

# USER'S MANUAL

## Marvel Series



HP-1  
HP-1L  
HP-1S



**SUMMIT**  
DURABLE MEDICAL EQUIPMENT, INC.

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# INTRODUCTION

Thank you for choosing a Summit Power mobility product. We hope that it will provide many years of mobility for you.

This is a general manual for our power wheelchairs, HP-1, HP-1L, and HP-1S. The information in this manual applies to all these models. HP-1 is a power wheelchair with seat width of 18", HP-1L with 20" seat width and HP-1S with 16" seat width. We use "HP-1" or "power wheelchair" to refer to all these models in this manual. Your Summit power mobility product HP-1, HP1L and HP-1S were designed with three basic objectives in mind: value, durability, and reliability.

We have prepared this manual to guide you in the proper use of your power wheelchair while performing daily activities. *For your safety, you should become familiar with proper operating techniques before use.* This owner's manual is compiled from the latest specifications and product information available at the time of publication. We reserve the right to make changes as they become necessary.

Summit is not responsible for injuries and/or damage resulting from any person's failure to follow the warnings, cautions, and instructions in this owner's manual. Summit is also not responsible for injuries and/or damage resulting from any person's failure to exercise good judgement and/or common sense when operating the HP-1.

Our distribution center has inspected your power wheelchair thoroughly. However, damage may have occurred during shipment. Please inspect your power wheelchair and if you notice any damage, notify your dealer immediately.

Routine inspection and maintenance are essential for safety and long-term use. Keep your power wheelchair in good working condition by correcting problems promptly. Please keep this manual for future reference.

Please complete the following information now for ready reference in the event service becomes necessary whether under or outside of warranty.

Dealer Name : \_\_\_\_\_

Dealer Phone : \_\_\_\_\_

Purchase Date : \_\_\_\_\_

Model Name & Number : \_\_\_\_\_

Serial Number : \_\_\_\_\_

(Located on the  
Crossbar)

*Keep sales receipt for warranty service.*

# COMPONENTS

Your power wheelchair is shipped partially disassembled to protect it during shipping. After unpacking, please check whether you have received the following main components as our standard specification (Fig. 1).

1. Main frame with motor and gearbox
2. Flip-back arm sub-assembly
3. Controller
4. Controller supporting bar
5. Charger
6. Cushion
7. Battery boxes
8. Battery supporting bar
9. Battery knobs
10. Anti-tippers
11. Footrest strap
12. Footrest
13. Elevating legrest (Optional)

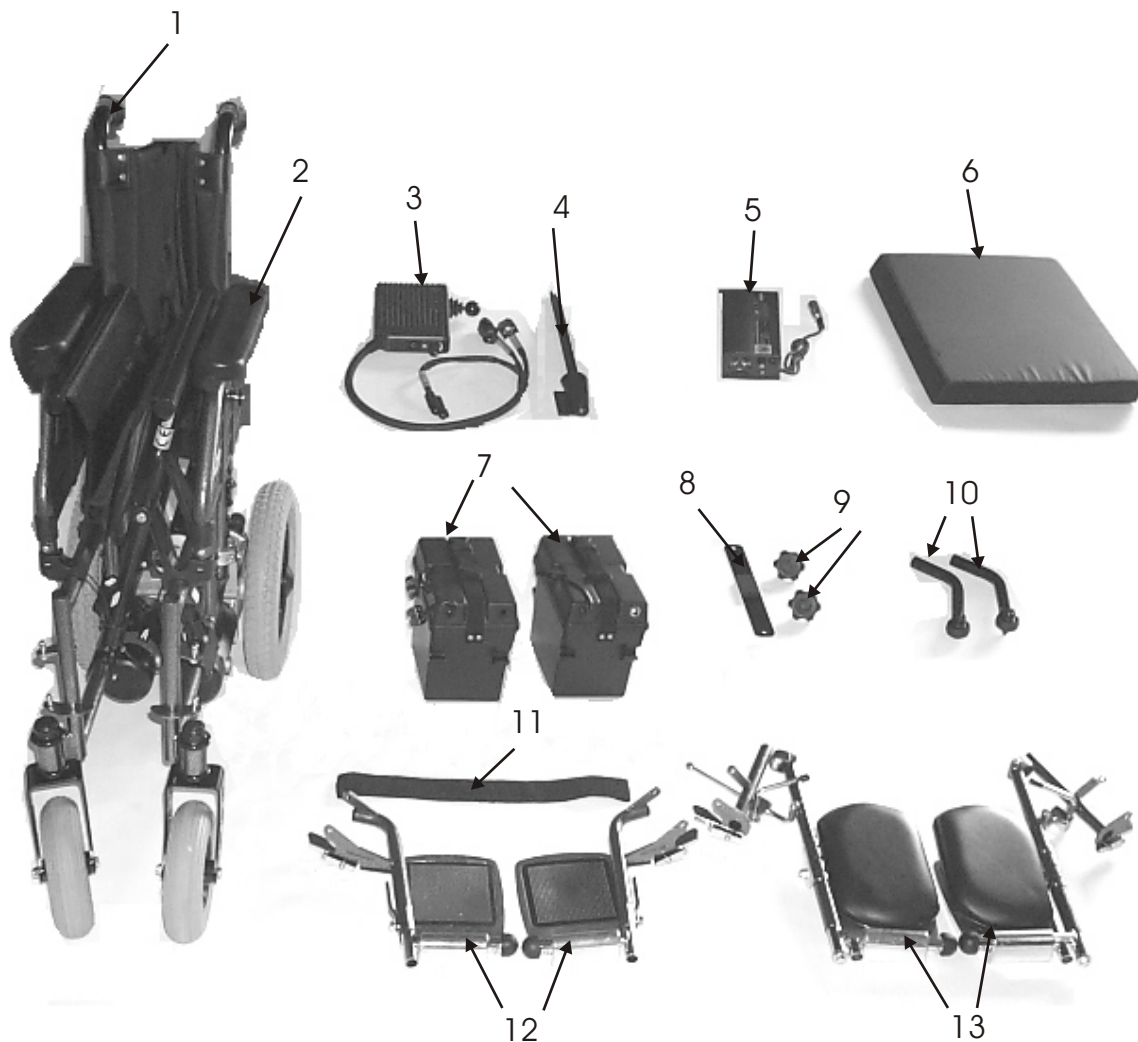


Fig. 1

# SAFETY INSTRUCTIONS

## Operation of Chair

1. Always ensure that the power is switched off when getting in or out of the wheelchair. This will eliminate the possibility of accidentally activating the joystick and causing injury to yourself or others.
2. Always check that the drive wheels are engaged (drive mode) before driving.
3. Set the speed control knob according to your driving ability and the environment in which you are going to operate. We recommend that you keep the speed at the slowest position (fully counter-clockwise) until you are familiar with the driving characteristics of this vehicle. We also recommend that you use the slowest speed when using your power wheelchair indoors.
4. Always reduce your speed when making sharp turns.
5. Do not switch off the power when the wheelchair is still moving forward. This will bring the chair to an extremely abrupt stop.
6. Avoid jerky stop/start motions as this will result in excessive current draw from the batteries, increased tire wear and the rapid wearing of the gearboxes and motors.
7. To brake in an emergency, simply release the joystick.

## Ramps and Curbs

8. When driving up or down ramps, be sure to check that the angle of the slope is less than 12 degrees (slopes about 1/5). Also check that ramp surface is roughened to prevent slipping, and that ramp surface is correctly in line with the tires and is wide enough to allow the tires to pass freely along the ramp.
9. Always climb or descend gradients perpendicular to the slope. Never drive across the slope or turn sharply on a slope. Check that the slope surface is roughened to prevent slipping. Do not attempt to climb or descend slope greater than 12 degrees (slopes about 1/5).
10. When driving up curbs, always check the height of the curb to ensure that it does not exceed 1-1/2" in height. Traverse up or down curbs perpendicular to the curb.

## Transfers, Reaching and Bending

11. Transferring on and off the HP-1 requires a good sense of balance. Have an attendant present at all times until you learn to safely transfer yourself. To eliminate the possibility of injury, Summit recommends performing the following tasks before attempting a transfer:

# SAFETY INSTRUCTIONS

Position chair so that the distance between your power chair and the object to which you are transferring is close enough for a safe transfer.

Turn the power off.

Ensure that your power chair is not in freewheel mode.

Flip up or remove armrests.

Flip up footplate or remove footrest or legrest.

Turn both caster wheels towards the transfer direction to improve power chair stability during transfer.

12. When reaching, bending or leaning while seated on your power chair, make sure that you maintain a stable center of gravity to keep the power chair from tipping.

## General

13. Always use a seat belt, keep your arms on or inside the armrests, and keep feet on the footplate at all times.
14. For safety reasons, make sure that your weight does not exceed the recommended weight limit of the wheelchair. Consult your dealer for the specified weight limits for your particular model.
15. Do not attempt to lift or move a power chair by any of its removable parts. Personal injury and damage to the power chair may result.
16. Do not stand on the footplate directly.
17. Never try to use your wheelchair beyond its limitations as described in this manual.
18. Do not operate your vehicle if it is not functioning properly.
19. Do not connect any electrical or mechanical device to the vehicle. Failure to obey this instruction may result in injury and will void the warranty.
20. 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.

## Use While Under The Influence Of Medication Or Alcohol

21. Check with your physician if you are taking any medication that may affect your ability to operate your power wheelchair safely.
22. Do not operate your HP-1 while you are under the influence of alcohol, as this may impair your ability to operate your power chair in a safe manner.

# SAFETY INSTRUCTIONS

## Electromagnetic Interference (EMI) from Radio Wave Sources

The rapid development of electronics, especially in the area of communications, has saturated our environment with electromagnetic (EM) 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 power wheelchairs 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 power wheelchairs like the HP-1:

Power wheelchairs and motorized scooters (in this section, 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 20 V/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 powered wheelchair 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 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 interference from radio wave sources. (*Note:* It is difficult to evaluate the effect on the overall immunity of the powered wheelchair).
5. Report all incidents of unintended movement or brake release to the powered wheelchair manufacturer, and note whether there is a radio wave source nearby.

# SAFETY INSTRUCTIONS

TURN OFF YOUR POWERED WHEELCHAIR AS SOON AS POSSIBLE WHEN EXPERIENCING THE FOLLOWING:

- Unintentional motions.
- Unintended or uncontrollable direction.
- Unexpected brake release.

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

Your powered wheelchair has an immunity level of 20 V/m which should protect against common sources of EMI.

# ENVIRONMENTAL CONDITIONS

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

## A) Rain, Sleet and Snow

If exposed to water, your power wheelchair is susceptible to damage to electronic or mechanical components. Water can cause electronic malfunction or promote premature corrosion of electrical components and frame.

## B) Temperature

Some of the parts of the power wheelchair are susceptible to change in temperature. The controller can only operate in temperatures that range between 18 F (-8 C) and 122 F (50 C).

At extreme low temperatures, the batteries may freeze, and your power wheelchair may not be able to operate. In extreme high temperatures, it may operate at slower speeds due to a safety feature of the controller that prevents damage to the motors and other electrical components.



# ASSEMBLY & DISASSEMBLY

## ASSEMBLY

### A. Opening the wheelchair

Standing at one side of the wheelchair, tilt it to one side, and push down firmly on the seat rails. The seat should be locked into the receivers on the wheelchair side frame when the chair is fully opened.

### B. Installing the batteries (not provided)

*Note:* We recommend using a battery with 12 volt 34AH (for example, U-1) for better performance. Each battery weighs more than 23 lbs. as an average. Please seek help if you cannot lift them by yourself.

Put the batteries into the battery boxes. Using the screws, washers, and nuts provided from the battery supplier, connect the red line to the Positive (+) terminal of a battery while connecting the black line to the Negative ( ) terminal of the same battery (Fig. 2). Close the box properly and carry it with the strap. Apply the same connecting method to both batteries.



Fig. 2

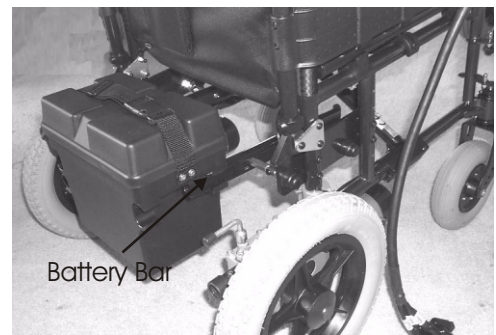


Fig. 3

Fold down the battery bars on each side of the frame so that you can slide the battery boxes underneath the seat (Fig. 3). The battery box with the reset button and two outlet connectors should be put underneath the power chair first. The outlet connectors of the battery boxes should be put on the same side for connection.

Connect the two battery connectors (Fig. 4). Put the battery supporting bar at the back of the battery box. Screw on the battery knobs to tightly fasten the bar (Fig. 5).

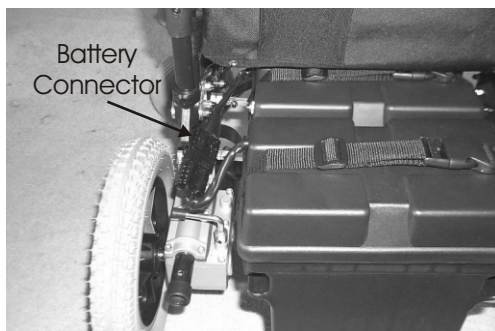


Fig. 4

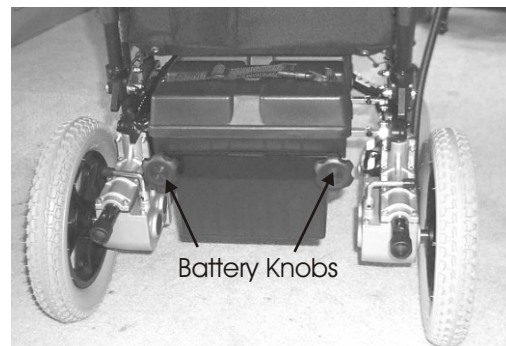


Fig. 5

# ASSEMBLY & DISASSEMBLY

## C. Installing the controller

Your power wheelchair comes standard with a swing-away joystick controller. To install the controller, simply fasten it to the controller supporting bar with the two (2) black screws provided (Fig. 6).



Fig. 6

## D. Connecting the main cables

Plug the three main cables (connected to left, right motor and battery) underneath the seat near the crossbar to the connectors on the other end of the controller. Cables should be connected according to the indicated labels only, i.e. left to L (motor), right to R (motor), and middle cable to the battery cable only.

*Warning:*

*Wrong connection can make the power wheelchair defective.*

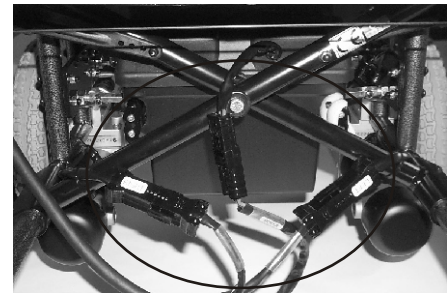


Fig. 7

## E. Installing the anti-tippers

Remove the pin on the anti-tipper. Insert the anti-tipper, one on each side, at the rear bottom of the frame. Snap the pins to fasten the anti-tippers (Fig. 8).

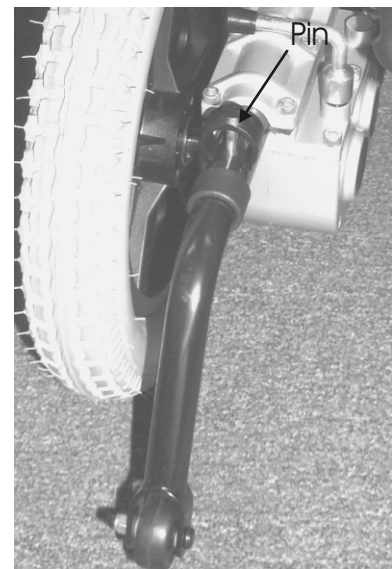


Fig. 8

## F. Installing the footrests and strap

Locate the pins for the footrests on the frame. Put the footrest, one at a time, to the wheelchair. Slide the footrest strap accordingly.

# ASSEMBLY & DISASSEMBLY

## DISASSEMBLY

### A. Battery removal

#### *For transportation*

Unplug the battery connector from the controller connector underneath the seat near the crossbar. Refer to Assembly, Section D, Connecting the main cables on Page 8.

Unscrew the knobs and remove the battery bar at the rear battery box.

Unplug the battery connector that joins the two battery boxes together.

Slide out the battery boxes, one at a time.

Lift the battery boxes using the battery strap.

#### *For replacement*

Unplug the battery connector from the controller connector underneath the seat near the crossbar. Refer to Assembly, Section D, Connecting the main cables on Page 8.

Unscrew the knobs and remove the battery bar at the rear battery box.

Unplug the battery connector that joins the two battery boxes together.

Slide out the battery boxes, one at a time.

Lift the battery boxes using the battery strap.

Unlock the battery strap and remove the battery box cover.

Remove the battery post caps.

Unscrew positive terminals (+) one at a time.

Unscrew negative terminals (-) one at a time.

Remove batteries one at a time.

For installing the batteries, refer to Assembly, Section B, Installing the Batteries on page 7.

# ASSEMBLY & DISASSEMBLY

## B. Folding the wheelchair

To fold the wheelchair, it is necessary to remove certain components. Follow the simple guidelines below:

Turn the wheelchair off.

Park the chair on a level surface.

Ensure the wheels are in drive (engaged) mode, with controller lever on the vertical position (Fig. 9).

Fold up the footrests and remove the entire footrests assembly.

Remove the battery boxes. You can refer to Disassembly, Section A, Battery Removal, For Transportation on page 9.

Grab the strap on the seat upholstery and pull upward. This will pull the entire frame together (Fig. 10).



Fig. 9



Fig. 10

# ADJUSTMENTS FOR SEATING COMFORT

To maximize seating comfort, your power wheelchair lets you adjust:

- Armrest height.
- Controller position.
- Flip-back and detachable armrest.
- Footrest height.

A. Armrest height  
(Adjustable up to 4" in 1" increments)

To adjust the armrest height, pull and hold the button on the arm sub-assembly, lift the armrest up to the desired height (Fig. 11). Release the button when the armrest is locked.

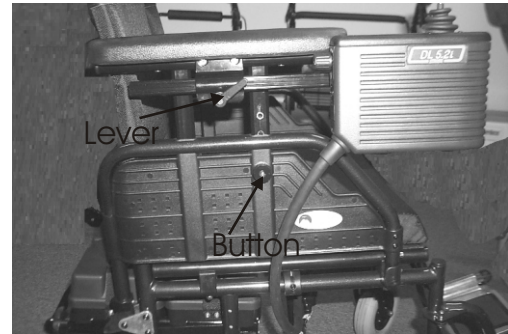


Fig. 11

B. Controller position

Unscrew the lever underneath the armrest (Fig. 11). Slide the supporting bar for the controller to the desired length. Screw back the lever to lock the controller position.

Controller can be placed either on the left side or on the right side. No extra spare parts are needed.

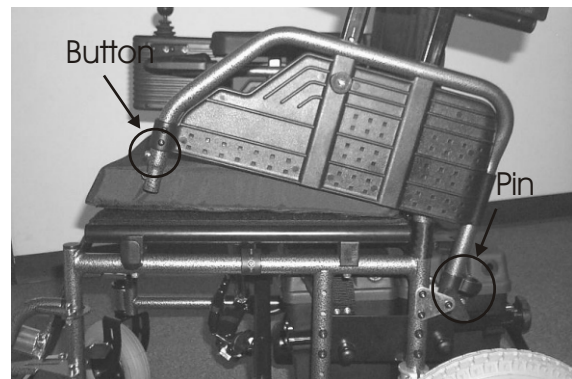


Fig. 12

C. Flip-back and detachable armrest

The armrests can be flipped back to easily access the wheelchair (Fig. 12). You can flip back the arm Sub-assembly by pressing and holding the button located in the front bottom of the side panel. To detach the arm sub-assembly, remove the pin at the rear bottom of the arm sub-assembly (Fig. 12).

D. Footrest height

The swingaway footrests are height adjustable. To increase or decrease the height of the footplate, unscrew the bolt at the rear of the hanger (Fig. 13). The bolt is located just below the hexagonal part of the hanger. Slide the footplate to the required height and then re-tighten the bolt.



Fig. 13

# OPERATION

The power wheelchair is simple to operate. However, we recommend that you read carefully the following instructions to become familiarized with your new vehicle.

## A Word of Caution:

Before you turn the power on, always be aware of the environment that surrounds you to select your desired speed. For indoor environments we recommend that you select the slowest speed setting. For outdoor operation of this vehicle we recommend that you select a speed that is comfortable for you to control it safely.

The following steps are required to operate your vehicle safely with the controller (Fig. 14):

## A. Driving:

### 1. Controller ON/OFF Switch

Press the ON/OFF button (I/O) switch located in front of the joystick to activate your power wheelchair. The battery condition meter will light up to indicate the current charge of your batteries. Pressing the ON/OFF button again will deactivate the controller.

### 2. Speed Control

The speed control knob allows you to set the forward speed to your desired setting. Turning the speed control knob clockwise will set the speed at the faster settings while turning it counter-clockwise will set the speed at slower settings. The controller sets the reverse speed, acceleration and deceleration proportionally and automatically for your safety.

### 3. Joystick

The joystick controls the direction and speed of your vehicle. Pointing the joystick away from the neutral position, (center), will move the vehicle in the direction where the joystick is pointing. The farther away (forward/backward) the joystick is from the neutral position, the faster the vehicle will go. The farther away to the right/left the joystick is pointing, the sharper the turn of the vehicle will be. To operate the vehicle, gently push the joystick in the direction you want to go. Returning the joystick to its neutral position, (center), will reduce the speed and stop the vehicle by automatically applying the electromagnetic brakes.

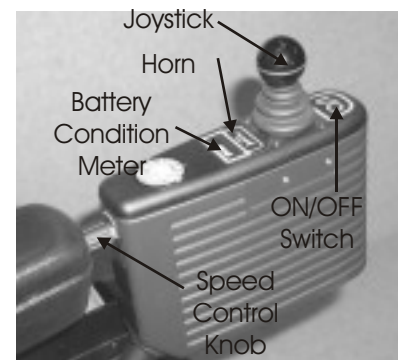


Fig. 14

## Note:

After pressing the controller ON/OFF switch, allow two seconds to elapse before engaging the joystick. This is a safety feature to prevent sudden starts.

Gentle operation of the joystick will result in smoother transitions in speed and direction, while sharp operation of the joystick will result in drastic transitions in direction and velocity.

When the wheelchair is in operation, the surface of the controller may become slightly hot.

In case of emergency, let go of the joystick and the chair will come to a stop.

# OPERATION

## B. Controller Display:

The controller display is a multifunction visual display. It can provide three types of information: i) ON/OFF status, ii) battery condition meter and iii) fault diagnostics.

### 1. ON/OFF Status

When the power is on, the controller's LED will be lit up. If the LED is not lit, the controller is OFF.

### 2. Battery Condition Meter

The battery condition meter is composed of 6 segments (two each of red, orange, and green). It enables you to monitor battery charge. The battery condition meter indicates the approximate amount of battery charge left.

Red, orange and green LEDs indicate that the batteries are fully charged.




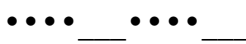



Red and orange LEDs indicate that you should charge the batteries if possible.

Red LEDs indicate that you should charge the batteries as soon as possible, because low battery voltage may cause your power wheelchair to become inoperative.

*Note:* When the batteries begin to approach a discharged state, the first red LED will begin to flash slowly, reminding you that the batteries need to be charged immediately.

### 3. Diagnostics:

The controller's LEDs can also indicate some common causes of problems with your power wheelchair. The following chart lists possible problems indicated by the flashing meter:

| FLASH CODE SEQUENCE                                                                    | DIAGNOSIS                                         | SOLUTION                       |
|----------------------------------------------------------------------------------------|---------------------------------------------------|--------------------------------|
| 1.  | Low battery voltage fault                         | Check Batteries/Battery Wiring |
| 2.  | High battery voltage fault                        | Check Batteries                |
| 3.  | Left motor (or connection) Fault                  | Check Left Motor Wiring        |
| 4.  | Right motor (or connection) fault                 | Check Right Motor Wiring       |
| 5.  | Left or right park brake (or connection) fault    | Check Motor/Brake Wiring       |
| 6.  | Controller fault                                  | Contact your Authorized Dealer |
| 7.  | Motor stalled or joystick out of neutral time out | Reset the Power On/Off Button  |

Where

"•" means all 6 LED's flash on for a period of 0.2 seconds and off for 0.8 seconds

"\_\_\_" means all 6 LED's are off for a period of two seconds before flashing sequence repeats

# OPERATION

## Note:

You must turn the controller OFF and then ON again to reset the controller, even if the source of the fault is removed/corrected.

If more than one fault exists, then the fault having the highest priority is indicated.

## C. Free-Wheeling:

Because the motors are designed to engage the electromagnetic brakes when the vehicle is not in use or when the power is OFF, they also have a manual feature that allows them to "free-wheel". Free-wheeling is accomplished by turning the free-wheeling levers to the disengaged position as shown in Fig. 15.

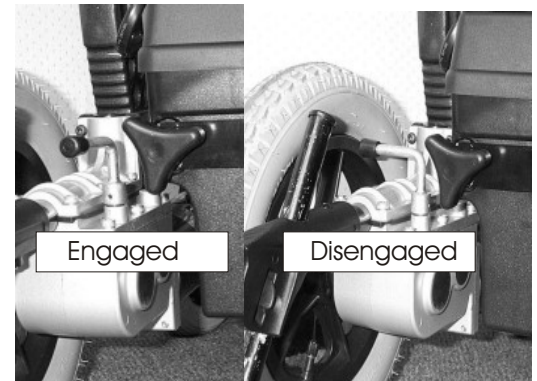


Fig. 15

## *Warning!*

Never free-wheel your power wheelchair on a slope;

Never free-wheel the motors while operating your vehicle;

Always remember to engage the motors before turning the power back ON.

## D. Electromagnetic Brakes:

Your power wheelchair comes with an Electromagnetic Brakes, i.e. an automatic magnetic disc safety brake which is also known as Fail-Safe brakes.

The Electromagnetic Brakes are automatic and work when the power wheelchair is ON but in a steady state (i.e. Joystick is released to the neutral position), even when the chair is on a slope. The Electromagnetic Brakes will also be set whenever the power wheelchair is OFF, but the motor levers are in the engaged (vertical) position.

## Note:

Please refer to the section titled "To check brake" in the Maintenance & Repair section in page 18 to make sure brakes are in good condition.



# OPERATION

## E. Thermal Protection:

Your power wheelchair controller is equipped with a safety system called thermal rollback. A built-in circuit monitors the temperature of the controller and motors. In case of excessive heating of the controller and motors, the controller reduces the motor voltage and speed of the power wheelchair. The reduction of the speed allows the electrical components to cool down. Although your power wheelchair will resume its normal speed when the temperature returns to a safe level, we recommend that you turn the power off and wait for 5 minutes before restarting to allow the components to cool down if you find that you have lost speed suddenly.

## F. Main Circuit Breaker:

The main circuit breaker is a reset button located on the front battery box with 2 connectors (Fig. 16). The main circuit breaker monitors the electric current drawn from the batteries. It is a safety feature built in your power wheelchair for your extra safety. When the batteries and the motors are heavily strained (e.g., from excessive loads), the main circuit breaker will trip to prevent damage to the motors and the electronics. If the circuit breaker trips, wait for approximately one minute and then press the button to reset it. Then turn on the controller power, and continue normal operation. If the main circuit breaker continues to trip repeatedly, contact your authorized dealer.

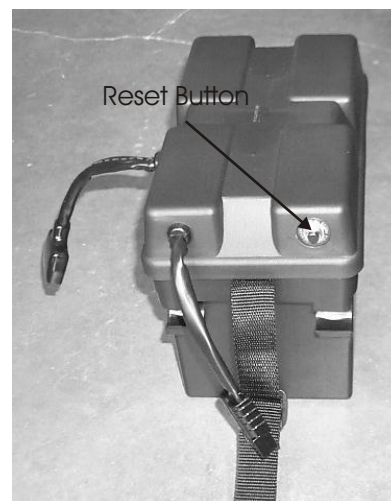


Fig. 16

## G. Chair Response:

Should the chair's response not be to your satisfaction, ask your dealer to adjust the program to a level at which you are comfortable. The program can be altered to either increase or decrease the response rates for better control of your power wheelchair.

# BATTERIES & CHARGER

## BATTERY

We recommend that you use deep-cycle batteries that are sealed and maintenance free for your power wheelchair. Both sealed lead-acid (SLA) and gel cell are deep-cycle batteries and are similar in performance. Deep-cycle batteries are specifically designed to provide power, drain down, and then accept a relatively quick recharge. Lead-acid batteries should be charged as often as possible.

Specification of the battery that we recommend:

|            |                                         |
|------------|-----------------------------------------|
| Type:      | Deep-cycle sealed lead-acid or gel cell |
| Size:      | U-1                                     |
| Voltage:   | 12 V each                               |
| Amp Hours: | 30-35 amp hours                         |

Depending on the use, terrain and driving conditions, the batteries will provide a range of 15-20 miles of travel. However, even if the power chair is not used, we recommend that the batteries be charged periodically.

### Note:

Do not use any automotive batteries. They are not designed to handle a long, deep discharge and also are unsafe for use in power chairs.

The useful life of a battery is quite often a reflection of the care it receives.

## CHARGER

The battery charger takes the standard wall outlet voltage (alternating current) and converts it to VDC (direct current). The batteries use direct current to run your power chair. When the battery voltage is low, the charger works harder to charge the batteries. When the batteries are fully charged, the amperage from the charger is almost at zero. This is how the charger maintains a charge but does not overcharge the battery.

### Note:

The surface of the charger will become slightly hot during charging.

Make sure the fan of the charger works properly for cooling the charger.

The batteries will not be able to be charged after they are discharged to nearly zero voltage.

If your charger comes with two settings, 110V or 220V, always make sure you are using the correct setting before charging.

**Warning!** Only use the off-board charger that is supplied with your power wheelchair. Do not use an automotive-type battery charger. Use of any other charging unit voids the warranty and could result in severe damage to the batteries, the HP-1, and may cause a fire hazard.

# BATTERIES & CHARGER

## CHARGING INSTRUCTIONS

To recharge the batteries, follow the steps below:

Place your power wheelchair close to a standard electrical wall outlet.

Turn the controller power OFF.

Connect the charger connector to the control box charging socket (Fig. 17).

Plug the charger power cord into a standard wall outlet.

Turn the charger switch ON. A red and a yellow (if battery charge is low) LED will illuminate.

When charging is completed, the yellow LED will turn green.

Turn the charger switch OFF when the batteries are fully charged.

Unplug the charger power cord from the wall outlet

Disconnect the other end of the charger power cord from the charging socket.

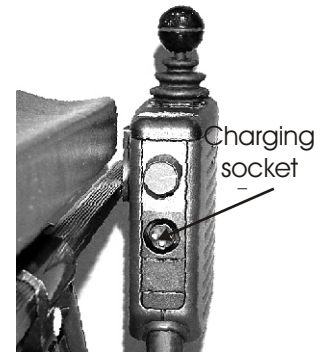


Fig. 17

### Note:

Make sure to unplug the charger from the wall outlet and chair after charging.

Leaving the charger connected to the chair but unplugged from the wall outlet will slowly discharge the batteries.

Always charge your batteries in well ventilated areas.

The charger is intended for indoor use only. Protect from moisture.

For maximum performance, it is recommended that you replace both batteries at the same time if the batteries are weak.

If the chair will not be used for a long period of time, arrange to have the batteries fully charged for at least once every month.

According to the battery type and condition of the batteries, batteries usually can be fully charged in 4-10 hours. This will be indicated when the status light in the battery charger side panel turns green. Charging the battery longer than necessary will not harm the battery. We recommend that you charge the batteries for 8 to 10 hours after daily use. Do not charge the batteries for more than 24 hours.

# MAINTENANCE & REPAIR

Your power wheelchair is designed for minimal maintenance. However, like any motorized vehicle it requires routine maintenance. To keep your HP-1 for years of trouble-free operation, we recommend you follow the following maintenance checks as scheduled.

## DAILY CHECKS

1. With the controller turned OFF, perform a joystick check. Make sure it is not bent or damaged and that it returns to center when you release it. Visually inspect the rubber boot around the base of the joystick for damage. Do not handle or try to repair it.
2. Visually inspect the controller harnesses. Make sure that they are not frayed, cut or have any exposed wires.
3. Inspect the battery condition meter on the controller to determine if batteries need to be charged.

## WEEKLY CHECKS

1. Inspect the connections by disconnecting the controller and charger harnesses from the electronics connector housing. Look for signs of corrosion.
2. Ensure that all parts of the controller system are securely fastened to your power wheelchair. Do not overtighten any screws.
3. Check for proper tire inflation. Your power wheelchair comes with standard flat-free solid tires. If your power wheelchair comes with optional air tires, make sure to maintain the pressure of the tires between 30-35 psi.
4. Check the brakes. This test should be carried out on a level surface with at least three feet of clearance around your power wheelchair.

To check the brakes (*Your power wheelchair may move slightly when performing this test*):

Turn on the controller and turn down the speed and response adjustment knob.

After one second, check that the battery condition meter remains on.

Slowly push the joystick forward until you hear the parking brakes click. Immediately release the joystick. You must be able to hear each parking brake operate within a few seconds of joystick release.

Repeat this test of the brake for the back, left, and right joystick positions.

# MAINTENANCE & REPAIR

## SEMI-ANNUAL CHECKS

1. Check the motor brushes. We recommend that your authorized dealer inspect the brushes every six months, or sooner if your power wheelchair is not operating smoothly. If inspection determines excessive wear on the brushes, they must be replaced or motor damage will result.

*Warning!* Failure to maintain the brushes could void the power wheelchair's warranty.

To inspect or replace the motor brushes:

1. Unscrew the motor brush caps (Fig. 18).
  2. Remove the brushes.
  3. Inspect the brushes for wear (Fig. 19).
  4. Replace the brushes if necessary.
2. Inspect the state of the battery terminals every six months. Make sure that they are not corroded and the connections are tight. Periodically apply a thin film of petroleum jelly on the surface of terminals to Guard against corrosion.

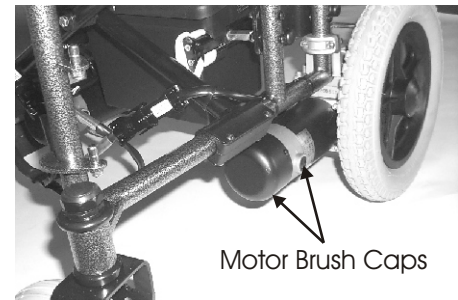


Fig. 18

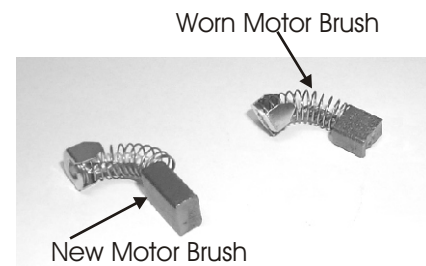


Fig. 19

## PERIODICAL CHECKS

1. Make sure to keep the controller clean while protecting it from rain or water. Never hose off your power wheelchair or place it in direct contact with water.
2. Keep wheels free from lint, hair, sand and carpet fibers.
3. Visually inspect the tire tread. If less than 1/32", please have your tires replaced by your local dealer.
4. All upholstery can be washed with warm water and mild soap. Occasionally check the seat and back for sagging, cuts and tears. Replace if necessary. Do not store your chair in damp conditions as this will lead to mildew and rapid deterioration of the upholstery parts.
5. All moving mechanisms will benefit from simple lubrication and inspection. Lubricate using petroleum jelly or light oil. Do not use too much oil, otherwise small drips could stain and damage carpets and furnishings etc. Always perform a general inspection of the tightness of all nuts and bolts.

# MAINTENANCE & REPAIR

Note:

If you experience any technical problems, it is recommended that you check with your local dealer before attempting to troubleshoot on your own.

The following symptoms could indicate a serious problem with your power wheelchair. Contact your local dealer if any of the following arises:

1. Motor noise
2. Frayed harnesses
3. Cracked or broken connectors
4. Uneven wear on any of the tires
5. Jerky motion
6. Pulling to one side
7. Bent or broken wheel assemblies
8. Does not power up
9. Powers up, but does not move

# SPECIFICATIONS

|                                       |              | HP1                                     | HP1L | HP1S |
|---------------------------------------|--------------|-----------------------------------------|------|------|
| DIMENSION<br>(INCHES)                 | Length:      | 43.5                                    | 43.5 | 43.5 |
|                                       | Width close: | 17.5                                    | 20.0 | 14.5 |
|                                       | Width open:  | 25.5                                    | 27.5 | 23.5 |
|                                       | Height:      | 38.0                                    | 38.0 | 38.0 |
| SEAT<br>(INCHES)                      | Width:       | 18.0                                    | 20.0 | 16.0 |
|                                       | Depth:       | 16.0                                    | 16.0 | 16.0 |
|                                       | Height:      | 20.5                                    | 20.5 | 20.5 |
|                                       | Back height: | 17.0                                    | 17.0 | 17.0 |
| FRONT CASTERS                         |              | 8" x 2" Solid                           |      |      |
| REAR WHEELS                           |              | 12" x 2.5" Solid<br>(Option: Pneumatic) |      |      |
| WEIGHT CAPACITY (LBS.)                |              | 300                                     |      |      |
| WEIGHT W/FOOTRESTS W/O BATTERY (LBS.) |              | 89.2                                    | 90.1 | 89.0 |
| BATTERY WEIGHT (LBS.)                 |              | 23.5 X 2                                |      |      |

|                  | HP1                                        | HP1L | HP1S |
|------------------|--------------------------------------------|------|------|
| MAXIMUM SPEED    | 5.0 mph                                    |      |      |
| RANGE            | Up to 20.0 miles                           |      |      |
| TURNING RADIUS   | 33.0"                                      |      |      |
| GRADIENT         | 10 - 12 degrees                            |      |      |
| GROUND CLEARANCE | 4.5"                                       |      |      |
| DRIVE TRAIN      | 2-Motor<br>Rear-Wheel Drive                |      |      |
| MOTOR            | 24V Permanent<br>Magnetic Motor            |      |      |
| CONTROLLER       | Dynamic 5.2i<br>Controller                 |      |      |
| BRAKE            | Automatic<br>Magnetic Disc<br>Safety Brake |      |      |
| BATTERY TYPE     | 12V. 34AH X 2                              |      |      |
| BATTERY CHARGER  | DC 24V. 5A<br>Off-Board Charger            |      |      |

# LIMITED WARRANTY

Five-Year Limited Warranty: Power chair frame

We will repair the frame with new or refurbished parts, free of charge, in the USA, in the event of defective materials or workmanship.

One-Year Limited Warranty: Electronic controller, drive train components

We will repair these products with new or refurbished parts, free of charge, in the USA, for one-year from the original date of purchase in the event of defective materials or workmanship.

Six-Month Limited Warranty: Plastic parts, rubber parts, bearings, other parts not specifically identified above

We will repair these products with new or refurbished parts, free of charge, in the USA, for six-months from the original date of purchase in the event of defective materials or workmanship.

Warranty Exclusions: Tires and tubes, motor brushes, brake pads, batteries (batteries are warranted by the battery manufacturer), motor commutator (if damage is caused by not replacing the motor brushes and they are worn heavily)

This warranty is extended only to the original purchaser from an authorized dealer. Your original receipt will be required as proof of purchase before any warranty performance is rendered.

This warranty only covers failures due to defects in materials or workmanship which arise during normal use and does not cover damage that occurs in shipment or failures which are caused by products not supplied by Summit, or failures resulting from accident, misuse, abuse, neglect, mishandling, misapplication, alteration, modification, commercial use or damage resulting from the alteration or modification of the wheelchair by anyone other than an Authorized Dealer, or damage that is attributable to acts of God.

Limitation and Exclusions: Products subjected to negligence, abuse, misuse, improper operation, improper maintenance, improper storage, or improper transporting are not covered by warranty. The warranty shall not apply to problems arising from normal wear or failure to follow instructions.

We shall not be liable for incidental or consequential damages resulting from the use of this product or arising out of any breach of this warranty.



authorized SUMMIT DME dealer

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