

REV

REVERSE PROPULSION WHEELCHAIR WHEELS

ROWHEELS REV™ SERIES (HX & LX): OWNER'S MANUAL



ROWHEELS®

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Thank you for purchasing a Rowheels REV™ wheelset!

Please do not use these wheels until you have read this entire manual and received training by an Assistive Technology Practitioner (ATP) on how to safely use this product.

Please feel free to contact Rowheels with any questions or concerns you may have about the wheels, service, or the contents of this manual.

Rowheels, Inc.
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Prior to using your REV™ wheelset please be sure to closely read the instructions pertaining to safety and installation. It is highly recommended that you seek and use the advice of a trained professional service technician. If anything is unclear please contact Rowheels Inc. at support@rowheels.com or contact your local equipment provider. Failure to understand installation or improper use of your REV™ Wheelset could result in serious injury or damage to your chair and wheelset.

SAFETY INFORMATION

As with standard wheels, always use your wheelchair within the limits of your ability and in accordance with the manufacturer's specifications. Failure to do so may cause serious injury or death.

The REV™ is designed to keep the geometry of your chair similar to a standard set of wheels, but to achieve optimal posture and positioning, it may be necessary to make modifications to your chair. If such modifications are desired, please contact your local wheelchair provider.

PRODUCT LIMITS

- Maximum axle camber is 4 degrees for the REV-HX and 6 degrees for the REV-LX.
- Maximum user weight is 300 pounds (136 kgs)
- Do not submerge your wheels in water or clean with a pressure washer.
- Use only mild soap and water to clean your wheels, no solvents, abrasives or bleach should be used.
- Do not disassemble or remove seals on your wheels, doing so will void the warranty.
- Avoid sandy conditions and any other exposure to excessive fine particles.
- When weight shifting, refrain from using only the handrim. Hands should be placed on the tire or tire and handrim together.



WARNING!

WARNING: Your REV™ wheelset is equipped with spoke guards that are specifically designed to keep hands and fingers safe. Do not operate the wheels if these guards have been damaged or removed. Operation without this equipment may result in serious injury. **VOID the warranty?**



WARNING!

WARNING: Verify that wheel axles, frame clamps and torque arms are properly inserted and in a locked fixed position prior to use. Failure to adhere to this precaution may result in improper operation or serious injury.



WARNING!

WARNING: It is strongly recommended that anti-tipping devices be used at all times. Failure to do so may result in serious injury.



WARNING!

Be careful when navigating steep hills and always operate under control. Be specifically aware of the position of your body in the chair. Correct balance when navigating hills may differ from conventional wheels and may require the user to reposition themselves to avoid tipping.

Be careful of excessive speed and ride under control at all times, especially when going downhill. Maintain proper braking pressure with hands and control downhill speed at all times to avoid accidents and collisions.

Rowheels REV™ wheelsets are a precision mechanical device. As such, users should always provide proper care, especially when installing, removing or storing wheelsets. Remain attentive when attaching, removing and stowing the wheelset. Be cautious of moving parts, metal edges and other mechanisms that may cause injury.

WARNING!

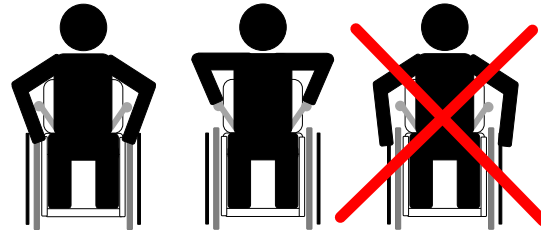
Use extra padding, cushioning and separation between wheels when transporting. A soft cushioned case or blanket is highly recommended to prevent accidental damage or marring to the wheels. It is recommended that you reuse the foam axle protectors that the wheels were shipped with for added protection of the wheels in transport.

Failure to read or comply with these warnings may cause damage to your wheels or a loss of control of your chair that may result in severe injury to yourself or others.

WARNING!

When performing a weight shift, rowheels users should avoid using the hand rim as support. Rowheels rev series wheels use the handrim as the input into the geared hub that inverts the wheel motion. Supporting your weight off of the handrim could damage the wheels and should be avoided at all costs.

User should use the wheel tires, the chair seat or armrests for support during weight shift.



VOID the warranty?

MAINTENANCE SCHEDULE

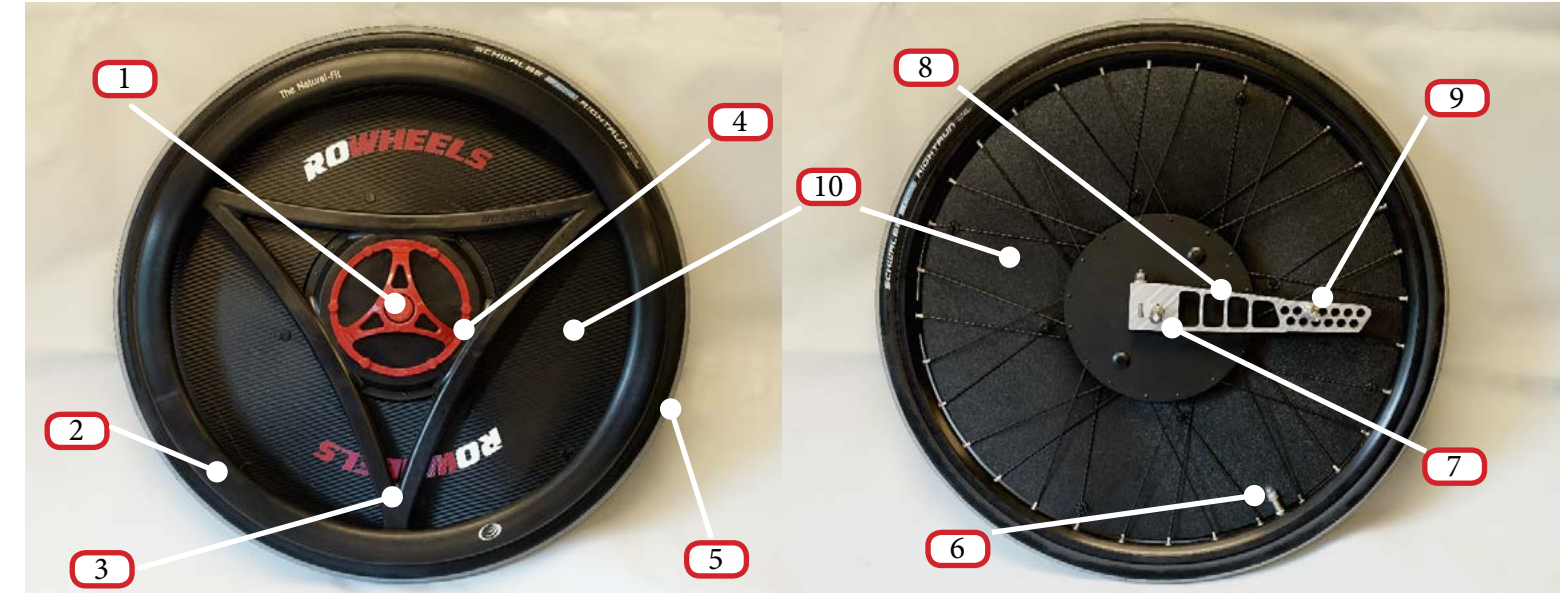
An important part of safely operating your REV™ wheelset is to have a weekly maintenance and inspection routine. It is highly recommended that you inspect tire pressure, tire wear, wheel spoke tension, clamps and mounting hardware, handrim condition or any other potential impediments that may cause improper operation or injury.

If routine maintenance or service is beyond your capabilities, please deliver your wheelset to an authorized service technician who can assure that your REV™ wheelset to their proper working condition.

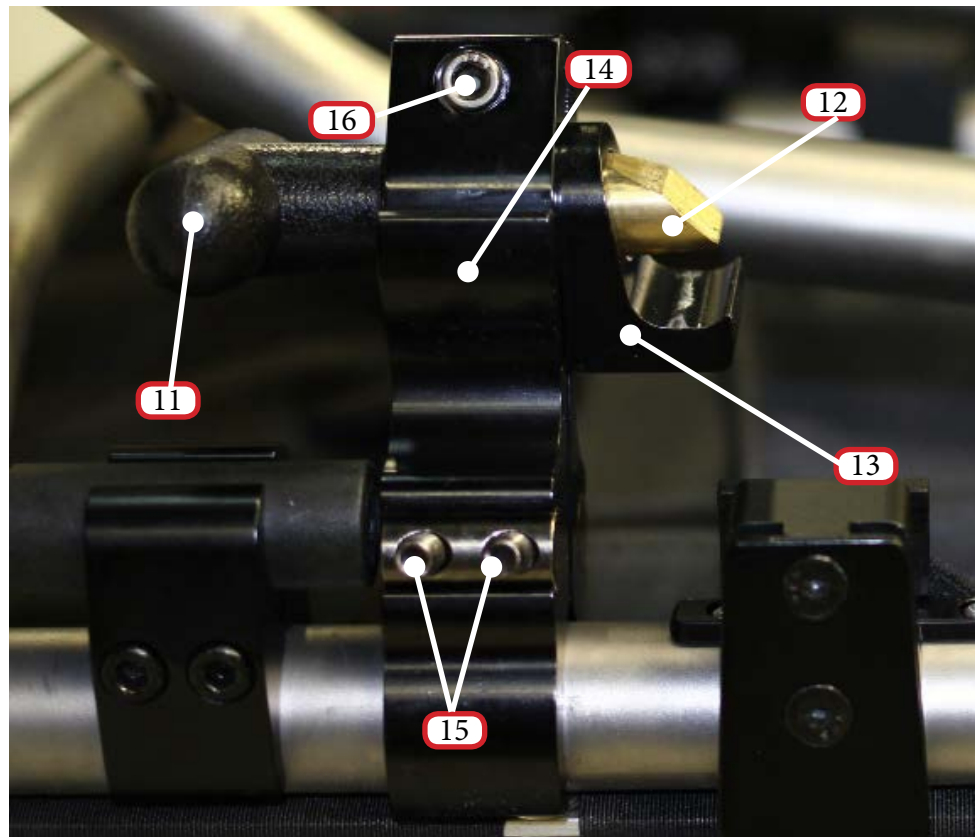
PARTS OVERVIEW

ITEM NUMBER	DESCRIPTION
1	Quick Release Button
2	Handrim
3	Handrim Hub
4	Handle
5	Tire

ITEM NUMBER	DESCRIPTION
6	Valve Stem
7	Axle
8	Torque Arm
9	Torque Arm Pin
10	Spoke Guard



LATCH ASSEMBLY



ITEM NUMBER	DESCRIPTION
11	T-Handle Release
12	Pin Latch Mechanism
13	Pin Receiver Slot
14	Universal Frame Clamp
15	Frame Clamp Screws
16	Set Screw

BEFORE OPERATING YOUR REV™ WHEELSET

INITIAL INSTALLATION

Please refer to the previous pages to locate the various parts of the wheel.

Attaching the Pin Latch Mechanism -

For the REV™ to function properly the torque arm (8) must be held securely in place. The torque arm pin (9) is held by the pin latch mechanism (11). The pin latch mechanism is permanently mounted to the frame by the universal frame clamp (13).

1. Begin installation by removing your standard rear wheels and locating the seating frame tubes of the chair. This part of the frame is below the seat cushion of the chair and runs along the underside of the seat cushion. This is the optimal mounting location.

2. Engage the quick release button on your wheel (Figure #1)



FIGURE #1

Initial Installation cont.

3. Loosely install the universal frame clamp (14) and the pin latch mechanism (12) with the two frame clamp bolts (15) so that the clamp will not fall off, but can move freely along the frame tube. There may be a need to adjust the placement of the seat straps or other accessories to make room for the clamp (Figure #3). Rotate the pin latch mechanism by loosening the set screw (16) so that the pin sits properly as seen in Figure #4.

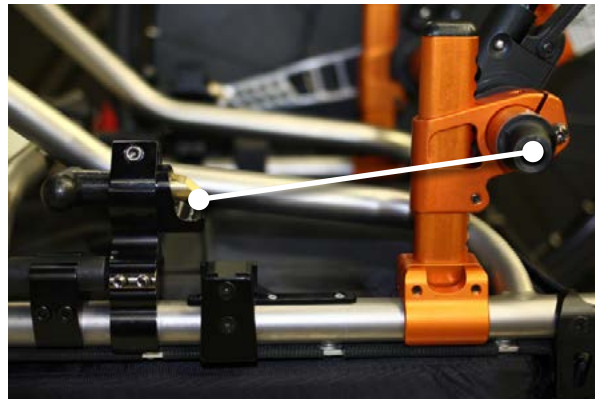


FIGURE #2

4. Measure the approximate distance from the center of the axle receiver to the slot where the pin seats in the latch (Figure #2). Please note that it may be necessary to find other more suitable places to mount the pin latch mechanism. This is most common on folding chairs where there is less space available. Please refer to our installation videos at www.rowheels.com for detailed instructions.



FIGURE #3

**Move seat straps to position universal frame clamp*

Initial Installation cont.

5. (Refer to table on page 5 for part location). Slide the wheel axle (7) partially into the axle receiver of the chair. With the axle in place, locate the torque arm pin in the pin receiver slot (13) of the pin latch mechanism. Finish pushing the axle into the axle receiver until the quick release balls are fully engaged.

Verify that the t-handle release knob is easily accessible and does not interfere with any other parts of the chair. The universal frame clamp should be adjusted and mounted to the frame such that the pin sufficiently extends through the slot and is also able to swing freely for latching.

In order to have smooth engagement between the torque arm pin (9) and the pin latch mechanism, the angle between the flat face of the pin receiver slot and the torque arm pin should be as close to parallel as possible. To adjust the angle, loosen the set screw (16) and rotate the pin latch mechanism until the correct angle is achieved. Tighten the set screw after the parts have been adjusted.

The torque arm pin should sit snugly between the pin latch mechanism and the flat area on the pin receiver slot (Figure 4). If the frame clamp is not close enough to the torque arm pin, the pin may rattle. To reduce rattling, move the frame clamp along the frame of the chair closer to the axle receiver. By moving the frame clamp closer to the torque arm pin, it may become more difficult to remove the wheel. If it does become more difficult, use the release knob to disengage the latch before attempting to remove the wheel.

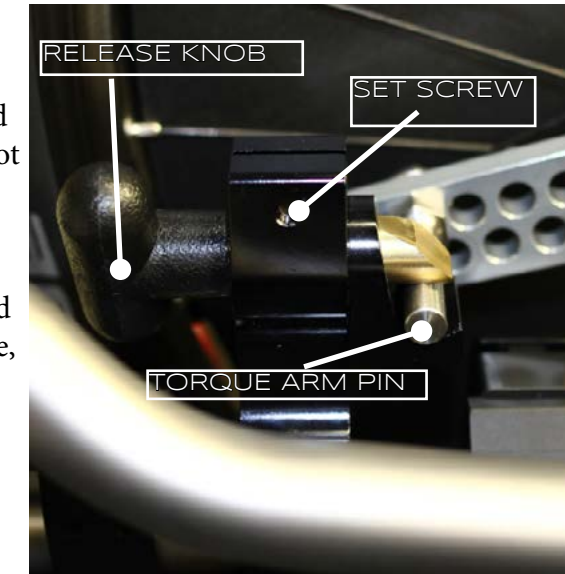


FIGURE #4

Initial Installation cont.

6. Confirm that the axle has been fully inserted into the axle receiver of your chair. Release the quick release button to lock the wheel into the axle receiver. Make sure that the axle is secure in the axle receiver, then begin to tighten the frame clamp bolts using a 3/16" hex wrench, alternating between screws. Give the wheel a pull to test that it is secure.

7. Repeat the same procedure with the other wheel.

EVERYDAY INSTALLATION & REMOVAL

WHEEL INSTALLATION

1. Release the ball locks of the axle by pressing and holding the quick-release button (Figure #5).

2. Slide the axle into the axle receiver until it reaches its limit and stop pressing the quick-release button (so the ball locks are re-engaged)in order to prevent wheel from sliding out (Figure #6).



FIGURE #5

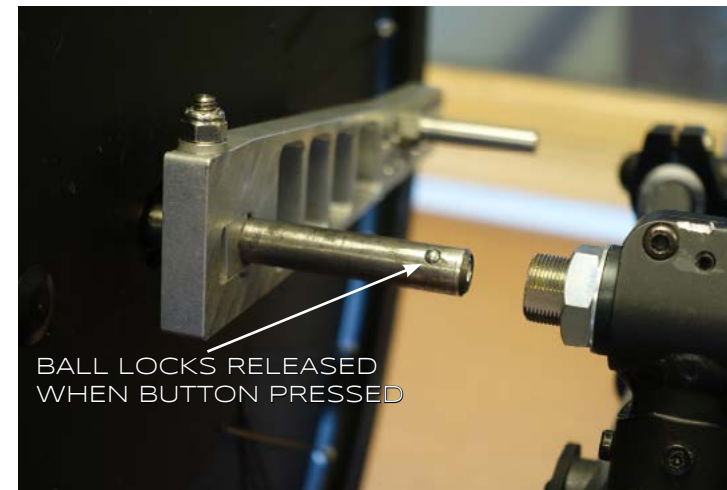


FIGURE #6

3. With the axle securely inserted, proceed to lock each torque arm pin in place. To do so while not seated in the chair, grasp the handrim and wheel together and proceed to pull back until the pin is locked in the pin latch mechanism. If seated in the chair pull just the handrim back in a rowing motion as if propelling yourself forward. The force will rotate the torque arm pin into the pin latch mechanism. An audible clicking sound will be heard as the torque arm pin locks into the pin latch mechanism. (Figure #7, Figure #8)



FIGURE #7



FIGURE #8

WHEEL REMOVAL

1. Hold down the quick-release button in the center of the wheel handle to release the ball locks (Figure #5).
2. Pull the wheel away from the chair with the use of the handle (4). The wheel should easily slide out of the axle receiver and pin latch mechanism. If the wheel does not slide out easily it may be necessary to pull back on the t-handle (11) to free the torque arm pin (9).

AXLE LENGTH

The REV™ is designed to be compatible with many styles of wheelchairs and are completely interchangeable with most existing wheelchair frames. The axle length, as measured from the edge of the torque arm to the end of the axle, should be approximately the same length as the axles of the standard wheels that came with the original wheelchair. Be sure to confirm that the axle ordered fits your chair and is secured properly. For more information on measuring axles visit www.rowheels.com.

OPERATING YOUR REV™ WHEELSET

FORWARD PROPULSION TECHNIQUES

The pulling motion places muscles in tension (versus compression) and helps mitigate the compressive forces felt in conventional wheelchair use when pushing exclusively.

To move forward in the chair from a standstill, grab each handrim at a forward position as though you were shaking someone's hand and pull the handrim towards yourself. As with a standard push handrim, control your steering by pulling or pushing harder on one side or the other. Concentrate on completing a full arm motion for the greatest efficiency. As with conventional push wheels, drop your arms after a completed stroke and again grasp the handrim to begin another cycle. Also consider the use of gloves for hand protection and grip to relieve stress on your hands.



PUSH-PULL TECHNIQUE

To achieve greater speed and efficiency the user may choose, after completing a pull stroke, to push the tire on the return stroke. Similar to the motion while using standard wheelchair wheels, this is done by pushing the tire in the forward direction and acts to increase speed and maintain your chair's momentum. It is particularly effective when navigating challenging inclines and obstacles.

The REV™ has a specially designed gearing system that allows a user to propel greater distances for every arm stroke cycle. Pulling the handrim engages a set of gears which move the wheels in a counter-rotating direction. Removing the hands from the handrims and pushing the tires on a return stroke in the same direction as the tire allows for further power transfer to the wheels. This combined motion enhances the forward momentum of the chair and serves to reduce the stresses felt by the shoulders and wrists when using regular wheel propulsion techniques. When pulling the handrim and pushing the tire, one complete propulsion cycle (pull back+push forward) will propel the chair farther than a conventional wheel-set and helps to conserve shoulder cycles.

BRAKE ASSIST

The REV™ is equipped with a system that is capable of slowing your chair very quickly. To activate this feature, simply press the palm of your hand inwardly on the handrim, lightly flexing the arm of the hand rim hub (Figures #9 and #10). This action engages the pads with the wheel rim, much like a bicycle brake. The frictional force is greater on the pad than on your hand and will allow you to make quick turns and to slow the chair much faster than without the use of this feature.

Slowing your chair with the REV™ is very similar to stopping conventional wheels. Apply equal pressure with the palms of your hands to both handrims, keeping the chair under control and allowing for slowing. Resist suddenly gripping the handrims when stopping. Always use caution when descending an incline and always maintain a controlled speed.

Applying pressure to one handrim will both slow and direct the chair. Movement will be towards the direction of the wheel you are slowing down. To stop completely, apply equal force to the side of the handrims with your palms to slow the chair evenly.

Brake assist continued:

CAUTION:

The REV™ brake assist system is not designed to hold hills or act as a substitute for wheel locks. Always use the wheel locks that were supplied with your chair.



FIGURE #9



FIGURE #10

CAUTION:

Over time pad wear may make it more difficult to slow and control steering in your chair. Be sure to replace the brake pads if any sign of wear or difficulty braking is evident.

TRANSPORTING YOUR REV™ WHEELSET

Because the axles on the REV™ are not removable from the wheel assembly, extra care must be taken when transporting your wheels in a car or elsewhere. This can be done by laying the wheels side by side, handrim side down, or by placing the wheels face to face (handrim to handrim). It is recommended that you reuse the foam axle protectors that the wheels were shipped with for added protection of the wheels in transport. These methods will ensure that the axles do not scratch or damage any part of the other wheel.



AXLES FACING OUT
CORRECT



AXLES FACING IN
INCORRECT

MAINTENANCE

Clean your Rowheels REV™ wheelset with a lightly damp or dry cloth and if necessary a mild non-abrasive soap. Do not use harsh solvents or any cleaner that contains bleach.

The hub on a Rowheels REV™ wheel is sealed to keep dirt and water out of the internal moving parts. While the seals will keep out dirt, particles and water, they are not able to withstand submersion in water nor pressure-washing.

MAINTENANCE CHECKLIST

DAILY

- ✓ Check tire pressure (pneumatic only)
- ✓ Make sure torque arm pin is latched securely
- ✓ Test universal frame clamp to verify it is secured to wheel chair frame
- ✓ Inspect to ensure that the handrim is properly attached and secure to the handrim hub

WEEKLY

- ✓ Inspect spokes to make sure they are not broken or loose
- ✓ Make sure the spoke guard is secured properly to the spokes
- ✓ Inspect brake pads for wear or damage.

MONTHLY

- ✓ Check tires for tread wear
- ✓ Inspect torque arm pin for signs of wear or looseness

For your safety and the optimal performance of the REV™ wheels, do not operate your chair if any one of these items listed are not found to be functioning properly. Please take care of any observed issues before operating. Contact your local provider or email support@rowheels.com for further information.

TIRE AND TUBE REPLACEMENT

It is recommended that replacement of all tires be done by a qualified technician. Improper installation of pneumatic tires may cause the tire to leak or pop under pressure. Proceed with caution.

Removing and Installing Tire and Tube

1. If not already deflated, deflate the tube by depressing the valve.
2. Place a plastic tire tool under the bead of the tire and begin to lift the bead over the edge of the rim. It may be necessary to use two levers to accomplish this, depending on the tire.
3. Slide the tire lever along the rim until one bead of the tire is on the outside of the rim.
4. The tube can now be removed by pushing the valve into

the rim, grabbing it from the other side and pulling out.

5. If replacing a tire, remove the old tire completely from the rim, then install one side of the bead of the new tire.
6. Lightly inflate the new tube and insert the valve stem into the valve hole in the rim and work the tube back into the tire. Make sure that the tire is free from holes and foreign objects by inspecting the tire closely.
7. Begin to hook the second bead of the tire into the rim, making sure that it hooks completely into the rim. This may again require the use of a second plastic tire lever.
8. When both beads are hooked on to the rim make sure that the tube is not pinched between the rim and the tire. It is then safe to inflate the tube to the pressure recommended by the tire manufacturer.

LIMITED WARRANTY INFORMATION

IMPORTANT: READ CAREFULLY

WHAT DOES THIS LIMITED WARRANTY COVER?

ROWHEELS INC. (“ROWHEELS”) warrants this product against defects in material or workmanship for the original and any subsequent **end** user owner(s) for the time periods as set forth below.

Under this Limited Warranty, ROWHEELS will, at its option, (i) repair the product using new or refurbished parts or (ii) replace the product with a new or refurbished product. “Refurbished” means a product or part that has been returned to its original specifications. **These are your exclusive remedies.** ROWHEELS does not warrant that the operation of the product will be uninterrupted or error-free.

Term: One (1) year from the original date of purchase of the product. This Limited Warranty is transferable. However, any transfer of this product does not extend the term.

A copy of the dated receipt or bill of sale from the original end user purchase is required to determine coverage. The purchaser must submit the fully completed Product Registration and Warranty Form to the customer service address listed and within thirty (30) days of the date of purchase.

Product Coverage: Only the components packaged with the Product are covered. Technical assistance and labor is not covered. When a product or part is exchanged, the original item becomes ROWHEELS’ property.

Any replacement product provided under this limited warranty may vary in the color and/or cosmetic design from the original product.

Instructions: You must contact ROWHEELS or an authorized service provider prior to returning any product for warranty service. ROWHEELS will not reimburse You for service performed by others.

Unless otherwise instructed by ROWHEELS or an authorized service provider, You must deliver the product, freight prepaid, in either its original packaging or packaging affording an equal degree of protection to the address and facility specified by ROWHEELS.

For specific instructions on obtaining warranty service for your product,

**Visit ROWHEELS Web Site: www.rowheels.com/support
Or call ROWHEELS at 1-608-268-9670**

Certain States and jurisdictions may impose limitations to the terms and length of an implied warranty, so the above terms and conditions may not apply. This limited warranty gives the purchaser specific legal rights. You may have other rights that vary based on state or jurisdiction.

HOW DO I OBTAIN WARRANTY SERVICE?

To receive instructions and authorization for obtaining repair or replacement warranty services, please contact your original equipment provider. Alternatively, you may contact customer support at info@rowheels.com, telephone (608) 268-9670 or write to the following address:

Rowheels, Inc.
2895 Commerce Park Drive
Fitchburg, WI 53719

You must also provide a proof of purchase. This could be in the form of a dated bill of sale or invoice receipt. The document should provide sufficient evidence that the request for service was made within the warranty period.

WHAT IS NOT COVERED BY THE WARRANTY?

This limited warranty does not apply if the product is used with products or services that are not compatible with Rowheels or if the wheel has been modified or tampered with in any way. The warranty also does not apply to damaged caused by an Act of God, misuse, abuse, negligence, accident, wear and tear, unreasonable use, or by other causes that do not fall into the category of defective materials or workmanship. The warranty does not cover the wheel being used beyond the maximum weight limit nor does it cover the serial number being altered or removed.

U.S. Patent No. 8,931,796





ROWHEELS[®]

THE RIGHT WAY TO ROLL.[™]

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