



ZM-310

## Zippie® ZM-310

BC, SC

**Supplier:** This manual must be given to the rider of this wheelchair.

**User:** Before using this wheelchair read this entire manual and save for future reference.

Owner's Manual

## Zippie® ZM-310

BC, SC

**Distribuidor:** Este manual debe ser entregado al pasajero de esta silla de ruedas.

**Pasajero:** Antes de usar esta silla de ruedas, lea este manual en su totalidad y guárdelo para futura referencia.

Cada una de las sillas se envía con un manual de instrucciones en inglés. El manual en español o francés está disponible en formato PDF en nuestra página en Internet: [www.SunriseMedical.com](http://www.SunriseMedical.com). Ingrese a la página del producto específico para descargar el manual, o comuníquese con el proveedor autorizado de Sunrise Medical.

Manual de Instrucciones

## Zippie® ZM-310

BC, SC

**Fournisseur:** Ce manuel doit être remis à l'utilisateur / utilisatrice de ce fauteuil roulant.

**Utilisateur / Utilisatrice:** Avant d'utiliser ce fauteuil roulant, lisez entièrement ce manuel et conservez-le pour le consulter ultérieurement.

Chaque fauteuil est livré avec un manuel d'instructions en anglais. Les versions en espagnol et en français sont à votre disposition en format PDF sur le site: [www.SunriseMedical.com](http://www.SunriseMedical.com). Veuillez vous rendre à la page de votre produit pour télécharger le manuel dans la langue souhaitée, ou contactez un fournisseur agréé Sunrise Medical.

Mode d'emploi



## SUNRISE LISTENS

Thank you for choosing a Zippie wheelchair. We want to hear your questions or comments about this manual, the safety and reliability of your chair, and the service you receive from your Sunrise supplier. Please feel free to write or call us at the address and telephone number below:

Sunrise Medical  
Customer Service Department  
12002 Volunteer Blvd.  
Mount Juliet, TN 37122  
(800) 333-4000

## FOR ANSWERS TO YOUR QUESTIONS

Your authorized supplier knows your wheelchair best, and can answer most of your questions about chair safety, use and maintenance. For future reference, fill in the following:

Supplier: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone: \_\_\_\_\_

Serial #: \_\_\_\_\_ Date/Purchased: \_\_\_\_\_

## ADDITIONAL INFORMATION YOU SHOULD KNOW

No component of this chair was made with Natural Rubber Latex.



## DISPOSAL AND RECYCLING INFORMATION

When this product reaches the end of its life, please take it to an approved collection or recycling point designated by your local or state government. This wheelchair is manufactured using a variety of materials. Your product should not be disposed of as ordinary household waste. You should dispose of your wheelchair properly, according to local laws and regulations. Most materials that are used in the construction of this product are fully recyclable. The separate collection and recycling of your product at the time of disposal will help conserve natural resources and ensure that it is disposed in a manner that protects the environment.

Ensure you are the legal owner of the product prior to arranging for the product disposal in accordance with the above recommendations.

## USER WARNING



Attention wheelchair users, do not operate this wheelchair without first reading the owner's manual. If you do not understand the instructions and warnings of this owner's manual please contact your dealer or qualified technician before operating this Zippie wheelchair. Failure to do so may result in damage and/or injury.

## DEALER/TECHNICIAN WARNING



Attention dealers and qualified technicians, do not operate or service this wheelchair without first reading this owners manual. If you do not understand the instructions and warnings of this owners manual please contact the Zippie Technical Service Department before operating and/or servicing this Zippie wheelchair. Failure to do so may result in damage and/or injury.

## ELECTROSTATIC DISCHARGE



Power wheelchairs have printed circuit boards. Careful attention should be given to printed circuit board handling techniques to avoid damaging the control, and/or drive electronics of the chair, this could create a safety hazard. Do not expose or remove printed circuit boards. Contact your Authorized Dealer for help with any electronics issues.

## Related Documents

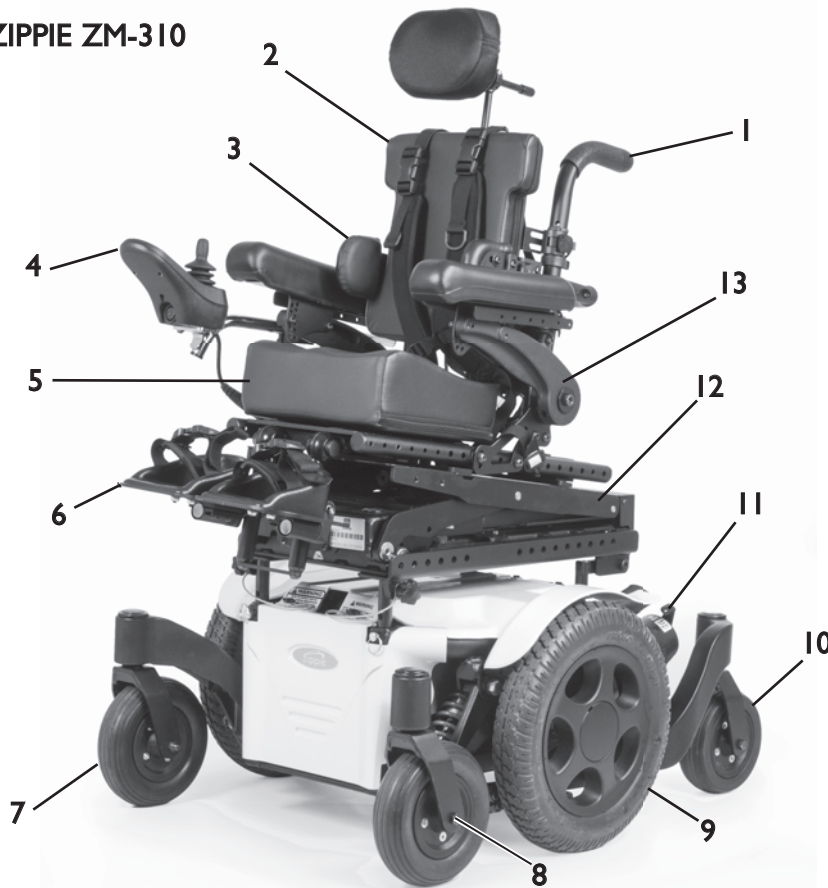
Listed below are additional documents which are referenced in this owners manual.

- RNET Owners Manual
- PG Drives Technology CJS2 Installation manual
- RNET OBP Owners Manual
- RNET Omni2 Owners Manual
- Pulse / ZM-310 Service Manual

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## III. YOUR CHAIR AND ITS PARTS

## ZIPPIE ZM-310



1. Push Handles
2. Back Cushion
3. Optional Postural Supports
4. VR2 Controller Joystick (RNET option)
5. Seat Cushion
6. Footplate (shown) (optional)
  - Swing-away 65° Hangers
  - Swing-away ELR Hangers
  - Swing-away 70° Hangers
  - Swing-away 75° Hangers (tapered)
  - Swing-in/out 80° Hangers
  - Swing-in/out 90° Hangers
  - Fixed Center Mount Legrest
  - Angle Adjustable Center Mount LR
7. Front Caster wheel 7"
8. Caster Fork
9. Drive Wheel
10. Rear Stabilizing Caster 6"
11. Motor Lock
12. Tilt/Lift (optional)
13. Height Adjustable Cantilever Armrest

**Models**

Zippie ZM-310 SC, BC

## ZIPPIE ZM-310

**Weight (lbs)**

Chair with Batteries  
SC -260, BC -235

Chair without Batteries  
SC -182, BC -157

**Drive Wheels**

13" Mag: Std. airless insert

**Joystick**

- Option - VR2 - Right or left handed, assembly, actuator control.
- Option - RNET - (LED,Color)
- Option Joystick Advanced - Color display, paddle switches, Infrared Output, programmable buttons, Stereo Jacks.

**Batteries**

(2 deep cycle batteries required to operate chair)

Standard - Group 22

**Battery Charger**

Off board 8 AMP

**Shroud Colors**

Red, Black, Blue, Silver, Copper, Green  
Apple, Yellow, Pearl Pink, Candy  
Purple, Matte Black, Midnight Blue,  
Pearl white, Pink, Camo, Grunge  
skulls, American Flag.

**Seats, Upholstery and Style**

Standard- BC & SC: A.S.A.P. II Seat Frame  
Sizes: 10" - 16" wide, 10" -19" deep

**Footrest:**

SC & BC: Standard- SA Swing away  
footrests w/heel loops  
Option-Foot platform

**Backrest**

SC & BC: Standard Canes Angle Adjust  
Option- 8° Bend, Semi Recline,  
Folding

**Casters front**

Standard- 7" solid

**Casters rear**

Standard- 6" solid

**Armrest**

SC & BC: Standard- Cantilever, height  
adjustable 14" arm pad  
Option- Locking, two-point arm,  
Dual post Arm, Single Post arm

**Suspension**

Standard- all wheel

All features may not be available with some chair setups or in conjunction with another chair feature. Please consult your supplier for more information. Your authorized supplier can also provide you with more information on accessories.

## A. CHOOSE THE RIGHT CHAIR & SAFETY OPTIONS

Sunrise provides a choice of many power wheelchair styles, sizes and adjustments to meet the needs of the user. However, final selection of a wheelchair rests solely with you and your health care professional. Choosing the best chair for you depends on such things as:

1. Your size, disability, strength, balance and coordination.
2. Your intended use, and your level of activity.
3. The types of hazards you must overcome in daily use (in areas where you are likely to use your chair).
4. The need for options for your safety and comfort (such as positioning belts or special seat systems).

**INTENDED USE:** The ZM-310 is a battery operated device with wheels that is intended for medical purposes to provide mobility to persons restricted to a sitting position.

## B. ADJUST CHAIR TO YOUR ABILITY

You need to work with your doctor, nurse or therapist, and your supplier, to fit this chair and adjust the controller settings for your level of function and ability.

## C. REVIEW THIS MANUAL OFTEN

Before using this chair you, and each person who may assist you, should read this entire Manual and make sure to follow all instructions. Review the warnings often, until they are second nature to you.

## D. WARNINGS

The word “WARNING” refers to a hazard or unsafe practice that may cause severe injury or death to you or to other persons. The “Warnings” are in four main sections, as follows:

1. **V — EMI**  
Here you will learn about electromagnetic interference and how it can affect your chair.
2. **VI — GENERAL WARNINGS**  
Here you will find a safety checklist and a summary of risks you need to be aware of before you ride this chair.
3. **VII — WARNINGS — COMPONENTS & OPTIONS**  
Here you will learn about your chair. Consult your supplier and your health care professional to help you choose the best set-up and options for your safety.
4. **X — BATTERIES**  
Here you will learn about battery and charger safety, and how to avoid injury.

Throughout this owner’s manual and on the wheelchair you will see the icons listed below to identify warnings and potential hazards.



### **WARNING!**

These warnings must be followed, failure to do so may cause personal injury or may damage the wheelchair.



### **ESD:**

Electrostatic Discharge can damage printed circuit boards.

## V. EMI (ELECTROMAGNETIC INTERFERENCE)



### **WARNING**

Heed all warnings to reduce the risk of unintended brake release or chair movement:

1. **Beware of the danger from hand-held transceivers. Never turn on or use a hand-held transceiver while power to your chair is on. Use extra care if you believe that such a device may be in use near your chair.**
2. **Be aware of nearby radio or TV stations, and avoid coming close to them.**
3. **If unintended movement occurs, turn your chair off as soon as it is safe to do so.**

### A. WHAT IS EMI?



### **WARNING**

1. EMI means: electromagnetic (EM) interference (I). EMI comes from radio wave sources such as radio transmitters and transceivers. (A “transceiver” is a device that both sends and receives radio wave signals).
2. There are a number of sources of intense EMI in your daily environment. Some of these are obvious and easy to avoid. Others are not, and you may not be able to avoid them.
3. Powered wheelchairs may be susceptible to electromagnetic interference (EMI) emitted from sources such as radio stations, TV stations, amateur radio (HAM) transmitters, two way radios, and cellular phones.
4. EMI can also be produced by conducted sources or electrostatic discharge (ESD).

### B. WHAT EFFECT CAN EMI HAVE?



### **WARNING**

1. EMI can cause your chair, without warning, to:
  - Release its brakes
  - Move by itself
  - Move in unintended directions
 If any of these occur, it could result in severe injury to you or others.
2. EMI can damage the control system of your chair. This could create a safety hazard, and lead to costly repairs.

### C. SOURCES OF EMI



### **WARNING**

The sources of EMI fall into three broad types:

#### 1. **Hand-Held Transceivers:**

The antenna is usually mounted directly on the unit. These include:

- Citizens band (CB) radios
- “Walkie-talkies”
- Security, fire and police radios
- Mobile phones
- Lap-top computers with phone or fax
- Other personal communication devices
- Electronic Article Surveillance Systems

**NOTE** – These devices can transmit signals while they are on, even if not in use.



**2. Medium-Range Mobile Transceivers:**

These include two-way radios used in police cars, fire trucks, ambulances and taxi cabs. The antenna is usually mounted on the outside of the vehicle.

**3. Long-Range Transceivers:**

These include commercial radio and TV broadcast antenna towers and amateur (HAM) radios.

**NOTE**– The following are not likely to cause EMI problems: Laptop computers (without phone or fax), Cordless phones, TV sets or AM/FM radios, CD or tape players.

**D. DISTANCE FROM THE SOURCE****⚠ WARNING**

Electro-magnetic energy rapidly becomes more intense as you get closer to the source. For this reason, EMI from hand-held devices is of special concern. (See Section C.1) A person using one of these devices can bring high levels of EM energy very close to your chair without you knowing it.

**E. IMMUNITY LEVEL****⚠ WARNING**

1. The level of EM is measured in volts per meter (V/m). Every power wheelchair can resist EMI up to a certain level. This is called its “immunity level”.
2. The higher the immunity level, the less the risk of EMI. It is believed that a 20 V/m immunity level will protect the power wheelchair user from the more common sources of radio waves.
3. The common configuration tested and found to be immune to at least 20 V/m is: Zippie ZM-310 power wheelchair with a right-hand mounted RNET remote joystick system, 18" seat width, 18" seat depth, dual post height adjustable arm-rests, fixed tapered legrests with one piece solid footplate, and Gp 22 gel cell batteries.
4. All After Market input device options, classified as breath controls, Proportional controls, and/or Switched controls that can be used with this powerchair, have an unknown effect on their immunity level to different types of EMI. They have not been specifically tested with the ZM-310 and RNET control system:
5. All modifications required for the common configuration to comply with ANSI/RESNA WC2/21 have been installed

**⚠ WARNING**

If there is any doubt that the specialty control input device is not immune to 20V/m, extra care should be taken around known sources of EMI.

**⚠ WARNING**

There is no way to know the effect on EMI if you add accessories or modify this chair. Any change to your chair may increase the risk of EMI. Parts not specifically tested or parts from other suppliers have unknown EMI properties

**F. REPORT ALL SUSPECTED EMI INCIDENTS****⚠ WARNING**

You should promptly report any unintended movement or brake release. Be sure to indicate whether there was a radio wave source near your chair at the time. Contact:

Sunrise Medical, Customer Service Department at (800) 333-4000.

**G. EMI FROM CHAIR****⚠ WARNING**

The chair itself can disturb the performance of electromagnetic fields such as emitted by alarm systems of shops.

**H. HEAD ARRAY SAFETY AND RFI****⚠ WARNING**

If you have a Head-array, the sensors used in the product have the potential to operate unintentionally if moisture or any substance that is electrically conductive is present in sufficient quantities.

Electro magnetic interference from electrical power lines and certain types of phones can cause the sensors to activate.

These sensors are capacitive in nature, and can generate an electronic field, which can be affected by liquids and/or a source of radio frequency Interference (RFI). Any material that is conductive has the potential to activate the Head-array unintentionally.

**Avoid** use under high power lines and around cell phones.

**Avoid** the use of a Head Array in rain or snow and protect against the potential of spilled liquids on the sensors.

**Avoid** Mobile phones and electronic devices in proximity to the array.

**Avoid** any source that has the potential of (RFI).

**Warn** the user of this chair that the chair controls have the potential of acting erratically or making sudden stops, if (RFI) is not avoided.

If any (RFI) causes erratic behavior, immediately cut off the power to the wheelchair, and wait until the interference passes.

**⚠ WARNING**

Heed all warnings in this section. If you fail to do so, a fall, tip-over or loss of control may occur and cause severe injury to you or others.

**A. NOTICE TO USER AND ATTENDANTS****⚠ WARNING****User:**

1. Before using this chair, you should be trained in its safe use by your health care professional.
2. Every wheelchair is different. Take the time to learn the feel of this chair before you begin riding.
3. Be aware that you must develop your own methods for the safe use of this chair that are best suited to your level of function and ability.
4. Have someone help you practice bending, reaching and transfers until you learn how to do them safely.
5. Never try a new maneuver on your own unless you are sure it is safe.
6. Get to know the areas where you plan to use your chair. Look for hazards and learn how to avoid them.
7. Always wear a positioning strap.
8. Do not use a wheelchair if the joystick does not spring back to the neutral position.
9. Do not use your wheelchair if the joystick boot is ripped or damaged.
10. Do not try to tip this wheelchair without an attendant present.
11. Do not allow additional riders, the chair may become unstable.

**User and Attendants:**

1. When transferring the user in or out of the wheelchair never use the footplate as a platform.
2. Do not lift this wheelchair by any parts that are removable, doing so may result in damage to the wheelchair or injury to the user.
3. Never try to stop or slow this wheelchair with the wheel locks (if applicable). Wheel locks are designed to prevent the chair from moving when stopped. They are not brakes.
4. Always keep your hands and body parts clear of moving parts to help prevent injuries.

**Attendants:****⚠ WARNING**

Make sure you heed all warnings and follow all instructions in each section of this manual. Warnings that apply to the user also apply to you.

1. Do not stand or sit on any portion of this wheelchair.
2. You need to work with the user, and the user's doctor, nurse or therapist, to develop safe methods best suited to your abilities and those of the user.
3. To manually push the chair you must release the motor brakes.
  - Do not engage or disengage motor brakes **unless** power to the chair is **off**.
  - Make sure you have full control over the chair when you release the motor brakes. When you do so the chair will not have brakes.
  - Make sure the chair is on level ground before you release the motor brakes.
4. Propel this chair by the push handles only. They provide secure points for you to hold the rear of the chair to prevent a fall or tip-over.
5. Check to make sure push handle grips will not rotate or slip off.

**B. WEIGHT LIMIT****⚠ WARNING**

1. The user plus items carried should never exceed the total weight capacity identified on your chair.
2. Never use this chair for weight training.
3. Exceeding the weight limit is likely to damage the seat, frame, or fasteners, and may cause severe injury to you or others from chair failure.
4. Exceeding the weight limit will void the warranty.

**C. CONTROLLER SETTINGS****⚠ WARNING**

Be aware that you may need to adjust the controller settings of your chair.

1. Check and adjust the settings every six to twelve months.
2. Consult your supplier to adjust the control settings immediately if you notice any change in your ability to:
  - Control the joystick
  - Hold your torso erect
  - Avoid running into objects.

**D. SAFETY CHECK-LIST****⚠ WARNING**

Before each use of this chair:

1. Make sure the chair operates smoothly. Check for noise, vibration, or a change in ease of use. (They may indicate low tire pressure, loose fasteners, or damage to your chair).
  - Inspect any problem. Your authorized dealer can help you find and correct the problem.
2. Make sure batteries are charged. Green lights on charge indicator will light up when charge is full. Yellow lights indicate battery charge level is getting low. Red lights indicate batteries are in immediate need of charging.

**E. CHANGES & ADJUSTMENTS****⚠ WARNING**

Never use non-Zippie parts to replace Zippie provided parts or make changes to your chair unless authorized by Sunrise. (Doing so will void the warranty and may create a safety hazard.)

**F. ACCESSORIES****⚠ WARNING**

Accessories designed by manufacturers other than Sunrise, not available through Sunrise order process have not been tested or approved for use by Sunrise.

1. If you modify or adjust this chair it may increase the risk of a fall or tip-over.
2. Modifications unauthorized by Sunrise constitutes remanufacturing of the wheelchair. This voids the warranty. The user then assumes all future liability for the wheelchair.

**G. WHEN SEATED IN A PARKED WHEELCHAIR****⚠ WARNING**

1. Always turn off all power to your chair when you are parked, even for a moment. This will prevent:
  - Accidental movement from contact with the joystick by you or others.
  - Unintended brake release or movement from EMI sources. (See Section V)
2. Make sure that persons who help you (for example, store clerks) are aware of the joystick and do not touch it. If they do, your chair may move suddenly when you do not expect it.

**H. ENVIRONMENTAL CONDITIONS****⚠ WARNING**

Your chair is not designed for use in a heavy rain storm, or in snowy or icy conditions.

1. Contact with water or excessive moisture can cause an electrical malfunction. The frame, motors and other chair parts are not water-tight and may rust or corrode from the inside.

**To avoid a chair failure:**

- Minimize exposure of your chair to rain or very wet conditions.
  - Never take your chair into a shower, tub, pool or sauna.
  - Do not use your chair in fresh or salt water (such as at the edge of a stream, lake, or ocean).
  - Make sure battery cover is secure.
  - Replace joystick boot if it becomes torn or cracked.
  - Make sure all electrical connections are secure.
  - Dry the chair as soon as you can if it gets wet, or if you use water to clean it.
2. Proceed slowly and use extra care if you must operate your chair on a wet or slick surface.
    - When in doubt, have someone help you.
    - Stop if one or both main wheels lose traction. If this occurs, you may lose control of your chair or fall.
    - Never operate your chair on a slope or ramp if there is snow, ice, water or oil film present.
  3. When not in use, keep your chair in a clean, dry place.

**⚠ WARNING**

Extra caution should be used when employing the disc switch or the proximity head array as control devices. These two devices are susceptible to malfunction when wet.

**I. TERRAIN****⚠ WARNING**

1. This chair will perform at optimum on firm, even surfaces such as concrete, asphalt and indoor flooring.
2. Although equipped with suspension, the performance can be substantially reduced on uneven surfaces and rough terrain.
3. Do not operate the chair on sand, loose gravel or soil. Doing so may damage wheels, bearings, axles, motors or loosen fasteners.

**J. STREET USE****⚠ WARNING**

1. This product is not intended for street use.
2. Avoid streets whenever possible.
3. Obey and follow all legal pedestrian pathways, and laws that apply to pedestrians.
4. Be alert to the danger of motor vehicles in parking lots, or if you must cross a road.

**⚠ WARNING****K. MOTOR VEHICLE SAFETY**

Identify whether your chair has been manufactured with the Transit Option installed.

**If your chair is not equipped with the Transit Option:** The wheelchair does not meet federal standards for seating while travelling in a motor vehicle.

1. NEVER let anyone sit in this chair while in a moving vehicle.
2. ALWAYS secure the rider with OEM (original equipment manufacturer) motor vehicle restraints. In an accident or sudden stop the rider may be thrown from the chair. Wheelchair seat belts will not prevent this, and further injury may result from the belts or straps.
3. NEVER transport this chair in the front seat of a vehicle. It may shift and interfere with the driver.
4. ALWAYS secure this chair so that it cannot roll or shift.
5. Do not use any chair that has been involved in a motor vehicle accident. It may have changed the structure of the chair, and damaged, or broken components. This could lead to a risk of injury or damage to your chair. If the wheelchair has been involved in an accident, discontinue use and contact your supplier for a thorough inspection.

**If your chair is equipped with the Transit Option:** See section VII-R: "Transit Option and use".

**L. CENTER OF BALANCE****⚠ WARNING**

The point where this chair will tip forward, back, or to the side depends on its center of balance and stability.

**The Center Of Balance Is Affected By:**

1. The seat height and seat angle.
2. A change in your body position, posture or weight distribution.
3. Using this chair on a ramp or slope.
4. The use of a back pack or other options, and the amount of added weight.
5. Drive wheel positioning.

**To Reduce The Risk Of A Fall Or Tip-Over:**

1. Whenever a condition exists that may change the center of balance, reduce speed, proceed cautiously.
2. When in doubt, always have someone help you.



**M. TRANSFERS****⚠ WARNING**

It is dangerous to transfer on your own. It requires good balance and agility. Be aware that there is a point during every transfer when the wheelchair seat is not below you. To prevent a fall:

1. Always turn off power before you transfer to or from your chair. If you fail to do so you may touch the joystick and cause your chair to move when you do not expect it.
2. Make sure motor brakes are engaged. This keeps the chair from moving when you transfer.
3. Work with your health care professional to learn safe methods for transfers.
  - Learn how to position your body and how to support yourself during a transfer.
  - Have someone help you until you are sure you can do a safe transfer on your own.
4. Move your chair as close as you can to the seat you are transferring to. If possible, use a transfer board.
5. Rotate the front casters until they are as far forward as possible.
6. Be careful of the footrests. If you can, remove or swing them out of the way.
  - As a standard rule, never stand on footrests when you transfer. Doing so may damage them or cause your chair to tip. If the footplate is in contact with the ground, it is possible to use the footplate for a transfer.
  - Make sure your feet do not “hang up” or get caught in the space between the footrests.
7. Make sure armrests do not interfere.
8. Transfer as far back onto the seat surface as you can. This will reduce the risk that you will miss the seat or fall.

**N. REACHING OR LEANING****⚠ WARNING**

Reaching or leaning affects the center of balance of your chair. If done improperly, a fall or tip-over is likely. When in doubt, ask for help or use a device to extend your reach.

**To Reduce the Risk of injury and/or Damage to the Chair:**

1. Never reach or lean if you must shift your weight sideways or rise up off the seat.
2. Never reach or lean if you must move forward in your seat to do so. Always keep your buttocks in contact with the backrest.
3. Never reach with both hands (you may not be able to catch yourself to prevent a fall if you lose your balance).
4. Never try to pick up an object from the floor by reaching down between your knees.
5. Never put pressure on the footrests while reaching.
6. Never reach or lean over the top of the seat back. This may damage the backrest and cause you to fall.

**⚠ WARNING****IF YOU MUST REACH OR LEAN, DO SO AT YOUR OWN RISK.****Remember to:**

1. Move your chair as close as you can to the object you wish to reach.
2. Rotate the front casters until they are as far forward as possible. This makes the chair more stable.

**NOTE—** To do this: Move your chair past the object you want to reach, then back up alongside it. Backing up will rotate the casters forward.

3. Turn off all power to your chair. If you fail to do so, you may touch the joystick and cause your chair to move when you do not expect it.

**O. DRESSING OR CHANGING CLOTHES****⚠ WARNING**

Be aware that your weight will shift if you dress or change clothes while seated in this chair. To make the chair more stable, rotate the front casters until they are in the **forward position**.

**P. OBSTACLES****⚠ WARNING**

Riding over curbs or obstacles can cause tipping and serious bodily harm. If you have any doubt that you can safely cross any curb or obstacle, **ALWAYS ASK FOR HELP**. Be aware of your riding skills and personal limitations. Develop new skills only with the help of a companion.

1. Be aware that thresholds are very dangerous. (Even a small change in height may stop a caster wheel and cause your chair to tip). You may need to:
  - Remove or cover threshold strips between rooms.
  - Install a ramp at entry or exit doors.
2. Keep your eyes moving when you ride; scan the area well ahead of your chair.
3. Make sure the floor areas where you use this chair are level and free of obstacles.

**Q. DRIVING IN REVERSE****⚠ WARNING**

Use extra care when you drive your chair in reverse. You may lose control or fall if one of the rear wheels hits an object.

1. Operate your chair slowly and at an even speed.
2. Stop often and check to make sure your path is clear of obstacles.

**R. RAMPS, SLOPES & SIDEHILLS****⚠ WARNING**

Your center of balance changes when you are on a slope.

**NOTE -** “Slope” includes a ramp or sidehill. Your chair is less stable when it is at an angle. Never use this chair on a slope unless you are sure it is safe. When in doubt, have someone help you.

**Beware Of:**

1. Steep slopes. Do Not use this chair on a slope steeper than 6%. (A 6% slope means: One foot in elevation for every ten feet of slope length).
2. Wet or slippery surfaces (such as when ice, snow, water or oil film is present). A loss of traction may cause a fall or tip-over.
3. A change in grade on a slope (or a lip, bump or depression). These may cause a fall or tip-over.
4. A drop-off at the bottom of a slope. (A drop-off of as small as 3/4 inch (19 mm) can stop a front caster and cause the chair to tip forward).

## S. TO REDUCE THE RISK OF A FALL, TIP-OVER OR LOSS OF CONTROL

### WARNING

1. Never use your chair on a slope unless you are sure you can do so without losing traction.
2. Always go as straight up and as straight down as you can.
  - Do not “cut the corner” on a slope or ramp.
  - Do not turn or change direction on a slope.
3. Always stay in the center of the ramp. Make sure ramp is wide enough that you are not at risk that a wheel may roll off the side.
4. Keep your chair moving at a slow, steady speed. Keep control over the chair at all times.
  - On a descent, do not let your chair accelerate beyond its normal speed.
  - If the chair picks up speed, center the joystick to slow down or stop.
  - If you stop, re-start slowly.

## T. RAMPS AT HOME & WORK

### WARNING

Before driving on a ramp, survey the condition of the ramp. On slippery ramps traction may be reduced causing your wheelchair to slide.

### WARNING

**NOTE**— Make sure ramps meet all Building Codes for your area.

1. For your safety, have a licensed contractor build or remodel the ramp to meet all standards.
2. The proper design will vary, depending on such things as: the length and height of the ramp; the need for an intermediate platform; landing size; doors, and the direction of swing, and; whether the ramp includes a turn or angle.

#### At A Minimum:

1. Open sides of ramp must have side rails to prevent your chair from going over the edge.
2. Slope must not be steeper than one inch in height for every one foot of slope length (approximately 10°).
3. Ramp surface must be even, and have a non-skid surface.
4. You may need to add a section at the top or bottom to avoid a lip or drop-off.
5. Ramp must be sturdy. Add bracing if needed, so ramp does not “bow” when you ride on it.

## U. WHEELCHAIR LIFTS

### WARNING

Wheelchair lifts are used in vans, buses, and buildings to help you move from one level to another.

1. Always turn **off** all power to your chair when you are on a lift. If you fail to do so, you may touch the joystick by accident and cause your chair to drive off the platform. (Be aware that a “roll-stop” at the end of the platform may not prevent this).
2. Make sure there is not a lip or drop-off at the top or bottom of the platform. These may cause a fall or tip-over. When in doubt, have someone help you.
3. Always position the user securely in the chair to help prevent falls while on a lift.
4. Avoid moving forward if a wheel is “hung up” on the lip of the ramp. Backup, reposition the caster for a more direct approach. And slowly try again.

## V. CURBS & SINGLE STEPS

### WARNING

1. It is recommended to climb and/or descend a curb, single step, or other obstacle that a ramp or curb cutout is always used.
2. If you must climb or descend a curb, single step, or other obstacle that is greater than 2.5", it is recommended to have a person assist you in doing so.
3. In no case should you try to climb a curb, single step, or other obstacle greater than 4" high.
4. If you must climb or descend a curb or step alone do so at your own risk using extreme care and use the following procedure:
  - Proceed slowly, at a steady speed
  - Go as straight up or down as you can over the obstacle. Never turn when trying to climb or descend an obstacle, doing so may result in a fall or tip-over.
5. Failure to follow the above procedures may cause:
  - A Fall or Tip Over
  - Damage to the frame, wheels, axles or other parts, or loose fasteners.

## W. STAIRS

### WARNING

Never use this chair to go up or down stairs, even with an attendant. Doing so is likely to cause a fall or tip-over.

## X. ESCALATORS

### WARNING

Never take this chair on an escalator, even with an attendant. Doing so is likely to cause a fall or tip-over.

**⚠ WARNING**

Note: If you use parts or make changes not authorized by Sunrise it may create a safety hazard and will void the Warranty.

**A. ARMRESTS****⚠ WARNING**

1. Armrests will not bear the weight of this chair.
2. Never lift this chair by its armrests. They may come loose or break.

**B. BATTERIES****⚠ WARNING**

1. Only **deep cycle sealed case** construction batteries should be used in this device.
2. Read all of section **X. Batteries** before attempting to change, or charge batteries.

**C. CUSHIONS AND SLING SEATS****⚠ WARNING**

1. Standard foam cushions and other body supports are not designed for the relief of pressure. Do not sit directly on a sling type surface.
2. If you suffer from pressure sores, or if you are at risk that they will occur, you may need a special seat system or a device to control your posture.
  - Consult your doctor, nurse or therapist to find out if you need such a device for your well-being.

**D. FASTENERS****⚠ WARNING**

Many of the screws, bolts and nuts on this chair are special high-strength fasteners. Use of improper fasteners may cause your chair to fail.

1. Only use fasteners provided by Sunrise.
2. If fasteners become loose, tighten them immediately.
3. Over- or under-tightened fasteners may fail or cause damage to chair parts.

**E. FOOTPLATE & FOOTRESTS****⚠ WARNING**

1. At the lowest point, footrests should be **at least 2 1/2 inches (65 mm)** off the ground. If set too **LOW**, they may “hang up” on obstacles you can expect to find in normal use. This may cause the chair to stop suddenly and tip forward.
2. To avoid a trip or fall when you transfer:
  - Make sure your feet do not “hang up” or get caught in the space between the footrests.
  - Avoid putting weight on the footrests, as the chair may tip forward.
  - Remove or swing the footrests out of the way, if possible.
3. The footrest should always be in the down position when operating the chair.
4. Never lift this chair by the footrests. Footrests detach and will not bear the weight of this chair. Lift this chair only by non-detachable parts of the main frame.

**F. MOTOR LOCKS****⚠ WARNING**

1. Do not engage or disengage motor locks **unless** power to the chair is **off**.

2. Be aware that the chair **will not have brakes** when motor locks are in the free-wheel position.
3. Make sure that the person pushing the chair has full control when motor locks are disengaged.
4. Make sure that the chair is on level ground when motor locks are disengaged.

**G. ON/OFF SWITCH****⚠ WARNING**

1. **Never** use the ON/OFF switch to stop the chair **except** in an emergency. This will result in an **abrupt** stop, and may cause you to fall.
2. To slow your chair to a stop, return the joystick to neutral.

**H. PNEUMATIC TIRES****⚠ WARNING**

Proper inflation extends the life of your tires and makes your chair easier to use.

1. Do not use this chair if any of the tires are under- or over-inflated. Check weekly for proper inflation level, as listed on the tire sidewall.
2. Low pressure in a tire may cause the chair to veer to one side and result in a loss of control.
3. An over-inflated tire may burst.
4. **Never** use a gas station air pump to inflate a tire. Such pumps provide air at **high volume**, and could cause the tire to burst. To prevent tire damage:
  - Use a hand pump (or **low volume** air pump) to inflate tires.
  - Use a tire gauge to check pressure.
5. Driving over sharp objects may cause damage to pneumatic tires and tubes.

**I. POSITIONING BELTS (Optional)****⚠ WARNING**

The positioning belt is predominately used to support your posture. It can also be used to limit slipping and/or sliding that you might experience when the chair is in motion. The positioning belt is not a transit rated safety belt and should not be used in the place of a seat belt while being transported in a motor vehicle. Improper use of Positioning belts may cause severe injury or death. If you use a positioning belt, be sure to follow the recommendations in this section:

1. Make sure the rider does not slide down in the wheelchair seat. If this occurs, the rider may suffer chest compression or suffocate due to pressure from the belts.
2. The belts must be snug, but must not be so tight that they interfere with breathing. You should be able to slide your open hand, flat, between the belt and the rider.
3. A pelvic wedge or a similar device can help keep the rider from sliding down in the seat. Consult with the rider's doctor, nurse or therapist to find out if the rider needs such a device.
4. Use positioning belts only with a rider who can cooperate. Make sure the rider can easily remove the belts in an emergency.
5. **NEVER** use positioning belts
  - a. As a patient restraint. A restraint requires a doctor's order.
  - b. On a rider who is comatose or agitated.
  - c. As a motor vehicle restraint. In an accident or sudden stop the rider may be thrown from the chair. Wheelchair seat belts will not prevent this, and further injury may result from the belts or straps.

If you fail to heed these warnings, damage to your chair, a fall, tip-over or loss of control may occur and cause severe injury to the rider or others.

**J. PUSH HANDLES****⚠ WARNING**

1. Push handles provide secure points for an attendant to propel and control the chair. This helps to prevent a fall or tip-over.
2. Check to make sure push handle grips will not rotate or slip off.

**K. SEATING SYSTEMS****⚠ WARNING**

1. Use of a seating system not approved by Sunrise may affect or interfere with other parts of the chair.
2. **Never** change the seating system of your chair unless you consult your supplier first.
3. Never raise your seating system to a height of more than 22" (measuring from the front of the seat pan to the floor) with all actuators in their home position.

**L. UPHOLSTERY FABRIC****⚠ WARNING**

1. Replace worn or torn fabric of the seat sling and seat back as soon as you can. If you fail to do so, the seat may fail and cause you to fall. Worn fabrics may increase the potential for a fire hazard.
2. Sling fabric will deteriorate with age and use. Look for fraying, thin spots, or stretching of fabric at rivet holes. Replace fabric as required.
3. Be aware that washing may reduce flame retardation qualities of the fabric.

**M. SUSPENSION**

No component of the chair, was made with natural rubber latex, including the Suspension system.

**N. WIRING****⚠ WARNING**

Never pull on cables directly. This can result in wires breaking inside the connector or harness. To remove a plug or connector, always grasp the plug or connector itself. (See section XI (H) for wiring diagram).

**O. ASSIGNABLE CONTROLS****⚠ WARNING**

It is possible to assign a function to an input control (buttons, jacks) of your wheelchair. If controls have been assigned to perform a dual or alternate function ensure you know what each control operates. Please contact your Authorize Dealer or the Quickie Technical Service Department if you do not receive this information. Failure to do so may result in damage and/or injury.

**P. POWER SEATING (SC & MPC)****⚠ WARNING****1. Operation**

- While driving this wheelchair in the reclined, elevated, or tilted position use caution.
- Do Not attempt to operate any power seating option while positioned on an incline.
- Do Not attempt to operate any power seating option while this wheelchair is in motion.
- Do not attempt to operate the lift or tilt power seating options around children.
- Through programming it is possible to reverse the direction of all powered seating functions, ensure you know which direction your seat is going to move before operating.

**2. Reduced Speed Driving (Creep)**

This power chair is designed to automatically reduce the maximum driving speed to a creep mode when certain power seating limits are reached.

**3. Pinch points**

Pinch points may occur when operating the powered seating options on this chair. Ensure all hands and body parts are clear of all power seating components that may result in pinch points before operating them.

**4. Tilting Power Base with Push Handles**

Do not attempt to tilt power wheelchairs by pulling down on the push handles. Power wheelchairs have heavy bases. As such, attempting to tilt a power wheelchair to traverse obstacles can damage components in the seating system and/or modular actuators.

**5. Remain Clear During Power Accessory Operation**

Please stay clear of any powered actuator while the component is in motion. Sunrise power mechanisms move over large ranges of travel. Users should be aware of their surroundings while components are in motion.

**6. Maximum User Weight**

Do not exceed the weight capacity for your specific chair/seating system configuration. Doing so could result in premature failure or injury.

**7. Latch Mode**

While operating any power seating function in latched mode use caution. In latch mode, powered seating will not stop until a reverse command is performed or the end of travel is met.

**Q. S.P.O.T. (Single Power Option Tilt)  
POWER ACCESSORY (SC only)****⚠ WARNING**

The powered S.P.O.T. accessory for this chair has a maximum user weight capacity of up to 165 lbs. Never exceed this capacity while operating the powered actuator.

**⚠ WARNING**

The powered S.P.O.T. should not be operated for more than three minutes of continuous use. Doing so may shorten the life of the powered S.P.O.T.

## R. TRANSIT OPTION AND USE

Refer also to sections VI-K: “Motor Vehicle Safety” for additional transit option and motor vehicle warnings.

### WARNING

Contact Sunrise Medical customer service (800-333-4000) with any questions about using this power wheelchair for seating in a motor vehicle, or if a Zm-310 is a candidate for the transit option.

Whenever possible, wheelchair occupants should transfer into the vehicle seat and use the OEM (Original Equipment Manufacturer) vehicle-installed restraint system.

It is important to note that the ZM-310 transit option has been designed for use by occupants that weigh more than 51lbs(23kg). Do not attempt to use this chair in a transit situation for an occupant that weighs less than 51 lbs(23kg), as they will not be restrained properly, and in the event of an accident, there is a risk of serious injury or death.

When travelling in a motor vehicle, use only Wheelchair Tie-down and Occupant Restraint Systems (WTORS) which meet the requirements of the SAE (Society of Automotive Engineers) J2249 Recommended Practice.

This wheelchair has been tested for seating in a motor vehicle with the factory-installed seating system only. This wheelchair must be in a forward facing position during travel in a motor vehicle.

This wheelchair is equipped with wheelchair-anchored pelvic belts. It has been dynamically tested to rely on wheelchair-anchored pelvic belts. If desired, vehicle-anchored pelvic belts may also be used. It is strongly recommended that the combination of both pelvic and upper-torso belt(s) be used to reduce the risk of injury if a sudden stop and/or collision were to occur.

To reduce the potential of injury to vehicle occupants, wheelchair-mounted accessories, including but not limited to IV poles, trays, respiratory equipment, backpacks, and other personal items should be removed from the wheelchair and secured separately. Postural supports, positioning devices, and/or strap(s) should not be relied on for occupant restraint. These items may be used in addition to the wheelchair anchored, or vehicle-anchored belts.

Backrests of wheelchairs with adjustable seat angles must not be tilted to more than 30°. Do not alter or substitute wheelchair frame parts, components, or seating systems.

A sudden stop and/or collision may structurally damage your wheelchair. Wheelchairs involved in such incidents should be replaced.

Spill proof batteries, such as “gel cells”, should be installed on wheelchairs that will experience travel in a motor vehicle.

### WARNING

**NOTE**– Only use the transit brackets included with Zippie ZM-310 for the purposes described in this manual.

## ABOUT TRANSPORT READY PACKAGES

The Zippie ZM-310 Transit System includes four factory-installed transport brackets and an optional wheelchair anchored pelvic belt. The Zippie ZM-310 has been crash-tested in accordance with ANSI-Resna WC Vol I Section 19 Frontal Impact Test requirements for wheelchairs with a 170 lb crash dummy. As of this date, the Department of Transportation has not approved any tie-down systems for transportation of a user while in a wheelchair, in a moving vehicle of any type.

It is Sunrise Medical's position that users of wheelchairs should be transferred into the vehicle seating when transport is necessary and that the restraints made available by the auto industry be used. Sunrise Medical does not recommend any wheelchair transportation systems

## COMPLIANCE INFORMATION

This wheelchair conforms to the requirements of the ANSI-Resna WC Vol I Section 19.

Minimum Turning Radius = 53cm (21")

Minimum Turn-around width = 109cm (43")

Mass of Tested Chair in Standard configuration = 135kg (298lbs)

This wheelchair has been dynamically tested in a forward-facing mode with a specified crash test dummy, restrained by both pelvic and upper-torso belts in accordance with ANSI-Resna WC Vol I Section 19. Both pelvic and upper-torso belts should be used to reduce the possibility of head and chest impacts with vehicle components in the event of a sudden stop and/or collision.

## SECURING THE WHEELCHAIR TO THE VEHICLE

(See Figures 1 & 2 below)

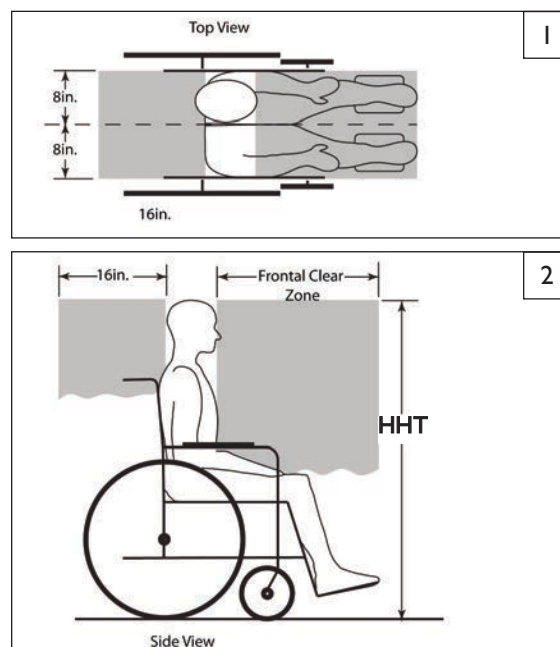
### WARNING

This wheelchair must be in a **forward facing position** during travel in a motor vehicle. The recommended clear zones for wheelchair seated occupants restrained by both pelvic and upper-torso belt(s) and only by a pelvic belt are shown in the diagrams and described below. Frontal Clear Zones (FCZ) need to be larger when upper torso belt(s) are not used.

The Rear Clear Zone of 16in is measured from the rearmost point on an occupant's head.

The Frontal Clear zone is measured from the front most point of an occupant's head and is 26-inches with pelvic and upper-torso belt(s) and 37 inches with only a pelvic belt. The frontal clear zone may not be achievable for wheelchair- seated drivers.

The estimated seated height (HHT) from the ground or floor to the top of the wheelchair-seated occupant's head ranges from approximately 47 inches for a small adult female to about 61 inches for a tall adult male.





**SECUREMENT POINTS** 3

Rear securement points(A), front securement points(B), Pelvic Belt Securement point(C)

**SECURING THE WHEELCHAIR**

This wheelchair is to be used only with Wheelchair Tie-down and Occupant Restraint Systems (WTORS) that have been installed in accordance with the manufacturer's instructions and SAE J2249.

**NOTE**—A copy of SAE J2249 Wheelchair Tie-down and Occupant Restraint Systems (WTORS) for use in Motor Vehicles can be obtained from:

SAE International  
400 Commonwealth Drive.  
Warrendale, PA. 15096-0001  
(877) 606-7232 or (724) 776-4970

Attach WTORS to the tie-down brackets in accordance with the manufacturer's instructions and SAE J2249.

**SECURING THE OCCUPANT:****WHEELCHAIR-ANCHORED BELTS** 3 4**⚠ WARNING**

Only use a pelvic belt system that meets the requirements of ANSI-Resna WC Vol I Section I9 and SAE J2249, and has been specified to work in conjunction with the Zippie ZM-310 transit system.

**I. Installation**

- a. Install the pelvic belt (D) onto the pelvic belt securement point anchored to the seating frame of the Zippie ZM-310. Using a 10mm Hex key, torque the screw to 144in-lbs securing the pelvic belt to the mounting anchor (E).
- b. Repeat step I for the opposite side.

**VEHICLE-ANCHORED BELTS** 4 5**⚠ WARNING**

This wheelchair has an overall rating of "A" with regard to accommodating the use and fit of vehicle-anchored belts. This rating is scored as follows: A = Excellent, B = Good, C = Fair, D = poor.

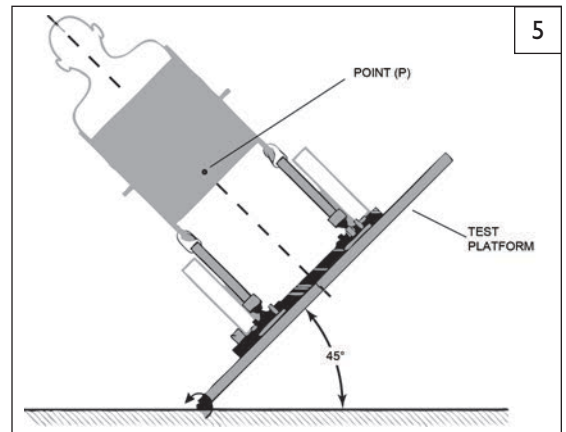
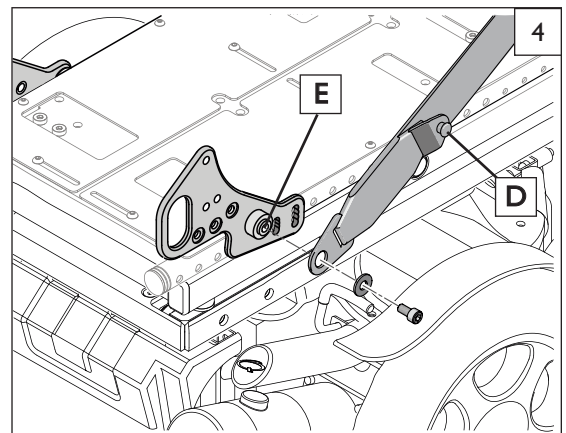
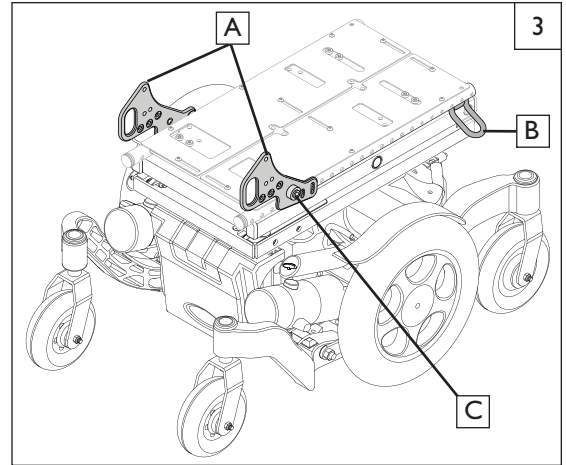
The test for Lateral Stability Displacement for Point (P) is shown in the figure at right. The average test result for point (P) is:

- Zippie ZM-310 - 0.547inches (13.9mm)

**NOTE**—Figure 5 shows the rear view of the wheelchair and human surrogate secured on test platform and tilted to 45°.

**SEATING SYSTEM** 5**⚠ WARNING**

This wheelchair has been tested for seating in a motor vehicle with the factory installed seating system only. Ensure that the factory installed seating system is secured to the wheelchair frame before operation. Refer to the seating system owner's manual for further information.



## POSITIONING BELTS 6 7 8

**⚠ WARNING**

The angle of the pelvic belt should be within the preferred zone of 45 to 75 degrees to the horizontal or within the optional zone of 30 to 45 degrees to the horizontal. 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. Steeper belt angles also reduce the tendency for upper-torso belts to pull the pelvic belt onto the abdomen during a frontal impact loading.

**I. Proper Installation**

- The pelvic belt should be worn low across the front of the pelvis.
- Position the upper torso belts over the shoulders.
- The belt(s) should not be held away from the body by the wheelchair components or parts, including but not limited to the armrests or wheels.
- Ensure the belt(s) are not twisted.
- Adjust belts as firmly as possible being mindful of user comfort
- Place the upper-torso belt across the middle of the shoulder and the center of the chest, and connect to the pelvic belt near the hip of the power chair occupant.
- If an Upper torso belt is in use, the anchor point(A) should be above and behind the occupant to ensure the occupant is properly restrained during transport.

**GENERAL USE WARNINGS****⚠ WARNING**

If the total weight of the power chair exceeds 275lbs(125Kg), it is recommended that two additional ANSI/RESNA WC/Vol.4, Section 18/ISO 10542 compliant rear securement straps be used to anchor the power chair during motor vehicle transport. For power chairs that exceed the weight threshold mentioned above, It is further recommended that the vehicle used for transport have a gross vehicle weight greater than 8800lbs(4000Kg) if the option exists.

**⚠ WARNING**

The buckle of the belt restraint system should not be located near any item that may come in contact with the buckle release button in the event of a vehicle accident or collision.

**⚠ WARNING**

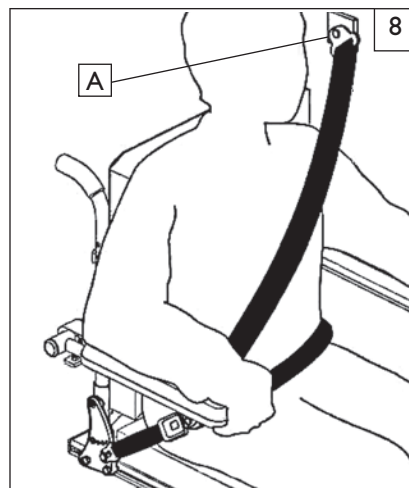
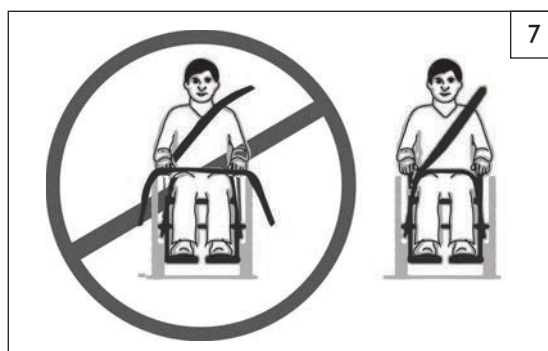
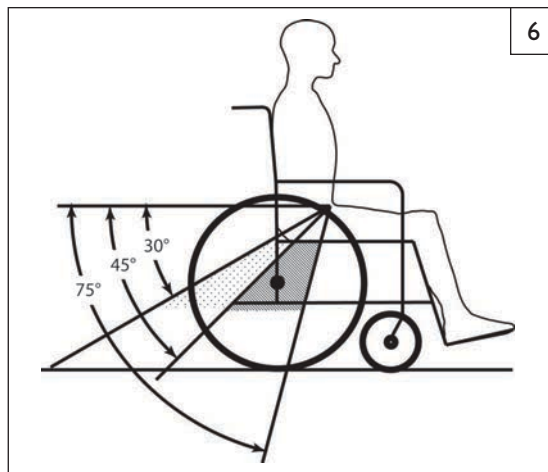
If a recline angle is required during transport, the Power chair seat/back should be positioned at an angle of no more than 30° to the vertical or the occupant is at risk of injury from sliding under the restraint in the event of an accident or collision while in the motor vehicle.

**⚠ WARNING**

Visually inspect all WTORS equipment at least once per month, and have worn or broken components replaced immediately.

**⚠ WARNING**

Interior components that can't be removed from the clear zones should be padded with material that complies with FMVSS201.

**⚠ WARNING**

Although postural supports and belts may be used in a moving vehicle in addition to the occupant belt restraint system, they should not be relied upon to replace occupant restraints that have been designed and tested for the purpose of securing an occupant during a motor vehicle collision or accident. Any postural supports that can be used during transit, must be positioned so that they do not interfere with the clear path for proper transit securement belt restraint.

**⚠ WARNING**

The owner and/or Caregiver for the use of this product, is responsible for making sure that it has been setup and adjusted by a trained service professional under the advice of a Healthcare Professional. The chair may require periodic maintenance or certain in-use adjustments that may be performed by the owner or caregiver.

**A. INTRODUCTION****⚠ WARNING**

1. Your chair needs regular maintenance for peak performance and to avoid injury from chair failure, damage or premature wear.
2. Inspect and maintain this chair per the Safety Checklist.
3. If you detect a problem, make sure to service or repair the chair before use.
4. At least once a year, have a complete safety check and service of your chair performed by a supplier.

**B. CLEANING****1. Paint Finish:**

- Clean the paint finish with mild soapy water monthly.
- Protect the paint with a coat of non-abrasive auto wax every three months.

**2. Motors:**

- Clean around motor area weekly with a slightly damp (not wet) cloth.
- Wipe off or blow away any fluff, dust, or dirt on or around the motors.

**NOTE**— You do not need to grease or oil the chair.

**3. Upholstery:**

- Hand-wash only as needed. Machine washing may damage fabric.
- Drip-dry only. Heat from a dryer may damage fabric.

**NOTE**— Washing the fabric may decrease fire retardant properties.

**4. Joystick:**

- Use a cloth that has been slightly dampened with diluted detergent. to clean the joystick and boot.
- LCD Screen can be cleaned with a soft, lint free, dry cloth.

**NOTE**— NEVER use any type of window cleaner, scouring powder, or any cleanser with solvents such as alcohol, benzene, ammonia, or paint thinner. Never use abrasive pads or paper towels.

**C. STORAGE TIPS**

1. Store your chair in a clean, dry area. If you fail to do so, parts may rust or corrode.
2. Before using your chair, make sure it is in proper working order. Inspect and service all items on the "Maintenance Chart".
3. If you store this chair for more than three months, have it inspected by a supplier before use.
4. Use petroleum jelly to re-grease the terminals after connecting cable to battery. (Completely cover the terminal nut and bolt, cable clip and any exposed cable with jelly).

**D. TIRE PRESSURE****⚠ WARNING**

Residual air pressure in tires can cause severe injury. Make sure you release all air in tire before attempting to service or have your tires repaired.

**I. Drive Wheels:**

- a. It is important to keep the correct air pressure in your tires at all times. You can find the correct pressure in Psi, or Kilopascals on the sidewall of your tire.
- b. Remove the air stem cap.
- c. Inflate the tire to the proper pressure level (listed on the tire sidewall)

**E. MOTOR BRUSHES**

Check the motor brushes every four (4) months for wear. The brushes should be clean and shiny. Replace worn or blackened brushes

**F. DISPOSING OF BATTERIES****⚠ WARNING**

1. All batteries once they have reached the end of their useful life are deemed to be hazardous waste.
2. For further information on handling and recycling contact your local recycling authority.
3. Always dispose of product through a recognized agent.

**G. ORDERING PARTS**

When you order parts, provide the following:

1. Model of chair
2. Serial number of chair
3. Left hand or right hand control
4. Part number, description and quantity of parts you need.
5. State reason for replacement.

**H. SAFETY CHECKLIST**

You should check the items on this chart at the indicated intervals. If any of the items are loose, worn, bent or distorted, immediately have them checked and/or repaired by your Authorized Dealer. Frequent maintenance and servicing will improve performance, extend wheelchair life, and help prevent injuries.

**NOTE** - The user or caregiver should perform these weekly and monthly checks to maintain safety of the chair. If an item is not working properly, please contact your authorized dealer.

	Daily	Weekly	Monthly	Quarterly	Annually
<b>SAFETY AND FUNCTION CHECK</b>					
Charge Batteries	<input checked="" type="checkbox"/>				
Check tires for proper inflation level		<input checked="" type="checkbox"/>			
Check plugs and connectors for proper connections			<input checked="" type="checkbox"/>		
Check all moving parts for wear				<input checked="" type="checkbox"/>	
Visually check all nuts, bolts and fasteners for looseness or wear				<input checked="" type="checkbox"/>	
Inspect upholstery for wear				<input checked="" type="checkbox"/>	
Service by authorized supplier					<input checked="" type="checkbox"/>

## I. FOLDING BACKREST 9

Zippie ZM-310 wheelchairs are shipped with backrest in folded position. (optional)

### 1. Upright Positioning

- Lift backrest to upright position so that latch handles (A) lock into place.
- Backrest is ready for use.

### 2. Folding Backrest

- Lift and turn backrest latch handles (A) inward or outward.
- Fold backrest forward.

## ⚠ WARNING

Backrest latches must be locked into place before operating wheelchair.

## J. MANUAL RECLINE OPERATION 10

The ASAP II seating system has two manual recline options.

### 1. Manual operation with wrench

- Using a 16mm socket wrench at point (B) Rotate clockwise to recline, and counter-clockwise to return the back to an upright position.
- Backrest is ready for use.

### 2. Manual operation with recline knob

- Using the manual recline knob (C) on the side of the chair, rotate clockwise to recline, and counter-clockwise to return the back to an upright position

## K. SWING-IN/OUT FOOTRESTS 11

Swing-in-Swing-out Hangers and Footrests are available in (80° & 90°)

### 1. Installation

- From the side, place the pivot (F) into the top of the frame tube which guides the hanger into the correct alignment with the locking plate (E) on front frame tube.
- Rotate the hanger to the front until it locks into place on locking plate.

### 2. Removal

- To remove footrest, release latch (D) by pulling lever upward or pushing lever downward.
- Rotate footrest inward or outward and lift it out of the front frame tube.

## L. ELEVATING LEGREST (Optional) 12

### 1. Installation

To install or remove Elevating Legrest (ELR) see instructions for Swing-away Footrest installation.

### 2. Adjustment

- To raise legrest, lift to desired position. Legrest will automatically lock in place.
- To lower legrest, while seated in chair, first lift slightly then press release lever (G) down and lower legrest to desired position.

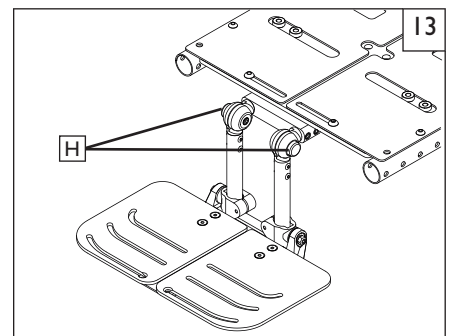
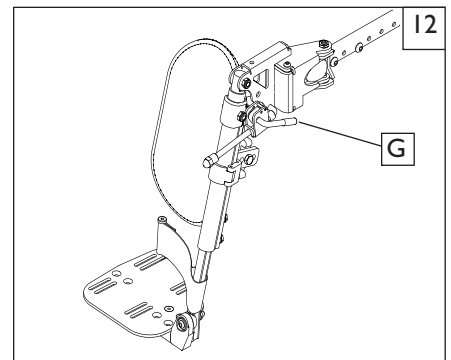
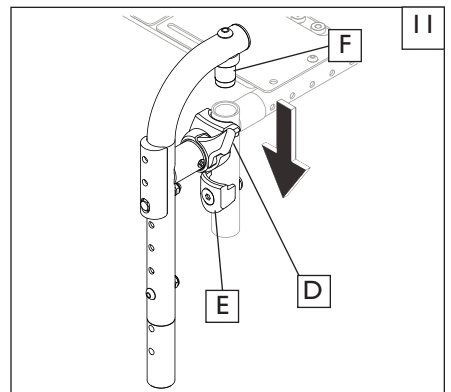
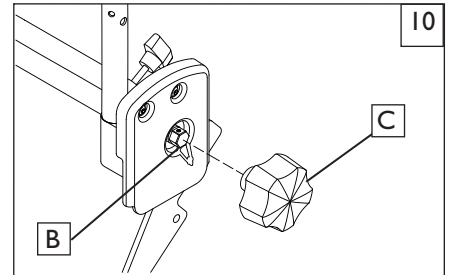
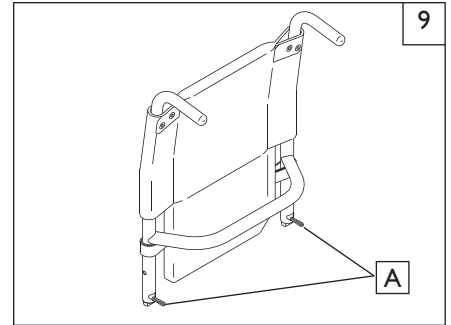
## M. ANGLE ADJUSTABLE CENTER MOUNT FOOTREST 13

### 1. Quick Independent angle adjustment

- Depress the button(H) and angle adjust the footplates as an assembly or independently of each other.

### 2. Adjustment

- To raise legrest, lift to desired position. Legrest will automatically lock in place.
- To lower legrest, while seated in chair, first lift slightly then press the button (H) and lower legrest to desired position.



**N. DUAL-POST FIXED HEIGHT STANDARD AND DUAL-POST****HEIGHT ADJUSTABLE ARMRESTS (Optional) 14**

The dual-post flip-back armrest can be either a flip-back or removable armrest.

**1. Installing Armrest**

- Insert front and rear posts into armrest receivers.
- Engage levers (A and B) to secure armrest.

**2. Flip-back Operation**

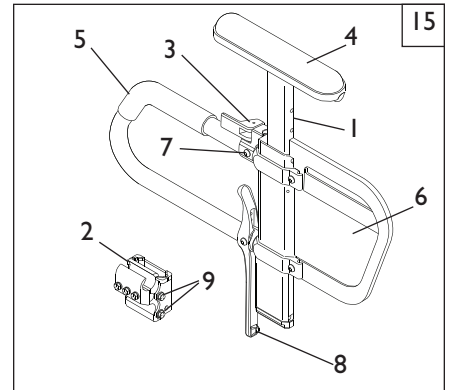
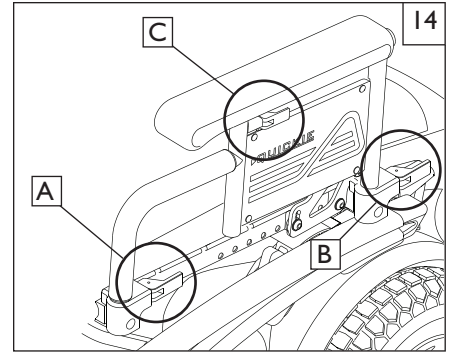
- Disengage lever (A) so front post is able to come free.
- Armrest now has the ability to be flipped back without removal.

**3. Removal**

- Disengage levers (A and B) so front and rear posts are able to come free.
- Armrest can now be easily removed for transferring.

**4. Height-Adjustment (option)**

- Release the upper securing lever (C).
- Set at desired height
- Return securing lever to locked position.
- Move armrest up or down to allow armrest to snap into place

**Height-Adjustable Armrest Key**

- Inner Arm Post
- Receiver
- Release Lever, Locked Position
- Armrest Pad
- Transfer Bar
- Side Panel
- Tension Adjustment Set Screw
- Armrest release lever
- Receiver Adjustment Bolts

**O. SINGLE POST HEIGHT-ADJUSTABLE ARMRESTS (Optional) 15****1. Installation**

- Slide the outer armpost into the receiver mounted to the wheel chair frame.
- The armrest will automatically lock into place.

**2. Height Adjustment**

- Rotate release lever to stop.
- Slide armrest pad up or down to desired height.
- Return lever to locked position.
- Push arm pad until upper armpost locks firmly into place.

**3. Removal**

- Press on the release lever and remove the armrest.

**4. Replacing Armrest**

- Slide armrest back into receiver.
- Return release lever to locked position against armpost.

**P. RETRACTABLE, SWING-AWAY AND MIDLINE****JOYSTICK MOUNTS 16 17**

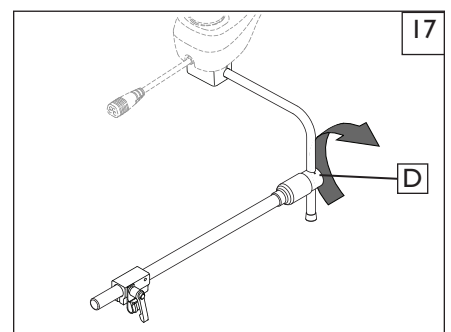
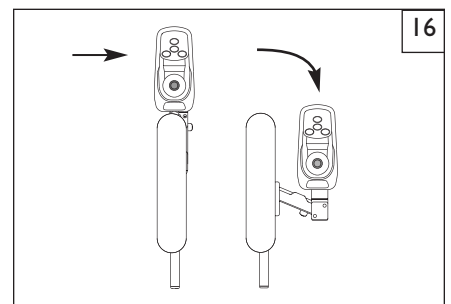
The joystick or Enhanced Display is mounted with a mechanism that allows the joystick to be locked in a forward or retracted position.

**Retractable and Swing-away**

- To retract the joystick, push outward on the inside of joystick.
- Push the joystick away from the front of the armrest until it locks into the swing-away position.
- To return to forward position, push the front of the joystick mount forward until it locks into place.

**Rotating the Midline Mount.**

- Push in on the release button (D) at the end of the joystick arm.
- The Joystick and midline arm should rotate out of the way.
- To return to midline position, repeat step (a) and rotate the joystick mount back to its original position until it locks into place.



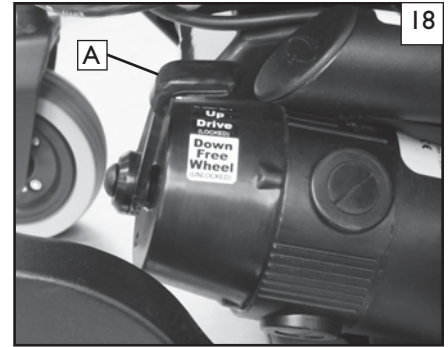


**Q. MOTOR LOCK** 18

Disengage the Motor Lock when you need to manually push the chair. (For example, in an emergency, or if batteries fail).

**⚠ WARNING**

1. Do not disengage Motor Lock unless chair power is off.
  2. With either one or both locks released, the chair will not operate and the battery charge indicator will flash 9 bars rapidly (if power to the chair is on.)
  3. Be aware that the chair will not have brakes in the free-wheel position.
  4. Make sure that the person pushing the chair has full control when Motor Lock lever is disengaged.
1. **Disengage the Motor Lock to push the chair manually**
    - a. The Motor Lock lever (A) is attached to the rear section of the motors located towards the back of the chair.
    - b. Push the Motor Lock lever down to disengage.
  2. **Engage the Motor Lock to drive the chair**
    - a. The Motor Lock (A) is attached to the upper rear section of the motors located at the back of the chair.
    - b. Pull the lever up to engage the Motor Lock.

**R. BATTERY REMOVAL** 19

1. **To remove the batteries before transporting or servicing:**
  - a. Carefully flip back the seat (see Section XI Q. "Seat removal")
  - b. Remove the shroud (see Section XI E. "Shroud removal") .
  - c. Unplug the main power connect (B) (Fig. 19)
  - d. Lift the batteries out of the frame using the battery strap as a lifting handle.
2. **Battery installation**
  - See section X. (Batteries) for installation

**⚠ WARNING**

Batteries may weigh up to 55 lbs. Care must be taken to avoid injury when lifting up on battery straps.

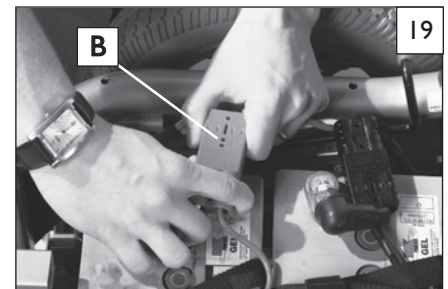
**S. CHECK-OUT**

Once the wheelchair is assembled and adjusted, it should roll smoothly and easily. All accessories should be checked to make sure they are also performing smoothly. After the wheelchair has been set-up, be sure that the chair performs to your specified operational settings.

**If the chair does not perform the way you expect it to, (according to specifications), turn your wheelchair OFF immediately and contact your authorized supplier to re-program operational settings using the RNET operating guide.**

If you have any problems, follow this Procedure:

- a. Review the Set-up, Adjustment, and use section and the Operating Guide to make sure the chair was properly prepared.
- b. If your problem persists, contact your authorized supplier. If you still have a problem after contacting your authorized supplier, contact Sunrise Medical Customer service. See the introduction page for details of how to contact the people who can help you.



**Profiles and modes explained:** The operation of the RNET system is based around the concept of Profiles and Modes.

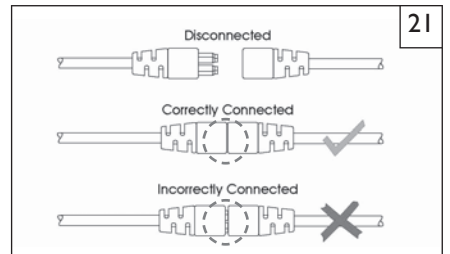
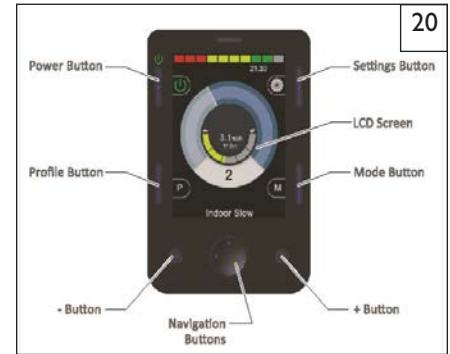
A Profile is a collection of programmable parameters that affect the operation and performance of the wheelchair. It is typical to have 5 Profiles, each set-up to give a different driving performance. For example, Profile 1 may have very slow settings for speeds and accelerations, while Profiles 2 through to 5 would have progressively faster settings. In this way, the user can change the performance of the wheelchair by selecting the appropriate Profile with the Profile Button on the JSM. Although Profiles are used mainly to change driving performance, they can also contain parameters for other functions, such as seating control.

A Mode reflects the actual operation that occurs as a result of a joystick command. Typical examples are Drive Mode, Seating Control Mode and Bluetooth Mode. The user can select the required Mode with the Mode Button on the JSM. Note, it will only be possible to select a Mode if there is a Module that will support that Mode connected into the system. For example, if there is no Mouse Module connected, then the user will not be able to select that Mode.

## A. CONTROLS 20

### Omni2 Input Display

is a universal specialty controls interface that accepts signals from many different types of SIDs and translates them into commands compatible with the PG Drives Technology RNET control system.



## B. CONNECTORS 21 22

### Mating Connectors

To connect the communication cables (A):

Holding the connector housing, firmly push the connector into its mate until you can no longer see the yellow plastic. The connectors are secured using a friction system.

To disconnect the communication cables:

Holding the connector housing firmly, pull the connectors apart.

**NOTE-** Do not hold or pull on the cable. Always grip the connector when connecting and disconnecting.

When the control system is first switched on after a connection, or system component change, the timer will be displayed while the system checks itself. Then the re-start icon will be displayed. Switch the control system off and on again to operate,

## C. R-NET JOYSTICKS 23



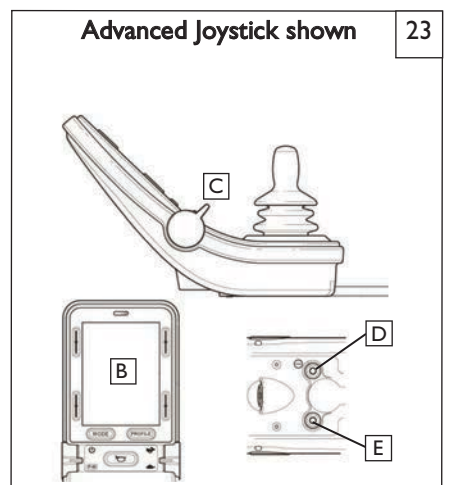
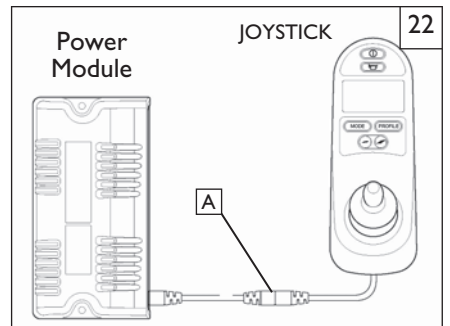
**Controls:** LED, Color Display, and Advanced Joystick

**Joystick key:** LCD Screen (B), Paddle Switch (Left and Right) (D), External On/Off Switch Jack (E), External Profile Jack (C).



### Cleaning the LCD screen (B)

1. **ALWAYS** use a soft, clean, lint free, dry cloth
2. To clean fingerprints and greasy smudges off of your LCD screen use a screen cleaning solution that is designed for LCD screens (Non-ammonia based). Put a small amount of the solution on a clean, lint free, dry cloth and rub the screen gently.
3. **NEVER** use any type of windex cleaner, soap, scouring powder, or any cleanser with solvents such as alcohol, benzene, ammonia, or paint thinner.
4. **NEVER** use abrasive pads or paper towels. If you do, you can scratch the screen or strip the anti-glare coating off of the screen and cause permanent damage to the joystick screen.



## D. JOYSTICK BUTTONS AND CONTROLS 24 25 26

### Battery Indicator A

This displays the charge available in the battery and alerts the user when the charge level is low.

- Steady: This indicates that all is well
- Flashing Slowly: The control system is functioning correctly, but you should charge the battery as soon as possible.
- Stepping Up: The wheelchair batteries are being charged. You will not be able to drive the wheelchair until the charger is disconnected and you have switched the control system off and on again.
- If the battery gauge shows red, yellow and green, the batteries are charged (bars 1 - 10).
- If the battery gauge shows just red and yellow, then you should charge the batteries as soon as you can (bars 1 - 7).
- If the gauge shows red, then you should charge the batteries immediately (bars 1 - 3).

### On/Off Button B

The on/off button applies power to the control system electronics, which in turn supply power to the wheelchair's motors. Do not use the on/off button to stop the wheelchair.

### Horn Button C

The horn will sound while this button is depressed.

### Actuator Indicator D

This LED set displays which actuator channel is currently being controlled when the control system is in Actuator Mode. Actuator selection and operation is achieved using the joystick.

- Motions to the LEFT or RIGHT select different actuator channels.
- Motions FORWARD and BACKWARD move the actuator(s) selected.

### Mode Button E F

The Mode button allows the user to navigate through the available operating modes for the control system. The available modes are dependent on programming and the range of auxiliary output devices connected to the control system.

### Maximum Speed/Profile Indicator G

This is a gauge that shows the maximum speed or profile setting of the wheelchair. There are five speed/profile settings— step 1 is the lowest speed and step 5 is the highest.

- Speed level active is indicated on display by a series of five lights. One light indicates slowest level currently active, while five lights indicates highest level currently active.
- Drive mode is indicated by a single light. The first light indicates Drive Mode 1; the second light indicates Mode 2, and so on.

### Speed Increase / Decrease Button H

These buttons Increase or decrease the maximum speed setting. If the control system is programmed for drive profile operation, the buttons select a lower or higher drive profile.

### Screen Side buttons I

These buttons operate lighting functions: Hazards, lights, left and right indicator. Once the function is activated, the icon will appear on the screen.

- If no lighting system is fitted, the buttons will be inactive.
- In all instances, the top left button, when held for a short time, will open the settings menu.

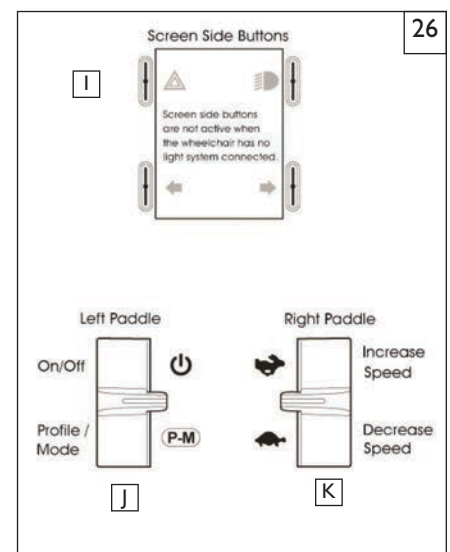
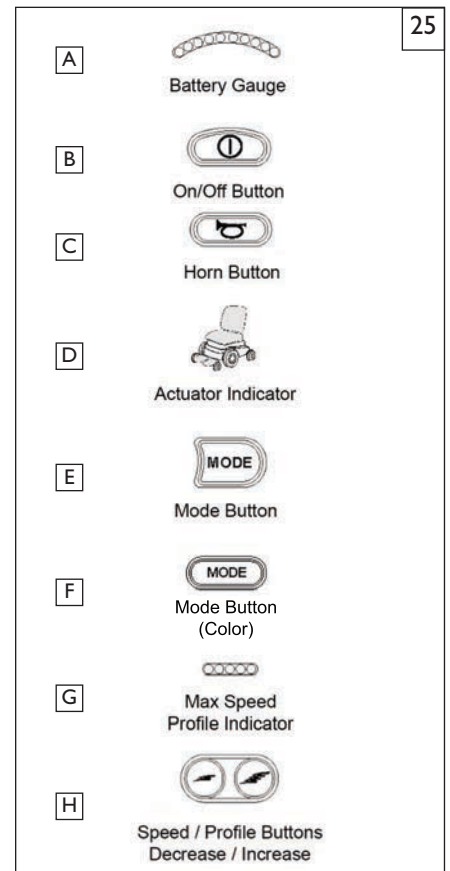
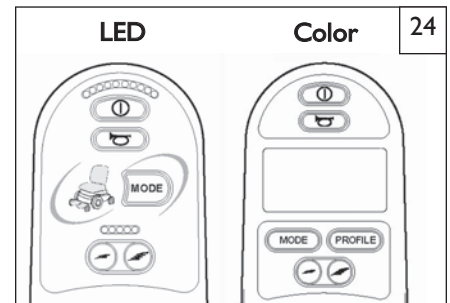
### Left Paddle switch J

Power On/Off, (Do not use this to stop the wheelchair)

Profile/Mode: Allows the user to navigate thru the available drive profiles and modes.

### Right Paddle switch K

This button increases or decreases the maximum speed setting. A momentary screen may be displayed when the paddle is operated. Depending on the programming, the paddle switch can act as a momentary speed control, or as a continuous speed control.



**E. LCD SCREEN (color and advanced)** <sup>27</sup>

This section covers those joystick modules that are fitted with a color LCD screen. The color LCD screen is split into three areas of information. The Top Bar, the Text Bar and the Main Screen Area.

**TOP BAR (A)** <sup>28</sup>**Battery Indicator:**

Displays the charge available in the battery and alerts the user when the charge level is low.

- **Steady:** Indicates that all is well.
- **Flashing Slowly:** The control system is functioning correctly, but you should charge the battery as soon as possible.
- **Stepping Up:** The wheelchair batteries are being charged. You will not be able to drive the wheelchair until the charger is disconnected and you have switched the control system off and on again.
- If the battery gauge shows red, yellow and green, the batteries are charged (bars 1-10).
- If the battery gauge shows just red and yellow, then you should charge the batteries as soon as you can (bars 1-7).
- If the battery gauge shows just red, then you should charge the batteries immediately (bars 1-3).

**MAIN DRIVE SCREEN (B) (color and advanced)****Profile Name** <sup>29</sup>

A text string that displays the name of the currently selected profile.

**Clock** <sup>30</sup>

Displays the current time in a numeric format.

**Color Joystick Speed Display** <sup>31</sup>

Gives a proportional display of the wheelchair's speed.

**Maximum Speed Indicator** <sup>32</sup>

Displays the current maximum speed setting.

**Digital Speed Display** <sup>33</sup>

Displays the actual speed of the wheelchair derived from the motors.

**Advanced Joystick Speed Display** <sup>34</sup>

Gives a proportional display of the wheelchair's speed.

**Odometer** <sup>35</sup>

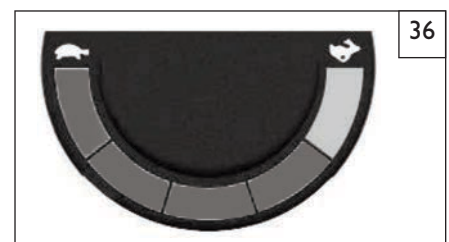
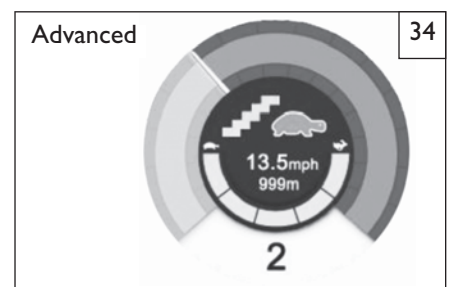
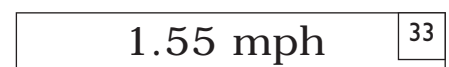
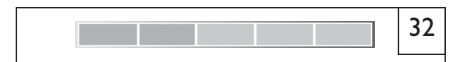
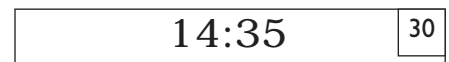
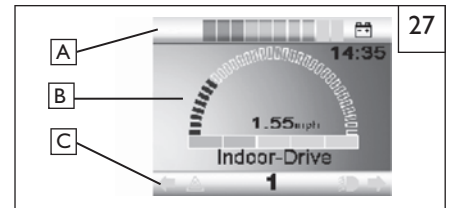
Displays the distance driven by the wheelchair. The display can show either the total distance or the trip distance, in miles or kilometers. The Settings Menu contains an option that sets whether the trip or total distance is displayed, as well as a facility to reset the trip distance. If Latched operation is active, then that symbol will take priority over the odometer.

**Advanced Joystick Max speed indicator** <sup>36</sup>

Displays the current maximum speed setting.

**TEXT BAR (C) (color Joystick)****Current Profile** <sup>27</sup>

The currently selected profile is shown in numeric form or may be displayed as text. Temperature warnings may also be displayed on this bar.



**IMPORTANT ICONS AND MESSAGES (color and advanced)****Latched** <sup>37</sup>

When the control system is operating in a Latched condition this symbol will be displayed.

**Inhibit** <sup>38</sup>

If the speed of the wheelchair is being limited; for example, by a tilted seat, then this orange symbol will be displayed. If the wheelchair is being inhibited from driving, then this red symbol will be flashing.

**MODE SCREENS:****Actuator (Seating) Mode** <sup>39</sup>

Displays the sections of the chair currently selected for movement, the name given to the selection and a direction arrow showing what sort of movement is available.

**Speed Adjust** <sup>40</sup>

When Speed Adjust Mode is entered, this screen will be displayed momentarily.

**Color Joystick Message Window** <sup>41</sup>

The RNET displays warning icons and informational messages, in a dedicated message window.

**Advanced Joystick Message Window** <sup>42</sup>

The RNET displays warning icons and informational messages, in a dedicated message window.

**Restart** <sup>43</sup>

When the control system requires a reboot; for example, after a module re-configuration, this green symbol will be flashed.

**E-Stop** <sup>44</sup>

If the External Profile Switch is activated during drive, or actuator operation, this red symbol will be displayed.

**Joystick Displaced** <sup>45</sup>

If you operate the Joystick before or just after you switch the control system on, the screen will flash the joystick displaced screen.

You must release and center the joystick to resume normal operation. If you do not release the joystick within five seconds the wheelchair will not be able to move, even if you release the joystick and operate it again. The screen will display a diagnostic screen at this time. You can reset this condition by switching the control system off and on again.

**Control System Locked** <sup>46</sup>

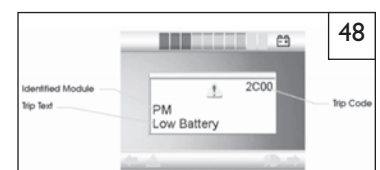
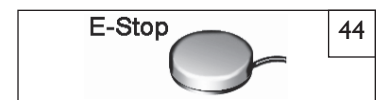
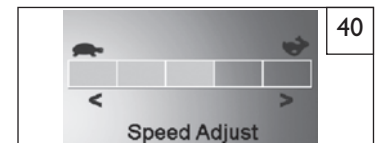
The control system can be locked in one of two ways. Either using a sequence of deflections and presses with the Joystick, or with a physical key. How the control system is locked depends on how the wheelchair manufacturer has programmed it. Refer to the R-Net technical manual SK77981- Programming chapter for more details.

**MOMENTARY SCREENS** <sup>47</sup>

If the momentary screens are programmed to be displayed, then pressing the Speed or Profile Buttons will display screens such as this.

**DIAGNOSTIC SCREEN** <sup>48</sup>

When the control system safety circuits have operated and the control system has been prevented from moving the wheelchair, a diagnostics screen will be displayed. This indicates a system trip, i.e. the RNET has detected a problem somewhere in the wheelchair's electrical system.





## F. PERFORMANCE CONTROL SETTINGS

**NOTE - BEFORE attempting to check and/or adjust settings on your joystick, be sure to see your Dealer or Clinician and have them make the adjustments if needed.**

1. It is vital to match control settings to your level of function and ability.
2. Consult your health care professional and your Authorized Dealer to select the best control settings for you.
3. Check and adjust the settings every six to twelve months.

### WARNING

Adjust the control settings immediately if you notice any change in your ability to:

- Control the joystick.
- Avoid running into objects.

## G. ON BOARD PROGRAMMER OR DTT (DIAGNOSTIC TEST TOOL) OR RNET PC PROGRAMMER (Optional)

### WARNING

Program settings beyond the ability of the user can result in serious injury. Consult your health care advisor before you alter settings.

The On-board Programmer or RNET PC Programmer lets you adjust the control settings of the ZM-310. Listed below are a few of the many settings that can be adjust via the On-board Programmer or RNET PC Programmer. (See RNET OBP Owners Manual for full programmable parameters.)

- acceleration rate
- deceleration rate
- turn acceleration
- turn deceleration
- forward speed (max & min)
- reverse speed (max & min)
- turn speed (max & min)
- steer correct

#### Programming the Chair:

- a. Access via DTT (Diagnostic Test Tool), or the PC Programmer require an inline connection to the communication cable.
- b. Program as needed.
- c. Remove Dongle or recycle power.

**NOTE-** Review the RNET OBP Owner's Manual for more details on how to program your chair.

## H. CTRL+5 ASSIGNABLE BUTTONS

The Ctrl+5 (Canbus switch) is a device that plugs into the PG Drives R-net system and allows for the set up of up to ten different functions into the ten discrete buttons, (each toggle switch is two buttons). This device uses the Sunrise Medical patented Assignable Buttons feature. The Ctrl+5 switches are pre-programmed from the factory to default values for the actuators on the chairs. Using the Dealer PC Programmer and dongle, the button assignments can be changed to any of the Assignable Buttons functions to suit the user just like the joystick buttons.

## I. JOYSTICK STATIONARY

Your chair has an available programming feature called "Joystick Stationary" which can be set by your dealer. This feature senses when the joystick is displaced from neutral, yet left in a steady position for a predetermined period of time. The controller will automatically turn off if the set time has been reached. This feature is designed to protect the user, batteries and electronics if the joystick is inadvertently displaced. There are two parameters that can be adjusted:

### 1. Joystick Stationary Time:

This is the time the joystick has to remain within the stationary range before the unit will come to a stop. It can be programmed from 0 to 60 minutes in steps of one minute. Select 0 to disable the function. Default setting is 0 (Disabled).

### 2. Joystick Stationary Range:

This determines the size of a region around the present joystick position. If the joystick remains within this region for the stationary time the controller will stop. The range can be programmed from 1 to 50, in steps of 1. Default setting is 1.

### WARNING

Before turning on or adjusting these parameters, carefully read and understand the implications for use of these features, Joystick Stationary Time and Joystick Stationary Range. When the "Joystick Stationary Time" is reached within the "Joystick Stationary Range", the drive motors on the chair will shut off. As an example, this will happen while driving in a straight line for extended periods of time with no joystick movement. Once the drive motors turn off, the user will need to turn the chair off and back on to drive.

## J. THERMAL ROLL-BACK

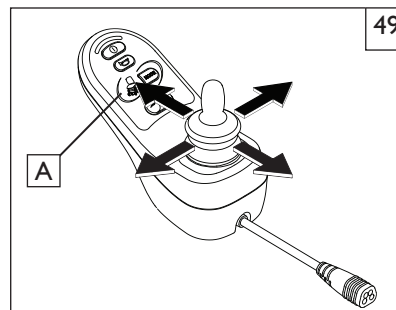
Your chair has a thermal roll back circuit. This protects the controller from damage due to overheating. In extreme conditions (such as repetitive hill climbing) the circuit will decrease the power to your motors. This allows the chair to operate at a reduced speed. When the controller cools, the chair will return to normal speed.

## K. TILT & LIFT OPERATION 49

The tilt and lift features on your chair can all be operated using the joystick on your chair. Follow the instructions below to operate:

#### If the thru drive option was selected,

1. Make sure your controller is on.
2. From the Drive Mode, press the Mode button(A) to enter Power Seating Mode.
3. Move the joystick left or right selecting the power option (recline, tilt, lift, legrests) you wish to control.
4. Move the joystick forward or backward to adjust the selected power option to the desired position.
5. Press the Mode button(A) to return to normal operation or continue moving the joystick left or right to adjust the next power option. Multiple Mode button presses will be necessary if other modules, such as Output, are active.



**L. VR2 JOYSTICK** 50

The standard VR2 joystick controls the chair's performance. It consists of the following parts:

**1. Speed Control or Drive Mode Selection Buttons (A, B and C)**

- To decrease the speed level depress button(A). Or, when 1- 5 Drive modes are programmed, depress button A to activate lower drive mode(s).
- To increase speed level, depress button (B). Or, when 1- 5 Drive modes are programmed, depress button B to activate higher drive mode(s).
- Speed level active is indicated on display (C) by a series of five lights. One light indicates lowest level currently active, while five lights indicates highest level currently active.
- Drive Mode is indicated by a single light. The first light indicates Drive Mode 1; the second light indicates Mode 2, and so on.

**2. Battery Charge Indicator (D)**

Displays the charge available in the battery and alerts the user when the charge level is low.

- Steady: Indicates that all is well.
- Flashing Slowly: The control system is functioning correctly, but you should charge the battery as soon as possible.
- Stepping Up: The wheelchair batteries are being charged. You will not be able to drive the wheelchair until the charger is disconnected and you have switched the control system off and on again.
- If the battery gauge shows red, yellow and green, the batteries are charged (bars 1-10).
- If the battery gauge shows just red and yellow, then you should charge the batteries as soon as you can (bars 1-7).
- If the battery gauge shows just red, then you should charge the batteries immediately (bars 1-3).

**3. On/Off Button (E)**

Turning the chair on or off is accomplished by depressing button E.

**4. Horn (F)****5. Joystick (G)** 51

The joystick controls the direction and speed of your chair. Turn the chair on and move the joystick in the direction you want to go.

- Moving the joystick from the neutral (center) position disengages the motor brakes, allowing the chair to move.
- The chair will move faster the more you move the joystick away from neutral.

**NOTE** - If your speed becomes hard to manage, release the Joystick and the chair will come to a complete stop.

- When you release the joystick it will return to neutral; the chair will slow to a stop and the motor brakes will reengage.
- We recommend that you switch the chair off if you stop for any length of time. This will conserve battery power.

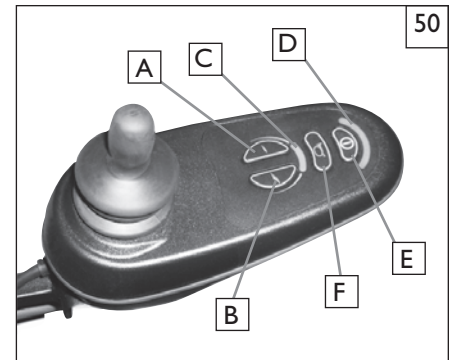
**NOTE** - Once the chair stops, switching the chair off will not affect the motor brakes.

**6. Joystick Boot (H)** 51

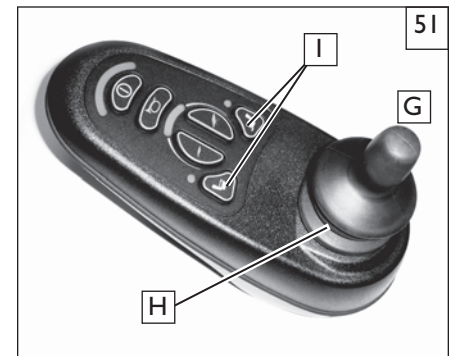
Make sure the boot is not torn or cracked (this could allow debris, water or moisture to enter). If the boot is torn or cracked, replace it as soon as possible.

**7. Tilt or Lift Control (SC only) (I)** 51

This button once depressed allows you to control the up and down movement of the tilt/lift. Press button "I". Then push the joystick forward to tilt/lift the seat upward or pull the joystick back to tilt/lift the seat downward. Pressing button "I" again will allow drive operations to resume.



VR2 Joystick



VR2 Joystick with Actuator Control

## A. INTRODUCTION

### 1. Notes—

- Batteries supply the power for your chair. They contain a finite amount of energy and have limits on how long they can store and supply energy.
- You can charge batteries only a certain number of times before they will fail and no longer hold a charge.
- For answers to questions about batteries, consult your Authorized Dealer.

### 2. Use Proper Batteries:

Your chair operates on two 12 volt batteries.

- They should be Group 22 batteries.
- When you buy a replacement, insist on a **deep cycle sealed case** type. Do not use a car or boat battery.

### 3. Breaking In:

- A battery requires “breaking-in” for the first 6 to 12 charges. It will not accept a full charge for this period.
- It is best to limit the length of your trips until you break the batteries in and you know the range of your chair.

### 4. Discharged Batteries:

- Never** allow a battery to completely discharge. If you operate your wheelchair until it has almost stopped, you will greatly reduce the life of your batteries.
- Never** let a battery sit in a discharged condition. Give unused or stored batteries a full charge once per month.
- Always** fully charge the batteries. **Avoid** charging when it is not necessary.

### WARNING

Never connect a life support or auxiliary device to a wheelchair battery. The electrical system may fail, and result in severe injury to or death of the user.

## B. CHARGING YOUR BATTERIES

### WARNING

To avoid the risk of severe injury or death from electrical shock, fire or explosion while charging: Never connect charger to a 240 volt source. The main input voltage is 110 volts. Never make direct contact across both battery terminals, as an explosion may occur. A spark may result in an explosion and/or fire resulting in severe injury or death.

### WARNING

**Never** touch the charger after it is connected to an electrical outlet. This may cause electrical shock.

**Never** connect or disconnect charger from battery while there is power to the charger.

### WARNING

- Never** use an extension cord. Use of an improper cord could damage the charger or cause a fire or electrical shock.
- A battery emits explosive hydrogen gas during charging. To reduce the risk of fire or explosion:
  - Never smoke or allow a spark, flame or high heat near battery during charging.
  - Never allow metal tools or chair parts to make direct contact across both battery terminals.

### ALWAYS:

- Use the charger that comes with your wheelchair. Read and follow all instructions and warnings.
- Make sure room is well ventilated.
- Turn off all power to your chair.
- Connect and disconnect battery cables with caution.

**NOTE—** Always remove and reattach the negative cable (black cable) first.

- Make sure to allow enough time to fully charge batteries.

**NOTE—** Batteries should never be left for long periods in the discharged state. Unused or stored batteries should be given a charge once per month.

## C. BATTERY CHARGER 52

A battery charger produces a direct current (DC). When applied to a discharged battery, this reverses the chemical reaction that led to its discharge.

### 1. Charge Rate. How fast a battery will charge depends on:

- Its electrical capacity; state of charge; electrolyte temperature, and; internal condition.
- The DC output of the charger. (The charge rate will vary if the alternating current (AC) supply is higher or lower than 110 volts).

### 2. Caution — To Avoid Damage to the Charger:

- Never place the charger on top of a battery during charging. (Gases from the battery can damage the charger and may lead to an explosion or fire).
- Never** place a battery on top of the charger.
- Never** expose charger to rain or snow.
- Never unplug charger by pulling on the electrical cord. This will damage the cord.
- Never** open a charger or attempt to repair it yourself. Return charger to Sunrise or have repairs made only by a qualified person.
- Keep cord out of the way, where it will not be stepped on, tripped over, or damaged.

### 3. Caution — To Avoid Damage to the Battery:

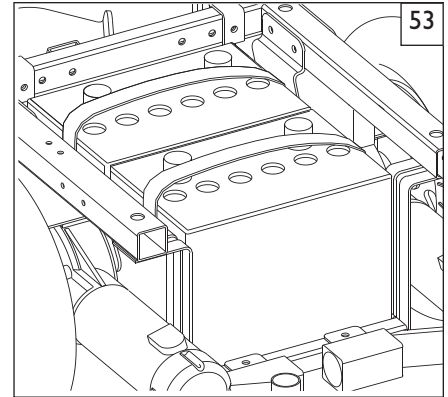
- Make sure you use the correct setting for sealed (gel) batteries (located on the off-board charger).
- Never** charge a frozen battery. A fully charged battery will rarely freeze, but the fluid in a discharged battery can freeze at 16 degrees Fahrenheit (minus 9 degrees Centigrade). If you suspect a battery is frozen, thaw it before charging.



Off-board charger port  
located under joystick

**D. CONNECTING BATTERIES IN THE BATTERY COMPARTMENT** 53**⚠ WARNING**

1. Batteries weigh up to 55 lbs. (25 kg). Take care to avoid injury when lifting.
2. Keep batteries upright.
3. Always wear rubber gloves and safety glasses when you handle batteries.
4. Before working around batteries, remove all metal personal effects, such as necklaces, rings, watches, pins and other metal jewelry that might contact battery terminal and cause a short.
5. Connect and disconnect battery cables with caution. Connect the red lead to the positive terminal and the black lead to the negative terminal. Do this for each battery.
6. Tighten all terminal fasteners using two 1/2" box end wrenches to 60 in-lbs (6.8 N.m).
7. Place the battery compartment lid on power base.
8. To charge batteries, use the off-board charger by plugging off-board charger plug into the off-board charger socket.

**E. BATTERY MAINTENANCE****⚠ WARNING**

1. **Fire or sparks**
  - a. Never smoke or hold an open flame near batteries.
2. **Protect your skin and clothes**
  - a. Always wear rubber gloves and safety glasses when you handle batteries.
3. **Corrosion:**  
Check battery terminals often for corrosion.
  - a. If corrosion is present, use a wire brush to clean the terminals.
  - b. Use petroleum jelly to re-grease the terminals after connecting cable to battery. (Completely cover the terminal nut and bolt, cable clip and any exposed cable with jelly).
4. **For Answers To Questions about batteries: Contact your authorized dealer.**

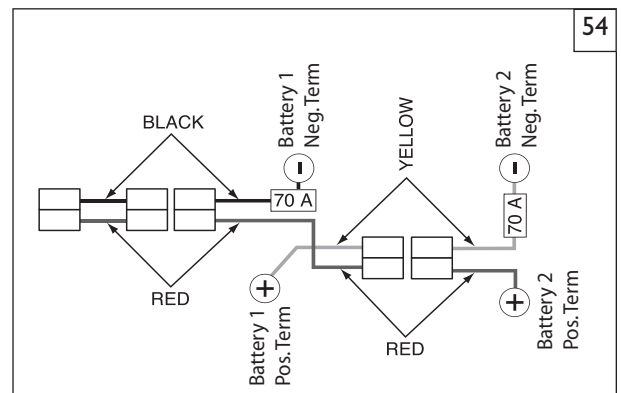
**F. DISPOSING OF BATTERIES****⚠ WARNING**

1. All batteries once they have reached the end of their useful life are deemed to be hazardous waste.
2. For further information on handling and recycling contact your local recycling authority.
3. Always dispose of product through a recognized agent.

**G. FUSES**

Your Zippie ZM-310 has two inline fuses.

- In the unlikely event of a short circuit or other fault, all power to your chair will be shut off to protect your motors and controller from damage.
- Qualified service personnel are required to repair the fault and replace the battery harnesses.

**H. BATTERY WIRING DIAGRAM** 54

## ⚠ WARNING

The owner of this chair is responsible for making sure that it has been setup and adjusted by a trained service professional under the advice of a Healthcare Professional. Service or adjustments should only be done with the advice of a Healthcare Professional. Always use parts and accessories that have been recommended and approved by Sunrise Medical when servicing this chair.

### A. DEALER SERVICE INTRODUCTION

1. At least once per year, this chair should have a complete inspection, safety check, and regular service made by an Authorized Dealer.
2. If you have discovered a worn, bent, or damaged part, repair or replace them with recommended parts **before returning this chair to service.**
3. All major maintenance and repair work should be done by the Authorized Dealer.

### B. CRITICAL MAINTENANCE TIPS

#### 1. Torque settings:

A torque setting is the optimum tightening which should be made on a particular fastener. It is important to use proper torque settings where specified. When not specified, torque settings should be set at a minimum of 60 in-lbs.

#### 2. Dealer Service and Adjustment Reference materials:

Go to [www.sunrisemedical.com](http://www.sunrisemedical.com) for parts manuals, instruction sheets, and instructional videos that will aid in the repair of the Quickie/Zippie Family of wheelchairs.

### C. CLEANING

#### 1. Paint Finish

- a. Clean the painted surfaces with mild soap or detergent.
- b. Protect the paint with a coat of non-abrasive auto wax.

#### 2. Axles and Moving Parts

- a. Clean around axles and moving parts with a slightly damp (not wet) cloth.
- b. Wipe off or blow away any fluff, dust or dirt on axles or moving parts.
- c. DO NOT USE 3 in 1 oil, or WD-40® for lubrication. Only use Teflon based Lubricant when working on this wheelchair.

### D. ADJUSTMENT NOTES

#### 1. Work Surface For Set-Up:

Use a flat surface, such as a table, to assemble, adjust and check your chair. This makes the steps easier and helps ensure a correct set-up.

#### 2. Fasteners:

- Many of the screws and bolts on this chair are special high-strength fasteners and may have special coatings.
- Many nuts are of the Nylock type. They have a plastic insert to help prevent loosening.
- Only use screws, bolts and nuts provided by Sunrise.

## ⚠ WARNING

1. Use of improper fasteners may cause the chair to fail.
  2. Over- or under-tightened fasteners may fail or cause damage to chair parts.
  3. If bolts or screws become loose, tighten them as soon as you can. Loose bolts or screws can cause damage to other chair parts causing them to fail.
- #### 3. Washers & Spacers:
- Note the position of washers and spacers before disassembly.
  - To avoid damage to the frame, replace all washers and spacers when you reassemble parts.



#### TOOLS YOU WILL NEED

1. Imperial Hex key set
2. Metric Hex key set
3. Imperial Open-end Wrench set
4. Metric Open-end Wrench set
5. Torque wrench
6. Imperial Hex bit Socket set
7. Metric Hex bit Socket set
8. Phillips and Flat screwdrivers

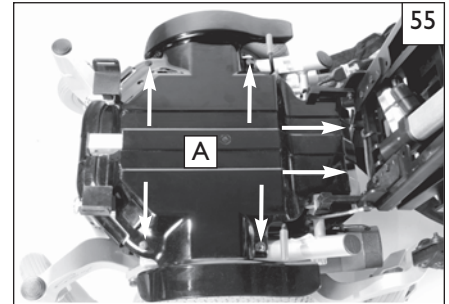


**E. SHROUD REMOVAL** 55

The plastic protective shroud can be removed for adjustment or servicing.

**1. Remove the top shroud**

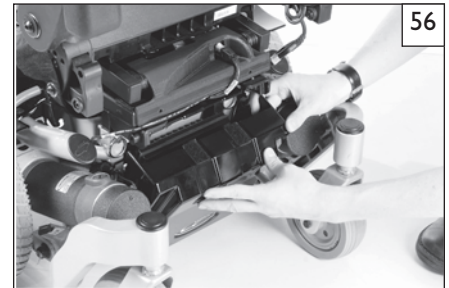
- Remove the Seat.
- Remove the six screws(A) that hold the shroud to the frame.
- Once all of the screws have been removed, the shroud should be free to remove.

**2. Remove the rear shroud** 56

- Remove the two rear shroud screws.
- Pull downward at the top of the rear shroud, then lift up and off.

**3. Replacing the front, or rear shroud**

- Position the shroud and hand thread a few screws to hold the shroud in place.
- You can then insert the other screws while moving the shroud to line up the holes.
- Be sure not to tighten screws too much, because it could fracture the plastic.

**F. BATTERY REMOVAL** 57**1. To remove the batteries before transporting or servicing:**

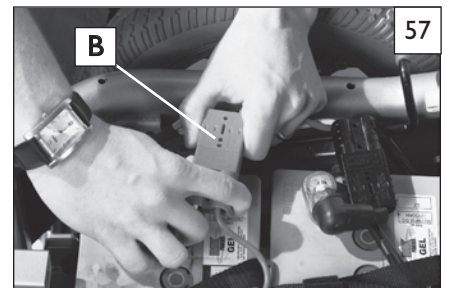
- Carefully flip back the seat (see XI Section Q "Seat removal")
- Remove the shroud (see Section E "Shroud removal") .
- Unplug the main power connect (B)
- Lift the batteries out of the frame using the battery strap as a lifting handle.

**2. Battery installation**

- See section X. (Batteries) for installation



Batteries may weigh up to 55 lbs. Care must be taken to avoid injury when lifting up on battery straps.

**G. SINGLE POST HEIGHT-ADJUSTABLE ARMRESTS (Optional)** 58 59**1. Adjusting armrest receiver (forwards or backwards)**

- Loosen the 3 bolts (C) on the receiver clamp.
- You can move the armrest and receiver forwards or backwards for a universal fit.
- Tighten the hardware when adjustment is complete(C).

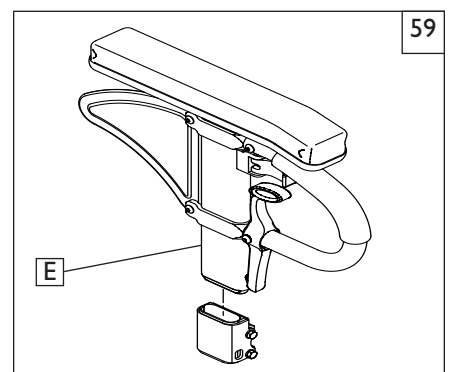
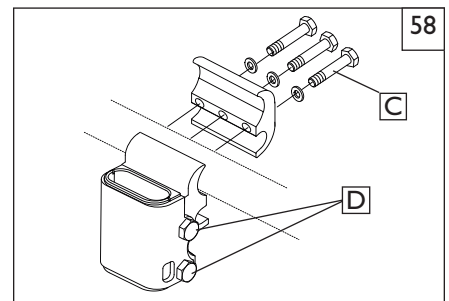
**2. Adjusting Armrest Receiver Fit (tighten or loosen fit)**

To tighten or loosen the fit of the outer armrest in the receiver:

- Loosen the four bolts (D) on both sides of the receiver.
- With the armrest in the receiver, squeeze the receiver to achieve the desired fit.
- Continue the pressure on the receiver and tighten the four bolts.

**3. Adjusting Inner Armrest Fit**

- Two set screws(E) are installed in the outer armrest.
- Turn the set screws in or out until the desired fit is achieved.



**H. CANTILEVER ARMRESTS (Optional)** 60 61**1. Adjusting Armrest Pad (forwards or backwards)**

- Loosen the 2 bolts (A) on the armrest pad bracket.
- You can move the armrest and receiver forwards or backwards for a universal fit.
- Tighten the hardware when adjustment is complete.

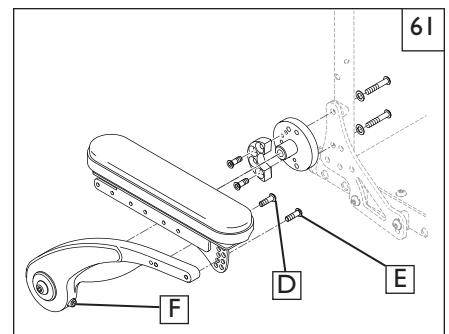
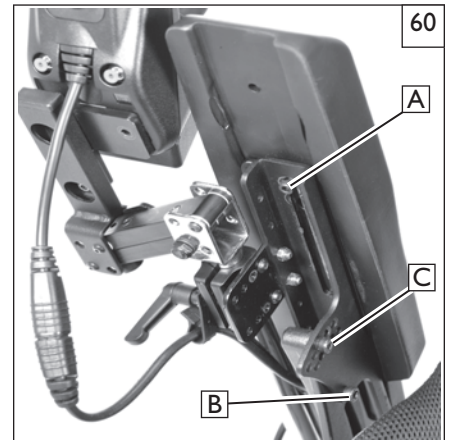
**2. Adjusting Armrest Angle or levelling the armrest after height adjustment.**

- Loosen the pivot bolt (B) on the armrest angle bracket.
- Remove the Socket head screw and hardware. (C)
- Adjust the angle of the armrest and joystick and re-insert the hardware thru the adjusted hole.
- Tighten all hardware when adjustments are complete.

**3. Adjusting Armrest Height (within factory limits)**

- Locate the height adjustment screw (F) at the bottom of the cantilever arm and adjust the height by using a 5mm hex key and turning the screw either clockwise (more height), or counter-clockwise (less height).
- Do not loosen the screw to the point where it will fall out of the armrest. If this happens simply re-thread the screw into the armrest until it starts to height adjust the armrest again.
- When you reach desired height remember to level the armrest using screws (D) and (E) as shown in step 2 above.

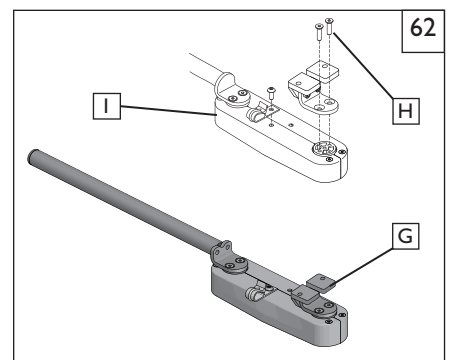
NOTE - The cantilever armrest has about 2" of adjustment set from the factory. In most cases the external height adjustment will be all that is necessary for a proper fit

**I. RETRACTABLE JOYSTICK MOUNT** 62

The Retractable Joystick Mount can swing in/out in increments of 45°, 90°, and 135°

**1. Height adjustment**

- Remove the Joystick mount (G) by removing hardware (H).
- Flip bracket (I) upside down and re-attach the Joystick mount assembly components
- Replace and retighten bolts on each side.

**J. MIDLINE JOYSTICK MOUNT** 63

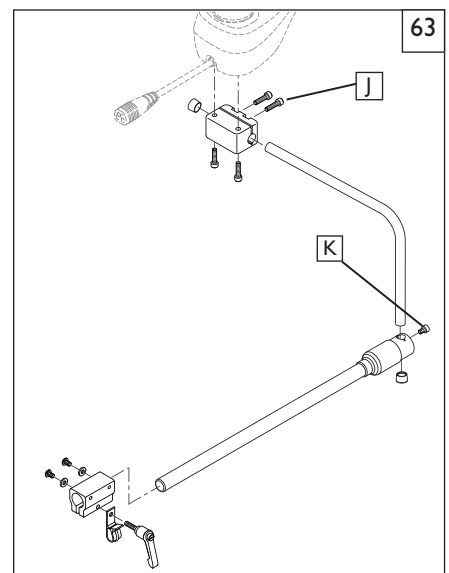
The Midline Joystick Mount has 3 axis adjustment, and can be rotated out of the way.

**1. Left, Right, Center adjustment**

- Loosen the clamp screws (J) and move the joystick laterally in front of the rider.
- After finding the most comfortable adjustment, make sure the joystick is level.
- Retighten the clamp screws.

**2. Height adjustment**

- Loosen the clamp screw (K) and move the joystick vertically,
- After finding the most comfortable adjustment, retighten the clamp screw.



**K. JOYSTICK CONTROLLER POSITION** 64

The controller can be moved in or out in relation to the armrest. You can also move the controller to either side of your chair to accommodate left or right-hand use.

**⚠ WARNING**

**Be careful of pinching the controller cords.** When the controller is moved, the harness and cord can be at risk of pinching from the Seat frame, and/or the Power base frame. Be sure to route and secure the cord with a zip tie to avoid cord pinching. Cord pinching could eventually disable your power chair if left unchecked.

**Before Moving the controller from one side to the other read these important tips.**

- Turn off the power to the controller.
- Unplug the controller connectors from the power base.
- Remove any wire ties securing the controller harness to the armrest.
- Flip up the armrest so that it is perpendicular to the floor.
- Loosen the hardware on the controller bracket and slide the controller out.
- Re-tighten the hardware, so it won't be lost accidentally.
- Loosen the hardware on the other armrest.
- Slide the controller arm into the other armrest, and tighten the hardware.
- Route and secure the controller harness to the back of the power base and plug in the controller cord. Make sure to avoid any areas where the cord may be pinched.

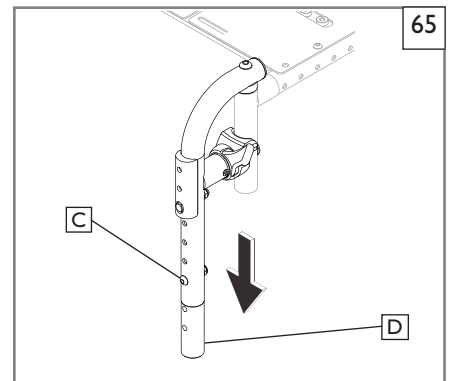
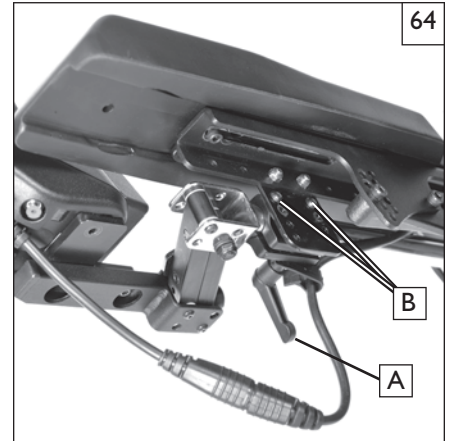
**Adjustment and/or switch sides.**

- To adjust the joystick, forward or back, loosen the clamp(A), move the joystick, and then hand-tighten the clamp handle.
- To move the joystick to the opposite side of the chair, remove the hardware(B) and move the clamp and joystick receiver to the other armrest.
- Tighten all hardware to avoid any movement of the joystick while travelling.

**L. SWING-IN/OUT FOOTREST ADJUSTMENT** 65

**Footplate Height Adjustment**

- Remove the hardware(C) from the hanger frame tube.
- Move the footrest extension tube(D) up or down to set the correct height, and line up the adjusted holes.
- Insert the hardware to hold the tube in place.
- Re-tighten all hardware(C)

**M. ANGLE ADJUSTABLE CENTER MOUNT FOOTREST** 66

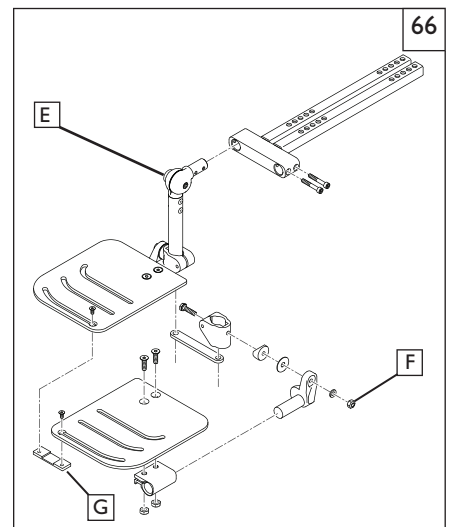
(ASAP Seating only)

**1. Quick Independent angle adjustment**

- Depress the button(E) and angle adjust the footplates as an assembly
- The footplates can be moved independently of each other by removing the bracket (G) that locks the footplates together.

**2. Footplate Height Adjustment**

- Loosen the securing screws (F).
- You can move the footplates up or down to the desired height as an assembly or adjust the height for each footplate independently
- Tighten the hardware(F)

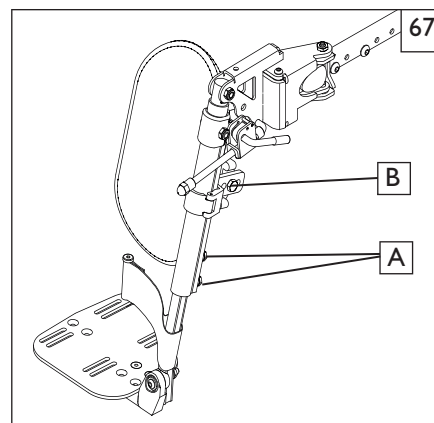


**N. ELEVATING LEGREST ADJUSTMENT(Optional)** 67**1. Footplate Height Adjustment**

- a. To raise footrest, loosen the two bolts(A) that hold the extension tube and footplate in place.
- b. Adjust the footplate up or down for best adjustment, and tighten the hardware(A).

**2. Calf pad Adjustment**

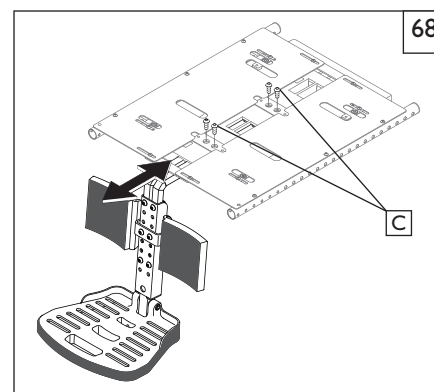
- a. Remove the securing screw (B).
- b. Move Calf Pads to desired height.
- c. Re-tighten the screws (B) through adjusted hole.

**O. CENTER MOUNT HANGER ADJUSTMENT** 68 69 70

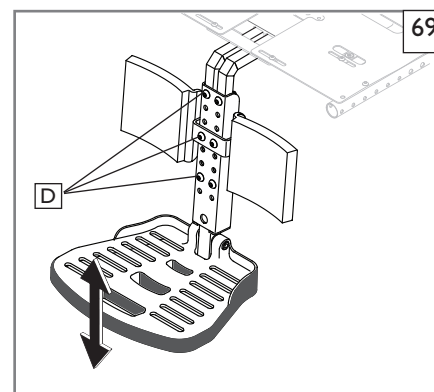
(ASAP Seating only)

**1. Removing the assembly** 68

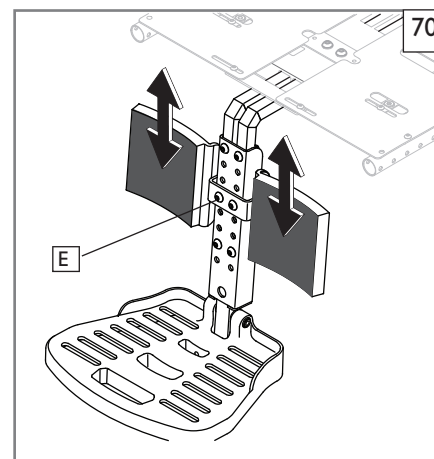
- a. Remove the four screws (C) and slide the footrest assembly out of the receiver.

**2. Footplate Height Adjustment** 69

- a. Remove the six securing screws (D).
- b. Move the footplate up or down to the desired height.
- c. Re-install screws (D) through adjusted holes and tighten the hardware.

**3. Calf pad Adjustment** 70

- a. Remove the two securing screws (E).
- b. Move Calf Pads to desired height.
- c. Re-install screws (E) through adjusted holes.



## P. SEAT DEPTH ADJUSTMENT 10" - 18", 12" - 20" only 71

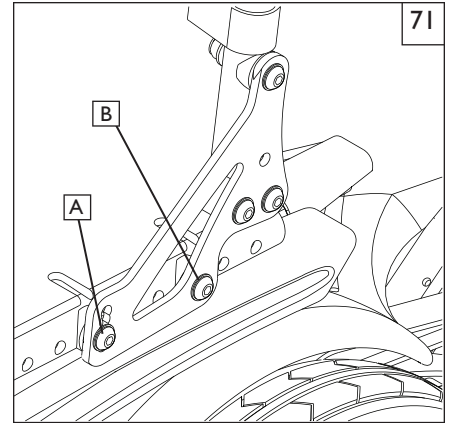
The seat depth can be adjusted in one inch increments on standard rehab seating.

### 1. Seat Frame Depth Adjustment

- To adjust, remove the two bolts (A & B) from each side of the backrest pivot plate.
- Reposition the backrest to the desired position.
- Replace and retighten bolts on each side of the backrest pivot plate.

### 2. Back Angle Adjustment on Seat Frame

- Remove the front securing bolt (A) on the side of the backrest hinge plate.
- Loosen the lower rear bolt (B)
- Set at desired angle. There are five holes (in 4° increments) to choose from.
- Reinstall the front bolt and tighten both bolts securely.



## Q. SEAT REMOVAL 72 73 74

Most adjustments that can be made to the ASAP II seating system, should be done with the seating system removed from the base. Standard practice should be to remove the seating system and place it on a workbench for an easier and safer adjustment.

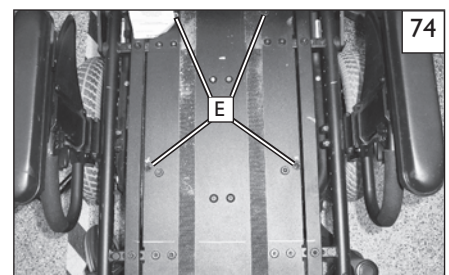
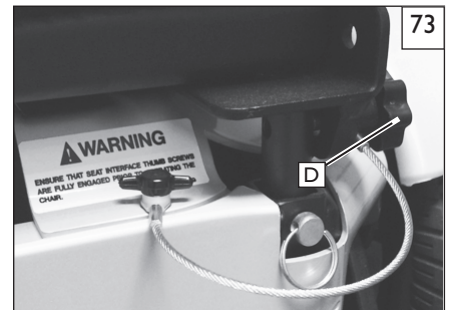
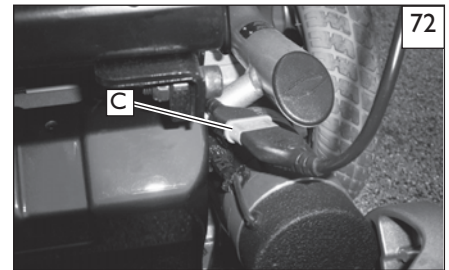
- Disconnect the joystick power cable (C) in the rear of the chair.

### 1. Seat tilt back (for quick access to battery compartment)

- Remove the knobs (D) that attach the seat to the seat posts.
- Tilt the seat back until it is resting on the work surface.

### 2. Seat removal (required to replace modules or adjust the seat width of the chair)

- Remove the 4 screws (E) to detach the seat pan from the modules underneath. The locations of the screws may vary depending on the size of the seating area, type of module, and size of seat pan.
- Remove the seat and place it in a stable work area.

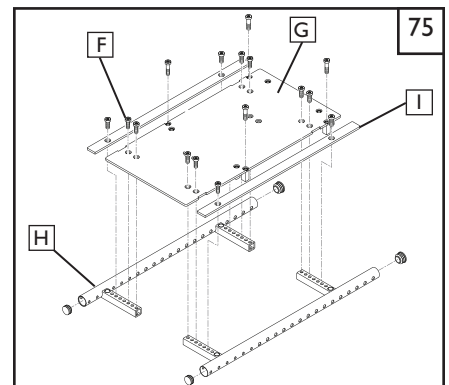


## R. SEAT PAN AND BACK SIZE ADJUSTMENTS 75 76

**NOTE:** Your ASAP II seating system can be adjusted to a wide range of widths and depths to accommodate specific user needs. Seating dimensions should only be altered by a trained medical professional and may require a new seat pan, cushion and/or stabilizer bar to complete the adjustment.

### 1. Seat Pan/Frame Width Adjustment

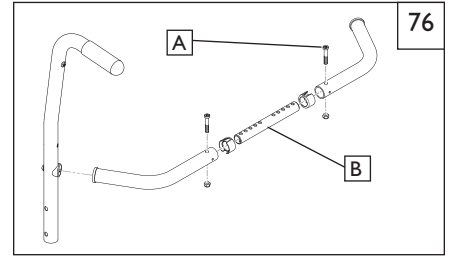
- Most width adjustments require the back, stabilizer bar, and back brackets to be loosened and/or removed before adjusting the seating width.
- To adjust the width of the seating area, remove the screws (F) that attach the seat pan to the seat frame (H).
- Reposition (G) (either solid seat pan, or split-cover seat pan) to achieve the desired width (1/2" increments on each side). Make sure that it is centered and equally spaced from side to side.
- For the 13" wide, (10x10-13x18 seat), you will need to mount the width fillers (H) to cover the gap between the seat rail (H) and seat pan (G).
- Check your width measurements and then replace and retighten all the hardware.





## 2. Back Support Frame Width Adjustment 75 76

- After measuring the width adjustment in the seating area, Remove the front securing hardware (A) from the adjustment tube (B) on the stabilizer bar.
- The Stabilizer bar can be adjusted in 1" increments (1/2" on each side) to match the width change in the seating area.
- Replace the Stabilizer bar, recheck the measurement and make sure your backposts are straight and parallel. Tighten the adjustment screws (A)



## S. SEAT HEIGHT ADJUSTMENT 77

- After removing the seat, remove the lockout Pins (C) from all 4 seat mount posts.
- In most cases, select the desired seat height by moving all four post up the same distance, so the seating system is level following the adjustment.
- Reinsert the hardware, and Lockout pin(C).



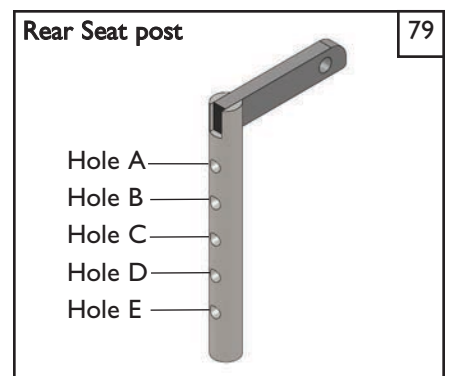
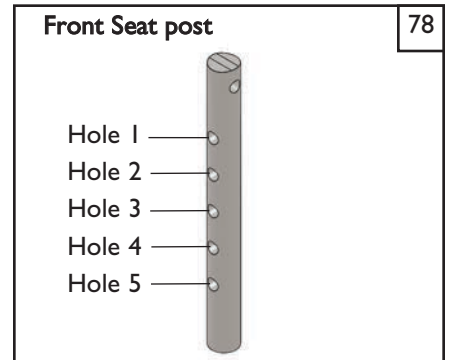
## T. SEAT TO FLOOR HEIGHT/PRE-TILT POSITIONING 78 79

Your ASAP II seating system can be adjusted to many different seat to floor heights, and pre-tilt positioning depending on your specific configuration. Seat to floor heights and Pre-tilt positioning should only be altered by a trained medical professional. For the correct Pre-tilt settings and seat to floor heights, in relation to specific configurations of the Zm-310, please Refer to the seat to floor matrix in the Pulse service manual before changing any of the factory settings.

### WARNING

**DO NOT** increase the front post height independent from the rear posts when providing seating pre-tilt.

- NOTE**— For chairs configured with SPOT tilt, do not increase the Pre-tilt greater than 3 degrees.
- For chairs configured with seat elevator, do not increase the Pre-tilt greater than 3 degrees.
- For chairs configured with SPOT tilt and seat elevator, do not increase the seat-to-floor height greater than 1" from the lowest position.
- For chairs configured with SPOT tilt and recline, do not increase the seat to floor height greater than 18", and do not increase the pre-tilt greater than 0 degrees.



## U. REPAIRING OR REPLACING A TIRE 80

### WARNING

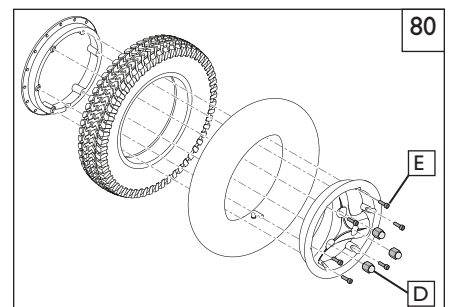
Residual air pressure in tires can cause severe injury. Make sure you release all air in tire before attempting to service or repair tires.

### 1. Drive Wheels:

- Elevate and securely support chair so that wheel is off the ground. Release all air from tire.
- Remove the three main lugnuts (D).
- Remove the Drive wheel/tire assembly

### 2. Air Tube:

- To replace the air tube, remove the six hex screws (E) so that the rims can be separated.
- Separate the two halves of the rim and remove tire and solid insert
- Repair or replace.
- Reassemble the wheel. Use a torque setting of 420 in-lbs to re-tighten the bolts.
- Install the wheel on the chair using a torque setting of 180 in-lbs to retighten the bolts.
- Inflate the tire to the proper pressure level (listed on the tire sidewall)



**A. FOR FIVE (5) YEARS**

Sunrise warrants the frame of this wheelchair against defects in materials and workmanship for five years from date of first consumer purchase.

**B. FOR ONE (1) YEAR**

We warrant all Sunrise-made parts and components of this wheelchair including: motors, gearboxes, and electronic components, against defects in materials and workmanship for one year from the date of first consumer purchase.

**C. FOR SIX (6) MONTHS**

We warrant batteries for 6 months from the date of first consumer purchase.

**D. LIMITATIONS**

1. We do not warrant:
  - a. Tires and tubes, upholstery, pads and push-handle grips.
  - b. Damage from neglect, accident, misuse, or from improper installation or repair.
  - c. Products modified without Sunrise Medicals express written consent.
  - d. Damage from exceeding the weight limit.
2. This warranty is VOID if the original chair serial number tag is removed or altered.
3. This warranty applies in the USA only. Check with your supplier to find out if international warranties apply.
4. This warranty is not transferable and only applies to the first consumer purchase of this wheelchair through an authorized Sunrise Medical dealer.

**E. WHAT WE WILL DO**

Our sole liability is to repair or replace covered parts. This is the exclusive remedy for consequential damages.

**F. WHAT YOU MUST DO**

1. Obtain from us, while this warranty is in effect, prior approval for return or repair of covered parts.
2. Return the wheelchair or part(s), freight pre-paid to the designated Sunrise Medical location.
3. Pay the cost of labor to repair, remove or install parts.

**G. NOTICE TO CONSUMER**

1. If allowed by law, this warranty is in place of any other warranty (written or oral, express or implied, including a warranty of merchantability, or fitness for a particular purpose).
2. This warranty gives you certain legal rights. You may also have other rights that vary from state to state.

**H. ADDITIONAL WARRANTY INFORMATION**

For goods provided by Sunrise Medical Pty Ltd in Australia, our goods come with a guarantee by Sunrise that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure. The benefits to you given by this warranty are in addition to your other rights and remedies under a law in relation to the goods to which the warranty relates.

Record your serial number here for future reference:

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Sunrise Medical (US) LLC  
North American Headquarters  
12002 Volunteer Blvd.  
Mount Juliet, TN 37122, USA  
(800) 333-4000  
(800) 300-7502  
[www.SunriseMedical.com](http://www.SunriseMedical.com)

Sunrise Medical Canada Inc.  
1000 Creditstone Rd., Unit #2  
Concord, ON, L4K 4P8  
Canada  
Phone: 1-800-263-3390  
Fax: 1-800-561-5834  
[www.SunriseMedical.ca](http://www.SunriseMedical.ca)

