DHOLLANDIA

MULTI-DECK COLUMN LIFTS

USER'S MANUAL
MAINTENANCE & REPAIR
COMPULSORY INSPECTIONS & REPORTS

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Advice to the user: This user's manual must be kept in the immediate vicinity of the tail lift at all times, as reference for the vehicle driver and tail lift operator.

Advice to the driver and service personnel: All maintenance & repair works, and periodic inspections must be duly recorded in this manual.

A

Chapter A: USER'S MANUAL

B

Chapter B: MAINTENANCE & REPAIR

C

Chapter C: COMPULSORY INSPECTIONS & REPORTS

CE - DECLARATION OF CONFORMITY

Corresponding Directive 2006/42/EC, annex 2, A)

Identification of the tail lift:

We hereby declare that the **DHOLLANDIA** tail lift identified above, based on its design and its construction, complies to the relevant fundamental health and safety requirements of the CE-Directives, and is destined to be mounted on a vehicle.

This declaration of conformity is only valid, and the use of the tail lift is only permitted, once the following conditions are met:

- The tail lift is fitted to a vehicle and the fitting complies with the conditions of the CE-Directives, with the fitting instructions of DHOLLANDIA and the Fitting and Body Building Instructions of the vehicle manufacturer.

- After the fitting of the lift, the risk analysis, the weight test and put-into-service test has been carried out with positive results and the fitting declaration (see page C3) has been filled out completely and correctly.

This Declaration of Conformity and the responsibility of the manufacturer are no longer valid if any modification to the tail lift is made without the prior written permission of the manufacturer, or if the maintenance instructions have been neglected and/or the periodic inspections have not been executed.

Applicable CE-Directives:
- 2006/42/EC

Signature + stamp manufacturer

Belsele, / /

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DISCLAIMER

The illustrations and information contained within this manual are not contractually binding, and cannot lead to any form of legal action against DHOLLANDIA.

DHOLLANDIA tail lifts are constantly being adapted to new vehicle and chassis developments, and specialised customer requirements. Therefore DHOLLANDIA reserves the right to alter product specifications without prior notice; and potentially modifications or new developments might not have been taken into account at the time of printing.

If you require further information on non-conforming parts, contact your official DHOLLANDIA agent for advice.

The illustrations shown in this manual represent tail lifts prepared for left-hand drive countries (= continental Europe). The operators of tail lifts prepared for right-hand drive countries (= UK, Ireland, South Africa, Australia,…) shall consider that their equipment, if ordered with the correct option number, is executed mirror wise.

GENERAL INTRODUCTION

This manual explains :

- chapter A: how the DHOLLANDIA tail lift is manufactured; what safety devices are incorporated in its design; and how to use the tail lift in a correct way, that guarantees the integrity of the machine over the intended life time and the safety of the operator and any bystanders.
- chapter B: how to maintain and service the tail lift in an appropriate way, that can guarantee its reliability over the intended life time.
- chapter C: what legal requirements re. periodic testing and certification must be observed.

Warning !

- This manual must be kept with the tail lift at all times, as reference book for the operators and technical service personnel.
- **In order to ensure the safety of the operator, and occasional bystanders, the use of the lift is strictly reserved to skilled operators, who have been duly trained, who know and understand the full content of this manual.**
- Negligence can put the operator and third parties at great risk.

Unless otherwise agreed upon ordering (export outside CE-region), DHOLLANDIA tail lifts comply with the European CE safety regulations mentioned in the Declaration of Conformity. They have been designed and manufactured with the greatest care, to guarantee a safe and reliable operation.

Warning !

- It is strictly forbidden to modify the construction of the lift and its safety devices in any way.
- DHOLLANDIA disclaims liability for any personal injury or property damage that results from operating a product that has been modified from the original design, without explicit written approval from the manufacturer.
- The Declaration of Conformity, the manufacturer's product liability and the warranty are voided in case of disregard in this respect, and when non-original components or spare parts are used to service or repair the lift.

CHAPTER A
USER'S MANUAL

A

1. INTENDED USE

DHOLLANDIA tail lifts are designed to be fitted to commercial vehicles (factory built panel vans, commercial trucks, trailers and semi-trailers), and shall be used exclusively to load and unload the goods transported on this vehicle, with obedience of the load chart, and the user's and safety instructions described in this Chapter A.

Warning !

- It is strictly forbidden to use the tail lift in a different way, or for different purposes, than foreseen in fore lying user's manual
- Negligence can put the operator and third parties at great risk.
- DHOLLANDIA disclaims liability for any personal injury or property damage that results from improper use.
- The manufacturer's product liability and the warranty are voided in case of disregard in this respect.

2. IDENTIFICATION

Every DHOLLANDIA tail lift is identified by and labelled with a unique serial number. Use this reference for any inquiry on this particular lift, or when ordering spare parts.

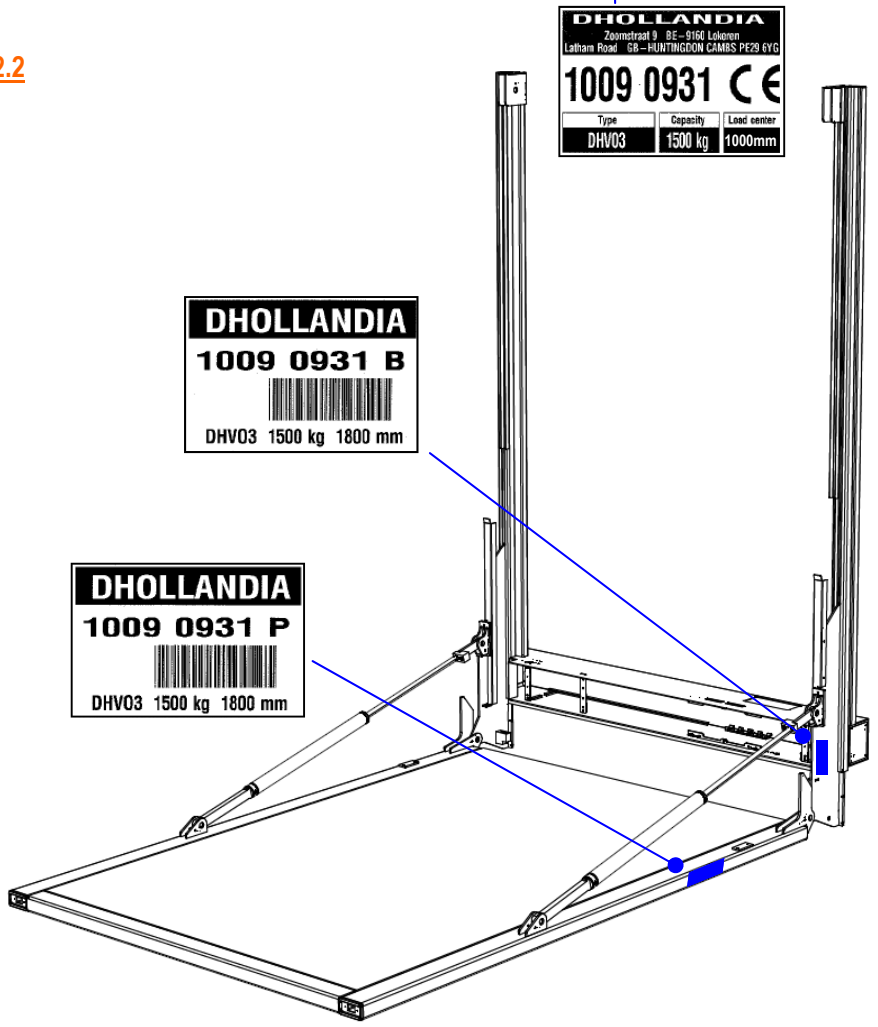
Apart from the lift type and serial number, the main identification sticker in the control box also mentions the nominal lift capacity, the centre of gravity, and the date of construction [see Fig. 2.1]. Additional identification stickers are used on various components [see Fig. 2.2]

3. DESCRIPTION

DHOLLANDIA tail lifts are developed and manufactured using state-of-the-art technology, high quality materials and components, and comply with the European CE safety regulations mentioned in the Declaration of Conformity (unless agreed otherwise upon ordering - export outside CE region).

Fig. 2.1

Fig. 2.2



- The column lift range **DH-V**… comprises of a wide variety of constructions with vastly different lifting mechanisms, but sharing many functional components such as platform, safety rails, roll-stop & ramp options, safety devices etc... These lifts are designed for a wide variety of trucks, trailers and semi-trailers, and are available with lift capacities of 1000 to 5,000kg.

- The main types are as follows:

Fig. 3.1 - Main types of column lifts		
1	DH-VB...	Operated by a single lift cylinder and a set of steel cables, cylinder beam is mounted horizontally at roof level.
2	DH-VO...	Operated by a single lift cylinder and a set of steel cables, cylinder beam is mounted horizontally at or below the vehicle floor level.
3	DH-VX...	Operated by a single lift cylinder and a set of steel cables, cylinder beam is mounted vertically in the right side column.
4	DH-VH...	Operated by 2 hydraulic lift cylinders mounted in the left and right side columns. No cables or chains involved.

- By adding specific options, these multi-functional lifts can be adapted to suit specific applications, such as the intensive distribution transport, the transport or (race) cars, the collection of waste containers, the transport of live stock, etc...

- The columns lifts can be mounted on the outside, or on the inside [see Fig. 3.2], or can be combined with each other.

Fig. 3.2 - Mounting position		
5	External lift	Is mounted at the rear of the vehicle body, and is stowed vertically behind the vehicle body in it's travel position. This lift has all functions LIFT / LOWER and CLOSE / OPEN.
6	Internal lift	Is mounted inside the vehicle body. When it is stowed in it's travel and locked, it forms an integral part of one of the vehicle floors. When used, it works as a moving deck. This lift only has the functions LIFT / LOWER, no tilt.

Fig. 3.1

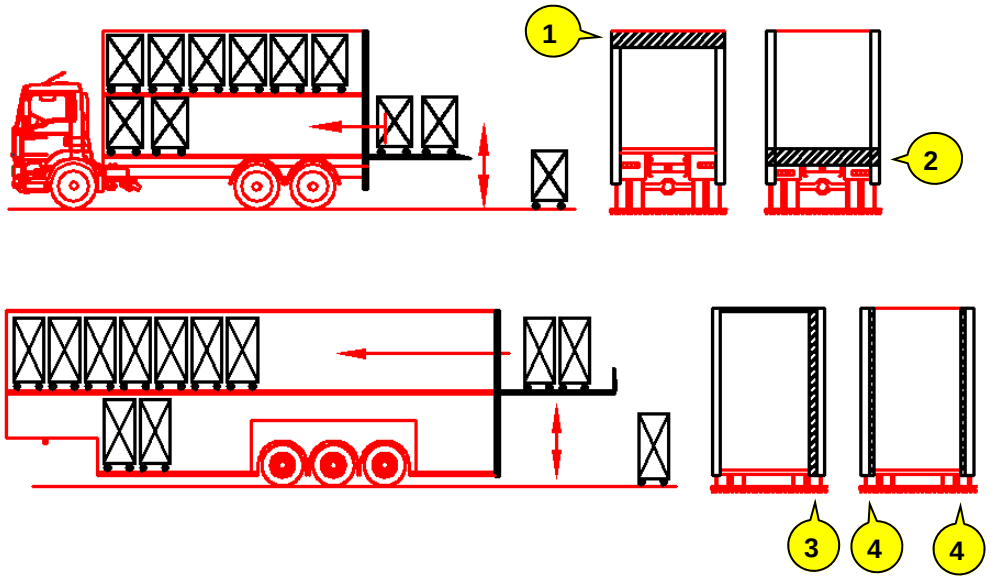
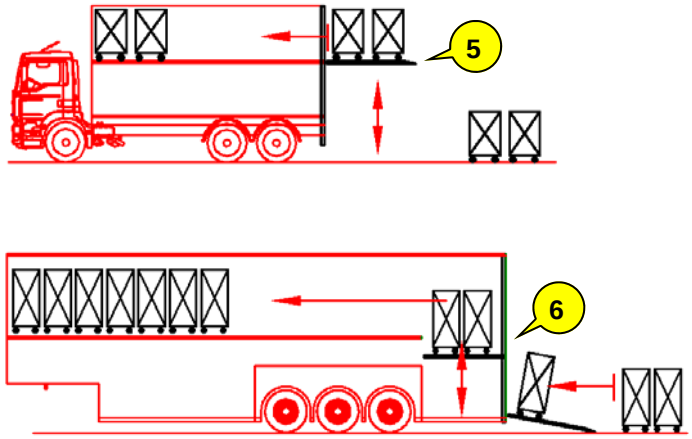


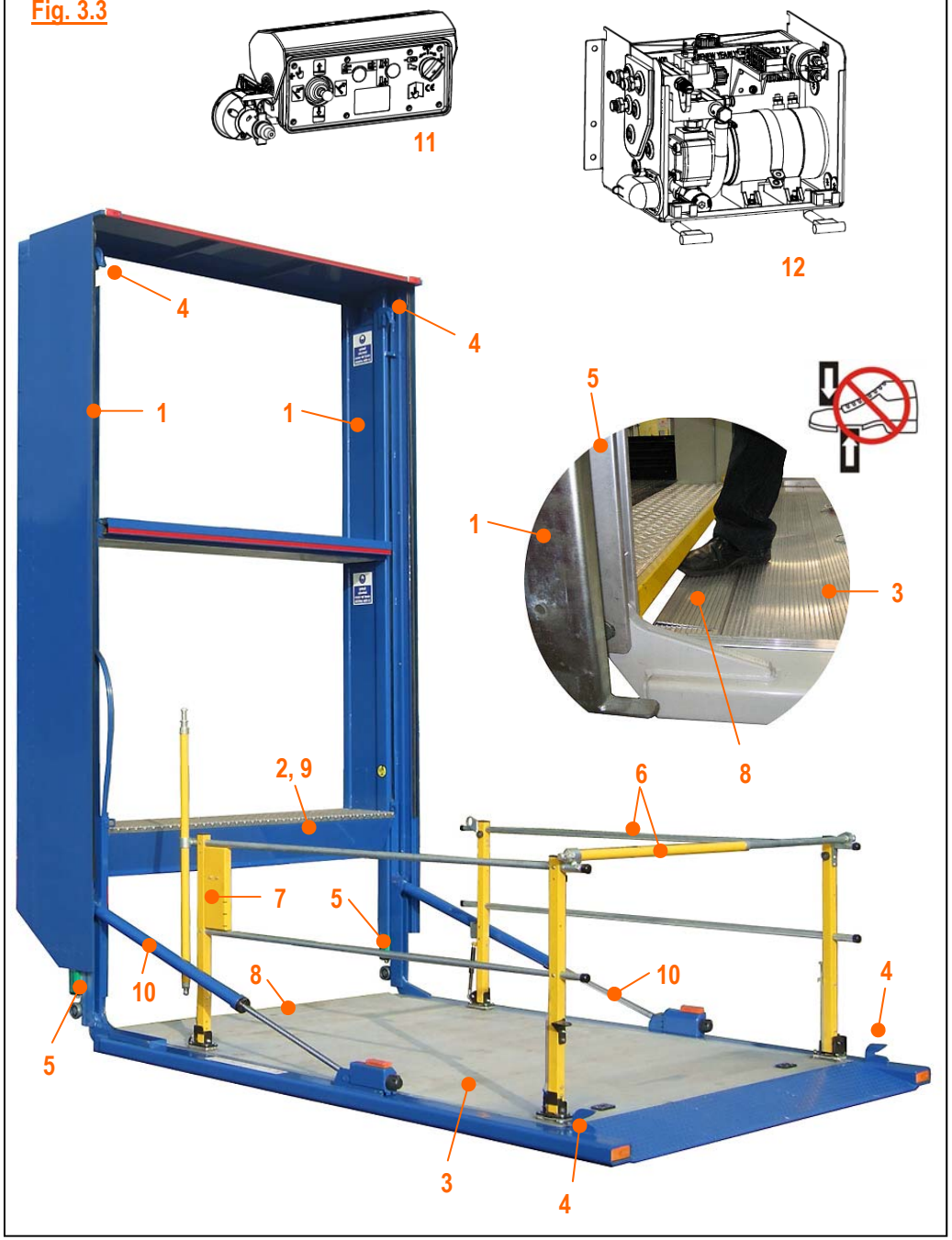
Fig. 3.2



- Main details & terminology:

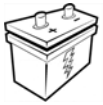
Fig. 3.3 - Lower beam column lift DH-VO...	
N°	**Description**
1	Lift columns: set of 2 columns mounted in a fixed position against the vehicle body. They form the tracks in which the lift runners carrying the platform go up & down.
2	Cylinder beam: horizontal or vertical beam mounted according to different configurations [see Fig. 3.1]. It contains the lift cylinder(s), and - if applicable - the drive mechanism (steel ropes or chains, plus pulleys).
3	Platform: carries the load during loading / unloading. Manufactured from steel or light -weight aluminium and foreseen of a non-slip working surface.
4	Travel lock: mechanical lock mounted on the lift columns and the platform, keeping the platform in its vertical travel position when not being used, and holding the platform hard against the rubber buffers.
5	Lift runners: set of 2 profiles carrying the platform and its load. They are lifted / lowered by the lift cylinder and the drive mechanism (consisting of steel ropes or chains, plus pulleys).
6	Safety rails: rails to protect the operator against falling from heights, and incurring serious injuries. They should be used on all exposed platform sides, and are compulsory above 2m lifting height [see also Fig. 4.11]
7	Auxiliary controls: LIFT / LOWER controls integrated in one of the safety rails
8	Toe-guard protection: flap + detection switch, protection the toes & limbs of the operator in the dangerous crushing zone between the moving platform and the loading floors of the vehicle.
9	Lift cylinder(s): hydraulic cylinder(s) used to LIFT / LOWER the lift runners, the platform and its load.
10	Tilt cylinder(s): hydraulic cylinder(s) used on external lifts to OPEN / CLOSE the platform
11	Hydraulic power pack: contains the electric motor driving the hydraulic pump, the oil tank, and the control valves.
12	Electric control box: mounted in a fixed position under the vehicle chassis. Contains the electrical switches allowing the operator to execute all tail lift functions.

Fig. 3.3



- For all tail lift models above, the electric control box and the hydraulic power pack are connected to the vehicle battery (or auxiliary battery) during fitting, according to the fitting instructions of DHOLLANDIA, and the requirements imposed by the vehicle manufacturer.

- 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 following above mentioned instructions. Insufficient battery tension will cause harm and irreparable damage to the electrical components of the lift (starter solenoid, electric motor, electric switches, etc...).



- Specifically because of the long cycle times typical for multi-deck lifts, it is strongly recommended to sufficiently upgrade the battery capacity and recharging system, and to install a battery guard system.

- As most vehicles are supplied with power supplies that cover the primary needs of the original equipment only, the vehicle owner & his contractors should consider upgrading the battery capacity and charging system in function of the additional needs of <u>all</u> auxiliary equipment (tail lift, but also extra heating system, refrigeration units, etc…).

  → The alternator of the vehicle should have a min. rating of 14V/45A for 12V vehicles and 28V/80A for 24V vehicles.
  → In case of long journeys and short periods of tail lift use, the existing alternator and batteries will probably suffice.
  → In case of long journeys and long periods of intensive tail lift use, the batteries will probably need upgrading to heavier duty ones.
  → In case of short journeys and long periods of intensive tail lift use, both the alternator and the batteries will probably need upgrading. (Alternator of 14V/80A or 28V/135A).

- The following min. battery equipment is recommended in function of the tail lift capacity:

Capacity	V	MIN. battery capacity (*)
1000-2000kg	12V	1x 180Ah
	24V	2x 180Ah
+2000kg	12V	Not recommended
	24V	2x 225Ah semi-traction

- (*) if lifts are used very intensely, e.g. to load or unload a full multi-deck vehicle, it is extremely important to use sufficiently strong semi-traction batteries, and a powerful recharging system that will keep the performance of the batteries high during the whole activity.

4. SAFETY DEVICES

DHOLLANDIA tail lifts are equipped with a wide range of safety devices, in order to ensure that goods can be loaded / unloaded with a maximum degree of safety for both the operator and the load.

The following safety devices are incorporated or recommended on most tail lifts :

- Fig. 4.1: **Electrical safety valves** mounted to all lift and tilt cylinders. A safety valve locks the hydraulic oil inside the cylinder as long as its solenoid is not activated by a control switch.

  Its purpose is to hold the platform in its travel position during driving, or in a fixed position in case of the failure of a hydraulic pipe (as soon as the control button is released).

  DHOLLANDIA valves are equipped with a manual emergency control, allowing the operator to open the valve in case of electrical power failure (see chapter B).

- Fig. 4.2: **Mechanical travel lock**, preventing the stowed platform to lower or fall open unintentionally while driving. It consists of 2 systems:

  1. A set of platform hooks, preventing the platform from falling open in case of accidental pressure loss in the tilt circuit [see 1 in Fig. 4.2].
  2. A set of locking pins through the lift columns, to remove prior to each use, and the refit back in place after each use, preventing the platform from creeping down in case of accidental pressure loss in the lift circuit [see 2 in Fig. 4.2].

- 4.3: **Braking valves** (= flow control valves) mounted to the hydraulic cylinders and the power pack.

  Pressure compensating braking valves are used to align the speed of the functions LOWER and OPEN with the legal requirements. This is:
  → Vertical movements: max. 15cm/sec
  → OPEN & CLOSE: max. 10°/sec (= min. 9 sec. for the opening and closing cycles)
  → OPEN speed: max. 40cm/sec up to 500kg capacity, max. 30cm/sec for other lifts
  → TILT at groundlevel: max. 4°/sec

  "Compensating" means that the valve brakes less / more if the load is lighter / heavier, to obtain similar speeds regardless of the load on the platform.

Fig. 4.1

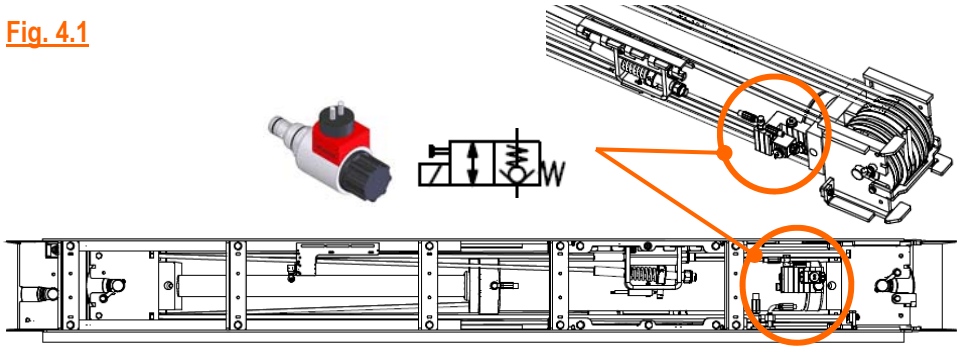
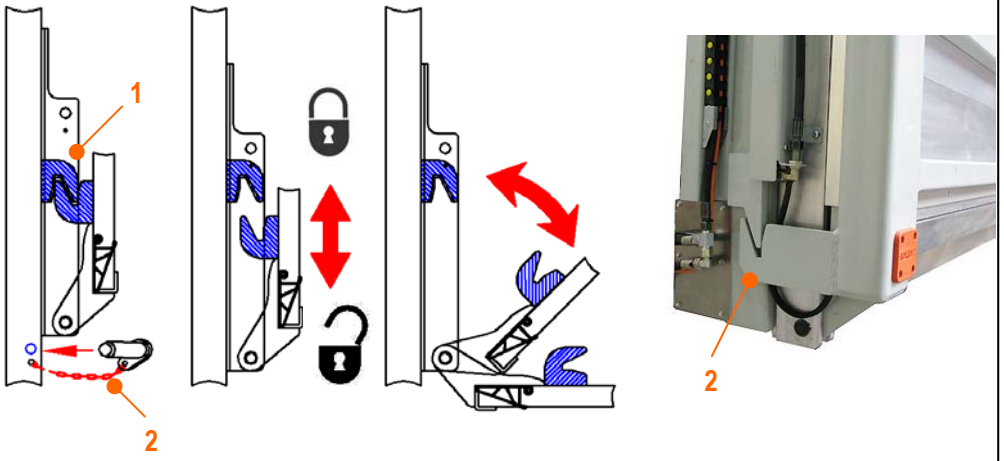


Fig. 4.2



- Fig. 4.4: **Pressure relief valve**: permits the manufacturer and the installer to limit the final performance of the tail lift to its nominal capacity, and protects it against overload during the LIFT cycle.

- Fig. 4.5: **2-hand exterior control box** equipped with functional control switches and a safety or selection switch. The compulsory use of the 2 hands to actuate the tail lift functions, protects the operator from crushing his head or limbs between the rear frame of the body and the lifting or closing platform.

- Fig. 4.6: **Emergency stop**: this stop is formed by a battery switch or selection switch with removable key, integrated in the control box [see Fig. 4.6.a] or mounted by the installer at another location, that is clearly visible and easily accessible to the operator. As option, the control box can be equipped with a genuine emergency button [see Fig. 4.6.b]. The emergency stop allows to cut the electrical power in case of danger.

- Fig. 4.7: **Cabin switch** mounted on the dashboard in the driver cabin (optional): this switch enables the operator to switch the electrical power to the tail lift on / off, and contains a signal as to whether the platform is correctly stowed in its travel position or not.

- Fig. 4.8: **Marking of the centre of gravity**: Hydraulic tail lifts are not designed to LIFT / LOWER weights corresponding to their nominal capacity over the full surface of the platform. The nominal capacity is valid at a certain distance or centre of gravity behind the vehicle body. Behind that point that is marked on the platform, the maximum safe working load diminishes according to the load diagrams [see also Point 6].

- All column lift platforms must be protected from falling in case of accidental failure of the suspension system (steel rope or chain, sprocket , pulley, etc...). This protection can be:
  → 4.9: **Double cable system + cable rupture detection**: suspension system with 2 steel lift cables plus 2 safety cables. When one of steel lift cables breaks, the platform is caught by the safety cable, and a cable rupture detection activated. From this moment onwards, the platform can only be lowered to offload any goods on the platform. An emergency button allows to LIFT and CLOSE the platform in order to stow it into it's travel position, and drive to a professional service agent. [see Chapter B].

  → 4.10: **Load safety device (LSD):** suspension system with 1 steel cable or chain, and a mechincal spring-activated safety device mounted to each of the lift runners. In the unlikely event of a steel rope or chain breaking, the LSD will jam the lift runner and the platform in the lift column, preventing the platform to drop more than 100mm from its position at the time of the failure [see Chapter B].

Fig. 4.4

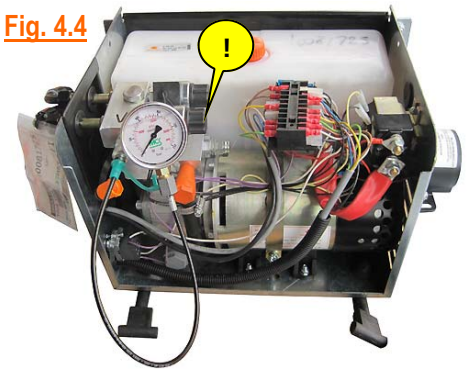


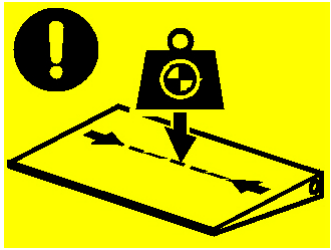
Fig. 4.5

Fig. 4.6.a

Fig. 4.6.b

Fig. 4.7

Fig. 4.8



- Fig. 4.11: **Safety rails**: safety rails should be fitted and used in all applications where a significant risk exists that the operator could be injured when falling off the platform (UK Work at Heights Regulation 2005), and are compulsory above 2m lifting height. Safety rails are available in a wide range of executions, to suit the particular needs of the operator [see examples Fig. 4.11].

  DHOLLANDIA safety rails are available with integrated LIFT / LOWER controls [see Fig. 4.12]

- Fig. 4.13: **4-button foot controls** mounted to the platform (option S782). The compulsory use of the 2 feet to actuate the functions LIFT and LOWER, immobilises the feet of the operator on a safe location (= the buttons of the foot controls), and protects him from crushing or squeezing his toes, feet or limbs between the edge of the lifting platform and the rear cross member of the vehicle floor. [See also §5.5]

- Fig. 4.14: **Protection of toes, feet & limbs**: safety solutions are adopted to
  → Prevent that the operator standing on the front edge of the platform would crush or sheer his toes, feet & limbs between the lifting platform and the underside of one of the vehicle floors;
  → Prevent that the operator standing on the rear edge of one of the loading floors would crush or sheer his toes, feet & limbs between the lowering platform and the top side of this vehicle floor.

  One of the methods shown under 4.14 is adopted in most cases:
  → 4.14.a: Toe-guard flap with detection: when the operator puts his weight on this flap at the front edge of the platform, the LIFT function is stopped.
  → 4.14.b: double toe-guard flaps on platform and vehicle floor: when the foot of the operator protrudes beyond the platform or vehicle floor, the opposite toe-guard flap hinges up and clears the way.

Fig. 4.11

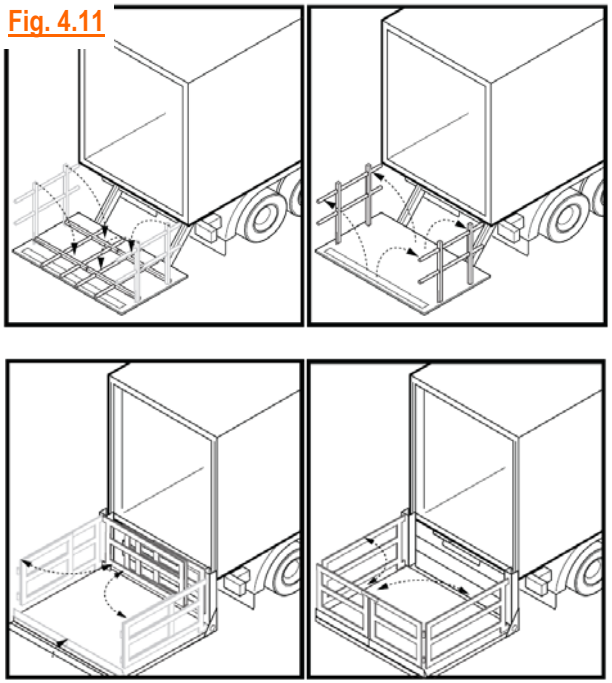


Fig. 4.12

Fig. 4.13

Fig. 4.14.a

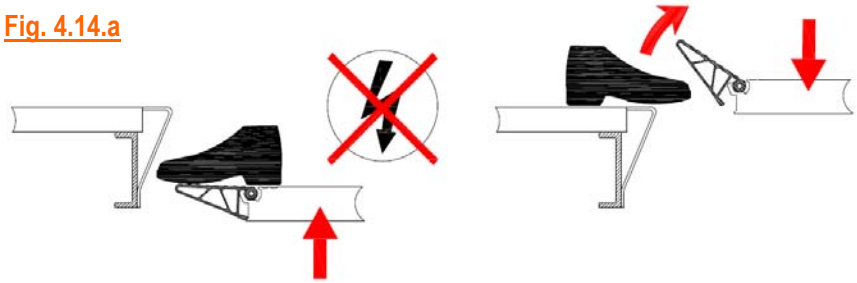
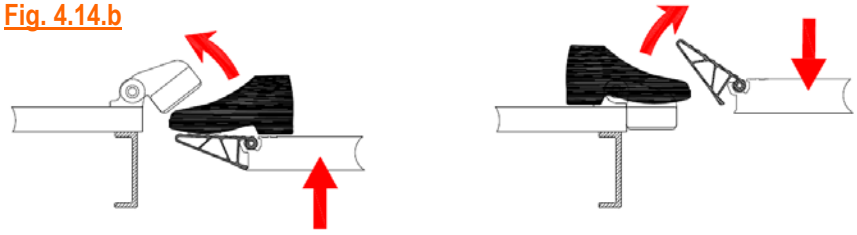


Fig. 4.14.b



- Fig. 4.15: **Roll-stops on the platform** (optional): any platform aimed to LIFT and LOWER rolling loads, must be equipped with a device that prevents this load from rolling unintentionally off the edge. DHOLLANDIA roll-stops can be fitted into the platform point, or at intermediate distances further towards the front edge of the platform [see Fig. 4.15.a]
  As alternative, on platforms equipped with hinged ramps, these ramps can be opened and raised 90° in vertical position to serve as roll-stops, or opened over 180° to service as access ramp. These ramps are available for the rear edge, and for the sides of the platform for applications where side loading is required. [see Fig. 4.15.b]

- Fig. 4.16: **Main battery fuse** on the (+) battery cable, **15A fuse** on the wires inside the control box: both fuses are used to protect the electrical system of the tail lift and the vehicle against short-circuits and amperage peaks.

- Fig. 4.17: **Signalling of the deployed platform**: any platform protruding beyond the extremities of the vehicle, must be clearly visible from all approachable sides in daylight and at night.

  Check the national regulations of the country where the vehicle will be registered, as these might be very strict on the application of platform lights, and the size and type of the platform flags.

  The impact of platform lights [see Fig. 4.17.a], reflective flags [see Fig. 4.17.b] and lateral reflecting tape [see Fig. 4.17.c] on the visibility of the platform strongly depends on the direction of approach, and the light conditions (bright sunlight versus night darkness). A combination of the 3 is ideal to cover all circumstances.

  Outside the delivery scope, it is good practice to encourage operators to mark the working area of the platform in the streets by means of traffic cones. [see Fig. 4.17.d].

- 4.18: **Audible alarm**: due to their lifting height above 2m, multi-deck column lifts are equipped with an audible alarm, warning accidental bystanders of the lowering platform, and the potential hazard of getting trapped under the platform.

Fig. 4.15.a

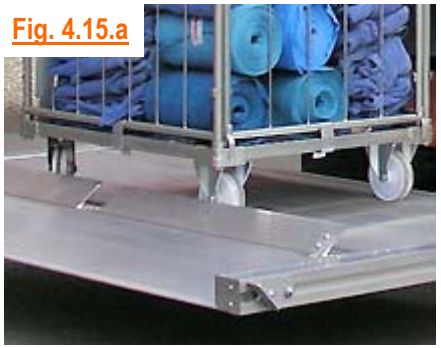


Fig. 4.15.b

Fig. 4.16

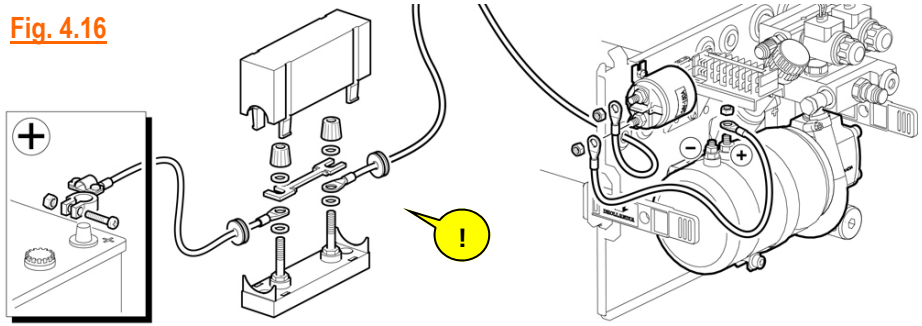


Fig. 4.17.a

Fig. 4.17.b

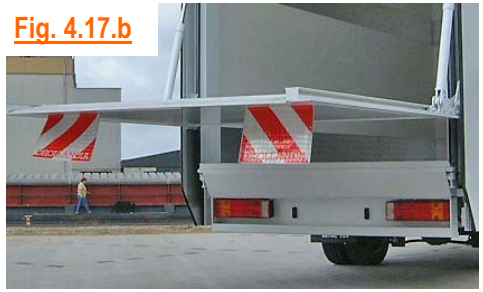


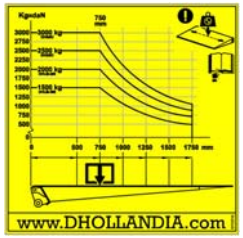
Fig. 4.17.c

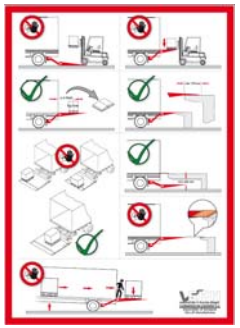
Fig. 4.17.d

- Fig. 4.19: **Warning decals**: apart from the identification stickers [see Point 2], every tail lift is supplied with one or more warning decals. They cover the applicable load chart, a simplified set of instructions for use, and other decals warning the operator for specific hazards.

Note: all images above are examples. The exact execution might vary in function of the type of lift, and the application. If required, contact your DHOLLANDIA agent for further advice.

Fig. 4.19





5. SAFETY INSTRUCTIONS FOR THE USE OF THE LIFT

§5.1 - Introduction

- DHOLLANDIA tail lifts shall be exclusively used to load the goods transported on the carrying vehicle, with obedience of the applicable load chart, the user's and safety instructions described in Chapter A of this manual.


Warning !

- The nature of loading / unloading at heights above 2m leads to additional hazards and requires additional skills and comprehension from the operator in addition to those that can be expected from an average operator from more conventional lifts [see §5.4]
- **In order to ensure the safety of the operator, and occasional bystanders, the use of the lift is therefore strictly reserved to skilled operators, who have been duly trained, who know and understand the full content of this manual.**
- Negligence can put the operator and third parties at great risk.

- Simultaneously, the operator should follow all other precautions and instructions applicable to his work situation (e.g. health & safety regulations, road traffic regulations, company procedures, Driver Periodic Training according to 2003/59/CE, etc…).
- The operator should have passed the minimum age of 18 years.

§5.2 - General safety instructions

- The operator should use appropriate working clothes. Never wear loose-fitting clothes that may be trapped in the moving parts of the tail lift. Always wear safety footwear with steel protection tips and a good non-slip sole, and protective gloves. [See Fig. 5.1]

- Prior to releasing the mechanical platform lock and using the lift, check if the lift can be used safely. Take precautions to guarantee your own safety, and the safety of occasional bystanders or third parties in traffic. Clear the working area of any objects that could potentially impede the movements of the lift. Make sure the platform is clearly visible from all approach directions (flashing platform lights, platform flags, traffic cones, etc…), and that the working zone is sufficiently illuminated. [See Fig. 4.17.a...d]

- The vehicle must be safely parked, the parking brake applied, and the engine must be switched off. Lock the rear doors and fasten all other moving parts of the vehicle body.

- Ensure that the vehicle cannot tip-over when putting heavy weights on the platform. [See Fig. 5.2.a]

- If the vehicle or the tail lift are equipped with mechanical or hydraulic stabilising legs, deploy these before opening the platform. Ensure that the stabilising legs are positioned on solid even ground. In case of soft terrain (sand, gravel,…), solid support blocks must be used under the stabilising legs [see Fig. 5.2.b].

- Ensure that the operator can overview and keep visual control over the whole working area of the lift and its platform at all times.

- The operation of the lift should be confined to a single operator. Upon deployment & use of the lift, the operator should not permit anyone, except himself, to stand in the immediate vicinity of the lift and its platform. Ensure at all times that nobody stands under or within reach of the moving platform. Always stand to one side of the lift when opening the platform, never under or behind the platform.[See Fig. 5.3]

- Inspect the lift prior to each use. If any unsafe condition exists or unusual noises or movements are noticed, DO NOT use the lift and contact an authorised DHOLLANDIA service agent for repair.

- Read and comply with all warning decals, pictograms and instructions affixed to the lift.

Fig. 5.1

Fig. 5.2.a

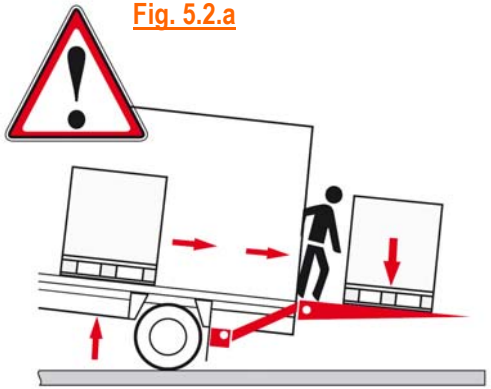


Fig. 5.2.b

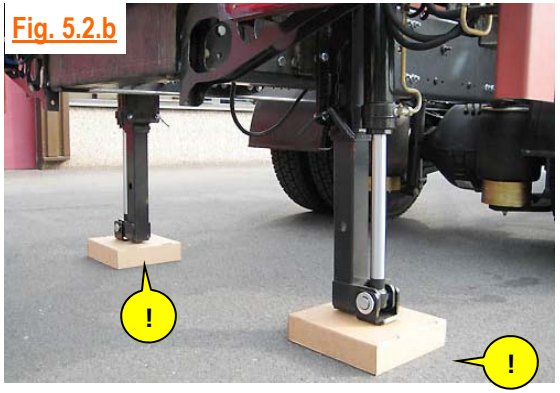
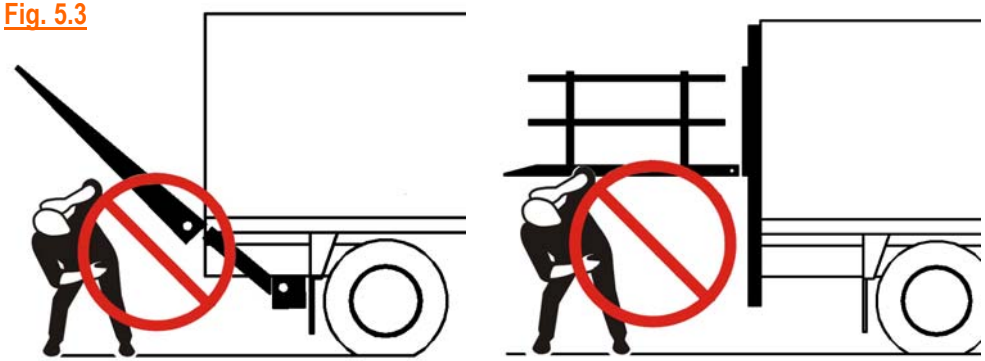


Fig. 5.3



- Never leave the lift behind unattended in the open position. Before leaving the vehicle behind unattended, store the lift away, and close the doors of the vehicle.

- Don't move the vehicle with the lift in open position. Stow the lift away, and close the doors of the vehicle before moving position. Never move the vehicle while a person stands on the platform, or inside the vehicle body.

- The lift should not be used if the operator is intoxicated or impaired in any way.

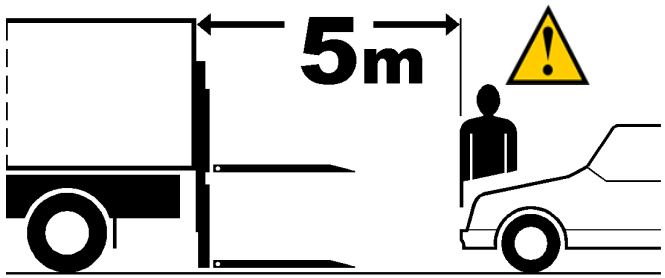
- Use extreme care in wet or slippery conditions.

- The tail lift should be used by means of original control units only. DHOLLANDIA disclaims liability for any personal injury or property damage that results from operating a product that has been modified from the original design.

- In traffic, always respect a safety distance of 5m to the following car, and ask other drivers to respect an equivalent distance when parking behind your tail lift. [see Fig. 5.4]

- Remark for column lifts with manual closure:
  - → These platforms are often equipped with (invisible) torsion bars, reinforcing the manual open / close movement. As a consequence, depending on the setting of this torsion bar, the platform might start to open / close by itself, from the moment that the corresponding lock is released.
  - → These torsion springs incorporate a significant amount of energy, and are potentially dangerous. Incorrect installation, use, or adjustment / servicing may result in serious injury of the operator or service personnel.
  - → Bear in mind that in case of mechanical failure, the platform might have been closed with the help of external devices (forklift, gantry crane,...), and that the platform might drop in free fall to the open position after disengaging the travel lock. Don't attempt to control the opening speed of the platform just by human force. The platform might be very heavy (possibly more than 100kg !) to handle.
  - → Therefore, always stand to one side of the lift when opening the platform, and always keep your head, hands and limbs clear of the moving platform or other moving parts of the lift.

Fig. 5.4



§5.3 - Danger zones, risk of crushing & sheering

- The operator should maintain a clear visual control over the platform, the operation radius of the platform, and the load on the platform at all times.

- The operator should stay out of the operation radius of the platform, and stay clear of the moving parts at all times. Beware at all times for potential risks of crushing or sheering fingers, hands, limbs, feet or toes between the moving parts of the lift arms, hydraulic cylinders and the moving platform.

DANGER !

- **Stay out of the operation radius of the platform.**
- **Keep clear of moving parts.**
- **Beware of hand, foot and head traps at all times.**

- The main danger zones for the operator and occasional bystanders in traffic, are the following:
  - → the zone directly behind the platform, and within the operation radius of the platform [see Fig. 5.5];
  - → the crushing zone between the lowering platform and the ground [see Fig.5.6];
  - → the crushing zone between the lifting platform and the rear cross member of the vehicle floor [see Fig. 5.7];
  - → the crushing zone between the closing platform and the rear frame of the vehicle body [see Fig. 5.8];
  - → the danger zone between the load on the platform and the rear frame of the vehicle;
  - → the danger zone between the platform and fixed obstacles like walls, loading docks, etc…

- The prescribed position of the exterior control box [see Fig. 5.9], and the compulsory use of 2 hands to actuate the tail lift functions [see Fig. 4.5], aim to protect the operator from crushing his head between the closing platform and the rear frame of the vehicle body. Therefore never try to look inside the body when closing the platform.

Correct operator position Danger zone

Fig. 5.5

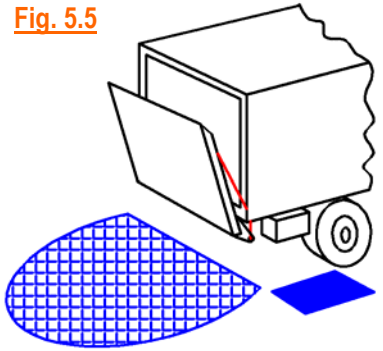


Fig. 5.6

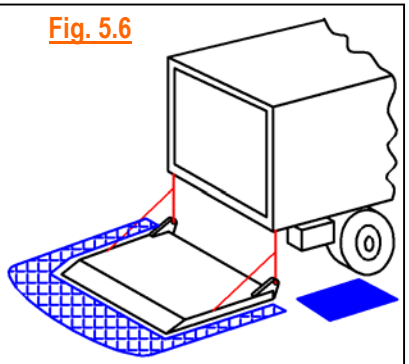


Fig. 5.7

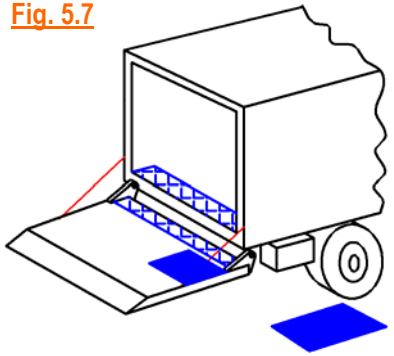


Fig. 5.8

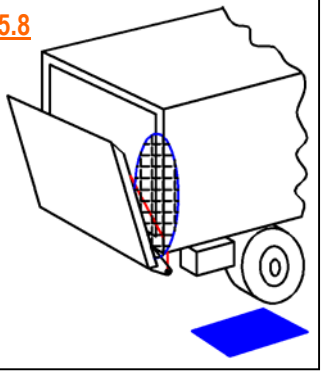
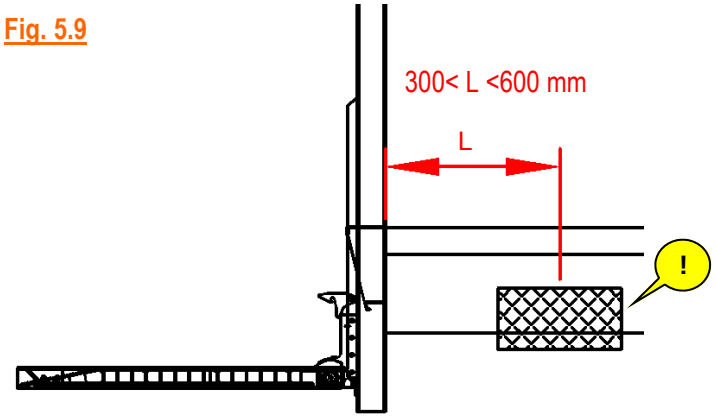


Fig. 5.9



§5.4 - Additional risk of lifting heights > 2m

- The nature of loading / unloading at heights above 2m leads to additional hazards. Whenever working with the lift, pay special attention to the following issues.

- To prevent injury when falling from heights, it is compulsory to use safety rails along the exposed edges of the platform if the lifting height ≥ 2000mm. [see examples Fig. 5.10]

- Protect your toes, feet and limbs:
  → when standing on the lifting platform: stay away from the hazardous crushing zone at the front edge of the platform [see Fig. 5.11];
  → when standing inside the vehicle body: stay away from the hazardous crushing zone between rear edge of the loading floor and the lowering platform [see Fig. 5.11].

- Make adequate and consistent use of the available load restraints (roll-stop systems, hinged ramps, trolley brakes, straps & latches,…) to prevent goods from falling or rolling unintentionally off the platform.

- Oversee and keep visual control over the whole working area of the lift and its platform at all times, INCLUDING the area UNDER the platform. [see Fig. 5.12]

Fig. 5.12

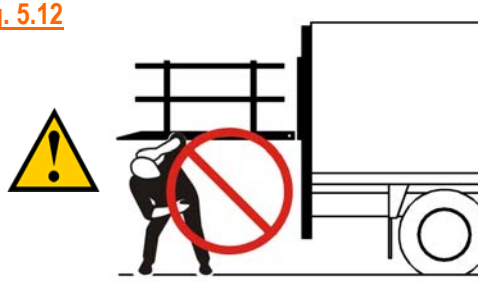


Fig. 5.10

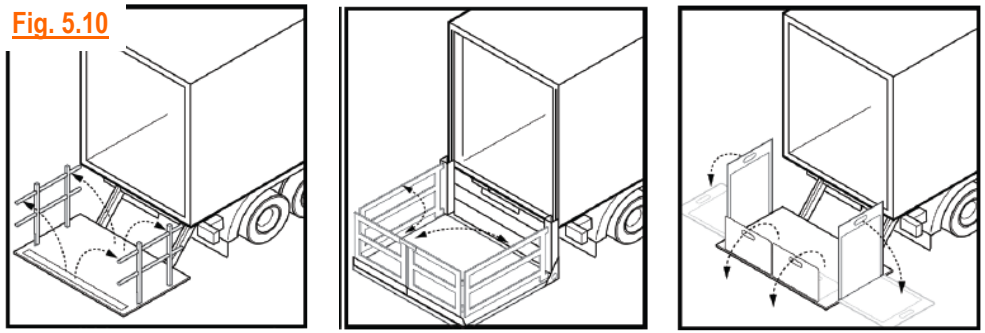


Fig. 5.11

Risk: operator on raising platform crushes foot under vehicle floor.	**Solution 1**: toe-guard flap + switch (= standard on multi-deck lifts).	**Solution 2**: double toe-guard flap on platform and floor.
Risk: operator on vehicle floor crushes foot under lowering platform.	**Solution**: toe-guard flap on platform flips up automatically.	**Solution**: toe-guard flap on platform flips up automatically.

§5.5 - Auxiliary controls / Position of the operator on the platform

- The issue of the choice and position of the auxiliary controls deals with the **protection of the toes, feet and limbs** of the operator working on or around the platform. It deals with the **risk** that the operator might squeeze, crush or injure his toes or limbs between the edge of the moving platform, and the rear cross member of the loading floor of the vehicle; or between the lowering platform and the ground.

- The standard delivery specification comprehends a 2-button control for LIFT / LOWER mounted to the safety rail on the platform, in combination with one of the toe-guard solutions shown in §5.4 [see Fig. 5.13]. This provides an efficient remedy against the risk of crushing and sheering of the toes, feet or limbs.

- It is strictly forbidden to use any other configuration of auxiliary controls without explicit risk assessment by the installer of the lift and the safety executive of the company operating the vehicle and the lift. The summary further in this § can be used as a guide only, and cannot lead to any form of legal complaint against DHOLLANDIA. Contact your national DHOLLANDIA distributor in case of doubt.

- It is generally accepted that the **foot control with compulsory 2-feet operation** provides an efficient remedy against this risk, since it immobilises both feet of the operator on a predetermined and safe location on the platform (= the buttons of the foot control). [see Fig. 5.14]

- Other auxiliary controls (wander lead with spiral cable, fixed interior control) should only be used under the safe working conditions described in the European Standard EN1756-1:2001+A1:2008 and the latest issue of the DHOLLANDIA fitting instructions FIT-ELEC_OPTION.

- If no hinged foot protector [see Fig. 5.15] or safety cut-out [see Fig. 5.16] is used, the **wander lead with spiral cable** can only be used:
  → If the end of the loading floor is executed with a **toe-guard profile** according to Fig. 5.17 [see Fig. 5.17].
  → **On the platform**, from a safe working zone of min. 400x400 mm, clearly and perma-

Fig. 5.13

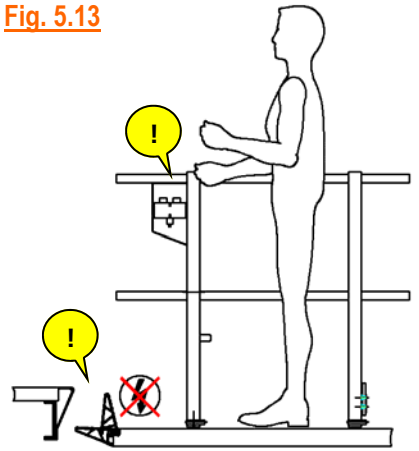


Fig. 5.14

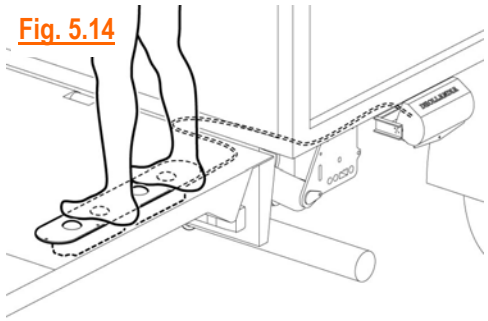


Fig. 5.15

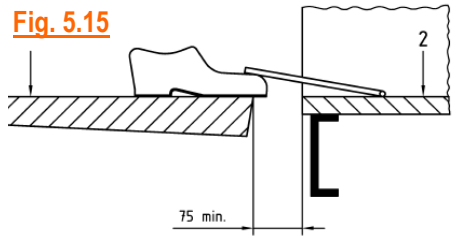


Fig. 5.16

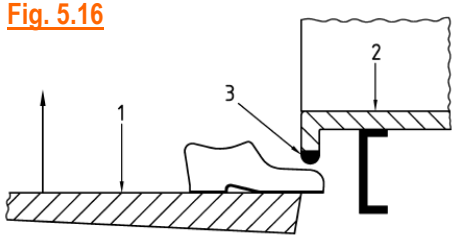


Fig. 5.17

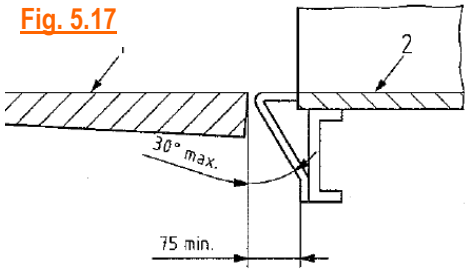


Fig. 5.18

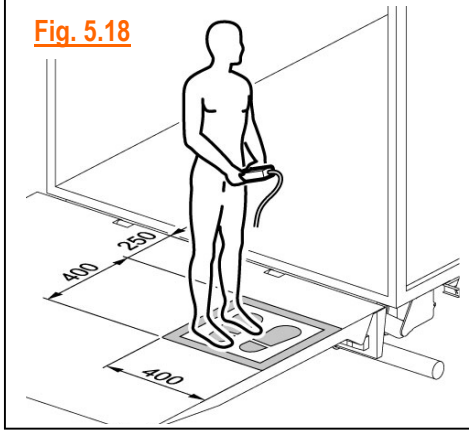
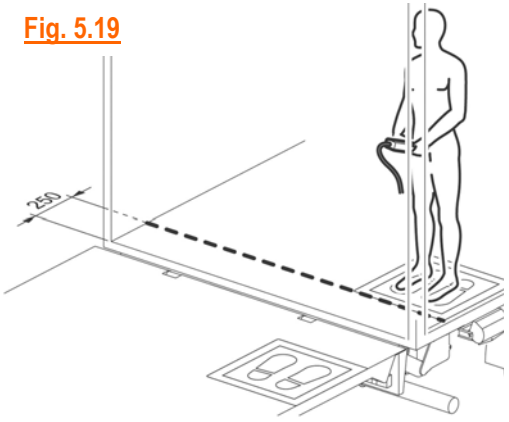


Fig. 5.19



nently marked at min. 250 mm distance from the hazard zone between the platform and the rear of the vehicle floor [See Fig. 5.18].

→ **Inside the vehicle body**, from a safe working zone of min. 400x400 mm, clearly and permanently marked at min. 250 mm distance from the hazard zone between the platform and the rear of the vehicle floor [See Fig. 5.19], and only if the front edge of the platform is equipped with a hinged toe-guard flap according to Fig. 5.11.

→ **On the ground**, from a safe working zone min. 500 mm away from the side edge of the platform [See Fig. 5.20].

- When lifting / lowering, the operator standing on the platform should hold on to the safety rail mounted on the platform. [See Fig. 5.21]. The operator should keep his hands clear of the lift runners, lift columns, steel cables or chains, pulleys,... to avoid hand injuries.

- If no hinged foot protector [see Fig. 5.15] or safety cut-out [see Fig. 5.16] is used, the **fixed interior control** should only be used inside the vehicle body, from a safe working zone of min. 400x400 mm, clearly and permanently marked at min. 250 mm distance from the hazard zone between the platform and the rear of the vehicle floor. [See Fig. 5.22]], and only if the front edge of the platform is equipped with a hinged toe-guard flap according to Fig. 5.11.

- In addition to having the safe working zones on the platform & the vehicle floor permanently marked, it is recommended to mark the hazardous areas at the end of the vehicle floor and the front of the platform in a contrasting colour. [See Fig. 5.23]

- The safe working zones for the operator must be kept clear at all times. It is prohibited to put load on these dedicated areas.

- The operator should always stand beside the load, to prevent him from being crushed between the load and the rear side of the vehicle.

- To prevent injury by tripping, the operator should pay attention to protruding items on the platform surface at all times (ex.: platform lights, roll-stops and their lever, foreign objects, etc…)

- It is prohibited to use the platform as elevated working platform.

- The power feed to any of the auxiliary controls should be connected to the safety switch in the control box. Activation of the auxiliary controls should deactivate the functions on the exterior control box. It is prohibited to bypass any of the safety features of the tail lift.

Fig. 5.20

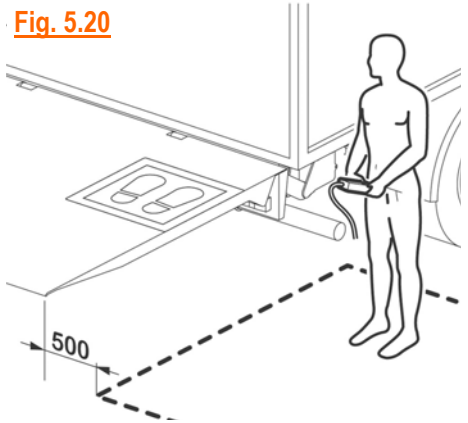


Fig. 5.21

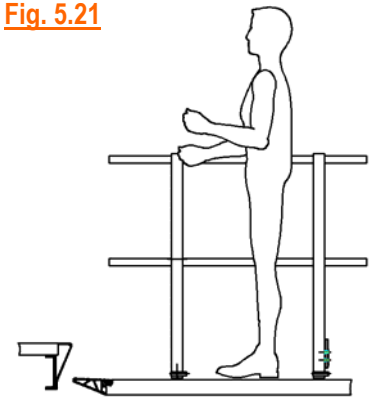


Fig. 5.22

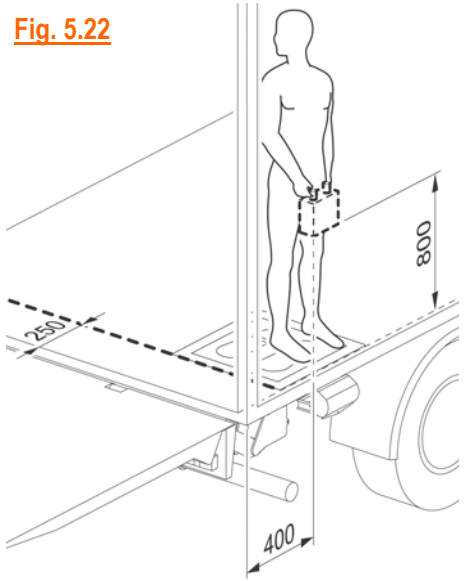
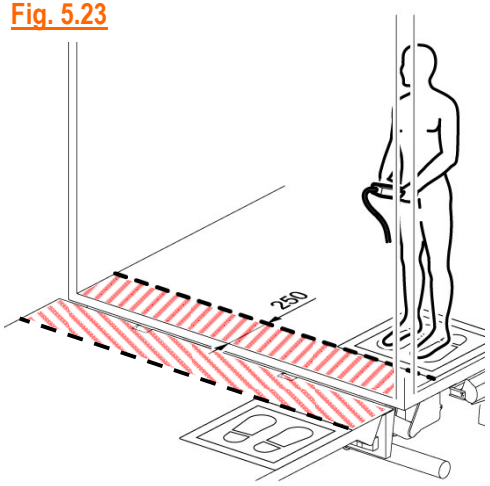


Fig. 5.23



§5.6 - Instructions for loading & unloading

- Follow the loading diagrams & explanatory comments [see Point 6] at all times.
- Never try to scoop loose substance (ex. sand, gravel, rocks, etc…) from the ground, to move it by means of the platform, or to lift / lower it on the platform. [See Fig. 5.24-5.25]
- Never use the platform to level the ground surface, or to push or pull loads or substances by means of the platform. [See Fig. 5.25]
- Never drop any load on the platform (ex. by means of a forklift, gantry crane etc…). Due to the kinetic effect, the impact of dropping a load is far greater than the nominal weight of this load might deceivingly suggest initially. [See Fig. 5.26]
- Never step or climb on a load.
- Prior to putting load on the platform, its angle should be inclined a few degrees upwards to compensate for the compression of the vehicle suspension and the minimal play in the articulations of the lift. Doing so, the platform will find itself in a perfect horizontal position after placing the load onto it.
- Never adjust the angle of the platform when it is loaded. Do so only when the platform is empty [see Fig. 5.27].
- For lifts with conical platform, always use the automatic tilt at ground level. [See §7.11]
- Platform accessed by fork lifts: is allowed only when the platform is at full rest on the ground. The combined weight of the fork lift and the load, should not exceed 125% of the nominal capacity of the tail lift [see Fig. 5.28]
- When unloading the platform at the ground, always push the load off the platform, don't pull. By pushing the load from a higher position, the operator avoids that the load would roll or fall over him, or hit him. [See Fig. 5.29].
- Loads must be protected against shifting position, and unintentional rolling off the platform. For loads that have no natural resistance against slipping, the use of original DHOLLANDIA roll-stops [see §7.10] or alternative fixation devices (ex. ratchet straps) is compulsory. The gravity point of the load should not be able to move during the movements of the platform.

Fig. 5.24

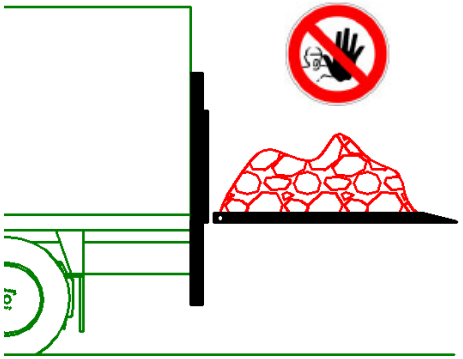


Fig. 5.25

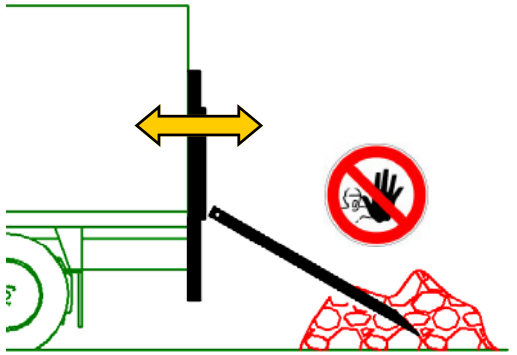


Fig. 5.26

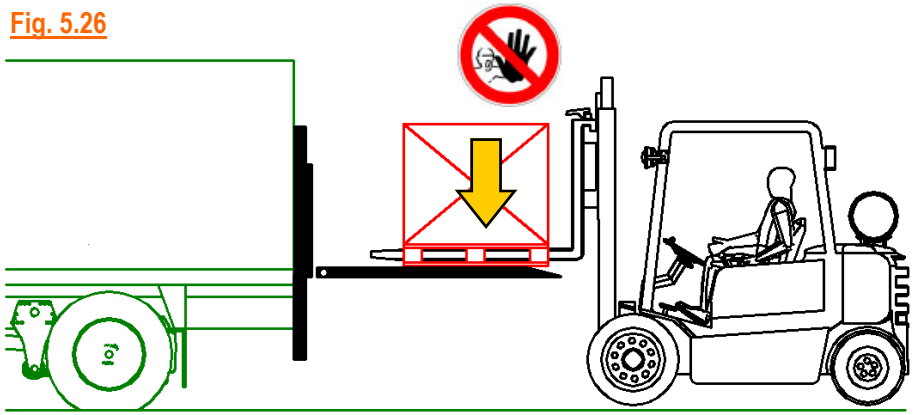


Fig. 5.27

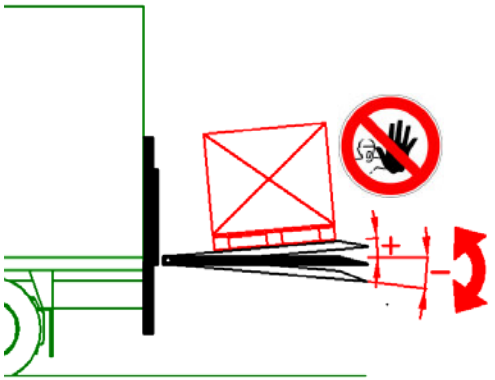
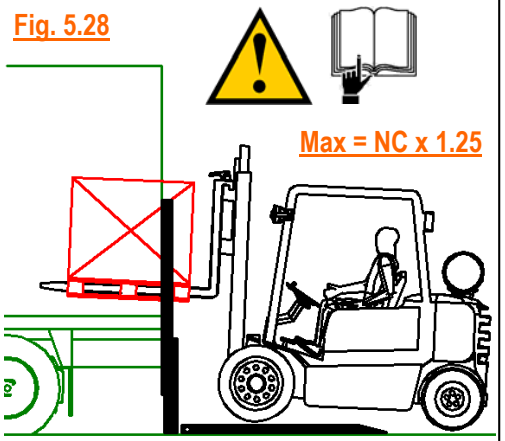


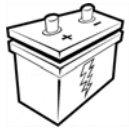
Fig. 5.28



§5.7 - Other important user's info

- **Exterior lifts** are equipped with a set of platform hooks, preventing the platform from falling open; and a set of locking pins through the lift columns, preventing the platform from lowering in case of accidental pressure loss. [See also Fig. 4.2 in Pt. 4]. The operator should ensure that this mechanical travel lock is released when putting the tail lift in use, and re-installed when putting it out of service. [See Fig. 5.30]

- **Interior lifts** are equipped with a set of locking pins through the lift columns only (or equivalent system made by the installer of the lift). In order to protect the lifting mechanism against overload and premature failure, it is very important that the platform and its weight don't put any stress on the suspension system (steel cables or chains, pulleys, sprockets). Therefore:
  → Before driving off: mount the locking pins through the lift columns, and LOWER the platform onto them to remove the stress from the suspension system.
  → Prior to unload: LIFT the platform, and remove the locking pins so that the platform can lower to the ground.



- Sufficient battery tension is vital to protect the electric components of the lift (battery switch, starter solenoid, electromotor, ...) against overheating or burning. [See also pg. A9]. The time needed to LIFT the platform strongly depends on the condition of the power source, and the weight on the platform.

- In most cases, the electric motor is fan-cooled and equipped with a **thermal fuse**. In case of intensive use, or a low voltage issue, the motor will heat up, and might be automatically stopped by this thermal fuse. This is **no** reason to call out for a service agent. Normally, this fuses resets itself after the motor has cooled down, this is approx. 20 min.

- Overheating can be avoided by lightening the work and inserting pauses; and by assuring a sufficiently strong power source giving min. 23V constant output . If overheating happens frequently, the condition and capacity of the batteries & the battery charging system, and the dimension of battery cables, earth cables and fuses must be checked; the implementation of a battery guard evaluated.

Fig. 5.29

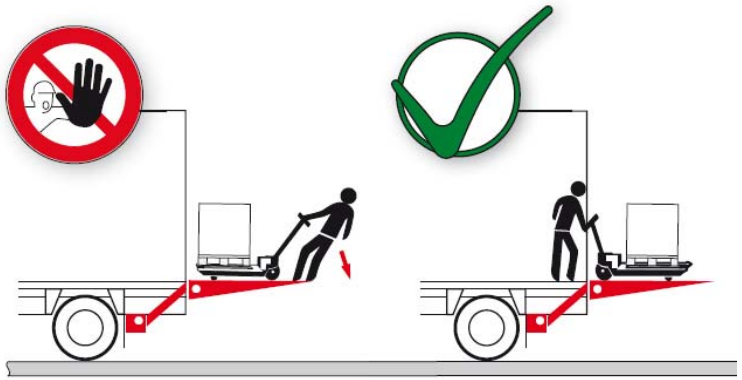
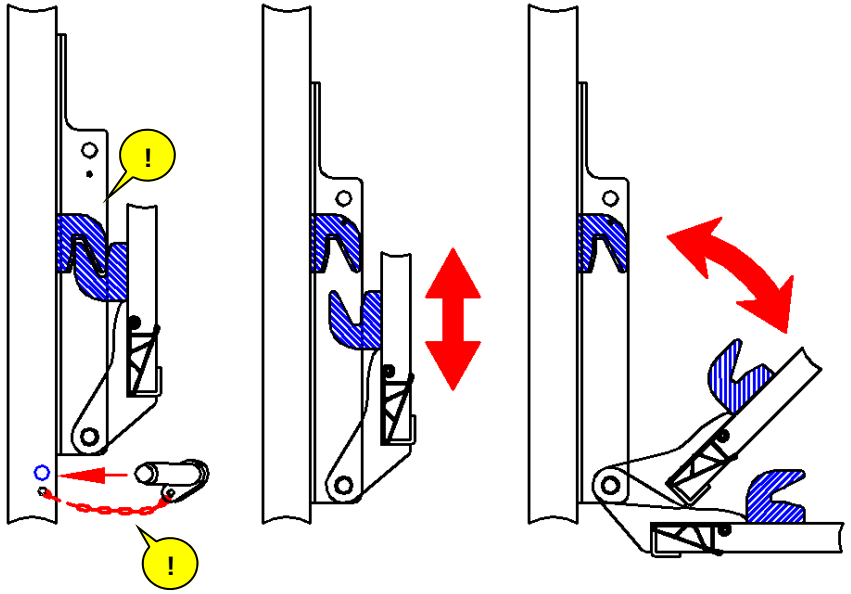


Fig. 5.30



§5.8 - Instructions for working at loading docks

- When working at loading docks, it is recommended to store the platform safely away, and to drive the goods directly from the dock onto the vehicle floor (and vice versa):

  → Platform stored vertically under the vehicle floor: when reversing into to dock, make sure there is enough clearance between the underside of the platform and the ground. Reverse at low speed, and make sure not to hit the platform against the dock to prevent mechanical damage. [see Fig. 5.31]

  → Platform stored horizontally in a storage pocket under the loading dock: make sure there is sufficient clearance under and above the platform, taking into account all expected positions of the vehicle suspension. The platform shouldn't touch either the ceiling, or the bottom of the storage pocket in the loading dock [see Fig. 5.32].

- When using the tail lift platform as bridge plate between the loading floor of the vehicle and the loading dock, follow the instructions below:

  → The total weight of the load and the lifting device (forklift, electric or manual transpallet truck, etc…) shouldn't exceed the nominal capacity of the lift [see Fig. 5.33].

  → A minimum section of 150mm of the platform point should cover the loading dock [see Fig. 5.34].

  → When loading / unloading, the loading floor of the vehicle might lower / rise relative to the loading dock. Use the electrical controls to adjust the platform when the point of the platform rises above or below the dock [see Fig. 5.35]. Negligence to adjust the platform angle could cause severe damage to the tail lift.

  → It is forbidden to let the platform float, and use a second articulated link bridge between its point and the loading dock [see Fig. 5.36]. When loading / unloading, the platform point should always overlap a rigid underground over a minimum of 150mm [see Fig. 5.34 - 5.35].

  → It is forbidden to use a folding platform as bridge plate.

  → In order to prevent damage, the platform should always be closed in its travel position, prior to driving away from the loading dock.

Fig. 5.31

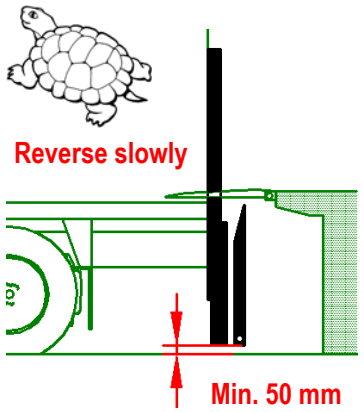


Fig. 5.32

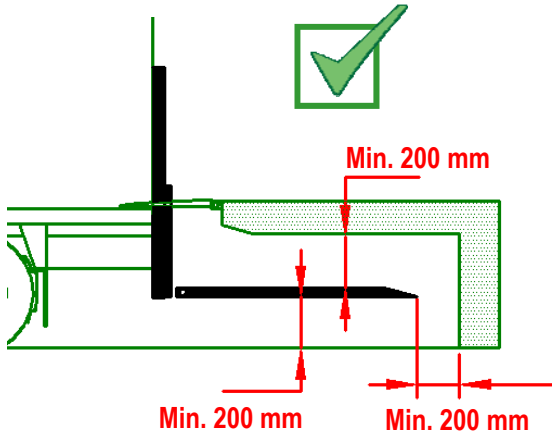


Fig. 5.33

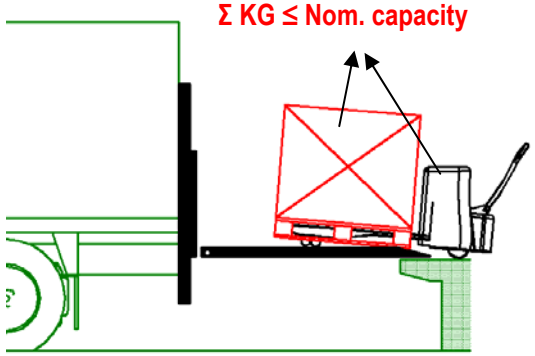


Fig. 5.34

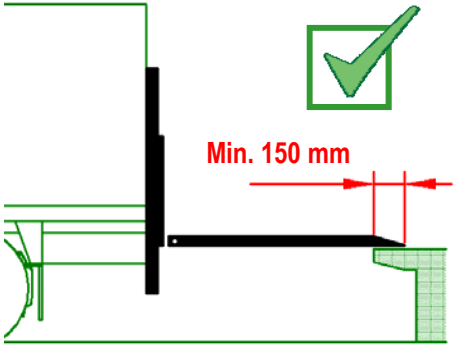


Fig. 5.35

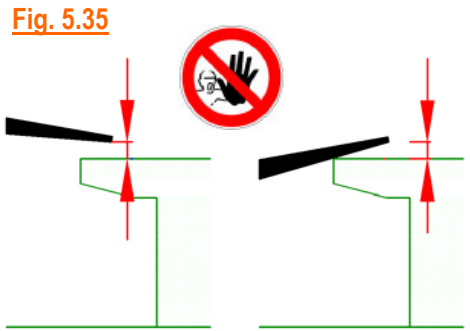
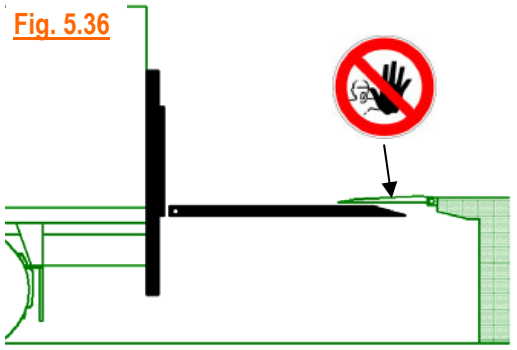


Fig. 5.36



§5.9 - Importance of good maintenance

- Prior to use, inspect the tail lift to ensure that all safety systems and all functions operate correctly, and that no urgent maintenance or damage repair is required. If any unsafe condition exists or unusual noises or movements are noticed, DO NOT use the lift and contact an authorised DHOLLANDIA service agent for repair.

- Missing, worn or illegible warning decals must be immediately replaced.

- Competent and regular maintenance is very important for the operational reliability, and the safety of the operator and occasional by-standers in traffic.

- All maintenance and repair works should be executed by authorised DHOLLANDIA service agents, and using original spare parts only.

Warning in case of breakdowns

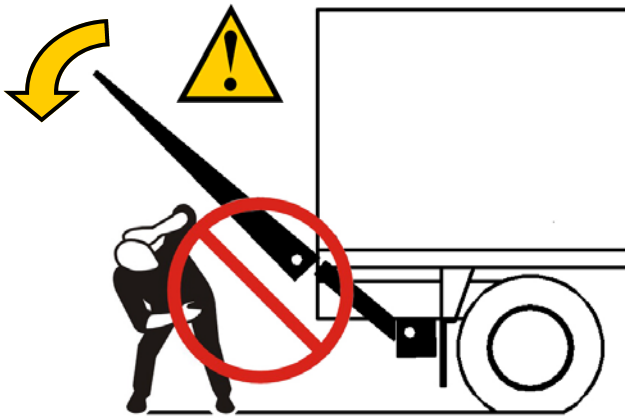
- If a tail lift cannot be repaired immediately in case of breakdown, it must be put out of operation and secured against unauthorised use.

- A lift put into its travel position with the help of external devices (forklift, gantry crane, …), is not supported by its hydraulic cylinders. After releasing the mechanical platform lock, the platform and lifting mechanism will drop in free fall to the start point of the breakdown, without any possibility to stop the fall by means of the regular control box. [See Fig. 5.37]. This can result in the unaware operator and third parties being at great risk.

- To avoid any risk, close the mechanical platform lock and apply additional means to immobilise the platform (eg. by additionally securing the original platform lock, by means of ratchet straps,…). Signal the hazard in a clearly visible way.

- To re-open the lift, use again an external device (forklift, gantry crane,…) for additional support. Or repair the breakdown first, bring the hydraulic system under pressure, and release the platform locks after satisfactory testing of the lift functions.

Fig. 5.37



6. LOADING DIAGRAMS

- Hydraulic tail lifts are not designed to LIFT / LOWER weights corresponding to their nominal capacity over the full surface of the platform. The nominal capacity is valid at a certain distance or **centre of gravity** behind the vehicle body. Behind that point that is marked on the platform, the maximum safe working load diminishes according to the load diagrams below.

- When LIFTING, the tail lift is normally protected against overload by the pressure relieve valve in the hydraulic circuit. Most of the overload, and consequential damage, happens when LOWERING loads.

Warning !

- **In order to ensure the safety of the operator, and occasional bystanders, and protect the structural integrity of the lift, fore lying loading instructions and diagrams should be followed with great care.**

- Negligence can put the operator and third parties at great risk, or cause premature wear or damage to the tail lift.

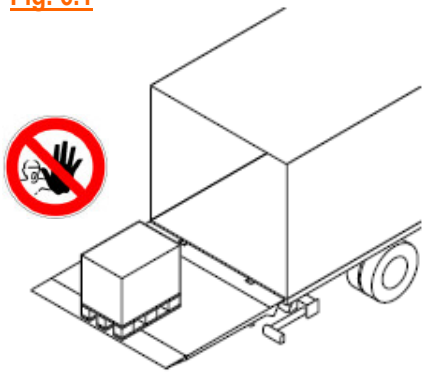
- DHOLLANDIA disclaims liability for any personal injury or property damage that results from overload practices.

- The **nominal capacity (= NC)** is the maximum weight that the tail lift should carry under the best possible circumstances:
  → the centre of gravity of the load stands no further than the nominated centre of gravity of the tail lift, marked on the platform surface (always place the load as close as possible to the rear side of vehicle), and
  → the load stands centrally between the lift columns, this is at equal distance from both platform sides.

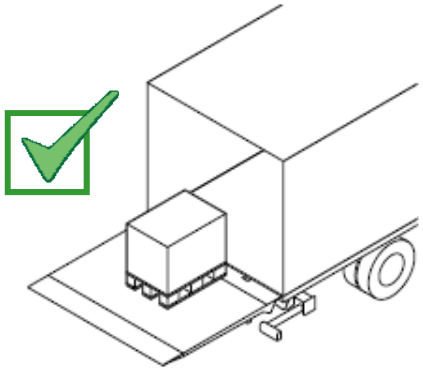
- Beyond these best possible circumstances, the maximum **safe working load (=SWL)** goes down according to the load diagrams & instructions below. [see Fig. 6.1 - 6.2]

- The load should never protrude beyond the side edges or front edge of the platform.

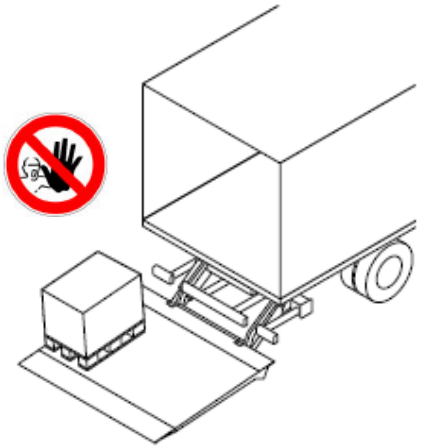
Fig. 6.1



NOT OK: load positioned too close to the platform point

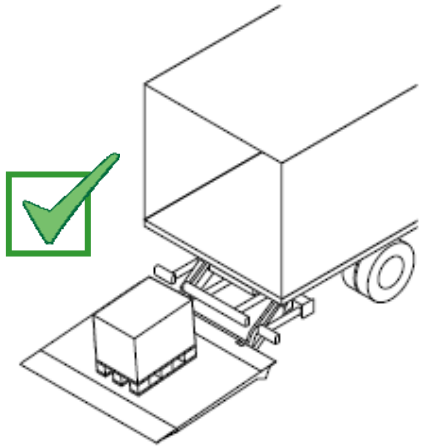


OK: load positioned as close as possible to the rear of the vehicle



NOT OK: load positioned too far off centre

→ SWL = 50% of NC



OK: load positioned centrally between the lift columns

- Be aware that the centre of gravity of the load doesn't necessarily correspond with its physical middle point. The weight can be spread very unevenly.

- Unilateral loading on 1 side of the platform should be avoided. Restrict the load to a maximum safe working load of 50% of the nominal capacity. [see Fig. 6.1].

- Pay attention to avoid "concealed" overload situations, such as:
  → Platform squeezed in the storage pocket of a loading dock: unexpected forces can apply to the lifting mechanism, causing severe damage [see Fig. 5.32].
  → Platform and lifting mechanism damaged by hard reversing of the vehicle against the loading dock [see Fig. 5.31].
  → Platform accessed by fork lifts: is allowed only when the platform is at full rest on the ground. The combined weight of the fork lift and the load, should not exceed 150% of the nominal capacity of the tail lift [see Fig. 5.28].
  → Fork lifts offloading merchandise on the platform point standing at the floor level of the vehicle: the kinetic effects of the descend speed & the additional weight of the forks / masts of the forklift often lead to significant overload. Load over the side edge of the platform, place the merchandise centrally between the 2 lift columns (at equal distance from both platform sides). [See Fig. 5.26]

- Note: stickers indicating the nominal capacity + the centre of gravity [see Fig. 6.3] and applicable load diagram [see Fig. 6.2] are supplied with the lift. The operator should take note of this information prior to using the lift.

Fig. 6.2

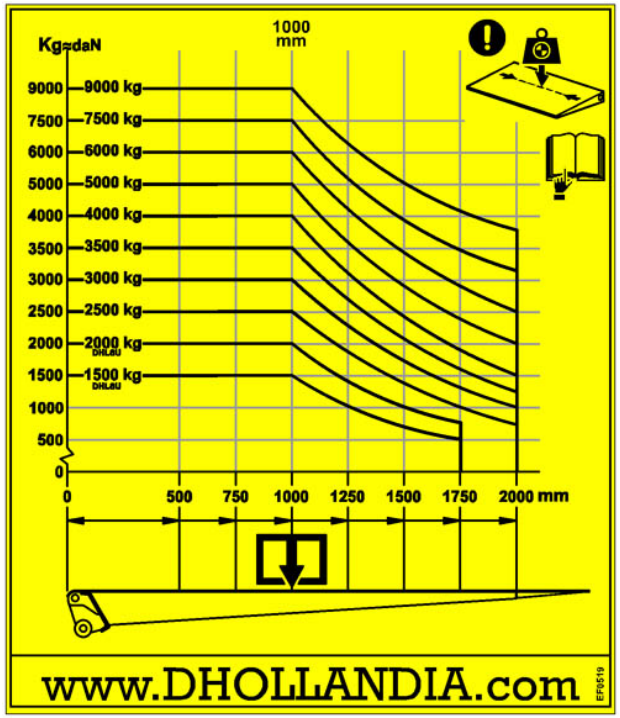


Fig. 6.3

7. OPERATING INSTRUCTIONS

§7.1 - Introduction to the standard control box

- All the symbols in this chapter represent left hand drive vehicles (= continental Europe) with the control box mounted on the right side of the vehicle. For control boxes mounted to the left side of the vehicle, the images should be mirrored.

- The standard control box contains a 4-way joystick operating the functions LIFT / LOWER / OPEN* / CLOSE*, plus a safety switch.

- The safety switch can be a rotary switch with removable key [see Fig. 7.1], a standard rotary switch [see Fig. 7.2 –7.3] or a push button [see Fig. 7.4]. They function as follows:

Rotary switch as safety switch [See Fig. 7.5]	
Switch turned & held clockwise (1)	Activates the joy-stick in the exterior control box, and deactivates the auxiliary controls
Switch turned counter-clockwise (2)	Activates the auxiliary controls, and deactivates the joy-stick in the exterior control box
(1) Hold-to-run principle: when the safety switch is released, it will automatically return to the neutral position, and deactivate the joy-stick. (2) Fixed position: the auxiliary controls remain active as long as the safety switch is not manually returned to the neutral position.	

Push button as safety switch	
Button pushed-in	Activates the joy-stick in the exterior control box
Button left idle	Activates the auxiliary controls

- The joy-stick operates the 4 basic functions LIFT, LOWER, CLOSE* & OPEN*. [See Fig. 7.5]

* Where applicable: for lifts with tilt cylinders only, not for lifts with manual OPEN / CLOSE.

Fig. 7.1

Fig. 7.2

Fig. 7.4

Fig. 7.3

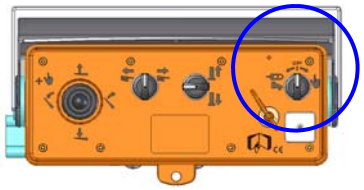
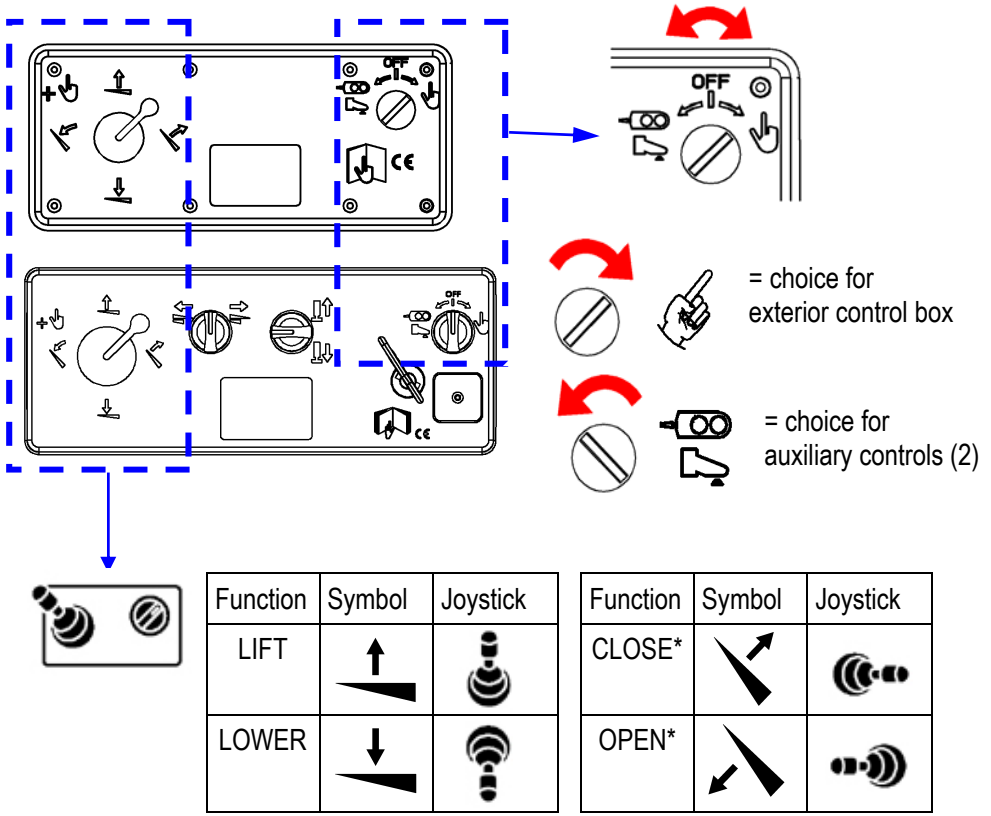


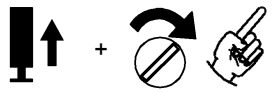
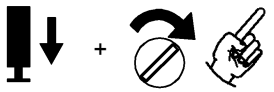
Fig. 7.5



- Additional rotary switches are foreseen in case of more complex lifts. The functions LEG IN, LEG OUT in case of lifts with hydraulic stabilising legs. [See Fig. 7.6].

- In practice, the functions on the exterior control box are actuated as follows:

Function	To actuate :
LIFT	
LOWER	
CLOSE*	
OPEN*	

Function	To actuate (*) :
LEG IN	
LEG OUT	
(*) use of safety switch not required on all lift models	

- Most of the DHOLLANDIA control boxes are equipped with a removable key, functioning as an emergency switch. This emergency switch allows to cut the electrical power in case of danger [see Fig. 7.7]. Where not implemented, the European Standard foresees other means to disconnect the power, such as disconnecting the battery connections.

* Where applicable: for lifts with tilt cylinders only, not for lifts with manual closure

Fig. 7.6

Function	Symbol	Switch
LEG IN		
LEG OUT		

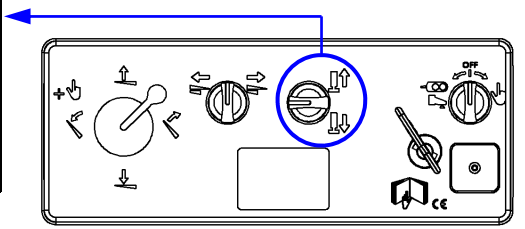


Fig. 7.7

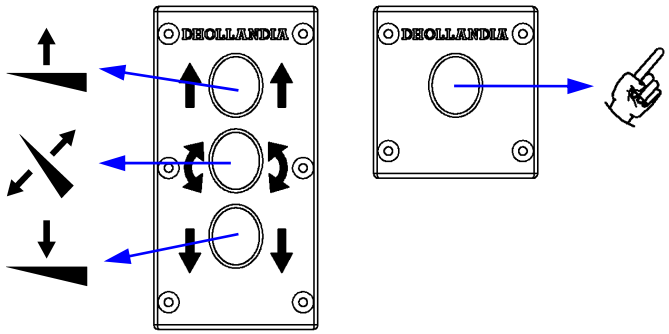
§7.2 - Option S094: 3+1 button control box

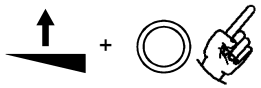
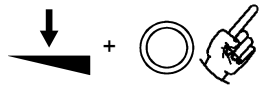
- The option S094 features a 1st control box with 3 buttons, plus a 2nd separate control box with 1 safety button. (A separate battery switch should be mounted during installation of the lift).
- This type is for instance used for mounting into the side panel of the vehicle body.
- The 3 buttons plus the safety button operate the 4 basic functions LIFT, LOWER, CLOSE & OPEN. [See Fig. 7.8]

§7.3 - Interior lifts with fixed platform, and lifts with manual closure only

- Interior lifts with fixed platform, and lifts with manual closure only have the functions LIFT / LOWER, and no tilt functions. They can be controlled by the standard control box, or the 3+1 button control box [see Fig. 7.9].

Fig. 7.8



Function	To actuate :
LIFT	
LOWER	

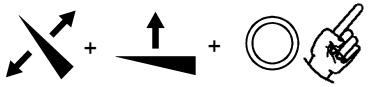
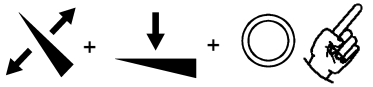
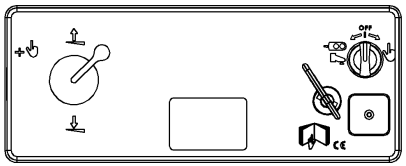
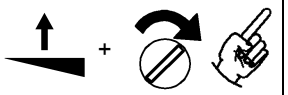
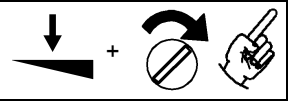
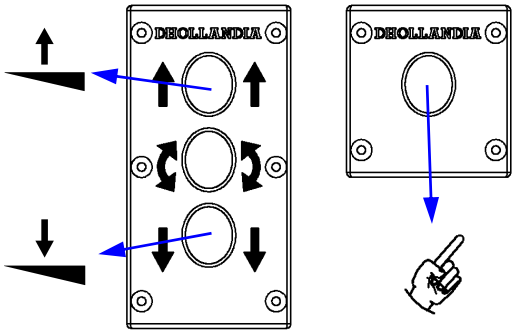
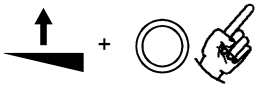
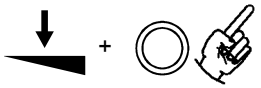
Function	To actuate :
CLOSE*	
OPEN*	

Fig. 7.9



Function	To actuate :
LIFT	
LOWER	



Function	To actuate :
LIFT	
LOWER	

- The option S011 features a single control box with 2 control buttons and an emergency cut-out switch. (A separate battery switch should be mounted during installation of the lift).

- The 2 buttons operate the 2 basic functions LIFT, LOWER (the closure of the platform is done manually). The emergency switch enables the operator or any bystander to cut off the power to the control unit is case of emergency. [See Fig. 7.10]

- These lifts can also be operated by any of the auxiliary controls below. But whatever configuration, the operation of the lift should be subject to an explicit risk assessment by the installer of the lift and the safety executive of the company operating the vehicle and the lift. [See Pt. 5 - safety instructions].

§7.4 - Auxiliary controls

- The auxiliary controls should be used with full respect of the particular safety instructions of §5.5.

- If the safety switch in the exterior control box is a rotary switch, this switch should be turned counter-clockwise to activate the auxiliary control. [See Fig. 7.11]

- The standard auxiliary control mounted to the side gate, is equipped with 2 buttons: 1 button to LIFT, 1 button to LOWER. In case the lift is equipped with a hydraulic ramp (option S764, S765), the side gates is equipped with 2 more buttons, 1 button for RAMP UP, 1 button for RAMP DOWN. [See Fig. 7.12].

Fig. 7.10

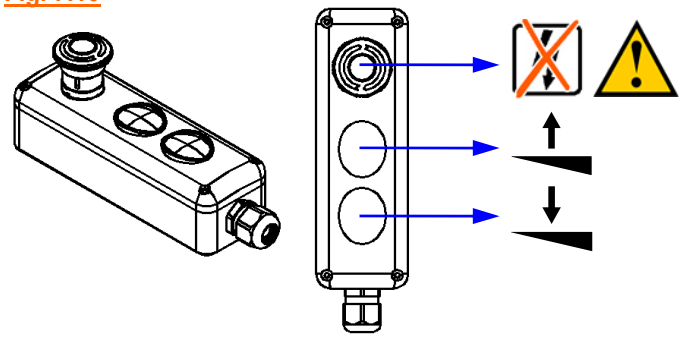


Fig. 7.11

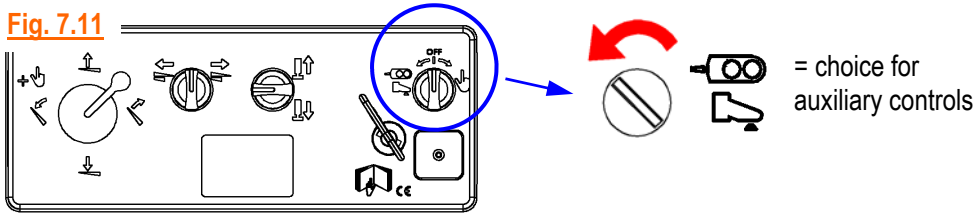
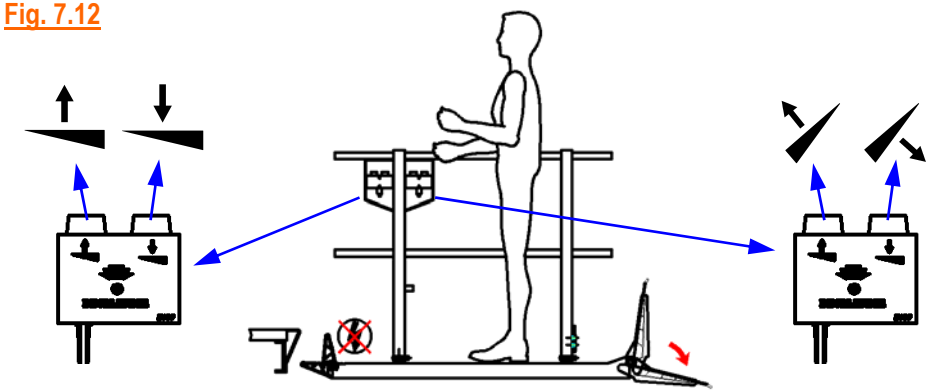


Fig. 7.12



Function	To actuate :
LIFT	↑
LOWER	↓

Function	To actuate :
RAMP UP	↑
RAMP DOWN	↓

- The foot controls (option S006 or S075) are equipped with 4 buttons: 2 buttons to LIFT, 2 buttons to LOWER. Any of the 2 movements is stopped immediately if 1 of the 2 buttons is released, or if a wrong combination of buttons is actuated. [See Fig. 7.13].

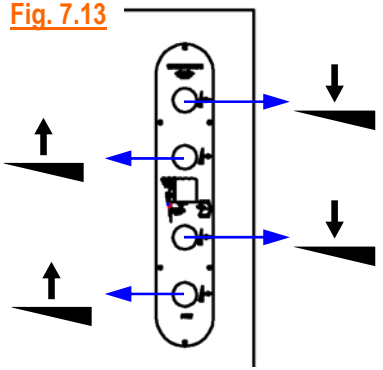
- The 2-button wander lead with spiral cable (option S001), and the 2-button fixed interior controls (option S003, S005) are equipped with 2 buttons: 1 button to LIFT, 1 button to LOWER. [See Fig. 7.14].

- The use of 3-button wander leads with spiral cable, enabling the operator to additionally TILT the platform, is disallowed under the European CE Safety Directives.

- The selection switch (selection between exterior & auxiliary controls) that is normally fitted in the exterior control box [see Fig. 7.1 - 7.5], can also be mounted in the auxiliary controls mounted on the side gate (option S004.C), or in the fixed interior controls (option S015) [see Fig. 7.15].

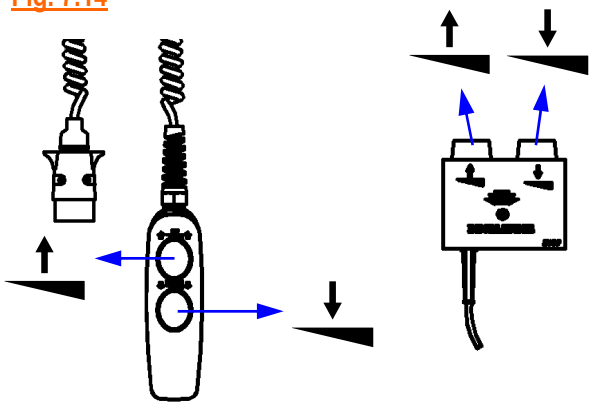
Selection switch on the auxiliary controls [See Fig. 7.15]	
Switch turned clockwise (1)	Activates the LIFT / LOWER buttons in the auxiliary controls, and deactivates the exterior control box.
Switch turned counter-clockwise (2)	Activates the exterior control box, and deactivates the auxiliary controls.

Fig. 7.13



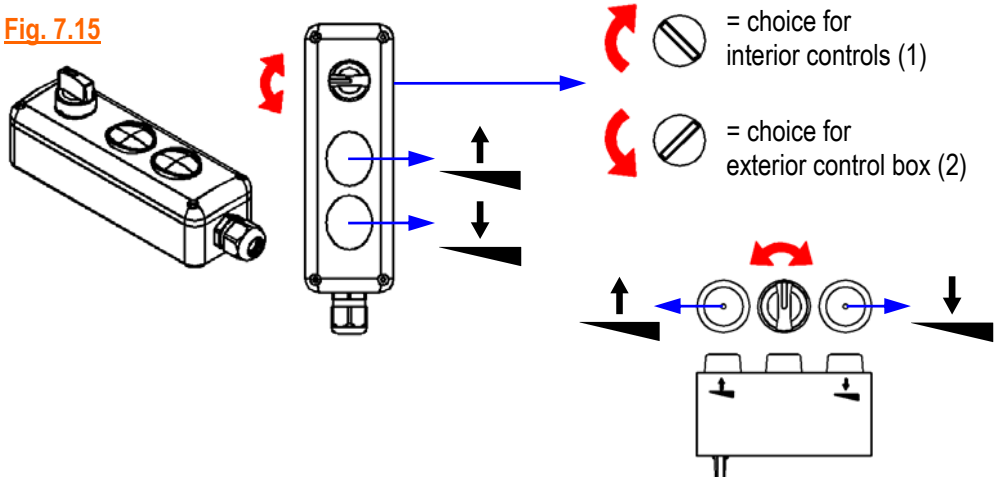
Function	To actuate :
LIFT	↑ + ↑
LOWER	↓ + ↓

Fig. 7.14



Function	To actuate :
LIFT	↑
LOWER	↓

Fig. 7.15

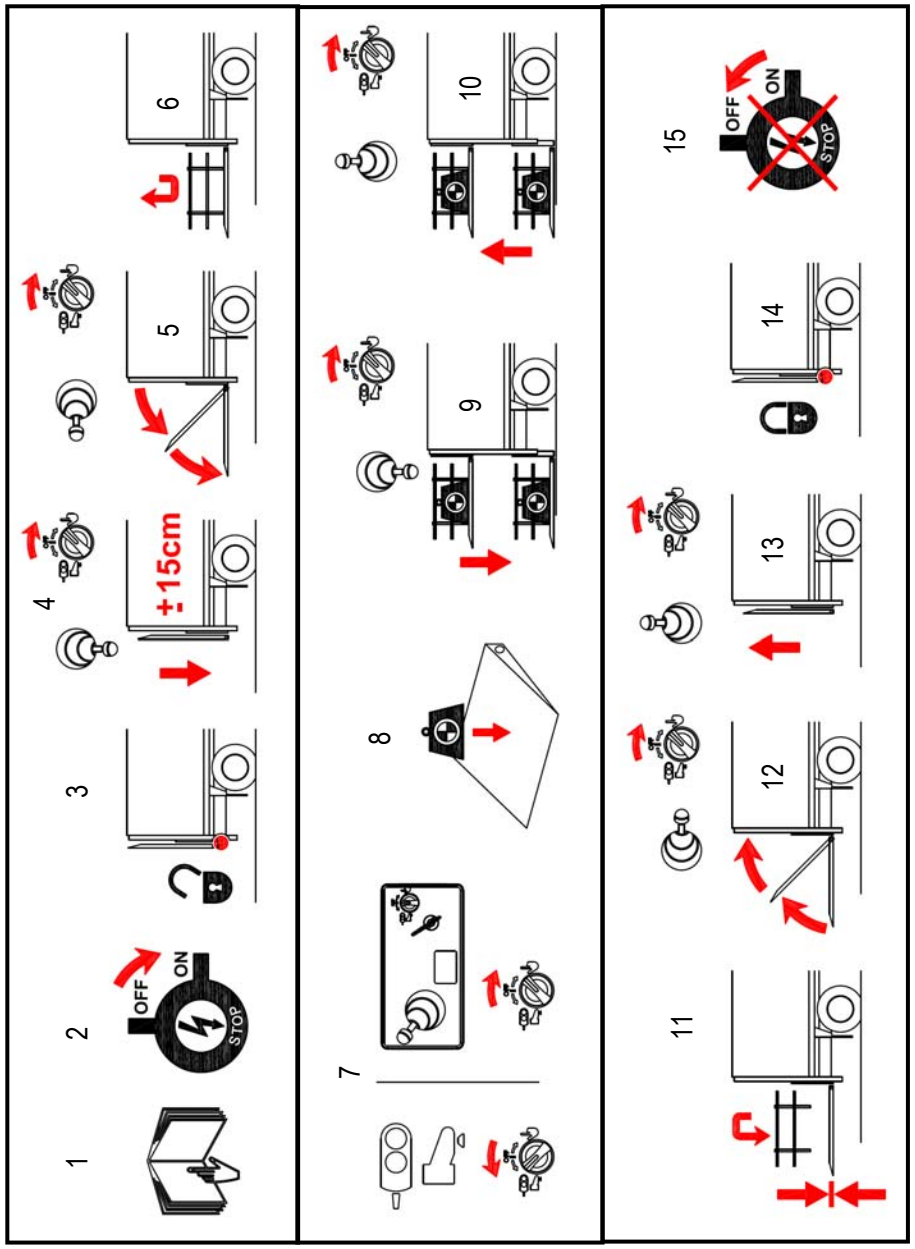


§7.5 - Operating instructions for standard exterior column lift

- Standard exterior column lifts should be operated as follows :

Fig. 7.16 - Operation of standard exterior column lifts	
N°	**Opening the platform**
1	Consult the user's manual before getting started. Observe all safety instructions.
2	Switch on the electrical power to the tail lift (cabin switch in the driver's cabin, and battery switch of the exterior control box).
3	Remove the locking pins through the columns.
	LEG OUT: if applicable, lower the stabilising legs into work position.
4	LOWER the platform approx. 150mm to disengage the platform hooks.
5	OPEN the platform 90° into the horizontal work position.
6	Raise and lock the safety rails into vertical position.
N°	**Loading & unloading**
7	Select between exterior control box and auxiliary controls.
8	Observe the loading diagrams & instructions at all times.
9	Use any of the functions LOWER depicted in §7.1 to §7.4 to LOWER the platform to the ground.
10	Use any of the functions LIFT depicted in §7.1 to §7.4 to LIFT the platform to the vehicle floor level.
N°	**Closing up in travel position**
11	Close and lock the safety rails. LIFT or LOWER the platform to approx. 15cm under the vehicle floor, or any suitable height in function of the specific vehicle execution.
12	CLOSE the platform until it reaches the closed vertical position, and you hear the hydraulic system turn in overpressure.
13	LIFT the platform until the platform hooks are engaged.
14	Mount the locking pins through the columns.
	LEG IN: If applicable, lift the stabilising legs into travel position.
15	Switch off the electrical power to the lift. Close the lid of the control box.

Fig. 7.16

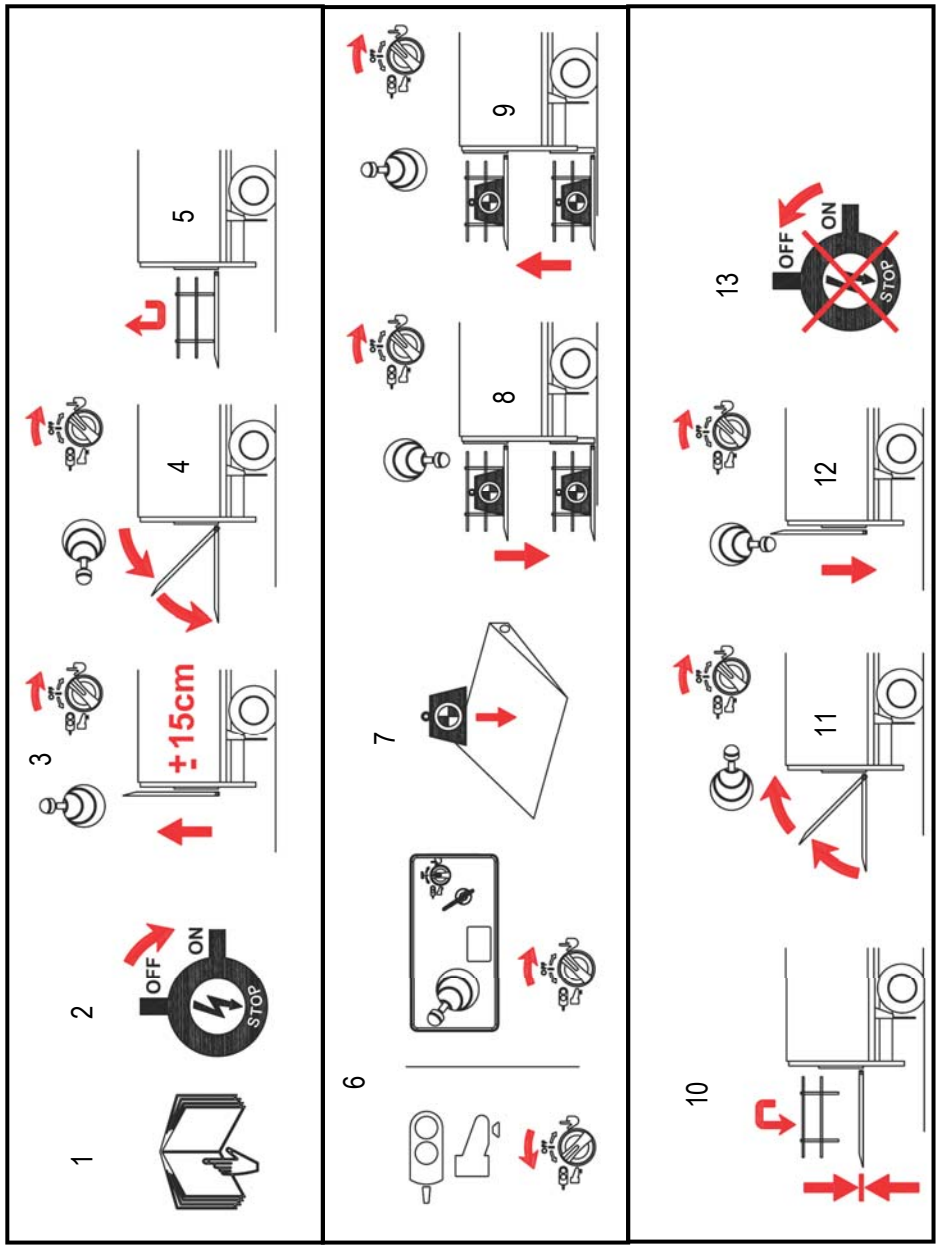


§7.6 - Operating instructions for cattle lifts DH-VBV, DH-VXV

- The lifts for cattle transport types DH-VBV and –VXV are equipped with inverted platform locks and should be operated as follows:

Fig. 7.17 - Operation of cattle lifts with inverted platform hooks	
N°	**Opening the platform**
1	Consult the user's manual before getting started. Observe all safety instructions.
2	Switch on the electrical power to the tail lift (cabin switch in the driver's cabin, and battery switch of the exterior control box).
	LEG OUT: if applicable, lower the stabilising legs into work position.
3	LIFT the platform approx.150mm to disengage the platform hooks.
4	OPEN the platform 90° into the horizontal work position.
5	Raise and lock the safety rails into vertical position.
N°	**Loading & unloading**
6	Select between exterior control box and auxiliary controls.
7	Observe the loading diagrams & instructions at all times.
8	Use any of the functions LOWER depicted in §7.1 to §7.4 to LOWER the platform to the ground.
9	Use any of the functions LIFT depicted in §7.1 to §7.4 to LIFT the platform to the vehicle floor level.
N°	**Closing up in travel position**
10	Close and lock the safety rails. LIFT or LOWER the platform to approx. 15cm above the normal height of the platform in it's travel position.
11	CLOSE the platform until it reaches the closed vertical position, and you hear the hydraulic system turn in overpressure.
12	LOWER the platform until the platform hooks are engaged.
	LEG IN: If applicable, lift the stabilising legs into travel position.
13	Switch off the electrical power to the lift. Close the lid of the control box.

Fig. 7.17

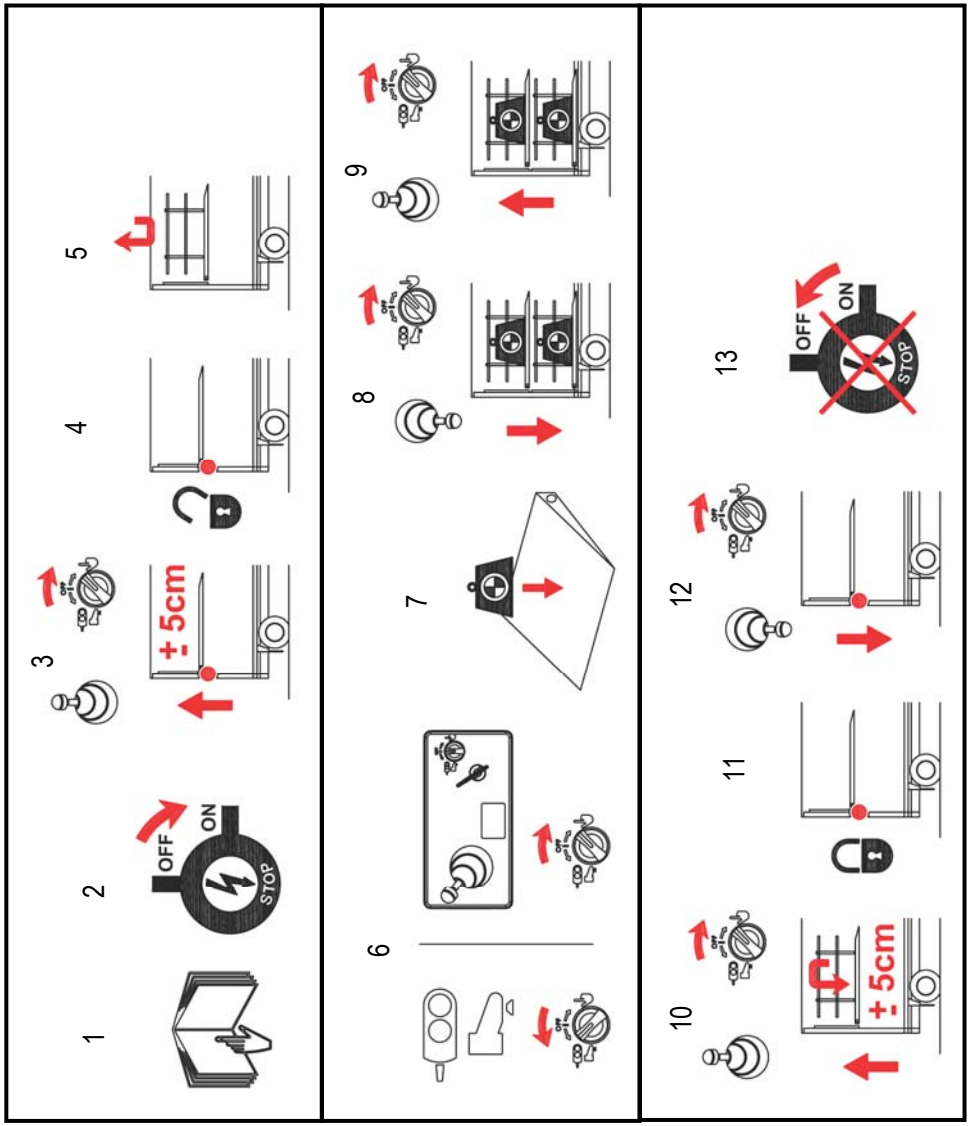


§7.7 - Operating instructions for interior lifts

- Interior mounted column lifts should be operated as follows:

Fig. 7.18 - Operation of interior column lifts	
N°	**Opening the platform**
1	Consult the user's manual before getting started. Observe all safety instructions.
2	Switch on the electrical power to the tail lift (cabin switch in the driver's cabin, and battery switch of the exterior control box).
3	LIFT the platform approx.50mm to take the platform weight off the locking pins.
4	Dismount the locking pins
5	Raise and lock the safety rails into vertical position (if applicable).
N°	**Loading & unloading**
6	Select between exterior control box and auxiliary controls.
7	Observe the loading diagrams & instructions at all times.
8	Use any of the functions LOWER depicted in §7.1 to §7.4 to LOWER the platform to the ground.
9	Use any of the functions LIFT depicted in §7.1 to §7.4 to LIFT the platform to the vehicle floor level.
N°	**Closing up in travel position**
10	If applicable, stow away the safety rails. LIFT the platform to approx. 5cm above the normal height of the platform in it's travel position.
11	Mount the locking pins through the columns.
12	LOWER the platform until the platform rests on the locking pins.
13	Switch off the electrical power to the lift. Close the lid of the control box.

Fig. 7.18



§7.8 - Operating instructions for DH-VO5 removal lifts

- Removal lifts type DH-VO5 are equipped with telescopic lift runners, and can reach to heights between 5 and 6m above ground level, to load / unload goods at a 1st or 2nd building floor.

- Since this platform lifts well above the roof level of any commercial vehicle, the risk of falling from extreme heights exists on all 4 platform sides. Therefore safety rails should be used on all exposed sides at all times, and operators should follow the safety instructions of this manual with due diligence.

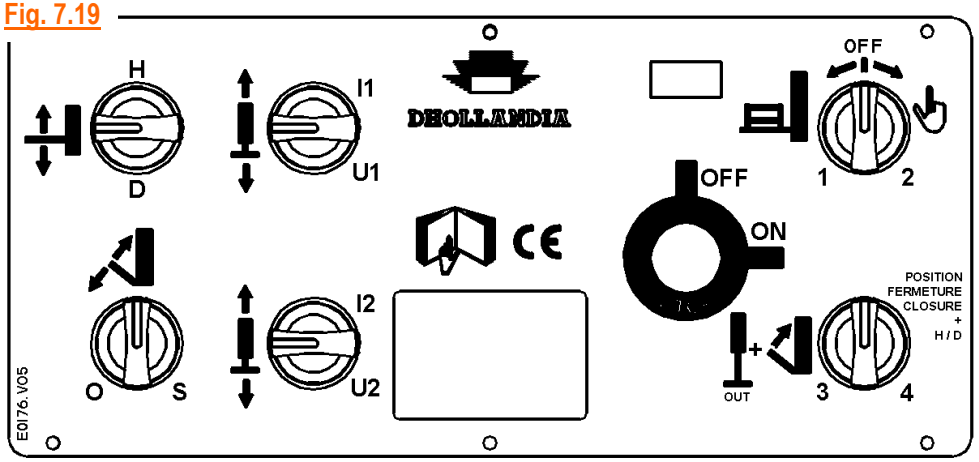
- On top of the standard safety features, the DH-VO5 is equipped with:
  - → Hydraulic stabilising legs to stabilise the vehicle and the platform when working at extreme heights. The use of the stabilising legs is obliged for all activities above roof level, and generally for all circumstances where the stability of the vehicle and the load on the platform, as well as the safety of the operator standing on the platform is compromised without the legs in place.
  - → Detection on the stabilising legs: the platform cannot be closed before the stabilising legs are fully retracted.
  - → Safety rails on all sides: hinged safety rails on the sides, a fixed safety rail with plinth at the rear edge, and a telescopic safety rail at the front edge of the platform.
  - → Limitation of the lift capacity at 500kg above the roof level.

- The DH-VO5 is available with 1 type of control box only. The different functions are actuated as show in Fig. 7.19 [see Fig. 7.19].

  (1) The function CLOSE only works if the stabilising legs are fully pulled in. So in order to CLOSE the platform:
  - → Use the function “Height detection to CLOSE” to LIFT / LOWER the platform to the suitable height for closing the platform into it’s travel position.
  - → Use the function LEG IN to raise the left & right stabilising legs into their travel position.
  - → Use the function CLOSE to close the platform until it reaches the closed vertical position, and you hear the hydraulic system turn in overpressure.
  - → Use the function LIFT until the platform hooks are engaged.

  (2) Still with the stabilising legs on the ground, the angle of the platform can be adjusted to the slope of the ground. Use the functions TILT UP and TILT DOWN to do so.

Fig. 7.19



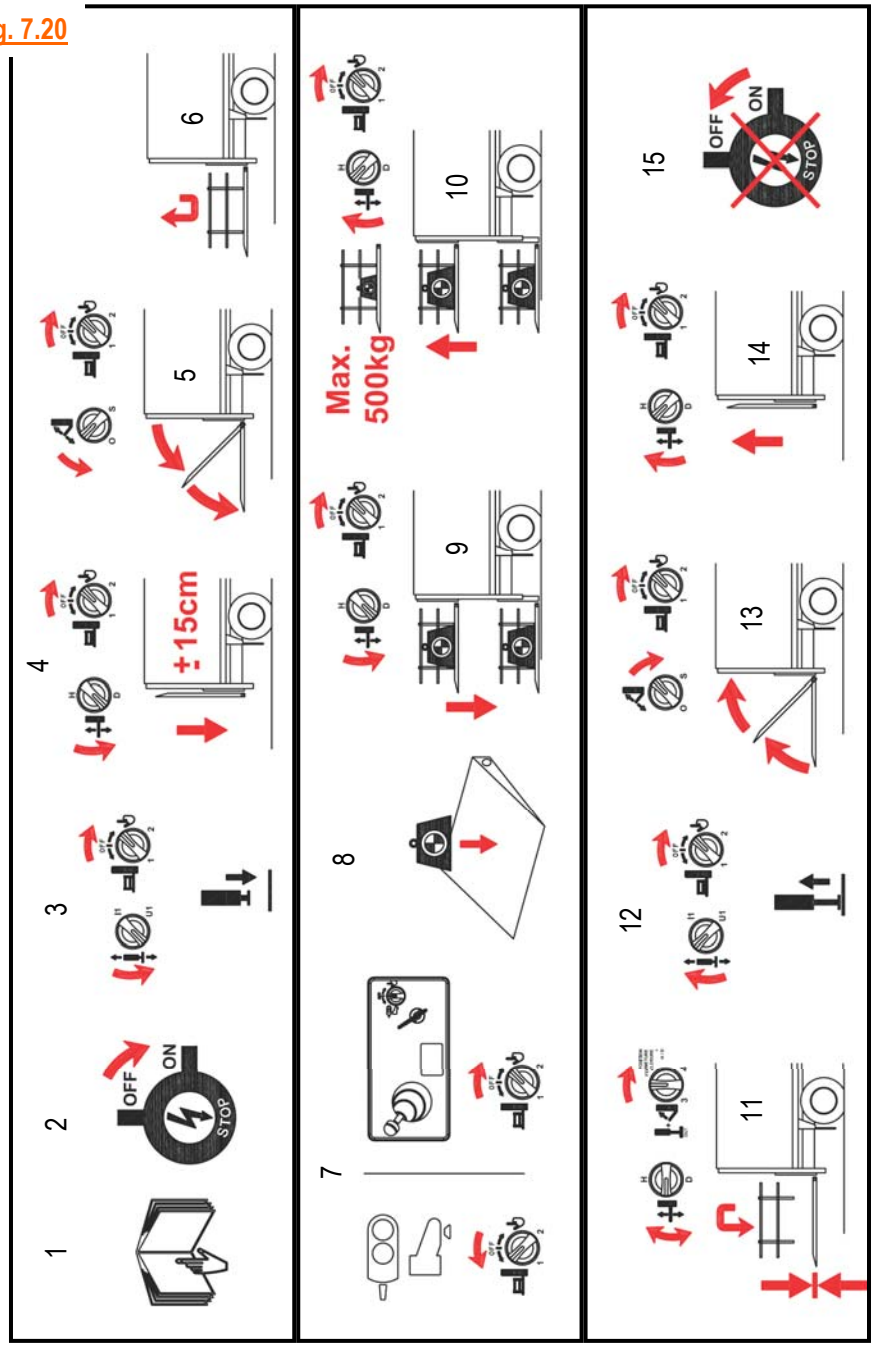
Function	To actuate :
LIFT	H + 2
LOWER	D + 2
CLOSE (1)	S + 2
OPEN	O + 2
Change-over to auxiliary controls	1
Height detection to CLOSE	H + 4 D + 4
TILT UP (when legs are out) (2)	S + 2 + OUT
TILT DOWN	O + 2

Function	To actuate :
LEG IN left side	I1 + 2
LEG OUT left side	U1 + 2
LEG IN right side	I2 + 2
LEG OUT right side	U2 + 2

- The DH-VO5 should be operated as follows:

Fig. 7.20 - Operation of removal lifts DH-VO5	
N°	**Opening the platform**
1	Consult the user's manual before getting started. Observe all safety instructions.
2	Switch on the electrical power to the tail lift (cabin switch in the driver's cabin, and battery switch of the exterior control box).
3	LEG OUT: lower the hydraulic stabilising legs into work position.
4	LOWER the platform 150mm to disengage the platform hooks.
5	OPEN the platform approx. 90° into the horizontal work position.
6	Raise and lock the safety rails into vertical position.
N°	**Loading & unloading**
7	Select between exterior control box and auxiliary controls.
8	Observe the loading diagrams & instructions at all times.
9	LOWER the platform to the ground to load / unload.
10	LIFT the platform to the vehicle floor level to load / unload. Above the roof level, the lift capacity is reduced to 500 kg.
N°	**Closing up in travel position**
11	Close and lock the safety rails. LIFT or LOWER the platform to approx. 15cm under the vehicle floor, or use the function "Height detection to CLOSE" to find the suitable height.
12	LEG IN: lift the hydraulic stabilising legs into their travel position.
13	CLOSE the platform until it reaches the closed vertical position, and you hear the hydraulic system turn in overpressure.
14	LIFT the platform until the platform hooks are engaged.
15	Switch off the electrical power to the lift. Close the lid of the control box.

Fig. 7.20



§7.9 - The use of stabilising legs

- DHOLLANDIA tail lifts are available with 2 types of stabilising legs:
  → Mechanical stabilising legs are deployed and restored manually by the operator [see Fig. 7.21]. They are only suitable for light commercial vehicles up to 3.5T GVW, and support maximum 3T total weight.
  → Hydraulic stabilising legs are operated via the exterior control box [see Fig. 7.22]. They are available in capacities of 2.5T, 4T and 10T, and are therefore suitable for a much wider range of commercial vans and trucks. See page A31 on the practical operation of the functions LEGS IN / LEGS OUT.

- The purpose of the stabilising legs is to prevent the vehicle from tipping over (e.g. central axle trailers), or to support the chassis of the vehicle during loading / unloading (e.g. vehicles with very long overhang, with relatively weak chassis, or in case of extreme lift capacities).

- The use of stabilising legs is compulsory on certain vehicles. Consult the user's manual and / or the Fitting and Body Building Instructions from the vehicle manufacturer.

- When using the stabilising legs, the operator should observe following points:
  → Ensure that the stabilising legs are positioned on solid even ground. In case of soft terrain (sand, gravel,…), solid support blocks must be used under the stabilising legs [see Fig. 7.22].
  → Use the legs upon every loading / unloading activity.
  → Ensure the legs are completely lifted in travel position before sliding the lift in / out (slider lifts), or before moving the vehicle.
  → DHOLLANDIA stabilising legs should be used to stabilise the vehicle only. They are not suitable to lift the vehicle (not empty, not fully loaded).
  → In order to ascertain this, the height of the stabilising legs should be adjusted during loading / unloading, to adapt them to the variation in the vehicle suspension.
  → In case of mechanical legs, be very careful when releasing the mechanical lock to store the legs in travel position. If the vehicle has been loaded, the extra weight in the vehicle body might induce significant tension on the sliding foot of the leg, and its locking mechanism.

Fig. 7.21

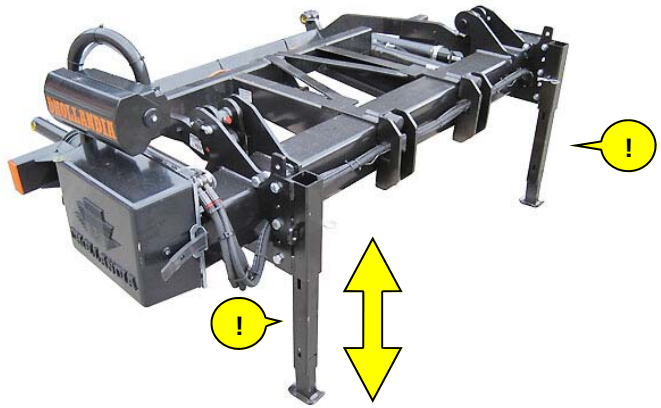
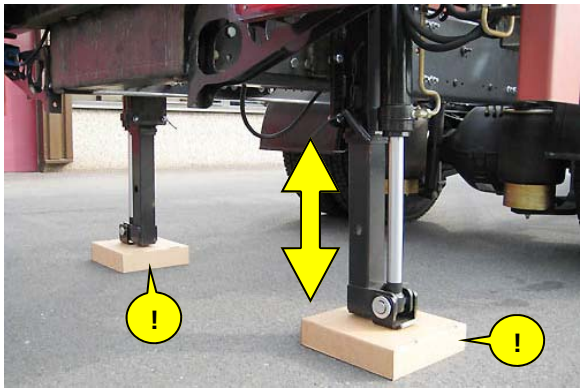


Fig. 7.22



§7.10 - The use of roll-stops

- Any platform aimed to lift and lower rolling loads, must be equipped with a roll-stop system:
  → to prevent the load from rolling unintentionally off the edge;
  → to protect the load against shifting position, and its centre of gravity to move during the LIFT / LOWER movement.

- As part of the ordering process of the lift, it is important that the vehicle owner and his contractors choose the position of the roll-stops in function of the intended application (pallets, trolleys,…), and the loading diagrams applicable to the nominal capacity chosen. The loading diagrams & instructions of chapter 6 should be observed at all times.

- The option list features 4 types of roll-stop systems:

S215.M = Manual roll-stops, operated by torsion springs [see Fig. 7.23]	
OPEN	Press the lever on the side of the roll-stop flap.
CLOSE	Step on the roll-stop flap. When driving a load from the ground onto the platform, the roll-stop will automatically close.

S215.A = Automatic roll-stops, operated by torsion springs [see Fig. 7.24]	
OPEN MANUAL MODE	Kick the lever on the side of the roll-stop flap sideways from position 1 to position 2. S215.A will now function as a manual roll-stop S215.M. When stepping on the roll-stop flap, or when driving load from the ground onto the platform, the roll-stop will automatically close.
OPEN AUTOMATIC MODE	Kick the lever on the side of the roll-stop flap sideways + rearward, from position 1 to position 3. S215.A will now function as automatic roll-stop. When stepping on the roll-stop flap, or when driving a load from the ground onto the platform, the flap automatically jump back to the open position after releasing it, or when the load is passed over it.
CLOSE	Kick the lever into position 1. Step on the roll-stop flap.

Fig. 7.23

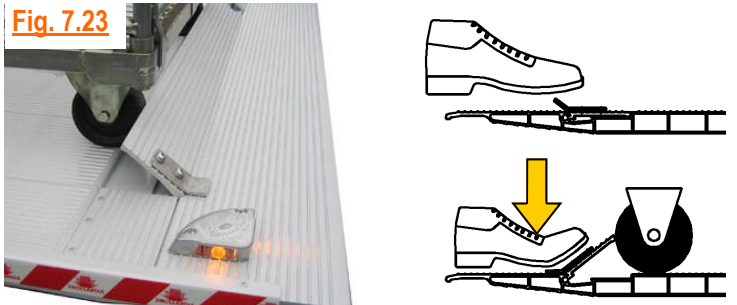
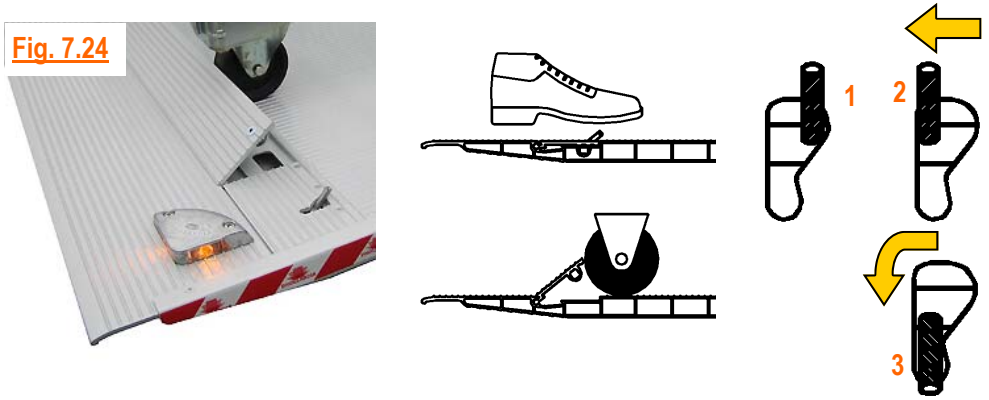


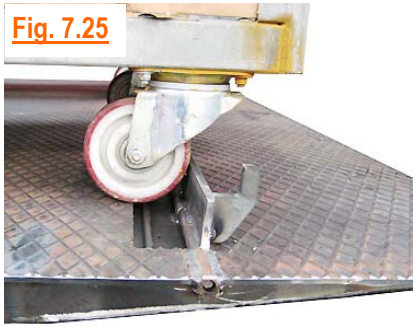
Fig. 7.24



S215.V = Vertical roll-stops, no springs [see Fig. 7.25]	
OPEN	Kick the button on the side of the roll-stop flap in the direction of the platform point.
CLOSE	Step on the roll-stop flap. When driving a load from the ground onto the platform, the roll-stop will automatically close.

S701.S.R = Hinged ramps at the rear edge of the platform [see Fig. 7.26] **S701.S.S** = Hinged ramps at the sides of the platform	
The hinged ramps can be manually raised into 90° vertical position to serve as roll-stop device, or swung over 180° to serve as access ramp.	
OPEN	Pull the rear side of the ramp towards you, raise and lock it into 90° vertical position.
CLOSE	Lift up the ramp, and swing it further to the 180° open position, where it can service as loading / unloading ramp.

Fig. 7.25



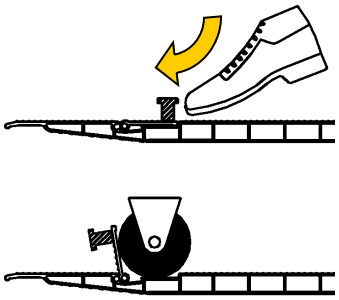
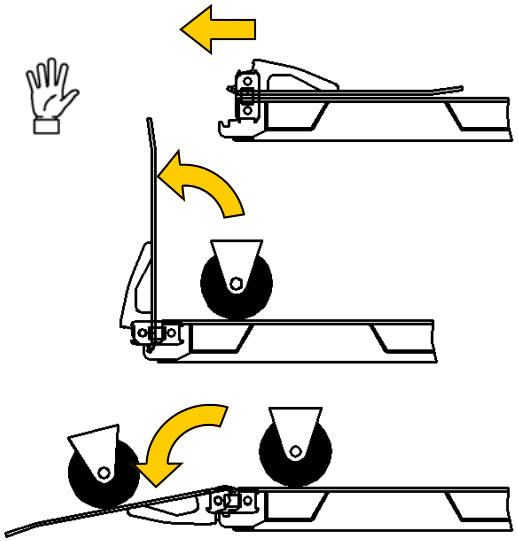
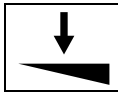


Fig. 7.26

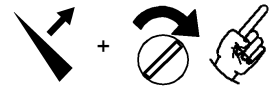


§7.11 - Automatic tilt at ground level

- Some column lifts are equipped with a conical platform and automatic tilt at ground level. This means:

	When the platform touches the ground, its point automatically tilts down when the buttons for “LOWER” remain pushed in.	See Fig. 7.27
	When the buttons for “LIFT” are pushed in, and the platform rises off the ground, it will first tilt up to a preset horizontal position, then lift further in this setting to the vehicle floor.	See Fig. 7.28

- These and other types of lifts are equipped with tilt cylinders, which allow the operator to adjust the angle of the platform to the slope of the underground [see Fig. 7.29]

Function	To actuate :
TILT UP	
TILT DOWN	

- The automatic tilt incorporates a “memory”: the angle of the platform (set by the operator upon opening the platform, possibly slightly above or below perfect horizontal level) is automatically repeated upon every new LIFT cycle off the ground. This angle is “memorised”.

- Automatic tilt should be used with auxiliary controls featuring the functions LIFT / LOWER only (4-button foot controls, 2-button wander leads, 2-button fixed interior controls). The use of 3– or 4-button auxiliary controls (including TILT) results in confusion and errors. It might cause damage to the tail lift, and injuries to the operator or third parties near by.

Fig. 7.27

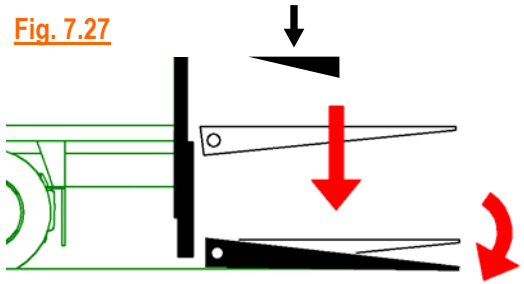


Fig. 7.28

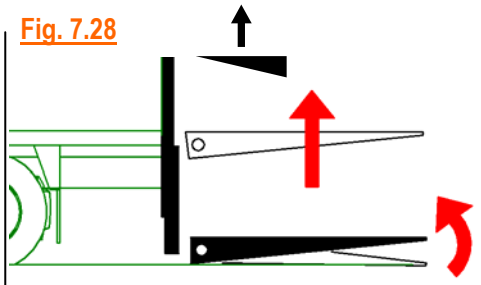
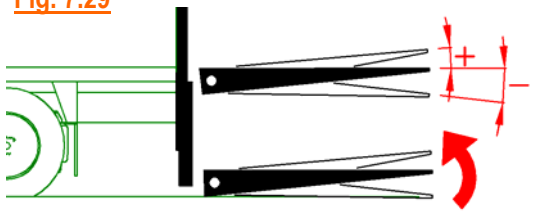
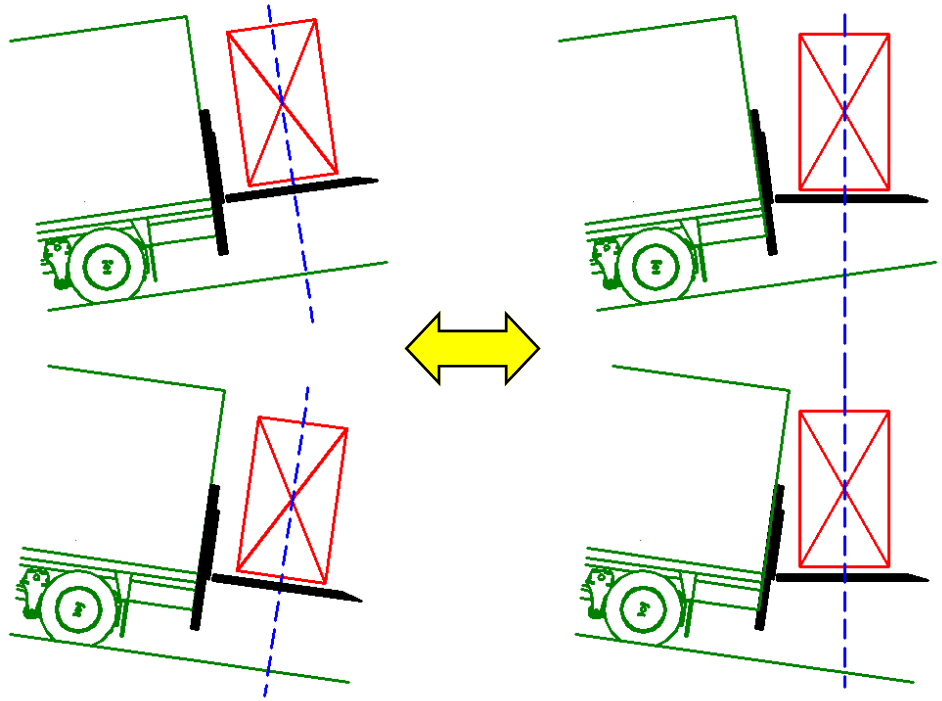


Fig. 7.29



Without tilt cylinders

With tilt cylinders



8. WARRANTY CONDITIONS

§8.1 - Abbreviations

DHO = DHOLLANDIA or her official national agent / distributor
HTL = Hydraulic tail lift
CV = (Commercial) vehicle

§8.2 - Period

8.2.1 - The warranty period lasts 12 months from the day that the HTL is taken into operation for the first time. This point in time is determined by the date of the weight test and commissioning of the HTL, prescribed by and conform with the CE Machine-Directive and the fitting instructions of DHO, without exceeding however 3 months after the delivery date of the HTL concerned.

For this purpose, the results of the weight test and commissioning must be duly reported and inscribed in the Fitting Declaration in the User's Manual issued with every HTL.

8.2.2 - The initial warranty period is not modified or influenced by occurring service-, repair-, or improvement works, or by the replacement of failing parts.

§8.3 - Conditions

8.3.1 - In case of a warranty claim, DHO has the right to examine the defect or failure, or to have it examined. For this purpose, the supplied object (if mounted to a wheeled vehicle) must be presented at the DHO workshop, or any other workshop appointed by DHO to this respect. The same is also valid for the warranty repair works themselves.

8.3.2 - Warranty can only be attributed to HTL which are maintained in the original delivery condition and specification. Modifications to the construction or safety devices of Dhollandia HTL are strictly forbidden, except in case of explicit prior written approval by DHO.

8.3.3 - Defects, failures, deficiencies in general, that restrict the utility of the HTL due to faulty design / construction, material deficiencies, or failing manufacture, are solved by rectifying works or by substitution / replacement, and this at the discretion of DHO.

8.3.4 - Upon becoming apparent, defects, failures, deficiencies in general, must be immediately reported to DHO via the fastest possible way. Warranty claims, which are older than 30 days, will be declared inadmissible. Parts replaced under warranty become the property of DHO.

8.3.5 - The warranty is only valid for HTL, which are mounted, serviced, repaired and conserved according to the relevant instructions from DHO, and for which all works have been carried out using original DHO spare parts.

8.3.6 - A warranty claim can only be admitted for further investigation, when the following documentation is available:

- A fitting declaration from the hands of the installer of the HTL, confirming that the HTL is correctly fitted according to the Fitting Instructions of DHO, and the Body and Equipment Building Instructions of the manufacturer of the CV;
- A weight test and commissioning certificate with positive result;
- A copy of the last inspection certificate (relating the yearly inspection, TÜV inspection, special inspection, or repeated inspection);
- A copy of the last "maintenance and repair report" as mentioned in the User's Manual.

8.3.7 - The final decision if a warranty claim is accepted and reimbursed by DHO, lies with DHO alone.

8.3.8 - The right of DHO to have specific warranty works carried out in specific workshops appointed by it, doesn't entitle the user of the HTL, in case of repetition or with another HTL under warranty, to have works carried out in a non-DHO workshop. This requires in all cases the prior approval of DHO. Non-observation of this clause annihilates the product warranty.

8.3.9 - Failing parts must be returned to DHO within 15 days after execution of the works, free of transport, port and package charges. Upon positive recognition of the warranty claim, only the cost of the most economical transport means is reimbursed.

8.3.10 - For the parts that DHO acquires from its own suppliers, the warranty supplied and ensured by DHO is limited to the specific warranty conditions given by these suppliers to DHO.

8.3.11 - Outgoing spare parts are temporarily invoiced for administrative reasons. As soon as the failing parts have been returned and the warranty claim has been positively recognized, the invoice is credited.

8.3.12 - Except in case of different contractual agreement, the warranty is always limited to the free replacement of the failing parts. Labour and mileage costs relating to a roadside repair are only reimbursed if the CV is physically blocked due to the nature of the tail lift failure, and

according to the agreed labour rates and standard or agreed repair times. See document C-GAR-02-EN.

In case of different contractual agreement, whereby full warranty is guaranteed, the labour cost is only taken into consideration at the standard repair times prescribed by DHO, which represent an average time required to repair specific problems by trained tail lift technicians, and at the standard hourly labour rates foreseen in the DHO network.

§8.4 - NOT covered under DHO warranty conditions:

8.4.1 - Except for the cases described under Pt. 3.12, labour cost and mileage are excluded from the warranty coverage. Also excluded in all cases and under all circumstances are: consequential damage / loss such as immobility, tractor or other transport / logistic costs, all transport costs to and from the DHO workshop, driver's waiting hours, rental costs for replacement CV, opportunity cost and missed sales.

8.4.2 - All administrative costs and start forfeits, unless different contractual agreement with the service agent concerned.

8.4.3 - Consumables and serviceable parts subject to wear and tear (such as rubber and synthetic parts, hydraulic flexible hoses, platform flags,...); hydraulic oil; defects to foot controls caused by loss of or damage to the protection rubbers; defects to platform lights caused by impact or abuse with pallets, pallet trucks or other foreign objects; defects to wander leads, their spiral cables and plugs.

8.4.4 - The normal regular HTL activities with relation to service / maintenance and paint finish conservation, and the different types of inspections according to the CE-Machine Directive or DHO User's Manual.

8.4.5 - HTL problems, caused by the subsequent use of polluted oil, or oil with technical or hydraulic characteristics that are not compatible with the original oil foreseen by DHO.

8.4.6 - The adjustment of the hydraulic cylinders after the first period of use, and the checking and retightening of bolt connections made during the fitting process.

8.4.7 - All additional components added to the HTL construction after delivery of the HTL to the body builder or the installer of the lift. All defects, failures, deficiencies caused by the use and implementation of non-original DHO spare parts.

8.4.8 - Defects to the electric plugs of the main power supply to the HTL (plus and earth); defects to the batteries; defects to or caused by any type of low-battery appliance, alarm or anti-theft device prescribed or mounted by the customer; all other electrical failures (to the electric motor, the starter solenoid, other switch elements,...) caused by insufficient battery or power capacity.

8.4.9 - Damage caused by normal and natural wear and tear. Damage or defects caused by inaccurate or faulty fitting (unless mounted by DHO). Damage or defects caused by negligence and disregard of the DHO Maintenance and Repair instructions, and by disregards of the prescribed maintenance intervals. Damage or defects caused by negligent or improper use; by negligence and disregard of the general or product-specific DHO user's instructions; by abuse or improper use of the HTL for any application other than its normal intended use as described in the DHO User's Manual; by overload, collision or any other form of accident; and by all other influences as for as they cannot be attributed to a fault or mistake from DHO.

8.4.10 - Defects and damage caused by unauthorised modifications to the original construction or safety devices of the HTL, without explicit prior written approval by DHO, during the fitting process or afterwards (e.g. during repair and maintenance works).

8.4.11 - As far as any given incident is not covered by the legislation on product liability and warranty, a warranty case cannot lead to a damage claim of any kind.

Remark: full conditions (includ. standard repair times), and description of procedures available on request.

Procedure for the initiation and management of a warranty claim

The EXTERNAL REPAIR AGENT checks :
1. serial number of the lift (strictly required)
2. date of entry into use (registration date of vehicle)
3. and faxes a correctly filled-out warranty claim document (C-WAR-REG-2007-01-EN) to DHOLLANDIA.

↓

The EXTERNAL REPAIR AGENT contacts the service department of DHOLLANDIA and confirms :
1. the customer data (see above)
2. the expected diagnosis.

↓

DHOLLANDIA opens a file for repair of the tail lift on her behalf

YES	NO
DHOLLANDIA faxes an order number for repair, and despatches the relating spare parts if required	The EXTERNAL REPAIR AGENT may repair, but in consultation with and directly at the account of the client.

↓

The EXTERNAL REPAIR AGENT executes the repairs according to the standard or agreed repair times.

↓

The EXTERNAL REPAIR AGENT fills out a detailed work report to conclude and document the warranty case, with
1. detailed technical description of the works performed
2. list of the labour and spare parts spent on the job.

↓

If asked by DHOLLANDIA, the EXTERNAL REPAIR AGENT returns the failing parts to DHOLLANDIA with clear reference to warranty claim report.

↓

The EXTERNAL REPAIR AGENT sends an invoice to DHOLLANDIA according to the agreed labour rates and standard or agreed repair times, and with a copy of the detailed work report in the attachment.

Important contact info

Central Service Department

Tel : +32 (0)9 340 49 67
Fax: +32 (0)9 340 49 69

24h service

Mob. +32 (0)496 56 90 27
Mob. +32 (0)496 56 90 22

Central Spare parts department

Tel : +32 (0)9 340 49 66
Fax : +32 (0)9 340 49 94

DHOLLANDIA

WARRANTY CLAIM REPORT for DHOLLANDIA tail lifts

Doc : C-WAR REQ-2007-01-EN
Date : 6/06/2007

ID of service agent / claimant :	ID of operator / owner :
Your ref :	Vehicle reg :
Date of repair :	S/N° + type of lift :
Dhollandia order N° :	Date matriculation :

Description of defect : ☐ See pictures enclosed	Diagnosis / work required or performed :

Description / Code	Quantity	Price EUR netto	Allowed by DHO
Labour			
Km / mileage			
Total			

Attention: Dhollandia warranty conditions and standard repair times apply to all warranty claims

To be filled in by Dhollandia

☐ Claim is accepted
☐ Claim is accepted in modified form
☐ Claim is not accepted

Comments :.....
.....
.....
.....
.....

☐ Return parts to Dhollandia (+ copy of warranty claim)
☐ Scrap parts
☐ Don't return the parts, but keep them for inspection for 3 months

☐ Dhollandia will replace parts
☐ Dhollandia will credit you for the items
☐ Other: .....

Date: / / Name

Dhollandia N.V. • Zoomstraat 9 B-9160 Lokeren Belgium • Tel +32.(0)9.349.06.92 • Fax +32.(0)9.349.09.77
E-mail info@dhollandia.be

1

DHOLLANDIA

CHAPTER B
MAINTENANCE & REPAIR

B

1. SAFETY INSTRUCTIONS FOR MAINTENANCE & REPAIR

Warning !

- In order to ensure the safety of the technical personnel, the operator of the tail lift, and occasional bystanders, the execution of maintenance and repair works is strictly reserved to skilled and authorised service agents, who have been duly trained, who know and understand the content of this manual, and master the safety aspects involved in their job.
- Negligence can put the technical personnel, the operator and third parties at great risk.

- During the maintenance & repair works, the service engineer should follow the general safety instructions for the use of the tail lift [see Chapter A], as well as the specific technical safety instructions described below.

§1.1 - General safety instructions

- Use appropriate working clothes. Never wear loose-fitting clothes that may be trapped in the moving parts of the tail lift (called HTL hereafter). Always wear safety goggles with side guards, safe footwear with steel protection tips, non-flammable overalls, protective gloves, and ear plugs. Wear a safety helmet when working under the HTL or vehicle chassis. Avoid wearing rings, bracelets, necklaces, watches, etc… [See Fig. 1.1]
- Before releasing the mechanical platform lock, check if the hydraulic system builds up pressure (goes in overpressure), and ensure that there is no visible oil leaks. [see Fig. 1.2]
- Take into account that a leak (visible or not) in one or more of the hydraulic components may cause a pressure loss, causing the platform to fall open as soon as the mechanical lock is released. [see Fig. 1.3]
- Consider that in an emergency situation, the platform might have been closed with use of external help (forklift, hoist, gantry crane,…), leaving the hydraulic cylinders empty instead of filled with oil, and causing the platform to fall down as soon as the mechanical lock is released. [see Fig. 1.3 - 1.4]
- When opening the platform, always stand to one side of the vehicle. Never behind the platform. Always avoid the area directly behind, and within reach of the moving platform [see Fig. 1.3]. If the nature of the works require that you enter this danger zone nevertheless, make sure that you secure the platform against accidental falling by means of hoists, forklifts, gantry crance, etc... [see Fig. 1.5]. Ideally, rest the platform on the ground before

Fig. 1.1

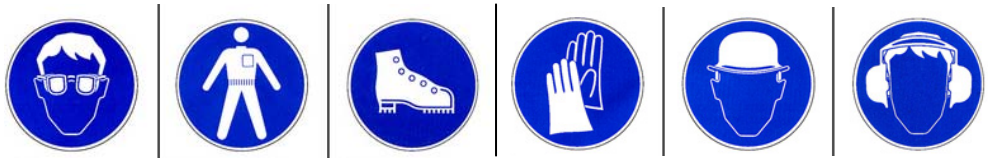


Fig. 1.2

Fig. 1.3

Fig. 1.4

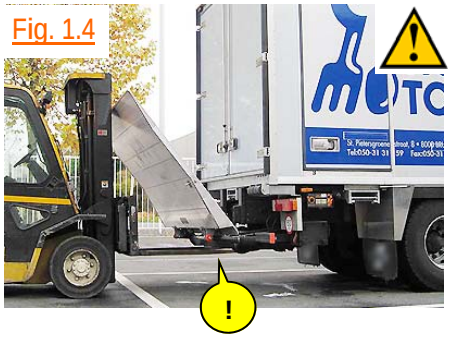
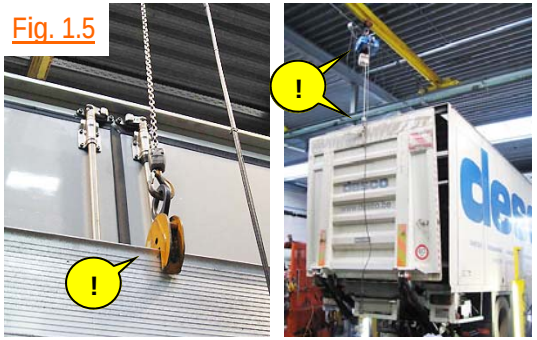


Fig. 1.6

Fig. 1.5



starting the works. [see Fig. 1.6]

- Avoid to stand on, or sit between the open platform and the rear side of the vehicle. [see Fig. 1.7]
- If the nature of the works require that you enter into one of the danger zones [see §5.3 in Chapter A], or between the movable parts of the HTL, make sure that you switch off the power source to the HTL. Switch off the isolator switch in the vehicle cabin, remove the key from the battery switch in the exterior control box, or disconnect main fuse on the battery, to avoid unsafe, injudicious or unauthorized (also by strangers in traffic!) use of the HTL. [see Fig. 1.7]
- When dismounting & remounting articulation pins, make sure these pins are remounted in the original way, and are duly secured by means of locking pins, bolts & nuts.
- It is prohibited to modify (straighten, heat up, weld, lengthen or shorten, etc…) the construction of the mechanical components (articulation points, lift arms, frames or platforms, cylinders, etc...). In case of damage or failure, these components must be replaced by original spare parts.

- Remark for column lifts with manual closure:
  - → These platforms are often equipped with (invisible) torsion bars, reinforcing the manual open / close movement. The torsion bar is preset during manufacturing, and is housed in the 1st section at the front of the platform [see Fig. 1.8].
  - → Short aluminium platforms may have only 1 torsion bar. Heavier platforms (with hinged ramps, longer depth, platform in steel,…) often have 2 bars, running from either articulation point to a bar retainer inside the platform.
  - → These torsion springs incorporate a significant amount of energy, and are potentially dangerous. Incorrect installation, use, or adjustment / servicing may result in serious injury of the operator or service personnel.
  - → Therefore, the tension in the bar should only be adjusted by someone who has been specifically trained to do so. It is NOT a user serviceable part.
  - → Bear in mind that in case of mechanical failure, the platform might have been closed with the help of external devices (forklift, gantry crane,...), and that the platform might drop in free fall to the open position after disengaging the travel lock. Don't attempt to control the opening speed of the platform just by human force. The platform might be very heavy (possibly more than 100kg !) to handle.
  - → Even when the platform is closed, there can still be significant force on the torsion bar and the other components attached to it. The components (bar retainer, articulation pins) should not be altered while the bar is under torsion.

In case of doubt on any of the subjects in this chapter, stop immediately, and ask advice from DHOLLANDIA prior to continuing.

Fig. 1.7

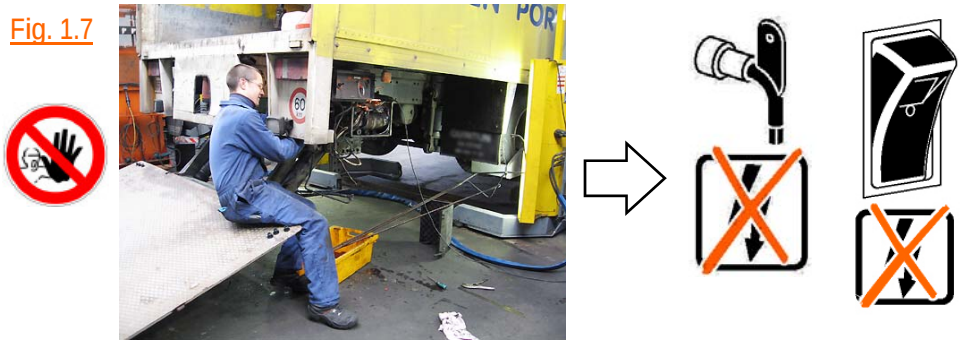
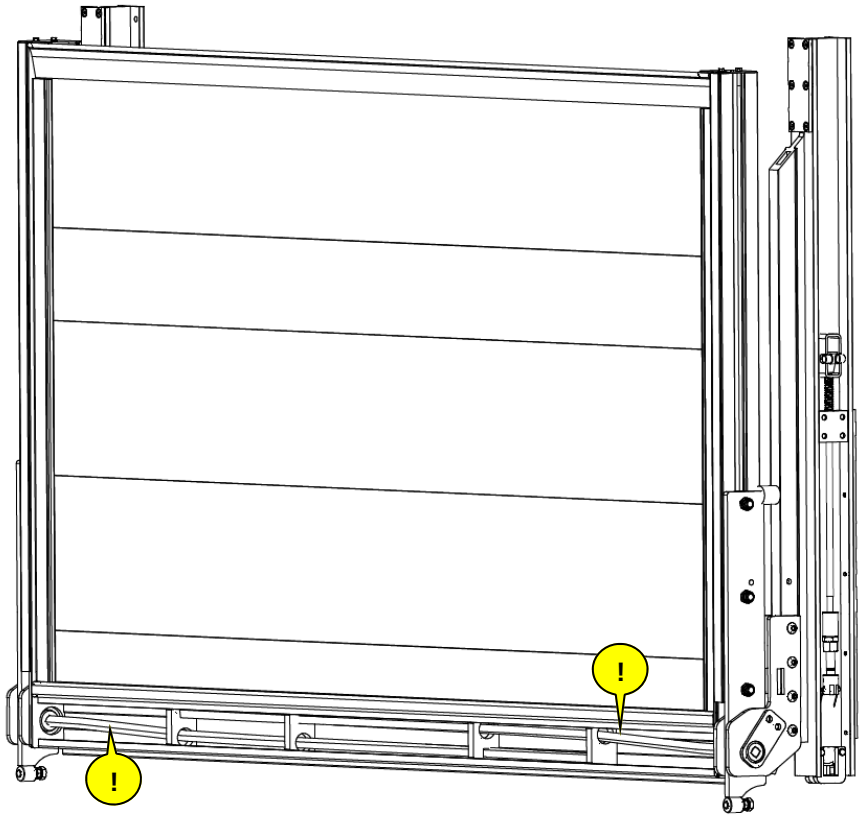


Fig. 1.8



§1.2 - Hydraulic components

- In normal working order, a HTL is supported by the hydraulic pressure in the cylinders. Therefore, hydraulic components such as valves, hydraulic pipes, cylinders, etc… should not be removed before the platform and lift arms are secured against accidental falling (by means of a hoist, a forklift, a gantry crane, or by resting the platform on the ground).

- Dismounting of hydraulic cylinders (general): release the oil pressure in the hydraulic circuit by pushing the control switches for “LOWER” (for revision of the lift cylinders), or “OPEN” (for revision of the tilt cylinders) for approx. 20 sec. Only when the oil pressure is released, is it allowed to remove the corresponding articulation pins.

- Dismounting of hydraulic TILT cylinders: take into account that the some tilt cylinders are equipped with strong internal springs [see Fig. 1.9], generating a strong pull force on the articulation pins when the platform stands in its closed position. Consult the spare parts list to check the cylinder construction.
- In order to remove the articulation pins of such cylinders, the platform must be opened to 45° first to release the tension from the springs (secure platform against accidental fall, see above!).
- For the revision of the tilt cylinders with internal spring, make sure this spring is without tension before opening up the cylinder. Consult the spare parts list to check the cylinder construction. Negligence may lead to serious injury.

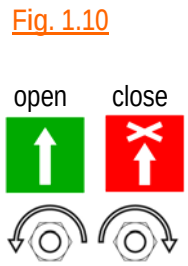
- Before opening any hydraulic cylinder, make sure that you manually open the safety valve via the manual emergency operation, and you remove the hydraulic pressure from the system. [see Fig. 1.10]

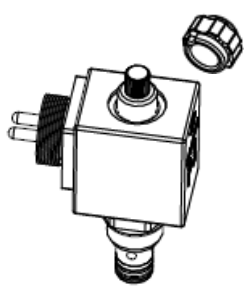
- Support the cylinders during dismounting, to prevent them against free fall onto the ground upon extraction of the articulation pins.

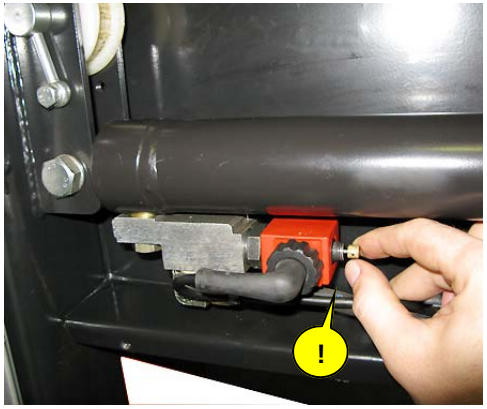
- Remounting hydraulic cylinders: when the underside of the cylinder is connected to the frame with the corresponding pin, the easiest way forward is to connect the hydraulic pipe to the cylinder first, so that the cylinder can be extended to the correct length by means of the regular electrical controls.
- Take into account that - after a repair - the cylinders are filled with air, and that the piston rods will move with shocks when the cylinder is filled with oil. Therefore, when remounting the articulation pins, never check with your finger if the eye of the cylinder is lined up with the holes of the articulations on the platform, pulley blocks or frame. [see Fig. 1.11]

Fig. 1.9 - Tilt cylinder with internal spring

Fig. 1.10







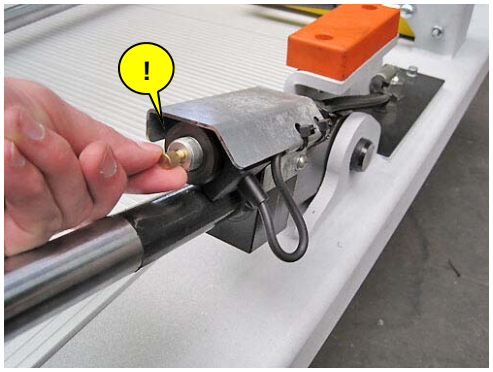


Fig. 1.11

- Also take into account that the tilt cylinders (type VS…) on many column lifts work in opposite way as cylinders on conventional cantilever lifts: when filled with oil, the piston rod slides in, and the platform closes. The safer way to extend them to the correct stroke in order the remount them into the platform, is to loosen the hydraulic pipe, open the safety valve on the cylinder by hand, and to push / pull the piston rod by hand.
- Don't try to CLOSE the platform before all articulation pins are mounted and secured by their locking bolt. [See Fig. 1.12 - 1.13]
- Only when all articulation pins are mounted and secured, is it allowed the build up full pressure in the hydraulic system by means of the regular electric controls.
- And only after assuring that the hydraulic system generates over-pressure, and no oil leaks are visible, is it allowed to remove the mechanical devices supporting the platform (hoist, gantry crane, forklift,…).

- For dismounting and remounting hydraulic valves (safety valves on the cylinders, control valves in the power pack), the same safety precautions apply.

DANGER !

- **Stay out of the operation radius of the platform.**
- **Keep clear of moving parts.**
- **Beware of hand, foot and head traps at all times.**

§1.3 - Electrical components

- Before dismounting and remounting electrical components, ensure that the components are without tension.
- It might be insufficient to just switch-off the battery switch in the exterior control box, or the isolator switch on the dashboard in the vehicle cabin. For certain works, the main fuse or the connection to the battery will need to be disconnected.
- First, define clearly which area you need to work on, then interrupt the circuit at a point which is nearer to the battery or power source.

Fig. 1.12

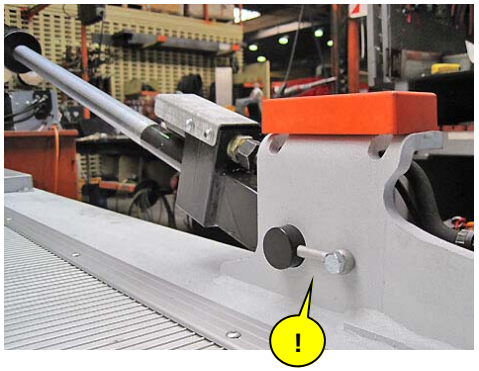
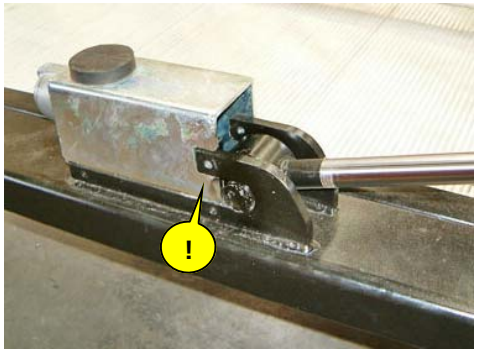


Fig. 1.13



2. MAINTENANCE

- Competent and regular maintenance is extremely important, not only in order to maximise the life expectancy of the tail lift (called HTL hereafter), but also in order to guarantee the operational reliability and safety of the operator (and potential bystanders).

Warning !

- Only original **DHOLLANDIA** spare parts should be used to execute maintenance and repair works.
- The warranty and product liability are only valid for HTL which are maintained in good working condition according to the instructions in this manual.
- **DHOLLANDIA** disclaims liability for any personal injury or property damage that results from operating a product that has been modified from the original design, that hasn't been serviced / repaired according to the instructions in this manual, or when non-original components or spare parts are used.

- The HTL should work smoothly and quietly, and at a fairly constant pace. During LIFT and LOWER, only the sound of the hydraulic power pack should be audible. Any other (creaking, grinding or shrieking,...) noise should be carefully investigated to avoid damage.

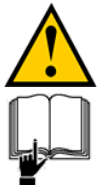
- The maintenance frequency depends on the intensity and conditions of use. The minimum frequency for the various works is given below:
  - → W52 = 52 x/year = weekly check (by owner / operator)
  - → M12 = 12x/year = monthly (by the owner / operator or service agent)
  - → M3 = 3x / year = 4-monthly check (by a qualified **DHOLLANDIA** service agent)
  - → J1 = 1x / year = yearly winter maintenance (to be executed just before the winter, so that any condensation water in the hydraulic circuit can be removed during the oil change, and frost problems during the winter can be avoided).

- HTL are subject to compulsory periodic inspections by an expert / competent person [see §2.4 in chapter C]. The frequency of these inspections is set at minimum 1 / year for most countries in Europe. In the United Kingdom, the frequency of the LOLER examination, or the Statutory Thorough Examination, is set at minimum 2 / year by the Health and Safety Executive (HSE).

- During this periodic inspection or Statutory Thorough Examination (jointly called STE hereafter), the expert / competent person assesses the rate of deterioration of the equipment, identifies any defects, and certifies that the equipment is safe for continued use for the following period up to the next STE (6 months for UK, 12 months in most other countries across Europe).

- No maintenance or repair work is done during a STE. The scope of STE therefore implies all points of the checklist below (with exception of the actual greasing work (§2.2) and the purging work (§2.8)). Other points are specially reserved for the STE, and are marked as follows:
  → STE = Statutory Thorough Examination or periodic inspection.

- Follow the scheme on the next pages, verify point after point and "tick-off" as you make progress.



- Some steps in the check list require special skills and specific knowledge [see **DHOLLANDIA** Repair & Maintenance training program]. In case of doubt on how to proceed, DON'T go any further, but ask your local DHOLLANDIA distributor for professional advice.

- Remark: When checking on the correct tightening of the bolts, the only accurate tool to use is a torque wrench. The following values are prescribed:

Prescribed tightening moment M (N.m)			
Type of thread	Size	Strength class	
		8.8	10.9
Standard	M6 x 1	10	14
	M8 x 1.25	24	33
	M10 x 1.5	47	68
	M12 x 1.75	82	115
	M14 x 2	129	185
	M16 x 2	195	285
Fine	M14 x 1.5	135	195
	M16 x 1.5	208	300
	M20 x 1.5	360	-
	M24 x 2	450	-

CHECKLIST FOR MAINTENANCE & INSPECTION

Legend

W52 = Weekly check (by owner / fleet operator)
M12 = monthly = 12x / year (by the owner / operator or service agent)
M3 = 4-monthly check = 3x / year (by a qualified DHOLLANDIA service agent)
J1 = Yearly winter maintenance (by a qualified DHOLLANDIA service agent)

STE = Statutory Thorough Examination (UK), or Periodic inspection by expert / competent person
☐ To be verified during maintenance AND periodic inspection STE
O *Additional points, only to be verified during periodic inspection STE*

§2.1 - High pressure cleaning	What to verify? Execute, service or repair if required !!	Freq.
☐ Complete HTL at the rear + under the vehicle chassis, incl. lift columns	• Clean the HTL thoroughly to make all greasing points, welding seams, bolt and pin connections, hydraulic pipes and couplings tidy, and clearly visible for inspection.	M3 J1

§2.2 - Greasing	What to verify? Execute, service or repair if required !!	Freq.
☐ All articulation points with grease nipples ☐ Inside of lift columns & slide pads on lift runners ☐ Inside of cylinder beam	• Grease thoroughly with acid-free grease, according to the grease plans under Point 3.	M12 J1
☐ Mechanical platform lock, platform retaining catch ☐ Chains, steel cables of the lift system, LSD	• Lubricate with chain or steel cable oil	M3 J1
O *Correct and complete greasing*	• *Verify correct and complete greasing according to the points above*	STE
Remark :		

§2.3 - Documents & reports	What to verify? Execute, service or repair if required !!	Freq.
O *CE Declaration of Conformity* O *Fitting Declaration (by the installer)* O *User's manual in the correct language* O *Maintenance & Repair Reports* O *Inspection Reports*	• *Presence in the driver's cabin* • *Readability* • *Completeness, reports duly filled out after each intervention*	STE
Remark :		

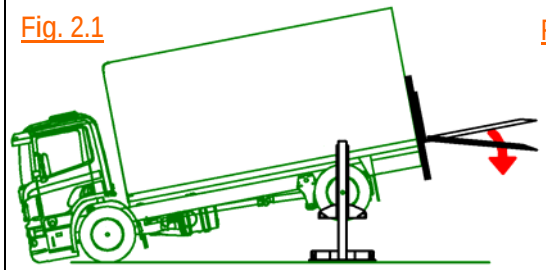
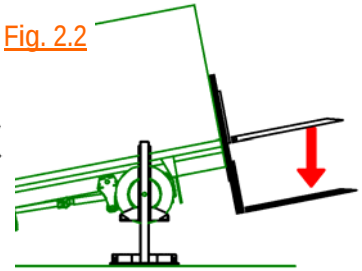
§2.4 - Identification, marking & satefy decals	What to verify? Execute, service or repair if required !!	Freq.
☐ Identification sticker + serial number ☐ Pictograms on the various control units ☐ Decal with user's pictograms near the exterior control box ☐ Marking of the centre of gravity ☐ Marking of the safe working zone on the platform (for wander lead with spiral cable & fixed interior control) ☐ Other originally applied safety decals & signs	• Readability • completeness • Fixation & adhesion to the surface	W52 M3 J1 STE
Remark :		

§2.5 - Protection against unauthorized use	What to verify? Execute, service or repair if required !!	Freq.
☐ On/off isolator switch for the HTL in the vehicle cabin	• General condition • Function & operation	W52 M3 J1
☐ Battery switch in the exterior control box of the HTL ☐ Safety switch in the exterior control box	• General condition • Function & operation, automatic return to the neutral 0-position (all switches)	W52 M3 J1
Remark :		

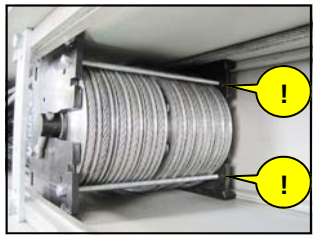
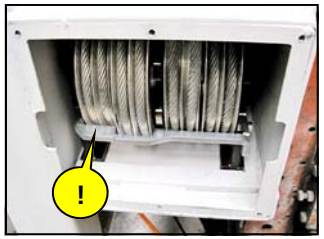
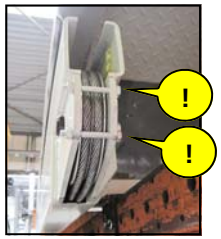
§2.6 - Electrical control devices	What to verify? Execute, service or repair if required !!	Freq.
☐ Exterior control box ☐ Joy-stick, push buttons, rotary switches ☐ Protection rubbers on the buttons & switches ☐ Lid over the control box O *Position of the exterior control box*	• General condition • Function & operation • Automatic return to the neutral 0-position (all switches) • Conditions of electrical cables, wires, and protection rubbers • *Conformity with the fitting instructions (between 300 & 600mm from centre line of the control box to the rear side of the vehicle body)*	W52 M3 J1 STE
☐ 15A fuse in the exterior control box ☐ Electrical contacts (in the various control units)	• General condition • Moisture inside the control unit & corrosion • Fixation & tightening of all cable & wire connections	J1
☐ Foot controls (optional) O *Safety issues on foot controls*	• See points above + • Condition, routing & guidance of the electrical cables from the platform over the lift runners to the connection point in the power pack or exterior control box • *Connection to the safety button in the exterior control box (see fitting instructions)* • *Compulsory 2-feet operation*	W52 M3 J1 STE
☐ Auxiliary control mounted to the safety rail ☐ Wander lead with spiral cable (optional) ☐ Fixed interior control (optional) O *Safety issues on these controls*	• See points above + • Condition of the electrical cable from the safety rail to the platform • Condition of the spiral cable, condition of the plug connections • Position inside the vehicle body, protection against damage by the load • *Connection to the safety button in the exterior control box (see fitting instructions)* • *Marking of safe working zone on the platform and / or on the loading floor inside the vehicle body* • *Conformity with fitting instructions re. toe-protection*	W52 M3 J1 STE
☐ Sound alarm on function LOWER	• General condition & function • Audibility from within the working range of the platform	M3 J1
Remark :		

§2.7 - Electrical installation	What to verify? Execute, service or repair if required !!	Freq.
☐ Batteries ☐ 35mm² (+) BATTERY cable to the battery (1) ☐ 35mm² (-) EARTH cable to the battery or earth point (1) ☐ Electrical plug connections between truck & trailer: Harrisson, Rema,… (1) where 35mm² is mentioned, also other cable sections (25mm², 50mm²,…) are implied	• General condition • Good mounting & fixation of electrical cable & wire connections (see fitting instructions) • Technical maintenance of the batteries, power circuit, battery charging circuit and earth circuit • Apply grease or Vaseline to all connections to protect them against corrosion	M3 J1
☐ 250/300A main fuse near the battery ☐ Battery switch in the exterior control box and / or near the battery	• General condition • Corrosion, burn marks / arcing • Good tight fixation of the 35mm² (+) BATTERY & (-) EARTH cables • Apply grease or Vaseline to all connections to protect them against corrosion	M3 J1
☐ 35mm² (+) BATTERY & (-) EARTH cables ☐ Cables between exterior control box and power pack ☐ Cables to the safety valves on the cylinders ☐ Cables to the auxiliary controls ☐ Cables to the platform (foot controls & platform lights)	• Routing & guidance, protection against squeezing, sheering or rubbing • Damage, good insulation & protection • Sufficient fixation to the vehicle body or chassis • Clearance from dangerous vehicle components (exhaust, braking circuit, drive & engine parts, …)	M3 J1
☐ All cable connections inside the exterior control box ☐ All cable connections in the connection box on the platform ☐ All cable connections inside the power pack ☐ All cable connections inside the auxiliary controls	• General condition, insulation of the separate wires • Moisture inside the control unit & corrosion • Fixation & tightening of all cable & wire connections	M3 J1
☐ Limit switches, pressure switches, reed sensors, … (optional)	• General condition • Function & operation, automatic return to the neutral 0-position	W52 M3 J1
Remark :		

§2.8 - Hydraulic pipes, flexible hoses, hydraulic couplings	What to verify? Execute, service or repair if required !!	Freq.
☐ Hydraulic pipes & flexible hoses ☐ Flexible hoses in the energy track between lift columns and platform (for HTL with hydraulical closure)	• General condition: outside rubber coat is intact, inside steel braids are not visible • Routing & guidance, protection against squeezing, sheering or rubbing • Fragility & porosity • Age: to be replaced every 4th year (+ fill out the Maintenance & Repair Report)	M3 J1
☐ Couplings ☐ Fixed hydraulic pipes in steel	• General condition • Corrosion, fixation • Hydraulic system is free from leaks, both during operation & at rest.	M3 J1
Remark :		

§2.9 - Hydraulic power pack	What to verify? Execute, service or repair if required !!	Freq.
☐ Oil reservoir, casing of the power pack & lid ☐ Fixation of the power pack to the HTL frame or to the chassis	• General condition, no cracks or deformation in the mechanical parts & mounting brackets • Protection against corrosion, sealing of all the holes • Condition of the lid & the rubber locking straps • Hydraulic system is free from leaks, both during operation & at rest. • Tightness of the collars of the suction hose and return hose	M3 J1
☐ Hydraulic oil	• Check oil level & refill if required. • Oil type: ISO 22 as standard (other types used as option - check before refill) • Oil level: rest the platform in work position on the ground. The correct oil level reaches to the MAX mark on the oil reservoir. • Change oil & clean filter. To remove all the oil, lift the rear of the vehicle off the ground, so that the lift & tilt cylinders can contract fully, and no oil remains in the cylinders.	M3 J1 J1
☐ Hydraulic functions Fig. 2.1  Fig. 2.2 	• Hydraulic system is free from leaks, during execution of all functions. • If oil needs to be refilled, search for reason and repair. • Purge the hydraulic system. 1. OPEN the platform completely (below horizontal level), until the tilt cylinders are fully retracted, and continue to push the function OPEN for another 20 sec [See Fig. 2.1]. 2. Tilt the platform back up to horizontal position, and LOWER the platform completely (further down below normal ground level), until the lift cylinders are fully retracted, and continue to push the function LOWER for another 20 sec [See Fig. 2.2]. (*) and after each replacement of hydraulic pipes or revision of hydraulic cylinders	M3 J1 J1 (*)
☐ Starter solenoid + electric motor ☐ Electrical connection block in the power pack ☐ Control valves on the logical valve block	• General condition, correct amperage • Corrosion, burn marks / sparkles • Fixation & tightening of all cable & wire connections	M3 J1
☐ Pressure relief valve	• General condition • Verify the maximum oil pressure in function of the nominal capacity of the HTL, and adjust if required (HTL lifts too little or too much weight). Max. oil pressure = 220 BAR.	J1
☐ Emergency push button overriding the safety devices	• General condition & function of the button [see also §??]. When the button is pushed in: → platform LIFTS when toe-guard detection on platform is activated; → platform LIFTS when one or more switches of the cable rupture detection is / are activated; → Platform LOWERS when one or more switches of the slack-cable detection is / are activated (DH-VO5)	
Remark :		

§2.10 - Hydraulic cylinders	What to verify? Execute, service or repair if required !!	Freq.
☐ All cylinders	• General condition • Hydraulic system is free from leaks, both during operation & at rest. • Fixation & locking of all articulation pins	M3 J1
☐ Piston rods	• Surface should be free of paint, dirt & scratches.	M3 J1
☐ Electrical safety valves	• General condition • Function & operation of the manual emergency button • Clearance to the bumper, mounting plates, and other fixed parts • Condition of the electrical cable to the power pack	M3 J1
☐ Tilt cylinders (on HTL with hydraulical closure)	• Condition of the springs used for function OPEN	J1
Remark :		

§2.11 - Lift frame	What to verify? Execute, service or repair if required !!	Freq.
☐ Frame construction ☐ Toe-guard (at end of loading floor and / or front edge of platform)	• General condition, condition of the welds • Check for cracks & deformation, straightness of the columns • Corrosion	M3 J1
☐ Lift columns, lift runners	• General condition, check for cracks & deformation • Straightness of the columns and runners • Corrosion • Smooth sliding UP / DOWN • Wear of bearings, rollers, pins and slide surfaces • Adequate greasing	M3 J1
☐ Articulation points	• General condition • Cracks, deformation, elliptic deformation	M3 J1
☐ Articulation pins ☐ Articulation bearings	• General condition, deformation • Locking of the articulation pins by locking pins, bolts & nuts • Wear of bearings, rollers, pins, and slide surfaces (if applicable) • Presence of grease nipples, correct and regular greasing	M3 J1
☐ Cylinder beam & drive system, steel cables, chains, pulley blocks, pulleys and their roller bearings, sprockets   	• General condition, check for cracks & deformation, wear, stretching • Alignment of pulleys, chains or steel cables • Correct lubrication • Horizontal alignment of the platform with the loading floor, adjustment of the steel cables or chains if required • Vertical alignment of the platform in the rear frame of the vehicle body, adjustment of the steel cables or chains if required • Fitting & position of the retainers for the steel cables on the pulley blocks / sprockets [See photos]	M3 J1
☐ LSD (= Load Safety Device), cable rupture device, chain rupture device (for HTL with single cable system)	• General condition, function & operation, correct lubrication • Execute LSD test following Chapter 4	M3 J1
☐ Electrical cable rupture detection (for HTL with double cable system)	• General condition, function & operation of the switches • Adequate adjustment of the lift and safety cable [see Chapter 5]	M3 J1
☐ Slack-cable detection (for DH-VO5)	• General condition, function & operation of the switches	M3 J1
☐ Mounting plates, fixation to the vehicle body ☐ Mounting plates of the bumper bar	• General condition, check for cracks & deformation • Presence, condition & correct tightening of all mounting bolts	M3 J1
Remark :		

§2.12 - Platform	What to verify? Execute, service or repair if required !!	Freq.
☐ Platform construction	• General condition, condition of the welds • Check for cracks & deformation. • Corrosion	M3 J1
☐ Articulation points ☐ Articulation pins	• General condition, check for cracks, deformation, elliptic deformation • Locking of the articulation pins by locking pins, bolts & nuts • Presence of grease nipples, correct and regular greasing	M3 J1
☐ Load restraints, roll-stops, hinged ramps ☐ Platform lights / flags / traffic cones ☐ Foot controls ☐ Travel lock & platform retaining catch O *Visibility of the platform in public traffic*	• General condition, function & operation • Condition, routing & guidance of the electrical cables from the platform over the lift arms to the connection point in the power pack or exterior control box • *The platform is clearly visible in surrounding traffic from all approachable angles*	M3 J1 STE
☐ Torsion bar(s) in the platform (HTL with manual OPEN / CLOSE)	• General condition, function & operation • Required effort to open / close the platform is within normal limits	W52 M3 J1
☐ Safety rails ☐ Toe-guard (at end of loading floor and / or front edge of platform) ☐ Toe-guard switch (at end of loading floor and / or front edge of platform)	• General condition, function & operation • Automatic stop of the LIFT function (from all controls) when the toe-guard flap is pressed down, and its switch activated	W52 M3 J1
☐ Synthetic platform rollers (if applicable)	• General condition, replace when damaged or worn out	M3 J1
☐ Platform at loading floor	• Presence & condition of end stops for LIFT movement • Alignment of platform flush with the loading floor	M3 J1
Remark :		

§2.15 - Practical tests	What to verify? Execute, service or repair if required !!	Freq.
☐ General operation with empty platform	• Execute all movements several times with ALL available control units. The movements should be executed smoothly & quietly, without strange noises. • Verify occurrence of any play or deformation in the articulation points when driving over the platform, and when OPENING / CLOSING the platform.	W52 M3 J1
O *Static test at 125% overload - test on DEFORMATION*	• *Position the platform at 1/2 height.* • *Note the distance and angle to the vehicle floor.* • *Put a load of 1.25 x nominal capacity at the centre of gravity, and remove it again.* • *Verify the distance and angle to the vehicle floor. No permanent deformation should be noted.*	STE
O *Static test at 125% overload - test on INCLINATION*	• *Position the platform at the level of the vehicle floor.* • *Put a load of 1.25 x nominal capacity at the centre of gravity.* • *Note the distance and angle to the vehicle floor.* • *Repeat the same measurements after 15 min.* • *The platform should not be lowered more than 15 mm, and should not be tilted down more than 2°.*	STE
☐ Dynamic test at 100% nominal capacity ☐ Dynamic test with 500kg above roof level (DH-VO5	• Verify if the lift has sufficient lift capacity. • Verify the general performance & stability. • DH-VO5: verify if the lift capacity is limited to 500kg above roof level. Adjust if necessary. • Verify the working speeds LIFT & LOWER: max. 15 cm/sec OPEN & CLOSE: max. 10°/sec AUTOMATIC TILT at ground level: max. 4°/sec	J1
O *Overload test*	• *Place the platform at rest on the ground* • *Put a load of 1x nominal capacity at the centre of gravity; adjust the hydraulic pressure on the pressure relief valve so that the nominal capacity is just reached. Seal the pressure relief valve after final adjustment.* • *Put a load of 1.25x nominal capacity at the centre of gravity; the platform should not be able to lift..*	STE
Remark :		

§2.16 - Administrative obligations	What to verify? Execute, service or repair if required !!	Freq.
☐ Maintenance & repair reports ☐ Certificates for Periodic inspection; Special Inspection, Re-inspection	• All works are duly documented in the corresponding report or certificate documents	always
Remark :		

3. GREASE PLANS

- Grease schedule: under normal conditions of use and a single labour shift, the schedule can be limited to 12 thorough greasings per year.

- In case of very intensive use (multiple shift, 24h operation,…) or use in a hostile environment (food industry, frequent high pressure cleaning with strong detergents,…), the frequency of greasing should be increased / adjusted to the specific working conditions according to practical experience. In case of doubt, contact your local DHOLLANDIA agent.

- Before greasing, the HTL should be cleaned with a high pressure steam cleaner, in order to clear the lift columns & lift runners from hardened grease and debris, and all articulation points and grease nipples (if applicable) from sand and dirt.

- Any grease job should include:
  → Greasing of the lift columns, lift runners and their Teflon slide surfaces
  → Lubrication of the Load Safety Device (LSD), steel cables or chains
  → Greasing of the inside of the cylinder beam, the pulleys, pulley blocks, sprockets,…
  → Lubrication of the platform lock, platform retaining catch, hinged toe-guards (if applicable), articulation points of the safety rails
  → Greasing of all articulation points equipped with grease nipples.

- Where grease nipples are used, the greasing must be executed in such a way that all articulation points get a grease collar on both sides of the bearing or articulation, protecting it against ingress of water, salt, sand or dirt.

- Ensure all grease nipples function correctly, and replace any defective nipples. For articulations that cannot be greased, even after replacing the grease nipple, the articulation pin must be dismounted and polished, and its grease channel must be cleaned. (As ultimate solution, the articulation pin must be renewed).

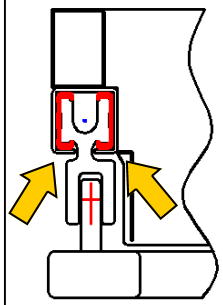
- Always use acid-free grease. The use of graphite grease is not allowed.

- Verify if the platform lock and / or platform retaining catch operate smoothly, and lubricate with oil if necessary.

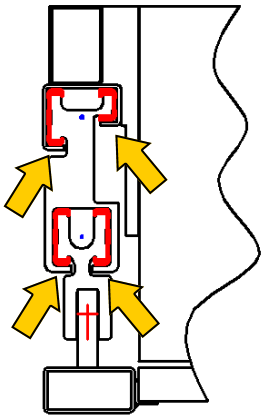
- The various types of HTL should be greased according to the grease plans in Fig. 3.1 and following.

Fig. 3.1 Columns on ALL lifts

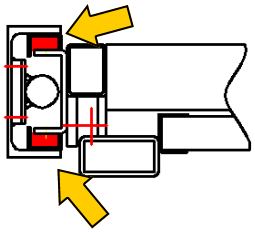
DH-VB, VO, VX...

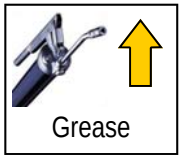


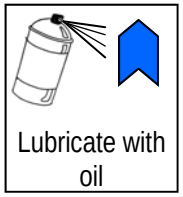
DH-VO5



DH-VH...







In case of special tail lifts deviating from these images, contact DHOLLANDIA to obtain further instructions.

Fig. 3.2 DH-VB, VO, VX..., VO5: double cable system

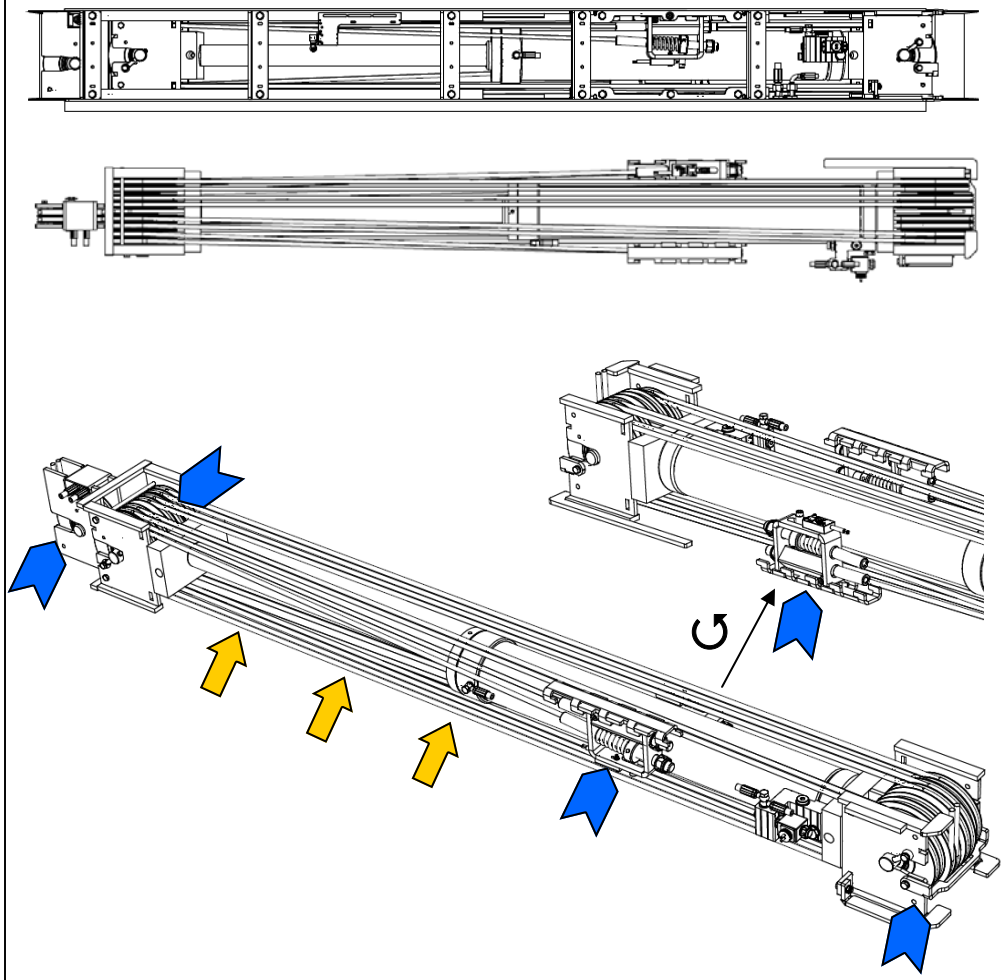


Fig. 3.3 Lifts with chains

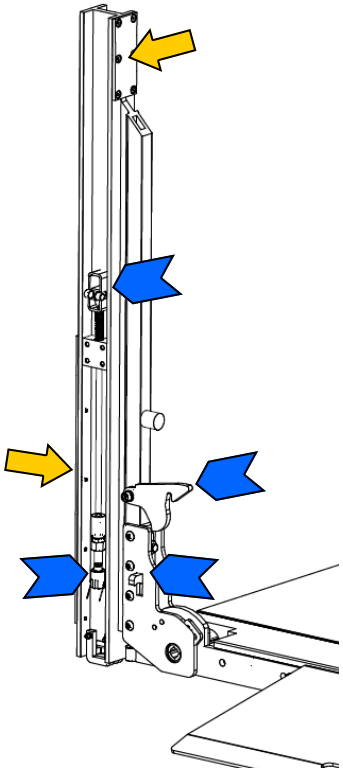
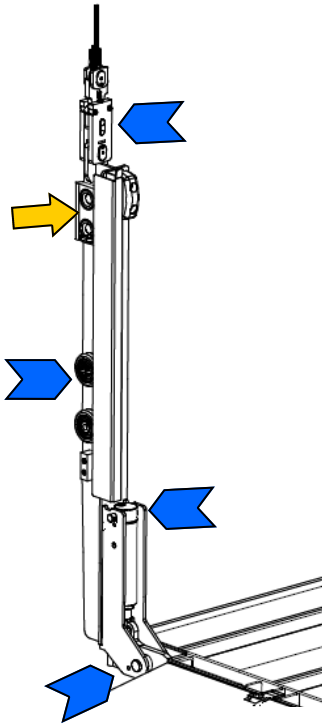


Fig. 3.4 Lifts with single cable system



4. TESTING THE CABLE / CHAIN RUPTURE DEVICE

- The column lifts driven by a lift cylinder plus a single cable or single chain system, are equipped with a mechanical Load Safety Device (= LSD)

- These cable rupture devices, or chain rupture devices are designed to block the platform inside the lift columns in case of failure of the suspension system, and to protect the platform, the load and the operator from falling to the ground.

- The LSD is tested as follows:
  - → Clean the lift columns. Remove all foreign objects & dirt from the inside of the columns and from the LSD.
  - → With the platform in open position, lower the platform to approx. knee height.
  - → Place a block (of wood) under each side of the platform, near the front platform edge, and LOWER the platform onto the blocks.
  - → Continue to press the function LOWER until the chain or steel cable is physically slack underneath the lift runner. If the chain or steel cable doesn't go slack, remove the cover of the cylinder beam, and whilst pressing the function LOWER, push the cylinder in by hand. This will create slack chain or cable to continue the test. Slack chain or cable is a necessity, otherwise the LSD test can prove negative.
  - → Manually lever one side of the platform upwards and remove the blocks, then release the platform. The LSD should engage within 100mm drop.
  - → If the LSD has not been activated, check if the various components of the LSD can move freely.
  - → To disengage the LSD, press the function LIFT to raise the platform to the floor level of the vehicle. You will hear the LSD disengage.
  - → Repeat the same test on the other side of the platform.

Fig. 4.1 - chains

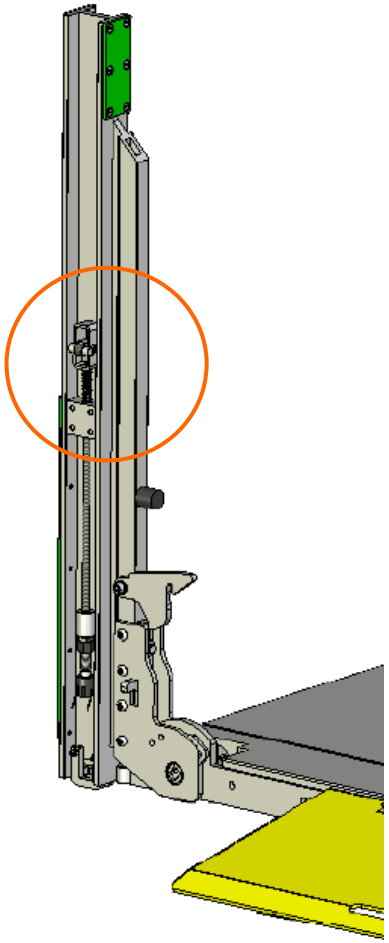
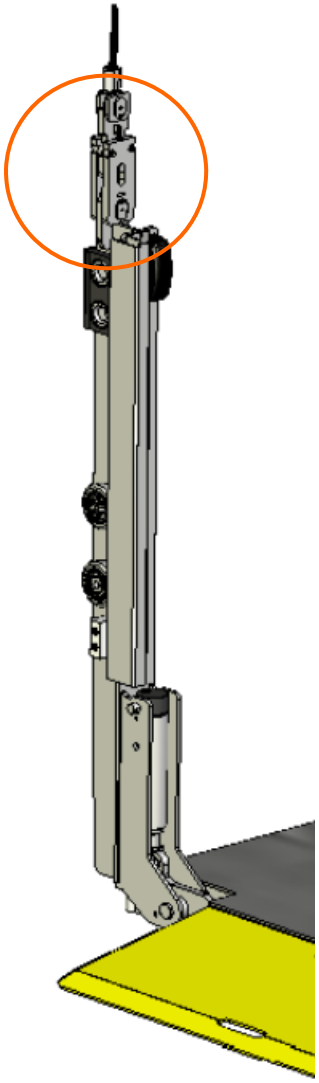


Fig. 4.2 - steel cables



5. DOUBLE CABLE SYSTEMS

- Many types of column lifts are driven by a double-cable system: the lift cylinder actuates a pulley block with 2 lift cables (left & right) and 2 safety cables (left & right). [See Fig. 3.2 - 5.1]

- In case of failure of one of the lift cables [1 if Fig. 5.1], the platform is caught by the safety cable [2] to protect the platform, the load and the operator from falling on the ground. Then, when one of the safety cables [2] is put under tension, the corresponding cable rupture switch [3] is activated, the earth of the starter solenoid in the power pack interrupted, and the function LIFT disabled. The various cable rupture switches [3] (normally 2) are wired serially, so that the safety is activated in case of failure in any of the 2 suspension systems left or right. [See also Fig. 5.2]

- In function of the intensity of use, the steel lift cables [1] might stretch, even unequally on the right and left side. As a consequence the platform might get out of horizontal alignment with the vehicle floor, or out of vertical alignment with the vehicle body, and the steel cables might need adjustment in the cylinder beam. [see also §2.11].

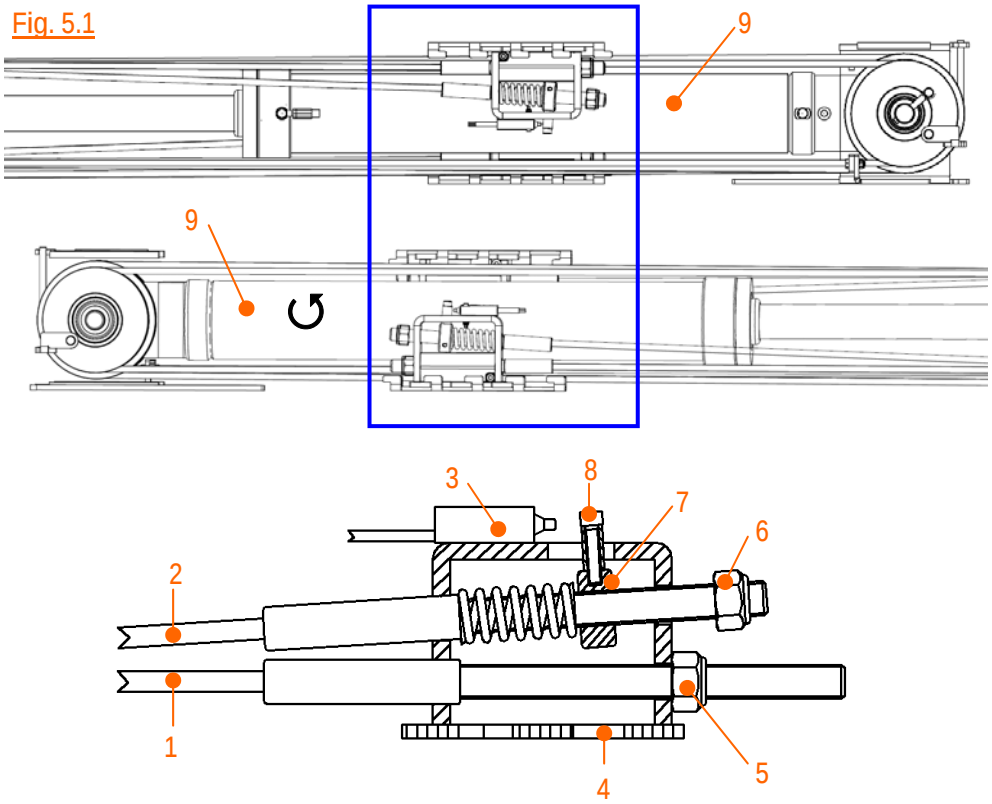
- Dismount the cover from the cylinder beam. To lift / lower the platform in rest position on one side, turn the nut [5] on the threaded fitting of the steel cable resp. clockwise / counter clockwise.

- The corresponding safety cable(s) [2] must be adjusted as well. Adjust their tension, so that it is possible to pull the safety cable(s) 30 to 40mm away from the lift cable(s) by hand, without coming out of the columns. The tension of the safety cable(s) [2] is again increased / decreased by turning the nut [6] on the threaded fitting of the steel cable resp. clockwise / counter clockwise. The round nut [7] and pawl [8] for the cable rupture switch (es) must be readjusted so that distance X = distance Y at all times. [See Fig. 5.3].

- Execute the adjustment of safety cables [2], the round nut [7] and pawl [8] with due diligence, as they determine the good function of the cable rupture safety feature. Negligence can put the operator, the technical service personnel and third parties at great risk.

- If Y > X, the pawl [8] on the round nut [7] will hit the switch [3] very hard in case of a cable rupture, and the switch [3] might be damaged, need replacement. If X>Y, the pawl [8] will not reach the switch [3] in case of a cable rupture, and the safety will fail to work.

Fig. 5.1



N°	Description
1	Lift cable
2	Safety cable
3	Cable rupture switch
4	Cable anchor
5	Nut on threaded end of lift cable
6	Nut on threaded end of safety cable
7	Round nut of the cable rupture detection
8	Pawl of the cable rupture detection
9	Lift cylinder

- In case of a cable rupture, the functions LIFT and CLOSE are disabled. In order to allow the operator to stow the platform in it's travel position to reach a skilled service agent for further repair, the power pack is equipped with an emergency push button [see Fig. 5.4]. This allows to by-pass the safety system, and enables the functions LIFT and CLOSE temporarily until the button is released again.

  - The emergency functions should be used to stow the platform in it's travel position and make the vehicle mobile for repair only. They should not be used to enable regular loading / unloading. The functions automatically return to the neutral position after being released. It is strictly forbidden and potentially dangerous to temper with the safety devices, or to try and overrule them permanently.

- The cable rupture protection is tested as follows:
  → Dismount the cover from the cylinder beam.
  → Turn the nut [5 on Fig. 5.1] on the threaded fitting of the lift cable [1] counter-clockwise, so that the platforms slants on one side, and is caught by the corresponding safety cable [2].
  → Check if the cable rupture switch [3] is activated correctly, with X=Y [see Fig. 5.3]. Adjust the position of the round nut [7] and its pawl [8] if necessary.
  → Check if the function LIFT is disabled. The functions LOWER and OPEN should still work.
  → Check the function of the emergency button in the power pack.
  → Recondition the lift cable [1] in the original work status. Repeat the same test on the other side of the platform, on the other set of steel cables.

6. ORDERING SPARE PARTS

- The following information must be confirmed when ordering spare parts:
  → Type, year of construction & serial number of the tail lift
  → Spare parts reference [consult the spare parts lists]
  → The desired quantity of each item
  → Your administrative data: company name, invoice address + VAT number, purchase order number, delivery address, and expected delivery time.

- The type, year of construction & serial number of the tail lift can be found on the identification stickers [see point 2 in Chapter A].

Fig. 5.2

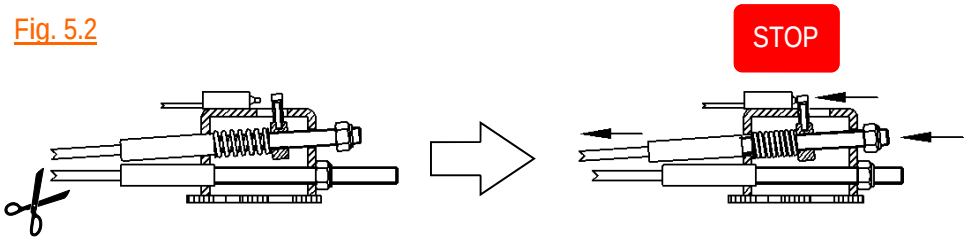
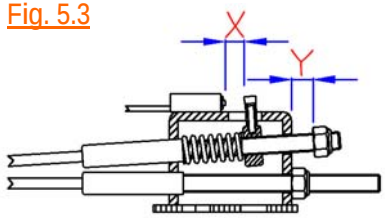
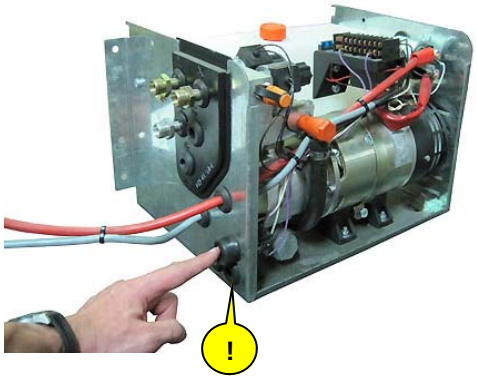


Fig. 5.3



Default:
X=Y= 18mm

Fig. 5.4



7. FAULT FINDING & REPAIR

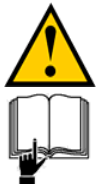
- In case of a malfunction, the operator can verify a number of points himself, before calling an approved DHOLLANDIA service agent:
  - → Is the isolator switch for the tail lift (called HTL hereafter) in the vehicle cabin switched on? Are the main power plugs between the tractor unit and the trailer properly connected? Is the battery switch in the exterior control box switched on?
  - → Is the main fuse for the HTL near the vehicle batteries still functional?
  - → Is the connection of the HTL to the vehicle batteries ok?
  - → Are the batteries (auxiliary batteries) too weak?
  - → Has the mechanical platform lock been released?

- If all this has been verified, and an approved service agent intervenes to repair the HTL, it is very important that the fault analysis is executed in a logical and systematic way. Too often components are replaced at random until the malfunction disappears. Such method is very expensive however on labour hours and spare parts cost.

- Therefore, it is very important to identify quickly and precisely if a malfunction has an electrical, a hydraulic or a mechanical cause.

- For instance, when a HTL doesn't LOWER, it can be that:
  - → The coil(s) of control valve H in the power pack, or one of the safety valves D on the lift cylinders receive no current (= electrical fault);
  - → one of the cartridges of the safety valves D on the lift cylinders has been hit and bent by a projecting stone, or that one of the braking valves on the cylinders is blocked (= hydraulic fault);
  - → one of the piston rods of the lift cylinders is bent by overload or accident (= mechanical fault);
  - → ...

- The tables below can be used as guide during the further fault analysis.



- Some steps in the check list require special skills and specific knowledge [see DHOLLANDIA Repair & Maintenance training program]. In case of doubt on how to proceed, DON'T go any further, but ask your local DHOLLANDIA distributor for professional advice. These cross-references to the training program are marked as for example:
  [see RMT HB3] = see Repair & Maintenance Training, Hydraulic Base techniques N° 3

§7.1 - Summary: activation of electrical solenoids per tail lift function

Scheme	MECH.E MECH.SA MECH Single Acting	HYDR. (Hydraulical)	MECH.X (mixed system)
LIFT	R + H	R + H	R+ H
LOWER	D	B + H	D
CLOSE	R + S	R + S	R + S
OPEN	O	B + S	O + S
LEG OUT	R + US	R + US	R + US
LEG IN	R + IS	R + IS	R+ IS
	All valves H, D, S, O, I, U, IS, US = SA	H, S = DA B, I, U, IS, US = SA	S = DA H, D, I, U, IS, US = SA

SA = single acting electrovalve
DA = double acting electrovalve

R = starter solenoid of the electric motor
H = control valve LIFT in the power pack
D = safety valve LOWER on the lift cylinders
S = control valve CLOSE in the power pack
O = safety valve OPEN on the tilt cylinders
IS = control valve LEG IN in the power pack, or on the stabilising leg
US = control valve LEG OUT in the power pack, or on the stabilising leg

§7.2 - HTL moves at normal speed, without any control switch being operated.	
• Button or switch of the exterior control or auxiliary control doesn't return to the neutral 0-position. • Button or switch does return to the 0-position, but one of the electrical contacts behind the switch is stuck or burnt. • Short circuit between the various wires in one of the electrical cables.	Typically, a malfunction at normal speed is usually caused by an electrical failure. Determine this by isolating the power source from the solenoid concerned, e.g.. Remove the solenoid from the electro-valve. (when this action doesn't end the malfunction, the cause is not electrical: e.g.. dirt in the cartridge, damaged sealing;...). Disconnect the auxiliary control to further isolate the problem and narrow down the scope. Measure the tension at the electrical distribution block in the power pack, and repair the fault.

§7.3 - HTL doesn't react on the exterior control, nor on the auxiliary control.	
• Isolator switch for the HTL in the vehicle cabin is not switched on. • Main power plugs between the tractor unit and the (semi-) trailer are defective or not plugged in. • 250A main fuse is out of order (corroded, heated and burnt by bad connection,...). • Battery switch in the exterior control box is not switched on, or is out of order (doesn't pass the current). • 15A fuse in the control box is defective. • The power pack is not properly earthed.	Switch on the isolator switch for the HTL in the vehicle cabin. Plug in, measure the tension and / or repair the plugs between the tractor and (semi-) trailer: (+) battery link, (-) earth link and the charging system. Verify the 250A main fuse, and repair or replace if necessary. Switch on the battery switch in the exterior control box. Measure if the switch passes current to the 2nd pole. Verify the 15A fuse on the control panel of the exterior control box, and repair or replace if necessary. Establish a direct earth link to the HTL batteries, and verify if the power pack is properly earthed: none of the electric valves, starter solenoid, electric motor can work without a good earth link.

§7.4 - Symptoms of weak batteries or damaged current supply.	
• The downward functions (OPEN & LOWER) are working, but the upward movements (LIFT & CLOSE) are failing. • The electric motor still runs, but audibly slower and laboriously. • The starter solenoid switches on, but the electric motor doesn't react. • The starter solenoid quickly switched on and off (doorbelling). • Nothing at all happens. Remark: For multi-deck column lifts, min. 50mm² cable section is recommended for the (+) battery and (-) earth cables. ...⇨	Remove the lid of the power pack, and measure the tension at the incoming pole of the starter solenoid, when the system is under strain (push the function LIFT). If you measure 24V/12V, check the working of the starter solenoid when pushing the function LIFT (you should measure 24V/12V at the outgoing pole of the starter solenoid); verify and measure the (+) battery cable to the electric motor, check the (-) earth link of the starter solenoid and the (-) earth link of the electric motor up to the vehicle batteries. Also if you measure 24V/12V on the multimeter, also check if there is sufficient Amp by using a test bulb. If the bulb doesn't light, check for poor connection at the 250A main fuse, and the whole (+) battery cable up to the power source. If no 24V/12V is measured at the incoming pole of the starter solenoid, verify the (+) battery cable to the battery switch in the exterior control box, and measure if the battery switch itself passes through the current. ...⇨

... §7.4 - Symptoms of weak batteries or damaged current supply.

⇦...

⇦...

If no 24V/12V is measured at the incoming pole of the battery switch, check out the (+) battery cable, the 250A main fuse, all plug connections (if applicable), and the complete power circuit up to the batteries of the vehicle.

Charge the batteries, verify the function of the separate cells, and renew the batteries if necessary.

Seek the reason for flat batteries (damaged or corroded fuse, under-rated alternator,...) and repair or adjust.

§7.5 - The electric motor doesn't run, but the downward functions OPEN / LOWER work fine.

For HTL with double-cable system:

- Failure of one of the steel lift cables.
- Defect in the detection circuit for the cable rupture.

Reason: the earth of the starter solenoid runs over min. 2 cable rupture switches mounted serially inside the cylinder beam [see also ??].

"Conventional" points:

- The button / switch or electric contacts are faulty, or the connection to one of the contacts is loose.
- The electric cable is cut or damaged, or there is a bad contact.
- The incoming or outgoing connection to the electrical distribution block in the power pack is faulty.
- The starter solenoid in the power pack is defective.
- The carbon brushes of the electric motor are worn out.
- The thermal fuse inside the electric motor (= earth of the starter solenoid) is switched off by overheating (caused by overload or insufficient battery tension).
- The (+) battery or (-) earth cable is under dimensioned, damaged, or loose at the connection to the battery pole.
- Insufficient battery tension.

Remark: For multi-deck column lifts, min. 50mm² cable section is recommended for the (+) battery and (-) earth cables.

...⇨

For HTL with double-cable system: push the emergency button in the power pack + the function LIFT or CLOSE. If the electric motor starts to run, possible causes are:

→ defect in the wiring circuit from the (-) earth pole of the starter solenoid over the cable ruptures in the cylinder beam to the thermal fuse inside the electric motor;

→ defect in one of the cable rupture switches;

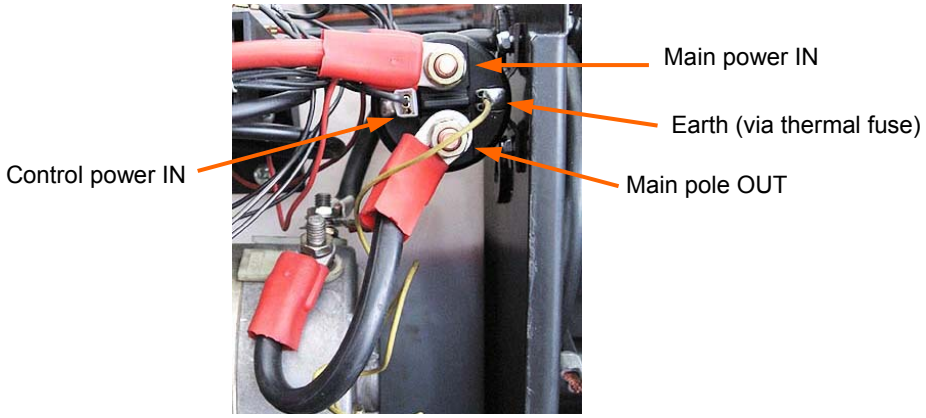
→ rupture of one of the lift cables, with activation of one of the cable rupture switches as consequence.

Dismount the cover of the cylinder beam, check if one of the cable rupture switches is activated, check the steel cables and pulleys and repair if necessary. Adjust the cable length, the position of the cable nut and its pawl if necessary. Check the condition and function of the cable rupture switches, and repair if necessary.

"Conventional" points:

Remove the lid of the power pack, and feel the temperature of the electric motor. If the motor feels hot, the thermal fuse inside the motor probably has interrupted the earth of the starter solenoid. (This can be verified by giving the starter solenoid a direct connection to the earth. After a cooling period of approx.15 min., the thermal fuse automatically restores the earth of the starter solenoid, and the electric motor becomes operational again).

If not, measure the tension at the incoming poles of the starter solenoid (main power & control power). If no 24V/12V is measured, measure and verify the main power circuit and the control power circuit.



...⇨

... §7.5 - The electric motor doesn't run, but the downward functions OPEN / LOWER work fine.	
⇦...	⇦... If 24V/12V is measured at both incoming poles, measure the tension at the outgoing main pole of the starter solenoid. If no 24V/12V is measured here, and the electric motor doesn't feel overheated, the thermal fuse or the starter solenoid itself is defective, or the electric motor containing the earth of the starter solenoid, is badly earthed as a whole. (The failure of the thermal fuse can be verified by replacing the thermal fuse by a direct earth connection). If you measure 24V/12V with the multimeter at the outgoing main pole of the starter solenoid, also check if there is sufficient Amp by using a test bulb. If the bulb doesn't light, check for poor connection at the 250A main fuse, and the whole (+) battery cable up to the power source. Also if you measure 24V/12V at the outgoing main pole of the starter solenoid, verify the earth of the electric motor. If the earth of the electric motor is ok, revise the motor or replace it.

§6.6 - The electric motor doesn't switch off.	
• The button or switch for LIFT in the exterior control box or auxiliary control doesn't return to the neutral 0-position. • The button or switch returns to 0-position, but one of the electric contacts behind the switch is stuck or burnt. • Short circuit between the various wires in one of the electrical cables. • The contacts of the starter solenoid are burnt and remain activated.	Remove the plug of the control power to the starter solenoid: (if this action doesn't remove the fault, the starter solenoid is burnt and remains activated). If the fault lies with the control circuit: uncouple the auxiliary controls to narrow down the scope. Measure the electrical distribution block in the power pack, and repair the electric fault. If the control circuit isn't at fault, switch off the battery switch in the exterior control box (or cut the power in a different way, e.g. remove the 250A main fuse) and replace the starter solenoid. Check the battery voltage , when the system is under load (push the function LIFT). Insufficient battery voltage (doorbelling) is a frequent cause of starter solenoid failure !!

§6.7 - The platform doesn't LOWER, the other functions work ok.

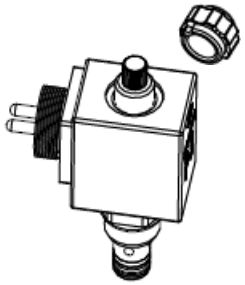
- The button / switch or electric contact are faulty, or the connection to one of the contacts is loose.
- The incoming or outgoing connection to the electrical distribution block in the power pack is faulty.
- The electric cable to one of the safety valves D needed to LOWER is interrupted, or has a bad contact.
- One of the solenoids D needed to LOWER is defective, or the cartridge of one of the valves is mechanically defective.
- One of the braking valves on the cylinders or in the power pack is mechanically blocked (by ice, dirt or by mechanical malfunction).
- One of the lift cylinders is blocked (piston rod bent by accident, badly greased,…).
- The lift columns and / or lift runners are damaged, causing the lift runners to jam.
- The lift columns contain to much hardened grease, are clogged up with debris and dirt.
- The LSD is engaged due to bad greasing or too much debris in the lift columns, or by genuine rupture of the suspension system (steel cable or chain, pulleys and sprockets).

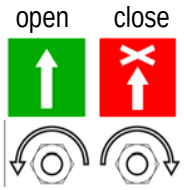
Check the lift columns and lift runners for visible damage, and repair.

Verify the electrical operation of the safety valves D needed to LOWER (on cylinders or in power pack):

- with a magnetic tester (a solenoid generates a magnetic field when it is electrically activated);

- or open the safety valves manually via the emergency operation (if the valves are opened manually, and the platform LOWERS, the cause is electrical for sure).





If one of the valves is not energized, measure the current & earth circuit to that solenoid into the control box, and repair.

If the electrical operation of all solenoids is correct, verify the cartridges of the valves for mechanical damage. Dismount the braking valves on the cylinders and in the power pack to verify if they work ok.

Verify if the LSD is engaged. Check the steel cables or chains, pulleys and sprockets for mechanical damage and repair. Clear all debris from the lift columns, clean them with high pressure steam cleaner and apply grease.

Finally, verify the lift cylinder(s) themselves for any mechanical damage.

§6.7.b - DH-VO5: the platform doesn't LOWER, the other functions work ok.

Only for the lift type DH-VO5:

- Lift runners and platform are jammed in the lift columns
- Defect in the detection circuit for the slack cables.

Reason: the power of the electrovalve for LOWER run over 2 detection switches mounted serially on the fixed steel lift columns left & right. Their purpose is to prevent the lift cables to go slack, if the function LOWER would be activated, and the platform + lift runners would be jammed mechanically in the lift columns (by deformation, dirt, ...).

Visually check the slack cable detection switches on the fixed steel lift columns left & right. If one of them is activated, the lift runners and platform are mechanically blocked in the lift columns. Search for the cause of the block and repair, clean the 2 column sets by means of a high-pressure cleaner and grease again. LOWER by means of the regular controls.

If the detection switches are not visibly activated, but the platform lowers when you push the emergency push button in the power pack + the function LOWER, possible causes are:

→ defect in the (-) earth circuit of the electrovalve D for LOWER on the lift cylinder in the cylinder beam, running over the 2 slack cable detection switches to the earth;

→ Defect in one of the slack cable switches.

Check the condition and function of both switches, incl. their wiring.

Don't use the emergency switch when the switches are visibly activated and the platform is physically blocked. Disregard can potentially lead to damage and hazardous situations.

§6.8 - The platform doesn't OPEN, the other functions work ok. (for HTL with hydraulical OPEN / CLOSE)

- The button / switch or electric contact are faulty, or the connection to one of the contacts is loose.
- The incoming or outgoing connection to the electrical distribution block in the power pack is faulty.
- The electric cable to one of the safety valves O or S needed to OPEN, is interrupted, or has a bad contact.
- One of the solenoids O or S needed to OPEN, is defective, or the cartridge of one of the valves is mechanically defective.
- One of the braking valves on the cylinders or in the power pack is mechanically blocked (by ice, dirt or by mechanical malfunction).
- The travel lock has not been opened.
- One of the tilt cylinders is blocked (piston rod bent by accident, interior spring or piston is seized up...).

Verify if the travel lock is open.

Verify if the electrical operation of the safety valves O or S needed to OPEN (on cylinders or in power pack) is ok.

- with a magnetic tester (a solenoid generates a magnetic field when it is electrically activated);
- or open the safety valves manually via the emergency operation (if the valves are opened manually, and the platform OPENS, the cause is electrical for sure).

See explanation of the different techniques under §6.7.

If one of the valves is not energized, measure the current & earth circuit to that solenoid into the control box, and repair.

If the electrical operation of all solenoids is correct, verify the cartridges of the valves for mechanical damage. Dismount the braking valves on the cylinders and in the power pack to verify if they work ok.

Finally, verify the tilt cylinders and their spring for mechanical damage.

§6.9 - The lift capacity is insufficient, the HTL doesn't reach the full nominal capacity.

- The load is too heavy, or removed too far from the centre of gravity.
- The pressure relief valve is set too low.
- The pressure relief valve is polluted or mechanically blocked in open position.
- The pump sucks insufficient oil: the oil or filter are polluted, clogged up with ice or dirt, or the oil is too viscous (after refilling with oil of incorrect specifications).
- The hydraulic pump is worn out.
- The seal of one of the lift cylinder is leaking.
- HTL with hydraulic tilt at ground level: the seal of the hydraulic memory cylinder is leaking.
- The lift columns and / or lift runners are damaged, causing the lift runners to jam.
- The lift columns contain to much hardened grease, are clogged up with debris and dirt.

For DH-VO5:

- The electrovalve controlling the 2nd pressure relief valve (lift capacity limited to 500kg above roof level) is electrically activated while it shouldn't be
- The electrovalve controlling the 2nd pressure relief valve is polluted or mechanically blocked in open position

Check the lift columns and lift runners for visible damage, and repair. Clear all debris from the lift columns, clean them with high pressure steam cleaner and apply grease.

Fit a pressure gauge to the power pack, and measure the maximum pressure delivered by the pump. [see RMT HB1]

If set too low, try to adjust the pressure relief valve (to max. 220 bar, and only as far as required). [See RMT HB3]

If the adjustment of the pressure relief valve doesn't show any result, try first to purge this valve. [See RMT HB4]

If no result, dismount the oil filter and clean it (dirt or ice when freezing).

If also without result, the pump is probably worn out. (A worn out pump heats up quickly).

If the oil pressure can be raised, but the lift capacity remains insufficient, possibly one of the seals of the lift cylinders or the hydraulic memory cylinder is leaking. Verify if the cylinders are free of internal leaks. [See RMT HB6a]

For DH-VO5:
Remove the solenoid from the electrovalve Z controlling the 2nd pressure valve, and determine of the cause is electrical or hydraulic. If electrical, check the condition & function of the limit switch in the cylinder beam, incl. its wiring. When hydraulic, flush / purge the cartridge of the valve to evacuate any pollution, revise (replace O-rings) or replace the part.

§6.9.b - DH-VO5: the lift capacity is insufficient above the vehicle roof level

DH-VO5 are equipped with a safety circuit, that limits the lift capacity to 500kg above the vehicle floor level. This circuits consists of a electrovalve Z in the power pack, and an 2nd pressure relief valve set at 500kg lift capacity.

If the lift capacity is fine below the roof level, but not above the roof, possible causes are:

- The 2nd pressure relief valve is set too low.
- The lift columns and / or lift runners are damaged, causing the lift runners to jam.
- The lift columns contain to much hardened grease, are clogged up with debris and dirt.

If the lift capacity doesn't diminish above the roof level, it is very important to re-adjust the 2nd pressure relief valve to a lower value. Disregard can potentially lead to damage and hazardous situations.

Fit a pressure gauge to the power pack, and measure the maximum pressure delivered by the pump. [see RMT HB1]

If set too low, adjust the pressure relief valve (to max. 200 bar, and only as far as required to reach 500kg). [See RMT HB3]

Check the lift columns and lift runners for visible damage, and repair. Clear all debris from the lift columns, clean them with high pressure steam cleaner and apply grease.

§6.10 - The HTL doesn't reach floor height	
• Insufficient battery power. • Insufficient quantity of oil in the reservoir. • The lift columns and / or lift runners, or the pulleys / sprockets are damaged, causing the lift runners to jam. • The lift columns contain to much hardened grease, are clogged up with debris and dirt. • The chain or steel cable length is incorrectly adjusted. • Too much cable stretch.	Listen to the sound of the electric motor in the power pack, measure the evolution of the voltage when trying to reach the higher positions. If the sound of the electric motor drops dead, or you measure a voltage drop below 21V/10V, there is insufficient battery tension [see also §7.4]. Verify the oil level in the power pack, and top-up oil if necessary. (Rest the platform in work position on the ground. The correct oil level reaches to the MAX mark on the oil reservoir). Check the position of the stops for lift runners, and adjust them when required. Check the lift columns, lift runners, pulleys and sprockets for visible damage, and repair. Clear all debris from the lift columns, clean them with high pressure steam cleaner and apply grease. Adjust the length of the chain or steel cable anchor, or move to the next mounting position.

§6.11 - The electric motor seemingly runs at normal speed, but the platform doesn't move	
• The switch on the toe-guard flap at the front edge of the platform is activated, interrupting the circuit of electrovalve H for function LIFT. • Insufficient quantity of oil in the reservoir. The hydraulic pump sucks air. • The oil filter between the reservoir and pump is clogged up (dirt or ice formation). • The drive shaft between the electric motor and the hydraulic pump is broken. • The hydraulic pump is completely worn out. • The seals of the cylinder(s) are heavily damaged, or torn off by incorrect manipulation.	The power to valve H for function LIFT runs over the switch under the toe-guard flap on the platform. Ensure that the toe-guard flap is not pressed down, and try again to LIFT. If no, push the emergency button in the power pack + function LIFT. If the platform now starts to lift, possible causes are: → defect or short circuit in the wiring circuit for the toe-guard switch; → defect of the toe-guard switch itself. Verify the oil level in the power pack, and top-up oil if necessary. (Rest the platform in work position on the ground. The correct oil level reaches to the MAX mark on the oil reservoir). Dismount the filter and clean it. Replace the filter if a complete rinse is not possible. Feel the temperature of the pump (a worn out pump heats up quickly). Dismount the pump off the electric motor, and verify the condition of the drive shaft. Test and verify the tightness of the hydraulic cylinders. [See RMT HB 6a / 6b]

§6.12 - The platform LIFTS and CLOSES simultaneously, when the function LIFT is actuated. (for HTL with hydraulical OPEN / CLOSE)	
• The solenoid of the control valve S CLOSE is electrically activated, while it should remain without tension. • The cartridge of the control valve S CLOSE is polluted or stuck in open position, or defective in another way.	Remove the solenoid of control valve S. If the fault remains, the cartridge of the valve is probably leaking (stuck in open position). Flush / purge the valve or replace. [See RMT HB 5]. If the fault disappears after removal of solenoid S, the cause is electrical. Measure the control circuit of the function CLOSE (switches, electrical contacts, electrical distribution block in power pack,…) to identify the origin of the malfunction.

§6.13 - The platform LOWERS (OPENS) with shocks, when the function LOWER (OPEN) is actuated.	
• The lift columns and / or lift runners are damaged, causing the lift runners to jam. • The lift columns contain to much hardened grease, are clogged up with debris and dirt. • One of the piston rods of the lift cylinders (tilt cylinders) is bent by overload or by accident. • The logical 3-way valve in the main valve block V012 or V096 in the power pack leaks, and opens / closes the return of oil to the reservoir alternately. • The braking valve in the power pack, or one of the braking valves in the banjo couplings on the lift cylinders (tilt cylinders) is blocked (mechanical defect, or blocked by dirt or ice,…).	Check the lift columns and lift runners for visible damage, and repair. Clear all debris from the lift columns, clean them with high pressure steam cleaner and apply grease. Verify if the piston rods of the lift (tilt) cylinders are straight, and if they move freely and smoothly through the cylinder head. Dismount the non-return valve from the 3-way valve in the main valve block V005, V012 or V096 in the power pack. Clean the seat of the bullet (ball), reshape it if required, renew the bullet and reassemble the valve. Dismount the braking valve in the power pack, and the banjo couplings on the lift (tilt) cylinders. Verify if all run freely and work correctly.

§6.14 - The platform LOWERS slowly without any control being actuated (the platform angle remains unchanged).	
• The safety valve D needed to LOWER (on the lift cylinders or in the power pack) is leaking. The O-ring of the cartridge is damaged, or the valve is stuck in open position by dirty or ice. • The seal on the piston of the lift cylinder(s) is (are) leaking. • HTL with hydraulic tilt at ground level: the seal of the hydraulic memory cylinder is leaking. For DH-VB, DH-VO: • The check-valve on the pressure pipe of the lift cylinder is leaking.	Remark: Take into account the quantity of cylinders, the quantity of safety valves and where they are fitted.Verify if the control valves in the power pack are single acting or double acting. For most types of HTL multiple valve system, there must be a combination of different defects if the platform lowers spontaneously: safety valve leaking on one cylinder, and the cylinder seal leaking on the other; or the safety valves on both cylinders leaking and the control valve in the power pack leaking;... A single malfunction wouldn't be enough if the hydraulic circuit counts more than 1 safety valve. Verify if the manual emergency operation on the valves is firmly closed. Test and verify if the lift cylinders and hydraulic memory are not leaking internally. [See RMT HB 6a / 6b]. Revise the cylinders if required. Flush / purge the cartridge of the safety valves on the cyllinder, and (if applicable) the control valve in the power pack [see RMT HB5], revise (replace O-rings) or replace the part. For DH-VB, DH-VO: These HTL have separate hydraulic pipes for LIFT and LOWER, in order to accelerate the function LOWER. The pipe for LIFT is equipped with a check-valve. Check this valve for leakage. [See RMT HB 6b]. Try to clean the check valve, or replace the part.

§6.15 - The platform falls open, the point of the platform tips down. for HTL with hydraulical OPEN / CLOSE)	
• The safety valve O needed to OPEN (on tilt cylinder or in power pack) is leaking. The O-ring of the cartridge is damaged, or the valve is stuck in open position by dirty or ice. • The seal on the piston of the tilt cylinder(s) is (are) leaking. • HTL with hydraulic tilt at ground level: the seal of the hydraulic memory cylinder is leaking.	Remark: Take into account the quantity of cylinders, the quantity of safety valves and where they are fitted.Verify if the control valves in the power pack are single acting or double acting. For most types of HTL multiple valve system, there must be a combination of different defects if the platform falls open spontaneously: safety valve leaking on one cylinder, and the cylinder seal leaking on the other; or the safety valves on both cylinders leaking and the control valve in the power pack leaking;... A single malfunction wouldn't be enough if the hydraulic circuit counts more than 1 safety valve. Verify if the manual emergency operation on the electro valves is firmly closed. Test and verify if the tilt cylinders and hydraulic memory are not leaking internally. [See RMT HB 6a / 6b]. Revise the cylinders if required. Flush / purge the cartridge of the safety valves on the tilt cylinders, and (if applicable) the control valve in the power pack [see RMT HB5], revise (replace O-rings) or replace the part.

8. EMERGENCY OPERATION

§8.1 - Introduction and safety instructions

- Most types of **DHOLLANDIA** tail lifts (called HTL hereafter) are equipped with a manual emergency operation on the electrovalves used on their cylinders and in their power pack.
- This emergency operation
  → enables the operator to execute certain movements by hand (e.g. LOWER, OPEN) when the regular electrical controls fail;
  → and help the service agent in fault finding, to distinguish between electrical and hydraulic malfunctions.

Warning !

- Prior to manipulating any of the emergency devices, take maximum safety precautions, and take notice of the safety instructions for use, for repair & maintenance, and the ones included in this section.
- In case of doubt, stop immediately, and ask advice from **DHOLLANDIA** prior to continuing.
- Negligence can put the technical personnel, the operator and third parties at great risk.

- Switch off the isolator switch in the vehicle cabin, remove the key from the battery switch in the exterior control box, or disconnect main fuse on the battery, to avoid unsafe, injudicious or unauthorized use (also by strangers in traffic!) of the HTL. [See Fig. 8.1]
- Stay out of the operation radius of the platform, and stay clear of the moving parts at all times. Beware at all times for potential risks of crushing or sheering fingers, hands, limbs, feet or toes between the moving parts of the lift arms, hydraulic cylinders and the moving platform. [See Fig. 8.2]
- Work from a position beside the HTL frame, or over the front side of the HTL frame. Never behind the HTL frame or under the lift arms! [See Fig. 8.3]
- Refer to the summary in §7.1 to determine which valves (on the cylinders, and also in the power pack in case of Double Acting valves) need to be opened in order to actuate the functions OPEN or LOWER, and proceed accordingly.

Fig. 8.1

Fig. 8.2

Fig. 8.3

- For HTL with Double Acting valves in the power pack:
  → If the power pack is mounted on the side of the HTL frame, manipulate the valves on the cylinders first, and open the valve in the power pack afterwards.
  → If the power pack is mounted in the middle of the frame between the lift arms, it is safer to manipulate the valve in the power pack first, and open the valves on the cylinders afterwards.
- After use, don't forget to close the buttons for the manual emergency operation again, and the mount the protective cap again on top of the cartridge of the valve.

§8.2 - Operation of the SINGLE ACTING valves

- Refer to the summary in §7.1 to determine which valves are Single Acting, and can be manipulated as described in this §. Except for OMM3 wiring diagrams, these valves V036/ V037 or V036.H/V037.H are mounted on all hydraulic lift & tilt cylinders. Depending on the wiring diagram, they are also mounted in the power pack. [See Fig. 8.4]

- First remove the protective cap from the top of the cartridge of the valve. [See Fig. 8.5] Under this cap sits a bronze-coloured button that can be screwed / unscrewed.

- Unscrew this button (= counter-clockwise) to OPEN the valve manually. [See Fig. 8.6]

- The flow of oil through the valve, and the speed of the downward movement can be adjusted by opening the valve more (= faster) or less (= slower).

- After use, screw the button in (= clockwise) to CLOSE the valve manually. [See Fig. 8.6] Lock it hand-tight in closed position.

- To end, mount the protective cap again on top of the cartridge of the valve.

Fig. 8.4

Fig. 8.5

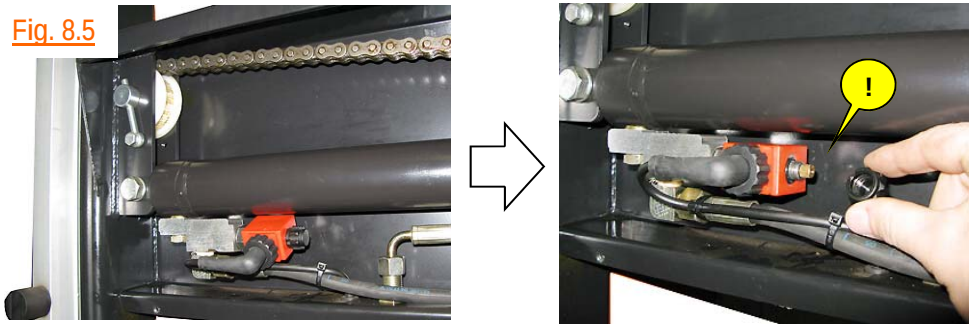
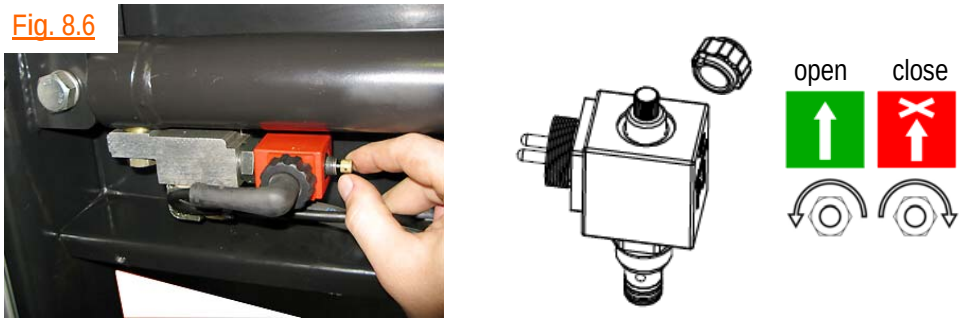


Fig. 8.6



§8.3 - Operation of the DOUBLE ACTING valves

- Refer to the summary in §7.1 to determine which valves are Double Acting, and can be manipulated as described in this §. For OMM3 wiring diagrams, these valves V071/V072 or V071.H/V072.H are mounted on all hydraulic lift & tilt cylinders. Depending on the wiring diagram, they are also mounted in the power pack. [See Fig. 8.7]

- For V071.H/V072.H : the protective caps on the cartridge of the valve are equipped with an elastic skin, covering an emergency button that can be pushed in by the finger. These valves can be operated manually without dismounting anything.

- Push-in the button under the protective rubber cap to OPEN the valve manually. [See Fig. 8.8]

- Release the button under the protective rubber cap to CLOSE the valve manually. [See Fig. 8.8]

§8.4 - Manual override of the starter solenoid

- When the main pole IN of the starter solenoid [see §7.5] receives normal 24V/12V tension, but the electric motor doesn't function, the starter solenoid can be overridden as follows.

- Switch off the isolator switch in the vehicle cabin, remove the key from the battery switch in the exterior control box, or disconnect the main fuse on the battery. [See Fig. 8.1]

- Connect the main poles IN & OUT of the starter solenoid with 2 spanners of the same string (!) of a starter cable. Ensure non of the spanners touches the earth (steel casing of the starter solenoid, electric motor or power pack itself) ! [See Fig. 8.9]

- Re-establish the electric power to the power pack: switch on the isolator switch in the vehicle cabin, insert the key from the battery switch in the exterior control box, or reconnect the main fuse on the battery. If the starter solenoid is the failing part, the electric motor will now start to run.

- Alternatively, you can maintain the electric power on the power pack, and link the 2 main poles IN & OUT of the starter solenoid with an old screw driver, or other metal object. Again ensure not to make any connection to the earth. [See Fig8.10]

Fig. 8.7

Fig. 8.8

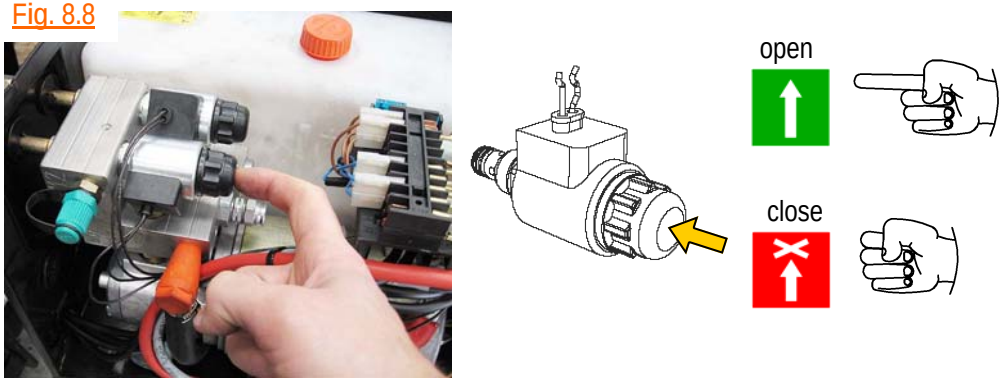


Fig. 8.9

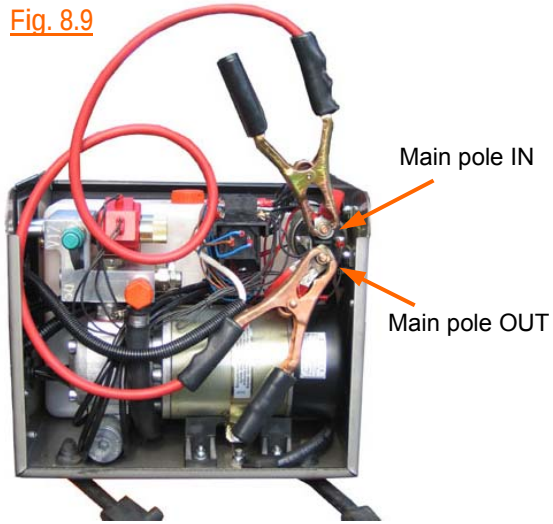


Fig. 8.10

§8.5 - Emengency push button on the power pack

- The emergency push button mounted on the side of the power pack enables the operator or service agent to overrule some of the safety features incorporated on the HTL in case of failure of the relevant switch or its wiring circuit.

- The emergency functions should be used to stow the platform in it's travel position and make the vehicle mobile for repair only. They should not be used to enable regular loading / unloading. The functions automatically return to the neutral position after being released. It is strictly forbidden and potentially dangerous to tamper with the safety devices, or to try and overrule them permanently. Upon use of the emergency button, the safety instructions of this manual must be strictly followed.

- Working principle:

Fig.	Safety device	Effect upon activation of the safety device	Effect of pushing the emergency button
8.11	Switch on the under side of the toe-guard flap at the front edge of the platform	The power circuit of electrovalve H for the function LIFT is interrupted. The platform doesn't LIFT any more.	The electrovalve H for the function LIFT receives direct current from the emergency button. The platform can LIFT, but the toe-guard protection is inactive !
8.12	Cable rupture switches on the HTL with double-cable system (normally 2 mounted serially)	The earth circuit of the starter solenoid is interrupted. The Platform doesn't LIFT any more.	The starter solenoid is directly earthed over the emergency button. The electric motor can run again, the platform can LIFT and CLOSE, in order to stow it in its travel position.
8.13	DH-VO5: slack cable switches on the lift columns (2 mounted serially)	The power circuit of electrovalve D for LOWER is interrupted. The platform doesn't LOWER any more.	The electrovalve D for the function LOWER receives direct current from the emergency button. The platform can LOWER, but the slack cable protection is inactive !

Fig. 8.11

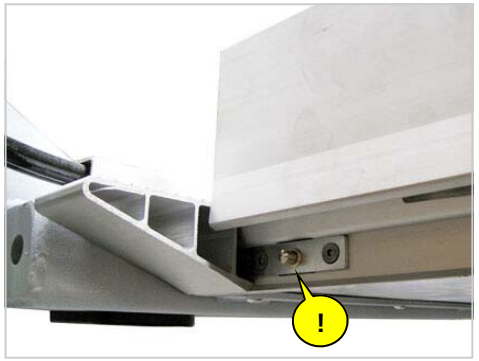


Fig. 8.12

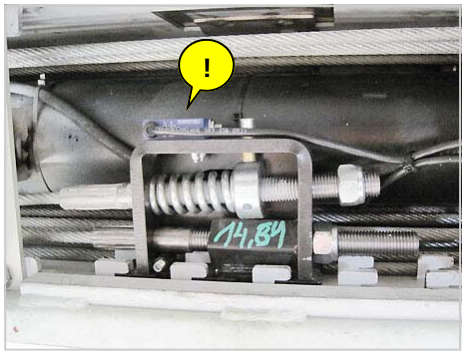
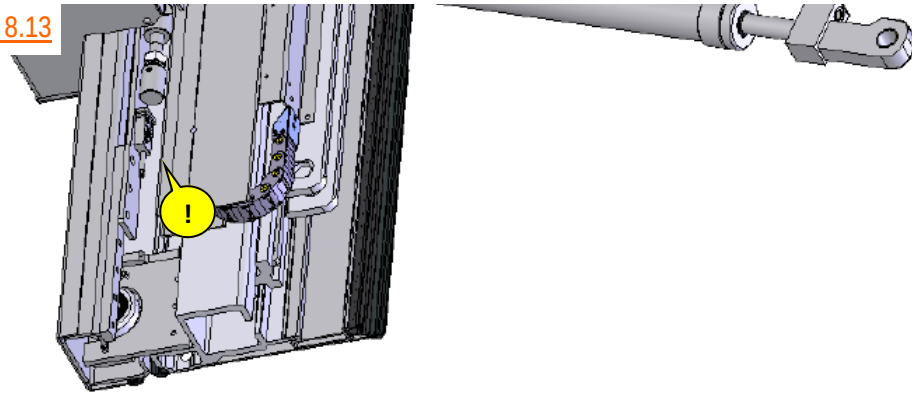


Fig. 8.13



§8.6 - Course of action

- The table below shows which courses of action can be taken in case of a breakdown, resulting from a failure on one of the solenoids R, D, O, H, S, … The actions are ranked from high preference (if relevant parts and professional labour skills are available) down to “last help” (if parts or professional labour skills are not available, if a correct diagnosis for definitive repair cannot be established quickly).

- In case of doubt, stop immediately, and ask advice from DHOLLANDIA prior to continuing.

R	• Identify the failure and repair. • Override the starter solenoid as described above. • Apply an external auxiliary battery directly to the electric motor. • Use an external power pack to LIFT and CLOSE the platform back into its travel position.
D, O, B, H, S	• Identify the failure and repair. • Use the manual emergency operation on the valve to actuate the corresponding function.

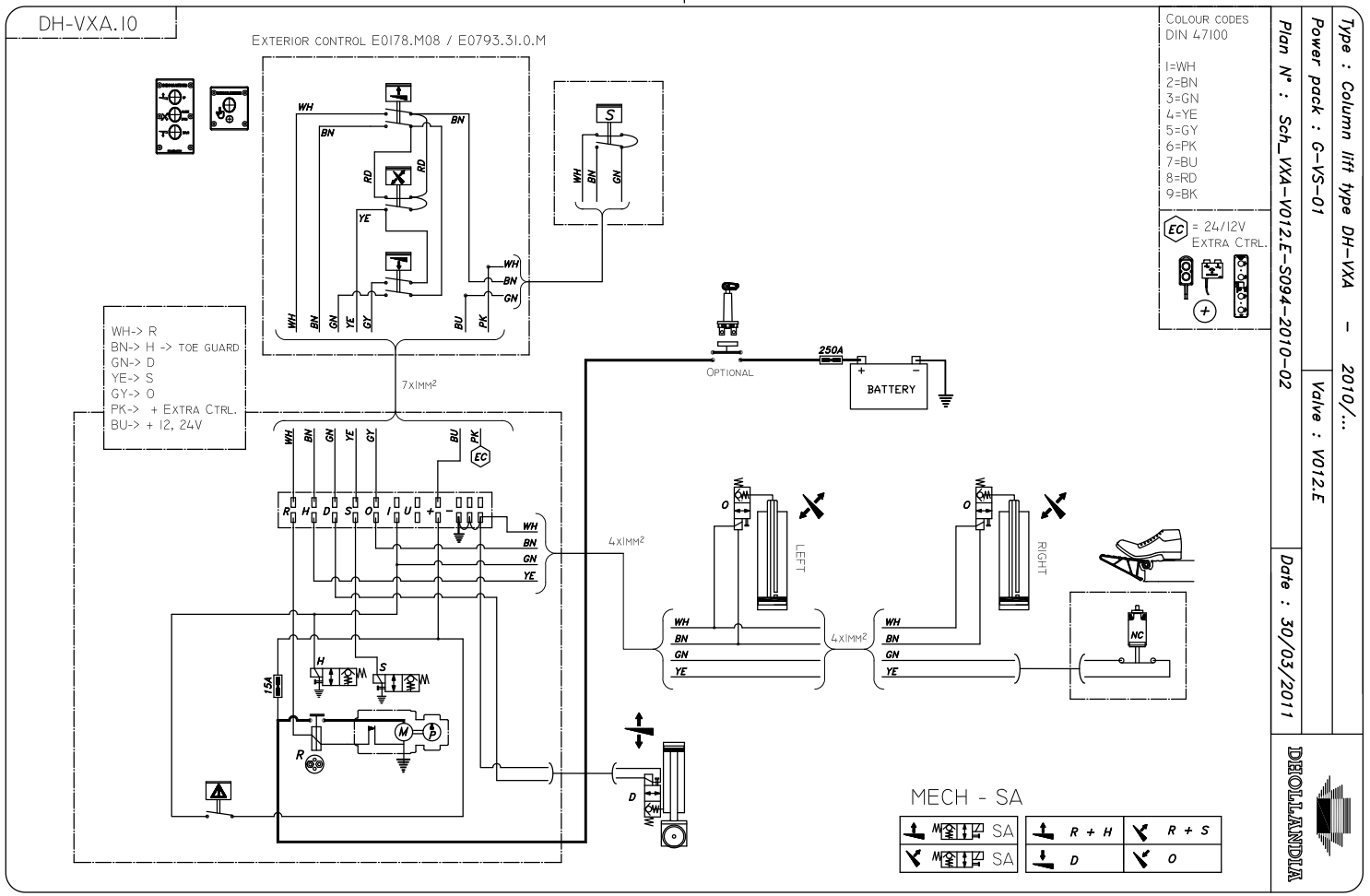
High preference

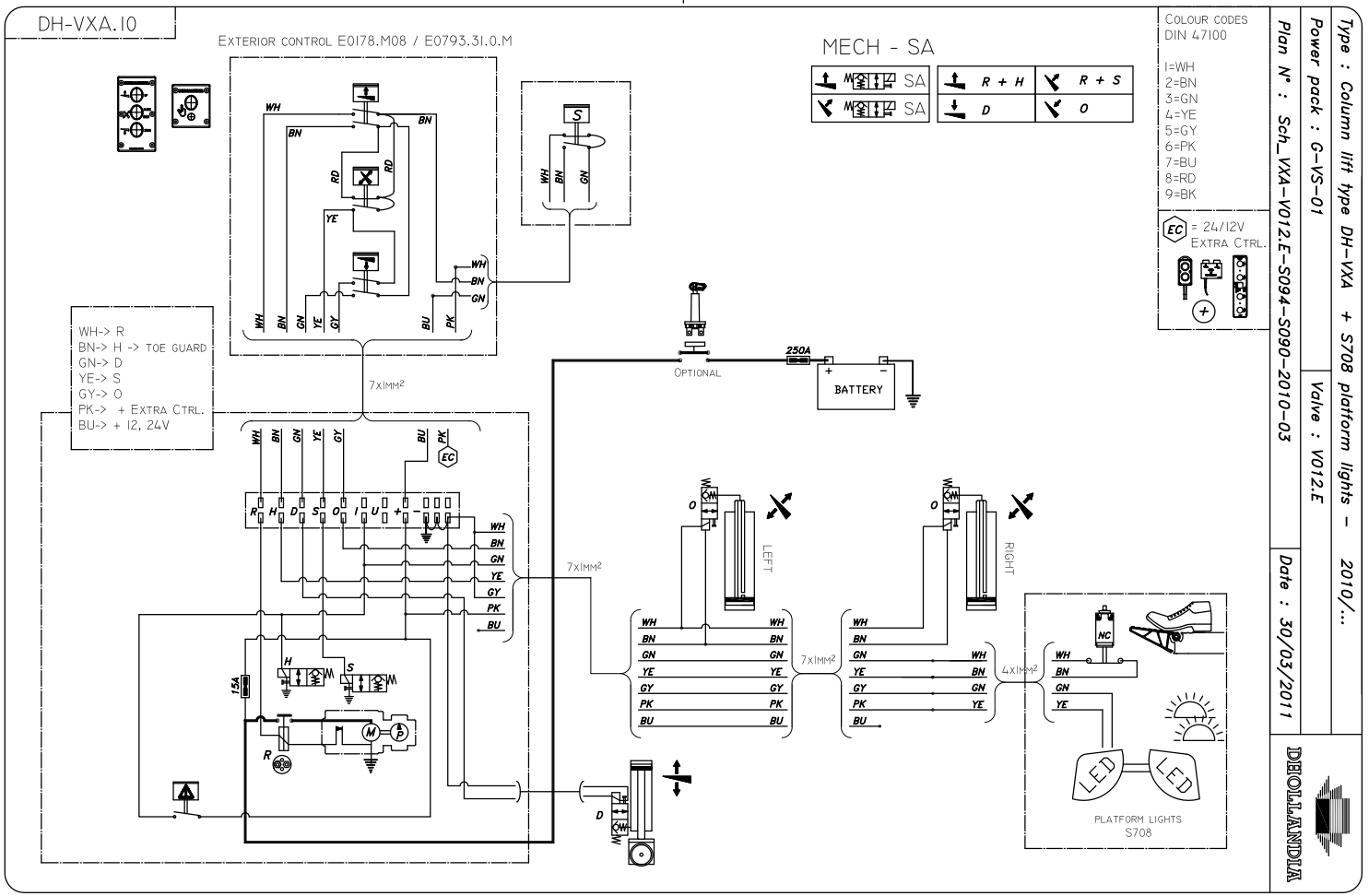
Last help

9. ELECTRICAL & HYDRAULIC WIRING DIAGRAMS

- The following pages contain the main wiring diagrams for DHOLLANDIA tail lifts as supplied in their standard execution.

- In case of special lifts, should the original wiring diagram joined to the lift be lost or unavailable, contact DHOLLANDIA for further help.


DH-VXA.10
EXTERIOR CONTROL E0178.M08 / E0793.3I.0.M
COLOUR CODES DIN 47100
1=WH
2=BN
3=GN
4=YE
5=GY
6=PK
7=BU
8=RD
9=BK
EC = 24/12V EXTRA CTRL.
WH-> R
BN-> H -> TOE GUARD
GN-> D
YE-> S
GY-> O
PK-> + EXTRA CTRL.
BU-> + 12, 24V
7X1MM²
OPTIONAL
250A
BATTERY
4X1MM²
LEFT
RIGHT
15A
MECH - SA
R + H
R + S
D
O
Type : Column lift type DH-VXA - 2010/...
Power pack : G-VS-01
Valve : V012.E
Plan N° : Sch_VXA-V012.E-S094-2010-02
Date : 30/03/2011
DEOLANDA


DH-VXA.10
EXTERIOR CONTROL E0178.M08 / E0793.3I.0.M
MECH - SA
M SA
M SA
R + H
R + S
D
O
COLOUR CODES
DIN 47100
1=WH
2=BN
3=GN
4=YE
5=GY
6=PK
7=BU
8=RD
9=BK
EC = 24/12V
EXTRA CTRL.
WH-> R
BN-> H -> TOE GUARD
GN-> D
YE-> S
GY-> O
PK-> + EXTRA CTRL.
BU-> + 12, 24V
7X1MM²
OPTIONAL
250A
BATTERY
LEFT
RIGHT
4X1MM²
NC
LED
LED
PLATFORM LIGHTS
S708
15A
Type : Column lift type DH-VXA + S708 platform lights - 2010/...
Power pack : G-VS-01
Valve : V012.E
Plan N° : Sch_VXA-V012.F-S094-S090-2010-03
Date : 30/03/2011
DEOLANDA

Type : DH-VXA, VBA, VBC, VBV hydraulic connection diagram - 2002/...

Power pack : Serial N°

Valve : V012.D

Plan N° : Sch_VXA_VBA_VBC_VBV-hydr-2011-01

Date : 01/04/2011

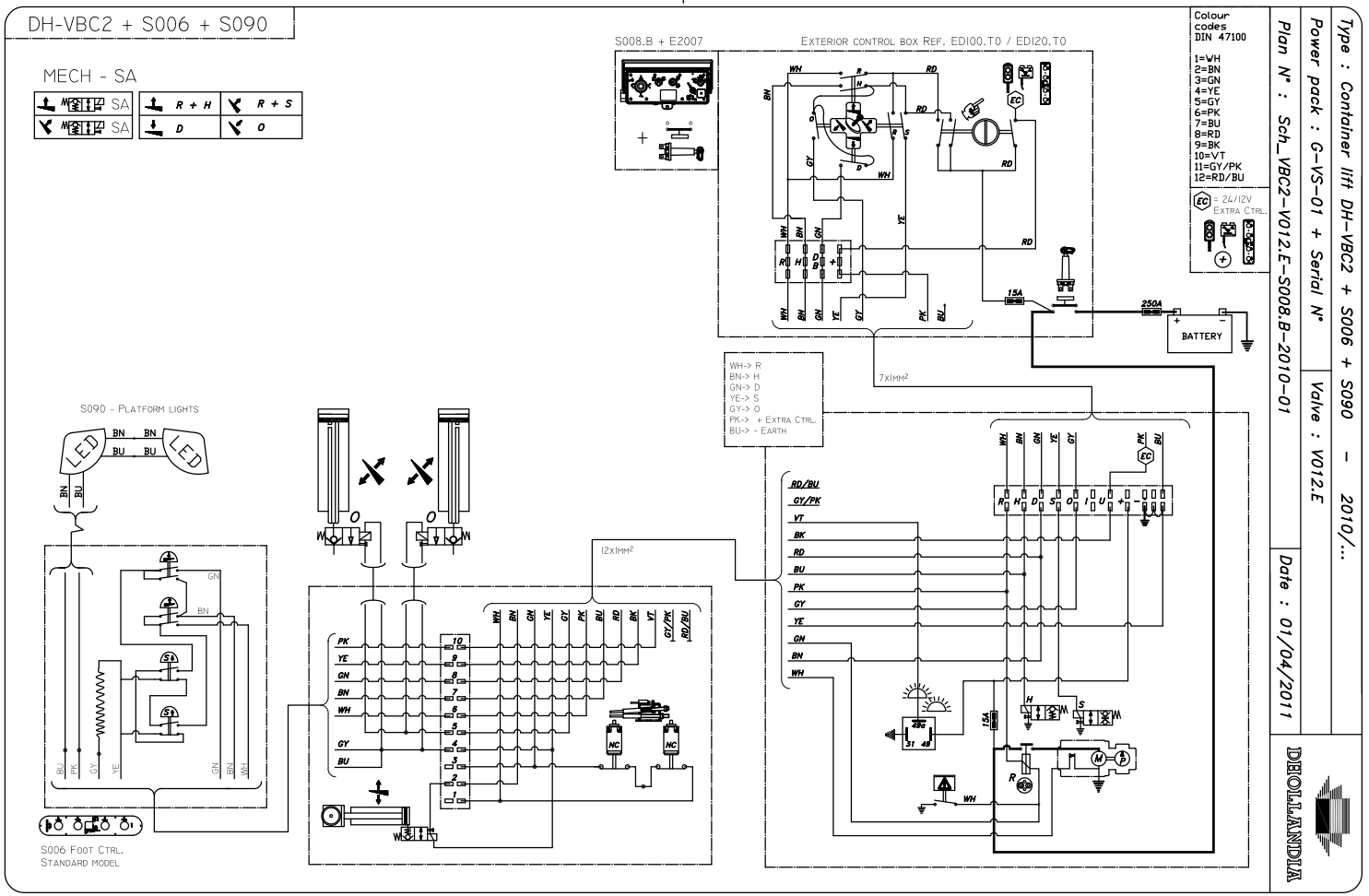
DEOLANDA

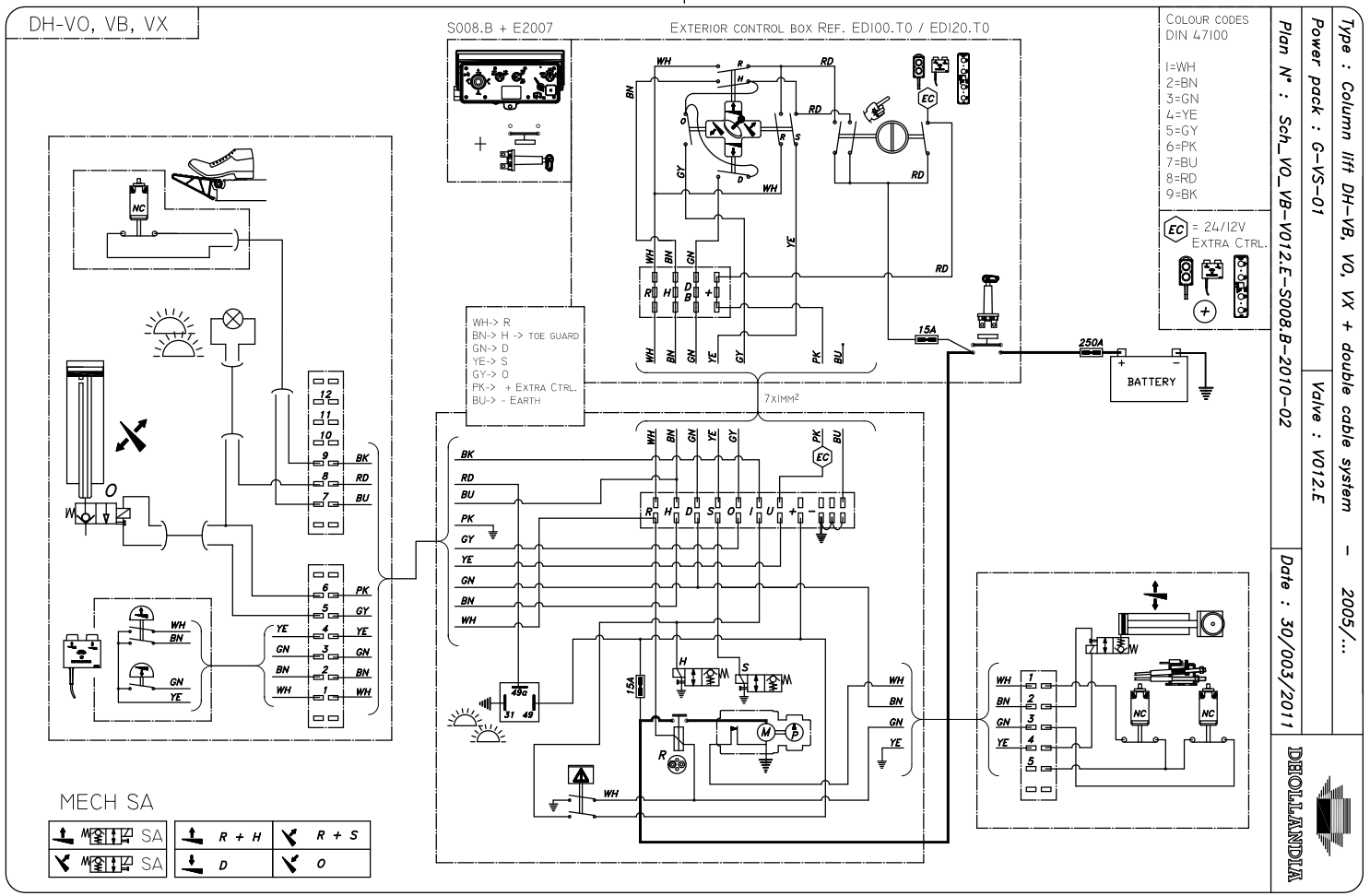
DH-VXA / VBA / VBC

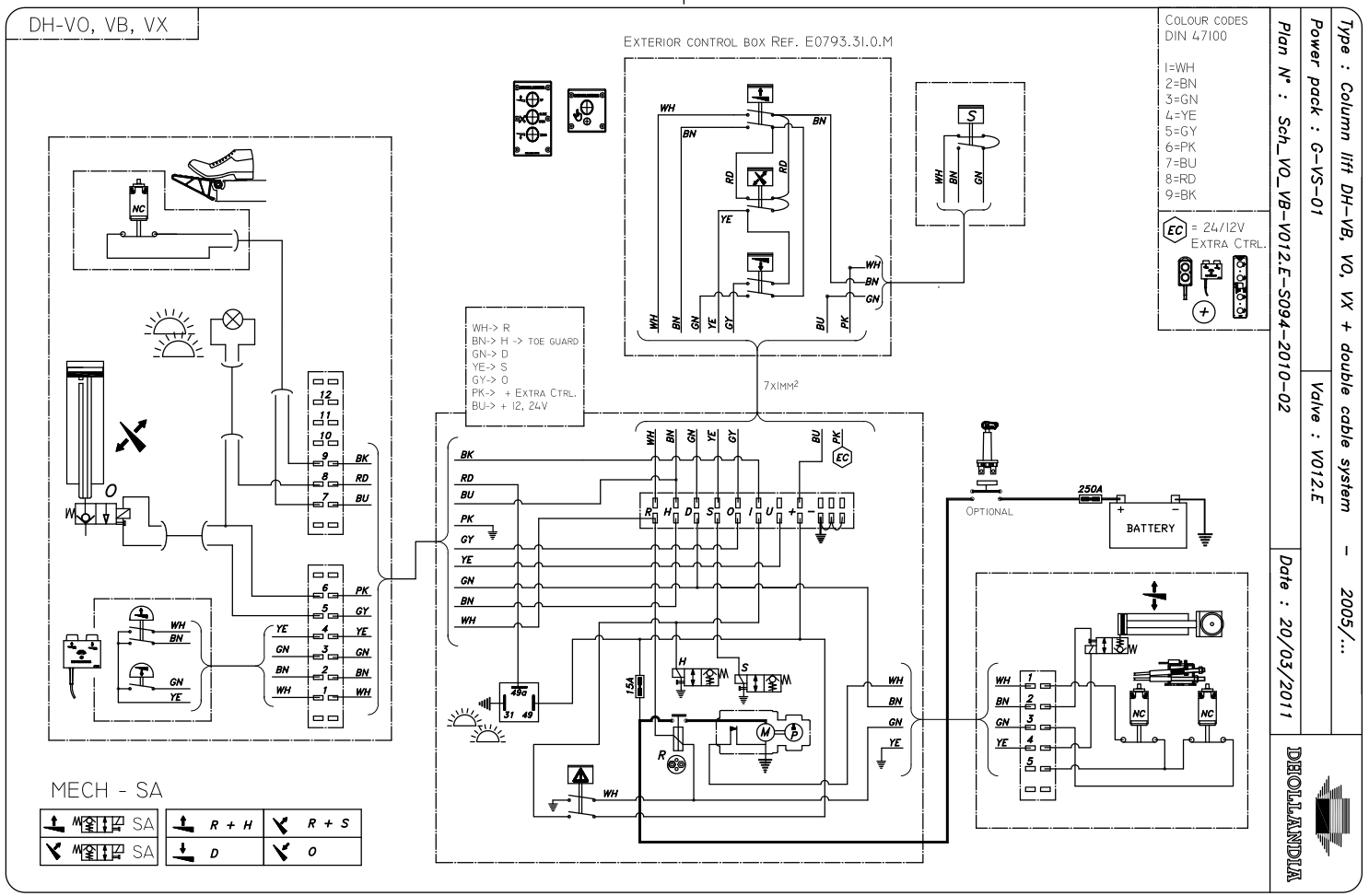
HYDRAULIC CLOSURE WITH 2 TILT CYLINDERS

DH-VBV CATTLE LIFT

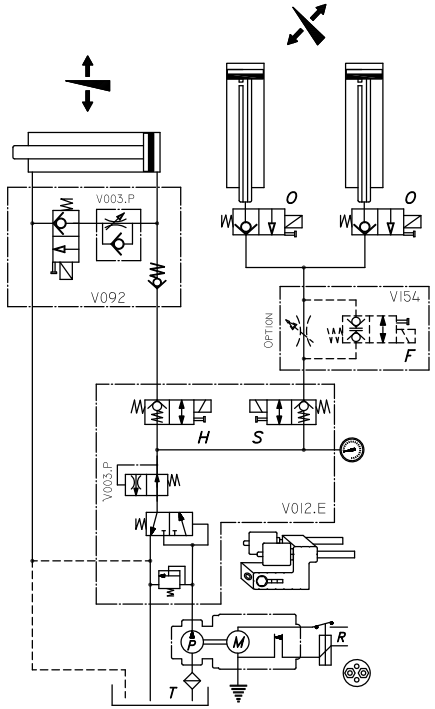
HYDRAULIC CLOSURE WITH 2 TILT CYLINDERS


DH-VBC2 + S006 + S090
MECH - SA
R + H
R + S
D
O
S008.B + E2007
EXTERIOR CONTROL BOX REF. EDI00.T0 / EDI20.T0
Colour codes DIN 47100
1=WH
2=BN
3=GN
4=YE
5=GY
6=PK
7=BU
8=RD
9=BK
10=VT
11=GY/PK
12=RD/BU
EC = 24/12V EXTRA CTRL.
BATTERY
250A
15A
7X1MM²
12X1MM²
WH-> R
BN-> H
GN-> D
YE-> S
GY-> O
PK-> + EXTRA CTRL.
BU-> - EARTH
S090 - PLATFORM LIGHTS
LED
S006 FOOT CTRL.
STANDARD MODEL
Type : Container lift DH-VBC2 + S006 + S090 - 2010/...
Power pack : G-VS-01 + Serial N°
Valve : V012.E
Plan N° : Sch_VBC2-V012.E-S008.B-2010-01
Date : 01/04/2011
DEOLANDA


DH-VO, VB, VX
S008.B + E2007
EXTERIOR CONTROL BOX REF. EDI00.T0 / EDI20.T0
COLOUR CODES DIN 47100
1=WH
2=BN
3=GN
4=YE
5=GY
6=PK
7=BU
8=RD
9=BK
EC = 24/12V EXTRA CTRL.
WH-> R
BN-> H -> TOE GUARD
GN-> D
YE-> S
GY-> O
PK-> + EXTRA CTRL.
BU-> - EARTH
7X1MM²
15A
250A
BATTERY
MECH SA
R + H
R + S
D
O
Type : Column lift DH-VB, VO, VX + double cable system - 2005/...
Power pack : G-VS-01
Valve : V012.E
Plan N° : Sch_VO_VB-V012.E-S008.B-2010-02
Date : 30/003/2011
DEOLANDA


DH-VO, VB, VX
EXTERIOR CONTROL BOX REF. E0793.31.0.M
COLOUR CODES DIN 47100
1=WH
2=BN
3=GN
4=YE
5=GY
6=PK
7=BU
8=RD
9=BK
EC = 24/12V EXTRA CTRL.
WH-> R
BN-> H -> TOE GUARD
GN-> D
YE-> S
GY-> O
PK-> + EXTRA CTRL.
BU-> + 12, 24V
7X1MM²
OPTIONAL
250A
BATTERY
MECH - SA
R + H
R + S
D
O
Type : Column lift DH-VB, VO, VX + double cable system - 2005/...
Power pack : G-VS-01
Valve : V012.E
Plan N° : Sch_VO_VB-V012.E-S094-2010-02
Date : 20/03/2011
DEOLANDA

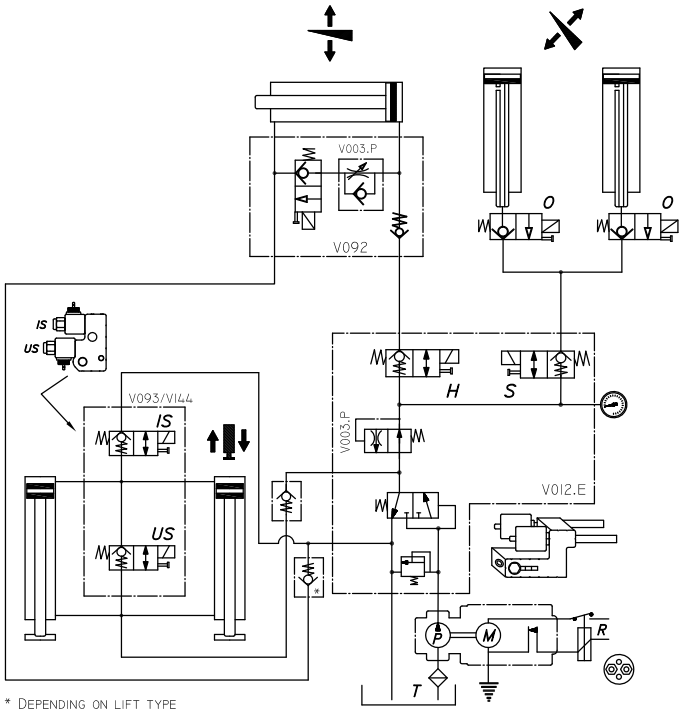
TYPE DH-VB...,, VBV, VO... EXTERNAL LIFT
(+ HYDRAULIC CLOSURE)



MECH - SA

SA	R + H	R + S		
SA	D	O		

TYPE DH-VB..., VO... EXTERNAL LIFT (+ HYDRAULIC CLOSURE)
+ HYDRAULIC STABILISING LEGS



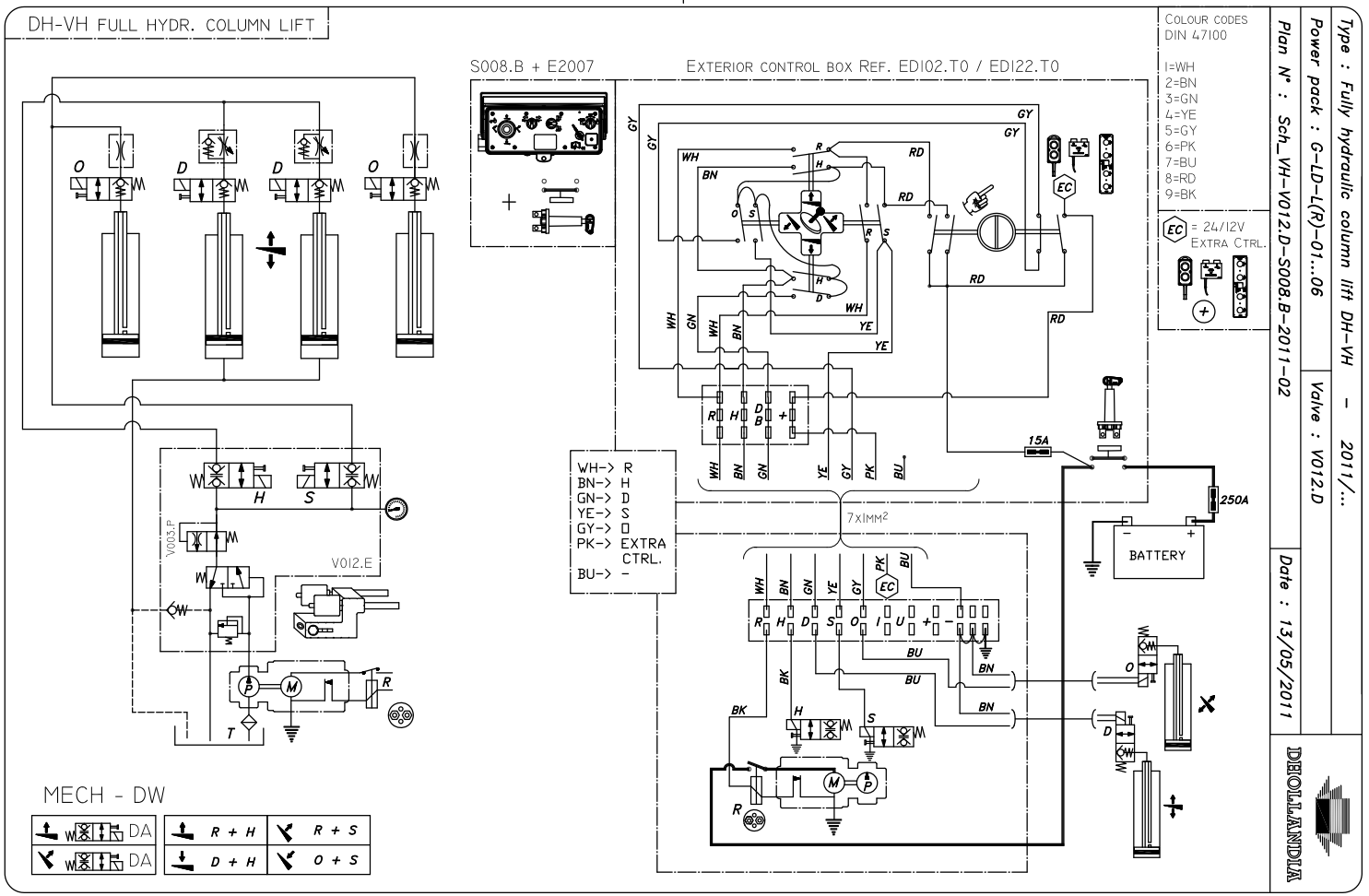
* DEPENDING ON LIFT TYPE

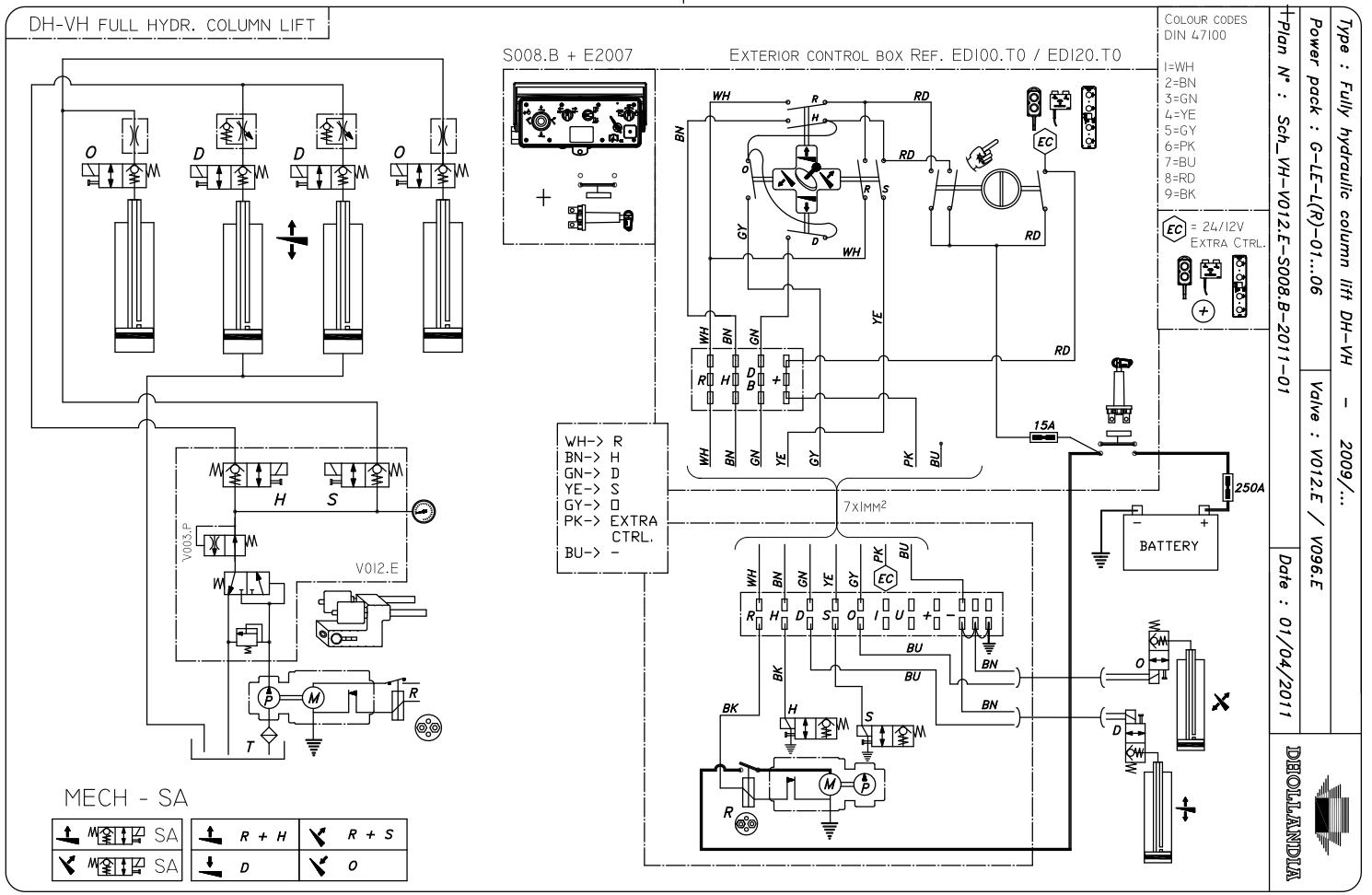
MECH - SA

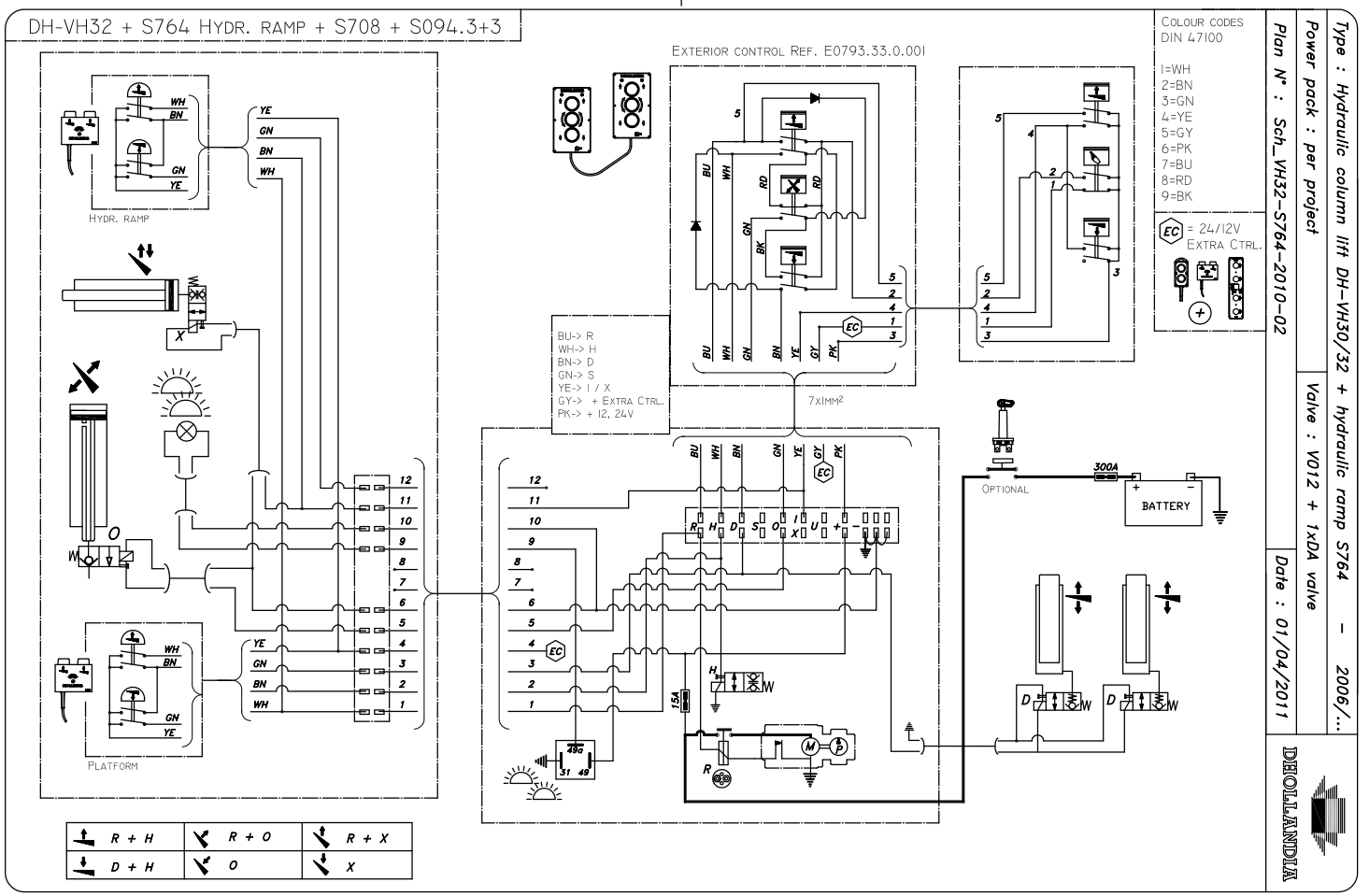
SA	R + H	R + S	R + IS	
SA	D	O	R + US	

Type : Column lift DH-VB, VO, VX + double cable system - 2005/...
Power pack : G-VS-01
Valve : V012.E
Plan N° : Sch_VO_VB-HYDR-2010-02
Date : 30/03/2011

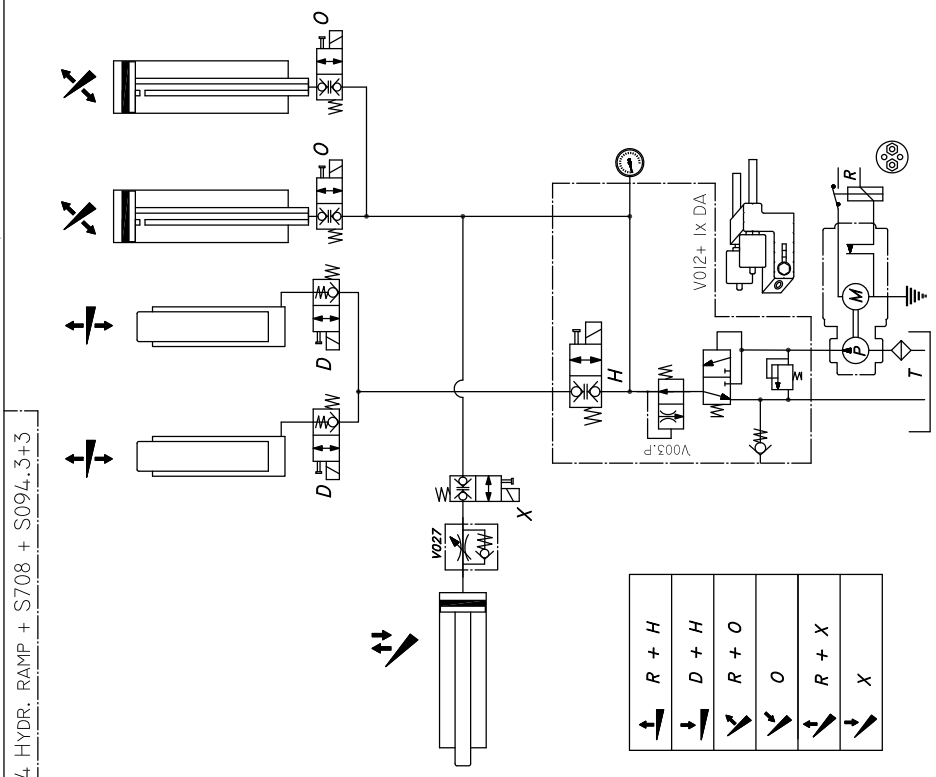
DEOLANDA


DH-VH FULL HYDR. COLUMN LIFT
S008.B + E2007
EXTERIOR CONTROL BOX REF. EDI02.T0 / EDI22.T0
COLOUR CODES DIN 47100
1=WH
2=BN
3=GN
4=YE
5=GY
6=PK
7=BU
8=RD
9=BK
EC = 24/12V EXTRA CTRL.
WH-> R
BN-> H
GN-> D
YE-> S
GY-> O
PK-> EXTRA CTRL.
BU-> -
7X1MM2
15A
250A
BATTERY
V003.P
V012.E
MECH - DW
DA
DA
R + H
R + S
D + H
O + S
Type : Fully hydraulic column lift DH-VH - 2011/...
Power pack : G-LD-L(R)-01...06
Valve : V012.D
Plan N° : Sch_VH-V012.D-S008.B-2011-02
Date : 13/05/2011
DEOLANDA

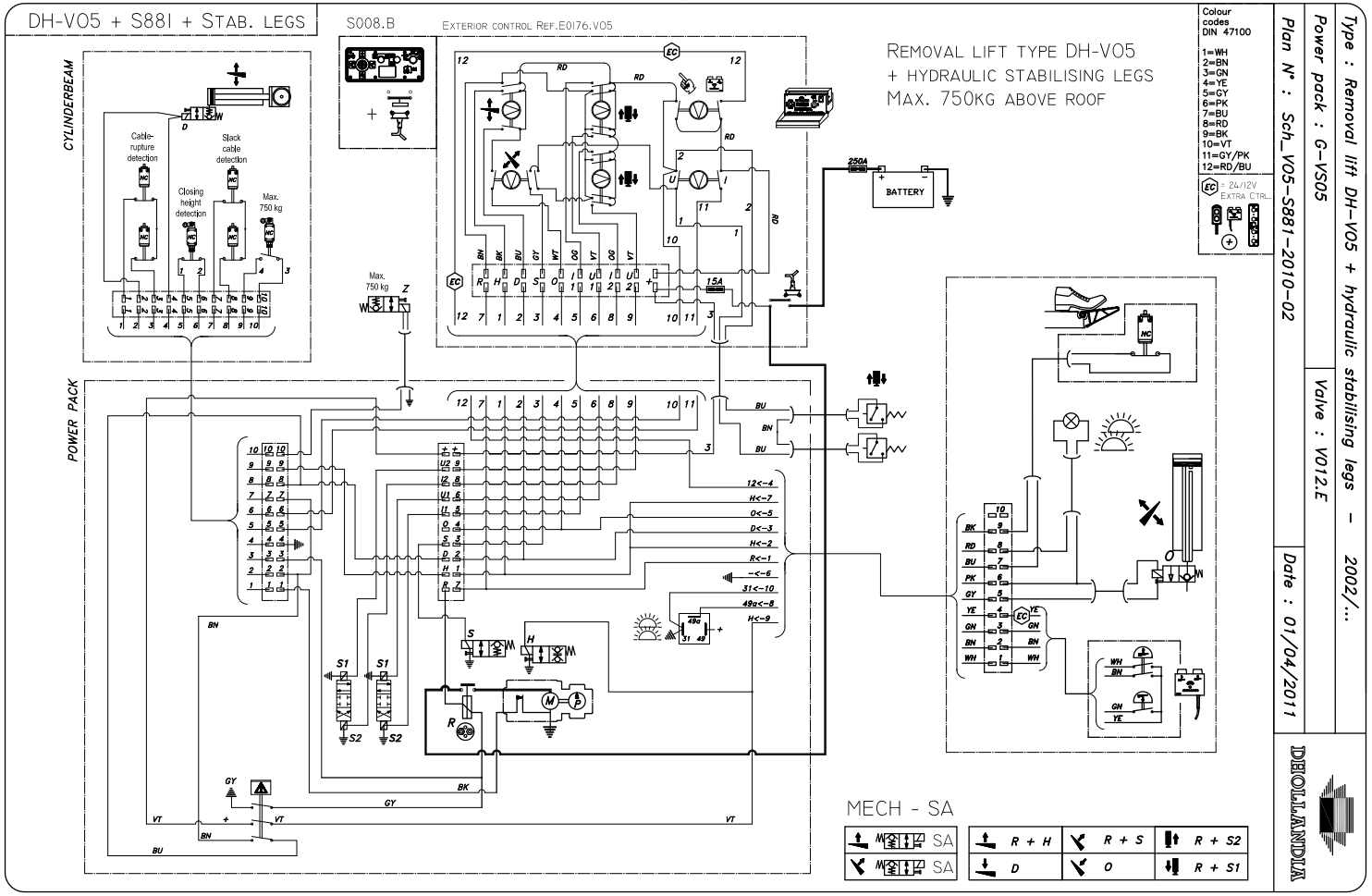

DH-VH FULL HYDR. COLUMN LIFT
S008.B + E2007
EXTERIOR CONTROL BOX REF. EDI00.T0 / EDI20.T0
COLOUR CODES DIN 47100
1=WH
2=BN
3=GN
4=YE
5=GY
6=PK
7=BU
8=RD
9=BK
EC = 24/12V EXTRA CTRL.
WH-> R
BN-> H
GN-> D
YE-> S
GY-> O
PK-> EXTRA CTRL.
BU-> -
7X1MM2
15A
250A
BATTERY
V003.P
V012.E
MECH - SA
SA
SA
R + H
D
R + S
O
Type : Fully hydraulic column lift DH-VH - 2009/...
Power pack : G-LE-L(R)-01...06
Valve : V012.E / V096.E
Plan N° : Sch_VH-V012.E-S008.B-2011-01
Date : 01/04/2011
DEOLANDA

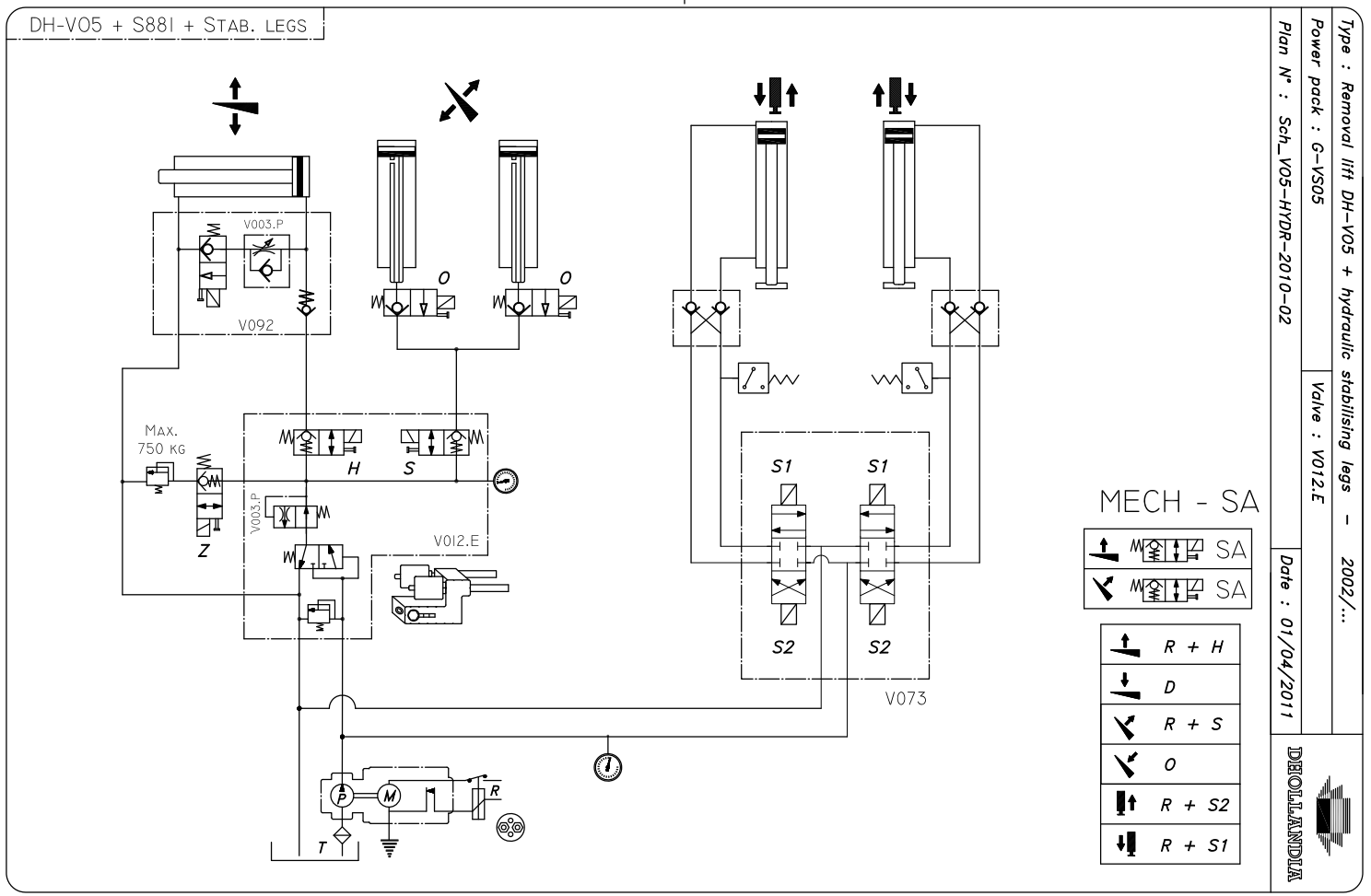

DH-VH32 + S764 HYDR. RAMP + S708 + S094.3+3
EXTERIOR CONTROL REF. E0793.33.0.001
COLOUR CODES DIN 47100
1=WH
2=BN
3=GN
4=YE
5=GY
6=PK
7=BU
8=RD
9=BK
EC = 24/12V EXTRA CTRL.
BU-> R
WH-> H
BN-> D
GN-> S
YE-> I / X
GY-> + EXTRA CTRL.
PK-> + 12, 24V
7XIMM²
HYDR. RAMP
PLATFORM
OPTIONAL
300A
BATTERY
15A
R + H
D + H
R + O
O
R + X
X
Type : Hydraulic column lift DH-VH30/32 + hydraulic ramp S764 - 2006/...
Power pack : per project
Valve : V012 + 1xDA valve
Plan N° : Sch_VH32-S764-2010-02
Date : 01/04/2011
DEOLANDA

Type : Hydraulic column lift DH-VH30/32 + hydraulic ramp S764 - 2006/...		DHOLLANDIA
Power pack : per project	Valve : V012 + 1xDA valve	
Plan N° : Sch_VH32-s764-2010-02	Date : 01/04/2011	



DH-VH32 + S764 HYDR. RAMP + S708 + S094.3+3


DH-V05 + S881 + STAB. LEGS
S008.B
EXTERIOR CONTROL REF.E0176.V05
REMOVAL LIFT TYPE DH-V05
+ HYDRAULIC STABILISING LEGS
MAX. 750KG ABOVE ROOF
CYLINDERBEAM
POWER PACK
Cable-rupture detection
Slack cable detection
Closing height detection
Max. 750 kg
BATTERY
250A
15A
Colour codes DIN 47100
1=WH
2=BN
3=GN
4=YE
5=GY
6=PK
7=BU
8=RD
9=BK
10=VT
11=GY/PK
12=RD/BU
MECH - SA
R + H
R + S
R + S2
D
O
R + S1
Type : Removal lift DH-V05 + hydraulic stabilising legs - 2002/...
Power pack : G-VS05
Plan N° : Sch_V05-S881-2010-02
Valve : V012.E
Date : 01/04/2011
DEOLANDA


DH-V05 + S881 + STAB. LEGS
V003.P
V092
O
O
MAX.
750 KG
H
S
V003.P
Z
V012.E
S1
S1
S2
S2
V073
R
P
M
T
MECH - SA
SA
SA
R + H
D
R + S
O
R + S2
R + S1
Type : Removal lift DH-V05 + hydraulic stabilising legs - 2002/...
Power pack : G-VS05
Valve : V012.E
Plan N° : Sch_V05-HYDR-2010-02
Date : 01/04/2011
DHOLLANDIA

CHAPTER C
COMPULSORY INSPECTIONS & REPORTS

C

1. INTRODUCTORY REMARKS

- Since the 1st of Jan. 1997, all tail lifts sold in one of the EC member states should comply with the European Machine Directives 89/392/EC and 98/37/EC and subsequent amendment 2006/42/EC. As a consequence, all DHOLLANDIA tail lifts are designed and manufactured in accordance with these regulations, and they are carrying the "CE"-mark.
- These 'regulations' include:
  → the CE Machine Directive 89/392/CEE in its most recent version (called CEMD hereafter)
  → the EN-Standards derived from the Directives, that enable manufacturers to prove conformity of their machines with the Directives
  → the national norms that become applicable upon execution of the Machine Directives.
- By means of a Declaration of Conformity (see Chapter 1), the manufacturer confirms that the machines supplied comply with the regulations stated above.

2. INSPECTIONS

- All tail lifts should be subjected to a number of compulsory inspections, as explained below.

§2.1 - Put-into-service test and Fitting Declaration

- All tail lifts are largely pre-assembled and tested by the manufacturer, and receive a CE Declaration of Conformity "Annex II a" covering the design and mode of construction.
- Tail lifts are no stand-alone application though, and must be incorporated into a complete vehicle to become operational. CEMD regards the complete vehicle, including the tail lift and any other ancillary equipment as one single machine. The manufacturer's Declaration of Conformity and the authorisation to put the equipment into service, must be reinforced by a put-into-service test by an expert, and must be validated by a Fitting Declaration.
- The content of this compulsory put-into-service test is explained in Chapter C - Point 4.

§2.2 - Periodic inspections

- Once in service, every tail lift should be inspected periodically, at least once per year, by an expert / competent person to evaluate its condition and suitability for continued use, or if a specific repair or maintenance is required. The findings of these inspections should be summarised in the relevant inspection certificates [see pg. C6 & following]
- In Great-Britain, these periodic inspections are called Statutory Thorough Examinations, and they require a frequency of min. 2 times per year.
- The content of this compulsory periodic inspection is explained in Chapter B - Point 2.

§2.3 - Maintenance & Repair Reports, special inspections, re-inspections

- All maintenance & repair works performed on the tail lift, should be reported in the Maintenance & Repair Reports [see pg. C11 & following], to provide any service agent or safety officer intervening on the lift, with a full history of the works carried out.
- In case of important repair works with significant impact on the structural integrity of the lift or the safe working conditions, the lift should be subjected to a special inspection by an expert / competent person to evaluate if it is safe to continue to use it. The findings of these inspections should be summarised in the relevant inspection certificates [see pg. C6 & following].
- If a tail lift has failed to pass a periodic or special inspection, it should be repaired and be subjected to a further inspection (= re-inspection) by an expert / competent person to evaluate if it is safe to continue to use it after the latest repair. The findings of these inspections should be summarised in the relevant inspection certificates [see pg. C6 & following].
- The content of these compulsory inspections is explained in Chapter B - Point 2.

§2.4 - Expert / competent person

- The expert or competent person (in UK law) is a person appointed by the user or owner of the tail lift. By his expert technical knowledge and experience, and by his expertise in health and safety regulations, he should be qualified to form an impartial judgement regarding the safety and reliability of a tail lift.
- The British ACOP (Approved Code of Practice), Regulation 9 describes it as follows: the owner should ensure that the person carrying out a thorough examination has such appropriate practical and theoretical knowledge and experience of the lifting equipment to be thoroughly examined as will enable them to detect defects or weaknesses and to assess their importance in relation to the safety and continued use of the lifting equipment.
- The expert / competent person should read and use the content of this user's manual, of the technical documentation of the tail lift, and all other information required to execute the various inspections in a professional way.
- The expert / competent person should perform all inspections with due diligence, fill-out all points of the relevant inspection certificates, and sign.

§2.5 - Initiative to organise inspections

The initiative to choose an expert and organise the inspections described above, lies with the owner of the vehicle or fleet operator.

3. VALIDATION OF THE MANUFACTURER'S WARRANTY

- The safety, reliability and durability of any tail lift and its components depends on the quality of the fitting works.

- Therefore, the manufacturer's warranty can only be activated and validated if it has been mounted correctly and professionally to conform with the fitting instructions; if a put-into-service test has been executed with an affirmative result; and if the findings of this test have been duly reported in the relevant inspection certificates.

Warning !

- **DHOLLANDIA** disclaims liability for any personal injury or property damage that results from operating a product that has not been fitted according to the fitting instructions, or if the put-into-service test has been omitted or its findings falsified.

- The Declaration of Conformity, the manufacturer's product liability and the warranty are voided in case of disregard in this respect.

4. SCOPE OF THE PUT-INTO-SERVICE TEST

- The put-into-service test [see also §2.1] comprises of:
  → a visual inspection on the fitting work of the tail lift on the vehicle chassis, and of the various aspects determining the operational safety of the tail lift;
  → a series of static and dynamic weight tests.

- Most points of the visual inspection will be executed through practical tests without load. The test shall allow the expert to evaluate if the tail lift has been incorporated on the vehicle chassis in accordance to the manufacturer's fitting instructions, if the tail lift is safe to be used, if it can be operated safely & correctly from all existing controls, if it can execute all functions smoothly, without unexpected movements or sounds.

- The content of this compulsory put-into-service test is explained hereunder.

FITTING DECLARATION (by installer of the tail lift)

Name & address of the fitting company :

Name & function of the inspector :

By means of this Fitting Declaration, I declare that the tail lift identified in the Declaration of Conformity in this manual has been fitted conform to the fitting instructions from the manufacturer, and that the put-into-service test has been executed with affirmative result. As a consequence, the tail lift has been found suitable for use in its fitted condition.

The following results have been noted:

- The vehicle is technically suitable for the installation and use of the tail lift concerned ☐ YES ☐ NO
- The installation has been executed conform to the fitting instructions of Dhollandia, and the put-into-service test has been executed following the instructions of this manual ☐ YES ☐ NO
- After weight testing with nominal capacity, the hydraulic pressure has been at : …… BAR

Remarks :

Date : Signature of the inspector :

CHECKLIST FOR THE PUT-INTO-SERVICE TEST

§4.1 - General inspection on the fitting parameters	
The vehicle is technically suitable for the type of lift and its nominal capacity.	
The requirement for mechanical or hydraulic stabilising legs has been checked, and been fulfilled (if applicable).	
The actual fitting dimensions don't exceed the theoretical maximum fitting dimensions mentioned in the fitting drawings.	
The lift has been fitted to conform with the fitting instructions of DHOLLANDIA, and the Fitting & Body Building instructions from the vehicle manufacturer.	
All safety decals & labels (identification sticker, decal with user's pictograms, decal with load diagram, …) have been fitted conform with the fitting instructions.	

§4.2 - Inspection of the mechanical part	
The size, number and spread of mounting bolts and / or welding seams conform with the fitting instructions. All mounting bolts are fastened to the prescribed torques. Check for potential deformation after weight testing.	
All welding has been performed by qualified welders.	
All articulation pins are properly fastened and locked.	
The lift columns are adequately greased.	
End stops have been mounted to stop the lift runners and the platform flush with the vehicle loading floor.	
The lift columns are equipped with locking pins under the platform	

§4.3 - Inspection of the electrical part	
Voltage of the lift is compatible with voltage of the vehicle. The foreseen batteries & alternator suit the lift capacity, application & frequency of use.	
The cabin switch in the driver's cabin, and the battery switch of the exterior control box function OK.	
...	
...	
The main fuse, the battery and earth cables are fitted correctly and conform to the fitting instructions, all bolted connections of cables and fuses are properly tightened.	
The position of the exterior control box conforms to the fitting instructions.	
The power feed to all auxiliary controls is wired into the safety switch on the exterior control panel. When the exterior control box is alive, non of the auxiliary control units is activated, and vice versa.	
The "hold-to-run" principle works on all control units: any ongoing movement should immediately stop when one of the corresponding switches is released.	
The cables going to the platform (platform lights, foot controls, …) are properly routed, and cannot be damaged during the various movements of the lift.	
The function LOWER is signalled by a well audible sound alarm	

§4.4 - Inspection of the hydraulic part	
There are no visible oil leaks after the weight tests, all cylinders are free from paint remainders.	
The hydraulic circuits have been purged conform to the fitting instructions.	
During the various movements of the lift, the flexible oil pipes stay clear from the the vehicle chassis & body. They cannot be damaged by rubbing, squeezing, ...	

§4.5 - Inspection of the platform	
The centre of gravity is correctly marked, and corresponds with the data mentioned on the identification sticker in the exterior control box.	
The safe working zone for the operator is clearly and permanently marked on the platform (If applicable).	
The platform is equipped with a suitable toe-guard protection according to Chapter A §5.4. In case of a toe-guard flap + switch, the platform stops the LIFT function as soon as the toe-guard flap is pushed in.	
The emergency push button for the toe-guard switch (mounted on the power pack) functions OK.	
...	

...	
The platform is made sufficiently visible for the surrounding traffic (platform lights, flags, reflective tape, traffic cones,…)	
For all lifting heights ≥2000mm, and applications < 2000mm with a significant risk of falling from heights, the platform is equipped with safety rails on all exposed edges.	

§4.6 - Inspection of the suspension system	
For lifts with a single cable or single chain system, test the LSD [see Pt. 4 in Chapter B	
For lifts with a double cable system (1 set of lift cables, 1 set of safety cables), test the cable rupture detection switches [see Pt. 5 in Chapter B]	
The emergency push button for the cable rupture switches (mounted on the power pack) functions OK.	

§4.7- General operation, practical tests	
General operation with an empty platform: execute all movements several times with ALL available control units. The movements should be executed smoothly & quietly, without strange noises.	
Static test at 125% overload - Test for deformation • Position the platform at 1/2 height. • Note the distance and angle to the vehicle floor. • Put a load of 1.25 x nominal capacity at the centre of gravity, and remove it again. • Verify the distance and angle to the vehicle floor. No permanent deformation should be noted.	
Static test at 125% overload -Test on inclination • Position the platform at the level of the vehicle floor. • Put a load of 1.25 x nominal capacity at the centre of gravity. • Note the distance and angle to the vehicle floor. • Repeat the same measurements after 15 min. • The platform should not be lowered more than 15 mm, and should not be tilted down more than 2°.	
...	

...	
Dynamic test at 100% nominal capacity • Verify if the lift has sufficient lift capacity. • Verify the general performance & stability. • DH-VO5: verify if the lift capacity is limited to 500kg above roof level • Verify the working speeds: → LIFT & LOWER: max. 15 cm/sec → OPEN & CLOSE: max. 10°/sec → AUTOMATIC TILT at ground level: max. 4°/sec	
Overload test - Limitation of the lift capacity • Place the platform at rest on the ground. • Put a load of 1x nominal capacity at the centre of gravity; adjust the hydraulic pressure on the pressure relief valve so that the nominal capacity is just reached. Seal the pressure relief valve after final adjustment. • Put a load of 1.25x nominal capacity at the centre of gravity; the platform should not be able to lift vertically.	

§4.8 - European homologation of the bumper bars

- Upon technical vehicle inspection, compliance of the vehicle with the European Directive for rear bumper bars (2006/20/EG) will be checked.
- In case of slider lifts, the platform functions as bumper bar, and it is homologated as such. In case of cantilever, tuck-away or column lifts, an additional bumper bar with official homologation is available as an option.
- Remark: DHOLLANDIA's homologations only cover the equipment in their original delivery format, and mounted conform to DHOLLANDIA's fitting instructions.

- If needed, the homologations can be downloaded from the internet. See : www.dhollandia.com > Downloads > Bumper certificates after 2007

INSPECTION CERTIFICATE for:

☐ PERIODIC INSPECTION ☐ SPECIAL INSPECTION ☐ RE-INSPECTION

Date of inspection :

The tail lift identified in the Declaration of Conformity has been inspected on its operational safety and reliability.

☐ During this inspection, no imperfections have been found, or

☐ During this inspections, the following shortcomings have been identified:

Scope of the inspection :

Partial inspections to follow :

Evaluation : the tail lift is safe and suitable for further use ?

☐ YES ☐ NO

Place, date :

Name & function of the expert :
Name & address of the inspection body :

Follow-up by the owner or fleet operator

☐ Shortcomings have been acknowledged

☐ Shortcomings have been repaired

Place, date :

Name & signature of the owner or fleet operator :

INSPECTION CERTIFICATE for:

☐ PERIODIC INSPECTION ☐ SPECIAL INSPECTION ☐ RE-INSPECTION

Date of inspection :

The tail lift identified in the Declaration of Conformity has been inspected on its operational safety and reliability.

☐ During this inspection, no imperfections have been found, or

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Scope of the inspection :

Partial inspections to follow :

Evaluation : the tail lift is safe and suitable for further use ?

☐ YES ☐ NO

Place, date :

Name & function of the expert :
Name & address of the inspection body :

Follow-up by the owner or fleet operator

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Place, date :

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INSPECTION CERTIFICATE for:

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Partial inspections to follow :

Evaluation : the tail lift is safe and suitable for further use ?

☐ YES ☐ NO

Place, date :

Name & function of the expert :
Name & address of the inspection body :

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Scope of the inspection :

Partial inspections to follow :

Evaluation : the tail lift is safe and suitable for further use ?

☐ YES ☐ NO

Place, date :

Name & function of the expert :
Name & address of the inspection body :

Follow-up by the owner or fleet operator

☐ Shortcomings have been acknowledged

☐ Shortcomings have been repaired

Place, date :

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Evaluation : the tail lift is safe and suitable for further use ?

☐ YES ☐ NO

Place, date :

Name & function of the expert :
Name & address of the inspection body :

Follow-up by the owner or fleet operator

☐ Shortcomings have been acknowledged

☐ Shortcomings have been repaired

Place, date :

Name & signature of the owner or fleet operator :

MAINTENANCE & REPAIR REPORTS		
DATE	NATURE OF THE REPAIR OR MAINTENANCE	IDENTIFICATION OF SERVICE AGENT

MAINTENANCE & REPAIR REPORTS		
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5. PUWER & LOLER IN GREAT-BRITAIN

- The CE Machine Directives apply to the manufacturers of all kinds of machines, including tail lifts, and require that machines are designed and manufactured to be safe.

- The Government of Great Britain has complemented these CE Directives with a legislation called PUWER (The Provision and Use of Work Equipment Regulations 1998) and LOLER (The Lifting Operations and Lifting Equipment Regulations 1998), which focuses on the users of the same machinery.

- PUWER and LOLER fall under UK criminal law, and neglect or failure to comply with the previsions can lead to financial penalties or imprisonment.

- This legislation imposes following obligations on owners / fleet operators:
  → Operate safely.
  → Carry out a risk assessment of your operation.
  → Set up a formal maintenance plan.
  → Ensure that both lift users and service personnel are trained, and that they have written instructions.
  → Ensure that lifts are safe. Lifts provided after 1997 should meet the Machinery Directive.
  → Plan lifting operations, and ensure they are supervised.
  → Appoint a "competent person".
  → This appointed "competent person" should establish a thorough examination procedure (minimum every six months).
  → Rectify any reported defects.

§5.1 - PUWER = the Provision and Use of Work Equipment Regulations 1998

- Applies to all work equipment, including tail lifts, but also includes vehicles.
- Strengthens the requirements of the Management of Health and Safety at work Regulations 1992.
- Stipulates that vehicles and lifts must be maintained in a good state of repair.
- Only competent, trained people should operate, repair and service the equipment.
- Lifts supplied from 1993 - 1996 may require upgrading to meet the Essential Safety Requirements of the Machinery Directive.
- For more information, refer to "Safe Use of Work Equipment" ACOP and guidance L22 HSE Books 1998 ISBN 0 7176 16266.

§5.2 - LOLER = the Lifting Operations and Lifting Equipment Regulations 1998

- Employers must ensure that the lifting equipment, its mounting and the load itself are adequately strong.
- Tail lifts, which lift people, must be operated in a way that avoids risks to operators or passengers.
- Employers should be sure that the lift has been installed properly, and that in use the vehicle and tail lift are positioned so as to ensure safe working conditions for operators and bystanders.
- Lifting tasks must be planned, supervised and carried out safely.
- The tail lifts must be thoroughly examined after they have been installed on the vehicle, and before they are first used. In service, they must be thoroughly examined at least every 6 months. The content of these thorough examinations is defined not by the tail lift manufacturer (*), but by a "competent person" appointed, normally from outside the company, by the user of the equipment. He will report any defects and specify the time within which they must be rectified.
- Whilst this examination may well include testing, there is no legal requirement (*) for a weight test to be performed every six months.
- For more information, refer to "Safe Use of Lifting Equipment" ACOP and guidance L113 HSE Books ISBN 0 7176 16282.

(*) Remark : the particular and national character of the Puwer and Loler regulations don't liberate the users and owners of DHOLLANDIA tail lifts in any way of the full requirements with regards to periodic servicing and testing, reporting,...described in the user's manual. DHOLLANDIA's own written instructions are of prime importance to comply with the overall CE-Safety Directives, with DHOLLANDIA's code of good practice re. maintenance, and with the validation of the product warranty.

6. INTERNATIONAL DISTRIBUTOR NETWORK

Australia	Tieman Industries PTY LTD, Melbourne	(+61) 3 9469 6700
Austria	Dhollandia Austria, Neuhofen im Innkreis	(+43) 7752 70 270
Baltic states (Estonia, Latvia, Lithuania)	Dhollandia Latvia, Riga	(+371) 28 305 904
Belgium & Luxemburg	Dhollandia Service, Lokeren	(+32) 9 349 06 92
Brazil	Dhollandia Brasil, Sumaré	(+55) 19 3832 4000
Bulgaria	Dhollandia Bulgaria, Sofia	(+359) 2 870 42 76
Czech Republic	Dhollandia Czech Republic, Troubsko	(+420) 545 232 603
Denmark	Dhollandia branch ~IKJ, Abenraa	(+45) 45 70 0201
Finland	Dhollandia branch, Helsinki	(+358) 45 26 90077
France	Dhollandia France, Argenteuil	(+33) 134 11 74 00
	Free service number	(+33) 825 042 966
Germany	Dhollandia Germany, Hamburg	(+49) 40-76 11 96-0
Great-Britain	Dhollandia UK, Huntingdon	(+44) 1480 435 266
	Free service number	0800 0855 141
Greece	Smyrliadis Truck & Trailer, Athens	(+30) 210 816 12 18
Hungary	Liberatus, Budapest	(+36) 23 312 398
Ireland	Ballinlough Refrigeration, Dublin	(+353) 146 00 322
Israel	Amir Engineering, Petach-Tikva	(+972) 39 222 750
Italy	Dhollandia Italy, Diegaro die Cesena	(+39) 0547 347 615
Kuwait	Bader al Mulla, Kuwait	(+965) 48 15 077
Malta	Alexander Xerri, Qormi	(+356) 21 470 900
Netherlands	Dhollandia Netherlands, Breda	(+31) 765 81 14 55
Norway	Dhollandia Norway, Oslo	(+47) 98221333
Poland	Dhollandia Poland, Krakow	(+48) 12 260 61 10
Portugal	Dhollandia Plataformas,Villa Franca de Xira	(+351) 263 286 570
Romania	Dhollandia Romania, Bucharest	(+40) 744 571 655
Russia	Dhollandia Russia, Moscow	(+7) 916 531 36 00
Saudi-Arabia	Alaa Industrial Equipment, Damman	(+966) 1448 4482
Slovakia	Dhollandia CE, Predmier	(+421) 41 500 10 80
South-Africa	Grenco, Capetown	(+27) 21 555 90 00
Spain	Dhollandia Spain, Madrid	(+34) 91 877 16 50
	Reder System, Barcelona	(+34) 937 18 09 94
Sweden	Dhollandia Sweden, Alvesta	(+46) 8 594 63 400
Switzerland	Dhollandia Vertretung, Müllheim	(+41) 52 762 77 00
Ukraine	Dhollandia Ukraine, Kiev	(+380) 44 492 86 49
United Arab Emirates	Hytec, Dubai	(+971) 4 333 13 99

The national distributors can help you to locate the nearest Dhollandia service centre.

See www.dhollandia.com for the latest update on the service network