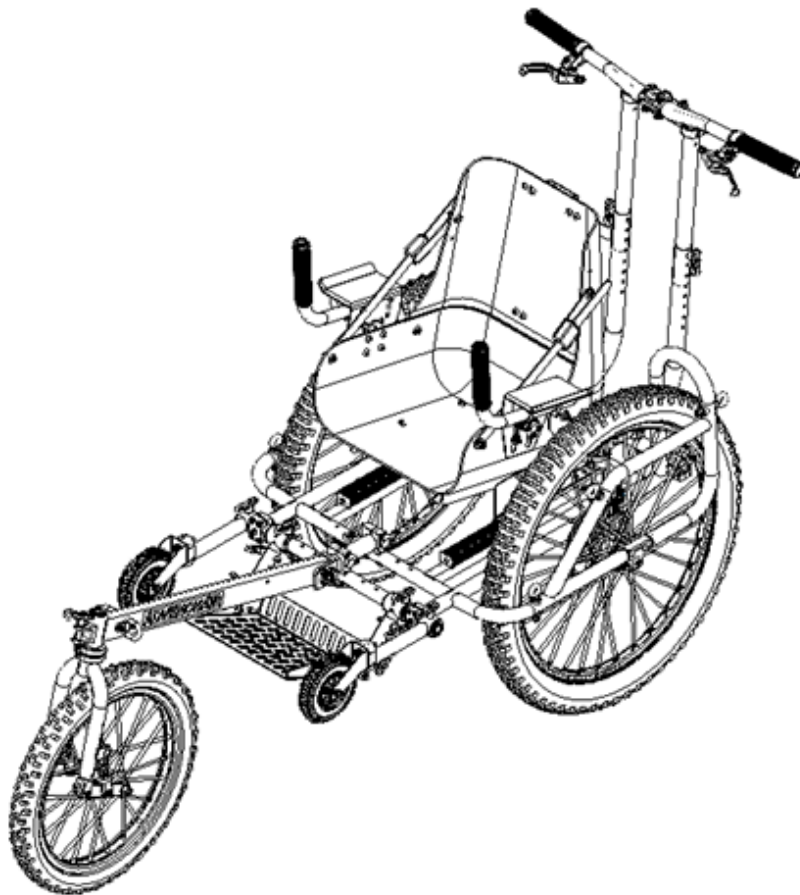




Field Guide and Trail Notes



Before you hit the trail

Always be prepared before leaving home for a hike.

Equipment checklist

AdvenChair itself!	Front wheel and forward beam
Towing straps	Bicycle helmet for the rider
Gloves for mules	Optional: Towing Poles and Harness

Tool kit

Required: Hex wrench: 6 mm (for removing main wheels) 2 oz bottle of Stan's no Tubes Tire Sealant Stan's no Tubes Tire Plug Kit	Recommended: Hex wrenches: 2.5, 3, 4, 5 mm Screwdrivers: Phillips no. 2 and standard Open end wrenches: 10, 13, 17 mm and 13/16 in. Tire pressure gauge (for presta stems) Spare inner tube (20" x 2" for front wheel) Tire pump for presta and Schraeder stems Tube patch kit Tire levers
--	---

Hiking gear (recommended)

Appropriate foot gear Extra socks Water and water purifier Warm clothes Flashlight or headlamp Knife or multi-tool Sunscreen, sunglasses, and hat First aid kit GPS/Emergency Locator Device	Food Rain gear Map and compass Matches and fire starter Bug repellent Emergency shelter (e.g. a space blanket) Cell Phone Binoculars
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A day pack can be hung on the back of the seat and any member of the team can carry a backpack

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Out There

***To be alone in the heart of a wilderness
is a provocation for some
who seek to pare the fat off their soul
to recharge their gratitude for life
a reconnect to being apart
feeling the here and now of self
secure from security
the certainness of certainty
knowing the quiescent sounds of silence
the pervasiveness of open space
the elemental simplicity of a natural world
the real nakedness of being
in a place and time that was
and still is
out there***

~ John Dell



Introduction

Welcome to the growing community of adventurers who refuse to let mobility challenges stop them from enjoying the outdoors on the trail. This Field Guide is designed to help get you and your AdvenChair to the trailhead, along the trail, and home safely so you can enjoy your whole experience. For information about initial setup of the AdvenChair, please refer to the AdvenChair Owner's Manual at www.advenchair.com/advenchair-user-manual. This field guide can be found at www.advenchair.com/advenchair-field-guide.

Parts of the AdvenChair

The primary parts of the AdvenChair are shown in Figure 1.

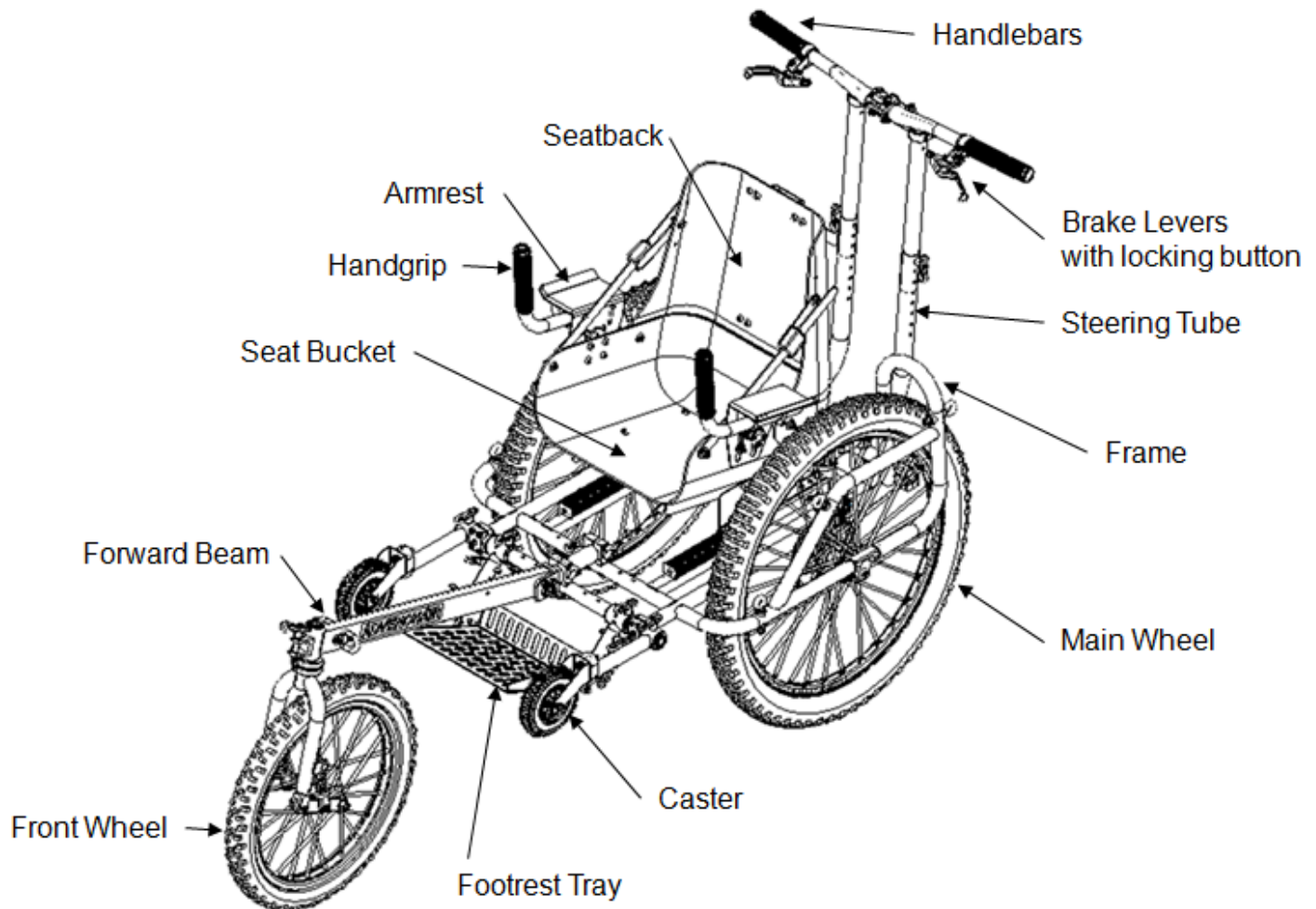


Figure 1. Primary parts of the AdvenChair.

There are three types of adjustable connectors used in the AdvenChair (Figure 2):

1. **Detent Pins:** Detent pins go through holes to pin parts in place at the desired position. Press the button on top to release the pin so it can be inserted or removed.
2. **Ratchet Handles:** Ratchet handles are used to tighten bolts which hold parts in the desired position. Pulling the ratchet handle straight out releases the ratchet so the handle can be turned without tightening or loosening the bolt. When the ratchet handle is released, the bolt is engaged and turning the ratchet handle will tighten or loosen the bolt. The ratchet handles should be hand tight. Never loosen the ratchet handle more than one full turn.

NOTE: Do not loosen the ratchet handle more than one full turn. If loosened too far, the handle will come off and the internal spring and bolt will come out.

3. **Spring Plungers:** Spring plungers lock two pieces of sheet metal in position by holding a pin that goes through a hole in both pieces of sheet metal. To retract the pin, pull the spring plunger straight out and turn it 90 degrees. To insert the pin, turn the spring plunger back 90 degrees and release it. The pieces may then need to be adjusted so the two holes line up and the pin can go through both of them.

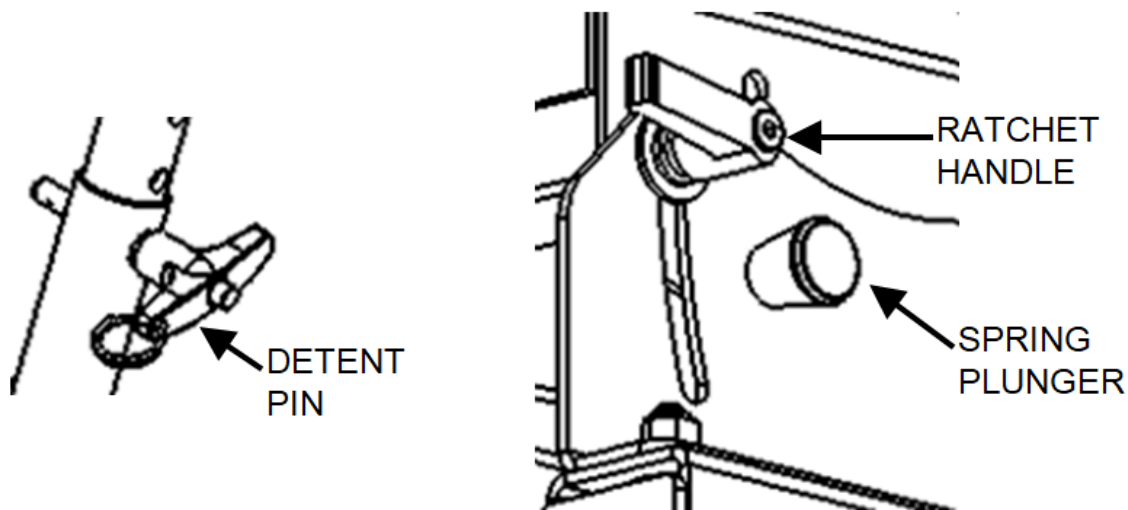


Figure 2. Detent pin, ratchet handle, and spring plunger.

Transporting the AdvenChair

1. Always make sure the AdvenChair is tied down and secure when it is being transported. If the rider will be riding in the chair follow these additional steps:
 - a. Set the parking brakes by pulling the levers and pushing the locking button.
 - b. Attach the vehicle-mounted tie-down straps (e.g. QStraints) to the AdvenChair **frame**, not the wheels.
 - c. Attach the seat belt firmly and securely across the waist and the chest strap firmly and securely across the chest.

2. **Disassembling the AdvenChair**—Only do what’s required for the size of your vehicle. For large vehicles you only need to remove the front wheel and forward beam.
 - a. **Remove the front wheel and forward beam:**
 - i. Lower the casters into wheelchair mode by removing the yellow pin in Figure 3, rotating the casters down, and re-pinning.
 - ii. Rotate the front wheel forward to take pressure off the forward beam, with weight on the casters (Figure 7).
 - iii. Loosen both of the forward beam clamps with the ratchet handles (Figure 6).
 - iv. Unpin the white detent pin (Figure 6) from the forward beam rear clamp.
 - v. Pull the forward beam straight forward, out of the clamps.
 - b. **Footrest: Rotate the entire footrest assembly up towards the seat so it is out of the way (Figure 3).**
 - i. Pull the red detent pins from the top of the footrest assembly on both sides
 - ii. Pull the blue detent pins from both sides of the footrest tray.
 - iii. Rotate the footrest assembly up so the tubes are straight up and pin the tubes in place. Reinsert the red detent pin from the bottom to keep the footrest up and out of the way.
 - iv. Pin the footrest tray in place using the blue detent pin.
 - c. **Casters: Rotate the casters up so they take up less room.**
 - i. Tip the AdvenChair on its back
 - ii. Unpin the yellow detent pins from the top of both casters (Figure 3).
 - iii. Rotate the casters up and re-pin them so they point straight up.
 - d. **Taking off the main wheels.**
 - i. Tip the chair onto its front and have someone hold it in place.
 - ii. Unscrew the axles from each wheel with the 6mm hex wrench and pull the wheels “down” and away from the chair (Figure 5).
 - iii. Screw the axles back into the AdvenChair frame to prevent loss of the axles and to protect their threads.
 - iv. While the main wheels are off, protect the brake rotors from being bent.
 - v. Don’t squeeze the brake levers while the brake rotors aren’t in the brake calipers.
 - e. **Folding the seat:** Place the chair upright and push the seatback forward and down.
 - f. **Remove the handle bars:**
 - i. Pull the detent pins from the steering tubes
 - ii. Lift the handle bars and the upper steering tubes out of the lower steering tubes and place them just behind the seat. Make sure not to twist the brake cables.
 - iii. Insert the detent pins into the lower steering tubes.

The chair is now fully disassembled and ready for transport.

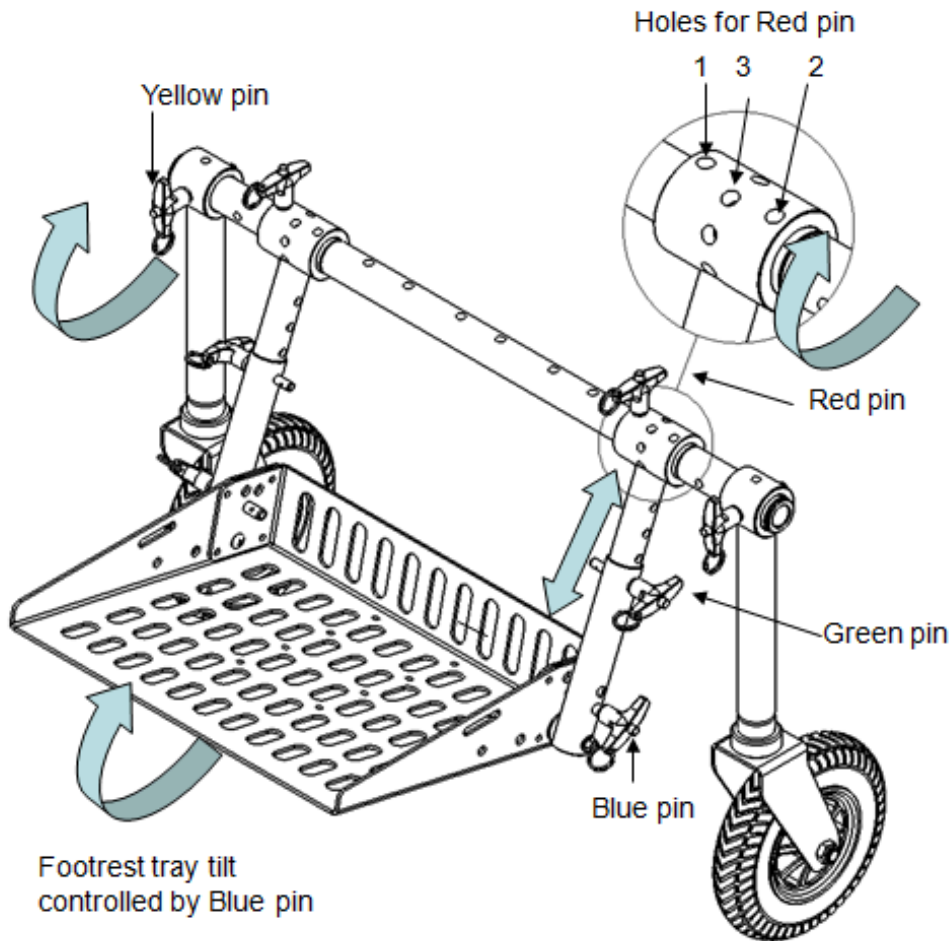


Figure 3. Positioning the footrest and casters.

Casters and footrest are shown in wheelchair mode.

Detent Pins:

The pins and the holes they fit into are color coded for clarity.

Red: Controls position/angle of the entire footrest assembly.

- Holes 1, 2, and 3 allow angles of 22, 38, and 45 degrees from vertical for adjustment for the rider.
- For transport and storage, the footrest assembly can be rotated up so the footrest support tubes are vertical and the footrest tray is next to the seat. The red pin is then inserted into hole 3 from the bottom to hold the footrest assembly in place.

Green: Adjusts the height of the footrest.

Blue: Controls the angle of the footrest tray.

Yellow: Controls the angle of the caster assembly.

Arrows show direction of rotation of each part, not the detent pins.

View is looking down on the Main Wheel

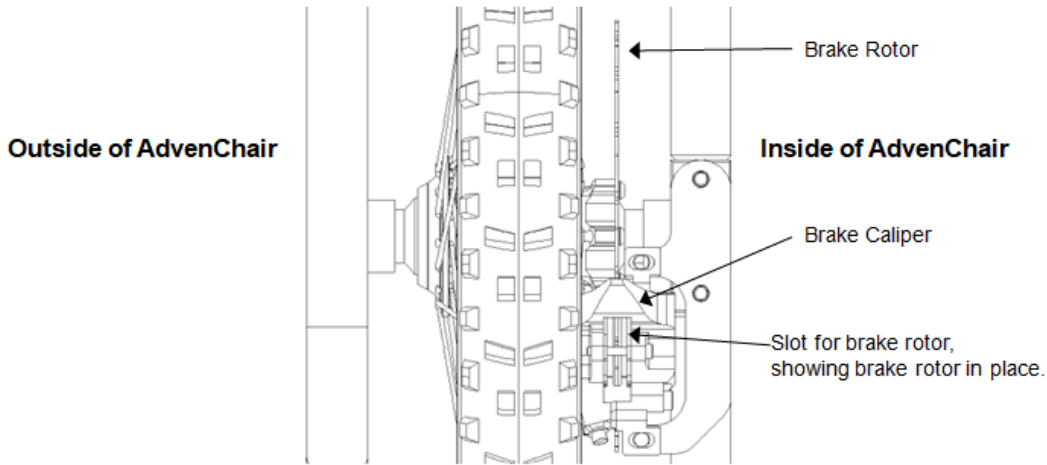


Figure 4. Installing the main wheels--Inserting the brake rotors into the brake caliper.

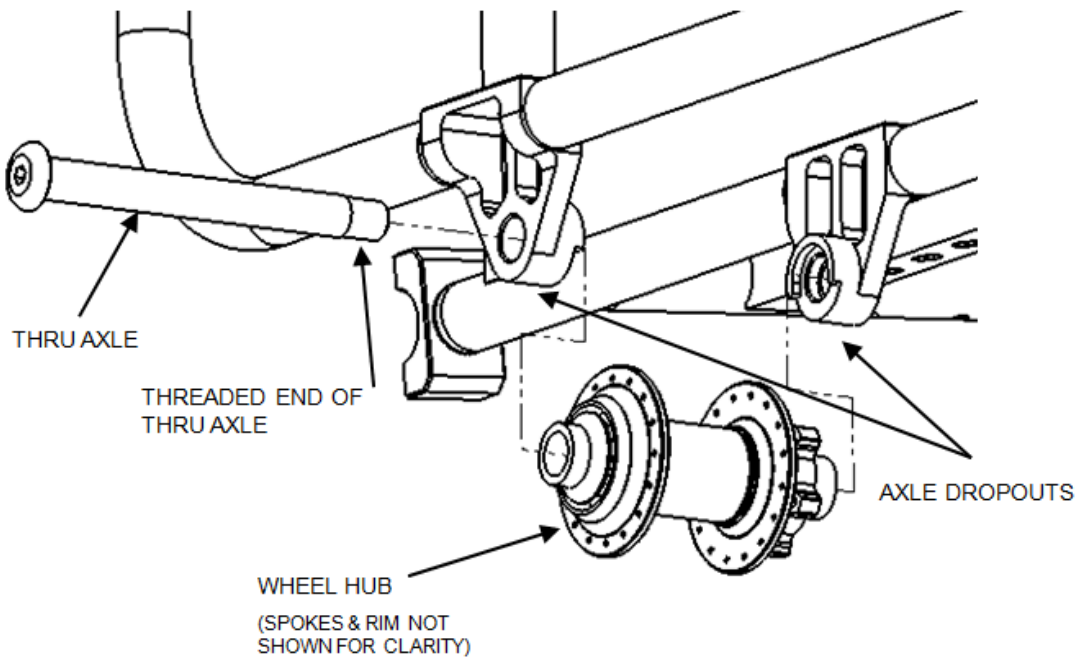


Figure 5. Install or remove the main wheels--Inserting the hub and axle.

3. Setting up a fully disassembled AdvenChair

a. **Unfold the seatback** by pulling the top of the seatback up and back until it is upright.

b. Install the handlebars

- i. Pull the detent pins from the lower steering tubes.
- ii. Lift the handle bars and slide the attached steering tubes into the lower steering tubes.
- iii. Insert the detent pins into each steering tube to position the handle bars at the desired height.

c. Install the main wheels

- i. Tip the chair onto its front.
- ii. Place each wheel in position with the brake rotor in the brake caliper slot (Figure 4) and the wheel hubs in their dropouts (Figure 5). Make sure to slide the brake rotor straight into the brake caliper slot to avoid damaging the rotor and the brake pad.
- iii. Slide the axle through the axle dropouts and the hub; screw the axle tight with a 6mm hex wrench.

d. Lower the casters

- i. Tip the chair on its back.
- ii. Pull the yellow pins from each caster, rotate each caster down and pin them in place (Figure 3).

e. Position the footrest (Figure 3)

- i. Tip the chair upright, on its wheels and casters.
- ii. Unpin the footrest assembly by pulling the red pins and the footrest tray by pulling the blue pins.
- iii. Rotate the footrest assembly down and pin both sides with the red pins in the desired position. There are three holes, for different angles.
- iv. Position the footrest tray in the desired position and pin both sides with the blue pins.

At the Trailhead

Prepare the Chair

- 1. Tire pressure:** The maximum safe tire pressure is 35 psi. The tires roll more easily at that pressure. Lower pressures provide more shock absorbance and less bounce. Heavier riders require higher pressure. The lowest pressure that should be used is 10 psi for the main wheels and 15 psi for the front wheel. We recommend starting at 35 psi and adjusting downward depending on preferences and conditions.
- 2. Brakes:** If the brakes are keeping the wheels from spinning:
 - a. Make sure the brake levers are not locked in the brake position with the button on the brake lever.
 - b. Make sure the main wheels are mounted straight and the brake rotor is inside the brake caliper slot.
 - c. There is an adjustment barrel at the brake lever that can be used to loosen or tighten the brakes.

Install the forward beam and front wheel

1. Reverse the front wheel to take the weight off the forward beam (Figure 7).
2. Slide the rear, round end of the forward beam into the two round clamp blocks above the standard footrest. Make sure the ratchet handles on both the clamp blocks are loose and the white detent pin is not inserted through the rear clamp block (Figure 6).
3. Insert the white detent pin through the rear clamp block and forward beam (Figure 6). The forward beam must be slid all the way into the front clamp block and may need to be rotated so the white detent pin will fit through its hole. The clamp blocks should remain loose at this step. Tighten both clamps with the ratchet handles and turn the front wheel into rolling position. This takes the weight off the caster wheels (Figure 7).
4. Raise the casters by pulling the yellow pins from the caster assemblies, rotating the casters up so they point forward, and re-pinning them (Figure 3).

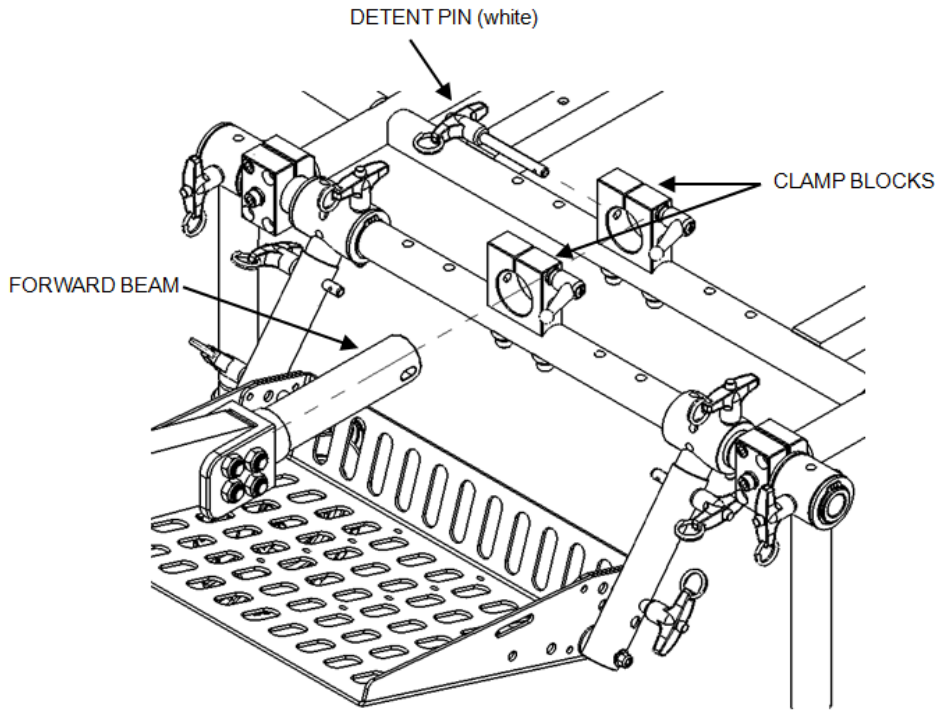


Figure 6. Installing and removing the forward beam.
 The detent pin securing the front wheel beam is marked white. Note that the white detent pin goes through both the rear clamp and the hole through the end of the forward beam.

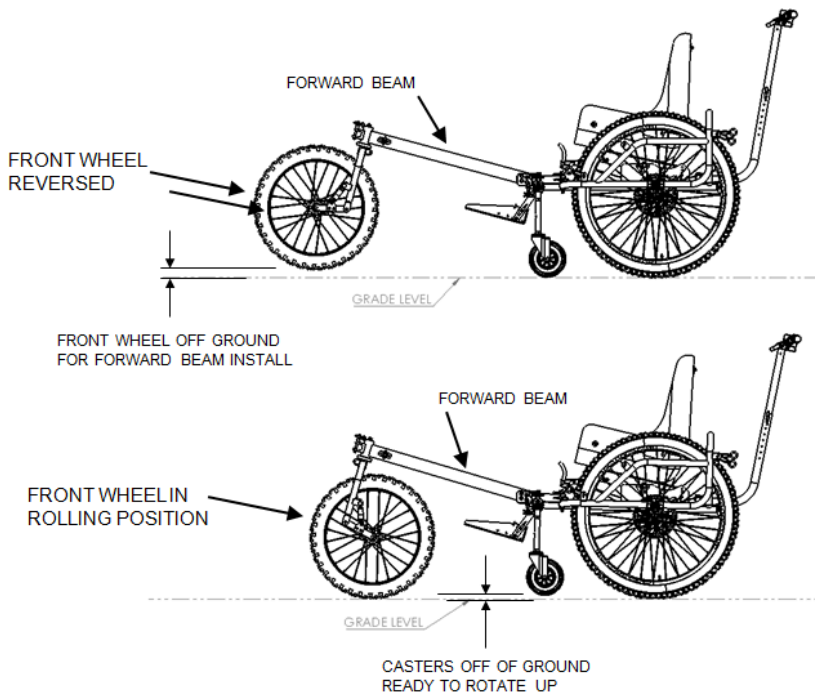


Figure 7. Positioning the front wheel to install or remove the forward beam.
 When the front wheel is reversed, the casters take the weight and the front wheel is off the ground. When the front wheel is in rolling position the casters are lifted off the ground, putting the weight on the front wheel.

Adjust the AdvenChair for the Rider

Adjusting the AdvenChair for a rider is best done with the rider in the chair, the front wheel in place, and two people to make the adjustments. These adjustments allow sizing the chair for a rider from child sized to adult sized.

1. **Seat position forward and back:** (Figure 8)

People with longer legs typically need the seat positioned farther back.

- a. To position the seat base forward or back, unclamp the seat position ratchet handles under both sides of the seat.
- b. Slide the seat forward or back to a comfortable position and clamp the ratchet handles.

2. **Angle (dump) of the seat base:** (Figure 8)

- a. People with longer legs typically need to recline more.
- b. The seat angle or dump is adjustable from zero degrees (level) to sixteen degrees in four degree increments. The seat shown is currently level and pinned to the bottom hole.
- c. Loosen the seat angle ratchet handles under the back of the seat on both sides. They should only be loosened one half to one full turn. Keep the handle pointed back to keep it from getting stuck under the spring plunger.
- d. On each side of the chair, pull the round spring plunger out and turn it 90 degrees to disengage. If the rider is in the seat, the spring plunger may be too tight to pull out. In this case, lift the blue webbing strap at the top and back of the seatback to unbind the spring plungers, after which they can be pulled out and disengaged.
- e. Adjust the seat to a comfortable angle. Use the blue web strap on the top of the seatback to pull the seat up or down.
- f. Re-engage the spring plungers by turning them back 90 degrees. Then make minor adjustments to the seat angle by using the blue webbing strap at the top of the seatback to rock the seat up and down gently until the pins click into the desired adjustment holes. This may require fitting one side and then matching the other side.
- g. Tighten the ratchet handles on both sides.

Note: If the end of the handgrip tubes rubs against the tire, correct this with the following adjustments:

- Move the handgrips forward.
- Move the seat forward.
- Reduce the angle (or dump) of the seat so it is more upright.

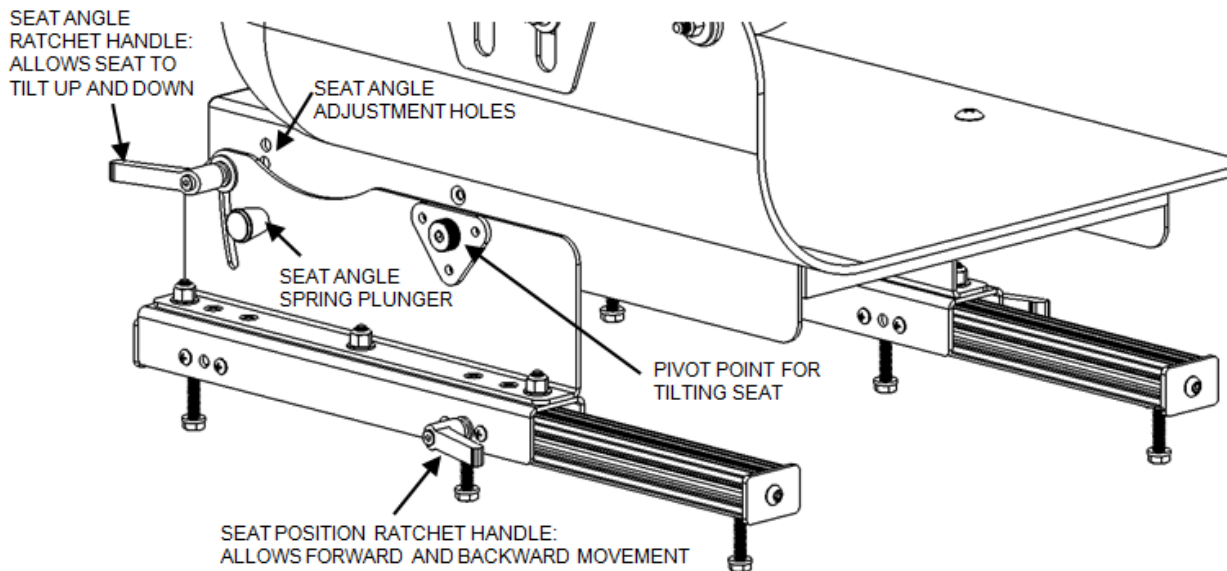


Figure 8. Controls for adjusting seat position and angle (dump) of the seat bucket.

Note: There are five seat angle adjustment holes. Two are shown and three are hidden.

3. Footrest: (Figure 3)

- a. **Angle of the footrest assembly:** The tube supporting the footrest assembly has three positions: 22, 38, and 45 degrees forward from vertical. Pull the red pin on both sides, choose the angle most comfortable for the rider, and re-pin both sides. Taller riders will need the footrest angled farther forward.
- b. **Height of the footrest assembly:** The tube supporting the footrest assembly telescopes and can be lengthened or shortened. Pull the green detent pins from the tubes on both sides, raise or lower the footrest assembly to a comfortable height, and re-pin both sides.
- c. **Angle of the footrest tray:** At the top, back of the footrest tray, there is a blue detent pin on each side and three holes in the each side of the footrest tray. Pin the footrest tray to a comfortable angle by placing the yellow detent pin through the appropriate hole on both sides.
- d. **Strap the rider's feet into the footrest:** Buckle the footrest straps together over the rider's feet and pull snug. (The footrest straps are on both the standard footrest and the optional upper footrest and are not shown.)

4. Angle of the seatback: The angle between the seat bucket and the seatback is adjusted by lengthening or shortening the side strap which runs diagonally from the seatback to the seat bucket. The buckle on the side strap has two adjustments: one to loosen the side strap and tilt the seatback further back and the second, a ratchet mechanism, to tighten the side strap and raise the seatback to a more upright position (Figure 9).

- To tilt the seatback further back, lengthen the side strap by pulling out on the gray portion of the buckle and sliding the strap through the buckle to make the strap longer.
- To raise the seatback to a more upright position, pull the black lever portion of the lever as many times as necessary to pull the seatback more upright.
- To get the seatback adjusted evenly, adjust one side and then adjust the other side strap to the same length.

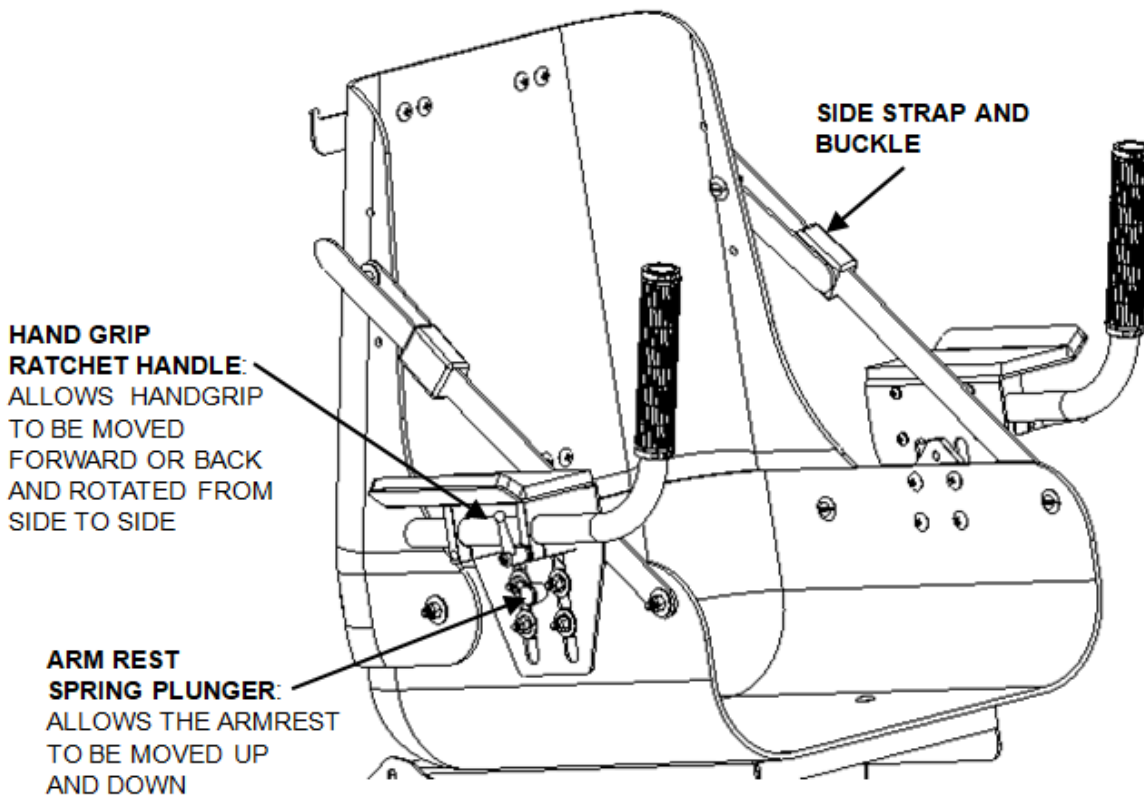


Figure 9. Controls for positioning the seatback, armrest, and handgrips.

5. Height of the armrests: (Figure 9)

- a. Pull and hold the spring plunger to disengage it.
- b. Raise or lower the armrest.
- c. Release the spring plunger to re-engage it into one of the adjustment holes. (These holes are not visible in the picture.) There are 5 holes, each ½ inch apart.

6. Position of the handgrips: (Figure 9)

- a. For each handgrip, loosen the ratchet handle just below the armrest and position the handgrip to a comfortable position. The distance between the front end of the armrest and the handgrip and the angle of the handgrip can both be adjusted.
- b. Tighten the ratchet handle to clamp the handgrip in place. This is best done with the rider in the chair to ensure the position is comfortable.
- c. Point the handgrips down for rider loading and unloading.

Note: If the end of the handgrip tubes rubs against the tire, correct this with the following adjustments:

- Move the handgrips forward.
- Move the seat forward.
- Reduce the angle (or dump) of the seat so it is more upright.

7. Adjust the chest strap: Bring both sides of the chest strap around the rider, buckle them together and tighten them by pulling the rings to a comfortable position. Additional length adjustment can be made where the chest straps attach to the seatback. (The chest strap is not shown.)

The chest strap can be lengthened where it attaches behind the seat back.

8. Adjust the seat belt: Bring both sides of the seat belt across the rider's lap, buckle them, and pull them tight. The tighter the seat belt, the less the rider will slide forward, but don't make the rider uncomfortable. Additional length adjustment can be made where the seat belt attaches to the seat bucket under the seat cushion. (The seat belt is not shown.)

The seat belt can be lengthened where it attaches to the seat bucket.

9. Pressure relief: Some riders may need extra cushions to provide adequate pressure relief. Seat cushion from their regular wheelchair may be fit in the AdvenChair seat.

10. Adjust the upper footrest (optional component): (Figure 10)

Adjusting the upper footrest is best done with the rider in the chair.

- a. **Upper footrest position:** Loosen the ratchet handles on both sides of the front of the upper footrest assembly, slide the upper footrest forward or back to the desired position and clamp it in place with the two ratchet handles.
- b. **Upper footrest angle:** Loosen the ratchet handles just below the center of the upper footrest on both sides; pull the pins just in front of those ratchet handles; rotate the upper footrest to an angle comfortable for the rider; insert the pins; and tighten the ratchet handles. There is no button to push to release these pins.
- c. **Strap the rider's feet into the footrest:** Buckle the footrest straps together over the rider's feet and pull snug. (The footrest straps are on both the standard footrest and the optional upper footrest and are not shown.)

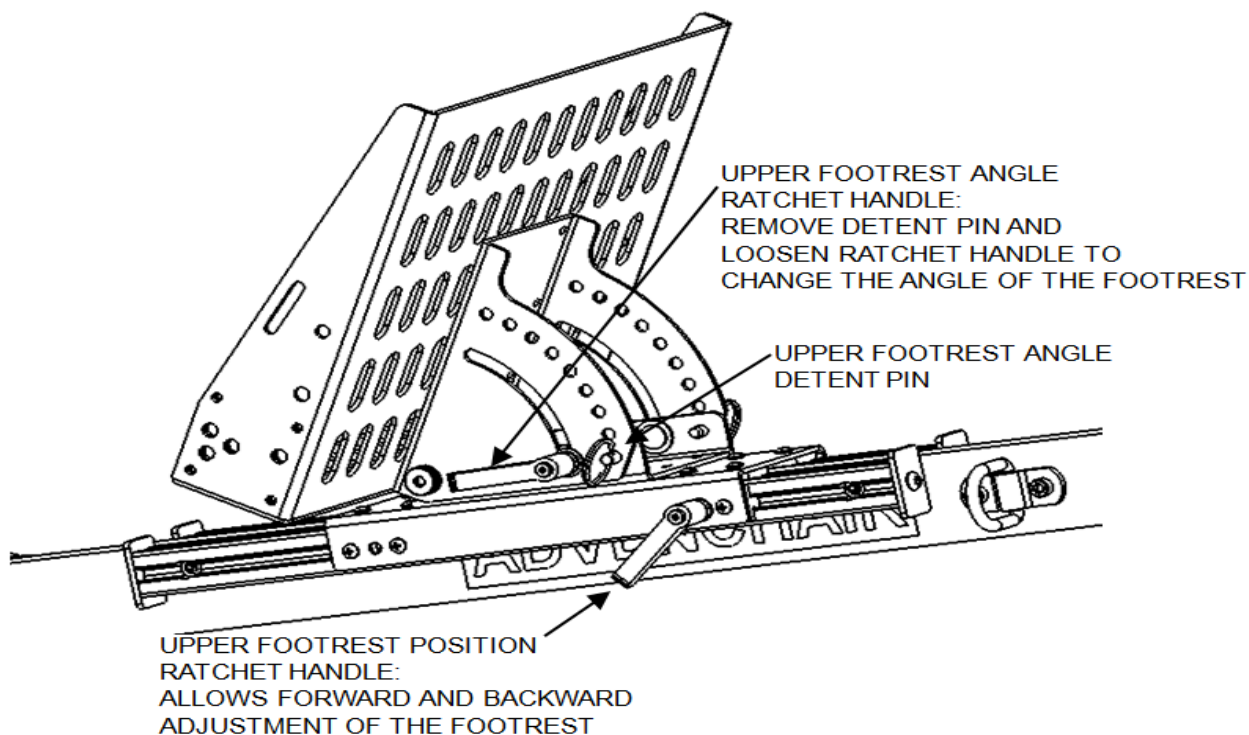


Figure 10. Controls for adjusting the position/angle of the optional upper footrest.

11. Installation and Adjustment of the Headrest (optional component): (Figure 11)

- a. The bracket can be lowered 3" by removing the four screws with a 5mm hex key and reattaching the bracket to the four holes below the current bracket position. This will position the headrest for a short person.
- b. **Install the headrest:** Slide the stem of the headrest support into the headrest bracket and tighten the clamp. The height is adjusted by how far the stem is inserted into the bracket. The bottom of the stem must be in far enough for the clamp to engage with the stem.
- c. **Adjust the angle of the headrest:** There are two swivel joints on the headrest support. Loosen both of them with a 5mm hex wrench just enough so they can be moved. Adjust the height and angle of the headrest, and tighten the swivel joints.

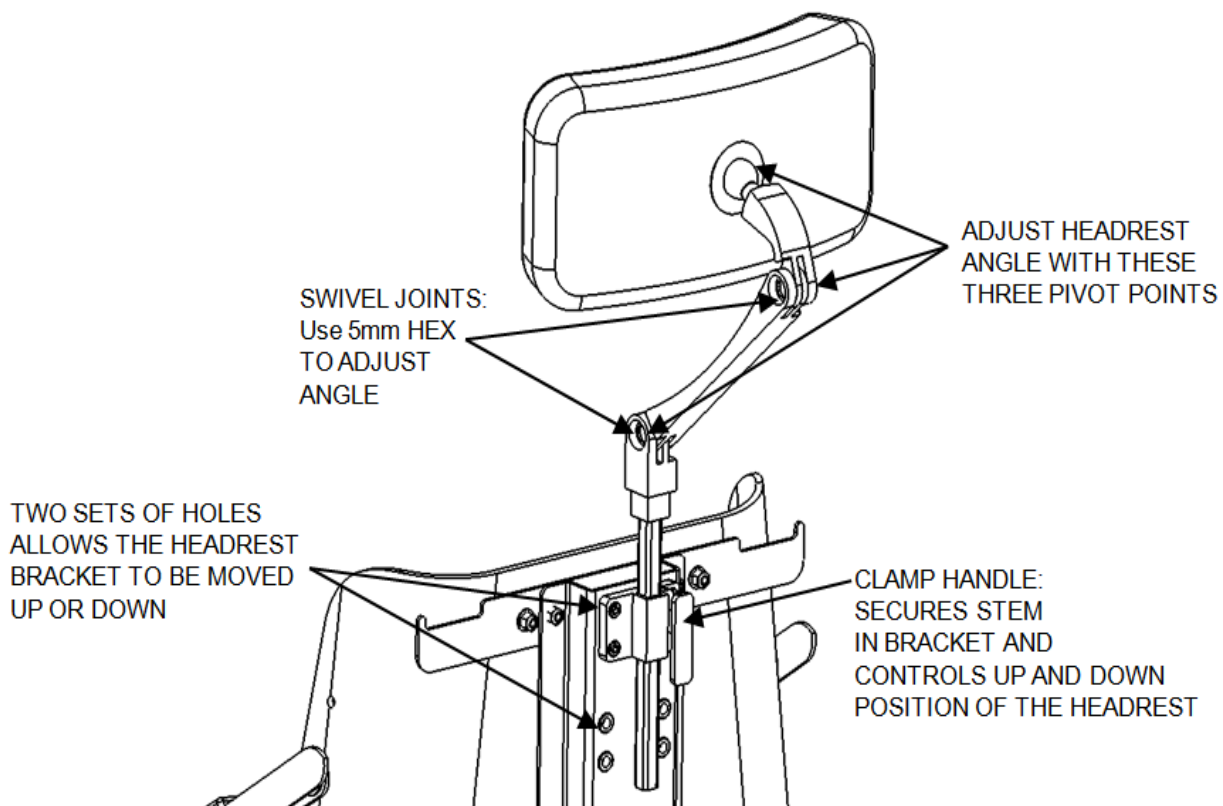
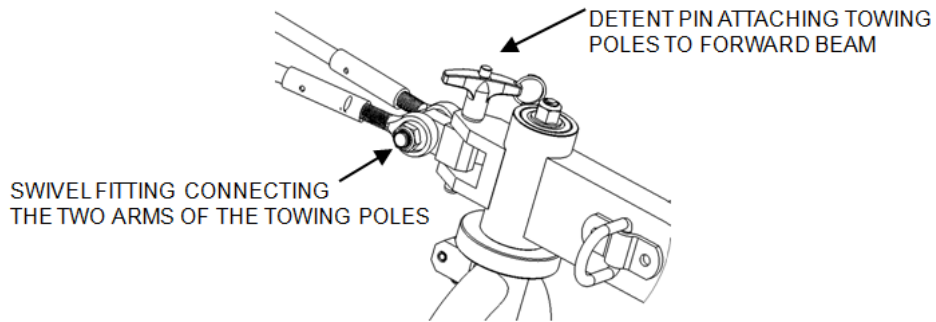


Figure 11. Installing and adjusting optional headrest.

Setup for Driver and Mules

(see page 19 for a description of these roles.)

- 1. Handle bar adjustment:** To raise or lower the handle bar, pull the detent pins on both the steering tubes directly below the handlebars and slide the handle bar up or down. Re-pin at the desired height.
- 2. Set up for the Lead Mule**
 - a. For easy and moderate level trails, attach a towing strap to the front of the forward beam (Figure 13).
 - b. For more difficult trails, especially those involving significant uphill sections, install the towing poles (optional component) (Figure 12).
 - i. Screw the poles together—each arm has two sections. The arms are connected by a swivel fitting.
 - ii. To attach the poles to the side of the towing harness, put the eye bolt at the end of the pole over the webbing loop at the widest point of the lead mule's hip and slide the carabiner through the webbing loop to secure the poles and minimize slop.
 - iii. Pull the detent pin on the top of the forward beam, insert the towing pole swivel fitting, and insert the pin, attaching the towing poles to the top of the forward beam.
 - iv. Buckle the lead mule into the towing harness.



TO ATTACH TOWING POLES TO TOWING HARNESS:

- PLACE WEBBING LOOP ON TOWING HARNESS THROUGH EYE-BOLT OF TOWING POLE
- INSERT CARABINER THROUGH LOOP



FULL TOWING PACKAGE WITH HARNESS, POLES, AND SWIVEL FITTING ATTACHED TO FRONT OF FORWARD BEAM

Figure 12. Attaching towing poles to forward beam and to towing harness.

3. Attaching straps for additional Mules: Attach the towing straps only when needed on steep uphill or downhill sections of the trail or when the trail crosses a steep sidehill. A carabiner should be attached to the end of each strap and then clipped to one of the attachments on the AdvenChair frame. There are four attachment points on each side of the AdvenChair and if the towing poles are not being used, at the front of the forward beam (Figure 13).

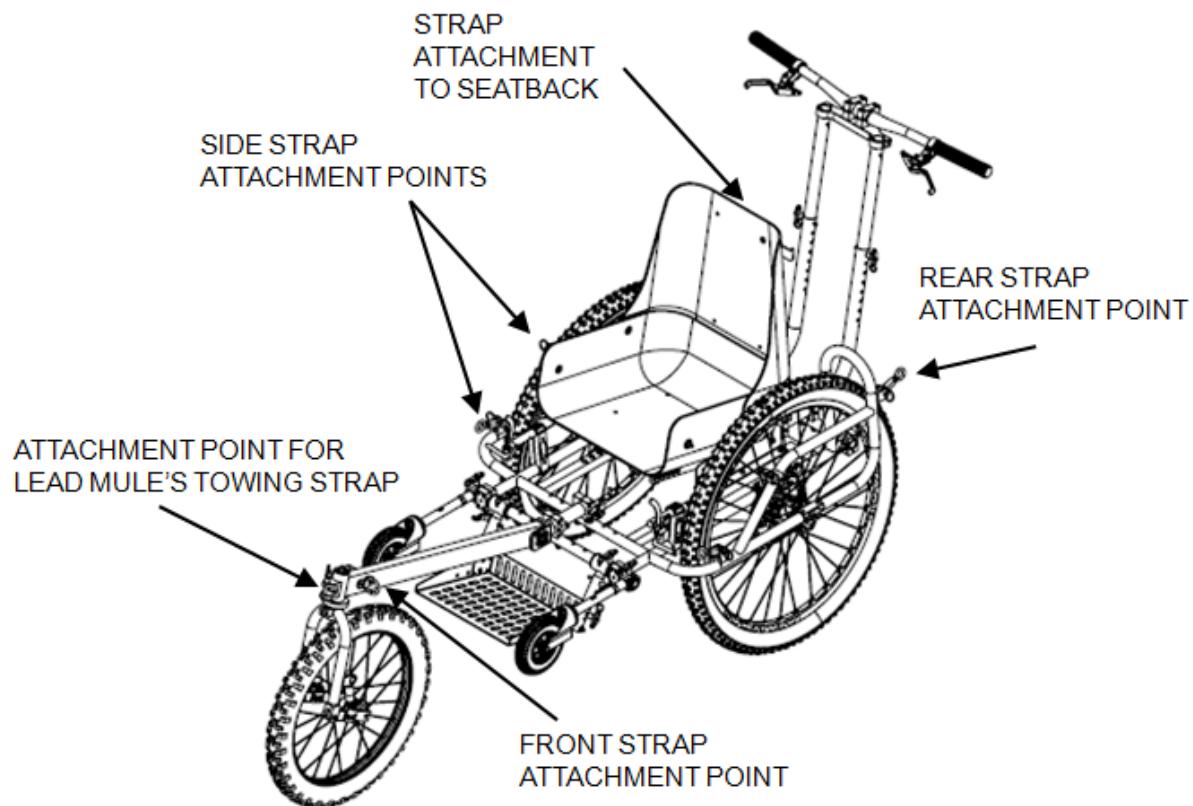


Figure 13. Strap attachment points.

4. Lifting handles for Side Mules: Side mules can lift the AdvenChair by the caster legs, the frame next to the main wheels, or the frame where it loops over the main wheels (Figure 14). The forward beam should not be used for lifting the AdvenChair but can be used to tilt the chair back on its main wheels (a wheelie).

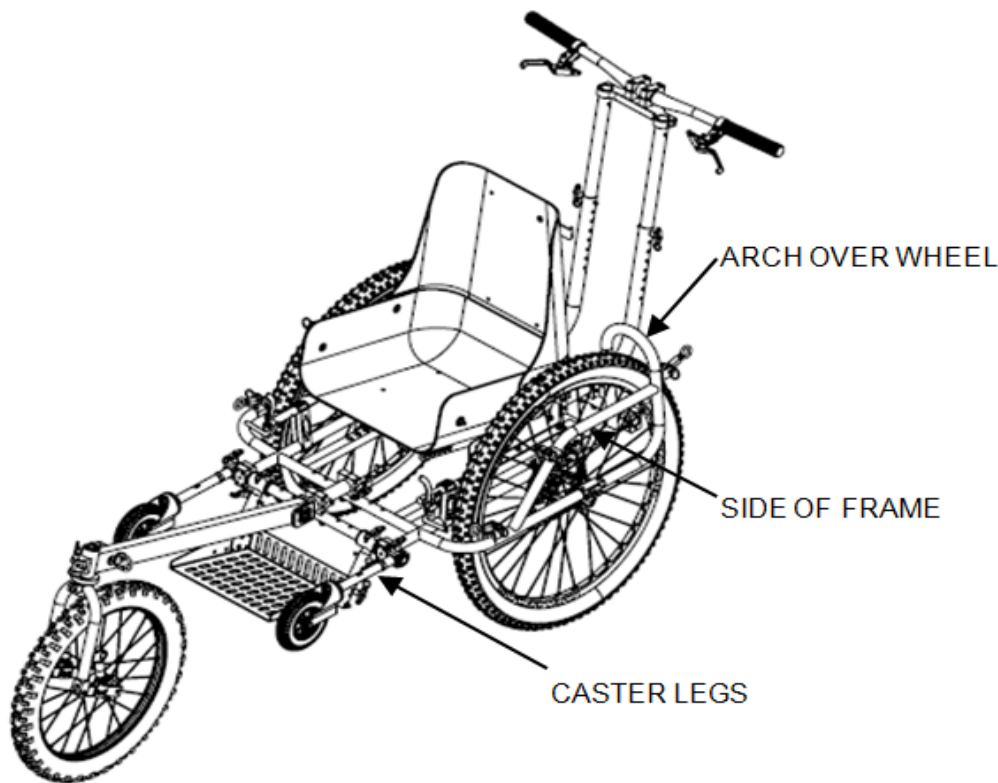


Figure 14. Handles for lifting the AdvenChair.

Choosing a trail and planning a hike

Team Members

AdvenChair hiking is a team sport. Everyone has a job and all jobs are important. It's best to switch jobs regularly to make sure everyone understands the team effort and to share the physical and mental effort. Team configuration will vary depending on the terrain and trail conditions.

1. **RIDER:** Sits in the seat and, depending on interest, helps direct the expedition or participates on the ride.
2. **DRIVER:** Pushes the chair, issues commands to start and stop, does most of the steering and braking, and is the primary director of tactics to get around and through obstacles.
3. **MULE:** The mules, a term of endearment for our friends, have a variety of roles and can move from one role to another as needed. The major roles include:
 - a. **Lead Mule:** Pulls the chair with the towing poles, especially on uphill sections; warns the rest of the team about upcoming obstacles; and helps with steering and braking to a limited extent. On downhill sections, the lead mule may use a towing strap to lift the front wheel over obstacles rather than pulling the chair with the poles. The lead mule

usually acts as the chief scout and directs the speed and decides when to stop progress for discussion of upcoming trail conditions.

- b. Front Mule:** On steep uphill sections, one to four front mules may assist the lead mule pull the chair up the hill with towing straps.
- c. Rear Mule:** On steep downhill sections, one or two rear mules stand behind the driver holding straps attached to the back of the AdvenChair. They exert a backwards force on the chair to help with braking and steering.
- d. Side Mule:**
 - i. On sections of trail across side slopes, side mules can be deployed with towing straps on the uphill side of the chair to keep the chair from rolling over.
 - ii. On rough sections of the trail, side mules lift the chair up and over obstacles (e.g. roots, rocks, logs, or stairs and waterbars). This is most common on uphill trails, but may also be needed on rough flat or downhill trails or on side-sloped trails.

Mules are reputed to be more patient, hardy and long-lived than horses and are described as less obstinate and more intelligent than donkeys.
--Wikipedia

Safety

AdvenChair hiking is about the journey. As with any outdoor activity, continually evaluate the weather and terrain and be ready to change plans or return home early if conditions are not safe. Safety issues specific to AdvenChair hiking include:

- 1. Understand your route.** Very easy routes, in town or on paved or wide, firm trails, can be undertaken with a rider and driver. Difficult routes with steep hills and rough, irregular trails require a larger, experienced crew. Scout ahead on the route; match the crew to the route and be prepared to alter the route or turn back depending on conditions..
- 2. Communicate.** The lead mule has the best view of what's coming and should let the driver and other team members know what's ahead. Often the driver can't see the trail directly in front of the chair and needs advice about how to straddle or steer around obstacles. On rough trails, the team needs to coordinate how to get through difficult sections. In these situations, casual conversation, usually encouraged, should stop and the team should focus on the obstacle, safety, and problem solving.
- 3. Don't be in a hurry.** If the trail gets rough, slow down and adjust. Don't barrel through difficult sections to show how competent you and the equipment are.
- 4. Downhill hiking.**
 - a. On a rough trail, downhill hiking is often the most difficult for getting around or over obstacles. Slow down and configure the team for the situation.




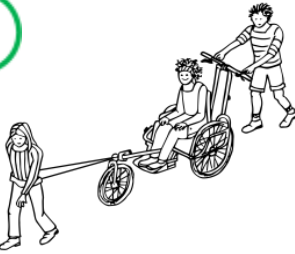

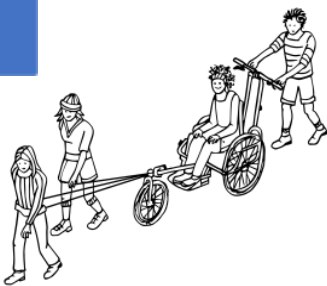

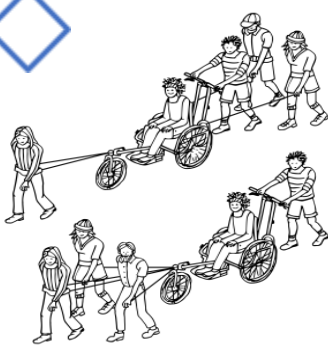
- b. On downhill sections, if using a towing strap, the lead mule must stay aware of the front wheel. In this situation, the lead mule should stay ahead and to the side, out of reach of the front wheel. The driver should pay attention to the location of the lead mule and use the brakes as necessary.
 - c. Keep gravity in mind. Use it, but keep it under control.
 - d. On steep downhills, deploy rear mules to act as a backup to the driver in case the driver loses contact with the brakes.
- 5. Side Mules.** Side mules risk trips, falls, and scratched legs when they are off the trail. Deploy side mules only when the chair needs to be lifted over obstacles or on steep side hills when straps are needed to keep the chair from tipping sideways. Turning ankles and knees is possible—take good care. Side mules on the downhill side often have poor footing and are most at risk. Use mules in the downhill position only when absolutely needed.
- 6. Side sloping trails.** When the trail is sloped across the direction of travel, the chair could tip or slide to the side. Side mules need to be deployed, carefully, in this situation. If the side slope is steep and the footing above and below the trail is unstable, consider how much of this condition the team can deal with and consider turning around if the team is not comfortable proceeding.
- 7. Uphill Hiking.** When the lead mule and front mules are both deployed, they sometimes get in each other's way causing tripping and falling hazards. Make sure they are deployed so as not to interfere with each other.
- 8. Extra person to go for help if necessary.** If the hike extends out of easy reach of help, make sure the team includes at least one person who can stay with the rider and chair and one person who can go for help if needed.
- 9. Have a contact at home:** Always make sure someone staying at home knows about your plans and can notify emergency help if the team doesn't return when expected.
- 10. Match the crew to the route:** Always match the crew to the trail. This is especially true on difficult and extreme trails for which the crew must be in good shape and experienced enough for the route. With a new crew, start with easy trails and build experience.


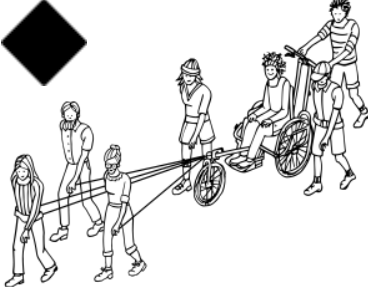

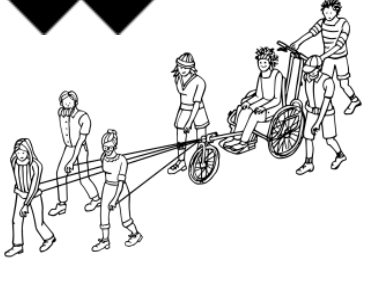

AdvenChair hiking is a team sport. Take care of each other!

Trail difficulty levels

The AdvenChair Trail Difficulty Rating System is modeled after the [City of Phoenix Trail Rating System](#) but adjusted for the special requirements of wheelchairs.

Table 1: AdvenChair Trail Difficulty Rating System

<p>Easiest</p>  	<p>Surface: Accessible paved or hard footing Steepness: Generally flat with only short sections of gentle uphill or downhill Obstacles: None Trail Width: Greater than 48" with no narrow sections Suggested Minimum Team Size: 2; rider and driver</p>
<p>Easy</p>  	<p>Surface: Almost all firm footing with short sections of uneven material Steepness: Generally flat with some sections of easy uphill or downhill Obstacles: 2" or less: Rocks, ruts, or roots. There may be curbs or short sections of 2 to 3 stairs. Trail Width: Greater than 36" with no narrow sections Suggested Minimum Team Size: 3; rider, driver, lead mule</p>
<p>Moderate</p>  	<p>Surface: Mostly firm footing with long sections of uneven material Steepness: Includes long sections of moderate uphill or downhill Obstacles: 8" or less: Rocks, ruts, logs, or roots. May include short sections of constructed stairs. Trail Width: Generally greater than 36" with short narrow sections. No or very minor side-slopes. Suggested Minimum Team Size: 4; rider, driver, lead mule, extra mule</p>
<p>Moderate/Difficult</p>  	<p>Surface: Mix of firm footing and loose, uneven material Steepness: Includes long sections of moderate uphill or downhill and short steep sections Obstacles: Many obstacles of 8" or less and occasional obstacles of 12" or less: rocks, ruts, logs, or roots. May include short sections of stairs or uneven steps constructed of logs or rocks. Trail Width: Generally greater than 32" with narrow sections. May include some gentle side-slopes. Suggested Minimum Team Size: 5; rider, driver, lead mule, 2 extra mules</p>

<p style="text-align: center;">Difficult</p>  	<p>Surface: Substantial amount of loose, unstable material and uneven footing</p> <p>Steepness: Includes long sections of steep uphill or downhill</p> <p>Obstacles: Many obstacles of 12” or less: Rocks, ruts, logs, and roots, and with sudden drops or rises in the trail.</p> <p>Trail Width: Generally greater than 32” with long narrow sections. Side slopes are common but not extreme</p> <p>Scouting: These trails should be scouted before attempting to travel on them with an AdvenChair to ensure they are passable safely with the available team.</p> <p>Suggested Minimum Team Size: 7; rider, driver, lead mule, 4 extra mules</p>
<p style="text-align: center;">Extremely Difficult</p>  	<p>Surface: Substantial amount of loose, unstable material and uneven footing</p> <p>Steepness: Includes long sections of steep uphill with some very steep sections.</p> <p>Obstacles: Many obstacles of 12” or less and some of 18”: Rocks, ruts, roots, and with sudden drops or rises in the trail. Some sections of the trail may feel like natural stairs.</p> <p>Trail Width: Trail can be quite narrow with steep sidehill sections. The rider may have to be carried through some narrow sections.</p> <p>Scouting: These trails should be scouted before attempting to travel on them with an AdvenChair to ensure they are passable safely with the available team.</p> <p>Suggested Minimum Team Size: 7+; rider, driver, lead mule, 5 or more extra mules</p>
 <p style="text-align: center;">Impossible</p>	<p>Some hiking trails are simply not accessible with any wheelchair. Characteristics that make trails not accessible include: Very narrow; very steep; side slopes that would cause the AdvenChair to tip or slide sideways with unstable footing above and below the trail; large and common obstacles > 18” which can’t be navigated around. These trails are extremely unsafe for the entire team and should not be attempted or, if encountered, should cause the team to turn around.</p>

Hit the trail

Minor Maintenance

1. Tires

- a. **Main Wheels:** The main wheels can be used in an emergency with no tire pressure because the CushCore tire inserts provide enough protection for the rims to roll the AdvenChair with no tire pressure if needed.
 - b. **Front Wheel:** The front wheel has a standard tire with tube. If it is punctured, it should be repaired by replacing the tube or patching the hole in the tube and re-inflating the tire.
2. **Brakes:** If the brakes rub, make sure the wheel is on straight and adjust the calipers by turning the adjustment barrels on the brake cables at the brake levers. If this doesn't correct the issue, a bike mechanic can trouble-shoot other brake issues.

Voice Commands

Communication between team members is critical. When the going gets tough, clear, incisive commands, usually from the driver, are essential. Other team members, especially the lead mule, need to contribute as needed.

1. Start the chair forward: **Onward!**
2. Stop the chair: **Stop!**
3. Back up a bit: **Back!**
4. Stop talking and pay attention: **Focus!**
5. Trail obstacles: Rock, Root, Log, Whatever...
 - a. <Call out the obstacle> right! (e. g. Rock Right!)
 - b. <Call out the obstacle> left! (e. g. Log Left!)
 - c. An obstacle in the center of the trail: **Straddle <Call out the obstacle>!** (e.g. Straddle Rock!)
6. **Wheelie!** (driver tilts the chair back to lift the front wheel and footrest)
7. Develop more voice commands if your group finds them useful.

Hiking Techniques

When encountering new or difficult situations, stop and discuss exactly what everyone will be doing. When the team has learned these techniques, they can often be performed without stopping the chair although discussion is always needed to adjust for conditions. Different teams prefer different techniques and develop new techniques. Keep improvising!

1. **Strap handling:** Use of the straps is pretty simple, but requires some planning and thought.
 - a. Make sure the straps are attached securely to one of the AdvenChair mounting points with a carabiner (Figure 13).
 - b. Holding the straps: The straps must be held securely so that they aren't dropped and the loose end doesn't trip someone.
 - i. **Hold in hands:** If the force on the straps is not going to be extreme, the straps can be held directly in the hands. To get better purchase on the strap, the strap can be wrapped around the mule's hand. The strap handler should be able to drop the strap to prevent the strap from sliding through the hand causing a rope burn.
 - ii. **Wrap around body:** Another way to hold the strap is to pass the strap around the strap handler's waist or hips, and then hold the end of the strap in the hand. The extra friction of the strap around the body makes it much easier to apply force to the strap. The strap is held much like a rock climb belayer holds a rope.

Straps can be used in many configurations and as the team gains experience, they will figure out their preferred techniques and develop the ability to improvise. A few considerations:

- Make sure the mule's footing is stable and secure to minimize slips, trips, and falls.
- Make sure that if unexpected force is put on the strap that the mule has the ability to handle that force.
- Make sure that if the mule falls or loses grip on the strap, the chair is not at risk of tipping and other members of the team are not at risk of falling.
- Many mules appreciate work gloves to protect their hands.

2. Stopping and slowing:

- a. **Brakes:** The most effective stopping or slowing technique is for the driver to squeeze the brake levers as needed. Lock the brakes with the buttons on the brake lever during any stops.
- b. **Poles:** If using towing poles, the lead mule can slow the chair by pushing back against the poles. Use care with this technique—if the chair is going too fast or not directly behind the mule, the chair could continue past the mule, pulling the mule around with the poles as the chair passes. Avoid the jackknife! The driver and the lead mule need to be coordinated so the lead mule doesn't get pushed out of the way.

- c. **Rear straps:** If rear mules are deployed, they can help slow or stop the chair by pulling back on the rear straps.

3. Steering

- a. **Handlebars:** The primary steering is done by the driver pushing the handle bars in the direction of travel.
- b. **Brakes:** The driver can steer with the brakes by squeezing the right brake lever for a right turn or the left brake lever for a left turn. This is most useful while traveling downhill when slowing forward momentum won't put a drag on the lead mule. This steering technique is similar to that used by heavy equipment like tractors or tanks.
- c. **Poles and front straps:** The lead and front mules can help with steering by pulling the front of the chair around corners with the poles or straps. This is most useful on wide, gentle turns or to direct the front wheel to one side of an obstacle in the trail.
- d. **Rear straps:** If rear straps are being used, the rear mules can help with the turn. The rear mule on the inside of the turn can hold the strap taut while the other can give the strap some slack. The chair will pivot on the taut strap. This technique is most useful on steep downhill trails. A single rear mule can employ a similar method with a strap in each hand: pull on the side towards which you're turning.

4. Sharp corners:

- a. **Lead mule swings wide:** When approaching sharp corners, the lead mule can swing wide to the outside of the corner to give the chair as much room as possible to get around the corner. This is most effective on sharp corners with few obstacles and allows the chair to get around the corner with the least amount of forward momentum.
- b. **Multi-point turn:** If there isn't room for a wide swing, or if obstacles require the chair to slow, a multi-point turn (alternately moving forward and then backing up, turning as much as possible on each leg of the turn) may be required.
- c. **Pivot turn:** When the corner is extremely tight or obstacles prevent any other technique, the driver can lift the front wheel off the ground and turn the chair on the two main wheels with the help of mules. In a variation of this technique, the chair can be lifted by two or more side mules, turned, and placed down facing the right direction. The pivot turn usually requires planning and discussion about exactly what needs to be done. On very tight corners, the poles can be detached, the turn made, and the poles reconnected.

5. Uphill:

Uphill hiking is challenging because of the effort involved but it is usually pretty straight-forward.

- a. **Uphill on a smooth trail:** The driver pushes and the lead mule pulls, pulling with a towing strap or the towing poles and harness. The towing poles become more useful as the trail steepens and when there are other mules to help guide the front wheel around

obstacles. As it gets steeper, front mules can be added as needed. Make sure to space the front mules so they don't interfere with each other or the lead mule.

b. Uphill on a rough trail: Again, the driver pushes, the lead mule pulls, and front mules pull as it gets very steep. Specific situations include:

- i. When there is an obstacle such as a step or a big rock, log, or root that the chair can't straddle or roll over, the driver communicates that they are going to pop a wheelie (gently!) to lift the front wheel over the obstacle.
- ii. When the obstacle is large, the side mules can grab the lifting points on the frame and lift and pull the main wheels over the obstacles. Don't use the forward beam to lift the chair. The forward beam can be used to tip the chair back on the main wheels (a wheelie).

6. Downhill: Downhill hiking may be less strenuous than uphill hiking but on steep and rough trails it takes lots of coordination and thought.

a. Downhill on a smooth trail: The driver uses the brakes to keep the chair from going too fast. If using the towing poles, the lead mule can push back against the poles to help slow the chair (taking care not to get pushed out of the way by the poles). As the trail steepens, rear mules can help hold the chair back with the straps.

b. Downhill on a rough trail: All the same techniques described for traveling on a rough uphill trail are used, except that the front mules are replaced by rear mules. The two primary differences are that

- i. the speed of the chair needs to be controlled carefully with the brakes and by the rear mules and
- ii. it is more difficult to lift the front wheel over obstacles when traveling downhill. Some lead mules prefer a towing strap to the towing poles in these conditions. In either case, the lead mule may need help from side mules to direct the front wheel over and around obstacles. When using a strap, the lead mule should stay far enough in front and/or to the side to avoid the front wheel.

7. Sidehill: Narrow trails crossing steep side hills are the most challenging and dangerous situations for the AdvenChair. **When this situation is encountered, stop and consider if it is safe to continue.** If the section is short, it may be acceptable to continue even if the sidehill is steep. But if the steep sidehill is continuous for a long ways, it is best to turn around. Consider how much the chair tilts and how stable the sides of the trail where side mules will have to walk are. It is very important to move slowly and give the side mules plenty of time to adjust their position. Techniques for crossing sidehills can be combined:

- a. The rider leans into the sidehill to help shift the center of gravity uphill. The rider's core strength is a large determinant of how steep a sidehill can be navigated.
- b. The driver lifts up on the downside handlebar to keep the chair from tipping over (Figure 15).

- c. Lift or support the chair on the downhill side: If the downhill side of the trail is stable enough and free of branches and other obstacles, have side mules ready to step to the downhill side of the trail to lift the downhill side of the chair using the lifting handles on each side (Figure 14).
- d. Straps pulling to the uphill side: If the uphill side of the trail is stable and free of branches and other obstacles, one or two side mules can attach straps to the side of the chair or back of the seat and pull up and to the side to keep the chair from tipping to the downhill side (Figure 13 and Figure 15).
- e. Before using these techniques, make sure that the side of the trail is stable enough to hold the side mules and that they can safely walk over any branches, rocks or other obstacles without tripping or sliding down the hill.

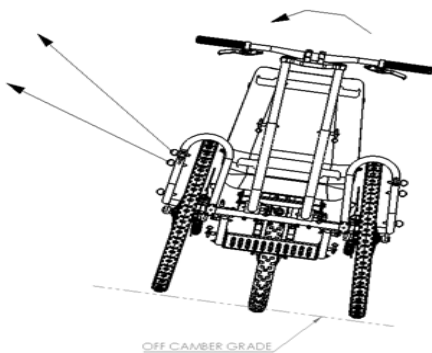


Figure 15. Using straps and the handlebars to cross a steep sidehill.

- 8. Crossing wide obstacles:** When crossing wide obstacles like water bars or stairs, square the chair to the obstacles so that both wheels roll over at the same time to prevent any chance of tipping the chair.
- 9. Narrow passages:** Very narrow trail sections or trails constricted by rocks, trees, or logs, which cannot be navigated by the AdvenChair, can be a dead end and may require turning around if more than a few feet long. If they are only a few feet long, and you're unlikely to encounter more, lift the rider out of the chair and carry her/him through the narrow trail section, and lay or sit him/her down in a safe location. Then get the AdvenChair through, around, or over the narrow trail section. Re-load the rider, and you're off! This technique requires enough people to move the rider safely and to get the chair through the passage without damage.
- 10. Rest breaks and lunch:** When stopped, make sure the brakes are locked so the AdvenChair can't roll, even on flat ground. Make sure the rider is comfortable, gets a chance to stretch legs and get feet out of the footrest straps.

Finding Trails to Hike

There are many websites which describe locations and characteristics of trails. Many focus on particular geographic areas or types of travel but few provide much information about accessibility. When reading these trail descriptions, pay attention to clues about accessibility such as references to narrow bridges, steep stairs and so forth. Use web searches to find trails in your area. Some example sites include:

- [AdventureGuru](#)
- [All Trails](#) (requires a subscription for full use)
- [Oregon Hiker's Guide](#)
- [Accessible Nature](#)
- [Trail Link](#)
- [American Hiking](#)
- [Access Recreation](#)
- [Explore Central Oregon](#)

Many of these sites let users suggest and describe trails that aren't on their sites. Let others know what great hikes you recommend!

Tell your AdvenChair stories

Contribute stories of your hikes to inspire others to get outdoors and hike! Send your stories to info@advenchair.com and we'll post them to www.advenchair.com/field-notes. Help others Roll Boldly!

Use the **Trail Notes** section in this guide to keep notes about your hikes so that you can pass your stories on to others.

Trail Notes

In this section, keep track of your adventures on the trail...

Date:

Trail:

Distance:

Team:

Weather:

Trail rating/description:

Notes:

Date:

Trail:

Distance:

Team:

Weather:

Trail rating/description:

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Date: Trail: Distance:
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Trail rating/description:

Notes:

Ready to Roll Checklist

- Expected time frames for the hike
- Expected weather
- Expected trail conditions
- Explanation of team member roles
- We're not in a hurry. Slow down when things get rough
- Communicate about trail conditions.
- What should be considered an obstacle and worth talking about?
- Review voice commands
- Remember that shorter drivers can't see the trail. Help them out
- Who is the point-of-contact if help is needed?
- What is their phone number?
- Is there cell service for a 911 call?

AdvenChair COVID-19 Precautions

Pay attention to the four Cs: Close contact, confined spaces, crowds, choices.

Every individual ultimately must make a personal decision about the level of risk he or she is comfortable with, weighing their own age and health status, life circumstances and general level of risk aversion or tolerance.

- All team members are free of COVID-19 symptoms: temperature, cough
- Maintain social distancing of at least 6 feet
- Wear a mask when near others
- Limit team size to 5 - Rider, driver, 3 mules. Preferably driver is from household of rider, or in regular contact. Mules preferably from same household or in regular contact
- Clean chair between users
- Use hand sanitizer
- Avoid touching face
- Communication from a distance to mitigate proximity
- Use easy, moderate trails that do not require lifting
- Limit time in proximity to others
- Travel separately in vehicles to/from trailhead
- Check with the local health district about COVID-19 conditions and restrictions in the area.

*The wild requires that we learn the terrain,
nod to all the plants and animals and birds,
ford the streams and cross the ridges, and
tell a good story when we get home.*

~Gary Snyder

