Installation Instructions

Tail Lift

Z/ZL 150/200-135/155/175

Z/ZL 250-135/155

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

54245TL
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ZEPRO

Contents

Introduction

Important

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

NOTE.

Take care. Risk of damage to the product.

⚠ WARNING!

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

1. Introduction

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

Product approval

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

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.

Guarantee

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

2. General

Identifications list

E.g. Z 150 - 135 MA

Z = Standard model
ZL = Wide support frame, wide liftarm

Max liftcapacity x 10 (kg)

Max lifting height -135 = 1350 mm
-155 = 1540 mm
-175 = 1725 mm
-195 = 1880 mm

Cylindermodel, MA = Doubleacting Adjustable Tilt
Single acting one speed Lift

DA = Doubleacting Adjustable Tilt
Doubleacting one speed Lift

Weights

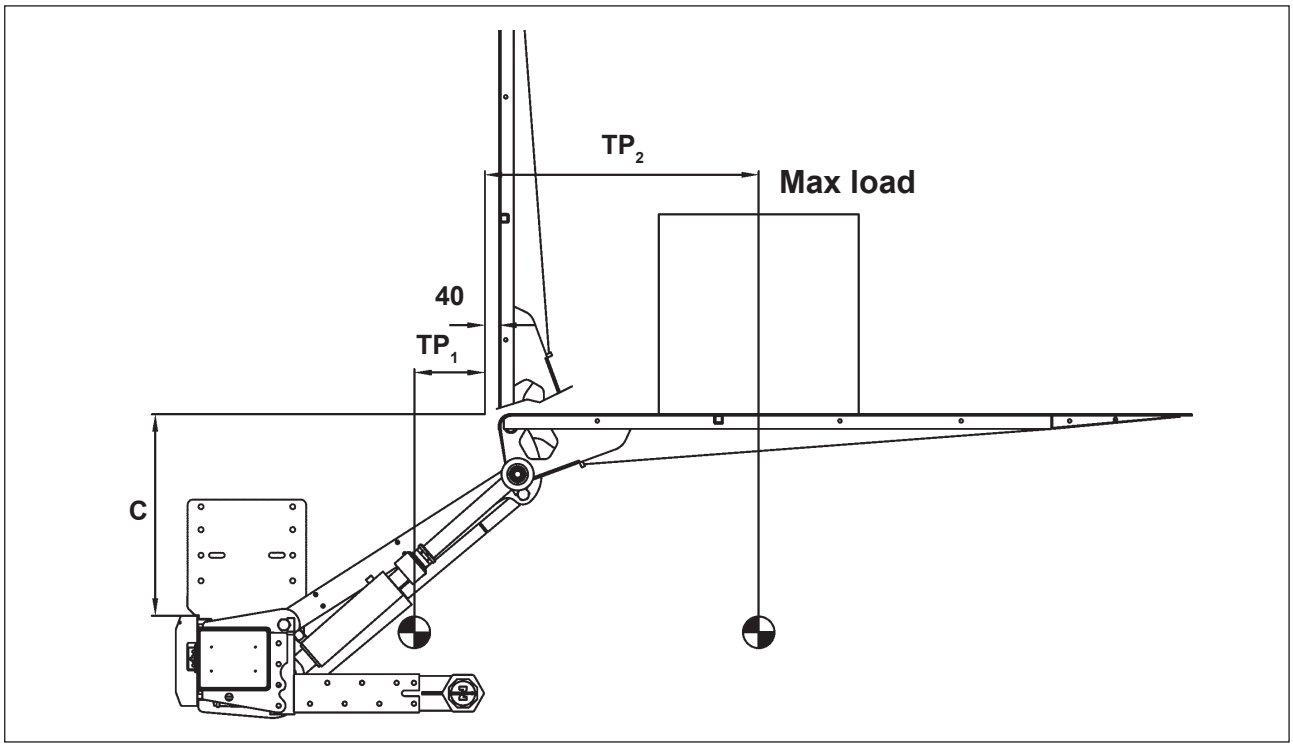
Some components of the tail lift must be manipulated by other lifting equipment during handling and therefore could represent hazards if their weights exceed the equipment's permitted load. The following are the ranges of weights for various heavy components.

Cpl. Lift chassis (without platform)	
Z 150-135	351 kg
Z 150-155	360 kg
Z 150-175	369 kg
Z 150-195	389 kg
Z 200-135	356 kg
Z 200-155	365 kg
Z 200-175	376 kg
Z 250-135	366 kg
Z 250-155	376 kg
ZL 200-135	369 kg
ZL 200-155	378 kg
ZL 200-175	387 kg
ZL 250-135	379 kg
ZL 250-155	389 kg
Steel platforms	
Steel platform 1500x2560 mm	230 kg
Steel platform 1700x2560 mm	255 kg
Steel platform 2000x2560 mm	302 kg
Steel platform 2200x2560 mm	326 kg
Aluminium platforms	
Conical Laser (KOLAS M)	
Alu. platform 1700x2560 mm	167 kg
Alu. platform 2000x2560 mm	186 kg
Alu. platform 2200x2560 mm	203 kg
Flat 40mm Laser (PLALAS S)	
Alu. platform 1710x2560 mm	154 kg
Alu. platform 2010x2560 mm	174 kg
Alu. platform 2210x2560 mm	186 kg

Lift components (part of cpl. lift chassis).	
Support frame Z 150/200/250	86 kg
Support frame ZL 150/200/250	93,5 kg
Liftarm Z 150/200-135	45 kg
Liftarm ZL 150/200-135	46 kg
Liftarm Z 250-135	51,5 kg
Liftarm ZL 250-135	50 kg
Liftarm Z 150/200-155	49,5 kg
Liftarm ZL 150/200-155	52 kg
Liftarm Z 250-155	56,5 kg
Liftarm ZL 250-155	54 kg
Liftarm Z 150/200-175	54 kg
Liftarm ZL 150/200-175	56 kg
Liftarm Z 150-195	59 kg
3-part underrunbar cpl. Z	55 kg
3-part underrunbar cpl. ZL	58 kg
Mounting bracket cpl. Z/ZL	32 kg
Liftcylinder Z/ZL 150-135	8,5 kg/pce.
Liftcylinder Z/ZL 150-155	9 kg/pce.
Liftcylinder Z/ZL 150-175	10 kg/pce.
Liftcylinder Z 150-195	13,5kg/pce.
Liftcylinder Z/ZL 200-135	9 kg/pce.
Liftcylinder Z/ZL 200-155	10 kg/pce.
Liftcylinder Z/ZL 200-175	11 kg/pce.
Tiltcylinder Z/ZL 150/200-135	14,5 kg/pce.
Tiltcylinder Z/ZL 150/200-155	16 kg/pce.
Tiltcylinder Z/ZL 150/200-175	17,5 kg/pce.
Tiltcylinder Z 150-195	21,5kg/pce.
Liftcylinder Z/ZL 250-135	11 kg/pce.
Liftcylinder Z/ZL 250-155	12,5 kg/pce.
Tiltcylinder Z/ZL 250-135	15 kg/pce.
Tiltcylinder Z/ZL 250-155	16,5 kg/pce.

2. General

Centre of gravity



Z-150/200-135, steel platform 2000x2540 mm

	C = 330	C = 470	C = 610
TP_1(mm)	203	166	100
TP_2(mm) 1500 kg	631	648	665
TP_2(mm) 2000 kg	661	678	685
TP_2(mm) 2500 kg	681	688	705

Z-150/200-155, steel platform 2000x2540 mm

	C = 360	C = 580	C = 715
TP_1(mm)	256	196	125
TP_2(mm) 1500 kg	610	630	650
TP_2(mm) 2000 kg	650	660	680
TP_2(mm) 2500 kg	670	680	690

Z-150/200-175, steel platform 2000x2540 mm

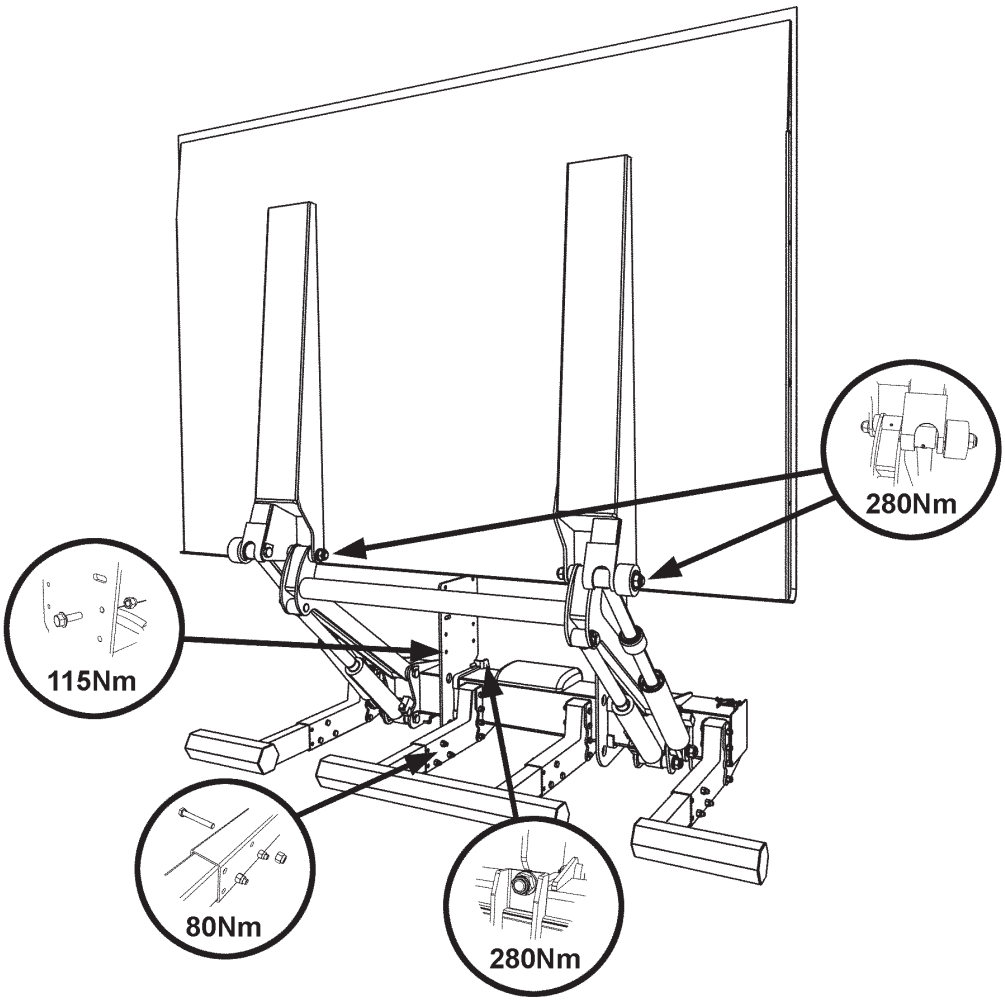
	C = 400	C = 615	C = 800
TP_1(mm)	301	246	158
TP_2(mm) 1500 kg	599	617	635
TP_2(mm) 2000 kg	629	647	665

Max Power Consumption

Z/ZL-150/200/250 (200 bar)

7000	12 volt	24 volt
Pump - Motor Unit	245 A	135 A
Magnet (hydraulic unit)	4,2 A	2,1 A
Magnet (electric safety valve)	1,5 A	0,75 A
Solenoid	1,5 A	0,85 A
Cable area:		
Control cable	1,5 mm^2	1,5 mm^2
Main cable <8 m	35 mm^2	35 mm^2
Main cable 8-15 m	50 mm^2	35 mm^2
Main cable >15 m	-	50 mm^2
Power source:		
Min. capacity	180 Ah	170 Ah
Min. voltage	9 Volt	18 Volt

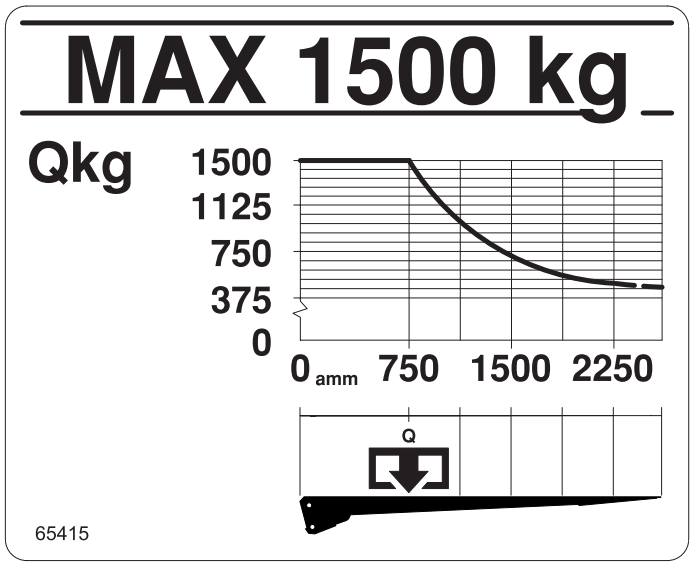
Torque values

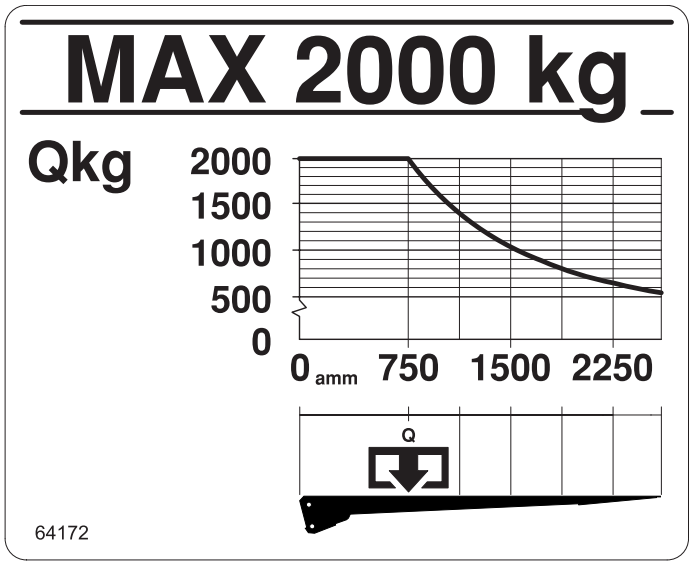


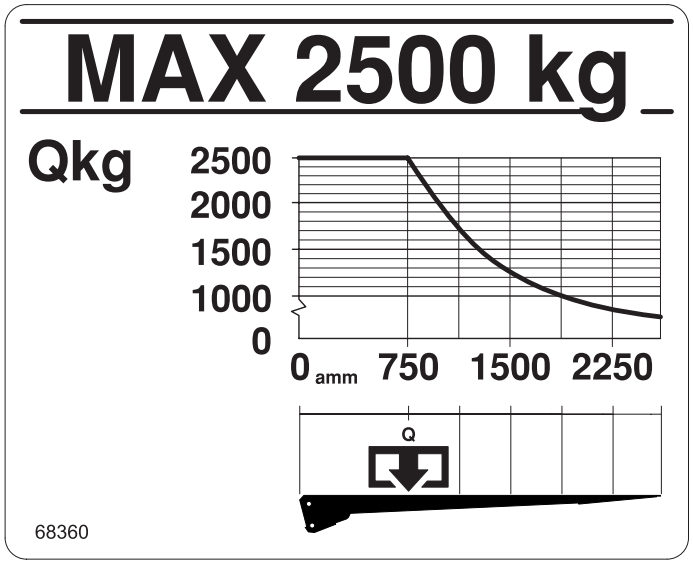
NOTE!

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

Loading Diagram

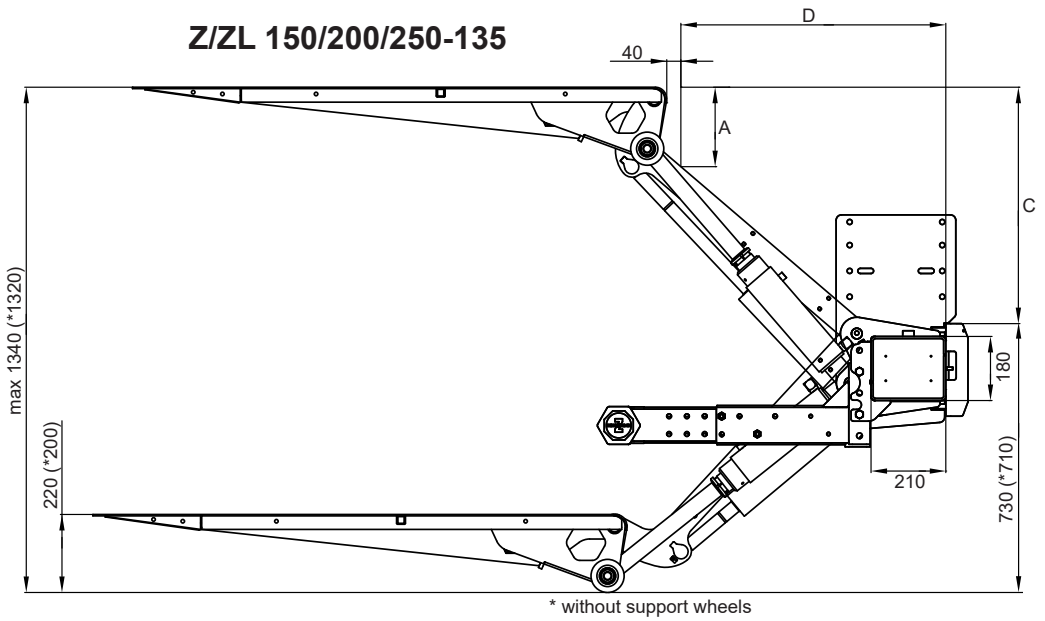






3. Dimensions for installation

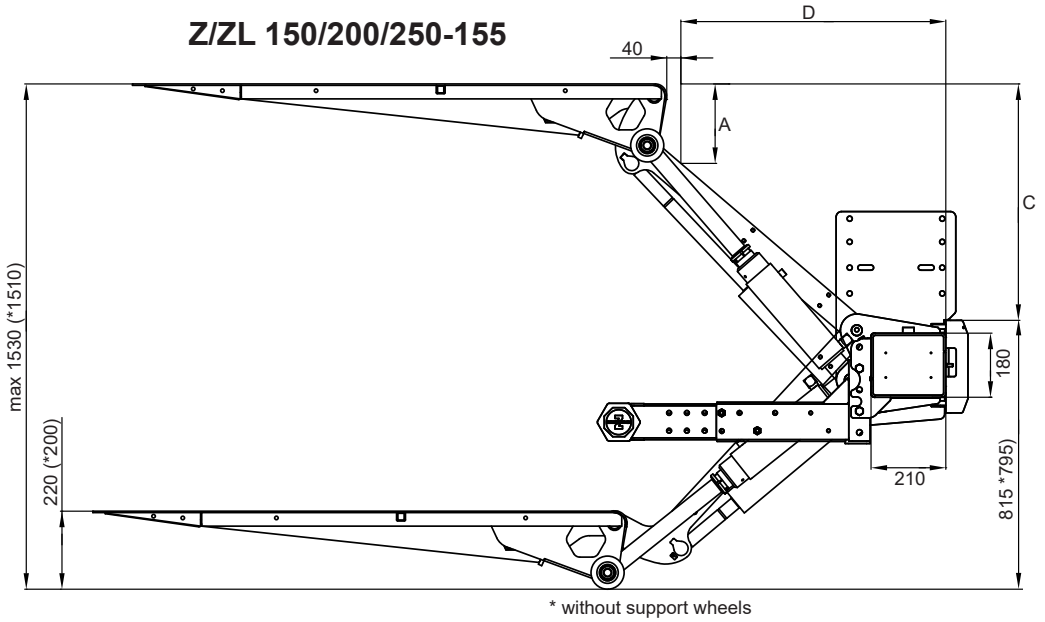
Z/ZL 150/200/250-135



* without support wheels

C	D
610	622
570	672
520	723
470	766
420	802
370	832
330	856
A = C / 3 - 20	

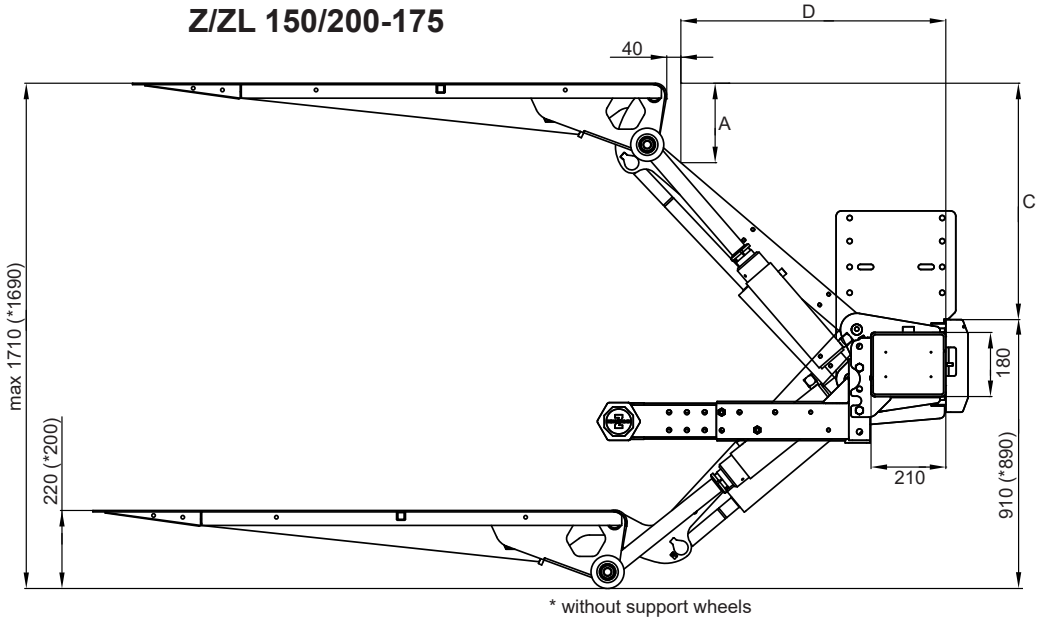
Z/ZL 150/200/250-155



* without support wheels

C	D
715	682
680	728
630	784
580	831
530	872
480	907
430	937
360	972
A = C / 3 - 20	

Z/ZL 150/200-175

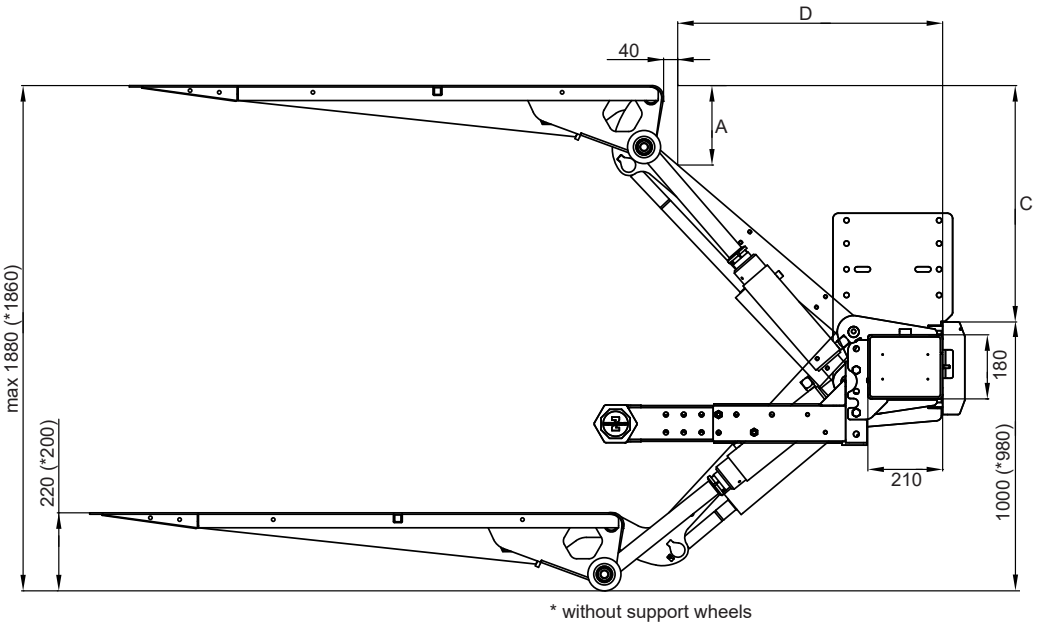


* without support wheels

C	D
800	769
765	813
715	868
665	916
615	958
565	994
515	1026
465	1054
400	1085
A = C / 3 - 20	

3. Dimensions for installation

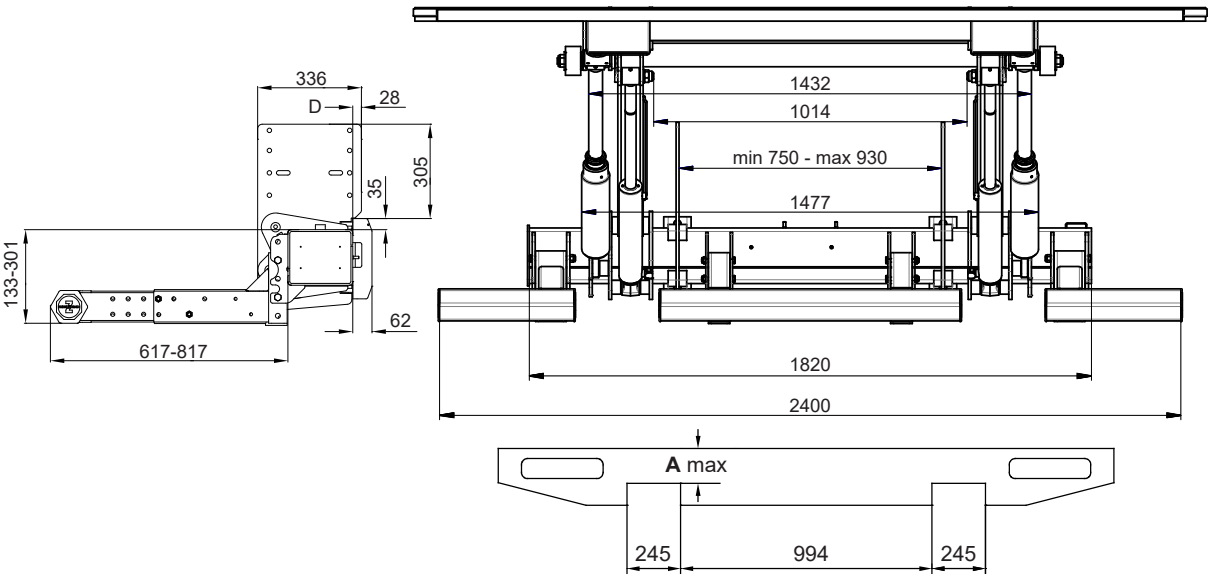
Z 150-195



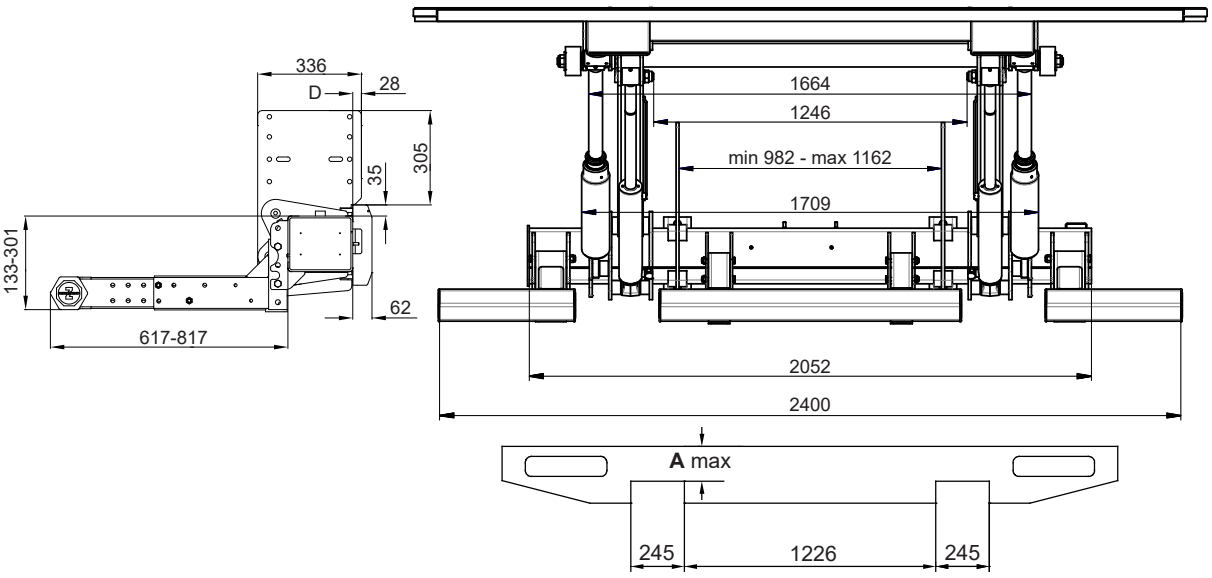
C	D
880	923
815	995
765	1040
715	1080
665	1120
615	1150
565	1180
515	1206
450	1230
A = C / 3 - 20	

* without support wheels

Z 150/200/250



ZL 150/200/250

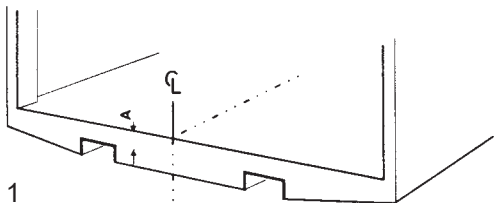


4. Installation support frame

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

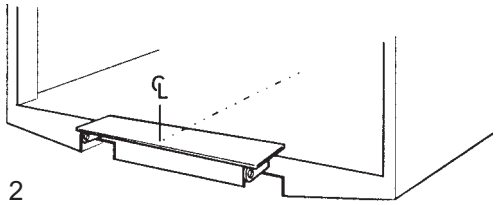
Preparation/support frame

1. Measure out and mark the centre point of the truck's rear frame. **See picture 1**.



Pict. 1

2. Fasten the jig with bolts or spot weld it to the rear frame so that the middle points line up. **See picture 2**.

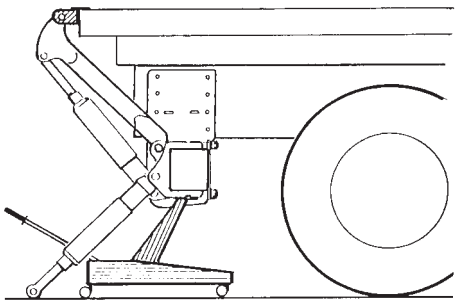


Pict. 2

3. Make the notches as required in the rear beam in accordance with the measures on previous pages.
4. Place the support frame of the lift under the frame of the truck and fit the lift arms to the installation jig. Use the specified platform pivot bolt.

5. Position the support frame as required under the truck's chassis frame (a wheeled jack is a good aid). **See picture 3**.

Installation jig,
Art. no. 51724 for Z-150/200/250
Art. no. 52312 for ZL-150/200/250



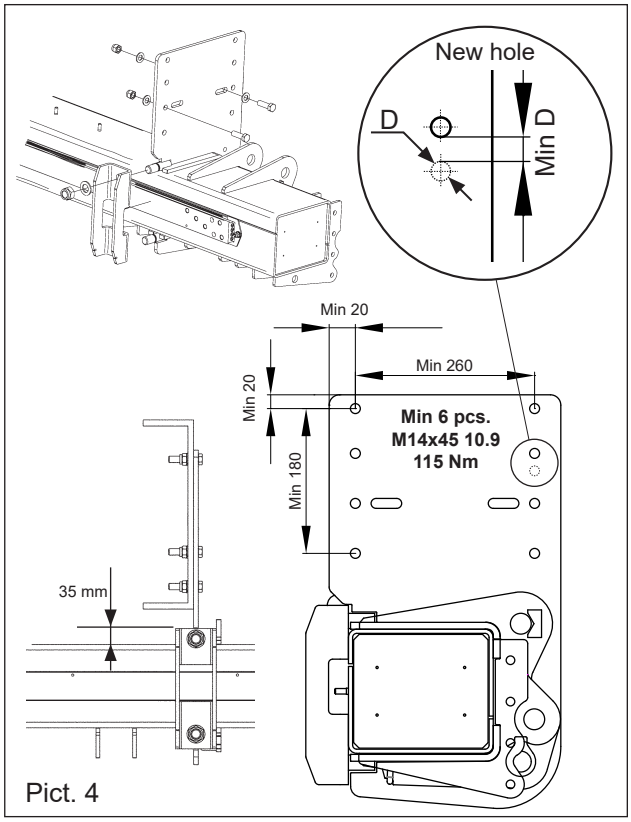
Pict. 3

The support frame ought to be positioned as high as possible. Note the measures on previous pages. The support frame must be parallel with the chassis frame, but it must not be pressed against the frame. There must be some mm between.

If it is difficult to get the support frame into its right position, loosen a hydraulic hose from one lift cylinder to let oil or air out.

The brackets should be positioned according to picture 4. Slide the brackets over the support frame so that the opening points towards the front of the vehicle see picture 4. If adjustment is necessary, drill **14 mm holes** in the truck frame in the middle of the oval holes of the bracket. Then fasten the brackets securely to the frame (torque=115 Nm) with the delivered **M14x45 10.9 screws**. Washers should be placed under the screwheads and washers under the nuts. **Bag 31, 31B. See picture 4.**

NB! Welding on the mounting brackets is not allowed.



Pict. 4

Install the u-profile end plate with the u pointing to the front of the vehicle using the washers and nuts provided, one plate for each mounting bracket, two nuts and two washers for each plate (torque=260 Nm). After testing the position of the lift relative to the chassis, drill the remaining holes in the frame on each side and fasten the brackets, min. 6 pcs. M14x45 10.9 115 Nm (this does not include screws in oval holes).
NB. Do not run the lift up against the armstops during installation before all the bolts between the mounting brackets and vehicle frame are tightened.

Note! Please note that the space for the bracket requires additional 35 mm between the frame of the truck and the support frame. **See pict. 4**

Do not load the lift before all bolts are tightened.

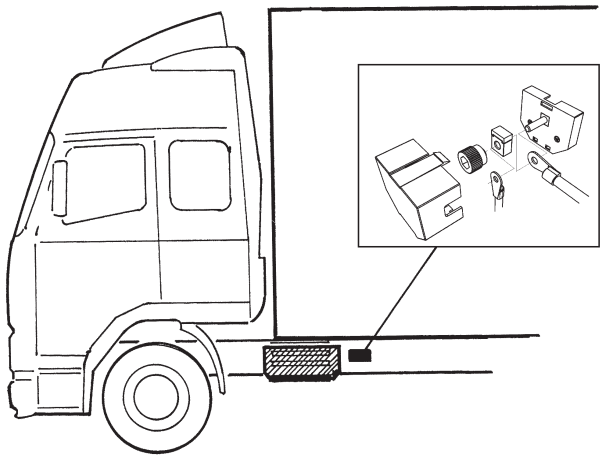
Loosen the installation jig.

5. Electrical installation

Install control units at suitable places, but the position of the control unit should ensure that the operator has a good view of the load, the working area and the loading area, whilst maintaining a safe distance from the risk zone between the platform and the body. Note that all cables must be connected from below so that water can´t get into the units but condensation can drain out.

All control units must be connected in parallel.
The control cable is connected to the circuit card in the connection unit (see electric schema).
Install the control current cable from the dashboard of the truck according to the customers requirements. The control current swich should be located so it is possible to be reached from the ground 10 A (24 V), 15 A (12 V) fuse between the current source and the switch.
The control current cable is connected to a fixed control unit. You can fasten the cable together with the main cable to the hydraulic unit.
Connect the main power cable to the starter motor (B+) of the truck, never to the battery. The cable should be protected with a plastic sheath. It must not be fastened together with brake pipes or other electric cables of the truck. When passing through holes the cables must be protected with rubber bushings.
A 160 A (24 V) or 250 A (12 V) fuse is to be installed on the main power cable running from the battery compartment**. This acts to protect the electrical systems from overloading and the risk of fire.

**Note! The fuse should be placed on a well protected place and as near as possible to the battery.

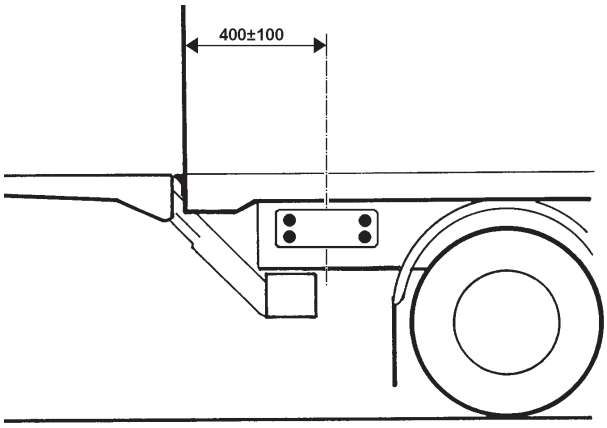


If you have a spiral cable unit, its cable colours are different (see electric diagram):
If you want an electrically heated spiral cable unit you can order a 5-part cable (spare-part no 21303). Note that the spiral cable unit must have its fastening plate for the wall (spare-part no 20302).

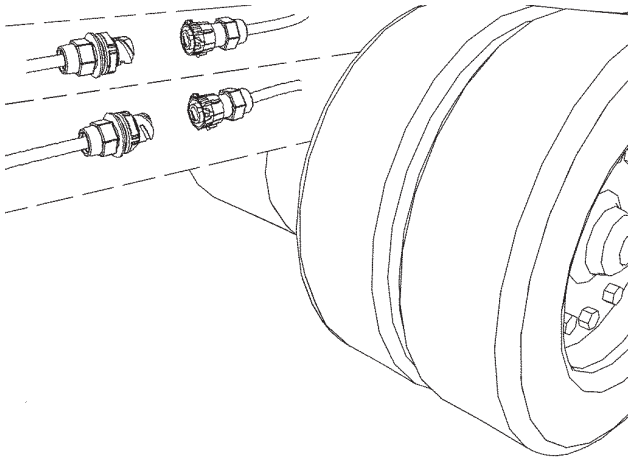
Check that the hydraulic unit is well earthed according to truck manufacturer´s instructions (earthing is made through leading in plate, se picture).

If you must lead a spiral cable up through the floor you must protect it with a sheath up from the floor.
If you need to use power from the circuit card +ve connection point a fuse must be installed, eg. overload alarm 7.5 Ampere.
Test run all functions from all control units.

Positioning of control unit



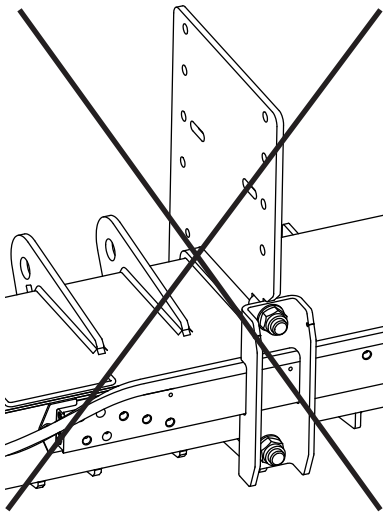
NB. The quick connectors must be well protected and should be positioned inside the vehicle chassis.

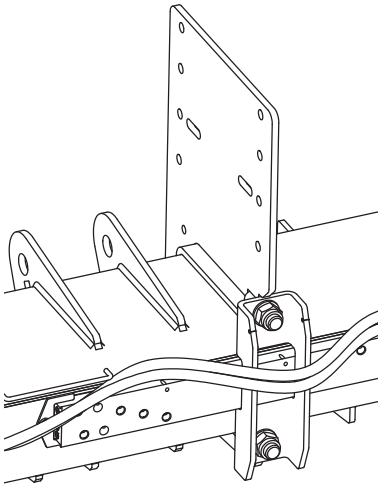


5. Electrical installation

Cable routing of earth and supply cable to the lift.

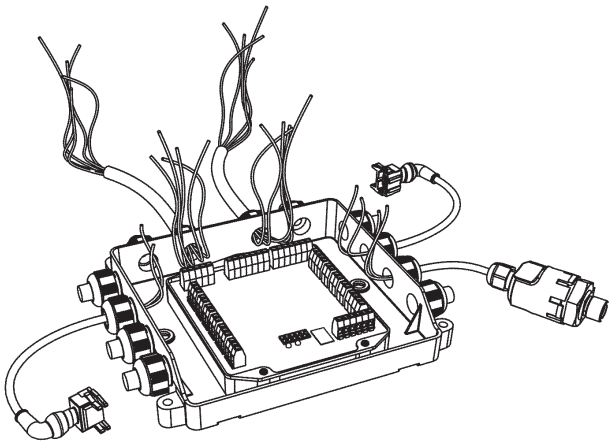
Due to the risk of cables being pinched and / or damaged which can lead to short circuits and cable fire, the earth and supply cable should be mounted outside the clamping bracket (see photos above). They must also be sufficiently far away from edges so there is no risk for abrasion.
Also make sure that the routing of cables is done with similar care to avoid damage from contact with edges of the frame and other parts of the vehicle. This will increase the life of the cables and reduce the risk of unnecessary downtime





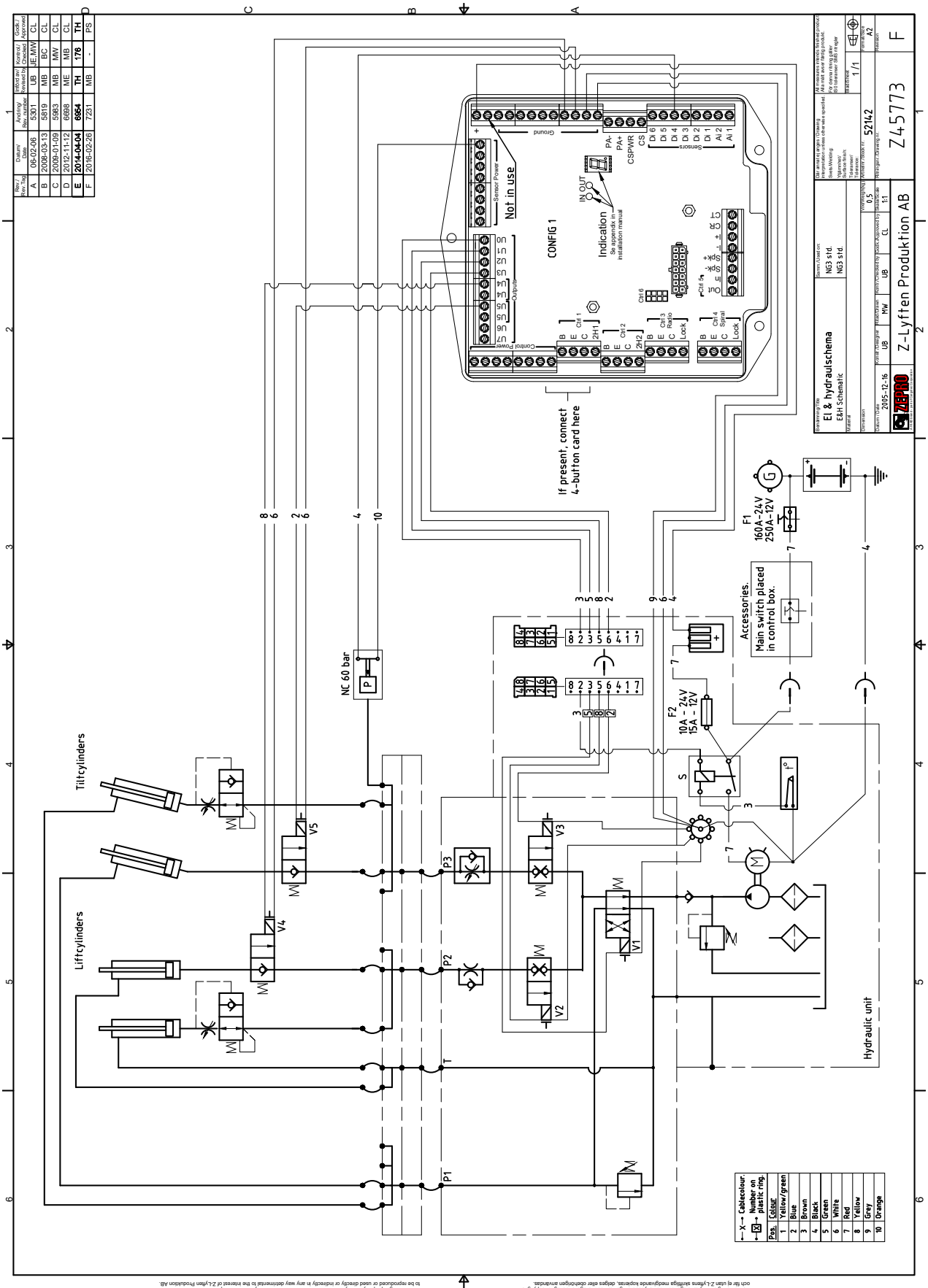
Connection of non-original components on zepro tail lifts

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



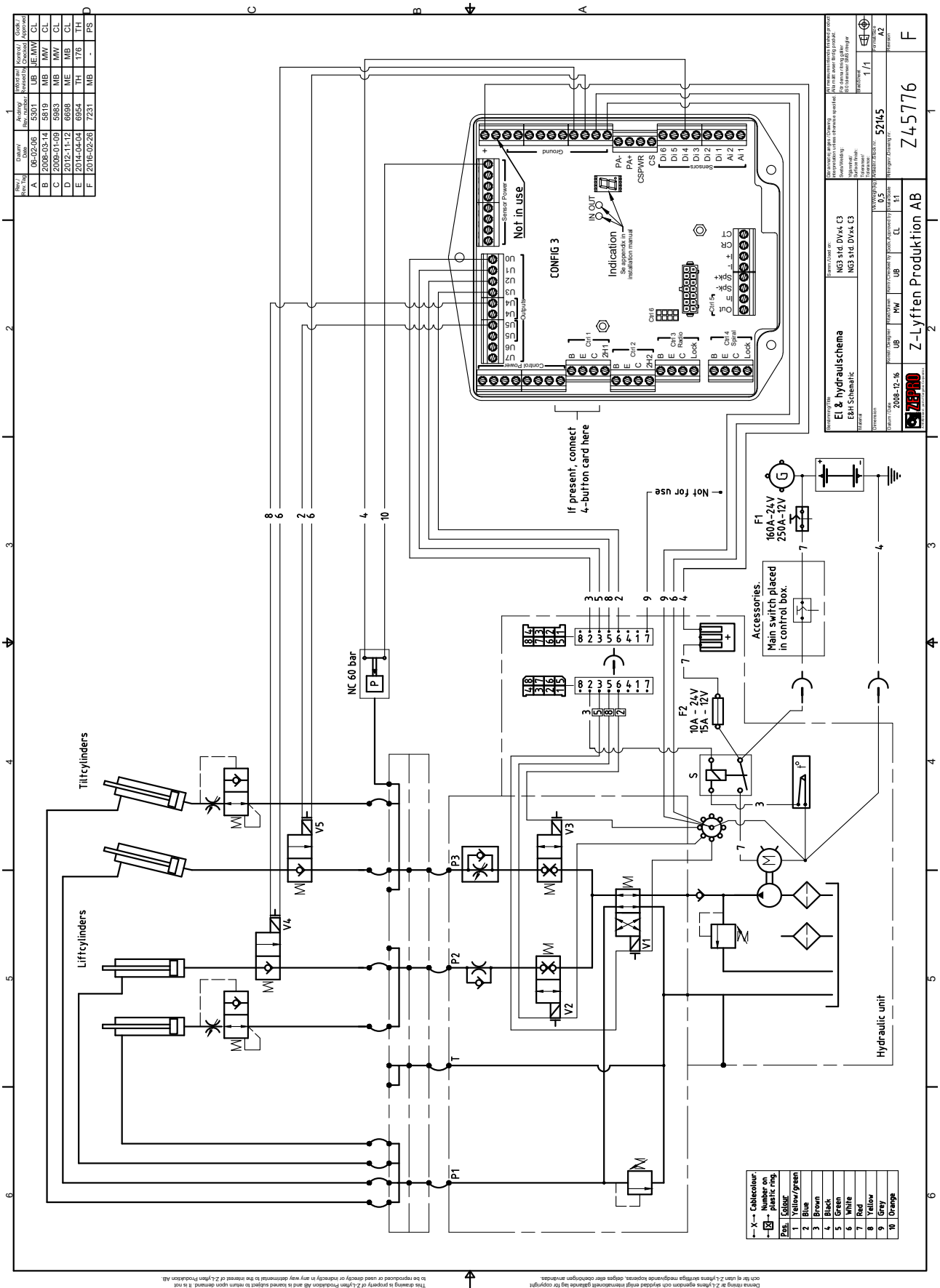
6. Electric and hydraulic diagram

Z/ZL-150/200/250 MA



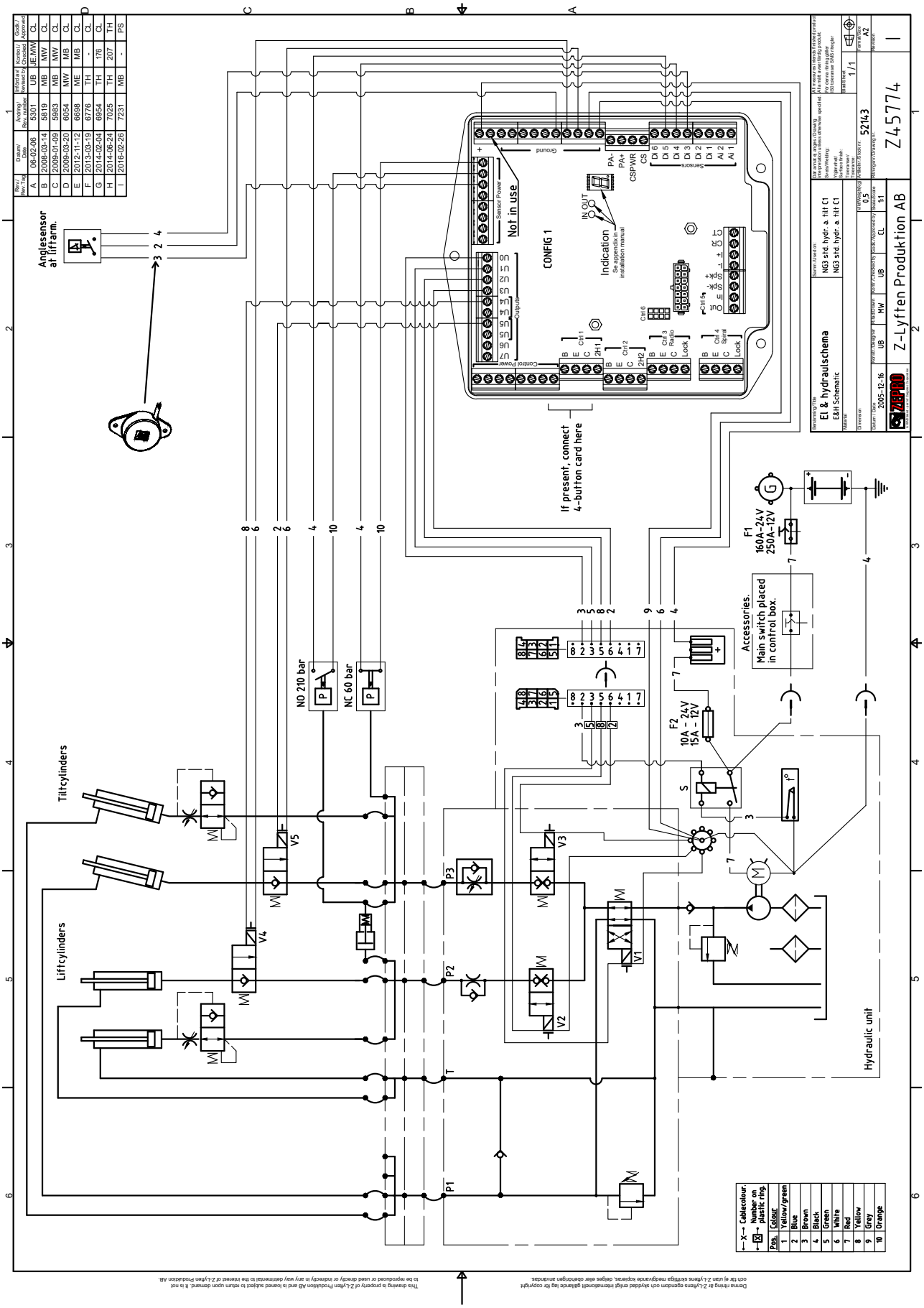
6. Electric and hydraulic diagram

Z/ZL-150/200/250 DA



6. Electric and hydraulic diagram

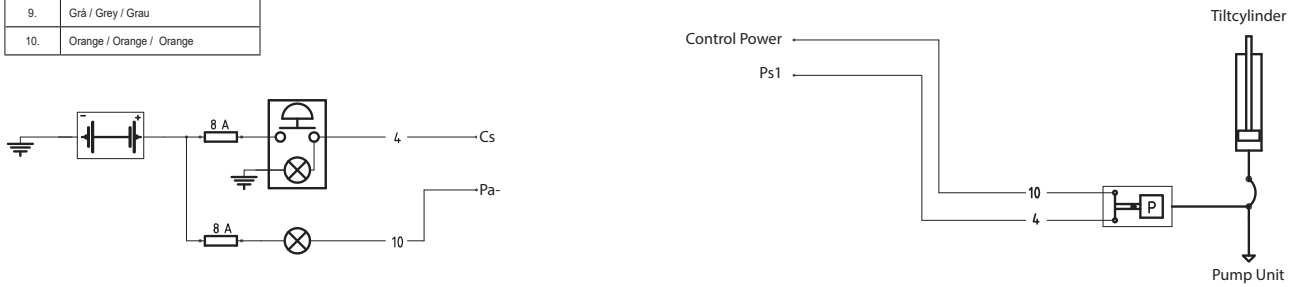
Z/ZL-150/200/250 MA, with hydraulic Auto-tilt



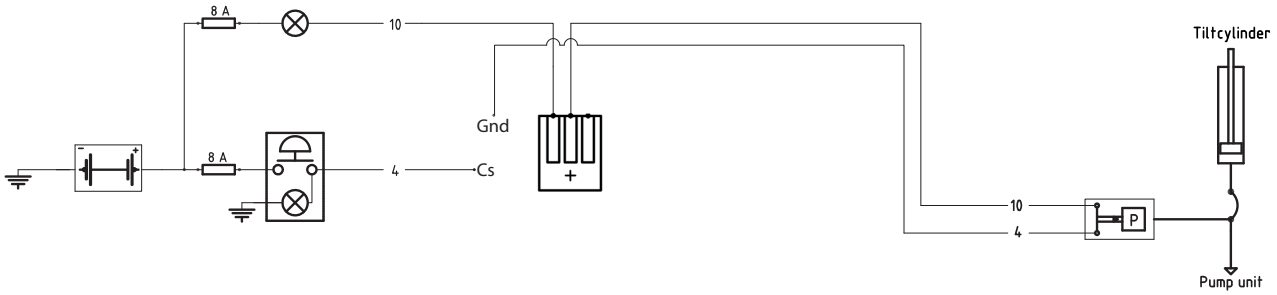
6. Electric and hydraulic diagram

Nr. /No.	Färg / Color/Farbe
1.	Gul / Grön, Yellow / Green, Gelb / Grün
2.	Blå / Blue / Blau
3.	Brun / Brown / Braun
4.	Svart / Black / Schwarz
5.	Grön / Green / Grün
6.	Vit / White / Weiß
7.	Röd / Red / Rot
8.	Gul / Yellow / Gelb
9.	Grå / Grey / Grau
10.	Orange / Orange / Orange

Cabin switch, Alarm for open platform



Cabin switch, Alarm for open platform when control unit has main switch



Alarm for open platform (trailer)

ZEPRO recommends that a strobe lamp/light placed on the trailer body exterior represents the alarm indication, clearly visible so that the driver can see it in the mirror

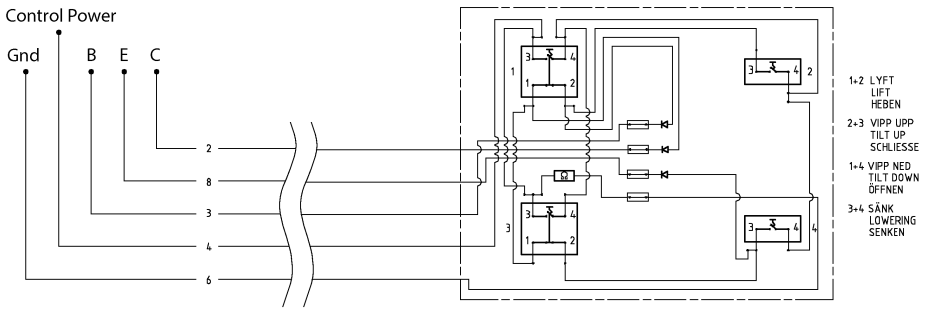
The light must be of amber color.

Connect the lamp/indicator according to the electric diagram.

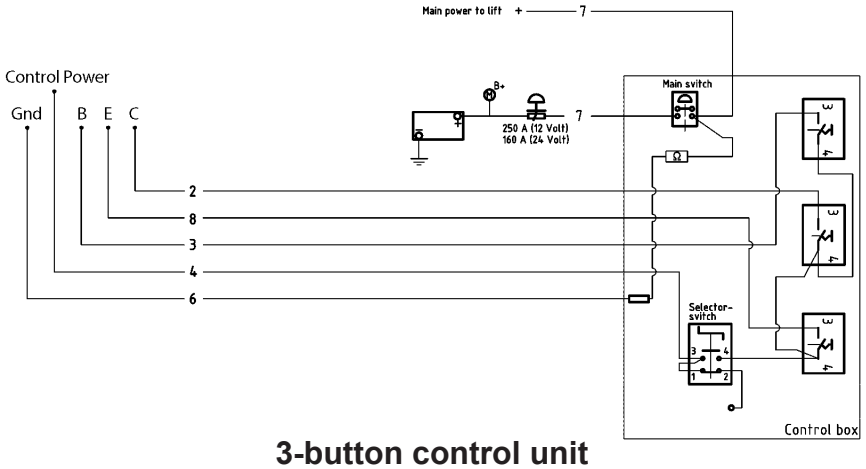
3A fuse connected between the circuit card and the pressure switch.

6. Electric and hydraulic diagram

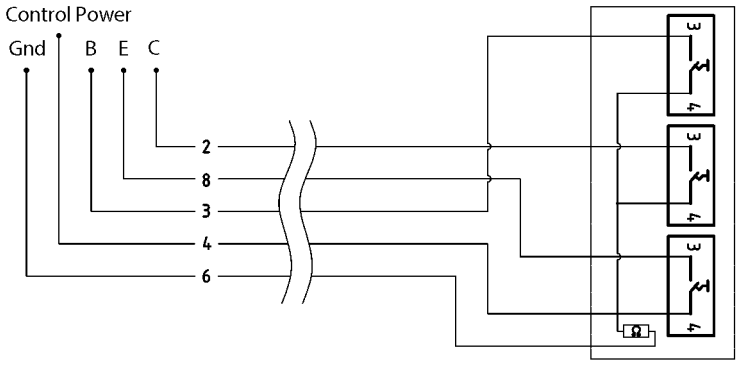
4-button control unit



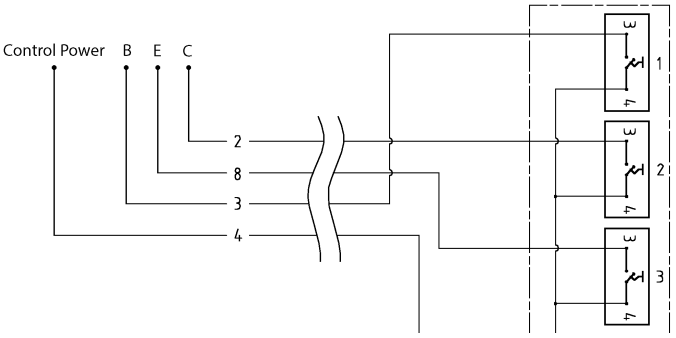
3-button control unit with main switch and selector switch



3-button control unit



3-button remote control unit with spiral cable



Connection unit

Power save mode

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

Operating information

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

The display indicates:

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

Flashing light indicates:

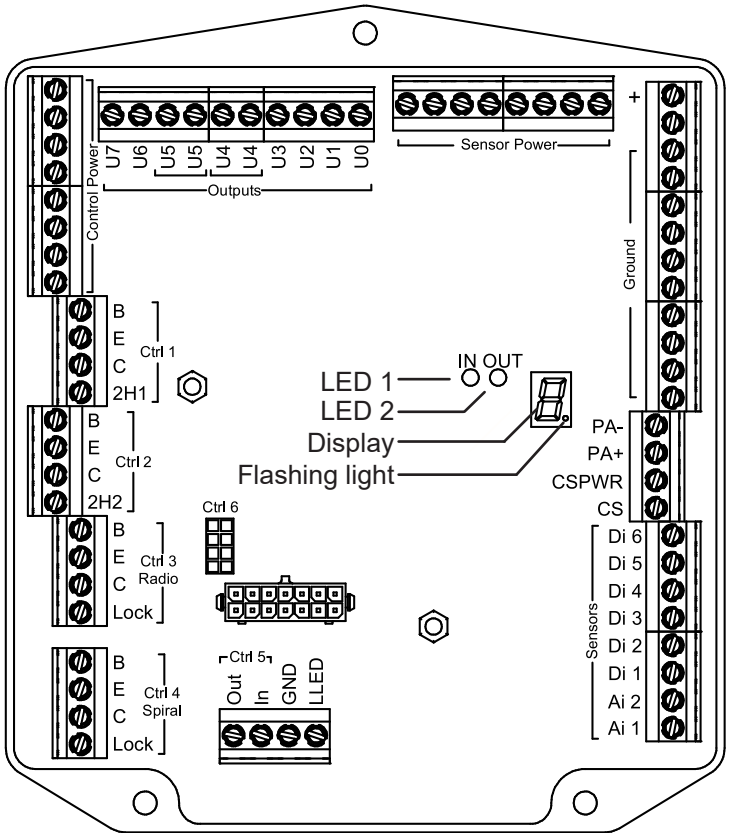
- Supply voltage
- Off: No supply voltage
- On: Supply voltage available but CS (cabin switch) is not active.
- Flashing: CS (cabin switch) is active, the system is awaiting input signal.

LED 1 indicates:

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

LED 2 indicates:

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



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

7. Connection unit

Information codes

Codes are shown on the display in a sequence. First a letter for identification of information, followed by figures or segments for further information and then ending with a pause:
When the CS (cabin switch) is switched on, the current program configuration (P) is displayed first, followed by configuration number. The number of volts detected is then displayed and, after this, the current software version (J), followed by version number.
As long as no control device is used, a scrolling sequence is then displayed, with sensor indication (C), followed by 0-6 segments showing which sensors have a signal.
When a control device is used, the control device being used (1-7) is displayed, followed by which button has been pressed, segments B, C, E or X (X symbolises the 4th button on the respective control device (2h1 for fixed control device 1, 2h2 for fixed control device 2, lock knob for radio control device and coil control device).

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

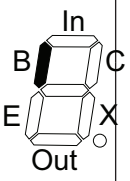
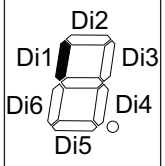
1. Fixed control device 1, including two-hand button 2h1
2. Fixed control device 2, including two-hand button 2h2
3. Radio control device, External
4. Coil control device
5. Truck slider control device
6. Radio control device, internal module
7. CS (cabin switch)

Once a button has been released, the control system for the current control device is locked for a while to ensure that no other person operates the lift from another control device. During the period the control system is locked for the current control device, its number (1-7) will flash on the display. This primarily applies to radio and coil control devices, as other control devices have such a short locking period that there is hardly time to see the indication.
Coil control devices can be equipped with a locking function. Once the control device has been used, the control system is locked for the current control device until it is unlocked manually from the respective control device's deactivation button. With some configurations, however, the coil control device can, for safety reasons, always tilt the platform down in the event of the operator getting shut inside.
The radio control device is also equipped with a locking function. The control system can then be locked/unlocked by pressing and holding button 5. The lock's status is indicated by the locking function LED, which comes on when the lock is activated. In the event of a fault in the remote control, unlocking can be performed by turning the control power (CS) Off/On.
If the remote control is in the locked position and the lift has been unlocked by turning the control power (CS) Off/On, the lift will be locked again as soon as any button on the remote control is pressed.

NOTE.

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

7. Connection unit

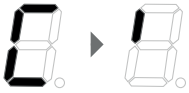
Information codes					
Identification	**Code 1**	**Code 2**	**Code 3**	**Information**	**Other**
P (Program configuration)	00–99			Cancelled configuration	
		-		Dividers	
			12/24	Number of volts detected	
J Software version	01–99	–	1-9	Version number	
1-6 (Fixed light) Active control device while operating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

Example of sequence of information codes:

Configuration 1 | Voltage detected 12V | Firmware 9.0

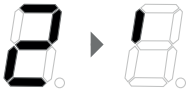
Example of sequence with sensor indication:

Sensor indication: C, Detected sensor: Di1



Example of sequence with control device indication:

Control device: 2, Detected button: B



Fault codes

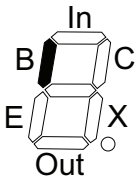
If a fault arises, the fault code is shown in the display in the form of a letter for identifying the fault, followed by numbers and/or number segments for further information, followed by sensor indication (C) in accordance with the previous page.

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

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

If the system discovers several faults, only the fault code for the fault with the highest priority will be shown automatically. The display is prioritised in the order in the table below, L/H, E, F and A.
When the CS is switched off, the system will browse through a list containing the five most recent faults detected before the display goes off after approx. 5 minutes, the control card then goes into power save mode.

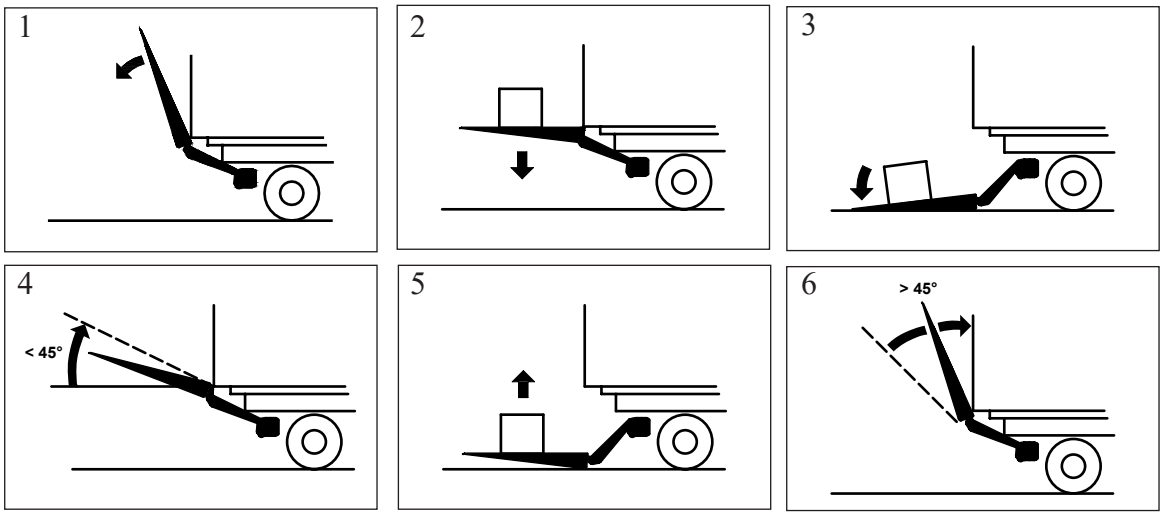
7. Connection unit

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

7. Connection unit

Function schema (also refer to corresponding. el & hyd. diag.)
ZHD 3000-150 MA
ZHD 3000-150 MA, with hydraulic Auto-tilt
(config 1, art. no. 34301TL)

Function	Signal in	Signal Out	Notes
Lift	B	U0+U2	
Lower[1]	E	U1+U2+U4	
Lower[2]	E+Di3	U1+U2+U4+U5	
Tilt up	B+C	U0+U3	
Tilt down [1]	C+E	U0+U1+U3+U5	
Tilt down [2]	C+E	U0+U1+U3+U5+U8	Quick opening. Signal from angle sensor, activates valve U8, which opens oil return directly to tank.
Angle indicator for lift arm.	Di3	-	Indicates lift arm at ground. Prevents unwanted down tilting with hydraulic auto tilt.
Open platform alarm	Di4	Pa- (-).	Pressure guard for dropping pressure connected to the tilt cylinders + side, sends (when in neutral mode) connected signal (+) back to Di4, which in turn sends a signal out (-) on Pa-, or provides Di4 with +signal from a tilt sensor in the foot control unit cable set to indicate 'platform open'.
Over load protection	Di5	Blocks/cancels lift and tilt up functions.	Pressure guard for rising pressure connected to tilt cylinders + side sends (when activated) +signal back to Di5 which blocks/cancels lift and tilt up functions.
Activation	Cs	Connection units' functions are activated.	No signal in on Cs results in blocked control unit connectors. Signal to Cs usually comes from the cabin switch, or in cases where such a switch is not used the +signal comes in on Cs bridged from+ on the nearby connector.



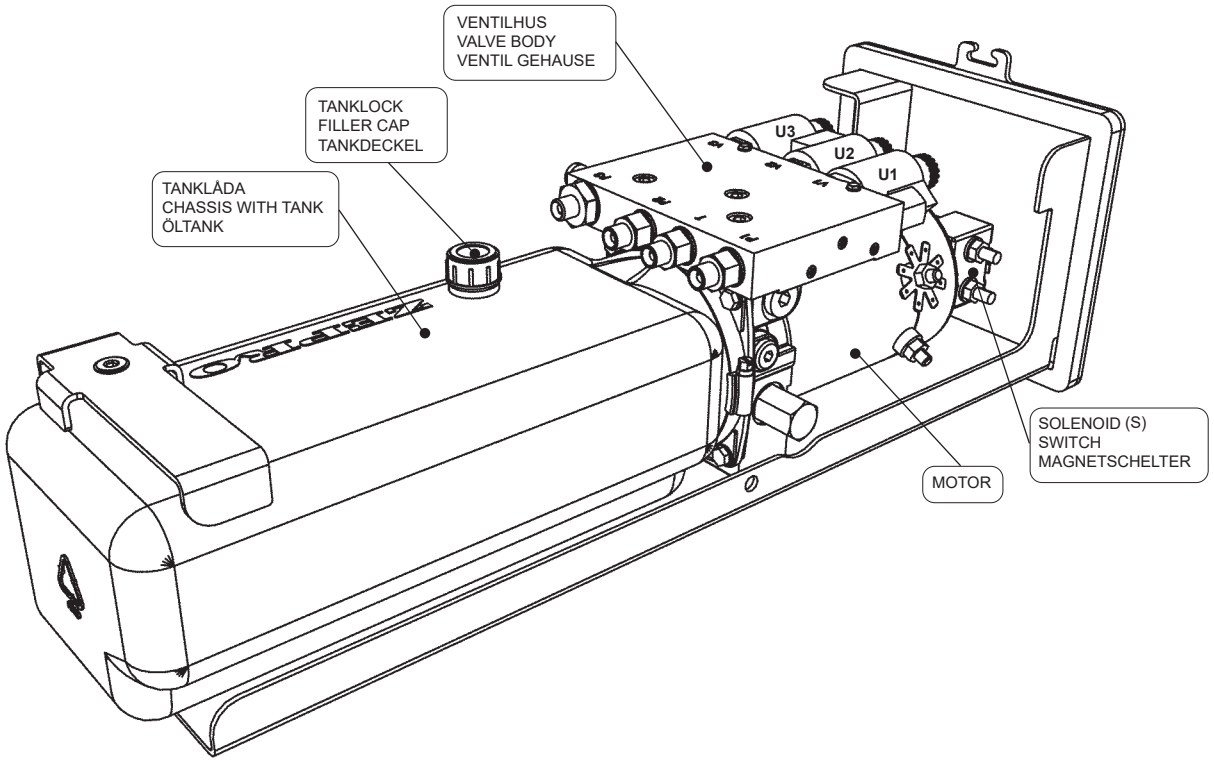
Function schema (also refer to corresponding. el & hyd. diag.)
Z/ZL-150/200/250 MA
Z/ZL-150/200/250 MA, with hydraulic Auto-tilt
(config 1, art. no. 34301TL)

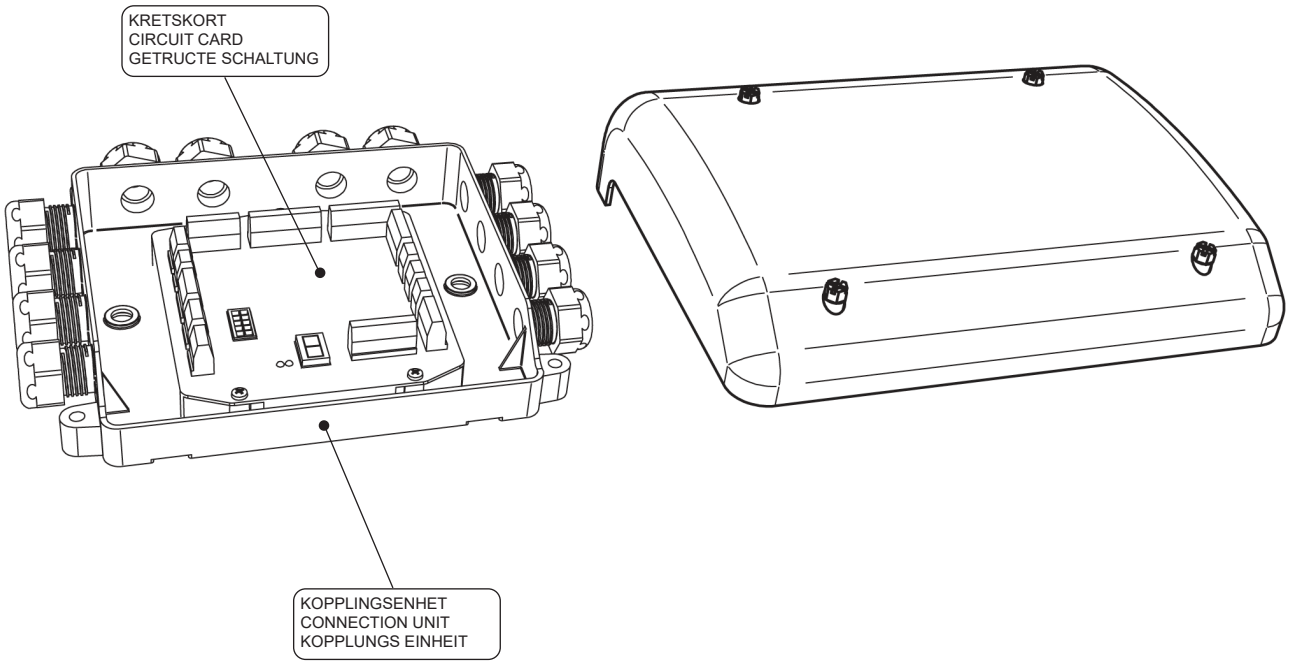
Function	Signal in	Signal Out	Notes
Lift	B	U0+U2	
Lower[1]	E	U1+U2+U4	
Lower[2]	E+Di3	U1+U2+U4+U5	
Tilt up	B+C	U0+U3	
Tilt down	C+E	U0+U1+U3+U5	
Angle indicator for lift arm.	Di3	-	Indicates lift arm at ground. Prevents unwanted down tilting with hydraulic auto tilt.
Open platform alarm	Di4	Pa- (-).	Pressure guard for dropping pressure connected to the tilt cylinders + side, sends (when in neutral mode) connected signal (+) back to Di4, which in turn sends a signal out (-) on Pa-, or provides Di4 with +signal from a tilt sensor in the foot control unit cable set to indicate 'platform open'.
Over load protection	Di5	Blocks/cancels lift and tilt up functions.	Pressure guard for rising pressure connected to tilt cylinders + side sends (when activated) +signal back to Di5 which blocks/cancels lift and tilt up functions.
Activation	Cs	Connection units' functions are activated.	No signal in on Cs results in blocked control unit connectors. Signal to Cs usually comes from the cabin switch, or in cases where such a switch is not used the +signal comes in on Cs bridged from+ on the nearby connector.

Z/ZL-150/200/250 DA
(config 3, art. no. 34303TL)

Function	Signal in	Signal Out	Notes
Lift	B	U0+U2	
Lower	E	U0+U1+U2+U4	
Tilt up	B+C	U0+U3	
Tilt down	C+E	U0+U1+U3+U5	
Open platform alarm	Di4	Pa- (-).	Pressure guard for dropping pressure connected to the tilt cylinders + side, sends (when in neutral mode) connected signal (+) back to Di4, which in turn sends a signal out (-) on Pa-, or provides Di4 with +signal from a tilt sensor in the foot control unit cable set to indicate 'platform open'.
Activation	Cs	Connection units' functions are activated.	No signal in on Cs results in blocked control unit connectors. Signal to Cs usually comes from the cabin switch, or in cases where such a switch is not used the +signal comes in on Cs bridged from+ on the nearby connector.

7. Connection unit, hydraulic unit

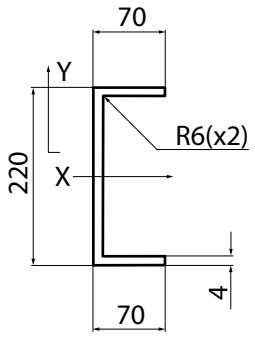




Underrun protection

Vehicle chassis requirements

In order to comply with the applicable underrun protection standards, there are requirements for the vehicle chassis on which the rear tail lift is mounted. The moment of inertia in a cross-section on the current frame beam (excluding any support frame) shall not be less than 937 cm⁴. The cross-section of the frame beam shall therefore have at least dimensions of 220x70x4 mm, corresponding to a surface moment of inertia of 555 cm⁴ around the x-axis. See illustration. If in doubt, contact ZEPRO for support.



The cross-secton of the frame beam

⚠ WARNING!

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

Statutory dimensions for underrun protection

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

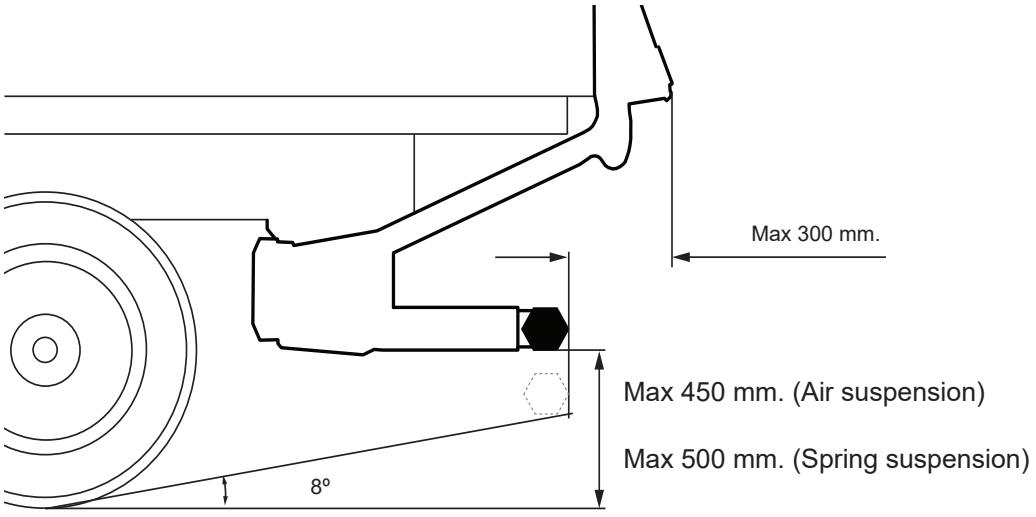
Max. 450 mm for vehicles with air suspension.

Max. 500 mm for vehicles with conventional suspension.

If the exit angle with the above setting is less than 8º, the distance between beam and ground in an unladen vehicle may be increased until the angle is 8º, but to Max. 550 mm.
Horizontal distance from the outermost part of the platform to the underrun protection: Max. 300 mm. See illustration below.

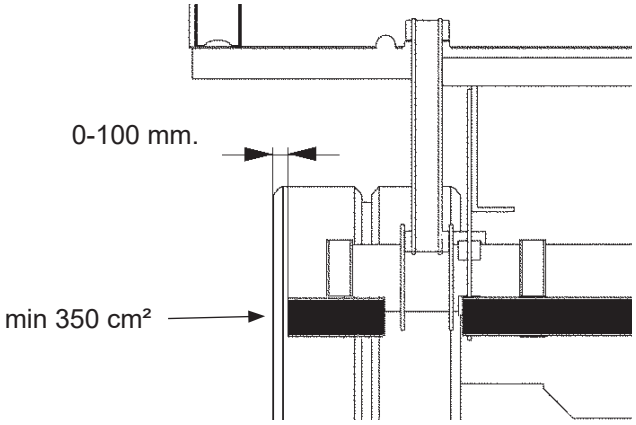
NOTE!

The underrun protection may be placed further back and lower.



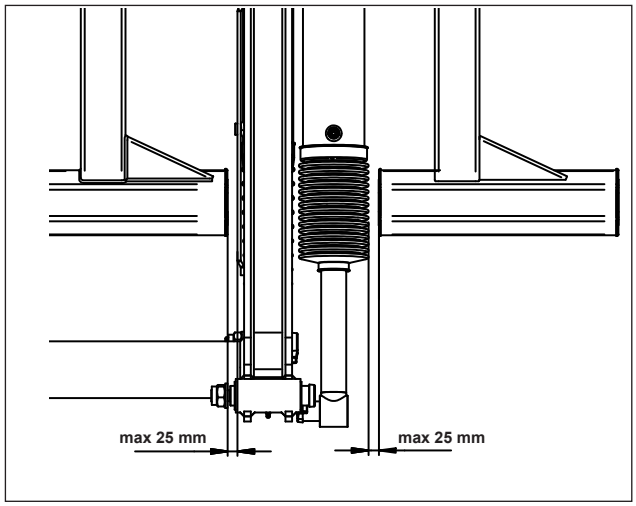
Statutory dimensions

Horizontal distance from the outer edge of the member to the outside of the wheel: Max. 100 mm.
See image.



Statutory dimensions

The lateral distance between the underrun protection and the moving parts of the tail lift must not exceed 25 mm. See image.
Each of the individual parts of the underrun protection must have a surface area of at least 350 cm². See image.



Statutory dimensions

Installation

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

1. Fit the inner part of each bracket at one of four heights. Select the height that meets the statutory requirements, see page 27. Use the corresponding bolts M12x100. Assemble without tightening the bolts, see image.

2. Fit the outer part of each bracket at one of five positions. Select a position that meets the statutory requirements, see page 27.

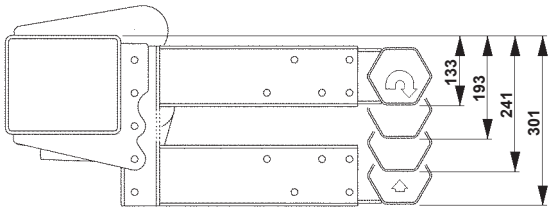
> **⚠ WARNING!**
>
> Check carefully that there is no risk of the outer part of each bracket colliding with any part of the cylinders when using the lift's functions. In particular, check in relation to the cylinders' hose connections, especially when the outer part of the brackets is installed a long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

   Use the corresponding bolts M12x80. Assemble without tightening the bolts. See image.

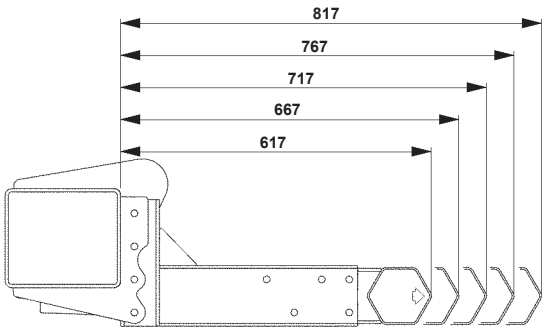
3. Check that the installation meets the statutory requirements.

4. Tighten all the bolts using a torque wrench. **Tightening torque: 80 Nm.**

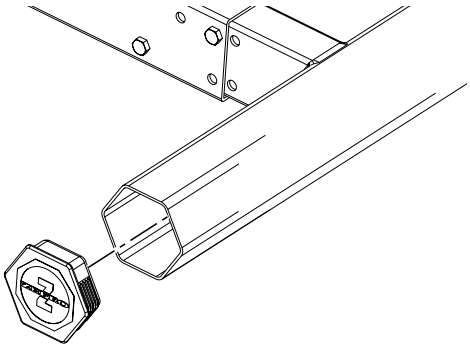
5. Fit the member end caps, rotated so the logo is the right way up, and press them firmly to secure. If necessary, tap carefully with a rubber hammer.



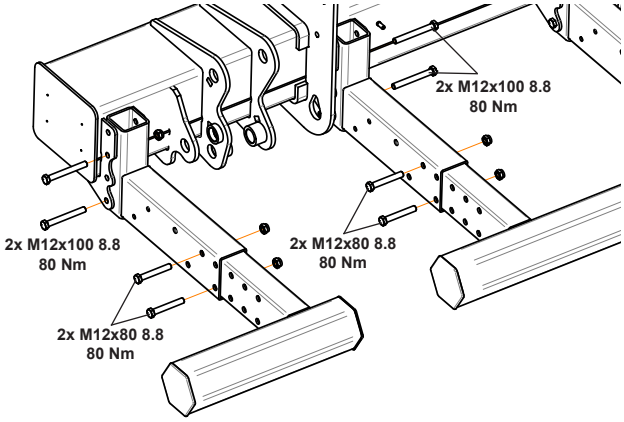
The inner part of the brackets can be fitted at one of four heights



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

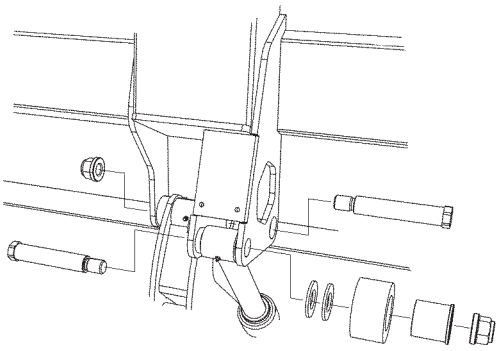


Fit the member end caps



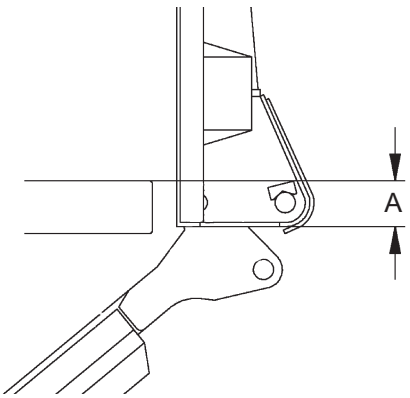
Installing underrun protection

Installation of platform
Install platform onto the lift arms and tilt cylinders to the platform. Use axles and support wheels provided (280 Nm). **pict 10**.



Pict. 10

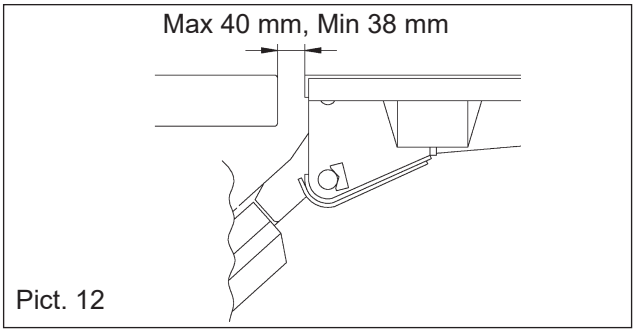
The platform´s overlap (A) is dependent on the type of platform. Please note the values below which are particulary relevant when installing a rubber seal on the body at the top of the platform.



Pict. 11

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

When the platform is installed you should test run the lift carefully. Remember that the lift is only fastened to the frame temporarily. Check the platform position at rear beam. Adjust the position of the lift if necessary. **See picture 11.**



Pict. 12

Tighten all nuts (see section 4). Weld the square shaped washers to the brackets. 8 bolts at every bracket.

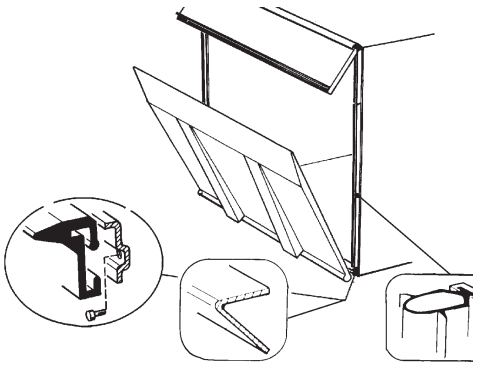
Sealing system (horizontal)
Install the horizontal aluminium or steel guide bar. Self-tapping screws delivered. Drill 7.2 mm holes. Mitre the rubber against the side seal. **Bag 3. See pictures 13**

Sealing system (vertical)
Install the rails for the vertical sealing strips. Note the position of the lock ears.
They can be fastened with screws, rivets or welding. The rubber strips are installed after the lock ears.

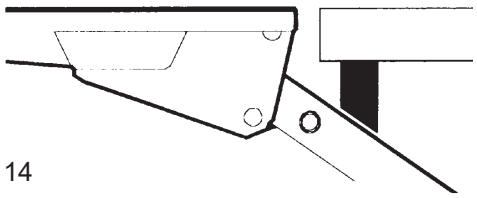
The rubber strips are locked by pressing the rails together.

If upper seal must be installed you must mitre 45 degrees against vertical stripes.

Pict. 13



Armstops
Install armstops for both arms at the rear beam. Install them equal on both sides so they meet the liftarms at the same time. The stops must reach as high up as possible on the liftarm.
See picture 14.



Pict. 14

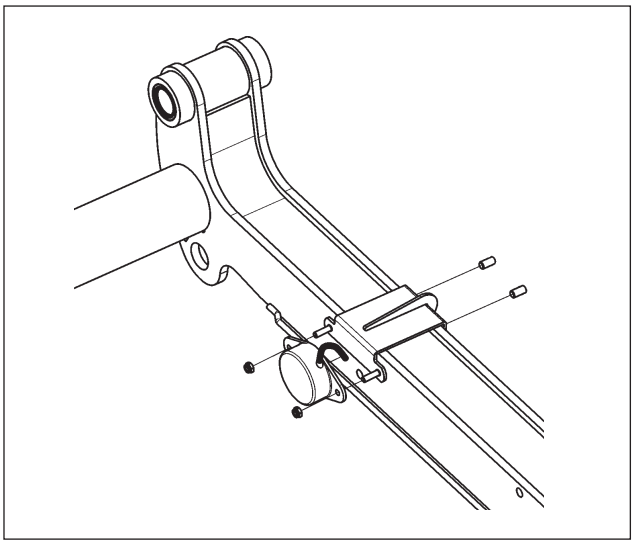
Transport lock
For CE marked lifts with 1000kg max lifting capacity and over ZEPRO provides platforms without transport lock. For other lifts transport lock are installed on the platforms right side.

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

Bleeding the cylinders
For all lift cylinder models.
Fully lower the platform a few times. You may have to lift the truck to fully lower the platform.

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

Hydraulic Automatic Tilt
When hyd. auto-tilt is installed the angle sensor should be installed on the lift arm as in the diagram



8. Installation, continued

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

1. Tilt up so that the platform closes ie. the tilt cylinders are extended as far as the geometry allows. See pict 16. NB. Adjustment according to "3" should always be made when the tilt cylinders are fully pressurized.

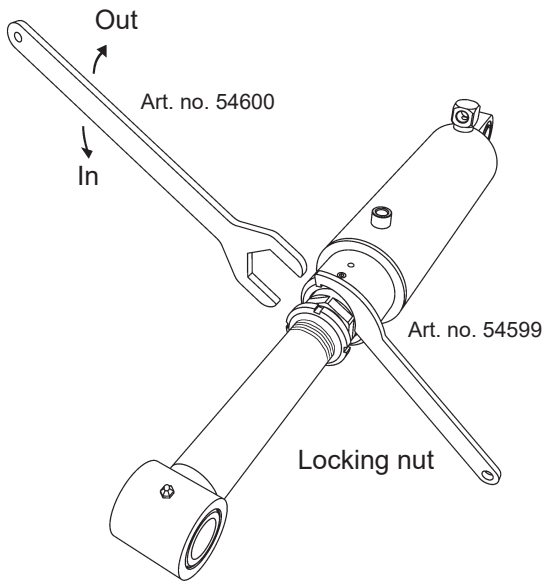
2. Loosen lock nuts, see pict 17
(Zepro tool 54599).

3. Turn the adjusment collar (spanner width 50mm) as seen from above, as per pict 17 (Zepro tool 54600), alternately the right cylinder and then left one, so that the platform fits exactly to the body as per pict B. NB. Always adjust right and left sides the same.

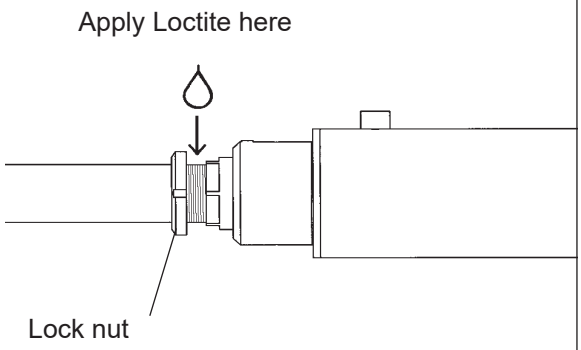
4. In order to ensure that the lock nut and collar remain in the desired position we recommend that they are secured with loctite 243 or similar.
Apply enough Loctite on the pressure rod's thread so that there is enough to also secure the collar when the lock nut is tightened. See pict. 18

5. Tighten the lock nuts against the collar. Measure as per in pict 19. NB. Max. 50 mm between the mark on the push rod and the tightened lock nut. Lock nut torque is minimum 100 Nm.

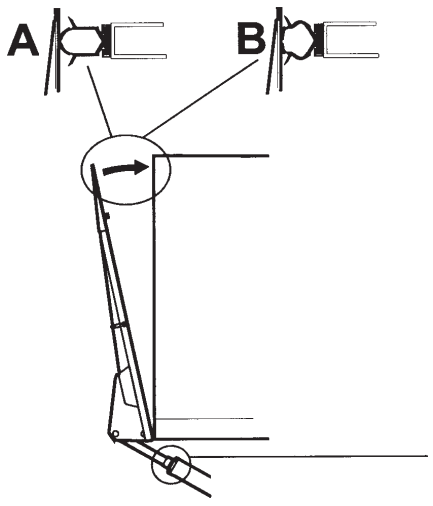
Pict. 17



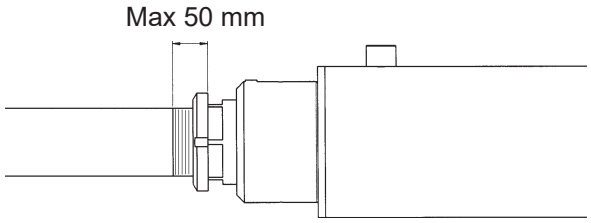
Pict. 18



Pict. 16



Pict. 19



Adjustment of tilt down angle.
NB. To obtain the correct function after adjustment, it is necessary to first follow the procedure on previous page which describes the adjustment of the 90º tilt angle up against the body.

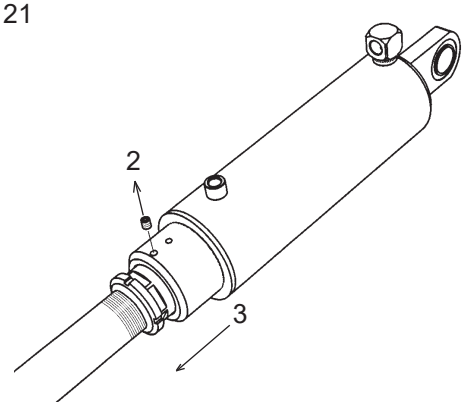
Run the lift up so that the lift is at the floor level, see pict 20.

Loosen the ring's lock screw (2). Screw the ring out in the direction of the platform (3). See pict 21.

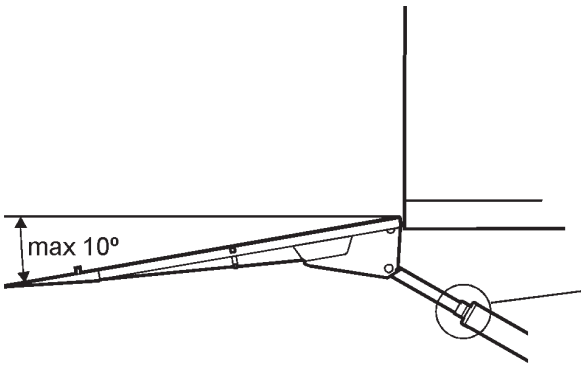
Tilt down the platform to maximum 10 degrees under horizontal.
As per pict 20.

Adjust the ring to the top of the cylinder (4).
Tighten the lock screw in the ring (5). See pict 22.
Test run all functions.

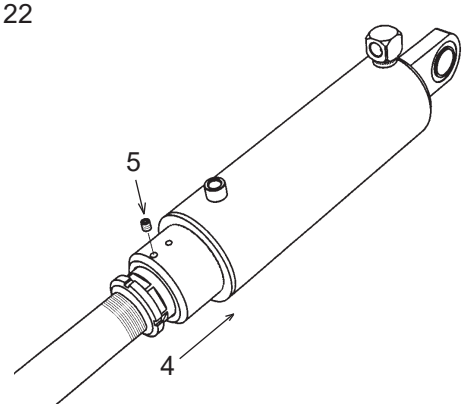
Pict. 21

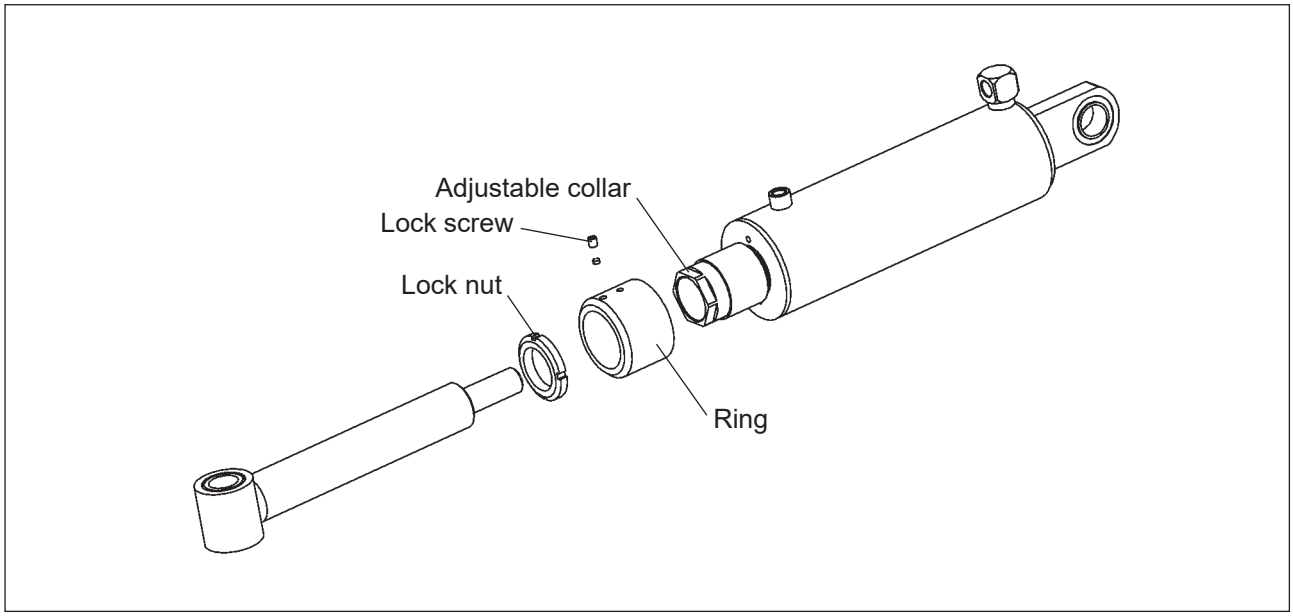


Pict. 20



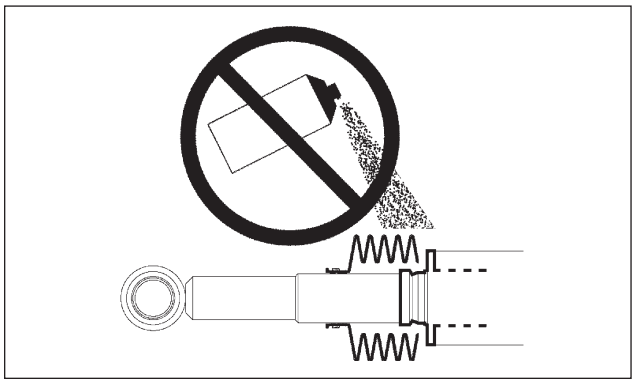
Pict. 22



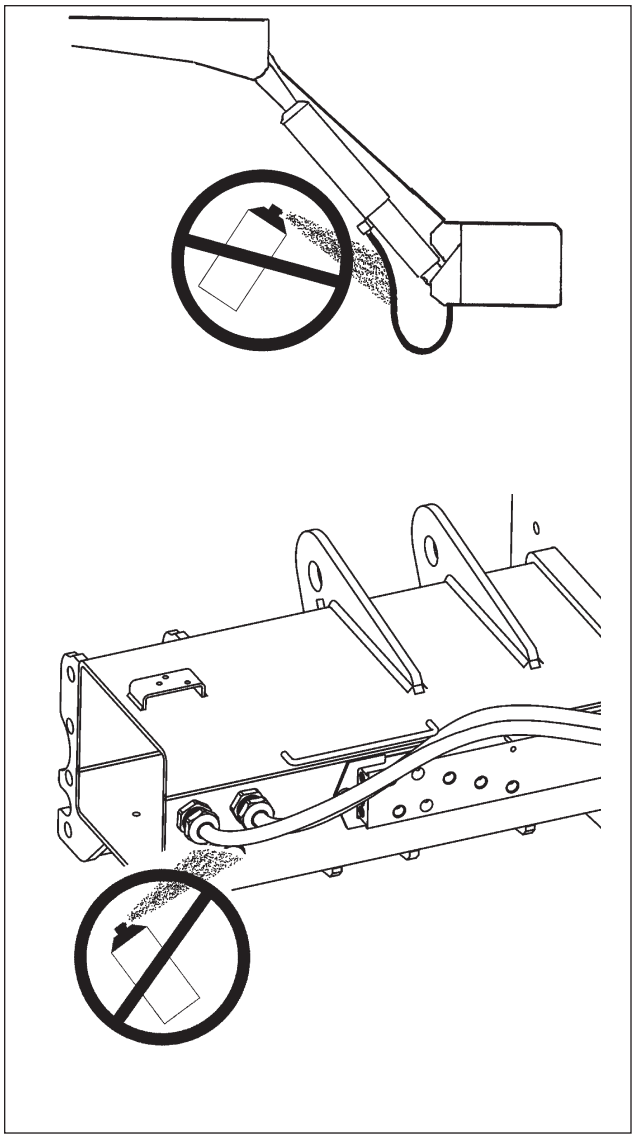


9. Important information

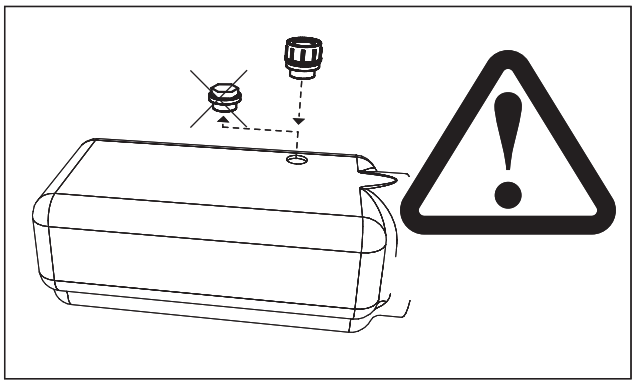
Repainting
NB. If the cylinders are to be repainted, ensure that the cylinder push rod and cover are not painted (this can damage the seals/gaskets). This also applies to rubber bellows if they exists!



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

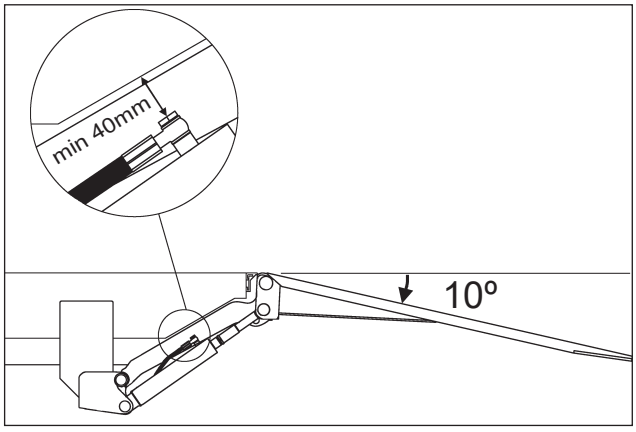


Replace the transport plug
During installation the oil tank transport plug should be removed and replaced

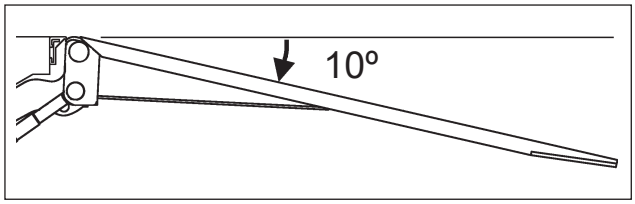


Moveable parts - free movement
When the final post-installation testing is carried out, it is important that there is sufficient clearance between the cylinders working envelopes and all fixed points. During lift operation and cylinder movement there is a risk for conflict with the subframe, truck frame,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

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



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



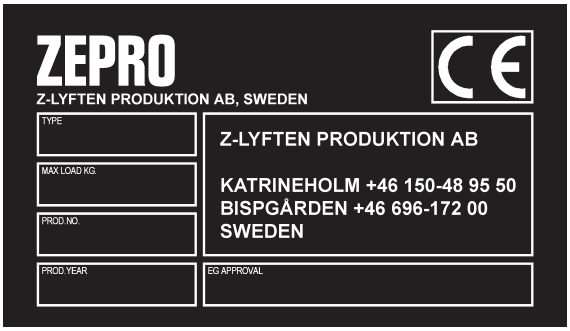
10. Markings, decals

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

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

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

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



The mark below represents the manufacturer's guarantee that the tail lift is designed and was supplied according to the requirements laid down in the European Machinery Directive. It is a customer's guarantee of high quality and safety.

CE

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

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

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

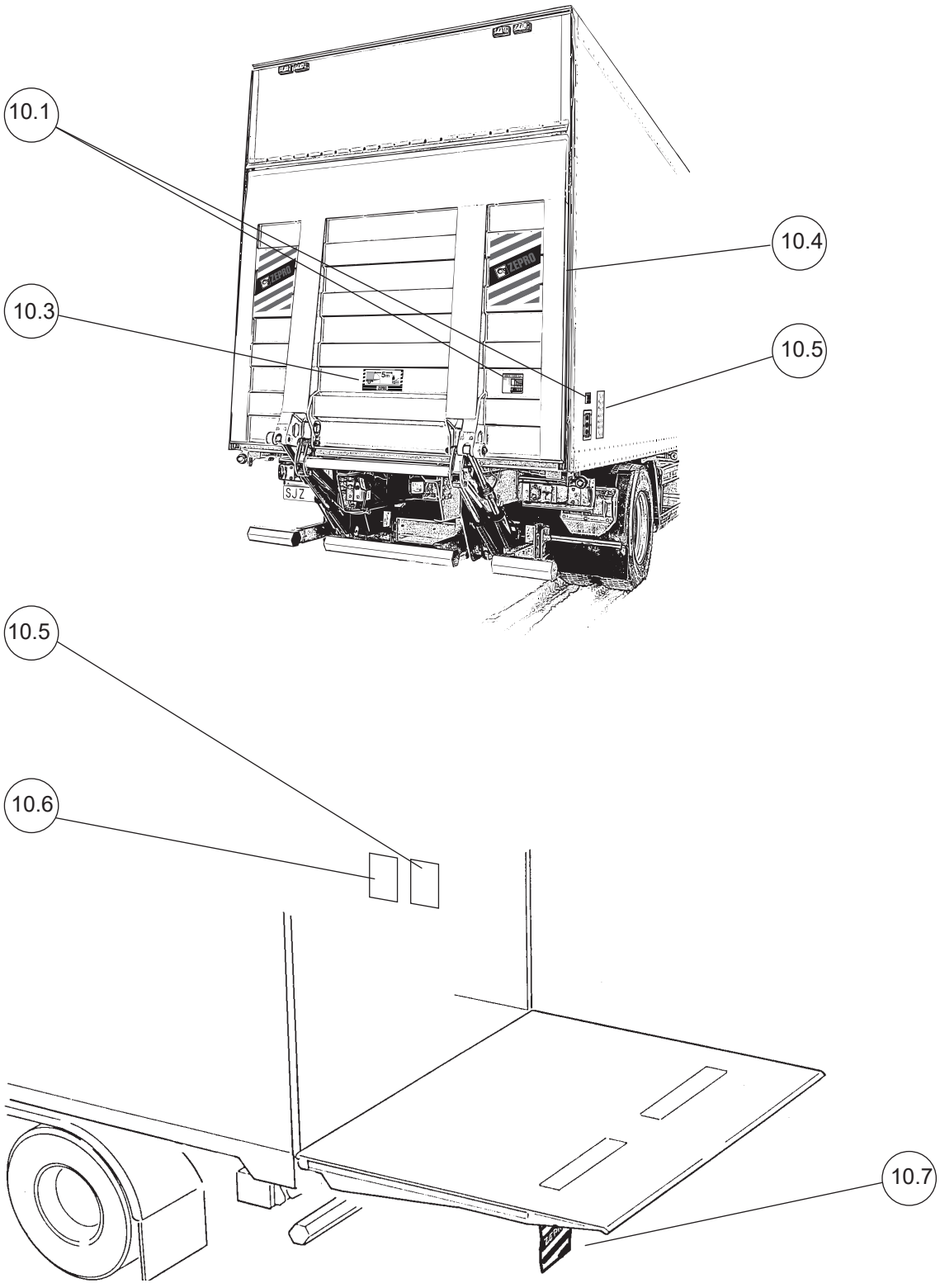
We suggest that you stick the warning tape along the side edge of the platform to make it more clearly visible when in the horizontal position.

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

10. Markings, decals

Marking

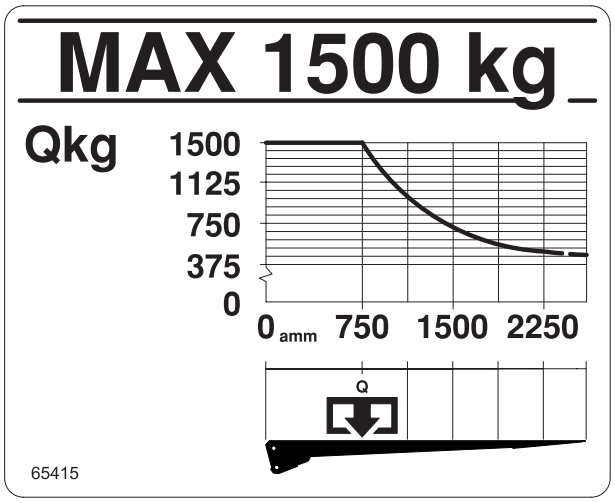
Below, an overview of the location of the different markings is shown. Image of marking and further information can be found under the each subchapter for subsequent pages.



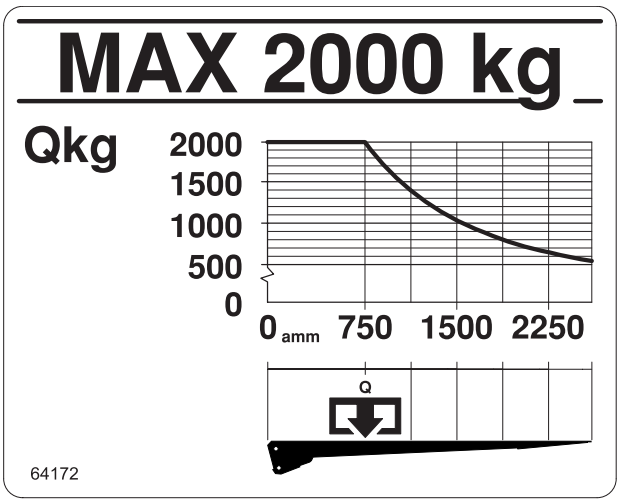
Overview of labelling

10.1. Loading diagram

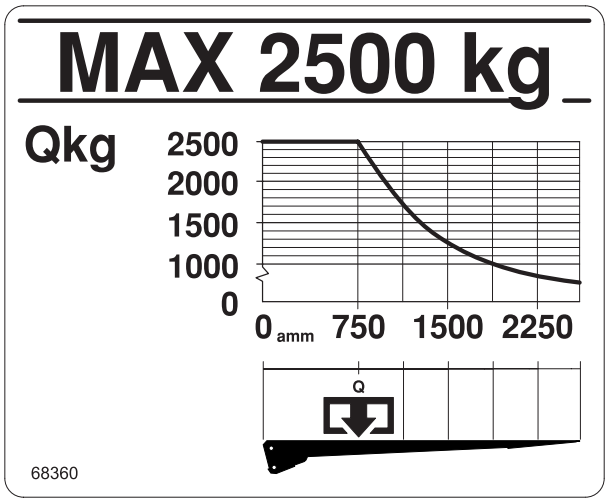
Affix the load diagrams for the appropriate lift model close to the primary controller and in a suitable clearly visible position on the vehicle body.



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



Load diagram for load capacity 2000 kg, centre of gravity distance 750 mm.



Load diagram for load capacity 2500 kg, centre of gravity distance 750 mm.

10.2. Identification plate

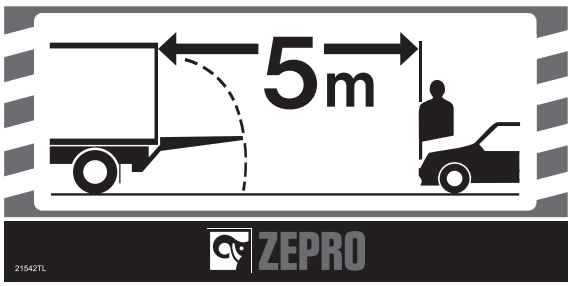
The identification plate is fixed on to the tail lift's frame. Affix the corresponding sticker version of the identification plate, preferably by the cab door post to facilitate identification.
The identification plate contains the following information:

- 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)

Identification plate

10.3. Work area

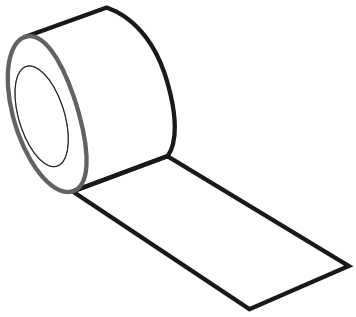
Affix the sticker clearly visible on the rear of the vehicle.



Work area

10.4. Warning tape

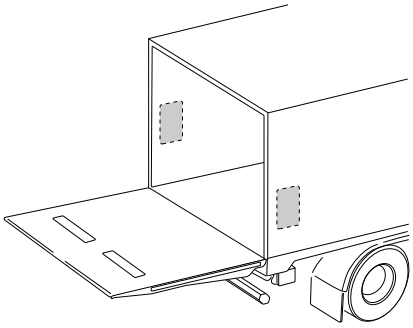
Affixed along the platform edge strips to mark the platform edges in its lowered position. The location of the warning tape often coincides with the contour marking, in which case the warning tape can be omitted.



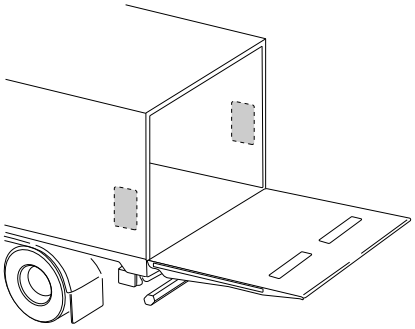
Warning tape

10.5. Controller sticker

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



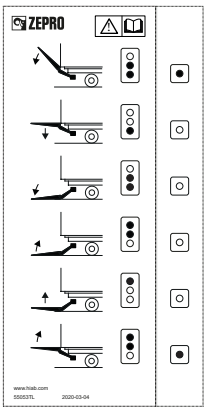
Standard mounting



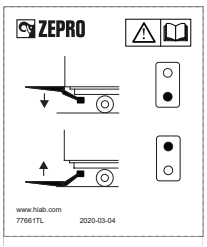
Reversed mounting

Controller	Sticker (Standard)	Sticker (Reversed)
CD 1,2,9	55053TL*	55054TL*
CD 4	55055TL	55056TL
CD 10	77661TL	77662TL

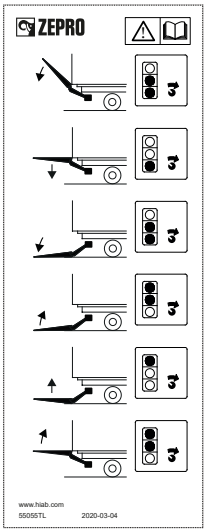
* The sticker section for 2-hand operation is delivered on the same backing paper and has to be affixed if the application has 2-hand operation. For applications without 2-hand operation, this part of the sticker is discarded.



Controller sticker for CD 1, 2, 9



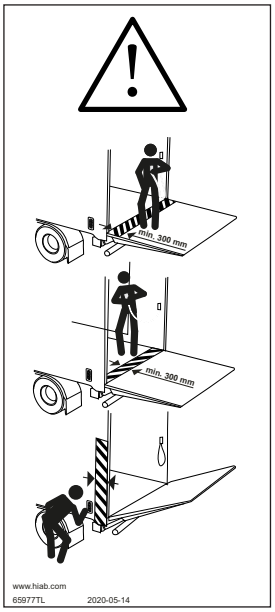
Controller sticker for CD 10



Controller sticker for CD 4

10.6. Danger area

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



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.

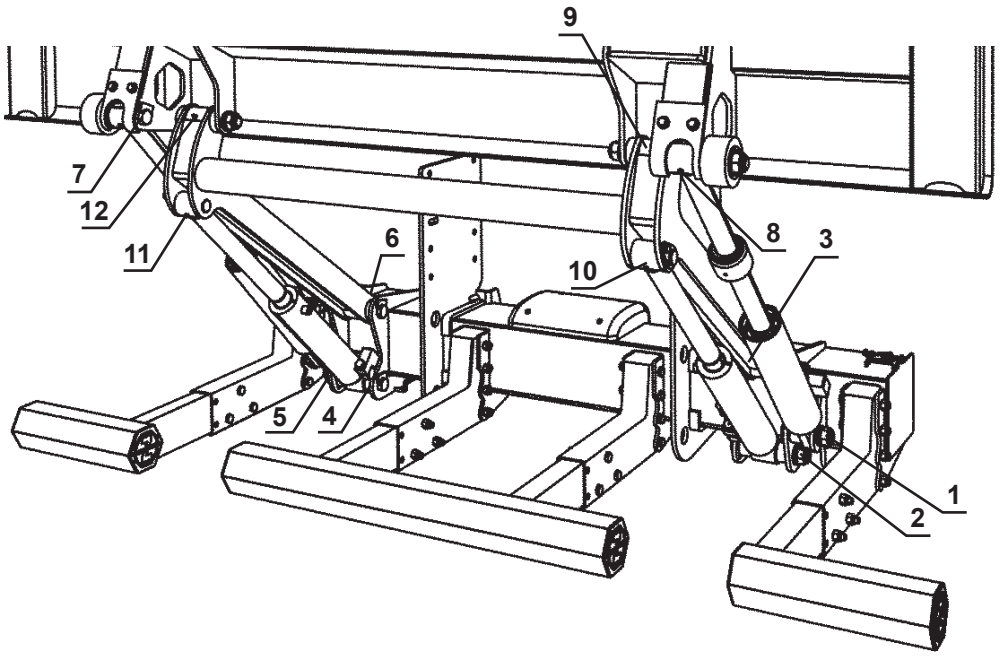
Warning flags

11. Maintenance

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

Greasing at least 8 times / year

1. Right tiltcylinder, lower bearing.
2. Right liftcylinder, lower bearing.
3. Liftarm right side, lower bearing.
4. Left liftcylinder, lower bearing.
5. Left tiltcylinder, lower bearing.
6. Liftarm left side, lower bearing.
7. Lift tiltcylinder, upper bearing.
8. Right tiltcylinder, upper bearing.
9. Liftarm right side, upper bearing.
10. Right liftcylinder, upper bearing.
11. Left liftcylinder, upper bearing.
12. Liftarm left side, upper bearing.



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

12. Load testing the tail lift

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

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

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

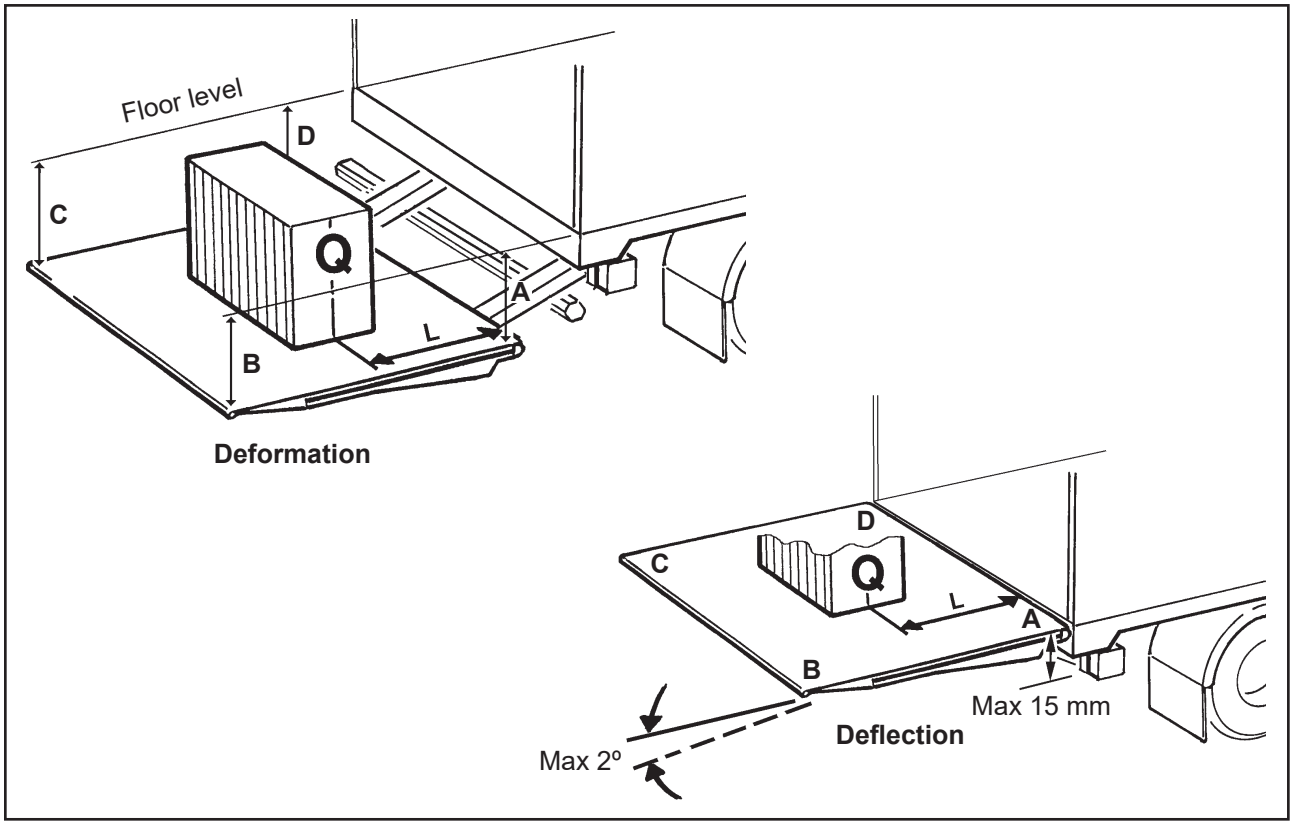
Deflection
Place a test load on the platform according to the table (for the corresponding tail lift model and loading capacity). The tail lift should be in the same level and angle as floor. Leave the test load on the platform for 15 minutes. Check that the platform´s deflection is not more than 15mm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

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

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

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

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



12. Load testing the tail lift

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

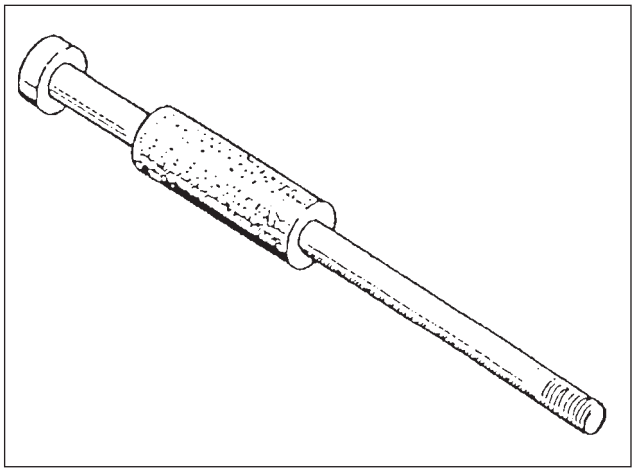
- That the platform´s mechanical lock functions correctly (where applicable).

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

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

13. Dismantling

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



HIAB

BUILT TO PERFORM

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