

Installation instructions

Tail Lift ZS MK2

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78612TL

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ZEPRO

Contents

1	Important information	5
1.1	Attention!	5
1.2	Configuration	5
1.3	Technical support	5
1.4	CE marking.....	6
1.5	Product approval	6
1.6	Hydraulic oil.....	6
1.7	Guarantee	6
1.8	Repainting	7
1.9	Battery maintenance	7
2	Safety rules	8
2.1	Moving parts - free movement.....	8
2.2	Connection of third-party equipment is forbidden.....	8
2.3	Installation	8
3	Before installation	9
3.1	Underrun protection.....	9
3.2	Calculating the installation dimensions (Standard lift).....	11
3.3	Calculating the installation dimensions (Slimline)	13
3.4	Rear member cut-outs.....	15
3.5	Prepare the tail lift	16
3.6	Temporary connection of lift	18
3.7	Adjustment of slide profiles	19
4	Installation.....	20
4.1	Support frame.....	20
4.2	Setting the work position	22
4.3	Work position lock (Option)	23
4.4	Platform	24
4.5	Platform stop	26
4.6	Arm stops	26
4.7	Purging the cylinders.....	26
4.8	Transport stops.....	27
4.9	Angle sensor for autotilt.....	29
4.10	Control device	30
5	Cable routing	35
5.1	General.....	35
5.2	Maximum power consumption - Minimum recommended conductor cross-sectional area	36
5.3	Main power cable, earth cable, main fuse and main switch	37
5.4	Control power cable	39
5.5	Open platform alarm.....	39
5.6	Foot controller / Warning lights.....	39

6	Connection	40
6.1	Cable grommet	40
6.2	Connection	41
7	Powering up the tail lift	45
8	Electrical and hydraulic diagrams	46
8.1	ZS MK2	46
8.2	ZS MK2 Autotilt	47
9	Lubrication and oil level check	48
9.1	Lubrication points	48
9.2	Oil level check	48
10	Marking	49
10.1	Max permissible load	50
10.2	Identification plate	51
10.3	Work area	51
10.4	Warning tape	51
10.5	Controller sticker	52
10.6	Danger area	55
10.7	Warning flags	55
11	Testing and verification	56
11.1	Static load test	56
11.2	Dynamic load test	57
11.3	Test of safety functions	57
12	Registration	58
13	Specifications	58
13.1	Weights	58

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 Configuration

This tail lift is available in a many different configurations. It is available in two versions, Standard and Slimline. Lift height, lift capacity, slider profile length and platform size may vary. However, the installation principles are the same whatever the configuration.

- Standard or Slimline
- Lifting capacity: 1500, 2000 or 2500 Kg.
- Max lift height: -135 (1330 mm), -155 (1510 mm), -175 (1700 mm).
- Slide profiles: 1590, 1700 and 1850 mm.
- Platform: 1565 x 2400, 1765 x 2400, or 1965 x 2400 mm.

1.3 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.



Picture 1. Identification plate

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.



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

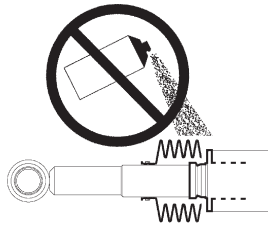
The ZEPRO warranty applies only if assembly has been carried out according to ZEPRO's assembly instructions by a ZEPRO approved bodybuilder.

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

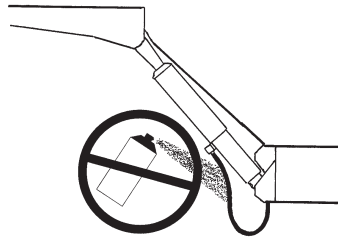
1.8 Repainting

IMPORTANT!

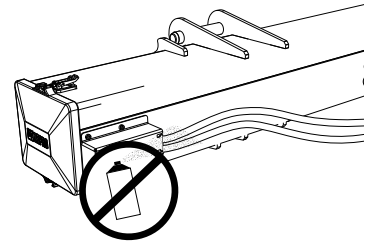
Piston rods and cylinder covers must not be painted. Among other things, this can damage the cylinder gaskets. Boots, hydraulic hoses and cables may not be coated/painted as the solvent in the paint can damage the hoses and cables and impair durability.



Picture 2. Piston rods, cylinder covers and boots



Picture 3. Hydraulic hoses



Picture 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.

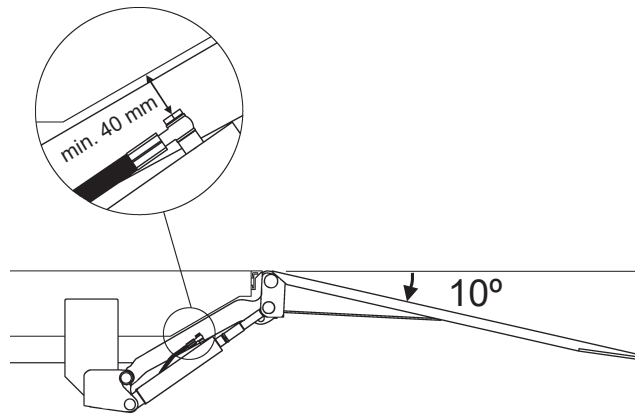
2 Safety rules

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).

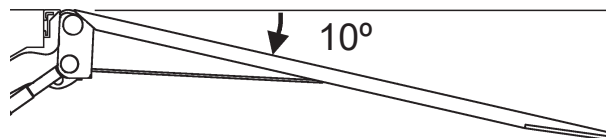
**Final inspection to be carried out with the platform at the vehicle floor and tilted down 10°. The clearance from the closest part of the cylinder must be at least 40 mm.



Picture 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 10° from the horizontal.



Picture 6. The platform may not be tilted down more than 10° 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 $\pm 5\%$.

3 Before installation

3.1 Underrun protection

Because the tail lift transport stop forms a vital part of the underrun protection, correct installation is very important. Certain configurations can render correct installation difficult and modifications may be necessary. Configurations highlighted in grey in the table below may mean that some modification is necessary for the tail lift underrun protection to meet statutory requirements. If in doubt, contact ZEPRO for support.

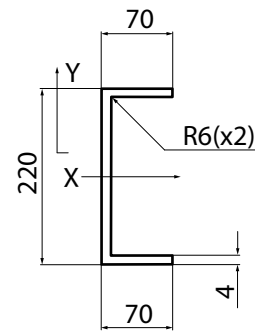
Model	Arm	Platform (length)	Length of slide profiles		
			1590	1700	1850
Standard	135	1565			
		1765	OK		
		1965	OK	OK	
	155	1565	OK		
		1765	OK	OK	
		1965	OK	OK	OK
	175	1565	OK	OK	
		1765	OK	OK	OK
		1965	OK	OK	OK
Slimline	135	1565	OK		
		1765	OK	OK	
		1965	OK	OK	
	155	1565	OK	OK	
		1765	OK	OK	OK
		1965	OK	OK	OK
	175	1565	OK	OK	OK
		1765	OK	OK	OK
		1965	OK	OK	OK

3.1.1 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. Thus the frame beam cross-section must measure at least 220x70x4 mm, which corresponds to a minimum moment of inertia of 937cm⁴ around the x-axis. See Picture 7.

If in doubt, contact ZEPRO for support.



Picture 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.

3.1.2 Statutory dimensions

Make sure the installation location allows the tail lift to meet the statutory dimensions for underrun protection when in transport mode

Distance between the platform and the ground when the vehicle is unladen:

Max 450 mm for vehicles with air suspension.

Max 500 mm for vehicles with conventional suspension.

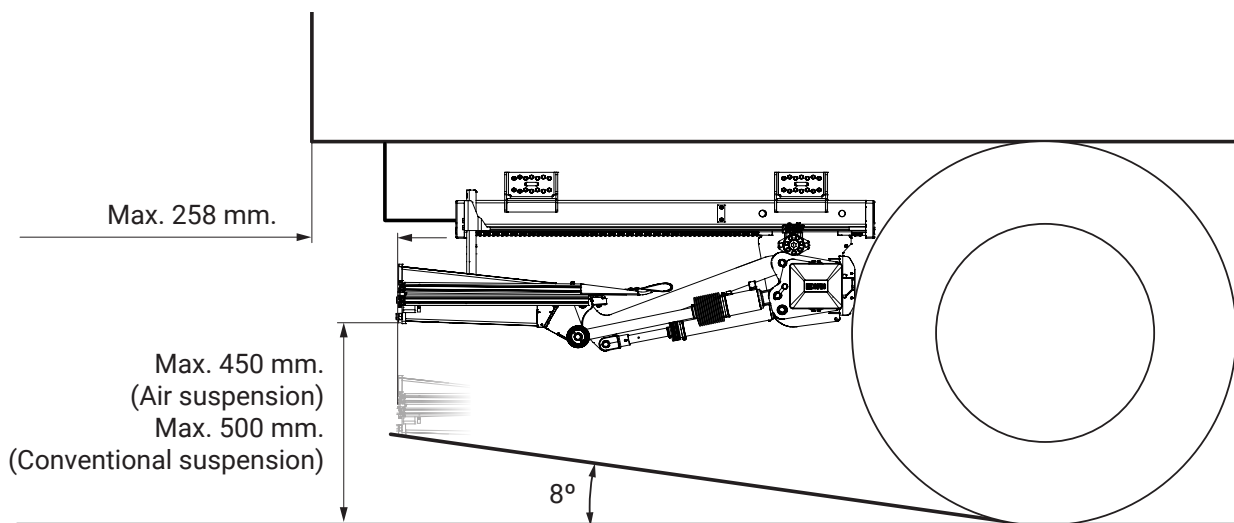
If the departure angle with the above setting is less than 8°, the distance between the platform and the ground on an unladen vehicle must be increased until the angle reaches 8°, but by not more than 550 mm.

Horizontal distance from the outermost part of the vehicle to the platform: Max. 258 mm.

See Picture 8.

NOTE!

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



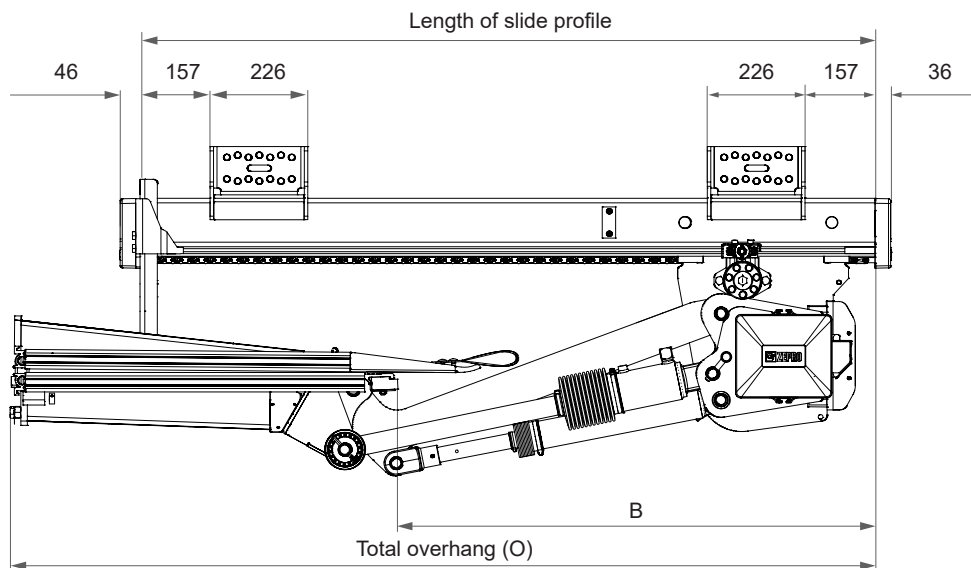
Picture 8. Statutory dimensions for underrun protection

3.2 Calculating the installation dimensions (Standard lift)

For easier installation it is useful to calculate and specify the necessary dimensions in advance. Efforts should be made to install the lift as high as possible.

The platform and lift arm assembly are optimized for minimum overall length (O). Try to fit the slider profile in such a position that when the platform is folded its rear edge aligns with the rear edge of the superstructure. This makes sure the platform can be folded out.

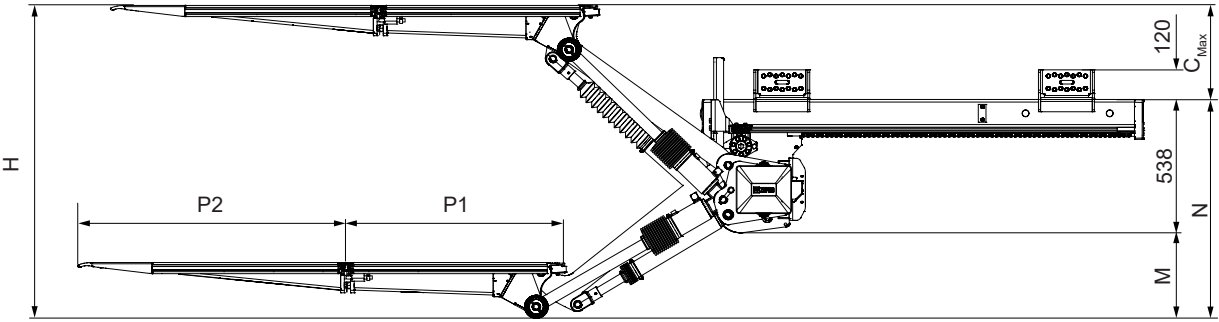
The easiest way to calculate the installation dimensions is to use a CAD program. 2D drawings are available for downloading from www.c-office.com. For help with calculating installation dimensions, contact ZEPRO. Phone: +46 (0)10-459 05 04, Email: zeprotech@hiab.com.



Picture 9. Installation dimensions

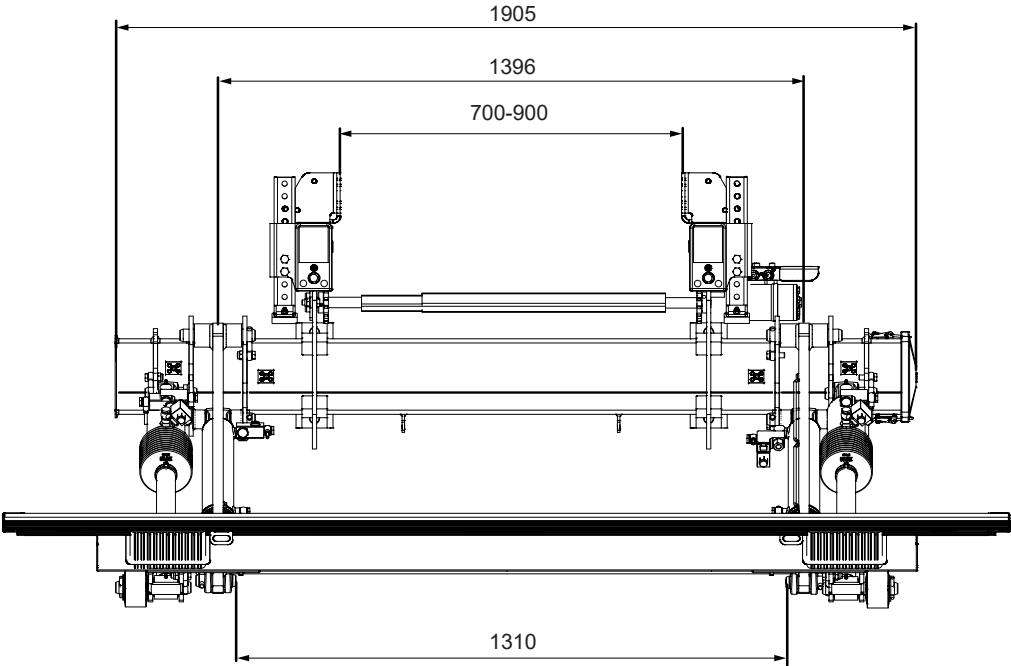
Arm	Lifting height	Slide profile (length)	B	Platform (length)	O
135	1330	1590	989*	1565	1669
				1765	1769
				1965	1869
155	1510	1700	1109*	1565	1789
				1765	1889
				1965	1989
170	1700	1850	1229*	1565	1910
				1765	2010
				1965	2110

* Valid with 50 mm bavetta. With a 70 mm bravetta, dimension (B) is reduced by 20 mm.



Picture 10. Installation dimensions

Arm	Lifting height (H)	C _{max}	M	N
135	1330	400	Max. 389	Max 927
155	1510	490	Max. 486	Max 1024
170	1700	580	Max. 513	Max. 1120

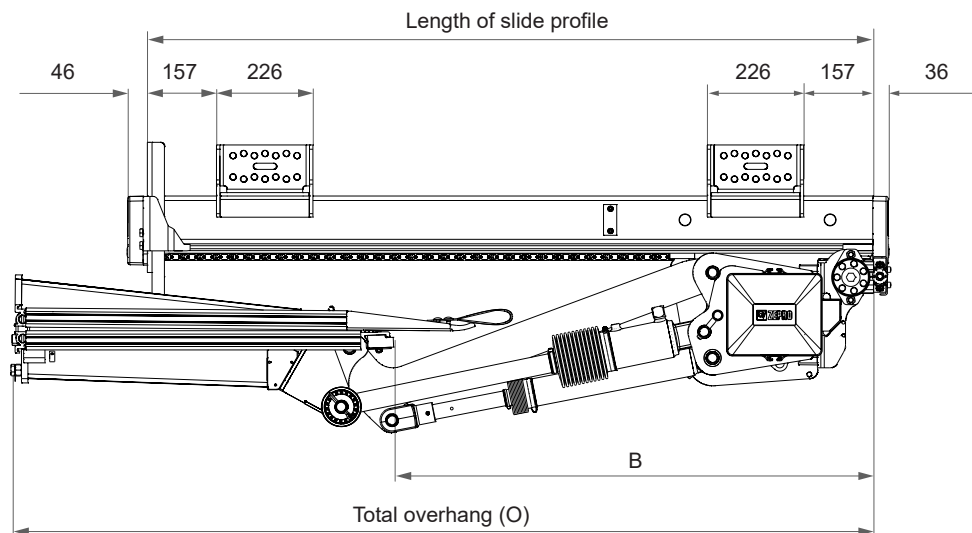


Picture 11. Installation dimensions

3.3 Calculating the installation dimensions (Slimline)

For easier installation it is useful to calculate and specify the necessary dimensions in advance. Efforts should be made to install the lift as high as possible.

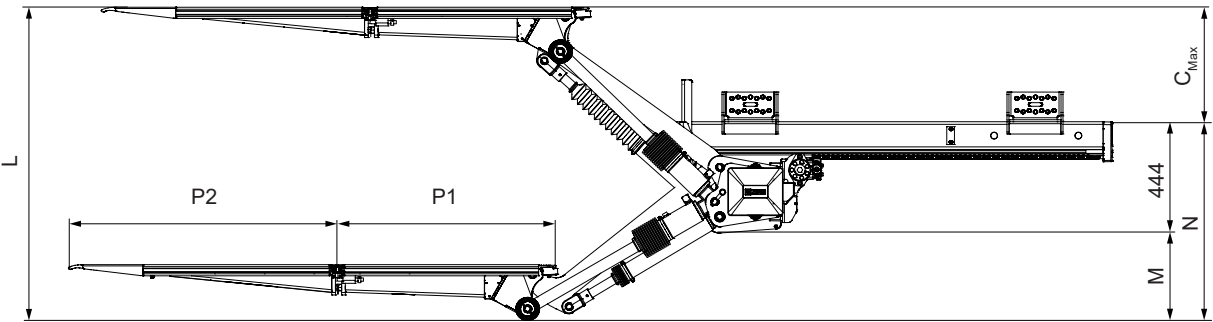
The platform and lift arm assembly are optimized for minimum overall length (O). Try to fit the slider profile in such a position that when the platform is folded its rear edge aligns with the rear edge of the superstructure. This makes sure the platform can be folded out.



Picture 12. Installation dimensions

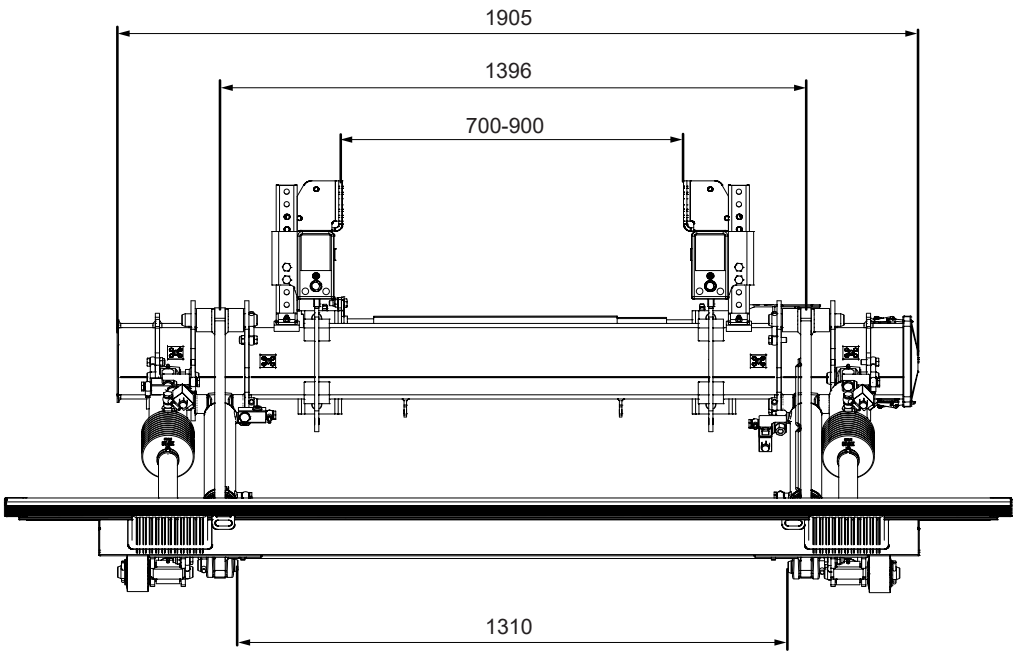
Arm	Lifting height	Slide profile (length)	B	Platform (length)	O
135	1330	1590	1054*	1565	1734
				1765	1834
				1965	1934
155	1510	1700	1176*	1565	1856
				1765	1956
				1965	2056
170	1700	1850	1297*	1565	1977
				1765	2077
				1965	2177

* Valid with 50 mm bavetta. With a 70 mm bravetta, dimension (B) is reduced by 20 mm.



Picture 13. Installation dimensions

Arm	Lifting height	C _{max}	M	N
135	1330	490	Max 397	Max 841
155	1510	575	Max 494	Max 938
170	1700	665	Max 590	Max 1034

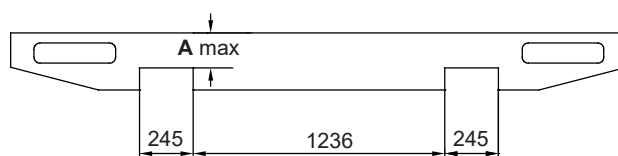


Picture 14. Installation dimensions

3.4 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 upper 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.



Picture 15. Rear member cut-outs

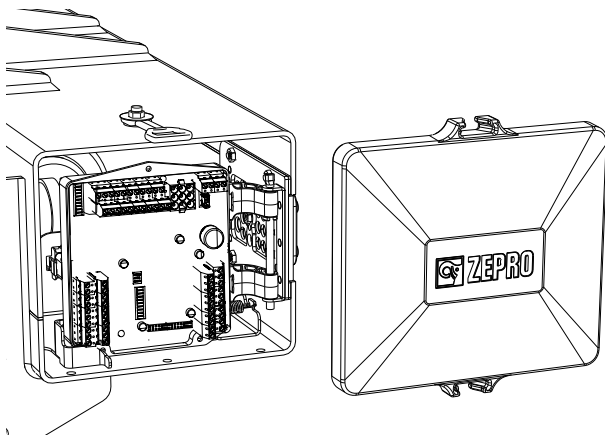
3.5 Prepare the tail lift

1. Position the support frame under the vehicle's chassis.
2. Remove the protective cover mounted with a rubber strap, see Picture 16.
3. Fold out the control card (B) and loosen the cabling at the connector on the hydraulic unit, see Picture 17 and Picture 18.
4. Release the hydraulic unit by unscrewing the wing nut and corresponding screw (C); see Picture 19 and pull out the hydraulic unit until the tank cap is accessible; see Picture 21.

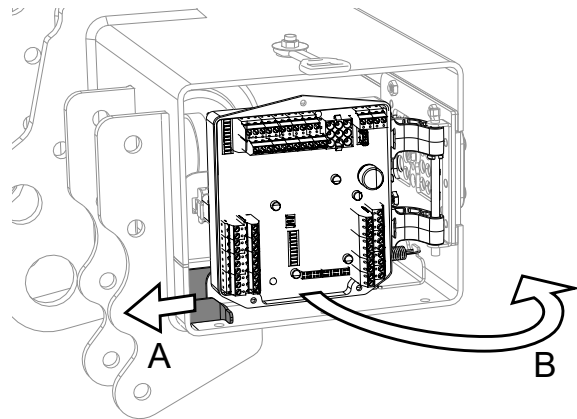
⚠ CAUTION!

Ensure that no cables are trapped or in any other way damaged when the control card is folded out or removed.

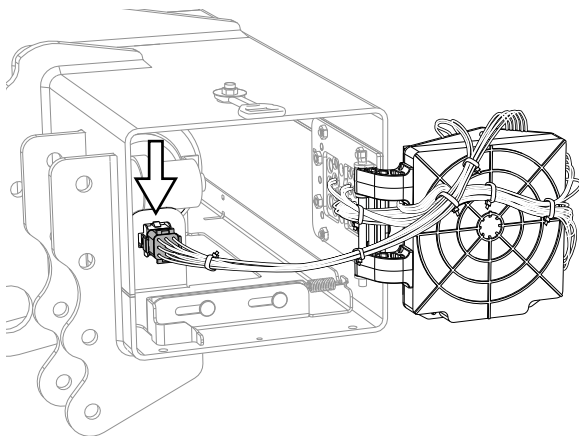
Do not pull out the hydraulic unit more than necessary; make sure it is not pulled completely out of the frame, as this can entail a risk of personal injury and damage to the equipment.



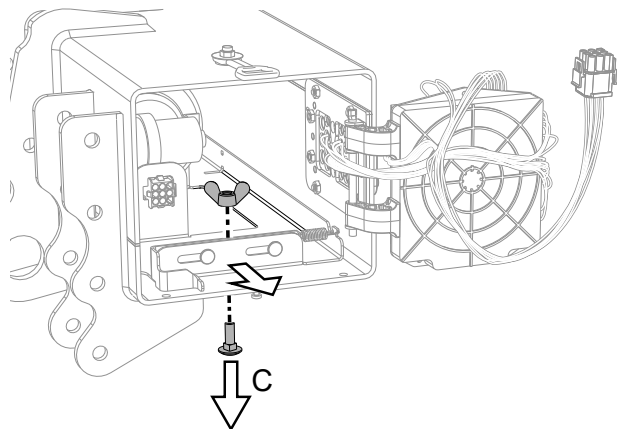
Picture 16. Remove the protective cap



Picture 17. Release latch control card

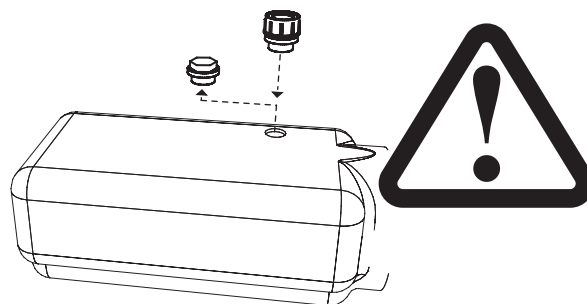


Picture 18. Connection socket

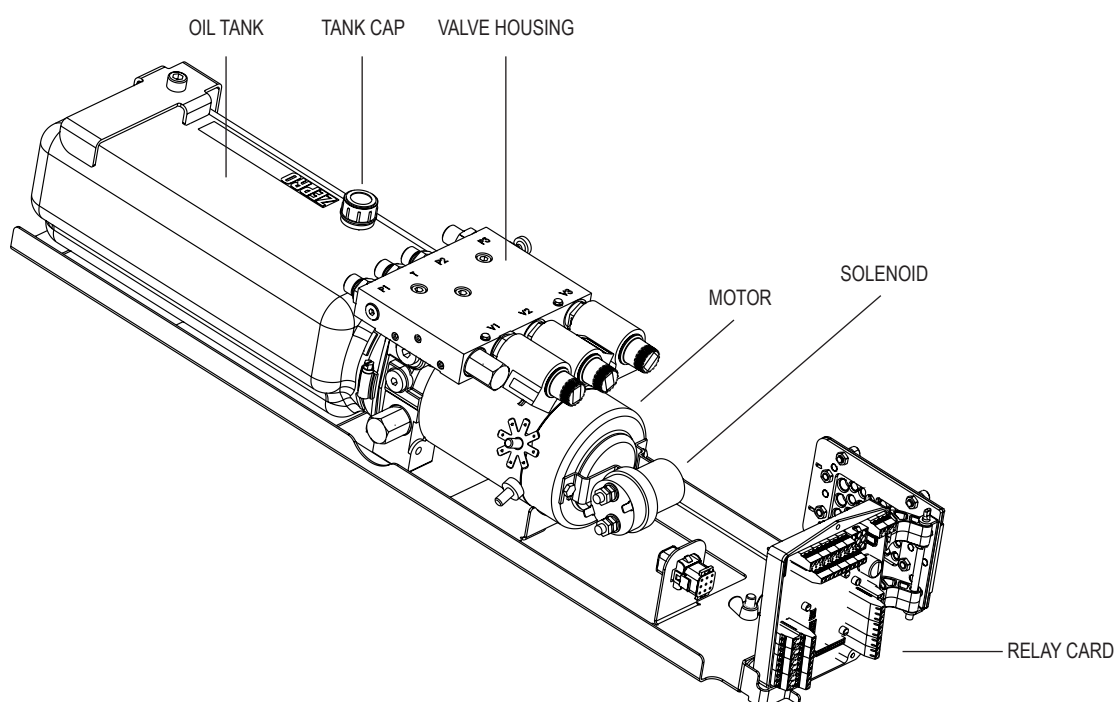


Picture 19. Releasing the hydraulic unit

5. Check whether the hydraulic tank is fitted with a transport plug seal. If so, replace it with the regular tank cap supplied.



Picture 20. Where necessary, replace the transport plug with a regular tank cap



Picture 21. Hydraulic unit and relay card

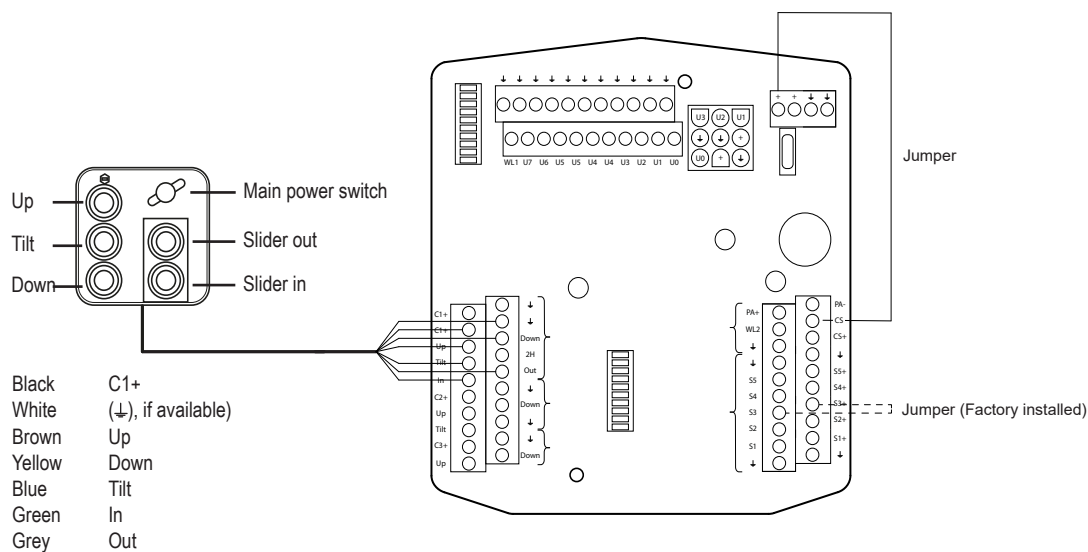
3.6 Temporary connection of lift

When the lift is installed, it is sometimes necessary to operate the lift functions in order to change the positions of the cylinders and the 1st booms. Temporarily connect the lift to enable the lift functions.

1. If the actuator is not connected, connect the controller to the relay card.
2. Connect the +12/24V battery to the tail lift's main power cable.
3. Connect the negative battery terminal to the tail lift's earth cable (GND).
4. On lifts with a connected cab circuit breaker (CS), ensure it is in the ON position.
5. On lifts without a connected cab circuit breaker (CS), 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.

⚠ WARNING!

Take great care when running the lift functions, ensure nothing gets trapped, risk for personal injury and material damage.



Picture 22. Temporary connection of controller

3.6.1 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.

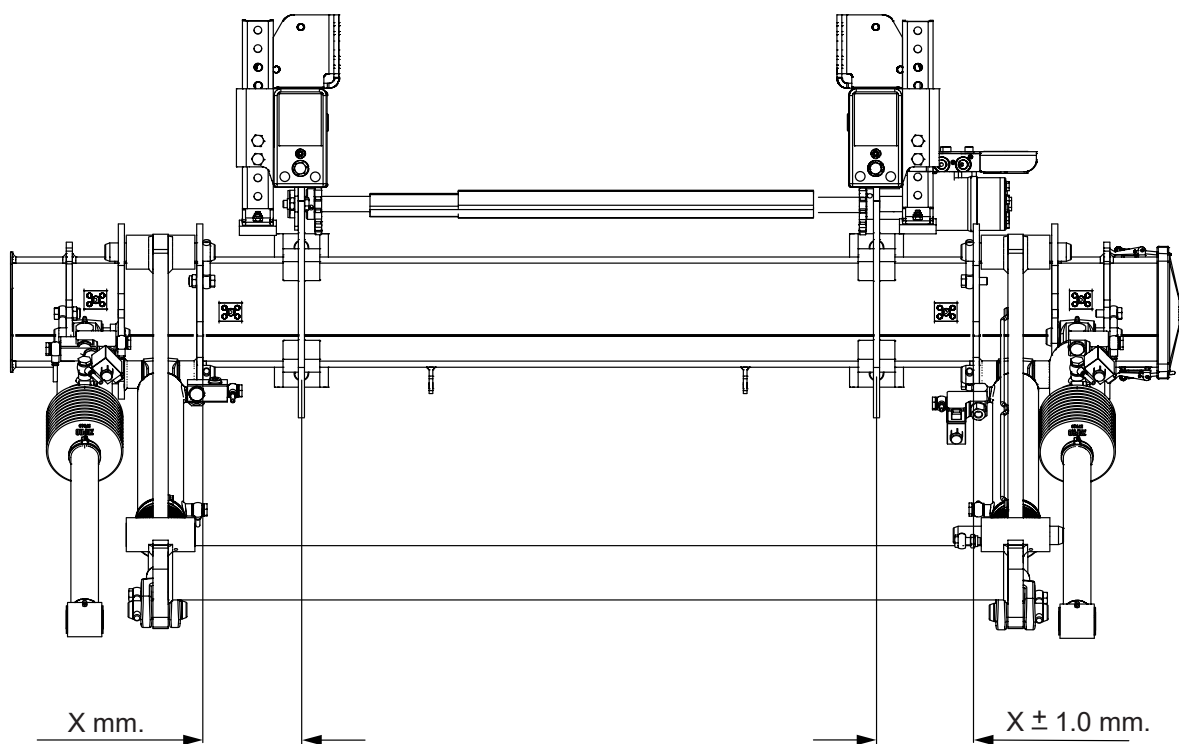
3.7 Adjustment of slide profiles

The position of the slide profiles on the support frame has to be adjusted to the vehicle's frame width.

1. Loosen the nuts holding the clamps on the back of the frame brackets.
2. Adjust the distance of the slide profiles from each other to the width of the chassis and centre the frame so the distance from the brackets to the centre of the frame is equally long on both the left and right-hand sides. Measure the distance between the brackets and the 1st boom's attachment.
3. Tighten the nuts alternately until the clamp bears fully on the frame.
4. Tighten the nuts. Tightening torque: 260 Nm.

IMPORTANT!

The frame brackets must be mounted completely parallel with each other and perpendicular to the support frame.



Picture 23. Adjusting the chassis bracket

4 Installation

4.1 Support frame

1. On delivery, the support frame is strapped to the pallet with packing straps. Leave the packing straps in place until the frame has been assembled.
2. Adjust the distance (width) between the slide profiles to fit the vehicle.
3. Carefully drive the slide function so the support frame is positioned as far back on the slide profiles as possible.
4. Lift the pallet up to the trailer frame using a forklift truck.
5. Carefully run the lifting arm up to bed height according to the current X and Y dimensions. See figure 25
6. If necessary, move the slide profiles (by running the slide function) to avoid the slide profiles touching the chassis, mudguards etc.
7. Fit the support frame to the vehicle frame. Fit with at least four screws on each bracket and according to the bolt pattern described in table below. When installing on Mercedes-Benz chassis with a pre-drilled frame, drill out the holes to Ø16.5 mm. Suitable M16 nuts and bolts (Part no: P403TL) can be ordered separately, please contact ZEPRO for more information.

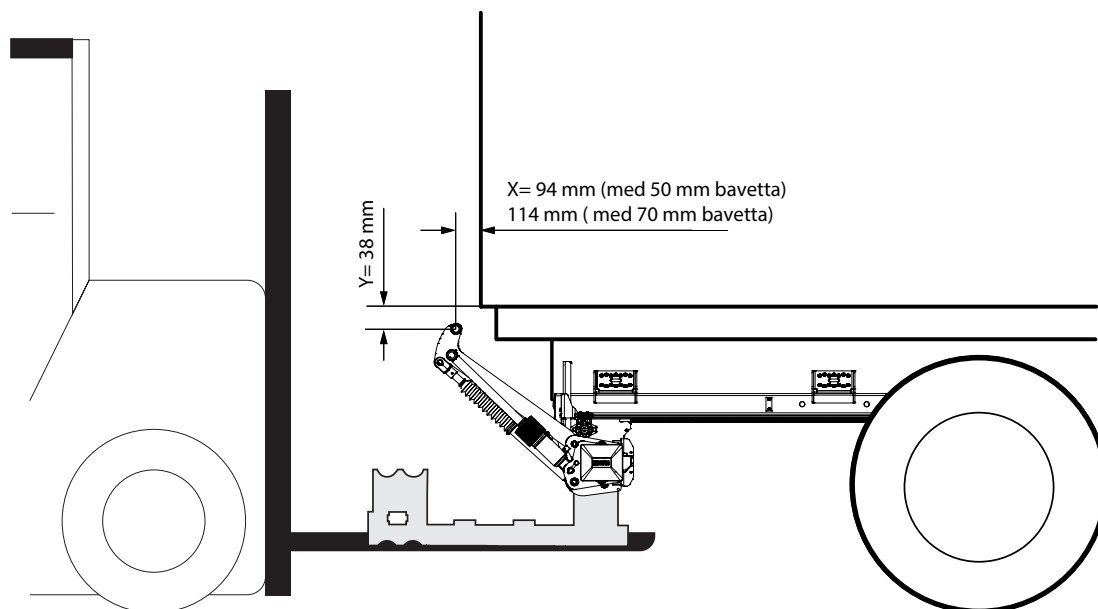
IMPORTANT!

Welding is not permitted on the chassis brackets.

Do not run the lift against the arm stop or with the platform installed until all bolts are properly tightened against the frame.

Do not load the lift until all screws have been tightened.

Do not load the lift before the body work is installed.



Picture 24. Installation of support frame in the working position

1.

Chassis with pre-drilled holes:		Bolt pattern - option			
		1	2	3	4
SCANIA, MAN,	M14x45 10.9 Tightening torque 120 Nm				
MERCEDES-BENZ NOTE! Drill out the bracket holes to Ø16.5 mm.	M16x45 10.9 Tightening torque 180 Nm				
VOLVO	M14x45 10.9 Tightening torque 120 Nm				
Chassis without pre-drilled holes:					
(A minimum of one bolt in each market area)	M14x45 10.9 Tightening torque 120 Nm				

4.2 Setting the work position

If necessary, the working position of the tail lift can be adjusted forwards (max. 55 mm). The adjustment option can be extended by installing a longer adjustment screw (M12). However, the screw should be no longer than 150 mm, which allows adjustment up to approx. 125 mm. If further adjustment is needed, see section 4.3.

Comment

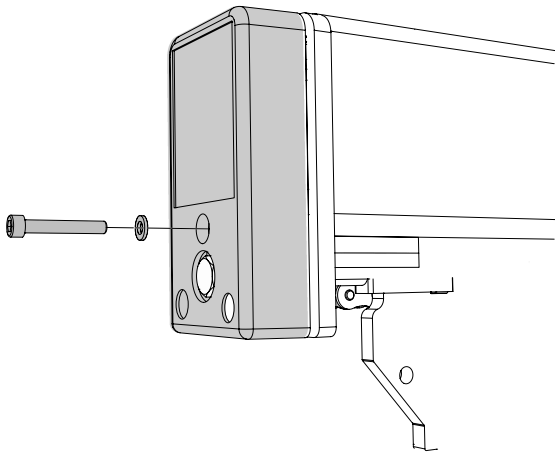
The space for adjusting the working position forwards is limited by the length of the platform. Make sure the platform can be unfolded into the intended working position after installation.

1. Unscrew the rear end caps on both slide profiles.
2. Loosen the adjusting screws' counter-nuts.
3. Adjust the lift to the correct working position using the adjusting screws.

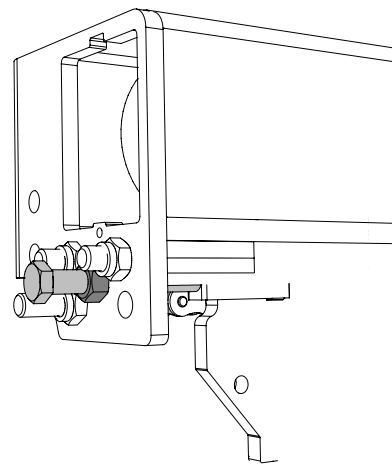
IMPORTANT!

It is important that the adjustment is made equally on the left and right sides.

4. Lock the adjustment by tightening the counter-nuts.
5. Screw the end caps on to both slide profiles.



Picture 25. The slide profile's end cap



Picture 26. Screw for setting the work position

4.3 Work position lock (Option)

If the stop position for the slider profile's rear end does not correspond to the lift's working position after maximum adjustment of the adjusters screw, a working position lock (part no 76692TL) may be installed to correct the distance between the platform and the superstructure. The work position lock can be moved in 19 mm increments.

Work position locks should always be mounted in pairs (left and right) and at equal distances from the end of both slide profiles (count links from the edge).

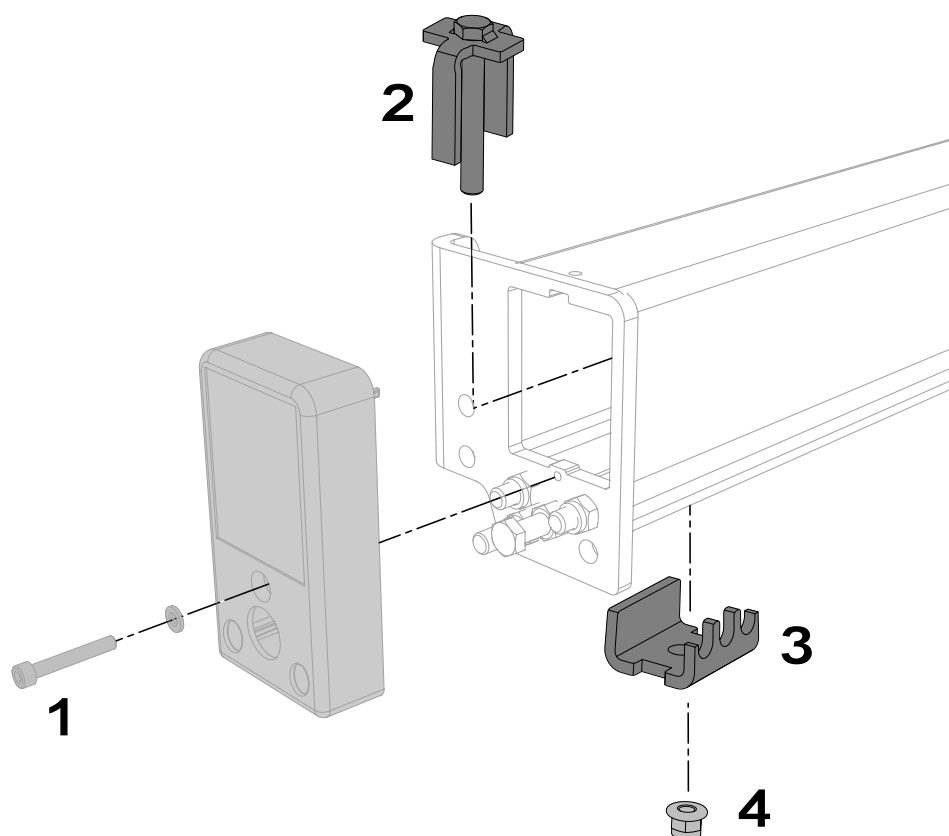
Comment

The space for adjusting the working position forwards is limited by the length of the platform. Make sure the platform can be unfolded into the intended working position after installation.

1. Unscrew the end caps from the slide profiles.
2. Insert the T-shaped stop pins into the grooves on the slide profiles.
3. Hook the lower part of the lock into a position on the chain that provides the correct working position. Check the position is the same on the right and left sides (count links from the edge).
4. Fasten with associated nuts.
Tightening torque: 50 Nm.
5. Screw the end caps back on.

⚠ WARNING!

Under no circumstances may the working position locks be used to stop the slider anywhere other than in the working position. Risk of injury.



Picture 27. Work position lock (Option)

4.4 Platform

1. Check that all included components are clean, clean where necessary.
2. Lubricate the lift arms' metal bushings before installation. Make sure that the small holes on the inside of the bushing are filled with grease. Use LE lubricant 4622.
3. Lift the platform, suitably with the aid of a forklift or lifting table, and align it with the lift arms.
4. Install the platform on the arms, using the shafts, screws and spacers supplied. Tighten the screws.

Tightening torque: 80 Nm.

IMPORTANT!

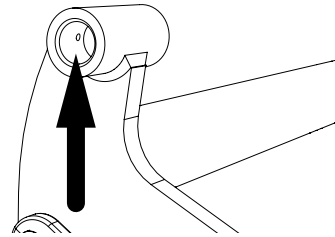
Mount the enclosed spacers between the bracket of the platform and the outer side of the lift arms. See Picture 29.

5. Install one of the tilt cylinders on the platform. Use the enclosed shaft and screw supplied. Tighten the screw.

Tightening torque: 80 Nm.

NOTE!

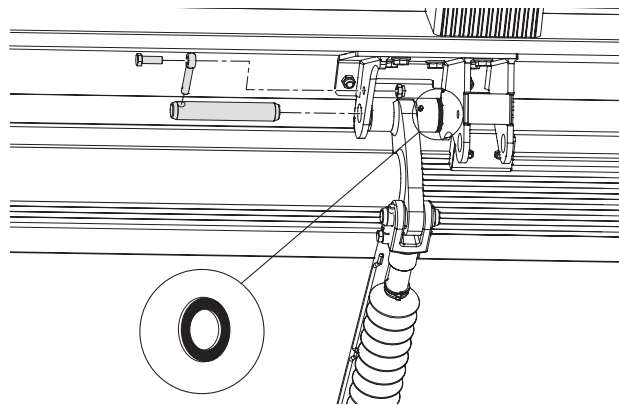
Make sure the cylinder is installed with the grease nipple facing up.



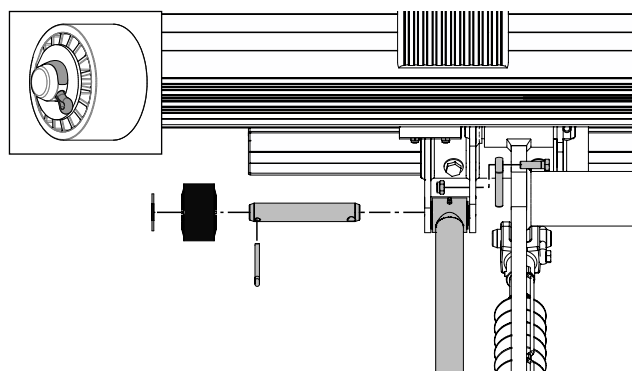
NOTE!

Lubricate the bushings before installation.

Picture 28. Take care to lubricate the metal bushings initially



Picture 29. Install the platform on the arms



Picture 30. Install the tilt cylinder on the platform

6. Fit the support wheel on the shaft. Secure with associated split pin.
7. Run the lift up until the platform reaches the vehicle floor. Loosen the cylinder boots.
8. Undo lock screw (A) on the tilt cylinder installed on the platform. Screw the stop all the way back (B) toward the platform. See Picture 32.
9. Tilt the platform down to max 10° below the horizontal. See Picture 31.

⚠ WARNING!

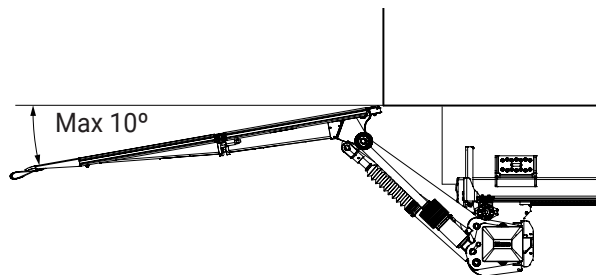
To ensure lift safety and CE compliance, adjust the downward tilt angle to no more than 10°.

10. Adjust the end stop all the way to the top of the cylinder (C). Picture 32.
11. Fix the setting with the lock screw (A). See Picture 32. **Tightening torque: 3-5 Nm**
12. Loosen the lock screw (A) on the other tilt cylinder.
13. Turn the adjuster sleeve so that the tilt cylinder fits into the attachment point on the platform and then fix this setting using lock screw (A).
14. Install the other tilt cylinder in the platform attachment point. Use the enclosed shaft and screw. Tighten the screw. **Tightening torque: 80 Nm**

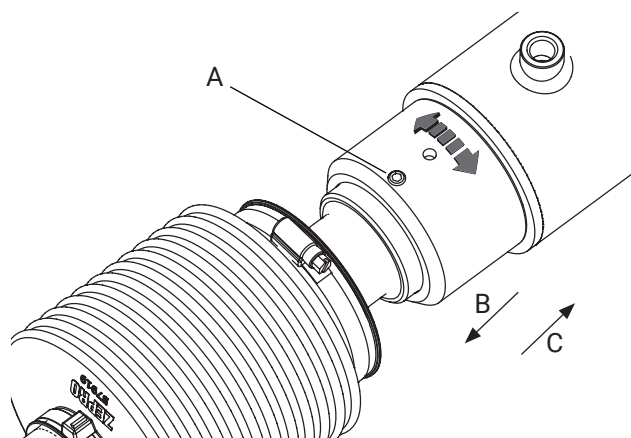
NOTE!

Make sure the cylinder is installed with the grease nipple facing up.

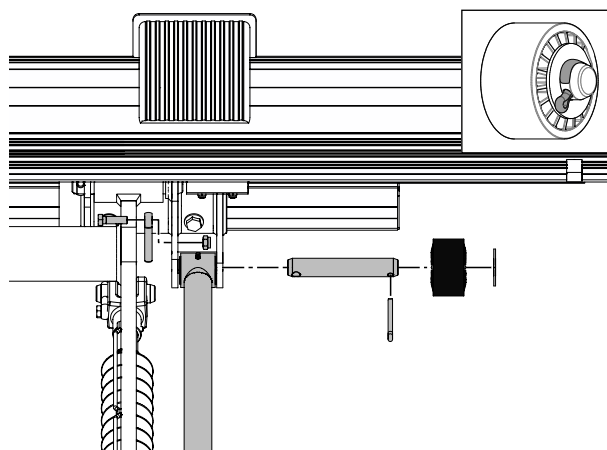
15. Fit the tilt cylinder boots.
16. Fit the support wheel on the shaft. Secure with associated split pin.
17. Test all functions.



Picture 31. The downward tilt angle must be adjusted to max. 10°



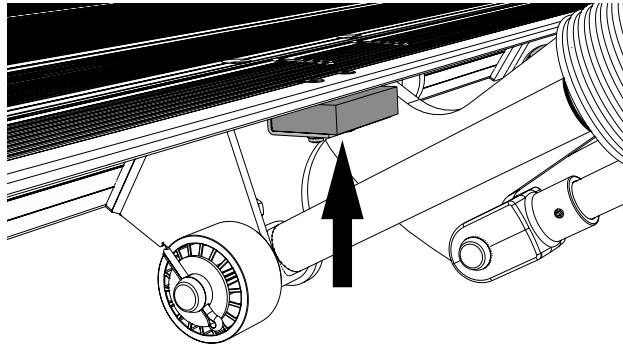
Picture 32. End stop with lock screw



Picture 33. Install the tilt cylinder on the platform

4.5 Platform stop

The platform is fitted with two platform stops installed beneath the bavetta (rear edge of platform). If necessary, the platform stops can be moved sideways if they are e.g. in the way of the superstructure shute bolt.



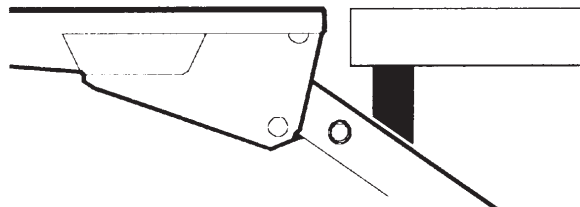
Picture 34. Platform stops are installed beneath the bavetta

4.6 Arm stops

If platform stops cannot be installed, they may be replaced by end stops between the lift arms and the vehicle floor rear beam. The left and right end stops must be reached at the same time, as high as possible on the left arm.

IMPORTANT!

Welding on the lift arm is not permitted. Installation must take place on the vehicle body.



Picture 35. Fit end stops between the lift arms and the rear beam of the vehicle floor

4.7 Purging the cylinders

Purge the lift cylinders by lowering the platform all the way to the ground a few times. It may be necessary to raise the truck to allow the platform to be lowered completely.

Purge the tilt cylinders by tilting the platform all the way up and then all the way down.

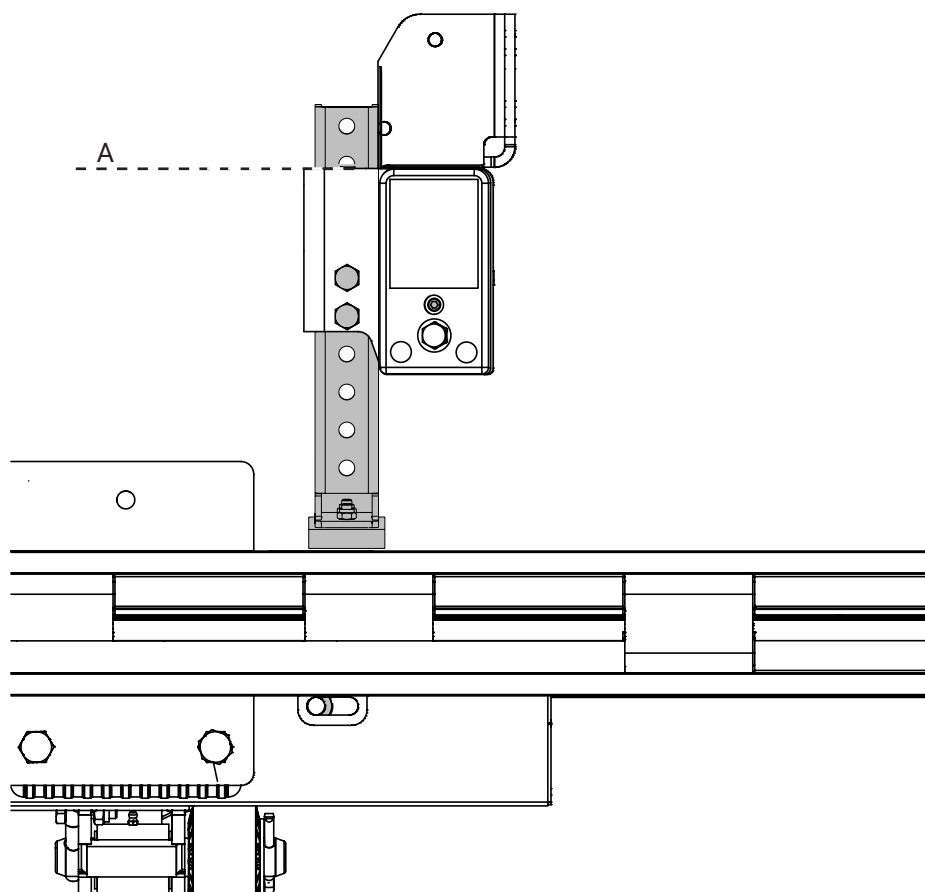
4.8 Transport stops

Transport stops must be installed to secure the platform during transport.

IMPORTANT!

Transport stops must always be installed in pairs, one on each slider profile.

1. Run the lift to transport position.
 2. Choose an appropriate hole pattern for installing the transport stop.
 3. If necessary, cut the bracket above the mounting (A).
 4. Bolt the transport stops to the left and right slider profiles.
- Tightening torque: 70-75 Nm.**

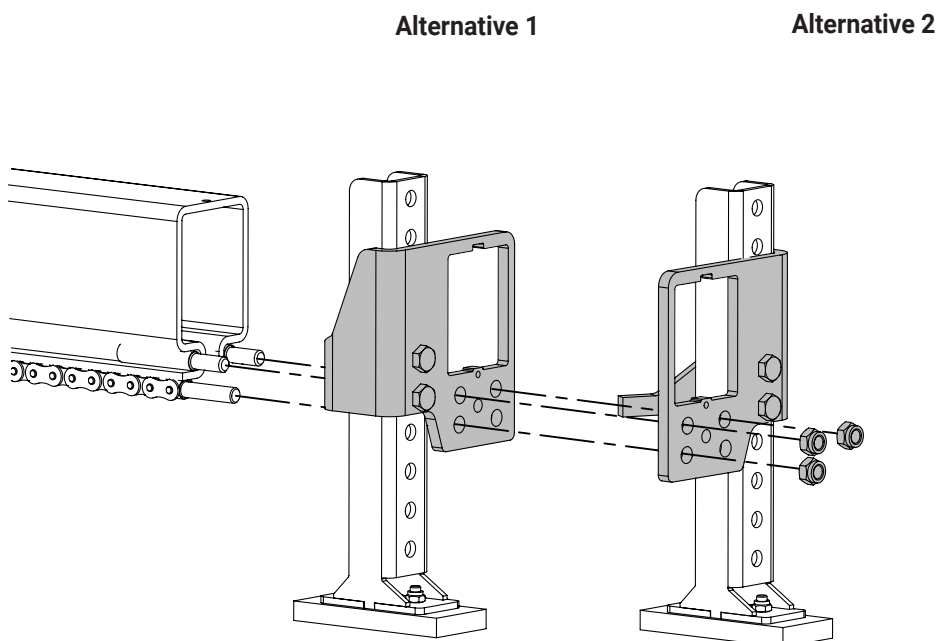


Picture 36. Installing transport stops

4.8.1 Alternative installation

Transport stops can be installed on the inside or outside of the slider profile. This is done by swapping position on the right and left sides respectively.

1. Run the lift to transport position.
2. Unscrew the end caps from the slide profiles.
3. On each slide profile, unscrew the nut that tensions the chain and the two nuts that hold the bracket.
4. Swap position of the left and right-hand brackets. Screw each bracket into place with the two nuts.
Tightening torque: 80 Nm.
5. Screw and tighten the chain by tightening the nut.
Tightening torque: 50 Nm.



Picture 37. Alternative transport stop installation

4.9 Angle sensor for autotilt

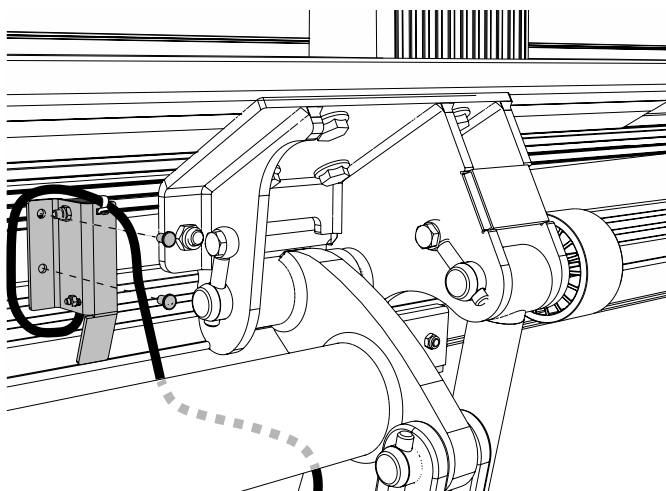
Install the angle sensor on the platform if the tail lift is fitted with autotilt. The angle sensor is connected but not secured to the tail lift when delivered.

1. When installing the angle sensor on the platform, use the rivets supplied.
2. Secure the sensor cable with cable ties.

IMPORTANT!

Route the cable between the platform and the lift arm tube such that it is well protected when the platform touches the ground.

Leave enough slack to the first cable tie to avoid the risk of damage to the cable during lift operation.

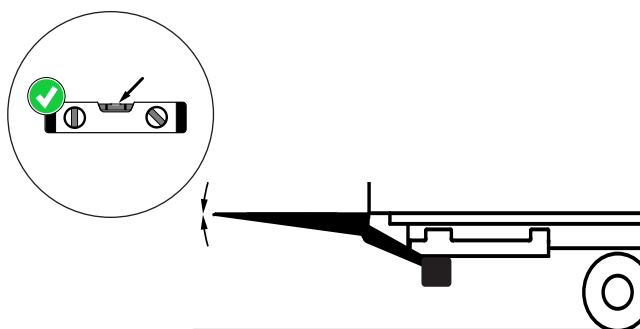


Picture 38. Installing the angle sensor

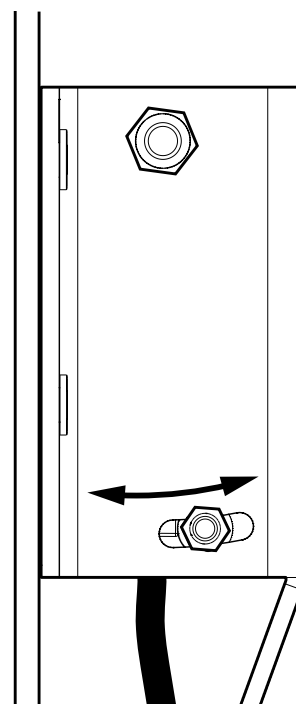
Autotilt angle setting

By default, the autotilt angle is set to 0°. If necessary, the position of the angle sensor (autotilt angle) can be adjusted.

1. Loosen the two screws without removing them, see Picture 39.
2. Adjust the position of the angle sensor to the desired angle, see Picture 39.
3. Retighten the screws.



Picture 39. Adjusting the autotilt angle



4.10 Control device

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 sections 6 if this is not already done from the factory.
2. Additional control devices may be installed in any location. Connection is described later in section 6.

IMPORTANT!

The controller's cable intake must always face downwards.

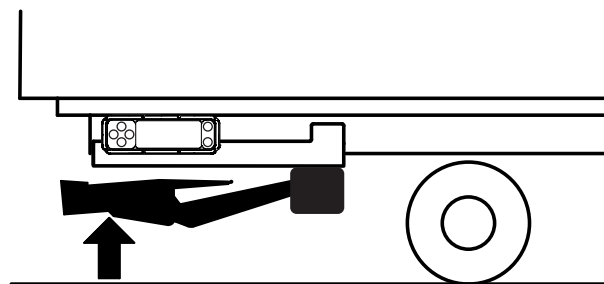
Pay attention and be careful when running cables to get longer life for the cables and to reduce the risk of unnecessary downtime.

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.

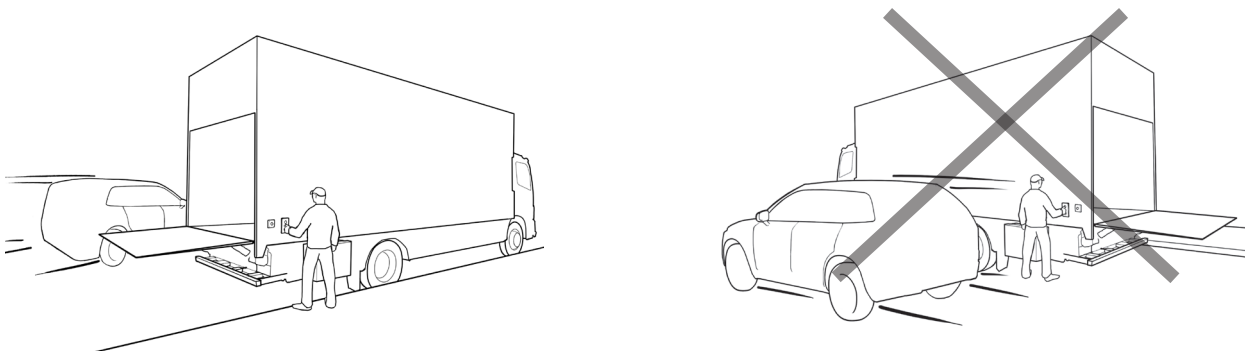
Take care not to bend cables to too tight a radius as this can cause damage.



Picture 40. 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.



Picture 41. Installing controllers

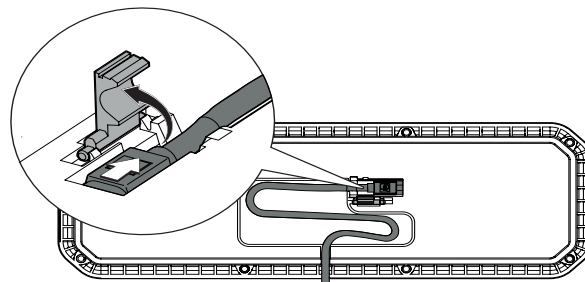
4.10.1 Controller UCU (CD 20)

The UCU can be delivered as either a vertical or a horizontal controller

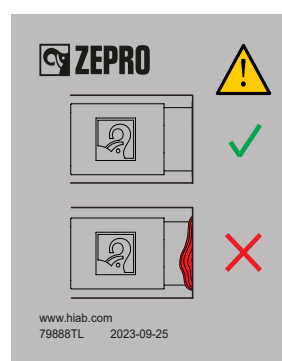
Installation on the outside of the body

The cable is always connected to the control unit. If the cable needs to be disconnected from the control unit to be pulled through the wall:

1. Raise the connector latch to pull out the connector. See Picture 42
2. When the cable has been pulled through the wall, reconnect it to the controller and secure it using the latch.
3. Keep enough cable in the space on the back of the panel so that the plug can be detached from the panel in case of replacement in the future.
Picture 42



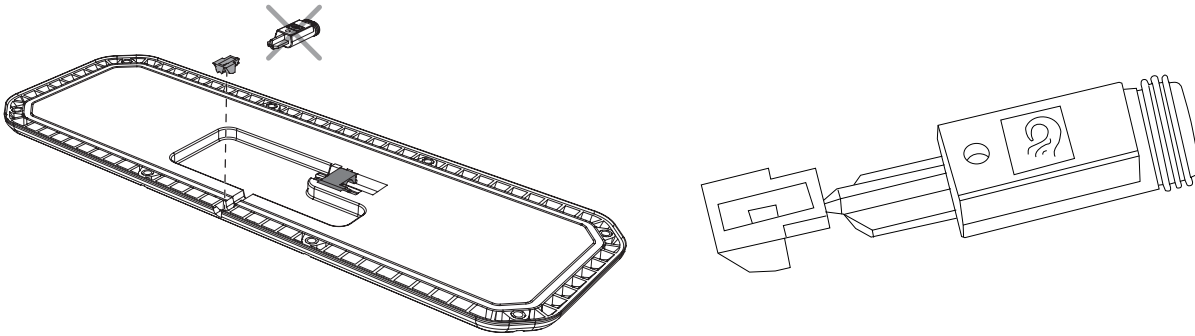
Picture 42. Disconnecting the connector



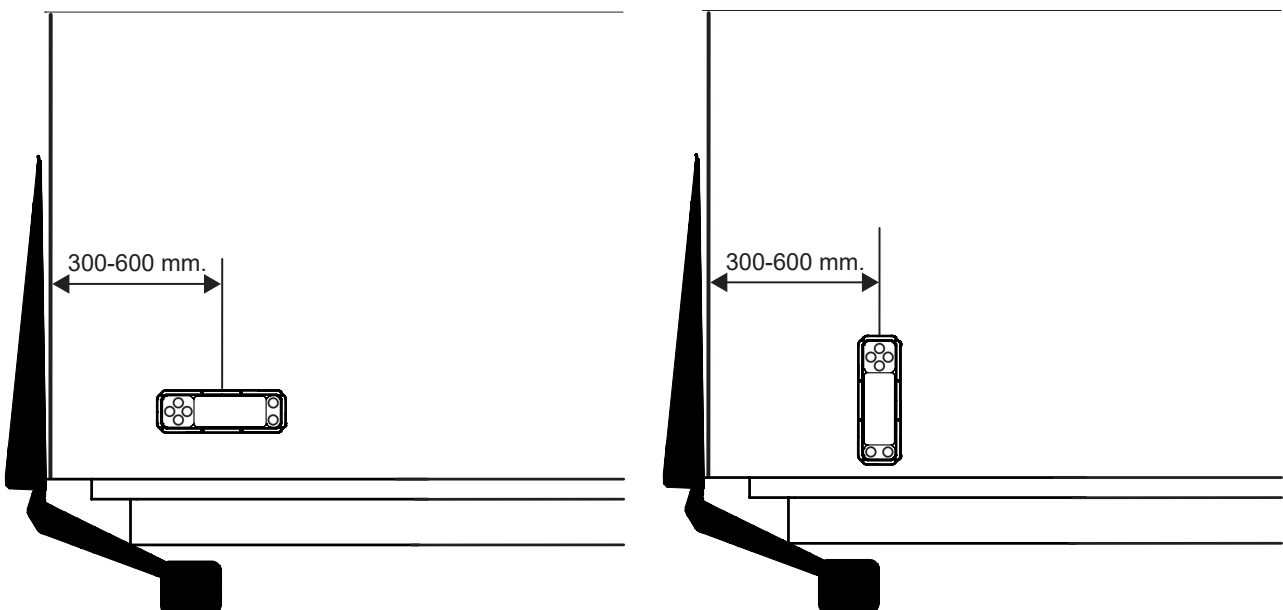
NOTE!

Make sure that the connector is correctly fitted with the rubber seal not be visible

4. Carefully break off the outer part of the plug and place in the recess. See Picture 43.
5. Then install the controller securely on the body. See Picture 44



Picture 43. Installation of plug for sealing UCU.

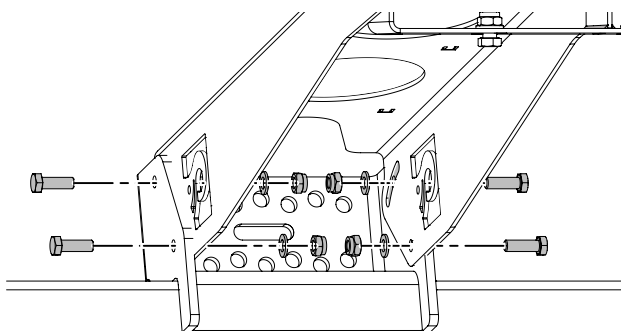


Picture 44. Installing controllers

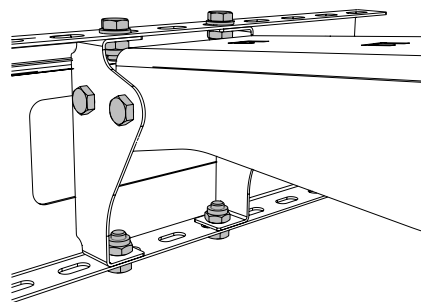
4.10.2 Installation with bracket on tail lift (accessory)

There is a bracket for controller CD 20 for mounting on the tail lift.

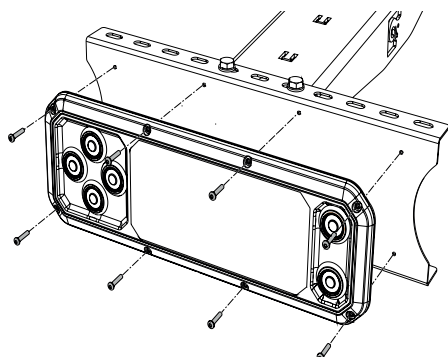
1. Install the bracket's arm on the tail lift chassis attachment, see Picture 45.
2. Install the controller attachment plate on the arm, see Picture 46.
3. Install the controller on the attachment plate, see Picture 47.
4. If the tail lift is to be equipped with a main switch and/or CD 18 handheld controller, install the associated attachment plate alongside CD 20, see Picture 48.
5. If the tail lift is to be equipped with the CD 18 handheld controller, mount its connector on the attachment, see Picture 49.
6. In cases where the main switch is not to be mounted, run the cabling on the underside of the arm and then on to the tail lift cable grommet. Secure with cable ties. The controller's cabling may, in some cases, already be connected from the factory. If not, connection takes place later in section 6.



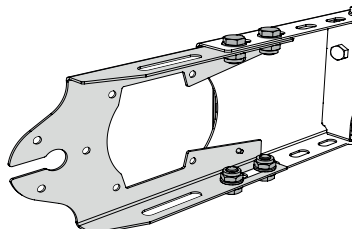
Picture 45. Installation with bracket on tail lift



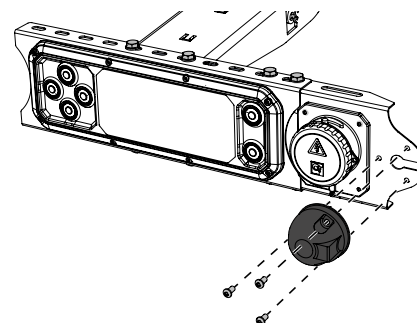
Picture 46. Installation with panel bracket on tail lift



Picture 47. Installation of CD 20 control panel



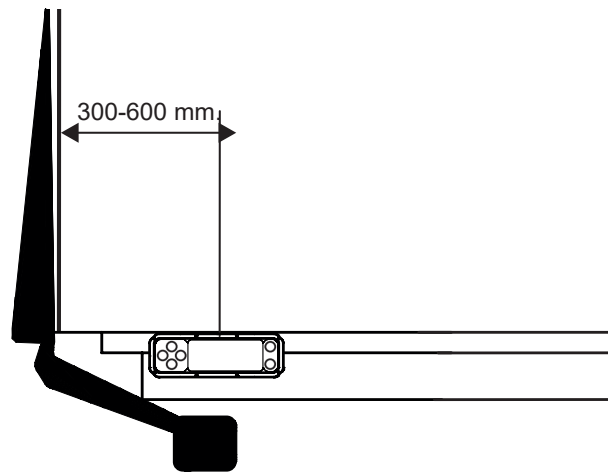
Picture 48. Bracket for main switch mounted next to CD 20.



Picture 49. Installation of contact for hand-held CD 18 controller.

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.



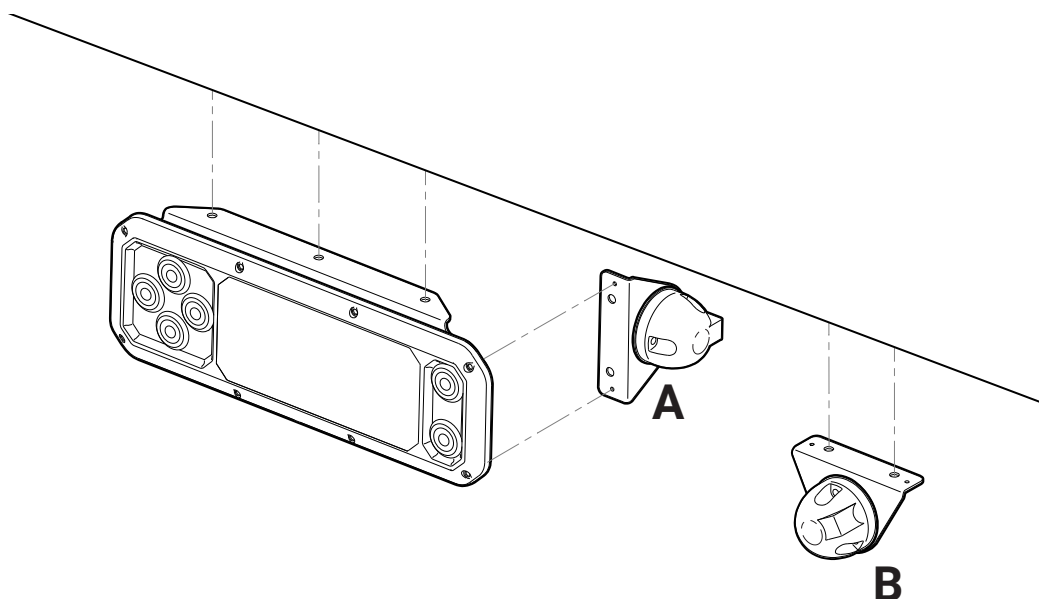
Picture 50. Installing controllers

4.10.3 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.



Picture 51. Installing controller CD20 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.)

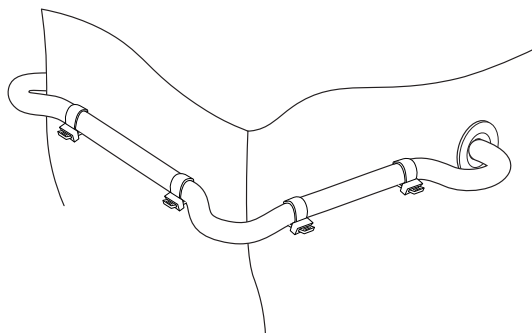
Insufficient main power and/or ground cable area may result in overheating, poor performance of the electrical system and shortened life expectancy of the main electrical components.

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.



Picture 52. Protect the cable against sharp edges and use cable grommets



Picture 53. Always use shrink hose over the cable connection when fitting cable terminals

5.2 Maximum power consumption - Minimum recommended conductor cross-sectional area

Ensure that cable with sufficient wire area is used.

ZS MK2 (200 bar)

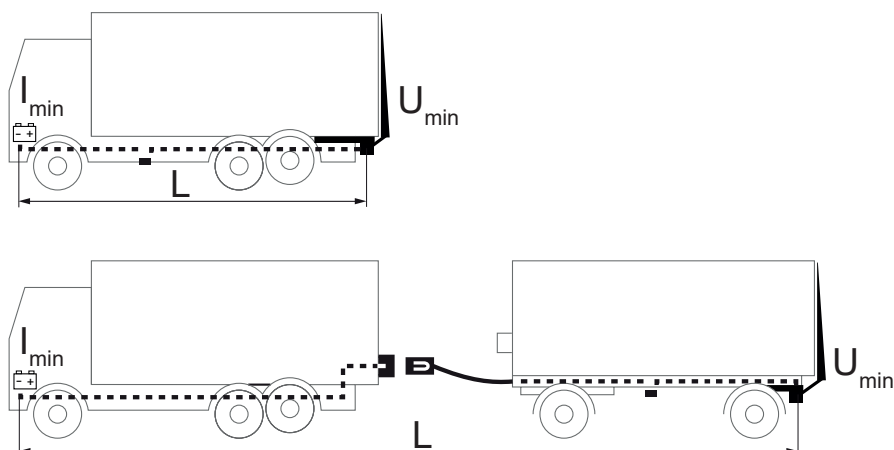
Hydraulic Unit 7050	12-Volt	24-Volt
Pump - Motor unit	245 A	145 A
Minimum recommended conductor cross sectional area (copper cables, plus and minus cables)		
Control cable	1.5 mm ²	1.5 mm ²
Main power cable, L ≤ 6 m	35 mm ²	35 mm ²
Main power cable, L = 6 - 8 m	50 mm ²	35 mm ²
Main power cable, L = 8 - 15 m	50 mm ² *	35 mm ²
Main power cable, L > 15 m	50 mm ² *	50 mm ²
Battery		
Min. capacity, I_{min} (available for lift)	180 Ah	180 Ah
Min. voltage during operation, U_{min} (at lift)	9 Volts	18 Volts

* **Additional batteries required**

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.



Picture 54. Maximum power consumption - Minimum recommended conductor cross-sectional area

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.

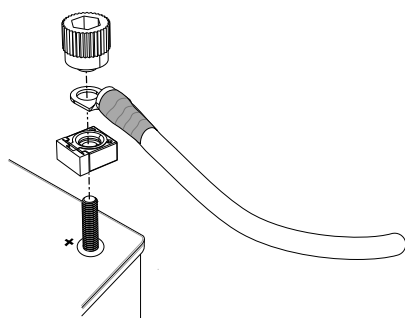
1. If the positive battery terminal is suitable for the main fuse of the lift, it can be used for mounting the fuse. Otherwise, secure the fuse box in a suitable, well-protected place as close to the battery as possible.
2. When using the fuse box, route the main power cable from the battery to the fuse box. Prepare the cable with cable terminals and shrink hose over the connections without connecting. 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!

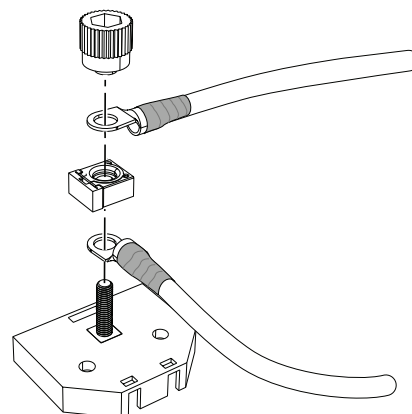
Earth connection must be made primarily to the negative terminal of the battery. Alternatively, another well-protected earthing point, which will not increase the voltage drop, can be used. The earthing point must be so well protected that increased voltage drop due to oxidation over time can be eliminated. 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.



Picture 55. Connection to the battery's positive terminal



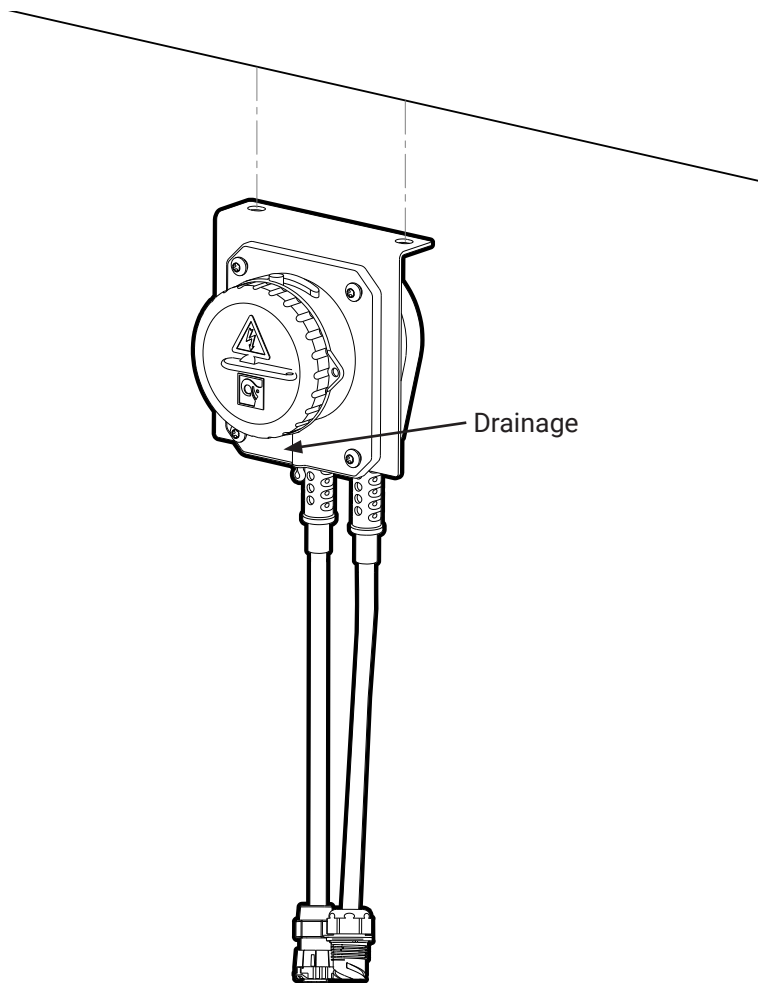
Picture 56. Connection to the fuse box

5.3.1 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 6.

IMPORTANT!

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



Picture 57. Installing the 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 Foot controller / Warning lights

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

1. Connect the supplied cable to the connector on the foot controller/warning lighting cable.
2. Route the cable and install with cable ties according to Picture 59.

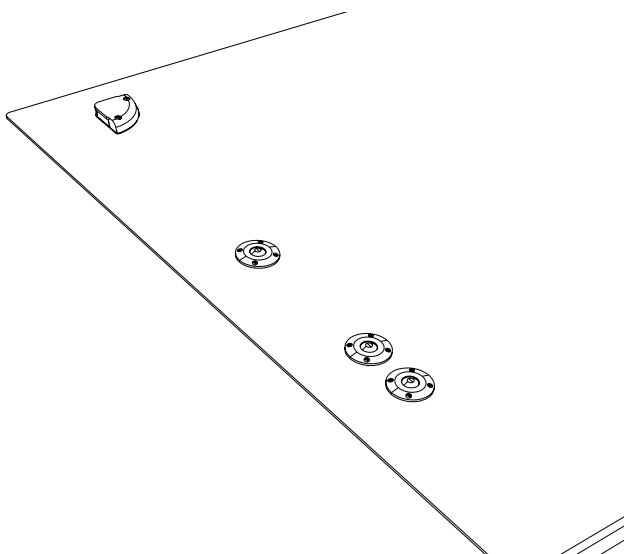
Connection is described later in section 6.

IMPORTANT!

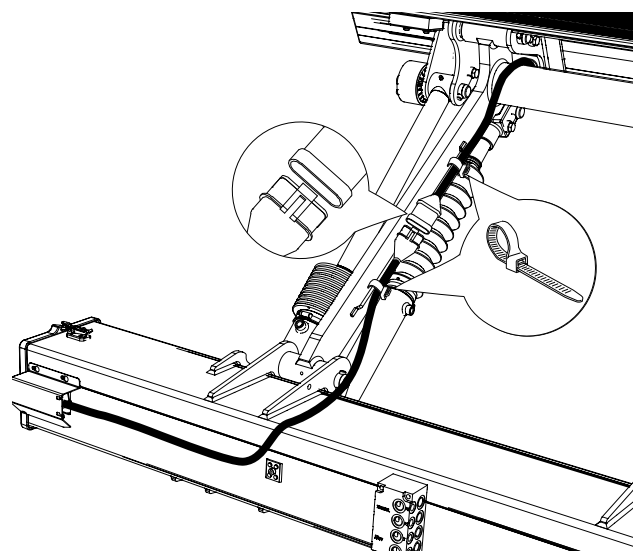
Route the cable between the platform and the lift arm tube such that it is well protected when the platform touches the ground.

Position the quick connector in such a way that it does not conflict with the underrun protection while the lift arm is in motion.

Leave enough slack to the first cable tie to avoid the risk of damage to the cable during lift operation.



Picture 58. Warning lights and foot controller



Picture 59. Installing cabling

6 Connection

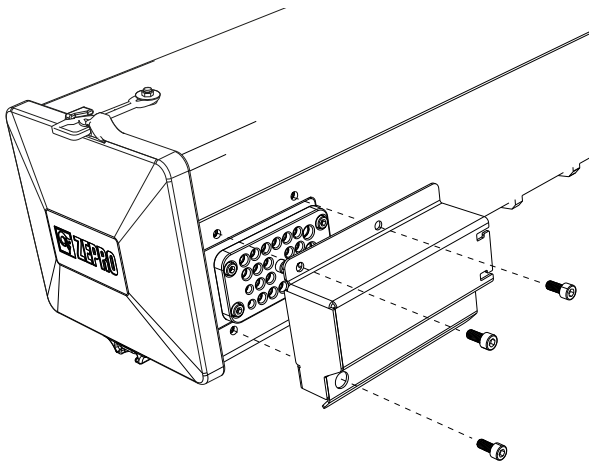
6.1 Cable grommet

6.1.1 Before connection

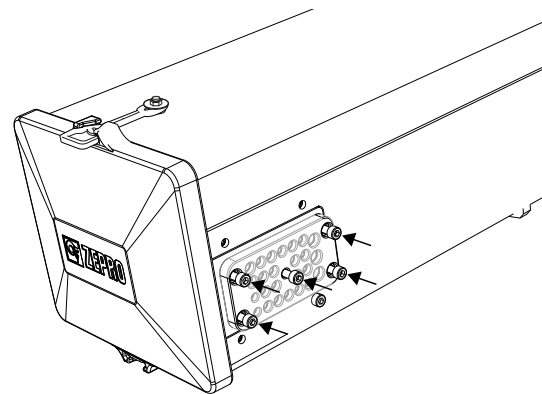
1. Disconnect the cable grommet's protective cover, which is secured with three screws; see Picture 60.
2. Loosen the five screws on the cable grommet, see Picture 61. Cables can now be installed/removed/adjusted in the grommet. The cable should be installed together with existing cabling using cable ties. Ensure the length of the cable is sufficient. The outer casing should be stripped back 350 mm. See Picture 62.

6.1.2 After connection

1. Tighten the five screws once all cables are suitably located in the cable grommet, see Picture 61. Tightening torque: 5 Nm.
2. Install the cable grommet's protective cover with the three bolts provided, see Picture 60. Tightening torque: 8 Nm.



Picture 60. Fasten the cable grommet's protective cover with three screws



Picture 61. Cable grommet's five screws



Picture 62. The outer casing of cables should be stripped 350 mm.

6.2 Connection

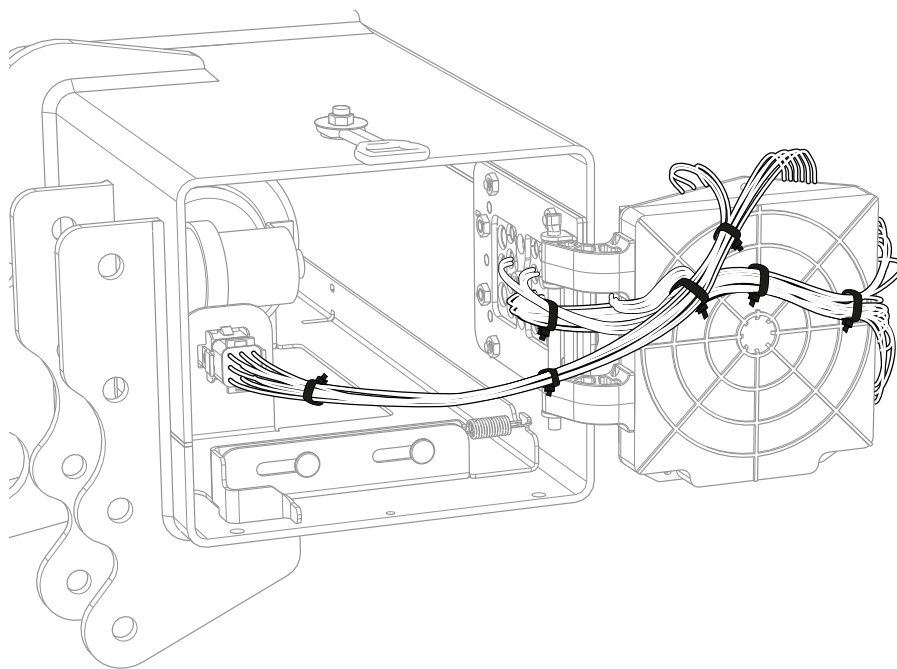
IMPORTANT!

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

1. Release and tilt out the relay board.
2. Run the cabling through the grommet.
3. Connect the relevant controller. See Section 6.2.1.
4. Where applicable, connect the warning lights. See Section 6.2.2.
5. Where appropriate, plug in cab switch (CS) and open platform alarm. See Section 6.2.3.
6. Route the cabling on the reverse of the control board / relay board and secure it with cable ties. See Picture 63.
7. Tilt in and secure the relay board.
8. Replace the cable grommet, see Section 6.1.2.

IMPORTANT!

Ensure that no cables are pinched or in any other way damaged when the control board is tilted out/in.



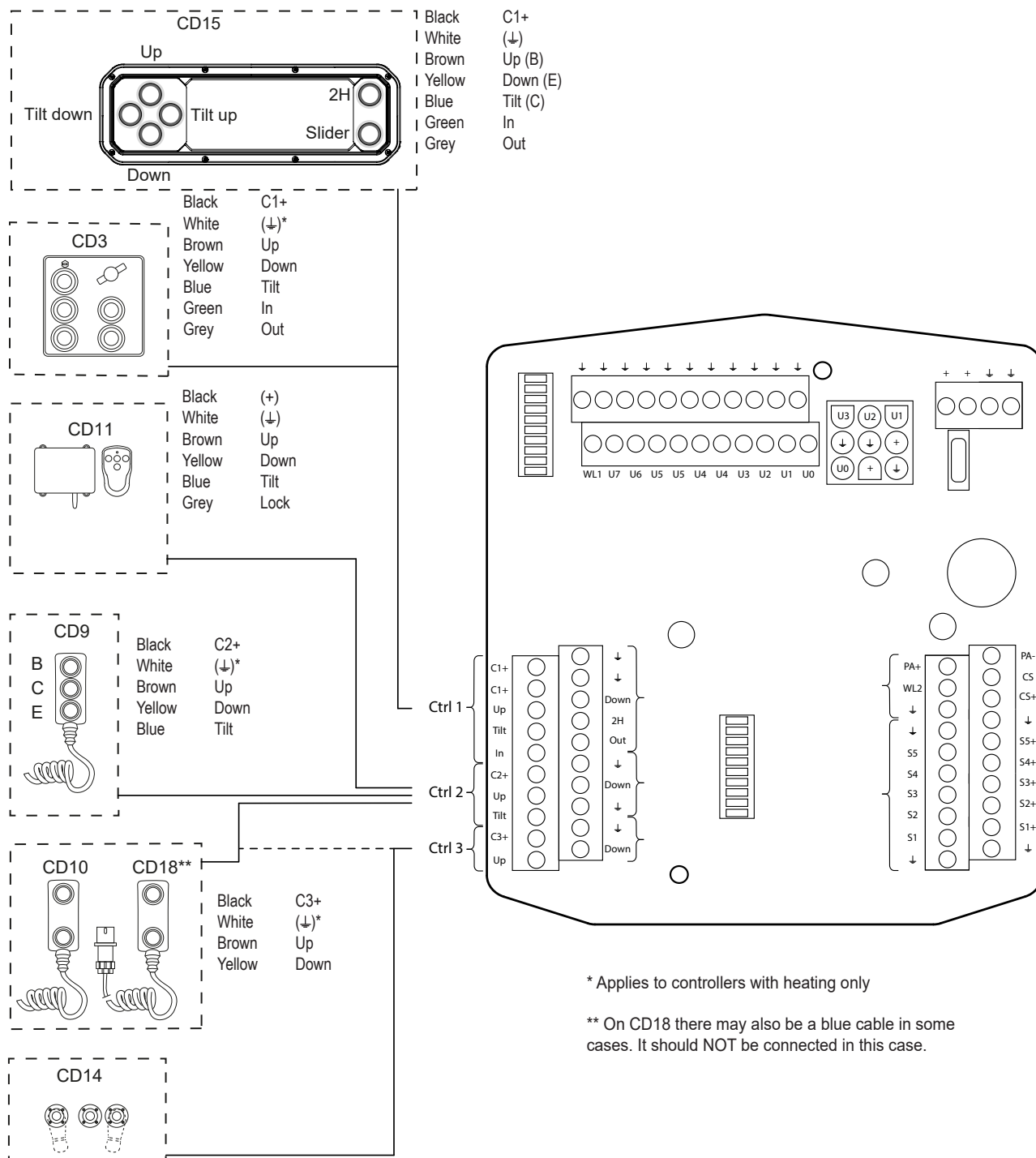
Picture 63. Installing cabling with cable ties

6.2.1 Controller

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

! 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 physical damage.



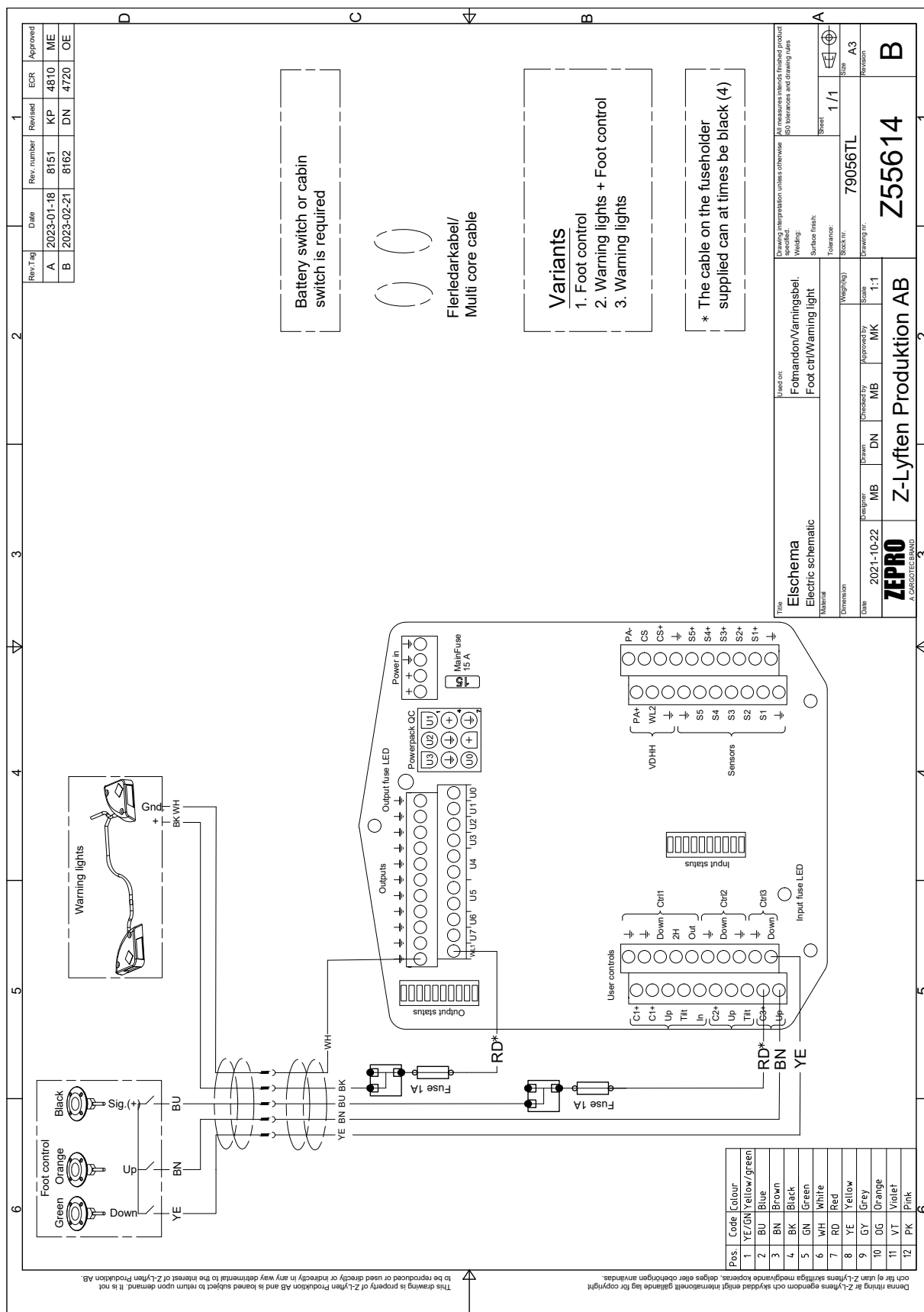
* Applies to controllers with heating only

** On CD18 there may also be a blue cable in some cases. It should NOT be connected in this case.

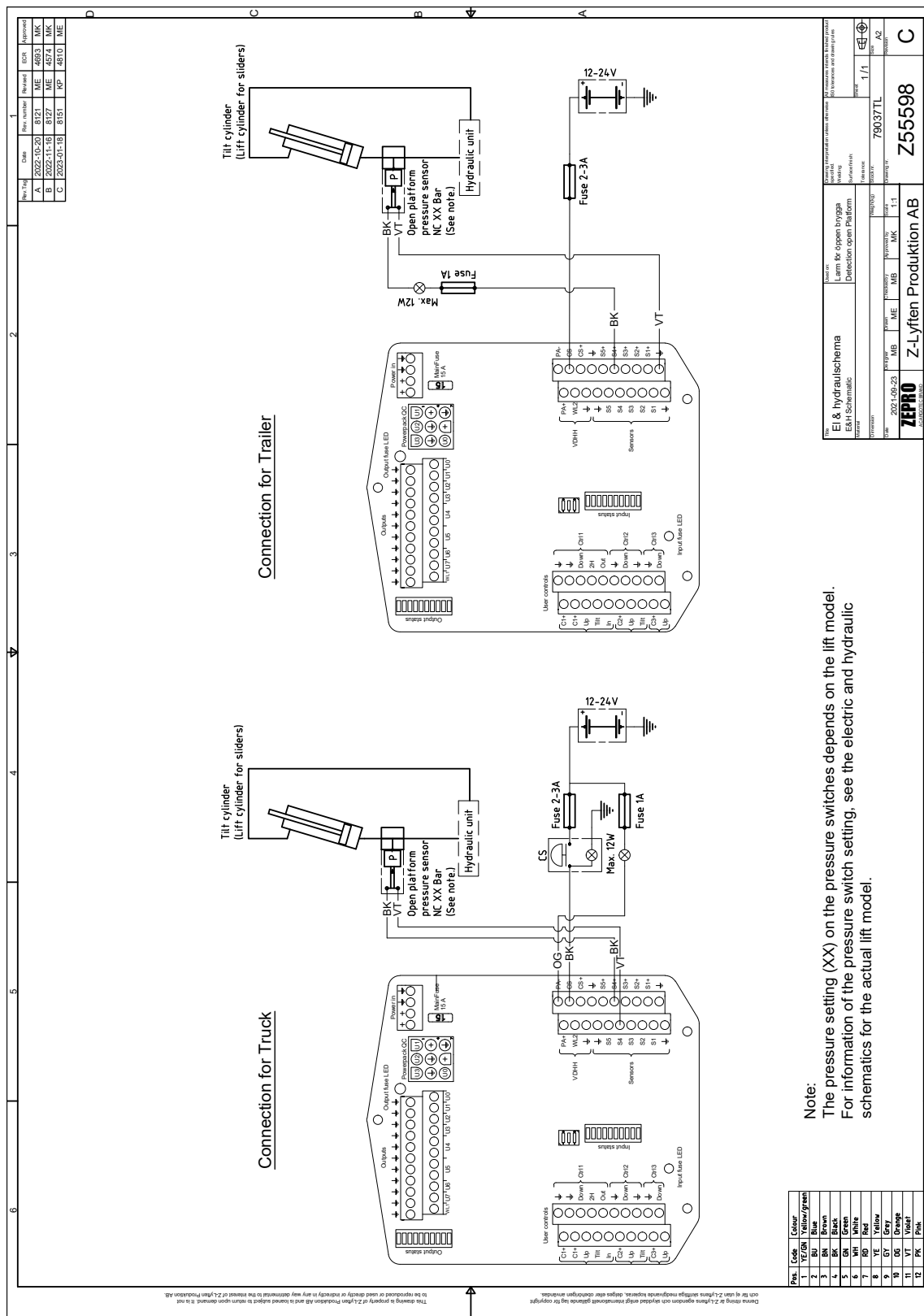
Picture 64. Connection of controller and warning lights

6.2.2 Warning light and foot controller

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



6.2.3 Cabin switch (CS) and alarm for open platform



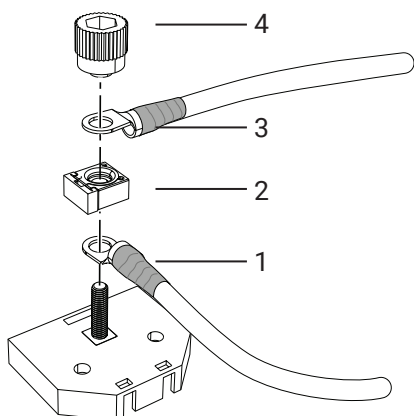
7 Powering up the tail lift

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 Picture 65.
4. When connecting directly to the positive battery terminal, place the fuse (2) on the positive terminal, see Picture 66.
5. Connect the main power cable (3) to the fuse box / positive terminal, see Picture 65 - Picture 66.
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 Picture 65 - Picture 66.

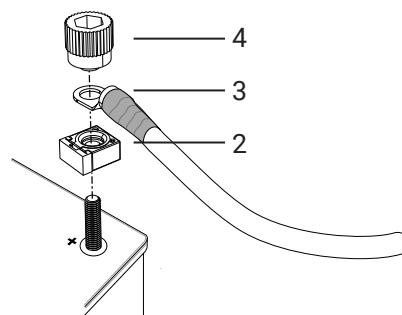
IMPORTANT!

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.

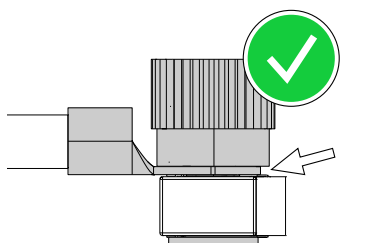
7. Install the fuse box cover.
8. Where fitted, set the main switch to the ON position.
9. Where fitted, set the cab switch to the ON position.



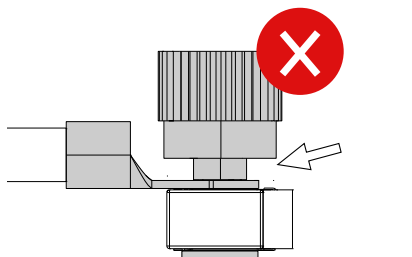
Picture 65. Connection to the fuse box



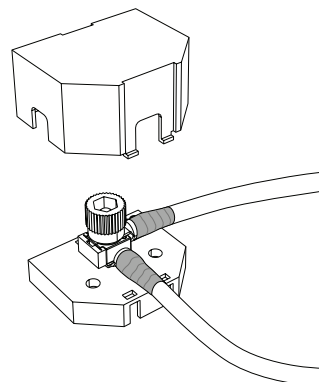
Picture 66. Connection to the battery's positive terminal



Picture 67. Correct installation

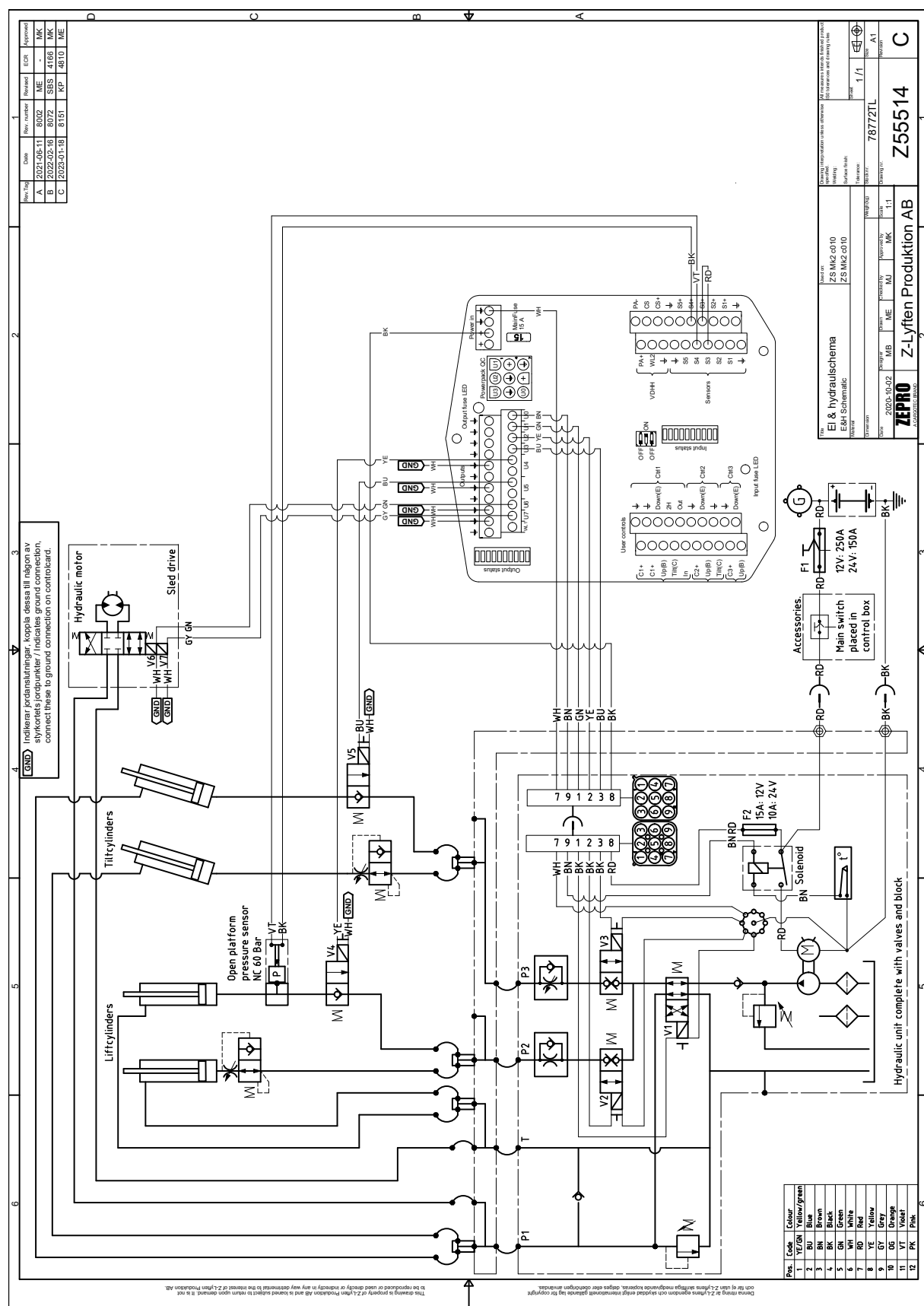


Picture 68. Incorrect installation

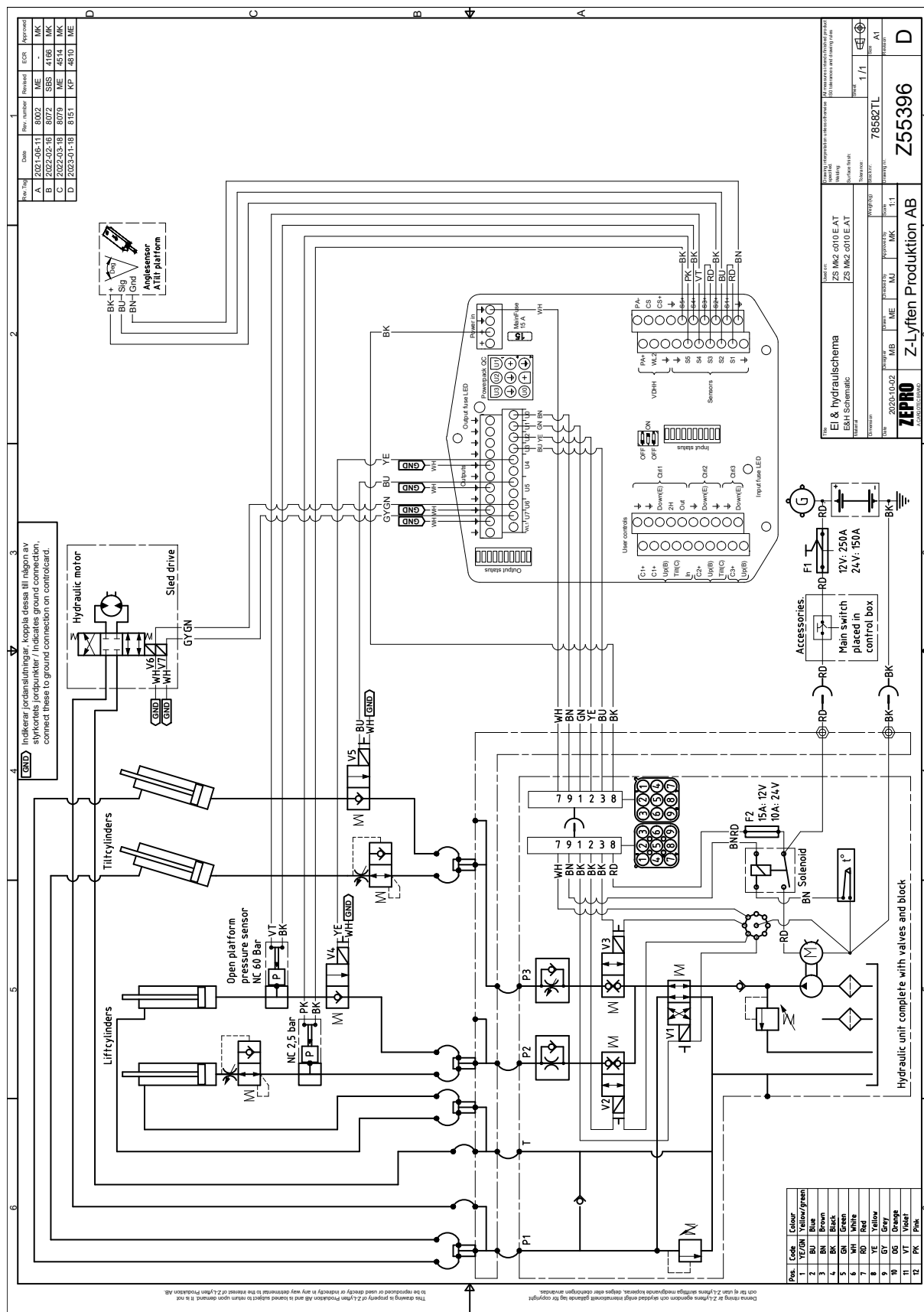


Picture 69. Cover, fuse box

8.1 ZS MK2



8.2 ZS MK2 Autotilt



9 Lubrication and oil level check

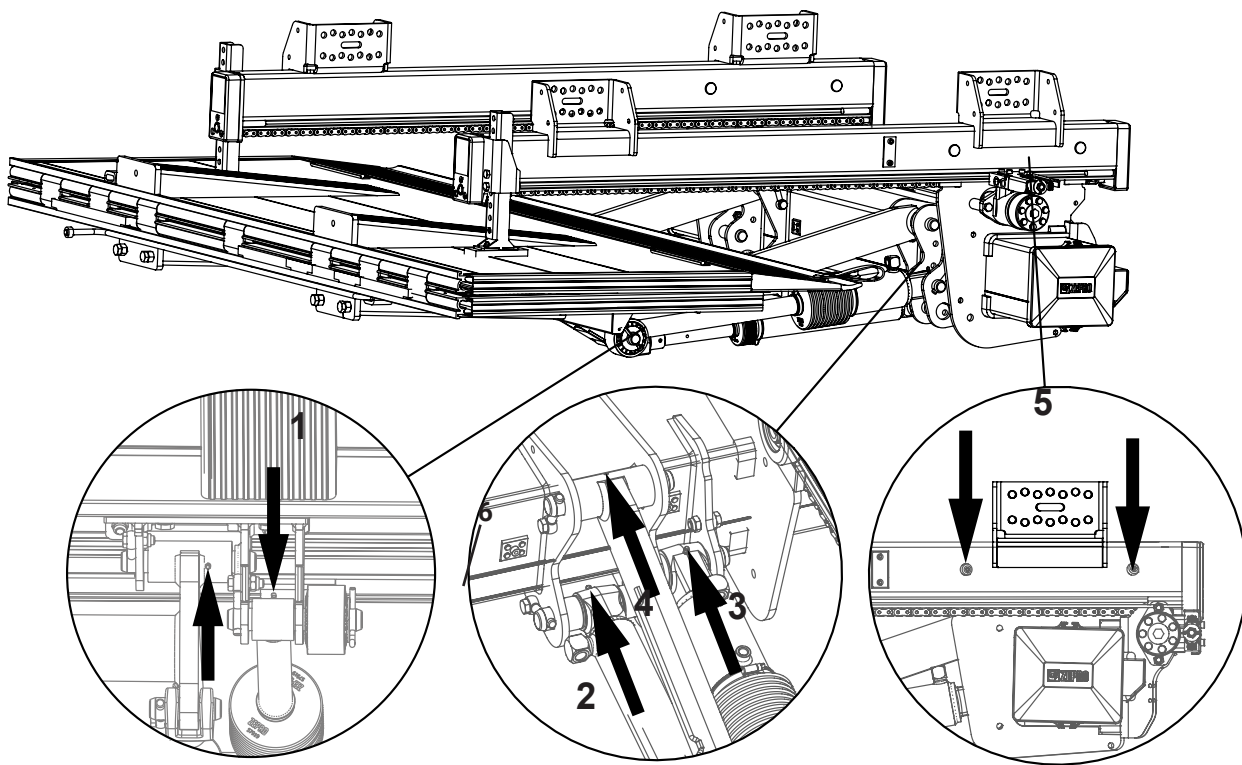
9.1 Lubrication points

The following lubrication points must be greased on installation. Move the slider all the way in on the rails to access the grease nipples through the slider profile holes when lubricating the slider wheels.

IMPORTANT!

Use LE lubricant 4622 for the lubrication points below.

1. The tilt cylinder bearing at platform, right and left sides.
2. The tilt cylinders' bearing against frame, right and left side.
3. The lift cylinders' bearing against frame, right and left side.
4. The 1st booms' bearing against frame, right and left side.
5. The slider's wheels, right and left side.



Picture 70. Lubrication points

9.2 Oil level check

Check the oil level in the tank, top up if necessary.

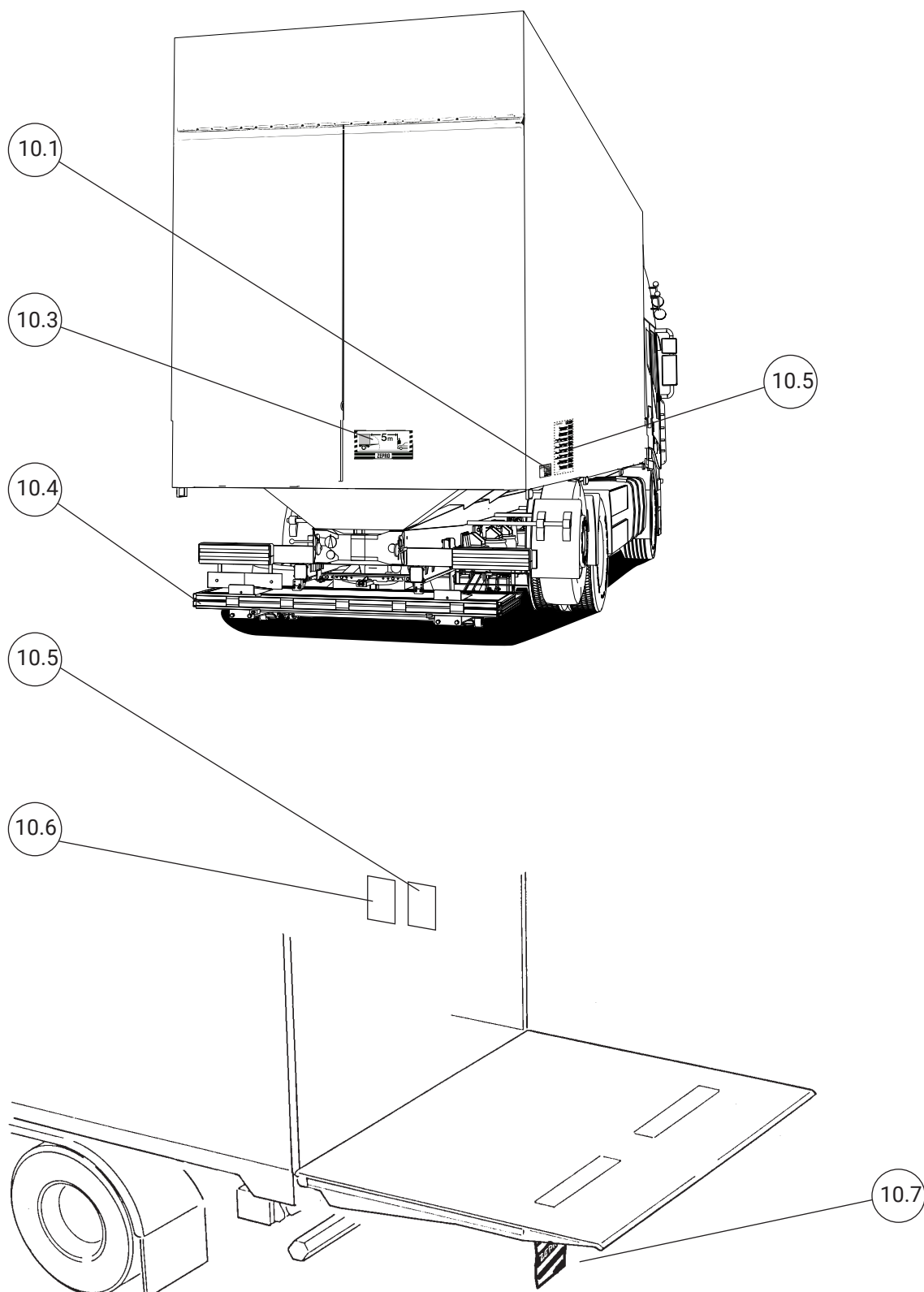
If the hydraulic oil needs to be replenished, only the oil recommended by ZEPRO is permitted to be used.

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.

10 Marking

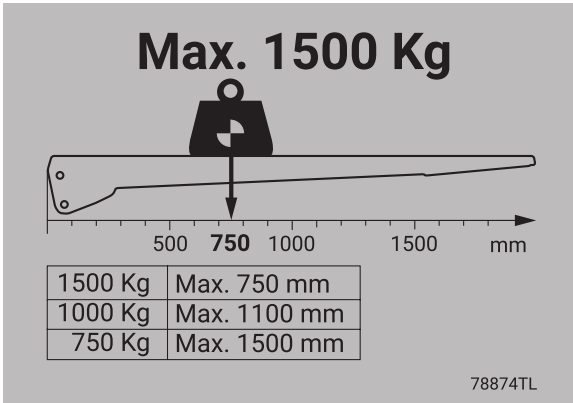
Below, an overview of the location of the different markings is shown. Image of marking and further information can be found under the each subchapter for subsequent pages.



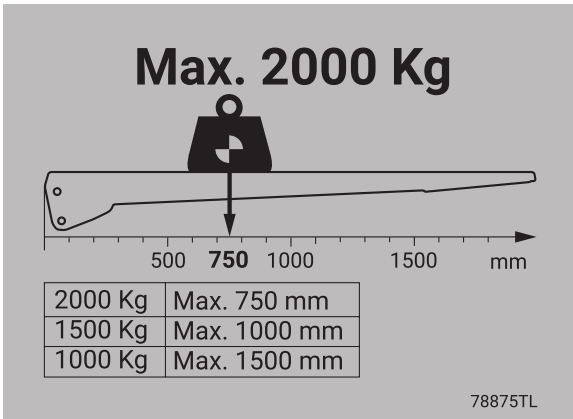
Picture 71. Overview of labelling

10.1 Max permissible load

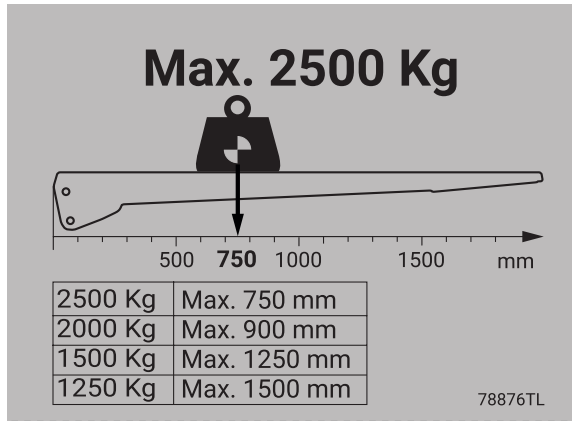
Affix the load diagram in a suitable, conspicuous place on the platform and in the vicinity of the primary controller or in the designated location on the controller (CD20).



Picture 72. Max permissible load for load capacity 1500 kg, load centre distance 750 mm.



Picture 73. Load diagram for load capacity 2000 kg, load centre distance 750 mm.



Picture 74. Load diagram for load capacity 2500 kg, load centre distance 750 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:

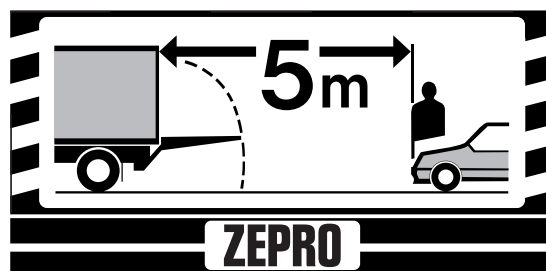
- Type of lift
- Max. permitted load in kg
- Production number
- Year of manufacture
- Address and tel. no. of manufacturer
- Country of manufacture
- Type number for approved underrun protection (RUPD)
- Type number for electromagnetic compatibility (EMC)



Picture 75. Identification plate

10.3 Work area

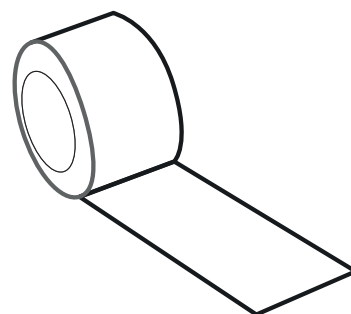
Affix the sticker clearly visible on the rear of the vehicle.



Picture 76. Work area

10.4 Warning tape

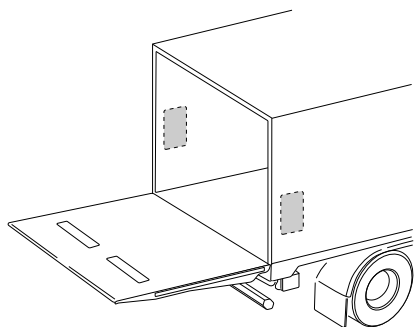
The warning tape is affixed along the edges of the platform to make the edges more conspicuous when the platform is deployed.



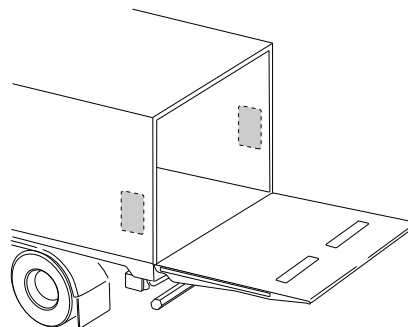
Picture 77. Warning tape

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.



Picture 78. Standard mounting

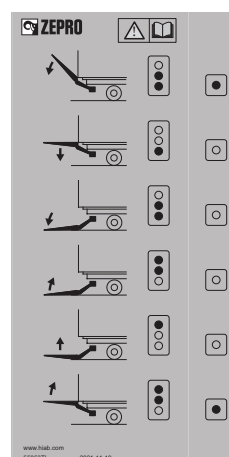


Picture 79. Reversed mounting

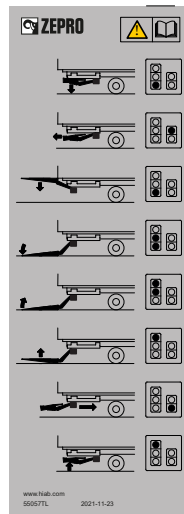
Control device	Sticker
CD 9	55053TL*
CD 9 Horizontal	79854TL**
CD 3	55057TL
CD 10	77661TL

* 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.

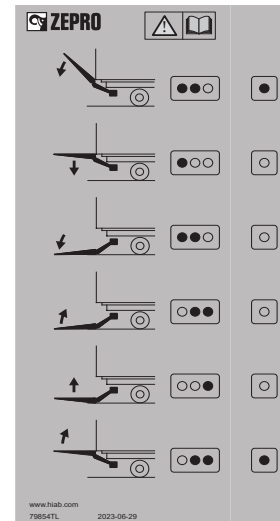
** Ordered separately



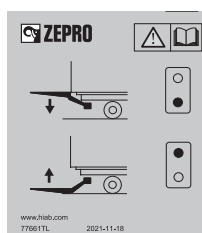
Picture 80. Control device sticker for CD 9



Picture 81. Control device sticker for CD 3



Picture 83. Control device decals for CD 9 for horizontal control device is ordered separately. 79854TL

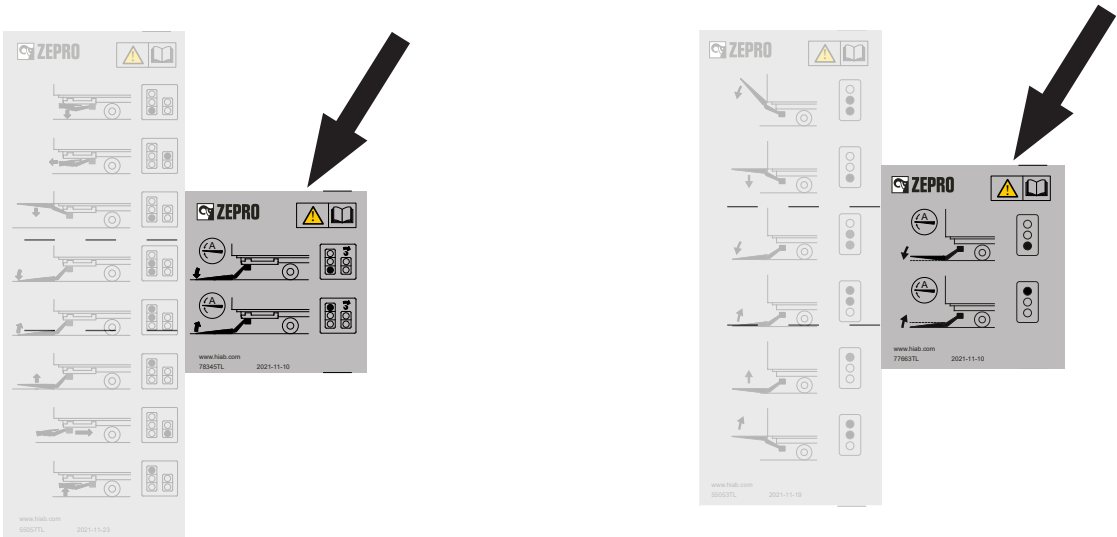


Picture 82. Control device sticker for CD 10

10.5.1 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 laterally reversed version (option) for affixing on the opposite side of the vehicle.

Affix additional autotilt stickers for CD3 and CD9 next to their respective controller stickers and align them with the two middle symbols for the tilt down and tilt up functions.

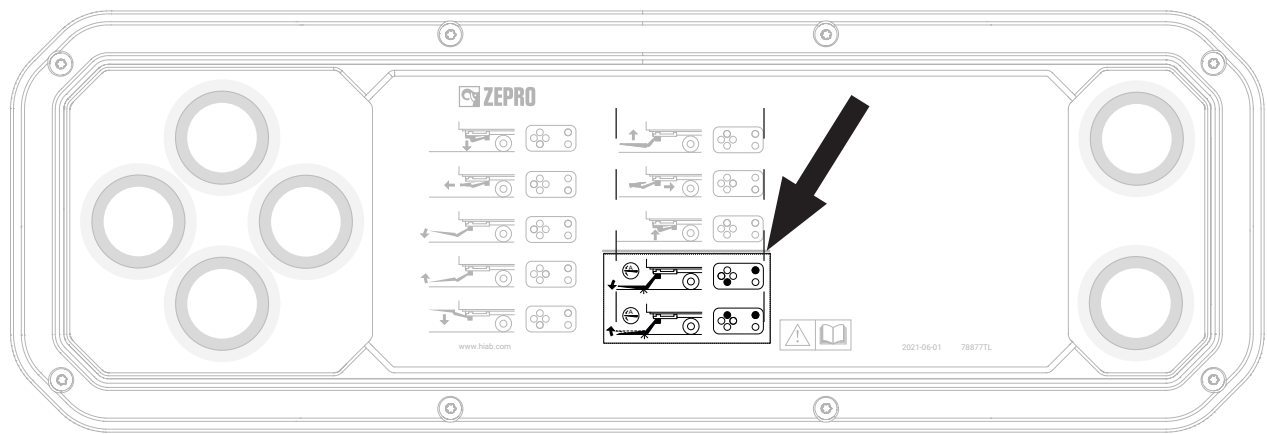


Additional autotilt sticker for CD 3

Additional autotilt sticker for CD 9

Control device	Sticker
CD 3	78888TL
CD 9	77663TL
CD 19	78878TL

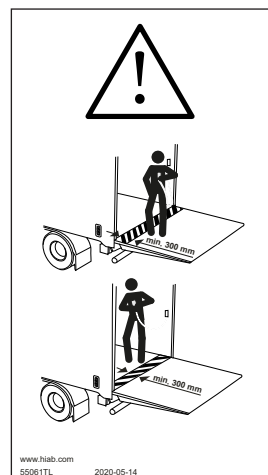
Affix the additional CD20 autotilt sticker on control device CD20 directly below the line in the right column of symbols and in line with the symbols above.



Additional autotilt sticker for CD 20

10.6 Danger area

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



Picture 84. Danger area

10.7 Warning flags

Install warning flags as close to the top and as close to the edge of the platform as possible, but without the risk of the flags coming loose when the platform is placed on the ground. Swage the tracks together to secure the warning flags. The flags must be provided with reflective tape.



Picture 85. Warning flags

11 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.

11.1 Static load test

11.1.1 Deformation

Position the tail lift half way to vehicle floor level and with the platform horizontal. Measure dimensions A-B-C-D for comparison as illustrated.

Place a test load on the platform, as shown in table (for each lift model/lift capacity).

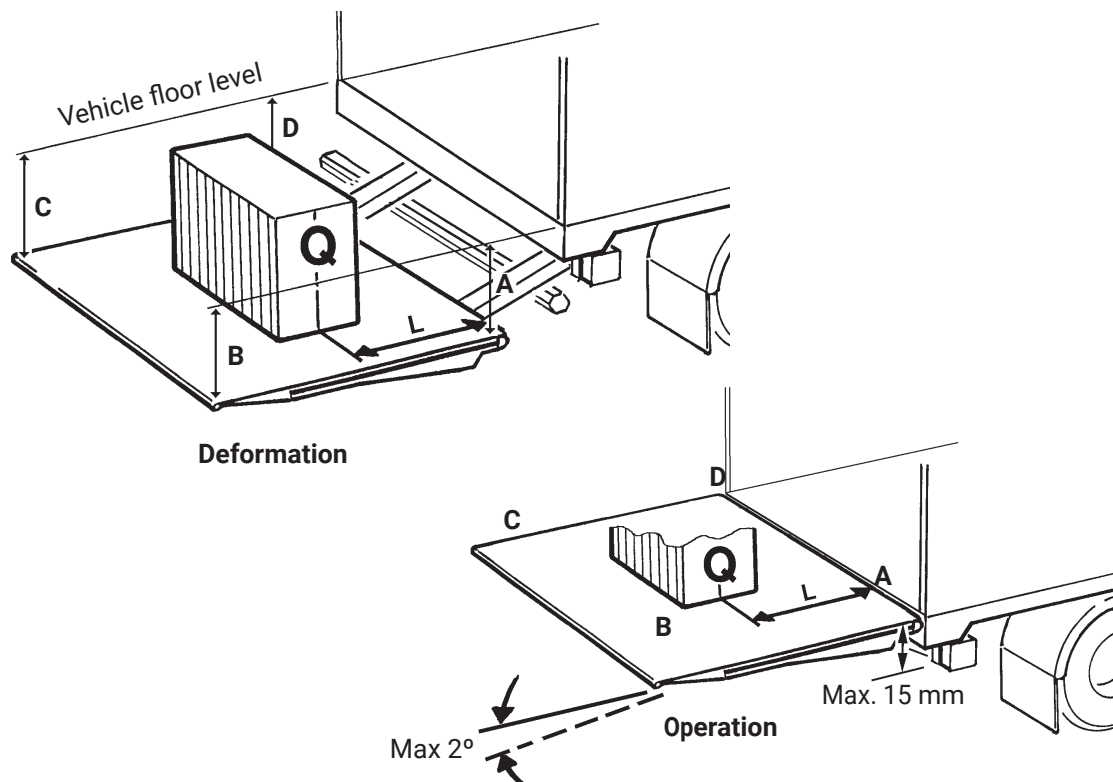
Remove the test load from the platform. Repeat the measurement of A-B-C-D and verify that there has been no deformation of the lift or its fixing.

11.1.2 Operation

Place a test load on the platform, as shown in 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 platform operation is not more than 15 mm in the vertical direction (points A and D) and not more than 2° in the angular direction (points B and C), in relation to the vehicle floor level.

11.1.3 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 out on platform (L)	
1500 kg	1410 mm	940 mm
2000 kg	1875 mm	1250 mm
2500 kg	2360 mm	1570 mm



Picture 86. Testing and verification

11.2 Dynamic load test.

11.2.1 Test with max. load

Place a test load on the platform, as shown in table (for each lift model/lift 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.

11.2.2 Test with overload

Place a test load on the platform, as shown in table (for each lift model/lift capacity). The test load should be 1.25 x the lift model's max. load. 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).

11.2.3 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 on platform (L)	
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 driver's cab is disabled when the platform is in transport position and vice a versa, and that it is enabled when the platform is deployed.
- 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 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 cabin 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 the platform max load sticker is present and suitably positioned in relation to the load diagram for the 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 locking device is working (if accessible).
- 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.

12 Registration

For the tail lift's guarantee to be valid, the delivery card must be registered in C-care (www.c-office.com). The bodybuilder is responsible for registration in C-care and must certify in the intended location in tail lift's manual that registration has been done.

13 Specifications

13.1 Weights

Many of the lift's parts are heavy, requiring the use of lifting equipment to get them in place. Make sure the weight of the parts does not exceed the maximum permitted load of the lifting equipment.

Complete lift chassis ZS(S) MK2 (without platform), slider profile 1850 mm

Lifting capacity	Arm	Weight
1500 Kg	135	369 Kg*
1500 Kg	155	379 Kg*
1500 Kg	175	387 Kg*
2000 Kg	135	373 Kg*
2000 Kg	155	383 Kg*
2000 Kg	175	391 Kg*
2500 Kg	135	378 Kg*
2500 Kg	155	389 Kg*

* Shorter slide profile reduces the weight:

Slide profile: 1590 mm	- 10 Kg
Slide profile: 1700 mm	- 6 Kg

Aluminium platforms

	Lifting capacity: 1500/2000 Kg	Lifting capacity: 2500 Kg
1565x2400 mm	140 Kg	142 Kg
1765x2400 mm	152 Kg	154 Kg
1965x2400 mm	166 Kg	168 Kg



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Zepro, Del and Waltco are Hiab trade marks 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.