
430	510	457
405	521	442
380	531	427

13.4 Center of gravity Z3NN(U)



C	TpX	TpY
463	1169	483
438	1192	460
413	1211	463
388	1229	412



C	TpX	TpY
463	498	481
438	510	465
413	521	450
388	531	435

13.5 Loading diagram

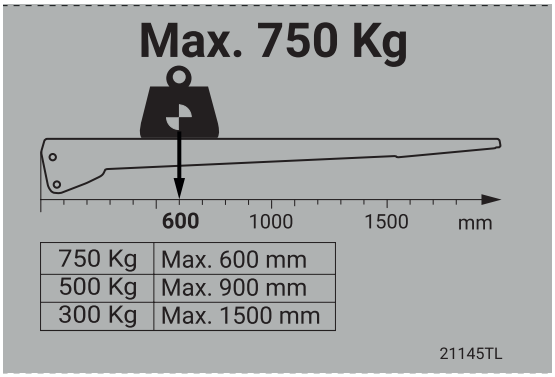


Image 80. Loading diagram

13.6 Tightening torque

NOTE!

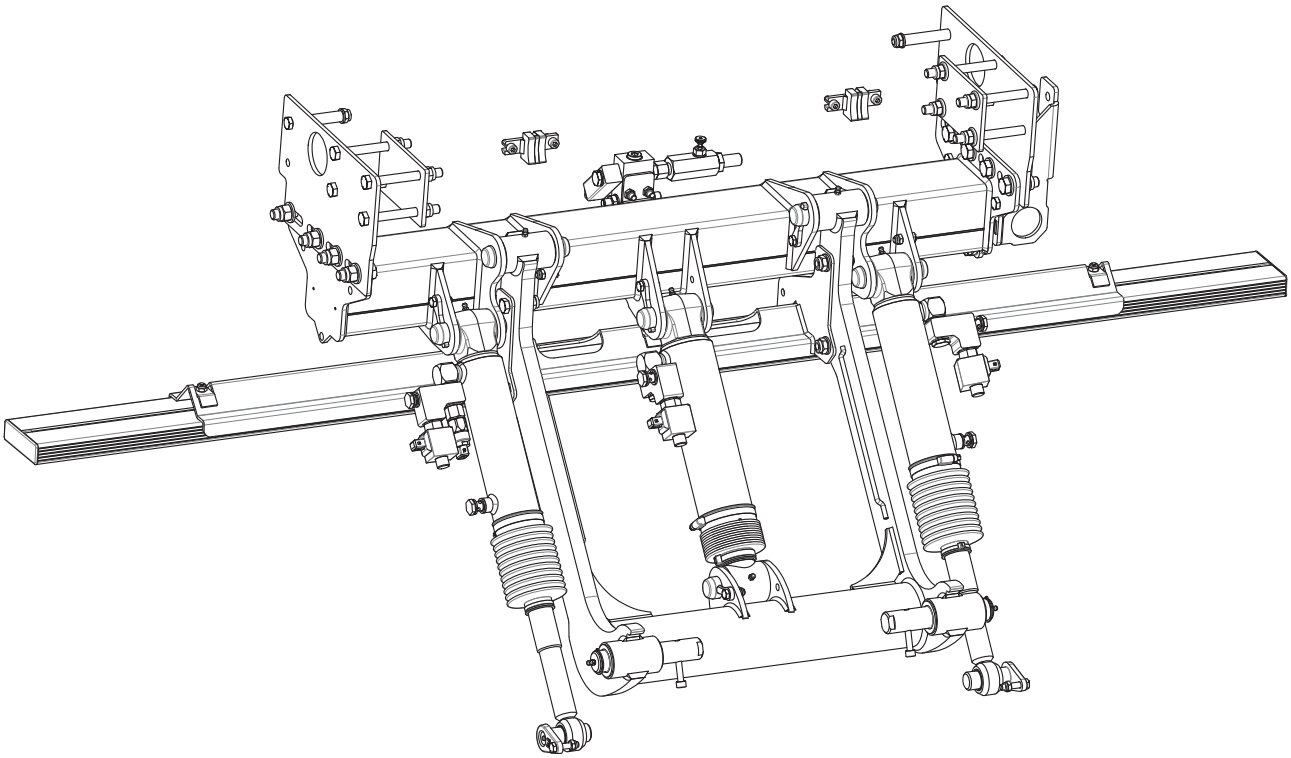
All specified torque values apply for use with a screw or impact wrench with torque control.
Torque distribution max ± 5%.

- M8..... 25Nm.

- M10..... 50Nm.

- M12..... 80Nm.

- M14..... 120Nm.



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