



WOLTURNUS

Manual

For Fixation of Wheelchair in Motor Vehicles



Wolturnus A/S recommends that you read this manual before using the wheelchair.

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1 Introduction

1.1 Foreword

INFORMATION

Read this manual carefully and follow the safety instructions to ensure correct and safe use of the wheelchair as seat in motor vehicles. If you are in doubt about how to secure or use your chair contact your Wolturnus supplier mentioned on the back. Make sure you have read your user's manual first.

This instruction has been developed to illustrate how to secure your Wolturnus wheelchair in a motor vehicle with the correct safety equipment. This manual is an extension of the User's Manual, and it is recommended to read the user manual first.

Wolturnus has developed safety equipment which are in compliance with national and international standards regarding transport in motor vehicles in case of frontal collisions. Wolturnus do however always recommend transferring to the vehicles seats whenever possible.

Only wheelchair(s) that has been tested and approved in accordance with ISO 7176-19 and 10542-5, are eligible to be used as seat in a motor vehicle.

Wolturnus chairs suited as seat in a motor vehicle have been tested with Dahl safety belts and straps or docking system. Read the whole of this manual and your wheelchair user manual to find out if your wheelchair is suited as a seat in a motor vehicle, or ask your Wolturnus supplier.

- Whenever travelling in a Wolturnus wheelchair, always make sure proper and approved seats and restraining systems are installed with the car.
- Remove detachable accessories, such as tables, trays, and detachable push handles, during transportation whenever possible.
- Secure detachable accessories needed for user comfort, such as headrest and armrest, to prevent uncontrolled movement of any equipment.
- Secure joystick and controls.
- The wheelchair and all support systems must support the weight of user and accessories.
- Custom fabrications for individual patients have not been tested. Therefore it is especially recommended to transfer to the vehicles seats in such cases.
- Follow and observe all instructions and recommendations from the tie-down manufacturer's regarding the restraints systems within the vehicle.
- Check if your wheelchair is prepared for fixating within a vehicle from your manufacturer (Wolturnus).
- Reattach all the detached accessories after transportation is complete.
- Make sure your vehicle has suitable equipment installed for access/egress.

NOTICE

Being able to use the wheelchair as a seat in a motor vehicle is an optionally function, and it is added during the ordering of the wheelchair. Are you ever in doubt of your chair functionality always contact your Wolturnus supplier.

2 Safety

If the label on the wheelchair contains the following symbol, the wheelchair may be used as a seat in motor vehicles (see image 1). If the wheelchair may be used as a seat in motor vehicles, it may only be vehicles approved or adapted for such purposes.



Image 1 Icon for wheelchairs that may be used as seat in motor vehicles.

All safety belts and restraints for transportation in a motor vehicle must live up to the following standards and regulations.

Component	Standard
Wheelchair tiedown and occupant-restraint systems	ISO 10542 or ECE 16
Wheeled mobility devices for use as seats in motor vehicles	ISO 7176-19

WARNING!

Risk of injury with incorrect use

Injuries due to pinching, crushing, tipping over, or falling due to incorrect user might occur, if all safety instructions are not followed both within the user's manual and the fixation systems manual.

WARNING!

Risk of injury due to wheelchair accessories

Make sure all accessories are removed from the chair or secured, to avoid unexpected movement which can cause injury.

WARNING!

Secure all screws, bolts, and nuts

Always check that all screws and nuts are secured to avoid a collapse of your wheelchair. Failure to do so can cause serious injury or death.

INFORMATION

The wheelchairs have been subjected to a crash test according ISO 7176-19 in a forward-facing direction. A test dummy was secured in the wheelchair with a three-point belt. The Hawk wheelchair was tested with a four-point system. The W5, A-run, and Rex350 wheelchairs were tested with a four-point system as well as the Dahl Docking station. The wheelchairs have been tested with a total weight of the wheelchair which was > 125 kg (variation between models).

INFORMATION

Manoeuvrability and access to the vehicle may differ depending on type of vehicle and wheelchair.

INFORMATION

If you want to retrofit a safety system which allows you to use your wheelchair in a motor vehicle, contact Wolturnus for more information. Contact information can be found on Wolturnus' webpage www.wolturnus.dk

INFORMATION

To transport children up to 36 kg Wolturnus recommends using a system designed to children. There are children seats specially designed for children with a handicap. Make sure to choose a system with the right qualifications which satisfy the needs and demands of the child.

WARNING!

Missing use of headrest can result in serious damage or dead

Always mount the headrest when using the wheelchair as a seat in a motor vehicle.

WARNING!

Risk of damage with incorrect use

Insufficient transport safety can result in damage of the wheelchair and physical damage of the person or death. Always follow all instructions.

2.1 Safety-related clearances in motor vehicle

The following illustrations show the clearance zones which are to be maintained around the passenger of the product (see image 2 and 3). HHT (Seated head height) should be approx. 1200mm for a small female or 1550mm for at tall adult male. Always place the wheelchair user in a forward position when in the vehicle.

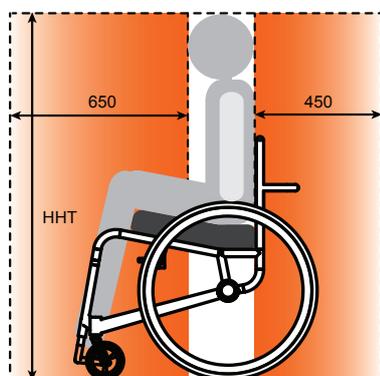


Image 2 Clearance from the side in mm

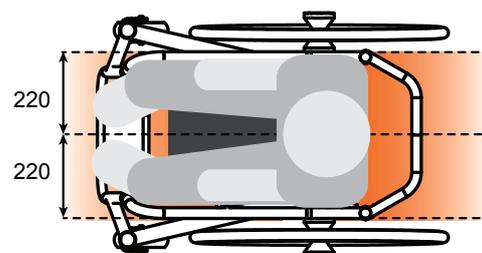


Image 3 Clearance from the top in mm

3 Fixation of Person in Wheelchair with Safety Belt

The following text will explain how to fixate a person in a wheelchair for travel in motor vehicle. Wolturnus do however always recommend switching to a car seat. Always ensure that the vehicle is installed with Wheelchair Tiedown and Occupant Restraint Systems (WTORS) (see table on page 5). Always use a three point occupant restraint to secure the occupant. Both pelvic and upper restraint belts must be used to reduce the possibility of head and chest impact with vehicle components. Restraint should be mounted to the appropriate vehicle pillar. It applies for both the four-point tie down restraint and Dahl Docking station.

The following points will describe incorrect and correct placement of safety belt for fixing of the person:

- If the wheelchair is installed with armrests, either remove the armrests or make sure the safety belt does not rest on the armrests (see image 4A).
- Make sure the safety belt is not placed to close the neck (see image 4B), or to far down on the shoulder (see image 4C). The safety belt should be placed on the middle of the shoulder (see image 4D).
- The pelvic restraint belt must be worn low across the front of the pelvis so that the angle of the pelvic belt is within the optional or preferred zone of 30° to 75° to the horizontal. A steeper (greater) angle within the preferred zone, 45° to 75° is desirable i.e. closer to, but never exceeding 75° degrees (see image 5).

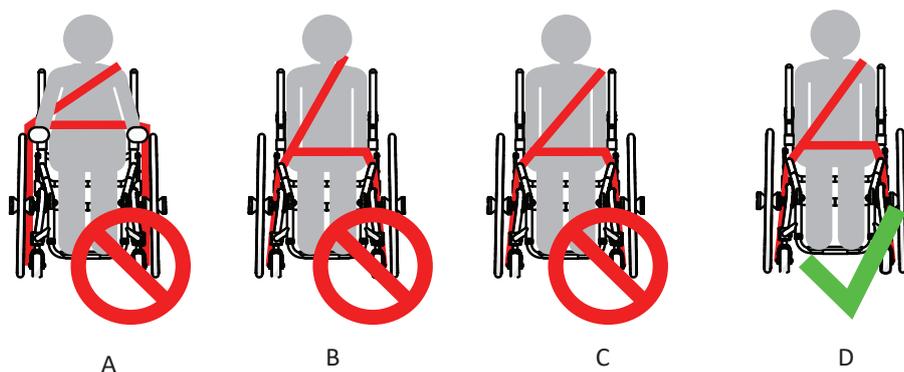


Image 4 Placement of safety belt

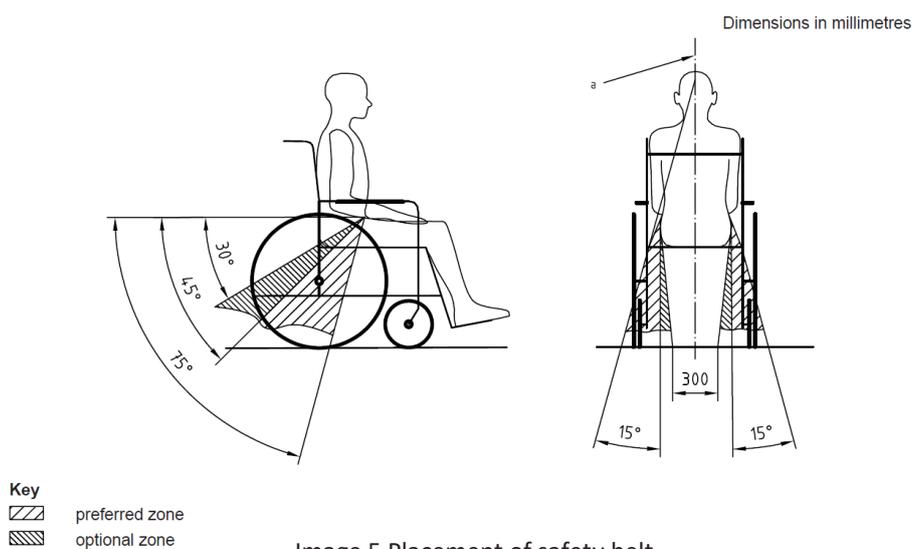


Image 5 Placement of safety belt

INFORMATION

Belt restraints should make full contact with the shoulder, chest, and pelvis and pelvic belt should be positioned low on the pelvis near the thigh-abdominal junction. Safety belt should not be twisted when in use.

WARNING!

The position belt of a wheelchair is not meant to be used as a car safety belt. It only prevents the user from sliding out of the seat while driving the wheelchair. When transported in a vehicle, the user shall wear an car safety belt which is attached to the vehicle.

4 Four-point Tie Down Restraint System

The wheelchair may only be fastened with the four-point tie down restraint system if the following restraining points and label are mounted on the wheelchair (see image 6).



Image 6 Restraining points and label

WARNING!

Standard ISO 10542-1 approved four-point Wheelchair Tie Down and Occupant Restraint Systems (WTORS) are only tested to 85 kg. It is recommended to use an ISO 10542 compliant WTORS (Heavy Duty System) which is rated for the total weight of the wheelchair including any options. Use four straps to secure the wheelchair, two straps at the front and two straps at the back. If using a standard four-point WTORS for securing a wheelchair heavier than 85 kg, use six straps to secure the wheelchair, two straps at the front and four straps at the back.

Make sure that the tire pressure is at the recommended level, so the straps can have maximum effect. The following points will describe how to fixate your wheelchair in a motor vehicle with four anchor points:

- Place the wheelchair in the center of the four anchor points, with the front facing the forward motion direction of the vehicle, and apply wheelchair brakes and turn off electrical control components.
- Attach four hooks, one from each anchor point in the vehicle, to the four restraintment points on the wheelchair. Make sure the hooks you are using, as well as the straps are approved safety equipment which fulfil all international safety standards. (See image 7, to see which points to connect to each other).
- Make sure that the straps are placed in the correct angle. The front straps should have an angle of 40-60 degrees from the floor to the strap and be in front of the frame. The straps in the back should have an angle of 30-45 degrees between the floor and the straps, and be placed behind the wheelchair (see image 7).
- Make sure the distance between the straps at the anchor points in the vehicle are approximately the same or wider than the corresponding restraintment points on the wheelchair.
- Make sure all accessories are either removed or are restrained by approved safety equipment and secured to either the wheelchair itself or the motor vehicle.
- Check that straps are tightened to such degree that the wheelchair will not move, yet not so much that it deforms the frame, as this will compromise the wheelchair and its safety features.

After the wheelchair is fastened, remember to fasten the person by putting on the safety belt as described in section 3.

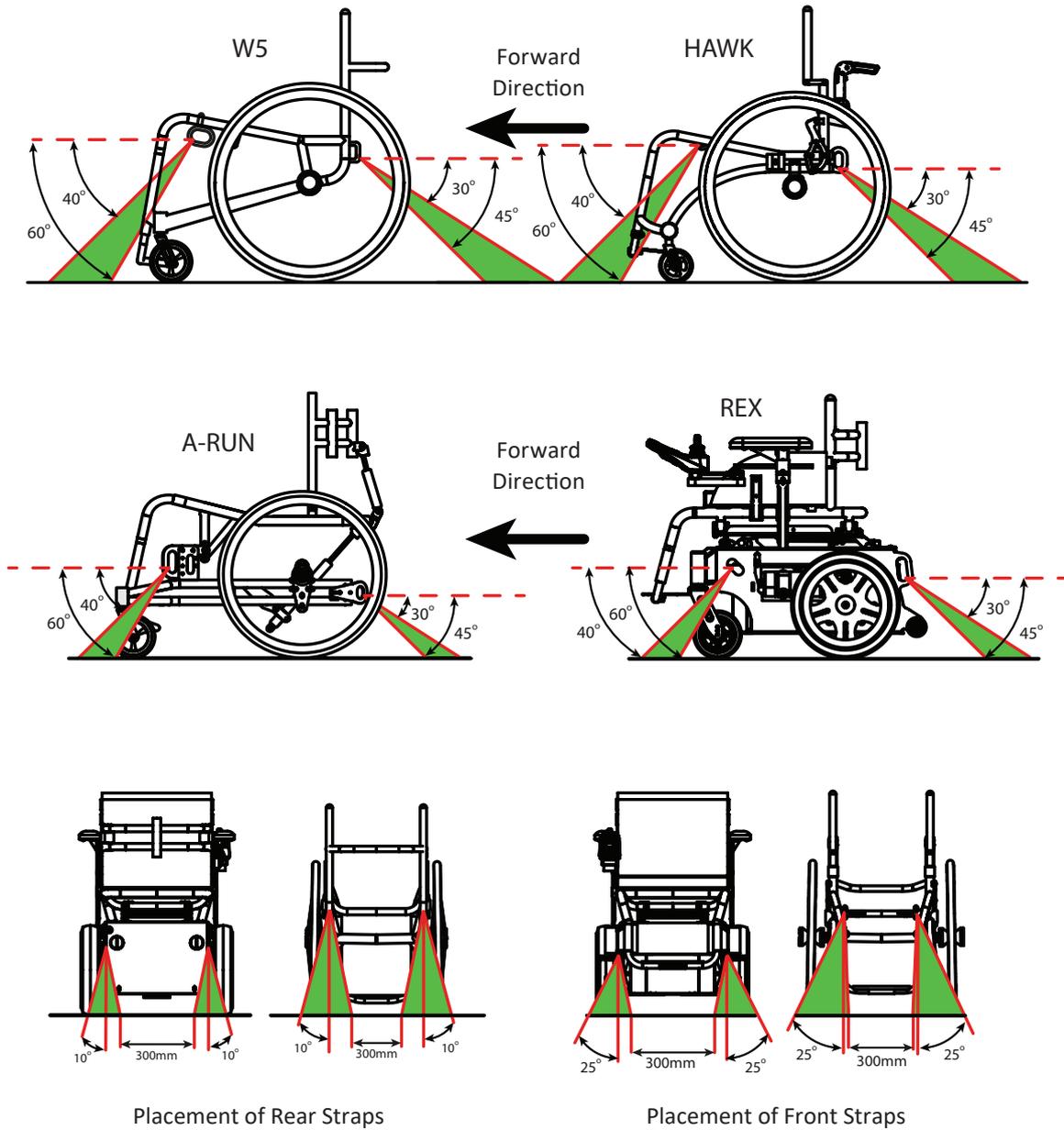


Image 7 Placement of straps

5 Dahl Docking Station

The Dahl Docking Station is a flexible vehicle locking system for wheelchair users. The vehicle mounted system allows the user to quickly and easily lock the wheelchair to the floor of the vehicle. This system can only be retrofitted by Wolturnus A/S on both W5 and REX models.

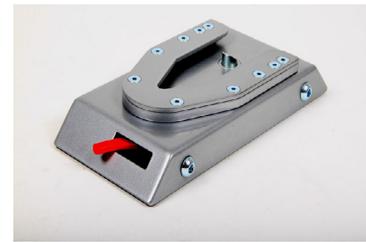


Image 8 Dahl Docking station with emergency release

5.1 Preparation of the wheelchair before use

A locking plate need to be mounted under the wheelchair (see image 9).

The locking plate is mounted to the main plate/mounting plate which is welded to four tubes, or on the battery casing, under the wheelchair. The follow points will describe how the locking is mounted:

- Measure the ride height of the wheelchair with the user sitting in it to correctly position the locking plate with a spacing plate of optimal thickness, maximum 25mm (see image 10).
- Mount the locking plate and the spacing plate to the main plate with the special Dahl bolts M8x35, washers DIN 9021 - Ø8 and nuts ISO 10511 - M8. Tighten all M8 bolts with 16-18 N.m.
- If the bolts are too long they should be cut the the right length. If they are too short replace them with Dahl's special bolts #502800.

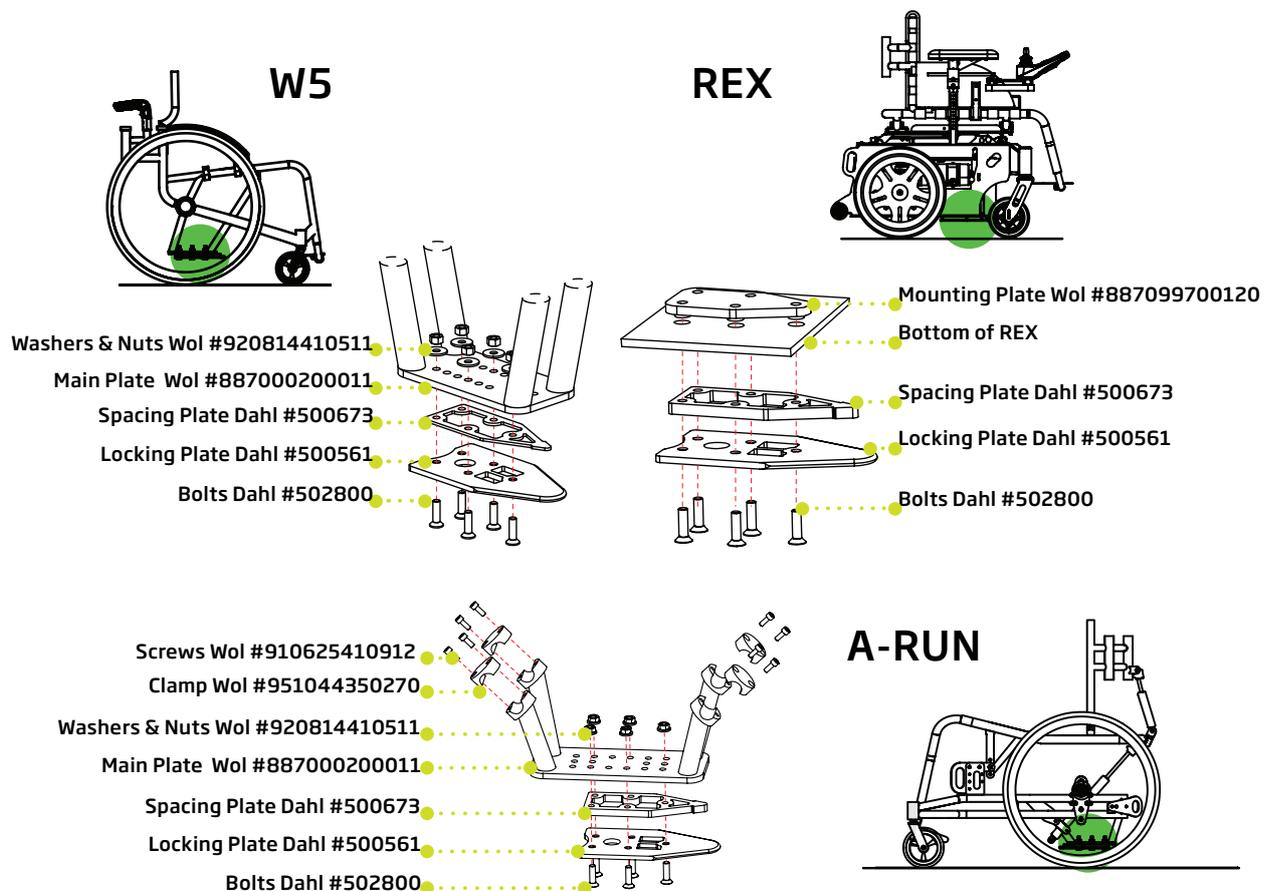


Image 10 Mounting the locking plate

WARNING!

Do not use any other bolts than those supplied from Dahl Engineering (part#502800 which is quality 14.9, torx 27). Standard screws will not be strong enough in the event of a collision.

5.2 Preparation of the vehicle before use

A Dahl Docking Station needs to be built into the vehicle. The lock plate on the wheelchair fits into the station, and a locking pin automatically secures the lock plate. Thereby the wheelchair is fastened to the vehicle.

WARNING!

The Dahl Docking station is only allowed to be mounted in a vehicle by trained and authorized staff of a registered car adaptation company. For ordering the Dahl Docking, vehicle installations kits, and its accessories, please contact Dahl Engineering in Denmark for further vehicle specific mounting manual, which must be followed. You can find Dahl at www.dahlengineering.dk

Also see Dahl Engineering's instruction for installation, use, and maintenance.



Image 11 Dahl Docking system in vehicle

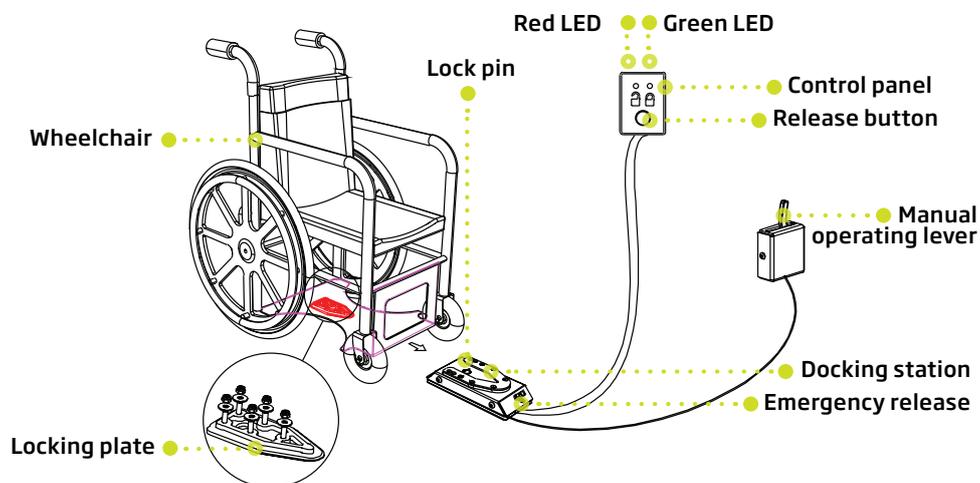


Image 12 Dahl Docking station system

5.3 Use of the Dahl Docking station: Attachment

This system to fasten the wheelchair is self locking. The following points will describe how to fixate the wheelchair in a motor vehicle with a Dahl Docking station:

- Drive the wheelchair into the vehicle and make sure to centre the wheelchair in the middle of the docking station.
- Drive slow until you feel the wheelchair is hitting the end position in the docking station corresponding to the lock plate fitting into the docking station. As soon as the plate comes into contact with the locking pin, a warning tone will sound and a red light on the control panel will light up until the plate is fastened or removed from the docking station. A clicking sound will appear when the end position is hit.
- The wheelchair is now locked into the docking station. The warning tone stops and the green light on the control panel will light up showing the wheelchair is locked correctly.

After the wheelchair is fastened, remember to fasten the person by putting on the safety belt as described in section 3.

WARNING!

If the wheelchair is not centered correctly, it might not be possible to lock in top the docking station. In that case, retry by driving a bit backwards and re-center the wheelchair. Try once more until you hear the clicking sound and you see the green light turning on.

5.4 Use of the Dahl Docking station: Release

The following points will describe how to release the wheelchair in a motor vehicle with a Dahl Docking station:

1. When the vehicle has been brought to a halt, remove the safety belt.
2. To unlock commence by driving the wheelchair forward to release pressure on the lock pin and then press the red release button in the control panel. The locking pin will be triggered/ released for approx. 5 seconds, after which the locking pin is automatically locked/activated again. Do not attempt to reverse out of the docking station until the red LED on the control module, which indicates the unlock position, has been illuminated.

INFORMATION

Attempting to reverse the wheelchair before the red LED has been illuminated will result in blocking the docking stations lock mechanism which makes it impossible to reverse. If this happens repeat above unlocking procedure.

3. The wheelchair is now released. Drive away from the station.

5.5 Use of the Dahl Docking station: Manual release in Case of Electric Failure

The following points will describe how to release the wheelchair in a motor vehicle with a Dahl Docking station in case of electric failure:

1. In the event of electrical failure, a manual emergency release is located at the front edge of the docking station. Move the wheelchair forward to release pressure on the lock pin and push the red release arm to one side and hold it there while the wheelchair reverses out of the docking station.
2. A cable-activated manual operating lever can also be fitted (optional). The red release arm must be pushed to one side and should be held there whilst the wheelchair moves away.
3. If the described manual release procedures fail, an emergency release tool made from red plastic comes with each docking station. Move the wheelchair forward to release pressure on the lock pin and place the emergency release tool in the gap between the locking plate and the docking station. Push the release tool and wheelchair forward until the locking pin will be forced down – after which the wheelchair can be reversed out of the docking station (see image 12 and 13).



Image 12 Dahl Docking Manual Release



Image 13 Insert Release Tool

5.6 Safety-belt with Dahl Docking

When using wheelchair with Dahl Docking system, the floor anchorage points for the occupant restraint system should be located 10-60 mm outside wheels, on each side. The pelvic belt must be worn low across the front of the pelvis so that the angle of the pelvic belt is within the optional or preferred zone of 30° to 75° as shown. A steeper (greater) angle within the preferred zone, 45° to 75° is desirable i.e. closer to, but never exceeding 75° degrees (see image 14).

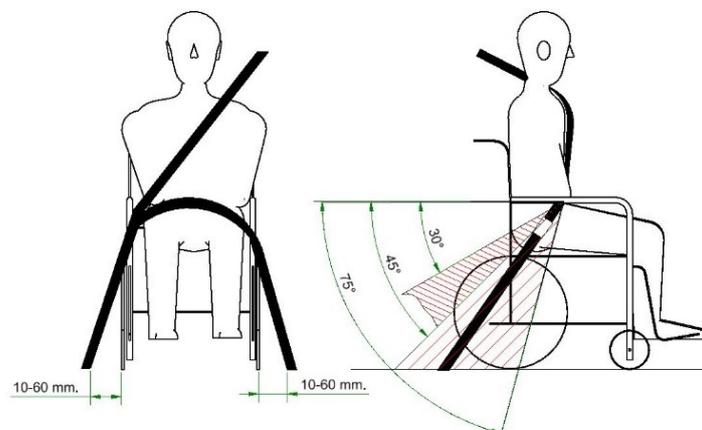


Image 14 Safety-Belt with Dahl Docking

NOTICE

Note that the Dahl-Docking system can only be retrofitted on a Wolturnus wheelchair by Wolturnus A/S.

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