



Aero X



FOLDING OWNERS MANUAL

DEALER/SUPPLIER:

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

USER:

BEFORE USING THIS WHEELCHAIR, YOU MUST READ THIS MANUAL IN ITS ENTIRETY AND SAVE IT FOR FUTURE REFERENCE.

ATTENDANTS/ASSISTANTS:

BEFORE ASSISTING THE USER OF THIS WHEELCHAIR, YOU MUST READ THIS MANUAL IN ITS ENTIRETY AND SAVE IT FOR FUTURE REFERENCE.

SERIAL NUMBER _____

⚠️ WARNING - READ THIS MANUAL

DO NOT OPERATE THIS WHEELCHAIR WITHOUT FIRST READING AND UNDERSTANDING THIS OWNERS MANUAL. IF YOU ARE UNABLE TO UNDERSTAND THE WARNINGS, CAUTIONS AND INSTRUCTIONS, CONTACT YOUR TILITE DEALER OR TILITE CUSTOMER SUPPORT AT (800) 545-2266 BEFORE ATTEMPTING TO USE THIS WHEELCHAIR. IF YOU IGNORE THIS WARNING, YOU MAY FALL, TIP OVER OR LOSE CONTROL OF THE WHEELCHAIR AND SERIOUSLY INJURE YOURSELF OR OTHERS OR DAMAGE THE WHEELCHAIR.

⚠️ WARNING - WHEELCHAIR SELECTION

TILITE MANUFACTURES A WIDE VARIETY OF WHEELCHAIRS TO MEET THE VARIED NEEDS OF WHEELCHAIR USERS. HOWEVER, TILITE IS NOT YOUR HEALTH CARE ADVISOR, AND WE KNOW NOTHING ABOUT YOUR INDIVIDUAL CONDITION OR NEEDS. THEREFORE, THE FINAL SELECTION OF THE PARTICULAR MODEL, AND HOW IT IS ADJUSTED, AND THE TYPE OF OPTIONS AND ACCESSORIES NECESSARY REST SOLELY WITH YOU, THE WHEELCHAIR USER, AND THE HEALTH CARE PROFESSIONAL THAT IS ADVISING YOU. CHOOSING THE BEST CHAIR AND SETUP FOR YOUR SAFETY DEPENDS ON SUCH THINGS AS:

1. YOUR DISABILITY, STRENGTH, BALANCE AND COORDINATION;
2. THE TYPES OF HAZARDS YOU MUST OVERCOME IN DAILY USE (WHERE YOU LIVE AND WORK AND OTHER PLACES YOU ARE LIKELY TO USE YOUR CHAIR); AND
3. YOUR NEED FOR OPTIONS FOR YOUR SAFETY AND COMFORT (SUCH AS ANTI-TIPPERS, POSITIONING BELTS OR SPECIAL SEATING SYSTEMS).

IF YOU IGNORE THIS WARNING, YOU MAY ENDANGER YOUR HEALTH.

⚠️ WARNING - TIE-DOWN RESTRAINTS

TILITE RECOMMENDS THAT WHEELCHAIR USERS NOT BE TRANSPORTED IN VEHICLES OF ANY KIND WHILE IN WHEELCHAIRS. AS OF THIS DATE, THE UNITED STATES DEPARTMENT OF TRANSPORTATION HAS NOT APPROVED ANY TIE-DOWN SYSTEM FOR TRANSPORTATION OF A USER WHILE IN A WHEELCHAIR IN A MOVING VEHICLE OF ANY TYPE. IT IS TILITE'S POSITION THAT USERS OF WHEELCHAIRS SHOULD BE TRANSFERRED INTO APPROPRIATE VEHICLE SEATING FOR TRANSPORTATION AND SHOULD USE THE RESTRAINTS MADE AVAILABLE BY THE AUTO INDUSTRY. TILITE CANNOT, AND DOES NOT, RECOMMEND ANY WHEELCHAIR TRANSPORTING SYSTEMS.

⚠️ WARNING - SEATING RESTRAINTS

IT IS THE OBLIGATION OF YOUR DEALER AND THE HEALTH CARE PROFESSIONALS WHO ARE ADVISING YOU TO DETERMINE IF YOU REQUIRE A SEATING RESTRAINT OR POSITIONING SYSTEM IN ORDER TO ENSURE THAT YOU CAN SAFELY OPERATE YOUR WHEELCHAIR. SERIOUS INJURY CAN OCCUR IN THE EVENT OF A FALL FROM A WHEELCHAIR.

Note: The information contained in this document is subject to change without notice. An updated version of this Owners Manual may be available at www.tilite.com

SAVE THIS MANUAL FOR FUTURE REFERENCE



Thank you for purchasing a TiLite!

Located in a 50,000 square foot facility in the southeastern corner of Washington State, TiLite is surrounded by miles of potato fields. Our biggest distraction is the occasional wind-blown tumbleweed, which gives us plenty of time to think about innovative designs and cutting-edge materials.

Your hand made TiLite wheelchair is the result of extensive research into wheeled mobility. It represents the latest in state-of-the-art design and performance. TiLite combines the finest frame and component materials with sophisticated manufacturing and quality control procedures, ensuring you many years of exceptional performance and durability.

Please take a moment to register your new TiLite with the registration card on page 10 or at <http://www.tilite.com> under the "CONTACT TiLITE" tab. This will allow us to better serve you should you have any questions regarding your TiLite.

At TiLite we took great pride in building you "The Ultimate Ride". Once again thank you for choosing TiLite.

Sincerely,

The TiLITE family.

David Lippes
Chairman & CEO

Alan Ludovici
VP of Engineering

Marty Ball
VP of Sales

Ken Winward
VP of Quality

Iain Bampton
Fabrication Supervisor

Ed Owings
Technical Director

Mark Westphal
Customer Service Director

Josh Anderson
VP of Marketing

Rick Forman
President

REGISTER YOUR TiLITE

Register online at www.tilite.com

or

Complete and mail the form on the next page

Why Should You Register:

- 1. Increase your use and enjoyment of your TiLite by receiving updates from TiLite with product information, maintenance tips and industry news.**
- 2. Enable TiLite to contact you or your health care provider if servicing is needed for your wheelchair.**
- 3. Provide your feedback to TiLite regarding your experience and needs, thereby enabling TiLite to further improve product designs.**

All information you provide to TiLite when you register will be protected by TiLite as required by applicable laws and regulations and will be used solely by TiLite.



PRODUCT REGISTRATION FORM

Register online at www.tilite.com or
Complete and mail this form

CUT ALONG LINE

Name _____

Address _____

City _____ State/Province _____

Zip/Postal Code _____ Country _____

FOLD HERE

Email _____ Day Phone No. _____

Model _____ Serial No. _____

Purchased From _____ Date of Purchase: _____

1. Method of purchase: (check all that apply)
 Medicare Insurance Medicaid Other _____

2. This product was purchased for use by: (check one)
 Self Parent Spouse Other

3. Reasons for purchasing a TiLite:
 Reputation Dealer Relative Friend Therapist/Doctor
 Advertisement: (Please Specify) _____

4. Were your expectations met in the following areas? If not, please specify.
Quality of Service: Yes No _____
Timeliness of Delivery: Yes No _____
Quality of Product: Yes No _____

FOLD HERE

5. What additional features, if any, would you like to see on this or future TiLite products?

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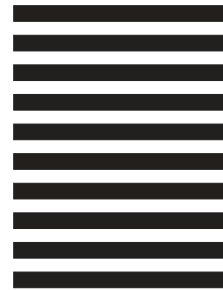


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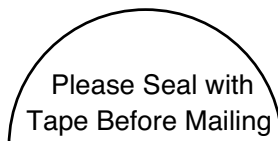
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TILITE
1426 EAST THIRD AVE
KENNEWICK WA 99337-9904



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TiLite Product Registration Form



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GENERAL WARNINGS

A. SAFETY INSPECTIONS AND MAINTENANCE

WARNING

It is important to keep your wheelchair in proper working condition. Chapter 2 of this Manual outlines the safety inspections that you should make before each use of your chair, as well as weekly, quarterly and annual inspections.

1. ALWAYS inspect and maintain your TiLite wheelchair strictly in accordance with the instructions and charts in Chapter 2.
2. If you detect a problem in the course of your inspections or maintenance, ALWAYS have the chair serviced or repaired to correct the problem **BEFORE** using the chair.
3. ALWAYS have your chair completely inspected and serviced by an authorized TiLite supplier at least once a year.
4. ALWAYS perform your safety inspections and any maintenance or adjustments while the chair is unoccupied (unless this Manual expressly states otherwise).

If you fail to inspect or maintain your wheelchair as directed in this Manual, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

B. ACCLIMATING TO YOUR NEW CHAIR

WARNING

Each wheelchair is a unique piece of medical equipment, with unique handling, maneuvering and ride characteristics. Whether you are a new wheelchair user or have years of experience, you **MUST** take the time to acclimate to this particular chair before you begin riding. Start slowly and take the time to learn the handling, maneuvering and ride characteristics of this chair. For example, your previous chair may have been a heavier and less responsive chair, and, therefore, you may be used to using more force than is necessary to maneuver your TiLite chair. *If you ignore these warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

C. WEIGHT LIMITATION

WARNING

TiLite wheelchairs have a weight limit of 250 pounds (113.6 kilograms). This weight limitation applies to the combined weight of the user and any items carried by the user. **DO NOT** exceed this weight limit. *If you exceed the limit, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

D. PREVENTING ACCIDENTS AND INJURIES

WARNING

1. You **MUST** be properly and fully trained in the safe use of this wheelchair by your health care advisor **BEFORE** you use this chair.
2. Together with your health care advisor, you **MUST** analyze your level of function and ability and develop your own methods for safe use that best suit you based on your level of function and ability.
3. You **MUST** learn the limits of your ability and operate this wheelchair within such limits. This means you must **PRACTICE** the maneuvers you will need to perform, such as bending, reaching and transfers, until you know the limits of your ability. **ALWAYS** practice with the assistance of someone who can help you until you know what can cause, and how to avoid, a fall or tip-over. **NEVER** try a new maneuver on your own until you are sure you can do it safely.
4. **ALWAYS** learn as much as you can about the places where you will be using your chair before you get there. **ALWAYS** be alert for hazards and learn how to avoid them.
5. Anti-Tippers **MUST** be used with your wheelchair at all times. Because anti-tippers are an option on this wheelchair, TiLite strongly recommends you order the anti-tippers as they are an important safeguard for the wheelchair user.
6. Together with your health care advisor, you **MUST** analyze your medical condition to determine whether you are capable of using this chair safely and/or what options or accessories you will require in order to use this chair safely (e.g., pressure-relief cushions, seat belts).

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

CHAPTER 1: WARNINGS

E. CHANGING/ADJUSTING YOUR WHEELCHAIR

WARNING

1. Use extreme caution when changing or adjusting the configuration of your TiLite wheelchair. When you change or adjust the configuration, you may increase the risk of a tip-over. Therefore, you should consult your authorized TiLite dealer BEFORE you change or adjust the configuration. Further, TiLite recommends that you use anti-tippers at all times, and this is particularly true after you have changed or adjusted the configuration of your chair.
2. Unauthorized modifications to your chair, or the use of parts not supplied or approved by TiLite, may change the chair structure, may cause a safety hazard, including an increased risk of a tip-over, and will void the warranty.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

F. ENVIRONMENTAL FACTORS

WARNING

1. Riding your TiLite wheelchair on wet, icy or other slick surfaces increases the risk of losing control of the wheelchair or tipping over. Use extra care if you must ride your chair on any such surface. If you have any doubt about your ability to negotiate a particular surface, ALWAYS ask for assistance.
2. Titanium does not rust or corrode. Aluminum does not rust, but it will corrode. However, contact with water or excess moisture may still damage parts or components of your TiLite wheelchair that are made from other materials and could cause such parts or components to fail. Therefore, DO NOT:
 - a. use your chair in a shower, pool or other body of water,
 - b. leave your chair in a damp location, or
 - c. fail to dry your chair as soon as you can if it gets wet or if you use water to clean it.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

G. STREET USE

WARNING

1. As a wheelchair rider, you MUST obey all traffic rules pertaining to pedestrians (use of crosswalks, etc.). Most states do not permit wheelchairs to be ridden on public roads, streets or highways (i.e., as one would drive a car), so you should not do so without first consulting the traffic laws in your own state. Even if legal, riding your wheelchair on public roads, streets or highways is extremely dangerous and is not recommended.
2. At all times when riding your wheelchair in public areas (sidewalks, crosswalks, parking lots, etc.), be very alert to the danger of motor vehicles.
3. At night, or when lighting is poor, use reflective tape on your chair and clothing.
4. Due to your low position, it may be hard for drivers to see you. This is particularly true in situations where drivers may be driving in reverse, such as parking lots. If at all possible, make eye contact with drivers before you go forward. When in doubt, yield until you are sure it is safe, even if you have the right-of-way.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

H. TERRAIN

WARNING

Your TiLite wheelchair is designed for riding over firm, relatively smooth surfaces such as concrete and asphalt outdoors and indoor flooring (wood, tile, etc.) and carpeting. Your TiLite wheelchair is NOT designed for riding over sand, loose soil or rough terrain. Do NOT operate your chair in such terrain. You may damage the wheels or axles or loosen fasteners of your chair.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

I. MOTOR VEHICLE SAFETY

WARNING

TiLite wheelchairs are NOT designed to be used for seating in a motor vehicle, and TiLite wheelchairs do NOT meet Federal standards for motor vehicle seating.

1. NEVER sit in your chair while in any type of moving vehicle (bus, automobile, van, truck, boat, train, etc.). In an accident or sudden stop, you may be thrown from the chair. In an accident or sudden stop, a wheelchair seat belt will NOT prevent injuries and may, in fact, cause injuries.
2. ALWAYS transfer to an approved vehicle seat before the vehicle begins moving.
3. ALWAYS secure yourself in the approved vehicle seat using the proper seating restraints (in a motor vehicle, lap/shoulder belts; in a plane, lap belts, etc.).
4. NEVER transport your chair in the front seat of a vehicle. Movements of the vehicle may cause the chair to shift and interfere with the driver's ability to control the vehicle.
5. When transporting your chair in a moving vehicle, ALWAYS secure your chair so that it cannot roll or shift. In most cases, stowing it in the trunk is the safest alternative.
6. NEVER use any chair that has been involved in a motor vehicle accident. A wheelchair that has been involved in a motor vehicle accident may be damaged in ways that are not readily apparent and which could cause the chair to fail in use.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

J. WEIGHT TRAINING

WARNING

NEVER use your TiLite wheelchair for weight training. When your chair was set up with the assistance of your health care advisor, your center of gravity was determined based on your weight, the configuration of your chair and your abilities. If you engage in weight training activities in your chair, you are altering the total weight supported by your chair and the distribution of that weight. The center of gravity of your chair may not be appropriate with the additional weight or with the different distribution of weight, which may cause the chair to tip over. The additional weight could exceed the weight limit for the chair and damage the chair. If you intend to engage in weight training, TiLite recommends that you utilize weight training equipment with built-in seating and that you transfer to that seating rather than using your chair.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

K. OBTAINING ASSISTANCE

WARNING

For The Wheelchair User:

ALWAYS make sure that each person who assists you reads and understands this entire Manual, especially the Warnings in Chapter 1.

For Attendants/Assistants:

1. ALWAYS work with the user's health care advisor to learn safe methods to assist the wheelchair user and to determine which methods are best suited to your abilities and those of the user.
2. ALWAYS communicate to the user what you plan to do before you do it and explain what you expect the user to do while you are taking such action. This will put the user at ease and reduce the risk of an accident due to a miscommunication.
3. ALWAYS use good posture and proper body mechanics in order to avoid injury to your back.
4. When you lift or support the user or tilt the chair, ALWAYS bend your knees slightly and keep your back as upright and straight as you can.
5. Wheelchair push handles are designed to provide a secure location for an attendant to grip the rear of the wheelchair to prevent a fall or tip-over. ALWAYS make sure the wheelchair has push handles and ALWAYS use them. REGULARLY check to make sure the push handle grips are securely seated on the back canes so they will not rotate or slip off.
6. If you are going to tilt the chair backward, ALWAYS remind the user to lean back.
7. If you are going to descend a curb or single step, ALWAYS lower the chair slowly in one easy movement. NEVER let the chair drop the last few inches to the ground. This may damage the chair or injure the user.

CHAPTER 1: WARNINGS

8. ALWAYS become familiar with the user's wheelchair and all of its parts and components. In particular, be very aware of any removable parts. Removable parts must NEVER be used for a hand-hold or lifting supports because they may inadvertently release, resulting in possible injury to the user and/or assistant.
9. Anti-tippers may present a tripping hazard to the attendant. To avoid tripping over the anti-tippers, unlock and rotate anti-tip tubes up, out of the way. However, if you must leave the user unattended, even for a moment, ALWAYS rotate the anti-tippers back into the down position and lock the rear wheels using the wheel locks. This will reduce the risk of a tip-over or loss of control of the chair.
10. When you are learning a new assistance technique, ALWAYS have an experienced attendant help you before attempting it on your own.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

L. STANDING ON YOUR CHAIR

WARNING

Your TiLite wheelchair has been designed for use as a wheelchair, not as a step ladder. NEVER stand on your TiLite wheelchair.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

WARNINGS FOR SAFE USE OF YOUR WHEELCHAIR

A. LEARNING TO DO A “WHEELIE”

WARNING

DO NOT attempt to perform a “wheelie” in your wheelchair because of the dangerous nature of this kind of maneuver.

TiLite recognizes that some wheelchair users will ignore this warning. If you should choose to ignore this warning, you should follow these steps to help learn to do a “wheelie” as safely as possible (but doing a “wheelie” is never completely safe and TiLite assumes no responsibility for any injury you may sustain as a result of doing a “wheelie”):

1. Read and follow the Warning for “WHEELIES” on page 9 of this Manual.
2. NEVER attempt to learn how to do a wheelie without the assistance of someone strong enough to catch you should you start to tip over (a “spotter”). Your spotter should read and be completely familiar with this entire Manual, especially this Warning and the Warning for “WHEELIES” on page 9 of this Manual.
3. Instruct your spotter to stand at the rear of your chair. Your spotter must be agile enough to move with you and your chair to prevent a tip-over.
4. Instruct your spotter to keep his or her hands BENEATH the push handles or backrest rigidizer bar so that he or she is ready to catch you if you exceed the balance point of the rear wheels and start to tip over backward.
5. When your spotter is in position and is ready, place your hands on the forward portion of the handrims. Using the handrims, make a quick BACKWARD movement of the rear wheels, quickly followed by a hard FORWARD thrust. This will tilt the chair up on the balance point of the rear wheels. DO NOT remove your hands from the handrims after either the backward movement or forward thrust so that you can continue to manipulate the rear wheels to maintain your balance on the two rear wheels.
6. Use SMALL movements of the handrims to maintain your balance on the two rear wheels.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

B. CLIMBING A CURB OR SINGLE STEP

WARNING

1. NEVER attempt to negotiate a curb or single step without assistance.
2. Instruct your assistant to stand at the rear of your wheelchair, with the front of the wheelchair facing the obstacle. NEVER attempt to negotiate any such obstacle backward.
3. Instruct your assistant to tilt the chair up on the rear wheels so that the front casters clear the curb or step.

4. Instruct your assistant to slowly move the chair forward and to gently lower the front casters to the upper level as soon as you are sure that they are beyond the edge of the curb or step.
5. Instruct your assistant to continue to roll the chair forward until the rear wheels contact the face of the curb or step.
6. Instruct your assistant to lift and roll the rear wheels up to the upper level.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

C. CLIMBING A FLIGHT OF STAIRS

WARNING

TiLite does NOT recommend that its wheelchairs be transported up stairways with the user in the wheelchair.

However, TiLite recognizes that wheelchair users may, on occasion, have no other choice. Only if you have no alternative, you should follow these steps to climb up a flight of stairs.

1. NEVER attempt to negotiate more than one step unless you have two (2) able-bodied adult assistants.
2. ALWAYS position the chair and rider facing away from the stairs, with one assistant at the rear (facing away from the stairs) and one at the front of the chair (facing the rider).
3. The assistant at the rear of the chair is in control of this procedure. He or she must tilt the chair back to its balance point on the rear wheels. NEVER attempt to lift a wheelchair by lifting on any removable (detachable) parts, including upholstery and removable push handles or push handle grips.
4. The second assistant at the front must firmly grasp a non-detachable part of the front frame (but NOT swing-away hangers) with both hands and lift the chair up and over one stair at a time.
5. Each assistant then carefully moves up to the next stair.
6. Repeat steps 1 through 5 for each stair, until you reach the landing.
7. When you reach the landing, the assistants should roll the chair backward on the two rear wheels until the front casters have cleared the last step, at which point the assistants can gently lower the front casters to the landing.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

D. DESCENDING A CURB OR SINGLE STEP

WARNING

1. NEVER attempt to negotiate a curb or single step without assistance.
2. When you are still several feet from the edge of the curb or step, instruct your assistant to stand at the rear of your wheelchair and turn it around so you are facing AWAY from the obstacle.
3. NEVER attempt to negotiate any such obstacle facing forward.
4. Instruct your assistant to carefully step backwards, pulling the chair backwards, until he or she is off the curb or stair and standing on the lower level. The assistant should watch his or her step over his or her shoulder when backing up in this manner.
5. Instruct your assistant to carefully pull the chair backward until the rear wheels reach the edge of the curb or step, and to then allow the rear wheels to slowly roll down to the lower level.
6. Instruct your assistant that, when the rear wheels are safely on the lower level, he or she may then tilt the chair backward to the balance point of the rear wheels, thereby raising the front casters off the upper level.
7. Instruct your assistant to slowly roll the chair backward on the rear wheels, taking small steps until the front casters have cleared the step or curb and, when clear, to gently lower the front casters to the ground at the lower level.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

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E. DESCENDING A FLIGHT OF STAIRS

WARNING

TiLite does NOT recommend that its wheelchairs be transported down stairways with the user in the wheelchair.

However, TiLite recognizes that wheelchair users may, on occasion, have no other choice. Only if you have no alternative, you should follow these steps to descend a flight of stairs.

1. NEVER attempt to negotiate more than one step unless you have two (2) able-bodied adult assistants.
2. ALWAYS position the chair and rider facing down the stairs, with one assistant at the rear (facing down the stairs) and one at the front of the chair (facing the rider).
3. The assistant at the rear of the chair is in control of this procedure. He or she must tilt the chair back to its balance point on the rear wheels and roll it to the edge of the first step. NEVER attempt to lift a wheelchair by lifting on any removable (detachable) parts, including upholstery and removable push handles or push handle grips.
4. The second assistant at the front must stand at the third step from the top and firmly grasp a non-detachable part of the front frame (but NOT swing-away hangers) with both hands. The second assistant must lower the chair one stair at a time by letting the rear wheels roll over the stair edge. Each assistant then carefully moves down to the next stair.
5. Repeat steps 1 through 4 for each stair, until you reach the ground level.
6. When you reach the ground level, the first assistant should carefully lower the front casters to the ground.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

WARNINGS REGARDING FALLING AND TIPPING OVER

A. CENTER OF GRAVITY—STABILITY AND BALANCE



WARNING

Most falls or tip-overs occur when you go beyond the center of gravity of you and your wheelchair. TiLite wheelchairs are designed to remain stable and upright in normal daily use and activities so long as you do not exceed the center of gravity. The most stable setup is with the rear wheels in the most rearward position on the chair. Anti-tips will help prevent the chair from tipping over backwards.

Every movement you make in your chair, and the rapidity with which you move, will have an affect on your center of gravity. The more you shift your body weight and the greater the speed at which you shift it, the greater the impact on your center of gravity in your chair.

There is a point where your wheelchair will tip forward or backward or to the side—which is a function of your center of gravity in the chair—its center of balance and stability. The type of chair, the setup of your chair, the options on your chair and the changes you make to the setup or options will all affect the center of gravity and therefore the stability of the chair. As the stability decreases, the risk of a fall or tip-over increases.

Set forth below is a list of various types of adjustments that you may be able to make to your wheelchair, depending on the

wheelchair model you own, and a brief description of how those adjustments will affect your center of gravity:

1. The position of the rear wheels is the most significant factor affecting your center of gravity. The more you move the rear wheels forward, the more likely your chair will tip over backward.
2. The distance between the rear wheels. The less distance between the rear wheels, the greater the likelihood your chair will tip over to the side.
3. The amount of rear wheel camber. The less camber, the greater the likelihood your chair will tip over to the side.
4. The height of your seat. As you raise the height of your seat, you raise your center of gravity and increase the likelihood of all types of tip-overs.
5. The angle of your seat. As you increase the angle of your seat (relative to the floor), your position in the chair is shifted toward the rear of the chair, increasing the likelihood your chair will tip over backward.
6. The angle of your backrest. As you increase the angle of your backrest (relative to the seat), your position in the chair is shifted toward the rear of the chair, increasing the likelihood your chair will tip over backward.
7. The height of your seat back. As you lower the height of your seat back, you make it easier to lean back in your chair, which in turn shifts your center of gravity rearward and increases the likelihood your chair will tip over backward.
8. The position of your front casters. As you move your front casters rearward on the frame (toward the rear wheels), you increase the likelihood your chair will tip over forward.

Other factors will affect your center of gravity:

1. A change in your body position, posture or weight distribution. For example, if you lean forward you shift the center of gravity forward and increase the likelihood of tipping over forward.
2. Riding your chair on a ramp or slope. On an up-slope, your weight shifts to the rear and a backward tip-over becomes more likely. On a down-slope, your weight shifts to the front of the chair and a forward tip-over becomes more likely.
3. The use of a backpack or other options, and the amount of weight added by those options. For example, carrying a lot of weight in a backpack will shift the center of gravity rearward and increase the likelihood of tipping over backward. However, using a TiLite seat pouch beneath the seat sling to carry heavier items will lower your center of gravity and reduce, but not eliminate, your risk of a tip over.

In order to reduce the risk of a tip-over, you should:

1. CONSULT your doctor, nurse or therapist to find out what axle and caster position and other chair configuration options are best for you.
2. CONSULT your authorized TiLite dealer BEFORE you modify or adjust your wheelchair. Often, an adjustment you wish to make can be offset by another that you have not considered. For example, you may want to adjust the back angle rearward, which will increase the likelihood of a rear tip-over. You might not think you could counteract this tendency by moving the rear wheels backward. Your authorized TiLite dealer will be able to give you expert, personalized advice in such matters. See “Changing/Adjusting Your Wheelchair” on page 2 of this Manual.
3. ALWAYS have someone assist you until you learn your chair’s balance points and are completely comfortable in your ability to operate your chair under all conditions so as to avoid tip-overs.
4. ALWAYS use anti-tippers. See “Changing/Adjusting Your Wheel Chair” on page 2 of this Manual.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

B. TRANSFERRING IN AND OUT OF YOUR WHEELCHAIR

WARNING

Transferring in or out of your wheelchair is one of the most dangerous things you can attempt relating to your wheelchair. It requires good balance, agility and upper body conditioning. At some point in every transfer, there is no wheelchair seat beneath you and the seat, bed, etc. to or from which you are transferring is not beneath you either.

Important rules that will help to reduce the risk of a fall during a transfer are discussed below:

1. ALWAYS work with your health care advisor to learn safe transfer methods.
2. ALWAYS ask your health care advisor to teach you proper body positioning during a transfer and how to support yourself during a transfer.

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3. ALWAYS have someone assist you when you transfer until you have learned how to transfer safely and have developed the upper body strength and coordination to transfer safely.
4. ALWAYS move your chair as close as you can to the seat (bed, etc.) to which you are transferring. If possible, use a transfer board.
5. ALWAYS lock the rear wheels using wheel locks before you transfer. This keeps the rear wheels from rolling. If your wheelchair is equipped with caster pin locks, ALWAYS lock them before you transfer. Caster pin locks keep the front casters from rotating (but not from rolling). NOTE: Wheel locks and caster pin locks will NOT keep your chair from sliding away from you or tipping.
6. If your wheels have pneumatic (inflatable) tires, ALWAYS make sure to keep the tires properly inflated at all times. The wheel locks may slip if the tire pressure is low, which may cause the chair to roll unexpectedly during a transfer.
7. ALWAYS rotate the front casters as far forward as possible and turn them to the seat (bed, etc.) to which you are transferring.
8. ALWAYS remove the wheelchair armrests, or swing them out of the way, so they do not impede your movement during the transfer.
9. If possible, ALWAYS remove the footrests, or swing them out of the way, to ensure your feet do not get caught between the footrests. TiLite strongly recommends that you place your feet on the floor when you are transferring to or from your chair.
10. NEVER put your weight on the footrests when you are transferring to or from your chair because this may cause the chair to tip over and/or roll away.
11. When transferring into your chair, ALWAYS transfer as far back onto your seat as possible in order to reduce the risk that the chair will tip over or move away from you causing you to fall.
12. If possible, ALWAYS try to avoid falling into your chair uncontrollably when transferring into your chair. This places undue stress on your chair's components, and if your chair does start to move or tip you will not be ready to regain control.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

C. DRESSING/UNDRESSING IN YOUR CHAIR

WARNING

When you engage in activities while seated in your chair such as dressing or undressing or changing your clothes, your weight will shift. Since your attention may be directed to the activity in question rather than maintaining your balance, your risk of falling or tipping over is increased. To reduce this risk, get dressed or undressed or change your clothes while seated in a regular chair or on a bed. If you must get dressed or undressed or change your clothes while seated in your wheelchair:

1. ALWAYS rotate the front casters so they are trailing forward. This makes the chair more stable. NOTE: To get your front casters to trail forward, first move your chair forward and, second, back up. By moving backward, your front casters will rotate and trail forward.
2. ALWAYS lock your anti-tippers in the down position so the risk of a backward tip-over is minimized. If your chair does not have anti-tippers, back it up against a wall and lock both rear wheels using your wheel locks.
3. If your chair is equipped with caster pin locks, ALWAYS engage them.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

D. BENDING/LEANING/REACHING

WARNING

When you bend, reach or lean from your chair you will affect the center of balance of your chair. Therefore, bending, reaching or leaning may cause you to fall or tip over. In order to avoid falling or tipping over, you must determine your particular safety limitations given the configuration of your chair and your body weight and type. To do this, practice bending, reaching and leaning activities (and various combinations of such activities) under the supervision of your health care advisor. Do this BEFORE attempting active use of your chair. The following will help you avoid falling or tipping over when bending, reaching or leaning from your chair:

1. NEVER bend, reach or lean in a way that requires you to move forward in your seat.
2. ALWAYS keep your buttocks in contact with the backrest and the seat cushion when bending, reaching or leaning.
3. NEVER shift your weight in the same direction you are bending, reaching or leaning.

4. NEVER reach or lean to the rear unless your chair has anti-tippers locked in place.
5. NEVER reach with both hands. By keeping one hand free, you may be able to catch yourself to prevent a fall if the chair starts to tip.
6. NEVER reach or lean over the top of the seat back. If you do so you may damage the seat back tubes, which could cause you to fall.
7. ALWAYS move your chair as close as possible to the object you are trying to reach.
8. NEVER shift your weight to the footrests.
9. NEVER try to pick up an object from the floor by reaching down between your knees. You are less likely to tip over if you reach to the side of your chair when picking up an object on the floor.
10. DO NOT lock the rear wheels when bending, reaching or leaning backward. Locking the rear wheels creates a tip point and makes falling or tipping over more likely.
11. When bending or leaning, ALWAYS grasp one rear wheel with one hand. This will help to prevent a fall if the chair starts to tip over.
12. ALWAYS rotate the front casters until they are trailing forward. This will make the chair more stable. NOTE: To get your front casters to trail forward, first move your chair forward past the object you want to reach and, second, back up alongside the object. By moving backward, your front casters will rotate and trail forward.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

E. MOVING BACKWARD

WARNING

When you propel backward, you will tend to shift your weight backward, making a tip-over more likely. In addition, you may be unable to see an obstruction that could block one of your wheels and cause a tip-over. Therefore, use extreme caution when propelling backward. If you must propel backward:

1. ALWAYS propel slowly with smooth, short strokes.
2. MAKE frequent stops to check for obstructions in your path.
3. If your chair has anti-tippers, ALWAYS make sure to lock them in place.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

F. WHEELIES

WARNING

Balancing in your chair on just the rear wheels with the front casters in the air is known as doing a “wheelie.” DOING A WHEELIE IS DANGEROUS. A fall or tip-over is very likely. However, if you can do a “wheelie” safely, you may be able to overcome curbs and obstacles that would otherwise impede you.

NEVER attempt to learn to do a “wheelie” without first consulting your health care advisor to make sure you are a good candidate to learn to do a “wheelie.” NEVER attempt to learn to do a “wheelie” without an assistant that can catch you if you should happen to start to fall. NEVER attempt to learn to do a “wheelie” unless you are a skilled rider of this chair. See “Learning to do a ‘Wheelie’” on page 4 of this Manual.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

G. OBSTACLES

WARNING

When riding outdoors, uneven pavement, sidewalk irregularities, potholes and other obstacles and road hazards can be dangerous. When riding indoors, doorway thresholds, plush carpeting and other obstacles can be dangerous. In order to avoid these risks:

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1. ALWAYS be alert for such dangers.
2. ALWAYS scan the area ahead of you as you ride.
3. REMOVE or cover threshold strips between rooms.
4. INSTALL ramps at entry or exit doors from your residence. Make sure the transition from such ramps to the pavement or other surface is smooth and does not have an abrupt drop-off.
5. ALWAYS make sure the floors where you live and work are level.
6. KEEP all floors where you live and work free of obstacles and hazards.
7. When riding UP and over an obstacle, lean your upper body slightly FORWARD.
8. When riding DOWN from a higher to a lower level, press your upper body BACKWARD lightly.
9. ALWAYS keep both hands on the handrims as you go over an obstacle.
10. NEVER push or pull on any object, such as a door knob or door jamb or furniture, in order to propel your chair.
11. If your chair has anti-tippers, lock them in place before you go UP over an obstacle.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

H. CURBS/STEPS

WARNING

Curbs and steps are extremely dangerous obstacles.

1. NEVER attempt to go up or down a curb or step without an assistant UNLESS:
 - a. you are a very skilled rider of your chair; and
 - b. you have previously learned to safely do a “wheelie” in your chair; and
 - c. you are sure you have the strength and balance to control your chair during any such maneuver.
2. ALWAYS unlock and rotate anti-tippers up and out of the way so they do not prevent you from executing this maneuver.
3. Even if you are a highly skilled rider, NEVER attempt to climb or descend a curb or step more than 4” high.
4. ALWAYS go straight up or down a curb or step. NEVER climb or descend at an angle.
5. ALWAYS be aware that the impact of dropping down from a curb or step can damage your chair or cause components to become loose. If you perform such maneuvers, inspect your chair more frequently.

If you are not highly skilled at tilting the chair, or the step or the curb is more than 4” high, ALWAYS have an assistant help you negotiate curbs and steps. Your assistant must first read the Warnings contained in this Manual in their entirety, especially the sections titled “Climbing a Curb or Single Step”, “Climbing a Flight of Stairs”, “Descending a Curb or Single Step” and “Descending a Flight of Stairs” on pages 4-6.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

I. HILLS/SLOPES/RAMPS

WARNING

The center of balance of your chair is affected by the slope of the surface over which you are riding. Because your center of balance will be affected, your chair will be less stable when it is at an angle. This is especially true when riding on a slope sideways. Furthermore, do not assume anti-tippers will prevent a fall or tip-over under these conditions. The following rules may help to avoid a fall or tip-over:

1. ALWAYS go up or down a slope, hill or ramp as straight as possible. If you try to cut the corner, you will be traversing the slope, hill or ramp sideways to the slope and your risk of tipping over sideways will increase.
2. NEVER use your chair on a slope greater than 10%—a slope with an elevation greater than one foot in height for every ten feet in length.
3. NEVER stop on a steep slope. If you stop on a steep slope, you may not be able to maintain control of the chair.
4. NEVER use rear wheel locks as a brake to slow or stop your chair. Wheel locks are NOT brakes. Doing so will most likely cause the chair to veer out of control.
5. NEVER try to turn around or change direction when going up or down a slope.
6. ALWAYS stay in the CENTER of a ramp.
7. NEVER start up or down a ramp unless you are certain the ramp is wide enough for its entire length so your wheels will not fall off the edge.

8. In order to control your speed, ALWAYS keep pressure with your hands on the handrims when going down a hill, slope or ramp. DO NOT go too fast. Excessive speed may cause you to lose control of your chair, or it may cause your casters to flutter which can cause a fall or tip-over.
9. ALWAYS lean or press your body in the UPHILL direction. This will help shift your weight to counteract the change in the center of balance caused by the hill, slope or ramp.
10. ALWAYS ask for assistance if you have any concerns at all about your ability to maintain safe control of your chair on a hill, slope or ramp.
11. ALWAYS be alert for wet or slippery conditions or surfaces, any changes in the grade of the slope (such as a lip, bump or depression), and any drop-off or lip at the bottom of a slope. For example, even a 3/4 inch lip at the bottom of a ramp can cause the front casters to stop and cause the chair to tip forward.
12. Ramps at your home and work must meet all legal requirements for your area, including building codes. If you are having a ramp installed at your home or work, ALWAYS make sure it complies with local legal requirements.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

J. STAIRS

WARNING

NEVER use your wheelchair on stairs without the assistance of at least two (2) able-bodied assistants or attendants and ONLY AFTER such assistants or attendants have read and understand the Warnings “Climbing a Flight of Stairs” and “Descending a Flight of Stairs” on pages 5-6.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

K. ESCALATORS

WARNING

NEVER use your wheelchair on an escalator, not even with an assistant or attendant.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

L. ASSISTANTS AND ATTENDANTS

WARNING

Before you permit any person to assist you in any aspect of riding your wheelchair, you MUST require that the assistant or attendant fully read, understand and follow the Warnings contained in this Manual.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

WARNINGS REGARDING COMPONENTS AND OPTIONS

A. ANTI-TIPPERS

WARNING

Anti-tippers are an optional accessory that can help to prevent your chair from tipping over backward. However, even the use of anti-tippers will not guarantee that your chair will not tip over backward. Also, they will not prevent your chair from tipping over sideways or forward.

TiLite strongly recommends you use anti-tippers with your wheelchair. This is most especially true:

1. if you are a new wheelchair rider; or
2. even if you are an experienced rider but you are switching to a new wheelchair, regardless of whether the prior chair was as lightweight as your TiLite; or

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3. even if you are an experienced rider in your TiLite chair but you have made any modifications or adjustments to the configuration of your chair, such as changing the position of the front or rear wheels, changing the seat height, changing the camber or changing the seat or back angle. Any modification or change to your chair can make it easier to tip over and you should use anti-tippers until you have adapted to the modified configuration; or
4. even if you are an experienced rider in your TiLite chair but your physical condition has changed.

In order to properly use your anti-tippers, please follow the following rules:

1. Your anti-tippers should be between 1-1/2 inches to 2 inches off the ground when they are locked in place in the “down” position.
2. If your anti-tippers are set too LOW, they may “catch” on obstacles that you can expect to encounter in normal wheelchair use. If this happens, you may tip over and fall.
3. If your anti-tippers are set too HIGH, their ability to prevent a backward tip-over will be limited and they may not prevent a tip-over at all.
4. ALWAYS keep your anti-tippers locked in place in the “down” position unless:
 - a. You have an attendant (but your attendant must rotate the anti-tippers into the “down” position whenever he or she leaves you unattended in your chair, even for a moment), or
 - b. You have to climb or descend a curb or step or overcome an obstacle. Even if this is the case, only unlock the anti-tippers if you can safely climb or descend the curb or step or overcome the obstacle and make sure the anti-tippers are locked in the “up” position.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

B. SEAT SLINGS/CUSHIONS

WARNING

TiLite seat slings (which are standard equipment) and foam cushions (which are optional equipment) are not designed for the relief of pressure. If you have pressure sores, or are at risk to get them, you may need a special pressure-relieving cushion or other seating system. If you have pressure sores, consult with your doctor immediately. If you are at risk to develop pressure sores or do not know if you are at risk, consult with your doctor as to the most appropriate seating system for you. TiLite has NO information about your medical condition and assumes no responsibility should you choose the wrong seating system for your medical needs. You MUST regularly check your seat sling while you are seated in your wheelchair to ensure that the tension is properly adjusted so that your weight does not cause the seat sling to touch the cross tubes beneath the seat sling.

TiLite also offers a limited number of seat cushions manufactured by other manufacturers. However, the selection of any of these products is a decision to be made by you and your doctor or therapist. TiLite has NO information about your medical condition and assumes no responsibility should you choose the wrong seating system for your medical needs.

If you ignore these Warnings, you may develop pressure sores, which can be a life-threatening complication from wheelchair use.

C. UPHOLSTERY FABRIC

WARNING

1. If the fabric of your seat sling or seat back becomes worn or torn, ALWAYS replace it immediately. If you fail to do so, the seat sling or seat back upholstery may sag or fail.
2. The upholstery on your chair is flame retardant. Laundering or allowing the upholstery to become wet repeatedly will reduce the flame retardant qualities of the fabric.
3. DO NOT “drop down” into your chair. By placing undue force on the upholstery, you will weaken the fabric and it may become worn sooner than it otherwise would. If you do “drop down” into your chair on a regular basis, inspect and replace the upholstery more often.
4. The upholstery on your chair will weaken with age and use. Regularly inspect your upholstery for fraying, thin spots, or stretching of the fabric at the rivet holes.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

D. SEATING SYSTEMS

WARNING

TiLite does not sell any seating systems specifically designed for use with TiLite wheelchairs, nor does TiLite recommend any particular seating system. If your doctor or therapist recommends that you use a seating system with your TiLite chair, always consult with an authorized TiLite dealer to determine if the recommended seating system is compatible with your TiLite chair. In addition, the following warnings must be followed:

1. If you add a seating system to your TiLite chair, you will affect its center of balance. This may cause the chair to tip over. Therefore, **NEVER** install a new seating system on your own. Instead, have it installed by an authorized TiLite dealer who can assist you in making other necessary adjustments to ensure your center of balance is maintained as closely as possible to what you are used to.
2. As with other changes to the configuration of your chair that affect its center of balance, if you add a seating system to your TiLite chair, **ALWAYS** use anti-tippers until you have fully learned to control your chair in its new configuration.
3. Keep in mind that adding a seating system also may inhibit the proper operation of a folding back wheelchair.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

E. POSITIONING OR SEAT BELTS

WARNING

TiLite hook & loop, non-padded seat belts and Bodypoint® non-padded hip belts, both of which are optional equipment, are intended **ONLY** for use as a positioning aid for simple positioning needs, such as posterior pelvic tilt. These belts will not be sufficient for persons with more involved positioning needs. Only your health care advisor can determine the proper positioning products for your situation. If used improperly, positioning or seat belts can cause severe injury or even death. If your health care advisor has instructed you to use positioning or seat belts, make sure they instruct you on the proper usage of such belts, and such professional should supervise your use of such belts to ensure you can use them safely.

1. Belts must fit snugly in order to work properly. However, they must not be so snug they interfere with your breathing. Your health care advisor should be able to slide his or her open hand flat between the belt and your body.
2. Make sure you do not slide down in your chair while wearing a belt. If this should happen, you may suffer chest compression or be suffocated due to pressure from the belt.
3. Do not use a positioning or seat belt unless you are capable of removing the belts easily in an emergency. If you cannot do this, consult with your health care advisor for other options to help with your posture.
4. There are devices that help to keep you from sliding down in the seat of your wheelchair, such as a pelvic wedge. Consult with your health care advisor to find out if you need to use such a device in conjunction with positioning or seat belts to mitigate the risks described above.
5. **NEVER** use positioning or seat belts as a motor vehicle restraint. These types of belts are not intended to protect the wheelchair rider from the forces involved in a vehicle accident, and they may, in fact, cause you to be injured. TiLite recommends wheelchair users **ALWAYS** transfer to appropriate motor vehicle seating when traveling in a motor vehicle.

Note to Attendants/Assistants: **NEVER** use positioning or seat belts as a patient restraint (a restraint requires a doctor's order) or on a wheelchair user who is comatose or agitated.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

F. ARMRESTS

WARNING

Armrests are optional equipment on TiLite wheelchairs. TiLite armrests are detachable and are not designed to support the weight of your wheelchair. Therefore, **NEVER** lift your chair by its armrests. If you do, they may detach, causing you to drop the chair, or you may break the armrests or cause them to become loose and break at a later time unexpectedly. **ALWAYS** lift your chair by grasping the non-detachable parts of the main frame (not including the swing-away hangers).

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

CHAPTER 1: WARNINGS

G. FOOTRESTS/HANGERS

WARNING

Certain footrests are standard equipment with TiLite wheelchairs. Other, more specialized footrests are optional equipment. The following rules should be followed with respect to footrests:

1. ALWAYS allow for AT LEAST 2 inches of clearance between the ground and the lowest point on the underside of your footrests. If you set your footrests too LOW, they may “catch” on obstacles you can expect to find in normal use of your chair. If your footrests “catch,” the chair may stop and tip forward.
2. NEVER lift your wheelchair by grasping the footrests or the swing-away hangers. Footrests and swing-away hangers are detachable and are not designed to support the weight of your chair. If you do, the footrests or the swing-away hangers may detach, causing you to drop the chair, or you may break the footrests or the swing-away hangers or cause them to become loose and break at a later time unexpectedly.
3. READ and understand the warnings under “Transferring In and Out of Your Wheelchair” on pages 7-8 of this Manual. There is important information in that section regarding your footrests and transfers.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

H. REAR WHEELS

WARNING

Rear wheels are standard components on your wheelchair. The positioning of the rear wheels is a critical factor in locating the center of balance of your chair. Any change to your rear wheel position will change your center of balance. Therefore, use extreme caution when making any adjustment to the position of your rear wheels.

1. As you move the rear wheels and axles forward on your chair, you shift the center of balance FORWARD. This means it is easier for your chair to tip over backward.
2. As you move the rear wheels and axles backward on your chair, you shift the center of balance BACKWARD. This means your chair is less likely to tip-over backward. However, even if your rear wheels and axles are set as far back as possible, the chair can still tip-over backward.
3. ALWAYS consult with your health care provider to determine the best rear wheel/axle setup for you based on your weight and body type and your abilities to control the chair.
4. Once you and your health care provider have determined the best rear wheel/axle setup for you, NEVER change the setup UNLESS you are sure you are not at risk to tip over.
5. If you do change the rear wheel/axle position, you MUST adjust the positioning of the rear wheel locks to ensure they work properly to lock the rear wheels. When relocating the rear wheel locks, make sure the locking arm indents the tire by at least 1/8th inch when the wheel lock is in the “locked” position.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

I. QUICK-RELEASE AXLES

WARNING

Stainless quick-release axles are a standard TiLite wheelchair component. Other axle types are optional equipment. Quick-release axles are designed to make your rear wheels easy to remove quickly. However, if not used properly, they can be dangerous.

NEVER use your chair UNLESS you are sure that both quick-release rear axles are locked into place in the axle receiver. If an axle is not fully locked into place, the rear wheel may come off during use of the chair and cause you to fall. You can *tell when the axle is locked into place because the quick-release button in the center of the axle will pop out fully. It is also a good idea to pull on the wheel to double-check that the axle is securely locked as a final precaution.*

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

J. PNEUMATIC TIRES

WARNING

Pneumatic rear tires are standard components on TiLite wheelchairs. Other types of rear tires are optional equipment. Pneumatic front tires are optional equipment on some TiLite wheelchairs.

With pneumatic tires, it is important to maintain the proper inflation. Maintaining the proper inflation will extend the life of your tires and will reduce the rolling resistance of your chair, making it easier to use.

1. Check your tires WEEKLY for proper inflation. The correct inflation level is imprinted on the tire sidewall.
2. DO NOT use your chair if any of the pneumatic tires are under-inflated or over-inflated.
3. If any tire is under-inflated, the chair may tend to veer to one side, which could cause you to lose control of the chair.
4. If a rear tire is under-inflated, the wheel lock for that wheel may not work properly and may slip, thereby allowing the wheel to turn unexpectedly.
5. An over-inflated tire may burst, thereby causing a loss of control of the chair.
6. ALWAYS have pneumatic tire inner tubes replaced by an authorized TiLite dealer.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

K. REAR WHEEL LOCKS

WARNING

Standard rear wheel locks are available on all TiLite wheelchairs as a no-charge option. Scissor locks and uni-locks are optional equipment. TiLite wheel locks are NOT designed to slow or stop a moving wheelchair - they are NOT brakes. Wheel locks are ONLY designed to keep the rear wheels from rolling when your chair is at a complete stop.

1. NEVER attempt to “brake” by using rear wheel locks to try to slow or stop your chair when it is moving. If you do so, you will lose control of the chair and may fall.
2. ALWAYS make sure the locking arm of your wheel lock embeds into the tire at least 1/8th inch when in the locked position. If the wheel lock does not properly embed in the tire, the wheel lock may not work and the chair may roll unexpectedly.
3. ALWAYS maintain proper tire pressure. If a rear tire is under-inflated, the wheel lock for that wheel may not work properly and may slip, thereby allowing the wheel to turn unexpectedly.
4. When you transfer to or from your chair, ALWAYS set both rear wheel locks to prevent the rear wheels from rolling.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

L. CASTER PIN LOCKS

WARNING

Caster pin locks are an optional accessory for TiLite wheelchairs. Caster pin locks are not designed to slow or stop a moving wheelchair - they do not prevent the casters from turning. Caster pin locks are ONLY designed to keep the front casters from rotating within the caster barrel when your chair is at a complete stop. In other words, properly engaged caster pin locks will not stop the chair from rolling, but will stop it from turning.

1. ALWAYS make sure the locking pin on your caster pin locks fully engages with the front casters. If the caster pin lock does not properly engage, the caster pin lock may not work properly and the front casters may rotate unexpectedly causing the chair to turn unexpectedly.
2. When you transfer to or from your chair, ALWAYS set both rear wheel locks and both caster pin locks to prevent the rear wheels from rolling and front casters from rotating.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

CHAPTER 1: WARNINGS

M. PUSH HANDLES

WARNING

Push handles are optional equipment on TiLite wheelchairs. Push handles provide secure points for an attendant or assistant to hold the rear of the chair to prevent a fall or tip-over. If you have an attendant or assistant, you should have push handles installed on your chair by TiLite. TiLite offers push handles that are integral to the back canes and bolt-on push handles. TiLite recommends that you do NOT use non-TiLite bolt-on push handles because they will damage the backrest of your TiLite chair. Your attendant or assistant should regularly check the push handle grips to make sure they fit securely and will not rotate or slip off. Push handles should NEVER be used to lift the chair or pull the chair, especially when it is occupied, as they may detach. ALWAYS lift or pull the chair by grasping a non-detachable part of the frame.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

N. FASTENERS

WARNING

TiLite uses only high-strength, high quality fasteners (nuts, bolts, screws and clamps) on its wheelchairs. If you replace any of these fasteners with improper or inferior fasteners, you may damage your chair or may cause it to fail unexpectedly.

1. ALWAYS use fasteners obtained from an authorized TiLite dealer.
2. REGULARLY inspect all fasteners to make sure they have not become loose. If any become loose, tighten them immediately.
3. NEVER over- or under-tighten the fasteners on your chair. Over-tightened or under-tightened fasteners may damage your chair or fail unexpectedly.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

O. POWER DRIVE

WARNING

Certain manufacturers offer manual wheelchair power drive add-on products. TiLite has approved only a limited number of these products for use with TiLite wheelchairs. For more information about power add-ons approved by TiLite, contact TiLite Customer Service.

If you intend to install an approved power drive system on your TiLite chair, this must be taken into account when your chair is ordered so TiLite can manufacture your chair with a power-adaptable frame.

If you have not purchased your TiLite chair with a power adaptable frame, do not install a power drive on your TiLite chair. If you install a power drive add-on system to your TiLite chair and your chair does not have a power adaptable frame, you may damage your chair and you will void your warranty.

In addition, power drive systems are heavy and will affect the center of balance of your chair. Any change to the center of balance of your chair could cause you to lose control or fall or tip-over.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

P. UNAUTHORIZED PARTS AND ACCESSORIES

NEVER use parts, accessories or adapters other than those authorized by TiLite. If you have any doubt about the compatibility of a particular part, accessory or adapter, consult with an authorized TiLite dealer or contact TiLite Customer Service.

If you ignore these Warnings, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

CHAPTER 2: SAFETY INSPECTION, MAINTENANCE & TROUBLESHOOTING

Introduction

Your TiLite wheelchair is designed, engineered and built to provide you with years of exceptional performance. However, proper maintenance and regular safety inspections are essential in order to make sure your wheelchair is operating properly, safely and at maximum efficiency. In addition, proper maintenance and regular safety inspections will extend the life of your TiLite wheelchair.

Safety Inspections and Maintenance

WARNING

If you fail to inspect and maintain your wheelchair as directed in this Manual, you will be at risk for health complications or you may fall, tip over or lose control of your wheelchair and seriously injure yourself or others or damage the wheelchair.

WARNING

After making ANY adjustments or repairs to your wheelchair and after any servicing of your wheelchair, ALWAYS make sure all attachment hardware is tightened securely BEFORE using the chair. *If you ignore this Warning, you may fall, tip over or lose control of your wheelchair and seriously injure yourself or others or damage the wheelchair.*

1. You MUST inspect and maintain your TiLite wheelchair strictly in accordance with the following chart.
2. If your inspection per the chart uncovers any problem, make sure to service or repair the problem BEFORE using the wheelchair.
3. If your inspection reveals any loose, worn, bent or damaged parts, you MUST tighten, repair or replace them before using your TiLite wheelchair.
4. Clean your wheelchair ONLY in accordance with the instructions under “Cleaning” on pages 19 of this Manual.
5. Annually, or more often if necessary, you MUST have your wheelchair serviced and thoroughly inspected by a qualified TiLite dealer.
6. In addition to the maintenance and safety inspections indicated in the chart below, ALWAYS make sure that all nuts and bolts are tight before riding in your wheelchair.

Inspection Item	Initially	Weekly	3 Months
General <ul style="list-style-type: none">• Make sure chair rolls straight (does not drag or pull to one side)• Inspect for loose/missing/broken/worn/damaged hardware	✓ ✓	✓ ✓	
Rear Wheels <ul style="list-style-type: none">• Inspect for cracked, bent or broken spokes• Make sure all spokes are uniformly tight• Inspect hubs and rims for cracks and wear• Inspect for “trueness” (excessive side movement when wheel lifted and spun indicates lack of “trueness”)	✓ ✓ ✓ ✓	✓ ✓	✓ ✓
Quick-Release/Quad-Release Axles <ul style="list-style-type: none">• Make sure axles are free of dirt and lint• Wipe axle with cloth using “dry” silicone spray as lubricant• Make sure that axles lock properly in axle sleeve	✓ ✓	✓ ¹	✓ ✓
Rear Tires <ul style="list-style-type: none">• Check for proper inflation as per sidewall of pneumatic tire (under-inflation will increase rolling resistance and will prevent wheel locks from properly engaging; over inflation may cause a tire to explode)• Inspect for cracks, wear and flat spots	✓ ✓	✓ ✓	

CHAPTER 2: SAFETY INSPECTION, MAINTENANCE & TROUBLESHOOTING

Inspection Item	Initially	Weekly	3 Months
Camber Tube/Axle Sleeves <ul style="list-style-type: none"> • Make sure camber plug clamps are securely tightened • Make sure camber plugs are secure in camber plug clamps and axle sleeves are secure in camber plugs 	✓ ✓	✓ ✓	
Handrims <ul style="list-style-type: none"> • Inspect for signs of rough edges or peeling • Make sure handrims are securely attached to rim 	✓ ✓		✓ ✓
Wheel Locks <ul style="list-style-type: none"> • Make sure wheel locks embed proper distance into tire and prevent chair from moving when engaged • Make sure wheel locks do not interfere with tire when disengaged • Make sure pivot points are free of wear and looseness 	✓ ✓ ✓	✓ ✓ ✓	
Seat Sling and Back Upholstery <ul style="list-style-type: none"> • Inspect for rips or sagging • Inspect fastening flaps to ensure they are securely attached • Inspect while seated to ensure sling supports your weight and does not touch crosstubes 	✓ ✓ ✓	✓ ✓	✓
Front Casters/Forks <ul style="list-style-type: none"> • Inspect wheels and tires for cracks and wear • Inspect wheel/fork assembly for proper tension by spinning caster (caster should come to a gradual stop); if caster wobbles, tighten axle; if caster binds to a stop, loosen axle • Inspect wheel/fork assembly/stem bolt to ensure that stem bolt is secure (wheel/fork assembly should not have excessive play relative to the stem bolt but should rotate freely); if necessary, tighten stem bolt • Ensure that wheel bearings are clean and free from moisture • If pneumatic, check for proper inflation as per the sidewall (under-inflation will increase rolling resistance and will prevent wheel locks from properly engaging; and over-inflation may cause a tire to explode) 	✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓
Armrests <ul style="list-style-type: none"> • Inspect to ensure that all hardware is securely attached 	✓	✓	
Footrests/Hangers <ul style="list-style-type: none"> • Inspect to ensure that all hardware is securely attached 	✓	✓	
Anti-tips <ul style="list-style-type: none"> • Inspect anti-tip wheel for cracks and wear • Inspect to ensure that anti-tip receptacle is securely attached 	✓ ✓	✓	✓
Frame <ul style="list-style-type: none"> • Inspect for cracks 	✓		✓

¹You MUST make sure that axle locks properly in the axle sleeve every time you remove and reinstall a rear wheel, and you should verify this at least weekly.

CHAPTER 2: SAFETY INSPECTION, MAINTENANCE & TROUBLESHOOTING

Cleaning

Clean your chair regularly. Cleaning often will reveal loose or worn parts and enhance the smooth operation of your chair.

Cleaning the Frame

1. If your titanium frame came with a “Satin” finish, use a soft cloth to clean the finish. If necessary, moisten the cloth with glass cleaner. If the “Satin” finish of your chair becomes scratched, you can buff out the scratch using a Scotch Brite™ pad. Moisten the pad with water and rub it over the scratch in a circular motion. After buffing, wipe off the buffed area using a soft cloth moistened with glass cleaner or wood furniture polish. Note: Do NOT use a Scotch Brite™ pad on the logo, and NEVER use steel wool to clean your frame.
2. If your titanium chair came with a “Polished” finish, use a soft cloth to clean the finish. If necessary, moisten the cloth with glass cleaner. Note: NEVER use Scotch Brite™ pads or steel wool on a polished frame.
3. If your chair has a painted aluminum frame, use a soft clean cloth with soap and water to clean the frame. Immediately dry the frame and all components and parts that become wet. Note: Do NOT use Scotch Brite™ pads, steel wool, abrasive cleaners or petroleum-derived products to clean painted aluminum frames.

Cleaning the Cross Tubes

Use a soft clean cloth with soap and water to clean the painted aluminum cross tubes. Immediately dry the cross tubes and all components and parts that become wet. Note: Do NOT use Scotch Brite™ pads, steel wool, abrasive cleaners or petroleum-derived products to clean painted aluminum cross tubes.

Cleaning the Upholstery

1. Regularly hand-wash the seat sling and back upholstery using water and a mild detergent. Always air dry the upholstery.
2. NEVER machine wash the upholstery, and NEVER machine dry the upholstery.
3. When washing the upholstery, carefully check for sagging, rips or tears. If you find any rips or tears, you MUST order new upholstery.
4. After washing the seat sling, always check the tension while seated in the chair to ensure the sling does not touch the cross tubes beneath the seat sling.

Axles and Moving Parts

Clean axles and other moving parts weekly with a slightly damp cloth. The cloth should not be wet. Try to wipe away any lint, dust or dirt on these parts that could interfere with their smooth operation. DO NOT use WD-40®, 3-in-1 oil®, or other penetrating lubricants on quick-release or quad-release axles. Instead, as indicated in the chart under “Safety Inspections and Maintenance”, ALWAYS use a “dry”, Teflon®-based lubricant.

Storage

1. Always store your chair in a clean, dry location. Excessive dirt can cause moving parts to become damaged or fail. Moisture can rust or corrode the non-titanium components of your chair.
2. Always fully inspect your chair after it has been stored for any period of time before riding in it. See the chart under “Safety Inspections” on pages 17-20 of this Manual.
3. If you store your chair for more than three (3) months, have your chair inspected by an authorized TiLite supplier.

CHAPTER 2: SAFETY INSPECTION, MAINTENANCE & TROUBLESHOOTING

TROUBLESHOOTING

Your TiLite wheelchair is a precision engineered product. To ensure your chair continues to operate at peak performance, you will need to make minor adjustments from time to time—especially if you alter the original factory settings. The chart below provides advice on solving some of the more common “adjustment” issues you may experience. If the solutions below do not solve your problem or if you experience a problem not addressed below, please contact an authorized TiLite supplier or TiLite Customer Service. Please note, if more than one solution in the chart below applies to your particular adjustment issue, always try one solution at a time until the problem is solved.

Chair Veers Right or Left	Caster Flutter	Looseness in Chair	Squeaks and Rattles	Sluggish Turning or Performance	Floating Caster	Solution
✓	✓			✓	✓	If you have pneumatic front and/or rear tires, make sure that the tires are properly and equally inflated
	✓	✓	✓	✓		Make sure that all nuts and bolts are securely tightened
		✓	✓			Make sure that all spokes and nipples are uniformly tight on all spoked wheels
✓	✓			✓	✓	Make sure that front caster barrels and mounts are properly adjusted
	✓	✓	✓	✓		Make sure that rear wheels are equally spaced away from the seat frame
✓				✓		Adjust the toe-in/toe-out of the

⚠️ WARNING

Check all clamps, screws, nuts and bolts that secure the footrest to the wheelchair frame to make sure they are securely tightened before using the wheelchair. *If you ignore this Warning, the footrests could move unexpectedly while you are using the chair, causing you to fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

⚠️ WARNING

A calf strap or heel loop is offered as an option with each wheelchair to prevent your feet from slipping backwards off of the footrest. TiLite recommends that you purchase our calf strap or our heel loops with your wheelchair. Always make sure the calf strap is, or heel loops are, secure when using the wheelchair. *If you ignore this Warning, you could fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

⚠️ WARNING

Whenever you adjust the angle or height of your footrest, or you replace your footrest, always allow at least 2" of ground clearance to permit you to maneuver over objects. *If you ignore this Warning, you could fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

Flip-Up Footrest; Angle Adjustable Flip-Up Footrest; Depth Adjustable Flip-Up Footrest; and Depth and Angle Adjustable Flip-Up Footrest

(2GX, Aero X, SX, TX, X and XC)

If you are unsure which type of flip-up footrest is installed on your chair, see Figure 1. **Note:** Only Flip-Up and Angle Adjustable Flip-Up Footrests are available on the XC. **Note:** Only Flip-Up Footrests are available on the TX. **Note:** If your chair has 90° hangers (see Figure 10), see "90° Hanger Flip-Up Footrests; 90° Hanger Depth Adjustable Flip-Up Footrests" on page 24 or "90° Hanger Depth and Angle Adjustable Flip-Up Footrests" on page 25.

Replacing or Adjusting the Height of the Footrest

(SX, X and XC)

Tools Needed:

- 3/16" Allen Wrench
- Ruler

1. Loosen the Allen Screw on the binder clamp. See Figure 2.
2. Depress the snap button and raise or lower the footrest assembly to the desired height (not less than 2" of ground clearance), making sure the snap button pops out through a hole in the frame.
3. If replacing the complete footrest assembly, remove the footrest assembly completely and reinsert a new footrest assembly, making sure the snap button pops out through a hole in the frame.
4. Securely tighten the Allen Screw on the binder clamp.

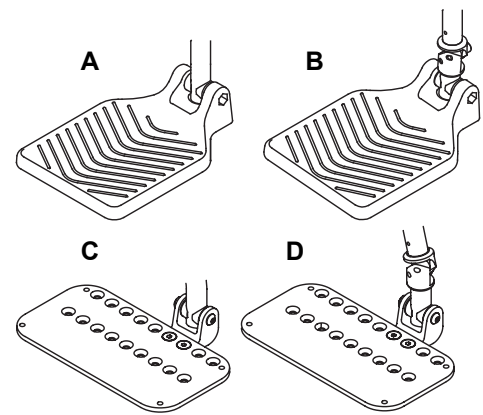


Figure 1
Flip-Up Footrests

- A. Flip-Up
- B. Angle Adjustable Flip-Up
- C. Depth Adjustable Flip-Up
- D. Depth and Angle Adjustable Flip-Up

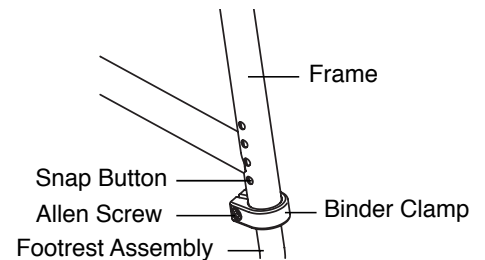


Figure 2
Adjusting/Replacing SX/X/XC Flip-Up Footrests

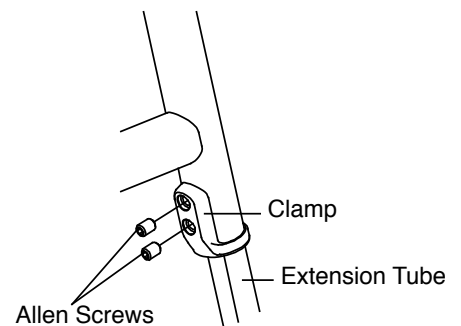


Figure 3
Adjusting/Replacing 2GX/Aero X/TX Flip-up Footrests

CHAPTER 3: FOOTRESTS

Adjusting the Height of the Footrest

(2GX, Aero X and TX)

Tools Needed:

- 1/8" Allen Wrench
- Ruler

1. Loosen the two Allen Screws in the clamp that secures the footrest to the frame. See Figure 3. Loosen each Allen Screw until the entire head of the screw is completely visible outside the clamp.
2. Place the end of a ruler on the floor and hold it vertically against the left corner of the footrest. See Figure 4. Adjust the footrest to the desired height (not less than 2" of ground clearance) and tighten the Allen Screws in the clamp so the footrest height cannot change.
3. Repeat the procedure from steps 1 and 2 above on the opposite footrest.
4. When both sides are set, fully tighten the two Allen Screws in each clamp that secures the footrests to the chair frame, making sure the clamp remains securely butted up against the end of the frame tube.

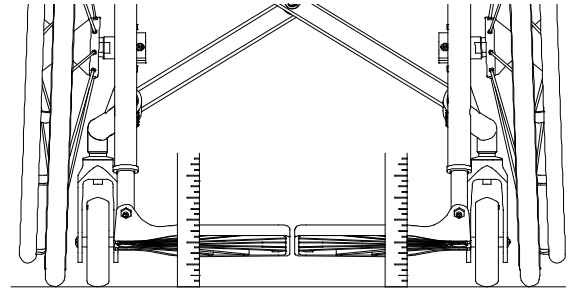


Figure 4
2GX/Aero X/TX Footrest Height Adjustment

Replacing the Footrest

(2GX, Aero X and TX)

Tools Needed:

- 1/8" Allen Wrench
- Ruler

1. Loosen the two Allen Screws in the clamp that secures the footrest to the frame. See Figure 3. Loosen each Allen Screw until the entire head of the screw is completely visible outside the clamp. The Allen Screws should disengage from the T-Nuts.
2. Remove the footrest by sliding the extension tube down and the out of the frame.
3. While holding the wedge in place on the inside wall of the frame, carefully insert the new footrest into the frame. Partially tighten the Allen Screws into the clamp and T-Nuts, thereby sandwiching the wedge between the T-Nuts and the Extension Tube. See Figure 5.
4. Place the end of a ruler on the floor and hold it vertically against the left corner of the footrest. See Figure 4. Adjust the left side of the footrest to the desired height (not less than 2" of ground clearance) and tighten the Allen Screws in the clamp so the footrest height cannot change.
5. Repeat the procedure from steps 1 to 4 above on the right side of the footrest.
6. When both sides are set, fully tighten the two Allen Screws in each clamp that secures each footrest.

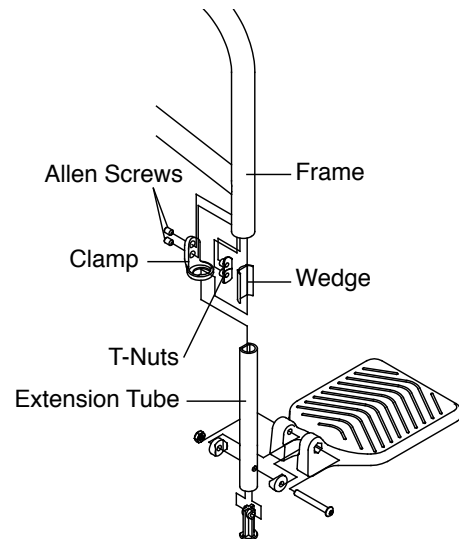


Figure 5
TX/Aero X Replacing Footrest

Adjusting the Angle of the Footrest

(2GX, Aero X, SX, X and XC)

Tools Needed:

- 3/16" Allen Wrench
- 5/32" Allen Wrench

If your flip-up footrest is angle adjustable, you can adjust the angle as follows:

1. Loosen the two Allen Screws that clamp the angle adjustable footrest extension to the angle adjustable footrest mount. See Figure 6.

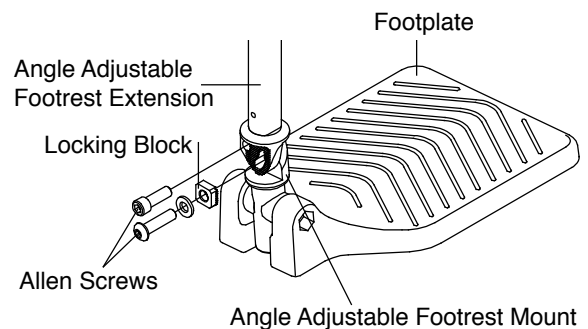


Figure 6
Angle Adjustable Flip-Up Footrest

- Adjust the angle of the footrest to the desired angle.
- Securely tighten the two Allen Screws that clamp the angle adjustable footrest extension to the angle adjustable footrest mount, making sure the teeth on the locking block are properly engaged to prevent the footrest from moving.

⚠ WARNING

The threads on the Allen Screws that secure the angle adjustable footrest extension to the angle adjustable footrest mount have been treated with a medium strength threadlock to reduce the possibility they will become loose. You should be able to adjust the angle of the footrest two or three times without reapplying threadlock to these screws. If you repeatedly adjust the angle, TiLite requires that you reapply a medium strength threadlock after every second adjustment.

Adjusting the Depth of the Footrest

(2GX, Aero X, SX and X)

Tools Needed:

- 5/32" Allen Wrench
- 7/16" End Wrench

If your flip-up footrest is depth adjustable, you can adjust the depth as follows:

- Remove the flat head Allen Screws and locknuts that attach the footplate to the flip-up footrest pivot. See Figure 7.
- Move the footplate forward or backward to the desired depth setting.
- Reinstall and securely tighten the Allen Screws and locknuts

High Mount Flip-Up Footrest; Angle Adjustable High Mount Flip-Up Footrest; Depth Adjustable High Mount Flip-Up Footrest; and Depth and Angle Adjustable High Mount Flip-Up Footrest

(2GX, Aero X, SX, TX, X and XC)

If you are unsure which type of High Mount Flip-Up Footrest is installed on your chair, see Figure 8. **Note:** Only High Mount Flip-Up and Angle Adjustable High Mount Flip-Up Footrests are available on the XC. **Note:** Only the High Mount Flip-Up footrests are available on the TX. **Note:** If your chair has 90° hangers (see Figure 10), see "90° Hanger Flip-Up Footrests; 90° Hanger Depth Adjustable Flip-Up Footrests" on page 24 or "90° Hanger Depth and Angle Adjustable Flip-Up Footrests" on page 25

Replacing or Adjusting the Height of the Footrest

Tools Needed:

- 3/16" Allen Wrench
- Ruler

- Loosen the two Allen Screws through the footrest extension clamp that secures the high mount extension tube to the frame. See Figure 9.
- Raise or lower the high mount footrest extension tube to the desired height (not less than 2" of ground clearance).

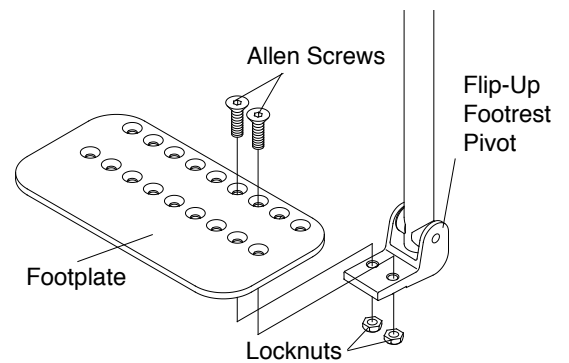


Figure 7
Depth Adjustable Flip-Up Footrests

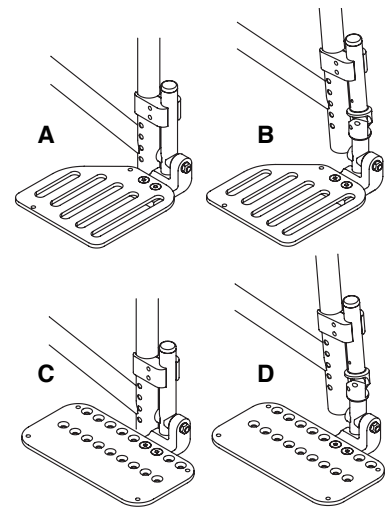


Figure 8
High Mount Flip-Up Footrests
A. High Mount Flip-Up
B. Angle Adjustable High Mount Flip-Up
C. Depth Adjustable High Mount Flip-Up
D. Depth and Angle Adjustable High Mount Flip-Up

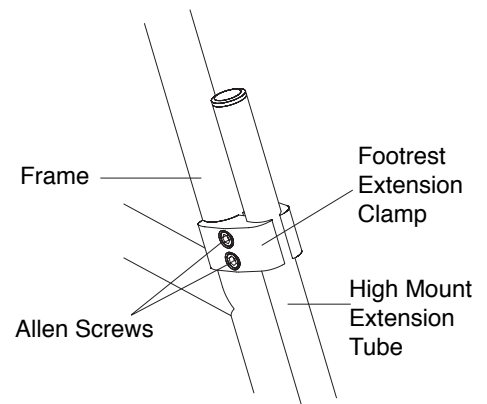


Figure 9
Height Adjustments on High Mount Flip-Up Footrests

CHAPTER 3: FOOTRESTS

3. If replacing the entire footrest assembly, remove the high mount footrest extension tube and flip-up footrest assembly completely and reattach a new high mount footrest extension tube and footrest assembly at the desired height (not less than 2" of ground clearance).
4. When both of the footrests on both sides of the chair are adjusted to the desired height, securely tighten the two Allen Screws through the extension clamps that secure the high mount footrest extension tubes to the frame.

Adjusting the Angle or Depth of the Footrest

If your high mount flip-up footrest is angle or depth adjustable or both, you can adjust the angle or depth by using the tools and following the procedures for adjusting the angle or depth of a flip-up footrest as set forth under "Flip-Up Footrest; Angle Adjustable Flip-Up Footrests; Depth Adjustable Flip-Up Footrests; and Depth and Angle Adjustable Flip-Up Footrests" on pages 21-23.

90° Hanger Flip-Up Footrests; 90° Hanger Depth Adjustable Flip-Up Footrests

(2GX, Aero X and SX)

Replacing or Adjusting the Height of the Footrest

Tools Needed:

- 5/32" Allen Wrench
- 7/16" Open End Wrench
- Ruler

1. Remove the Allen Screw that secures the footplate bracket to the frame. See Figures 11 or 12. Make sure to note the order in which you remove the various washers and nuts when removing the Allen Screw.
2. Reposition the existing (or replacement) footrest assembly to the desired height (not less than 2" of ground clearance), lining up the hole in the footplate bracket with a hole in the frame.
3. Reinsert the Allen Screw through the 1/2" washer, footplate bracket, the 1" concave washer, the frame, the second 1" concave washer, the second 1/2" washer and the lock nut. Securely tighten.

Adjusting the Depth of the Footrest

Tools Needed:

- 5/32" Allen Wrench
- 7/16" Open End Wrench

1. Remove the two Allen Screws and locknuts that secure the footplate to the angle adjustable footrest bracket. See Figure 12.
2. Reposition the footplate to the desired depth.
3. Reinsert and securely tighten the two Allen Screws and locknuts .

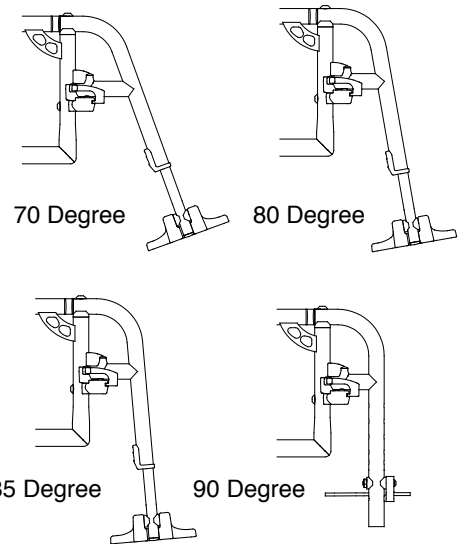


Figure 10
Available Hanger Options

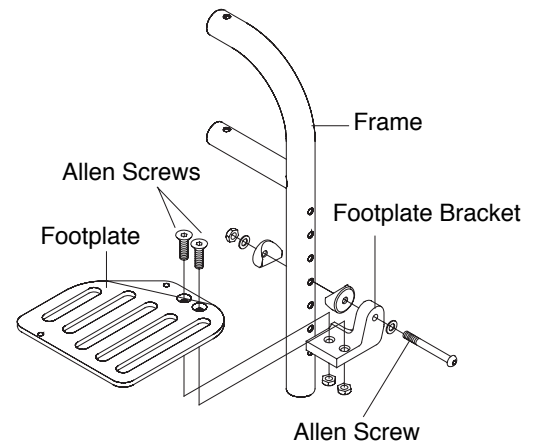


Figure 11
90° Hanger Flip-Up Footrests

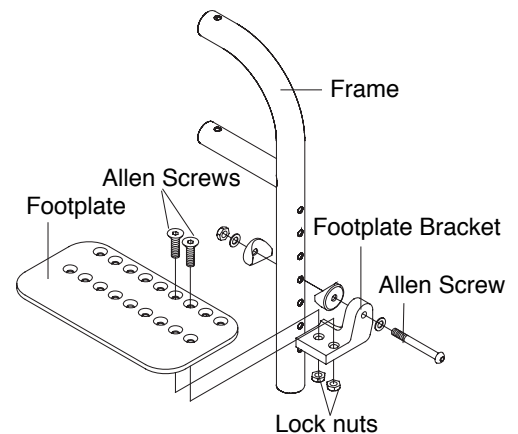


Figure 12
90° Hanger Depth Adjustable Flip-Up
Footrests

90° Hanger Depth and Angle Adjustable Flip-Up Footrests

(2GX, Aero X and SX)

Replacing, or Adjusting the Height of, the Footrest

Tools Needed:

- 5/32" Allen Wrench
- 7/16" Open End Wrench
- Ruler

1. Remove the Allen Screw that secures the angle adjustable footrest bracket to the frame. See Figure 13. Make sure to note the order in which you remove the various washers and nuts when removing the Allen Screw.
2. Reposition the existing (or replacement) footrest assembly to the desired height (not less than 2" of ground clearance), lining up the holes in the angle adjustable footrest bracket with the holes in the frame.
3. Reinsert the Allen Screw through the 1/2" washer, the angle adjustable footrest bracket, the concave washer, the frame, the second concave washer, the angle adjustable footrest bracket, the second 1/2" washer and the lock nut. Securely tighten.

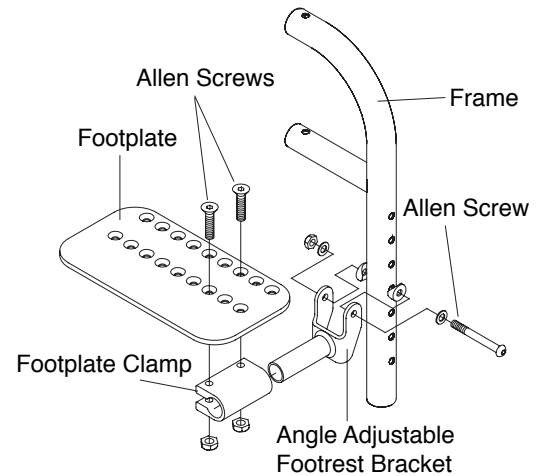


Figure 13
90° Hanger Depth and Angle Adjustable Flip-Up Footrests

Adjusting the Angle of the Footrest

Tools Needed:

- 5/32" Allen Wrench
- 7/16" Open End Wrench

1. Loosen the two Allen Screws and locknuts that secure the footplate to the footplate clamp. See Figure 13.
2. Reposition the footplate to the desired angle.
3. Securely tighten the two Allen Screws and locknuts.

Adjusting the Depth of the Footrest

Tools Needed:

- 5/32" Allen Wrench
- 7/16" Open End Wrench

1. Remove the two Allen Screws and locknuts that secure the footplate to the footplate clamp. See Figure 12.
2. Reposition the footplate to the desired depth.
3. Reinsert the two Allen Screws through the footplate, the footplate clamp and the locknuts.
4. Securely tighten the two Allen Screws and locknuts.

Swing-Away Hangers

(SX)

The swing-away hangers can be rotated inward or outward to be removed or positioned out of the way.

To swing the hanger inward or outward, push or pull the release lever and push the hanger inward or outward, as desired. See Figure 14.

To remove the hanger from the wheelchair, swing it outward and pull it upward.

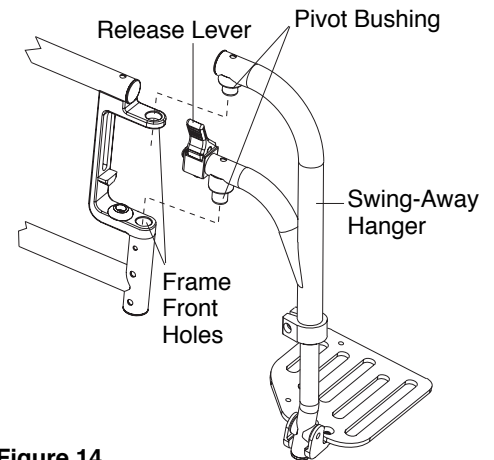


Figure 14
SX Swing-Away Hangers

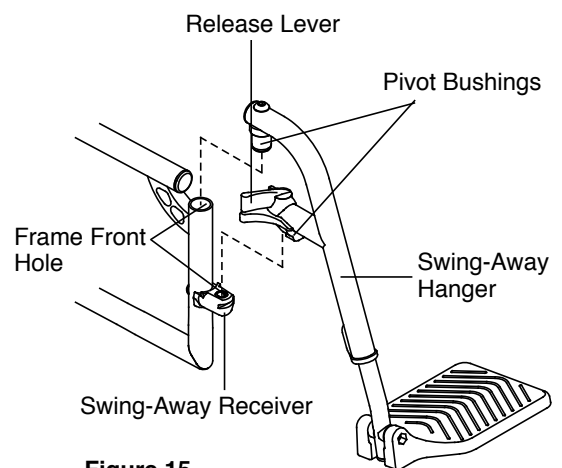


Figure 15
Aero X Swing-Away Hangers

CHAPTER 3: FOOTRESTS

To replace the hanger on frame:

1. Align the pivot bushings with the frame front holes, sliding in the bottom pivot first. This must be done with the hanger slightly off center of the frame. See Figure 14.
2. Holding the hanger (not the release lever), swing the hanger until hanger locks in place.

Swing-Away Hangers

(2GX and Aero X)

The Swing-away Hangers can be rotated inward or outward to be removed or positioned out of the way.

To swing the hanger inward or outward, pull the release lever and push the hanger inward or outward. See Figure 15.

To remove the hanger from the wheelchair swing it outward and pull it upward.

To replace the hanger on the frame:

1. Align the pivot bushings with the front frame hole and swing away receiver on the frame.
2. Holding the hanger, not the release lever, swing the hanger until it locks into place.

1-Piece, Over-Center Folding Footrest

(2GX, Aero X, TX and X)

Note: The 1-Piece, Over-Center Folding Footrest is not available on 2GX or Aero X chairs with swing-away hangers.

Replacing or Adjusting the Height of the Footrest

You can adjust the height of, or replace, the footrest by using the tools and following the procedures for adjusting the height of, or replacing, a flip up footrest as set forth under “Flip-Up Footrest; Angle Adjustable Flip-Up Footrest; Depth Adjustable Flip-Up Footrest; and Depth and Angle Adjustable Flip-Up Footrest” on pages 21-22. **Note:** In following those procedures, it will be necessary to adjust both sides of the frame simultaneously because the left and right footrests are attached to operate as a 1-piece footrest. See Figure 16.

Adjusting the Angle of the Footrest

You can adjust the height and the angle of the footrest by using the tools and following the procedures for adjusting the angle of the Angle Adjustable Flip-Up Footrest as set forth under “Flip-Up Footrest; Angle Adjustable Flip-Up Footrest; Depth Adjustable Flip-Up Footrest; and Depth and Angle Adjustable Flip-up Footrest” on pages 19-20

1-Piece Flip-Up Footrest

(2GX, Aero X, SX, TX and X)

The 1-Piece Flip-Up Footrest can be lifted up completely. **Note:** When returning the footrest to the down position, make sure that the latch properly engages with the latch spacer. See Figures 17 and 18.

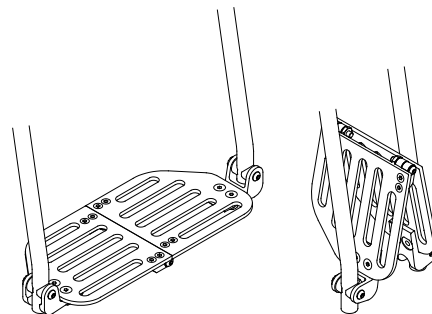


Figure 16
2GX/Aero X/TX/X
Piece 1-Piece Over Center Footrest

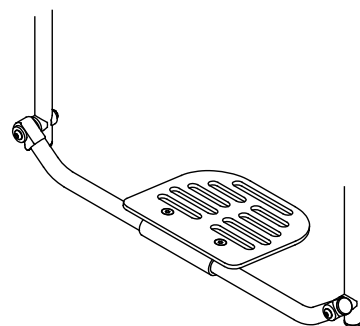


Figure 17
2GX/Aero X/SX/TX/X
One Piece Flip-Up Footrest

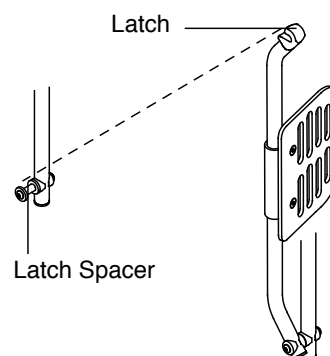


Figure 18
2GX/Aero X/SX/TX/X
One Piece Flip-Up Footrest in Up Position

WARNING

If you have leg spasticity that requires that your feet be secured to the footrest, you should not use a 1-Piece Flip-Up Footrest because the latch mechanism does not lock and prevent inadvertent disengaging. If your feet are secured to the footrest and you unintentionally lift your feet, you will disengage the latch, which could cause the footrest to come into contact with obstacles in your path. *If you Ignore the Warning, you could fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

Replacing or Adjusting the Height of the Footrest

You can adjust the height of, or replace, the footrest by using the tools and following the procedures for adjusting the height of, or replacing, a flip up footrest as set forth under “Flip-Up Footrest; Angle Adjustable Flip-Up Footrest; Depth Adjustable Flip-Up Footrest; and Depth and Angle Adjustable Flip-Up Footrest” on pages 19-20. Note: In following those procedures, it will be necessary to adjust both sides of the frame simultaneously because there is only a single, 1-piece footrest.

CHAPTER 4: BACKRESTS, PUSH HANDLES AND STROLLER HANDLES

Adjustable Height Backrest (Straight or 8° Bend) (With or Without Integrated Push Handles)

(SX and X)

Adjusting the Backrest Height

Tools Needed:

- 5/32" Allen Wrench
- 7/16" Open End Wrench

1. Observe the tautness of the back upholstery.
2. Remove the back upholstery. See "Chapter 7: Back Upholstery; Seat Upholstery; and Seat Cushions" on pages 28-31.
3. Remove the four Allen Screws (two on each side of the chair) that secure the axle plate to the frame. These Allen Screws also secure the back extension tube within the frame. Carefully note the order in which the various washers and nuts (and any other parts, such as anti-tip receptacles) were originally installed on the chair as you will need to reinstall all of the parts in the exact same order in Step 7 below. See Figure 19.
4. If your chair is equipped with stroller handles or swing-away armrests, remove the four Allen Screws (two on each side of the chair) that secure the Axle Plate and stroller handle or armrest brackets to the frame. Carefully note the order in which the various washers and nuts were originally installed on the chair as you will need to reinstall all of these parts in Step 6 below. See Figure 20.
5. Adjust the backrest extension tubes to the desired height. See Figures 18 or 19.
6. Reinstall the axle plate and stroller handle or armrest receivers if removed in Step 4 above.
7. Reinstall the axle plate removed in Step 3 above.
8. Reinstall the backrest upholstery. Adjust the backrest upholstery to the desired tautness. See "Chapter 7: Back Upholstery; Seat Upholstery; and Seat Cushions" on pages 36-40.

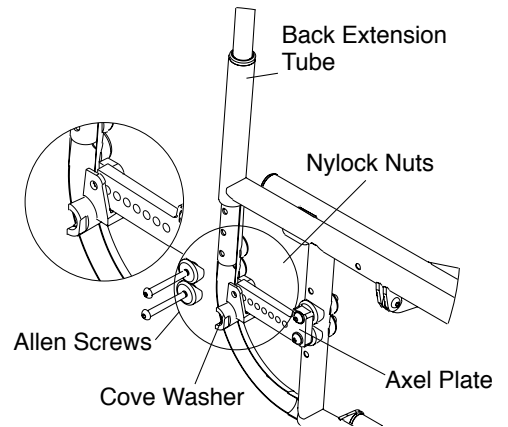


Figure 19
SX/X Back Height Adjustment

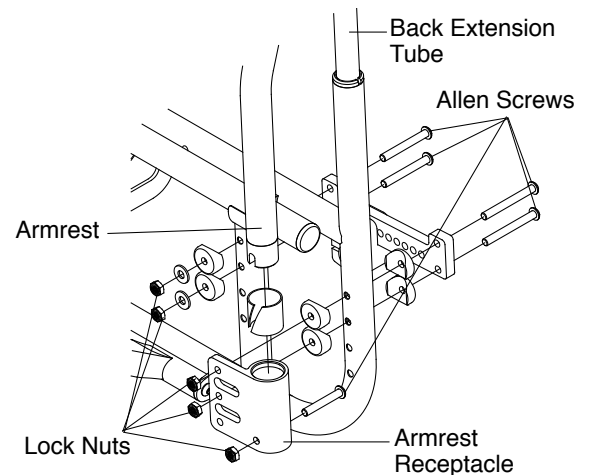


Figure 20
SX/X Back Height Adjustment with Armrests

Adjustable Height Backrest (Straight or 8° Bend) (With or Without Integrated Push Handles)

(2GX and Aero X)

Adjusting the Backrest Height

Tools Needed:

- 5/32" Allen Wrench
- 7/16" Open End Wrench

1. Observe the tautness of the back upholstery.
2. Remove the back upholstery. See "Chapter 7: Back Upholstery; Seat Upholstery; and Seat Cushions" on pages 36-40.
3. Remove the two Allen Screws (one on each side of the chair) that secure the back extension tubes inside the frame. See Figure 21. If your chair is equipped with swing-away armrests or stroller handles, the receiver will be attached to the frame with two screws, one of which will also secure the backrest extension on either side of the frame. See Figure 22. Carefully note the order in which the various washers and nuts (and any other parts, such as armrest receivers or stroller handle receivers) were originally installed on the chair as you will need to reinstall all of the parts in the exact same order in Step 5 below.

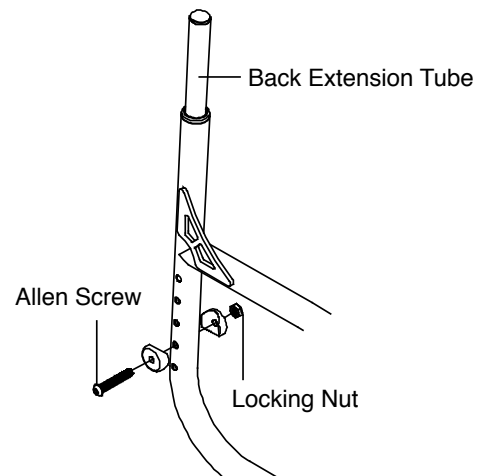


Figure 21
2GX/Aero X Tubular Swing Away Armrest

CHAPTER 4: BACKRESTS, PUSH HANDLES AND STROLLER HANDLES

- Adjust the backrest extension tubes to the desired height. See Figures 21 or 22.
- Reinstall the stroller handle or armrest receivers if removed in Step 3 above.
- Reinstall the backrest upholstery. Adjust the backrest upholstery to the desired tautness. See “Chapter 7: Back Upholstery; Seat Upholstery; and Seat Cushions” on pages 36-40.

Adjustable Height Backrest (With or Without Integrated Push Handles)

(TX and XC)

Note: On the TX, the backrest is aluminum. On the XC, the backrest is titanium.

Adjusting the Backrest Height

Tools Needed:

- 5/32” Allen Wrench

Note: In order to adjust the backrest height you will have to remove the backrest upholstery. Therefore, make a note of the tautness of the backrest upholstery before removing it so you can reinstall it to approximately the same degree of tautness.

- Remove the backrest upholstery, including the two fastening flaps. See “Chapter 7: Back Upholstery; Seat Upholstery; and Seat Cushions” on pages 36-40.
- On both sides of the chair, remove the Allen Screw that secures the backrest post inserts inside the backrest post. See Figure 23.
- Reposition both backrest post inserts to the desired height inside the backrest posts, making sure to align the holes in the backrest post inserts with the holes in the backrest posts.
- Make sure both backrest post inserts are at the same height in the backrest posts and reinsert and securely tighten the two Allen Screws.
- Reinstall the back upholstery, adjust the upholstery to the desired tautness.

⚠ WARNING

The threads on the Allen Screws that secure the backrest posts to the backrest post inserts have been treated with a medium strength threadlock to reduce the possibility that they will become loose. You should be able to adjust the backrest height two or three times without reapplying threadlock to these screws. If you repeatedly adjust the backrest height, TiLite requires that you reapply a medium strength threadlock after every second adjustment.

Non-Folding Fixed Height & Angle Backrest

(TX and XC)

If your chair has a non-folding Titanium Fixed Height Backrest, you cannot adjust the backrest height or the backrest angle.

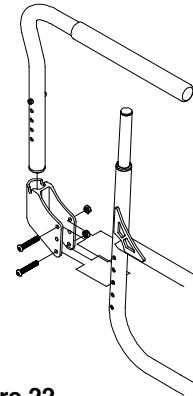


Figure 22
2GX/Aero X Adjusting the Swing Away Armrest Height

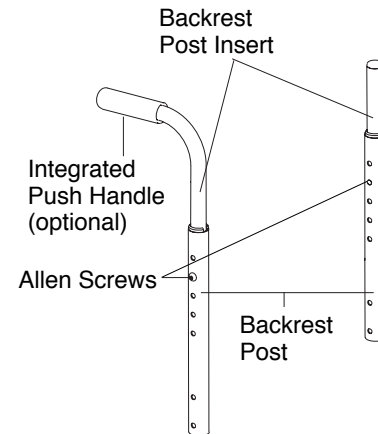


Figure 23
Adjusting the Backrest Height

CHAPTER 4: BACKRESTS, PUSH HANDLES AND STROLLER HANDLES

Stroller Handles

(SX and X)

Adjusting the Height of the Receiver

Tools Needed:

- 5/32" Allen Wrench
- 7/16" Open End Wrench

1. Remove the Allen Screws that secure the stroller handle receiver to the frame. See Figure 24.
2. Reposition the stroller handle receiver to the desired height and reinsert the Allen Screws through the complete assembly. Securely tighten the Allen Screws and lock nuts.

WARNING

When reassembling, make sure that at least one of the Allen Screws bolts the axle plate to the frame. This may limit your options for adjusting the height of the stroller handle receiver.

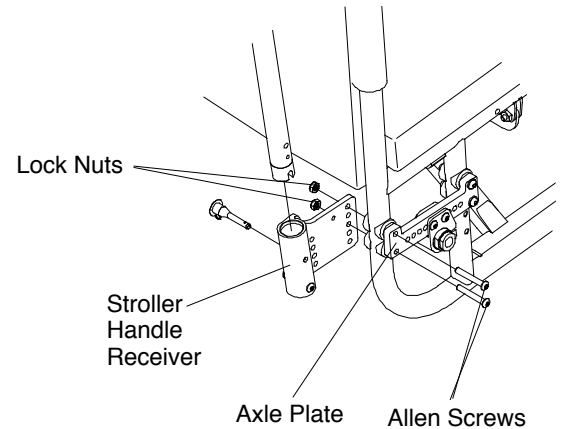


Figure 24
SX/X Stroller Handle Assembly

Height Adjustable Push Handles

(2GX, Aero X, SX, TX and X)

Adjusting the Height of the Push Handle

Tools Needed:

- 7/64" Allen Wrench

1. Loosen the two Allen Screws that secure the push handle inside the push handle clamp, See Figure 25.
2. Raise or lower the push handle to the desired height.
3. Securely tighten the two Allen Screws

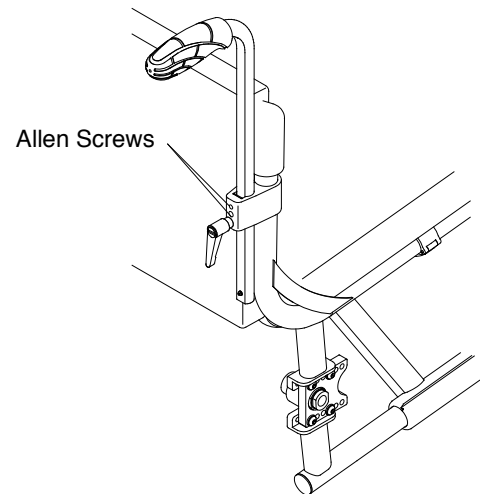


Figure 25
2GX/Aero X/X/SX/TX/X Height Adjustable Push Handles

Tubular Swing Away Armrest

(2GX, Aero X, SX, TX, X, and XC)

To swing away the armrest, lift the armrest and rotate the armrest away from chair. See Figures 26-28. On the 2GX, TX, XC and Aero X, make sure to lift the armrest until the armrest pins are above the notch on the armrest receiver. See Figures 26 and 27.

To replace the armrest, rotate the armrest back towards the chair and gently push it down into place. See Figures 25-27. On the TX, XC and Aero X, make sure the armrest pins are in the notch on the armrest receiver. See Figures 27 and 28.

Note: On all TiLite wheelchairs, the swing away armrests pivot on nylon sleeves, located inside the armrest receiver. If the armrest does not rotate properly, check the nylon sleeves for wear.

Adjusting the Height of the Tubular Swing Away Armrest

(2GX, Aero X, TX and XC)

Tools Needed:

- 2 5/32" Allen Wrenches

1. Remove the armrest from the armrest receiver.
2. Remove both armrest pins. See Figure 29.
3. Reassemble the armrest pins in the desired location on the armrest (in 3/4" increments).
4. Securely tighten both armrest pins in the new location.
5. Reinstall the armrest in the armrest receiver.

Adjusting the height of the Tubular Swing Away Armrest Receiver

(2GX and Aero X)

Tools Needed:

- 5/32" Allen Wrench
- 7/16" Open End Wrench

1. Remove the armrest from the armrest receiver.
2. Remove the two Allen Screws pass through the frame and the armrest receiver. See Figure 30.
3. Reposition the armrest receiver to the desired height and reinsert the Allen Screws. Securely tighten the Allen Screws and Locknuts.
4. Reinstall the armrest in the armrest receiver.

Adjusting the Height on the Armrest Receiver

(SX and X)

Tools Needed:

- 5/32" Allen Wrench
- 7/16" Open End Wrench

Note: Unless you ordered anti-tippers for your X or SX chair, the armrest receiver may be raised or lowered to achieve a higher or lower height for the swing away armrest.

1. Remove the armrest from the armrest receiver.

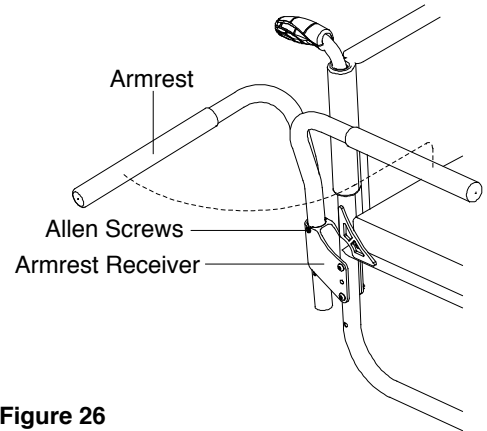


Figure 26
SX/X Tubular Swing Away Armrest

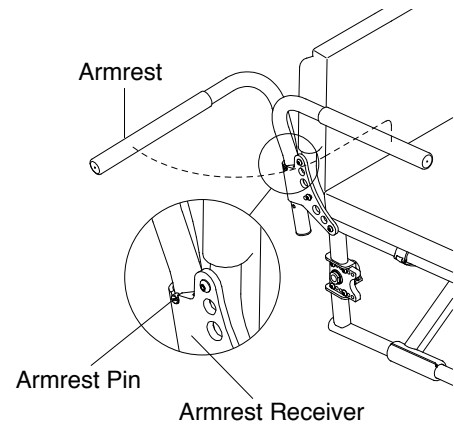


Figure 27
TX/XC Tubular Swing Away Armrest

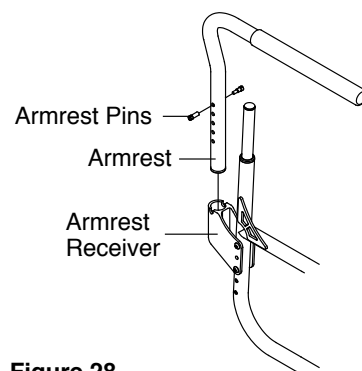


Figure 28
2GX/Aero X Tubular Swing Away Armrests.

CHAPTER 5: ARMRESTS

2. Remove the two Allen Screws that pass through the frame, the armrest receiver and the various washers and locknuts. The two Allen Screws also may pass through the axle plate. See Figure 31.
3. Reposition the armrest receiver to the desired height and reinsert the Allen Screws through the complete assembly. Securely tighten the Allen Screws and locknuts.
4. Reinstall the armrest in the armrest receiver.

WARNING

When reassembling, always make sure that each axle plate is bolted to the frame with four Allen Screws. This may limit your options for adjusting the height of the armrest receiver.

Removable Desk Arm and Removable Desk Arm with Transfer Loop

(2GX, Aero X, SX, TX, X and XC)

WARNING

Make sure the locking pin activated by the height adjustment lever is securely positioned in the desk arm bracket before applying weight to the armrest.

Adjusting the Armrest Height

1. Pull up on the height adjustment lever to permit the armrest to be raised or lowered to the desired height. See Figures 32 and 33.
2. After repositioning the armrest to the desired height, release the height adjustment lever to lock the armrest in that position. The positioning holes are in 1/2" increments. The height ranges from 9" to 12" or 12" to 15" depending on the size of desk arm ordered.

Removing

1. To remove the desk arm assembly, press and hold the armrest release lever. See Figures 32 and 33.
2. While holding the armrest release lever, lift the desk arm assembly to remove it from the mounting bracket attached to the wheelchair frame. See Figure 34.

Replacing

Slide the desk arm bracket into the mounting bracket attached to the wheelchair frame. See Figure 34.

WARNING

Make sure the desk arm bracket securely locks in the mounting bracket before applying weight to the desk arm.

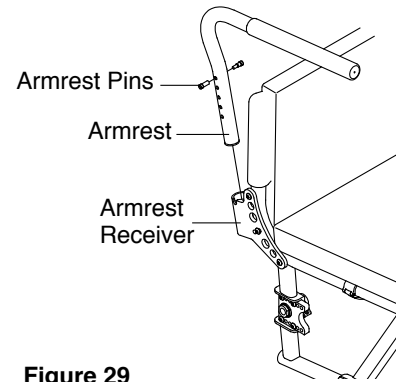


Figure 29
2GX/Aero X/TX/XC Height Adjustment of Tubular Swing Away Armrests.

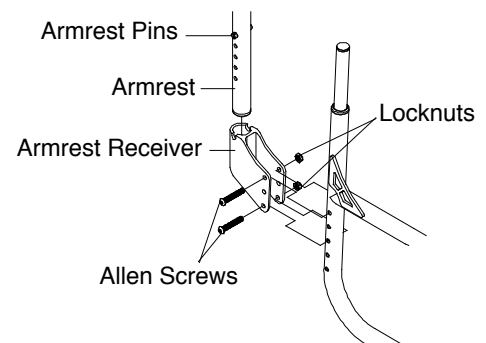


Figure 30
2GX/Aero X Height Adjustment of Armrest Receiver.

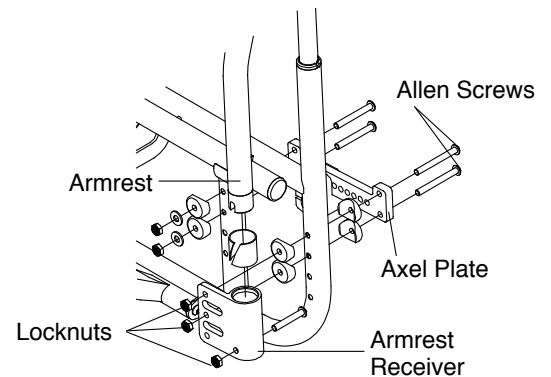


Figure 31
Height Adjustment of Armrest Receiver.

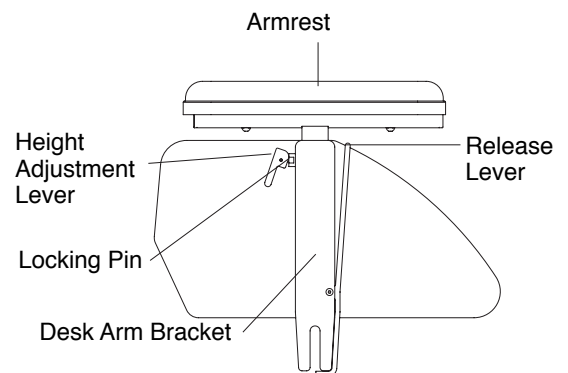


Figure 32
Removable Desk Arm

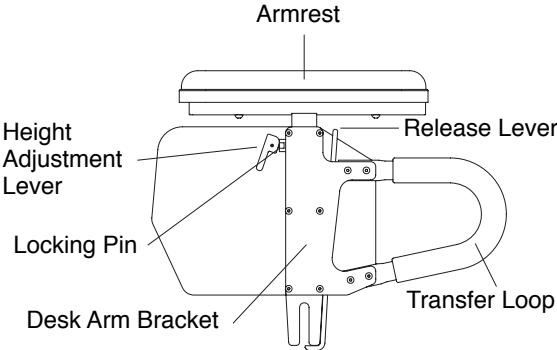


Figure 33
Removable Desk Arm with Transfer Loop

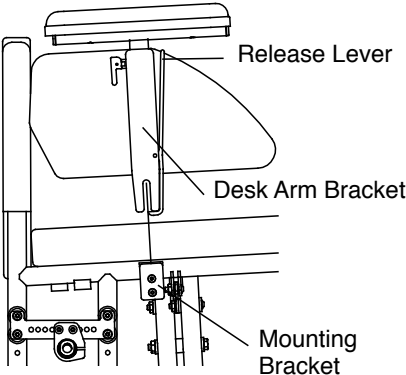


Figure 34
Replacing the Mounting Bracket

CHAPTER 6: SIDE GUARDS

Cloth Side Guards

(2GX, Aero X, SX, TX, X and XC)

Removing/Replacing Cloth Side Guards

1. Lift up on the seat cushion and remove it from the chair.
2. Separate the cloth side guards from the back upholstery and from the frame. See Figure 34.
3. If desired, install new cloth side guards onto the frame and back upholstery. **Note:** For Padded Nylon Back Upholstery, the fastening flaps that secure the cloth side guards to the back upholstery wrap around the outside of the back canes and attach to the outside of the back upholstery. For tension adjustable by straps back upholstery, the fastening flaps that secure the cloth side guards to the back upholstery wrap around the outside of the back canes and under the back upholstery flap.
4. Replace the seat cushion.

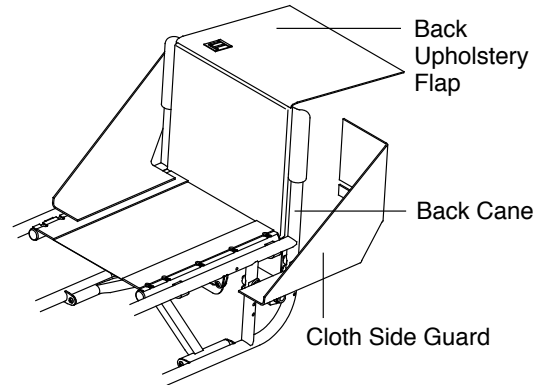


Figure 35
Cloth Side Guards

Rigid Removable and Quad Removable Side Guards (Aluminum and Carbon Fiber)

(2GX, Aero X, SX, TX, X and XC)

Using Rigid Side Guards

To remove either type of rigid side guard, lift the side guard out of the side guard mount by grasping it at the top or by placing a finger in the hole and pull it upward. See Figure 36. To replace, place the side guard bracket into the slot between the side guard mount and the side guard clamp and push down. See Figure 36.

Adjusting Rigid Side Guards

Tools Needed:

- 1/8" Allen Wrench

You can adjust the "snugness" of the fit of the side guard bracket in the side guard mount by loosening or tightening the two Allen Screws in the side guard mount. See Figure 36.

Either type of rigid side guard can be made "non-removable" by firmly tightening the two Allen Screws in the side guard mount while the side guard is installed. See Figure 36.

Removing Rigid Side Guard Assembly

Tools Needed:

- 3/16" Allen Wrench

To remove the entire side guard assembly, including the side guard clamp:

1. Remove the side guard from the side guard mount. See Figure 36.
2. Remove the Allen Screw that secures the two halves of the side guard clamp to the frame. See Figure 37.

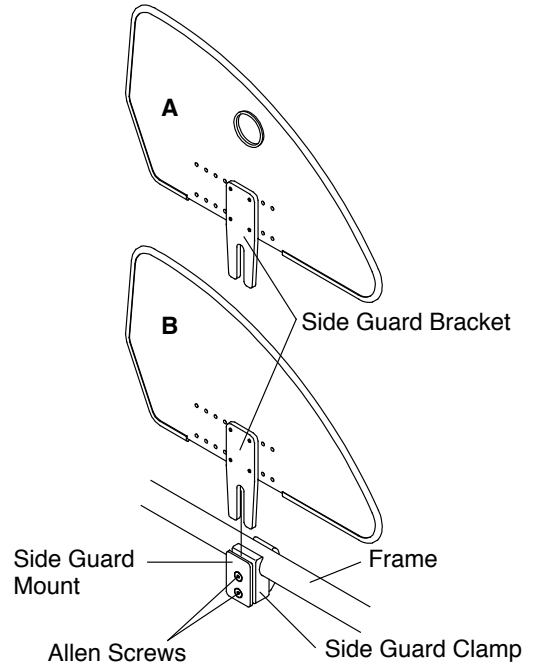


Figure 36
Quad Removable Side Guard (A) and Rigid Removable Side Guard (B)

Reinstalling Rigid Side Guard Assembly

Tools Needed:

- 3/16" Allen Wrench

1. Align the two halves of the side guard clamp around the seat tube of the chair frame. See Figure 37. The half of the side guard clamp to which the side guard mount is attached has a dowel pin protruding from the clamp that must be inserted in the side guard clamp hole in the frame.
2. Insert the Allen Screw into the two halves of the side guard clamp and securely tighten.
3. Insert the side guard bracket into the side guard mount and adjust the two Allen Screws as described under "Adjusting Rigid Side Guards" on page 34.

Fixed-In-Place Side guards (Aluminum or Carbon Fiber)

(TX and XC)

If your chair has a fixed-in-place side guard, you can not remove the side guard.

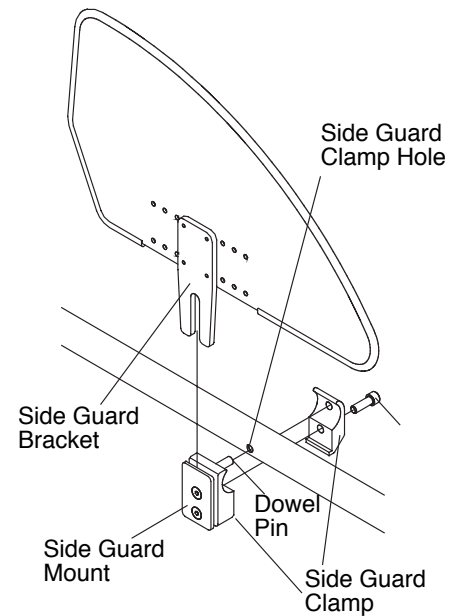


Figure 37
Removing/Replacing Side Guard Assembly

CHAPTER 7: BACK UPHOLSTERY, SEAT UPHOLSTERY AND SEAT CUSHIONS

Padded Nylon Back Upholstery

(2GX, Aero X, SX and X)

Replacing the Upholstery

Tools Needed:

- Phillips Screwdriver
- Scissors

1. Remove the seat cushion.
2. Cut the plastic ties that secure the bottom of the back upholstery to the frame. See Figure 38.
3. Remove the screw that secures the upholstery to each back cane. See Figure 38.
4. Slide the upholstery off the back canes.
5. Slide new upholstery onto the back canes.
6. Secure the upholstery to the back canes with the screws removed in Step 3.
7. Secure the bottom of back upholstery to the seat frame with new plastic ties.
8. Replace the seat cushion.

Note: If your chair has push handles, you will not be able to slide the back upholstery off the top of the back canes. Instead, you will need to remove the back canes. See “Adjustable Height Backrest (Straight or 8° Bend) (With or Without Integrated Push Handles) (SX and X)” on pages 28 and 29 or “Adjustable Height Backrest (Straight or 8° Bend) (With or Without Integrated Push Handles) (2GX and Aero X) on pages 28 and 29. Then you can slide the back upholstery off the bottom end of the back canes and install the new upholstery in this manner as well.

Tension Adjustable Back Upholstery (Straps)

(2GX, Aero X, SX, TX, X and XC)

Adjusting the Tension

1. Lift the back flap to expose the back straps/backrest ears (which are adjustable using “hook & loop” material). See Figure 39.
2. Completely detach the back upholstery from the back straps/backrest ears. Do not remove the back straps/backrest ears from the back canes.
3. Adjust to the desired tautness by loosening the back straps and then pulling on the loose end to pull the backrest ears closer together. Tighter back upholstery will increase the stability and maintain normal maneuverability of the chair because the user is pushed forward slightly. It may also make unfolding and folding the chair more difficult. Looser back upholstery will increase maneuverability, but will make the chair more prone to tip over backward because additional weight is being distributed onto the rear wheels.
4. Align the top of the back upholstery with the uppermost back strap.
5. Securely attach the back upholstery to the back straps/backrest ears using the “hook & loop” material and lower the back flap back into position.

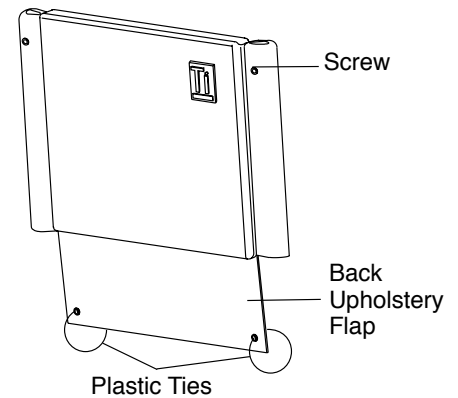


Figure 38
Replacing Padded Nylon Back Upholstery

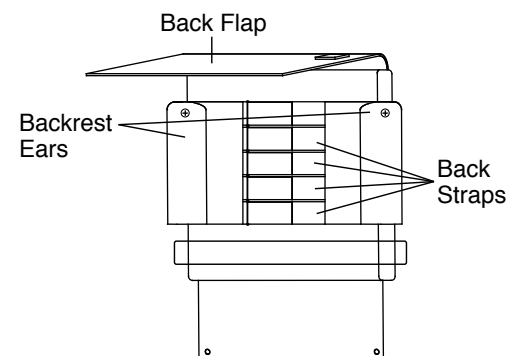


Figure 39
Tension Adjustable Back Upholstery

CHAPTER 7: BACK UPHOLSTERY, SEAT UPHOLSTERY AND SEAT CUSHIONS

Replacing the Upholstery

Tools Needed:

- Phillips Screwdriver

1. Remove the seat cushion.
2. Remove the back upholstery from the backrest ears and straps. See Figure 39.
3. If replacing the ears, remove the screw that secures each backrest ear to the back canes. See Figure 39.
4. Slide the backrest ears off the back canes.
5. If replacing the lower straps, remove the straps from the back canes.
6. Install new backrest straps.
7. Slide new backrest ears onto back canes.
8. Secure the backrest ears with the screws removed in Step 3.
9. Install the new backrest upholstery over the backrest ears.
10. Replace the seat cushion.

Note: If your chair has push handles, you will not be able to slide the back upholstery off the top of the back canes. Instead, you will need to remove the back canes. See “Adjustable Height Backrest (Straight or 8° Bend) (With or Without Integrated Push Handles) (SX and X)” on page 28 and 29 or “Adjustable Height Backrest (Straight or 8° Bend) (With or Without Integrated Push Handles) (2GX and Aero X) on pages 28 and 29. Then you can slide the back upholstery off the bottom end of the back canes and install the new upholstery in this manner as well.

“Hook & Loop” Adjustable Backrest Upholstery

(TX and XC)

Adjusting the Tension

1. Lift the back flap to expose the back straps/backrest ears (which are adjustable using “hook & loop” material). See Figure 40.
2. Completely detach the back upholstery from the backrest ears. Do not remove the backrest ears from the back canes.
3. Adjust to the desired tautness by reattaching the back upholstery to the backrest ears. Tighter back upholstery will increase the stability and maintain normal maneuverability of the chair because the user is pushed forward slightly. It may also make unfolding and folding the chair more difficult. Looser back upholstery will increase maneuverability, but will make the chair more prone to tip over backward because additional weight is being distributed onto the rear wheels.
4. Align the top of the back upholstery with the backrest ear.
5. Securely attach the back upholstery to the backrest ears and lower the back flap back into position.

Replacing the Upholstery

Tools Needed:

- 1/8” Allen Wrench

1. Remove the seat cushion.
2. Remove the back upholstery from the Velcro backrest ears and straps. See Figure 39.
3. If replacing the ears, remove the screw that secures each backrest ear to the back canes. See Figure 39.
4. Slide the backrest ears off the back canes.
5. If replacing the lower Velcro straps, remove the straps from the back canes.

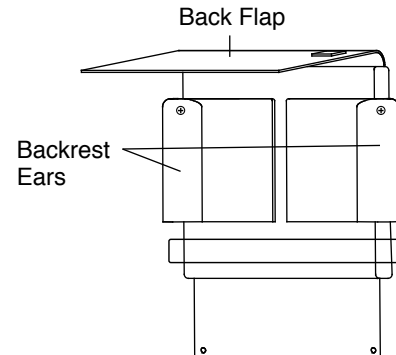


Figure 40
TX/XC Tension Adjustable Back Upholstery

CHAPTER 7: BACK UPHOLSTERY, SEAT UPHOLSTERY AND SEAT CUSHIONS

6. Install new backrest straps.
7. Slide new backrest ears onto back canes.
8. Secure the backrest ears with the screws removed in Step 3.
9. Install the new backrest upholstery over the backrest ears.
10. Replace the seat cushion.

Note: If your chair has push handles, you will not be able to slide the back upholstery off the top of the back canes. Instead, you will need to remove the back canes. See Adjustable Height Backrest (with or without Integrated Push Handles) (TX and XC). Then you can slide the back upholstery off the bottom end of the back canes and install the new upholstery in this manner as well.

Tension Adjustable Bolt-On Seat Sling

(SX, X and XC)

WARNING

Do not make the seat sling upholstery tension so loose that it does not properly support your weight. The sling should never be so loose that the sling causes your weight to be borne by the cross-tubes below the seat sling.

Adjusting the Tension

Tools required:

- 1/8" Allen Wrench

1. Remove the seat cushion.
2. Loosen, but do not remove, the Allen Screws on the side of the seat upholstery where the "hook & loop" adjustment flap is located on the underside of the seat upholstery. See Figure 41.
3. Detach the "hook & loop" adjustment flap and adjust the seat upholstery to the desired tension.
4. Retighten the Allen Screws that attach the seat upholstery to the frame. **Note:** this adjustment will be much easier if someone assists you by retightening the Allen Screws while you hold the adjustment flap at the desired tension.
5. Replace the seat cushion.

Replacing the Upholstery

Tools required:

- 1/8" Allen Wrench

1. Remove the seat cushion.
2. Remove all Allen Screws that attach the seat upholstery to the chair frame. See Figure 42.
3. Detach the "hook & loop" adjustment flap and remove the bolt-on seat sling.
4. If your replacement upholstery included new aluminum seat rails, proceed to step 5. If not, remove the aluminum seat rails from old upholstery and insert them into the new upholstery.
5. Place the new seat upholstery on the frame and align the fastening holes in the upholstery and aluminum seat rails with the holes in the seat tubes of the frame.

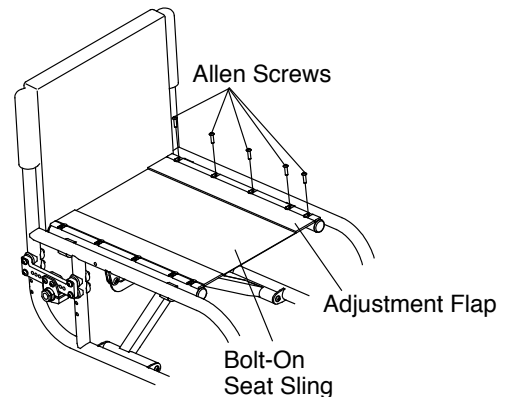


Figure 41
Adjusting Tension Adjustable Bolt-On Seat Sling

CHAPTER 7: BACK UPHOLSTERY, SEAT UPHOLSTERY AND SEAT CUSHIONS

- Loosely install all the Allen Screws on the side of the seat sling where the “hook & loop” adjustment flap is located.
- Install all the Allen Screws on the opposite side of the seat sling and securely tighten all Allen Screws.
- Detach the “hook & loop” adjustment flap and adjust the seat upholstery to the desired tension.
- Fully tighten the Allen Screws that attach the seat upholstery to the frame. **Note:** this adjustment will be much easier if someone assists you by retightening the Allen Screws while you hold the adjustment flap at the desired tension.
- Replace the seat cushion.

Tension Adjustable Slide-in Seat Sling

(2GX, Aero X and TX)

WARNING

Do not make the seat sling upholstery tension so loose that it does not properly support your weight. The sling should never be so loose that the sling causes your weight to be borne by the cross-tubes below the seat sling.

Adjusting the Tension

Tools required:

- Flat Head Screw Driver
- Rubber Mallet

- Remove the seat cushion.
- Insert the flat head screwdriver in the notch on the underside of each seat rail cap and pry off both caps. See Figure 43.
- Fold the chair.
- Remove slide in seat sling and rods. See Figure 43.
- Detach the “hook & loop” adjustment flap and adjust the seat upholstery to the desired tension.
- Re-insert slide in seat sling and rods into the seat rails.
- Unfold the chair.
- Reattach the seat rail caps using the rubber mallet and replace the seat cushion.

Replacing the Upholstery

Tools required:

- Flat Head Screw Driver
- Rubber Mallet

- Remove the seat cushion.
- Insert the flathead screwdriver into the notch on the underside of each seat rail cap and pry off both caps. See Figure 43.
- Fold the chair
- Remove slide-in seat sling and seat sling rods. See Figure 43.
- If your replacement upholstery included new seat sling rods, proceed to Step 6. If not, remove the seat sling rods from the old upholstery and insert them in the new upholstery.
- Adjust the seat upholstery to the desired tension using the “hook & loop” adjustment flap.
- Re-insert slide in seat rail sling and rods into the seat rails.
- Unfold the chair.
- Reattach the seat rail end caps using the rubber mallet.

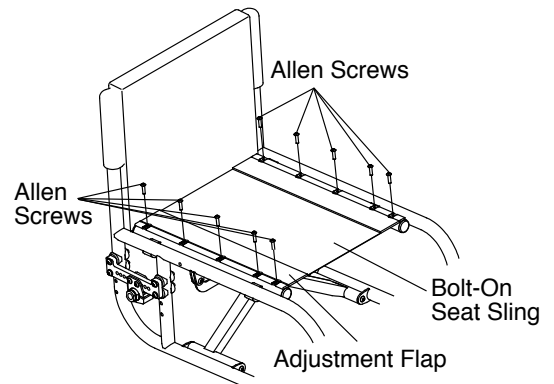


Figure 42
Replacing Tension Adjustable Bolt-On Seat Sling

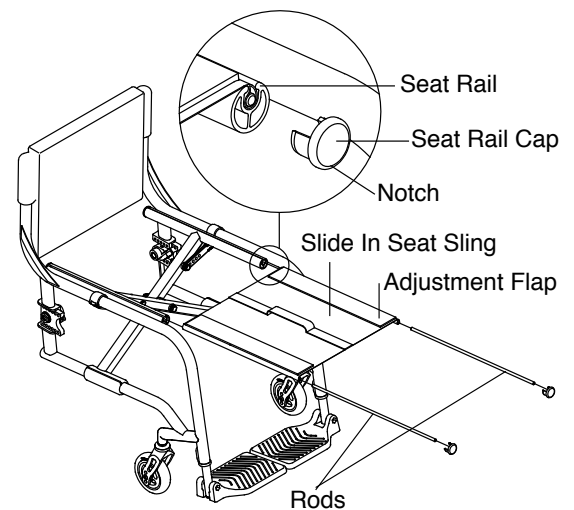


Figure 43
Adjusting Tension Adjustable Slide-in Seat Sling

CHAPTER 7: BACK UPHOLSTERY, SEAT UPHOLSTERY AND SEAT CUSHIONS

10. Replace the seat cushion.

TiLite Seat Cushion

(2GX, Aero X, SX, TX, X and XC)

Replacing the Foam Insert to Your TiLite Seat Cushion

1. Lift up and remove the existing seat cushion from the seat upholstery.
2. Unzip the seat cushion cover and remove the foam insert.
3. Insert the new foam insert into the seat cushion cover.
4. Close the seat cushion cover and replace on the chair.

For seat cushions or seat backs manufactured by manufacturers other than TiLite (e.g. Corbac, ROHO, Supracor or Varilite), consult the owners manual provided by the applicable manufacturer.

CHAPTER 8: AXLE PLATES AND CAMBER PLUGS (CENTER OF GRAVITY; REAR SEAT HEIGHT)

All TiLite folding wheelchairs are equipped with standard camber plugs. By adjusting the position of the camber plugs, you can adjust the center of gravity of your chair. In some cases, you also can adjust the rear seat height. This section explains the various adjustments that are possible.

⚠ WARNING

Any changes to the position of the camber plugs will affect the stability of the chair. Use extreme caution when using a new camber plug position as the new position may make the chair more prone to tip over. *If you ignore this Warning, your chair may not perform properly, which in turn, may cause you to fall, tip over or lose control of the chair and seriously injure yourself or others or damage the chair.*

⚠ WARNING

Whenever you adjust the position of the camber plug (either to adjust the rear seat height or the center of gravity), it may be necessary to adjust the toe-in/toe-out of the rear wheels. See “Adjusting Toe-In/Toe-Out” on page 48. In addition, whenever you adjust the position of the camber plug or when you adjust the toe-in/toe-out, it may be necessary to square the front casters to the floor. See “Adjustable Angle Caster Barrel (SX, and X)” on page 62. *If you ignore this Warning, your chair may not perform properly, which, in turn, may cause you to fall, tip over or lose control of the chair and seriously injure yourself or others or damage the chair.*

Note: To facilitate making the adjustments to rear seat height and center of gravity discussed in this chapter, it is recommended that you remove the rear wheels and turn the chair upside down before starting to make any adjustments.

Adjusting the Center of Gravity (SX and X)

Note: Depending on the configuration that was specified when your chair was ordered, your SX or X chair will have one of two axle plates. See Figure 44.

Tools Needed:

- 3/16” Allen Wrench
- 3/16” Open End Wrench

1. Remove the rear wheels.
2. Remove the four Allen Screws (two on each side of the chair) that secure the camber plug clamps to the axle plates. See Figure 45.
3. Reposition one camber plug clamp to the desired location and align the two holes in the camber plug clamp with two holes in the axle plate.
4. Reinsert the two Allen Screws through the axle plate, the camber plug clamp and the nylock nuts.
5. Repeat Steps 3 and 4 on the opposite side of the chair. Make sure the second camber plug clamp is mounted in exactly the same location on the opposite side of the frame.
6. Securely tighten all four Allen Screws.
7. Reinstall the rear wheels.
8. Check the toe-in/toe-out and adjust as needed and square the front casters as needed.

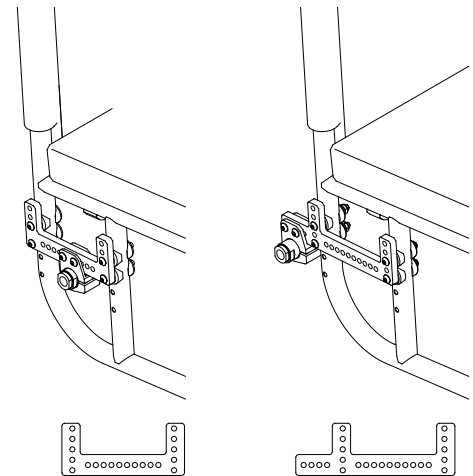


Figure 44
SX/X Regular and Amputee Axle Plates

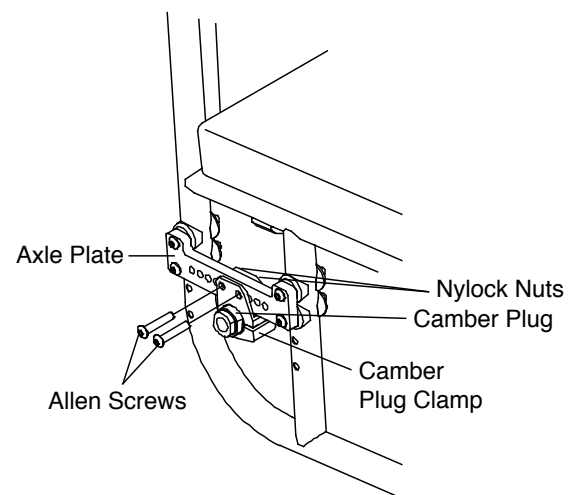


Figure 45
SX/X Adjusting the Center of Gravity

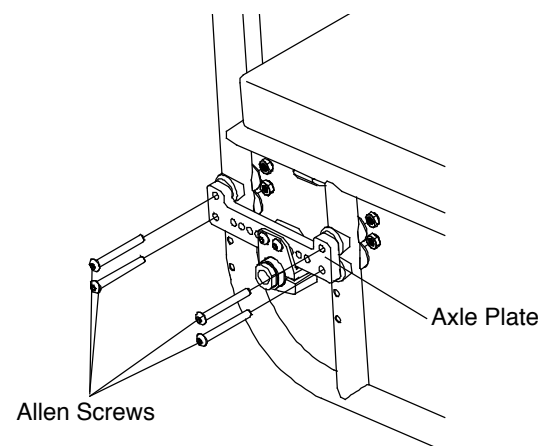


Figure 46
SX/X Adjusting Rear Seat Height

CHAPTER 8: AXLE PLATES AND CAMBER PLUGS (CENTER OF GRAVITY; REAR SEAT HEIGHT)

Adjusting the Rear Seat Height

(SX and X)

Note: Depending on the configuration that was specified when your chair was ordered, your SX or X chair will have one of two axle plates. See Figure 44.

Tools Needed:

- 3/16" Allen Wrench
- 3/16" Open End Wrench

1. Remove the rear wheels.
2. Remove the four Allen Screws that secure the axle plate to the frame. See Figure 46. Carefully note the order in which the various washers and nuts (and other parts, such as anti-tip receptacles or armrest or stroller handle receivers) originally installed on your chair as you will need to reinstall all of these parts in the exact same order in Step 4 below.
3. Reposition the axle plate to the desired height, making sure that two holes at either end align with two holes in the frame. Note that the holes in the frame are spaced in 1" increments. The holes in the axle plate are spaced in 1" increments but the axle plates can be reversed, making the height adjustable in 1/2" increments. Also note that if your chair is equipped with armrests and/or anti-tips, you may need to raise or lower these by the same amount you raise or lower the axle plate.
4. Reinstall the four Allen Screws that secure the adjustable axle plate to the frame, making sure all washers and nuts (and any other parts, such as anti-tip receptacles or armrest or stroller handle receivers) are reinstalled in the exact same order as they were originally installed.
5. Repeat Steps 2 through 4 with the axle plate on the opposite side of the chair. Make sure the second axle plate is mounted in exactly the same location on the opposite side of the frame.
6. Securely tighten all eight Allen Screws.
7. Reinstall the rear wheels.
8. Check the toe-in/toe-out and adjust as needed and square the front casters as needed.

Adjusting the Rear Wheel Spacing/Replacing the Camber Plugs

(SX and X)

Note: Depending on the configuration that was specified when your chair was ordered, your SX or X chair will have one of two axle plates. See Figure 44.

Tools Needed:

- 3/16" Allen Wrench
- Ruler
- Level

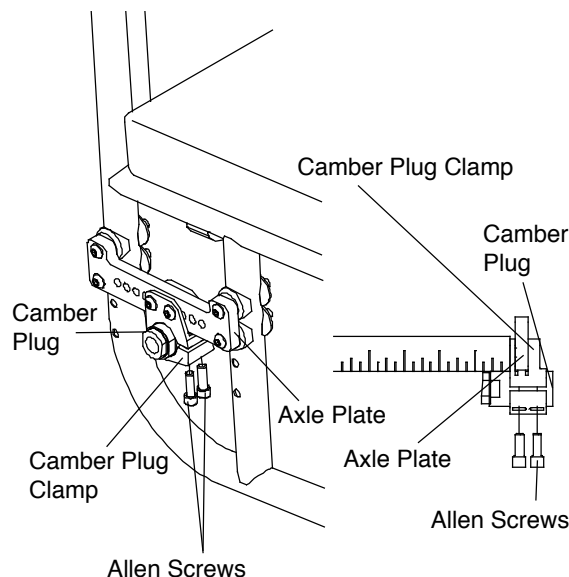


Figure 47
SX/X Adjusting Rear Wheel Spacing

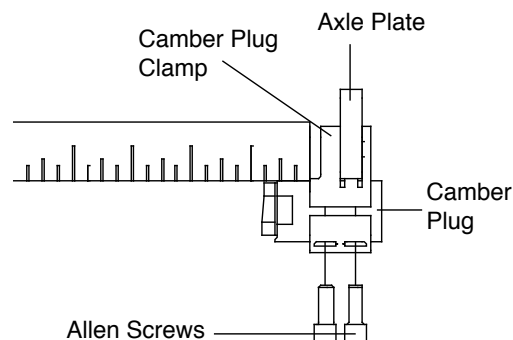


Figure 48
SX/X Measuring Rear Wheel Spacing

CHAPTER 8: AXLE PLATES AND CAMBER PLUGS (CENTER OF GRAVITY; REAR SEAT HEIGHT)

⚠ WARNING

Do not extend the camber plug more than 1" out of the camber plug clamp. If more than 1" of the camber plug is outside of the camber mount clamp, the camber plug could disengage from the camber mount clamp while you are using the chair. *If you ignore this Warning, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

1. Remove the rear wheels.
2. Loosen, but do not remove, the two Allen Screws that secure the camber plug to each camber plug clamp. See Figure 47. If you are adjusting the rear wheel spacing, only loosen the screws enough to permit the camber plug to slide in and out of the camber plug clamp and skip to Step 5 below.
3. Remove the camber plug from the camber plug clamp.
4. Install the new camber plug in the camber plug clamp.
5. The amount of the camber plug that extends outside of the camber plug clamp affects the rear wheel spacing. The less of the camber plug that extends outside the camber plug clamp, the narrower the rear wheel spacing. The more of the camber plug that extends outside the camber plug clamp, the wider the rear wheel spacing. However, the distance from the camber plug clamp to the end of the camber plug should never exceed 1". Make sure the distance from the outside edge of the camber clamp to the end of the camber plug is identical on each side of the chair. **Note:** If your desired rear wheel width would require that more than 1" of the camber plug extends beyond the camber plug clamp, consider repositioning the camber plug clamp to the outside of the adjustable axle plate. See Figure 48.
6. Before tightening the four Allen Screws, use a level to make sure that the notches on the camber plug are perpendicular to the ground.
7. Securely tighten all four Allen Screws.
8. Reinstall the rear wheels.
9. Check the toe-in/toe-out and adjust as needed and square the front casters as needed.

Adjusting the Center of Gravity

(TX)

⚠ WARNING

When repositioning the camber clamps on the CG Bracket (as described below), always leave as many open holes between each pair of Allen Screws as your desired placement will permit. NEVER use two adjacent holes to attach the camber clamp to the CG Bracket. *If you ignore this Warning, your camber clamp may fail, causing you to fall, tip over or lose control of the chair and seriously injure yourself or others or damage the chair.*

Tools Needed:

- 3/16" Allen Wrench
- Ruler

1. Remove the rear wheels.
2. Remove the eight Allen Screws (four on each side of the chair) that secure the camber clamps to the CG brackets. See Figure 49.

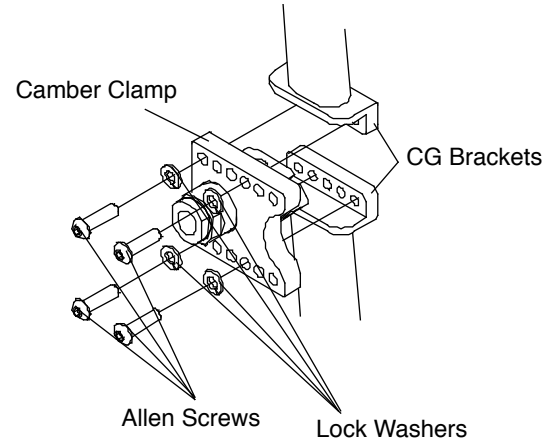


Figure 49
TX Adjusting the Center of Gravity

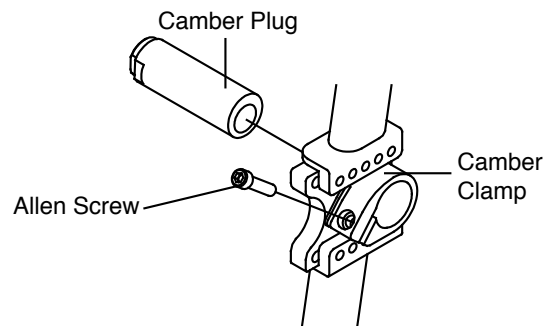


Figure 50
TX Adjusting the Rear Wheel Spacing

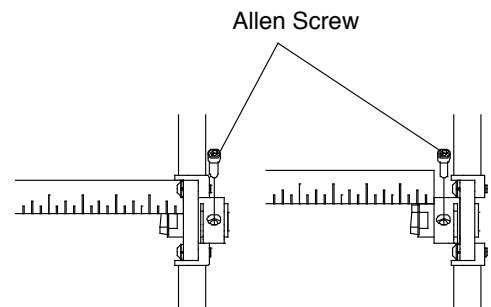


Figure 51
TX Measuring the Rear Wheel Spacing

CHAPTER 8: AXLE PLATES AND CAMBER PLUGS (CENTER OF GRAVITY; REAR SEAT HEIGHT)

3. Reposition the camber clamps to the desired position on the CG brackets, making absolutely sure the positioning is the same on both sides of the chair. You **MUST** leave one open hole between each pair of Allen Screws.
4. Reinstall the Allen Screws and lock washers and securely tighten all eight Allen Screws.
5. Reinstall the rear wheels.
6. Check the toe-in/toe-out and adjust as needed.

Adjusting the Rear Seat Height

(TX)

If your chair is a TX, you cannot change the rear seat height.

Adjusting the Rear Wheel Spacing/Replacing the Camber Plugs

(TX)

⚠ WARNING

Do not extend the camber plug more than 1" out of the camber mount clamp. If more than 1" of the camber plug is outside of the camber mount clamp, the camber plug could disengage from the camber mount clamp while you are using the chair. *If you ignore this Warning, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

Tools Needed:

- 3/16" Allen Wrench
- Ruler
- Level

1. Remove the rear wheels.
2. Loosen, but do not remove, the Allen Screw that secures each camber plug to each camber mount clamp. See Figure 50. If you are adjusting the rear wheel spacing, only loosen the screw enough to permit the camber plug to slide in and out of the camber mount clamp and skip to Step 5 below.
3. Remove the camber plugs.
4. Install the new camber plugs.
5. The amount of the camber plug that extends outside of the camber mount clamp affects the rear wheel spacing. The less of the camber plug that extends outside of the camber mount clamp, the narrower the rear wheel spacing. The more of the camber plug that extends outside of the camber mount clamp, the wider the rear wheel spacing. However, the distance from the camber mount clamp to the end of the camber plug should never exceed 1". Make sure that the distance from the outside edge of the camber clamp to the end of the camber plug is identical on both sides of the chair. **Note:** If your desired rear wheel width would require that more than 1" of the camber plug extends beyond the camber plug clamp, consider repositioning the camber mount clamp to the outside of the adjustable axle plate. See Figure 51.

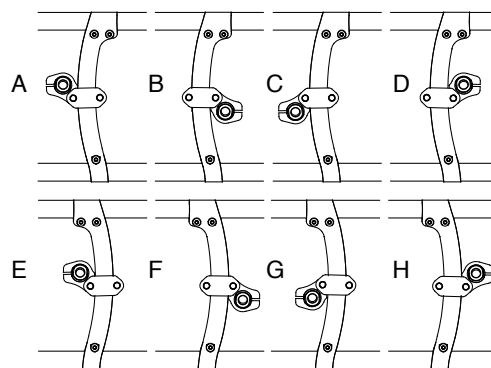


Figure 52
2GX/Aero X Camber Mount Clamp Configurations

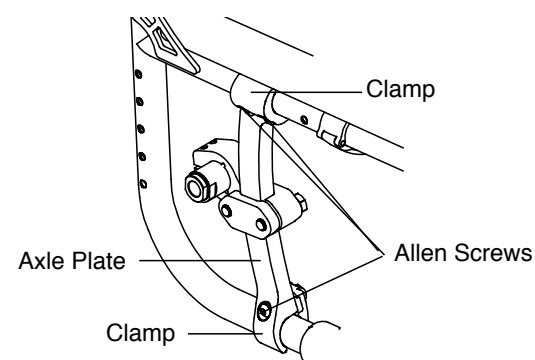


Figure 53
2GX/Aero X Adjusting the Center of Gravity

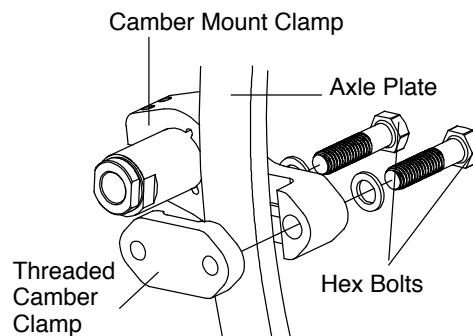


Figure 54
2GX/Aero X Adjusting the Rear Seat Height

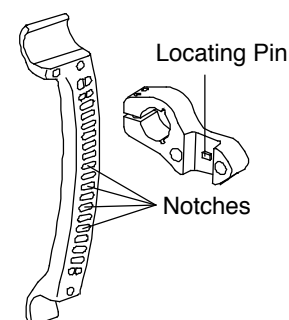


Figure 55
2GX/Aero X

CHAPTER 8: AXLE PLATES AND CAMBER PLUGS (CENTER OF GRAVITY; REAR SEAT HEIGHT)

6. Before tightening the four Allen Screws, use a level to make sure that the notches on the camber plug are perpendicular to the ground.
7. Securely tighten each Allen Screw.
8. Reinstall the rear wheels.
9. Check the toe-in/toe-out and adjust as needed.

Adjusting the Center of Gravity

(2GX and Aero X)

Note: The camber mount clamps and axle plates on either side of the chair can be reversed or exchanged so as to achieve any of the eight configurations shown in Figure 52. When your chair shipped from the factory, it shipped in the configuration shown in Figure 52a or 52c. Depending on the desired location of the center of gravity and/or rear seat height, it may be necessary to change the configuration of the camber mount clamps and axle plates to one of the other configurations shown in Figure 52.

Tools Needed:

- 5/32" Allen Wrench
- Ruler

1. Partially fold the chair and remove the rear wheels.
2. Loosen the six Allen Screws (three on each side of the chair) that secure the clamps at either end of the vertical axle plates to the frame. See Figure 53.
3. Reposition the rear axle assemblies to the desired location on both sides of the frame.
4. Using a ruler, make sure that both axle assemblies are the same distance forward from the rear of the frame.
5. Securely tighten all six Allen Screws.
6. Reinstall the rear wheels and unfold the chair.
7. Check the toe-in/toe-out and adjust as needed and square the front casters as needed.

Note: If the preceding procedure does not permit you to achieve your desired center of gravity, consider utilizing one of the other configurations shown in Figure 52. For example, if your chair was delivered in the configuration shown in Figure 52A but you want the center of gravity more forward while maintaining the same rear seat height, then switch the left and right axle plates and camber mount clamps so as to achieve the configuration shown in Figure 52H

Adjusting the Rear Seat Height

(2GX and Aero X)

Note: The camber mount clamps and axle plates on either side of the chair can be reversed or exchanged so as to achieve any of the four configurations shown in Figure 52. When your chair shipped from the factory, it shipped in the configuration shown in Figure 52a or 52c. Depending on the desired location of the center of gravity and/or rear seat height, it may be necessary to change the configuration of the camber mount clamps and axle plates to one of the other configurations shown in Figure 52.

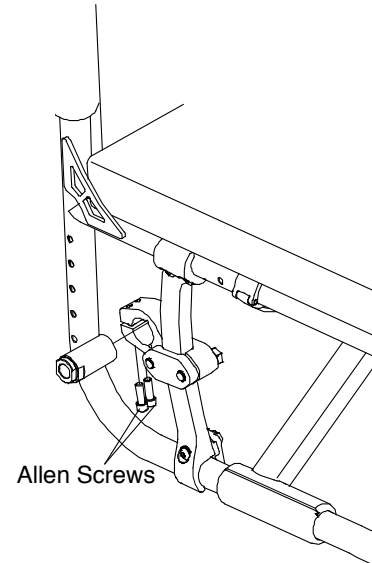


Figure 56
2GX/Aero X Adjusting Rear Wheel Spacing

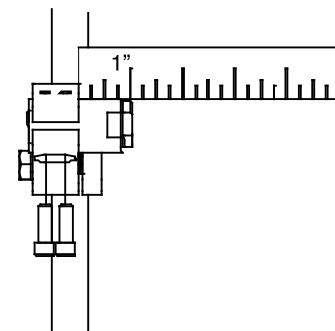


Figure 57
2GX/Aero X Measuring Rear Wheel Spacing

CHAPTER 8: AXLE PLATES AND CAMBER PLUGS (CENTER OF GRAVITY; REAR SEAT HEIGHT)

Tools Needed:

- 5/32" Allen Wrench
- 9/16" Torque Wrench

1. Remove the rear wheels.
2. Remove the two hex bolts (two on each side of the chair) that secure the camber mount clamp to the vertical axle plate. See Figure 54.
3. Reposition the camber mount clamp to the desired height, making sure that locating pin on the inside of the clamp is secured inside one of the notches on the vertical axle clamp. See Figure 55. Note that the notches in the vertical axle plate spaced in approximately 5/16" increments.
4. Reinstall the two hex bolts that secure the camber mount clamp to the vertical axle plate, making sure all washers are reinstalled in the exact same order as they were originally installed. Initially each hex bolt should be finger-tight. See Figure 54.
5. The two hex bolts should be tightened to 30 ft-lbs. In order to insure that the back wheel is properly toed, it is important to tighten these bolts as follows:
 - a. Alternating between the forward and rearward hex bolts. Use the torque wrench to turn each bolt approximately one-half turn. Continue alternating until each bolt has been tightened to 30 ft-lbs.
 - b. Visually inspect the gap between the camber mount clamp and the threaded camber clamp both forward and rearward of the axle plate.
 - c. If necessary, use the torque wrench to tighten down the side where the gap described above is larger
6. Repeat Steps 3 and 4 with the camber mount clamp on the opposite side of the chair. Make sure the second camber mount clamp is mounted in exactly the same location on the opposite side of the frame.
7. Securely tighten all four hex bolts.
8. Using a level, make sure that the notches on each camber plug are perpendicular to the ground. If necessary, loosen the two Allen Screws that secure the camber plug with the camber mount clamp and rotate the camber plug within the clamp to ensure that the notches are perpendicular to the ground. See Figure 56.
8. Reinstall the rear wheels.
9. Check the toe-in/toe-out and adjust as needed and square the front casters as needed.

Note: If the preceding procedure does not permit you to achieve your desired rear set height, consider utilizing one of the other configurations shown in Figure 52. For example, if your chair was delivered in the configuration shown in Figure 52A but you want the rear seat height while maintaining the same center of gravity, then switch the left and right camber mount clamps so as to achieve the configuration shown in Figure 52C

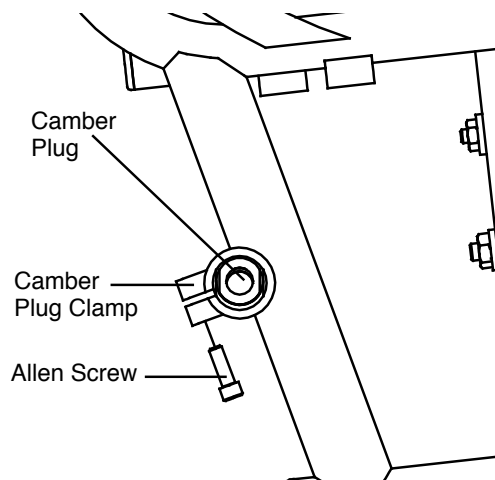


Figure 58
XC Adjusting the Rear Wheel Spacing

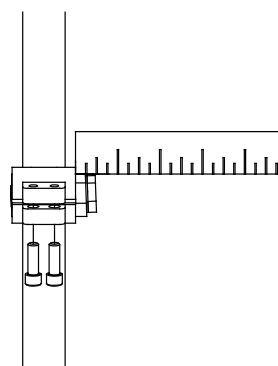


Figure 59
XC Measuring Rear Wheel Spacing

CHAPTER 8: AXLE PLATES AND CAMBER PLUGS (CENTER OF GRAVITY; REAR SEAT HEIGHT)

Adjusting the Rear Wheel Spacing/Replacing the Camber Plugs

(2GX and Aero X)

Tools Needed:

- 3/16" Allen Wrench
- Ruler

⚠ WARNING

Do not extend the camber plug more than 1" out of the camber mount clamp. If more than 1" of the camber plug is outside of the camber mount clamp, the camber plug could disengage from the camber mount clamp while you are using the chair. *If you ignore this Warning, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

1. Remove the rear wheels.
2. Loosen, but do not remove, the two Allen Screws that secure the camber plug within each camber mount clamp. See Figure 56. If you are adjusting the rear wheel spacing, only loosen the screws enough to permit the camber plug to slide in and out of the camber mount clamp and skip to Step 5 below.
3. Remove the camber plug from the camber mount clamp.
4. Install the new camber plug in the camber plug clamp.
5. The amount of the camber plug that extends outside of the camber mount clamp affects the rear wheel spacing. The less of the camber plug that extends outside the camber mount clamp, the narrower the rear wheel spacing. The more of the camber plug that extends outside the camber mount clamp, the wider the rear wheel spacing. However, the distance from the camber mount clamp to the end of the camber plug should never exceed 1". Make sure the distance from the outside edge of the camber clamp to the end of the camber plug is identical on each side of the chair. See Figure 57.
6. Before tightening the four Allen Screws use a level to make sure that the notches on the camber plug are perpendicular to the floor.
7. Securely tighten all four Allen Screws.
8. Reinstall the rear wheels.
9. Check the toe-in/toe-out and adjust as needed and square the front casters as needed.

Adjusting the Center of Gravity

(XC)

If your chair is an XC, you cannot adjust the center of gravity of the chair.

Adjusting the Rear Seat Height

(XC)

If your chair is an XC, you cannot adjust the rear seat height of the chair.

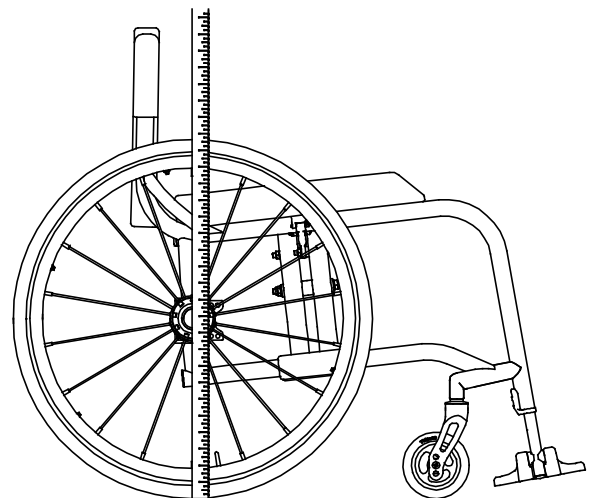


Figure 60
Adjusting Toe-in/Toe-Out (Measurement A)

CHAPTER 8: AXLE PLATES AND CAMBER PLUGS (CENTER OF GRAVITY; REAR SEAT HEIGHT)

Adjusting the Rear Wheel Spacing/Replacing the Camber Plugs

(XC)

⚠ WARNING

Do not extend the camber plug more than 1" out of the camber mount clamp. If more than 1" of the camber plug is outside of the camber mount clamp, the camber plug could disengage from the camber mount clamp while you are using the chair. *If you ignore this Warning, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

Tools Needed:

- 3/16" Allen Wrench
- Ruler

1. Remove the rear wheels.
2. Loosen, but do not remove, the two Allen Screws that secure each camber plug to each camber plug clamp. See Figure 58. If you are adjusting the rear wheel spacing, only loosen the screws enough to permit the camber plug to slide in and out of the camber mount clamp and skip to Step 5 below.
3. Remove the camber plugs.
4. Install the new camber plug in the camber plug clamp.
5. The amount of the camber plug that extends outside of the camber plug clamp affects the rear wheel spacing. The less of the camber plug that extends outside the camber plug clamp, the narrower the rear wheel spacing. The more of the camber plug that extends outside the camber plug clamp, the wider the rear wheel spacing. However, the distance from the camber plug clamp to the end of the camber plug should never exceed 1". Make sure the distance from the outside edge of the camber plug to the end of the camber plug is identical on each side of the chair. See Figure 59.
6. Securely tighten all four Allen Screws.
7. Reinstall the rear wheels.
8. Check the toe-in/toe-out and adjust as needed.

Adjusting Toe-In/Toe-Out

Tools Needed:

- 3/16" Allen Wrench
- Ruler or Tape Measure
- Level
- 9/16" Torque Wrench

1. Make sure both rear wheels are equally spaced. See "Adjusting Rear Wheel Spacing/Replacing the Camber Plugs" on pages 44-47.
2. Make sure the rear wheels are properly inflated.
3. Place the chair on all four wheels with the front casters trailing toward the rear of the frame. See Figure 60.
4. Measure from the floor to the center of the axle ("Measurement A"). Be sure the tape measure/ruler is perpendicular to the floor. See Figure 60.

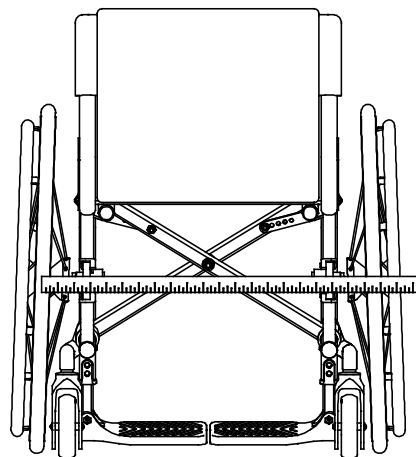


Figure 61
Adjusting Toe-in/Toe-Out (Measurement B)

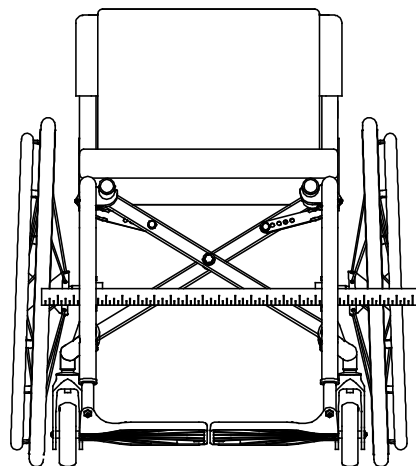


Figure 62
Adjusting Toe-in/Toe-Out (Measurement C)

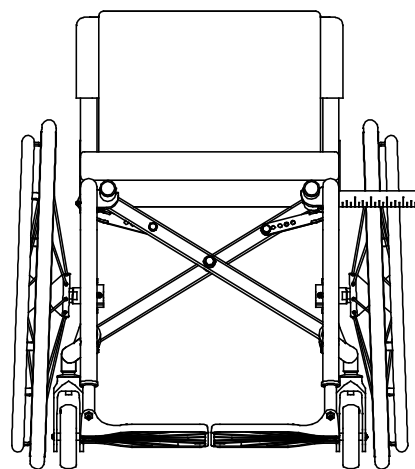


Figure 63
Adjusting Toe-in/Toe-Out (Measurement D)

CHAPTER 8: AXLE PLATES AND CAMBER PLUGS (CENTER OF GRAVITY; REAR SEAT HEIGHT)

5. Block the wheels with a heavy object so the chair can not roll forward or backward (do not use the wheel locks as this may affect the toe-in/toe-out adjustment).
6. Measuring from the floor at the rear of each tire, mark the tire (with a felt tip pen) at the same height as Measurement A.
7. Measuring from the floor at the front of each tire, mark the tire (with a felt tip pen) at the same height as Measurement A.
8. Measure the distance between the left and right tires at the rear reference marks made in step 6 ("Measurement B"). See Figure 61.
9. Measure the distance between the left and right tires at the front reference marks made in step 7 ("Measurement C"). See Figure 62.
10. If the measurements B and C are the same (within 1/8"), no toeing adjustment is needed, and you may skip to step 14. If not, proceed to step 11 if your chair is a 2GX or an Aero X or Step 12 if your chair is an SX, TX, X or XC.
11. Use the torque wrench to adjust the hex bolts that secure the camber mount clamps to the threaded camber mounts. Tightening the more rearward bolt should increase the toe-in. Re-measure Measurements B and C to determine if this adjustment has achieved proper toe-in/toe-out continue adjusting these hex bolts until measurement B and C are equal (within 1/8"). Further, if this adjustment is successful, no toeing adjustment is necessary, and you may skip to step 14. If not, proceed to step 12.
12. Loosen the Allen Screws in each camber plug clamp that secures the camber plug in place. See "Adjusting Rear Wheel Spacing/Replacing the Camber Plugs" or pages 44-47.
13. If the measurement in step 9 is less than the measurement in step 8, rotate both Camber Plugs rearward to toe-out the rear wheels. If the measurement in step 9 is greater than the measurement in step 8, rotate both Camber Plugs forward to toe-in the wheels. Continue adjusting the axle sleeves until these two measurements are equal.
14. Measure the distance from the tube to the inside of the tire at the front of each tire on both sides of the frame ("Measurement B"). See Figure 63.
15. If Measurement B is the same on both sides of the chair, proceed to step 17.
16. If Measurement B is not the same on both sides of the chair, you will need to rotate the camber plugs in the camber plug clamps as necessary to make sure Measurement B is equal on both sides of the chair. Make sure when you rotate the camber plugs, you do not affect the rear wheel spacing. See "Adjusting Rear Wheel Spacing/Replacing the Camber Plugs" on pages 44-47.
17. After adjusting the camber plugs in step 15, it will be necessary to recheck the toe-in/toe-out. See steps 6 through 10 above.
18. Securely tighten the Allen Screws in the camber plug clamps. See Figures 47, 50 or 56.

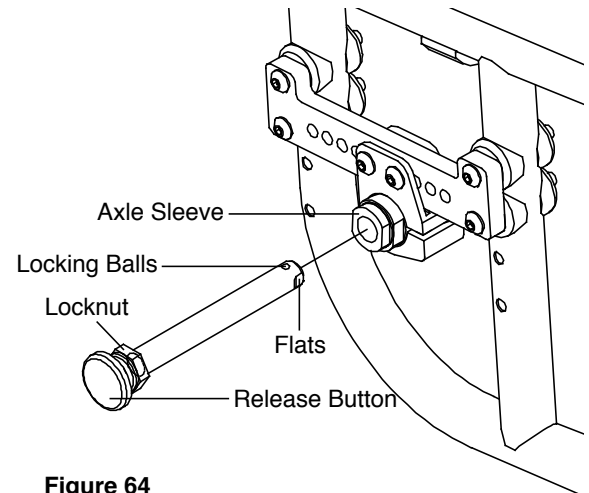


Figure 64
Adjusting the Quick Release Axle

CHAPTER 9: AXLES AND AMPUTEE ADAPTERS

⚠ WARNING

Do not attempt any of the procedures in this Chapter when the chair is occupied. *If you ignore this Warning, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

Stainless and Titanium Quick Release Axles

(2GX, Aero X, SX, TX, X and XC)

Adjusting the Quick-Release Axle

⚠ WARNING

Quick release axles are pre-adjusted to permit minimal “play” in the axle. TiLite recommends that you do not adjust the axle. Improperly adjusting the axle could cause it to malfunction—too much play can cause the axle to bend and become stuck in the axle sleeve; too little play can prevent the locking balls from engaging fully, causing the wheel to disengage from the chair without warning. TiLite recommends that any adjustments be made by an authorized TiLite dealer. *If you ignore this Warning, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

Tools Needed:

- 3/4” End Wrench
- 7/16” End Wrench

1. Depress the release button and remove rear wheel and quick release axle. See Figure 64.
2. Remove axle from the wheel by depressing the release button and sliding the axle through the rear wheel hub.
3. Once removed from the hub, release the release button (the locking balls should be fully extended).
4. Increase or decrease axle play by adjusting the locknut while securing the opposite end of the axle using the smaller wrench at the flats at the end of the axle.
5. Depress the release button on the quick release axle and slide the axle through the rear wheel hub.
6. Depress the release button and reinstall rear wheel into the axle sleeve.
7. Before riding in the chair, make sure the locking balls have fully secured the wheel in the axle sleeve by pulling on the hub without depressing the release button on the quick release axle. If the locking balls do not fully engage, repeat these procedures and increase the play (i.e., increase the distance between the locknut and the locking balls) to permit the locking balls to fully engage properly. Also check to make sure there is not too much play in the axle.

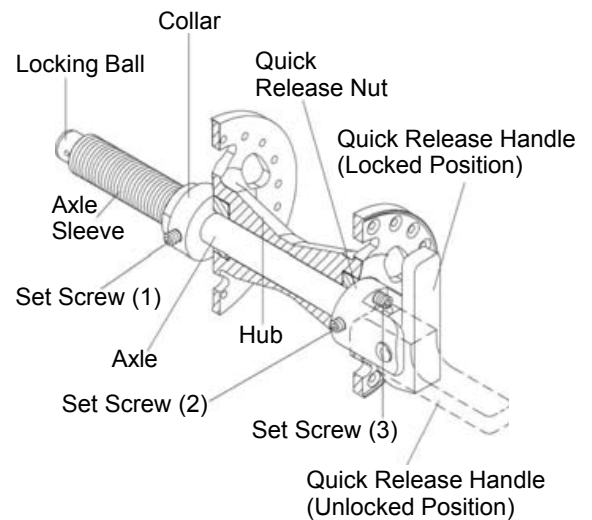


Figure 65
Quad Quick Release Axle Adjustment

Quad Quick-Release Axles

(SX, TX, X, XC and Aero X)

Adjusting the Quad Quick Release Handle

WARNING

Quick release axles are pre-adjusted to permit minimal “play” in the axle. TiLite recommends that you do not adjust the axle. Improperly adjusting the axle could cause it to malfunction—too much play can cause the axle to bend and become stuck in the axle sleeve; too little play can prevent the locking balls from engaging fully, causing the wheel to disengage from the chair without warning. TiLite recommends that any adjustments be made by an authorized TiLite dealer. *If you ignore this Warning, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

If there is no play in the quad quick release handle, or if the release handle does not flip back and forth from locked to unlocked properly, or if you cannot fully engage it in the locked position or the unlocked position, the procedure below will permit you to adjust the operation of the handle.

Tools Needed:

- 5/64” Allen Wrench

1. Flip the quick release handle to the unlocked position and remove rear wheel and quick release axle. See Figure 65.
2. Flip quick release handle to locked position.
3. To adjust the “play” between the quick release handle and the release button inside the quick release nut: (a) loosen Set Screw 2 on the quick release nut; (b) rotate the quick release nut clockwise or counter-clockwise on the axle until the release button inside the quad quick release nut just touches the release handle while it is in the locked position; and (c) tighten Set Screw 2.
4. Adjusting the “play” in the quick release handle may necessitate an adjustment to the “play” between the collar and the wheel hub. See “Adjusting the Play” on page 52.
5. With the quick release handle in the unlocked position, reinstall the rear wheel on the chair.
6. Before riding in the chair, make sure the locking balls have fully secured the wheel in the axle sleeve by pulling on the hub with the release handle in the locked position. If the locking balls do not fully engage, repeat these procedures to increase the “play” (i.e., increase the distance between the quick release nut and the locking balls), to permit the locking balls to fully engage properly. Also check to make sure there is not too much play in the axle. See “Adjusting the Play” on page 52.

CHAPTER 9: AXLES AND AMPUTEE ADAPTERS

Adjusting the “Play”

Tools Needed:

- 5/64” Allen Wrench

⚠ WARNING

Quick release axles are pre-adjusted to permit minimal “play” in the axle. TiLite recommends that you do not adjust the axle. Improperly adjusting the axle could cause it to malfunction—too much play can cause the axle to bend and become stuck in the axle sleeve; too little play can prevent the locking balls from engaging fully, causing the wheel to disengage from the chair without warning. TiLite recommends that any adjustments be made by an authorized TiLite dealer. *If you ignore this Warning, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

If there is too much play in the axle so the wheel is loose when locked into position in the axle sleeve or too little play so the locking balls do not properly engage, follow this procedure:

1. Flip the quick release handle to the unlocked position and remove rear wheel and quick-release axle. See Figure 65.
2. Adjust Set Screw 3 on the quick release nut so that no portion of Set Screw 3 is protruding out of the opposite side of the quick release nut (the side adjacent to the wheel hub).
3. Loosen Set Screw 1 on the collar.
4. Replace the wheel on the chair.
5. With the wheel still on the chair and the quad quick release handle in the locked position so the locking balls are fully engaged, securely tighten Set Screw 1 so the collar is securely on the axle sleeve.
6. With the release handle in the unlocked position, turn Set Screw 3 clockwise to remove any remaining play between the wheel hub and collar.
7. Flip the quad quick release handle to the locked position and check the “play” in the axle. Make sure the locking balls fully engage and lock the axle into the camber tube. If there is still too much play in the axle, repeat the procedure in step 6. If you have taken too much play out of the axle, repeat the procedure in step 6, but turn Set Screw 3 counter-clockwise to add play to the axle.
8. Before riding in the chair, check the play in wheel and check to make sure the locking balls have fully secured the axle inside the axle sleeve by pulling on the hub with the quad quick release handle in the locked position. If the locking balls do not properly engage or there is too much play, return to Step 1 and repeat this procedure.

Amputee Adapters

(SX, X and Aero X)

Amputee adapters serve to relocate the camber plugs behind the rear of the wheelchair. By positioning the camber plugs behind the rear of the chair, the center of gravity is shifted rearward and the stability of the chair is increased. Figures 66 and 67 show the configuration of the 2GX, Aero X, SX and X wheelchairs when amputee adapters are used.

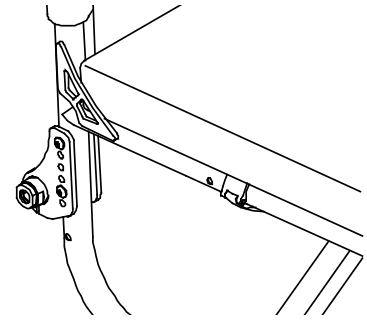


Figure 66
2GX/Aero X Amputee Adapters

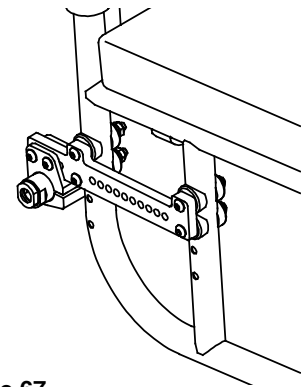


Figure 67
SX/X Amputee Adapters

⚠ WARNING

TiLite recommends that you remove the wheel locks (whether Standard Push to Lock, Uni-Lock or Scissor Lock) from your chair frame prior to engaging in any contact sport. *If you ignore this Warning, you may seriously injure yourself or others or damage the wheelchair.*

⚠ WARNING

If the wheel locks (whether Standard Push to Lock, Uni-Lock or Scissor Lock) are improperly adjusted so the wheel stop embeds less than 3/16" into the tire, the chair may roll unexpectedly. Therefore, before adjusting the lock you must make sure the tires are properly inflated to the recommended tire pressure (see sidewall of the tire). If you adjust the locks when the tires are under-inflated, the lock will not operate properly when the tire is fully inflated. *If you ignore this Warning, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

⚠ WARNING

After making any adjustment to the wheel locks (whether Standard Push to Lock, Uni-Lock or Scissor Lock), engage the wheel locks and push against the tires to verify that the new position permits the wheel locks to fully prevent the wheels from moving. If not, readjust the wheel locks until the wheel locks securely prevent the chair from rolling. *If you ignore this Warning, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

Standard Push to Lock

(2GX, Aero X, SX, TX, X and XC)

Adjusting the Push to Lock Wheel Lock

Tools Needed:

- 3/16" Allen Wrench

1. Loosen the Allen Screws in the wheel lock clamp. See Figure 68.
2. Adjust the position of the wheel lock clamp on the frame so the wheel stop embeds at least 3/16" into the tire when engaged in the locked position.
3. Securely tighten the two Allen Screws that secure the wheel lock clamp to the frame.

Replacing the Push to Lock Wheel Lock

Tools Needed:

- 3/16" Allen Wrench

1. Loosen the two Allen Screws that secure the wheel lock clamp to the frame.
2. Slide the old Standard Push to Lock wheel lock out of the wheel lock clamp. See Figure 68.
3. Slide the new wheel lock into the wheel lock clamp, but do not tighten the Allen Screws.
4. Follow the procedures under "Adjusting the Push to Lock Wheel Lock" on page 53 to position and secure the new wheel lock.

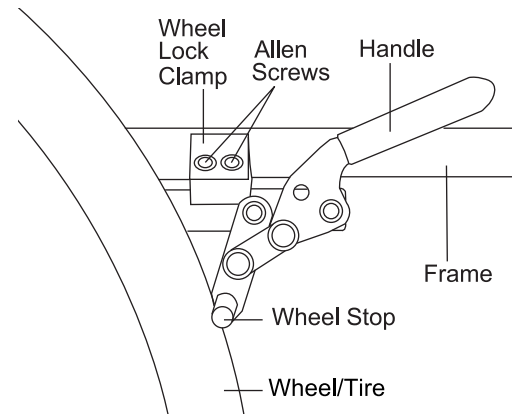


Figure 68
Adjusting/Replacing Standard Push to Lock Wheel Lock

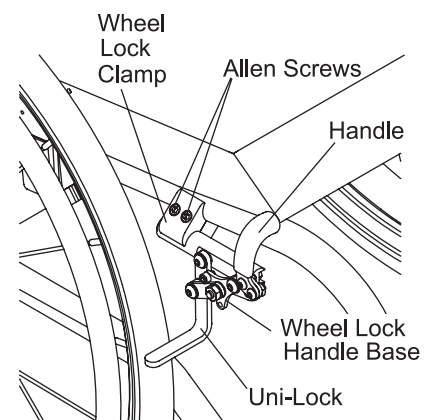


Figure 69
Adjusting/Replacing Uni-Lock Wheel lock

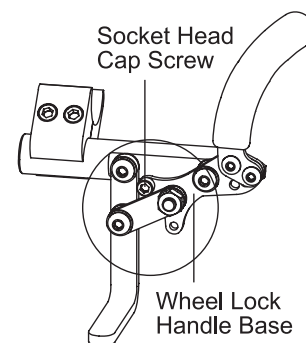


Figure 70
Pull to Lock Position

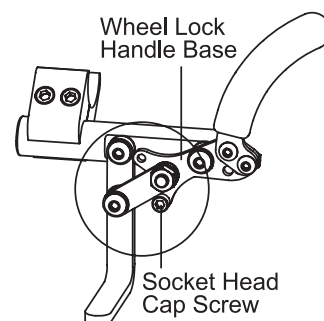


Figure 71
Push to Lock Position

CHAPTER 10: WHEEL LOCKS

Uni-Lock

(2GX, Aero X, SX, X, TX and XC)

Adjusting the Uni-Lock Wheel Lock

Tools Needed:

- 3/16" Allen Wrench

1. Loosen the two Allen Screws in the wheel lock clamp. See Figure 69.
2. Adjust the position of the wheel lock clamp on the frame so the wheel stop embeds at least 3/16" into the tire when engaged in the locked position.
3. Securely tighten the two Allen Screws that secure the wheel lock clamp to the frame.

Replacing the Uni-Lock Wheel Lock

Tools Needed:

- 3/16" Allen Wrench

1. Loosen the two Allen Screws that secure the wheel lock clamp to the frame.
2. Slide the old Uni-Lock out of the wheel lock clamp. See Figure 69.
3. Slide the new Uni-Lock into the wheel lock clamp, but do not tighten the Allen Screws.
4. Follow the procedures under "Adjusting the Uni-Lock Wheel Lock" on page 54 to position and secure the new wheel lock.

Changing the Uni-Lock From the Push to the Pull Position

Tools Needed:

- 5/32" Allen Wrench

The Uni-Lock wheel lock can be set up so that you either pull the handle to engage the lock or push the handle to engage the lock. To determine which setup you have, locate the small socket head cap screw in the wheel lock handle base. If it is in the upper position (see Figure 70), the Uni-Lock is set to the "Pull to Lock" position. If it is in the lower position (see Figure 71), the Uni-Lock is set to the "Push to Lock" position. You can change the operation from pull to push or vice versa as follows:

1. Remove the socket head cap screw and reposition it to either the Pull to Lock or Push to Lock position, as desired. See Figure 72.
2. Securely tighten the socket head cap screw.

Repositioning the Handle of the Uni-Lock Wheel Lock

Six (6) handle positions are achievable using the Uni-Lock. See Figures 74 through 77. Each handle position can be used as either a Pull to Lock or a Push to Lock (see "Changing the Uni-Lock From the Push to the Pull Position" on page 54), resulting in 12 possible Uni-Lock setups.

Figures 74 through 77 show the handle in both the engaged (locked) and disengaged (unlocked) positions. Study the Figures to determine which handle configuration will work best for you. Follow the directions below to reconfigure your handle to the desired configuration.

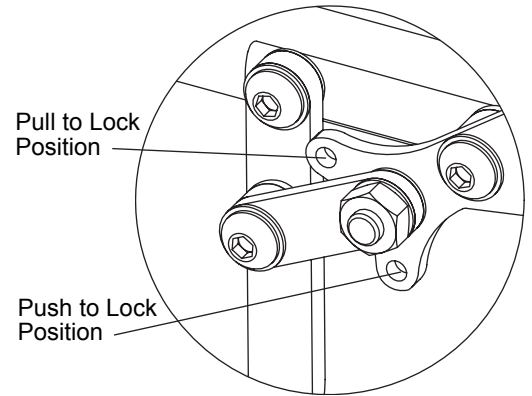


Figure 72
Changing From Push to Pull

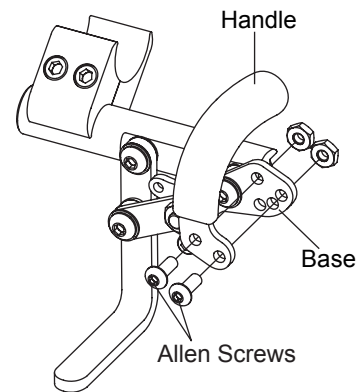


Figure 73
Removing the Wheel Lock Handle

Standard Handle Positions 1, 2, 3

Your Uni-Lock is shipped by TiLite with the handle in standard position 3. If you desire to switch to standard positions 1 or 2, follow the procedures below.

Tools Needed:

- 1/8" Allen Wrench
- 3/8" Open End Wrench

1. As shown in Figure 73, the wheel lock handle attaches to the wheel lock handle base with two Allen Screws. There is only one hole in the wheel lock handle base through which to attach the upper Allen Screw. There are three holes in the wheel lock handle base through which to attach the lower Allen Screw.
2. Remove the lower Allen Screw and nut that secure the wheel lock handle to the wheel lock handle base.
3. Loosen, but do not remove, the upper Allen Screw that secures the wheel lock handle to the wheel lock handle base.
4. Reposition the wheel lock handle to the desired Standard Handle Position 1, 2 or 3 (see Figures 74 and 75) and replace the Allen Screw and nut.
5. Securely tighten both Allen Screws and nuts.

Reverse Handle Positions 1, 2, 3

You can achieve three additional wheel lock handle positions for your Uni-Lock by reversing the wheel lock handles from the right and left Uni-Locks. To do this, follow the procedures below.

Tools Needed:

- 1/8" Allen Wrench
- 3/8" Open End Wrench

1. Remove the two Allen Screws and nuts that secure the wheel lock handle to the wheel lock handle base on both the right and left Uni-Locks. See Figure 73.
2. Position the wheel lock handle from the left Uni-Lock on the right Uni-Lock in the desired position. See Figures 76 and 77.
3. Reinstall the two Allen Screws and nuts that secure the wheel lock handle to the wheel lock handle base.
4. Repeat steps 2 and 3 with the wheel lock handle from the right Uni-Lock and the left Uni-Lock.
5. Securely tighten all screws and nuts.

Uni-Lock with Extension Handles

(2GX, Aero X, SX, TX, X and XC)

All of the adjustments set forth under "Uni-Lock" on pages 54 and 55 apply to the Uni-Lock with Extension Handles.

Composite Scissor Lock

(2GX, Aero X, SX, TX, X and XC)

Adjusting the Composite Scissor Lock

Tools Needed:

- 3/16" Allen Wrench

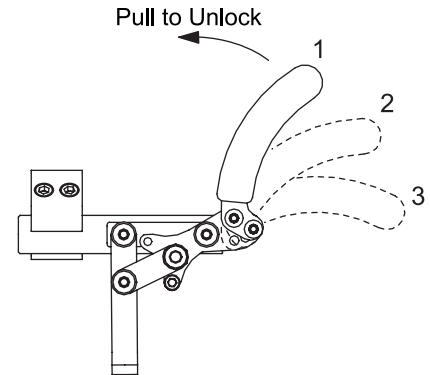


Figure 74
Standard Handle Positions 1, 2 and 3 Locked

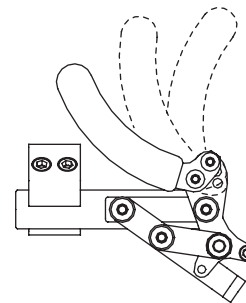


Figure 75
Standard Handle Positions 1, 2 and 3 Unlocked

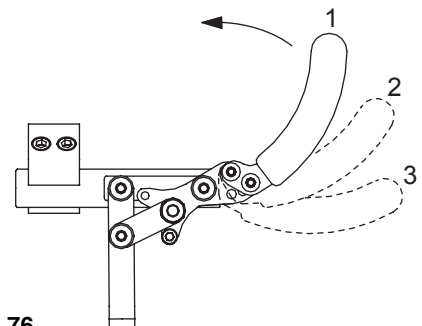


Figure 76
Reverse Handle Positions 1, 2 and 3 Locked

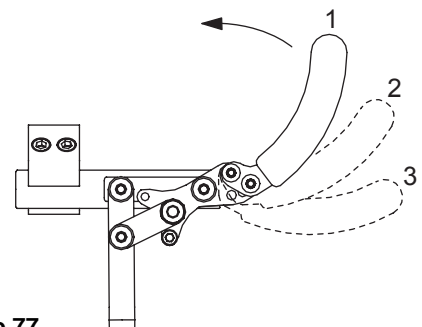


Figure 77
Reverse Handle Positions 1, 2 and 3 Unlocked

CHAPTER 10: WHEEL LOCKS

1. Loosen the two Allen Screws in the wheel lock clamp. See Figure 74.
2. Adjust the position of the wheel lock clamp on the frame so the wheel stop embeds at least 3/16" into the tire when engaged in the locked position.
3. Securely tighten the two Allen Screws that secure the wheel lock clamp to the frame.

Replacing the Composite Scissor Lock

Tools Needed:

- 3/16" Allen Wrench

1. Loosen the two Allen Screws that secure the wheel lock clamp to the frame. See Figure 78.
2. Slide the old composite scissor lock out of the wheel lock clamp.
3. Slide the new composite scissor lock into the wheel lock clamp, but do not tighten the two Allen Screws.
4. Follow the procedures under "Composite Scissor Lock - Adjusting the Composite Scissor Lock" on page 55 to position and secure the new composite scissor lock.

Removing the Scissor Lock Spring

WARNING

The spring will likely pop out when the two parts are separated, so eye protection is required. *If you ignore this Warning, you may seriously injure yourself.*

Tools Needed:

- 1/8" Allen Wrench
- 7/16" Open End Wrench

Some wheelchair users may not have sufficient arm strength to comfortably operate the composite scissor lock due to the tension in the spring mechanism. The spring can be removed to facilitate easier operation of the lock. Removal of the spring does not affect the lock's ability to properly secure the rear wheel when fully engaged.

Note: Once removed, the spring cannot be readily re-installed without a special spring installation tool. If you require the spring installation tool, contact TiLite Customer Service at 1-800-545-2266.

To remove the spring:

1. Remove the Allen Screw. See Figure 79. Carefully note the order of the washers on either side of the lock handle. See Figure 79.
2. Remove the nut. See Figure 79. Carefully note the order of the washers between the nut and base.
3. Carefully separate the locking mechanism (handle and blade) portion of the scissor lock from the base.
4. Remove and set aside the spring and metal washer shown in Figure 79.
5. Replace the spring and washer shown in Figure 79 with the black plastic washer that shipped with your wheelchair.

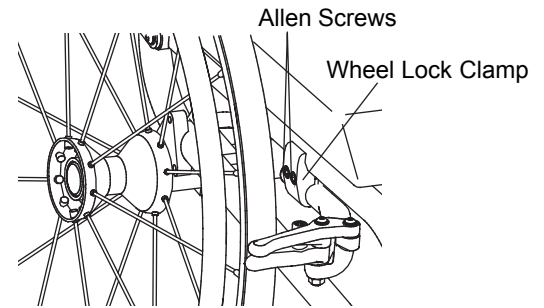


Figure 78
Adjusting/Replacing the Composite Scissor lock

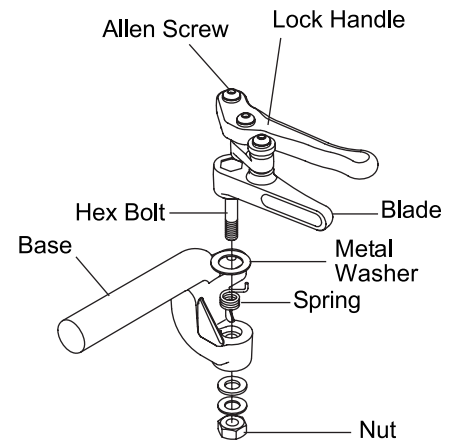


Figure 79
Removing the Scissor Lock Spring

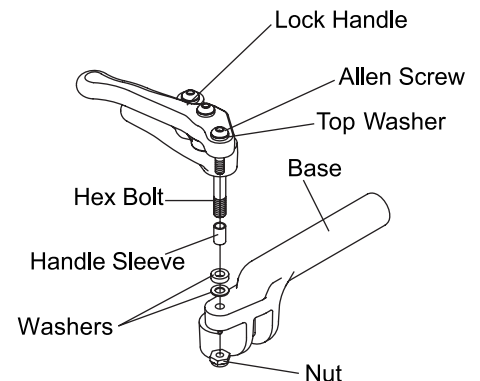


Figure 80
Reassembling the Scissor Lock

6. Reattach the locking mechanism (handle and blade) portion of the scissor lock to the base by inserting the hex bolt through the black plastic washer (instead of the metal washer and spring), the base, and the two washers and nut removed in Step 2.
7. Loosely secure the nut.
8. Reattach the handle to the base by inserting the Allen Screw removed in Step 1 through the top washer, the handle sleeve, the handle, the two middle washers, the base and the bottom nut. See Figure 80.
9. Securely tighten the Allen Screw.
10. Tighten the nut that was loosely secured in Step 7. Do not over-tighten or the scissor lock will become difficult to operate.
11. Reinstall the scissor lock on the wheelchair and make sure it is properly positioned to fully lock the rear wheel and prevent it from turning when the lock is engaged. See “Adjusting/Replacing the Composite Scissor Lock” on page 56.

CHAPTER 11: CASTERS, FORKS AND CASTER PIN LOCKS

Front Casters and Forks

(SX, X and XC)

⚠ WARNING

Always mount identical size front casters and forks on both sides of your wheelchair. *If you ignore this Warning, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

Note: The following instructions apply with respect to all 3", 4", 5", 6" and 8" (SX and X only) front casters. See Figure 81.

Replacing Front Casters

Tools Needed:

- Two 1/8" Allen Wrenches

1. Remove the two Allen Screws, finish washers and axle that secure the front caster to the fork. See Figure 82. **Note:** It will be necessary to use one Allen Wrench to hold one screw in place and a second Allen Wrench to loosen the other screw. See Figure 82.
2. Remove the front caster and fork spacers from the fork.
3. Install the new front caster and fork spacers onto the fork and securely tighten the two Allen Screws. **Note:** It will be necessary to use one Allen Wrench to hold one screw in place in order to be able to securely tighten the other screw with the second Allen Wrench.

⚠ WARNING

The threads on the Allen Screws that secure the front casters to the forks have been treated with a medium strength threadlock to reduce the possibility they will become loose. You should be able to remove and reinstall these Allen Screws two or three times without reapplying threadlock to these screws. If you repeatedly remove and reinstall these Allen Screws, TiLite requires that you reapply a medium-strength threadlock after every second adjustment. *If you ignore this Warning, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

Replacing Front Fork Assemblies

Tools Needed:

- 5/64" Allen Wrench

Note: TiLite fork stems are installed in TiLite forks using Loctite™. Accordingly, if it becomes necessary to replace your forks or fork stems, TiLite requires that you order the complete front fork assembly.

1. Remove the front casters. See "Replacing Front Casters" on page 58.
2. Loosen the set screw in the caster barrel cap. See Figure 83.
3. Unscrew the caster barrel cap.
4. Remove the front fork assembly (consisting of the fork and the fork stem from the caster barrel.)
5. Insert the new fork assembly through the caster barrel and washer and screw the caster barrel cap onto the end of the fork stem. The caster barrel cap should be sufficiently tight so that the fork and stem do **not** rotate freely. With the chair tipped backward so that the stem is parallel to the ground, if you hold the caster at 90° to the ground and release it, it should move slightly toward the ground.

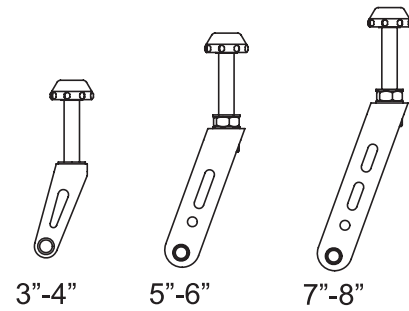


Figure 81
SX/X/XC Available Forks

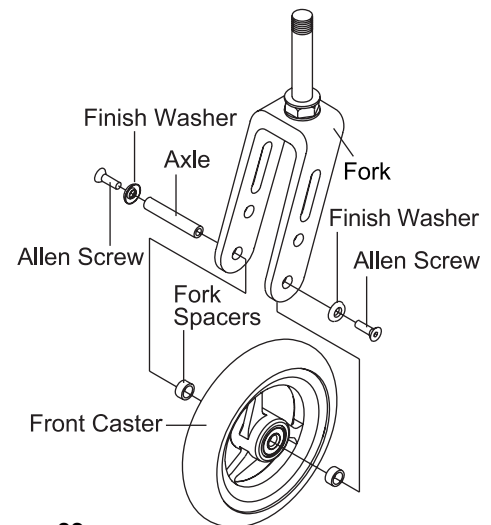


Figure 82
SX/X/XC Replacing the Front Caster Casters

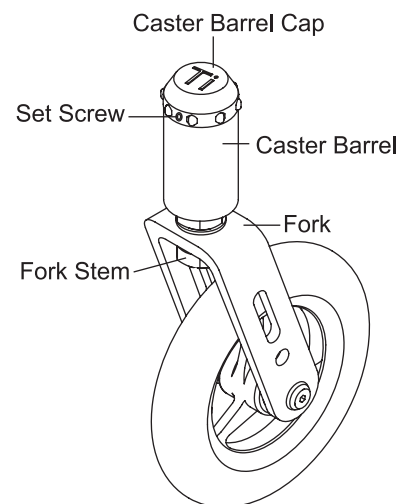


Figure 83
SX/X/XC Replacing the Front Fork Assembly

CHAPTER 11: CASTERS, FORKS AND CASTER PIN LOCKS

6. Tighten the set screw in the caster barrel cap.
7. Reinstall the front caster. See “Replacing Front Casters” on page 58.

Front Casters and Forks

(TX)

⚠ WARNING

Always mount identical size front casters and forks on both sides of your chair. *If you ignore this Warning, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

Replacing Front Casters

Tools Needed:

- Two #2 Phillips Head Screw Drivers

1. Remove the two Phillips head screws and axle that secure the front caster to the fork. **Note:** It will be necessary to use one Phillips head screw driver to hold one screw in place and a second screw driver to loosen the other screw. See Figure 84.
2. Remove the front caster and fork spacers from the fork.
3. Install the new front caster and fork spacers onto the fork and securely tighten the two screws so there is no space between the front caster, the fork spacers and the fork sides. **Note:** It will be necessary to use one Phillips head screw driver to hold one screw in place in order to be able to securely tighten the other screw with the second screw driver.

⚠ WARNING

The threads on the screws that secure the front casters to the fork have been treated with a medium strength thread lock to reduce the possibility that they will become loose. You should be able to remove and reinstall these screws two or three times without reapplying thread lock to these screws. If you repeatedly remove and reinstall these screws, TiLite requires that you reapply a medium-strength thread lock after every second adjustment. *If you ignore this Warning, you may, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

Replacing Front Forks

Tools Needed:

- 1/2" Socket Wrench

1. Remove the front casters. See “Replacing Front Casters” on page 59.
2. Loosen and remove the jam nut and washer that secures the fork to the fork stem. See Figure 85.
3. Remove the old fork and install the replacement fork on the fork stem.
4. Replace the jam nut and washer and securely tighten. The jam nut should be sufficiently tight so that the fork does **not** rotate freely around the stem bolt. With the chair tipped backward so that the stem bolt is parallel to the ground, if you hold the caster at 90° to the ground and release it, it should move slightly toward the ground.
5. Reinstall the front casters. See “Replacing Front Casters” on page 59.

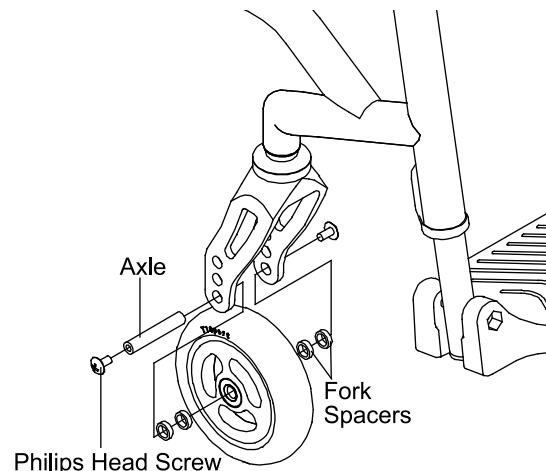


Figure 84
TX Replacing the Caster Wheel

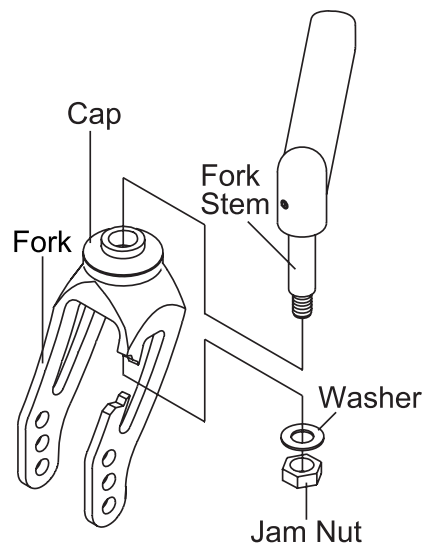


Figure 85
TX Replacing the Fork

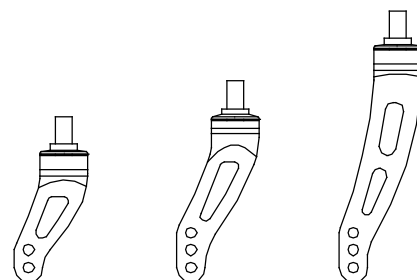


Figure 86
2GX/Aero X Available Forks

CHAPTER 11: CASTERS, FORKS AND CASTER PIN LOCKS

Front Casters and Forks

(2GX and Aero X)

⚠ WARNING

Always mount identical size front casters and forks on both sides of your wheelchair. *If you ignore this Warning, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

Note: The following instructions apply with respect to all 3", 4", 5", 6" and 8" front casters. See Figure 86.

Replacing Front Casters

Tools Needed:

- Two #2 Phillips Head Screwdrivers

1. Remove the two Phillips head screws and axle that secure the front caster to the fork. **Note:** It will be necessary to use one screw driver to hold one screw in place and a second screw driver to loosen the other screw. See Figure 87.
2. Remove the front caster and fork spacers from the fork.
3. Install the new front caster and fork spacers onto the fork and securely tighten the two screws. **Note:** It will be necessary to use one screwdriver to hold one screw in place in order to be able to securely tighten the other screw with the second screwdriver.

⚠ WARNING

The threads on the screws that secure the front casters to the forks have been treated with a medium strength threadlock to reduce the possibility they will become loose. You should be able to remove and reinstall these screws two or three times without reapplying threadlock to these screws. If you repeatedly remove and reinstall these screws, TiLite requires that you reapply a medium-strength threadlock after every second adjustment. *If you ignore this Warning, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

Replacing Front Fork Assemblies

Tools Needed:

- 5/64" Allen Wrench

1. Remove the front casters. See "Replacing Front Casters" on page 59.
2. Loosen and remove the jam nut and washer that secures the fork to the fork stem. See Figure 87.
3. Remove the old fork and install the replacement fork on the fork stem.
4. Replace the jam nut and washer and securely tighten. The jam nut should be sufficiently tight so that the fork does **not** rotate freely around the stem bolt. With the chair tipped backward so that the stem bolt is parallel to the ground, if you hold the caster at 90° to the ground and release it, it should move slightly toward the ground.
5. Reinstall the front caster. See "Replacing Front Casters" on page 59.

Adjusting Front Seat Height

Note: Depending on the fork that came with your chair, you may be able to adjust the front seat height of your chair up or down without changing the front casters to a larger or smaller size. Follow the procedures under

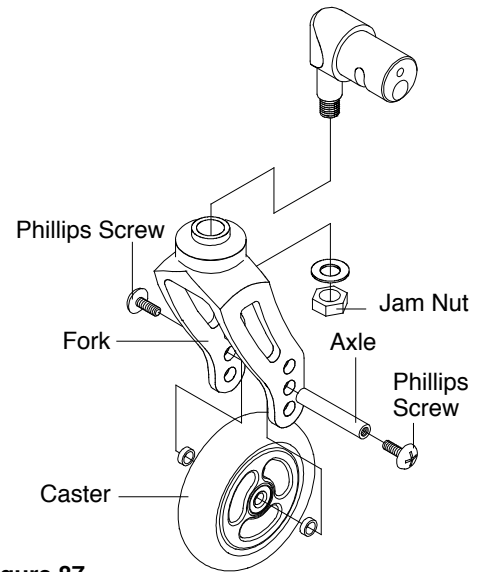


Figure 87
2GX/Aero X Front Fork

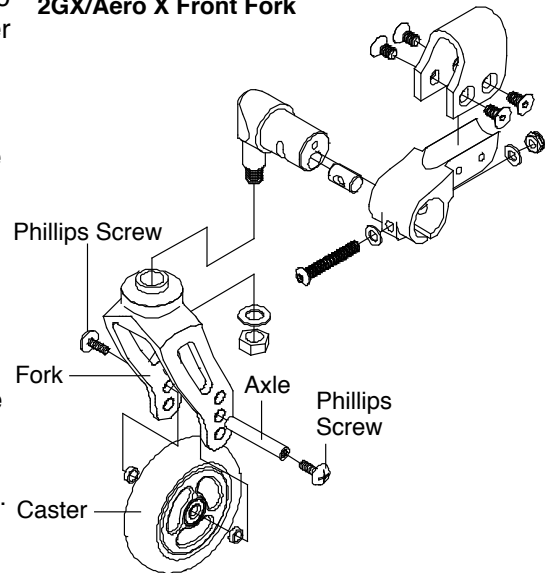


Figure 88
2GX/Aero X Center Mount

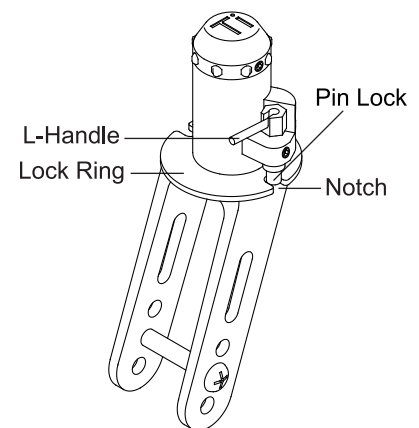


Figure 89
SX/X Caster Pin Lock
(shown in the locked position)

CHAPTER 11: CASTERS, FORKS AND CASTER PIN LOCKS

“Replacing Front Casters” on pages 59 (depending on your TiLite model) to mount the front casters in the alternative axle holes in the fork. The full range of adjustability will not be available with 5”, 6” or 8” front casters. Additional adjustability may be achieved with different forks or casters or with fork stem extensions. Contact TiLite Customer Service at 1-800-545-2266 for assistance.

Caster Pin Locks

(SX, X)

WARNING

ALWAYS be sure to disengage both caster pin locks before attempting to propel your chair. *If you ignore this Warning, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

To engage the caster pin lock:

1. Rotate the front caster until either notch on the lock ring is directly beneath the pin lock. See Figure 89.
2. Rotate the L-Handle towards the front of the chair until the pin lock snaps down into the locked position.

To disengage the center pin lock:

Lift the L-Handle so the pin lock disengages from the notch in the lock ring and rotate the L-Handle towards rear of the chair. See Figure 90.

Caster Pin Locks

(2GX, Aero X and TX)

WARNING

ALWAYS be sure to disengage both caster pin locks before attempting to propel your chair. *If you ignore this Warning, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

To engage the caster pin lock:

1. Rotate the front caster until either notch on the lock ring is directly beneath the T-Handle. See Figure 91.
2. Lift up on the T-Handle and rotate it so that it is perpendicular to the caster pin lock plate and can be lowered down into the lower notch on the caster pin lock plate.

To disengage the caster pin lock:

Lift up on the T-Handle and rotate it so that it is parallel to the caster pin lock plate and can be lowered down into the higher notch on the cast pin lock plate. See Figure 92.

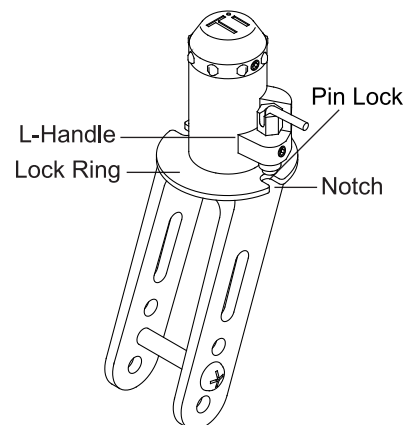


Figure 90
SX/X Caster Pin Lock
(shown in the unlocked position)

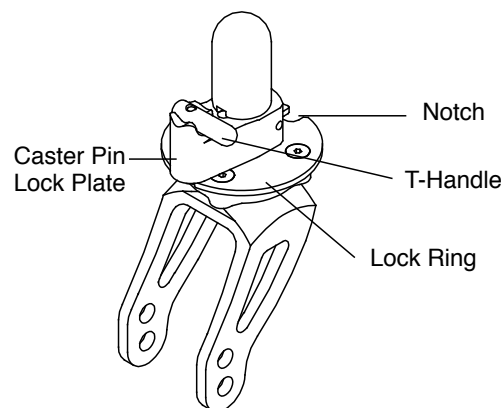


Figure 91
2GX/Aero X/TX Caster Pin Lock
(shown in the locked position)

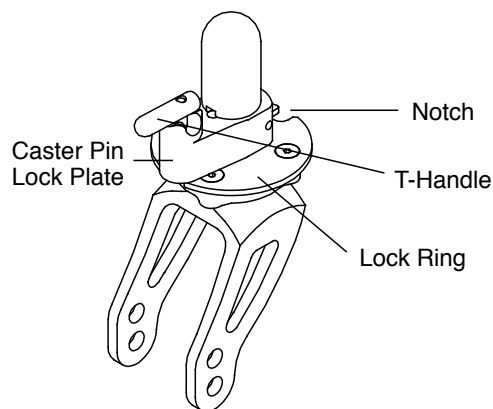


Figure 92
2GX/Aero X/TX Caster Pin Lock
(shown in the unlocked position)

CHAPTER 11: CASTERS, FORKS AND CASTER PIN LOCKS

Adjustable Angle Caster Barrel

(SX and X)

⚠ WARNING

Always make sure the grooves in the locking block are properly aligned with the grooves in the caster barrel tab. If these grooves are not properly aligned, the grooves may become worn, causing the front caster angle to change unexpectedly. *If you ignore this Warning, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

Adjusting the Angle

Tools Needed:

- 5/32" Allen Wrench

1. Place the chair on a level surface.
2. Loosen, but do not remove, the two Allen Screws that hold the caster barrel tab in place against the U-Clamp (see Figure 93) or the frame (see Figure 94). **Note:** It is necessary to loosen the top screw more than the lower screw in order to permit the locking block to disengage from the caster barrel tab. See Figures 93 and 94.
3. Using a drafting triangle or similar 90° angle tool as shown in Figures 93 and 94, rotate the caster barrel until the straight edge of the caster barrel tab is perpendicular to the level surface.
4. Securely tighten both Allen Screws, making sure the grooves in the locking block are properly seated in the grooves in the caster barrel tab.
5. After tightening the screws, recheck the caster barrel tab to be certain it is still perpendicular to the ground before riding.

Adjustable Angle Fork

(2GX and Aero X)

Tools Needed:

- 7/16" Open End Wrench
- 5/32" Allen Wrench

1. Place the chair on a level surface.
2. Loosen the locknut while keeping the bolt from rotating. **Note:** it is only necessary to loosen (not remove) the locknut to allow the bolt to be easily turned with an Allen Wrench. See Figure 95.
3. Turn the bolt to adjust the angle of the fork.
4. Use a drafting triangle or similar 90° angle tool as shown in figure 95, to adjust the fork to be perpendicular to the level surface. To do this, first rotate the fork toward the rear wheel past the perpendicular position. Then slowly turn the bolt to bring the fork back to a perpendicular position.
5. Using the Allen Wrench to prevent the bolt from turning (and the angle of the fork from changing), use the open end wrench to securely tighten the locknut.
6. After tightening the locknut, recheck the fork to be certain it is still perpendicular to the ground before riding

Note: If your chair is equipped with Frog Legs®, you must square the receiver to the level surface because the flat edge of the Frog Legs® fork (see Figure 100 on page 64) is not parallel to the receiver

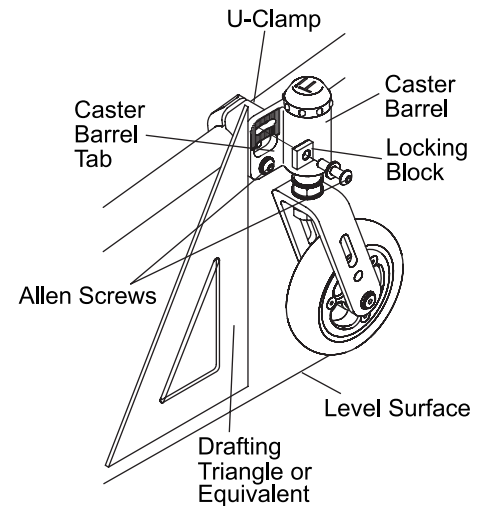


Figure 93
SX/X Caster Barrel Angle Adjustment

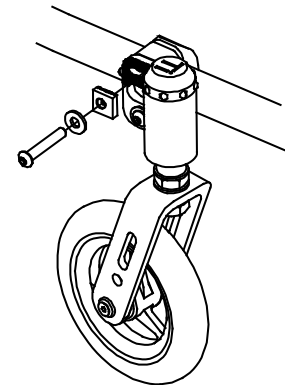


Figure 94
SX/X Caster Barrel Angle Adjustment

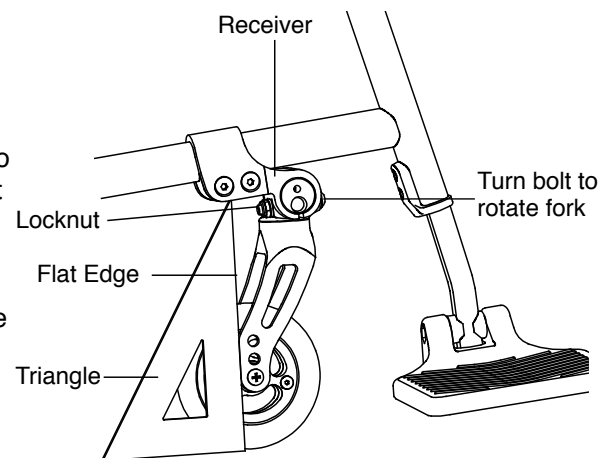


Figure 95
2GX/Aero X Squaring Up the Adjustable Angle Fork

Adjustable Caster Position

(2GX and Aero X)

Tools needed:

- 5/32" Allen Wrench
- Ruler

The position of the caster along the frame is fully adjustable within approximately 3 1/2" of range. To adjust the position of the caster:

1. Remove the four Allen Screws that secure the caster clamp to the caster mount. See Figure 96.
2. Remove the caster mount fork/caster assembly.
3. Reposition the caster clamp to the desired position forward or rearward on the chair, making sure that the casters will not interfere with the rear wheels or the footrest.
4. Reinstall the caster mount and fork/caster assembly.
5. Securely tighten all four Allen Screws.
6. Repeat steps 1 through 5 with the opposite caster mount assembly, making sure that the assemblies on both sides of the chair are identical distances from the front frame tube.

Note: In order to achieve a greater range of adjustment, it is possible to reverse the caster clamps and caster mounts (i.e. installing the left side assembly on the right side of the chair and vice versa).

Floating Casters

(2GX, Aero X, SX, X, TX and XC)

Tools needed:

- 3/16" Allen Wrench
- Wood Block (1" Minimum)
- Drafting Triangle
- Ruler

Note: TiLite folding wheelchairs are designed to be flexible for improved maneuverability and increased ride comfort. However, this flexibility requires that your chair be set-up properly. By following these instructions you will be able to properly set up your TiLite folding wheelchair so it will perform to its greatest potential.

1. Place the wheelchair on a smooth, level surface.
2. Make sure that (i) all tires are properly inflated, (ii) the camber plugs are properly centered on the frame side to side, (iii) both cross-tubes are properly seated in all seat saddles, (iv) the toe-in/toe-out is correctly set up, and (v) the angle adjustable casters are square to level surface. All of these adjustments are explained elsewhere in this Manual.
3. Loosen, but do not remove, the Allen Screws on the footrest clamp only on the side of the chair with the floating caster. See Figures 97 and 98.
4. Place a wood block under the other caster wheel (which is not floating) as shown in Figure 99.
5. Apply gentle downward pressure on the caster wheel that is floating. It is advisable that you have an assistant to place downward pressure on the opposite side of the chair at the backrest when making this adjustment.

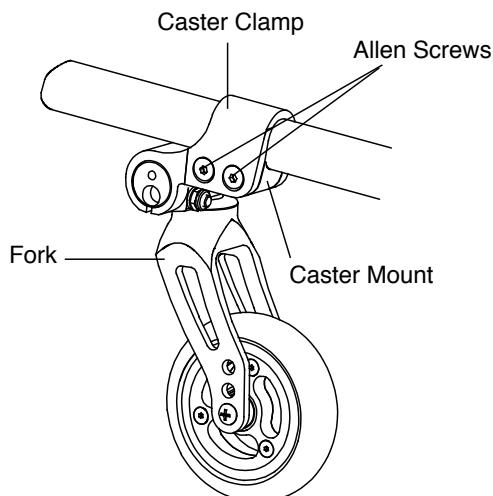


Figure 96
2GX/Aero X Adjustable Caster Position

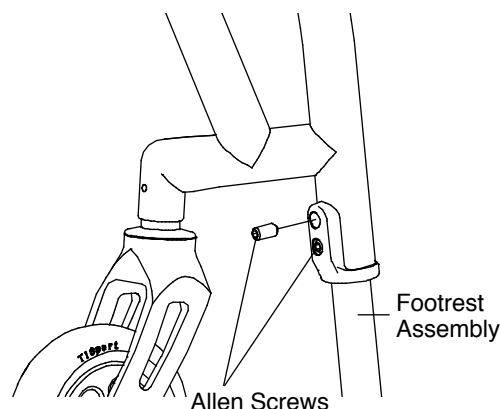


Figure 97
2GX/Aero X/TX Fixing Floaters

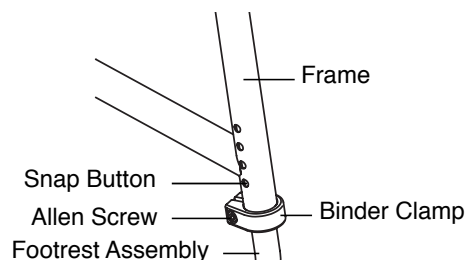


Figure 98
SX/XC Fixing Floaters

CHAPTER 11: CASTERS, FORKS AND CASTER PIN LOCKS

6. Remove the wood block and check to see if the caster still floats. If the caster no longer floats, securely tighten the Allen Screws on the footrest clamp. If the caster still floats, or if the other caster starts to float, repeat steps 2 through 6 until the caster no longer floats.

Frog Legs®

(2GX, Aero X, SX, X, TX, X and XC)

Tools Needed:

- 5/32" Allen Wrench

Replacing the Elastomer Shock

1. Remove Allen Screws from hinge and push out the threaded spacer. See Figure 100.
2. Rotate the fork stem section to release the elastomer shock. **Note:** The metal disc is glued to the top of the elastomer shock.
3. Install the new elastomer shock (making sure the metal disc is facing upward toward the fork stem).
4. Push firmly on the fork stem to facilitate reinstalling the Allen Screws and threaded.

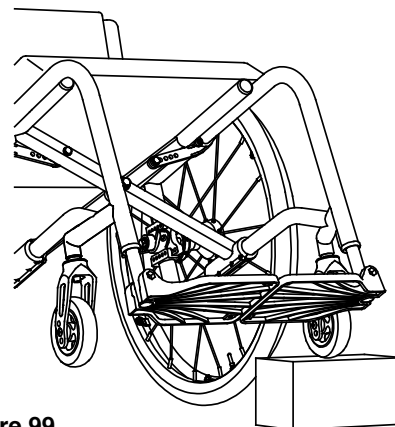


Figure 99
Fixing a Floating Caster

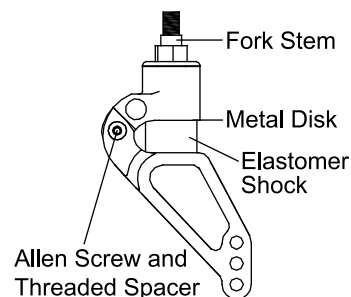


Figure 100
Frog Legs®

Rear Wheels with Quick Release Axles

(All Models)

⚠ WARNING

Do not attempt these procedures when the chair is occupied. Serious injury to the occupant will occur.

Removing

1. Hold wheel securely at the hub through the spokes. See Figure 101.
2. Depress the release button on the quick-release axle and slide the wheel and axle out of the axle sleeve.
3. Release the release button.

Replacing

⚠ WARNING

Make sure the locking balls of the quick-release axle are fully secured inside the axle sleeve before operating the chair. *If you ignore this Warning, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

1. Hold wheel securely at the hub through the spokes. See Figure 101.
2. Depress the release button on the quick-release axle, making sure the locking balls recess into the axle.
3. Insert the axle all the way into the axle sleeve.
4. Release the release button.
5. Make sure the wheel is securely locked in place by pulling firmly on the wheel without depressing the release button.

Rear Wheels With Quad Release Axle

(All Models)

⚠ WARNING

Do not attempt these procedures when the chair is occupied. Serious injury to the occupant will occur.

Removing

1. Unlock the lever on the quad release axle. See Figure 102.
2. Slide wheel and axle out of the axle sleeve.

Replacing

⚠ WARNING

Make sure the locking balls of the quad release axle are fully secured inside the axle sleeve before operating the chair. *If you ignore this Warning, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

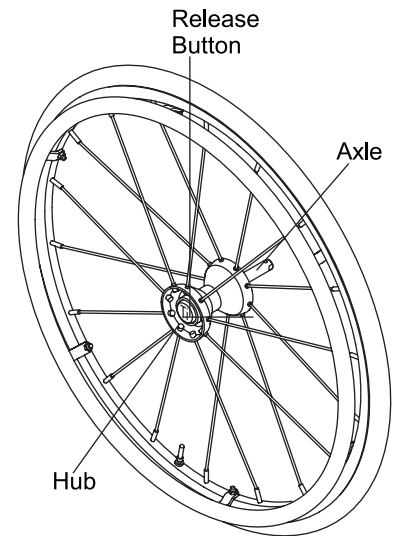


Figure 101
Removing and Replacing the Rear Wheel

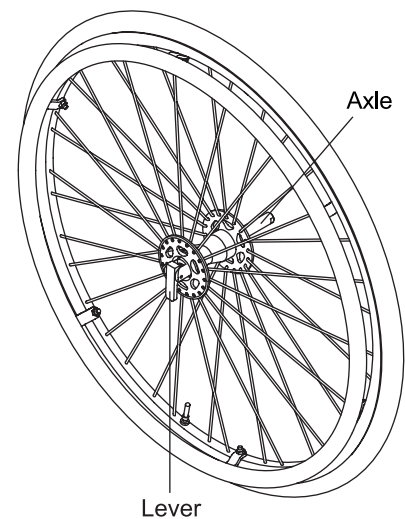


Figure 102
Removing and Replacing the Rear Wheel with Quad Release Axle

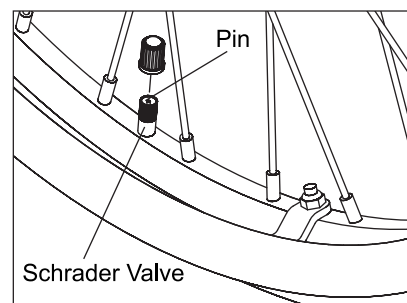


Figure 103
Schrader Valve

CHAPTER 12: REAR WHEELS

1. Unlock lever on quad release axle. See Figure 102. **Note:** Make sure the locking balls in the axle are recessed.
2. Insert the axle all the way into axle sleeve.
3. Lock lever on the quad release axle.
4. Make sure the wheel is securely locked in place by pulling firmly on the wheel without unlocking the lever on the quad release axle.

Handrims

(All Models)

WARNING

Do not attempt these procedures when the chair is occupied. Serious injury to the occupant will occur.

WARNING

Replacement of the handrim must be performed by an authorized TiLite dealer or qualified technician. If you ignore this Warning, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

Replacing the Handrim

Tools required:

- #2 Phillips Screw Driver
- 3/8" Open End Wrench

WARNING

The tire must be fully deflated before any disassembly procedures are performed. Do not re-inflate the tire until all re-assembly is completed. If you ignore this Warning, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

1. Remove the rear wheel from the chair.
2. Remove all air from the inner tube. If you have a Schrader valve (see Figure 103), remove valve stem cap and release all of the air from the tube, by pressing down on the pin in the center of the valve stem. If you have a Presta valve (see Figure 104), remove the valve stem cap, unscrew, counter clockwise, the knurled nut on the valve stem and release all of the air from the tube by pressing down on the pin in the center of the valve stem. **Note:** If you have a solid tire, do not remove it from the wheel unless you have the proper equipment to permit you to reinstall it after changing the handrim.
3. While carefully holding the tire, inner tube and rim strip to one side, hold the Phillips Screws with a screw driver and remove the locknuts that secure the handrim tabs to the rear wheel. See Figure 105.
4. Remove the existing handrim.
5. Install the new handrim by reversing the procedures in step 3 above. **Note:** Your handrim may have two (2) holes on each tab as shown in Figure 105. If you choose to install the handrim in the position closest to the wheel, cut off the extra length of tab. Otherwise it could catch on your clothing or body.
6. Make sure the rim strip is properly in place so the screws do not puncture the inner tube. Inflate the tire to the correct PSI Rating on the sidewall of the tire.
7. Reinstall the rear wheel on the chair.
8. Repeat the procedure for the opposite rear wheel if necessary.

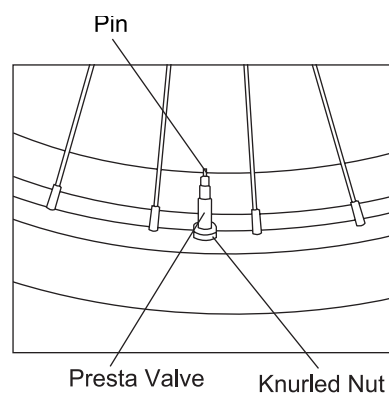


Figure 104
Presta Valve

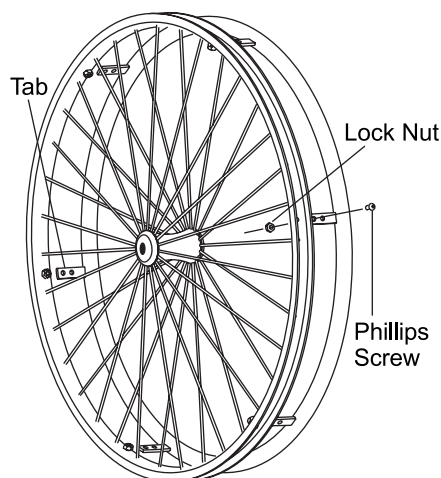


Figure 105
Handrim Replacement

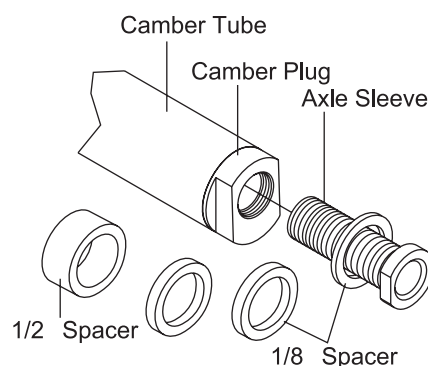


Figure 106
Rear Wheel Spacing

Rear Wheel Spacers

(All Models)

Adjusting Rear Wheel Spacing

Tools required:

- 7/8" open-ended wrench
- 3/4" open-ended wrench
- Torque Wrench

WARNING

Do not use spacers exceeding a total of 3/4". If more than 3/4" of the axle sleeve is outside of the camber plug, the axle sleeve could disengage from the camber plug while you are using the chair. *If you ignore this Warning, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

1. Place the 7/8" open-end wrench onto the camber plug and use the 3/4" open-end wrench to remove the axle sleeve. See Figure 106.
2. Add or delete the spacers you need to increase/decrease your rear wheel spacing.
3. After you have adjusted your rear wheel spacing, reinstall the axle sleeve in the camber plug and hand tighten.
4. Using a torque wrench, tighten the axle sleeve to 230 inch-pounds.

CHAPTER 13: ANTI-TIPS

Rear Anti-Tips

(All Models)

Adjusting

1. To adjust the height of the rear anti-tip, press the two release buttons on the telescoping lower tube, then adjust the height of the lower tube so the wheel is within 1-1/2" to 2" off the ground. See Figure 107.
2. To rotate the anti-tips upward, press the release button on the anti-tip receptacle to release the extension tube and rotate upward until the release button locks in place on the opposite side of the anti-tip receptacle.
3. To remove the rear anti-tip, press the release button on the anti-tip receptacle and pull the extension tube out of the anti-tip receptacle.

Note: 1-1/2" to 2" of clearance between the bottom of the anti-tip wheels and the floor must be maintained to ensure proper anti-tip function.

Mounting the Rear Anti-Tip Receptacle

(SX and X)

⚠ WARNING

Mounting the rear anti-tip receptacle must be performed by an authorized TiLite dealer or qualified technician. *If you ignore this Warning, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

Note: Unless you ordered rear anti-tips when you originally ordered your TiLite wheelchair, you will need to order replacement Allen Screws when ordering rear anti-tips.

Tools Needed:

- 5/32" Allen Wrench
- 7/16" Open End Wrench

1. Remove the rear wheels and place the frame on a level surface.
2. Remove the Allen Screws that secure the adjustable axle plate at the rear of the frame. Carefully note the placement of the plate and the order of the various washers and nuts (and, if applicable, stroller handle and/or armrest receivers). See Figure 108.
3. Install the anti-tip receptacle as shown in Figure 108.
4. Insert the replacement Allen Screws through the anti-tip receptacle, the axle plate, the various washers and the locknuts and securely tighten the locknuts.
5. Reinstall the rear wheels.

Mounting the Rear Anti-Tip Receptacle

(TX and XC)

⚠ WARNING

Mounting the rear anti-tip receptacle must be performed by an authorized TiLite dealer or qualified technician. *If you ignore this Warning, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

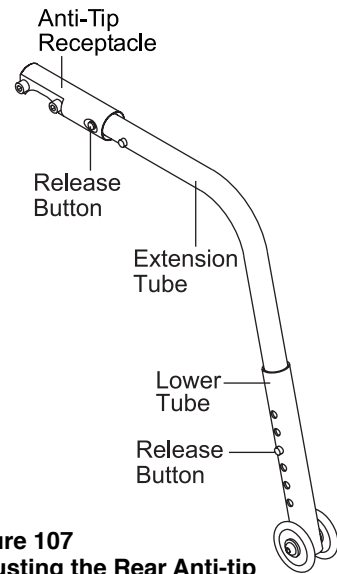


Figure 107
Adjusting the Rear Anti-tip

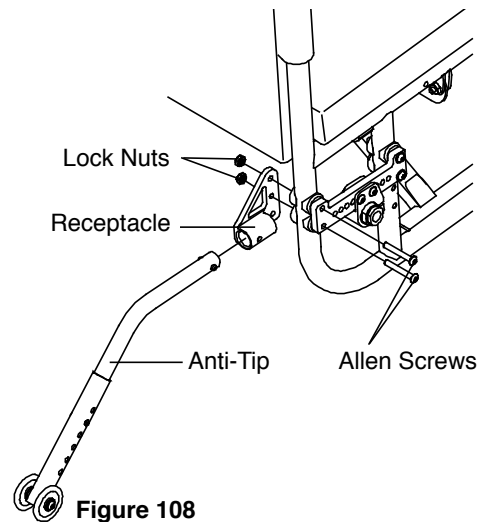


Figure 108
SX/X Mounting Rear Anti-Tip Receptacle

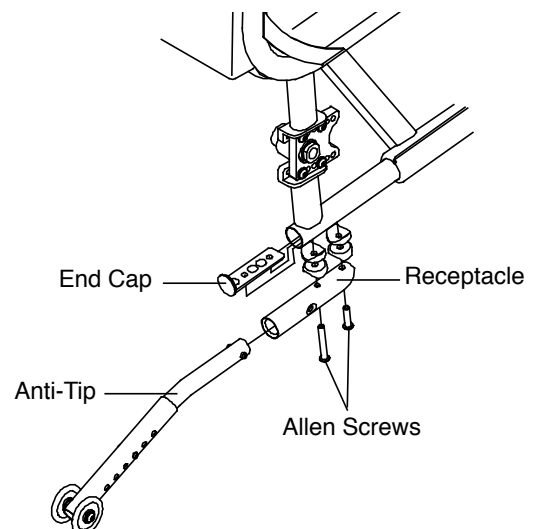


Figure 109
TX/XC Mounting Rear Anti-Tip Receptacle

Tools Needed:

- 3/16" Allen Wrench

1. Remove the rear wheels and place the frame on a level surface.
2. Remove the plastic end cap from the bottom frame tube as shown in Figure 109.
3. Install the anti-tip receptacle as shown in Figure 109.
4. Reinstall the end cap and rear wheels.

Mounting the Rear Anti-Tip Receptacle

(2GX and Aero X)

⚠ WARNING

Mounting the rear anti-tip receptacle must be performed by an authorized TiLite dealer or qualified technician. *If you ignore this Warning, you may fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

Tools Needed:

- 5/32" Allen Wrench
- 7/16" Open End Wrench

1. Remove the rear wheels and place the frame on a level surface.
3. Install the anti-tip receptacle as shown in Figure 110.
4. Insert the replacement Allen Screws through the anti-tip receptacle, the axle plate, the various washers and the locknuts and securely tighten the locknuts.
5. Reinstall the rear wheels.

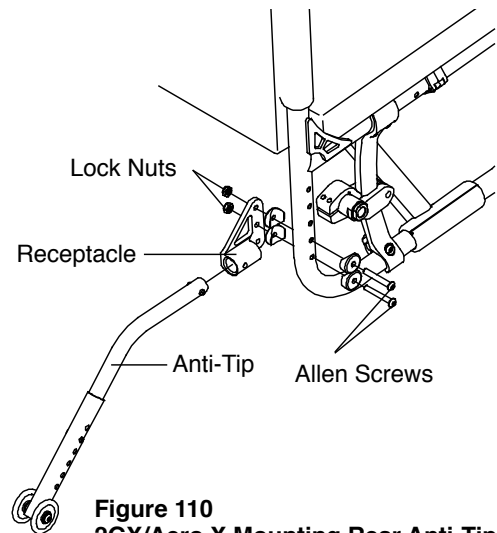


Figure 110
2GX/Aero X Mounting Rear Anti-Tip Receptacle

TILITE LIMITED WARRANTY

A. FRAME – LIFETIME

TiLite warrants the wheelchair frame (including the cross-braces, if any) against defects in materials and workmanship for the lifetime of the original user of the wheelchair. The expected life of the frame is five years.

B. COMPONENTS – ONE (1) YEAR

TiLite warrants all TiLite-made wheelchair components (including, but not limited to, armrest assemblies, backrest assemblies, footrest assemblies, camber tubes and plugs and caster forks) against defects in materials and workmanship for one (1) year from the date of purchase, except as provided below.

C. LIMITATIONS AND EXCLUSIONS

1. This warranty does not cover:
 - a. tires and tubes for front or rear wheels, upholstery (including cushions, seat slings, backrest upholstery and armrest upholstery), or push-handle or stroller handle grips; or
 - b. damage arising from normal wear and tear or from other circumstances beyond TiLite's control; or
 - c. any labor or shipping charges incurred in replacement part installation or repair of this product; or
 - d. TiLite Designs Unlimited frames and frame components, unless TiLite, in its sole discretion, determines that the Designs Unlimited frame or frame component was defectively manufactured.
2. This warranty is VOID if TiLite, in its sole discretion, determines that:
 - a. the original TiLite serial number tag has been removed, altered or defaced; or
 - b. the wheelchair has been subjected to negligence, accident, improper maintenance, storage or operation as required by your TiLite Owners Manual, commercial or institutional use, misuse or abuse, including, but not limited to, exceeding the maximum weight limit of 250 pounds or using the wheelchair with tie downs or locking, clamping or other restraint systems related to the use of the wheelchair in a motor vehicle; or
 - c. the wheelchair has been damaged by improper repairs or repairs made to any component without the express written consent of TiLite; or
 - d. the wheelchair has been modified without TiLite's express written consent, including, but not limited to, modification through the use of unauthorized parts or attachments.
3. This warranty applies only to the original intended user of the wheelchair.

D. OUR RESPONSIBILITY

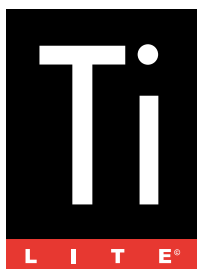
TiLite's sole responsibility is to repair or replace, in our sole discretion, the covered components of the wheelchair.

E. FOR WARRANTY SERVICE

If your wheelchair requires warranty service, please contact an authorized TiLite Dealer in the USA or an authorized international Distributor. In the event of a defect in material or workmanship, the Dealer or Distributor must obtain a return authorization (RA) number from TiLite, and TiLite issues RA numbers authorizations only to authorized TiLite Dealers and Distributors. If you do not receive satisfactory service, please write to TiLite Customer Service at 1426 E. Third Avenue, Kennewick, WA 99337-9680 or email customerservice@tilite.com. Do not return products to our factory without our prior consent. Returns must be shipped with freight pre-paid, and we recommend that you insure the returned product for its full replacement cost.

F. CONSUMER NOTICE

1. The foregoing express warranty is exclusive and in lieu of all other warranties whatsoever, whether written or oral, express or implied, including the implied warranties of merchantability and fitness for a particular purpose. TiLite shall not be liable for any direct, indirect, consequential or incidental damages whatsoever. By registering your TiLite wheelchair, you will be deemed to agree with all provisions of this warranty.
2. No person is authorized to alter or extend the foregoing express warranty or to waive any of the limitations or exclusions.



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