

***Pronto<sup>®</sup> M91<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.

Also, 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
MK <sub>5</sub> <sup>™</sup> NX <sup>™</sup> Electronic Owner Manual	1110532
M91/M94 <sup>™</sup> Service Manual	1125038
Quad Link Instruction Sheet	1134844

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

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**.

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**⚠ WARNING**

**POWERED SEATING SYSTEMS ONLY** - This seating system has been custom designed and will be assembled to the wheelchair base before delivery to the user. The information contained in this manual is for maintaining and adjusting the seating system. There are very few adjustments that can safely be made by the user. If there is a procedure or adjustment that needs to be performed on the seating system that is not in this manual, do not perform that procedure. Have the seating system serviced by a qualified technician.

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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 wheelchair with optimum traction and stability when driving forward over transitions and thresholds of up to 3-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.

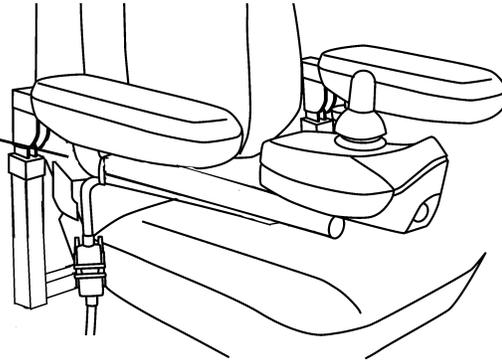
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# LABEL LOCATIONS

## M91 Standard

**WEIGHT CAPACITY  
LIMITE DE POIDS  
300 LBS. (136 kgs.)**  
REFER TO OWNER'S MANUAL  
SE RÉFÉRER AU MANUEL DE L'UTILISATEUR

P/N 1111028



**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. P/N 1114904

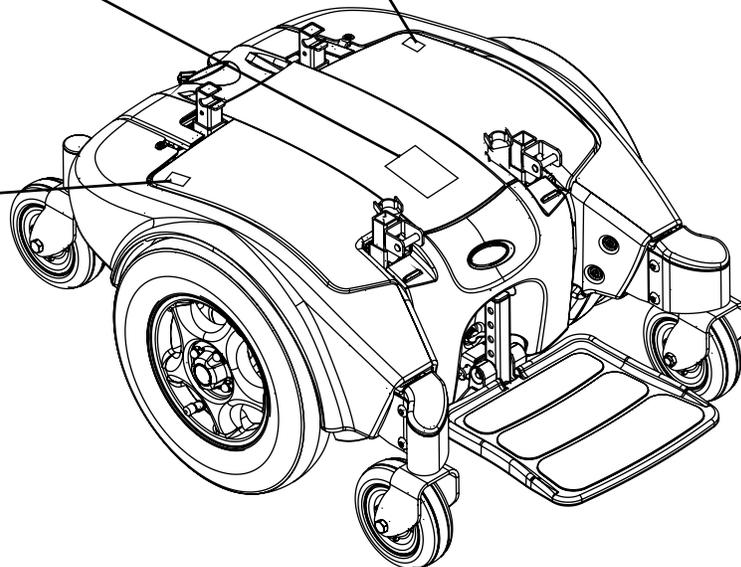
**AVERTISSEMENT**  
SCHEMA POUR LE FILAGE des batteries doubles 22NF  
NE PAS ENLEVER CETTE ÉTIQUETTE

Le câble ROUGE POSITIF (+) DOIT être connecté à la borne POSITIVE(+). Le câble NOIR NÉGATIF (-) DOIT être connecté à la borne NEGATIVE (-). 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(+).



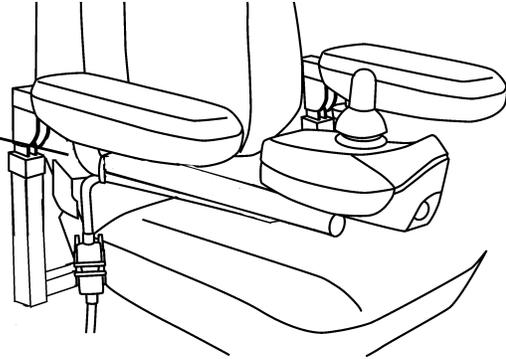
Serial Number Label is located on a plate on the inside of the right rear frame.



M91 Heavy Duty

**WEIGHT CAPACITY  
LIMITE DE POIDS  
400 LBS. (182 kgs.)**  
REFER TO OWNER'S MANUAL  
SE RÉFÉRER AU MANUEL DE L'UTILISATEUR

P/N 11111030



**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(+).

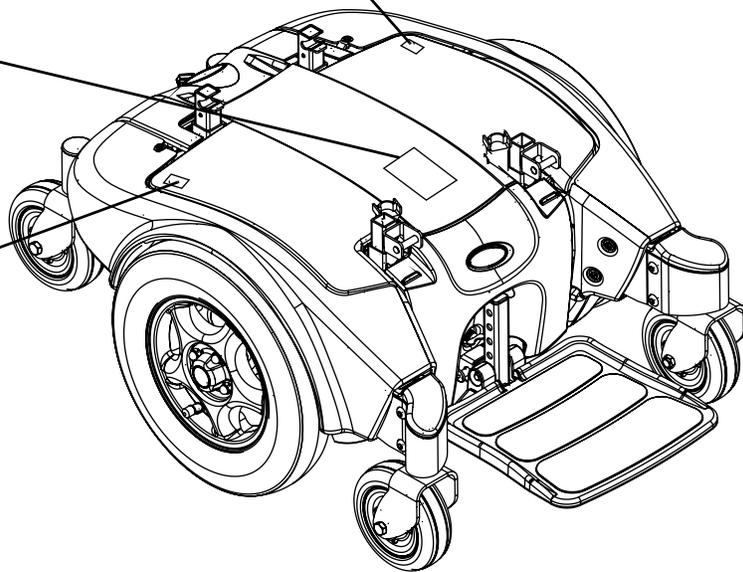
**WARNING**

**Pinch Point.**  
1079203

Serial Number Label is located on a plate on the inside of the right rear frame.

**WARNING**

**Pinch Point.**  
1079203

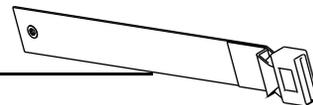


All Wheelchairs

*NOTE: Auto style seat positioning strap shown. This label is also on the airline style seat positioning strap.*

**WARNING**

This seat/chest positioning strap is NOT intended for occupant restraint in a moving motor vehicle, and DOES NOT conform with ANSI/RESNA WC/19. If signs of wear appear, positioning strap MUST be replaced IMMEDIATELY.



# SPECIFICATIONS

## PRONTO M91

	18-INCH VAN SEAT	20-INCH VAN SEAT	22-INCH VAN SEAT
<b>SEAT WIDTH RANGE:</b>	18 inches	20 inches	22 inches
<b>SEAT DEPTH:</b>	16 -18 inches	18-20 inches	20-22 inches
<b>BACK HEIGHT W/O HEADREST SEMI RECLINE:</b>	18 inches	18 inches	18 inches
<b>BACK ANGLE RANGE SEMI RECLINE:</b>	35° to 115°	35° to 115°	35° to 115°
<b>UPHOLSTERY:</b>	Grey Vinyl, Grey Cloth, Tan Vinyl		
<b>SEAT-TO-FLOOR:</b>	22½ to 23½ inches (Cushion Not Compressed)		
<b>OVERALL WIDTH (NO JOYSTICK):</b>	25-7/8 inches		
<b>OVERALL HEIGHT:</b>	36-49¼ inches (Semi Recline Back)		
<b>OVERALL LENGTH:</b>	39 inches (With Footboard Folded)		
<b>DRIVE WHEELS/TIRES:</b>	14 x 3-inch		
<b>CASTERS:</b>	6 x 2-inch Front/Rear with Precision Sealed Bearings		
<b>FOOTRESTS/LEGRESTS:</b>	Flip Up, Depth and Height Adjustable, Footboard, Swingaway Front Rigging, Elevating Legrest, Center Mount		
<b>WEIGHT W/SEATING SYSTEM AND ACCESSORIES</b> W/O BATTERIES: W/BATTERIES:	199 lbs 273 lbs		
<b>SHIPPING:</b>	260 lbs (w/o Batteries), 310 lbs (w/Batteries)		
<b>ARMRESTS:</b>	Adjustable Angle, Depth and Width		
<b>BATTERIES:</b>	22NF - Quantity 2		
<b>INCLINE CAPABILITY:</b>	9°		
<b>PERFORMANCE</b> SPEED Standard: Heavy Duty: TURNING RADIUS: *RANGE (VARIABLE) Standard: Heavy Duty: **WEIGHT LIMITATION Standard: Heavy Duty:	0 to 6.4 mph 0 to 4.25 mph 19½ inches (Front with Footboard); 21½ inches (Rear) 22 miles 12-16 miles 300 lbs 400 lbs		
<b>OPERATING TEMPERATURE</b> <b>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 18-inch deep Van seat.

## SPECIFICATIONS

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*\*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 Battery Charger Operation on page 68 for more information about the battery discharge indicator.*

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

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# 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.

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## **⚠ 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.

## Accessories Information

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## **⚠ WARNING**

**Risk of Serious Injury or Damage**

Use of non-Invacare accessories may result in serious 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.

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## Electrical

### Grounding Instructions

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#### **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.

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### Batteries

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#### **WARNING**

The warranty and performance specifications contained in this manual are based on the use of deep cycle gel cell 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.

**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.

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.

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### Charging Batteries

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#### **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 a 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.

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**⚠ DANGER**

**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.

**DO NOT** attempt to recharge 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 manufacturer's instructions for each charger (supplied or purchased). If charging instructions are not supplied, consult a qualified technician for proper procedures.

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**⚠ WARNING**

**AFTER** charging batteries, **ALWAYS** make sure that the battery charger cord is securely wrapped and stored within the hook and loop strap assembly on the rear of the battery tray. Failure to do so may result in damage to the cord or personal injury to the user or bystanders.

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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## Operation Information

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**⚠ 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.

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**⚠ 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.

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**⚠ 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.

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**⚠ DANGER**

**Risk of injury or damage**

Misuse of the wheelchair may cause the wheelchair to start smoking, sparking, or burning.

**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**.

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**⚠ 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.

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

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## **⚠ WARNING**

**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.

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

**DO** determine and establish your particular safety limits by practicing bending, reaching and transferring activities in the presence of a qualified healthcare professional before attempting active use of the 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.

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

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

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

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

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

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

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

**DO NOT** service or adjust your wheelchair while occupied, unless otherwise noted.

Invacare strongly recommends proceeding down ramps or slopes at half speed or slower and to avoid hard braking or sudden stops.

**DO NOT** leave elevating legrests in the fully extended position when proceeding down ramps or slopes.

**DO NOT** attempt to move up or down an incline with a water, ice or oil film.

**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 wheelchair.

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

**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** stand on the frame of the wheelchair.

**DO NOT** stand on the footplates/footboard. When getting in or out of the wheelchair, make sure that the footboard or footplates are in the upward position or swing the footrests towards the outside of the wheelchair.

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## **⚠ WARNING**

Before attempting to transfer in or out of the wheelchair, every precaution should be taken to reduce the gap distance. Turn both casters parallel to the object you are transferring onto. Also be certain the power is **Off** and wheel locks are engaged to prevent the wheels from moving.

**DO NOT** adjust the rear seat posts higher than the front seat posts.

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

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

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## **Rain Test**

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### **⚠ 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**. Invacare has tested its power wheelchairs in accordance with ISO 7176 “Rain Test”. This provides the end user or his/her attendant sufficient time to remove his/her power wheelchair from a rain storm and retain wheelchair operation.

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## **Repair or Service**

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### **⚠ 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.

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**⚠ 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.

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**⚠ 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.

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## Weight Training

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**⚠ WARNING**

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.

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## Weight Limitation

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**⚠ WARNING**

The Pronto M9I wheelchairs have the following weight limitations: Standard is 300 lbs; Heavy Duty is 400 lbs.

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## SECTION 2—SAFETY GUIDELINES

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### **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**

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.

#### **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.

---

**⚠ 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.

---

**⚠ 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.

**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.

---

**⚠ WARNING**

**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 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**

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

**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.**

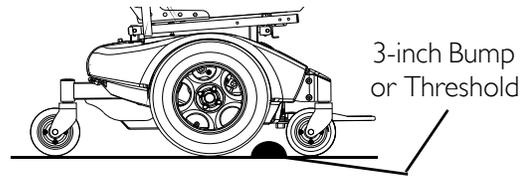
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To assure stability and proper operation of your wheelchair, you must at all times maintain proper balance. Your wheelchair has been designed to remain upright and stable during normal daily activities as long as you DO NOT move beyond the center of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



**FIGURE 4.1** Coping With Everyday Obstacles

While the walking beam allows to traverse up to a 3-inch bump or threshold, stopping after the wheels cross the bump poses a problem. The wheelchair cannot reverse over the bump at this point. Continue forward and then turn around.

While the M91 is designed for use primarily in and around the home, the provider should determine whether this wheelchair is suitable for the actual environment the wheelchair will be used in.

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

### CAUTION

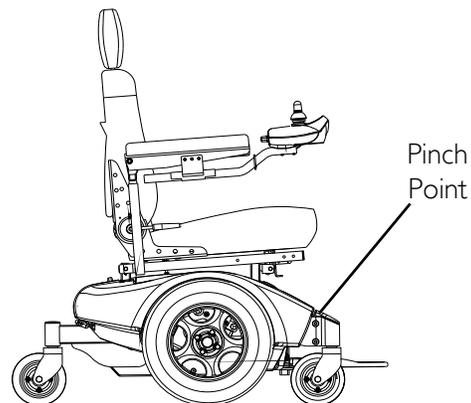
**Be aware of condition of ramp. Traction will be diminished/nonexistent on a slippery surface. Proceed with caution.**

## Pinch Points

### ⚠ WARNING

**Pinch point may occur when returning the tilted seat to the full upright position. Make sure the hands and body of the occupant, attendants and bystanders are clear of all pinch points before lowering seat (FIGURE 4.2).**

**DO NOT store or place items under the seat.**

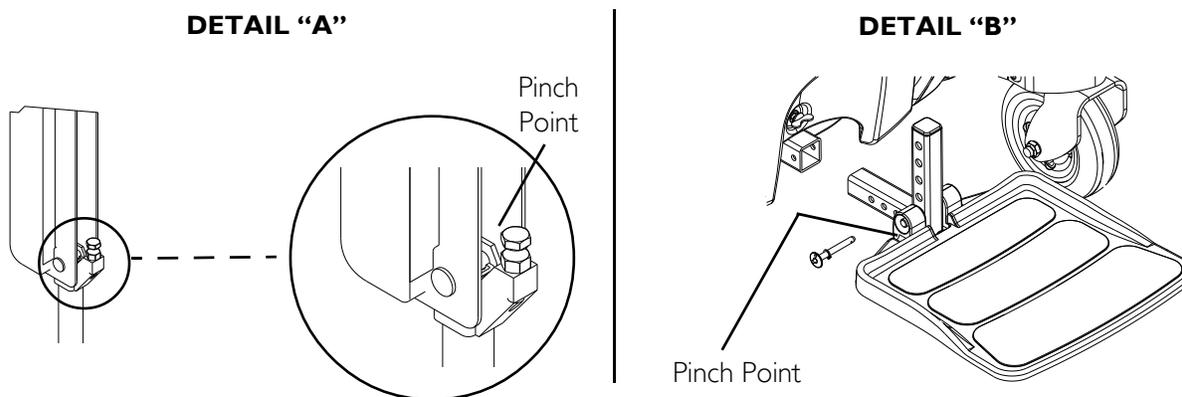


**FIGURE 4.2** Pinch Points

*NOTE: For this procedure, refer to FIGURE 4.2 and FIGURE 4.3.*

### ⚠ WARNING

**Pinch point may occur when adjusting the arm angle position (Detail "A").  
Pinch point may occur when rotating the footboard assembly (Detail "B").**



**FIGURE 4.3** Pinch Points

## 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.

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.

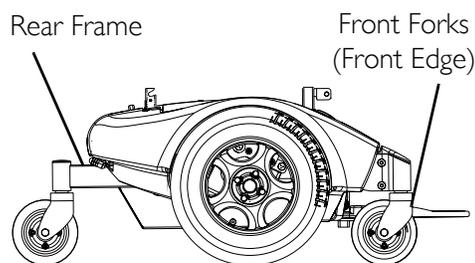
**DO NOT** attempt to lift the wheelchair by any removable (detachable) parts. Lifting by means of any removable (detachable) parts of a wheelchair may result in injury to the user or damage to the wheelchair.

The weight of the wheelchair with batteries and without the user is between 203 and 318 lbs. Use proper lifting techniques (lift with your legs) to avoid injury.

*NOTE: For this procedure, refer to FIGURE 4.4.*

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

1. Remove the occupant from the wheelchair.
2. Bend your knees and keep your back straight.
3. Using the rear frame and the front edge of the front forks as hand hold supports, transfer the wheelchair base to the desired location.



**FIGURE 4.4** Lifting/Stairways - Hand Hold Supports

---

**⚠ WARNING: ESCALATORS**

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

---

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

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



**FIGURE 4.5** Transferring To and From Other Seats

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 59.
3. Flip back or remove arm on side of wheelchair you are transferring from.
4. Shift body weight into seat with transfer.

---

### ⚠ **WARNING**

**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

---

### ⚠ **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.**

---

*NOTE: For this procedure, refer to FIGURE 4.6.*

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.



**FIGURE 4.6** 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 4.7.*

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 4.7** 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

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### CAUTION

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

---

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

### Inspect/Adjust Initially

- Ensure wheelchair rolls straight (no excessive drag or pull to one side).
- Ensure arms are secure but easy to release and adjustment levers engage properly (on ASBA only).
- Ensure adjustable height arms operate and lock securely.
- Ensure armrest pads sit flush against arm tubes.
- Ensure seat is secured to wheelchair frame.
- Ensure seat release latch is functional. Replace if necessary.
- Ensure wheel mounting nuts are secure on drive wheels.
- Ensure there is no excessive side movement or binding when drive wheels are lifted and spun when disengaged (freewheeling).
- Ensure wheel/fork assembly has proper tension when caster is spun. Caster should come to a gradual stop.
- Loosen/tighten caster locknut if wheel wobbles noticeably or binds to a stop.
- Ensure all caster/wheel/fork/headtube fasteners are secure.
- Inspect tires for flat spots and wear.
- Inspect and clean the stability lock gears.
- Clean upholstery and armrests.
- Check that all labels are present and legible. Replace if necessary.
- Ensure casters are free of debris.

### **Inspect/Adjust Weekly**

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

### **Inspect/Adjust Monthly**

- Ensure wheel mounting nuts are secure on drive wheels.
- Ensure there is no excessive side movement or binding when drive wheels are lifted and spun when disengaged (free-wheeling).
- Ensure wheel/fork assembly has proper tension when caster is spun. Caster should come to a gradual stop.
- 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 the seat positioning strap for signs of wear. Replace if worn or damaged.
- Ensure that the buckle on the seat positioning strap latches. Replace if necessary.
- Verify that the hardware that attaches the seat positioning strap to the seat frame is secure and undamaged. Replace if necessary.
- Ensure casters are free of debris.

### **Inspect/Adjust Periodically**

- Ensure wheelchair rolls straight (no excessive drag or pull to one side).
- Ensure that casters are free of debris.
- Ensure arms are secure but easy to release and adjustment levers engage properly (on ASBA only).
- Ensure adjustable height arms operate and lock securely.
- Ensure arm pivot points are not worn and/or loose. Replace if necessary.
- Ensure armrest pads sit flush against arm tubes.
- Ensure seat and/or back upholstery have no rips and do not sag. Replace if necessary.
- Inspect electrical components for signs of corrosion. Replace if corroded or damaged.
- Ensure seat release latch is not worn. Replace if necessary.

- Inspect and clean the stability lock gears. Replace if worn.
- Clean upholstery and armrests.
- Inspect charger AC power cord for damage. Replace if necessary.
- Check that wiring is routed and secured properly to ensure that wiring does NOT become entangled and damaged.
- Inspect electrical components for signs of corrosion. Replace if corroded or damaged.
- Check that all labels are present and legible. Replace if necessary.

## Troubleshooting Guide

SYMPTOM	PROBABLE CAUSE	SOLUTIONS
Batteries draw excessive current when charging.	Battery failure.  Electrical malfunction.	Have batteries checked for shorted cell. Replace if necessary.  Contact Dealer/Invacare for service.
Battery indicator flashes the charge level is low - IMMEDIATELY after recharge.	Battery failure.  Malfunctioning battery charger.  Electrical malfunction	Check batteries for shorted cell. Replace if necessary.  Contact Dealer/Invacare for service.  Contact Dealer/Invacare for service.
Battery indicator flashes the charge level is low - too soon after being recharged.	Batteries not charged.  Weak batteries	Have charger checked.  Replace batteries if necessary. Contact Dealer/Invacare for service.
Motor “chatters” or runs irregular.	Electrical malfunction.	Contact Dealer/Invacare for service.
Only one drive wheel turns.	Electrical malfunction.  One motor lock is disengaged.	Contact Dealer/Invacare for service.  Engage motor lock.
Joystick erratic or does not respond as desired.	Damaged motor coupling.  Electrical malfunction.  Controller programmed improperly.	Contact Dealer/Invacare for service.  Contact Dealer/Invacare for service.  Reprogram controller (Refer to MK <sub>5</sub> ™ EX™ or MK <sub>5</sub> NX™ electronics owner’s manual supplied with wheelchair).
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.

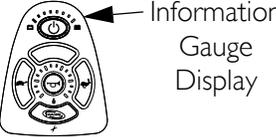
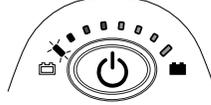
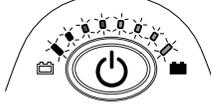
*NOTE: For additional troubleshooting information and explanation of error codes, refer to the Electronics Manual supplied with each wheelchair.*

## Troubleshooting - Electrical

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

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
			
	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 67. Check that battery cables are connected properly. Refer to <a href="#">Connecting/Disconnecting the Battery Wiring Harness</a> on page 65. If necessary, replace batteries. Refer to <a href="#">Charging Batteries</a> on page 67.

NUMBER OF FLASHES	ERROR CODE DESCRIPTION	POSSIBLE SOLUTION
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.

## 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

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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. 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 if improperly setup or adjusted.

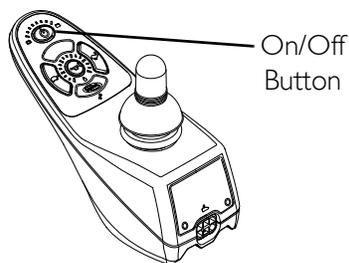
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## Operating the Wheelchair

### Turning the Power On/Off

*NOTE: For this procedure, refer to FIGURE 6.1.*

1. To turn the power on, press the On/Off button.
2. Turning the power off, press the On/Off button.



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

### 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).

### Using the Joystick to Drive the Wheelchair

The joystick is located at the front of 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.

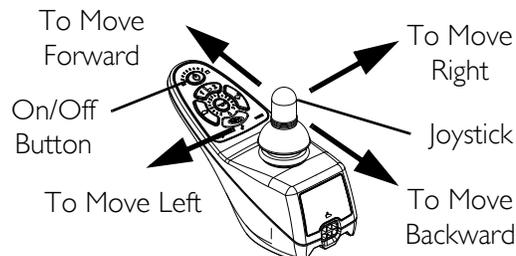
To slow the wheelchair to a stop, simply release the joystick. The wheelchair has automatic speed and direction compensation to minimize corrections.

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. Refer to Speed Control Buttons on page 36.
2. Turn the power On. Refer to Turning the Power On/Off on page 34.
3. Maneuver the joystick in the following manner:

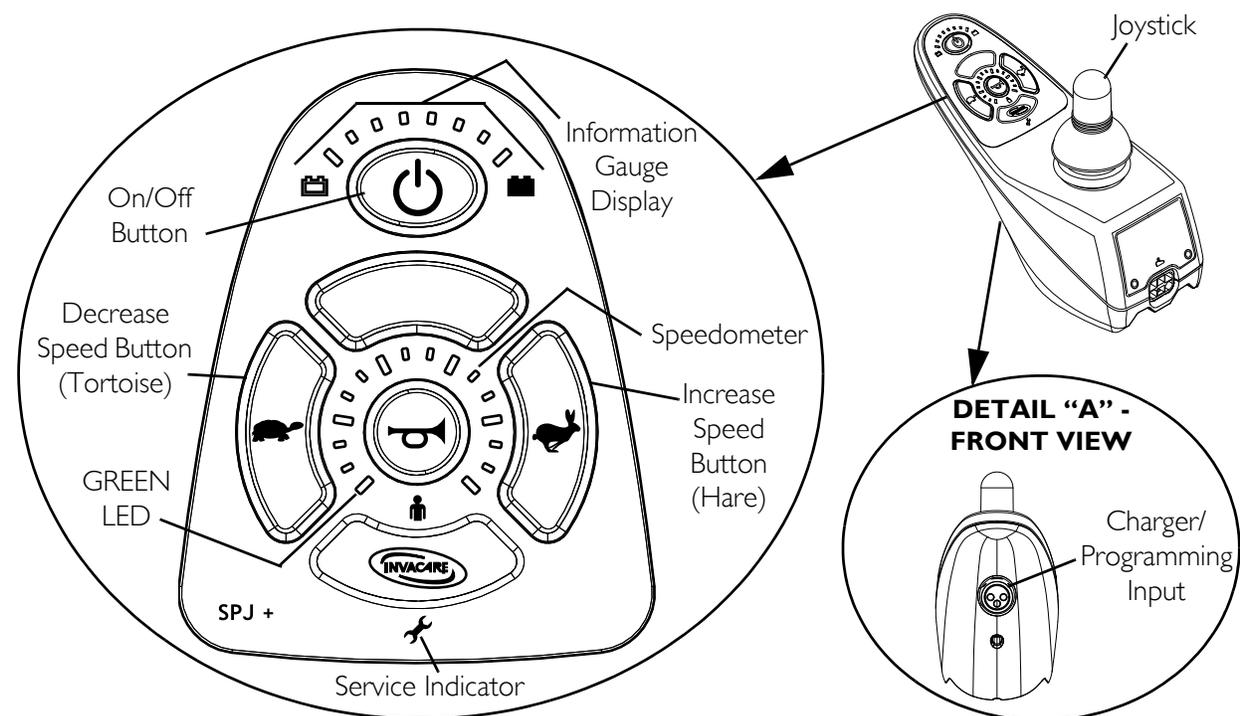
MOVEMENT	ACTION
FORWARD	Push forward on the joystick.
REVERSE	Pull back on the joystick.
Turn RIGHT	Move the joystick RIGHT.
Turn LEFT	Move the joystick LEFT.
STOP	Release the joystick and the wheelchair will quickly slow down.



**FIGURE 6.2** Operating the Wheelchair

## SPJ™ + Joystick Switches and Indicators

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



**FIGURE 6.3** SPJ™ + 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.

- 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 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. A chart of the diagnostic indications is given in Diagnostic Code of the electronics manual supplied with the wheelchair.

## Information Gauge Display

Located on the front of the joystick housing, it 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 [Troubleshooting Guide](#) on page 31 for the diagnostic indications of the wheelchair status.

# SECTION 7—ARMS

## ⚠ 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 Van Seat Armrests

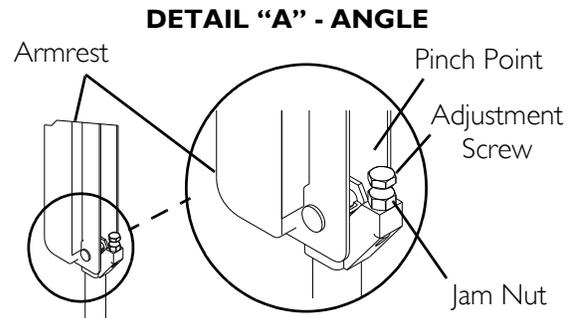
## ⚠ WARNING

Pinch point may occur when adjusting the arm angle position (Detail “A”).

### Angle

NOTE: For this procedure, refer to Detail “A” of FIGURE 7.1.

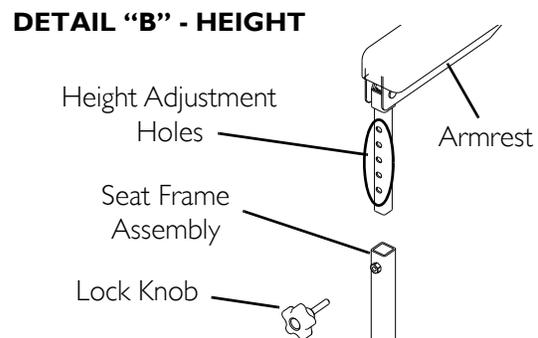
1. Lift up the armrest.
2. Loosen the jam nut.
3. Adjust the socket screw up or down to the desired arm angle position.
4. Tighten the jam nut.
5. To determine the same angle for the opposite armrest, count the exposed threads after the jam nut has been tightened.
6. Repeat STEPS 1-4 for opposite armrest,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



### Height

NOTE: For this procedure, refer to Detail “B” of FIGURE 7.1.

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 7.1** 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.

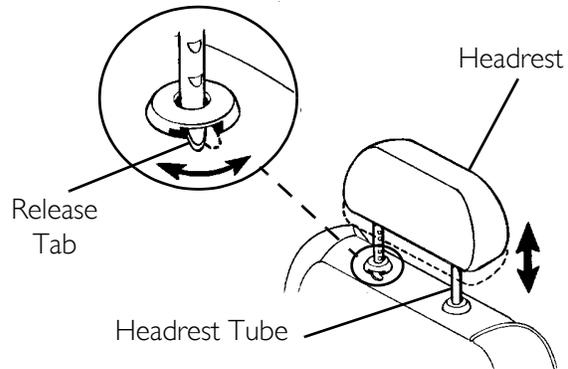
## Adjusting the Headrest

*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 wheelchair. Lower headrest to desired position.

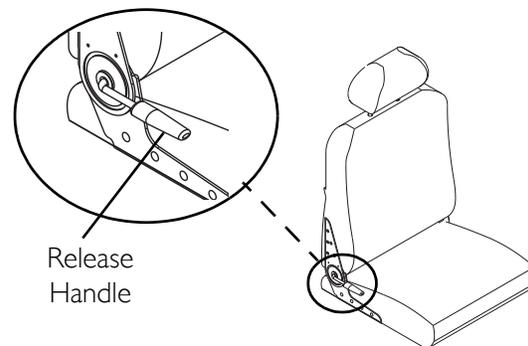


**FIGURE 8.1** Adjusting the Headrest

## Adjusting the Back Angle

*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

## 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 8.3 on page 40.*

### Removing

1. Disconnect the joystick. Refer to [Disconnecting/Connecting the MK5 Joysticks](#) on page 72.

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 8.3.
2. Tilt front edge of seat down.
3. When seat is lowered, engage seat brackets into seat clevis pins.

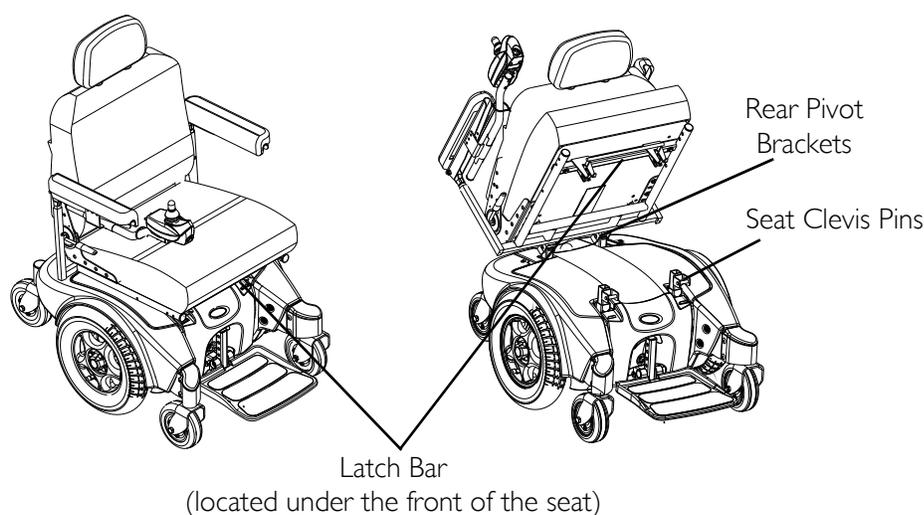
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### **⚠ WARNING**

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

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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 MK5 Joysticks](#) on page 72.



**FIGURE 8.3** Removing/Installing the Seat Assembly

## Adjusting the Seat Height

*NOTE: For this procedure, refer to FIGURE 8.4 on page 41.*

*NOTE: The seat can be adjusted to five height positions in 1/2-inch increments.*

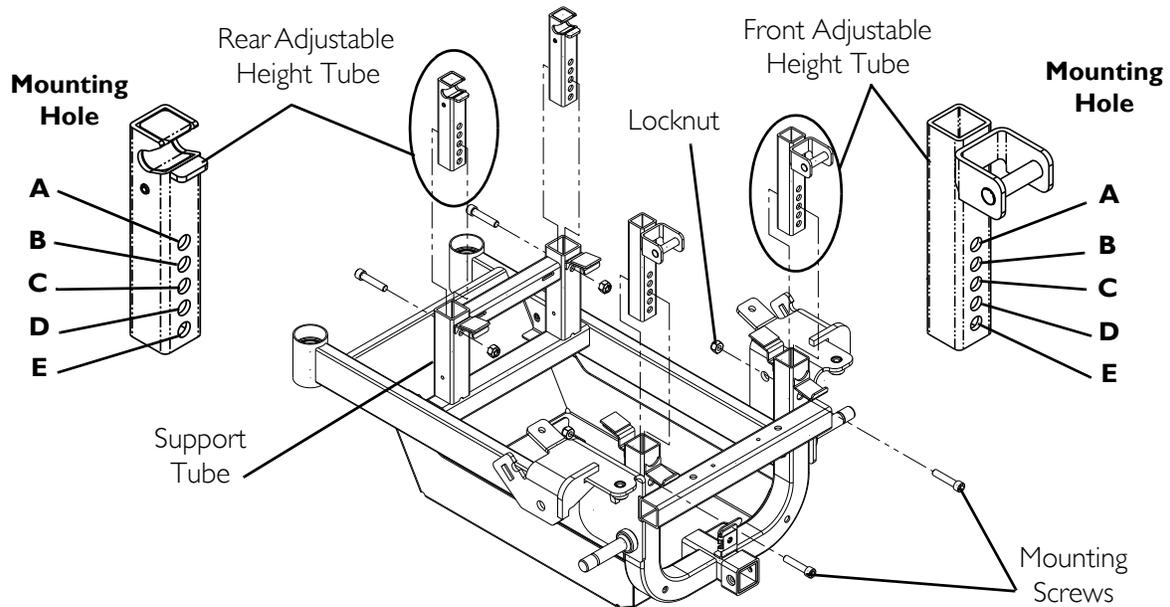
1. Remove the seat. Refer to [Removing/Installing the Seat Assembly](#) on page 39.
2. Remove the mounting screw and locknut that secures the adjustable height tube to the support tube.

3. Adjust tube to desired mounting position. Refer to the following table for available mounting positions.

AVAILABLE MOUNTING HOLES FOR FRONT ADJUSTABLE HEIGHT TUBE					
WHEELCHAIR IS EQUIPPED WITH	A	B	C	D	E
<b>VAN SEAT WITH FOOTBOARD</b>					
<b>REAR ADJUSTABLE HEIGHT TUBE</b>					
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 wheelchair.



**FIGURE 8.4** Adjusting the Seat Height

4. Reinstall mounting screw and locknut (FIGURE 8.4). Securely tighten.  
5. Repeat STEPS 2-4 for the three remaining adjustable height tubes.

### **⚠ WARNING**

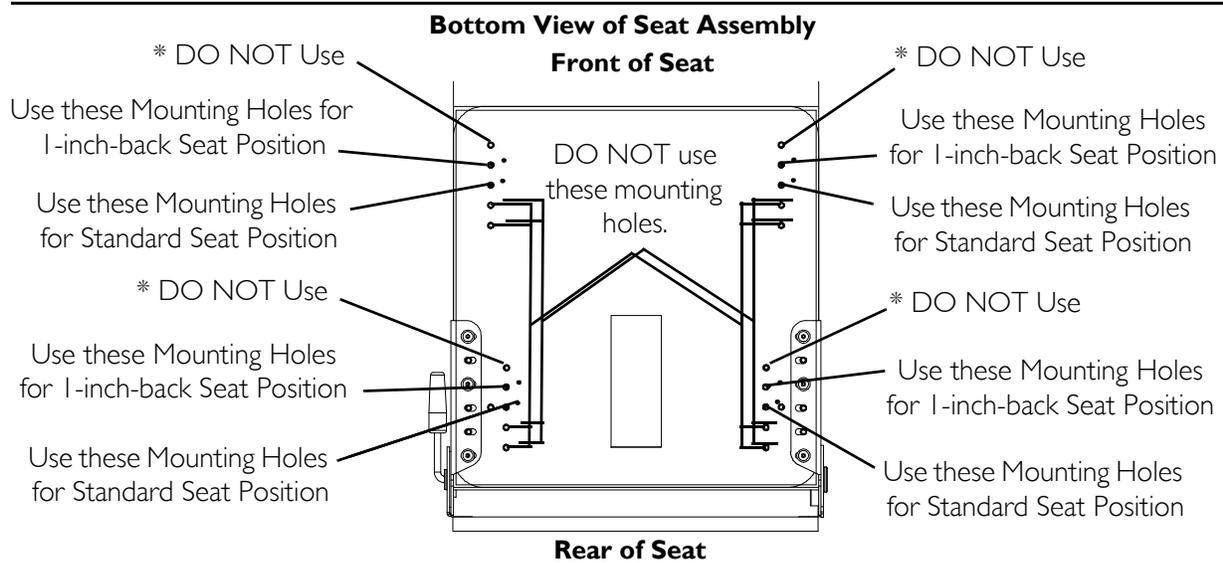
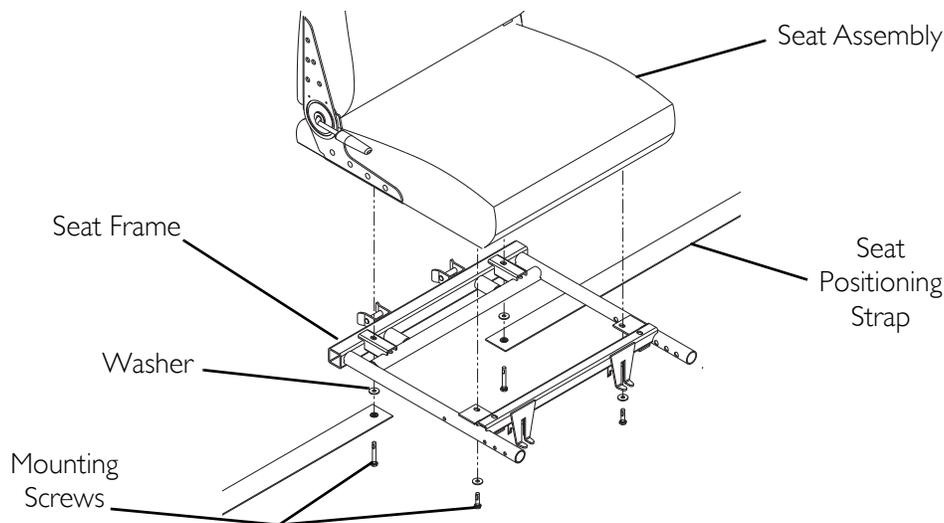
**When reinstalling the seat verify that the seat brackets are engaged with the seat clevis pins by pulling up on the latch bar.**

6. Reinstall the seat. Refer to Removing/Installing the Seat Assembly on page 39.

## Adjusting Seat Position on Seat Frame

*NOTE: For this procedure, refer to FIGURE 8.5 and FIGURE 8.7 on page 44.*

1. Remove the seat. Refer to Removing/Installing the Seat Assembly on page 39.
2. Remove the four mounting screws and washers securing the seat assembly to the seat frame (FIGURE 8.5).
3. Separate the seat assembly from the seat frame.
4. Refer to FIGURE 8.7 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 39.



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

**FIGURE 8.5** Adjusting Seat Position on Seat Frame

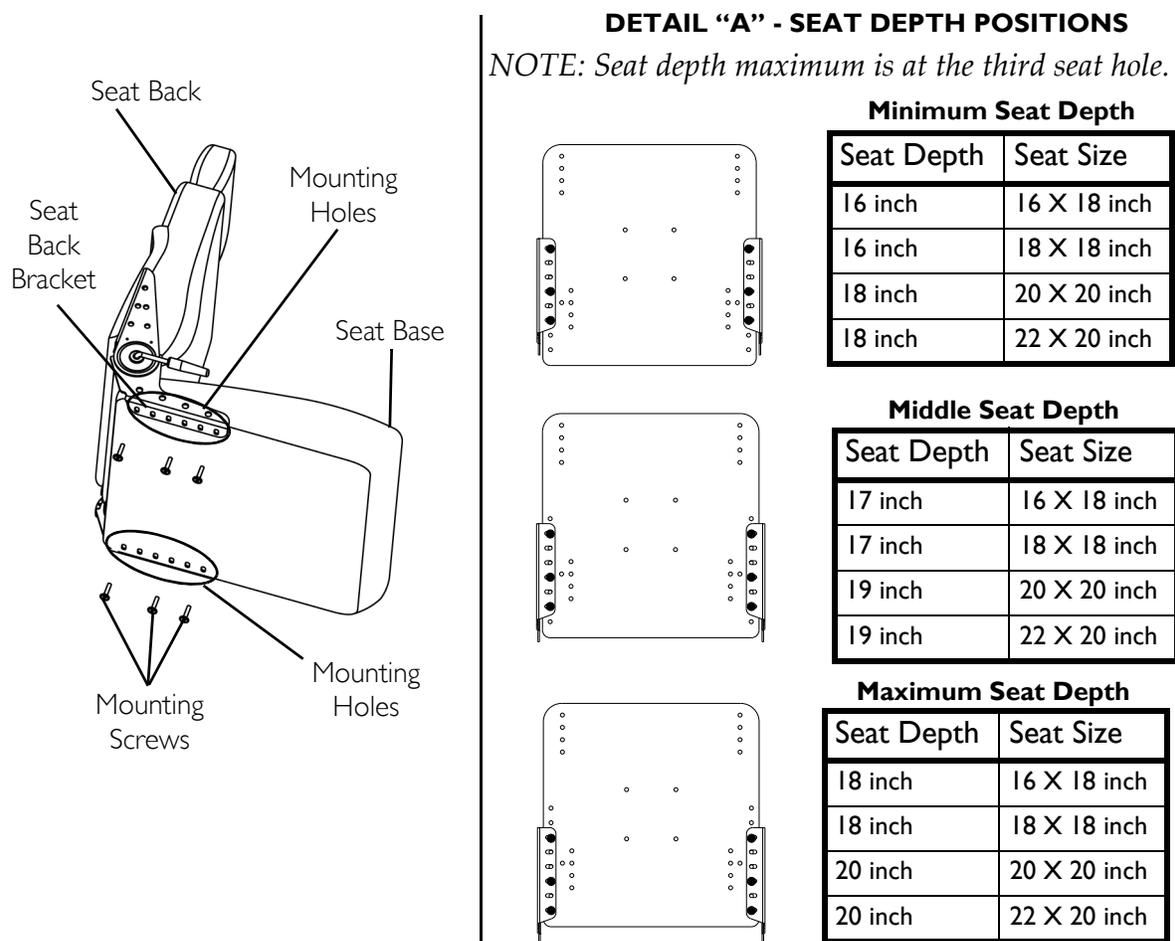
## Adjusting Seat Depth

*NOTE: For this procedure, refer to FIGURE 8.6 on page 43.*

1. Remove the seat. Refer to Removing/Installing the Seat Assembly on page 39.
2. Remove the seat base from the seat assembly. Refer to Adjusting Seat Position on Seat Frame on page 42.
3. Remove the six mounting screws located under the seat that secure the seat back assembly in place.
4. Adjust seat back assembly to desired position and reinstall the six mounting screws. Securely tighten.

*NOTE: Refer to Detail "A" of FIGURE 8.6 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.*

5. Reinstall the seat base onto the seat assembly. Refer to Adjusting Seat Position on Seat Frame on page 42.
6. Reinstall the seat. Refer to Removing/Installing the Seat Assembly on page 39.



**FIGURE 8.6** Adjusting Seat Depth

## Replacing the Seat Positioning Strap

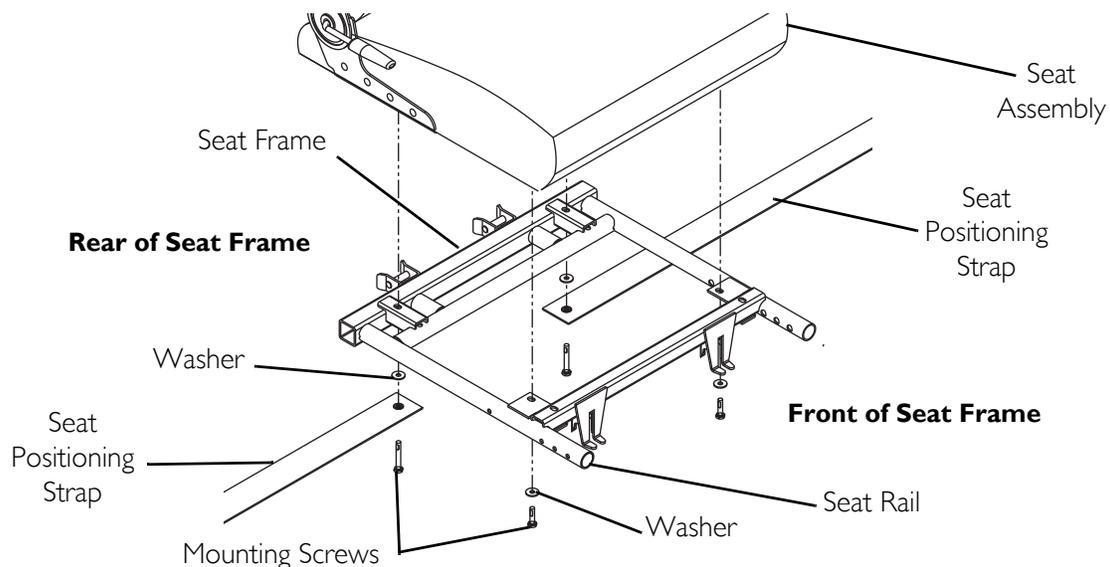
### ⚠ WARNING

**ALWAYS** wear your seat positioning strap.

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, belt must be replaced **IMMEDIATELY**.

*NOTE: For this procedure, refer to FIGURE 8.7 on page 44.*

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 8.7** Replacing the Seat Positioning Strap

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# SECTION 9—FOOTBOARD ASSEMBLY

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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.

Pinch point may occur when rotating the footboard assembly.

**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 wheelchair. 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

*NOTE: For this procedure, refer to FIGURE 9.1 on page 46.*

### 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

---

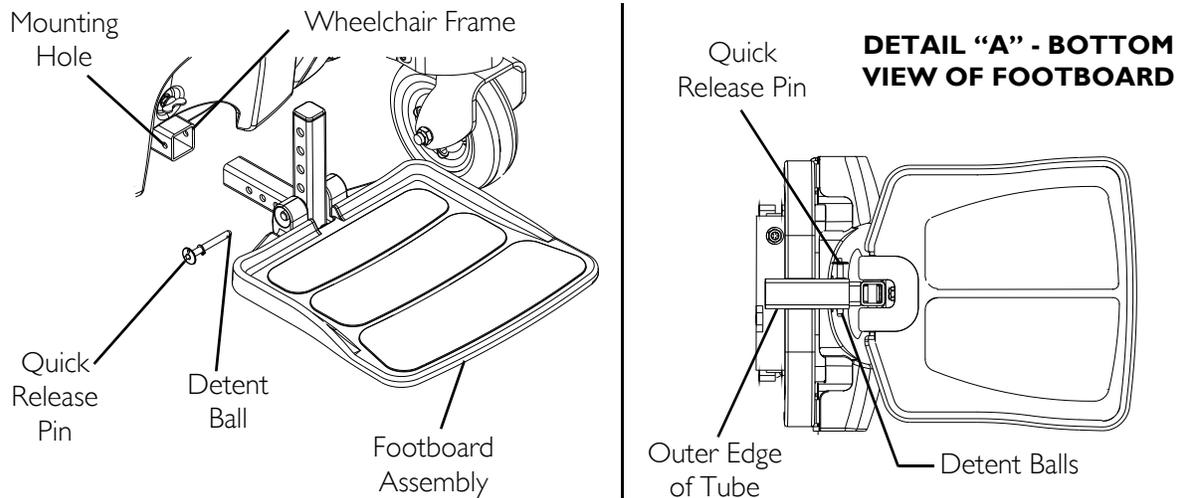
## **⚠ WARNING**

**Make sure the detent balls of the quick release pin are fully released and protruding past 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. Ensure that the detent balls of the quick release pin are fully released and protruding past the outer edge of the tube (Detail "A").



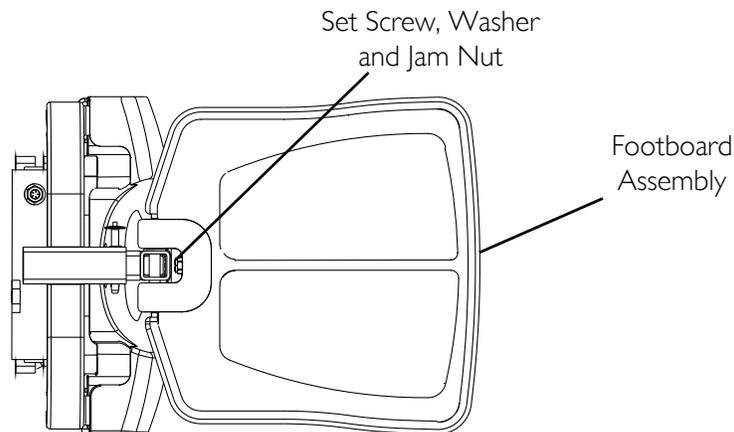
**FIGURE 9.1** Removing/Installing the Footboard Assembly

## 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 back 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.*

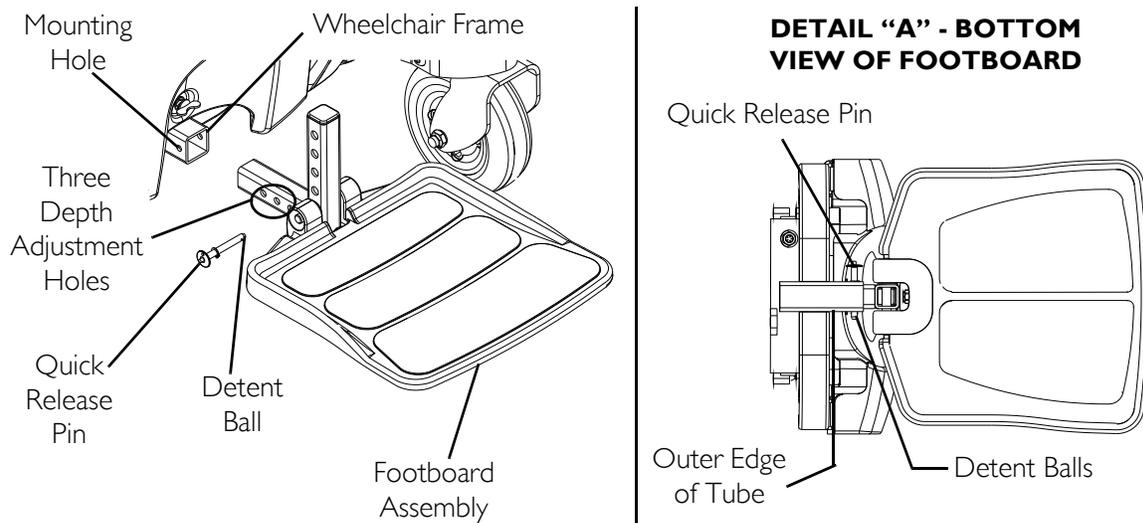
1. Remove the quick release pin that secures the footboard assembly to the wheelchair frame.

### **⚠ WARNING**

**Make sure the detent balls of the quick release pin are fully released and protruding past 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 of the quick release pin are fully released and past the outer edge of the tube (Detail “A”).



**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.

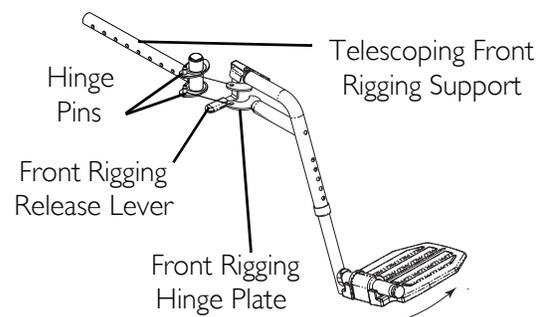
### PW93, PH904A and PHAL4A

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

1. If necessary, remove the footboard.  
Refer to Removing/Installing the Footboard Assembly on page 45.
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.

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

5. Repeat STEPS 1-4 for opposite side of wheelchair.
6. To Remove the footrests, push the front rigging release lever inward and rotate the footrest out.



**FIGURE 10.1** Installing/Removing Front Riggings - PW93, PH904A and PHAL4A

- Lift up on front rigging and remove from the wheelchair.
- Repeat STEPS 1-2 for opposite side of wheelchair.

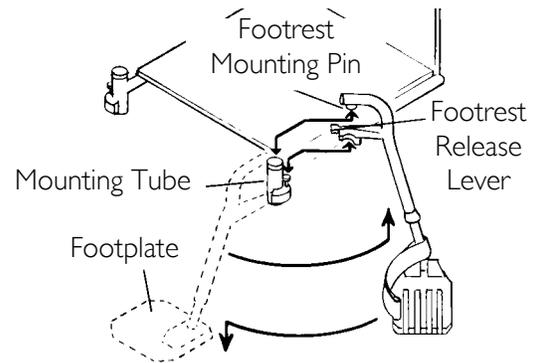
### 70° and 70° Taper

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

- Turn the footrest to the side (open footplate is perpendicular to wheelchair).
- Insert footrest mounting pin into mounting tube.
- Push the footrest towards the inside of the wheelchair until it locks into place.

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

- Repeat STEPS 1- 3 for the other footrest assembly.
- To remove the footrest, push the footrest release lever inward, rotate footrest outward.
- Adjust footrest height, if desired. Refer to [Adjusting Footrest Height](#) on page 49.



**FIGURE 10.2** Installing/Removing Front Riggings - 70° and 70° Taper

## Adjusting Footrest Height

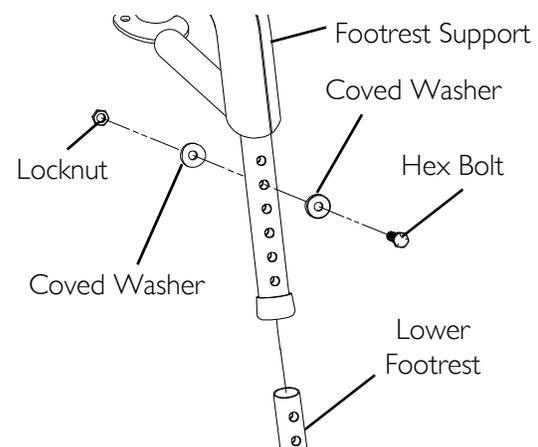
### Model PHWH93, PW93 and 70°

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

- Remove any accessories from the footrest(s).
- Remove the footrest from the wheelchair. Refer to [Installing/Removing Front Riggings](#) on page 48.

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

- Remove the hex bolt, coved washers and locknut that secure the lower footrest to the footrest support.
- Reposition the lower footrest to the desired height.
- Reinstall hex bolt, coved washers and locknut that secure lower footrest to footrest support. Tighten securely.
- Repeat STEPS 1-5 for the opposite side of the wheelchair footrest, if necessary.



**FIGURE 10.3** Adjusting Footrest Height - Model PHWH93, PW93 and 70°

7. Reinstall the footrest(s) onto the wheelchair. Refer to [Installing/Removing Front Riggings](#) on page 48.
8. Reinstall any accessories onto the footrest(s).

## 70° Taper

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

1. Remove any accessory from the footrest(s).
2. Remove the footrest from the wheelchair. Refer to [Installing/Removing Front Riggings](#) on page 48.

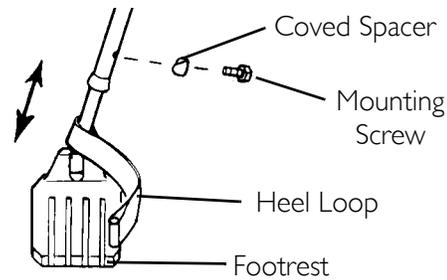
*NOTE: Lay the assembly on a flat surface to improve access to the hardware.*

*NOTE: Note the position of the spacers before disassembly.*

3. Remove the mounting screw and coved spacer that secures the lower footrest assembly.
4. Position the footrest assembly to the desired height.
5. Secure lower footrest assembly with existing mounting screw and coved spacer. Securely tighten.

*NOTE: Make sure spacers are positioned properly when reassembling to prevent damage to the frame mounting tubes.*

6. Reinstall the footrest(s) onto the wheelchair. Refer to [Installing/Removing Front Riggings](#) on page 48.
7. Reinstall any accessory onto the footrest(s).



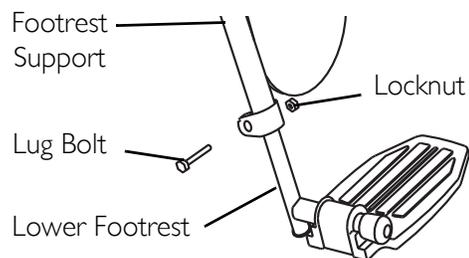
**FIGURE 10.4** Installing/Removing Front Riggings - 70° Taper

## Model PH904A and PHAL4A

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

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

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.
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.

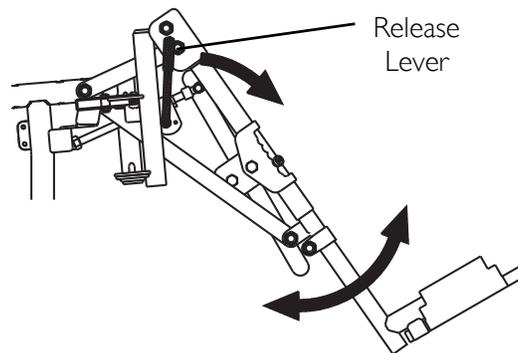


**FIGURE 10.5** Adjusting Footrest Height - Model PH904A and PHAL4A

## Raising/Lowering Elevating Front Riggings

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

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 10.6** Raising/Lowering Elevating Front Riggings

## Adjusting/Replacing Telescoping Front Rigging Supports

*NOTE: For this procedure, refer to FIGURE 10.7 on page 52.*

*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.*

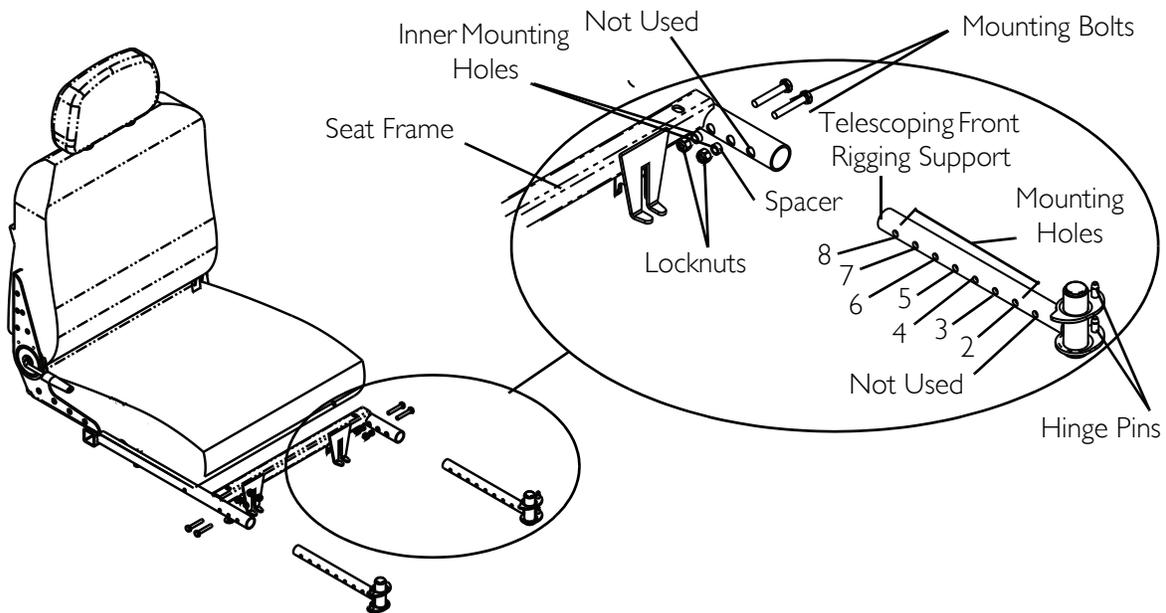
*NOTE: When installing the front riggings support tubes, ensure that the hinge pins are on the outside of the wheelchair facing away from the seat frame.*

1. Remove the seat. Refer to [Removing/Installing the Seat Assembly](#) on page 39.
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 - 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 10.7.
  - Replacing - Perform the following steps:
    - 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 10.7.

*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 10.7.
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 39.



STANDARD POSITION			1 INCH OUT			2 INCHES OUT		
18 inches wide	20 inches wide	22 inches wide	18 inches wide	20 inches wide	22 inches wide	18 inches wide	20 inches wide	22 inches wide
Holes 2 and 3	Holes 2 and 3	Holes 3 and 4	Holes 3 and 4	Holes 3 and 4	Holes 5 and 6	Holes 4 and 5	Holes 4 and 5	Holes 6 and 7

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

## Installing Adjustable Angle Flip-up Footplate Hinge

*NOTE: For this procedure, refer to FIGURE 10.8.*

1. Position footplate hinge on the footrest support tube at the desired height.
2. Position mounting screw, washers, spacer, and locknut on the footrest support as shown (FIGURE 10.8).
3. Flip the footplate hinge to the up position.

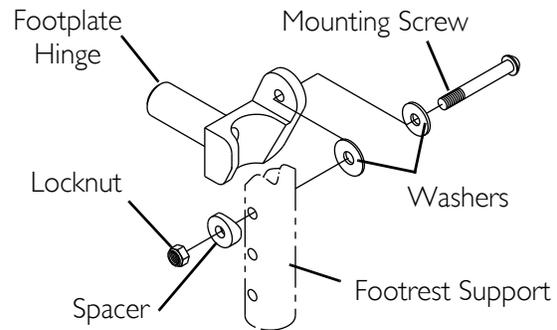
*NOTE: The footplate hinge will fall to the down position.*

4. Tighten the mounting screw, washer, and locknut that secure the footplate hinge to the footrest support until the footplate hinge remains in the up position.
5. Check the up and down motion of the footplate hinge to make sure the user of the wheelchair can operate the footplates easily.

*NOTE: If footplate's motion is too tight, loosen the mounting screw and locknut approximately ¼-turn counterclockwise.*

*NOTE: If the footplate's motion is too loose, tighten mounting screw and locknut approximately ¼-turn clockwise.*

6. Adjust footplate. Refer to [Installing Adjustable Angle Flip-up Footplates](#) on page 53.

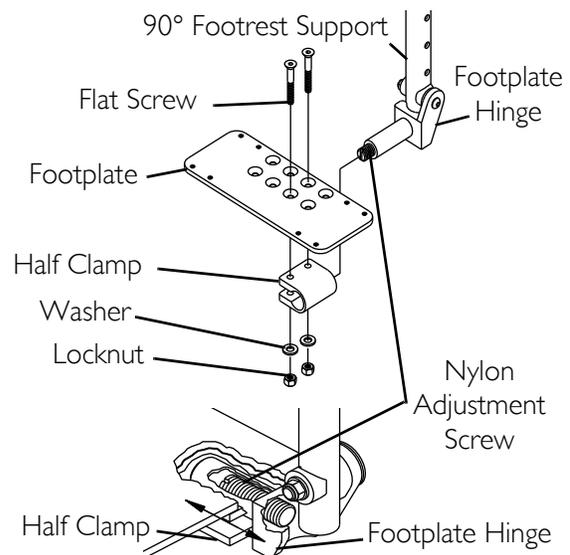


**FIGURE 10.8** Installing Adjustable Angle Flip-up Footplate Hinge

## Installing Adjustable Angle Flip-up Footplates

*NOTE: For this procedure, refer to FIGURE 10.9.*

1. Slide the half clamp over the footplate hinge.
2. Hand tighten the two flat screws that secure the footplate to the half clamp.
3. Adjust the footplates to the necessary angle and depth for the user. Refer to [Adjusting Adjustable Angle Flip-Up Footplates](#) on page 54.



**FIGURE 10.9** Installing Adjustable Angle Flip-up Footplates

## Adjusting Adjustable Angle Flip-Up Footplates

### Depth Adjustment

*NOTE: For this procedure, refer to FIGURE 10.9 on page 53.*

1. Remove the two flat screws, washers and locknuts that secure footplate to the half clamp.

*NOTE: Observe the angle of the footplate for reinstallation.*

2. Move footplate to one of four mounting positions.

*NOTE: If desired depth is still not obtained, rotate the half clamp on the footplate hinge 180°.*

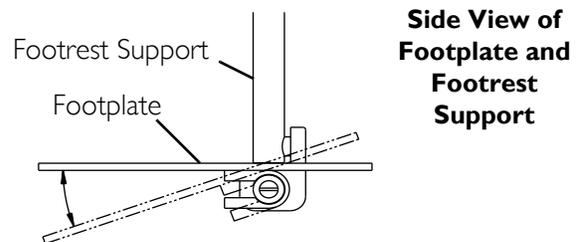
3. Retighten the two flat screws, washers and locknuts.

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

### Angle Adjustment

*NOTE: For this procedure, refer to FIGURE 10.9 on page 53 and FIGURE 10.10.*

1. Loosen, but DO NOT remove, the two flat screws, washer and locknuts that secure the footplate to the footplate hinge (FIGURE 10.9).
2. Position the footplate to the necessary angle to accommodate the user (FIGURE 10.10).
3. Retighten the two flat screws, washers and locknuts.



**FIGURE 10.10** Angle Adjustment

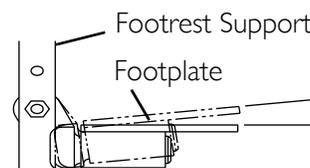
### Perpendicular and/or Inversion/Eversion Adjustment

*NOTE: For this procedure, refer to FIGURE 10.9 on page 53 and FIGURE 10.11.*

*NOTE: It is not necessary to remove the footplate to perform this adjustment.*

1. Insert a flathead screwdriver through the half clamp on the footplate (FIGURE 10.9).
2. Slowly turn nylon adjustment screw in or out until footplate is perpendicular to the footrest assembly or the desired inversion or eversion is obtained (FIGURE 10.11).

**Front View of Footplate and Footrest Support**



**FIGURE 10.11** Perpendicular and/or Inversion/Eversion Adjustment

## Composite/Articulating Footplate Heel Loop Replacement

*NOTE: For this procedure, refer to FIGURE 10.12.*

*NOTE: To assemble, reverse these procedures.*

*NOTE: When securing heel loop to the footrest assembly, tighten mounting screw until the spacer is secure.*

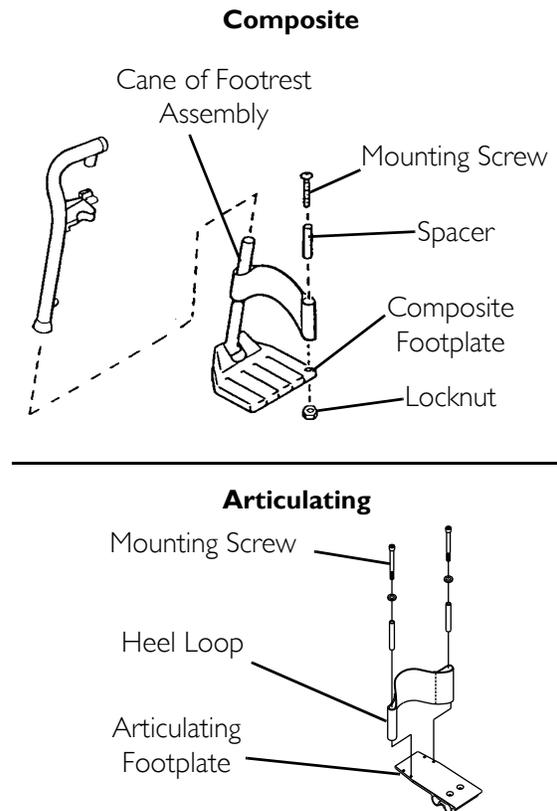
### Disassembly

#### Composite

1. Remove the mounting screw and covered washer that secures the lower half of the footrest to the swingaway footrest assembly.
2. Remove the lower footrest assembly.
3. Remove the mounting screw and locknut that secure the heel loop to the footrest.
4. Slide heel strap over cane of footrest assembly.

#### Articulating

1. Remove the two mounting screws that secure the heel loop to the articulating footplate.



**FIGURE 10.12** Composite/Articulating Footplate Heel Loop Replacement

## Installing/Removing Elevating Legrests

*NOTE: For this procedure, refer to FIGURE 10.13.*

### Installing

1. Turn legrest to side (open footplate is perpendicular to wheelchair).
2. Install the legrest hinge plates onto the hinge pins on the wheelchair frame.
3. Rotate legrest toward the inside of the wheelchair until it locks in place.

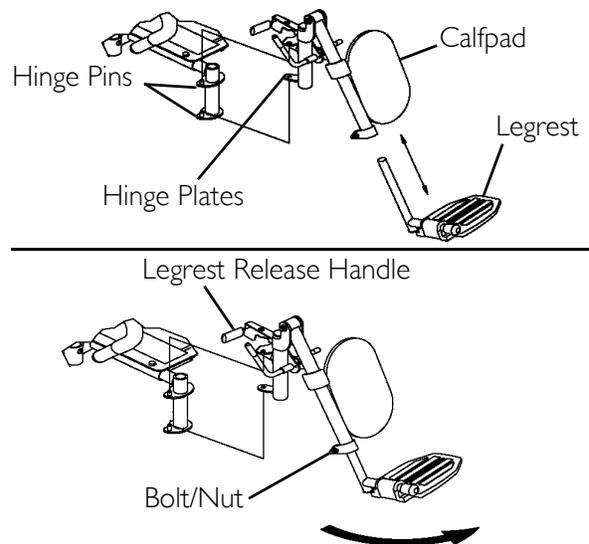
*NOTE: The footplate will be on the inside of the wheelchair when locked in place.*

4. Repeat STEPS 1-3 for the opposite legrest.

- After the user is seated in wheelchair, adjust footplate to correct height by loosening nut and sliding the lower footrest assembly up or down until desired height is achieved.

## Removing

- Push the legrest release handle toward the inside of the wheelchair (facing the front of the wheelchair) and swing the legrest to the outside of the wheelchair.
- Lift up on the legrest and remove from the wheelchair.
- Repeat STEPS 1- 2 for opposite side of wheelchair.



**FIGURE 10.13** Installing/Removing Elevating Legrests

## Raising/Lowering Elevating Legrests and/or Adjusting Calfpads

*NOTE: For this procedure, refer to FIGURE 10.14.*

### Raising/Lowering Elevating Legrests

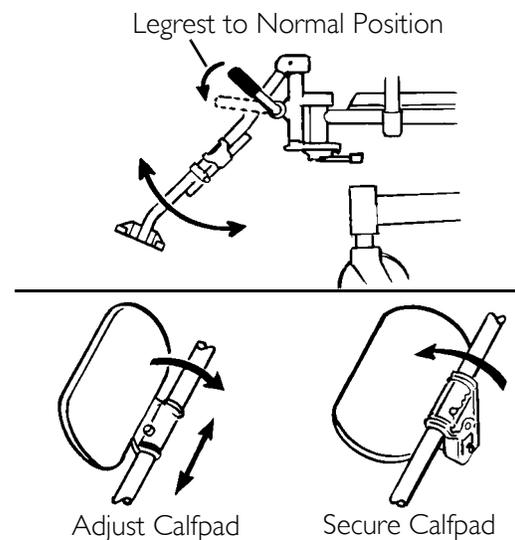
- Perform one of the following:
  - Raising - Pull back on the release lever until the leg is at the desired height.
  - Lowering - Support leg with one hand and push release lever downward with other hand.

### Adjusting Calfpads

- Turn the calfpad towards the outside of the wheelchair.
- Slide the calfpad up or down until the desired position is obtained.

*NOTE: If one of the top two calfpad adjustment positions is being used, the legrest will need to be raised to avoid interference with the front stabilizers while going over obstacles or going UP and down ramps. Refer to Raising/Lowering Elevating Legrests on page 56.*

- Turn the calfpad towards the inside of the wheelchair.



**FIGURE 10.14** Raising/Lowering Elevating Legrests and/or Adjusting Calfpads

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# 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

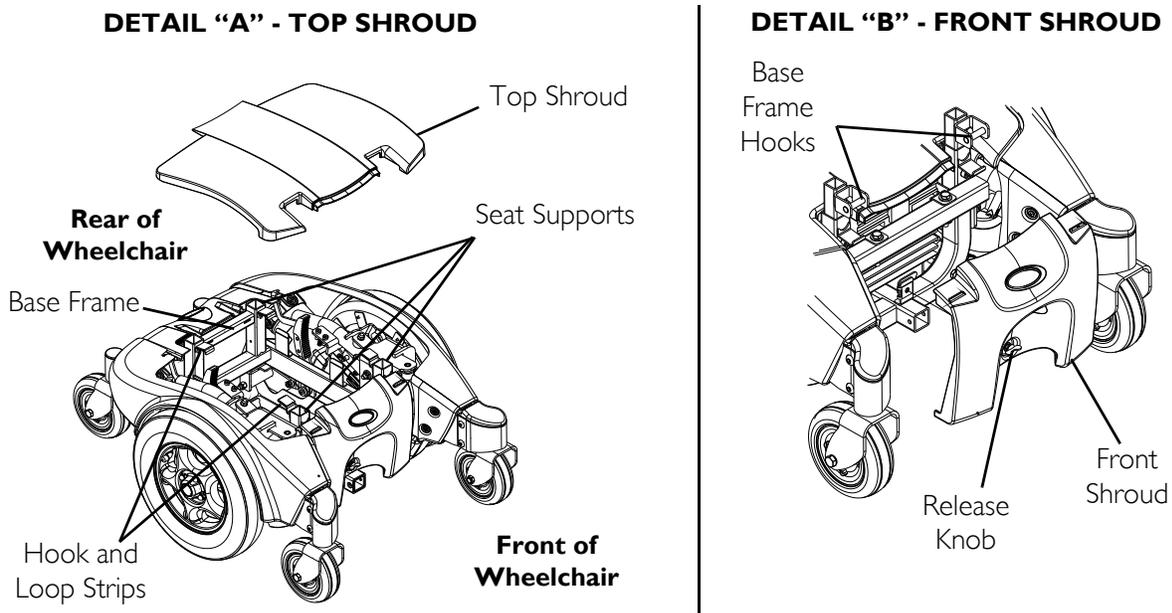
*NOTE: For this procedure, refer to FIGURE 11.1 on page 58.*

### Removing

1. Remove the seat assembly. Refer to Removing/Installing the Seat Assembly on page 39.
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 (Detail "A").
  - Front Shroud - Turn release knob ¼-turn to the unlocked position and lift up to remove front shroud from base frame hooks (Detail "B").

## 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 (Detail "A").
  - Front Shroud - Position front shroud onto the two base frame hooks. Turn release knob  $\frac{1}{4}$ -turn to the locked position (Detail "B").
2. Reinstall the seat. Refer to [Removing/Installing the Seat Assembly](#) on page 39.



**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: For this procedure, refer to FIGURE 11.2.*

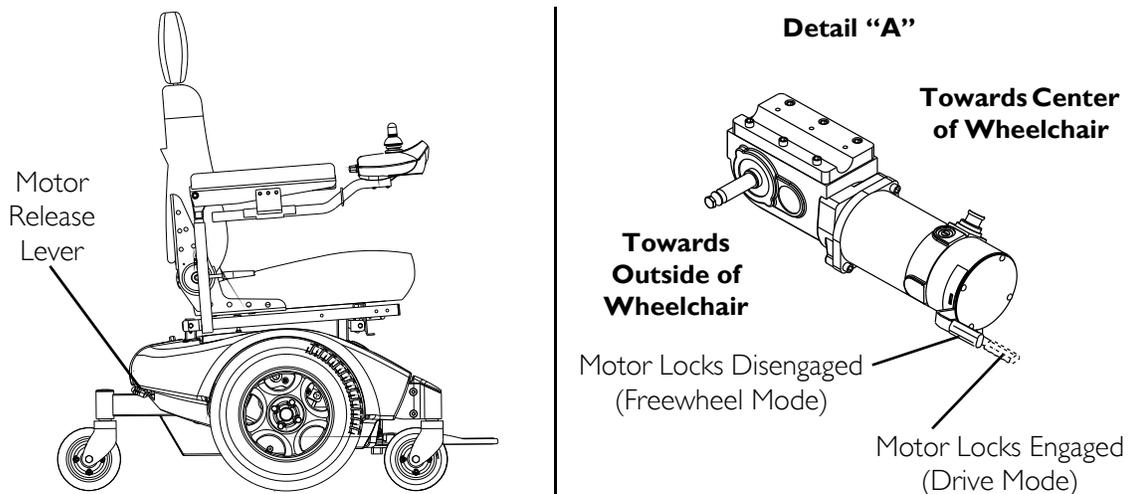
*NOTE: The motor lock disengagement/engagement allows freewheeling or joystick controlled operation. Freewheeling allows an attendant to maneuver the wheelchair without power.*

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 - Slide the motor lock lever towards the outside of the wheelchair (free wheel position) (Detail "A").

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

- To engage the motor release levers - Slide the motor lock handles towards the center of the wheelchair (drive position) (Detail "A").

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



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

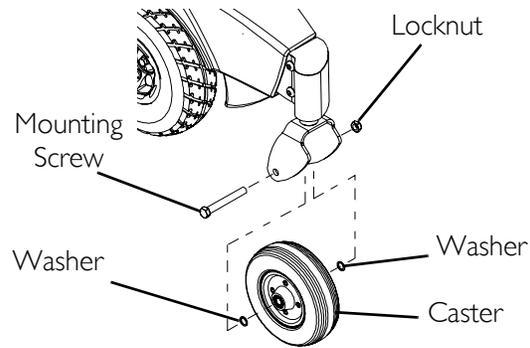
## Replacing Front/Rear Caster Assemblies

*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.

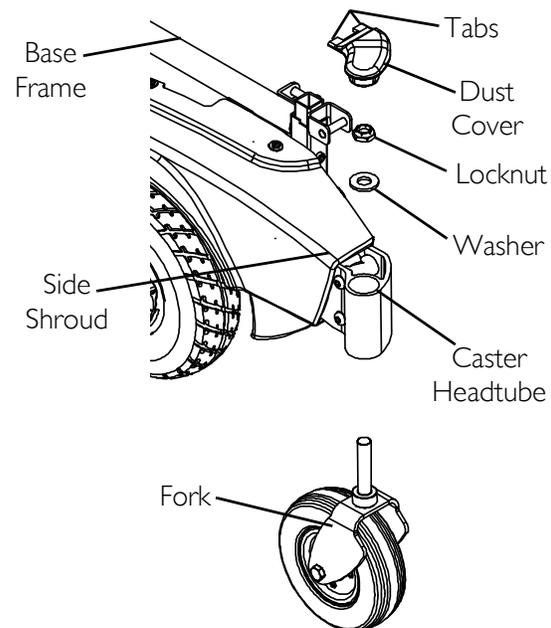


**FIGURE 11.3** Replacing Front/Rear Caster Assemblies

## 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.



**FIGURE 11.4** Adjusting Forks

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

---

# 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**

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

Improperly connecting the motor leads to the controller may cause injury or damage.

**WHEELCHAIRS WITH G-TRAC:** Crossing the motor leads (for example: connecting the left motor lead into the right motor connector on the controller) may result in unintended movement.

**DO NOT** cross the motor leads when connecting the motors to the controller - otherwise injury or damage may occur.

---

## **⚠ 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.

Avoid storage or use near external flame or combustible products.

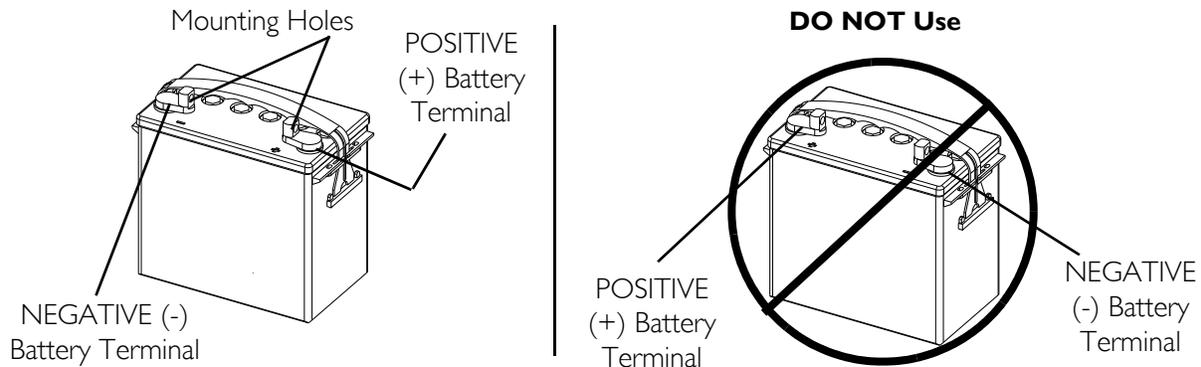
Invacare strongly recommends that battery installation and battery replacement always be done by a qualified technician.

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

---

**⚠ WARNING**

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 bottom of the battery tray or on the sides of the battery(ies), apply baking soda to these areas to neutralize the battery acid. Before reinstalling the existing or new battery(ies), clean the baking soda from the battery tray or battery(ies) being sure to avoid contact with skin and eyes. Determine source of contamination. NEVER install/reinstall a battery with a cracked or otherwise damaged case.*

## Installing/Removing the Batteries

*NOTE: For this procedure, refer to FIGURE 12.1 on page 63 and FIGURE 12.2 on page 64.*

*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

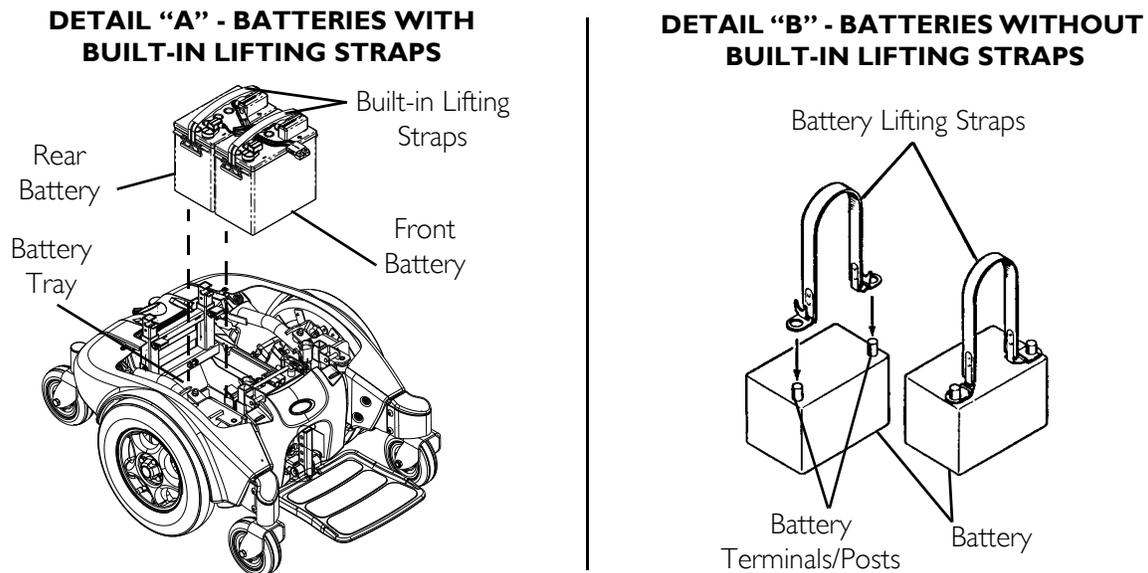
### Installing

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 MK5 Joysticks on page 72.
3. Remove the seat. Refer to Removing/Installing the Seat Assembly on page 39.
4. Remove the top shroud. Refer to Removing/Installing the Shrouds on page 57.
5. If necessary, disconnect right and left motor leads to allow access to the front of the battery tray.
6. 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.*

7. Perform one of the following to position the battery into the battery tray:
  - Batteries With Built In Lifting Strap - Use built in lifting strap to position battery into the battery tray (Detail "A" of FIGURE 12.1).
  - 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).
8. Using the battery retaining strap, secure the two batteries into the battery tray.
9. If necessary, connect the wiring harness to the two batteries. Refer to Connecting/Disconnecting the Battery Wiring Harness on page 65.
10. Reconnect RIGHT and LEFT motor leads to allow access to the FRONT of the battery tray, if disconnected in STEP 5.



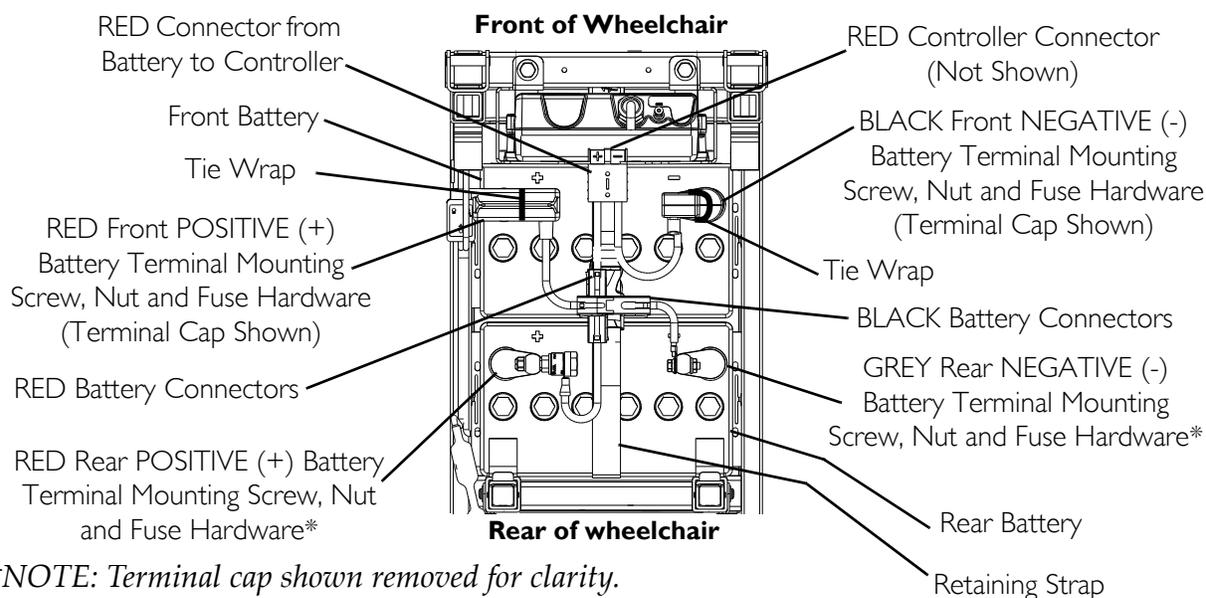
**FIGURE 12.1** Batteries with/without Lifting straps

11. Connect the front battery to the controller (RED connector). Refer to FIGURE 12.2.
12. Connect the rear battery to the front battery (RED and BLACK connectors). Refer to FIGURE 12.2.

13. Reinstall the top shroud. Refer to [Removing/Installing the Shrouds](#) on page 57.
14. Reinstall the seat. Refer to [Removing/Installing the Seat Assembly](#) on page 39.
15. Connect the joystick. Refer to [Disconnecting/Connecting the MK5 Joysticks](#) on page 72.

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

16. If necessary, charge the battery(ies). Refer to [Charging Batteries](#) on page 67.



*\*NOTE: Terminal cap shown removed for clarity.*

**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 MK5 Joysticks](#) on page 72.
3. Remove the seat. Refer to [Removing/Installing the Seat Assembly](#) on page 39.
4. Remove the top shroud. Refer to [Removing/Installing the Shrouds](#) on page 57.
5. If necessary, disconnect right and left motor leads to allow access to the front of the battery tray.
6. Disconnect the front battery from controller (RED connector). Refer to FIGURE 12.2.
7. Move aside the motor leads and controller cable to allow unobstructed access to the front of the battery tray.
8. Disconnect the rear battery from the front battery (RED and BLACK connectors). Refer to FIGURE 12.2.
9. If necessary, disconnect the wiring harness from batteries. Refer to [Connecting/Disconnecting the Battery Wiring Harness](#) on page 65.

10. 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.*

11. 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.

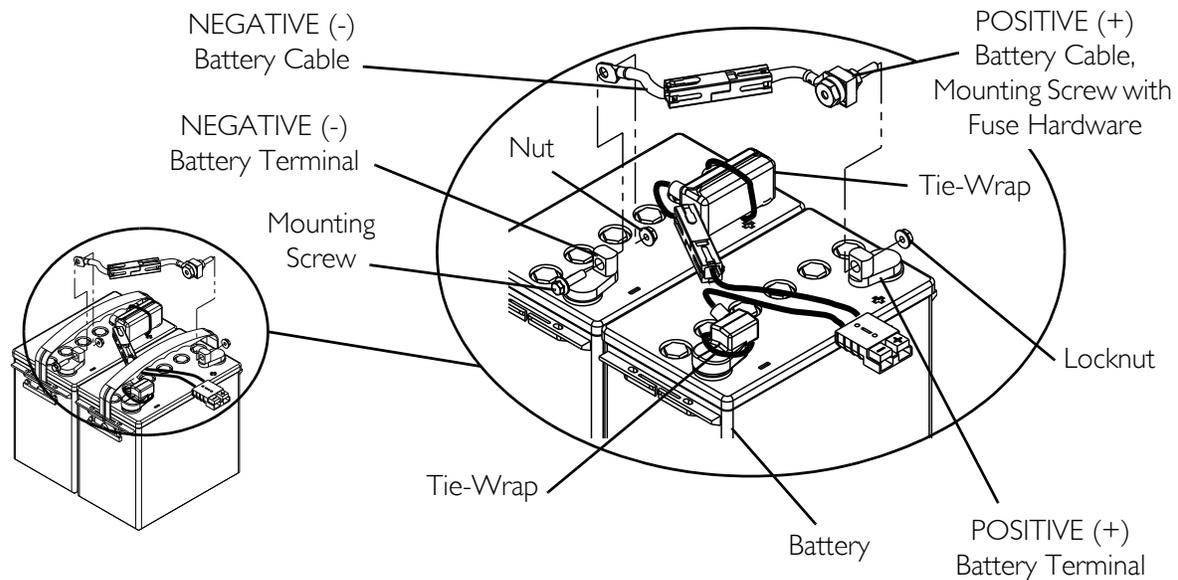
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### Connecting

*NOTE: For this procedure, refer to FIGURE 12.3 on page 66.*

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

9. Repeat STEPS 1-8 to install and connect the rear battery to the rear battery harness.



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

### Disconnecting

*NOTE: For this procedure, refer to FIGURE 12.3 on page 66.*

1. Remove the existing tie-wraps that secure the battery terminal covers to the battery terminals.
2. Peel back RED battery terminal cover to expose RED battery cable connection to battery terminal.
3. Peel back BLACK battery terminal cover from BLACK battery cable on front battery or GREY battery terminal cover from BLACK battery cable on rear battery.
4. Remove the mounting screws and nuts that secure the POSITIVE (+) RED battery cable to the POSITIVE (+) battery terminal/post as shown in FIGURE 12.3.
5. Remove the mounting screws and nuts that secure the NEGATIVE (-) BLACK battery cable to the NEGATIVE (-) battery terminal/post as shown in FIGURE 12.3.
6. Set wiring harness aside.
7. Repeat STEPS 1-6 to disconnect the rear battery from the rear battery harness.

---

## 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 a 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** 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 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.

### **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 SPJ-80/DPJ/MPJ joysticks.*

## Battery Charger Operation

---

### **⚠ 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. Using three prong adapters can result in improper grounding and present a shock hazard to user.**

---

### On-Board Battery Charger

---

### **⚠ 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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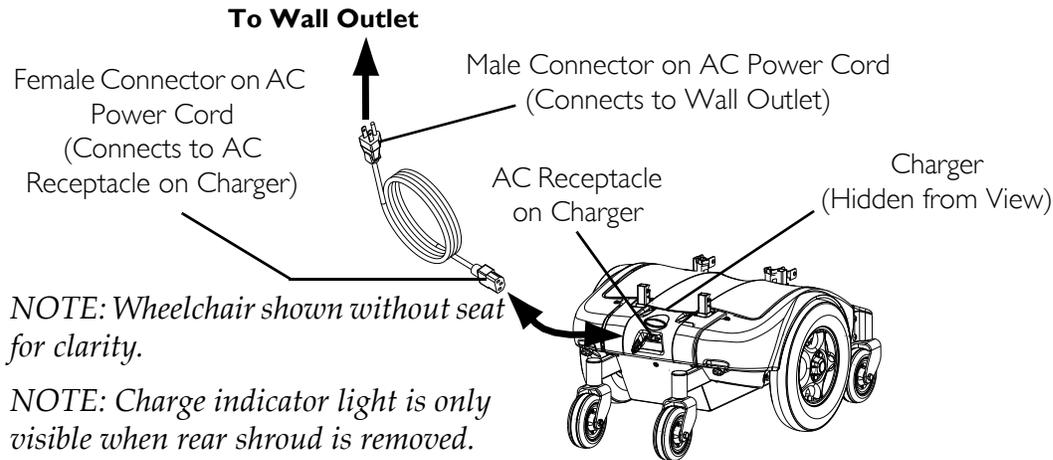
*NOTE: For this procedure, refer to FIGURE 12.4 on page 69.*

*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.



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

**FIGURE 12.4** On-Board Battery Charger

### Independent Charger

**⚠ 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.

*NOTE: For this procedure, refer to FIGURE 12.5 on page 70.*

*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.*

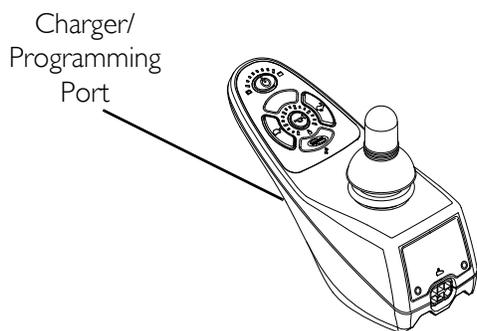
**Required Items:** Battery Charger\*, Power Cord\*\*

\*NOTE: Item not supplied.

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

Wheelchair with MK<sub>5</sub> SPJ-80/DPJ/MPJ/SPJ+ joystick:

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 12.5** Independent Charger

# SECTION 13—ELECTRONICS

## ⚠ 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.

## Repositioning the Joystick

NOTE: For this procedure, refer to FIGURE 13.1.

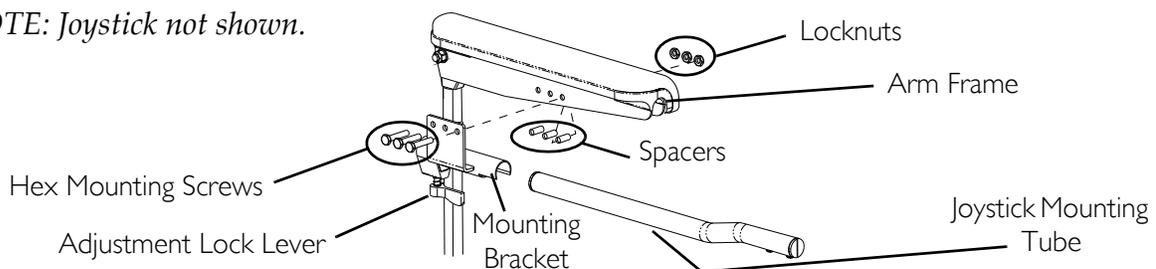
NOTE: Take note of position and orientation of mounting hardware for reinstalling the joystick assembly.

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.

NOTE: Joystick not shown.



**FIGURE 13.1** Repositioning the Joystick

## Disconnecting/Connecting the MK<sub>5</sub> Joysticks

*NOTE: For this procedure, refer to FIGURE 13.2.*

### Disconnecting

1. Loosen the thumb screws on the joystick connector.
2. Disconnect the joystick connector from the controller connector.

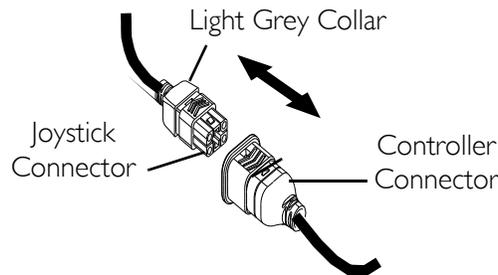
### Connecting

1. Align the joystick connector with the controller connector.
2. Secure the joystick connector to the controller connector using the thumb screws on the controller connector.

### **⚠ WARNING**

**The excess joystick cable must be coiled, and tie-wrapped to the rear of the seat frame to ensure that cable does NOT become entangled or damaged during normal operation of seating system - otherwise injury or damage may result.**

3. If necessary, coil and tie wrap excess joystick cable to rear of seat frame.



**FIGURE 13.2** Disconnecting/Connecting the MK5 Joysticks

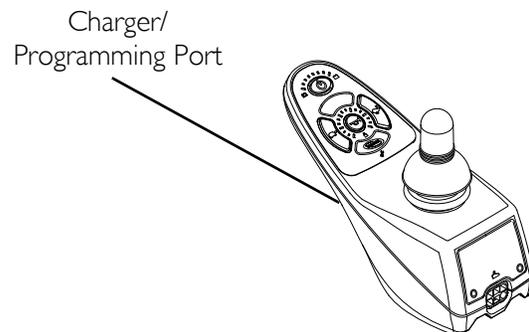
## Programming the Control Module

### **⚠ WARNING**

**DO NOT attempt to program the control module. This section MUST be performed by a qualified technician.**

*NOTE: For this procedure, refer to FIGURE 13.3.*

*NOTE: Connect programmer to multi-function charger port located on front of joystick as shown in FIGURE 13.3.*



**FIGURE 13.3** Programming the Control Module

# SECTION 14—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)

# NOTES

# 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.

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 two (2) 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 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.**

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Rev F-07 - 4/16

