

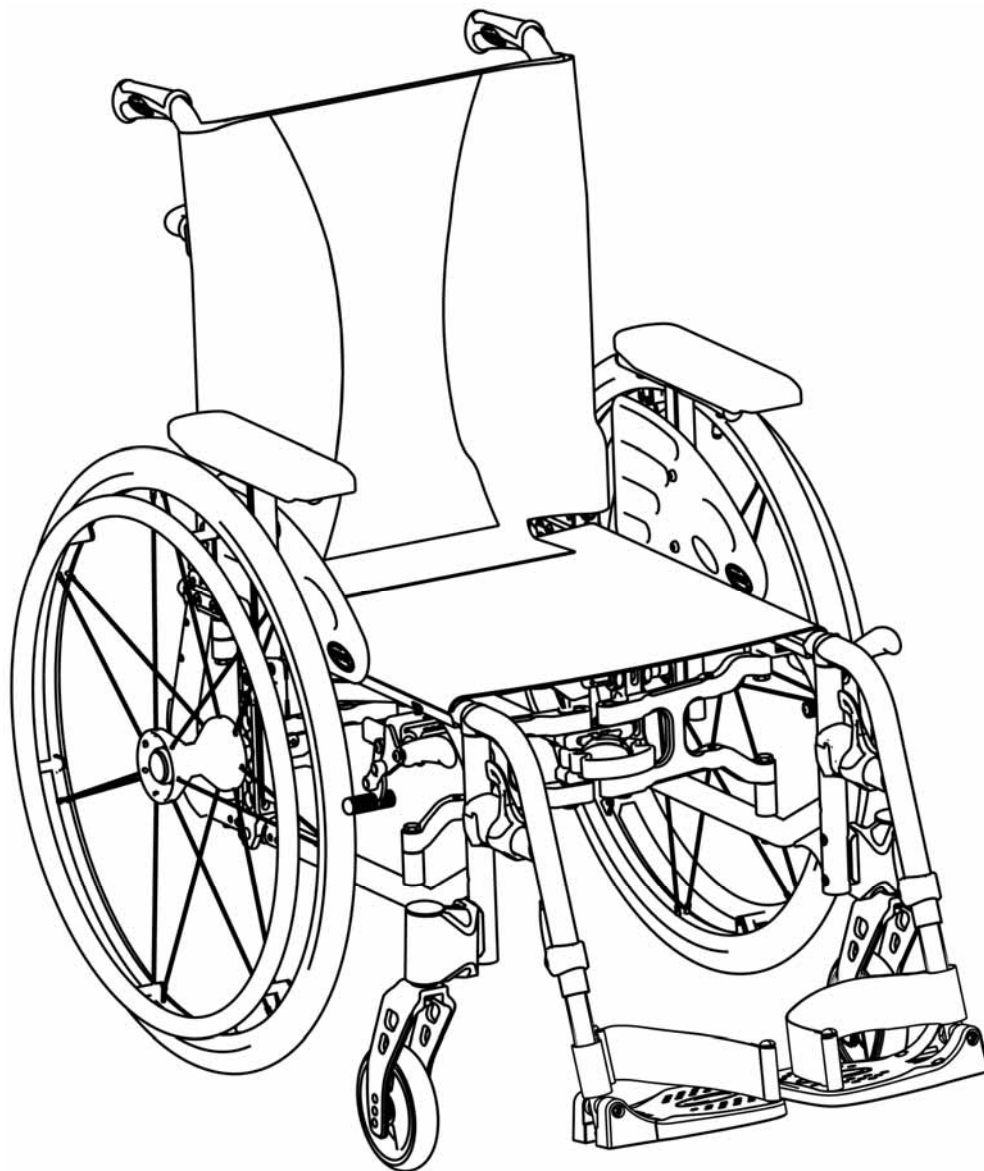
*Invacare<sup>®</sup> Action<sup>®5</sup> & MyOn<sup>®HC</sup>*

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## SERVICE MANUAL

(MAINTENANCE AND ADJUSTMENT)

The procedures in this manual MUST be performed by a qualified technician.



CE

1601503-G

September 2018



**Yes, you can.®**

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# SECTION 1—TROUBLESHOOTING AND MAINTENANCE GUIDELINES

## General Information

### User manual and pre-sales information:

For pre-sales information and user manual related to this wheelchair, please consult the [www.invacare.eu.com](http://www.invacare.eu.com) website.

*NOTE: Please recommend the user to follow the rules mentioned in the User Manual about Maintenance Schedule, Cleaning and Troubleshooting sections.*

## Troubleshooting :

Fault	Possible cause	Action
The wheelchair does not travel in a straight line	Incorrect tire pressure on one rear wheel	Correct tire pressure
	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 adapter plate lower on the side profile, → authorized dealer Select a smaller front fork, → authorized dealer
The brakes are gripping poorly or asymmetrically	Incorrect tire pressure in one or both rear tires	Correct tire pressure
	Brake setting incorrect	Correct the brake setting, → authorized dealer
Rolling resistance is very high	Tire pressure in rear tires is too low	Correct tire pressure
	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

**⚠ CAUTION**

It is compulsory to use original Invacare spare parts which you can obtain from any Invacare authorized dealer. A list of spare parts is available at [www.invacare.eu.com](http://www.invacare.eu.com)

**⚠ WARNING**

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

**⚠ CAUTION**

DO NOT over tighten hardware attaching to the frame. This could cause damage to the frame tubing.

**Tightening torques**

The tightening torques stated in the following table are dependent on the thread diameters for the nuts and bolts for which no special values are determined. All values apply to dry and grease-free threads.

Thread	M4	M5	M6	M8	M10/12
Tightening torque in Nm mini/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!**

**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 [Adjusting Quick Release Axles](#) on section 5.

**⚠ 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.

**⚠ 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, casters 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 on section 5.
8. Periodically check caster 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.

## Stability Warning

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

	SEAT HEIGHT	SEAT DEPTH	BACK ANGLE	SEATING SYSTEM/UPHOLSTERY	CASTOR SIZE	CASTOR POSITION	REAR WHEEL SIZE	REAR WHEEL POSITION	USER CONDITION	WHEEL BRAKES	ANTI-TIPPERS
<i>NOTE: 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.</i>											
<b>SEAT HEIGHT</b>	•	X	X	X	X	X	X	X	N/A	N/A	N/A
<b>SEAT DEPTH</b>	X	•	X	X	X	X	X	X	N/A	N/A	N/A
<b>BACK ANGLE</b>	X	X	•	X	X	X	X	X	N/A	N/A	N/A
<b>SEATING SYSTEM/UPHOLSTERY</b>	X	X	X	•	X	X	X	X	X	N/A	N/A
<b>CASTER SIZE</b>	X	N/A	X	N/A	•	X	X	X	N/A	X	X
<b>CASTER POSITION</b>	X	N/A	X	N/A	X	•	X	X	N/A	X	X
<b>REAR WHEEL SIZE</b>	X	N/A	X	N/A	X	X	•	X	N/A	X	X
<b>REAR WHEEL POSITION</b>	X	N/A	X	N/A	X	X	X	•	N/A	X	X
<b>USER CONDITION</b>	X	X	X	X	X	X	X	X	•	N/A	N/A

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

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## SECTION 2—FRONT HANGERS

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### WARNING

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

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

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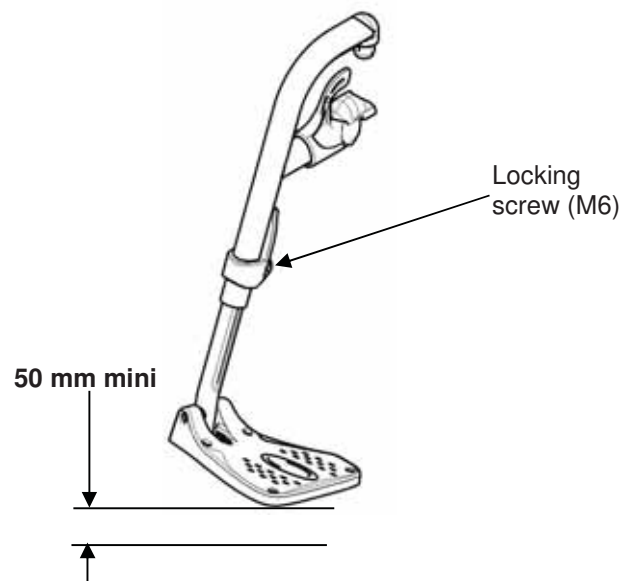
### Adjusting Footrest Height

*NOTE: For this procedure, refer to FIGURE 2.1.*

1. Remove calf strap, if so equipped.
2. Unscrew locking screw (M6).
3. Position the footrest assembly to the desired height.

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

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



**FIGURE 2.1** Adjusting Footrest Height

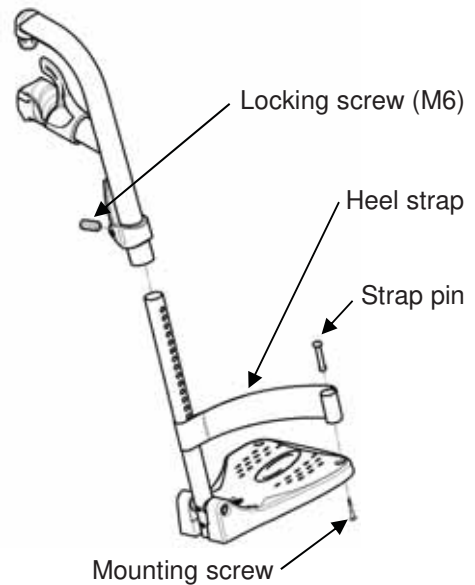
## Replacing Heel Strap

*NOTE: For this procedure, refer to FIGURE 2.2.*

1. Remove the locking screw (M6) 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.

*NOTE: 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), secure the footrest tube to the footrest support.

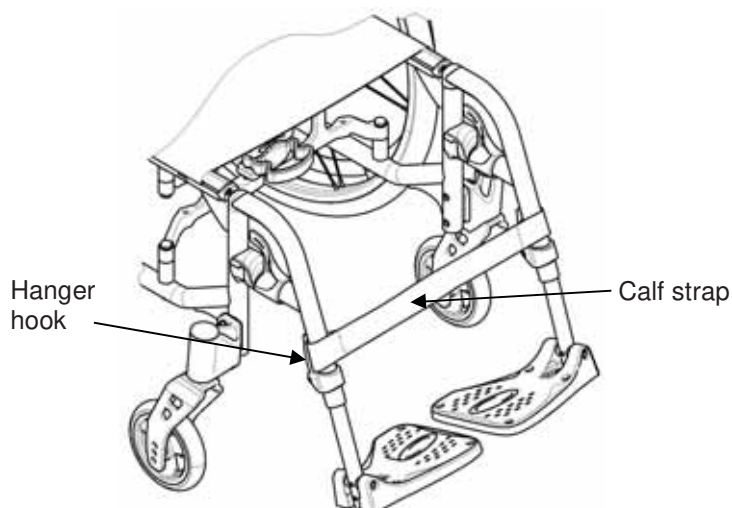


**FIGURE 2.2** Replacing Heel Strap

## Installing Calf Strap

*NOTE: For this procedure, refer to FIGURE 2.3.*

1. Secure the optional calf strap around the hanger hook.



**FIGURE 2.3** Installing Calf Strap



## Installing Angle Adjustable Footplate

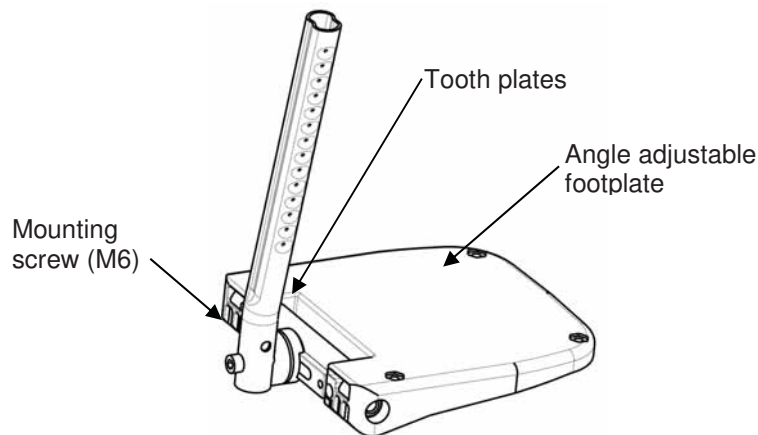
*NOTE: For this procedure, refer to FIGURE 2.4.*

*NOTE: 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 (M6), loosely secure the angle adjustable footplate to the footrest support tube.

*NOTE: Refer to Adjusting Footrest Height paragraph on page 7.*

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.
5. If necessary, repeat STEPS 1-4 to adjust remaining Angle Adjustable Footplate.



**FIGURE 2.4** Installing Angle Adjustable Footplate

## Adjusting Elevating Leg rest Angle, Height and Calf pad Height/Depth

*NOTE: For this procedure, refer to FIGURE 2.5.*

### Adjusting the Leg rest Angle

1. Rotate the indexer lever with one hand while supporting the leg rest with your other hand.
2. When a suitable angle is obtained, let go off the knob and the leg rest will lock into the desired position.
3. If necessary, repeat STEPS 1-2 to adjust remaining elevating leg rest angle.

### Adjusting the Footplate Height

1. Loosen locking screw (M6) securing the slide tube to the elevating leg rest.

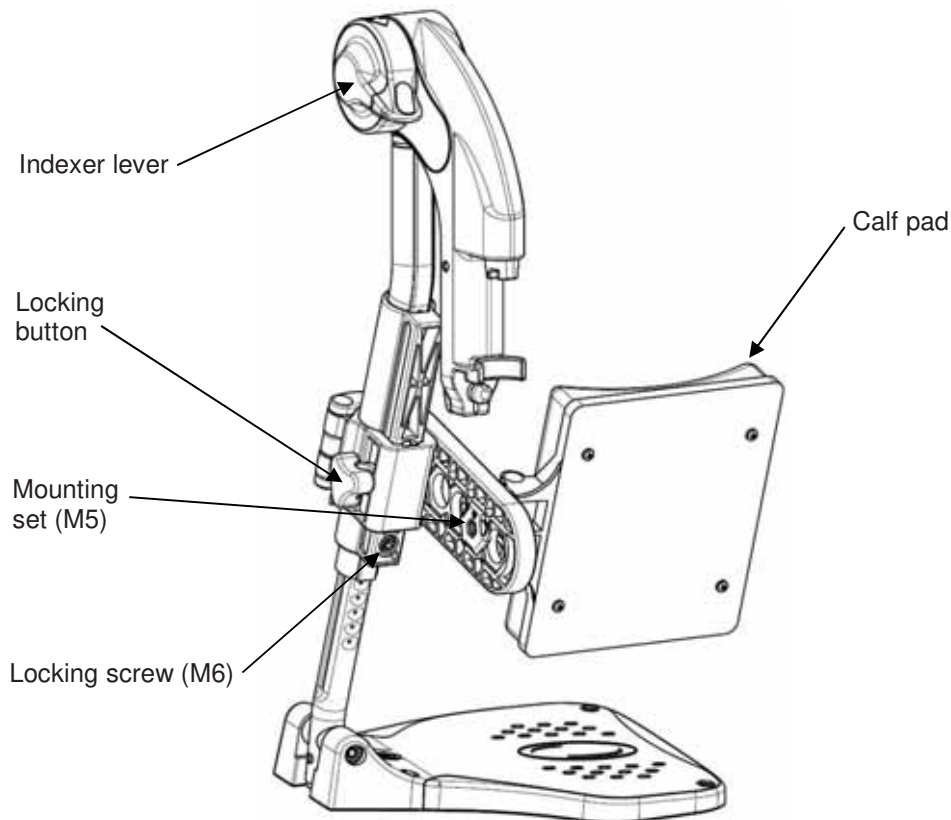
2. Reposition footplate to desired height, securely tighten locking screw (M6).
3. If necessary, repeat STEPS 1-2 to adjust remaining footplate height.

### Adjusting Calf pad Height

1. Loosen the locking button that secure the calf pad bracket to the elevating leg rest 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 leg rest assembly.
4. If necessary, repeat STEPS 1-3 to adjust remaining calf pad bracket.

### Adjusting Calf pad Depth

1. Remove the mounting set that secure the calf pad to the calf pad bracket.
2. Insert mounting set through one of four calf pad bracket mounting holes.
3. Using the mounting set (M5) secure the calf pad to the calf pad bracket.
4. If necessary, repeat STEPS 1-3 to adjust remaining calf pad assembly.



**FIGURE 2.5** Adjusting Elevating Leg rest Height and Calf pad Height/Depth

## SECTION 3—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.

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

*NOTE: For this procedure, refer to FIGURE 3.1.*

### Removing/Installing removable armrest (n°1)

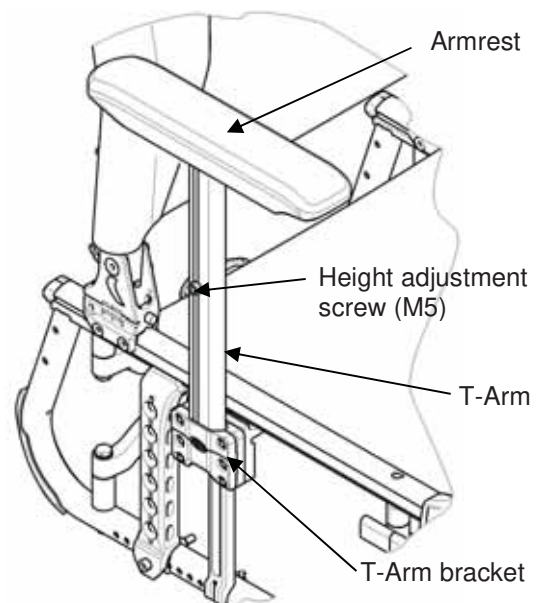
*NOTE: To remove the removable armrest, reverse this procedure.*

1. Align the vertical tube with the socket in the T-Arm bracket on the wheelchair frame.
2. Slide the vertical tube into the T-Arm bracket until the height adjustment screw rests on the top on the T-Arm bracket.

### Adjusting removable armrest Height

*NOTE: For this procedure, refer to FIGURE 3.1.*

1. Remove the removable armrest. Refer to Removing/Installing removable armrest paragraph.
2. Unscrew the Height adjustment screw (M5)
3. Adjust to the desired height adjustment. Secure tightly the Height adjustment screw (M5).
4. Both T-arm should be set to the same position if required.
5. Reinstall the removable armrest. Refer to Removing/Installing removable armrest paragraph.



**FIGURE 3.1** Removable armrest

## Removing/Installing Swing Away Armrests (n°3)

### Removing/Installing Swing Away Armrest (n°3)

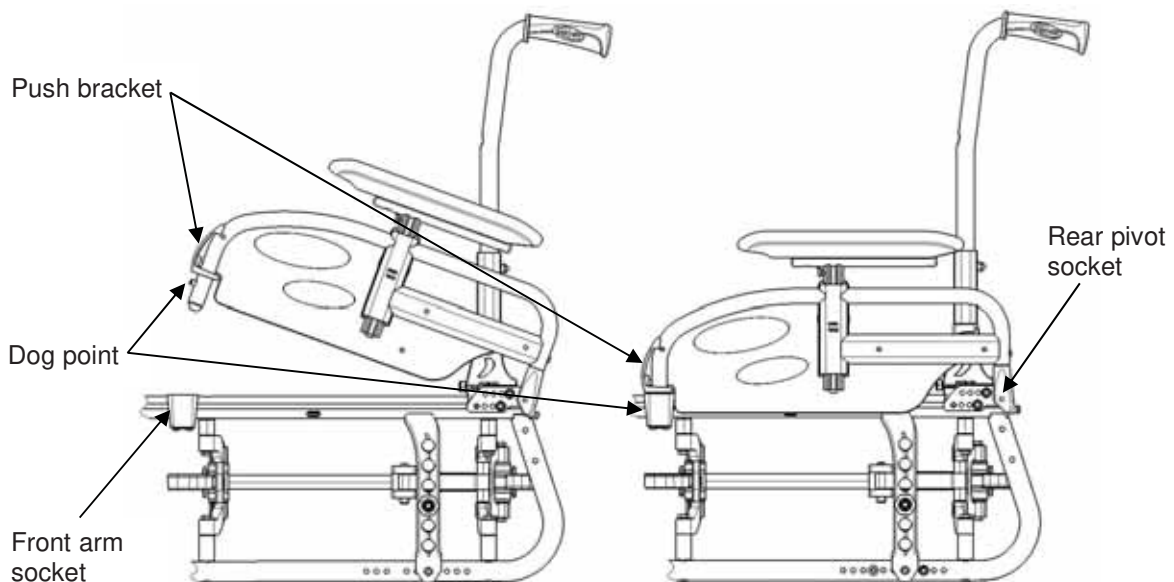
*NOTE: For this procedure, refer to FIGURE 3.2.*

#### Removing Swing Away Armrest

1. Unlock existing armrest assembly by operate the push bracket.
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 bracket. Make sure that the dog point is properly engaged in its housing.
4. Repeat STEPS 1-3 for opposite side, if necessary.

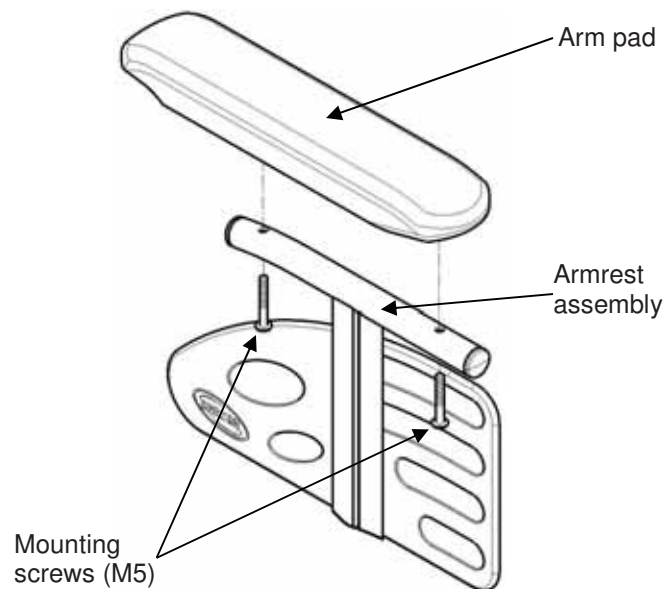


**FIGURE 3.2** Removing/Installing Swing Away Armrest

## Replacing Armrest Arm pad

*NOTE: For this procedure, refer to FIGURE 3.3.*

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



**FIGURE 3.3** Replacing Armrest Arm Pad

---

### WARNING

**After ANY adjustments, repair or service and BEFORE use, make sure all attaching hardware/components are fitted securely - otherwise injury or damage may occur.**

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## Removing/Installing Hand Grips

1. Remove end caps from backrest canes, if present.
2. Remove the hand grips from the back canes (Cut the handle lengthwise thanks to a sharp tool).
3. Install new end caps on backrest canes, if necessary.
4. Install the new hand grips on the back canes (Previously, spray a solution of neutral alcohol inside the handle and settle it immediately on the back cane).
5. Ensure hand grips are settled to the desired position on each side.

*NOTE: Both hand grips should be set at the same position.*

## SECTION 4—SEAT/BACK

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### WARNING

The seat height, seat depth, back angle, seating system, size/position of the rear wheels, size/position of the front casters, seating options (e.g. 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 table on page 6.

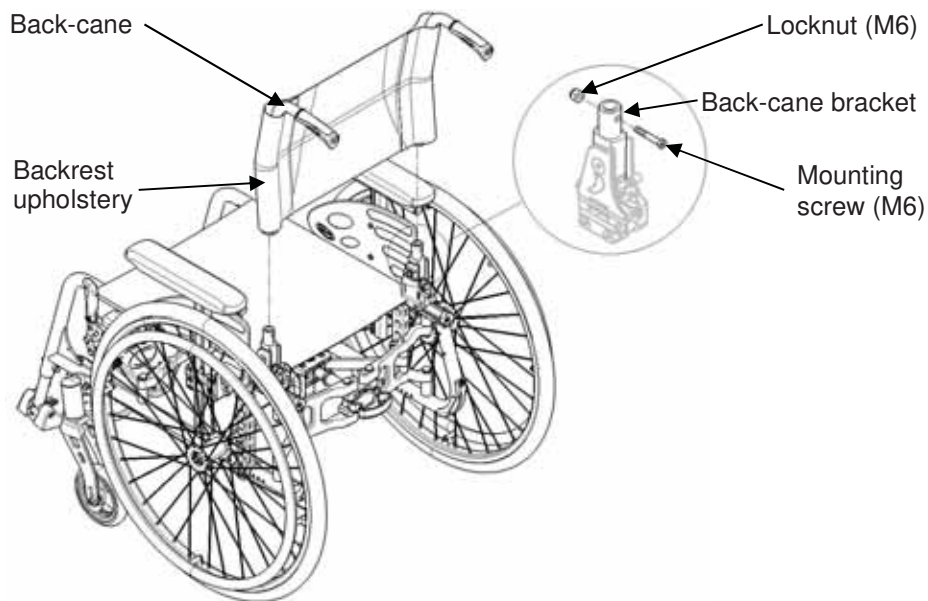
After ANY adjustments, repair or service and BEFORE use, make sure all attaching hardware is tightened securely - otherwise injury or damage may occur.

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### Removing Back-Canes

*NOTE: For this procedure, refer to FIGURE 4.1.*

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



**FIGURE 4.1** Removing Back-Canes

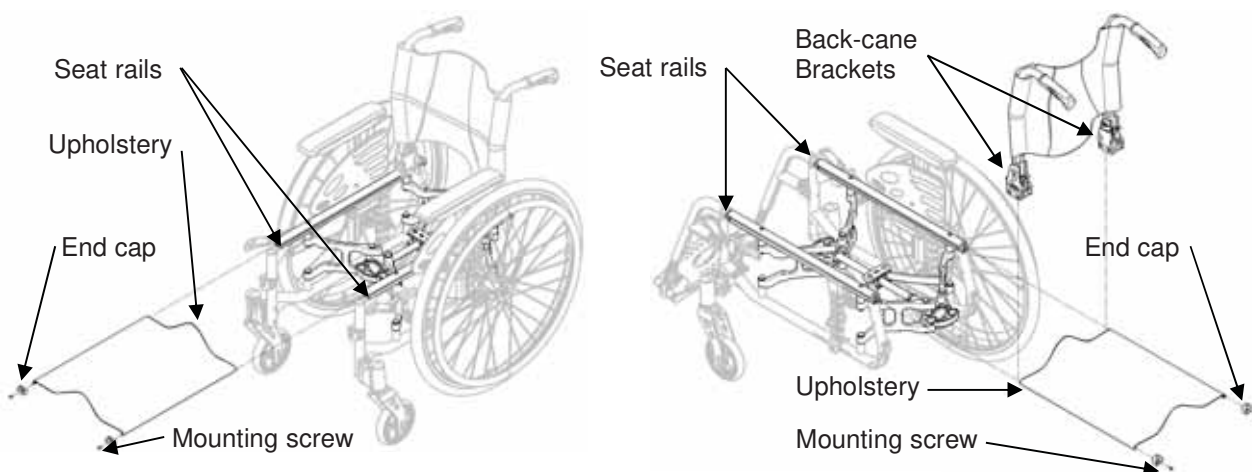
## Removing/Installing/Adjusting Seat Upholstery

*NOTE: For this procedure, refer to FIGURE 4.2.*

### Removing/ Installing Seat Upholstery

*NOTE: To install the seat upholstery, reverse the following procedure*

1. Fold the wheelchair.
2. Remove the mounting screws (T25 Torx key) that secures the seat upholstery to the front and back seat rails.
3. Remove the end caps from the front or the rear of the seat rails (in this case, preliminary dismount the back-cane bracket, refer to figure 4.8).
4. Slide the seat upholstery out of the seat rails on the front or on the rear of the chair.



**FIGURE 4.2** Removing/Installing Seat Upholstery

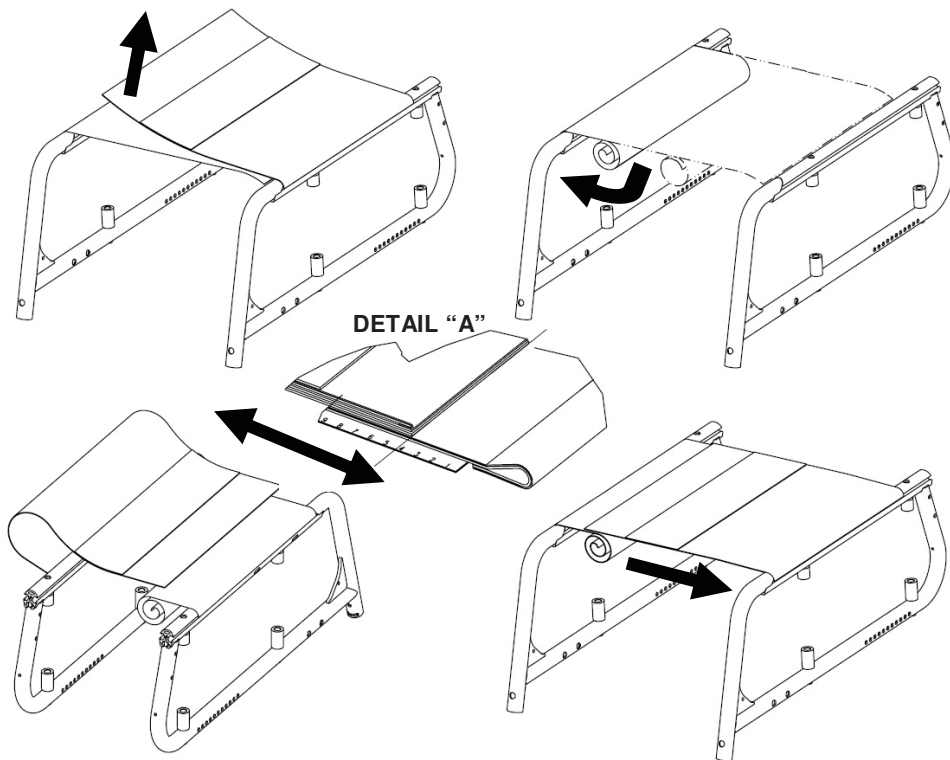
### Adjusting the seat upholstery

*NOTE: for Rigid version, the adjuster strips can be adjusted at various levels of tension to accommodate individual end users, follow the same procedure as per Contour (adjustable) backrest paragraph next pages and refer to FIGURE 4.5.*

*NOTE: for Folding version, refer to the following procedure and FIGURE 4.3 next page.*

*NOTE: Adjust the tension by overlapping more or less the 2 parts of the seat upholstery thanks to Velcro's to obtain an easy movement of the folding mechanism, adjust step by step if necessary.*

1. Unlock the folding mechanism by pushing on the black plastic handle.
2. Separate the 2 parts of the seat upholstery; roll up the lower part.
3. Overlap more or less the upper part, adjust the position thanks to the index label (at the rear of the seat upholstery, detail A); roll out the lower part.
4. Lock the folding mechanism by pulling on the black plastic handle.
5. If the setting is not optimal for the user, repeat STEPS 1 to 4.



**FIGURE 4.3** Adjusting the Seat Upholstery

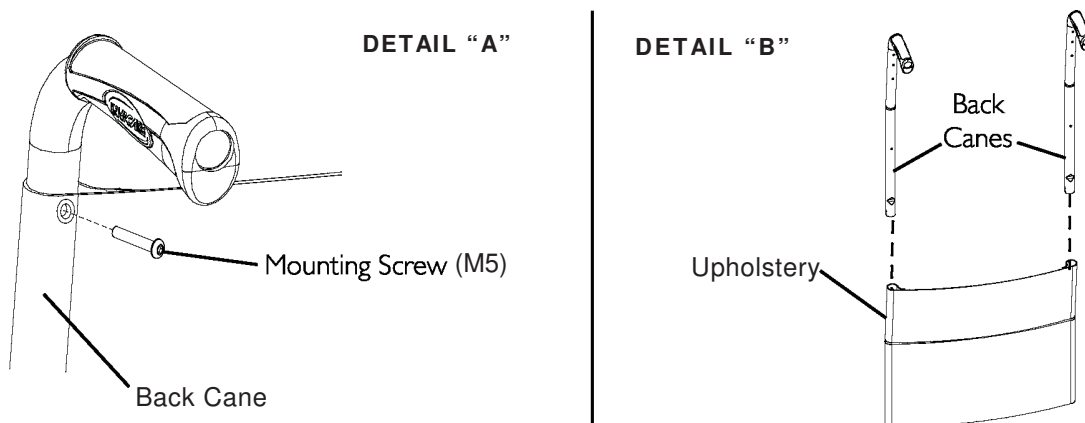
## Removing/Installing Standard Back Upholstery

*NOTE: For this procedure, refer to FIGURE 4.4.*

### Removing Back Upholstery

*NOTE: To Install the Back Upholstery, reverse this procedure.*

1. Remove the back-canes. Refer to Removing Back-Canes paragraph.
2. Remove the mounting screw (M5) that secures the back upholstery to the back-canes. Refer to Detail “A”.
3. Remove the back upholstery from the back-canes. Refer to Detail “B”.



**FIGURE 4.4** Removing/Installing Standard Back Upholstery



## 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

*NOTE: For this procedure, refer to FIGURE 4.5 on page 18.*

#### Installing

1. Remove the existing back upholstery from the wheelchair. Refer to [Removing/Installing Standard Back Upholstery](#) on page 16.
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 with the two mounting screws.

*NOTE: Clean the upholstery with warm water and mild detergent to remove superficial soil.*



**Ensure that the wheelchair is fully opened and the folding mechanism 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 through corresponding anchor loops and adjust the back upholstery. Secure with the fastening strips.
5. Secure the back upholstery cover (fastening strap) to the back of the adjustable back upholstery (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

1. Lift on the existing back upholstery cover and remove the cover from the wheelchair.
2. Remove the two mounting screws 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 from 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.

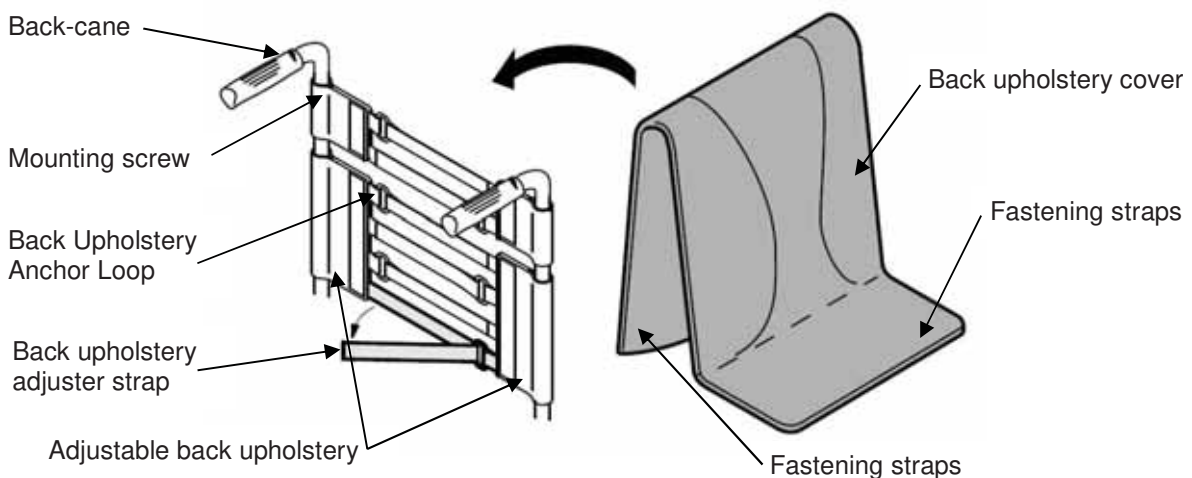
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### WARNING

**Ensure that the wheelchair is fully opened 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 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.



**FIGURE 4.5** Installing/Replacing Contour (adjustable) Back Upholstery

## Adjusting the Height Adjustable Back

*NOTE: For this procedure, refer to FIGURE 4.6.*

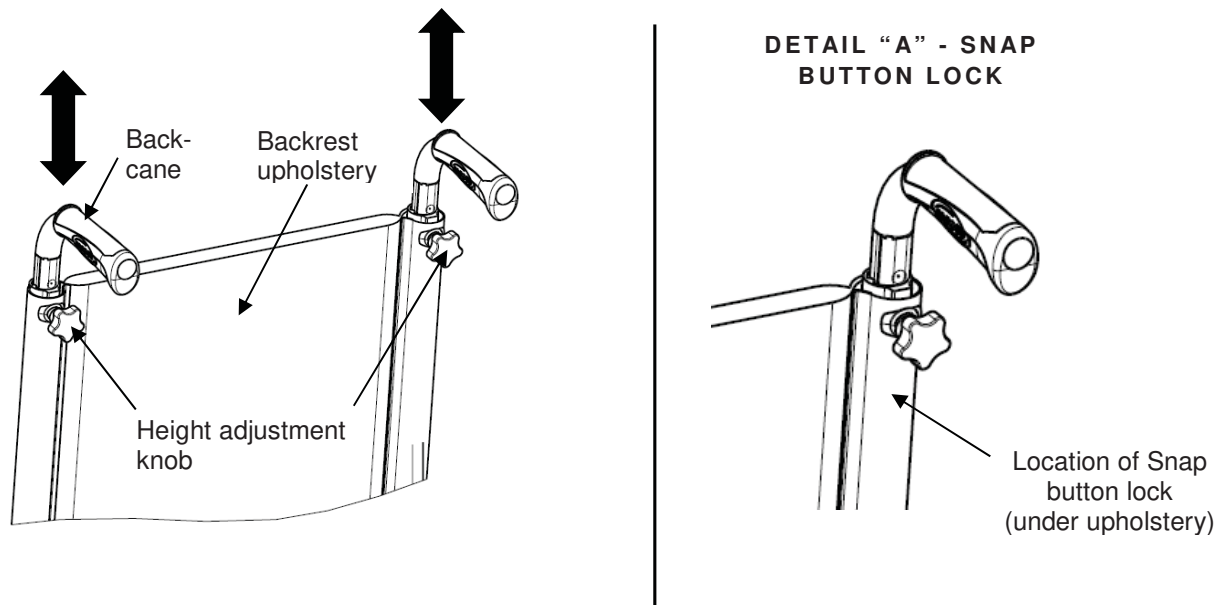
1. Loosen, but DO NOT remove, the height adjustment knobs.
2. Reposition the back-canes to the desired height.

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

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

3. Tighten the height adjustment knobs.

*NOTE: To prevent accidental removal of a back-cane, the spring button lock 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, on the back-cane (Detail "A").*



**FIGURE 4.6** Adjusting the Height Adjustable Backrest cane

## Adjusting the Backrest Angle

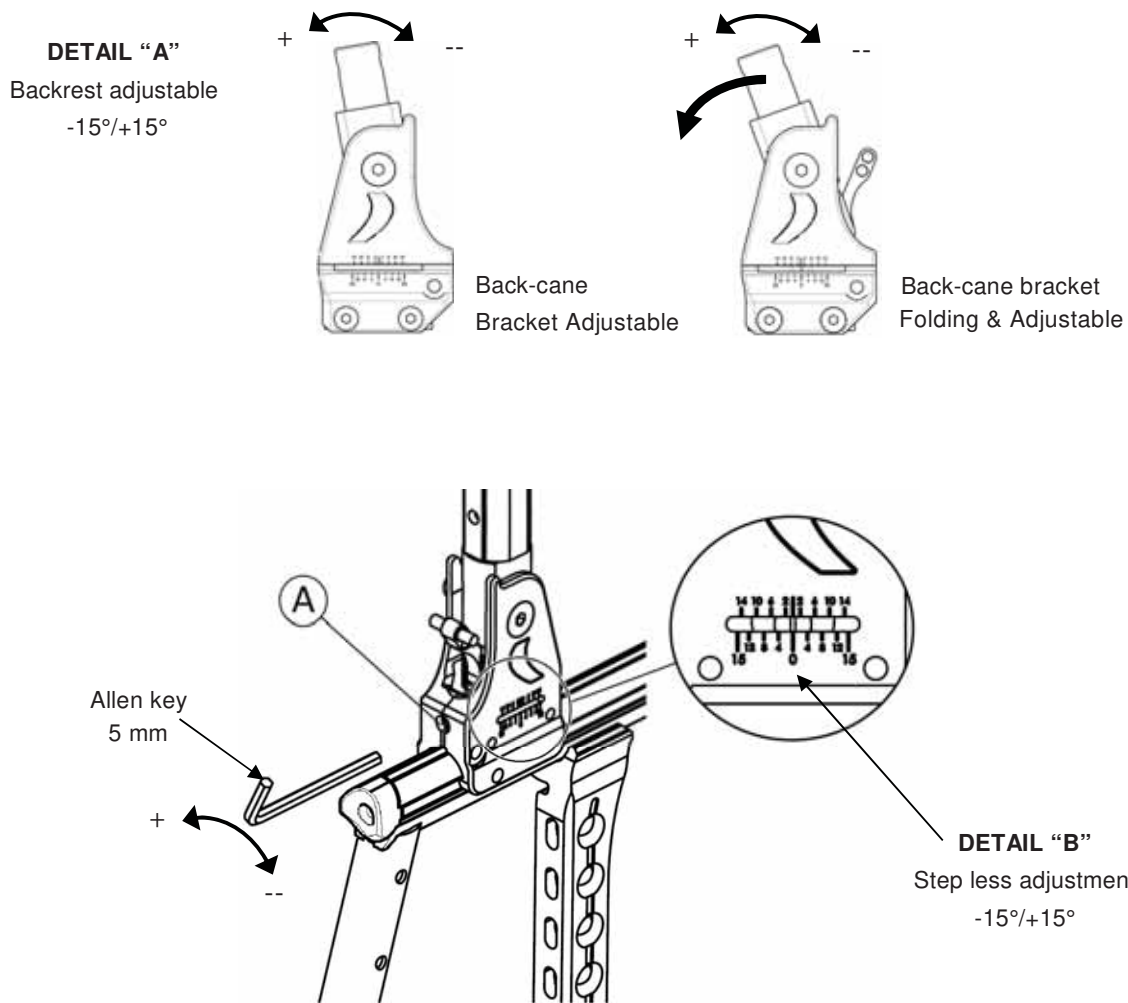
*NOTE: For this procedure, refer to FIGURE 4.7.*

*NOTE: This procedure applies to adjustable angle backs only (refer to detail "A").*

*NOTE: The backrest angle adjusts from  $-15^{\circ}$  to  $+15^{\circ}$  (step less).*

1. Adjust the back angle thanks to the adjustable screw (A).
2. Turn Allen key (5 mm) clockwise to obtain a negative angle.
3. Alternatively, turn Allen key (5 mm) under clockwise to obtain a positive angle.
4. Ensure both adjustment to the desired angle are equal on each side of the Back-Cane Bracket. Refer to Detail "B" of FIGURE 4.7.

*NOTE: Both backrest angle should be set to the same position.*



**FIGURE 4.7** Adjusting the Backrest Angle

## Removing/Installing different type of Backrests

*NOTE: For this procedure, refer to FIGURE 4.1 on page 14.*

### Fixed backrest

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

1. Remove the back-canes. Refer to Removing Back-Cane paragraph.
2. Pull up on the seat upholstery.
3. Remove the two mounting screws and locknuts (M6) that secure the back-cane to the back-cane bracket.
4. Install the new set including the appropriate backrest upholstery

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

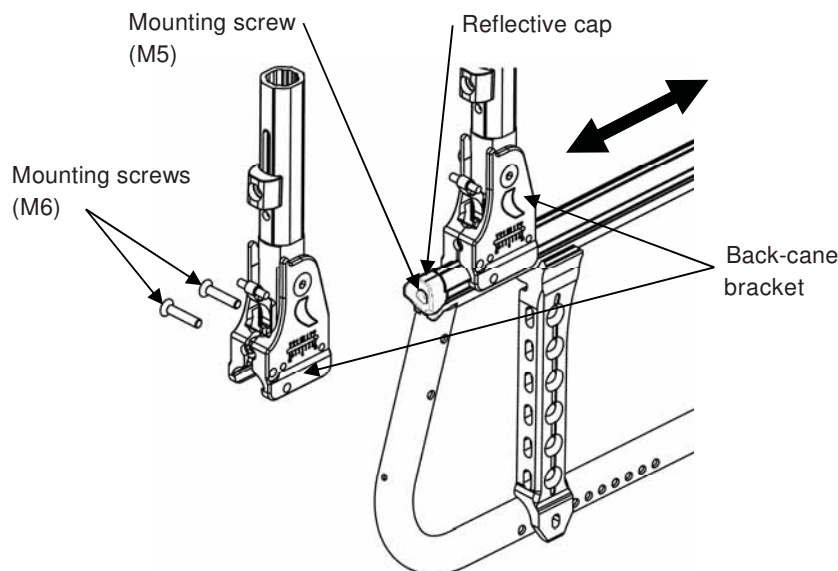
## Removing/Installing/Adjusting the Back-Cane Bracket

*NOTE: For this procedure, refer to FIGURE 4.8.*

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

1. Remove the back canes. Refer to Removing Back-Canes paragraph.
2. Pull up on the seat upholstery.
3. Unscrew the two mounting screws (M6) with T30 Torx key that secure the back-cane bracket to the wheelchair frame.
4. Do one of the following:
  - **To Remove:**
    - 1) Remove the mounting screw (T25 Torx key) that secures the reflective cap on the back of the seat rails
    - 2) Remove the back-cane bracket by sliding it off the back of the wheelchair frame.
  - **To Adjust:**
    - 1) Slide the back-cane bracket to the desired position to the wheelchair frame.
    - 2) Tighten (12-14 Nm) the two mounting screws (M6) with T30 Torx key that secure the back-cane bracket on the frame.

*NOTE: Both back-canes bracket should be set to the same position.*



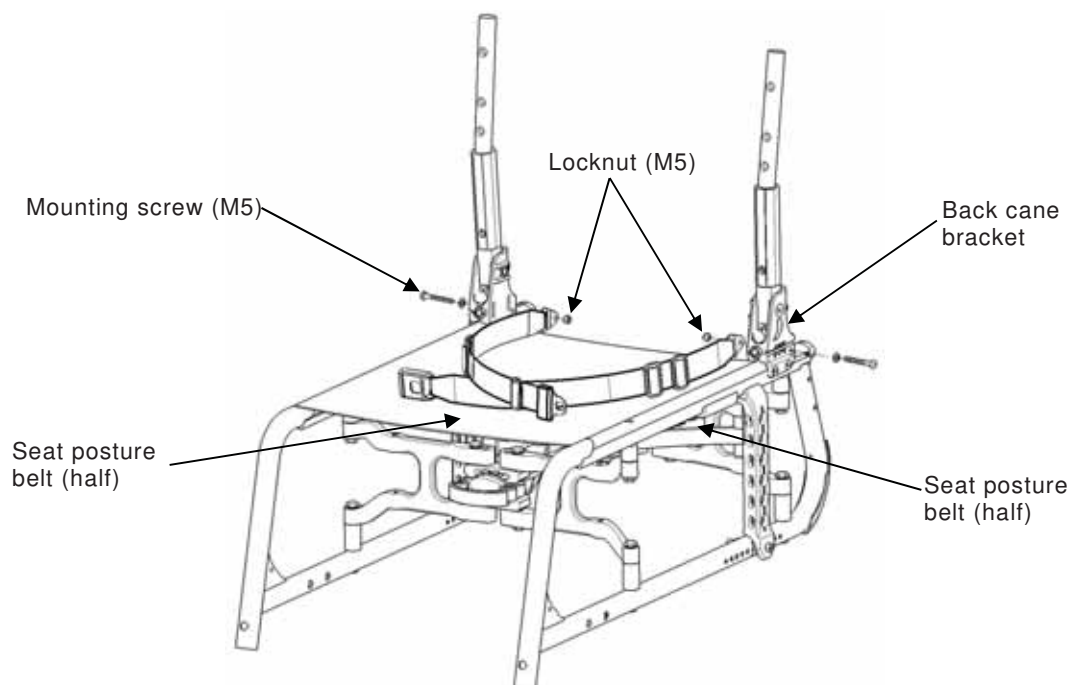
**FIGURE 4.8** Removing/Installing/Adjusting the Back-Cane Bracket

## Installing/Removing Seat Posture Belt

*NOTE: For this procedure, refer to FIGURE 4.9.*

1. Remove seat cushion from wheelchair, if necessary.
2. Remove the mounting screw and locknut (M5) 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 (M5) and washer. Tighten securely.
8. Repeat STEPS 6 and 7 for the opposite side of the seat posture belt.
9. Reinstall seat cushion onto wheelchair, if necessary.

*NOTE: Backrest upholstery removed for clarity.*



**FIGURE 4.9** Installing/Removing Seat Posture Belt

## Installing/Removing the Folding Back Brace

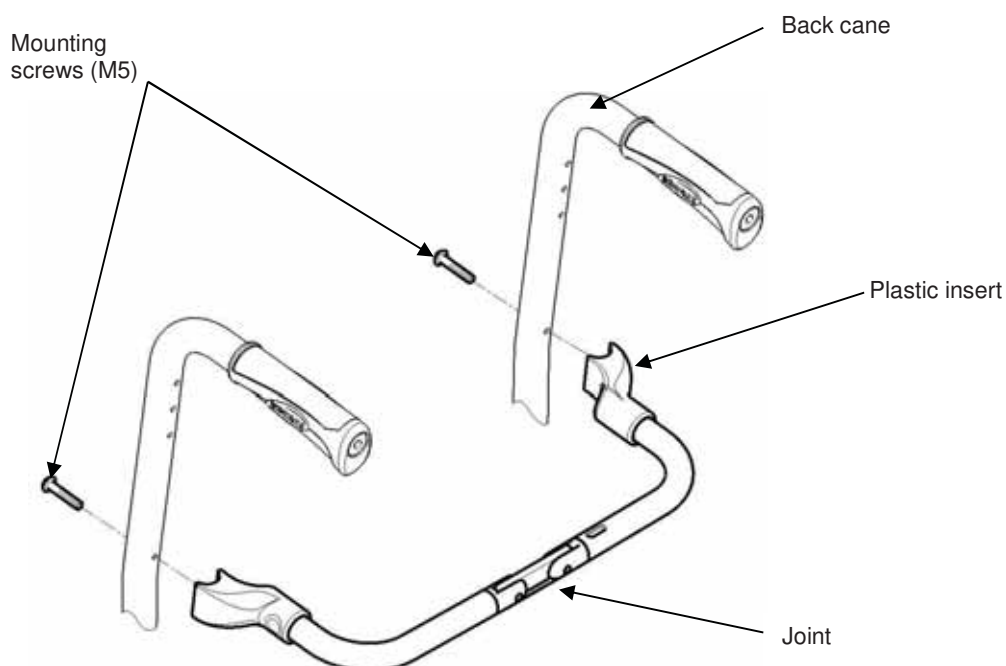
### WARNING

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

*NOTE: For this procedure, refer to FIGURE 4.10.*

*NOTE: To remove the folding back brace, reverse this procedure.*

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



**FIGURE 4.10** Installing/Removing the Folding Back Brace

## SECTION 5—REAR WHEELS/FRONT CASTERS

---

### WARNING

The seat height, seat depth, back angle, seating system, size/position of the rear wheels, size/position of the front casters, seating options (e.g. 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.

---

## Removing/Installing Rear Wheels

---

### WARNING

If changing the size of the rear wheel or the seat-to-floor height, this procedure must be performed by a qualified technician.

---

### Fixed Axles, Transit version

*NOTE: For this procedure, refer to FIGURE 5.1. (See next page)*

#### Removing rear wheels

1. 12"; remove the fixed axle, washers, dust cap and locknut that secure rear wheel to the axle brackets. Remove existing rear wheel from the wheelchair.
2. Install new/existing rear wheel onto wheelchair. Refer to [Installing Transit Kit](#) Paragraph, see STEPS 3-6 only.
3. 24" or 22"; remove the complete wheel and the axle bracket from the axle plate. Refer to [Removing/Installing Rear Wheels](#) paragraph.

#### Installing Transit Kit

1. Always make sure that the axle plate is in the passive position on both sides, refer to [Adjusting the Wheel Base Length](#) paragraph.
2. Install the axle bracket and anti-tippers bracket with the Axle brackets hardware.
3. Install fixed axle through washer, new/existing rear wheel and axle bracket.
4. Securely tighten with the existing fixed axle locknut. Torque to 25 Nm.
5. Fixed and adjust the transit brake with its brake hardware, adjust the distance between the brake shoe and the wheel, see [Adjusting Wheel Brake](#) paragraph.
6. If necessary, repeat STEPS 1-5 for opposite rear wheel.

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

---



## Quick-Release Axles

*NOTE: For this procedure, refer to FIGURE 5.2.*

### Removing

1. Hold the centre of the rear wheel and push in the tip of the quick release axle.
2. Pull the quick release axle and rear wheel out of the axle bracket on the wheelchair frame.
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 [Removing/Installing Rear Wheels](#) paragraph.

### WARNING

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

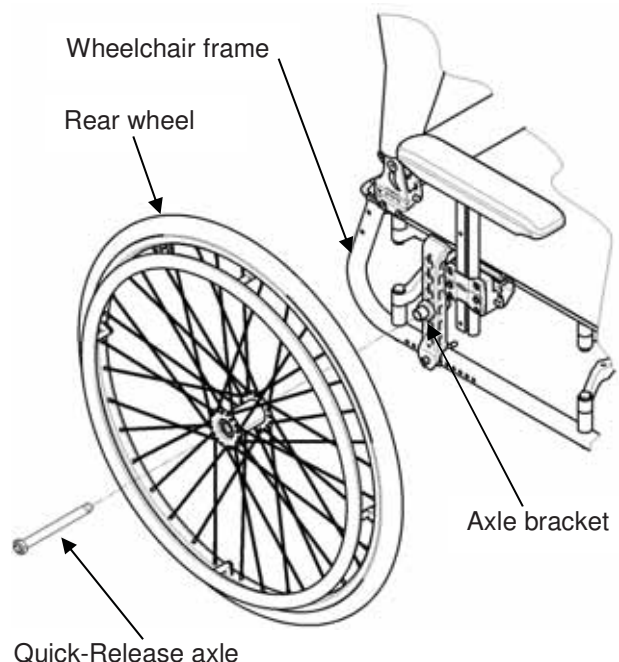
**The locking pins MUST be protruding past the inside of rear wheel hub for a positive lock.**

**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.
2. Install the new/existing rear wheel and quick release axle into the axle bracket on the wheelchair frame.
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.



**FIGURE 5.2** Removing/Installing Rear Wheels

## Adjusting Quick-Release Axles

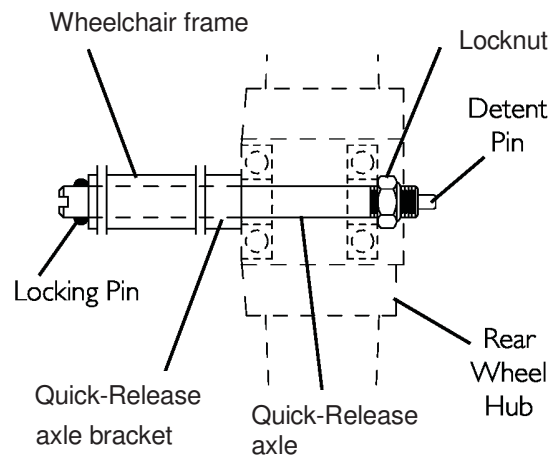
*NOTE: For this procedure, refer to FIGURE 5.3.*

1. Remove rear wheel and quick release axle from the wheelchair. Refer to [Removing/Installing Rear Wheels](#) paragraph.
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 [Removing/Installing Rear Wheels](#) paragraph.
6. Repeat STEPS 4-5 until the quick release axle detent pins are fully released past the wheelchair frame.



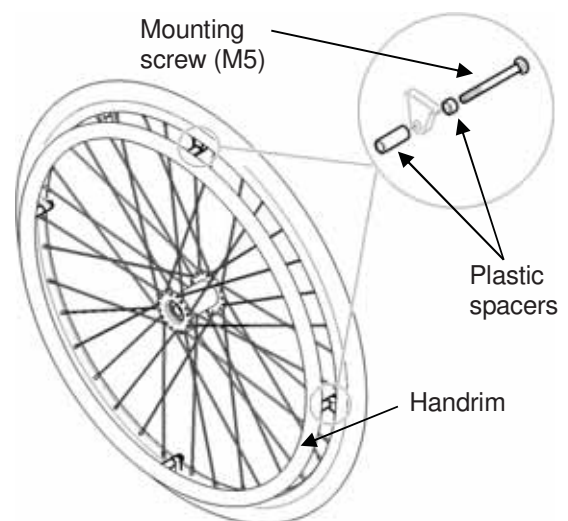
**FIGURE 5.3** Adjusting Quick-Release Axles

## Replacing Handrims

*NOTE: for this procedure, refer to FIGURE 5.4.*

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

1. Remove the rear wheel from the wheelchair. Refer to [Removing/Installing Rear Wheels](#) paragraph.
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.



**FIGURE 5.4** Replacing Handrims

6. Reinstall the rear wheel to the wheelchair. Refer to [Removing/Installing Rear Wheels](#) paragraph.
7. Repeat STEPS 1~6 for opposite wheel, if necessary.

## Adjusting the Wheelbase Length

*NOTE: For this procedure, refer to FIGURES 5.5 & 5.6.*

1. Remove the wheel. Refer to [Removing/Installing Rear Wheels](#) paragraph.
2. Remove the bottom mounting bolt that secure the bottom of the axle plate to the wheelchair frame and loosen, but DO NOT remove, the top mounting screw.

### CAUTION

**The axle plate must be moved with care. Otherwise, scratching and slight frame damage may occur.**

3. Align the axle plate with one of eleven adjustment holes. There are 11 positions possible by step of 12,5 mm.

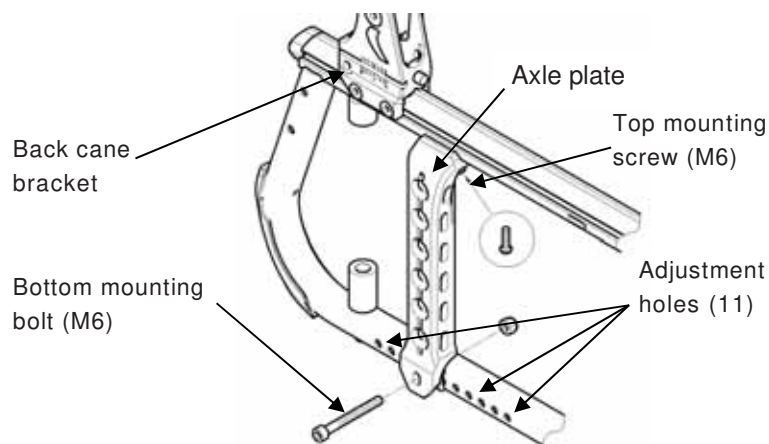
Factory settings from the vertical axis of the backrest to axle plate axis are:  
 Standard position (+ 25 mm, 1"); Medium Active position (+50 mm, 2"); Active position (+75 mm, 3") and Very Active position (+ 100 mm, 4"). Refer to FIGURE 5.6 (next page).

### WARNING

**Standard position "A"; Medium Active position "B"; Active position "C" and Very Active Position "D" of the axle plates directly relate to the stability of the wheelchair. Any change to one or any combination of the 11 positions may cause the wheelchair to increase or decrease in stability. Anti-tippers can be fitted to secure the stability if required. Refer to SECTION 9.**

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

*NOTE: Both axle plates should be set at the same position.*



**FIGURE 5.5** Adjusting the Wheelbase Length

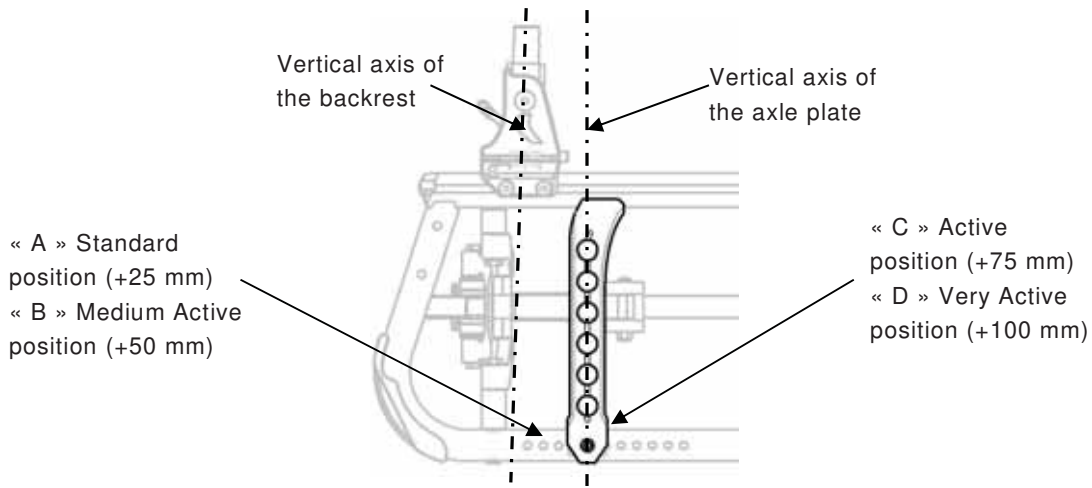


FIGURE 5.6 4 Possible Positions of Wheel Plate

## Adjusting Rear Wheel Height

*NOTE: For this procedure, refer to FIGURE 5.7.*

1. Remove the rear wheel. Refer to Removing/Installing Rear Wheels paragraph.
2. Remove the lock nut and washer that secures the axle bracket to the axle plate
3. Align the axle bracket with one of the six adjustment holes on the axle plate.
4. Secure the axle bracket to the axle plate, at the desired height, with the lock nuts (30-35 Nm) and washers.
5. The position of the axle bracket can be adjusted on the axle plate step less thanks to the lock nut. Take care to save enough space between the wheel and armrest skirt guard.
6. Install the rear wheel. Refer to Removing/Installing Rear Wheels paragraph.
7. Repeat STEPS 1 to 5 for the other rear wheel.

*NOTE: Both rear wheels MUST be set at the same position.*

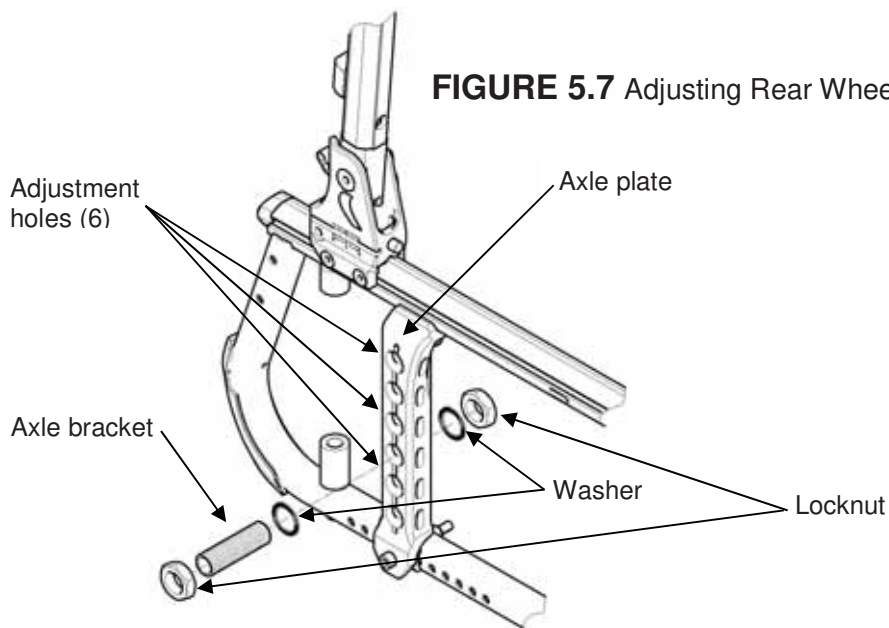


FIGURE 5.7 Adjusting Rear Wheel Height

## Adjusting the Rear Wheel Camber

*NOTE: For this procedure, refer to FIGURE 5.8.*

1. Remove the wheel. Refer to [Removing/Installing Rear Wheels](#) paragraph.
2. Loosen, but DO NOT remove, the top mounting screw and remove the bottom mounting bolt that secure the bottom of the axle plate to the wheelchair frame and rule out the axle plate from the frame.

### CAUTION

**The axle plate must be moved with care. Otherwise, scratching and slight frame damage may occur.**

3. Insert the number of spacer required to achieve the desired camber position as shown in Detail "A".

Camber positions "0°"; "1°"; "2°" are possible with the standard configuration, refer to Detail "A" Camber Settings; "3°" and "4°" camber positions can be performed with the additional kit (# 1604403), see detailed Mounting Instruction (# 1607075) at the end of this manual.

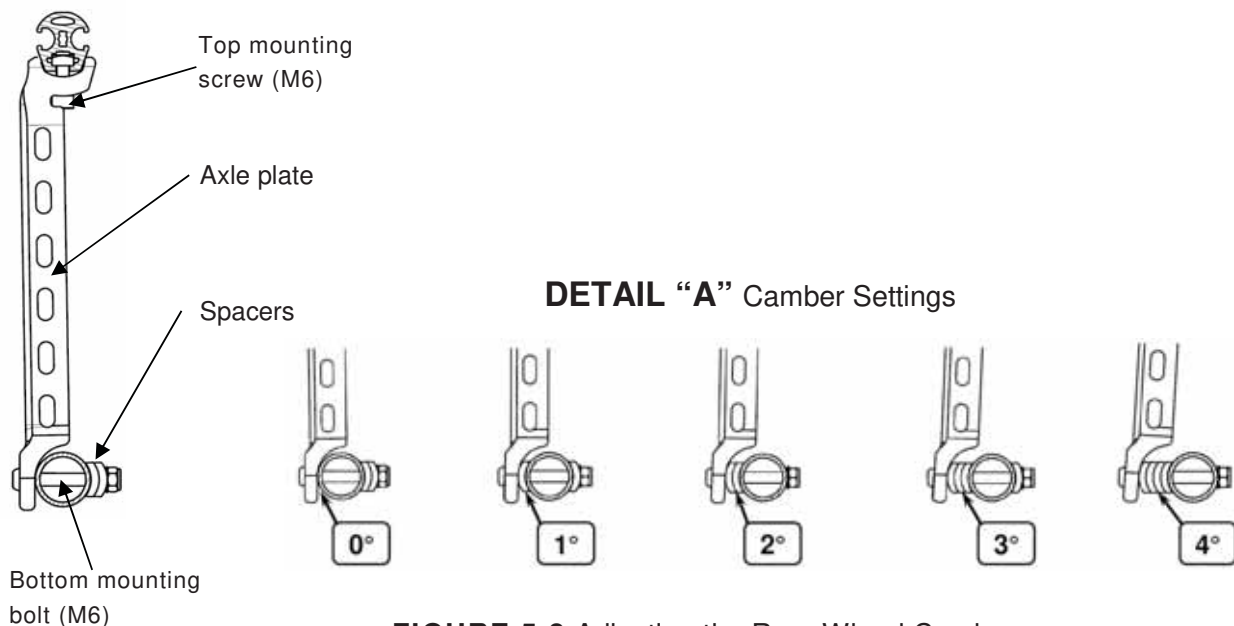
4. Re-insert the bottom mounting screw that secure the bottom of the axle plate and tighten the bolt, retighten the top mounting screw.

### WARNING

**After ANY adjustments, before use, make sure all attaching hardware is tightened securely - otherwise injury or damage may occur. When changing the camber position of the rear wheels, the wheel locks MUST be repositioned, refer to [Adjusting Wheel Lock Position](#) paragraph and to the [Mounting Instruction](#).**

5. Repeat STEPS 1 to 4 for the other side.

*NOTE: Both axle plates should be set at the same camber position.*



**FIGURE 5.8** Adjusting the Rear Wheel Camber

## Replacing/Repairing Rear Wheel & Front Caster Tire/Tube

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

---

## Adjusting Forks

### WARNING

Caster angle vertical axis **MUST** be at  $90^{\circ} \pm 1^{\circ}$  from the ground, if not a fluttering risk may occur. Both caster assemblies should be at the same angle.

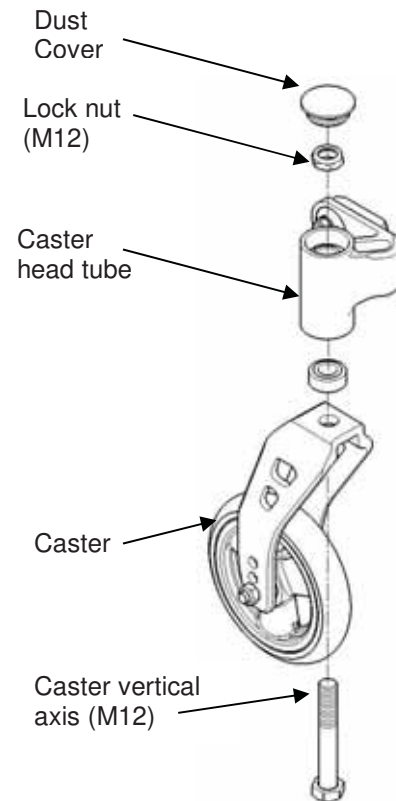
After **ANY** adjustments, before use, make sure all attaching hardware is tightened securely - otherwise injury or damage may occur.

*NOTE: For this procedure, refer to FIGURE 5.8.*

*NOTE: In case of unacceptable rotation, the specific*

*Top bearing needs to be change by a new one.*

1. Remove the dust cover from the caster head tube.
2. To properly control caster system and guard against flutter, perform the following check:
  - A. Tip back the wheelchair to floor.
  - B. Pivot caster fork assemblies in rear position
  - C. Push caster to initiate clockwise movement
  - D. Let caster fork assembly rotate freely
  - E. Unacceptable rotation can't be adjusted, the Specific top bearing needs to be replaced.
  - F. Do not overtighten the locknut (50-60 Nm), you may Risk damaging the bearings.
3. Repeat STEPS B-F until the wheels swing once to one side, then immediately rest in a straight downward position.
4. Test wheelchair for manoeuvrability.
5. Snap dust cover into the caster head tube.



**FIGURE 5.8** Adjusting Fork

## Removing/Installing/Repositioning the Caster Assemblies

*NOTE: If replacing a front caster note the mounting position of the existing front caster for installation of the new front caster.*

*NOTE: If repositioning front casters or replacing the existing front caster with a caster of a different size, refer to [Changing Front Seat-to-Floor Height](#) paragraph to determine the front caster position needed for the required front seat-to-floor height.*

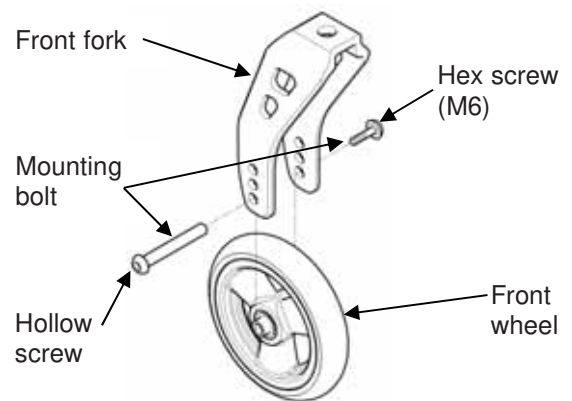
*NOTE: Both front casters MUST be the same size and adjusted to the same height. NOTE: For this procedure, refer to FIGURE 5.9.*

### Removing Front Wheel

1. Remove the mounting bolt, Hollow screw and Hex screw (M6) that secure the front wheel to the fork.
2. Remove the wheel from the fork.

### Installing Front Wheel

1. Using the mounting bolt, Hollow screw and Hex screw (M6), secure the wheel to the desired wheel mounting position.
2. Ensure fork stem is perpendicular to the flat surface. Refer to [Adjusting Caster Angle](#) paragraph.



**FIGURE 5.9** Removing/Installing/Repositioning the front wheel

## Adjusting Caster Angle

*NOTE: For this procedure, refer to FIGURE 5.10.*

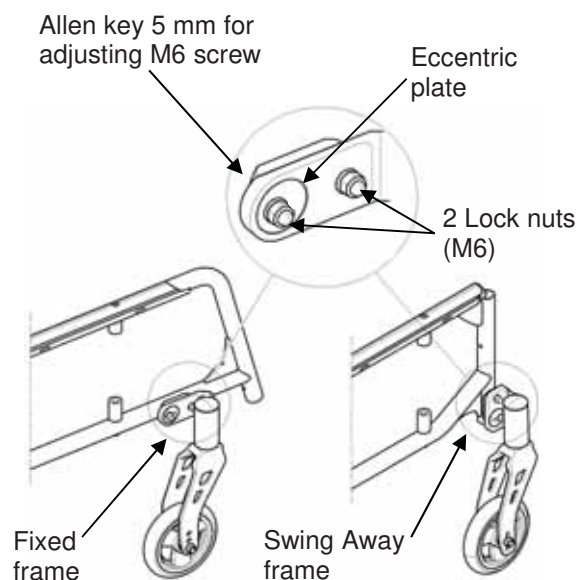
1. Loosen Lock nuts (M6) with 1-2 turns with an opened wrench, while holding screws firmly in place with 4 & 5 mm Allen keys.

*NOTE: It is not necessary to remove the mounting screws.*

2. Adjust the caster housing to desired angle by using the 10 mm opened wrench to rotate the eccentric plate, tighten with the 5 mm Allen key.

*NOTE: Both casters should be set at the same angle ( $90^\circ \pm 1^\circ$  from the ground).*

3. Firmly tighten the screws and lock nuts that secure the caster assembly to the wheelchair frame.



**FIGURE 5.10** Adjusting Caster Angle

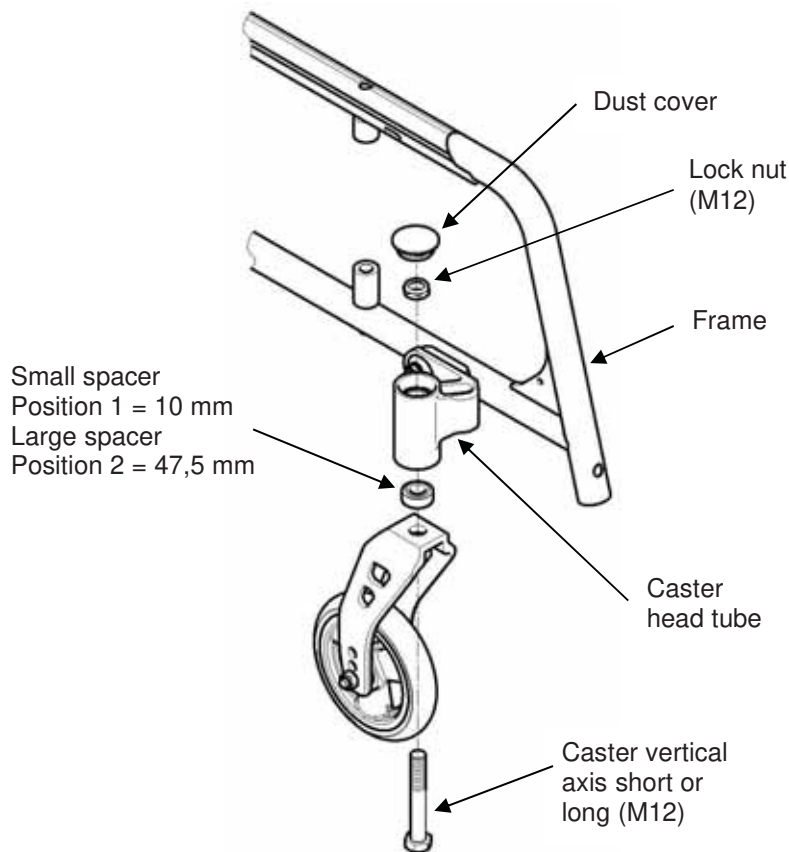


## Adjusting Fork Assembly Height

*NOTE: For this procedure, refer to FIGURE 5.8 and 5.11.*

1. Remove the dust cover from the Caster head tube.
2. Unscrew the Lock nut (M12) that secure the Vertical axis assembly to the Caster head tube.
3. Replace the Small spacer (10 mm) by a Large spacer (47,5 mm) and a new longer caster vertical axis if required. Refer to table Seat-To-Floor-Height, page 35.
4. Secure the caster vertical axis assembly to the Caster head tube.
5. Do not overtight the locknut (50-60 Nm), you may RISK damaging the bearings and the axis.
6. Repeat STEPS 1 to 5 for the other caster assembly.

*NOTE: Both fork assemblies must be set at the same height.*



**FIGURE 5.11** Adjusting Fork Assembly Height

# SECTION 6—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.**

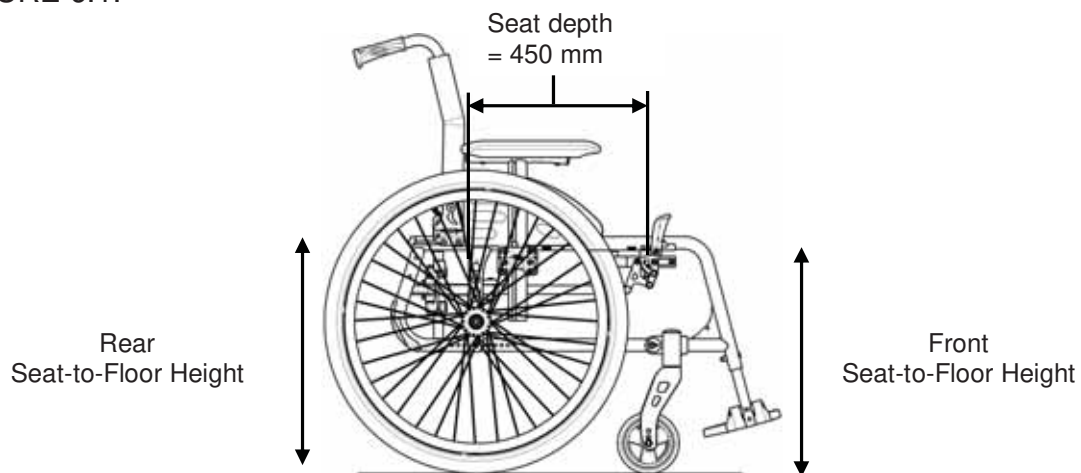
## Seat Angle

*NOTE: For this procedure, refer to FIGURE 6.1.*

*NOTE: Refer to Measuring Seat-to-Floor Height paragraph for measuring instructions.*

*NOTE: Invacare recommends that the rear seat-to-floor height be AT LEAST 25 mm shorter than the front seat-to-floor height. Otherwise a front slipping 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 in FIGURE 6.1.



**Example:**

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

**FIGURE 6.1** Seat Angle

**⚠ WARNING**

**Because of the parts mechanical tolerances and all adjustments possible the seat angles possible are 0°/3°/6° +/-1° depending of the wheelchair assembly. Refer to table “Seat-to-floor heights” paragraph.**

## Measuring Seat-to-Floor Height

*NOTE: For this procedure, refer to FIGURE 6.2.*

*NOTE: All measurements are in millimetres. The front and rear seat-to-floor heights may vary depending 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

*NOTE: 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.

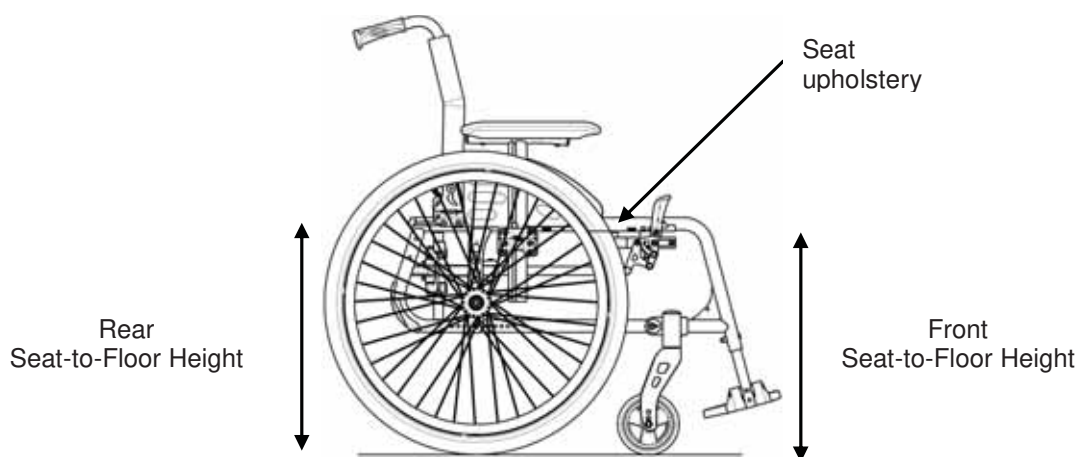


FIGURE 6.2 Seat-to-Floor Height

## Changing Seat-to-Floor Height

### ⚠ WARNING

The seat height, seat depth, back angle, seating system, size/position of the rear wheels, size/position/angle of the front casters, seating options (e.g. back bag, ...) as well as the user condition directly relate to the stability of the wheelchair. Any change to one or any combination of these factors change the center of gravity and may cause the wheelchair to decrease in stability. Refer table on page 6.

Always check caster vertical axis is to  $90^{\circ} \pm 1^{\circ}$  from the ground.

*NOTE: For this procedure, refer to the table with main values to determine adjustment(s) necessary to achieve desired front seat to floor height.*

## SECTION 6—SEAT-TO-FLOOR HEIGHT

**NOTE:** To obtain the desired front seat to floor height, it will be necessary to perform one or both following:

- Changing the caster size and/or mounting position on the fork, and/or seat angle Refer to Adjusting Caster Angle and/or Removing/Installing/Repositioning the Caster Assemblies paragraphs.
- Changing the fork size or adding/removing height adjustment spacers. Refer to Adjusting Fork Assembly Height paragraph.
- Changing the rear wheel size. Refer to Removing/Installing Rear Wheels paragraph.
- Changing the rear height positioning. Refer to Adjusting Rear Wheel Height paragraph.

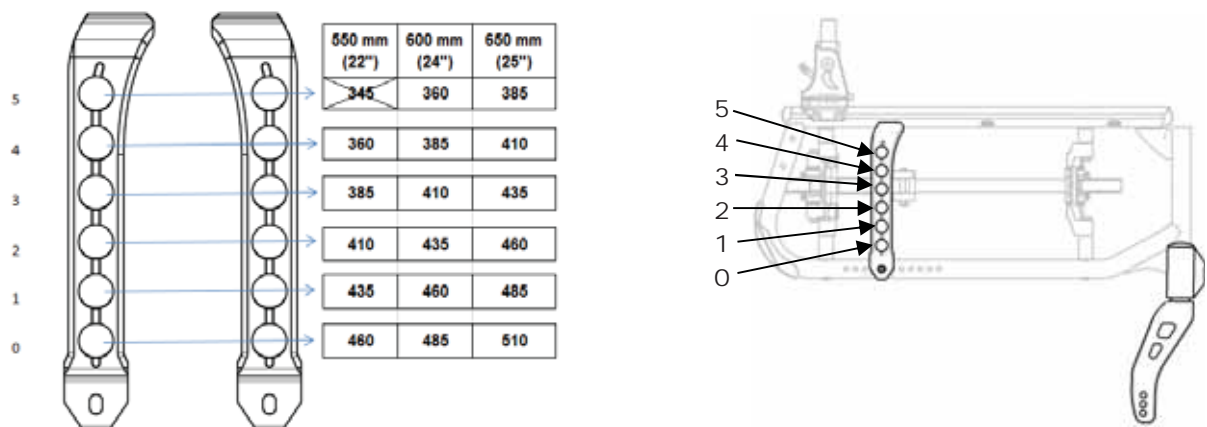
### CHANGING FRONT SEAT-TO-FLOOR HEIGHT

Seat height in front (FSTF) in mm

Fork Type		360	385	410	435	460	485	510	535
Front wheel size	Ultra Low (UL)	UL 1		S 2 ⚠	S 4	L 3	L 2 +		
	Small (S)		UL 2	S 1 ⚠	S 3	L 2	L 1 +	L 3 +	
					S 2	S 4	L 3	L 2 +	
	Large (L)					S 3	L 2	L 1 +	L 3 +

⚠ Be aware: ONLY 16.5mm between floor and fork.  
+ Spacer is added to achieve height

### CHANGING REAR SEAT-TO-FLOOR HEIGHT



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# SECTION 7—WHEEL LOCKS

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## ⚠ 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.

---

## Adjusting Wheel Locks

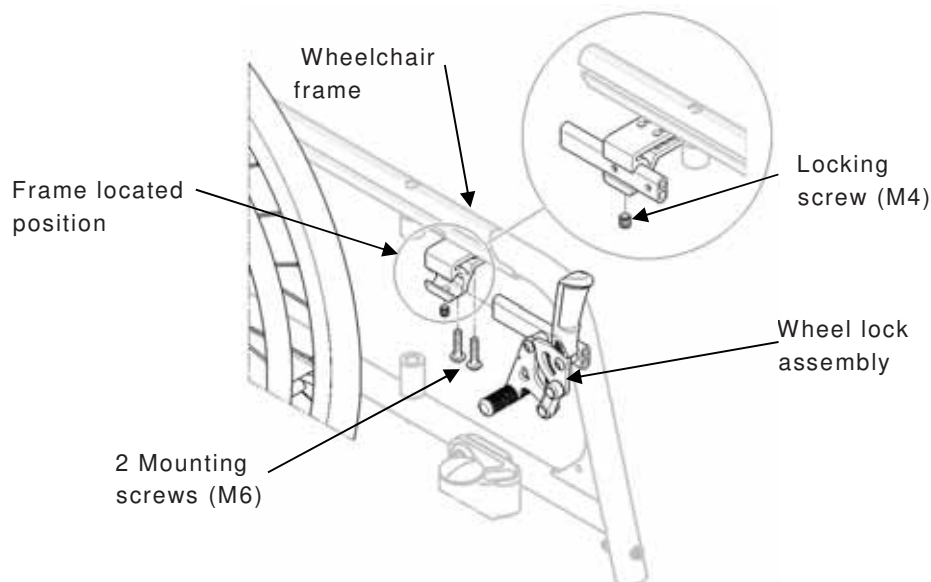
*NOTE: When changing the position of the rear wheels, the wheel locks MUST be repositioned.*

*NOTE: Before adjusting or replacing the wheel locks assemblies, ensure that the tires are inflated to the recommended BAR, KPa, P.S.I on the sidewall of the tire.*

### Adjusting Wheel Lock Position

*NOTE: For this procedure, refer to FIGURE 7.1.*

1. Remove the two mounting screws (M6) that secures the wheel lock assembly to the wheelchair frame.
2. Remove the wheel lock assembly from the clamp assembly.
3. Move the clamp assembly (if necessary) to the other wheel lock position on the wheelchair frame.
4. Install the wheel lock assembly into the clamp assembly.
5. Secure the wheel lock assembly to the wheelchair frame with the two mounting screws (M6).
6. Repeat STEPS 1 to 6 for the other wheel lock assembly.

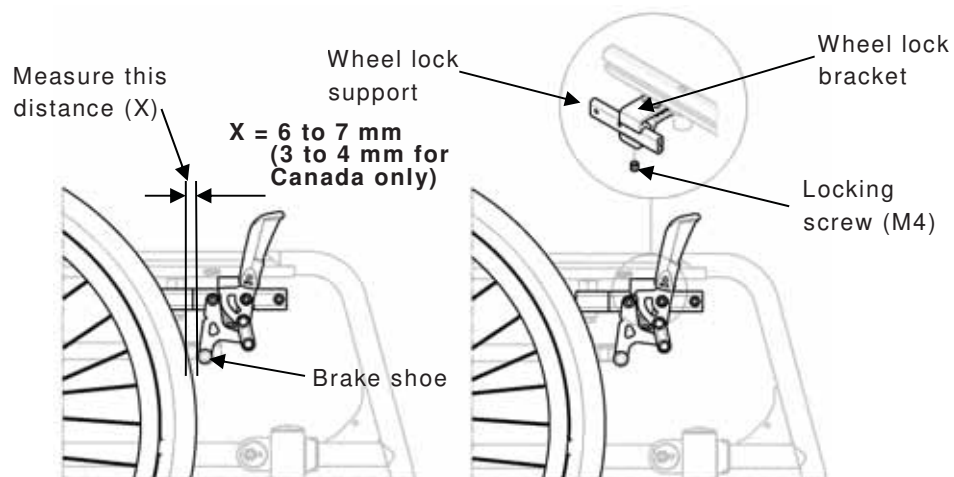


**FIGURE 7.1** Adjusting Wheel Locks - Adjusting Wheel Lock Position

## Adjusting Wheel Lock Tension

*NOTE: For this procedure, refer to FIGURE 7.2.*

1. Loosen, but **DO NOT** remove locking screws (M4) that secure the wheel lock support to the wheel lock bracket.
2. Measure the distance between the wheel lock shoe and the rear wheel.
3. Slide the wheel lock support along the wheel lock bracket until the measurement is **6 to 7 mm (3 to 4 mm for Canada only)** for solid and for pneumatic tires.
4. Securely tighten the locking screws (M4).
5. Repeat STEPS 1-4 for the opposite wheel lock.
6. Engage the wheel locks and push against the wheelchair to determine if the wheel locks engage the rear wheels enough to hold the occupied wheelchair.
7. Repeat STEPS 1-6 until the wheel locks engage the rear wheels enough to hold the occupied wheelchair.

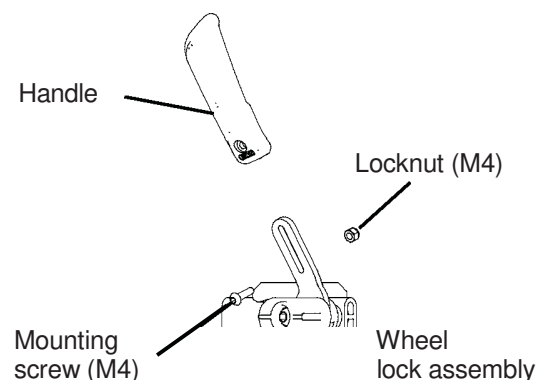


**FIGURE 7.2** Adjusting Wheel Locks- Adjusting Wheel Lock Tension

## Replacing Wheel Lock Handle

*NOTE: For this procedure, refer to FIGURE 7.2.*

1. Remove the mounting screw and locknut (M4) that secures the wheel lock handle to the wheel lock assembly.
2. Remove the wheel lock and discard
3. Align the new wheel lock handle with the wheel lock assembly.
4. Secure the new wheel lock handle with the mounting screw and locknut (M4).
5. If necessary, repeat STEPS 1 to 4 for the other wheel lock.



**FIGURE 7.3** Replacing Wheel Lock Handle

**⚠ 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 wheel locks to secure the wheelchair during short or long stops.

Ensure both hub brakes are adjusted to the same mounting hole.

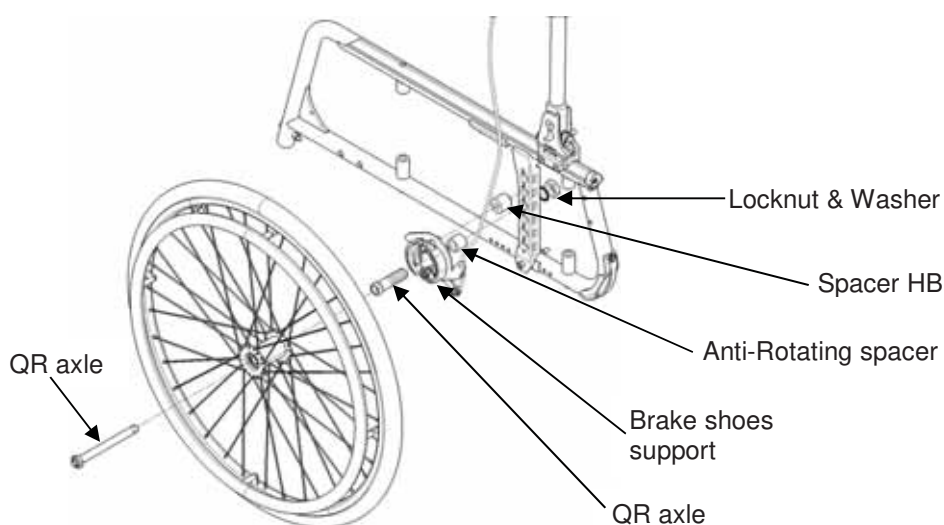
## Installing/Adjusting Hub Brakes

*NOTE: 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.*

### Installing Hub Brakes

*NOTE: For this procedure, refer to FIGURE 7.4 (next page).*

1. Remove the rear wheel. Refer to Removing/Installing Rear Wheels paragraph.
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.



**FIGURE 7.4** Installing Hub Brakes

## Installing/Adjusting Hub Brake

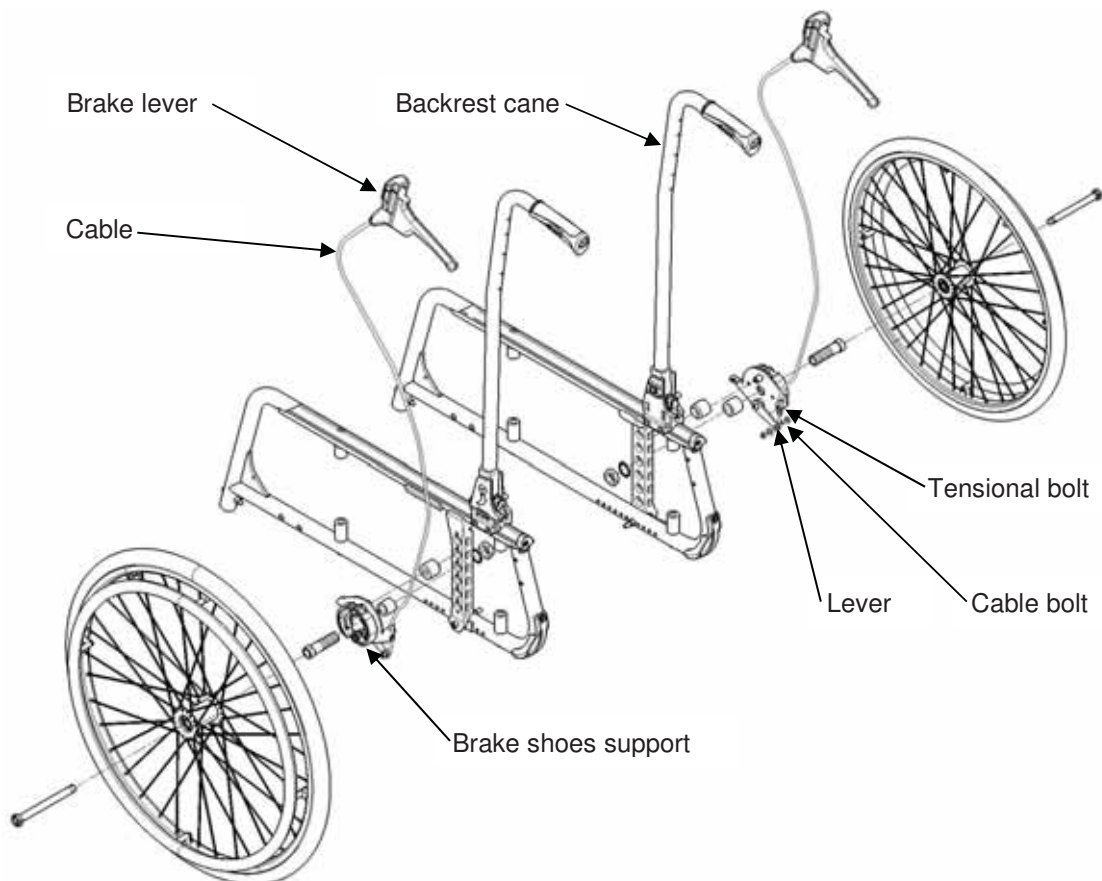
7. Repeat STEPS 1 to 6 for the other rear wheel.

### Installing/adjusting Hub Brake

*NOTE: For this procedure, refer to FIGURE 7.5.*

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

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



**FIGURE 7.5** Installing/Adjusting Hub Brake



## SECTION 8—OPTIONS

### WARNING

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

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.

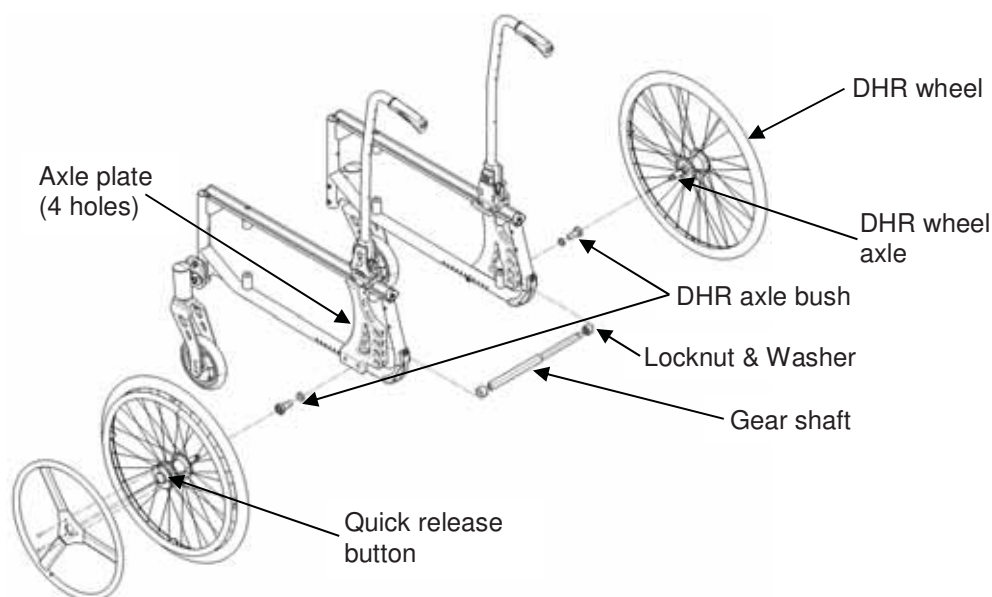
Ensure both wheels are adjusted to the same mounting hole.

## Installing/Adjusting Dual Handrim (DHR)

### Installing Dual Handrim (DHR)

*NOTE: For this procedure, refer to FIGURE 8.1.*

1. Remove the rear wheel. Refer to [Removing/Installing Rear Wheels](#) paragraph.
2. Remove the locknut and washer that secures the axle bracket to the axle plate.
3. Align the DHR Axle bush with one of the four adjustment holes on the axle plate
4. Secure the DHR axle bush to the axle plate, at the desired height, with the locknut and washer. Insert the wheel with the axle DHR wheel axle into the DHR axle bush
5. Repeat STEPS 1 to 6 for the other rear wheel.
6. Insert the gear shaft onto the end of the wheel axle to connect both DHR wheels.



**FIGURE 8.1** Installing Dual Handrim

# SECTION 9—ANTI-TIPPERS

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

Anti-tipper adjustments are required regarding the position and diameter of the rear wheel as well as the user conditions and his particular safety limits. The factory settings are adjusted to obtain a tip backward angle between 10° and 15°, refer to DETAIL “A” Factory settings FIGURE 3.3.

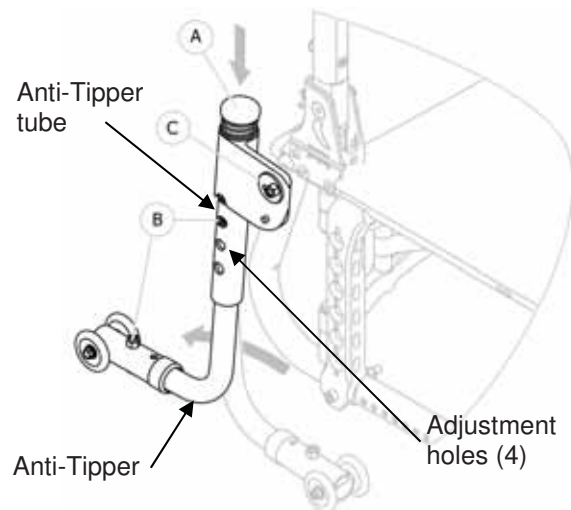
Ensure both anti-tippers (if so equipped) are adjusted to the same position.

## Installing/Adjusting Swing Away Anti-Tippers

### Installing/Adjusting Anti-Tippers Height

*NOTE: For this procedure, refer to FIGURE 9.1.*

1. Remove the mounting bolts ⑥ (M5) that secures the anti-tipper to the anti-tipper tube. Adjust the position of the anti-tipper thanks to the adjustment holes. Secure the assembly with the mounting bolts ⑥ (M5).
2. Measure the distance between the top of the anti-tipper wheels and the rear wheel tire circumference, see FIGURE 9.3.  
*NOTE: A 50 mm minimum clearance between the top of the anti-tipper wheels and the rear wheel tire circumference MUST be maintained always.*
3. If the distance between the top of anti-tipper wheels and the tire circumference is not 50 mm minimum, adjust anti-tippers height thanks to one of the four adjustment holes.
4. Angle and Depth adjustments are often required to achieve the recommended distance of 50 mm, see Adjusting Anti-Tipper Angle and Depth paragraphs, next page.



**FIGURE 9.1** Installing Swing Away Anti-Tippers

## Adjusting Anti-Tipper Angle

*NOTE: For this procedure, refer to FIGURE 9.2.*

1. Loosen Mounting screws (M6) with 1-2 turns with a 10 mm opened wrench, while holding screws firmly in place with 4 mm Allen keys.

*NOTE: It is not necessary to remove the mounting screws.*

2. Adjust the anti-tipper housing to approximate perpendicular angle from the ground/floor by using the 10 mm opened wrench to rotate the eccentric plate ©, tighten with the 4 mm Allen key.

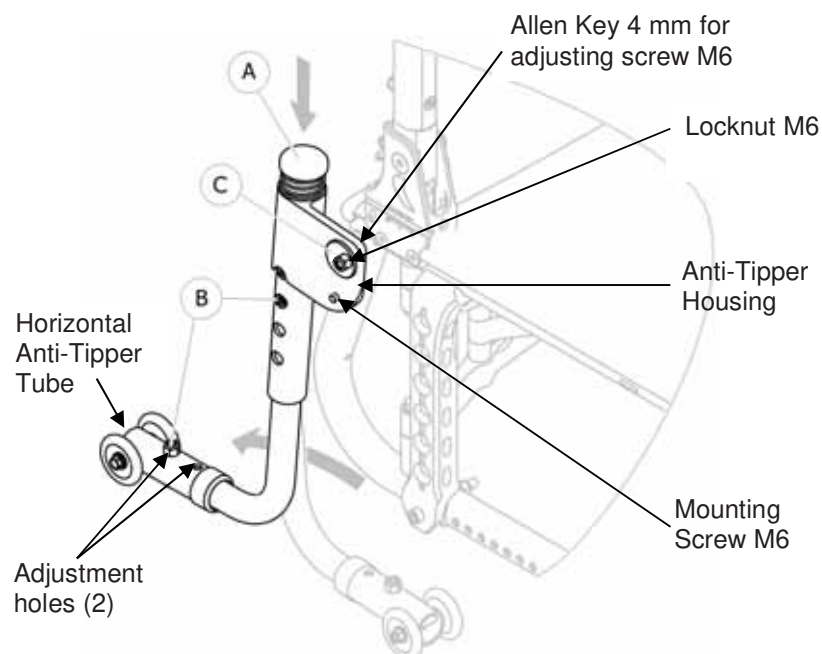
*NOTE: Both anti-tippers should be set at the same angle on both sides.*

3. Firmly tighten the screws and lock nuts that secure the anti-tipper housing to the wheelchair frame.

## Adjusting Anti-Tippers Depth

1. Remove the mounting bolt ② (M5) that secures the horizontal anti-tipper tube to the anti-tipper.
2. Adjust the position of the horizontal anti-tipper tube thanks to the two adjustment holes.
3. Secure the assembly with the mounting bolt ② (M5).

*NOTE: The anti-tipper adjustment MUST have the same depth on both sides.*



**FIGURE 9.2** Adjusting Anti-Tipper Angle and Depth

 **WARNING**

When anti-tippers are used, anti-tippers **MUST** be adjusted to maintain a 50 mm minimum clearance between the top of the anti-tipper wheels and the rear wheel tire circumference. This spacing should always be checked whenever adjustments/changes are made to the wheelchair.

Failure to maintain proper spacing may result in the chair tipping over backward causing serious injury or property damage

### Adjusting Anti-Tippers when Swing Inwards

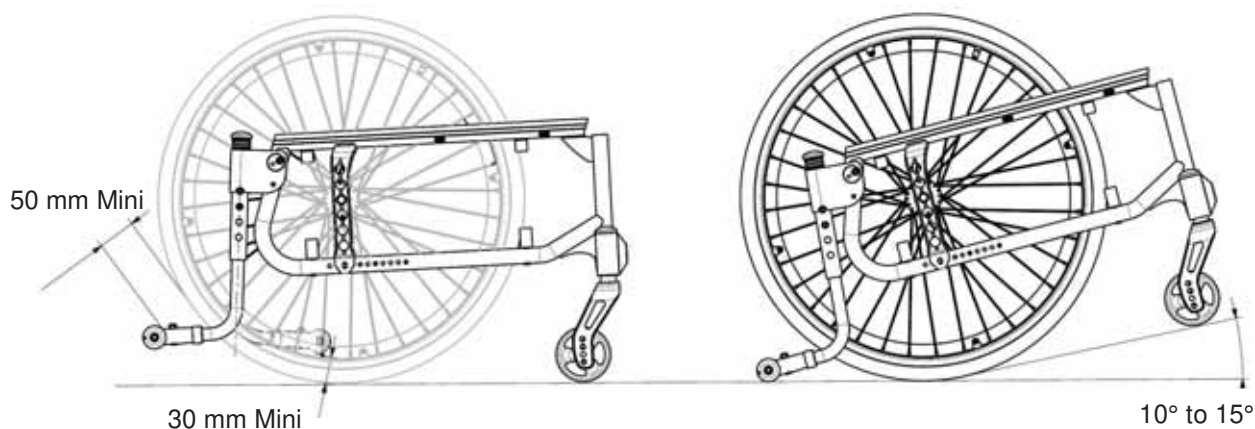
*NOTE: For this information, refer to FIGURE 9.3.*

1. Adjust anti-tipper when swing inwards thanks to combination of height, angle and depth adjustments.
2. Adjust the angle of the anti-tipper to maintain a 30 mm minimum clearance between the top of the anti-tipper wheels and the tire circumference, see Adjusting Anti-Tipper Angle paragraph.
3. Secure the assembly with the mounting bolts  $\text{\textcircled{B}}$  (M5) and mounting screws/locknut (M6) of the anti-tipper housing.

*NOTE: The anti-tippers when swing inwards must be adjusted to maintain a 30 mm minimum clearance between the top of the anti-tipper wheels and the tire circumference to avoid anti-tipper sink into the ground. Re-adjust angle if necessary.*

*NOTE: A table with combination of front wheels, rear wheels, seat depths and seat heights is available on demand.*

#### DETAIL "A" Factory Settings



**FIGURE 9.3** Adjusting Anti-Tippers when Swing Inwards

 **WARNING**

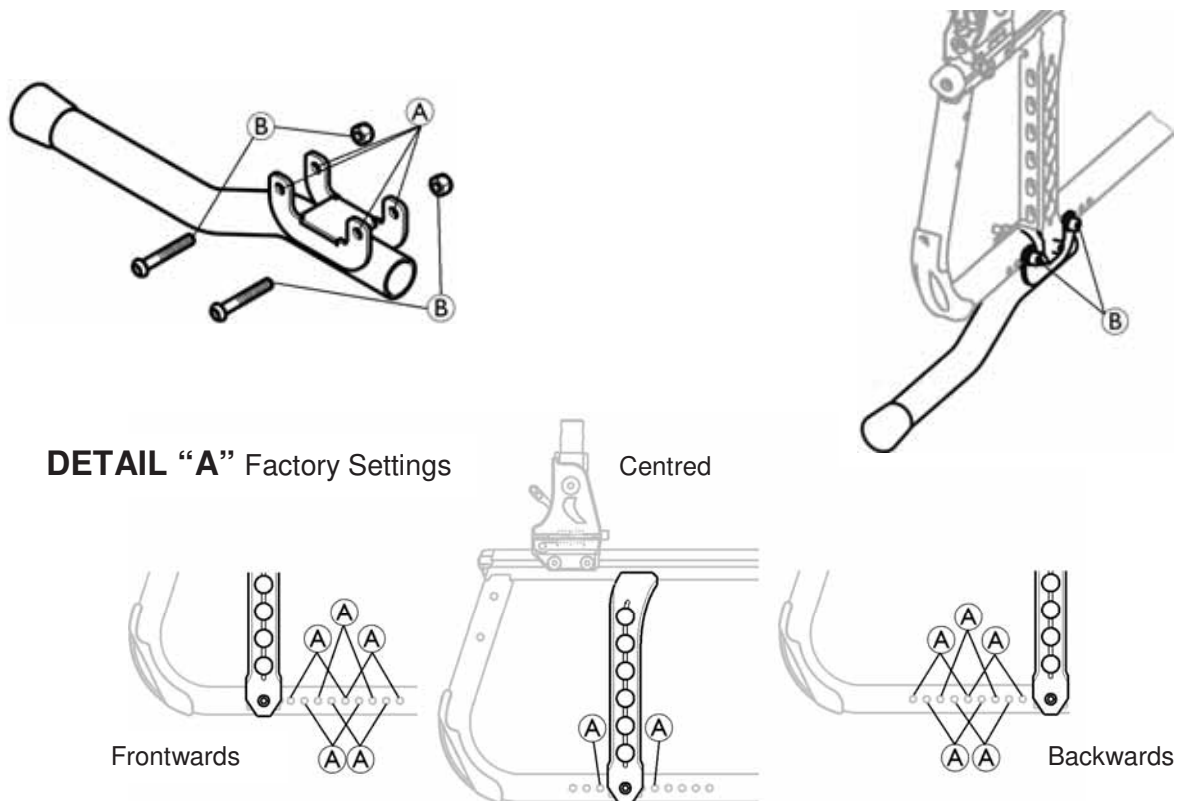
After ANY adjustments, repair or service and BEFORE use, make sure all attaching hardware is tightened securely - otherwise injury or damage may occur. Tipper Aid adjustment is required regarding the spacing for the foot and the strength necessary for the attendant to tip over easily the wheelchair. This spacing and position should always be checked whenever adjustments/changes are made to the wheelchair.

### Installing/Adjusting Tipper Aid

*NOTE: For this information, refer to FIGURE 9.4.*

1. Install Tipping Aid, on right or left side of the frame, thanks to the set of bolts (B) in the appropriate adjustments holes (A), see detail "A" Factory Settings.
2. Adjust tipping aid in depth to have enough space for the foot and the strength necessary for the attendant to tip over easily the wheelchair.
3. Secure the assembly with the two mounting bolts (B) (M6).

*NOTE: Standard position is centred around the axle plate. Other position of Tipper Aid must be frontwards when the axle plate is settled backwards and inversely when the axle plate is settled frontwards, see detail "A" Factory Settings. Re-adjust depth position to avoid Tipper Aid sink into the ground, if necessary.*



**FIGURE 9.4** Installing/Adjusting Tipper Aid

## SECTION 10—PERIODIC MAINTENANCE GUIDELINES

*NOTE: 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**

- Wheelchair rolls straight (no excessive drag or pull to one side).
- Ensure all hardware is tight (see page 5).
- All fasteners on clothing guards are secure.
- Arms are secure but easy to release and locking systems engage properly.
- Adjustable height arms operate and lock securely.
- Armrest armpad sits flush against arm tube.
- Seat and/or back upholstery have no rips.
- Inspect adjustable angle back attaching hardware is securely tightened.
- Ensure hand grips are secure to backrest-canes.
- Sealed bearings and axle nut tension are correct.
- No excessive side movement or binding when rear wheels are lifted and spun.
- Quick-release axles lock properly (see page 24).
- Inspect handrims for signs of rough edges or peeling finish.
- Inspect for broken spokes.
- Wheel/fork assembly has proper tension when caster is spun. Caster should come to a gradual stop.
- Wheel bearings are clean and free of moisture.
- Loosen/tighten locknut if wheel wobbles noticeably or binds to a stop.
- Ensure all caster/wheel/fork/head tube fasteners are secure (see pages 5 & 31).
- Wheel brakes do not interfere with tires when rolling.
- Wheel brakes pivot point are free of wear and looseness.
- Wheel brakes are easy to engage.
- Inspect tires/casters for flat spots and wear.
- Check pneumatic tires for proper inflation (recommended tire pressure is listed on the side wall of the tire).
- Ensure axles are free from dirt, lint, etc.
- Ensure roller bearings are free from dirt, lint, etc.
- Adjust wheel brakes as tires wear.
- Clean and wax all parts.
- Clean upholstery and armrests.
- Ensure casters are free of debris.

### **Inspect/Adjust Weekly**

- Wheelchair rolls straight (no excessive drag or pull to one side).
- Quick-release axles lock properly (see page 24).
- Inspect for broken spokes. Adjustment/replacement.
- Wheel/fork assembly has proper tension when caster is spun. Caster should come to a gradual stop.
- Inspect tires/casters for flat spots and wear.
- Check pneumatic tires for proper inflation (recommended tire pressure is listed on the side wall of the tire).
- Ensure casters are free of debris.

### **Inspect/Adjust Monthly**

- 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.
- Loosen/tighten locknut if wheel wobbles noticeably or binds to a stop.
- Wheel bearings are clean and free of moisture.
- Wheel brakes do not interfere with tires when rolling.
- Wheel brake pivot point are free of wear and looseness.
- Ensure all caster/wheel/fork/head tube fasteners are secure (see pages 5 & 31).
- Ensure all hardware is tight (see page 5).
- Ensure hand grips are secure to backrest canes.
- Ensure casters are free of debris.

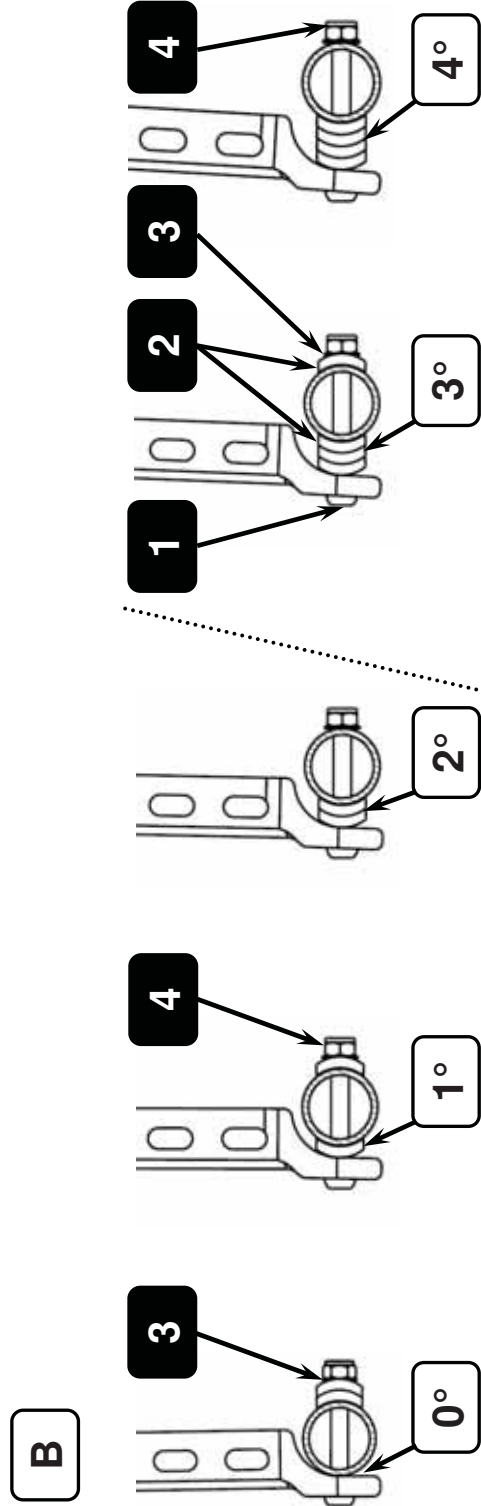
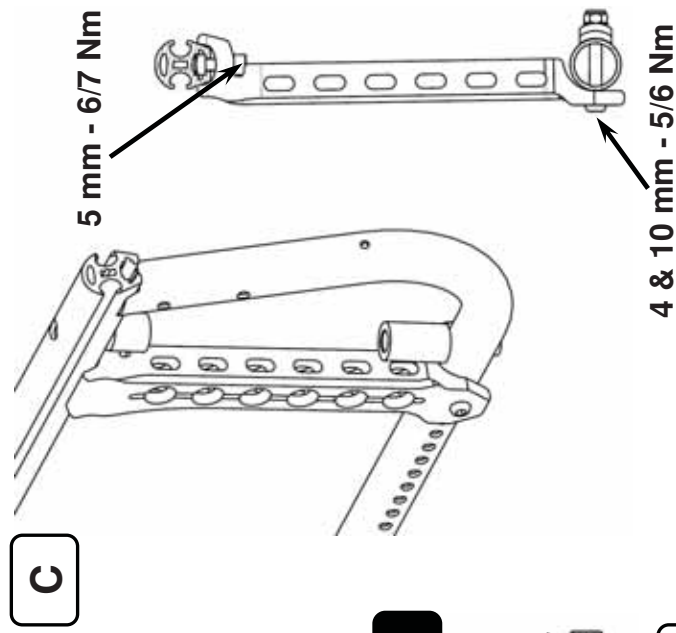
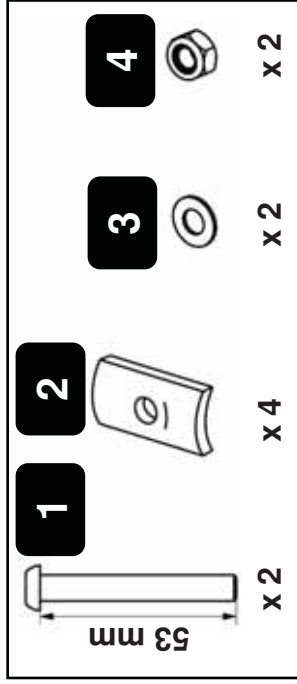
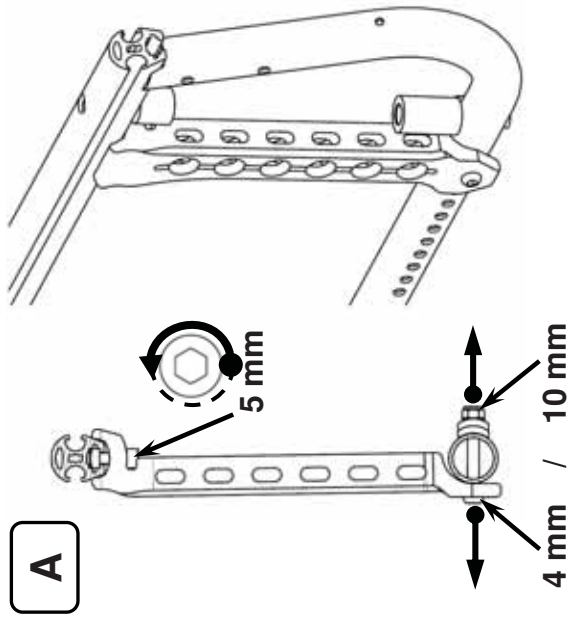
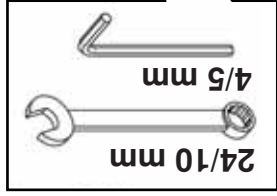
### **Inspect/Adjust every twelve months (1)**

- Wheelchair rolls straight (no excessive drag or pull to one side).
- Arms are secure but easy to release and locking systems engage properly.
- Adjustable height arms operate and lock securely.
- Armrest armpad sits flush against arm tube.
- All fasteners on clothing guards are secure.
- Seat and/or back upholstery have no rips.
- Inspect the backrest attaching hardware and mechanisms are securely tightened.
- No excessive side movement or binding when rear wheels are lifted and spun.
- Inspect handrims for signs of rough edges or peeling finish.
- Inspect side frame and cross brace for signs of cracks, flaked paint or deformed metal work.
- Inspect tires/casters for flat spots and wear.
- Check pneumatic tires for proper inflation (recommended tire pressure is listed on the side wall of the tire).

### **Inspect/Adjust every twelve months (2)**

- Wheel brake pivot point are free of wear and looseness.
- Clean upholstery and armrests.
- Sealed bearings and axle nut tension are correct.
- Wheel/fork assembly has proper tension when caster is spun. Caster should come to a gradual stop.
- Loosen/tighten locknut if wheel wobbles noticeably or binds to a stop.
- Wheel bearings are clean and free of moisture.
- Wheel brakes are easy to engage.
- Clean quick-release axles with a Teflon lubricant.
- Ensure axles are free from dirt, lint, etc.
- Ensure roller bearings are free from dirt, lint, etc.
- Adjust wheel brakes as tires wear.
- Clean and wax all parts.
- Ensure casters are free of debris



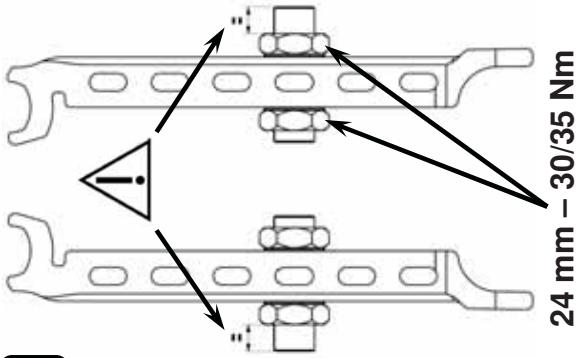


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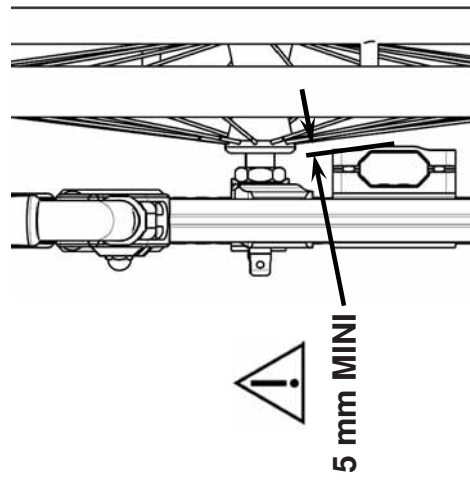
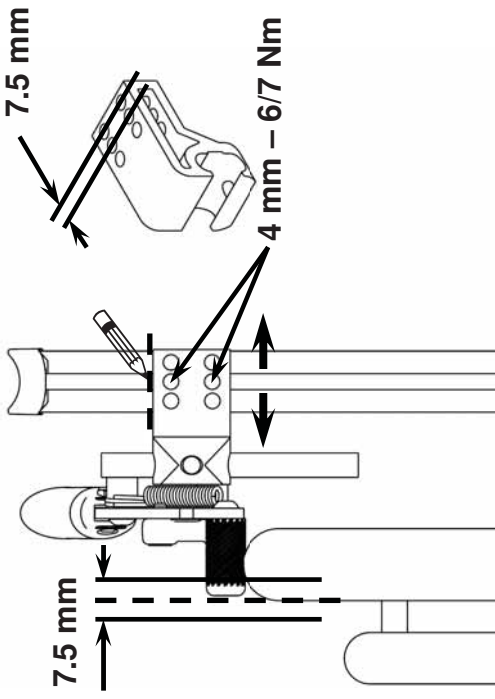
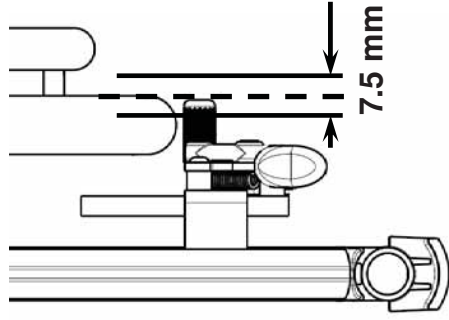


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