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.
WARNING

DO NOT OPERATE THIS EQUIPMENT WITHOUT FIRST READING AND UNDERSTANDING THIS MANUAL. IF YOU ARE UNABLE TO UNDERSTAND THE WARNINGS AND INSTRUCTIONS, CONTACT AN INVACARE DEALER OR INVACARE TECHNICAL SUPPORT BEFORE ATTEMPTING TO USE THIS EQUIPMENT - OTHERWISE INJURY OR DAMAGE MAY RESULT.

SAVE THESE INSTRUCTIONS
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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 Action 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 health care professional capable of making such a selection.

WHEELCHAIR TIE-DOWN RESTRAINTS AND SEAT RESTRAINTS

Invacare recommends that Action 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 Action 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 BELTS - IT IS THE OBLIGATION OF THE DME DEALER, THERAPISTS AND OTHER HEALTH CARE PROFESSIONALS TO DETERMINE IF A SEATING RESTRAINT 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.
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.

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.

The position of the footrest, camber bar and rear seat height, as well as the tautness of the back upholstery are directly related to the wheelchair’s stability. Any change to one (1) or any combination of the four (4) may cause the wheelchair to decrease in stability. Use EXTREME caution when using a new seating position.

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.

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. Turn both casters toward 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 unauthorized 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 restraint. Inasmuch as the SEAT RESTRAINT is an option on this wheelchair (You may order with or without the seat restraint), Invacare strongly recommends ordering the seat restraint as an additional safeguard for the wheelchair user.
SAFETY SUMMARY

TIRE PRESSURE
DO NOT use your wheelchair unless it has the proper tire pressure (p.s.i.). DO NOT overinflated 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 an authorized Invacare Dealer or Qualified Technician.

WEIGHT TRAINING
Invacare DOES NOT recommend the use of its Action wheelchairs as a weight training apparatus. Action 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 Action A4 wheelchair has 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. 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 restraint. Inasmuch as the SEAT RESTRAINT is an option on this wheelchair (You may order with or without the seat restraint), Invacare strongly recommends ordering the seat restraint 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 restraint 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.

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.

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 this procedure to tackle curbs, short stairs, etc.

METHOD 1 - WHEELCHAIR WITH STEP TUBES

Apply a continuous downward motion until the balance point is achieved and the front casters clear the curb. At this point, the assistant will feel a difference in the weight distribution.
Roll the wheelchair forward and slowly lower the 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. Push the wheelchair forward until the rear wheels roll up and over the curb.

**METHOD 1 - WHEELCHAIR WITH STEP TUBES**

**METHOD 2 - WHEELCHAIRS WITHOUT STEP TUBES**

Unless the first assistant has exceptional upper body strength, it is recommended that **METHOD 2** use two (2) assistants. The second assistant should be positioned at the front of the wheelchair lifting upward on a non-removable (non-detachable) part of the wheelchair frame when lifting the wheelchair and stabilizing the wheelchair when the wheelchair is being lowered to the ground.

The first assistant should stand on the sidewalk and turn the wheelchair so that the rear wheels are against the curb. The wheelchair should be tilted back to the balance point and, in one continuous downward 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.

**STAIRWAYS**

**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.

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

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

1. 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.

2. The second assistant, with a firm hold on a non-detachable part of the framework, lifts the wheelchair and over the stair and steadies the wheelchair as the first assistant places one (1) foot on the next stair and repeats **STEP 1**.

3. The wheelchair should not be lowered until the last stair has been negotiated and the wheelchair has been rolled away from the stairway.

**METHOD 2 - WHEELCHAIR WITHOUT STEP TUBES**

DO NOT use an escalator to move a wheelchair between floors. Serious bodily injury may occur.
TRANSFERRING TO AND FROM OTHER SEATS

WARNING
BEFORE attempting to transfer in or out of the wheelchair, every precaution should be taken to reduce the gap distance. Turn both casters toward 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 pointing toward 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.

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.

Example 46% 54% 103 lbs. 130 lbs.

UNOCCUPIED OCCUPIED

LENGTHENING SHORTENING

WARNING
The position of the footrest, camber bar and rear seat height, as well as the tautness of the back upholstery are directly related to the wheelchair stability. Any change to one (1) or any combination of the four (4) may cause the wheelchair to decrease in stability. Use EXTREME caution when using a new seating position.

Many activities require the wheelchair owner to reach, bend and transfer in and out of the wheelchair. These movements will cause a change to the normal balance, the center of gravity, and the weight distribution of the wheelchair. To determine and establish your particular safety limits, practice bending, reaching and transferring activities in several combinations in the presence of a qualified health professional BEFORE attempting active use of the wheelchair.

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

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.
FUNCTIONAL REACH FROM A WHEELCHAIR

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

REACHING, LEANING, BENDING and BENDING - FORWARD

Position the front casters so that they are extended as far forward as possible and engage wheel locks. **DO NOT LEAN FORWARD BEYOND NORMAL RANGE OF MOTION AS THE WHEELCHAIR MAY BECOME LESS STABLE.**

REACHING, BENDING - 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.
FEATURES

- Rigid Aluminum Frame
- 22, 24, 26-inch, 559 or 700C Rear Wheels w/Hard Anodized Handrims
- Adjustable Footplate
- Quick/Quad-Release Axles
- 3 or 5-inch Casters
- Camber Bar
- Folding Back
- Adjustable Upholstery
- 2, 3-inch Seat Cushion
- Rigid Side Guards
- High or Under Mount Wheel Locks
- Anti-Tippers (Option)
- Impact Guards (Option)
- Quick Release Push Handles (Option)
- Spoke Protectors (Option)
- Calf Strap
**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>INVACARE A4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frame Type</strong></td>
</tr>
<tr>
<td><strong>Seat Width:</strong></td>
</tr>
<tr>
<td><strong>Camber Width:</strong></td>
</tr>
<tr>
<td><strong>Add the inches listed in the chart to the wheelchair width to obtain the overall width of the wheelchair at the widest point.</strong></td>
</tr>
<tr>
<td><strong>Seat Depth:</strong></td>
</tr>
<tr>
<td><strong>Seat-to-Floor (approx.):</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Camber (in Degrees)</th>
<th>0</th>
<th>3</th>
<th>6</th>
<th>9</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rear Wheel Type:</strong></td>
<td><strong>Spoke</strong></td>
<td>6-3/4</td>
<td>8</td>
<td>10</td>
<td>12-1/4</td>
</tr>
<tr>
<td><strong>Composite</strong></td>
<td>7</td>
<td>8-1/4</td>
<td>10-1/4</td>
<td>12-1/2</td>
<td>14-1/2</td>
</tr>
</tbody>
</table>

**ADJUSTABLE REAR FRAME**

<table>
<thead>
<tr>
<th>REAR SEAT-TO-FLOOR RANGE</th>
<th>REAR WHEEL SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>14-19-inch</td>
<td>22-inch</td>
</tr>
<tr>
<td>15-20-inch</td>
<td>24-inch</td>
</tr>
<tr>
<td>16-21-inch</td>
<td>26-inch</td>
</tr>
</tbody>
</table>

**FIXED REAR FRAME**

<table>
<thead>
<tr>
<th>REAR SEAT-TO-FLOOR RANGE</th>
<th>REAR WHEEL SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>14-21-inch</td>
<td>22-inch</td>
</tr>
<tr>
<td>15-21-inch</td>
<td>24-inch</td>
</tr>
<tr>
<td>16-21-inch</td>
<td>26-inch</td>
</tr>
</tbody>
</table>

*Fixed rear seat-to-floor is determined at time of purchase and can only be adjusted with rear wheel size.*

**Back Style:** Fold Down or Fixed
**Back Height:** 8 to 20-inches - Adjustable (8-11, 10-14, 12-16, 14-18 or 16-20-inch ranges)
**Footrest:** 5-inch Adjustable Height, Adjustable Angle
**Side - Wheel Clearance:** 1/2 to 2-1/2-inches (1-inch Standard)
**Rear Axle:** Quick-Release, Quad-Release
**Rear Wheel Camber:** 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°
**Rear Wheels:** 22, 24-inch - Composite or Spoke (24-inch Spoke Standard) 26-inch, 559mm or 700C - Spoke Only
**Handrims:** Aluminum Welded Tab (Standard), Plastic Coated, Projections
**Wheel Locks:** High Mount (Standard), Low Mount
**Caster Size:** 3-inch Rollerblade, 5-inch Urethane, 6-inch ("V" Front Only) - Urethane, Semi-Pneumatic, Pneumatic w/Flat Free
**Seat Cushion:** 2 or 3-inch
**Back Upholstery:** U240 Black (Standard), Adjustable Tension
**Arms (Optional):** Half, "T"
**Weight:** 22 lbs.
**Shipping Weight (approx.)*:** 34 lbs.

*15 x 15-inch Seat Frame with complete package.*
UNPACKING

1. Check for any obvious damage to the carton or its contents. If damage is evident, notify your Dealer/Carrier.

2. Remove all loose packing from the carton.

3. Carefully remove all components from the carton.

NOTE: Unless the Invacare A4 is to be assembled immediately, retain cartons and packing materials for use in storing the wheelchair until assembly is required.

INSPECTION

1. Examine exterior of the Invacare A4 for nicks, dents, scratches or other damages. Inspect all components. If damage is evident, notify your Dealer/Carrier.

STORAGE

1. Store the packaged/repackaged Invacare A4 in a dry area.

2. DO NOT place other objects on top of the packaged/repackaged wheelchair.
SAFETY INSPECTION CHECKLIST

NOTE: Twice a year take your wheelchair to a qualified dealer 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.

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

<table>
<thead>
<tr>
<th>ITEM</th>
<th>INITIALLY</th>
<th>INSPECT/ADJUST WEEKLY</th>
<th>INSPECT/ADJUST MONTHLY</th>
<th>INSPECT/ADJUST PERIODICALLY</th>
</tr>
</thead>
</table>
| GENERAL - (TROUBLESHOOTING)  
Wheelchair rolls straight (no excessive drag or pull to one side). | X | | | X |
| WHEEL LOCKS - PROCEDURE 3  
Do not interfere with tires when rolling. 
Pivot points free of wear and looseness.  
Wheel locks easy to engage. | X | X | | X |
| SEAT AND BACK UPHOLSTERY - PROCEDURE 1  
Inspect for rips or sagging.  
Inspect fastening flaps to ensure they securely latch. | X | | X | X |
| REAR WHEELS - PROCEDURE 3  
Quick/Quad-release axles lock properly.  
No excessive side movement or binding when lifted and spun. | X | X | | |
| HANDRIMS - PROCEDURE 3  
Inspect for signs of rough edges or peeling. | X | | | X |
| SPOKES  
Inspect for bent or broken spokes.  
All spokes uniformly tight. | X | X | | |
| FRONT CASTERS - PROCEDURE 3  
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.  
CAUTION: As with any vehicle, the wheels and tires should be checked periodically for cracks and wear, and should be replaced when necessary. | X | X | X | X |
| TIRES - PROCEDURE 3  
Inspect for flat spots and wear.  
If pneumatic tires check for proper inflation.  
CAUTION: As with any vehicle, the wheels and tires should be checked periodically for cracks and wear, and should be replaced when necessary. | X | X | | |
| CAMBER BAR - PROCEDURE 2  
Camber bar is securely tightened.  
Camber inserts are not extended more than 3-inches. | X | X | | X |
| CLEANING  
Clean Optional Quick Release Levers (axle tubes).  
Clean upholstery and armrests. | X | X | | X |
TROUBLESHOOTING

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

MAINTENANCE

MAINTENANCE SAFETY PRECAUTIONS

**WARNING**
After making adjustments, always make sure that parts are properly tightened BEFORE using the wheelchair.

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

**SUGGESTED MAINTENANCE PROCEDURES**

1. Before using your Invacare A4, 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 AXLE in PROCEDURE 3 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.
5. Recommended tire pressure is listed on the side wall of the tire.
6. The wheels and tires should be checked periodically for cracks and wear, and should be replaced when necessary by a qualified technician or authorized dealer.
7. Regularly check for loose spokes in the rear wheels. If loose, have them adjusted by a qualified technician or authorized dealer.
8. Periodically check handrims to ensure they are secured to the rear wheels. Refer to HANDRIM REPLACEMENT in PROCEDURE 3 of this manual.
9. Periodically adjust wheel locks in correlation to tire wear. Refer to ADJUSTING WHEEL LOCKS in PROCEDURE 3 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.
This Procedure Includes the following:

- Folding/Unfolding Back
- Adjusting/Replacing the Back Upholstery
- Adjustable Back Upholstery
- Seat Upholstery Replacement

**WARNING**
After adjustments and before use make sure all attaching hardware is securely tightened.

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

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

1. Lift up on the back and pull 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 forward towards the front of the wheelchair.

**FIGURE 1 - FOLDING/UNFOLDING BACK**

**ADJUSTING/REPLACING THE BACK UPHOLSTERY (FIGURE 2)**

**WARNING**
The position of the footrest, camber bar and rear seat height, as well as the tautness of the back upholstery are directly related to the wheelchair's stability. Any change to one (1) or any combination of the four (4) may cause the wheelchair to decrease in stability. Use EXTREME caution when using a new seating position.

**Adjusting**
1. Unfold the top of the back upholstery.
2. Adjust the back upholstery to the desired height.
3. Resecure the top of the back upholstery.

**Replacing**
1. Un latch the two (2) fastening flaps that secure the bottom of the existing back upholstery to the back canes.
2. Un latch the top of the existing back upholstery.
3. Lift up on the existing back upholstery and remove from the wheelchair.
4. Install the new back upholstery onto the wheelchair.
5. Securely latch the fastening flaps on the bottom of the new back upholstery to the back canes.
6. Adjust the NEW back upholstery to the desired height. Refer to ADJUSTING THE BACK UPHOLSTERY in this section of the manual.

**FIGURE 2 - ADJUSTING/REPLACING THE BACK UPHOLSTERY**

**ADJUSTABLE BACK UPHOLSTERY**

**THE ADJUSTABLE TENSION STRAPS**
The straps can be adjusted at various levels of tension to accommodate individual end-users. In a typical scenario, the bottom two (2) straps can be adjusted tightly to support and/or assist the extensor muscles.
The top two (2) straps would be left looser to allow the upper body to lean back over the upholstery to fight gravity. This configuration may enable the back canes to be lowered for a quad. In another instance, you might loosen all of the straps and allow the end-user to sink all the way back into the wheelchair. Every person will be different. Let the therapist experiment with different positions and then decide. It is easy to change.

THE BACK UPHOLSTERY COVER

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

1. The first is as a modesty cover to prevent one’s posterior from protruding out of the wheelchair.
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 flap is pulled under the seat cushion.

REMOVING NON-ADJUSTABLE TENSION BACK UPHOLSTERY (FIGURE 3)

1. Unlatch the two (2) fastening flaps that secure the back upholstery to the back canes.
2. Unlatch the top of the back upholstery.
3. Remove the seat cushion.
4. Separate the bottom of the existing back upholstery from the top of the seat upholstery.
5. Lift up on the existing back upholstery and remove from the wheelchair.

INSTALLING ADJUSTABLE TENSION BACK UPHOLSTERY (FIGURE 3)

1. Slide each section (anchor loop/adjuster strap) of the adjustable back upholstery with the grommet hole facing the rear of the wheelchair.
2. Secure the adjustable back upholstery to the back posts with the mounting screws.

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

WARNING

After the adjustable 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 back should be checked whenever entering the wheelchair to ensure that the fastening straps are securely fastened.

FIGURE 3 - REMOVING NON-ADJUSTABLE/INSTALLING ADJUSTABLE TENSION BACK UPHOLSTERY

3. Slip adjuster straps through corresponding anchor loops and adjust the back upholstery. Secure with the fastening straps.
4. Secure the back upholstery cover (fastening strap) to the back of the adjustable back upholstery (fastening strap).
5. Flip the back upholstery cover over the adjustable back upholstery and secure the fastening straps to the front of the adjustable back upholstery.
6. Lay the front portion of the back upholstery cover on the seat upholstery.
7. Adjust the slack in the back upholstery cover and then secure to the seat upholstery.
8. Reinstall the seat cushion.
WHY USE ADJUSTABLE TENSION UPHOLSTERY: A CLINICAL DISCUSSION

The flexible sling upholstery commonly used on wheelchairs allows the wheelchair to fold without removing rigid components. Sling upholstery will stretch with use. Unfortunately, stretched upholstery does not support the back well. Stretched upholstery often allows the pelvis to drift into posterior tilt while the back assumes a kyphotic posture.

With the adjustable tension backrest, the sag can be taken out of the sling restoring the original tightness. Adjustable tension upholstery can also provide significant improvement to the seated posture and function of the wheelchair. By changing the tension of the strap, the backrest can be adjusted to accommodate back postures such as kyphosis, lordosis, stabilize the pelvis and back, and provide lateral stability.

In addition to restoring the sling to original tension, the adjustable tension backrest can be adjusted to help maintain the pelvis and back position, which can improve posture balance and function.

The wheelchair backrest should be able to follow the natural anatomical contours of the back. When viewing a person from the side, the thoracic portion of the back will extend posteriorly to the pelvis and buttocks (FIGURE 4).

When using a non-adjustable flat backrest, the top portion of the upholstery will usually push the trunk forward of the center of gravity over the pelvis. To maintain the trunk in the upright posture, the user must have and use the back extensor musculature, or add tilt or recline to backrest (FIGURE 5).

When using adjustable upholstery, it is possible to tighten the lower portion of the backrest which assists in maintaining a neutral pelvis. The upper portion can then be adjusted to follow the natural curvature of the spine bringing the back over the pelvis in a position of balance relative to the center of gravity (FIGURE 6).

The best point of control for the pelvis is near the Posterior Superior, Iliac Spine (P.S.I.S.). The upper trunk should be relined until a balanced posture is achieved, approximately 10 to 15 degrees (FIGURE 7).
For individuals who have fixed kyphotic spine, the backrest can be adjusted to allow for an increased recline while providing increased contact and support of the back (FIGURE 8).

The height of the backrest and the amount of control provided by the adjustable tension upholstery will vary depending on the abilities of the user. An active paraplegic (SCI) may require minimal back height which adds posterior stability to the pelvis and lets the trunk assume a natural balance over the top edge of the wheelchair upholstery. A less active para (with a higher level of injury) or a quadriplegic may require a higher backrest with an increased level of recline (FIGURE 9).

The effect of back support and the angle of the backrest are interconnected. Changes to one often requires change to the other if optimal support and balance are to be achieved. Use of a wheelchair with adjustable tension upholstery can significantly increase function, postural condition, balance and comfort.

SEAT UPHOLSTERY REPLACEMENT (FIGURE 10)

1. Remove the seat cushion from the wheelchair.
2. Remove the twelve (12) phillips screws that secure the existing seat upholstery to the seat frame.
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.
This Procedure includes the following:
Back Angle Adjustment - Adjustable Backs Only
Back Height Adjustment
Adjusting Rear Seat-To-Floor Height - Adjustable Rear Frame Wheelchairs Only
Replacing Seat Frame - Adjustable Rear Frame Wheelchairs Only
Determining Toe in/Toe Out
Adjusting Toe in/Toe Out
Repositioning Camber Inserts (Adjusting Rear Wheels Camber)
Adjusting Wheelbase Length (Adjusting Center of Gravity)
Adjusting Wheelbase Width
Replacing Axle Tube

WARNING
After adjustments and before use make sure all attaching hardware is securely tightened.

BACK ANGLE ADJUSTMENT - ADJUSTABLE BACKS ONLY (FIGURE 1)

NOTE: DO NOT remove the hex screws that secure the back angle bracket to the chair frame and back cane.

NOTE: Perform this procedure to both sides at the same time.

1. Loosen the locknuts and hex screws that secure the back angle bracket to the chair frame and the back cane.
2. Loosen the TOP hex screw locknut and slide the TOP hex screw away from the back angle mounting bracket to adjust the cam.
3. Adjust the back canes to the approximate back angle required.
4. Adjust cam to achieve desired position.

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

PROCEDURE 2
FRAME ADJUSTMENTS

This Procedure includes the following:
Back Angle Adjustment - Adjustable Backs Only
Back Height Adjustment
Adjusting Rear Seat-To-Floor Height - Adjustable Rear Frame Wheelchairs Only
Replacing Seat Frame - Adjustable Rear Frame Wheelchairs Only
Determining Toe in/Toe Out
Adjusting Toe in/Toe Out
Repositioning Camber Inserts (Adjusting Rear Wheels Camber)
Adjusting Wheelbase Length (Adjusting Center of Gravity)
Adjusting Wheelbase Width
Replacing Axle Tube

WARNING
After adjustments and before use make sure all attaching hardware is securely tightened.

BACK ANGLE ADJUSTMENT - ADJUSTABLE BACKS ONLY (FIGURE 1)

NOTE: DO NOT remove the hex screws that secure the back angle bracket to the chair frame and back cane.

NOTE: Perform this procedure to both sides at the same time.

1. Loosen the locknuts and hex screws that secure the back angle bracket to the chair frame and the back cane.
2. Loosen the TOP hex screw locknut and slide the TOP hex screw away from the back angle mounting bracket to adjust the cam.
3. Adjust the back canes to the approximate back angle required.
4. Adjust cam to achieve desired position.

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

PROCEDURE 2
FRAME ADJUSTMENTS

This Procedure includes the following:
Back Angle Adjustment - Adjustable Backs Only
Back Height Adjustment
Adjusting Rear Seat-To-Floor Height - Adjustable Rear Frame Wheelchairs Only
Replacing Seat Frame - Adjustable Rear Frame Wheelchairs Only
Determining Toe in/Toe Out
Adjusting Toe in/Toe Out
Repositioning Camber Inserts (Adjusting Rear Wheels Camber)
Adjusting Wheelbase Length (Adjusting Center of Gravity)
Adjusting Wheelbase Width
Replacing Axle Tube

WARNING
After adjustments and before use make sure all attaching hardware is securely tightened.

BACK ANGLE ADJUSTMENT - ADJUSTABLE BACKS ONLY (FIGURE 1)

NOTE: DO NOT remove the hex screws that secure the back angle bracket to the chair frame and back cane.

NOTE: Perform this procedure to both sides at the same time.

1. Loosen the locknuts and hex screws that secure the back angle bracket to the chair frame and the back cane.
2. Loosen the TOP hex screw locknut and slide the TOP hex screw away from the back angle mounting bracket to adjust the cam.
3. Adjust the back canes to the approximate back angle required.
4. Adjust cam to achieve desired position.

NOTE: An indexing notch has been put on the adjustment cam to help determine cam position for desired back angle adjustment.
5. Reassemble and torque hex screws 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.

BACK HEIGHT ADJUSTMENT (FIGURE 2)

NOTE: Observe the tautness of the back upholstery for reinstallation.

1. Unlatch the two (2) fastening flaps that secure the back upholstery to the back canes.
2. Unlatch the top of the back upholstery.
3. Remove the seat cushion.
4. Separate the bottom of the back upholstery from the top of the seat upholstery.
5. Lift up on the back upholstery and remove from the wheelchair.

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

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

6. 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:

<table>
<thead>
<tr>
<th>Original Back Height (in inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOLE #</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
</tbody>
</table>

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

7. Reinstall back upholstery. Reverse STEPS 1-5.
8. Adjust the back upholstery to the desired tautness. Refer to ADJUSTING THE BACK UPHOLSTERY in PROCEDURE 1 of this manual.

ADJUSTING REAR SEAT-TO-FLOOR HEIGHT - ADJUSTABLE REAR FRAME WHEELCHAIRS ONLY (FIGURE 3)

WARNING
After making adjustments, always make sure that parts are properly tightened BEFORE using the wheelchair.

1. Remove the two (2) allen screws that secure the seat frame to the wheelchair frame.
2. Adjust the rear seat-to-floor height to one (1) of six (6) heights:

REAR SEAT-TO-FLOOR RANGES (in inches)

<table>
<thead>
<tr>
<th>HOLE #</th>
<th>14-19</th>
<th>15-20</th>
<th>16-21</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>14</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>2</td>
<td>15</td>
<td>16</td>
<td>17</td>
</tr>
<tr>
<td>3</td>
<td>16</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>4</td>
<td>17</td>
<td>18</td>
<td>19</td>
</tr>
<tr>
<td>5</td>
<td>18</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>6</td>
<td>19</td>
<td>20</td>
<td>21</td>
</tr>
</tbody>
</table>

Note: Holes numbered from bottom to top for reference only. (There are no numbers on the wheelchair frame.)

NOTE: The rear seat-to-floor ranges are dependent on the size of the rear wheel. Refer to the SPECIFICATIONS page of this manual for complete information.

3. Resecure the seat frame to the wheelchair frame with the two (2) allen screws.
REPLACING SEAT FRAME - ADJUSTABLE REAR FRAME WHEELCHAIRS ONLY
(FIGURE 4)

**WARNING**
After making adjustments, always make sure that parts are properly tightened BEFORE using the wheelchair.

Make sure the detent pin of the quick/quad-release axle is fully released BEFORE operating wheelchair.

1. Remove the rear wheels from the wheelchair.
2. Remove the mounting hardware that secures the back angle brackets to the seat frame.

**NOTE:** Note position of washers and coved washers for reinstallation.

3. Remove the seat upholstery from the wheelchair.
4. Remove the wheel locks from the wheelchair.
5. Move the protective coverings on the front of the seat frame to expose the allen screws that secure the seat frame to the wheelchair frame.
6. Remove the four (4) allen screws that secure the seat frame to the wheelchair frame.

**NOTE:** Note position of the existing seat frame for correct seat-to-floor height when installing the new seat frame.

7. Remove the existing seat frame.
8. To install the new seat frame, reverse the above steps.

---

DETERMINING TOE IN/TOE OUT (FIGURES 5 AND 6)

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 5).

**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 $\pm \frac{1}{8}$-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 6).
   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 6).
4. If the difference between the measurements is not within $\pm \frac{1}{8}$-inch, correct the toe-in/toe-out condition. Refer to ADJUSTING TOE-IN/TOE-OUT in this section of the manual.
ADJUSTING TOE IN/TOE OUT

Degree of Camber Has Been Changed (FIGURES 7 and 8)

AXLE TUBE POSITIONING FOR 0°/3°, 0°/6°, 3°/6° or 9°/12° CAMBER INSERTS.

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 AXLE TUBE POSITIONING FOR 0°/3°, 0°/6°, 3°/6° or 9°/12° CAMBER INSERTS in 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.

FIGURE 6 - DETERMINING TOE IN/TOE OUT - COMPARING CENTERLINE MEASUREMENTS OF THE REAR WHEELS

PROCEDURE 2

FRAME ADJUSTMENTS

Toe-in
Smaller Than Front
Larger Than Front

Top View of Wheelchair

Front of Wheelchair

Toe-out

FIGURE 7 - QUICK RELEASE LEVERS OR STANDARD ATTACHING HARDWARE

AXLE TUBE POSITIONING FOR 0°/9°, 0°/12°, 3°/9°, 6°/9°, 3°/12° or 6°/12° CAMBER INSERTS.

1. Do one (1) of the following:

QUICK RELEASE LEVERS - Push the quick release lever down to the open position.

STANDARD - Loosen, but do not remove the hex screw and locknut that secures the axle tube to the frame bracket.

2. Slowly rotate the axle tube until the stop on the opposite toe adjustment ring is positioned at the opposite end of the frame bracket (approximately 1/8-inch).

WARNING
QUICK RELEASE LEVERS - Make sure the quick release levers are pointing towards the rear of the wheelchair and 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 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.

3. Do one (1) of the following:

QUICK RELEASE LEVERS - Make sure the quick release lever is facing towards the back of the wheelchair and is in line with the wheelchair frame and pull up to the closed position.

STANDARD - Securely tighten the hex screw and locknut that secures the axle tube to the frame bracket.

FIGURE 8 - AXLE TUBE POSITIONING FOR 0°/3°, 0°/6°, 3°/6° or 9°/12° CAMBER INSERTS

NOTE: Refer to AXLE TUBE POSITIONING FOR 0°/3°, 0°/6°, 3°/6° or 9°/12° CAMBER INSERTS in 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.
PROCEDURE 2

FRAME ADJUSTMENTS

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

NO ADJUSTMENT REQUIRED

Axle Tube - LOCKED OUT by Toe Adjustment Rings and Will NOT Rotate

Left Tab Stopped Against Lower Metal Tab on Frame Bracket

Right Tab Stopped Against Upper Metal Tab on Frame Bracket

FIGURE 8 - ADJUSTING TOE IN/TOE OUT - DEGREE OF CAMBER HAS BEEN CHANGED

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Axle Tube is Moved From the Factory Set Position or is Replaced (FIGURES 9 and 10)

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.

1. Do one (1) of the following:
   QUICK RELEASE LEVERS - Push the quick release levers down to the open position.
   STANDARD - Loosen, but do not remove the hex screws and locknuts that secure the axle tube to the frame bracket.

2. Loosen the set screws that secure the toe adjustment rings to the axle tube.

3. Using an "L" square, rotate the axle tube until the flat edge of the camber insert is at a 90-degree angle with the ground/floor as shown in FIGURE 10.

4. Do one (1) of the following:
   QUICK RELEASE LEVERS - Make sure the Right quick release lever is facing towards the back of the wheelchair and is in line with the wheelchair frame and pull up to the closed position.
   STANDARD - Securely tighten the Right hex screw and locknut that secures the axle tube to the frame bracket.

5. Rotate the Left toe adjustment ring until the tab stops against the Lower metal tab on the frame bracket.

6. Securely tighten the set screw on the 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 section of the manual.

8. Repeat STEPS 1-6 until the toe in/toe out measurement is within ±1/8-inch.

9. Reposition the camber insert for the highest degree of camber. Refer to REPOSITIONING CAMBER INSERTS (ADJUSTING REAR WHEEL CAMBER) in this section of the manual.

10. Do one (1) of the following:
    QUICK RELEASE LEVERS - Make sure the Left quick release lever is facing towards the back of the wheelchair and is in line with the wheelchair frame and pull up to the closed position.
    STANDARD - Securely tighten the Left hex screw and locknut that secures the axle tube to the frame bracket.

11. Do one (1) of the following:
    QUICK RELEASE LEVERS - Push the Right quick release lever down to the open position.
    STANDARD - Loosen, but do not remove the Right hex screw and locknut that secures the axle tube to the frame bracket.

12. Repeat STEPS 3-8 for the Right side of the wheelchair.

13. Make sure the quick release levers or hex screws and locknuts are securely tightened.

WARNING
QUICK RELEASE LEVERS - Make sure the quick release levers are pointing towards the rear of the wheelchair and 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 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.

STEPS 1, 4, 10 AND 11
QUICK RELEASE LEVER
CLOSED POSITION
Axle Tube
Camber Insert (not shown)
Quick Release Lever

STANDARD
Axle Tube
Camber Insert (not shown)
Hex Screw and Locknut

OPEN POSITION
FIGURE 9 - QUICK RELEASE LEVERS OR STANDARD ATTACHING HARDWARE
PROCEDURE 2
FRAME ADJUSTMENTS

STEP 3
Flat Edge of Camber Insert

Place "L" Square Here

90 Degree Angle

LOWER DEGREE OF CAMBER

Frame Bracket

Set Screw (STEP 2)

Tab (STEP 5)

Metal Tab (STEP 5)

Axle Tube - Will Rotate UP Only

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.

REPOSITIONING CAMBER INSERTS
(ADJUSTING REAR WHEEL CAMBER) (FIGURE 11)

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

1. Do one (1) of the following:
   QUICK RELEASE LEVERS - Push the quick release lever down to the open position.
   STANDARD - Loosen, but do not remove the hex screw and locknut that secures the axle tube to the frame bracket.

2. Pull one (1) rear wheel with the camber insert out of the axle tube.

3. Remove the rear wheel from the camber insert.

4. Rotate the camber insert 180°.

5. Reinstall the rear wheel into the camber insert.

6. Position the camber insert to desired position. Make sure there is no more than 3-inches (12 indexing marks) of the camber inserts outside of the axle tube.

7. 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 to the same indexing mark. This will make sure the distance between the rear wheel and the wheelchair is the same on both sides.

8. 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 - DEGREE OF CAMBER HAS BEEN CHANGED in this section of the manual.

WARNING
QUICK RELEASE LEVERS - Make sure the quick release levers are pointing towards the rear of the wheelchair and are in the CLOSED position BEFORE using the wheelchair, otherwise personal injury or damage to the wheelchair may result.

FIGURE 10 - ADJUSTING TOE IN/TOE - THE AXLE TUBE IS MOVED FROM THE FACTORY SET POSITION OR IS REPLACED
WARNING
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.

9. Do one (1) of the following:
   QUICK RELEASE LEVERS - Make sure the quick release lever is facing towards the back of the wheelchair and is in line with the wheelchair frame and pull up.
   STANDARD - Securely tighten the hex screw and locknut that secures the axle tube to the frame bracket.

10. Repeat STEPS 1-9 for the opposite side of the wheelchair.

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 3 of this manual.

12. Refer to the following chart to determine if it will be necessary to adjust the toe in/toe out of the wheelchair:

<table>
<thead>
<tr>
<th>Camber Insert Degree Range</th>
<th>Adjustment Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 and 3, 0 and 6, 3 and 6, 9 and 12</td>
<td>NO</td>
</tr>
<tr>
<td>0 and 9, 0 and 12, 3 and 9, 3 and 12, 6 and 9, 6 and 12</td>
<td>* YES</td>
</tr>
</tbody>
</table>

* Refer to ADJUSTING TOE IN/TOE OUT in this section of the manual.

ADJUSTING WHEELBASE LENGTH (ADJUSTING CENTER OF GRAVITY) (FIGURE 12)

WARNING
The position of the footrest, camber bar and rear seat height, as well as the tautness of the back upholstery are directly related to the wheelchair's stability. Any change to one (1) or any combination of the four (4) may cause the wheelchair to decrease in stability. Use EXTREME caution when using a new seating position.

NOTE: The camber bar is always mounted to the BOTTOM of the wheelchair frame.

1. Loosen, but do not remove the two (2) hex screws that secure the axle tube to the wheelchair frame.
2. Position the frame brackets on the wheelchair frame at the desired position.

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

**SHORTENING THE WHEELBASE** will increase the maneuverability and distribute additional weight onto the rear wheels.

**NOTE:** The performance of the wheelchair will be affected if the frame brackets do not sit flush on the wheelchair frame.

3. Securely tighten one (1) hex screw that secures the camber bar to the wheelchair frame.

**NOTE:** Securely tightening one (1) hex screw at a time ensures that the frame brackets will sit flush on the wheelchair frame.

4. Repeat **STEP 3** for the opposite side of the wheelchair.

5. Roll the wheelchair before using to make sure there is no excessive drag to either side.

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

---

**ADJUSTING WHEELBASE WIDTH** *(FIGURE 13)*

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

1. Do one (1) of the following, if necessary:

   **QUICK RELEASE LEVERS** - Push the quick release lever down to the open position.

   **STANDARD** - Loosen, but do not remove the hex screw and locknut that secures the axle tube to the frame bracket.

   **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 pointing towards the rear of the wheelchair and is 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 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.
PROCEDURE 2

FRAME ADJUSTMENTS

4. Do one (1) of the following:
   **QUICK RELEASE LEVERS** - Make sure the quick release lever is facing towards the back of the wheelchair and is in line with the wheelchair frame and pull up.
   **STANDARD** - Securely tighten the hex screw and locknut that secures the axle tube to the frame bracket.
5. Repeat STEPS 1-4 for the opposite side of the wheelchair.

**REPLACING AXLE TUBE (FIGURE 14)**

**NOTE:** The camber bar is always mounted to the BOTTOM of the wheelchair frame.

**NOTE:** There is no need to remove the two (2) frame brackets 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. Do one (1) of the following:
   **QUICK RELEASE LEVERS** - Push the quick release lever down to the open position.
   **STANDARD** - Loosen, but do not remove the two (2) hex screws and lock nuts that secure the axle tube to the frame brackets.
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 frame brackets.
6. Remove the toe adjustment rings from the existing axle tube.
7. Pull the existing axle tube through the other frame bracket and remove from the wheelchair.
8. Slide the new axle tube through one (1) of the frame brackets. 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 frame bracket until the end of the axle tube is flush with the outside of the frame bracket.
   **NOTE:** Do not close the quick release levers or tighten the hex screws that secure the axle tube to the frame brackets at this time.

**FIGURE 13 - ADJUSTING WHEELBASE WIDTH**
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 frame bracket.

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. Determine the toe in/toe out of the wheelchair. Refer to DETERMINING TOE IN/TOE OUT in this section of the manual.

NOTE: The performance of the wheelchair will be affected if the toe in/toe out of the wheelchair is not correct.
This Procedure includes the following:
Removing/Installing Rear Wheels
Adjusting the Quick-Release Axle
Installing the 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
Wheel Lock Extension Handle Installation
Replacing Casters
Replacing Front Forks
Adjusting Caster Height
Installing Quick Release Casters
Adjusting Front Seat-To-Floor Height

WARNING
After adjustments and before use make sure all attaching hardware is securely tightened.

REMOVING/INSTALLING REAR WHEELS (FIGURE 1)
NOTE: If replacing the rear wheels with a different size than what was originally on the wheelchair, the front caster height must also be changed to keep the wheelchair frame parallel to the floor. Refer to ADJUSTING CASTER HEIGHT in this section of the manual. Anti-tipper height (if applicable) must also 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 5 of this manual.

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.

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.

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

NOTE: During contact activities, Invacare recommends inserting quick-release axles with the head end to the inside of the wheelchair to prevent accidental release.

FIGURE 1 - REMOVING/INSTALLING REAR WHEELS

ADJUSTING QUICK-RELEASE AXLE (FIGURE 2)

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.

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

FIGURE 2 - ADJUSTING QUICK-RELEASE AXLE

INSTALLING QUAD-RELEASE AXLE (FIGURE 3)

1. Remove rear wheel and the existing quick-release axle from the wheelchair.
2. Remove the existing quick-release axle from the rear wheel hub.
3. Insert the new quad-release axle through the rear wheel hub.
4. Slide the locking collar onto the quad-release axle until it is snug against the rear wheel and tighten securely with the 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 the handle of the quad-release axle down to release the detent pin ensuring that the 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.
6. Inflate the tire to the correct psi rating on the sidewall of the 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.

---

**ADJUSTING QUAD-RELEASE HANDLE IN/AND OR OUT**

**FIGURE 4 - ADJUSTING QUAD-RELEASE AXLE**

**REMOVING THE PLAY FROM THE REAR WHEELS (FIGURE 4)**

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, make the following adjustment:
   
   **Tighten** the length adjusting screw until there is no in and out movement of the quad-release axle and rear wheel.

**HANDRIM REPLACEMENT (FIGURE 5)**

1. Remove the rear wheel from the wheelchair.

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

2. Remove all air from the bar 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.

**FIGURE 5 - HANDRIM REPLACEMENT**

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

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

**WHEEL LOCK ADJUSTMENT/REPLACEMENT (FIGURE 6)**

NOTE: INVACARE recommends UNDER mount wheel 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.

**If 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.

**If Replacing or Adjusting the High/Under Mount Wheel Lock:**

1. Securely tighten the hex screws that secure the High/Under mount wheel lock to the seat frame and engage the wheel lock.
1. Remove the plastic cover on the existing wheel lock handle, if necessary.
2. Remove the button screw and locknut that secure the existing wheel lock handle and spacer to the wheel lock assembly.
3. Attach the looped end of the elastic cord of the wheel lock extension handle over the spacer of the existing wheel lock handle.
4. Reattach the existing wheel lock handle and spacer onto the wheel lock assembly and secure with the button screw and locknut.

**NOTE:** The elastic cord is made of stretchable material and may be adjusted to a tight or loose fit to meet the need of the user.

5. Remove the black tip of the wheel lock extension handle.
6. Push the opposite end of the elastic cord up and through the slotted hole in the wheel lock extension handle.
7. Run the elastic cord through the washer and tie a knot in the elastic cord above the washer.
8. Pull the elastic cord back down into the wheel lock extension handle.
9. Reinstall the black rubber tip onto the wheel lock extension handle.
10. Slide the wheel lock extension handle over the existing wheel lock handle.

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

2. Adjust position of the wheel lock until the 3/16-inch measurement is obtained for correct wheel lock adjustment.
3. Engage the wheel locks and push against the wheelchair and determine if wheel locks engage the rear wheels enough to hold the wheelchair.
4. Repeat the above procedures until the wheel locks hold the wheelchair.

**FIGURE 6 - WHEEL LOCK ADJUSTMENT/REPLACEMENT**

**WHEEL LOCK EXTENSION HANDLE INSTALLATION (FIGURE 7)**

**NOTE:** Wheel lock extension handles may be installed on all push or pull type wheel locks NOT already equipped with swing-up extension handles.

**FIGURE 7 - WHEEL LOCK EXTENSION HANDLE INSTALLATION**
REPLACING CASTERS (FIGURE 8)

1. Remove the bolt and locknut that secure the existing caster and axle spacers to the fork.
2. Remove the existing caster and axle spacers from the fork.
3. Install the new caster and axle spacers onto the fork and securely tighten.
4. Repeat the above procedures 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 FRONT FORKS (FIGURE 9)

1. Remove the front casters from the wheelchair. Refer to REPLACING CASTERS in this section of the manual.
2. Remove the head tube cap.
3. Remove the locknut and nylon washer.
4. Drop the fork out of the caster head tube.
5. Slide the new fork into the caster head tube.
6. Ensure that fork slides completely into the caster head tube.
7. Install nylon washer and secure with locknut.

NOTE: Check bearing assemblies and replace if necessary.

FIGURE 9 - REPLACING FRONT FORKS

ADJUSTING CASTER HEIGHT (FIGURE 10)

When changing the degree of camber, the size of a rear wheel/front caster or the need to adjust the wheelchair due to use, it becomes necessary to adjust the caster height so the wheelchair frame will remain parallel to the floor.

1. Place the wheelchair on a flat surface.
2. Remove the head tube cap on the fork.
3. Remove the locknut that secures the fork to the wheelchair frame.
4. Position a large right triangle or "L" square on the flat surface and against the caster housing that is welded to the wheelchair frame.
5. 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.

WARNING
Improper positioning of the washer will prohibit the free movement of the forks.

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.
6. Reinstall the locknut and head tube cap onto the wheelchair.

7. Repeat this procedure for the opposite front caster.

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 head tube of the wheelchair making sure the fork stem is approximately 1/4-inch above the caster head tube.

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.

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 head tube.

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.

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.

FIGURE 10 - ADJUSTING CASTER HEIGHT

FIGURE 11 - INSTALLING QUICK-RELEASE CASTERS
ADJUSTING FRONT SEAT-TO-FLOOR HEIGHT

Refer to the charts on the following pages to determine available front seat-to-floor heights for the original set up of the wheelchair.

After determining caster size and fork stem combination, refer to REPLACING CASTERS and REPLACING FRONT FORKS in this section of the manual to replace casters and fork/stem combination if necessary.

ORIGINAL WHEELCHAIR SETUP -

3-INCH FRONT CASTER, 3-INCH FORK W/1-INCH SPACER AND 22-INCH REAR WHEELS

<table>
<thead>
<tr>
<th>★ FRONT SEAT-TO-FLOOR (FSTF) (IN INCHES)</th>
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<tbody>
<tr>
<td>ORIGINAL 17 18 19 20 21</td>
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<tr>
<td>INCREASING BY 1-INCH 18 19 20 21 22</td>
<td>INCREASE FSTF 1-INCH 3-INCH 3-INCH/ 2-INCH 24-INCH</td>
</tr>
<tr>
<td>DECREASING BY 1-INCH N/A N/A N/A N/A N/A</td>
<td>DECREASE FSTF 1-INCH N/A N/A N/A</td>
</tr>
</tbody>
</table>

★ MEASUREMENTS ARE APPROXIMATE TO ±1/4-INCH. *New fork is required for different size spacer.

ORIGINAL WHEELCHAIR SETUP -

3-INCH FRONT CASTER, 3-INCH FORK W/1-INCH SPACER AND 24-INCH REAR WHEELS

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<tr>
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★ MEASUREMENTS ARE APPROXIMATE TO ±1/4-INCH. *New fork is required for different size spacer or no spacer.

ORIGINAL WHEELCHAIR SETUP -

3-INCH FRONT CASTER, 3-INCH FORK W/1-INCH SPACER AND 26-INCH REAR WHEELS

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★ MEASUREMENTS ARE APPROXIMATE TO ±1/4-INCH. *New fork is required for different size spacer or no spacer.
### ORIGINAL WHEELCHAIR SETUP -

**5-INCH FRONT CASTER, 3-INCH FORK W/NO SPACER AND 22-INCH REAR WHEELS**

<table>
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<tr>
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<td>19</td>
</tr>
<tr>
<td>DECREASING BY 1-INCH</td>
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</table>

*New fork is required for different size spacer.

### ORIGINAL WHEELCHAIR SETUP -

**5-INCH FRONT CASTER, 3-INCH FORK W/NO SPACER AND 24-INCH REAR WHEELS**

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</tr>
<tr>
<td>DECREASING BY 1-INCH</td>
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*New fork is required for different size spacer or no spacer.

### ORIGINAL WHEELCHAIR SETUP -

**5-INCH FRONT CASTER, 3-INCH FORK W/NO SPACER AND 26-INCH REAR WHEELS**

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<td>DECREASING BY 1-INCH</td>
<td>16</td>
</tr>
</tbody>
</table>

*New fork is required for different size spacer or no spacer.
This Procedure includes the following:

Footrest Replacement/Adjustment

WARNING
After adjustments and before use make sure all attaching hardware is securely tightened.

---

FOOTREST REPLACEMENT/ADJUSTMENT

(FIGURE 1)

WARNING
The position of the footrest, camber bar and rear seat height, as well as the tautness of the back upholstery are directly related to the wheelchair's stability. Any change to one (1) or any combination of the four (4) may cause the wheelchair to decrease in stability. Use EXTREME caution when using a new seating position.

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) flat screws and 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) flat screws and locknuts.

NOTE: The locknuts should lie in the channel of the footplate half clamp.

Footplate Depth Adjustment

1. Loosen, but do not remove the four (4) flat screws and locknuts that secure the footplate to the footrest tubes.

NOTE: Observe the angle of the footplate for reinstallation.

2. Move the footplate to one (1) of two (2) positions to accommodate the user.

3. Retighten the four (4) flat screws and locknuts.

NOTE: The settings for positioning the footplates on the half-clamps may vary for each end-user.

NOTE: The locknuts should lie in the channel of the footplate half clamp.
This Procedure includes the following:
Anti-tipper Adjustment/Replacement

WARNING
After adjustments and before use make sure all attaching hardware is securely tightened.

ANTI-TIPPER ADJUSTMENT/REPLACEMENT (FIGURE 1)

Adjustment

NOTE: If the rear wheel size is changed or the position of the camber bar 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 push pin 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.

NOTE: If the 1-1/2 to 2-inch clearance between the bottom of the anti-tipper wheels and the ground/floor can not be obtained by adjusting the anti-tipper wheels only, follow these procedures.

3. Push in the push pin that secures the anti-tipper to the wheelchair frame.
4. Reposition the anti-tipper into one (1) of two (2) positions and release the push pin.
5. Repeat STEPS 1-4 until the 1-1/2 to 2-inch clearance between the bottom of the anti-tipper wheels and the ground/floor is achieved.
6. Repeat STEPS 1-5 for the opposite anti-tipper.

Replacement

1. Press in the push pin that secures the existing anti-tipper to the wheelchair frame and remove the anti-tipper from the wheelchair frame.
2. Insert the new anti-tipper into the wheelchair frame to one (1) of two (2) positions.
3. Press in the push pin 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.

---

FIGURE 1 - ANTI-TIPPER ADJUSTMENT/REPLACEMENT

**Anti-tipper**

**Wheelchair Frame**

**Push Pins**

1-1/2 to 2-inch clearance
This Procedure includes the following:

- Installing the "T" Arm Sockets
- Installing/Removing the "T" Arms
- Adjusting the "T" Arms
- Adjusting the Transfer Assists and/or Side Guards - "T" Arms
- Replacing the Locking Lever - "T" Arms
- Installing the Half Arm Socket
- Adjusting the Half Arm Height

WARNING
NEVER try to lift or tip the wheelchair by "T" or half arms, serious injury can occur.
After adjustments and before use make sure all attaching hardware is securely tightened.

INSTALLING THE "T" ARM SOCKETS (FIGURE 1)

1. Remove the rear wheels from the wheelchair. If necessary, refer to the owner's manual supplied with the wheelchair.
2. 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.

3. Install the hex screws and washers through the "T" arm clamp and "T" arm socket and loosely tighten.
4. Tighten the hex screws and washers that secure the "T" arm mounting socket to the wheelchair frame in the following sequence:
   A. Middle hex screw and washer.
   B. The two (2) outside hex screws and washers.
5. Continue to repeat STEP 5 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.

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

6. Repeat STEPS 2-6 for the opposite side of the wheelchair.
7. Install the "T" arms into the "T" arm sockets. Refer to INSTALLING/REMOVING THE "T" ARMS in this section of the manual.

INSTALLING/REMOVING THE "T" ARMS (FIGURE 2)

Installing

1. 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.

2. 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.
3. 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.

4. Adjust the "T" arm for desired height, width and depth, if necessary. Refer to ADJUSTING THE "T" ARMS in this section of the manual.
5. Repeat STEPS 1-4 for the opposite side of the wheelchair.
PROCEDURE 6

ARMS

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.

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 2 - INSTALLING/REMOVING THE "T" ARMS

ADJUSTING THE "T" ARMS

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:

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.
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.

"T" Arm Sockets (FIGURE 6)

1. Remove the rear wheels from the wheelchair. If necessary, refer to the owner's manual supplied with the wheelchair.
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.

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.
ADJUSTING THE TRANSFER ASSISTS AND/OR SIDE GUARDS - "T" ARMS (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 manual.

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REPLACING THE LOCKING LEVER - "T" ARMS (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.
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. Position arm socket in line with mounting holes on the wheelchair frame making sure the arm socket is towards the inside of the wheelchair frame.

2. Position the top coved washer between the arm socket and the wheelchair frame.

NOTE: The slot in the arm socket is used with either the top or the bottom mounting holes in the arm socket depending on the half arm height desired.

3. Install top hex screw through the slot in the arm socket, coved washer, wheelchair frame, and washer and loosely tighten with locknut.

4. Slide the arm socket up and/or down until the bottom mounting hole in the arm socket is in line with the mounting hole in the wheelchair frame.

5. Position the bottom coved washer between the arm socket and the wheelchair frame.

6. Install bottom hex screw through the mounting hole in the arm socket, coved washer, wheelchair frame and washer and securely tighten with locknut.

7. Securely tighten the top hex screw that secures the arm socket to the wheelchair frame.

8. Repeat STEPS 1-7 for the opposite arm socket.

ADJUSTING HALF ARM HEIGHT (FIGURE 9)

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.

NOTE: If desired height is still not obtainable, reposition the arm socket on the wheelchair with the top hex screw in the top mounting hole of the arm socket and the bottom hex screw in the slot of the arm socket. Refer to INSTALLING THE HALF ARM SOCKET in this section of the manual if needing to perform this procedure.
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, and the 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 the following instructions.

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