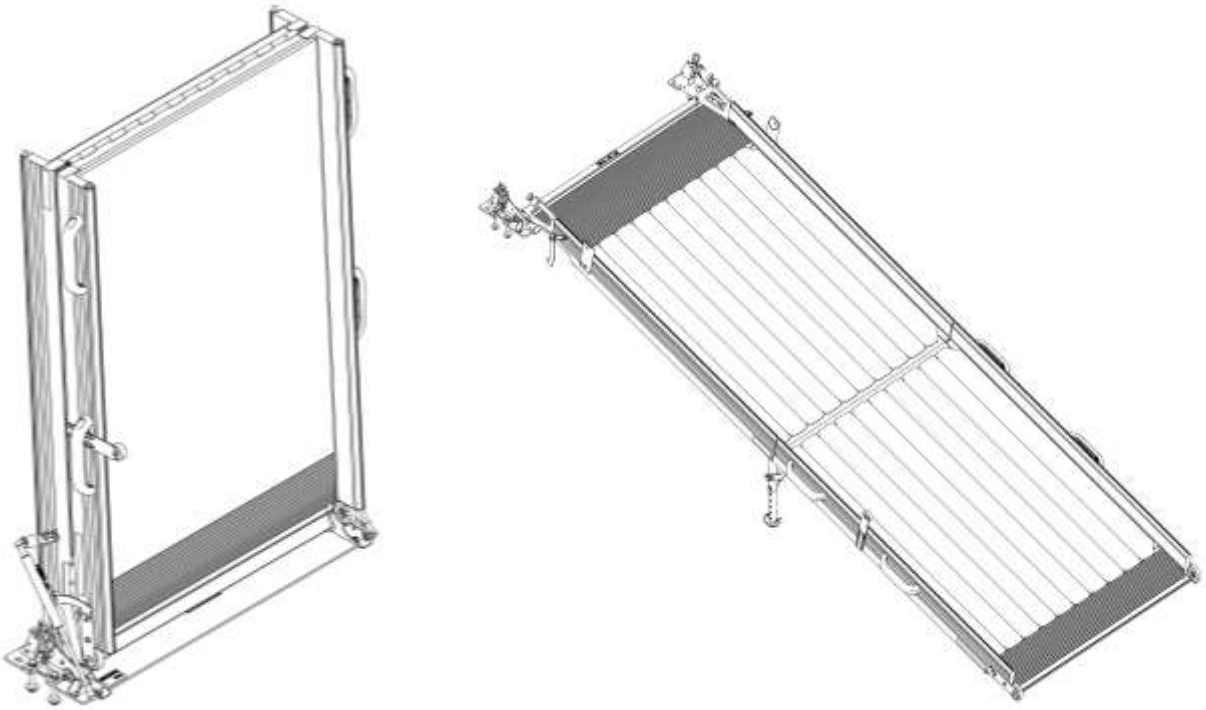
CE
edition

DHOLLANDIA

DH-AI12.04.01/10.01
DH-AI13.04.01
DH-AI02.04.01
INSTALLATION MANUAL



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website : www.dhollandia.com

Read the manual in its entirety before operating the lift

Keep this manual in the vehicle cab, as reference for the driver and lift operator

Order ref: xxx Doc: **FIT_DH-AI series_CE_EN_2021** Rev: 1 Date: JUL 10, 2021

TABLE OF CONTENTS

1 UNDERSTANDING SAFETY AND WARNING SIGNS

- Many safety signs and symbols used in this manual are based on international standards, others refer to specific situations or actions.
- Consult section 11.1 for an overview of signs and symbols used in DHOLLANDIA manuals and their meaning.
- Please take special notice of the following signs used in the manual. They indicate the likelihood and severity of a potential injury if a person fails to follow the instructions presented on the safety sign.

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

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

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

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

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

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

WARNING

- Failure to understand and to follow the instructions in this manual can put the operator and any bystanders at great risk of serious bodily injury and death.
- Prior to operating the ramp, make sure you understand the safety and warning signs used, and read them in conjunction with the instructions in this manual.
- If in doubt, DO NOT operate the ramp. Contact your national DHOLLANDIA distributor. See page 3 for contact info.

2 CONTACT INFORMATION AND DISCLAIMERS

- DHOLLANDIA products are regularly being adapted to new vehicle and chassis developments and specialized 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.

NOTICE

Please confirm you have reviewed the most up-to-date version of this manual prior to operation of the associated DHOLLANDIA ramp. See below for instructions to download the latest version of the manual.

- Contact your national DHOLLANDIA distributor if you have any questions regarding the installation, operation, repair and maintenance of DHOLLANDIA lifts and ramps, to obtain replacement copies of manuals or decals, or to learn about available equipment options for DHOLLANDIA lifts and ramps.

If in doubt where to find your national DHOLLANDIA distributor, visit the official DHOLLANDIA website

www.dhollandia.com → Country selection / language selection → Distributors & service

The latest version of all manuals can also be downloaded from the DHOLLANDIA website

www.dhollandia.com → Country selection / language selection → Downloads → Operation manuals → … select required manual

- Take notice of following important disclaimers:

DISCLAIMERS

- DHOLLANDIA disclaims liability for any personal injury, death or property damage that results from **operating a ramp that has been modified from the original design**, without explicit written approval from the manufacturer.
- DHOLLANDIA disclaims liability for any personal injury, death or property damage that results from the **use of aftermarket or non-OEM replacement parts for service or repair of the ramp**.
- DHOLLANDIA disclaims liability for any personal injury, death or property damage that results from **improper use of the ramp**.
- DHOLLANDIA disclaims liability for any personal injury, death or property damage that results from **overloading or improperly loading the platform**, disregard of the maximum rated capacity and the applicable load charts.
- There are no warranties, express or implied, including the warranty of merchantability or a warranty of fitness for a particular purpose extending beyond that set forth in this manual.

3 SAFETY PRECAUTIONS FOR THE OPERATION

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

⚠ WARNING

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

4 SAFETY PRECAUTIONS FOR THE INSTALLATION

- It is essential that the personnel involved in installing, servicing and repairing ramps, knows, understands and applies the safety instructions and precautions contained in the GENERAL SAFETY INSTRUCTIONS FOR INSTALLATION, MAINTENANCE AND REPAIR manual.
- Make sure you consult these instructions prior to installing the ramp.
- Safety instructions are a matter of progressive insight. The basics are listed in this manual, but contact the national DHOLLANDIA distributor for a copy of the latest set of instructions [see contact info on page 3, or download the latest edition from the DHOLLANDIA website:

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

⚠ WARNING

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

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

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

NOTICE

DHOLLANDIA ramps are designed as a bolt-on system, and usually don't require any welding. See Appendix 2 for prescribed torque values for bolts and nuts.

- If for any reason, welding would be required, check first if this is allowed by the vehicle manufacturer and take note of the following precautions:

⚠ CAUTION	
	Welding on galvanised parts can produce hazardous fumes. To avoid intoxication: • ALWAYS wear a suitable respirator. • ALWAYS provide good ventilation. • ALWAYS grind off the galvanisation from the areas to weld.
	Welding can cause severe damage to the electronic components of the vehicle and ramp or lift. To prevent damage: • ALWAYS follow the instructions and precautions of the vehicle manufacturer. • DO NOT weld if this is not authorised by the vehicle manufacturer. • ALWAYS disconnect the positive and negative battery terminals. • ALWAYS connect the earth directly to the component being welded, as close to the weld as possible. Welding should be done by skilled and qualified installers only.

5 DESCRIPTION AND TERMINOLOGY

- The DH-AI ramps are designed as a multi-purpose solution. They can be used for wheelchair access to assist wheelchair occupants or persons with an impaired mobility embark and disembark the vehicle. And they can be used as a commercial ramp, used to load and unload cargo.
- Ramps for wheelchair access are usually finished with a mesh aluminum platform surface [option OAP821.0]. A perforated aluminum plate with non-slip buds is available as an option OAP822.1.
- As the ramps come in different versions, it is important to check the capacity of your specific ramp.
- DHOLLANDIA lifts and ramps are developed and manufactured using state-of-the-art technology, high quality materials and components, and highly skilled workmanship. They comply with the European CE safety regulations mentioned in the Declaration of Conformity issued with each lift and ramp (unless otherwise agreed for lifts exported outside the CE region).

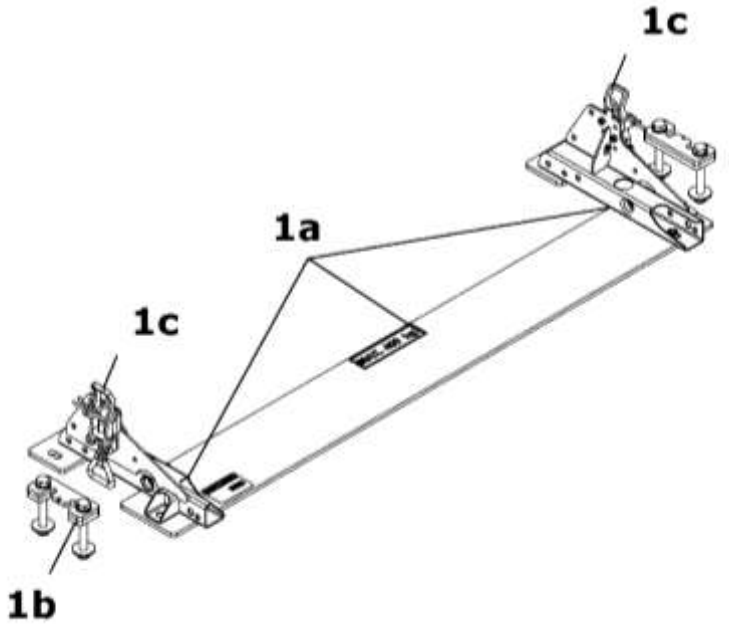
- The DH-AI are opened and closed manually, assisted by powerful gas cylinders. DH-AI12 are equipped with 2 folding platform sections, DH-AI13 with 3 folding platform sections.
- In travel position, the ramp (DH-AI12/ 13) is stowed in upright position, just in front of the vehicle doors (standard execution), or swung out of the way against the side of the vehicle body [option OAF820.L]. The portable ramp DH-AI02 can be stored anywhere.

- Main details and terminology: see below.

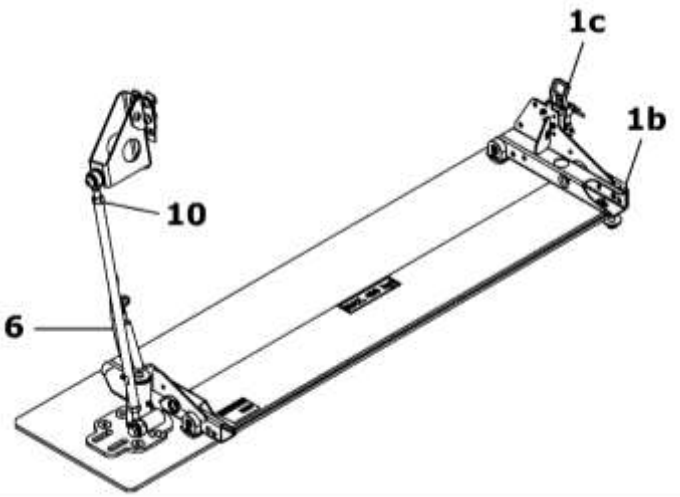
DH-AI02/12/13 ● TERMINOLOGY	
See figure below for parts corresponding to numbers in this table	
#	**Description**
1 1a	**Ramp frame + base plate**: steel and aluminum assembly forming the feet of the ramp and connecting the ramp with the vehicle floor. Following executions are available: 1. Standard version: ramp frame [1a] + ramp fixations [1b] designed for a fixed position of the ramp inside the vehicle (no swing facility). The ramp frame is equipped with quick-release locks so that the ramp can be dismounted and mounted very quickly. 2. Pivoting frame [option OAF820.L]: the ramp frame [1] incorporates an articulation pin, so that the platform can be swung inside or outside to clear the door aperture. This ramp is not demountable.
1b	**Ramp fixations:** fixation brackets for the ramp frame to the vehicle floor. The ramp fixations remain attached to the vehicle floor if the ramp is dismounted (in case of standard version).
1c	**Quick-release locks:** connects and locks the ramp frame to the ramp fixations.
2	**Gas cylinders:** Gas cylinders make the operation of the ramp light and easy.
3	**Platform**: carries the load during loading and unloading. Following surfaces are available: [OAP821.0] → Platform in mesh aluminum, evacuating rainwater, snow, dirt, etc. quickly through the platform surface. [OAP822.1] → Platform in perforated aluminum plate with non-slip buds.
3a	**Platform main section:** inboard section of the foldable platform connected to the ramp frame.
3b	**Foldable point**: foldable, outboard section of the platform resting on the ground during use.
3c	**Flip-over point** [DH-AI13]: on DH-AI13 ramps with 3 platform sections, the foldable point [3b] is replaced by a foldable middle section supported by support feet [7] and a flip-over point [3c] resting on the ground during use.
4	**Door protection rubber:** absorbs small movements and/or vibration caused by the motion of the vehicle.
5	**Automatic lock:** keeps the 2 (or 3) parts of the platform together in travel position.
6	**Fixation pin** [OAF820.L]: gives the operator the possibility to lock the platform in a 90° outwards or inwards position.
7	**Support feet**: DH-AI13 → height-adjustable feet supporting the flip-over point and middle section of the DH-AI13 while loading and unloading. DH-AI12.10 → height adjustable feet proving additional support while loading and unloading heavy loads.

8	**Rollers** [DH-AI12]: rollers mounted at the outboard edge of the flip-over point, helping the operator to unfold and fold the ramp.
9	**Handles:** mounted at the side edges of the platform, used to grab the platform while unfolding and folding the ramp. The use of the handles is mandatory! They prevent that the operator can crush his / her fingers or hands between the folding platform sections.
10	**Turn support + bar** [OAF820.L]: holds the platform during the pivoting motion.
11	**Middle gas cylinder**: standard on DH-AI13, optional [OAP825] on DH-AI12 to induce a fully automatic deployment in case of emergency.
12	**Platform lock**: mechanical lock at the side of the platform. [DH-AI13] → locking the flip-over point [3c] in travel position**.** [DH-AI02] → keeps the platform main section and the foldable point together.
13	**Support rubber:** rubber buffers on which the platform rests in travel position, absorbing vibrations and mechanical driving noises [DH-AI12 / AI13]. On demountable ramps DH-AI02, support rubbers are used as feet to rest the ramp frame on the vehicle floor.
14	**Side supports** [DH-AI02]: protect the ramp when placed on its side.

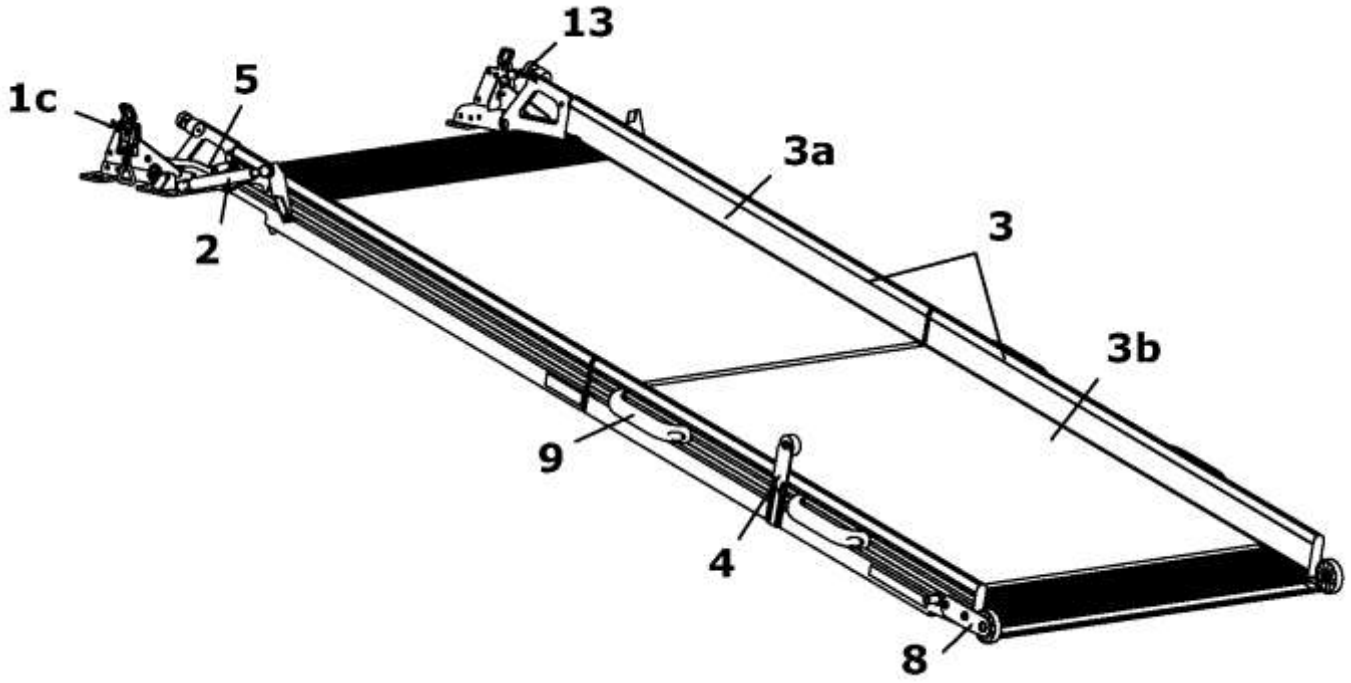
DH-AI Fixed frame ● TERMINOLOGY



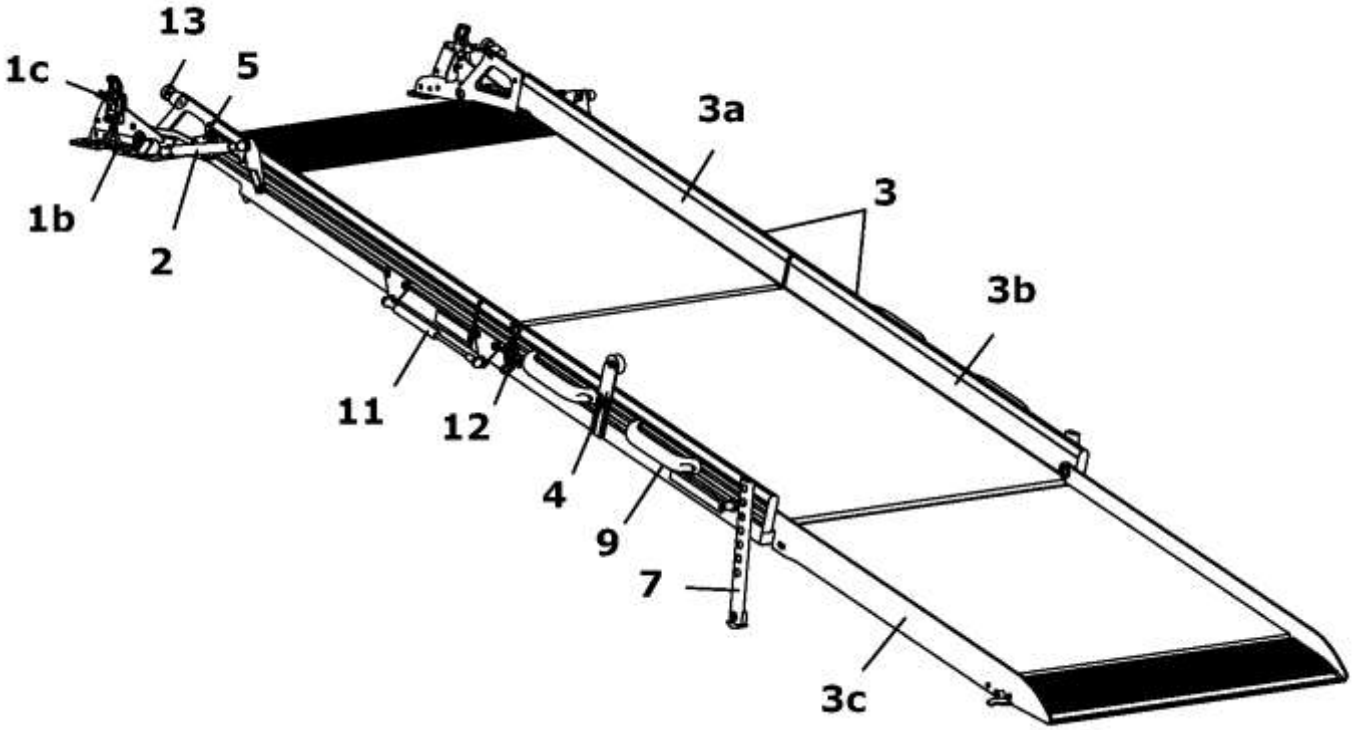
DH-AI Pivoting frame option OAF820.L ● TERMINOLOGY



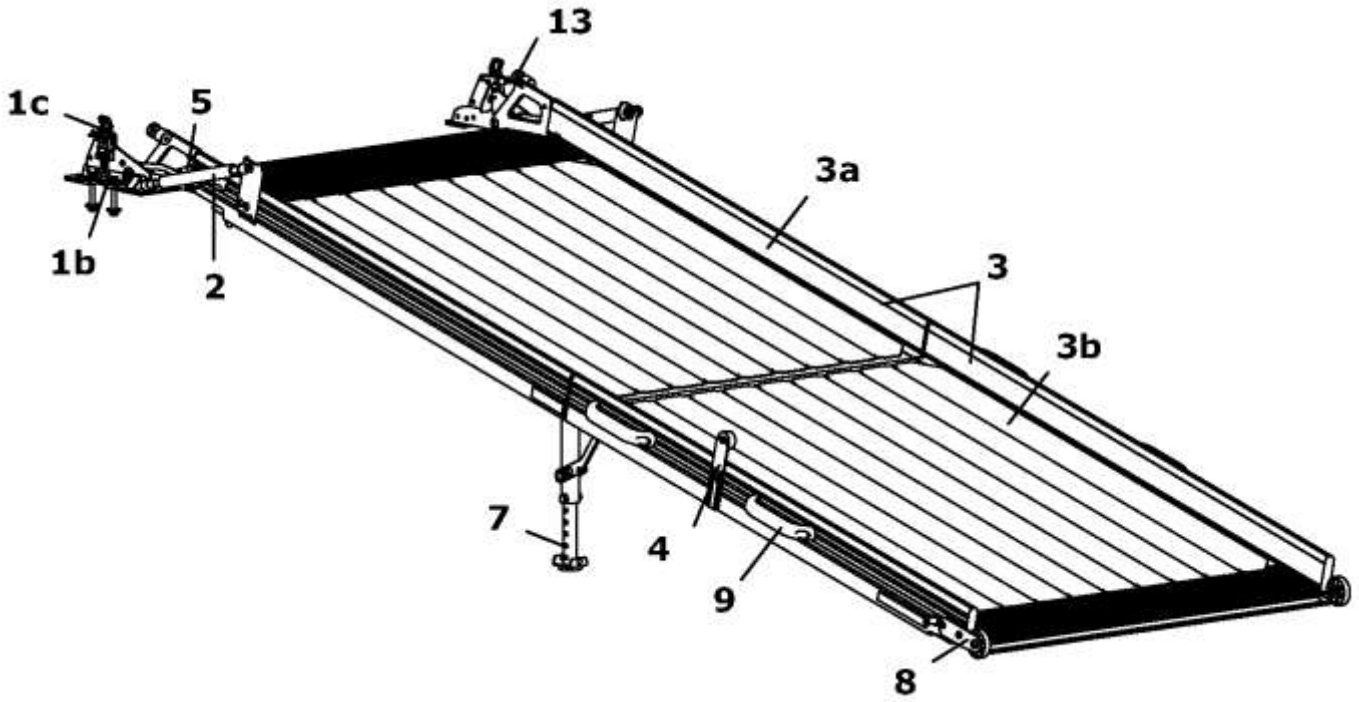
DH-AI12.04.01 ● TERMINOLOGY



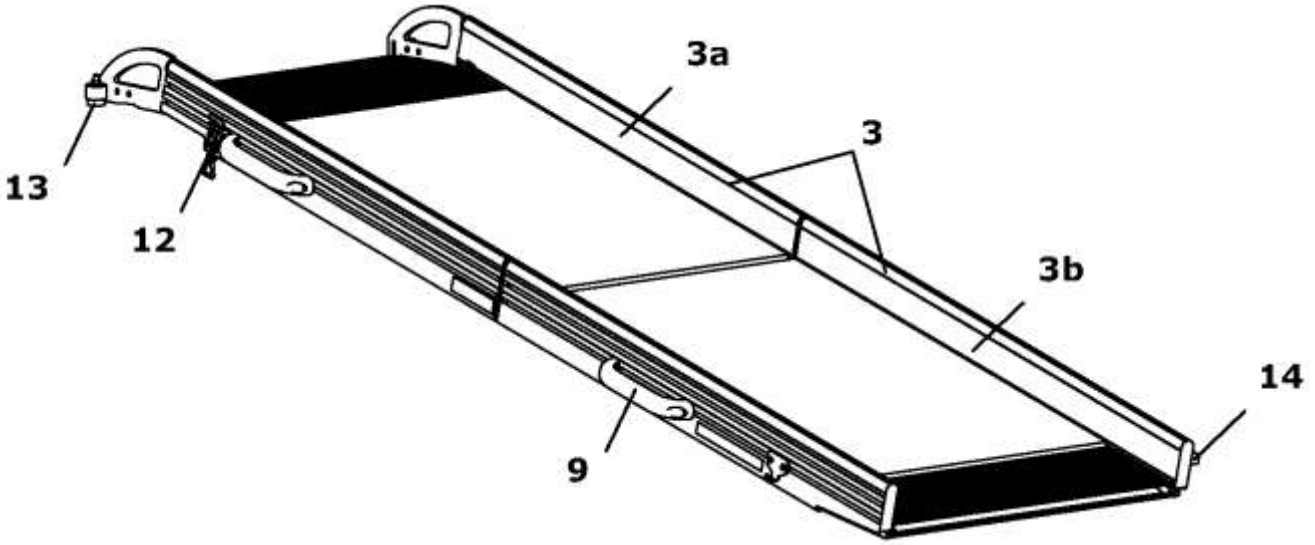
DH-AI13.04.01 ● TERMINOLOGY



DH-AI12.10.01 ● TERMINOLOGY



Portable ramp DH-AI02.04.01 ● TERMINOLOGY



6 GETTING STARTED

- Many vehicle manufacturers issue important instructions on various aspects of the ramp installation, specific to the brand and type of chassis. Examples:
  - → welding instructions or the prohibition to weld
  - → instructions on chassis drilling and bolt-on connections to the chassis
  - → recommendations on the use of mechanical or hydraulic stabilizing legs

NOTICE

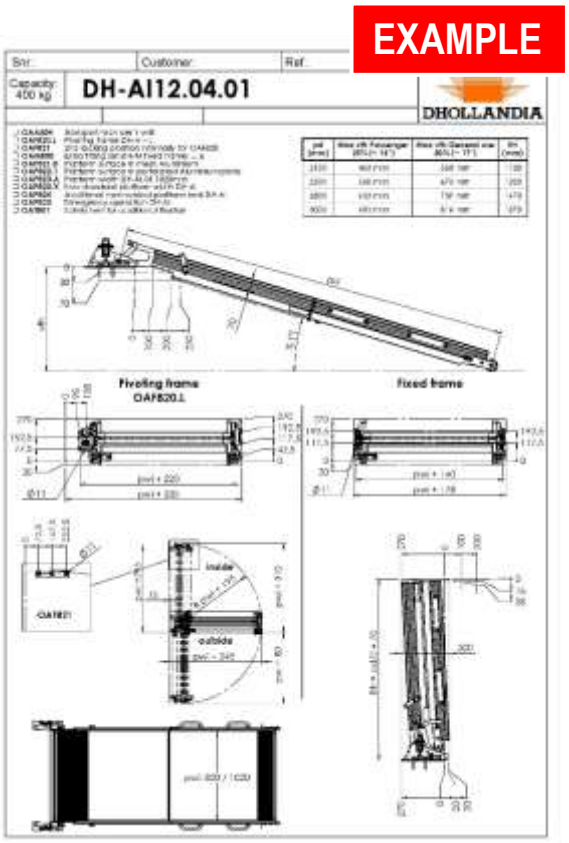
- ALWAYS verify and ensure compatibility between the ramp and the vehicle.
- ALWAYS ensure compliance with the fitting and body building instructions issued by the vehicle manufacturer.
- Make sure planned modifications to the vehicle chassis and body will not adversely affect the strength and integrity of the vehicle.
- If the instructions of vehicle manufacturer conflict with the installation instructions issued by DHOLLANDIA, contact your national DHOLLANDIA distributor for further advice. See contact info on page 3.

- Verify if the installation kit is complete and that all parts needed to install the ramp, are present.
- Compare the actual vehicle dimensions with the maximum installation parameters indicated in the technical documentation. If the actual dimensions go outside of the maximum installation parameters, DON'T continue and contact your national DHOLLANDIA distributor for further advice.
- Verify and make sure that the vehicle chassis and body are strong enough to support the forces induced by the ramp at its maximum rated capacity. Refer to the instructions of the vehicle manufacturer for calculation and construction guidelines.
- Execute the required stability and weight distribution calculations.
- Make sure that the body is accurately fitted to the vehicle chassis.
- Remove all objects that impede the installation of the ramp (bumper bar, spare wheel carrier, etc.). If necessary, consult with the vehicle manufacturer for replacement solutions (e.g. special spare wheel carriers, exhaust pipe modifications, etc.).
- Finish the ramp in accordance with the road legislation of the country where the vehicle will be registered.
- After installation, work through the checklist of the Pre-Delivery Inspection (PDI). Make sure the final inspection is signed off by an inspector who is not part of the installation team.
- During installation and testing, verify and make sure that the ramp and its moving parts don't interfere with any of the vehicle systems (e.g. the suspension, braking system, hydraulic and electrical circuits, etc.), or cause damage to them.

7 INSTALLATION SPECIFICATIONS AND GUIDELINES

7.1 INSTALLATION DIMENSIONS

- The order forms provide you with the critical installation dimensions for the various types of ramps and platform depths. See 7.4 from page 14 onwards.

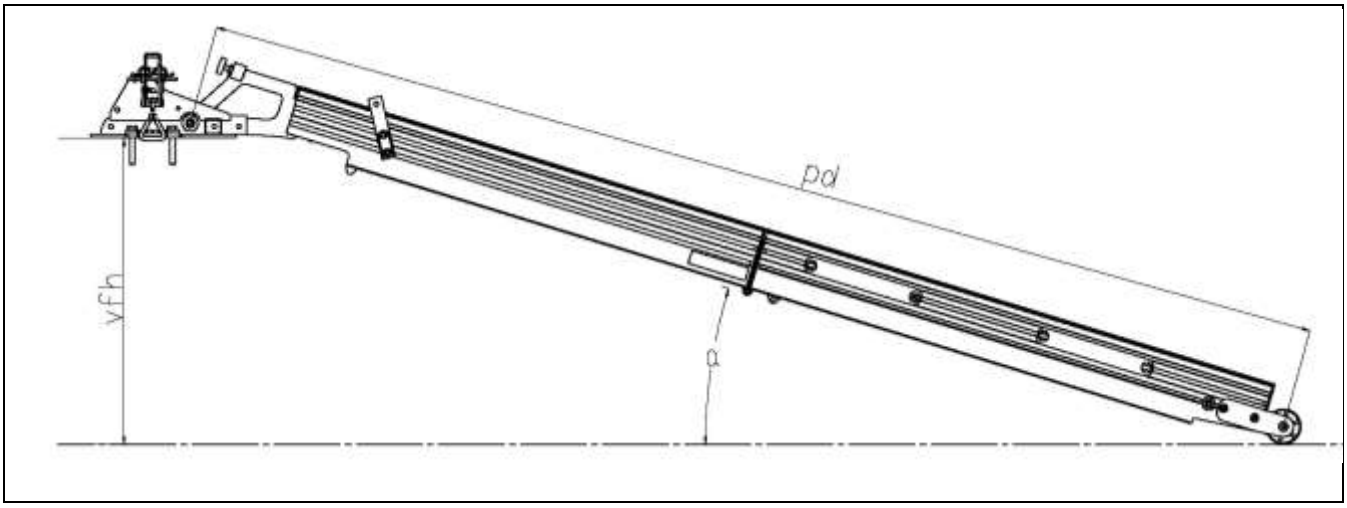


- Compare the maximum installation parameters indicated in the order forms with the actual vehicle dimensions. If the actual dimensions go outside of the maximum installation parameters, DON'T continue and contact your national DHOLLANDIA distributor for further advice.

7.2 PLATFORM DEPTH AND VEHICLE FLOOR HEIGHT

- The DH-AI*series ramps can be installed on a wide range of minibuses, vans and other light-duty commercial vehicles. vehicles such as vans, minivans, etc.
- Determine the ramp angle in function of the platform depth and the vehicle floor height. Perform a risk analysis in function of the expected use; the loads, their weight and means of propulsion; and the maximum ramp angle acceptable for the end user. Make sure that the embarkation and disembarkation of wheelchair occupants or the loading and unloading of cargo can be done with an acceptable level of safety.
- A maximum slope of 25% for passenger use and 30% for commercial use is recommended. Reference values for the various platform depths are given in 7.4 from page 14 onwards.
- When the wheelchair occupant does not have assistance from trained staff, the slope should not exceed 12%.
- Useful formulas (approximation):

To calculate the minimum platform depth *pd* if the vehicle floor height *vfh* and the maximum ramp angle *a* are known: **Platform depth pd (mm) = vehicle floor height vfh (mm) / access angle (%) * 100**
To calculate the ramp angle a if the vehicle floor height vfh and the platform depth pd are known: **Access angle (%) = vehicle floor height vfh (mm) / platform depth pd (mm) * 100**



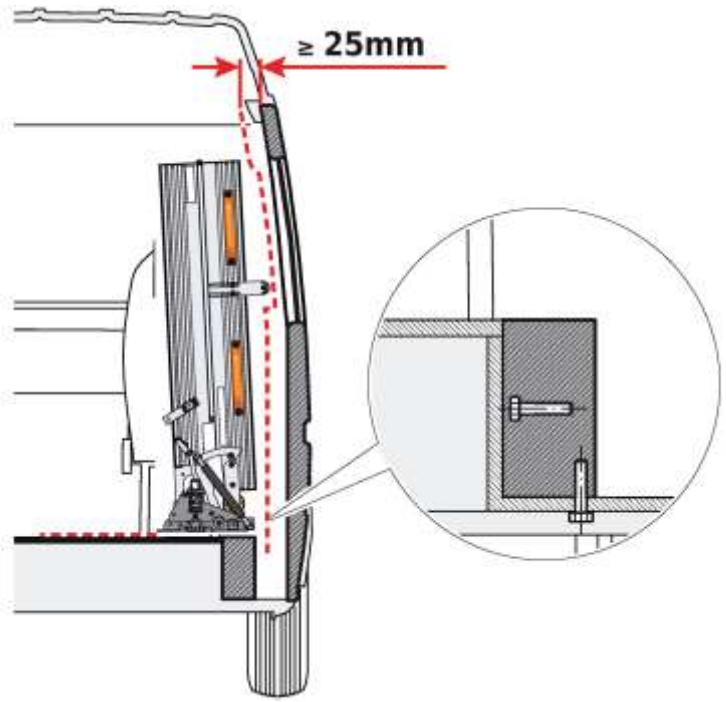
- Where required, the relationship between % and ° ramp angles is as follows:

Percentage ramp angle	degrees
30%	16.7°
25%	14°
20%	11.3°
15%	8.5°
10%	5.7°

- Check if the vehicle chassis and body are sufficiently strong to carry the proper weight of the ramp with its nominal load, both statically and dynamically.
- When unsure about the suitability of the vehicle, contact your DHOLLANDIA distributor.
- Practical check: On technical drawings in paragraph 7.4, a bumper clearance curve is drawn. Use the dimensions on this drawing to verify the suitability of your vehicle.

7.3 LATERAL INSTALLATIONS

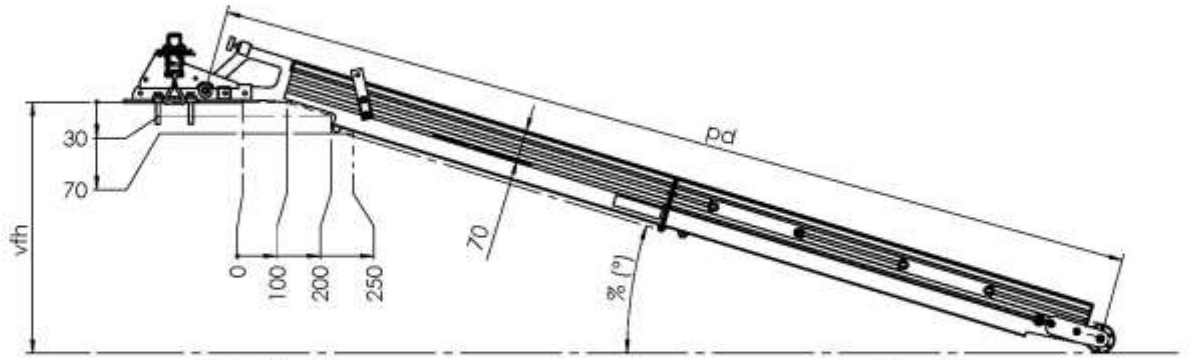
- When the ramp is located at the side door it is possible that it stands over a stepwell. A support must be created to fill the gap between the base plate and the step.
- This support needs to be level with the vehicle floor and sufficiently strong to sustain the forces induced by the load on the platform.



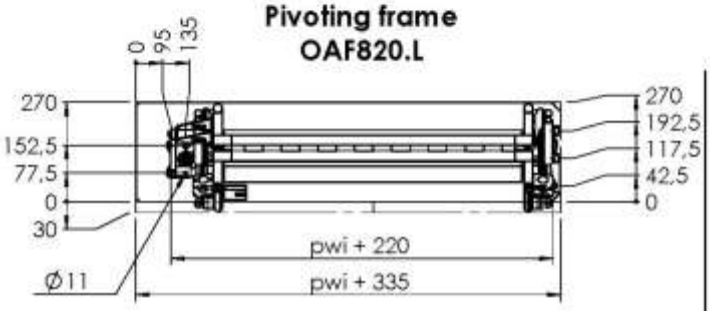
7.4 TECHNICAL SPECIFICATIONS

- **DH-AI12.04.01**

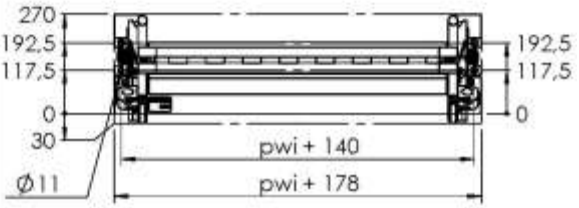
pd (mm)	Max vth Passenger 25% (~ 14°)	Max vth General use 30% (~ 17°)	lth (mm)
2100	463 mm	558 mm	1120
2500	560 mm	673 mm	1320
2800	633 mm	759 mm	1470
3000	681 mm	816 mm	1570

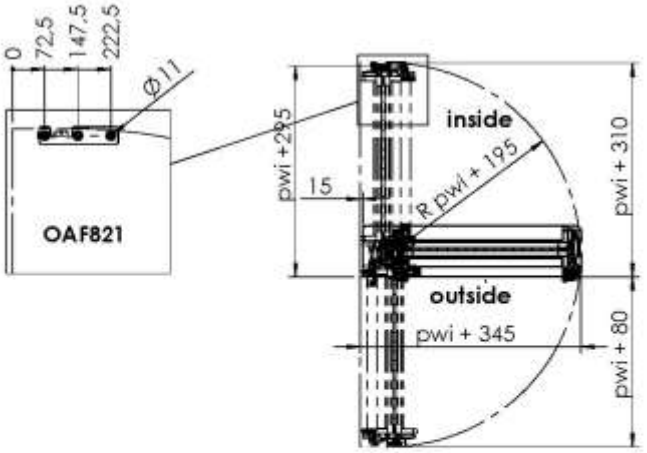


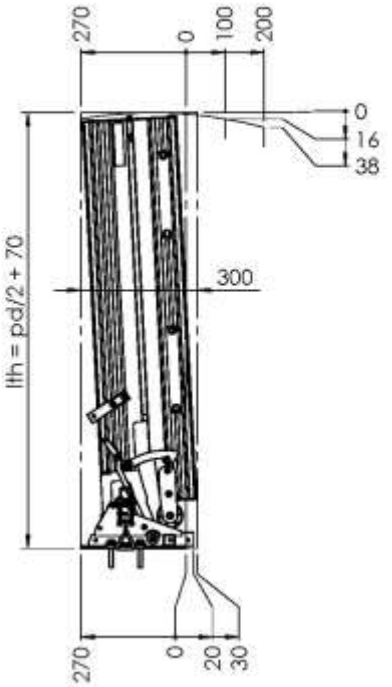
Pivoting frame
OAF820.L

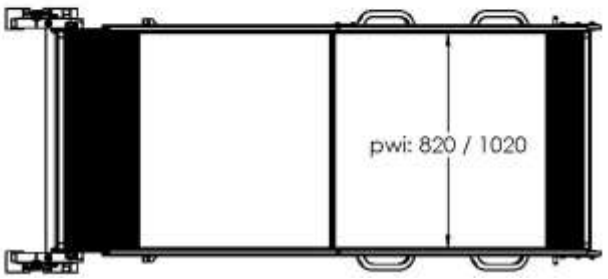


Fixed frame



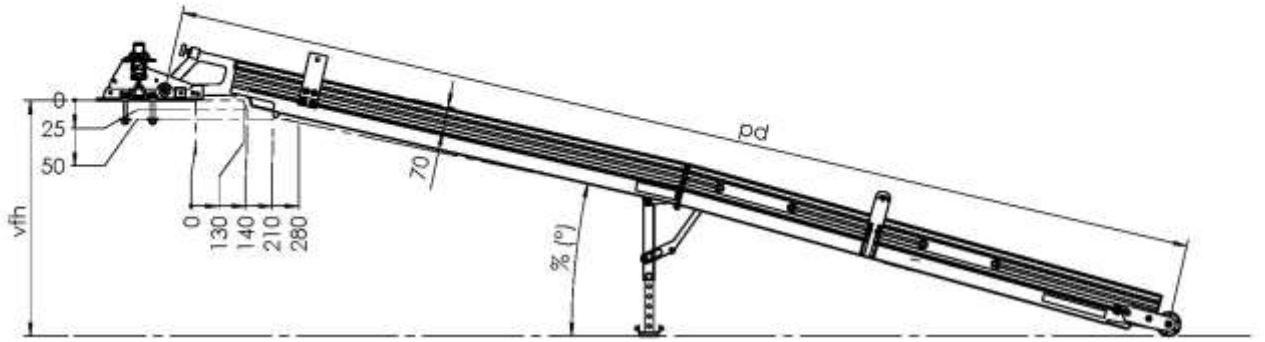


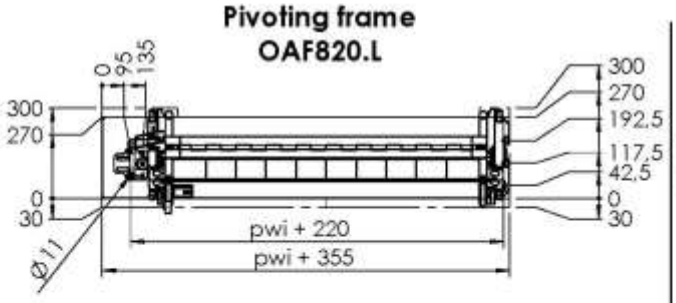


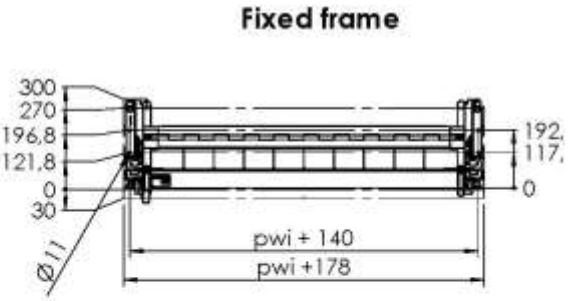


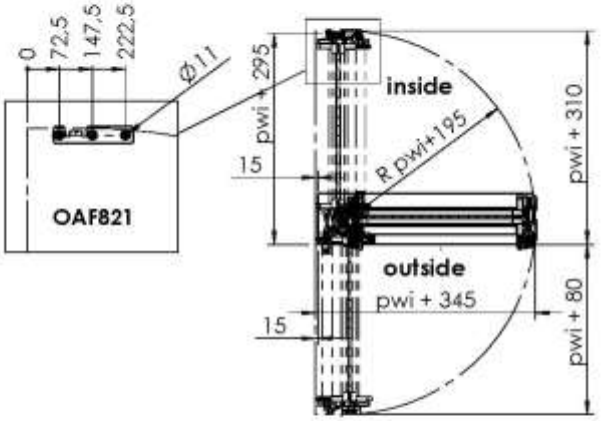
- **DH-AI12.10.01**

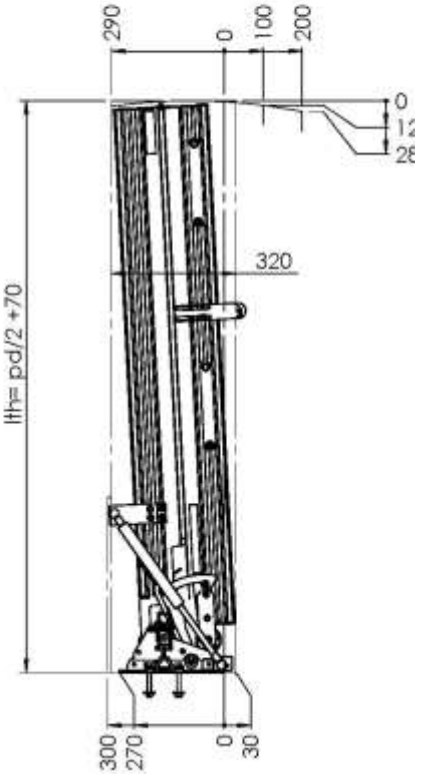
pd (mm)	Max vfh General use 25% (~ 14°)	lth (mm)
2800	633 mm	1470
3000	681 mm	1570

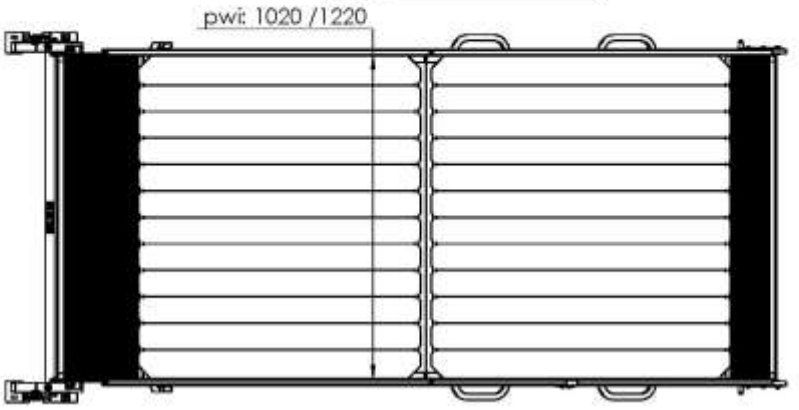






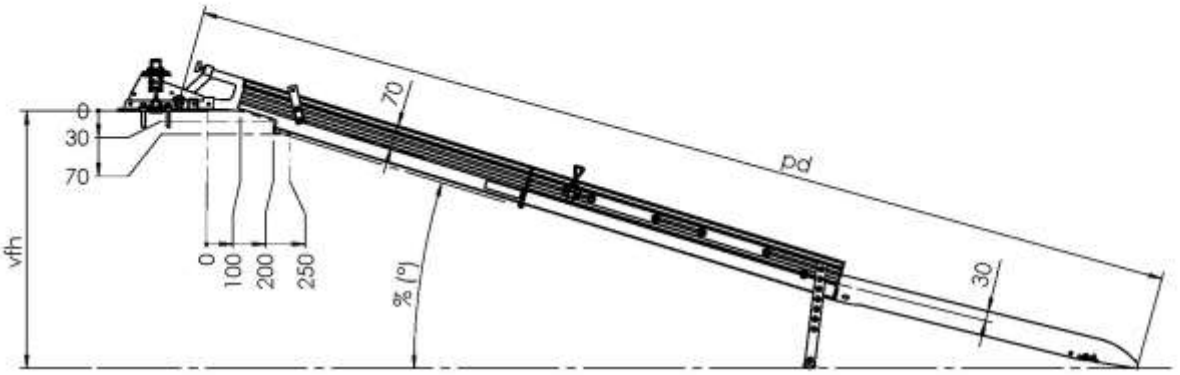


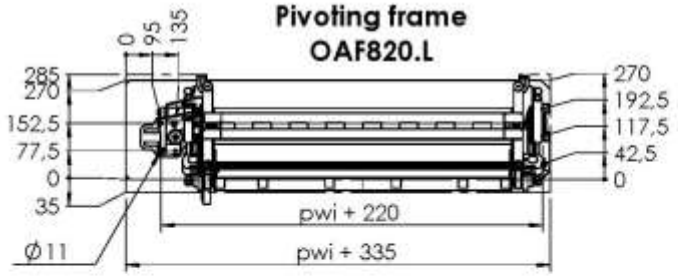


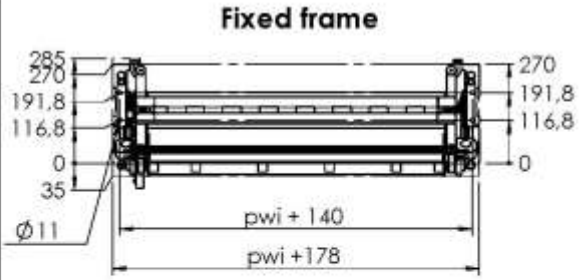


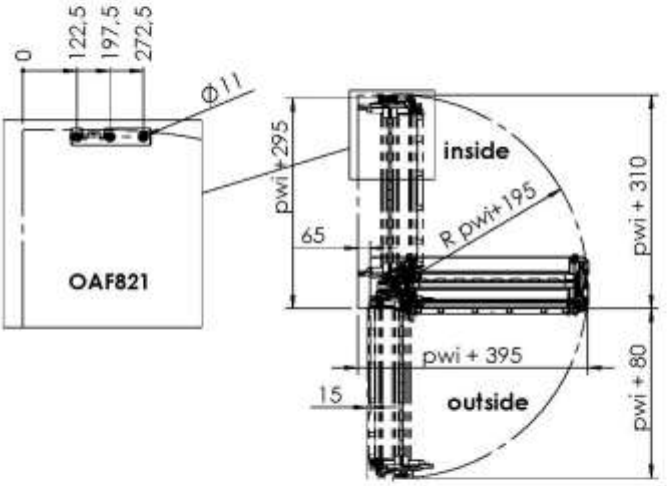
- **DH-AI13.04.01**

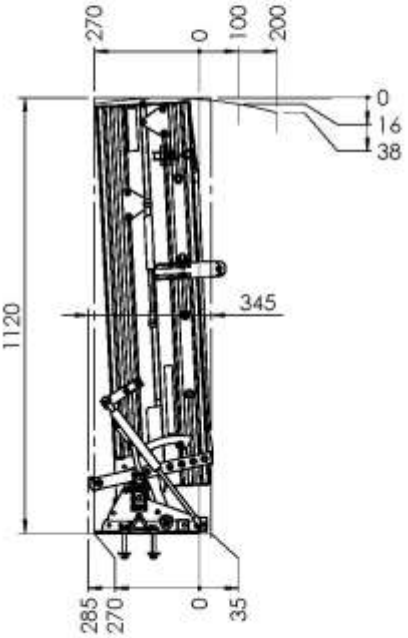
pd (mm)	Max vfh Passenger 25% (~ 14°)	Max vfh General use 30% (~ 17°)	lth (mm)
3000	681 mm	816 mm	1120

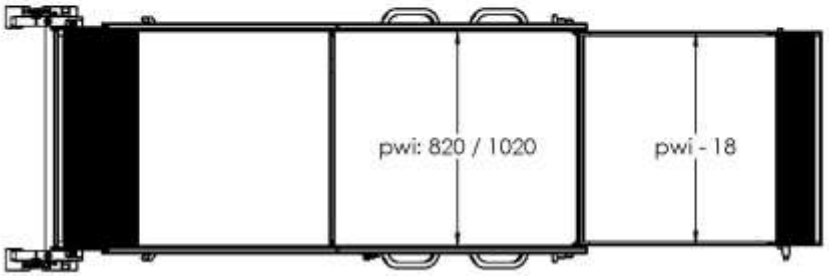






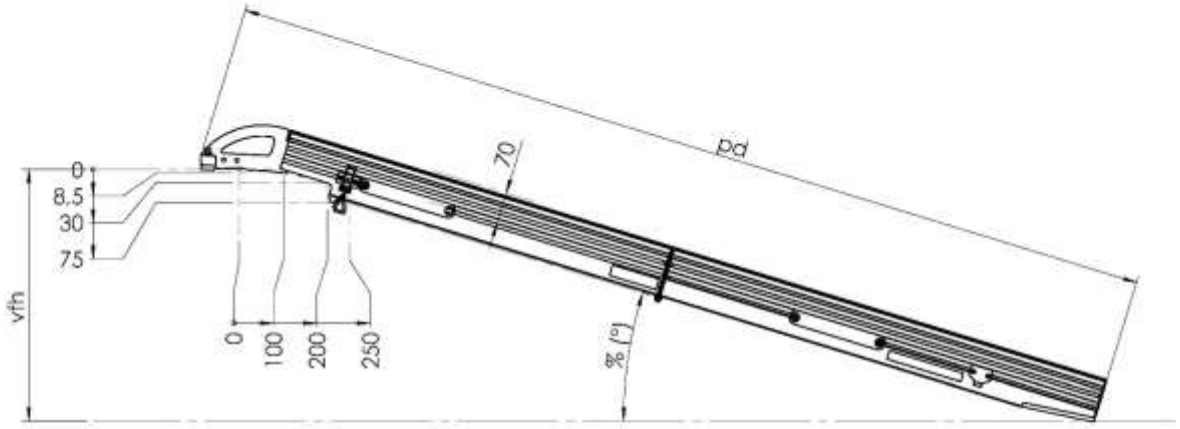


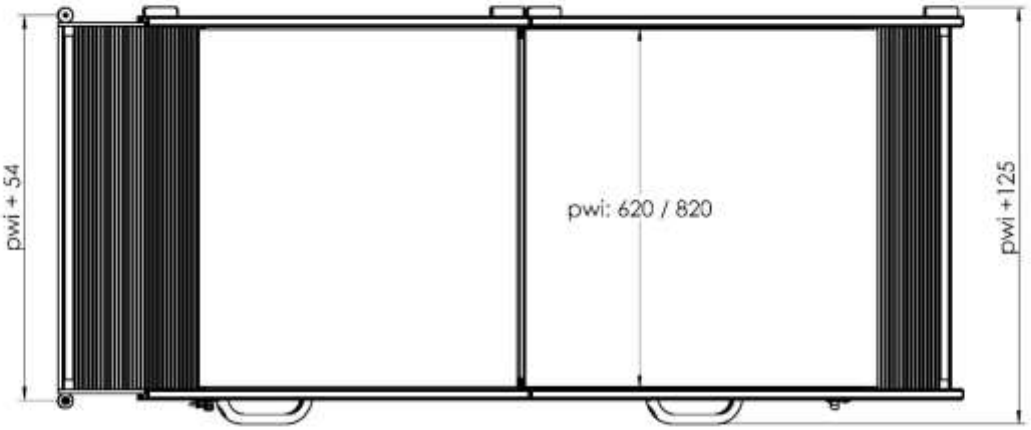


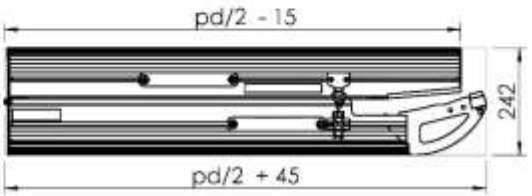


- **DH-AI02.04.01**

pd (mm)	Max vth Passenger 25% (~ 14°)	Max vth General use 30% (~ 17°)
2100	463 mm	558 mm
2500	560 mm	673 mm







8 INSTALLATION OF THE DH-AI

- Due to the wide range of vehicles on which DH-AI ramps can be mounted, detailed fitting information for all vehicle types is not available.
- In this paragraph, the most common installation cases will be explained in a generic way.
- When in doubt about a specific installation case, contact your DHOLLANDIA distributor before making any permanent changes to the vehicle. See contact info on page 3.

8.1 INSTALLATION KIT – SCOPE OF DELIVERY

- AI-ramp and its optional extras
- Bolts and nuts: the kit contains a set of bolts and nuts suitable for most installation situations. Other bolts and nuts for deviating installation situations are not included in the kit.
- Flanges, big washers, mounting brackets for the underside of the vehicle floor / chassis are not included in the kit. They are to be provided by the installer.
- In case something is missing, contact your national DHOLLANDIA distributor. See contact info on page 3. Or refer to the parts list to find replacement parts.

8.2 PREPARATION

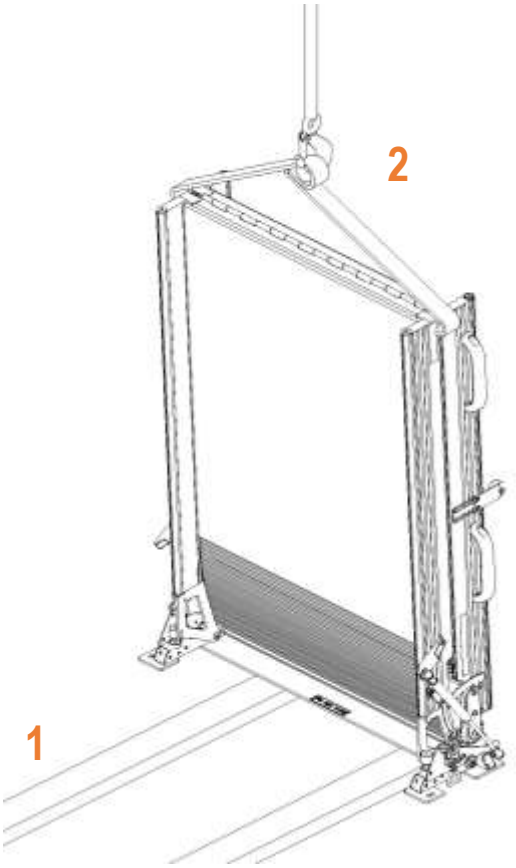
- Remove any obstacles within the door opening or the mounting area.
- Remove or adapt the floor coverings in case of interference with the ramp fixations, the ramp frame + base plate.
- Remove all objects (spare wheel carrier, parts of the exhaust pipe, …) that could hinder the mounting of the ramp. For permanently removed parts, consult with the vehicle manufacturer for replacement solutions.
- Make sure the vehicle floor is sufficiently strong to support the weight of the ramp and its load.
- Make sure the ramp can be mounted on a straight and rigid floor surface.

NOTICE
The installation of the ramp on non-planar, soft or flexible surfaces and the incorrect fastening of the mounting bolts can cause deformations to the ramp frame + base plate and lead to incorrect unfolding / folding of the platform during use.

8.3 HANDLING

⚠ WARNING

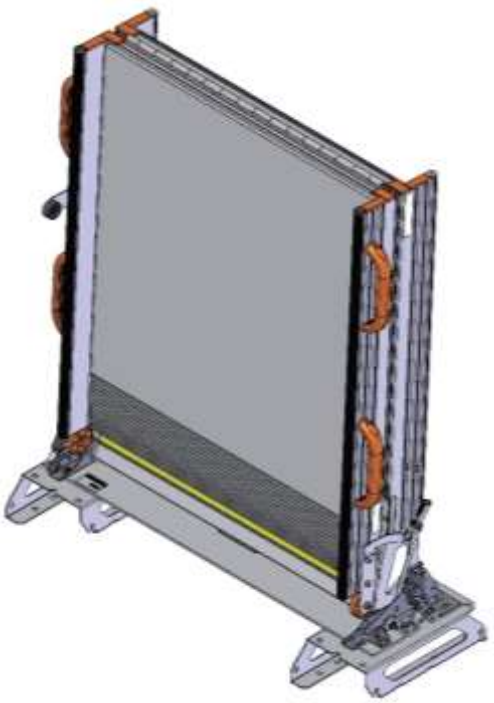
- The ramp is heavy! When falling on a person it can cause serious personal injury or death.
- Therefore, handle the ramp with extreme care. Use adequate lifting aids such as a forklift (1) by its forks or with slings, a gantry crane, hoists (2) etc. to secure the platform and prevent it from falling.
- Make sure these lifting aids are fit for purpose, sufficiently strong and in proper condition.
- ALWAYS secure the ramp against falling, as long as you work within reach of the platform.
- ALWAYS stay out of reach of the platform and keep clear of the moving parts of the ramp.

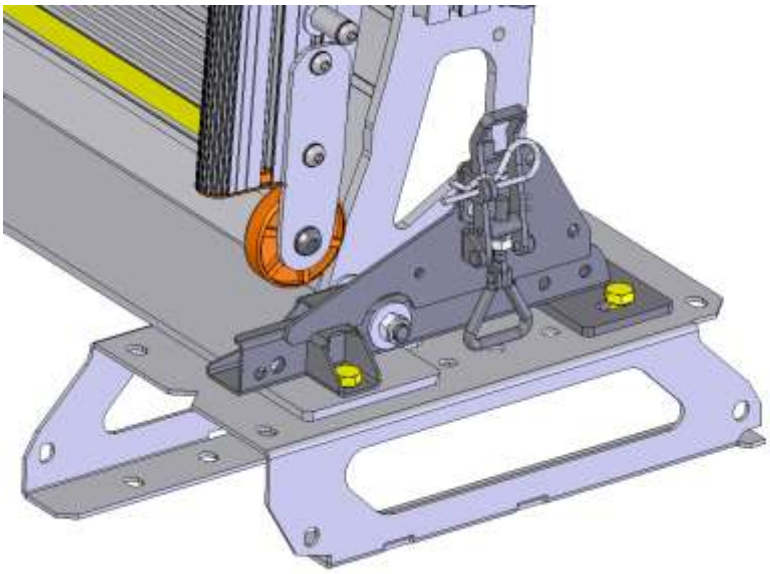


8.4 INSTALLATION OF THE STANDARD FIXED FRAME

8.4.1 Unpacking

- Check the delivered goods immediately upon arrival. Any damages should be documented e.g. by means of photos. Contact your national DHOLLANDIA distributor to report the incident. See contact info on page 3.
- Remove the plastic wrap around the ramp.
- The ramp is fixed to two transport pieces. Release the bolts and nuts and take off the ramp.

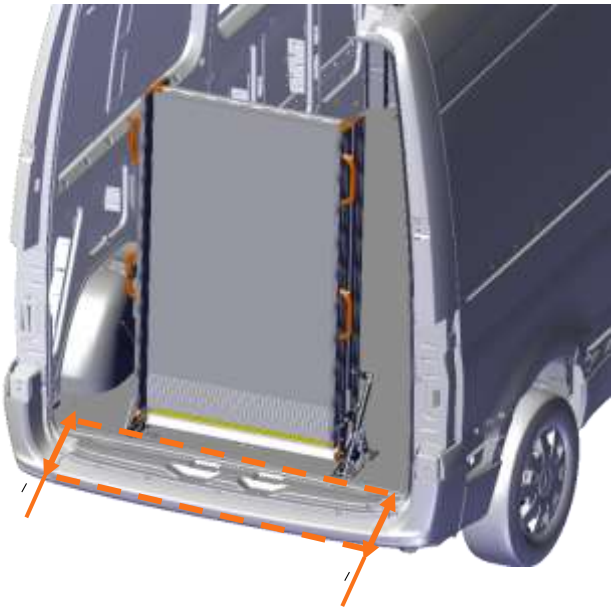




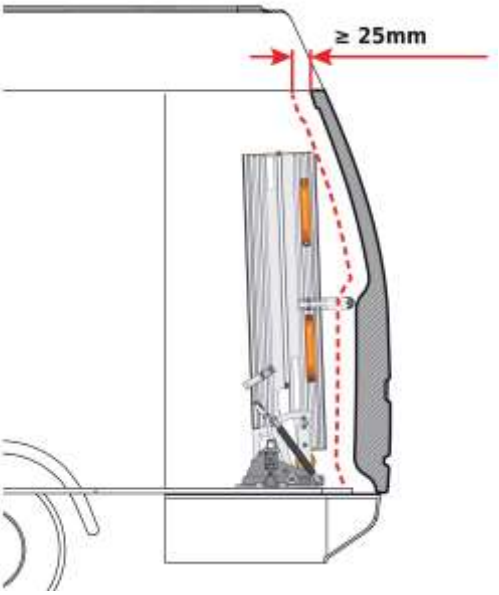
8.4.2 Positioning

- Use the dimensions given in section 7.4 from page 14 onwards as reference during the positioning of the ramp.

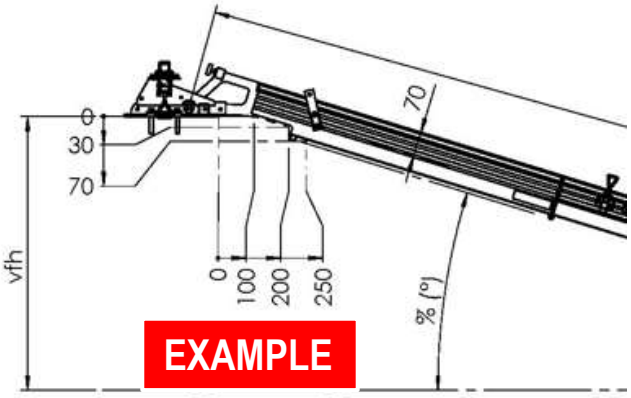
- Position the ramp in the vehicle so that the outboard edge of the ramp frame + base plate is parallel with the rear of the vehicle.



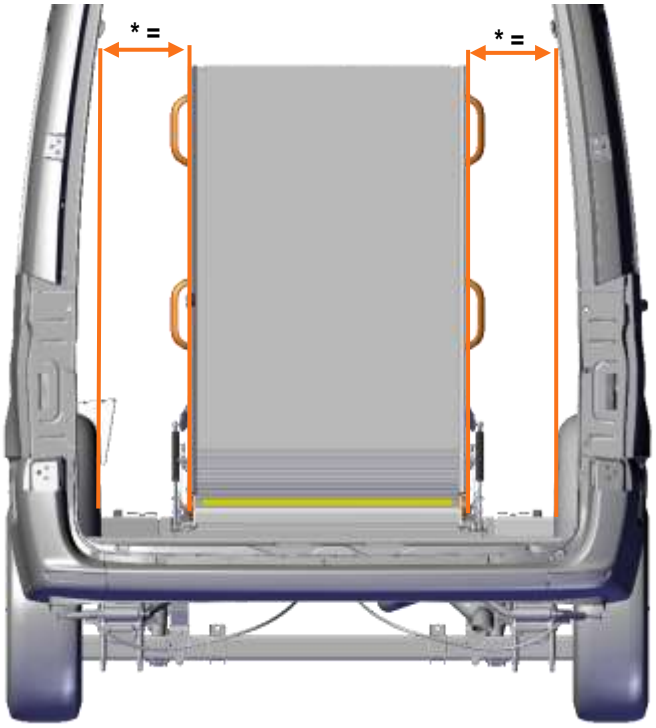
- Position the ramp as far as possible towards the outside, but keep a gap of min. 25 mm between the ramp and the closed doors.



- Verify if the platform can be deployed in its work position without interfering with the rear sill of the vehicle floor, the bumper or other possible obstructions. Use the provided bumper clearance dimensions in section 7.4 on page 14.



- If technically possible, it is recommended to mount the ramp in the center of the vehicle, but it can be installed in asymmetric position as well. E.g. in function of the bolt positions and possibilities to mount flanges and nuts at the underside of the vehicle floor, or simply on client's request.

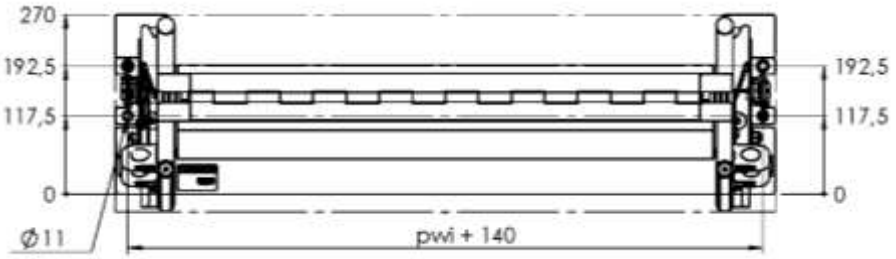


- After determining the ramp position and before drilling any holes, make sure there is sufficient space at the underside of the vehicle floor to mount flanges (to spread the forces of the bolts over a wider area) and the nuts of the mounting bolts.

- Place the ramp fixations so that they align correctly with the quick-release locks on the ramp frame.
- Mark the position of the 4 drill holes through the ramp fixations.
- Take the ramp out of the vehicle or place it further inside the vehicle to have an open environment to perform the drilling.

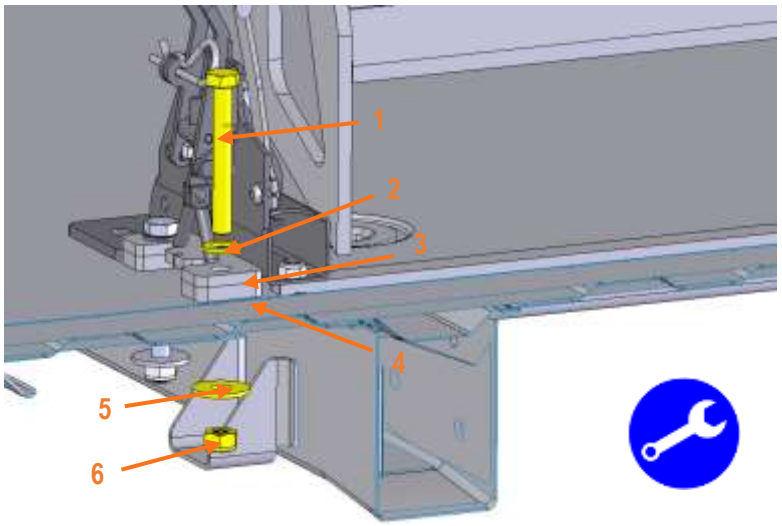
8.4.3 Drilling the holes for the mounting bolts

- See section 8.6 on page 31 for drilling guidelines.
- The position of the drill holes can be verified by using the template.



8.4.4 Fixation

- Bolt the ramp fixations to the vehicle floor by means of the bolts and nuts provided in the kit. Fasten the bolts and nuts with the required torque. See torque values in appendix 11.2 on page 42.

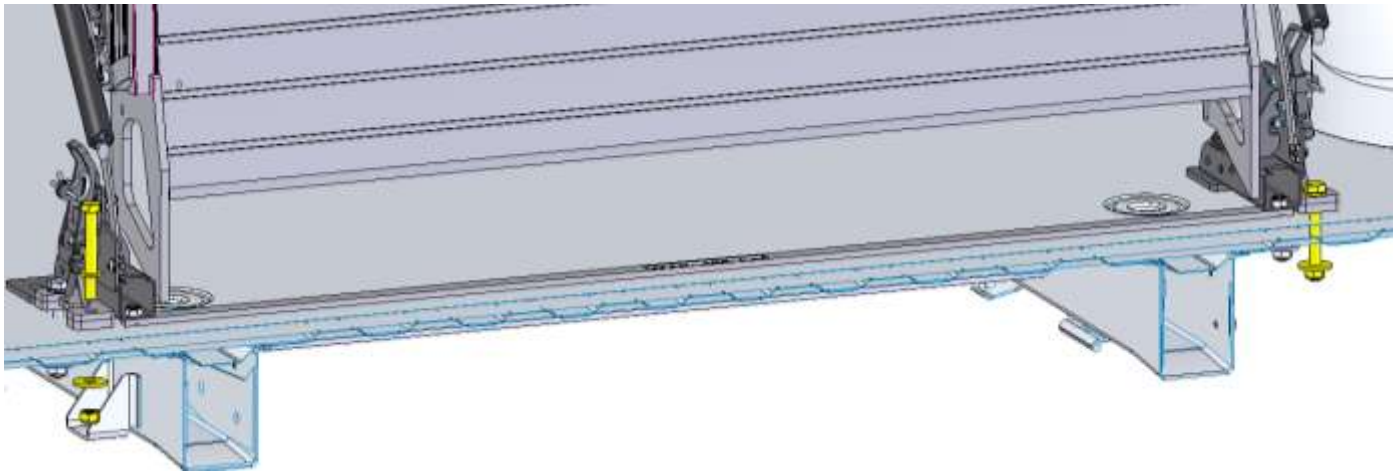


1	Bolt M10
2	Washer
3	Ramp fixation bracket
4	Vehicle floor
5	Large washer
6	Locking nut

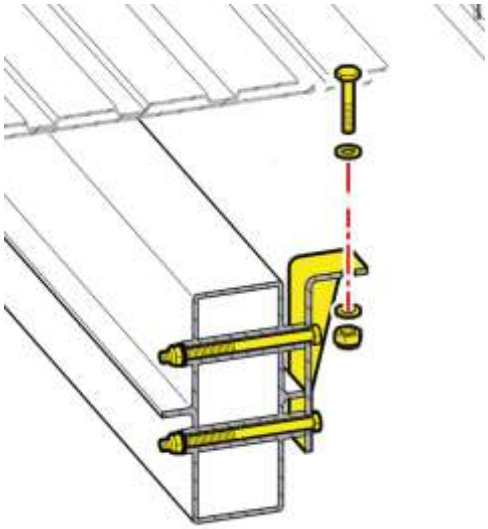
NOTICE

- It is essential that bolts and nuts used to mount the lift frame to the vehicle chassis, are fastened with the required torque by means of a proper torque wrench. See appendix 11.2 on page 42.
- If you use mounting bolts not supplied by DHOLLANDIA, obtain confirmation of the required torque from your supplier and make sure they guarantee at least an equivalent strength.
- Check and retighten the bolts after the static and dynamic weight test performed during the PDI test.

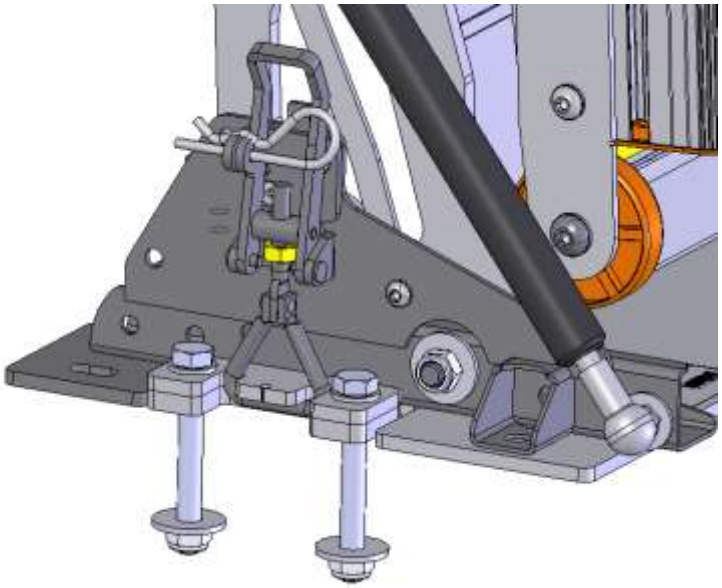
- Underneath the vehicle floor, use the larger washers supplied with the ramp or other flanges or profiles of at least equivalent strength to spread the forces of the bolts and nuts over a wider area. Mount these between the underside of the vehicle floor and the nuts of the mounting bolts.



- If the vehicle floor is not sufficiently strong to support the ramp and its load, or additional structural support is wanted, it is recommended to link the mounting bolts to the chassis by means of additional support pieces (not included in the kit).



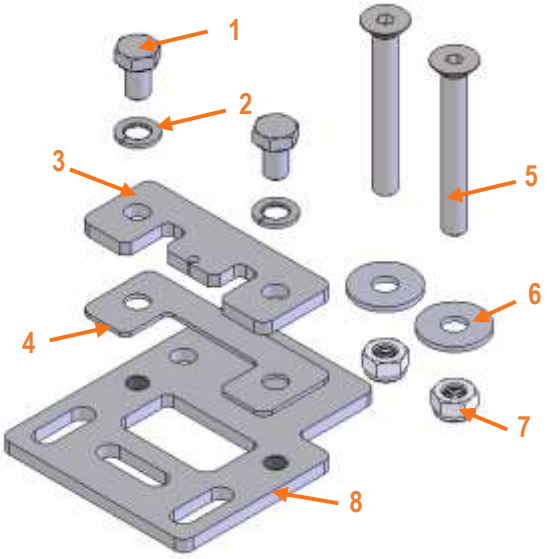
- Position the ramp over the ramp fixations and engage the quick-release locks at both sides.
- The quick-release lock is adjustable in length. It is set at the factory, but verify this during installation to make sure the ramp frame is very solidly attached to the ramp fixations.
- To adjust the length, release the nut on the threaded part of the lock. Turn the eye to shorten or lengthen the lock. Fasten the nut firmly after final adjustment.



8.4.5 Additional installation kits DH-AI

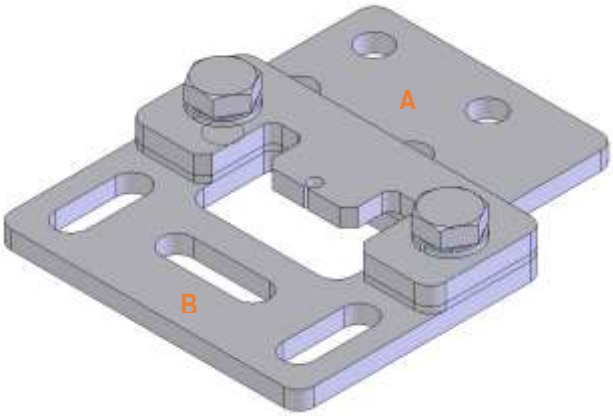
- Dhollandia offers additional installation kits in case certain circumstances don't allow the installation to follow the standard procedure:
  - Standard location for floor perforations coincide with chassis beams or other structural elements of the chassis.
- OAM801.CFG: 1001

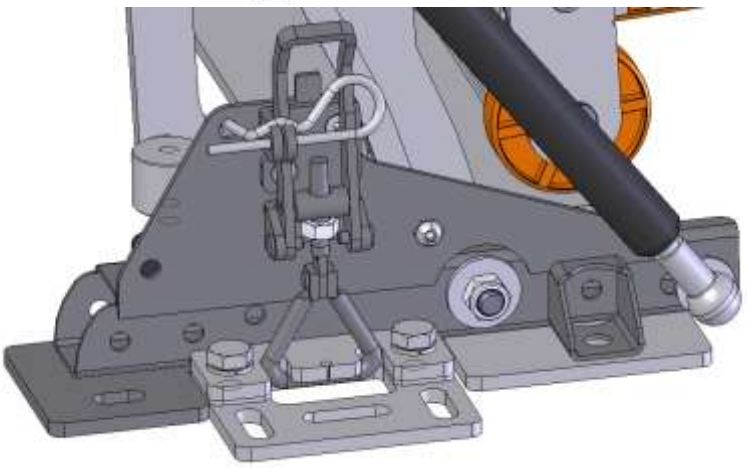
This installation kit should make the installation possible in most situations. It is positioned under the ramp frame and offers additional fixation points. The kit includes two times the assembly that is shown below, for both sides of the ramp.



1	Bolt M10x16	BT10.016
2	Spring washer M10	BC10.2
3	Included in standard mounting set	
4	Spacer plate	MQ0603.F.B02
5	Allen Bolt with countersunk head	BI10.080.7991.FT
6	Large washer M10	BC10.3
7	Locking nut M10	BMB10
8	Base plate	MQ0603.F.B01

A: The base plate provides two additional fixation opportunities. As these are located underneath the ramp frame, the plates need to be adapted for the use of an Allen bolt with a countersunk head.
B: It is recommended to fixate the base plate also on the other side of the standard fixation plate as shown on the picture.

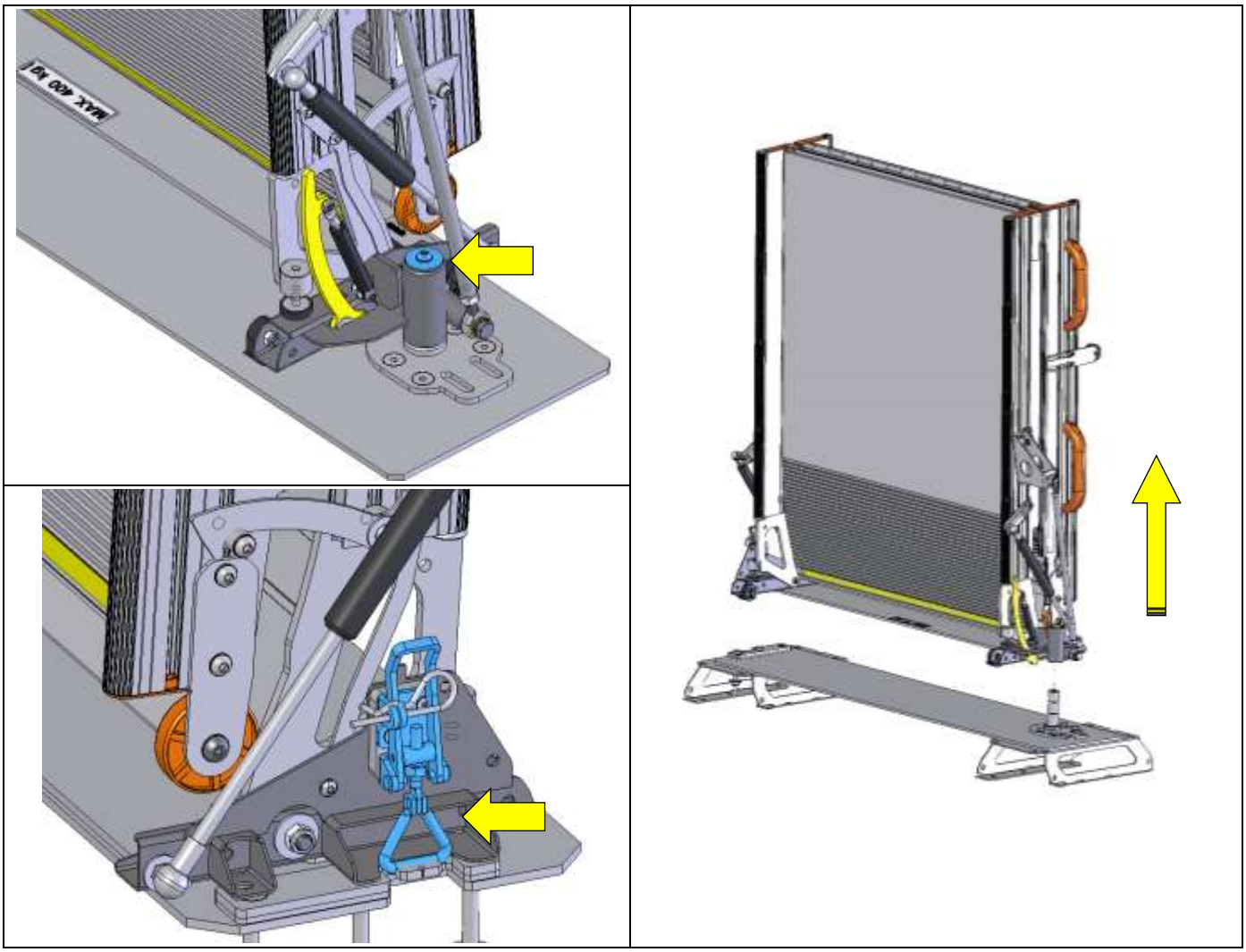




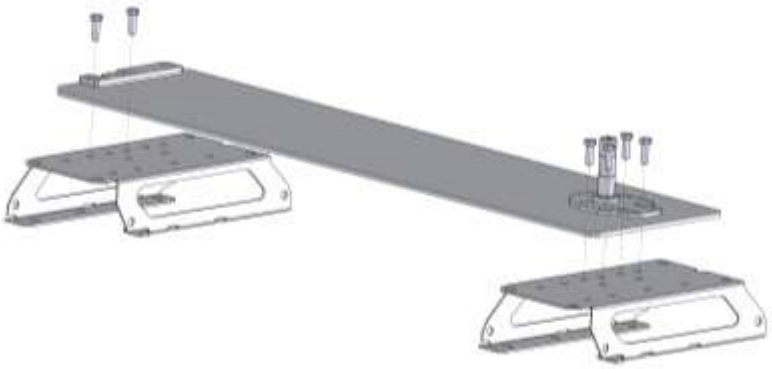
8.5 INSTALLATION OF THE OPTIONAL PIVOTING FRAME [OAF820.L]

8.5.1 Unpacking

- Check the delivered goods immediately upon arrival. Any damages should be documented e.g. by means of photos. Contact your national DHOLLANDIA distributor to report the incident. See contact info on page 3.
- Remove the plastic wrap around the ramp.
- The ramp is fixed to two transport pieces.
- Remove the ramp frame from its base plate by releasing the quick-release lock on one side and the bolt and washer on the other side. Refer to guidelines in section 8.3 on page 19 before lifting the ramp using any lifting devices.

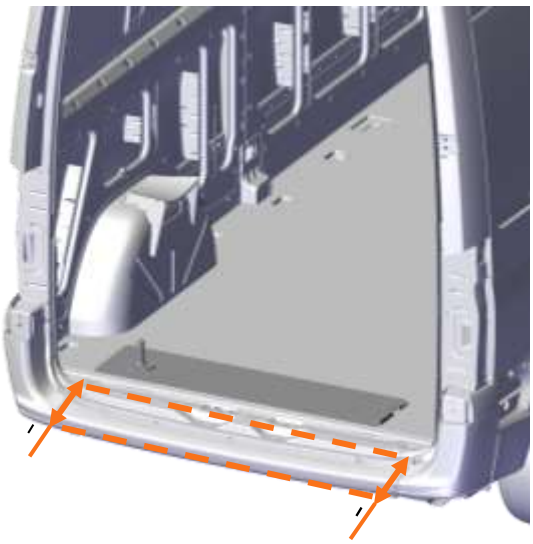


- Remove the base plate from the transport pieces

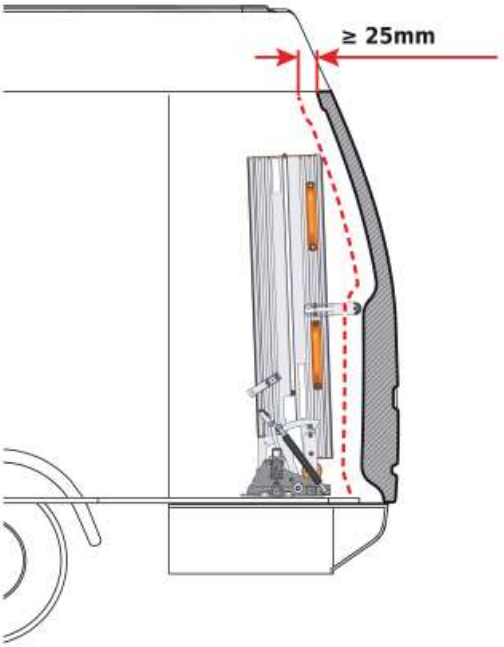


8.5.2 Positioning

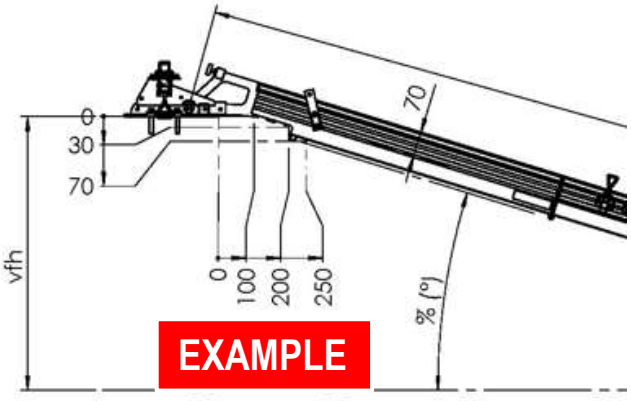
- Use the dimensions given in section 7.4 from page 14 onwards as reference during the positioning of the ramp.



- Position the base plate in the vehicle so that the outboard edge is parallel with the rear of the vehicle.

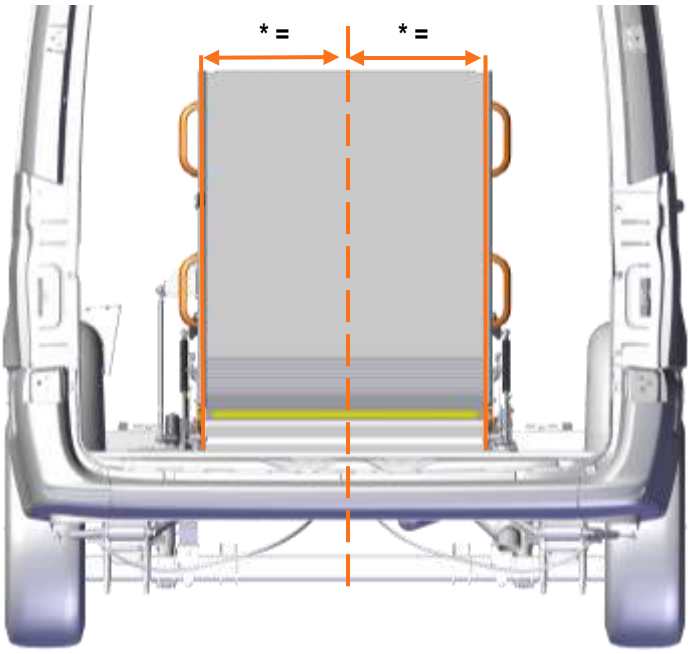


- Position the base plate as far as possible towards the outside, while making sure this mounting position ensures at least a 25mm gap between the ramp and the closed doors.
  Place the ramp temporarily over the base plate and articulation pin or use the dimensions from section 7.4 to verify.



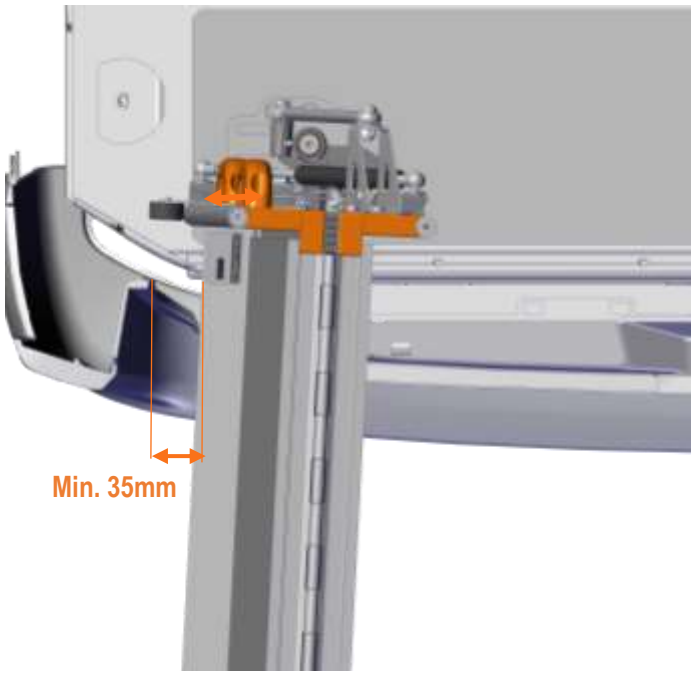
- Make sure that the platform can be deployed in work position without interfering with the rear sill of the vehicle floor, the bumper or other possible obstructions. Use the provided bumper clearance dimensions in section 7.4 or place the ramp frame over the base plate to verify the position.

- It is recommended that the pivot point of the ramp frame is located as close as possible to one of the chassis rails or a structural element of the subframe to absorb the load of the platform while swung inboard or outboard.
- If technically possible, it is recommended to mount the ramp in the center of the vehicle, but it can be installed in asymmetric position as well. E.g. in function of the bolt positions and possibilities to mount flanges and nuts at the underside of the vehicle floor, or simply on client's request.
- Use the center of the platform and not the center of the base as reference.(*)

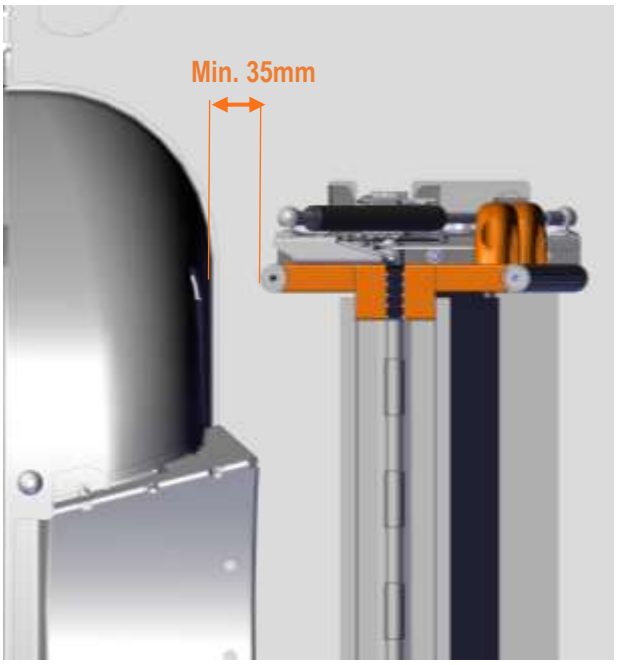


- Observe a minimum distance of 35 mm between the ramp frame and the vehicle body when the platform is swung outboard.
- If it is desired that the platform can be swung inboard, verify if there is sufficient clearance to swing the platform inboard from its default position across the door aperture to the longitudinal position alongside the side panel of the vehicle body (wheel boxes, internal racking or seating, other equipment, etc.)

Out: 93°



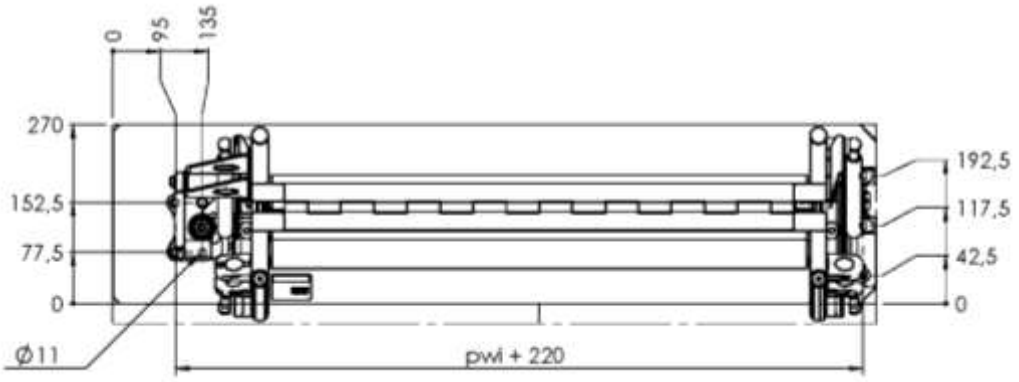
In: 90°



- Mark the position of the drill holes through the base plate and the ramp fixations.
- Take the ramp and/or base plate out of the vehicle or place it further inside the vehicle to have an clear environment to perform the drilling.

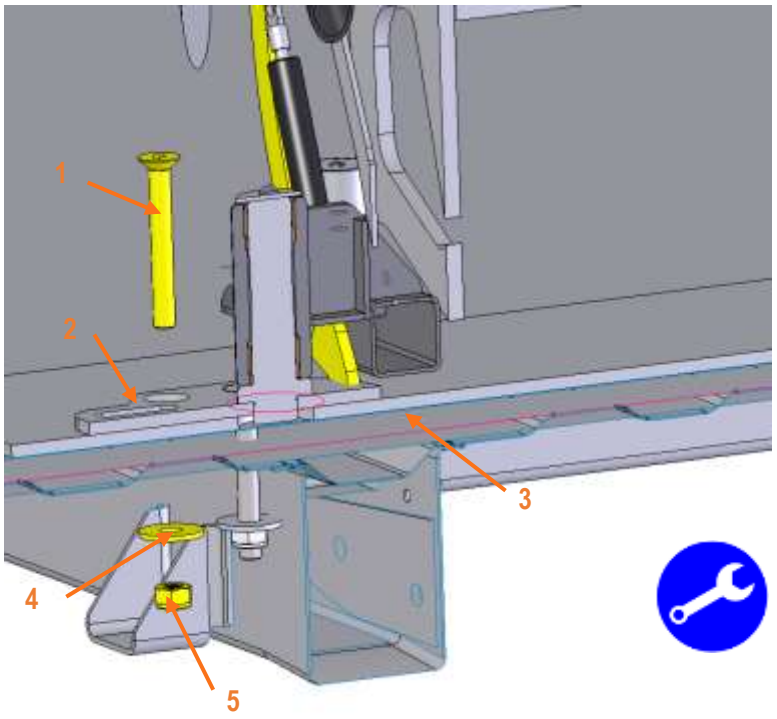
8.5.3 Drilling the holes for the mounting bolts

- See section 8.6 on page 31 for drilling guidelines.
- The position of the drill holes can be verified by using the template.



8.5.4 Fixation

- Bolt the ramp fixations and the base plate to the vehicle floor by means of the bolts and nuts provided in the kit. Fasten the bolts and nuts with the required torque. See torque values in appendix 11.2 on page 42.

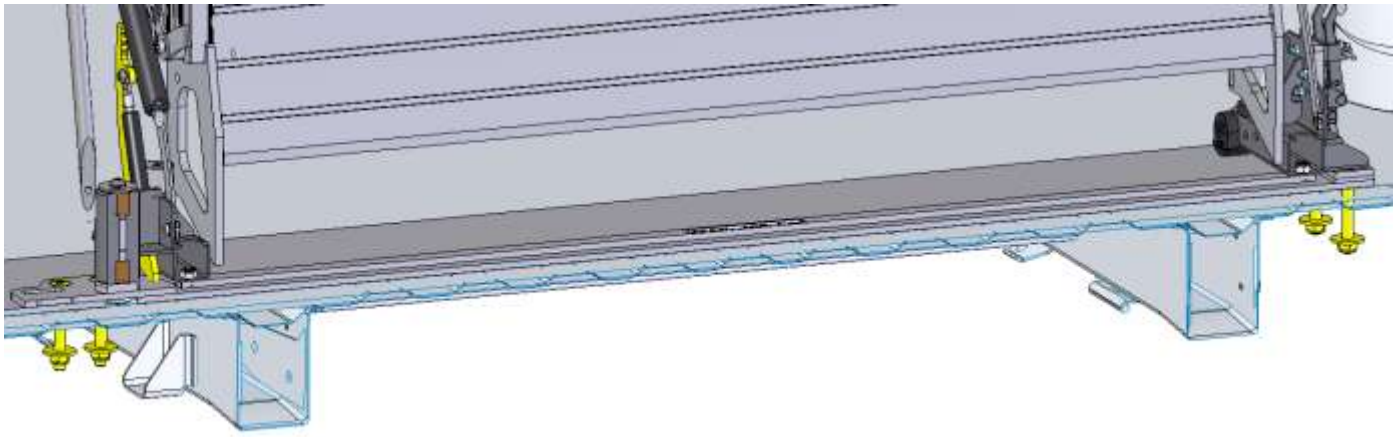


1	Bolt M10
2	Ramp fixation bracket
3	Vehicle floor
4	Large washer
5	Locking nut

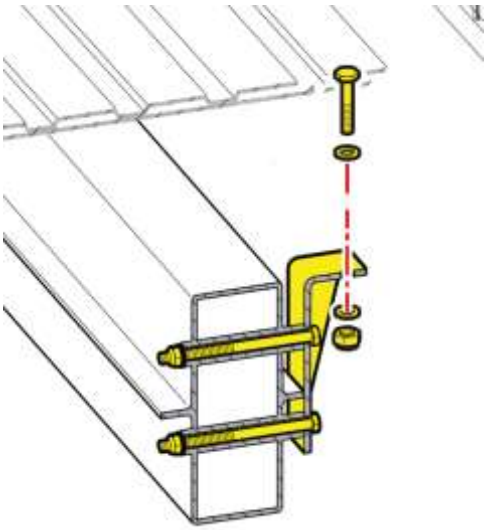
NOTICE

- It is essential that bolts and nuts used to mount the lift frame to the vehicle chassis, are fastened with the required torque by means of a proper torque wrench. See appendix 11.2 on page 42.
- If you use mounting bolts not supplied by DHOLLANDIA, obtain confirmation of the required torque from your supplier and make sure they guarantee at least an equivalent strength.
- Check and retighten the bolts after the static and dynamic weight test performed during the PDI test.

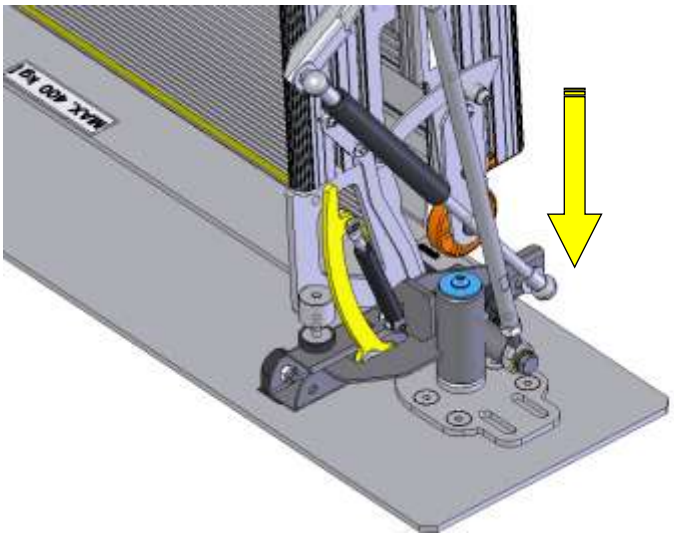
- Underneath the vehicle floor, use the larger washers supplied with the ramp or other flanges or profiles of at least equivalent strength to spread the forces of the bolts and nuts over a wider area. Mount these between the underside of the vehicle floor and the nuts of the mounting bolts.

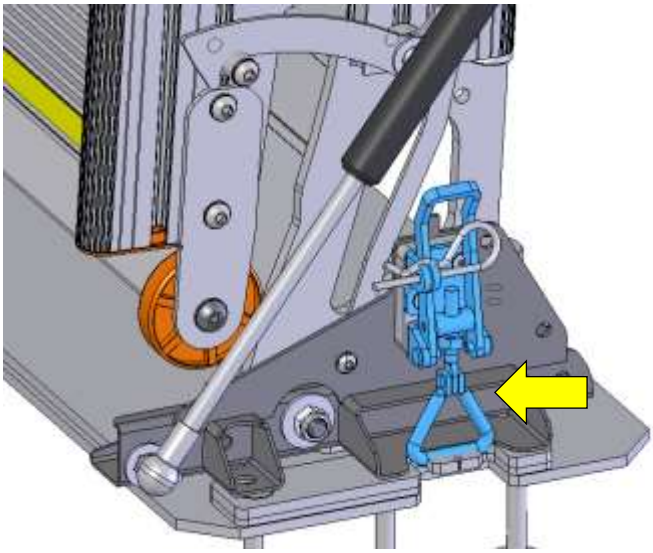


- If the vehicle floor is not sufficiently strong to support the ramp and its load, or additional structural support is wanted, it is recommended to link the mounting bolts to the chassis by means of additional support pieces (not included in the kit).



- Maneuver the ramp and ramp frame back into position. Slide the ramp frame over the articulation pin on the base plate. Mount the washer, spring washer and bolt, and tighten the bolt with the required torque. See appendix 11.2 on page 42.
- Engage the quick-release lock at the opposite side.

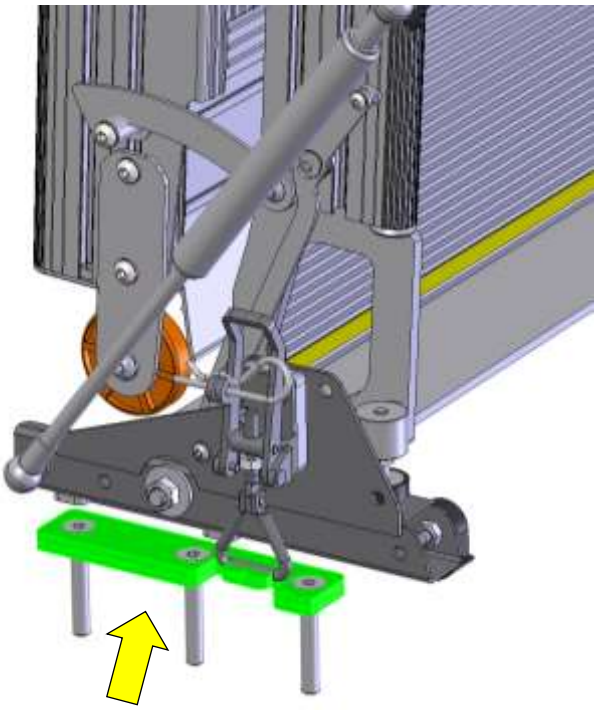




- The quick-release lock is adjustable in length. It is set at the factory, but verify this during installation to make sure the ramp frame is very solidly attached to the ramp fixations.
- To adjust the length, release the nut on the threaded part of the lock. Turn the eye to shorten or lengthen the lock. Fasten the nut firmly after final adjustment.

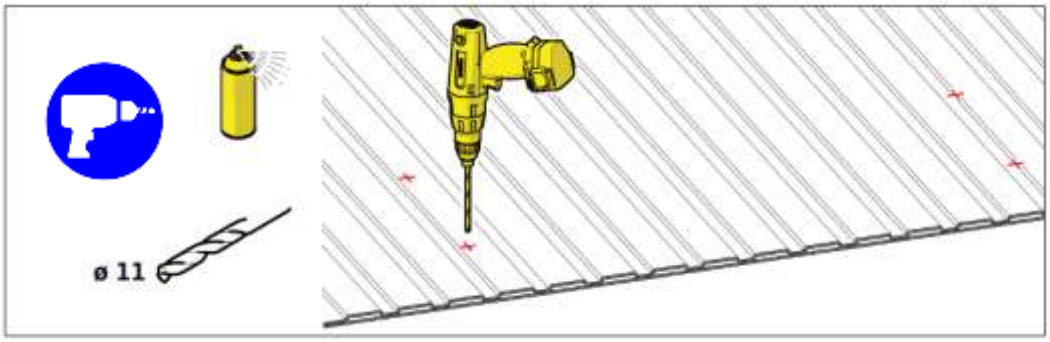
8.5.5 Additional ramp fixations for a 2nd travel position of the ramp inside the vehicle [option OAF821]

- Option OAF821 provides ramp fixations for a second travel position alongside the side panel of the vehicle body.
- Turn the ramp 90° inwards to locate the correct position of ramp fixations. Verify with the installation dimensions provided in section 7.4 from page 14 onwards.
- Mark the drill points. Proceed with drilling and installation as described in previous steps.



8.6 DRILLING GUIDELINES

- Double check the position of the ramp frame and ramp fixations prior to drilling holes. Use the dimensions in section 7.4 on page 14 and the instructions in 8.4 on page 20 and 8.4.5 on page 24 as guidelines.
- Mark the drill positions on the vehicle floor.
- Temporarily place the ramp further inwards or take it out again to be able to work comfortably.
- Check if the drill pattern on the vehicle floor can be reproduced at the underside of the vehicle. Verify if all bolts and nuts can be mounted properly, together with the large washers or flanges to spread the forces of the bolts over a wider area. Reposition the ramp frame and ramp fixations if required.
- Verify the fixation points and prepare solutions in the event that drilling interferes with chassis beams, fuel tank or other vehicle components, spare wheel carrier, etc.
- Refer to the FITTING AND BODY BUILDING INSTRUCTIONS of the vehicle manufacturer, as some have strict procedures how to execute the chassis drills.
- Drill the vehicle floor on the markings you made earlier with a ø11mm drill.
- Properly deburr all freshly made chassis perforations. Apply adequate anti-corrosive protection (zinc-spray, Dinitrol, etc.) and allow to dry.

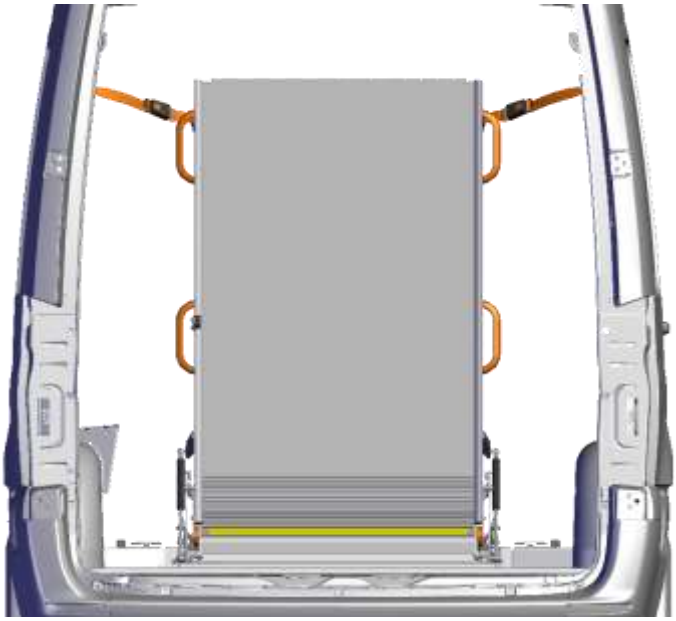


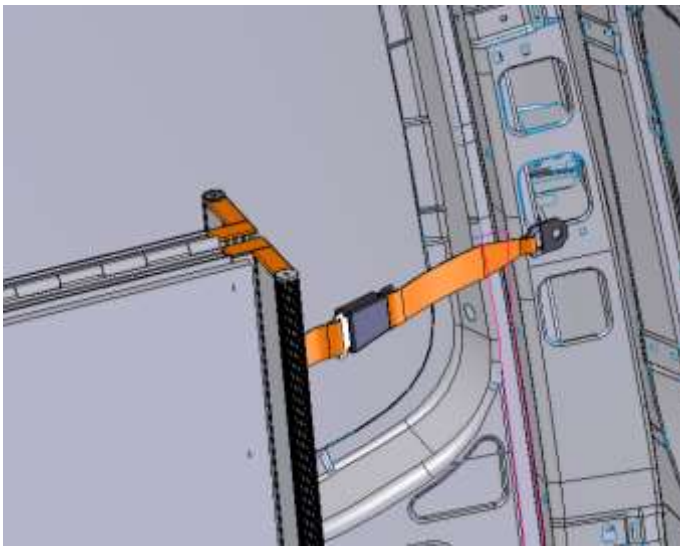
NOTICE

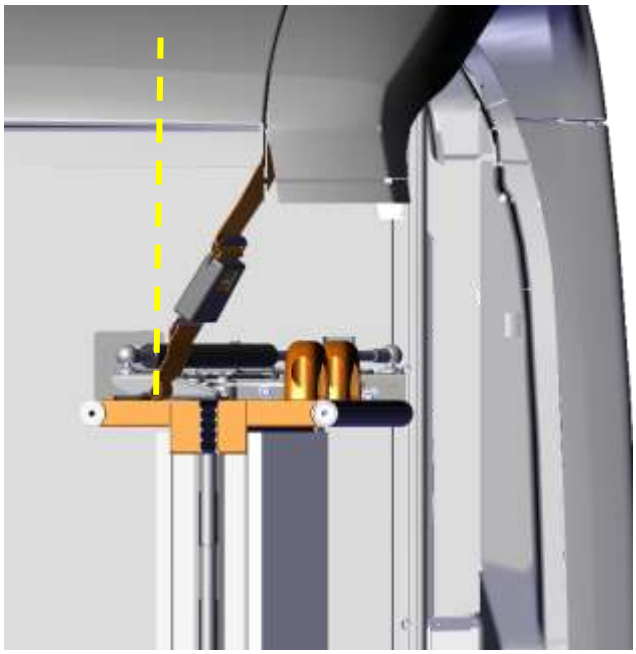
- All drilling works most be executed in accordance with the FITTING AND BODY BUILDING INSTRUCTIONS of the vehicle manufacturer.
- ALWAYS use reinforcement tubes whenever instructed to do so or whenever they are included in the bolt kit of the lift.
- All metal works (drilling, cutting, grinding) to the chassis, subframe, rear cross member and vehicle body require adequate anti-corrosion protection.

8.7 SAFETY BELT [OPTION OAT801]

- Safety belts [option OAT801] are available to provide additional fixation of the platform to the vehicle body. Their purpose is to secure the platform and prevent it from moving forward in case of heavy braking or a front collision.
- One end of the belts is already premounted to the platform.
- The other end must be attached to a stronger structural element of the body work of the vehicle, positioned in line with the platform or more towards the rear of the vehicle.
- Don't tighten the safety belts too hard as this might put unwanted stress on the ramp and vehicle body.

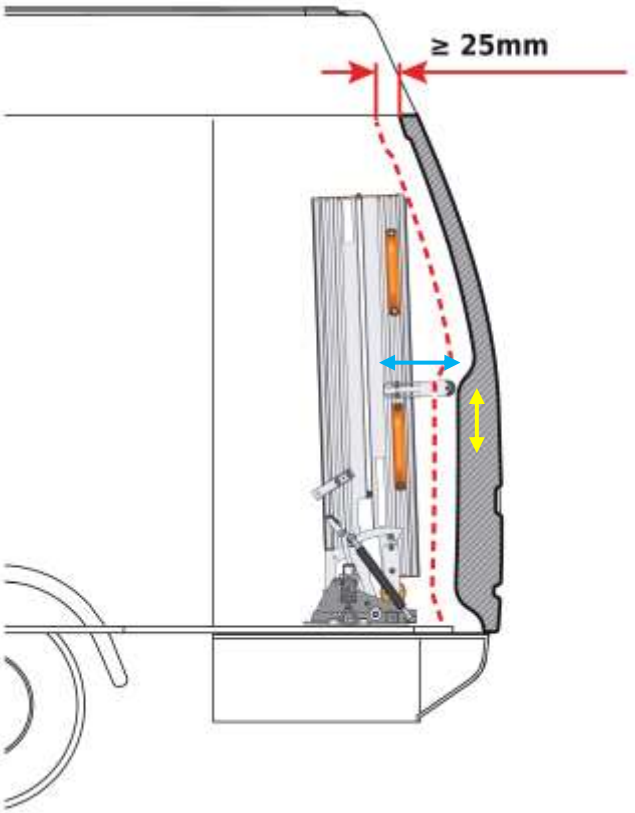


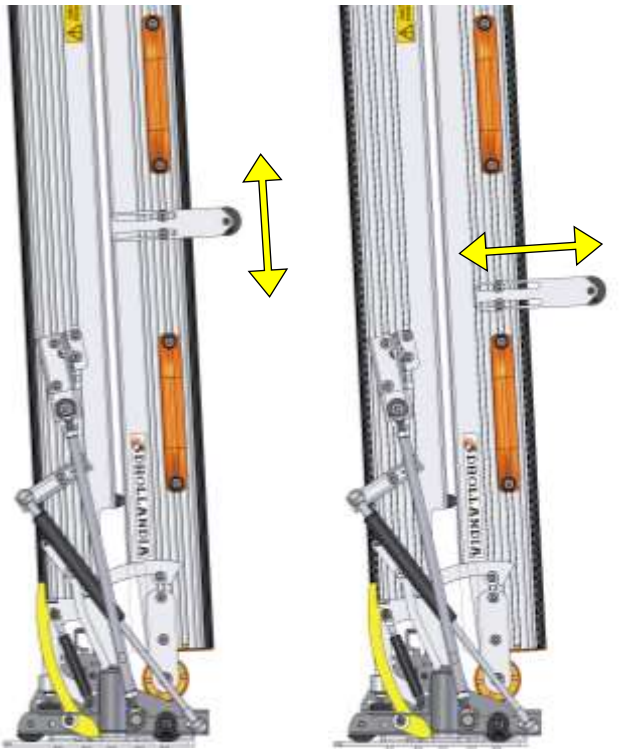




8.8 DOOR PROTECTION RUBBER

- The ramp is equipped with a door protection rubber, providing additional support to absorb small movements and vibrations.
- Close the door of the vehicle. Position the rubber so that it rests against a stronger structural element of the door, not visible from the outside.
- The door protection rubber can be slid in / out, moved up / down and rotated slightly.
- Loosen the bolts and move the door protection rubber to a suitable location.
- In some cases the desired position can't be reached without taking out the handles.
  - Take out the orange caps at the end of the aluminum side profile of the platform.
  - Loosen the bolts of the handles and the door protection rubber, so that you can just slide these parts up / down. But don't take out the bolts completely as this will make it harder to place everything back.
  - Slide out the parts and place them back in the desired order.
  - Fasten all bolts with the required torque. See appendix 11.2 on page 42.





9 PUTTING THE RAMP INTO SERVICE

9.1 QUALITY CONTROL AND PDI TEST

⚠ WARNING

- Improper use of the ramp can put the operator at great risk of serious bodily injury and death. If in doubt how to use the ramp correctly, ALWAYS consult the operation manual prior to continuing.
- NEVER exceed the maximum rated capacity of the ramp.

- Finish the ramp in accordance with local regulations.
- Ensure that all mounting bolts are fastened with the required torque. See appendix 11.2 on page 42.
- Execute all movements min. 5 times to ensure all ramp functions work properly. Pay special attention to:
  1. When deploying: the platform main section and foldable point fold open smoothly and can be handled with reasonable human effort.
  2. When deploying: (if so equipped) the support feet and the outboard platform edge are resting on the ground.
  3. When stowing: the platform main section and foldable point fold shut smoothly and can be handled with reasonable human effort.
  4. When stowing: the automatic lock engages automatically.

  Refer to section 9.3 on page 35 in case any adjustments must be made.
- Make sure that the ramp will be clearly visible in surrounding traffic:
  Place cones around the platform to alert surrounding traffic.
- Apply the safety decals to the ramp and the vehicle body before delivery to the customer, see section 10 on page 38.
- Work through the CHECKLIST FOR THE PRE-DELIVERY INSPECTION (PDI) TEST in appendix 11.3 on page 43 and complete the practical load tests indicated.
- Refer to the CE IDENTIFICATION AND INSPECTION LOGBOOK and fill-out the FITTING DECLARATION therein.

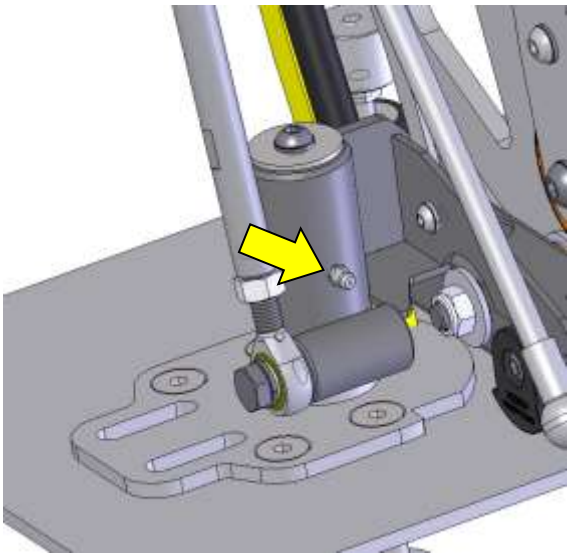
NOTICE

⚠ WARNING

- The PDI checklist completes the final quality inspection of the installation. Once completed successfully, it will certify the safe and reliable operation of the ramp.
- Operating a ramp that hasn't successfully passed the PDI can lead to premature wear or damage of the ramp itself.
- Operating a ramp that hasn't successfully passed the PDI can put the operator and third parties at great risk, and could result in severe personal injury or death.

9.2 LUBRICATION

- Ramps equipped with the pivoting frame [option OAF820.L] are equipped with a grease nipple on the articulation pin mounted on the base plate. Grease it with acid free grease after installation, and regularly once in service in function of the intensity of use.
- Use penetrating oil to lubricate the platform hinges, whenever unfolding / folding the platform reveals too much friction.

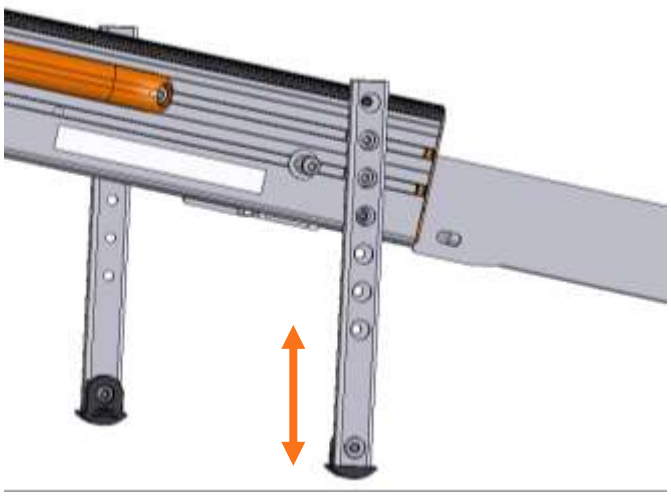


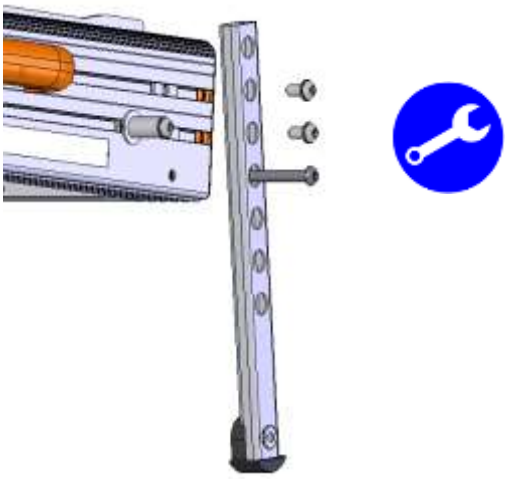
9.3 ADJUSTMENTS

9.3.1 Length of the support feet

- On **DH-AI12.10.01** ramps, the support feet can be slid in and out.
- Deploy the ramp in its open work position.
- Release and dismount the bolts that hold the 2 tubes of the support feet together.
- Extend or retract the support feet so that:
  1. the subsequent platform sections are fully aligned and form one straight surface.
  2. the support feet are in firm contact with the ground.
- If the holes in both tubes don't line up when the platform sections are fully aligned, raise the platform main section slightly, take the next hole down and make the support feet slightly too long.
- Mount the bolts again and fasten the bolts and nuts with the required torque. See appendix 11.2 on page 42.

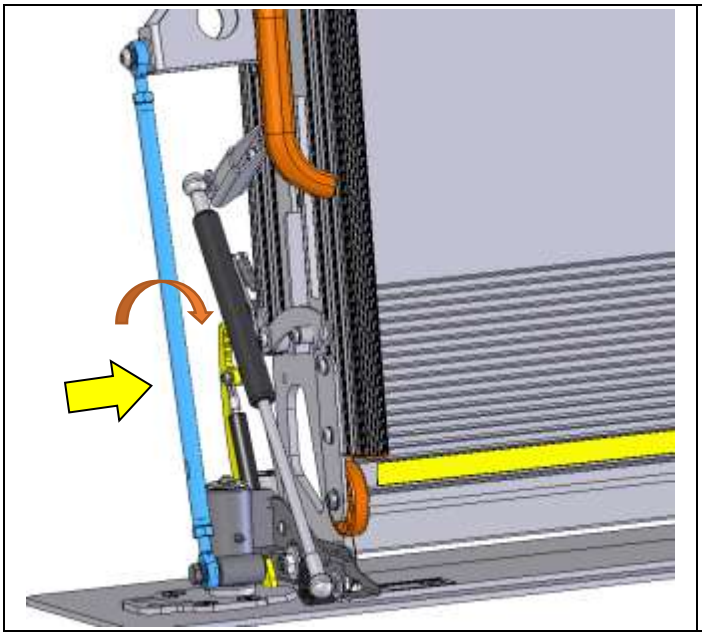
- On **DH-AI13.04.01** ramps, the support feet can be dismounted and moved up / down.
- Deploy the ramp in its open work position.
- Dismount the bolts that hold the support feet to the side platform profile.
- Extend or retract the support feet so that:
  1. the subsequent platform sections are fully aligned and form one straight surface.
  2. the support feet are in firm contact with the ground.
- If the holes in the tubes don't line up with the positions in the side platform profile when the platform sections are fully aligned, lower the platform slightly, take the next hole up and make the support feet slightly too short. Make sure that in final position, the tip of the flip-over point touches the ground.
- Mount the bolts again and fasten the bolts and nuts with the required torque. See appendix 11.2 on page 42.

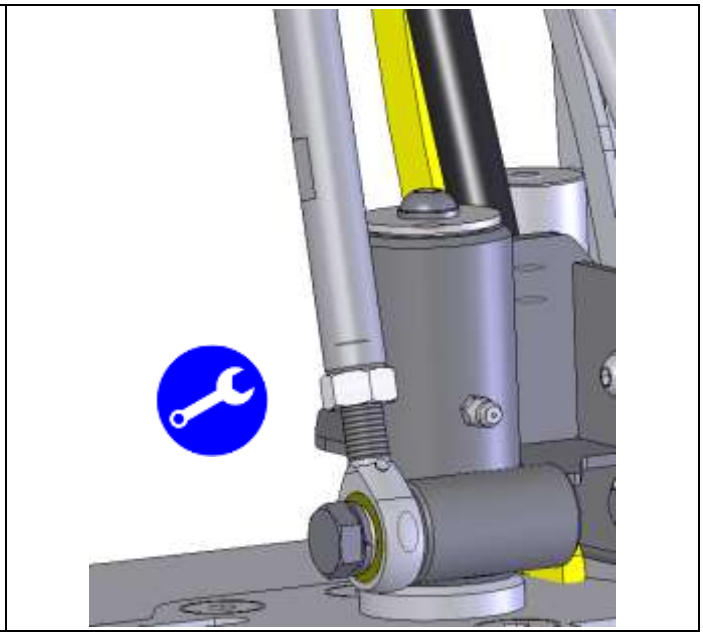




9.3.2 Support rod on ramps with the optional pivoting frame [OAF820.L]

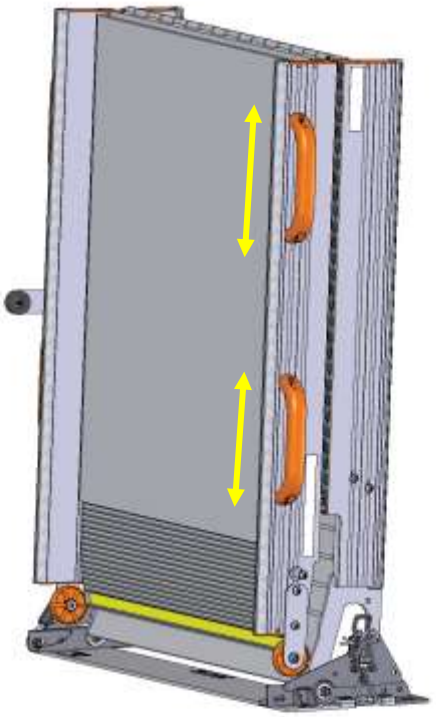
- The pivoting frame [option OAF820.L] is equipped with a support rod, holding the platform upright during the pivoting movement.
- Adjusting the length of the rod influences the angle of the platform during the pivoting movement and its ability to swing in and out.
- To adjust:
  - Loosen the counter-nuts.
  - Turn the rod by means of a wrench.
  - Test the ramp in the various closed positions across the rear doors, pivoted inwards and outwards. Adjust further if needed.
  - Retighten the counter nuts firmly after fine-tuning.





9.3.3 Handles

- The handles are positioned on the side profiles of the ramp with an average user in mind.
- Although it is recommended that handles are kept in original position, the installer can make small adjustments.
- To adjust their position, loosen the 2 bolts just enough so that the handle can be moved up and down in the profile.
- Reposition the handles as per your needs.
- Test the new position. Ensure the platform can be deployed safely and comfortably, with reasonable human effort.
- Retighten the bolts firmly after adjusting the position. Fasten the bolts and nuts with the required torque. See torque values in appendix 11.2 on page 42.



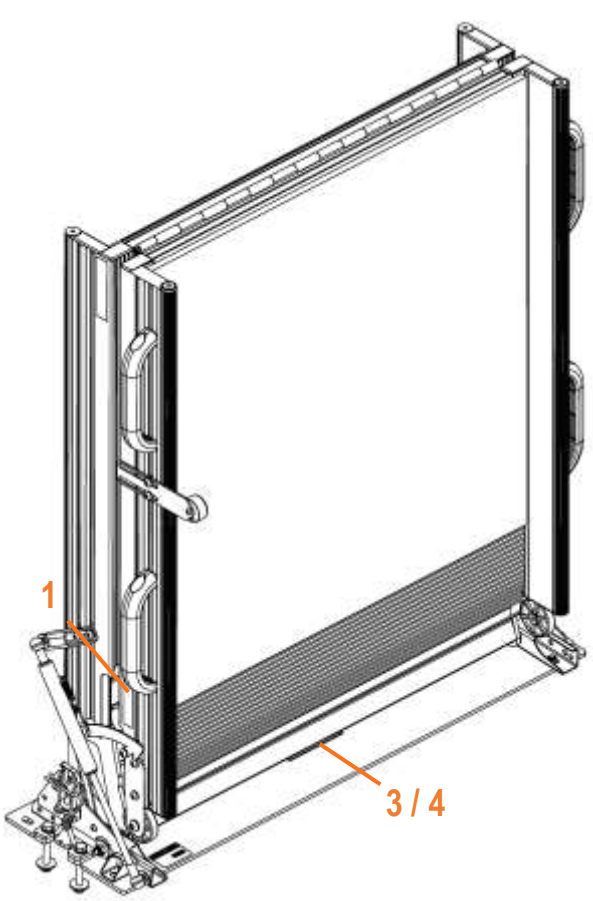
10 DECALS

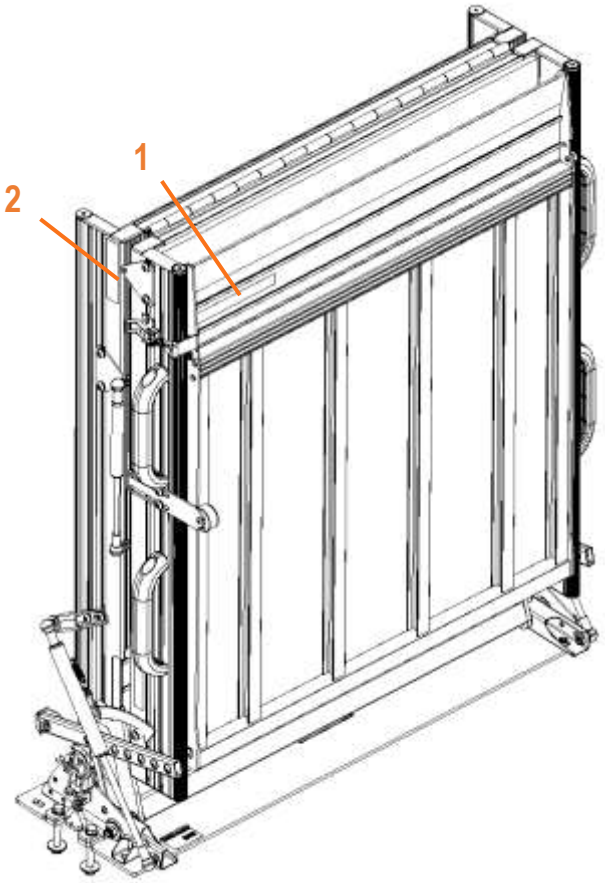
10.1 INTRODUCTION

- Decals are used to remind the operator and warn the wheelchair occupant for a number of specific hazards and instructions. Decals can be premounted on the ramp itself, or shall be mounted by the installer during installation and PDI of the lift.
- NEVER remove or paint over any decal. Missing, worn or illegible warning decals must be immediately replaced. Get replacement decals from DHOLLANDIA. Contact your national DHOLLANDIA distributor. See page 3 for contact info.
- The operator should comply with all affixed safety and operation decals. Beware that the decals merely summarize the main points, and that the operator must know, understand, and comply with the full contents of the operation manual.

10.2 REGULAR DECALS ON THE LIFT

- The following decals are premounted by DHOLLANDIA on the lift.





1 EF0577

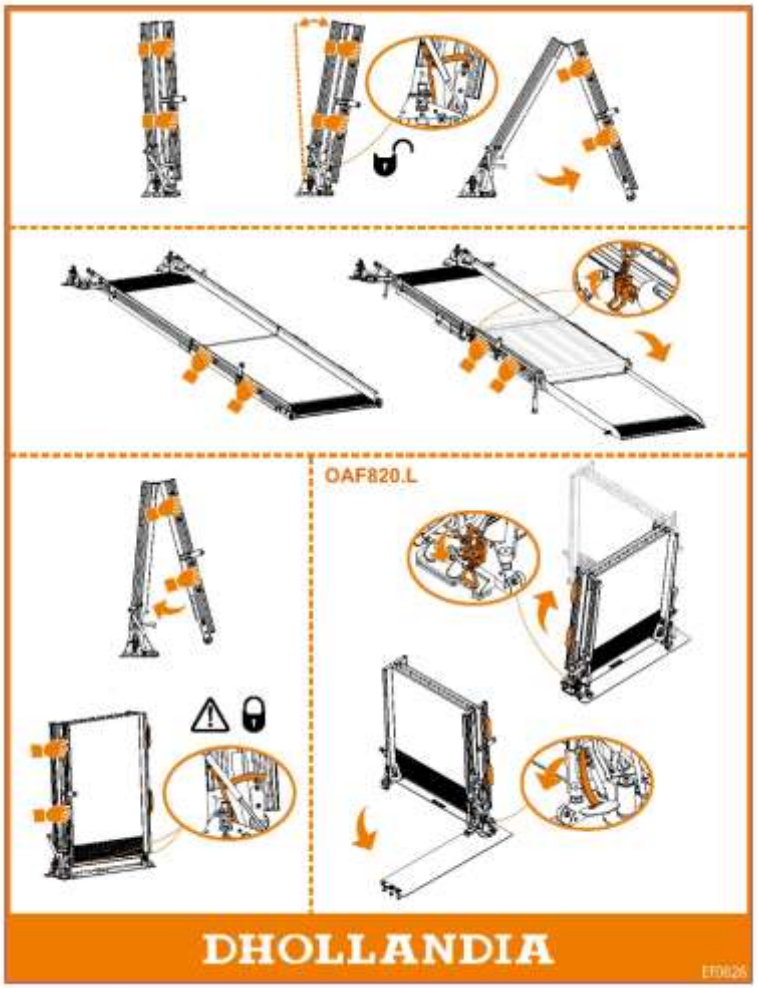
2 EF0593.EN

3 EF0570.00400

4 EF0570.01000

10.3 DECALS INSIDE THE VEHICLE

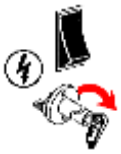
- The following decal is supplied loose with the lift and shall be affixed by the installer near the lift at a location clearly visible to the operator, preferably inside the vehicle to maximize longevity.



11 APPENDIX

11.1 MEANING OF SAFETY AND WARNING SIGNS

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

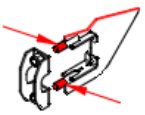
OTHER frequently used signs		Signs for the electric / hydraulic functions	
	Yes do this way. Correct work procedure.		OPEN the platform, or TILT DOWN.
	No, DO NOT do this way. -Incorrect work procedure.		LOWER the platform.
	Position the load at the applicable center of maximum load. Follow the load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

11.2 PRESCRIBED TORQUE VALUES FOR BOLTS AND NUTS

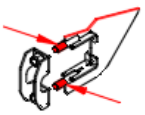
- The installer MUST verify that all bolted connections are fastened with required torque in accordance with the table below.
- After weight testing, the installer MUST verify that all bolted connections between ramp frame and mounting plates, and between mounting plates and vehicle chassis are still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

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

Nm – Metric Value	Type of Stress STD = 8.8 * = 10.9 – Pull	Shear
1. M08 x 1.25	8	23
2. M10 x 1.50	15	46
3. M12 x 1.75	26	79
3. M12F x 1.5	65 *	125 *
5. M14 x 2.00	65	125
6. M14F x 1.50	100 *	195 *
8. M16 x 2.00	100	195
7. M16F x 1.50	150 *	280 *
9. M20F x 1.50	160 **	
10.M24F x 2.00	270 **	

* = 10.9 ** = 

LbsFt – Imperial Value	Type of Stress STD = 8.8 * = 10.9 – Pull	Shear
1. M08 x 1.25	6	17
2. M10 x 1.50	11	34
3. M12 x 1.75	19	58
3. M12F x 1.5	48 *	92 *
5. M14 x 2.00	48	92
6. M14F x 1.50	74 *	144 *
8. M16 x 2.00	74	144
7. M16F x 1.50	111 *	206 *
9. M20F x 1.50	118 **	
10.M24F x 2.00	199 **	

* = 10.9 ** = 

11.3 PDI CHECKLIST

1 - General inspection on the fitting parameters	OK
The vehicle is technically suitable for the type of ramp and its max. rated capacity.	
The requirement for mechanical or hydraulic stabilizing 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 ramp has been fitted conform with the fitting instructions of DHOLLANDIA and the Fitting and Body Building Instructions of the OEM vehicle manufacturer.	
The ramp angle complies with client's instructions. Embarkation / disembarkation of wheelchair occupants or loading / unloading of cargo can be done with an acceptable level of safety.	
All safety decals have been affixed in conformance with the installation instructions and are clearly legible.	

2 - Inspection of the mechanical part	OK
The size, number and spread of mounting bolts conform with the installation instructions. All bolts are fastened to the prescribed torque values. Check for potential deformation of the mounting bolts and plates after weight testing.	
All articulation pins and retaining bolts are properly fastened and secured.	
Areas of drilling, cutting, grinding, welding etc. are adequately protected against corrosion.	
The support feet underneath the platform have been adjusted correctly (see 9.3.1 on page 35).	
The support rod on ramps with optional pivoting frame has been adjusted correctly (see 9.3.2 on page 36).	

3- General operation, practical tests	OK
General operation with an empty platform: execute all movements several times. The ramp should work smoothly and quietly through its full range of motion. Any (creaking, grinding or squeaking) noise should be carefully investigated and solved.	
Dynamic test at 100% of maximum rated ramp capacity. Load and unload the ramp with a weight equal to the maximum rated capacity. • Verify the general performance & stability. • Verify if there is no permanent deformation after the weight test	

4– Documentation for the operator	OK
The OPERATION MANUAL is available in the vehicle.	

NOTICE	⚠ WARNING

- The PDI check-list completes the final quality inspection of the installation. Once completed successfully, it will certify the safe and reliable operation of the ramp.
- Operating a ramp that hasn't successfully passed the PDI can lead to premature wear or damage of the ramp itself.
- Operating a ramp that hasn't successfully passed the PDI can put the operator and third parties at great risk and could result in serious personal injury or death.
- It is therefore essential that the PDI check is completed with due diligence, and any shortcomings rectified prior to delivery of the vehicle to the operator.

11.4 SPARE PARTS LIST

- The latest spare parts lists can be downloaded from:

  www.dhollandia.com → Country & language selection → Downloads → …

12 END NOTE

NOTICE

- Competent and regular preventative maintenance is essential to the operational reliability, and the safety of the operator and bystanders.

- The latest update of our check-list for preventative maintenance & inspection can be downloaded from:

  www.dhollandia.com → Country & language selection → Downloads → Checklists → … select required manual

- All maintenance and repair work should be performed by authorized DHOLLANDIA service agents and using only authorized OEM DHOLLANDIA replacement parts.
- Consult the separate MAINTENANCE AND REPAIR MANUAL for safety instructions, maintenance guidelines, and troubleshooting support.
- Lubricate the ramp on a regular basis to maximize its durability and operational reliability. This is at least 3 times per year in a single shift operation; more frequently in case of very intensive use (multiple shift, 24h operation, etc.) or use in hostile environment conditions (frequent high pressure cleaning with strong detergents, etc.).

- The latest version of the MAINTENANCE AND REPAIR MANUAL can be downloaded from the DHOLLANDIA website:

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