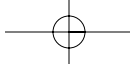


MPV 4



OWNER'S MANUAL & WARRANTY

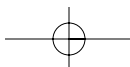


All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of HOVEROUND CORPORATION.

Neither HOVEROUND CORPORATION nor its affiliates shall be liable to the purchaser of this product or third parties for damages, losses, cost or expenses incurred by purchaser or third parties as a result of: accident, misuse, or abuse of this product or unauthorized modifications, repairs, or alterations to this product.

HOVEROUND and MPV 4 are registered trademarks of the HOVEROUND CORPORATION. Other product names used herein are for identification purposes only and may be trademarks of their respective owners. HOVEROUND disclaims any and all rights in those marks.

Specifications and equipment subject to change without notice.



Dear MPV 4 Owner,

Congratulations on your choice of the Hoveround MPV 4 to fulfill your personal mobility needs.

The MPV 4 has the same innovation of design that is the hallmark of our company. It is compact yet very stable; attractive yet rugged; simple yet functional; gentle yet powerful; and above all, the MPV 4 provides an outstanding level of maneuverability.

We believe that the MPV 4 will afford you reliable, comfortable transportation for years to come. Should you have questions or concerns, our customer service personnel are a toll-free call away.

Welcome to our family, and thank you for choosing the MPV 4.

Happy motoring.



Thomas E. Kruse, President
Hoveround Corporation

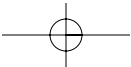
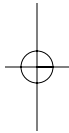
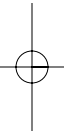
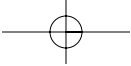
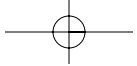


Table Of Contents

Introduction	7-11
Service	7
Safety Instructions / Before You Use Your MPV 4.	8
Hoveround® MPV 4.	11
Chapter 1	Operating Instructions 12-15
Driving Your MPV 4.	12
Joystick Controllers	14
Chapter 2	Batteries and Charging 16-20
Caring For Your Batteries And Charger	16
Battery Replacement	17
Charging Your Batteries	18
Chapter 3	Manual Brake Release Levers 21
Chapter 4	Seating 22-25
Arm Angle Adjustment	22
Controller Position Adjustment	23
Swivel Seat Adjustment.	23
Seatback Adjustment	24
Chapter 5	Options 26-28



Chapter 6 Routine Maintenance 29-30

Chapter 7 Disassembling and Reassembling Your MPV 4 31-34

 Removing and Replacing Your Controller 31

 Removing and Replacing the Seat 32

 Removing and Replacing Batteries 33

 Removing and Replacing the Outrigger 34

Chapter 8 Electromagnetic Interference (EMI) 35-37

Chapter 9 Appendixes 38-46

 Appendix A Programmable Parameters 38

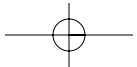
 Appendix B Fault Codes 39

 Appendix C Locking Feature 42

 Appendix D Specifications 45

 Appendix E Record of Service 46

Limited Warranty 47



Introduction

Hoveround Corporation is a home medical equipment provider dedicated to serving people with mobility needs. Our reputation for service and our concern for our clients assures the highest standards of professionalism available.

At Hoveround® we know that clients are happier and progress faster when they can convalesce in familiar home surroundings. Our goal is to be an active participant in making that a reality. Our staff consists of dedicated professionals who take exceptional pride in the products and services they provide. These include mobility specialists, factory trained technicians and skilled customer service personnel.

Whenever your mobility needs require special attention and equipment delivered with an extra measure of care and concern, you can count on Hoveround.

Service

Service is our commitment to our clients and their continued mobility is our priority. In the event that you need assistance with your Hoveround, our Service Representatives are just a phone call away. If we cannot answer your questions over the phone or in the unlikely event your chair requires repair, we will dispatch a Service Specialist to your home.

Just call Hoveround Technical Support and Repair, toll free at 1-800-96-HOVER (1-800-964-6837).

Safety Instructions

Before You Use Your MPV 4

The Hoveround® MPV 4 is a battery operated motor vehicle. The operation of the power chair requires caution and consideration for your personal safety and the safety of others around you. The list below details some of the important “dos” and “do not’s.” Please read this entire manual thoroughly and call toll free 1-800-96-HOVER (1-800-964-6837) if you require further assistance.

The “DOs”

1. **Always** use the seat belt.
2. **Always** set the joystick/controller speed/response control to be consistent with the surrounding environment. In confined spaces and while learning to drive the vehicle, we recommend that the speed/response control be set to minimum.
3. **Always** climb and/or descend slopes straight up or straight down. Never drive across the slope.
4. **Always** use extreme caution when driving over soft and/or uneven surfaces such as grass or gravel.
5. **Always** perform the operator performance and maintenance checks that are detailed in the maintenance section of this guide.
6. **Always** ensure that the unit power is off before:
 - a) Getting in to or out of the seat.
 - b) Making any adjustments to your Hoveround.
 - c) Bending, leaning, adjusting clothing while seated.

The “DO NOTs”

1. **Do not** stand on front/foot area of unit.
2. **Do not** lean out of, or get on or off your unit while the power is on.
3. **Do not** exceed the 300 lbs. maximum weight capacity of this vehicle.
4. **Do not** operate optional power seat lift unless you are on a flat, hard, level surface.
5. **Do not** occupy your Hoveround® MPV 4 while it is being transported within a motor vehicle. Transfer from the MPV 4 to one of the motor vehicle seats and secure your MPV 4 to the motor vehicle with an approved four point tie-down system.
6. **Do not** modify your MPV 4 in any way. Modification or tampering will void the warranty and may cause the vehicle to malfunction and expose you to physical harm.
7. **Do not** operate your MPV 4 while taking medications or alcohol that may affect your ability to safely drive your powerchair. Follow your doctor’s and pharmacist’s directions as to the effects that a medication may have on your ability to drive a powered wheelchair.
8. **Do not** subject unit to direct rain, water, slush or snow.
9. **Do not** abruptly change direction when traveling at higher speeds, or when operating on an incline or uneven surface.
10. **Do not** attempt to climb or descend a slope greater than 5 degrees (one foot of climb for each eleven feet of travel).
11. **Do not** operate on ramps without side rails or ramps that do not comply with ADA standards.
12. **Do not** drive your MPV 4 on the roadway or public streets.
13. **Do not** attempt to climb steps greater than 1.5 inches in height or operate on unstable surfaces.
14. **Do not** operate radio transmitters such as CB’s, walkie-talkies or cellular phones from the vehicle unless the power to your MPV 4 is OFF.

15. **Do not** perform any maintenance without first disconnecting batteries.
16. **Do not** adjust or operate vehicle with the seat in a reclined, forward, or swivelled position.
17. **Do not** adjust the seat recline lever unless the seatback is held in place.
18. **Do not** adjust seating such that driving visibility is impaired.
19. **Do not** leave your battery charger connected to a power source when not charging.
20. **Do not** connect any devices, medical or otherwise, to the batteries or electrical system of your MPV 4 except those supplied by Hoveround.
21. **Do not** operate without your feet securely on the footrest or legrests.
22. **Do not** operate a vehicle that is not functioning correctly.
23. **Do not** let your batteries run down.
24. **Do not** hang objects from the joystick.

When it is necessary to cross a road:

1. Do so at a location where you are clearly visible to motor traffic, preferably at a light-controlled pedestrian crossing.
2. Cross the road by the most direct route.

Slopes, Ramps and Obstacles:

Slopes, ramps and obstacles can be dangerous. Even experienced wheel chair drivers can get into trouble by underestimating the slope, ramp or obstacle before driving on it. Do not drive on slopes, ramps or over obstacles that might cause you to fall or injure yourself or others around you.

Slopes and ramps can be especially dangerous when wet, uneven, covered with gravel, sand, ice or grass or not secured properly. Traversing a slope, ramp or obstacle on an angle can present further danger of side tip over. To prevent harm or injury, only drive on slopes and ramps that are ADA approved and properly maintained. Use caution and a slow speed setting when approaching the slope, ramp or obstacle. Only drive straight up or down slopes, ramps and obstacles. Do not exceed the obstacle or ramp climbing capability of your power chair.

Hoveround MPV 4



Chapter 1

Operating Instructions

Driving your MPV 4



Note: See section on joystick controllers to identify the type of control on your MPV 4.

1. Always fasten your seat belt before driving.
2. Allow plenty of space to test drive your MPV 4.
3. With the power off, hold the joystick and move it to determine the limits of movement. Observe that, when released, the joystick returns to center (neutral).
4. With the joystick in the center position (neutral), turn vehicle power on. Check battery gauge for adequate battery capacity.



Note: If the joystick is not in the center position when the chair is turned on, a fault condition is indicated. Return the joystick to center. If the chair does not move, reset the control by turning the power off and then on.

5. Set the Speed/Response Control to the lowest level.
6. Gently move the joystick forward. A “click” will be heard as the controller releases the motor brakes and the MPV 4 will move slowly forward. Observe that if the joystick is released, the lever will return to center (neutral) and the vehicle will stop. Note that when the vehicle stops, another “click” will be heard as the brakes are engaged.

If the status indicator is flashing the controller has sensed a fault condition. Refer to the fault code section of Appendix B (page 39-41) to determine the cause of the fault. The vehicle will not respond to move commands if a fault condition is sensed.

7. Move the joystick lever fully right. The chair will move in a circle to the right. Moving the lever fully left will cause the chair to circle to the left.
8. Gently move the joystick lever backward, and the chair will move slowly backward. Note that the backward movement is about half the speed of the forward movement.
9. If you move the joystick lever gently back and to the right, the chair will move backward to the left and vice versa.
10. Learn the characteristics of the MPV 4 and the limits of your own driving ability before attempting to drive at higher speed settings.



Warning! Keep the speed low until you are completely comfortable with controlling the chair. Practice driving in a wide open area using movable items such as empty boxes as an obstacle course to learn how to maneuver your Hoveround®.

11. As your skill increases, you may want to increase the Speed/Response Control. For each increase of the Speed/Response Control, be sure you practice several stops until you get used to the new stopping distance.
12. The controller has a fast-brake system. To stop quickly move the joystick from the forward position to a full reverse position and release the joystick. This will cause the vehicle to stop more quickly.



Warning! Do not operate the unit on unstable surfaces.

Joystick Controllers

All the controls and indicators necessary to drive your MPV 4 are located on the joystick controller. Your MPV 4 may be equipped with one of the following joystick controllers.

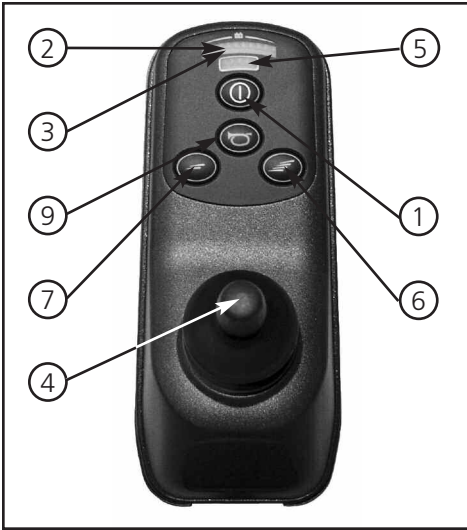


Figure 1A - VSI

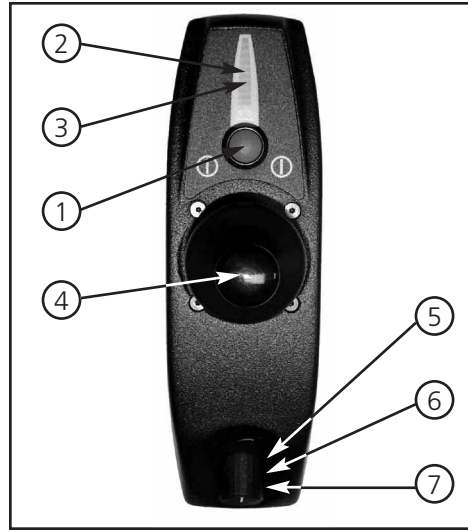


Figure 1B - Pilot

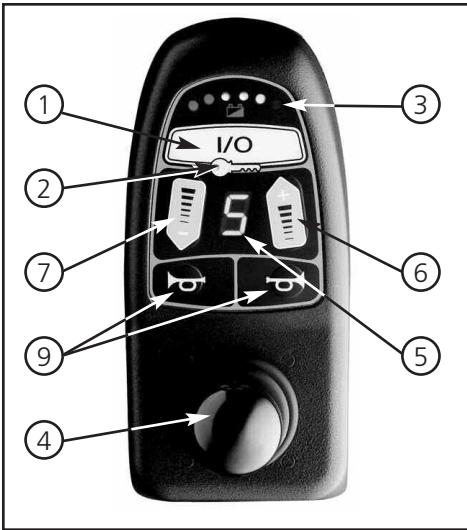


Figure 1C - Commando

1. **On/Off** - Press to turn the system on and off.
2. **System Status Indicator** – Steady illumination means all systems are functioning properly. A flashing display indicates an error is present or the controller is locked. Refer to appendix B (page 39) for error codes and troubleshooting information.
3. **Battery Gauge** – Shows how much battery charge is remaining. All lights lit means full charge. Recharge as often as possible.
4. **Joystick** – Controls speed and direction. The further you push, the faster you go. To prevent an error code, do not push the joystick at the same time you turn the power on.
5. **Speed/Response Indicator** (if so equipped) – Indicates the currently selected speed by the number displayed or the number of lighted segments. (If the number 5 is displayed or when all lights are lit, or knob is fully clockwise you are at top speed.)
6. **Speed Up** – Depending on the model, pressing the button or rotating the knob clockwise increases speed.
7. **Speed Down** – Depending on the model, pressing the button or rotating the knob counterclockwise decreases speed.
8. **Mode** (if so equipped) – Press to select the desired mode of operation drive, speed or power options. In speed mode, move the joystick right to increase setting, left to decrease. Press mode or move the joystick forward to lock in the setting.
9. **Horn Button** (if so equipped) – Press to activate the horn.

Additional Features

Locking feature (optional on some controls) – Locks the controller. Refer to appendix C (page 42) for operating instructions.

Sleep mode – Your chair will either power down or go off if left idle for 5 minutes. The system indicator may blink or the controller will completely power off. Push the on/off button twice to restart.

Chapter 2

Batteries And Charging

The MPV 4 uses two sealed 12 volt batteries of the U1 size, with capacity of 33 ampere hours.

The battery pair is connected into a series configuration to provide 24 volts of power.

The batteries supplied by Hoveround® are of the sealed-type that require no maintenance. These batteries are classified as "wet - non-spill" and may be transported by air, land or sea.

Caring For Your Batteries And Charger



Warning! The batteries supplied with the vehicle contain sulfuric acid. Extreme caution should be observed when handling and/or recharging these batteries.

The guidelines below will assure your safety and maximize the useful life of the batteries and charger.

1. Never attempt to open a sealed battery.
2. Charge the batteries with only the charger supplied.
3. Place the charger where it can be seen, clear of anything flammable including carpeting, drapes, etc.
4. Do not allow contaminants to enter the charger case.
5. Do not use a charger if either the power cord or the output cord is damaged.

6. Never leave batteries in a discharged condition. If the vehicle gets intermittent use only, recharge after that use. If the vehicle is idle for a prolonged period, charge the batteries prior to storage and once every three weeks thereafter.
7. The useful life of the batteries is about 200 - 500 discharge/charge cycles. Failure to get normal driving range from the MPV 4 could be a symptom of failing batteries.
8. Your batteries work as a pair. The pair is only as good as the weaker of the two. Replace your batteries only as a pair, never a single battery.
9. Be suspicious of any fluid that may be on the battery tops. Although your batteries are sealed and should not discharge fluids, there are circumstances that could allow a discharge of fluid. The possibility of this increases with failing batteries. A pinch of household baking soda dropped into the fluid will both reveal the presence of acid and will help neutralize it. If, when the baking soda is dropped into the fluid, the mixture fizzes, then the fluid is acidic and should not be allowed to contaminate other areas. Deposit more baking soda to absorb fluid and consult Hoveround Technical Support, toll free at 1-800-96-HOVER (1-800-964-6837).

Battery Replacement

When it becomes necessary to replace batteries, consult with Hoveround Technical Support. The replacement batteries must be of the sealed, deep-cycle Wet or Gel electrolyte or Sealed Lead Acid types of the appropriate size. We recommend that your Hoveround service technician installs the new batteries for you. Dispose of the old batteries in accordance with EPA regulations.



Warning! Have your old batteries disposed of by the battery supplier. Do not keep old batteries because they can be dangerous to life, property, and the environment.

Charging Your Batteries

Your chair is equipped with one of several different chargers. Please follow the operating instructions for the appropriate charger. The recharging time for the batteries will vary based on the amount of use the chair has had. It may take up to 8 hours for a full recharge.

We recommend an overnight charge after the day's use of the chair.

1. Select a clean, dry, cool, well ventilated area to use the charger.
2. Make sure the charger is switched to the off position, if so equipped, and the joystick controller is off.
3. Connect the charger output cord into the charger port located on the front of the joystick controller. (see Figure 2A, below) Align the three pins on the plug with the three holes on the port and push the plug in place. Make sure the plug is fully seated in the charger port. If it is not pushed in far enough the batteries will not charge or the plug may become hot.
4. Plug the AC power cord into the back of the charger.
5. Plug the other end of the AC power cord into a grounded, household power receptacle.
6. Follow the specific instructions for your charger from the following pages.
7. When the batteries are charged, or you are ready to use the chair,
 - a. If there is a power switch on your charger, turn it off.
 - b. Unplug the charger from the household outlet.
 - c. Unplug the charger from the joystick controller.



Figure 2A - Charger Port, Typical Location

If you have a:

Flying Power FY-4101 Charger

1. Switch the power on. A light will illuminate on the output side of the charger, indicating power is available. **If the light does not go on, please check to make sure the household power is working.**
2. If the light is red, the batteries are charging.
3. If the light is green the batteries are fully charged. You can leave the charger connected until ready for use.
4. If the batteries do not appear to be fully charged and the green light is on, check to make sure the charger has been properly plugged into the controller charging port and the batteries are connected.

Soneil 2409 Charger

1. When fully plugged in, the charger is ON and the indicator light will be illuminated. **If the light is not on when all connections are made, please check to make sure the household power is working.**
2. When the light is orange, the batteries are charging.
3. When the light is green, the batteries are charged.
4. Please note the charger will get hot to the touch during operation. This is normal. Make sure delicate surfaces are protected with a pad between the charger and the surface.
5. If the batteries do not appear to be fully charged and the green light is on, check to make sure the charger has been properly plugged into the controller charging port and the batteries are connected.

CSB/prism 2404 Charger

1. Turn the red power switch to the power on position. A red light will illuminate indicating power is available. **If the red light does not go on, please check to make sure the household power is working.**
2. The green charge indicator light on the front panel will illuminate indicating the batteries are being charged. If the green light is not lit, it means the batteries or the charger are not connected. Please check all connections and proceed.
3. When the green light goes out, the batteries are charged.
4. Please note the charger will get hot to the touch during operation. This is normal. Make sure delicate surfaces are protected with a pad between the charger and the surface.

Chapter 3

Manual Brake Release Levers

On occasion it may be necessary to push your MPV 4. To enable the chair to be pushed, each motor has a manual release lever. These manual brake release levers protrude forward through the cover (See Figure 3A, below).

The levers move downward to release the brake of that motor. When both brake release levers are released, and the power turned off, the chair can be pushed. When either of the levers is in the released position (downward) the vehicle cannot be driven. An error code will be displayed if driving is attempted. Pull both brake release levers up to re-engage the brakes.

Move levers to the Drive (up) position when pushing is completed.

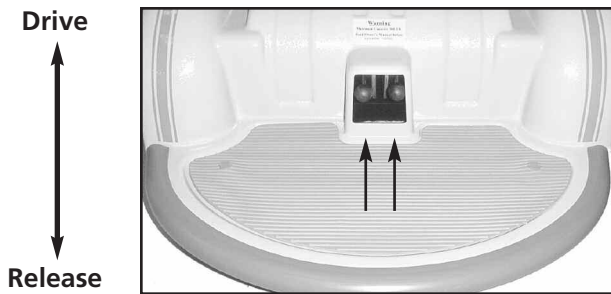


Figure 3A - Manual Brake Release Levers

Chapter 4

Seating

A good driving posture is necessary for both comfort and safety. You must have a clear line of sight ahead of the vehicle, a good view of the joystick/controller and comfortable hand access to the joystick and speed/response control.



Warning! Make sure the joystick controller is off before making any adjustments.

A. Arm Angle Adjustment

The seat arms have angle adjustments to suit your driving and comfort requirements.

To adjust the arm angle on the seat arms, lift the arm and locate the adjustment bolt near the pivot point. (see Figure 4A, below)

Use the supplied 1/4" hex wrench to make the adjustment. Turn the screw clockwise to lower the arm and counter clockwise to raise the arm.

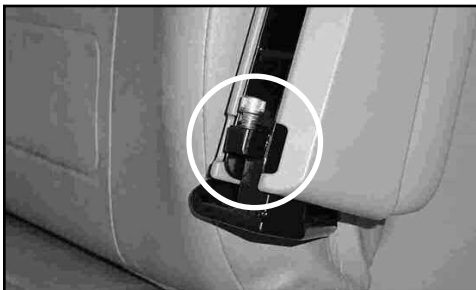


Figure 4A

B. Controller Position Adjustment

You can adjust the position of the controller by lifting the arm and loosening the socket head cap screw closest to the controller. Use the 1/4" hex, T-handle wrench provided with your chair (See Figure 4B below).

Slide the controller bracket to a comfortable position and secure the screw. Make sure the screw is clear of the removal key opening, (Fig. 7B, Pg. 31) in the bracket before tightening.

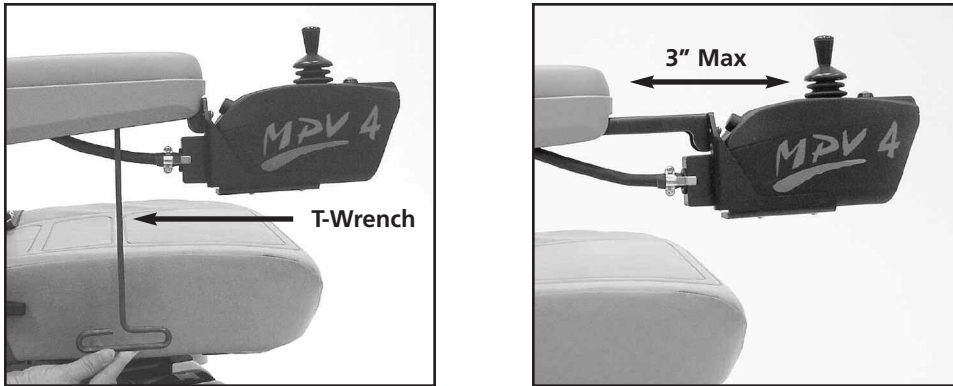


Figure 4B

C. Swivel Seat

The swivel seat permits the seat to pivot from the forward facing position through 90 degrees in either the left or right directions. The seat will lock in each of the forward, left and right facing positions. This feature is provided to make side transferring easier. The swivel release lever is mounted on the left side in the standard position, and can be changed to the right side by a Hoveround Service Technician.



Warning! The seat must be locked into the forward position before attempting to drive the vehicle.

To unlock the seat and swivel 90 degrees in either direction:

1. Locate the swivel release lever positioned at the rear-left underside of the seat, or front-right side under the seat if so equipped.
2. Release the seat by moving that lever horizontally back if left location, or horizontally forward if right location.
3. Keeping the lever in the release position, push with your arm or feet to cause the seat to pivot in the desired direction. Once the seat has moved away from the locked position, the lever can be released.

Note: Do not use the lever to rotate the seat. Do not force the lever to the locked position while rotating the seat.

4. Continue to pivot the seat around in the desired direction. When the seat reaches a 90 degree position, the lever will lock into place to hold the seat in that position.

Note: Rapid rotation may cause the swivel to skip the locking position.



Warning!

Before attempting to get in to or exit from the seat:

1. Turn the controller off.
2. Check that the seat is firmly locked into position.

D. Seatback Adjustment

The standard seat allows some adjustment for back position.

To adjust the back position, locate the recline lever, at the lower right hinge area (see Figure 4C, Page 25, two different configurations are shown). The seat-back is spring-loaded and will lurch forward if left unrestrained while the lever is released. It is best to make adjustments while in the seated position.

Move the spring loaded lever counter clockwise by pulling the lever up or pushing it back, depending on the configuration on your seat, to release the latch and position the seat-back until a comfortable position is reached. Release the lever and move the level clockwise to lock in the position.



Warning! Make sure the lever is in the locked position before applying weight to the seat back or arms. Move the lever clockwise if unsure.



Warning! The power chair should be driven only with seat-back in an upright position.

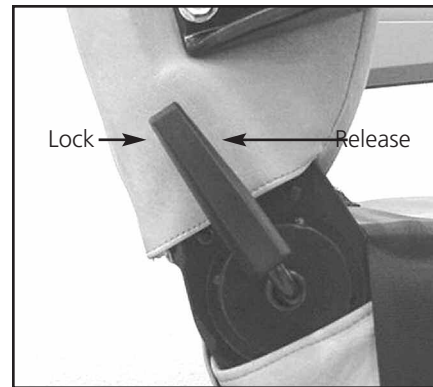
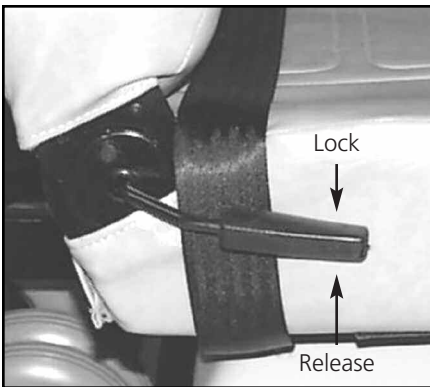


Figure 4C - Manual Recline Lever

Chapter 5

Options

A. Optional Tie-Down Brackets

When transporting the MPV 4 in a motor vehicle, the wheelchair must be adequately secured within the motor vehicle. Optional tie-down brackets can be located in the sockets provided at the front and rear corners under the seat (See Fig. 5a below).

The tie-down facility outlined above is intended to tie down the wheelchair only.



Warning! The wheelchair must not be occupied while being transported.



Figure 5A

B. Optional Powered Seat Lift (PSL) – 6" Lift

Press either seat symbol button to activate the PSL mode. When the indicator light is lit, move the joystick forward to raise the seat, back to lower. The MPV 4 will not drive while seat is raised and light is on. When seat is fully down, press either button to restore drive mode.

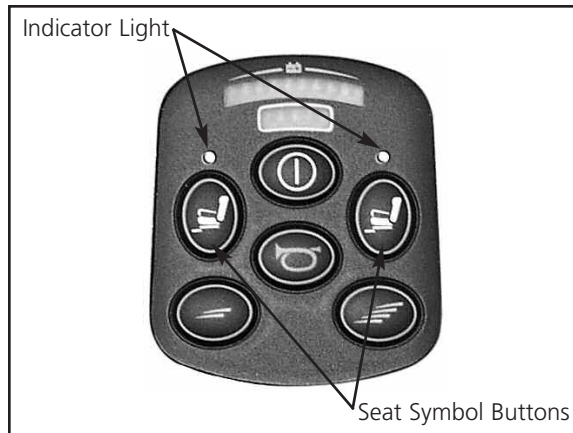


Figure 5B



Warning! Do not attempt to drive this vehicle with a seat-back recline angle that will impede comfortable forward vision.

C. Optional Reclining Seat

The optional reclining seat will permit the seat back to recline approximately 45 degrees. Adjustment of the seat back angle is described on page 24 Chapter 4.

D. Optional Legrests or Footrests

1. Install each leg / footrest onto the appropriate hanger bracket and swing into the forward facing position. If elevating legrests are installed, set the angle to the lowest possible position.
2. Fold down the foot plates. Your feet should comfortably rest on the plates without a tendency to lift your thighs from the seat cushion.
3. If length adjustment is necessary, loosen the bolt at the base of one of the footrest stems by two complete turns, (1/2 inch wrench required). Tap the head of the bolt to loosen the inner tube from the outer tube (See Fig. 5C below)
4. Slide the lower (inner) tube within the upper (outer) tube to achieve the correct footrest length. Tighten the bolt.
5. Repeat (3) and (4) for other footrest.



Figure 5C

Chapter 6

Routine Maintenance

Wherever possible, Hoveround® has incorporated maintenance-free components into the design of the MPV 4. Bearings and batteries are sealed. The requirement for periodic service is minimal.

Owner Maintenance

Daily

- Check drive tires.
- Charge batteries (or as required).

Weekly

- Check tire treads and pressure. (Should be 45-50 psi.).
- Check that casters are free to pivot.
- Check that caster wheels rotate freely.
- Check manual brake releases. Release each brake separately to ensure that each disables the drive when released.
- Check that drive is prevented and that a fault code is present when the optional PSL is raised, and the controller is ON.
- Check that the rubber boot around joystick is intact.
- Check that all seat locking screws are tight.
- Check charger cords and connectors for loose connections, damaged cables or signs of electrical damage.

Cleaning your MPV 4

The MPV 4 is designed to operate both inside and outside the home. To keep the vehicle clean:

- Seat** – Wipe with a damp cloth or towel, using a mild detergent or window cleaner.
- Tires** – Brush-off loose material with a dry bristle brush and wipe with a damp cloth or towel.
- Top Cover** – Vacuum or brush off dirt, then wipe with a damp cloth or towel, using a mild detergent.
- Controller** – Ensure that the power switch is off before attempting to clean this area. Food-type contaminants can be removed from around the joystick boot by carefully cleaning with a cotton swab, using a mild detergent. The controller body can be wiped with a damp cloth or towel, using a mild detergent.



Warning! Never spray the vehicle with water - use a damp cloth only.

Service

Service requirements for your MPV 4 are minimal. Yearly service and maintenance is highly recommended to ensure proper operation. Please contact Hoveround Technical Support at 1-800-96-HOVER (1-800-964-6837).

Chapter 7

Disassembling and Reassembling Your MPV 4

A. Controller Removal/Replacement

Removal

1. Check that vehicle power is OFF.
2. Lift the arm and loosen the socket head cap screw closest to the controller. Use the 1/4 inch hex wrench supplied with your chair (See Fig. 7A, Below).
3. Slide the controller bracket forward until it hits the key slot. (See Fig. 7B, Below). Remove bracket from arm and place on footrest or other safe location. Unlock cable from seat. (See Fig. 7C, Pg. 32).



Figure 7A

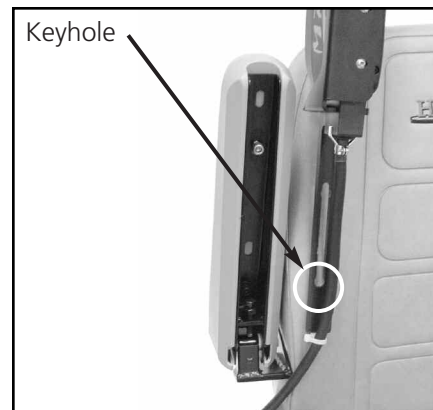


Figure 7B

Replacement

1. Loosen forward socket head cap screw.
2. Position key hole portion of bracket over screw and slide into place.
3. Position controller in a comfortable position and secure screw.
4. Fasten the controller cable on to the catch on the lower seat (See Figure 7D, Pg. 32).

B. Seat Removal/Replacement

Removal

1. Remove controller.
2. Remove the controller cable from the seat clip by pinching the small tabs on the clip with one hand while removing the strap with your other hand. (See Fig. 7C, 7D and 7E, Below).
3. Using the 1/4 inch hex wrench supplied with the vehicle, loosen the cap screw located at the top-front corner of the seat post. (See Fig. 7F, Pg. 33).
4. Grasp the seat at the front and back and lift seat directly upward until it is free of the seat post.



Warning! Seat is heavy. Do not attempt to lift beyond your capability.

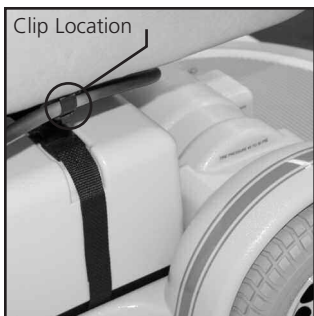


Figure 7C

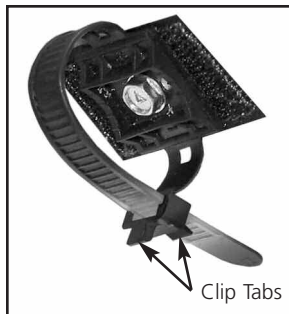


Figure 7D



Figure 7E

Replacement

1. Grasp the seat at the front and back.
2. Align the male post of the seat bracket with the seat post and allow seat bracket to descend into the seat post.
3. Tighten the socket head cap screw at the top-front corner of the seat post with the 1/4" hex wrench that is supplied with the vehicle.
4. Reattach the controller cable to the seat by placing the strap around the cable and inserting the strap into the slot on the clip. Position the cable to the minimum length to allow the arm to lift. Tighten the strap to keep the cable in position. To prevent cable damage, do not let the cable hang free or extend beyond the chair. Use care when driving to keep the cable from catching on objects.



Warning! The cable that joins the joystick to the junction box is a critical part of the vehicle. Ample cable is provided to allow for adjustments. There is a danger if this cable is not correctly routed. Do not allow the excess cable to extend beyond the width of the chair where it may become damaged.

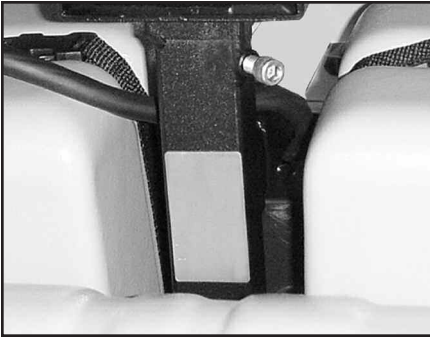


Figure 7F

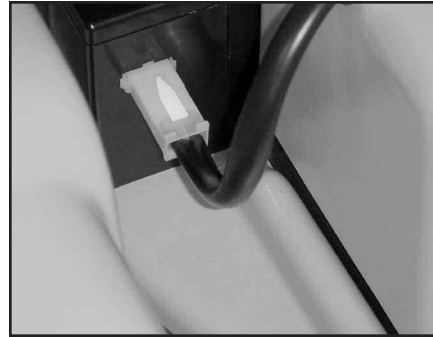


Figure 7G

C. Battery Removal/Replacement

Removal

1. Remove each of the battery connectors by pinching the white tab on the connector at the junction box and gently pulling free (See Fig. 7G, Above).
2. Carefully lift the battery and case clear of the vehicle.

Replacement

1. Either battery can fit onto either side of the vehicle.
2. Place one of the batteries onto the vehicle deck, under the seat, into the recess of the deck that is provided.
3. Hold the connector of that battery such that the clip is upward.
4. Locate that connector into the appropriate receptacle of the vehicle junction-box, (left battery connects to the receptacle on the left side).
5. Lock the battery connector plug to the receptacle by pushing until a click is heard. Gently pull on the connector to ensure it is fully locked in place.

D. Outrigger Removal

1. Remove seat as detailed on pages 32-33.
2. Find the retaining hitchpin that protrudes through the outrigger horizontal tube from the top.
3. Remove that retaining pin.
4. Loosen the socket head cap screw that is located on the outrigger horizontal corner using the 1/4" hex wrench that is supplied with the vehicle.
5. Pull the outrigger clear of the frame and allow frame to rest on its back edge (See Figures 7H and 7I, below).

E. Outrigger Replacement

1. Align the male outrigger tube with the female receiver tube that exits horizontally from the seat post.
2. Mate the two tubes to each other. The outrigger tube should push into the receiver tube until the holes in the top-face of each are aligned (See Figure 7H).
3. Replace the hitchpin through both members of the outrigger.
4. Tighten the socket head cap screw that is positioned on the corner of the outrigger horizontal tube, using the 1/4" hex wrench that was supplied with the vehicle.

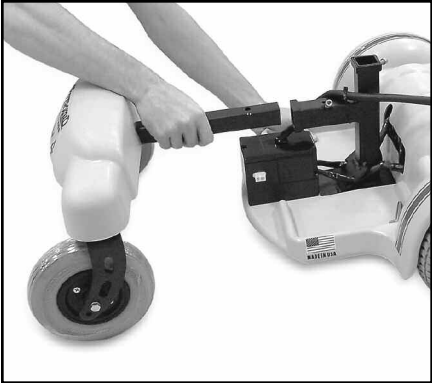


Figure 7H



Figure 7I

Chapter 8

Electromagnetic Interference (EMI)

Our environment is saturated with radio (electromagnetic) waves that originate from transmitters of television, radio and communication signals. The waves are invisible and their strength at any location is unknown but in general, the strength of a given e.m. wave increases as you move toward the transmitting source. All electrical conductors act as antennas to the e.m. signals. To varying degrees, all powered wheelchairs and scooters are susceptible to electromagnetic interference. Abnormal operation in the form of unintentional movement and / or erratic control of the vehicle could result if the interference is such as to override the control system of the vehicle. The U.S. F.D.A. has suggested that the following statement be incorporated to the owner's manual for all powered wheelchairs.

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. This MPV 4 powered wheelchair model, as shipped, without any further modification has a tested immunity level of at least 20 V/m. There are a number of sources of relatively intense electromagnetic fields in the everyday environment. Some of the sources are obvious and easy to avoid. Others are not so obvious 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 antennas mounted directly to the transmitting unit. Examples include: Citizen band (CB) radios, "walkie-talkie", security, fire, and police transceivers, cellular telephones and other personal communication devices. Note: some of the above transmit signals even when they are not being used for communication.
2. Medium range mobile transceivers, such as those used in police cars, fire trucks, ambulances and taxis. These usually have the antenna mounted to the outside of the vehicle; and
3. Long-range transmitters that have the antenna mounted upon a fixed tower.



Note: Other types of hand-held devices, such as lap-top computers, AM/FM receivers, TV sets, CD and cassette players, and small appliances such as electric shavers and hair dryers, as far as we know, are not likely to cause problems to your powered wheelchair.



WARNING! Radio Wave sources may affect powered wheelchair control.

Radio wave sources, such as radio stations, TV stations, amateur radio (HAM) transmitters, two-way radios and cellular phones, can affect powered wheelchairs and motorized scooters (in this text, both will be called powered wheelchairs). 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: 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 radio wave source nearby.

Important Information

1. 20 volts per meter (V/m) is a generally achievable and useful immunity level against interference from radio wave sources (as of May 1994, the higher the level, the greater the protection).
2. The MPV 4 wheelchair has an immunity level of at least 20 V/m.

Chapter 9

Appendixes

Appendix A: Programmable Parameters

The controller used on your power chair is programmable for basic functions. It requires a programmer to make changes. Any changes must be made by a qualified technician only.

The following chart indicates the standard program values of the factory settings. Refer to the appropriate section depending on the style of control system on your chair. Any subsequent change of the programmed values should be recorded and saved for future reference.

Program Settings

	VSI	VSI PSL	Pilot	Commando
Acceleration	20	20	20	20
Deceleration	50	50	50	50
Forward Speed Max	100	100	100	100
Forward Speed Min	10	10	10	10
Turn Speed Max	15	10	18	15
Turn Speed Min	10	10	10	5
Reverse Speed Max	55	55	55	60
Reverse Speed Min	10	10	–	10
Turn Acceleration	30	10	30	10
Turn Deceleration	40	25	40	15

Appendix B: Fault Codes

The microprocessor checks various features within the controller and will display any fault indication. The controller may prevent the chair from driving should a critical fault condition exist. Refer to the appropriate fault code section for the system used on your MPV 4.

Note: When there is a fault please follow this procedure:



- A. Switch off the control system.
- B. Make sure that all connectors on the chair and the control system are connected securely. Make sure brake release levers are in the drive position.
- C. Switch on the control system again and try to drive the chair. If the fault occurs again, switch off and do not try to use the chair. Contact Hoveround Support 1-800-96-HOVER (1-800-964-6837)

MPV 4s using these style control systems use lighted bars to display fault codes.



VSI



PILOT

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

- 1 bar:** Low battery or a bad connection.
- 2 bars:** Bad connection to left motor.
- 3 bars:** Short circuit, left motor to battery.
- 4 bars:** Bad connection to right motor.
- 5 bars:** Short circuit, right motor to battery.
- 6 bars:** Verify battery charger is not plugged in (Pilot). Controller fault (VSI).
- 7 bars:** Joystick fault.
- 8 bars:** Controller fault.
- 9 bars:** Problem with brake circuit. Check that manual brake release levers are in the drive position and power seat lift is lowered (if equipped).
- 10 bars:** An excessive voltage to the control system. This is usually caused by a poor battery connection.
- 10 bars Rapid Flash:**
Powered up when joystick deflected. Restart with joystick in neutral.
- 10 bars, Three Second Blink (Pilot) or 6 bars, three second blink (VSI):**
Control is in sleep mode. Press Off/On twice to restart.
- Speed Bars Cycling (VSI) or bars cycling (Pilot):**
Controller locked.
- Speed Bars Flashing:**
Power seat lift is inhibiting drive. Lower the seat.

MPV 4s with this controller system use a flashing "System Status Indicator" light in the key symbol.



Figure 9A

When flashing, it indicates a “fault” condition somewhere in the control system (see Figure 9A, Pg. 40).

The nature of the fault is indicated by the number of flashes in each burst, referred to as the “Flash Code”.

The joystick control will act differently depending on the severity of the fault and its impact on safety. It may do one of the following:

1. Simply give a flash code as a warning and let driving continue.
2. Automatically stop the chair and indicate a fault by giving flash codes. Transient faults may be cleared by turning the unit off then on. Permanent faults will need to be cleared in order to resume driving.
3. Let the chair drive but at a reduced speed. This is known as Limp Mode and is used for intermediate faults in which maintaining some degree of driving is the preferred and safest option.

Flash Code	Probable Fault
Burst of 1 flash	Joystick controller may be faulty
Burst of 2 flashes	Accessory fault
Burst of 3 flashes	Left Motor fault
Burst of 4 flashes	Right Motor fault
Burst of 5 flashes	One of the Park Brakes is faulty
Burst of 6 flashes	Unused
Burst of 7 flashes	Battery very low
Burst of 8 flashes	Battery Voltage too high
Burst of 9 flashes	Internal comms fault 1
Burst of 10 flashes	Internal comms fault 2
Burst of 11 flashes	Stall time out
Quick pulse every 2 sec. red	Powered up but locked
Rapid flashing	Powered up when joystick deflected
Dash (-)	Charger connected

Appendix C: Locking Feature

Your MPV 4 is equipped with a locking feature. Please refer to the appropriate instructions for the controller on your MPV 4.

Lock Sequence System

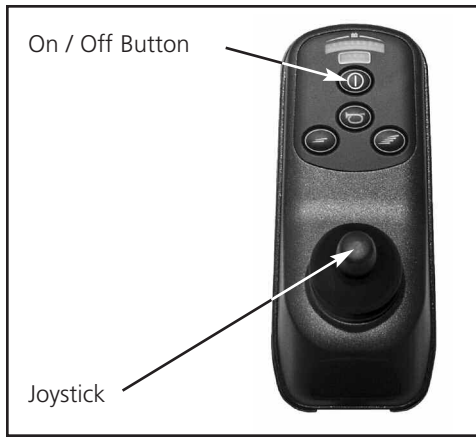


Figure 9B - VSI

1. Turn the controller on.
2. To lock the chair, depress and hold the on/off button. After one second the controller will beep. Release the on/off button. Move the joystick forward until the control beeps. Move the joystick in reverse until the control beeps. Release the joystick. There will be a long beep that indicates the controller is locked.
3. To unlock, turn the control system on. The speed/response indicator will be rippling up and down. Move the joystick forward until the control beeps. Then move the joystick in reverse until the control beeps. Release the joystick. There will be a long beep that indicates the controller is unlocked.

Key Lock Systems



Figure 9C - Pilot Key

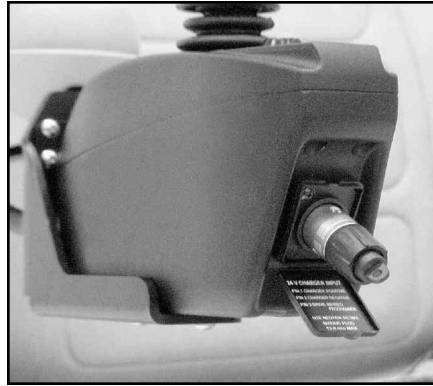


Figure 9D - Pilot

1. Turn the controller on.
2. To lock the unit, insert and **REMOVE** the key at the charger port. (See Figure 9C and 9D above). Note: The key must be removed for controller to lock. Press the on/off button. When the display cycles, the chair is locked. If you want to shut off the cycling display, press the on/off button again. The chair cannot be operated or driven when locked.
3. To unlock the controller, press the on/off button. The speed display will cycle. Insert and **REMOVE** the key (See Figure 9C and 9D above). The display will illuminate indicating the controller is unlocked and the chair can be operated.

Magnetic Lock Systems



Figure 9E - Commando

1. Turn on the controller.
2. To lock the chair, swipe the magnetic key over the key symbol (see Fig. 9E, above). The joystick controller will beep and turn off and lock.
3. To unlock the power chair, press the on/off button (note red flashing light in the "key") and swipe the magnetic key across the key symbol from right to left. The joy stick controller will turn on and unlock.
4. If you turn the unit on but do not swipe the key, the red light in the key symbol will pulse every 2 seconds to indicate it is turned on, but locked. The controller will automatically turn itself off if the lock is not disarmed within 1 minute.

Appendix D: MPV 4 Specifications

Performance

Maximum Speed	5 mph*
Range (per battery charge)	15 miles*
Capacity	300 lbs
Turning Radius	22.3"
Ground Clearance	2.5"
Maximum step climb	1.5"
Maximum grade climb	5° per ADA ramp recommendations

Dimensions and weight (with 17" seat in lowest position)

Length	38"
Overall Width	24.5"
Top of seat cushion to floor	19.5"
Seat height adjustment from lowest position	1.6", 2.4", or 3.1"
Total weight, with batteries	193 lbs
Base only	89 lbs
Base with batteries	141 lbs

Batteries

Two U-1 batteries, 33 amp hour capacity each, Sealed AGM

Tires and casters

Tire type and tread	Pneumatic, non-marking
Tire diameter and width	9" x 3.5"
Caster type and tread	Solid, non-marking
Caster diameter and width	8" x 2"

Seat

Width	17"	18"	19"	22"
Back height	20"	17"	20"	20"
Depth	18"	18"	18"	19"
Cushion height	4.5"	4"	4.5"	5.5"
Seat belt length	60"	60"	60"	90"
Recline lever position	Right	N/A	Right	Dual

* Speed and range will vary with respect to terrain and weight of rider.

Note: Specifications and equipment subject to change without notice.

Limited Warranty

Hoveround Corporation warrants the products manufactured by it, other than its component battery or batteries, to be free from defects in materials and workmanship for a period of one (1) year from the date of purchase. Batteries are warranted by the battery manufacturer. If, within such warranty period, any such product shall be proven to Hoveround's satisfaction to be defective, such product shall, at Hoveround's option, be repaired or replaced. Hoveround's sole obligation and your exclusive remedy under this warranty shall be limited to such repair and/or replacement.

For warranty service please contact your authorized Hoveround service center. In the event that you do not receive satisfactory warranty service, please write or call directly to Hoveround, provide the service center's name and address, and indicate the nature of the problem.

Please do not return products directly to Hoveround without our prior written consent.

Limitations and exclusions:

The foregoing warranty shall not apply to upholstery and tires; normal wear and tear; or to products subjected to negligence; accidents; improper operation, maintenance or storage; commercial, institutional, or service use other than normal application; or to products damaged by reason of repairs or modifications made to any product without the specific written consent of Hoveround, or to products damaged by circumstances beyond Hoveround's control. This warranty applies in the USA only and only within the geographic boundary of the Hoveround service network.

The foregoing warranty is exclusive and in lieu of all other express warranties, implied warranties, if any, including but not limited to the implied warranties of merchantability and fitness for a particular purpose, and shall not extend beyond the duration of the express warranty provided herein. Hoveround shall not be liable for any consequential or incidental damages whatsoever.



HOVEROUND[®]
Personal Mobility Vehicles

Phone: 1-800-96-HOVER (1-800-964-6837)
Fax: 1-800-747-9252

CORPORATE HOURS:
Monday-Friday (EST) 8:00 am - 8:00 pm | Saturday (EST) 9:00 am - 1:00 pm

2151 Whitfield Industrial Way | Sarasota, Florida 34243

www.hoveround.com