

Action 2 NG[®]

en **Manual wheelchair
Service Manual**



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



Yes, you can.

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Making Life's Experiences Possible is a registered trademark in the U.S.A.

1 General

1.1 Introduction

This document contains important information about assembly, adjustment and advanced maintenance of the product. To ensure safety when handling the product, read this document and the user manual carefully and follow the safety instructions.

Find the user manual on Invacare's website or contact your Invacare representative. See addresses at the end of this document.

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.

Previous product versions may not be described in this manual's current revision. If you require assistance, please contact Invacare.

For pre-sale and user information, see the user manual.

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

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

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. 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

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

1.4 Limitation of Liability

Invacare accepts no liability for damage arising from:

2 Safety

2.1 General Safety Information



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 accessories 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, refer to your local Invacare catalog or website for available accessories or contact your local Invacare representative. See addresses at the 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 carrying out repairs.



Recommendation

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

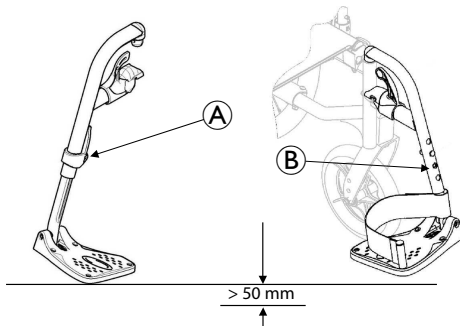
- After each assembly, check that all fittings are properly tightened AND that all parts have the correct function.

3 Assembly

3.1 Front Hangers

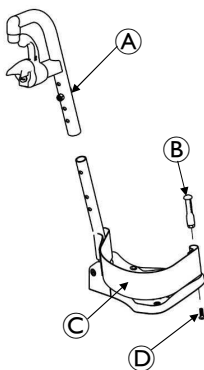
3.1.1 Adjusting the footrest height

1. Remove calf strap, if so equipped.
2. Unscrew locking screw (5 mm Allen Key) or locking bolt (5 mm Allen key and 10 mm Spanner).
3. Position the footrest assembly to the desired height.
4. A 50 mm clearance between the bottom of the footplate and the ground/floor MUST be maintained at all times.
5. If the distance between the bottom of footplate and the ground/floor is not 50mm minimum, adjust footrest tube accordingly.
6. Using the locking screw (M6) with a 5 mm Allen Key or the locking bolt with 5 mm Allen key and 10 mm Spanner, secure the footrest tube to the footrest support.
7. Securely tighten (5 Nm).
8. If necessary, repeat STEPS 2-5 to adjust remaining footrest.
9. Reinstall the calf strap, if so equipped.



Component	Description
(A)	Locking Screw (M6)
(B)	Locking Bolt (M6)

3.1.2 Replacing Heel Strap

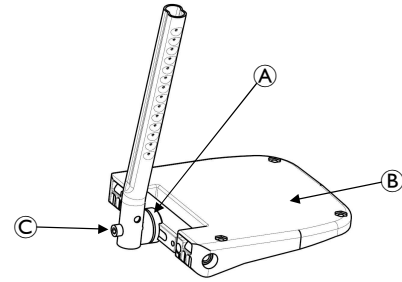


Component	Description
(A)	Tooth Plates
(B)	Angle Adjustable Footplate
(C)	Heel strap
(D)	Mounting Screw (M6)

1. Remove the locking screw (5 mm Allen Key) or locking bolt (5 mm Allen key and 10 mm Spanner) that secure the footrest tube to the footrest support

2. Remove the lower footrest assembly.
3. Remove the mounting screw, strap pin that secure the heel strap to the footplate.
4. Slide heel strap over footrest tube.
 - ⓘ When securing the heel strap to the footrest assembly tighten the mounting screw 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) with a 5 mm Allen key or locking bolt with 5 mm Allen key and 10 mm Spanner, secure the footrest tube to the footrest support.
7. Securely tighten (5 Nm).

3.1.3 Installing Angle Adjustable Footplate



Component	Description
(A)	Tooth Plates
(B)	Angle Adjustable Footplate
(C)	Mounting Screw (M6)

ⓘ This procedure is for individual Angle Adjustable Footrests only.

1. Position the angle adjustable footplate on the footrest support tube at the desired height.
2. Using the locking screw, loosely secure the angle adjustable footplate to the footrest support tube.
 - ⓘ Refer to *Adjusting the legrest height*, page 1
3. Using the mounting screw, adjust to the desired angle (Tooth Plates) by rotating the footplate and depth by sliding the footplate into the tooth plates support.
4. Using the mounting screw (M6), secure the Angle Adjustable Footplate to the footrest tube. Securely tighten (12 Nm).
5. If necessary, repeat STEPS 1-4 to adjust remaining Angle Adjustable Footplate.

3.1.4 Adjusting Elevating Legrest Angle, Height and Calf pad Height/Depth


Adjusting the Legrest Angle

There are nine pre-set positions available for angle adjustment.

1. Loosening the knob and pull it up with one hand while supporting the leg rest with your other hand.
2. Adjust into one of nine pre-set positions, downwards the knob into the desired position and firmly tighten the knob.
3. If necessary, repeat STEPS 1-2 to adjust remaining elevating legrest angle.

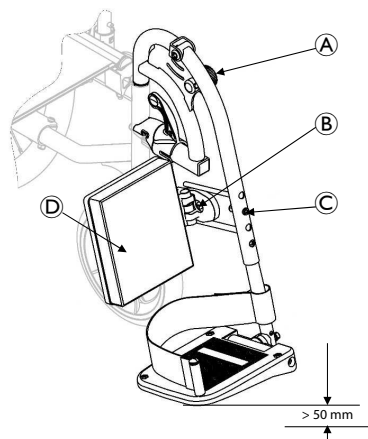
Adjusting the Footplate Height

1. Unscrew locking bolt (5 mm Allen key and 10 mm Spanner).
2. Position the footrest assembly to the desired height.

 A 50 mm clearance between the bottom of the footplate and the ground/floor **MUST** be maintained at all times.

3. If the distance between the bottom of footplate and the ground/floor is not 50 mm minimum, adjust footrest tube accordingly.
4. Using the locking bolt with 5 mm Allen key and 10 mm Spanner, secure the footrest tube to the footrest support. Securely tighten (5 Nm).
5. If necessary, repeat STEPS 2-4 to adjust remaining footrest.

Adjusting Calf pad Depth



Component	Description
Ⓐ	Knob
Ⓑ	Locking Screw B (M6)
Ⓒ	Locking Bolt A (M6)
Ⓓ	Calf pad

1. Remove the Locking Screw Ⓑ that secure the calf pad to the calf pad bracket.
2. Insert Locking Screw Ⓑ through one of three calf pad bracket mounting holes.
3. Using the Locking Screw Ⓑ secure the calf pad to the calf pad bracket.
4. If necessary, repeat STEPS 1-3 to adjust remaining calf pad assembly.


3.2 Armrests

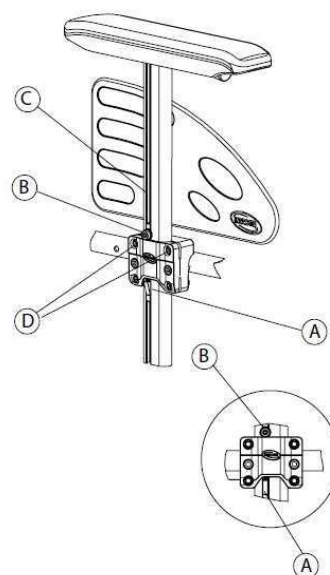


WARNING!

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

3.2.1 Removing/ Installing and Adjusting Removable Armrests (n°1)

 To remove the removable armrest, reverse this procedure.

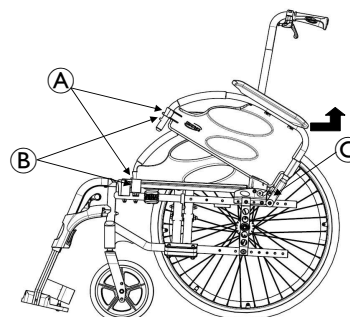


1. Previously press on the locking mechanism Ⓐ located at the bottom of the armrest vertical bracket (if so equipped).
2. Pull /Push the armrest by the arm cushion out of the holder.
3. To adjust how easy or difficult it is to pull/push the armrest out of the holder, change the degree to which the 4 screws Ⓓ (M6) are tightened.

3.2.2 Adjusting removable armrest Height

1. Remove the removable armrest. Refer to 3.2.1 *Removing/ Installing and Adjusting Removable Armrests (n°1), page 6.*
2. Loosen the screw Ⓑ (M6) in the groove of the armrest tube.
3. Move the armrest upwards or downwards until you reach the desired height, while keeping screw Ⓑ (M6) in place (at the top edge of the holder).
4. Tighten firmly the screw Ⓑ (M6).
5. Perform the setting on both sides.
6. Reinstall the removable armrest. Refer to 3.2.1 *Removing/ Installing and Adjusting Removable Armrests (n°1), page 6*

3.2.3 Removing/ Installing Swing Away Armrests (n°2)



Self Propulsion version

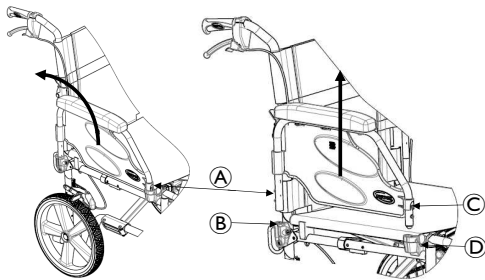
Component	Description
Ⓐ	Push Pin
Ⓑ	Dog point
Ⓒ	Rear pivot socket

Removing Swing Away Armrest

1. Unlock existing armrest assembly by operate the push pin.
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.
4. Repeat STEPS 1-3 for opposite side of wheelchair, if necessary.

Installing Swing Away Armrest

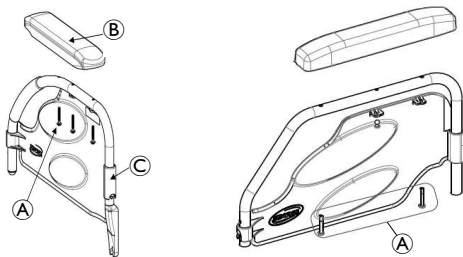
1. If necessary, remove existing armrest assembly as describe above.
2. Install new/ existing armrest assembly, first into the rear pivot socket and into the front arm socket.
3. Lock new/ existing armrest assembly by operate the push pin. Make sure that the dog point is properly engaged in its housing.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



Transit version

Component	Description
(A)	Push Pin
(B)	Rear Dog point
(C)	Push pin
(D)	Front Dog point

3.2.4 Replacing Armrest Arm pad



Self Propulsion version

Transit Version

Component	Description
(A)	Mounting screws (M6)
(B)	Armpad
(C)	Armrest Assembly

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

3.3 Seat / Back

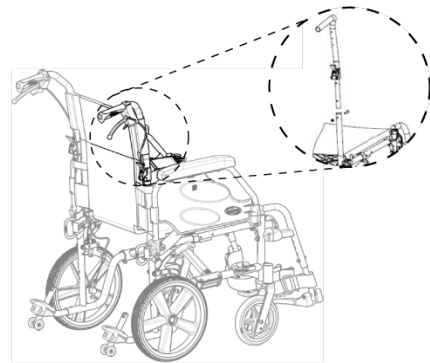


WARNING!

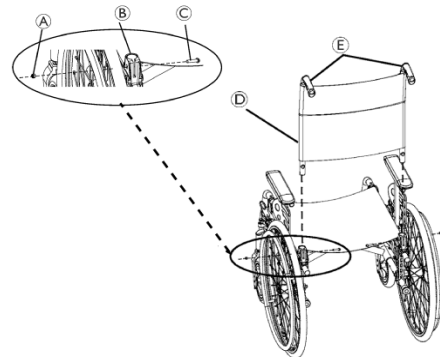
The seat height, seat depth, back angle, seating system, size/position of the rear wheels, size/position of the front castors, seating options (e.g. headrest, back bag, ...) as well as the user condition directly relate to the stability of the wheelchair. Any change to one or any combination of the nine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

3.3.1 Removing Back-Canes



Transit Version




Self Propulsion version

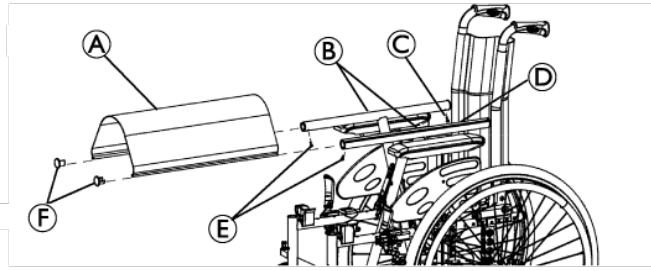
Component	Description
(A)	Locknut
(B)	Back Cane Bracket
(C)	Mounting Screw
(D)	Upholstery
(E)	Back Cane

1. Remove the mounting screw (C) 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 (E).
3. Remove the back canes (E) out of the back-cane brackets (B).

3.3.2 Removing/ Installing Seat Upholstery

Removing Seat Upholstery

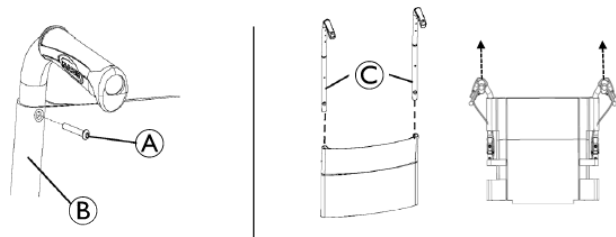
 To install the seat upholstery, reverse this procedure.



Component	Description
A	Seat Upholstery
B	Seat Rails
C	Mounting Screw
D	Mounting Screw (hidden from view)
E	Mounting Screws
F	Endcaps

1. Fold the wheelchair.
2. Remove the mounting screw (Torx) that secures the seat upholstery to the front and back seat rails.
3. Remove the end caps from the front of the seat rails.
4. Slide the seat upholstery out of the seat rails.

3.3.3 Removing/ Installing Standard Back Upholstery




DETAIL "1"

DETAIL "2"

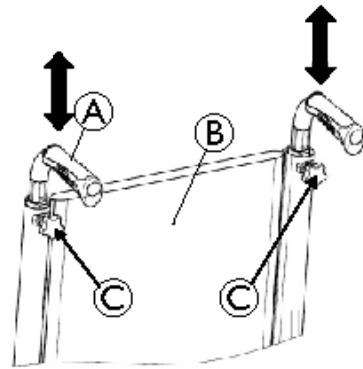
Component	Description
A	Mounting Screw
B	Upholstery Back Cane
C	Back Canes

Removing Back Upholstery



 To Install the Back Upholstery, reverse this procedure.

1. Remove the back-caness. Refer to 3.3.1 *Removing Back-Canes*, page 7 paragraph.
2. Remove the mounting screw that secures the back upholstery to the back-caness. Refer to Detail "2".
3. Remove the back upholstery from the back-caness. Refer to Detail "2".

3.3.4 Installing Angle Adjustable Footplate




Component	Description
A	Back Cane
B	Backrest Upholstery
C	Height Adjustment Knob


1. Loosen, but DO NOT remove, the height adjustment knobs
2. Reposition the back-caness to the desired height.
 -  Both back-caness should be adjusted to the same height.
 -  DO NOT raise push handles to maximum height when tilting the chair.
3. Tighten the height adjustment knobs.

3.3.5 Removing/ Installing different type of Backrests

Folding backrest

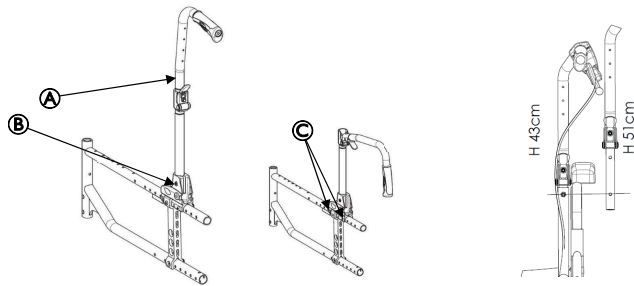
 To Install the Fixed/Folding backrest, reverse this procedure from STEP 3 to 1.

1. Remove the back-cane bracket. Refer to 3.3.6 *Removing/Installing/Adjusting the Back-Cane Bracket*, page 9 paragraph.
2. Pull up on the seat upholstery.
3. Remove the two mounting screws and locknuts (M6) that secure the back-cane bracket to the wheelchair frame.
4. Install the new set including the appropriate backrest upholstery.

 Both back-caness should be set to the same adjustment hole.

Transit version

Backcaness are designed for 2 backrest heights: 430/510 mm. For a backrest height setting 510 mm, a seat cushion may be recommended for a good back support.



Self Propulsion version


Transit version

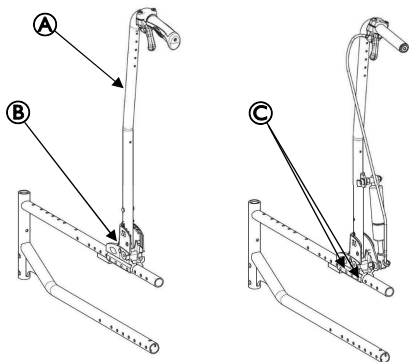
Component	Description
(A)	Backrest Cane
(B)	Back-Cane Bracket
(C)	Mounting Scre

Recliner backrest (Mechanical and Gas strut versions)

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

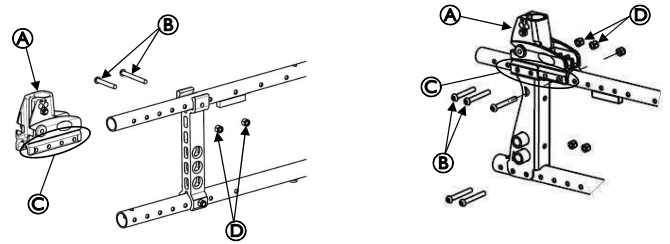
1. Remove the back-cane bracket. Refer to 3.3.6 *Removing/Installing/Adjusting the Back-Cane Bracket, page 9.*
2. Pull up on the seat upholstery.
3. Remove the two mounting screws and locknuts that secure the back-cane bracket to the wheelchair frame.
4. Install the new set including the appropriate backrest upholstery.

 Both back-canes should be set to the same adjustment hole.




Component	Description
(A)	Backrest Cane
(B)	Back-Cane Bracket
(C)	Mounting Scre


3.3.6 Removing/Installing/Adjusting the Back-Cane Bracket



Component	Description
(A)	Back-Cane Bracket
(B)	Mounting Screws
(C)	Adjustment Holes
(D)	Locknuts


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

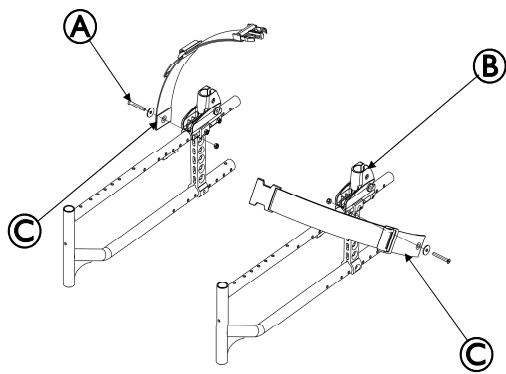
1. Remove the back-canes. Refer to 3.3.1 *Removing Back-Canes, page 7.*
2. Pull up on the seat upholstery.
3. Remove the two mounting screws and locknuts that secure the back-cane bracket to the wheelchair frame.
4. Do one of the following:
 - **To Remove:** the back-cane bracket by sliding it off the back of the wheelchair frame.
 - **To Adjust:** slide the back-cane bracket to one of the four adjustment holes on the bracket.

 Both back-canes should be set to the same adjustment hole.

3.3.7 Installing/Removing Seat Posture Belt

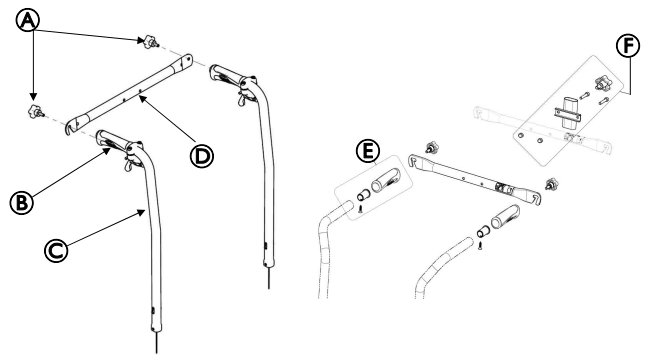
1. Remove seat cushion from wheelchair, if necessary.
2. Remove the mounting screw and locknut that secures the seat posture belt half to the back-cane bracket.
3. Repeat STEP 2 for opposite side, if necessary.
4. Do one of the following:
 - To install the seat posture belt, proceed to STEP 6.
 - Remove the existing seat posture belt from the wheelchair.
5. Engage the two halves of the new seat posture belt.
6. Align the mounting holes on the back-cane bracket and one end of the new seat posture belt.
7. Secure the new seat posture belt to the wheelchair frame with one mounting screw (M6) and washer. Tighten securely (3-4 Nm)
8. Repeat STEPS 6 and 7 for the opposite side of the seat posture belt.
9. Reinstall seat cushion onto wheelchair, if necessary.

 Seat upholstery removed for clarity.



Self Propulsion version


Component	Description
(A)	Mounting Screw (M6)
(B)	Back-Cane Bracket
(C)	Seat Posture belt Half

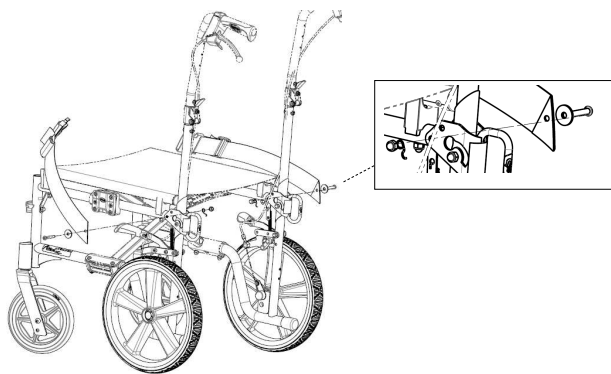


Self Propulsion version

Transit Version

Component	Description
(A)	Mounting bolts
(B)	Handle
(C)	Back-Canes
(D)	Back brace
(E)	Insert + Handle
(F)	Head support brackets (if so equipped)

 This procedure is for individual Angle Adjustable Footrests only.




Transit Version

3.3.8 Installing/ Removing the Back Brace



WARNING!

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 - otherwise injury or damage may occur.

 To remove the back brace, reverse this procedure.

1. Remove the end caps from the back-canes.
2. Remove the handles from the back-canes (Cut the handle lengthwise thanks to a sharp tool).
3. Install the inserts into the canes.
4. Secure the inserts with mounting screws.
5. 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)
6. Align the back brace ends with the handles of the back-canes.
7. Secure the back brace to the back-canes with the mounting bolts.

3.4 Armrests Rear Wheels/ Front Castors



WARNING!

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 - otherwise injury or damage may occur.

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

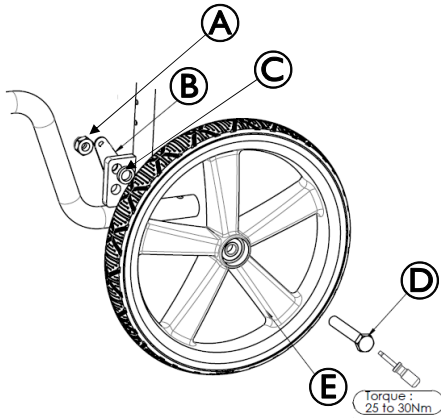
Removing rear wheels

1. 12"; remove the fixed axle, washers and locknut that secure rear wheel to the axle bracket. Remove existing rear wheel from the wheelchair.
2. Install new/existing rear wheel onto wheelchair. Refer to Transit versions paragraph.
3. 24" or 22"; remove the complete wheel and the axle bracket from the side frame. Refer to Removing/Installing Rear Wheels paragraph.


Transit version

1. Install fixed axle through the wheel, spacer, frame, and washer.
2. Securely tighten with the existing fixed axle locknut. Torque to 25 Nm.
3. Fixed and adjust the transit brake with its brake hardware, adjust the distance between the brake shoe and the wheel see *Chapter 3.6.1 Adjusting Wheel Brakes, page 16.*
4. If necessary, repeat STEPS 1-3 for opposite rear wheel.

 Both Axle brackets should be set at the same position. Head of bottom mounting screws needs to be on the outside position.

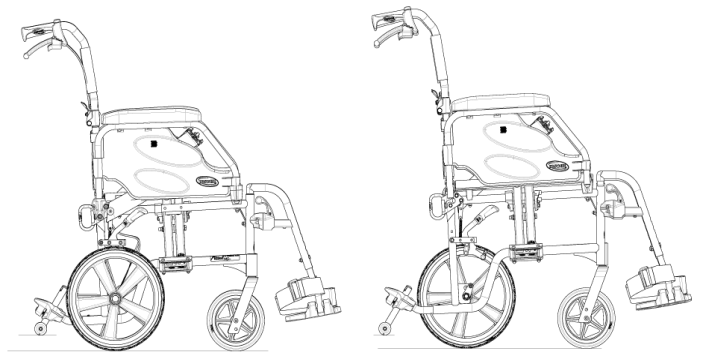
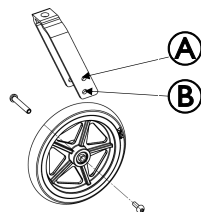
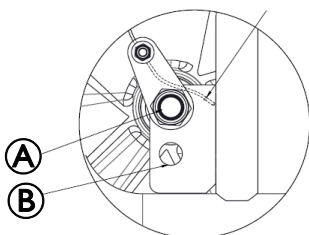


Component	Description
A	Locknut
B	Washer
C	Spacer
D	Axle
E	Wheel

 To obtain the desired front seat to floor height (for details, see Seat-to Floor Height paragraph), it will be necessary to perform one or both of the following:

- Changing the mounting position on the fork. Refer to *Removing/Installing/Repositioning the Castor Assemblies.*
- Changing the rear height positioning. Refer to the table below.

Seat Angle 3°	Rear Wheel	Front Castor
Seat Height	12"	7"
485 mm	A	A
510 mm	B	B



H 485

H 510

3.4.2 Quick-Release Axles

Removing

1. Hold the centre of the rear wheel and push in the tip of the quick release axle. Pull the quick release axle and rear wheel out of the axle bracket on the wheelchair frame.
2. Push in the tip of the quick release axle again and pull the quick release axle out of the existing rear wheel.
3. Install new/existing rear wheel onto wheelchair. Refer to *3.4.1 Removing/Installing Rear Wheels, page 10.*



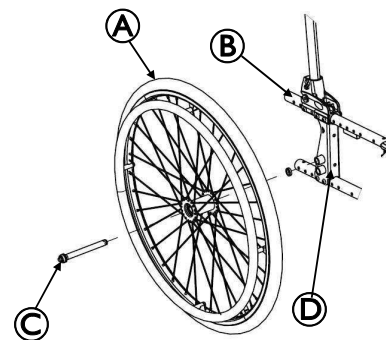
WARNING!

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

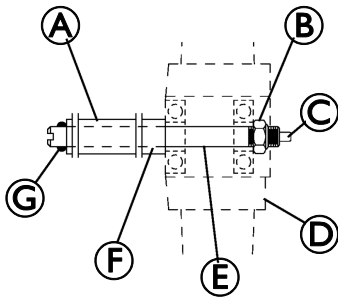
1. Install the existing quick release axle through the new/existing rear wheel.3. Refer to *Adjusting Quick Release Axles* paragraph if the locking pins are not protruding past the inside of the axle bushing or there is too much movement of the rear wheel assembly in a back and forth position.
2. Install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



Component	Description
A	Rear wheel
B	Wheelchair Frame

Ⓒ	Quick-Release Axle
Ⓓ	Axle Bracket

3.4.3 Adjusting Quick-Release Axles



Component	Description
Ⓐ	Wheelchair Frame
Ⓑ	Locknut
Ⓒ	Detent Pin
Ⓓ	Rear Wheel Hub
Ⓔ	Quick-Release Axle
Ⓕ	Quick-Release Axle Bracket
Ⓖ	Locking Pin

1. Remove rear wheel and quick release axle from the wheelchair. Refer to 3.4.1 *Removing/Installing Rear Wheels, page 10*.
2. Depress detent pin in the quick release axle and slide the quick release axle through the rear wheel hub.
3. Release detent pin to ensure that the locking pins are fully released.
4. Increase or decrease end play by adjusting the locknut on the end of the quick release axle.

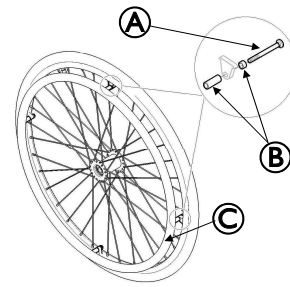


WARNING!

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 10*.
6. Repeat STEPS 4-5 until the quick release Axle Bracket axle detent pins are fully released past the wheelchair frame.

3.4.4 Replacing Handrims



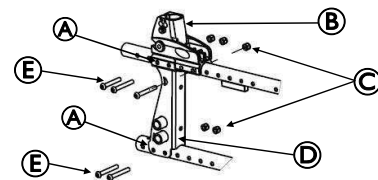
Component	Description
Ⓐ	Mounting screw (M5)
Ⓑ	Plastic spacers
Ⓒ	Handrim



To replace the handrim, use 8 new mounting pre-glued screws (M5)

1. Remove the rear wheel from the wheelchair. Refer to 3.4.1 *Removing/Installing Rear Wheels, page 10*.
2. Remove the mounting screws that secure the existing handrim 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.
6. Reinstall the wheel to the wheelchair. Refer to 1.1 *Removing/Installing Rear Wheels, page 1*.
7. Repeat for the opposite wheel

3.4.5 Adjusting the Wheelbase Length



Component	Description
Ⓐ	Adjustment Holes
Ⓑ	Back-Cane Bracket
Ⓒ	Nuts
Ⓓ	Rear Wheel Support
Ⓔ	Mounting Screws

1. Remove the wheel. Refer to 3.4.1 *Removing/Installing Rear Wheels, page 10*.
2. Remove the (two or four) mounting screws that secure the top and bottom of the axle plate to the wheelchair frame.



CAUTION!

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

3. Align the axle plate with one of (two or four) adjustment holes. There are 2 positions possible:.

- Factory setting for Fixed backrest is Standard position “A”, for Recliner backrest is Passive position “B”. Refer to detail “A”, next page.

Position ①	Fixed backrest
Position ②	Recliner backrest



WARNING!

The (four or two) mounting screws need to be (four or two) adjustment holes apart to maintain frame integrity.

- Respect factory settings related to backrest type (Standard “A” for Fixed, Passive “B” for Recliner), refer to FIGURES 5.6 a and 5.6 b.
- Any change to one or any combination of the 2 positions may cause the wheelchair to increase/decrease in stability.
- Anti-tip device can be fitted to secure the stability if required.

Refer to 3.8 *Anti-Tip devices, page 20.*



When using the last adjustment position, the existing mounting screws needs to be switched to the front of the back-cane bracket. 4. Repeat STEPS 1 to 3 for the other axle plate.



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

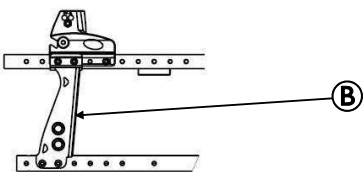
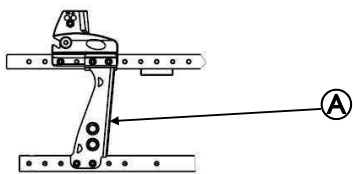


WARNING!

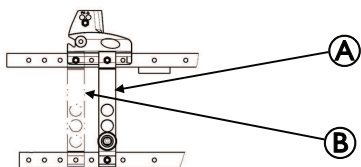
The longitudinal position of the rear wheels axis of the wheelchair compared to the backrest position can affect its stability.

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 safety limits, the decrease in stability can be compensated for by installing an anti-tip device.

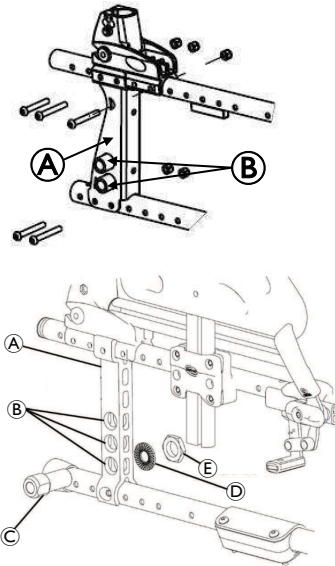


2 Possible Positions of Wheel Plate (four mounting screws)



2 Possible Positions of Wheel Plate (two mounting screws)

3.4.6 Adjusting Rear Wheel Height



Component	Description
①	Axle Plate
②	Adjustment Holes
③	Axle Bracket
④	Washer
⑤	Locknut

1. Remove the rear wheel. Refer to 3.4.1 *Removing/Installing Rear Wheels, page 10.*
2. Remove the locknut and washer that secures the axle bracket to the axle plate needed).
3. Align the axle bracket with one of the two or three adjustment holes on the axle plate.
4. Secure the axle bracket to the axle plate, at the desired height, with the locknut and washer (if needed).
5. Install the rear wheel. Refer to 3.4.1 *Removing/Installing Rear Wheels, page 10*
6. 3.4.1 *Removing/Installing Rear Wheels, page 10*



Both rear wheels should be set at the same position.

3.4.7 Replacing/Repairing Rear Wheel & Front Castor Tire/Tube



CAUTION!

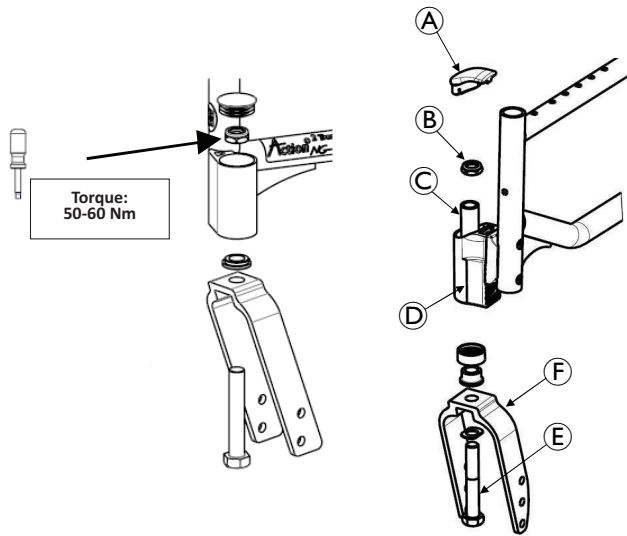
As with any vehicle, the wheels and tires should be checked periodically for cracks and wear, and should be replaced when necessary.

3.4.8 Adjusting Fork



WARNING!

Castor angle vertical axis **MUST** be at 90° +/- 1° from the ground, if not a flattering risk may occur. Both caster assemblies should be at the same angle. After **ANY** adjustments, before use, make sure all attaching hardware is tightened securely - otherwise injury or damage may occur.



Transit Version

Self Propulsion Version

Component	Description
(A)	Dust Cover
(B)	Locknut
(C)	Specific Bearing
(D)	Castor Housing
(E)	Vertical Axle
(F)	Fork

1. Remove the dust cover from the caster housing
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 rotate freely, if not change the upper specific bearing.
3. Adjust locknuts to appropriate torque (50-60 Nm) with a 19 mm socket wrench; do not over tight the locknut, you may risk damaging the bearings.
4. Test wheelchair for maneuverability.
5. Snap dust cover into the caster housing.
6. Perform STEPS 1 to 5 on the other side.

3.4.9 Removing/Installing/Repositioning the Castor Assemblies



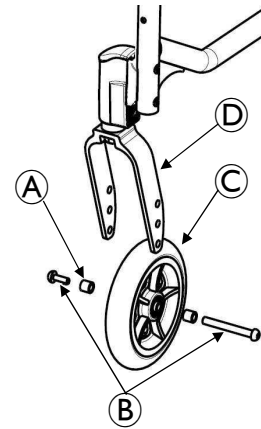
If replacing a front castor note the mounting position of the existing front castor for installation of the new front castor.



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 16 to determine the front castor position needed for the required front seat-to-floor height.



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



Component	Description
(A)	Axle Spacers
(B)	Mounting Bolt
(C)	Wheel
(D)	Fork

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. Refer to *Chapter 3.4.10 Adjusting Castor Angle (if so equipped)*, page 14.

3.4.10 Adjusting Castor Angle (if so equipped)



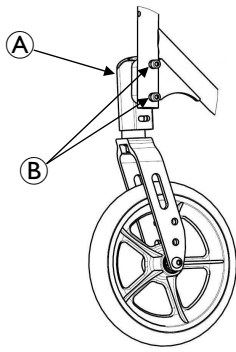
NOTICE!

Fixing screws may only be used once. Always use the dedicated spare parts kit (SP1657713) for castor housing Standard.

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™).



Always refer to the liquid thread locking adhesive supplier's recommendations before applying on the screw.



Component	Description
(A)	Castor Housing Assembly
(B)	Mounting pre-glued Screws

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

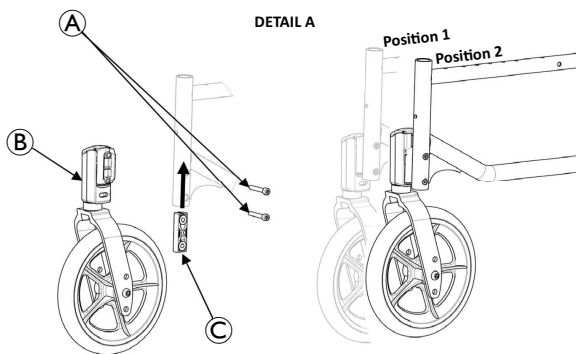
NOTICE!
To adjust the castor angle on both sides, use the spare parts kit (SP1657713) consisted of 4 mounting pre-glued screws (M6x37mm) and 2 attachment plates.

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

! Both castors housing must be set at the same angle.
4. 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.
5. Repeat STEPS 1 to 4 for the other castor housing assembly.

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

3.4.11 Adjusting Castor Height Position (if so equipped)



Component	Description
(A)	Mounting pre-glued Screws
(B)	Castor Housing Assembly
(C)	Plastic Insert

1. Remove the two mounting screws that secure the castor assembly to wheelchair frame.

NOTICE!
To adjust the castor position on both sides, use the spare parts kit (SP1657713) consisted of 4 mounting pre-glued screws (M6x37mm) and 2 attachment plates.

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

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

3. To finalize the assembly, refer to section Adjusting Castor Angle, repeat STEPS 4 to 6.

3.5 Seat To Floor Height

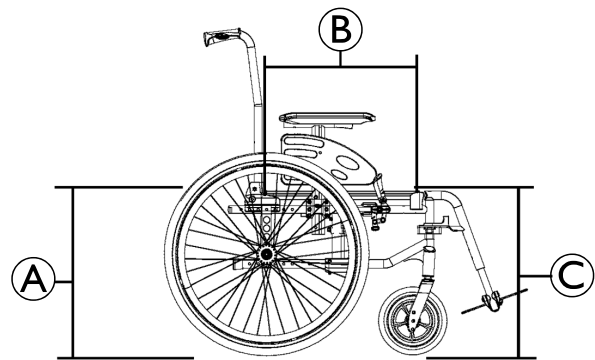
WARNING!
After ANY adjustments, repair, or service and before use, make sure all attaching hardware is tightened securely - otherwise injury or damage may occur.

3.5.1 Seat Angle

! Refer to 3.5.2 *Measuring Seat-to-Floor Height*, page 16 paragraph for measuring instructions.

! Invacare recommends 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 430 mm
(C)	Front Seat-to-Floor Height

Example:

510 mm	Seat-to-Floor Height
- 485 mm	Minus Rear Seat-to-Floor
Height (3° +/-1°)	Equals Seat Angle



WARNING!

Because of the parts mechanical tolerances and all adjustments possible (+/- 1°) the seat angle possible is 3° +/-1° depending of the wheelchair assembly. Refer to 3.5.2 *Measuring Seat-to-Floor Height*, page 16.

3.5.2 Measuring Seat-to-Floor Height



All measurements are in millimetres. The front and rear seat-to-floor heights are approximate to 6.5 mm due to tire wear and air pressure.

Measuring Front Seat-to-Floor Height

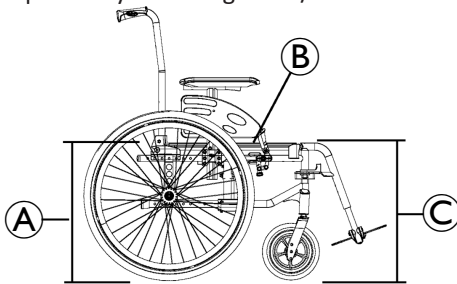
Front Seat-to-Floor Height: Measure the distance between the front of the seat upholstery and the ground/floor.

Measuring Rear Seat-to-Floor Height



The rear seat-to-floor heights are based on pneumatic tires and pneumatic tires with flat free inserts. If wheelchair is equipped with urethane tires, 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.



Component	Description
(A)	Rear Front Seat-to-Floor Height
(B)	Seat Upholstery
(C)	Height Seat-to-Floor

3.5.3 Changing Seat-to-Floor Height



WARNING!

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 Stability Warning table on 1.1 *Suggested Maintenance Procedures*, page 1. Always check castor and rear wheel vertical axis is to 90° +/-1° from the ground.

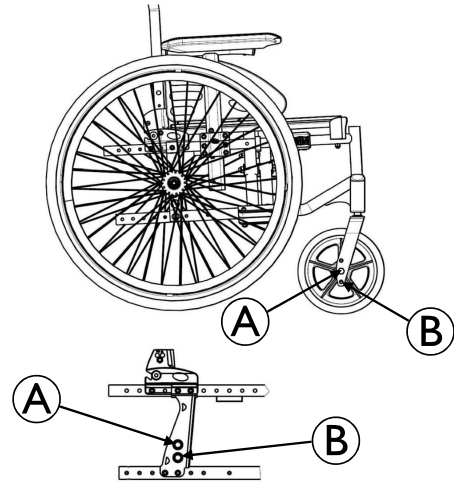


For this procedure, refer to the table to determine adjustment(s) necessary to achieve desired front seat to floor height.



To obtain the desired front seat to floor height, it will be necessary to perform one or both 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 14 paragraph.
- Changing the rear height positioning. Refer to 3.4.6 *Adjusting Rear Wheel Height*, page 13 paragraph.



Seat Angle 3°	Rear Wheel	Front Castor
Seat Height	24"	8"
485 mm	(A)	(A)
510 mm	(B)	(B)



NOTICE!

For more information about CHANGING SEAT-TO-FLOOR HEIGHT of Transit Version, refer to 3.4 *Armrests Rear Wheels/ Front Castors*, page 10.

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

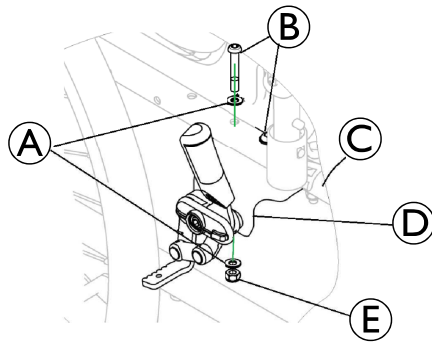


When changing the position of the rear wheels, the wheel brakes MUST be repositioned.



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

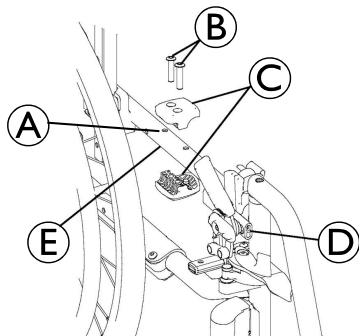
Action 1 R Brake Type



Component	Description
(A)	Washers
(B)	Mounting screws
(C)	Wheelchair frame
(D)	Wheel Brake
(E)	Locknuts

1. Remove the two mounting screws that secures the wheel brake assembly to the wheelchair frame.
2. Remove the wheel brake assembly from the clamp assembly.
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.

Action 2 NG Brake Type



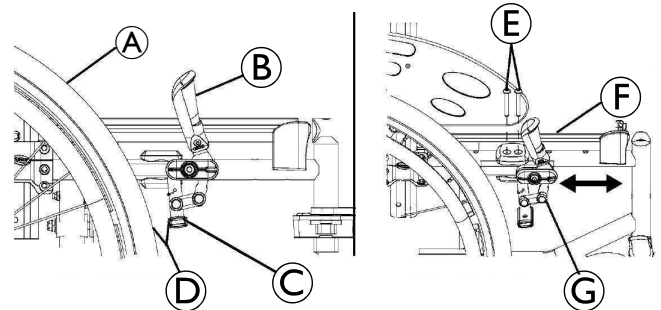
Component	Description
(A)	Frame locate D position
(B)	Mounting screws
(C)	Clamp Assembly
(D)	Wheel Brake
(E)	Wheel Frame

Adjusting Wheel Brake Tension

1. Loosen, but DO NOT remove the set of screws/bolts (Detail –A-) that secure the wheel brake assembly to the wheelchair frame
2. Measure the distance between the wheel brake shoe and the rear wheel.
3. Slide the wheel lock along the wheelchair frame until the measurement is 4 mm for solid tire and for pneumatic.

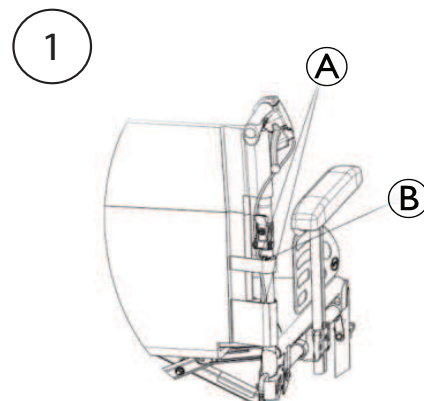
4. Securely tighten the set of screws/bolts (Detail –A-).
5. Repeat STEPS 1-4 for the opposite wheel brake.
6. Engage the wheel brakes and push against the wheelchair to determine if the wheel brakes engage the rear wheels enough to hold the occupied wheelchair.
7. Repeat STEPS 1-6 until the wheel brakes engage the rear wheels enough to hold the occupied wheelchair.

Detail A



Component	Description
(A)	Rear Wheel
(B)	Wheel Lock Handle
(C)	Shoe
(D)	Measure this distance
(E)	Set screws
(F)	Wheelchair frame
(G)	Wheel Brake Assembly

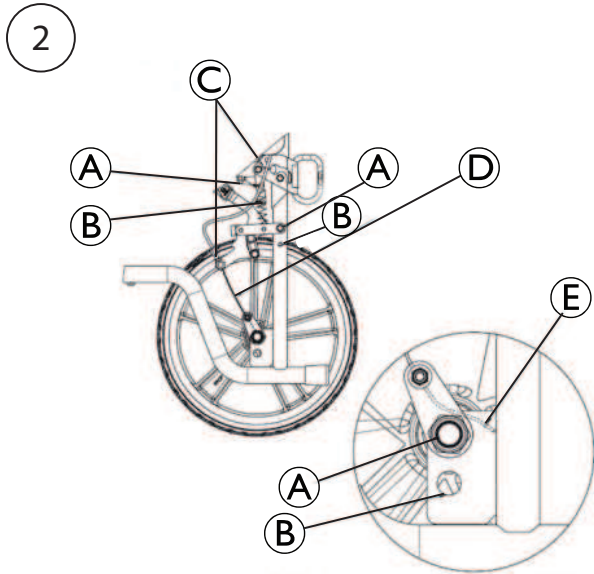
Transit version



1. Assemble Brake handle on backrest tube.
2. Pass the steel wire and shift housing inside two lower buckle of backrest up (A).

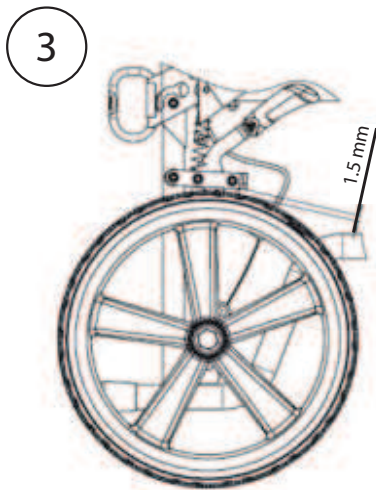
! NOTICE!

Backrest Canne (B) must be assembly with torque 5/6Nm



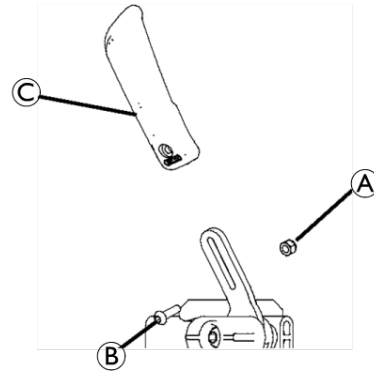
Rep	Seat Height
(A)	485 mm
(B)	510 mm

1. Under the seat pass the cable through the guide then through the sheath stop. (C)
2. After stopping the shift, the wire (D) runs towards the axle of the wheel, and is tightened using the wire clamp on the bracket.
3. Go over the rear wheel nut (E) and leave 10 to 20 mm after the axis, cut and place the protective cap.



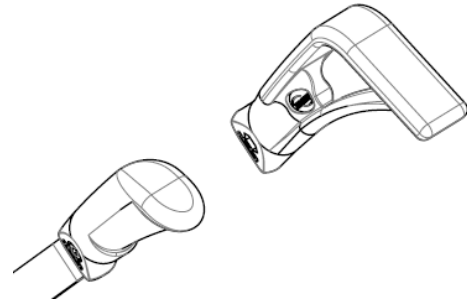
1. Before tightening the wire, make sure the shift are well engaged at the bottom of the stops (Brake handle and sheath stop).
2. Place a brake on unlock position
3. Place a 1.5mm shim between the brake pad and the wheel.
4. Tighten the wire as much as possible, tighten the wire clamp remove the shim, the brake should be adjusted through the sheath stop.

3.6.2 Replacing Wheel Brake Handle



Component	Description
(A)	Locknut
(B)	Mounting screw
(C)	Handle

Brake extension option :



1. Remove the mounting screw and locknut that secures the wheel brake handle to the wheel brake assembly.
2. Remove the wheel brake handle and discard.

3.6.3 Installing/Adjusting Hub Brakes



WARNING!

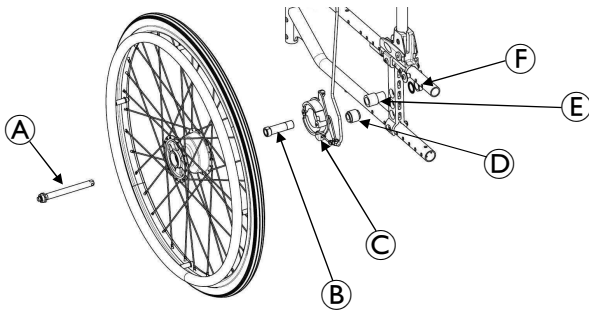
After ANY adjustments, repair, or service and BEFORE use, make sure all attaching hardware is tightened securely - otherwise injury or damage may occur.

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 Hub Brakes




After adjusting or replacing the hub brake assemblies, ensure that the tires are inflated to the recommended BAR, KPa, P.S.I on the side wall of the tire

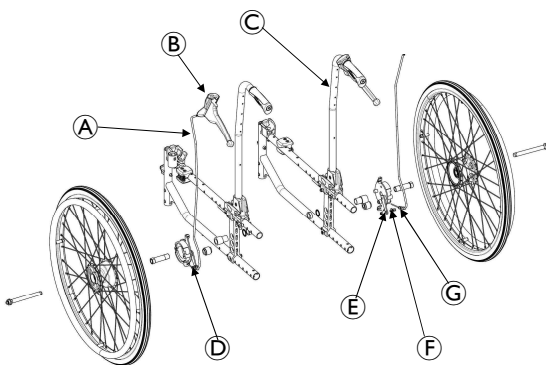


Component	Description
(A)	QR Axle
(B)	QR Axle Bush
(C)	Brake Shoes Support
(D)	Anti - Rotating Spacer
(E)	Spacer HB
(F)	Locknut & Washer

1. Remove the rear wheel. Refer to 3.4.1 *Removing/Installing Rear Wheels, page 10*.
2. Remove the locknut and washer that secures the axle bracket to the axle plate.
3. Thread a brake shoe support on a QR axle bush support then add spacer HB.
4. Present the 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 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.

Installing/adjusting Hub Brake

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



Component	Description
(A)	Cable
(B)	Brake Lever
(C)	Backrest cane
(D)	Brake Shoes Support
(E)	Lever

(F)	Cable Bolt
(G)	Tensional Bolt

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

3.7 Options

3.7.1 Installing/Adjusting Headrest



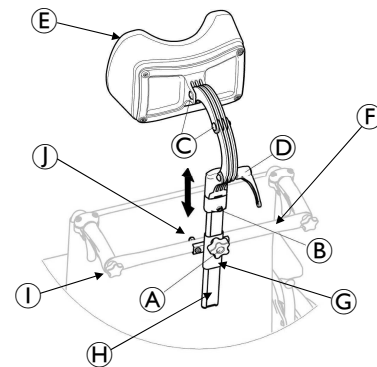
WARNING!

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

— Otherwise injury or damage may occur.

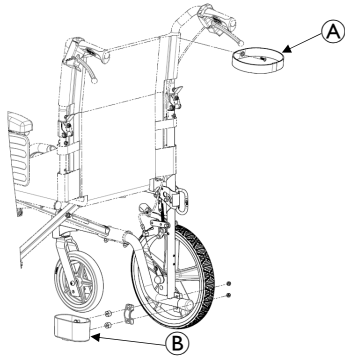
Installing Headrest

1. Install the back brace. Refer to 3.3.8 *Installing/ Removing the Back Brace, page 10*.
2. Set the Headrest bracket (mounting bolts, headrest bracket and the hand wheel (A)) in the fixing holes on the back brace tube.
3. Introduce the vertical tube that support the headrest cushion into the headrest bracket.
4. Adjust to the appropriate height position with the user sat into the chair, tighten the hand wheel (A).
5. Adjust the headrest cushion (depth and angle position) and tighten securely the screws (C) and the handle (D).



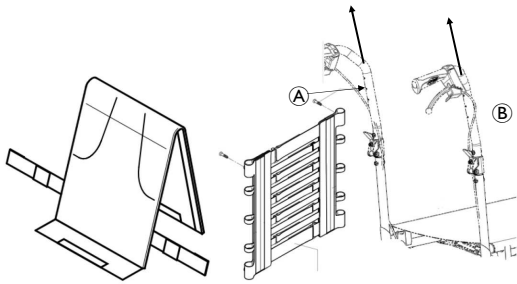
Component	Description
(A)	Tooth Plates
(B)	Angle Adjustable Footplate
(C)	Heel strap
(D)	Mounting Screw (M6)
(E)	Headrest Cushion
(F)	Back Brace
(G)	Headrest Bracket
(H)	Vertical tube
(I)	Hand Screws
(J)	Mounting Bolts

Installing Cane Holder



Component	Description
Ⓐ	Cane holder strap: Fixed with backrest screw.
Ⓑ	Cane holder receiver: Fixed on bottom frame tube

Installing Tension adjustable



Component	Description
Ⓐ	Contour adjustable backrest: Fixed with backrest screw.
Ⓑ	Backcanes should be dismantled And mounted/adjusted according Procedures Section 4.

Installing Cane Holder



Dismount skirtguard, and insert the in rigged part between the skirtguard and the armrest structure, replacing screw M6 by longer ones.

3.8 Anti-Tip devices



WARNING!

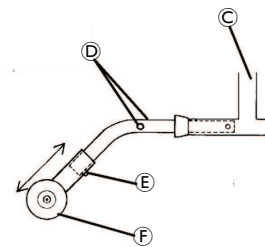
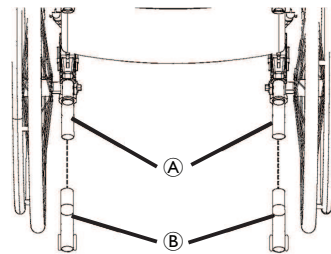
After ANY adjustments, repair or service and BEFORE use, make sure all attaching hardware is tightened securely - otherwise injury or damage may occur.

Anti-tip device MUST be attached always. Since the anti-tip device are an option on this wheelchair (you may order it with or without the anti-tip devices), Invacare strongly recommends ordering the anti-tip device as an additional safeguard for the wheelchair user.

Anti-tip device MUST be fully engaged and release buttons fully protruding out of adjustment holes. Ensure both anti-tip device are adjusted to the same mounting hole.

3.8.1 Installing/Adjusting simple Anti-Tip device

Installing Anti-tip device



Component	Description
Ⓐ	Wheelchair frame
Ⓑ	Anti-Tip devices
Ⓒ	Rear Frame Tubing
Ⓓ	Release Buttons
Ⓔ	Anti-Tip
Ⓕ	Anti-Tip Wheel

1. Press release buttons in and insert anti-tip with the anti-tip wheels pointing toward ground/floor into the rear frame tubing until bottom release button locks in place.

2. Measure the distance between the bottom of the anti-tip wheels and the ground/floor.



WARNING!
RISK OF TIPPING!

Adjust with a clinician the clearance to the user & assistant abilities.

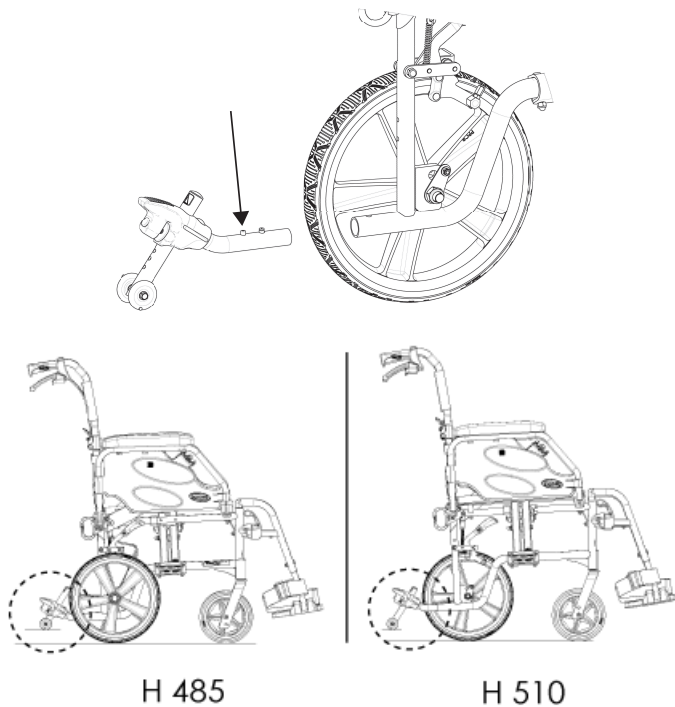
- Recommended clearance between the bottom of the anti-tip wheels and the ground is 30 to 50 mm.
- This clearance could be lower to secure better the user in case of poor stability or use of an add on.

3. If the distance between the bottom of anti-tip wheels and the ground/floor is not 30 to 50 mm, adjust anti-tip devices.



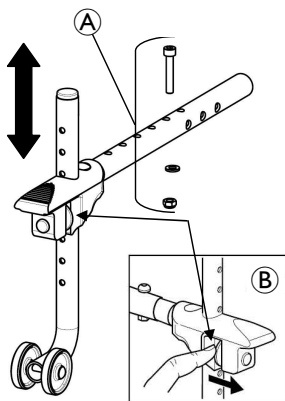
Make sure that the anti-tip wheel is ALWAYS located outside the rear wheel volume (50 mm Minimum); refer to 3.8.3 *Adjusting Anti-Tip devices*, page 21.

3.8.2 Installing/Adjusting Anti-Tip device with Tipping Aid



H 485

H 510



1. Insert anti-tip devices with the anti-tip wheels pointing toward ground/floor into the rear frame tubing until anti-tip device vertical hole appear in the frame vertical hole.
2. Secure the anti-tip device with the mounting set (screw, washer and locking nut) to the wheelchair frame.
3. Measure the distance between the bottom of the anti-tip device wheels and the ground/floor.
4. If the distance between the bottom of anti-tip wheels and the ground/floor is not 30 to 50 mm, adjust anti-tip device by push down the large washer (refer to detail "A").



WARNING!
Risk of tipping!

Adjust with a clinician the clearance to the user & assistant abilities.

- Recommended clearance between the bottom of the anti-tip wheels and the ground is 30 to 50 mm.
- This clearance could be lower to secure better the user in case of poor stability or use of an add on.

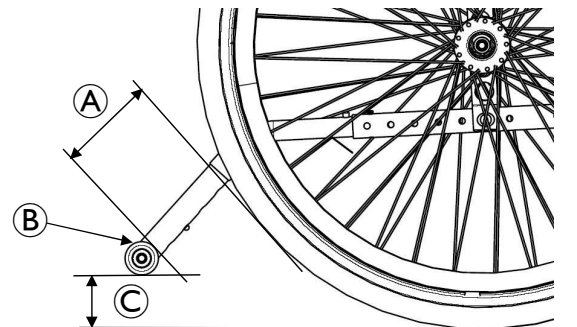
3.8.3 Adjusting Anti-Tip devices



WARNING!

When anti-tip devices are used, anti-tip devices MUST be adjusted to maintain a 30 to 50 mm clearance between the bottom of the anti-tip wheels and the ground/ floor. This spacing should always be checked whenever adjustments/changes are made to the wheelchair.

- Make sure that the anti-tip wheel is ALWAYS located outside the rear wheel volume. Failure to maintain proper spacing may result in the chair tipping over backward causing serious injury or property damage.



1. Press the release buttons on the wheeled portion of the anti-tip device and slide it up or down to achieve the 30 to 50 mm clearance C.
2. Check to make sure that the release buttons are fully engaged in adjustment holes.



Make sure that the anti-tip wheel B is ALWAYS located outside the rear wheel volume (50 mm Minimum) as shown in A.

Component	Description
A	Mounting Set
B	Large Washer

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 Suggested Maintenance Procedures

1. Before using your wheelchair, make sure all nuts and bolts are tight. Check all parts for damage or wear and replace. Check all parts for proper adjustment.
2. Keep quick release axles free of dirt and lint to ensure positive locking and proper operation. Refer to 3.4.3 *Adjusting Quick-Release Axles*, page 12


WARNING!

DO NOT use WD-40, 3-in-1 oil, or other penetrating lubricants on Quick-Release axles.

- Otherwise, binding and/or damage to the wheelchair may occur.

3. Clean quick release axles once a week with a Teflon lubricant. Dry the wheelchair carefully with a cloth after using it in the rain.


WARNING!

DO NOT use your wheelchair unless it has the proper tire pressure (BAR, KPa or P.S.I.).

DO NOT over inflate the tires. Failure to follow these suggestions may cause the tire to explode and cause bodily harm. The recommended tire pressure is on the sidewall of the tire.

4. Recommended tire pressure is listed on the sidewall of the tire (BAR, KPa or P.S.I.).


CAUTION!

As with any vehicle, the wheels and tires should be checked periodically for cracks and wear and should be replaced if damaged.

5. The wheels, castors and tires should be checked periodically for cracks and wear, and should be replaced when necessary.
6. Regularly check for loose spokes in the rear wheels. If loose, have them adjusted.
7. Periodically check handrims to ensure they are secured to the rear wheels. Refer to Replacing Handrims paragraph, in section 5.
8. Periodically check castor wheel bearings to make sure they are clean and free from moisture. Use a Teflon® lubricant if necessary.
9. Check upholstery for sagging, rips, or tears.
10. Clean upholstery with mild soap and water.

4.3 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.

4.4 Cleaning

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

! NOTICE! 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 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.

• 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

4.5 Flat tire


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

4.6 Disinfection

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

-  The Robert Koch Institute has a list of currently approved disinfectants at www.rki.de.

4.7 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 one 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 page 27).
x				Inspect handrims for signs of rough edges or peeling finish.
x				Inspect for broken spokes. q Wheel/fork assembly has proper tension when caster is spun.
x				Caster should come to a gradual stop.
x				Wheel bearings are clean and free of moisture.
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 pages 6 & 33).
x				Wheel brakes do not interfere with tires when rolling.
x				Wheel brakes pivot point are free of wear and looseness.
x				Wheel brakes are easy to engage.
x				Inspect tires/castors for flat spots and wear.
x				Check pneumatic tires for proper inflation (recommended tire pressure is listed on the side wall of the tire).
x				Ensure axles are free from dirt, lint, etc.
x				Ensure roller bearings are free from dirt, lint, etc.

x				Adjust wheel brakes as tires wear.
x				Clean and wax all parts
x				Clean upholstery and armrests. q Ensure castors are free of debris.
	x			Wheelchair rolls straight (no excessive drag or pull to one side).
	x			Quick-Release axles lock properly (see page 27).
	x			Inspect for broken spokes. Adjustment/replacement.
	x			Wheel/fork assembly has proper tension when caster is spun. Caster should come to a gradual stop.
	x			Inspect tires/castors for flat spots and wear.
	x			Check pneumatic tires for proper inflation (recommended tire pressure is listed on the side wall of the tire).
	x			Inspect tires/castors for flat spots and wear. Check pneumatic tires for proper inflation (recommended tire pressure is listed on the side wall of the tire).
	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 tires 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 pages 6 & 33).
		x		Ensure all hardware is tight (see page 6).
		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.
			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 tires/castors for flat spots and wear.
			x	Check pneumatic tires for proper inflation (recommended tire pressure is listed on the side wall of the tire).
			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 caster is spun. Caster 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 tires wear.
			x	Clean and wax all parts.
			x	Ensure castors are free of debris.



Risk of injury

- Do not use a defect 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.

4.7.1 Tires

The ideal pressure depends on the tire type:

The table below shows the tire assortment, check the side of the tire, the maximum pressure is listed there.

Tire
Pneumatic 24 x 1 3/8 x 1 1/4
Pneumatic 24 x 1 3/8
Pneumatic low profile
Low profile PKT (24x1)
Pneumatic block pattern puncture proof
Solid



The compatibility of the tires listed above depends on the configuration and/or model of your wheelchair



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






The size of the tire is mentioned on the sidewall of the tire. The change of appropriate tires must be carried out by a qualified technician/dealer.





CAUTION!

- The tire pressure needs to be equal in both wheels to avoid decreased driving comfort, to keep the parking brakes working properly and to ease propelling of the wheelchair.

4.8 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 section: "Washing" and "Disinfection" • If the fabric is torn, replace the cover.
Seat angle	<p>Check the function by changing the angle from the lower to the upper position.</p> <div style="background-color: #e0e0e0; padding: 5px;">  Risk of damage — The gas piston must not be opened, it contains oil and gas under high pressure. </div>
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, retighten.
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> Note: 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.

Main parts of the wheelchair	
	<ul style="list-style-type: none"> • Check that the screws are tightened. • Test the brake function. When braking, the brake pin should press the tyre down by 5 mm.  Note: Make sure that you have the correct air pressure in the tyres to attain the optimal brake effect.
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 the pressure — recommended max air pressure is 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- and 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.
Trunk support “Multi functional”	<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.
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.

4.8.1 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			

	OK	NOTE	SIGN
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 tire pressure on one rear wheel	Correct tire pressure, → Section "Tires"
	One or more spokes broken	Replace faulty spoke (s), → authorized dealer
	Spokes tightened unevenly	Tighten loose spokes, → authorized dealer
	Front wheel bearings are dirty or damaged	Clean or replace the bearings, → authorized dealer
The wheelchair tips backwards too easily	Rear wheels are mounted too far forwards	Mount the rear wheels further back, → authorized dealer
	Back angle too large	Reduce the backrest angle, → authorized dealer
	Seat angle too large	Mount the front wheel upper on the front fork, → authorized dealer
The brakes are gripping poorly or asymmetrically	Incorrect tire pressure in one or both rear tires	Correct tire pressure, → Section "Tires"
	Brake setting incorrect	Correct the brake setting, → authorized dealer

Fault	Possible cause	Action
Rolling resistance is very high	Tire pressure in rear tires is too low	Correct tire pressure, → Section "Tires"
	Rear wheels not parallel	Ensure the rear wheels are parallel, → authorized dealer
The front wheels wobble when moving fast	Too little tension in front wheel bearing block	Tighten the nut on the bearing block axle slightly, → authorized dealer
	Front wheel has worn smooth	Change front wheel, → authorized dealer
The front wheel is stiff or stuck	Bearings are dirty or faulty	Clean or replace the bearings, → authorized dealer
The wheelchair is very difficult to unfold	Backrest cover is too tight	Loosen the Velcro bands of the backrest cover a little



6 After Use

6.1 Cleaning

- Wipe metal parts and the upholstery regularly with a damp cloth.
- A mild detergent can be used.
- If necessary, the upholstery can be washed at 60° C.
- Ordinary washing powder/liquid can be used.
- For disinfection only use alcohol based detergent.

 Only use water and soft soap to clean the table!


6.2 Washing

1. Remove all loose and removable covers and wash them in a washing machine according to the washing instructions for each cover.
2. Remove all padded parts such as seat cushions, armrests, headrest or neckrest with fixed padded parts, calf pads and so on and clean them separately.
 -  The padded parts can not be cleaned with a high-pressure cleaner or water jet.
3. Spray the wheelchair chassis with detergent, for example a car-cleaning agent with wax, and leave on to work.
4. Rinse the wheelchair chassis with a high-pressure cleaning or ordinary jet of water depending on how dirty the wheelchair is. Do not aim the jet towards bearings and draining holes. If the wheelchair chassis is washed in a machine the water must not be hotter than 60° C.
 -  Only use water and soft soap to clean the table.
5. Leave the wheelchair to dry in a drying cabinet. Remove parts where water has collected for example in end tubes, ferrules etc. If the wheelchair has been washed in a machine, blow-drying with compressed air is recommended.

6.2.1 Multi stretch polyurethane (PU) coated fabric

Lighter stains on the fabric may be neutralized with a soft dampcloth and some neutral detergent. To neutralize larger, more persistent stains, wipe the fabric with alcohol or turpentine substitutes, and wash with hot water and a neutral detergent.

The fabric can be washed at temperatures up to 60° C. Normal detergents can be used.

 All parts of the wheelchair with multi stretch polyurethane (PU) coated fabric upholstery, such as armrest pads, calf pads, headrest or neckrest, should be cleaned according to the instruction above.

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1638510-G 2024-11-05



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