WHIRLWIND Wheelchair

RoughRider®

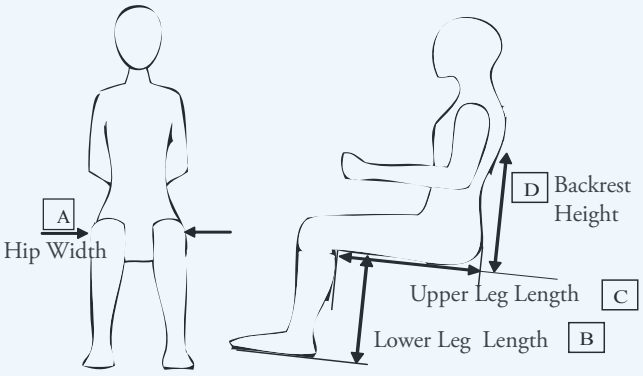
For more information on specifications and fitting of the RoughRider wheelchair see www.whirlwindwheelchair.org/roughrider

Rider Name	
Rider Age	
Rider Gender	
Rider Reference #	
Rider contact information	
Distributing Organization	
Assessment performed by	
Date	

Yes	No	
☐	☐	1. Rider has head control
☐	☐	2. Rider can maintain upright sitting position
☐	☐	3. Rider does not have significant contractures
☐	☐	4. Rider needs pressure relief cushion. Notes:

If any of the answers are "No" in the grey boxes, the RoughRider may not be appropriate for this rider without intermediate-level service.

Rider Measurements



Rider Hip Width (A) ☐

Rider Lower Leg Length (B) ☐
The footrest height is adjustable from 11" to 17"
Actual footrest height range varies with seat height

Rider Upper Leg Lenth (C) ☐
Measured behind knee to back of buttocks

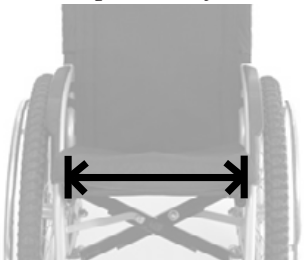
Rider Backrest support Height (D) ☐
Record where backrest should contact riders back with cushion; Effective height of back support will vary

Select Wheelchair Size Options

Seat Width *The seat with is measured inside the frame tubes. The RoughRider backrest width matches the seat width. Seat heights (and footrest adjustment range) vary slightly based on seat depth. Seat heights are measured from the top of the seat tubes of the 14" seat depth to the floor.*

Choose Wheelchair Width:

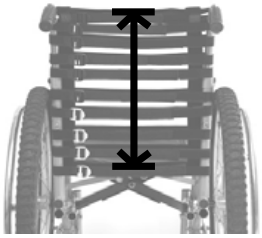
- ☐ 12.5" *(18 1/2" Seat height)*
- ☐ 14" *(19" Seat height)*
- ☐ 15.5" *(19 3/4" Seat height)*
- ☐ 17" *(20 1/4" Seat height)*
- ☐ 18.5" *(20 3/4" Seat height)*



Backrest Height *Select Backrest Height Position*

Backrest Height (Adjustable)

- ☐ 14"
- ☐ 16"
- ☐ 18"



Axle Position *Select initial axle position, 1 through 5*
#1 is farthest forward and is the most active position
#5 is farthers backwatrds and is the most stable

Axle position (adjustable)

- ☐ #1 (Farthest forward)
- ☐ #2 (Second from front)
- ☐ #3 (Center- a good starting point)
- ☐ #4 (Second from rear)
- ☐ #5 (Farthest back-good for double amputees)

Seat Depth *Actual length of seat surface. There is an additional 1 1/2" space between the back edge of seat and backrest.*

Choose Seat Depth (Adjustable)

- ☐ 14"
- ☐ 16"
- ☐ 18"

RoughRider™ Service Quickstart: Assessment

See Whirlwind Screening and Assessment Materials: www.whirlwindwheelchair.org/service

1. Head Control

When sitting in a chair with a backrest, can the rider independently hold up and move his/her head? *If no, the RoughRider is not likely an appropriate chair for this rider.*

2. Maintain Sitting

Can the rider independently maintain upright sitting in a standard chair with a backrest? *If no, the RoughRider is not likely an appropriate chair for this rider and you may need intermediate-level service.*

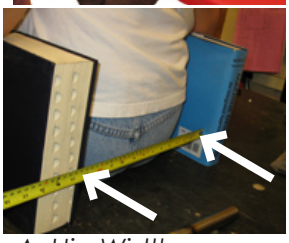
3. Contractures

Are there contractures in hips or knees that would prevent the rider from sitting comfortably in the RoughRider wheelchair? (Contractures: Tight muscles that have become shortened and make it difficult to move the joint) *If yes, the RoughRider is not likely an appropriate chair for this rider.*

4.Sensation

Does rider have full sensation at seat surface? Incomplete sensation increases the likelihood of pressure sores.

Yes: the rider will receive a comfort cushion. No: the rider will receive a pressure relief cushion.



A: Hip Width

A: Hip Width

- Position the rider sitting with the pelvis upright on a firm surface.
- Measure the distance between the widest points of the hips or thighs without compressing any tissue.
- Record this measurement.
- Select seat width using the following chart.
  The Whirlwind RoughRider Distribution Guide explains pressure sore risk.

Risk of Pressure Sores	Chair Width Prescription
High Risk and/or bony hips	At least Hip/Thigh Width + 1/2" (refer to Service Guide)
Low Risk	At least Hip/Thigh Width
For riders with extra hip width	As narrow as comfortable without causing high pressure

B: Seat Depth

B: Seat Depth/ Upper Leg Length

With the client sitting upright on a firm surface measure the distance from the back of the pelvis to the back side of the lower leg (the back of the knee). Record this measurement as lower leg length. Subtract 1/2" to find the maximum seat depth, to allow for space between the knee and seat fabric, then add 1 1/2" for backrest sag. *Select seat depth.*

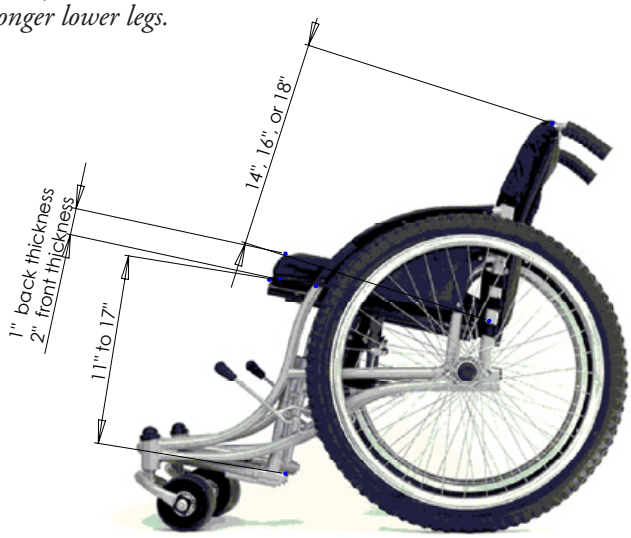
C: Lower Leg Length

C: Lower Leg Length

With the rider sitting on a firm surface wearing the footwear they will be using, measure the distance from the bottom of the foot to the underside of the front of the thigh. Record this measurement. Subtract approximately 2" for the cushion, to find the desired length between the seat upholstery and the footrest. The footrest height can be adjusted when the wheelchair is fit for a rider. *Extra cushion foam can be used to accommodate longer lower legs.*

D: Backrest Height

Generally the top of the back support should be located just below the bottom of the shoulder blade. For less active riders needing more trunk support, the back support can be close to the level of the armpit. Find this height by using your hands held flat to measure the lowest place on the riders back where he or she is comfortably supported.Measure from the seat surface to the point on the back that is most appropriate for this rider. To determine the wheelchair backrest height, add 1" for the compressed cushion that the rider will be using. *Effective backrest height will vary. A 2010 RR has a 12 degree seat angle and an 8 degree backrest angle. The actual sitting angle can be adjusted with a Tension Adjustable Backrest.*



D: Backrest Height

RoughRider™ Service Quickstart: Fitting

For support on fitting the RoughRider see www.whirlwindwheelchair.org/support

Cushion

Check Sensation Level. (See Whirlwind Service Guide.) Riders without full sensation at seat surface should use a pressure relief cushion. The cushion should be about 1/2" wider than the seat width, to hold the cushion in place in the chair. The rider should sit on their cushion for the next fitting steps.

Seat Width

Check that the seat width is appropriate for the rider (no more than Grade 1 pressure on the hips, see Whirlwind's Cushion Fitting Guide).

Seat Depth

Check that the front of the seat fabric is not pressing on the back of the rider's legs, when the legs are tucked back as far as they will be allowed (check the calf strap). Look for a minimum of 1/2" gap (1 1/4" is preferable). The 14" seat depth can be adjusted to 16" with a seat depth extension accessory, and the 16" seat depth can be adjusted to 18". See Support site for more information.

One philips screwdriver and one 10mm wrench needed

Footrest Height

With the rider sitting in the chair wearing the footwear they will be using in the chair, place one hand under the lower thigh (closer to the knee) on the cushion and one hand holding the sole of the foot with the footrest flipped out of the way. Find the optimal height of the foot where there is moderate pressure under the thigh, where the foot is not hanging, and both foot and thigh bear approximately equal amounts of weight. Adjust the footrest height by loosening the footrest clamp bolt and raise or lower the footrest until the weight of the foot and lower thigh on your hands are equal. If the footrests can't be adjusted low enough, add extra foam under the cushion after considering the drawbacks (see Service Guide).

Two 13mm wrenches needed

Backrest Height

Check that the backrest supports the rider's back, first supporting the rider's trunk, and secondly allowing pushing on the handrims. Check the backrest height again later if cushion height is changed in the fitting process. The 2010 RoughRider backrest height can be adjusted to 14", 16", and 18" from the seat surface. See Support site for more information.

Two 13mm wrenches needed

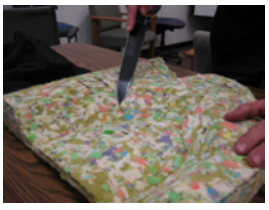
Pressure Relief Cushion Adjustment (if needed)

Evaluate pressure on seat surface, and add additional cutout layers under the cushion or carve away foam where needed. See cushion fitting guide on the following pages.

Rear Wheel Axle Adjustment

Adjust the position of the rear wheels to meet the rider's needs; a forward position increases the rearward tippiness of the chair, but makes the chair easier to push and use in rough terrain. Adjust the brakes to match the Axle position.

One 19mm socket, one 19mm wrnech, and one 13mm wrench needed



Rider Orientation to Wheelchair

A wheelchair rider should train new riders and attendants in independent and assisted skills including moving in the chair, the use of parking brakes, transfers, pressure management, wheelies and leaning for rough terrain, and managing curbs and steps. Additional topics are maintenance, cleaning, repairs, and wheelchair adjustments including footrest and rear axle position. A game of "follow the leader" over mixed terrain helps riders learn and teach each other riding skills.

Check Comfort

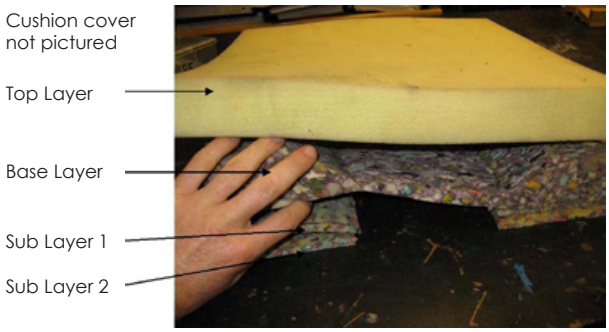
Ask about comfort and feel for high pressure grades after a half hour of use, and make adjustments if needed. This is a critical fitting step.

RoughRider™ Service Quickstart: Cushion Fitting Guide

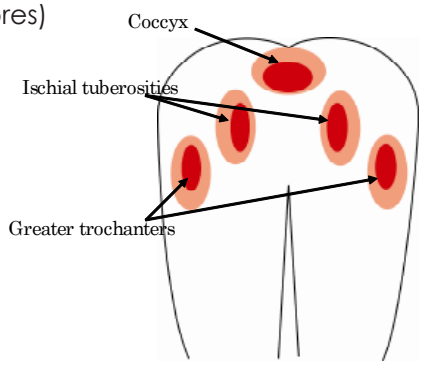
For riders with full sensation at seat surface, a comfort cushion may be adequate. The cushion should fit the chair width and seat depth. The Whirlwind comfort cushion is 2" of foam covered in a water-resistant fabric cover. The comfort cushion lifts the rider approximately 1" off the seat surface in the rear, and 2" off the seat surface in the front of the chair.

Comfort cushion

Riders without full sensation at seat surface should use a pressure relief cushion. The following information can be used to customize the fit of a Whirlwind pressure relief cushion. The Whirlwind pressure relief cushion has optional sub layers and an optional plastic layer, between the top foam and the base foam. Include the plastic if the cushion is likely to frequently come in contact with urine (but be sure to spend extra time educating about moisture as a cause of pressure sores)



Layers of a Whirlwind Pressure Relief Cushion



Pressure Sore Risk Areas

Check Pressure Grades:

- Adjust footrests (see Fitting Guide).
- Detatch the bottom strap of the backrest fabric on the wheelchair, and adjust the footrests to fit the rider while sitting on a pressure relief cushion.
- Ask the rider to sit back on your hand(s) in the wheelchair.
- Find each of the risk area locations (Ischial tuberosity, greater trochanter, Coccyx) with your fingers.
- The rider should then place his or her hands on their legs, face forward, and relax into a natural and comfortable sitting posture.
- Evaluate the pressure grade using the chart below, and modify the cushion if needed (see Fitting Guide).
- Replace the backrest fabric as it was. The fabric should be tight when the chair is open, but not so tight as to pull the sidesframes of the chair together or to prevent the seat fabric from being opened fully. The strap/webbing should pass through the buckle three times (see photo below).

Pressure Grade	Pressure Test	Indication
Grade One	You can wriggle your fingers easily.	**Grade One** is safe for most people.
Grade Two	You can't wriggle your fingers but you can remove them easily.	If there is **Grade Two** pressure at one of the risk locations **and** several risk conditions (history of pressure sores, moisture, heat, shearing or active sliding, low muscle mass, older age) are present, make a change to the cushion to reduce the pressure at that location.
Grade Three	It is hard to remove your hand and you can feel restricted blood flow to the tips of your fingers after 10-20 seconds.	**Grade Three** pressure at one of the locations at risk will require that the cushion be adapted to reduce the pressure at that location.

Check pressure grade sitting in the wheelchair, with an appropriate cushion

Incorrect and correct fabric buckle lacing

RoughRider™ Service Quickstart: Cushion Fitting Guide (continued)

Modifying cushion

Whirlwind pressure relief cushions will come with extra base layers which can be positioned underneath the base foam to provide additional cutout for the Iscial Tuberosities (ITs) by lifting the rider up to create more depth for the rider's tissue to be supported. Add layers and check for pressure again. If there is still grade two or three pressure present, modify the cutout shape in the base foam by removing (carving with a knife) a little material at a time around the area of high pressure. If pressure cannot be resolved with these simple solutions, refer to a practitioner with further training and instruct the rider to do longer pressure reliefs more often as well as frequent skin checks.

If there are any active or recently healed pressure sores, remove some material (approximately 0.5") below that area.

After selecting the number of foam layers to use and further carving the foam if necessary, place a plastic cover between the top layer and base layer (if needed), and enclose the cushion in its cover. The pleats in the cover, the closure system, and the cutout should be at the **back** of the cushion.

Carve areas of high pressure if needed.

Use additional layers under base foam if needed

Replace base foam (in plastic if needed), in cushion cover

Using extra cushions to accommodate longer lower leg length:

If the rider has a long lower leg length that cannot be accomodated by the RoughRider wheelchair without additional cushioning, add additional foam underneath the cushion to lift the rider higher off the seat fabric. This foam can be placed inside the cushion cover and underneath the base foam, as long as it does not stretch the top fabric of the cushion cover. Raising a rider with extra foam will increase the tippiness of the chair and make it more difficult to fit knees under tables.

Approximate elevation gains of compressed cushions (at back of cushion)

Cushion Type	Back Elevation from seat	Front Elevation from seat
Comfort Cushion	1"	2"
Foam pressure relief cushion without sub-layers	3/4"	1 1/2"
Foam pressure relief cushion with 2 sub layers	1 1/2"	2 1/4"
Additional 2" of foam lift under cushion	adds 1 1/2" elevation	adds 1 1/2" elevation
No Cushion (sitting on sling seat)	3/4" below flat seat	3/4" below flat seat

RoughRider™ Service Quickstart: Rider Orientation

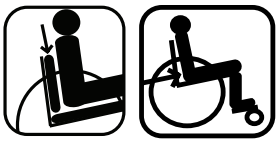
An experienced wheelcair rider should orient new riders to their wheelchair once they have been properly fit. Play a game of "follow the leader" to practice riding skills, and include attendants in the training.

See the Whirlwind Basic Guide to Wheelchair Service and Distribution, at www.whirlwindwheelchair.org/service

Rider orientation Topics

- Wheel-locks/Brakes
- Transfers (in and out of chair)
  - Independent and assisted
  - To/from chairs
  - To/from the floor
- Leaning
- Moving the Wheelchair
  - Forward, Backward, Turning
  - Uphill, downhill
  - Wheelies, curbs
- Pressure Management
- Axle Position
- Transporting Wheelchair
- Attendant Training
  - Transfers
  - Up/Down Curbs
  - Up/Down stairs
- Maintenance
  - Cushion Care
  - Cleaning
  - Tires
  - Parking Brakes
- Repair

RoughRider™ Service Quickstart: Basic Problem-solving

Problem	Possible Solution
Hips sliding forward 	*Put a cushion between the rider's back and the backrest if the seat is too long.* Tie or velcro the cushion to the seat if the cushion is sliding. 
Trunk falls forward 	Use up to 1/2" cushioning behind the rilower back and under to help rider's torso to recline farther into the sling backrest. Use a more supportive seating system. 
Trunk falls to side 	Is wheelchair too wide? A narrower wheelchair will help. Use up to 1/2" cushioning behind the rilower back and under to help rider's torso to recline farther into the sling backrest. Use a more supportive seating system. 
Difficult to self-propel 	Is a narrower wheelchair possible? Is rider sitting on enough cushioning? Could the rider propel with one leg? Can an assistant help rider practice riding skills? Move the wheel axles forward. 
Improper leg position 	Adjust footrests and calf strap for better leg and foot support. Build or cut contour abductor (foam between knees) or Adductor (foam outside of knees) into cushion with foam to position knees. 
Gap between foot and footrest 	Raise footrest height to lightly support foot. Add blocks/raises to footrest if the footrest cannot be raised enough. 
Front of thigh is not supported by cushion 	Lower footrest. If needed, insert extra foam underneath cushion. 
Seat fabric presses back of knee 	Tighten back fabric. Put a cushion between the backrest and rider's back to move the rider forward, and adjust the axle position forward. 
Wheelchair is tippy backwards	Move the wheels backward one axle position. Beginner riders: balance point of a wheelie holds caster wheels 7"-9" high. Experienced riders: balance point of a wheelie holds caster wheels 5"-7" high.