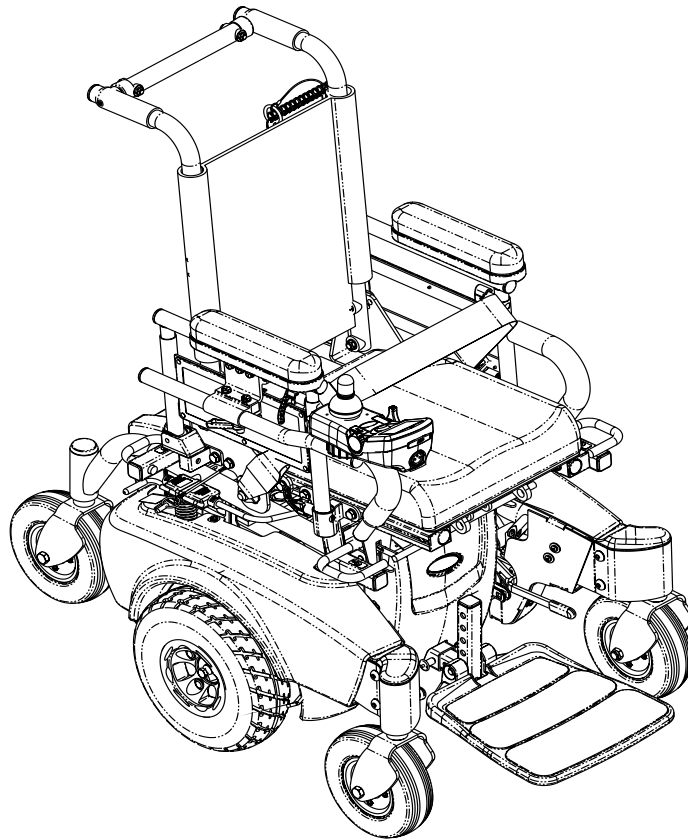


# Pronto<sup>®</sup> M71<sup>™</sup> Jr. with SureStep<sup>®</sup>



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

**USER:** 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**

**A QUALIFIED TECHNICIAN MUST PERFORM THE INITIAL SET UP OF THIS WHEELCHAIR.**

**WHEELCHAIR USERS: DO NOT SERVICE OR OPERATE THIS EQUIPMENT WITHOUT FIRST READING AND UNDERSTANDING (1) THE OWNER’S OPERATOR AND MAINTENANCE MANUAL AND (2) THE SEATING SYSTEM’S MANUAL (IF APPLICABLE). IF YOU ARE UNABLE TO UNDERSTAND THE WARNINGS, CAUTIONS, AND INSTRUCTIONS, CONTACT INVACARE TECHNICAL SUPPORT BEFORE ATTEMPTING TO SERVICE OR OPERATE THIS EQUIPMENT - OTHERWISE INJURY OR DAMAGE MAY RESULT.**

**DEALERS AND QUALIFIED TECHNICIANS: DO NOT SERVICE OR OPERATE THIS EQUIPMENT WITHOUT FIRST READING AND UNDERSTANDING (1) THE OWNER’S OPERATOR AND MAINTENANCE MANUAL, (2) THE SERVICE MANUAL (IF APPLICABLE) AND (3) THE SEATING SYSTEM’S MANUAL (IF APPLICABLE). IF YOU ARE UNABLE TO UNDERSTAND THE WARNINGS, CAUTIONS AND INSTRUCTIONS, CONTACT INVACARE TECHNICAL SUPPORT BEFORE ATTEMPTING TO SERVICE OR OPERATE THIS EQUIPMENT - OTHERWISE, INJURY OR DAMAGE MAY RESULT.**

---

**REFERENCE DOCUMENTS**

MANUAL	PART NUMBER
MK6i™ Field Reference Guide	1141471
MK6i Service Manual	1143203

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

# TABLE OF CONTENTS

<b>REGISTER YOUR PRODUCT</b> .....	<b>6</b>
<b>SPECIAL NOTES</b> .....	<b>9</b>
<b>LABEL LOCATIONS</b> .....	<b>11</b>
<b>TYPICAL PRODUCT PARAMETERS</b> .....	<b>12</b>
<b>SECTION 1—GENERAL GUIDELINES</b> .....	<b>13</b>
Controller Settings/Repair or Service .....	13
Operation Information.....	13
Accessories .....	15
Batteries.....	15
Charging Batteries .....	15
Grounding Instructions .....	16
Rain Test.....	16
Weight Training .....	17
Weight Limitation.....	17
<b>SECTION 2—EMI INFORMATION</b> .....	<b>18</b>
<b>SECTION 3—SAFETY/HANDLING OF WHEELCHAIRS</b> .....	<b>20</b>
Stability and Balance.....	20
Coping With Everyday Obstacles.....	21
A Note to Wheelchair Assistants .....	21
Lifting/Stairways .....	21
Transferring To and From Other Seats .....	23
Percentage of Weight Distribution .....	24
Reaching, Leaning and Bending - Forward .....	24
Reaching and Bending - Backward.....	25
<b>SECTION 4—SAFETY INSPECTION/TROUBLESHOOTING</b> .....	<b>26</b>
Safety Inspection Checklists.....	26
Troubleshooting Guide.....	28
All Wheelchairs .....	28
Wheelchairs with Manual Tilt Option.....	28
Checking Battery Charge Level.....	29
<b>SECTION 5—WHEELCHAIR OPERATION</b> .....	<b>30</b>
Operating the Wheelchair.....	30
Turning the Power On/Off.....	30
Using the Joystick to Drive the Wheelchair .....	30
A Note About Drive Lock-Out .....	32
Operating the Manual Tilt Option .....	32
DPJ Joystick Switches and Indicators .....	33
Drive Select Toggle Switch.....	33
Speed Control Knob.....	34
Joystick.....	34
Mode (On/Off) Switch .....	34
Battery Gauge Display (BGD).....	34

# TABLE OF CONTENTS

MPJ Joystick Switches and Indicators.....	35
Drive Select Toggle Switch.....	35
Speed Control Knob.....	35
Joystick.....	36
LCD Display.....	36
Emergency Stop/Reset Switch.....	37
Emergency Stop/Reset Input.....	37
Remote On/Off Switch.....	37
<b>SECTION 6—ARMS .....</b>	<b>38</b>
Installing/Removing/Positioning/Adjusting Flip Back Armrests.....	38
Installing.....	38
Removing.....	38
Positioning for User Transfer.....	39
Positioning for Use.....	39
Adjusting.....	39
<b>SECTION 7—SEAT .....</b>	<b>40</b>
Removing/Installing the Seat Assembly.....	40
Without Manual Tilt Option.....	40
With Manual Tilt Option.....	41
Adjusting the Seat Height.....	44
Without Manual Tilt Option.....	44
With Manual Tilt Option.....	45
Adjusting the Adjustable Angle Stroller Handle.....	47
Removing/Installing/Adjusting Headrest.....	48
Removing.....	48
Installing.....	48
Adjusting Headrest Height.....	49
Adjusting Headrest Depth/Direction.....	49
<b>SECTION 8—TILT .....</b>	<b>50</b>
Removing/Installing Tilt Release Lever from Stroller Handle.....	50
Removing.....	50
Installing.....	50
Adjusting the Cable Assembly.....	51
<b>SECTION 9—FOOTBOARD ASSEMBLY .....</b>	<b>52</b>
Removing/Installing the Footboard Assembly.....	52
Removing.....	52
Installing.....	52
Adjusting the Footboard Assembly.....	53
Angle.....	53
Depth.....	54



# TABLE OF CONTENTS

<b>SECTION 10—FRONT RIGGINGS .....</b>	<b>55</b>
Installing/Removing Front Riggings .....	55
Installing.....	55
Removing .....	55
Adjusting Footrest Height .....	56
On PHWH93 Front Riggings.....	56
On PH93M2 And PHAL4A Front Riggings .....	56
Replacing Heel Loops .....	57
Raising/Lowering Elevating Front Riggings .....	58
Adjusting/Replacing Telescoping Front Rigging Supports.....	58
Removing/Installing/Adjusting Center Mount Adjustable Knee Angle Footrest.....	59
Removing .....	59
Installing.....	59
Adjusting Height.....	60
Adjusting Angle.....	61
Adjusting the Footplate Angle .....	61
Adjusting the Tension of the Flip up Footplate .....	62
<b>SECTION 11—SHROUD/WHEELS .....</b>	<b>63</b>
Replacing Foam Filled or Pneumatic Tires Onto Wheel Rim .....	63
Removing/Installing Shrouds.....	63
Removing .....	63
Installing.....	64
Engaging/Disengaging Motor Release Lever .....	65
Engaging/Disengaging/Adjusting Wheel Locks .....	66
Engaging/Disengaging.....	66
Adjusting .....	66
Replacing Front/Rear Caster Assemblies.....	67
Adjusting Forks .....	67
<b>SECTION 12—BATTERIES .....</b>	<b>68</b>
Warnings For Handling and Replacing Batteries .....	68
Using the Proper Batteries.....	68
Removing/Installing Batteries .....	69
Without Manual Tilt Option .....	70
With Manual Tilt Option.....	71
Connecting/Disconnecting Battery Cables.....	73
Connecting Battery Cables.....	73
Disconnecting Battery Cables.....	75
Cleaning Battery Terminals .....	75
Charging Batteries .....	76
When to Charge Batteries .....	77
Battery Charger Operation.....	78
On-Board Battery Charger.....	78
Charging Using an Independent Charger Plugged Into the Joystick.....	80

# TABLE OF CONTENTS

<b>SECTION 13—ELECTRONICS .....</b>	<b>81</b>
Preparing the Joystick for Use.....	81
Repositioning Joystick.....	81
Disconnecting/Connecting the Joystick.....	82
Disconnecting .....	82
Connecting .....	82
<b>SECTION 14—TRANSPORTING THE WHEELCHAIR .....</b>	<b>84</b>
Disassembling the Wheelchair .....	84
Removing the Batteries .....	85
Removing the Side Frame Assemblies.....	86
Assembling the Wheelchair .....	88
Installing the Side Frame Assemblies Onto the Battery Tray.....	88
Installing the Batteries.....	88
Final Assembly .....	90
<b>SECTION 15—TRANSPORT READY PACKAGE .....</b>	<b>91</b>
Compliance Information .....	92
Specifications.....	92
Securing the Wheelchair to the Vehicle .....	92
Positioning the Wheelchair in the Vehicle.....	92
Securement Points.....	93
Securing the Wheelchair .....	93
Securing the Occupant.....	94
Wheelchair-Anchored Belts.....	94
Vehicle-Anchored Belts .....	95
Seating System .....	95
Positioning Belts .....	96
<b>LIMITED WARRANTY .....</b>	<b>99</b>

## REGISTER YOUR PRODUCT

The benefits of registering include:

1. Safeguarding your investment.
2. Ensuring long-term maintenance and servicing of your product.
3. Receiving updates with product information, maintenance tips and industry news.

**Register ONLINE at [warranty.invacare.com](http://warranty.invacare.com)**

Please have your model number and purchase date available to complete your registration.

Any registration information you submit will only be used by Invacare Corporation and protected as required by applicable laws and regulations.

# 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.

## NOTICE

**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 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 (TRRO OR TRBKTS)

**TRRO** includes four factory-installed transport brackets and a wheelchair anchored pelvic belt. **TRRO** has been crash-tested in accordance with **ANSI/RESNA WC Vol I Section 19.5.3 Frontal Impact Test** requirements for wheelchairs with a 168 lb crash dummy, which corresponds to a person with a weight of 114 to 209 lbs.

**TRBKTS** includes four factory-installed wheelchair transport brackets. **TRBKTS** has not been crash-tested in accordance with **WC 19.5.3**. Use these transport brackets only to secure an unoccupied wheelchair during transport.

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.

Refer to **Transport Ready Package** on page 94 for more information about transporting the wheelchair.

## **⚠ TRRO AND TRBKTS WARNINGS**

Only use the transport brackets included with **TRRO** and **TRBKTS** for the purposes described in this manual.

**⚠ WARNING**

**Always wear your positioning belt. If signs of wear appear, belt must be replaced immediately.**

**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.**

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

- **DO NOT** use on inclines greater than 9°.
- **DO NOT** use on inclines with wet, slippery, icy or oily surfaces. This may include certain painted or otherwise treated wood surfaces.
- **DO NOT** traverse down ramps at high speed. Doing so will reduce traction and increase stopping distance.
- The end user's weight can materially affect traction on sloped surfaces. Great care should be taken when traversing such slopes.

**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.**

**Wheelchairs should be examined during maintenance for signs of corrosion (water exposure, incontinence, etc.). Electrical components damaged by corrosion should be replaced IMMEDIATELY.**

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

---

# LABEL LOCATIONS

THIS WHEELCHAIR COMPLIES WITH **ANSI/RESNA WC/19**

**⚠ WARNING**

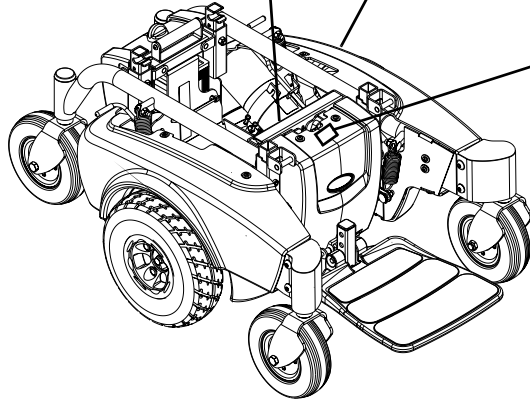
Refer to attached **TRANSPORT READY OPTION Instruction Card** and wheelchair **Owner's Manual** before use.

P/N 1082692 REV B - 08/05

NO WHEELCHAIR HAS BEEN APPROVED FOR USE AS A SEATING SURFACE WITHIN A MOTOR VEHICLE. THIS LABEL IS FOR INFORMATIONAL PURPOSES ONLY. LIABILITY ISSUES WERE NOT CONSIDERED IN THE ATTACHMENT OF THIS LABEL.

AUCUN FAUTEUIL ROULANT N'A ÉTÉ APPROUVÉ POUR ÊTRE UTILISÉ COMME SIÈGE À L'INTÉRIEUR D'UN VÉHICULE MOTORISÉ. CETTE ÉTIQUETTE NE PEUT ÊTRE UTILISÉE OÙ A TITRE D'INFORMATION ET N'A PAS ÉTÉ AFFICHÉE ICI POUR DES RAISONS DE RESPONSABILITÉ LÉGALE

*NOTE: This label is located on the inside of the battery tray.*



**⚠ WARNING** 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. **DO NOT REMOVE THIS LABEL.**

**FRONT BATTERY**

Red Connector, BLACK Battery Cable, U-1 BATT., RED Battery Cable, FUSE, RED Battery Cable, BLACK Battery Cable, U-1 BATT., REAR BATTERY

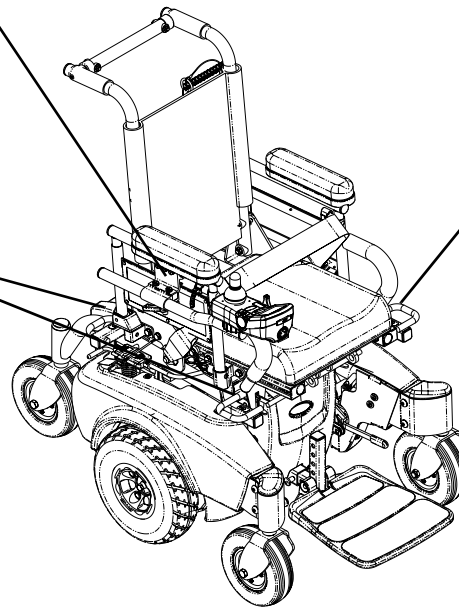
**100 AMP FS-HVBF Fuse**

Washers, Nut, RED Battery Cable, RED Battery Cable Mounting, POSITIVE (+) Battery Terminal, Insulator Nut, DO NOT REMOVE

P/N 1122143

*NOTE: Weight limit label location.*

**TIE DOWN POINT**  
1083199



**TIE DOWN POINT**  
1083199

# TYPICAL PRODUCT PARAMETERS

	ASBA
<b>SEAT WIDTH:</b>	12-16 inches
<b>SEAT DEPTH:</b>	12-18 inches
<b>BACK HEIGHT:</b>	12-22 inches
<b>TILT RANGE:</b>	Up to 45°
<b>BACK ANGLE RANGE:</b>	Standard - 80° to 100°
<b>UPHOLSTERY:</b>	Black Nylon Back with Seat Pan
<b>*SEAT TO FLOOR HEIGHT:</b>	18¼ to 19¼ (to seat pan)
<b>OVERALL WIDTH OF BASE (W/O JOYSTICK):</b>	24½ inches
<b>OVERALL HEIGHT:</b>	34½ to 35½ inches (with 16 inch back height)
<b>OVERALL LENGTH</b> WITHOUT FOOTREST: WITH FOOTREST:	34 inches 39 inches
<b>WEIGHT<sup>1</sup></b> WITHOUT BATTERIES: WITH BATTERIES: SHIPPING (WITHOUT BATTERIES):	159 pounds 206 pounds 200 pounds
<b>DRIVE WHEELS/TIRES (PNEUMATIC AND FLAT FREE):</b>	10 x 3½ inches
<b>CASTERS W/PRECISION SEALED BEARINGS (FRONT AND REAR):</b>	6 x 2 inches
<b>FOOTRESTS/LEGRESTS:</b>	Flip Up, Depth and Height Adjustable Footboard, Swing-away Front Rigging, Elevating Legrest, Center Mount Footrest
<b>ARMRESTS:</b>	Adjustable Height
<b>BATTERY REQUIREMENTS:</b>	Use only U1 gel cell batteries or AGM (Quantity - 2)
<b>ELECTRONICS:</b>	MK6i™ ACC with SPJ+ Joystick (standard) or MPJ+ Joystick (optional)
<b>**WEIGHT LIMITATION:</b>	up to 150 pounds
<b>INCLINE CAPABILITY:</b>	9°
<b>PERFORMANCE</b> SPEED: TURNING RADIUS: ***RANGE (VARIABLE):	up to 4¼ MPH 19½ inches with footboard Up to 12 miles

1. Includes seating systems and accessories.

*NOTE: All heights are measured with properly inflated new tires. These heights can vary ±¼ inch due to tire wear.*

*\*NOTE: The seat-to-floor heights are based on 18-inch deep seat with 0° (±1°) seat pan angle and pneumatic tires or flat free inserts. Seat-to-floor height measured from the front edge of seat to floor.*

*\*\*NOTE: Refer to Stability and Balance on page 19.*

*\*\*\*NOTE: Values for range are calculated for maximum chair weight rating using largest batteries applicable (U1), per test procedures described in ANSI/RESNA WC/VOL2-1998 Section 4 and meet federal reimbursement requirements for this product. While considered typical, they are derived based on certain ideal conditions. Variances in battery condition, user weight, usage pattern or overall terrain conditions will result in actual values for range that differ from these stated values. Users should become accustomed to how their unique conditions impact their individual results. Users should become familiar with the battery discharge indicator on the joystick to determine the range of their wheelchair. Refer to When to Charge Batteries on page 81 for more information about the battery discharge indicator.*

# SECTION I—GENERAL GUIDELINES

---

## **⚠ WARNING**

**SECTION I - GENERAL GUIDELINES** contains important information for the safe operation and use of this product. **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 **Owner's Manuals, Service Manuals or Instruction Sheets** supplied with this product or optional equipment. If you are unable to understand the **Warnings, Cautions or Instructions**, contact a healthcare professional, dealer or technical personnel before attempting to use this equipment - otherwise, injury or damage may occur.

---

## **Controller Settings/Repair or Service**

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

Wheelchairs should be examined during maintenance for signs of corrosion (water exposure, incontinence, etc.). Electrical components damaged by corrosion should be replaced IMMEDIATELY.

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

## **Operation Information**

Performance adjustments should only be made by professionals of the healthcare field or persons fully conversant with this process and the driver's capabilities. Incorrect settings could cause injury to the driver, bystanders, damage to the chair and to surrounding property.

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.

After the wheelchair has been set-up, 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 re-enter set-up specifications. Repeat this procedure until the wheelchair performs to specifications.

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 attempt to reach objects if you have to move forward in the seat.

DO NOT attempt to reach objects if you have to pick them up from the floor by reaching down between your knees.

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

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.

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 engage or disengage the motor release levers until the power is in the off position.

DO NOT operate on roads, streets or highways.

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

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 chair.

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

DO NOT attempt to lift the wheelchair by lifting on 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.

DO NOT stand on the frame of the wheelchair.

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

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

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.

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, seat positioning strap **MUST** be replaced immediately.

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 wheelchair near open flame or combustible products. Serious injury or damage to property may result.

ALWAYS check hand grips for looseness before using the wheelchair. If loose and/or worn, replace immediately.

If the wheelchair is exposed to extreme temperature (above 100°F or below 32°F), high humidity and/or becomes wet, prior to use, ensure handgrips do not twist - otherwise injury or damage may occur.

NEVER leave an unoccupied wheelchair on an incline.

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

### **Tilt Seats Only**

A 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 returning the tilted seat to the full upright position.

DO NOT allow the user to leave the wheelchair while the seat is tilted. ALWAYS return the seat to upright position when transferring the user in or out of the wheelchair.

### **Accessories**

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

### **Batteries**

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.

---

## Charging Batteries

---

### **⚠ DANGER**

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

---

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.

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.

## Grounding Instructions

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.

## Rain Test

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

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

DO NOT use power wheelchair in a shower.

DO NOT store power wheelchair in a damp area for an extended period of time.

Direct exposure to excessive rain or dampness may cause the chair to malfunction electrically and mechanically, may cause the chair to prematurely rust or may damage the upholstery.

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

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

## Weight Training

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

## Weight Limitation

The Pronto M71 jr. has a weight limitation of 150 lbs.

---

# SECTION 2—EMI INFORMATION

---

## **⚠ 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.

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# SECTION 3—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

---

### **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, seat positioning strap must be replaced immediately.**

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

**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.**

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

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

---

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

## Coping With Everyday Obstacles

### **⚠ WARNING**

**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.

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.

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.

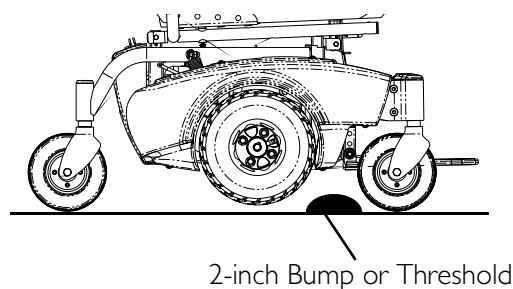
The Pronto M71 jr. with SureStep has a weight limitation of 150 lbs.

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

*NOTE: For this information, refer to FIGURE 3.1.*

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

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



**FIGURE 3.1** Coping With Everyday Obstacles

While the Pronto M71 jr. is designed for use primarily in and around the home, the provider should determine whether this chair is suitable for the actual environment the chair will be used in.

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

### **CAUTION**

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



## A Note to Wheelchair Assistants

When assistance to the wheelchair user is required, remember to use good body mechanics. Keep your back straight and bend your knees whenever tipping 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.**

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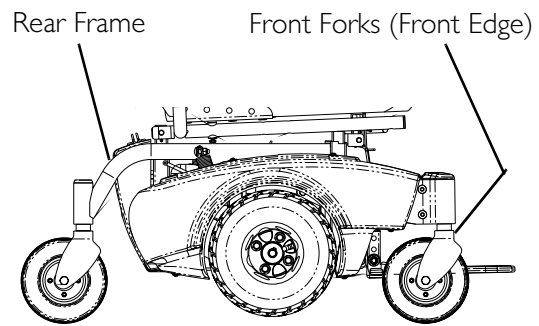
*NOTE: For this procedure, refer to FIGURE 3.2 on page 22.*

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

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

1. Remove the occupant from the wheelchair.
2. M71 jr. without Manual Tilt Option ONLY - Disassemble the wheelchair. Refer to Transporting the Wheelchair on page 87.
3. Bend your knees and keep your back straight.
4. Perform one of the following:

- A. M71 jr. without Manual Tilt Option Only - Using nonremovable (non-detachable) parts of the assemblies, transfer the individual pieces.
- B. M71 jr. with Manual Tilt Option Only - 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 3.2** Hand Hold Supports

- 5. Move the wheelchair or assemblies away from the stairway.
- 6. M71 jr. without Manual Tilt Option ONLY - Reassemble the wheelchair. Refer to Transporting the Wheelchair on page 87.

---

**⚠ 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**

**ALWAYS** turn the wheelchair power off and engage the motor release levers to prevent the wheels from moving before attempting to transfer in or of the wheelchair. Also, make sure every precaution is taken to reduce the gap distance by aligning both the front and rear casters parallel with the object you are transferring onto.

---

**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 3.3.*

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

- 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.



**FIGURE 3.3** Transferring To and From Other Seats

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 69.
3. Flip back or remove arm on side of wheelchair you are transferring from.
4. Shift body weight into seat with transfer.

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

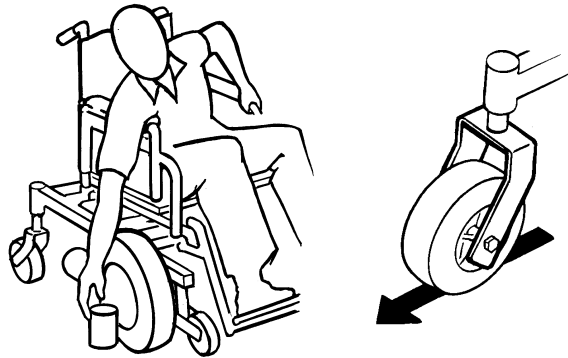
## Reaching, Leaning and Bending - Forward

*NOTE: For this procedure, refer to FIGURE 3.4.*

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

### **⚠ WARNING**

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



**FIGURE 3.4** Reaching, Leaning and Bending - Forward

## Reaching and Bending - Backward

### **⚠ WARNING**

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

*NOTE: For this procedure, refer to FIGURE 3.5.*

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



**FIGURE 3.5** Reaching and Bending - Backward

# SECTION 4—SAFETY INSPECTION/ TROUBLESHOOTING

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

## Safety Inspection Checklists

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

---

### **CAUTION**

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

---

#### **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 arm pivot points are free of wear and looseness.
- Ensure armrest pads sit flush against arm tubes.
- Clean upholstery and armrests.
- Inspect seat and back upholstery for rips or sagging.
- Ensure seat release latch is functional. Replace if necessary.
- Ensure wheel mounting bolts are secure on drive wheels.
- Inspect for excessive side movement or binding when drive wheels are lifted and spun when disengaged (freewheeling).
- Inspect wheel/fork assembly for proper tension by spinning the caster. 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.
- On wheelchairs with manual tilt option ONLY - Ensure that the drive lockout is working.
- Check that all labels are present and legible. Replace if necessary.
- Ensure casters are free of debris.

**Inspect/Adjust Weekly**

- Inspect tires for flat spots and wear.
- Ensure casters are free of debris.

**Inspect/Adjust Monthly**

- Ensure arm pivot points are free of wear and looseness.
- Ensure wheel mounting bolts are secure on drive wheels.
- Inspect for excessive side movement or binding when drive wheels are lifted and spun when disengaged (freewheeling).
- Inspect wheel/fork assembly for proper tension by spinning the caster. 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 positioning belt for any signs of wear. Ensure buckle latches. Verify hardware that attaches belt to frame is secure and undamaged. Replace if necessary.
- On wheelchairs with manual tilt option ONLY - Ensure that the drive lockout is functioning.
- Ensure casters are free of debris.

**Inspect/Adjust Periodically**

- 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 arm pivot points are free of wear and looseness.
- Ensure armrest pads sit flush against arm tubes.
- Clean upholstery and armrests.
- Inspect seat and back upholstery for rips or sagging.
- Ensure seat is secured to wheelchair frame.
- Ensure seat release latch is functional. Replace if necessary.
- Clean upholstery and armrests.
- Inspect positioning belt for any signs of wear. Ensure buckle latches. Verify hardware that attaches strap to frame is secure and undamaged. Replace if necessary.
- Inspect charger AC power cord for damage. Replace if necessary.
- Inspect electrical components for signs of corrosion. Replace if corroded or damaged.
- Check that all labels are present and legible. Replace if necessary.
- Ensure casters are free of debris.

## Troubleshooting - Mechanical

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





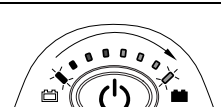
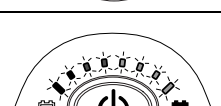
## Troubleshooting - Electrical

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

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

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


## Information Gauge Display Diagnostics

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

## Service Indicator Light Diagnostics

NUMBER OF FLASHES	ERROR CODE DESCRIPTION	POSSIBLE SOLUTION
1	User Fault	Release joystick to neutral and try again.
2	Battery Fault	Charge the batteries. Refer to <a href="#">Charging Batteries</a> on page 80. Check that battery cables are connected properly. Refer to <a href="#">Connecting/Disconnecting Battery Cables</a> on page 77. If necessary, replace batteries. Refer to <a href="#">Removing/Installing Batteries</a> on page 73.
3	Left Motor Fault	Contact Invacare/Dealer for service.
4	Right Motor Fault	Contact Invacare/Dealer for service.
5	Left Park Brake Fault	Contact Invacare/Dealer for service.
6	Right Park Brake Fault	Contact Invacare/Dealer for service.
7	Remote Fault	Check to make sure joystick is connected properly. Contact Invacare/Dealer for service.
8	Controller Fault	Contact Invacare/Dealer for service.
9	Communications Fault	Contact Invacare/Dealer for service.
10	General Fault	Contact Invacare/Dealer for service.
11	Incompatible or incorrect Remote	Wrong type of remote connected. Contact Invacare/Dealer for service.

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

SYMPTOM	PROBABLE CAUSE	SOLUTIONS
<p>⚠ SPM L Park Brake Fault or</p> <p>⚠ SPM R Park Brake Fault displays and wheelchair does not drive.</p>	Motor lock levers disengaged (Error code E9 or E10).	Engage motor lock levers. Refer to <u>Engaging/Disengaging Motor Release Lever</u> on page 69.
CHARGER PLUGGED IN displays.	Battery charger connected (Error code E28).	Unplug battery charger from the wheelchair. Refer to <u>Charging Batteries</u> on page 80.
⚠ SPM Battery Fault displays and the wheelchair does not drive.	Batteries need to be charged (Error code E14).	Charge batteries. Refer to <u>Charging Batteries</u> on page 80. If batteries fail to charge properly, check battery charger or replace batteries. Refer to <u>Charging Batteries</u> on page 80.
⊘ JOYSTICK TIMEOUT displays and the wheelchair does not drive.	Joystick or input device is disconnected (Error code 32).	Turn Off power, reconnect the joystick of input device and turn power On.
<p>⊘ JS REV TOO LARGE</p> <p>⊘ JS FWD TOO LARGE</p> <p>⊘ JS LFT TOO LARGE or</p> <p>⊘ JS RGT TOO LARGE</p> displays and the wheelchair does not drive.	The joystick or input device is sending a value outside of the reverse, forward, left or right limits (Error codes E01, E02, E03 or E04).	Replace joystick or input device.
NEUTRAL TESTING displays.	The joystick neutral test has failed (Error code E18).	Release the joystick and try to get the joystick back into the center-most position.
⊘ BAD JOYSTICK CAL VALUES displays and the wheelchair does not drive.	The joystick calibration values are outside of the expected range (Error code E19).	Recalibrate the joystick (joystick throw procedure).
⚠ SPM NOT CONNECTED	The MPJ or Display module is not communicating with the control module (Error code E200).	Check the connections between the joystick or display and the controller. Turn the power Off and then back On. Replace the controller if necessary.
⚠ SPM Communications Fault displays and the wheelchair drives slowly.	The controller has determined a fault during a previous turn-off process (Error code E41).	Turn the wheelchair Off and back On.
ATTENDANT ACTIVE and  displays.	The Proportional or Digital Attendant control is active and can be used to drive the chair (Error code W05).	This is normal behavior.
Batteries draw excessive current when charging.	Battery failure.	Have batteries checked for shorted cell. Replace if necessary.
	Electrical malfunction.	Contact Dealer/Invacare for service.
Battery indicator flashes the charge level is low - immediately after recharge.	Battery failure.	Check batteries for shorted cell. Replace if necessary.
	Malfunctioning battery charger.	Contact Dealer/Invacare for Service.
	Electrical malfunction.	Contact Dealer/Invacare for Service.



SYMPTOM	PROBABLE CAUSE	SOLUTIONS
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.
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. Contact Dealer/Invacare to have controller reprogrammed.
Wheelchair does not respond to commands.	Poor battery terminal connection.	Have terminals cleaned.
Power indicator Off - even after recharging.	Electrical malfunction.	Contact Dealer/Invacare for Service.

### Wheelchairs with Manual Tilt Option

SYMPTOM	PROBABLE CAUSE	SOLUTIONS
Wheelchair Power ON but does not drive.	Seat tilted beyond drive lock-out angle (20°).	<b>Return to neutral position (upright).</b> Contact Invacare/Dealer for service if this does not solve the problem.

### 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 <b>ONLY</b> a gel charger for a gel battery.

# SECTION 5—WHEELCHAIR OPERATION

## ⚠ WARNING

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

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

## Operating the Wheelchair

### Turning the Power On/Off

NOTE: For this procedure, refer to FIGURE 5.1.

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

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

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

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

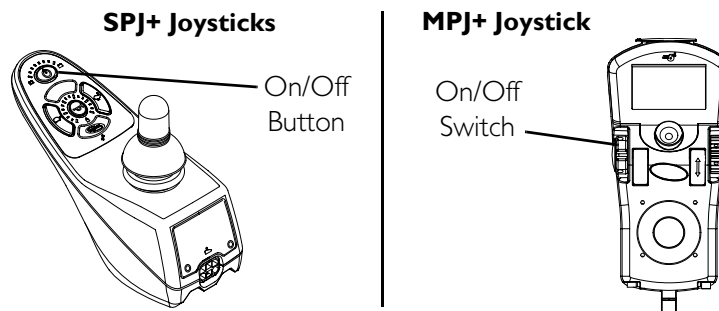


FIGURE 5.1 Turning the Power On/Off

## Using the Joystick to Drive the Wheelchair

*NOTE: For this procedure, refer to FIGURE 5.2.*

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

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

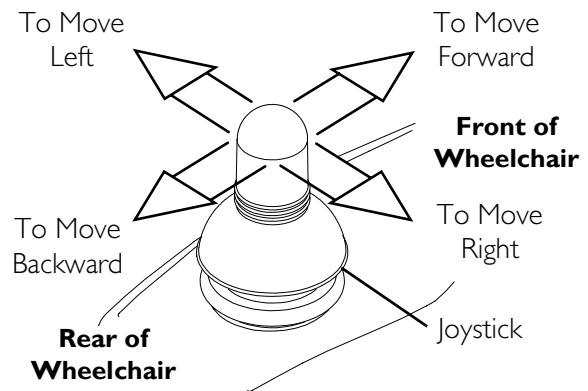
To slow the wheelchair to a stop, simply release the joystick. The wheelchair has automatic speed and direction compensation to minimize corrections.

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

To drive the wheelchair, perform the following:

1. Adjust speed control knob to the appropriate setting.
2. Turn the power On. Refer to [Turning the Power On/Off](#) on page 30.
3. Maneuver the joystick in the following manner:

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



**FIGURE 5.2** Using the Joystick to Drive the Wheelchair

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

- [SPJ+, MK6i SPJ+ w/PSS and MK6i SPJ+ w/ACC Joystick Switches and Indicators](#) on page 34.
- [MPJ+ Joystick Switches and Indicators](#) on page 36.

## A Note About Drive Lock-Out

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### **⚠ WARNING**

**NEVER** operate the wheelchair while the back is in any tilted/back angle position over 20° relative to the vertical position. If the drive lock-out does not stop the wheelchair from operating in a tilt/back angle position over 20° relative to the vertical position, **DO NOT** operate the wheelchair. **DO NOT** attempt to adjust the drive lock-out. Have the wheelchair serviced by a qualified technician.

The wheelchair user **MUST** have a clear line of sight to drive safely. On initial chair delivery and after adjusting the back angle, drive lock-out switch or tilt system, tilt the seat back to the farthest driving position immediately before drive lock-out engages and ensure there is a clear line of sight present in which to drive the wheelchair. If a clear line of sight is not present, have the back angle repositioned or readjust the lockout angle such that safe driving with a clear line of sight is achieved. **Otherwise injury or damage may occur.**

---

One of the following will occur when the drive lock-out feature has been activated:

- MPJ+ Joysticks Only - ⚠ TILT WARNING or ⚠ SPM Inhibited displays on the joystick or display unit.
- SPJ+ Joysticks Only - Left to right chase alternating with a steady display.

Drive lock-out is a feature designed to prevent the wheelchair from being driven after the seating system has been tilted beyond 20°\* relative to the vertical position. The back can be positioned at a 10° relative offset to the seat base, thereby resulting in a back angle potential of 30° before which the drive lock-out is activated. This may affect the wheelchair user's line of sight while driving. Make sure the wheelchair user can see properly to ensure safe driving.

\*NOTE: 20° back angle can be any combination of tilt, back angle and/or surface angle.

NOTE: Refer to Typical Product Parameters on page 10 for tilt angle ranges.

### **Operating the Manual Tilt Option**

Tilt is a term used to define the angle between the seat rails and the ground/floor.

---

### **⚠ WARNING**

**Make sure the occupant of the wheelchair is properly positioned in the wheelchair BEFORE using the tilt-in-space to maintain maximum stability and safety. Refer to General Guidelines on page 12.**

The wheelchair **MUST** be operated by an assistant when in any tilt position.

**Always engage both wheel locks while using the manual tilt option.**

**Always wear your positioning belt. If signs of wear appear, belt must be replaced immediately.**

---

**⚠ WARNING**

**ALWAYS** make sure that the wheelchair is stable before using the manual tilt option. Rear wheels may have to be repositioned rearward depending on the degree of tilt required. **ALWAYS** ensure stability before using maximum amount of tilt. test wheelchair before it is occupied by the end user to ensure safety.

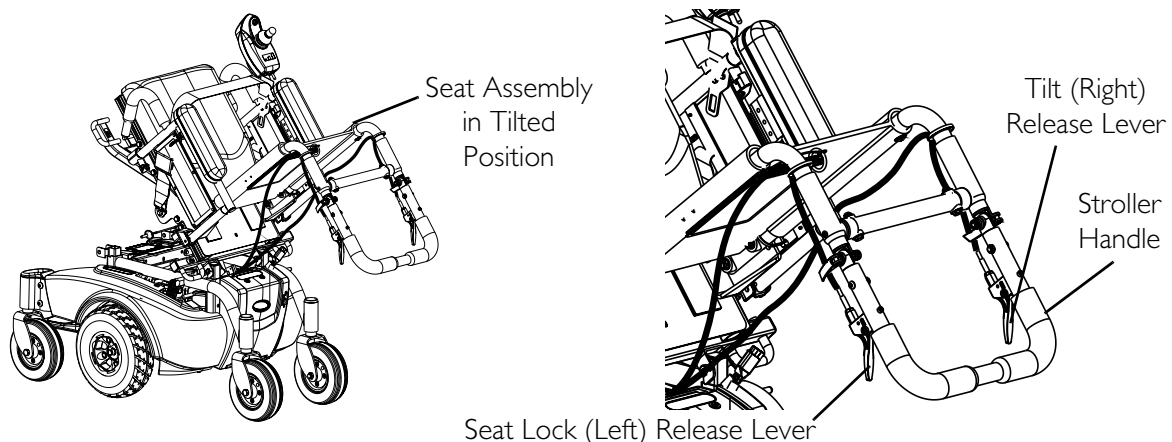
**DO NOT** operate the manual tilt mechanism if the release levers and cables are not properly adjusted to ensure that the wheelchair holds the tilted position. For adjustments on the manual tilt mechanism, refer to **Tilt** on page 54.

**A 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 returning the tilted seat to the full upright position.**

*NOTE: For this procedure, refer to FIGURE 5.3.*

*NOTE: To tilt the seat parallel back to the upright position, reverse the following procedure.*

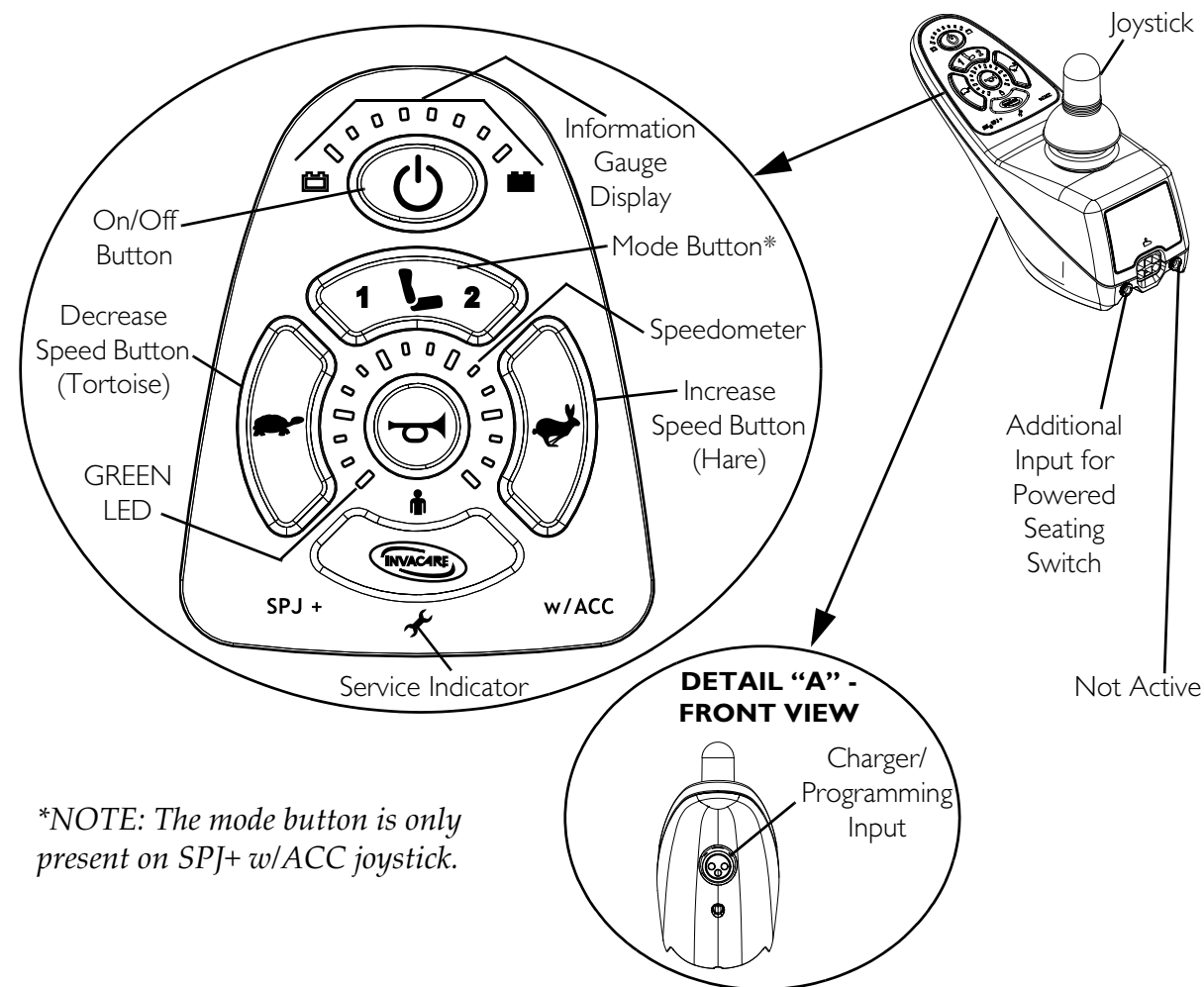
1. Place the wheelchair on a level surface.
2. Inform the occupant of the wheelchair that the wheelchair is about to be tilted and remind them to lean back.
3. Make sure the occupant's hands and body are clear of all pinch points.
4. Stand behind the wheelchair and grasp both release levers on the stroller handle.
5. Pull up on the left release lever to disengage the seat lock lever and simultaneously pull up on the right release lever to engage the manual tilt system.
6. Slowly, push down on the stroller handle while holding on the release levers in a continuous motion.
7. When the seat reaches the desired angle, slowly let go of the two release levers.



**FIGURE 5.3** Operating the Manual Tilt Option

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

NOTE: For the following information, refer to FIGURE 5.4.



\*NOTE: The mode button is only present on SPJ+ w/ACC joystick.

**FIGURE 5.4** SPJ+, MK6i SPJ+ w/PSS and MK6i SPJ+ w/ACC Joystick Switches and Indicators

### On/Off Button

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

### Speedometer

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

## Speed Control Buttons

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

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

## Joystick

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

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

## Charger/Programming Input

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

## Service Indicator

The AMBER service indicator will light when an error or fault occurs. Refer to [Service Indicator Light Diagnostics](#) on page 34 for a listing of the flash codes and what they indicate.

## Information Gauge Display

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

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

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

## MPJ+ Joystick Switches and Indicators

*NOTE: For this procedure, refer to FIGURE 5.5.*

### Drive Select Toggle Switch

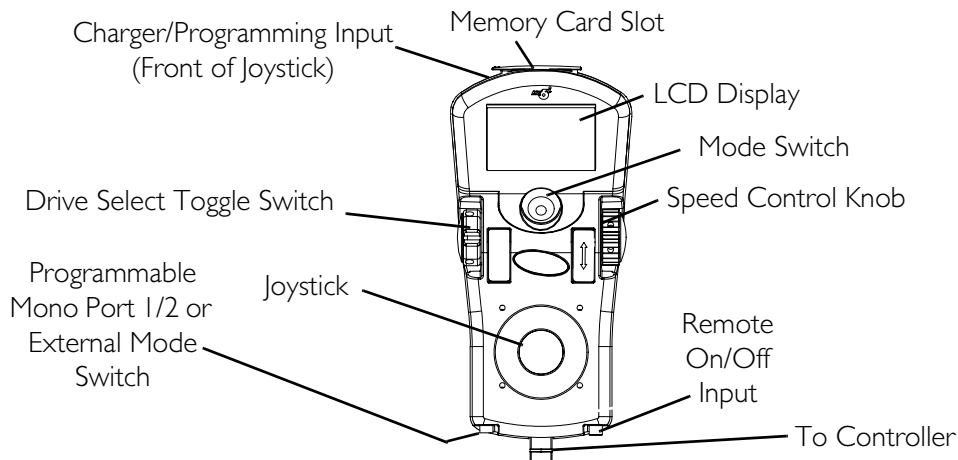
The drive select toggle switch is located on the left side, below the LCD. The drive select position is momentary, meaning that it will return to the neutral position after a selection is made.

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

### Selecting the Drive Mode

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





**FIGURE 5.5** MPJ+ Joystick Switches and Indicators

## Speed Control

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

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

## Joystick

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

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

## Charger/Programming Input

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

## LCD Display Screens

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

## Splash Screen

*NOTE: For this procedure, refer to FIGURE 5.6.*

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

After this screen, the joystick displays the Main Screen.



**FIGURE 5.6** LCD Display Screens - Splash Screen

## Main Screen

*NOTE: For this information, refer to FIGURE 5.7 on page 39.*








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

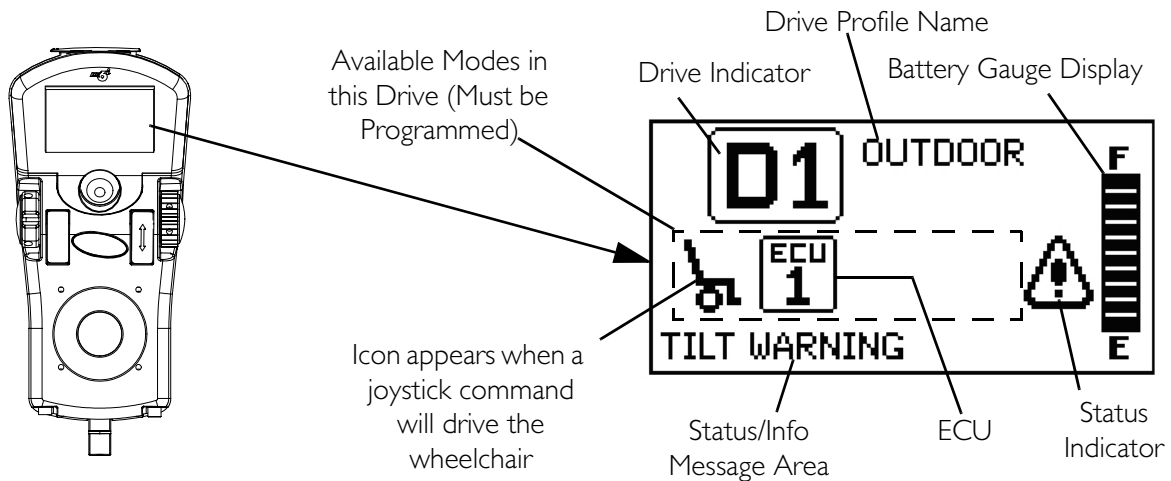
The lower half of the LCD display is the Information Center. The Information Center displays current data on the wheelchair.

Refer to LCD Display table on page 38 for descriptions of information shown.

### LCD DISPLAY

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

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



**FIGURE 5.7** LCD Display Screens - Main Screen

### Driving Screen

*NOTE: For this procedure, refer to FIGURE 5.8.*

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

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

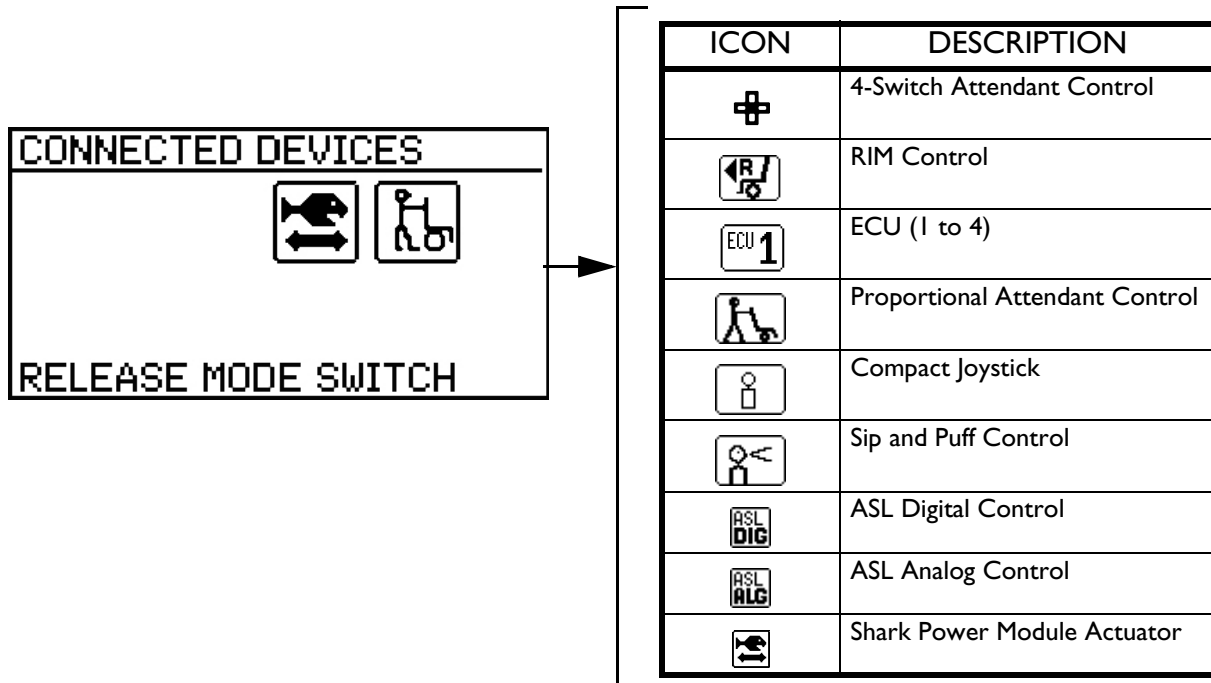


**FIGURE 5.8** LCD Display Screens - Driving Screen

### Connected Devices Screen

*NOTE: For this procedure, refer to FIGURE 5.9.*

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



**FIGURE 5.9** LCD Display Screens - Connected Devices Screen

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

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

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

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

#### Remote Stop Switch

The remote stop switch is used to stop the wheelchair.

#### Remote Mode (Reset) Switch

The remote mode reset switch functions the same way as the mode switch. Refer to [Mode Switch](#) on page 41.

## Remote On/Off Switch

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

## Mode Switch

*NOTE: For this procedure, refer to FIGURE 5.5.*

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

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

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

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

## Memory Card Slot

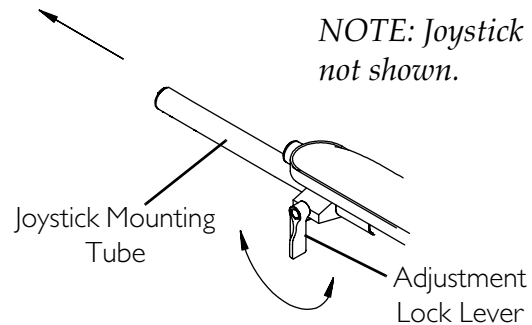
The memory card slot is used with the basic or professional memory card for saving or reading wheelchair parameters.

## Preparing the Joystick for Use

*NOTE: For this procedure, refer to FIGURE 5.10.*

*NOTE: The joystick is factory installed on the right side of the wheelchair. To reposition the joystick onto the left side of the wheelchair, refer to [Repositioning the Joystick](#) on page 42.*

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

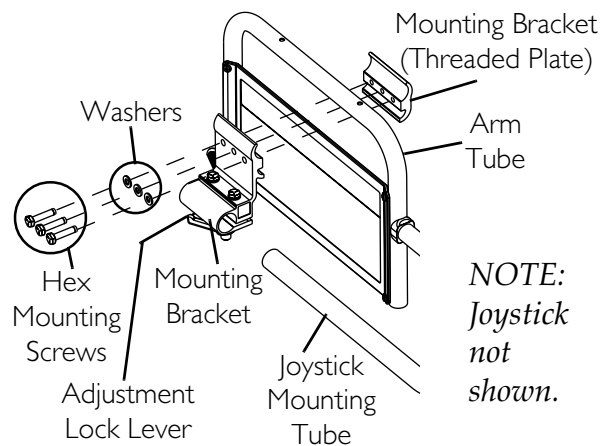


**FIGURE 5.10** Preparing the Joystick for Use

## Repositioning the Joystick

*NOTE: For this procedure, refer to FIGURE 5.11.*

1. Turn the adjustment lock lever to release the joystick mounting tube from the mounting bracket.
2. Remove the joystick from the wheelchair.
3. Remove the three hex screws that secure both halves of the mounting bracket to the arm tube.
4. Reposition mounting bracket on opposite arm tube ensuring the threaded plate of the mounting bracket is on the inside of the arm tube as shown in FIGURE 5.11.



**FIGURE 5.11** Repositioning the Joystick

5. Using the three hex mounting screws and washers, secure both halves of the mounting bracket to the arm tube.
6. Slide the joystick mounting tube through the mounting bracket to the desired position.
7. Turn the adjustment lock lever to secure the joystick mounting tube into the mounting bracket.

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# SECTION 6—ARMS

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## **⚠ WARNING**

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

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

---

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

---

### **⚠ WARNING**

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

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*NOTE: For this procedure, refer to FIGURE 6.1 on page 44.*

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

### **Installing**

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

### **Removing**

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

## Positioning for User Transfer

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

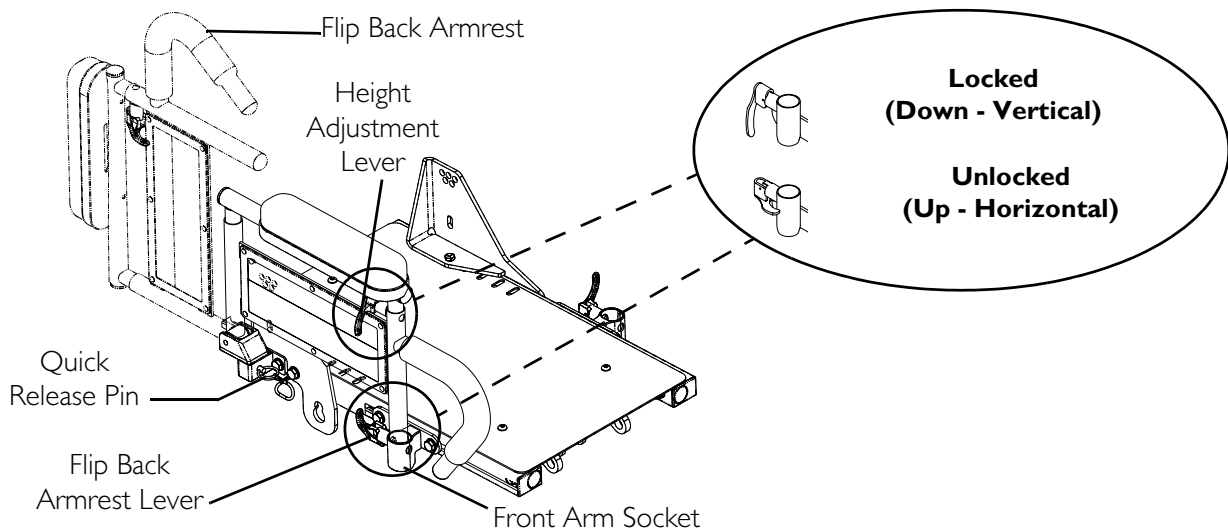
## Positioning for Use

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

## Adjusting

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

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



**FIGURE 6.1** Installing/Removing/Positioning/Adjusting Flip Back Armrests



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# SECTION 7—SEAT

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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.**

**For the following procedures, make sure the On/Off switch on the joystick is in the off position.**

**DO NOT install an adult seat onto a M71 jr. base. The M71 jr. base is not equipped to support an adult seat. Otherwise, injury to the user and /or damage to surrounding environment will occur.**

---

## Removing/Installing the Seat Assembly

### Without Manual Tilt Option

*NOTE: For this procedure, refer to FIGURE 7.1 on page 46.*

#### Removing

1. Disconnect the joystick cable at rear of the seat. Refer to Disconnecting/Connecting the Joysticks on page 85.
2. Push down on the latch bar underneath the front of the seat.
3. Rotate the seat assembly backward.
4. Slide the seat assembly forward to disengage the seat from the rear pivot brackets.
5. Remove the seat from the base frame.

#### Installing

1. Position the seat in the rear pivot brackets.
2. Rotate seat assembly forward.
3. When seat is lowered, engage seat brackets into seat clevis pins.

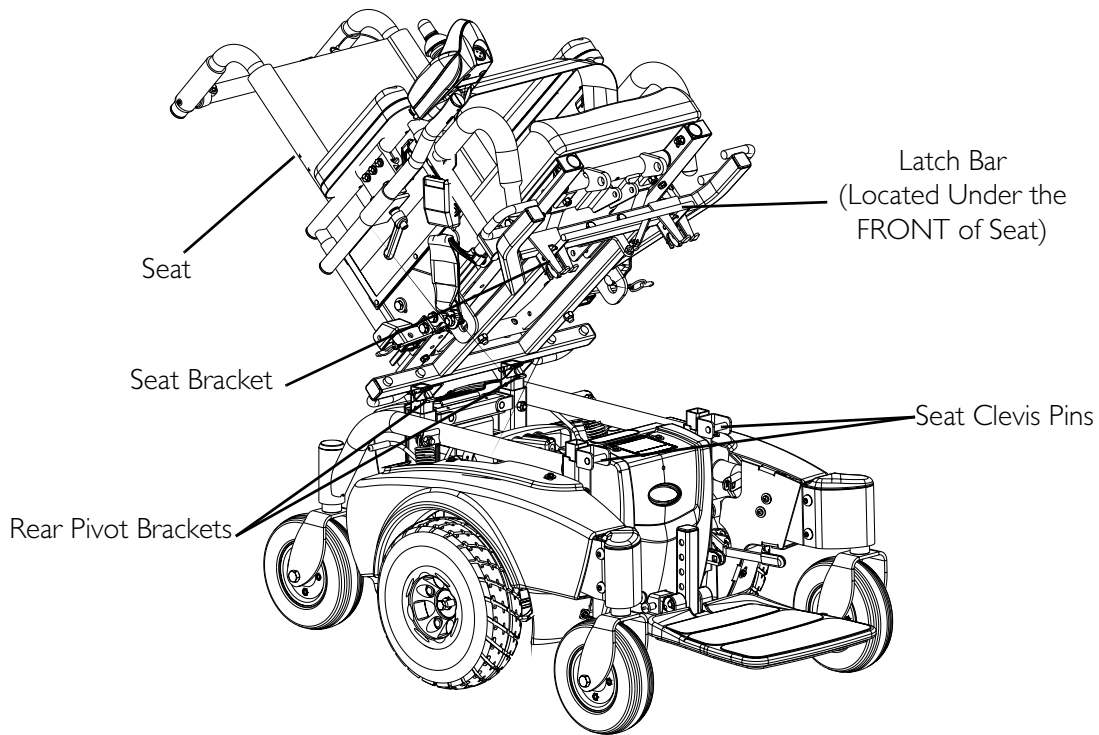
---

## **⚠ WARNING**

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

---

4. Pull up on latch bar to verify that brackets are engaged with seat clevis pins.
5. Reconnect the joystick. Refer to Disconnecting/Connecting the Joysticks on page 85.



**FIGURE 7.1** Removing/Installing the Seat Assembly - Without Manual Tilt Option

### With Manual Tilt Option

*NOTE: For this procedure, refer to FIGURE 7.2 on page 47.*

#### Removing

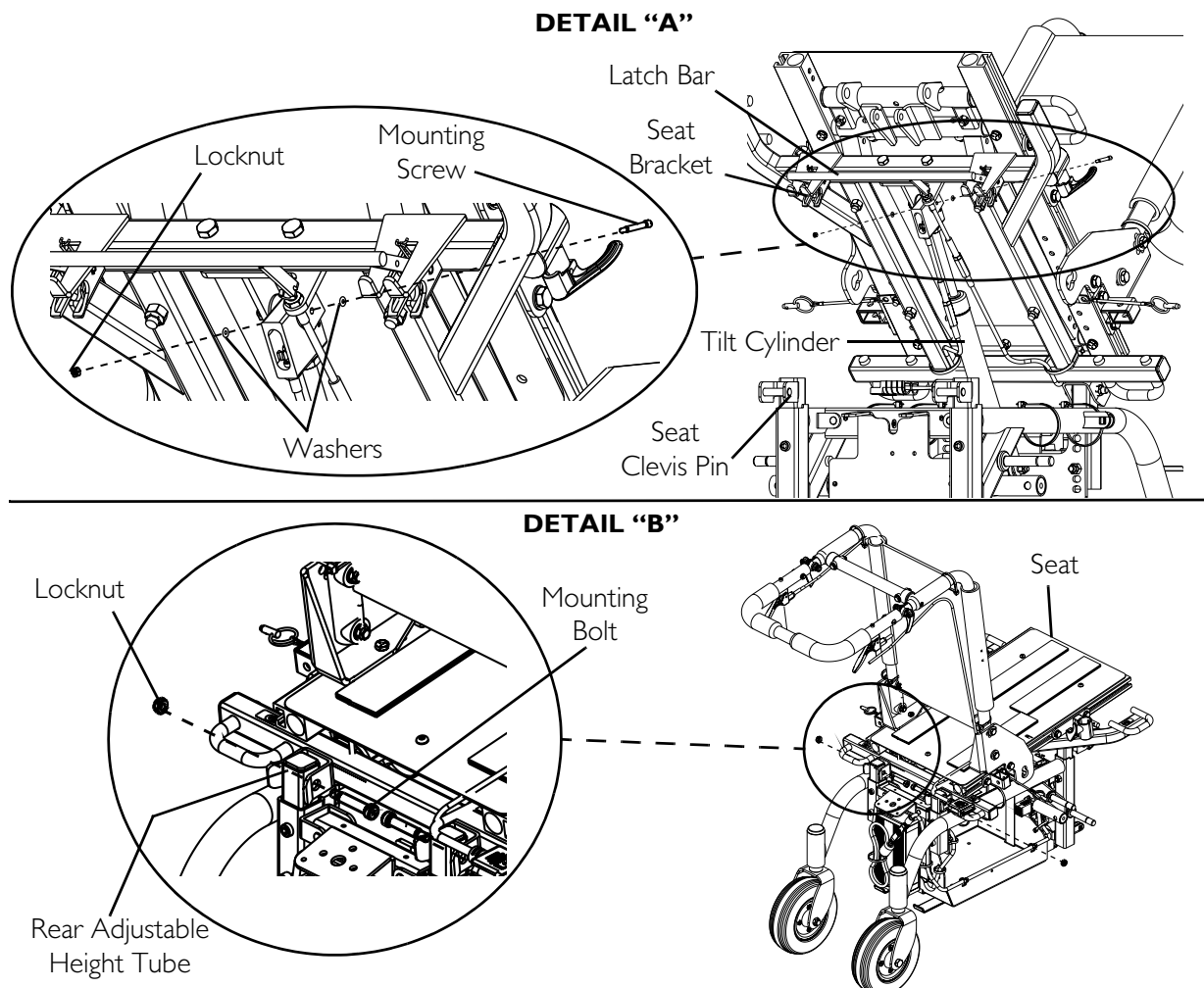
1. Disconnect the joystick cable at rear of the seat. Refer to Disconnecting/Connecting the Joysticks on page 85.
2. Tilt the seat assembly backward. Refer to Operating the Manual Tilt Option on page 32.
3. Remove the mounting screw, two washers and locknut that secure the tilt cylinder to the bottom of the seat (Detail "A" of FIGURE 7.2).
4. Rotate the seat assembly forward and lock in place.
5. Remove the tilt release lever. Refer to Removing/Installing Tilt Release Lever from Stroller Handle on page 54.
6. Remove the two mounting bolts and locknuts that secure the seat to the two rear adjustable height tubes (Detail "B" of FIGURE 7.2).
7. Push down on the latch bar underneath the front of the seat.
8. Remove the seat the base frame.

## Installing

1. Engage seat brackets in the seat clevis pins and lower the seat onto the rear adjustable height tubes.
2. Secure the seat to the two rear adjustable height tubes with mounting bolts and locknuts (Detail “B” of FIGURE 7.2).
3. Install the tilt release lever. Refer to Removing/Installing Tilt Release Lever from Stroller Handle on page 54.
4. Push down on the latch bar underneath the front of the seat.
5. Rotate the seat assembly back.
6. Connect the tilt cylinder to the bottom of the seat using the mounting screw, two washers and locknut (Detail “A” of FIGURE 7.2).
7. Tilt the seat assembly forward. Refer to Operating the Manual Tilt Option on page 32.

*NOTE: Pull up on the latch bar to ensure that the seat assembly is locked in place.*

8. Connect the joystick cable at rear of the seat. Refer to Disconnecting/Connecting the Joysticks on page 85.



**FIGURE 7.2** Removing/Installing the Seat Assembly - With Manual Tilt Option

## Adjusting the Seat Height

### **⚠ WARNING**

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

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

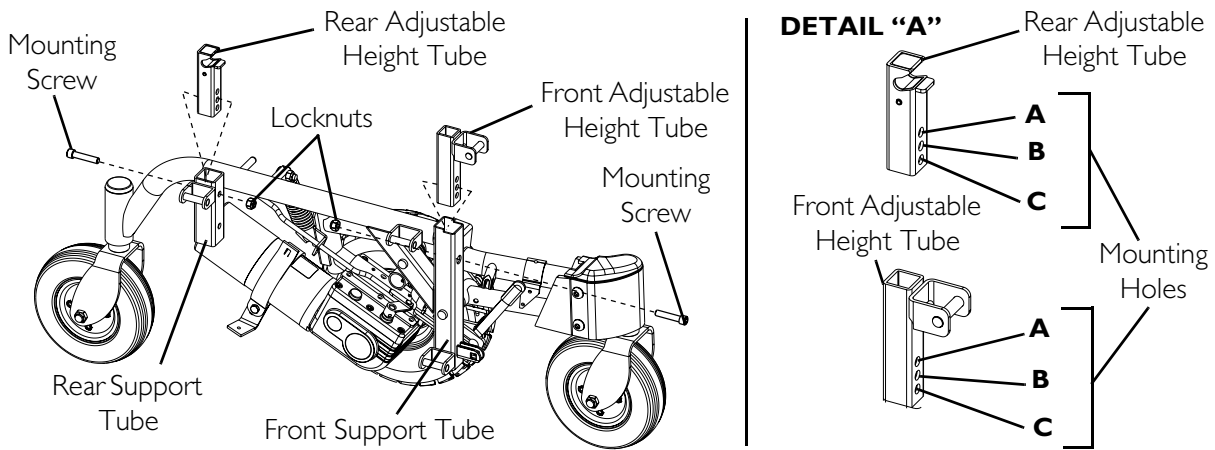
### **Without Manual Tilt Option**

*NOTE: For this procedure, refer to FIGURE 7.3 on page 49.*

1. Remove the seat. Refer to Removing/Installing the Seat Assembly on page 45.
2. Remove the rear shroud. Removing/Installing Shrouds on page 67.
3. Remove the mounting screw and locknut that secure the rear adjustable height tube to the rear support tube.
4. Adjust tube to desired mounting position. Refer to the chart below for available mounting positions.
5. Reinstall mounting screw and locknut. Securely tighten.
6. Repeat STEPS 2-4 for the three remaining adjustable height tubes.
7. Reinstall the rear shroud. Removing/Installing Shrouds on page 67.
8. Reinstall the seat. Refer to Removing/Installing the Seat Assembly on page 45.

REAR ADJUSTABLE HEIGHT TUBE	AVAILABLE MOUNTING HOLES FOR FRONT ADJUSTABLE HEIGHT TUBE		
	A	B	C
Mounted in hole A	✓	✓	✓
Mounted in hole B	N/A*	✓	✓
Mounted in hole C	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.*



**FIGURE 7.3** Adjusting the Seat Height - Without Manual Tilt Option

### With Manual Tilt Option

*NOTE: For this procedure, refer to FIGURE 7.4 on page 50.*

1. Remove the seat. Refer to Removing/Installing the Seat Assembly on page 45.
2. Remove the rear shroud. Removing/Installing Shrouds on page 67.
3. Remove the four locknuts that secure the cylinder mounting bracket to the frame. DO NOT remove the mounting screws yet.
4. Slide the cylinder mounting bracket off from the four mounting screws.
5. To adjust the rear adjustable height tubes, perform the following:
  - A. Remove the top mounting screw that secures one rear adjustable height tube to the rear support tube.
  - B. Adjust the rear adjustable height tube to the desired mounting position. Refer to the table in FIGURE 7.4 for available mounting positions.
  - C. Reinstall the mounting screw to hold the rear adjustable height tube in the new mounting position. DO NOT reinstall the locknut yet.
  - D. Repeat STEPS A-C for the other rear adjustable height tube.

*NOTE: The two rear adjustable height tubes should be adjusted to the same height.*

6. Slide the cylinder mounting bracket and cylinder onto the four mounting screws.

*NOTE: The mounting holes used to slide the cylinder mounting bracket onto the four mounting screws should correspond to the mounting hole on the rear adjustable height tube. Refer to Detail "B" of FIGURE 7.4.*

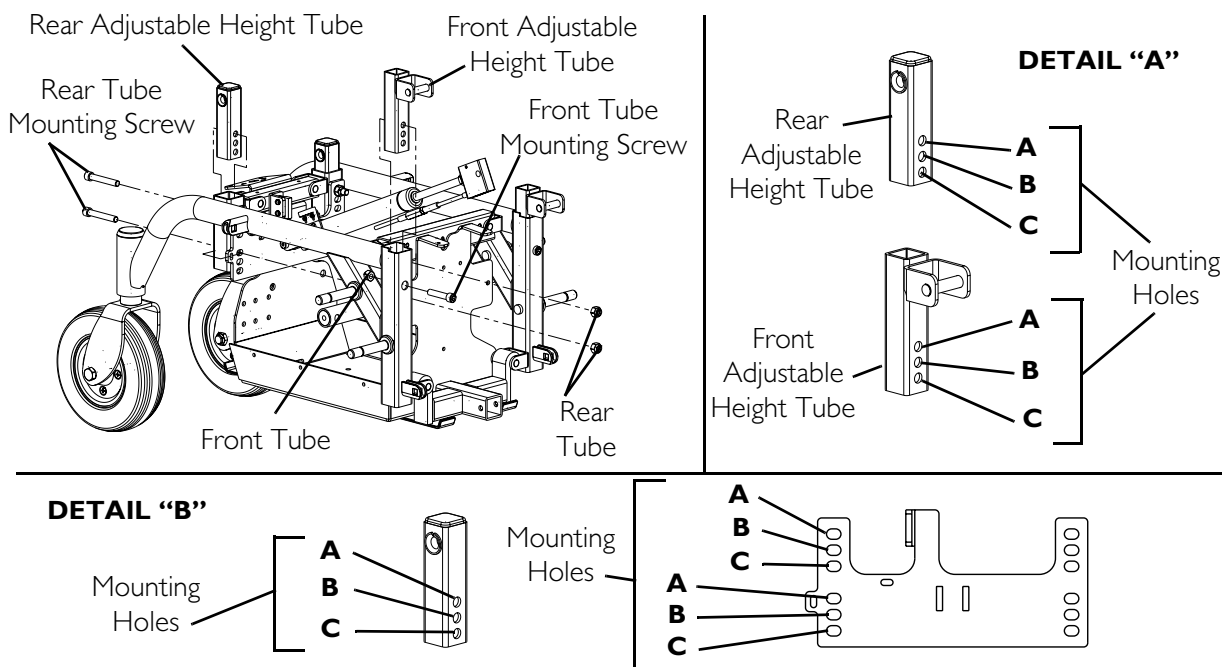
7. Reinstall the four locknuts to secure the rear adjustable height tubes and cylinder mounting bracket to the support tubes. Securely tighten.

8. To adjust the front adjustable height tubes, perform the following:
  - A. Remove the mounting screw and locknut that secure one front adjustable height tube to the front support tube.
  - B. Adjust the front adjustable height tube to desired mounting position. Refer to the table below for available mounting positions.
  - C. Reinstall the mounting screw and locknut to secure the front adjustable height tube in the new mounting position.
  - D. Repeat STEPS A-C for the other front adjustable height tube.
9. The two front adjustable height tubes should be adjusted to the same height.
10. Reinstall the rear shroud. Removing/Installing Shrouds on page 67.
11. Reinstall the seat. Refer to Removing/Installing the Seat Assembly on page 45.

REAR ADJUSTABLE HEIGHT TUBE	AVAILABLE MOUNTING HOLES FOR FRONT ADJUSTABLE HEIGHT TUBE		
	A	B	C
Mounted in hole A*	✓	✓	✓
Mounted in hole B*	N/A**	✓	✓
Mounted in hole C*	N/A**	N/A**	✓

\*NOTE: Corresponding mounting holes on the cylinder mounting bracket must be used to mount the cylinder mounting bracket. Refer to Detail “B” of FIGURE 7.4.

\*\*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.



**FIGURE 7.4** Adjusting the Seat Height - With Manual Tilt Option

## Adjusting the Adjustable Angle Stroller Handle

*NOTE: For this procedure, refer to FIGURE 7.5.*

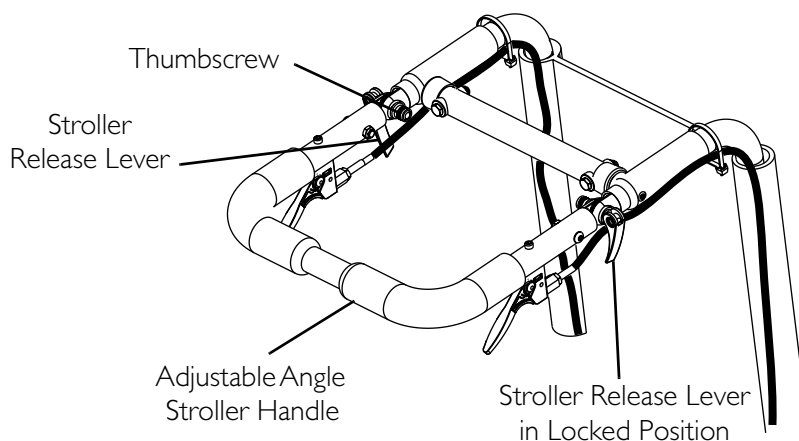
1. Flip both release levers up to the unlocked position.
2. Adjust stroller handle to desired angle.
3. Flip both stroller release levers down to the locked position.
4. Push down on stroller handle to ensure stroller release levers hold the desired position of the stroller handle.
5. If the stroller handle release levers do not hold the position, tighten each release lever by performing the following:
  - A. Flip the release lever to the unlocked position.
  - B. Rotate the thumbscrew clockwise one revolution.

*NOTE: When tightening the stroller release lever, the release lever must be able to close completely into the locked position. Otherwise, the release levers will not hold the desired angle.*

- C. Flip the stroller release levers to the locked position.

*NOTE: If the stroller release levers do not close completely into the locked position, rotate the thumbscrew on each release lever counterclockwise ½ revolution.*

- D. Repeat STEPS A-C for the other release lever.
- E. Push down on the stroller handle to ensure that the stroller release levers hold the desired position of the stroller handle.
- F. Repeat STEPS A-E until the release levers hold the position.



**FIGURE 7.5** Adjusting the Adjustable Angle Stroller Handle

## Removing/Installing/Adjusting Headrest

### ⚠ WARNING

**DO NOT** remove the screw that holds the headrest in the offset fixture. Refer to **FIGURE 7.6**.

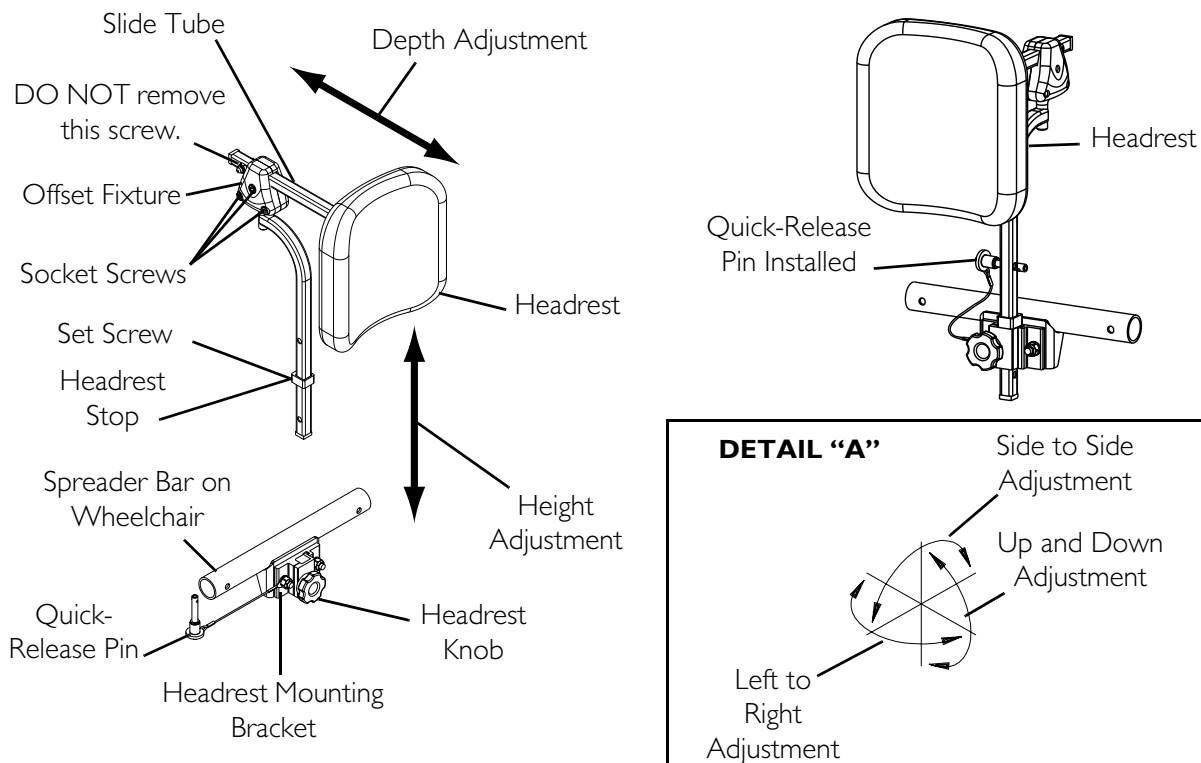
*NOTE: For these procedures, refer to FIGURE 7.6.*

### Removing

1. Loosen, but **DO NOT** remove, the headrest knob that secures the headrest to the headrest mounting bracket.
2. Remove the quick-release pin.
3. Remove the headrest from the headrest mounting bracket.

### Installing

1. Make sure headrest knob is loose.
2. Install the headrest until the headrest stop sits on the headrest mounting bracket.
3. Install the quick-release pin.
4. If necessary, adjust the height, depth or direction of the headrest. Refer to Adjusting Headrest Height on page 53 or Adjusting Headrest Depth/Direction on page 53.



**FIGURE 7.6** Removing/Installing/Adjusting Headrest



---

## Adjusting Headrest Height

1. Loosen the set screw on the headrest stop.
2. Loosen, but DO NOT remove, the headrest knob that secures the headrest to the headrest mounting bracket.
3. Remove the quick-release pin.
4. Position the headrest to the desired height.
5. Tighten the headrest knob to secures the headrest to the headrest mounting bracket.
6. Install the quick-release pin.
7. Tighten the set screw on the headrest stop.
8. If necessary, adjust the depth or direction of the headrest. Refer to [Adjusting Headrest Depth/Direction](#) on page 53.

## Adjusting Headrest Depth/Direction

---

### **⚠ WARNING**

**Do not remove the screw that holds the headrest in the offset fixture. Refer to FIGURE 7.6.**

---

1. Loosen, but DO NOT remove, the three socket screws that secure the offset fixture to the slide tube.
2. If necessary, reposition the headrest to the desired depth by sliding the headrest towards the front of the wheelchair or towards the rear of the wheelchair.
3. If necessary, reposition the headrest to the desired position (headrest will move in any direction). Refer to Detail "A" in FIGURE 7.6.
4. While holding the headrest in the desired position, securely tighten the three socket screws.
5. If necessary, adjust the height of the headrest. Refer to [Adjusting Headrest Height](#) on page 53.

# SECTION 8—TILT

## ⚠ WARNING

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

## Removing/Installing Tilt Release Lever from Stroller Handle

NOTE: For this procedure, refer to FIGURE 8.1.

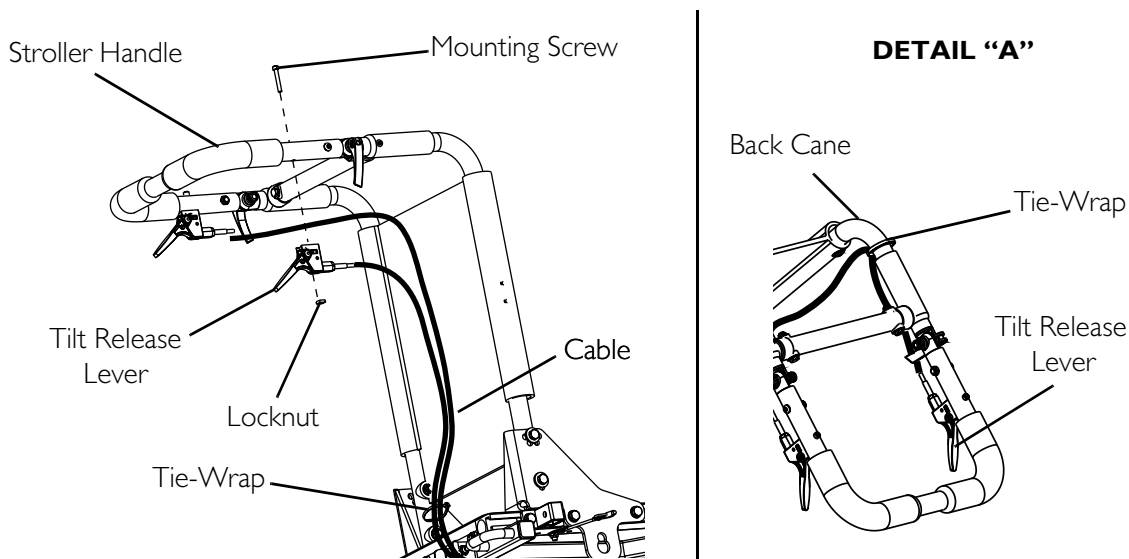
### Removing

1. Cut tie-wrap that secures the cable to the back cane (Detail "A" of FIGURE 8.1).
2. Remove the mounting screw and locknut that secures the tilt release lever to the stroller handle.

NOTE: The tilt release cable is still connected to the tilt cylinder.

### Installing

1. Secure the tilt release lever to the stroller handle with the existing mounting screw and locknut.
2. Secure the cable to the wheelchair frame with tie wrap (Detail "A" of FIGURE 8.1).
3. Adjust the tilt release cable, if necessary. Refer to [Adjusting the Cable Assembly](#) on page 55.



**FIGURE 8.1** Removing/Installing Tilt Release Lever from Stroller Handle

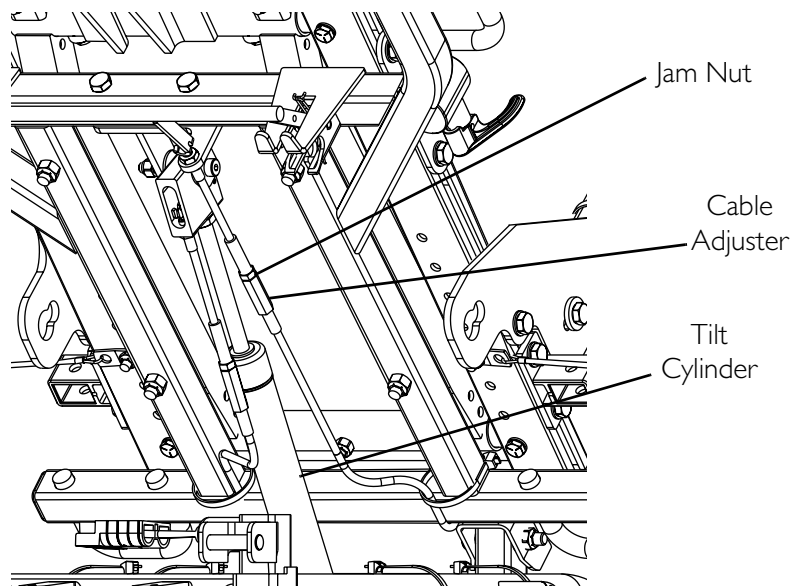
## Adjusting the Cable Assembly

*NOTE: For this procedure, refer to FIGURE 8.2.*

*NOTE: For operating the manual tilt option, refer to Operating the Manual Tilt Option on page 32.*

1. Loosen the jam nut (counterclockwise) on the cable.
2. Turn the cable adjuster until the right release lever engages the tilt mechanism properly.
3. Retighten the jam nut (clockwise) on the cable.
4. Tilt the wheelchair to any tilt position. Refer to Operating the Manual Tilt Option on page 32. Make sure the wheelchair holds the position.

*NOTE: If the wheelchair does not hold the position, repeat STEPS 1-4 until the wheelchair is able to hold the tilted position.*



**FIGURE 8.2** Adjusting the Cable Assembly

# SECTION 9—FOOTBOARD ASSEMBLY

---

## **⚠ WARNING**

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

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

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

**Limited clearance between footboard and caster - The user's feet **MUST** remain on the footboard while operating the 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.**

**Pinch point may occur when rotating the footboard assembly.**

---

## **Removing/Installing the Footboard Assembly**

*NOTE: For this procedure, refer to FIGURE 9.1 on page 57.*

### **Removing**

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

### **Installing**

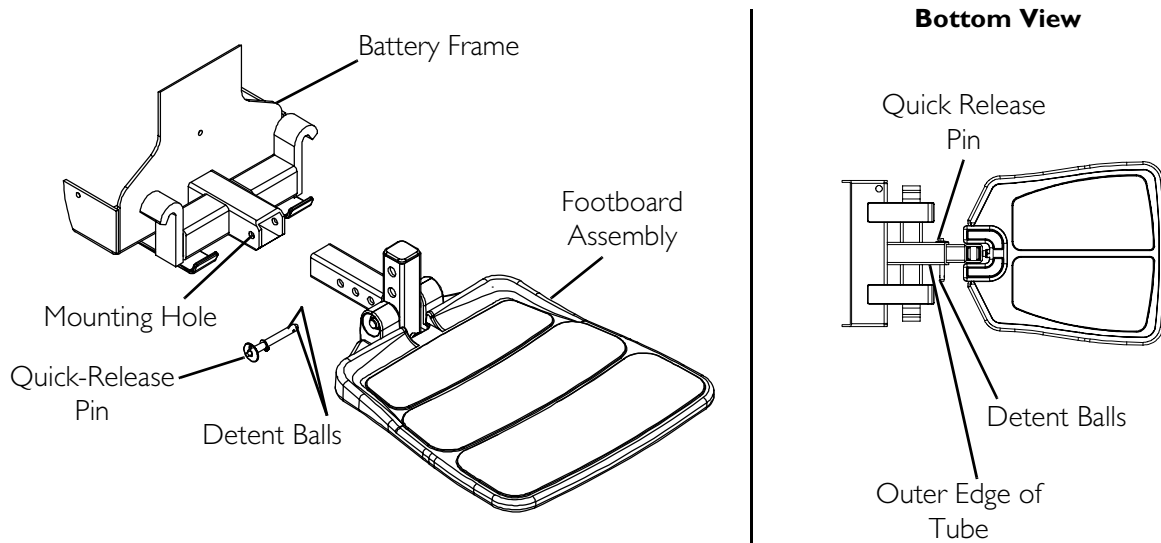
## **⚠ WARNING**

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

**Keep detent balls clean.**

---

1. Position the footboard assembly onto the wheelchair frame so that the mounting holes in the wheelchair frame align with the desired mounting holes in the footboard assembly.
2. Install the quick-release pin by depressing the button while sliding the pin in.



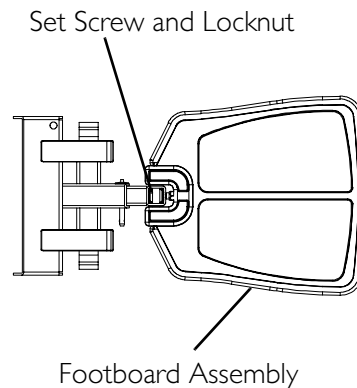
**FIGURE 9.1** Removing/Installing the Footboard Assembly

## Adjusting the Footboard Assembly

### Angle

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

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



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

## Depth

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

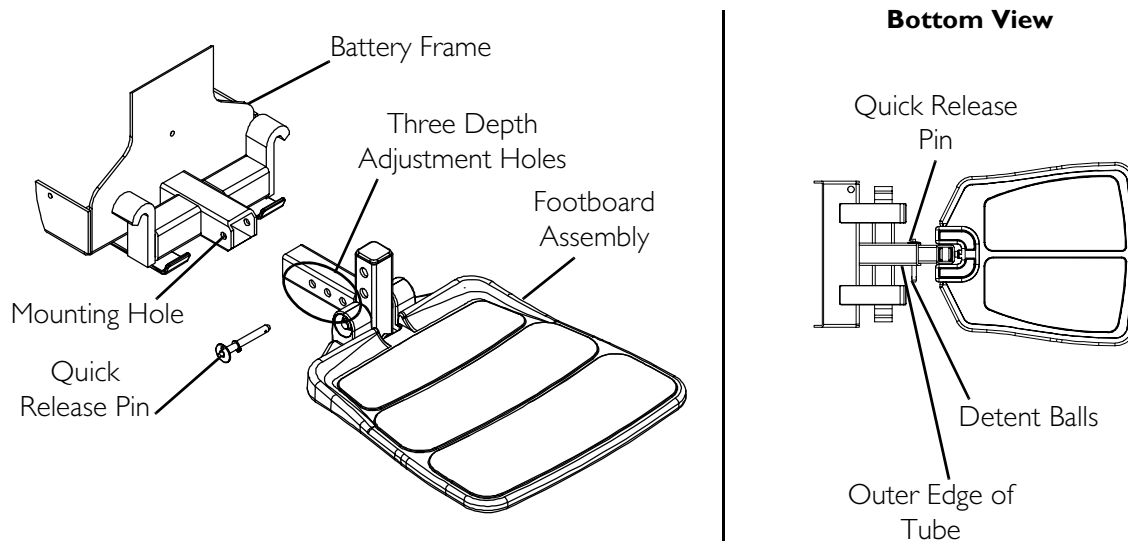
1. Remove the quick-release pin that secures the footboard assembly to the wheelchair frame.

### **⚠ WARNING**

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

**Keep detent balls clean.**

2. Adjust footboard to one of three mounting positions.
3. Install the quick-release pin.



**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.

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

While the wheelchair is moving, minimum ground clearance for the front rigging is two 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.

## Installing/Removing Front Riggings

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

*NOTE: Ensure that the walking beam does not interfere with the front riggings. It may be necessary to adjust seat height. Refer to [Adjusting the Seat Height](#) on page 48.*

### Installing

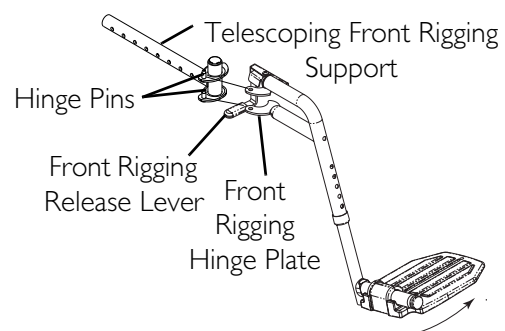
1. If necessary, remove the footboard.
2. Turn front rigging to the side (open footplate is perpendicular to wheelchair) and position mounting holes in the front rigging hinge plates with hinge pins on the wheelchair frame.
3. Install the front rigging hinge plates onto the hinge pins on the wheelchair 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.

### Removing

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



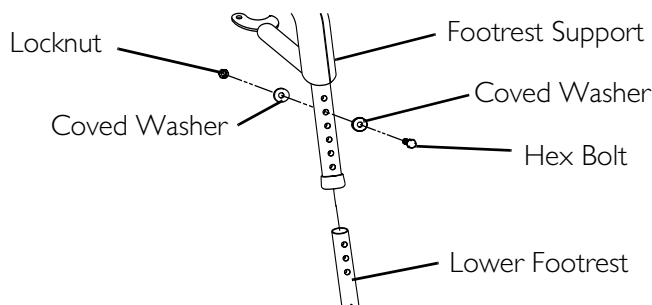
**FIGURE 10.1** Installing/Removing Front Riggings

## Adjusting Footrest Height

### On PHWH93 Front Riggings

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

1. Remove any accessory from the footrest(s).
2. Remove the front riggings from the wheelchair. Refer to [Installing/Removing Front Riggings](#) on page 59.
3. Lay the front riggings on a flat surface to make the hardware more accessible.
4. Remove the hex bolt, coved washers and locknut that secure the lower footrest to the footrest support.
5. Reposition the lower footrest to the desired height.
6. Reinstall hex bolt, coved washers and locknut that secure lower footrest to footrest support. Tighten securely.
7. Repeat STEPS 1-5 for the opposite side of the wheelchair footrest, if necessary.
8. Reinstall the front rigging(s) onto the wheelchair. Refer to [Installing/Removing Front Riggings](#) on page 59.
9. Reinstall any accessory onto the footrest(s).



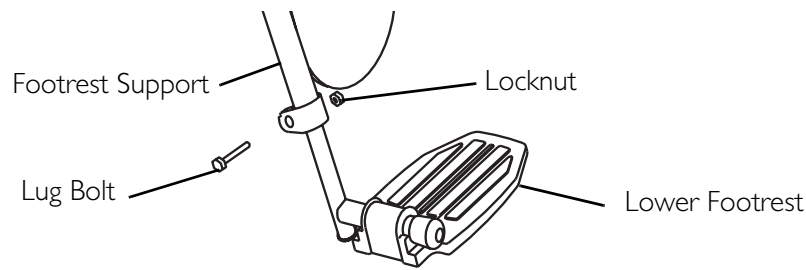
**FIGURE 10.2** Adjusting Footrest Height - On PHWH93 Front Riggings

### On PH93M2 And PHAL4A Front Riggings

*NOTE: For this procedure, refer to FIGURE 10.3 on page 61.*

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.





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

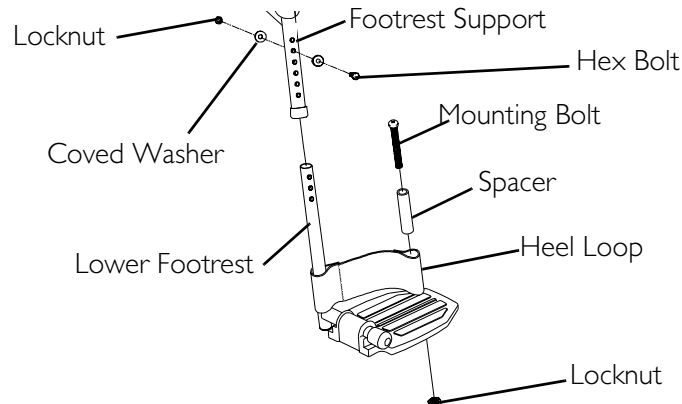
**FIGURE 10.3** Adjusting Footrest Height - On PH93M2 And PHAL4A Front Riggings

## Replacing Heel Loops

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

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

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

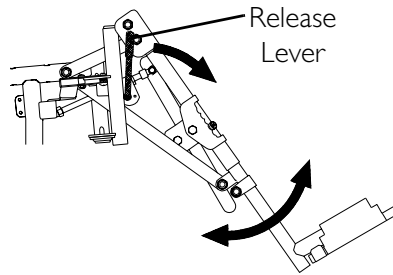


**FIGURE 10.4** Replacing Heel Loops

## Raising/Lowering Elevating Front Riggings

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

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



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

## Adjusting/Replacing Telescoping Front Rigging Supports

*NOTE: For this procedure, refer to FIGURE 10.6 on page 63.*

### **⚠ WARNING**

**When determining the depth of the telescoping front rigging tubes, make sure the rear of the footrests do not interfere with the movement of the front casters. Otherwise damage to the wheelchair may result or may impede proper operation.**

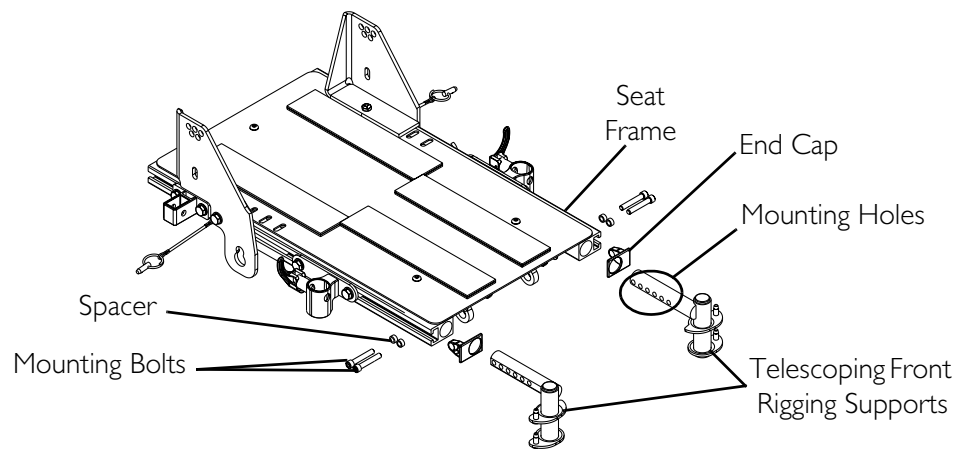
*NOTE: Telescoping front rigging supports may be extended up to 2-inches from the wheelchair frame in 1-inch increments. This adjustment does not affect seat depth.*

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

*NOTE: The two telescoping front rigging supports can be positioned at different depths.*

1. Remove the two mounting bolts and spacers that secure the telescoping front rigging support to the seat frame.
2. Remove the end cap.
3. Perform one of the following:
  - To adjust - slide the existing telescoping front rigging support to one of three depth positions.
  - To replace - remove the existing telescoping front rigging support.

4. Secure the telescoping front rigging support at the desired depth with the existing two mounting bolts, spacers and end cap. Securely tighten.
5. Repeat STEPS 1-4 for the other telescoping front rigging support.



**FIGURE 10.6** Adjusting/Replacing Telescoping Front Rigging Supports

## Removing/Installing/Adjusting Center Mount Adjustable Knee Angle Footrest

### Removing

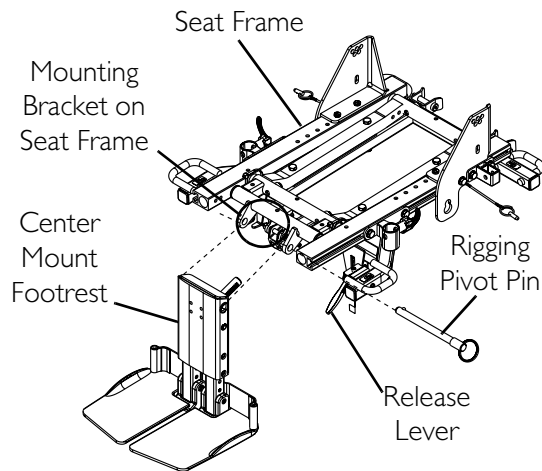
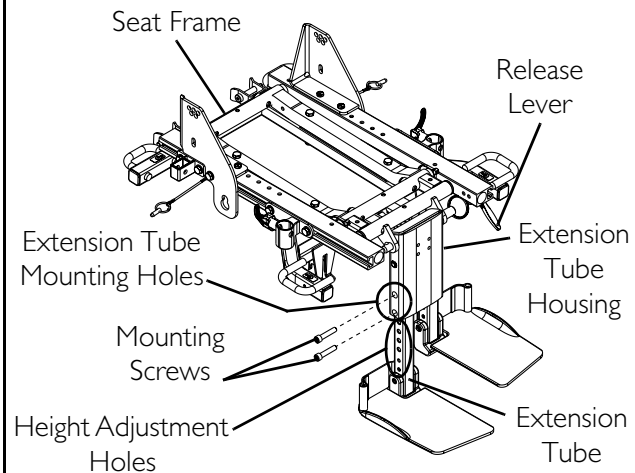
*NOTE: For this procedure, refer to Detail "A" of FIGURE 10.7 on page 64.*

1. Remove the rigging pivot pin that secures the footrest to the mounting bracket of the seat frame.
2. Hold the center mount rigging with one hand and engage the release lever with the other hand.
3. Pull the center mount rigging out of the mounting bracket of the seat frame.

### Installing

*NOTE: For this procedure, refer to Detail "A" of FIGURE 10.7 on page 64.*

1. Engage the release lever with the one hand and hold the center mount footrest with the other
2. Insert the center mount footrest into the mounting bracket of the seat frame.
3. Reinstall the rigging pivot pin to secure the center mount footrest to the mounting bracket of the seat frame.

**DETAIL “A” - REMOVING/INSTALLING****DETAIL “B” - ADJUSTING HEIGHT****FIGURE 10.7** Removing/Installing/Adjusting Center Mount Adjustable Knee Angle Footrest**Adjusting Height****⚠ WARNING**

**While the wheelchair is moving, minimum ground clearance for the front rigging is two 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.**

*NOTE: For this procedure, refer to Detail “B” of FIGURE 10.7 on page 64.*

1. Remove the two mounting screws that secure the footrest extension tube to the extension tube housing.
2. Adjust the footrest extension tube to the desired height and align the corresponding holes to the mounting holes on the extension tube housing.
3. Reinstall the two mounting screws to secure the footrest extension tube to the extension tube housing. Securely tighten.
4. Repeat STEPS 1-3 for the other extension tube.

## Adjusting Angle

### ⚠ WARNING

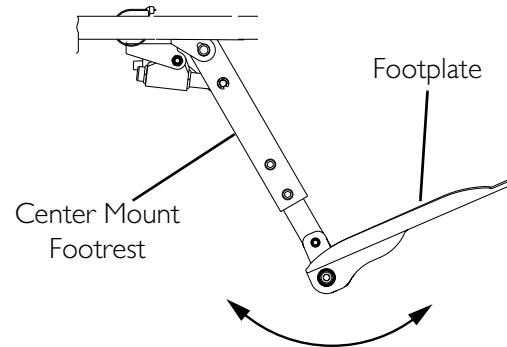
While the wheelchair is moving, minimum ground clearance for the front rigging is two inches. If the wheelchair is not moving, the front rigging **MUST** maintain a minimum of one inch ground clearance - otherwise personal injury and damage may result.

NOTE: For this procedure, refer to FIGURE 10.7 on page 64 and FIGURE 10.8.

1. Engage the release lever with one hand (not shown) and move the center mount footrest to the desired angle with the other hand.

NOTE: Refer to FIGURE 10.7 on page 64 for the location of the release lever.

2. Disengage the release lever (not shown) to lock the center mount footrest in the new position.



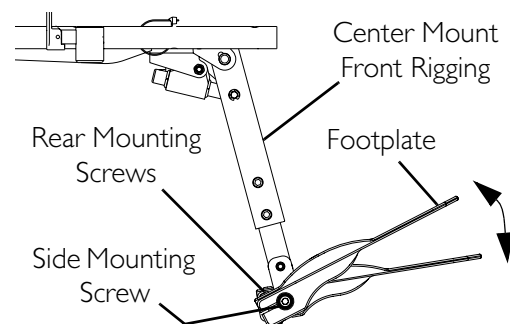
**FIGURE 10.8** Removing/Installing/Adjusting Center Mount Adjustable Knee Angle Footrest - Adjusting Angle

## Adjusting the Footplate Angle

### After 2/14/07

NOTE: For this procedure, refer to FIGURE 10.9.

1. Loosen, but DO NOT remove, the two rear mounting screws and side mounting screw.
2. Move the footplate to the desired angle.
3. Tighten the two rear mounting screws and side mounting screw to secure the footplate in the desired position.
4. Repeat STEPS 1 and 2 for the other footplate.



**FIGURE 10.9** Adjusting the Footplate Angle - After 2/14/07

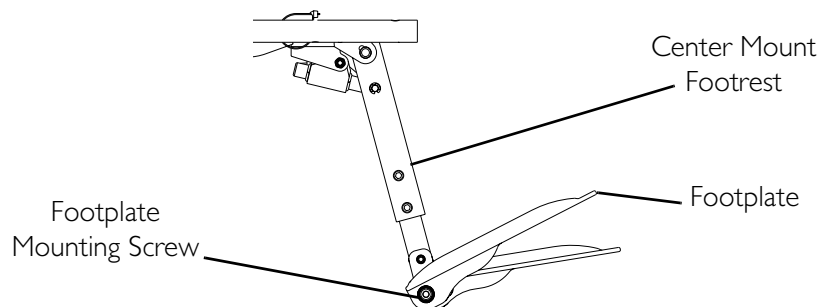
**Before 2/15/07**

*NOTE: For this procedure, refer to FIGURE 10.10.*

1. Loosen the footplate mounting screw and move the footplate to the desired angle.

*NOTE: DO NOT remove the footplate mounting screw.*

2. Tighten the footplate mounting screw to secure the footplate in the desired position.
3. Repeat STEPS 1 and 2 for the other footplate.



**FIGURE 10.10** Adjusting the Footplate Angle - Before 2/15/07

**Adjusting the Tension of the Flip up Footplate**

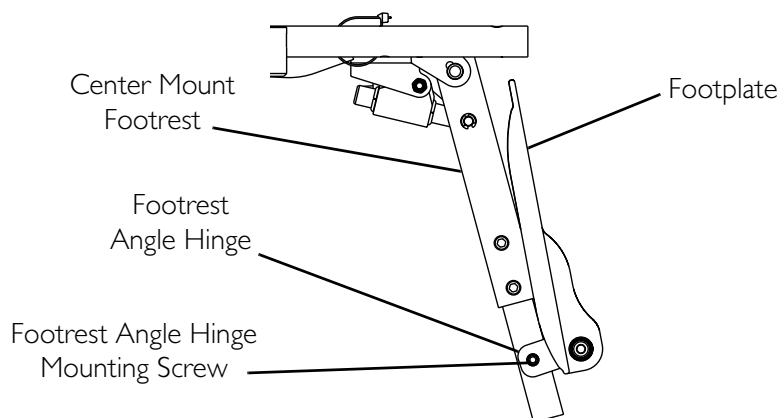
*NOTE: For this procedure, refer to FIGURE 10.11.*

*NOTE: The tension can be adjusted to increase or decrease the rotation effort of the flip up footplates.*

1. Loosen the mounting screw on the footrest angle hinge to decrease the rotation effort.

*NOTE: DO NOT remove the footplate mounting screw.*

2. Tighten the footrest angle hinge mounting screw to increase the rotation effort.
3. Repeat STEPS 1 and 2 for the other footplate.



**FIGURE 10.11** Adjusting the Tension of the Flip up Footplate

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# SECTION 11—SHROUD/WHEELS

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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.

---

## Replacing Foam Filled or Pneumatic Tires Onto Wheel Rim

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### **⚠ WARNING**

**DO NOT** attempt to replace foam filled or pneumatic 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 Shrouds

*NOTE: For this procedure, refer to FIGURE 11.1 on page 68.*

### Removing

1. Disconnect the joystick. Refer to [Disconnecting/Connecting the Joysticks](#) on page 85.
2. Remove the seat assembly. Refer to [Removing/Installing the Seat Assembly](#) on page 45.
3. Perform one of the following:
  - Right and Left Side Shroud - Remove the five mounting screws that secure each shroud to the base frame. Refer to Detail "A" of FIGURE 11.1.

*NOTE: The shorter mounting screws are used to secure the top rear of side shrouds. Refer to Detail "A" of FIGURE 11.1.*

- Front Shroud - Remove the two mounting screws that secure the front shroud to the base frame. Refer to Detail "B" of FIGURE 11.1.
  - Rear Shroud - Remove the two mounting screws that secure the rear shroud to the base frame. Refer to Detail "B" of FIGURE 11.1.
4. Lift the shrouds off of the wheelchair frame.

## Installing

### CAUTION

To prevent cracking the plastic shroud material, **DO NOT** overtighten the mounting screws.

1. Perform one of the following:

- Right and Left Side Shroud - Secure each side shroud to the base frame with the five mounting screws. Refer to Detail "A" of FIGURE 11.1.

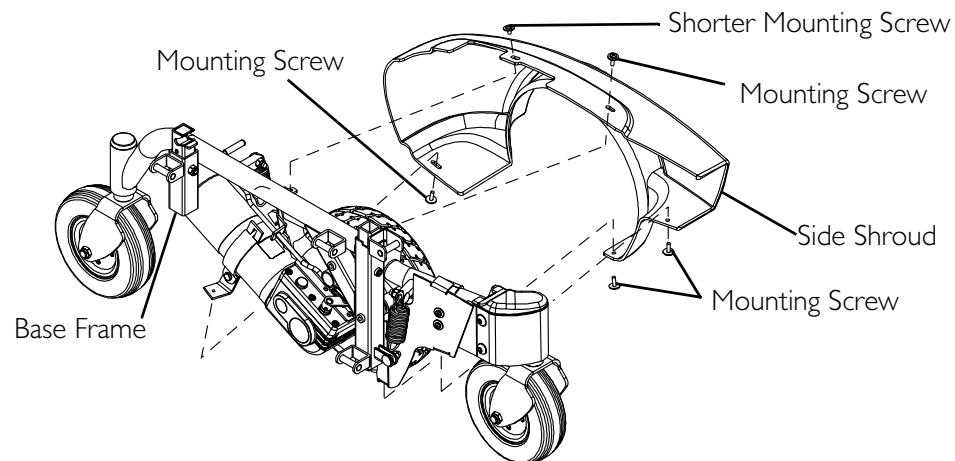
*NOTE: The shorter mounting screws are used to secure the top rear of side shrouds.*

- Front Shroud - Secure the front shroud to the base frame with two mounting screws. Refer to Detail "B" of FIGURE 11.1.
- Rear Shroud - Secure the rear shroud to the base frame with two mounting screws. Refer to Detail "B" of FIGURE 11.1.

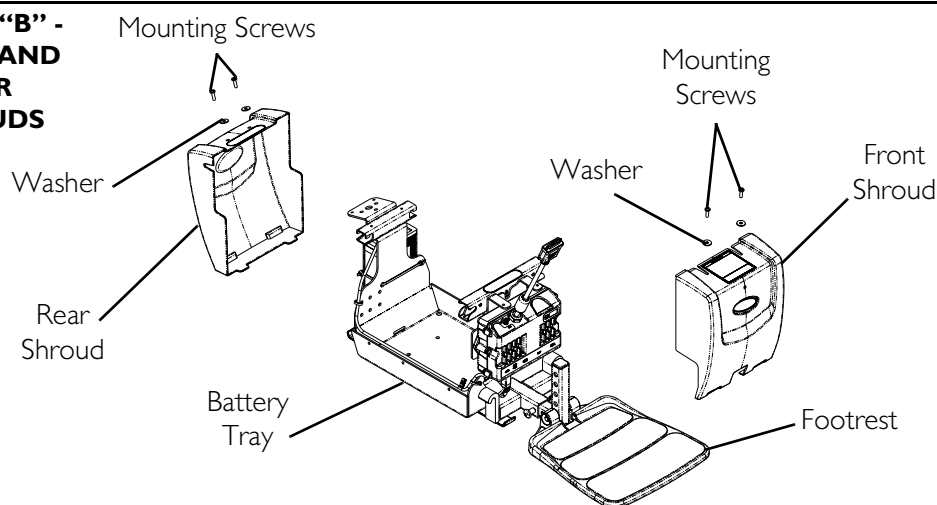
2. Reinstall the seat. Refer to [Removing/Installing the Seat Assembly](#) on page 45.

3. Reconnect the joystick. Refer to [Disconnecting/Connecting the Joysticks](#) on page 85.

#### DETAIL "A" - SIDE SHROUDS



#### DETAIL "B" - FRONT AND REAR SHROUDS



**FIGURE 11.1** Removing/Installing 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.*

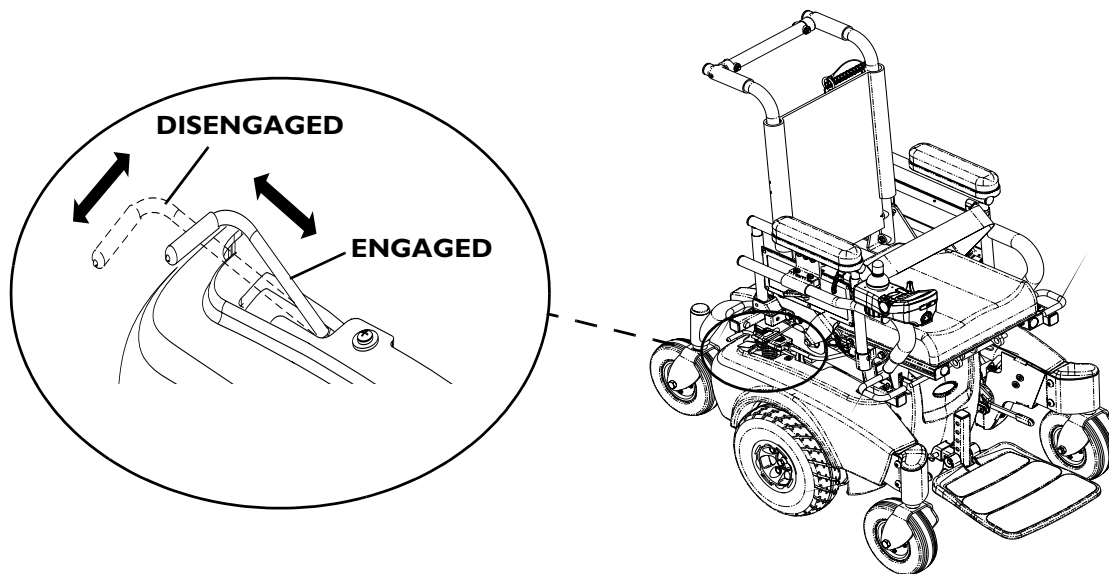
*NOTE: The motor lock disengagement/engagement allows free-wheeling or joystick controlled operation. Free-wheeling allows an attendant to maneuver the wheelchair without power.*

1. Locate the motor lock handles on the motors protruding through the shrouds by the rear springs.
2. Perform one of the following:
  - To Disengage the Motor Release Levers - Grasp the motor release lever connected to the motors and pull out and away from the wheelchair. If necessary rock the wheelchair gently while pulling on the motor lock handle.

*NOTE: This allows the chair to free-wheel for pushing if necessary.*

- To Engage the Motor Release Levers - Grasp the motor release lever connected to the motors and push towards and into the wheelchair. Rock the wheelchair gently if necessary.

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



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

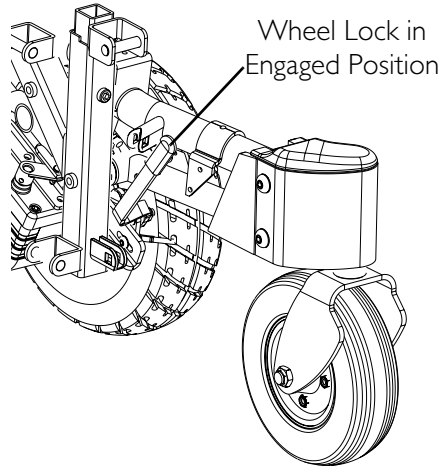
## Engaging/Disengaging/Adjusting Wheel Locks

### Engaging/Disengaging

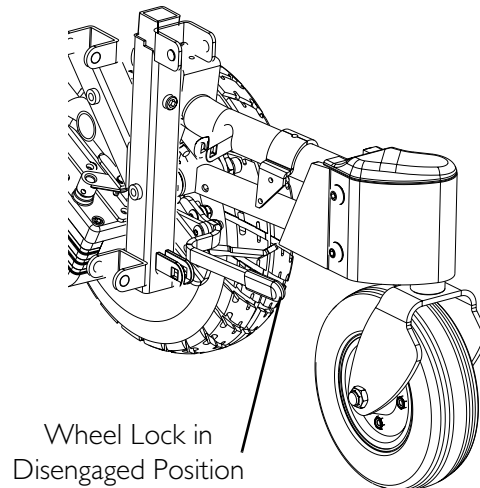
NOTE: For this procedure, refer to FIGURE 11.3.

1. To engage wheel lock pull handle up (Detail A" of FIGURE 11.3).
2. To disengage wheel lock push handle down (Detail "B" of FIGURE 11.3).

**DETAIL "A" - WHEEL LOCK ENGAGED**



**DETAIL "B" - WHEEL LOCK DISENGAGED**

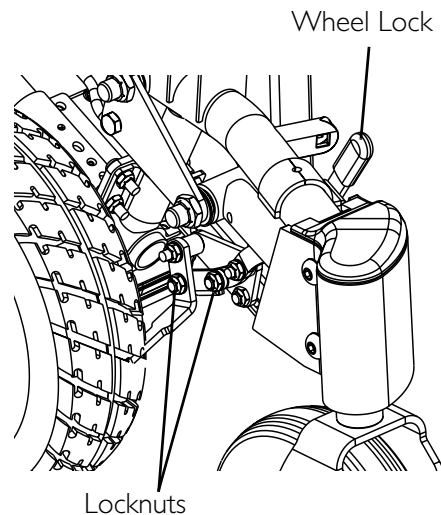


**FIGURE 11.3** Engaging/Disengaging/Adjusting Wheel Locks - Engaging/Disengaging

### Adjusting

NOTE: For this procedure, refer to FIGURE 11.4.

1. Ensure wheel lock is to the "DISENGAGED" position.
2. Loosen, but do not remove, the two locknuts identified in FIGURE 11.4.
3. Slide wheel lock assembly forward or back to achieve approximately 1/8-inch clearance.
4. Securely tighten the two locknuts from STEP 1.



**FIGURE 11.4** Engaging/Disengaging/Adjusting Wheel Locks - Adjusting

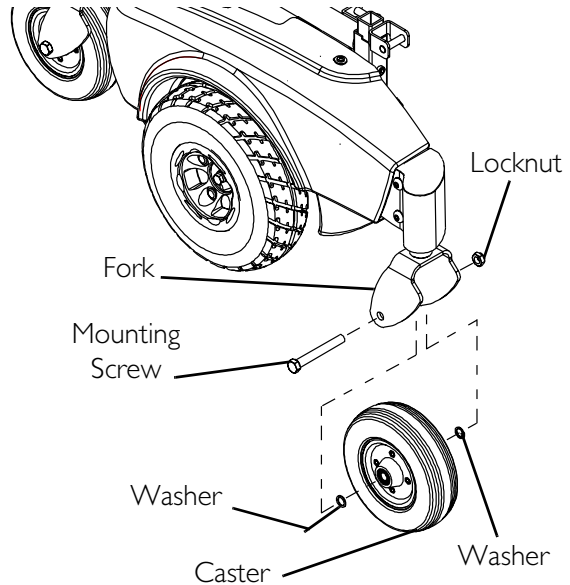
## Replacing Front/Rear Caster Assemblies

*NOTE: For this procedure, refer to FIGURE 11.5.*

*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. Securely tighten.

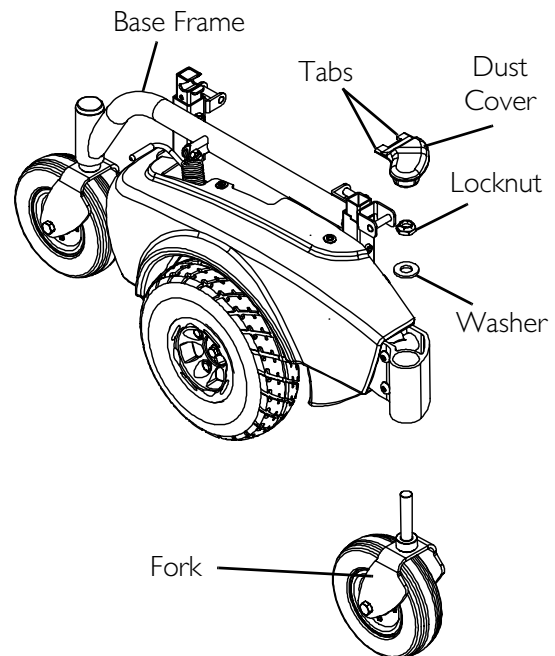


**FIGURE 11.5** Replacing Front/Rear Caster Assemblies

## Adjusting Forks

*NOTE: For this procedure, refer to FIGURE 11.6.*

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 11.6** Adjusting Forks

# SECTION 12—BATTERIES

## Warnings For Handling and Replacing Batteries

---

### **⚠ 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.

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

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

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

UI batteries weight 18 pounds each. Use proper lifting techniques (lift with your legs) to avoid injury.

Use UI batteries only. Failure to use the correct battery size and/or voltage may cause damage to your wheelchair and give you unsatisfactory performance.

**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.

**NEVER** allow any of your tools and/or battery cables to contact **BOTH** battery posts at the same time. An electrical short may occur and serious personal injury or damage may occur.

The **POSITIVE (+) RED** battery cable must connect to the **POSITIVE (+)** battery terminal, otherwise serious damage will occur to the electrical system.

---

*NOTE: If there is battery acid in the bottom of the battery tray or on the sides of the batteries, apply baking soda to these areas to neutralize the battery acid. Before reinstalling the existing or new batteries, clean the baking soda from the battery tray or batteries 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.*

## Using the Proper Batteries

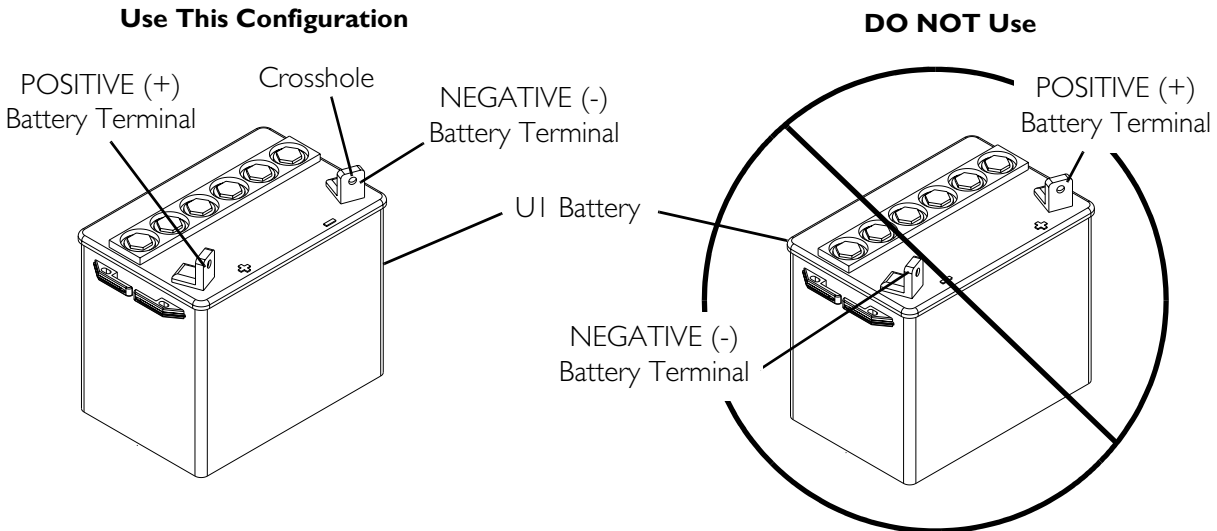
*NOTE: For this procedure, refer to FIGURE 12.1 on page 73.*

1. Place battery on ground/flat surface.
2. Visually draw a horizontal and vertical centerline through the middle of battery (FIGURE 12.1).
3. Position the battery so that the terminals are above the horizontal centerline.
4. Visually inspect the battery to ensure the correct position of the POSITIVE and NEGATIVE terminals (FIGURE 12.1)

**⚠ WARNING**

Batteries with terminal configuration as shown below **MUST** be used. Batteries that have the reverse terminal configuration **MUST NOT** be used - otherwise injury and damage may occur.

Terminals **MUST** have a cross hole in them as shown below.



**FIGURE 12.1** Using the Proper Batteries

## Removing/Installing Batteries

*NOTE: Have the following tools available:*

TOOL	QTY	COMMENTS
7/16-inch (6pt) Box Wrench	1	Not Supplied
Diagonal Cutters	1	Not Supplied

**⚠ WARNING**

**Always use the battery handle when lifting the 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.**

*NOTE: If there is battery acid in the bottom of the battery tray or on the sides of the batteries, apply baking soda to these areas to neutralize the battery acid. Before reinstalling the existing or new batteries, clean the baking soda from the battery tray or batteries 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.*

## Without Manual Tilt Option

*NOTE: For this procedure, refer to FIGURE 12.2.*

### Removing

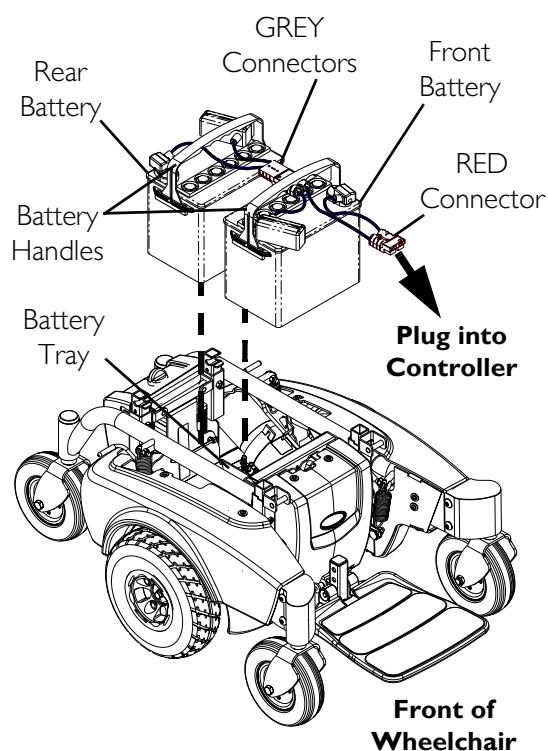
1. Place the wheelchair in a well ventilated area where work can be performed without risking damage to carpeting or floor covering.
2. Verify the joystick On/Off switch is in the Off position and disconnect joystick cable. Refer to Disconnecting/Connecting the Joysticks on page 85.
3. Remove seat from base. Refer to Removing/Installing the Seat Assembly on page 45.
4. Disconnect the front battery from the controller (RED connector).
5. Disconnect the rear battery from the front battery (GREY connector).
6. Unlatch the battery tie-down strap (not shown).
7. Lift the rear battery out of the battery tray using the battery handle.
8. Slide front battery back and lift out of battery tray using the battery handle.

### Installing

1. Verify the joystick On/Off switch is in the Off position and disconnect joystick cable (not shown).
2. Position front battery in rear of battery tray and slide forward into position.
3. Position rear battery in rear of battery tray.

*NOTE: Route the battery strap underneath the battery cables.*

4. Latch the battery tie-down strap (not shown).
5. Connect the rear battery to the front battery (GREY connectors).
6. Connect the front battery to the controller (RED connector).
7. Reinstall seat assembly. Refer to Removing/Installing the Seat Assembly on page 45.
8. Connect joystick cable. Refer to Disconnecting/Connecting the Joysticks on page 85.



*NOTE: Seat not shown for clarity.*  
**FIGURE 12.2** Removing/Installing Batteries  
 - Without Manual Tilt Option

## With Manual Tilt Option

*NOTE: For this procedure, refer to FIGURE 12.3 on page 76.*

### 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 cable. Refer to Disconnecting/Connecting the Joysticks on page 85.
3. Tilt the seat assembly backward. Refer to Operating the Manual Tilt Option on page 32.
4. Remove the tilt release lever. Refer to Removing/Installing Tilt Release Lever from Stroller Handle on page 54.
5. Remove the mounting screw, two washers and locknut that secure the tilt cylinder to the bottom of the seat (Detail “A” of FIGURE 12.3).
6. Slowly tilt the seat all the way back.
7. Remove the four locknuts (two on each side) that mount the cylinder mounting bracket to the frame.
8. Slide cylinder mounting bracket with the cylinder off the mounting screws and move aside.

*NOTE: It is not necessary to remove the four mounting screws.*

*NOTE: The tilt release lever is connected to the tilt cylinder via the tilt release cable.*

9. If necessary, disconnect the drive lock-out.

*NOTE: It may be necessary to cut the tie wraps on the drive lock-out cable.*

10. Disconnect the front battery from the controller (RED connector).
11. Disconnect the rear battery from the front battery (GREY connectors).
12. Unlatch the battery tie-down strap (not shown).
13. Lift the rear battery out of the battery tray using the battery handle.
14. Slide front battery back and lift out of battery tray using the battery handle.

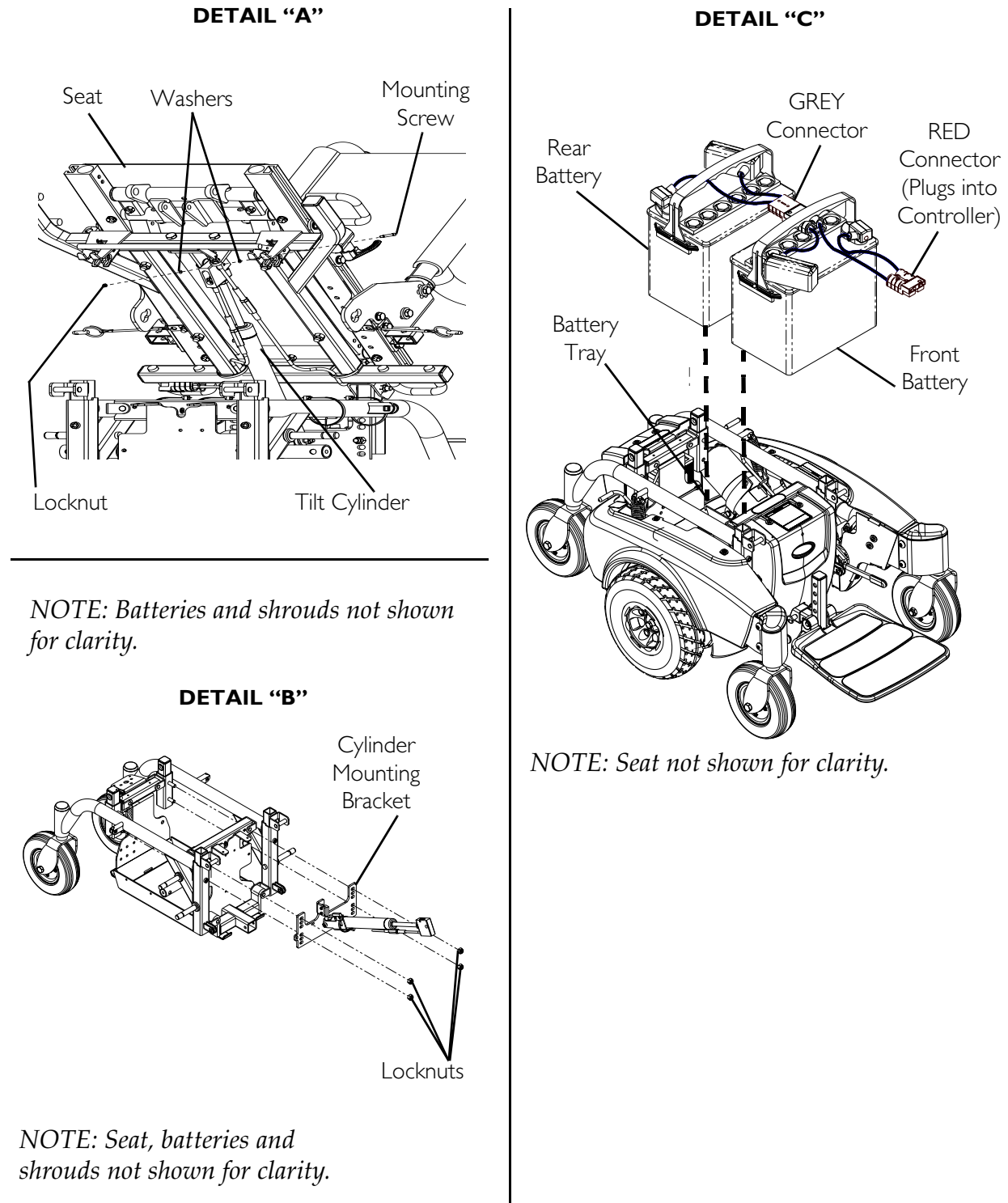
### Installing

1. Position front battery in rear of battery tray and slide forward into position.
2. Position rear battery in rear of battery tray.

*NOTE: Route the battery strap underneath the battery cables.*

3. Latch the battery tie-down strap (not shown).
4. Connect the rear battery to the front battery (GREY connector).
5. Connect the front battery to the controller (RED connector).
6. Slide cylinder mounting bracket with the cylinder onto the four mounting screws.

7. Reinstall the four locknuts to secure the cylinder mounting bracket to the frame.
8. Install the tilt release lever to the stroller handle. Refer to Removing/Installing Tilt Release Lever from Stroller Handle on page 54.
9. Tilt the seat forward. Refer to Operating the Manual Tilt Option on page 32.
10. Connect joystick cable. Refer to Disconnecting/Connecting the Joysticks on page 85.



**FIGURE 12.3** Removing/Installing Batteries - With Manual Tilt Option



## Connecting/Disconnecting Battery Cables

*NOTE: For this procedure, refer to FIGURE 12.4 on page 78.*

### Connecting Battery Cables

---

#### **⚠ WARNING**

**NEVER** allow any of your tools and/or battery cables to contact **BOTH** battery terminals at the same time. An electrical short may occur and serious personal injury or damage may occur.

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

Battery terminal configuration as shown in **FIGURE 12.4, DETAIL “A”**, **MUST** be used. Batteries that have the terminal configuration reversed **MUST NOT** be used - otherwise serious injury or damage may occur.

**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.

---

#### **CAUTION**

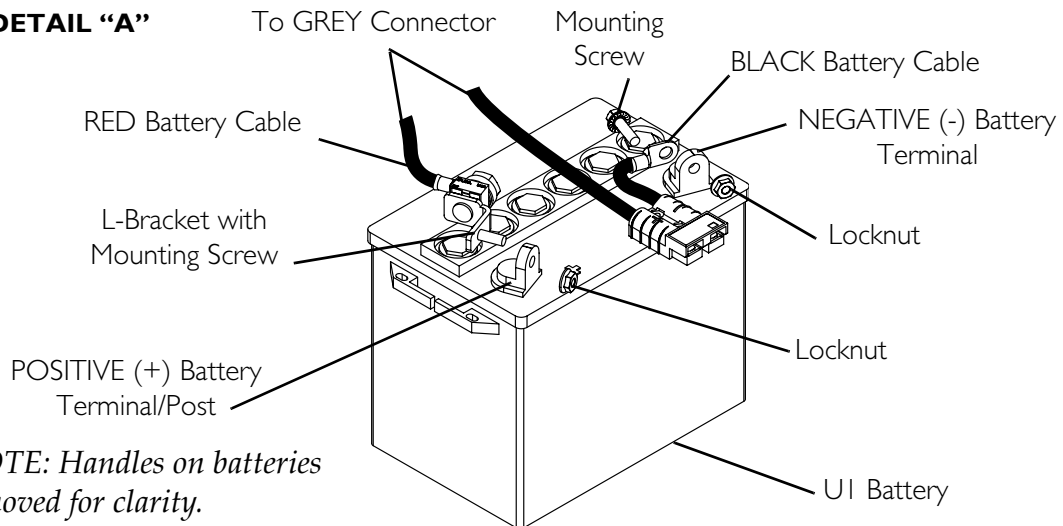
When connecting the battery cables to the batteries, the battery cables **MUST** be connected to the battery terminals as shown in **FIGURE 12.4, DETAIL “B”**, (depending on battery type), otherwise damage to the battery cable may result when installing battery terminal caps.

- 
1. Secure the battery cables to the battery terminals as described below. Securely tighten. Refer to Detail “A” of FIGURE 12.4:
    - A. Secure **NEGATIVE (-)** battery cable to the **NEGATIVE (-)** battery terminal using the mounting screw and the locknut.
    - B. Secure the **POSITIVE (+)** battery cable to the **POSITIVE (+)** battery terminal using the L-bracket with mounting screw and the locknut.
  2. Verify all battery cables are correctly installed and securely tightened.
  3. Slide terminal caps down battery cables and onto battery clamps (FIGURE 12.4).
  4. Secure each terminal cap in place with a tie-wrap [use tie-wraps 11-1/2-inches long] (Detail “B” of FIGURE 12.4).
  5. Position the batteries into the wheelchair. Refer to Removing/Installing Batteries on page 73.

*NOTE: New Batteries MUST be fully charged before using, otherwise the life of the batteries will be reduced.*

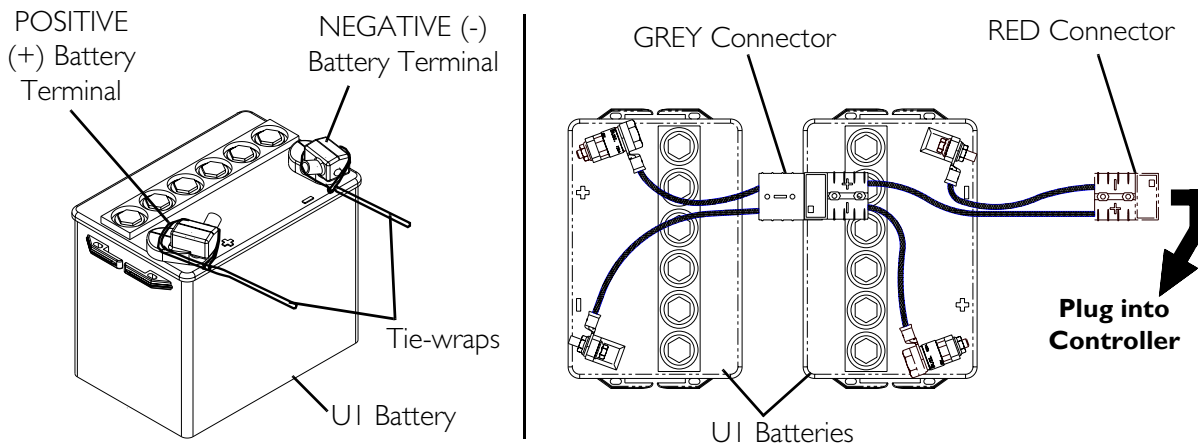
6. If necessary, charge the batteries. Refer to Charging Batteries on page 80.

**DETAIL "A"**



*NOTE: Handles on batteries removed for clarity.*

**DETAIL "B"**



**FIGURE 12.4** Connecting/Disconnecting Battery Cables

---

## Disconnecting Battery Cables

---

### **⚠ WARNING**

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

**NEVER** allow any of your tools and/or battery cables to contact **BOTH** battery terminals at the same time. An electrical short may occur and serious personal injury or damage may occur.

---

1. Remove the seat. Refer to Removing/Installing the Seat Assembly on page 45.
2. Remove the batteries. Refer to Removing/Installing Batteries on page 73.
3. Cut the tie-wrap that secures the battery terminal cap in place. See Detail “B” in FIGURE 12.4.
4. Slide terminal caps up on the battery cables. See FIGURE 12.4.
5. Disconnect POSITIVE (+) RED battery cable from the POSITIVE (+) battery terminal/post (FIGURE 12.4).
6. Disconnect NEGATIVE (-) BLACK battery cable from NEGATIVE (-) battery terminal/post (FIGURE 12.4).

## Cleaning Battery Terminals

---

### **⚠ WARNING**

Most batteries are not sold with instructions. However, warnings are frequently noted on the cell caps. Read them carefully.

**DO NOT** allow the liquid in the battery to come in contact with skin, clothes or other possessions. It is a form of acid and harmful or damaging burns may result. Should the liquid touch your skin, wash the area **IMMEDIATELY** and thoroughly with cool water. In serious cases or if eye contact is made, seek medical attention **IMMEDIATELY**.

---

1. Examine battery terminals for corrosion.
2. Verify the plastic caps are in place over battery cell holes.
3. Clean terminals by using a battery cleaning tool, wire brush, or medium grade sand paper.

*NOTE: Upon completion, areas should be shiny, not dull.*

4. Carefully dust off all metal particles.

## Charging Batteries

---

### **⚠ 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 recharging 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 individual instructions for each charger (supplied or purchased). If charging instructions are not supplied, consult a qualified technician for proper procedures.

---

### **CAUTION**

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

**Always** 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.**

---

Basic concepts which will help you understand this automatic process are:

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

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

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

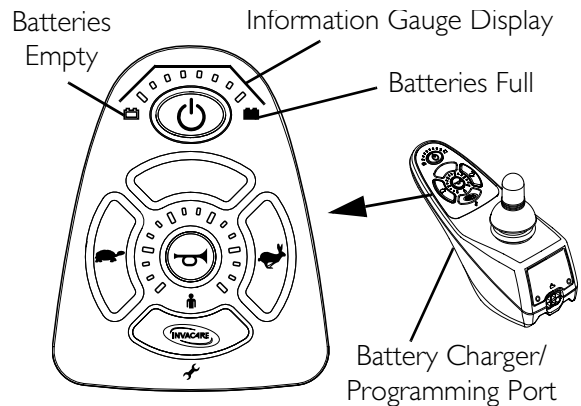
## When to Charge Batteries

### SPJ+ Joysticks

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

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

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



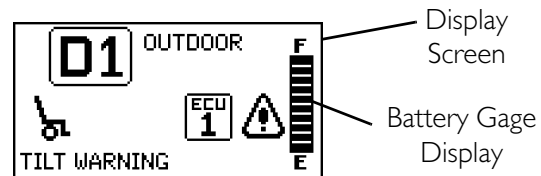
**FIGURE 12.5** SPJ+ Joysticks

### MPJ+ Joystick

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

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

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



**FIGURE 12.6** MPJ+ Joystick

## 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.

**NEVER** leave the charger unattended when the circuit breaker (charger) is tripping on and off.

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

## On-Board Battery Charger

---

### **⚠ WARNING**

**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.**

**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.**

---

*NOTE: For this procedure, refer to FIGURE 12.7 on page 83.*

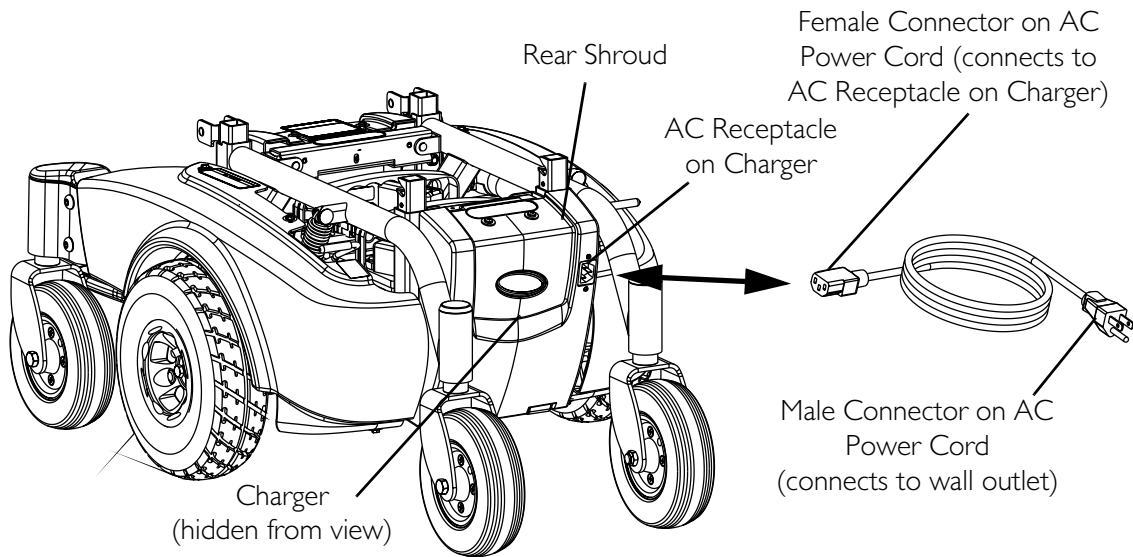
*NOTE: The on/off LED indicator light and the charger LED indicator light are located on the top of the charger on the rear of the wheelchair. Remove the rear shroud to view indicator lights. Refer to Removing/Installing Shrouds on page 67.*

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.**

---



ON/OFF INDICATOR	STATUS
<b>SOLID RED</b>	Charger On
<b>“BLINKING” RED</b>	Abnormal
<b>LED “OFF”</b>	Charger Off

CHARGING INDICATOR	STATUS
<b>YELLOW</b>	Charging
<b>“BLINKING” GREEN</b>	Output not connected
<b>SOLID GREEN</b>	Fully charged
<b>LED “OFF”</b>	Charger disconnected

**FIGURE 12.7** On-Board Battery Charger

## Charging Using an Independent Charger Plugged Into the Joystick

### ⚠ 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.

**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.

### CAUTION

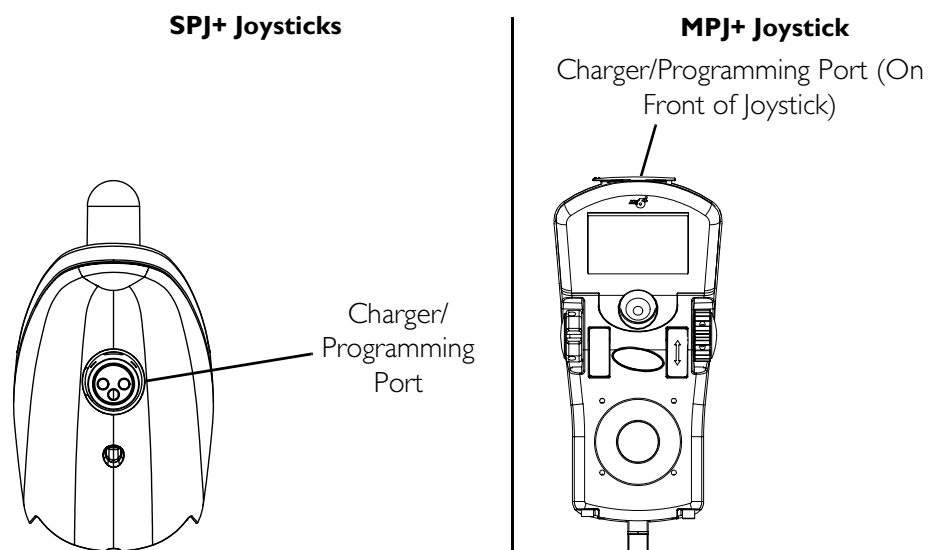
Only use a charger approved by Invacare when charging through the joystick on this wheelchair model.

**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 12.8.*

*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.*

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. When charging is complete, turn charger off.
4. Disconnect output cable from joystick charger port



**FIGURE 12.8** Charging Using an Independent Charger Plugged Into the Joystick



# 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.

## Disconnecting/Connecting the Joysticks

*NOTE: For this procedure, refer to FIGURE 13.1.*

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

### SPJ+ Joysticks

#### Disconnecting

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

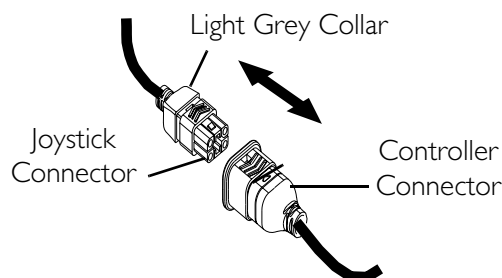
#### Connecting

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 13.1** Disconnecting/Connecting the Joysticks - SPJ+ Joysticks

## MPJ+ Joysticks

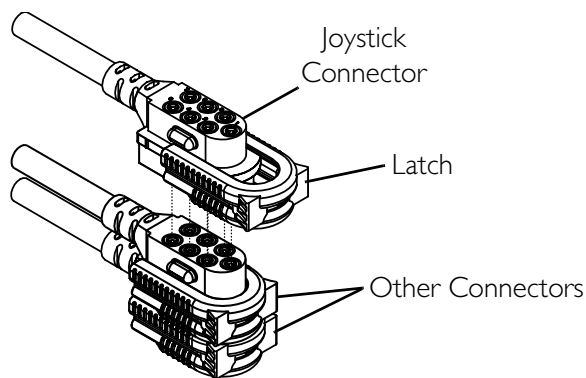
*NOTE: For this procedure, refer to FIGURE 13.2.*

### Disconnecting

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

### Connecting

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



**FIGURE 13.2** Disconnecting/Connecting the Joysticks - MPJ+ Joysticks

# SECTION 14—TRANSPORTING THE WHEELCHAIR

*NOTE: The information in this section is ONLY for wheelchairs without the Manual Tilt option.*

---

## **⚠ WARNING**

**DO NOT** attempt to disassemble wheelchair or remove the seat if equipped with Manual Tilt option - otherwise injury or damage may result.

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

For the following procedures, make sure the On/Off switch on the joystick is in the Off position.

---

## **CAUTION**

All cables are securely tie-wrapped in place before being shipped. If any changes are made to the locations of the tie-wrapped cables, the customer **MUST** verify that they are clear from being pinched in any of the latching points of the “take-apart” side-frames.

Cables **MUST** be routed and secured properly to ensure that they **DO NOT** become entangled or damaged during normal operation of seating system.

---

## Disassembling the Wheelchair

---

### **⚠ WARNING**

The joystick **MUST** be turned off and disconnected before attempting to remove the seat - otherwise personal injury, damage to the wheelchair and/or surrounding property may result. See Note below.

The weight of the van seat is 47 lbs and weight of each of the side frames is 39 lbs. It is recommended that two people pick up these components together - otherwise injury may result.

---

*NOTE: For this procedure, refer to FIGURE 14.1 on page 89 and FIGURE 14.2 on page 90.*

*NOTE: To remove the seat, the seat is flipped up and the arm is rotated backwards which results in the joystick facing the ground. The chair could be inadvertently activated by the joystick coming in contact with the ground.*

1. Turn the joystick off and disconnect. Refer to Disconnecting/Connecting the Joysticks on page 85.

---

### **CAUTION**

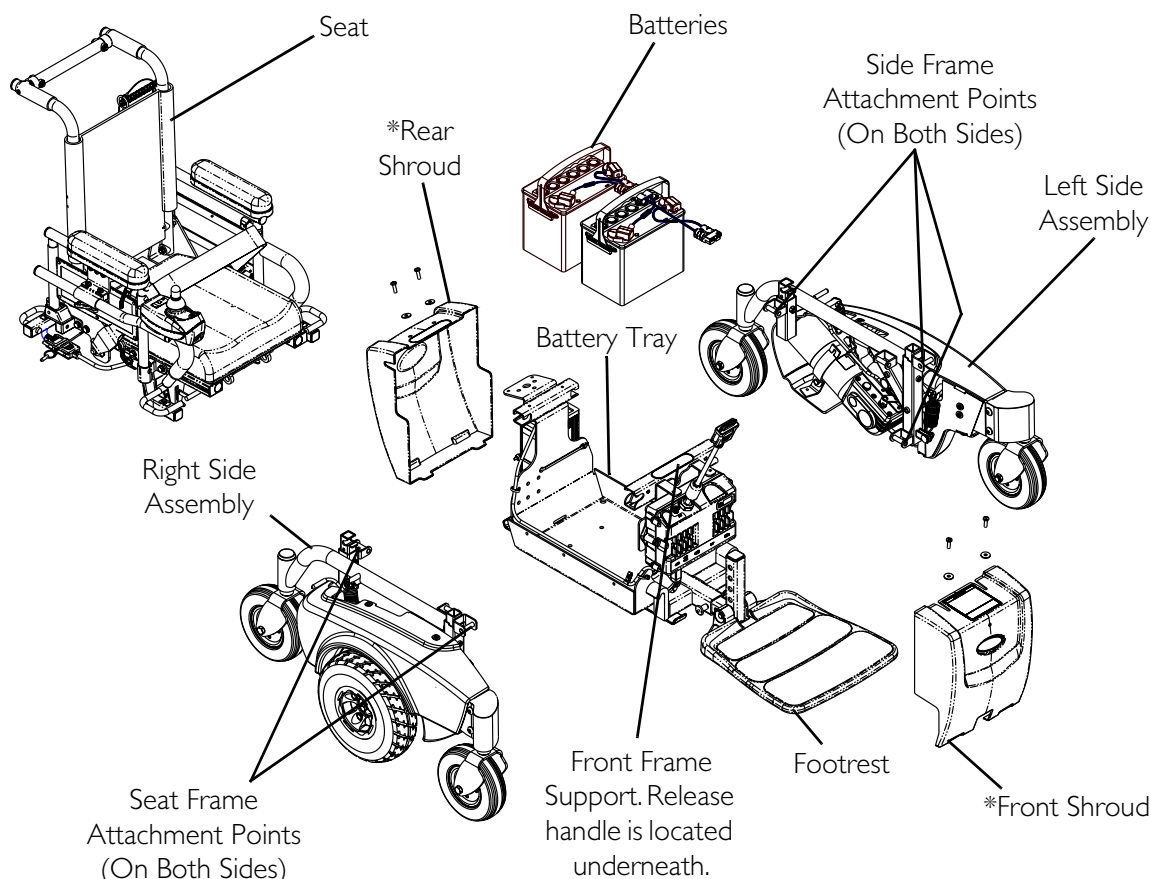
**When flipping back the seat, be sure to maintain a grip on the seat so it does not flip over the back of the base frame - otherwise damage to the wheelchair may result.**

---

2. Remove the seat. Refer to Removing/Installing the Seat Assembly on page 45.
3. While standing at the rear of the wheelchair base, disconnect the left motor connector from the controller and insert the motor connector into the opening in the side shroud behind the left motor release lever.
4. Disconnect the right motor connector from the controller and insert the motor connector into the opening in the side shroud behind the right motor release lever.

### **Removing the Batteries**

5. Disconnect the rear battery from the front battery (GREY connectors).
6. Disconnect the front battery from the controller (RED connector).
7. Unlatch the battery tie-down strap (not shown).
8. Remove the rear battery and place on the ground away from the wheelchair base.
9. Slide the front battery rearward then remove and place on the ground away from the wheelchair base.



*NOTE: Battery tie-down strap not shown.*

*\*NOTE: Front and rear shrouds are removable but removing the shrouds is not required for transporting.*

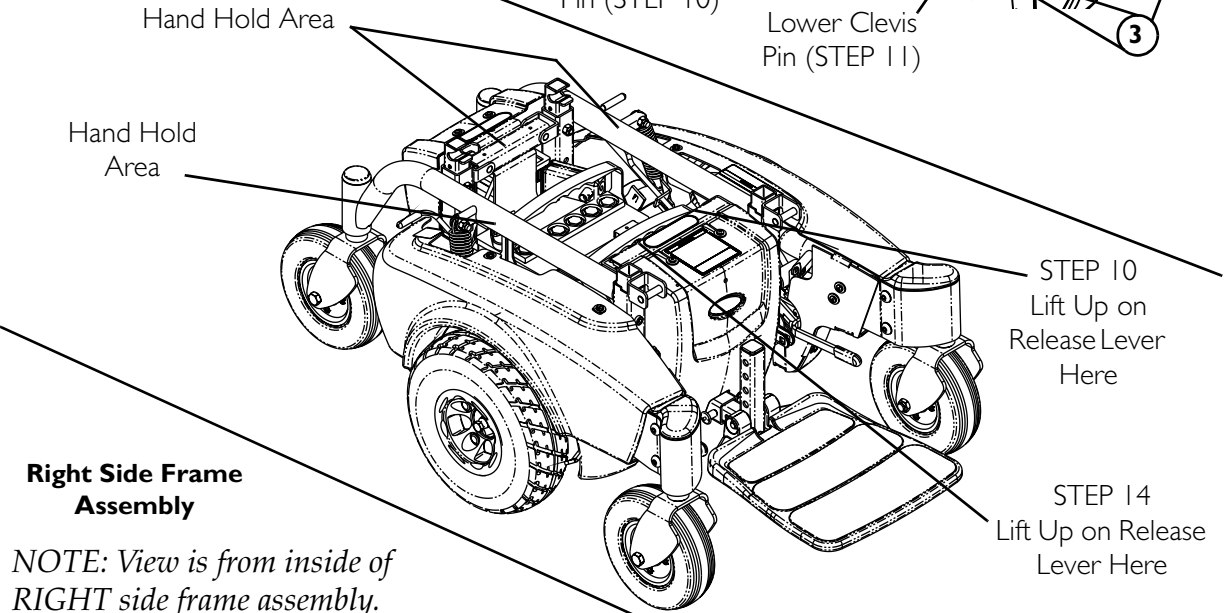
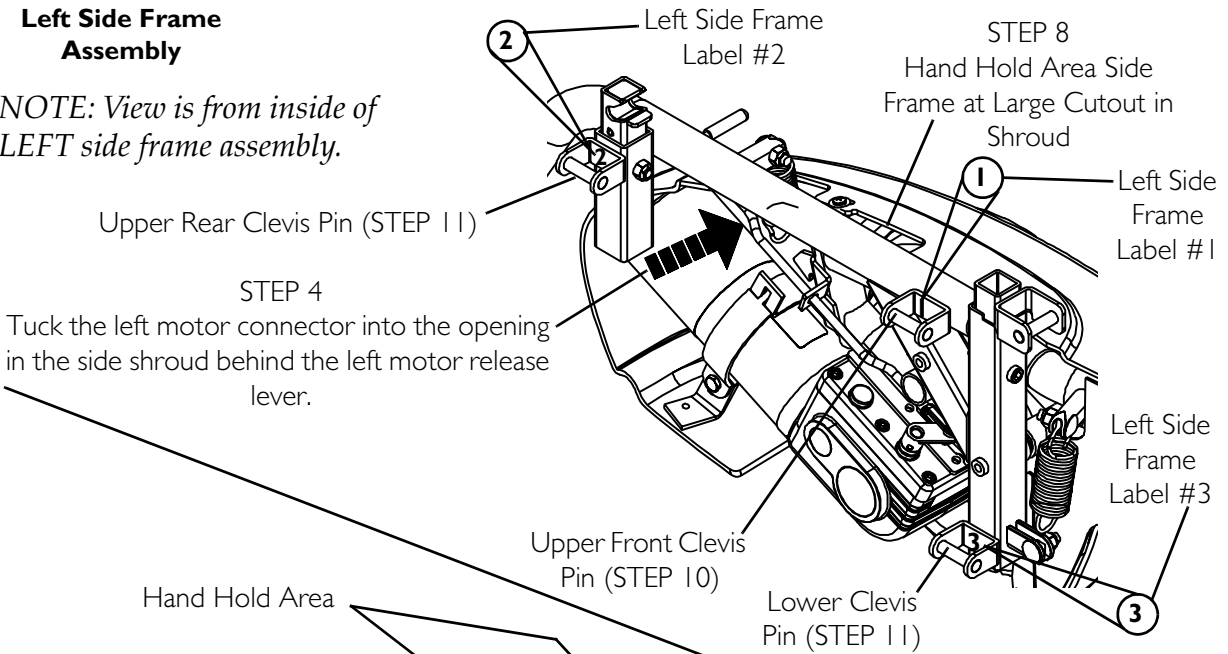
**FIGURE 14.1** Disassembling the Wheelchair

### Removing the Side Frame Assemblies

10. Using your left hand, grip the left side frame at the large cutout in the side shroud.
11. Using your right hand, lift up on the frame release lever at the front of the battery section on the left side (Left Side Frame Label #1).
12. While the frame release lever is activated, separate the upper front clevis pin (Left Side Frame Label #1) and upper rear clevis pin (Left Side Frame Label #2) away from the battery section while simultaneously lifting the frame release lever and battery section.
13. Continue lifting the battery section with the right hand until the battery section lifts completely away from the lower clevis of the left side frame (Left Side Frame Label #3).
14. Slide the left side frame away from the battery section and lay down on its side or leave in an upright position by turning both the front and rear caster inward.
15. Repeat STEPS 9 to 13 for the opposite side frame assembly.

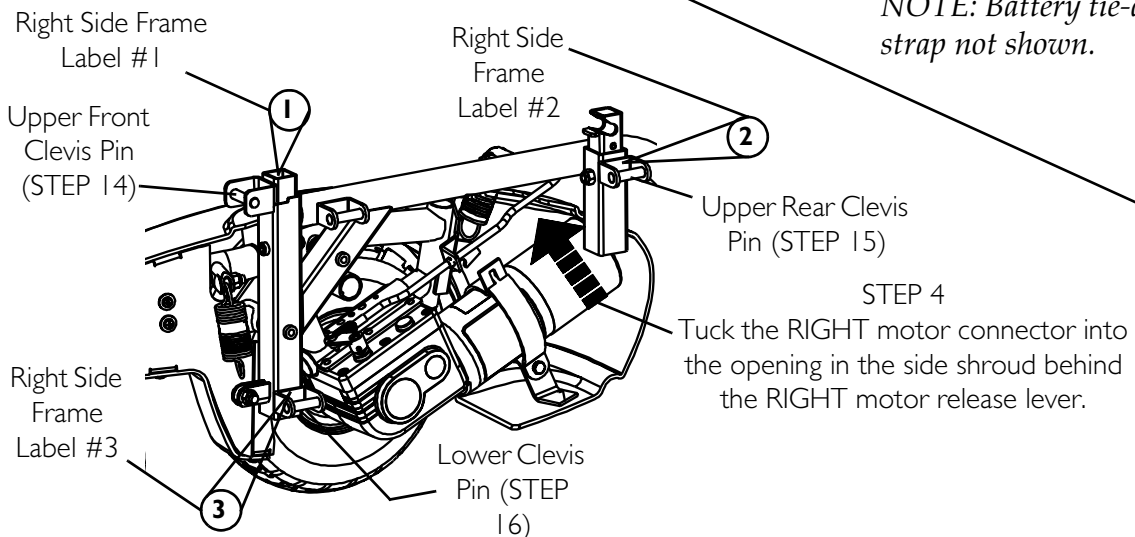
**Left Side Frame Assembly**

*NOTE: View is from inside of LEFT side frame assembly.*



**Right Side Frame Assembly**

*NOTE: View is from inside of RIGHT side frame assembly.*



*NOTE: Battery tie-down strap not shown.*

**FIGURE 14.2** Disassembling the Wheelchair

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## Assembling the Wheelchair

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### CAUTION

When reassembling the base frame be sure that the motor, battery and joystick leads are positioned away from any of the three side frame attachment points (FIGURE 14.3 on page 92) and the four seat frame attachment points (FIGURE 14.3 on page 92) - otherwise pinched cables could result. It is recommended that the cables from the controller are draped over the front of the shroud (FIGURE 14.2 on page 90) and tuck the motor leads (from each side frame) behind the rear spring in the side shroud (FIGURE 14.2 on page 90).

---

NOTE: For this procedure, refer to FIGURE 14.1 on page 89 and FIGURE 14.3 on page 92.

### Installing the Side Frame Assemblies Onto the Battery Tray

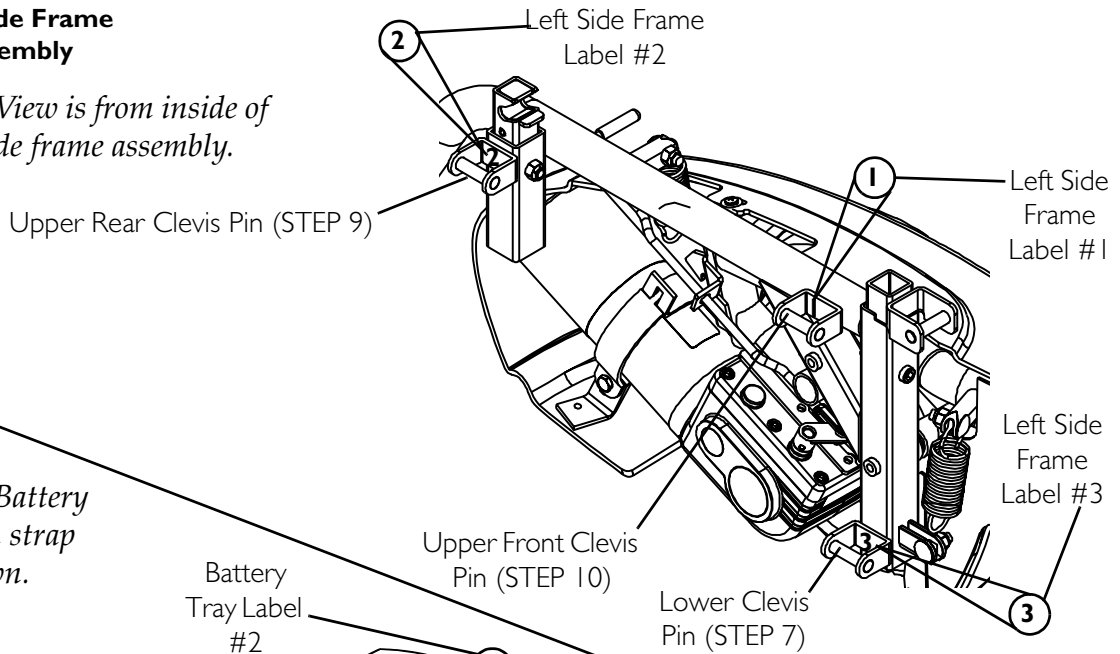
1. Using your right hand, grip the right side frame at the hand hold area (See FIGURE 2) and slide close to the battery section.
2. Using your left hand, grip the handle on the battery section and rotate the battery section to align the battery tray hook (Battery Tray Label #3) with the lower clevis pin (Right Side Frame Label #3).
3. Continue sliding the right side frame towards the battery section and guide the hook onto the front lower clevis pin.
4. Continue lifting the handle on the battery section and guide the rear upper clevis pin (Right Side Frame Label #2) into the slot on the rear of the battery tray (Battery Tray Label #2).
5. Push right side frame towards the battery section until an audible click is heard to confirm that the front upper clevis pin (Right Side frame Label #1) is locked in place (Battery Tray Label #1).
6. Repeat STEPS 1 to 5 for the opposite side frame.

### Installing the Batteries

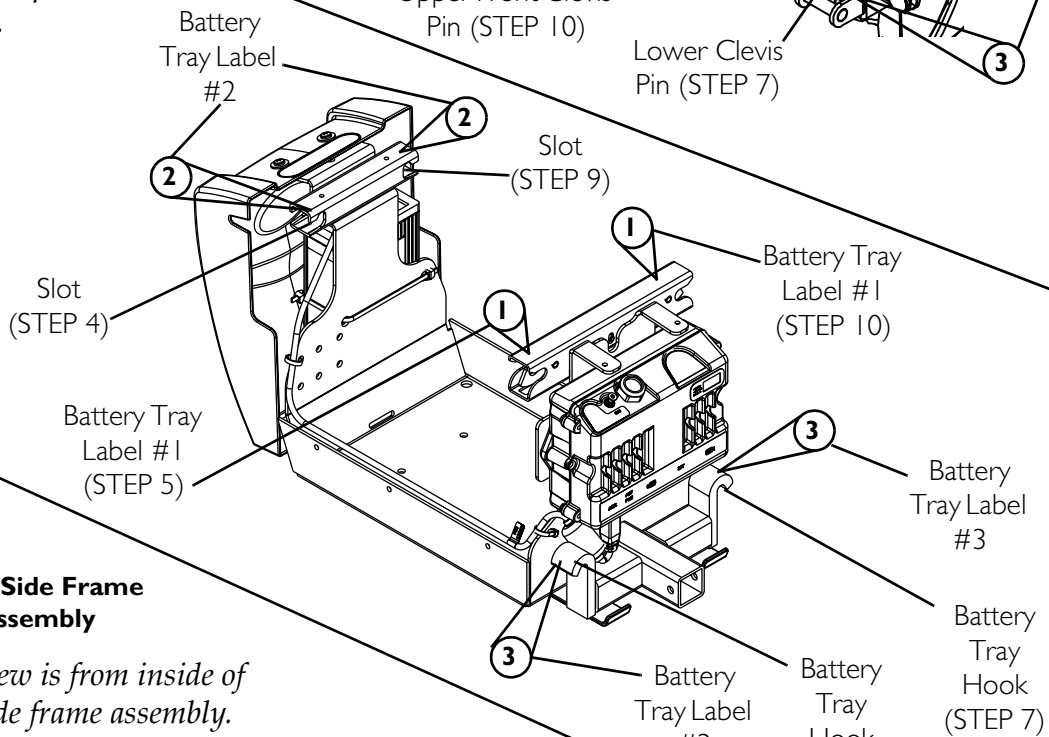
7. Insert front battery first with battery terminals towards the front of the wheelchair and ensure front battery is sitting firmly in the bottom of the battery tray. Slide front battery forward into position.
8. Insert rear battery with battery terminals towards the front of the wheelchair and ensure battery is sitting in the bottom of the battery tray.
9. Latch the battery tie-down straps (not shown).
10. Connect the rear battery to the front battery (GREY connectors).
11. Connect the front battery to the controller (RED connector).

**Left Side Frame Assembly**

*NOTE: View is from inside of LEFT side frame assembly.*

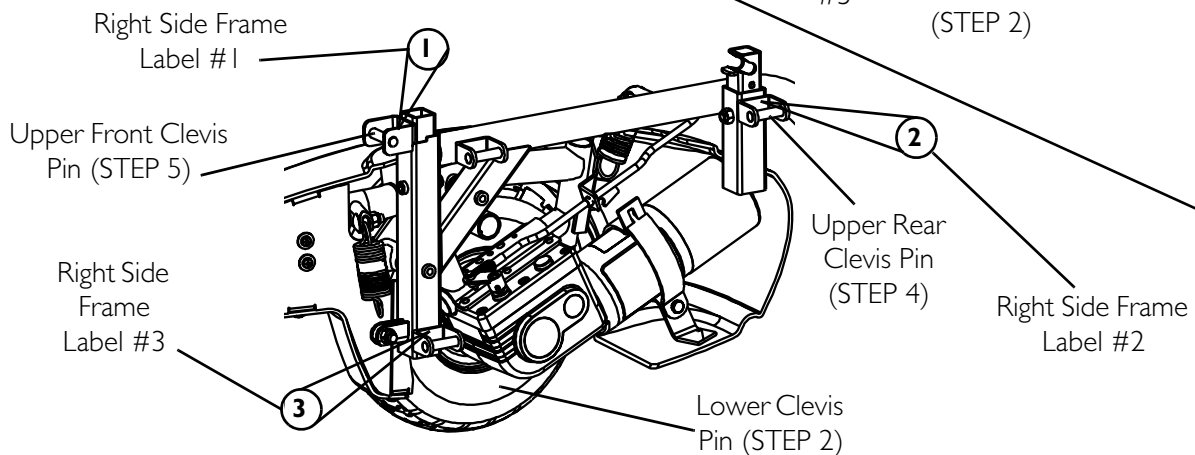


*NOTE: Battery tie-down strap not shown.*



**Right Side Frame Assembly**

*NOTE: View is from inside of RIGHT side frame assembly.*



**FIGURE 14.3** Assembling the Wheelchair



## **Final Assembly**

12. Connect the right motor lead to the right motor connector. Align the red connectors on both the lead and connector.
13. Connect the left motor lead to the left motor connector. Align the red connectors on both the lead and connector.
14. Install the seat. Refer to Removing/Installing the Seat Assembly on page 45.
15. Connect the joystick cable. Refer to Disconnecting/Connecting the Joysticks on page 85.

# SECTION 15—TRANSPORT READY PACKAGE

*NOTE: The information in this section is for wheelchairs ordered with the transport ready package ONLY.*

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## **⚠ WARNING**

Contact Invacare Corporation (800-333-6900) with any questions about using this wheelchair for seating in a motor vehicle.

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

This wheelchair has been dynamically tested in a forward-facing mode with the specified crash test dummy restrained by both pelvic and upper-torso belt(s) (shoulder belts), and that both pelvic and upper-torso belt(s) should be used to reduce the possibility of head and chest impacts with vehicle components.

Use only Wheelchair Tie-Down and Occupant Restraint Systems (WTORS) which meet the requirements of the SAE (Society of Automotive Engineers) J2249 Recommended Practice during travel in a motor vehicle.

This wheelchair has been tested for seating in a motor vehicle with the factory installed seating system only.

This wheelchair **MUST** be in a forward facing position during travel in a motor vehicle.

This wheelchair is equipped, and has been dynamically tested to rely on Wheelchair-Anchored pelvic belts. If desired, Vehicle-Anchored pelvic belts may be used.

It is strongly recommended that both pelvic and upper-torso belt(s) be used to reduce the risk of injury.

To reduce the potential of injury to vehicle occupants, wheelchair-mounted accessories, including but not limited to IV poles, trays, respiratory equipment, backpacks, and other personal items should be removed and secured separately.

Postural supports, positioning devices, and/or strap(s) should not be relied on for occupant restraint. These items may be used in addition to the wheelchair-anchored or vehicle-anchored belts.

Ensure that the seat (with and without manual tilt option) is latched in the Down position prior to transporting.

**DO NOT** alter or substitute wheelchair frame parts, components, or seating systems.

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

Spill proof batteries, such as “gel cells”, should be installed on wheelchairs to be used during travel in a motor vehicle

Transport ready packages are not retrofittable to existing models and are not field serviceable.

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**⚠ WARNING**

**Use only the transport brackets included with TRRO and TRBKTS for the purposes described in this manual.**

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## About Transport Ready Packages

TRRO includes four factory-installed transport brackets and a wheelchair anchored pelvic belt. TRRO has been crash-tested in accordance with ANSI/RESNA WC Vol 1 Section 19.5.3 Frontal Impact Test requirements for wheelchairs with a 168 lb crash dummy, which corresponds to a person with a weight of 114 to 209 lbs.

TRBKTS includes four factory-installed wheelchair transport brackets. TRBKTS has not been crash-tested in accordance with WC 19.5.3. Use these transport brackets only to secure an unoccupied wheelchair during transport.

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.

## Compliance Information

This wheelchair conforms with the requirements of the ANSI/RESNA WC/Vol. 1 - Section 19.5.3 (Frontal Impact Test).

*NOTE: ANSI = American National Standards Institute, RESNA= Rehabilitation Engineering and Assistive Technology Society of North America.*

This wheelchair has been dynamically tested in a forward-facing mode with the specified crash test dummy, which corresponds to a person with a weight of 114-209 pounds, restrained by BOTH pelvic and upper-torso belts in accordance with ANSI/RESNA WC Vol 1 Section 19.5.3. BOTH pelvic and upper-torso belts should be used to reduce the possibility of head and chest impacts with vehicle components.

## Specifications

Only wheelchairs which fit in the following size ranges should be occupied in a motor vehicle:

- 12-inches to 16-inches wide
- 12-inches to 18-inches deep

Maximum User Weight is 150 lbs.

## Securing the Wheelchair to the Vehicle

### Positioning the Wheelchair in the Vehicle

#### **⚠ WARNING**

This wheelchair must be in a forward facing position during travel in a motor vehicle.

The recommended clear zones for wheelchair seated occupants restrained by both pelvic and upper-torso belt(s) and only by a pelvic belt are shown in the diagrams and described below.

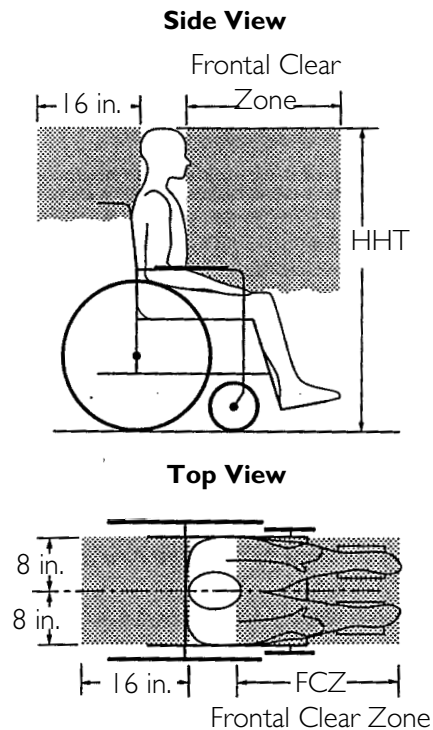
**Frontal Clear Zones (FCZ)** need to be larger when upper-torso belt(s) are not used.

The rear clear zone of 16-inches is measured from the rearmost point on an occupant's head.

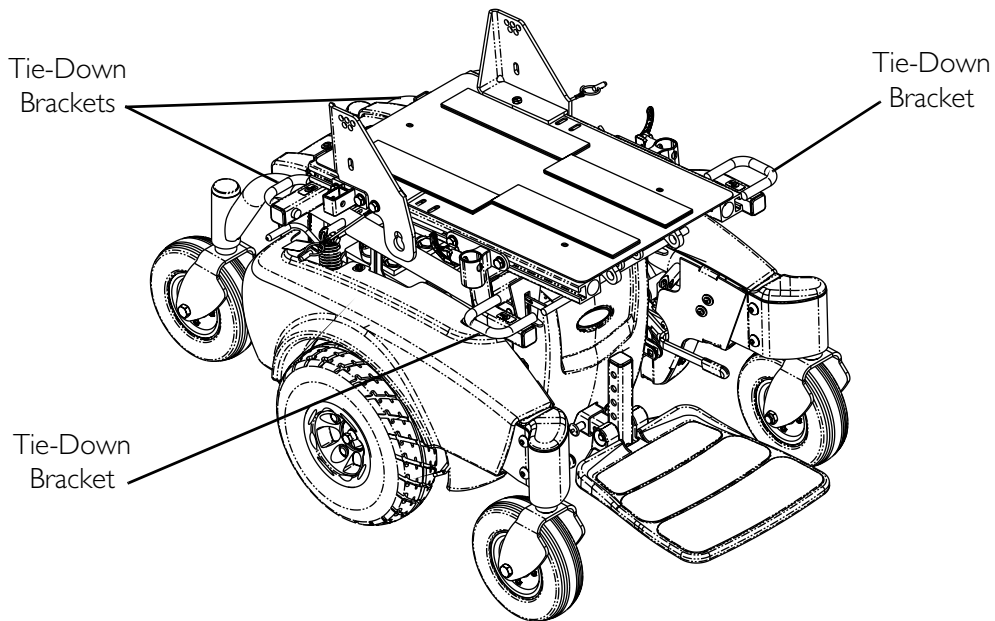
The frontal clear zone is measured from the frontmost point on an occupant's head and is 26-inches with pelvic and upper-torso belt(s) and 37-inches with only a pelvic belt.

The frontal clear zone may not be achievable for wheelchair-seated drivers.

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



## Securement Points



**FIGURE 15.1** Securement Points

### Securing the Wheelchair

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

*NOTE: A copy of SAE J2249 Wheelchair Tie-down and Occupant Restraint Systems (WTORS) for use in Motor Vehicles can be obtained from: SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, (877) 606-7232 or (724) 776-4970.*

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

## Securing the Occupant

### Wheelchair-Anchored Belts

#### **⚠ WARNING**

The pelvic belt that is provided by Invacare has been tested for use in a motor vehicle on this wheelchair **ONLY**. **DO NOT** replace the pelvic belt with a different style pelvic belt.

*NOTE: For this procedure, refer to FIGURE 15.2 on page 98.*

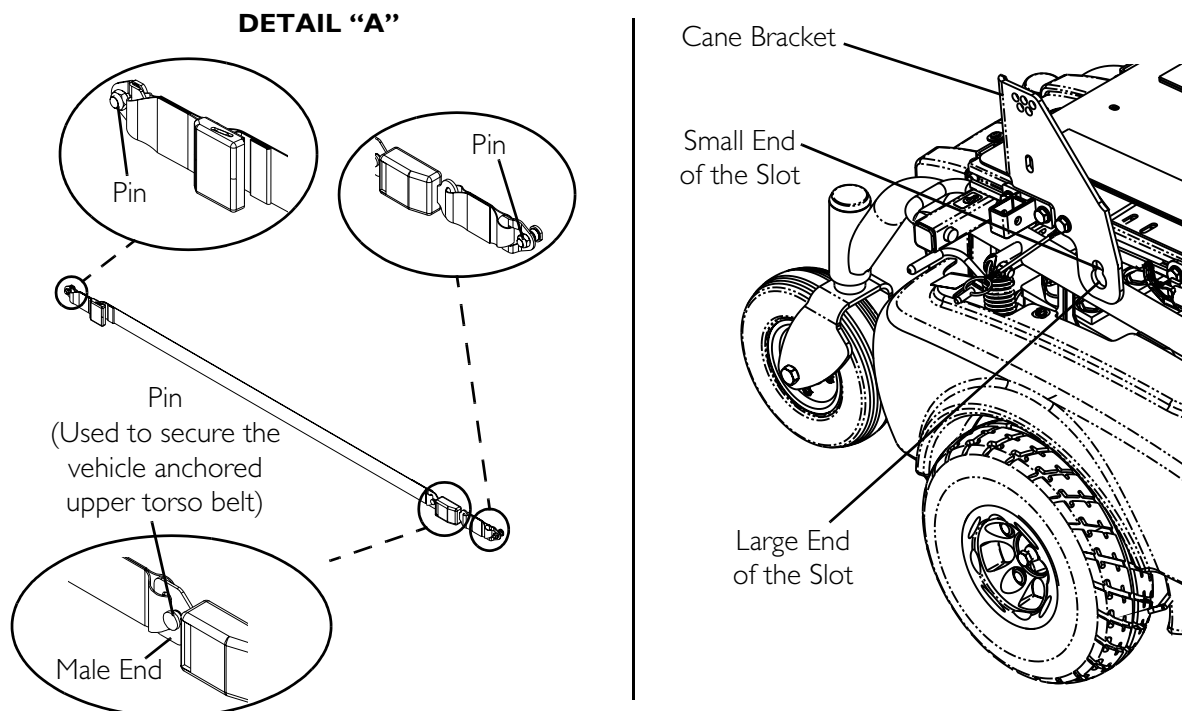
The wheelchair has been provided with a pelvic belt which meets the requirements of ANSI/RESNA W/C 19.5.3.

This pelvic belt, provided by Invacare, has been designed to accommodate use on either side of the vehicle. If necessary, follow the instructions below to reverse the orientation of the pelvic belt to accommodate the vehicle-anchored upper torso belt.

1. Install the pelvic belt pin (Detail "A" of FIGURE 15.2) into the large end of the slot in the cane bracket. Pull upward until it snaps into place in the small end of the slot.

*NOTE: Note the position of the male end of the belt when installing the pelvic belt onto the cane brackets. The male end of the pelvic belt (Detail "A" of FIGURE 15.2) has a pin which is used to secure the vehicle-anchored upper torso belt.*

2. Repeat STEP 1 for the opposite cane bracket.
3. Install the vehicle-anchored upper torso belt onto the pin on the male end of the pelvic belt.



**FIGURE 15.2** Wheelchair-Anchored Belts

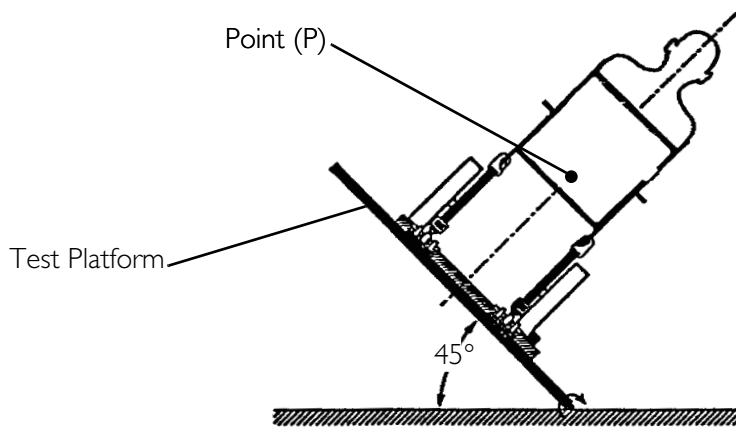
## Vehicle-Anchored Belts

*NOTE: For this procedure, refer to FIGURE 15.3.*

This wheelchair has an overall rating of “B” with regard to accommodating the use and fit of vehicle-anchored belts. This rating is scored as follows:

RATING	DESCRIPTION
<b>A</b>	Excellent
<b>B</b>	Good
<b>C</b>	Fair
<b>D</b>	Poor

The test for Lateral Stability Displacement for Point (P) is shown in FIGURE 15.3. The average test result for point (P) is 0.71-inches (18.1 mm).



*NOTE: Rear view of the wheelchair and human surrogate secured on test platform and tilted to 45°.*

**FIGURE 15.3** Vehicle-Anchored Belts

## Seating System

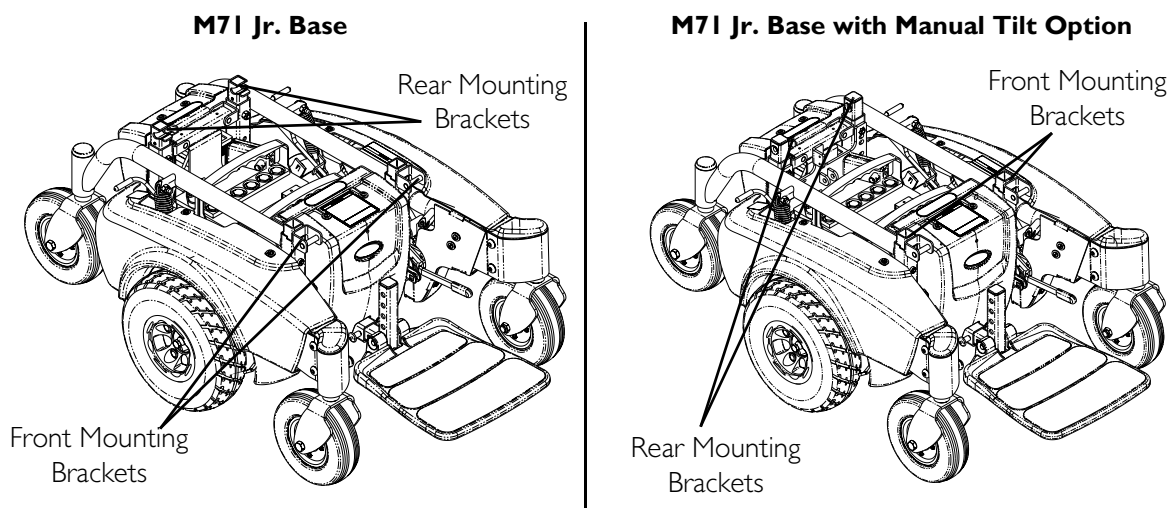
### **⚠ WARNING**

**This wheelchair has been tested for seating in a motor vehicle with the factory installed seating system ONLY.**

*NOTE: For this procedure, refer to FIGURE 15.4 on page 100.*

The factory installed seating system secures to front and rear mounting brackets on the seat frame. Ensure seating system is secured to the wheelchair frame before operation.

1. Refer to the owner’s manual provided with the seating system for additional information.



**FIGURE 15.4** Seating System

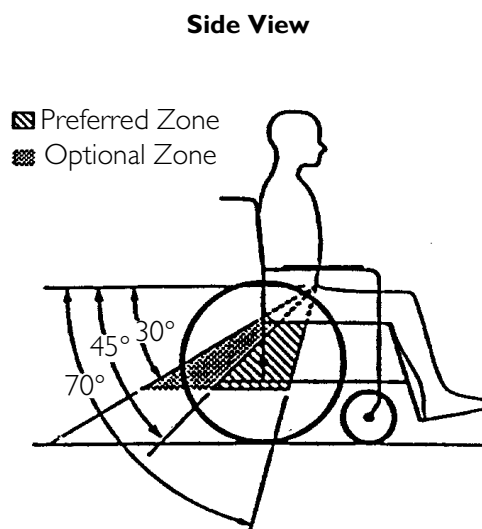
## Positioning Belts

### ⚠ WARNING

The angle of the pelvic belt should be within the preferred zone of 45 to 75 degrees to the horizontal or within the optional zone of 30 to 45 degrees to the horizontal.

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

Steeper belt angles also reduce the tendency for upper-torso belts to pull the pelvic belt onto the abdomen during frontal impact loading.



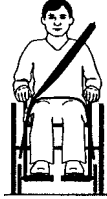
*NOTE: For this procedure, refer to FIGURE 15.5 on page 101.*

1. The pelvic belt should be worn low across the front of the pelvis.
2. Position the upper torso belt(s) over the shoulders.
3. The belt(s) should not be held away from the body by wheelchair components or parts, including but not limited to wheelchair armrests or wheels. Refer to FIGURE 15.5 for proper and improper positioning of the belts.



4. Ensure the belt(s) are not twisted.
5. Adjust belts as firmly as possible, being mindful of user comfort.

**DO POSITION BELT INSIDE OF  
ARMRESTS, WHEELS, ETC.**



**DO NOT POSITION BELT OUTSIDE OF  
ARMRESTS, WHEELS, ETC.**



**FIGURE 15.5** Positioning Belts

# NOTES

# NOTES

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# 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 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 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 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 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) 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 DEFACTED, 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.**

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