TiLite Pilot

Owner's 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.

permobil

Serial Number_____

⚠WARNING - READ THIS MANUAL
DO NOT OPERATE THIS WHEELCHAIR WITHOUT FIRST READING AND UNDERSTANDING THIS OWNER'S MANUAL. IF YOU ARE UNABLE TO UNDERSTAND THE WARNINGS, CAUTIONS AND INSTRUCTIONS, CONTACT YOUR PERMOBIL DEALER OR PERMOBIL 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
PERMOBIL MANUFACTURES A WIDE VARIETY OF WHEELCHAIRS TO MEET THE VARIED NEEDS OF WHEELCHAIR USERS. HOWEVER, PERMOBIL 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 SUPPORT WHEELS, POSITIONING BELTS OR SPECIAL SEATING SYSTEMS).

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

⚠WARNING - TIE-DOWN RESTRAINTS
PERMOBIL RECOMMENDS THAT WHEELCHAIR USERS NOT BE TRANSPORTED IN VEHICLES OF ANY KIND WHILE IN WHEELCHAIRS. IT IS PERMOBIL'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. PERMOBIL 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 Owner's Manual may be available at www.permobil.com

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SAVE THIS MANUAL FOR FUTURE REFERENCE

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Dear Permobil Customer:

Thank you for choosing a TiLite manual chair by Permobil. We believe every person has the right to the best manual chairs in the world. Over the years, we have achieved that goal by putting our heart and soul into every wheelchair. That heart and soul comes from:

- We Are You: From our designers and engineers to our sales people in the field, you will find chair users. When we design for you, we are designing for us.
- Evidence-Based Quality: TiLite chairs represent the latest in state-of-the-art design and performance based on extensive research into wheeled mobility. The result is a chair which provides unparalleled quality and performance.
- Choice Matters:Permobil offers the most extensive range of options and components on a chair. More choices mean more ability to truly create a custom configuration of options to meet the widest variety of needs and to maximize function.
- Customer Service: Our goal is to provide the ultimate service for the Ultimate Ride. The sale of a chair does not mark the end of our relationship with our customers, it marks the beginning. We will always work with you, our customers, to ensure the highest levels of satisfaction.

What does this mean for you? It means your handmade TiLite combines the finest frame and component materials with beautiful aesthetics and cutting edge manufacturing, ensuring you many years of exceptional performance and durability. Enjoy your ride!

Please take a moment to register your chair at Permobil.com. Should you have any questions regarding your chair, this will help get you answers more quickly.

On behalf of the Permobil Team, thank you for choosing TiLite.

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PHONE 800.545.2266 | **FAX** 800.586.2413

CONTENTS

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 and quarterly 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 Permobil 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
The TiLite Pilot has a weight limit of 120 pounds (54.4 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. Support wheels are an option on this wheelchair, Permobil strongly recommends you order and use support wheels for added safety.
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, support 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.

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 create the risk of a tip-over. Therefore, you should consult your authorized Permobil dealer BEFORE you change or adjust the configuration. Further, Permobil recommends that you use support wheels 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 Permobil, 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.
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, Permobil 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 centimeters to the ground. This may damage the chair or injure the user.
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. Support wheels may present a tripping hazard to the attendant. To avoid tripping over the support wheels, unlock and rotate support wheel tubes up, out of the way. However, if you must leave the user unattended, even for a moment, ALWAYS rotate the support wheels 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. 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 casters clear the curb or step.
4. Instruct your assistant to slowly move the chair forward and to gently lower the 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.

B. DESCENDING A CURB OR SINGLE STEP

⚠WARNING
1. NEVER attempt to negotiate a curb or single step without assistance.
2. When you are still one meter 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 casters off the upper level.
7. Instruct your assistant to slowly roll the chair backward on the rear wheels, taking small steps until the casters have cleared the step or curb and, when clear, to gently lower the 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.

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 substantially alter the center of gravity.

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 casters. As you move your 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 Permobil 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 Permobil 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 Permobil dealer will be able to give you expert, personalized advice in such matters. See “Changing/Adjusting Your Wheelchair” on page 1-2.
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 support wheels. See “Changing/Adjusting Your Wheel Chair” on page 1-2.

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.
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.

   NOTE: Wheel 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 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. Permobil 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 will be directed to the activity in question, 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 casters so they are trailing forward. This makes the chair more stable. NOTE: To get your casters to trail forward, first move your chair forward and, second, back up. By moving backward, your casters will rotate and trail forward.
2. ALWAYS lock your support wheels in the down position so the risk of a backward tip-over is minimized. If your chair does not have support wheels, back it up against a wall and lock both rear wheels using your wheel locks.

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 support wheels 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 casters until they are trailing forward. This will make the chair more stable.

NOTE: To get your 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 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 support wheels, 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.

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:

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 support wheels, 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 single 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 support wheels 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 10 cm 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 10 cm 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 1-4 to 1-6.

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 support wheels 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 30 cm in height for every three meters 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 2 cm lip at the bottom of a ramp can cause the 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 page 1-6.

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. SUPPORT WHEELS

⚠WARNING
Support wheels are an optional accessory that can help to prevent your chair from tipping over backward. However, even the use of support wheels will not guarantee that your chair will not tip over backward if you use this chair improperly. Also, they will not prevent your chair from tipping over sideways or forward if you use this chair improperly. Permobil strongly recommends you use support wheels with your wheelchair. This is most especially true:

a. if you are a new wheelchair rider; or
b. 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 Permobil; or
c. 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 support wheels until you have adapted to the modified configuration; or
d. even if you are an experienced rider in your TiLite chair but your physical condition has changed.

In order to properly use your support wheels, please follow the following rules:

1. Your support wheels should be between 4 cm to 5 cm off the ground when they are locked in place in the “down” position.
2. If your support wheels 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 support wheels 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 support wheels locked in place in the “down” position unless:
   a. You have an attendant (but your attendant must rotate the support wheels 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 support wheels if you can safely climb or descend the curb or step or overcome the obstacle and make sure the support wheels 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 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. Permobil 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 crosstubes beneath the seat sling.

Permobil 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. Permobil 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

Permobil does not sell any seating systems specifically designed for use with TiLite wheelchairs, nor does Permobil 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 Permobil 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 Permobil 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 support wheels 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 on 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.

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 wheelchair positioning 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. Permobil recommends wheelchair users ALWAYS transfer to appropriate motor vehicle seating when traveling in a motor vehicle.

Note to Attendants/Assistants: NEVER use positioning 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 or backrests).
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. FOOTRESTS

⚠WARNING
Certain footrests are standard equipment with TiLite wheelchairs. Other, more specialized footrests are optional equipment. The following rules apply to footrests:
1. ALWAYS allow for AT LEAST 5 cm 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. Footrests are detachable and are not designed to support the weight of your chair. If you do, the footrests may detach, causing you to drop the chair, or you may break the footrests 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 1-7 to 1-8 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 5 mm 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. AXLES

⚠WARNING
Stainless quick-release axles are a standard TiLite wheelchair component. Other axle types are optional equipment. All TiLite 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 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. 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 Permobil 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 5 mm 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. 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 Permobil. Permobil offers push handles that are integral to the back canes and bolt-on push handles. Permobil 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 main frame (not the backrest, armrest or footrest).

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.

M. FASTENERS

⚠WARNING

Permobil 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 Permobil dealer.
2. REGULARLY inspect all fasteners to make sure they have not become loose. If any become loose, tighten them immediately.
3. NEVER over-tighten 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.

N. UNAUTHORIZED PARTS AND ACCESSORIES

NEVER use parts, accessories or adapters other than those authorized by Permobil. If you have any doubt about the compatibility of a particular part, accessory or adapter, consult with an authorized Permobil dealer or contact Permobil 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 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 page 2-3.
5. Annually, or more often if necessary, you MUST have your wheelchair serviced and thoroughly inspected by a qualified Permobil 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			
• Make sure chair rolls straight (does not drag or pull to one side)	√	√	
• Inspect for loose/missing/broken/worn/damaged hardware	√	√	
Rear Wheels			
• 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			
• Make sure axles are free of dirt and lint	√		√
• Wipe axle with cloth using either a “dry” silicone spray or a “dry” Teflon® -based lubricant	√	√[1]	√
• Make sure that axles lock properly in axle sleeve			
Rear Tires			
• Check for proper inflation as per sidewall of pneumatic tire	√	√	
• Inspect for cracks, wear and flat spots	√	√	

CHAPTER 2: SAFETY INSPECTION, MAINTENANCE & TROUBLESHOOTING

Inspection Item	Initially	Weekly	3 Months
Camber Tube/Axle Sleeves			
• 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			
• Inspect for signs of rough edges or peeling	√		√
• Make sure handrims are securely attached to rim	√		√
Wheel Locks			
• Make sure wheel locks embed proper distance into tire and prevents 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			
• 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	√	√	
Casters/Forks			
• 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			
Armrests			
• Inspect to ensure that all hardware is securely attached	√	√	
Footrests/Hangers			
• Inspect to ensure that all hardware is securely attached	√	√	
Support Wheels			
• Inspect support wheels wheel for cracks and wear	√		√
• Inspect to ensure that support wheels receiver is securely attached	√	√	
Frame			
• Inspect for cracks	√		√

Cleaning

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

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

Cleaning the Upholstery
1. Regularly hand-wash the seat sling and back upholstery using water and a mild detergent. Always allow the upholstery to air dry before riding in the chair.
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 crosstube 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 either a "dry" Teflon®-based lubricant or a "dry" silicone spray as a 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 before riding in it. See the chart under "Safety Inspections and Maintenance" on pages 2-1
3. If you store your chair for more than three (3) months, have your chair inspected by an authorized Permobil supplier.

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 Permobil supplier or Permobil 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.

[1]You 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.

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 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 rear wheels

⚠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
Whenever you adjust the angle or height of your footrest, or you replace your footrest, always allow at least 5 cm 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.*

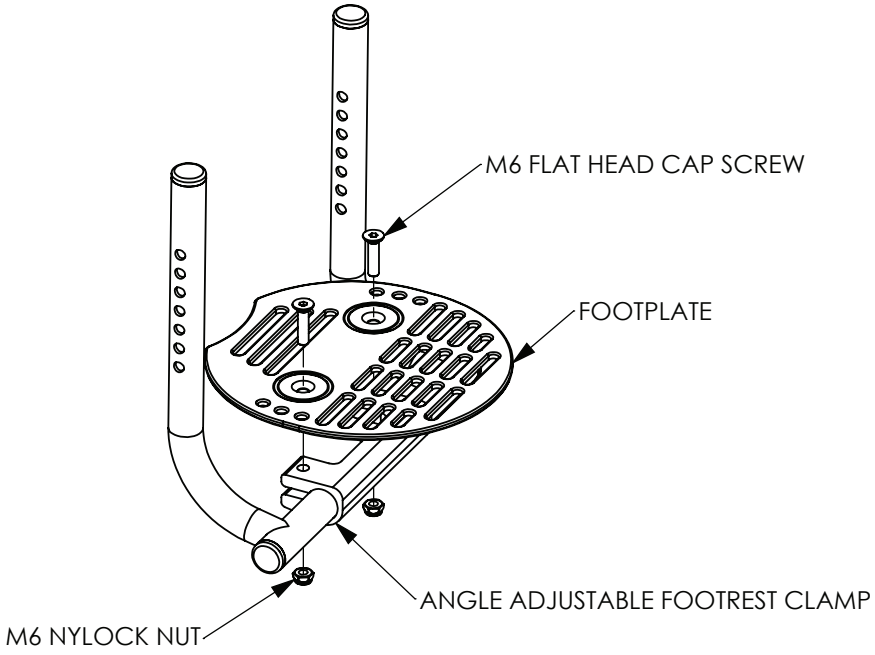
Angle Adjustable Footrest

Adjusting the Angle

Tools Needed:
- 5 mm Allen Wrench

1. Loosen, but do not remove the two Allen screws that secure the footplate to the clamp. See figure 3-1.
2. Adjust the footrest to the desired angle.
3 Tighten the Allen screws and locknuts, making sure the screws and the locknuts are secure and will not permit the footplate to rotate up or down under use.

FIGURE 3-1
ANGLE ADJUSTABLE FOOTPLATE



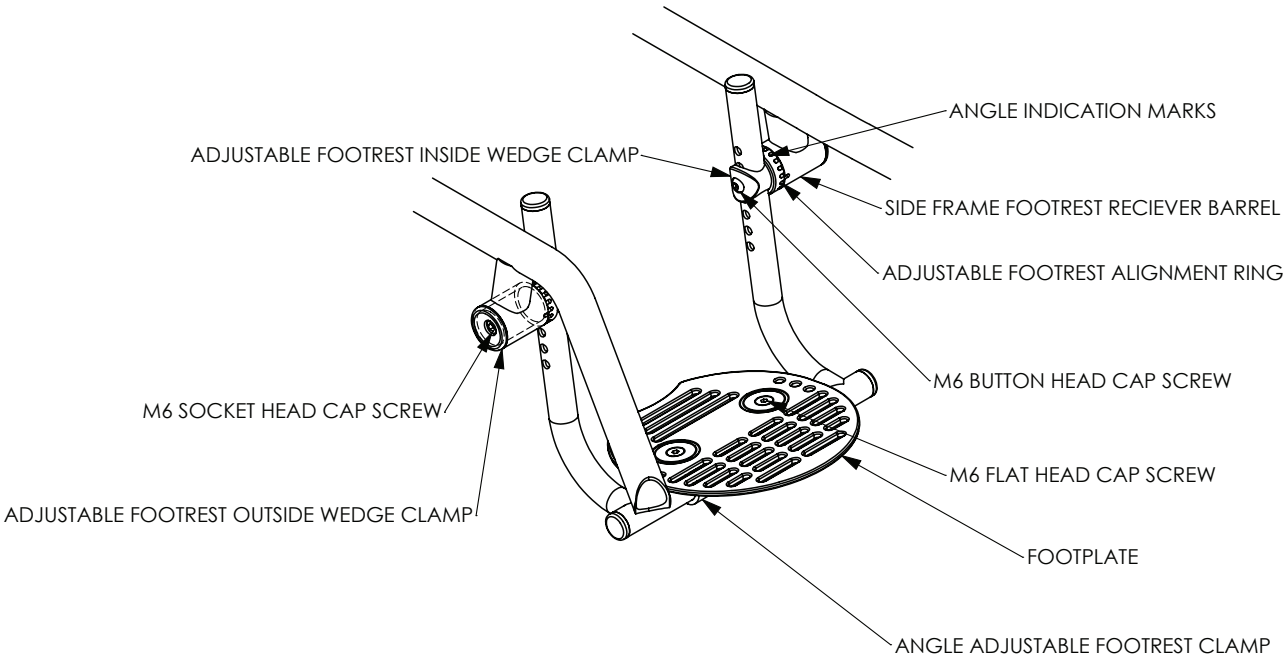
CHAPTER 3: FOOTRESTS

Adjusting the Height/Replacing

Tools Needed:
- 5 mm Allen Wrench
- 6mm Allen Wrench
- Small Screwdriver

1. Loosen, but do not remove the M6 socket head cap screws on the outside of the footrest receiver barrel.
2. Remove the M6 button head cap screws on the inside of the footrest receiver barrel. The threaded piece inside the footrest tube will now be loose.
3 Slide the footrest tubes to the desired location.
4 Insert the small screwdriver in the adjustment hole adjacent to the inside wedge clamp. Flip the chair upside down, and the threaded piece will slide inside the footrest tube and locate on the screwdriver.
5. Re-install the M6 button head cap screws into the threaded piece inside the footrest tube in the new position.
6. Tighten the M6 socket head screws on the outside of the footrest receiver barrel.

FIGURE 3-2
ADJUSTING THE FOOTREST



Aluminum Adjustable Backrest Panel

⚠WARNING
Before using your wheelchair, make sure the backrest is securely in place in the upright position and all mounting hardware is securely tightened. 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.

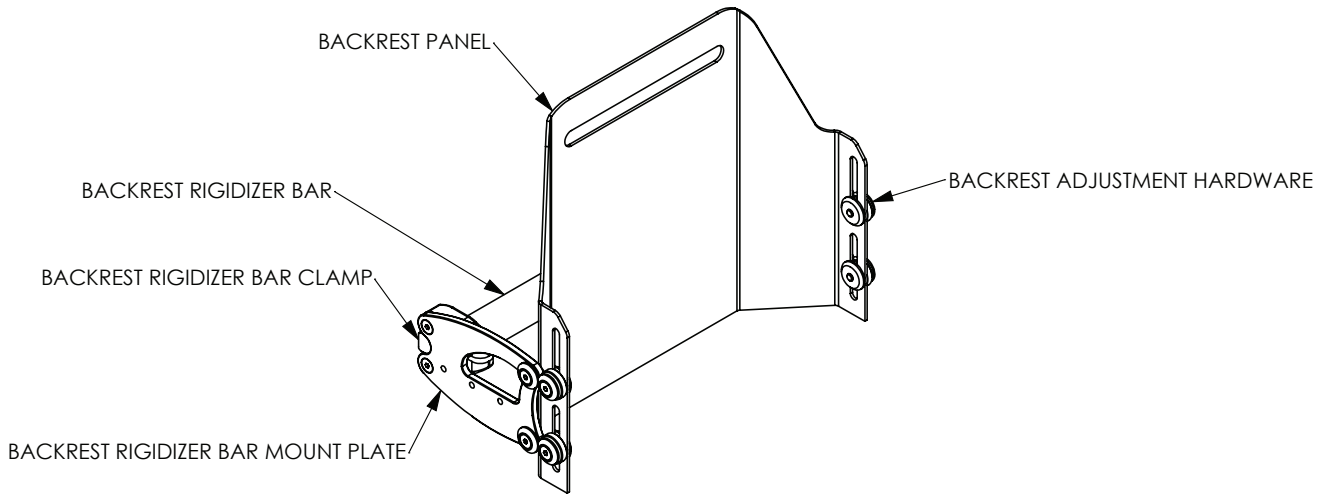
⚠WARNING
Any changes to the position of the camber tube will affect the stability of the chair. Use extreme caution when using a new camber tube position as the new position may make the chair more prone to tip over. *If you ignore this Warning, your chair may not perform properly, which in turn, may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

Adjusting the Back Angle and Height

Tools Needed:
- M3 Allen Wrench

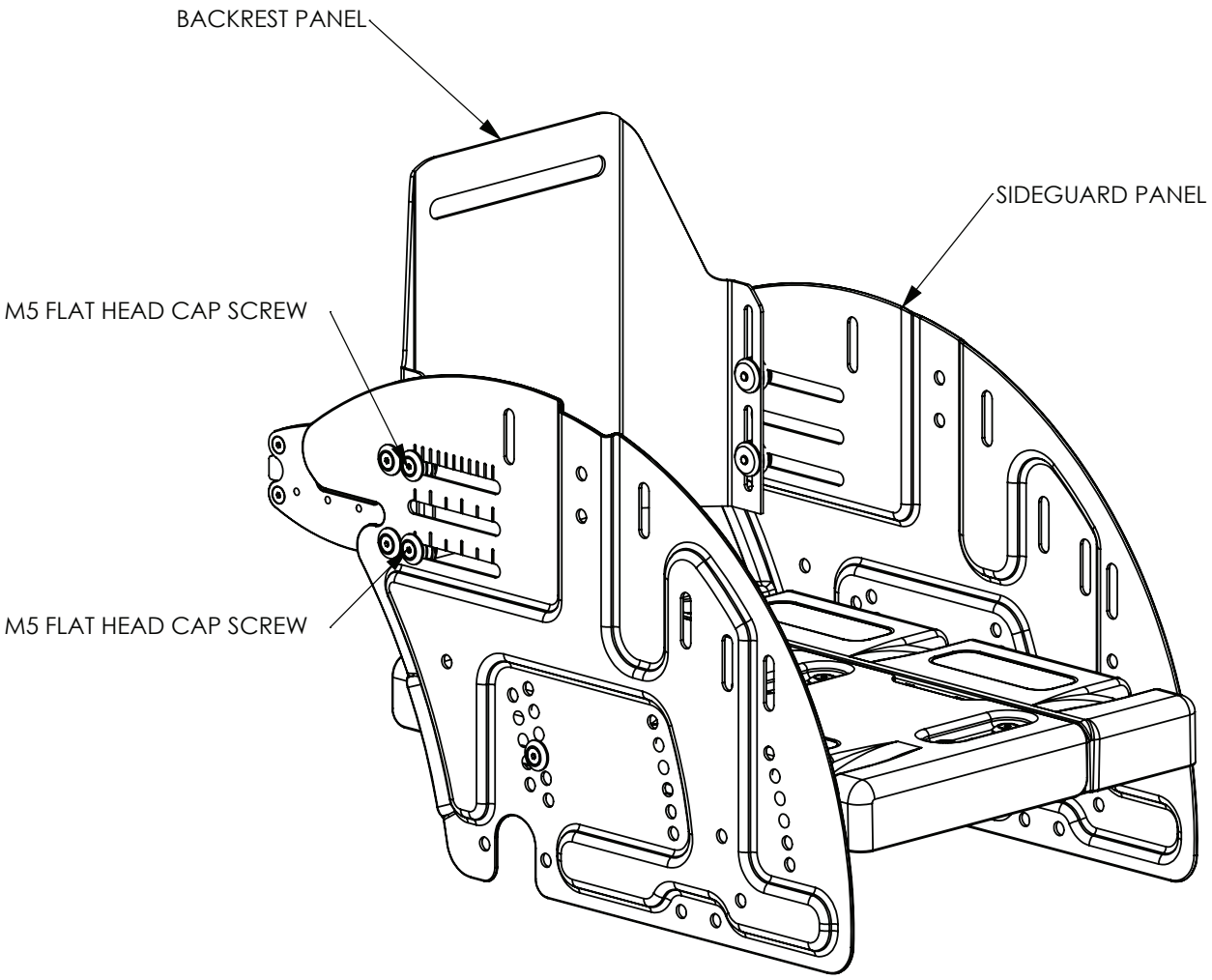
1. Loosen but do not remove the four M5 flat head cap screws holding the backrest shell or backrest canes to the side panels.
2. Make any adjustments necessary to the angle or height of the backrest by sliding along the slots in the side panel and the backrest shell.
3 Tighten the four M5 flat head cap screws and ensure that the backrest is secure.

FIGURE 4-1
PILOT BACKREST



Changing the Back Angle and Height

FIGURE 4-2
ADJUSTING BACKREST ANGLE

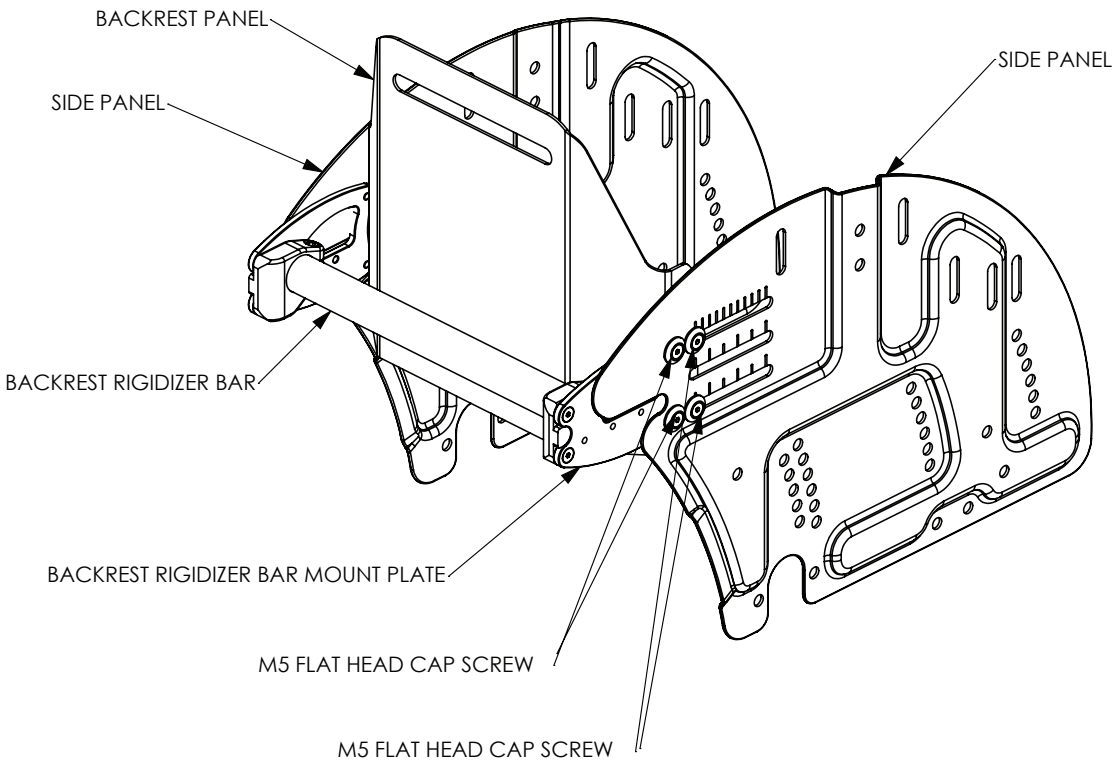


⚠**WARNING**
The threads on the Allen screws that secure the backrest have been treated with a Vibra-TITE® VC-3, a locking and sealing coating, to reduce the possibility that they will become loose. You should be able to adjust the backrest height approximately four times without reapplying thread lock to these screws. Permobil requires that you reapply Vibra-TITE® VC-3 after every fourth adjustment. If you ignore this Warning, your backrest posts could become loose or disconnected from the wheelchair, and you could fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.

Replacing the Backrest

Adjusting the Depth

FIGURE 4-3
CHANGING BACKREST PANEL



⚠**WARNING**
Any changes to the depth of the backrest will affect the stability (i.e. center of gravity) of the chair. Use extreme caution when using a new backrest depth as it may make the chair more prone to tip over. After adjusting the depth of the backrest, you must consider whether additional changes need to be made to compensate for the modified stability of the chair (e.g., changing the rear axle position, backrest angle, rear seat height). 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**
Your assistant or attendant should NEVER attempt to lift a wheelchair up a curb, step or flight of stairs by lifting on any removable (detachable) parts, such as Adjustable Height Push Handles. Similarly, your assistant or attendant should NEVER attempt to lower a wheelchair down a curb, step or flight of stairs by holding onto any removable (detachable) parts, such as the Adjustable Height Push Handles. If you ignore this Warning, the removable parts, such as the Adjustable Height Push Handles, could detach from the wheelchair causing you to fall, tip over or lose control at the wheelchair and seriously injure yourself or others or damage the wheelchair.

Pediatric Desk Arm with Rigid Side Guard

⚠WARNING
Make sure the armrest is securely engaged in the desk arm housing, before applying weight to the armrest. 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
Make sure the desk arm housing securely locks in the desk arm mount before applying weight to the desk arm. 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.

Adjusting the Armrest Height
Removing the Armrest
Replacing the Armrest

FIGURE 5-1
DESK ARMREST

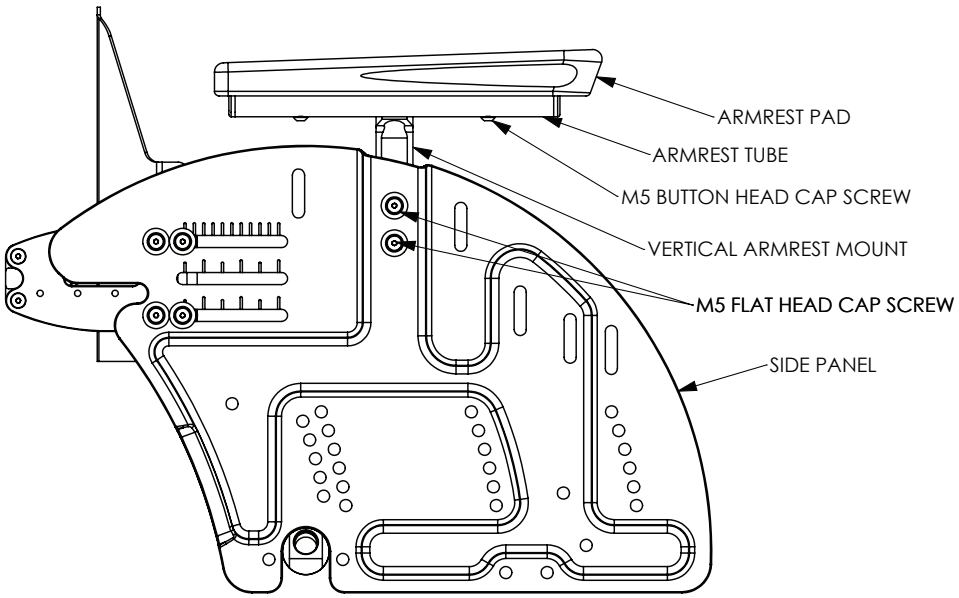
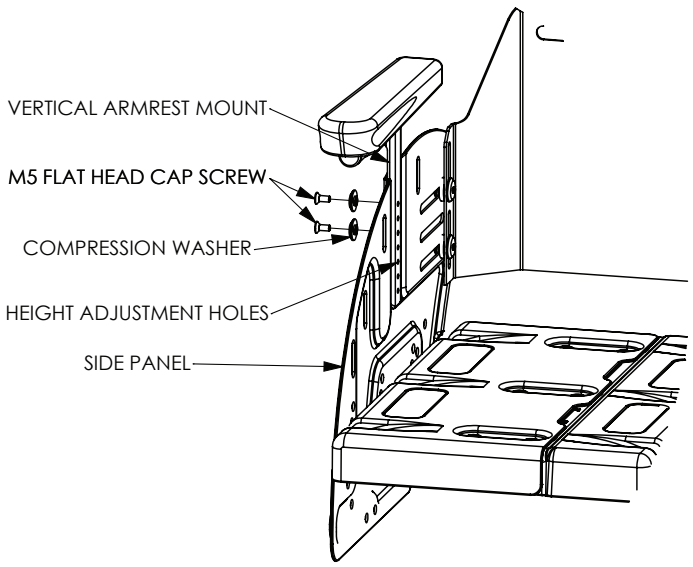
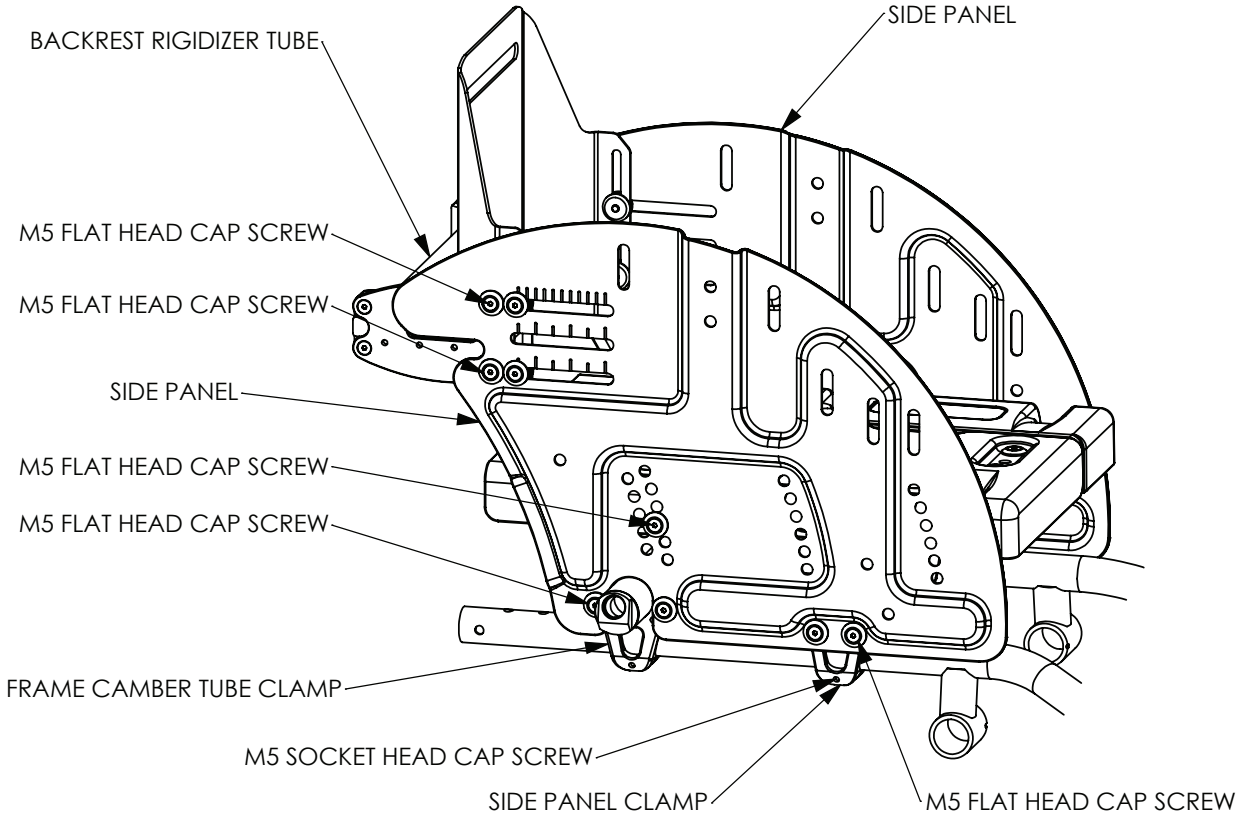


FIGURE 5-2
DESK ARMREST HEIGHT ADJUSTMENT



TiLite Pilot Side Guards

FIGURE 6-1
SIDE PANEL



CHAPTER 6: SIDE GUARDS

TiLite Pilot Fendered Side Guards

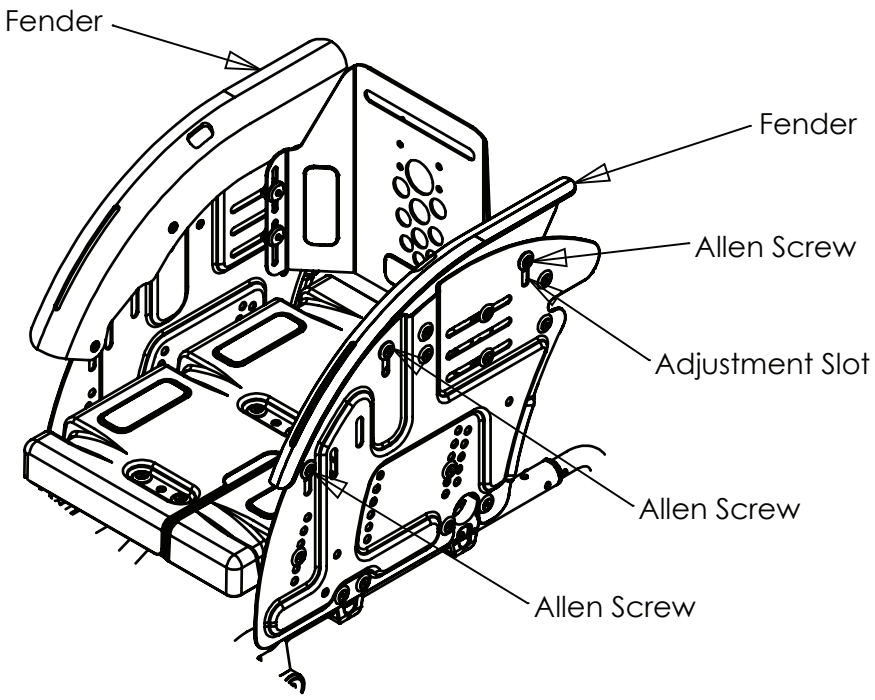


FIGURE 6-2
FENDER HEIGHT ADJUSTMENT

Adjusting Fender Height

Tools Needed:
- 3mm Allen Wrench

1. Loosen but do not remove the three M4 flat head cap screws that hold the fender to the side panel.
2. Adjust the height of the fender along the slots in the side panel.
3 Tighten the three M4 flat head cap screws and ensure the fender is secure.

CHAPTER 7: AXLE PLATES AND CAMBER PLUGS

The TiLite Pilot is equipped with a camber tube. This chapter explains the various adjustments that are possible. The same adjustment will apply regardless of the degree of camber.

⚠**WARNING**
Whenever you adjust the position of the camber tube (either to adjust the rear seat height or the Camber Tube Position), it may be necessary to adjust the toe-in/toe out of the rear wheels. See “Adjusting Toe-In/Toe-Out” on pages 8-3 to 8-4. . *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: It is recommended that you remove the rear wheels and turn the chair upside down before attempting to make any adjustments described in this chapter.

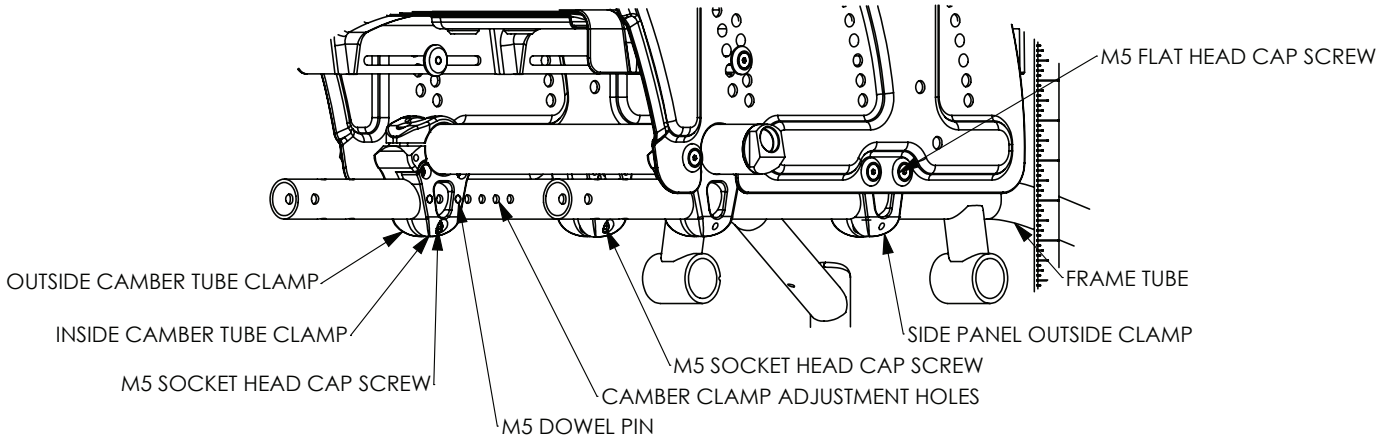
Camber Mounts

Adjusting the Camber Tube Position

Tools Needed:
- 3mm Allen Wrench
- 4mm Allen Wrench
- 5mm Allen Wrench

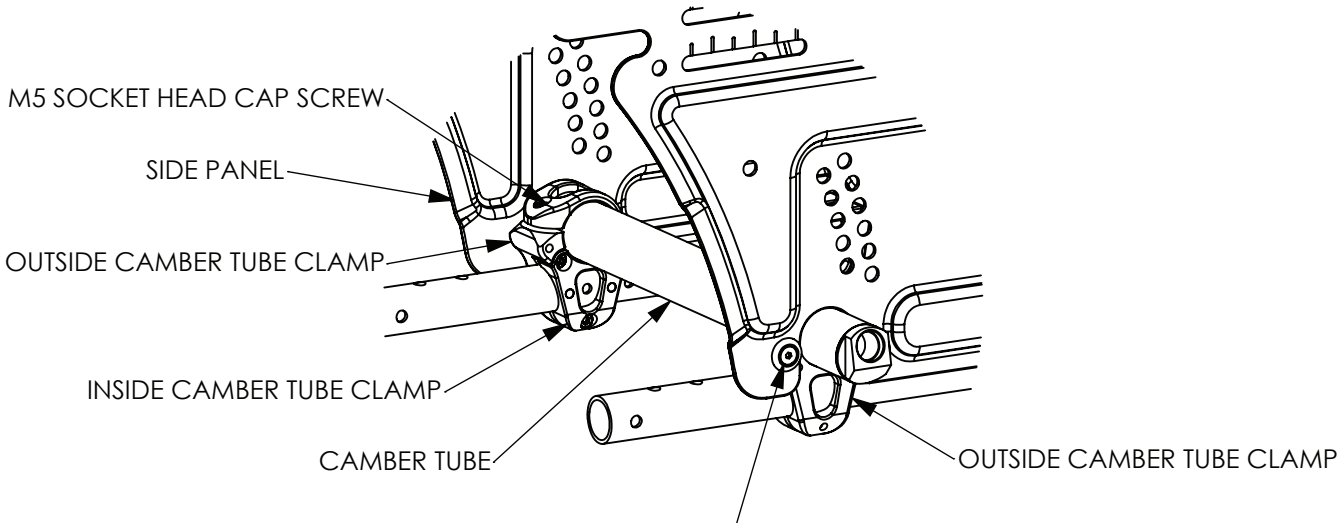
1. Remove the footrest from the chair.
2. Loosen and remove the inside camber tube clamps.
3 Loosen but do not remove the side panel outside clamps.
4. Pull the side frames towards the center of the chair. Note the dowel pins in the outside camber tube clamp that locate on the adjustment holes in the side frame tubes. Moving the frame forward relative to the seat will increase forward stability by positioning the casters further forward. Locate the side frames at the desired position, ensuring the dowel pins line up with holes in the frame.
5. Re-install the camber tube clamps and side panel outside clamps.
6. Re-install the footrest.

FIGURE 7-1
CAMBER CLAMP ADJUSTMENT



Replacing the Camber Tube

FIGURE 7-2
REPLACING THE CAMBER TUBE



Adjusting Toe-In/Toe-Out

Tools Needed:
- 5 mm Allen Wrench
- 22 mm Open End Wrench
- Ruler or Tape Measure

Note: Adjusting toe-in/toe-out does not apply to chairs with 0° camber; however, it is still necessary to make sure that the camber plug flats are perpendicular to the ground.

1. Make sure the distance from the end of the camber tube to the camber clamp is identical on both sides of the chair. See Figure 8-4.
2. Make sure the rear wheels are properly inflated.
3. Place the chair on all four wheels with the casters trailing toward the rear of the frame. See Figure 8-5.
4. Measure from the floor to the center of the axle (“Measurement A”). Be sure the tape measure/ruler is perpendicular to the floor.
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. See Figure 8-6.
9. Measure the distance between the left and right tires at the front reference marks made in Step 7.
10. If the measurements in Steps 8 and 9 are the same (within 3 mm), no toeing adjustment is needed, and you may skip to Step 13. If not, proceed to Step 11.
11. Loosen the Allen screw in each camber clamp that secures the camber tube in place.
12. If the measurement in Step 9 is less than the measurement in Step 8, rotate the camber tube using the 22 mm Open End wrench rearward to toe-out the rear wheels. If the measurement in Step 9 is greater than the measurement in Step 8, rotate the camber tube using the 22 mm Open End wrench forward to toe-in the rear wheels. Continue adjusting the camber tube until these two measurements are equal. See Figure 8-7.
13. Securely tighten the Allen screws in the camber tube mount.
14. Square the casters to the floor.

FIGURE 7-3
ADJUSTING TOE-IN/TOE OUT

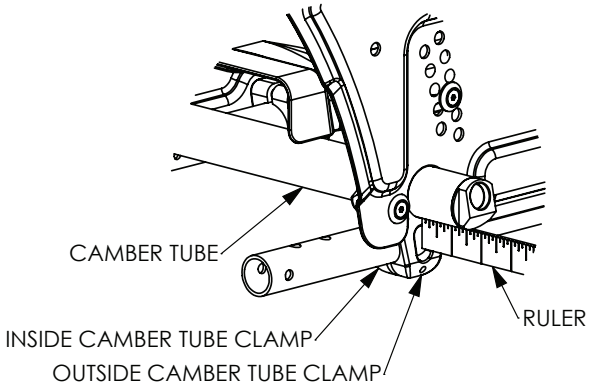


FIGURE 7-4
ADJUSTING TOE-IN/TOE OUT

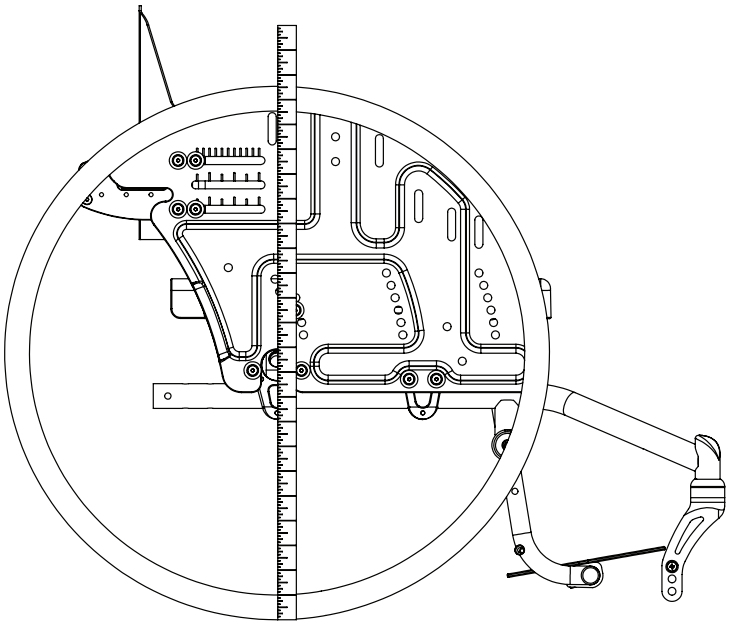


FIGURE 7-5
ADJUSTING THE TOE-IN/TOE-OUT

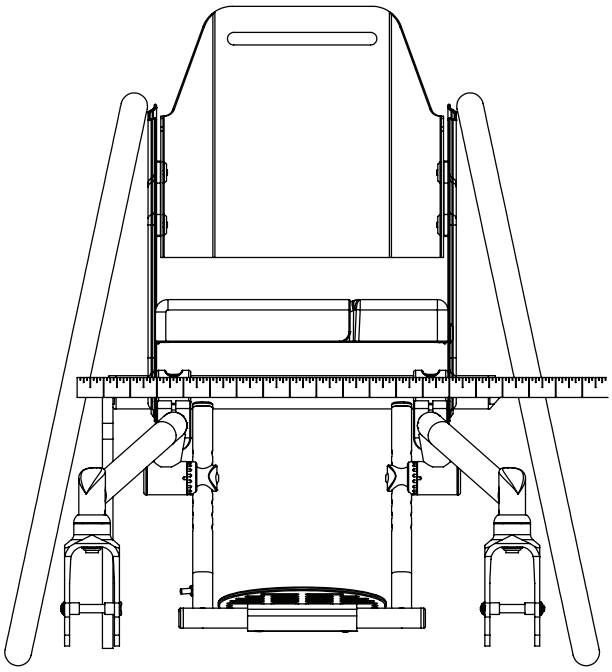
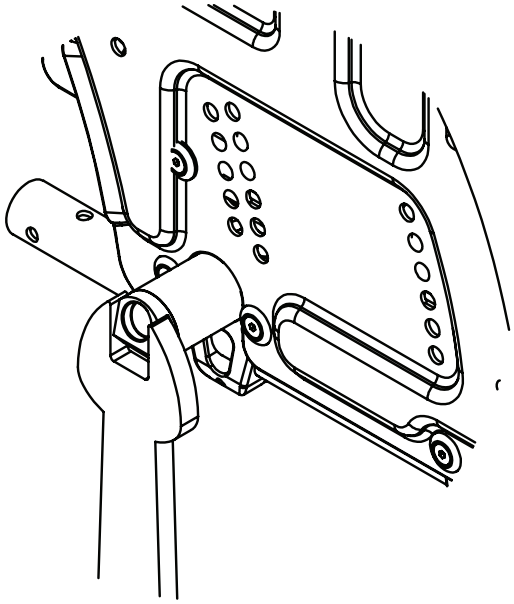


FIGURE 7-6
ADJUSTING TOE-IN/TOE-OUT



⚠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

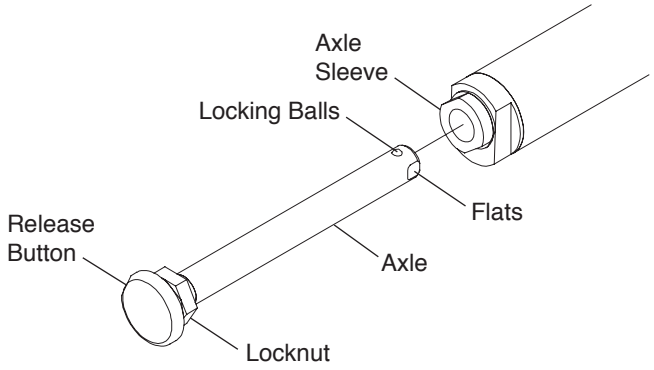
Adjusting

⚠WARNING
Quick Release Axles are pre-adjusted to permit minimal "play" in the axle. Permobil 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. Permobil recommends that an authorized Permobil dealer make any adjustments. *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:
- 19 mm End Wrench
- 11 mm End Wrench

1. Depress the release button and remove the rear wheel and Quick Release Axle. See Figure 8-1.
2. Remove the 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 the 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 8-1
Adjusting the Quick Release Axle



CHAPTER 8: AXLES

Quad Release Axles

Adjusting the Handle

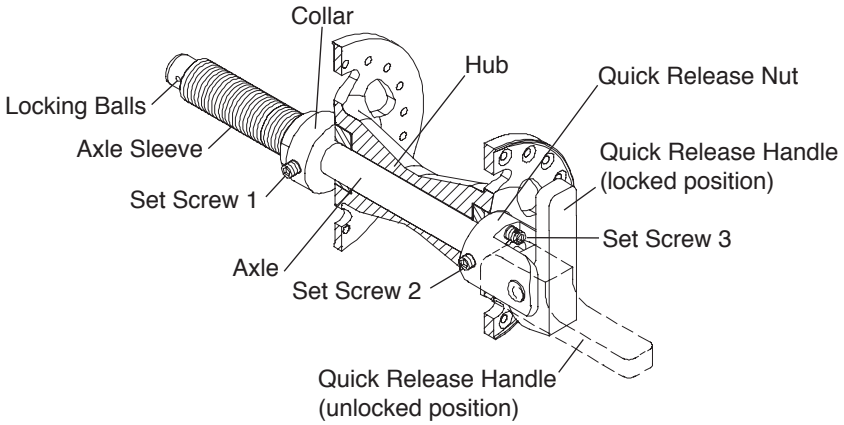
⚠WARNING
Quad Release Axles are pre-adjusted to permit minimal "play" in the axle. Permobil recommends that you do not adjust the axle. Improperly adjusting the axle could cause it to malfunction—too much "play" can cause the axle to bend and become stuck in the axle sleeve; too little "play" can prevent the locking balls from engaging fully, causing the wheel to disengage from the chair without warning. Permobil recommends that an authorized Permobil dealer make any adjustments. *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 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:
- 2 mm Allen Wrench

1. Flip the quick-release handle to the unlocked position and remove the rear wheel and Quad Release Axle. See Figure 8-2.
2. Flip the quick release handle to the 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 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 "Quad Release Axles – Adjusting the Play" on page 8-3.
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 "Quad Release Axles – Adjusting the Play" on page 8-3.

Figure 8-2
Quad Release Axle Adjustment



⚠WARNING
The threads on the set screws on the Quad Release Axles assemblies are treated with Loctite® 242®, a medium strength thread lock. If you loosen any set screw, you MUST remove and reapply Loctite® 242® or an equivalent medium strength thread lock. *If you ignore this Warning, your rear wheel could become loose or fall off and you could fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

Adjusting the "Play"

⚠WARNING
Quad Release Axles are pre-adjusted to permit minimal "play" in the axle. Permobil 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. Permobil recommends that an authorized Permobil dealer make any adjustments. *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:

Tools Needed:
- 2 mm Allen Wrench

1. Flip the quick release handle to the unlocked position and remove the rear wheel and Quad Release Axle. See Figure 8-2.
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 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 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 the 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 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.

⚠WARNING
The threads on the set screws on the Quad Release Axle assemblies are treated with Loctite® 242®, a medium strength thread lock. If you loosen any set screw, you MUST remove and reapply Loctite® 242® or an equivalent medium strength thread lock. *If you ignore this Warning, your rear wheel could become loose or fall off and you could fall, tip over or lose control of the wheelchair and seriously injure yourself or others or damage the wheelchair.*

⚠WARNING
Permobil recommends that you remove the wheel locks 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
The wheel stop must embed at least 5 mm into the tire or the chair may roll unexpectedly. Therefore, before adjusting the lock you must inflate the tires 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 adjusting the wheel locks, engage the wheel locks and push against the tires to verify that the wheel locks 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*

Wheel Lock Adjustment

Tools Needed:
- 5mm Allen Wrench

1. Loosen but do not remove the two M5 socket head cap screws holding the wheel lock brake assembly to the rear of the side panel.
2. Slide the brake assembly forward or backward to the desired position.
3. Tighten the two M5 socket head cap screws to lock in the brake position.

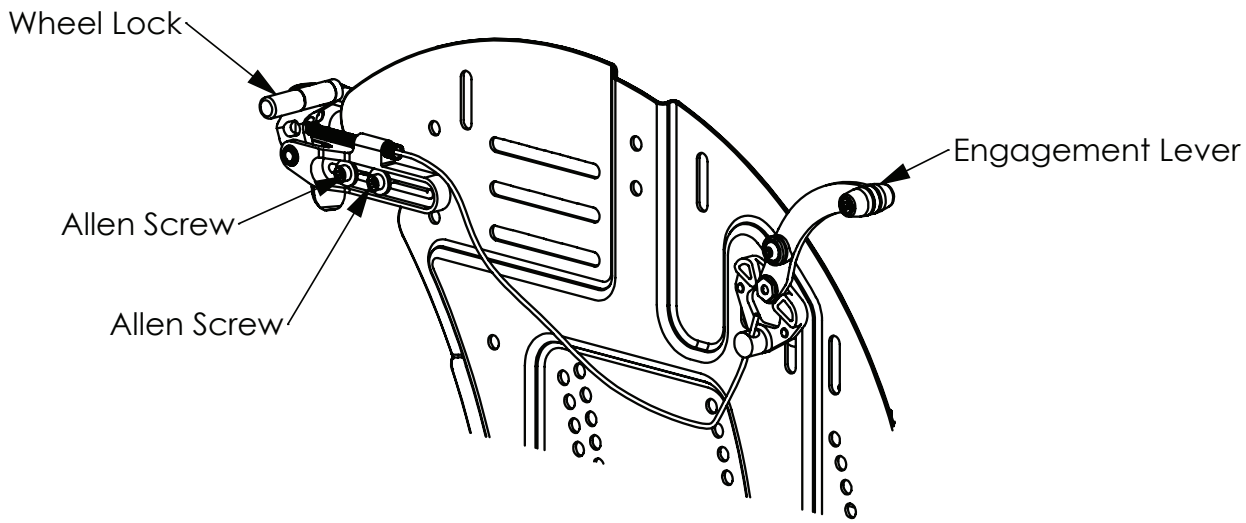


Figure 9-1
Wheel Lock

⚠WARNING
DO NOT attempt any of the procedures in this chapter if the chair is occupied. *If you ignore this Warning, serious injury to the occupant will occur.*

Quick Release Axle

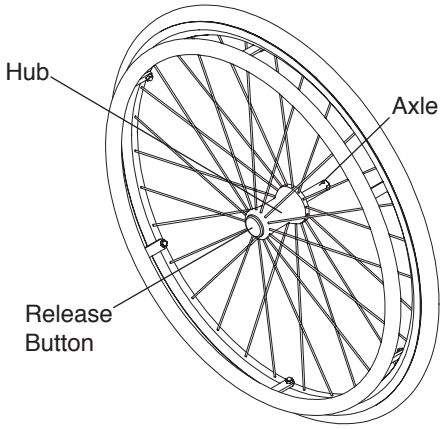
Removing
1. Hold the wheel securely at the hub. See Figure 10-1.
2. Depress the release button on the Quick Release Axle and slide the wheel and axle out of the axle sleeve.
3. Release the release button.

Replacing

⚠WARNING
Make sure the locking balls fully secure the Quick Release Axle 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 the wheel securely at the hub. See Figure 10-1.
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. Pull firmly on the wheel (without depressing the release button) to make sure the wheel is locked securely in place.

Figure 10-1
Removing and Replacing the Rear Wheel with the Quick Release Axle



Quad Release Axle

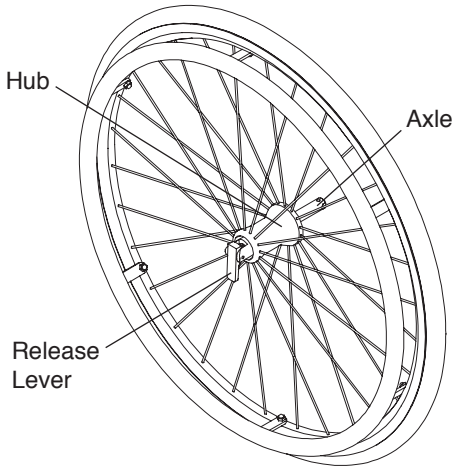
Removing
1. Unlock the lever on the Quad Release Axle. See Figure 10-2.
2. Slide the wheel and axle out of the axle sleeve.

Replacing

⚠WARNING
Make sure the locking balls fully secure the Quad Release Axle 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 the wheel securely at the hub. See Figure 10-2.
2. Unlock the lever on the Quad Release Axle, making sure the locking balls recess into the axle.
3. Insert the axle all the way into axle sleeve.
4. Lock the lever on the Quad Release Axle.
5. Pull firmly on the wheel (without unlocking the lever) to make sure the wheel is locked securely in place.

Figure 10-2
Removing and Replacing the Rear Wheel with the Quad Release Axle



CHAPTER 10: REAR WHEELS

Handrims

⚠WARNING
You must have your handrims replaced by an authorized Permobil dealer or qualified technician. *If you ignore this Warning, you may seriously injure yourself or others or damage the wheelchair.*

Pneumatic Tires and Tubes

⚠WARNING
Fully deflate the tire before performing any disassembly procedures. Do not re-inflate the tire until all re-assembly is completed. *If you ignore this Warning, you may seriously injure yourself or others or damage the wheelchair.*

Tools required:
- #2 Phillips Screw Driver
- 8 mm Open End Wrench or 10 mm Open End Wrench

1. Remove the rear wheel from the chair.
2. Remove all air from the inner tube. If you have a Schrader valve (see Figure 10-3), remove the 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 10-4), 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.
3. Remove the tire and inner tube.
4. Make sure the rim strip is properly in place.
5. Install the new inner tube and wheel tire onto the wheel.
6. Make sure the tire is properly seated in the wheel rim, and inflate the tire to the correct PSI rating on the sidewall of the tire.
7. Reinstall the rear wheel on the chair.

Figure 10-3
Schrader Valve

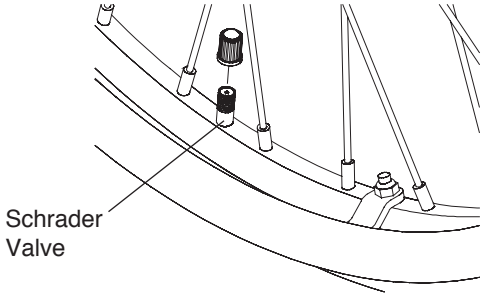
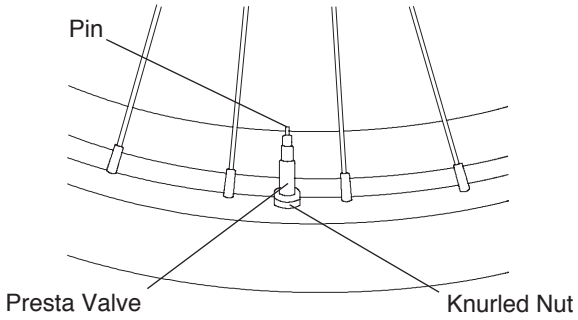


Figure 10-4
Presta Valve



Solid Tires

⚠WARNING
Replacement of solid tires requires specialized equipment. Therefore, if your solid tires need replacement, you must have this done by an authorized Permobil dealer or qualified technician. *If you ignore this Warning, you may seriously injure yourself or others or damage the wheelchair.*

Rear Wheel Spacers

Adjusting Rear Wheel Spacing

⚠WARNING
Make sure you use the same spacers on both sides of the chair. Do not use spacers exceeding a total of 2 cm. If more than 2 cm 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.*

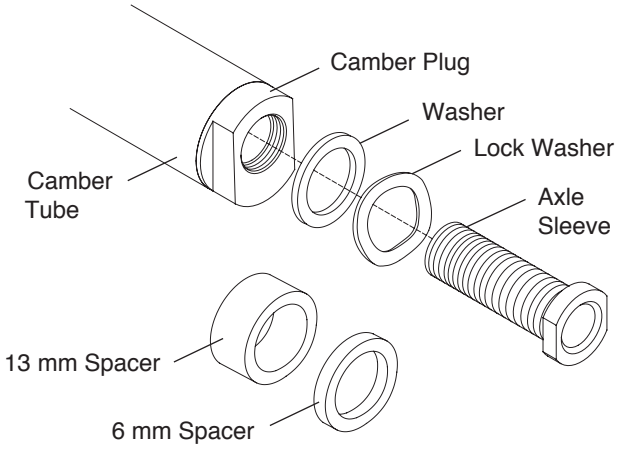
Tools required:
- 22 mm Open End Wrench
- 19 mm Open End Torque Wrench

1. Place the 22 mm Open End wrench onto the camber plug and use the 19 mm Open End Torque wrench to remove the axle sleeve. See Figure 10-5.

   Note: If you have only one washer and do not have a lock washer, your rear wheel spacing package will include a lock washer. Always use a lock washer.

2. Add or delete the spacers you need to increase/ decrease your rear wheel spacing, keeping the two washers against the head of the axle sleeve.
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 26 N-m.

Figure 10-5
Adjusting the Rear Wheel Spacing



Mounting the Support Wheels

⚠**WARNING**
Only an authorized Permobil dealer or qualified technician should install the rear support wheels receiver. *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.*

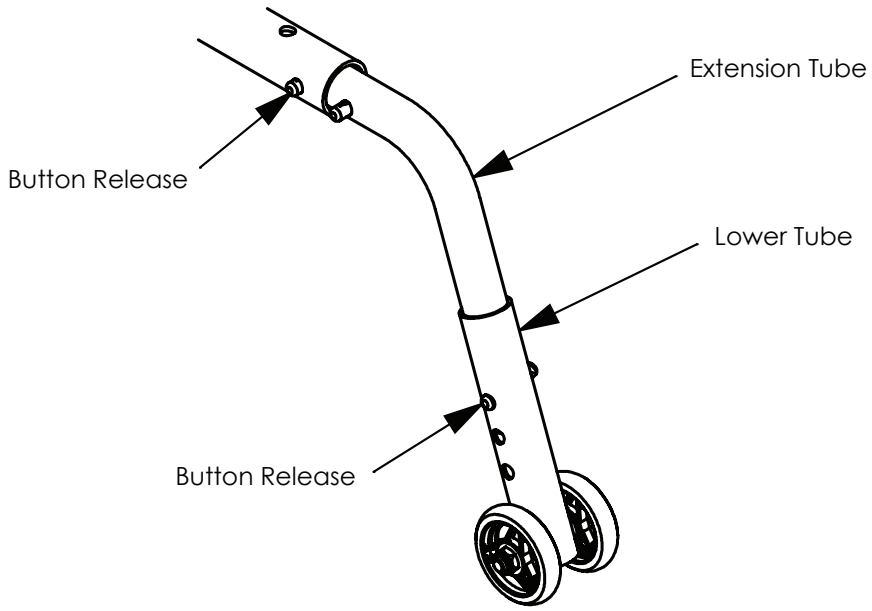


FIGURE 11-1
REAR SUPPORT WHEELS

CHAPTER 12: ADJUSTABLE SEAT WIDTH AND DEPTH

The TiLite Pilot wheelchairs are designed to be expandable to accommodate the needs of a growing child. This chapter explains the procedures to follow in order to expand the seat width and/or depth on these chairs. One growth kit may be ordered at no additional charge. Please contact Customer Service for assistance.

Adjusting the Width of the Wheelchair

Seat Pan Width Adjustment

Note: This chair is width adjustable in one-inch increments. When you are ready to grow the chair, make sure to call Permobil ahead of time to request a growth kit. The chair is not able to be grown without this kit.

Tools Needed:
- 3mm Allen Wrench
- 4mm Allen Wrench
- 5mm Allen Wrench

1. Start by removing the backrest from the chair. If using the Permobil standard backrest, remove the four bolts retaining the backrest to the side panels. Otherwise, remove the backrest from the chair utilizing the manufacturer's hardware.
2. Next, loosen and remove the footplate clamp bolts.
3. Loosen and remove the backrest rigidizer bar. The backrest rigidizer is held in place by two clamps on either end of the bar. The bolts need to be loose but do not need to be removed.
4. Loosen and remove the six bolts and washers that hold the seat pan together.
5. Loosen and remove the camber tube. The camber tube is held in by two clamps on the side panels. The clamp bolts are accessed from the top of the clamp, underneath the seat pan. A L-shaped hex wrench may be required to access this bolt underneath the seat pan. Note that these bolts only need to be loosened a few turns to remove the camber tube. Note also that on the larger camber chairs, the plug may have to be removed to slide the tube through the hole in the side panel.
6. At this point, the chair should be completely separated into two halves. Looking at the seat pan, select the desired width by sliding the seat pans apart from each other. There will be indicator lines to delineate the chair width.
7. Start re-assembly by installing two of the seat pan bolts to set chair width.
8. Slip the camber tube into the camber tube brackets to align the two halves of the chair.
9. Install the backrest rigidizer bar.
10. Install the backrest and finish installing the remainder of the seat hardware.
11. Once the chair is fully re-assembled, put the rear wheels on and check for floating casters. If present, loosen the camber tube clamp and footrest clamps to align the two halves of the chair. Ensure all fasteners are tight.

Adjusting the Seat Depth

Seat Depth Adjustment

Tools Needed:
- 3mm Allen Wrench

1. Begin by ensuring the ideal backrest position has been set.
2. The seat depth can be adjusted by loosening four M5 flat head cap screws underneath the seat pan and sliding the seat pan fore-aft.
3. When the desired position has been achieved, tighten the four flat head cap screws.

CHAPTER 12: ADJUSTABLE SEAT WIDTH AND DEPTH

FIGURE 12-1
SEAT PAN WIDTH ADJUSTMENT

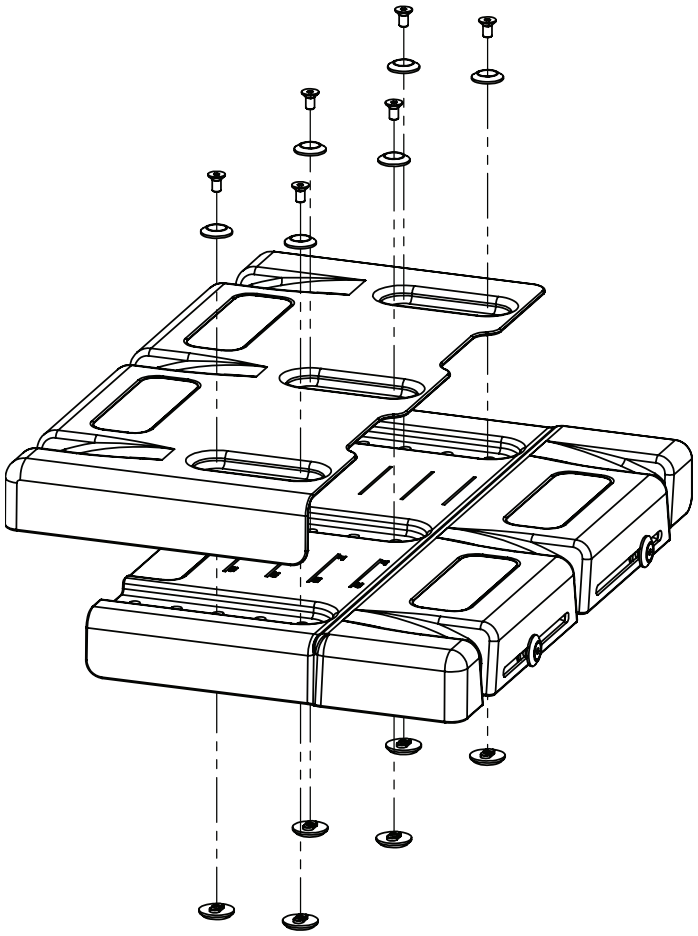


FIGURE 12-2
FOOTREST WIDTH ADJUSTMENT

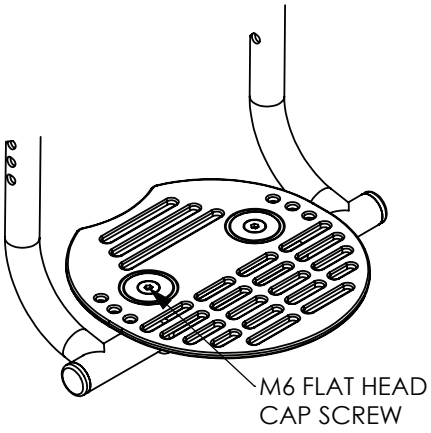
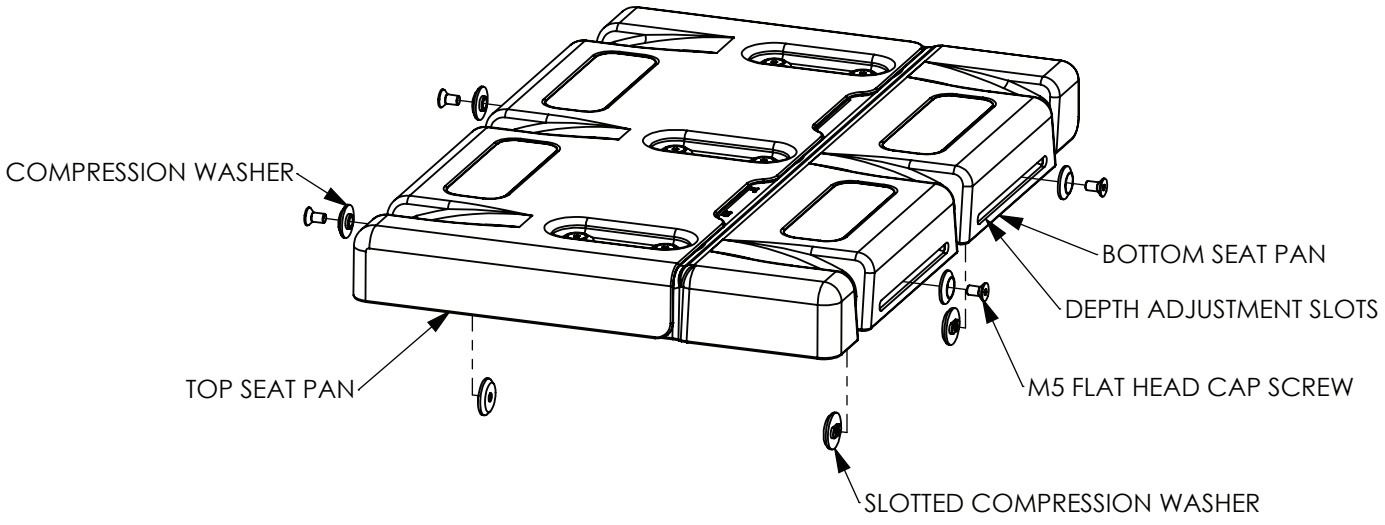


FIGURE 12-3
SEAT DEPTH ADJUSTMENT



Permobil recommends that wheelchair users either transfer into appropriate vehicle seating for transportation or utilize a transit tie-down option that has been crash tested in accordance with ISO-717619

TRANSPORTATION OPTIONS

The TiLite Pilot is available with a Transit Tie-Down Option or a Wheelchair Transport Option. The Transit Tie-Down Option, which is only available as a factory-installed option, has been crash-tested in accordance with ANSI/RESNA WC19 and crash-tested with ISO 7176-19 as described in this Owner's Manual. To determine whether your TiLite Pilot is equipped with the Transit Tie-Down Option or the Wheelchair Transport Option, see Figures 13-1 and 13-2.

GENERAL WARNINGS

⚠WARNING
If you cannot locate either sticker on your TiLite Pilot (see Figures 13-1 and 13-2), you must assume that your chair is equipped with Transport Brackets and is only to be used for unoccupied transport of a wheelchair in a motor vehicle.

⚠WARNING
You should contact Permobil Customer Service at 800-545-2266 with any questions you may have about using this wheelchair for seating in a motor vehicle.

⚠WARNING
This Chapter contains detailed information regarding the exact configuration of the TiLite Pilot wheelchair that was subjected to the frontal impact and other tests required by ISO 7176-19. See "Statement of Compliance/Specifications" on pages 13-5 and 13-6. Those test results apply only to the configuration of the wheelchair as tested and described herein. Therefore, if you order your chair differently, such as with a seating system from outside the Permobil product line, you are hereby advised that the wheelchair was not tested in such different configuration and should not be considered "transit approved" by Permobil. Because Permobil has not tested the chair with such different configurations, Permobil has no knowledge of how the product would perform in such configuration. Therefore, Permobil makes no claims or warranties about the wheelchair's performance in any configuration other than the configuration described herein. Permobil has not authorized any person to make any such claims or warranties on Permobil's behalf.

⚠WARNING
The TiLite Pilot wheelchair equipped with the TiLite Transit Tie-Down Option has been dynamically tested in a forward-facing orientation for a 30 mph (48-km/h) frontal impact with varying weights, as set forth in "Statement of Compliance/ Specifications" on pages 13-5 and 13-6. The TiLite Pilot wheelchair equipped with the TiLite Transit Tie-Down Option has met the performance requirements for traveling forward-facing in frontal impact conditions, and it should be used ONLY for forward-facing seating in motor vehicles. Its use in other orientations (e.g., rearward-facing or sideways-facing) has not been tested, and it should NOT be used in such other orientations.

⚠WARNING
Do not ride this wheelchair in a motor vehicle if your weight, together with the weight of all items

attached to the wheelchair (such as backpacks, seat pouches, etc.) is more than 95 lbs (75 kg) or if the user weighs less than 50 lbs.

⚠WARNING
Alterations or substitutions should NOT be made to the wheelchair securement points or to structural or frame parts or components. Wheelchairs are tested in the configurations with the components specified in "Statement of Compliance/ Specifications" on pages 13-5 and 13-6. Any significant modification or substitution to the wheelchair's components or seating could significantly alter the chair's performance during an impact.

⚠WARNING
Permobil expressly disclaims that use of its Transit Tie-Down Option or Transport Bracket Option on a TiLite wheelchair will prevent the wheelchair user from injury or death in the event of a motor vehicle accident.

⚠WARNING
A sudden stop and/or collision may structurally damage your wheelchair. Such damage may not be visible. IMMEDIATELY STOP using any wheelchair that is involved in any such incident. Because the structural damage may not be visible, you MUST replace any wheelchair that is involved in any such incident.

USE OEM SEATING AND RESTRAINT SYSTEMS

⚠WARNING
Whenever feasible, wheelchair users should transfer into the vehicle seat and use the Original Equipment Manufacturer (OEM) vehicle-installed restraint system and the unoccupied wheelchair should be stored in a cargo area or secured in the vehicle during travel.

USE APPROPRIATE TIE-DOWN SYSTEMS AND USE THEM PROPERLY

⚠WARNING
Your TiLite wheelchair MUST be used with Wheelchair Tie-Down and Occupant Restraint Systems (WTORS) that meet the requirements of the SAE (Society of Automotive Engineers) J2249 Recommended Practice – Wheelchair Tie-Down and Occupant Restraint Systems for Use in Motor Vehicles (SAE J2249). Do NOT use WTORS that are designed to rely on the wheelchair structure to transfer occupant restraint loads to the vehicle.

⚠WARNING
Do NOT use your TiLite wheelchair with a WTORS unless the WTORS has been installed fully in accordance with the instructions of the manufacturer of the WTORS and SAE J2249.

⚠WARNING
ALWAYS attach the WTORS to your TiLite wheelchair at all four (4) of the TiLite Transit Tie-Down Option securement points in accordance with the instructions provided by the manufacturers of the WTORS and SAE J2249.

Note: See Figures 13-4 and 13-5 for the location of the four (4) Permobil installed WTORS securement points.

⚠WARNING
ALWAYS attach vehicle-anchored occupant restraints (pelvic belts and upper torso belts) in accordance with the instructions of the manufacturer of such restraints and SAE J2249.

USE PROPER EQUIPMENT/USE ONLY AS INSTRUCTED

⚠WARNING
You MUST use your TiLite Pilot wheelchair in strict accordance with all warnings and instructions contained in this Owner's Manual.

⚠WARNING
The TiLite Pilot wheelchair equipped with the TiLite Transit Tie-Down Option was dynamically tested in a forward-facing orientation with the specified anthropomorphic test dummy restrained by BOTH a vehicle-anchored pelvic belt and a vehicle-anchored upper torso belt. BOTH pelvic and upper torso (shoulder) belts should be used to reduce the possibility of head and chest impacts with components of the motor vehicle. PERMOBIL REQUIRES THAT BOTH PELVIC AND UPPER TORSO BELTS BE USED FOR MAXIMUM PROTECTION IN A FRONTAL IMPACT COLLISION.

⚠WARNING
The backrest angle may be adjustable on your TiLite wheelchair. You must adjust the backrest angle so that it does not exceed the angle specified in Table 13-1 below, when the wheelchair is occupied during transit in a motor vehicle.

AVOID USING IMPROPER EQUIPMENT/SECURE OTHER EQUIPMENT

⚠WARNING
Postural supports, such as pelvic positioning belts, anterior trunk supports and lateral trunk supports, should NOT be relied on for occupant restraint in a moving vehicle unless they are labeled as being in accordance with ISO 7176-19.

⚠WARNING
Posturing and positioning accessories, such as pelvic positioning belts, anterior trunk supports and lateral trunk supports, should NEVER be relied upon for occupant restraint in a moving vehicle unless they are labeled as being in accordance with the requirements specified in ISO 7176-19.

⚠WARNING
Whenever possible, other auxiliary wheelchair equipment should be either effectively secured to the wheelchair or removed from the wheelchair and secured in the vehicle during travel so that such equipment does not break free and cause injury to the vehicle occupants in the event of a collision.

⚠WARNING
In order to reduce the potential of injury to vehicle occupants, wheelchair-mounted trays and other accessories, such as IV poles, respiratory equipment, backpacks and other personal items, not specifically designed for crash safety should: (i) be removed and secured separately in the vehicle, or (ii) be secured to the wheelchair but positioned away from the occupant with energy-absorbing padding placed between the tray or other accessory and the occupant.

CHAPTER 13: TRANSPORTATION OPTIONS

⚠WARNING
IF YOU FAIL TO HEED THE WARNINGS IN THIS OWNER'S MANUAL, YOU MAY DAMAGE YOUR WHEELCHAIR, CAUSE SEVERE PHYSICAL INJURY TO OTHERS OR SUFFER SEVERE PHYSICAL INJURIES YOURSELF, UP TO AND INCLUDING DEATH.

INTRODUCTION

This Chapter of the TiLite Pilot Owner's Manual provides detailed instructions on the proper use of Permobil's Transit Tie-Down Option and Transit Bracket Option for your TiLite Pilot wheelchair.

In 2001, the International Organization for Standardization (ISO) developed and adopted ISO 7176-19 entitled "Wheeled Mobility Devices for Use in Motor Vehicles" (ISO 7176-19). ISO 7176-19 sets forth design and performance requirements, and associated test methods, for wheeled mobility devices (wheelchairs) that will be used as seats in motor vehicles. ISO 7176-19 was last revised in 2008.

In 2000, the American National Standards Institute, Inc. (ANSI) and the Rehabilitation Engineering and Assistive Technology Society of North America (RESNA) adopted ANSI/RESNA Wheelchair Standards Volume 1, Section 19 entitled "Wheelchairs Used as Seats in Motor Vehicles" (ANSI/RESNA WC/19). ANSI/RESNA WC/19 was developed to establish design and performance requirements for wheelchairs that will be used as seats in a motor vehicle.

Both ISO 7176-19 and ANSI/RESNA WC/19 provide a testing methodology for testing a wheelchair in a simulated frontal impact collision at 30 mph (48 kph). One difference between ISO 7176-19 and ANSI/RESNA WC/19 is that ISO 7176-19 permits the anthropomorphic test dummy to be secured using a vehicle-anchored pelvic belt and a vehicle-anchored shoulder belt while ANSI/RESNA WC/19 requires that the anthropomorphic test dummy be secured using a wheelchair-anchored pelvic belt and a vehicle-anchored shoulder belt.

ISO 7176-19 and ANSI/RESNA WC/19 are intended to promote occupant safety and reduce the risk of injury for motor-vehicle occupants who remain seated in their wheelchair during transit by improving the crashworthiness of wheelchairs that conform to its requirements. In the opinion of the authors of ANSI/RESNA WC/19, "a wheelchair that complies with all the requirements of this standard can be considered to provide a reasonable measure of safe and suitable seating during vehicle ingress/egress, during normal transportation, and in a frontal impact" (emphasis added). However, the authors of ANSI/RESNA WC/19 also noted that "wheelchairs that conform to the requirements of this standard should not be considered to offer seating and occupant restraint that is equivalent to that provided by seats provided by the vehicle manufacturer" (emphasis added). Similarly, the authors of ISO 7176-19 stated that wheelchairs "that comply with this part of ISO 7176 will have additional features that provide increased levels of occupant security and safety whilst their occupants are riding in motor vehicles." Accordingly, ISO 7176-19 and ANSI/RESNA WC/19 include numerous warnings to the effect that "wheelchair users should transfer to the vehicle seat and use the vehicle-installed restraint system whenever it is feasible."

Therefore, there are several important considerations that users of the TiLite Transit Tie-Down Option must keep in mind. First, ISO 7176-19 only tests for wheelchair performance where the wheelchair, secured in the forward-facing position, is involved in a frontal impact collision at 30 mph (48 kph). It does not test for wheelchair performance in any other type of collision, including, without limitation, side impacts, rear impacts, rollovers or higher speed frontal impacts. Second, compliance with ISO 7176-19 does not guarantee that the occupant will not be injured, even in a frontal impact collision at 30 mph (48 kph) or less. In such an impact, the forces experienced are very severe and injuries can be sustained even if the wheelchair performs exactly as required by the standard.
This Owner's Manual contains detailed information regarding the exact configuration of the Permobil wheelchairs that were subjected to the frontal impact and other tests required by ISO 7176-19. See

"Statement of Compliance/Specifications" below. The results of that testing apply only to the configuration of the wheelchair as tested and described herein. **Therefore, if you order your chair differently, such as with a seating system manufactured by someone other than Permobil, you are hereby advised that the wheelchair was not tested in such different configuration and should not be considered "transit approved" by Permobil. Because Permobil has not tested the chair with such different configurations, Permobil has no knowledge of how the product would perform in such configuration. Therefore, Permobil makes no claims or warranties about the wheelchair's performance in any configuration other than the configuration described herein. Permobil has not authorized any person to make any such claims or warranties on its behalf.**

STATEMENT OF COMPLIANCE/SPECIFICATIONS

TiLite Pilot wheelchairs equipped with the TiLite Transit Tie-Down Option conform to the requirements of ISO 7176-19. Specifically, it has been tested in accordance with Section 5.2 (Frontal Impact), Section 5.3 (Accessibility of Securement Points Intended for Use with Four-Point Strap-Type Tie-Downs with Hook-Type End-Fittings) and Section 5.4 (Accommodation of Vehicle-Anchored Belt Restraints) of ISO 7176-19. The wheelchair Tie-Down and occupant restraint system (WTORS) used in these tests was strap-type tie-down that complied with SAE J2249 and ISO 10542-1.

The TiLite Wheelchair Tranport Bracket Option has NOT been crash-tested either pursuant to ISO 7176-19 "Wheeled Mobility Devices for Use in Motor Vehicles" or pursuant to ANSI/RESNA WC19. Therefore, the Wheelchair Transport Bracket Option is provided solely for the purpose of securing an UNOCCUPIED wheelchair in a motor vehicle.

The TiLite Pilot wheelchair with the Transit Tie-Down Option was tested in accordance with ISO 7176-19 Section 5.2 using a surrogate wheelchair tie-down device that complied with Annex E of ISO 7176-19 and a three-point, vehicle-anchored, occupant restraint system consisting of a shoulder belt and a pelvic belt. The anthropomorphic test dummy weighed as set forth in the table above. The wheelchair that was tested passed the frontal impact test configured as described above.

The rider of a TiLite Pilot wheelchair must not weigh more than the Maximum User Weight stated above. If there are items attached to the wheelchair, such as backpacks, seat pouches, etc., the weight of such attached items must be counted as part of the Maximum User Weight limit for the wheelchair. In other words, if the wheelchair rider has a 20 lb (9.1 kg) backpack attached to the wheelchair, then the wheelchair rider must not weigh more than the Maximum User Weight in Table 13-1 less 20 lbs (9.1 kg). **The TiLite Pilot wheelchair was not tested with a wheelchair-anchored pelvic belt, and Permobil does not offer this wheelchair with a wheelchair-anchored pelvic belt.**

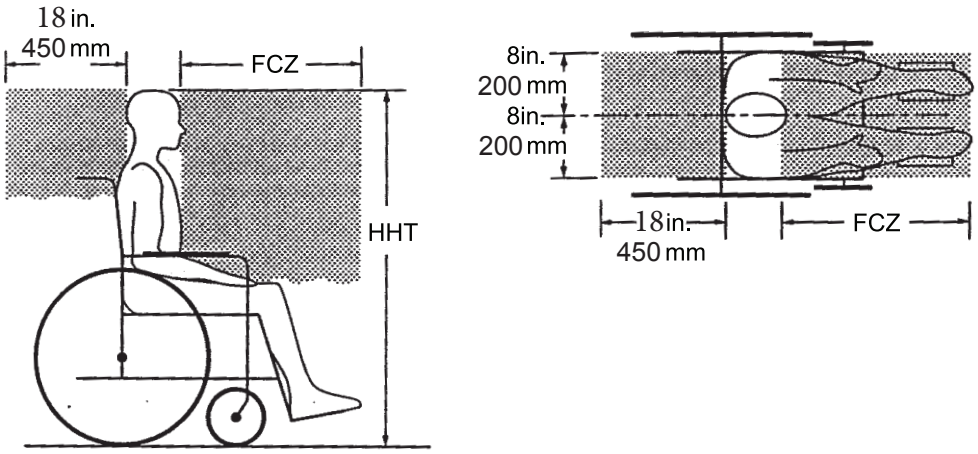
POSITIONING THE WHEELCHAIR IN THE VEHICLE

⚠WARNING
The TiLite Pilot wheelchair equipped with a TiLite Transit Tie-Down Option complies with the requirements of ISO 7176-19 and, as such, has been designed and tested for use ONLY as a forward-facing seat in a motor vehicle. This Permobil wheelchair was not designed to be rearward-facing or sideways-facing when used as a seat in a motor vehicle.

⚠WARNING
It is imperative that the wheelchair ALWAYS be positioned in a vehicle with appropriate clear zones around the wheelchair because in a frontal impact, even when properly secured, the wheelchair and its occupant will move from their secured position. Clear zones are required whether the wheelchair occupant is restrained by both pelvic and upper torso belts or only by a pelvic belt. The use of only pelvic or only upper torso belts is highly dangerous and is never recommended. The minimum necessary clear zones for the TiLite wheelchairs are shown in

Figure 13-3.

Figure 13-3
Clear Zones



- **Frontal Clear Zone** ("FCZ") is measured from the front most point on an occupant's head and is 215 cm (650 mm) with pelvic and shoulder belts and 37-13 mm (950mm) with pelvic belt only. The recommended clearance may not be achievable for wheelchair-seated drivers.
- **Rear Clear Zone** ("RCZ") is 120 cm (450 mm) and is measured from the rear most point on an occupant's head. There must be no obstructions in the RCZ.
- **Seated head height** ("HHT") is measured from the floor of the vehicle to the top of the occupant's head and it ranges from about 47" (1200 mm) for a small adult female to about 625 mm (1550 mm) for a tall adult male.

SECURING THE WHEELCHAIR TO THE VEHICLE

⚠WARNING
The Tie-Down brackets on your wheelchair were designed, located and installed by Permobil to comply with ISO 7176-19 and SAE J2249 standards so as to ensure that they operate properly and maximize the performance of the brackets in a frontal impact collision. The two front Tie-Down brackets (see Figures 13-4 and 13-5) should NEVER be removed or relocated to another position on the wheelchair frame. The two rear brackets may be removed ONLY if it is necessary to adjust the seat depth. However, any adjustment of the rear Tie-Down brackets must ALWAYS be performed by an authorized Permobil dealer, and, even if such an adjustment is made, you must ALWAYS use the bolts and nuts originally shipped with your wheelchair. If you substitute another bolt or nut, the Tie-Down brackets may not operate properly. Notwithstanding this Warning regarding removing or relocating the brackets, you should ALWAYS inspect the brackets before securing the wheelchair in a motor vehicle to ensure that they are properly secured, and, if necessary, the bolts should be tightened.

1. Whenever feasible, wheelchair users should transfer to the Original Equipment Manufacturer vehicle seat and use the vehicle-installed restraint system.
2. This wheelchair must be used ONLY with a WTORS comprised of a four-point, strap-type wheelchair Tie-Down and a three-point, vehicle-anchored, pelvic and torso belt-type, occupant restraint that has been installed in accordance with the manufacturer's instructions and SAE J2249. It is NOT compatible with other types of WTORS.

   Note: To obtain a copy of SAE J2249 Wheelchair Tie-Down and Occupant Restraint Systems (WTORS) for use in Motor Vehicles, please contact SAE International, 400 Commonwealth Drive,

Warrendale, PA 15096-0001, USA. Telephone: 724-776-4970. Web: www.sae.org

3. This wheelchair MUST be positioned in a forward-facing position prior to engaging the WTORS.
4. The positions of the four wheelchair securement points (Tie-Down brackets) are shown in Figure 13-4.

   Note: For TiLite Pilot wheelchairs manufactured prior to October 2012, the two front securement points were located as shown in Figure 13-5.

5. Each of the four Tie-Down brackets (see Figure 13-4) is identified with the symbol shown in Figure 13-6
6. Carefully inspect each of the four Tie-Down brackets to ensure that they are properly secured to the wheelchair.
7. Carefully inspect each wheelchair Tie-Down strap for damage or wear.
8. The four wheelchair Tie-Down straps must be attached to the four Tie-Down brackets in accordance with the WTORS manufacturer's instructions and SAE J2249.
9. Each of the four wheelchair Tie-Down straps must be tightened to ensure that the wheelchair is securely fastened to the vehicle—there should be no "play" or looseness in any of the four wheelchair Tie-Down straps.

SECURING THE OCCUPANT; POSITIONING THE PELVIC AND UPPER TORSO BELTS

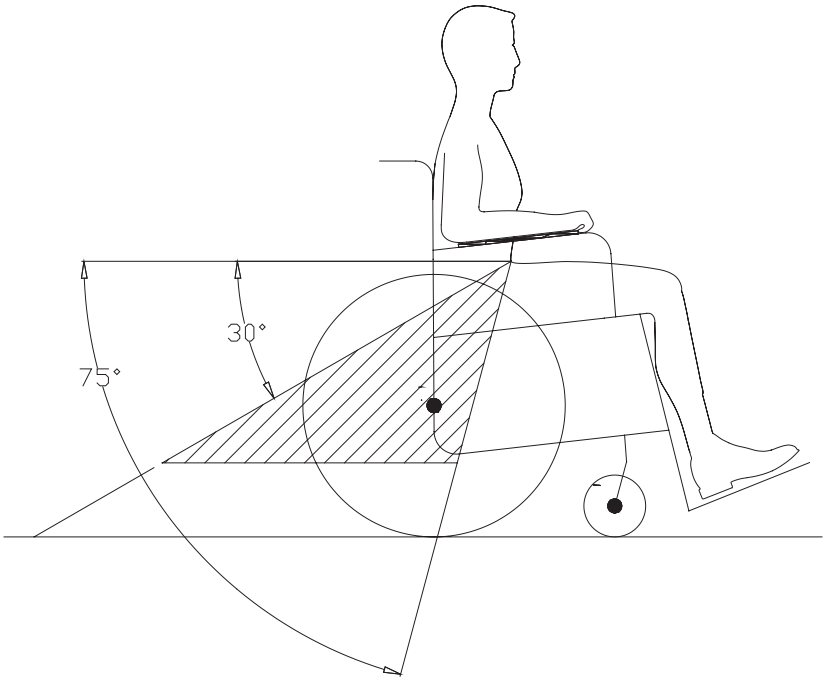
⚠WARNING
A three-point, vehicle-anchored, pelvic and upper torso belt occupant restraint system must be properly installed and worn while riding in your TiLite Pilot wheelchair in a motor vehicle.

⚠WARNING
A side-view pelvic-belt angle of 30° to 75° to the horizontal (see Figure 13-7) is preferred to lower pelvic belt angles.

⚠WARNING
Always ensure that the vehicle-anchored pelvic and upper torso belt buckles are positioned so that the release buttons will not be contacted by wheelchair components during a crash.

1. Carefully inspect the vehicle-anchored occupant restraint system belts, brackets and clamps to ensure that they are properly secured to the vehicle and are not damaged or worn.
2. Secure the wheelchair occupant using the vehicle-anchored pelvic belt and vehicle-anchored upper torso belt. See Figure 13-7. It is imperative that you position the belts properly. Paragraphs 3 to 7 which follow explain how to properly position your vehicle-anchored restraint belts.
3. The pelvic belt should be worn low across the front of the pelvis so that the angle of the pelvic belt is within the preferred zone of 30° to 75° to the horizontal. See Figure 13-7. A steeper (greater) angle within the preferred zone is desirable.

Figure 13-7
Pelvic Belt Angle



Note: Steeper side-view pelvic-belt angles are especially important if the pelvic belt is intended to be used for postural support in addition to occupant restraint in a frontal crash. Steeper angles will reduce the tendency for a vertical gap to develop between the user and the belt due to compliance of seat cushions and belt movement, thereby reducing the tendency for the user to slip under the belt and for the belt to ride up on the soft abdomen during normal use.
Note: Steeper belt angles also reduce the tendency for upper torso belts to pull the pelvic belt onto the abdomen during frontal impact loading.

4. The upper torso belt should fit over the shoulder and across the chest. See Figure 13-8.
5. Belt restraints should not be held away from the body by wheelchair components or parts, including, for example, the wheelchair armrests or wheels. See Figure 13-8 for the correct position of the belt restraints. See Figure 13-9 for the incorrect position of the belt restraints.

Figure 13-8
Illustration of Proper Belt-Restraint Fit

Belt restraints should make full contact with the shoulder, chest, and pelvis and pelvic belts should be positioned low on the pelvis near the thigh-abdominal junction.

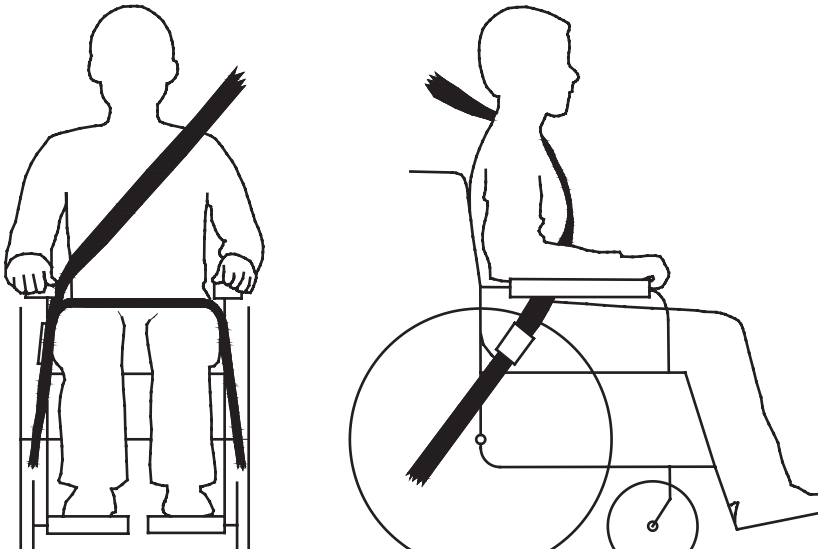
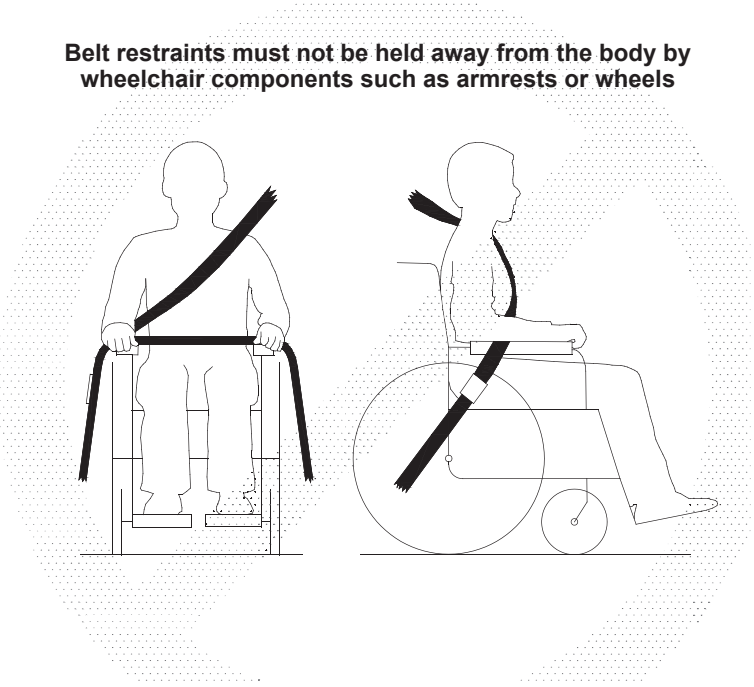


Figure 13-9
Illustration of Improper Belt-Restraint Fit

Belt restraints must not be held away from the body by wheelchair components such as armrests or wheels



6. Always adjust the belt restraints to fit as tightly as possible, consistent with the wheelchair user's comfort.
7. Always carefully inspect the belt webbing to ensure that it is not twisted. If it is twisted, it will reduce the surface area of the belt that is in contact with the user, which could adversely affect the performance of the belt and injure the user in the event of an impact.

RATING OF ACCOMMODATION OF VEHICLE-ANCHORED BELT RESTRAINTS

In accordance with ISO 7176-19 Annex D, the TiLite wheelchairs were evaluated by an independent, university test facility with regard to the effective use of a vehicle-anchored three-point belt restraint system.

The TiLite Pilot received an overall score of 14 points for a rating of C.

SEATING OPTIONS

⚠WARNING
The TiLite Pilot wheelchair was crash-tested in accordance with ISO 7176-19 only with TiLite backrest. Therefore, these are the only seating options approved by Permobil for use with the TiLite Transit Tie-Down Option. If you order your TiLite wheelchair with the Transit Tie-Down Option and you use seating components other than these, the performance of the other seating system or upholstery is unknown. Therefore, Permobil makes no warranty or claim as to the performance of the TiLite wheelchair in the event of a motor vehicle accident of any type, even if the other seating system was crash tested with a different manufacturer's wheelchair or with a surrogate wheelchair in accordance with ANSI/RESNA WC/20.

WARRANTY MODIFICATION

A copy of the Permobil Limited Warranty was enclosed with your new wheelchair when it was shipped from our factory. Our warranty is also available on our website, www.permobil.com. That Limited Warranty applies to your TiLite wheelchair with the Transit Tie-Down Option, with the following modification: The warranty is void if the wheelchair is damaged as a result of transit use.

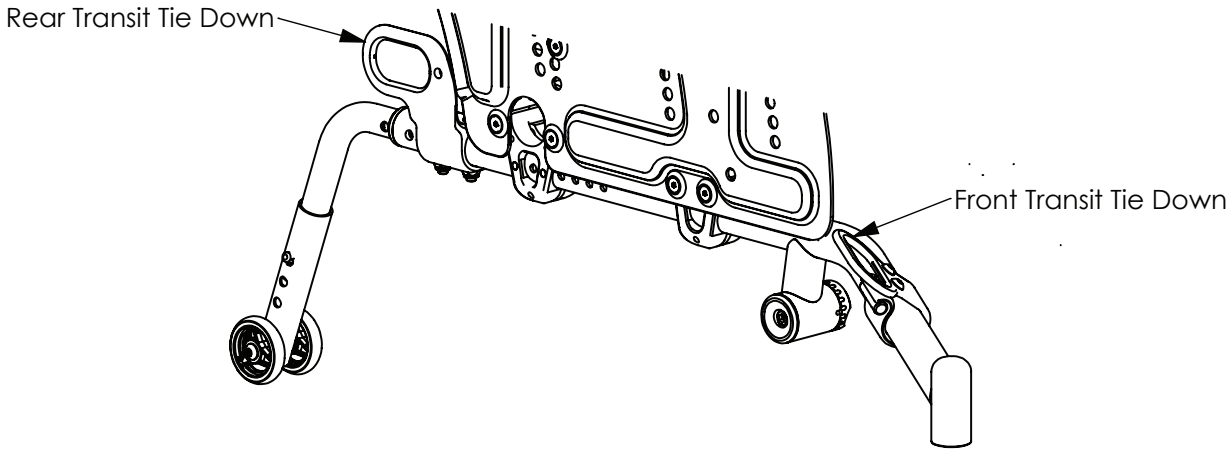


Figure 13-10
Transit Tie Downs

permobil

Every person has the right to have his or her disability compensated as far as possible by aids with the same technical standard as those we all use in our everyday lives.

Per Uddén, Permobil Founder

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