

Invacare® Action3 NG

en **Manual Wheelchair
Service Manual**



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



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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.

In case of a serious incident with the product, you should inform the manufacturer and the competent authority in your country.

1.2 Delivery check

Any transport damage must be reported immediately to the transport company. Remember to 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.

This document is printed in greyscale. For your information, the safety messages have the following colour coding according to ANSI Z535.6: Danger (Red), Warning (Orange), Caution (Yellow) and Notice (Blue).

See the information below for definitions of the signal words.



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

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

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.

1.5 Limitation of Liability

Invacare accepts no liability for damage arising from:

- Non-compliance with the user manual.
- Incorrect use.
- Natural wear and tear.
- Incorrect assembly or set-up by the purchaser or a third party.
- Unauthorised modifications, combinations and/or use of unsuitable spare parts.

1.6 Compliance

Quality is fundamental to the company's operation, working within the disciplines of ISO 13485.

This product features the CE mark, in compliance with the Medical Device Regulation 2017/745 Class I.

This product features the UKCA mark, in compliance with Part II UK MDR 2002 (as amended) Class I.

We are continuously working towards ensuring that the company's impact on the environment, locally and globally, is reduced to a minimum.

We only use REACH compliant materials and components.

We comply with the current environmental legislations WEEE and RoHS.

1.6.1 Product-specific standards

The wheelchair has been tested in accordance with EN 12183. It includes testing for flammability.

For further information about local standards and regulations, contact your local Invacare representative. See addresses at the end of this document.



WARNING!

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

1.7 Service Life

The expected service life of this product is five years when used daily and in accordance with the safety instructions, maintenance intervals and correct use, stated in this manual. The effective service life can vary according to frequency and intensity of use.

2 Safety

2.1 General Safety Information



WARNING!

Risk of injury or property damage

- The information contained 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!

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.



WARNING!

Risk of contamination

- Clean and disinfect the product before servicing.



NOTICE!

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

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



NOTICE!

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

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

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 repairs.



Technicians should work in an environment (light, space, access to the wheelchair, ...) that allows them 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

The tightening torques in the following table are dependent on the thread diameters. All values apply to dry and grease-free threads.

Thread	M4	M5	M6	M8	M10/12
Tightening torque in Nm (min/max)	1.5/3 Nm	3/6 Nm	7/12 Nm	10/20 Nm	20/30 Nm



CAUTION!

All other nuts not noted here must be tightened fingertight!

3 Assembly

3.1 Front hangers

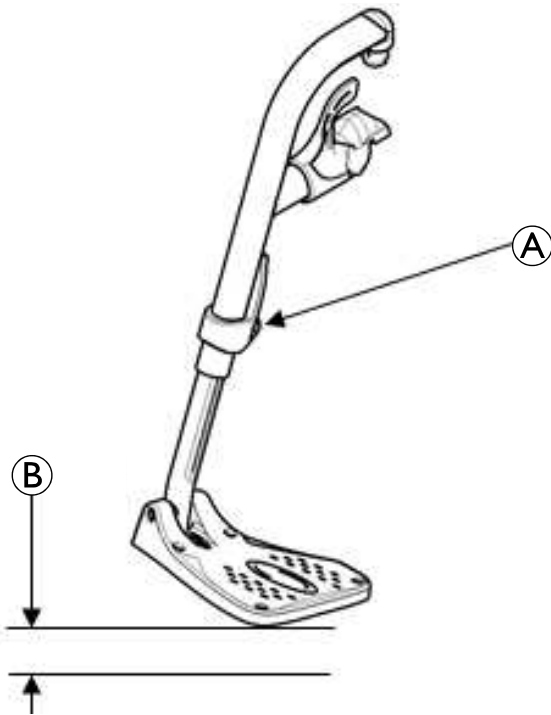


WARNING!

Risk of injury or damage

- After ANY adjustments, repair or service and before use, make sure all attaching hardware is tightened securely. To adjust the leg rest, refer to dedicated paragraphs in user manuals.
- A 50 mm clearance between the bottom of the footplate and the ground/floor MUST be maintained always.

3.1.1 Adjusting footrest height



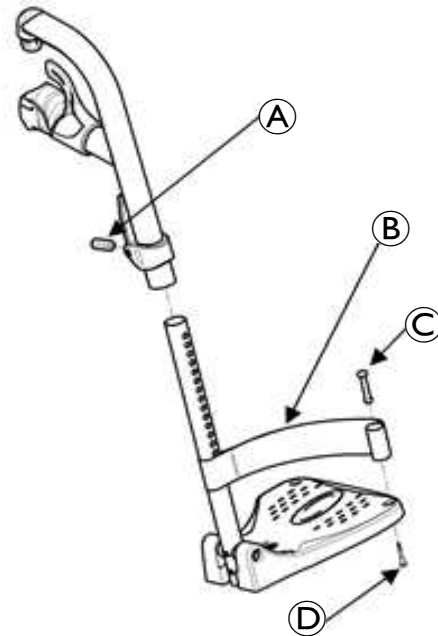
1. Remove calf strap, if so equipped.
2. Unscrew locking screw and/or locking bolt.
3. Position the footrest assembly to the desired height.

NOTICE!

- A 50 mm clearance between the bottom of the footplate and the ground/floor MUST always be maintained.

4. If the distance between the bottom of footplate and the ground/floor **B** is not 50 mm minimum, adjust footrest tube accordingly.
5. Using the locking screw (M6) **A**, secure the footrest tube to the footrest support. Securely tighten.
6. If necessary, repeat STEPS 2 to 5 to adjust remaining footrest.
7. Reinstall the calf strap, if so equipped.

3.1.2 Replacing heel strap



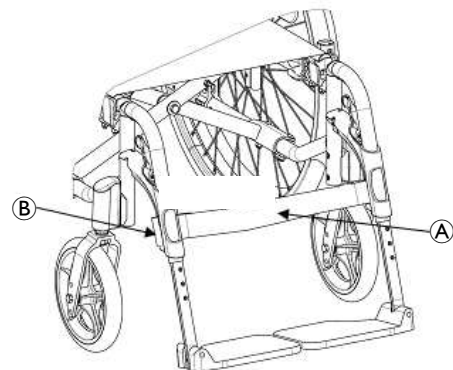
1. Remove the locking screw **A** that secures the footrest tube to the footrest support.
2. Remove the lower footrest assembly.
3. Remove the mounting screw, strap pin **C** that secure the heel strap **B** to the footplate.
4. Slide heel strap over footrest tube.

NOTICE!

- When securing the heel strap to the footrest assembly tighten the mounting screw **D** and strap pin until they are secure.

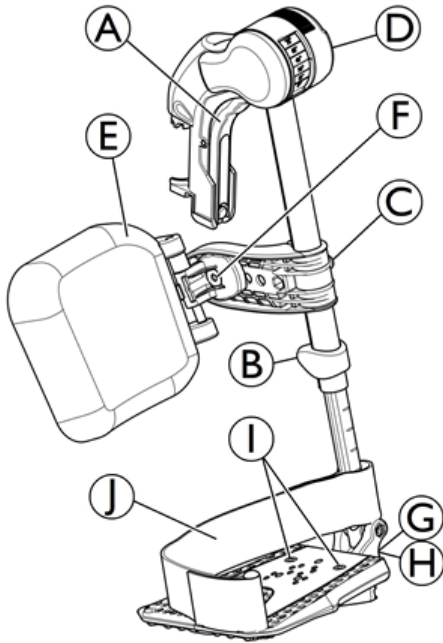
5. Using the mounting screw, strap pin, secure the heel strap to the footplate.
6. Using the locking screw (M6), secure the footrest tube to the footrest support.

3.1.3 Installing calf strap



1. Secure the optional calf strap **A** around the hanger hook **B**.

3.1.4 Adjusting calf pad height/depth



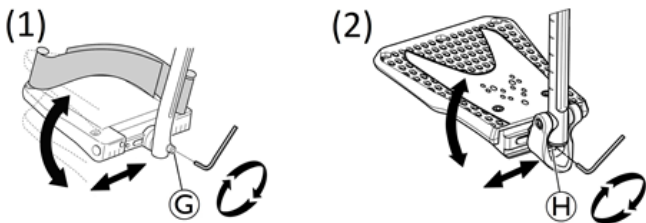
Adjusting calf pad height

1. Loosen the locking button © that secure the calf pad bracket to the elevating legrest assembly.
2. Slide the calf pad bracket up or down until the desired calf pad height is obtained.
3. Tighten the locking button © securing the calf pad bracket to the elevating legrest assembly.
4. If necessary, repeat STEPS 1-3 to adjust remaining calf pad bracket.

Adjusting calf pad depth

1. Remove the mounting screw ⑥ that secure the calf pad ⑤ to the calf pad bracket.
2. Insert mounting screw ⑥ through one of four calf pad bracket mounting holes.
3. Using the mounting screw ⑥, secure the calf pad to the calf pad bracket.
4. If necessary, repeat STEPS 1 to 3 to adjust remaining calf pad assembly.

3.1.5 Installing angle adjustable footplate



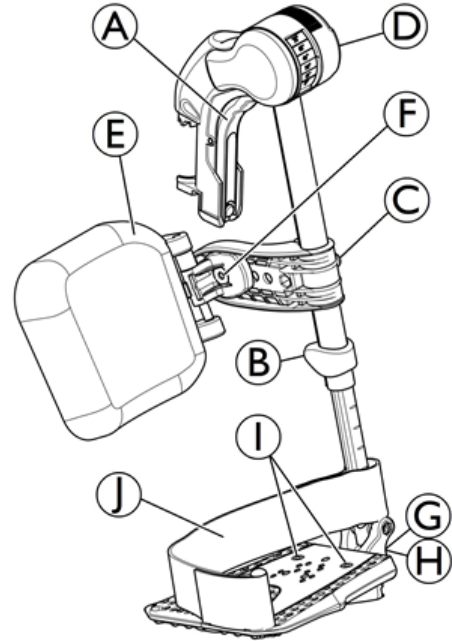
! NOTICE!
— This procedure is for angle and depth adjustable footrests standard version (1) and new version (2) only.

1. Position the angle adjustable footplate on the footrest support tube at the desired height.
2. Using the locking screw, loosely secure the adjustable footplate to the footrest support tube.

! NOTICE!
— Refer to 3.1.1 Adjusting footrest height, page 5.

3. Using the mounting screw, adjust to the desired angle by rotating the footplate into the tooth plates support.
4. Using the mounting screw ③ version (1) or ④ version (2), secure the Angle Adjustable Footplate to the footrest tube. Securely tighten.
5. If necessary, repeat STEPS 1 to 4 to adjust remaining angle adjustable footplate.

3.1.6 Adjusting elevating legrest angle, height



Adjusting the legrest angle

1. Loosen locking knob ④ securing the rotating axle of the elevating legrest.
2. Adjust to desired angle, firmly tighten locking knob ④.
3. If necessary, repeat STEPS 1 to 2 to adjust remaining elevating legrest angle.

Adjusting the footplate height

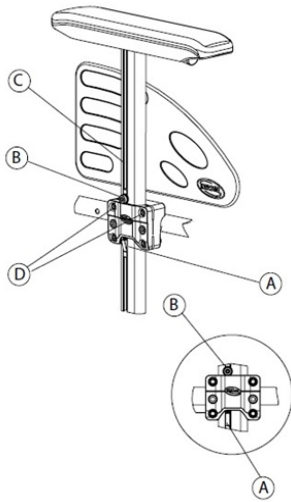
1. Loosen locking screw ② securing the slide tube to the elevating legrest.
2. Reposition footplate to desired height, securely tighten locking screw ②.
3. If necessary, repeat STEPS 1 and 2 to adjust remaining footplate height.

3.2 Armrests



WARNING!
Risk of injury or damage
— After ANY adjustments, repair, or service and BEFORE use, make sure all attaching hardware is tightened securely.


3.2.1 Removing installing and adjusting removable armrests



(A)	Locking mechanism
(B)	Armrest groove screw
(C)	Armrest groove tube
(D)	Four tightening screws

Removing installing removable armrest

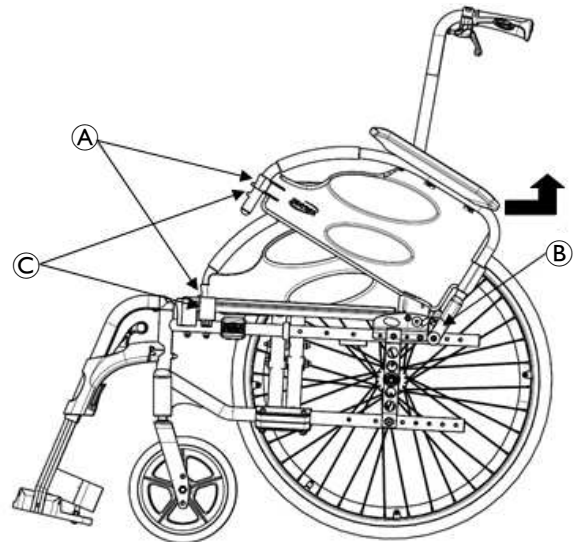
1. Previously press on the locking mechanism (A) located at the bottom of the armrest vertical bracket.
2. Pull/push the armrest by the arm cushion out of the holder.
3. To adjust how easy or difficult it is to pull / push the armrest out of the holder, change the degree to which the four screws (D) (M6) are tightened.

 To remove the removable armrest, reverse this procedure.

Adjusting removable armrest height

1. Remove the removable armrest. Refer to *Removing installing removable armrest, page 7*.
2. Loosen the screw (B) (M6) in the groove (C) of the armrest tube.
3. Move the armrest upwards or downwards until you reach the desired height, while keeping screw (B) (M6) in place (at the top edge of the holder).
4. Tighten firmly the screw (B) (M6).
5. Perform the setting on both sides.
6. Reinstall the removable armrest. Refer to *Removing installing removable armrest, page 7*.

3.2.2 Removing installing swing away armrest (n°2 & n°3)



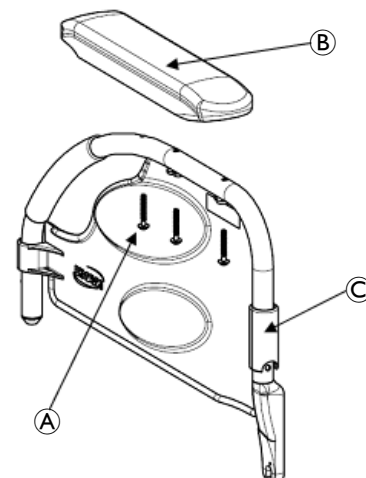
Removing swing away armrest (n°2 & n°3)

1. Unlock existing armrest assembly by operate the push bracket (A).
2. Swing back on the existing armrest to remove from the front arm socket.
3. Pull up on the existing armrest to remove from the rear pivot socket (B).
4. Repeat STEPS 1 to 3 for opposite side of wheelchair, if necessary.

Installing swing away armrest

1. If necessary, remove existing armrest assembly as described above.
2. Install new/existing armrest assembly, first into the rear pivot socket and into the front arm socket.
3. Lock new/existing armrest assembly by operate the push bracket. Make sure that the dog point (C) is properly engaged in its housing.
4. Repeat STEPS 1-3 for opposite side, if necessary.

3.2.3 Replacing armrest arm pad



1. Remove the mounting screws (A) that secure the arm pad (B) to the armrest assembly (C).
2. Replace arm pad and securely tighten with the existing mounting screws (M5).
3. Repeat STEPS 1 and 2 for the opposite side if necessary.

3.3 Seat back

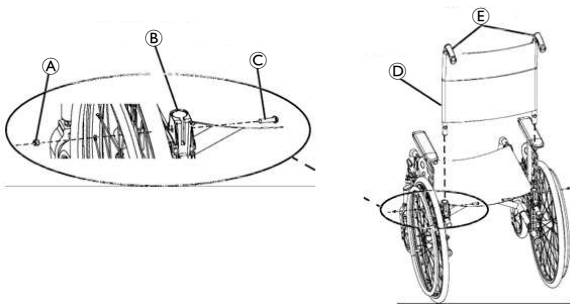


WARNING!

Risk of injury or damage

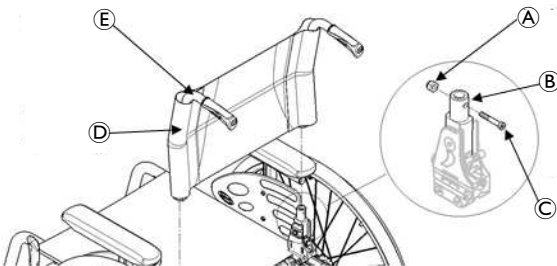
- The seat height, seat depth, back angle, seating system, size/position of the rear wheels, size/position of the front castors, seating options (e.g., headrest, back bag, ...) as well as the user condition directly relate to the stability of the wheelchair. Any change to one or any combination of the nine may cause the wheelchair to decrease in stability. Refer to the table in 4.2 *Stability warning, page 26*.
- After ANY adjustments, repair, or service and BEFORE use, make sure all attaching hardware is tightened securely - otherwise injury or damage may occur.

3.3.1 Removing back-canes



1. Remove the mounting screw © and locknut (M6) (A) that secure the back-cane (E) to the back-cane bracket (B).
2. Repeat STEP 1 for the other back-cane.
3. Remove the back-canes and upholstery (D) out of the back-cane brackets.

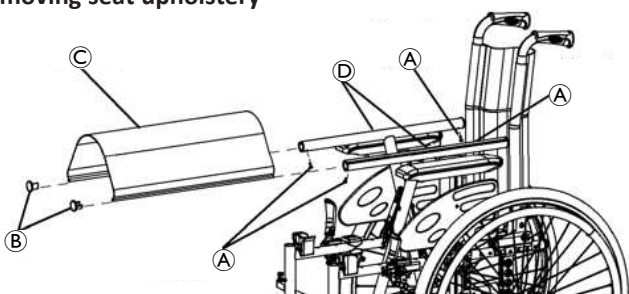
3.3.2 Removing angle adjustable back-canes



1. Remove the mounting screw © and locknut (M6) (A) that secures the back-cane (E) to the back-cane bracket (B).
2. Repeat STEP 1 for the other back-cane.
3. Remove the back-canes and upholstery (D) out of the back-cane brackets.

3.3.3 Removing installing seat upholstery

Removing seat upholstery



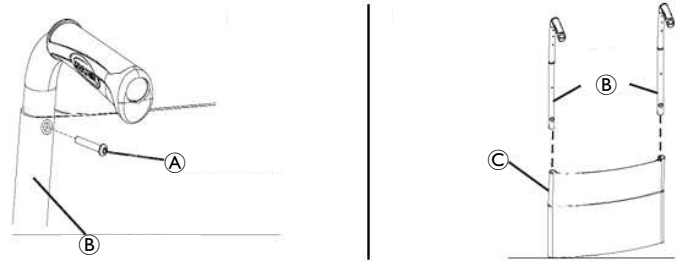
1. Fold the wheelchair.
2. Remove the mounting screws (Torx) (A) that secure the upholstery (C) to the front and back rails (D).
3. Remove the end caps (B) from the front of the seat rails.
4. Slide the seat upholstery out of the seat rails.



To install the seat upholstery, reverse this procedure.

3.3.4 Removing installing standard back upholstery

Removing back upholstery



1. Remove the back-canes. Refer to 3.3.1 *Removing back-canes, page 8*.
2. Remove the mounting screw (A) that secures the back upholstery (B) to the back-canes (C).
3. Remove the back upholstery from the back-canes.



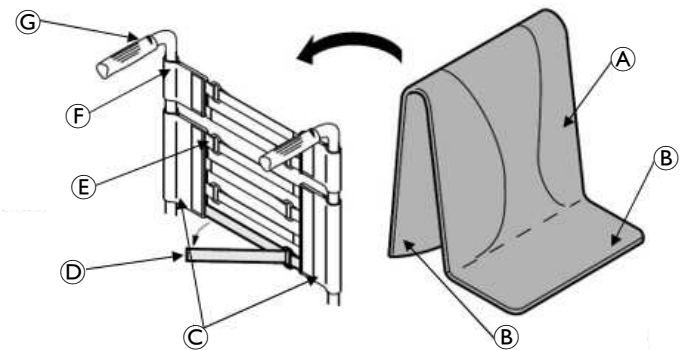
To install the back upholstery, reverse this procedure.

3.3.5 Contour (adjustable) back upholstery

Contour (adjustable) tension strips

The adjuster strips can be adjusted at various levels of tension to accommodate individual end users. In a typical scenario, the bottom two strips can be adjusted tightly to support and/or assist the extensor muscles.

Installing replacing adjustable back upholstery



Installing back upholstery

1. Remove the existing back upholstery (A) from the wheelchair. Refer to 3.3.4 *Removing installing standard back upholstery, page 8*.
2. Slide each section (anchor loop/adjuster strap) of the adjustable back upholstery with the grommet hole facing the rear of the wheelchair.
3. Secure the adjustable back upholstery to the back-canes (C) with the two mounting screws (F).



NOTICE!

- Clean the upholstery with warm water and mild detergent to remove superficial soil.

**WARNING!****Risk of injury or damage**

- Ensure that the wheelchair is fully opened, the back brace is fitted, and the seat rails properly located. The fastening straps **MUST** be securely fastened before applying the back-upholstery cover. The Contour (adjustable) back should be checked whenever entering the wheelchair to ensure that the fastening strips are securely fastened.

4. Slip adjuster straps **D** through corresponding anchor loops and adjust the back upholstery. Secure with the fastening strips.
5. Secure the back-upholstery cover (fastening strap **B**) to the back of the adjustable back upholstery **C** (fastening strap).
6. Flip the back-upholstery cover over the adjustable back upholstery and secure the fastening strips to the front of the adjustable back upholstery.
7. Lay the front portion of the back-upholstery cover on the seat upholstery.
8. Adjust the slack in the back-upholstery cover and then secure to the seat upholstery.

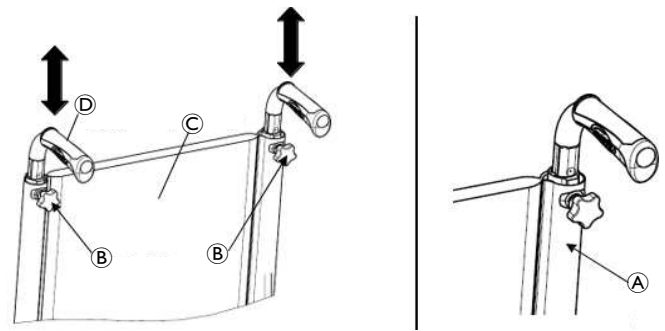
Replacing back upholstery

1. Lift the existing back upholstery cover and remove the cover from the wheelchair.
2. Remove the two mounting screws and washers that secure the existing adjustable back upholstery to the back-canes.
3. Slide each section (anchor loop/adjuster strap) of the existing adjustable back upholstery off the back-canes.
4. Slide each section (anchor loop/adjuster strap) of the new adjustable back upholstery with the grommet hole facing the rear of the wheelchair.
5. Secure new adjustable back upholstery to the back-canes with the two mounting screws and washers.

**WARNING!**

Ensure that the wheelchair is fully opened, the back brace is fitted, and the seat rails properly located. The fastening strips **MUST** be securely fastened before applying the back-upholstery cover. The Contour (adjustable) back should be checked whenever entering the wheelchair to ensure that the fastening strips are securely fastened.

6. Slip adjuster strips through corresponding anchor loops **E** and adjust the back upholstery. Secure with the fastening strips.
7. Secure the new back upholstery cover (fastening strap) to the back of the new adjustable back upholstery (fastening strap).
8. Flip the new back upholstery cover over the new adjustable back upholstery and secure the fastening strips to the front of the new adjustable back upholstery.
9. Lay the front portion of the new back upholstery cover on the seat upholstery.
10. Adjust the slack in the new back upholstery cover and then secure to the seat upholstery.

3.3.6 Adjusting the height adjustable back

1. Loosen, but **DO NOT** remove, the height adjustment knobs **B**.
2. Reposition the back canes **C** to the desired height

**NOTICE!**

- Both back canes should be adjusted to the same height.

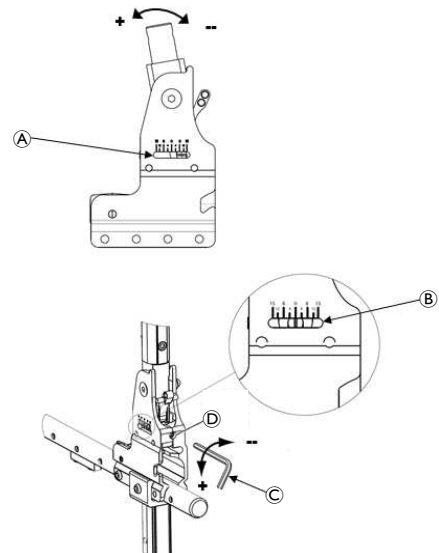
**NOTICE!**

- **DO NOT** raise push handles to maximum height when tilting the chair.

3. Tighten the height adjustment knobs.

**NOTICE!**

- To prevent accidental removal of a back-cane, the snap button lock **A** will engage at the full extension of the back-cane. To disengage the button, press the button located below the height adjustment, under the upholstery **D**, on the back-cane.

3.3.7 Adjusting the angle adjustable backrest**Adjusting angle backs****NOTICE!**

- This procedure applies to adjustable angle backs only (see **A**).

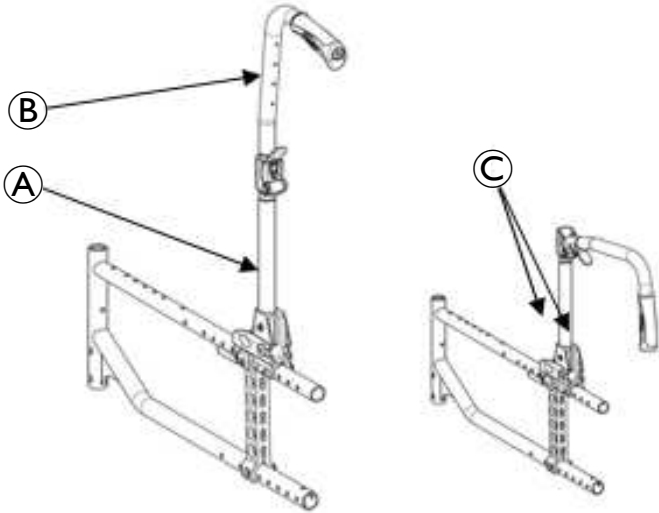
1. Adjust the back angle with the adjustable screw **D**.
2. Turn Allen key (5 mm) **C** clockwise for a negative angle.

- Alternatively, turn Allen key (5 mm) anticlockwise to obtain a positive angle.
- Ensure both adjustment to the desired angle are equal on each side of the back cane bracket.

! NOTICE!
The backrest angle adjusts from -15° to +15° (step less).

- Refer to ② for step less adjustment -15°/+15°.

3.3.8 Removing installing different types of backrests



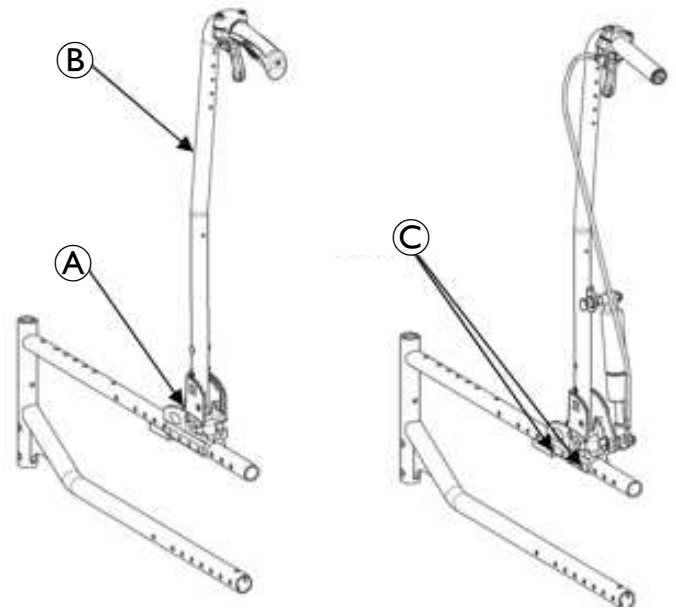
Removing installing folding backrest

- Remove the back-cane bracket ①. Refer to 3.3.2 *Removing angle adjustable back-canes*, page 8.
- Pull up on the seat upholstery.
- Remove the two mounting screws ③ and locknuts (M6) that secure the back-cane bracket to the wheelchair frame.
- Install the new set including the appropriate backrest upholstery.

i To install the fixed/folding backrest, reverse this procedure from STEP 1 to 3.

! NOTICE!
— Both back canes ② should be set to the same adjustment hole.

Removing installing recliner backrest (mechanical and gas strut versions)

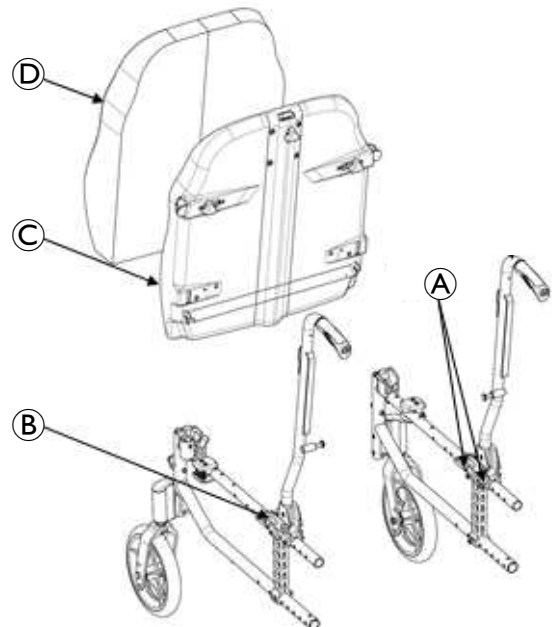


i To install the recliner backrest, reverse this procedure from STEP 1 to 3.

- Remove the back-cane bracket ①. Refer to 1.1 *Removing / Adjusting / Installing Back-Cane Bracket*, page 1.
- Pull up on the seat upholstery.
- Remove the two mounting screws ③ and locknuts that secure the back-cane bracket to the wheelchair frame.
- Install the new set including the appropriate backrest upholstery.

! NOTICE!
— Both back canes ② should be set to the same adjustment hole.


Comfort backrest (mechanical and gas strut versions)



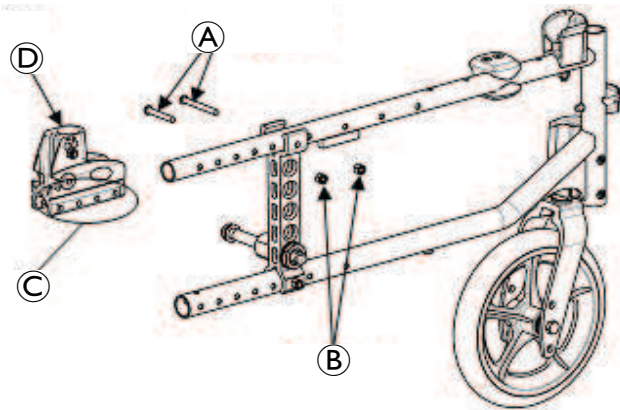
i To install the fixed / folding backrest, reverse this procedure from STEP 1 to 3.


- Remove the back-cane bracket ②. Refer to 1.1 *Removing / Adjusting / Installing Back-Cane Bracket*, page 1.
- Pull up on the seat upholstery ④.
- Remove the two mounting screws ① and locknuts that secure the back-cane bracket to the wheelchair frame.

- Install the new seat including the appropriate backrest upholstery and shell ©. (Refer to User Manual for details on locking and unlocking the complete backrest upholstery).

 To Install the comfort backrest, reverse this procedure from STEP 1 to 3.

Removing installing adjusting the back-cane bracket



 To install the back-cane bracket, reverse this procedure.

- Remove the back canes. Refer to 3.3.1 *Removing back-canes, page 8*.
- Pull up on the seat upholstery.
- Remove the two mounting screws (A) and locknuts (B) that secure the back-cane bracket to the wheelchair frame.
- Do one of the following:
 - To Remove:** slide the back-cane bracket (D) off the back of the wheelchair frame.
 - To Adjust:** slide the back-cane bracket into one of the four adjustment holes (C) on the bracket.

NOTICE!
— Both back canes should be set to the same adjustment hole.

3.3.9 Installing removing seat posture belt

NOTICE!
Seat upholstery removed for clarity.

- Remove seat cushion from wheelchair, if necessary.
- Remove the mounting screw (C) and locknut that secures the seat posture belt half (B) to the back-cane bracket (A).
- Repeat STEP 2 for the opposite side, if necessary.
- Do one of the following:
 - To install the seat posture belt, proceed to STEP 6.
 - Remove the existing seat posture belt from the wheelchair.
- Engage the two halves of the new seat posture belt.
- Align the mounting holes on the back-cane bracket and one end of the new seat posture belt.
- Secure the new seat posture belt to the wheelchair frame with one mounting screw and washer. Tighten securely.
- Repeat STEPS 6 and 7 for the opposite side of the seat posture belt.
- Reinstall seat cushion onto wheelchair, if necessary.

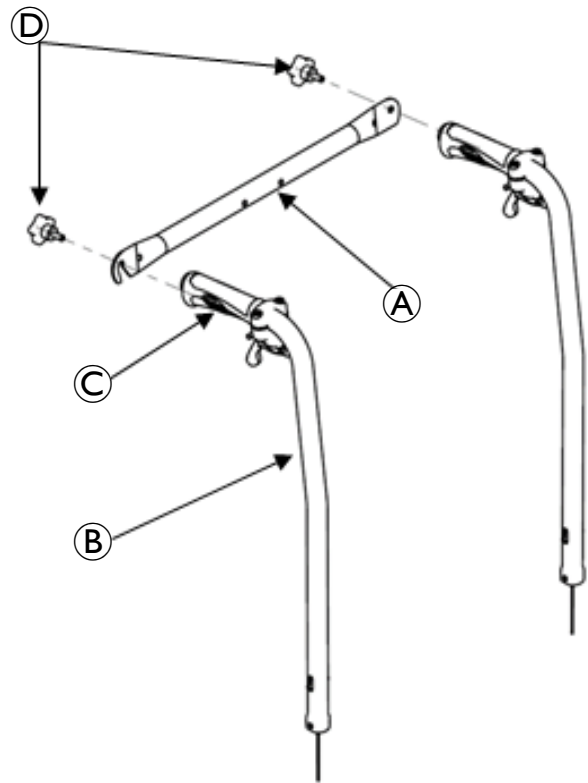
3.3.10 Installing removing the standard back brace



WARNING!

Risk of injury or damage

- If a back brace is already installed, you don't have to re-install the back-cane inserts (for fixed backrest canes only).
- After ANY adjustments, repair, or service and before use, make sure all attaching hardware is fitted and tightened securely.



- Remove the end caps from the back-canes.
- Remove the handles (C) from the back-canes (B). Cut the handle lengthwise with a sharp tool.
- Install the inserts into the canes (fixed backrest canes only).
- Secure the inserts with mounting screws (fixed backrest canes only).
- Install the handles on the back-canes. (Previously, spray a solution of neutral alcohol inside the handle and settle it immediately on the back-cane).
- Align the back brace (A) ends with the handles of the back-canes.
- Secure the back brace to the back-canes with the hand screws (D).



To remove the back brace, reverse this procedure.

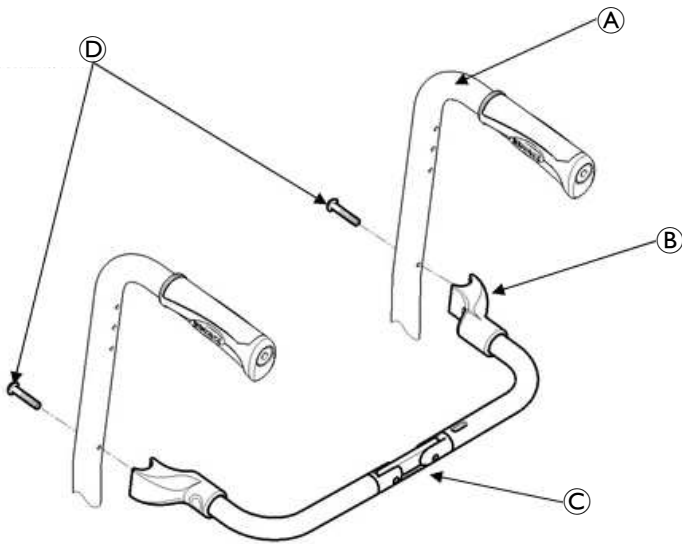
3.3.11 Installing removing the folding back brace



WARNING!

Risk of injury or damage

- After ANY adjustments, repair or service and before use, make sure all attaching hardware is tightened securely - otherwise injury or damage may occur.



Removing installing back brace (evolutive version)

1. Remove the upholstery from the back-canes (A).
2. Install the two mounting screws (M5) through the holes of the back-cane and into the plastic inserts (B).
3. Secure the back brace (C) to the back-canes with the mounting screws (M5) (D).
4. Reinstall back upholstery onto wheelchair.



To remove the folding back brace, reverse this procedure.

3.4 Rear wheels and front castors



WARNING! Risk of injury or damage

The seat height, seat depth, back angle, seating system, size/position of the rear wheels, size/position of the front castors, seating options (e.g. headrest, back bag, ...) as well as the user condition directly relate to the stability of the wheelchair. Any change to one or any combination of the nine may cause the wheelchair to decrease in stability.

- After ANY adjustments, repair or service and before use, make sure all attaching hardware is tightened securely.

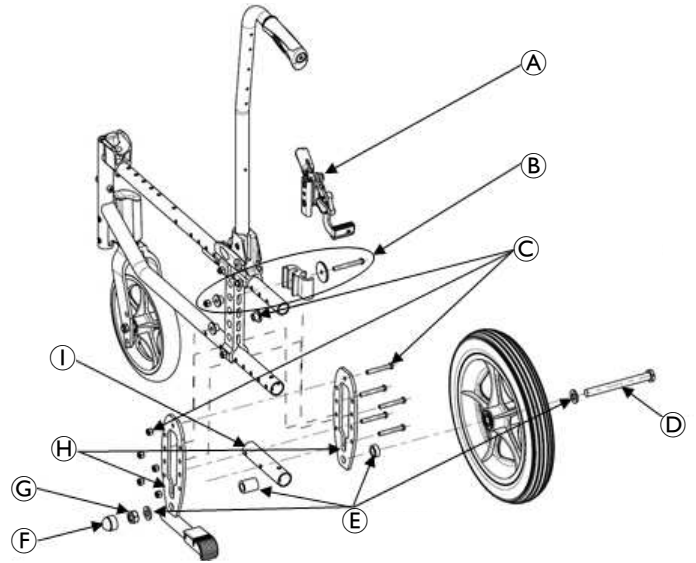
3.4.1 Removing installing rear wheels



WARNING!

- If changing the size of the rear wheel or the seat-to-floor height, refer to the table in the next page.

Fixed axles, transit version



Removing rear wheels

1. 12"; remove the fixed axle, washers (E), dust cap (E) and locknut (G) that secure rear wheel to the axle brackets (H). Remove existing rear wheel from the wheelchair.
2. Install new/existing rear wheel onto wheelchair. Refer to the [Installing transit kit](#) paragraph below. See STEPS 3 to 6 only.
3. 24" or 22"; remove the complete wheel and the axle bracket from the axle plate.

Installing transit kit

1. Always make sure that the axle plate is in the passive position on both sides, refer to [3.4.3 Adjusting quick-release axles, page 14](#).
2. Install the axle bracket and anti-tip device bracket (I) with the axle brackets hardware (C).
3. Install fixed axle (D) through washers, new/existing rear wheel, and axle bracket.
4. Securely tighten with the existing fixed axle locknut. Torque to 25 Nm.
5. Fix and adjust the transit brake (A) with its brake hardware (B), adjust the distance between the brake shoe and the wheel, see [3.6.1 Adjusting wheel brakes, page 22](#).
6. If necessary, repeat STEPS 1 to 5 for opposite rear wheel.



NOTICE!

- Both axle brackets should be set at the same position. The head of bottom mounting screws needs to be on the outside position.

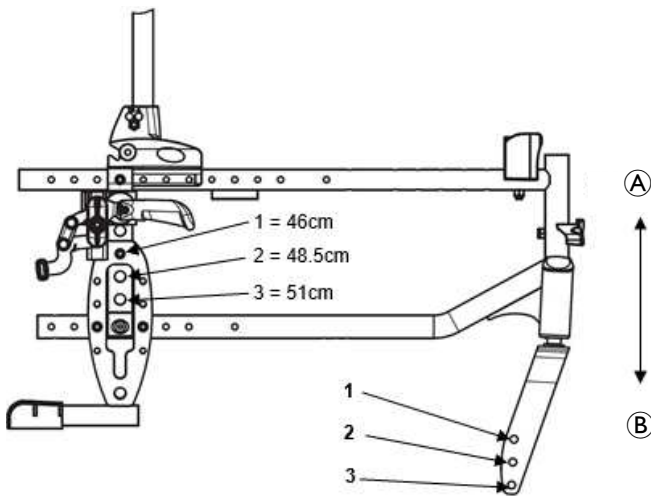


NOTICE!

- To obtain the desired front seat to floor height, see [3.5.3 Changing seat-to-floor height, page 20](#).

You will need to perform one or all of the following:

- Change the mounting position on the fork. Refer to 3.4.9 *Removing installing repositioning the castor assemblies, page 17.*
- Change the fork size or adding/removing height adjustment spacers. Refer to 3.4.8 *Adjusting forks, page 16.*
- Change the rear height positioning of the rear wheel and the front wheel. Refer to the tables below.

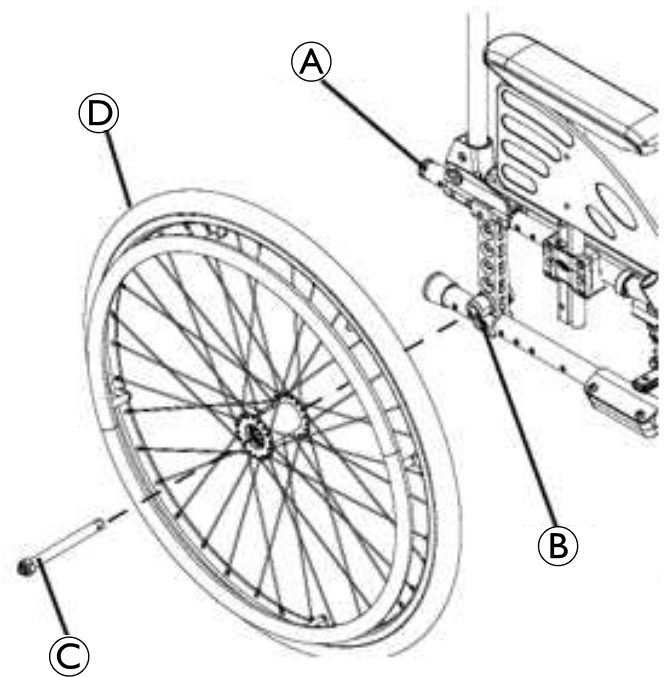


Seat Angle 0°	Rear Support		Headset Support	
	Seat height	Transit	Position A	Position B
		12"	8"	8"
38.5	X			
41	X			
43.5	X			
46	2		2	1
48.5	3		3	2
51	X			

Seat Angle 3°	Rear Support		Headset Support	
	Seat height	Transit	Position A	Position B
		12"	8"	8"
38.5	X			
41	X			
43.5	X			
46	1		2	1
48.5	2		3	2
51	3		X	3

Seat Angle 0°	Rear Support		Headset Support	
	Seat height	Transit	Position A	Position B
		12"	8"	8"
38.5	X			
41	X			
43.5	X			
46	X		2	1
48.5	2		3	2
51	3		X	3

3.4.2 Quick-release axles



Removing the quick release axle

1. Hold the center of the rear wheel **D** and push in the tip of the quick release axle **C**.
2. Pull the quick release axle and rear wheel out of the axle bracket **B** on the wheelchair frame **A**.
3. Push in the tip of the quick release axle again and pull the quick release axle out of the existing rear wheel.
4. Install new/existing rear wheel onto wheelchair. Refer to 3.4.1 *Removing installing rear wheels, page 12.*



WARNING!

Risk of injury or damage

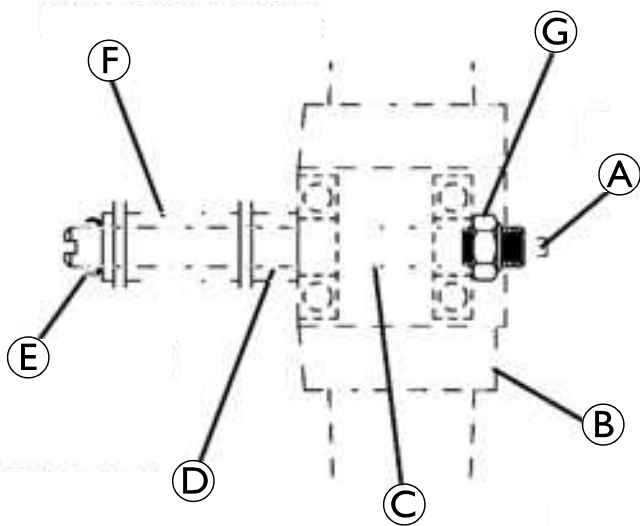
Make sure the detent pin and locking pins of the quick-release axle are fully released before operating the wheelchair.

- The locking pins **MUST** be protruding past the inside of rear wheel hub for a positive lock.
- Keep locking pins clean.
- Invacare recommends inserting quick-release axles with the head end to the inside of the wheelchair to prevent accidental release during contact leisure activities

Installing the quick-release axle

1. Install the existing quick release axle through the new/existing rear wheel.
2. Install the new/existing rear wheel and quick release axle into the axle bracket on the wheelchair frame.
3. Refer to 3.4.3 *Adjusting quick-release axles, page 14* if the locking pins are not protruding past the inside of the axle bushing or there is too much movement of the rear wheel assembly in a back and forth position.

3.4.3 Adjusting quick-release axles



1. Remove rear wheel and quick release axle from the wheelchair. Refer to 3.4.1 *Removing installing rear wheels, page 12*.
2. Depress detent pin **A** in the quick release axle **C** and slide the quick release axle through the rear wheel hub **B**.
3. Release detent pin to ensure that the locking pins **E** are fully released.
4. Increase or decrease end play by adjusting the locknut **G** on the end of the quick release axle bracket **D**.



WARNING!

Make sure the detent pin of the quick release axle is fully released **BEFORE** operating the wheelchair.
— Keep locking pins clean.

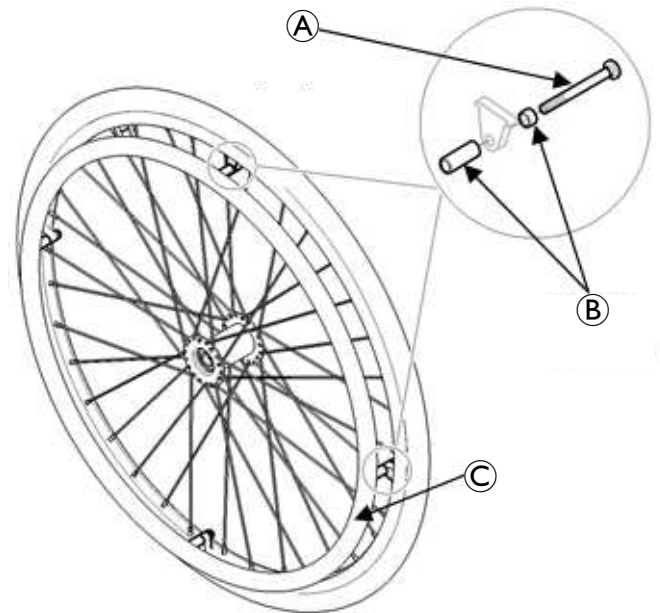
5. Reinstall rear wheel onto the wheelchair. Refer to 3.4.1 *Removing installing rear wheels, page 12*.
6. Repeat STEPS 4 to 5 until the quick release axle detent pins are fully released past the wheelchair frame **F**.

3.4.4 Replacing handrims



NOTICE!

— To replace the handrim, use new mounting pre-glued screws (M5).



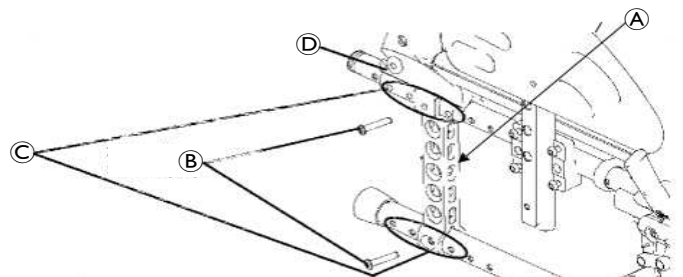
1. Remove the rear wheel from the wheelchair. Refer to 3.4.1 *Removing installing rear wheels, page 12*.
2. Remove the mounting screws **A** that secure the existing handrim **B** to the rear wheel.
3. Remove the existing handrim.
4. Install the new handrim and secure to the rear wheel with the new mounting pre-glued screws (M5).
5. The space between the rim and handrim can be adjusted thanks to the different length of the plastic spacers **C**.
6. Reinstall the rear wheel to the wheelchair. Refer to 3.4.1 *Removing installing rear wheels, page 12*.
7. Repeat STEPS 1 to 6 for opposite wheel, if necessary.

3.4.5 Adjusting the wheelbase length



NOTICE!

— For this procedure, refer to the figures at the end of this section for Passive, (Active Position & Very Active Position).



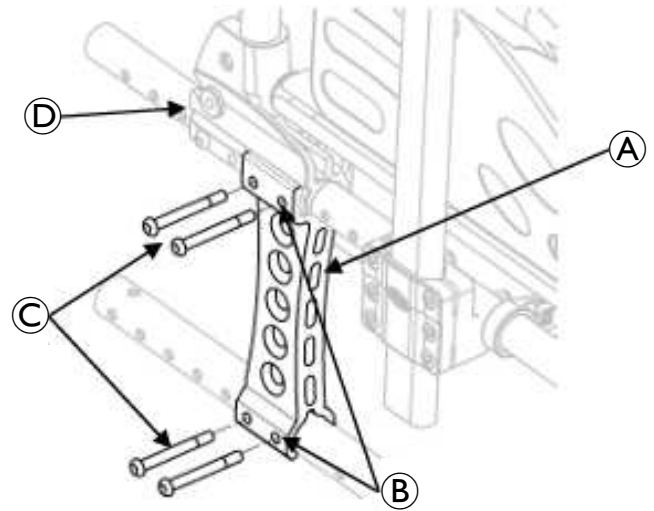
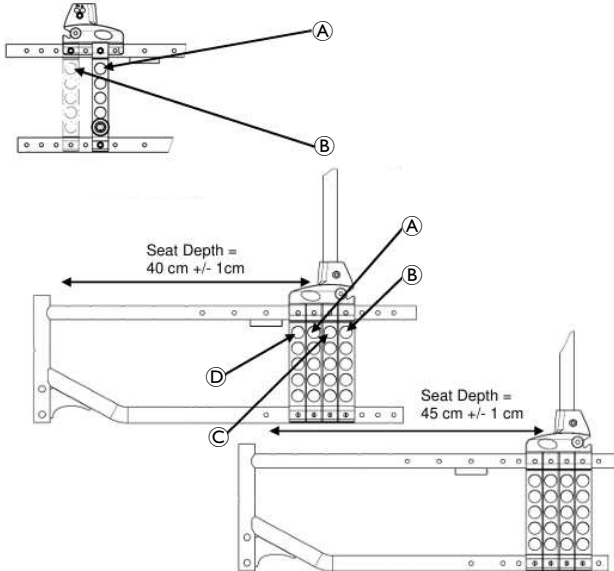
1. Remove the wheel. Refer to 3.4.1 *Removing installing rear wheels, page 12*.
2. Remove the two mounting screws **B** that secure the top and bottom of the axle plate **A** to the wheelchair frame.

**CAUTION!**

- The top of the axle plate must remain on the plastic seat bracket (D). Otherwise, scratching and slight frame damage may occur.

3. Align the axle plate with one of four adjustment holes (C). There are 3 positions possible:

- Factory setting for Fixed backrest is Standard position (A), for Recliner backrest is Passive position (B) or (C) for some configurations. Refer to diagram below.



Adjusting wheelbase lengths A, B, C, D positions

Components in the above diagram:

(A)	Axle plate active
(B)	Adjustment holes
(C)	4 mounting screws (M6)
(D)	Back-cane bracket

**WARNING!****Risk of injury or damage**

- The two mounting screws need to be two adjustment holes apart to maintain frame integrity. Respect factory settings related to backrest type (A for Fixed, B for Recliner), refer to the above image.
- Medium position (C) of the axle plates directly relates to the stability of the wheelchair. Only change to one or any combination of the three positions may cause the wheelchair to increase or decrease in stability.
- Anti-tip devices can be fitted to secure the stability if required. Refer to 3.8.1 *Installing simple anti-tip devices*, page 24.

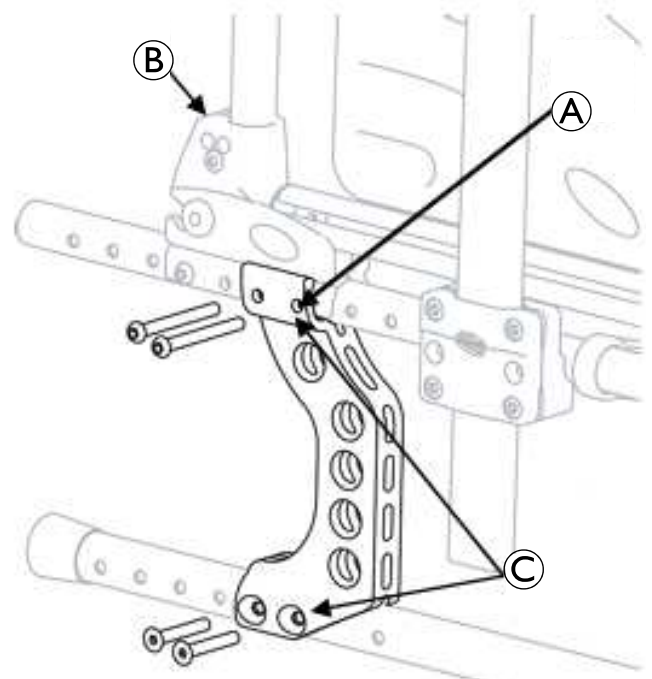
**NOTICE!**

- When using the last adjustment position, the existing mounting screw needs to be switched to the front of the back-cane bracket.

4. Repeat STEPS 1 to 3 for the other axle plate.

**NOTICE!**

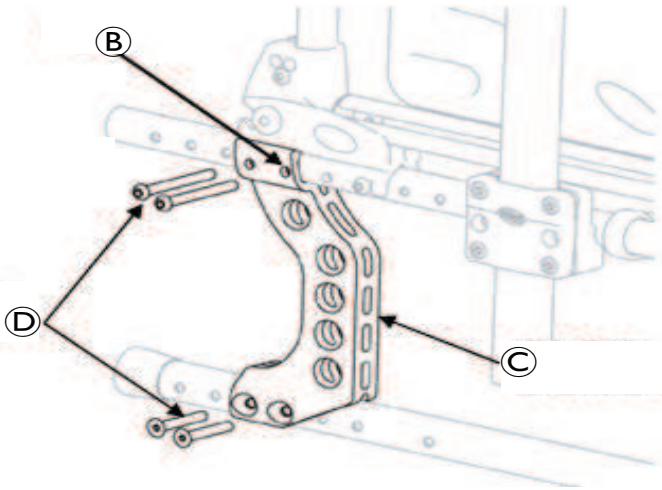
- Both axle plates should be set at the same position. The head of bottom mounting screws needs to be on the outside position.



Adjusting the Wheelbase Length - Very Active (A)

Components in the above diagram:

(B)	Adjustment holes
(C)	Back-cane bracket

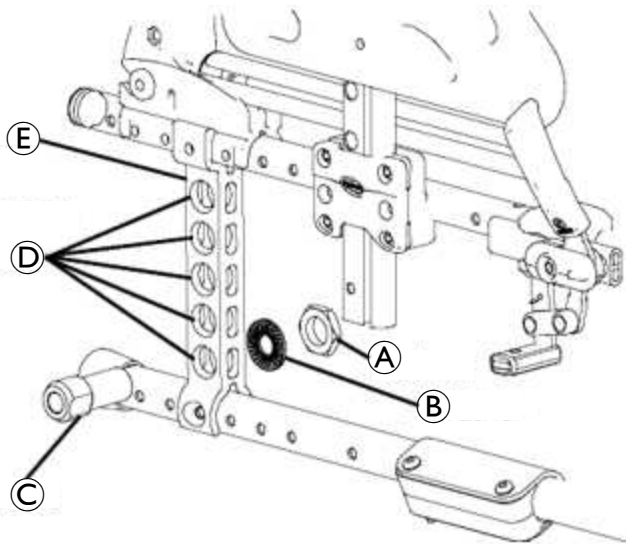


Adjusting the Wheelbase Length - Passive (B)

Components in the above diagram:

(C)	Axle plate very active
(D)	4 mounting screws (M6)

3.4.6 Adjusting rear wheel height



1. Remove the rear wheel. Refer to 3.4.1 Removing installing rear wheels, page 12.
2. Remove the locknut (A) and washer (B) that secures the axle bracket to the axle plate
3. Align the axle bracket (C) with one of the five adjustment holes (D) on the axle plate.
4. Secure the axle bracket to the axle plate (E), at the desired height, with the locknut and washer.
5. Install the rear wheel. Refer to 3.4.1 Removing installing rear wheels, page 12.
6. Repeat STEPS 1 to 5 for the other rear wheel.



NOTICE!

- Both rear wheels should be set at the same position.

3.4.7 Replacing repairing rear wheel & front castor tyre and inner tube



CAUTION!

- As with any vehicle, the wheels and tyres should be checked periodically for cracks and wear, and should be replaced when necessary.

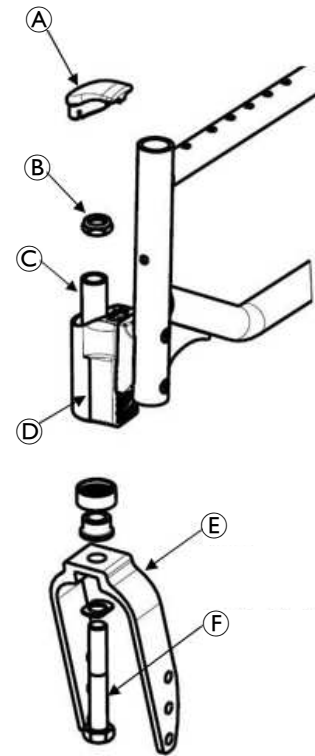
3.4.8 Adjusting forks



WARNING!

Risk of injury or damage

- Castor angle vertical axis (F) MUST be at 90° +/- 1° from the ground, if not a fluttering risk may occur. Both castor assemblies should be at the same angle.
- After ANY adjustments, before use, make sure all attaching hardware is fitted and tightened securely.



1. Remove the dust cover (A) from the castor housing (D).
2. To properly tighten castor journal system and guard against flutter, perform the following check:
 - a. Tip back the wheelchair to floor.
 - b. Pivot castor fork assemblies in rear position.
 - c. Push castor to initiate clockwise movement.
 - d. Let castor fork assembly (E) rotate freely, if not change the upper specific bearing (C).
3. Adjust locknuts (B) to appropriate torque (15-20 Nm) with a 19 mm socket wrench; do not over tighten the locknut, you may risk damaging the bearings.
4. Test wheelchair for maneuverability.
5. Snap dust cover into the castor housing.
6. Perform STEPS 1 to 5 on the other side.

3.4.9 Removing installing repositioning the castor assemblies

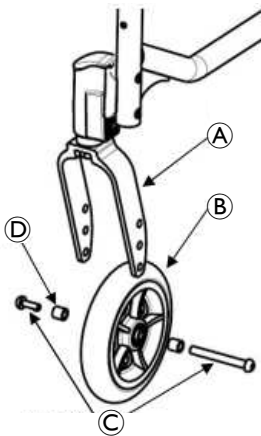
- ! NOTICE!**
- Fixing screws may only be used once. Always use the dedicated spare parts kit (**SP1657713**) for castor housing Standard or use the spare parts kit (**SP1657714**) for castor housing Light.
 - Alternatively, the screws can be cleaned (remove old thread locking adhesive) and reinstalled with new medium-strength thread locking adhesive (e.g.: LOCTITE® 243™ or 270™).

- ! NOTICE!**
- Always refer to liquid thread locking adhesive supplier recommendations before applying on screw.

- ! NOTICE!**
- If replacing a front castor, note the mounting position of the existing front castor for installation of the new front castor.

- ! NOTICE!**
- If repositioning front castors or replacing the existing front castor with a castor of a different size, refer to 3.5.3 *Changing seat-to-floor height, page 20* to determine the front castor position needed for the required front seat-to-floor height.

- ! NOTICE!**
- Both front castors **MUST** be the same size and adjusted to the same height.



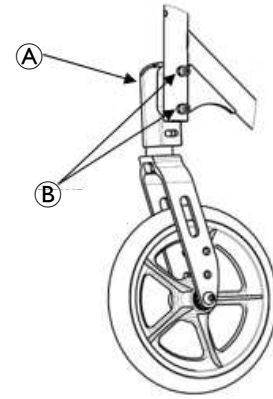
Removing front wheel

1. Remove the mounting bolt (5 mm Allen key) ©, axle spacers (if present) © that secure the front wheel to the fork ©.
2. Remove the wheel © from the fork.

Installing Front Wheel

1. Using the mounting bolt (5 mm Allen key), axle spacers (if present), secure the wheel to the desired wheel mounting position.
2. Ensure fork stem is perpendicular to the flat surface.

Adjusting castor angle (Castor housing standard)



1. Remove the two pre-glued mounting screws (5 mm Allen key) © that secure the castor housing assembly © to the wheelchair frame and the attachment plate.

- ! NOTICE!**
- To adjust the castor angle on both sides, use the spare parts kit (**SP1657713**) consisted of four mounting pre-glued screws (M6x37mm) and two attachment plates.

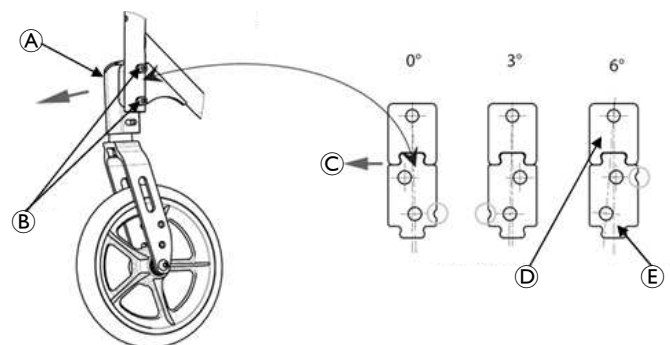
2. Fit but not tighten the new attachment plate and the two mounting screws.
3. Rotate the castor assembly to the desired angle.

- ! NOTICE!**
- Both front castors **MUST** be the same size and adjusted to the same height.

4. Tighten in 3 steps (lower-upper-lower) progressively the two mounting pre-glued screws (13/14 Nm) that secure the castor housing assembly to the wheelchair frame.
5. Repeat STEPS 1 to 4 for the other castor housing assembly.

- ! NOTICE!**
- You **MUST** wait 24 hours before using the wheelchair (polymerization time required for a safe assembly).

Adjusting castor angle (Castor housing light)



- © **Castor Housing RH**
- © **Pre-glued mounting screws**
- © **Front RH**
- © **Upper plate**
- © **Lower plate**

1. Remove the two pre-glued mounting screws that secure the castor assembly to wheelchair frame and attachment plates set.

! NOTICE!
To adjust the castor angle on both sides, use the spare parts kit (SP1657714) consisting of four mounting pre-glued screws (M6x37mm) and two attachment plates.

2. Move the castor housing assembly to one of two positions. Refer to the above figure. Always check that the plastic insert is present before tightening the mounting screws.

! NOTICE!
Both castor housing assemblies must be set at the same position.

3. Tighten in 3 steps (lower-upper-lower) progressively the 2 mounting pre-glued screws (13/14 Nm) that secure the castor housing assembly to the wheelchair frame.
4. Repeat STEPS 1 to 4 for the other castor housing assembly

! NOTICE!
You MUST wait 24 hours before using the wheelchair (polymerization time required for a safe assembly).

Adjusting castor assembly position (Castor housing Standard or Light)

1. Remove the two mounting screws that secure the castor housing assembly to wheelchair frame, the attachment plate (Standard) or the angle plates set (Light)

! NOTICE!
To adjust the castor position on both sides, use the spare parts kit (SP1657713) consisted of four mounting pre-glued screws (M6 x 37mm) and two attachment plates for castor housing Standard or use the spare parts kit (SP1657714) consisting of four mounting pre-glued screws (M6 x 33mm) and two angle plates set for castor housing Light.

2. Move the castor housing assembly to one of two positions. Refer to the above figure. Always check that the plastic insert is present before tightening the mounting screws.

! NOTICE!
Both castor housing assemblies must be set at the same position.

3. To finalise the assembly, refer to section Castor housing Standard, repeat STEPS 4 to 6 or refer to section Castor housing Light, repeat STEPS 2 to 6.

3.5 Seat to floor height



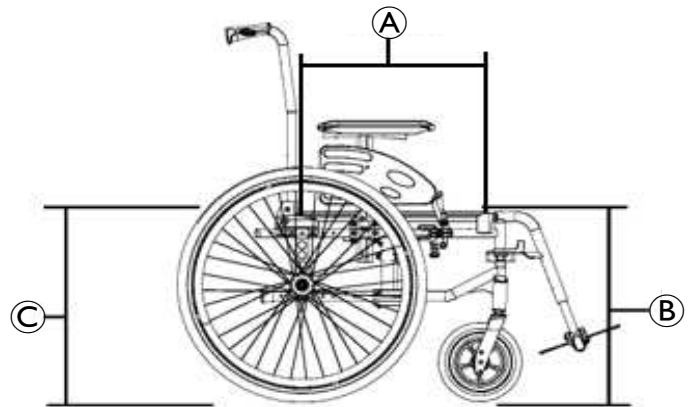
WARNING!
Risk of injury or damage
— After ANY adjustments, repair, or service and before use, make sure all attaching hardware is tightened securely.

3.5.1 Seat angle

! NOTICE!
— Refer to 3.5.2 Measuring seat-to-floor height, page 18 for measuring instructions.

! NOTICE!
— We recommend that the rear seat-to-floor height be AT LEAST 25 mm shorter than the front seat-to-floor height. Otherwise, a forward seat angle can occur.

Subtract the rear seat-to-floor height measurement from the front seat-to-floor height measurement to determine the amount of seat angle as shown in the example below.



Component	Description
A	Rear seat-to-floor height
B	Seat depth = 350 mm
C	Front seat-to-floor height

Example:

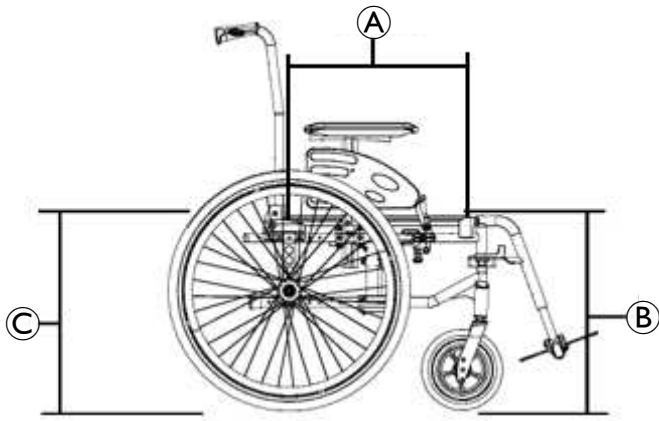
460 mm	Seat-to-floor height
- 415 mm	Minus rear seat-to-floor
Height (5° +/-1°)	Equals seat angle



WARNING!
Because of the parts mechanical tolerances and all adjustments possible (+/- 1°) the seat angles possible are 1,5° +/-1° or 5° +/-1° or 8,5° +/-1° depending of the wheelchair assembly. Refer to table Seat-to-floor heights.

3.5.2 Measuring seat-to-floor height

! NOTICE!
All measurements are in millimeters. The front and rear seat-to-floor heights are approximate to 6.5 mm due to tyre wear and air pressure.



Measuring front seat-to-floor height

Front seat-to-floor height: Measure the distance between the front of the seat upholstery (A) and the ground/floor (B).

Measuring rear seat-to-floor height

! NOTICE!
The rear seat-to-floor heights are based on pneumatic tyres and pneumatic tyres with flat free inserts. If wheelchair is equipped with urethane tyres, subtract 6.5 mm from the measurement.

Rear seat-to-floor height: Measure distance between the rear of the seat upholstery and the ground/floor (C).

3.5.3 Changing seat-to-floor height



WARNING!

Decrease in stability. Risk of tipping.

The seat height, seat depth, back angle, seating system, size/position of the rear wheels, size/position of the front castors, seating options (e.g. headrest, back bag, ...) as well as the user condition directly relate to the stability of the wheelchair. Any change to one or any combination of the nine may cause the wheelchair to decrease in stability. Refer to 5.2 *Identifying and repairing faults*, page 32.

- Always check castor and rear wheel vertical axis is to 90° +/-1° from the ground.



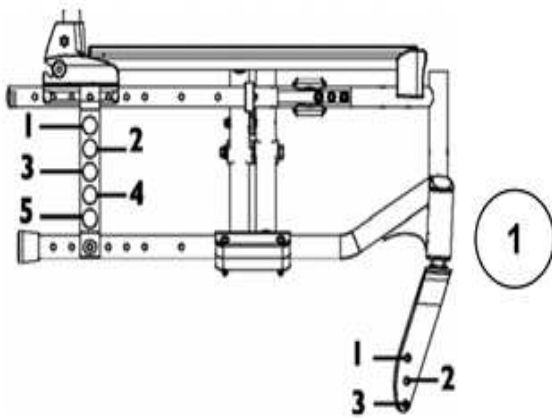
NOTICE!

- For this procedure, refer to the tables below to determine adjustment(s) necessary to achieve desired front seat to floor height.

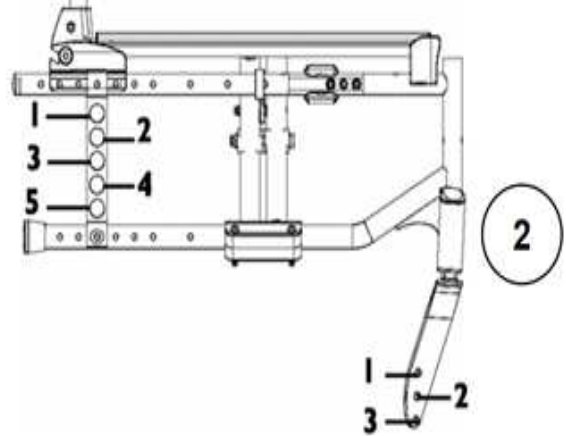
To obtain the desired front seat to floor height, you must perform one or all of the following:

- Changing the castor size and/or mounting position on the fork, and/or seat angle. Refer to 3.4.9 *Removing installing repositioning the castor assemblies*, page 17.
- Changing the fork size or adding/removing height adjustment spacers. Refer to 3.4.8 *Adjusting forks*, page 16.
- Changing the rear wheel size. Refer to 3.4.1 *Removing installing rear wheels*, page 12.
- Changing the rear height positioning. Refer to 3.4.3 *Adjusting quick-release axles*, page 14.

Front Position P1



Front Position PC



Front seat height	Front castor					
	8"			6"		
	Castor Position	Fork Type	Wheel Fixation	Castor Position	Fork Type	Wheel Fixation
510 mm	P2	60	3	N/A		
485 mm	P2		2	P2	40 (3 holes)	3
460 mm	P1		2	P1		3
435 mm	N/A			P1		2
410 mm				P1	1	
385 mm				N/A		
360 mm	N/A					

Front seat height	Front castor					
	5.5"			5"		
	Castor Position	Fork Type	Wheel Fixation	Castor Position	Fork Type	Wheel Fixation
510 mm	N/A			N/A		
485 mm	P2		3			
460 mm	P1		3	P2	40 (2 holes)	3
435 mm	P1		2	P1		3
410 mm	N/A			P1	40 (Ultra low)	1
385 mm				P2		3
360 mm				P1	3	

Front seat height	Rear Wheel/ Seat angle								
	20"			22"			24"		
	0°	3°	6°	0°	3°	6°	0°	3°	6°
510 mm	N/A			N/A	N/A	5	N/A	5	4
485 mm				5	4	5	4	3	
460 mm				5	4	3	4	3	2
435 mm				4	3	2	3	2	1
410 mm				3	2	N/A	2	1	N/A
385 mm	3	N/A		2	N/A		1	N/A	
360 mm	2	3	N/A	N/A			N/A		

3.6 Wheel brakes



WARNING!

After ANY adjustments, repair or service and BEFORE use, make sure all attaching hardware is tightened securely - otherwise injury or damage may occur. Ensure that the clamp assembly is well positioned in its frame located position.

3.6.1 Adjusting wheel brakes



NOTICE!

— When changing the position of the rear wheels, the wheel brakes MUST be repositioned.



NOTICE!

— Before adjusting or replacing the wheel brake assemblies, ensure tyres are inflated to the recommended BAR, KPa, P.S.I on the side wall of the tyre.



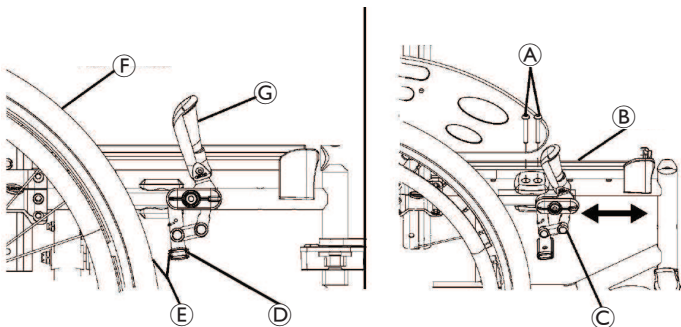
NOTICE!

— If wheel brakes need replacement, installation must be performed by a qualified technician.

Adjusting wheel brake position

1. Remove the two mounting screws (A) that secures the wheel brake (C) assembly to the wheelchair frame (D).
2. Remove wheel brake assembly from the clamp assembly (B).
3. Move the clamp assembly (if necessary) to the other wheel brake position on the wheelchair frame.
4. Install the wheel brake assembly into the clamp assembly.
5. Secure the wheel brake assembly to the wheelchair frame with the two mounting screws.
6. Repeat STEPS 1 to 6 for the other wheel brake assembly.

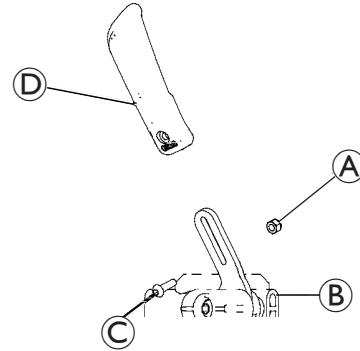
Adjusting wheel brake tension



1. Loosen, but DO NOT remove the two set screws (A) that secure the wheel brake assembly (C) to the wheelchair frame (B).
2. Measure the distance between the wheel brake shoe (D) and the rear wheel (F).
3. Slide the wheel lock (G) along the wheelchair frame until the measurement is 4 mm for solid and pneumatic tyres (E).
4. Securely tighten the two set screws (A).
5. Repeat STEPS 1 to 4 for the opposite wheel brake.

6. Engage the wheel brakes and push against the wheelchair to determine if the wheel brakes engage the rear wheels enough to hold the occupied wheelchair.
7. Repeat STEPS 1 to 6 until the wheel brakes engage the rear wheels enough to hold the occupied wheelchair.

3.6.2 Replacing wheel brake handle



1. Remove the mounting screw (C) and locknut (A) that secures the wheel brake handle (D) to the wheel brake assembly (B).
2. Remove the wheel brake handle and discard.
3. Align the new wheel brake handle with the wheel brake assembly.
4. Secure the new wheel brake handle with the mounting screw and locknut.
5. If necessary, repeat STEPS 1 to 4 for the other wheel brake.

3.6.3 Installing adjusting hub brakes



WARNING!

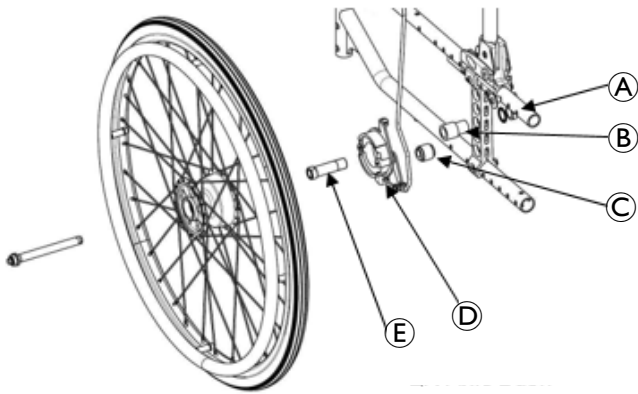
Risk of injury or damage

- After ANY adjustments, repair, or service and BEFORE use, make sure all attaching hardware is tightened securely - otherwise injury or damage may occur.
- Always operate the two brakes simultaneously and do not take slopes exceeding 5° to ensure perfect control of the wheelchair steering. Hub brakes are running brakes only, always use the manual brakes to secure the wheelchair during short or long stops.
- Ensure both hub brakes are adjusted to the same mounting hole.

Installing adjusting hub brakes

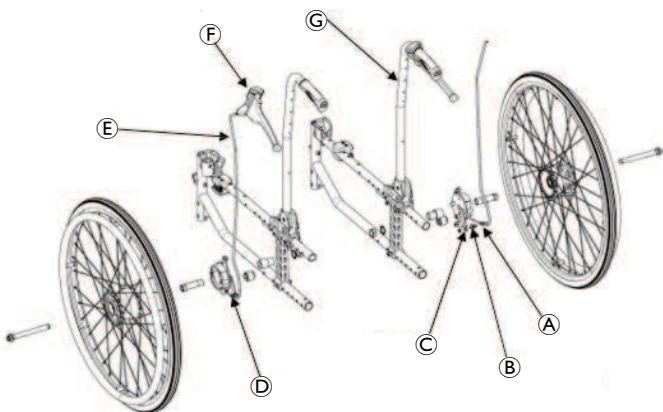
- ! NOTICE!**
- After adjusting or replacing the hub brake assemblies, ensure that the tyres are inflated to the recommended BAR, KPa, P.S.I on the side wall of the tyre.

- ! NOTICE!**
- If hub brakes need replacement, installation must be performed by a qualified technician.



1. Remove the rear wheel. Refer to 3.4.1 *Removing installing rear wheels, page 12*.
2. Remove the locknut and washer (A) that secure the axle bracket to the axle plate.
3. Thread a brake shoe support (D) on a QR axle bush (E) support then add spacer HB (B).
4. Present the mounting set-in front of the axle plate outside of the chair, by directing the brake shoe support following the plan opposite then insert the anti-rotating spacer (C) between the pin of the brake shoes support and the hole of the axle support.
5. Align the hub brake set with one of the five adjustment holes on the axle plate.
6. Secure the hub brake set to the axle plate at the desired height, with the locknut and washer.
7. Repeat STEPS 1 to 6 for the other rear wheel.

Adjusting hub brake



1. Install the hub brake lever (F) with the cable (E) on the backrest canes (G).
2. Secure the cable to the lever (C) of the brake shoes support (D) by tightening the cable bolt (B).
3. Adjust the cable tension to desire brake effort by screw/unscrew the tensional bolt (A) situated on the brake shoes support.
4. Repeat STEPS 1 to 3 for the other side.

- ! NOTICE!**
- The cable adjustment MUST have the same brake effect on both sides.

3.7 Options



WARNING!

Risk of injury or damage

- After ANY adjustments, repair or service and BEFORE use, make sure all attaching hardware is tightened securely.
- Make sure the detent pin and locking pins of the quick-release button are fully released before operating the wheelchair. The locking pins MUST be protruding past the inside of rear wheel hub for a positive lock. Keep locking pins clean.
- Ensure both wheels are adjusted to the same mounting hole.

3.7.1 Installing adjusting dual handrim (DHR)

1. Remove the rear wheel (A). Refer to 3.4.1 *Removing installing rear wheels, page 12*.
2. Remove the nut and washer (C) that secures the axle bracket to the wheel plate.
3. Align the DHR Axle bush (E) with one of the adjustment holes on the wheel plate.
4. Secure the DHR axle bush to the wheel plate, at the desired height, with the nut and washer (45 0/+5 Nm) with a 32 mm fixed spanner. Insert the wheel with the DHR wheel axle (F) into the DHR axle bracket.
5. Repeat STEPS 1 to 4 for the other rear wheel.
6. Insert the telescopic rear wheel shaft (B) onto the end of the wheel axle to connect both DHR wheels.

3.7.2 Installing adjusting headrest

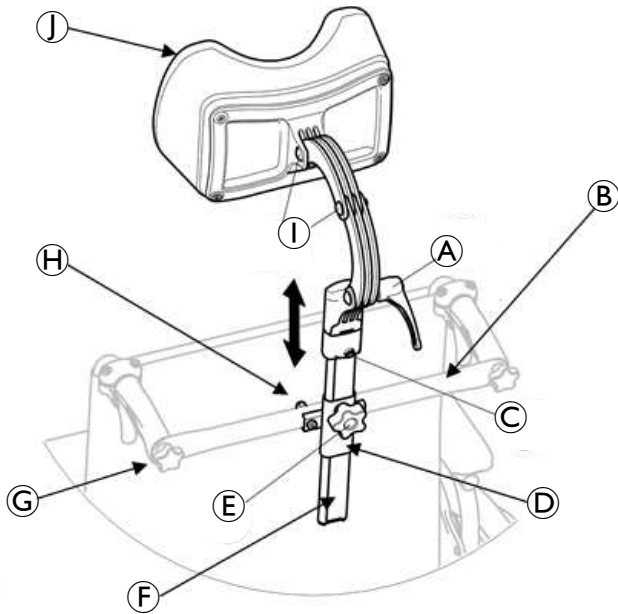


WARNING!

Risk of injury or damage

- After ANY adjustments, repair, or service and before use, ensure all attaching hardware is fitted and tightened securely.

Installing headrest



1. Install the back brace (B). Refer to 3.3.10 *Installing removing the standard back brace*, page 11.
2. Set the headrest bracket (D) (mounting bolts (H), headrest bracket and the hand wheel (E)) in the fixing holes on the standard back brace tube (C).
3. Introduce the vertical tube (F) that support the headrest cushion (I) into the headrest bracket.
4. Adjust to the appropriate height position with the user sat into the chair, tighten the hand wheel.
5. Adjust the headrest cushion (depth and angle position) and tighten securely the screws (I) and the handle (A).

3.8 Anti-tip devices



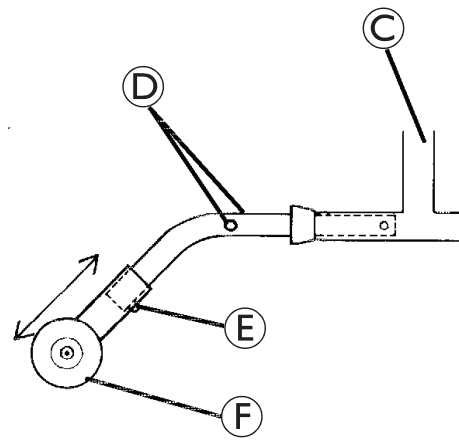
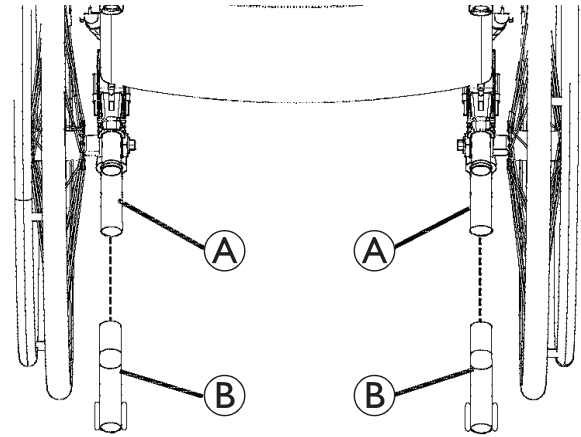
WARNING!

Risk of injury or damage

- After ANY adjustments, repair or service and BEFORE use, ensure all attaching hardware is tightened securely.
- Anti-tip device MUST be attached always. Anti-tip devices are optional on this wheelchair (you may order it with or without the anti-tip device). We strongly recommend ordering the anti-tip device as an added safeguard for wheelchair users.
- Anti-tip device MUST be fully engaged and release buttons fully protruding out of adjustment holes.
- Ensure both anti-tip devices are adjusted to the same mounting hole.

3.8.1 Installing simple anti-tip devices

Installing simple anti-tip devices



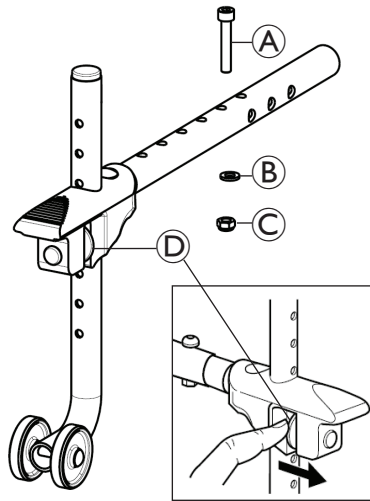
1. Press the release button (D) and, with the wheels pointing towards the ground, insert the anti-tip device (B) and (E) into the rear frame tubing (A) and (C) until the front release button snaps into the frame hole.
2. The closer the anti-tip device is to the ground, the more effective it is. Whenever possible, position the anti-tip device as close to the ground as possible.



NOTICE!

- Make sure that the anti-tip device wheel (F) is ALWAYS located outside the rear wheel volume (50 mm minimum). Refer to the image in the section 3.8.3 *Adjusting anti-tip devices*, page 25.

3.8.2 Installing adjusting anti-tip devices with tipping aid



1. Press the release buttons on the wheeled portion of the anti-tip device and slide it up or down to adjust the clearance.
2. Check to make sure that the release buttons are fully engaged in adjustment holes.

1. Insert anti-tip devices with the anti-tip wheels pointing toward ground/floor into the rear frame tubing until the anti-tip device vertical hole appears in the frame vertical hole.
2. Secure the anti-tip device with the mounting set (screw **A**), washer **B** and locking nut **C**) to the wheelchair frame.
3. Measure the distance between the bottom of the anti-tip device wheels and the ground/floor.

! NOTICE!

- A 50 mm clearance between the bottom of the anti-tipper wheels and the ground/floor **MUST** be maintained always.

4. If the distance between the bottom of anti-tip device wheels and the ground/floor is not 50 mm, adjust anti-tip devices by pushing down the large washer **D** (see enlarged image inset).

3.8.3 Adjusting anti-tip devices



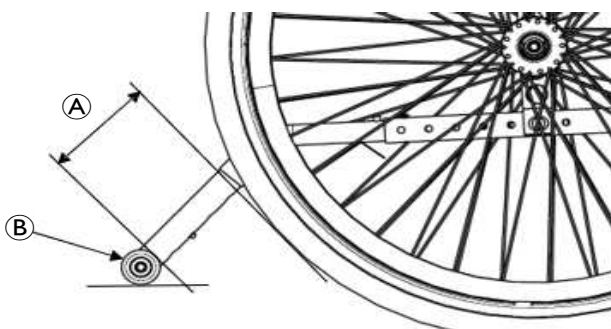
WARNING!

Risk of injury or damage

- Make sure that the anti-tip device wheel is **ALWAYS** located outside the rear wheel volume.
- An anti-tip device that is too far from the ground may result in the chair tipping over backward causing serious injury or property damage.

! NOTICE!

- Make sure that the anti-tip wheel **B** is **ALWAYS** located outside the rear wheel volume (50 mm minimum). See image below **A**.



4 Maintenance

4.1 Safety information



WARNING!

Some materials deteriorate naturally over time. This could result in damage to wheelchair components.

- Your wheelchair should be checked by a specialist dealer at least once a year or if it has not been used for a long period.



Your Invacare® specialist dealer can provide help in carrying out regular maintenance. To find an authorized specialist dealer near you, contact the Invacare® distributor for your country (end of this document).

4.2 Stability warning

The seat height, seat depth, back angle, seating system/ upholstery, size/ position of the rear wheels, size/ position of the front castors, seating options (e.g. headrest, back bag, ...) as well as the user condition directly relate to the stability of the wheelchair. Any change to one or any combination of the nine may cause the wheelchair to increase/ decrease in stability.

When changes to the left hand column occur, follow across the chart and refer to the X procedure to maintain the proper stability, safety and handling of the wheelchair.

Castor Position	Seat Height	Seat Depth	Back Angle	Seating System/ Upholstery	Castor Size	Castor Position	Rear Wheel Size	Rear Wheel Position	User Condition	Wheel brakes	Anti-tip devices
Seat Height	-	x	x	x	x	x	x	x	NA	NA	NA
Seat Depth	x	-	x	x	x	x	x	x	NA	NA	NA
Back Angle	x	x	-	x	x	x	x	x	NA	NA	NA
Seating System/ Upholstery	x	x	x	-	x	x	x	x	X	NA	NA
Castor Size	x	NA	x	NA	-	x	x	x	NA	x	x
Castor Position	x	NA	x	NA	x	-	x	x	NA	x	x
Rear Wheel Size	x	NA	x	NA	x	x	-	x	NA	x	x
Rear Wheel Position	x	NA	x	NA	x	x	x	-	NA	x	x
User Condition	x	x	x	x	x	x	x	x	-	NA	NA

Seat-to-floor heights have specific positions depending on rear wheel size, rear wheel position, front castor size/position and seat-to-floor angle.

4.3 Cleaning

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



CAUTION!

Risk of injury

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.



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

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:

- **Cleaning metal surfaces**

Hot water and mild detergent on soft cloth should be use to cleaning 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.

4.4 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 replaced by a skilled person.

4.5 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.

4.6 Maintenance schedule



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

Initial Inspection: Initial adjustments should be made to suit the personal body structure needs and preferences of the user:

Inspect/ Adjust Initially	Weekly	Monthly	12 months	Check
x				Wheelchair rolls straight (no excessive drag or pull to side).
x				Ensure all hardware is tight
x				All fasteners on clothing guards are secure.
x				Arms are secure but easy to release and locking systems engage properly.
x				Adjustable height arms operate and lock securely.
x				Armrest armpad sits flush against arm tube.
x				Seat and/or back upholstery have no rips.
x				Ensure hand grips are secure to backrest canes.
x				Sealed bearings and axle nut tension are correct.
x				No excessive side movement or binding when rear wheels are lifted and spun.
x				Quick-Release axles lock properly (see 3.4.2 <i>Quick-release axles, page 13</i>).
x				Inspect handrims for signs of rough edges or peeling finish.
x				Inspect for broken spokes. Wheel/fork assembly has proper tension when castor is spun.
x				Castor should come to a gradual stop.
x				Wheel bearings are clean and free of moisture.

Inspect/ Adjust Initially	Weekly	Monthly	12 months	Check
x				Loosen/tighten locknut if wheel wobbles noticeably or binds to a stop.
x				Ensure all castor/wheel/fork/head tube fasteners are secure (see <i>1.1 Removing/Installing/Repositioning the Castor Assemblies, page 1</i>).
x				Wheel brakes do not interfere with tyres when rolling.
x				Wheel brakes pivot point are free of wear and looseness.
x				Wheel brakes are easy to engage.
x				Inspect tyres/castors for flat spots and wear.
x				Check pneumatic tyres for proper inflation (recommended tyre pressure is listed on the side wall of the tyre).
x				Ensure axles are free from dirt, lint, etc.
x				Ensure roller bearings are free from dirt, lint, etc.
x				Adjust wheel brakes as tyres wear.
x				Clean and wax all parts
x				Clean upholstery and armrests. Ensure castors are debris free.
	x			Wheelchair rolls straight (no excessive drag or pull to one side).
	x			Quick-Release axles lock properly (see <i>3.4.2 Quick-release axles, page 13</i>).
	x			Inspect for broken spokes. Adjust or replace as necessary.
	x			Wheel/fork assembly has proper tension when castor is spun. Castor should come to a gradual stop.
	x			Inspect tyres/castors for flat spots and wear.
	x			Check pneumatic tyres for proper inflation (recommended tyre pressure is listed on the side wall of the tyre).
	x			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).
	x			Ensure castors are free of debris.
		x		Inspect seat positioning strap for any signs of wear. Ensure buckle latches. Verify hardware that attaches strap to frame is secure and undamaged. Replace if necessary.
		x		Loosen/tighten locknut if wheel wobbles noticeably or binds to a stop.
		x		Wheel bearings are clean and free of moisture.
		x		Wheel brakes do not interfere with tyres when rolling.
		x		Wheel brake pivot point are free of wear and looseness.
		x		Check the tension and appearance of the brake cable.
		x		Ensure all castor/wheel/fork/head tube fasteners are secure (see <i>1.1 Removing/Installing/Repositioning the Castor Assemblies, page 1</i>).
		x		Ensure all hardware is tight.
		x		Ensure hand grips are secure to backrest canes.
		x		Ensure castors are free of debris.
			x	Wheelchair rolls straight (no excessive drag or pull to one side).
			x	Arms are secure but easy to release and locking systems engage properly.
			x	Adjustable height arms operate and lock securely.
			x	Armrest armpad sits flush against arm tube.
			x	All fasteners on clothing guards are secure.

Inspect/ Adjust Initially	Weekly	Monthly	12 months	Check
			x	Seat and/or back upholstery have no rips.
			x	Inspect the backrest attaching hardware and mechanisms are securely tightened.
			x	No excessive side movement or binding when rear wheels are lifted and spun.
			x	Inspect handrims for signs of rough edges or peeling finish.
			x	Inspect side frame and cross brace for signs of cracks, flaked paint or deformed metal work.
			x	Inspect tyres/castors for flat spots and wear.
			x	Check pneumatic tyres for proper inflation (recommended tyre pressure is listed on the side wall of the tyre).
			x	Wheel brake pivot point are free of wear and looseness.
			x	Clean upholstery and armrests.
			x	Sealed bearings and axle nut tension are correct.
			x	Wheel/fork assembly has proper tension when castor is spun. Castor should come to a gradual stop.
			x	Loosen/tighten locknut if wheel wobbles noticeably or binds to a stop.
			x	Wheel bearings are clean and free of moisture.
			x	Wheel brakes are easy to engage.
			x	Change brake cable and readjust the brake tension cable.
			x	Clean Quick-Release axles with a Teflon lubricant.
			x	Ensure axles are free from dirt, lint, etc.
			x	Ensure roller bearings are free from dirt, lint, etc.
			x	Adjust wheel brakes as tyres wear.
			x	Clean and wax all parts.
			x	Ensure castors are free of debris.



CAUTION!
Risk of injury

— Do not use a defective wheelchair.





If you discover damages, contact your Dealer, Technical Service Centre or Invacare service department immediately for technical service. Technical service, is to be carried out by an authorized wheelchair technician or by an Invacare service department.




Only use original parts or those with equal quality fulfilling Invacare's specifications.

4.7 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 damages. Pay special attention to areas close to welds. If damages are 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	<ul style="list-style-type: none"> • Check that the self-gripping strips are intact and can be fixed properly. • Check that the covers are intact and clean, if not see sections: 4.3 <i>Cleaning</i>, page 26 and 4.5 <i>Disinfection</i>, page 27 • If the fabric is torn, replace the cover.

Main parts of the wheelchair	
Carer-operated brakes	<p>Check that the brake function is good, if not:</p> <ol style="list-style-type: none"> 1. Check that the wire is intact, if not, it must be replaced. 2. Check that the wire cover is intact, if not, the wire must be replaced. 3. Adjust the wire at the handle and/or at the wheel hub. 4. Tighten the wire until the optimal brake function is achieved.
Armrests / side rests	Check that the armrests / side rests are intact, they should be easy to detach / attach.
Leg rests	<p>Check that the leg rests are:</p> <ul style="list-style-type: none"> • Easy to detach. • Easy to attach. • Easy to adjust in height and angle.
Anti-tip device	<ul style="list-style-type: none"> • Check that the anti-tip device is easy to adjust and fold. • Check that the screws are tight, if not, re-tighten.
Rear wheels	<ul style="list-style-type: none"> • 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	<p>Check:</p> <ul style="list-style-type: none"> • That the screws on the rear wheel attachment are tight. • That the axle housing is correctly placed. <p>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.</p>
Brakes	<ul style="list-style-type: none"> • Check that the hub brakes work properly on both tyres. • 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. <p> Ensure you have the correct air pressure in the tyres to attain the optimal brake effect.</p>
Castors	<ul style="list-style-type: none"> • 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 therecommended 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	<p>Bolts and other fasteners can come loose due to constant use:</p> <ol style="list-style-type: none"> 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.

Options	
	Note: Lubricate all removable parts with a dry Teflon® based spray, e.g. “Viso 900–B5”.
All fasteners for wear and tightness	<p>Bolts and other fasteners can come loose due to constant use:</p> <ol style="list-style-type: none"> 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.
Headrest	<ul style="list-style-type: none"> • Check that the side-angle adjustment for the “wings” works properly. • Check that the angle adjustment works and that there is a memory function.
Neckrest	<ul style="list-style-type: none"> • Check that the angle adjustment works and that there is a memory function.
“Multi functional” Trunk support	<ul style="list-style-type: none"> • Check that the angle adjustment works properly and that there is a memory function.
Abduction cushion	<ul style="list-style-type: none"> • Check that the depth adjustment works.

Options

Table tray	<ul style="list-style-type: none"> When re-mounting the table tray, try to find the thread manually before fastening the screws with tools. This spare the threading.
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4.7.1 Checklist for reconditioning

	OK	NOTE	SIGN
WASHING			
RECONDITIONING:			
Chassis			
Backrest angle			
Push handles / Push bar			
Backrest cover			
Seat cover			
Seat angle			
Carer-operated brake			
Armrests / Side rests			
Legrests			
Footrests			
Anti-tip device			
Rear wheels			
Rear wheel attachment			
Brakes			
Castors			
Fasteners for wear and tightness			
Headrest			
Neckrest			
Trunk support			
Abduction cushion			
Table tray			
TEST:			
Chair rolls in straight line			
Easy to propel			
DELIVERY CHECK:			
Include a user manual			

5 Troubleshooting

5.1 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.

**CAUTION!**

- Contact your specialist dealer immediately if you notice a fault with your wheelchair, e.g. a significant change in handling.

**CAUTION!**

- Some of the actions listed must be carried out by an authorized specialist dealer. These are indicated. We recommend that all adjustments are carried out by a specialist dealer.

5.2 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	Rear wheels are mounted too far forwards	Mount the rear wheels further back (see 3.4.5 <i>Adjusting the wheelbase length, page 14</i>)
	Back angle too large	Reduce the backrest angle (see 3.3.7 <i>Adjusting the angle adjustable backrest, page 9</i>)
	Seat angle too large	Mount the front wheel higher on the front fork (see 3.4.9 <i>Removing installing repositioning the castor assemblies, page 17</i>)
The brakes are gripping poorly or asymmetrically	Incorrect tyre pressure in one or both rear tyres	Correct tyre pressure
	Brake setting incorrect	Correct the brake setting (see 3.6.1 <i>Adjusting wheel brakes, page 22</i>)
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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Yes, you can.