



312 OWNER'S MANUAL



**ELECTRIC
MOBILITY** 

World Leader in Personal Independent Mobility
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■ General Warnings

Read and understand these Warnings and the entire manual before using your Power Chair. This unit may tip over if the following instructions are not followed.

NOTE: The anti-tip caster wheels may NOT prevent the powerchair from tipping if the powerchair is used improperly.

Warning!

Failure to follow these instructions may result in damage to the vehicle or serious injury

Read Carefully

1. **DO NOT** exceed the specifications of this unit, modify this unit in any way, or use the unit for other than a powerchair.
2. **DO NOT** operate this unit if your health or medications you are taking cause you to feel dizzy, affect your vision, or in any way impact your thought process, coordination, or ability to safely operate the unit. Check with your physician should you experience any of these symptoms.
3. **DO NOT** operate this unit after consuming any alcoholic beverages.
4. **DO NOT** transfer "on" or "off" the unit until it is turned "off", completely stopped, and when it is on a stable and level surface.
5. **DO NOT** attempt to ride over curbs or other obstruction higher than 1-1/2 inches.
6. **DO NOT** stop when going up an incline. If you must do so, always lean forward when you start to move. This will shift your center of gravity forward to prevent the unit from tipping over backwards.
7. **DO NOT** climb inclines that pose a concern for stability. The ability to climb or descend grades varies with the load rating of the powerchair. See the specification section for the maximum grade recommendation.
8. **DO NOT** drive across an incline or attempt to turn while on an incline.
9. **DO NOT** back down an incline or allow the unit to be backed down an incline.
10. **DO NOT** turn off the power while the unit is moving.
11. **DO NOT** operate on a ramp or incline unless the seat is in an upright position and the seatlift is in the lowest position.
12. **ALWAYS** remember vehicle capacity is limited to one occupant only. This unit is not approved for towing or for weight in excess of the published maximum.
13. **ALWAYS** drive straight up and down inclines.

14. **ALWAYS** turn the power off when the unit is not in use. This will not only extend the life of the battery but will keep the unit from being accidentally moved.
15. **ALWAYS** use a 3-prong grounded receptacle for the battery charger. If you must use an extension cord, use a UL approved 3-prong cord with 16 gauge wire.
16. **ALWAYS** reduce speed when making a turn.
17. **ALWAYS** use a positioning belt and keep arms and legs within the confines of the unit. Do not carry passengers or packages while operating the powerchair.
18. **ALWAYS** keep your feet on a footrest when operating the PowerChair.
19. **USE EXTRA CAUTION** when climbing inclines (ramps, hills, driveways, etc.)
20. **USE CAUTION** when braking on an incline or wet or slippery surfaces as the unit will take longer to come to a complete stop.
21. **USE CAUTION** when driving over soft, uneven or unprotected surfaces such as grass, gravel and decks.
22. **USE CAUTION** when operating the unit in bad weather or driving through water as moisture could affect the control system or other parts of the unit either temporarily or permanently.
23. **NEVER** hose off your PowerChair, use it in a shower or steam room, or allow it to come in direct contact with water.
24. **NEVER** charge batteries that may be frozen.
25. **SET** the speed control knob according to your driving ability and the environment in which you are going to operate it. We recommend that you keep the speed at the slowest (fully counter-clock-wise) until you are familiar with the driving characteristics of this vehicle.
26. **NEVER** occupy your PowerChair when transporting it in a motor vehicle. When transporting, make sure it is securely strapped with an approved tie-down system.
27. **NEVER** drive on the roadway. Leave and join sidewalk curb-cuts perpendicular to the road. Always cross street intersections via the most direct route and make sure that you are visible to traffic.
28. **NEVER** use electronic radio transmitters such as CB's, walkie-talkies, portable computers or cellular phones while using the vehicle without first turning the vehicle off.

■ Electromagnetic Interference (EMI) from Radio Wave Sources

The rapid development of electronics, especially in the area of communications, has saturated our environment with electromagnetic (radio) waves that are emitted by television, radio and communication signals. These EM waves are invisible and their strength increases as one approaches the source. All electrical conductors act as antennas to the EM signals and, to varying degrees, all powerchairs and scooters are susceptible to electromagnetic interference (EMI).

This interference could result in abnormal, unintentional movement and/or erratic control of the vehicle. The United States Food and Drug Administration (FDA) suggests that the following statement be incorporated to the user's manual for all powerchairs.

Powerchairs 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 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 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 the "immunity level." The higher the immunity level, the greater the protection. At this time, current technology is capable of providing at least 20V/m of immunity level, which would provide useful protection against common sources of radiated EMI.

Following the warnings listed below should reduce the chance of unintended brake release or powerchair movement that could result in serious injury:

- 1) Do not turn on hand-held personal communication devices such as citizens band (CB) radios and cellular phones while the powerchair 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 powerchair off as soon as it is safe.
- 4) Be aware that adding accessories or components, or modifying the powerchair, may make it more susceptible to interference from radio wave sources. (Note: there is no easy way to evaluate their effect on the overall immunity of the powerchair).
- 5) Report all incidents of unintended movement or brake release to the powerchair retailer, and note whether there is a radio wave source nearby.

TURN OFF YOUR POWERCHAIR AS SOON AS POSSIBLE WHEN EXPERIENCING THE FOLLOWING:

1. Unintentional motions.
2. Unintended or uncontrollable direction.
3. Unexpected brake release.

The FDA has written to the manufacturers of power wheelchairs, asking them to test their new products to be sure they provide a reasonable degree of immunity against EMI. This letter says that powered wheelchairs should have an immunity level of at least 20V/m, which provides a reasonable degree of protection against the more common sources of EMI. The higher the level, the greater the protection.

Your power chair has an immunity level of 20V / m which should protect against EMI.

■ Environmental Conditions

Environmental conditions may affect the safety and performance of your powerchair. Water and extreme temperatures are the main elements that can cause damage and affect the performance.

A) Rain, Sleet and Snow

If exposed to moisture, your powerchair is susceptible to damage of electronic or mechanical components. Water will cause electronic malfunction or promote premature corrosion of electrical and frame components.

B) Temperature

Some parts of the power chair are susceptible to changes in temperature. At extremely low temperatures, the batteries may freeze, and your power chair may not be able to operate. In extremely high temperatures, it may operate at slower speeds due to the controller safety feature to prevent damage to the motors and other electrical components.

■ Terminology

Component Identification

Your power chair consists of the following components shown in Figures 1a and 1b.

Figure 1a



Figure 1b



1. Joystick Controller
2. Armrests
3. Cover
4. Footrest
5. Front Caster
6. Drive Wheel
7. Controller Harness Connector
8. Seat-Lock Lever
9. Free-Wheel Levers
10. Side Net Bag

EMC Part No: 55079100 Rev 02

■ Definitions

Joystick Controller The device used to control power chair movements.

Armrests Where arms rest while on the power chair.

Cover Plastic piece that covers the power chair base.

Footrest Where feet rest while on the power chair.

Caster Wheel The front wheels that swivel.

Drive Wheel The large main wheels that move the power chair.

Controller Harness Connector Connects joystick controller to the power module located in the power chair base.

Seat-Lock Lever Secures seat to seat-post and prevents rotation or removal of seat unless the seat-lock lever is raised.

Free-Wheel Levers L-Shaped levers at the top rear part of the cover.

Free-Wheel Levers

Your power chair is equipped with two free-wheel levers. These levers allow you to disengage the drive motors and maneuver the chair manually.

Warning!

The power chair brakes are part of the drive motors. Do not disengage the motors unless an attendant is present because there are no brakes when the motors are disengaged. Additionally, do not disengage the drive motors when the power chair is on an incline, as the chair could roll down on its own, causing injury.

To engage or disengage the drive motors:

1. Turn the free-wheel levers outward to disengage the motors.

2. Turn the free-wheel levers toward the back of the power chair to engage the drive motors.

Assembly and Disassembly

Your power chair is shipped partially disassembled to maximize its protection during shipment. Please follow the steps below to assemble it for use:

Components:

- Base
- Cover
- Seat assembly
- Controller/bracket
- Batteries (2)

Assembly:

Components are installed on the base in the following order.

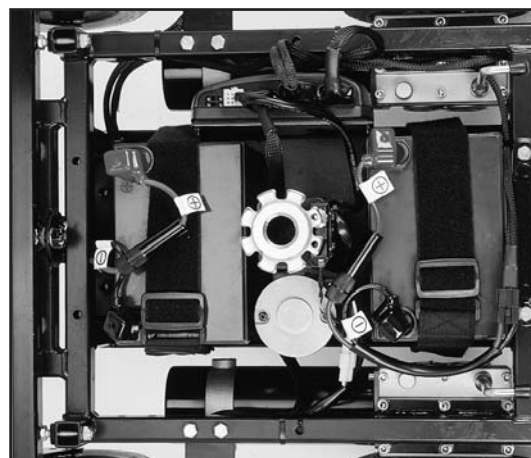
A) Install Batteries

1. Place the batteries in your power chair with the terminals of each battery inward towards the seat post. Be sure the positive (+) contact of each battery is adjacent to the negative (-) of the other battery, as shown in Figure 2.

Note: Please seek help if you cannot lift the battery by yourself.

2. Connect positive (+) battery terminals (red), one at a time using the screws, washers and nuts provided.
3. Connect negative (-) battery terminals (black), one at a time.

Figure 2



4. Plug-in the color-coordinated connectors (batteries and motors).
5. Cover the battery posts with the colored caps.

B) Install the cover

1. Slide the main controller cable through the seat pedestal hole as shown in Figure 3.
2. The cover should also slide over the motor free-wheeling levers which should be in the engaged position (pointing rearward).
3. Secure the cover to the base with the attached Velcro strips.



Figure 3

C) Install the Seat:

1. Pull up the seat-lock lever up, see Figure 4.
2. Slide the seat post stem (bottom of seat) into the seat pedestal. The seat-lock lever must be raised before it contacts the pedestal and released after the seat is fully down.
3. Be sure to swivel the seat and push down until the seat-lock engages in place on the pedestal, then release the seat-lock lever as shown in Figure 5.

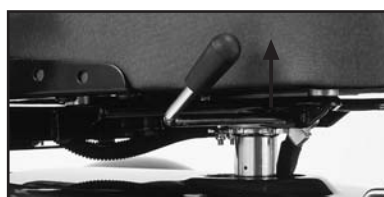


Figure 4



Figure 5

Warning!

Be sure the seat-lock is engaged. To check attempt to rotate the seat back and forth-it should not rotate. If it rotates, lift the seat to eliminate the contact between the bottom of the seat-lock and the pedestal, then lift up the seat-lock lever and lower the seat onto the pedestal again before releasing the seat lock lever.

D) Install Armrests:

1. Loosen the screws on the horizontal armrest receivers with an allen wrench see Figure 6
2. Slide armrest tubes into the horizontal armrest receivers.
3. Adjust to desired width and tighten set screws with the allen wrench.
4. Set armrest height as follows:
 - a. Loosen knobs on vertical armrest holder
 - b. Insert the armrests into the vertical receivers
 - c. Adjust to desired height and securely tighten knobs



Figure 6

E) Secure Control Cable

1. Attach the Joystick harness to armrest as shown in Figures 7.
2. The cable should be located on the inside of the armrest to avoid snagging objects during operation of the power chair.
3. Check operation of the swing-away bracket and adjust the cable if necessary.



Figure 7

Positioning Belt, Joystick & Joystick Cable Installation

The normal position for the joystick is on the right side. In this position the swing away arm will move the joystick outward. Alternately, the joystick may be positioned on the left side. However, when in the left side position, the swing away arm will swing the joystick inward.

After determining on which side the joystick will be positioned, attach the positioning belt(loop attachment type) as shown in Figure 6. The positioning belt loop is slid on the armrests prior to inserting the armrest into the armrest bottom mounting tube.

For positioning belts that have a hole instead of a loop, remove the rear seat base bolts then slide belt end between seat base and seat, align hole in end of belt with hole in base, then insert and tighten bolts.

Insert the armrest, obtain a comfortable armrest height and tighten the adjustment knobs. Make sure all adjustment knobs and set screws used to attach the armrests are tight.

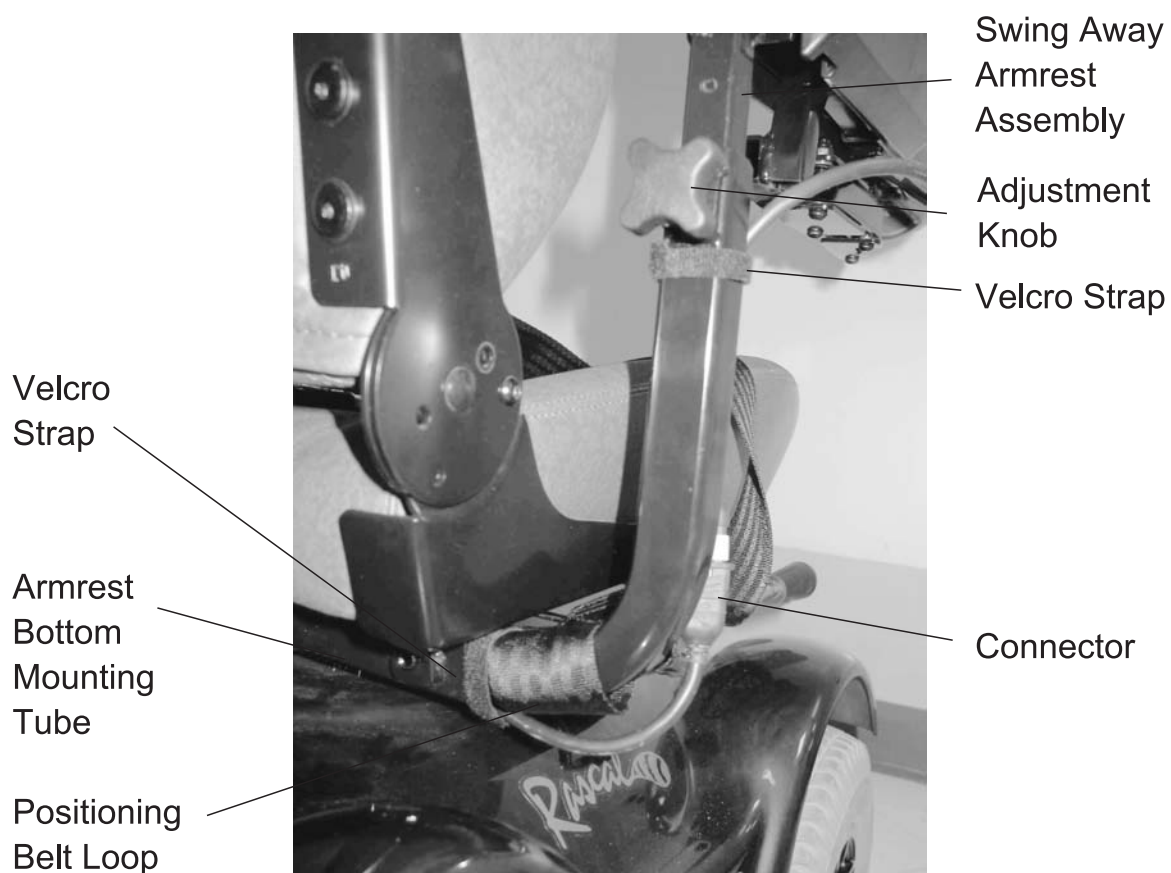


Figure 6 (right hand shown)

The velcro straps in the bag with this instruction are to secure the joystick cable to the powerchair as shown in the photos. The velcro strap is attached around the cable and seat bottom mounting tube as shown in Figure 6 and 7.

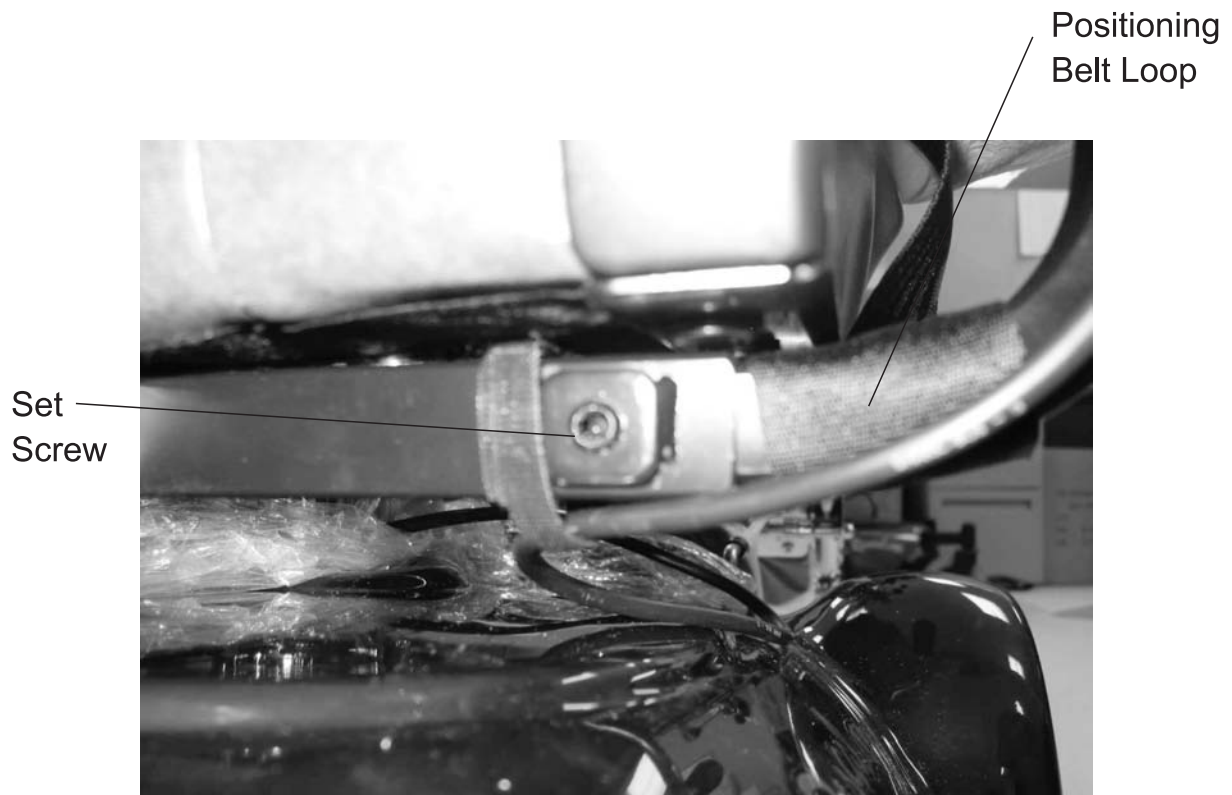


Figure 7

The velcro strap by the knob in Figure 6 is used for mounting the joystick cable to the left armrest. The velcro can be used to attach the cable for right mounted joystick if clip is not supplied.

To remove the chair assembly from the base remove the Velcro shown in Figure 7 and unplug the connector shown in Figure 6.

■ Comfort Adjustments

Two types of seats are available for the power chair. Standard is a non-recline with a fixed, but adjustable, seat-back angle. An optional recline seat provides a lever to easily adjust the seat-back angle to a maximum adjustable position.

Seat-back Angle

The fixed or maximum seat-back angle can be set to one of four positions;

1. Seat-back vertical (90 degrees)
2. Seat-back 10 degrees reclined (100 degrees)
3. Seat-back 15 degrees reclined (105 degrees)
4. Seat-back 30 degrees reclined (120 degrees)

For best forward visibility and vehicle stability, it is recommended that the most forward seat-back angle, that provides adequate operator comfort, be used.

Setting the Seat-back Angle

1. A screw is positioned through a hole in the seat-back bracket that limits the backward motion of the seat-back. The left side seat-back bracket is imprinted with the stop angles. Observe the current stop angle.
2. Remove the nut and screw from both brackets.
3. Position the seat-back to obtain a clear through hole at the desired angle.
4. Insert the screws through the holes and secure a nut on each screw.

Seat Height Adjustments

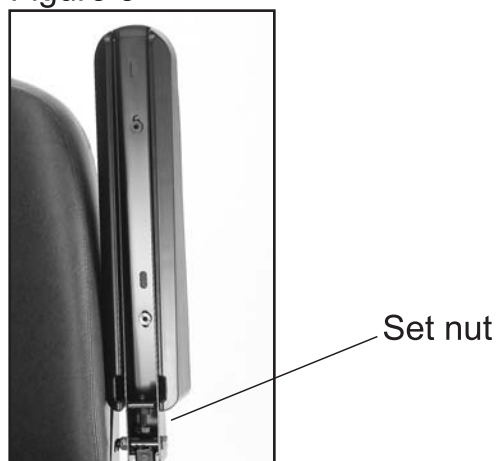
For power chairs with the seatlift option, refer to the Seatlift section of the manual. For the standard manual height adjustment, use the following steps:

1. Disconnect the joystick controller cable connector and remove the seat and cover from the base. This exposes the seat flower.
2. Remove the bolt holding the flower in the mounting tube.
3. The flower post has multiple holes with about 1" increments that can be lined up with the hole in the mounting tube.
4. Select the desired height by lining up the appropriate flower post and mounting tube holes, insert the bolt and secure the nut on the bolt.
5. Replace the cover and seat, then reconnect the joystick controller cable connector.

■ Armrest Angle Adjustment

1. Flip up the armrest.
2. Turn the armrest adjustment screw, shown in Figure 8, clockwise to lower the end of the armrest or counter-clockwise to raise the end of the armrest.
3. Lower the armrest to check the angle, repeat until desired angle is obtained.

Figure 8



■ Footrest Adjustments

Footrest Height Adjustment

1. Disconnect the joystick controller cable connector, then remove the seat and cover.
2. Using a 10 mm allen wrench, remove the bolts and nuts.
3. Slide the platform to the desired height.
4. Replace both bolts and tighten the nuts securely.
5. Replace the cover and seat, then reconnect the joystick controller cable connector.

Footrest Angle Adjustment

1. Flip up the footrest and loosen the nut on the adjustment screw (the seat and cover do not need to be removed).
2. With an allen wrench, turn the adjustment screw counter-clockwise to increase the angle or clockwise to decrease it.
3. Retighten the nut and return the footrest to the down position.

■ Headrest Adjustment

1. To free the headrest press the tab located on the left slide collar inward.
2. Raise or lower the headrest to the desired height.
3. Release the tab and insure that the collars have engaged at set of the height adjustment grooves on the headrest posts.

■ Joystick Controller Adjustments

Joystick Position Adjustment

1. Flip up the armrest for easy access.
2. Loosen the bracket bolt with an allen wrench.
Slide the joystick controller in or out to the desire position. See Figure 9.
3. Re-tighten the bolt.

Figure 9



Re-Position Joystick Controller to the other side.

1. Disconnect the joystick controller cable connector and disconnect wire from clip on armrest tube.
2. Loosen both vertical armrest knobs and remove both armrests.
3. Exchange both armrests and re-tighten the knobs.
4. Re-connect the joystick controller cable connector and connect wire to clip on armrest tube.

Changing Drive Position (FWD/RWD)

To change from front wheel drive (FWD) to rear wheel drive (RWD) or vice-versa, lift up the seat-lock lever and rotate the chair 180 degrees. The two positions are shown in Figures 9a and 9b below.



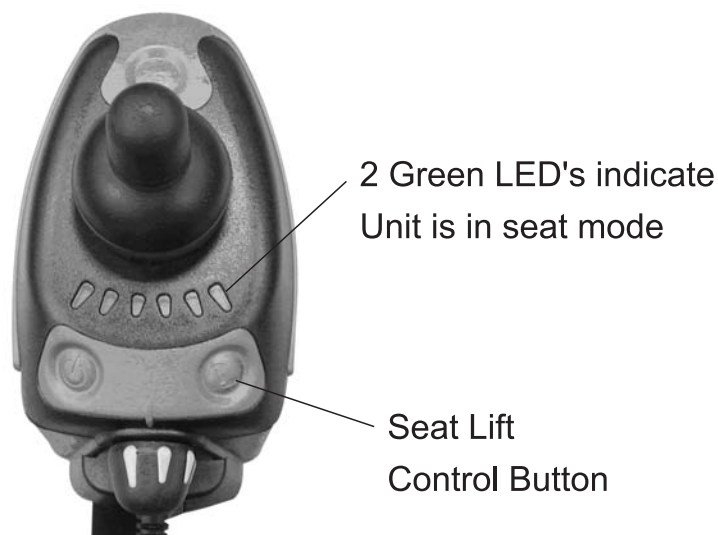
Figure 9a



Figure 9b

■ Seat Lift System (Optional)

Figure 10



Using the Seat Button

Press the Seat button, shown in Figure 10, to toggle the control unit between Drive and Seat Modes.

When in Drive Mode, the Battery Gauge displays the current battery capacity and the joystick controls the vehicle movement .

When in Seat Mode the two Green Battery Gauge LEDs next to the Seat button light to indicate the control unit is in Seat Mode (See photo). Moving joystick now controls the seat lift function.

Press the seat button again to toggle from the Seat mode back to the Drive Mode.

Safety Considerations

Do not move the power chair if the seat is not in the lowest position.

WARNING!

Do not move the power chair unless the seat is in the lowest position.

■ Operating Your Power Chair

Make sure that you have and understood this entire manual before operating this PowerChair. Call Electric Mobility Customer Service with any questions.

Transferring in from Front

- Make sure the unit is on a level surface and the controller is turned off.
- Make sure the seat is facing forward and verify that it is locked by trying to rotate it back and forth.
- Make sure that the motor engaging levers on the base are facing the back of the PowerChair (drive mode).
- Insure the brakes are engaged by trying to push the PowerChair manually. If it rolls, the brakes are not activated. Re-engage the motor levers and check again.
- Carefully turn your back to the unit, and using your arms for support on the armrest, gently lower yourself onto the seat. If you need assistance to transfer onto the unit, have an assistant locate themselves in front or alongside of you depending on which position they find safer.

Transferring in from Side

- Make sure the unit is on a level surface and the controller is turned off.
- Raise the seat-lock lever and rotate the seat to face the side you want to enter as shown in Figure 11. Verify that the seat is locked by trying to rotate it back and forth.



Figure 11

- Insure the brakes are engaged by trying to push the PowerChair manually. If it rolls, the brakes are not activated. Re-engage the motor levers and check again.
- Carefully turn your back to the unit, and using your arms for support on the armrest, gently lower yourself onto the seat. If you need assistance to transfer onto the unit, have an assistant locate themselves in front or alongside of you depending on which position they find safer.

WARNING!

Never operate your PowerChair without your feet on the footrest. Driving the unit without your feet on the footrest could result in bodily harm.

■ **Manual (Push) Mode**

To activate the manual mode, turn both of the motor levers outward. When the unit is in manual mode, you will have no brakes.

Your PowerChair features a "free-wheel" mode for attendant assisted operation. You will be unable to drive the unit. The two positions of the motor engaging levers are shown in Figures 12a and 12b.



Figure 12a



Figure 12b

WARNING!

Never sit in your unit if it is in "free-wheel" mode on an incline.

This manual includes instructions for both the VR2 and Shark Joysticks. Please note which joystick your unit is equipped with and refer to the appropriate instructions.

The Standard Joystick Controller Unit

All user controls can be accessed from the ergonomically designed control unit shown in Figure 13.

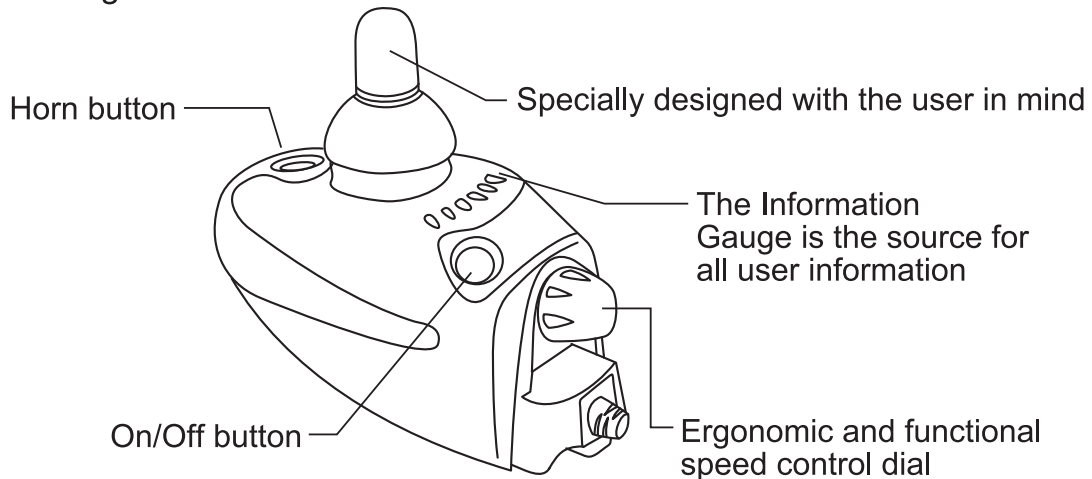
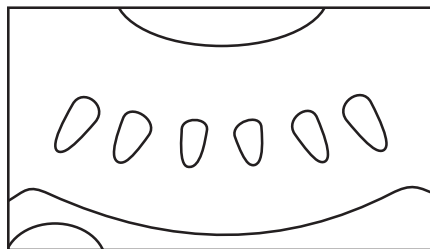


Figure 13

The Information Gauge



The Information Gauge is the primary source of user feedback. It displays every possible status that may have, including;

- Power ON

True state-of-battery-charge, including notification of when the battery desperately requires charging.

- **Any green** LEDs lit indicates well-charged batteries.

- If only **amber and red** LEDs are lit, the batteries are moderately charged. Recharge before undertaking a long trip.

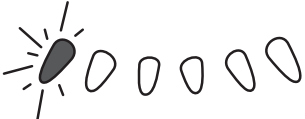
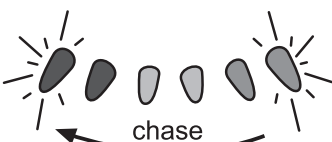
- If **only red** LEDs are lit, the batteries are running out of charge. Recharge as soon as possible.

- Lock Mode countdown

- Program, inhibit or charge modes

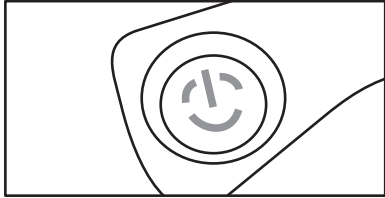
- Fault indication (Flash Codes)

The following table indicates what the gauge will display for any given state.

Display	Description	Meaning	Notes
	All LED's OFF	Power is OFF	
	All LED's ON steady	Power is ON	Less LED's imply a reduced battery charge.
	Left RED LED is flashing	Battery charge is low	The batteries should be charged as soon as possible.
	Right to left 'chase'	Controller coming out of Lock mode	To unlock, press the Horn button twice with in 10 seconds.
	Left to right 'chase' alternating with steady display	Controller is in inhibit, or charging mode	The steady LED's indicate the current state of battery charge.
	Right GREEN LED is flashing	Controller is in speed limit mode	The current state of battery charge will be displayed at the same time.
	All LED's flashing slowly	Controller has detected an Out Of Neutral At Power Up condition	Release the joystick back to neutral.
	All LED's flashing quickly	Controller has detected a fault	SHARK uses Flash Codes to indicate faults. Refer to the Diagnostics section for further information about fault diagnostics.

■ Turning the Controller ON/OFF

Turning the Power ON

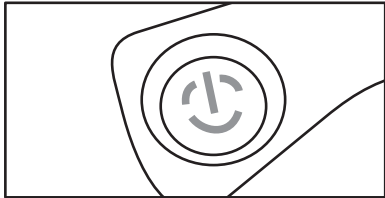
	Press the Power button. All indicators will light briefly. Either the current battery charge or Lock Mode will then be indicated.
---	--

If the controller is turned on while the joystick is out of neutral, a fault will be displayed. Refer to the previous table. Release the joystick back to neutral and the fault will disappear.

"Out Of Neutral At Power Up" is a feature that prevents driving if the joystick is out of neutral when the powerchair is turned on or an inhibit condition is removed.

This feature prevents sudden and unexpected powerchair movements.

Turning the Power OFF

	Press the Power button. The LEDs will turn off.
---	---

Alternatively, the controller may be placed into a Lock Mode. This may be preferable to turning the power off if leaving the powerchair at a place where unauthorized persons may attempt to use the powerchair.



The Power button can also be used to turn the controller off in case of an emergency.

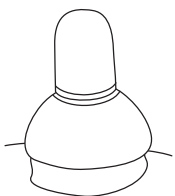
Sleep Mode

The controller is programmed with a Sleep Feature that will automatically turn the controller off if the joystick has not been moved after a certain period of time.

	After a certain amount of time with no joystick movement the controller will automatically turn itself off. Any button pressed or joystick movement will bring the system out of sleep mode.
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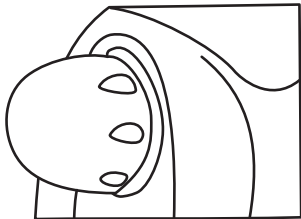
The controller may enter Sleep Mode while charging the batteries. This will not affect charging.

Driving

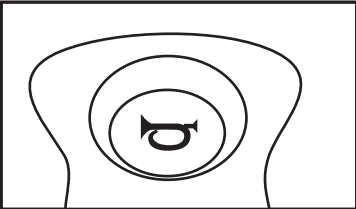
	Moving the joystick will cause the powerchair to drive in that direction. The amount of joystick movement will determine the speed that the powerchair will move in that direction.
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For safety reasons joystick movements are ignored when the controller is first turned on. The Information Gauge will slowly flash to indicate this.

Simply release the joystick back to the neutral position and the error will disappear.

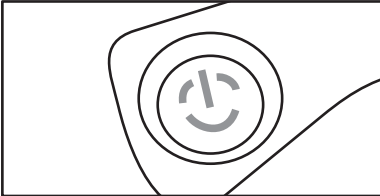
	A user may adjust the top speed of their powerchair to suit their preference or environment by turning the speed control dial. Simply turn the dial fully clockwise to travel at top speed when the joystick is pushed fully forward. The top speed progressively reduces as the dial is turned counter-clockwise.
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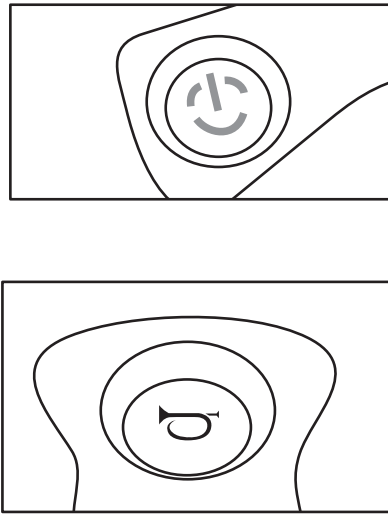
Using The Horn

	Press the Horn button. The horn will sound for as long as the button is pressed.
---	--

Locking Controller

The controller has a Lock Feature that prevents unauthorized people from turning the controller on.

	To Lock While the power is ON, press and hold the Power button for 2 seconds. The display will turn off immediately. After 2 seconds all LEDs will flash briefly and the horn will sound a short beep. The powerchair will then turn off.
--	--

	To Unlock While locked, press the power button to turn on. All LEDs will flash briefly The LEDs will then perform a slow right-to-left countdown. Press the Horn button twice before the countdown is completed (approximately 10 seconds). The current state-of-charge will then be displayed and the controller may be operated normally.
---	---

If the user does not press the Horn button twice before the countdown is complete, the Horn will sound a short beep and the controller will turn itself off.

The unlock sequence must be completed successfully before the controller will operate again normally.

Diagnostics

Components are not user serviceable. Specialized tools are necessary for the repair of any component.

Introduction

A flashing Information Gauge indicates there is an abnormal condition somewhere on the powerchair. The components that the information gauge provides fault information for include: the motors, the brakes, the batteries, the cabling and the modules themselves.

Note that joystick Out Of Neutral At Power Up is not a fault. Simply by removing your hand from the joystick and allowing it to return to the neutral position, off will immediately clear.

If the condition persists after removing your hand, the joystick may be damaged. Contact Customer Service at 1-800-257-7955.

The nature of the abnormal condition is indicated by a flash code. This is a sequence of flashes, separated by a pause, followed by a repetition of the sequence. The number of flashes relates to the condition. For instance, four flashes of the Information Gauge, a pause, followed by four flashes, etc. indicates a right motor fault. Five flashes would indicate a left brake fault.

Depending on the severity of the condition, the powerchair may or may not allow driving. In some cases the chair may be allowed to drive but in a reduced speed ('limp') mode.

Flash Codes

Flash codes indicate the nature of an abnormal condition directly from the Information Gauge.

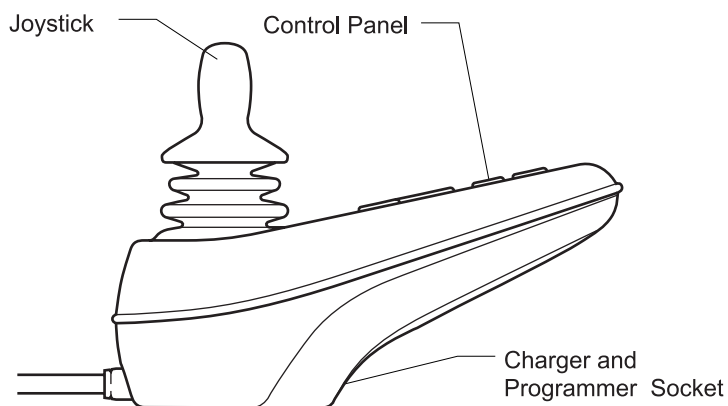


Flash Code	Description	Remark
1	User Fault	Possible stall timeout user error. Release the joystick to neutral and try again.
2	Battery Fault	Check the batteries and cabling. Try charging the batteries. Batteries may require replacing.
3	Left Motor Fault	Check the left motor, connections and cabling.
4	Right Motor Fault	Check the right motor, connections and cabling.
5	Left Brake Fault	Check the left park brake, connections and cabling.
6	Right Barke Fault	Check the right brake, connections and cabling.
7	Control Unit Fault	Check the Communications Bus connections and wiring. Replace the Control Unit.
8	Power Module Fault	Check connections and wiring. Replace the Power Module.
9	Communications Fault	Check connections and wiring. Replace the Control Unit.
10	Unknown Fault	Check all connections and wiring. Contact EMC customer service.

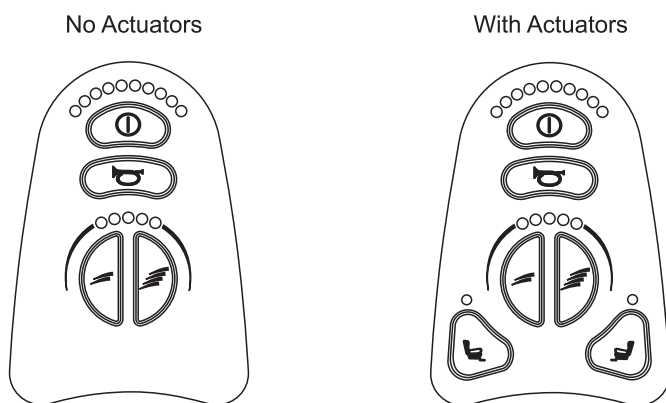
■ VR2 Controller Operation:

The VR2 control system has two versions of the front control panel - with and without actuator control. Most of the controls are common to both versions, however, the actuator buttons are only included on VR2 control systems with seat actuator control. Each of the controls is explained within this section.

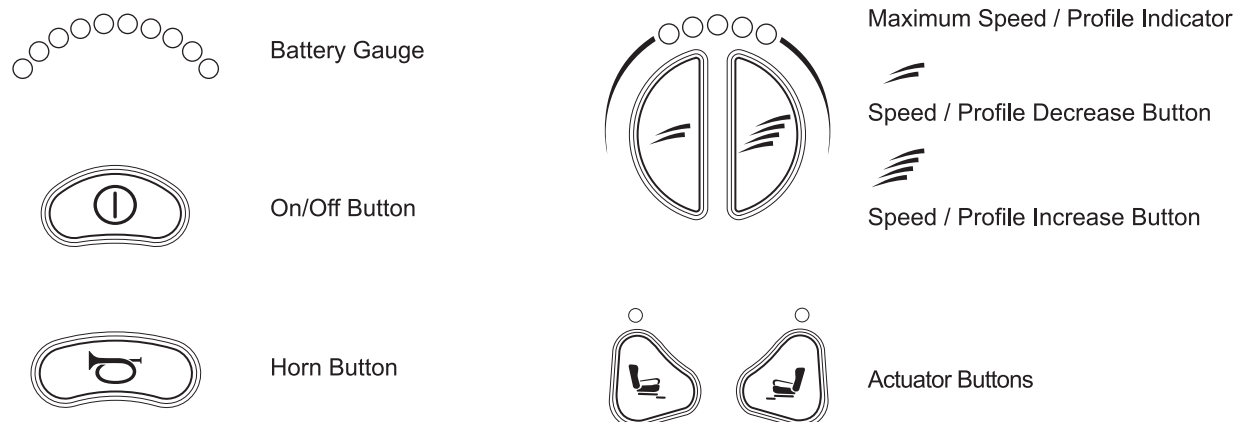
VR2 USER CONTROLS



Front Control Panel Details



VR2 CONTROL BUTTONS



On/Off Button and Battery Gauge

The on/off button applies power to the control system electronics, which in turn supply power to the wheelchair's motors. Do not use the on/off button to stop the wheelchair unless there is an emergency. (If you do, you may shorten the life of the wheelchair drive components).

The battery gauge shows you that the wheelchair is switched on. It also indicates the operating status of the wheelchair. Details are given in section 1.

1 Control System Status Indication

The battery gauge and maximum speed / profile indicator show the status of the control system.

A number of supposedly defective control systems returned to us are subsequently found to operate correctly. This indicates that many reported faults are due to wheelchair problems rather than the control system.

1.1 Battery Gauge is Steady

This indicates that all is well.

1.2 Battery Gauge Flashes Slowly

The control system is functioning correctly, but you should charge the battery as soon as possible.

1.3 Battery Gauge steps Up

The wheelchair batteries are being charged. You will not be able to drive the wheelchair until the charger is disconnected and you have switched the control system off and on again.

1.4 Battery Gauge Flashes Rapidly (even with the joystick released)

The control system safety circuits have operated and the control system has been prevented from moving the wheelchair.

This indicates a system trip, i.e. the VR2 has detected a problem somewhere in the wheelchair's electrical system. Please follow this procedure.

- Switch off the control system.
- Make sure that all connectors on the wheelchair and the control system are mated securely.
- Check the condition of the battery.
- If you can't find the problem, try using the self-help guide given in section 1.6.
- Switch on the control system again and try to drive the wheelchair. If the safety circuits operate again, switch off and do not try to use the wheelchair.

Contact your service agent.

1.5 Self-Help Guide

If a system trip occurs, you can find out what has happened by counting the number of bars on the battery gauge that are flashing.

Below is a list of self-help actions. Try to use this list before you contact your service agent. Go to the number in the list which matches the number of flashing bars and follow the instructions.

If the problem persists after you made the checks described above contact your service agent.

* If the programmable parameter, Motor Swap has been enabled, then left and right hand references in this table will need transposing.

1 Bar 	The battery needs charging or there is a bad connection to the battery. Check the connections to the battery. If the connections are good, try charging the battery.
2 Bar 	The left hand motor* has a bad connection. Check the connections to the left hand motor.
3 Bar 	The left hand motor* has a short circuit to a battery connection. Contact your service agent.
4 Bar 	The right hand motor* has a bad connection. Check the connections to the right hand module.
5 Bar 	The right hand motor* has a short circuit to a battery connection. Contact your service agent.
6 Bar 	The wheelchair is being prevented from driving by an external signal. The exact cause will depend on the type of wheelchair you have, one possibility is the battery charger is connected.
7 Bar 	A joystick fault is indicated. Make sure that the joystick is in the center position before switching on the control system.
8 Bar 	A control system fault is indicated. Make sure that all connections are secure.
9 Bar 	The parking bakes have a bad connection. Check the parking brake and motor connections. Make sure the control system connections are secure.
10 Bar 	An excessive voltage has been applied to the control system. This is usually caused by a poor battery connection. Check the battery connections.
7 Bar + S 	A comunication fault is indicated. Make sure that joystick cable is securely connected and not damaged.
8 Bar + A 	An Actuator trip is indicated. If more than one actuator is fitted, check which actuator is not working correctly. Check the actuator wiring.

1.6 Slow or sluggish movement

If the wheelchair does not travel at full speed or does not respond quickly enough, and the battery condition is good, check the maximum speed setting. If adjusting the speed setting does not remedy the problem then there may be a non-hazardous fault.

Contact your service agent

1.7 Maximum Speed / Profile Indicator is Steady

The display will vary slightly depending on whether the control system is programmed to operate with drive profiles.

1.7.1 Maximum Speed Indication

The number of LEDs illuminated shows the maximum speed setting. For example, if the setting is speed level 4, then the four left hand LEDs will be illuminated.

1.7.2 Profile Indication

The LED illuminated shows the selected drive profile. For example, if drive profile 4 is selected, then the fourth LED from the left will be illuminated.

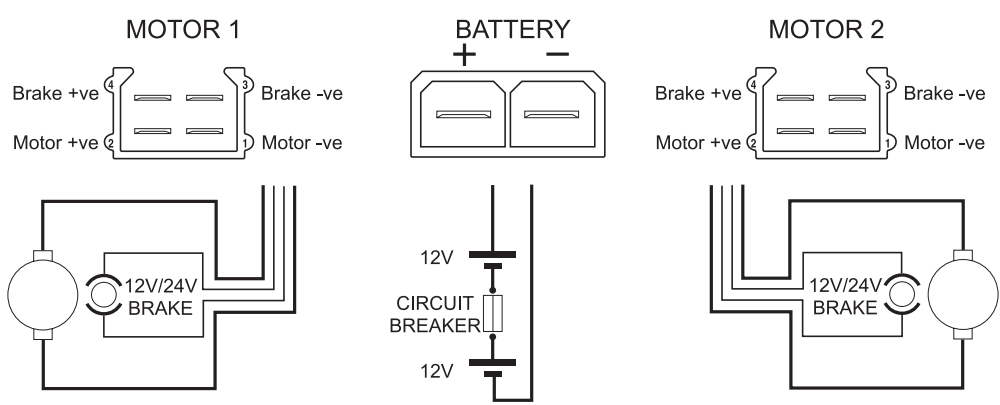
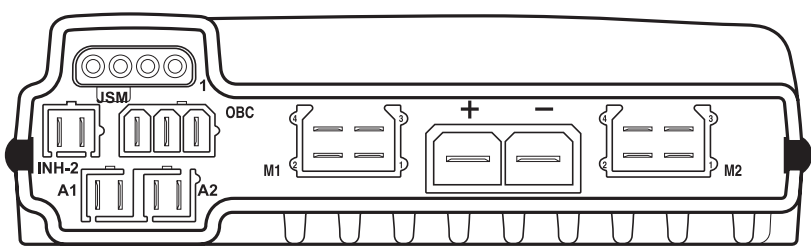
1.8 Maximum Speed / Profile Indicator Ripples Up and Down

This indicates the control system is locked.

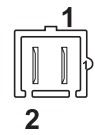
1.9 Maximum Speed / Profile Indicator Flashes

This indicates the speed of the wheelchair is being limited for safety reasons. The exact reason will depend on the type of wheelchair, however, the most common cause is that the seat is in the elevated position.

VR2 POWER MODULE CONNECTIONS

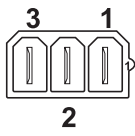


INHIBIT 2



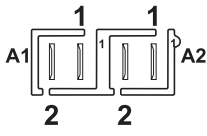
INH-2	Function
1	0V
2	Inhibit 2

ON-BOARD CHARGER



OBC	Function
1	Battery +ve
2	Inhibit 3
3	0V

ACTUATORS



Joystick Movement	Pin 1	Pin 2	Actuator Movement
Forward	+ve	-ve	Channel Up
Backward	-ve	+ve	Channel Down

■ Batteries System and Charger

Your Power Wheelchair uses two long-lasting, 12-volt batteries. These batteries are sealed, maintenance free, deep-cycle batteries. Since they are sealed, there is no need to check the electrolyte (fluid) level. Deep-cycle batteries are designed to handle a deep discharge. Though they are similar in appearance to automotive batteries, they are not interchangeable. Automotive batteries are not designed to handle a long, deep discharge, and are also unsafe for use in power wheelchairs.



WARNING! Battery posts, terminals and related accessories contain lead and lead compounds. Wash hands after handling.

BATTERY BREAK-IN

To break in your power wheelchair new batteries for maximum efficiency:

1. Fully recharge any new battery prior to initial use. This will bring the battery up to about 90% of its peak performance level.
2. Run your power wheelchair. Move slowly at first, until you become accustomed to the controls and break in the batteries.
3. Give the batteries another full charge of 8 to 14 hours and operate the power wheelchair again. The batteries should now perform at over 90% of their potential.
4. After four or five charging cycles, the batteries will top off at 100% charge and last for an extended period.

IMPORTANT INFORMATION ABOUT BATTERIES

A fully charged deep-cycle battery provides reliable performance and extended battery life. Keep your batteries fully charged whenever possible. Batteries that are regularly discharged, infrequently charged, or stored without a full charge may be permanently damaged, causing unreliable operation and limited battery life.

If you do not use your power wheelchair regularly, we recommend maintaining battery vitality by charging the batteries at least once a week.

Note: If you are storing a power wheelchair for an extended period of time, you may wish to block the unit up off the ground with several boards under the frame. This keeps the tires off the ground and prevent the possibility of flat spots developing.

If you intend to use public transportation while using your power wheelchair, you must contact in advance the transportation provider to determine their specific requirements.

Sealed Lead Acid and Gel Cell batteries are designed for application in wheelchairs and in other mobility vehicles. Generally, Sealed Lead Acid batteries that are marked as "Non-Spill" are safe for all forms of transportation such as aircraft, buses, and trains. We suggest that you contact your transportation provider to determine specific requirements of transportation and packaging.

If you wish to use a freight company to ship the power wheelchair to your final destination, repack the power wheelchair in the original shipping container and ship its batteries in separate boxes.

Charging Your Batteries

The battery charger is one of the most important parts of your power wheelchair. Optimize your power wheelchair performance by charging the batteries safely, quickly, and easily. Use only the charger supplied with the vehicle.

Charging Procedures

1. Keep charger output plug inserted into the charging socket in the front of the controller before having the charger input plugged into an electrical outlet.
2. Follow the instructions on the front panel of the charger for operating and learn the meanings of the different indicators accordingly.
3. Minimum charging time varies depending on battery condition and discharge level. It is recommended to charge the batteries overnight.

NOTE: The specially designed charger assures that excess power is not consumed regardless of how long it is switched on, and connected to the batteries.

4. Once charging is complete, disconnect the charger from the electrical outlet and then disconnect the charger from the controller socket. Do not leave the charger connected to controller when input power is disconnected.

■ Maintenance

Your power chair is designed for minimal maintenance. However, we recommend that you periodically check the following:

Tire tread:

Visually inspect the tire tread. If less than 1/32", the tires should be replaced.

Motor brushes:

Have your local dealer inspect the motor brushes every six months.

Joystick/controller:

Make sure to keep the controller from the elements. Moisture will damage the controller and void the warranty.

Battery terminal connections:

Inspect the battery terminals. To make sure that they are not corroded.

Clean your power chair cover only with a damp cloth:

The ABS cover has a clear coat that is very easy to clean. Please do not use water to clean your power chair.

Note: *If you experience any technical problems, contact Emc customer service at 1-800-257-7955 before attempting to trouble shoot on your own.*

■ Limited Warranty

Three Year Warranty

For three years from the date of purchase, Electric Mobility will repair or replace at our option to the original purchaser, the main frame if found upon examination by an authorized representative of Electric Mobility to be defective in material and/or workmanship.

One Year Warranty

For one year from the date of purchase, Electric Mobility will repair or replace at our option to the original purchaser, any of the following parts found upon examination by an authorized representative of Electric Mobility to be defective in material and/or workmanship:

- Electronic controller and joystick modules
- Motor/gear box assembly
- Main frame sub-assemblies (forks, torsion bar, metal seat base, foot rest)
- Plastic components except body shell
- Rubber components except tires
- Bearings and bushings
- Casters and anti-tip wheels
- Electrical functionality of the brake

One Year Warranty Exceptions:

Motor: Commutator damage as a result of not replacing motor brushes after heavy wear to the brushes.

Brushes are wear items and are not warranted.

Brakes: Brake pads are wear items and are not warranted.

Batteries: Battery warranties are covered by the battery manufacturer.

Battery warranty is not covered by Electric Mobility.

Warranty Exclusions:

- Plastic body shell is a wear item and is not warranted.
- Batteries are warranted by the battery manufacturer and not by Electric Mobility.
- Tires.
- Seating and upholstery.
- Damage caused by: battery fluid spillage or leakage; abuse, misuse, accident, negligence; improper operation, maintenance or storage; commercial use or use other than normal; repair and/or modifications made to any part without prior consent by Electric Mobility, or any circumstances beyond the control of Electric Mobility.
- Labor, service calls, shipping, and other charges incurred for repair of the product unless specifically authorized by Electric Mobility.
- There is no other expressed warranty.

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Specification	English	Metric
Weight		
Base	93.5 lbs	42.5 kg
Total with batteries	197.5 lbs	89.5 kg
Dimensions		
Length (Footplate to Anti-tip wheels)	38"	96 cm
Width (Armrest Minimum)	24"	61 cm
Height (Ground to Top of Headrest with Highest Seat & Headrest Position)		
Manual Height-Adjusted Seat	46.5"	118 cm
Seat on Seat Lift	48.5"	123 cm
Height - Seat Front Edge to Ground		
Manually Height - Adjusted Seat	18.5 to 21.5"	46.9 to 54.6 cm
Seat on seat Lift	18.5 to 23.5"	46.9 to 59.6 cm
Maximum Speed	RWD-4.5mph FWD-3.7mph	RWD-7.2kph FWD-6.0kph
Load Capacity	350 lbs	160 kg
Maximum Incline	12 deg with 300 lbs 10 deg with 350 lbs	12 deg with 136.2 kg 10 deg with 158.9 kg
Wheel Sizes		
Drive Wheels	10"	25.4 cm
Caster Wheels	8"	20.3 cm
Anti-Tip Wheels	2"	5.1 cm
Seat Dimensions		
Width	18, 20.5, or 22"	45.7, 52.1, or 55.9 cm
Back (Seat to top of headrest)	24.5 to 27.5"	62.2 to 69.9 cm
Depth	18"	45.7cm
Armrest Adjustments		
Width	24.25 to 32.25"	61.6 to 81.9cm
Height	3" Range	7.6 cm Range
Footrest Height	3.5 to 6.5"	8.9 to 16.5 cm
Battery Charger	5 A Off - Board	
Battery Type	(2) 12v - 33 Ah	
Color	Candy Apple Red	

■ Rascal Spare Parts & Accessories

Spare Parts & Accessories are available for your PowerChair through customer service at:

Electric Mobility
591 Mantua Blvd
Sewell, NJ 08080
1-800-257-7955

Available accessories

- Seats - 18, and 20.5, wide seats are available for your powerchair. Wider seats are available as special orders.
- Saddle Bag - This handy bag folds over your Rascal's armrest and is ideal for carrying glasses and other small items.
- Shoulder / Chest Harness - Padded "X" style chest harness keeps you securely in your seat.
- Monster Bag - The Monster Bag is big and is not suitable for the P320 Powerchair but is available for all the other models. It attaches securely to your Rascal's seat back with heavy duty straps. Made of water-resistant nylon.
- Weather Cover - Durable weatherproof cover protects your Rascal from the elements.
- Oxygen Tank Holder - An armrest mounted oxygen tank holder is available for the P320 and a rear mounted oxygen tank holder is available for the other models.
- Legrests - Legrests are available for each model powerchair.
- Cane Holder - Cane holders are available for all but the model P320 powerchair.

