

***Pronto[®] M5 I[™] Base with
SureStep[®]
Formula[™] CG Tilt,
Rehab Seating***

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



Yes, you can.[®]

⚠ WARNING

A QUALIFIED TECHNICIAN MUST PERFORM THE INITIAL SET UP OF THIS WHEELCHAIR. ALSO, A QUALIFIED TECHNICIAN MUST PERFORM ALL PROCEDURES IN THE SERVICE MANUAL.

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

| DOCUMENT | PART NUMBER |
|---|-------------|
| M50/51/61 Service Manual | 1125075 |
| Formula CG Powered Seating Owner’s Manual | 1143155 |
| Adjustable ASBA Seats Owner’s Manual | 1143192 |
| Adjustable ASBA Seat Service Manual | 1143238 |
| Van Seat Owner’s Manual | 1143195 |
| MK6i™ Electronics Field Reference Guide | 1141471 |

NOTE: Updated versions of this manual are available on www.invacare.com.

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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

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, minor injury or both. |

NOTICE

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

WHEELCHAIR USER

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

WHEELCHAIR TIE-DOWN RESTRAINTS AND SEAT RESTRAINTS (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 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. Use these transport brackets only to secure an unoccupied wheelchair during transport.

As of this date, the U.S. 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 62 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 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, the 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.

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

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.

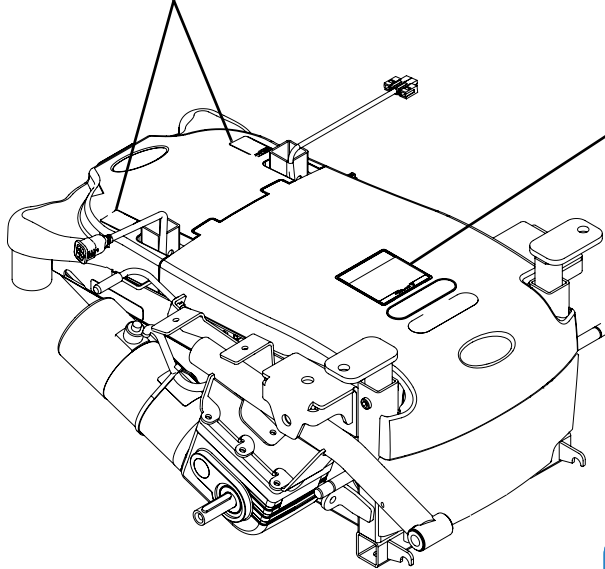
TYPICAL PRODUCT PARAMETERS

| | FORMULA CG | ASBA | VAN SEAT |
|---|--|-----------------|--|
| SEAT WIDTH RANGE: | 16 to 20 inches | | |
| SEAT DEPTH: | 16 to 20 inches | | |
| BACK HEIGHT: | 16 to 20 inches | | |
| BACK ANGLE RANGE: | 85° to 105° in 5° increments | | |
| UPHOLSTERY: | Black Nylon Back with Seat Pan | | Gray Vinyl |
| SEAT-TO-FLOOR: | 17½ to 19¾ inches | 18 to 20 inches | 19 to 21 inches (Solid Wood Base, without Cushion) |
| OVERALL WIDTH: | 24 inches (Without Joystick) | | |
| OVERALL HEIGHT: | 41½ inches | | |
| OVERALL LENGTH: | 34 inches (With Footboard Folded) 39½ inches (With Footboard Extended) | | |
| DRIVE WHEELS/TIRES: | 10 x 3-inch (Flat Free inserts) | | |
| CASTER: | 6 x 2-inch Front/Rear w/Precision Sealed Bearings | | |
| FOOTRESTS/ LEGRESTS: | Flip Up, Depth and Height Adjustable, Footboard, Swingaway Front Rigging, Elevating Legrest | | |
| *WEIGHT W/O BATTERIES: W/BATTERIES (UI): | 145 to 170 lbs 192 to 217 lbs | | |
| SHIPPING BASE W/O BATTERIES: BASE WITH BATTERIES: ADJUSTABLE ASBA (20 X 20 X 20): | 107 lbs 154 lbs 48 lbs | | |
| ARMRESTS: | Adjustable Width, Angle, Heights and Depth UI - Quantity 2 | | |
| BATTERIES: | | | |
| WEIGHT LIMITATION: | 300 lbs | | |
| PERFORMANCE SPEED: TURNING RADIUS: **RANGE (VARIABLE): | 0 to 4.3 m.p.h. 19½ inches up to 12 miles | | |

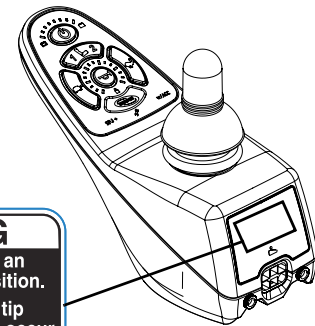
*NOTE: Includes seating systems and accessories.

**NOTE: Values for range are calculated for maximum chair weight rating using largest batteries applicable (UI1), per test procedures described in ANSI/RESNA WC/VOL2-1998 Section 4 and meet federal reimbursement requirements for this product. While considered typical, they are derived based on certain ideal conditions. Variances in battery condition, user weight, usage pattern or overall terrain conditions will result in actual values for range that differ from these stated values. Users should become accustomed to how their unique conditions impact their individual results. Users should become familiar with the battery discharge indicator on the joystick to determine the range of their wheelchair. Refer to Battery Charger Operation on page 59 for more information about the battery discharge indicator.

LABEL LOCATION

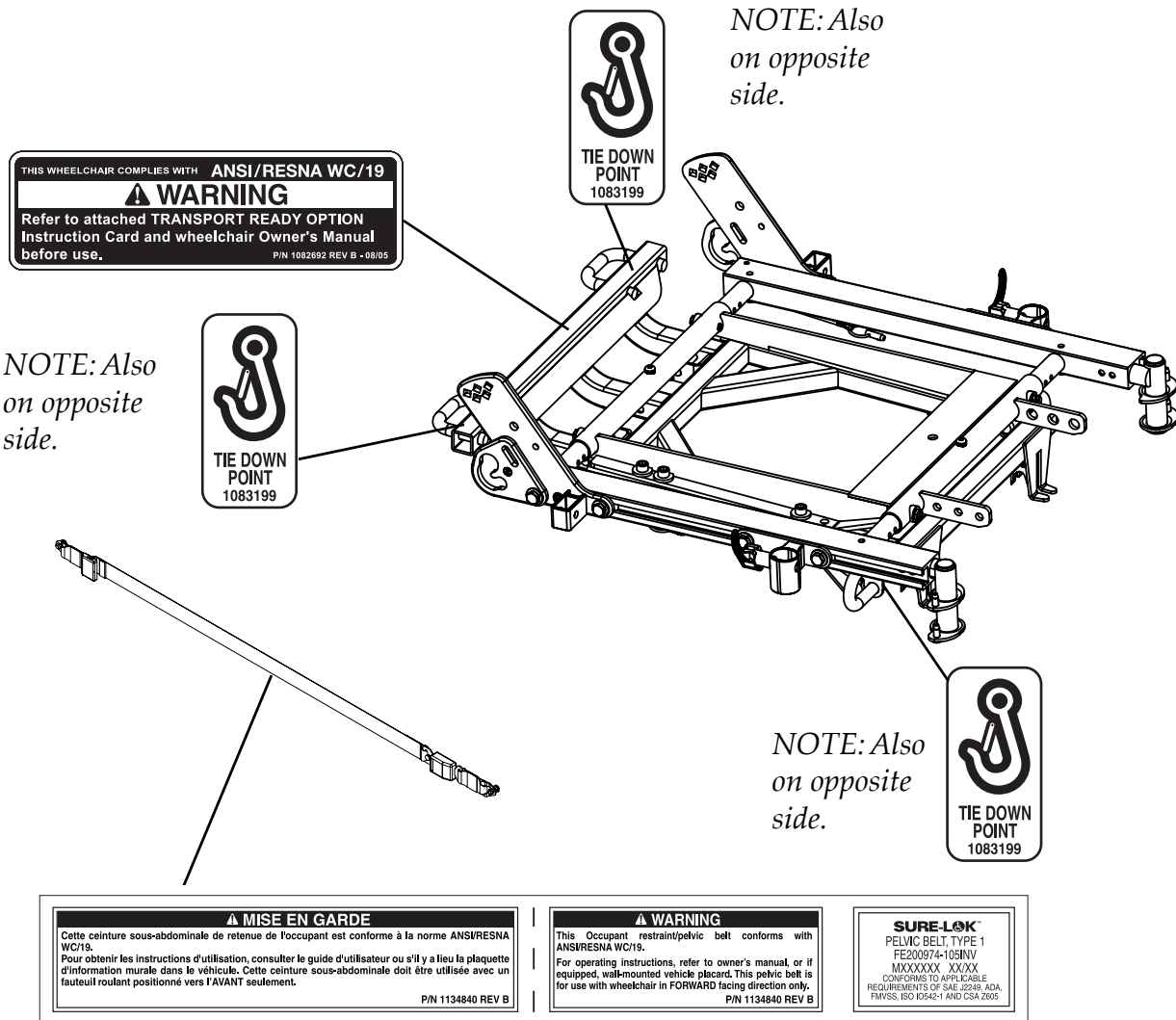


⚠ WARNING The POSITIVE (+) RED Battery Cable MUST connect to the POSITIVE (+) Battery Terminal(s)/ Post(s). The NEGATIVE (-) BLACK Battery Cable MUST connect to the NEGATIVE (-) Battery Terminal(s)/Post(s). DO NOT allow Battery Cable(s) to contact the opposite Battery Terminal(s)/Post(s). Install protective 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.



⚠ WARNING
DO NOT operate wheelchair on an incline while in an elevated position. Otherwise, the wheelchair may tip over and injury or damage may occur.
1130210 Rev. A - 01/05

Wheelchairs With TRRO



Wheelchairs Without TRRO

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



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 Electronic Control Unit is to be performed only by a qualified technician. The final adjustments of the controller may affect other activities of the wheelchair. Damage to the equipment could occur if improperly 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.

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 reenter 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 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°.

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 stand on the frame of the wheelchair.

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

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

ALWAYS wear your seat positioning strap. The seat positioning strap is a positioning belt only. It is not designed for use as a safety device withstanding high stress loads such as auto or aircraft safety belts. If signs of wear appear, belt MUST be replaced immediately.

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

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

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

NEVER leave an unoccupied wheelchair on an incline.

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

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.

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.

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.

Batteries

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

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

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.

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 wheelchair has a weight limitation of 300 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.

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, belt MUST be replaced immediately.

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.

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.

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.

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.

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

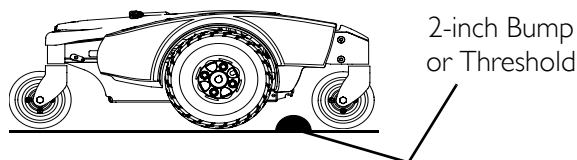


FIGURE 3.1 Coping With Everyday Obstacles

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

CAUTION

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

A Note to Wheelchair Assistants

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

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

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

Lifting/Stairways

⚠ WARNING

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

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 212 lbs. Use proper lifting techniques (lift with your legs) to avoid injury.

NOTE: For this procedure, refer to FIGURE 3.2 on page 19.

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.

NOTE: This procedure needs two assistants to lift the wheelchair to transport it.

1. Remove the occupant from the wheelchair.
2. Remove the seat. Refer to Tilting the Seat Assembly (Formula CG Only) on page 42.
3. Remove any accessories on the wheelchair.
4. Bend your knees and keep your back straight.
5. Ensure that the casters are oriented as shown in FIGURE 3.2.
6. Using the rear and front forks as hand hold supports, transfer the wheelchair base to desired location. Refer to FIGURE 3.2.
7. Using non-removable (nondetachable) parts, transfer the seat and any accessories to desired location.
8. Reinstall any accessories that were removed in STEP 3.
9. Reinstall the seat. Refer to Tilting the Seat Assembly (Formula CG Only) on page 41.

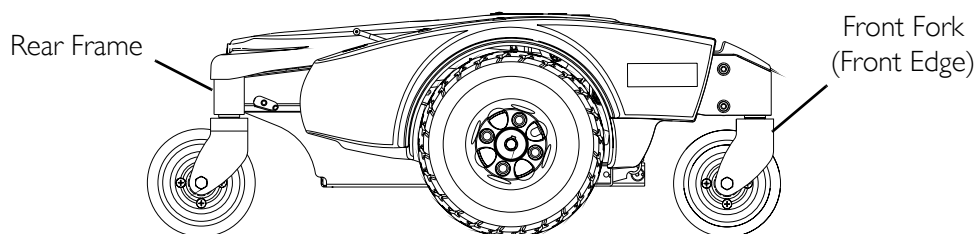


FIGURE 3.2 Lifting/Stairways

⚠ WARNING - ESCALATORS

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

Transferring To and From Other Seats

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

NOTE: For this procedure, refer to FIGURE 3.3.

1. Position the wheelchair as close as possible along side the seat to which you are transferring, with the rear casters pointing away from it.
2. After the wheelchair is positioned properly for transfer, verify that the motor release levers are engaged. Refer to [Engaging/Disengaging Motor Release Lever](#) on page 49.
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.

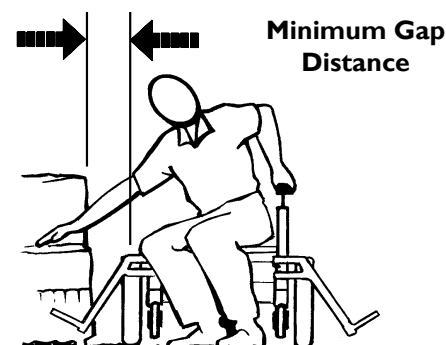


FIGURE 3.3 Transferring To and From Other Seats

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.

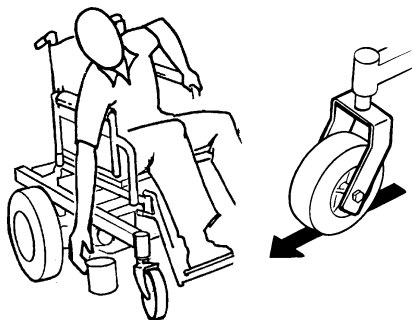


FIGURE 3.4 Reaching, Leaning and Bending - Forward

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 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 dealer for a thorough inspection and servicing. Regular cleaning will reveal loose or worn parts and enhance the smooth operation of your wheelchair. To operate properly and safely, your wheelchair must be cared for just like any other vehicle. Routine maintenance will extend the life and efficiency of your wheelchair.

Safety Inspection Checklists

CAUTION

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

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

All Wheelchairs

Inspect/Adjust Initially

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

Inspect/Adjust Weekly

- Seat is secured to wheelchair frame.
- Inspect tires for flat spots and wear.
- Ensure casters are free of debris.

Inspect/Adjust Monthly

- Ensure wheel mounting nuts are secure on drive wheels.
- Ensure no excessive side movement or binding occurs when drive wheels are lifted and spun when disengaged (freewheeling).
- Inspect caster assembly has proper tension when caster is spun. Caster should come to a gradual stop.
- Loosen/tighten caster locknut if wheel wobbles noticeably or binds to a stop.
- Ensure all caster/wheel/fork/headtube fasteners are secure.
- Inspect for any loose hardware on the wheelchair.
- Ensure casters are free of debris.

Inspect/Adjust Periodically

- Ensure seat release latch is functional. Replace if necessary.
- Ensure wheelchair rolls straight (no excessive drag or pull to one side).
- Inspect charger AC power cord for damage. Replace if necessary.
- Ensure casters are free of debris.
- Inspect electrical components for signs of corrosion. Replace if corroded or damaged.
- Check that all labels are present and legible. Replace if necessary.

Troubleshooting Guide

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

All Wheelchairs

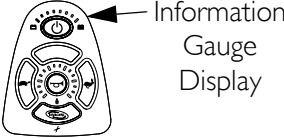





General Troubleshooting

| SYMPTOM | PROBABLE CAUSE | SOLUTIONS |
|---|--|---|
| Limited driving distance. | Batteries not charged long enough. Batteries weak; wont hold charge. | Charge batteries overnight or ensure 8 hours of charge time between use. Ensure correct setting on charger. Replace Batteries. |
| Batteries not charging. | Charger not working. Battery connections loose. No current at wall outlet. Bad connection on charger, charger cable, plug or internal wiring problem. | Have charger replaced. Contact Dealer/Invacare. Check all connections. Secure connections. Switch to another wall outlet. Replace charger or internal repairs may be required. Contact Dealer/Invacare. |
| Batteries draw excessive current when charging. | Battery failure. | Have batteries checked for shorted cell. Replace if necessary. |
| Charger indicator shows low charge level immediately after charging. | Batteries weak, wont hold charge. Electrical malfunction. Charger malfunction. | Replace Batteries. Contact Dealer/Invacare. Replace charger. Contact Dealer/Invacare. |
| Battery indicator flashes the charge level is low immediately after recharging. | Weak Batteries. Charger malfunction. Electrical malfunction | Replace batteries. Replace charger. Contact Dealer/Invacare. Contact Dealer/Invacare. |
| Wheelchair will not drive. | Motor release levers are disengaged. Batteries require charging. Charger plugged in. Circuit breaker tripped. | Engage motor release levers. Charge batteries. Make sure the setting on the charger is correct. Unplug charger from wall outlet before operating the wheelchair. Reset circuit breaker. If breaker trips again, it may indicate need for internal repair. Contact Dealer/Invacare. |
| Motor “chatters” or runs irregularly. | Electrical malfunction. | Contact Dealer/Invacare. |
| Only one drive wheel turns. | Electrical malfunction. One motor lock is disengaged. | Contact Dealer/Invacare for service. Engage motor lock. |
| Joystick erratic or does not respond as desired. | Electrical malfunction. Controller programmed improperly. | Contact Dealer/Invacare for service. Reprogram controller (Refer to electronics manual supplied with wheelchair). |
| Wheelchair does not respond to commands. | Poor battery terminal connection. | Have terminals cleaned. |
| Power indicator off - even after recharging. | Electrical malfunction. | Contact Dealer/Invacare for service. |

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 |
|--|--|---|---|
|  | 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 Charging Batteries on page 62. Check that battery cables are connected properly. If necessary, replace batteries. Refer to Replacing Batteries on page 55. |
| 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 |
|---|---|--|
|  SPM L Park Brake Fault or  SPM R Park Brake Fault displays and wheelchair does not drive. | Motor lock levers disengaged (Error code E9 or E10). | Engage motor lock levers. Refer to Disengaging/Engaging Motor Lock Levers on page 48. |
| CHARGER PLUGGED IN displays. | Battery charger connected (Error code E28). | Unplug battery charger from the wheelchair. Refer to Charging Batteries on page 62. |
|  SPM Battery Fault displays and the wheelchair does not drive. | Batteries need to be charged (Error code E14). | Charge batteries. Refer to Charging Batteries on page 62. If batteries fail to charge properly, check battery charger or replace batteries. Refer to Replacing Batteries on page 55. |
|  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. |
|  JS REV TOO LARGE  JS FWD TOO LARGE  JS LFT TOO LARGE or  JS RGT TOO LARGE 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. |

SECTION 4—SAFETY INSPECTION/TROUBLESHOOTING

| SYMPTOM | PROBABLE CAUSE | SOLUTIONS |
|--|--|---|
| 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. Electrical malfunction. | Have batteries checked for shorted cell. Replace if necessary. Contact Dealer/Invacare for service. |
| Battery indicator flashes the charge level is low - immediately after recharge. | Battery failure. Malfunctioning battery charger. Electrical malfunction. | Check batteries for shorted cell. Replace if necessary. Contact Dealer/Invacare for Service. Contact Dealer/Invacare for Service. |
| Battery indicator flashes the charge level is low - too soon after being recharged. | Batteries not charged. Weak batteries. | Have charger checked. Replace batteries if necessary. Refer to Replacing Batteries on page 55. |
| 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. |

Checking Battery Charge Level

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

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

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

Operating the Wheelchair

Turning the Power On/Off

NOTE: For this procedure, refer to FIGURE 5.1.

NOTE: MPJ+ Joystick available on Formula CG seating system only.

- 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. |

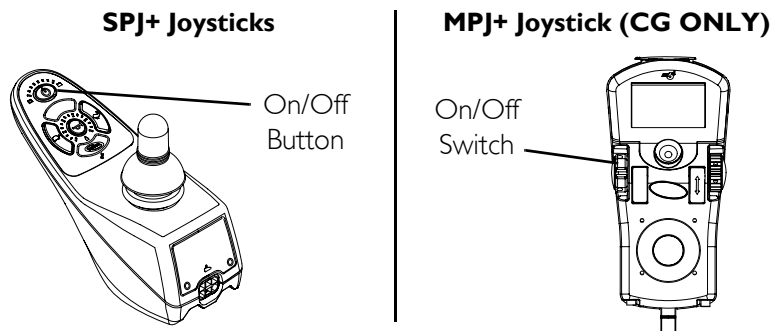


FIGURE 5.1 Turning the Power On/Off

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 29.
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. |

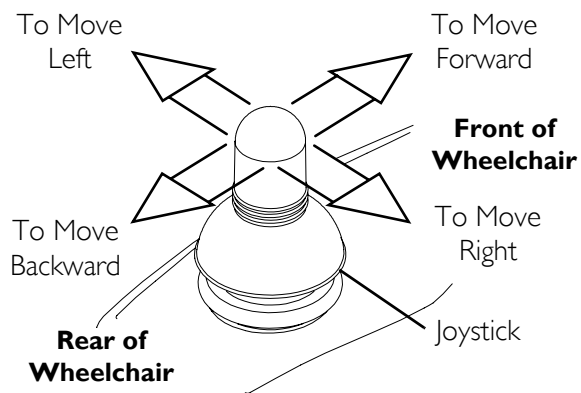


FIGURE 5.2 Using the Joystick to Drive the Wheelchair

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

- MK6i™ SPJ+ w/PSS and MK6i SPJ+ w/ACC Joystick Switches and Indicators on page 31.
- MPJ+ Joystick Switches and Indicators on page 33.

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

NOTE: For this procedure, refer to FIGURE 5.3.

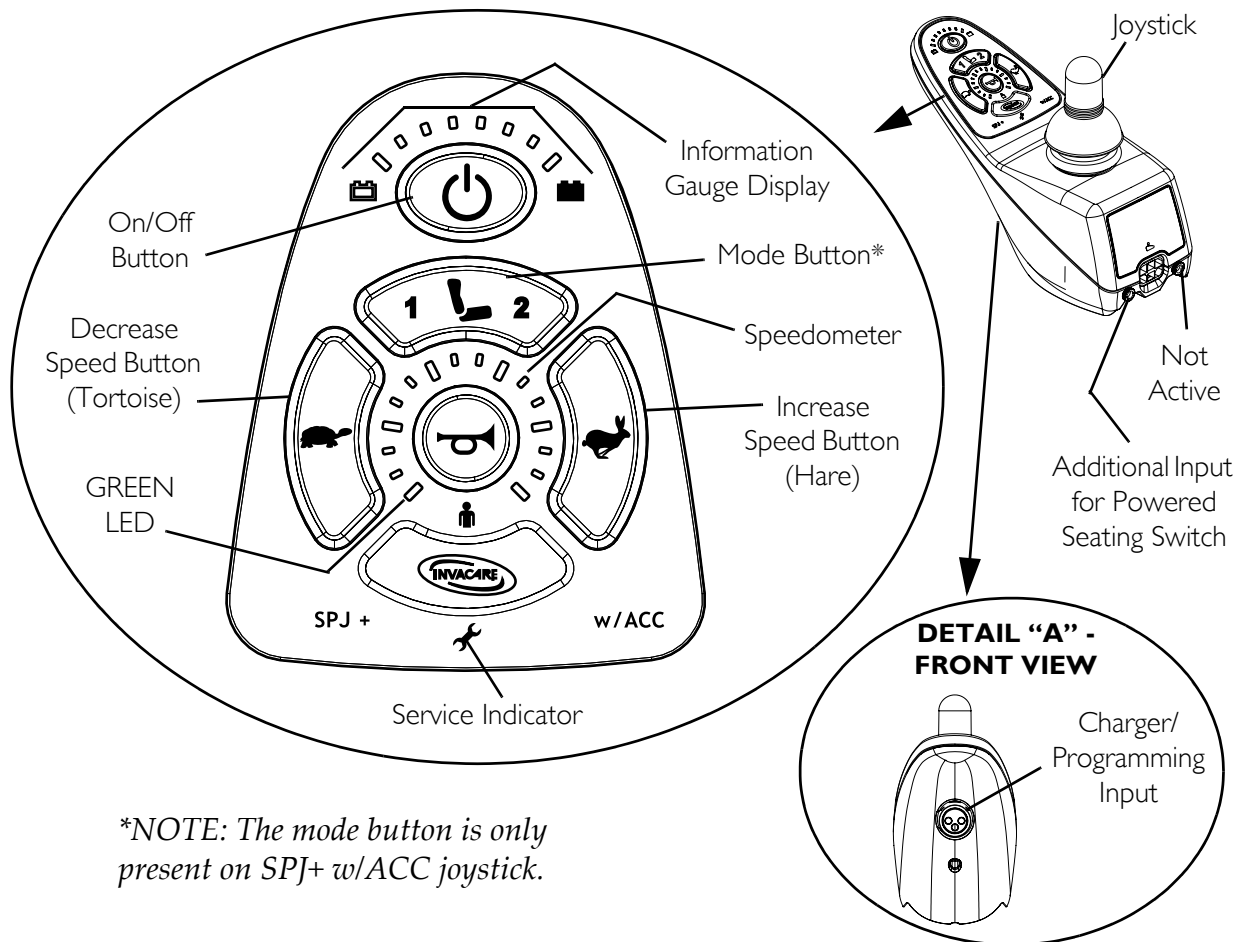


FIGURE 5.3 MK6i™ SPJ+ w/PSS and MK6i SPJ+ w/ACC Joystick Switches and Indicators

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 30 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 Service Indicator Light Diagnostics on page 30 for the diagnostic indications of the wheelchair status.

MPJ+ Joystick Switches and Indicators

NOTE: For this procedure, refer to FIGURE 5.4 on page 34.

NOTE: MPJ+ Joystick available on Formula CG seating system only.

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**).

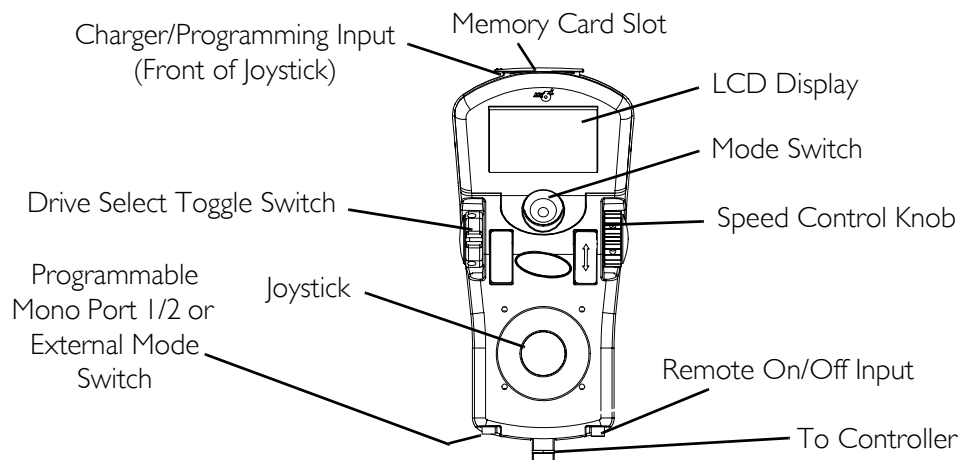


FIGURE 5.4 MPJ+ Joystick Switches and Indicators

Speed Control

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

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

Joystick

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

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

Charger/Programming Input

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

LCD Display Screens

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

Splash Screen

NOTE: For this procedure, refer to FIGURE 5.5.

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

After this screen, the joystick displays the Main Screen.



FIGURE 5.5 LCD Display Screens - Splash Screen

Main Screen

NOTE: For this information, refer to FIGURE 5.6 on page 36.








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 35 for descriptions of information shown.

LCD DISPLAY

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

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

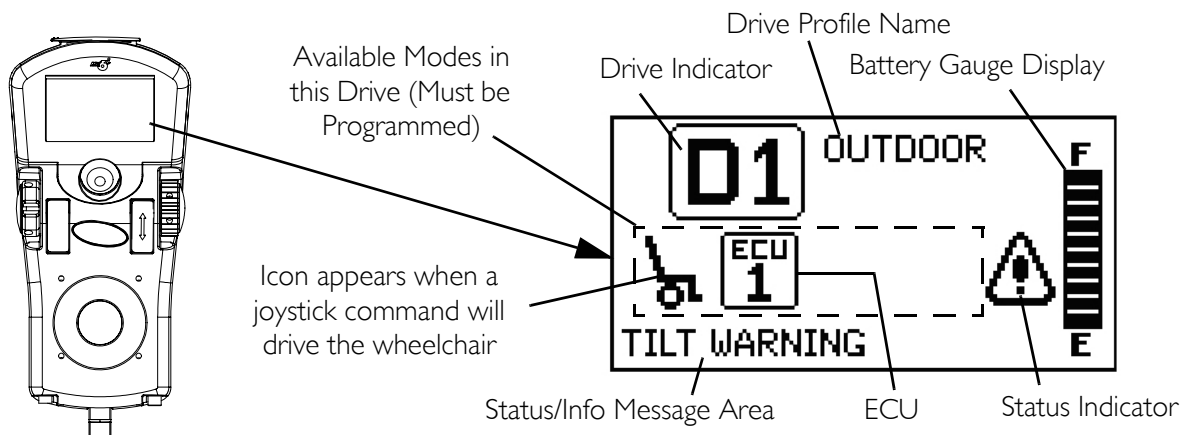


FIGURE 5.6 LCD Display Screens - Main Screen

Driving Screen

NOTE: For this procedure, refer to FIGURE 5.7.

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

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



FIGURE 5.7 LCD Display Screens - Driving Screen

Connected Devices Screen

NOTE: For this procedure, refer to FIGURE 5.8.

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

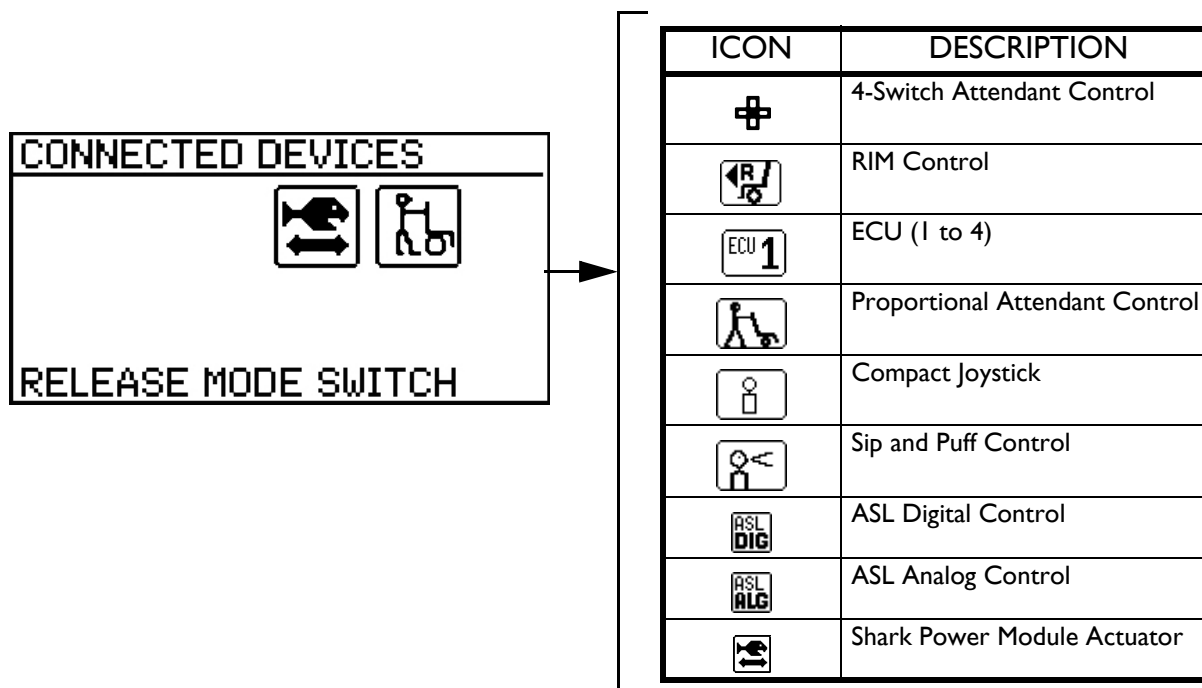


FIGURE 5.8 LCD Display Screens - Connected Devices Screen

Programmable Mono Port 1/2 or External Mode Switch

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

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

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

Remote Stop Switch

The remote stop switch is used to stop the wheelchair.

Remote Mode (Reset) Switch

The remote mode reset switch functions the same way as the mode switch. Refer to [Mode Switch](#) on page 38.

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 5.4 on page 34.

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.

Repositioning Joystick

NOTE: For this procedure, refer to FIGURE 5.9.

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 5.9.
5. Using the three hex mounting screws and washers, secure both halves of the mounting bracket to the arm tube.
6. Slide the joystick mounting tube through the mounting bracket to the desired position.
7. Turn the adjustment lock lever to secure the joystick mounting tube into the mounting bracket.

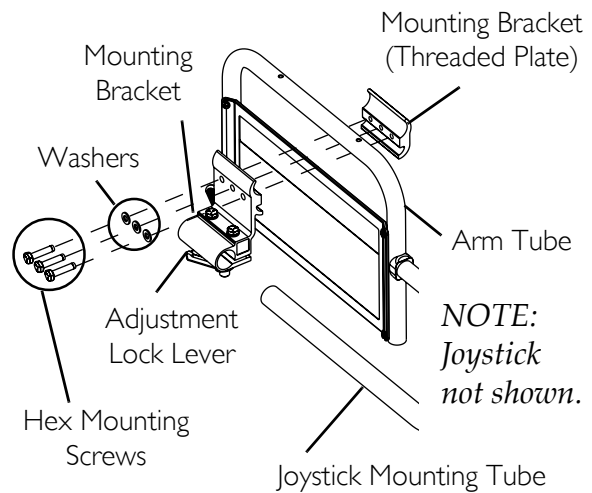


FIGURE 5.9 Repositioning Joystick

Disconnecting/Connecting the Joysticks

NOTE: For this procedure, refer to FIGURE 5.10 on page 40.

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

SPJ+ Joysticks

Disconnecting

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

Connecting

⚠ WARNING

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

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

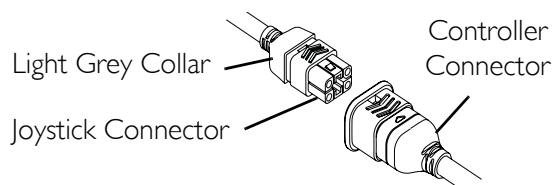


FIGURE 5.10 Disconnecting/Connecting the Joysticks - SPJ+ Joysticks

MPJ+ Joysticks

NOTE: For this procedure, refer to FIGURE 5.11.

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.

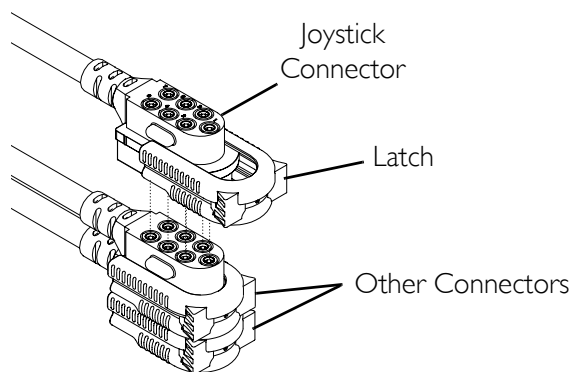


FIGURE 5.11 Disconnecting/Connecting the Joysticks - MPJ+ Joysticks

SECTION 6—SEAT

⚠ WARNING

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

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

Tilting the Seat Assembly (Formula CG Only)

⚠ WARNING

Make sure power to the wheelchair is OFF before performing this procedure.

Never leave the seat assembly in the UP/OPEN position unless necessary to perform a procedure on the wheelchair - otherwise injury or damage may result.

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

NOTE: For this procedure, refer to FIGURE 6.1 on page 42.

NOTE: Removing the seat is not necessary to access the battery compartment on wheelchairs equipped with a Formula CG seating system. The seat assembly tilts back and props into place to provide access to the batteries and the underside of the seat.

Tilting the Seat Assembly Back

1. Place the wheelchair in a well ventilated area where work can be performed without risking damage to carpeting or floor covering.
2. Ensure the seating system is in the fully upright position. See Formula CG seating system manual shipped with wheel chair.
3. Verify the joystick On/Off switch is in the Off position and disconnect joystick cable.
4. Engage the motor release levers. Refer to Engaging/Disengaging Motor Release Lever on page 80.
5. Remove front rigging. See Formula CG seating system manual shipped with wheelchair.
6. Remove the two screws and locknuts securing the seating assembly to the front seat posts.
7. Firmly grasp the front edge of the seat assembly, slowly tilt the seat assembly back into the Up/Open position.
8. Remove prop rod from the clip located on the seating assembly and engage the prop rod end into the front seat post as shown in FIGURE 6.1.

9. Gently allow weight of seat assembly to be supported by the prop rod.

NOTE: Only leave the seat assembly in the Up/Open position while performing any necessary procedures. Always lower the seat assembly to the Down/Closed position when not servicing the wheelchair. Ensure the seat is locked in place before using.

Tilting the Seat Assembly Forward

1. Using one hand, firmly grasp the front edge of the seat assembly and lift until seat assembly is no longer supported by the prop rod.
2. Disengage the prop rod from the front seat post and secure into clip.
3. Using both hands, slowly tilt the seat assembly Forward into the Down/Closed position.

⚠ WARNING

Ensure the two screws are fully engaged and the seat assembly is securely locked in place before use - otherwise injury or damage may result.

4. Using the two screws and locknuts, secure the seat assembly to the two front seat posts.

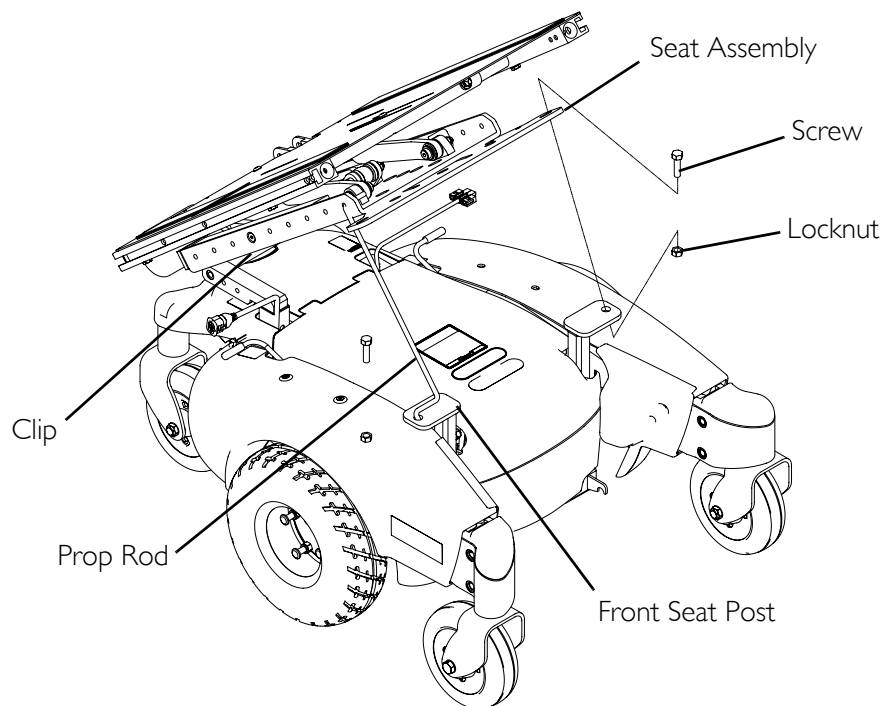


FIGURE 6.1 Tilting the Seat Assembly (Formula CG Only)

Removing/Installing the Seat Assembly

NOTE: For this procedure, refer to FIGURE 6.2.

NOTE: This procedure is for wheelchairs WITHOUT the Formula PTO Plus seating system installed ONLY. For wheelchairs with the Formula PTO Plus seating system, refer to Tilting the Seat Assembly (Formula CG Only) on page 41.

Removing

1. Disconnect the joystick cable at rear of seat. Refer to Disconnecting/Connecting the Joysticks on page 44.
2. Push down on the latch bar underneath front of seat.
3. Rotate seat assembly backward.
4. Slide the seat assembly forward to disengage seat from pivot brackets located in the rear.

Installing

1. Position the seat in the rear pivot brackets as shown in FIGURE 6.2.
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.

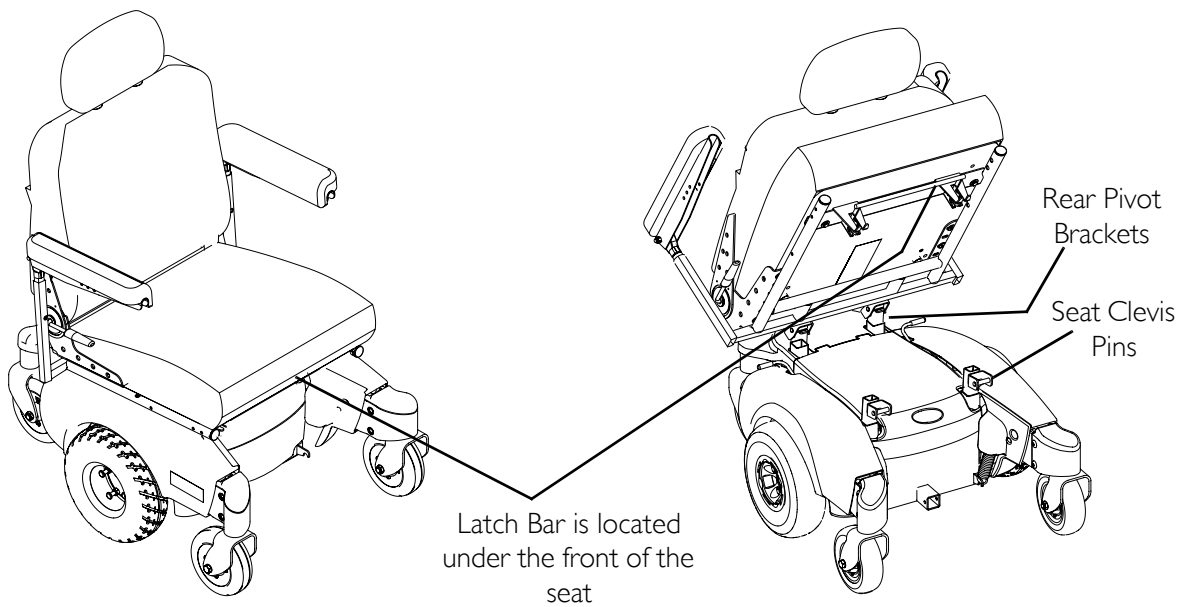


FIGURE 6.2 Removing/Installing the Seat Assembly

SECTION 7—FOOTBOARD ASSEMBLY

⚠ WARNING

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

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

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

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

Removing/Installing the Footboard Assembly

⚠ WARNING

Pinch point may occur when rotating the footboard assembly.

NOTE: For this procedure, refer to FIGURE 7.1 on page 45.

Removing

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

Installing

⚠ WARNING

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

Keep detent balls clean.

1. Position the footboard assembly onto the wheelchair frame so that the mounting hole in the wheelchair frame aligns with the desired mounting hole in the footboard assembly.
2. Install the quick release pin by depressing the button while sliding the pin in. Ensure that the detent balls of the quick release pin are fully released beyond the outer edge of the tube (Detail "A" of FIGURE 7.1).

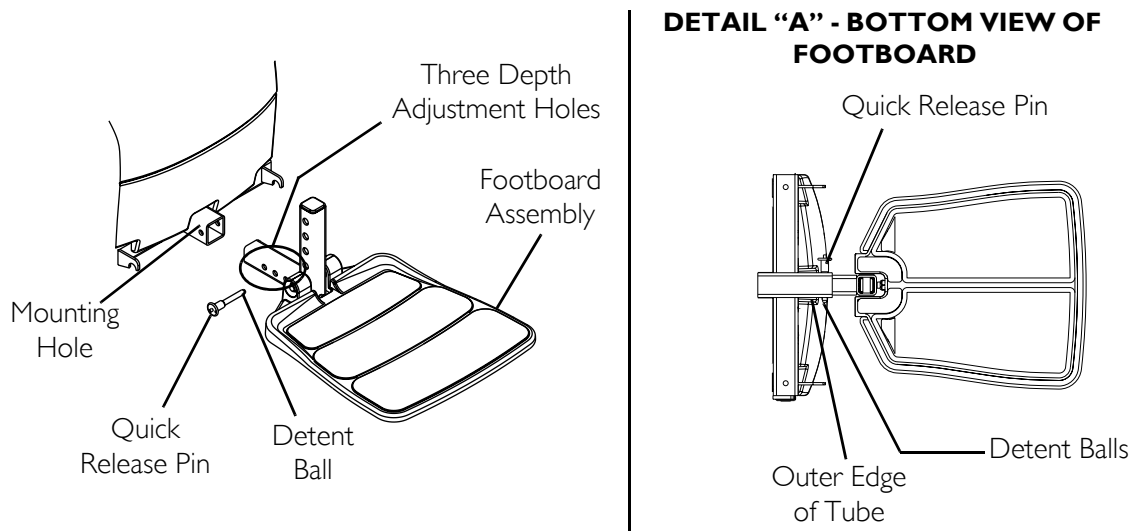


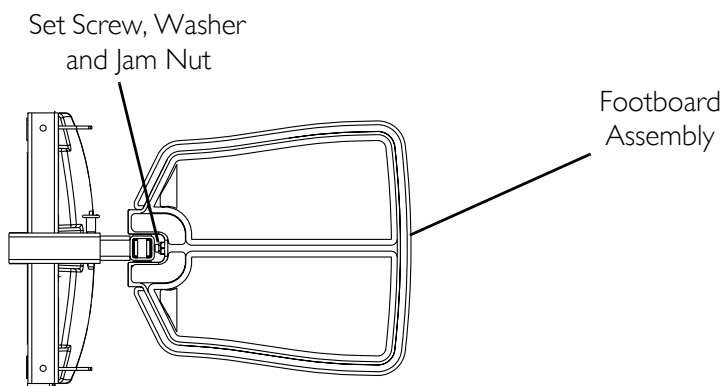
FIGURE 7.1 Removing/Installing the Footboard Assembly

Adjusting the Footboard Assembly

Angle

NOTE: For this procedure, refer to FIGURE 7.2 on page 46.

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

**Bottom View of
Footboard****FIGURE 7.2** Adjusting the Footboard Assembly - Angle

Depth

NOTE: For this procedure, refer to FIGURE 7.3.

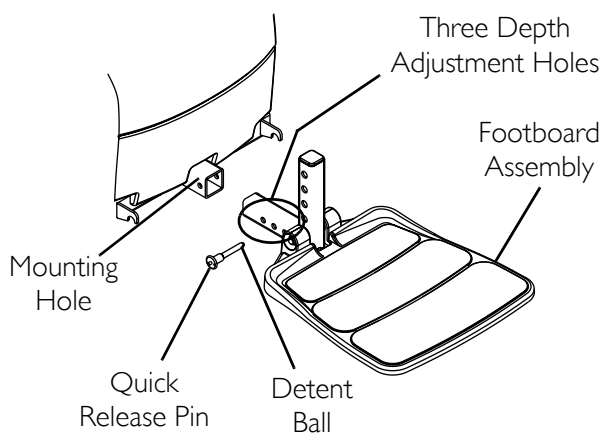
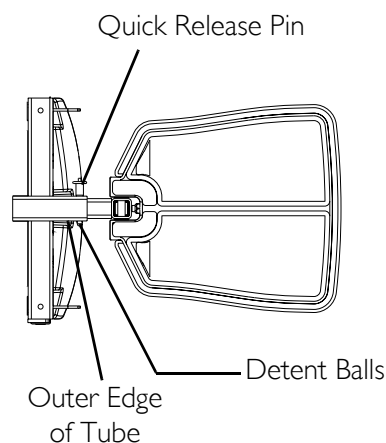
1. Remove the quick release pin that secures the footboard assembly to the wheelchair frame.

⚠ WARNING

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

Keep detent balls clean.

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

**DETAIL "A" - BOTTOM VIEW OF
FOOTBOARD****FIGURE 7.3** Adjusting the Footboard Assembly - Depth

SECTION 8—TOP SHROUD AND WHEELS

⚠ WARNING

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

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

Replacing the Flat Free Tires on the Wheel Rim

⚠ WARNING

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

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

Removing/Installing the Battery Shroud

NOTE: For this procedure, refer to FIGURE 8.1 on page 48.

Removing

1. Disconnect the joystick. Refer to Disconnecting/Connecting the Joysticks on page 40.
2. Perform one of the following:
 - Tilt the seat assembly to the up position. Refer to Tilting the Seat Assembly (Formula CG Only) on page 41.
 - Remove the seat assembly from the wheelchair. Refer to Removing/Installing the Seat Assembly on page 43.
3. If Installed, disconnect the powered seating system.
4. Lifting up to release the hook and loop straps, remove the battery shroud from the base frame.

Installing

1. Ensure the seat is tilted back to the up position or removed. Refer to [Tilting the Seat Assembly \(Formula CG Only\)](#) on page 41 or Refer to [Removing/Installing the Seat Assembly](#) on page 43.
2. Place the battery shroud on the base frame and push downward to engage the hook and loop straps.
3. Perform one of the following:
 - Lower the seat assembly to the up position. Refer to [Tilting the Seat Assembly \(Formula CG Only\)](#) on page 41.
 - Install the seat assembly from the wheelchair. Refer to [Removing/Installing the Seat Assembly](#) on page 43.
4. Connect the joystick. Refer to [Disconnecting/Connecting the Joysticks](#) on page 40.
5. Connect the powered seating system

NOTE: Batteries and seating system not shown for clarity.

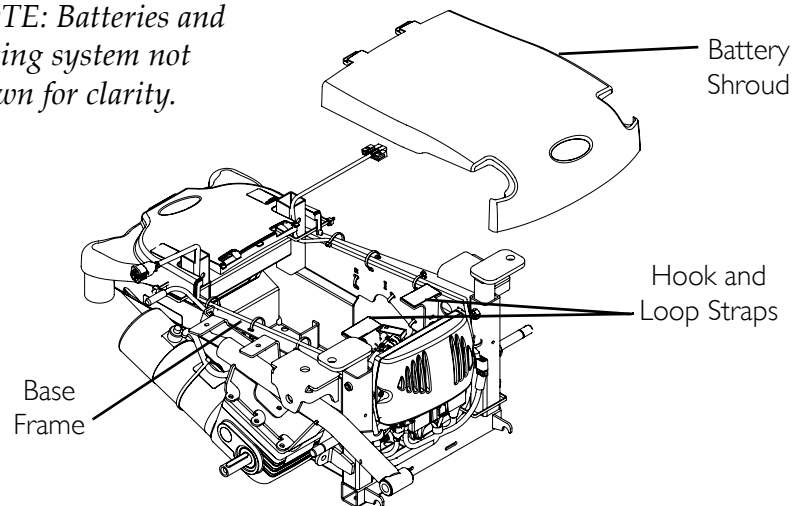


FIGURE 8.1 Removing/Installing the Battery Shroud

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 8.2.

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

1. Locate the motor release handles on the motors protruding through the top shroud on the rear of the wheelchair.
2. Perform one of the following:
 - To Disengage the Motor Release Levers - Pull the motor lock lever towards the rear of the wheelchair (freewheel position).

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

NOTE: It may be necessary to rock the wheels slightly until the motor release lever disengages.

- To Engage the Motor Release Levers - Push the motor lock handles towards the front of the wheelchair (drive position).

NOTE: This allows the motors to drive the wheels.

NOTE: It may be necessary to rock the wheels slightly until the motor release lever engages.

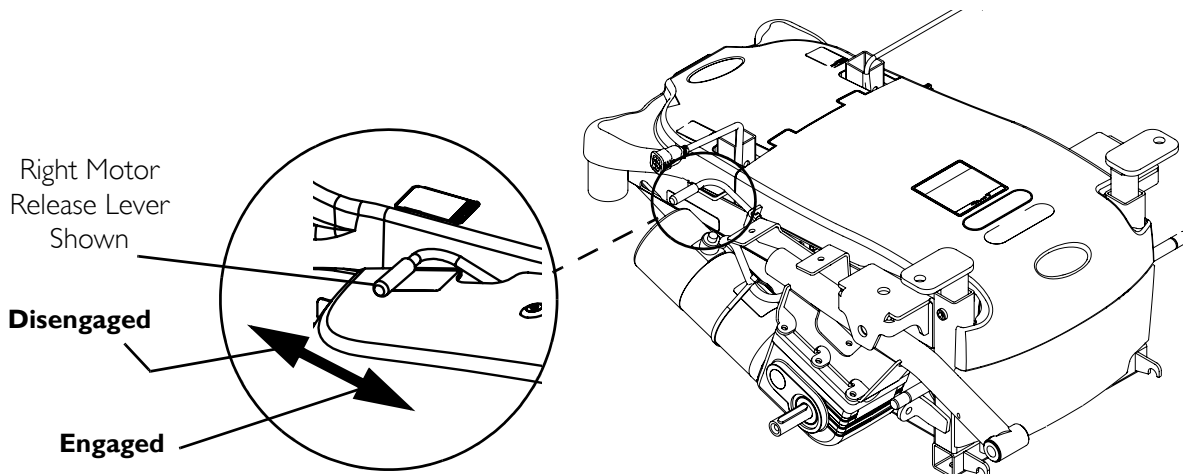


FIGURE 8.2 Engaging/Disengaging Motor Release Lever

Replacing Front/Rear Caster Assemblies

NOTE: For this procedure, refer to FIGURE 8.3.

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

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

1. Remove the mounting screw, two washers, and locknut that secures the caster to the fork.
2. Remove the caster and discard.
3. Secure new caster to fork with existing mounting screw, two washers and locknut (FIGURE 8.3). Securely tighten.

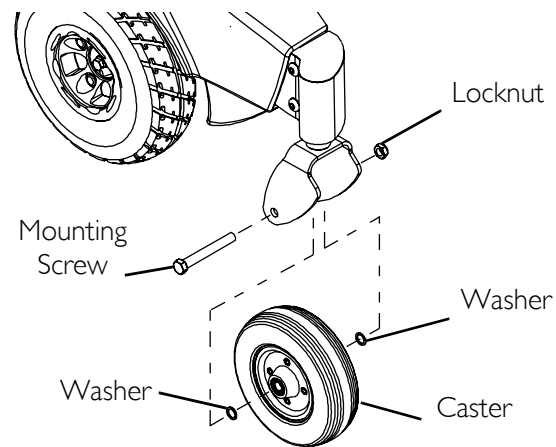


FIGURE 8.3 Replacing Front/Rear Caster Assemblies

Adjusting Forks

NOTE: For this procedure, refer to FIGURE 8.4.

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

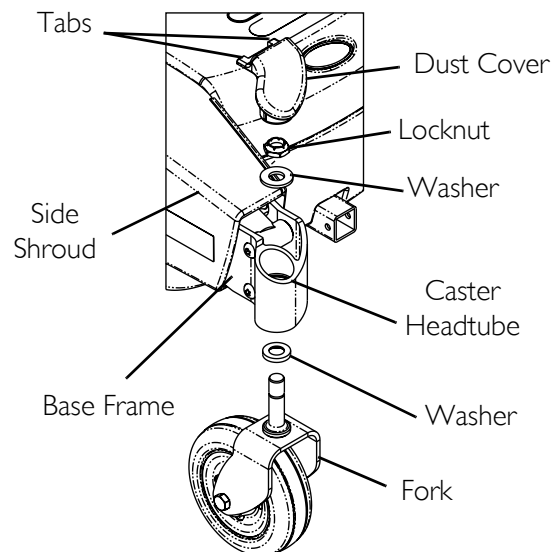


FIGURE 8.4 Adjusting Forks

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

SECTION 9—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 weigh 24 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 handle/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 (+)** battery cable **MUST** connect to the **POSITIVE (+)** battery terminal, otherwise serious damage will occur to the electrical system.

Connect same color connectors to each other (**RED to RED, BLACK to BLACK**).

DO NOT remove fuse or mounting hardware from **POSITIVE (+)** battery cable mounting screw. To replace the fuse, obtain and replace battery harness with fuse.

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.

NOTE: If there is battery acid in the bottom of the battery tray or on the sides of the battery, apply baking soda to these areas to neutralize the battery acid. Before reinstalling the existing or new battery, clean the baking soda from the battery tray or battery 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 9.1.

1. Place battery on ground/flat surface.
2. Visually draw a horizontal and vertical centerline through the middle of battery (FIGURE 9.1).
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 9.1).

⚠ 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.

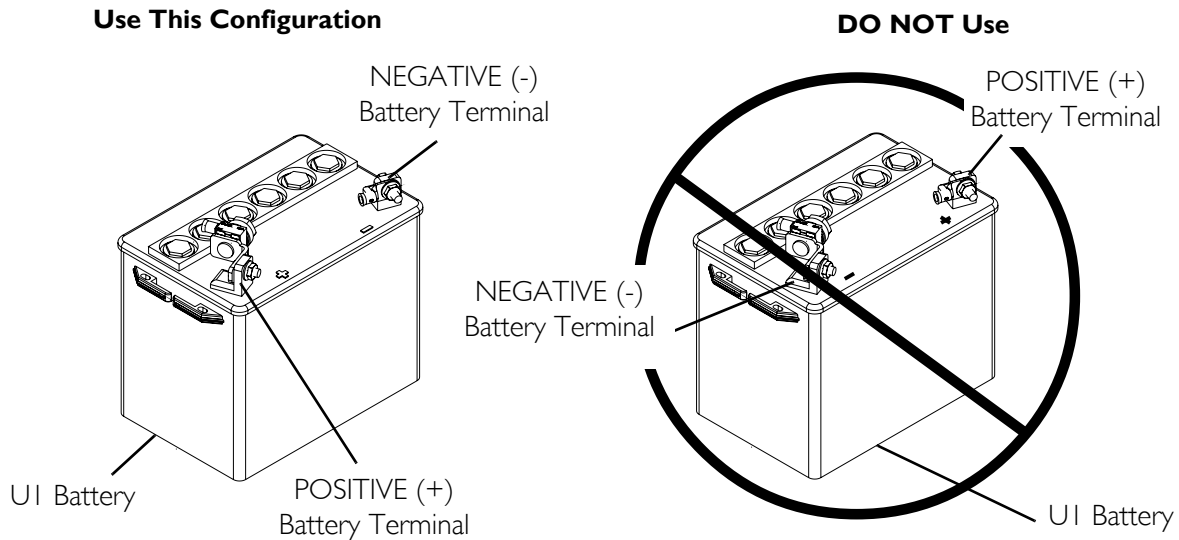


FIGURE 9.1 Using the Proper Batteries

Removing/Installing Batteries from/into Battery Tray

⚠ 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: For this procedure, refer to FIGURE 9.2 on page 54.

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

NOTE: Have the following tools available:

| TOOL | QTY | COMMENTS |
|----------------------------|-----|--------------|
| 7/16-INCH (6PT) BOX WRENCH | 1 | Not Supplied |
| DIAGONAL CUTTERS | 1 | Not Supplied |

Removing

- Place the wheelchair in a well ventilated area where work can be performed without risking damage to carpeting or floor covering.
- Verify the joystick On/Off switch is in the Off position and disconnect joystick cable (not shown). Refer to Disconnecting/Connecting the Joystick on page 121.
- Perform one of the following:
 - Tilt the seat assembly to the up position. Refer to Tilting the Seat Assembly (Formula CG Only) on page 41.
 - Remove the seat assembly from the wheelchair. Refer to Removing/Installing the Seat Assembly on page 43.
- Remove the battery shroud. Refer to Removing/Installing the Battery Shroud on page 47.
- Disconnect the front battery from the controller (BLACK connector).
- Disconnect the rear battery from the front battery (RED and BLACK connectors).
- Lift rear and front battery out of the battery tray using the battery handles.

Installing

- Verify the joystick On/Off switch is in the Off position and disconnect joystick cable. Refer to Disconnecting/Connecting the Joystick on page 121.

2. Position the front battery in the front of the battery tray.
 3. Position rear battery in rear of battery tray.
- NOTE: Ensure that both batteries are properly seated and resting on the battery tray.*
4. Connect the rear battery to the front battery (RED and BLACK connectors).
 5. Connect the front battery to the controller (BLACK connector).
 6. Reinstall the top shroud. Refer to Removing/Installing the Top Shroud on page 85.
 7. Perform one of the following:
 - Lower the seat assembly to the up position. Refer to Tilting the Seat Assembly (Formula CG Only) on page 41.
 - Install the seat assembly from the wheelchair. Refer to Removing/Installing the Seat Assembly on page 43.
 8. Lower the seat assembly to the down position. Refer to Tilting the Seat Assembly (Formula CG Only) on page 41.
 9. Remove the battery shroud. Refer to Removing/Installing the Battery Shroud on page 47.
 10. Connect joystick cable (not shown). Refer to Disconnecting/Connecting the Joystick on page 121.

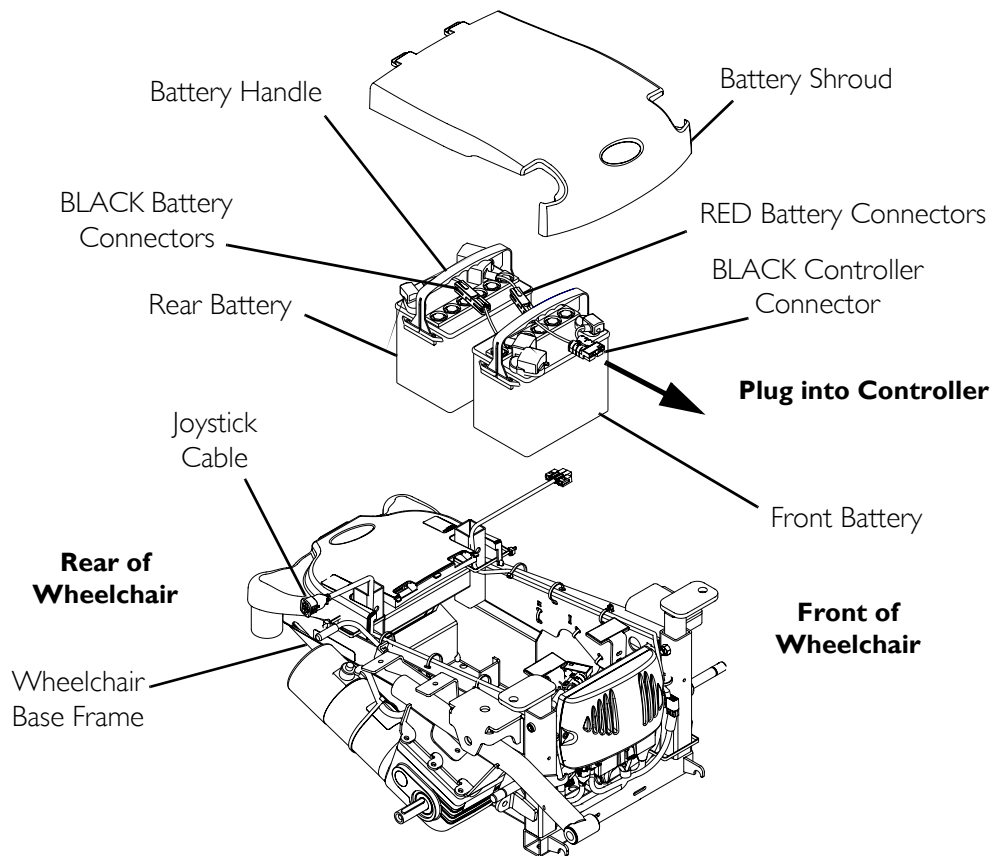


FIGURE 9.2 Removing/Installing Batteries from/into Battery Tray

Connecting/Disconnecting Battery Cables

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.

Connect same color connectors to each other (**RED to RED, BLACK to BLACK**).

DO NOT remove fuse or mounting hardware from **POSITIVE (+)** battery cable mounting screw. To replace the fuse, obtain and replace battery harness with fuse.

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

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

Battery terminal configuration as shown in Detail “A” of **FIGURE 9.3** **MUST** be used. Batteries that have the terminal configuration reversed **MUST NOT** be used - otherwise serious injury or damage may occur.

Install protective caps on **POSITIVE (+)** and **NEGATIVE (-)** terminals.

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 battery, the battery cables **MUST** be connected to the battery terminals, as shown in Detail “A” of **FIGURE 9.3** (depending on battery type), otherwise damage to the battery cable may result when installing battery terminal caps.

NOTE: For this procedure, refer to FIGURE 9.3 on page 56.

1. Secure the battery cables to the battery terminals as described below. Securely tighten. Refer to Detail “A” of **FIGURE 9.3**:
 - 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 terminals.
4. Secure each terminal cap in place with a tie-wrap [use tie-wraps 11-1/2-inches long] (Detail “B” of **FIGURE 9.3**).
5. Position the batteries into the wheelchair. Refer to Removing/Installing Batteries from/into Battery Tray on page 53.

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

6. If necessary, charge the battery. Refer to Charging Batteries on page 58.

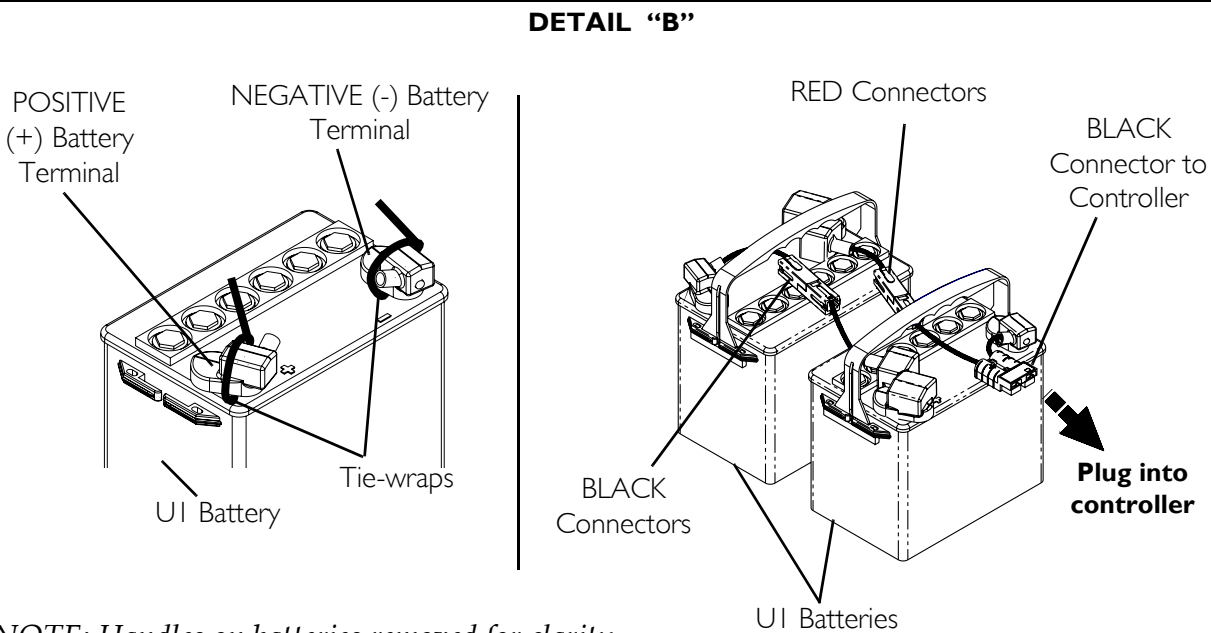
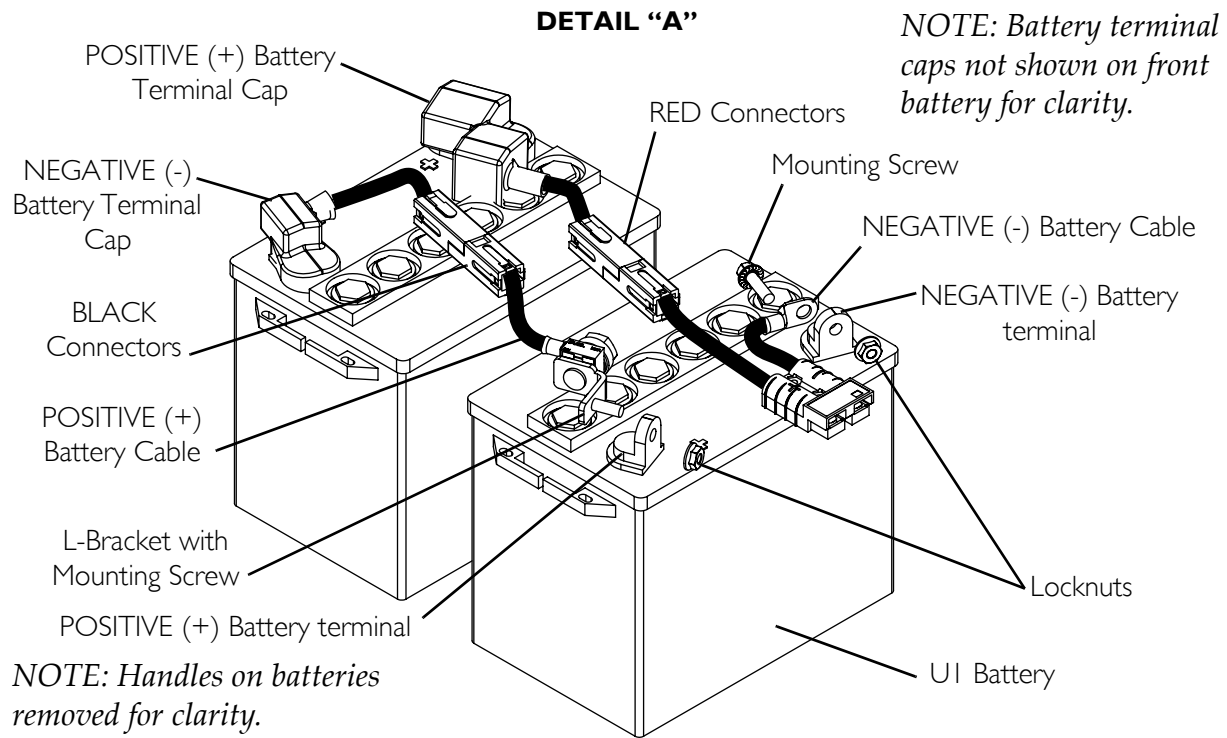


FIGURE 9.3 Connecting/Disconnecting Battery Cables

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.

NOTE: For this procedure, refer to FIGURE 9.3 on page 56.

1. Remove the batteries. Refer to Removing/Installing Batteries from/into Battery Tray on page 53.
2. Cut the tie-wrap that secures the battery terminal cap in place (Detail “B” of FIGURE 9.3).
3. Slide terminal caps up onto the battery cables (FIGURE 9.3).
4. Disconnect POSITIVE (+) battery cable from the POSITIVE (+) battery terminal (FIGURE 9.3).
5. Disconnect NEGATIVE (-) battery cable from NEGATIVE (-) battery terminal (FIGURE 9.3).

When to Charge Batteries

SPJ+ w/PSS and SPJ+ w/ACC Joysticks

NOTE: For this procedure, refer to FIGURE 9.4.

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

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

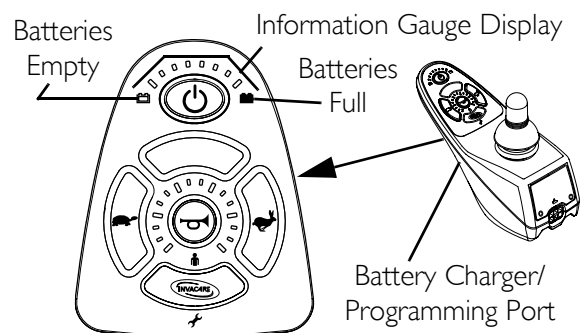


FIGURE 9.4 SPJ+ w/PSS and SPJ+ w/ACC Joysticks

MPJ+ Joystick

NOTE: For this procedure, refer to FIGURE 9.5.

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

At full charge, solid blocks fill in all ten segments between E (Empty) and F (Full). As the battery becomes discharged, the 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.

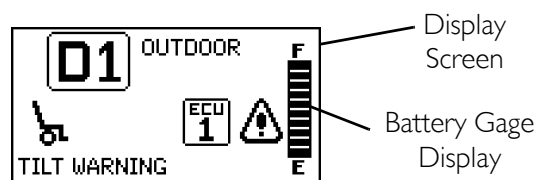


FIGURE 9.5 MPJ+ Joystick

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.

Battery Charger Operation

⚠ DANGER

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

⚠ 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 charger circuit breaker is tripping.

On-Board Battery Charger

⚠ DANGER

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

⚠ WARNING

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.

NOTE: For this procedure, refer to FIGURE 9.6 on page 60.

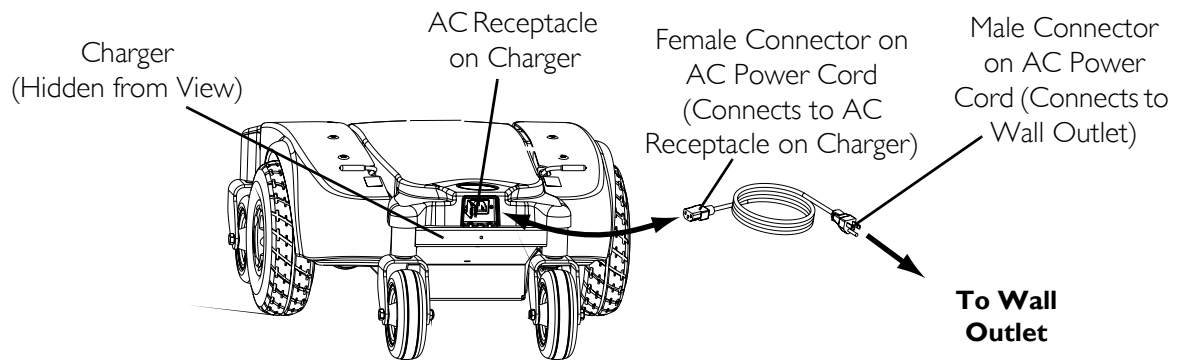
NOTE: The On/Off LED indicator light and the charger LED indicator light are located on the top of the charger on the rear of the wheelchair. Open rear shroud to view indicator lights.

NOTE: If the batteries are completely discharged, the charger will not charge them. Replace the batteries. Refer to Removing/Installing Batteries from/into Battery Tray on page 53.

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 is blinking RED, this is abnormal. Unplug AC power cord from the on-board battery charger and wall outlet. Charger may need to be replaced. Contact an Invacare dealer or qualified technician.
3. When the On/Off LED indicator light is Off, charger is Off.
4. When the Charge LED indicator light is YELLOW, the batteries are charging.
5. When the Charge LED indicator light is solid GREEN, the batteries are fully charged (as their condition will allow).
6. 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 |
|-----------------------|-------------|
| SOLID RED | Charger On |
| “BLINKING” RED | Abnormal |
| LED “OFF” | Charger Off |

| CHARGING INDICATOR | STATUS |
|--------------------|---------------|
| YELLOW | Charging |
| SOLID GREEN | Fully charged |

FIGURE 9.6 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 9.7.

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.

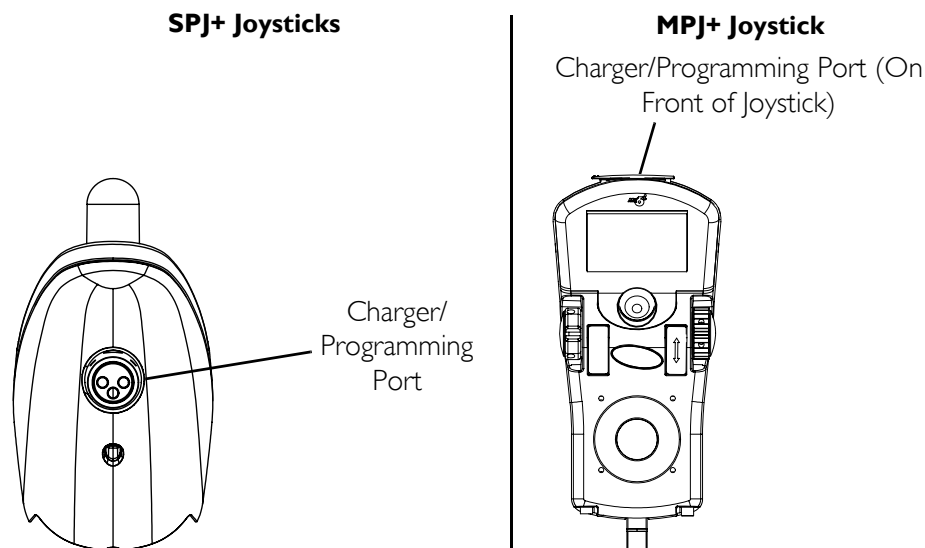


FIGURE 9.7 Charging Using An Independent Charger Plugged Into The Joystick

SECTION 10—TRANSPORT READY PACKAGE

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

⚠ 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.

Wheelchairs with adjustable seat angles **MUST** be set to 10°.

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.

⚠ WARNING

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

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 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. 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.

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. BOTH pelvic and upper-torso belts should be used to reduce the possibility of head and chest impacts with vehicle components.

Specifications

| MODEL | WHEELCHAIR WEIGHT LIMIT |
|-------|-------------------------|
| M51PR | Up to 300 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.

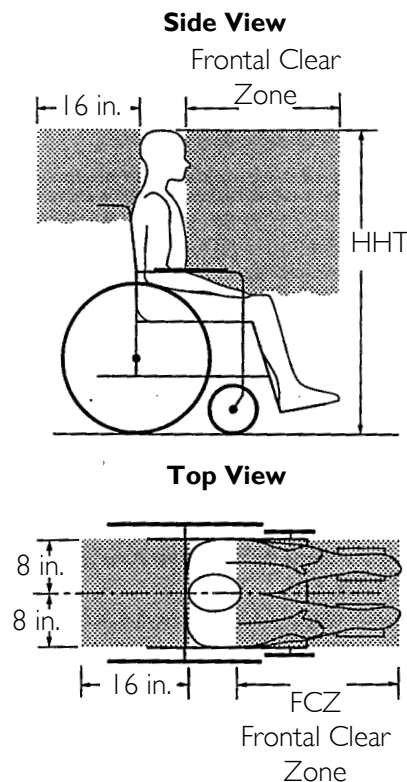
Frontal Clear Zones (FCZ) need to be **LARGER** when upper-torso belt(s) are **NOT** used.

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

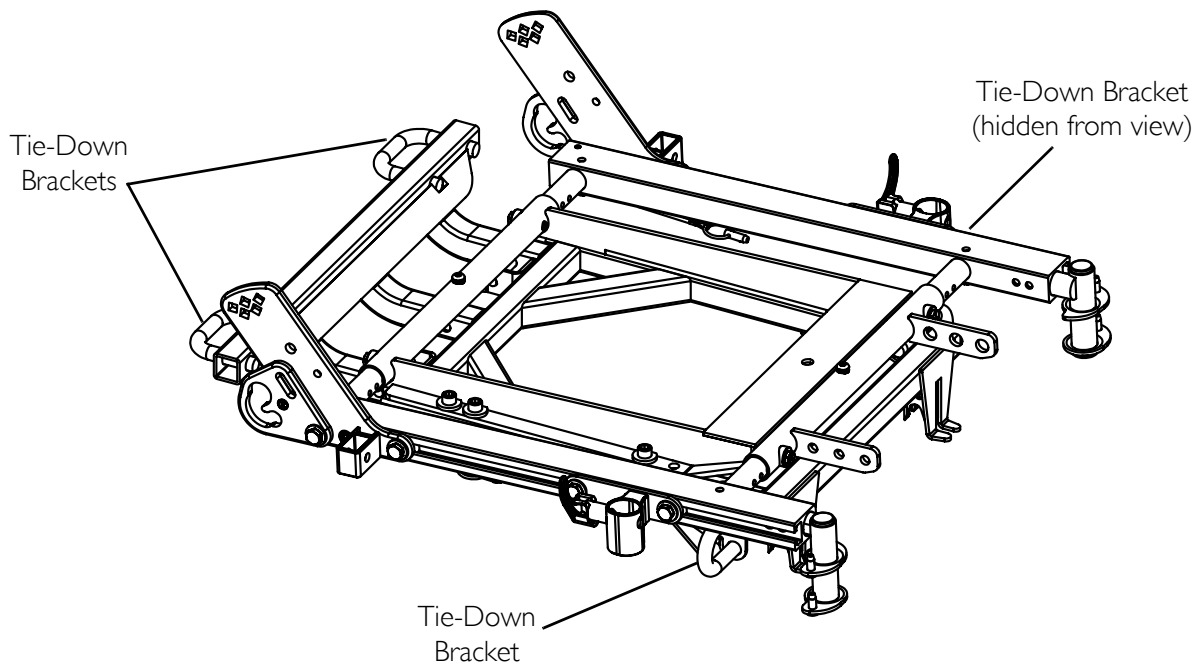


FIGURE 10.1 Securement Points

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 10.2.

The wheelchair has been provided with a pelvic belt which meets the requirements of ANSI/RESNA W/C 19.

The 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") into the large end of the slot in the belt mounting bracket. Rotate downward and forward until it snaps into place into the small end of the slot.

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

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

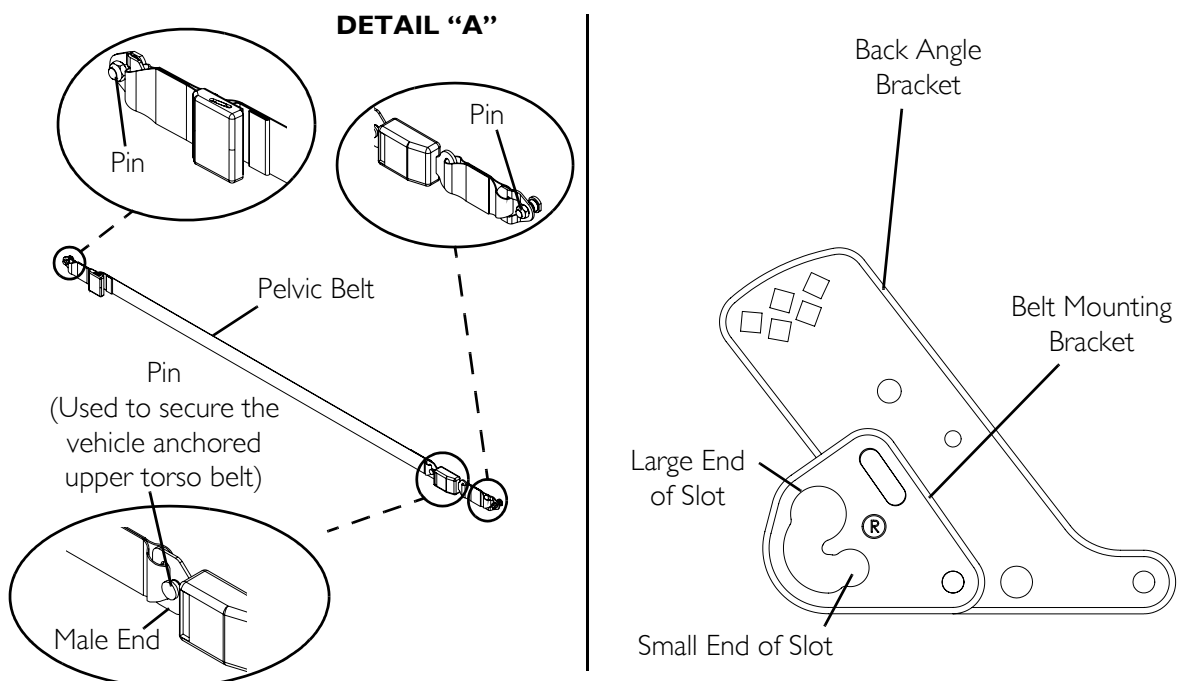


FIGURE 10.2 Wheelchair-Anchored Belts

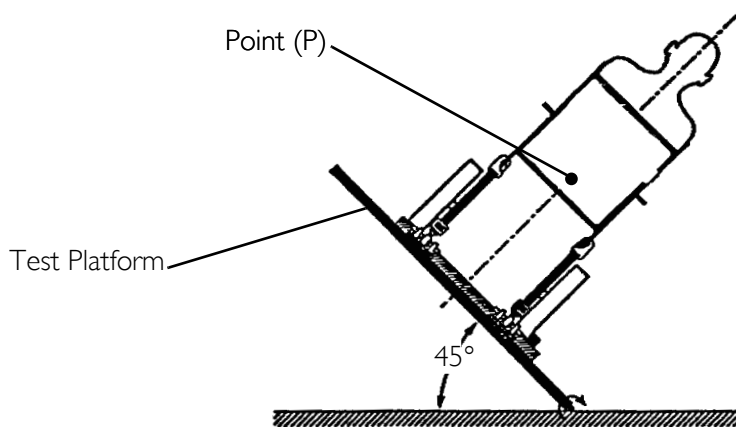
Vehicle-Anchored Belts

NOTE: For this procedure, refer to FIGURE 10.3.

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

| RATING | DESCRIPTION |
|----------|-------------|
| A | Excellent |
| B | Good |
| C | Fair |
| D | Poor |

The test for Lateral Stability Displacement for Point (P) is shown in FIGURE 10.3. The average test result for point (P) is 0.33-inches (8.4 mm).



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

FIGURE 10.3 Vehicle-Anchored Belts

Seating System

⚠ WARNING

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

Ensure that the factory installed seating system is secured to the wheelchair frame before operation. Refer to the seating system owner’s manual.

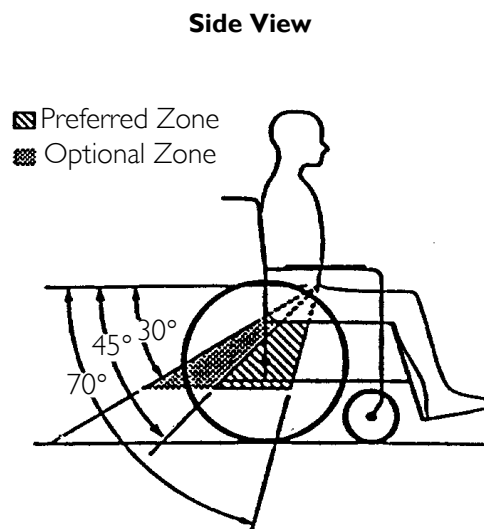
Positioning Belts

⚠ 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 10.4.

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 10.4 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 10.4 Positioning Belts

NOTES

NOTES

NOTES

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 all electronics and electrical components (excluding batteries), 2-pole and 4-pole motors, powered seating actuators and gearboxes to be free from defects in materials and workmanship for a period of one (1) year from the date of purchase from Invacare or a dealer, with a copy of the seller's invoice required for coverage under this warranty. Invacare warrants all batteries to be free from defects in materials and workmanship for a period of six (6) months from the date of purchase from Invacare or a dealer, with a copy of the seller's invoice required for coverage under this warranty. Invacare warrants all remaining components (excluding all upholstered materials, padded materials, tires and wheels) to be free from defects in materials and workmanship for a period of one (1) year from the date of purchase from Invacare or a dealer, with a copy of the seller's invoice required for coverage under this warranty. If within such warranty periods any such product component shall be proven to be defective, the product component shall be repaired or replaced, at Invacare's option. This warranty does not include any labor or shipping charges incurred in replacement part installation or repair of any such product. Invacare's sole obligation and your exclusive remedy under this warranty shall be limited to such repair and/or replacement.

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

LIMITATIONS AND EXCLUSIONS: THE FOREGOING WARRANTY SHALL NOT APPLY TO SERIAL NUMBERED PRODUCTS IF THE SERIAL NUMBER HAS BEEN REMOVED OR DEFACED, PRODUCTS SUBJECT TO NEGLIGENCE, ACCIDENT, IMPROPER OPERATION, MAINTENANCE OR STORAGE, COMMERCIAL OR INSTITUTIONAL USE, PRODUCTS MODIFIED WITHOUT INVACARE'S EXPRESS WRITTEN CONSENT (INCLUDING, BUT NOT LIMITED TO, MODIFICATION THROUGH THE USE OF UNAUTHORIZED PARTS OR ATTACHMENTS); PRODUCTS DAMAGED BY REASON OF REPAIRS MADE TO ANY COMPONENT WITHOUT THE SPECIFIC CONSENT OF INVACARE, OR TO A PRODUCT DAMAGED BY CIRCUMSTANCES BEYOND INVACARE'S CONTROL, AND SUCH EVALUATION WILL BE SOLELY DETERMINED BY INVACARE. THE WARRANTY SHALL NOT APPLY TO PROBLEMS ARISING FROM NORMAL WEAR AND TEAR OR FAILURE TO ADHERE TO THE PRODUCT INSTRUCTIONS. A CHANGE IN OPERATING NOISE, PARTICULARLY RELATIVE TO MOTORS AND GEARBOXES DOES NOT CONSTITUTE A FAILURE OR DEFECT AND WILL NOT BE REPAIRED; ALL DEVICES WILL EXHIBIT CHANGES IN OPERATING NOISE DUE TO AGING. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IN LIEU OF ANY OTHER WARRANTIES WHATSOEVER, WHETHER EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, AND THE SOLE REMEDY FOR VIOLATIONS OF ANY WARRANTY WHATSOEVER, SHALL BE LIMITED TO REPAIR OR REPLACEMENT OF THE DEFECTIVE PRODUCT PURSUANT TO THE TERMS CONTAINED HEREIN. THE APPLICATION OF ANY IMPLIED WARRANTY WHATSOEVER SHALL NOT EXTEND BEYOND THE DURATION OF THE EXPRESS WARRANTY PROVIDED HEREIN AND INVACARE SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES WHATSOEVER; SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGE, OR LIMITATION OF HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE EXCLUSION AND LIMITATION MAY NOT BE APPLICABLE.

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

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