



Küschall® Compact 2.0

Compact SA / Compact FF

en **Manual Wheelchair**
Service Manual



PROVIDER: Keep this manual.
The procedures in this manual **MUST** be performed by a qualified technician.

Küschall®
UNLIMIT YOUR WORLD

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1 General

1.1 Introduction

This user manual contains important information about the handling of the product. To ensure safety when using the product, read the user manual carefully and follow the safety instructions.

Only use this product if you have read and understood this manual. Seek additional advice from a healthcare professional who is familiar with your medical condition and clarify any questions regarding the correct use and necessary adjustment with the healthcare professional.

Note that there may be sections in this document, which are not relevant to your product, since this document applies to all available models (on the date of printing). If not otherwise stated, each section in this document refers to all models of the product.

The models and configurations available in your country can be found in the country-specific sales documents.

Invacare reserves the right to alter product specifications without further notice.

Before reading this document, make sure you have the latest version. You find the latest version as a PDF on the Invacare website.

If you find that the font size in the printed document is difficult to read, you can download the PDF version from the website. The PDF can then be scaled on screen to a font size that is more comfortable for you.

For more information about the product, for example product safety notices and product recalls, contact your Invacare distributor. See addresses at the end of this document.

Incidents leading to serious personal injury resulting from product malfunctions must be reported to the manufacturer and the competent authority of the country in which the user is established.

An overview of the competent EU Member State authorities can be found online at: <http://ec.europa.eu/growth/sectors/medical-devices/contacts/>

For non-EU countries, check with your local government for the relevant authorities and guidelines. For any other questions or support, contact your Invacare distributor.

1.2 Delivery Check

Any transport damage must be reported immediately to the transport company. Keep the packaging until the transport company has checked the goods and a settlement has been reached.

1.3 Symbols in this Manual

Symbols and signal words are used in this document and apply to hazards or unsafe practices which could result in personal injury or property damage.

See the information below for definitions of the signal words.



WARNING!

Indicates a hazardous situation that could result in serious injury or death if it is not avoided.



CAUTION!

Indicates a hazardous situation that could result in minor or slight injury if it is not avoided.



NOTICE!

Indicates a hazardous situation that could result in damage to property if it is not avoided.



Tips and Recommendations

Gives useful tips, recommendations, and information for efficient, trouble-free use.



Tools

Lists the tools and tool sizes to use when working on the wheelchair.

1.3.1 Other Symbols

(Not applicable for all manuals.)



UK Responsible Person

Indicates if a product is not manufactured in the UK.



Triman

Indicates recycling and sorting rules (only relevant for France).

1.4 Warranty Information

We provide a manufacturer's warranty for the product in accordance with our General Terms and Conditions of Business in the respective countries.

Warranty claims can only be made through the provider from whom the product was obtained.

2 Safety

2.1 General Safety Information


WARNING!
Risk of injury or property damage

The procedures in this manual must be performed by a qualified technician. Invacare expects that the qualified technician is familiar with the product, with good technical knowledge to understand and follow the steps of the described instructions in this manual, and equipped with proper tools.

- Installation or repairs made by unqualified persons can result in hazardous situations to the users.
- Failure to carefully read and follow all instructions in this manual can result in equipment malfunction, property damage, personal injury and/or death.


NOTICE!

Assembly of optional equipment might not be described in this service manual. Refer to the manual, delivered with the optional equipment.

- Additional manuals can be ordered from Invacare. See addresses at the end of this document.
- Due to regional differences, refer to your local Invacare catalog or website for available optional equipment or contact your local Invacare representative. See addresses at the end of this document.


NOTICE!

Refer to the user manual of this product for information on:

- Technical data
- Product components
- Labels
- Additional safety instructions

The information contained in this document is subject to change without notice.


NOTICE!

Medical Devices must be identified at all times to ensure their traceability.

- If the component where the product label with the serial number is located is replaced, or if the product label is no longer readable, a new product label must be requested from Invacare.
- If you have any doubts regarding labeling, please contact Invacare.

2.2 Personal Safety Information

These safety instructions are intended to help avoid accidents during work and must be observed under all circumstances. All employees coming into contact with contaminated products must regularly consult a company doctor. Work clothing and personal protective equipment must be available in necessary quantities and be in proper condition. Reliable hand and surface disinfection must be ensured.


WARNING!
Risk of contamination

- Clean and disinfect the product before carrying out repairs.



The technician should work in an environment (light, space, access to the wheelchair, ...) that allows him to work safely.

2.3 General Repair Information


NOTICE!

Some replacement parts are only available as a kit. Always use the complete new kit when replacing a part.

- Use only original spare parts.
- Spare parts can be ordered from Invacare. Refer to your local Invacare website to access the electronic spare parts catalogue (ESPC).

Tightening torques

Correct tightening will allow safe and durable use of the device. All bolts must be tightened with the torques specified in the following instructions. If not specified, use the table below.

All values apply to dry and grease-free threads.

Thread diameter	M4	M5	M6	M8	M10/12
Tightening torque (mini/ max)	1,5/3 Nm	3/6 Nm	7/12 Nm	10/20 Nm	20/30 Nm

**WARNING!**
Risk of injury or damage to property
— After each assembly, check that all fittings are properly tightened AND that all parts have the correct function.

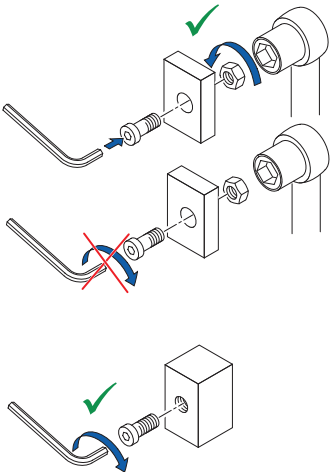
Repairs require a high level of expertise. These assembly instructions therefore break down the various tasks into 3 categories:

Requirement	Symbol
Easy – technical understanding required	■□□
Medium – technical knowledge required	■ ■ □
Difficult – technical knowledge and expertise in assembling required	■ ■ ■

The required tools and their sizes are listed before the instructions.

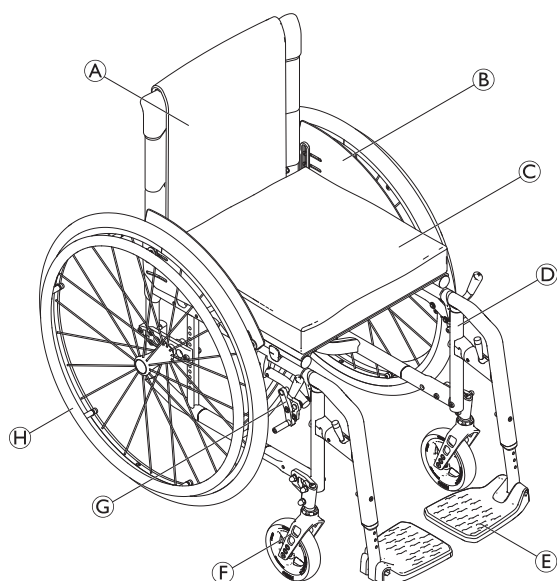
**NOTICE!**
— If screws with thread locker are loosened, these must be replaced with new screws with thread locker. Alternatively, new thread locker must be applied.
— If screws with circlip rings are loosened, these must be replaced with new ones.
— Parts that become damaged during removal must be replaced with new ones.
— All bolts must be tightened with the torque specified in the following instructions. After the torque specifications, the adhesive to be used (high-strength or low-strength) is indicated in brackets.

Fastening with hexagon socket bolts

Hexagon socket bolts are not designed to withstand an excessive application of force. When tightening or undoing a hexagon socket bolt, force should be applied to the nut wherever possible to avoid damaging the bolt.	
Tightening and undoing Turn the nut using a socket spanner (only use an open-end spanner if there is insufficient space), using the Allen key simply to stop the bolt turning. Tightening and undoing when no nut is present If a hexagon socket bolt is screwed directly into a thread, the bolt must be tightened using the Allen key.	
Ensure that the Allen key is of good quality and not worn.	

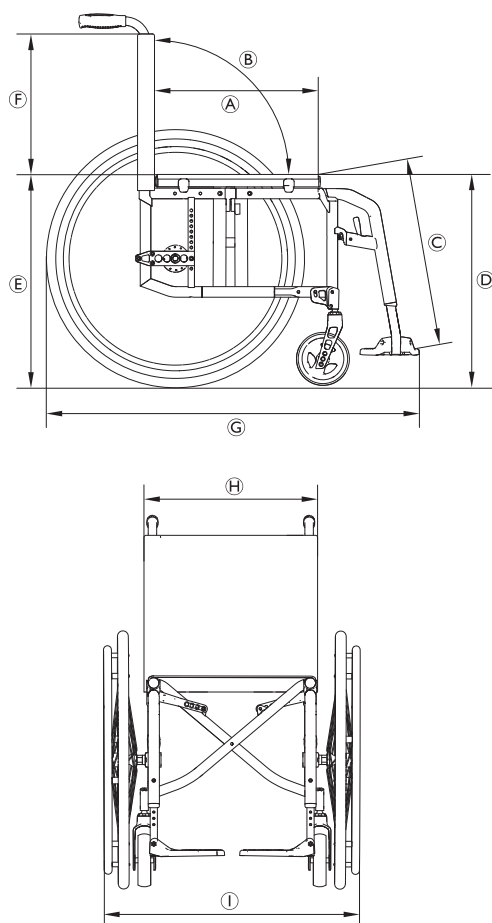
3 Product Overview

3.1 Main parts of the wheelchair



- Ⓐ Backrest
- Ⓑ Clothes-guard
- Ⓒ Seat
- Ⓓ Frame
- Ⓔ Footrest
- Ⓕ Castor fork with castor wheel
- Ⓖ Parking brake
- Ⓗ Rear wheel with handrim
- Ⓘ Seat
- ⓵ Clothes-guard

3.2 Dimensions



Ⓐ	Seat depth (SD)	320 – 500 mm, in increments of 20 mm
Ⓑ	Backrest angle (BA)	82°/86°/90°/ 94°/98°/102°
Ⓒ	Lower leg length (LLL)	200 – 510 mm, in increments of 10 mm
Ⓓ	Front seat-to-floor height (FSTF)	370 – 530 mm, in increments of 10 mm
Ⓔ	Rear seat-to-floor height (RSTF)	370 – 500 mm, in increments of 10 mm
Ⓕ	Backrest height (BH)	300 – 510 mm, in increments of 15 mm
Ⓖ	Total length (TL)	70° frame angle: approx. 870 – 1220 mm 80° frame angle: approx. 850 – 1200 mm
Ⓗ	Seat width (SW)	280 – 500 mm, in increments of 20 mm
Ⓘ	Total width (TW)	Seat width + 180 mm approx. 290 mm
	Overall height	740 – 1070 mm
	Folded length	280 – 370 mm
	Folded width	280 – 370 mm
	Folded height	740 – 1070 mm
	Armrest to seat height	200 – 335 mm
	Front location of armrest structure	170 – 360 mm
	Hand rim diameter	520 – 540 mm
	Horizontal location of axle (3 positions, also depending on seat angle)	35 – 103 mm

4 Settings and adjustments

4.1 Frame overview

Ⓐ Rear Frame

Ⓐ1 -> 13 Nm

Ⓐ2 -> 7 Nm

Ⓑ Retaining lever

Ⓑ1 -> 4 Nm

Ⓒ Cross

Ⓓ Front frame

Ⓓ1 -> 13 Nm

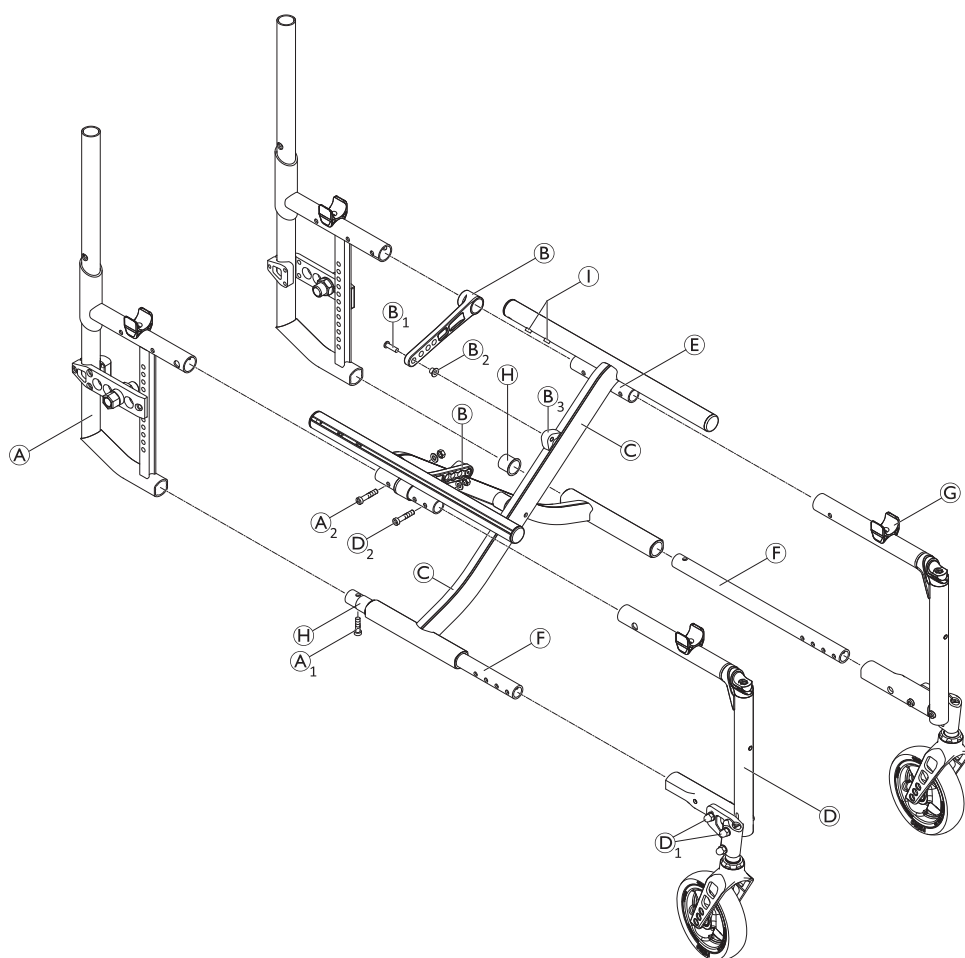
Ⓓ2 -> 7 Nm

Ⓔ Upper connecting tube

Ⓕ Lower connecting tube

Ⓖ Seat locking mechanism

Ⓗ Longitudinal stopping bolts



4.1.1 Replacing the rear frame



Allen key (5 mm) / Socket spanner (10)



1. Remove backrest. See 4.3 *Backrest*, page 15.
2. Loosen and remove bolts Ⓐ1 and Ⓐ2.
3. Pull out rear frame Ⓐ to the back.
4. Push the rear frame onto the upper Ⓔ and lower Ⓕ connecting tubes.
5. Reinsert and tighten bolts Ⓐ1 and Ⓐ2.

4.1.2 Replacing the front frame



Allen key (3, 4, 5 mm) / Socket spanner (10)



1. Disassemble brakes.
2. Loosen and remove bolts Ⓓ1 and Ⓓ2 on both sides. (On abduction frames, the connecting tube Ⓕ is welded onto the front frame; in this case, loosen Ⓐ1 and Ⓓ2.)
3. Pull out front frame Ⓓ to the front.
4. Remove seat locking mechanism Ⓖ with threaded insert from old front frame and fit it on the new front frame. See 4.2.7 *Turning the seat locking mechanism*, page 14.
5. Push the front frame onto the upper and lower connecting tube.
6. Reinsert and tighten bolts Ⓓ1, Ⓓ2 on both sides.
7. Set the front wheel fork angle. See 4.7.3 *Adjusting the front wheel angle*, page 38.

4.1.3 Replacing the retaining Lever



Allen key (3, 4, 5 mm) / Socket spanner (10)



1. With mudguard or clothes guard, fixed: remove Ⓐ1 and Ⓓ2, with mudguard or side rest, insertable and siderest, foldable: remove Ⓐ1 and Ⓐ2.
2. Remove bolt Ⓑ1.
3. Pull the retaining lever Ⓑ from the upper connecting tube Ⓔ.
4. Remove sleeve Ⓑ2.
5. Push the new retaining lever over the upper connecting tube Ⓔ.
6. Position sleeve Ⓑ2 with wide edge in joint Ⓑ3.
7. Secure retaining lever with bolt Ⓑ1.
8. With mudguard or clothes guard, fixed: reinsert and tighten bolts Ⓐ1 and Ⓓ2, with mudguard or side rest, insertable and side rest, flip to back: reinsert and tighten bolts Ⓐ1 and Ⓐ2.

4.1.4 Replacing the central cross-brace pivot bolt

NOTICE!
The pivot bolt connection must be replaced when the central cross-brace is mounted with the old assembly kit.

The old assembly kit can be easily identified as follows:

- The spacer Ⓑ is not included.
- Nut Ⓓ is not a cap nut.

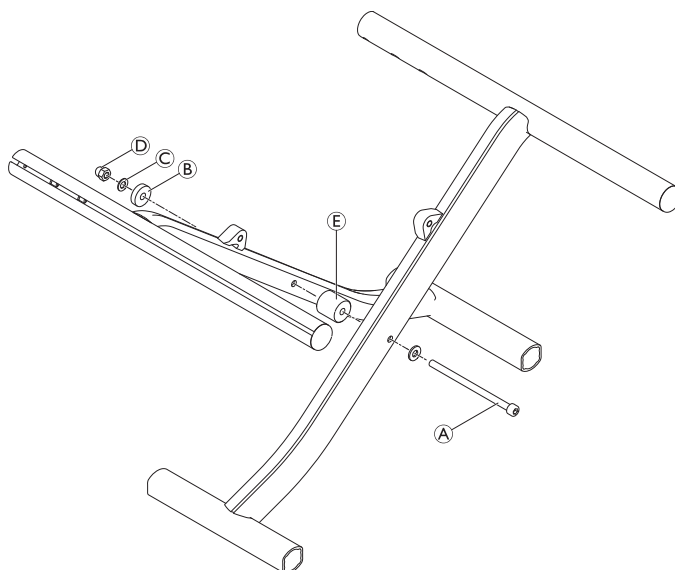


Allen key (5 mm) / Socket spanner (10) / Molykote TP42



1. Remove the old bolt connection from the cross-brace.
2. Lubricate both sides of distance part Ⓔ slightly with Molykote TP42 and remove excess grease.
3. Re-assemble the cross-brace using only the new assembly kit (SP1537689) containing bolt Ⓐ with washer, spacer Ⓑ, spring washer Ⓒ, safety cap nut Ⓓ and distance part Ⓔ.

Ⓓ = 3 Nm (High strength)



4.1.5 Cutting the rear frame to length



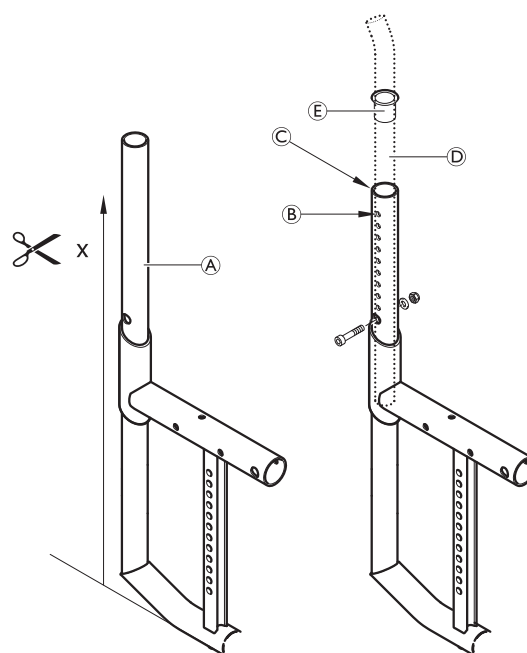
Saw, cutting template, tube deburrer



1. Referring to the table below, cut the rear frame to length measured from the lower edge of the back frame tube (A).
2. Deburr the outer and inner cut edges at the back frame tube.
3. Attach the plastic guide bushing (E) to the back frame tube and insert the telescopic tube (D).

**WARNING!****Risk of backrest breakage**

- When mounting the telescopic tubes, always make sure that the uppermost hole (B) of the telescopic tube is positioned at least 10 mm below the upper edge (C) of the rear frame tube.



Rear Frame - Cut off table in relation to backrest height and mounting type:

Backrest height (RH)		300	315	330	345	360	375	390	405	420	435	450	465	480	495	510
Standard/mini push handle																
Lumbar	x [mm]	420	420	420	435	450	465	480	495	510	525	—	—	—	—	—
Without push handle																
Lumbar	x [mm]	405	420	435	450	465	480	495	405	420	435	450	465	480	495	510
Foldable push handle																
Straight	x [mm]	420	435	450	465	480	495	510	435	450	465	480	495	510	525	—
Height-adjustable push handle, rearset																
Straight	x [mm]	405	420	435	450	465	480	495	510	525	—	—	—	—	—	—
Lumbar	x [mm]	405	420	435	450	465	480	495	405	420	435	450	465	480	495	510
Height-adjustable push handle, integrated																
Straight	x [mm]	390	405	405	405	405	405	405	420	435	450	465	480	495	435	450
Lumbar	x [mm]	360	375	390	405	405	405	405	405	405	405	405	405	420	435	450

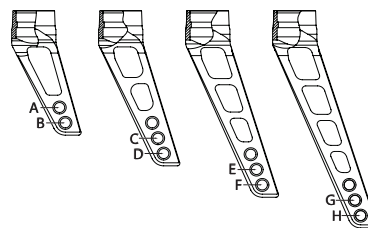
4.2 Seat

4.2.1 Front seat-to-floor height

Options for changing the front seat-to-floor height **FSTF**:

There are four castor fork sizes available:

- Replace the castor wheel with larger or smaller one or fit it at another position on the castor fork, see 4.7.1 *Replacing a castor wheel, page 37*.
- Replace castor fork with a larger or a smaller one, see 4.7.2 *Replacing castor wheel fork, page 37*
- Install the castor fork in high or low position.



Fork supporter, high mounted	Fork supporter, low mounted
1	2
3	4
5	
6	

Seat height front with respect to Frame type, Castor size, Fork size and Fork supporter:

Frame	SA frame / Hemi frame					FF frame				
Castor size	3"	4"	5"	6"	7"	3"	4"	5"	6"	7"
FSTF 350	—	—	—	—	—	—	—	—	—	—
FSTF 360	—	—	—	—	—	—	—	—	—	—
FSTF 370	E6	C6	—	—	—	—	—	—	—	—
FSTF 380	A4	B3	C6	—	—	—	—	—	—	—
FSTF 390	A5	C3	D6	—	—	A5	—	—	—	—
FSTF 400	B5	C3	E6	D6	—	B5	—	—	—	—
FSTF 410	C5	B5	C3	E6	—	C5	B5	—	—	—
FSTF 420	A1	C5	D3	E6	—	A1	C5	—	—	—
FSTF 430	B1	C5	E3	D3	E6	B1	C5	—	—	—
FSTF 440	C1	B1	C5	E3	F6	C1	B1	C5	—	—
FSTF 450	A2	C1	D5	E3	G6	A2	C1	D5	—	—
FSTF 460	B2	C1	E5	D5	E3	B2	C1	E5	D5	—
FSTF 470	C2	B2	C1	E5	F3	C2	B2	C1	E5	—
FSTF 480	D2	C2	D1	E5	G3	D2	C2	D1	E5	—
FSTF 490	D2	C2	E1	D1	E5	D2	C2	E1	D1	E5
FSTF 500	E2	D2	C2	E1	F5	E2	D2	C2	E1	F5
FSTF 510	F2	E2	D2	E1	G5	F2	E2	D2	E1	G5
FSTF 520	G2	F2	E2	D2	E1	G2	F2	E2	D2	E1
FSTF 530	H2	G2	F2	E2	F1	H2	G2	F2	E2	F1
FSTF 540	—	—	—	—	—	H2	G2	F2	E2	G1
FSTF 550	—	—	—	—	—	—	H2	G2	F2	E2



6" and 7" castor wheels cannot be used on the dynamic frame (80°), if a 2-part angled footrest is installed.

4.2.2 Installing/shifting the castor fork supporter on the frame



Allen key (5 mm) / Socket spanner (8 mm)

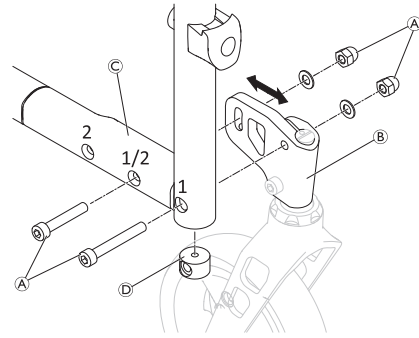


Compact SA

Low-mounted supporter (2):

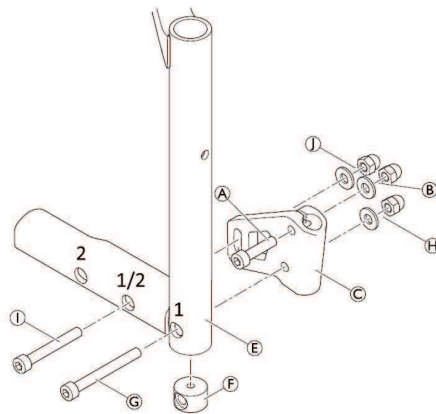
1. Remove nuts, washers and bolts **A**.
2. Remove round nut **D** from the frame tube.
3. Shift the castor fork supporter **B** on the frame **C** to the required position 1 or 2.
4. Reinsert round nut **D** into the frame tube.
5. Reinsert nuts, washers and bolts and tighten.

A = 7 Nm



High-mounted supporter (2):

1. Remove nuts and washers **H** and **I**, bolts **G** and **J**, sleeve insert **K** and the castor fork supporter **C** from the frame **E**.
2. Remove round nut **F** from the frame tube.
3. Replace bolt **A** and washer with nut **B** on the castor fork supporter if necessary.
4. Reinstall the castor fork supporter in position 1 or 2 by following steps 2 to 1 in reverse order.

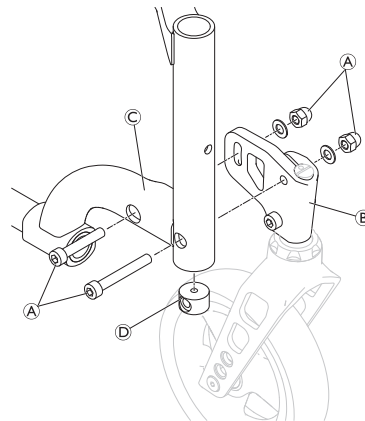


Compact SA Hemi

Low-mounted supporter (4):

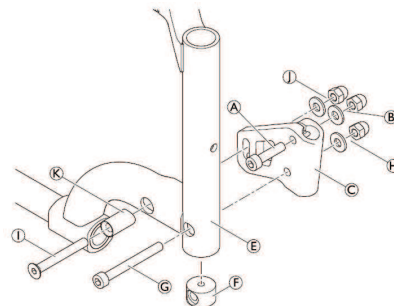
1. Remove nuts, washers and bolts **A**.
2. Remove round nut **D** from the frame tube.
3. Replace the castor fork supporter **B** on the frame **C**.
4. Reinsert round nut **D** into the frame tube.
5. Reinsert nuts, washers and bolts and tighten.

A = 7 Nm



High-mounted supporter (3):

1. Remove nuts and washers **H** and **I**, bolts **G** and **J**, sleeve insert **K** and the castor fork supporter **C** from the frame **E**.
2. Remove round nut **F** from the frame tube.
3. Replace bolt **A** and washer with nut **B** on the castor fork supporter if necessary.
4. Reinstall the castor fork supporter by following steps 2 to 1 in reverse order.

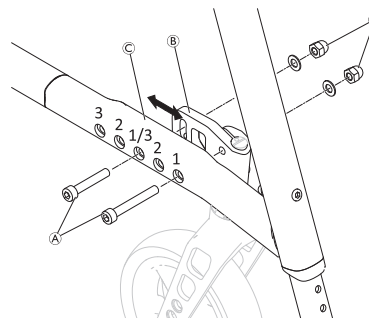


Compact FF

Low-mounted supporter (2):

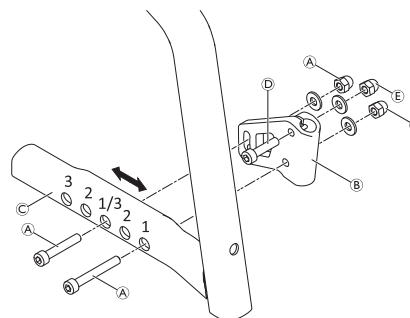
1. Remove nuts, washers and bolts (A).
2. Shift the castor fork supporter (B) on the frame (C) to the required position 1, 2 or 3.
3. Reinsert nuts, washers and bolts and tighten.

(A) = 7 Nm



High-mounted supporter (1):

1. Remove nuts, washers and bolts (A).
2. Shift the castor fork supporter B on the frame (C) to the required position 1, 2 or 3.
3. Replace bolt (D) and washer with nut (E) on the castor fork supporter if necessary.
4. Reinsert nuts, washers and bolts and tighten.



 Set the steering error angle and reset if necessary, see 4.7.3 *Adjusting the front wheel angle*, page 38.

4.2.3 Rear seat-to-floor height

Options for changing the rear seat-to-floor height **RSTF**:

- Replace rear wheel with a larger or a smaller one.
- Change the position of the adaptor plate. See 4.8 *Rear wheels*, page 39.

Rear seat-to-floor height with respect to the rear wheels and positioning on the frame:

Rear seat-to-floor height (RSTF) [mm]	Rear wheel size [inch]						
	22"	24"	25"	26"			
370	1	—	—	—			1
380	2	—	—	—			2
390	3	1	—	—			3
400/410	4	2	1	—			4
420	5	3	2	1			5
430	6	4	3	2			6
440	7	5	4	3			7
450/460	8	6	5	4			8
470	9	7	6	5			9
480	10	8	7	6			10
490	—	9	8	7			11
500	—	10	9	8			12

4.2.4 Seat width

The possible seat width range is from 280 – 500 mm.

Once the seat width is specified, it is very difficult to change it: the cross struts, backrest cover (on standard backs), seat cover and, on some configurations, the footrests, must all be replaced.

4.2.5 Seat depth

The possible seat depth (SD) range is from 320 – 500 mm.

To reduce the SD, the cross struts must be shortened, a new appropriately sized seat cover fitted. At a SD ≥ 400 mm, the frame can be shortened.

To enlarge the SD, new cross struts, a new appropriately sized seat cover, new connecting tubes and, depending on the SD, a new frame, must be installed.

4.2.6 Replacing the seat cover

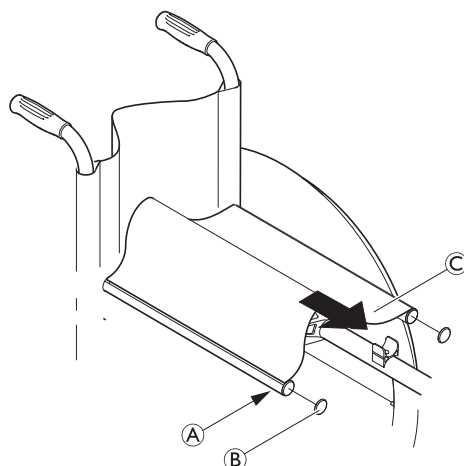


Pozidrive screwdriver (PZ1)



1. Loosen bolts ① and remove plug ②.
2. Remove seat cover ③ including plastic rods.
3. Position new seat cover. Adjust seat cover to width (seat width + 25 mm)
4. Retighten bolts and reinsert the plugs.

① = Hand-tight



4.2.7 Turning the seat locking mechanism

If the seat can be too easily removed from the seat locking mechanisms, either the front two or all four seat locking mechanisms can be rotated by 180°:

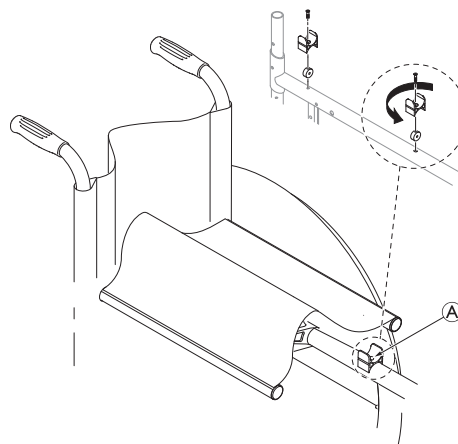


Allen key (3 mm)



1. At the front and/or rear, loosen bolt in seat locking mechanism ①.
 Screw out the bolt only to the extent that the seat locking mechanism can be turned as otherwise the threaded insert can move and is then difficult to re-position.
2. Turn seat locking mechanism by 180°.
3. Secure bolt with adhesive (low-strength).
4. Retighten the bolt.

① = 4 Nm (low-strength)



4.3 Backrest

4.3.1 Backrest height

The backrest height can be changed by installing the telescopic tubes in another position in the backrest tubes. If this setting option is insufficient, the telescopic tubes can be replaced.

4.3.2 Adjusting the height of standard backrests



Allen keys (3, 4, 6 mm) / Socket spanner (8, 10 mm)



1. Push the backrest cover ① upwards and remove the screw and nut ② on both sides.
2. Push the push handles ③ upwards or downwards until you reach the required height. Replace the screws and nuts and tighten.

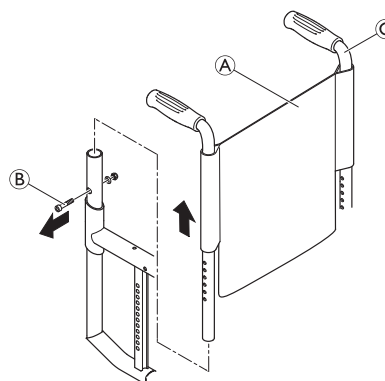
② = 7 Nm



If this setting range is insufficient, use new push handle tubes.



If the backrest height was changed considerably, a new backrest cover may have to be installed.



4.3.3 Adjusting the height of hook and loop adjustable backrests



Allen key (3, 4, 6 mm) / Socket spanner (8, 10 mm)



1. Remove the backrest cover ① and move the hook and loop bands ② until the screws ③ are visible on both sides.
2. Remove screws and nuts ④ and move the push handle tubes ⑤ to the required height on both sides.
3. Reinsert the screws into the appropriate holes on both sides and tighten using nuts.

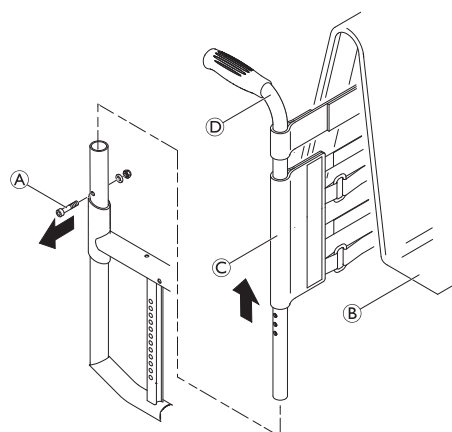
④ = 7 Nm



If the backrest height is changed considerably, the push handles must be replaced. An additional hook and loop band may have to be installed or one may have to be removed.



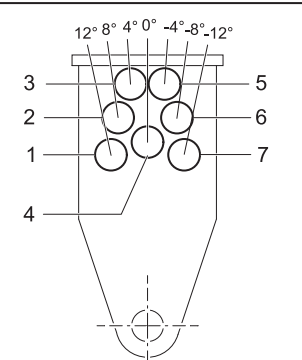
If the backrest height was changed considerably, a new backrest cover may have to be fitted.



4.3.4 Angle-adjustable backrest

In order to make the backrest angle adjustable, angle-adjustable backrest can be fitted.

Possible backrest angles:

Position	Deviation from standard backrests	Angle between backrest and seat	
1	12°	102°	
2	8°	98°	
3	4°	94°	
4	0°	90°	
5	-4°	86°	
6	-8°	82°	
7	-12°	78°	

4.3.5 Installing an angle-adjustable backrest



Allen key (3, 4, 5 mm) / Socket spanner (8, 10 mm) / Open-end spanner (10 mm)



Shorter rear frame (variant III) required:

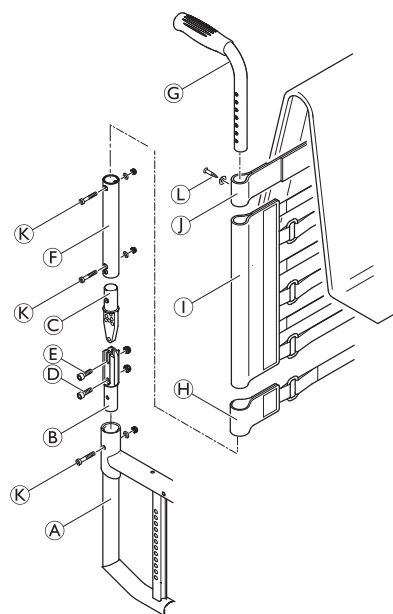
1. Push the lower joint pin **B** into the rear frame **A** and fix it using a bolt **K**.
2. Secure backrest tube **F** to the upper joint pin **C** using a bolt.
3. Assemble the upper and lower joint pins (**C** and **B**) and secure with bolt **D**.
4. Set the desired backrest angle and secure in the nearest hole using bolt **E**.
5. Push the single hook and loop band **H** and then the other hook and loop bands **I** and the end band **J** over the backrest tube **F**.
6. Insert the push handle tube **G** into the backrest tube **F** and install at the required height.
7. Secure the end band **J** on the push handle tube **G** using a bolt using washer and screw **L**.

D = 4 Nm

E = 4 Nm

K = 7 Nm

L = hand-tight



4.3.6 Adjusting the backrest angle



Allen key (5 mm) / Socket spanner (10 mm) / Open-end spanner (10 mm)



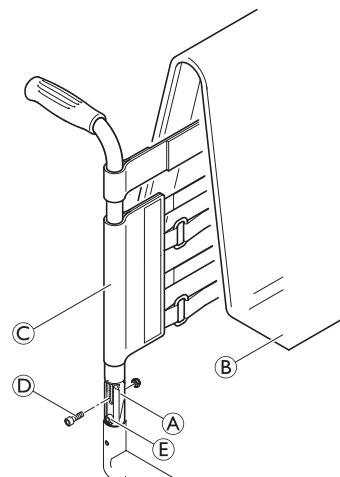
1. Remove the backrest cushion **B** and push the hook and loop bands **C** upwards, until the backrest joint **A** is invisible.
2. Remove the bolt **D**.
3. Slightly loosen bolt **E**.
4. Set the desired backrest angle, insert the bolt **D** in the nearest hole and tighten.
5. Re-tighten bolt **E**.
6. Perform the same settings on both sides.

D = 4 Nm

E = 4 Nm

Visual check:

By looking from the side check that both backrest tubes are level and thus that the same angle has been set on both sides.



4.3.7 Installing the joint for a folding backrest



Allen key (4, 5 mm) / Socket spanner (10 mm)



Shorter rear frame (variant III) required.

1. Set the desired backrest angle, insert bolt (A) in the nearest position (Pos. 1, 2 or 3) and tighten with washer and nut. (With the curved backrest tubes, other positions can be achieved in addition to the 3 positions specified.)
2. Install the intermediate backrest tube (B) to the joint housing using bolt (E), washer and nut.
3. Insert the joint housing (C) into the rear frame (D) and secure using bolt (F), washer and nut.

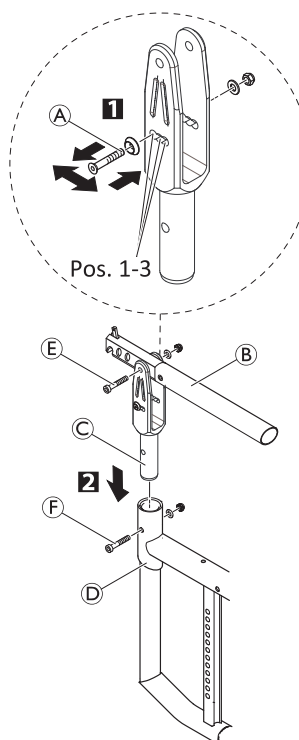
(A) = 4 Nm

(E) = 4 Nm

(F) = 7 Nm

Possible Backrest Angles:

- Position 1 (rear position): 82°, with curved backrest tube 90°
- Position 2 (mid position): 86°, with curved backrest tube 94°
- Position 3 (front position): 90°, with curved backrest tube 98°



4.3.8 Replacing push handles / replacing push handles and backrest

If the push handles are replaced with a different type of push handles, e.g. height-adjustable ones, it can happen that the rear frame must also be replaced.

Changing the backrest height can also mean that the configuration of the hook and loop bands must be changed.

4.3.9 Installing standard push handles



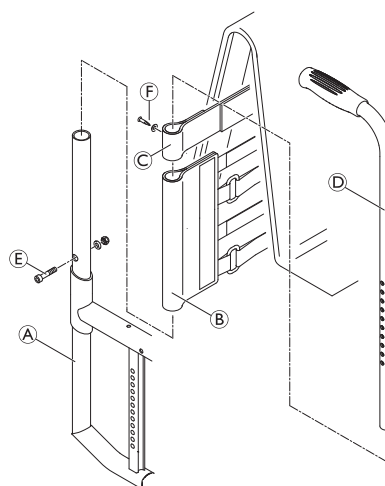
Allen key (4, 5 mm) / Socket spanner (8, 10 mm) / Phillips screwdriver (4 mm)



1. Push the end band (C) onto the telescopic tube (D).
2. Push the backrest bands (B) onto the telescopic tube.
3. Secure end band at the telescopic tube using washer and screw (F).
4. Secure the telescopic tube (D) to the rear frame (A) at the required height using bolt, washer and nut (E).

(E) = 7 Nm

(F) = Hand-tight



4.3.10 Installing height-adjustable, integrated push handles



Allen key (4, 5 mm) / Socket spanner (8, 10 mm) / Philips screwdriver (4 mm)



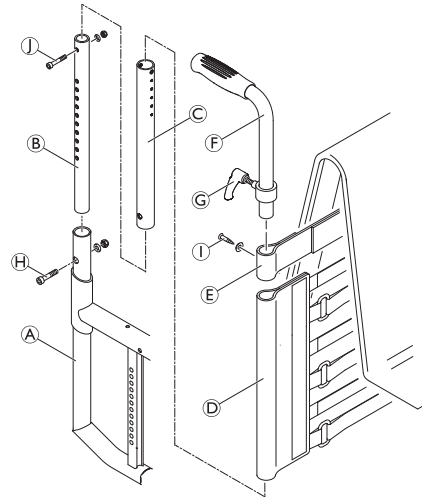
Special rear frame required for RH 300 – 465 (variant II)

1. Push lower telescopic tube **B** and upper telescopic tube **C** into one another, insert screw and nut **J** and tighten.
2. Secure pre-assembled element (telescopic tubes **B** and **C**) at the required height on the rear frame **A** using bolt **H**, washer and nut.
3. Push the hook and loop bands **D** and end band **E** onto the telescopic tubes.
4. Using the clamp bolt **G** secure the height adjustable push handle **F** through the telescopic tube **C**.
5. Push in push handle completely.
6. Secure end band **E** on the telescopic tube **C** using screw **I**.

H = 7 Nm

I = Hand-tight

J = 7 Nm



4.3.11 Installing height-adjustable, rear set push handles



Allen key (4, 5 mm) / Socket spanner (8, 10 mm) / Philips screwdriver (4 mm)

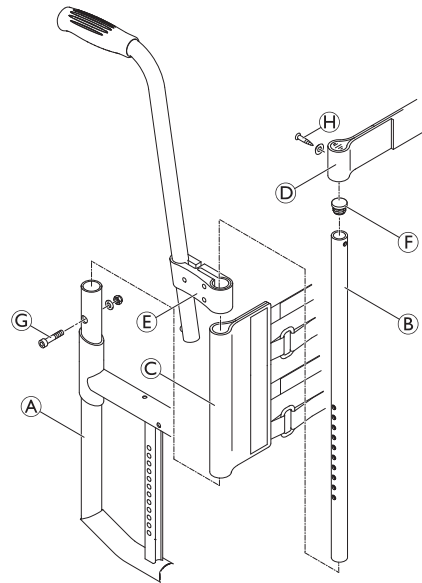


The hook and loop bands may have to be replaced with narrower ones, as space is required to secure the holder on the telescopic tube.

1. Secure the telescopic tube **B** to the rear frame **A** at the required height using bolt **G**, washer and nut.
2. Press the cover cap **F** onto the end of the telescopic tube.
3. Push the hook and loop bands **C** onto the telescopic tube.
4. Push the holder **E** onto the telescopic tube and fix in place by tightening the clamp bolts.
5. Install the end band **D** onto the telescopic tube and secure with screw **H**.
6. Install protective cushion.

G = 7 Nm

H = Hand-tight



4.3.12 Installing angle-adjustable backrest with height-adjustable push handles

 Allen key (4, 5 mm) / Socket spanner (8, 10 mm) / Philips screwdriver (4 mm) / Open-end spanner (10 mm) 

Shorter rear frame (variant III) required.

1. Push the lower joint pin **B** into the rear frame **A** and fix it using bolt **M**, washer and nut.
2. Fit backrest tube **F** onto the upper joint pin **C** using screw **L** and nut.
3. Assemble the upper and lower joint pins (**C** and **B**) and secure with a bolt and nut **D**.
4. Set the desired backrest angle and secure in the nearest hole using bolt and nut **E**.
5. Retighten the bolt and nut **D**.
6. Push the single hook and loop band **H** and then the other hook and loop bands **I** and the end band **J** over the backrest tube **F**.
7. Push in the push handle **G** completely.
8. Using the clamp bolt **K** fit the push handles **G** through the telescopic tube **F**.
9. Fix the end band **J** onto the telescopic tube with screw **N**.

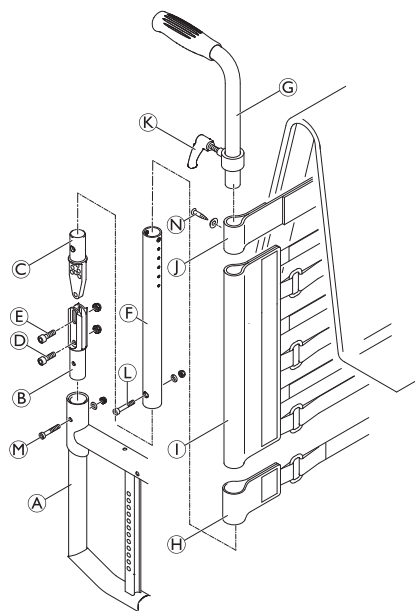
D = 13 Nm

E = 13 Nm

L = 7 Nm

M = 7 Nm

N = Hand-tight



4.3.13 Replacing the foldable push handles

 Allen key (3, 4 mm) / Hole punch pliers (6 mm) 

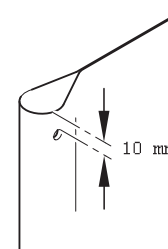
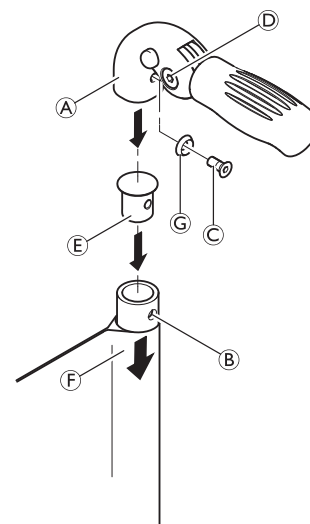
1. Remove the old foldable push handle.
2. Pull down the backrest cover **F** on the telescopic tube, until its hole **B** is uncovered.



NOTICE!

Make sure that the threaded insert **E** (part no. 1580450) supplied with the new push handle is used for assembly.

3. Place the threaded insert **E** in the telescopic tube.
4. Punch a hole through the backrest cover with a distance of 10 mm from the upper edge, using hole punch pliers (see graphic below).
5. Slide the new foldable push handle **A** onto the telescopic tube.
6. Pull up the backrest cover, until it covers completely the rear hole in the push handle.
7. Install the foldable push handle with screw **C** and washer **G**.
8. Check screws **D** on both sides of the push handle and retighten if necessary.
9. Carry out the same steps for the other push handle.



NOTICE!

Make sure that the folding force is approximately 5 N (0.5 kg).



NOTICE!

Fixing screw **C** may only be used once. Alternatively the screw can be cleaned (remove old thread locking adhesive) and reinstalled with new low-strength thread locking adhesive.



The retrofit of foldable push handles requires new tubing.

4.3.14 Installing the stabilization bar

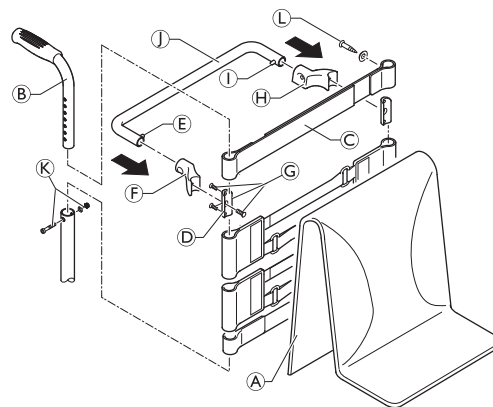


Allen key (3 mm) / Socket spanner (8 mm) / Philips screwdriver (2 mm)



With a backrest height (RH) over 405 mm or larger it is possible to assemble a stabilisation bar to increase the rigidity of the backrest handles.

1. Remove backrest cover (A), push handles (B) and the 10 cm backrest band (or end band, if no push handles are assembled).
2. Install a 5 cm backrest band (C) or end band with the screws (L) to the push handles (B).
3. Install the push handles (B) with screws and nuts (K).
4. Attach the clamps (D) together with the right-hand socket (F) and the left-hand socket (H) with the screws (G) below the backrest band (C) to the push handles (B).
5. Replace the push handle / backrest band / socket assembly.
6. Press pin (E) and slide the stabilization bar (I) into the right-hand socket (F) then swing the stabilization bar upwards, press pin (I) and click the stabilization bar into the left-hand socket (H).



© = 4 Nm

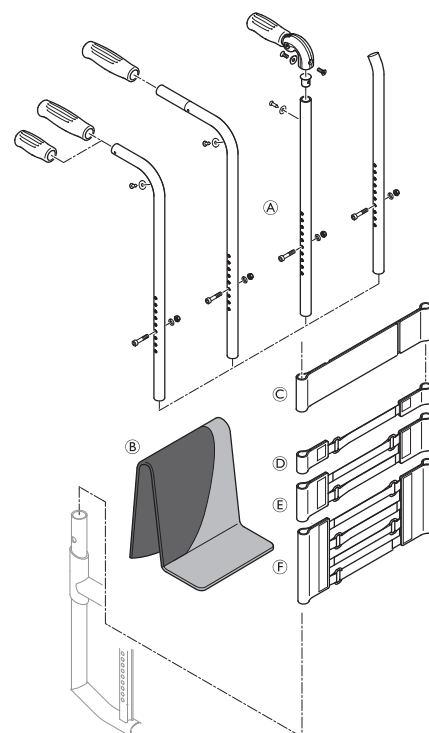
Ⓚ = 7 Nm

Ⓛ = Hand-tight

4.3.15 Backrest parts for adjustable backs with respect to backrest height

Fixed backrest with standard/mini push handles, foldable push handles* or without push handles:

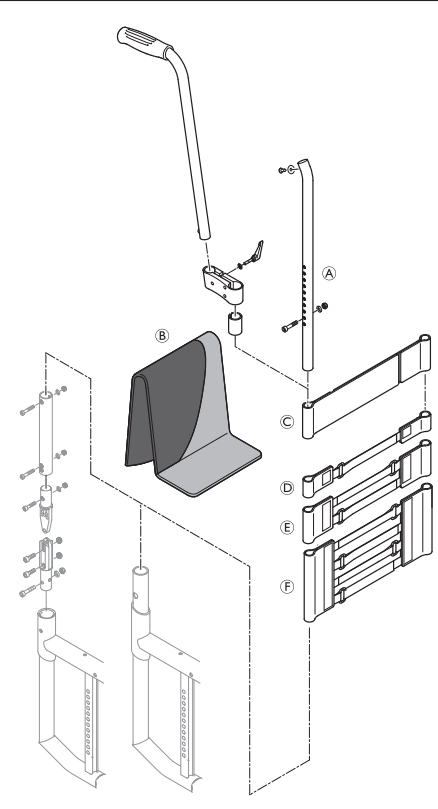
Backrest height (RH) with respect to cover, backrest tubes, bands				
RH [mm]	Cover (B)	Telescopic tube (A) (straight/lumbar)	Bands (without stabilisation bar, end band © = 10 cm)	Bands (with stabilisation bar, end band © = 5 cm)
300	S	S	1-band (D) + 2-band (E)	—
315	S	S	1-band + 2-band	—
330	S	S	2x2-band	—
345	M	S	2x2-band	—
360	M	S	2x2-band	—
375	M	S	1-band + 2x2-band	—
390	M	S	1-band + 2x2-band	—
405	M	M	1-band + 4-band (F)	1-band + 2x2-band
420	L	M	1-band + 4-band	2x1-band + 4-band
435	L	M	1-band + 4-band	2x1-band + 4-band
450	L	M	2-band + 4-band	2x1-band + 4-band
465	L	M	2-band + 4-band	1-band + 2-band + 4-band
480	L	M	2-band + 4-band	1-band + 2-band + 4-band
495	L	M	2-band + 4-band	1-band + 2-band + 4-band
510	L	M	1-band + 2-band + 4-band	1-band + 2-band + 4-band



*Stabilization bar not possible for foldable push handles

Fixed or angle adjustable backrest with height adjustable push handles, rear set:

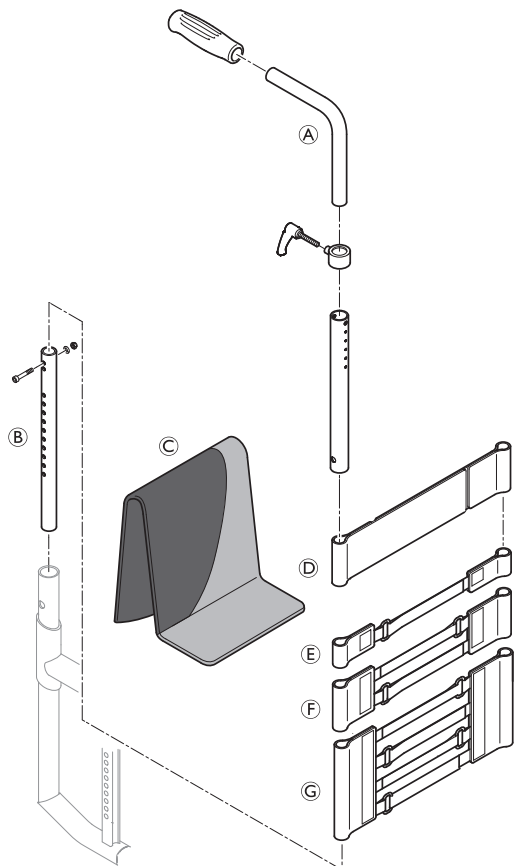
Backrest height (RH) with respect to cover, backrest tubes, bands				
RH [mm]	Cover Ⓑ	Telescopic tube Ⓐ	Bands (without stabilisation bar, end band Ⓒ = 10 cm)	Bands (with stabilisation bar, end band Ⓒ = 5 cm)
300	S	L	2-band E	—
315	S	L	2-band	—
330	S	L	1-band Ⓓ + 2-band	—
345	M	L	1-band + 2-band	—
360	M	L	1-band + 2-band	—
375	M	L	2x2-band	—
390	M	L/XL*	2x2-band	—
405	M	XL	4-band Ⓕ	2x1-band + 2- band
420	L	XL	4-band	1-band + 4-band
435	L	XL	4-band	1-band + 4-band
450	L	XL	1-band + 4-band	1-band + 4-band
465	L	XL	1-band + 4-band	1-band + 4-band
480	L	XL	1-band + 4-band	2-band + 4-band
495	L	XL	1-band + 4-band	2-band + 4-band
510	L	XL	2-band + 4-band	2-band + 4-band



*Telescopic tube XL for angle adjustable backrest.

Fixed backrest with height-adjustable push handles, integrated:

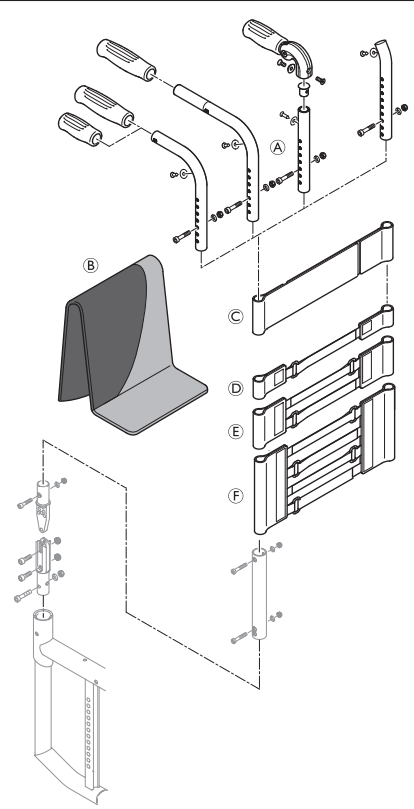
Backrest height (RH) with respect to cover, backrest tubes, bands*					
		Telescopic tube (straight)		Telescopic tube (lumbar)	
RH [mm]	Cover Ⓒ	Backrest tube Ⓑ	Push handle Ⓐ	Backrest tube Ⓑ	Push handle Ⓐ
300	S	S	S	S	S
315	S	S	S	S	S
330	S	S	S	S	S
345	M	S	S	S	S
360	M	S	S	S	S
375	M	S	L	S	S
390	M	S	L	S	S
405	M	S	L	M	S
420	L	S	L	M	S
435	L	S	L	M	L
450	L	S	L	M	L
465	L	S	L	M	L
480	L	S	L	M	L
495	L	M	L	M	L
510	L	XL	L	M	L



*For bands configuration, see first table "Fixed backrest with standard push handles".

Angle adjustable backrest with standard/mini push handles, foldable push handles* or without push handles:

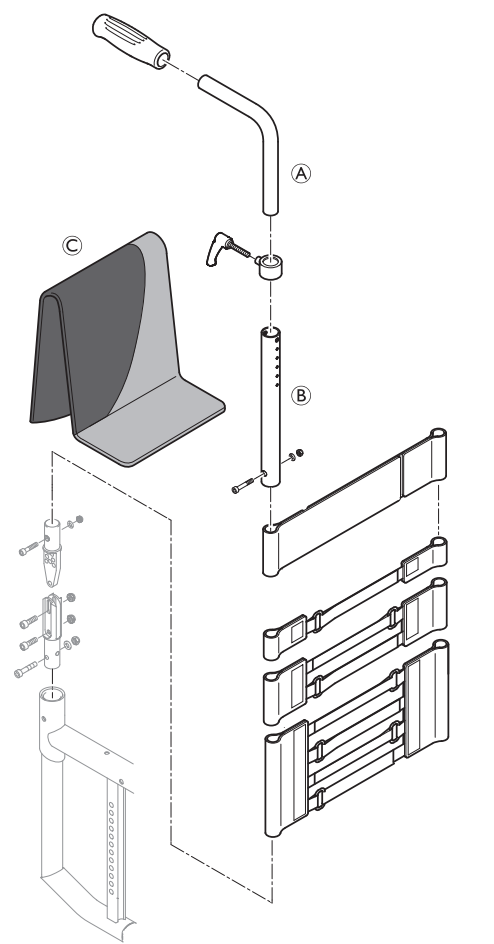
Backrest height (RH) with respect to cover, backrest tubes, bands				
RH [mm]	Cover ②	Telescopic tube ①	Bands (without stabilisation bar, end band ③ = 10 cm)	Bands (with stabilisation bar, end band ③ = 5 cm)
300	S	S	1-band ④ + 2-band ⑤	—
315	S	S	1-band + 2-band	—
330	S	S	2 x 2-band	—
345	M	S	2 x 2-band	—
360	M	S	2 x 2-band	—
375	M	S	1-band + 2x2-band	—
390	M	L	1-band + 2x2-band	—
405	M	L	1-band + 4-band ⑥	1-band + 4-band
420	L	L	1-band + 4-band	2-band + 4-band
435	L	L	1-band + 4-band	2-band + 4-band
450	L	L	2-band + 4-band	2-band + 4-band
465	L	L	2-band + 4-band	2-band + 4-band
480	L	L	2-band + 4-band	1-band + 2-band + 4-band
495	L	L	2-band + 4-band	1-band + 2-band + 4-band
510	L	L	1-band + 2-band + 4-band	1-band + 2-band + 4-band



* Stabilization bar not possible for foldable push handles

Angle adjustable backrest with height adjustable push handles, integrated:

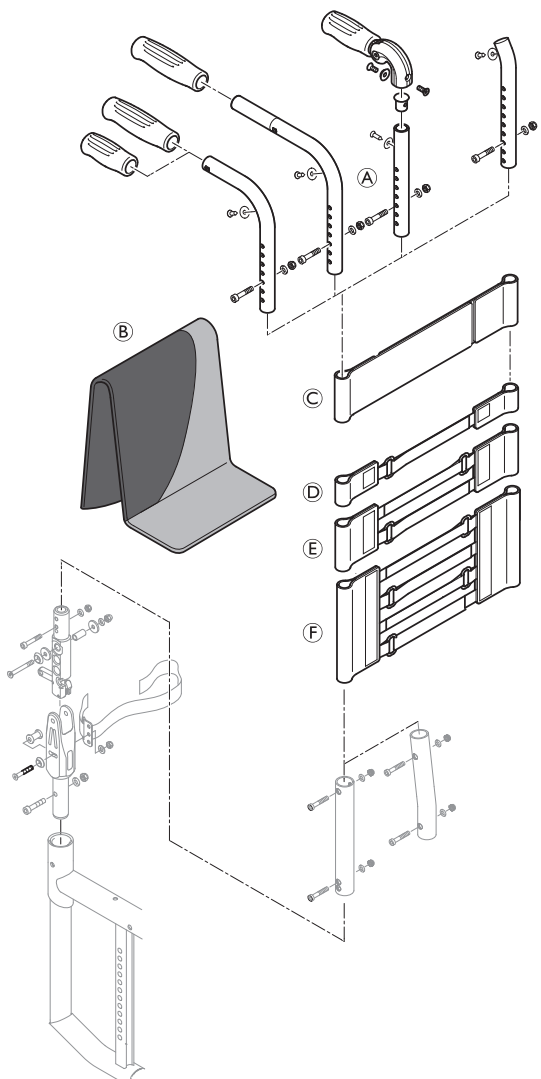
Backrest height (RH) with respect to cover, backrest tubes, bands*			
RH [mm]	Cover ②	Telescopic tube	
		Backrest tube ③	Push handle ①
300	S	S	S
315	S	S	S
330	S	S	S
345	M	M	L
360	M	M	L
375	M	M	L
390	M	M	L
405	M	M	L
420	L	L	L
435	L	L	L
450	L	L	L
465	L	L	L
480	L	L	L
495	L	XL	L
510	L	XL	L



* For bands configuration, see first table "Angle adjustable backrest with standard push handles".

Foldable backrest with standard/mini push handles, foldable push handles¹⁾ or without push handles:

Backrest height (RH) with respect to cover, backrest tubes ²⁾ , bands				
RH [mm]	Cover ②	Telescopic tube ①	Bands (without stabilisation bar, end band ③ = 10 cm)	Bands (with stabilisation bar, end band ③ = 5 cm)
300	—	—	—	—
315	—	—	—	—
330	—	—	—	—
345	M	S	2x1-band ④	—
360	M	S	2x1-band	—
375	M	S	1-band + 2-band ⑤	—
390	M	S	1-band + 2-band	—
405	M	S	1-band + 2-band	2x2-band
420	L	S	2x2-band	2x2-band
435	L	L	2x2-band	1-band + 2x2-band
450	L	L	2x2-band	1-band + 2x2-band
465	L	L	1-band + 2x2-band	1-band + 4-band
480	L	L	1-band + 2x2-band	1-band + 4-band
495	L	L	1-band + 4-band ⑥	1-band + 4-band
510	L	L	1-band + 4-band	3x2-band

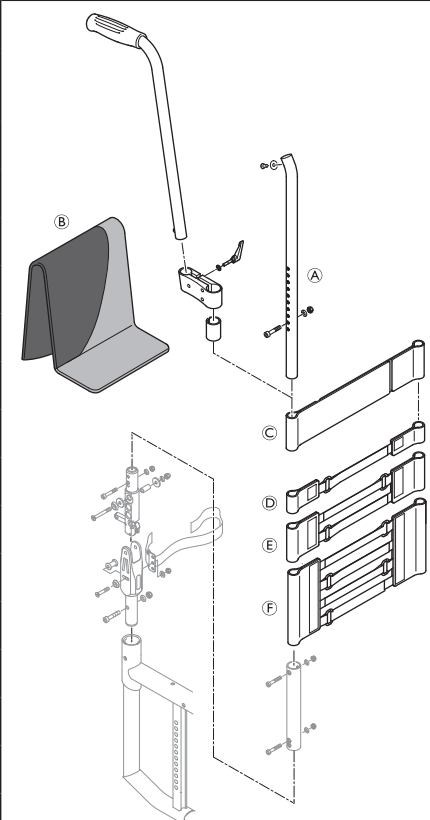


¹⁾ Stabilization bar not possible for foldable push handles

²⁾ Backrest tubes lumbar possible from RH360

Foldable backrest with height adjustable push handles, rearset:

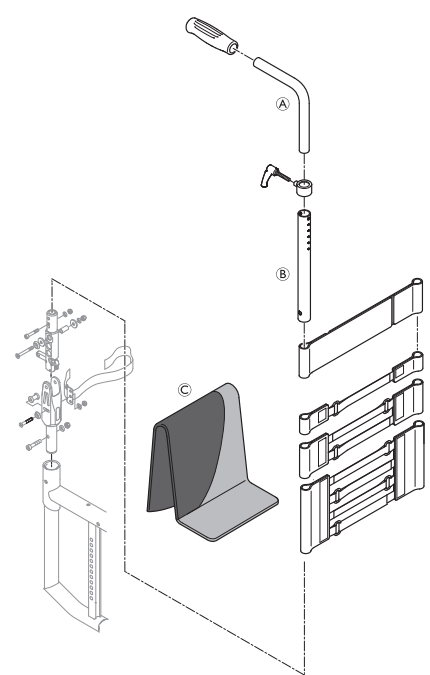
Backrest height (RH) with respect to cover, backrest tubes*, bands				
RH [mm]	Cover ⑥	Telescopic tube ①	Bands (without stabilisation bar, end band ③ = 10 cm)	Bands (with stabilisation bar, end band ③ = 5 cm)
300	—	—	—	—
315	—	—	—	—
330	—	—	—	—
345	M	S	2x1-band ④	—
360	M	S	2x1-band	—
375	M	S	2x1-band	—
390	M	S	2x1-band	—
405	M	S	1-band + 2-band ⑤	1-band + 2-band
420	L	S	1-band + 2-band	1-band + 2-band
435	L	L	1-band + 2-band	1-band + 2-band
450	L	L	2x2-band	2x2-band
465	L	L	2x2-band	2x2-band
480	L	L	2x2-band	2x2-band
495	L	L	1-band + 2x2-band	1-band + 2x2-band
510	L	L	1-band + 2x2-band	1-band + 2x2-band



* Backrest tubes lumbar possible from RH360

Foldable backrest with high adjustable push handles, integrated:

Backrest height (RH) with respect to cover, backrest tubes, bands*				
			Push handle ①	
RH [mm]	Cover ③	Backrest tube ②	Telescopic tube (lumbar) (82°, 86°, 90°)	Telescopic tube (lumbar) (94°, 98°)
300	—	—	—	—
315	—	—	—	—
330	—	—	—	—
345	M	S	S	S
360	M	S	S	S
375	M	S	S	S
390	M	M	L	S
405	M	M	L	S
420	L	M	L	S
435	L	M	L	S
450	L	M	L	L
465	L	L	L	L
480	L	L	L	L
495	L	L	L	L
510	L	L	L	L



* For bands configuration, see table "Foldable backrest with standard push handles".



For foldable backrests additionally a band is fixed close to the backrest joint.

The band is of different length according to the seat width (SW):

SW 280 mm - 360 mm = short / SW 380 mm - 440 mm = medium / SW 460 mm - 500 mm = long

4.4 Leg rests

Legrests with angle measurements of 70° and 80° are available.

4.4.1 Replacing the locking mechanism on the leg rest



Allen key (3, 5 mm) / Torx wrench (10 mm)



1. Screw off the unlocking lever (A) manually.
2. Remove the hinge pin (B).
3. Loosen bolts (D).
4. Remove locking mechanism (C) and replace with a new one.
5. Reinsert bolts (D) and tighten.
6. Screw in the hinge pin (B) again.
7. Screw the unlocking lever (A) back on manually.

(B) = hand-tight

(D) = hand-tight

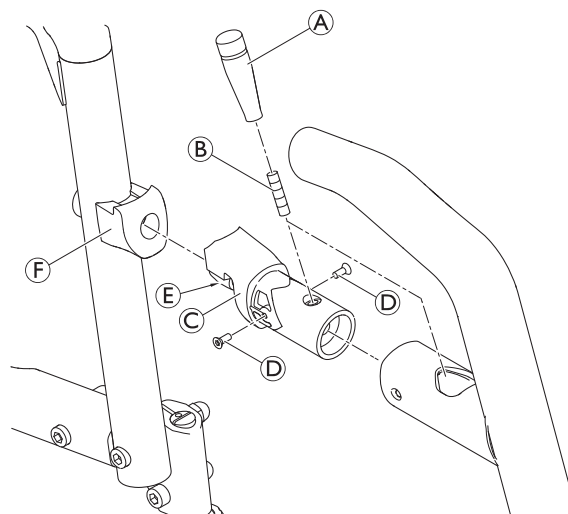
Adjusting the locking lever

It must be possible to move the unlocking lever (A) 1-2 mm freely forward and back, without having to move the bolt (E). This guarantees that the bolt is sitting optimally in the counterpiece (F). If this free mobility is greater or smaller than specified, the unlocking lever must be readjusted.

1. Screw off the unlocking lever (A) manually.
2. Loosen the hinge pin (B) (do not remove).
3. Screw the bolt (E) in deeper to reduce movement or screw it further out to increase movement.
4. Set it so that the pin can move freely by 1-2 mm.
5. Re-tighten the hinge pin (B).
6. Screw the unlocking lever (A) back on manually.

(B) = hand-tight

(D) = hand-tight



4.5 Footrests

One-piece and two-piece footrests are available.

4.5.1 Replacing the foot plate (one-piece footrest)

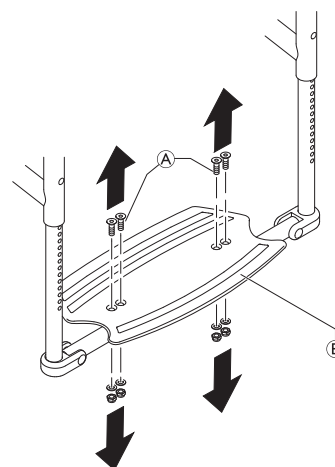


Allen key (4 mm) / Socket spanner (10 mm)



1. Remove all bolts (A), washers and nuts.
2. Remove foot plate (B) and replace with a new one.
3. Reinsert all bolts, washers and nuts and tighten.

(A) = 7 Nm



4.5.2 Replacing the footrest (one-piece footrest)

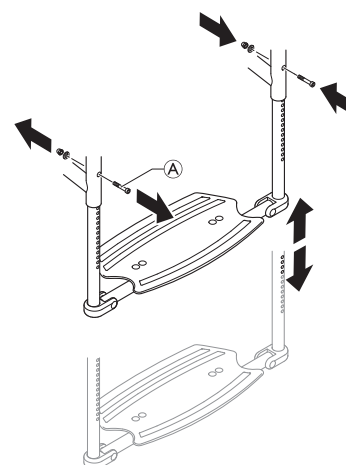


Allen key (4 mm) / Socket spanner (8 mm)



1. Remove bolts, washers and nuts (A) on both sides.
2. Pull the footrest out of the frame tubes.
3. Insert new footrest.
4. Insert bolts, washers and nuts (A) on both sides at the same height in the required position and tighten.

(A) = 4 Nm



4.5.3 Centering and adjusting the angle (one-piece footrest)



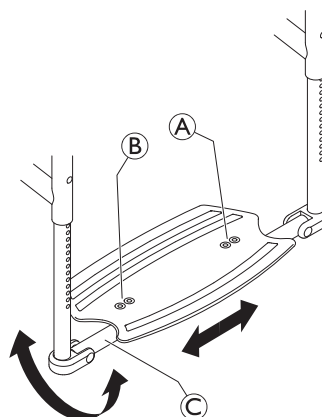
Allen key (4 mm) / Socket spanner (10 mm)



1. Slightly Loosen bolts (A) and (B).
2. Adjust the distance from the side tube to the foot plate to the same length on both sides.
3. Incline the foot plate to the required position.
4. Retighten bolts (A) (fixed side of the foot plate).
5. Turn the little tube (C) on the moving side of the footplate such that it engages properly.
6. Tighten bolts (B).

(A) = 7 Nm

(B) = 7 Nm



4.5.4 Changing the footrest position (one-piece footrest)

The foot plate can be mounted rear-set or front-set.

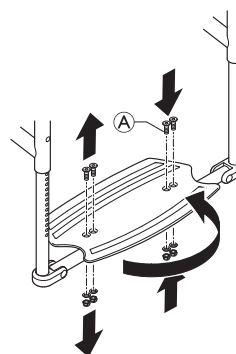


Allen key (4 mm) / Socket spanner (10 mm)



1. Remove bolts ①.
2. Turn the foot plate with the clamp component.
3. Reinsert bolts ① and tighten.

① = 7 Nm



4.5.5 Replacing the footrest (two-piece footrest)

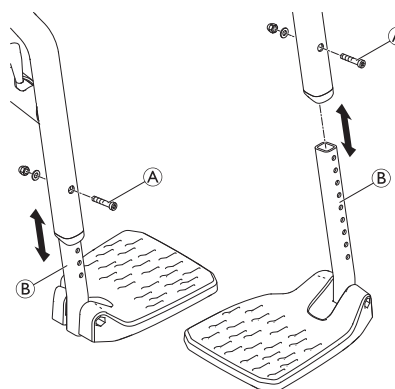


Allen key (4 mm) / Socket spanner (8 mm)



1. Remove bolts, washers and nuts ①.
2. Remove the footrests ② from the frame.
3. Insert new footrests into the frame and position at the required height.
4. Insert bolts ① into the nearest hole on both sides and tighten with washers and nuts.

① = 4 Nm



4.5.6 Adjusting the footrest height (two-piece footrest)

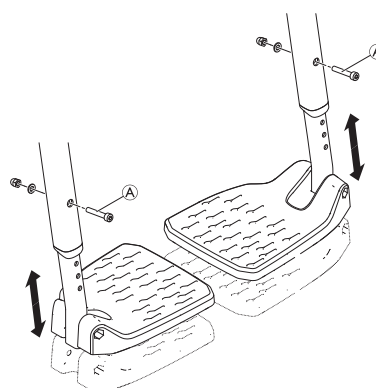


Allen key (4 mm) / Socket spanner (8 mm)



1. Remove bolts, washers and nuts ①.
2. Adjust the footrests to the required height.
3. Insert bolts ① into the nearest hole on both sides and tighten with washers and nuts.

① = 4 Nm



4.5.7 Changing the footrest position (two-piece footrest)

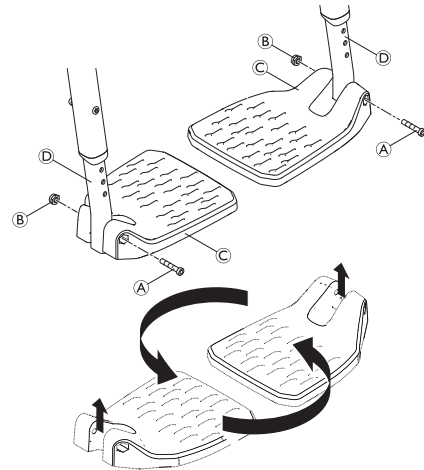


Allen key (5 mm)



1. Remove bolts (A) and nuts (B).
2. Remove the foot plates (C) from the telescopic tubes (D), turn both by 180°.
3. Reinstall the foot plates by inserting bolts and nuts and tighten.

(A) = 3 Nm



4.6 Sideparts

4.6.1 Installing the clothes guard / mudguard



Allen key (3, 4 mm) / Socket spanner (8 mm)



1. Install the side fastenings (A) onto the frame (D) using bolts, washer and nuts (C).
2. Install clothes-guard/mudguard (B) with bolts, washers and nuts (E) onto the side fastenings.

(C) = 7 Nm

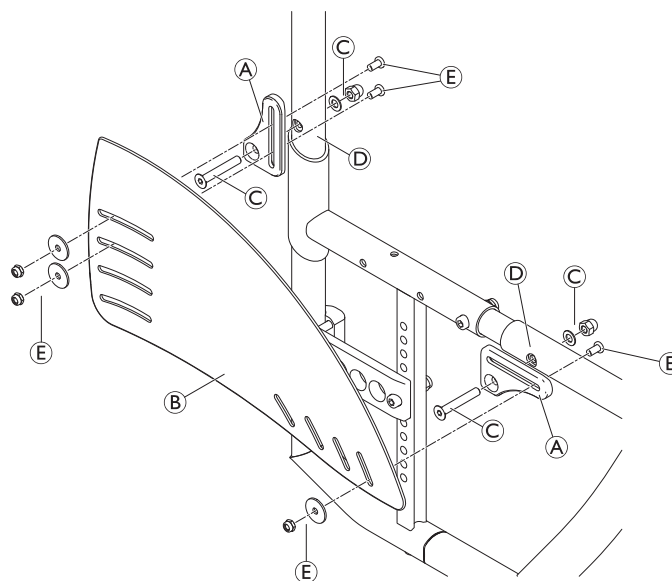
(E) = 4 Nm



CAUTION!

Risk of trapping fingers

- Install the mudguard such that it is positioned either < 8 mm or > 25 mm above the tyres, to avoid the risk of trapping one's fingers.



4.6.2 Adjusting the clothes guard / mudguard



Allen key (3 mm) / Socket spanner (8 mm)

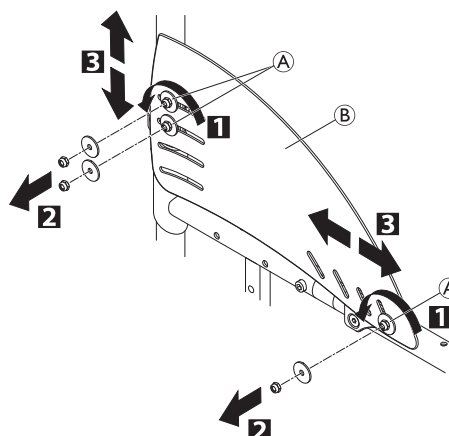


1. Loosen bolts (A). Move the clothes guard/mudguard (B).
2. Re-tighten bolts (A).

or

1. Loosen and remove bolts (A).
2. Reinstall clothes-guard/mudguard (B) in another position.
3. Re-tighten bolts (A).

(A) = 4 Nm



4.6.3 Installing and adjusting the removable clothes guard/mudguard



Allen key (3, 4 mm) / Socket spanner (10 mm) / Phillips screwdriver (2 mm)



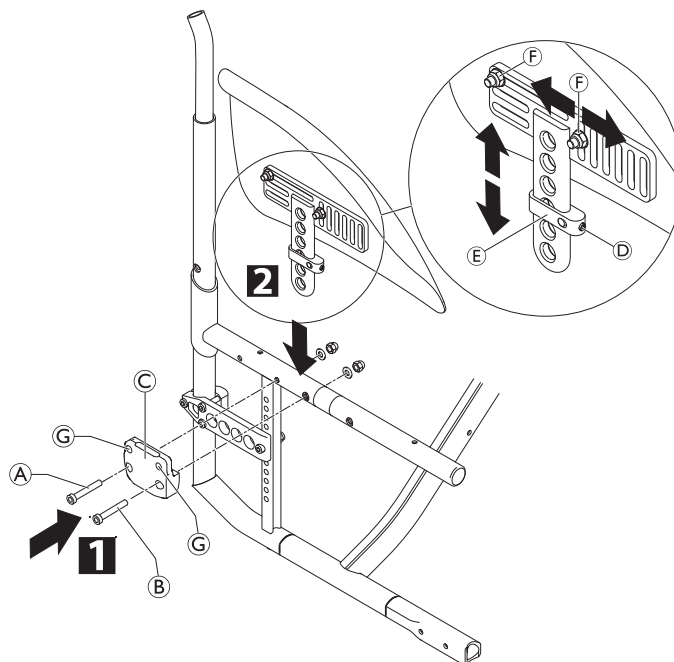
1. Install the holder © to the frame using the screw connections ① and ② and then reinstall the rear wheel.
2. Slightly loosen the scrub screw ③ on the adjustment plate ④ and slide it along the mudguard /clothes-guard carrier until the mudguard/clothes-guard is at the desired height.
3. The position of the mudguard/clothes-guard can also be adjusted: Here, loosen the screw connections ⑤, position the mudguard/clothes-guard as required and tighten the screw connections ⑥ again.
4. Tighten the scrub screw ③ again.
5. Carry out the same setting on both sides.
6. By tightening or loosening the screws ⑦ you can adjust how easily the mudguard/clothes-guard can be pulled out or pushed in.

① = 4 Nm

② = 7 Nm

③ = Hand-tight

⑤ = 7 Nm



The existing axle may not be sufficiently long for the new configuration with mudguard/clothes-guard. In this case, a longer axle must be fitted. See 4.8.5 *Changing the wheel camber*, page 41 and 4.8.7 *Adjusting the removable axle*, page 41.



CAUTION!

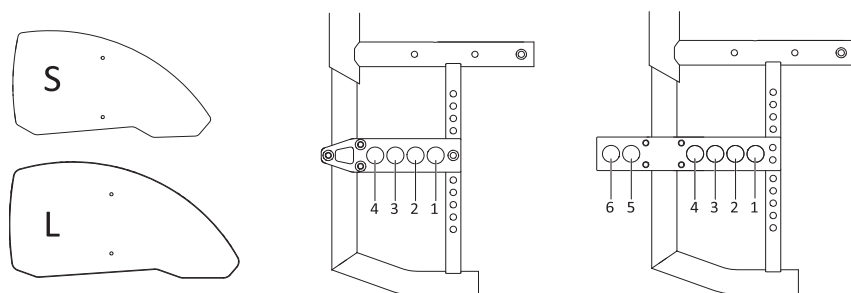
Risk of trapping fingers

The distance between the mudguard/clothes-guard and the wheel must be less than 12 mm to prevent fingers from becoming caught between the wheel and the mudguard/clothes-guard.

4.6.4 Size of the clothes guard/mudguard

The clothes guard and mudguard can be adjusted to suit the height of the rear wheel exactly. Two sizes of each are available.

Clothes-Guard mounted fixed (Carbon)



Clothes guard with respect to the position of the rear wheels with standard adaptor plate (Pos. 1 to 4) or rear wheel extension (Pos. 5 and 6)

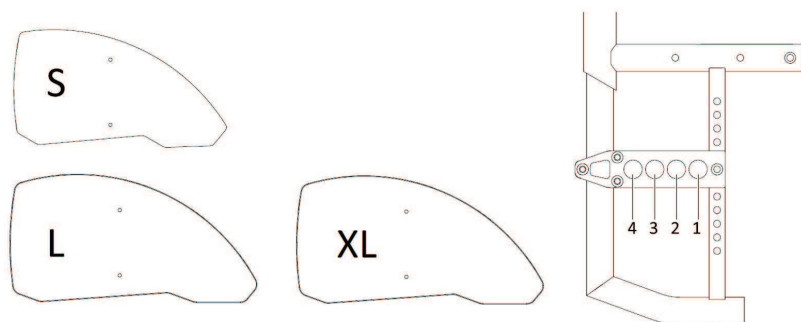
RSTF [mm]	Rear wheel 22"						Rear wheel 24"						Rear wheel 25"						Rear wheel 26"					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
370	L	L	L	L	L	L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
380	L	L	S	S	S	S	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
390	L	S	S	S	S	S	L	L	L	L	L	L	—	—	—	—	—	—	—	—	—	—	—	—
400	S	S	S	S	S	S	L	L	L	L	L	L	—	—	—	—	—	—	—	—	—	—	—	—
410	S	S	S	S	S	S	L	L	L	L	L	L	L	L	L	L	L	L	—	—	—	—	—	—
420	S	S	S	S	S	S	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
430	S	S	S	S	S	S	L	L	L	S	S	S	L	L	L	L	L	L	L	L	L	L	L	L
440	S	S	S	S	S	S	L	L	S	S	S	S	L	L	L	L	L	L	L	L	L	L	L	L
450	S	S	S	S	S	S	S	S	S	S	S	S	L	L	L	S	S	S	L	L	L	L	L	L
460	S	S	S	S	S	S	S	S	S	S	S	S	L	L	S	S	S	S	L	L	L	L	L	L
470	S	S	S	S	S	S	S	S	S	S	S	S	L	S	S	S	S	S	L	L	L	L	S	S
480	—	—	—	—	—	S	S	S	S	S	—	—	S	S	S	S	S	S	L	L	L	S	S	S
490	—	—	—	—	—	S	S	S	—	—	—	—	S	S	S	S	S	S	L	L	S	S	S	S
500	—	—	—	—	—	—	—	—	—	—	—	—	S	S	S	S	S	S	L	L	S	S	S	S

Clothes-Guard mounted fixed (Plastic)

Clothes guard with respect to the position of the rear wheels with standard adaptor plate (Pos. 1 to 4) or rear wheel extension (Pos. 5 and 6)

RSTF [mm]	Rear wheel 22"						Rear wheel 24"						Rear wheel 25"						Rear wheel 26"					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
370	L	L	L	L	L	L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
380	L	L	S	S	S	S	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
390	L	S	S	S	S	S	L	L	L	L	L	L	—	—	—	—	—	—	—	—	—	—	—	—
400	S	S	S	S	S	S	L	L	L	L	L	L	—	—	—	—	—	—	—	—	—	—	—	—
410	S	S	S	S	S	S	L	L	L	L	L	L	L	L	L	L	L	L	—	—	—	—	—	—
420	S	S	S	S	S	S	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
430	S	S	S	S	S	S	L	L	L	S	S	S	L	L	L	L	L	L	L	L	L	L	L	L
440	S	S	S	S	S	S	L	L	S	S	S	S	L	L	L	L	L	L	L	L	L	L	L	L
450	S	S	S	S	S	S	S	S	S	S	S	S	L	L	L	S	S	S	L	L	L	L	L	L
460	S	S	S	S	S	S	S	S	S	S	S	S	L	L	S	S	S	S	L	L	L	S	S	S
470	S	S	S	S	S	S	S	S	S	S	S	S	L	S	S	S	S	S	L	L	S	S	S	S
480	—	—	—	—	—	S	S	S	S	S	S	S	S	S	S	S	S	S	L	S	S	S	S	S
490	—	—	—	—	—	S	S	S	S	S	—	—	S	S	S	S	S	S	S	S	S	S	S	S
500	—	—	—	—	—	—	—	—	—	—	—	—	S	S	S	S	S	S	S	S	S	S	S	S

Mudguard mounted fixed and removable (Carbon)



Mudguard (mounted fix and removable) with respect to the position of the rear wheels with standard adaptor plate (Pos. 1 to 4)																
RSTF [mm]	Rear wheel 22"				Rear wheel 24"				Rear wheel 25"				Rear wheel 26"			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
360 (remo- vable)	L	L	L	L	XL	XL	XL	XL	XL	XL	XL	XL	XL	XL	XL	XL
370	L	L	L	L	XL	XL	XL	XL	XL	XL	XL	XL	XL	XL	XL	XL
380	L	L	L	L	XL	XL	XL	XL	XL	XL	XL	XL	XL	XL	XL	XL
390	L	L	L	L	XL	XL	XL	XL	XL	XL	XL	XL	XL	XL	XL	XL
400	L	L	L	L	XL	XL	XL	XL	XL	XL	XL	XL	XL	XL	XL	XL
410	S	S	S	S	XL	XL	XL	XL	XL	XL	XL	XL	XL	XL	XL	XL
420	S	S	S	S	L	L	L	L	XL	XL	XL	XL	XL	XL	XL	XL
430	S	S	S	S	L	L	L	L	XL	XL	XL	XL	XL	XL	XL	XL
440	S	S	S	S	L	L	L	L	XL	XL	XL	XL	XL	XL	XL	XL
450	S	S	S	S	L	L	L	L	L	L	L	L	XL	XL	XL	XL
460	S	S	S	S	L	L	L	L	L	L	L	L	XL	XL	XL	XL
470	S	S	S	S	S	S	S	S	L	L	L	L	XL	XL	XL	XL
480	S	S	S	S	S	S	S	S	S	S	S	S	L	L	L	L
490	S	S	S	S	S	S	S	S	S	S	S	S	L	L	L	L
500	S	S	S	S	S	S	S	S	S	S	S	S	L	L	L	L

Mudguard mounted fixed (Plastic)

Clothes guard with respect to the position of the rear wheels with standard adaptor plate (Pos. 1 to 4) or rear wheel extension (Pos. 5 and 6)																								
RSTF [mm]	Rear wheel 22"						Rear wheel 24"						Rear wheel 25"						Rear wheel 26"					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
360	L	L	L	L	L	L	—	—	—	—	L	L	—	—	L	L	L	L	—	—	L	L	L	L
370	L	L	L	L	L	L	—	—	L	L	L	L	—	—	—	—	L	L	—	—	—	—	—	—
380	L	L	L	L	L	L	—	L	L	L	L	L	—	—	—	L	L	L	—	—	—	—	—	—
390	L	L	S	S	S	S	L	L	L	L	L	L	—	—	—	L	L	L	—	—	—	—	—	—
400	L	S	S	S	S	S	L	L	L	L	L	L	—	—	L	L	L	L	—	—	—	—	—	—
410	S	S	S	S	S	S	L	L	L	L	L	L	—	—	L	L	L	L	—	—	—	—	—	—
420	S	S	S	S	S	S	L	L	L	L	L	L	—	—	L	L	L	L	—	—	—	L	L	L
430	S	S	S	S	S	S	L	L	S	S	S	S	L	L	L	L	L	L	—	—	L	L	L	L
440	S	S	S	S	S	S	L	L	S	S	S	S	L	L	L	L	L	L	—	—	L	L	L	L
450	S	S	S	S	S	S	L	S	S	S	S	S	L	L	L	S	S	S	L	L	L	L	L	L
460	—	—	—	—	—	—	S	S	S	S	S	S	L	L	L	S	S	S	L	L	L	L	L	L
470	—	—	—	—	—	—	S	S	S	S	S	S	L	L	S	S	S	S	L	L	L	L	S	S
480	—	—	—	—	—	—	S	S	S	S	S	S	L	S	S	S	S	S	L	L	L	L	S	S
490	—	—	—	—	—	—	S	S	S	S	S	S	L	S	S	S	S	S	L	L	L	S	S	S
500	—	—	—	—	—	—	S	S	S	S	S	S	S	S	S	S	S	S	L	L	S	S	S	S

Mudguard removable (Plastic)

Mudguard (fix) with respect to the position of the rear wheels with standard adaptor plate (Pos. 1 to 4) or rear wheel extension (Pos. 5 and 6)																								
RSTF [mm]	Rear wheel 22"						Rear wheel 24"						Rear wheel 25"						Rear wheel 26"					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
360	L	L	L	L	L	L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
370	L	L	L	L	L	L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
380	S	S	S	S	S	S	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
390	S	S	S	S	S	S	L	L	L	L	L	L	—	—	—	—	—	—	—	—	—	—	—	—
400	S	S	S	S	S	S	L	L	L	L	L	L	—	—	—	—	—	—	—	—	—	—	—	—
410	S	S	S	S	S	S	L	L	L	L	L	L	L	L	L	L	L	L	—	—	—	—	—	—
420	XS	XS	XS	XS	XS	XS	S	S	S	S	S	S	L	L	L	L	L	L	L	L	L	L	L	L
430	XS	XS	XS	XS	XS	XS	S	S	S	S	S	S	L	L	L	L	L	L	L	L	L	L	L	L
440	XS	XS	XS	XS	XS	XS	S	S	S	S	S	S	L	L	L	L	L	L	L	L	L	L	L	L
450	—	—	—	—	—	—	S	S	S	S	S	S	S	S	S	S	S	S	S	L	L	L	L	L
460	—	—	—	—	—	—	S	S	S	S	S	S	S	S	S	S	S	S	S	L	L	L	L	L
470	—	—	—	—	—	—	XS	XS	XS	XS	XS	XS	S	S	S	S	S	S	S	S	S	S	S	S
480	—	—	—	—	—	—	XS	XS	XS	XS	XS	XS	S	S	S	S	S	S	S	S	S	S	S	S
490	—	—	—	—	—	—	XS	XS	XS	XS	XS	XS	XS	XS	XS	XS	XS	XS	XS	S	S	S	S	S
500	—	—	—	—	—	—	—	—	—	—	—	—	XS	XS	XS	XS	XS	XS	S	S	S	S	S	S

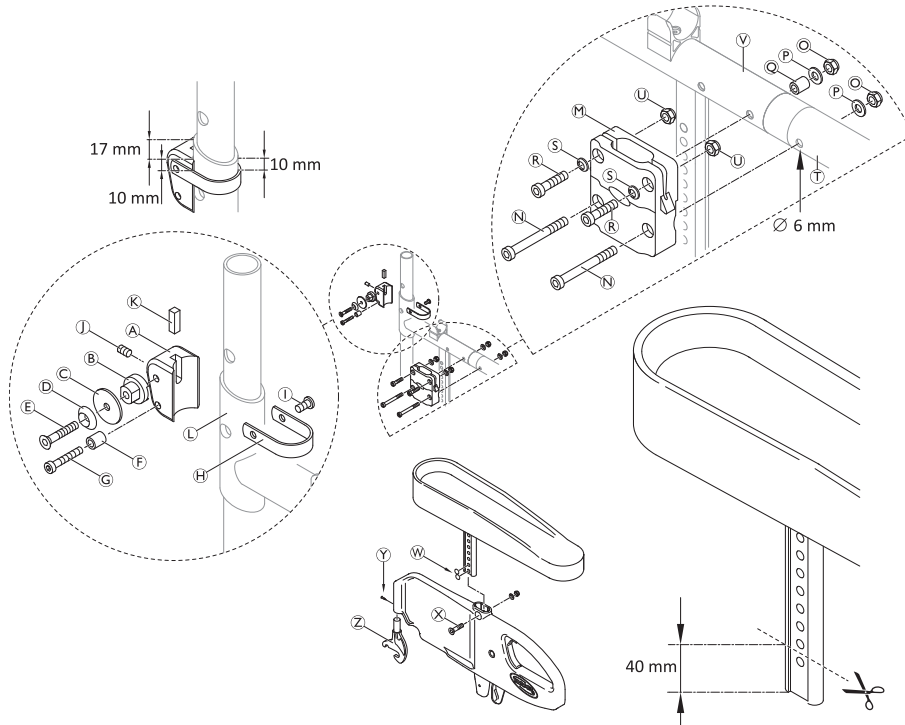
Clothes-guard removable (Plastic)

Clothes guard with respect to the position of the rear wheels with standard adaptor plate (Pos. 1 to 4) or rear wheel extension (Pos. 5 and 6)																								
RSTF [mm]	Rear wheel 22"						Rear wheel 24"						Rear wheel 25"						Rear wheel 26"					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
370	L	L	L	L	L	L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
380	L	L	L	L	L	L	L	L	L	L	L	L	—	—	—	—	—	—	—	—	—	—	—	—
390	L	L	L	L	L	L	L	L	L	L	L	L	—	—	—	—	—	—	—	—	—	—	—	—
400	S	S	S	S	S	S	L	L	L	L	L	L	L	L	L	L	L	L	—	—	—	—	—	—
410	S	S	S	S	S	S	L	L	L	L	L	L	L	L	L	L	L	L	—	—	—	—	—	—
420	S	S	S	S	S	S	L	L	L	L	L	L	L	L	L	L	L	L	—	—	—	—	—	—
430	S	S	S	S	S	S	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
440	S	S	S	S	S	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
450	S	S	S	S	S	S	S	S	S	S	S	S	L	L	L	L	L	L	L	L	L	L	L	L
460	S	S	S	S	S	S	S	S	S	S	S	S	L	L	L	L	L	L	L	L	L	L	L	L
470	S	S	S	S	S	S	S	S	S	S	S	S	L	L	L	L	L	L	L	L	L	L	L	L
480	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	L	L	L	L	L	L
490	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	L	L	L	L	L	L
500	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S

4.6.5 Installing the hemi armrest with holder



Allen key (3, 4, 5 mm) / Socket spanner (10 mm) / Drill with drill bit (6 mm) /
Saw / Deburring tool / Coating spray black)



Installing the guiding part

1. Install the retaining bracket **H** around the rear frame **L** to the clamping block **A** using bolt **1**.
2. Install the guiding part **B** to the clamping block using washer **C**, sunk sleeve **D** and bolt **E**.
3. Insert the wedge **K** from above into the clamping block and press the assembly against the rear frame using the grub screw **1**.



Make sure that the retaining bracket is exactly horizontal and meets the indicated distances of 10 mm resp. 17 mm to the upper frame edge.

4. Install the stop sleeve **F** using bolt **G**.

1 / **E** / **G** = 7 Nm

Installing the armrest holder

1. Remove the rear frame parts, see 4.1.1 *Replacing the rear frame, page 8*.
2. Drill a hole with a diameter of 6 mm through the upper frame connecting tube for installing the front bolt **N**.
3. Place the distance sleeve **Q** from the inside into the frame hole for the rear bolt **N**.
4. Install the armrest holder **M** to the frame **V** using bolts **N**, washers **P** and lock nuts **O**.
5. Reinstall the rear frame parts, see 4.1.1 *Replacing the rear frame, page 8*.
6. Insert nuts **U** into the armrest holder and install bolts **R** with spring washer **S**.



Adjust the bolts **R** so that the armrests engages optimally.

O = 7 Nm

Installing the Hemi armrest to the side rest

1. Install the hook bracket **Z** to the side rest using screw **Y**.
2. Cut off 40 mm from the Hemi armrest profile.
3. Deburr the cutting edge and coat it black with a spray.
4. Press 2 plastic caps **W** into the two lower holes of the profile.
5. Carefully insert the Hemi armrest into the side rest and secure in the profile's second hole from above using bolt, washer and nut **X**.

X = 4 Nm



To enlarge the distance between the wheels additionally, a different adaptor sleeve, which is mounted from the inside, has to be installed.

4.6.6 Fitting the Küschall armrest

Mounting the armrest hardware



Allen key (3, 4, 5 mm) / Socket spanner (10 mm)

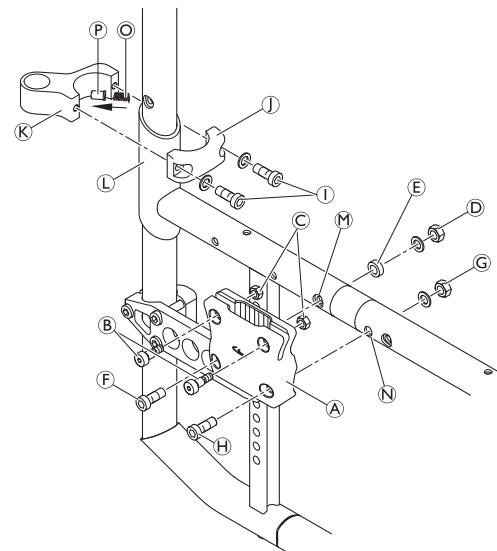


1. Insert nuts ③ and bolts ② into the upper holes of the armrest holder ① and carefully tighten. Do not squeeze the holder.
2. Mount the armrest holder ① to the rear frame hole ④ using bolt ⑥, sleeve ⑤, washer and nut ⑦.
3. Drill holes ⑧ with a diameter of 6 mm through the front frame by inserting the drill bit through the free hole of the pre-mounted armrest holder ①.
4. Insert bolt ⑨ and tighten with washer and nut ⑦.
5. Grease the pin ⑩ and Insert it with the spring ⑪ into the inner hole of clamping part ⑫ and place it around the reinforced part ⑬ of the rear frame.
6. Place the mating clamping part ⑭ around the rear frame and fix in true alignment with washers and bolts ⑩.

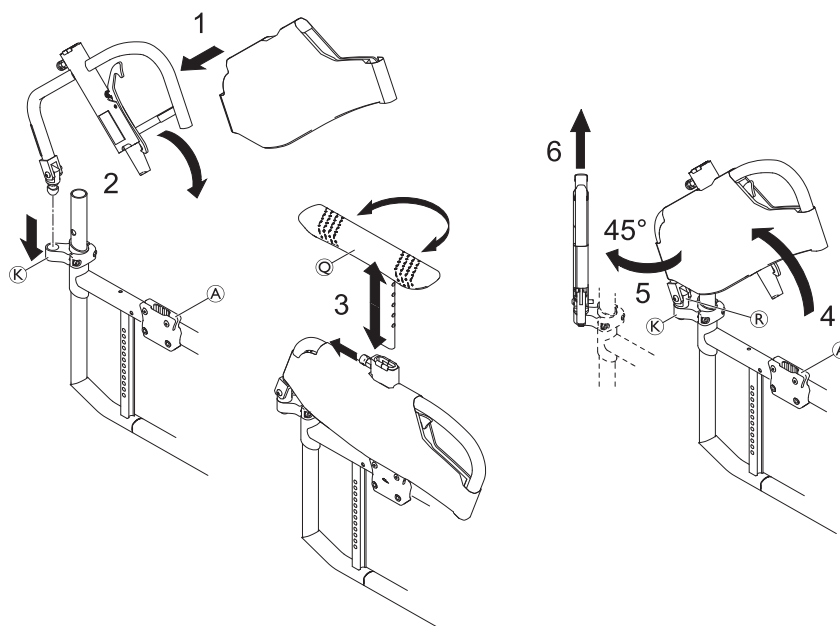
⑦ = 7 Nm

⑦ = 7 Nm

⑩ = 4 Nm



Installing/Removing the Armrest, T-Armrest Pad and Cover



Installing

1. Install the armrest cover to the armrest assembly.
2. Insert the armrest assembly into the joint ⑫ and swivel it downwards so that it engages into the armrest holder ①.
3. Install the T-armrest pad ⑬ to the armrest assembly.

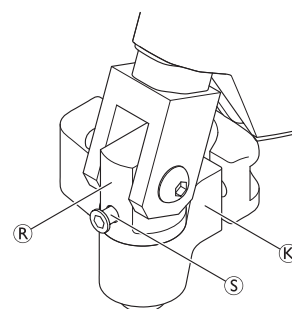
Removing

1. Remove the T-armrest pad from the armrest assembly.
2. Swivel the armrest assembly upwards out of the armrest holder ①.



On the backside of the joint pin ⑭ there is a tapped hole with a M5 stop screw ⑮ to define the stop of the armrest assembly when swivelling backwards. Adjust the stop screw as required.

3. Swivel the armrest assembly 45° outwards.
4. Lift the armrest assembly out of joint ⑫.



4.6.7 Installing the insertable, stepless height-adjustable siderest



Allen key (4, 5 mm) / Socket spanner (10 mm)



1. Fit the side fastening element **C** with bolts **A** and **B**.
2. Insert side rest into the fastening element.

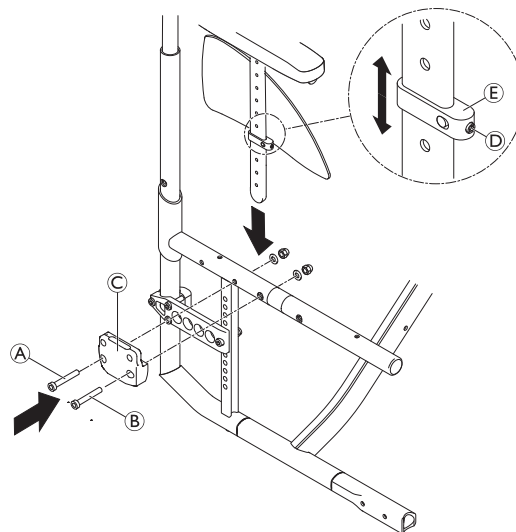
Adjusting the height

1. Slightly loosen the scrub screw **D** on the adjustment plate **E** and slide it along the armrest carrier until the armrest is at the desired height.
2. Retighten the scrub screw **D**.

A = 7 Nm

B = 7 Nm

D = Hand-tight



4.6.8 Installing the tubular armrest (swivelling)



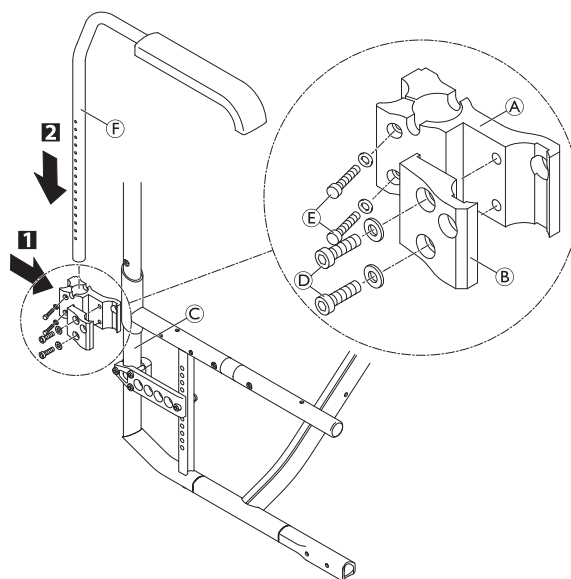
Allen key (4, 5 mm)



1. Install the rear fastening elements **A** and **B** around the frame tube **C** using bolts and washers **D**.
2. Insert the armrest tube **F** and set to the required height.
3. Secure the armrest tube in the fastening element by tightening bolts with washers **E**.

D = 7 Nm

E = 4 Nm



4.7 Castors

4.7.1 Replacing a castor wheel



Allen key (3 mm)



1. Remove the bolts (A) with washers (B) and pull out the wheel axle (C).
2. Remove castor wheel (D) from the castor fork (E) and replace with a new one or move to a new position.



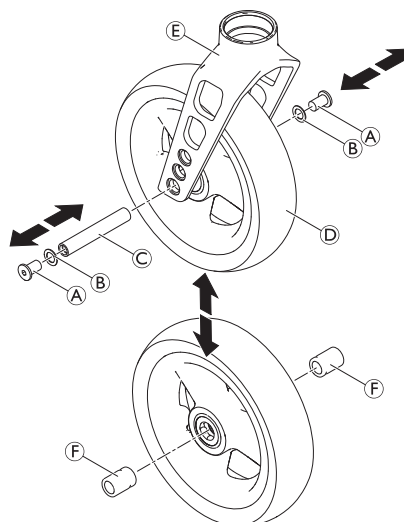
In the case of the Starec wheel, skater wheel, 3" sports wheel and the 5" soft roll wheel, 2 sleeves F must be pushed onto the axle. These sleeves are already in place on the low-resistance wheel, the sports wheels and the pneumatic wheels.

3. Reinsert washers and bolts and tighten

(A) = 4 Nm

Function check:

The wheel must not wobble, but must rotate easily.



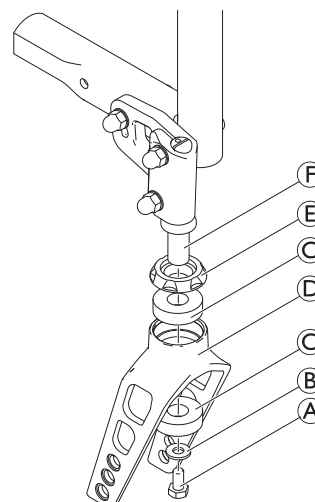
4.7.2 Replacing castor wheel fork



Socket spanner (10 mm) / Flat head screwdriver (4 mm)



1. Remove the castor wheel, see 4.7.1 *Replacing a castor wheel*, page 37.
2. Remove bolt (A), washer (B), the castor fork (D) with bearings (C) and part (E) from the clevis pin (F).
3. Replace the castor fork with bearings and reinstall in reverse order.
4. Re-insert the front wheel.



CAUTION!

Risk of property damage

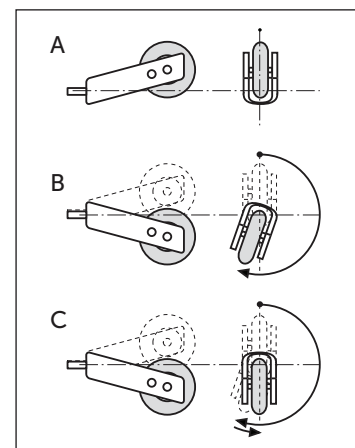
Do not overtighten screw (D), as this can damage the fork bearings.

Function check:

Tip the wheelchair backwards by 90° so that it is lying on the backrest and the rear wheels. Make sure that the clevis pin is as horizontal as possible. Turn the fork upwards (position (A)) and let it tip downwards.

The fork has been correctly adjusted if it easily turns to slightly beyond the bottommost point (position (B)) and then maximally turns back to the bottommost point (position (C)).

If the fork turns back over the bottommost point or even swings back and forth, it has not been sufficiently tightened. There is a risk that the front wheels will start to wobble at high speeds.



4.7.3 Adjusting the front wheel angle



Allen key (5 mm) / Socket spanner (10 mm)



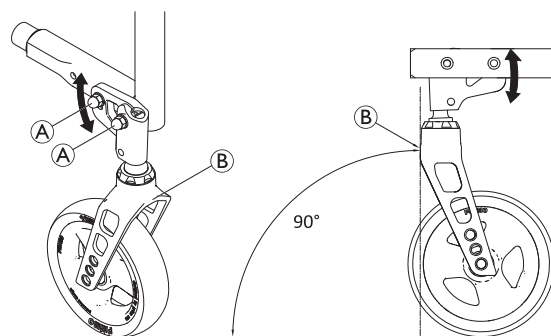
1. Position the wheelchair on a flat surface.
2. Loosen nuts (A).
3. Hold spirit level against the front edge of the castor fork (B) and position it exactly vertical.
4. Retighten nuts (A).

(A) = 13 Nm



CAUTION!

It is important that the settings on the left and right are precisely the same.



4.7.4 Adjusting the trial angle



Allen key (5 mm) / Socket spanner (10 mm) / Flat head screwdriver (4 mm)



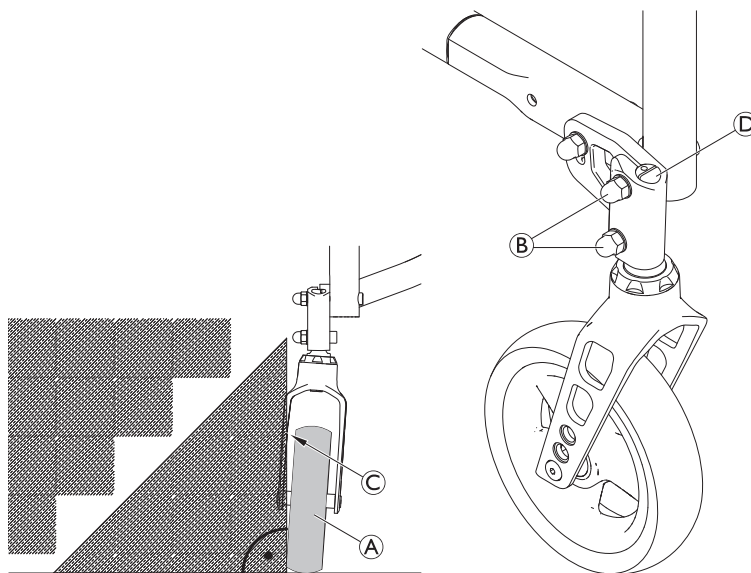
1. Position the wheelchair on a flat surface.
2. Turn the castor wheel (A) in driving direction, parallel to the rear wheels.
3. Apply a 90° ruler on the castor wheel and check if it is in a 100% vertical position to the floor.



It shows immediately whether the castor is in 90° to the floor or not. If there is a gap (C) between the ruler and the castor on the upper or lower rim of the wheel, it clearly indicates that the castor angle is not 90° (see image to the right).

4. If the castor wheel is not vertical, loosen nuts (B).
5. Adjust the trial angle by turning the clevis pin (D) until the castor wheel is 100% parallel to the vertical side of the ruler.
6. Retighten nuts (B).
7. Check the steering error angle and adjust if necessary, see chapter 4.7.3 *Adjusting the front wheel angle*, page 38.
8. Perform the same adjustment on both sides.

(B) = 13 Nm



4.8 Rear wheels



WARNING!

Risk of injury

- Check and adjust the anti-tip device and parking brake settings after each change on the rear wheel position.

4.8.1 Adjusting the rear seat-to-floor height



Allen key (5 mm) / Socket spanner (10 mm)



1. Loosen bolt (A).
2. Remove bolts (B), washer and nut (D) and move the adaptor plate (C) to the required position.
3. Insert bolts (B), washer and nut (D) at the required height.
4. Tighten bolts (A) and (B) respectively nut (D).
5. Perform the same setting on both sides.

(A) = 13 Nm

(B) = 13 Nm

(D) = 13 Nm

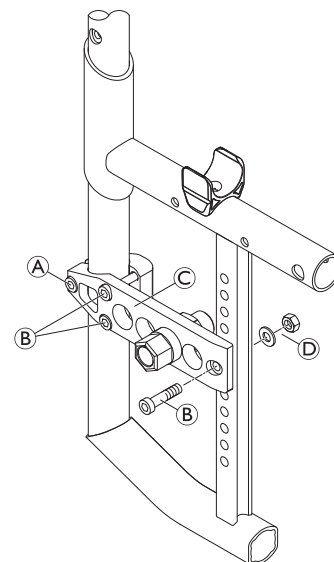


After the rear seat-to-floor height (RSTF) is changed, the front wheel angles must be checked. See 4.7.4 *Adjusting the trail angle*, page 38 and 4.7.3 *Adjusting the front wheel angle*, page 38.

With a wheel camber of 3° the angle of the rear wheels must also be checked. See 4.8.6 *Ensuring the rear wheels are parallel*, page 41.



After the RSTF is changed, distance sleeves may also have to be fitted in order to increase the distance to the rear wheels.



4.8.2 Tipping stability

The tipping stability is influenced by the rear wheel being installed further forward or further backward on the adaptor plate. The further back the adaptor sleeve is installed, the greater the tipping stability of the wheelchair.

If the rear wheel is to be installed even further back, a rear wheel extension can be installed to increase the tipping stability even more.



WARNING!

Risk of overturning

The longitudinal position of the rear wheels axis of the wheelchair compared to the backrest position can affect its stability.

- A forwards position makes the wheelchair less stable and increase the risk of tipping backwards, but improves its maneuverability by a better grip position of the handrim and a short turning radius.
- Conversely, by moving the rear wheels axis backwards, the wheelchair is more stable and tilts less easily, but its maneuverability is reduced.
- Depending on the user's abilities and its particular safety limits, the decrease in stability can be compensated for by installing an anti-tip device.

4.8.3 Adjusting the rear wheel position on the adaptor plate



Socket spanner (19, 22 mm)

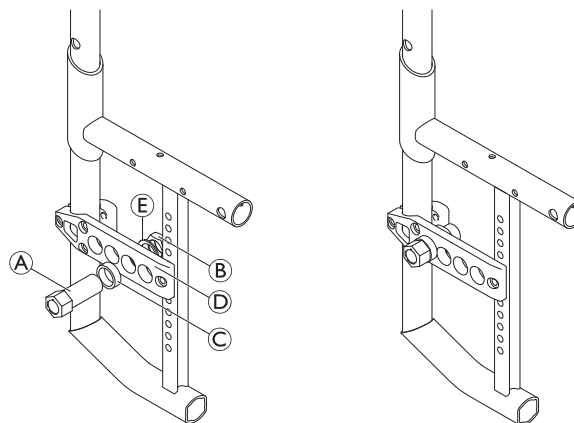


1. Remove the adaptor sleeve **A** with distance sleeve **C** by removing nut **B** and washer **E** from the adaptor plate **D**.
2. Install the adaptor sleeve with the distance sleeve at the required position in the adaptor plate using washer and nut.
3. Perform the same setting on both sides.

A = 33 Nm



Parking brakes and mudguard must be repositioned if the position of the rear wheel is changed.



4.8.4 Installing the rear wheel extension



Allen key (5 mm) / Socket spanner (10, 19, 22 mm)



1. Remove the standard adaptor plate **A** and counterpiece **B** by removing bolt **C**, bolts **D**, washer and nut **E** from the rear frame.
2. Position the adaptor plate for the rear wheel extension **F** at the required height and tighten securely on the counterpiece **G** using bolts **H** and bolt, washer and nut **I**.
3. Install the adaptor sleeve **J** (with distance sleeve **K** if necessary) at the required position in the adaptor plate and tighten the nut **L**.

C = 13 Nm

D = 13 Nm

E = 13 Nm

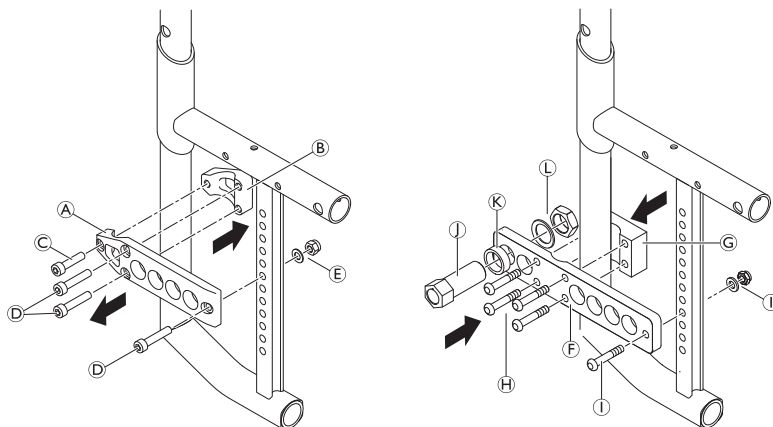
H = 13 Nm

I = 13 Nm

L = 33 Nm



Parking brakes and mudguard must be repositioned if the position of the rear wheel is changed.



4.8.5 Changing the wheel camber

A wheel camber of either 0° or 3° is possible.



Open-end spanner (18 mm) / Socket spanner (19, 22 mm)

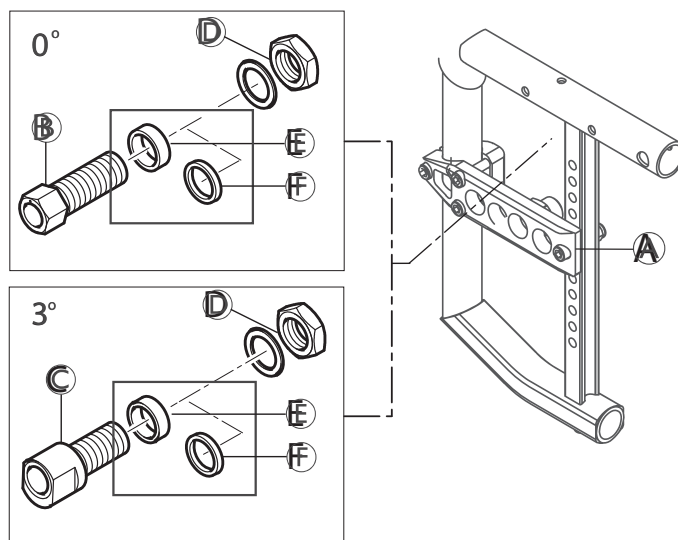


The wheel camber is changed by replacing the adaptor sleeve:

1. Remove adaptor sleeves **B** or **C** on both sides.
2. Insert new adaptor sleeves **C** and **B** on both sides at the required, identical position in the adaptor plate **A** and fasten securely with nut **D**.

The 3 mm distance sleeve **F** and 7 mm distance sleeve **E** may be needed to avoid interference with other parts such as armrest.

You can use zero, one or two distance sleeves together according to your needs.



4.8.6 Ensuring the rear wheels are parallel

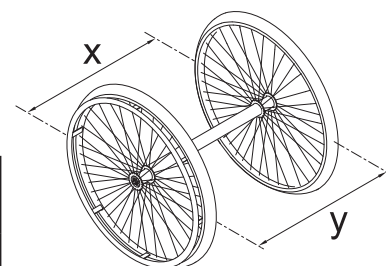


Open-end spanner (18 mm) / Socket spanner (19, 22 mm)



1. Loosen the nut of the adaptor sleeves on both sides. See 4.8.5 *Changing the wheel camber*, page 41.
2. At the height of the center of the axle, measure the distance between the rear wheels at the front and back (x, y).

Distance, back > distance, front	Turn adaptor sleeve towards rear (viewed from above)
Distance, front > distance, back	Turn adaptor sleeve towards front (viewed from above)



3. In accordance with the table, turn the adaptor sleeves so that the distance between the rear wheels is the same at the front and the back ($x = y$) – measured at the height of the center of the axle.



At the same time, the distance between the individual wheels and the relevant side frame can be checked for conformity and adjusted if necessary.

4. Retighten nut of adaptor sleeves on both sides.

4.8.7 Adjusting the removable axle



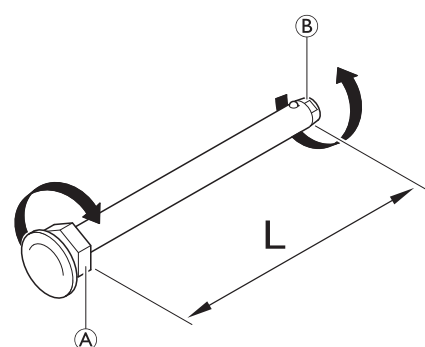
Open-end spanner (19 mm) / Straddle spanner (11 mm)



1. Remove the rear wheel.
2. Hold the end of the removable axle **B** using the straddle spanner.
3. Adjust the length **L** of the removable axle by turning the nut **A**. The length is correctly adjusted if the removable axle engages correctly when fixing the wheel and wheel has just minimal clearance.



The wheels must be exchanged (left to right side and vice versa) after adjusting both removable axles. The adjustment must now be checked or carried out again to ensure the wheels can be switched..



4.8.8 Installing the adaptor plate for the drum brake

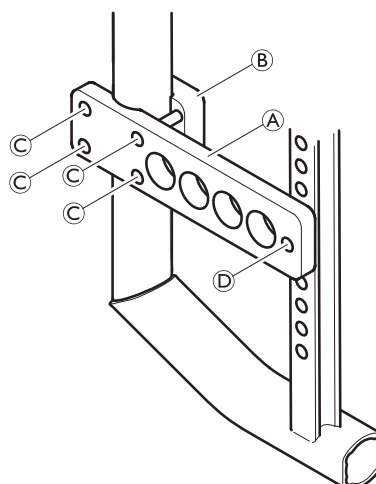


Allen key (5 mm) / Socket spanner (10 mm)



1. Remove the standard adaptor plate.
2. Position the adaptor plate **A** for the drum brake at the required height on the frame tube and install it with the counterpiece **B** using bolts **C** and **D**
3. Install the drum brake, see 4.9.3 *Installing/adjusting the drum brake*, page 44.

© / ⓓ = 13 Nm



4.8.9 Distance Sleeves for Rear Wheels

If new side parts are fitted on a wheelchair (side rests, arm rests, clothes guard or mudguard), the gap between the rear wheels must be increased by attaching additional distance sleeves. Likewise, distance sleeves may also have to be fitted if other rear wheels are fitted or if the seat height rear is altered.

4.8.10 Repairing or changing an inner tube



Tyre lever



1. Remove the rear wheel and release any air from the inner tube.
2. Lift one tyre wall away from the rim using a bicycle tyre lever. Do not use sharp objects such as a screwdriver which could damage the inner tube.
3. Pull the inner tube out of the tyre.
4. Repair the inner tube using a bicycle repair kit or, if necessary, replace the tube.
5. Inflate the tube slightly until it becomes round.
6. Insert the valve into the valve hole on the rim and place the tube inside the tyre (the tube must lie right round the tyre with no creases).
7. Starting close to the valve, push the tyre wall over the edge of the rim using both hands. When doing this, check all the way round to ensure that the inner tube is not trapped between the tyre and the rim.
8. Inflate the tube to its maximum operating pressure (see tyre side wall for details). Check that no air is escaping from the tyre.

4.8.11 Repairing or changing a solid tyre

Removing a solid tyre



Lever bar



1. Push on the side wall of the tyre while inserting a lever bar.



Some solid tyres are quite a bit smaller than the rim so this can be difficult.

2. Once one lever is in, insert a second lever and push the tyre over the rim until it comes off.



If you are unable to push off the tyre, it needs to be cut off. Make sure not to damage the rim.

Installing a solid tyre

Installing solid tyres on a rim can only be accomplished with the right tools. Most of these tyres are smaller than the rim they fit and need to be stretched to be installed. Follow the instructions that come with the tools for the process.

4.8.12 Replacing rear wheel spokes

We recommend having the spokes replaced by a technician qualified to change and adjust new spokes.

4.9 Brakes

4.9.1 Mounting the parking brake

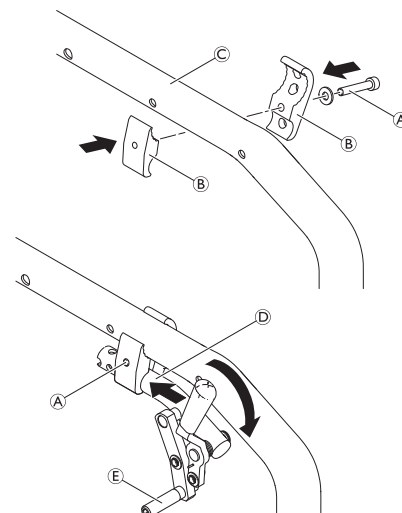


Allen key (5 mm)



1. Position the brake holder ⑥ around the front frame tube ③.
2. Place the brake ④ in the brake holder.
3. Screw the bolt ① with washer into the brake assembly but do not tighten.
4. Rotate the brake holder assembly around the frame tube to adjust the lateral distance of the brake.
5. Rotate the brake in the brake holder to achieve a horizontal position of the brake rod ⑤ to the tyre.
6. Fully apply the brake and slide it towards the tyre until the brake rod bears flush against the tyre.
7. Release the brake and slide it 3 mm backwards and tighten the bolt.

① = 13 Nm



4.9.2 Adjusting the parking brake



Allen key (5 mm)



WARNING! Risk of injury

The parking brakes must be readjusted whenever the rear wheels are replaced or the wheel camber is changed.
The parking brake function is only guaranteed if the tyre has the corresponding air pressure.

1. Check the tyre pressure in the rear wheels and correct if necessary.
2. Slightly loosen bolt ① of the brake holder.
3. Change the position of the brake assembly as described above in 4.9.1 *Mounting the parking brake*, page 43.
4. Tighten the bolt ①.



NOTICE!

The force to apply the brake must be 60 Nm (maximum).



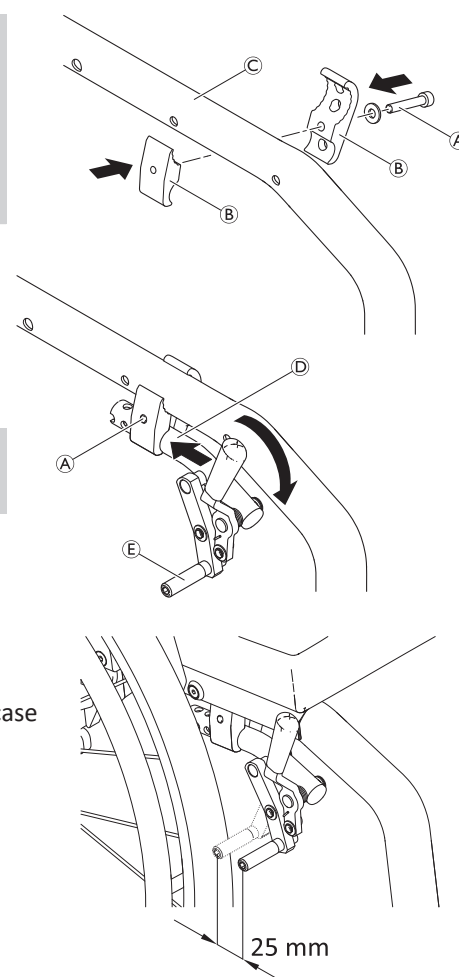
Very little force is required for activating and deactivating the brake. If necessary, a brake lever extension can be mounted.

Visual check:

Check that the parking brakes are positioned correctly. The brake is set correctly if the brake rod depresses the tyre by no more than 4 mm when the brake is applied. (In the case of push/pull and standard brakes this will be the case when the brake shoe is approx. 2 - 4 mm away from the tyre when released.)

Function check:

Place a weighted wheelchair with parking brake engaged facing uphill and then facing downhill on a ramp with an incline of 7°. The wheelchair must not move.



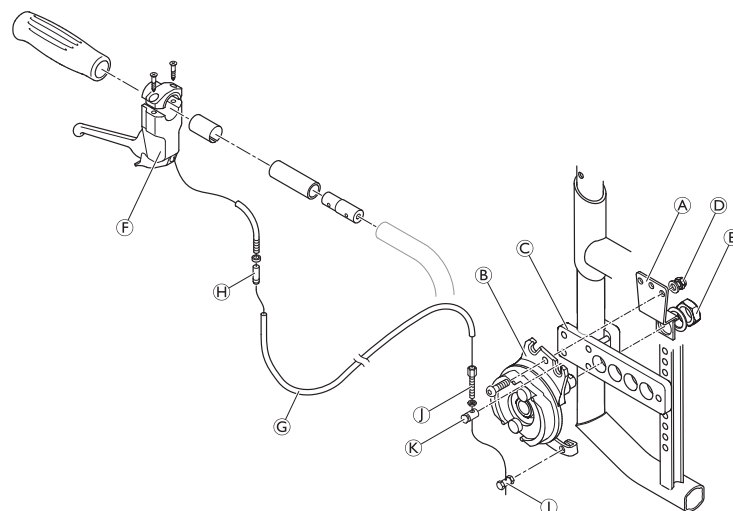
4.9.3 Installing/adjusting the drum brake



Allen key (4 mm) / Phillips screwdriver / Open-end spanner (9 mm) /
Socket spanner (10, 22 mm) / Wrench (4 mm)



1. Remove standard adaptor plate and replace with adaptor plate for drum brake, see 4.8.8 *Installing the adaptor plate for the drum brake*, page 42.
2. Install the drum brake plate **A** and rotary fixing **B** to the adaptor plate **C** using bolt, washers and nut **D** as well as adaptor sleeve nut **E** with washer.
3. Install the brake lever **F** on the push handle and secure the Bowden cable **G** with the installation set.
4. Adjust the tension of the Bowden cable by turning the setting sleeve **H**.
5. If the setting sleeve cannot be turned any further, unhinge the brake cable **I** from the rotary fixing and slightly unscrew the clamp bolt **J** from part **K** and refasten the little nut.
6. Hook the cable **I** back in the rotary fixing.
7. Repeat steps 4 to 6 until the brake setting is correct.



D = 7 Nm

E = 33 Nm

4.10 Options

4.10.1 Installing an anti-tip device

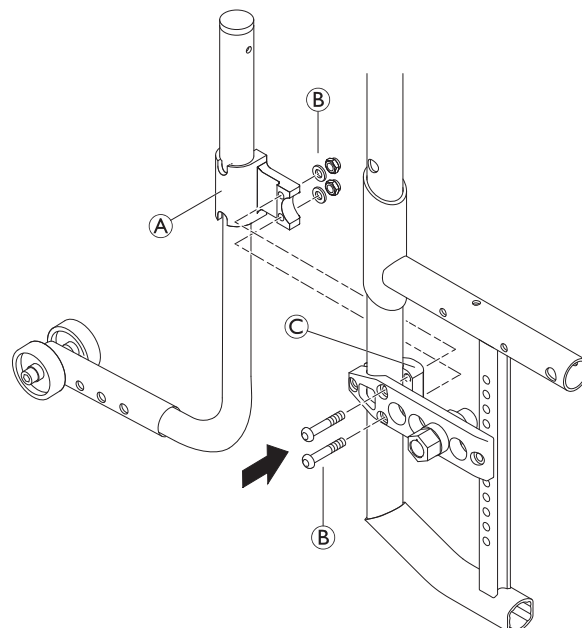


Allen key (5 mm) / Socket spanner (10 mm)



1. Install the adaptation support **A** with bolts, washers and nuts **B** to the adaptor plate **C**.

B = 13 Nm



4.10.2 Adjusting the height of the anti-tip device

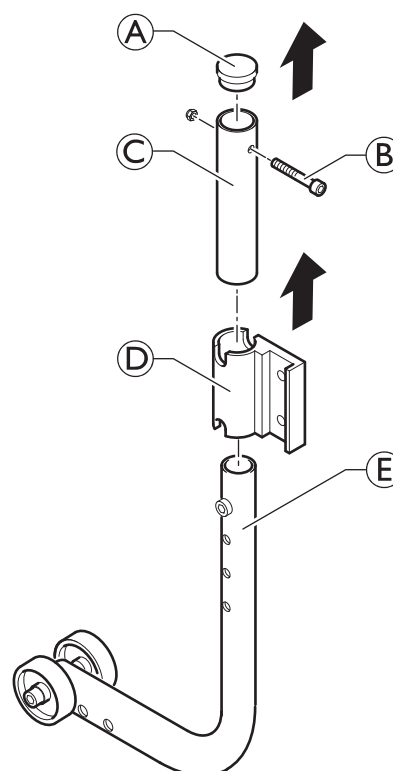
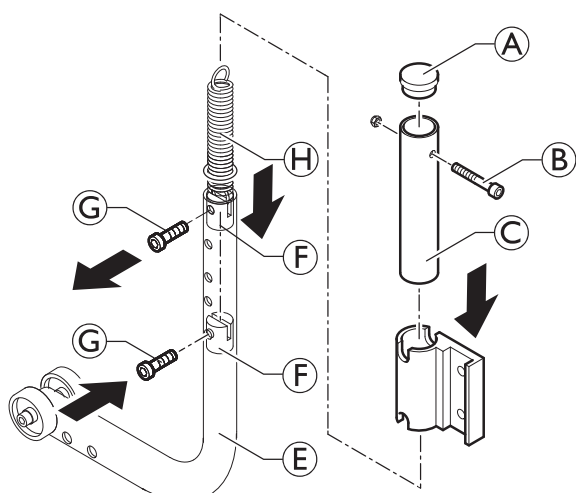
The height can be adjusted by loosening bolts **B** like described above. If this is not sufficient proceed as follows:



Allen key (4 mm) / Socket spanner (8 mm)



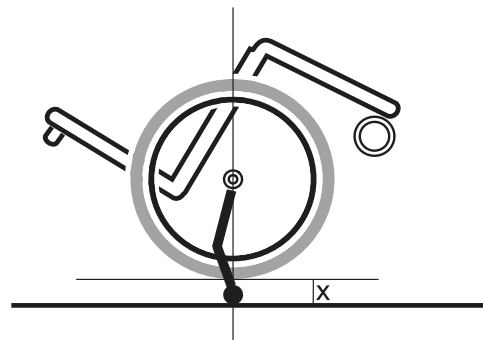
1. Loosen bolt **B** and remove the upper end **C** of the anti-tip device and the holder. Remove the sealing cap **A** (e.g. push it out through the tube using the screwdriver).
2. Loosen bolt **G** of the anti-tip device tube and push sleeve **F** into the correct position.
3. Screw bolt **G** in half way, position spring **H** in sleeve **F** and screw bolt **G** completely into the tube.
4. Put all the parts of the anti-tip device back together; in doing so pull spring **H** apart, e.g. using a wire hook, and secure it with the top bolt **B**.
5. Set the anti-tip device parallel to the wheel chair and tighten the bolts.



Function check:

The distance between the anti-tip device and the ground must be 50 - 70 mm. It must be easy to fold up the anti-tip device.

Tip the wheelchair backwards using the anti-tip device until the axle is perpendicular to the anti-tip device's point of contact with the ground. In this position, the distance between the rear wheel and the ground must be at least 50 mm.

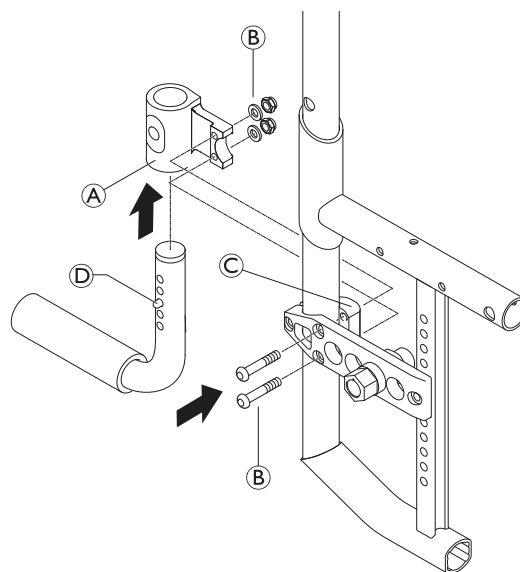
**4.10.3 Installing the tipper aid**

Allen key (5 mm) / Socket spanner (10 mm)



1. Install the adaptation support ① with bolt ② to the adaptor plate ③.
2. Push in spring clip ④ and push the tipper aid into the adaptation support.
3. Make sure that the spring clip is correctly engaged in the adaptation support.

② = 13 Nm

**4.10.4 Adjusting the height of the tipper aid**

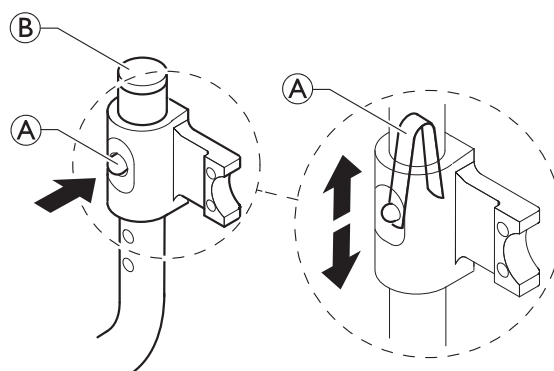
Flat-head screwdriver



1. To adjust the height, remove cap ① and, e.g. using a screwdriver, compress the spring ② inside the tube and push into the required position.

**NOTICE!**

The height of the tipper aid, measured from the upper part of the device to the ground, should be less than 175 mm. The distance between the center of the tipper aid device and the inner side of the nearest rear wheel should be larger than 50 mm.



4.10.5 Installing the cane holder

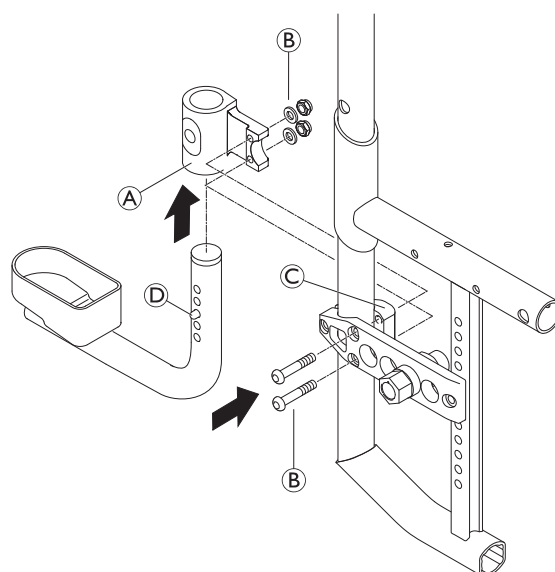


Allen key (5 mm) / Socket spanner (10 mm)



1. Mount the adaptation support (A) with bolt (B) onto the adaptor plate (C).
2. Push in spring clip (D) and push the cane holder into the adaptation support.
3. Make sure that the spring clip is correctly engaged in the adaptation support.

(B) = 13 Nm



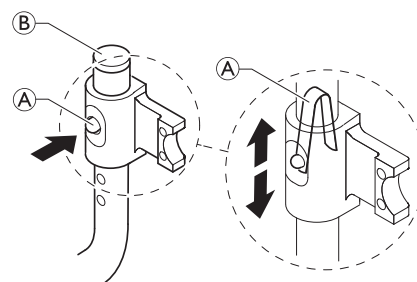
4.10.6 Adjusting the height of the cane holder



Flat-head screwdriver



1. To adjust the height, remove cap (B) and, e.g. using a screwdriver, compress the spring (A) inside the tube and push into the required position.



4.10.7 Installing the transit wheels

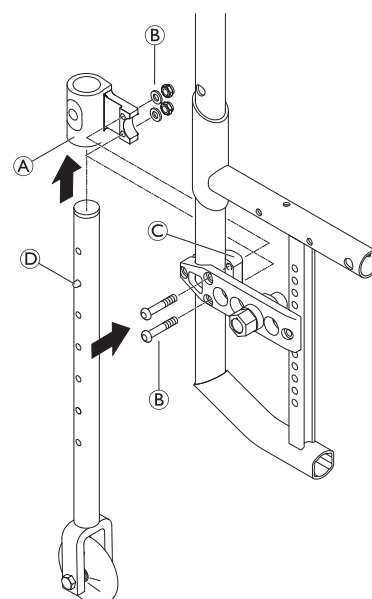


Allen key (5 mm) / Socket spanner (10 mm)



1. Mount the adaptation support (A) with bolt (B) onto the adaptor plate (C).
2. Push in spring clip (D) and push the transit wheel into the adaptation support.
3. Install the second transit wheel on the other side.
4. Make sure that the spring clips are correctly engaged in the adaptation supports.

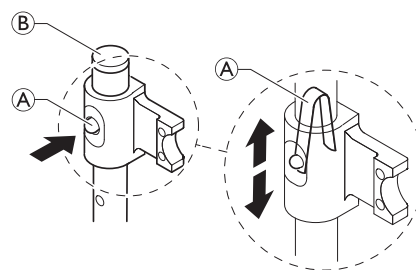
(B) = 13 Nm



4.10.8 Adjusting the height of the transit wheels

1. To adjust the height, remove cap ② and, e.g. using a screwdriver, compress the spring ① inside the tube and push into the required position.
2. Adjust the height of the second transit wheel accordingly.

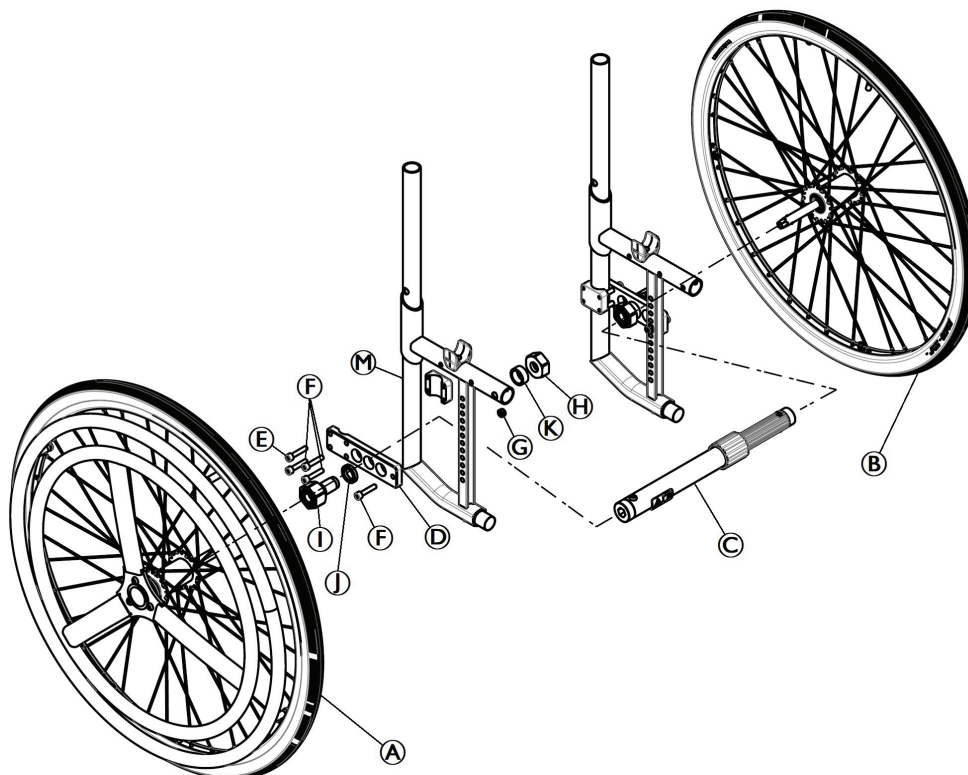
To bring the transit wheels into the upper or lower position, the spring clip must be pressed in.



4.10.9 Installing the one-arm drive



Allen key (5 mm) / Socket spanner (32 mm) / Wrench (10, 32 mm)



1. Install the adaptor plate ④ to the frame ⑤ using bolt ⑥ and bolts ⑦ with washer and nut ⑧.
2. Install the quick-release adaptor ① with washer ②, sleeve ③ and nut ④ to the adaptor plate on both sides.
(For SW 36 mm, place the quick-release adaptor ① inside the chassis)
3. Install the telescopic shaft ⑥ between the adaptor sleeves.
4. Install the active one hand drive wheel ① to the quick-release adaptor.
5. Install the passive one hand drive wheel ② to the quick-release adaptor on the other side.

⑥ = 13 Nm / ⑦ = 13 Nm / ⑧ = 13 Nm / ① = 45 Nm

4.10.10 Installing the posture belt



Allen key (5 mm) / Socket spanner (10 mm)

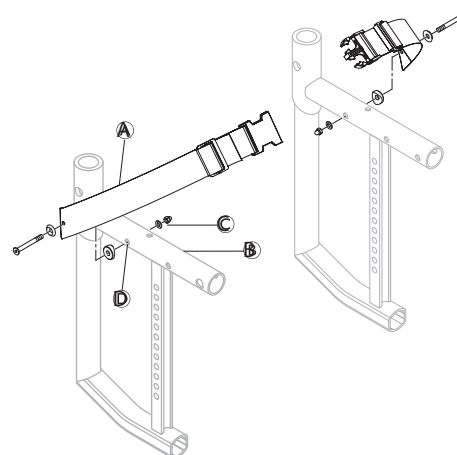


1. Mount the strap **A** using bolts, washers and nuts **C** through the holes **D** on both sides of the frame **B**.



WARNING!
Risk of injury

- Ensure that the webbing of the posture belt is not twisted during assembly and the locking mechanism shows towards the front.



4.10.11 Installing the positioning belt



Allen key (4 mm) / Open-spanner (13 mm)



1. Position the belt clamps **A** along the upper frame tube to the user's needs (backwards or frontwards the brake clamps). Follow the mounting instruction of the belt clamps.



If necessary, reposition the clamping part of the parking brake.



WARNING!
Risk of injury

Make sure that the parking brakes are positioned correctly to ensure the function.

2. Mount the belt **D** to the adaptor bracket **B** in the required hole using bolt **E** and nut **G**.

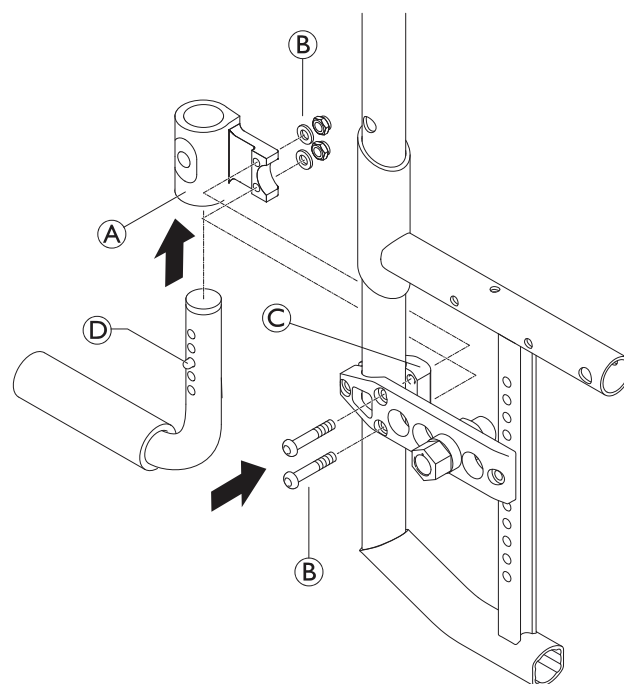


The washer **F** can be placed between the belt and the nut to avoid the rotation of the belt.



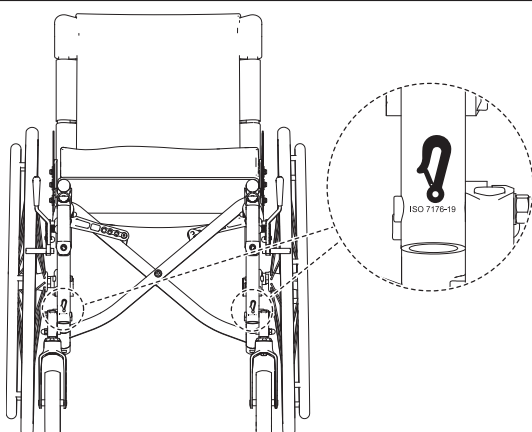
If necessary, reduce the length of the belt by cutting it in a curved shape (for a proper appearance) across the belt to the desired position.

3. When the belt **D** is mounted to the adaptor bracket **B**, fit belt assembly on the belt clamp **A** by using screw and nut **C** and washer **F**.

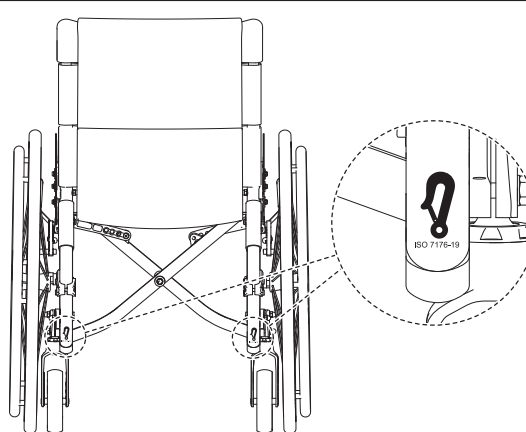


4.10.12 Attaching the snap hook symbol labels

Front side



Back side



5 Maintenance

5.1 Maintenance checks and schedules



Always clean the wheelchair before any inspection/adjustment. Regular cleaning will reveal loose or worn parts and enhance the smooth operation of the wheelchair.

5.1.1 Weekly and monthly user checks

This following table lists the regular weekly and monthly checks the wheelchair user is recommended to perform:

	Weekly	Monthly
Check the tyre pressure	x	
Check that rear wheels are seated correctly	x	
Check posture belt	x	
Visual wheelchair checks		x
Check the castors and its fixation		x
Check bolts		x
Check spokes		x
Check parking brakes (mechanism and cable)		x

5.1.2 Global inspection checklist

This table lists the global checks and actions to validate a wheelchair service. You can print it out and use it to validate a global inspection.

Wheelchair Serial Number:			NOTES
General inspection	☺	☹	
Is the product in good condition and is it complete?	☐	☐	
Is the product free from damage or weaknesses of any kind?	☐	☐	
Does the product operate correctly under nominal load?	☐	☐	
Is the product fully functional in accordance with the user manual?	☐	☐	
Eradication of faults	☺	☹	
Have all the faults found been eliminated and have faulty components been replaced?	☐	☐	
Are all screws/bolts firmly fitted and is the product securely assembled?	☐	☐	
Completion of checks	☺	☹	
Is the product technically and functionally safe?	☐	☐	
Has the product been cleaned and disinfected?	☐	☐	
Is the identification label easily readable and is it securely mounted on the product?	☐	☐	
Is the product accompanied by the latest revision of the user manual?	☐	☐	

5.1.3 Annual service checks

This following table lists the checks and actions to perform at the yearly wheelchair service. You can print out this form and use it to monitor the checks

Annual service checks			
Wheelchair Serial Number:	☺	☹	Notes
Wheelchair rolls straight (no excessive drag or pull to one side).	☐	☐	
Arms are secure but easy to release and locking systems engage properly.	☐	☐	
Adjustable height armrests operate and lock securely.	☐	☐	
All fasteners on clothing guards are secure.	☐	☐	
Seat and/or back upholstery have no rips.	☐	☐	
Inspect the backrest attaching hardware and mechanisms are securely tightened.	☐	☐	
No excessive side movement or binding when rear wheels are lifted and spun.	☐	☐	
Inspect handrims for signs of rough edges or peeling finish.	☐	☐	
Inspect seat module for signs of cracks, flaked paint or deformed metal work.	☐	☐	
Inspect tyres/castors for flat spots and wear.	☐	☐	
Check pneumatic tyres for proper inflation (recommended tyre pressure is listed on the side wall of the tyre).	☐	☐	
Wheel brake pivot point are free of wear and looseness.	☐	☐	
Clean upholstery and armrests.	☐	☐	
Sealed bearings and axle nut tension are correct.	☐	☐	
Wheel/fork assembly has proper tension when castor is spun. Castor should come to a gradual stop.	☐	☐	
Loosen / tighten locknut if wheel wobbles noticeably or binds to a stop.	☐	☐	
Wheel bearings are clean and free of moisture.	☐	☐	
Wheel brakes are easy to engage.	☐	☐	
Change brake cable and readjust the brake tension cable.	☐	☐	
Clean Quick-Release axles with a Teflon lubricant.	☐	☐	
Ensure axles are free from dirt, lint, etc.	☐	☐	
Ensure roller bearings are free from dirt, lint, etc.	☐	☐	
Adjust wheel brakes as tyres wear.	☐	☐	
Clean and wax all parts.	☐	☐	
Ensure castors are free of debris.	☐	☐	



CAUTION!

Risk of injury

— Do not use a defective wheelchair.



CAUTION!

Loose screws can cause injury and wheelchair damage

If screws with thread locker are loosened, these must be replaced with new screws with thread locker. Alternatively, new thread locker must be applied. Please also follow the torque recommendations in the service manual.



If you discover damage, contact your Technical Service Centre or Invacare Service Department immediately for technical service. Technical service, is to be carried out by a qualified technician or by an Invacare service department.

5.2 Cleaning

Your wheelchair will serve you well for many years if you clean it regularly.

- ! NOTICE!**
- Dirt, sand and seawater can damage the bearings and steel parts can rust if the surface is damaged.
- Only expose the wheelchair to sand and seawater for short periods and clean it after every trip to the beach.
 - If the wheelchair is dirty, wipe off the dirt as soon as possible with a damp cloth and dry it carefully.

- ! NOTICE!**
- Do not use coarse abrasives, aggressive cleaning products or high-pressure cleaners. Never use acids, alkalines or solvents such as acetone or cellulose thinner.
 - Always use ordinary household cleaning agents.

1. Clean the cushions and metal parts with a soft, damp cloth.
2. Dry the wheelchair carefully with a cloth after using it in the rain.
3. If the wheelchair is dirty, wipe off the dirt as soon as possible with a damp cloth and dry it carefully.

 Regular cleaning will reveal loose or worn parts and enhance the smooth operation of your wheelchair. To operate properly and safely, your wheelchair must be cared for just like any other vehicle. For upholstery that is severely stained or surface finish that is badly damaged, contact Invacare for further information.

• Cleaning upholstery

For cleaning upholstery refer to the instructions on the label on the seat, cushion and backrest cover.

 If possible, always overlap hook and loop strips (the self-gripping parts) when washing, to minimize lint and thread build-up on hook strips and prevent damage to upholstery fabric by these elements.

• Cleaning metal surfaces

Hot water and mild detergent on soft cloth should be used to clean metal surfaces.

1. Wipe down with damp cloth.
2. Dry surface by wiping down with dry cloth. Car polish and soft wax can be used to remove abrasions and restore gloss.

• Cleaning plastic surfaces

Plastic surfaces must be cleaned with soft cloth, mild detergent and hot water.

- ! NOTICE!**
- Do not use solvents or kitchen cleaners to clean plastic surfaces.

1. Rinse surface with clean water.
2. Dry surface by wiping down with dry cloth.

5.3 Disinfection

The wheelchair may be disinfected by spraying or wiping with tested, approved disinfectants.

- **Method:** Follow the application notes for the used disinfectant and wipe-disinfect all accessible surfaces.
- **Disinfectant:** Ordinary household disinfectant.
- **Drying:** Allow the product to air-dry.

5.4 Materials

The components used to manufacture Küschall wheelchairs consist of following materials:

Component	Material
Frame tubes	Aluminum
Backrest tubes	Aluminum
Axle tube	Aluminum
Seat cover / Backrest cover	PA / PE / PVC
Push handles	Aluminum / TPE
Clothes guard / Mudguard	Carbon Fibre or Plastic
Castor forks	Aluminum
Footrest tube	Carbon Fibre or Aluminum
Footplate	Carbon Fibre or Plastic
Supporting parts / Attachments	Steel / Aluminum
Screws, washers and nuts	Steel

 All materials used are protected against corrosion. We use only REACH compliant materials and components.

 Theft and metal detection systems: in seldom cases the materials used in the wheelchair may activate theft and metal detection systems.

5.5 Flat tyre

 In case of a tyre puncture consult a suitable workshop (e.g. bike repair shop, bicycle dealer, or other) to have the tube and/or tyre replaced by a skilled person.

5.6 Reconditioning

Main parts of the wheelchair	
 Lubricate all removable parts with a dry Teflon® based spray, e.g. “Viso 900–B5”.	
Chassis	All parts must be checked for cracks or other damage. Pay special attention to areas close to welds. If damage is discovered, the chassis must be discarded.
Backrest angle	Check that the angle is easy to adjust, it should be easy to fold and the locking mechanism must function properly.
Push handles / Push bar	Check that the push handles / push bar works properly. They should be firm and the screws must be tightened properly.
Back- and seat covers	• Check that the self-gripping strips are intact and can be fixed properly. • Check that the covers are intact and clean, if not see section: <i>5.2 Cleaning, page 52</i> and <i>5.3 Disinfection, page 52</i> • If the fabric is torn, replace the cover.
Armrests / side rests	Check that the armrests / side rests are intact, they should be easy to detach / attach.
Anti-tip device	• Check that the anti-tip device is easy to adjust and fold. • Check that the screws are tight, if not, re-tighten.
Rear wheels	• Change the tyres if the pattern is worn. • Replace missing spokes and tighten loose spokes. • Fasten the hand rim if it is loose. • Check that the hand rim is smooth and that there are no cracks or sharp edges. If so, replace the hand rim. • Check the rear wheel axle, it should be completely inserted into the axle housing. Check that the rear wheel axle locks properly. Pull on the rear wheel to check that the removable axle does not come off. • Check the air pressure — recommended max air pressure is written on the tyres.
Rear wheel attachment	Check: That the screws on the rear wheel attachment are tight. That the axle housing is correctly placed. The standard axle housing should be tightened with a manual and dynamometer wrench calibrated to 40 +/- 5 Nm, the One Arm Drive axle housing to 45 0/+5 Nm.

Main parts of the wheelchair	
Brakes	• Check the positioning of the user brakes. • Check that the brake pin is not worn down. If so, replace it. • Check that the screws are tightened. • Test the brake function. When braking, the brake pin should press the tyre down 5 mm.  Ensure you have the correct air pressure in the tyres to attain the optimal brake effect.
Castors	• Detach the castors and clean the castor forks. • Remove any dirt or hair from the castors. • Attach the castors again and check that the castors turn freely. • If the castors are air filled, check the recommended max air pressure written on the tyre. • If the castors are solid, check the tyres for cracks. If the tyres are dry and filled with cracks, they need to be replaced.
All fasteners for wear and tightness	Bolts and other fasteners can come loose due to constant use: 1. Check that the fasteners are tight on the castor forks, footrest, seat, side rests, backrest, handles etc. 2. Tighten any loose bolts or screws.

5.6.1 Checklist for reconditioning

You can print this page as a checklist for reconditioned wheelchairs.

	OK	NOTES	SIGN
Serial Number of the reconditioned wheelchair:			
WASHING			
RECONDITIONING:			
Chassis			
Backrest angle			
Push handles / Push bar			
Backrest cover			
Seat cover			
Seat angle			
Armrests / Side rests			
Footrests			
Anti-tip device			
Rear wheels			
Rear wheel attachment			
Brakes			
Castors			
Fasteners for wear and tightness			
Abduction cushion			
TEST:			
Chair rolls in straight line			
Easy to propel			
DELIVERY CHECK:			
Includes a user manual			

5.7 Waste disposal

Please be environmentally responsible and recycle this product through your recycling facility at its end of life. Waste disposal must comply with the laws and regulations pertaining to waste handling in each country.

The manufacturer works continuously towards ensuring that the company's impact on environment, locally and globally, is reduced to a minimum. We comply with the current environment legislation (e.g. WEEE and RoHS directive).

We only use REACH compliant materials and components.

Packing

- All packing material is developed to fit the products in an optimal way to reduce unnecessary material waste.
- All boxes are recyclable.

End of life

At the end of this products life, it should be recycled according to laws and regulations for waste handling in each country.



Contact your local recycling agent to obtain the correct information on how to handle the above mentioned materials.

6 Troubleshooting

6.1 Troubleshooting

6.1.1 Safety information

Faults may arise as a result of daily use, adjustments or changing demands on the wheelchair. The table below shows how to identify and repair faults.

6.2 Identifying and repairing faults

Fault	Possible cause	Action
The wheelchair does not travel in a straight line	Incorrect tyre pressure on one rear wheel	Correct tyre pressure
	One or more spokes broken	Replace faulty spoke(s)
	Spokes tightened unevenly	Tighten loose spokes
	Front wheel bearings are dirty or damaged	Clean or replace the bearings
The wheelchair tips backwards too easily	Back angle too large	Reduce the backrest angle (see 4.3.4 <i>Angle-adjustable backrest</i> , page 16).
	Seat angle too large	Mount the front wheel higher on the front fork (see 4.7.3 <i>Adjusting the front wheel angle</i> , page 38).
	Rear wheels are mounted too far forwards	Mount the rear wheels further back. See 4.8.3 <i>Adjusting the rear wheel position on the adaptor plate</i> , page 40.
Rolling resistance is very high	Tyre pressure in rear tyres is too low	Correct tyre pressure
	Rear wheels not parallel	Ensure the rear wheels are parallel
The front wheels wobble when moving fast	Too little tension in front wheel bearing block	Tighten the nut on the bearing block axle slightly
	Front wheel has worn smooth	Change front wheel
The front wheel is stiff or stuck	Bearings are dirty or faulty	Clean or replace the bearings
The wheelchair is very difficult to unfold	Backrest cover is too tight	Loosen the Velcro bands of the backrest cover a little



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