DAHL DOCKING STATION MK II

MAINTENANCE MANUAL

Installation and User Guide

ENG

DAHL ENGINEERING

503744 · 03.2023

For wheelchair and user facing forward in the vehicle

IMPORTANT:

Please read these instructions in full before commencing installation. Users must also read the instructions in full before using the product. These instructions must be submitted to the user on delivery of the docking station and should be kept at an easily accessible location in the vehicle.

The securing system for the wheelchair and safety belts for the user may be designated with the abbreviation WTORS (Wheelchair Tiedown & Occupant Restraint Systems) in these instructions.

Table of contents:

Warnings

1. In the event that the instructions and warnings in this guide are not followed, there is a risk of death or serious injury to the wheelchair user and the other passengers in the vehicle.
2. Please contact the wheelchair manufacturer regarding approved equipment and ground clearance to ensure compatibility with our Dahl Docking Systems.
3. Installation must be carried out by an experienced technician/fitter.
4. The docking station must be serviced and parts replaced with original Dahl parts according to the instructions of the service manual. Failure to comply with the instructions of the service manual may render the product partially or completely inoperative or cause damage to the product, which can result in serious or lethal injury to the user and/or other passengers of the vehicle in the event of fatal injury.
5. Never begin driving the vehicle whilst a wheelchair is being docked in the docking station or if the user's safety belt is not secured.
6. Never begin driving the vehicle if the warning tone sounds and/or the red warning lamp (LED) in the control panel flashes or lights up.
7. WTORS may only be used for forward-facing wheelchairs.
8. Contact Dahl Engineering or your dealer immediately if there is any doubt concerning the use of the product or if the product has faults or non-conformities.
9. Users in wheelchairs should never be transported in the vehicle if certified WTORS are not used.
10. The user should not be a passenger or driver of the vehicle if both lap belts and shoulder belts are not used. This is to reduce the risk of the user's head or chest hitting interior vehicle elements and other passengers.
11. The docking system, seat belts and components shall be subjected to a check and maintenance inspection at least once a year in accordance with maintenance interval and documentation.
12. The user should never try to repair, adjust or modify the WTORS components. Alterations or modifications to the system are strongly discouraged. Any alterations carried out without prior agreement with Dahl Engineering are entirely the responsibility of the fitter and/or the user.
13. It is forbidden to combine Dahl WTORS components with those of other manufacturers. Some belt fittings/components will be very obviously incompatible, while others may appear to engage correctly, but might not withstand crash loadings or perform satisfactorily.
14. Do not attach components to weak/non-solid components or materials.
15. The fitter is responsible for ensuring that the installed unit satisfies all statutory requirements. Contact local/national authorities if there is any doubt in this regard.
16. Incorrect installation of safety belts and the docking station can cause malfunctions which can result in death or serious injury to the user.
17. Belt webbing must be protected against contact with sharp edges and corners, contact with solvents, polishing agents, oil and caustic/corrosive fluids or materials (in particular battery acid). Damaged, worn, torn or contaminated belt webbing and components must be replaced. This should be checked daily.
18. An airbag should be deactivated if the user is situated less than 300 mm from the airbag, or as recommended by the vehicle manufacturer. An airbag should also be deactivated if retrofitted parts block or have an effect on its inflation/expansion. If it is necessary to deactivate or remove the airbag, it is imperative, before fitting the docking system, to check if the vehicle manufacturer can offer a safety belt which is approved to be fitted without an airbag.
19. A docking station which has been involved in a collision from which the vehicle has had to be towed away or where the airbag has been deployed, must be sent to DAHL Engineering for inspection and possible repair. Safety belts and components must be replaced without separating the components, because they may have suffered damage that is not visible to the naked eye.
20. Be sure to check national regulations with regard to minimum clear space requirements and access to emergency exists for seats and wheelchairs for the vehicle concerned.
21. It is essential, that wheelchair manufacturers' instructions, references and warnings are followed when installing and using Dahl Docking Systems. The EU medical device directive states that a CE-marked medical device which has been customized outside the manufacturer's specifications thereby becomes a customized medical device and that the CE-marking must be removed. Anyone who customizes a CE-marked medical device outside the manufacturer's specifications is responsible for quality, safety and performance of the device and becomes the responsible manufacturer of the customized device.

    Complying with the wheelchair manufacturer's user and installation guide when installing the Dahl Docking System will ensure that the wheelchair manufacturer's CE-marking will remain intact. Manufacturer manuals for all CE-marked wheelchairs can be downloaded from our website.

Declaration of conformity

Dahl Engineering's objective is to provide products for wheelchair users which meet the strict EU M1 safety requirements for cars, when it is possible, and to the extent it is possible, with due consideration of the design and function of the aid and appliance concerned. We are therefore continuing our efforts to develop a range of tested and approved installation kits for different vehicles. These installation kits are tested according to EU regulation 2018/858, ECE R14 & R17, concerning seats and safety belt anchorages in vehicles.

The docking system, part number 501750, has been crash tested in frontal collisions at 48 km/h, 20g in connection with a **surrogate** wheelchair weighing 200 kg+ test dummies with a mass of 76,4 kg and 102 kg, where the lap belt was anchored to the floor of the vehicle (276,4 kg and 302 kg total weight).

As manufacturer, we hereby declare that the docking system's country of origin is Denmark and that the docking system, and the wheelchairs listed on our website are successfully tested according to the following:

- ISO 10542-1:2012 with ISO surrogate wheelchair
- ISO 7176-19:2008, with specific wheelchairs, see list of tested and approved wheelchairs on our website
- EU Regulation 2018/858, ECE R14 & R17 in many different vehicles, see product catalogue
- ECE R10 (Electromagnetic compatibility in vehicles)
- A seat base which fits the Docking Station has also been tested to meet ECE R14 and ECE R17

Claus Dahl Pedersen, CEO
Dahl Engineering ApS

Visit our homepage for more information

All successfully tested wheelchairs as well as wheelchair manufacturers user and installation instructions can be found on our homepage - under products - dahl docking systems: www.wtors.com

All tested and approved installation kits can be found in our product catalogue which can be downloaded from our home-page - under support: www.wtors.com

Please do not hesitate to enquire whether a wheelchair or an installation kit that has been tested in accordance with the above directives, is available for the vehicle concerned. In this case, separate installation instructions are available, which **must** be followed when installing the docking station.

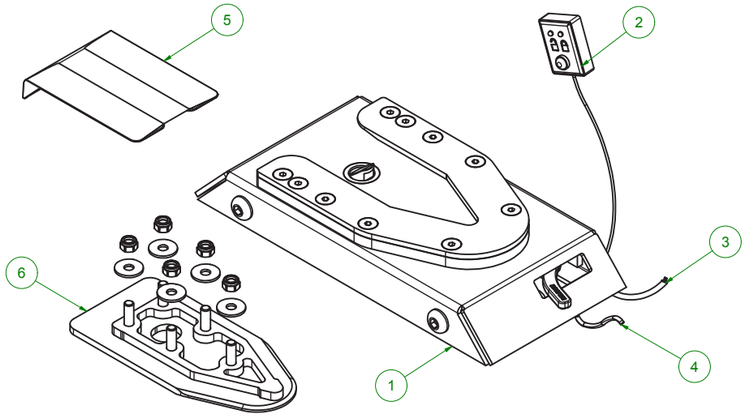
Product overview

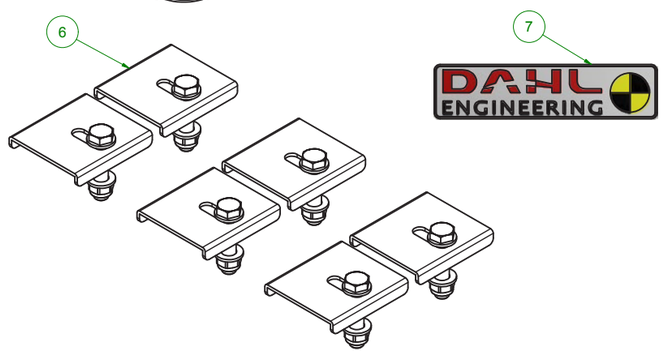
Inspection of the components delivered:
Start by checking if all of the components have been delivered correctly. Please contact us immediately if any parts are missing.

The contents of a standard kit with Dahl Docking Station, art. no. 501750, is shown on the next page. Safety belts for securing the user are not included in a standard kit and must be ordered separately! Please find accessories and spare parts in the respective chapters.

Positi-on	Name	Art. no.	Quantity
1	Dahl Docking Station MK II	501720	1
2	Control panel	500688	1
3	Power cable	500703	1
4	Cable for parking brake	500702	1
5	Emergency release tool	503161	1
6	Mounting kit for Docking Station MK II	501813	1

Art.no. 501750





Documentation at handover to customer

Vehicle specifications:

Make & Model:

Vehicle Identification Number:

Year:

Information about the docking station:

Article Number:

Serial Number:

Production Date:

VEHICLES 1ST OWNER

Name:

Street:

City:

Telephone:

Stamp of maintenance partner

Telephone:

VEHICLES 2ND OWNER

Name:

Street:

City:

Telephone:

Stamp of maintenance partner

Telephone:

VEHICLES 3RD OWNER

Name:

Street:

City:

Telephone:

Stamp of maintenance partner

Telephone:

VEHICLES 4TH OWNER

Name:

Street:

City:

Telephone:

Stamp of maintenance partner

Telephone:

Maintenance interval and documentation

Date: _____ Km: _____

Once a year or as required you must:

- ☐ Carefully remove the top section of the docking station (remove the two bolts on each side).
- ☐ Clean the docking station.
- ☐ Clean the locking cylinder and locking pin and lubricate with light oil.
- ☐ Remove the locking pin if there are any signs of corrosion or damage (art. no. 503555).
- ☐ Adjust the steel wire to the locking pin, art. no. 502400, if necessary.
- ☐ All steel wires must be examined for signs of wear or evidence of breaks. Replace if necessary.
- ☐ Replace the steel wire, reel and compression spring at least every second year or every 4000 operations. Order service kit with art.no. 502010 (for docking stations produced until 05/2017) or art.no. 502493 (for docking stations produced from 06/2017), which include these parts.
- ☐ Test whether the manual emergency release and the manual operating lever, no. 500680, if fitted, function properly.
- ☐ Check whether the wires are loose in the terminals and whether they are intact and insulated. Replace if necessary.
- ☐ Test whether the electromagnet/solenoid functions correctly.
- ☐ Test whether the micro switch, art. no. 500690, functions correctly. Can be found on spare parts list.
- ☐ Test whether the warning tone (high-pitched howl) is activated and functions correctly.
- ☐ Test whether the light diodes in the control panel function correctly along with the warning tone.
- ☐ Check whether any nuts, bolts or screws are loose or damaged. Tighten/replace if necessary. This also applies to the lock plate and its fitting under the wheelchair.

Maintenance carried out:

Stamp

Replaced parts:

Next maintenance:

Date: _____

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Stamp

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User Guide – Operation of the docking station

Please refer to the functional description of the docking station on the next page. The user must read these instructions in full prior to using the equipment.

Securing the wheelchair in the docking station

1. To use the system, maneuver the wheelchair slowly and in a uniform direction over the docking station. The lock plate under the wheelchair helps to guide the wheelchair into place in the docking station. When the lock plate is fully engaged in the docking station, a spring-action locking pin automatically secures the lock plate.
2. The docking station is equipped with a control switch that indicates whether the lock plate is correctly secured in the docking station. As soon as the lock plate comes into contact with the locking pin, a warning tone will sound (a high-pitched howl), and the red diode/lamp (LED) in the control panel will light up until the lock plate is either fully engaged or else the wheelchair is removed from the docking station.
3. As an indication that the wheelchair is properly secured, the warning tone will cease, the red diode in the control panel will go out and the green diode lamp (LED) will light up.
4. When the wheelchair is correctly secured, the safety belt should be fitted and adjusted so that it fits the user.

Do not drive the vehicle whilst a wheelchair is being maneuvered into position in the docking station. In general, do not use the vehicle if the wheelchair is not correctly secured, the warning tone sounds and/or the red warning lamp (LED) in the control panel flashes or is lit! Therefore, always check if the lock plate is properly engaged in the docking station by trying to back the wheel chair out of the docking station before moving the vehicle. (It must not be possible to back out of the docking station without pressing the red button in the control panel).

Release from the 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 or 8 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 panel, which indicates the unlock position, has been illuminated.

Warning!

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. Move the wheelchair away from the docking station within this 5 or 8 second period.

If the locking pin is not released when you press the red button in the control panel

1. In the event of electrical failure, a manual emergency release is located at the front edge of the docking station. Push the red release arm to one side and hold it there while the wheelchair moves away.
2. A cable-activated manual operating lever can also be fitted (accessory). The red release arm is also pushed to one side and should be held there whilst the wheelchair moves away.
3. An emergency release tool in red is delivered with each docking station. This has to be pushed into the docking station, between the lock plate of the wheelchair and the docking station to release the wheelchair.

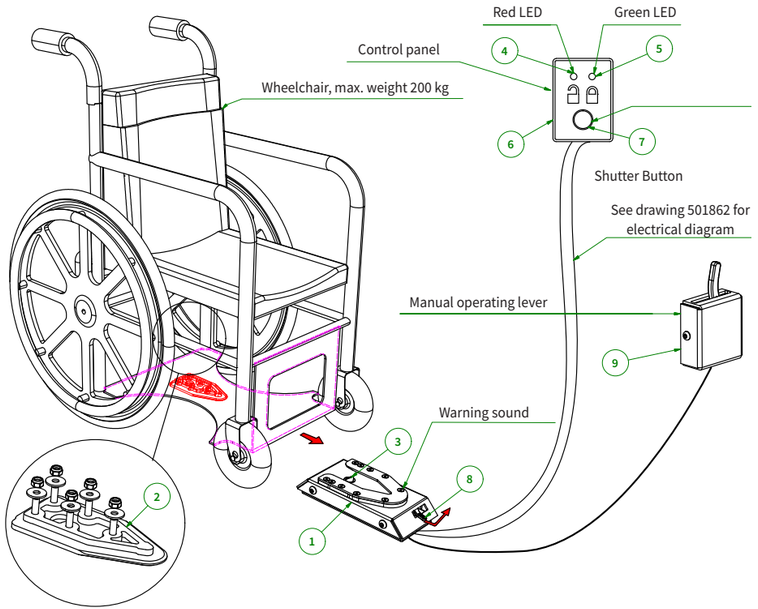
The docking station, belts and components should be inspected at least once a year in accordance with the maintenance interval and -documentation.

Safety belts (Accessory for docking station)
Safety belts must be inspected and cleaned regularly. Replace belts or straps that have faded in the sun, are worn at the edges, have tears or show clear signs of wear. Components that are damaged or worn must also be replaced. Avoid soiling the belts with chemicals, polishing agents, oil or, in particular, battery acid.

Cleaning the belts:
Wash by hand with hot water and mild soap. Rinse thoroughly with water and allow to dry in the shade. Do not expose the belts to direct sunlight and never use powerful cleaning agents.
Only moving metal parts that are not in contact with belt webbing should be lubricated with light oil when necessary and if so very carefully. Never lubricate inertia reels or other components that are part of the safety belt. Never let the belt webbing come into contact with oil or grease.

Functional Description

See drawing no. 501733



The Dahl **Docking Station (1)** is designed to retain the seat bracket, manual and electric wheelchairs on the floor of the vehicle. A circuit board is fitted in the docking station, which controls and monitors the docking station's functions, distributes power to the various components and sends and receives signals to and from the control panel. A wiring harness is included. Do not carry out any modifications to the supplied wiring harness or other components. A **lock plate** and a **spacer (2)** must be fitted under the wheelchair. When the wheelchair is maneuvered towards the docking station, the wheelchair is guided into place by means of the lock plate. When the lock plate is fully engaged in the docking station, a spring-loaded **locking pin (3)** automatically secures the lock plate. The docking station is equipped with a built-in control switch that indicates whether the lock plate is correctly secured in the docking station. As soon as the lock plate comes into contact with the locking pin, a warning tone will sound (a high-pitched howl), and the **red diode/lamp - LED (4)** in the control panel will light up until the lock plate is either fully engaged or else the wheelchair is removed from the docking station. With the wheelchair correctly secured, the warning tone stops and the **green diode/lamp - LED (5)** in the control panel will light up to indicate that the wheelchair is properly secured. **The control panel (6)** is equipped with a **pushbutton (7)** which is connected to an electromagnet which triggers/releases the locking pin for approx. 5 or 8 seconds, after which it is automatically locked once more.

In case of an electrical fault, there is a **manual emergency release (8)** on the front edge of the docking station. The release arm should be pushed sideways and held in order to release the wheelchair. A cable-activated **manual operating lever (9)** can be ordered as an extra accessory. Fixing parts in the form of bolts, nuts, washers, etc., are included.

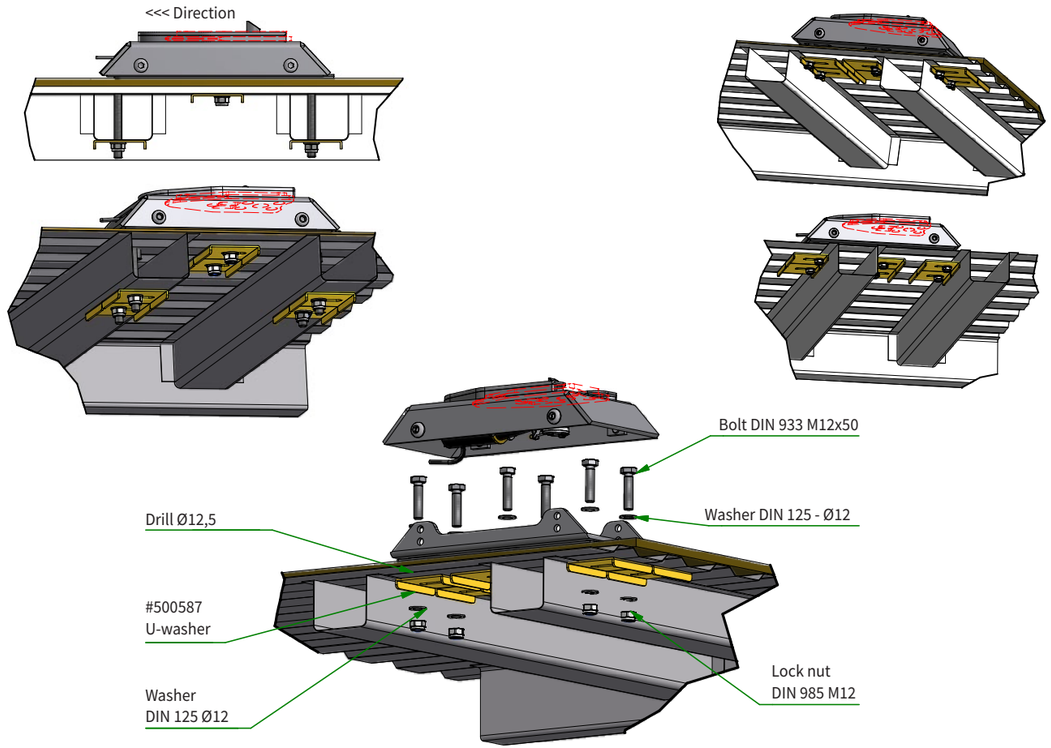
Installation of the Docking Station

Installation must be carried out by a qualified and experienced technician/fitter.
In the area where the wheelchair is to be locked into the docking system, the floor must be flat along the full length and width of the wheelchair. The length of the flat floor must be in a way that it is possible to maneuver the wheelchair into the docking system without problems. It is essential that there is no difference in the height of the floor from one side to the other at the location where the docking station is to be installed. It is also important that the lock plate is fitted straight/horizontally under the wheelchair. If the above is not carried out carefully, there is a risk that the wheelchair may not be able to be maneuvered properly into place in the docking station.

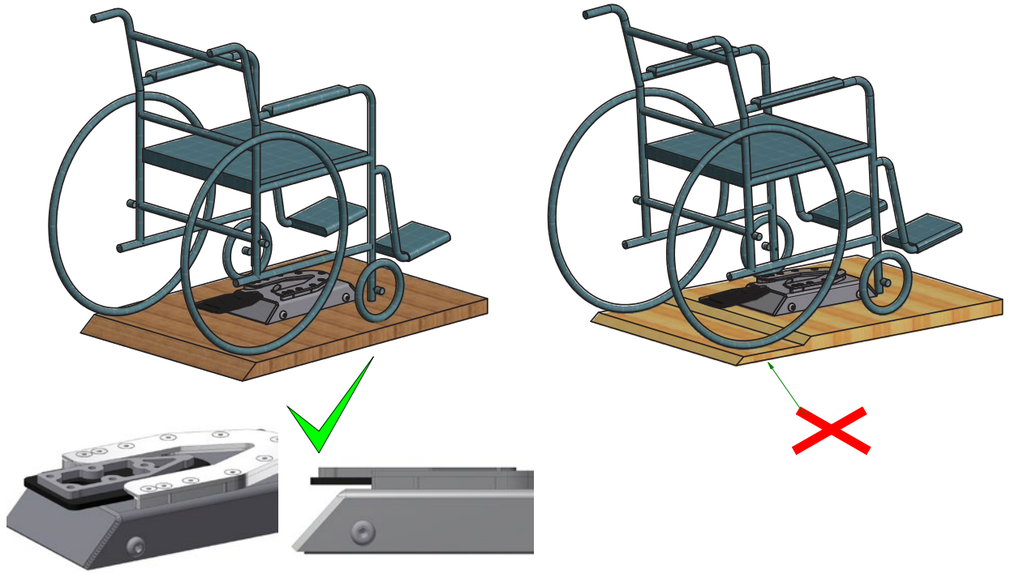
1. The lock plate and spacer should be fitted under the wheelchair in accordance with the wheelchair manufacturers instructions in the manual, as well as the instructions on drawing no. 501733 (see previous page). Before the lock plate and spacer are fitted, the following should be carried out:
2. The fitter must ensure that the wheelchair onto which the lock plate is to be attached has a solid construction that can withstand the forces it will be subjected to during a collision. On our homepage http://wtors.com you can find a list of all approved adaptionkits for wheelchairs and download manufacturers user- und installation guides, which must be followed when installing the lockplate and spacers.
3. Before installing the lockplate and spacer, carry out the following: be aware that bolt with art.no. # 502800 for securing the lock plate are custom made bolts, which are only available in one length. It is very important that the installer carefully adjusts the bolts to the correct length, which fits the individual wheelchair's approved adaptation kit with spacers, if applicable. If the bolts are too short to fully engage into the entire thread depth - they will not be strong enough to withstand the load during a collision. If the bolts are too long, the batteries or other wheelchair components may be damaged. Therefore, be careful when shortening the bolts.

   Warning! Never use other bolt, than original Dahl bolts. # 502800 for fixing the lockplate. Standard bolts are not strong enough to withstand a collision.
4. Place the wheelchair, with the user sitting in it, facing forward in the vehicle at the desired installation location. If the user is the driver of the vehicle, make sure that the user can reach and operate all necessary driving functions in a proper and safe manner from this position.
5. In order to be able to adapt the lock plate to the wheelchair, measure the clearance with the user sitting in the wheelchair. Spacers of different thickness can be purchased as accessories - see more in the respective chapter.
6. Place the docking station under the wheelchair and place any necessary spacers under the docking station. The docking station may be chocked up using Dahl's spacers – up to a maximum of 25 mm.
7. Mark the position of the docking station on the floor and the lock plate's position under the wheelchair.
8. Ask the wheelchair user to leave the vehicle so that installation work can begin.
9. Carefully remove the top section of the docking station – (electronic components are installed in the top section!). Mark the location of the bolts on the floor of the vehicle and drill holes through the floor at these locations. Care must be taken when marking and drilling through the floor so as to avoid damaging brake pipes, cables, fuel tank, etc. Never drill any holes until you are certain that the holes match the location of the installation components.
10. Secure the docking station with the accompanying bolts, nuts, etc. See illustrations on the following pages, or the vehicle specific installation instruction, which can be obtained from Dahl Engineering.
11. If the cable-activated operating lever is to be fitted, the cable must be installed before the docking station's top section is carefully fitted again. Remember electrical connection before the top section is fitted.

Fitting examples



Fitting examples



To allow tire wear as well as floor carpet getting compressed/worn - adjust the lock plate to be positioned at the top of the gap for the lock plate.
Using vinyl or another hard surface that will not get compressed or worn like floor carpet is recommended.

Electrical connection

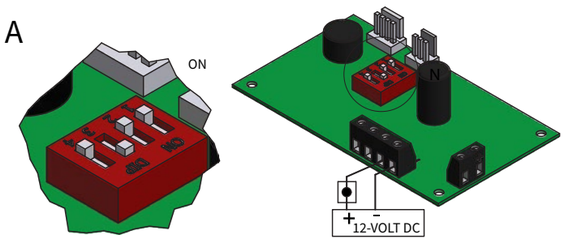
1. Disconnect the cable on the battery's negative terminal.
2. Find a suitable installation site for the control panel.
   If the docking station is used by a person driving the vehicle himself – At an easily accessible and visible location when the wheelchair is secured in the docking station and the driver is looking forward from the driving position.
   If the docking station is for a passenger – At a location which is visible when the driver of the vehicle is sitting in the driver's seat and looking forward.
3. Wiring must be installed so that it is not exposed to mechanical loads such as wear, vibrations, kinks and sharp edges which can cause breaks and result in malfunctions or in the worst case a short-circuit.
4. See wiring diagram and DIP switch settings on the following pages. The power supply must be fused with a 30A fuse (not included).
5. **Connection of control unit**
   The control unit can be set in such a way that the electric release button will only respond if the vehicles parking brake has been applied.
   A. If this function is **not** required, connect the wires as shown on **fig. A** - and switch 3 on DIP switch is set to ON.

   If the electric release system shall only be operable with the parking brake applied, the wires and switch 3 on DIP switch should be connected/positioned in one of the following ways.
   The correct setting for the vehicle concerned, depends on how the switch for the parking brake functions. E.g. whether the switch is of the type normally open (NO) or normally closed (NC). In figure B and C the switch is connected to (+) but polarity is irrelevant.
   B. If a signal is connected, when the parking brake is being activated, so that 12V can be measured on the control unit's parking brake terminals 1 and 2 (polarity is irrelevant), switch 3 on DIP switch must be set to OFF and the wires from the parking brake switch connected as shown on **fig. B** (NO function).
   C. If a signal is cut off, when the parking brake is activated, so that 12 V CANNOT be measured on the circuit board's parking brake terminals 1 and 2 (polarity is irrelevant), switch 3 on DIP switch must be set to ON and the wires from the parking brake switch connected as shown in **fig. C** (NC function).

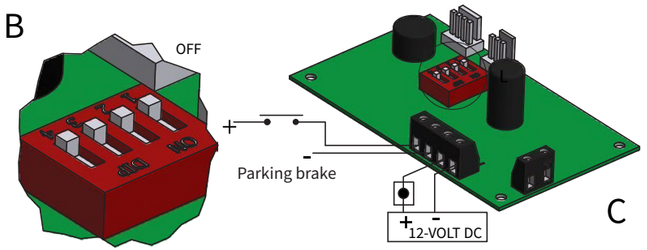
   Settings for the holding time of the lock pin
   The holding time for unlocking the lock pin can be set to 5 or 8 seconds and is adjusted on switch 1 on DIP switch.
   D. If a holding time of 5 seconds desirable, switch 1 on DIP switch must be set to OFF as shown in **fig. D**.
   E. If a holding time of 8 seconds is desirable, switch 1 on DIP switch must be set to ON as shown in **fig. E**.

   New feature when lock pin is blocked
   To protect the electrical system from overload, the power supply for the locking mechanism will pulsate if blocking the lock pin. This can be can be heard as pulsating/clicking sound from inside the docking station.
6. Carefully fit the docking station's top section. Be careful when placing wires and cables so that they do not touch the moving parts.
7. Fit the cable onto the battery's negative terminal.

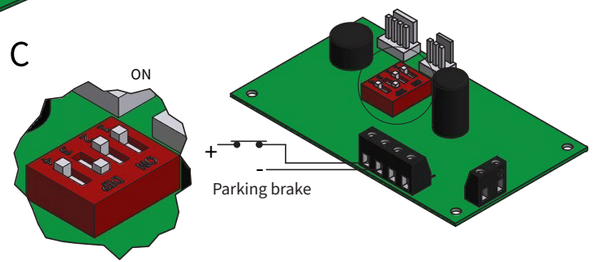
A



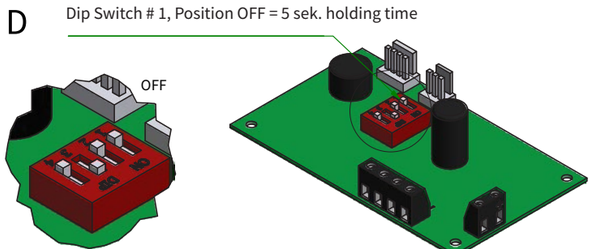
B



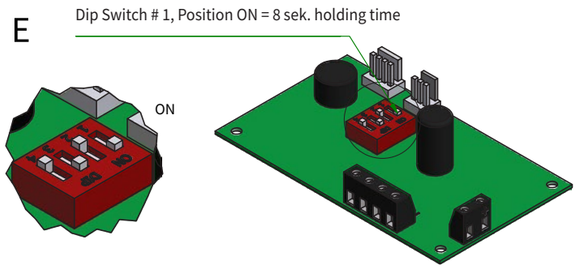
C



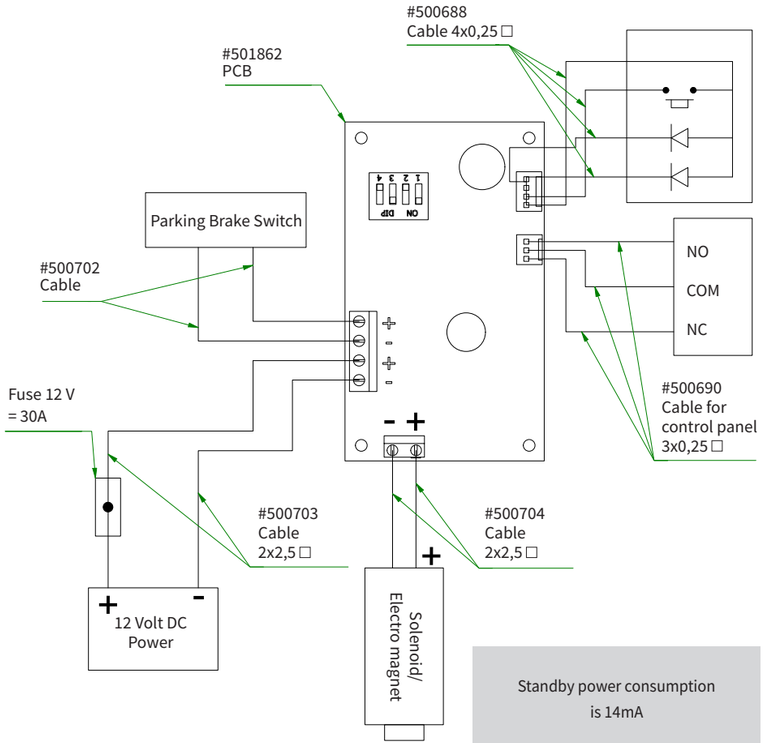
D



E



Wiring diagram



Standby power consumption
is 14mA

Adjustment and final check

1. Check the function, operation and location of the docking station, control panel and safety belt with the user sitting in the wheelchair.
2. Check if the lock plate and wheelchair scrape against the docking station. Adjust using Dahl spacers if necessary.
3. Check if all nuts and bolts are properly tightened.
4. Check if all wires and cables are free of the moving parts of the docking station and wheelchair.
5. Check if the manual emergency release mechanism functions correctly.
6. Check if the cable-activated manual operating lever functions correctly – if fitted.
7. Instruct the user in the correct use of the docking station and go through all warnings contained in these instructions.
8. Inform the user of maintenance and inspection as stated in the maintenance interval and documentation.

You can find videos and more information about maintenance and installation of DAHL docking station on our homepage: http://wtors.com

Tightening torque

Tightening torque for bolts and nuts		
Thread size	**Minimum Nm**	**Maximum Nm**
M5	4,5	5,9
M6	8	10
M8	20	25
M10	39,2	49
7/16'' UNF	50	75
#502800	16	18

When tightening nuts and bolts, they must not be tightened so hard that the floor profiles are compressed or deformed. Carefully tighten the screws until the profiles in the floor of the vehicle begin to give, though never more than the specified maximum tightening torque for the bolt concerned.

Corrosion protection

All holes and installation elements under the floor of the vehicle should be treated with an anti-corrosion agent. Please also be aware of the vehicle manufacturer's guidelines, if available, for corrosion protection. To avoid water penetrating the holes in the floor of the vehicle, sealant must be applied to the holes.

Warning

In countries where the legislation demands meeting EU-Regulation 2018/858, Annex II, Part III, Appendix 3 – about vehicles fitted for wheelchairs, a fitting kit MUST be used, which has been tested in the position and the specific vehicle the wheelchair will be used in, for fitting the docking system and safety belts for the wheelchair user.

Please enquire with regard to the current range of vehicle specific fitting kits with corresponding fitting instructions.

If a vehicle specific fitting instruction does exist it must be requested from Dahl Engineering, and followed when fitting safety belts, floor pockets, floor rails and docking station.

The following fitting examples for fitting the Dahl docking station can only be used in countries, where no legal requirements to tests of docking system in the specific vehicle and mounting position are to be found.

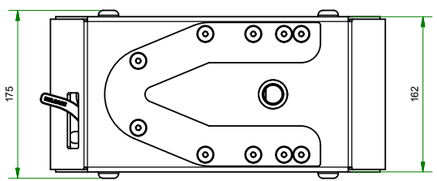
We always recommend to use a fitting kit, which has been tested in the specific vehicle.

Accessories for fitting the Dahl Docking Station

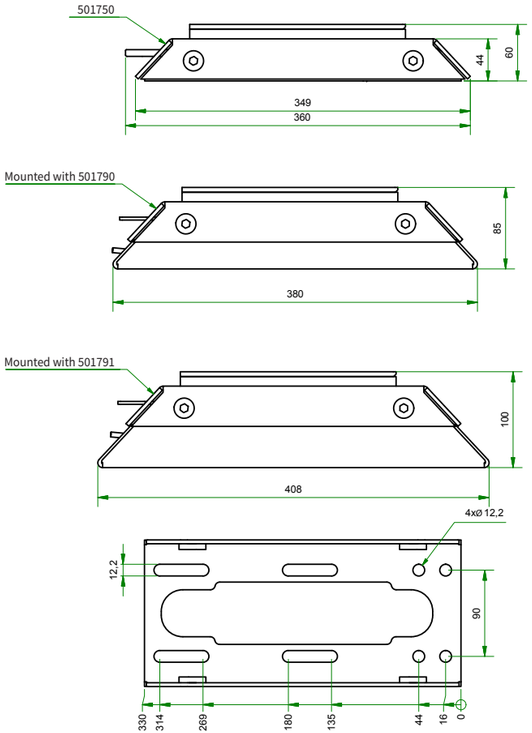
We provide a range of accessories, including spacers, for adjustment of the height, a manual operating lever, tested fitting kits and seat base frames that fit the docking station. The seat base frames, art. no. 500650, 502270 and 503245 ensure that the docking station can be used for both a wheelchair and a car seat. The seat base frames have undergone extensive testing in accordance with ECE reg. R14 & R17 in many different vehicles.

See our current range of tested fitting kits in our product catalogue which can be downloaded from our website: http://wtors.com

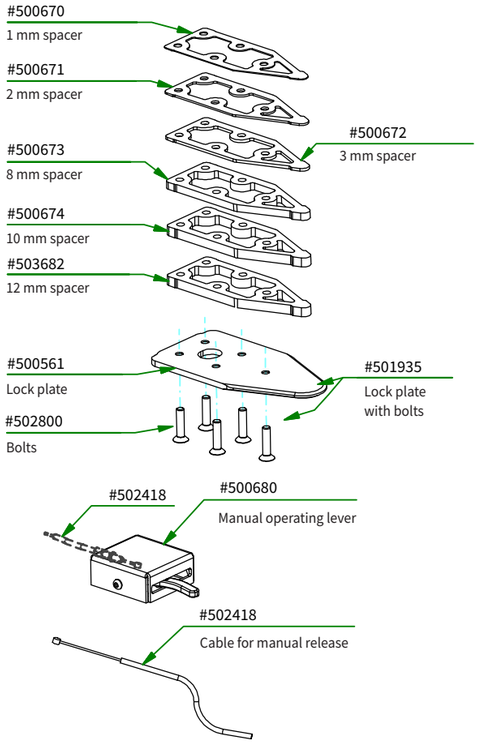
Please enquire for separate material regarding our range of safety belts.

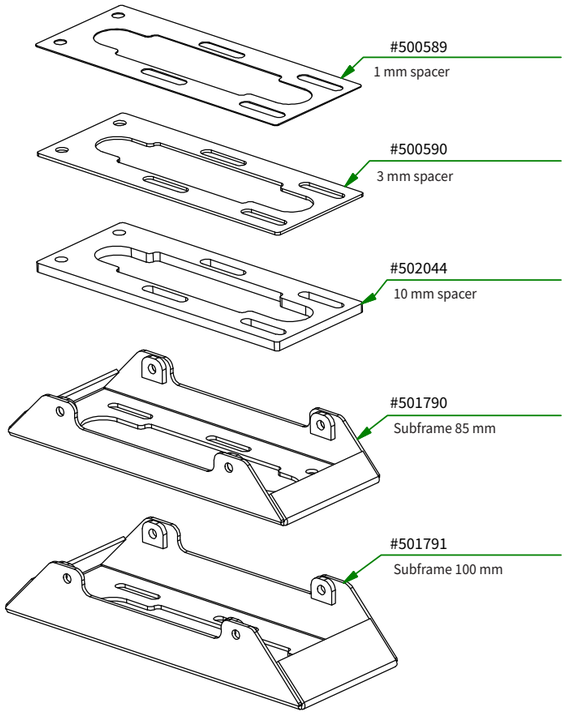


Available heights for subframes

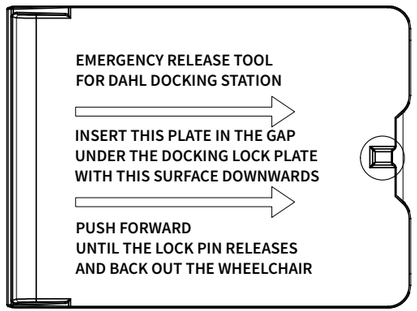


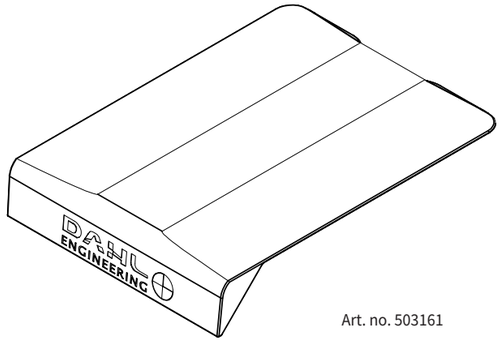
Accessories





Emergency release tool





Art. no. 503161

Seat base frames

In addition to being approved for securing wheelchair tie-down, the Dahl Docking Station MKII have also been tested and approved for anchoring several original car manufacturers' seats.

These seat bases with pre-drilled holes can be anchored in the Dahl Docking Station MK II and placed on the vehicles' 1st seat row, allowing the driver and passenger to switch seats.

Our seat base is tested according to ECE regulation 14 and 17.

Please ask which seat base is best suited for the specific car model.

Art.no. 503245
Height 135-202 mm

Art.no. 501448
Height 135-202 mm (wide base)

Art.no. 500650
Height 174-241 mm

Art.no. 502270
Height 231-297 mm

Art.no. 502214
Height 231-297 mm (wide base)

WARNING
(Risk of death or serious injury)

NEVER use Dahl Docking Station MK II to anchor Dahl COMFORT Seat or other seats with integrated 3-point belts.

Please contact us for further information regarding the use of Dahl VarioDock™ with Dahl COMFORT Seat.

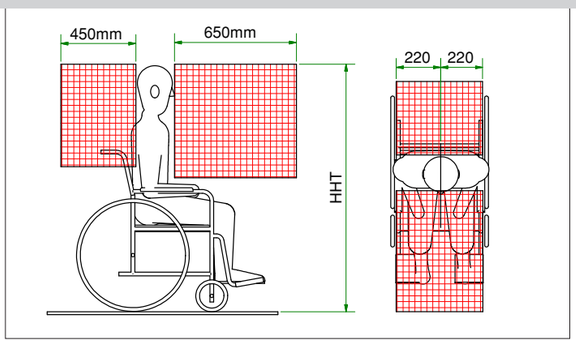
Recommendations for Clear Zones

Clear zones are recommended areas in which hard or sharp installation components or objects should not be placed. The clear zone recommendations in ISO 10542 are based on the way in which an occupant moves during a crash/collision. To reduce the risk of injuries to the head and chest, hard vehicle components and parts for WTORS which lie within the clear zones should be covered with padding that meets the requirements with regard to the hardness of materials as specified in FMVSS 201, ECE regulation no. 21 or EU directive 74/60.

The wheelchair and user must be placed facing forward in the vehicle.

FCZ = Frontal Clear Zone
650 mm. when both lap belts and diagonal belts are used.
950 mm. when only lap belts are used.
The use of both lap belts and diagonal belts is recommended to reduce the risk of head and chest impact. The majority of countries require the use of both lap belts and diagonal belts. It may be impossible to comply with the recommendation for FCZ if the wheelchair is used by a person driving the vehicle themselves.

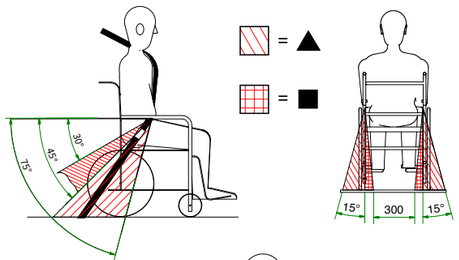
HHT= Seated head height
Approx. 1200 mm. for a small adult female. Approx.1550 for a tall adult male.



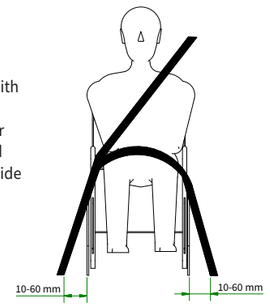
Safety belts

Only use Dahl WTORS or e-(ECE), E-(EU) or ISO 10542 certified safety belts for securing occupants of the vehicle. Please refer to Dahl Engineering's product catalogue containing WTORS and certified safety belts.

Preferred and optional angles for location of the lap belt:
▲ = Preferred Zone / ■ = Optional Zone

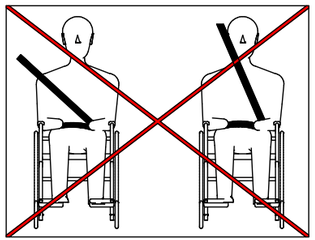


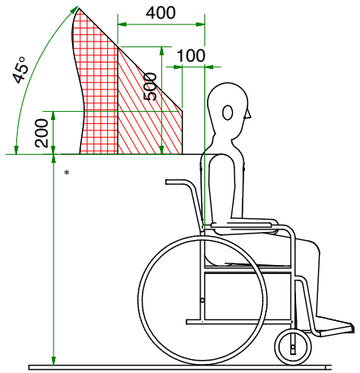
When using wheelchair with Dahl Docking system, the floor anchorage points for occupant restraint should be located 10-60mm outside wheels, on each side.



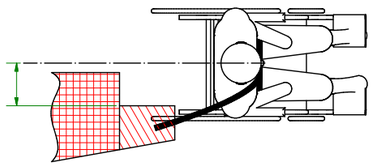
Recommended location of shoulder belt's top anchoring point:

▲ = Preferred Zone
■ = Optional Zone

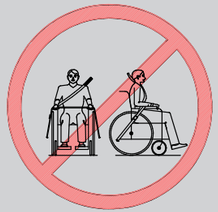




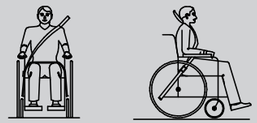
The lap belt should make full contact with the front of the body in the area where the pelvis and thighbone meet.



*= Installation height from the floor and up to the shoulder and the shoulder belt's top anchoring point depends on the height of both the user and the wheelchair. The shoulder belt's anchoring point must be located in such manner, that the belt runs over the mid-point of the shoulder.



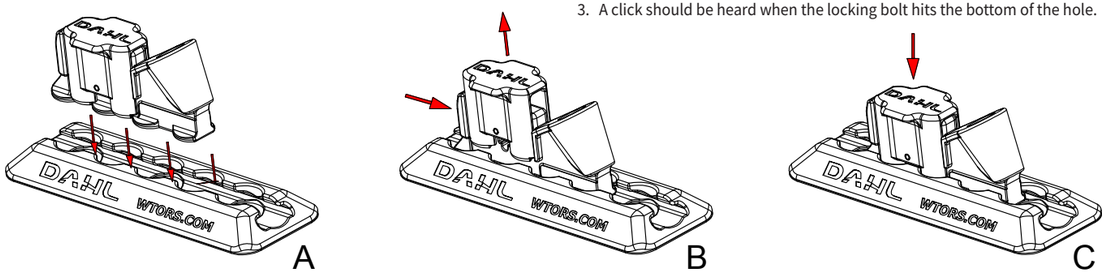
Safety belts must not be held away from the body by wheelchair components or parts such as armrests or wheels.



Installation of universal fitting in floor pocket and floor rail with airline hole pattern

Make sure that the floor pocket or floor rail is free of small stones or other dirt. If necessary, clean prior to installation of the universal fitting. If the floor pocket or the floor rail is not free of dirt, there is a risk that the fitting cannot be installed or that it will not be fitted correctly.

1. Place the universal fitting over the holes.
2. Press downwards on the universal fitting so that the spring-action locking bolt moves upwards. Whilst the fitting is being pressed downwards, push the fitting backwards or forwards until the spring-action locking bolt slides down into one of the holes.
3. A click should be heard when the locking bolt hits the bottom of the hole.



Warning

In countries where the legislation demands meeting EU-Regulation 2018/858, Annex II, Part III, Appendix 3 – about vehicles fitted for wheelchairs, a fitting kit MUST be used, which has been tested in the position and the specific vehicle the wheelchair will be used in, for fitting the docking system and safety belts for the wheelchair user.

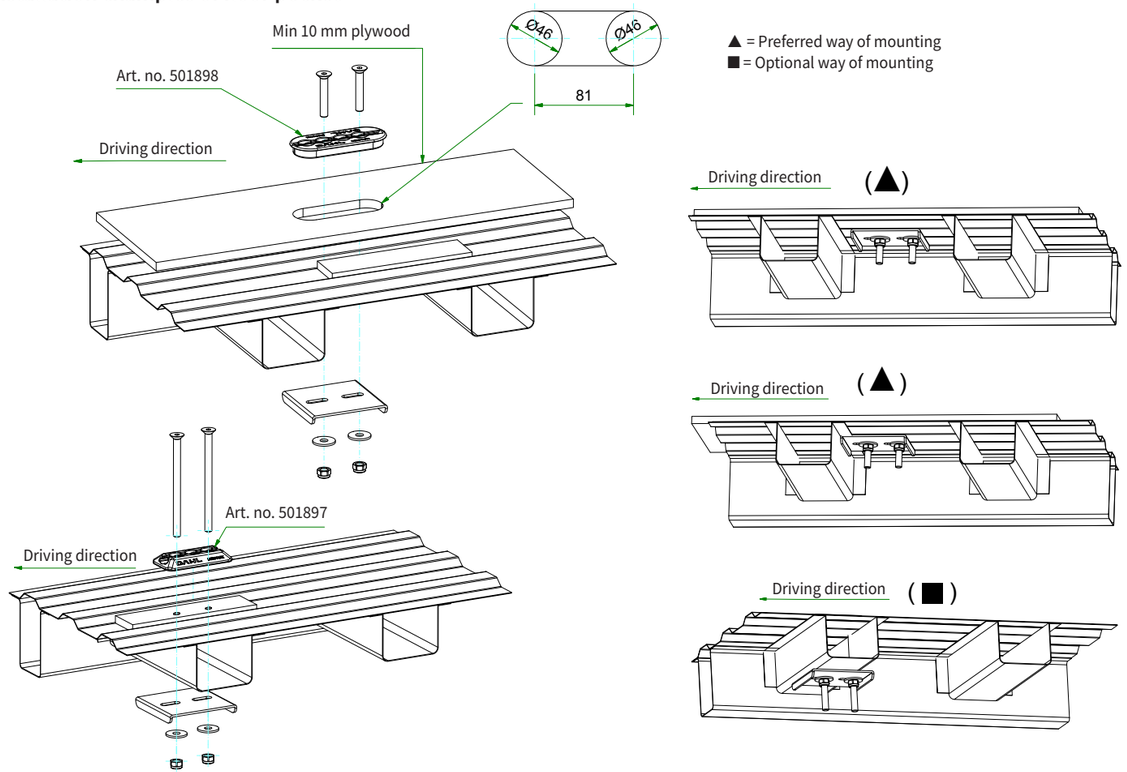
Please enquire with regard to the current range of vehicle specific fitting kits with corresponding fitting instructions.

If a vehicle specific fitting instruction does exist it must be requested from Dahl Engineering, and followed when fitting safety belts, floor pockets, floor rails and docking station.

The following fitting examples for fitting the Dahl docking station can only be used in countries, where no legal requirements to tests of docking system in the specific vehicle and mounting position, are to be found.

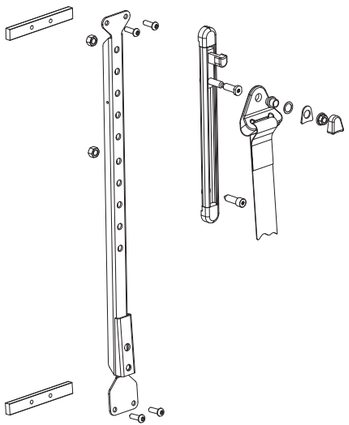
We always recommend to use a fitting kit, which has been tested in the specific vehicle.

Installation examples of floor pocket

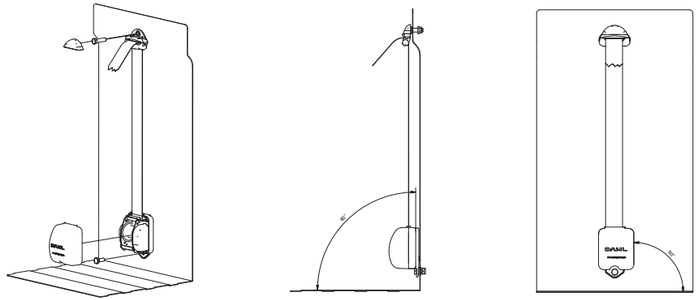


Examples of installation of retractor and bracket (D-loop) for anchoring of shoulder belt

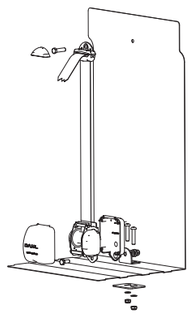
Please see separate installation guide for mounting of anchoring kit for shoulder belt for each vehicle.



Example with 178 mm height adjustment
Art. no. 500945.



Example with the retractor installed on the wall.



Example with the retractor installed in the vehicle floor.

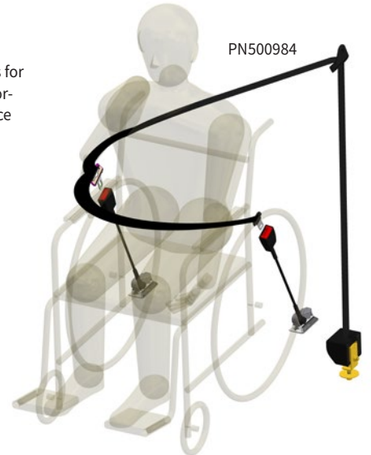
Here, examples are shown of the proper orientation (90°/90) of the D-loop and retractor for both floor and wall mounted retractors.

It must be possible to rotate the D-loop for the shoulder belt when the bolt is tightened.

Installation of safety belts

Please also refer to separate installation instructions for the safety belt concerned. We have safety belt anchorage kits available that have been tested in accordance with ECE regulation 14.

Please enquire about our current range of kits.



Seat belts must, as a starting point, ALWAYS be anchored in the vehicle floor, not on the wheelchair.

WARNING! Risk of death or serious injury

The docking station and vehicle-specific anchorage kits are designed and tested on the condition that the seat belt is anchored to the vehicle body and floor, not on wheelchair.

In the event of a collision, a wheelchair with an integrated safety belt will expose the docking station and vehicle floor to a much higher torque / load than a wheelchair, where the seat belt is anchored to the vehicle's body and floor.

Thus, there is a risk that the wheelchair user and other passengers in the vehicle can obtain severe or fatal injuries during a collision, as a result of the vehicle floor being deformed severely or the anchoring points of the docking station being torn loose. Therefore, never use the docking station for anchoring a wheelchair with integrated seat belt anchor points, whether this is a 3-point belt, an H- or lap belt.

Examples of seat belt components

PN500984
Seat belt

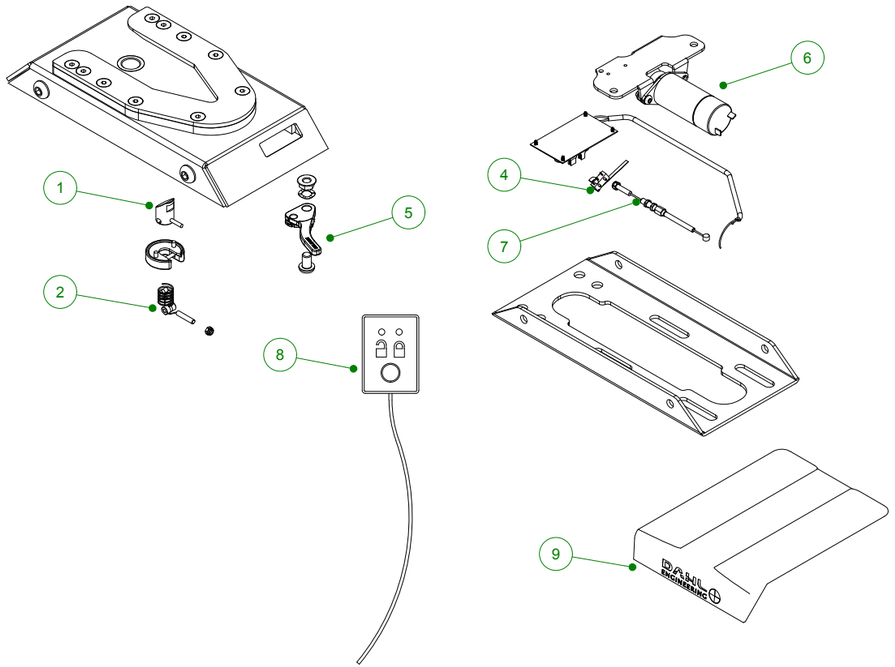
501768
Removeable safety belt buckle with fitting

PN501762
Safety belt buckle for permanent mount

Safety belt buckle can be ordered in different lengths. Please ask about the current range.

Spare parts list of docking station

#501750



Position	Quantity	Description	Art. no.
1	1	Lock pin complete	503555
2	1	Service kit	502493*
3	1	Circuit board	501862
4	1	Microswitch	500690
5	1	Release handle	501727
6	1	Solenoid with bracket	503621
7	1	Emergency release cable	502421
8	1	Control panel	500688
9	1	Emergency release tool	503161

* for docking stations produced before 05/2017 - order service kit art. no. 502010

WHERE SAFETY STARTS

DAHL ENGINEERING

Development and crash-test centre
Where safety starts

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e: sales@dahlengineering.dk | w: wtors.com