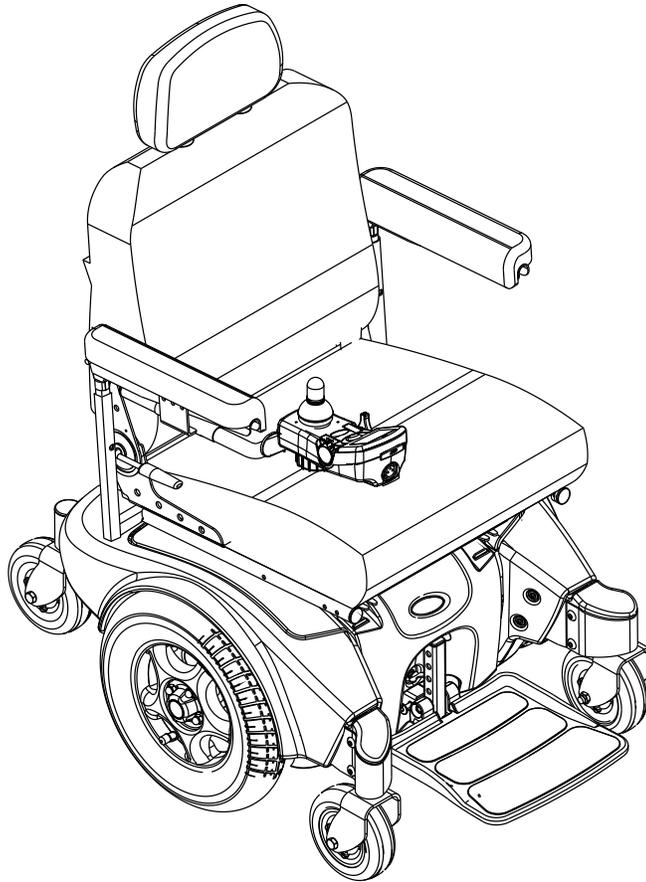


**Pronto<sup>®</sup> M94<sup>™</sup>**  
**with SureStep<sup>®</sup>**



This manual **MUST** be given to the user of the product.

**BEFORE** using this product, read this manual and save for future reference.

For more information regarding  
Invacare products, parts, and services,  
please visit [www.invacare.com](http://www.invacare.com)



**Yes, you can.<sup>®</sup>**

## **⚠ WARNING**

### **Risk of Injury or Damage**

**Incorrect set up of this wheelchair performed by users/caregivers or unqualified technicians can result in injury or damage.**

**User/Caregivers- DO NOT attempt to set up this wheelchair.**

**Initial set up of this wheelchair MUST be performed by a qualified technician.**

**A qualified technician MUST perform all procedures in the service manual.**

---

## **⚠ DANGER**

### **Risk of Death, Serious Injury or Damage**

**Improper use of this product may cause injury or damage**

**If you are unable to understand the warnings, cautions or instructions, contact a health care professional or dealer before attempting to use this equipment.**

**DO NOT use this product or any available optional equipment without first completely reading and understanding these instructions and any additional instructional material such as user manual, service manuals or instruction sheets supplied with this product or optional equipment.**

---

# **REFERENCE DOCUMENTS**

MANUAL	PART NUMBER
MK6i™ Electronics Field Service Guide	1141471
MK6i Electronics Service Manual	1143203
M91™ / M94 Service Manual	1125038

*NOTE: Updated versions of this manual are available on [www.invacare.com](http://www.invacare.com).*

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# SPECIAL NOTES

Signal words are used in this manual and apply to hazards or unsafe practices which could result in personal injury or property damage. Refer to the table below for definitions of the signal words.

SIGNAL WORD	MEANING
DANGER	Danger indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
WARNING	Warning indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION	Caution indicates a potentially hazardous situation which, if not avoided, may result in property damage or minor injury or both.

## NOTICE

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

### WHEELCHAIR USER

As a manufacturer of wheelchairs, Invacare endeavors to supply a wide variety of wheelchairs to meet many needs of the end user. However, final selection of the type of wheelchair to be used by an individual rests solely with the user and his/her healthcare professional capable of making such a selection.

### WHEELCHAIR TIE-DOWN RESTRAINTS AND SEAT RESTRAINTS

Wheelchair users should **NOT** be transported in vehicles of any kind while in wheelchairs. As of this date, the Department of Transportation has not approved any tie-down systems for transportation of a user while in a wheelchair, in a moving vehicle of any type.

It is Invacare's position that users of wheelchairs should be transferred into appropriate seating in vehicles for transportation and use be made of the restraints made available by the auto industry. Invacare cannot and does not recommend any wheelchair transportation systems.

## DANGER

### Risk of Death or Serious Injury

Not wearing your seat positioning strap could result in death or serious injury.

**ALWAYS** wear your seat positioning strap. Your seat positioning strap helps reduce the possibility of a fall from the wheelchair. The seat positioning strap is a positioning belt only. It is not designed for use as a safety device withstanding high stress loads such as auto or aircraft safety belts. If signs of wear appear, seat positioning strap **MUST** be replaced **IMMEDIATELY**.

---

**⚠ WARNING**

The drive behavior initially experienced by the user may be different from other chairs previously used. This Power Wheelchair has Invacare's SureStep technology, a feature that provides the chair with optimum traction and stability when driving forward over transitions and thresholds of up to 2-inches.

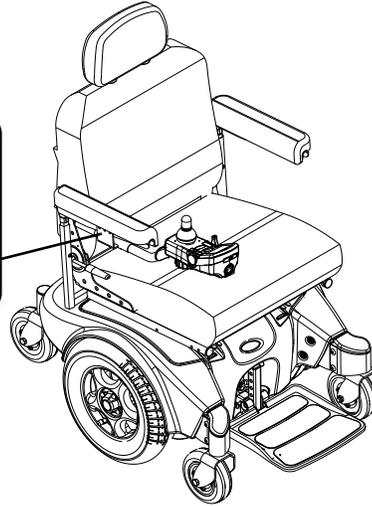
To determine and establish your particular safety limits, practice use of this product on various sloping surfaces in the presence of a qualified healthcare provider before attempting active use of this wheelchair. Other general warnings listed within this document also apply.

---

# LABEL LOCATIONS

**WEIGHT CAPACITY  
LIMITE DE POIDS  
500 LBS. (227 kgs.)**  
REFER TO OWNER'S MANUAL  
SE RÉFÉRER AU MANUEL DE L'UTILISATEUR

P/N 1122136



**WARNING**  
WIRING DIAGRAM for Dual 22NF Batteries  
**DO NOT REMOVE THIS LABEL**

The POSITIVE (+) RED Battery Cable MUST connect to the POSITIVE (+) Battery Terminal(s)/ Post(s). The NEGATIVE (-) BLACK Battery Cable MUST connect to the NEGATIVE (-) Battery Terminal(s)/Post(s). DO NOT allow Battery Cable(s) to contact the opposite Battery Terminal(s)/Post(s). Install protective caps on POSITIVE (+) and NEGATIVE (-) battery terminals. Replace cable(s) immediately if cable(s) insulation becomes damaged. Failure to observe these warnings may result in an electrical short with serious personal injury and/or damage to the electrical system. See Owner's Manual.

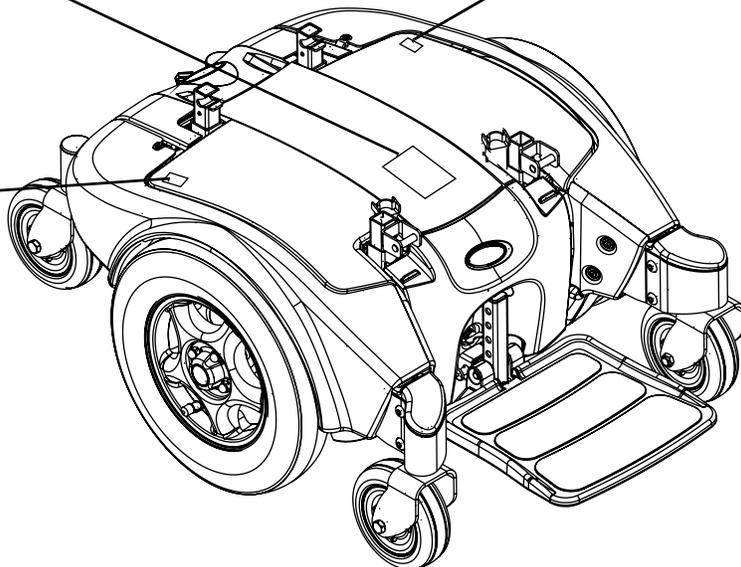
DO NOT remove fuse or mounting hardware from POSITIVE (+) RED battery cable mounting screw.

**AVERTISSEMENT**  
SCHEMA POUR LE FILAGE des batteries doubles 22NF  
**NE PAS ENLEVER CETTE ÉTIQUETTE**

Le câble ROUGE POSITIF (+) DOIT être connecté à la borne POSITIVE(+). Le câble NOIR NÉGATIF (-) DOIT être connecté à la borne NÉGATIVE (-). NE PAS laisser les câbles de batteries toucher les bornes opposées. Remplacer le câble immédiatement si l'isolation du câble est endommagée. Un court-circuit peut se produire et causer des blessures graves et/ou des dommages au système électrique si ces avertissements ne sont pas respectés. Se référer au MANUEL DE L'UTILISATEUR.

NE PAS enlever le fusible ou la quincaillerie de montage de la vis de montage du câble de batterie ROUGE POSITIF(+).

*NOTE: The serial number label is located on the inside of the right rear frame.*



# SPECIFICATIONS

	18-INCH VAN SEAT	20-INCH VAN SEAT	22-INCH VAN SEAT	24-INCH VAN SEAT	ASBA SEAT
<b>SEAT WIDTH RANGE:</b>	18 inches	20 inches	22 inches	24 inches	18-24 inches
<b>SEAT DEPTH:</b>	16 -18 inches	18-20 inches	20-22 inches	20-22 inches	16-22 inches
<b>BACK HEIGHT<sup>1</sup>:</b>					
SEMI RECLINE:	18 inches	18 inches	18 inches	18 inches	16-20 inches
<b>BACK ANGLE RANGE:</b>					
SEMI RECLINE:	35° to 115°	35° to 115°	35° to 115°	35° to 115°	Standard - 80° to 100°
<b>UPHOLSTERY:</b>					Black Nylon
WITH SEAT PAN:	Grey Vinyl				Back
<b>SEAT-TO-FLOOR:</b>	21-24 inches (Cushion Not Compressed)				19-22 inches (To Seat Pan)
<b>OVERALL WIDTH (NO JOYSTICK):</b>	27-29 inches				
<b>OVERALL HEIGHT:</b>	31 inches (Folded); 54 inches (Upright)				
<b>OVERALL LENGTH:</b>	35 inches (With Footboard Folded) 43 inches (With Footboard Extended)				
<b>DRIVE WHEELS/TIRES:</b>	14 x 3-inch (Flat Free)				
<b>CASTER W/PRECISION SEALED BEARINGS:</b>	6 x 2-inch Front/Rear				
<b>FOOTRESTS/ LEGRESTS:</b>	Flip Up, Depth and Height Adjustable, Footboard, Swingaway Front Rigging, Elevating Legrest				
<b>WEIGHT<sup>2</sup>:</b>					
W/O BATTERIES:	216 lbs				
W/BATTERIES:	290 lbs				
<b>SHIPPING:</b>	260 lbs (w/o Batteries), 310 lbs (w/Batteries)				
<b>ARMRESTS:</b>	Adjustable Angle, Height and Width, Desk and Full Length				
<b>BATTERIES:</b>	22NF - Quantity 2				
<b>PERFORMANCE:</b>					
SPEED:	0 to 4.5 MPH				
TURNING RADIUS:	19½ inches				
*RANGE (VARIABLE):	10-15 miles				
**WEIGHT LIMITATION:	500 lbs				
<b>OPERATING TEMPERATURE STORAGE TEMPERATURE</b>	122 F (50 C) Maximum to -13 F (-25 C) Minimum				
	149 F (65 C) Maximum to -58 F (-40 C) Minimum				

NOTE: Based on 24-inch wide Van seat.

\*NOTE: Values for range are calculated for maximum chair weight rating using largest batteries applicable (22NF), per test procedures described in ANSI/RESNA WC/VOL2-1998 Section 4 and meet federal reimbursement requirements for this product. While considered typical, they are derived based on certain ideal conditions. Variances in battery condition, user weight, usage pattern or overall terrain conditions will result in actual values for range that differ from these stated values. Users should become accustomed to how their unique conditions impact their individual results. Users should become familiar with the battery discharge indicator on the joystick to determine the range of their wheelchair. Refer to When to Charge Batteries on page 82 for more information about the battery discharge indicator.

\*\*NOTE: Refer to Stability and Balance on page 23.

**Footnotes:**

1. Back height without headrest.
2. Includes seating systems and accessories.

---

# SECTION I—GENERAL GUIDELINES

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## **⚠ WARNING**

**SECTION I - GENERAL GUIDELINES** contains important information for the safe operation and use of this product.

---

## **⚠ DANGER**

**Risk of Death, Serious Injury or Damage**

Improper use of this product may cause injury or damage

If you are unable to understand the warnings, cautions or instructions, contact a health care professional or dealer before attempting to use this equipment.

**DO NOT** use this product or any available optional equipment without first completely reading and understanding these instructions and any additional instructional material such as user manual, service manuals or instruction sheets supplied with this product or optional equipment.

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## **Accessories Information**

---

## **⚠ WARNING**

**Risk of injury or damage**

Use of non-Invacare accessories may result in injury or damage.

Invacare products are specifically designed and manufactured for use in conjunction with Invacare accessories. Accessories designed by other manufacturers have not been tested by Invacare and are not recommended for use with Invacare products.

**DO NOT** use non-Invacare accessories.

To obtain Invacare accessories, contact Invacare by phone or at [www.invacare.com](http://www.invacare.com)

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## **⚠ WARNING**

**EXTREME** care should be exercised when using oxygen in close proximity to electric circuits and other combustible materials. Contact your oxygen supplier for instruction in the use of oxygen.

---

## Batteries

---

### **⚠ WARNING**

The warranty and performance specifications contained in this manual are based on the use of deep cycle gel cell or sealed lead acid batteries. Invacare strongly recommends their use as the power source for this unit.

Carefully read battery/battery charger information prior to installing, servicing or operating your wheelchair.

The use of rubber gloves is recommended when working with batteries.

Some battery manufacturers mold a carrying strap and/or hold down flanges directly into the battery case. Batteries that interfere with the battery box cannot be used for these applications. Attempting to “wedge” a battery into a battery box may damage the box, the battery and/or be a fire hazard, resulting in serious injury or further damage to property.

---

## Charging Batteries

---

### **⚠ DANGER**

When using an extension cord, use only a three wire extension cord having at least 16 AWG (American Wire Gauge) wire and the same or higher electrical rating as the device being connected. Use of improper extension cord could result in risk of fire and electric shock. Three prong to two prong adapters should not be used. Use of three prong adapters can result in improper grounding and present a shock hazard to the user.

---

### **⚠ WARNING**

**NEVER** attempt to recharge the batteries by attaching cables directly to the battery terminals.

**DO NOT** attempt to recharge the batteries and operate the wheelchair at the same time.

**DO NOT** operate wheelchair with extension cord attached to the AC cable.

**DO NOT** attempt to recharge the batteries when the wheelchair has been exposed to any type of moisture.

**DO NOT** attempt to recharge the batteries when the wheelchair is outside.

**DO NOT** sit in the wheelchair while charging the batteries.

**READ** and **CAREFULLY** follow the manufacturer’s instructions for each charger (supplied or purchased). If charging instructions are not supplied, consult a qualified technician for proper procedures.

Ensure the pins of the extension cord plug are the same number, size, and shape as those on the charger.

**DO NOT** under any circumstances cut or remove the round grounding plug from the charger AC cable plug or the extension cord plug.

---

---

## Operation Information

---

### **WARNING**

#### **Risk of Serious Injury or Damage**

Moving the seating system from the factory setting may reduce driver control, wheelchair stability, traction and increase caster wear resulting in serious injury or damage.

Move the seating system **ONLY** when necessary to fit the wheelchair to the user.

If the seating system must be moved, **ALWAYS** inspect the wheelchair to ensure the front rigging **DOES NOT** interfere with the front casters.

If the seating system must be moved, **ALWAYS** inspect to ensure the wheelchair **DOES NOT** easily tip forward or backward.

---

### **DANGER**

#### **Risk of Death, Serious Injury or Damage**

Operating the wheelchairs outdoors or in areas of poor lighting may result in death, serious injury, or damage.

Operating the wheelchair near motor vehicles may result in death, serious injury or damage.

**DO NOT** operate on roads, streets or highways.

Use caution when operating the wheelchair outdoors at night or in areas with poor lighting.

**ALWAYS** be aware of motor vehicles when using the wheelchair.

---

### **DANGER**

#### **Risk of Death, Serious Injury, or Damage**

Continued use of the wheelchair that is not set to the correct specifications may cause erratic behavior of the wheelchair resulting in death, serious injury, or damage.

Performance adjustments should only be made by professionals of the healthcare field or persons fully conversant with this process and the driver's capabilities.

After the wheelchair has been set up/adjusted, check to make sure that the wheelchair performs to the specifications entered during the set up procedure. If the wheelchair does not perform to specifications, turn the wheelchair **Off** immediately and reenter set up specifications. Contact Invacare, if wheelchair still does not perform to correct specifications.

---

**⚠ DANGER**

**Risk of Death, Serious Injury or Damage**

Misuse of the wheelchair may cause component failure and/or the wheelchair to start smoking, sparking, or burning. Death, serious injury, or damage may occur due to fire.

**DO NOT** use the wheelchair other than its intended purpose. If the wheelchair starts smoking, sparking, or burning, discontinue using the wheelchair and seek service **IMMEDIATELY**.

---

**⚠ WARNING**

**Risk of Serious Injury or Damage**

Operating the wheelchair with a ground clearance of less than 3 inches between the footplates and the ground/floor may cause serious injury or property damage.

**ALWAYS** maintain a minimum of 3 inches between the bottom of the footplates and ground/floor to ensure proper ground clearance while the wheelchair is in motion. If necessary, adjust the footplates height to achieve proper ground clearance. After footplates height adjustment, if the wheelchair dips forward and the footplates touch the ground while in motion, please contact your dealer for an inspection and avoid use of the wheelchair if possible.

*NOTE: This warning applies to the use of the footboard as well.*

---

**⚠ WARNING**

Ensure that driving surfaces, ramps, lifts, elevators, etc. are capable of supporting combined weight of user and wheelchair (for a 500 lbs user, the combined weight could be up to 800 lbs).

**ALWAYS** shift your weight in the direction you are turning. **DO NOT** shift your weight in the opposite direction of the turn. Shifting your weight in the opposite direction of the turn may cause the inside drive wheel to lose traction and the wheelchair to tip over.

The arms on the M94 wheelchair are designed as armrests **ONLY**. The arms are not designed to support the full weight of the wheelchair user.

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

**DO NOT** make sharp turns in the forward or reverse direction at excessive speed. Failure to observe this warning can cause the wheelchair to tip over and may result in injury to users, bystanders and/or damage to product.

**DO NOT** store items under seat - interference with seat latch may result.

Avoid storing or using the wheelchair near open flame or combustible products. Serious injury or damage to property may result.

**DO NOT** engage or disengage the motor release levers until the power is in the off position.

**DO NOT** climb, go up or down ramps or traverse slopes greater than 9°.

---

**⚠ WARNING**

**NEVER** leave an unoccupied wheelchair on an incline.

**DO NOT** attempt to stop a moving wheelchair with wheel locks. Wheel locks are not brakes.

**DO NOT** attempt to drive over curbs or obstacles. Doing so may cause your wheelchair to turn over and cause bodily harm or damage to the chair.

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

**DO NOT** leave the power button in the on position when entering or exiting your wheelchair.

**DO NOT** lean over the top of the back upholstery to reach objects behind you, as this may cause the wheelchair to tip over.

**DO NOT** stand on the frame of the wheelchair.

**DO NOT** stand on the flip-up footboard, otherwise damage may occur. When getting in or out of the wheelchair, make sure that the flip-up footboard is in the upward position.

**DO NOT** stand on the front riggings, otherwise damage may occur. When getting in or out of the wheelchair, make sure that the footplates on the front riggings are in the upward position or moved out of the way.

**ALWAYS** keep hands and fingers clear of moving parts to avoid injury.

Make sure the detent balls of the quick-release pin are fully released beyond the outer edge of the tube before operating the wheelchair. Otherwise, injury and/or damage may result.

The detent balls **MUST** be protruding past the top of the seat plate assembly for a positive lock.

Keep detent balls clean.

Before performing any maintenance, adjustment or service verify that On/Off switch on the joystick is in the off position.

Avoid storage or use near external flame or combustible products.

---

## Grounding Instructions

---

### **⚠ WARNING**

**DO NOT**, under any circumstances, cut or remove the round grounding prong from any plug used with or for Invacare products. Some devices are equipped with three-prong (grounding) plugs for protection against possible shock hazards and fire. Where a two-prong wall receptacle is encountered, it is the personal responsibility and obligation of the customer to contact a qualified electrician and have the two-prong receptacle replaced with a properly grounded three-prong wall receptacle in accordance with the National Electrical Code. If you must use an extension cord, use **ONLY** a three-wire extension cord having the same or higher electrical rating as the device being connected. In addition, Invacare has placed **RED/ORANGE** warning tags on some equipment. **DO NOT** remove these tags.

---

## Repair or Service

---

### **⚠ DANGER**

**Risk of Death, Serious Injury or Damage**

Use of incorrect or improper replacement (service) parts may cause death, serious injury, or damage.

Replacement parts **MUST** match original Invacare parts.

**ALWAYS** provide the wheelchair serial number to assist in ordering the correct replacement parts.

---

### **⚠ DANGER**

**Risk of Death, Serious Injury, or Damage**

Incorrect repair and/or servicing of this wheelchair performed by users/caregivers or unqualified technicians can result in death, serious injury, or damage.

**Users/Caregivers — DO NOT** attempt to repair and/or service this wheelchair.

Repair and/or service of this wheelchair **MUST** be performed by a qualified technician. Contact a dealer or Invacare technician.

---

### **⚠ WARNING**

Set-up of the Electronics Control Unit is to be performed only by a qualified technician. The final adjustments of the controller may affect other activities of the wheelchair. Damage to the equipment could occur if improperly set-up or adjusted.

---

**⚠ DANGER****Risk of Death, Serious Injury, or Damage**

Corroded electrical components due to water, liquid exposure, or incontinent users can result in death, serious injury, or damage.

Minimize exposure of electrical components to water and/or liquids. Electrical components damaged by corrosion **MUST** be replaced immediately.

Wheelchairs that are used by incontinent users and/or are frequently exposed to water/liquids may require replacement of electrical components more frequently.

---

**Rain Test**

---

**⚠ CAUTION****Risk of Damage**

Operating the wheelchair in rain or dampness may cause the wheelchair to malfunction electrically and mechanically; may cause the wheelchair to prematurely rust or may damage the upholstery.

**DO NOT** leave wheelchair in a rain storm of any kind.

**DO NOT** use wheelchair in a shower.

**DO NOT** leave wheelchair in a damp area for any length of time.

Check to ensure that the battery covers are secured in place, joystick boot is **NOT** torn or cracked where water can enter and that all electrical connections are secure at all times. **DO NOT** use if the joystick boot is torn or cracked. If the joystick boot becomes torn or cracked, replace **IMMEDIATELY**.

---

**⚠ WARNING**

Check to ensure that the **RED** and **BLACK** battery terminal caps are secured in place, joystick boot is not torn or cracked where water can enter and that all electrical connections are secure at all times.

**DO NOT** use the wheelchair if the joystick boot is torn or cracked. If the joystick boot becomes torn or cracked, replace **IMMEDIATELY**.

---

**⚠ WARNING**

**WEIGHT TRAINING** - Invacare does not recommend the use of its wheelchairs as a weight training apparatus. Invacare wheelchairs have not been designed or tested as a seat for any kind of weight training. If occupant uses said wheelchair as a weight training apparatus, Invacare shall not be liable for bodily injury and the warranty is void.

**WEIGHT LIMITATION** - The M94 with SureStep has a weight limitation of 500 lbs.

---

## SECTION 2—SAFETY GUIDELINES

---

### **⚠ DANGER**

#### **Risk of Death, Serious Injury, or Damage**

Missing attaching hardware could cause instability resulting in death, serious injury or damage.

Ensure all attaching hardware is present and tightened securely.

#### **Risk of Death, Serious Injury, or Damage**

Lighted cigarettes dropped onto an upholstered seating system can cause a fire resulting in death, serious injury, or damage.

Wheelchair occupants are at particular risk of death or serious injury from these fires and resulting fumes because they may not have the ability to move away from the wheelchair.

**DO NOT** smoke while using this wheelchair.

#### **Risk of Death or Serious Injury**

Traveling on inclines with wet, slippery, icy or oily surfaces could cause loss of traction resulting in death or serious injury.

**DO NOT** use on inclines with wet, slippery, icy or oily surfaces. This may include certain painted or otherwise treated wood surfaces.

#### **Risk of Death or Serious Injury**

Electric shock can cause death or serious injury

To avoid electric shock, inspect plug and cord for cuts and/or frayed wires. Replace cut cords or frayed wires immediately.

#### **Risk of Death, Serious Injury, or Damage**

Malfunctioning joystick could cause unintended/erratic movement resulting in death, serious injury, or damage.

If unintended/erratic movement occurs, stop using the wheelchair immediately and contact a qualified technician.

---

### **⚠ WARNING**

#### **Risk of Serious Injury or Damage**

Attaching hardware that is loosely secured could cause loss of stability resulting in serious injury or damage

After **ANY** adjustments, repair or service and before use, make sure that all attaching hardware is tightened securely.

---

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**⚠ WARNING****Risk of Serious Injury or Damage**

Loss of power due to loose electrical connections could cause the wheelchair to suddenly stop resulting in serious injury or damage.

**ALWAYS** ensure that all electrical connections are tightly connected so they don't vibrate loose.

**Risk of Minor to Serious Injury**

Pinch points can cause minor to serious injury.

Be mindful of potential pinch points and use caution when using this product.

**Risk of Serious Injury**

Impacting objects in the surrounding environment can cause serious injury.

When maneuvering the wheelchair around, **ALWAYS** have assured cleared distance with all objects in environment.

**Risk of Serious Injury**

Sharp edges can cause serious injury.

Be mindful that some parts may have sharp edges. Use caution when encountering these sharp edges.

**Risk of Serious Injury**

Hot surfaces can cause severe burns.

Be mindful of potential hot surfaces and avoid touching.

**Risk of Serious Injury or Damage**

Accidental activation of wheelchair caused by pets, children, etc. can result in serious injury or damage.

**ALWAYS** turn power off when around pets and/or children to prevent unintended movement.

**Risk of Death or Serious Injury**

Braking hard and/or sudden stops while on inclines could cause loss of stability resulting in death or serious injury.

While on inclines, **ALWAYS** travel at a reduced, constant speed to maintain stability. Traveling down ramps at high speeds will reduce traction and increase stopping distance.

**DO NOT** brake hard and avoid sudden stops while traveling on an incline.

If stopping becomes necessary while on an incline, release the joystick and allow the wheelchair to come to a full stop. Then proceed at a slower speed.

---

**⚠ WARNING**

**Risk of Serious Injury or Damage**

Dropping the battery can result in serious injury or property damage.

Batteries can weigh up to 52 lbs (23.6 kg). **ALWAYS** use a battery lifting strap when lifting the battery. It is the most reliable method of carrying a battery and preventing serious injury.

**Risk of Death, Serious Injury or Damage**

Exceeding the weight capacity of the wheelchair/seating system could cause instability resulting in death or serious injury.

**DO NOT** exceed the weight capacity.

**Risk of Serious Injury or Death**

Failure to observe this warning can result in serious injury or death.

Loss of traction on ramps and inclines can occur for a variety of reasons including; water, ramp material, surface conditions, steepness or grade etc. Lighter weight users may be at an increased risk for loss of traction. As such, when using on ramps or inclines always reduce speed and proceed with caution.

**Risk of Death, Serious Injury, or Damage**

Improperly connected joystick could cause loss of power resulting in death, serious injury, or damage.

Ensure the joystick is securely connected to controller.

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# SECTION 3—EMI INFORMATION

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## **⚠ WARNING**

**CAUTION: IT IS VERY IMPORTANT THAT YOU READ THIS INFORMATION REGARDING THE POSSIBLE EFFECTS OF ELECTROMAGNETIC INTERFERENCE ON YOUR POWERED WHEELCHAIR.**

### **Electromagnetic Interference (EMI) From Radio Wave Sources**

Powered wheelchairs and motorized scooters (in this text, both will be referred to as powered wheelchairs) may be susceptible to electromagnetic interference (EMI), which is interfering electromagnetic energy (EM) emitted from sources such as radio stations, TV stations, amateur radio (HAM) transmitters, two way radios, and cellular phones. The interference (from radio wave sources) can cause the powered wheelchair to release its brakes, move by itself, or move in unintended directions. It can also permanently damage the powered wheelchair's control system. The intensity of the interfering EM energy can be measured in volts per meter (V/m). Each powered wheelchair can resist EMI up to a certain intensity. This is called its "immunity level." The higher the immunity level, the greater the protection. At this time, current technology is capable of achieving at least a 20 V/m immunity level, which would provide useful protection from the more common sources of radiated EMI.

There are a number of sources of relatively intense electromagnetic fields in the everyday environment. Some of these sources are obvious and easy to avoid. Others are not apparent and exposure is unavoidable. However, we believe that by following the warnings listed below, your risk to EMI will be minimized.

The sources of radiated EMI can be broadly classified into three types:

- 1) Hand-held Portable transceivers (transmitters-receivers with the antenna mounted directly on the transmitting unit. Examples include: citizens band (CB) radios, "walkie talkie", security, fire and police transceivers, cellular telephones, and other personal communication devices).

*NOTE: Some cellular telephones and similar devices transmit signals while they are ON, even when not being used.*

- 2) Medium-range mobile transceivers, such as those used in police cars, fire trucks, ambulances and taxis. These usually have the antenna mounted on the outside of the vehicle; and
- 3) Long-range transmitters and transceivers, such as commercial broadcast transmitters (radio and TV broadcast antenna towers) and amateur (HAM) radios.

*NOTE: Other types of hand-held devices, such as cordless phones, laptop computers, AM/FM radios, TV sets, CD players, cassette players, and small appliances, such as electric shavers and hair dryers, so far as we know, are not likely to cause EMI problems to your powered wheelchair.*

---

**⚠ WARNING****Powered Wheelchair Electromagnetic Interference (EMI)**

Because EM energy rapidly becomes more intense as one moves closer to the transmitting antenna (source), the EM fields from hand-held radio wave sources (transceivers) are of special concern. It is possible to unintentionally bring high levels of EM energy very close to the powered wheelchair's control system while using these devices. This can affect powered wheelchair movement and braking. Therefore, the warnings listed below are recommended to prevent possible interference with the control system of the powered wheelchair.

Electromagnetic interference (EMI) from sources such as radio and TV stations, amateur radio (HAM) transmitters, two-way radios, and cellular phones can affect powered wheelchairs and motorized scooters.

**FOLLOWING THE WARNINGS LISTED BELOW SHOULD REDUCE THE CHANCE OF UNINTENDED BRAKE RELEASE OR POWERED WHEELCHAIR MOVEMENT WHICH COULD RESULT IN SERIOUS INJURY.**

- 1) Do not operate hand-held transceivers (transmitters receivers), such as citizens band (CB) radios, or turn ON personal communication devices, such as cellular phones, while the powered wheelchair is turned ON;
- 2) Be aware of nearby transmitters, such as radio or TV stations, and try to avoid coming close to them;
- 3) If unintended movement or brake release occurs, turn the powered wheelchair OFF as soon as it is safe;
- 4) Be aware that adding accessories or components, or modifying the powered wheelchair, may make it more susceptible to EMI (NOTE: There is no easy way to evaluate their effect on the overall immunity of the powered wheelchair); and
- 5) Report all incidents of unintended movement or brake release to the powered wheelchair manufacturer, and note whether there is a source of EMI nearby.

**Important Information**

- 1) 20 volts per meter (V/m) is a generally achievable and useful immunity level against EMI (as of May 1994) (the higher the level, the greater the protection);
- 2) This device has been tested to a radiated immunity level of 20 volts per meter.
- 3) The immunity level of the product is unknown.

Modification of any kind to the electronics of this wheelchair as manufactured by Invacare may adversely affect the EMI immunity levels.

---

# SECTION 4—SAFETY/HANDLING OF WHEELCHAIRS

“Safety and Handling” of the wheelchair requires the close attention of the wheelchair user as well as the assistant. This manual points out the most common procedures and techniques involved in the safe operation and maintenance of the wheelchair. It is important to practice and master these safe techniques until you are comfortable in maneuvering around the frequently encountered architectural barriers.

Use this information only as a “basic” guide. The techniques that are discussed on the following pages have been used successfully by many.

Individual wheelchair users often develop skills to deal with daily living activities that may differ from those described in this manual. Invacare recognizes and encourages each individual to try what works best for him/her in overcoming architectural obstacles that they may encounter, however ALL WARNINGS and CAUTIONS given in this manual MUST be followed. Techniques in this manual are a starting point for the new wheelchair user and assistant with “safety” as the most important consideration for all.

## Stability and Balance

---

### **⚠ DANGER**

#### **Risk of Death or Serious Injury**

**Not performing periodic maintenance on stability lock could result in death or serious injury.**

**ALWAYS perform the periodic maintenance to the stability lock listed in the inspection checklist of this manual.**

---

### **⚠ WARNING**

**Ensure that driving surfaces, ramps, lifts, elevators, etc. are capable of supporting combined weight of user and wheelchair (for a 500 lbs user, the combined weight could be up to 800 lbs).**

**Be aware that carrying heavy objects on your lap while occupying the wheelchair may adversely affect the stability of the wheelchair, resulting in serious bodily injury to the user, damage to the wheelchair and surrounding property.**

**This wheelchair has been designed to accommodate one individual. If more than one individual occupies the wheelchair this may adversely affect the stability of the wheelchair, resulting in serious bodily injury to the user and passenger and damage to the wheelchair and surrounding property.**

---

To assure stability and proper operation of your wheelchair, you must at all times maintain proper balance. Your wheelchair has been designed to remain upright and stable during normal daily activities as long as you DO NOT move beyond the center of gravity. DO NOT lean forward out of the wheelchair any further than the length of the armrests.

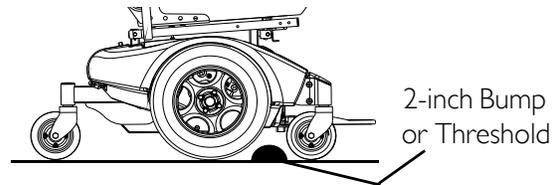
## Coping With Everyday Obstacles

*NOTE: For this procedure, refer to FIGURE 4.1.*

Coping with the irritation of everyday obstacles can be alleviated somewhat by learning how to manage your wheelchair. Keep in mind your center of gravity to maintain stability and balance.

While the walking beam allows to traverse up to a 2-inch bump or threshold, stopping after the wheels cross the bump poses a problem. The chair cannot reverse over the bump at this point. Continue forward and then turn around.

While the M94 is designed for use primarily in and around the home, the provider should determine whether this chair is suitable for the actual environment the chair will be used in.



**FIGURE 4.1** Coping With Everyday Obstacles

DO NOT go down ramp at full speed. Some seat/back positions will cause wheelchair to feel unstable.

---

### CAUTION

**Be aware of condition of ramp. Traction will be diminished/nonexistent on a slippery surface. Proceed with caution.**

---

## A Note to Wheelchair Assistants

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

Also, be aware of detachable parts such as arms or legrests. These must NEVER be used to move the wheelchair or as lifting supports, as they may be inadvertently released, resulting in possible injury to the user and/or assistant(s).

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

## Lifting/Stairways

---

### ⚠ WARNING

**DO NOT attempt to move an occupied power wheelchair between floors using a stairway. Use an elevator to move an occupied power wheelchair between floors. If moving a power wheelchair between floors by means of a stairway, the occupant MUST be removed and transported independently of the power wheelchair.**

---

**⚠ WARNING**

Ensure that driving surfaces, ramps, lifts, elevators, etc. are capable of supporting combined weight of user and wheelchair (for a 500 lbs user, the combined weight could be up to 800 lbs).

Extreme caution is advised when it is necessary to move an unoccupied power wheelchair up or down the stairs. Invacare recommends using two assistants and making thorough preparations.

Use **ONLY** secure, nondetachable parts for hand-hold supports.

It is strongly recommended to lift the wheelchair only by the rear frame and the front forks - otherwise injury or damage may occur.

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

Pinch point exists between head tube cap and walking beam.

The weight of the wheelchair with batteries and without the user is 290 lbs. Use proper lifting techniques (lift with your legs) to avoid injury.

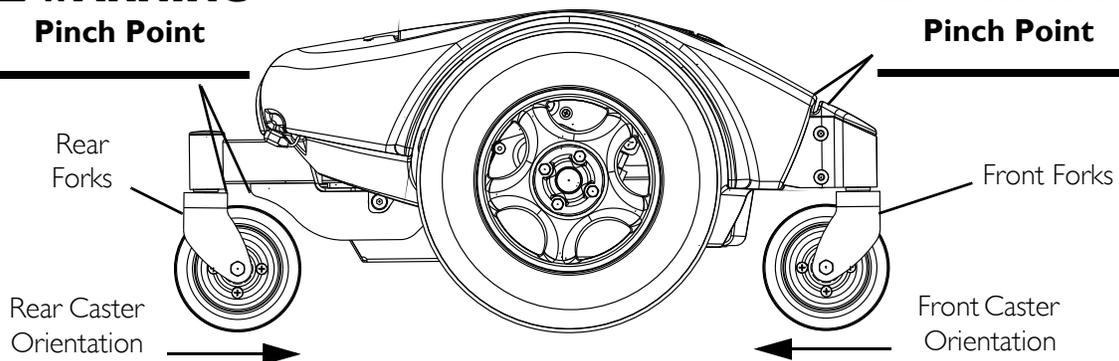
*NOTE: For this procedure, refer to FIGURE 4.2 on page 25.*

Follow this procedure for moving the wheelchair between floors when an elevator is not available or lifting the wheelchair is necessary:

*NOTE: When using a stairway to move the wheelchair, seat and any accessories, move all wheelchair components away from the stairway prior to reassembly.*

1. Remove the occupant from the wheelchair.
2. Remove the seat. Refer to Removing/Installing the Seat Assembly on page 56.
3. Remove any accessories on the wheelchair.
4. Bend your knees and keep your back straight.
5. Ensure that the casters are oriented as shown in FIGURE 4.2.
6. Using the rear and front forks as hand hold supports, transfer the wheelchair base to desired location. Refer to FIGURE 4.2.

**⚠ WARNING**  
**Pinch Point**



**FIGURE 4.2** Lifting/Stairways - orientation of casters and Pinch Points

7. Using non-removable (nondetachable) parts, transfer the seat and any accessories to desired location.
8. Reassemble the wheelchair.

---

**⚠ WARNING: ESCALATORS**

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

Ensure that driving surface, ramps, lifts, elevators, etc. are capable of supporting combined weight of user and wheelchair (for a 500lbs user, the combined weight could be up to 800 lbs).

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## Transferring to and From Other Seats

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**⚠ WARNING**

**Risk of Serious Injury or Damage**

Improper transfer techniques may cause serious injury or damage.

Before attempting transfers, consult a health care professional to determine proper transfer techniques for the user and type of wheelchair.

Reduce gap between transfer surface and wheelchair seat to the minimum distance necessary to perform transfer.

Align casters parallel to the drive wheels to improve stability during transfer.

**ALWAYS** turn the wheelchair power off.

**ALWAYS** engage both motor locks/clutches and free wheel hubs (if equipped) to prevent the wheels from moving before transferring into or from the wheelchair.

---

**CAUTION**

When transferring, position yourself as far back as possible in the seat. This will prevent broken screws, damaged upholstery and the possibility of the wheelchair tipping forward.

---

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

*NOTE: For this procedure, refer to FIGURE 4.3.*

1. Position the wheelchair as close as possible along side the seat to which you are transferring, with the rear casters pointing away from it.
2. After the wheelchair is positioned properly for transfer, verify that the Motor Release Levers are engaged. Refer to [Engaging/Disengaging Motor Release Lever](#) on page 72.
3. Flip back or remove arm on side of wheelchair you are transferring from.
4. Shift body weight into seat with transfer.



**FIGURE 4.3** Transferring to and From Other Seats'

During independent transfer, little or no seat platform will be beneath you. Use a transfer board if at all possible.

## Reaching, Leaning and Bending - Forward

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

Position the front and rear casters so that they are extended as far forward as possible and engage Motor Release Levers.

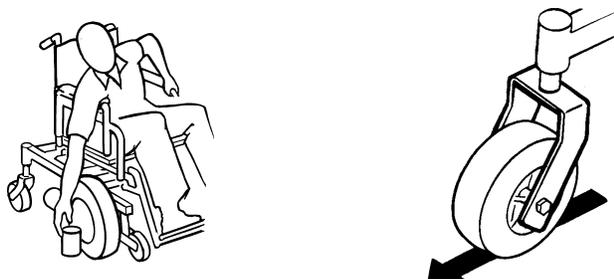
### **⚠ WARNING**

#### **Risk of Serious Injury or Damage**

**Improper positioning while leaning or bending could cause the wheelchair to tip forward resulting in serious injury or damage.**

**To assure stability and proper operation of your wheelchair, you must at all times maintain proper balance. Your wheelchair has been designed to remain upright and stable during normal daily activities as long as you **DO NOT** move beyond the center of gravity. **DO NOT** lean forward out of the wheelchair any further than the length of the armrests.**

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



**FIGURE 4.4** Reaching, Leaning and Bending - Forward

## Reaching and Bending - Backward

---

### **⚠ WARNING**

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

---

*NOTE: For this procedure, refer to FIGURE 4.5.*

Position wheelchair as close as possible to the desired object. Point the front and rear casters rearward to create the longest possible wheelbase. Reach back only as far as your arm will extend without changing your sitting position.



**FIGURE 4.5** Reaching and Bending - Backward

# SECTION 5—SAFETY INSPECTION/ TROUBLESHOOTING

*NOTE: Every six months or as necessary take your wheelchair to a qualified dealer for a thorough inspection and servicing. Regular cleaning will reveal loose or worn parts and enhance the smooth operation of your wheelchair. To operate properly and safely, your wheelchair must be cared for just like any other vehicle. Routine maintenance will extend the life and efficiency of your wheelchair.*

## Safety Inspection Checklists

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

---

### **⚠ DANGER**

#### **Risk of Death or Serious Injury**

**Failure to complete the inspection of the critical components listed below could result in death or serious injury.**

**Inspect stability control components which could include anti-dive spring, anti-dive cylinder, ratcheting gears, or end stops to ensure proper operation.**

**Inspect drive axle nut, locking tab, wheel fasteners or quick release to ensure drive wheel is secure.**

---

#### **Inspect/Adjust Initially**

- Ensure the wheelchair rolls straight (no excessive drag or pull to one side).
- Ensure the arms are secure but easy to release and adjustment levers engage properly (on ASBA only).
- Ensure the adjustable height arms operate and lock securely.
- Ensure the armrest pads sit flush against arm tubes.
- Ensure the seat is secured to wheelchair frame.
- Ensure the seat release latch is functional. Replace if necessary.
- Ensure the wheel mounting nuts are secure on drive wheels.
- Ensure the no excessive side movement or binding when drive wheels are lifted and spun when disengaged (freewheeling).
- Ensure the wheel/fork assembly has proper tension when caster is spun. Caster should come to a gradual stop.

### **CAUTION**

**As with any vehicle, wheels and tires should be checked periodically for cracks and wear and should be replaced as necessary.**

---

- Ensure the loosen/tighten caster locknut if wheel wobbles noticeably or binds to a stop.
- Ensure all caster/wheel/fork/headtube fasteners are secure.
- Ensure the inspect tires for flat spots and wear.
- Ensure the inspect and clean the stability lock gears.
- Ensure the clean upholstery and armrests.
- Ensure that casters are free of debris.

### **Inspect/Adjust Weekly**

- Ensure the seat is secured to wheelchair frame.
- Ensure the seat and/or back upholstery have no rips and DO NOT sag. Replace if necessary.
- Ensure the seat release latch is not worn and is functional. Replace if necessary.
- Ensure the inspect tires for flat spots and wear.
- Ensure the arm pivot points are not worn and/or loose. Replace if necessary.
- Ensure the inspect and clean the stability lock gears. Replace if worn.
- Ensure that casters are free of debris.

### **Inspect/Adjust Monthly**

- Ensure the wheel mounting nuts are secure on drive wheels.
- Ensure the no excessive side movement or binding when drive wheels are lifted and spun when disengaged (free-wheeling).
- Ensure the wheel/fork assembly has proper tension when caster is spun. Caster should come to a gradual stop.

### **CAUTION**

**As with any vehicle, wheels and tires should be checked periodically for cracks and wear and should be replaced as necessary.**

---

- Ensure the loosen/tighten caster locknut if wheel wobbles noticeably or binds to a stop.
- Ensure all caster/wheel/fork/headtube fasteners are secure.
- Inspect for any loose hardware on the wheelchair.

- Inspect seat positioning strap for any signs of wear. Ensure buckle latches. Verify hardware that attaches strap to frame is secure and undamaged. Replace if necessary.
- Ensure that casters are free of debris.

### Inspect/Adjust Periodically

- Ensure the wheelchair rolls straight (no excessive drag or pull to one side).
- Ensure the arms are secure but easy to release and adjustment levers engage properly (on ASBA only).
- Ensure the adjustable height arms operate and lock securely.
- Ensure the arm pivot points are not worn and/or loose. Replace if necessary.
- Ensure the armrest pads sit flush against arm tubes.
- Ensure the seat and/or back upholstery have no rips and DO NOT sag. Replace if necessary.
- Ensure the seat release latch is not worn. Replace if necessary.
- Inspect and clean the stability lock gears. Replace if worn.
- Clean upholstery and armrests.
- Inspect the seat positioning strap for wear. Replace if worn or damaged.
- Inspect charger AC power cord for damage. Replace if necessary.
- Ensure that casters are free of debris.
- Check that all labels are present and legible. Replace if necessary.
- Inspect electrical components for signs of corrosion. Replace if corroded or damaged.

### Troubleshooting - Mechanical

WHEELCHAIR VEERS LEFT/RIGHT	SLUGGISH TURN/ PERFORMANCE	CASTERS FLUTTER	SQUEAKS AND RATTLES	LOOSENESS IN WHEELCHAIR	WHEELCHAIR 3 WHEELS	SOLUTIONS
X	X	X				If pneumatic, check tires for correct and equal pressure.
X	X	X	X			Check for loose stem nuts/bolts.
X		X				Check that casters contact ground at the same time.
				X	X	If pneumatic, check tires for correct and equal pressure.

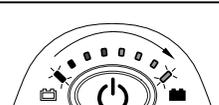
## Troubleshooting - Electrical

*NOTE: For additional troubleshooting information and explanation of error codes, refer to the individual Electronics Manual supplied with each wheelchair*

### **SPJ+™ , SPJ+ w/PSS or SPJ+ w/ACC Joysticks**

The joystick information gauge and the service indicator give indications of the type of fault or error detected by the control module. When a fault is detected, the wheelchair may stop and not drive. The LEDs on the information gauge may flash in a particular pattern or the service indicator light will flash. The number or type of flashes indicates the nature of the error. If multiple errors are found, only the first error encountered by the control module will be displayed.

## Information Gauge Display Diagnostics

DISPLAY	DESCRIPTION	DEFINITION	COMMENTS
 <p>Information Gauge Display</p>			
	All LEDs are off.	Power is off.	
	All LEDs are on.	Power is on.	Fewer than three LEDs on implies reduced battery charge.
	Left RED LED is flashing.	Battery charge is low.	The batteries should be charged as soon as possible.
	Left to Right “chase” alternating with steady display.	Joystick is in programming, inhibit and/or charging mode.	The steady LEDs indicate the current state of the battery charge.
	All LEDs are flashing slowly.	Joystick has detected Out-of-Neutral-at-Power-Up mode.	Release the joystick back to Neutral.

## Service Indicator Light Diagnostics

NUMBER OF FLASHES	ERROR CODE DESCRIPTION	POSSIBLE SOLUTION
1	User Fault	Release joystick to neutral and try again.
2	Battery Fault	Charge the batteries. Refer to <a href="#">Charging Batteries</a> on page 81. Check that battery cables are connected properly. Refer to <a href="#">Connecting/Disconnecting the Battery Wiring Harness</a> on page 79. If necessary, replace batteries. Refer to <a href="#">Installing/Removing the Batteries</a> on page 76.
3	Left Motor Fault	Contact Invacare/Dealer for service.
4	Right Motor Fault	Contact Invacare/Dealer for service.
5	Left Park Brake Fault	Contact Invacare/Dealer for service.
6	Right Park Brake Fault	Contact Invacare/Dealer for service.
7	Remote Fault	Check to make sure joystick is connected properly. Contact Invacare/Dealer for service.
8	Controller Fault	Contact Invacare/Dealer for service.
9	Communications Fault	Contact Invacare/Dealer for service.
10	General Fault	Contact Invacare/Dealer for service.
11	Incompatible or incorrect Remote	Wrong type of remote connected. Contact Invacare/Dealer for service.

**MPJ+™ , PSR+, PSF+ Joysticks or Displays**

SYMPTOM	PROBABLE CAUSE	SOLUTIONS
<p>⚠ SPM L Park Brake Fault or</p> <p>⚠ SPM R Park Brake Fault displays and wheelchair does not drive.</p>	Motor lock levers disengaged (Error code E9 or E10).	Engage motor lock levers. Refer to <u>Engaging/Disengaging Motor Release Lever</u> on page 72.
CHARGER PLUGGED IN displays.	Battery charger connected (Error code E28).	Unplug battery charger from the wheelchair. Refer to <u>Charging Batteries</u> on page 81.
<p>⚠ SPM Battery Fault displays and the wheelchair does not drive.</p>	Batteries need to be charged (Error code E14).	Charge batteries. Refer to <u>Charging Batteries</u> on page 81. If batteries fail to charge properly, check battery charger or replace batteries. Refer to <u>Installing/Removing the Batteries</u> on page 76.
<p>⊘ JOYSTICK TIMEOUT displays and the wheelchair does not drive.</p>	Joystick or input device is disconnected (Error code 32).	Turn Off power, reconnect the joystick of input device and turn power On.
<p>⊘ JS REV TOO LARGE</p> <p>⊘ JS FWD TOO LARGE</p> <p>⊘ JS LFT TOO LARGE or</p> <p>⊘ JS RGT TOO LARGE</p> <p>displays and the wheelchair does not drive.</p>	The joystick or input device is sending a value outside of the reverse, forward, left or right limits (Error codes E01, E02, E03 or E04).	Replace joystick or input device.
NEUTRAL TESTING displays.	The joystick neutral test has failed (Error code E18).	Release the joystick and try to get the joystick back into the center-most position.
<p>⊘ BAD JOYSTICK CAL VALUES</p> <p>displays and the wheelchair does not drive.</p>	The joystick calibration values are outside of the expected range (Error code E19).	Recalibrate the joystick (joystick throw procedure).
⚠ SPM NOT CONNECTED	The MPJ or Display module is not communicating with the control module (Error code E200).	Check the connections between the joystick or display and the controller. Turn the power Off and then back On. Replace the controller if necessary.
<p>⚠ SPM Communications Fault</p> <p>displays and the wheelchair drives slowly.</p>	The controller has determined a fault during a previous turn-off process (Error code E41).	Turn the wheelchair Off and back On.
<p>ATTENDANT ACTIVE and  displays.</p>	The Proportional or Digital Attendant control is active and can be used to drive the chair (Error code W05).	This is normal behavior.
Batteries draw excessive current when charging.	Battery failure.	Have batteries checked for shorted cell. Replace if necessary.
	Electrical malfunction.	Contact Dealer/Invacare for service.

SYMPTOM	PROBABLE CAUSE	SOLUTIONS
Battery indicator flashes the charge level is low - immediately after recharge.	Battery failure.	Check batteries for shorted cell. Replace if necessary.
	Malfunctioning battery charger.	Contact Dealer/Invacare for Service.
	Electrical malfunction.	Contact Dealer/Invacare for Service.
Battery indicator flashes the charge level is low - too soon after being recharged.	Batteries not charged.	Have charger checked.
	Weak batteries.	Replace batteries if necessary. Contact Dealer/Invacare for Service.
Motor “chatters” or runs irregular.	Electrical malfunction.	Contact Dealer/Invacare for Service.
Joystick erratic or does not respond as desired.	Damaged motor coupling.	Contact Dealer/Invacare for Service.
	Electrical malfunction.	Contact Dealer/Invacare for Service.
	Controller programmed improperly.	Contact Dealer/Invacare to have controller reprogrammed.
Wheelchair does not respond to commands.	Poor battery terminal connection.	Have terminals cleaned.
Power indicator Off - even after recharging.	Electrical malfunction.	Contact Dealer/Invacare for Service.

## Checking Battery Charge Level

The following “Do’s” and “Don’ts” are provided for your convenience and safety.

DON'T	DO
Don't perform any installation or maintenance without first reading this manual.	Read and understand this manual and any service information that accompanies a battery and charger before operating the wheelchair.
Don't perform installation or maintenance of batteries in an area that could be damaged by battery spills.	Move the wheelchair to a work area before cleaning terminals, or opening battery box.
Don't make it a habit to discharge batteries to the lowest level.	Recharge as frequently as possible to maintain a high charge level and extend battery life.
Don't use randomly chosen batteries or chargers.	Follow recommendations in this manual when selecting a battery or charger.
Don't put new batteries into service before charging.	Fully charge a new battery before using.
Don't tip or tilt batteries.	Use a carrying strap to remove, move or install a battery.
Don't tap on clamps and terminals with tools.	Push battery clamps on the terminals. Spread clamps wider if necessary.
Don't mismatch your battery and chargers.	Use only a GEL charger for a GEL battery.

# SECTION 6—WHEELCHAIR OPERATION

## ⚠ WARNING

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

Set-up of the Electronic Control Unit is to be performed only by a qualified technician. The final adjustments of the controller may affect other activities of the wheelchair. Damage to the equipment could occur under these circumstances.

## Operating the Wheelchair

### Turning the Power On/Off

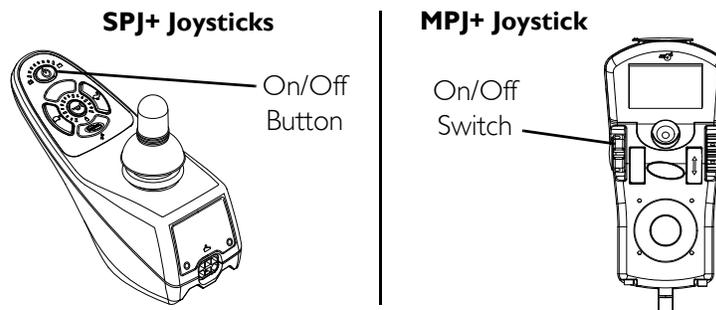
NOTE: For this procedure, refer to FIGURE 6.1.

- To turn the power On, perform one of the following steps:

JOYSTICK	ACTION
MPJ™ +	Move the On/Off switch Forward to the On position.
SPJ™ +	Press the On/Off button.

- Turning the power Off can be achieved by performing one of the following steps:

JOYSTICK	ACTION
MPJ+	Move the On/Off switch Back to the Off position.
SPJ+	Press the On/Off button.



**FIGURE 6.1** Turning the Power On/Off

## Using the Joystick to Drive the Wheelchair

*NOTE: For this procedure, refer to FIGURE 6.2.*

The joystick is located on the joystick housing and provides smooth control of speed and direction. It is equipped with 360 degrees of mobility for ease of operation. The joystick is spring-loaded, and automatically returns to the upright (neutral) position when released. Pushing the joystick in a given direction causes the wheelchair to move in that direction.

The joystick has proportional drive control, meaning that the further it is pushed from the upright (neutral) position, the faster the wheelchair moves. The maximum speed, however, is limited by the setting of the speed-control knob.

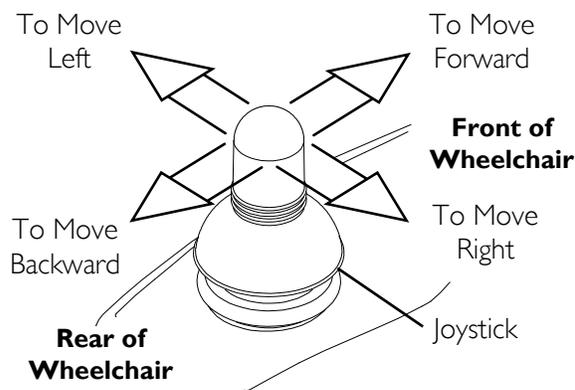
To slow the wheelchair to a stop, simply release the joystick. The wheelchair has automatic speed and direction compensation to minimize corrections.

When first learning to drive, select a slow speed and try to drive the wheelchair as slowly as possible by pushing the joystick slightly forward. This exercise will help you learn to utilize the full potential of the proportional control and allow you to start and stop smoothly.

To drive the wheelchair, perform the following:

1. Adjust speed control knob to the appropriate setting.
2. Turn the power On. Refer to Turning the Power On/Off on page 36.
3. Maneuver the joystick in the following manner:

MOVEMENT	ACTION
FORWARD	Push joystick forward, towards the front of the wheelchair.
REVERSE	Pull joystick back, towards the rear of the wheelchair.
Turn RIGHT	Move joystick toward the right side of the wheelchair.
Turn LEFT	Move joystick toward the left side of the wheelchair.
STOP	Release the joystick and the wheelchair will slow to a stop.



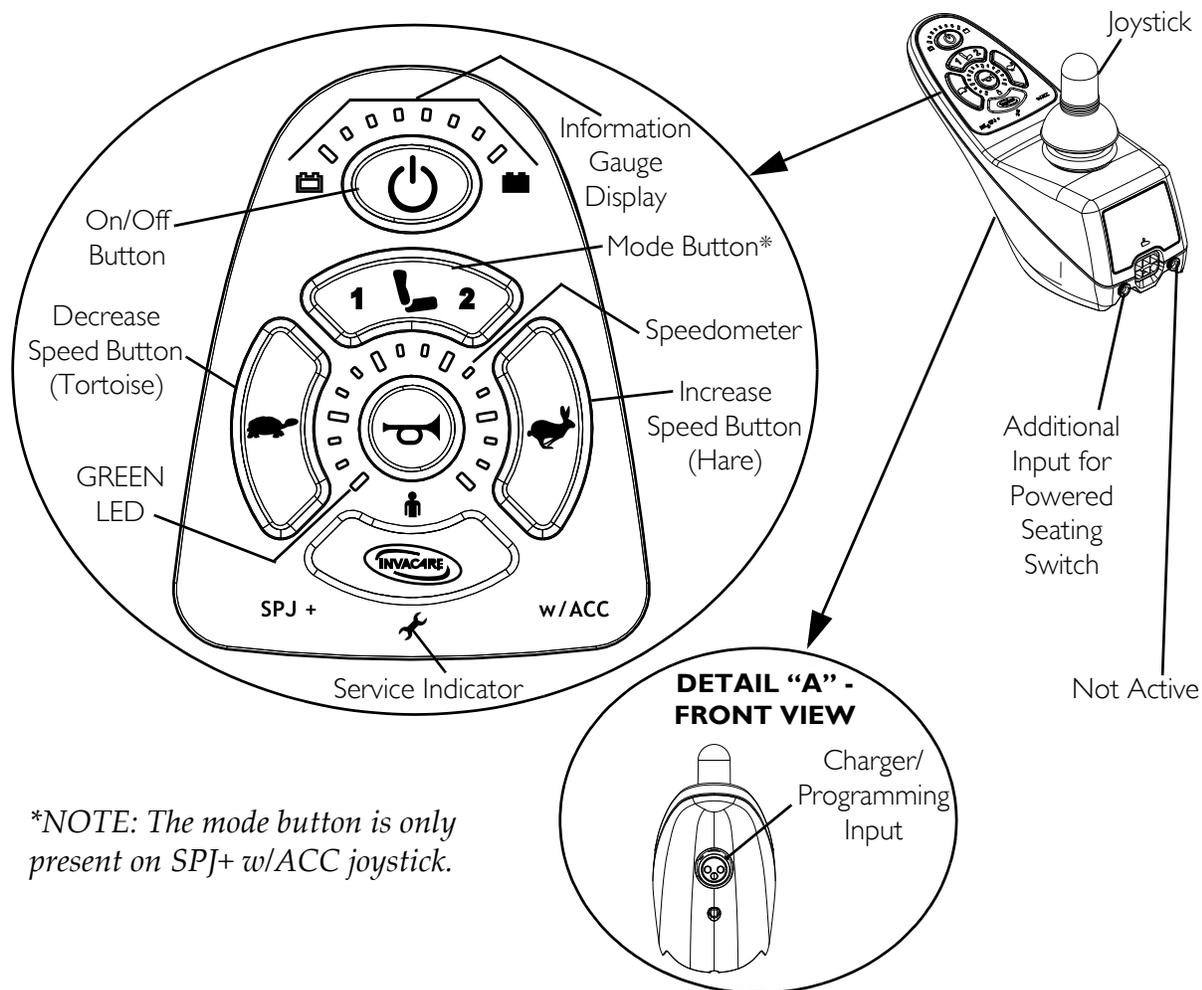
**FIGURE 6.2** Using the Joystick to Drive the Wheelchair

*NOTE: For specific information about the joystick installed on the wheelchair, refer to one of these procedures:*

- SPJ+, MK6i™ SPJ+ w/PSS and MK6i SPJ+ w/ACC Joystick Switches and Indicators on page 38.
- MPJ+ Joystick Switches and Indicators on page 40.

## SPJ+, MK6i™ SPJ+ w/PSS and MK6i SPJ+ w/ACC Joystick Switches and Indicators

NOTE: For the following information, refer to FIGURE 6.3.



**FIGURE 6.3** SPJ+, MK6i™ SPJ+ w/PSS and MK6i SPJ+ w/ACC Joystick Switches and Indicators

### On/Off Button

This button is located at the front of the joystick housing. It is used to turn the wheelchair On and Off, to remove the joystick from sleep mode (if programmed) and to lock or unlock the joystick (if programmed).

### Speedometer

The speedometer is used to show the maximum speed. The right-most LED indicates current maximum speed setting. The bottom left GREEN LED flashes to indicate that the joystick is in speed limit mode. Speed limit mode limits the drive speed to a pre-programmed value, typically when the seat has been elevated and the wheelchair is required to drive at 20% speed.

## Speed Control Buttons

The speed control buttons (tortoise button (🐢) and hare button (🐇)) are used to set and adjust the maximum speed.

1. To adjust the speed, perform one of the following:
  - Adjust Speed in 20% Increments (5 Speed Mode) - Press the tortoise button (🐢) or hare button (🐇) to decrease/increase the speed in 20% increments. The larger bars in the speedometer will light.
  - Adjust Speed in Smaller Increments (VSP Mode) - Perform the following steps:
    - i. Press and hold both the tortoise button (🐢) and hare button (🐇) until the joystick beeps.
    - ii. Perform one of the following:
      - Press the tortoise button (🐢) or hare button (🐇) to decrease/increase the speed in 20% increments. The larger bars in the speedometer will light.
      - Press and hold the tortoise button (🐢) or hare button (🐇) to decrease/increase the speed in smaller increments. The smaller bars in the speedometer will light.

## Joystick

The joystick has proportional drive control, meaning that the further the joystick is pushed from the upright (neutral) position, the faster the wheelchair or seat moves. Your top speed, however, is limited by the programmed settings.

To slow the wheelchair to a stop, simply release the joystick. The wheelchair has automatic speed and direction compensation to minimize corrections.

## Charger/Programming Input

The charger/programming input is located at the front of the joystick housing. This provides easy access for charging the wheelchair batteries. This port also serves as the Remote Programmer Communication connection. Driving is prevented while the system is charging.

## Service Indicator

The AMBER service indicator will light when an error or fault occurs. Refer to [Service Indicator Light Diagnostics](#) on page 33 for a listing of the flash codes and what they indicate.

## Information Gauge Display

The information gauge display is located on the front of the joystick housing and provides the following information to the user on the status of the wheelchair:

1. Power is On.
2. True state-of-battery-charge, including notification of when the battery requires charging:
  - A. GREEN LEDs are lit, indicating well charged batteries.
  - B. AMBER LEDs are lit, indicating batteries are moderately charged. Recharge batteries before taking a long trip.
  - C. RED LEDs are lit, indicating batteries are running out of charge. Recharge batteries as soon as possible.

The Information Gauge display also serves as a system diagnostic device when a fault is detected by the control module. A specific number of flashes of the LEDs indicate the type of fault detected. Refer to [Information Gauge Display Diagnostics](#) on page 33 for the diagnostic indications of the wheelchair status.

## MPJ+ Joystick Switches and Indicators

*NOTE: For this procedure, refer to FIGURE 6.4 on page 41.*

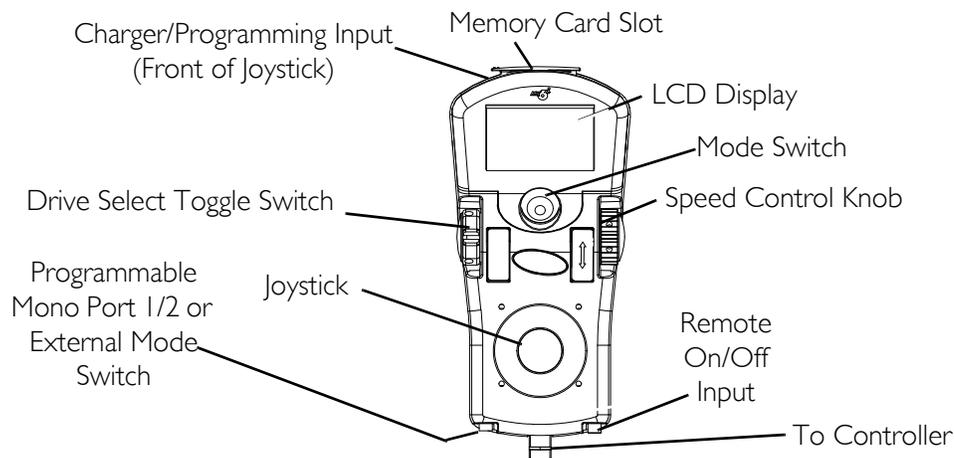
### Drive Select Toggle Switch

The drive select toggle switch is located on the left side, below the LCD. The drive select position is momentary, meaning that it will return to the neutral position after a selection is made.

This switch allows the operator to select the type of operation or performance which best suits a particular control need or situation. The DRIVE 1 program uses performance values which are independent of those used for the DRIVE 2 or 3 or 4 program. As an example, an operator may have a control need for spasticity in the morning and a very different need in the afternoon. DRIVE 1 can be programmed for higher speeds and quicker response while DRIVE 2 can be programmed for slower speeds and less responsiveness or vice versa. The other two drive programs could be indoor and outdoor versions of DRIVE 1 and DRIVE 2.

### Selecting the Drive Mode

1. Move the toggle up and release. DRIVE 1 (**01**) will appear on LCD.
2. Move the toggle up and release again. DRIVE 2 (**02**) will appear on LCD.
3. Move the toggle up and release again. DRIVE 3 (**03**) will appear on LCD.
4. Move the toggle up and release again. DRIVE 4 (**04**) will appear on LCD.
5. Move the toggle up and release one more time to select DRIVE 1 (**01**).



**FIGURE 6.4** MPJ+ Joystick Switches and Indicators

## Speed Control

The speed control knob is located on the side of the joystick housing.

1. Rotate the knob clockwise (forward) to increase the speed of the wheelchair to the programmed max speed.
2. Rotate the knob counterclockwise (backward) to decrease the speed of the wheelchair to the programmed max speed.

## Joystick

The joystick has proportional drive control, meaning that the further the joystick is pushed from the upright (neutral) position, the faster the wheelchair or seat moves. Your top speed, however, is limited by the programmed settings.

To slow the wheelchair to a stop, simply release the joystick. The wheelchair has automatic speed and direction compensation to minimize corrections.

## Charger/Programming Input

The charger/programming input is located at the front of the joystick housing. This provides easy access for charging the wheelchair batteries. This port also serves as the Remote Programmer Communication connection. Driving is prevented while the system is charging.

## LCD Display Screens

The LCD Display is located in front of the joystick and provides information on the status of the wheelchair through a backlit display. The LCD display is readable in both bright sunlight and complete darkness.

## Splash Screen

*NOTE: For this procedure, refer to FIGURE 6.5.*

This screen is displayed at startup of the joystick for about 2 seconds. This screen displays the software version and date information.

After this screen, the joystick displays the Main Screen.



**FIGURE 6.5** LCD Display Screens - Splash Screen

## Main Screen

*NOTE: For this information, refer to FIGURE 6.6 on page 43.*

During normal operation, the active drive is displayed in the upper half of the LCD display. Battery charge level is shown in the Battery Gauge Display (BGD) located on the right side of the LCD display. At full charge, solid blocks fill in all ten segments between E (Empty) and F (Full). As the battery becomes discharged, the top most segments will progressively disappear until no segments appear between E and F. At this level, the user should charge the batteries as soon as possible.

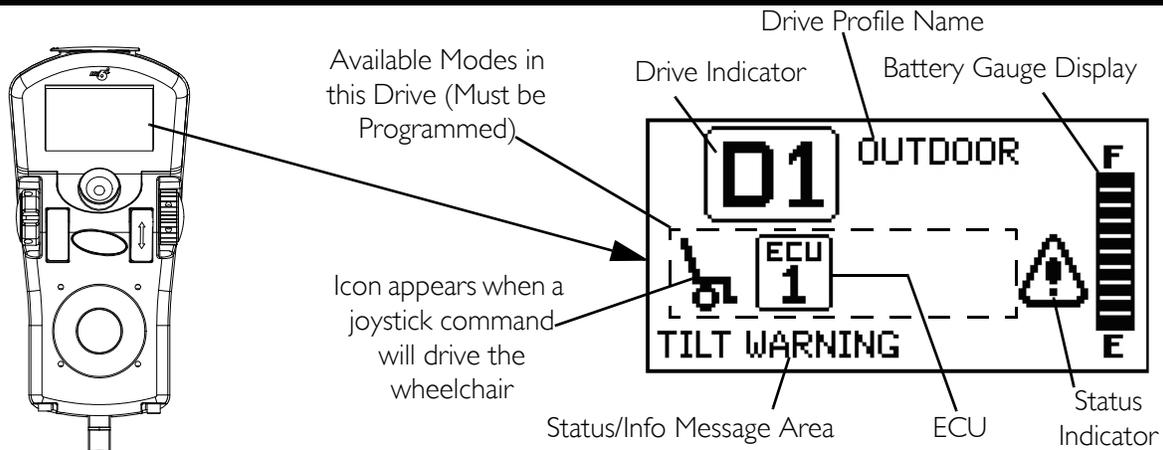
The lower half of the LCD display is the Information Center. The Information Center displays current data on the wheelchair.

Refer to LCD Display table on page 42 for descriptions of information shown.

### LCD DISPLAY

ITEM	DESCRIPTION
<b>DRIVE NAME</b>	<p>This field shows the currently selected Drive's Name. Available choices are as follows:</p> <p><b>D1</b> Drive 1*</p> <p><b>D2</b> Drive 2*</p> <p><b>D3</b> Drive 3*</p> <p><b>D4</b> Drive 4*</p> <p><b>X</b> "No Drive" selected via the programmer.</p> <p><i>*NOTE: Drive names can be customized. Actual drive names may display differently.</i></p>
<b>BATTERY LEVEL INDICATOR</b>	<p>This symbol shows the Battery Level and will change depending on the available battery power. This indicator is shown on every screen.</p>
<b>STATUS MESSAGE</b>	<p>This area displays status or instructions.</p>

ITEM	DESCRIPTION
<b>STATUS INDICATOR</b>	<p>The status indicator will show a “Warning” (exclamation point inside a triangle) indicator when the chair has a condition that requires attention.</p> <p>The status indicator will show a “STOP” sign when a serious condition exists. The chair will not be allowed to operate.</p> <p>The status indicator shows an Attendant Icon if the attendant’s override switch is active.</p>
<b>MODES</b>	<p>The dotted-box shows the area that contains the available “modes” in the currently selected drive. The modes are programmed for each drive and are based upon the configuration of the chair.</p> <p>These modes are highlighted when the Mode is active. The operator changes modes by pressing the Mode Select Switch.</p> <p>The available modes are as follows:</p> <ul style="list-style-type: none"> <li> Drive Mode (1 through 4)</li> <li> Automatic Positioning</li> <li> Actuator Control Switch Mode (4-switch, 4-switch 2 levels, etc.)</li> <li> ECU Output Activated (1 through 4)</li> <li> RIM Mode Activated</li> <li> Drive Select Mode Activated</li> <li> No Driving</li> </ul>



**FIGURE 6.6** LCD Display Screens - Main Screen

### Driving Screen

*NOTE: For this procedure, refer to FIGURE 6.7.*

This screen is shown when the operator issues a drive command and the Drive Icon on the main screen was highlighted.

*NOTE: The Drive’s name, warning/info message, status icon and battery indicator are displayed on this screen.*

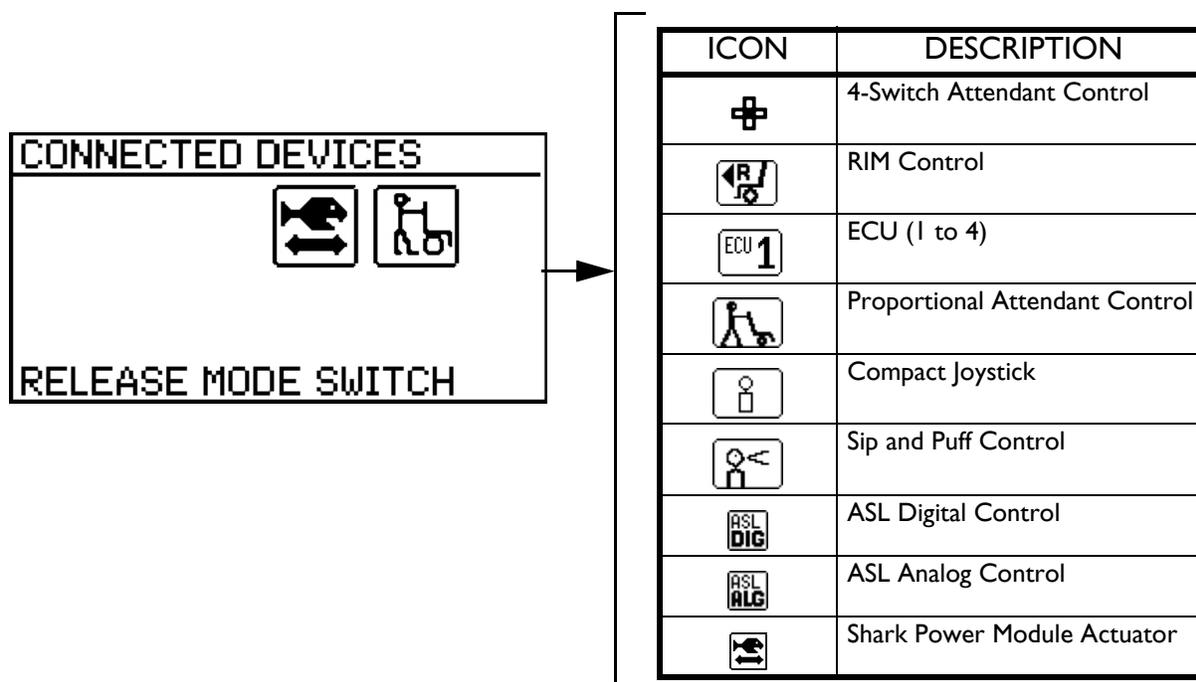


**FIGURE 6.7** LCD Display Screens - Driving Screen

## Connected Devices Screen

*NOTE: For this procedure, refer to FIGURE 6.8.*

This screen is displayed if the Mode Select switch is held active for about 10 seconds. This screen shows an icon that represents any additional devices that are connected to the chair.



**FIGURE 6.8** LCD Display Screens - Connected Devices Screen

## Programmable Mono Port 1/2 or External Mode Switch

The programmable mono port or external mode switch input is located at the rear of the joystick on the left side. The programmable mono port input offers the choice of three options:

- Remote drive select
- Remote stop/mode (reset) input
- Single actuator input

The single switch functions operate through mono port 1. An optional y-cable allows a second programmable function through mono port 2.

### Remote Stop Switch

The remote stop switch is used to stop the wheelchair.

### Remote Mode (Reset) Switch

The remote mode reset switch functions the same way as the mode switch. Refer to [Mode Switch](#) on page 45.

## Remote On/Off Switch

The remote On/Off switch input is located at the rear of the joystick on the right side and allows the power switch to be operated by an ability switch (normally open momentary switch with mono plug). To use the remote On/Off feature, the Drive Select/On/Off switch must be in the On position. Each activation of the ability switch will alternately turn the joystick On or Off.

## Mode Switch

*NOTE: For this procedure, refer to FIGURE 6.4 on page 41.*

The mode switch is used to select the operating mode for the wheelchair. The mode switch is located on the joystick. A mode switch is needed whenever any of the following operating modes are programmed:

- Environmental Controls (ECU 1, ECU 2, ECU 3, ECU 4)\*
- 3 Speed Mode in Digital 3 Speed (Slow, Medium, Full)
- Latched Modes
- Sleep Mode
- RIM Mode\*
- Remote Drive Selection Mode\*
- Tilt/Recline Mode\*
- Information Center Display Selection (does not require Reset activation at power up)

If any of the above modes are selected, the control will require activation of the switch immediately after the power switch is turned On in order to enter the drive mode. The second line of the LCD will display - PRESS RESET.

*\*NOTE: In these modes, Standby Select allows the reset switch to be bypassed for users unable to activate the switch.*

## Memory Card Slot

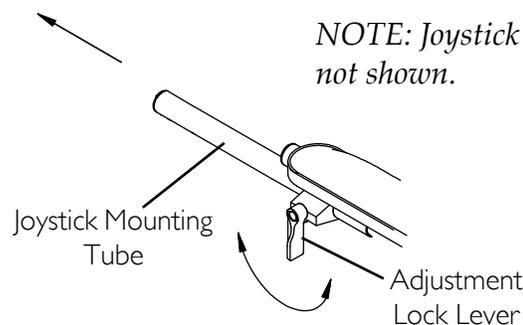
The memory card slot is used with the basic or professional memory card for saving or reading wheelchair parameters.

## Preparing the Joystick for Use

*NOTE: For this procedure, refer to FIGURE 6.9.*

*NOTE: The joystick is factory installed on the right side of the wheelchair. To reposition the joystick onto the left side of the wheelchair, refer to [Repositioning the Joystick](#) on page 46.*

1. Turn the adjustment lock lever to release the adjustment lock from joystick mounting tube.
2. Slide joystick mounting tube to the desired position.
3. Turn the adjustment lock lever to secure the adjustment lock to the joystick mounting tube.



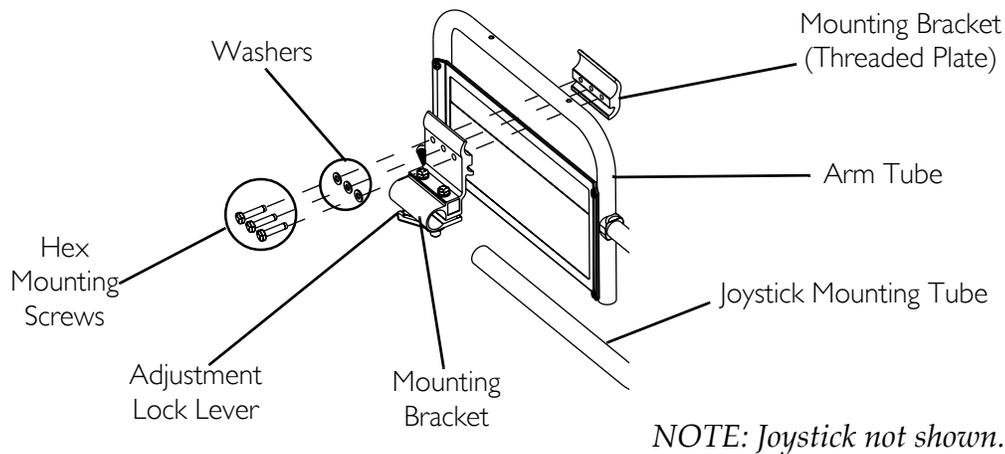
**FIGURE 6.9** Preparing the Joystick for Use

## Repositioning the Joystick

### ASBA Seat Model

*NOTE: For this procedure, refer to FIGURE 6.10 on page 47.*

1. Turn the adjustment lock lever to release the joystick mounting tube from the mounting bracket.
2. Remove the joystick from the wheelchair.
3. Remove the three hex screws that secure both halves of the mounting bracket to the arm tube.
4. Reposition mounting bracket on opposite arm tube ensuring the threaded plate of the mounting bracket is on the inside of the arm tube as shown in FIGURE 6.10.
5. Using the three hex mounting screws and washers, secure both halves of the mounting bracket to the arm tube.
6. Slide the joystick mounting tube through the mounting bracket to the desired position.
7. Turn the adjustment lock lever to secure the joystick mounting tube into the mounting bracket.



**FIGURE 6.10** Repositioning the Joystick - ASBA Seat Model

### Van Seat Model

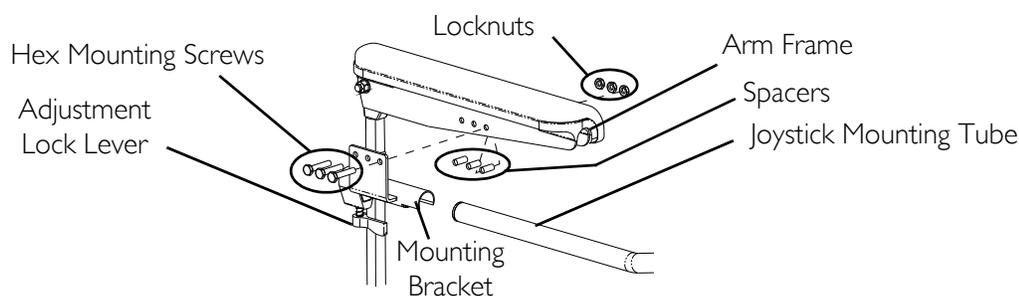
*NOTE: For this procedure, refer to FIGURE 6.11 on page 48.*

*NOTE: Take note of position and orientation of mounting hardware for reinstalling the joystick assembly.*

1. Turn the adjustment lock lever to release the joystick mounting tube from the mounting bracket.
2. Remove the joystick from the wheelchair.
3. Remove the three hex mounting screws, spacers and locknuts that secure the mounting bracket to the three mounting holes on the arm frame.

*NOTE: The mounting bracket is mounted to the inside of the arm frame.*

4. Reposition the mounting bracket on the opposite arm frame.
5. Using the three hex mounting screws, spacers and locknuts secure the mounting bracket to the three mounting holes of the arm frame.
6. If necessary, perform the following to reposition the adjustment lock:
  - A. Slide the adjustment lock from the mounting bracket.
  - B. Rotate adjustment lock 180° and slide adjustment lock over the opposite end of the mounting bracket.
7. Slide joystick mounting tube through the mounting bracket to the desired position and secure adjustment lock to tube by turning lever on adjustment lock.



**FIGURE 6.11** Repositioning the Joystick - Van Seat Model

## Disconnecting/Connecting the Joysticks

*NOTE: For this procedure, refer to FIGURE 6.12.*

*NOTE: The joystick connector is located at the rear of the seat frame.*

### SPJ+ Joysticks

1. Hold the light GREY collar portion of the joystick connector with one hand and the controller connector on the wheelchair in the other and disconnect them by pulling them apart.

### Connecting

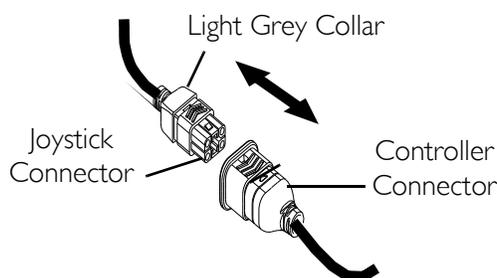
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#### **⚠ WARNING**

**The joystick connector and controller connector fit together in one way only. DO NOT force them together.**

---

1. Hold the light GREY collar portion of the joystick connector with one hand and the controller connector on the wheelchair in the other and align them.
2. Lightly push to engage the joystick connector and the controller connector.



**FIGURE 6.12** Disconnecting/Connecting the Joysticks - SPJ+ Joysticks

## MPJ+ Joysticks

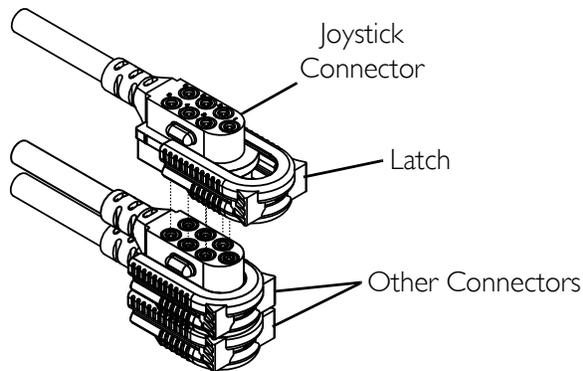
*NOTE: For this procedure, refer to FIGURE 6.13.*

### Disconnecting

1. Pull the latch away from the joystick connector.
2. Disconnect the joystick connector from the remaining connectors.

### Connecting

1. Ensure the latch is pulled away from the joystick connector.
2. Connect the joystick connector to the other connectors.
3. Push the latch in to secure the joystick connector to the other connectors.



**FIGURE 6.13** Disconnecting/Connecting the Joysticks - MPJ+ Joysticks

## SECTION 7—ARMS

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### **⚠ WARNING**

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

**Before performing any maintenance, adjustment or service verify that On/Off switch on the joystick is in the Off position.**

---

### **Installing/Removing Flip Back Armrests**

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#### **⚠ WARNING**

**Make sure the flip back armrest release and height adjustment levers are in the locked position before using the wheelchair.**

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*NOTE: Flip back armrest release lever must be in unlocked position when placing armrest into the arm sockets.*

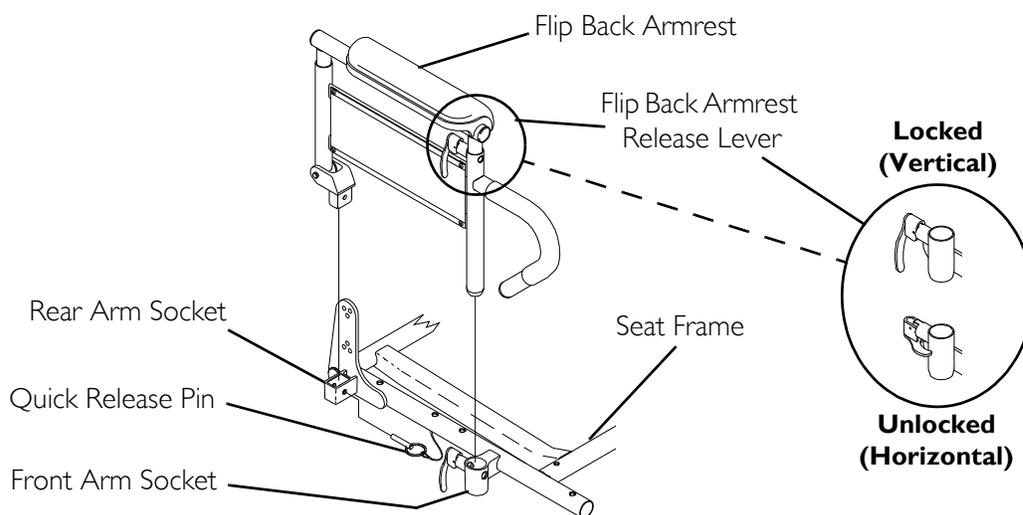
*NOTE: For this procedure, refer to FIGURE 7.1 on page 51.*

#### **Installing**

1. Slide the flip back armrest into the arm sockets on the wheelchair frame.
2. Install the quick release pin through the rear arm socket and flip back armrest.
3. Lock flip back armrest by pressing flip back armrest release lever into the locked position (FIGURE 7.1).
4. Lift up on flip back armrest to make sure the armrest is locked in place.
5. Repeat STEPS 1-4 for opposite flip back armrest.

#### **Removing**

1. Unlock flip back armrest by pulling flip back armrest release lever into the unlocked position (FIGURE 7.1).
2. Remove the quick release pin that secures the flip back armrest to the wheelchair frame.
3. Pull Up on the flip back armrest and remove the armrest from the arm sockets.
4. Repeat STEPS 1-3 for the opposite flip back armrest, if necessary.



**FIGURE 7.1** Installing/Removing Flip Back Armrests

## Adjusting Flip Back Armrests

*NOTE: For this procedure, refer to FIGURE 7.2 on page 52.*

### Positioning Flip Back Armrests for User Transfer

1. Unlock the flip back armrest by pulling the armrest release lever into the Up (horizontal) position.
2. Pull up on the flip back armrest and remove the armrest from the front arm socket.
3. Flip the armrest back until it is out of the way.
4. Repeat STEPS 1-3 for opposite flip back armrest, if necessary.

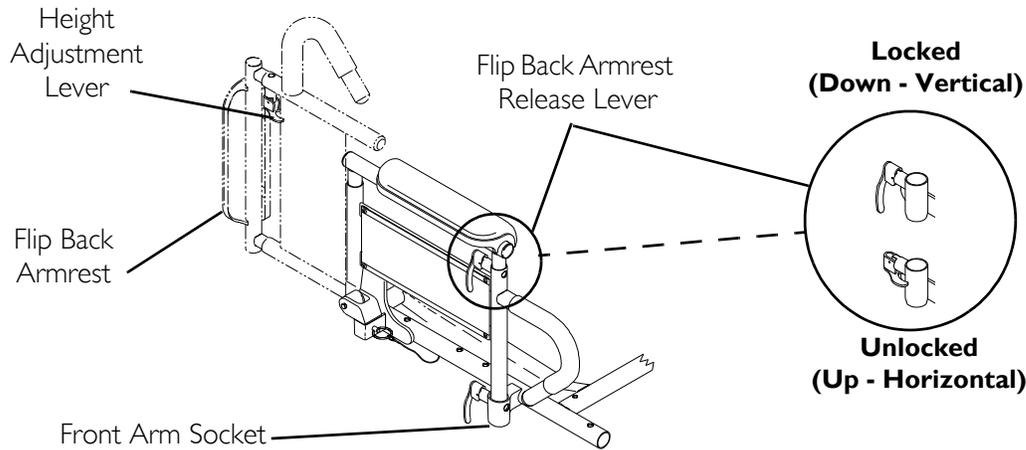
### Positioning Flip Back Armrests for Use

1. Ensure that the flip back armrest release lever is in the Up (horizontal) position.
2. Install the flip back armrest into the front arm socket.
3. Lock flip back armrest by pressing flip back armrest release lever into the Down (vertical) position.
4. Lift up on flip back armrest to make sure the armrest is locked in place.
5. Repeat STEPS 1-4 for opposite flip back armrest, if necessary.

### Adjusting

1. Unlock top of flip back armrest by pulling height adjustment lever into the Up (horizontal) position.
2. Adjust top of the flip back armrest to the desired height.

3. Lock top of flip back armrest by pushing height adjustment lever into the Down (vertical) position.
4. Lift up on flip back armrest to make sure the armrest is locked in place.
5. Repeat STEPS 1-4 for opposite flip back armrest, if necessary.



**FIGURE 7.2** Adjusting Flip Back Armrests

## Adjusting Van Seat Armrests

### Angle

#### **⚠ WARNING**

**Pinch point may occur when adjusting the arm angle position.**

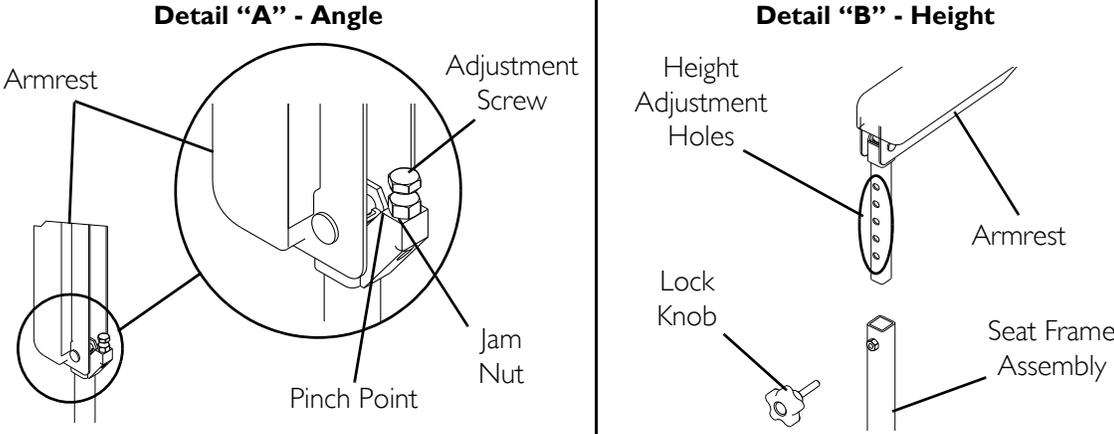
*NOTE: For this procedure, refer to Detail "A" of FIGURE 7.3 on page 53.*

1. Lift up the armrest.
2. Loosen the jam nut.
3. Adjust the socket screw up or down to the desired arm angle position.
4. Tighten the jam nut.
5. To determine the same angle for the opposite armrest, count the exposed threads after the jam nut has been tightened.
6. Repeat STEPS 1-4 for opposite armrest, if necessary.

### Height

*NOTE: For this procedure, refer to Detail "B" of FIGURE 7.3 on page 53.*

1. Remove the socket screw that secures the armrest to the seat frame assembly.
2. Adjust the armrest to one of four positions.
3. Reinstall the socket screw that secures the armrest to the seat frame assembly and tighten securely.



**FIGURE 7.3** Adjusting Van Seat Armrests

# SECTION 8—SEAT

## ⚠ WARNING

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

Before performing any maintenance, adjustment or service verify that On/Off switch on the joystick is in the Off position.

## Adjusting the Headrest

NOTE: For this procedure, refer to FIGURE 8.1.

1. To raise headrest, lift headrest up to desired position.

NOTE: Headrest is locked in position when an audible "click" is heard.

2. To lower headrest, push release tab towards the inside of the chair. Lower headrest to desired position.

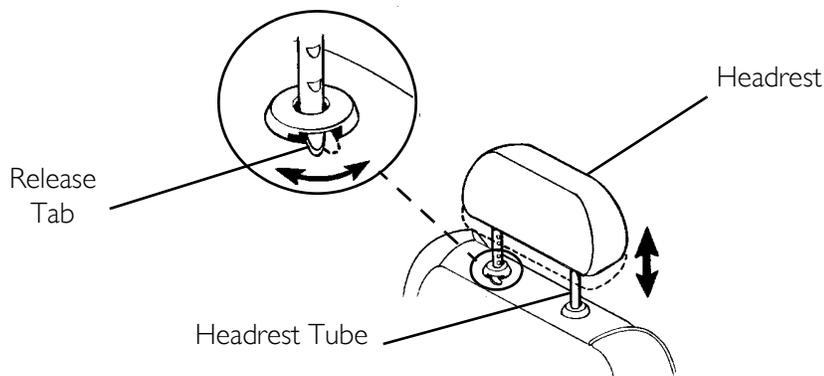


FIGURE 8.1 Adjusting the Headrest

## Adjusting the Back Angle

### Van Seat Model

NOTE: For this procedure, refer to FIGURE 8.2.

1. Lift up on the release handle and adjust seat to desired angle.
2. Let go of the release handle to lock the back in position.

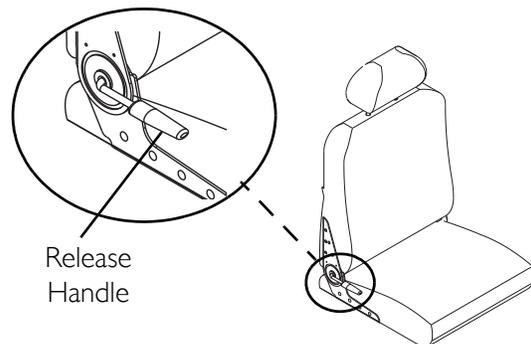


FIGURE 8.2 Adjusting the Back Angle - Van Seat Model

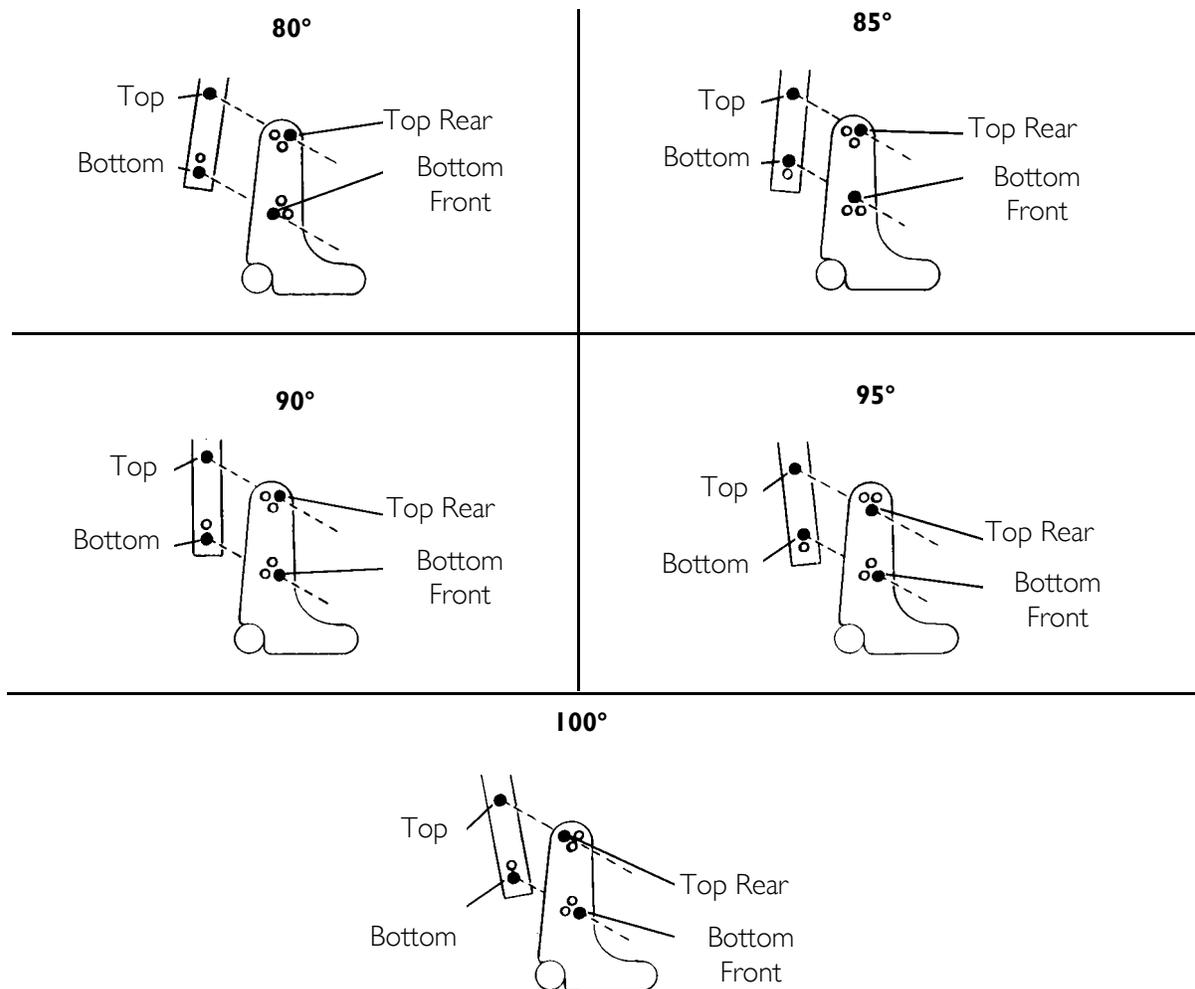
## Adjustable Seat Back Angle (ASBA) Model

*NOTE: For this procedure, refer to FIGURE 8.3.*

1. Remove armrests from the wheelchair. Refer to Installing/Removing Flip Back Armrests on page 50.
2. Remove the mounting screw and washer from the top mounting hole of back angle plate and back cane.

*NOTE: To avoid losing the insert in each back cane, thread the mounting screw through the cane from the inside of wheelchair to hold the insert in place.*

3. Remove the mounting screw and washer from the bottom mounting hole of the back angle plate and back cane.
4. Reposition the back canes into the correct mounting holes of the back angle plate to obtain a back angle between 80° and 100° in 5° increments.
5. Torque mounting screws to 75 inch-pounds.
6. Reinstall the armrests onto the wheelchair. Refer to Installing/Removing Flip Back Armrests on page 50.



**FIGURE 8.3** Adjusting the Back Angle - Adjustable Seat Back Angle (ASBA) Model

## Removing/Installing the Seat Assembly

### **⚠ WARNING**

**DO NOT** store items under seat - interference with seat latch may result.

*NOTE: For this procedure, refer to FIGURE 8.4.*

### Removing

1. Disconnect the joystick. Refer to [Disconnecting/Connecting the Joysticks](#) on page 48.
2. Push down on the latch bar underneath front of seat.
3. Tilt front edge of seat up.
4. Slide the seat assembly forward to disengage seat from the pivot brackets located in the rear.

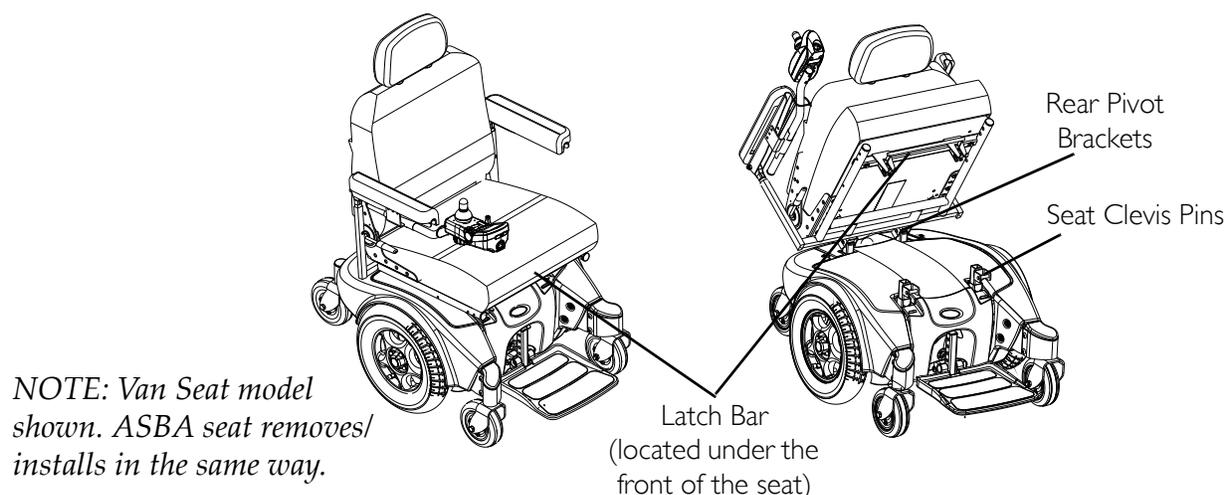
### Installing

1. Position the seat in the rear pivot brackets as shown in FIGURE 8.4.
2. Tilt front edge of seat down.
3. When seat is lowered, engage seat brackets into seat clevis pins.

### **⚠ WARNING**

**When reinstalling the seat verify that the seat brackets are engaged with the seat clevis pins by pulling up on the latch bar.**

4. Pull up on latch bar to verify that brackets are engaged with seat clevis pins.
5. Connect the joystick. Refer to [Disconnecting/Connecting the Joysticks](#) on page 48.



**FIGURE 8.4** Removing/Installing the Seat Assembly

## Adjusting the Seat Height

NOTE: For this procedure, refer to FIGURE 8.5 on page 58.

NOTE: The seat can be adjusted to five height positions in ½-inch increments.

1. Remove the seat. Refer to Removing/Installing the Seat Assembly on page 56.
2. Remove the mounting screw and locknut that secures the adjustable height tube to the support tube.
3. Adjust tube to desired mounting position. Refer to the following table for available mounting positions.

<b>AVAILABLE MOUNTING HOLES FOR FRONT ADJUSTABLE HEIGHT TUBE</b>					
<b>CHAIR IS EQUIPPED WITH</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>VAN SEAT WITH FOOTBOARD</b>					
REAR ADJUSTABLE HEIGHT TUBE					
Mounted in hole A	N/A**	✓	✓	✓	✓
Mounted in hole B	N/A*	N/A*	✓	✓	✓
Mounted in hole C	N/A*	N/A*	✓	✓	✓
Mounted in hole D	N/A*	N/A*	N/A*	✓	✓
Mounted in hole E	N/A*	N/A*	N/A*	N/A*	✓

\*NOTE: This mounting hole combination would result in a forward seat dump. Forward seat dump is where the rear of the seat is higher than the front of the seat. The seat should never be adjusted to a position that results in a forward seat dump.

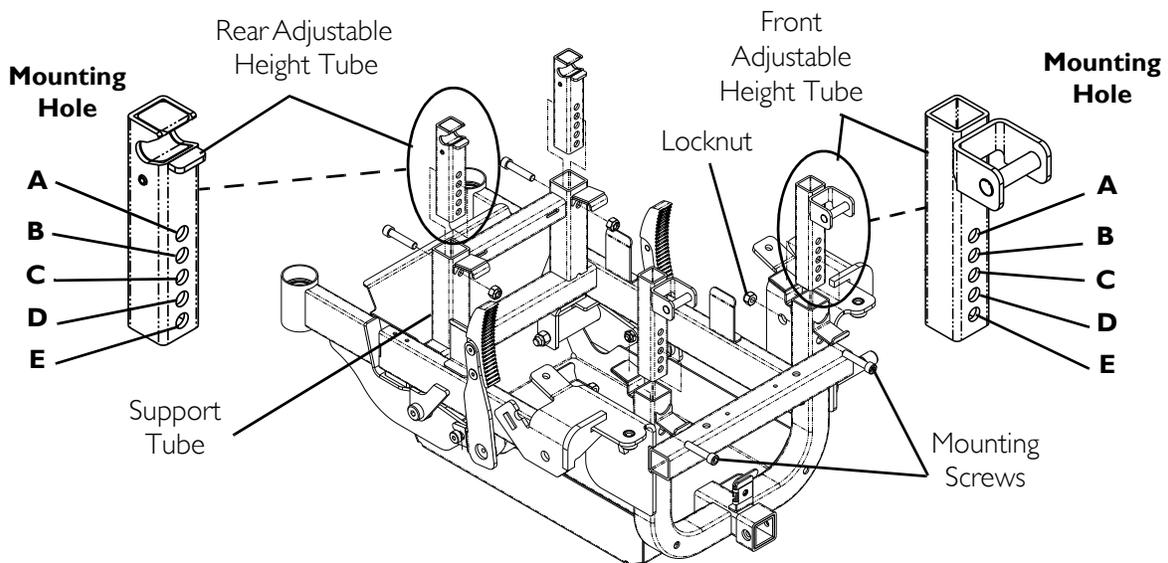
\*\*NOTE: This mounting hole combination cannot be used because it would cause the front riggings of the wheelchair to interfere with other components of the chair.

4. Reinstall mounting screw and locknut (FIGURE 8.5). Securely tighten.
5. Repeat STEPS 2-4 for the three remaining adjustable height tubes.

### **⚠ WARNING**

**When reinstalling the seat verify that the seat brackets are engaged with the seat clevis pins by pulling up on the latch bar.**

6. Reinstall the seat. Refer to Removing/Installing the Seat Assembly on page 56.



**FIGURE 8.5** Adjusting the Seat Height

## Adjusting Seat Position on Seat Frame

### ASBA Model

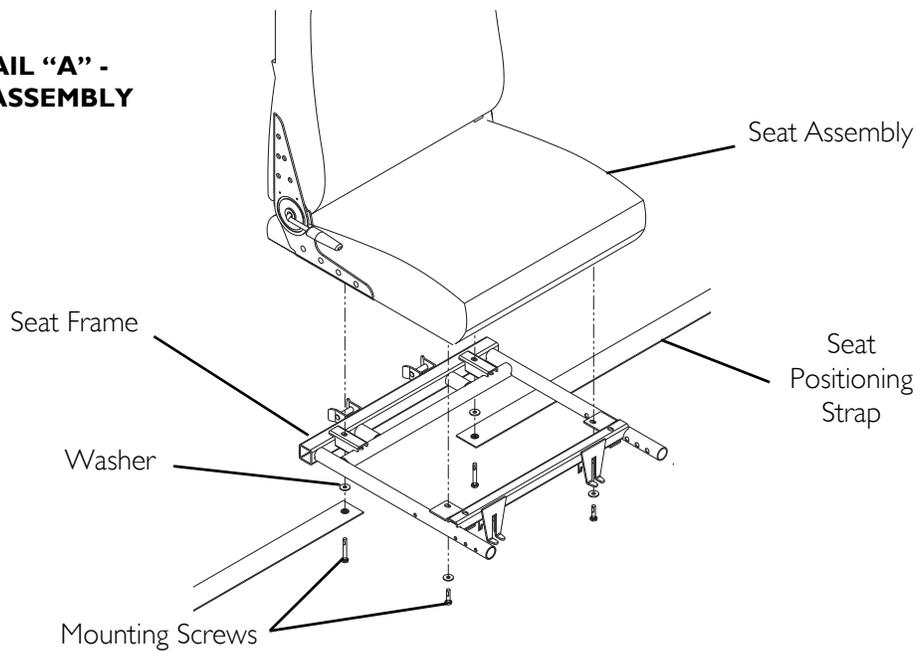
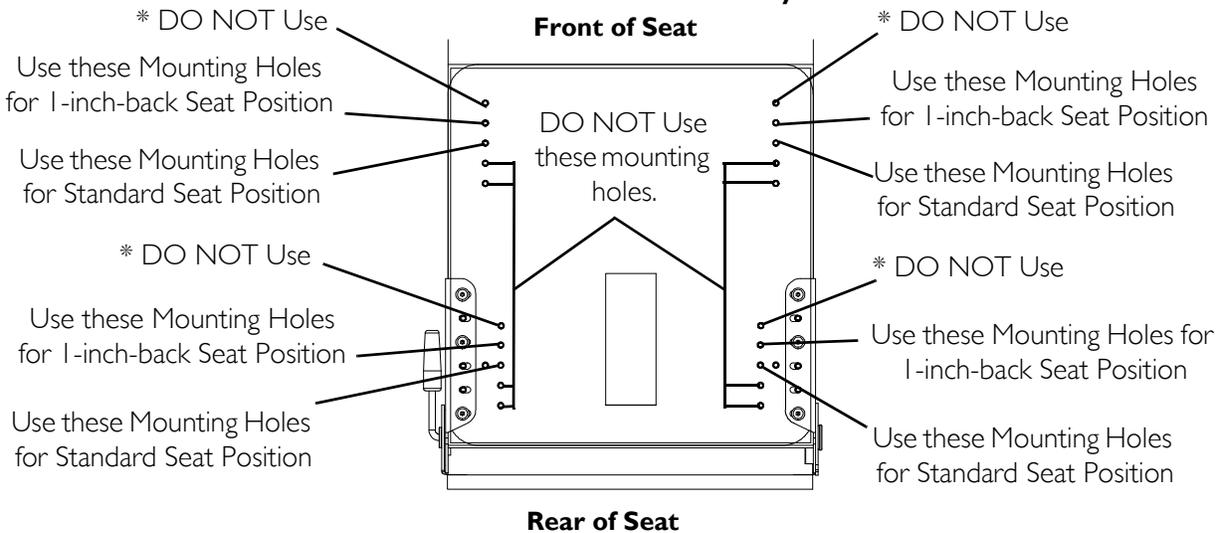
#### **⚠ WARNING**

**DO NOT** attempt to adjust the seat position of the **ASBA** seat on the seat frame. This procedure **MUST** be performed by a qualified technician.

### Van Seat Model

*NOTE: For this procedure, refer to FIGURE 8.6 on page 59.*

1. Remove the seat. Refer to Removing/Installing the Seat Assembly on page 56.
2. Remove the four mounting screws and washers securing the seat assembly to the seat frame. (Detail "A" of FIGURE 8.6)
3. Separate the seat assembly from the seat frame.
4. Refer to Detail "B" of FIGURE 8.6 to determine the correct mounting holes to achieve the desired seat position.
5. Align the seat assembly mounting holes determined in STEP 4 with the seat frame mounting holes determined in STEP 4.
6. Using the four mounting screws and washers, secure the seat assembly to the seat frame. Securely tighten.
7. Reinstall the seat. Refer to Removing/Installing the Seat Assembly on page 56.

**DETAIL “A” -  
SEAT ASSEMBLY****DETAIL “B” - SEAT POSITIONS****Bottom View of Seat Assembly**

*\*NOTE: Only the 22-inch wide seats have these mounting holes.  
DO NOT use these mounting holes.*

**FIGURE 8.6** Adjusting Seat Position on Seat Frame

## Adjusting Seat Depth - Van Seat Only

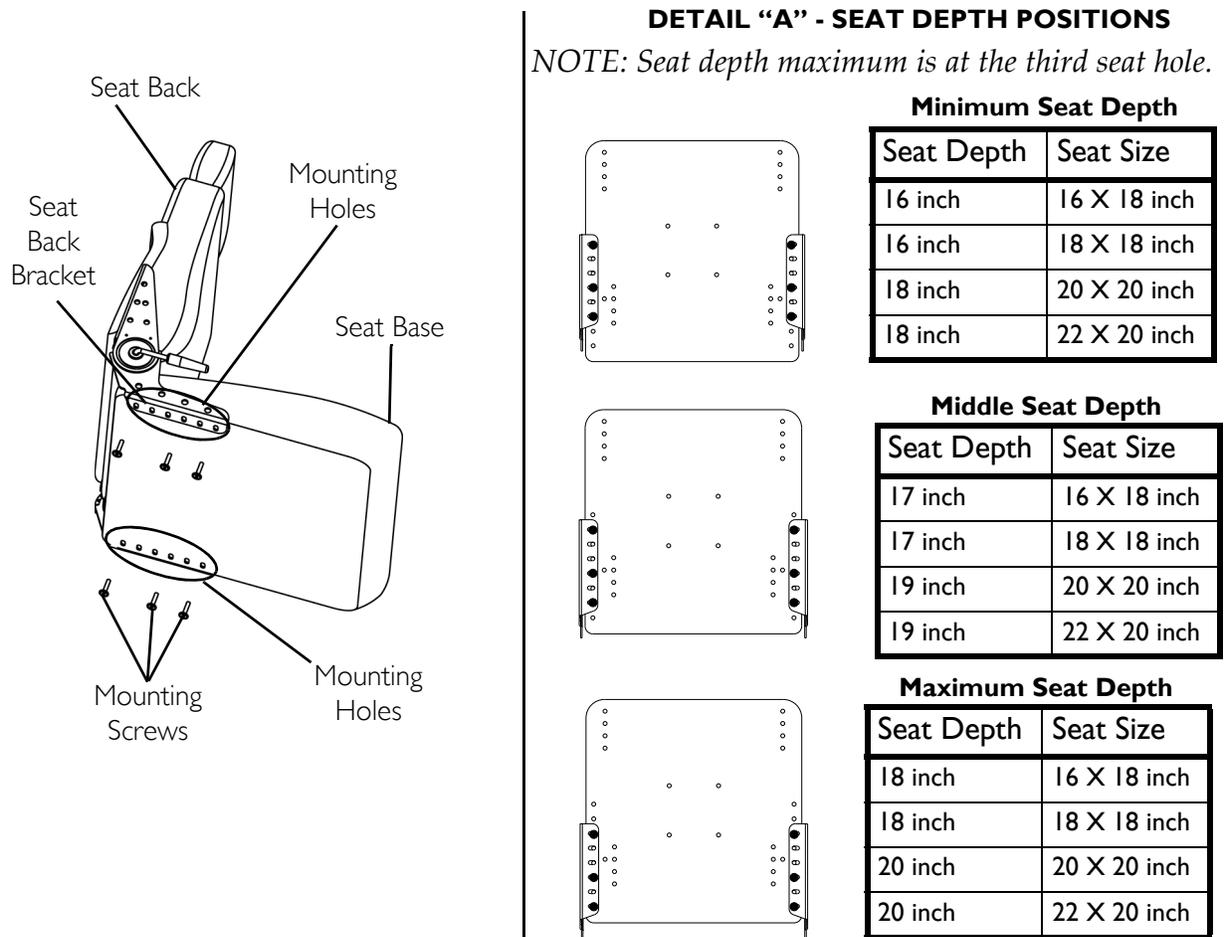
*NOTE: For this procedure, refer to FIGURE 8.7 on page 60.*

1. Remove the seat. Refer to Removing/Installing the Seat Assembly on page 56.
2. Remove the seat base from the seat assembly. Refer to Adjusting Seat Position on Seat Frame on page 58.
3. Remove the six mounting screws located under the seat that secure the seat back assembly in place.

- Adjust seat back assembly to desired position and reinstall the six mounting screws. Securely tighten.

*NOTE: Refer to Detail "A" of FIGURE 8.7 for proper seat depth positions. For example, to achieve maximum seat depth, the front mounting hole on the seat back bracket aligns with the third hole on the seat base.*

- Reinstall the seat base onto the seat assembly. Refer to Adjusting Seat Position on Seat Frame on page 58.
- Reinstall the seat. Refer to Removing/Installing the Seat Assembly on page 56.



**FIGURE 8.7** Adjusting Seat Depth - Van Seat Only

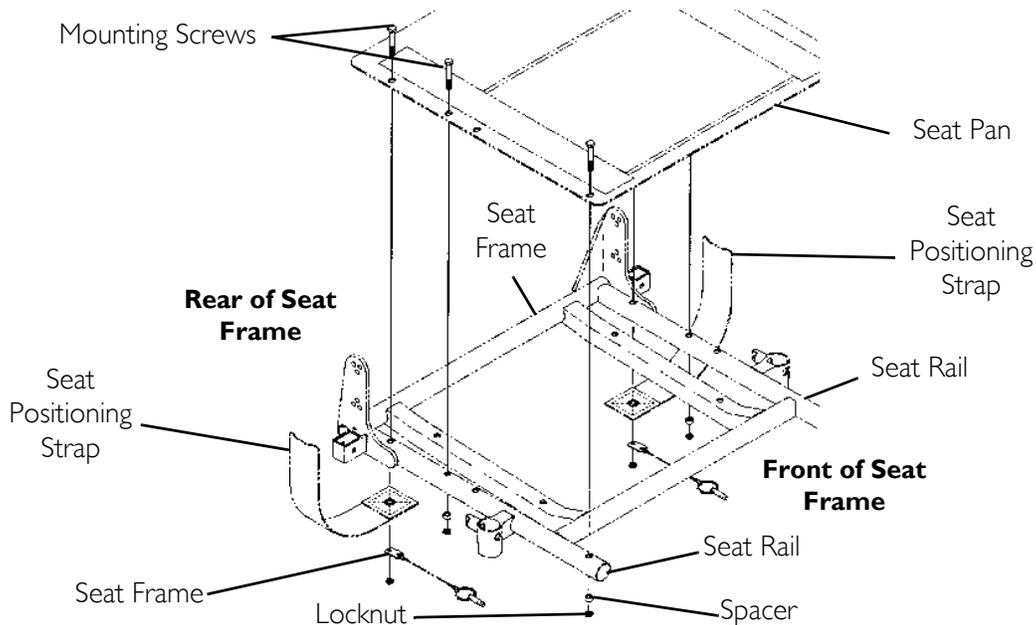
## Replacing the Seat Positioning Strap

### ASBA Model

*NOTE: For this procedure, refer to FIGURE 8.8 on page 61.*

- Remove the seat cushion from the seat pan.
- Move the flip back armrests out of the way. Refer to Adjusting Flip Back Armrests on page 51.
- Remove the two mounting screws, quick release pin tabs, spacers, and locknuts that secure the seat pan and seat positioning straps to the seat frame.

4. Remove the two halves of the seat positioning strap from the rear seat frame.
5. Reposition the two new seat positioning strap halves underneath seat rails.
6. Reinstall the two mounting screws, quick release pin tabs, spacers, and locknuts that secure the seat pan and seat positioning straps to the seat frame and torque to 75 inch-pounds.
7. Reinstall the seat cushion onto the seat pan.

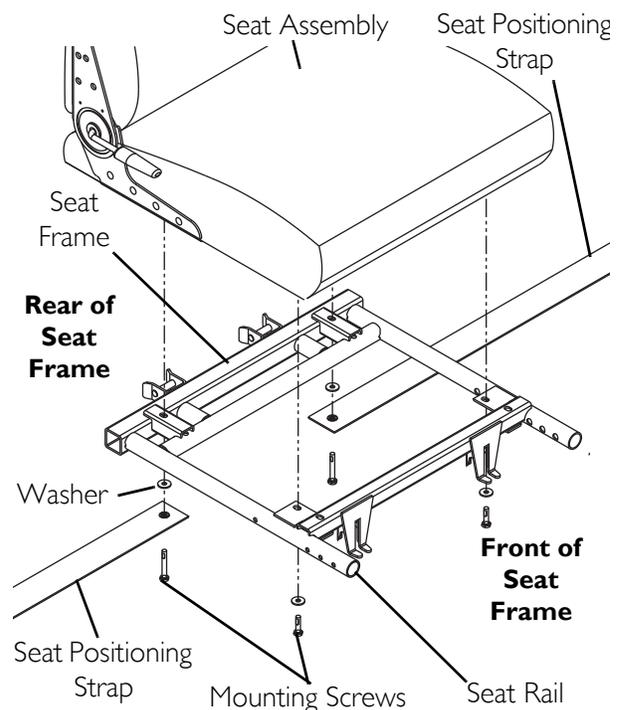


**FIGURE 8.8** Replacing the Seat Positioning Strap - ASBA Model

### Van Seat Model

*NOTE: For this procedure, refer to FIGURE 8.9.*

1. Remove the two mounting screws and washers that secure the seat positioning straps to the seat frame.
2. Remove the two halves of the seat positioning strap from the rear seat frame.
3. Reposition the two new seat positioning strap halves underneath seat rails.
4. Reinstall the two mounting screws and washers that secure the seat positioning straps to the seat frame. Securely tighten.



**FIGURE 8.9** Replacing the Seat Positioning Strap - Van Seat Model

# SECTION 9—FOOTBOARD ASSEMBLY

---

## **⚠ WARNING**

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

Before performing any maintenance, adjustment or service verify that On/Off switch on the joystick is in the Off position.

**DO NOT** stand on the flip-up footboard. When getting in or out of the wheelchair, make sure that the flip-up footboard is in the upward position.

Limited clearance between footboard and caster - The user's feet **MUST** remain on the footboard while operating the chair. If the user's feet are allowed to rest off the side of the footboard they may come in contact with the caster possibly resulting in injury.

---

## Removing/Installing the Footboard Assembly

---

### **⚠ WARNING**

Pinch point may occur when rotating the footboard assembly.

Make sure the detent balls of the quick-release pin are fully released beyond the outer edge of the tube before operating the wheelchair. Otherwise, injury and/or damage may result.

Keep detent balls clean.

---

*NOTE: For this procedure, refer to FIGURE 9.1 on page 63.*

### Removing

1. Remove the quick release pin that secures the footboard assembly to the wheelchair frame by depressing the button while sliding the pin out.
2. Remove the footboard assembly from the wheelchair frame.

### Installing

---

### **⚠ WARNING**

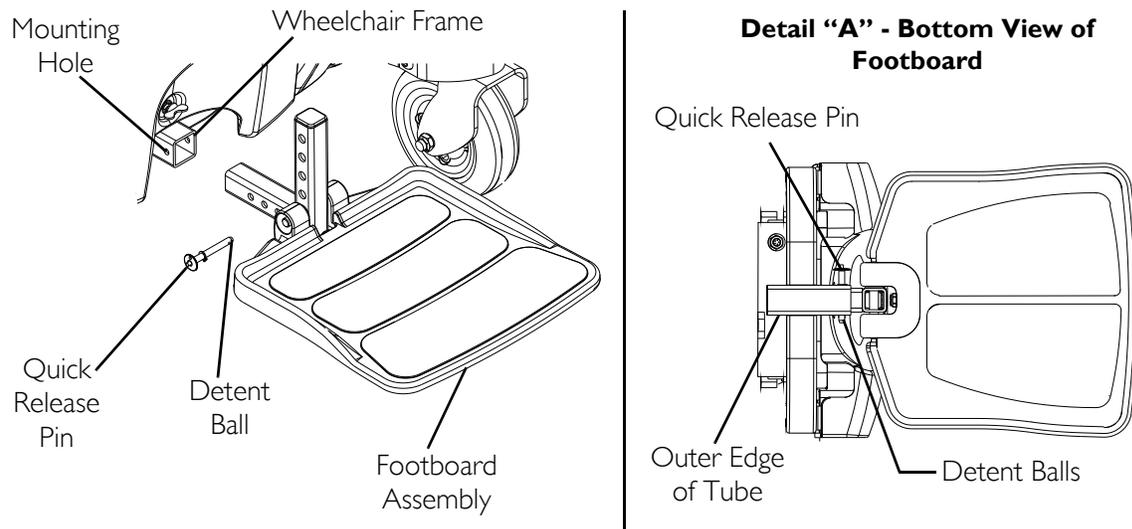
Make sure the detent balls of the quick-release pin are fully released beyond the outer edge of the tube before operating the wheelchair. Otherwise, injury and/or damage may result.

Keep detent balls clean.

---

1. Position the footboard assembly onto the wheelchair frame so that the mounting hole in the wheelchair frame aligns with the desired mounting hole in the footboard assembly.
-

2. Install the quick release pin by depressing the button while sliding the pin in. Make sure the detent balls are fully released beyond the outer edge of the tube (Detail "A" of FIGURE 9.3).



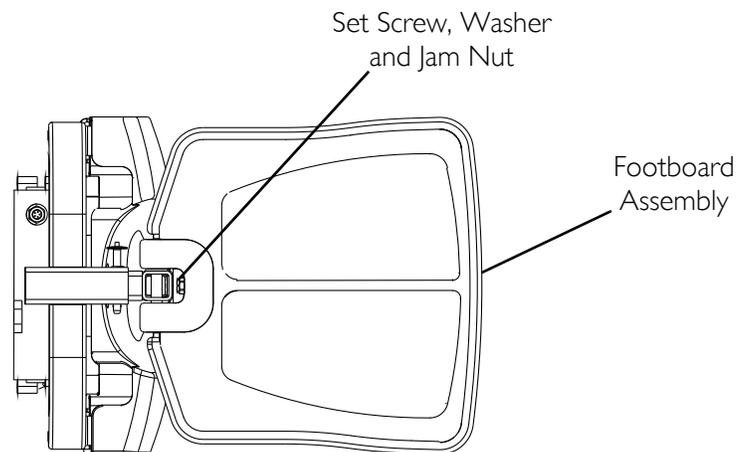
**FIGURE 9.1** Removing/Installing the Footboard Assembly

## Adjusting the Footboard Assembly

### Angle

*NOTE: For this procedure, refer to FIGURE 9.2.*

1. Loosen the jam nut and set screw located underneath on the backside of the footplate.
2. Adjust the set screw in or out to obtain the desired footboard assembly angle.
3. Thread the jam nut and washer inward until it is flush with the footboard bracket.
4. Securely tighten the jam nut and washer to secure the mounting screw in place.



**FIGURE 9.2** Adjusting the Footboard Assembly - Angle

## Depth

*NOTE: For this procedure, refer to FIGURE 9.3.*

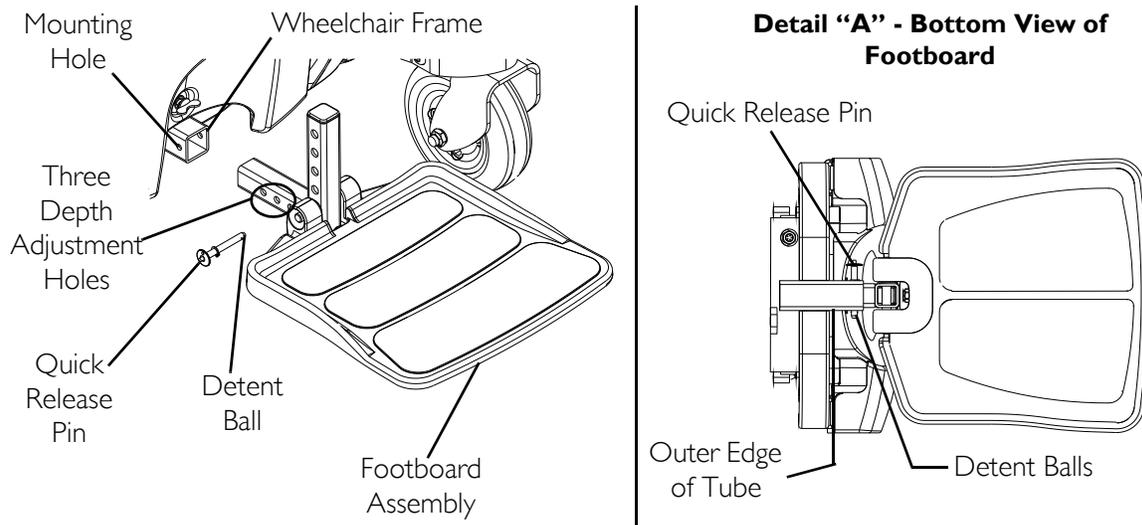
1. Remove the quick release pin that secures the footboard assembly to the wheelchair frame.

### **⚠ WARNING**

**Make sure the detent balls of the quick-release pin are fully released beyond the outer edge of the tube before operating the wheelchair. Otherwise, injury and/or damage may result.**

**Keep detent balls clean.**

2. Adjust footboard to one of three mounting positions.
3. Install the quick release pin. Make sure the detent balls are fully released beyond the outer edge of the tube (Detail "A" of FIGURE 9.3).



**FIGURE 9.3** Adjusting the Footboard Assembly - Depth

# SECTION 10—FRONT RIGGINGS

## ⚠ WARNING

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

**DO NOT** stand on the front riggings, otherwise damage may occur. When getting in or out of the wheelchair, make sure that the footplates on the front riggings are in the upward position or moved out of the way.

While the wheelchair is moving, minimum ground clearance for the front rigging is three inches. If the wheelchair is not moving, the front rigging **MUST** maintain a minimum of one inch ground clearance - otherwise personal injury and damage may result.

Before performing any maintenance, adjustment or service verify that On/Off switch on the joystick is in the **Off** position.

## Installing/Removing Front Riggings

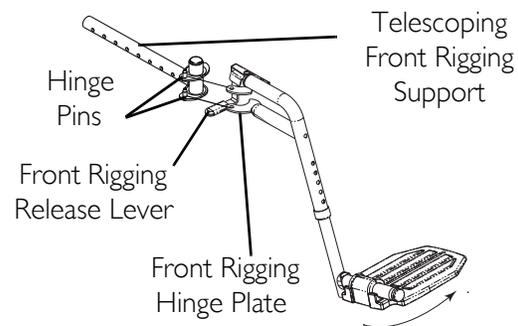
### CAUTION

If front riggings are used, then the seat **MUST** be adjusted to the highest mounting position - otherwise damage may occur.

*NOTE: For this procedure, refer to FIGURE 10.1.*

### Installing

1. If necessary, remove the footboard.  
Refer to [Removing/Installing the Footboard Assembly](#) on page 62.
2. Turn front rigging to the side (open footplate is perpendicular to wheelchair) and position mounting holes in the front rigging hinge plates with hinge pins on the wheelchair frame.
3. Install the front rigging hinge plates onto the hinge pins on the wheelchair frame.
4. Push the front rigging towards the inside of the wheelchair until it locks into place.
5. Repeat STEPS 1-4 for opposite side of wheelchair.



**FIGURE 10.1** Installing/Removing Front Riggings

*NOTE: The footplate will be on the inside of the wheelchair when locked in place.*

## Removing

1. Push the front rigging release lever inward and rotate the footrest out.
2. Lift up on front rigging and remove from the wheelchair.
3. Repeat STEPS 1-2 for opposite side of wheelchair.

## Adjusting Footrest Height

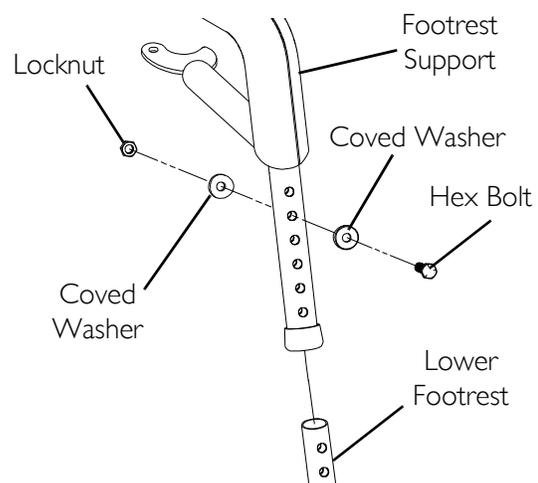
### Model PHWH93

*NOTE: For this procedure, refer to FIGURE 10.2.*

1. Remove any accessories from the footrest(s).
2. Remove the footrest from the wheelchair. Refer to [Installing/Removing Front Riggings](#) on page 65.

*NOTE: Lay footrest on a flat surface to simplify section.*

3. Remove the hex bolt, coved washers and locknut that secure the lower footrest to the footrest support.
4. Reposition the lower footrest to the desired height.
5. Reinstall hex bolt, coved washers and locknut that secure lower footrest to footrest support. Tighten securely.
6. Repeat STEPS 1-5 for the opposite side of the wheelchair footrest, if necessary.
7. Reinstall the footrest(s) onto the wheelchair. Refer to [Installing/Removing Front Riggings](#) on page 65.
8. Reinstall any accessories onto the footrest(s).



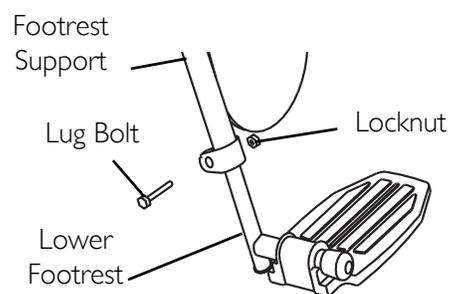
**FIGURE 10.2** Adjusting Footrest Height - Model PHWH93

### Model PH904A and PHAL4A

*NOTE: PH904A style front rigging shown. PHAL4A front rigging adjust the same way.*

*NOTE: For this procedure, refer to FIGURE 10.3.*

1. Loosen, but DO NOT remove the lug bolt and locknut that secure the lower footrest to the footrest support.
2. Reposition the lower footrest to the desired height.



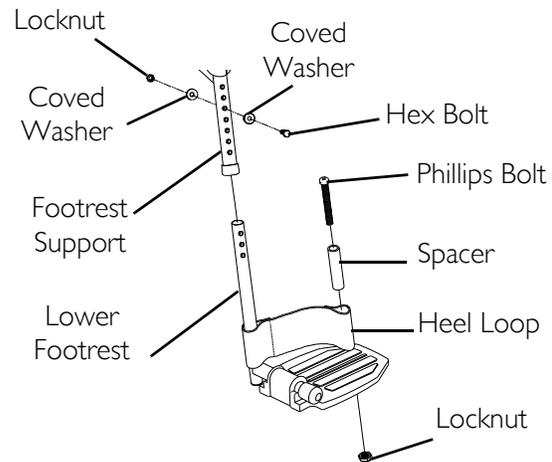
**FIGURE 10.3** Adjusting Footrest Height - Model PH904A and PHAL4A

3. Securely tighten the lug bolt and locknut that secure the lower footrest to the footrest support.
4. Repeat STEPS 1-3 for the opposite side of the wheelchair footrest, if necessary.

## Replacing Heel Loops

*NOTE: For this procedure, refer to FIGURE 10.4.*

1. Note the position of hex bolt, coved washers and locknut for reinstallation.
2. Remove the hex bolt, coved washers and locknut that secure the lower footrest to the footrest support.
3. Remove the lower footrest.
4. Remove the phillips bolt, spacer and locknut that secure the existing heel loop to the lower footrest.
5. Slide the existing heel loop off the lower footrest.
6. Replace heel loop.
7. Reverse STEPS 1-6 to reassemble.



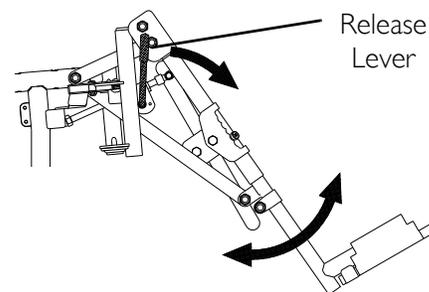
**FIGURE 10.4** Replacing Heel Loops

*NOTE: When securing heel loop to lower footrest, tighten the phillips screw and locknut until the spacer is secure.*

## Raising/Lowering Elevating Front Riggings

*NOTE: For this procedure, refer to FIGURE 10.5.*

5.
  1. Perform one of the following:
    - Raising - Pull back on the release lever and raise front rigging to the desired height.
    - Lowering - Support front rigging with one hand away from the release lever. Push release lever downward with other hand.



**FIGURE 10.5** Raising/Lowering Elevating Front Riggings

## Adjusting/Replacing Telescoping Front Rigging Supports - Van Style Seats

*NOTE: When adjusting the telescoping front rigging support depth, ensure the footplate does not interfere with the caster wheel rotation.*

*NOTE: Telescoping front rigging supports may be extended up to 2-inches from the wheelchair frame in 1-inch increments. This adjustment does not affect seat depth.*

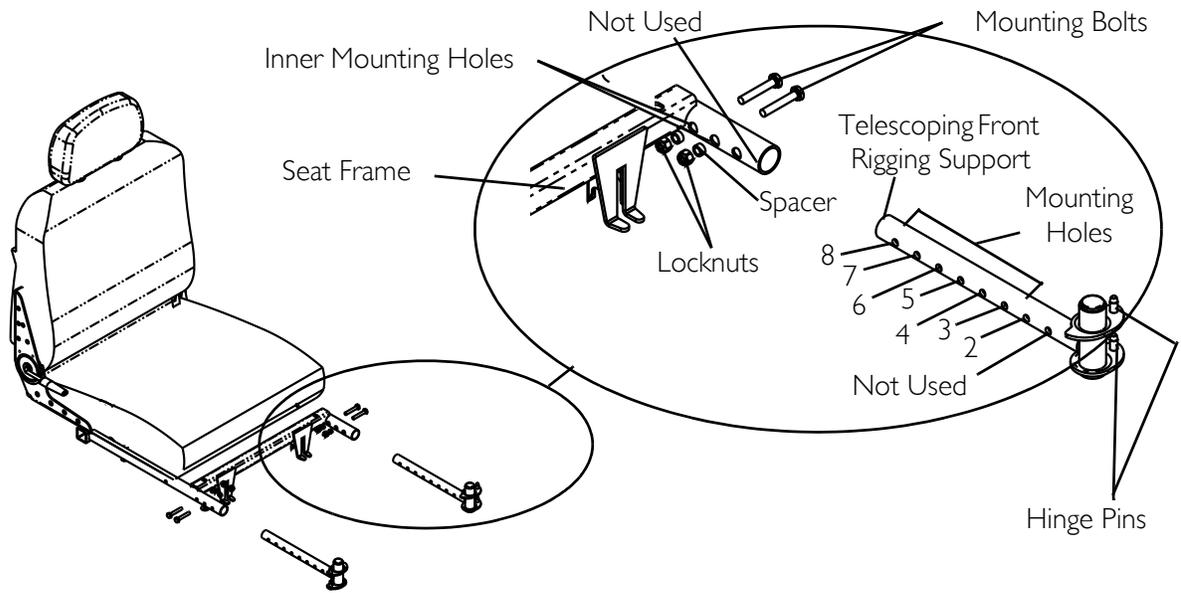
*NOTE: When installing the front riggings support tubes, ensure that the hinge pins are on the outside of the chair facing away from the seat frame.*

*NOTE: For this procedure, refer to FIGURE 10.6 on page 69.*

1. Remove the seat. Refer to Removing/Installing the Seat Assembly on page 56.
2. Remove the two socket bolts and locknuts that secure telescoping front rigging support to the seat frame.
3. Perform one of the following:
  - Adjusting
    - i. Align the appropriate mounting hole of the telescoping front rigging support with the front mounting hole in the seat frame tubes to achieve the desired depth as shown in FIGURE 10.6.
  - Replacing
    - i. Remove the existing telescoping front rigging support from the wheelchair frame.
    - ii. Insert the new telescoping front rigging support into the seat frame.
    - iii. Align the appropriate mounting hole of the telescoping front rigging support with the front mounting hole in the seat frame tubes to achieve the desired depth as shown in FIGURE 10.6.

*NOTE: The footplate will be on the inside of the wheelchair when locked in place.*

4. Using the two socket bolts and locknuts, secure the telescoping front rigging support to the seat frame as shown in FIGURE 10.6.
5. If necessary, repeat STEPS 2-4 on remaining telescoping front rigging support.
6. Reinstall the seat. Refer to Removing/Installing the Seat Assembly on page 56.



STANDARD POSITION		1-INCH OUT		2-INCHES OUT	
18 & 20-Inch Wide	22 & 24-Inch Wide	18 & 20-Inch Wide	22 & 24-Inch Wide	18 & 20-Inch Wide	22 & 24-Inch Wide
Holes 2 and 3	Holes 4 and 5	Holes 3 and 4	Holes 5 and 6	Holes 4 and 5	Holes 6 and 7

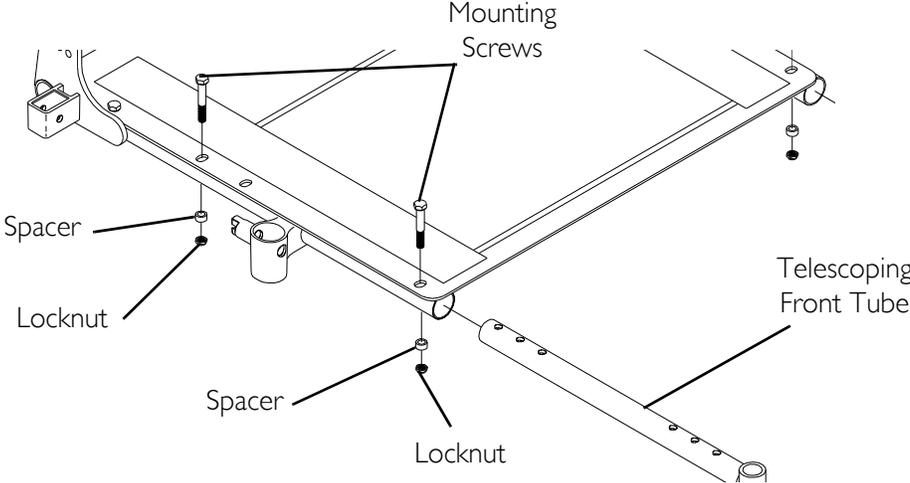
**FIGURE 10.6** Adjusting/Replacing Telescoping Front Rigging Supports - Van Style Seats

## Adjusting/Replacing Telescoping Front Rigging Supports - ASBA

*NOTE: For this procedure, refer to FIGURE 10.7.*

1. Remove the two mounting screws, spacers and locknuts that secure the telescoping front rigging support to the seat frame.
2. Perform one of the following:
  - A. Slide existing telescoping front rigging support to one of three depth positions.
  - B. Remove existing telescoping front rigging.
3. Secure telescoping front rigging at desired depth with existing two mounting screws, spacers, and locknuts. Securely tighten.

*NOTE: The two telescoping front rigging supports can be positioned at different depths depending on the need of the user.*



**FIGURE 10.7** Adjusting/Replacing Telescoping Front Rigging Supports - ASBA

# SECTION 11—SHROUD/WHEELS

## **⚠ WARNING**

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

Before performing any maintenance, adjustment or service verify that On/Off switch on the joystick is in the Off position.

## Replacing the Flat Free Tires on the Wheel Rim

### **⚠ WARNING**

**DO NOT** attempt to replace flat free tires. This procedure **MUST** be performed by a qualified technician.

*NOTE: During initial use of the wheelchair, the user may experience flat spots on the wheels. Flat spots will vanish with continued use of the wheelchair.*

## Removing/Installing the Shrouds

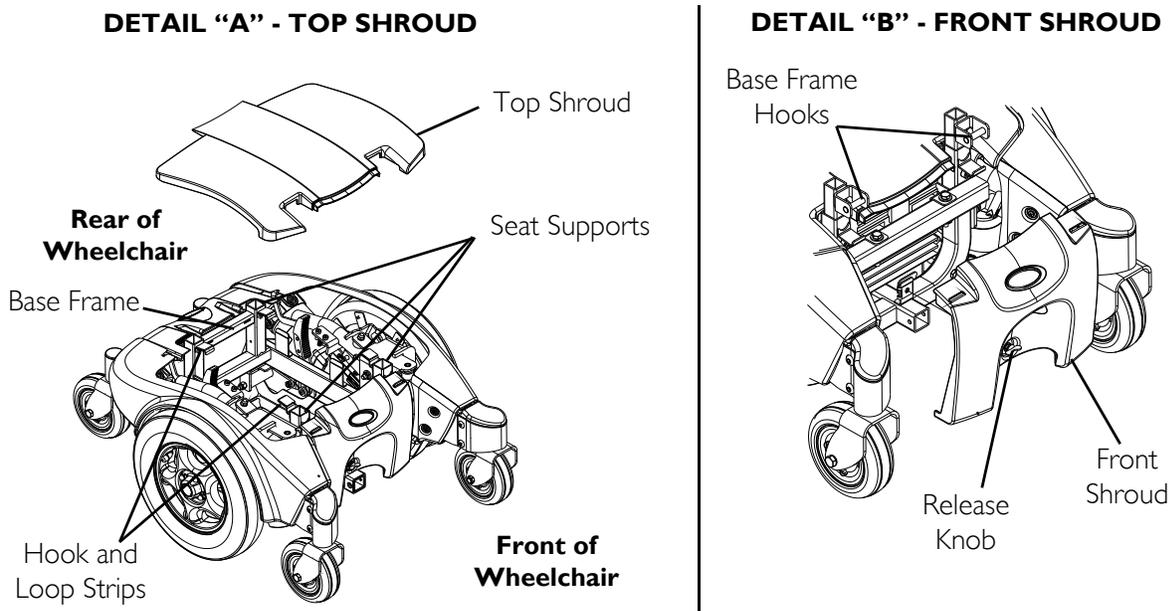
*NOTE: For this procedure, refer to FIGURE 11.1 on page 72.*

### Removing

1. Remove the seat. Refer to Removing/Installing the Seat Assembly on page 56.
2. Perform one of the following:
  - Top Shroud - Lift up on rear edge of top shroud to release the four hook and loop strips that secure the top shroud to the base frame as shown in Detail "A" of FIGURE 11.1.
  - Front Shroud - Turn release knob ¼-turn to the unlocked position and lift up to remove front shroud from base frame hooks as shown in Detail "B" in FIGURE 11.1.

### Installing

1. Perform one of the following:
  - Top Shroud - Position top shroud on to the base frame and gently press down on top shroud to secure the four hook and loop strips that secure the top shroud to the base frame as shown in Detail "A" of FIGURE 11.1.
  - Front Shroud - Position front shroud onto the two base frame hooks. Turn release knob ¼-turn to the locked position as shown in Detail "B" of FIGURE 11.1.
2. Install the seat assembly. Refer to Removing/Installing the Seat Assembly on page 56.



**FIGURE 11.1** Removing/Installing the Shrouds

## Engaging/Disengaging Motor Release Lever

### **⚠ WARNING**

**DO NOT** engage or disengage the motor release lever until the **On/Off** switch on the joystick is in the **Off** position.

### **CAUTION**

**Ensure both motor release levers are fully engaged before driving the wheelchair**

*NOTE: The motor lock disengagement/engagement allows freewheeling or joystick controlled operation. Freewheeling allows an attendant to maneuver the wheelchair without power.*

*NOTE: For this procedure, refer to FIGURE 11.2 on page 73.*

1. Locate the motor release handles on the motors protruding through the shrouds by the rear springs.
2. Perform one of the following:
  - To Disengage the motor release levers -

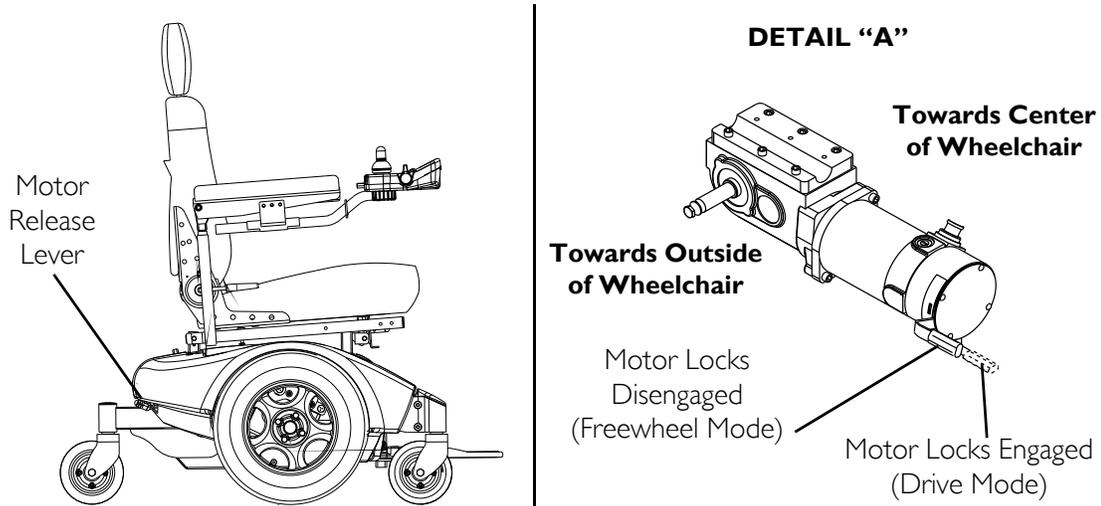
*NOTE: This allows the chair to freewheel for pushing if necessary*

- i. Slide the motor lock lever towards the outside of the wheelchair (free wheel position) as shown in Detail "A" of FIGURE 11.2.

- To Engage the motor release levers -

*NOTE: This allows the motors to drive the wheels.*

- i. Slide the motor lock handles towards the center of the wheelchair (drive position) as shown in Detail "A" of FIGURE 11.2.



**FIGURE 11.2** Engaging/Disengaging Motor Release Lever

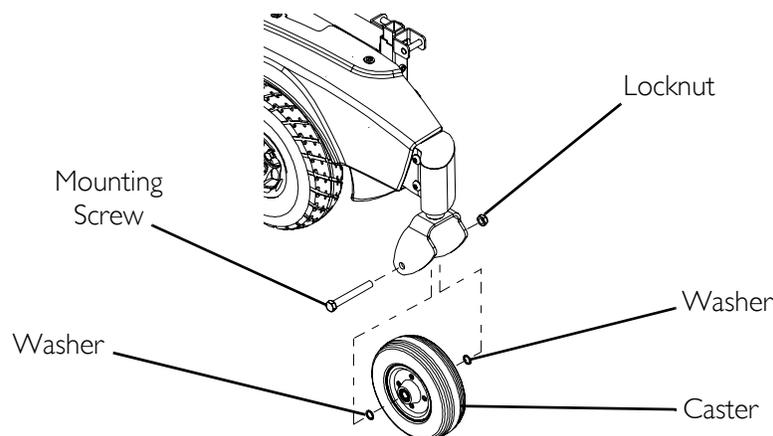
## Replacing Front/Rear Caster Assemblies

*NOTE: For this procedure, refer to FIGURE 11.3.*

*NOTE: Front and rear caster assemblies are replaced in the same manner.*

*NOTE: When replacing the front/rear caster assemblies, it is necessary to brace the caster assemblies to prevent the wheel from spinning.*

1. Remove the mounting screw, two washers, and locknut that secures the caster to the fork.
2. Remove the caster and discard.
3. Secure new caster to fork with existing mounting screw, two washers and locknut (FIGURE 11.3). Securely tighten.



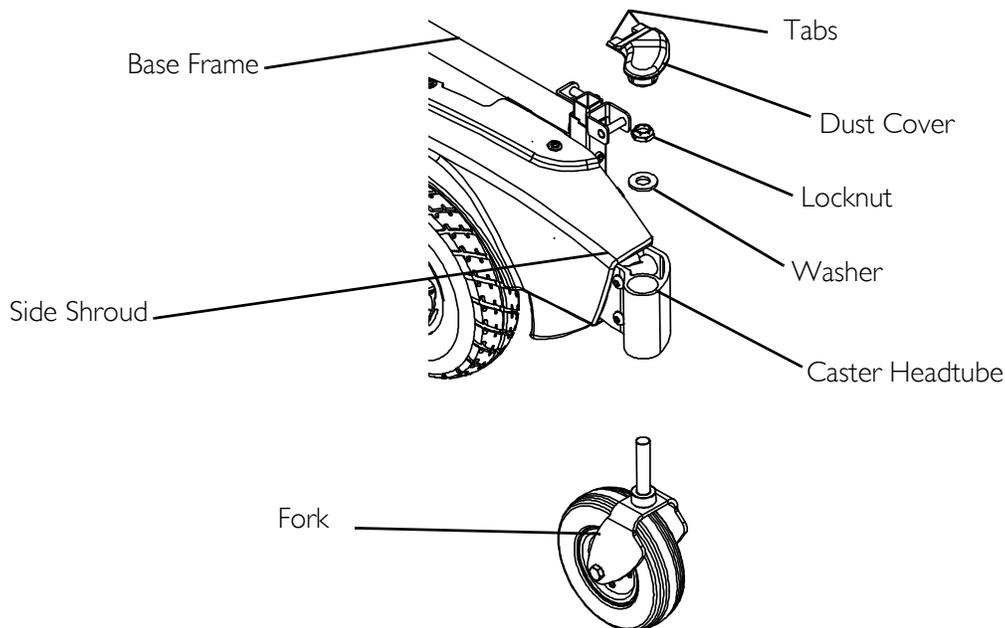
**FIGURE 11.3** Replacing Front/Rear Caster Assemblies

## Adjusting Forks

*NOTE: For this procedure, refer to FIGURE 11.4.*

1. Remove the dust cover.
2. To properly tighten caster journal system and guard against flutter, perform the following check:
  - A. Tip back the wheelchair.
  - B. Pivot both forks and casters to top of their arc simultaneously.
  - C. Let casters drop to bottom of arc (wheels should swing once to one-side, then immediately rest in a straight downward position).
  - D. Adjust locknuts according to freedom of caster swing.
3. Test wheelchair for maneuverability.
4. Readjust locknuts if necessary, and repeat STEPS 1-3 until correct.
5. Snap dust cover into the caster headtube ensuring that the tabs are under the plastic side shrouds.

*NOTE: Components exploded for clarity. There is no need to remove the fork from the base frame.*



**FIGURE 11.4** Adjusting Forks

# SECTION 12—BATTERIES

## ⚠ DANGER

### Risk of Death or Serious Injury

Failure to observe these warnings can cause an electrical short resulting in death, serious injury, or damage to the electrical system.

The **POSITIVE (+) RED** battery cable **MUST** connect to the **POSITIVE (+)** battery terminal(s)/post(s).

The **NEGATIVE (-) BLACK** battery cable **MUST** connect to the **NEGATIVE (-)** battery terminal(s)/post(s).

**NEVER** allow any of your tools and/or battery cable(s) to contact **BOTH** battery post(s) at the same time. An electrical short may occur and serious injury or damage may occur.

Install protective caps on positive and negative battery terminals.

Replace cable(s) immediately if cable(s) insulation becomes damaged.

**DO NOT** remove fuse or mounting hardware from **POSITIVE (+)** red battery cable mounting screw.

## ⚠ WARNING

Make sure power to the wheelchair is **Off** before performing this section.

The use of rubber gloves is recommended when working with batteries.

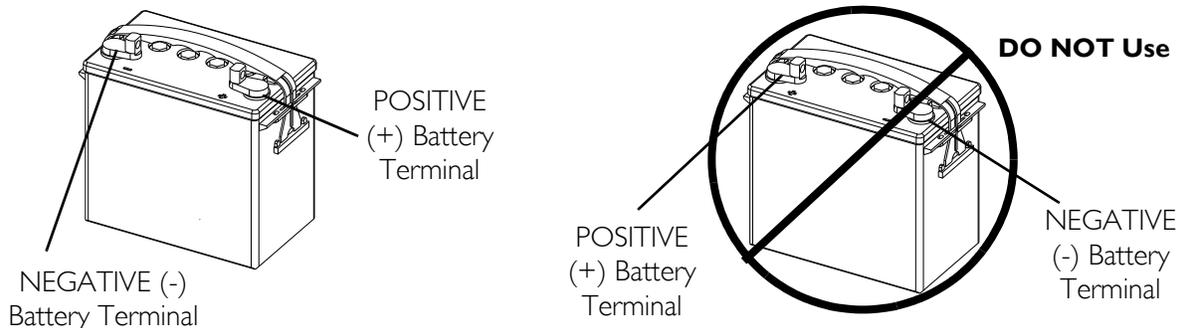
Always use a battery lifting strap when lifting a battery. It is the most convenient method and assures that the battery acid will not spill. It also helps to prolong the life of the battery.

**DO NOT** tip the batteries. Keep the batteries in an upright position.

Invacare strongly recommends that battery installation and battery replacement always be done by a qualified technician.

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

Battery terminal configuration shown below **MUST** be used. Batteries that have the reversed terminal configuration **MUST** not be used - otherwise serious injury or damage may occur.



## CAUTION

**When connecting the battery cables to the battery(ies), the battery cable(s) **MUST** be connected to the battery terminal(s)/post(s) as shown in **FIGURE 12.3** otherwise damage to the battery may result.**

**For proper battery connection, batteries **MUST** use post style terminals with mounting holes through the terminal.**

*NOTE: If there is battery acid in the battery well or on the sides of the batteries, apply baking soda to these areas to neutralize the battery acid. Before reinstalling the new or existing battery(ies), clean the baking soda from the battery box(es) or battery(ies).*

## Installing/Removing the Batteries

*NOTE: For this procedure, refer to **FIGURE 12.1** on page 77 and **FIGURE 12.2** on page 78.*

*NOTE: Have the following tools available:*

TOOL	QTY	COMMENTS
Battery Lifting Strap	1	Supplied
1/2-inch (6 pt) Box Wrench	1	Not Supplied
7/16-inch (6pt) Box Wrench	1	Not Supplied
3/8-inch (6pt) Box Wrench	1	Not Supplied
Diagonal Cutters	1	Not Supplied

### Installing

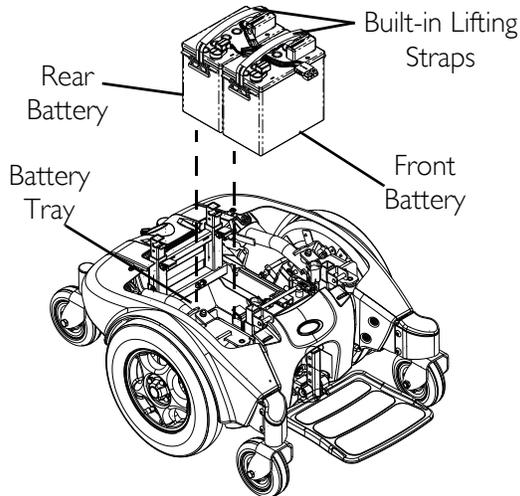
1. Place the wheelchair in a well ventilated area where work can be performed without risking damage to carpeting or floor covering.
2. Verify the joystick On/Off switch is in the Off position and disconnect joystick. Refer to Disconnecting/Connecting the Joysticks on page 48.
3. Remove the seat. Refer to Removing/Installing the Seat Assembly on page 56.
4. Remove the top shroud. Refer to Removing/Installing the Shrouds on page 71.
5. Move aside the motor leads and controller cable to allow unobstructed access to the front of the battery tray.

*NOTE: Perform this section on one battery at a time starting with the rear battery. Repeat **STEP 6** to position the remaining battery into the battery tray.*

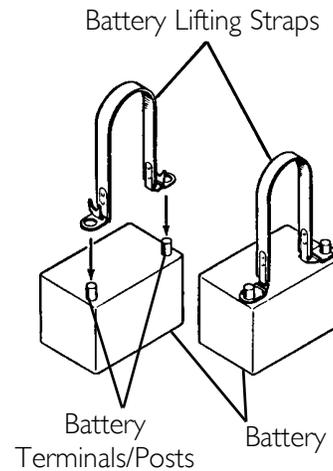
6. Perform one of the following to position the battery into the battery tray:
  - A. Batteries with Built-In Lifting Strap - Use built in lifting strap to position battery into the battery tray (Detail "A" of **FIGURE 12.1**).
  - B. Batteries without Built-In Lifting Strap - Use the battery lifting strap to position battery into the battery tray. When battery is in proper position, remove lifting strap (Detail "B" of **FIGURE 12.1**).

7. Using the battery retaining strap, secure the two batteries into the battery tray.
8. If necessary, connect the wiring harness to the two batteries. Refer to [Connecting/Disconnecting the Battery Wiring Harness](#) on page 79.

**DETAIL "A" - BATTERIES WITH BUILT-IN LIFTING STRAPS**



**DETAIL "B" - BATTERIES WITHOUT BUILT-IN LIFTING STRAPS**

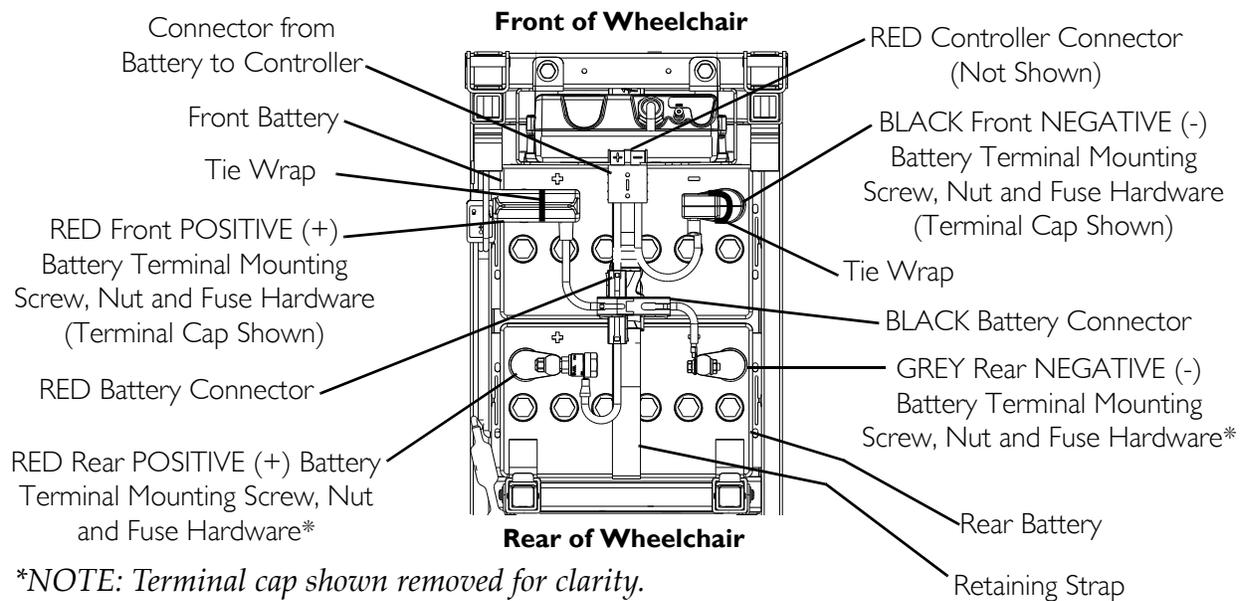


**FIGURE 12.1** Installing/Removing the Batteries

9. Connect the front battery to the controller (RED connector). Refer to FIGURE 12.2.
10. Connect the rear battery to the front battery (RED and BLACK connectors). Refer to FIGURE 12.2.
11. Reinstall the top shroud. Refer to [Removing/Installing the Shrouds](#) on page 71.
12. Reinstall the seat. Refer to [Removing/Installing the Seat Assembly](#) on page 56.
13. Connect the joystick. Refer to [Disconnecting/Connecting the Joysticks](#) on page 48.

*NOTE: New battery(ies) MUST be fully charged before using, otherwise the life of the battery(ies) will be reduced.*

14. If necessary, charge the battery(ies). Refer to [Charging Batteries](#) on page 81.



**FIGURE 12.2** Installing/Removing the Batteries

## Removing

1. Place the wheelchair in a well ventilated area where work can be performed without risking damage to carpeting or floor covering.
2. Verify the joystick On/Off switch is in the Off position and disconnect joystick. Refer to [Disconnecting/Connecting the Joysticks](#) on page 48.
3. Remove the seat. Refer to [Removing/Installing the Seat Assembly](#) on page 56.
4. Remove the top shroud. Refer to [Removing/Installing the Shrouds](#) on page 71.
5. Disconnect the front battery from controller (RED connector). Refer to FIGURE 12.2.
6. Move aside the motor leads and controller cable to allow unobstructed access to the front of the battery tray.
7. Disconnect the rear battery from the front battery (RED and BLACK connectors). Refer to FIGURE 12.2.
8. If necessary, disconnect the wiring harness from batteries. Refer to [Connecting/Disconnecting the Battery Wiring Harness](#) on page 79.
9. Unfasten the retaining strap that secures the two batteries in the battery tray.

*NOTE: Perform this section on one battery at a time starting with the FRONT battery. Repeat STEP 10 to remove remaining battery from battery tray.*

10. Perform one of the following to remove the battery from the battery tray:
  - Batteries with Built-In Lifting Strap - Use built in lifting strap to remove the battery from the battery tray (Detail "A" of FIGURE 12.1).
  - Batteries without Built-In Lifting Strap - Use the battery lifting strap to remove the battery from the battery tray (Detail "B" of FIGURE 12.1).

## Connecting/Disconnecting the Battery Wiring Harness

*NOTE: Perform this section on one battery at a time starting with the front battery.*

*NOTE: The front battery has three connectors - two to the rear battery wiring harness (RED and BLACK) and one to the controller cable (RED), and the rear battery has two connectors (RED and BLACK) to the front battery wiring harness.*

*NOTE: Both the front and rear wiring harnesses are shipped with the POSITIVE (+) RED battery cable and mounting screw connected. Use the exposed, threaded portion of the mounting screw to secure the POSITIVE (+) RED cable to the POSITIVE (+) terminal.*

---

### **⚠ WARNING**

**DO NOT** remove fuse or mounting hardware from **POSITIVE (+) RED** battery cable/mounting screw.

**All battery terminal covers (two on the front battery and two on the rear battery) MUST** be installed prior to use.

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*NOTE: For this procedure, refer to FIGURE 12.3 on page 80.*

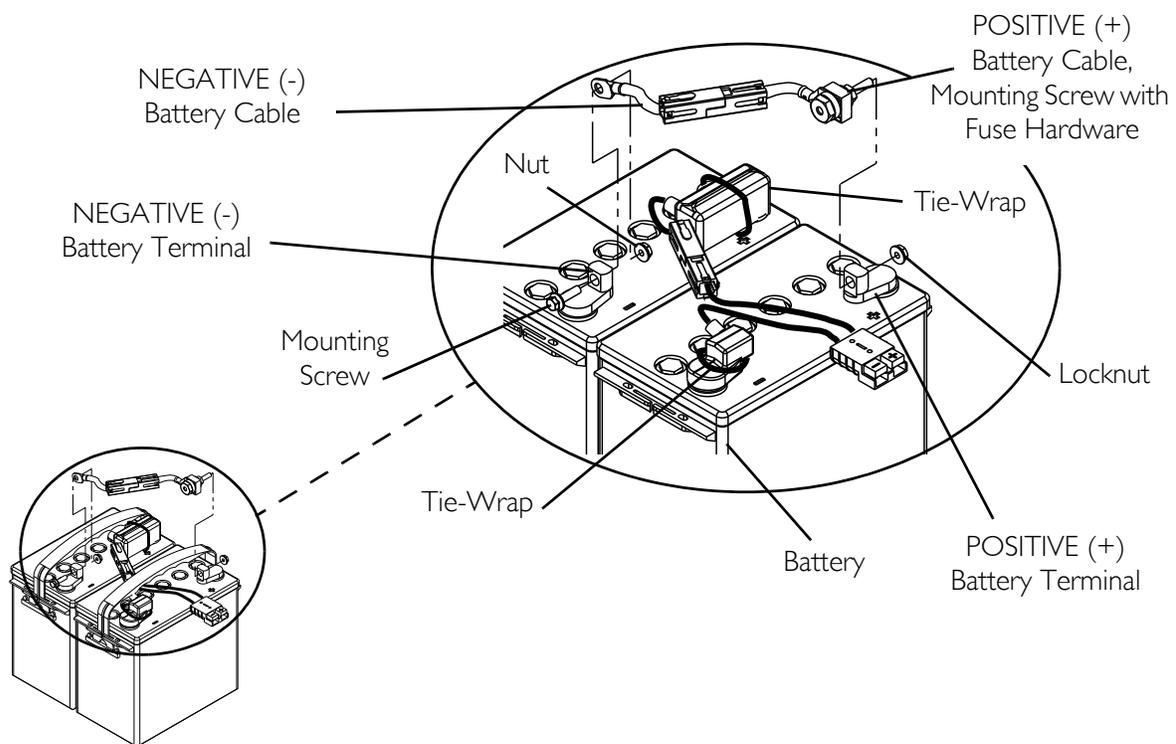
### **Connecting**

1. Peel back battery terminal covers to expose battery clamp on each battery cable as follows:
  - A. RED battery clamp cover from RED battery cable.
  - B. BLACK battery clamp cover from BLACK battery cable on front battery or GREY battery clamp cover from BLACK battery cable on rear battery.
2. Using the mounting screws and nuts, secure the battery cables to the battery terminals as shown in FIGURE 12.3 in the following order:
  - A. NEGATIVE (-) BLACK battery cable to NEGATIVE (-) battery terminal/post.
  - B. POSITIVE (+) RED battery cable to POSITIVE (+) battery terminal/post.
3. Verify wiring harness is correctly installed and securely tightened.
4. Verify proper battery orientation.
5. Reposition battery terminal covers over battery post(s).
6. Using new tie-wraps, secure the terminal covers to the battery terminals as shown in FIGURE 12.3.
7. Repeat STEPS 1-6 to install and connect the rear battery to the rear battery harness.

### **Disconnecting**

1. Remove the existing tie-wraps that secure the battery terminal covers to the battery terminals.

2. Peel back battery terminal covers to expose battery clamp on each battery cable as follows:
  - A. RED battery clamp cover from RED battery cable.
  - B. BLACK battery clamp cover from BLACK battery cable on front battery or GREY battery clamp cover from BLACK battery cable on rear battery.
3. Remove the mounting screws and nuts that secure the battery cables to the battery terminals as shown in FIGURE 12.3 in the following order:
  - A. POSITIVE (+) RED battery cable from POSITIVE (+) battery terminal/post.
  - B. NEGATIVE (-) BLACK battery cable from NEGATIVE (-) battery terminal/post.
4. Set wiring harness aside.
5. Repeat STEPS 1-4 to disconnect the rear battery from the rear battery harness.



**FIGURE 12.3** Connecting/Disconnecting the Battery Wiring Harness

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## Charging Batteries

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### **⚠ WARNING**

Never attempt to recharge the batteries by attaching cables directly to the battery terminals.

**DO NOT** attempt to recharge the batteries and operate the wheelchair at the same time.

**DO NOT** attempt to recharge the batteries when the wheelchair has been exposed to **ANY** type of moisture.

**DO NOT** attempt to recharge the batteries when the wheelchair is outside.

**DO NOT** sit in the wheelchair while charging the batteries.

**DO NOT** attempt to recharge the batteries using both the on-board battery charger and an independent battery charger (plugged into the joystick charger port) at the same time. Doing so will reduce the life of the batteries.

**READ** and **CAREFULLY** follow the manufactures instructions for each charger (supplied or purchased). If charging instructions are not supplied, consult a qualified technician for proper procedures prior to use.

---

### **CAUTION**

New batteries **MUST** be fully charged prior to initial use of the wheelchair.

**Always** fully charge new batteries before initial use or battery life will be reduced.

**As a general rule, you should recharge your batteries as frequently as possible to assure the longest possible life and to minimize required charging time. Plan to recharge them when you DO NOT anticipate using the wheelchair.**

---

Some basic concepts which will help you understand this automatic process are:

The amount of electrical current drawn within a given time to charge a battery is called “charge rate”. If, due to usage, the charge stored in the battery is low, the charge rate is high. As a charge builds up, the charge rate is reduced, and the battery charger rate decreases to a “trickle charge”.

*NOTE: If the batteries need to be charged more often or take longer to charge than normal, they may need to be replaced. Contact a qualified technician.*

*NOTE: The batteries can be charged using the on-board battery charger or by plugging an independent battery charger into the port located on the front of the joystick.*

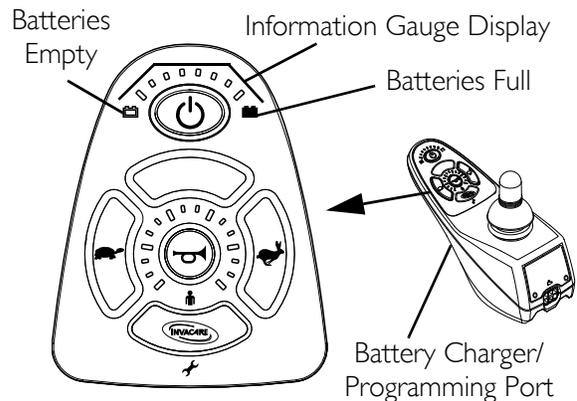
## When to Charge Batteries

### SPJ+ Joysticks

*NOTE: For this procedure, refer to FIGURE 12.4.*

The Information Gauge Display located on the front of the joystick housing, it provides the state-of-battery charge, including notification of when the battery requires charging. It also provides the following information to the user on the status of the wheelchair:

- A. GREEN LEDs are lit, indicating well charged batteries.
- B. AMBER LEDs are lit, indicating batteries are moderately charged. Recharge batteries before taking a long trip.
- C. RED LEDs are lit, indicating batteries are running out of charge. Recharge batteries as soon as possible.



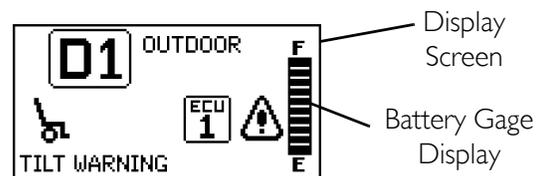
**FIGURE 12.4** SPJ+ Joysticks

### MPJ+ Joystick

*NOTE: For this procedure, refer to FIGURE 12.5.*

The far right side of the display screen is the Battery Gauge Display (BGD). It provides information on the remaining charge in the batteries.

At full charge, solid blocks fill in all ten segments between E (Empty) and F (Full). As the battery becomes discharged, the farthest segments will progressively disappear a bar at a time until no segments appear between E and F. At this level the user should charge the batteries as soon as possible.



**FIGURE 12.5** MPJ+ Joystick

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## Battery Charger Operation

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### **⚠ WARNING**

**READ and CAREFULLY follow the manufacturer's instructions for each charger (supplied or purchased). If charging instructions are not supplied, consult a qualified technician for proper procedures prior to use.**

**If the circuit breaker trips repeatedly, IMMEDIATELY unplug charger and contact dealer or a qualified technician.**

**Three prong to two prong adapters should not be used. Use of three prong adapters can result in improper grounding and present a shock hazard to the user.**

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### On-Board Battery Charger

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### **⚠ WARNING**

**Use of improper extension cord could result in risk of fire and electric shock.**

**When using an extension cord, use only a three wire extension cord having at least 16 AWG (American Wire Gauge) wire and the same or higher electrical rating as the device being connected.**

**Ensure the pins of the extension cord plug are the same number, size, and shape as those on the charger.**

**DO NOT under any circumstances cut or remove the round grounding plug from the charger AC cable plug or the extension cord plug.**

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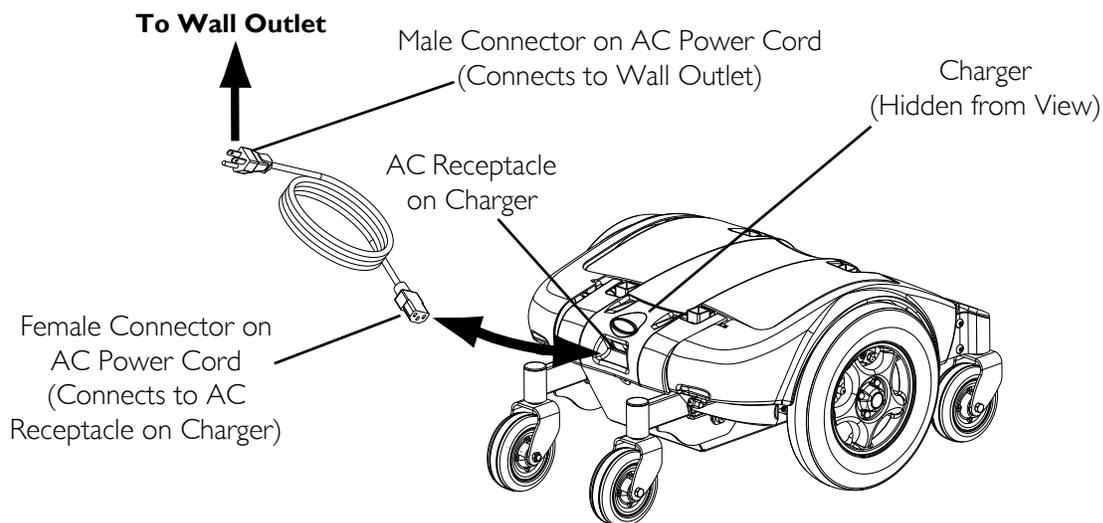
*NOTE: For this procedure, refer to FIGURE 12.6 on page 84.*

*NOTE: Charge indicator light is only visible with rear shroud removed.*

1. Plug the female connector of the AC power cord (supplied) to the AC receptacle on the charger and plug in the male connector on the AC power cord into the wall outlet.
2. The On/Off LED indicator illuminates solid RED indicating that the charger is ON.
3. If the On/Off LED indicator is "Blinking" RED, this is abnormal. Unplug AC power cord from the on-board battery charger and wall outlet. Contact Invacare at the number listed on the back page of this manual.
4. When the On/Off LED indicator light is OFF, charger is OFF.
5. When the Charge LED indicator light is YELLOW, the batteries are charging.
6. When the Charge LED indicator light is solid GREEN, the batteries are fully charged (as their condition will allow). At this point, the charger automatically stops charging.
7. When charging is complete, unplug the male connector of the AC power cord from the wall outlet and then unplug the female connector of the AC power cord from the AC receptacle on the charger.

**⚠ WARNING**

**DO NOT** operate wheelchair with **AC** power cord attached to the wheelchair.



*NOTE: Wheelchair shown without seat for clarity.*

CHARGING INDICATOR	STATUS
YELLOW	Charging (Under 80%)
"Blinking" YELLOW	Partially Charges (Over 80%)
Solid GREEN	Fully Charges
LED "Off"	Charger Disconnected
Solid RED or "Blinking" RED	Under Voltage
	Over Voltage
	Over Temperature

*NOTE: Charge indicator light is only visible with rear shroud removed.*

**FIGURE 12.6** On-Board Battery Charger

### Independent Charger

*NOTE: The charger port located on the Front of the joystick requires the use of an independent charger. The independent charger is not supplied with the wheelchair.*

*NOTE: For this procedure, refer to FIGURE 12.7.*

**⚠ WARNING**

**READ** and **CAREFULLY** follow the individual instructions for each charger (supplied or purchased). If charging instructions are not supplied, consult a qualified technician for proper procedures.

**CAUTION**

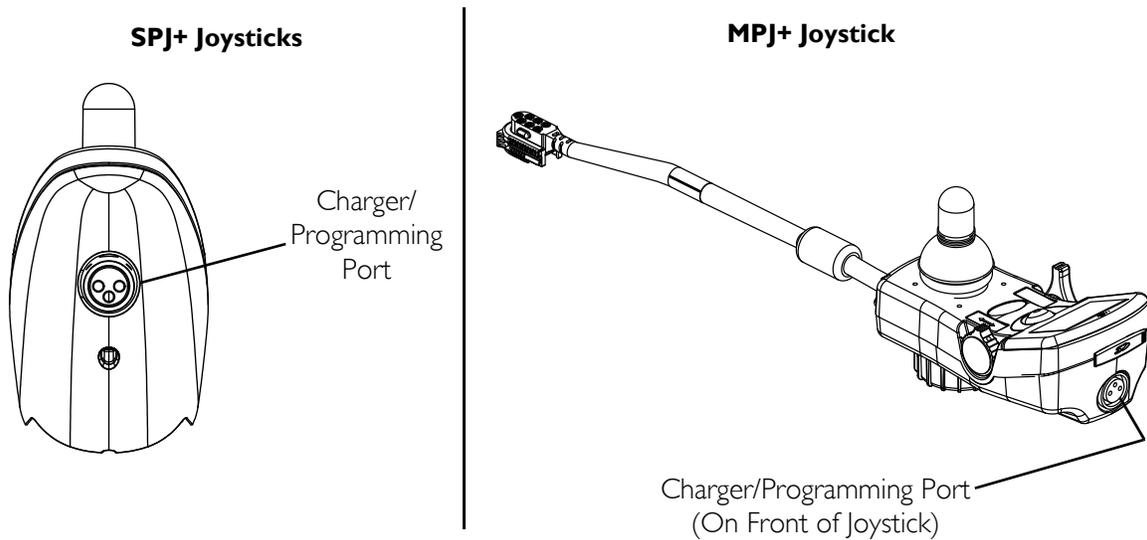
**DO NOT** use an independent charger with an output rating of over **8A** (amps). Otherwise, damage may occur.

**Required Items:** Battery Charger\*, Power Cord\*\*

\*NOTE: Item not supplied.

\*\*NOTE: AC power cord (3-prong plug, 15 ampere current rating; industrial type).

1. Attach the battery charger connector to the charger port on the front of the joystick.
2. Plug the charger's AC power cord or extension into the grounded 110-volt wall outlet.
3. Unplug the AC power cord or extension once charging is complete.



**FIGURE 12.7** Independent Charger

# SECTION 13—WEAR AND TEAR INFORMATION

## General Information

Normal wear and tear items and components include but are not limited to: all upholstery items including seat and back upholstery, arm and calf pads, cushions, wheels, tires and casters, all types of batteries, joystick overlays and inductive rubberized protective boots.

Invacare reserves the right to ask for any item back that has an alleged defect in workmanship. Refer to the Warranty section in this manual for specific warranty information.

Refer to the Inspection Checklists in this manual for proper preventative maintenance schedule.

This is just a general guideline and does not include items damaged due to abuse and misuse.

<b>PRODUCT TYPE</b>	<b>PRODUCT WEAR AND TEAR</b>
<b>Wheelchairs</b>	Wheels, Brake Assembly, Hand Grips
<b>Scooters</b>	Wheels, Braking System, Armrest, Seat
<b>Mobility Hardware and Electronics</b>	Rubber Urethane Tires and Casters, Handgrips, Joystick Inductive Tops, Joystick Overlays, Motors and Gearboxes (if exposed to prolonged moisture, urine, etc.), Stability Lock
<b>Upholstery and Seating</b>	Arm pads, Seat Cushion Foam, Seat Cushion Covers, Back Cushion Foam, Back Cushion Covers, Headrest Foam, Headrest Covers, Footplate Covers, Calf Pad (if applicable)Foam and Cover
<b>Batteries</b>	Lead acid/Lithium, Coin cell (watch type), Gel (6 months)

# **GLOBAL LIMITED WARRANTY (EXCLUDING CANADA)**

**PLEASE NOTE: THE WARRANTY BELOW HAS BEEN DRAFTED TO COMPLY WITH FEDERAL LAW APPLICABLE TO PRODUCTS MANUFACTURED AFTER JULY 4, 1975.**

This warranty is extended only to the original purchaser who purchases this product within any country excluding CANADA when new and unused from Invacare or a dealer. This warranty is not extended to any other person or entity and is not transferable or assignable to any subsequent purchaser or owner.

Coverage under this warranty will end upon any such subsequent sale or other transfer of title to any other person. For product purchased in Canada, please refer to the Canada Limited Warranty.

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

Invacare warrants the base frame to be free from defects in materials and workmanship for a period of five (5) years from the date of purchase from Invacare or a dealer, with a copy of the seller's invoice required for coverage under this warranty. Invacare warrants the seat frame to be free from defects in materials and workmanship for a period of three (3) years from the date of purchase from Invacare or a dealer, with a copy of the seller's invoice required for coverage under this warranty. Invacare warrants all electronics and electrical components (excluding batteries), motors and gearboxes to be free from defects in materials and workmanship for a period of one (1) year from the date of purchase from Invacare or a dealer, with a copy of the seller's invoice required for coverage under this warranty. Invacare warrants all batteries to be free from defects in materials and workmanship for a period of six (6) months from the date of purchase from Invacare or a dealer, with a copy of the seller's invoice required for coverage under this warranty. Invacare warrants all remaining components (excluding all upholstered materials, padded materials, tires and wheels) to be free from defects in materials and workmanship for a period of one (1) year from the date of purchase from Invacare or a dealer, with a copy of the seller's invoice required for coverage under this warranty. If within such warranty periods any such product component shall be proven to be defective, the product component shall be repaired or replaced, at Invacare's option. This warranty does not include any labor or shipping charges incurred in replacement part installation or repair of any such product. Invacare's sole obligation and your exclusive remedy under this warranty shall be limited to such repair and/or replacement.

For warranty service, please contact the dealer from whom you purchased your Invacare product. In the event you do not receive satisfactory warranty service, please write directly to Invacare at the address on the bottom of the back cover. Provide dealer's name address, date of purchase, indicate nature of the defect and, if the product is serialized, indicate the serial number. Do not return products to our factory without our prior consent.

**LIMITATIONS AND EXCLUSIONS: THE FOREGOING WARRANTY SHALL NOT APPLY TO SERIAL NUMBERED PRODUCTS IF THE SERIAL NUMBER HAS BEEN REMOVED OR DEFACED, PRODUCTS SUBJECT TO NEGLIGENCE, ACCIDENT, IMPROPER OPERATION, MAINTENANCE OR STORAGE, COMMERCIAL OR INSTITUTIONAL USE, PRODUCTS MODIFIED WITHOUT INVACARE'S EXPRESS WRITTEN CONSENT (INCLUDING, BUT NOT LIMITED TO, MODIFICATION THROUGH THE USE OF UNAUTHORIZED PARTS OR ATTACHMENTS); PRODUCTS DAMAGED BY REASON OF REPAIRS MADE TO ANY COMPONENT WITHOUT THE SPECIFIC CONSENT OF INVACARE, OR TO A PRODUCT DAMAGED BY CIRCUMSTANCES BEYOND INVACARE'S CONTROL, AND SUCH EVALUATION WILL BE SOLELY DETERMINED BY INVACARE. THE WARRANTY SHALL NOT APPLY TO PROBLEMS ARISING FROM NORMAL WEAR AND TEAR OR FAILURE TO ADHERE TO THE PRODUCT INSTRUCTIONS. A CHANGE IN OPERATING NOISE, PARTICULARLY RELATIVE TO MOTORS AND GEARBOXES DOES NOT CONSTITUTE A FAILURE OR DEFECT AND WILL NOT BE REPAIRED; ALL DEVICES WILL EXHIBIT CHANGES IN OPERATING NOISE DUE TO AGING.**

**THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IN LIEU OF ANY OTHER WARRANTIES WHATSOEVER, WHETHER EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, AND THE SOLE REMEDY FOR VIOLATIONS OF ANY WARRANTY WHATSOEVER, SHALL BE LIMITED TO REPAIR OR REPLACEMENT OF THE DEFECTIVE PRODUCT PURSUANT TO THE TERMS CONTAINED HEREIN. THE APPLICATION OF ANY IMPLIED WARRANTY WHATSOEVER SHALL NOT EXTEND BEYOND THE DURATION OF THE EXPRESS WARRANTY PROVIDED HEREIN AND INVACARE SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES WHATSOEVER; SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGE, OR LIMITATION OF HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE EXCLUSION AND LIMITATION MAY NOT BE APPLICABLE.**

**THIS WARRANTY SHALL BE EXTENDED TO COMPLY WITH STATE/PROVINCIAL LAWS AND REQUIREMENTS.**

# CANADA LIMITED WARRANTY

**PLEASE NOTE: THE WARRANTY BELOW HAS BEEN DRAFTED TO COMPLY WITH FEDERAL LAW APPLICABLE TO PRODUCTS MANUFACTURED AFTER JULY 4, 1975.**

This warranty is extended only to the original purchaser who purchases this product within Canada when new and unused from Invacare or a dealer. This warranty is not extended to any other person or entity and is not transferable or assignable to any subsequent purchaser or owner. Coverage under this warranty will end upon any such subsequent sale or other transfer of title to any other person.

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

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For warranty service, please contact the dealer from whom you purchased your Invacare product. In the event you do not receive satisfactory warranty service, please write directly to Invacare at the address on the bottom of the back cover. Provide dealer's name address, date of purchase, indicate nature of the defect and, if the product is serialized, indicate the serial number. Do not return products to our factory without our prior consent.

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