

# Owner's Operator And Maintenance Manual

## **A-6™**

**ADJUSTABLE SEAT ANGLE**

## **A-6S™**

**ADJUSTABLE SEAT ANGLE WITH SUSPENSION**

## **F-6™**

**FIXED SEAT ANGLE**

## **F-6S™**

**FIXED SEAT ANGLE WITH SUSPENSION**

DEALER: THIS MANUAL MUST BE GIVEN TO THE USER OF THE WHEELCHAIR.

USER: BEFORE USING THIS WHEELCHAIR, READ THIS MANUAL AND SAVE FOR FUTURE REFERENCE.



**Yes, you can.™**

**W  
A  
R  
N  
I  
N  
G**

**WARNING**

**DO NOT OPERATE THIS EQUIPMENT WITHOUT FIRST READING AND UNDERSTANDING THIS MANUAL. IF YOU ARE UNABLE TO UNDERSTAND THE WARNINGS, CAUTIONS AND INSTRUCTIONS, CONTACT A QUALIFIED TECHNICIAN BEFORE ATTEMPTING TO USE THIS EQUIPMENT - OTHERWISE INJURY OR DAMAGE MAY RESULT. THE INITIAL SETUP OF THIS WHEELCHAIR MUST BE PERFORMED BY A QUALIFIED TECHNICIAN.**

**SAVE THESE INSTRUCTIONS**

**TABLE OF CONTENTS**

**SPECIAL NOTES** ..... 4  
**SPECIFICATIONS** ..... 5

**PROCEDURE 1 - GENERAL GUIDELINES** ..... 6

STABILITY ..... 6  
 OPERATING INFORMATION ..... 6  
 TIRE PRESSURE ..... 8  
 WEIGHT TRAINING ..... 8  
 WEIGHT LIMITATION ..... 8  
 SAFETY/HANDLING OF WHEELCHAIRS ..... 9

**PROCEDURE 2 - SAFETY INSPECTION** ..... 13

SAFETY INSPECTION CHECKLIST ..... 13  
 TROUBLESHOOTING ..... 14  
 MAINTENANCE ..... 14

**PROCEDURE 3 - UPHOLSTERY** ..... 15

UNFOLDING/FOLDING THE BACK ..... 15  
 REMOVING/INSTALLING STANDARD BACK UPHOLSTERY ..... 15  
 ADJUSTABLE TENSION BACK UPHOLSTERY ..... 16  
 SEAT UPHOLSTERY REPLACEMENT ..... 16

**PROCEDURE 4 - FRAME** ..... 17

BACK ANGLE ADJUSTMENT -  
 ADJUSTABLE BACKS ONLY ..... 17  
 BACK HEIGHT ADJUSTMENT ..... 18  
 REPLACING SEAT FRAME - A-6/A-6S ONLY ..... 18  
 REAR SEAT-TO-FLOOR HEIGHT ADJUSTMENT -  
 A-6/A-6S ONLY ..... 19  
 REPLACING TURNBUCKLE ASSEMBLY -  
 A-6/A-6S ONLY ..... 20  
 OPENING/CLOSING CLAMPS ..... 20  
 DETERMINING TOE IN/TOE OUT ..... 21  
 ADJUSTING TOE IN/TOE OUT ..... 21  
 ADJUSTING THE AXLE TUBE ..... 23  
 REPOSITIONING CAMBER INSERTS  
 (ADJUSTING REAR WHEEL CAMBER) ..... 24  
 ADJUSTING WHEELBASE LENGTH  
 (ADJUSTING CENTER OF GRAVITY) ..... 25  
 ADJUSTING WHEELBASE WIDTH ..... 26  
 REPLACING AXLE TUBE ..... 27  
 REPOSITIONING THE AXLE TUBE ..... 28  
 REPOSITIONING QUICK RELEASE LEVERS ..... 29  
 REMOVING/INSTALLING TELESCOPING TUBES .... 30

**PROCEDURE 5 - WHEELS** ..... 31

REMOVING/INSTALLING REAR WHEELS ..... 31  
 ADJUSTING QUICK-RELEASE AXLE ..... 31  
 INSTALLING QUAD-RELEASE AXLE ..... 32  
 ADJUSTING THE QUAD-RELEASE HANDLE  
 IN AND/OR OUT ..... 32  
 REMOVING THE PLAY FROM THE  
 REAR WHEELS ..... 32  
 HANDRIM REPLACEMENT ..... 33  
 REPAIRING/REPLACING REAR WHEEL TIRE/TUBE ..... 33  
 WHEEL LOCK ADJUSTMENT/REPLACEMENT ..... 33  
 REPLACING/ADJUSTING CASTERS ..... 34  
 REPLACING FORKS ..... 34  
 ADJUSTING CASTER HEIGHT ..... 35  
 INSTALLING QUICK-RELEASE CASTERS ..... 35  
 ADJUSTING FRONT SEAT-TO-FLOOR HEIGHT ..... 36

**PROCEDURE 6 - FOOTREST** ..... 42

FOOTREST REPLACEMENT/ADJUSTMENT ..... 42

**PROCEDURE 7 - ANTI-TIPPERS** ..... 43

ANTI-TIPPER ADJUSTMENT/REPLACEMENT ..... 43

**PROCEDURE 8 - ARMS** ..... 44

INSTALLING THE T-ARM SOCKETS ..... 44  
 INSTALLING/REMOVING THE T-ARMS ..... 44  
 ADJUSTING THE T-ARMS ..... 45  
 ADJUSTING THE T-ARM TRANSFER ASSISTS  
 AND/OR SIDE GUARDS ..... 47  
 REPLACING THE T-ARM LOCKING LEVER ..... 47  
 INSTALLING THE HALF ARM SOCKET ..... 48  
 ADJUSTING HALF ARM HEIGHT ..... 48

**PROCEDURE 9 - SUSPENSION** ..... 49

ELASTOMERS AND SUSPENSION ..... 49  
 REPLACING REAR ELASTOMERS ..... 49  
 REPLACING FRONT ELASTOMERS ..... 49

**LIMITED WARRANTY** ..... 51

T  
A  
B  
L  
E  
O  
F  
C  
O  
N  
T  
E  
N  
T  
S

## **SPECIAL NOTES**

**WARNING/CAUTION** notices as used in this manual apply to hazards or unsafe practices which could result in personal injury or property damage.

### **NOTICE**

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

### **WHEELCHAIR USER**

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.

### **WHEELCHAIR TIE-DOWN RESTRAINTS AND SEAT POSITIONING STRAPS**

Invacare recommends that wheelchair users 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.

**AS REGARDS RESTRAINTS - SEAT POSITIONING STRAPS - IT IS THE OBLIGATION OF THE DME DEALER, THERAPISTS AND OTHER HEALTH CARE PROFESSIONALS TO DETERMINE IF A SEATING 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.**

# SPECIFICATIONS

S  
P  
E  
C  
I  
F  
I  
C  
A  
T  
I  
O  
N  
S

INVACARE A-6/A-6S/F-6/F-6S						
<b>Frame Type:</b>	Tapered, "V"					
<b>Seat Width:</b>	14 to 20-inches					
<b>✦ Camber Width:</b>	<b>Camber</b>	<b>0°</b>	<b>3°</b>	<b>6°</b>	<b>9°</b>	<b>12°</b>
<b>✦ Add the inches listed in the chart to the wheelchair width to obtain the overall width of the wheelchair at the widest point.</b>	<b>Rear Wheel Type:</b>					
	<b>Spoke</b>	6-3/4	8	10	12-1/4	14-1/4
	<b>Composite</b>	7	8-1/4	10-1/4	12-1/2	14-1/2
<b>Seat Depth:</b>	14 to 20-inches					
<b>Seat-to-Floor (approx.):</b>	<b>Front</b> - 17 to 21-1/2-inches - in 1/2-inch increments <b>Rear</b> - <b>ADJUSTABLE SEAT ANGLE (A-6/A-6S)</b>					
	<b>REAR SEAT-TO-FLOOR RANGE</b>			<b>REAR WHEEL SIZE</b>		
	13 to 21-1/2-inches			22-inch		
	13 to 21-1/2-inches			24-inch		
	14 to 21-1/2-inches			26-inch		
	<b>* FIXED SEAT ANGLE (F-6/F-6S)</b>					
	13 to 21-1/2-inches in 1/2-inch increments					
	<b>* Fixed rear seat-to-floor is determined at time of purchase and can be equal to or up to 4-inches less than front seat-to-floor.</b>					
<b>Back Style:</b>	A-6/A-6S - Fold Down Only F-6/F-6S - Fold Down or Fixed					
<b>Back Height:</b>	8 to 20-inches - Adjustable (8-11, 10-14, 12-16, 14-18 or 16-20-inch ranges)					
<b>Back Angle:</b>	94°, 90°, 85°, 84°, 77°, 73°					
<b>Footrest:</b>	5-inch Adjustable Height, Adjustable Angle					
<b>Side - Wheel Clearance:</b>	1/2 to 2-1/2-inches (1-inch Standard)					
<b>Rear Axle:</b>	Quick-Release, Quad-Release					
<b>Rear Wheel Camber:</b>	Custom - 0° and 3°, 0° and 6°, 0° and 9°, 3° and 6°, 3° and 9°, 3° and 12°, 6° and 9°, 6° and 12°, 9° and 12°					
<b>Rear Wheels:</b>	22, 24-inch - Composite or Spoke (24-inch Spoke Standard) 26-inch, 559mm or 700C - Spoke Only					
<b>Handrims:</b>	Aluminum Welded Tab (Standard), Plastic Coated, Projections					
<b>Wheel Locks:</b>	High Mount (Standard) - Push to Lock (Standard) or Pull to Lock, Undermount, Hill Holder, Wheel Lock Extensions					
<b>Caster Size:</b>	3-inch Rollerblade, 5-inch Urethane, 6-inch Urethane, Pneumatic					
<b>Seat Cushion:</b>	2 or 3-inch					
<b>Back Upholstery:</b>	U240 Black (Standard), Adjustable Tension					
<b>Arms (Optional):</b>	Half Arm, T-Arm					
<b>Weight*:</b>	19 lbs.					
<b>Shipping Weight (approx.)*:</b>	49 lbs.					

✦ Without rear wheels  
 ✦ A-6 - 18 x 18-inch Seat Frame with complete package.

***This Procedure includes the following:***

- Stability***
- Operating Information***
- Tire Pressure***
- Weight Training***
- Weight Limitation***
- Safety/Handling of Wheelchairs***

**STABILITY**

**STABILITY WARNINGS**

The position of the footrest, seat angle, back angle, seating system/upholstery, caster size and position, rear wheel size and position, anti-tippers, as well as the user condition directly relate to the stability of the wheelchair. Any change to one (1) or any combination of the ten (10) may cause the wheelchair to decrease in stability. **EXTREME** care **MUST** be taken when changing the stability of the wheelchair.

	Footrest Position	Seat Angle	Back Angle	Seating System	Caster Size	Caster Position	Rear Wheel Size	Rear Wheel Position	Anti-Tippers	User Condition
Footrest Position	●	✓	✓							✓
Seat Angle	✓	●	✓	✓						✓
Back Angle		✓	●	✓						✓
Seating System/Upholstery	✓	✓	✓	●						✓
Caster Size				●	✓	✓	✓	✓	✓	
Caster Position					●	✓	✓	✓	✓	
Rear Wheel Size				✓	✓	●	✓	✓	✓	
Rear Wheel Position				✓	✓	✓	●	✓	✓	
Anti-Tippers					✓	✓	✓	✓	●	✓
User Condition	✓	✓	✓	✓	✓	✓	✓	✓	✓	●

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

*NOTE: Additional adjustments may be needed according to the wheelchair type. Refer to the wheelchair owner's manual for these procedures.*

To maintain maximum stability, the rear wheels should be left in the factory setting. Moving the rear wheels forward causes the wheelchair to decrease in stability.

**ALWAYS** ensure stability **BEFORE** moving the rear wheels forward. **TEST** wheelchair **BEFORE** it is occupied by the end user to ensure safety.

**OPERATING INFORMATION**

**WARNING**

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

## OPERATING INFORMATION (continued)

**WARNING**

DO NOT attempt to reach objects if you have to move forward in the seat.

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

DO NOT lean over the top of the back upholstery. This will change your center of gravity and may cause you to tip over.

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

DO NOT tilt the wheelchair without assistance.

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

NEVER position the camber inserts in the axle tube with more than 3-inches (3-inches is 12 indexing marks showing) of the camber insert outside of the axle tube. The camber inserts will not be securely tightened in the axle tube resulting in possible injury to the user or damage to the wheelchair.

WHEEL LOCKS ARE NOT BRAKES. DO NOT attempt to stop a moving wheelchair with the wheel locks.

Before attempting to transfer in or out of the wheelchair, every precaution should be taken to reduce the gap distance. Align both casters parallel with the object you are transferring onto. When transferring to and from the wheelchair, ALWAYS ENGAGE BOTH WHEEL LOCKS.

DO NOT operate on roads, streets or highways.

DO NOT climb, go up or down ramps or traverse 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 turn over and cause bodily harm or damage to the wheelchair.

DO NOT use parts, accessories, or adapters other than those authorized by Invacare.

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

DO NOT stand on the frame of the wheelchair.

Anti-tippers MUST BE attached at all times. Inasmuch as the ANTI-TIPPERS are an option on this wheelchair (You may order with or without the anti-tippers), Invacare strongly recommends ordering the anti-tippers as an additional safeguard for the wheelchair user.

DO NOT use the footplate as a platform when getting in or out of the wheelchair.

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.

## TIRE PRESSURE

**WARNING**

DO NOT use your wheelchair unless it has the proper tire pressure (p.s.i.). DO NOT overinflate the tires. Failure to follow these suggestions may cause the tire to explode and cause bodily harm.

Replacement of a pneumatic tire or tube MUST be performed by a qualified technician.

## WEIGHT TRAINING

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 and the warranty will be voided immediately.

## WEIGHT LIMITATION

The Invacare A-6/A-6S/F-6/F-6S wheelchairs have a weight limitation of 250 lbs.

## SAFETY/HANDLING OF WHEELCHAIRS

“Safety and Handling” of the wheelchair requires 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 followed. 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

**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.

Anti-tippers **MUST BE** attached at all times. Inasmuch as the ANTI-TIPPERS are an option on this wheelchair (You may order with or without the anti-tippers), Invacare strongly recommends ordering the anti-tippers as an additional safeguard for the wheelchair user.

To assure stability and proper operation of your wheelchair, you must at all times wear your seat positioning strap and maintain proper balance. 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.

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.

### 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.

### A Note To Wheelchair Assistants

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

#### WARNING

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

Also, be aware of any removable (detachable) parts. These must NEVER be used for hand-hold or lifting supports, as they may be inadvertently released, resulting in possible injury to the user and/or assistant(s).

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

### Percentage of Weight Distribution

#### WARNING

**DO NOT** attempt to reach objects if you have to move forward in the seat or pick them up from the floor by reaching down between your knees.

Many activities require the wheelchair user 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.

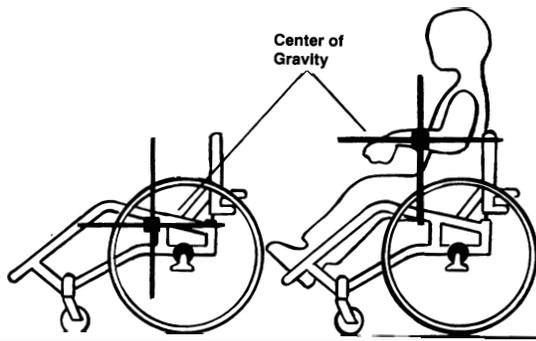
Proper positioning is essential for your safety. When reaching, leaning, or bending forward, it is important to use the front casters as a tool to maintain stability and balance.

The position of the footrest, seat angle, back angle, seating system/upholstery, caster size and position, rear wheel size and position, anti-tippers, as well as the user condition directly relate to the stability of the wheelchair. Any change to one (1) or any combination of the ten (10) may cause the wheelchair to decrease in stability. **EXTREME** care **MUST** be taken when changing the stability of the wheelchair.

**LENGTHENING THE WHEELBASE** will increase the stability and maintain standard maneuverability of the wheelchair.

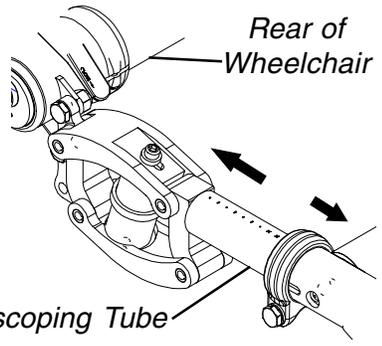
**SHORTENING THE WHEELBASE** will increase the maneuverability, distribute additional weight onto the rear wheels and make the wheelchair less stable.

GENERAL GUIDELINES



Example 46%	54%	103 lbs.	130 lbs.
UNOCCUPIED		OCCUPIED	

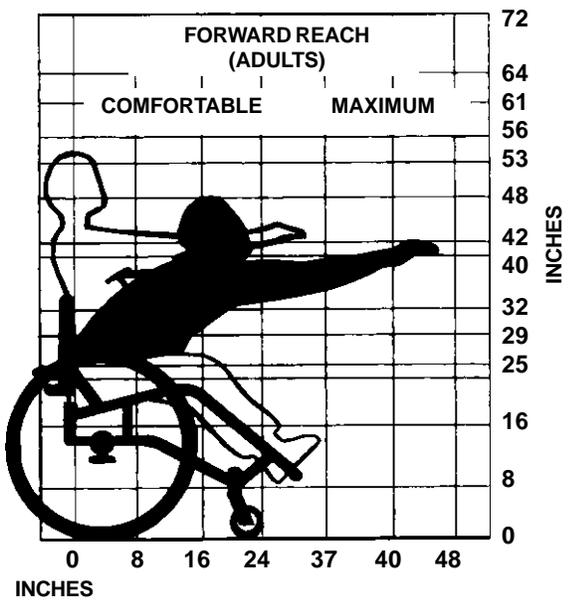
**LENGTHENING THE WHEELBASE**



**SHORTENING THE WHEELBASE**

**Functional Reach From a Wheelchair**

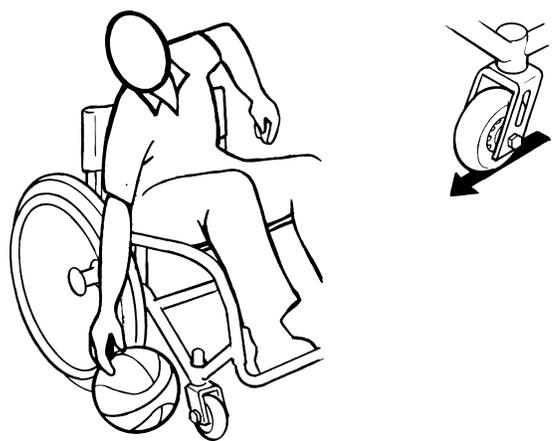
The approximate reach-limit values shown in the accompanying graph were derived on the basis of a sample of 91 male and 36 female wheelchair users. Note the difference between the maximum and the comfortable reach limits, a subjective but important consideration in design.



**REACHING, LEANING AND BENDING - FORWARD.**

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

**WARNING**  
 DO NOT attempt to reach objects if you have to move forward in the seat or pick them up from the floor by reaching down between your knees.



**REACHING, LEANING - BACKWARDS.**

**WARNING**  
 DO NOT lean over the top of the back upholstery. This will change your center of gravity and may cause you to tip over.



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.

**Tilting**

**WARNING**  
 DO NOT tilt the wheelchair without assistance.

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

**TILTING - CURBS.**

After mastering the techniques of tilting the wheelchair, use the following method to tackle curbs, short stairs, etc.

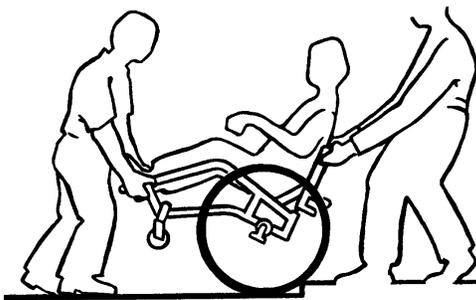
Turn the anti-tippers so the wheels are facing UP. Unless the first assistant has exceptional upper body strength, it is recommended that two (2) assistants perform this operation. The second assistant should be positioned at the front of the wheelchair lifting upward on a non-removable (non-detachable) 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. 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.

**WARNING**

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.

Roll the wheelchair backward and **SLOWLY** lower the wheelchair in one continuous movement. **DO NOT** let the wheelchair drop the last few inches to the ground. This could result in injury to the occupant. Turn the anti-tippers so the wheels are facing DOWN.



**Stairways**

**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.

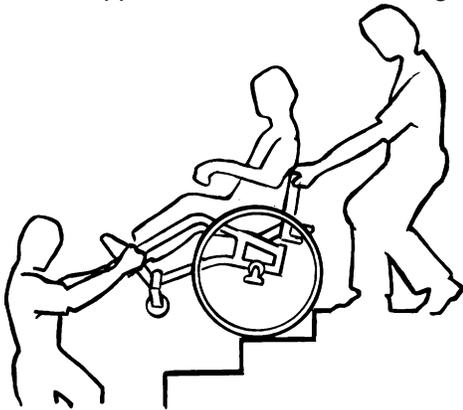
**WARNING**

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

Extreme caution is advised when it is necessary to move an occupied wheelchair up or down the stairs. Invacare recommends using two (2) 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:**

1. Turn the anti-tippers so the wheels are facing UP.
2. After the wheelchair has been tilted back to the balance point, one assistant (in the rear) backs the wheelchair up against the first step, while securely grasping a non-removable (non-detachable) part of the wheelchair for leverage.
3. The second assistant, with a firm hold on a non-detachable part of the framework, lifts the wheelchair up and over the stair and steadies the wheelchair as the first assistant places one (1) foot on the next stair and repeats STEP 1.
4. The wheelchair should not be lowered until the last stair has been negotiated and the wheelchair has been rolled away from the stairway.
5. Turn the anti-tippers so the wheels are facing DOWN.



**ESCALATORS? SORRY!**

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

**Transferring To And From Other Seats**

**GENERAL GUIDELINES**

**WARNING**

BEFORE attempting to transfer in or out of the wheelchair, every precaution should be taken to reduce the gap distance. Align both casters parallel with 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 prevent damaged upholstery and the possibility of the wheelchair tipping forward.

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



Position the wheelchair as close as possible along side the seat to which you are transferring, with the front casters parallel to it. Engage wheel locks. 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.

***This Procedure includes the following:***

***Safety Inspection Checklist***

***Troubleshooting***

***Maintenance***

*NOTE: Every six (6) months 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.*

## SAFETY INSPECTION CHECKLIST

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

ITEM	INITIALLY	INSPECT/ ADJUST WEEKLY	INSPECT/ ADJUST MONTHLY	INSPECT/ ADJUST PERIODICALLY
<b>GENERAL - (TROUBLESHOOTING)</b> Wheelchair rolls straight (no excessive drag or pull to one side).	X			X
<b>WHEEL LOCKS - PROCEDURE 5</b> Do not interfere with tires when rolling. Pivot points free of wear and looseness. Wheel locks easy to engage.	X X X		X X	X
<b>SEAT AND BACK UPHOLSTERY - PROCEDURE 3</b> Inspect for rips or sagging. Inspect fastening flaps to ensure they securely latch.	X X		X	X
<b>REAR WHEELS - PROCEDURE 5</b> Quick/Quad-release axles lock properly. No excessive side movement or binding when lifted and spun.	X X	X		X
<b>HANDRIMS - PROCEDURE 5</b> Inspect for signs of rough edges or peeling.	X			X
<b>SPOKES</b> Inspect for bent or broken spokes. All spokes uniformly tight.	X X	X X		
<b>FRONT CASTERS - PROCEDURE 5</b> Inspect wheel/fork assembly for proper tension by spinning caster; 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. <b>CAUTION: As with any vehicle, the wheels and tires should be checked periodically for cracks and wear, and should be replaced.</b>	X X X	X	X X	X
<b>TIRES - PROCEDURE 5</b> Inspect for flat spots and wear. If pneumatic tires check for proper inflation. <b>CAUTION: As with any vehicle, the wheels and tires should be checked periodically for cracks and wear, and should be replaced.</b>	X X	X X		
<b>CAMBER/AXLE TUBE - PROCEDURE 5</b> Axle tube is securely tightened. Camber inserts are not extended more than 3-inches.	X X		X X	X X
<b>TURNBUCKLE - PROCEDURE 4</b> Inspect turnbuckle and jam nut for proper adjustment.	X	X		
<b>SUSPENSION - PROCEDURE 9</b> Check elastomers for wear and/or damage.	X	X		
<b>CLEANING</b> Clean Optional Quick Release Levers. Clean upholstery and armrests.	X X		X	X

**TROUBLESHOOTING**

INSPECTION

CHAIR VEERS RIGHT	CHAIR VEERS LEFT	SLUGGISH TURN OR PERFORMANCE	CASTER FLUTTERS	SQUEAKS AND RATTLES	LOOSENESS IN CHAIR	CHAIR 3 WHEELS	SOLUTIONS
X	X	X	X			X	Check tires for correct and equal pressure.
		X	X	X	X		Check for loose stem nuts.
				X	X		Check spokes/nipples.
X	X		X			X	Check washers above and below bearings in headtube (Procedure 3).
X	X					X	Check that rear wheels are equally spaced away from seat frame (Procedure 3).

**MAINTENANCE**

**Maintenance Safety Precautions**

**WARNING**

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

**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. Check all parts for damage or wear and replace. Check all parts for proper adjustment.
2. Keep quick/quad-release axles free of dirt and lint to ensure positive locking and proper operation. Refer to ADJUSTING THE QUICK-RELEASE AXLE or ADJUSTING THE QUAD-RELEASE HANDLE IN AND/OR OUT in PROCEDURE 5 of this manual.
3. Oil quick-release axles at least once (1) a month (3-in-1 oil® or equivalent).
4. Keep optional quick release levers on axle tubes free of dirt and lint to ensure positive locking and proper operation.

**3-in-1 oil - Registered trademark of American Home Products Corp.**

**Teflon - Registered trademark of E. I. Du Pont De Nemours and Company**

**WARNING**

DO NOT use the wheelchair unless it has the proper tire pressure (p.s.i.). DO NOT over-inflate the tires. Failure to follow these suggestions may cause the tire to explode and cause bodily harm.

5. Inflate tires to the recommended tire pressure listed on the side wall of the tire.
6. The wheels and tires should be checked periodically for cracks and wear. If damaged, have them replaced by a qualified technician.
7. Regularly check for loose spokes in the rear wheels. If loose, have them adjusted by a qualified technician.
8. Periodically check handrims to ensure they are secured to the rear wheels. Refer to HANDRIM REPLACEMENT in PROCEDURE 5 of this manual.
9. Periodically adjust wheel locks in correlation to tire wear. Refer to WHEEL LOCK ADJUSTMENT/REPLACEMENT in PROCEDURE 5 of this manual.
10. Periodically check caster wheel bearings to make sure they are clean and free from moisture. Use a Teflon® lubricant if necessary.
11. Check Upholstery for sagging, rips or tears.
12. A-6S AND F-6S ONLY - Check elastomers for wear and/or damage. If wear or damage is found, replace elastomers.

*This Procedure includes the following:*  
 Unfolding/Folding the Back  
 Removing/Installing Standard Back Upholstery  
 Adjustable Tension Back Upholstery  
 Seat Upholstery Replacement

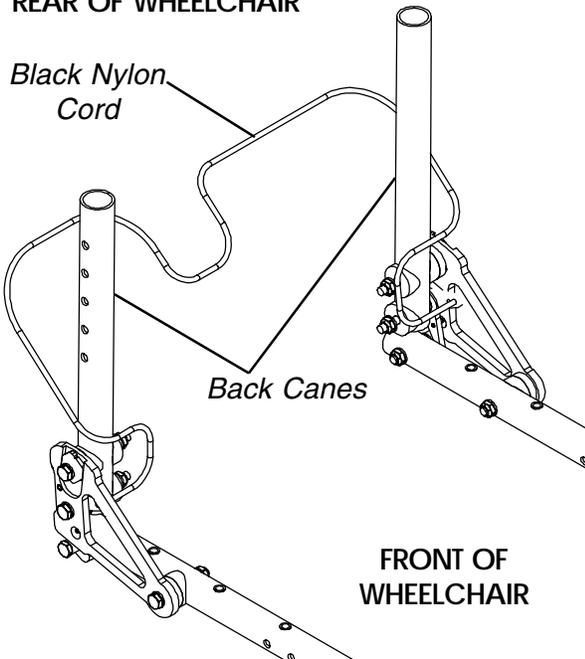
**WARNING**  
 After ANY adjustments, repair or service and BEFORE use, make sure all attachment hardware is tightened securely - otherwise, injury or damage may result.

**UNFOLDING/FOLDING THE BACK (FIGURE 1)**

**WARNING**  
 Back MUST be locked securely in place before using the wheelchair.

1. To unfold the back, lift up on the back canes and pull back towards the rear of the wheelchair until it locks into place.
2. To fold the back, pull up on the black nylon cord and push the back canes forward towards the front of the wheelchair.

**REAR OF WHEELCHAIR**



**FRONT OF WHEELCHAIR**

*NOTE: Back upholstery removed for clarity.*

**FIGURE 1 - UNFOLDING/FOLDING THE BACK**

**REMOVING/INSTALLING STANDARD BACK UPHOLSTERY (FIGURE 2)**

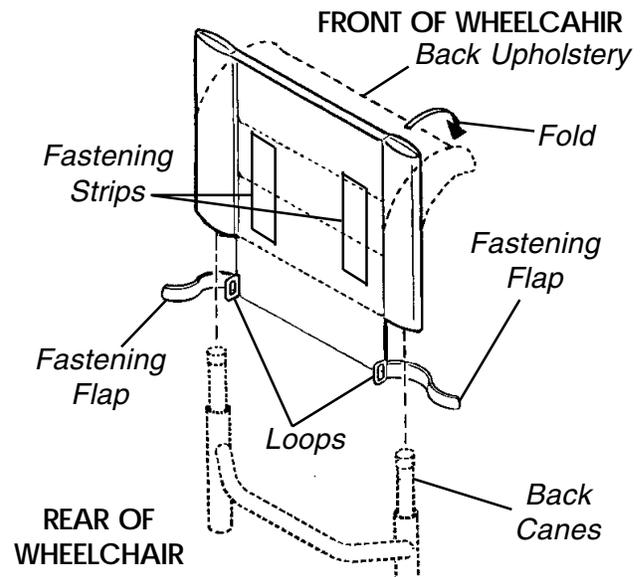
**WARNING**  
 The position of the footrest, seat angle, back angle, seating system/upholstery, caster size and position, rear wheel size and position, anti-tippers, as well as the user condition directly relate to the stability of the wheelchair. Any change to one (1) or any combination of the ten (10) may cause the wheelchair to decrease in stability. EXTREME care MUST be taken when changing the stability of the wheelchair. Refer to the chart in STABILITY in PROCEDURE 1 of this manual.

**Removing Standard Back Upholstery**

1. Unfasten the two (2) fastening flaps that secure the bottom of the existing back upholstery to the back canes.
2. Unfold the top of the back upholstery.
3. Lift up on the existing back upholstery and remove from the wheelchair.

**Installing Standard Back Upholstery**

1. Install the new back upholstery onto the back canes.
2. Wrap the end of a fastening flap around the back cane.
3. Insert the end of the fastening flap through the loop.
4. Wrap the fastening flap around the back cane again and press firmly to secure.
5. Fold the top of the back upholstery down over the back canes towards the front of the wheelchair.
6. Press firmly to secure the fastening strips.



**FIGURE 2 - REMOVING/INSTALLING STANDARD BACK UPHOLSTERY**

## ADJUSTABLE TENSION BACK UPHOLSTERY (FIGURE 3)

### The Adjustable Tension Straps

The adjuster straps can be adjusted at various levels of tension to accommodate individual end-users. The bottom two (2) straps can be adjusted tightly to support and/or assist the extensor muscles.

### The Back Upholstery Cover

The back upholstery cover is designed for three (3) reasons:

1. The first is as a modesty cover.
2. The second is to keep the cushion from sliding out of the back of the wheelchair.
3. The third is a sacral support depending upon how far or tight the seat portion of the back upholstery cover is pulled under the seat cushion.

### Removing/Installing Adjustable Tension Back Upholstery

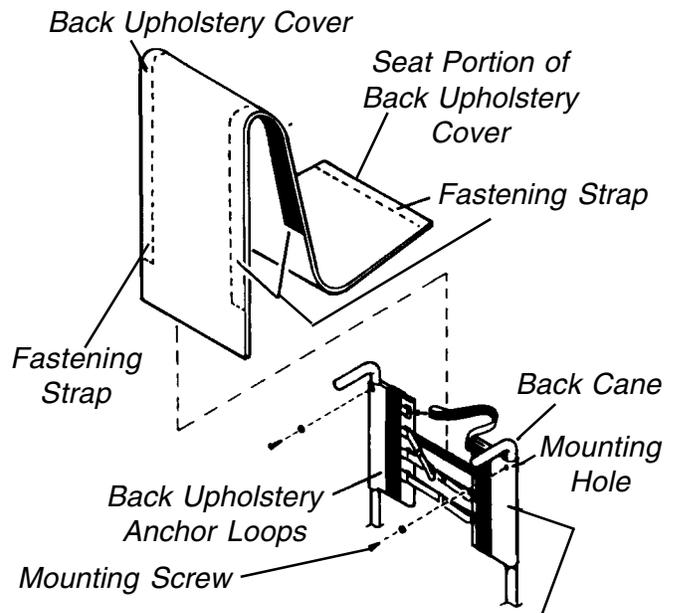
*NOTE: To remove adjustable tension back upholstery, reverse STEPS 2-4.*

1. Remove the existing back upholstery from the wheelchair. Refer to REMOVING/INSTALLING STANDARD BACK UPHOLSTERY in this procedure of the manual.
2. Stand behind the wheelchair and perform the following:
  - A. Slide anchor loop section of adjustable tension back upholstery over the LEFT back cane with the grommet hole facing the rear of the wheelchair.
  - B. Slide adjuster strap section of adjustable tension back upholstery over the RIGHT back cane with the grommet hole facing the rear of the wheelchair.
3. Adjust the adjuster straps to the desired tension.
4. Secure adjustable tension back upholstery to the back canes with the mounting screws. Torque to 20-25 in./lbs.

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

### WARNING

After the adjustable tension back upholstery has been positioned to the end-user's individual needs, the fastening straps **MUST** be securely fastened **BEFORE** applying the back upholstery cover. The adjustable tension back should be checked whenever entering the wheelchair to ensure that the fastening/adjuster straps are securely fastened.



*Back Upholstery Adjuster Straps*

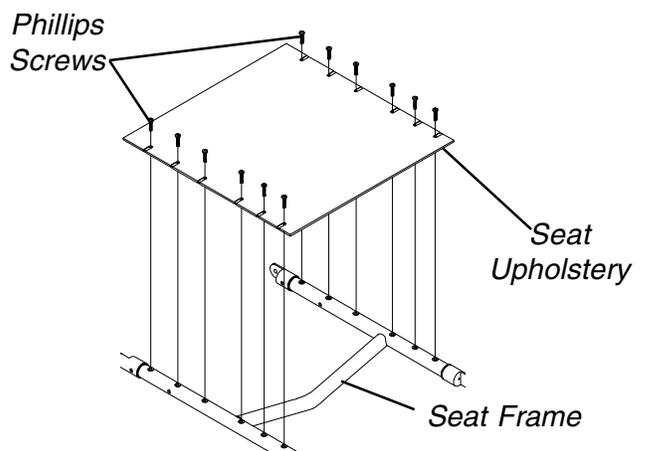
FIGURE 3 - ADJUSTABLE TENSION BACK UPHOLSTERY

## SEAT UPHOLSTERY REPLACEMENT (FIGURE 4)

1. Remove the seat cushion from the wheelchair.
2. Remove the phillips screws that secure the existing seat upholstery to the seat frame.

WHEELCHAIR DEPTH	NUMBER OF SCREWS
14-INCHES	8
15 TO 16-INCHES	10
17 TO 18-INCHES	12
19 TO 20-INCHES	14

3. Remove the existing seat upholstery.
4. Install the NEW seat upholstery by reversing the above steps.
5. Reinstall the seat cushion onto the wheelchair.



*NOTE: Wheelchair frame not shown for clarity.*

FIGURE 4 - SEAT UPHOLSTERY REPLACEMENT

- This Procedure includes the following:**
- Back Angle Adjustment - Adjustable Backs Only**
  - Back Height Adjustment**
  - Replacing Seat Frame - A-6/A-6S ONLY**
  - Rear Seat-to-Floor Height Adjustment - A-6/A-6S ONLY**
  - Replacing Turnbuckle Assembly - A-6/A-6S ONLY**
  - Opening/Closing Clamps**
  - Determining Toe in/Toe Out**
  - Adjusting Toe in/Toe Out**
  - Adjusting the Axle Tube**
  - Repositioning Camber Inserts (Adjusting Rear Wheel Camber)**
  - Adjusting Wheelbase Length (Adjusting Center of Gravity)**
  - Adjusting Wheelbase Width**
  - Replacing Axle Tube**
  - Repositioning the Axle Tube**
  - Repositioning Quick Release Levers**
  - Removing/Installing Telescoping Tubes**

**WARNING**

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

**BACK ANGLE ADJUSTMENT - ADJUSTABLE BACKS ONLY (FIGURE 1)**

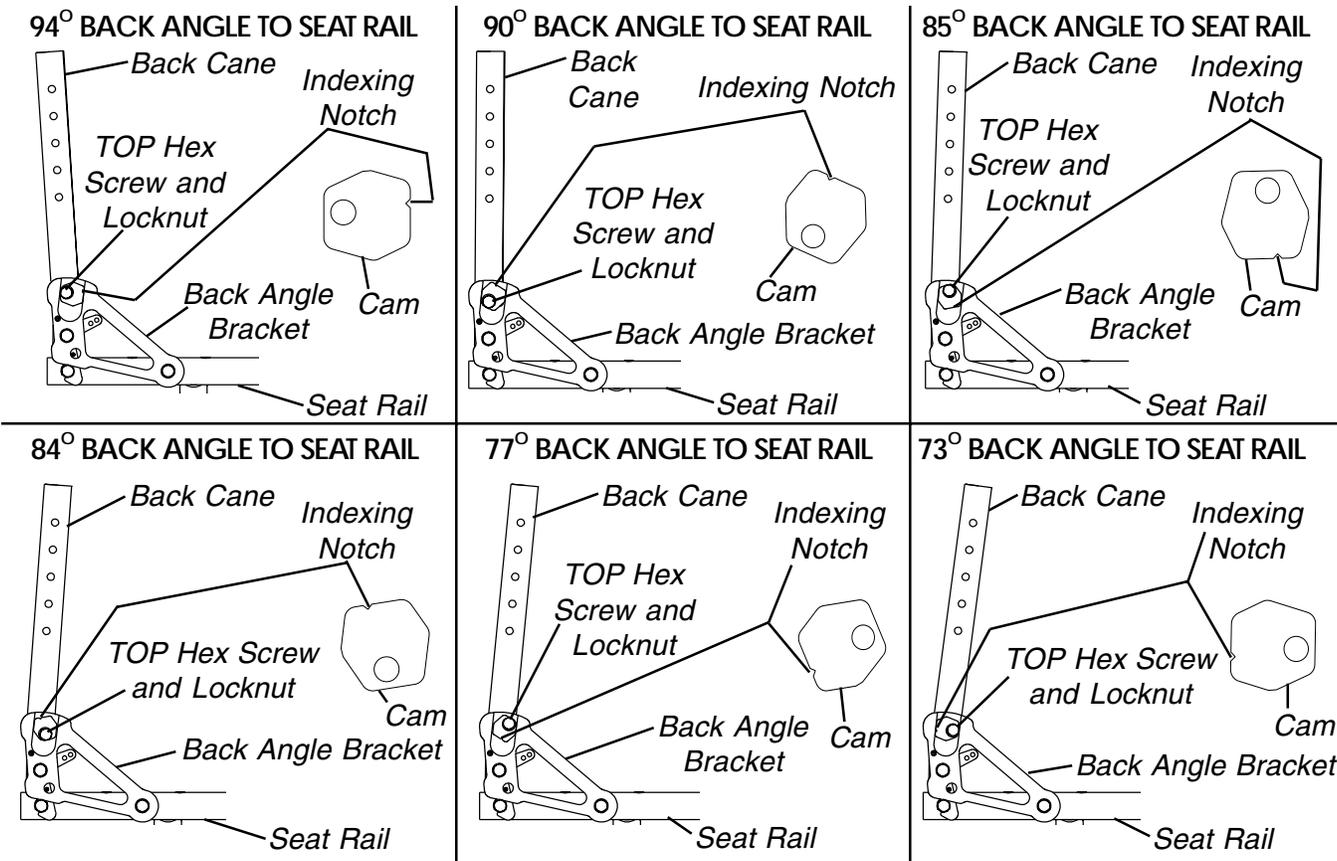
*NOTE: Perform this procedure on both sides of the wheelchair at the same time.*

1. Loosen, but DO NOT remove the locknuts and hex screws that secure the back angle bracket to the seat rail and the back cane.
2. Loosen the TOP locknut and slide the TOP hex screw away from the back angle bracket to adjust the cam.
3. Adjust back canes to back angle required.
4. Adjust cam to achieve desired position.

*NOTE: An indexing notch has been put on the cam to help determine cam position for desired back angle adjustment.*

5. Secure cam in desired position. Torque all hex screws and locknuts to 960-1020 inch pounds (80-85 foot pounds).

*NOTE: As shown in FIGURE 1, the adjustment cam can be rotated to several different positions thus changing the overall back angle relative to the seat rail.*



**FIGURE 1 - BACK ANGLE ADJUSTMENT - ADJUSTABLE BACKS ONLY**

FRAME

## BACK HEIGHT ADJUSTMENT (FIGURE 2)

*NOTE: Observe the tautness of the back upholstery/ adjustable tension back upholstery adjuster straps for proper reinstallation.*

1. Remove the back upholstery. Perform one (1) of the following:
  - A. **STANDARD BACK UPHOLSTERY** - Refer to REMOVING/INSTALLING STANDARD BACK UPHOLSTERY in PROCEDURE 3 of the manual.
  - B. **ADJUSTABLE TENSION BACK UPHOLSTERY** - Refer to ADJUSTABLE TENSION BACK UPHOLSTERY in PROCEDURE 3 of the manual.

### WARNING

Push pin of the back cane insert bar **MUST** be protruding through hole in each back cane.

Ensure that both back cane insert bars are at same height **BEFORE** reassembling the wheelchair.

2. Press the push pin on the back cane insert bar IN and adjust the back height to one (1) of five (5) heights depending on original back height:

**Back Height (in inches)**

⊛ HOLE #	8-11	10-14	12-16	14-18	16-20
1	8	10	12	14	16
2	9	11	13	15	17
3	10	12	14	16	18
4	11	13	15	17	19
5	N/A	14	16	18	20

⊛ Holes numbered from bottom to top for reference only. (There are no numbers on the back canes.)

3. Reinstall back upholstery. Perform one (1) of the following:
  - A. **STANDARD BACK UPHOLSTERY** - Refer to REMOVING/INSTALLING STANDARD BACK UPHOLSTERY in PROCEDURE 3 of the manual.
  - B. **ADJUSTABLE TENSION BACK UPHOLSTERY** - Refer to ADJUSTABLE TENSION BACK UPHOLSTERY in PROCEDURE 3 of this manual.

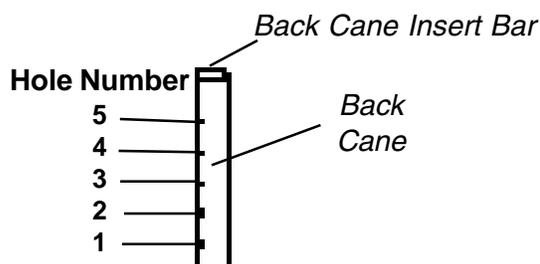


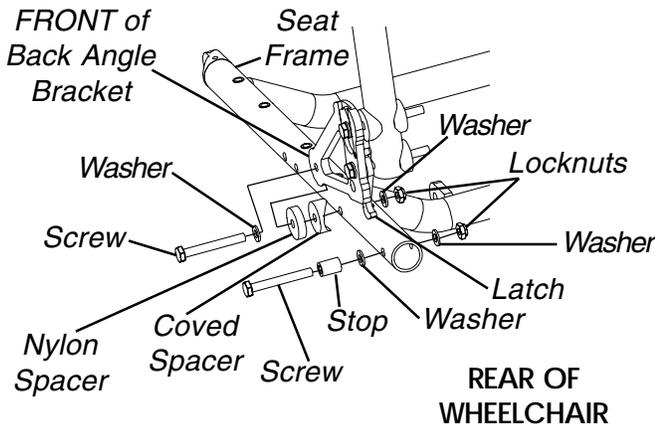
FIGURE 2 - BACK HEIGHT ADJUSTMENT

## REPLACING SEAT FRAME - A-6/A-6S ONLY (FIGURE 3)

1. Remove the rear wheels from the wheelchair. Refer to REMOVING/INSTALLING REAR WHEELS in PROCEDURE 5 of the manual.
2. Remove the seat upholstery from the wheelchair. Refer to SEAT UPHOLSTERY REPLACEMENT in PROCEDURE 3 of the manual.
3. Remove the wheel locks from the wheelchair. Refer to WHEEL LOCK ADJUSTMENT/REPLACEMENT in PROCEDURE 5 of this manual.
4. Remove the locknut, two (2) washers, stop and screw from the rearmost end of the seat frame.
5. Remove the locknut washer, coved spacer, nylon spacer, washer and screw from the FRONT of the back angle bracket.
6. Repeat STEPS 4-5 for the opposite side of the wheelchair.
7. Remove the back angle bracket and back canes from the seat frame.
8. Disconnect tumbuckle assembly from seat frame. Refer to STEPS 1-3 in REPLACING THE TURN-BUCKLE ASSEMBLY - A-6/A-6S ONLY in this procedure of the manual.
9. Remove two (2) allen screws and washers that secure front of seat frame to wheelchair front frame.
10. Remove the existing seat frame.
11. Align front of seat rail with wheelchair front frame as shown in FIGURE 3.
12. Install two (2) allen screws and washers to secure front of seat rail to wheelchair front frame.
13. Attach tumbuckle assembly to NEW seat frame. Refer to STEPS 8-12 in REPLACING THE TURN-BUCKLE ASSEMBLY - A-6/A-6S ONLY in this procedure of the manual.
14. Install the screw, stop, two (2) washers and locknut onto the rear of the seat frame.
15. Align the latch on the back angle bracket with the stop installed in STEP 14.
16. Secure the FRONT of the back angle bracket to the seat frame with the screw, washer, nylon spacer, coved spacer, washer and locknut as shown in FIGURE 3.
17. Reverse STEPS 1-3 to install wheel locks, seat upholstery and rear wheels.

**BACK ANGLE BRACKET HARDWARE**

FRONT OF WHEELCHAIR



**WHEELCHAIR FRONT FRAME HARDWARE**

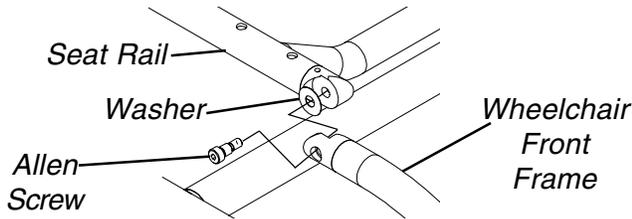


FIGURE 3 - REPLACING SEAT FRAME - A-6/A-6S ONLY

**REAR SEAT-TO-FLOOR HEIGHT ADJUSTMENT - A-6/A-6S ONLY (FIGURE 4)**

Rear seat-to-floor height is a measurement taken at the rear of the seat from the horizontal position, and is measured in inches. The rear seat-to-floor height of the A-6/A-6S can be adjusted up to 4-inches below the front seat-to-floor height.

**WARNING**

The position of the footrest, seat angle, back angle, seating system/upholstery, caster size and position, rear wheel size and position, anti-tippers, as well as the user condition directly relate to the stability of the wheelchair. Any change to one (1) or any combination of the ten (10) may cause the wheelchair to decrease in stability. **EXTREME** care **MUST** be taken when changing the stability of the wheelchair. Refer to the chart in STABILITY in PROCEDURE 1 of this manual.

**WARNING**

Adjusting the rear seat-to-floor height will change the back angle with respect to the ground and may decrease the stability of the wheelchair. **AFTER** adjusting rear seat to floor height, **ALWAYS** check back angle and adjust if necessary to ensure proper wheelchair stability.

**DO NOT** adjust rear seat-to-floor height with the wheelchair occupied.

**DO NOT** adjust the rear seat-to-floor height so the seat crossmember touches the axle tube.

**CAUTION**

**DO NOT** use tools to rotate the jam nut or turnbuckle. Otherwise, damage to the turnbuckle or jam nut may occur.

1. Rotate the jam nut **COUNTERCLOCKWISE** until a few threads are showing between the jam nut and the turnbuckle.
2. Rotate the turnbuckle in one of the following manners to adjust the rear seat-to-floor height:  
**CLOCKWISE** - Decreases the rear seat-to-floor height.  
**COUNTERCLOCKWISE** - Increases the rear seat-to-floor height.

*NOTE: QUICK RELEASE LEVERS ONLY - If quick release levers are on TOP of the axle tube and interfere with the desired rear seat-to-floor adjustment, the levers can be repositioned. Refer to REPOSITIONING QUICK RELEASE LEVERS in this procedure of the manual.*

3. Rotate the jam nut **CLOCKWISE** until it rests securely against the turnbuckle.
4. The back angle with respect to the floor/ground has changed. Adjust the back angle to maintain proper wheelchair stability. Refer to BACK ANGLE ADJUSTMENT - ADJUSTABLE BACKS ONLY in this procedure of the manual.

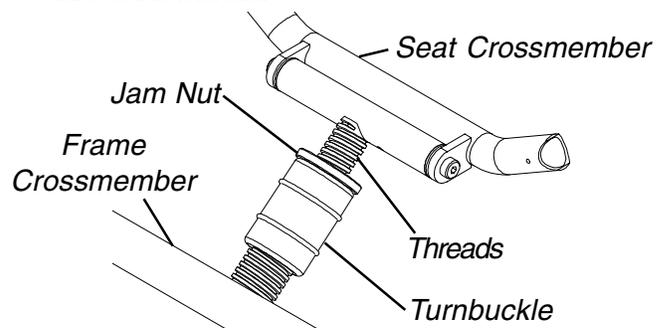


FIGURE 4 - REAR SEAT-TO-FLOOR HEIGHT ADJUSTMENT - A-6/A-6S ONLY

## REPLACING TURNBUCKLE ASSEMBLY - A-6/A6-S ONLY (FIGURE 5)

*NOTE: The turnbuckle assembly consists of the inside screw, turnbuckle, outside screw, flanges and rods. If the turnbuckle assembly becomes disassembled, refer to FIGURE 5.*

1. Carefully tip the wheelchair back so the back canes rest on the ground.
2. Insert an allen wrench into the hole in the inside screw and the hole in the rod to prevent the rod from spinning.
3. Remove the two (2) hex screws securing the inside screw to the seat crossmember.
4. Repeat STEPS 2-3 for the outside screw.
5. Remove the existing turnbuckle assembly from the seat and frame crossmembers.
6. Rotate the NEW turnbuckle until an equal number of threads shows on either end.
7. Position the NEW turnbuckle assembly with the jam nut towards the seat crossmember as shown in FIGURE 5.
8. Position the inside screw between the tabs on the seat crossmember.
9. Insert an allen wrench into the hole in the inside screw and the hole in the rod to prevent the rod from spinning.
10. Apply a removable thread locker to the threads of one (1) hex screw.
11. Install the hex screw into one end of the inside screw to secure the turnbuckle assembly to the seat crossmember.
12. Repeat STEPS 10-11 for opposite end of inside screw.
13. Repeat STEPS 8-12 to secure the outside screw to the frame crossmember.

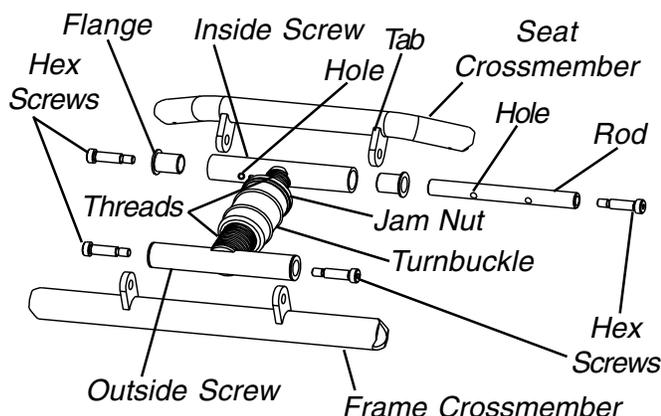


FIGURE 5 - REPLACING TURNBUCKLE ASSEMBLY - A-6/A-6S ONLY

## OPENING/CLOSING CLAMPS (FIGURE 6)

### WARNING

**QUICK RELEASE LEVERS** - Make sure the quick release levers are in the **CLOSED** position **BEFORE** using the wheelchair, otherwise personal injury or damage to the wheelchair may result.

**STANDARD CAMBER OR RECEIVER TUBE CLAMPS** - Make sure the hex screws and locknuts are **securely tightened** **BEFORE** using the wheelchair, otherwise personal injury or damage to the wheelchair may result.

### CAUTION

**DO NOT** close the quick-release levers or tighten the hex screws and locknuts **without** camber inserts in the axle tube. Damage to the axle tube will occur.

### Camber Clamps

1. Perform one (1) of the following to open a camber clamp:
  - A. **QUICK RELEASE LEVERS** - Pull the quick release lever to the open position.
  - B. **STANDARD CAMBER CLAMPS** - Loosen, but do not remove the hex screw and locknut on the camber clamp.
2. Perform one (1) of the following to close a camber clamp:
  - A. **QUICK RELEASE LEVERS** - Tighten the threaded knob to secure the quick release lever. Push the quick release lever on the camber clamps to the closed position.
  - B. **STANDARD CAMBER CLAMPS** - Securely tighten the hex screw and locknut to secure the axle tube.

### Receiver Tube Clamps

1. Perform one (1) of the following to open a receiver tube clamp:
  - A. **QUICK RELEASE LEVERS** - Pull the quick release levers on the receiver tube clamps to the open position.
  - B. **STANDARD RECEIVER TUBE CLAMPS** - Loosen, but do not remove the hex screws and locknuts on the receiver tube clamps.
2. Perform one (1) of the following to close a receiver tube clamp:
  - A. **QUICK RELEASE LEVERS** - Tighten the threaded knob to secure the quick release lever. Push the quick release lever on the receiver tube clamps to the closed position.
  - B. **STANDARD RECEIVER TUBE CLAMPS** - Tighten the hex screw and locknut on the receiver tube clamp. Torque to 75 in./lbs.

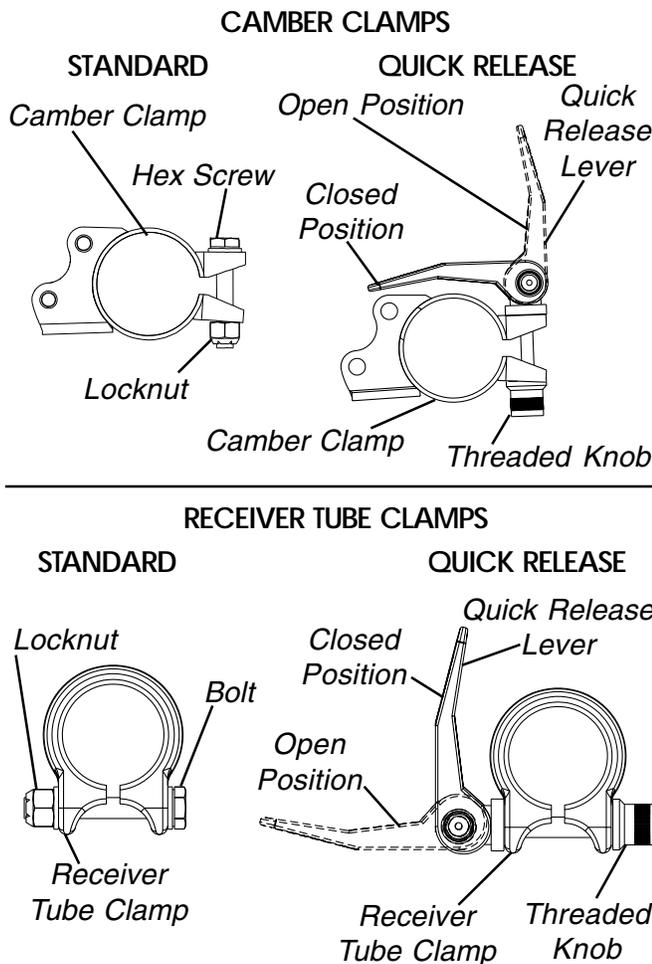


FIGURE 6 - OPENING/CLOSING CLAMPS

**DETERMINING TOE IN/TOE OUT (FIGURE 7)**

1. Inflate all pneumatic tires to recommended tire pressures (listed on the sidewall of the tire).
2. Measure the distance between the centerlines at the rear and front of the rear wheels at approximately 12-inches from the ground/floor (FIGURE 7).

*NOTE: For optimum accuracy, perform STEP 2 with the wheelchair occupied.*

3. Determine the difference between the two (2) measurements. If the **difference** between the **two (2) measurements** is **NOT** within  $\pm 1/8$ -inch, one (1) of two (2) conditions exists:
  - A. If the **back centerline measurement** of the rear wheels is **SMALLER** than the **front centerline measurement** of the rear wheels, a **TOE-OUT** condition exists (FIGURE 7).
  - B. If the **back centerline measurement** of the rear wheels is **LARGER** than the **front centerline measurement** of the rear wheels, a **TOE-IN** condition exists (FIGURE 7).

4. If the difference between the measurements is not within  $\pm 1/8$ -inch, correct the toe-in/toe-out condition. Refer to ADJUSTING TOE-IN/TOE-OUT in this procedure of the manual.

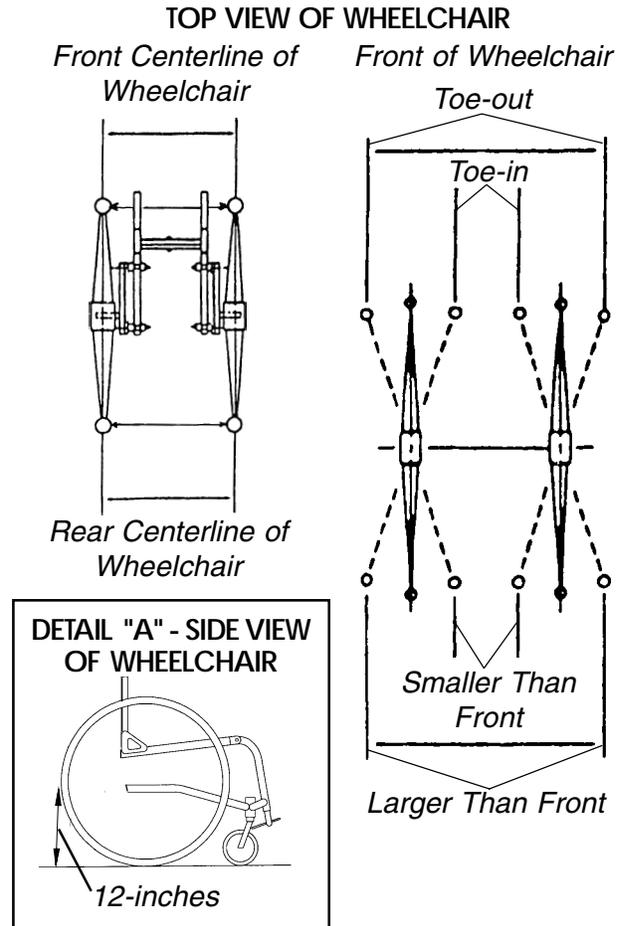


FIGURE 7 - DETERMINING TOE IN/TOE OUT

**ADJUSTING TOE IN/TOE OUT**

*NOTE: If the axle tube has been repositioned or replaced, proceed to LOCKING OUT AXLE TUBE in this procedure of the manual.*

**Axle Tube Positioning For 0°/3°, 0°/6°, 3°/6° or 9°/12° Camber Inserts (FIGURE 8)**

**CAUTION**  
**DO NOT** rotate the axle tube if the axle tube is locked out by the toe adjustment rings. If a locked out axle tube is rotated, damage to the toe adjustment rings will occur.

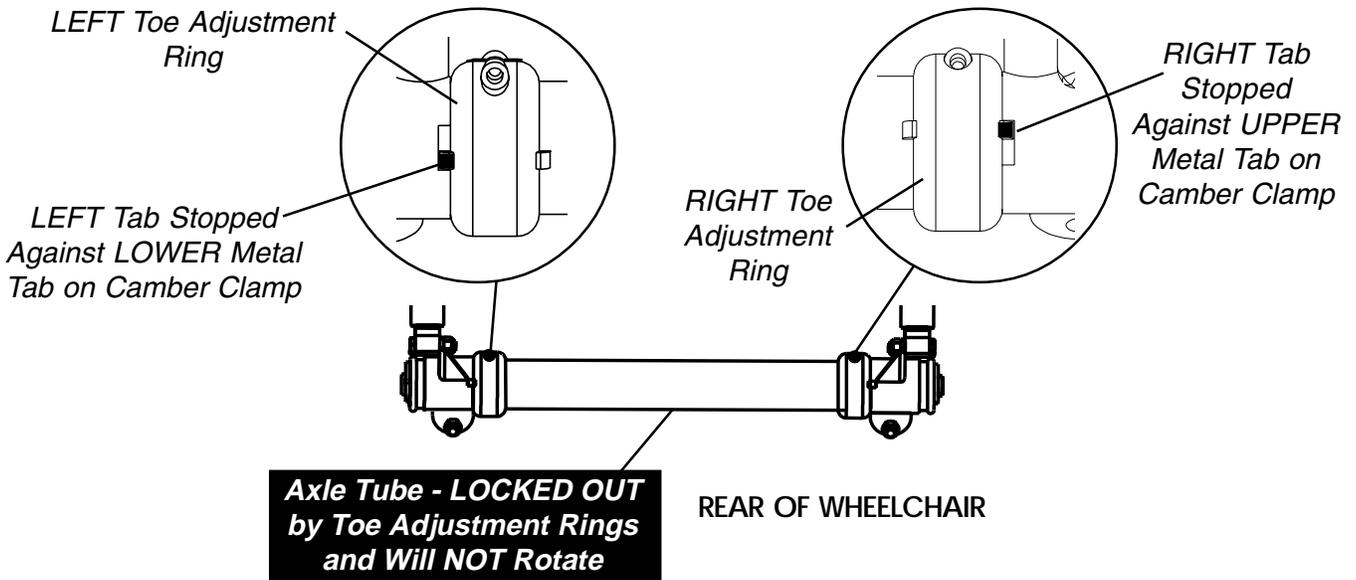
*NOTE: Refer to FIGURE 8 for a description of a locked out axle tube.*

There is **NO** adjustment required to maintain a correct toe in/toe out measurement.

*NOTE: The axle tube will be locked out by the toe adjustment rings and will **NOT** rotate.*

FRAME

**AXLE TUBE POSITIONING FOR 0°/3°, 0°/6°, 3°/6° OR 9°/12° CAMBER INSERTS - NO ADJUSTMENT REQUIRED**



**AXLE TUBE POSITIONING FOR 0°/9°, 0°/12°, 3°/9°, 3°/12°, 6°/9° OR 6°/12° CAMBER INSERTS**

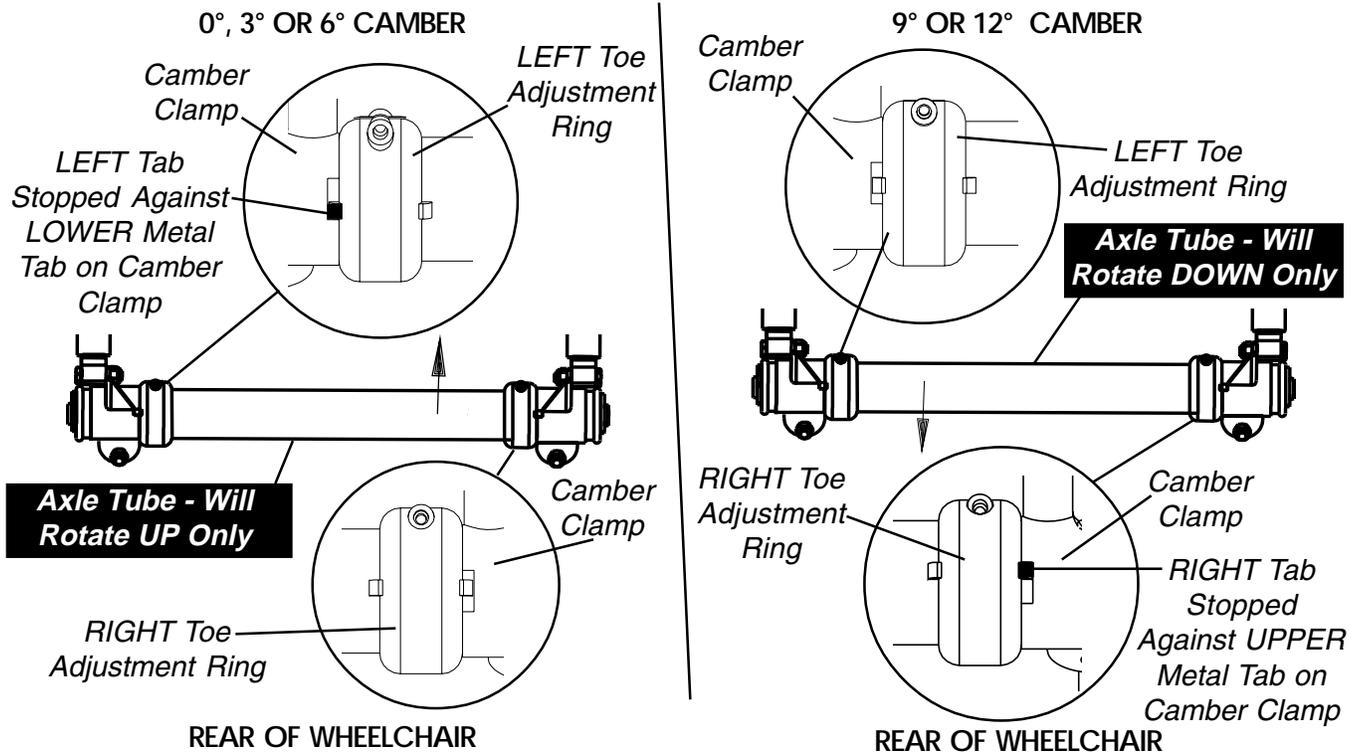


FIGURE 8 - ADJUSTING TOE IN/TOE OUT

**Axle Tube Positioning For 0°/9°, 0°/12°, 3°/9°, 6°/9°, 3°/12° Or 6°/12° Camber Inserts (FIGURE 8)**

NOTE: Stand behind the wheelchair to determine LEFT or RIGHT.

**WARNING**

**QUICK RELEASE LEVERS** - Make sure the quick release levers are in the CLOSED position BEFORE using the wheelchair, otherwise personal injury or damage to the wheelchair may result.

**STANDARD** - Make sure the hex screws and lock-nuts are securely tightened BEFORE using the wheelchair, otherwise personal injury or damage to the wheelchair may result.

**CAUTION**

DO NOT close the quick-release levers or tighten the hex screws and locknuts without camber inserts in the axle tube. Damage to the axle tube will occur.

**0°, 3° OR 6° CAMBER.**

1. Open the camber clamps. Refer to OPENING/CLOSING CLAMPS in this procedure of the manual.
2. Slowly rotate the axle tube until the tab on the LEFT toe adjustment ring is stopped against the LOWER metal tab on the camber clamp (FIGURE 8).
3. Close the camber clamps. Refer to OPENING/CLOSING CLAMPS in this procedure of the manual.

**9° OR 12° CAMBER.**

1. Open the camber clamps. Refer to OPENING/CLOSING CLAMPS in this procedure of the manual.
2. Slowly rotate the axle tube until the tab on the RIGHT toe adjustment ring is stopped against the UPPER metal tab on the camber clamp (FIGURE 8).
3. Close the camber clamps. Refer to OPENING/CLOSING CLAMPS in this procedure of the manual.

**ADJUSTING THE AXLE TUBE (FIGURE 9)**

**WARNING**

**QUICK RELEASE LEVERS** - Make sure the quick release levers are in the CLOSED position BEFORE using the wheelchair, otherwise injury or damage to the wheelchair may result.

**STANDARD** - Make sure the hex screws and locknuts are securely tightened BEFORE using the wheelchair, otherwise injury or damage to the wheelchair may result.

**CAUTION**

DO NOT close the quick-release levers or tighten the hex screws and locknuts without camber inserts in the axle tube. Damage to the axle tube will occur.

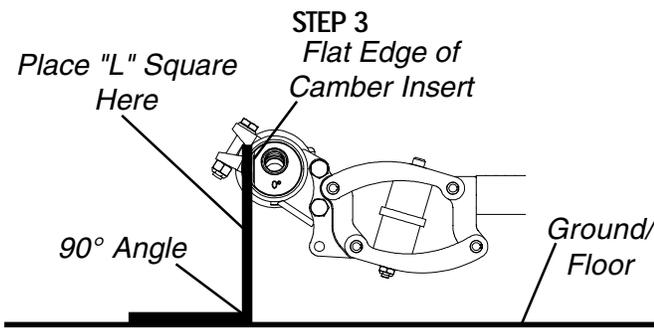
*NOTE: Before performing this procedure, make sure the camber inserts are positioned to the lowest degree of camber. Refer to REPOSITIONING CAMBER INSERTS (ADJUSTING REAR WHEEL CAMBER) in this section of the manual.*

*NOTE: Stand behind the wheelchair to determine LEFT or RIGHT.*

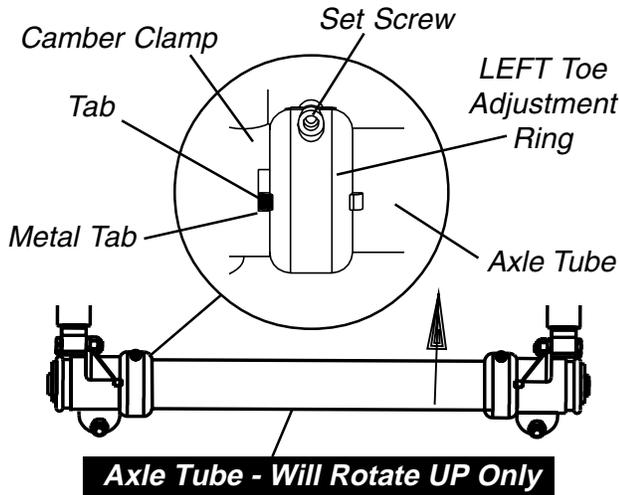
1. If necessary, open BOTH camber clamps. Refer to OPENING/CLOSING CLAMPS in this procedure of the manual.
2. Loosen the set screw that secures each toe adjustment ring to the axle tube (FIGURE 9).

3. Using an "L" square, rotate the axle tube until the flat edge of the camber insert is at a 90° angle with the ground/floor as shown in FIGURE 9.
4. Close the RIGHT camber clamp. Refer to OPENING/CLOSING CLAMPS in this procedure of the manual.
5. Rotate the LEFT toe adjustment ring until the tab stops against the LOWER metal tab on the camber clamp.
6. Securely tighten set screw on LEFT toe adjustment ring.
7. Measure the distance between the center lines at the rear and front of the rear wheels at approximately 12-inches from the ground/floor. Refer to DETERMINING TOE IN/TOE OUT in this procedure of the manual.
8. Perform one (1) of the following:
  - A. **TOE IN/TOE OUT MEASUREMENT IS WITHIN ±1/8-INCH** - Proceed to step 8.
  - B. **TOE IN/TOE OUT MEASUREMENT IS NOT WITHIN ±1/8-INCH** - Repeat STEPS 1-7 until toe in/toe out measurement is within ±1/8 inch.
9. Open the RIGHT camber clamp. Refer to OPENING/CLOSING CLAMPS in this procedure of the manual.
10. Reposition the camber inserts to the highest degree of camber. Refer to REPOSITIONING CAMBER INSERTS (ADJUSTING REAR WHEEL CAMBER) in this procedure of the manual.
11. Repeat STEP 3.
12. Close the LEFT camber clamp. Refer to OPENING/CLOSING CLAMPS in this procedure of the manual.
13. Rotate the RIGHT toe adjustment ring until the tab stops against the UPPER metal tab on the camber clamp.
14. Securely tighten set screw on RIGHT toe adjustment ring.
15. Repeat STEP 7.
16. Perform one (1) of the following:
  - A. **TOE IN/TOE OUT MEASUREMENT IS WITHIN ±1/8-INCH** -
    1. Proceed to STEP 17.
  - B. **TOE IN/TOE OUT MEASUREMENT IS NOT WITHIN ±1/8-INCH** -
    1. Repeat STEP 1.
    2. Loosen the set screw on the RIGHT toe adjustment ring.
    3. Repeat STEP 3.
    4. REPEAT STEPS 12-16 until toe in/toe out measurement is within ±1/8 inch.
17. If desired, reposition camber inserts to the desired degree of camber. Refer to REPOSITIONING CAMBER INSERTS (ADJUSTING REAR WHEEL CAMBER) in this procedure of the manual.

FRAME



**LOWER DEGREE OF CAMBER**



**HIGHER DEGREE OF CAMBER**

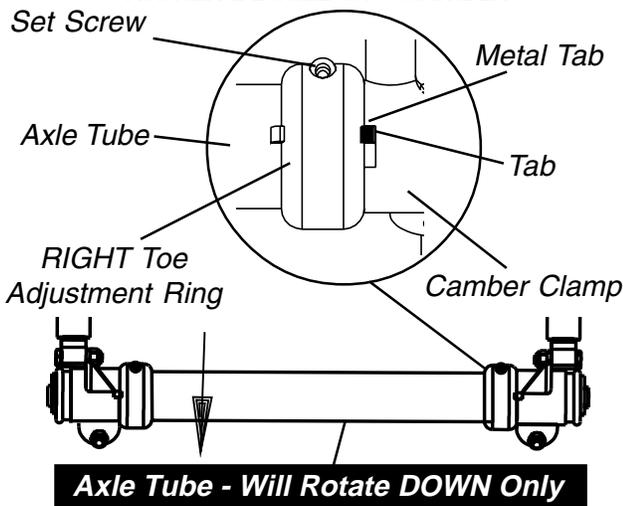


FIGURE 9 - ADJUSTING THE AXLE TUBE

**REPOSITIONING CAMBER INSERTS (ADJUSTING REAR WHEEL CAMBER) (FIGURE 10)**

*NOTE: Perform this procedure on one (1) side of the wheelchair at a time for ease of adjustment.*

1. Open the camber clamp. Refer to OPENING/CLOSING CLAMPS in this procedure of the manual.
2. Pull one (1) rear wheel with the camber insert out of the axle tube.
3. Remove the rear wheel from the camber insert. Refer to REMOVING/INSTALLING REAR WHEELS in PROCEDURE 5 of the manual.
4. Rotate the camber insert 180°.
5. Reinstall the rear wheel into the camber insert. Refer to REMOVING/INSTALLING REAR WHEELS in PROCEDURE 5 of the manual.

**WARNING**

**NEVER** position the camber inserts in the axle tube with more than 3-inches (12 indexing marks showing) of the camber insert outside of the axle tube. The camber inserts will not be securely tightened in the axle tube resulting in possible injury to the user or damage to the wheelchair.

6. Position camber insert to desired position. Make sure there is no more than 3-inches (12 indexing marks) of the camber inserts outside of axle tube.
7. Slide the indexing ring on the camber insert until it is flush with the camber clamp.

**WARNING**

**QUICK RELEASE LEVERS** - Make sure the quick release levers are in the **CLOSED** position **BEFORE** using the wheelchair, otherwise personal injury or damage to the wheelchair may result.

**STANDARD CAMBER CLAMPS** - Make sure the hex screws and locknuts are securely tightened **BEFORE** using the wheelchair, otherwise personal injury or damage to the wheelchair may result.

**CAUTION**

**DO NOT** close the quick-release levers or tighten the hex screws and locknuts without camber inserts in the axle tube. Damage to the axle tube will occur.

8. Close the camber clamp. Refer to OPENING/CLOSING CLAMPS in this procedure of the manual.
9. Repeat STEPS 1-8 for opposite side of wheelchair.

*NOTE: Before using the wheelchair, make sure both camber inserts are set to the same indexing mark. This will make sure the distance between the rear wheel and the wheelchair is the same on both sides.*

10. **Wheelchairs equipped with 0°/9°, 0°/12°, 3°/9°, 6°/9°, 3°/12° or 6°/12° camber inserts** - Adjust the toe in/toe out of the wheelchair. Refer to ADJUSTING TOE IN TOE OUT in this section of the manual.

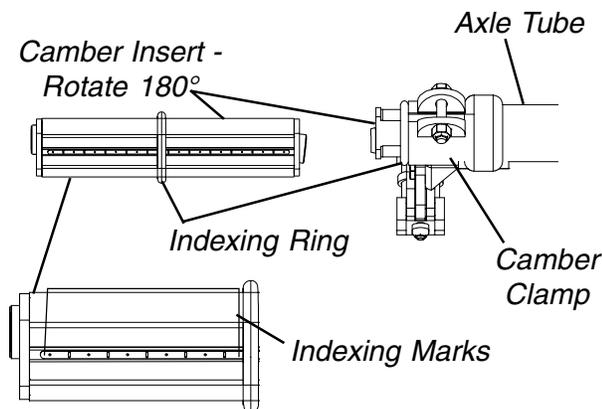
**WARNING**

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

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

Keep locking pins clean.

11. If the locking pins of the quick/quad-release axles 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, refer to ADJUSTING QUICK-RELEASE AXLES or REMOVING THE PLAY FROM THE REAR WHEELS in PROCEDURE 5 of this manual.
12. Ensure the wheelchair is parallel to the floor. Refer to ADJUSTING CASTER HEIGHT in PROCEDURE 5 of the manual.
13. Ensure anti-tippers are adjusted properly. Refer to ANTI-TIPPER ADJUSTMENT/REPLACEMENT in PROCEDURE 7 of this manual.



**FIGURE 10 - REPOSITIONING CAMBER INSERTS (ADJUSTING REAR WHEEL CAMBER)**

**ADJUSTING WHEELBASE LENGTH (ADJUSTING CENTER OF GRAVITY) (FIGURE 11)**

**WARNING**

The position of the footrest, seat angle, back angle, seating system/upholstery, caster size and position, rear wheel size and position, anti-tippers, as well as the user condition directly relate to the stability of the wheelchair. Any change to one (1) or any combination of the ten (10) may cause the wheelchair to decrease in stability. **EXTREME** care **MUST** be taken when changing the stability of the wheelchair. Refer to the chart in STABILITY in PROCEDURE 1 of this manual.

To maintain maximum stability, the rear wheels should be left in the factory setting. Moving the rear wheels **FORWARD** causes the wheelchair to decrease in stability.

**ALWAYS** ensure stability **BEFORE** moving the rear wheels forward. **TEST** wheelchair **BEFORE** it is occupied by the end user to ensure safety.

*NOTE: The wheelbase length of the wheelchair can be adjusted from just in front of the back cane (factory setting) up to four (4) inches forward.*

1. Open both receiver tube clamps. Refer to OPENING/CLOSING CLAMPS in this procedure of the manual.

**WARNING**

Telescoping tubes have two types of marks - "0" and "X" (DETAIL "A"). "X" marks are provided to indicate that the telescoping tube has been extended too far. **DO NOT** adjust the telescoping tubes so an "X" marks are showing. Otherwise, injury or damage may occur.

2. Perform one (1) of the following:
  - A. **PULL** telescoping tubes out of receiver tubes to **LENGTHEN THE WHEELBASE**, increase stability and maintain standard maneuverability of the wheelchair.
  - B. **PUSH** telescoping tubes into receiver tubes to **SHORTEN THE WHEELBASE**, increase the maneuverability and distribute additional weight onto rear wheels.

*NOTE: Marks on the telescoping tube have been provided to ensure the telescoping tubes are aligned with each other. The performance of the wheelchair will be affected if the telescoping tubes are not adjusted to the same position.*

**WARNING**

**QUICK RELEASE LEVERS** - Make sure the quick release levers are in the **CLOSED** position **BEFORE** using the wheelchair, otherwise injury or damage to the wheelchair may result.

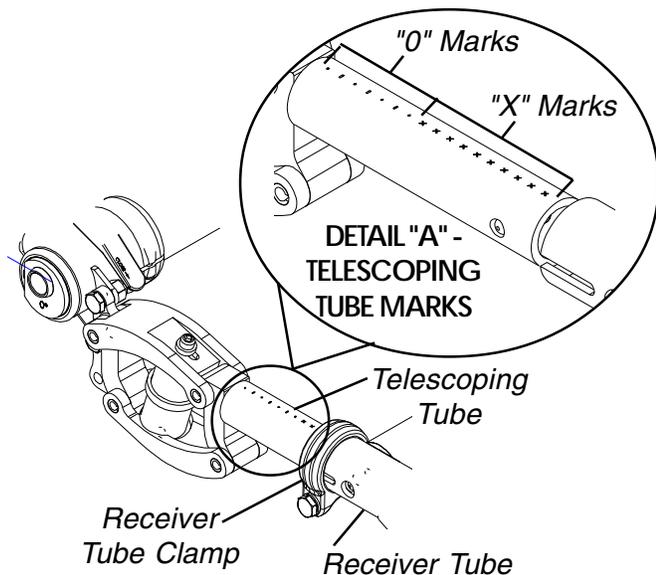
**STANDARD RECEIVER TUBE CLAMPS** - Make sure the hex screws and locknuts are securely tightened **BEFORE** using the wheelchair, otherwise injury or damage to the wheelchair may result.

**CAUTION**

**DO NOT** close the quick-release levers or tighten the hex screws and locknuts without telescoping tubes in the receiver tubes. Damage to the receiver tubes will occur.

3. Close both receiver tube clamps. Refer to OPENING/CLOSING CLAMPS in this procedure of the manual.
4. Test the occupied wheelchair for a short distance to make sure there is no excessive drag to either side.

*NOTE: If drag to either side occurs, refer to DETERMINING TOE INTOE OUT in this section of the manual.*



**FIGURE 11 - ADJUSTING WHEELBASE LENGTH (ADJUSTING CENTER OF GRAVITY)**

**ADJUSTING WHEELBASE WIDTH (FIGURE 12)**

*NOTE: Perform this procedure on one (1) side of the wheelchair at a time for ease of adjustment.*

1. Open the camber clamp. Refer to OPENING/CLOSING CLAMPS in this procedure of the manual.

**WARNING**

**NEVER** position the camber inserts in the axle tube with more than 3-inches (12 indexing marks showing) of the camber insert outside of the axle tube. The camber inserts will not be securely tightened in the axle tube resulting in possible injury to the user or damage to the wheelchair.

2. Position the camber insert to the desired position. Make sure there is no more than 3-inches (12 indexing marks showing) of the camber inserts outside of the axle tube.
3. Slide the indexing ring on the camber insert until it is flush with the frame bracket.

*NOTE: Before using the wheelchair, make sure both camber inserts are set at the same indexing mark. This will make sure the distance between the rear wheel and the wheelchair is the same on both sides.*

**WARNING**

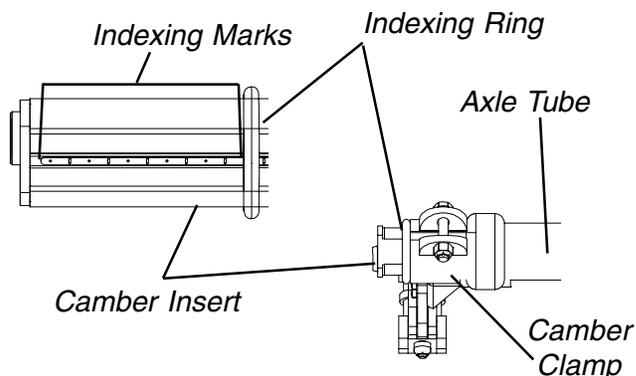
**QUICK RELEASE LEVERS** - Make sure the quick release levers are in the **CLOSED** position **BEFORE** using the wheelchair, otherwise personal injury or damage to the wheelchair may result.

**STANDARD CAMBER CLAMPS** - Make sure the hex screws and locknuts are securely tightened **BEFORE** using the wheelchair, otherwise personal injury or damage to the wheelchair may result.

**CAUTION**

**DO NOT** close the quick-release levers or tighten the hex screws and locknuts without camber inserts in the axle tube. Damage to the axle tube will occur.

4. Close the camber clamp. Refer to OPENING/CLOSING CLAMPS in this procedure of the manual.
5. Repeat STEPS 1-4 for the opposite side of the wheelchair.



**FIGURE 12 - ADJUSTING WHEELBASE WIDTH**

**REPLACING AXLE TUBE (FIGURE 13)**

*NOTE: There is no need to remove the two (2) camber clamps when replacing the axle tube.*

1. Note the position of the camber inserts so they can be installed to the original position in the new axle tube.
  2. Open the camber clamps. Refer to OPENING/CLOSING CLAMPS in this procedure of the manual.
  3. Remove the two (2) rear wheels and camber inserts positioned in the axle tube.
  4. Loosen, but do not remove the two (2) set screws that secure the toe adjustment rings to the axle tube.
  5. Pull the existing axle tube through one (1) of the camber clamps.
  6. Remove the toe adjustment rings from the existing axle tube.
  7. Pull the existing axle tube through the other camber clamp and remove from the wheelchair.
  8. Slide the new axle tube through one (1) of the camber clamps. Make sure the notches in the axle tube are towards the rear of the wheelchair and the slots in the axle tube are facing up.
  9. Install the toe adjustment rings onto the new axle tube. Make sure the stops on the toe adjustment rings are facing towards the outside of the wheelchair.
- NOTE: DO NOT tighten the set screws that secure the toe adjustment rings to the axle tube at this time.*
10. Slide the new axle tube through the other camber clamp until the end of the axle tube is flush with the outside of the camber clamp.

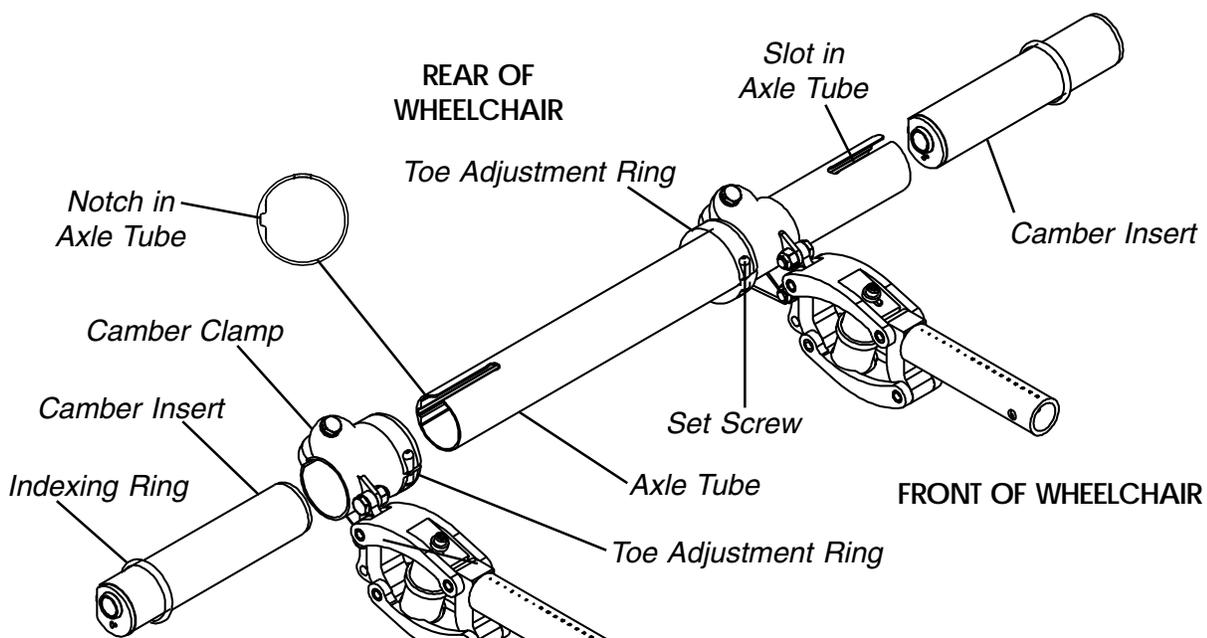
*NOTE: DO NOT close the quick release levers or tighten the hex screws that secure the axle tube to the camber clamps at this time.*

**WARNING**

**NEVER** position the camber inserts in the axle tube with more than 3-inches (12 indexing marks showing) of the camber insert outside of the axle tube. The camber inserts will not be securely tightened in the axle tube resulting in possible injury to the user or damage to the wheelchair.

11. Install the rear wheels and camber inserts into the new axle tube and slide the camber inserts to the position noted in STEP 1. Make sure there is no more than 3-inches (12 indexing marks) of the camber inserts outside of the axle tube.
  12. Slide the indexing ring on the camber insert until it is flush with the camber clamp
- NOTE: To maximize rollability: Before using the wheelchair, make sure both camber inserts are set to the same indexing notch. This will make sure the distance between the rear wheel and the wheelchair is the same on both sides.*
13. Adjust the axle tube. Refer to ADJUSTING THE AXLE TUBE in this procedure of the manual.
- NOTE: The performance of the wheelchair will be affected if the axle tube has not been adjusted to correct the toe in/toe out of the wheelchair.*
14. Ensure the camber clamps are closed. Refer to OPENING/CLOSING CLAMPS in this procedure of the manual.

FRAME



**FIGURE 13 - REPLACING AXLE TUBE**

## REPOSITIONING THE AXLE TUBE (FIGURES 14 AND 15)

*NOTE: This procedure should only be performed if changing the front seat-to-floor height. Refer to ADJUSTING FRONT SEAT-TO-FLOOR HEIGHT in PROCEDURE 5 of this manual.*

*NOTE: Right and left are determined by standing behind the wheelchair.*

1. Open both the camber clamps. Refer to OPENING/CLOSING CLAMPS in this procedure of the manual.
2. Remove the rear wheels from the camber inserts. Refer to REMOVING/INSTALLING REAR WHEELS in PROCEDURE 5 of the manual.
3. Remove the camber inserts from the wheelchair (FIGURE 14).
4. Refer to ADJUSTING FRONT SEAT-TO-FLOOR HEIGHT in PROCEDURE 5 of the manual to determine the proper position for the axle tube.
5. Refer to the chart in FIGURE 15 to determine the proper axle tube adjustment.

*NOTE: Refer to DETAIL "B" of FIGURE 15 for telescoping tube and clamp hole patterns.*

6. Remove the locknuts and hex bolts securing the telescoping tubes to the camber clamps.
7. Perform one (1) of the following:
  - A. **CLAMP POSITION MUST BE INVERTED**- Proceed to STEP 8.
  - B. **CLAMP POSITION REMAINS IN STANDARD POSITION** - proceed to STEP 12.

8. Remove the RIGHT camber clamp from the axle tube and set aside.
9. Remove the LEFT camber clamp from the axle tube.
10. Position the LEFT camber clamp onto the RIGHT end of the axle tube with the metal tabs facing the inside of the wheelchair.
11. Repeat step 10 for the RIGHT camber clamp and the LEFT end of the axle tube.

*NOTE: The camber clamps should now be inverted, as shown in DETAIL "A" of FIGURE 14.*

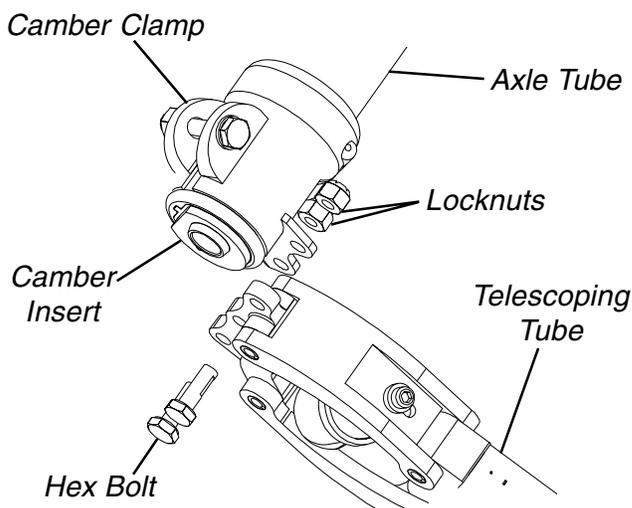
12. Align the camber clamp mounting holes with the telescoping tube holes determined in STEP 5.
13. Secure telescoping tube to camber clamp with hex bolts and locknuts.
14. Insert camber inserts into axle tube with lowest degree of camber facing towards outside of the wheelchair.
15. Install the rear wheels into the camber inserts. Refer to REMOVING/INSTALLING REAR WHEELS in PROCEDURE 5 of this manual.

16. Adjust the axle tube. Refer to ADJUSTING THE AXLE TUBE in this procedure of the manual.

*NOTE: The performance of the wheelchair will be affected if the axle tube has not been adjusted to correct the toe in/toe out of the wheelchair.*

17. Ensure the camber clamps are closed. Refer to OPENING/CLOSING CLAMPS in this procedure of the manual.
18. Adjust anti-tippers. Refer to ANTI-TIPPER ADJUSTMENT/REPLACEMENT in PROCEDURE 7 of the manual.

*NOTE: QUICK RELEASE LEVERS ONLY - Reposition the quick release levers to the top/bottom of the axle tube if desired. Refer to REPOSITIONING QUICK RELEASE LEVERS in this procedure of the manual.*



*NOTE: LEFT camber clamp and telescoping tube not shown for clarity.*

*NOTE: Suspension telescoping tube shown. Non-suspension telescoping tube attaches to camber clamp in the same manner.*

### DETAIL "A" - CLAMP POSITION

*NOTE: Axle tubes are viewed from the FRONT of the wheelchair.*

*NOTE: Socket facing DOWN not shown for clarity.*

#### STANDARD CLAMP POSITION - TABS/SOCKETS DOWN



#### INVERTED CLAMP POSITION - TABS/SOCKETS UP

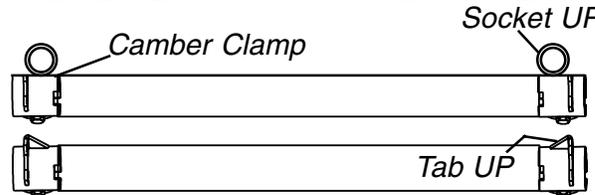


FIGURE 14 - REPOSITIONING THE AXLE TUBE

AXLE TUBE POSITIONS

AXLE POSITION	TELESCOPING TUBE HOLE	CLAMP HOLE	CLAMP POSITION*
TOP	A B	1 2	STANDARD
MIDDLE	B C	1 2	STANDARD
BOTTOM	A B	2 1	INVERTED

NOTE: Suspension telescoping tubes and tabs shown. Non-suspension telescoping tubes and anti-tipper sockets are not shown for clarity.

\* NOTE: When viewed from the front of the wheelchair, inside of the rear wheels, an inverted camber clamp has the tab or anti-tipper socket at the top of the axle tube. Refer to DETAIL "A" of FIGURE 14.

DETAIL "B" - MOUNTING HOLE PATTERN

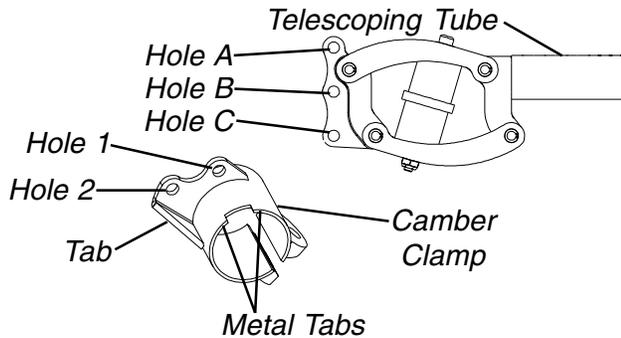
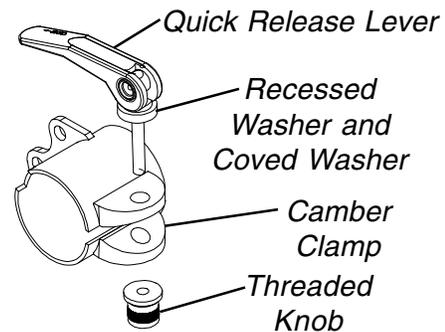


FIGURE 15 - REPOSITIONING THE AXLE TUBE

REPOSITIONING QUICK RELEASE LEVERS (FIGURE 16)

NOTE: This procedure should only be performed if quick release levers are on top of the axle mounting tube and interfere with the desired rear seat-to-floor adjustment. This procedure will position the quick release lever on the bottom of the axle tube.

1. Remove the threaded knob from the quick release lever.
2. Remove the quick release lever, recessed washer and covered washer from the camber clamp.
3. If necessary, position the recessed washer and covered washer onto the quick release lever, as shown in FIGURE 16.
4. Insert the quick release lever with washers through the camber clamp as shown in FIGURE 16.
5. Secure the quick release lever to the camber clamp with the threaded knob.
6. Repeat for opposite quick release lever.



SIDE VIEW OF CAMBER CLAMP WITH QUICK RELEASE LEVER

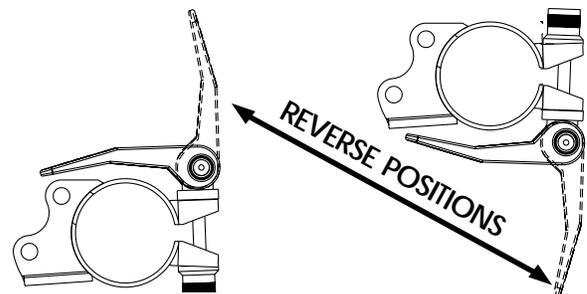


FIGURE 16 - REPOSITIONING QUICK RELEASE LEVERS

FRAME

FRAME

## REMOVING/INSTALLING TELESCOPING TUBES (FIGURE 17)

*NOTE: Invacare recommends replacing both telescoping tubes at the same time to maintain optimum wheelchair performance.*

### Removing Telescoping Tubes

1. Remove the rear wheels from the wheelchair. Refer to REMOVING/INSTALLING REAR WHEELS in PROCEDURE 5 of this manual.
  2. Note the number of marks showing on the telescoping tube.
  3. Open the receiver tube clamps. Refer to OPENING/CLOSING CLAMPS in this procedure of the manual.
  4. Pull the telescoping tubes with rear axle away from the receiver tube.
- NOTE: An audible "click" will be heard when the release buttons (DETAIL "A") pop out of the receiver tubes.*
5. Press the telescoping tube release buttons and continue to pull the telescoping tubes out of the receiver tubes.
  6. Note the mounting position of the two (2) mounting screws and locknuts securing the telescoping tubes to the camber clamp.
  7. Remove two (2) mounting screws and locknuts securing each telescoping tube to camber clamp (DETAIL "B").

### Installing Telescoping Tubes

1. Secure the NEW telescoping tubes to the camber clamps in the position noted in STEP 6 of REMOVING TELESCOPING TUBES with the mounting screws and locknuts (DETAIL "B").
2. Insert the ends of the telescoping tubes into the receiver tubes as far as possible.
3. Press telescoping tube release buttons and continue inserting the telescoping tubes into the receiver tubes.
4. Adjust wheelbase length to the position noted in step 2 of REMOVING TELESCOPING TUBES. Refer to ADJUSTING WHEELBASE LENGTH in PROCEDURE 6 of this manual.
5. Close the receiver tube clamps. Refer to OPENING/CLOSING CLAMPS in this procedure of the manual.
6. Reinstall the rear wheels. Refer to REMOVING/INSTALLING REAR WHEELS in PROCEDURE 5 of this manual.
7. A-6S AND F-6S WHEELCHAIRS ONLY - adjust suspension to correspond to the user's weight. Refer to REPLACING REAR ELASTOMERS in this procedure of the manual.

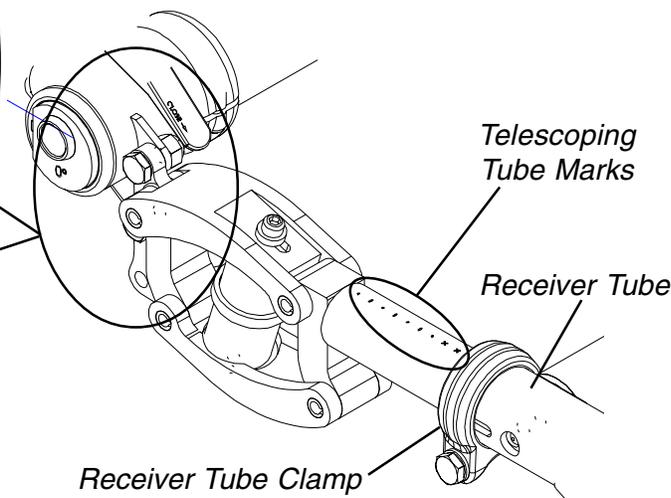
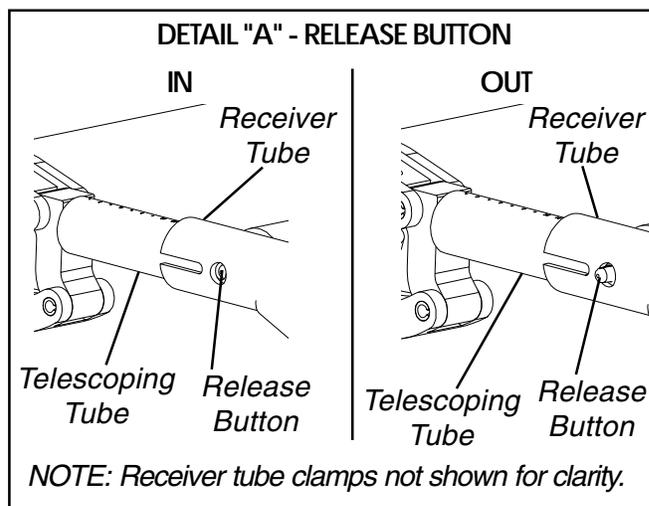
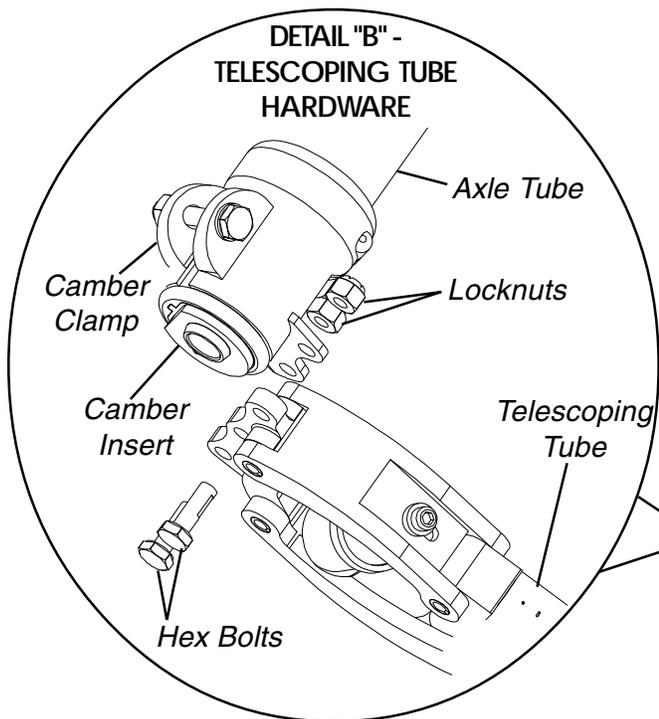


FIGURE 17 - REMOVING/INSTALLING TELESCOPING TUBES

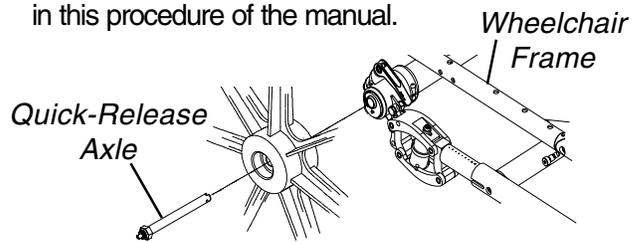
**This Procedure includes the following:**

- Removing/Installing Rear Wheels*
- Adjusting Quick-Release Axle*
- Installing Quad-Release Axle*
- Adjusting the Quad-Release Handle In and/or Out*
- Removing the Play From the Rear Wheels*
- Handrim Replacement*
- Repairing/Replacing Rear Wheel Tire/Tube*
- Wheel Lock Adjustment/Replacement*
- Replacing/Adjusting Casters*
- Replacing Front Forks*
- Adjusting Caster Height*
- Installing Quick Release Casters*
- Adjusting Front Seat-To-Floor Height*

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

Keep locking pins clean.

5. If locking pins are not protruding past the inside of axle bushing or there is too much movement of rear wheel assembly in a back and forth position, refer to ADJUSTING THE QUICK-RELEASE AXLE or REMOVING THE PLAY FROM THE REAR WHEELS in this procedure of the manual.



**FIGURE 1 - REMOVING/INSTALLING REAR WHEELS  
 ADJUSTING QUICK-RELEASE AXLE (FIGURE 2)**

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

**REMOVING/INSTALLING REAR WHEELS (FIGURE 1)**

*NOTE: Each wheelchair frame has been designed for a specific size rear wheel. Invacare does not recommend changing rear wheel size.*

1. Push in the tip of the quick-release axle (with wheel) and pull the axle out through the opening in the center of the rear wheel.
2. Push in the tip of the quick-release axle again and pull the axle out of the existing rear wheel.
3. Repeat STEPS 1-2 for the opposite rear wheel.
4. To reinstall the existing or install the new rear wheel onto the wheelchair, reverse STEPS 1-3.

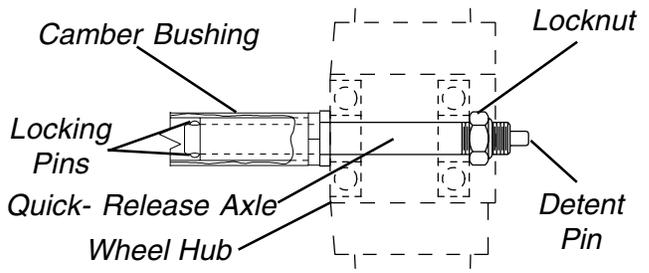
1. Remove rear wheel and quick-release axle from the wheelchair.
2. Depress detent pin in the quick-release axle and slide axle through the wheel hub.
3. Release detent pin ensuring that the locking pins are fully released.
4. Increase or decrease end play by adjusting the locknut on the end of the quick-release axle.

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

Keep locking pins clean.

5. Reinstall rear wheel onto the wheelchair.

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



*NOTE: End of Quick-Release axle is shown for reference only. It is not visible when inserted into cambar bar.*

**FIGURE 2 - ADJUSTING QUICK-RELEASE AXLE**

### INSTALLING QUAD-RELEASE AXLE (FIGURE 3)

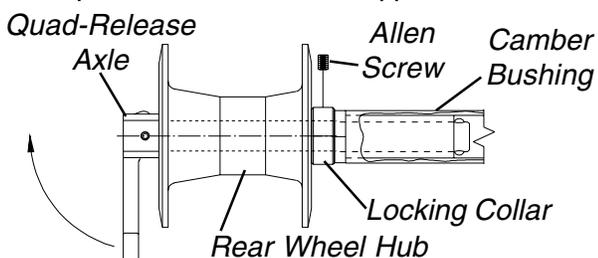
1. Remove rear wheel and existing quick-release axle from wheelchair.
2. Remove EXISTING quick-release axle from rear wheel hub.
3. Insert NEW quad-release axle through rear wheel hub.
4. Slide locking collar onto quad-release axle until it is snug against rear wheel and tighten securely with allen screw.
5. Reinstall rear wheel and the quad-release axle onto the wheelchair.

#### WARNING

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

Keep locking pins clean.

6. Flip handle of quad-release axle down to release detent pin ensuring that locking pins are fully released.
7. If detent pin does not fully release, proceed to ADJUSTING THE QUAD-RELEASE HANDLE IN AND/OR OUT.
8. Repeat STEPS 1-7 for the opposite rear wheel.



NOTE: End of Quad-Release axle is shown for reference only. It is not visible when inserted into camber bar.

FIGURE 3 - INSTALLING QUAD-RELEASE AXLE

### ADJUSTING THE QUAD-RELEASE HANDLE IN AND/OR OUT (FIGURE 4)

1. Remove rear wheel and the quad-release axle from the wheelchair.
2. Loosen the locking screw.
3. Make the following adjustments:

If the quad-release handle is **not releasing** the **locking pins completely**, **rotate** the **quad-release handle** approximately **one-quarter (1/4) turn CLOCKWISE.**

If the quad-release handle **hits the spokes** of the rear wheel when assembled, **rotate** the **quad-release handle** approximately **one-quarter (1/4) turn COUNTERCLOCKWISE.**

4. Tighten the locking screw.
5. Reinstall the rear wheel and quad-release axle onto the wheelchair.

#### WARNING

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

Keep locking pins clean.

6. Flip the handle of the quad-release axle down to release the detent pin ensuring that the locking pins are fully released.
7. Repeat the above procedures until the quad-release axle locks correctly.

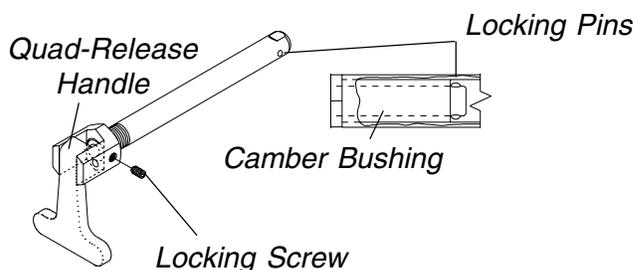


FIGURE 4 - ADJUSTING QUAD- RELEASE HANDLE IN/ AND OR OUT

### REMOVING THE PLAY FROM THE REAR WHEELS (FIGURE 5)

NOTE: The adjusting nut on the quick-release axles originally performed this function.

1. With the rear wheel and quad-release axle still mounted onto the wheelchair, **tighten** the **length adjusting screw** until there is **no in and out movement** of the **quad-release axle** and **rear wheel.**

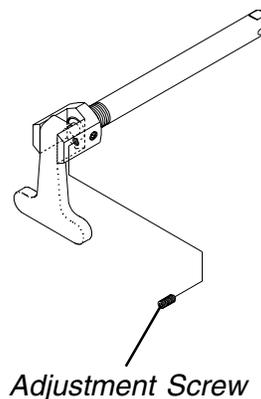


FIGURE 5 - REMOVING THE PLAY FROM THE REAR WHEELS

**HANDRIM REPLACEMENT (FIGURE 6)**

1. Remove rear wheel from the wheelchair.

**WARNING**  
Tire **MUST** be deflated before any disassembly procedures are performed.

2. Remove all air from the tire by pressing down on the pin in the center of the valve stem.
3. While carefully holding the tire, bar and rim strip to one side, hold the phillips screws and remove the locknuts that secure the handrim to the rear wheel.
4. Remove the existing handrim.
5. Install the new handrim by reversing the above procedures.

**WARNING**  
**DO NOT** inflate tire until it is completely assembled.

6. Inflate tire to correct psi rating on the sidewall of tire.

**WARNING**  
Make sure detent pin is fully released **BEFORE** operating the wheelchair.

7. Reinstall rear wheel to the wheelchair.
8. Repeat the procedure for the opposite rear wheel if necessary.

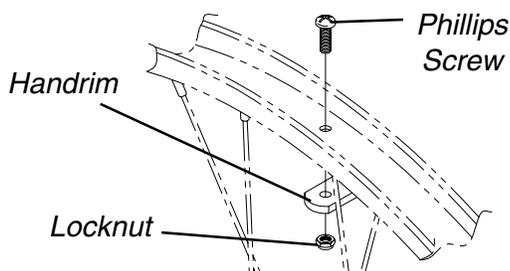


FIGURE 6 - HANDRIM REPLACEMENT

**REPAIRING/REPLACING REAR WHEEL TIRE/TUBE**

**WARNING**  
Replacement of a pneumatic tire or tube **MUST** be performed by a qualified technician.

**WHEEL LOCK ADJUSTMENT/REPLACEMENT (FIGURE 7)**

*NOTE: INVACARE recommends UNDER mount wheels locks when engaging in any contact sport.*

*NOTE: Before adjusting or replacing the High/Under mount wheel locks, ensure that the tires are inflated to the recommended psi on the sidewall of the tire.*

1. Loosen the hex screw(s) that secure the High/Under mount wheel locks to the seat frame.
2. Perform one (1) of the following:
  - A. REPLACING THE HIGH/UNDER MOUNT WHEEL LOCK:**
    1. Remove the hex screws and remove the existing wheel lock from the wheelchair.
    2. Install the NEW wheel lock.
  - B. ADJUSTING THE HIGH/UNDER MOUNT WHEEL LOCK:**
    1. Proceed to STEP 3.
3. Adjust position of wheel lock until the 3/16-inch engagement with the tire is obtained.

*NOTE: Any wheel lock adjustment should embed the wheel lock shoe at least 3/16-inch into the pneumatic tire when engaged.*

**WARNING**  
**A-6S AND F-6S WHEELCHAIRS ONLY** - Wheel locks **MUST** be checked for engagement with the wheelchair occupied **AND** unoccupied. Otherwise, injury or damage may occur.

4. Engage the wheel locks and push against the wheelchair and determine if wheel locks engage the rear wheels enough to hold the wheelchair.
5. Repeat the STEPS 3-4 until the wheel locks hold the wheelchair.

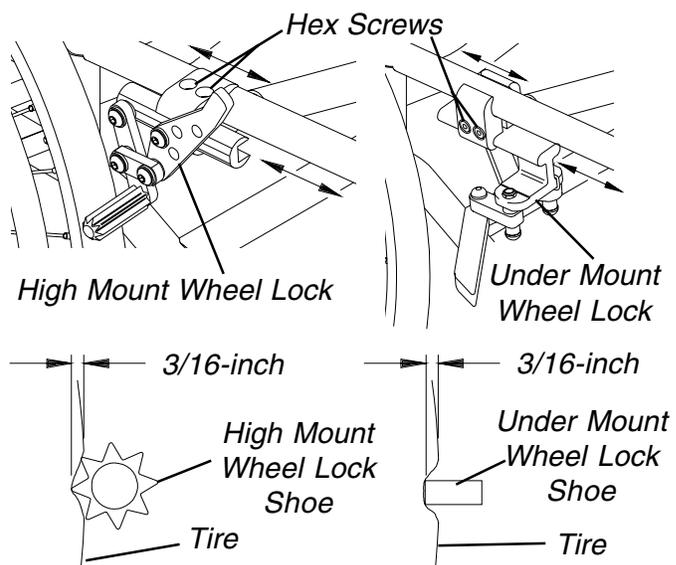


FIGURE 7 - WHEEL LOCK ADJUSTMENT/REPLACEMENT

**WHEELS**

**REPLACING/ADJUSTING CASTERS (FIGURE 8)**

*NOTE: Both casters should be the same size.*

1. REPLACING CASTERS ONLY - If replacing the EXISTING caster with the same size NEW caster, note the mounting position of the EXISTING caster.
2. Remove the bolt and locknut that secure the caster and axle spacers to the fork.
3. Perform one (1) of the following:
  - A. **REPLACING CASTERS -**
    1. Remove existing caster and axle spacers from fork.
    2. Install the new caster, bolt, locknut and axle spacers onto the fork and securely tighten.
  - B. **ADJUSTING CASTER POSITION -**
    1. Install the caster, bolt, locknut and axle spacers onto the fork in the mounting position determined in ADJUSTING FRONT SEAT-TO-FLOOR HEIGHT in this procedure of the manual. Tighten securely
4. Repeat STEPS 1-2 for the opposite caster if necessary.

*NOTE: If replacing casters with a different size than what was originally on the wheelchair, the caster height MUST be adjusted to keep the wheelchair frame parallel to the floor. Refer to ADJUSTING CASTER HEIGHT in this section of the manual.*

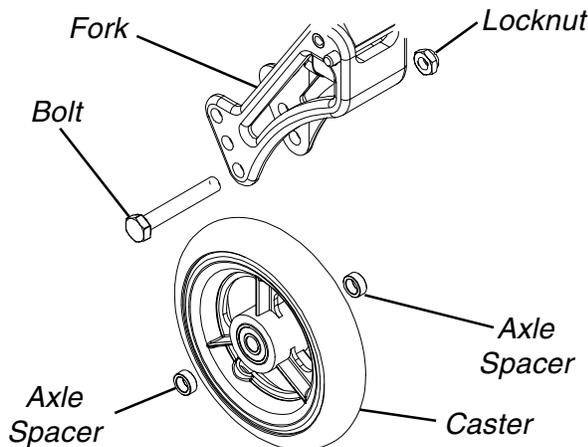


FIGURE 8 - REPLACING CASTERS

**REPLACING FORKS (FIGURE 9)**

1. Remove front casters from wheelchair. Refer to REPLACING CASTERS in this section of the manual.
2. Remove the headtube cap.
3. Remove the locknut and washer(s).

*NOTE: There may be up to four (4) washers on the fork stem above and/or below the headtube. Note the number and position of these washers for reinstallation.*

4. Drop the fork out of the caster headtube.
5. Slide the new fork into the caster headtube.

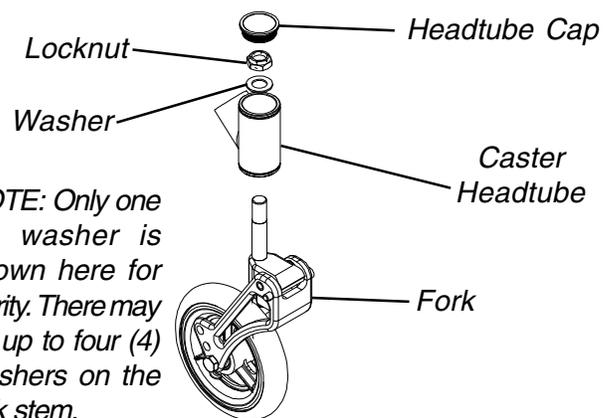
*NOTE: Check bearing assemblies and replace if necessary.*

6. Ensure that fork slides completely into caster headtube.
7. Install washer(s) and secure with locknut.

**WARNING**

**Improper positioning of the washer will prohibit the free movement of the fork.**

8. Reinstall existing/install new front casters onto the wheelchair. Refer to REPLACING CASTERS in this section of the manual.
9. To properly tighten caster journal system and guard against flutter, perform the following check:
  - A. Tip front of wheelchair off floor.
  - B. Pivot 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. Test wheelchair for maneuverability.



*NOTE: Only one (1) washer is shown here for clarity. There may be up to four (4) washers on the fork stem.*

FIGURE 9 - REPLACING FRONT FORKS

### ADJUSTING CASTER HEIGHT (FIGURE 10)

1. Place the wheelchair on a flat surface.
2. Remove the headtube cap on the fork.
3. Remove the locknut that secures the fork to the wheelchair frame.
4. Perform one (1) of the following:
  - A. **INSTALLING SPACERS** - Perform the following:
    1. Remove spacer from fork stem.
    2. Remove fork stem from caster headtube.
    3. Install the spacer onto the fork stem.
    4. Install the fork stem through the headtube.
    5. Loosely secure the fork stem with the locknut.
  - B. **REMOVING SPACERS** - Perform the following:
    1. Remove fork stem from caster headtube.
    2. Remove the spacer from the fork stem.
    3. Install the fork stem through the headtube.
    4. Install the spacer onto the fork stem.
    5. Loosely secure the fork stem with the locknut.
  - C. **NO SPACER ADJUSTMENT NECESSARY** - Proceed to STEP 5.
5. Position a large right triangle or "L" square on the flat surface and against the caster headtube that is welded to the wheelchair frame.
6. Adjust the height of the casters by either adding or removing washers on top of the fork stem until the wheelchair frame is parallel with the floor.
7. Reinstall the locknut and head tube cap onto the wheelchair.
8. Repeat this procedure for the opposite front caster.

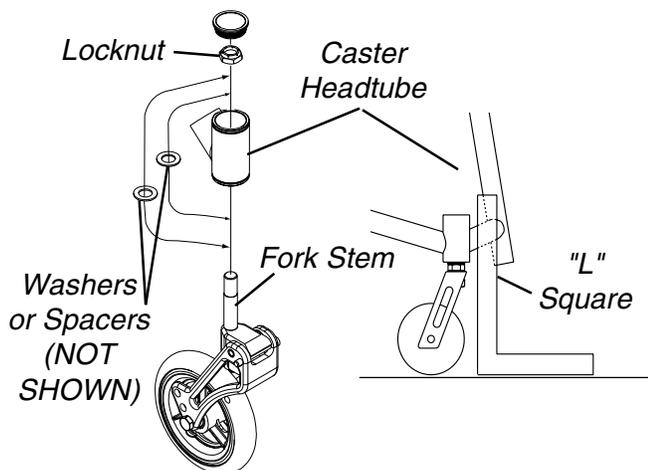


FIGURE 10 - ADJUSTING CASTER HEIGHT

### INSTALLING QUICK-RELEASE CASTERS (FIGURE 11)

**WARNING**

Pull on quick-release casters each time BEFORE using the wheelchair to make sure they are securely locked onto the wheelchair frame.

There are several configurations of the quick release caster. If caster fork stem DOES NOT look like the drawing in FIGURE 11 when installed, DO NOT USE. Contact Customer Service, 1-(800)-333-6900.

**A Note About Quick-release Casters**

Quick-release casters are an option that allow for quick and easy removal of the casters from the wheelchair so the wheelchair can be stored and transported conveniently. When using the quick-release caster option, a spring loaded caster head tube cap will be used instead of a stem nut to secure the front caster to the chair frame. Unlike the stem nut, the caster head tube cap is not adjustable and thus caster flutter will be more evident with the quick-release caster option than it would be with the standard caster attaching hardware.

1. Remove the bolt and locknut that secure the front caster and the two (2) spacers to the fork.
  2. Remove the dust cover on the top of the headtube.
  3. While holding the fork and using a socket wrench, remove the locknut that secures the fork, and spacer in the headtube of the wheelchair.
- NOTE: The dust cover and locknut are not used with the quick release casters. Keep them for future use.*
4. Remove the existing fork and install the quick release caster fork through the headtube of the wheelchair making sure the fork stem is approximately 1/4-inch above the caster headtube.

**WARNING**

Make sure the detent pin of the quick-release caster headtube cap is fully released BEFORE operating the wheelchair.

5. Depress the detent pin of the quick-release caster headtube cap and install over the top of the quick-release caster fork stem.
6. Release the detent pin of the quick-release caster headtube cap and pull on the fork to make sure the fork is securely attached to the wheelchair.
7. Reinstall the two (2) spacers and caster onto the quick-release caster fork.
8. Repeat this procedure for the opposite side.

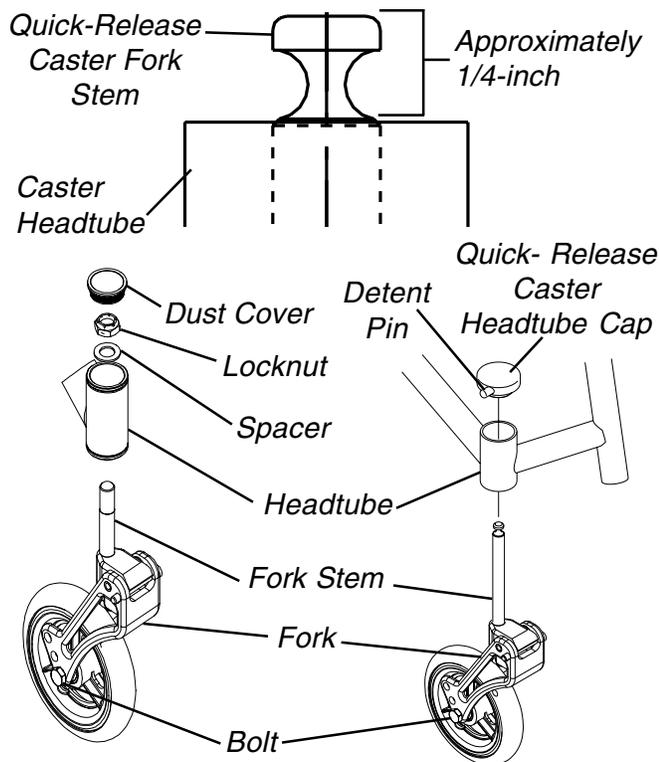


FIGURE 11 - INSTALLING QUICK-RELEASE CASTERS

### ADJUSTING FRONT SEAT-TO-FLOOR HEIGHT

**WARNING**

The position of the footrest, seat angle, back angle, seating system/upholstery, caster size and position, rear wheel size and position, anti-tippers, as well as the user condition directly relate to the stability of the wheelchair. Any change to one (1) or any combination of the ten (10) may cause the wheelchair to decrease in stability. EXTREME care MUST be taken when changing the stability of the wheelchair. Refer to the chart in STABILITY in PROCEDURE 1 of this manual.

*NOTE: Each wheelchair frame has been designed for a specific size rear wheel. Invacare does not recommend changing rear wheel size.*

**WARNING**

Forks for quick release casters are available in different sizes to accommodate spacers. If the wheelchair is equipped with quick release casters, DO NOT adjust front seat-to-floor height without changing forks.

#### Determining Frame Size (FIGURE 12)

1. To determine frame size, measure from the bottom of the caster headtube to the top of the seat rail at the edge of the seat upholstery.

2. Refer to the chart to determine the frame size.

LENGTH (INCHES)	FRAME SIZE
9.86	17
10.86	18
11.86	19
12.86	20
13.86	21

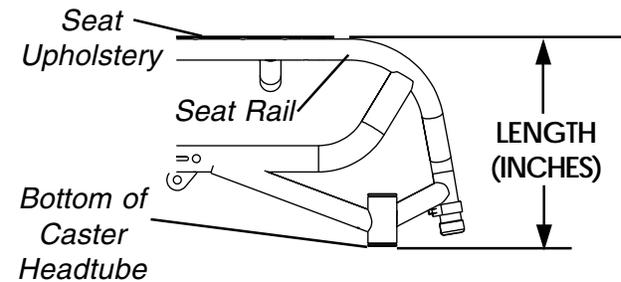


FIGURE 12 - DETERMINING FRAME SIZE

#### Front Seat-to-floor Height Adjustment

*NOTE: Refer to STABILITY in PROCEDURE 1 for warnings concerning wheelchair stability.*

Seat-to-floor height is determined by measuring from the top of the seat rail to the ground/floor.

The different seat-to-floor heights are possible by using different combinations of caster size, caster position, and axle tube position.

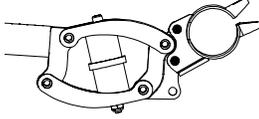
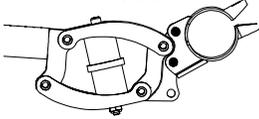
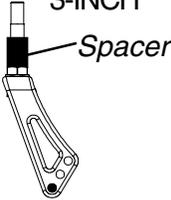
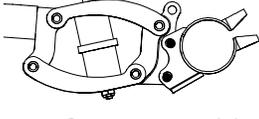
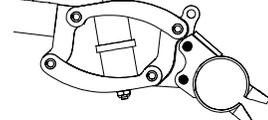
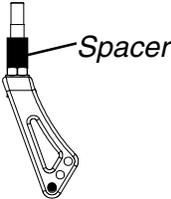
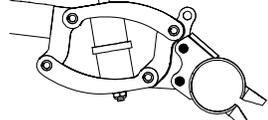
1. Refer to the charts on the following pages to determine available front seat-to-floor heights for each wheelchair frame size.
2. Determine the changes needed to the casters, axle tube and anti-tippers by reading across the chart for the seat-to-floor height determined in STEP 1.
3. After determining the caster size, refer to REPLACING CASTERS in this procedure of the manual to replace the casters or adjust the caster position.
4. After replacing or adjusting the caster size/position, refer to ADJUSTING CASTER HEIGHT in this procedure of the manual to add/remove fork spacers and add/remove washers to ensure caster headtubes are perpendicular to the ground.
5. After adjusting the caster height, refer to REPOSITIONING THE AXLE TUBE in PROCEDURE 4 of the manual to adjust the axle tube position.
6. Anti-tipper height (if applicable) must be adjusted to maintain 1-1/2 to 2-inch clearance between the bottom of the anti-tipper wheels and the floor. Refer to ADJUSTING ANTI-TIPPER HEIGHT in PROCEDURE 7 of this manual.
7. Ensure wheellocks engage properly. Refer to WHEEL LOCK ADJUSTMENT/REPLACEMENT in this procedure of the manual.

# 17-INCH FRAME FRONT SEAT-TO-FLOOR HEIGHT

*NOTE: The seat-to-floor heights are based on pneumatic tires and pneumatic tires with flat free inserts. If wheelchair is equipped with urethane tires, subtract 1/2-inch from the measurements listed below. All heights are approximate to ±1/4-inch due to tire wear and air pressure.*

*\* NOTE: Anti-tippers are available in two (2) sizes - "A" and "B". Note the size shown in the chart below.*

**WHEELS**

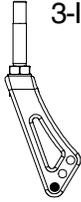
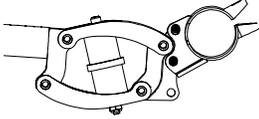
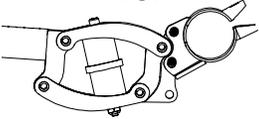
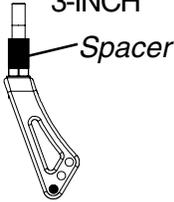
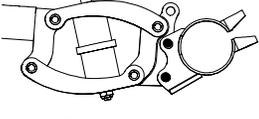
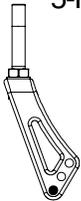
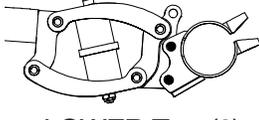
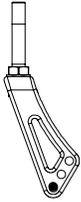
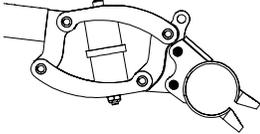
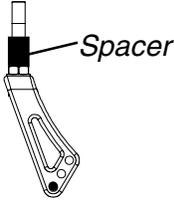
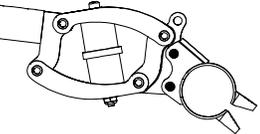
FRONT SEAT-TO-FLOOR HEIGHT	CASTER SIZE AND POSITION	AXLE TUBE POSITION	REAR WHEEL SIZE		
			ANTI-TIPPER SIZE* AND POSITION		
16-INCHES	 3-INCH	TOP  UPPER Two (2) Mounting Holes	22	24	26
			A	B	N/A
16-INCHES	 5-INCH	TOP  UPPER Two (2) Mounting Holes	22	24	26
			A	B	N/A
17-INCHES	 3-INCH <i>Spacer</i>	MIDDLE  LOWER Two (2) Mounting Holes	22	24	26
			A	B	N/A
17-INCHES	 5-INCH	MIDDLE  LOWER Two (2) Mounting Holes	22	24	26
			A	B	N/A
17.5-INCHES	 6-INCH <i>Spacer</i>	BOTTOM  LOWER Two (2) Mounting Holes INVERTED CAMBER CLAMPS	22	24	26
			A	B	N/A
18-INCHES	 5-INCH <i>Spacer</i>	BOTTOM  LOWER Two (2) Mounting Holes INVERTED CAMBER CLAMPS	22	24	26
			A	B	N/A

# 18-INCH FRAME FRONT SEAT-TO-FLOOR HEIGHT

NOTE: The seat-to-floor heights are based on pneumatic tires and pneumatic tires with flat free inserts. If wheelchair is equipped with urethane tires, subtract 1/2-inch from the measurements listed below. All heights are approximate to  $\pm 1/4$ -inch due to tire wear and air pressure.

\* NOTE: Anti-tippers are available in two (2) sizes - "A" and "B". Note the size shown in the chart below.

WHEELS

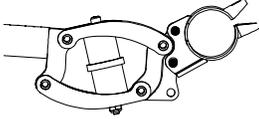
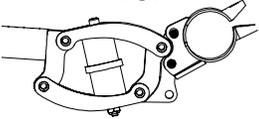
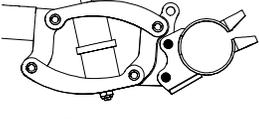
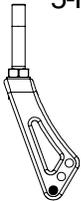
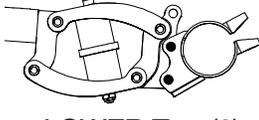
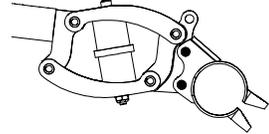
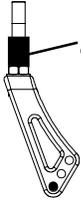
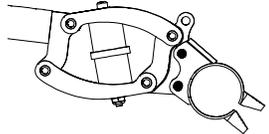
FRONT SEAT-TO-FLOOR HEIGHT	CASTER SIZE AND POSITION	AXLE TUBE POSITION	REAR WHEEL SIZE		
			ANTI-TIPPER SIZE* AND POSITION		
17-INCHES	 3-INCH	TOP  UPPER Two (2) Mounting Holes	22	24	26
			A	B	B
17-INCHES	 5-INCH	TOP  UPPER Two (2) Mounting Holes	22	24	26
			A	B	B
18-INCHES	 3-INCH <i>Spacer</i>	MIDDLE  LOWER Two (2) Mounting Holes	22	24	26
			A	B	B
18-INCHES	 5-INCH	MIDDLE  LOWER Two (2) Mounting Holes	22	24	26
			A	B	B
18.5-INCHES	 6-INCH	BOTTOM  LOWER Two (2) Mounting Holes INVERTED CAMBER CLAMPS	22	24	26
			A	B	B
19-INCHES	 5-INCH <i>Spacer</i>	BOTTOM  LOWER Two (2) Mounting Holes INVERTED CAMBER CLAMPS	22	24	26
			A	B	B

# 19-INCH FRAME FRONT SEAT-TO-FLOOR HEIGHT

*NOTE: The seat-to-floor heights are based on pneumatic tires and pneumatic tires with flat free inserts. If wheelchair is equipped with urethane tires, subtract 1/2-inch from the measurements listed below. All heights are approximate to ±1/4-inch due to tire wear and air pressure.*

*\* NOTE: Anti-tippers are available in two (2) sizes - "A" and "B". Note the size shown in the chart below.*

**WHEELS**

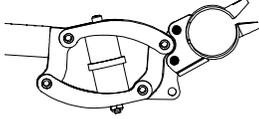
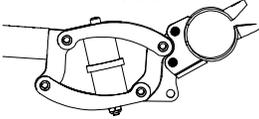
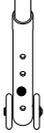
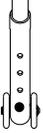
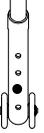
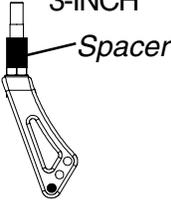
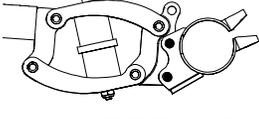
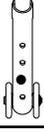
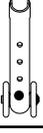
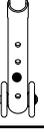
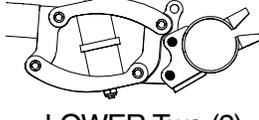
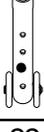
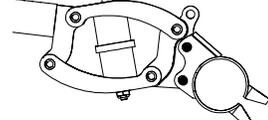
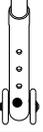
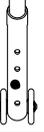
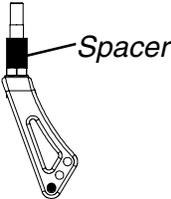
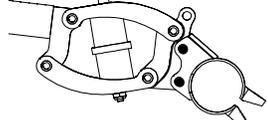
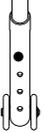
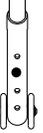
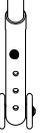
FRONT SEAT-TO-FLOOR HEIGHT	CASTER SIZE AND POSITION	AXLE TUBE POSITION	REAR WHEEL SIZE		
			ANTI-TIPPER SIZE* AND POSITION		
18-INCHES	 3-INCH	TOP  UPPER Two (2) Mounting Holes	22	24	26
			A	B	B
18-INCHES	 5-INCH	TOP  UPPER Two (2) Mounting Holes	22	24	26
			A	B	B
19-INCHES	 3-INCH <i>Spacer</i>	MIDDLE  LOWER Two (2) Mounting Holes	22	24	26
			A	B	B
19-INCHES	 5-INCH	MIDDLE  LOWER Two (2) Mounting Holes	22	24	26
			A	B	B
19.5-INCHES	 6-INCH	BOTTOM  LOWER Two (2) Mounting Holes INVERTED CAMBER CLAMPS	22	24	26
			A	B	B
20-INCHES	 5-INCH <i>Spacer</i>	BOTTOM  LOWER Two (2) Mounting Holes INVERTED CAMBER CLAMPS	22	24	26
			A	B	B

# 20-INCH FRAME FRONT SEAT-TO-FLOOR HEIGHT

NOTE: The seat-to-floor heights are based on pneumatic tires and pneumatic tires with flat free inserts. If wheelchair is equipped with urethane tires, subtract 1/2-inch from the measurements listed below. All heights are approximate to  $\pm 1/4$ -inch due to tire wear and air pressure.

\* NOTE: Anti-tippers are available in two (2) sizes - "A" and "B". Note the size shown in the chart below.

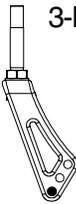
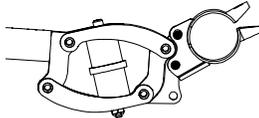
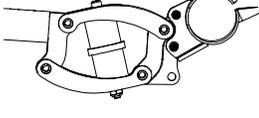
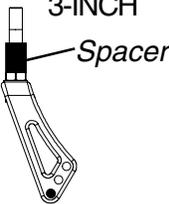
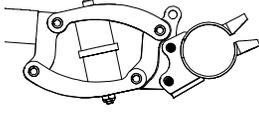
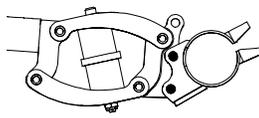
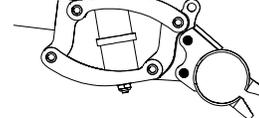
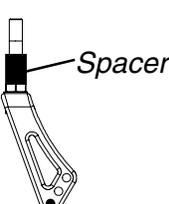
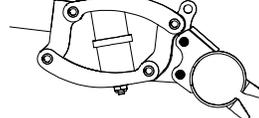
WHEELS

FRONT SEAT-TO-FLOOR HEIGHT	CASTER SIZE AND POSITION	AXLE TUBE POSITION	REAR WHEEL SIZE		
			ANTI-TIPPER SIZE* AND POSITION		
19-INCHES	 3-INCH	TOP  UPPER Two (2) Mounting Holes	22	24	26
			A 	B 	B 
19-INCHES	 5-INCH	TOP  UPPER Two (2) Mounting Holes	22	24	26
			A 	B 	B 
20-INCHES	 3-INCH <i>Spacer</i>	MIDDLE  LOWER Two (2) Mounting Holes	22	24	26
			A 	B 	B 
20-INCHES	 5-INCH	MIDDLE  LOWER Two (2) Mounting Holes	22	24	26
			A 	B 	B 
20.5-INCHES	 6-INCH	BOTTOM  LOWER Two (2) Mounting Holes INVERTED CAMBER CLAMPS	22	24	26
			A 	B 	B 
21-INCHES	 5-INCH <i>Spacer</i>	BOTTOM  LOWER Two (2) Mounting Holes INVERTED CAMBER CLAMPS	22	24	26
			A 	B 	B 

## 21-INCH FRAME FRONT SEAT-TO-FLOOR HEIGHT

*NOTE: The seat-to-floor heights are based on pneumatic tires and pneumatic tires with flat free inserts. If wheelchair is equipped with urethane tires, subtract 1/2-inch from the measurements listed below. All heights are approximate to ±1/4-inch due to tire wear and air pressure.*

*\* NOTE: Anti-tippers are available in two (2) sizes - "A" and "B". Note the size shown in the chart below.*

FRONT SEAT-TO-FLOOR HEIGHT	CASTER SIZE AND POSITION	AXLE TUBE POSITION	REAR WHEEL SIZE		
			ANTI-TIPPER SIZE* AND POSITION		
20-INCHES	 3-INCH	 UPPER Two (2) Mounting Holes	22	24	26
			N/A	B	B
20-INCHES	 5-INCH	 UPPER Two (2) Mounting Holes	22	24	26
			N/A	B	B
21-INCHES	 3-INCH <i>Spacer</i>	 LOWER Two (2) Mounting Holes	22	24	26
			N/A	B	B
21-INCHES	 5-INCH	 LOWER Two (2) Mounting Holes	22	24	26
			N/A	B	B
21.5-INCHES	 6-INCH	 LOWER Two (2) Mounting Holes INVERTED CAMBER CLAMPS	22	24	26
			N/A	B	B
22-INCHES	 5-INCH <i>Spacer</i>	 LOWER Two (2) Mounting Holes INVERTED CAMBER CLAMPS	22	24	26
			N/A	B	B

WHEELS

*This Procedure includes the following:*  
**Footrest Replacement/Adjustment**

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

**FOOTREST REPLACEMENT/  
 ADJUSTMENT (FIGURE 1)**

**WARNING**  
 The position of the footrest, seat angle, back angle, seating system/upholstery, caster size and position, rear wheel size and position, anti-tippers, as well as the user condition directly relate to the stability of the wheelchair. Any change to one (1) or any combination of the ten (10) may cause the wheelchair to decrease in stability. EXTREME care MUST be taken when changing the stability of the wheelchair.  
 The footrest assembly MUST be at least 1-3/4-inches above the ground/floor to avoid hitting protruding objects when using this wheelchair.

**Replacing the Footrest**

1. Loosen, but do not remove the two (2) allen screws that secure the footrest to the wheelchair frame.
2. Slide the existing footrest tubes out of the wheelchair frame and install new footrest by reversing this step.
3. Position the NEW footrest to a determined height.
4. Tighten the two (2) allen screws that secure the footrest to the wheelchair frame.
5. Adjust the footplate to the desired position. Refer to FOOTPLATE ANGLE ADJUSTMENT and/or FOOTPLATE DEPTH ADJUSTMENT in this section of the manual.

**Footplate Angle Adjustment**

1. Loosen, but do not remove the four (4) locknuts that secure the footplate to the two (2) footrest tubes.
2. Position the footplate to the necessary angle to accommodate the user.
3. Retighten the four (4) locknuts.

**Footplate Depth Adjustment**

1. Note the height of the footrest and the angle of the footplate for reinstallation.
2. Loosen, but do not remove the two (2) allen screws securing the footrest tubes to the wheelchair frame.
3. Remove the two (2) footrest tubes from the wheelchair frame.
4. Loosen, but do not remove the four (4) locknuts that secure the footplate to the footrest tubes.
5. Remove the footrest tubes from the footrest.
6. Insert the footrest tubes into one (1) of two (2) depth mounting positions to accommodate the user.
7. Adjust the angle of the footrest plate to the position noted in STEP 1.
8. Tighten the four (4) locknuts that secure the footplate to the footrest tubes.
9. Insert the footrest tubes into the wheelchair frame.
10. Adjust the footrest tubes to the height noted in STEP 1.
11. Tighten the two (2) allen screws to secure the footrest tubes to the wheelchair frame.

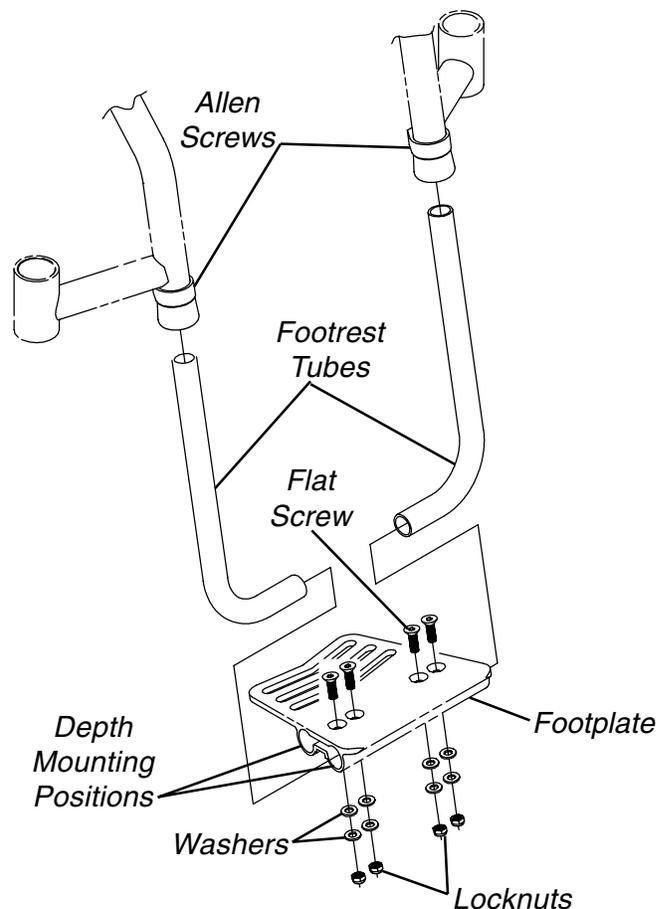


FIGURE 1 - FOOTREST REPLACEMENT/ADJUSTMENT

*This Procedure includes the following:*  
**Anti-tipper Adjustment/Replacement**

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

**ANTI-TIPPER ADJUSTMENT/REPLACEMENT (FIGURE 1)**

**WARNING**  
 Anti-tippers are specific to the rear wheel size and/or seat-to-floor heights. Refer to the charts in this procedure and in ADJUSTING FRONT SEAT-TO-FLOOR HEIGHT in PROCEDURE 5 of this manual for correct usage and adjustment. If these requirements CANNOT be achieved, DO NOT use the wheelchair. Contact a qualified technician. Any changes to the seat-to-floor height may require a different anti-tipper adjustment.  
 Anti-tippers MUST BE attached at all times. Inasmuch as 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-tippers MUST be fully engaged. Ensure the the release button of the anti-tipper fully protrudes out of the hole in the anti-tipper socket.  
 Ensure both anti-tippers are adjusted to the same height.

*NOTE: To ensure the correct model anti-tipper is used refer to FIGURE 1. Measurements for anti-tippers are approximate and are taken using the TOP adjustment hole ont he anti-tipper (DETAIL "A").*

**Anti-tipper Adjustment**

*NOTE: If the camber or mounting position of the axle tube is changed, the anti-tippers MUST be readjusted to maintain a 1-1/2 to 2-inch clearance between the bottom of the anti-tipper wheels and the ground/floor.*

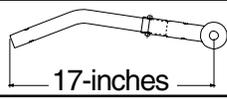
1. Press in the release button that secures the anti-tipper wheels to the anti-tipper bar.
2. Adjust the height of the anti-tipper wheels to between 1-1/2 and 2-inches of the ground/floor. Refer to the charts in ADJUSTING FRONT SEAT-TO-FLOOR HEIGHT in PROCEDURE 5 of the manual to determine the proper adjustment hole.
3. Repeat STEPS 1-2 for the opposite anti-tipper.

**Anti-tipper Replacement**

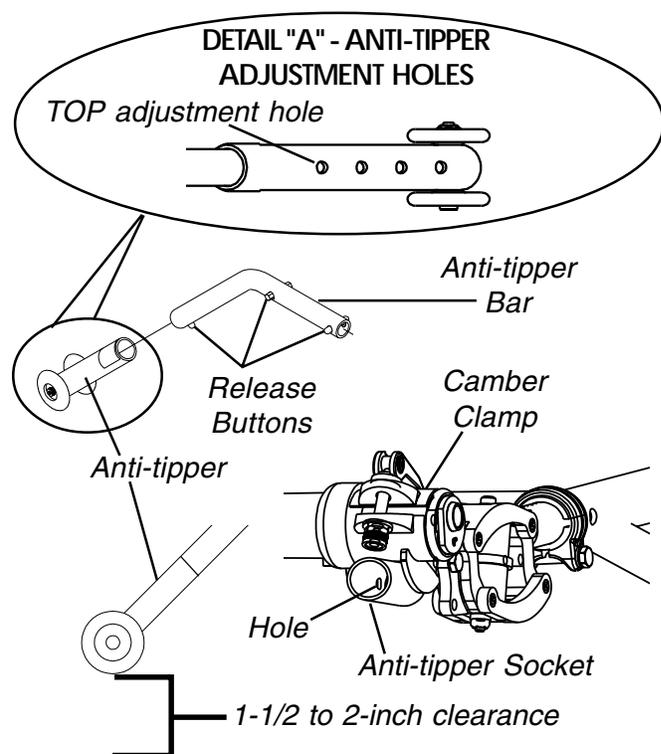
1. Press in the release button that secures the existing anti-tipper to the anti-tipper socket and remove the anti-tipper from the anti-tipper socket.
2. Insert the new anti-tipper into the anti-tipper socket until release button engages.
3. Press in the release button on the anti-tipper bar and install the anti-tipper wheels onto the new anti-tipper bar.
4. Repeat STEPS 1-3 for the opposite anti-tipper.
5. Measure the distance between the bottom of the anti-tipper wheels and the ground floor.

*NOTE: A 1-1/2 to 2-inch clearance between the bottom of the anti-tipper wheels and the ground/floor must be maintained.*

6. If necessary, adjust the height of the anti-tippers. Refer to ANTI-TIPPER ADJUSTMENT in this section of the manual.

SIZE*	REAR WHEEL	PART NUMBER	MEASUREMENT
A	22-inch	1093991	 17-inches
B	24-inch 26-inch	1100916	 19.5-inches

\*Size refers to the charts in ADJUSTING FRONT SEAT-TO-FLOOR HEIGHT in PROCEDURE 5 of the manual.



**FIGURE 1 - ANTI-TIPPER ADJUSTMENT/REPLACEMENT**

<p><b>This Procedure includes the following:</b></p> <p><b>Installing the T-Arm Sockets</b></p> <p><b>Installing/Removing the T-Arms</b></p> <p><b>Adjusting the T-Arms</b></p> <p><b>Adjusting the T-Arm Transfer Assists and/or Side Guards</b></p> <p><b>Replacing the T-Arm Locking Lever</b></p> <p><b>Installing the Half Arm Socket</b></p> <p><b>Adjusting Half Arm Height</b></p>
--

**WARNING**

NEVER try to lift or tip the wheelchair by T- or half arms, serious injury can occur.

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

*NOTE: If desired, locking pins can be installed to secure the T-arm brackets to the wheelchair frame, as shown in FIGURE 1.*

- Repeat STEPS 2-5 for the opposite side of the wheelchair.
- Install the T-arms into the T-arm sockets. Refer to INSTALLING/REMOVING THE T-ARMS in this section of the manual.

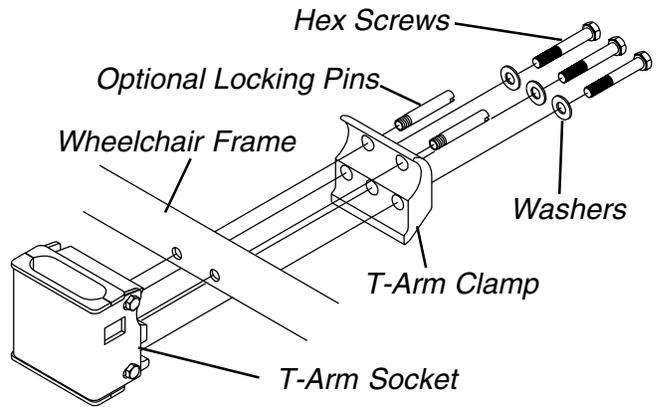


FIGURE 1 - INSTALLING THE T-ARM SOCKETS

**INSTALLING THE T-ARM SOCKETS (FIGURE 1)**

- Remove the rear wheels from the wheelchair. Refer to REMOVING/INSTALLING REAR WHEELS in PROCEDURE 5 of this manual.
- Position the T-arm socket and T-arm clamp on the wheelchair frame as shown in FIGURE 1.

*NOTE: The T-arm socket must be positioned on the outside of the wheelchair frame.*

- Install the hex screws and washers through the T-arm clamp and T-arm socket and loosely tighten.
- Tighten the hex screws and washers that secure the T-arm mounting socket to the wheelchair frame in the following sequence:
  - Middle hex screw and washer.
  - The two (2) outside hex screws and washers.
- Continue to repeat STEP 4 until the hex bolts are torqued to 156-inch pounds.

*NOTE: Make sure the hex bolts are torqued to 156-inch pounds, otherwise the T-arm sockets will be capable of rotating around the wheelchair frame.*

**INSTALLING/REMOVING THE T-ARMS (FIGURE 2)**

**Installing**

- Position the T-arm over the T-arm socket on the wheelchair frame.

*NOTE: Make sure the locking lever is towards the front of the wheelchair.*

- Slide the T-arm into the T-arm socket until the locking lever is in the slot in the T-arm socket and an audible "click" is heard.
- Pull up on the T-arm to make sure the T-arm is locked in place.

*NOTE: If the T-arm does not slide in the T-arm socket as desired, adjust the T-arm socket. Refer to ADJUSTING THE T-ARMS in this section of the manual.*

- Adjust the T-arm for desired height, width and depth, if necessary. Refer to ADJUSTING THE T-ARMS in this section of the manual.
- Repeat STEPS 1-4 for the opposite side of the wheelchair.

**Removing**

1. Press in on the locking lever and lift the T-arm straight up and out of the T-arm socket.

*NOTE: If the T-arm does not slide up and down in the T-arm socket as desired, adjust the T-arm socket. Refer to ADJUSTING THE T-ARMS in this section of the manual.*

2. Repeat STEP 2 for the opposite side of the wheelchair.

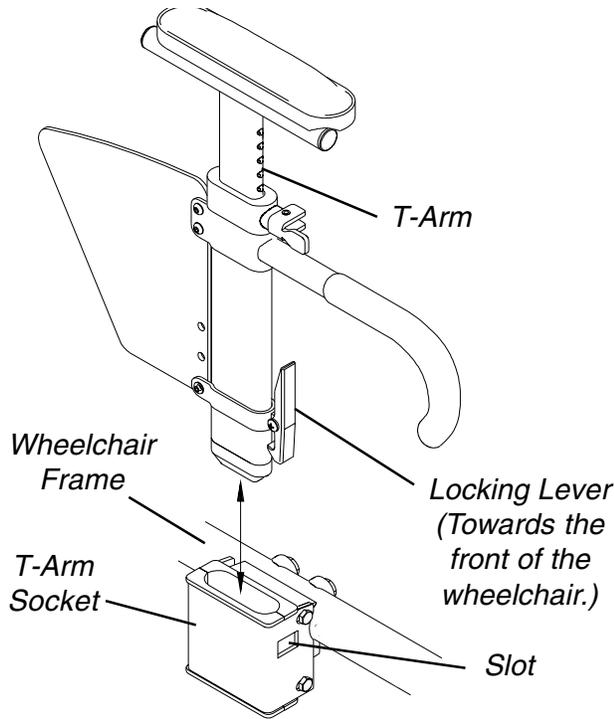


FIGURE 2 - INSTALLING/REMOVING THE T-ARMS

**ADJUSTING THE T-ARMS**

**Adjusting T-Arm Height (FIGURE 3)**

1. Unlock the T-arm by flipping the T-arm release lever towards the inside of the wheelchair.

*NOTE: If necessary, Pull out on the T-arm release lever and rotate 180° so it can be flipped towards the outside of the wheelchair.*

2. Slide the T-arm to one (1) of:
  - A. **Low Height T-Arms** - Nine (9) positions.
  - B. **High Height T-Arms** - Seven (7) positions.

*NOTE: If the inside T-arm post does not slide up and down in the outside T-arm post as desired, perform one (1) of the following:*

- A. **Tighten** - Tightening the set screws on the outside T-arm post **will make it harder** to move the inside T-arm post up and down.
  - B. **Loosen** - Loosening the set screws on the outside T-arm post **will make it easier** to move the inside T-arm post up and down.
3. Lock the T-arm by flipping the T-arm release lever towards the front of the wheelchair.

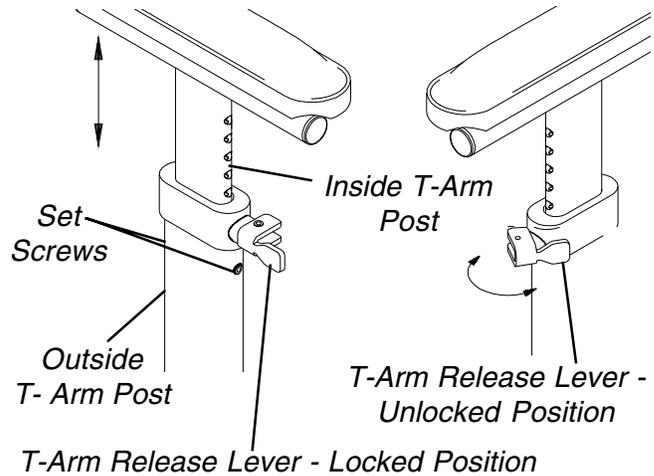


FIGURE 3 - ADJUSTING T-ARM HEIGHT

**Adjusting T-Arm Width (FIGURE 4)**

1. Remove the two (2) phillips screws that secure the arm pad to the arm tube.
2. Turn the arm pad around and reposition the arm pad on the arm tube.
3. Re-secure the arm pad to the arm tube with the two (2) phillips screws.
4. Repeat for the opposite side, if necessary.

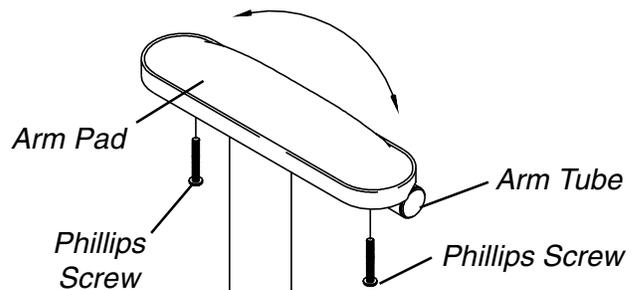


FIGURE 4 - ADJUSTING THE T-ARM WIDTH

**Adjusting T-Arm Depth (FIGURE 5)**

1. Remove the two (2) phillips screws that secure the arm pad to the arm tube.
2. Remove the two (2) socket screws that secure the arm tube to the T-arm post.
3. Reposition the arm tube on the T-arm post:
  - A. **Desk Length Arms** - to one (1) of three (3) positions depending on the desired arm pad depth.
  - B. **Full Length Arms** - to one (1) of five (5) positions depending on the desired arm pad depth.

*NOTE: Additional positions are obtainable by turning the arm tube 180°.*

4. Re-secure the arm tube to the T-arm post with the two (2) socket screws.
5. Reattach the arm pad to the arm tube with the two (2) phillips screws.
6. Repeat for the opposite side, if necessary.

4. Loosen, but do not remove the four (4) hex screws and washers that secure the T-arm socket together.

*NOTE: The T-arm socket will disassemble if the four (4) hex screws and washers are removed.*

5. Slide the T-arm into the T-arm socket until the lock lever is in the slot in the T-arm socket and an audible "click" is heard.
6. Squeeze the T-arm socket together until the socket is flush with the T-arm.
7. While holding the T-arm socket together, tighten the four (4) hex screws and washers securely.
8. Press in on the locking lever and lift the T-arm straight up and out of the T-arm socket.
9. Repeat STEPS 5-7, if necessary until the T-arm slides in the T-arm socket as desired.
10. Reinstall the T-arm socket onto the wheelchair. Refer to INSTALLING THE T-ARM SOCKETS in this section of the manual.

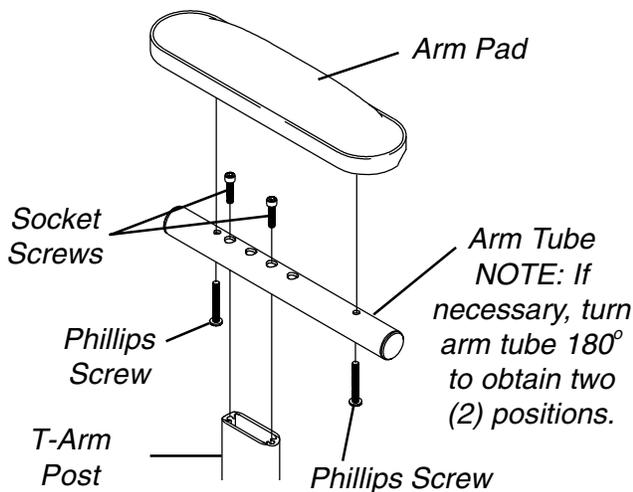


FIGURE 5 - ADJUSTING THE T-ARM DEPTH

**Adjusting T-Arm Sockets (FIGURE 6)**

1. Remove the rear wheels from the wheelchair. Refer to REMOVING/INSTALLING REAR WHEELS in of this manual.
2. Remove the three (3) hex screws and washers that secure the T-arm socket and T-arm clamp to the wheelchair frame and remove the T-arm socket from the wheelchair.
3. If equipped with optional locking pins, remove the locking pins that secure the T-arm socket to the wheelchair frame.

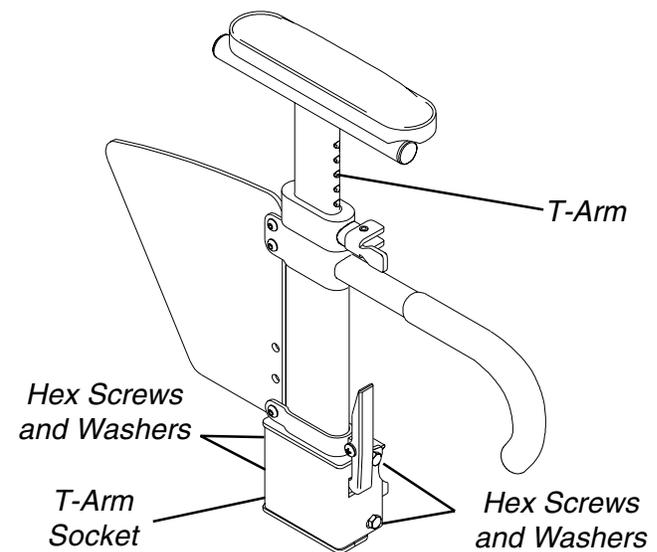
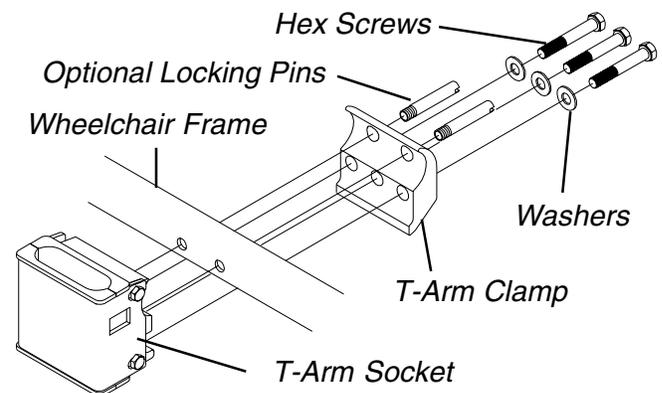


FIGURE 6 - ADJUSTING T-ARM SOCKETS

## ADJUSTING THE T-ARM TRANSFER ASSISTS AND/OR SIDE GUARDS (FIGURE 7)

1. Remove the T-arm from the wheelchair. Refer to INSTALLING/REMOVING THE T-ARMS in this section of the manual.
2. Remove the bottom socket screw that secures the side guard to the bottom clamp.
3. Move the bottom clamp to one (1) of three (3) mounting holes in the side guard.

*NOTE: The middle mounting hole is the standard mounting position for rigid wheelchairs.*

*NOTE: The bottom mounting hole is the standard mounting position for folding wheelchairs.*

*NOTE: The top mounting hole is an optional mounting position for folding or rigid wheelchairs.*

4. Re-secure the side guard to the bottom clamp with the socket screw.
5. Install the T-arm onto the wheelchair. Refer to INSTALLING/REMOVING THE T-ARMS in this section of the

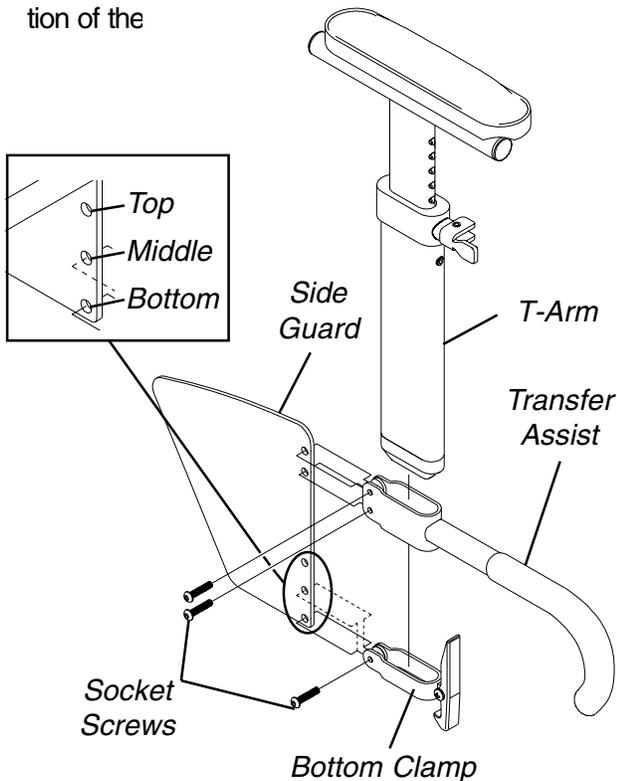


FIGURE 7 - ADJUSTING THE T-ARM TRANSFER ASSISTS AND/OR SIDE GUARDS

## REPLACING THE T-ARM LOCKING LEVER (FIGURE 8)

1. Remove the T-arm from the wheelchair. Refer to INSTALLING/REMOVING THE T-ARMS in this section of the manual.
2. Remove the phillips bolt and locknut that secure the existing locking lever to the bottom bracket.

### CAUTION

The locking lever is spring loaded. Place your free hand over the locking lever to prevent the parts from springing off of the bottom bracket.

3. Remove the existing locking lever and spring from the bottom bracket.

*NOTE: Inspect the spring and replace if necessary.*

4. Position the spring on the bottom bracket as shown in FIGURE 8.
5. Position the new locking lever onto the spring and the bottom bracket.

*NOTE: Make sure the two (2) extended ends of the spring are inside the notch in the locking lever.*

6. Line up the mounting holes in the new locking lever, spring and bottom bracket.

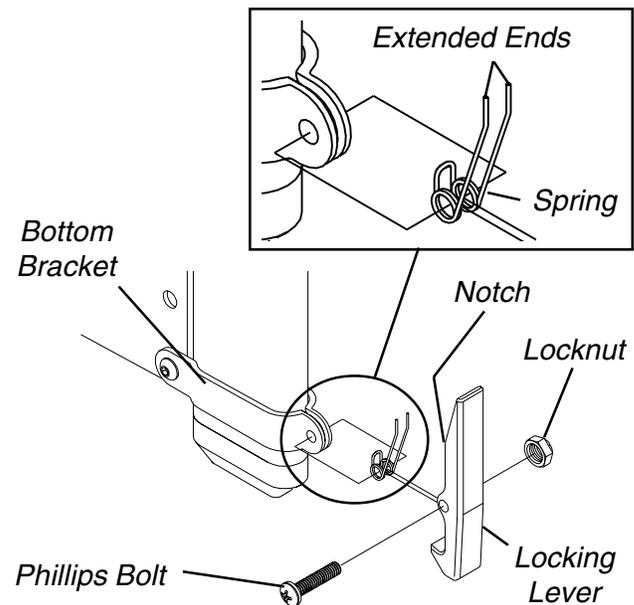


FIGURE 8 - REPLACING THE T-ARM LOCKING LEVER

**WARNING**

**DO NOT** over tighten the locknut that secures the locking lever to the bottom bracket. Over tightening this locknut will prevent the locking lever from operating properly, possibly causing injury.

7. Install the phillips bolt and tighten securely with the locknut.
8. Install the T-arm onto the wheelchair. Refer to INSTALLING/REMOVING THE T-ARMS in this section of the manual.

**INSTALLING THE HALF ARM SOCKET (FIGURE 9)**

1. Remove the two (2) locknuts and washers securing the back angle bracket to the back cane.
2. Position the half arm socket onto the two (2) hex screws.
3. Install one (1) washer onto each hex screw.
4. Secure the half arm socket to the back cane with the locknut. Tighten securely.
5. Repeat STEPS 1-4 for the opposite arm socket.

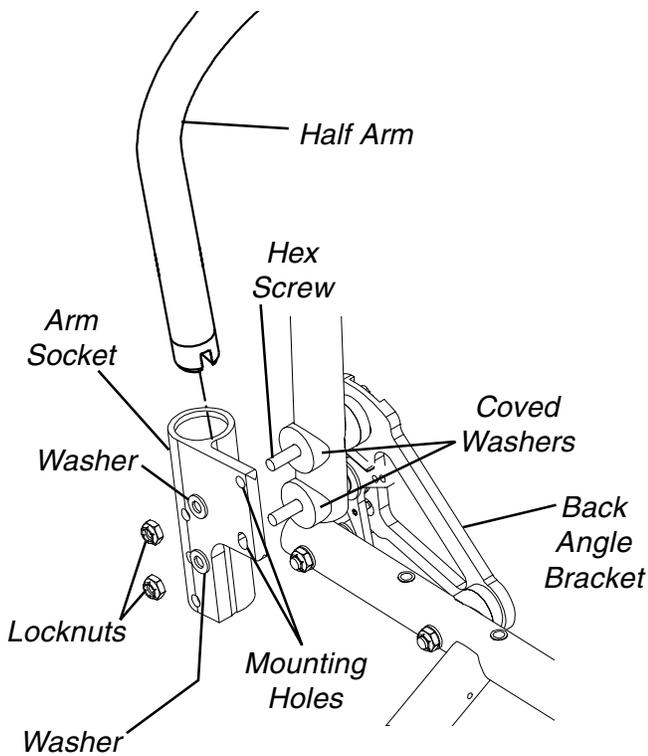


FIGURE 9 - INSTALLING THE HALF ARM SOCKET

**ADJUSTING HALF ARM HEIGHT (FIGURE 10)**

1. Remove the half arm from the arm socket.
2. Remove the hex screw, two (2) washers and locknut mounted in the arm socket that determine the half arm height.
3. Reposition hex screw and one (1) washer to one (1) of three (3) positions depending on the desired height.
4. Retighten the hex screw and washer to the arm socket with the remaining washer and locknut.
5. Reinstall the half arm into the arm socket.
6. Repeat STEPS 1-5 for the opposite side, if necessary.

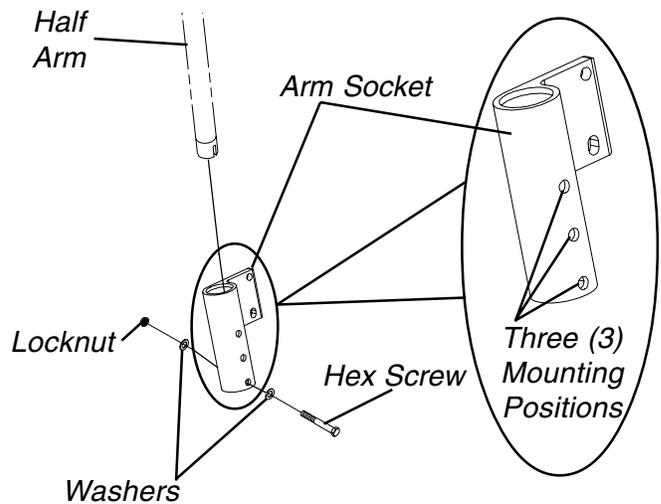


FIGURE 10 - ADJUSTING HALF ARM HEIGHT

**This Procedure includes the following:**  
**Elastomers and Suspension**  
**Replacing Rear Elastomers**  
**Replacing Front Elastomers**

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

NOTE: The following procedures are for the A-6S and F-6S ONLY.

**ELASTOMERS AND SUSPENSION**

**CAUTION**  
 Weather conditions may affect elastomers. Invacare recommends that elastomers be replaced once a year, otherwise the performance of the wheelchair may be affected.

NOTE: The performance of the wheelchair will be affected if elastomers ARE NOT the same on BOTH SIDES of the wheelchair.

NOTE: If elastomers squeak, lubricate the ends of the elastomers and the shaft of the mounting bolt that secures the elastomers to the suspension tube with a silicone based lubricant.

**REPLACING REAR ELASTOMERS (FIGURE 1)**

1. Refer to the following chart to determine the elastomers required for the user's weight.

NOTE: Periodically review the following chart to make sure the rear suspension still corresponds to user's weight.

USER'S WEIGHT (IN LBS.)	ELASTOMERS REQUIRED (PER SIDE)	
	UPPER	LOWER
Less Than 100	BLUE	BLUE
101 - 140	BLUE	BLACK
141 - 180	BLACK	BLACK
181 - 220	BLACK	PURPLE
221 - 250	PURPLE	PURPLE

NOTE: The performance of the wheelchair will be affected if elastomers DO NOT correspond to user's weight.

2. Remove the mounting bolt and locknut that secure the nylon washers, UPPER and LOWER elastomers and recessed spacer to the suspension arms.
3. Reinstall the nylon washers, UPPER and LOWER elastomers determined in STEP 1 and recessed spacer into the suspension tube with the mounting bolt. Refer to FIGURE 1 for hardware orientation.

4. Install the locknut onto the mounting bolt.  
 NOTE: It may be necessary to compress the rear suspension system to install the locknut onto the mounting bolt.
5. Tighten the locknut until three (3) threads can be seen on the end of mounting bolt.
6. Ensure wheel locks engage properly. Refer to WHEEL LOCK ADJUSTMENT/REPLACEMENT in PROCEDURE 5 of the manual.

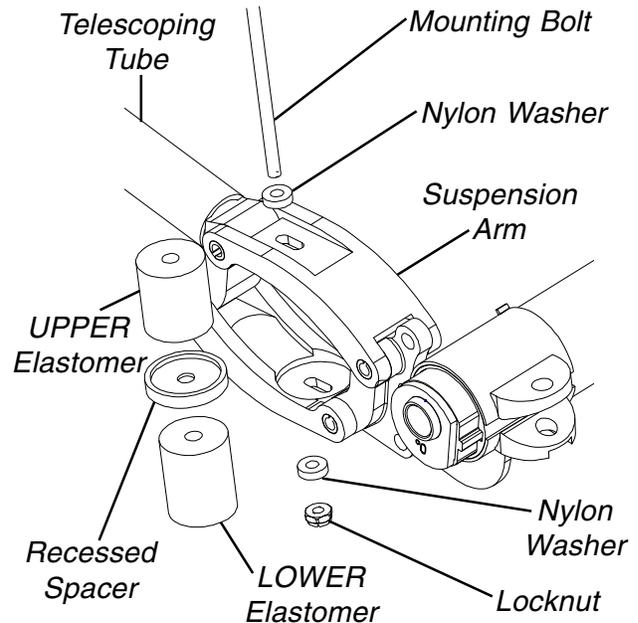


FIGURE 1 - REPLACING REAR ELASTOMERS

**REPLACING FRONT ELASTOMERS (FIGURE 2)**

**WARNING**  
 Ensure the detent ball protrudes past the fork BEFORE use. Otherwise, injury or damage may occur.

1. Remove the bolt and locknut securing the fork to the fork stem.
2. Remove the EXISTING elastomer from the fork.
3. Position one end of the NEW elastomer into the fork stem recess and the other end into the fork recess (DETAIL "A").

NOTE: Ensure the ends of the elastomer sit flush in the fork and fork stem recesses.

4. Hold and squeeze the fork and fork stem together (DETAIL "B").
5. Insert the bolt through the mounting holes in the fork to secure the elastomer to the fork.

NOTE: The bolt should be inserted from the OUTSIDE of the wheelchair, so the locknut will be on the INSIDE of the wheelchair.

6. Install the locknut onto the bolt and securely tighten.

NOTE: Caster not shown for clarity.

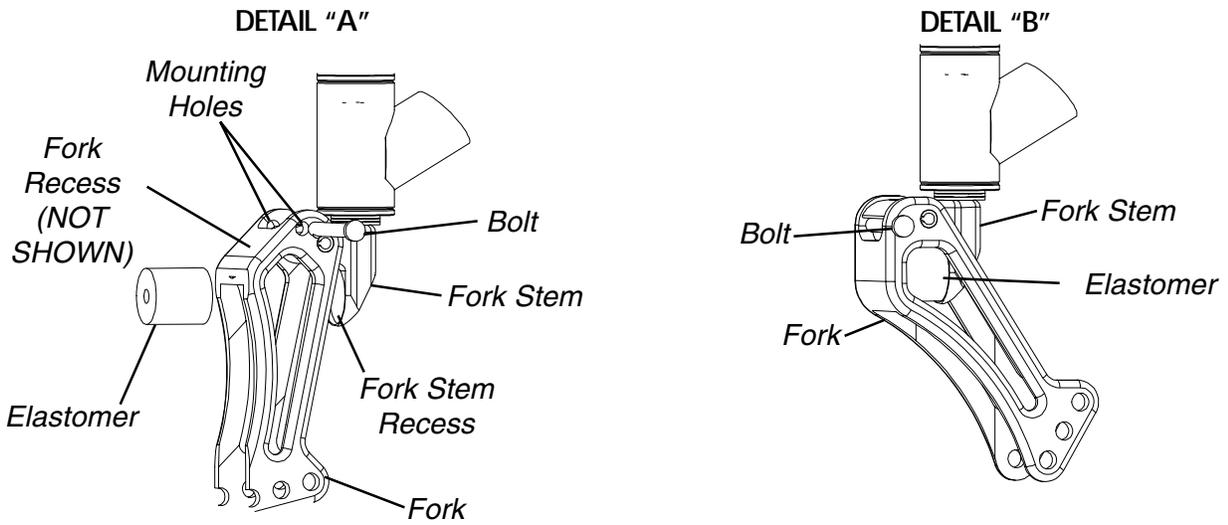


FIGURE 2 - REPLACING FRONT ELASTOMERS

**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/user of our products.

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

Invacare warrants the frame to be free from defects in materials and workmanship for a lifetime from date of purchase; all remaining components for one (1) year from date of purchase except upholstered materials, padded materials and tires/wheels. If within such warranty period 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 on the back cover, provide dealer's name, address, 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 PROBLEMS ARISING FROM NORMAL WEAR OR FAILURE TO ADHERE TO THESE INSTRUCTIONS.**

**THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESS WARRANTIES. IMPLIED WARRANTIES, IF ANY, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, SHALL NOT EXTEND BEYOND THE DURATION OF THE EXPRESSED WARRANTY PROVIDED HEREIN AND THE REMEDY FOR VIOLATIONS OF ANY IMPLIED WARRANTY SHALL BE LIMITED TO REPAIR OR REPLACEMENT OF THE DEFECTIVE PRODUCT PURSUANT TO THE TERMS CONTAINED HEREIN. INVACARE SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES WHATSOEVER. THIS WARRANTY SHALL BE EXTENDED TO COMPLY WITH STATE/PROVINCIAL LAWS AND REQUIREMENTS.**



**Yes, you can.™**

**Invacare Corporation**

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

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

**Technical Support**  
800-832-4707

Invacare and "Yes, you can" are trademarks of Invacare Corporation.

©2000 Invacare Corporation

Form No. 99-194 Part No. 1092293 Rev A (1) 6/2000