



## User Manual

EN

Invacare<sup>®</sup> Tracer<sup>™</sup> EX2 Wheelchair

*This manual MUST be given to the user of the product.*

*BEFORE using this product, read this manual and save for future reference.*



**Yes, you can.<sup>®</sup>**

© 2011 Invacare Corporation. All rights reserved. Republication, duplication or modification in whole or in part is prohibited without prior written permission from Invacare. Trademarks are identified by ™ and ®. All trademarks are owned by or licensed to Invacare Corporation or its subsidiaries unless otherwise noted.

Teflon is a registered trademark of DuPont.

<b>1</b>	<b>GENERAL</b>	<b>5</b>
	Symbols .....	5
	Limited Warranty .....	6
<b>2</b>	<b>OVERVIEW</b>	<b>7</b>
	Label Locations .....	7
	Component Identification .....	8
	Typical Product Parameters .....	9
<b>3</b>	<b>SAFETY</b>	<b>11</b>
	General Guidelines .....	11
	Safety/Handling of Wheelchairs .....	18
<b>4</b>	<b>SAFETY INSPECTION/TROUBLESHOOTING</b>	<b>25</b>
	Safety Inspection Checklist .....	25
	Troubleshooting .....	28
	Maintenance .....	29
<b>5</b>	<b>FRONT RIGGINGS</b>	<b>31</b>
	Installing/Removing Front Riggings .....	31
	Adjusting Footplate Height .....	33
	Raising/Lowering Elevating Legrest Assembly .....	35
	Installing Impact Guards/Calf Strap .....	36
	Replacing Heel Loop .....	37
<b>6</b>	<b>ARMS</b>	<b>39</b>
	Adjusting Armrest Height .....	39
	Removing/Installing Armrests .....	40
<b>7</b>	<b>SEAT AND BACK</b>	<b>41</b>
	Replacing Back Upholstery .....	41
	Replacing Seat Upholstery .....	41
	Adjusting the Seat Width .....	42
<b>8</b>	<b>REAR WHEELS</b>	<b>46</b>
	Removing/Installing Rear Wheels .....	46

## CONTENTS

Replacing/Repairing Rear Wheel Tire .....	47
Replacing Rear Wheel Handrim .....	48
<b>9 FRONT CASTERS</b> .....	<b>49</b>
Installing/Replacing Front Casters/Forks .....	49
Adjusting Forks.....	50
Replacing Front Casters .....	50
<b>10 ANTI-TIPPERS/WHEEL LOCKS</b> .....	<b>51</b>
Installing/Adjusting Anti-Tippers.....	51
Using/Adjusting Patient Operated Wheel Locks .....	54
<b>11 SEAT-TO-FLOOR</b> .....	<b>57</b>
Changing Seat-to-Floor Height .....	57
<b>12 OPTIONS</b> .....	<b>59</b>
Installing Amputee Bracket.....	59
Installing Crutch and Cane Carrier.....	61
Installing the Seat Positioning Strap .....	62
Installing the Wheel Lock Extension Handle.....	63

---

## I General

---

### I.1 Symbols

#### Warnings

Signal words are used in this manual 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.



#### **DANGER**

Danger indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



#### **WARNING**

Warning indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



#### **CAUTION**

Caution indicates a potentially hazardous situation which, if not avoided, may result in property damage or minor injury or both.



#### **IMPORTANT**

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



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

# I GENERAL

## I.2 Limited Warranty

**PLEASE NOTE: THE WARRANTY BELOW HAS BEEN DRAFTED TO COMPLY WITH FEDERAL LAW APPLICABLE TO PRODUCTS MANUFACTURED AFTER JULY 4, 1975.**

This warranty is extended only to the original purchaser who purchases this product when new and unused from Invacare or a dealer. This warranty is not extended to any other person or entity and is not transferable or assignable to any subsequent purchaser or owner. Coverage under this warranty will end upon any such subsequent sale or other transfer of title to any other person.

This warranty gives you specific legal rights and you may also have other legal rights which vary from state to state.

Invacare warrants the side frames and cross members of this product when purchased new and unused to be free from defects in materials and workmanship for a period of five (5) years from the date of purchase from Invacare or a dealer, with a copy of the seller's invoice required for coverage under this warranty. Invacare warrants the upholstered materials (seat, back and armrests of the arm assembly) and remaining components of this product when purchased new and unused to be free from defects in materials and workmanship for a period of thirteen (13) months from date of purchase from Invacare or a dealer, with a copy of the seller's invoice required for coverage under this warranty. If within such warranty periods any such product shall be proven to be defective, such product shall be repaired or replaced, at Invacare's option. This warranty does not include any labor or shipping charges incurred in replacement part installation or repair of any such product. Invacare's sole obligation and your exclusive remedy under this warranty shall be limited to such repair and/or replacement.

For warranty service, please contact the dealer from whom you purchased your Invacare product. In the event you do not receive satisfactory warranty service, please write directly to Invacare at the address at the bottom of this page. Provide dealer's name, address, the product model number, date of purchase, indicate nature of the defect and, if the product is serialized, indicate the serial number. Do not return products to our factory without our prior consent.

**LIMITATIONS AND EXCLUSIONS: THE FOREGOING WARRANTY SHALL NOT APPLY TO SERIAL NUMBERED PRODUCTS IF THE SERIAL NUMBER HAS BEEN REMOVED OR DEFACED, PRODUCTS SUBJECTED TO NEGLIGENCE, ACCIDENT, IMPROPER OPERATION, MAINTENANCE OR STORAGE, PRODUCTS MODIFIED WITHOUT INVACARE'S EXPRESS WRITTEN CONSENT INCLUDING, BUT NOT LIMITED TO, MODIFICATION THROUGH THE USE OF UNAUTHORIZED PARTS OR ATTACHMENTS; PRODUCTS DAMAGED BY REASON OF REPAIRS MADE TO ANY COMPONENT WITHOUT THE SPECIFIC CONSENT OF INVACARE, OR TO A PRODUCT DAMAGED BY CIRCUMSTANCES BEYOND INVACARE'S CONTROL, AND SUCH EVALUATION WILL BE SOLELY DETERMINED BY INVACARE. THE WARRANTY SHALL NOT APPLY TO NORMAL WEAR AND TEAR OR FAILURE TO ADHERE TO THE PRODUCT INSTRUCTIONS.**

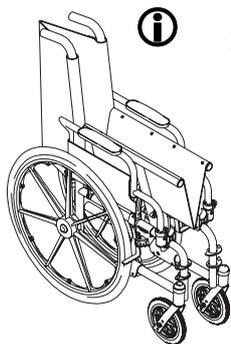
**THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IN LIEU OF ANY OTHER WARRANTIES WHATSOEVER, WHETHER EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, AND THE SOLE REMEDY FOR VIOLATIONS OF ANY WARRANTY WHATSOEVER, SHALL BE LIMITED TO REPAIR OR REPLACEMENT OF THE DEFECTIVE PRODUCT PURSUANT TO THE TERMS CONTAINED HEREIN. THE APPLICATION OF ANY IMPLIED WARRANTY WHATSOEVER SHALL NOT EXTEND BEYOND THE DURATION OF THE EXPRESS WARRANTY PROVIDED HEREIN. INVACARE SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES WHATSOEVER.**

**SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGE, OR LIMITATION OF HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE EXCLUSION AND LIMITATION MAY NOT BE APPLICABLE.**

**THIS WARRANTY SHALL BE EXTENDED TO COMPLY WITH STATE/PROVINCIAL LAWS AND REQUIREMENTS.**

## 2 Overview

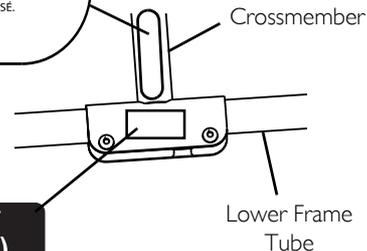
### 2.1 Label Locations



Serial Number Label located on X-Brace that attaches at the left hip.

NO WHEELCHAIR HAS BEEN APPROVED FOR USE AS A SEATING SURFACE WITHIN A MOTOR VEHICLE. THIS LABEL IS FOR INFORMATIONAL PURPOSES ONLY. LIABILITY ISSUES WERE NOT CONSIDERED IN THE ATTACHMENT OF THIS LABEL.

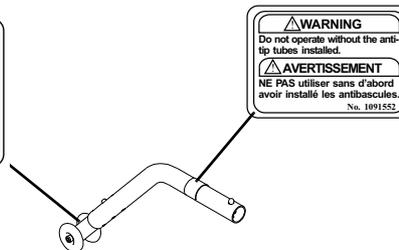
AUCUN FAUTEUIL ROULANT N'A ÉTÉ APPROUVÉ POUR ÊTRE UTILISÉ COMME SIÈGE À L'INTÉRIEUR D'UN VÉHICULE MOTORISÉ. CETTE ÉTIQUETTE NE PEUT ÊTRE UTILISÉE QU'À TITRE D'INFORMATION ET N'A PAS ÉTÉ AFFICHÉE ICI POUR DES RAISONS DE RESPONSABILITÉ LÉGALE.



**WEIGHT CAPACITY**  
**250 LBS. (114 kgs.)**  
**REFER TO OWNER'S MANUAL**  
 P/N 1111013

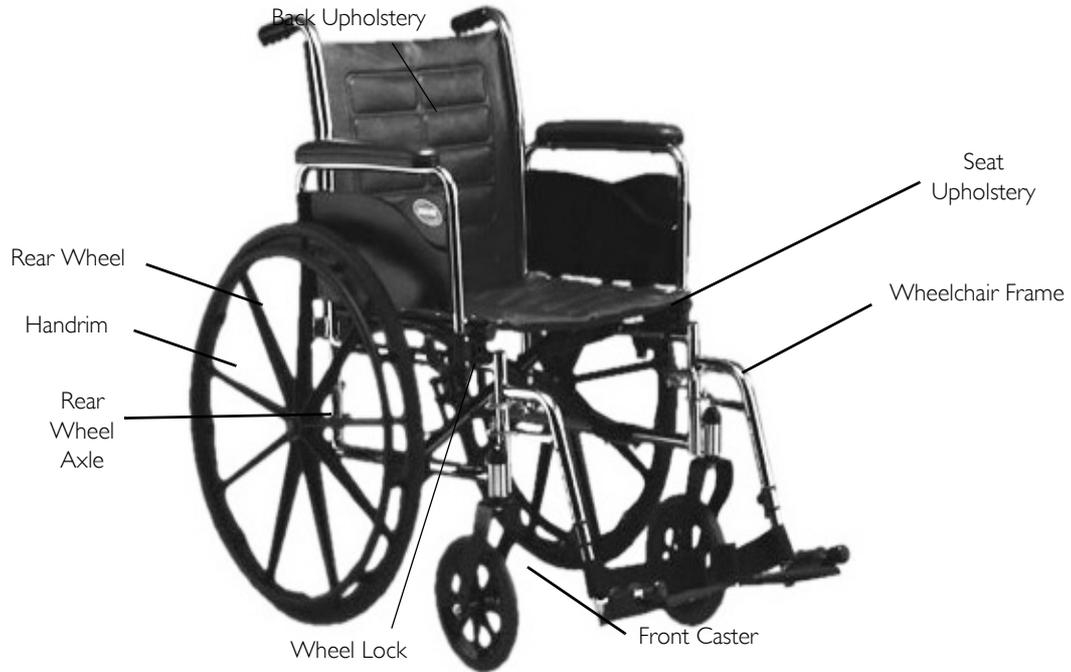


On all adjustable anti-tippers



## 2 OVERVIEW

### 2.1 Component Identification



## 2.2 Typical Product Parameters

	<b>Tracer EX2</b>
Overall Width Permanent Arm: Removable Arm:	23 <sup>1</sup> / <sub>4</sub> , 25 <sup>1</sup> / <sub>4</sub> , 27 <sup>1</sup> / <sub>4</sub> inches 24 <sup>1</sup> / <sub>4</sub> , 26 <sup>1</sup> / <sub>4</sub> , 28 <sup>1</sup> / <sub>4</sub> inches
Overall Depth (with Front Riggings)	31 <sup>7</sup> / <sub>8</sub> inches
Seat Width	16, 18, or 20 inches
Seat Depth SA Frame: FF Frame:	16 inches 16 inches
Seat-to-Floor ** Heights (with 24-inch Wheels) Adult: (SA Frame) Adult: (FF Frame) Hemi: (SA Frame)	19 <sup>1</sup> / <sub>2</sub> inches 21 inches 17 <sup>1</sup> / <sub>2</sub> inches
Back Style	Fixed
Back Height	16 inches
Arm Styles	Fixed or Adjustable Height, Desk or Full Length, Permanent or Removable
Front Riggings	Swingaways Footrests and Elevating Legrests (not available on FF Frame)
Rear Axle	Permanent
Rear Wheels	24-inch Composite or Urethane
Handrims	Composite

## 2 OVERVIEW

	<b>Tracer EX2</b>
Wheel Locks	Push to Lock* (Adult), Pull to Lock* (Hemi)
Caster Size	8x1 inch Solid Rubber
Upholstery	Vinyl - Midnight Blue
Frame Colors	Chrome* and colors
Weight *** (Approx) Permanent Arm: Removable Arm:	36 pounds (SA Frame), 37 pounds (FF Frame) 36 pounds (SA Frame)
Shipping Weight*** (Approx) Permanent Arm: Removable Arm:	45 <sup>1</sup> / <sub>2</sub> pounds (SA Frame), 46 <sup>1</sup> / <sub>2</sub> pounds (FF Frame) 45 <sup>1</sup> / <sub>2</sub> pounds (SA Frame)
Weight Limit	250 pounds (114 kg)



\* - These options are standard for this model.

\*\* - The seat-to-floor heights are based on urethane tires. These heights can vary +/- 1/4 inch due to tire wear and manufacturing tolerances.

\*\*\* - Weights based on 18-inch wide wheelchair without front riggings. Weights will vary depending on how the wheelchair is equipped.

## 3 Safety

The safety section contains important information for the safe operation and use of this product.

### 3.1 General Guidelines



#### **WARNING**

DO NOT use this product or any available optional equipment without first completely reading and understanding these instructions and any additional instructional material such as owner's manuals, service manuals or instruction sheets supplied with this product or optional equipment. If you are unable to understand the warnings, cautions or instructions, contact a healthcare professional, dealer or technical personnel before attempting to use this equipment - otherwise, injury or damage may occur.

A qualified technician **MUST** perform the initial set up of this wheelchair. Also, a qualified technician **MUST** perform all procedures specifically indicated in the manual.



#### **ACCESSORIES WARNINGS**

Invacare products are specifically designed and manufactured for use in conjunction with Invacare accessories. Accessories designed by other manufacturers have not been tested by Invacare and are not recommended for use with Invacare products.



#### **NOTICE**

THE INFORMATION CONTAINED IN THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE.

Check all parts for shipping damage and test before using. In case of damage, DO NOT use. Contact Invacare/Carrier for further instruction.

## 3 SAFETY

### Anti-tippers



#### **WARNING**

Anti-tippers are specific to the different seat-to-floor angles and/or seat-to-floor heights. Refer to the chart in this section of the manual for correct usage and adjustment. If these requirements cannot be achieved, **DO NOT** use the wheelchair. Contact a qualified technician. If changing the seat-to-floor height with or without a change to seat-to-floor angle, the correct anti-tippers **MUST** be used to maintain a 1 1/2 to 2 inch ground clearance.

If so equipped, anti-tippers **MUST** be attached at all times. Inasmuch as the anti-tippers are an option for 0° or 3° on this wheelchair (You may order with or without the anti-tippers), Invacare strongly recommends ordering the anti-tippers as a safeguard for the wheelchair user.

Anti-tippers **MUST** be fully engaged and release buttons fully protruding out of adjustment holes.

**ALWAYS** use anti-tippers. When outdoors on wet, soft ground or on gravel surfaces, anti tippers may not provide the same level of protection against tip over. Extra caution **MUST** be observed when traversing such surfaces.

Ensure both anti-tippers are adjusted to the same mounting hole.

**General Warnings****WARNING**

To determine and establish your particular safety limits, practice bending, reaching and transferring activities in several combinations in the presence of a qualified healthcare professional before attempting active use of the wheelchair. Avoid storing or using the wheelchair near open flame or combustible products. Serious injury or damage to property may result.

DO NOT stand on the frame of the wheelchair.

DO NOT use the footplate as a platform. When getting in or out of the wheelchair, make sure that the footplates are in the upward position.

ALWAYS use the handrims for self-propulsion. Inasmuch as the handrims are an option on this wheelchair (you may order with or without the handrims), Invacare strongly recommends ordering the handrims as an additional safeguard for the wheelchair user.

Invacare recommends that a non-folding device be installed to keep the wheelchair from being folded when left unoccupied in a public place.

DO NOT operate on roads, streets or highways.

DO NOT allow children to play on or operate the wheelchair.

DO NOT operate on soft surfaces such as sand, grass, or gravel.

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

## 3 SAFETY

### Hand Grips



#### **WARNING**

ALWAYS check hand grips for looseness before using the wheelchair. If loose and/or worn, replace IMMEDIATELY.

When cleaning rear cane or hand grip areas use only a clean towel lightly dampened with cool water. Verify that grips are dry prior to use. Use of soap or ammonia based cleaning solutions will result in the hand grips sliding off the cane assembly. Failure to observe this warning may result in injury to the user or bystanders.

If the wheelchair is exposed to extreme temperature (above 100°F or below 32°F), high humidity and/or becomes wet, prior to use, ensure that the handgrips DO NOT twist on the handle. Otherwise, damage or injury may occur.

### Information for Healthcare Professionals/Assistants



#### **WARNING**

When assistance to the wheelchair user is required, remember to use good body mechanics. Keep your back straight and bend your knees whenever tipping the wheelchair or traversing curbs, or other impediments.

When learning a new assistance technique, have an experienced assistant help you before attempting it alone.

### Lifting



#### **WARNING**

DO NOT attempt to lift the wheelchair by any removable (detachable) parts. Lifting by means of any removable (detachable) parts of the wheelchair may result in injury to the user or damage to the wheelchair.

### Ramps, Slopes, Inclines, and Obstacles



#### **WARNING**

DO NOT traverse, climb or go down ramps or slopes greater than 9°.

DO NOT attempt to move up or down an incline with a water, ice or oil film.

DO NOT attempt to ride over curbs or obstacles. Doing so may cause your wheelchair to tip over and cause bodily harm to you or damage to the wheelchair.

NEVER leave an unoccupied wheelchair on an incline.

DO NOT attempt to stop the wheelchair while on a sloped surface.

### Repair and Service Information



#### **WARNING**

Unless otherwise noted, all service and adjustment should be performed while the wheelchair is unoccupied.

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

### Seat Positioning Straps



#### **WARNING**

ALWAYS wear your seat positioning strap. Inasmuch as the seat positioning strap is an option on this wheelchair (you may order with or without the seat positioning strap), Invacare strongly recommends ordering the seat positioning strap as an additional safeguard for the wheelchair user. The seat positioning strap is a positioning strap only. It is not designed for use as a safety device withstanding high stress loads such as auto or aircraft safety belts. If signs of wear appear, strap MUST be replaced IMMEDIATELY.

With regards to seat/chest positioning straps - it is the obligation of the DME dealer, therapists and other healthcare professionals to determine if a seat/chest positioning strap is required to ensure the safe operation of this equipment by the user. Serious injury can occur in the event of a fall from a wheelchair.

### 3 SAFETY

#### Stability All Models



#### **WARNING**

The seat depth, size/position of the front casters, size/position of the rear wheels, use of anti-tipper model, as well as the user condition directly relate to the stability of the wheelchair. Any change to one or any combination of the seven may cause the wheelchair to decrease in stability. These adjustments **MUST** be performed by a qualified technician.

The various seat-to-floor heights require specific settings depending on rear wheel size, rear wheel position, front caster size/position and desired seat-to-floor angle. These adjustments **MUST** be performed by a qualified technician.

 When changes to the left hand column occur, follow across the chart and refer to the procedure that is checked (✓) to maintain the proper stability, safety and handling of the wheelchair.	CASTER SIZE	CASTER POSITION	WHEEL SIZE	WHEEL POSITION	ANTI-TIPPERS	USER CONDITION
<b>CASTER SIZE</b>	•	✓	✓	✓	✓	✓
<b>CASTER POSITION</b>	✓	•	✓	✓	✓	✓
<b>WHEEL SIZE</b>	✓	✓	•	✓	✓	✓
<b>WHEEL POSITION</b>	✓	✓	✓	•	✓	✓
<b>ANTI-TIPPERS</b>	✓	✓	✓	✓	•	✓
<b>USER CONDITION</b>	✓	✓	✓	✓	✓	•

#### Weight Limitation



#### **WARNING**

The Tracer EX2 has a weight limitation of 250 pounds (114 kg).

### Weight Training



#### **WARNING**

Invacare does not recommend the use of its wheelchairs as a weight training apparatus. Invacare wheelchairs have not been designed or tested as a seat for any kind of weight training. If occupant uses said wheelchair as a weight training apparatus, Invacare shall not be liable for bodily injury or damage to the wheelchair and the warranty is void.

### Wheel Locks



#### **WARNING**

DO NOT attempt to stop a moving wheelchair with wheel locks. Wheel locks are not brakes.

If the wheelchair is equipped with push to lock wheel locks, elevating legrests, and wheel lock extension handles, the wheel lock extension handles **MUST** be removed before swinging the elevating legrests to the side, otherwise injury or damage may result. Interference between the top of the elevating legrest and the wheel lock extension handle causes the wheel lock to disengage.

Engaging the wheel locks may not prevent the wheelchair from moving on all floor surfaces including those that may be wet or slick. **ALWAYS** exercise caution when transferring into or out of the wheelchair.

### Wheelchair Tie Down Restraints



#### **WARNING**

Wheelchair users should **NOT** be transported in vehicles of any kind while in wheelchairs. As of this date, the Department of Transportation has not approved any tie-down systems for transportation of a user while in a wheelchair, in a moving vehicle of any type.

It is Invacare's position that users of wheelchairs should be transferred into appropriate seating in vehicles for transportation and use be made of the restraints made available by the auto industry. Invacare cannot and does not recommend any wheelchair transportation systems.

## 3 SAFETY

### Wheelchair User



#### **WARNING**

As a manufacturer of wheelchairs, Invacare endeavors to supply a wide variety of wheelchairs to meet many needs of the end user. However, final selection of the type of wheelchair to be used by an individual rests solely with the user and his/her healthcare professional capable of making such a selection.

### 3.2 Safety/Handling of Wheelchairs

Safety and handling of the wheelchair require the close attention of the wheelchair user as well as the assistant. This manual points out the most common procedures and techniques involved in the safe operation and maintenance of the wheelchair. It is important to practice and master these safe techniques until you are comfortable in maneuvering around the frequently encountered architectural barriers.

Use this information only as a basic guide. The techniques that are discussed on the following pages have been used successfully by many.

Individual wheelchair users often develop skills to deal with daily living activities that may differ from those described in this manual. Invacare recognizes and encourages each individual to try what works best for him/her in overcoming architectural obstacles that they may encounter. However, all warnings and cautions given in this manual **MUST** be heeded. Techniques in this manual are a starting point for the new wheelchair user and assistant with “safety” as the most important consideration for all.

### Stability and Balance



#### **WARNING**

Be aware that carrying heavy objects on your lap while occupying the wheelchair may adversely affect the stability of the wheelchair, resulting in serious bodily injury to the user, damage to the wheelchair and surrounding property.

This wheelchair has been designed to accommodate one individual. If more than one individual occupies the wheelchair this may adversely affect the stability of the wheelchair, resulting in serious bodily injury to the user and passenger and damage to the wheelchair and surrounding property.

To assure stability and proper operation of your wheelchair, you **MUST** maintain proper balance at all times. Your wheelchair has been designed to remain upright and stable during normal daily activities as long as you **DO NOT** move beyond the center of gravity.

Virtually all activities which involve movement in the wheelchair have an effect on the center of gravity. Invacare recommends using seat/chest positioning straps for additional safety while involved in activities that shift your weight.

DO NOT lean forward out of the wheelchair any further than the length of the armrests. Make sure the casters are pointing in the forward position whenever you lean forward. This can be achieved by advancing the wheelchair and then reversing it in a straight line.

Many activities require the wheelchair owner to reach, bend and transfer in and out of the wheelchair. These movements will cause a change to the normal balance, the center of gravity, and the weight distribution of the wheelchair.

To determine and establish your particular safety limits, practice bending, reaching and transferring activities in several combinations in the presence of a qualified healthcare professional before attempting active use of the wheelchair.

Proper positioning is essential for your safety. When reaching, leaning, or bending forward, it is important to use the front casters as a tool to maintain stability and balance.

### Reaching, Leaning and Bending



#### **WARNING**

DO NOT shift your weight or sitting position toward direction you are reaching as the wheelchair may tip over.

DO NOT attempt to reach objects if you have pick them up from the floor by reaching down between your knees.

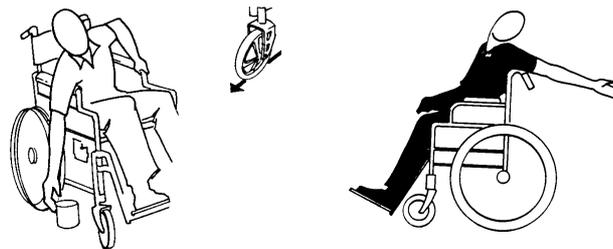
DO NOT lean over the top of the back upholstery to reach objects behind you, as this may cause the wheelchair to tip over.

#### **Forward**

Position the front casters so that they are extended as far forward as possible and engage wheel locks.

#### **Backwards**

Position wheelchair as close as possible to the desired object. Point front casters forward to create the longest possible wheelbase. Reach back only as far as your arm will extend without changing your sitting position.



**FIGURE 1** Backwards

## 3 SAFETY

### Coping With Everyday Obstacles

Coping with the irritation of everyday obstacles can be alleviated somewhat by learning how to manage your wheelchair. Keep in mind your center of gravity to maintain stability and balance.

#### Tipping



#### **WARNING**

**DO NOT** tip the wheelchair without assistance.

When lowering the front casters of the wheelchair, Do not let the wheelchair drop the last few inches to the ground. This could result in injury to the occupant and/or damage to the wheelchair.

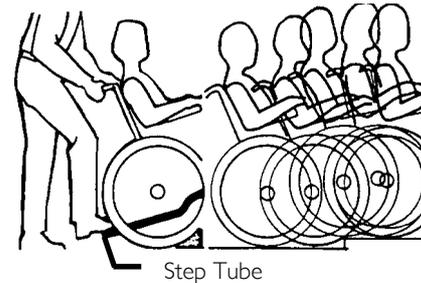
When tipping the wheelchair, an assistant should grasp the back of the wheelchair on a non-removable (non-detachable) part. Inform the wheelchair occupant before tipping the wheelchair and remind him/her to lean back. Be sure the occupant's feet and hands are clear of all wheels and/or pinch points.

After mastering the techniques of tipping the wheelchair, use one of the following methods to tackle curbs, short stairs, etc.

#### **Method 1 - Wheelchair With Step Tubes**

Place foot on the step tube and begin to tilt the wheelchair toward you. Apply a continuous downward motion until the balance point is achieved and the front casters clear the curb. At this point, the assistant will feel a difference in the weight distribution.

Roll the wheelchair forward and slowly lower the front of the wheelchair in one continuous movement onto the sidewalk. Push the wheelchair forward until the rear wheels roll up and over the curb.



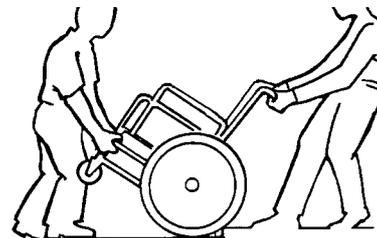
**FIGURE 2** Method 1 - Wheelchair With Step Tubes

#### **Method 2 - Wheelchair Without Step Tubes**

This method requires two assistants. The second assistant should be positioned at the front of the wheelchair lifting upward on a non-removable (non-detachable) part of the wheelchair frame when lifting the wheelchair and stabilizing the wheelchair when the wheelchair is being lowered to the ground.

The first assistant should stand on the sidewalk and turn the wheelchair so that the rear wheels are against the curb. Turn the anti-tippers so the anti-tip wheels are pointing up. The wheelchair should be tilted back to the balance point and, in one continuous upward movement, the rear wheels should be pulled up and over the curb. **DO NOT** return the front casters to the ground until the wheelchair has been pulled backward far enough for the front casters to clear the edge of the curb.

Roll the wheelchair backward and slowly lower the wheelchair in one continuous movement. Turn the anti-tippers so the anti-tip wheels are facing down.



**FIGURE 3** Method 2 - Wheelchair Without Step Tubes

## Stairways



### **WARNING**

Extreme caution is advised when it is necessary to move an occupied or unoccupied wheelchair up or down the stairs. Invacare recommends that, if possible, the user be removed from the wheelchair prior to moving. Invacare recommends using two assistants and making thorough preparations. Make sure to use only secure, non-detachable parts for hand-held supports.

Follow this procedure for moving the wheelchair between floors when an elevator is not available:

### **Moving Up Stairs**

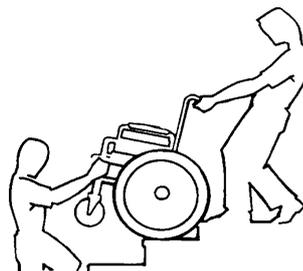
1. If necessary, rotate the anti-tippers so the wheels are facing up.
2. One assistant (positioned behind the wheelchair), securely grasps a non-removable (non-detachable) part of the wheelchair for leverage and tilts the wheelchair back to the balance point.
3. After the wheelchair has been tilted back to the balance point, the assistant behind the wheelchair backs the wheelchair up against the first step.
4. The second assistant (positioned in the front of the wheelchair), with a firm hold on a non-detachable part of the framework, lifts the wheelchair up and on to the next stair above and steadies the wheelchair as the assistant behind the wheelchair places one foot on the next stair above and repeats process.
5. The wheelchair should not be lowered until the last stair has been negotiated and the wheelchair has been rolled away from the stairway.

### 3 SAFETY

6. If necessary, rotate the anti-tippers so the wheels are facing down.

#### Moving Down Stairs

1. If necessary, rotate the anti-tippers so the wheels are facing up.
2. One assistant (positioned behind the wheelchair), securely grasps a non-removable (non-detachable) part of the wheelchair for leverage and tilts the wheelchair back to the balance point.
3. After the wheelchair has been tilted back to the balance point, the assistant behind the wheelchair rolls the wheelchair up to the edge of the first step.
4. The second assistant (positioned in the front of the wheelchair), with a firm hold on a non-detachable part of the framework, lowers the wheelchair down and on to the next stair below and steadies the wheelchair as the assistant in the rear places one foot on the next stair below and repeats process.
5. The wheelchair should not be lowered until the last stair has been negotiated and the wheelchair has been rolled away from stairway.
6. If necessary, rotate the anti-tippers so the wheels are facing down.



**FIGURE 4** Stairways

#### Escalators



#### **WARNING**

DO NOT use an escalator to move a wheelchair between floors. Serious bodily injury may occur.

#### Transferring To and From Other Seats



#### **WARNING**

Before attempting to transfer in or out of the wheelchair, every precaution should be taken to reduce the gap distance. Turn both casters parallel to the object you are transferring onto. Also be certain the wheel locks are engaged to help prevent the wheels from moving.



### CAUTION

When transferring, position yourself as far back as possible in the seat. This will help prevent damaged upholstery and the possibility of the wheelchair tipping forward.



This activity may be performed independently provided you have adequate mobility and upper body strength.

Position the wheelchair as close as possible alongside the seat to which you are transferring, with the front casters pointing parallel to it. Remove or flip up the armrest. Engage wheel locks. Swing away or remove front rigging. Shift body weight into seat with transfer.

During independent transfer, little or no seat platform will be beneath you. Use a transfer board if at all possible.

### Unfolding and Folding Wheelchair



### WARNING

ALWAYS keep hands and fingers clear of moving parts to avoid injury.

DO NOT place hand or fingers on the underside of the seat frame rail when opening or closing the wheelchair.

DO NOT sit or transfer into the wheelchair unless it is fully open and the seat frame rails are fully seated into the side frame H-blocks.

### Unfolding

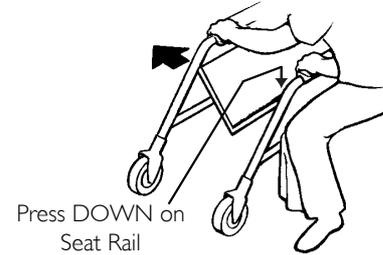
1. Tilt the wheelchair toward you (raising the opposite wheel and caster off the ground/floor).



**FIGURE 5** Transferring To and From Other Seats

### 3 SAFETY

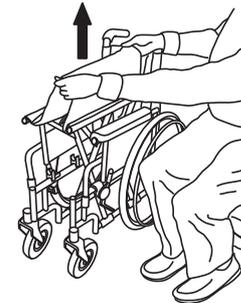
2. Place your hand on the top of the seat rail closest to you where the seat upholstery is attached.
3. Point your fingers and thumb to the inside of the wheelchair.
4. Press downward on the top of the seat rail until the wheelchair is fully open and the seat rails are fully seated in the H-blocks.
5. Engage both wheel locks, open the footrest/legrest for clearance and transfer into the wheelchair. Refer to [Transferring To and From Other Seats](#) on page 22.



**FIGURE 6** Unfolding and Folding Wheelchair

#### Folding Hammock or Sling Seat Models

1. Swing footrest/legrest in locked position to front of wheelchair.
2. Pivot footplates upward to vertical position.
3. With both hands, grasp the middle of the seat upholstery at the front and back edge and lift up.
4. Continue to close the wheelchair by grasping the armrest furthest from you and pulling the armrest towards you.



**FIGURE 7** Folding Hammock or Sling Seat Models

---

## 4 Safety Inspection/Troubleshooting

---



Every six months or as necessary, take your wheelchair to a qualified technician for a thorough inspection and servicing. 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. Routine maintenance will extend the life and efficiency of your wheelchair.

### 4.1 Safety Inspection Checklist

Initial adjustments should be made to suit your personal body structure and preference. Thereafter follow these maintenance procedures:

#### Inspect/Adjust Initially

- Ensure that the wheelchair rolls straight (no excessive drag or pull to one side).
- Inspect for loose or missing hardware on frame and crossbraces.
- Inspect for bent frame or crossbraces.
- Check that the wheel locks **DO NOT** interfere with tires when rolling.
- Check that the wheel lock pivot points are free of wear and looseness.
- Check that the wheel locks are easy to engage.
- Ensure that the wheel locks prevent the wheelchair from moving when engaged.
- Inspect the seat and back for rips and sagging.
- Inspect the seat and back for loose or broken hardware.
- Inspect the back cane hand grips for wear/looseness/deterioration.
- 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.
- Inspect tires for flat spots and wear.
- Check pneumatic tires for proper inflation.

## 4 SAFETY INSPECTION/TROUBLESHOOTING



### **WARNING**

As with any vehicle, check the wheels and tires periodically for cracks and wear. Replace if damaged.

- If equipped, check that the quick-release axles lock properly. Lubricate if necessary.
- Check that there is no excessive side movement or binding in the rear wheels when lifted and spun.
- Inspect rear wheels for cracked, bent or broken spokes.
- Ensure all spokes are uniformly tight.
- Inspect handrims for signs of rough edges or peeling.
- Inspect axle assembly for proper tension by spinning caster. Caster should come to a gradual stop.
- Adjust front casters/forks bearing system if wheel wobbles noticeably or binds to a stop.
- Ensure wheel bearings are clean and free of moisture.
- Check headtube locknuts for tightness.
- Inspect casters for cracks and wear.
- Inspect front casters for cracked, bent or broken spokes.
- Ensure that casters are free of debris.
- Clean upholstery and armrests with mild soap and water.
- Check that all labels are present and legible. Replace if necessary.

### **Inspect/Adjust Weekly**

- Ensure that the wheel locks prevent the wheelchair from moving when engaged.
- Inspect tires for flat spots and wear.
- Check pneumatic tires for proper inflation.
- If equipped, check that the quick-release axles lock properly. Lubricate if necessary.
- Inspect rear wheels for cracked, bent or broken spokes.
- Ensure all spokes are uniformly tight.

## 4 SAFETY INSPECTION/TROUBLESHOOTING

- Inspect axle assembly for proper tension by spinning caster. Caster should come to a gradual stop.
- Inspect front caster for cracked, bent or broken spokes.
- Ensure that casters are free of debris.

### **Inspect/Adjust Monthly**

- Ensure that the wheelchair rolls straight (no excessive drag or pull to one side).
- Check that the wheel locks DO NOT interfere with tires when rolling.
- Check that the wheel lock pivot points are free of wear and looseness.
- Inspect seat and back for loose or broken hardware.
- 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.
- Inspect back cane hand grips for wear/looseness/deterioration.
- Adjust front casters/forks bearing system if wheel wobbles noticeably or binds to a stop.
- Ensure wheel bearings are clean and free of moisture.
- Check headtube locknuts for tightness.

### **Inspect/Adjust Periodically**

- Inspect frame and crossbraces for loose or missing hardware.
- Inspect for bent frame or crossbraces.
- Check that wheel locks are easy to engage.
- Inspect seat and backs for rips and sagging.
- Check that there is no excessive side movement or binding in the rear wheels when lifted and spun.
- Inspect handrims for signs of rough edges or peeling.
- Adjust front casters/forks bearing system if wheel wobbles noticeably or binds to a stop.
- Ensure wheel bearings are clean and free of moisture.

## 4 SAFETY INSPECTION/TROUBLESHOOTING

- Inspect casters for cracks and wear.
- Ensure that casters are free of debris.
- Clean upholstery and armrests with mild soap and water.
- Check that all labels are present and legible. Replace if necessary.

### 4.2 Troubleshooting

Chair Veers Right/Left	Chair 3 Wheels	Sluggish Turn or Performance	Casters Flutter	Squeaks and Rattles	Looseness in Chair	Solutions
X	X	X	X			Check tires for correct and equal pressure
		X	X	X	X	Check for loose nuts and bolts.
X	X		X			Check caster headtube angle.
X	X					Check that rear wheels are equally spaced away from seat frame.

### 4.3 Maintenance

#### Maintenance Safety Precautions



#### **WARNING**

After any adjustments, repair or service and before use, make sure all attaching hardware is tightened securely. Otherwise injury or damage may result.

Replace any labels that are missing, worn, or torn. Refer to [Label Locations](#) on page 8 for a listing of the labels and their locations.



#### **CAUTION**

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

#### Suggested Maintenance Procedures

1. Before using your wheelchair, make sure all nuts and bolts are tight.
2. Check all parts for damage or wear and replace.
3. Check all parts for proper adjustment.



#### **CAUTION**

As with any vehicle, check the wheels and tires periodically for cracks and wear. Replace if damaged. Replace as recommended, refer to [Replacing/Repairing Rear Wheel Tire/Tube](#) on page 30 and [Replacing/Repairing Caster Tire/Tube](#) on page 30.

4. The rear wheels, casters and tires should be checked periodically for cracks and wear, and should be replaced by a qualified technician if damaged.
5. Periodically adjust wheel locks in correlation to tire wear. Refer to [Adjusting Patient Operated Wheel Locks](#) on page 55.

## 4 SAFETY INSPECTION/TROUBLESHOOTING



Tire wear is excessive if:

Pneumatic Tires - there is missing tread or the tires are bald.

Urethane Tires - there are cuts, surface defects or the tires are loose on the rims.

Rubber Tires - 30% or more of the tire has worn away.

Invacare recommends that tires and casters be replaced every five years.

6. Periodically check handrims to ensure they are secured to the rear wheels. If loose, have them tightened by a qualified technician.
7. Periodically check caster wheel bearings to make sure they are clean and free from moisture. Use a Teflon™ lubricant if necessary.
8. Check upholstery for sagging, rips or tears.
9. Clean upholstery with mild soap and water.
10. Hand grips should be checked monthly for wear/looseness/deterioration. Clean if desired. Replace if looseness or deterioration is found

### Replacing/Repairing Rear Wheel Tire/Tube



#### **WARNING**

Replacement of solid urethane tires is not recommended. If the solid urethane tire needs repaired, Invacare recommends replacing the complete wheel assembly.

### Replacing/Repairing Caster Tire/Tube



#### **WARNING**

Replacement of solid rubber tires is not recommended. If the solid rubber tires need replaced, Invacare recommends replacing complete caster assembly.

---

## 5 Front Riggings

---



### **WARNING**

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

### **5.1 Installing/Removing Front Riggings**

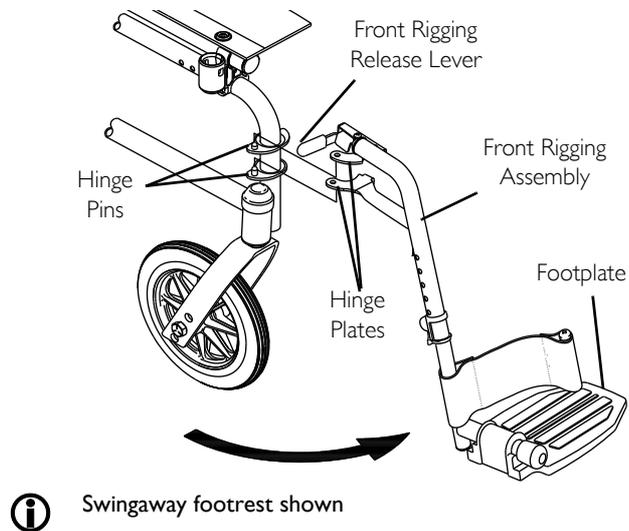
#### **Installing**

1. Turn the front rigging assembly to the side.
2. Install the hinge plates on the front rigging assembly onto the hinge pins on the wheelchair frame.
  -  When performing STEP 3, it may be necessary to pull release lever toward front of chair to assist the front rigging to lock in place.
3. Push the front rigging assembly towards the inside of the wheelchair until it locks into place.
  -  The footplate will be on the inside of the wheelchair when locked in place.
4. Repeat this procedure for the other front rigging assembly.
5. To release the front rigging, push the front rigging release lever inward, rotate front rigging outward.

#### **Removing**

1. Push the front rigging release lever inward.
2. Rotate swingaway front rigging assembly outward.
3. Lift the swingaway front rigging assembly off the hinge pins.

## 5 FRONT RIGGINGS



**FIGURE 1** Installing/Removing Front Riggings

## 5.2 Adjusting Footplate Height

### Spring Button



This procedure applies to the swingaway front riggings and swingaway elevating legrest.

1. Remove the front rigging assembly. Refer to [Installing/Removing Front Riggings](#) on page 31.



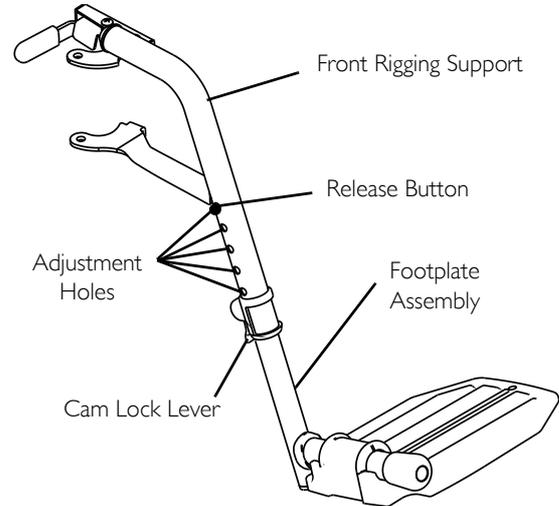
Lay the front rigging assembly on a flat surface to simplify this procedure.

2. Pull the cam lock lever up to unlocked position.



The elevating legrest has two sets of release buttons, one set above the other. Each set will be visible one at a time allowing finer footplate height adjustment.

3. Push in the release buttons and reposition the footplate assembly to the desired height.
4. Ensure that the release buttons fully protrude from holes on both sides of the front rigging support.
5. Rotate cam lock lever down to locked position.
6. Repeat this procedure for the other footplate, if necessary.
7. Reinstall the swingaway front rigging assembly. Refer to [Installing/Removing Front Riggings](#) on page 31.



Swingaway footrest shown

**FIGURE 2** Adjusting Footplate Height - Spring Button

## 5 FRONT RIGGINGS

### Bolt-In-Place



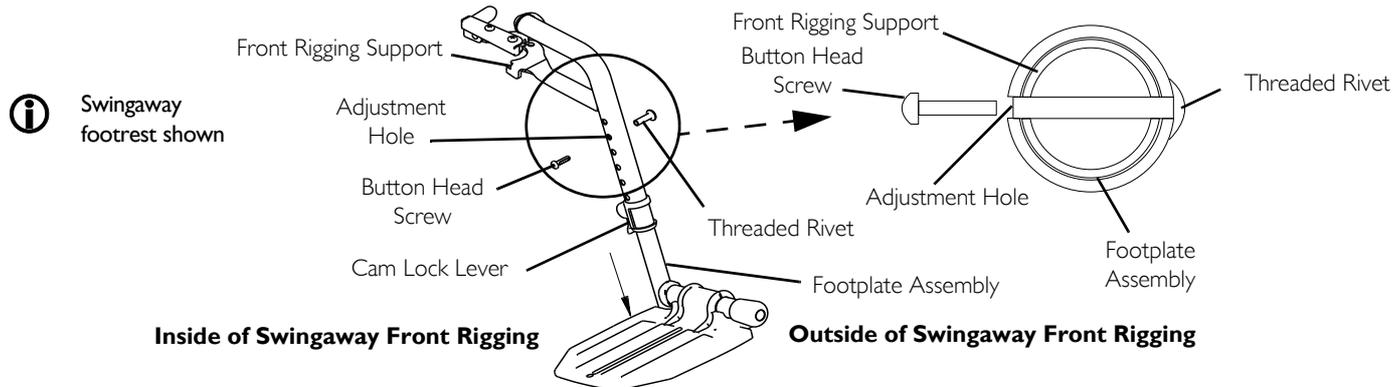
This procedure applies to the swingaway front riggings and swingaway elevating legrest.

1. Remove the swingaway front rigging. Refer to [Installing/Removing Front Riggings](#) on page 31.



Lay the front rigging assembly on a flat surface to simplify this procedure.

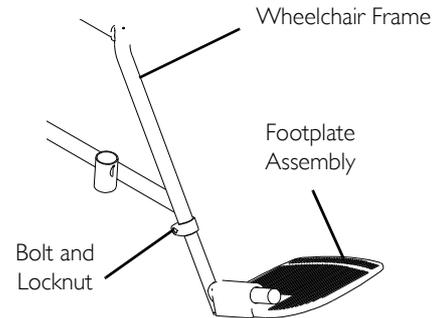
2. Pull the cam lock lever up to the unlocked position.
3. Using a screw driver to hold the threaded rivet in position, remove the button head screw from the threaded rivet.
4. Remove the threaded rivet and button head screw securing the footplate assembly to the front rigging support.
5. Adjust the footplate assembly height by aligning the desired adjustment holes in the upper front rigging support and lower footplate assembly.
6. From the outside of the swingaway front rigging, insert the threaded rivet through both the front rigging support and the footplate assembly.
7. From the inside of the swingaway front rigging, insert the button head screw through the appropriate adjustment hole and thread into the threaded rivet.
8. Using a screwdriver to hold the threaded rivet in position, securely tighten the button head screw. Torque to 32 in-lbs.
9. Rotate cam lock lever down to locked position.
10. Repeat STEPS 1-9 to adjust the remaining footrest.



**FIGURE 3** Adjusting Footplate Height - Bolt-In-Place

### Fixed Frame

1. Remove impact guards and/or calf strap, if necessary.
2. Loosen, but do not remove the bolt and locknut that secure the lower footrest assembly to the upper footrest support.
3. Reposition the lower footrest assembly to the desired height.
4. Securely tighten the bolt and locknut.
5. Repeat this procedure for the other footrest, if necessary.
6. Replace impact guards and/or calf strap, if necessary.



**FIGURE 4** Adjusting Footplate Height - Fixed Frame

### 5.3 Raising/Lowering Elevating Legrest Assembly

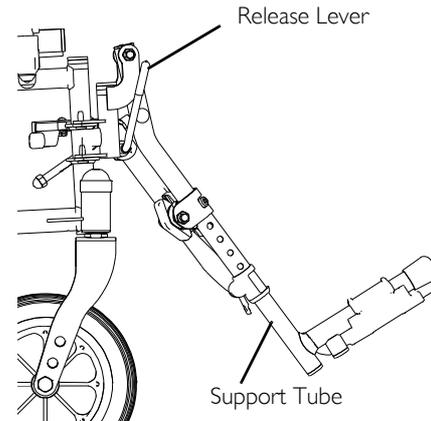


#### **WARNING**

Ensure hands and fingers are clear of elevating legrest mechanism before pushing release lever to lower the elevating legrest. Otherwise injury may occur due to pinch points.

The wheelchair user's leg **MUST** be supported by an assistant before attempting to lower legrest.

1. To raise the elevating legrest, the assistant should hold the support tube and raise the elevating legrest until the desired height is obtained.
2. To lower the elevating legrest, perform the following:
  - A. Support user leg with one hand.
  - B. Push release lever downward with other hand.
  - C. Gently, lower user leg down and rest against the legrest.



**FIGURE 5** Raising/Lowering Elevating Legrest Assembly

## 5 FRONT RIGGINGS

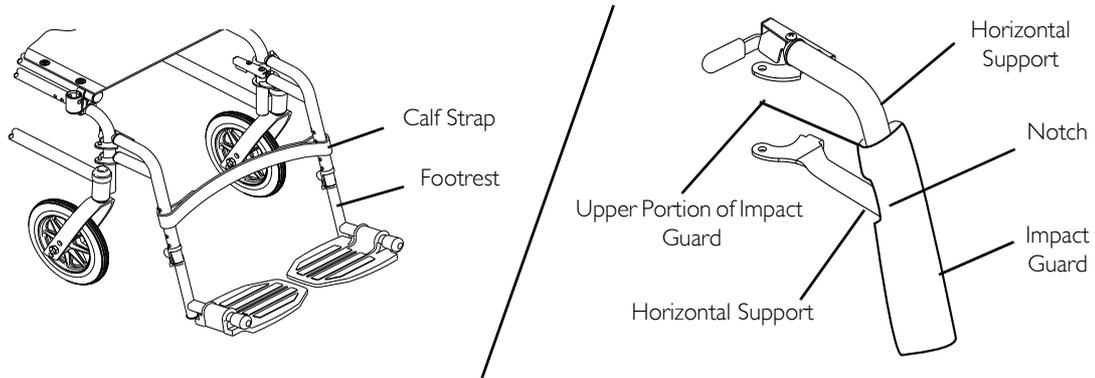
### 5.4 Installing Impact Guards/Calf Strap

1. Remove impact guard/calf strap from packaged container if not already secured to the footrest.
2. Secure one impact guard to each footrest.



Ensure the upper portion of the impact guard is between the two horizontal supports of the footrest.

3. Secure one side of the calf strap around each footrest (with the impact guards attached, if present).



**FIGURE 6** Installing Impact Guards/Calf Strap

## 5.5 Replacing Heel Loop



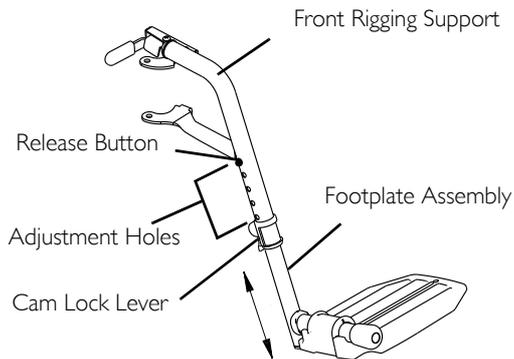
For this procedure, refer to FIGURE 7 on page 38.

1. Pull the cam lock lever up to unlocked position.
2. Perform one of the following:
  - Footplates with Spring Buttons (Detail "A"):
    - i. Push in the release buttons and remove the footplate assembly from the front rigging support.
  - Bolt-In-Place Footplates (Detail "B"):
    - i. Using a screw driver to hold the threaded rivet in position, remove the button head screw from the threaded rivet.
    - ii. Remove the threaded rivet and button head screw securing the footplate assembly to the front rigging support.
3. Remove the mounting screw, spacer and locknut that secure the heel loop to the footplate.
4. Remove existing heel loop from slide tube.
5. Install new heel loop onto slide tube.
6. Install the mounting screw, spacer and locknut to secure the heel loop to the footplate. Tighten until the spacer is secure.
7. Insert the lower footrest assembly into the upper footrest assembly to desired height.
8. Perform one of the following:
  - Footplates With Spring Buttons (Detail "A"):
    - i. Ensure that the release buttons fully protrude from holes on both sides of the upper footrest support.
  - Bolt-In-Place Footplates (Detail "B"):
    - i. From the outside of the swingaway front rigging, insert the threaded rivet through both the front rigging support and the footplate assembly.
    - ii. From the inside of the swingaway front rigging, insert the button head screw through the appropriate adjustment hole and thread into the threaded rivet.
    - iii. Using a screwdriver to hold the threaded rivet in position, securely tighten the button head screw. Torque to 32 in-lbs.
9. Rotate cam lock lever down to locked position.

## 5 FRONT RIGGINGS

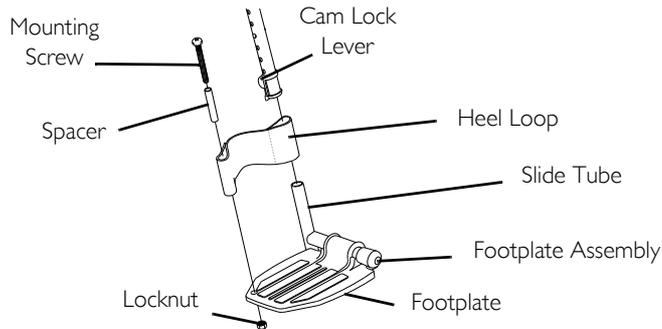
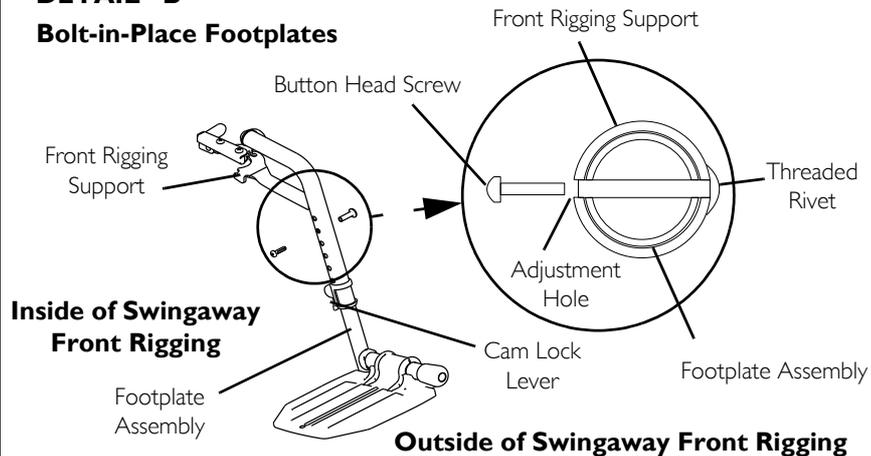
### DETAIL "A"

#### Footplates with Spring Buttons



### DETAIL "B"

#### Bolt-in-Place Footplates



**FIGURE 7** Replacing Heel Loop

## 6 Arms



### WARNING

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

### 6.1 Adjusting Armrest Height



### WARNING

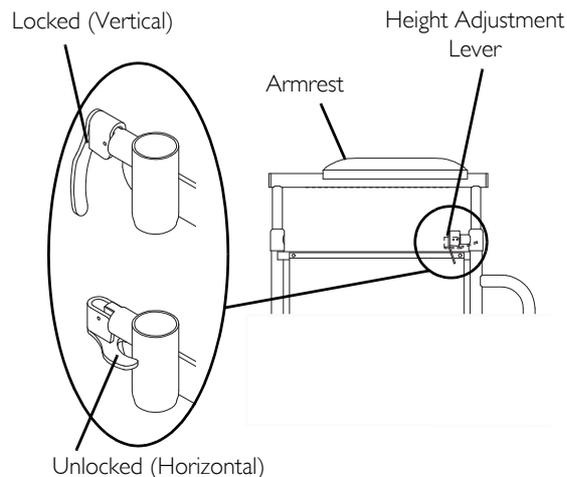
Make sure the height adjustment lever is in the locked position before using the wheelchair.

1. Unlock the armrest by flipping the height adjustment lever on the top front of the armrest to the up (horizontal) position.
2. Adjust the armrest to one of five positions.



Height adjustment lever **MUST** be in the unlocked position when placing armrest into the arm assembly.

3. Lock the armrest by pressing the height adjustment lever into the down (vertical) position when the desired armrest height is achieved.
4. Repeat STEPS 1-3 for the other armrest.



**FIGURE I** Adjusting Armrest Height

## 6 ARMS

### 6.2 Removing/Installing Armrests



#### **WARNING**

Make sure the height adjustment lever is in the locked position before using the wheelchair.

#### **Removing Armrest**

1. Push down on armrest to ensure it is fully seated in front and rear sockets.

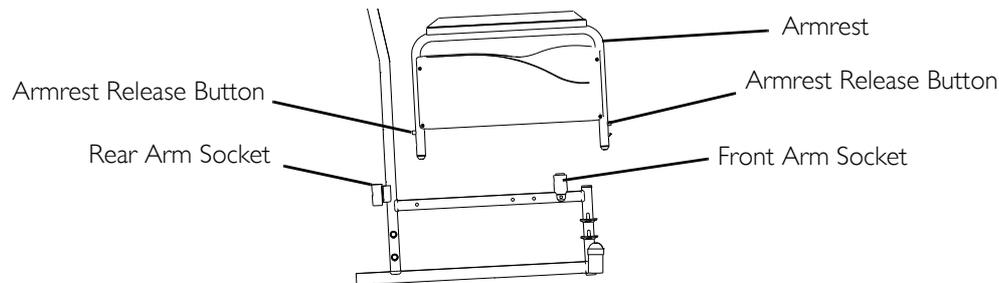


STEP 1 prevents the release buttons from hanging up on the sockets during removal.

2. Press in the armrest release button at the front and rear of the armrest.
3. While pressing in the armrest release buttons, remove the armrest from the arm sockets by pulling straight up.

#### **Installing Armrest**

1. Position the armrest just above the front and rear arm sockets.
2. Push arm down evenly at the front and rear until the front and rear armrest release buttons snap into the arm sockets.
3. Ensure armrest is locked securely in the arm sockets by gently lifting up. If not locked, repeat STEPS 1-3.



**FIGURE 2** Removing/Installing Armrests

## 7 Seat and Back

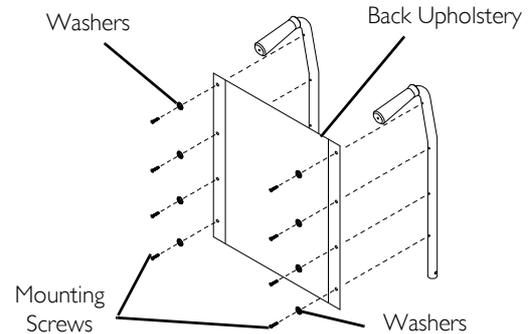


### WARNING

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

### 7.1 Replacing Back Upholstery

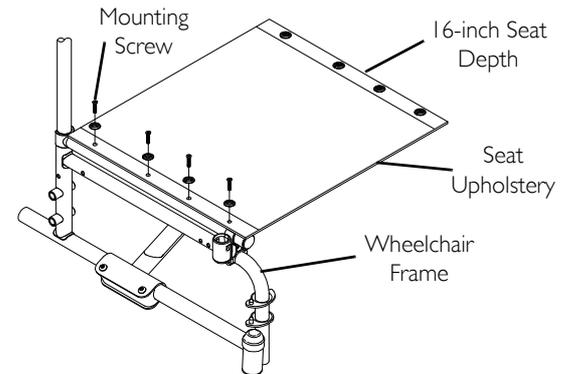
1. Remove the eight mounting screws and washers that secure the existing back upholstery to the back canes.
2. Remove existing back upholstery from the back canes.
3. Securely tighten the new back upholstery to the back canes with the phillips screws and washers.



**FIGURE 1** Replacing Back Upholstery

### 7.2 Replacing Seat Upholstery

1. Remove the eight phillips screws and washers that secure the existing seat upholstery to the crossbraces.
2. Remove the existing seat upholstery from the crossbraces.
3. Ensure positioning of seat positioning strap (if used). Refer to [Installing the Seat Positioning Strap](#) on page 62.
4. Install new seat upholstery by reversing STEPS 1-2.



**FIGURE 2** Replacing Seat Upholstery

## 7 SEAT AND BACK

### 7.3 Adjusting the Seat Width

#### Swingaway Front Riggings



For this procedure, refer to FIGURE 3, FIGURE 4 on page 43, and FIGURE 5 on page 44.

When adjusting the seat width of the wheelchair, the back and seat upholstery **MUST** be changed. If applicable, the headrest pillow and headrest upholstery **MUST** be changed as well.

1. Remove the existing back and seat upholstery from the wheelchair. Refer to [Replacing Back Upholstery](#) and [Replacing Seat Upholstery](#) on page 41.
2. Remove the four button screws and locknuts that secure the two pivot links to the wheelchair frame and crossbraces.
3. Remove the two button screws, locknuts and crossbrace saddle that secures the bottom of the crossbrace to the wheelchair frame. Repeat for other crossbrace.
4. Remove the hex screw, coved washers, washers and locknut that secure the two crossbraces together. See Detail "B".



Note the orientation of the coved washers, washers and locknut for assembling the new crossbraces. See Detail "B".

5. Assemble the two new crossbraces together with the existing hex screw, coved washers, washers and locknut. Securely tighten. Refer to Detail "B" for hardware orientation.
6. Determine the correct pivot link and mounting hole to use with the desired seat width.
7. Secure the pivot links to the crossbraces and wheelchair frame with the four button screws and locknuts. Securely tighten.

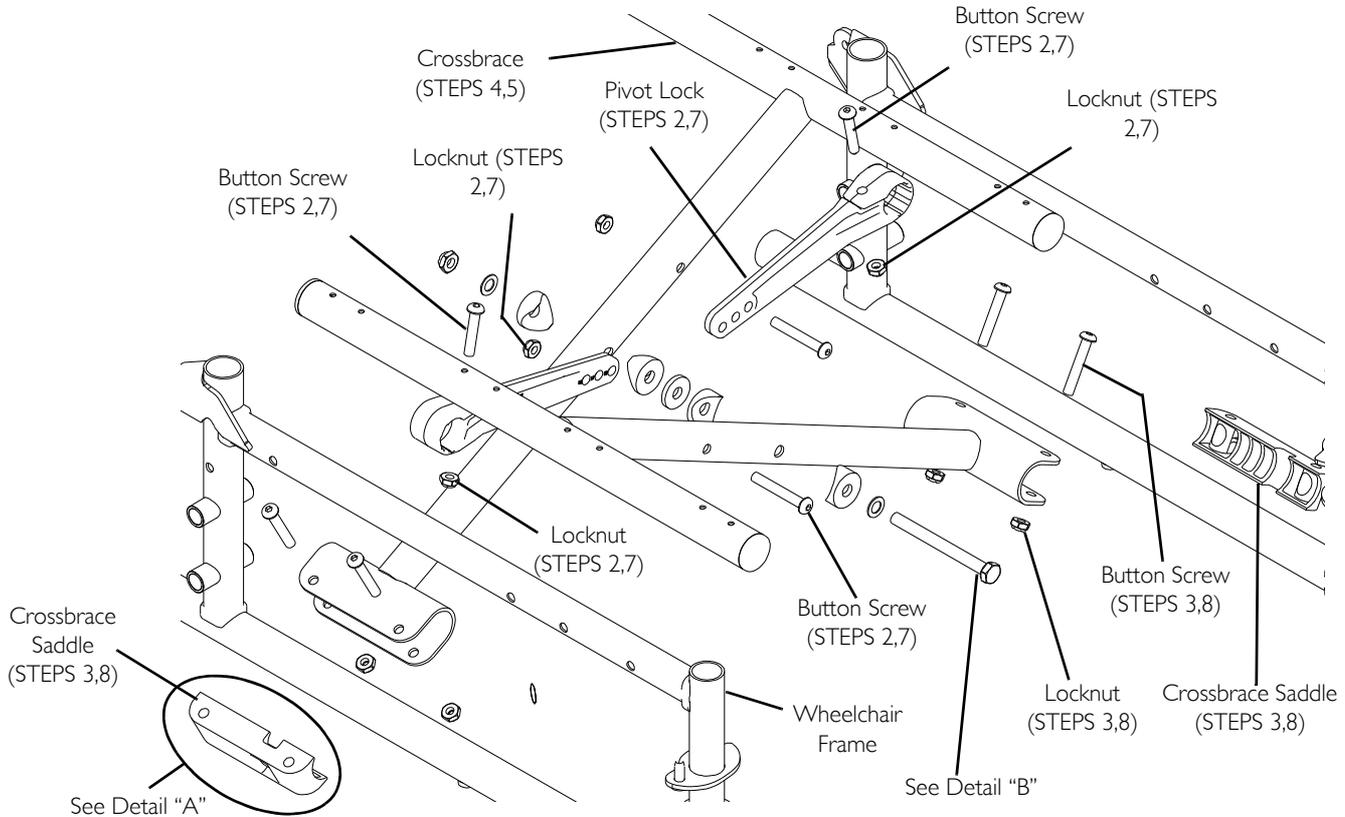


Position crossbrace saddle on wheelchair frame using the washer on the underside of the wheelchair frame as a reference. See Detail "A" for proper positioning of the crossbrace saddle.

8. Reinstall the two button screws, locknuts and crossbrace saddle that secures the bottom of the new crossbrace to the wheelchair frame. Refer to Detail "B" for hardware orientation. Repeat for opposite crossbrace. Securely tighten.
9. Install the new back and seat upholstery onto the wheelchair. Refer to [Replacing Back Upholstery](#) on page 41 and [Replacing Seat Upholstery](#) on page 41.

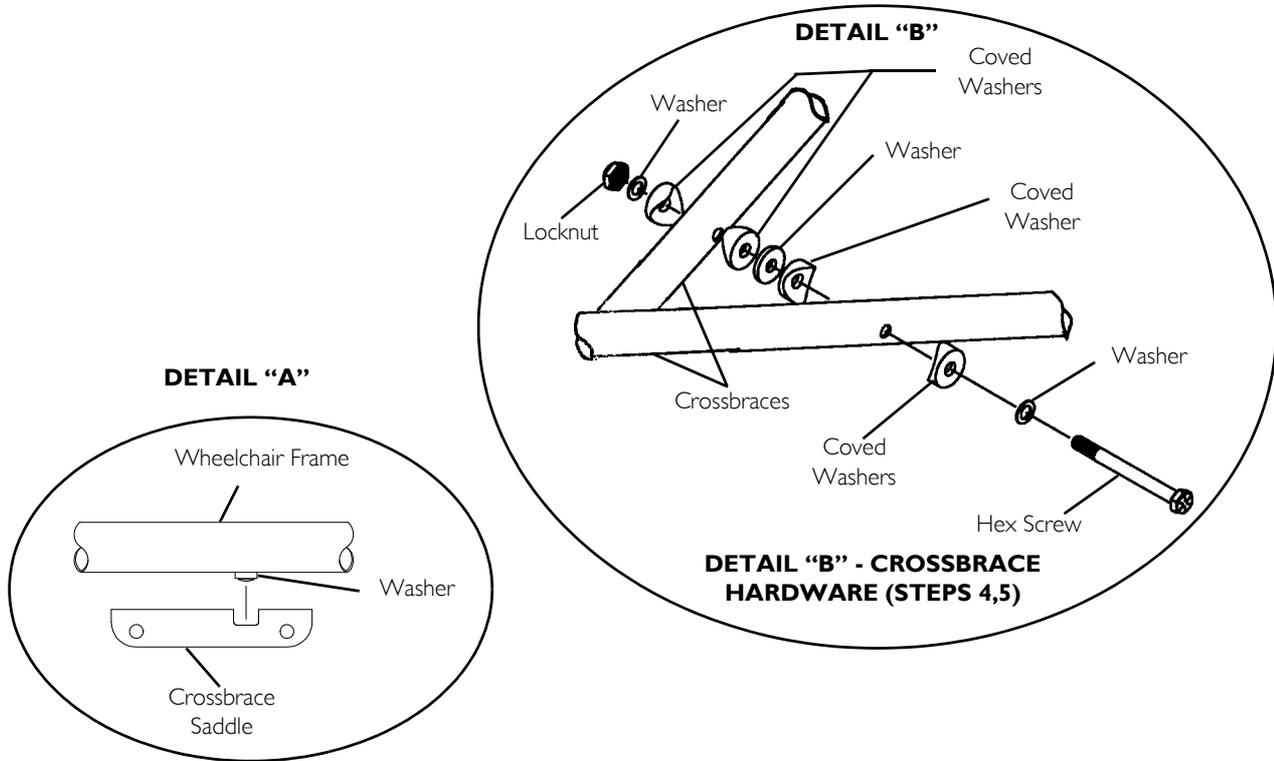
SEAT WIDTH	PIVOT LINK
<b>16 INCH 18 INCH</b>	<p>16 inch      18 inch</p> <p>HEM 1110001</p> <p>DO NOT USE</p>
<b>20 INCH 22 INCH</b>	<p>20 inch      22 inch</p> <p>HEM 1110002</p> <p>DO NOT USE</p>

**FIGURE 3** Adjusting the Seat Width - Swingaway Front Riggings



**FIGURE 4** Adjusting the Seat Width - Swingaway Front Rigging

## 7 SEAT AND BACK



**FIGURE 5** Adjusting the Seat Width - Swingaway Front Riggings

## Fixed Frame

### Removing Lower Mounting Hardware

1. Remove the existing back and seat upholstery from the wheelchair. Refer to [Replacing Back Upholstery](#) on page 41.



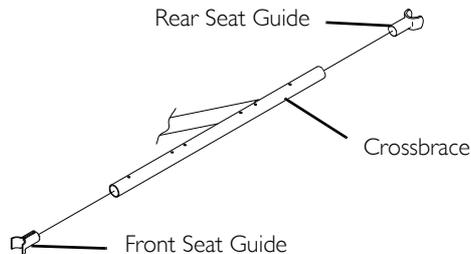
If adjusting the seat width of the wheelchair, back and seat upholstery as well as the crossbraces **MUST** be replaced.

2. Remove the four screws and locknuts that secure the insert tube to the lower wheelchair frame.
3. Remove the inserts from the rear of the wheelchair.
4. Remove the hex screw and locknut that secure the two existing crossbraces together.

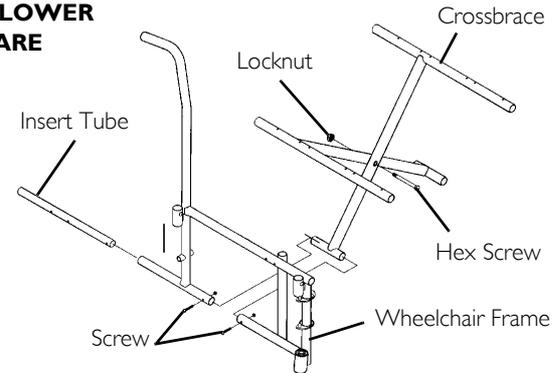
### Removing Upper Mounting Hardware

1. While pushing down on the rear seat guide, pull up the front seat guide until the front seat guide releases from the wheelchair frame.
2. Pull the crossbrace away from the rear seat guide.
3. Repeat STEPS 1-2 for opposite crossbrace.
4. Reverse STEPS 1-3 to assemble the upper mounting hardware.
5. Reverse STEPS 1-4 in [Removing Lower Mounting Hardware](#).

#### DETAIL "B" - REMOVING UPPER MOUNTING HARDWARE



#### DETAIL "A" - REMOVING LOWER MOUNTING HARDWARE



**FIGURE 6** Adjusting the Seat Width - Fixed Frame

## 8 REAR WHEELS

---

### 8 Rear Wheels

---



#### **WARNING**

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

#### 8.1 Removing/Installing Rear Wheels



#### **WARNING**

Only a qualified technician may change the size of the rear wheel or the seat-to-floor height.

If changing the size of the rear wheel or a change in the seat-to-floor height is desired, this procedure **MUST** be performed by a qualified technician.

Make sure both rear wheels are the same size and are installed into the same respective mounting hole before using the wheelchair, otherwise injury may occur.

## Permanent Axles

**WARNING**

This procedure **MUST** be performed by a qualified technician.



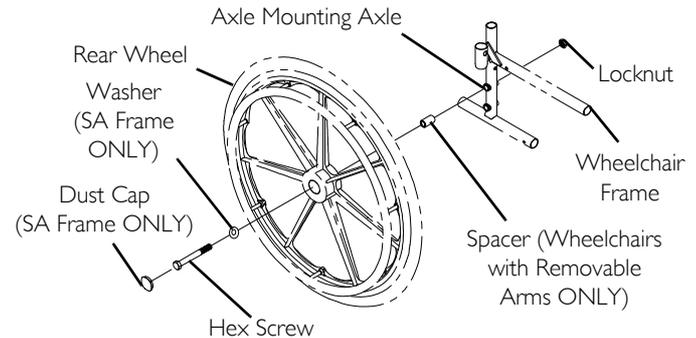
If replacing the same size rear wheel, note the mounting position on the wheelchair frame for proper reinstallation of the new rear wheel.

1. Remove the dust cap (SA Frame only), hex screw, washer (SA Frame only), spacer (if installed) and locknut that secure the rear wheel to the wheelchair frame.



The spacer is used on wheelchairs with removable arms only.

2. Repeat STEP 1 for the opposite rear wheel if desired.
3. To reinstall the rear wheel(s) onto the wheelchair, reverse STEPS 1-2 and torque locknut to 40 ft.-lbs.
4. Adjust wheel locks. Refer to [Using/Adjusting Patient Operated Wheel Locks](#) on page 54.



**FIGURE 1** Removing/Installing Rear Wheels - Permanent Axles

## 8.2 Replacing/Repairing Rear Wheel Tire

**WARNING**

Replacement of the rear wheel tire **MUST** be performed by a qualified technician.

As with any vehicle, check the wheels and tires periodically for cracks and wear. Replace if damaged.

## 8 REAR WHEELS

### 8.3 Replacing Rear Wheel Handrim



#### **WARNING**

If the wheelchair is equipped with permanent axles, this procedure **MUST** be performed by a qualified technician.

1. Remove the rear wheel from the wheelchair. Refer to [Removing/Installing Rear Wheels](#) on page 46.
2. Remove the mounting screws that secure the handrim to rear wheel.
3. Remove the existing handrim.
4. Secure the new handrim to the rear wheel with mounting screws. Tighten securely.



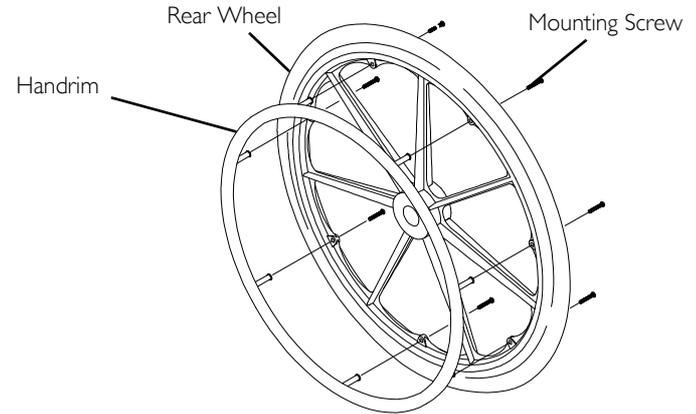
#### **WARNING**

Make sure the detent pin and detent balls of the quick-release axles are fully released and protruding out of the hole before operating the wheelchair.

Keep detent balls clean.

5. Reinstall rear wheel to the wheelchair. Refer to [Removing/Installing Rear Wheels](#) on page 46.

6. Repeat STEPS 1-5 for the opposite rear wheel if necessary.



**FIGURE 2** Replacing Rear Wheel Handrim

## 9 Front Casters



### WARNING

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

### 9.1 Installing/Replacing Front Casters/Forks



### WARNING

Make sure both fork/caster assemblies are the same size before using the wheelchair, otherwise injury may occur.



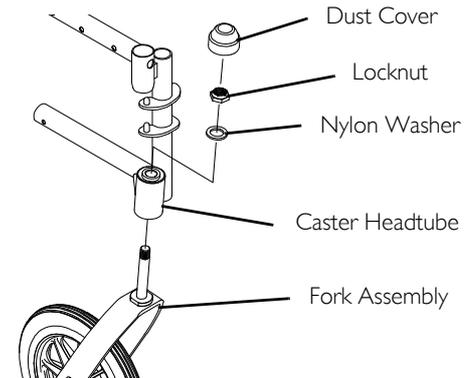
This procedure can be performed if replacing the exact same size front caster.

1. Remove the dust cover.
2. Remove the locknut and nylon washer that secures the fork to the caster headtube.
3. Drop the fork assembly out of the caster headtube.



If caster tire/tube replacement is desired, refer to [Replacing Front Casters](#) on page 50.

4. Slide the new fork assembly into the caster headtube.
5. Reassemble by reversing STEPS 1-3.
6. Repeat STEPS 1-6 for the opposite fork assembly.
7. Adjust the forks. Refer to [Adjusting Forks](#) on page 50.



**FIGURE 1** Installing/Replacing Front Casters/Forks

## 9 FRONT CASTERS

### 9.2 Adjusting Forks

1. To properly tighten caster journal system and guard against flutter, perform the following check:
  - A. Tip back of wheelchair to floor.
  - B. Pivot both forks and casters to top of their arc simultaneously.
  - C. Let casters drop to bottom of arc (wheels should swing once to one-side, then IMMEDIATELY rest in a straight downward position).
  - D. Adjust locknuts according to freedom of caster swing.
  - E. Repeat STEPS C-D until wheels swing once to one-side, then IMMEDIATELY rest in a downward position.
2. Test wheelchair for maneuverability.
3. Readjust locknuts if necessary, and repeat STEPS 1-2 until correct.
4. Snap dust cover over the locknut and stem.

### 9.3 Replacing Front Casters



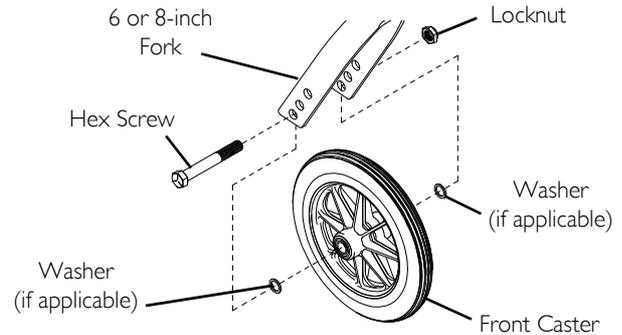
#### WARNING

Make sure both front casters are the same size and are installed into the same respective mounting hole before using the wheelchair, otherwise injury may occur.



Note the mounting position on the fork assembly for proper reinstallation of the new front caster.

1. Remove the hex screw, washers and locknut that secure the front caster to the fork.
  -  Washers are only used with 8 inch casters with precision bearings.
2. To reinstall the new front caster onto the fork, reverse step 1.



**FIGURE 2** Replacing Front Casters

## 10 Anti-tippers/Wheel Locks



### WARNING

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

### 10.1 Installing/Adjusting Anti-Tippers



For this procedure, refer to FIGURE 2 on page 52.



### WARNING

Anti-tippers are specific to the different seat-to-floor angles and/or seat-to-floor heights. Refer to the chart in this section of the manual for correct usage and adjustment. If these requirements cannot be achieved, **DO NOT** use the wheelchair. Contact a qualified technician. If changing the seat-to-floor height with or without a change to seat-to-floor angle, the correct anti-tippers **MUST** be used to maintain a 1½ to 2 inch ground clearance.

If so equipped, anti-tippers **MUST** be attached at all times. Inasmuch as the anti-tippers are an option for 0° or 3° on this wheelchair (You may order with or without the anti-tippers), Invacare strongly recommends ordering the anti-tippers as a safeguard for the wheelchair user.

Anti-tippers **MUST** be fully engaged and release buttons fully protruding out of adjustment holes.

**ALWAYS** use anti-tippers. When outdoors on wet, soft ground or on gravel surfaces, anti tippers may not provide the same level of protection against tipover. Extra caution **MUST** be observed when traversing such surfaces.

Ensure both anti-tippers are adjusted to the same mounting hole.

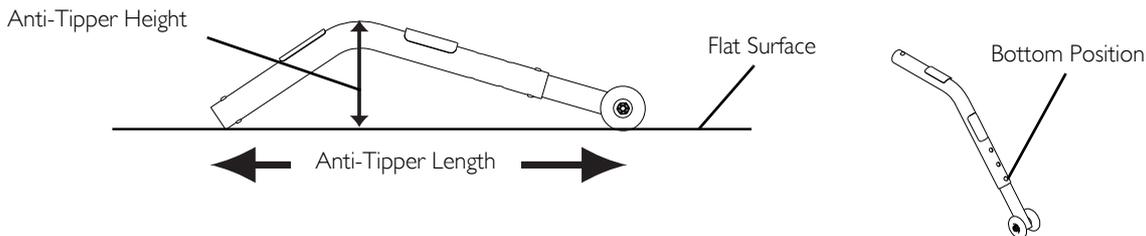
## 10 ANTI-TIPPERS/WHEEL LOCKS

### Installing Anti-Tippers



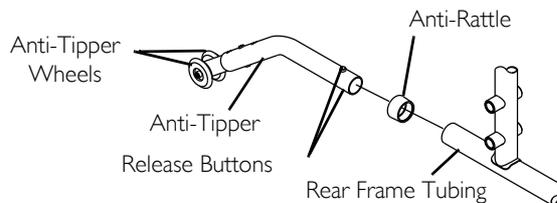
To ensure the correct model anti-tipper is used refer to chart below. Measurements for anti-tippers are approximate and are taken with extension tube in bottom hole position.

WHEELCHAIR MODEL	SEAT-TO-FLOOR HEIGHT IN INCHES	ANTI-TIPPER (MEASUREMENTS IN INCHES)			
		LENGTH	HEIGHT	MODEL	PART NO.
TRACER EX2	17½ to 19½	13½	3¼	1360	1058836
TRACER EX2 FF	21	12	2¾	9758	1086190



**FIGURE 1** Installing Anti-Tippers - Anti-Tipper Length

1. Press the release buttons and insert the anti-tippers with the anti-tipper wheels pointing toward the ground/floor into the wheelchair frame tubing.
2. Ensure that the release button of the anti-tipper fully protrudes out of the hole in the bottom of the wheelchair frame tubing.
3. Place the wheelchair on a flat surface.
4. Measure the distance between the bottom of the anti-tipper wheels and the ground/floor.



**FIGURE 2** Installing Anti-Tippers

**i** A  $1\frac{1}{2}$  to 2 inch clearance between the bottom of the anti-tipper wheels and the ground/floor MUST be maintained at all times.

5. If the distance between the bottom of anti-tipper wheels and the ground/floor is not  $1\frac{1}{2}$  to 2 inches, adjust anti-tippers. Refer to Adjusting the Anti-Tippers on page 53.

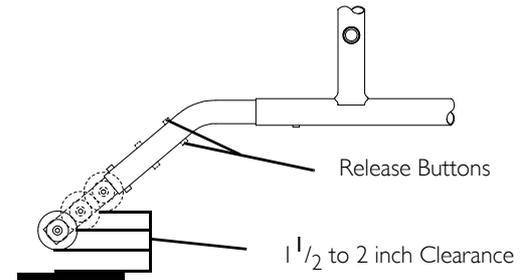
### Adjusting the Anti-Tippers

**i** A  $1\frac{1}{2}$  to 2 inch clearance between the bottom of the anti-tipper wheels and the ground/floor MUST be maintained at all times.

1. Place the wheelchair on a flat surface.

**i** If adjusting anti-tippers on recliner models, ensure back canes are in the upright position before making adjustments.

2. Press the release buttons on the wheeled portion of the anti-tipper and slide it up or down to the desired adjustment hole.
3. Check to make sure that the release buttons are fully engaged in adjustment holes.
4. Ensure both anti-tippers are adjusted to the same height.
5. Measure the distance between the bottom of the anti-tipper wheels and the ground/floor.
6. If the distance between the bottom of anti-tipper wheels and the ground/floor is not  $1\frac{1}{2}$  to 2 inches, repeat steps 2-5 until the distance is  $1\frac{1}{2}$  to 2 inches.
7. If the  $1\frac{1}{2}$  to 2 inch distance cannot be achieved, a different model may be required. Contact an Invacare dealer or qualified technician.



**FIGURE 3** Adjusting the Anti-Tippers

## 10 ANTI-TIPPERS/WHEEL LOCKS

### 10.2 Using/Adjusting Patient Operated Wheel Locks

#### Using Patient Operated Wheel Locks



#### **WARNING**

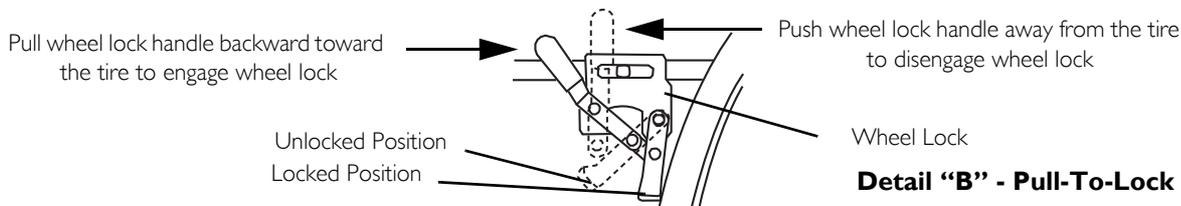
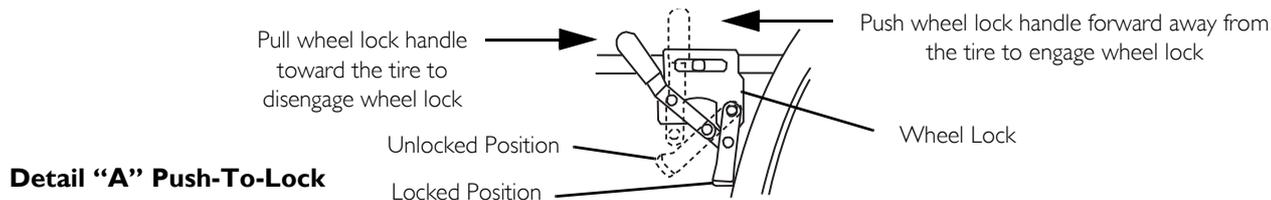
DO NOT attempt to stop a moving wheelchair with wheel locks. Wheel locks are not brakes.

If the wheelchair is equipped with push to lock wheel locks, elevating legrests, and wheel lock extension handles, the wheel lock extension handles **MUST** be removed before swinging the elevating legrests to the side, otherwise injury or damage may result. Interference between the top of the elevating legrest and the wheel lock extension handle may cause the wheel lock to disengage.



Position wheelchair on a flat, level surface to perform this procedure. Ensure the wheelchair is not moving before engaging the wheel locks.

1. See Detail “A” for instructions on Push-to-Lock. Refer to Detail “B” for instructions on Pull-to-Lock.
2. Disengage the wheel locks by reversing the directions in STEP 1.



**FIGURE 4** Using Patient Operated Wheel Locks

## Adjusting Patient Operated Wheel Locks



### WARNING

DO NOT attempt to stop a moving wheelchair with wheel locks. Wheel locks are not brakes.

If wheel locks do not hold the occupied wheelchair in place, contact a qualified technician; otherwise injury or damage may occur.

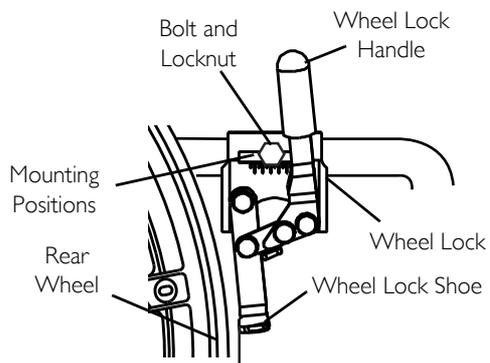


If wheels are pneumatic, before adjusting the wheel lock assemblies, ensure that the tires are inflated to the recommended psi on the side wall of the tire.

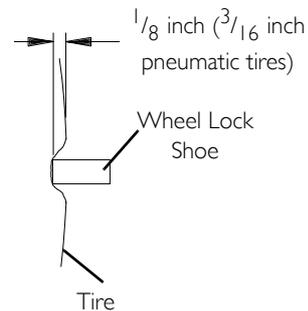
Position wheelchair on a flat, level surface to perform this procedure.

1. Ensure the wheel lock is in the open (unlocked) position.
  2. Loosen the bolt and locknut that secure the wheel lock assembly to the wheelchair frame.
  3. Reposition the wheel lock so that when engaged, the wheel lock shoe embeds the tire  $\frac{1}{8}$  inch ( $\frac{3}{16}$  inch for pneumatic tires) and holds the occupied wheelchair in place when pushed.
  4. Securely tighten the bolt and locknut attaching the wheel lock to the wheelchair frame.
  5. Engage the wheel lock.
  6. Measure the distance the wheel lock is embedded into the tire as shown in Detail "A".
-  Any wheel lock adjustment should embed the wheel lock shoe at least  $\frac{1}{8}$  inch ( $\frac{3}{16}$  inch for pneumatic tires) into the tire when engaged.
7. Repeat the STEPS 1-6 until the wheel lock shoe embeds the tire  $\frac{1}{8}$  inch ( $\frac{3}{16}$  inch for pneumatic tires) and holds the wheelchair in place when pushed.
  8. Repeat STEPS 1-7 for the opposite wheel lock.
  9. If the measurement of  $\frac{1}{8}$  inch ( $\frac{3}{16}$  inch for other tires) cannot be achieved, remove the bolt and locknut that secure the wheel lock to the wheelchair frame and mount the wheel lock in the remaining mounting position.
  10. Repeat STEPS 1-8.
  11. Engage both wheel locks and ensure the occupied wheelchair is held in place when pushed.

## 10 ANTI-TIPPERS/WHEEL LOCKS



### DETAIL "A"



**FIGURE 5** Using Patient Operated Wheel Locks

## II Seat-to-floor



### WARNING

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



The seat-to-floor height is not adjustable for the Tracer EX2 wheelchair with the fixed frame option (FF). This procedure applies to the EX2 wheelchair model with swingaway footrests only.

### II.1 Changing Seat-to-Floor Height



### WARNING

The seat depth, size/position of the front casters, size/position of the rear wheels, use of an anti-tipper model, as well as the user condition directly relate to the stability of the wheelchair. Any change to one or any combination of the seven may cause the wheelchair to decrease in stability. These adjustments **MUST** be performed by a qualified technician.

Seat-to-floor heights have specific positions depending on rear wheel size, rear wheel position, front caster size and front caster position. These adjustments **MUST** be performed by a qualified technician.

If changing the seat-to-floor height the correct anti-tippers **MUST** be ordered to maintain a 1<sup>1</sup>/<sub>2</sub> to 2 inch ground clearance.



For this procedure, refer to FIGURE 1 on page 58.

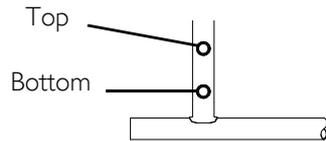
1. Refer to the following chart in FIGURE 1 to determine mounting positions for front casters/forks and rear wheels for the desired obtainable seat-to-floor height:
2. Remove the rear wheels from the wheelchair. Refer to [Removing/Installing Rear Wheels](#) on page 46.
3. If necessary, replace the front casters and forks with the casters and forks indicated in the chart. Refer to [Replacing Front Casters](#) on page 50.
4. Reinstall the rear wheels onto the wheelchair in the mounting position indicated in the chart. Refer to [Removing/Installing Rear Wheels](#) on page 46.
5. Adjust anti-tippers according to new seat-to-floor height. Refer to [Installing/Adjusting Anti-Tippers](#) on page 51.

## II SEAT-TO-FLOOR

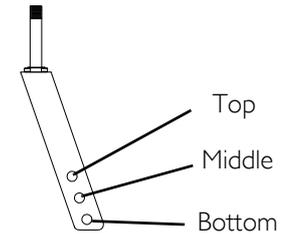
### 8-INCH FRONT CASTERS

SEAT-TO-FLOOR HEIGHT (IN INCHES)	FRONT CASTER MOUNTING POSITION	REAR WHEEL SIZE	REAR WHEEL MOUNTING POSITION
17½	Top	24 inch	Top
19½	Bottom	24 inch	Bottom

#### DETAIL "A" - REAR WHEEL MOUNTING POSITIONS - ADULT/HEMI FRAME STYLE



#### DETAIL "B" - 8 INCH FORK MOUNTING POSITIONS



**FIGURE I** Changing Seat-to-Floor Height

## 12 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.

### 12.1 Installing Amputee Bracket



For this procedure, refer to FIGURE 1 on page 60.

1. Refer to the following chart or FIGURE 1 to determine the mounting position of the amputee bracket:

SEAT-TO-FLOOR	BRACKET	AXLE SPACER POSITION (ON BRACKET)	SIDE OF WHEELCHAIR	BRACKET MOUNTING POSITION (ON WHEELCHAIR)
ADULT	A*	DOWN	RIGHT	TOP
ADULT	B*	DOWN	LEFT	TOP
HEMI	B*	UP	RIGHT	BOTTOM
HEMI	A*	UP	LEFT	BOTTOM



\* - "A" and "B" are stamped on the sides of the amputee bracket.

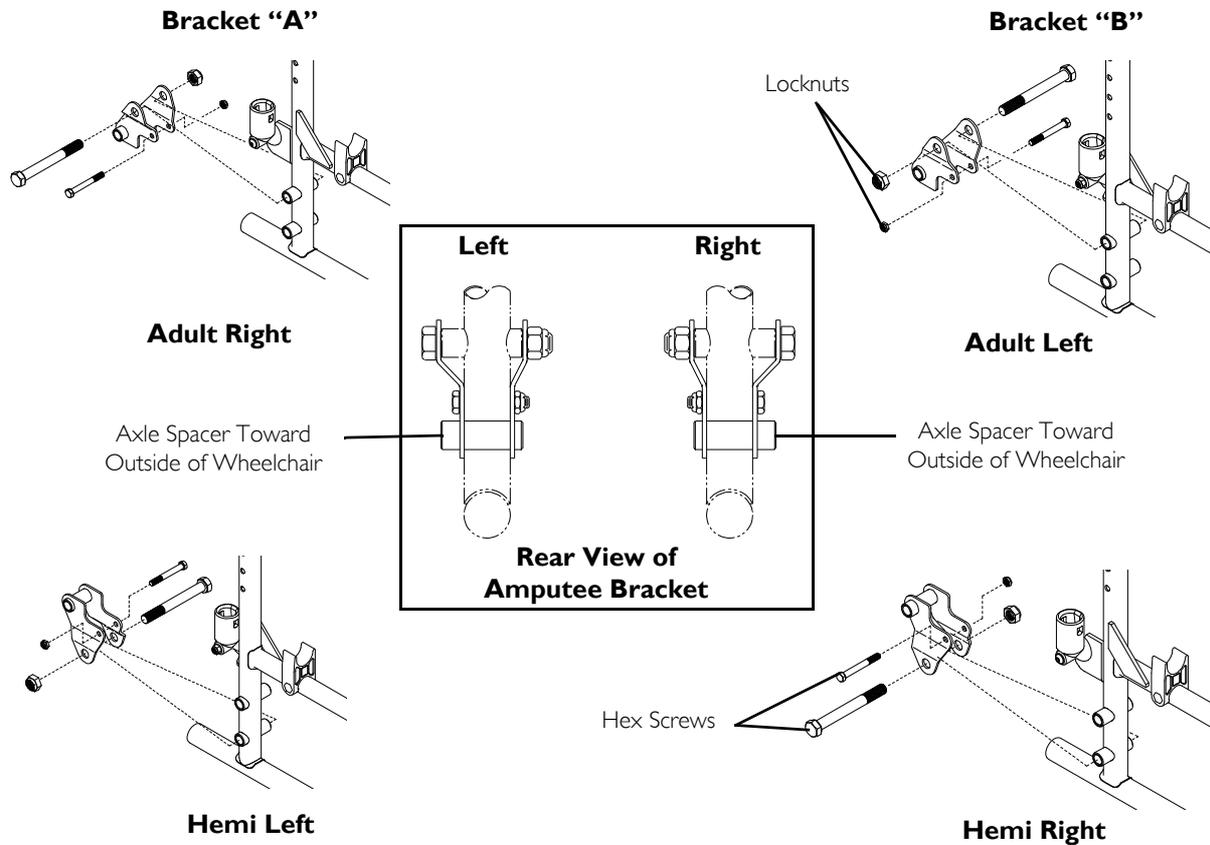
2. Install the amputee bracket on the wheelchair frame to the position determined in STEP 1.



Make sure the axle spacer is pointing towards the outside of the wheelchair.

3. Install the two hex screws and locknuts that secure the amputee bracket to the wheelchair.
4. Install the rear wheels onto the wheelchair. Refer to [Removing/Installing Rear Wheels](#) on page 46.

## 12 OPTIONS



**FIGURE I** Installing Amputee Bracket

## 12.2 Installing Crutch and Cane Carrier



### WARNING

Check base weekly to ensure proper placement.

When loading the crutch/cane carrier, ensure items are securely placed into the base. Also ensure that there is no interference with folding the wheelchair, the rear wheels, or the swing-back arms.

Strap **MUST** be securely fastened while carrying items.

**NEVER** insert or remove items while wheelchair is moving.

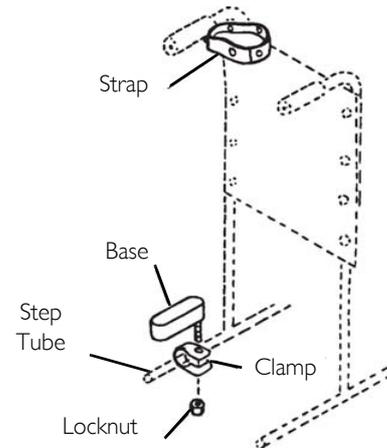
1. Slide the clamp with the base attached over the end of the step tube of the wheelchair. Ensure the base is towards the inside of the wheelchair.
2. Position the base parallel to the step tube.



### CAUTION

Base should be parallel to step tube to avoid bending spokes when folding the wheelchair.

3. Securely tighten the locknut that secures the base to the step tube of the wheelchair.
4. Remove the upper back upholstery screw and washer.
5. Align the strap with the back upholstery screw mounting hole.
6. Reinstall the back upholstery screw and washer and secure the strap to the wheelchair.
7. The base cleans easily with any chrome or glass cleaner. The strap can be cleaned with mild soap and water.



**FIGURE 2** Installing Crutch and Cane Carrier

## 12 OPTIONS

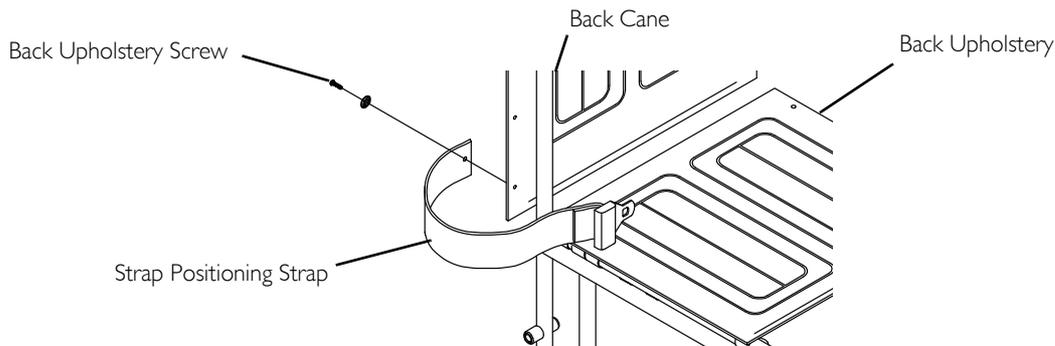
### 12.3 Installing the Seat Positioning Strap



#### **WARNING**

ALWAYS wear your positioning strap. Inasmuch as the Seat Positioning Strap is an option on this wheelchair (You may order with or without the seat restraint), Invacare strongly recommends ordering the Seat Positioning Strap as an additional safeguard for the wheelchair user.

1. Remove the bottom back upholstery screw from the wheelchair.
2. Position the seat positioning strap half between the back cane and back upholstery.
3. Secure the back upholstery and seat positioning strap to the wheelchair with the existing back upholstery screw.
4. Repeat STEPS 1-3 for the opposite side of the wheelchair.



**FIGURE 3** Installing the Seat Positioning Strap

## 12.4 Installing the Wheel Lock Extension Handle



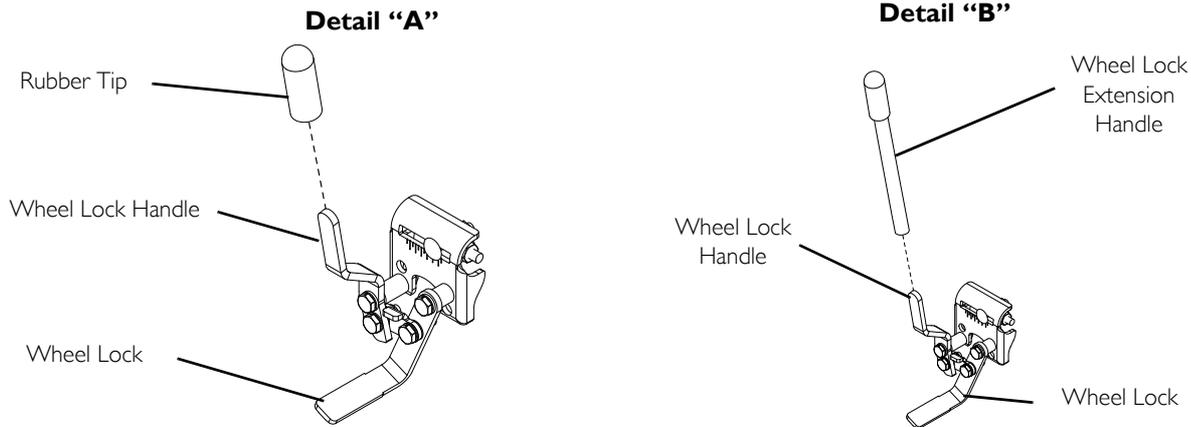
### WARNING

If the wheelchair is equipped with push to lock wheel locks, elevating legrests, and wheel lock extension handles, the wheel lock extension handles **MUST** be removed before swinging the elevating legrests to the side, otherwise injury or damage may result. Interference between the top of the elevating legrest and the wheel lock extension handle causes the wheel lock to disengage.



For this procedure, refer to FIGURE 4

1. Remove the existing rubber tip from the wheel lock handle (Detail “A”).
2. Install the extension handle over the wheel lock handle (Detail “B”).



**FIGURE 4** Installing the Wheel Lock Extension Handle

**Invacare Corporation  
USA**

One Invacare Way  
Elyria, Ohio USA  
44036-2125  
800-333-6900

**Canada**

570 Matheson Blvd E Unit  
8  
Mississauga Ontario  
L4Z 4G4 Canada  
800-668-5324

[www.invacare.com](http://www.invacare.com)

Part No 1110546

Rev G - 2/11



*Yes, you can.®*