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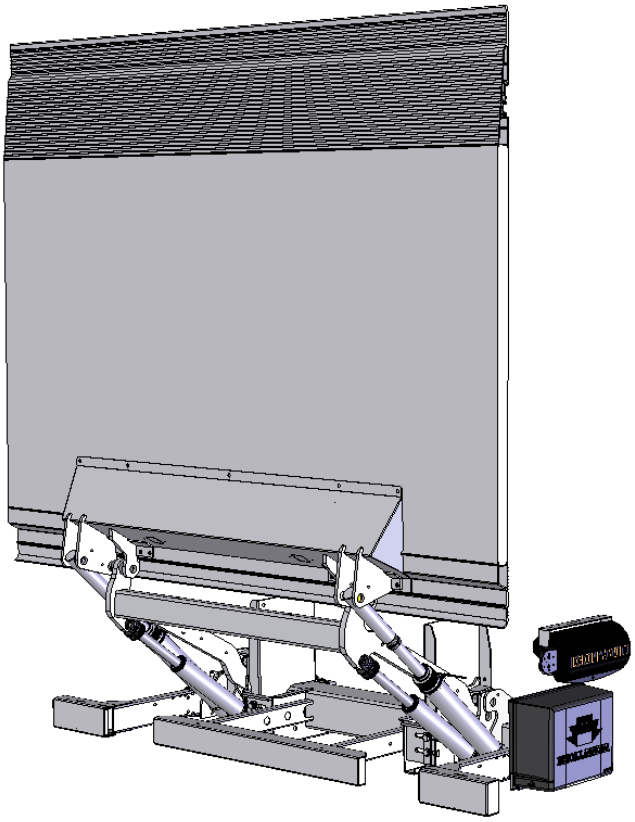
DHOLLANDIA

DH-L* 1500-3000 kg

INSTALLATION MANUAL



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Read the operation manual in its entirety before operating the tail lift

Read this installation manual in its entirety before installing the tail lift

Order ref : xxx Doc: **FIT_EUR installation manual LM.30_EUR EN_2020** Rev: **1** Date: JUNE 24, 2020

TABLE OF CONTENTS

1 UNDERSTANDING SAFETY AND WARNING SIGNS

- Many safety signs and symbols used in this manual are based on international standards, others refer to specific situations or actions.
- Consult appendix 16.1 on page 56 for an overview of signs and symbols used in DHOLLANDIA manuals, and their meaning. Make sure you understand these signs and symbols prior to starting the installation.
- Please take special notice of the following signs used in the manual. They indicate the likelihood and severity of a potential injury if a person fails to follow the instructions presented on the safety sign.

DANGER: indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. [white letters on red background]

WARNING: indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. [black letters on orange background]

CAUTION: indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. [black letters on yellow background]

NOTICE: is used to address practices not related to physical injury. [white letters on blue background]

SAFETY INSTRUCTIONS: indicate general instructions relative to safe work practices, reminders of proper safety procedures, or the location of safety equipment. [white letters on green background]

SAFETY ALERT SYMBOL: is used to alert the user to potential hazards. All safety messages that accompany this sign shall be obeyed to avoid possible harm. [free-standing, or on background colours red, orange, yellow or black]

⚠ WARNING

- Failure to understand and to follow the instructions in this manual can put the operator and any bystanders at great risk of serious bodily injury and death.
- Prior to operating the tail lift, make sure you understand the safety and warning signs used, and read them in conjunction with the instructions in this manual.
- If in doubt, DO NOT operate the tail lift. Contact your national DHOLLANDIA distributor. See page 4 for contact info.

2 INTRODUCTION , CONTACT INFO AND DISCLAIMERS

- This manual provides you with the information necessary for the installation of the 1500 – 3000 kg capacity DH-L* cantilever lifts.
- It contains general instructions applicable to the most common types of trucks and trailers. Possibly, specific issues particular to your case are not adequately covered by this manual. If in doubt, contact your national DHOLLANDIA distributor for further assistance prior to continuing.

⚠ WARNING

- Improper installation can cause damage to the tail lift, can reduce its durability and reliability, and can put the operator and bystanders at great risk of serious bodily injury and death in many ways.
- It is therefore essential that the tail lifts are installed with proper care, in compliance with the installation instructions of this manual and the fitting and body building instructions of the vehicle manufacturer.
- In case of doubt, ALWAYS contact your national DHOLLANDIA distributor for further advice, prior to continuing.

- DHOLLANDIA tail lifts are regularly adapted to new vehicle and chassis developments and specialised customer requirements. Therefore, DHOLLANDIA reserves the right to alter product specifications without prior notice. Such modifications might not have been included at the time this manual was printed.

NOTICE

- Please confirm you have reviewed the most up-to-date version of this manual prior to operation of the associated DHOLLANDIA tail lift. See below for instructions to download the latest version of the manual.
- It is the sole responsibility of the installer(s) to follow best workshop practices for safety and craftsmanship and to use good common sense.

- Contact your national DHOLLANDIA distributor if you have any questions regarding the installation, operation, repair and maintenance of DHOLLANDIA tail lifts, or to obtain replacement copies of manuals or decals:

If in doubt where to find your national DHOLLANDIA distributor, visit the official DHOLLANDIA website:
www.dhollandia.com → Country & language selection → Distributors & service

The latest version of all manuals can also be downloaded from the DHOLLANDIA website:
www.dhollandia.com → Country & language selection → Downloads → … select required manual

- Take notice of the following important disclaimers:

DISCLAIMERS

- DHOLLANDIA disclaims liability for any personal injury, death, or property damage that results from **operating a tail lift that has been modified from the original design**, without written approval from the manufacturer.
- DHOLLANDIA disclaims liability for any personal injury, death, or property damage that results from **improper use of the tail lift or negligence to apply the precautions and instructions of the operation manual**.
- DHOLLANDIA disclaims liability for any personal injury, death, or property damage that results from **incorrect of negligent installation**.
- There are no warranties, express or implied, including the warranty of merchantability or a warranty of fitness for a particular purpose extending beyond that set forth in this manual.

3 SAFETY PRECAUTIONS FOR OPERATION

- It is essential that the installers understand and apply the safety instructions and precautions contained in the OPERATION MANUAL issued with the tail lift.
- Therefore, make sure you consult the OPERATION MANUAL prior to installing or operating the tail lift.

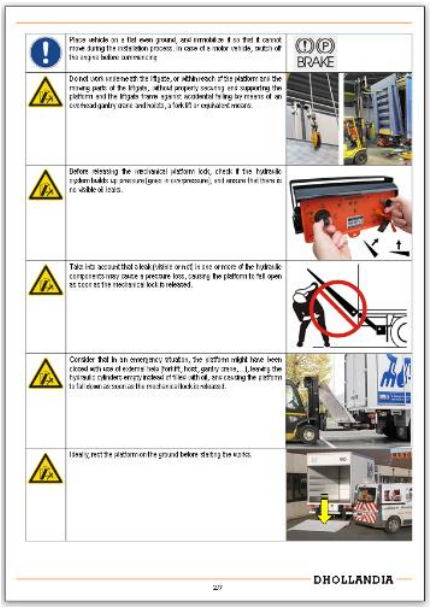
⚠ WARNING

- Improper use of the tail lift will put the operator and other parties at great risk of serious bodily injury and death.
- To reduce the risk of serious bodily injury to the operator and any bystanders, the use of the tail lift is restricted to skilled operators, who have been properly trained, and who know and understand the full content of the operation manual.
- To reduce the risk of serious bodily injury or death, the operator must comply with all safety instructions and warning labels in the operation manual before and while operating the tail lift.
- Please confirm you have reviewed the most up-to-date version of this manual prior to installation and operation of the associated tail lift.

4 SAFETY PRECAUTIONS FOR INSTALLATION

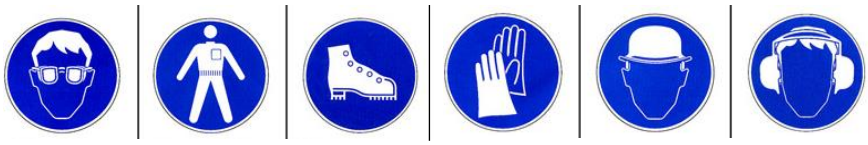
- It is essential that the personnel involved in installing, servicing and repairing tail lifts knows, understands and applies the safety instructions and precautions contained in the GENERAL SAFETY INSTRUCTIONS FOR INSTALLATION, MAINTENANCE AND REPAIR manual.
- Make sure you consult these instructions prior to installing the tail lift.
- Safety instructions are a matter of progressive insight. The basics are listed in this manual, but contact the national DHOLLANDIA distributor for a copy of the latest set of instructions [see contact info on page 4], or download the latest edition from the DHOLLANDIA website:

  www.dhollandia.com → Country & language selection → Downloads → Operation manuals → General information →… select required manual



⚠ WARNING

- The installers are exposed to various dangers. Improper use of the tail lift, ignorance and neglect during installation, will put them at great risk of bodily injury and death.
- Once the tail lift is in service, improper installation can cause damage to the tail lift, can reduce its durability and reliability. Further, it can also put the operator and bystanders at great risk of serious bodily injury and death.
- Therefore installation works MUST be carried out by skilled technicians, who have been professionally trained, and master the content of all manuals:
    1. OPERATION MANUAL
    2. INSTALLATION MANUAL
    3. GENERAL SAFETY INSTRUCTIONS FOR INSTALLATION, MAINTENANCE AND REPAIR
- ALWAYS confirm you have reviewed the most up-to-date version of these manuals prior to installation and operation of the associated DHOLLANDIA tail lift.
- In case of doubt, ALWAYS contact the national DHOLLANDIA distributor for further advice, prior to continuing.
- ALWAYS wear appropriate Personal Protective Equipment. This includes but may not be limited to: safety glasses with side guards or a wrap-around face shield; steel toe safety shoes; fire-resistant overalls; protective gloves; adequate ear protection; a safety helmet when working under the vehicle chassis.



- NEVER wear loose-fitting clothes that may get trapped in the moving parts of the tail lift, or in any machinery and tools used for the installation. Don't wear rings, bracelets, necklaces, watches etc…
- ALWAYS use the proper tool for the job. Replace worn or damaged tools before use.
- Pay special attention to the lifting devices (forklifts with slings, overhead cranes, hoists, etc.) used to handle the tail lifts, and for the clamping tools used to clamp the tail lift, its platform, mounting plates and various other components to the vehicle chassis and / or body. Ensure these tools are appropriate for the job, and in good working order.
- Place the vehicle on a flat even ground and chock the wheels so that it cannot move during the installation. In case of a motor vehicle, make sure the engine is off and the parking brake is engaged.
- Do not work underneath the tail lift or within reach of the platform and the moving parts, without properly securing and supporting the platform and the lift frame against an accidental fall. Use an overhead crane and hoists, a forklift with slings or equivalent means to secure the heavy components.
- NEVER modify DHOLLANDIA tail lifts or their mounting plates without prior written approval from the manufacturer.

NOTICE

- Make sure the main battery power is disconnected while installing the tail lift. Connect the battery power to the tail lift only when the installation is completed, or as required in the installation instructions.
- **DHOLLANDIA tail lifts are designed as a bolt-on system, and don't require any welding. See appendix 16.2 on page 58 for prescribed torque values.**

- If for any reason, trouble-shooting and / or repair might be needed during the installation process, consult and follow the guidelines and safety instructions of the MAINTENANCE MANUAL.

- If for any reason, welding would be required, please take note of the following precautions:

⚠ CAUTION

	Welding on galvanised parts can produce hazardous fumes. To avoid intoxication: • ALWAYS wear a suitable respirator. • ALWAYS provide good ventilation. • ALWAYS grind off the galvanisation from the areas to weld.
	• Most tail lifts are equipped with thermoplastic hoses, that can be damaged by hot metal chips, welding sparks and slag. Damage to a hose can lead to sudden loss of hydraulic pressure and an accidental drop of the platform. • The penetration of welding sparks and slag can also cause a flash fire. • Both types of incidents can put the welder or installer and any bystanders at great risk of personal injury or death. To avoid these risks: → ALWAYS protect and cover thermoplastic hoses with a welding blanket, prior to grinding, drilling and welding. → ALWAYS inspect the hydraulic hoses at the end of the installation process. Make sure all hoses are undamaged, replace them if required.
	Welding can cause severe damage to the electronic components of the vehicle and tail lift. To prevent damage: • ALWAYS follow the instructions and precautions of the vehicle manufacturer. • DO NOT weld if this is not authorised by the vehicle manufacturer. • ALWAYS disconnect the positive and negative battery terminals. • ALWAYS connect the earth directly to the component being welded, as close to the weld as possible. Welding should be done by skilled and qualified installers only.

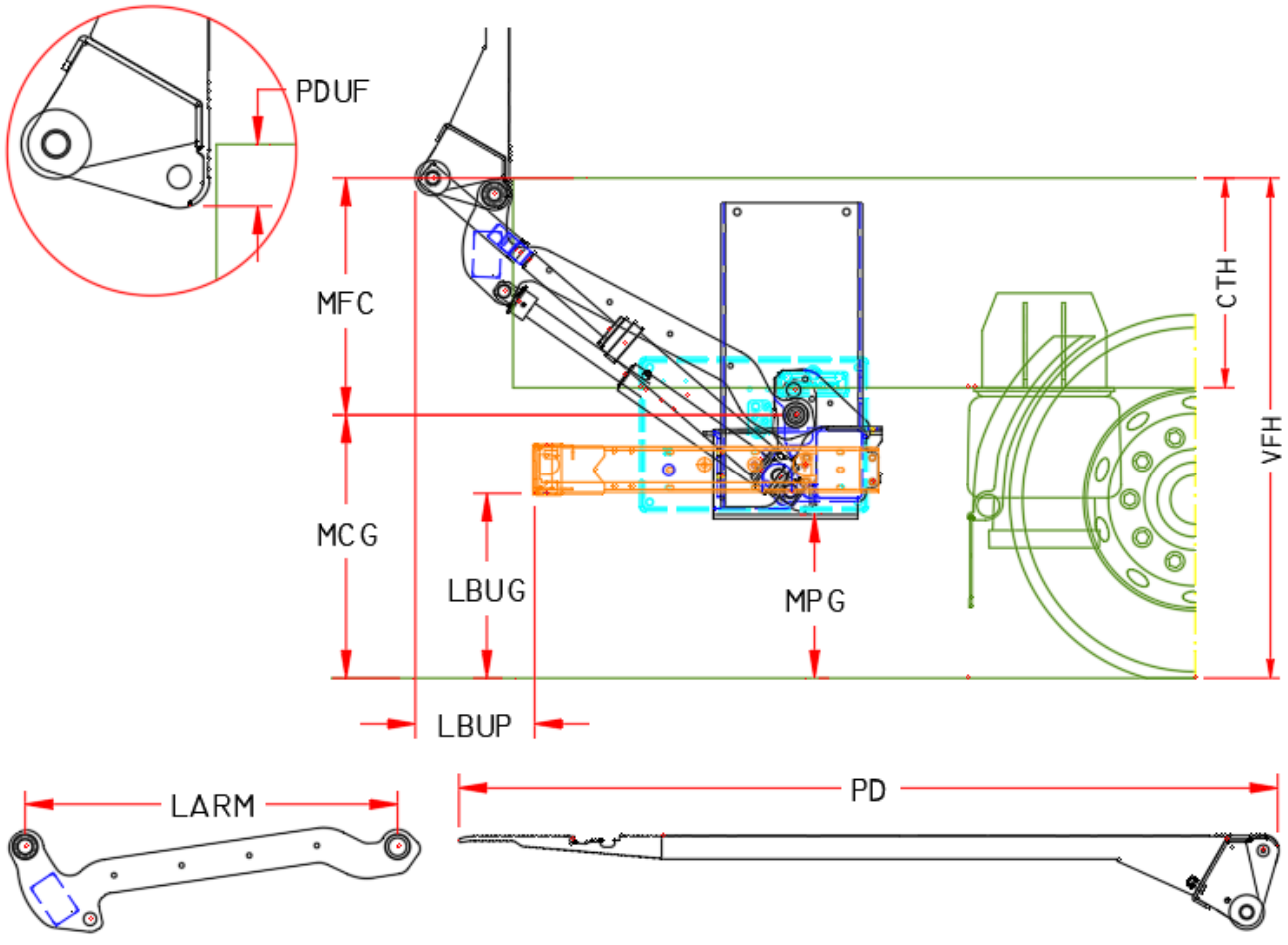
5 TAIL LIFT TERMINOLOGY

5.1 DH-LM* TAIL LIFT TERMINOLOGY

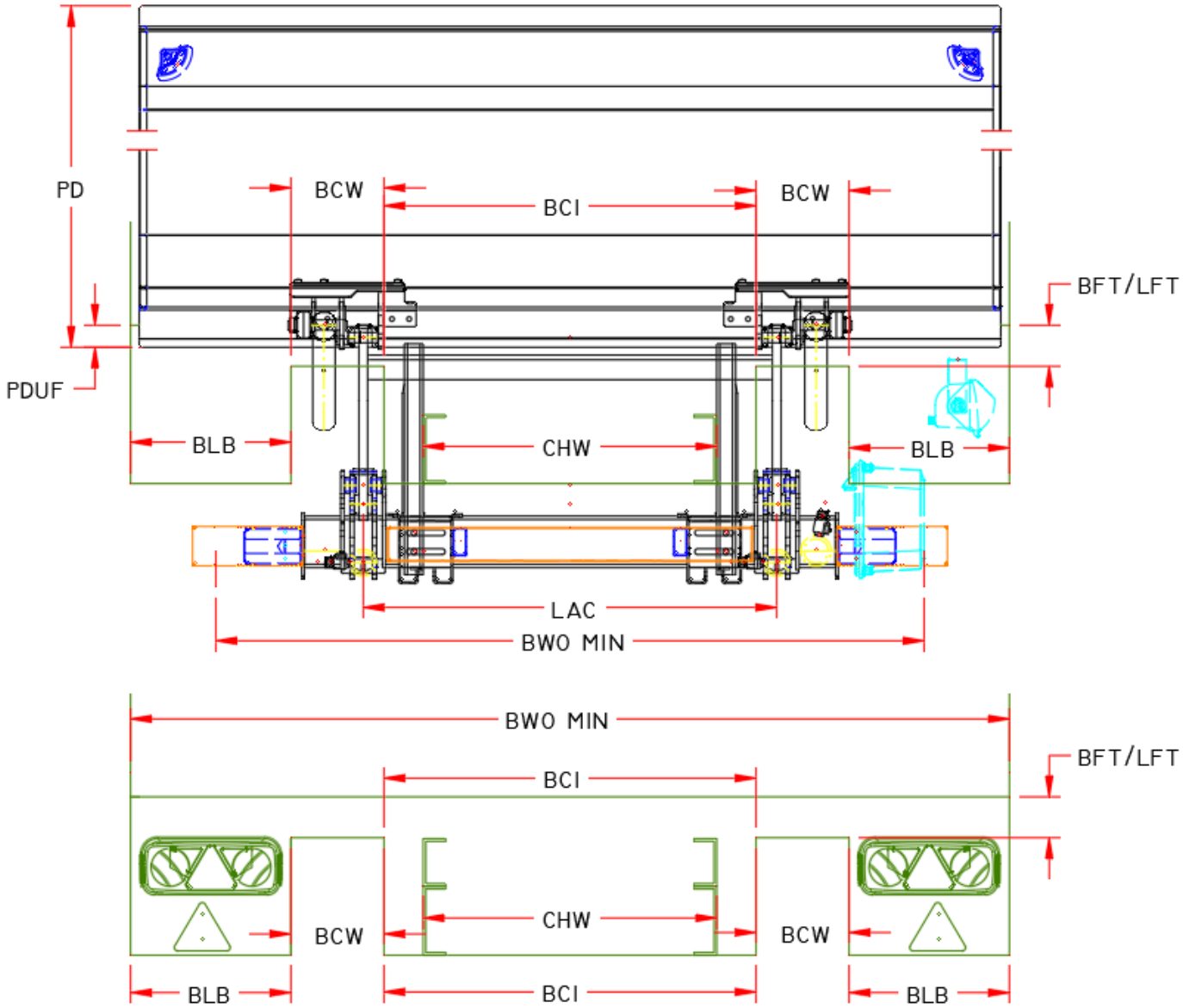
Refer to the OPERATION MANUAL for an overview of the most important terminology used in DHOLLANDIA manuals.

5.2 INSTALLATION PARAMETERS TERMINOLOGY

larm	Lift **ARM** length	Length of the lift arms
vfh max	**V**ehicle **F**loor **H**eight max	Max. vehicle floor height (UNLOADED), applicable for the given arm length
vfh	**V**ehicle **F**loor **H**eight	Actual vehicle floor height (UNLOADED)
vfh min	**V**ehicle **F**loor **H**eight min	Min. vehicle floor height (FULLY LOADED)
cth max	**C**hassis **T**otal **H**eight max	Max. height from underside of chassis to top of the vehicle floor, applicable for the given arm length
cth	**C**hassis **T**otal **H**eight	Actual height from underside of chassis to top of the vehicle floor
mfc	**M**ounting height **F**loor to **C**entre of lift arm	Mounting height of lift frame under the vehicle: measured from the top of vehicle floor to the centre of the lift arm
mcg	**M**ounting height **C**entre of lift arm to **G**round	Mounting height of lift frame above the ground: measured from the centre of the lift arm to the ground
mpg	**M**ounting clearance **P**lates to **G**round	Ground clearance under tail lift
lbup	Lift **BU**mper to rear of **P**latform	Horizontal dimension from rear of platform to rear of bumper bar
lbug	**L**ift **BU**mper to **G**round	Vertical clearance of bumper bar to ground
pd	**P**latform **D**epth	Overall platform depth
pduf	**P**latform **D**epth **U**nder **F**loor	Section of the platform that protrudes below the vehicle floor in closed position



lof	**L**ift **O**verhang to **F**rame	Required overhang to end of lift frame
lop	**L**ift **O**verhang to **P**ower pack	Required overhang to end of the premounted power pack
lac	**L**ift **A**rm **C**entre	Centre width of the lift arm
chw	**CH**assis **W**idth	Chassis width of the vehicle
bwo min	**B**ody **W**idth **O**utside min	Min. body width with power pack in premounted position
bci	**B**ody **C**ut **I**nside	Width of the mid panel between the lift arms
bcw	**B**ody **C**ut **W**idth	Width of the cut-outs for the lift arms and tilt cylinders
blb	**B**ody **L**ight **B**oxes	Available mounting space for rear truck lights on outside of the tilt cylinders
bft	**B**ody **F**loor **T**hickness	Thickness of the rear cross member of the vehicle floor
lft	**L**ift **F**loor **T**hickness	Max. thickness of the rear cross member of the vehicle floor, in the manoeuvre zone *bcw* for the lift arms and tilt cylinders



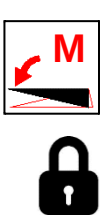
5.3 GETTING STARTED

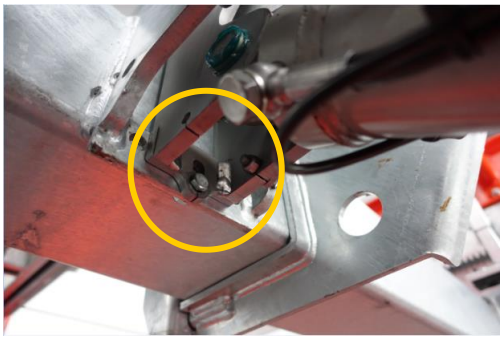
- Many vehicle manufacturers issue important instructions on various aspects of the tail lift installation, specific to the brand and type of chassis. Examples:
  - → welding instructions or the prohibition to weld
  - → instructions on chassis drilling and bolt-on connections to the chassis
  - → recommendations on the use of hydraulic stabilising legs
  - → guidelines on fuses, electrical interfaces, and the connection of battery and earth cables, etc.

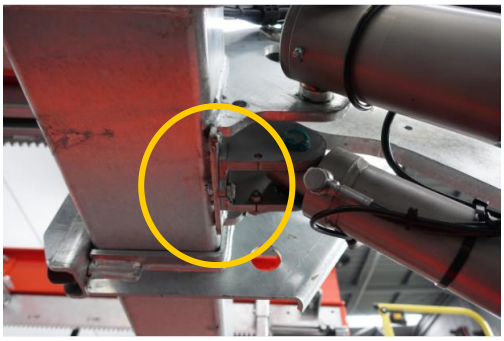
NOTICE

- ALWAYS verify and ensure compatibility between the tail lift and the vehicle.
- ALWAYS ensure compliance with the fitting and body building instructions issued by the vehicle manufacturer.
- Make sure planned modifications to the vehicle chassis and body will not adversely affect the strength and integrity of the vehicle.
- If the instructions of vehicle manufacturer conflict with the installation instructions issued by DHOLLANDIA (e.g. on fuse ratings, etc.), contact your national DHOLLANDIA distributor for further advice. See contact info on page 4.

- Verify if the installation kit is complete and that all parts needed to install the tail lift, are present.
- Compare the voltage of the batteries with the voltage of the hydraulic power pack of the tail lift.
- Compare the actual vehicle dimensions with the maximum installation parameters indicated in the INSTALLATION DRAWING or technical documentation. If the actual dimensions go outside of the maximum installation parameters, DON'T continue and contact your national DHOLLANDIA distributor for further advice.
- Verify and make sure that the vehicle chassis and body are strong enough to support the forces induced by the tail lift at its maximum rated capacity. Refer to the instructions of the vehicle manufacturer for calculation and construction guidelines.
- Execute the required stability and weight distribution calculations.
- Make sure that the body is accurately fitted to the vehicle chassis.
- Remove all objects that impede the installation of the tail lift (bumper bar, spare wheel carrier, pallet racks, tool boxes, etc.). If necessary, consult with the vehicle manufacturer for replacement solutions (e.g. special spare wheel carriers, exhaust pipe modifications, etc.).
- Finish the tail lift in accordance with the road legislation of the country where the vehicle will be registered.
- When connecting hydraulic couplings, make sure that the connections are clean. Don't contaminate the hydraulic oil.
- Grease all bearings and pins before putting the tail lift into service. Preferably, put grease in the bearings before mounting the corresponding articulation pin.
- After installation, work through the checklist of the Pre-Delivery Inspection (PDI) test. Make sure the final inspection is signed off by an inspector who is not part of the installation team.
- Do not pressurise any tail lift functions (LIFT / CLOSE) before the installation is fully finished.
- During installation and testing, verify and make sure that the tail lift and its moving parts don't interfere with any of the vehicle systems (e.g. the suspension, braking system, hydraulic and electrical circuits, etc.), or cause damage to them.
- Do not release the locking bolts of the auto-tilt swing brackets before the tail lift installation is fully finished.



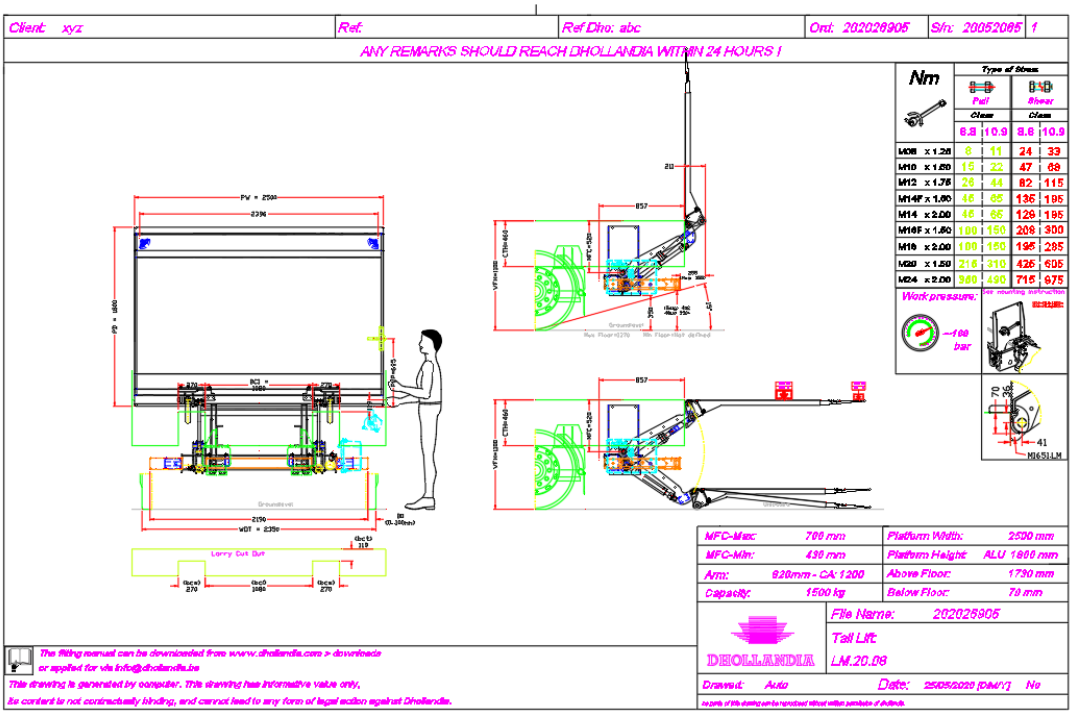




6 INSTALLATION DIMENSIONS AND GUIDELINES

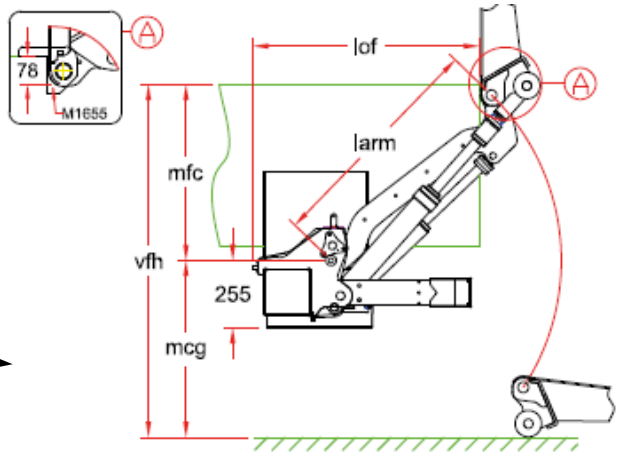
6.1 INSTALLATION DIMENSIONS

- The INSTALLATION DRAWING sent upon the order confirmation, will provide you with the critical installation dimensions that should be observed.



- If no installation drawing is available, use the DHOLLANDIA POCKET GUIDE (paper or App) to learn the maximum and minimum installation parameters per type of tail lift.

EXAMPLE



Fitting dimensions

larm		820	880	940	1000	1100	1200
vfh max.		1330	1420	1500	1590	1730	1870
mfc max.		680	730	780	820	900	980
mfc min.		300	300	350	400	450	500
mcg max.		650	690	720	770	830	890
lof	at mfc max.	770	800	835	880	940	1000
lof	at mfc min.	1030	1095	1140	1190	1275	1365

- Compare the maximum installation parameters indicated in these sources with the actual vehicle dimensions. If the actual dimensions go outside of the maximum installation parameters, DON'T continue and contact your national DHOLLANDIA distributor for further advice.
- The applicable mounting height *mfc* is given in the INSTALLATION DRAWING, or can be calculated by means of the following formula:

$$\text{mounting height } mfc = \frac{\text{vehicle floor height } vfh - 140}{2}$$

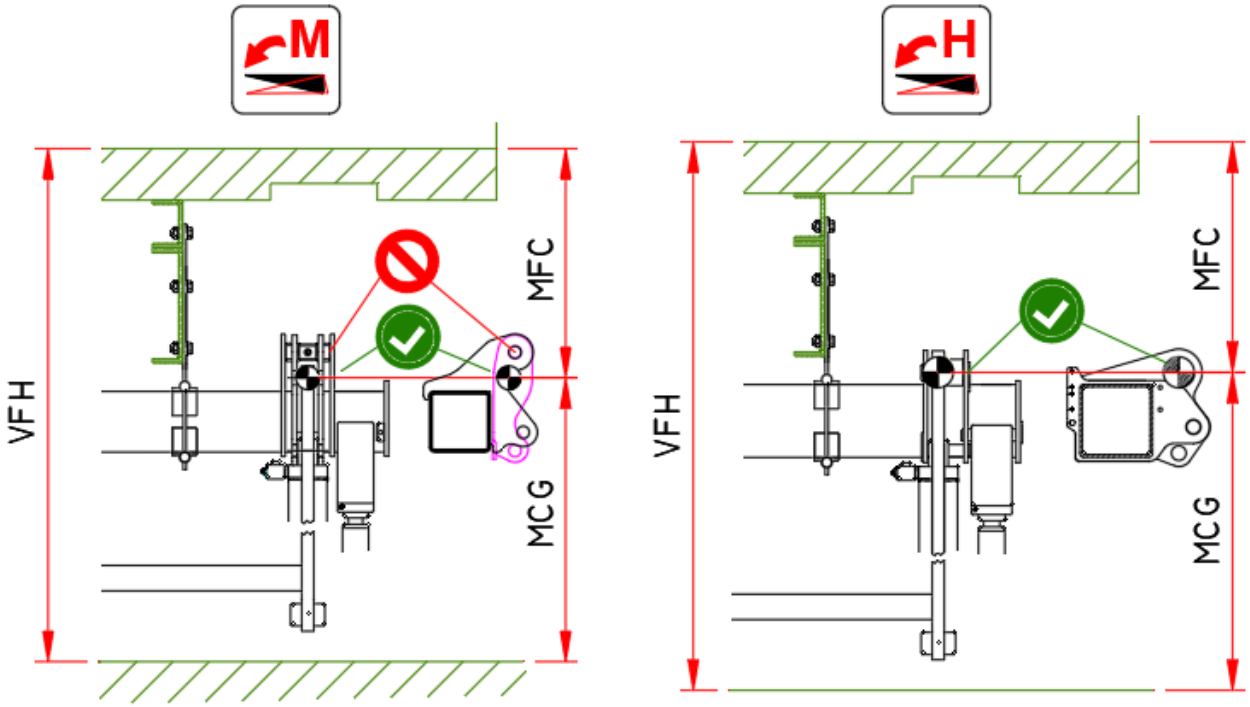
Example: For vehicle with 1250 mm floor height → mounting height *mfc* = (1250 – 140) / 2 = 555 mm

- Deviation is allowed as long as the maximum installation parameters *vfh, mfc, mcg* are respected.

NOTICE

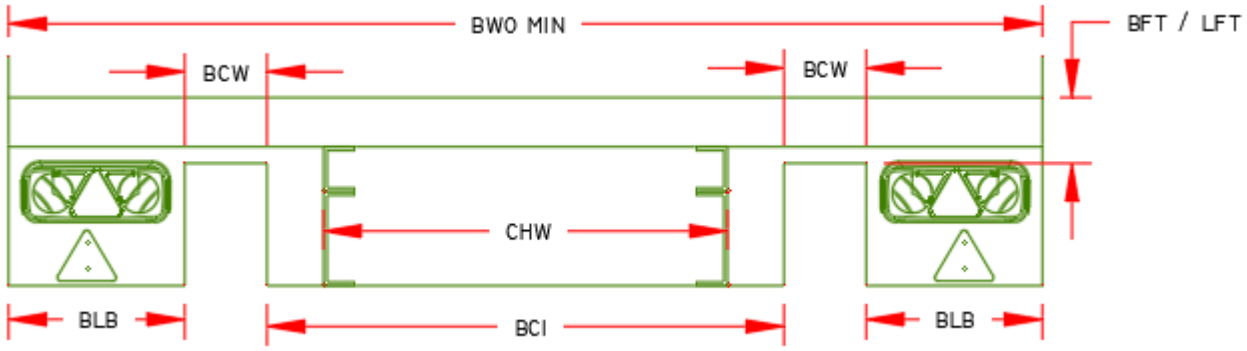
- When determining the installation dimensions, ALWAYS make sure to respect the maximum installation parameters *vfh, mfc, mcg*.
- Study the image below explaining how *mfc* and *mcg* are correctly measured.
- ALWAYS make sure you comply with applicable bumper bar regulations and observe the required dimensions *lbug, lbup*.

- The mounting height *mfc* is measured from the top of the vehicle floor to the centre of the lift arm. The image below shows how this is measured for tail lifts with a hydraulic auto-tilt at ground level (DH-LE* / LSP*) and mechanical auto-tilt at ground level (DH-LM*).

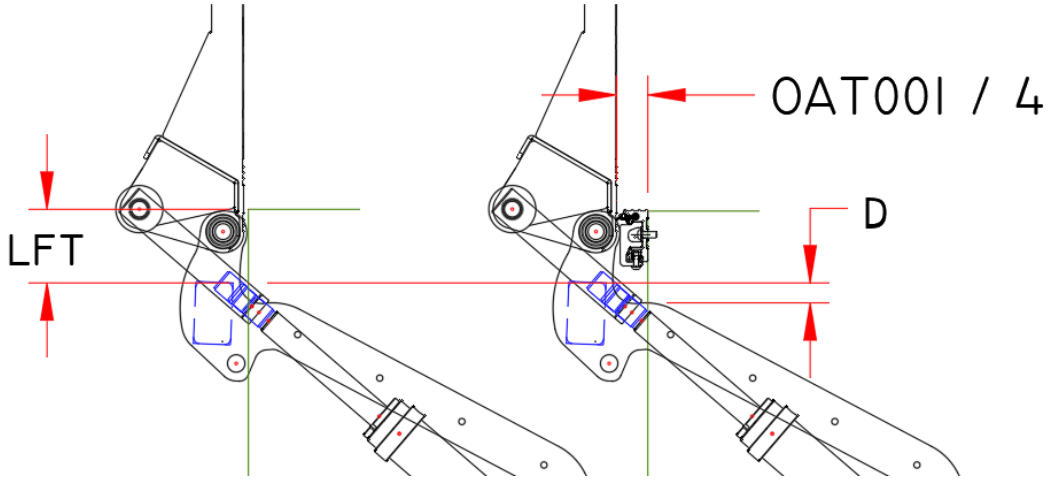


- The required overhang *lof / lop* varies in function of the arm length *larm* and the chosen mounting height *mfc*. Refer to the POCKET GUIDE (paper or App) for minimum overhang values (at *mfc max*) and maximum overhang values (at *mfc min*).
- The arm width *lac* determines the body dimensions *bci, bcw* and *blb* (see below).

- The arm width and the position of the power pack (standard at the side, or optionally in the middle) determines the *bwo min*.



- In the areas *bcw* where the lift arms and tilt cylinders cross the rear cross member of the vehicle floor, this rear cross member must be restricted in height to dimension *lft*. This *lft* depends on the mounting height *mfc* and the position of the platform behind the rear of the body:
  - → If platform is mounted directly against the rear frame, dimension *lft* is lower.
  - → If platform is mounted with sealing rubbers or other spacer, dimension *lft* is higher.

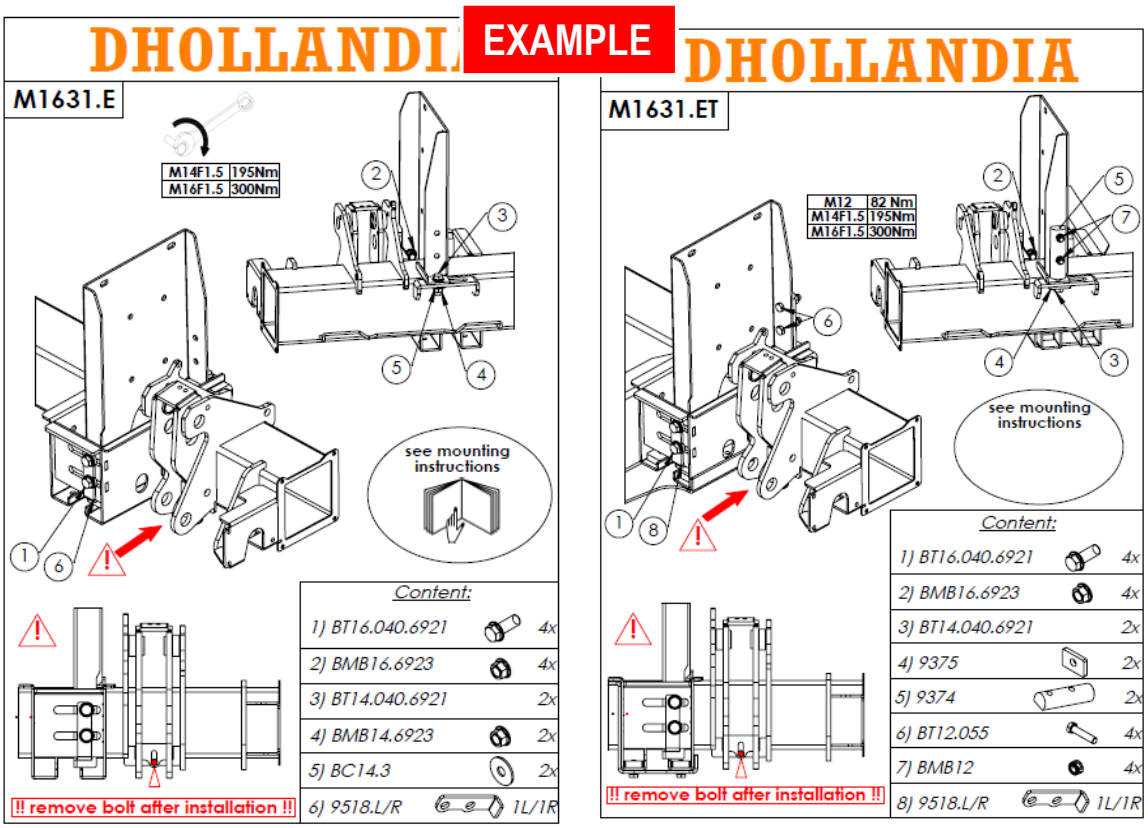


6.2 IMPORTANT GUIDELINES

6.2.1 Bolt instructions

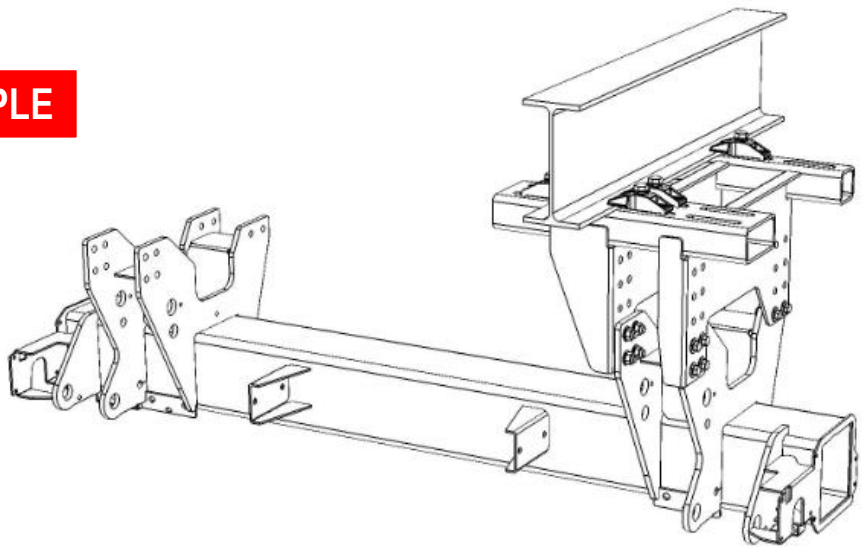
- Standard DH-L* cantilever lifts are supplied with bolt-on mounting plates ref. OAM010, suitable for basic trucks with C-shaped chassis beams. Follow the instructions in 8 from page 20 onwards to position the lift frame, determine the position of the mounting bolts and join the lift frame to the chassis. Instructions on the minimum quantity of bolts per side, their size and fastening torque, are mentioned on the instructions in the bolt kit supplied with the lift.

EXAMPLE



- For trailers and semi-trailers with I-shaped chassis beams, a special quick-fit model DH-LMR.30 is available. The DH-LMR.30 is clamped to the bottom flange of the chassis, and offers various adjustment possibilities. See 8.5 on page 29.

EXAMPLE

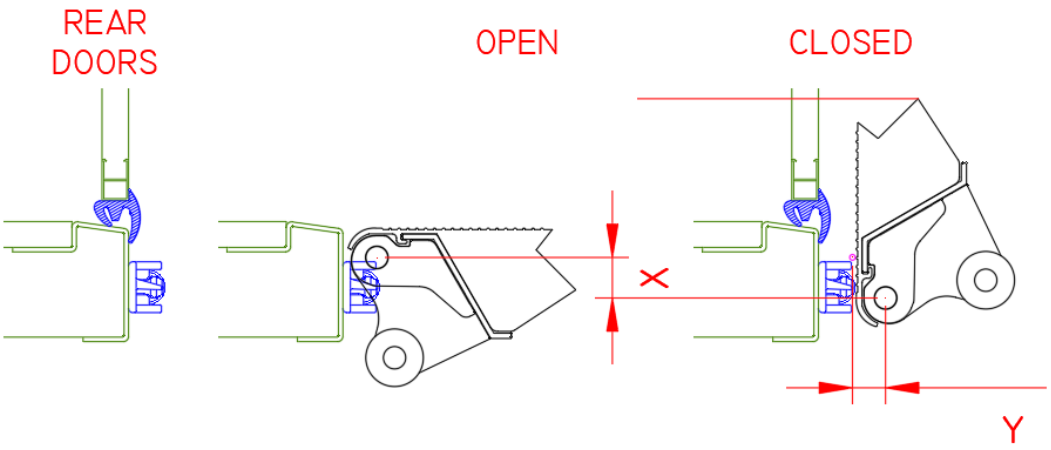


⚠ WARNING

- ALWAYS make sure that the lift frame and mounting plates are installed in accordance with the installation instructions of DHOLLANDIA.
- Pay special attention to the type of bolts, minimum quantity per side, minimum size and strength class, and the spread of the bolts over the full surface of the mounting plate. Fasten the bolts and nuts with the required torque. See Appendix 16.2. on page 58.
- Incorrect or negligent installation can cause the tail lift to fall off the vehicle chassis once the platform is loaded, and can put the installers, the operators and bystanders at great risk of bodily injury or death.
- In case of doubt, don't continue, but contact your national DHOLLANDIA dealer for further advice.

6.2.2 Rear doors with container locks

- Additional guidelines are available for cases where the rear doors sit behind the rear frame of the body and rear cross member of the vehicle floor, or where the locks sit on the outside face of the rear doors.



- These guidelines can be obtained from your national DHOLLANDIA distributor, or can be downloaded from the DHOLLANDIA website:
  www.dhollandia.com → Country & language selection → Downloads → Mounting instructions → Standard cantilever tail lifts → DH-LM Container locks

NOTICE

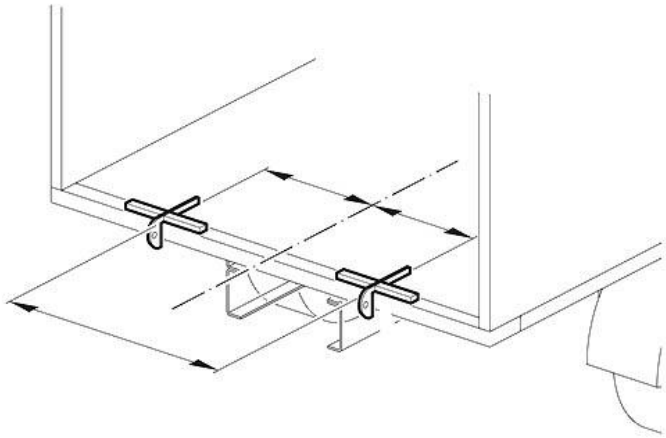
- To stow the platform correctly, it must first be LIFTED to the vehicle floor until the hydraulic circuit goes in overpressure. Then CLOSED, again until the hydraulic circuit goes in overpressure.
- If the maximum height differs in the horizontal work position and in the travel position, operators are left to "guestimate" how the platform should be closed correctly.
- Incorrect operation can lead to damage to the platform and vehicle body, or premature wear of articulation pins and bearings. It is therefore essential that the body is properly designed to work correctly in conjunction with a cantilever lift of any brand.

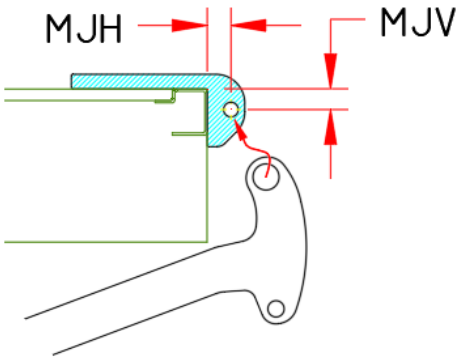
7 METHODS TO MOUNT LIFTFRAME

- There are 3 different methods to mount the tail lift:
  1. With fitting jigs (option OAM103). Universal method, suitable for situations where the platform forms the full rear closure of the rear body aperture (without rear doors), or stands behind the vehicle doors.
  2. Using the platform in vertical position. Equivalent to # 1, with the additional benefit that it allows to compensate the platform position if the body stands askew.
  3. Using the platform in horizontal position. Suitable for factory-built panel vans, or for bodies with door locks mounted behind the rear door. See also 6.2.2 on page 15.
- Methods # 1 and # 2 can only be used for STANDARD platforms with a conventional rounded edge [ref. OAP310].
- Platforms with extended edge (options OAP312, OAP313, OAP407, etc.) require method # 3.

7.1 METHOD WITH THE FITTING JIGS

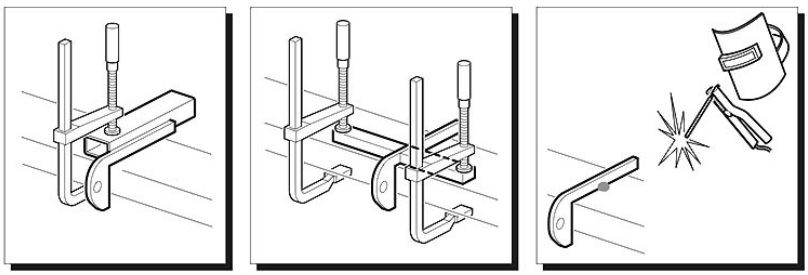
- Measure the outside width across the lift arms. This dimension corresponds with the inside width needed between the 2 fitting jigs.
- Mark the centre line of the vehicle on the rear cross member of the vehicle floor. Position the 2 fitting jigs so that:
  1. the distance between the 2 fitting jigs matches the outside width across the lift arms.
  2. the distance from each fitting jig to the centre line is equal, so that they are perfectly centred in the rear body aperture.

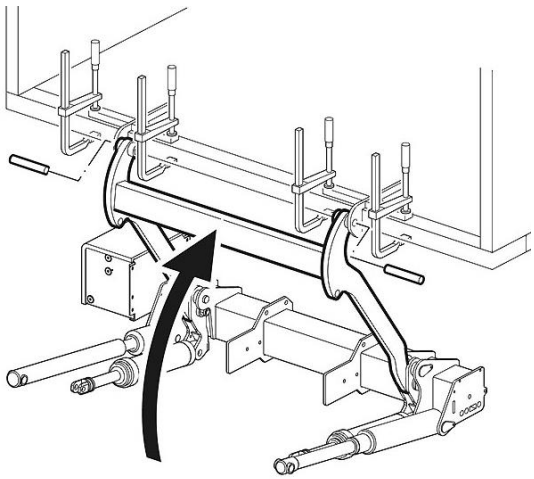




mjh and *mjv* are also confirmed on the INSTALLATION DRAWING sent upon order confirmation.

- For half width platforms, position the fitting jigs in function of the arm width *lac*, and the foreseen position of the half platform in the rear body aperture.
- Fasten the fitting jigs to the rear cross member of the vehicle floor by means of bolts, clamps or spot welding.

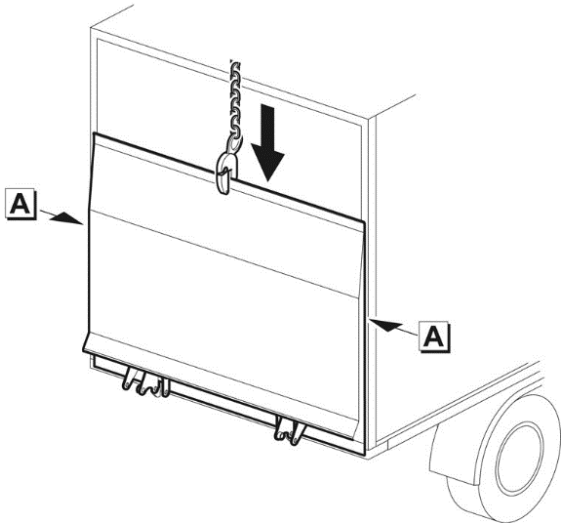


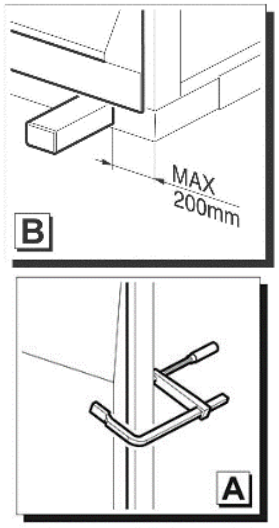


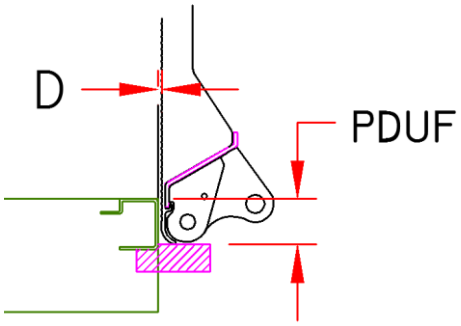
- Make sure that the holes of the 2 fitting jigs are perfectly aligned. To verify this, slide a round bar through the holes, and check the alignment with the rear cross member of the vehicle floor.
- If tail lift is mounted with a seal kit between the closed platform and vehicle body, the position of the fitting jigs must be adjusted to suit the thickness of the sealing rubbers. See 7.3 on page 18.

7.2 METHOD WITH VERTICAL PLATFORM

- Attach 2 temporary supports on the rear cross member, at max. 200 mm from the outside of the body. Make sure these supports are sufficiently strong to carry the proper weight of the platform during installation.
- Mount the supports at height *pduf* below the vehicle floor.







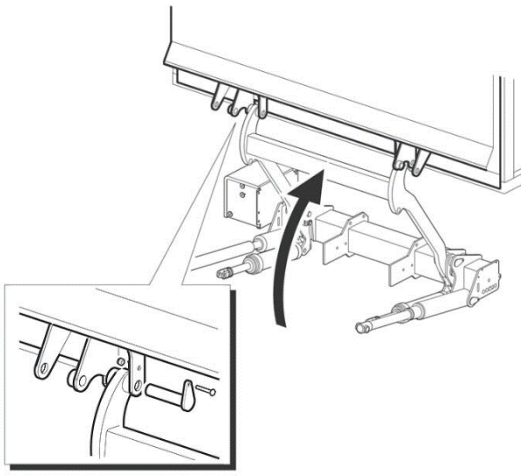
pduf is confirmed on the INSTALLATION DRAWING and in the POCKET GUIDE.

- Next, raise the platform and position it onto the supports.

WARNING

- The platform is very heavy! When falling on a person it can cause serious personal injury or death.
- Therefore, handle the platform with extreme care. Use adequate lifting aids such as a forklift with slings, a gantry crane, hoists etc. to secure the platform and prevent it from falling.

- Slide a spacer D = 5mm (see above) between the platform and the rear frame of the body.
- Adjust and centre its position. Ensure the platform stands perfectly aligned to the rear frame of the body.
- Fasten and secure the final position of the platform by means of hoists, clamps, etc. in order to prevent mounting errors, accidental fall and injuries.
- If the tail lift is mounted with a seal kit between the closed platform and vehicle body, the position of the platform must be adjusted to suit the thickness of the sealing rubbers. See 7.3 on page 18.

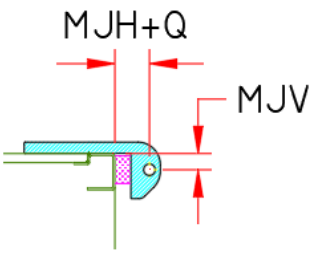


7.3 IMPACT OF THE SEAL KIT

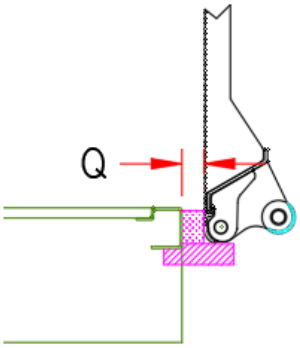
- If the tail lift is mounted with a seal kit between the closed platform and vehicle body (option OAT001-OAT005), a spacer Q must be inserted between the rear cross member and the fitting jigs or platform.

EXAMPLE

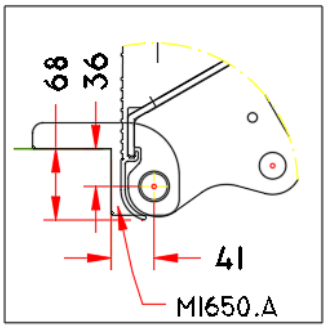
With fitting jig



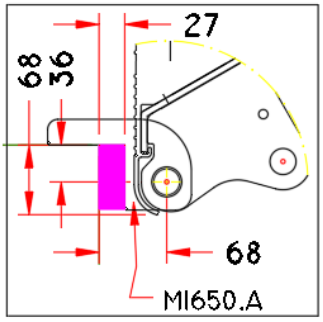
With vertical platform



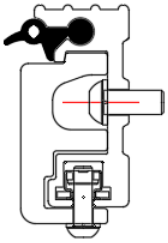
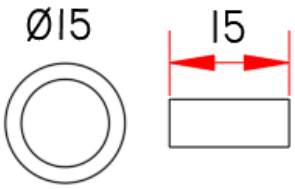
INSTALLATION DRAWING
without seal kit



INSTALLATION DRAWING
with seal kit



- If an INSTALLATION DRAWING is available, the required spacer Q for original DHOLLANDIA seal kits is mentioned on it.
- If no drawing is available, the following guidelines can be used.

Top & side profile	Floor profile	Q
		27 mm with fitting jigs 32 mm with platform
		13 mm with fitting jigs 18 mm with platform

7.4 METHOD WITH HORIZONTAL PLATFORM

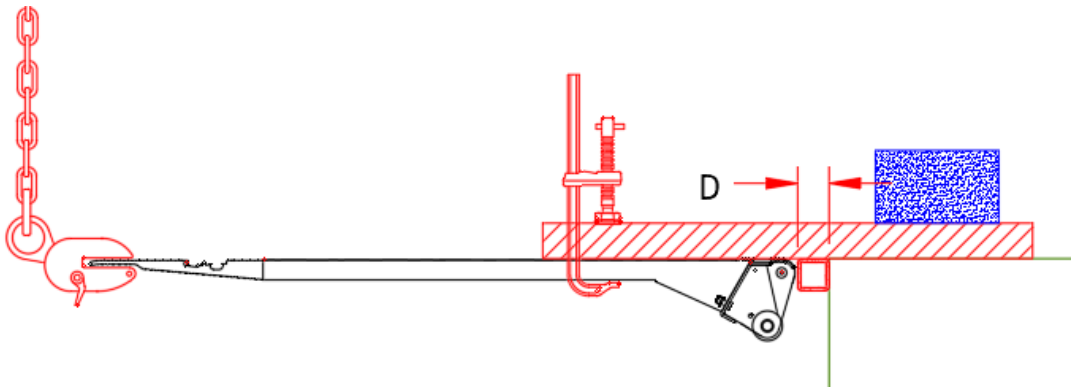
- This method is recommended only when the platform can't stand directly behind the rear frame of the body, or behind the rear doors. See also 6.2.2 on page 15.
- Determine the distance where the platform should stop behind the rear cross member. Prepare a corresponding spacer *d* [see below] to insert between the rear cross member and the platform during installation.
- Mount 2 tubes over the inboard platform edge, that overlap the vehicle floor by minimum 500 mm.

- Position the platform with the 2 tubes on the vehicle floor. Slide the required spacer between the rear cross member and the platform.

⚠ WARNING

- The platform is very heavy! When falling on a person it can cause serious personal injury or death.
- Therefore, handle the platform with extreme care. Use adequate lifting aids such as a forklift with slings, a gantry crane, hoists etc. to secure the platform and prevent it from falling.

- Secure the platform and prevent it from falling (by means of an overhead crane, hoists, forklift with slings, etc.)

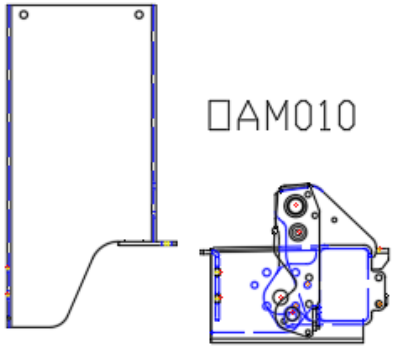
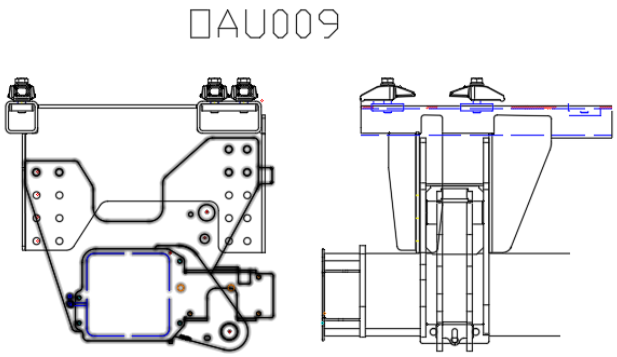


- Centre the platform in the door aperture.
- Make sure the platform is parallel and level with the vehicle floor.
- The gap between the rear cross member of the vehicle floor and the inboard platform edge will need to be covered by a bridge plate or other techniques. See also 6.2.2 on page 15.

8 MOUNTING OF THE LIFT FRAME

8.1 INTRODUCTION

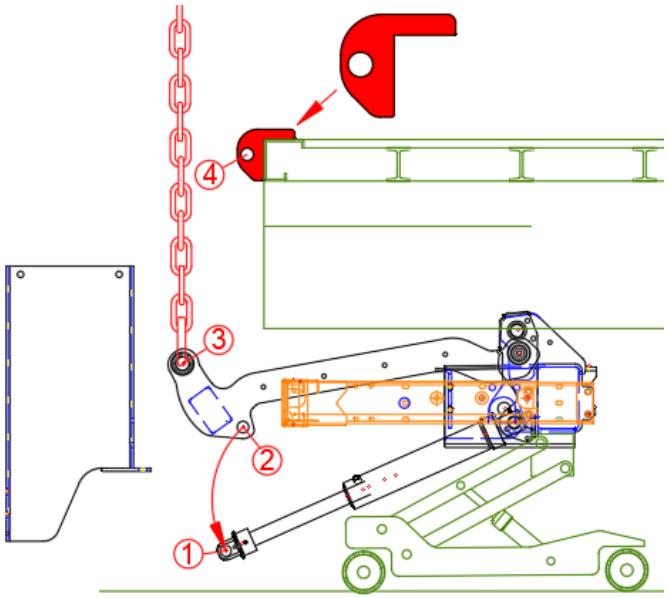
- The approach differs between truck chassis with C-shaped chassis beams and trailer chassis with I-shaped chassis beams. See also 6.2.1 on page 14.

Basic chassis with C-shaped chassis beams	**Trailer chassis with I-shaped chassis beams**
	
Universal mounting plates OAM010	Special execution with option ref. OAU009
	
Mounting plates are not-adjustable in longitudinal direction.	The clamping blocks enable adjustments in longitudinal and lateral direction.
Mounting plates and lift frame are mounted together.	Mounting plates can be mounted on the chassis first, lift frame can be attached to the plates later.

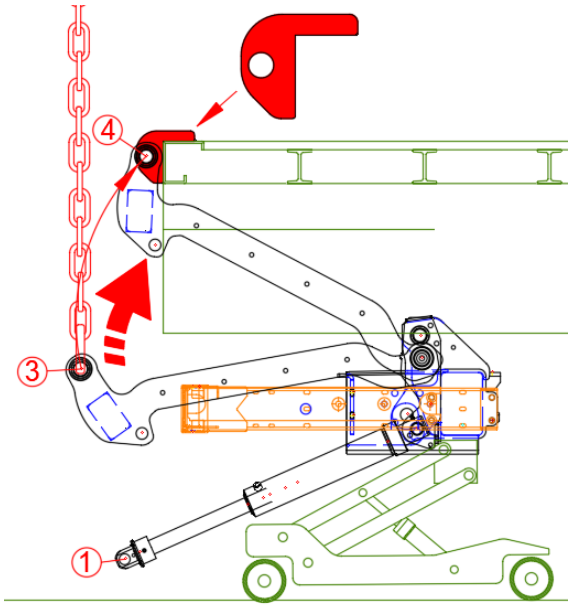
8.2 POSITIONING OF THE LIFT FRAME WITH OAM010

- Position the lift frame on a wheeled mounting jack (order code M0025) or a similar device.
- Slide the lift frame under the chassis.

- To manoeuvre the lift frame easily, suspend the lift arms [# 3] from a hoist, or secure them otherwise against falling.
- Then disconnect the forks of the lift cylinders [# 1] from the lift arms [# 2].



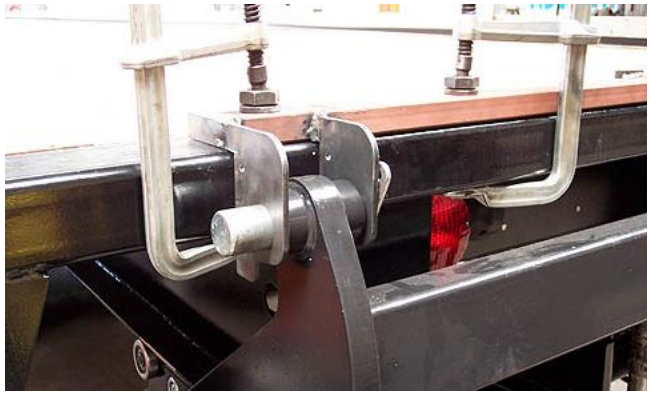
- Dismount the pins for the lift arms from the platform hands.
- Raise the lift arms [# 3] to the fitting jigs [# 4] (or to the platform hands, depending on the chosen installation method).



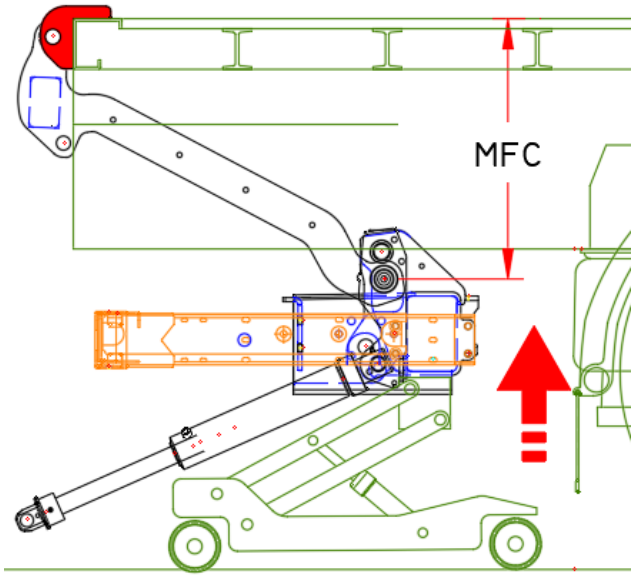
⚠ CAUTION

- The lift frame is heavy! When falling on a person it can cause serious personal injury or death.
- Therefore, handle the lift frame with extreme care. Use an adequate wheeled mounting jack to move the lift frame safely, without a risk of collapse.

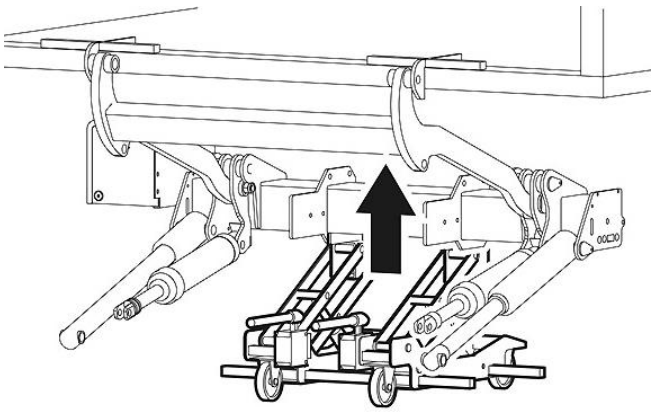
- Slide the articulation pins through the fitting jigs (or platform hands) and the lift arms.



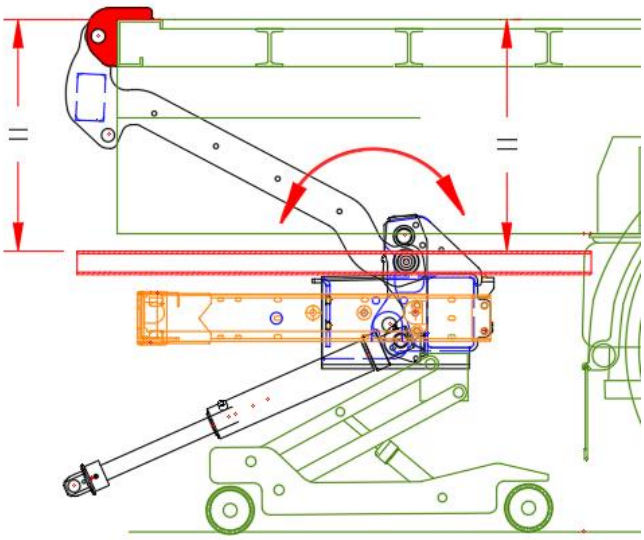
- Raise the lift frame to the correct mounting height *mfc*.



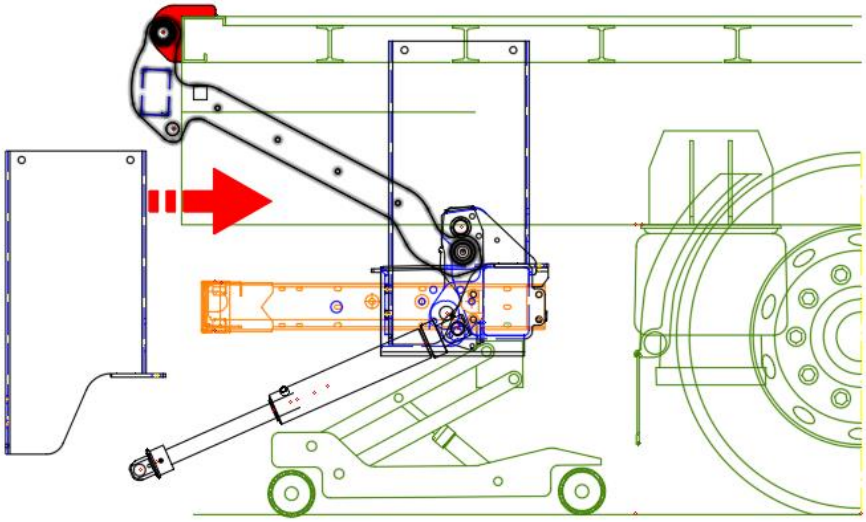
- While raising the lift frame, push centrally. Never force the lift frame at one side. Mount both sides of the frame at the natural position given by the lift arms hung up in the fitting jigs (or platform hands).



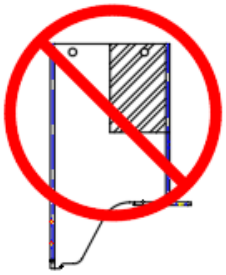
- Pivot the lift frame to ensure that top surface of the lift frame is parallel to the vehicle floor.



- In case of bolt-on mounting plates, fit the mounting plates over the frame by means of the bolts and nuts supplied in the kit bag. Do not tighten the bolts and nuts at this stage.



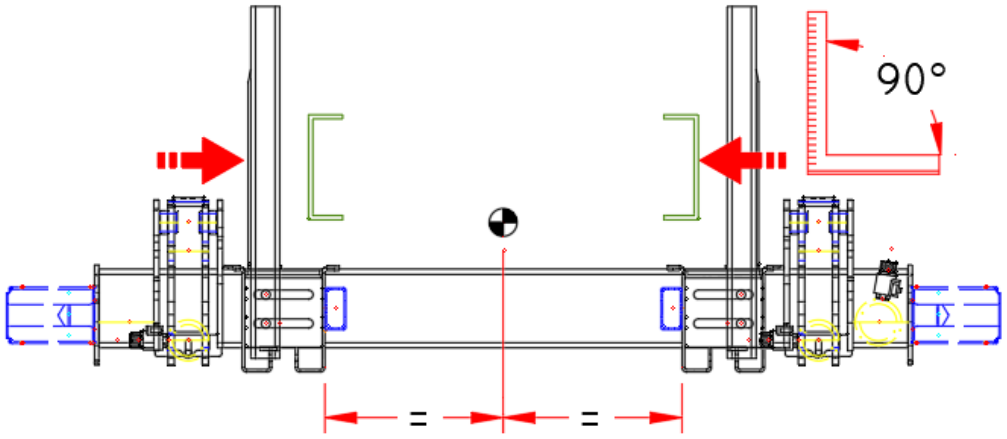
- **Make sure the lift frame is positioned in accordance with the INSTALLATION DRAWING or indications in the POCKET GUIDE (paper or App), before drilling or welding the mounting plates to the chassis.**

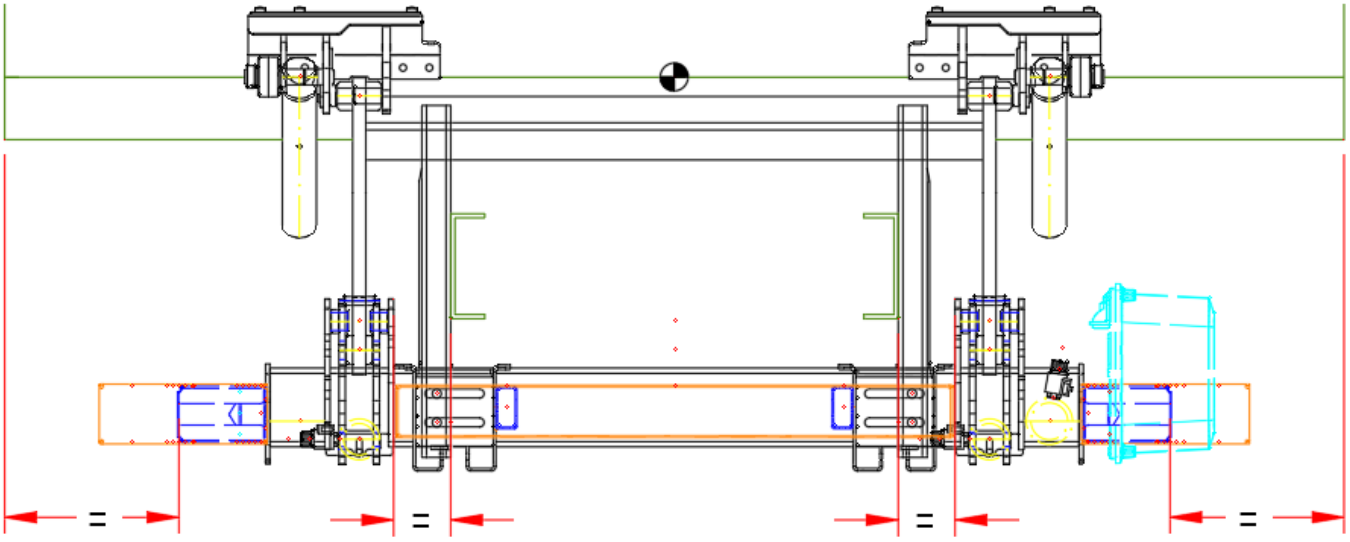


- **It is not allowed to reduce the width of the mounting plates without prior authorization from DHOLLANDIA.**

8.3 FIXATION OF THE MOUNTING PLATES OAM010

- Except lifts equipped with premounted mounting plates (DH-LV, etc.), the mounting plates are designed as bolt-on system, both where the plates are joined to the lift frame, as where they are mounted to the vehicle chassis.
- If you intend to weld anyhow, note that tail lift might be equipped with thermoplastic hoses. Observe the important precautions in 4 on page 5.
- Ensure that the lift frame is correctly centered under the vehicle chassis and body.
- Adjust the mounting plates to the width of the vehicle.
- Straighten the mounting plates, and make sure they stand perpendicular to the lift frame.



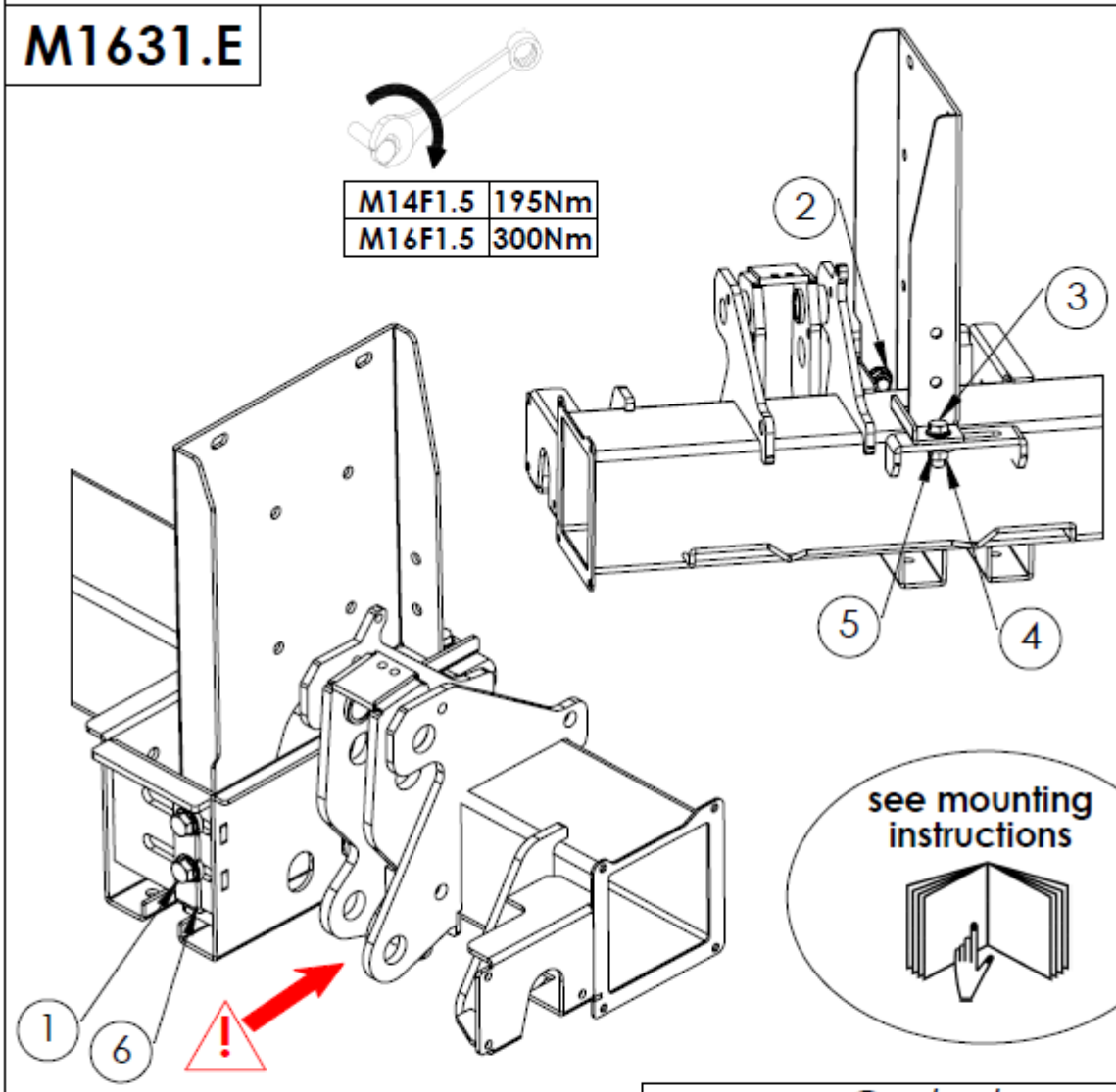


- The mounting plates should be bolted to the lift frame according to the instructions included in the bolt kit supplied with the tail lift (see below).

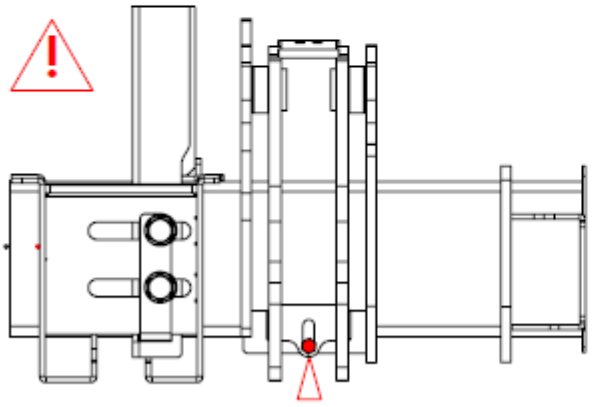
DHOLLANDIA

M1631.E

M14F1.5	195Nm
M16F1.5	300Nm



see mounting instructions

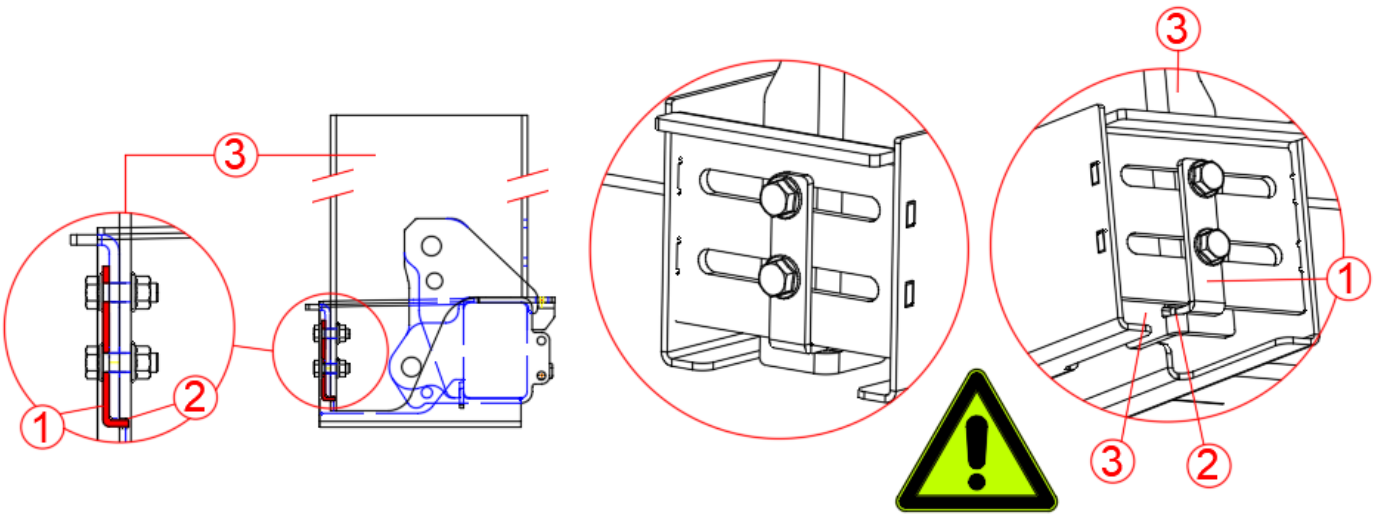


!! remove bolt after installation !!

Content:

1) BT16.040.6921		*4x*
2) BMB16.6923		*4x*
3) BT14.040.6921		*2x*
4) BMB14.6923		*2x*
5) BC14.3		*2x*
6) 9518.L/R		*1L/1R*

- When joining the mounting plates to the lift frame, it is essential that the L-shaped bracket [# 1 below] fully slots into the slot [# 2] foreseen in the mounting plate [# 3].



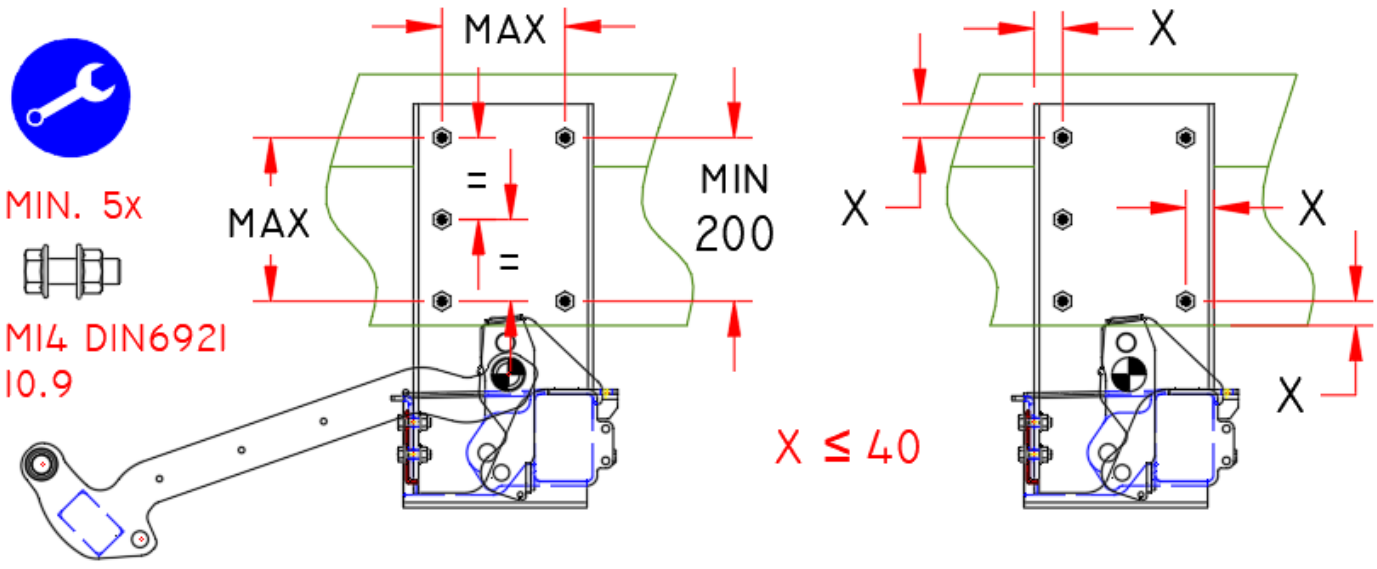
⚠ WARNING

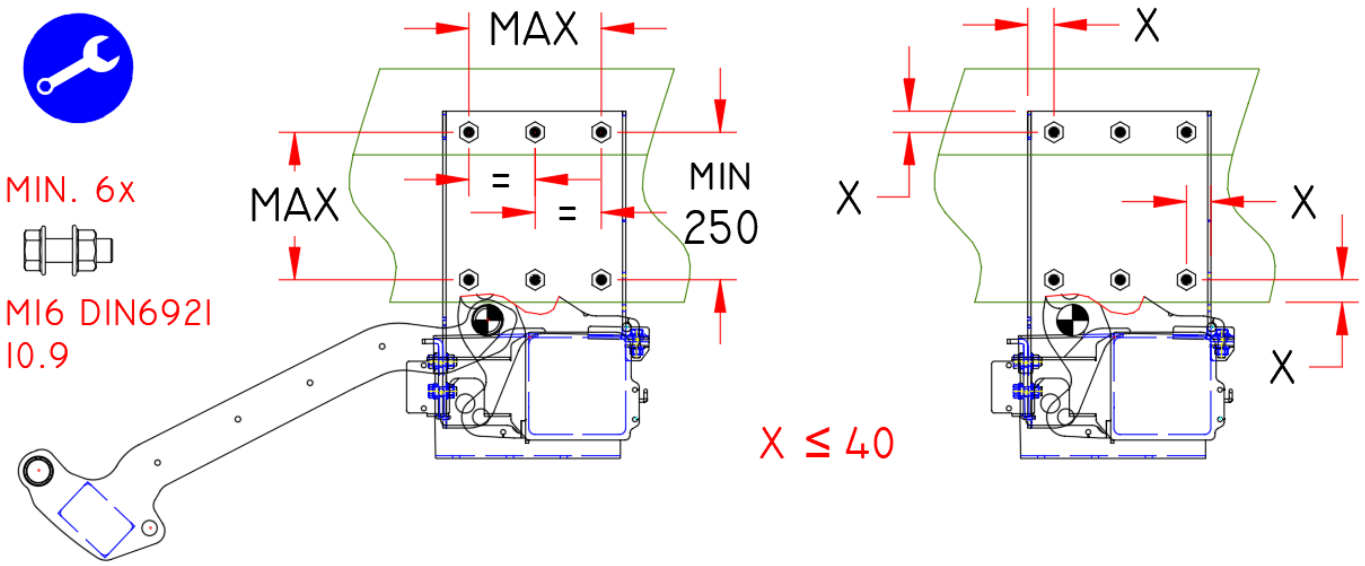
- Position the lift frame, mounting plates, bolts and nuts in accordance with the instructions in this manual.
- Fasten the mounting bolts with the required torque. See appendix 16.2 on page 58 (see values for “shear”).
- Disregard could lead to a fall of the tail lift and its load, and may put the operator and bystanders at risk of serious personal injury or death.

- The mounting plates should be bolted to the vehicle chassis according to the instructions below.
- The bolt kit supplied with the tail lift contains the prescribed bolts.
- Pay special attention to the type of bolts, minimum quantity per side, minimum size and strength class, and the spread of the bolts over the full surface of the mounting plate. Fasten the bolts and nuts with the required torque (see values for “shear”).

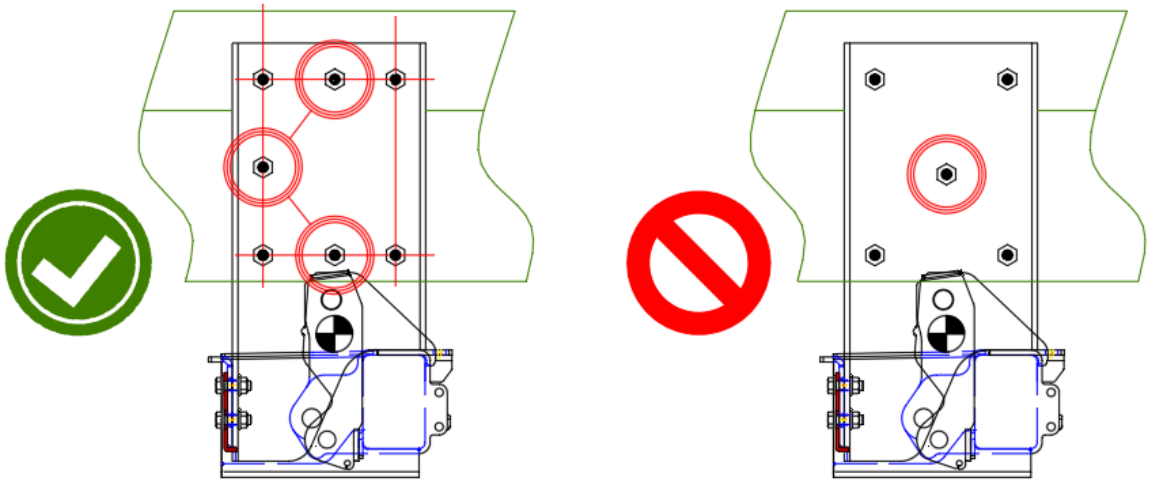
- Maximize the spread of the mounting bolts over the full surface of the plates overlapping the chassis and subframe.

DH-LM.15 / DH-LM.20 @ 1500 – 2000 kg





- When positioning the bolts, make maximum use of the external periphery of the mounting plates. A bolt positioned in the hart or centre of the mounting plate has very little added value.



- If the mounting plates are too high and interfere with the subframe or cross members of the vehicle body, they can be shortened in height, but with respect for the instructions in this section.

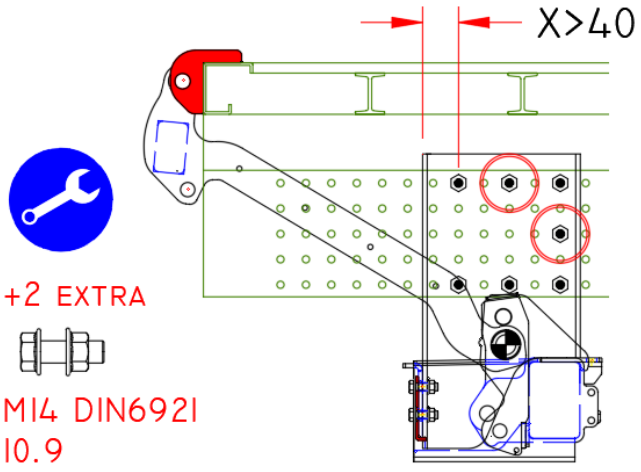
NOTICE
• Various vehicles manufacturers offer pre-punched chassis and don't allow you to drill additional holes through the chassis beams. • Consult the Fitting and Body Building Instructions of the vehicle manufacturer, and make sure you comply.

- If the spread of the holes on pre-punched chassis doesn't comply with the instructions above, first check if you can change the mounting height *mfc* to get a better match between the mounting plates and the pre-punched chassis holes.

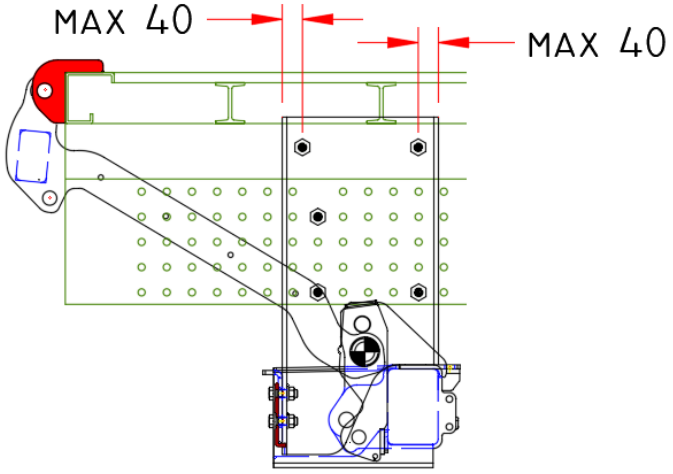
- If not, add 2 additional bolts on the horizontal or vertical periphery. A bolt right in the centre offers limited added value.
- Or, if possible, use the chassis subframe to comply with X<40.

Example for DH-LM.15 / LM.20 with standard min. 5 bolts per side:

Solution with 2 additional bolts:



Solution with 2 bolts positioned in subframe:



- To continue with drilling, mark the position of the drill holes on the mounting plates, vehicle chassis and subframe.
- Drill the holes (ø of the drill bit = M-value of the bolts + 0.5mm).
- Fit the mounting plates, bolts and nuts to the vehicle chassis and subframe. Fasten all bolts and nuts with the required torque (see values for “shear”).

NOTICE

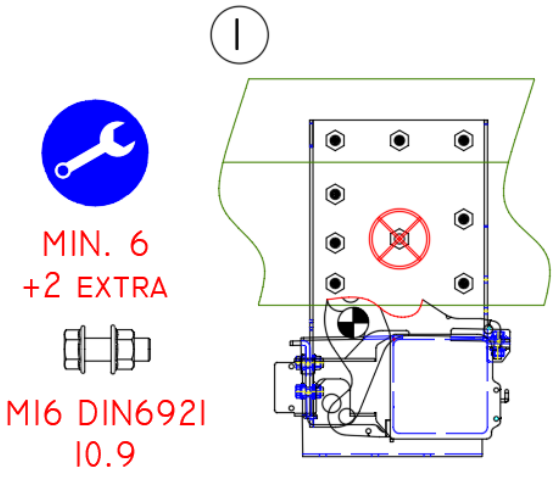
- It is essential that bolts and nuts used to mount the lift frame to the chassis, are fastened with the required torque (see values for “shear”).
- If you use mounting bolts not supplied by DHOLLANDIA, obtain confirmation of the required torque from your supplier and make sure they guarantee at least an equivalent strength.
- Check and retighten the bolts after the static and dynamic weight test performed during the PDI test.

8.4 ADDITIONAL REMARKS FOR HEAVY-DUTY LIFTS AND VERY LONG PLATFORMS

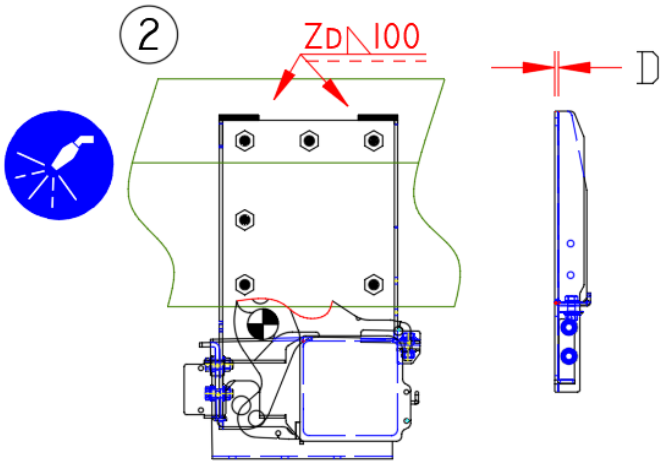
- These instructions apply for all tail lifts > 2500 kg and / or platform depth *pd* > 2250 mm.
- The part of the mounting plates overlapping the subframe must be additionally fastened:
  1. By adding 2 additional bolts per instructions below.
  2. By welding 2 seams connecting the mounting plates with the subframe per instructions below.

DH-LM.30 > 2500 kg and / or pd > 2250 mm

Solution with 2 additional bolts:



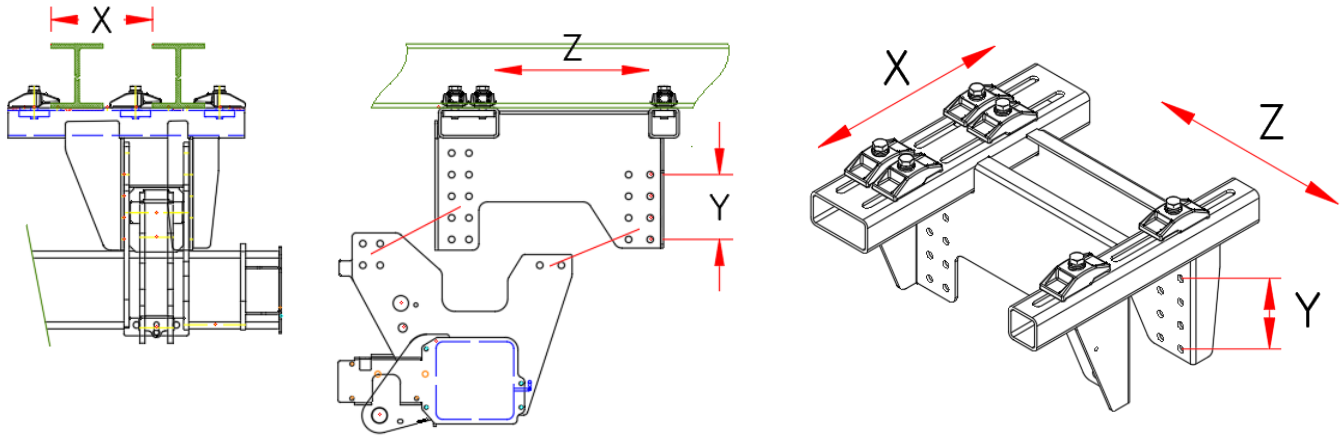
Solution with 2 welding seams on subframe:



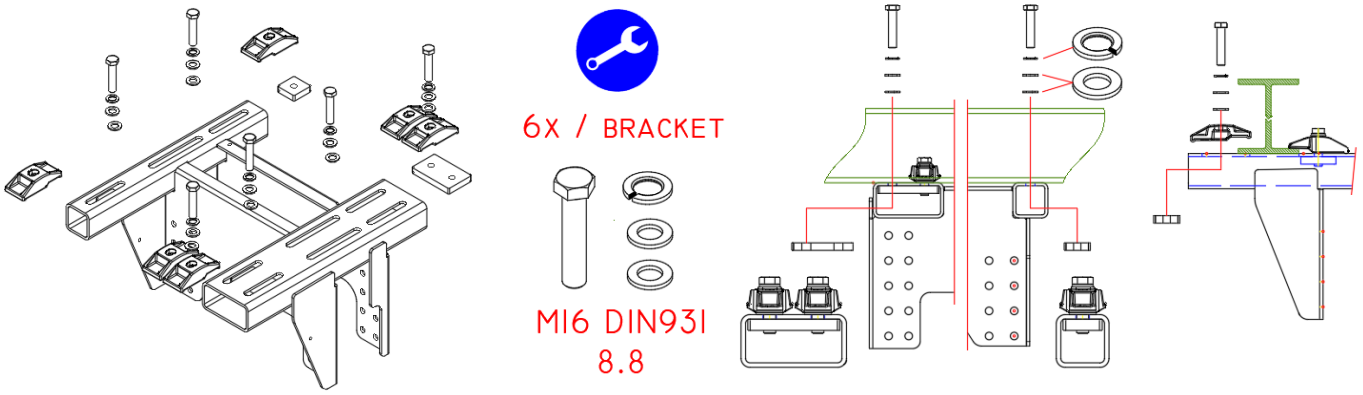
NOTICE
• Before doing any welding, take note of the precautions for welding in 4 from page 5 onwards.

8.5 MOUNTING ON (SEMI-) TRAILERS WITH I-BEAM CHASSIS

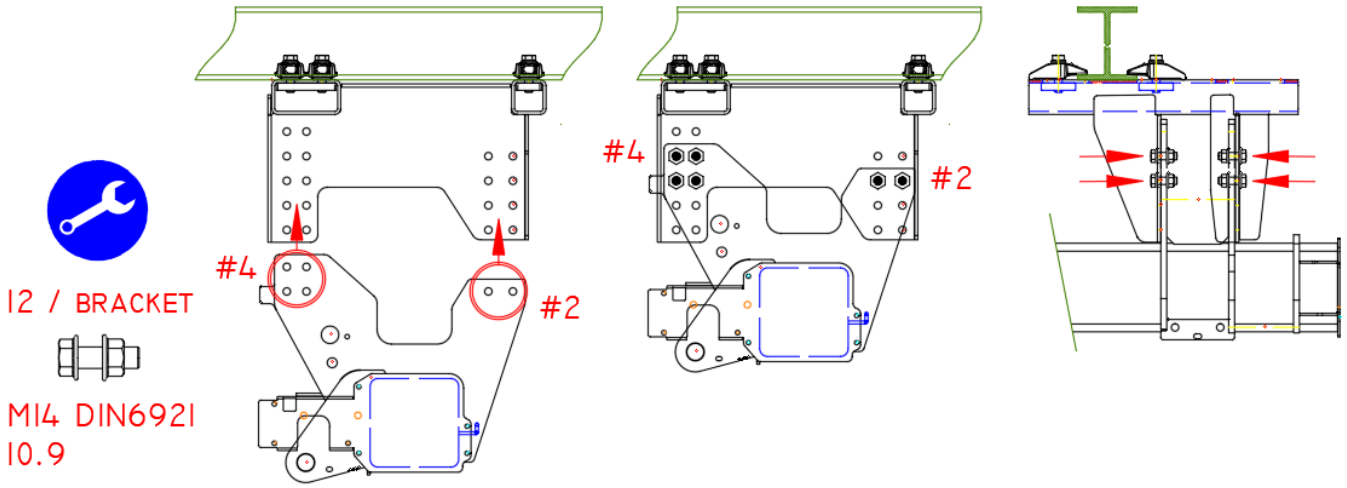
- Tail lifts type DH-LMR.30 (option OAU009) are equipped with 2 quick-fit mounting brackets that are clamped to the bottom flange of the I-beam chassis.
- The position of the tail lift can be adjusted in 3 axis:
  1. Lateral adjustment to various chassis widths = axis X
  2. Longitudinal adjustment along the chassis beams = axis Z
  3. Vertical adjustment to achieve the required mounting height *mfc* = axis Y



- Each of the 2 brackets is mounted to the bottom flange of the chassis beams by means of 6 clamps and 6 M16 bolts (+ spring washer + 2 washers), i.e. 3 sets of clamps and bolts on each side of the chassis beams. Follow the instructions below. Fasten the vertical bolts with the required torque values for “pull” in appendix 16.2 on page 58.



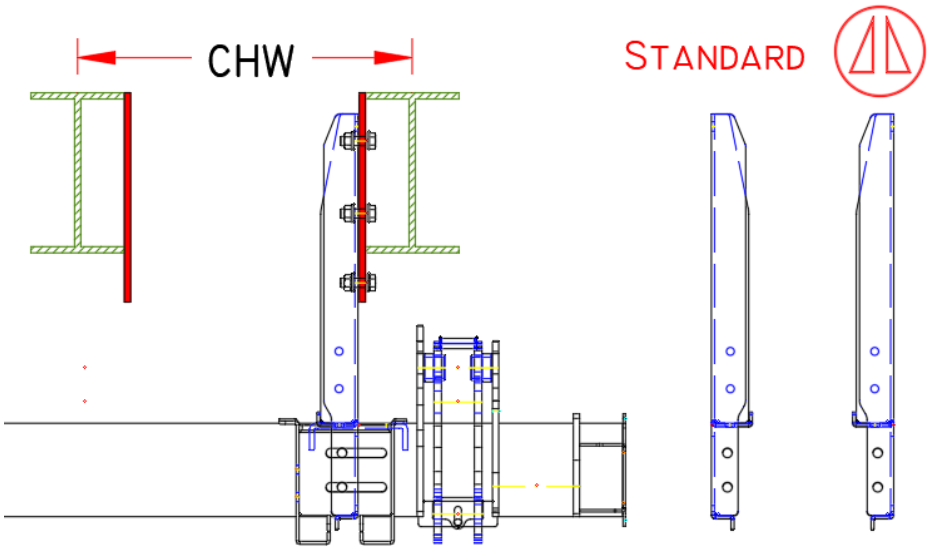
- The lift frame is bolted to the 2 mounting brackets by means of 24 bolts, i.e. 12 bolts per mounting bracket, or 6 bolts on each side of the chassis beams. Follow the instructions below. Fasten the horizontal bolts with the required torque values for “shear”.



NOTICE

- It is essential that bolts and nuts used to mount the lift frame to the chassis, are fastened with the required torque.
- Distinguish between the torque values for “pull” and “shear” as instructed above. See also appendix 16.2 on page 58.
- Check and retighten the bolts after the static and dynamic weight test performed at the end of the mounting procedure.

- A popular alternative for standard DH-L* (without option OAU009), is to foresee 2 extra plates on the I-shaped beams and continue the installation in the conventional way as explained in 8.2 - 8.3 from page 21 onwards.
- The set-up depends on the chassis width *chw* and the arm width *lac*. Usually, extra plates are foreseen on the inside of the I-shaped beams, and the lift frame is mounted with inverted mounting plates (L side plates used on R side, and vice versa).

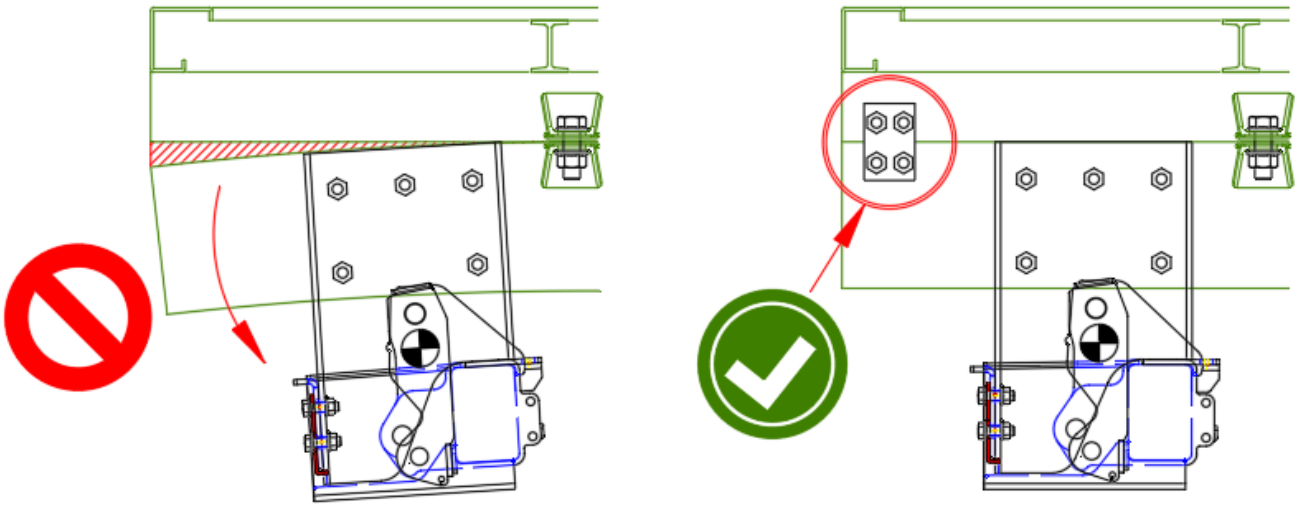


⚠ WARNING

- Position the lift frame, mounting plates, bolts and nuts in accordance with the instructions in this manual.
- Fasten the mounting bolts with the required torque.
- Disregard could lead to a fall of the tail lift and its load, and may put the operator and bystanders at risk of serious personal injury or death.

8.6 GENERAL REMARKS

- Unless the mounting plates are also bolted to the subframe, make sure the chassis and the subframe are connected in the area behind the mounting plates in a sufficiently strong way to prevent the chassis from bending.



NOTICE	WARNING
• In case of doubt how to install the tail lift correctly, DO NOT go any further, but ask your local DHOLLANDIA distributor for professional advice. • Negligence can put the technical personnel, the operator, and third parties at great risk, and could result in severe injury or death.	

NOTICE
• All metal works (drilling, cutting, grinding, welding) to the chassis, subframe, rear cross member and vehicle body require adequate anti-corrosion protection. Make sure you comply with the instructions of the vehicle manufacturer. • ALWAYS protect and cover thermoplastic hoses with a welding blanket. Inspect the hoses after finishing the metal works, and replace any damaged hoses.

8.7 MOUNTING THE TOWING HITCH

8.7.1 General

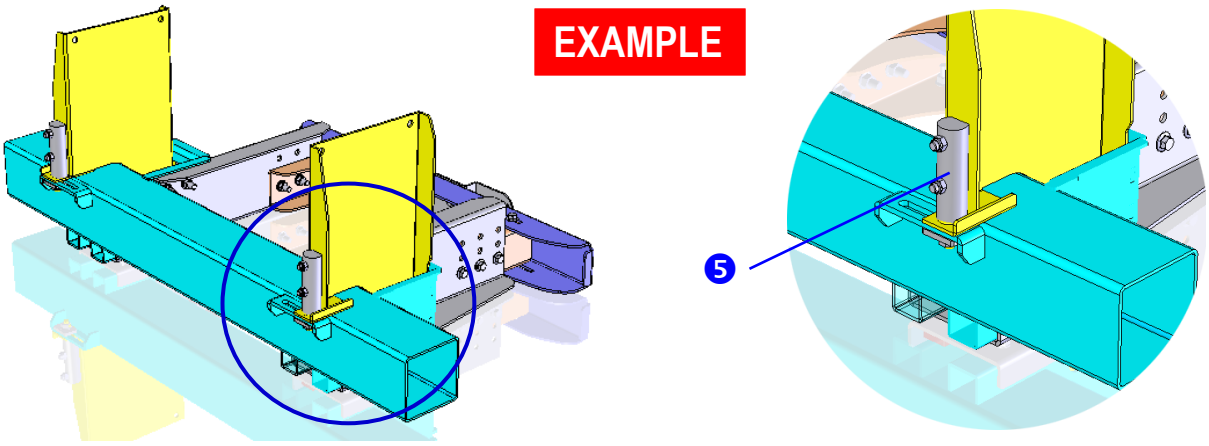
NOTICE	WARNING

- Bumper bars and towing hitches are manufactured and certified in accordance with strict European Standards, to guarantee maximum safety in traffic.
- Bumper bars and towing hitches must be installed according to DHOLLANDIA's instructions, and all bolts fastened with the required torque [see values for "shear" in appendix 16.2 on page 58]. It is not allowed to modify these constructions without prior written approval from DHOLLANDIA.
- Disregard can lead to an infraction against the applicable legislation and refusal of the vehicle upon inspection. It can put other parties in traffic at great risk and could result in sever injury or death.

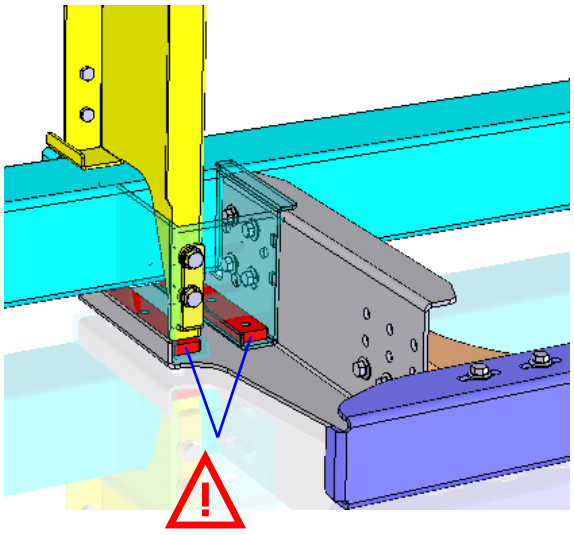
8.7.2 Towing hitch with OAM010 mounting plates

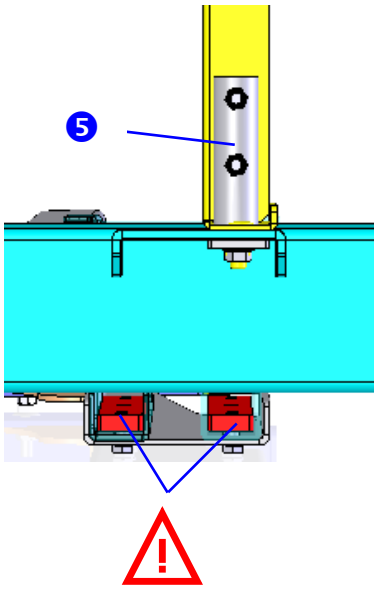
- When the tail lift order includes the bumper bar, it is generally premounted ex works.
- The middle bumper bar can be adapted with an optional preparation for a towing hitch [option OAF103].

EXAMPLE



- If the bumper bar is premounted ex works, mount the additional stiffeners [# 5] to each mounting plate by means of 3 bolts included in the kit. Fasten the bolts with the required torque. (see values for "shear").
- The towing hitch should be bolted to the lift frame and its mounting plates in accordance with the dedicated instructions.



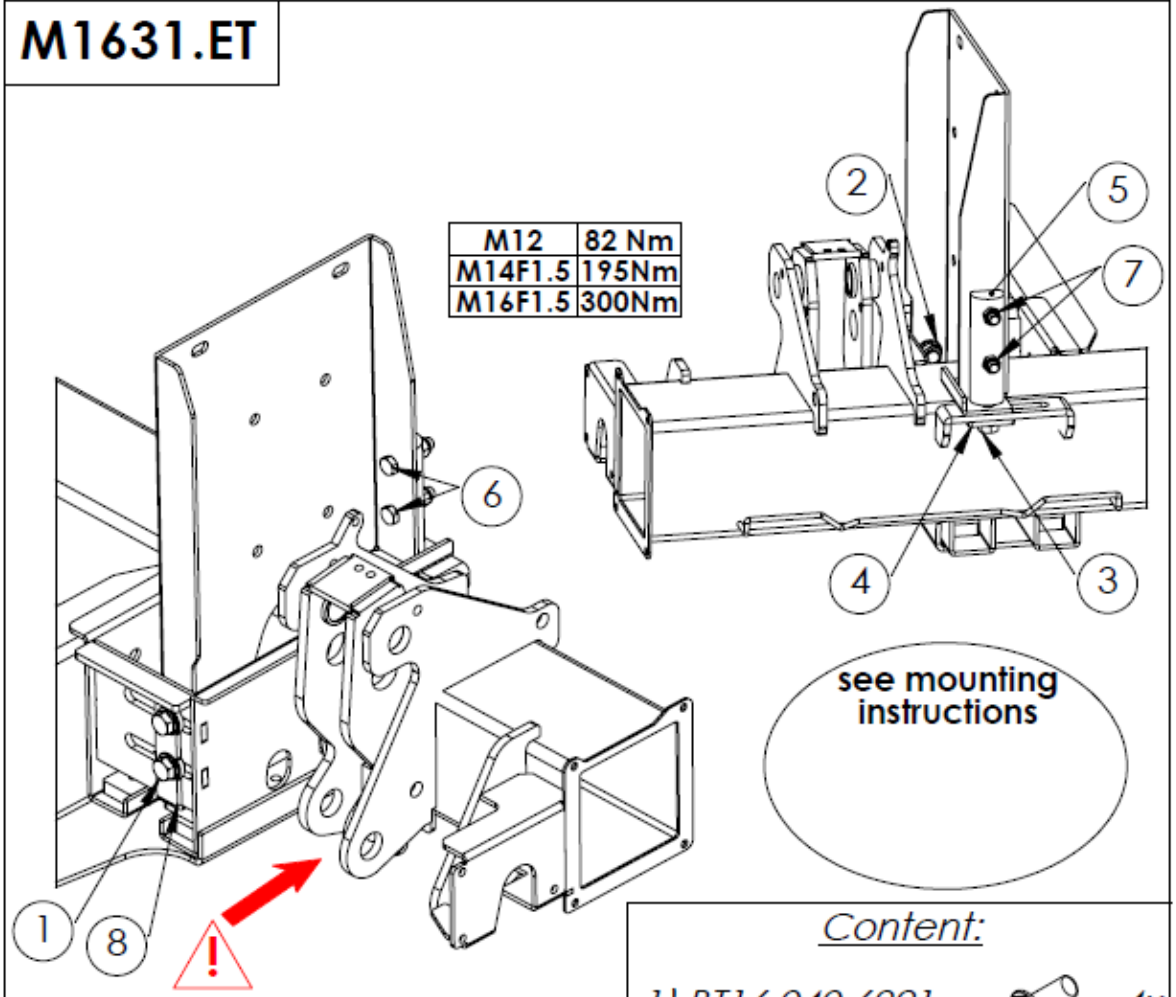


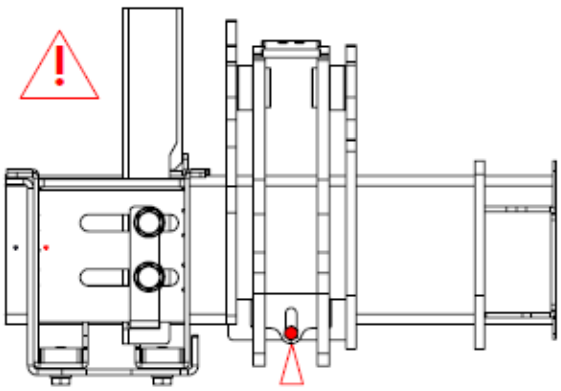
- The bolt kit supplied with the tail lift contains the prescribed bolts.
- Pay special attention to the type of bolts, minimum quantity per side, minimum size and strength class, and position. Fasten the bolts and nuts with the required torque (see values for “shear”).
- If the towing hitch must be repositioned in height and / or depth, the same number of bolts as originally supplied must be used.

EXAMPLE

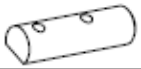
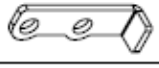
DHOLLANDIA

M1631.ET





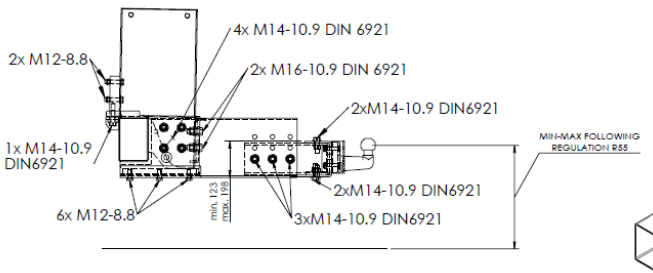
Content:

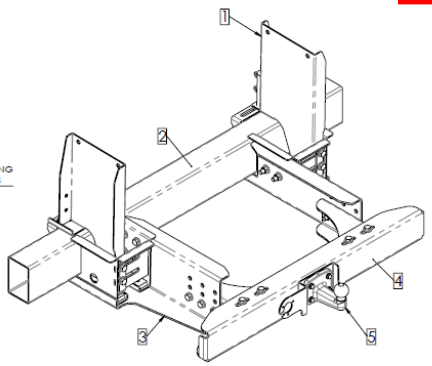
1) BT16.040.6921		*4x*
2) BMB16.6923		*4x*
3) BT14.040.6921		*2x*
4) 9375		*2x*
5) 9374		*2x*
6) BT12.055		*4x*
7) BMB12		*4x*
8) 9518.L/R		*1L/1R*

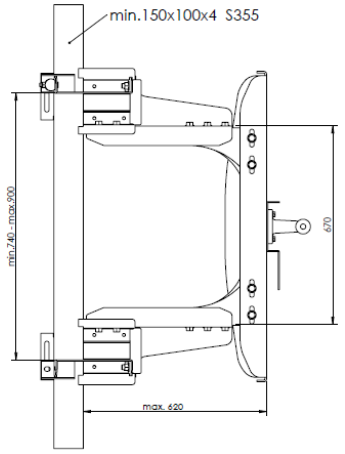
- If the bumper bar is supplied as a separate kit or if adjustments are required, observe the installation instructions sent upon order confirmation, or contact your national DHOLLANDIA distributor for a copy of the dedicated mounting instructions. See contact info on page 4.

EXAMPLE

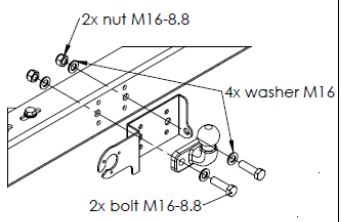
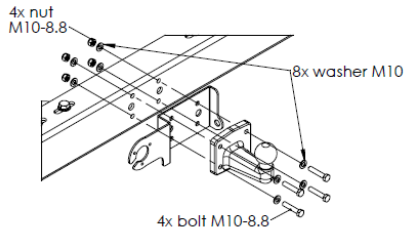
TWH0013.SK





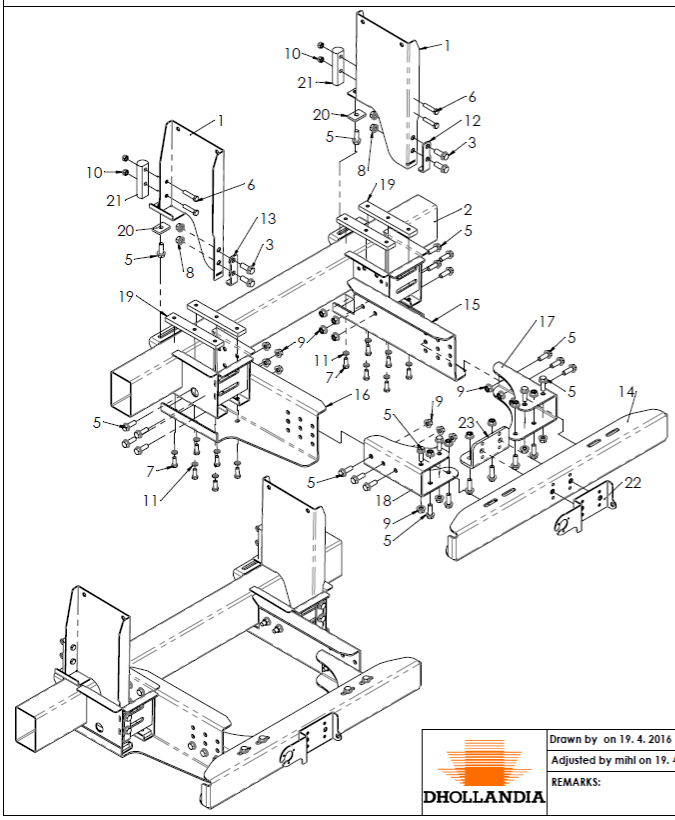


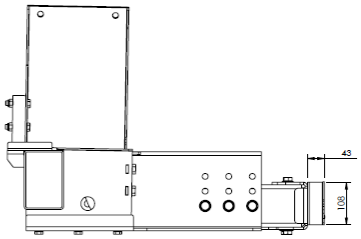
DEVICE CONNECTIONS

A50-1, A50-X, C50-X, S	A50-2, A50-4, A50-X, C50-1, C50-2, C50-X, S
	

DHOLLANDIA	Drawn by on 19. 4. 2016	Description: Towing hitch assembly for DHLM.15	
	Adjusted by mihl on 19. 4. 2016	SIZE A4 / Sales Article: TWH0013.SK	REV.
	REMARKS:	SCALE: 1:15 / GROUP:	PAGE: 1 OF 2

TWH0013.SK





Nr.	Code	DescriptionEN	QTY.	MATERIAL
1	MM.3.1510	Mounting plate set 150x100 - 370mm	1	S355
2	frame 150x100x4	frame LM.15.03-1300/140cc	1	S355
3	BT16.040.6921	Bolt flange M16x1.5x40	4	10.9
4	BT14.045.6921	Hexagon bolt M14x45 DIN 6921 10.9	2	10.9
5	BT14.040.6921	Bolt M14x40 DIN6921	24	10.9
6	BT12.055	Bolt M12x55	4	8.8
7	BT12.030	Bolt M12x30	12	8.8
8	BMB16.6923	Locking nut flange M16x1.5	4	10.9
9	BMB14.6923	Locking nut M14 DIN6923	24	10.9
10	BMB12	Locking nut M12	4	8.8
11	BC12.2	Spring washer M12	12	8.8
12	9518.R	fixation bar right mounting plate	1	S355
13	9518.L	fixation bar left mounting plate	1	S355
14	9470	Towing hook LM.15/20/30	1	S355
15	9384.LE.R	steun rechts TWH LM.15.03	1	S355
16	9384.LE.L	steun links TWH LM.15.03	1	S355
17	9377.R	spacer right trekhaak LM.15/20/30	1	S355
18	9377.L	spacer left trekhaak LM.15/20/30	1	S355
19	9376	fixation bar under trekhaak LM.15/20/30	4	S355
20	9375	fixation bar rear trekhaak LM.15/20/30	2	S355
21	9374	tightening part rear trekhaak LM.15/20/30	2	S355
22	8489	plate plug tow hook	1	S355
23	7798	adjusting plate towing hook LM.20	1	S355

DHOLLANDIA	Drawn by on 19. 4. 2016	Description: Towing hitch assembly for DHLM.15	
	Adjusted by mihl on 19. 4. 2016	SIZE A4 / Sales Article: TWH0013.SK	REV.
	REMARKS:	SCALE: 1:15 / GROUP:	PAGE: 2 OF 2

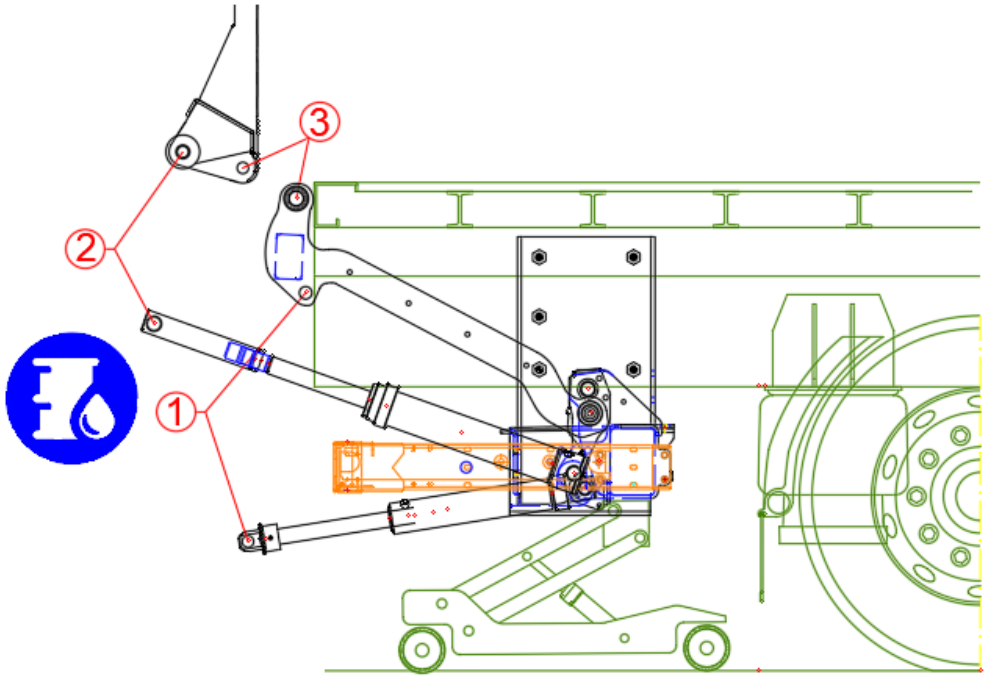
9 MOUNTING OF THE PLATFORM

- Connect the battery and earth cables of the tail lift to the batteries [see 11 from page 44 onwards], to enable easy manipulation of the hydraulic cylinders.

⚠ CAUTION

- The hydraulic cylinders and circuits might contain air. The piston rods might slide out with shocks when cylinder is filled with oil.
- ALWAYS observe the safety instructions and precautions contained in the GENERAL SAFETY INSTRUCTIONS FOR INSTALLATION, MAINTENANCE AND REPAIR manual.
- In case of doubt, contact the national DHOLLANDIA distributor for further assistance.

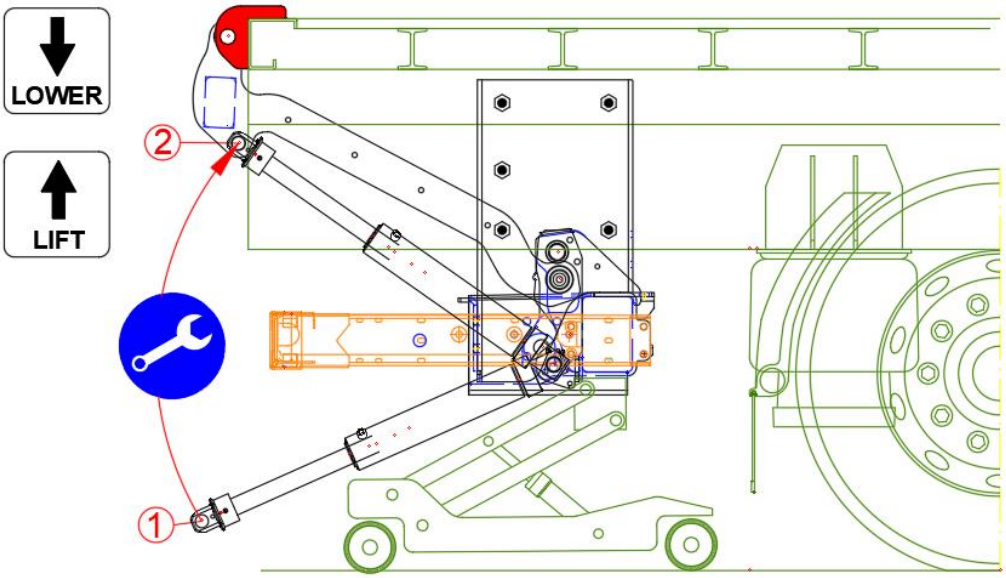
- Grease the bearings of the lift arms [# 1 – 3 below] and the adjustable extension of the tilt cylinders [# 2] before mounting the corresponding articulation pins.



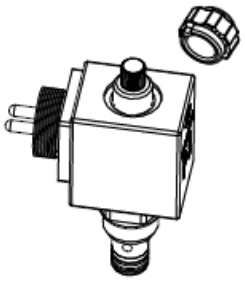
⚠ WARNING

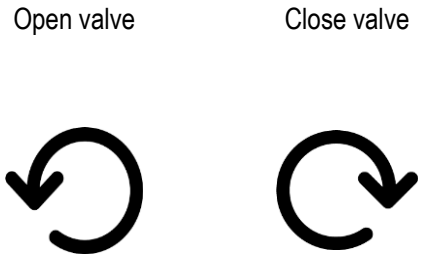
- The platform and the lift frame are very heavy! When falling on a person, they can cause serious personal injury or death.
- Therefore, handle the platform and the lift frame with great care. Use adequate lifting aids such as hoists, an overhead gantry crane, a fork lift with slings, etc. to secure the heavy components and prevent them from falling.
- ALWAYS secure the platform against falling, as long as you work within reach of the platform.
- From the moment the platform is no longer secured , ALWAYS remain vigilant as long as the air in the hydraulic system has not been bled. Stay out of reach of the platform, and keep clear of the moving parts of the tail lift.

- If the forks of the lift cylinders [# 1] have been separated from the lift arms [# 2], operate LIFT / LOWER to align the hole in the forks [# 1] with the holes in the lift arms [# 2].
- Mount the pins in same position as originally supplied. Fasten the locking bolts and nuts with required torque.

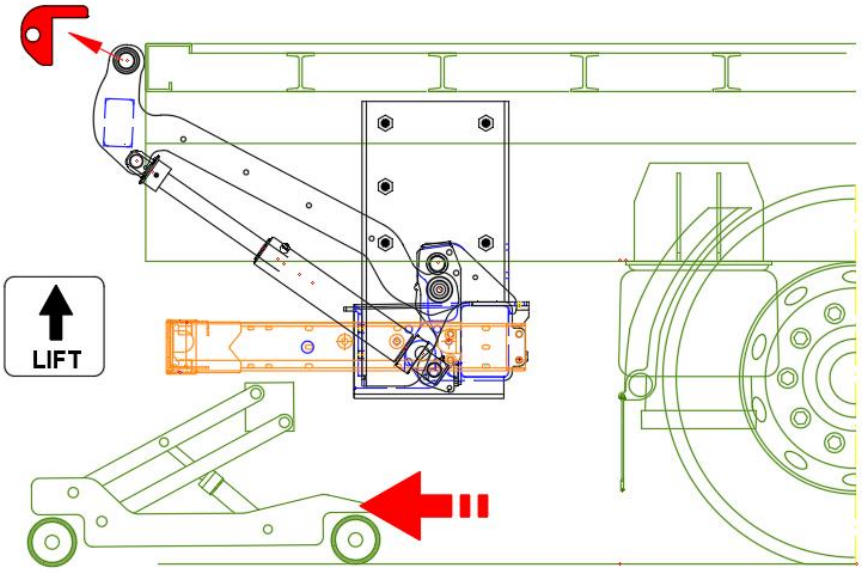


- As an alternative, push the piston rod in or pull it out manually, as follows:
  1. Open the safety valves on the lift cylinders manually [see below].
  2. Loosen up the hydraulic couplings of the hoses connected to the cylinder (to eliminate vacuum forces).
  3. Push / pull the piston rod by hand.





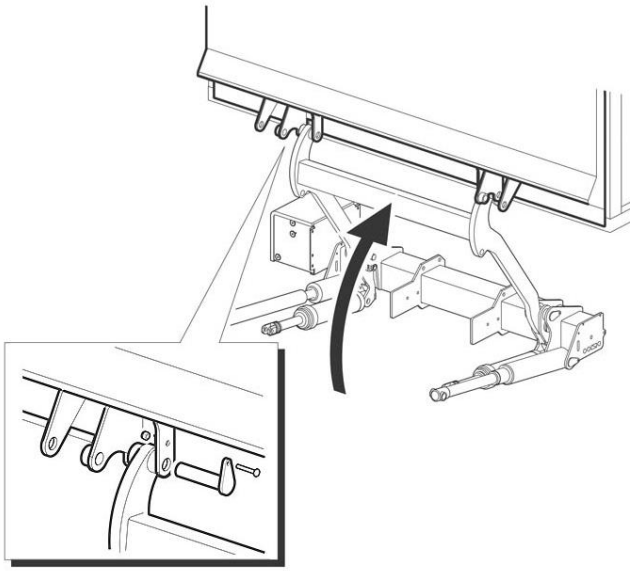
- Operate LIFT and pressurise the lift cylinders gently. Stop as soon as you hear the hydraulic system turn in overpressure.
- If applicable, remove the fitting jigs.
- Remove the wheeled mounting jack.

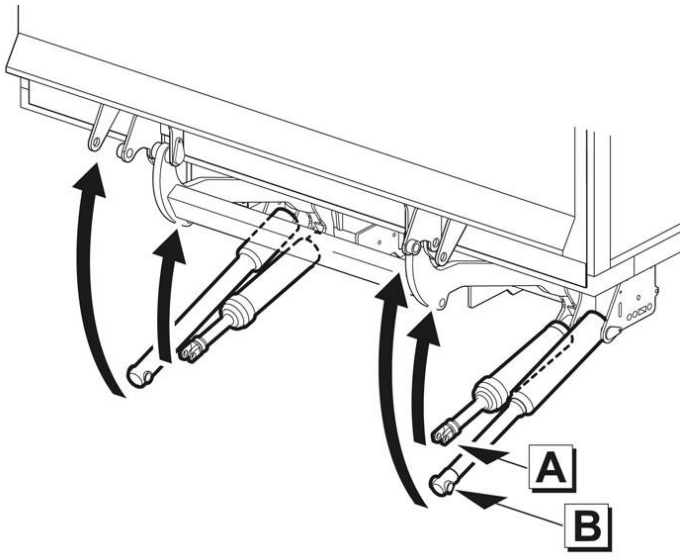


- Look carefully how the 4 articulation pins, rollers, bolts and nuts on the platform hands are mounted. Then dismount them. (If

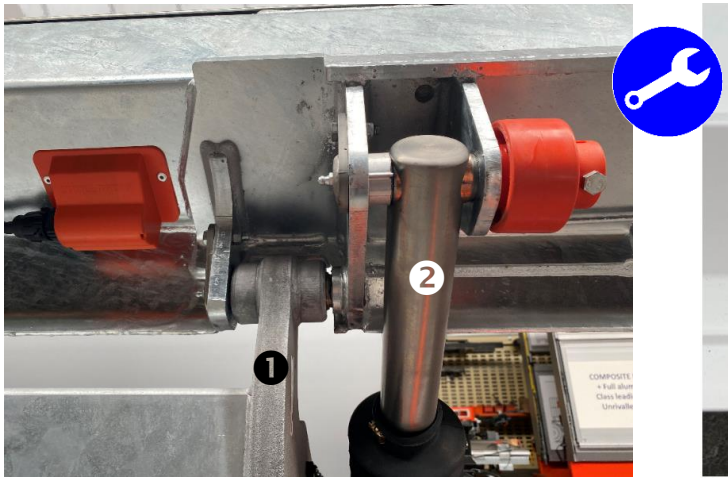
you have used the platform to mount the lift frame, you have just mounted the pins of the lift arms in previous steps, and they shouldn't be dismounted anymore.)

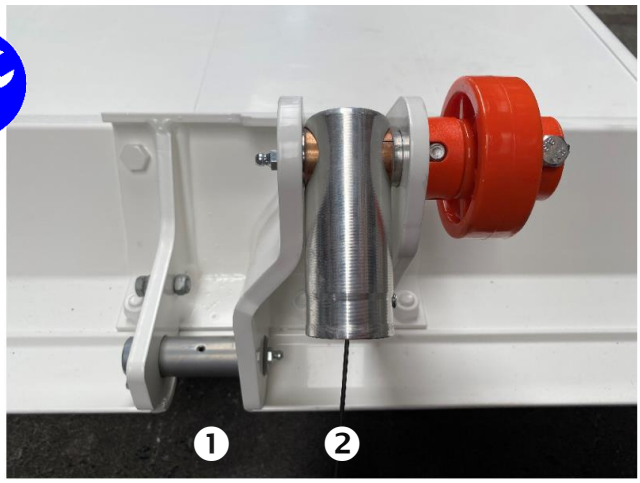
- Raise the platform (by hoist, overhead crane, fork lift with slings etc.) and position it above the lift arms.
- Align the platform hands with the holes in the lift arms.
- Mount the pins in the same way as originally supplied. Fasten the bolts and nuts with the required torque.





- Tilt the platform open to 45° angle. Align the hole in the tilt cylinders with the hole in the platform hands by means of the electrical controls, or manually [see procedure above].
- Mount the pins of the tilt cylinders. The rollers are mounted and the bolts are fastened after the adjustment of the stroke of the tilt cylinders. (see 10.2 on page 39).





Platform hand shown is the right hand side

1 Articulation pin for lift arm

2 Articulation pin for tilt cylinder

- Pressurise the lift and tilt cylinders gently. Stop as soon as you hear the hydraulic system turn in overpressure.

⚠ CAUTION

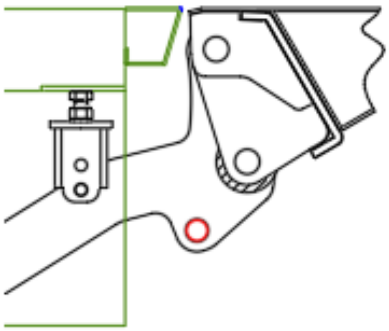
- To OPEN the platform, most tilt cylinders are powered in by powerful internal springs (*). The piston rods will react quickly and suddenly when releasing the hydraulic pressure.
  (*) Exception: in case of option OAH026, the tilt cylinders are powered in by means of hydraulic pressure (power open).

10 OTHER MECHANICAL WORKS

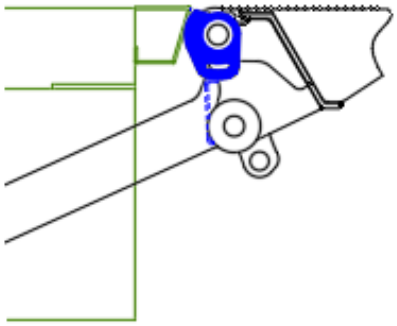
10.1 END STOPS FOR THE WORK POSITION OF THE PLATFORM

- In operation, it is necessary that the lift arms can be pressurised firmly against the underside or the rear face of the rear cross member of the vehicle floor. That will facilitate easy transfer of heavy loads from the platform to the vehicle floor (and vice versa).
- Various factory options exist .

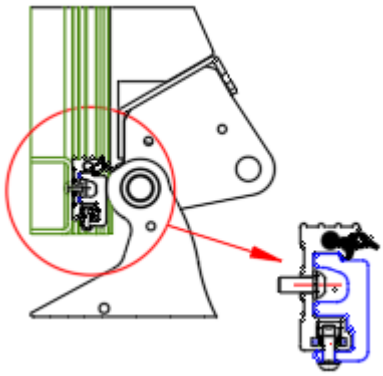
OAM006 – end stop against the underside of the vehicle body



OAM007 – end stop against the rear side of the rear cross member

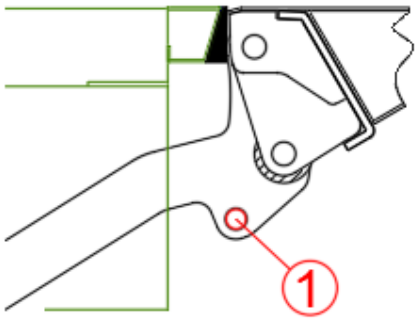


OAT001 – 4 sides rubber seal kit with integrated end stop

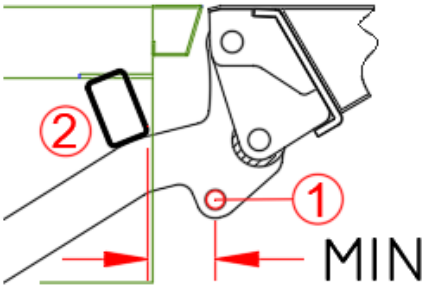


- Often, end stops are fabricated by the body builder, in function of his own body design. Various examples are shown below.

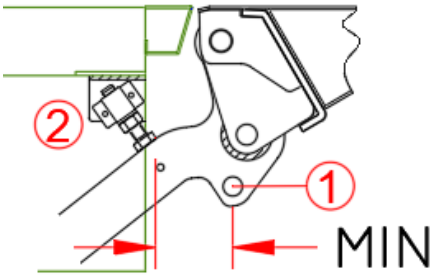
Self-fabricated end stops at the rear cross member of the vehicle body



Self-fabricated end stops bolted / welded to the chassis or subframe



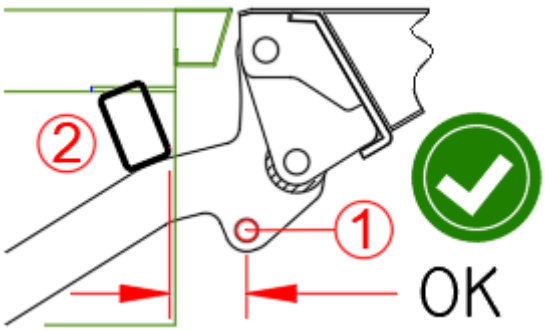
Self-fabricated, adjustable end stops mounted to the vehicle chassis or subframe



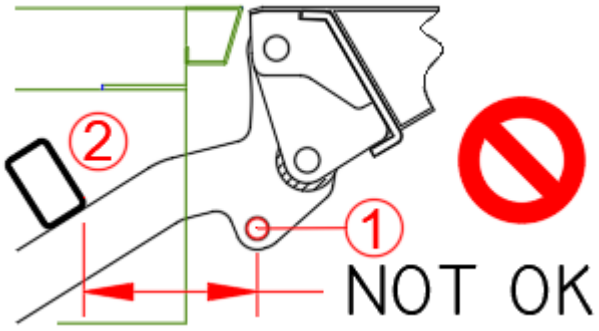
NOTICE

- The end stops [# 2 below] at the underside of vehicle body or at the chassis must be positioned as close as possible to the articulation point [# 1] of the lift cylinder, to avoid excess stress on the lift arms and deformation.
- The end stops [# 2] must be manufactured strong enough to sustain the forces induced by the lift cylinders at maximum hydraulic pressure.
- The end stops [# 2] must result in an optimum alignment of the platform with the rear cross member of the vehicle floor. Adjust if required.
- The end stops [# 2] must result in an adequate pressure of the platform on the sealing rubbers (if applicable). Adjust if required.
- Fasten all bolted connections with the required torque. See appendix 16.2 on page 58.

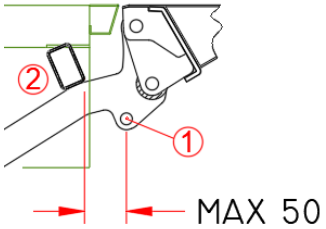
Figure 10.1

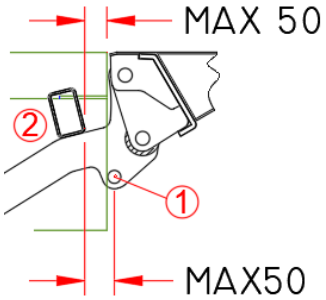


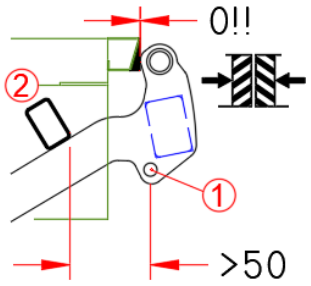
End stop at max. 50 mm from the articulation point of the lift cylinder is OK. No further measures required.

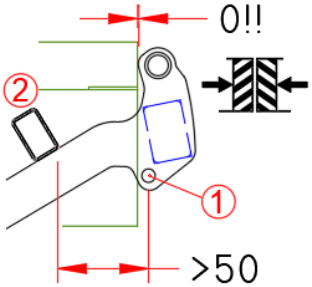


If end stops within 50 mm from the articulation point of the lift cylinder are not possible, a hard stop against the rear cross member of the vehicle floor is required



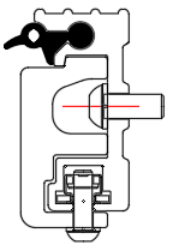
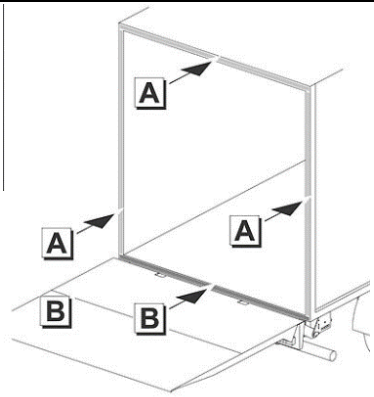
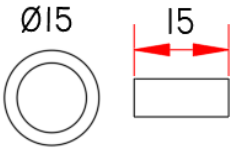
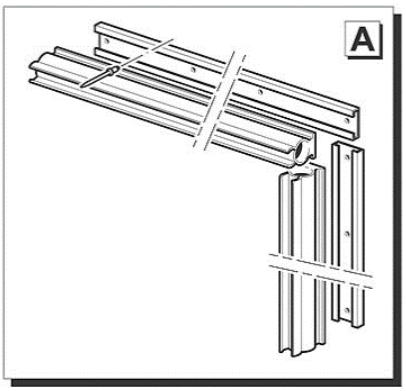
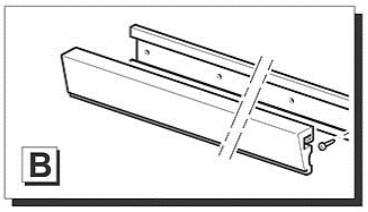






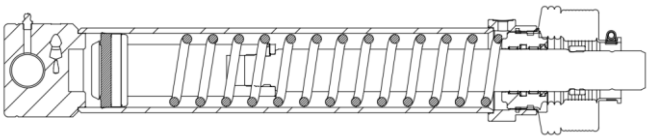
10.2 PLATFORM STOW POSITION

- If applicable, mount the aluminium profiles and sealing rubbers (option OAT001 - …OAT005) to the rear frame of the body. See also 7.3 on page 18.

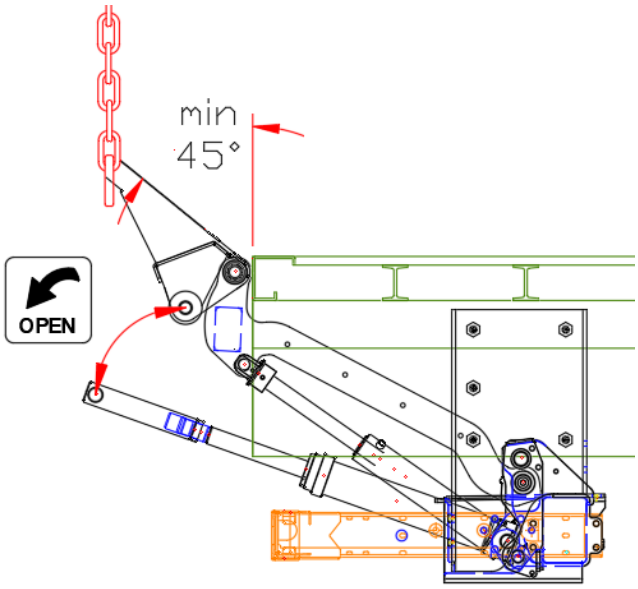
A	B	Installation
		
		 

- Next, adjust the stroke of the tilt cylinders and the travel position of the platform.

- Most tilt cylinders are OPENED by means of internal springs (*), which exert a strong pull force on the articulation pins while the platform is closed in its travel position.
- (*) Exception: power-open lifts = option OAH026

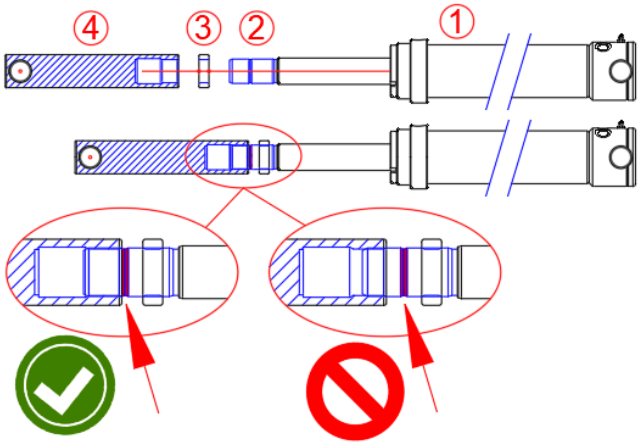


- Therefore, OPEN the platform at 45° angle to dismount the articulation pins of the tilt cylinders from the platform hands. And to mount these pins back in the platform hands if only manual force is used to extend the piston rods.

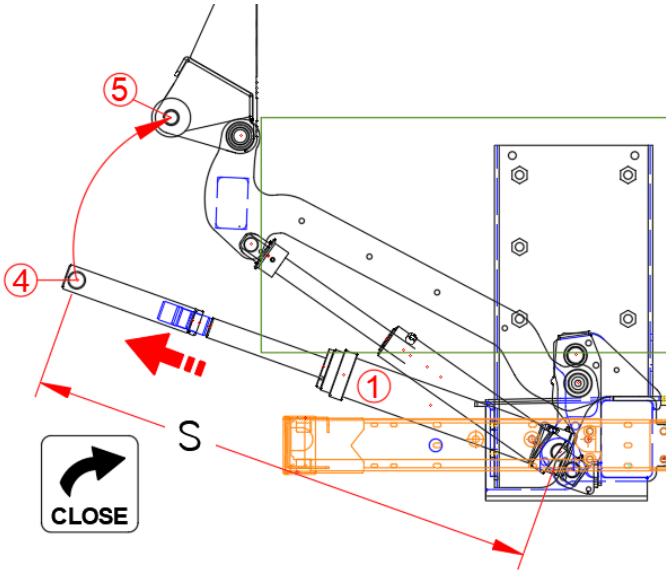


- ALWAYS make sure the platform is secured and protected against falling.
- Make sure the platform remains supported by 1 of the 2 tilt cylinders.
- Do NOT detach both tilt cylinders from the platform unless it is hung up on a gantry crane with hoists, a fork lift with slings etc.

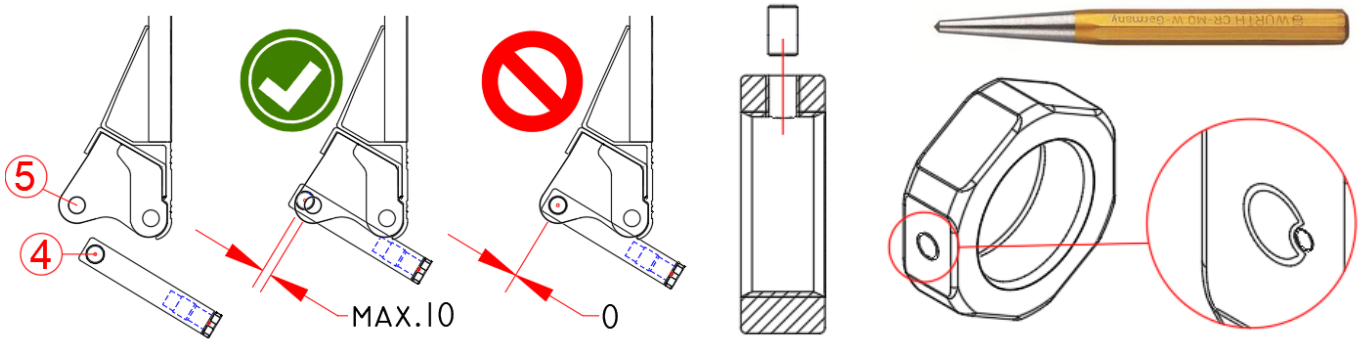
- The stroke of the tilt cylinders [# 1] is most easily adjusted while they are detached from the platform.
- 2 adjustable extensions [# 4] fit over the threaded end [# 2] of the tilt cylinders [# 1]. A locking nut [# 3] blocks the extensions [# 4] in the desired position.
- Do NOT unscrew the extensions [# 4] further than the marker groove on the threaded end [# 2]. If this is not possible, contact your national DHOLLANDIA distributor for longer extensions [# 4].



- Position the platform in the travel position, firmly against the rear frame of the body or the sealing rubbers .
- Loosen the rubber gaiter at the extremity of the piston rod.
- Turn the counter nut [# 3] loose, so that the adjustable extension [# 4] can be screwed in / out.
- Use the function CLOSE to slide out the tilt cylinders [# 1] to the maximum stroke S.



- Screw the extensions [# 4] in to shorten the tilt cylinders [# 1], screw them out the lengthen the tilt cylinders [# 1].
- Adjust the extensions [# 4] so that the centre of their hole sits 5 to max. 10 mm longer / further than the corresponding holes in the platform hands [# 5].
- Do NOT unwind the extensions [# 4] further than the marker groove shown above. If this is not possible, contact your national DHOLLANDIA distributor for longer extensions [# 4].
- After correct adjustment, fasten the locking nuts [# 3] firmly by means of a C-spanner.
- Secure the locking nuts [# 3] further by means of an M6 grub screw [# 5] in the side flank of the locking nut.
- Secure the M6 grub screw by means of a dot punch right beside the orifice.
- Put the rubber gaiter back in position and fasten its collar.

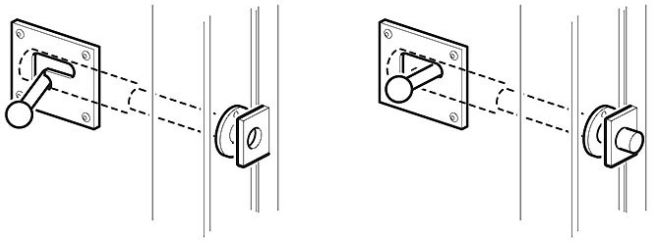


- Operate OPEN / CLOSE to align the wholes in the adjustable extensions [# 4] with the holes in the platform hands.
- Mount the pins of the tilt cylinders [# 1] and the rollers in the same way as originally supplied. See also 9 from page 35 onwards. Fasten the bolts and nuts with the required torque.

⚠ WARNING

- If extensions are unwound beyond the safe limits, this can cause the tilt cylinders to fail and the platform to fall down.
- Negligence can put the operator and third parties at great risk and could result in severe personal injury or death.

- Verify the effect of the tilt cylinder adjustment on the sealing rubbers (if applicable). Adjust the stroke of the tilt cylinders further if needed.
- If the platform is equipped with a platform lock, bolt or weld the fixed eye of the lock at the side of the vehicle body.



- If the tail lift must comply with EN12642 on the Securing of Cargo, contact your national DHOLLANDIA distributor prior to ordering the tail lift, to determine the required interfaces. See contact info on page 4.

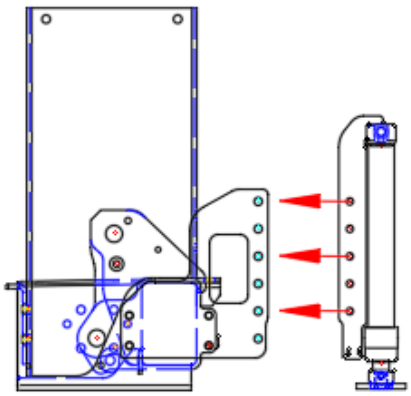
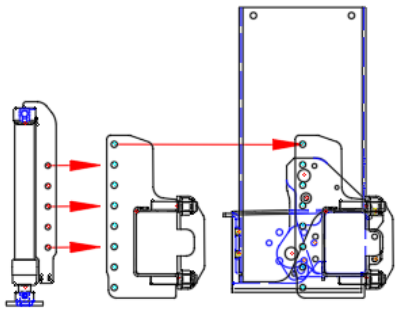
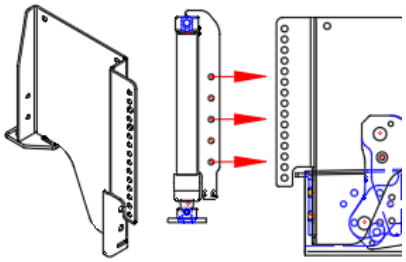
10.3 ADJUSTMENT OF THE HYDRAULIC STABILISING LEGS

- Hydraulic stabilising legs [option OAH013 – OAH014] may be purchased along with your tail lift at the initial order, or may be purchased and retrofitted to your tail lift later.

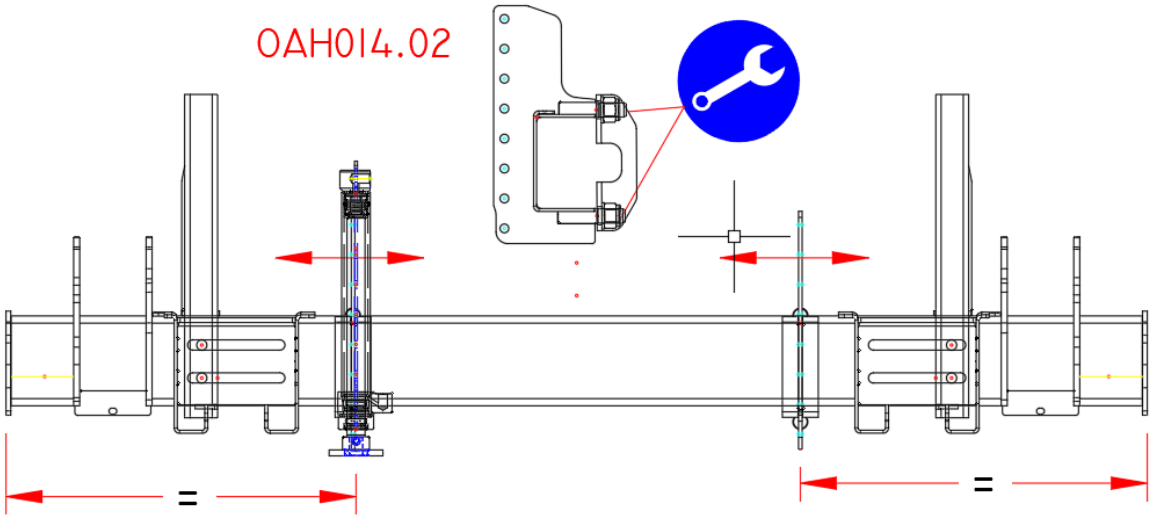
NOTICE

- DHOLLANDIA strongly recommends the use of hydraulic stabilising legs to load and unload heavy machinery.
- The use of stabilising legs is mandated by various vehicle manufacturers. Consult the instructions of the vehicle manufacturer.

- The purpose of the stabilising legs is to prevent the vehicle from becoming unstable and tipping over, and to support the vehicle chassis during loading and unloading. They are NOT suitable to lift the complete vehicle and its cargo. Refer to the OPERATION MANUAL section 9.7 for safe operation practices.
- 3 methods are available to mount the stabilising legs to the lift frame.

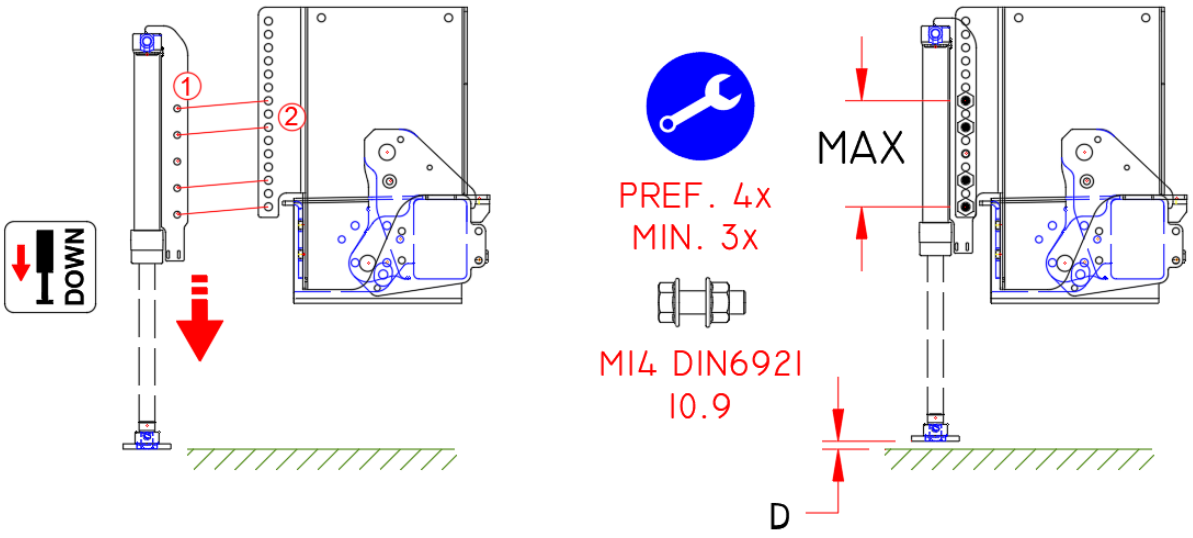
OAH014.01 = stabilising legs are mounted with fixed brackets on the lift frame.	OAH014.02 = stabilising legs are mounted with adjustable brackets on the lift frame.	OAH014.03 = stabilising legs are mounted on the rear face of the mounting plates of the lift frame
		

- For OAH014.01 and OAH014.03, the position of the mounting plates for the stabilising legs on the lift frame is fixed.
- For OAH014.02, the plates can be moved sideways to reach an optimum position between the chassis beams and the lift arms.
- Make sure that the stabilising legs, their hydraulic pipes and valves stay clear of the chassis and other possible obstructions.
- Make sure that both plates are correctly centered and mounted at equal distance from the L+R extremities of the lift frame.

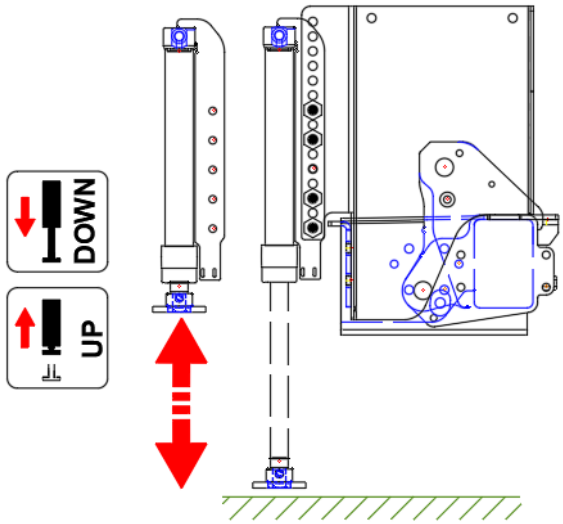


- Make sure the bolts of the adjustable plates are fastened with the required torque. See values for “shear” in appendix 16.2 on page 58.

- For ALL: while the vehicle suspension is at its unloaded, neutral position, operate LEG DOWN to lower the hydraulic stabilising leg(s) fully until you hear the hydraulic system turn in over pressure.
- Do NOT elevate the vehicle to force and line up the holes [# 1] in the stabilising legs with a lower positioned hole [# 2] in the lift frame. Join the holes [# 1] in the stabilising legs with the higher positioned holes [# 2] in the lift frame, so that you end up with a positive ground clearance *d* when the stabilising legs are fully lowered down.
- Follow the bolt instructions below to mount the stabilising legs to the lift frame. Preferably use 4 bolts per stabilising legs, a minimum of 3 is required. If this is not possible, contact your national DHOLLANDIA distributor for further help (probably stabilising legs with a longer stroke). See contact info on page 4.
- Maximise the spread between the bolts.



- Operate LEG UP / LEG DOWN minimum 3 times to verify the set-up and operation of the hydraulic stabilising legs.
- Fasten all bolts and nuts with the required torque. (See values for “shear”).



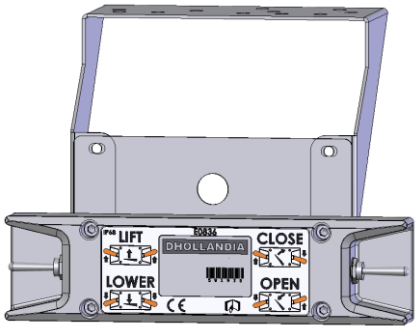
11 ELECTRICAL INSTALLATION

11.1 PHYSICAL INSTALLATION OF MAIN CONTROL BOX

- Because of the large choice in different control boxes, the installation of the main control box, the batteries and earth cables are dealt with in a separate document.

- Read and follow the instructions FIT-ELEC-GENERAL-… (latest update). If not supplied with the tail lift, these can be downloaded from the "DOWNLOAD" section on our website:
  www.dhollandia.com → Country & language selection → Downloads → Mounting instructions → General → … select required manual

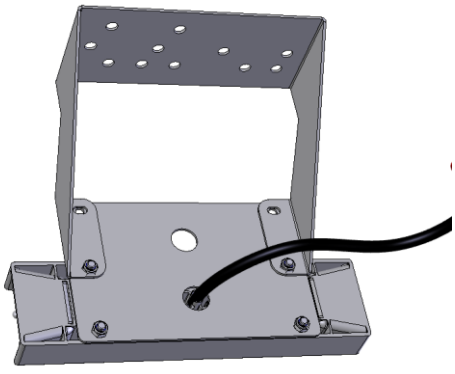
- The 3 prevalent types of main external control boxes are:

Type 1	Type 2	Type 3
		
Main external control box integrated in the power pack , with main battery disconnect switch	Dual toggle-switch control box, to be combined with a cabin switch	Optional: separate main external control box with main battery disconnect switch
Premounted on the lift frame – no extra work required	To be mounted to the underside of the body	To be mounted to the underside of the body, or with quick-fit mounting bracket OAM025
• OAE030.BT.P.0 with joy-stick	• OAE048.0	• OAE030.BT.0 with joy-stick
• OAE041.BP.P.0 with push buttons		• OAE041.BP.0 with push buttons

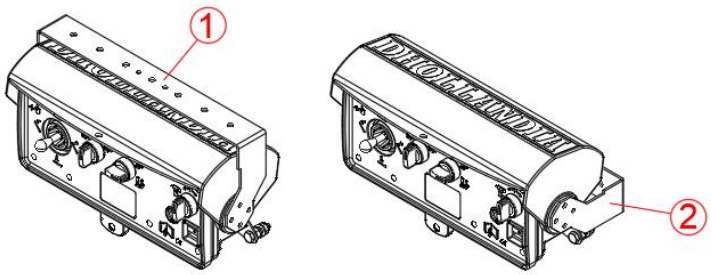
- The separate main external control boxes are supplied with a steel bracket that is preferably bolted to the underside of the vehicle body, but can also be welded.

NOTICE

- The control boxes are made of composite material. Welding sparks will cause damage.
- To avoid damage to the control boxes and all other composite components, dismount them from their steel bracket prior to welding. Shield them from hot metal chips, welding sparks and slag.

• The mounting bracket of the type 2 is foreseen with a series of holes for M8 bolts or self-tapping screws, and should be fixed to the body with a minimum of 3 pcs. of either one. The bracket also offers 2 height positions. • Fasten all bolts and nuts with the required torque.	

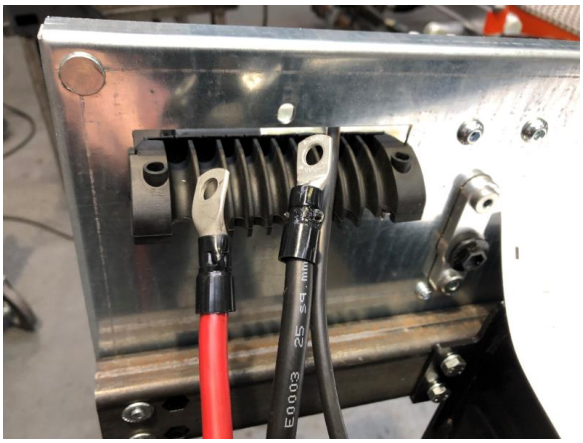
- The mounting bracket of the type 3 is foreseen with a series of holes for M8 bolts or self-tapping screws, and should be fixed to the body with a minimum of 3 pcs. of either one.
- The position of the bracket can be changed via the bolts at the side of the control box, and allow for a fixation from the top [# 1], or a fixation from the rear side [# 2] of the box.
- Fasten all bolts and nuts with the required torque.



- Option OAM025 offers a quick-fit bracket to mount the control box on the bumper tube.

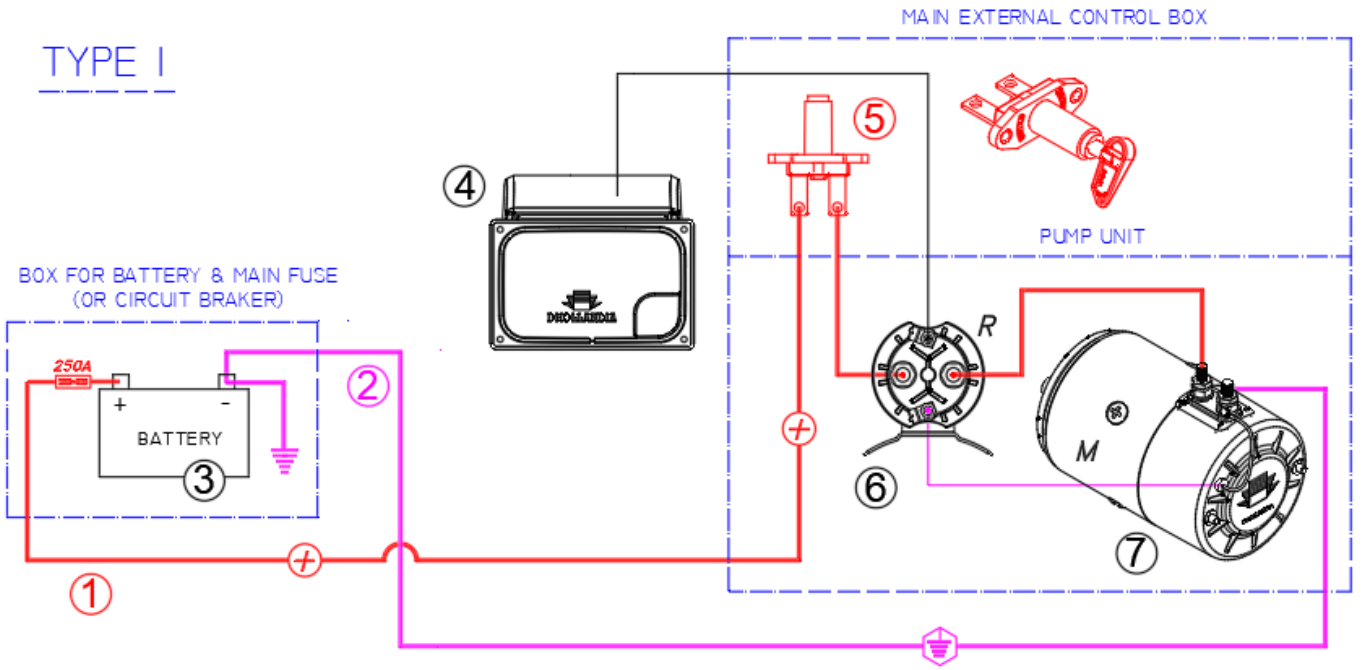
11.2 INSTALLATION OF THE (+) BATTERY CABLE AND (-) EARTH CABLE

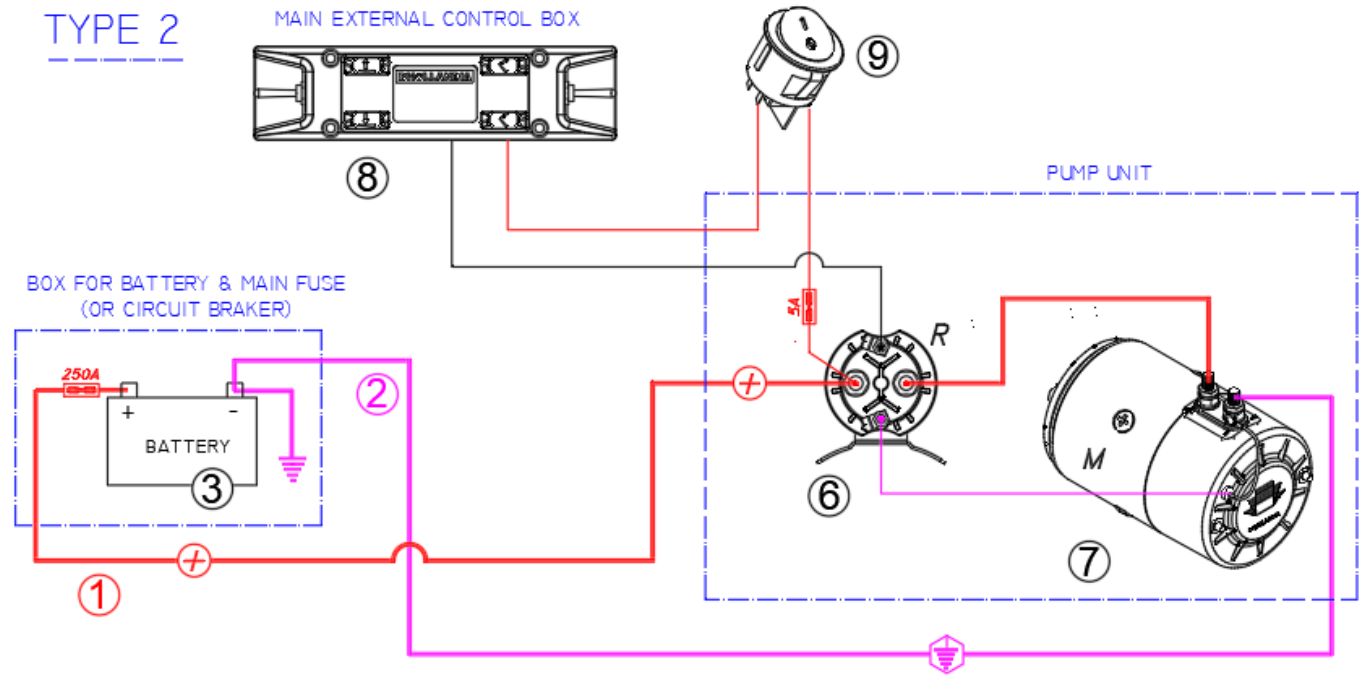
- APPENDIX 16.3 on page 59 provides important information on battery sizes and cable sizes. Make sure you comply with the minimum electrical requirements in that appendix.
- APPENDICES 16.5 - 16.6 from page 64 onwards provide important instructions how to connect the (+) battery cable and (-) earth cable to the main external control box and power pack. Make sure you comply with these instructions.

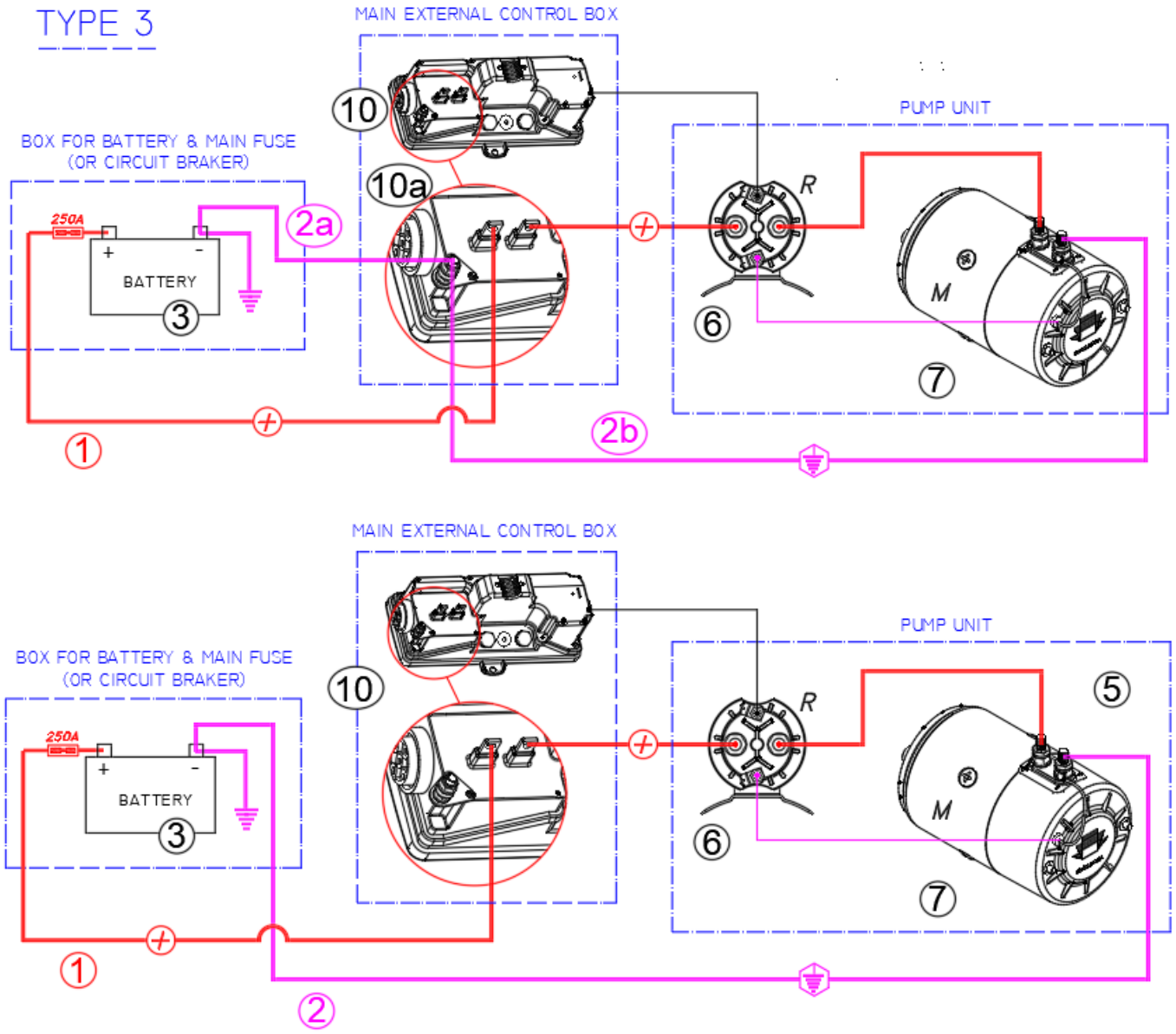


- It is good practice to run dual cables, this is:
  1. a (+) battery cable from the main battery fuse to the main battery disconnect switch of the control box (if applicable), or to the incoming main terminal of the starter solenoid;
  2. and a (-) earth cable, from the negative terminal of the batteries to the negative terminal of the electric motor.
- A short (-) earth cable to the vehicle chassis is prone to oxidation, bad contact and failure. Moreover, it is not allowed on many modern commercial vehicles.
- On type 1 and type 2 control boxes, the (-) earth cable is routed directly from the batteries to the earth point of the electric motor.
- On type 3 control boxes, there is a possibility to split the (-) earth cable from the negative terminal of the batteries to the earth point of the electric motor, and connect them at the rear corner of the control box. Apply a thick layer of anti-corrosive grease to protect the connection point against corrosion.
- Foresee a flexible protective conduit over the full length of the (+) battery cable [# 1 below] and the (-) earth cables [# 2].
- Make sure this conduit is suitable for automotive purposes , and its class is adapted to possible sources of heat nearby. In case of doubt, contact your national DHOLLANDIA distributor. See page 4 for contact info.
- Fasten all connections at both ends of the cables thoroughly. Loose connections can lead to bad contacts and overheating, followed by premature failing of the electrical circuit.
- Apply a thick layer of dielectric grease to the electric connections to the main fuse and the batteries.

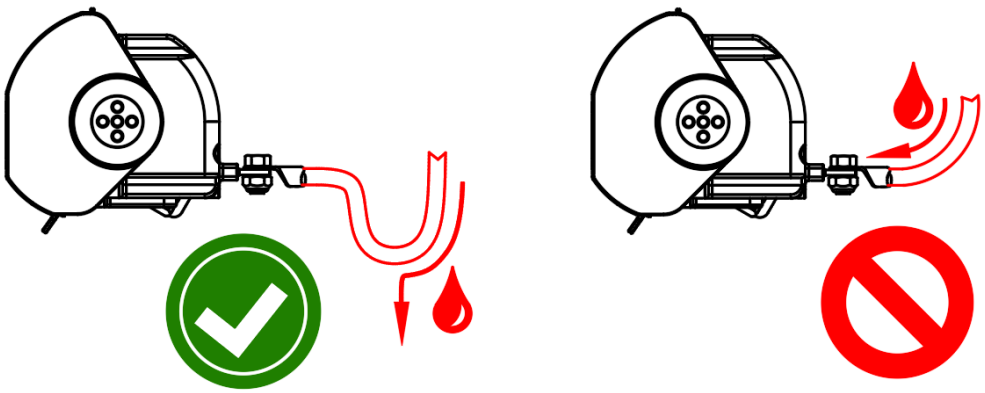
1	(+) battery cable	6	starter solenoid
2	(-) earth cable	7	electric motor
3	12V or 24V battery	8	dual toggle-switch control box
4	main external control box integrated in the power pack, with main battery isolator switch	9	cabin switch
5	main battery isolator switch	10	separate main external control box with main battery isolator switch
		10a	Earth connection point at rear of control box







- When mounting electrical cables, ALWAYS make sure they make a downward curb as they exit the control box or power pack; so that water can drop off in a natural way. This is an easy way to prevent water ingress through the grommets or cable glands.



NOTICE

- To ensure the reliability of the lift over many years, it is extremely important that the batteries, their charging system, the battery- and earth cables, and fuses are dimensioned sufficiently strong, and fitted with care in accordance with above mentioned instructions. Insufficient battery tension will cause harm and irreparable damage to the electric components of the lift (starter solenoid, electric motor, electric switches, etc.).
- Many vehicle manufacturers issue specific instructions where to connect the (+) battery cable and (-) earth cable, what fuses to use etc. Make sure you observe these instructions when installing tail lifts. If such prescriptions conflict with the fitting instructions of DHOLLANDIA, contact the vehicle importer or DHOLLANDIA for further advice.
- When installing cables, make sure these cannot be cut, squeezed, chafed, heated and melted or damaged otherwise by the equipment mounted on the vehicle or by the moving parts of the tail lift.
- Make sure that cables do NOT interfere with the vehicle suspension, the brake and hydraulic circuits or wire looms of the vehicle. Make sure cables are mounted sufficiently far from the exhaust pipe and other heat radiating parts.

11.3 INSTALLATION OF EXTRA CONTROLS

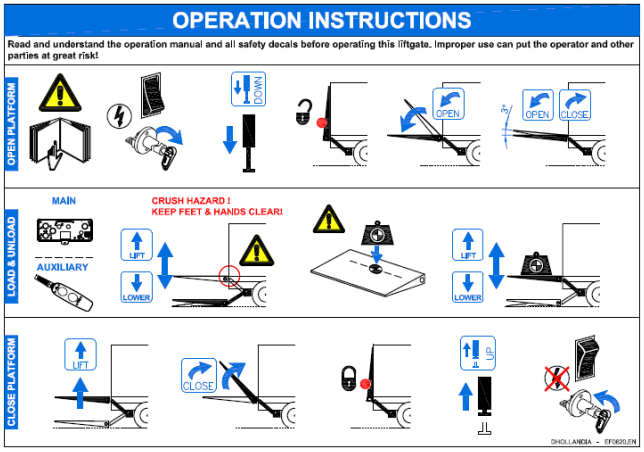
- Because of the large choice in different controls, the installation of these systems is dealt with in a separate document.

- Read and follow the instructions FIT-ELEC-OPTION-… (latest update). If not supplied with the tail lift, these can be downloaded from the “DOWNLOAD” section on our website:

  www.dhollandia.com → Country & language selection → Downloads → Mounting instructions → General → … select required manual

12 PUTTING THE TAIL LIFT INTO SERVICE

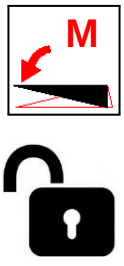
- Make sure that the lift frame and mounting plates are installed in accordance with the installations drawings and instructions.
- Make sure that all bolts and nuts are fastened with the required torque. See appendix 16.2 on page 58.
- Make sure that all electrical connections are finished in accordance with the instructions under 11 from page 44 onwards.
- Refer to the operation manual and decals for instructions how to operate the tail lift safely. See also 15 from page 53 onwards.
- Switch on the electrical power to the tail lift (cabin switch, main battery disconnect switch, or a combination of both).
- Operate LIFT to raise platform up to vehicle floor. Stop when you hear the hydraulic pump turn in overpressure.
- Operate CLOSE to close platform against rear frame of the body. Stop when you hear the hydraulic pump turn in overpressure.

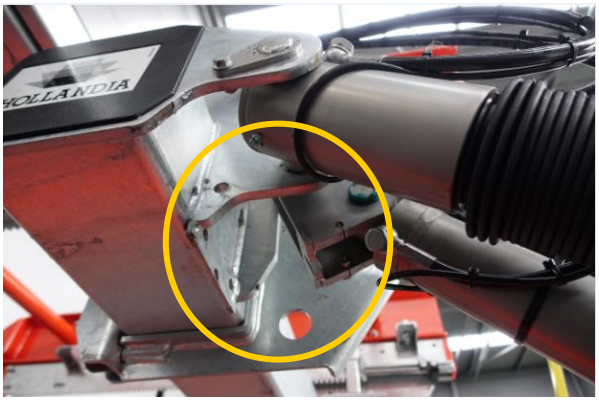


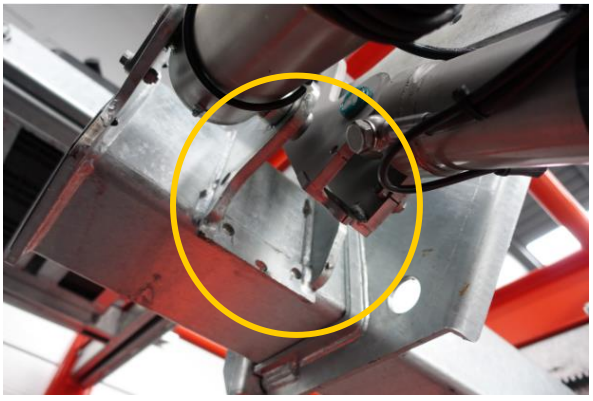
⚠ WARNING

- Improper use of the tail lift can put the operator at great risk of serious bodily injury and death. If in doubt how to use tail lift correctly, ALWAYS consult the operation manual prior to continuing.
- Check for visible leaks of hydraulic oil as the system is being pressurized. If there is leakage, correct the problem prior to continuing.
- Air might be trapped in the hydraulic circuits, as long as the tail lift has not been bled. Air can cause the platform to make unexpected movements, and can put the installer at great risk of serious bodily injury. The installer MUST remain vigilant, and stay out of the range of motion of the platform and the moving parts of the lift as long as the hydraulic circuits have not been bled and all functions duly tested.

- If not done so yet, remove the wheeled mounting jack. Remove all remaining mounting aids (hoists, forklift with slings, C-clamps, etc.) that have been used during installation.
- Operate OPEN followed by LOWER to lower the platform to the ground.
- Remove the locking bolts of the auto-tilt swing brackets. This will activate the AUTO-TILT function.



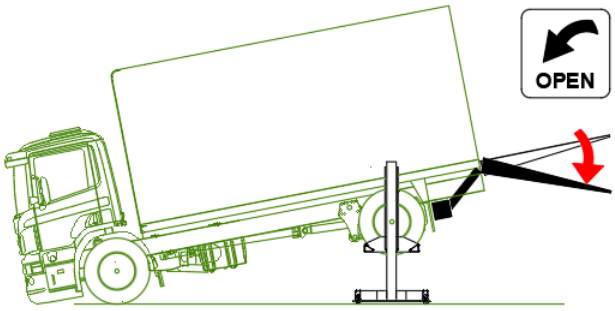


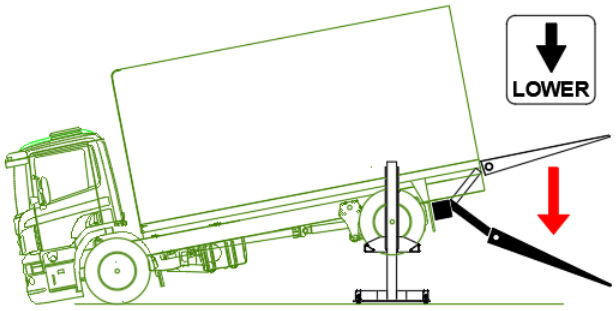


- Verify the safety valves on all cylinders. Make sure the coils and their cables are positioned so that they cannot be pinched or damaged during the various functions. Make sure the locking nut of the coil is firmly tightened.
- Execute all functions at least 5 times. Makes sure there is no interference or collision between the tail lift and the vehicle. The tail lift should operate smoothly and quietly, and at a fairly constant pace. Only the sound of the power pack should be audible. In case of jerking movements or odd sounds, discontinue, investigate the issue at hand, and correct prior to continuing.
- Bleed the air from the hydraulic circuits. Preferably, raise the rear end of vehicle off the ground, or raise its air suspension to the

allowed maximum.

- Starting from the platform in closed position:
  1. OPEN the platform fully to the lowest point and press OPEN for extra 20 sec. CLOSE the platform again and repeat until no more air bubbles back to the oil reservoir.
  2. LOWER the platform fully to the lowest point and press LOWER for extra 20 sec. LIFT the platform again and repeat until no more air bubbles back to the oil reservoir.





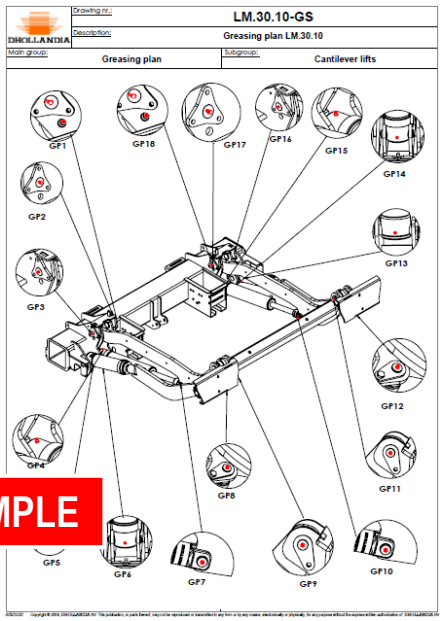
13 LUBRICATION INSTRUCTIONS

- All articulation points equipped with grease nipples should be lubricated with acid free grease after installation, and once in service with intervals as indicated in the MAINTENANCE AND REPAIR MANUAL.

- Refer to appendix 16.4 from page 61 onwards for relevant grease plan of the tail lift, or download any from the website:

  www.dhollandia.com → Country & language selection → Downloads → Maintenance & Repair → Grease plans → … select required plan

- Use the grease gun to inject grease, until a grease collar is formed on both sides of the articulation, that will protect it from ingress of water, salt, sand and dirt etc.
- Note that some grease nipples might be less visible, located in the pin itself, or in the larger assembly that pivots around the pin.
- In case a pin has 2 grease nipples, grease both sides.
- Ensure all grease nipples work correctly. Replace any defective nipples.
- Always acid-free grese. The use of graphite grease is not allowed.



EXAMPLE

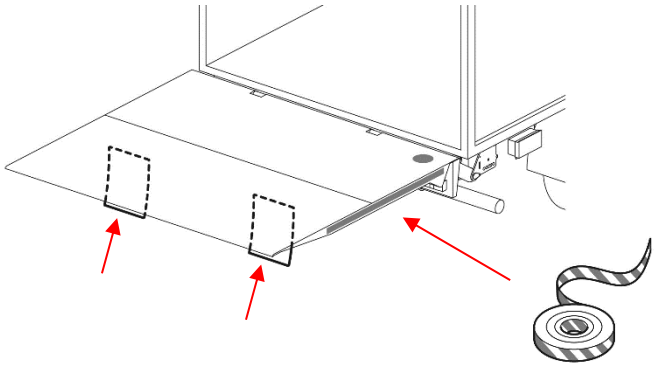
NOTICE

To give the tail lift a good start and maximize its longevity, it is important to grease all pivot points thoroughly after installation.

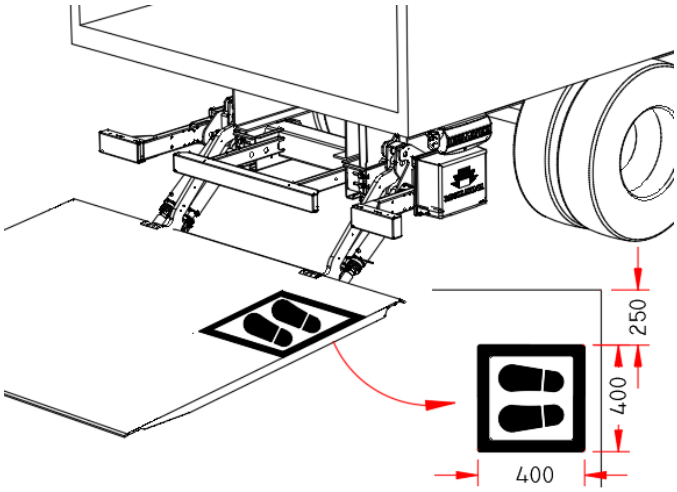
14 QUALITY CONTROL AND PDI TEST

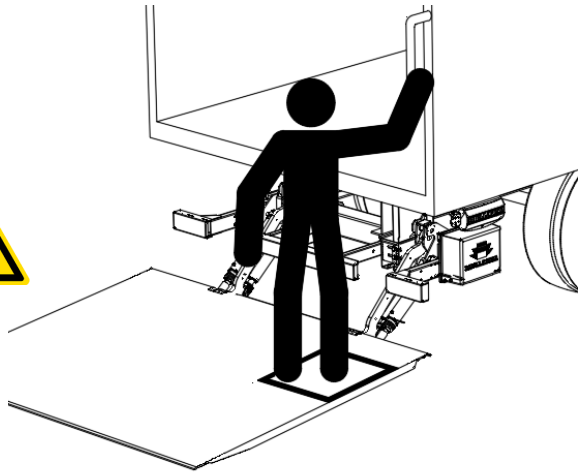
- Finish the tail lift in accordance with local regulations.
- Execute all functions min. 5 times to ensure the tail lift functions correctly. In particular:
  1 Verify that the automatic tilt at ground level operates properly.
  2 Verify that the end stops for the lift arms are strong enough and fit for purpose.
  3 Verify that the platform in work position aligns level with vehicle floor.
  4 Verify that the platform closes correctly in stow position.
- Make sure that the platform will be clearly visible in public traffic:

1 Apply the RD/WH reflective marking tape on both sides of the platform.
2 Install the platform flags to the underside of the platform point.
3 If applicable, connect the flashing platform lights and verify their function.

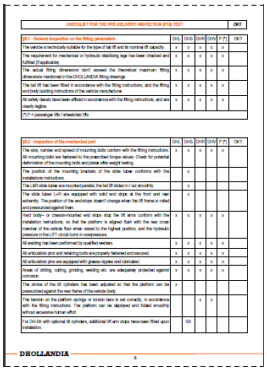


- If the operator is allowed to travel up and down on the platform by other means than original foot controls, mark a safe operator position of 400 x 400mm at a safe distance of 250 mm from the hazardous crushing area between the inboard platform edge and the rear cross member of the vehicle floor.





- Refer to the CE IDENTIFICATION AND INSPECTION LOGBOOK.
- Work through the CHECKLIST FOR THE PRE-DELIVERY INSPECTION (PDI) TEST.
- Complete the practical tests indicated therein.
- Fill-out the FITTING DECLARATION.



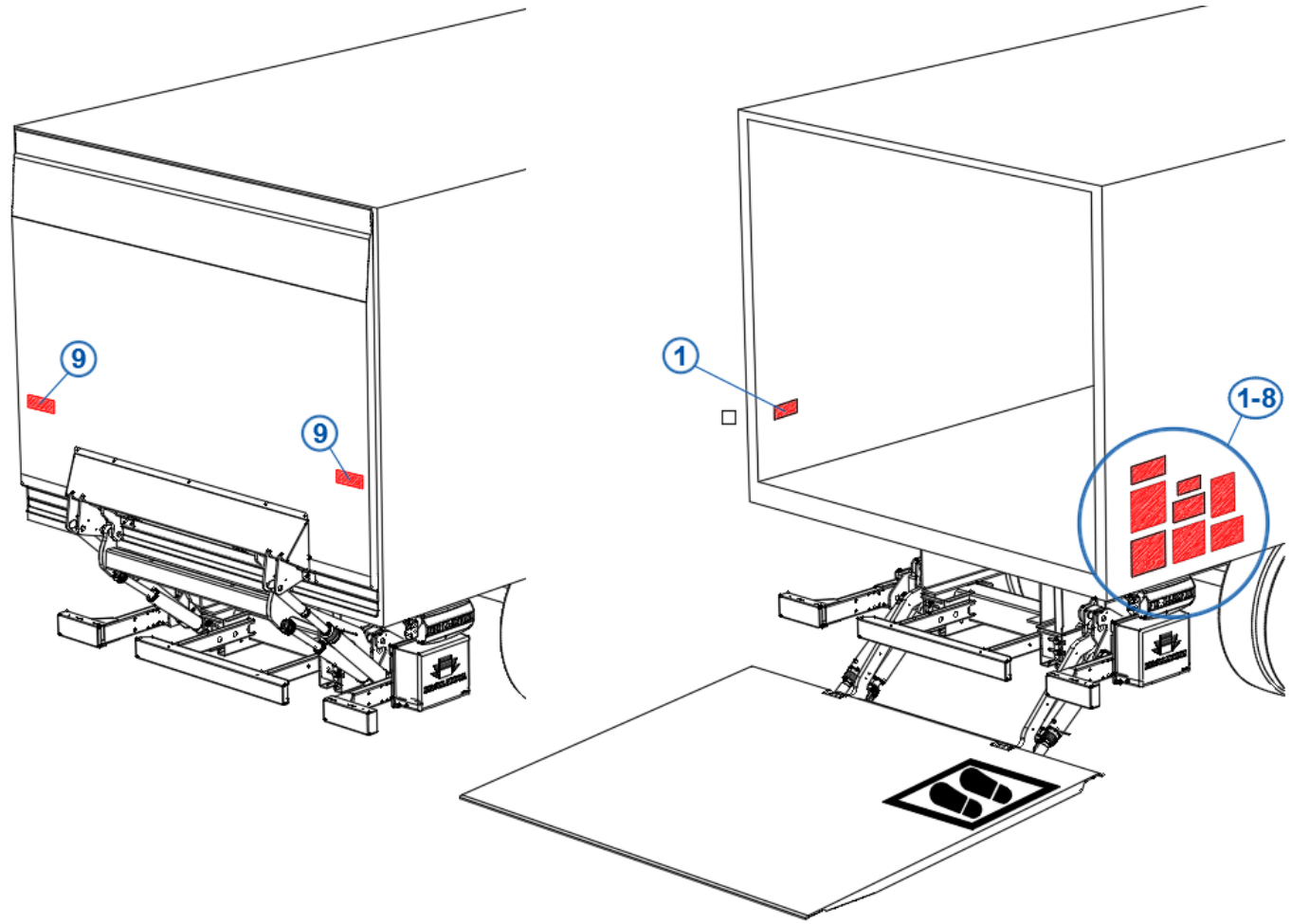
- During the weight test, adjust the hydraulic blow-off pressure at the main valve block inside the power pack in accordance with the maximum rated capacity of the tail lift.
- Adjust the pressure if too high or too low, seal the pressure relief valve after that.
- If in doubt how to adjust the pressure relief valve, refer to procedure I-SERV-G-003 of the MAINTENANCE AND REPAIR MANUAL, or contact your national DHOLLANDIA distributor for help. See contact info on page 4.

- Apply the safety decals to the tail lift and vehicle body before delivery to the customer, see 15 on page 53.

NOTICE	⚠ WARNING
• The PDI check-list completes the final quality inspection of the installation. Once completed successfully, it will certify the safe and reliable operation of the tail lift. • Operating a tail lift that hasn't successfully passed the PDI test can lead to premature wear or damage of the tail lift itself. • Operating a tail lift that hasn't successfully passed the PDI test can put the operator and third parties at great risk, and could result in sever personal injury or death.	

15 DECALS

- Affix the safety decals to the tail lift and vehicle body in accordance with the instructions below.
- Note: the decals marked as “EXAMPLE” can vary in function of the maximum rated capacity of the tail lift, or the chosen type of external control box.



1

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WARNING

- DO NOT use this liftgate without adequate safety and operator training.
- View safety and operator video prior to use. Use this QR-code to connect.
- Review operation manual prior to use. Manuals can be obtained from your DHOLLANDIA distributor, or downloaded from: www.dhollandia.com
- Improper use of the liftgate will put the operator and other parties at great risk of bodily injury and death.
- In case of doubt, contact DHOLLANDIA toll free:

LM

US West: 855 856 8225 US East: 855 894 1888 CAN: 888 750 5438

DHOLLANDIA • EF0583.LM.EN

2

EF0565.EN

WARNING - SAFETY INSTRUCTIONS

Read and understand the user’s manual, all instructions and warnings before use.

Carelessness or ignorance will put the operator and third parties at great risk of serious injury and death.¶

1. Do not use liftgate unless you have been properly trained and instructed, you have read and you understand the full operating instructions.
2. Wear appropriate working clothes, incl. footwear with steel toe caps and a good non-slip sole, and wear protective gloves.
3. Ensure the vehicle is safely parked and braked before using the liftgate.
4. Where applicable, refer to the site’s specific risk assessment, and follow the local work & safety instructions.
5. Always inspect the lift gate before using it. DO NOT use liftgate if there are signs of bad maintenance, subnormal wear or damage, or if the platform surface is slippery. DO NOT attempt to repair liftgate yourself, unless you have been trained and authorized to do so.¶
6. Do not overload. Observe the maximum rated capacity and load charts.
7. Do not stand behind or within reach of the platform.
8. Make sure that platform area, including the area in which loads may fall from platform, is clear of obstacles and other people at all times.
9. Make sure you can see and keep visual control over the whole working area of the liftgate, the platform and its load at all times.
10. Beware of finger and toe traps at all times. When riding platform, stand at safe distance of minimum 10” from the inboard edge of the platform adjacent to the rear sill of the vehicle body.¶
11. It is prohibited for anyone other than the operator to travel on the platform.
12. Liftgate is intended for loading and unloading cargo only. Do not use liftgate for anything else but its intended use.
13. Make sure platform is clearly visible from all approach directions (by means of flashing platform lights, platform flags, traffic cones, etc...) and that the working zone is sufficiently illuminated.

3

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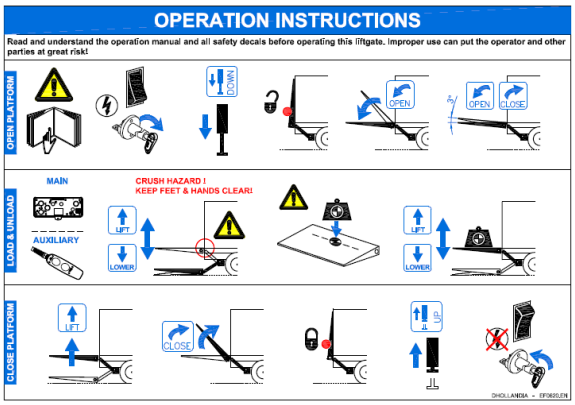

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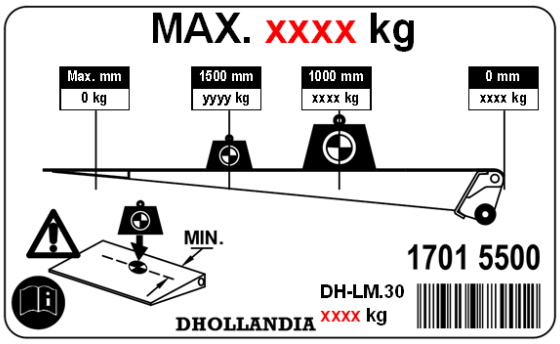

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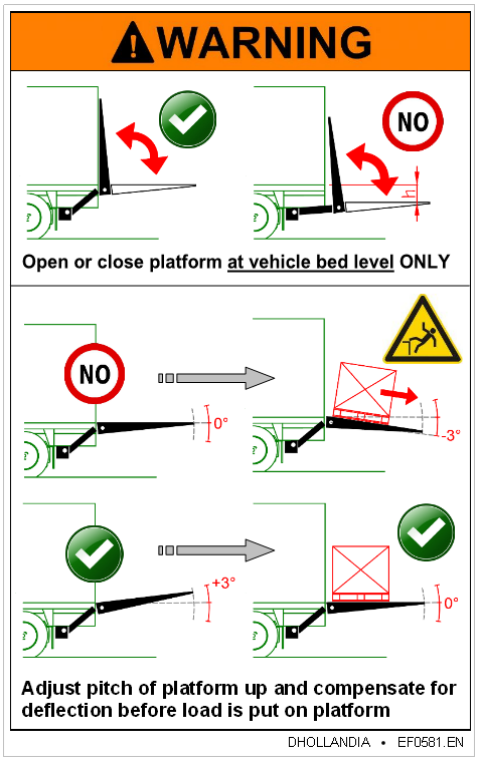

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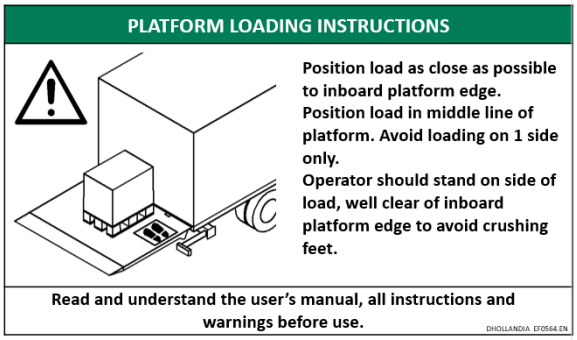
EF0564.EN



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- Tail lift decals used and affixed in areas, other than the rear of the vehicle.

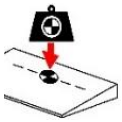
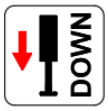
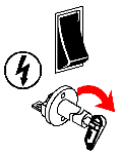
1 EF0814..EN.CE

Cabin switch in driver's cabin to switch electrical power to tail lift on / off (if so equipped)

16 APPENDIX

16.1 MEANING OF THE SAFETY AND WANRING SIGNS

WARNING signs		MANDATORY ACTION signs	
	Overview and keep visual control over the working area of the tail lift at all times.		Contact your regional DHOLLANDIA distributor.
	General warning sign used to alert the user to potential hazards. All messages that follow this sign shall be obeyed to avoid possible harm.		Consult the DHOLLANDIA website. Download from DHOLLANDIA website.
	Entrapment hazard. Keep hands, limbs, loose clothes and long hair away from moving parts.		Read the manual or instructions.
	Crushing & shearing hazard. Keep hands away from moving parts.		Hold onto guard rail. Protect yourself from falling off the platform, or vehicle floor.
	Crushing & shearing hazard. Keep feet away from moving parts.		Wear safety gloves.
	Slipping hazard.		Wear safety-toe shoes.
	Tripping hazard.		Wear appropriate work clothes, avoid loose-fitting clothes that might be trapped in the moving parts of the lift.
	Hazard caused by tilting objects.		Wear safety protection, eye protection and a safety hard hat.
	Hazard of falling from heights.		Follow these welding instructions.
	Crushing and entrapment hazard. Keep head, upper body and limbs away from moving parts		Follow these bolt instructions. Fasten the bolts and nuts with the required torque.
			Grease / lubricate. Inject grease in the grease nipples.
PROHIBITION signs			
	General prohibition. DO NOT do!		DO NOT use machine by more than 1 operator!
	General prohibition. DO NOT do!		DO NOT step or stand here!

OTHER frequently used signs		Signs for the electric / hydraulic functions	
	Yes do this way. Correct work procedure.		OPEN the platform, or TILT DOWN.
	No, DO NOT do this way. -Incorrect work procedure.		LOWER the platform.
	Position the load at the applicable center of maximum load. Follow the load instructions.		LIFT the platform.
	Tail lift with mechanical auto-tilt at ground level (and auto-tilt swing brackets).		CLOSE the platform, or TILT UP.
	Tail lift with hydraulic auto-tilt at ground level (and hydraulic memory cylinder)		SLIDE OUT the platform.
	Unlock. Disengage the mechanical locking system.		SLIDE IN the platform.
	Lock. Engage the mechanical locking system.		Push the stabilising LEGS DOWN.
	Switch ON the electrical power.		Pull the stabilising LEGS UP.
	Switch ON the electrical power to the tail lift via the main battery disconnect switch and / or cabin switch.		Lower the hydraulic RAMP DOWN.
	Switch OFF the electrical power.		Raise the hydraulic RAMP UP
	Switch OFF the electrical power to the tail lift via the main battery disconnect switch and / or cabin switch.		Switch between external and internal controls.
	This is an operation to be executed manually (as opposed to an electrical function controlled by means of one of the control units).		

16.2 PRESCRIBED TORQUE VALUES FOR BOLTS AND NUTS

- The installer MUST verify that all bolted connections are fastened with required torque in accordance with the table below.
- After weight testing, the installer MUST verify that all bolted connections between lift frame and mounting plates, and between mounting plates and vehicle chassis are still tightened in accordance with required torque. Retighten if required.
- Use a calibrated torque wrench to tighten bolts and nuts to the prescribed torque value.

NOTICE	⚠ WARNING
• Incorrect, too soft or too hard tightening of bolts can lead to accidental fall of the tail lift off the vehicle chassis. • A fall of the tail lift off the chassis can damage the tail lift and / or vehicle chassis and can cause serious bodily injury or death to the operator and any bystanders. • Therefore, it is essential that the mounting plates are installed following the instructions of this manual.	

Nm	Type of Stress			
	Pull		Shear	
	Class		Class	
Metric Value	8.8 ○	10.9 ◎	8.8 □	10.9 ▣
1. M08 x 1.25	8	11	24	33
2. M10 x 1.50	15	22	47	68
3. M12 x 1.75	26	44	82	115
4. M14F x 1.50	45	65	135	195
5. M14 x 2.00	45	65	129	185
6. M16F x 1.50	100	150	208	300
7. M16 x 2.00	100	150	195	285
8. M20F x 1.50	215	310	425	605
9. M24F x 2.00	360	490	715	975

LbsFt	Type of Stress			
	Pull		Shear	
	Class		Class	
Imperial Value	8.8 ○	10.9 ◎	8.8 □	10.9 ▣
1. M08 x 1.25	6	8	17.5	24.5
2. M10 x 1.50	11	16.5	34.5	50
3. M12 x 1.75	17.5	32.5	60.5	85
4. M14F x 1.50	32.5	48	99.5	144
5. M14 x 2.00	32.5	48	95	136
6. M16F x 1.50	73.5	111	154	221
7. M16 x 2.00	73.5	111	144	210
8. M20F x 1.50	159	228	314	446
9. M24F x 2.00	265	361	528	719

16.3 ELECTRIC AND HYDRAULIC REQUIREMENTS

- The applicable wiring diagrams are stored at the inside of the main external control box.

- A copy of the wiring diagrams can also be obtained from the national DHOLLANDIA distributor [see contact info on page 4]; or downloaded from the DHOLLANDIA website:
  www.dhollandia.com → Country & language selection → Downloads → Electrical & hydraulic wiring diagrams → … select required diagram

- Remark: the following cable sections are recommended (+) battery cables and (-) earth cables. Note: these are general data. Subject to agreement with our order department, other configurations are possible.

Recommended cable sections for (+) battery cables and (-) earth cables	
Size electric motor	**Cable section**
500 W	16 mm² - 5 AWG
12V ● 1200 – 2000 W 500 – 1500 kg capacity / length ≤ 10 m 500 – 1500 kg capacity / length 10 – 18 m Capacity > 1500 kg Length > 18 m	 25 mm² - 3 AWG 35 mm² - 1 AWG 50 mm² - 0 (1/0) AWG 50 mm² - 0 (1/0) AWG
24V ● 1200 – 2000 W 500 – 2000 kg / length ≤ 18 m Capacity > 2000 kg Length > 18 m	 25 mm² - 3 AWG 35 mm² - 1 AWG 35 mm² - 1 AWG
24V ● 3000 W Length < 18 m Length > 18 m	 35 mm² - 1 AWG 50 mm² - 0 (1/0) AWG
Long motor cycles > 25 sec (double deck, power down)	50 mm² - 0 (1/0) AWG

- Batteries and their charging system should be chosen to comply with the following minimum requirements:

	Voltage System					
	12V			24V		
Tail lift capacity (lb / kg)	**Electrical power (Amp)**	**Battery capacity (Ah)**	**Generator output (A)**	**Electrical power (Amp)**	**Battery capacity (Ah)**	**Generator output (A)**
≤ 1750 lbs / 750 kg	200	143	70	150	105 (2X)	70
≤ 2200 lbs / 1000 kg	250	143	70	200	105 (2X)	70
≤ 3300 lbs / 1500 kg	250	180	90	200	180 (2X)	90
> 3300 lbs / 1500 kg	250	180	110	200	180 (2X)	110
> 3300 lbs / 1500 kg Frequent usage	300	220	110	250	220 (2X)	110

NOTICE

- To ensure the reliability of the tail lift over many years, it is extremely important that the batteries, their charging system, the (+) battery and (-) earth cables, fuses and circuit breakers are dimensioned sufficiently strong, and fitted with care in accordance with the DHOLLANDIA installation instructions. Insufficient battery power will cause harm and irreparable damage to the electric components of the tail lift (starter solenoid, electric motor, electric switches, etc.).
- Insufficient cable gauge on the (+) battery and (-) earth cables can lead to overheating, bad performance of the electrical system, and premature wear of the main electrical components.
- (-) earth circuits are as important as (+) battery circuits for the good operation of the tail lift, but often overlooked in troubleshooting. Make sure you take these into consideration when executing repairs or maintenance checks.

- DHOLLANDIA mainly uses 3 types of oils in its hydraulic systems.

Option code	Temperature range	Type of oil, examples
Standard	Mild to hot	ISO VG 22
OAH001 winter oil	Down to -30°C / -22°F	ISO VG 15
OAH002 arctic oil	Down to -50°C / - 58°F	Hydr. Fluids such as Castrol Aero HF585B

NOTICE

It is important to follow these guide-lines with due care. A lot of oils or fluids used in automotive industry, such as transmission fluids and ATF oils, are not suitable for tail lift use. DHOLLANDIA has not tested the potential consequences of oils and fluids with deviating specifications and cannot be held responsible or legally liable for any damage to the tail lift caused by the replenishment with non-compatible oils or fluids; nor for the consequential damage to property or physical harm to individuals.

16.4 GREASE PLANS

- This annex includes grease plans for the most frequent tail lifts DH-LM* 1500 - 3000 kg.

- A copy of the grease plans can also be obtained from the national DHOLLANDIA distributor [see contact info on page 4]; or downloaded from the DHOLLANDIA website:
  www.dhollandia.com → Country & language selection → Downloads → Maintenance | Repair → Grease plans → … select required plan

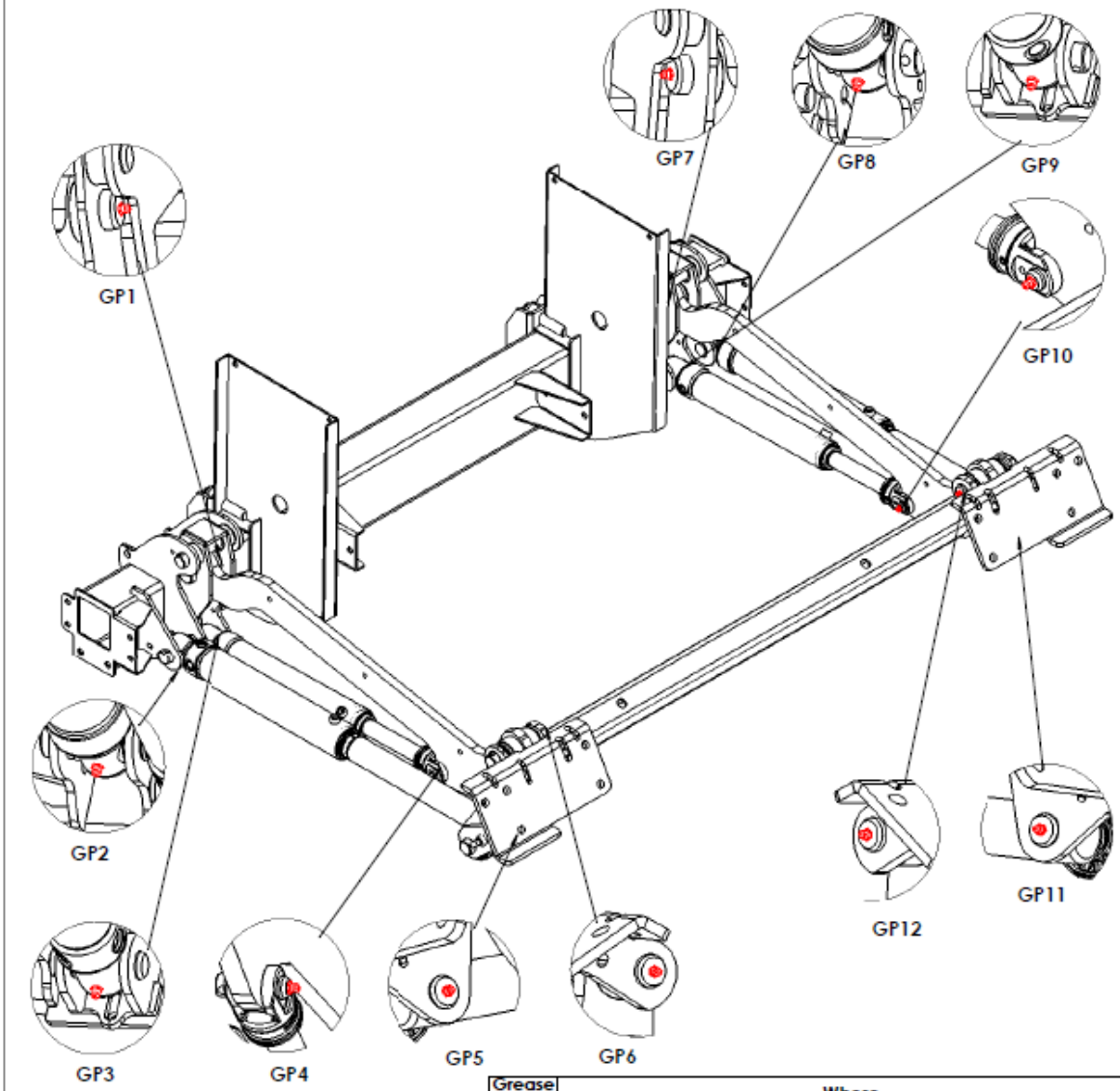
DHOLLANDIA

Drawing nr.: **LM.15.01-GS**

Description: **Greasing plan LM.15.01**

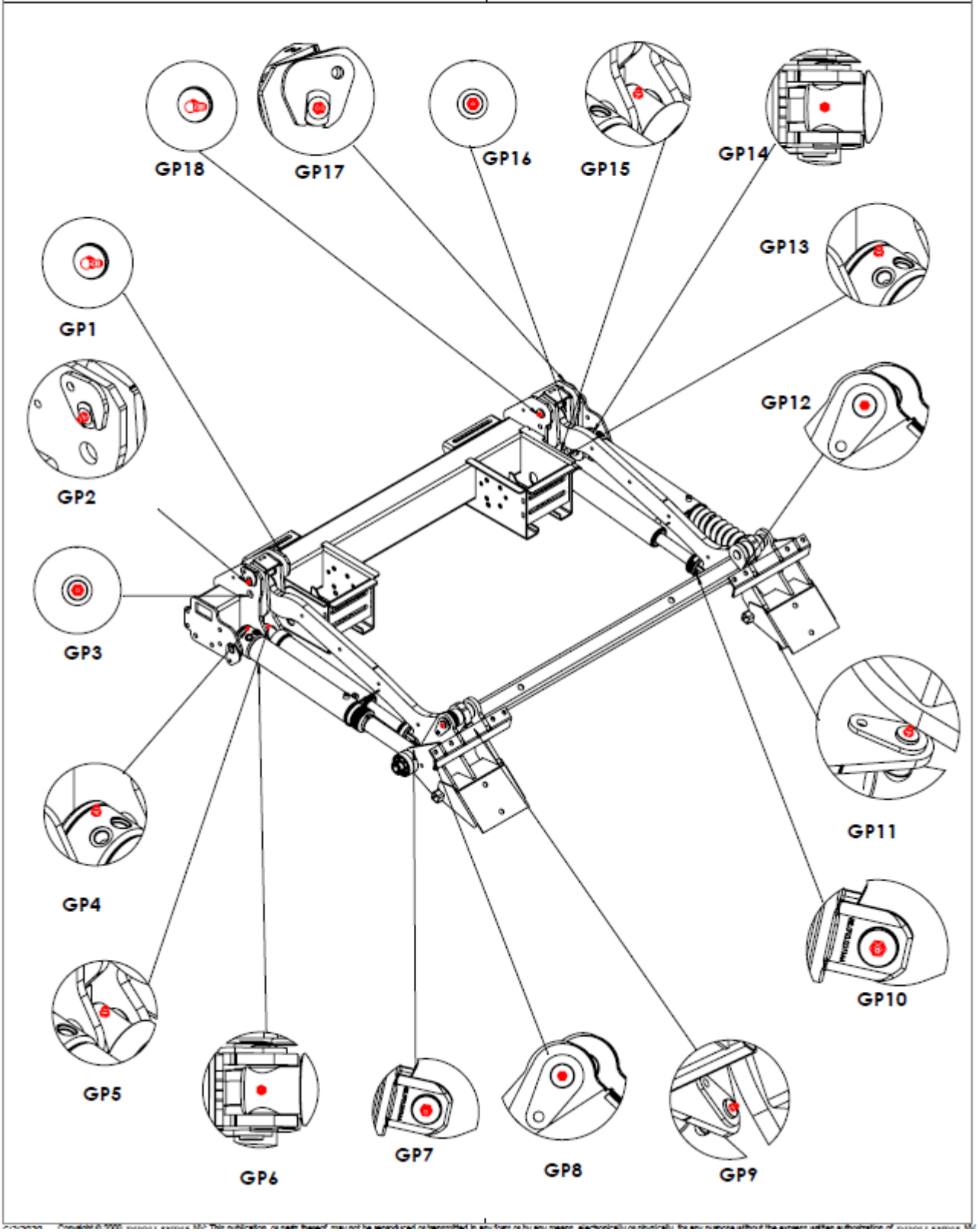
Main group: **Greasing plan**

Subgroup: **Cantilever lifts**

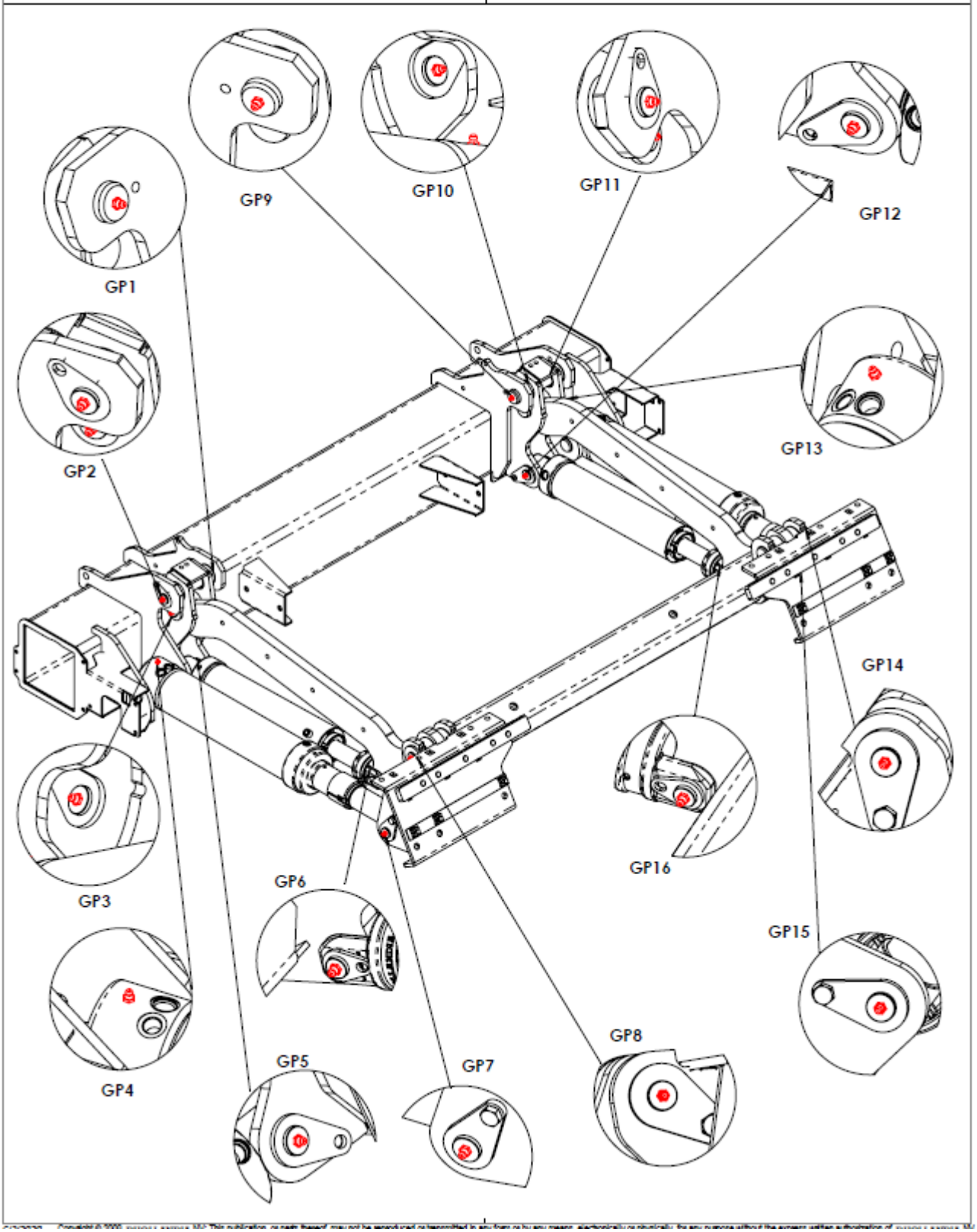


Grease point	Where
GP1	On pin between frame and swing (left side)
GP2	On tilt cylinder (left side)
GP3	On lift cylinder (left side)
GP4	On pin between lift cylinder and arm (left side)
GP5	On pin between tilt cylinder and platform (left side)
GP6	On pin between arm and platform (left side)
GP7	On pin between frame and swing (right side)
GP8	On tilt cylinder (right side)
GP9	On lift cylinder (right side)
GP10	On pin between lift cylinder and arm (right side)
GP11	On pin between tilt cylinder and platform (right side)
GP12	On pin between arm and platform (right side)

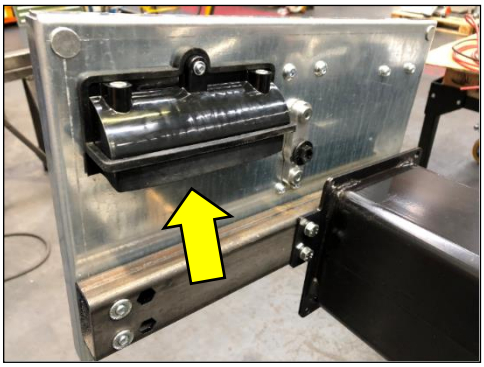
DHOLLANDIA	Drawing nr.:	LM.20.08-GS
	Description:	Greasing plan LM.20.08
Main group:	Greasing plan	Subgroup: Cantilever lifts

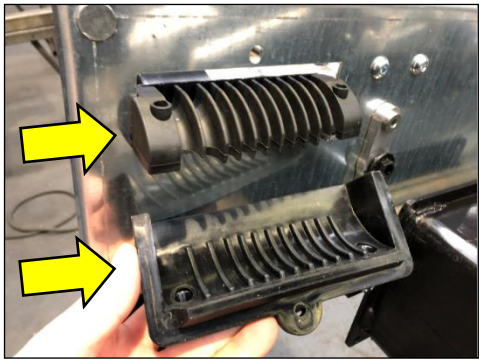


DHOLLANDIA	Drawing nr.:	LM.30.04-GS
	Description:	Greasing plan LM.30.04
Main group:	Greasing plan	Subgroup: Cantilever lifts

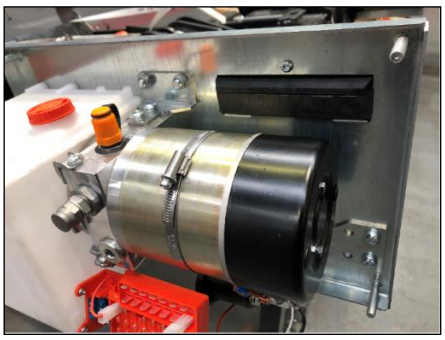


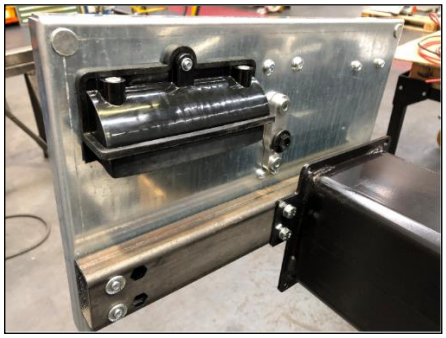
16.5 CONNECTIONS TO THE MAIN EXTERNAL CONTROL BOX TYPE 1



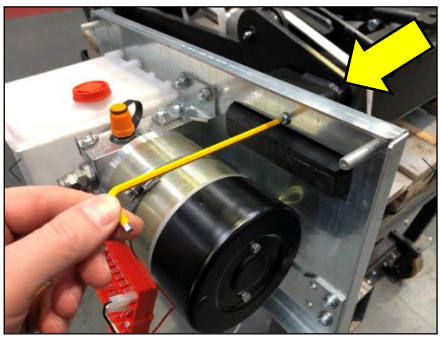


Most types of power packs are equipped with a multi-cable entry seal, with dedicated channels for narrower and wider diameter cables. Follow the instructions below to run cables through the entry seal.

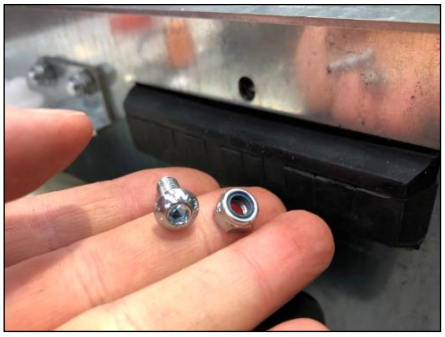




Above images show what the entry seal looks like, when no cables are mounted. To pass the cables through to entry seal, proceed as explained in the following steps.

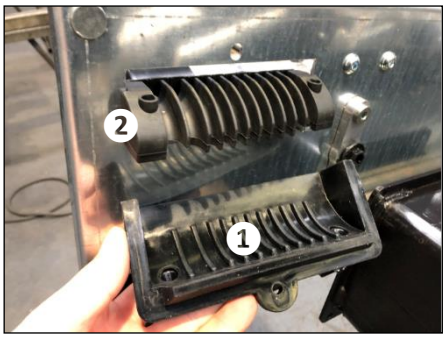


From the inside, unbolt the middle Allen bolt that bolts the entry seal to the back plate of the power pack, by means of an Allen key nr. 4.

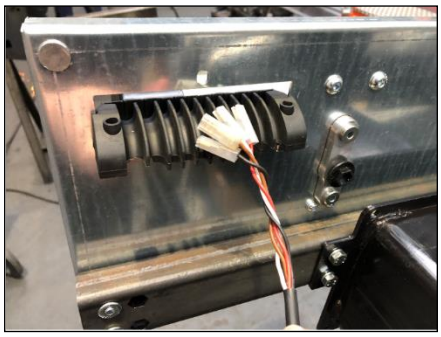


Unscrew the bolt and nut.

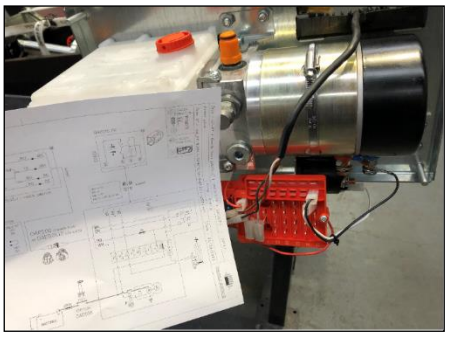
From the outside, unbolt the 2 vertical Allen bolts that hold the 2 main elements of the entry seal together, by means of an Allen key nr. 5.



Pull back and lift the upper element [1]. The entry seal has wider and narrower channels. Reserve the wider for the ticker battery & earth cables. Use the narrower for control units, cables of safety valves etc.

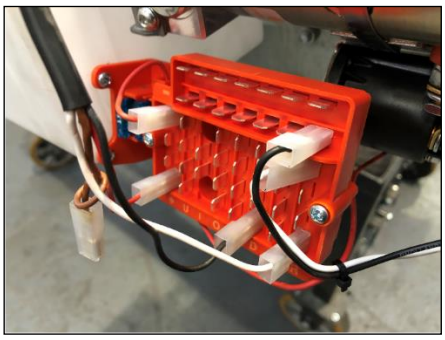


For control units, lead the cable through the entry seal. Use one of the narrower channels..

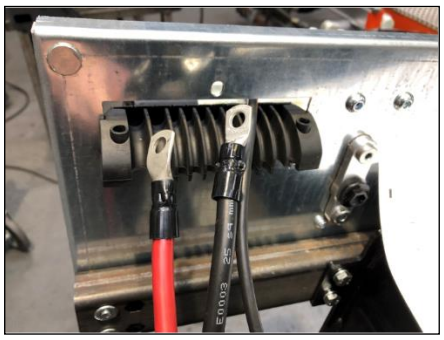


Lead the wire to the orange connection block and connect as per wiring diagram supplied with the tail lift.

Route the cable in such a way that it cannot be damaged or pinched.

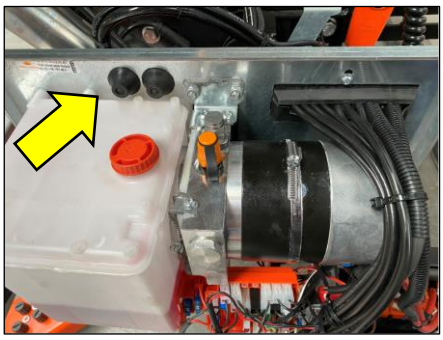


Connect the cable as per wiring diagram supplied with the tail lift.

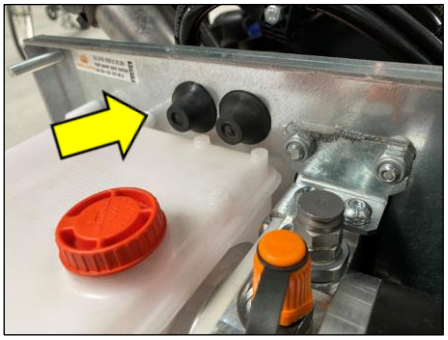


For the battery & earth cables, lead the cables through the entry seal. Use one of the wider channels.

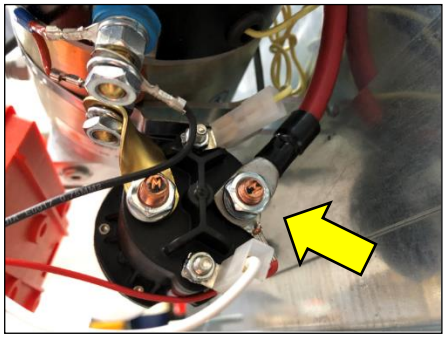
Route the cables in such a way that it cannot be damaged or pinched.



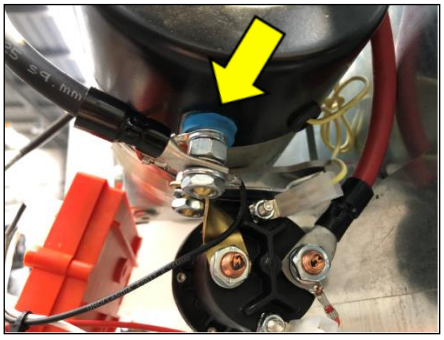
As alternative, 2 rubber grommets are available through which the battery & earth cables can be lead inside the power pack.



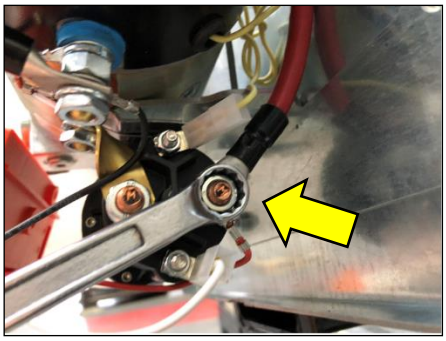
Make sure all rubber grommets are repositioned correctly after passing the cables.



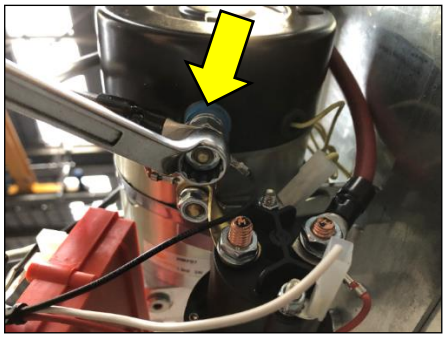
A- If no main battery disconnect switch, connect the battery cable to the incoming main terminal of the starter solenoid. [see B- below]



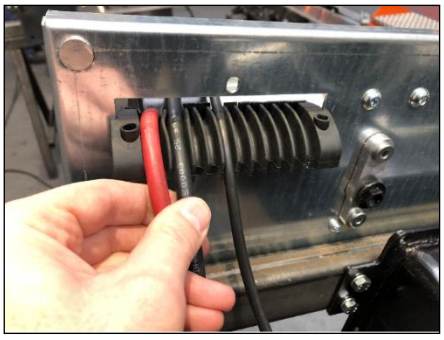
Connect the earth cable to the earth point of the DC motor.



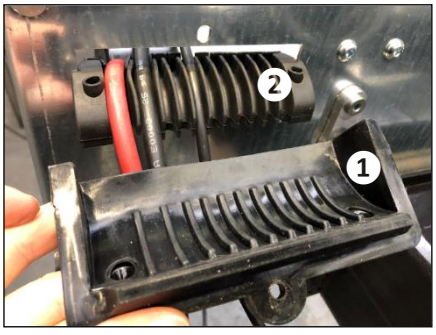
Tighten the nut of the incoming main terminal of the starter solenoid by means of a hexagonal key nr. 13.



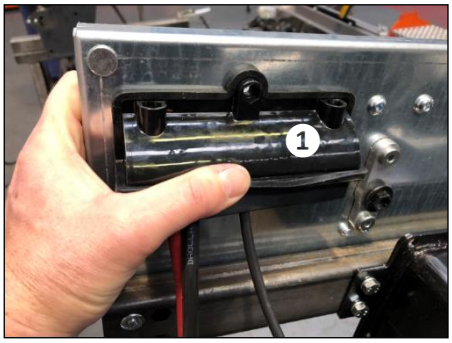
Tighten the nut of the earth point of the DC motor by means of a hexagonal key nr. 13.



Neatly arrange the various cables in their assigned channels. Push them down into the groove, make sure the cables don't overlap the vertical divider lips between the various channels.

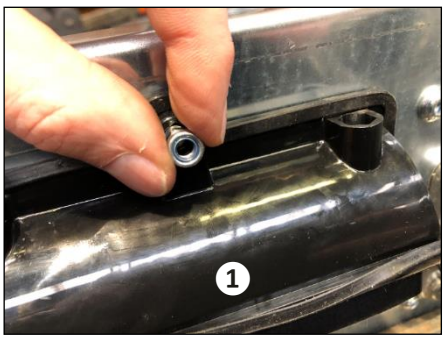


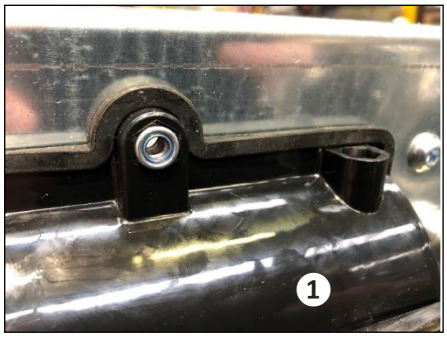
Prepare to place the top element [1] back on top of the bottom element [2].



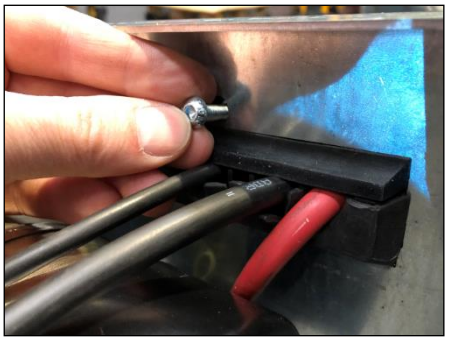
Slide the top element [1] back in the cut-out foreseen in the back plate of the power pack, and press it hard against the back plate.

Make sure the sealing lips between the various cables remain straight, don't get curled or deformed. Make sure that the various cables remain nicely located in their assigned channel.

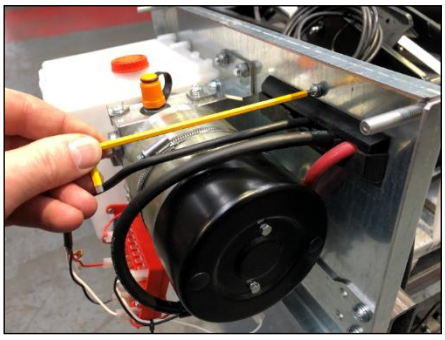




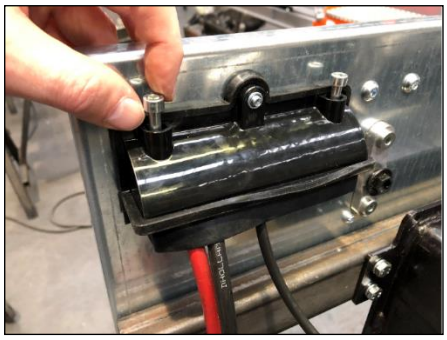
If the nut was dismounted or had become dislocated, insert it back into its socket.



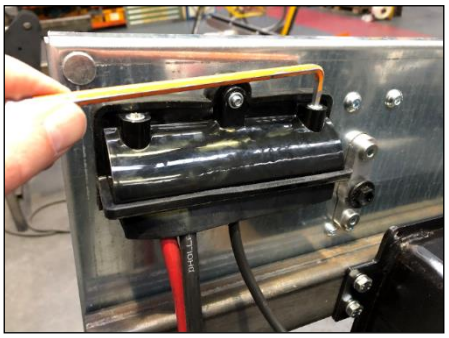
At the inside, mount the Allen bolt back in its original position.



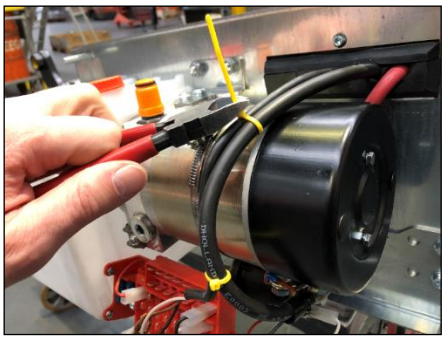
Tighten the bolt firmly by means of an Allen Key nr. 4.



At the outside, mount the 2 Allen bolts back in their original vertical position.

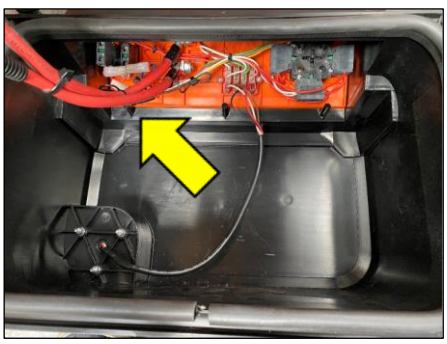


Tighten the 2 bolts firmly by means of an Allen Key nr. 5.

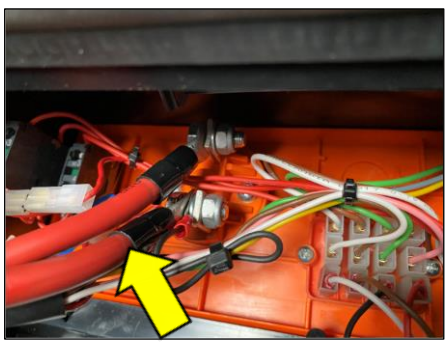


At the inside, route all cables so that they are protected against damage, pinching and chafing.

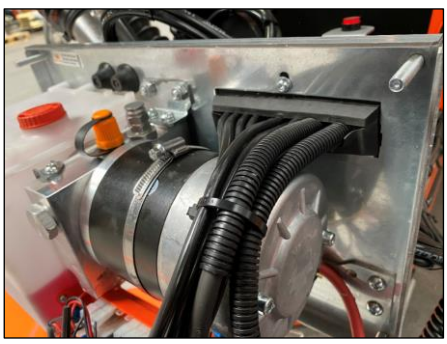
Use cable ties to bind the cables together, protect cables against vibration, and finish off in a clean way.



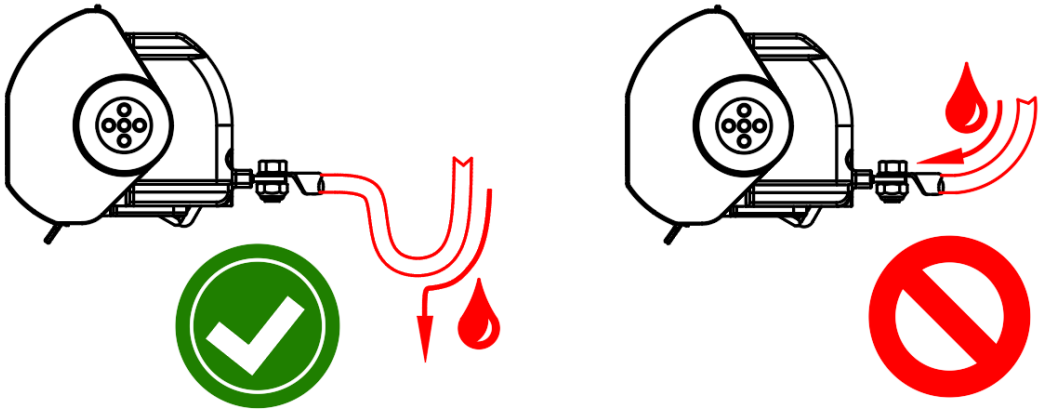
B- If so equipped, connect the battery cable to the incoming terminal of the main battery disconnect switch.



Tighten the nut of the incoming terminal of the main battery disconnect switch by means of a hexagonal key nr. 13.



Finish off the multi-cable entry seal as explained above for the case without main battery disconnect switch.

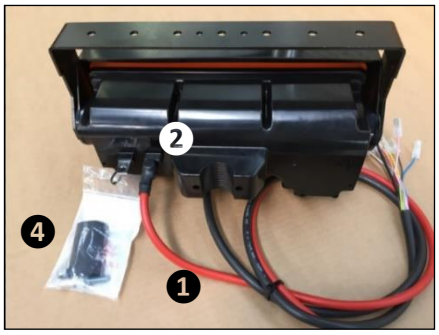


When mounting electrical cables, ALWAYS make sure they make a downward curb as they exit the control box or power pack; so that water can drop off in a natural way. This is an easy way to prevent water ingress through the grommets or cable glands.

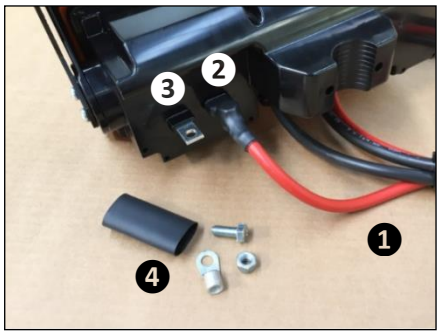
NOTICE

- To ensure the reliability of the lift over many years, it is extremely important that the installer connects the battery cables and earth cables to the control box and power pack, heat shrinks and seals the connections with due care.
- Insufficient torqueing of the connection bolts can cause overheating and short circuits. Improper sealing can cause water ingress, and premature corrosion of the connections.
- DHOLLANDIA disclaims liability for any personal injury or property damage that results from improper or negligent installation.

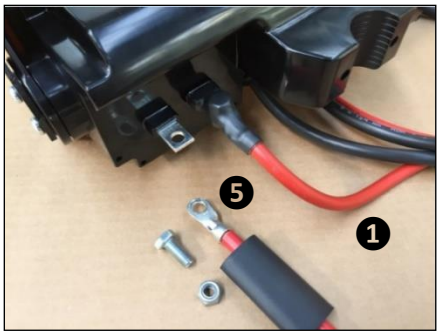
16.6 CONNECTIONS TO THE MAIN EXTERNAL CONTROL BOX TYPE 3



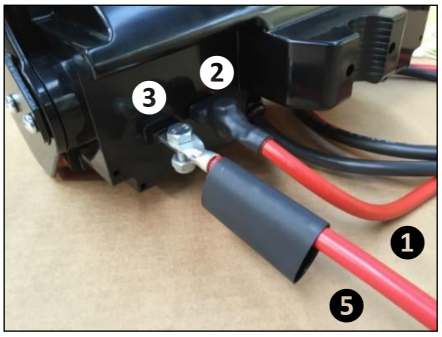
On new lifts, the battery cable (1) from the outgoing terminal of the main battery disconnect switch to the power pack is usually premounted.



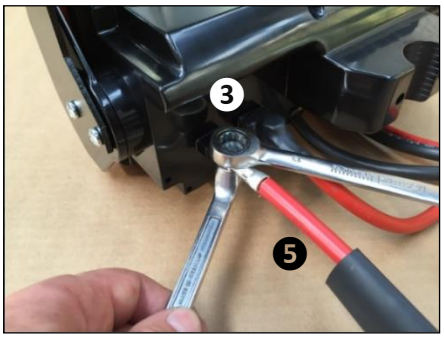
The bag (4) contains the items needed to connect the battery cable (5) from the batteries to the incoming terminal (3) of the main battery disconnect switch.



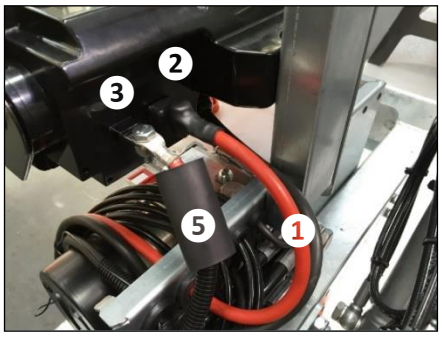
Carefully crimp the cable eye on the battery cable (5), using adequate tools and settings. Slide the heat-shrink wrap over the battery cable (5).



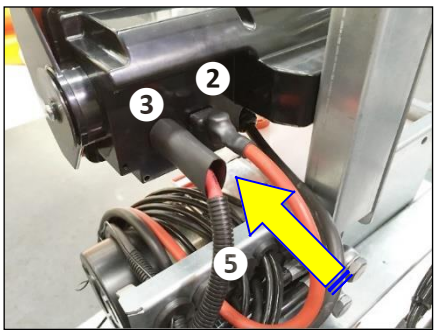
Bolt the cable eye of the battery cable (5) to the incoming terminal (3) of the main battery disconnect switch.



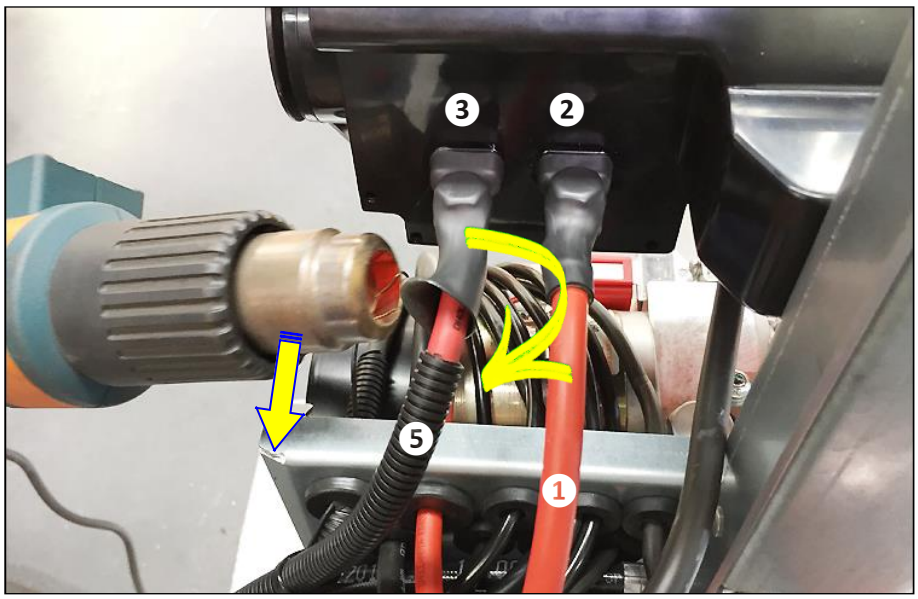
Fasten the M8 bolt connection (torque 24 N.m).



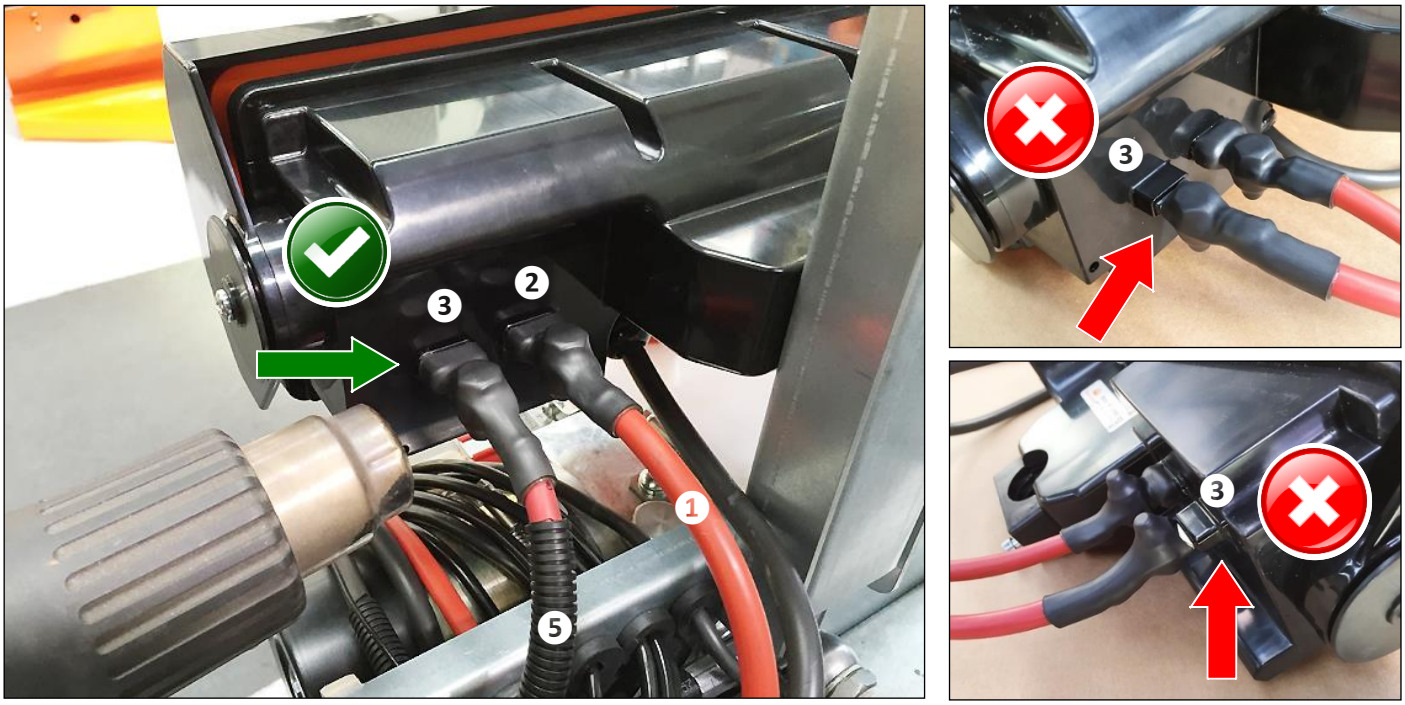
Slide the heat-shrink wrap over the connection bolt up to the incoming terminal (3) of the main battery disconnect switch at the rear of the control box.



Push the heat-shrink wrap right up to rear face of the control box. Ensure that it completely envelops the PVC base of the incoming terminal (3) of the main battery disconnect switch.



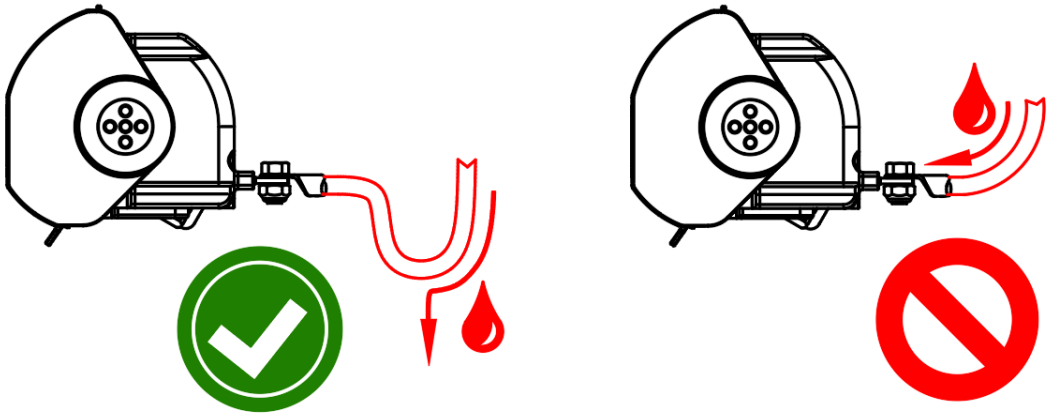
Use a heat gun to shrink the wrap over the battery cable connection (3+5). Start at the PVC base of the control box to ensure proper sealing. Once this basis is solidly wrapped and sealed, move the gun further away from the basis, and swing it around the incoming terminal (3) to obtain complete and even shrinking of the wrap on all sides.



The intended end result is a sealed heat-shrink protection that completely seals and envelops:

- the PVC basis of the incoming battery terminal (3) sticking out from the rear face of the control box,
- the bolt connection
- and min. 10 mm of the insulation of the battery cable (5) itself,

The heat-shrink protection should protect the assembly against all water ingress and corrosion.



When mounting electrical cables, ALWAYS make sure they make a downward curb as they exit the control box or power pack; so that water can drop off in a natural way. This is an easy way to prevent water ingress through the grommets or cable glands

NOTICE

- To ensure the reliability of the lift over many years, it is extremely important that the installer connects the battery cables and earth cables to the control box and power pack, heat shrinks and seals the connections with due care.
- Insufficient torqueing of the connection bolts can cause overheating and short circuits. Improper sealing can cause water ingress, and premature corrosion of the connections.
- DHOLLANDIA disclaims liability for any personal injury or property damage that results from improper or negligent installation.

16.7 SAFE OPERATOR POSITION ON THE PLATFORM

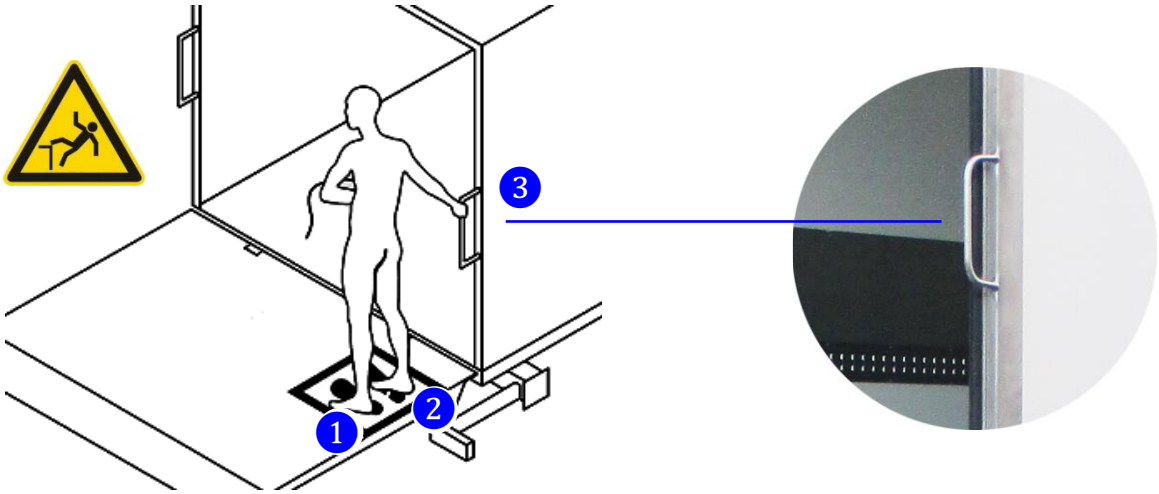
- Consult the OPERATION MANUAL section 7 on safety instructions for using the tail lift.

- The operator travelling up and down on the platform, faces 2 main risks:

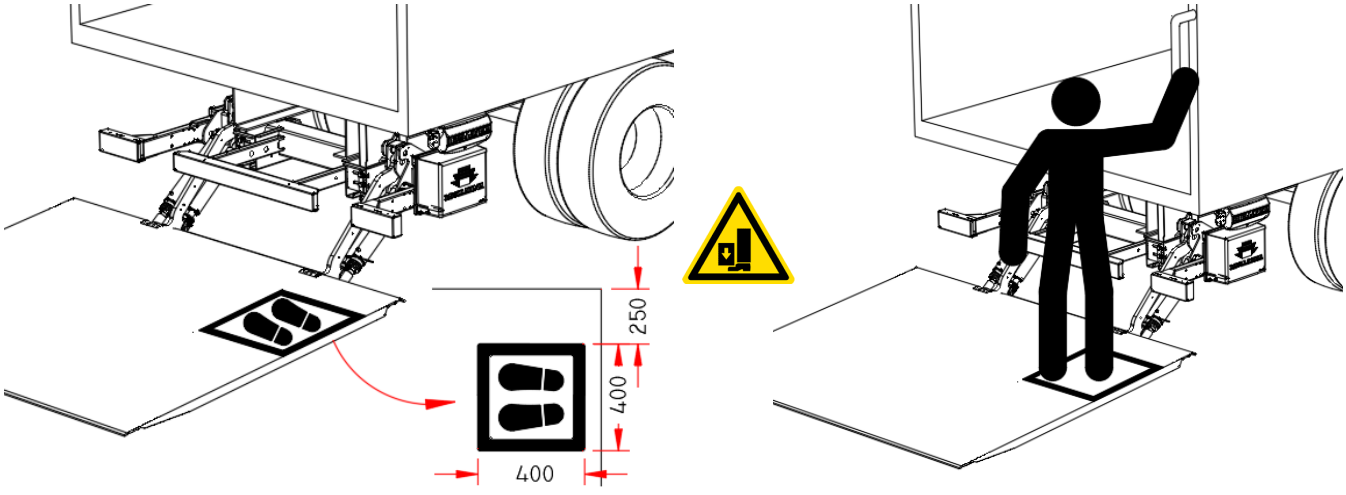
1. Falling from the platform. Falling from the platform can result in serious bodily injury or death.

2. Crushing and shearing the limbs between the raising platform and the rear end of the vehicle floor / floor plate / bed extension. Crushing or shearing body parts can will result in serious bodily injury or death.

- To reduce the risk of falling, mount a handgrip to the rear frame of the vehicle body. This handgrip will enable the operator to maintain 3 points of contact while travelling on the platform, in accordance with the operation manual.
- The handgrip is normally foreseen by the body builder as part of the design of the body. A DHOLLANDIA alternative can be ordered with spare part ref. M1406.



- To reduce the risk of crushing and shearing, permanently mark a safe operator position of 400 x 400 mm at a safe distance of 250 mm from the inboard platform edge, if the operator is allowed to travel on the platform by other means than the original foot controls.
- The marking is normally foreseen by the body builder, or can be ordered from DHOLLANDIA with option ref. OAT140.L / OAT140.R. A metal paint mask can be ordered from DHOLLANDIA with spare parts ref. EF0100.



16.8 END NOTE

- DHOLLANDIA would like to thank you for using our products and leave you with this final notice and warning.
- Additional information about this tail lift and many other DHOLLANDIA products is available at the following link: http://www.dhollandia.com/

NOTICE
• Competent and regular preventative maintenance is essential to the operational reliability and safety of the operator or bystanders. • All maintenance and repair work should be performed by authorized DHOLLANDIA service agents. • Only original DHOLLANDIA replacement parts should be used for all repairs. • Consult the separate MAINTENANCE AND REPAIR MANUAL for safety instructions, maintenance guidelines, and troubleshooting support.

⚠ WARNING
• Improper use of the tail lift may result in damage, premature wear or failure of the tail lift, and will increase the risk of serious injury or death to the operator or bystanders. • To maximize the durability, ensure long-term reliability of the tail lift, and protect operators and bystanders from serious bodily injury or death, the operator MUST comply with the proper loading instructions and safe working procedures in the OPERATIONS MANUAL.

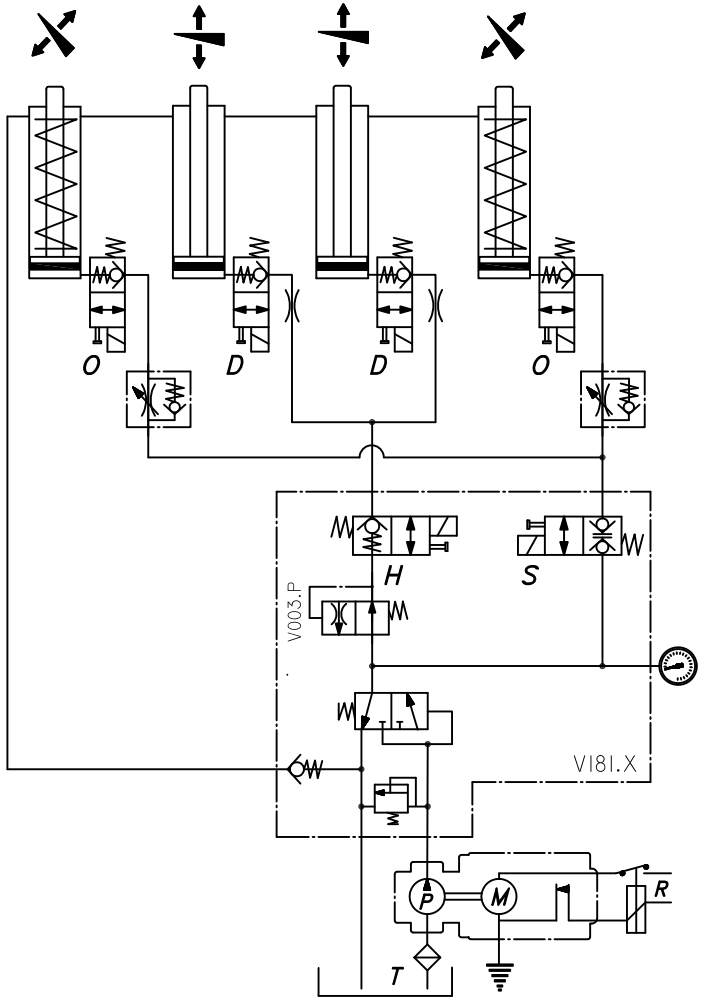
16.9 BASIC WIRING DIAGRAMS

- Because of the large choice in different control boxes, electric and hydraulic options, only the basic wiring diagrams are listed hereafter.
- A copy of the applicable diagram is usually stored inside the control box or power pack.
- Replacement copies can be obtained from your national DHOLLANDIA distributor, or downloaded from our website.

If in doubt where to find your national DHOLLANDIA distributor, visit the official DHOLLANDIA website:
www.dhollandia.com → Country & language selection → Distributors & service

Most wiring diagrams can also be downloaded from the DHOLLANDIA website:
www.dhollandia.com → Country & language selection → Downloads → Electrical & hydraulical wiring diagrams → … select required wiring diagram

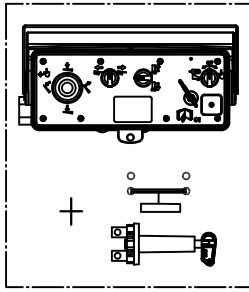
DH-LM* + OAE030.BT



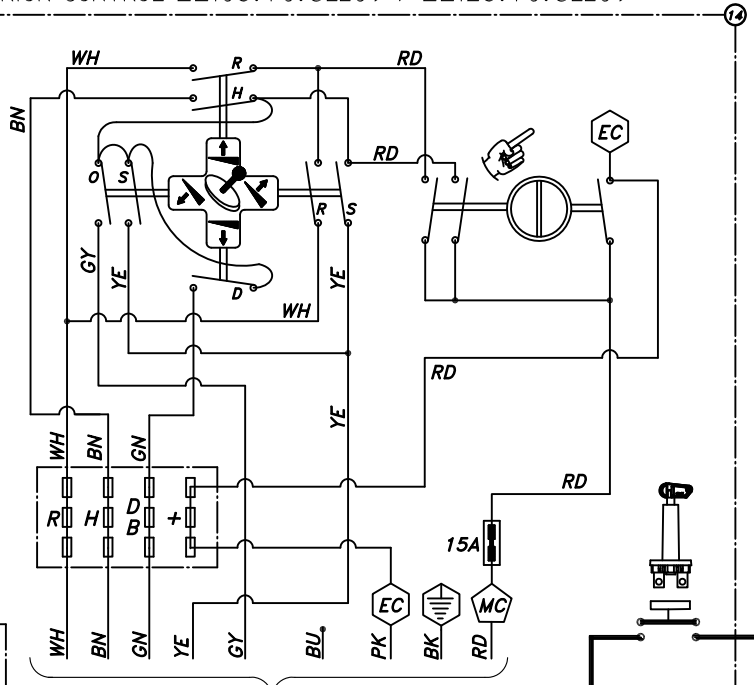
MECH - X

R + H	R + S	H-D-O	SA
D	S + O	S	DA

OAE030.BT

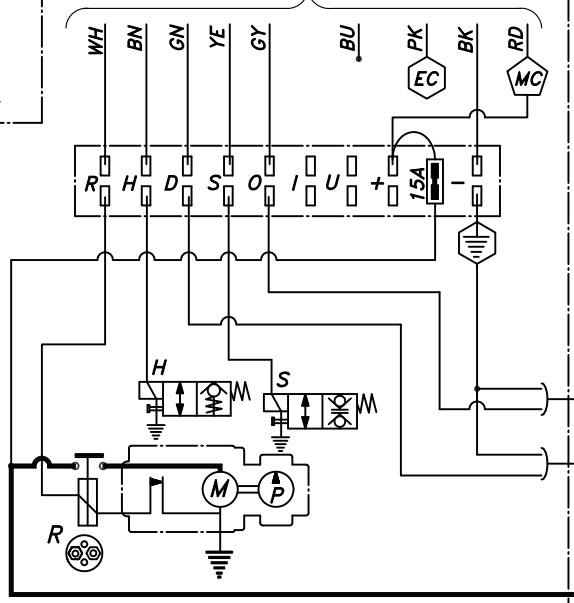


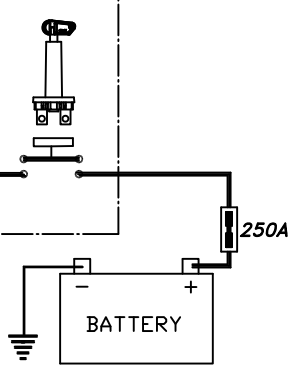
EXTERIOR CONTROL EEI03.T0.CLE09 / EEI23.T0.CLE09



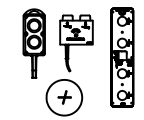
WH-> R
BN-> H
GN-> D
YE-> S
GY-> O
PK-> + EC
BU->
BK-> - EARTH
RD-> +12/24V MC

9X1MM²

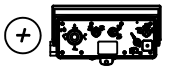




EC = 24/12V EXTRA CTRL.



MC = 24/12V MAIN CTRL.



Type : Cantilever lift DH-LM (MECH-X) + OAE030.BT - JUN. 2016/...

Power pack :

Valve : V181.X

Plan N° : wd_LM-MECH.X-OAE030.BT-2016-01

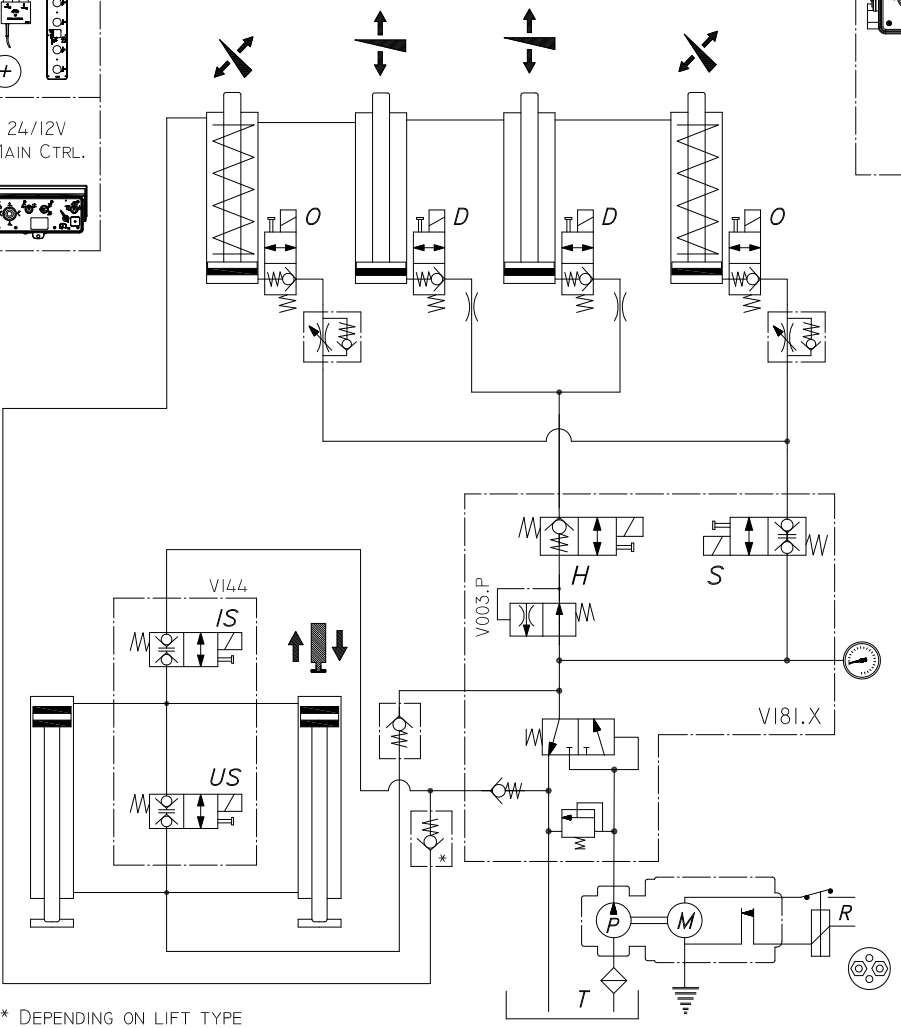
Date : 18/08/2016

DHOLLANDIA

DH-LM* / LC* + OAE030.BT + STAB. LEGS OAH010...15

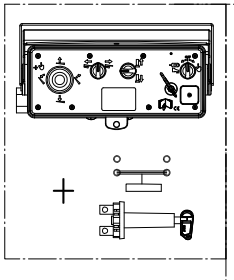
EC = 24/12V EXTRA CTRL.

MC = 24/12V MAIN CTRL.

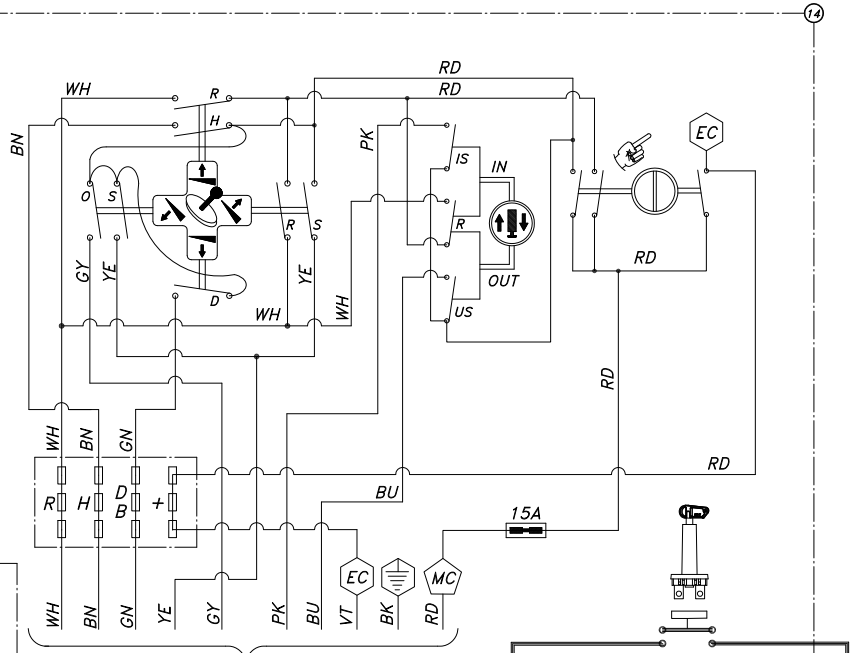


* DEPENDING ON LIFT TYPE

OAE030.BT

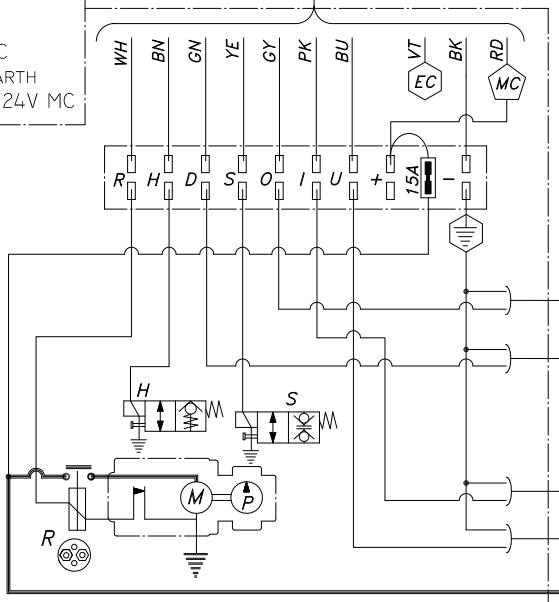


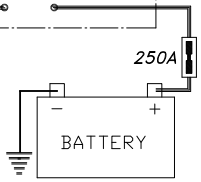
EXTERIOR CONTROL EE113.T0.CLE10 / EE133.T0.CLE10

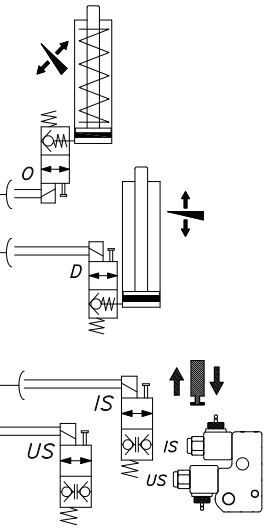


WH-> R
BN-> H
GN-> D
YE-> S
GY-> O
PK-> IS
BU-> US
VT-> + EC
BK-> - EARTH
RD-> +12/24V MC

10X1MM²







MECH - X

R + H	R + S	R + IS	H-D-O	SA
D	S + O	R + US	S	DA

Type : DH-LM (MECH-X,) + OAE030.BT + HYDR. STABILISING LEGS - 2016/...

Power pack :

Valve : V181.X + V144

Plan N° : wd_LM ST-MECH.X-OAE030.BT-2016-01

Date : 18/08/2016

DHOLLANDIA

DH-LM ~ TRUCK + OAE030.ZP + OAE064 + OAE065 + OAE200 + OAE500 / OAE501.LE + OAE503.2

Type : DHLM~TRUCK + OAE500 VEHH interface - 2019/...

Power pack :

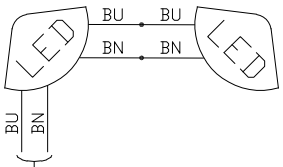
Valve : V181.X

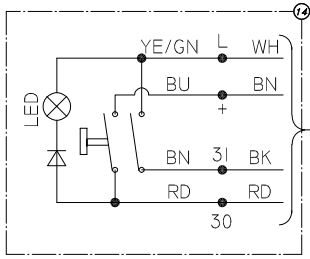
Plan N° : wd_LM-MECH.X-OAE030.ZP-Truck-2016-01

Date : 08/04/2019

DELLANDIA

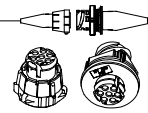
OAE200
PLATFORM LIGHTS





OAE503.2 CABIN SWITCH

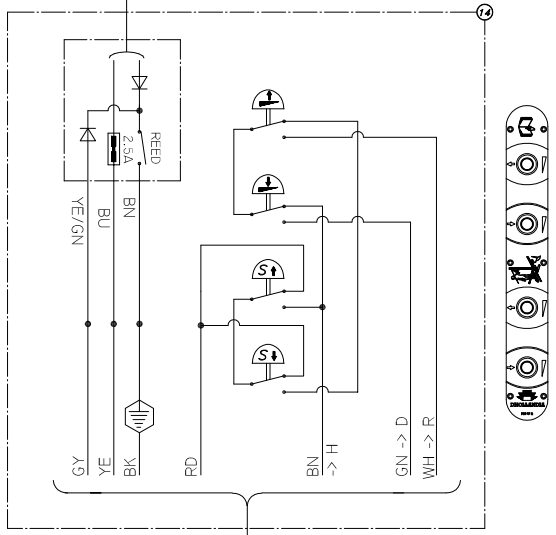
OAE500 (CANNON PLUG)
OR
OAE501.12 (12M 4X1,5)



CONNECTION

Pos.	Cable N°
1	BN
2	BK
3	
4	
5	
6	WH
7	RD

E0480.M.6.LE



OAE064 FOOT CTRL.
+ REED SENOR

E0581.M.7.LE

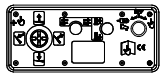
E0580.F.7.LE

CONNECTION

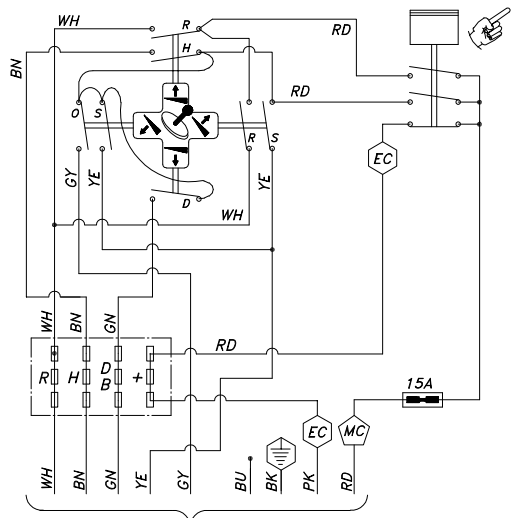
Pos.	Cable N°	
1	WH	-> R
2	BN	-> H
3	GN	-> D
4	RD	-> +24/12V EC
5	BK	-> - EARTH
6	YE	-> +24/12V (OAE200)
7	GY	-> WH EARTH OF OAE500

OAE065 CANNON PLUG

OAE030.ZP
EXTERIOR CONTROL EEZ103.P0.CLE09 / EEZ123.P0.CLE09



NO

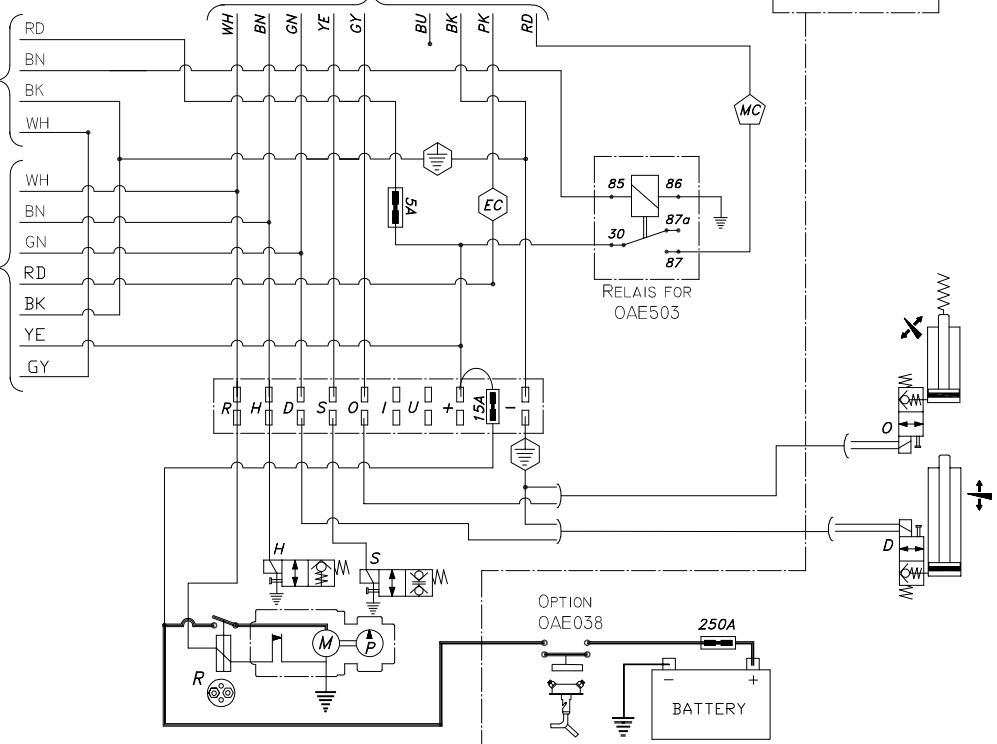


9X1MM²

WH-> R
BN-> H
GN-> D
YE-> S
GY-> O
PK-> + EC
BU->
BK-> - EARTH
RD-> + 24/12V MC

EC = 24/12V EXTRA CTRL.

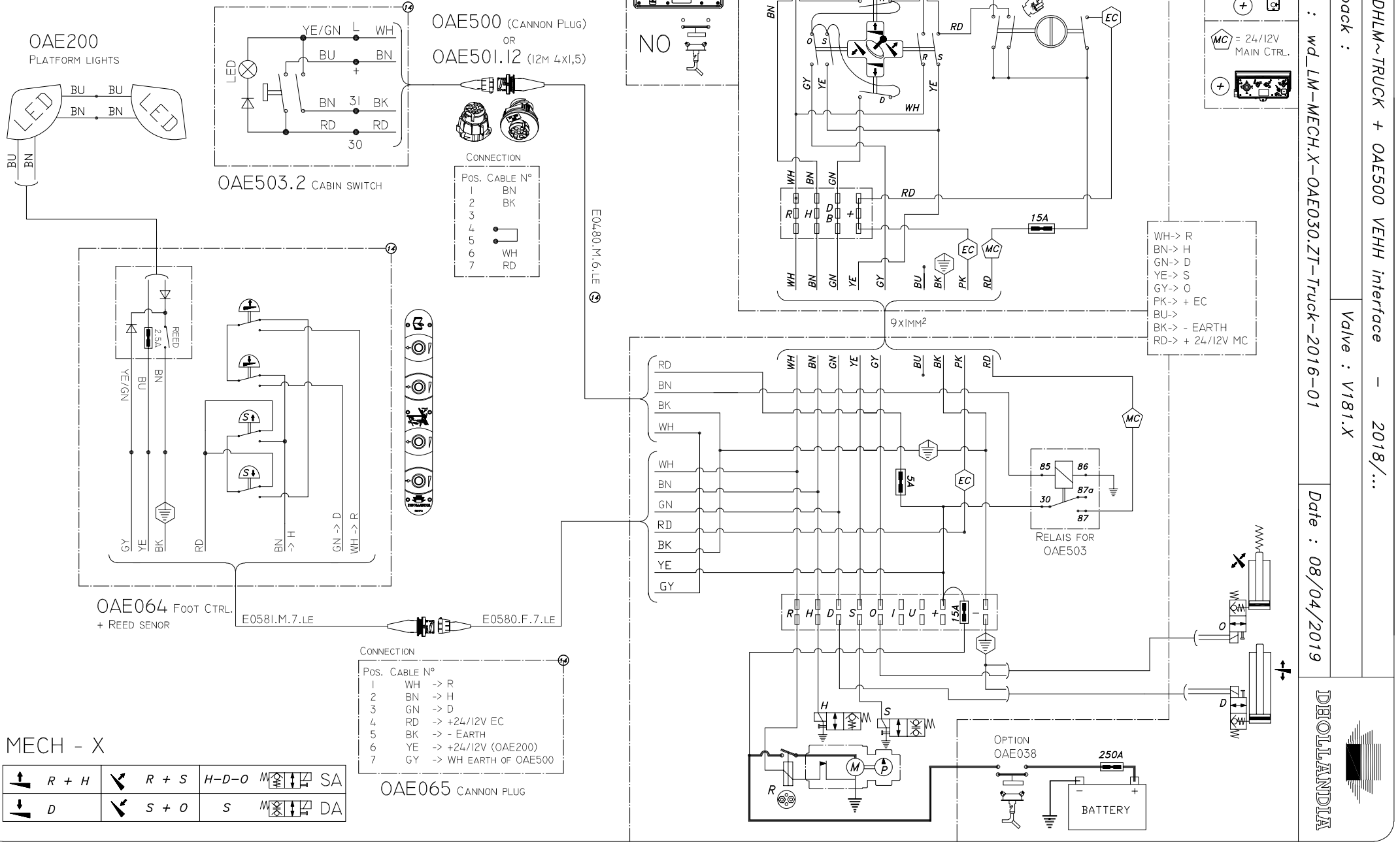
MC = 24/12V MAIN CTRL.



MECH - X

R + H	R + S	H-D-O	SA
D	S + O	S	DA

DH-LM ~ TRUCK + OAE030.ZT + OAE064 + OAE065 + OAE200 + OAE500 / OAE501.LE + OAE503.2



MECH - X

R + H	R + S	H–D–O	M	SA
D	S + O	S	M	DA

Type : DHLM~TRUCK + OAE500 VEHH interface – 2018/...

Power pack :

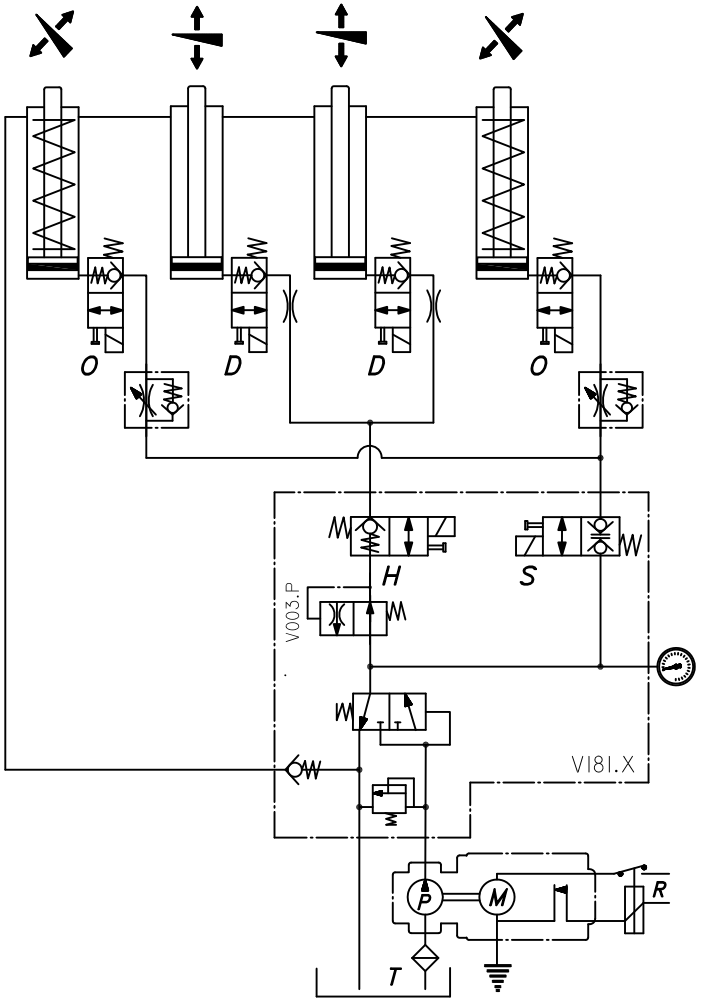
Valve : V181.X

Plan N° : wd_LM-MECH.X-OAE030.ZT-Truck-2016-01

Date : 08/04/2019

DIELLANDIA

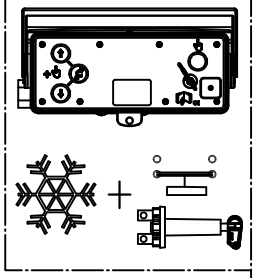
DH-LM* + OAE041.BP ARCTIC CTRL. BOX



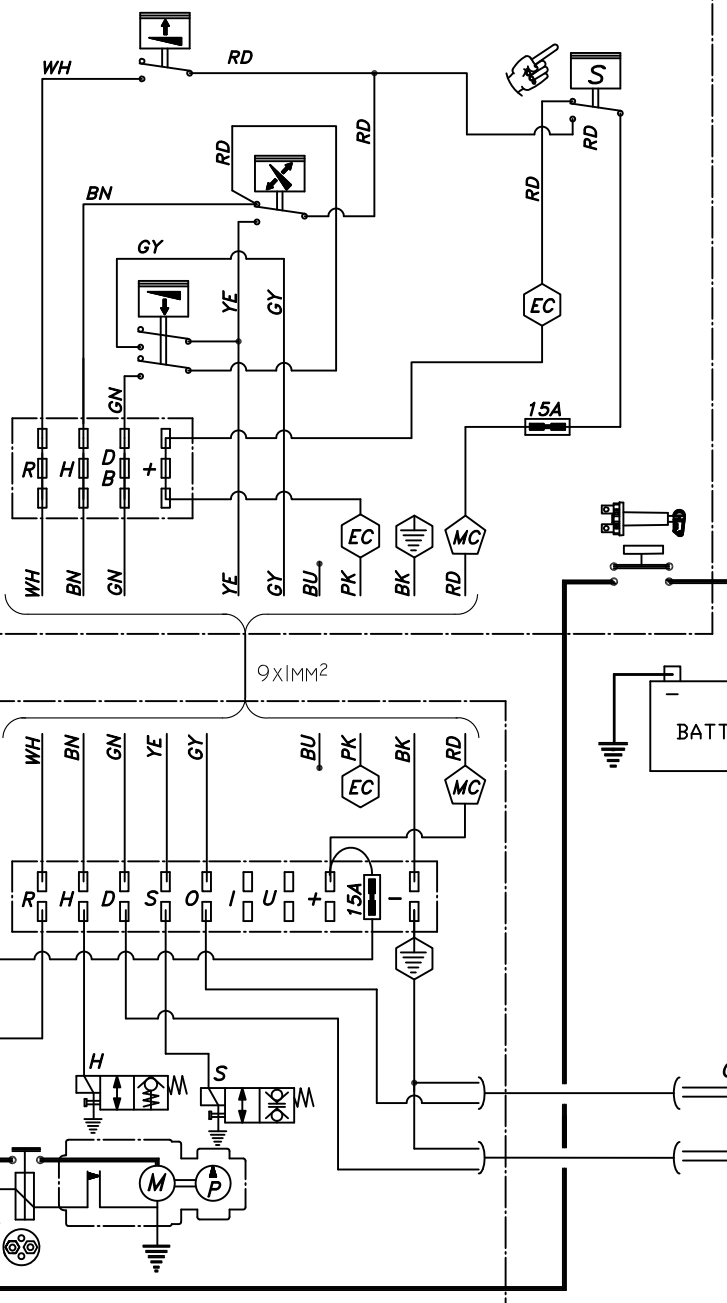
MECH - X

R + H	R + S	H-D-O	SA
D	S + O	S	DA

OAE041.BP



EXTERIOR CONTROL EG103.P0.CLE09 / EG123.P0.CLE09



WH-> R
BN-> H
GN-> D
YE-> S
GY-> O
PK-> + EC
BU->
BK-> - EARTH
RD-> + 12/24V MC

EC = 24/12V EXTRA CTRL.

MC = 24/12V MAIN CTRL.

Type : DH-L* lift (MECH-X) + OAE041.BP arctic control box - 2016/...

Power pack :

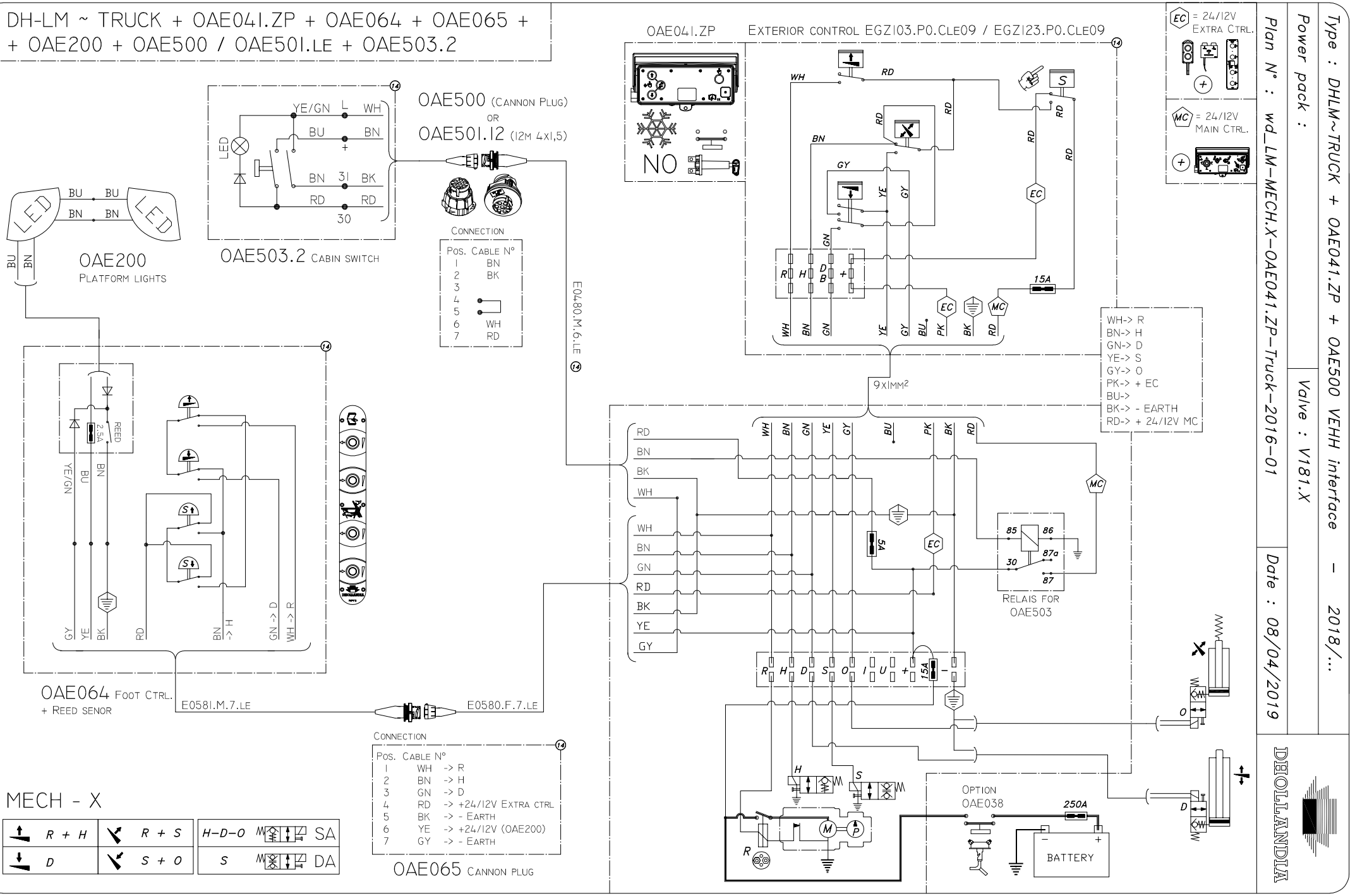
Valve : V181.X

Plan N° : wd_LM-MECH.X-OAE041.BP-2016-01

Date : 18/08/2016

DHOLLANDIA

DH-LM ~ TRUCK + OAE041.ZP + OAE064 + OAE065 + + OAE200 + OAE500 / OAE501.LE + OAE503.2



MECH - X

R + H	R + S	H-D-O	SA
D	S + O	S	DA

Type : DHLM~TRUCK + OAE041.ZP + OAE500 VEHH interface - 2018/...

Power pack :

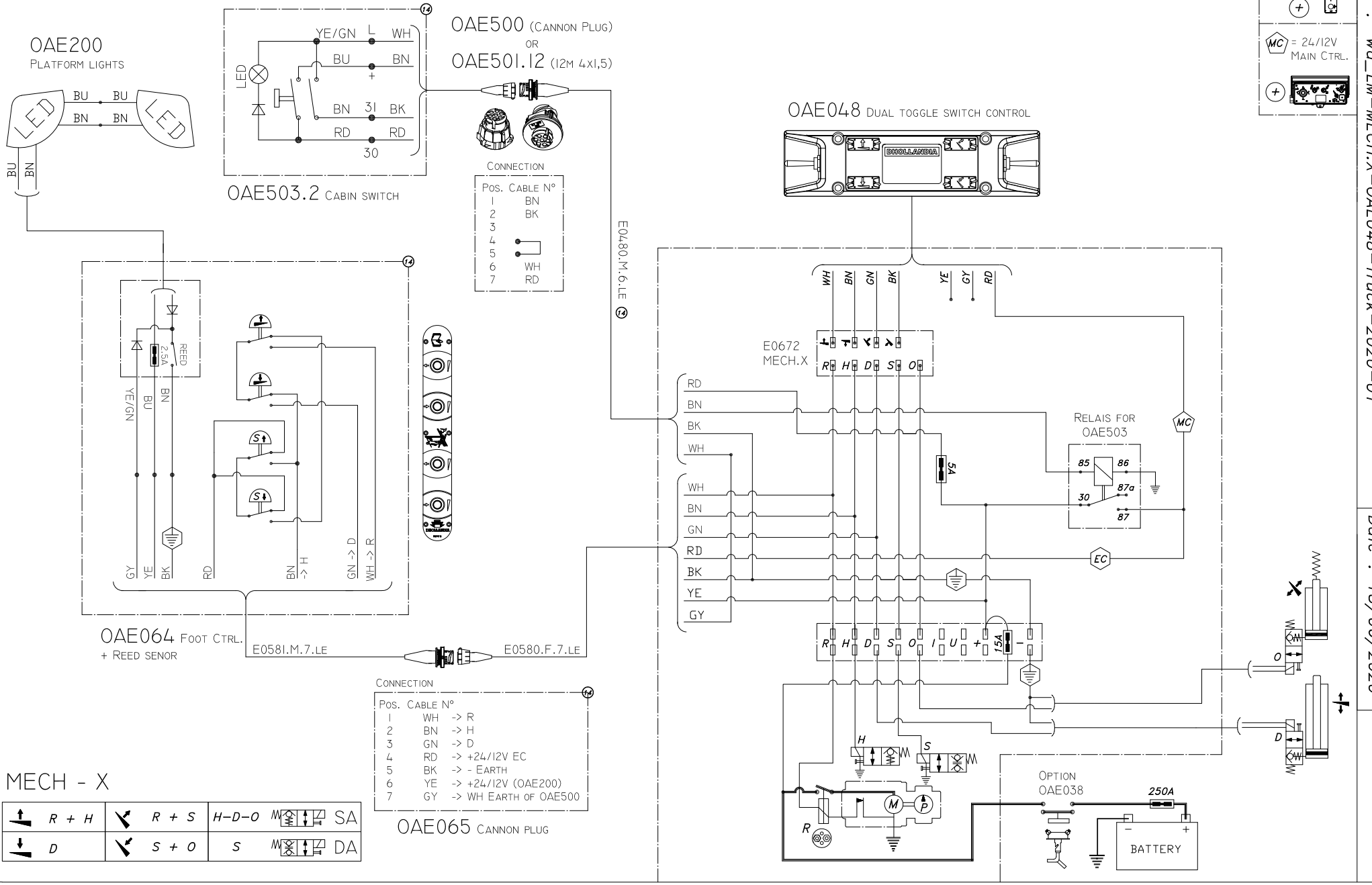
Valve : V181.X

Plan N° : wd_LM-MECH.X-OAE041.ZP-Truck-2016-01

Date : 08/04/2019

DHOLLANDIA

DH-LM ~ TRUCK + OAE048 + OAE064 + OAE065 + OAE200 + OAE500 / OAE501.LE + OAE503.2



MECH - X

R + H	R + S	H-D-O	SA
D	S + O	S	DA

Type : DHLM~TRUCK + OAE048 + OAE500 VEHH interface - 2020/...

Power pack :

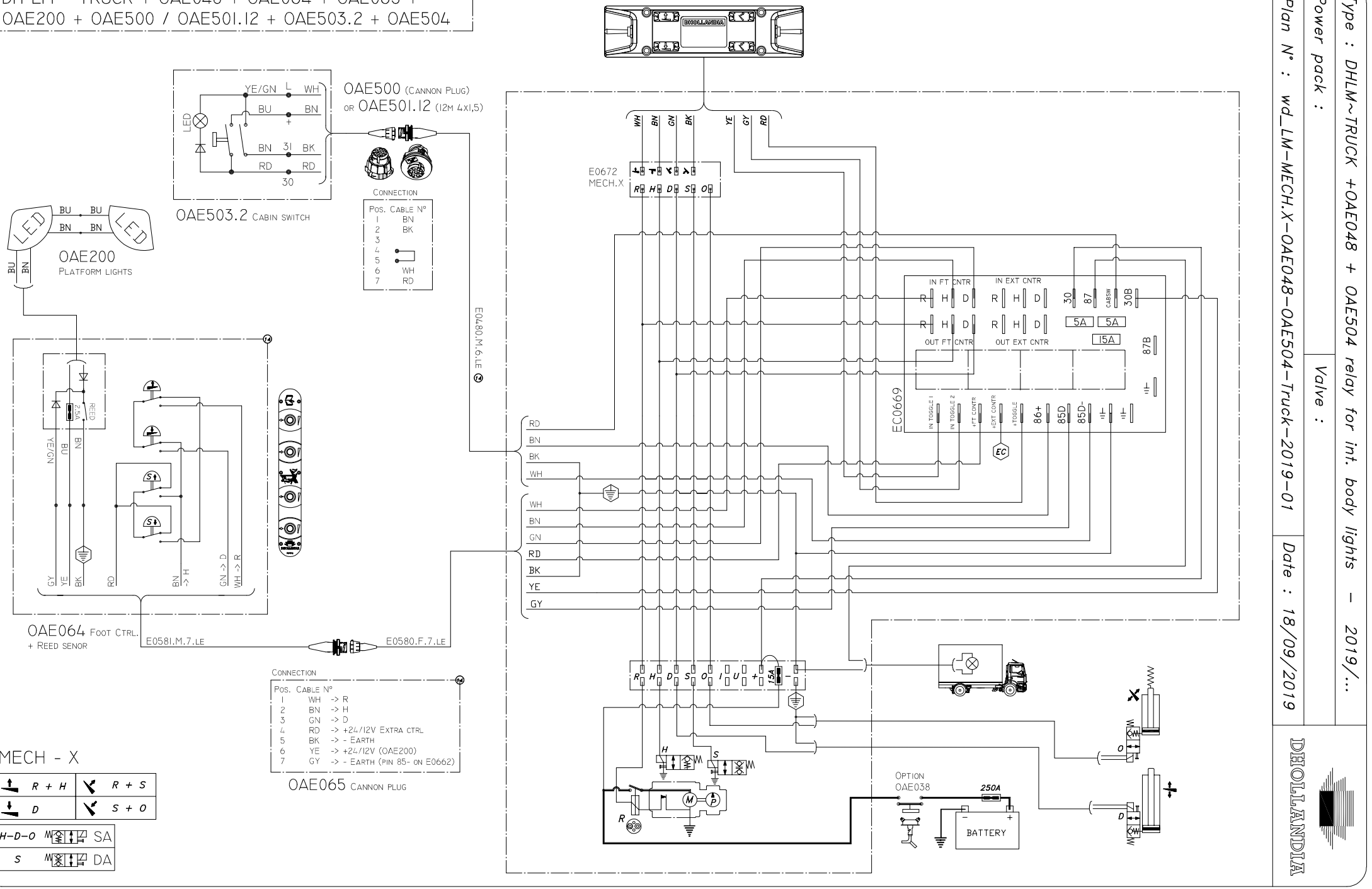
Valve : -

Plan N° : wd_LM-MECH.X-OAE048-Truck-2020-01

Date : 18/06/2020

DHOLLANDIA

DH-LM ~ TRUCK + OAE048 + OAE064 + OAE065 + OAE200 + OAE500 / OAE501.12 + OAE503.2 + OAE504



Type : DHLM~TRUCK +OAE048 + OAE504 relay for int. body lights - 2019/...

Power pack :

Valve :

Plan N° : wd_LM-MECH.X-OAE048-OAE504-Truck-2019-01

Date : 18/09/2019

DHOLLANDIA