

---

# **ADAPTIVE EQUIPMENT QUICK REFERENCE GUIDE**

---



**WINTER -- 2019**

## TABLE OF CONTENTS

<b>Section 1: Rock Climbing</b> .....	2
<b>Section 2: Skis</b> .....	8
Bi Skis.....	9
Dual Skis.....	11
Mono Skis.....	13
Stand Up Skis.....	14
Nordic Skis.....	16
Ski Glossary.....	17
<b>Section 3: Kayaks</b> .....	19
<b>Section 4: Cycles</b> .....	25
Therapeutic Tricycles.....	26
Recumbent Trikes.....	34
Delta Trikes.....	38
Tadpole Trikes.....	40
Handcycles.....	43
Tandem Cycles.....	50
Two-Wheel Cycles.....	54
Off-Road Cycles and Chairs.....	55

# **SECTION 1: ROCK CLIMBING**



# ADAPTIVE CLIMBING GEAR

**EASY SEAT:** A rigid seat and chest harness to ascend the wall. It provides a little extra support for the participant's legs. It includes multiple straps to provide core support, acting as a chest harness.

- Helpful for those with no or limited lower body mobility, or amputations
- Gives extra support to lower extremities and core
- Often used in conjunction with pull up bar/ascender to climb
- Individual uses upper extremities to climb, lower extremities can be used if the individual is able
- Knee pads commonly worn- prevents scraping/bumping of the knees against rocks and wall.
- Single point attachment via carabiner into a figure eight knot
- Tighten all straps to ensure proper fit and safety for the participant
  - Shoulder straps on either side-tight enough so they can't slide off but not too tight so that they're hurting the climber. Also tighten chest straps, waist band, and leg straps
- Inspect before use. Inspect all webbing/straps to be sure of no frays or rips, the attachment points for no frays or rips, the seat itself for no cracks or damage. Make sure all buckles are double backed and work properly.



**ARC (ADAPTIVE ROPES COURSE) CHAIR/HARNESS:** This is similar to the easy seat except it gives more support. There is a plastic square made of tubing above the participant's head called the ARC spreader. It provides equal pressure on the four attachment points to the seat to help with stability for the individual. The participant sits in a chair with a rigid seat and there is a dorsal panel (back side) for trunk support. There are shoulder, waist, and leg straps like the easy seat to ensure support and safety.

- Helpful for individuals with limited to no lower body mobility, amputations, and those with low core strength or neck support.
- Gives extra support to lower extremities and core
- Often used in conjunction with pull up bar/ascender to climb
- Individual uses upper extremities to climb, lower extremities can be used if the individual is able
- Dorsal panel to lean against if they cannot support their trunk
- Knee pads commonly worn- prevents the scraping/bumping of the knees against the rocks and wall
- Four attachment points on ARC spreader and chair. Front two attach on chair at outer thigh and ensure the legs are pulled together. Two back points start behind head on top of dorsal panel, helps keep the panel upright and supportive
- The four attachment points connected via one carabiner above the ARC spreader
- Carabiner attaches to rope with figure eight follow through



- Tighten all straps to ensure proper fit and safety
  - Shoulder straps on either side-tight enough so they can't slide off but not too tight so that they're hurting the climber. Also tighten chest straps, waist band, and leg straps.
- Inspect before use. Inspect all webbing/straps to be sure of no frays or rips, the attachment points for no frays or rips, the seat itself for no cracks or damage. Make sure all buckles are double backed and work properly

**PULL UP BAR:** A bar with handle grips on either end and it is attached to an ascender. An ascender is a device that locks on to the rope and can only move up. It allows the participant to climb up the wall without having to hold onto rocks. While using the ascender, the participant will be performing a pull up motion to ascend the wall. It is commonly used with an easy seat or ARC chair/harness, although it can be used on its own with a typical harness. The pull up bar is most likely used in conjunction with a 2:1, 3:1, or 4:1 weight system within the ropes. (See 2:1, 3:1, or 4:1 for more information) There is also webbing used as a safety precaution to attach the pull-up bar to the harness.



- Helpful for individuals with limited mobility or weakness throughout body, or trouble gripping the rocks and wall surface.
- To use the pull up bar, the ascender must be attached to the rope. Webbing from the ascender is clipped onto harness or chair using a carabiner. Ascender can be slid up the rope, the teeth will catch, and participant can pull themselves up using the bar. This requires tension in the rope so the ascender can easily be slid up; it will not work if there is no tension.
- Inspect before use to make sure there are no cracks or sharp edges. Make sure the webbing is intact and the carabiner locks. Teeth should engage on rope.

**2:1/3:1/4:1:** These are different systems of pulleys that create a mechanical advantage for the person climbing. While using a pull up bar, instead of pulling up all their weight, they would only be pulling a fourth, third, or half (depending on the system used) of their weight with one pull. It also takes more pulls by the climber to ascend rather than climbing with no pulley system. However, it makes it easier. For example, a 3:1 would require the climber to pull three feet of rope through the system for them to move one foot up the wall. That would require them to use more pulls on the pull up bar to move further up the wall.

**FIGURE 8/CHEST HARNESS:** This is a harness that goes around the climber's chest and upper torso to provide extra trunk support. It helps to minimize risk of inversion (flipping upside down). It goes on in a similar fashion as a backpack and connects in the front in the middle of the chest. It attaches to the rope using a locking carabiner or a knot through the bottom harness. There are many different styles.



- For individuals with low to mild core strength. Assists in trunk support and resistance to inversion.
- Straps should be tight enough, so they don't slide off.
- Inspect before use. Check webbing for rips, tears, frays. Buckles should be double backed.

**SWAMI-BELT WITH ADAPTED LEG LOOPS:** A harness where the leg loops are thicker as well as the waist band. This helps to provide more support in those areas.

- For individuals with lower-limb weakness, paraplegics, incomplete quadriplegics, and limited mobility in the lower limbs.
- Waist band sits above hip bones, one leg through each leg loop. The leg loop should wrap around the mid-upper thigh. The harness should fit securely on the individual.



**ASCENDER:** This is a device that locks onto the rope using teeth but can only be moved up. You can slide the ascender up the rope as you climb, and it will stay at that spot, it won't slide back down the rope. This is what the pull up bar is attached to.



- For individuals with low muscle tone or mobility on one side of the body or one arm. Hold onto or strap hand onto ascender to use as an aid on rope instead of grabbing rocks and other holds on wall. Other hand would use rocks and holds on wall.
- Often used by a belayer to help pull a climber up the wall if they need extra assistance.
- Rope is fed through ascender, teeth engage. Tension must be placed on rope for ascender to slide up.
- If needed, there is a grip that can be attached to the hand of the participant with Velcro and attached to the ascender. This makes it easier to hold onto the ascender if the participant has difficulties grasping the handle.
- Inspect before use. Check for no cracks or sharp edges. Function properly, teeth engage and disengage.

# **SECTION 2: SKIS**



# ADAPTIVE SKI EQUIPMENT

## SIT SKIS

**BI SKIS:** Bi skis are a type of sit ski with a bucket type seat and a bucket or area for their feet as well. The seat is mounted onto two skis. The skier can use handheld outriggers or fixed outriggers depending on their ability and the type of ski. Out of the three types of sit skis, the bi ski is the most assistive ski. It is helpful for skiers new to sit skiing and individuals that need a lot of support with trunk strength and over all assistance. Bi skis also work well for individuals that require assistance in balance and speed control while skiing. The participant should be seated as far back in the seat as they can and sitting up as straight as possible. Feet should reach the bucket or foot rest with a bend in the knees. Padding can help with proper fit if the ski cannot be adjusted to suit the needs of the participant. Common disabilities for bi-skiing include mid to high level spinal cord injuries, cerebral palsy, multiple sclerosis, spina bifida, muscular dystrophy, multiple amputations, orthopedic injuries or other balance impairments.

### 1. Mountain Man

- Adult and youth sizes
- Bucket style seat and foot bucket
- Easy, gentle ride because of adjustable air shock and minimal capabilities for hard turns
- Supportive and adjustable seat with padding, easy sit angle
- Handle bar that can be attached if using fixed outriggers
- Uses fixed or handheld outriggers
- Usually tethered (see glossary pg. 16 for more information)
- Straps at feet, knees, waist, and chest
- Requires assistance to load/unload chairlift



Fixed outriggers

## 2. Biunique

- Youth and adult sizes
- Glove seating system to hug the body
- More angled seat than Mountain Man
- Footplate for feet, no bucket



- Buckled around chest, over the lap, knees, and feet
- Optional shoulder straps
- Slightly faster and more aggressive than Mountain Man
- Very responsive, seat connected directly to the ski bindings, low to the ground
- Can be loaded and unloaded from the ski lift independently
- Often tethered, uses handheld or fixed outriggers
- Good way to bridge gap between bi-skis and mono skis

## 3. Dynamique

- Less aggressive than Biunique because of more suspension, smoother ride
- Shock located towards front of ski- allows participant to sit flat on chair lift with no teetering sensation
- Can be loaded and unloaded from the ski lift independently
- Footplate easily adjustable to each participant
- Bucket can be set in 4 different positions
- Two ratchet system straps at chest and knees, and Velcro chest strap
- Feet are secured using a buckle on footplate
- Handheld outriggers, can be tethered



**DUAL SKIS:** Dual skis are similar to bi-skis because they have two skis underneath the seat, but they ski more like a mono ski (see below). On a dual ski, each ski can articulate independently. For example, during a turn, one ski may be angled while the other is flat. But on a bi ski, both skis would be either angled or flat. Dual skis have adjustable shocks to be more fitted for the participant's needs and skill level. They can load and unload the ski lift independently and usually aren't tethered. The skier must use handheld outriggers. They work well for individuals that don't have enough strength, balance, or control to use a mono ski but the bi ski limits their ability to ski hard and technical. It also requires enough trunk and arm strength to control their turns and support themselves using the handheld outriggers. The dual ski the participant selects really depends on which suits their needs best, usually depending on the disability. Good candidates for dual skis include individuals with lower limb impairments, balance difficulties, spinal cord injuries, traumatic brain injuries, cerebral palsy, multiple sclerosis, muscular dystrophy, spina bifida, orthopedic injuries, and double amputations. The participant should be seated as far back in the seat as they can and sitting up as straight as possible. Feet should reach the bucket or foot plate with a bend in the knees. Padding can help with proper fit if the ski cannot be adjusted to suit the needs of the participant.

### 1. HOC Glide

- Basic dual ski
- More tunable for different suspension needs
- Clamshell: angle between the seat back and seat- adjustable for each individual
- High seat back, good fit for upper spinal cord injuries
- Ratchet strap on footplate and above knees, Velcro chest strap, buckle at waist
- Independent chair lift loading
- Handheld outriggers, usually not tethered



## 2. Leisure Tessier

- Blend between mono and dual ski
- Bucket like a mono ski
- Frame is adjustable depending on height, weight, and needs of skier
- Shock allows comfort and smooth ride
- The seat angle and the seat are also adjustable.
- Independent chair lift loading
- Velcro strap at lower legs and chest, buckles at waist, above knees and ankles
- Handheld outriggers, usually not tethered



**MONO SKIS:** Mono skis only have one ski under the bucket. They require more advanced balance and skills since there is only one ski. Although mono skis don't normally use tethers, they can, especially when learning to mono ski. They do not use fixed outriggers. Mono skis are made for individuals that have experience in sit skiing and are mostly independent. They can load and unload the chair lift independently. The participant should be seated as far back in the seat as they can and sitting up as straight as possible. Feet should reach the bucket or foot plate with a bend in the knees. Padding can help with proper fit if the ski cannot be adjusted to suit the needs of the participant. Good candidates for mono skiing include individuals with lower limb impairments, reasonable balance, spinal cord injuries, traumatic brain injuries, cerebral palsy, multiple sclerosis, muscular dystrophy, spina bifida, orthopedic injuries, and double amputations. Mono skis come in adults and youth sizes.

### 1. Yetti



- Older model of mono skis, good for lessons
- Carbon fiber bucket
- Air spring for suspension
- Feet rest in bucket-like platform
- Steep sitting angle for more aggressive riding
- Straps at waist, ankles, and above knees and feet
- Independent chair lift loading/unloading
- Very adjustable and adaptable
- Handheld outriggers, usually not tethered

### 2. KBG

- Newer model of mono ski
- Plastic sit bucket, footplate for feet
- Hard spring for suspension
- Ratchet strap at waist, knees, and feet, Velcro strap at chest
- Adjustable clamshell angle
- More tunable for each participant
- Independent chair lift loading/unloading
- Handheld outriggers, usually not tethered



### 3. Freedom Factory Revolution



- Similar to Yeti
- Clamshell not adjustable
- High foot plate
- Internal shock
- Adjustable frame
- Helpful for individuals that can't have dropped foot plate due to injury or disability
- Ratchet straps at foot, knee, and lap. Straps at chest and waist
- Handheld outriggers, usually not tethered

## ***STAND UP SKIS***

### **4 TRACK SKIING:**

4-track skiing is when there are four different points of contact on the snow. It allows the individual to stand up ski with assistance. Four track skiing is a good option for individuals with cerebral palsy, multiple sclerosis, post-polio, spinal cord injuries, stroke, spina bifida, or individuals with strength and/or balance difficulties. Individuals must be able to stand independently and have reasonable strength and balance.

#### **1. Outriggers**

- Skier wears skis on feet
- Uses handheld outriggers
- Provides physical support
- Assists in balance and turns
- Participant may be tethered



## 2. Snow slider

- Skier wears skis on feet
- Walker-like frame with skis on bottom



- Tethers can be used to assist in speed control and turns
- Assists in balance, turns, and physical support
- Good alternative if individual can't hold outriggers

## 3 TRACK SKIING:

Three track skiing is when there are three points of contact on the snow. Most often, one point is a ski on the foot of the individual and the other two are handheld outriggers. This type of skiing requires a strong knee and leg as well as strong arms. Commonly, types of 3 track skiers are those with single leg amputation or single leg weakness. Since it requires a lot of strength, it may not be the best choice for some individuals.



## 2 TRACK SKIING:

Two track skiing is when there are two points of contact on the snow, such as two skis. Two track skiing is a good choice for any individual that can balance on their own without use of outriggers. Adaptations such as tethers, spacer bars, or tip connectors can be utilized.



Tip connectors (pictured left) and spacer bars work in the same manner to keep the skis at the same distance from each other and to not cross or get too wide.

## **NORDIC SKIING:**

Nordic skiing, sometimes called cross country skiing, involves skiing on a trail in pre-made grooves. The participant should be able to stand on two legs, maintain posture, and have some control over their balance- although this is not required.

### **1. Snow walker (pictured below, left)**

- Walker with skis on bottom
- Assists in balance, provides physical support
- Works well for those with cerebral palsy, multiple sclerosis, muscular dystrophy, arthritis, mobility difficulties, limb weakness, and balance difficulties.

### **2. Nordic sit ski (pictured below, right)**

- Seat and footrest with straps
- Nordic skis on bottom
- Requires strength in arms to propel self forward using poles
- Youth and adult sizes
- Helpful for those with low standing endurance, lower extremity weakness, lower extremity amputation, cerebral palsy, multiple sclerosis, muscular dystrophy, spinal cord injuries, orthopedic injuries, and balance difficulties



## SKI GLOSSARY:

- **Tethers:** Lines of webbing (similar to rope) that allow the instructor to assist the skier in turns, speed control, and stopping. Tethers can be used with sit skis and stand up skis. Special training is required to properly handle tethers. The carabiners connect to the back of the sit ski or the front of the stand-up skis. The loops at the end go around the wrist of the instructor.



- **Outriggers:** Pieces of equipment used to assist in stabilization and turns while skiing. On a sit ski, they can be fixed or handheld. Fixed outriggers are placed in the sides of the sit ski and hover just above the ground. They contact the snow as the skier turns and leans onto the edge of the skis. It provides stability for the skier and helps make the turns. Handheld outriggers are like crutches with a ski on the end and a pick on the back end of the ski. The skier holds them in their hands to control their turns and balance manually. The end can be flipped up and used in the same manner as a pole to help with pushing and maneuvering the ski on flat ground along with loading on the chair lift. Handheld outriggers can be used with all types of sit skis as well as stand up skis. Fixed outriggers are only used with the Mountain Man and Biunique bi-skis.



Handheld outriggers



Fixed outriggers

- **Seizure Belt:** A seizure belt is a belt that participants wear if they have history of grand mal seizures within the past 24 months. The belt attaches to the chair lift with webbing and a non-locking carabiner. The belt is weight bearing, meaning it will hold the individual and prevent them from falling off the chairlift, if they were to have a seizure.



- **Padding/foam:** Padding and foam are often used in sit skis to make adjustments and adaptations for the individual. Commonly, padding is put in the foot bucket if there is extra room. Sometimes padding is placed between the knees of the skier so their knees don't hit each other when going over bumps. It is important for the individual to be secure in the sit ski so the padding helps to eliminate the extra space. Padding can also be placed in the side of the sit ski to give extra support and security.

- **Bamboo Pole:** A pole often used with new skiers/snowboarders to help teach them turns and other skiing/snowboarding techniques. The instructor holds the pole out in front of them and the participant is next to them also holding the pole. The instructor can then turn, and the pole makes the participant turn as well.



# **SECTION 3: KAYAKS**



# KAYAK EQUIPMENT

## Current Kayaks:

Necky Looksha T (Tandem)

Wilderness Systems Pemlico (Tandem)

Necky Manitou II (Tandem)

Necky Amaruk (Tandem)

Necky Zoar Sport (Single)

Necky Zoar (Single)

Looksha IV (Single)

Walden Odessey (Single)

Tandem kayaks have two cockpits so that two individuals can be in the kayak at the same time. This is helpful for participants with visual impairments, or those who need extra assistance in paddling and steering.

## ADAPTATIONS:

\*CVCA stands for Chosen Valley Canoe Accessories

### 1. \*CVCA Basic Paddle Seat

- Tall back rest, side supports
- Can be adjusted for different heights and widths
- Attaches to any kayak using clip on the bottom
- Helpful for those with low endurance, low trunk and upper body strength, balance difficulties, and/or low torso control



## 2. \*CVCA Outrigger System

- Provides outriggers on either side of kayak
- Reduces likelihood of kayak tipping



- Attaches to any kayak with a back hatch
- Outriggers can be adjusted in width, minimal or maximum support
- Helpful for those needing assistance in balance, spatial orientation, torso control, and anxiety

## 3. Back-of-hand Adaptation

- Assists individual in grip strength and holding onto paddle
- Small, clamp-like device attaches to paddle
- Participant's hand slides under clamp
- Clamp provides slight pressure, participant can hold better grip on paddle
- Doesn't attach to participant's hand, must have some ability to hold onto paddle
- Participant can slide hand out of handle at any time
- Important not to use any other straps or attachments, hand needs to come free from paddle in case of emergency
- Handle can be attached to any paddle
- Helpful for those who have slight difficulty with grip strength and paddle control



#### 4. Wristband Hand Adaptation

- Assists individual in gripping and holding paddle
- Attached to wrist with Velcro
- Wristband has a small metal plate, it slides into a spot on the attachment on the paddle
- Wrist and hand are secured on paddle, allows participant to paddle easier and use bigger strokes
- Device can be released, allows for safety during emergency
- Metal plate on the palm side of the wrist
- Helpful for those with low grip strength and low paddle control



#### 5. Jackson Kayak Sweet Cheeks

- Seat cushion attached over the kayak seat using its Velcro straps
- Seat inflates, participant sits down, air is pushed out and the beans (like in a bean bag chair) move around and form around participant
- Remaining air is sucked out, seat remains formed to participant
- Helps support around hips, helps to keep participant from sliding around in kayak seat



- Relieves pressure points, provides some extra support
- Helpful those who need extra pelvic and lumbar support and those who tend to slide around in seat

## 6. Bike Tubes and Zip-Ties

- Creates a grip and/or signifies correct area for hand placement on paddle
- Bike tubes are cut to the correct length and wrapped around paddle
- Zip-ties secure them
- Helps those with low grip strength, newer paddlers, those with visual impairments, those who have difficulty with hand placement
- Can be used as a back-of-hand adaptation

## 7. High Back Support Seat

- Flexible seat with sides and high seat back support
- Sits on top of kayak seat, attaches to kayak with straps
- Supports sides and back of individual
- Helpful for those with low endurance, limited trunk strength, balance difficulties, and/or low torso control
- Seat back angle is adjustable with straps



## 8. Padding/Foam

- Used to make adjustments in kayak
- Can be placed around individual such as under legs, on their side, or behind back
- Helps keep participant in correct position by reducing sliding and other movement
- Helps to reduce rubbing and pressure sores
- Helpful for participants that need slight support to stay in correct position due to leg, back, and/or core weakness

## 9. Paddle Pivot

- Triangular base in cockpit of the kayak in between paddler's legs
- Paddle is attached to pivot on top of base, allows the paddle to swivel
- Paddle is dipped in and out of the water without having to be held
- Adjustable to proper height and length for each individual
- Helpful for those with upper body weakness, low grip strength, those just learning to paddle, and those that have visual impairments



# **SECTION 4: CYCLES**



# THERAPEUTIC TRICYCLES



**Therapeutic Tricycles are great for all ages, from small children to large adults. Trike riding encourages socialization and the development of friendships, especially when inclusion enables children with special needs to ride alongside their peers.**

## **SAFETY TIPS!**

- Used almost always with hands-on assistance
- Tricycles tend to have a higher center of gravity.
- Only ride on smooth, flat terrain.
- Can tip over easily.

## **BENEFITS:**

- Great for riders with cognitive or developmental disabilities who cannot ride independently.
- Provides increased range of motion, motor planning, reciprocal leg movement, strength, coordination, endurance and fitness
- Seat belt and torso support for full body support

## **POSITIONING:**

- Upright posture with pedals under seat.
- The client's extended leg should reach comfortably from seat to pedal when both feet and torso are strapped into place.
- Latch seat belt and additional harnesses needed for support
- Ensure feet will stay on the pedals without slipping off, apply straps, buckles or heel support.

## **Many therapeutic trikes have a fixed gear:**

A fixed-gear cycle cannot coast unless the pedals are moving; if the bike is moving, the rider must pedal. If rider pedals backwards, bike travels in reverse. Fixed gear bikes can only have one gear. Some riders cannot maintain a full pedal stroke, so they need the momentum of the fixed gear to help them keep pedaling. A new rider may need a fixed gear when first learning to ride but may develop the muscle strength and coordination to move on to a free wheel.

# ADAPTIVE PEDALS

There are many different options when adapting pedals to meet the riders needs. It is common for these pedals to have heel support and straps to keep the foot secure and in the correct position while riding.



**TRIAID FOOT SANDALS** Constructed from a durable ABS plastic formed into a supportive foot shape. Each Foot Sandal has two webbing cross-over straps to hold the foot firmly in place. It is possible to add a pulley system which connects to the front of the Foot Sandals. The function of this system is to prevent the toe of the rider pointing downwards towards the ground when pushing on the pedals (available on some Rifton Tricycles as well).

**ABS FOOT PLATES:** These specially designed ABS plastic footplates provide precise positioning for children and adults with more spasticity. With the addition of the ratcheting straps and soft ankle/toe cushions, riders will enjoy premium comfort while benefiting from unmatched support



**PLATFORM PEDALS:** If rider has difficulty keeping foot straight, a platform pedal can help keep it aligned by providing a larger surface area for the foot to position on top of.



# ADAPTIVE ACCESSORIES FOR THERAPEUTIC TRICYCLES

**HAND GRIPS:** Active Hand Grips are great gripping aids function by the tightening of a strap in the upper section, which gently pulls the hand into a fist shape, adjusting to hold items in the palm.



**ADDUCTION STRAP:** Padded strap that helps keep legs together, assisting with hip and foot alignment.



**ABDUCTOR:** The abductor provides comfortable abduction if needed. Just set it in place, tool-free. The two larger sizes are height adjustable with a snap button.





**FRONT GUIDE BAR** Attaches to the handle bar and allows caregiver to guide the tricycle. This is ideal for beginners who cannot steer themselves. Guiding from the front enables eye contact between caregiver and rider.

**REAR STEERING BAR** Similar to the front guide bar but allows caregiver to guide tricycle from behind. Also great for beginners who cannot steer themselves. Guiding from behind allows the rider to feel a sense of independence.



**REAR STEERING** The Rear Steer allows the caregiver to steer or brake from the back of the mobility device. Once the rider becomes more comfortable with reciprocal movement, an adjustment can be made allowing the rider to control or assist with the navigation of the bike.



**PELVIC STRAP** Helps keep the riders pelvis stable.

**BACK/TRUNK SUPPORT** This trunk support provides the rider with support to the back and side to allow them to ride safely and comfortably. The buckle strap supports at the chest to keep the rider from falling forward. Also provides extra security.



**TRUNK SUPPORT** Stabilizes a rider with poor trunk control. The back rest adjusts for height and seat depth and laterals can be removed for transfer. A butterfly harness provides anterior support.

**4-POINT CHEST HARNESS** Stabilizes a rider with poor trunk control by providing anterior support. The back rest adjusts point chest harness. Perfect for riders with torso weakness and spinal deformities. The 4-point butterfly design enables riders to maintain an upright body position. Made of Neoprene (contains latex).



# THERAPEUTIC TRICYCLES

**TRIAID IMP** This pediatric adaptive tricycle is designed for special needs children (ages 2 ½ to 5 years old, up to 70 lbs). With a dual axle drive system there is reduced resistance when pedaling making it easier for a child with low muscle tone and decreased strength. Very stable with a low center of gravity and a broad wheelbase.



**TRIAID TERRIER** This tricycle was designed with a strong frame for a growing child (ages 4 to 8 years old, up to 100 lbs). For better stopping control, this tricycle has caliper brakes (brakes activate by rotating pedals in reverse). This trike also is a foldable design, making storage and transport much more convenient.

**TRIAID TMX** The TMX Tricycle is an easy-going cycle designed to suit larger children. It is constructed from a strong, yet lightweight, frame and is fitted with a fixed gear. The low gear ratio makes it easy to get going - yet also limits the top speed to enable the rider to stay in control - and the gear ratio can be changed to suit the rider's pedaling ability.



## **WORKSMAN TRIFECTA**

These trikes are great fun and ideal for those who may prefer riding a bicycle which allows them to get on and off easily. Also, this trike allows your feet to more easily touch the ground when mounting or dismounting.



## **RIFTON ADAPTIVE TRICYCLE**

The Rifton Tricycle is a leg-propelled tricycle designed for use by children with mobility disabilities. The tricycle features self-leveling pedals with sandals, an adjustable back support with chest belt, a seat belt, a square loop padded handle bar, reflectors, and a snap-out storage tray between the rear wheels. Tricycles comes in small to large frame sizes (pictured below)

### **RIFTON R120 (RUSTLER)**



### **RIFTON R130 (RANGER)**



### **RIFTON 140 (WRANGLER)**



## FREEDOM CONCEPTS DISCOVERY

These adaptive bikes provide a quality of life and lifestyle to those with limited mobility options. Every product is designed to provide normalcy and a sense of freedom. Each bike is built to the person and their special needs, taking leg length, trunk support, and type of disability into consideration.

## FREEDOM CONCEPTS ADVENTURE AS2000

The Adventurer Series offers many of the same features as the Discovery Series, with an added dimension of comfort and support for the mature rider. As with Discovery, the handlebars, seat and crank mechanisms are adjustable. Adventurer's walk-through design and step-on platform make loading as easy as sitting down in a comfortable chair. Brakes are mounted on the handlebars. If the rider is unable to operate the hand lever, one can be mounted on the discreet assistance handle for a companion to operate.



## FREEDOM CONCEPTS ADVENTURE ASR

This semi-recumbent trike features a low-to-the ground seat, extended frame and pull-away handlebar system, making it easy to transfer on and off in a natural sitting position, even for those with limited range of motion. With the ability to add a Nexus 8-speed shifter, riders will be able to keep up with the rest of the pack while still enjoying the device's

therapeutic benefits. The stable stretched three-wheel design enables riders with limited range of motion to have their legs further forward, providing increased pedal power and strength.



# RECUMBENT TRIKES

Recumbent seat is in the reclined position. These cycles are a lot of fun and great for riders of all abilities.

## RECUMBENT SEAT BENEFITS:

- Easier on the lower back while also encouraging better spinal posture.
- Head is up in a natural position providing a great view
- Soft and comfortable seat reduces painful pressure points
- Safer option for individuals with balance issues
- Good choice for most people with neurological conditions since the bike provides a low impact total body workout.

*Lower center of gravity = increased stability*

## TWO TYPES OF RECUMBENT TRIKES



**TADPOLE TRIKE:**  
**TWO FRONT WHEELS AND ONE BACK WHEEL**

**DELTA TRIKE:**  
**ONE FRONT WHEEL AND TWO BACK WHEELS**



# ADAPTATIONS



**TOE CLIPS:** Toe clips and straps bolt to regular pedals (non-clipless) and form cages to hold your feet in the correct place on the pedals and keep your feet from slipping off. This is a perfectly viable solution and one less expensive than clipless pedals and the special shoes needed to complete the clipless system.



## ADAPTED PEDAL WITH CALF SUPPORT:

**SUPPORT:** Secures positioning of the foot along with a calf brace which provides stability for the lower leg and the angle of the ankle.



**CLIP-LESS PEDAL:** Require special compatible bike shoes that attach directly to the pedal, keeping the riders foot secured to the pedal.



# PEDAL STRAPS

Instead of using an adaptive pedal, straps are another option to assist in keeping the rider's feet secure and positioned properly on the pedals. Strap material options available: Velcro, Neoprene (contains latex) and bike tubing.

Straps are compatible with a variety of cycles: therapeutic tricycles, trikes, two-wheel bikes, and tandems. Supportive & versatile

## NEOPRENE STRAP (CONTAINS LATEX)

Image on the right feature's neoprene strap. These straps are very versatile, they can be wrapped around and adjusted different ways to secure foot to the pedal. Depending on the rider's needs.



## VELCRO PEDAL STRAP

Hand-made by an Outdoors for All employee, these adjustable velcro straps provide support in keeping the rider's foot and heel secured to the pedal



**Step 1:** Insert two narrow strips through the openings of the pedal.



**Step 2:** Pull apart large velcro toe straps to bring down the heel strap and the first hook piece to attach the narrow straps.



**Step 3:** Pull the final large foot strap down to secure the base of the foot and then tighten the heel strap.

## **PEDAL EXTENDERS** Pedal extenders provide more space between pedal and crank.



Beneficial for riders with wider feet or wider leg alignment, allowing the foot to be comfortably positioned on the pedal. Pedal extenders are very versatile, they can be used on most pedal bikes such as therapeutic tricycles, recumbent and tadpole trikes, and standard two-wheel bicycles.



## **SHORTENED CRANKS:** Crank length makes a huge difference in a person with limited



range of motion or shorter limbs to power a bike. The crank arms are what the pedals attach to. Cranks can be replaced or crank shorteners can be attached to bring the pedal closer to the rider's foot.



## **DOUBLE-PULL BRAKE LEVER** A single lever that activates both brakes, allows for a single hand control setup. Helpful for individuals with limited hand strength, amputees or those who prefer to operate with one hand.



# DELTA TRIKES

One wheel in the front and two behind



## POSITIONING

- Legs should be slightly bent to prevent knees from locking.
  - Lengthen/shorten boom or adjust seat.
- Some riders have a tendency of wanting to sit upright which limits the upper leg range of motion.
- Raising height of seat will also raise center of gravity, decreasing stability
  - Bike may be easier and more comfortable to ride but will decrease stability

## ADJUSTMENTS TIPS:

(varies each model):

- Lengthening or shortening the boom (also requires steering adjustment as the steering linkage changes when the boom length changes)
- Recline and height adjustments

## ADAPTATIONS

- Pedal Straps
- Pedal with calf support
- Clipless Pedals
- One hand operation
- Shortened Cranks

**Delta Trikes are very maneuverable, comfortable and easy to get on and off. Great cycle for individuals with pain in the neck, shoulders and back, Carpel Tunnel Syndrome, or any nerve impingement.**

# DELTA TRIKES

**HASE KETTWIESEL** This delta trike is a very agile, yet smooth ride. Excellent safety and stability due to its low center of gravity. Perfect adaptability to the rider's height and weight. The under-seat handlebars complement its ergonomics. By loosening an Allen bolt, the angle and lateral positioning of each handlebar can be precisely adjusted to the rider and sitting position.



## EZ-3 TRIKE

Very popular cycle for adults and children who do better in a reclined position. Seat adjusts to accommodate various leg lengths. Cycle can be modified with crank shorteners that decrease the range of motion needed for a full pedal stroke.

## EZ-TRI CLASSIC SX

The rider gets the comfort and mechanical pedaling advantage along with the stability and confidence a trike brings.



# TADPOLE TRIKES

Two wheels in the front and one behind



Tadpole trikes are one of the most stable trikes due to the wide wheel base and low center of gravity. Often a good choice when speed and stability is prioritized over maneuverability and when the rider can easily get in and out of the lower seated riding position.

## TRANSFER

- Rider should approach the bike from the front and walk backwards into the space between the boom and wheels.
- Step over boom before sitting or sit and then swing leg over the boom.
- Getting off the bike is the same process in reverse.

## POSITION

- Legs should be slightly bent at full extension, to prevent knees from locking.
- Typically, all adjustments come from the boom length.
- Most seats do **not** move forward or back.
- Recline and height are adjustable on some models.

## ADAPTATIONS

- One-hand operation
- Pedal Straps
- Hand Grips
- Shortened Cranks
- Pedal Extender

# TADPOLE TRIKES



**TERRA TRIKE ROVER** This trike was built to provide excellent reliability and usability. The strong frame and high seat position make the Rover perfect for anyone who wants a solid, well built, no-nonsense machine. If you are ready to experience the joy of riding a TerraTrike, the Rover is the perfect entry level choice.

## TERRA TRIKE RAMBLER

This cycle is designed to do it all without sacrificing comfort. Its range of options and component levels make it the perfect platform to create a trike for specific needs. The sleek Y-frame design improves the handling and stability. This cycle is a quality trike for casual and serious riders alike. Great cycle for individuals with hemispheric weakness, can easily steer with one hand.



**TERRA TRIKE SPORTSTER** This trike accelerates effortlessly, maintains high speeds with ease, and powers through tight corners. The lightweight aluminum frame allows the rider to move faster than you ever thought possible. The Sportster is notable for its perfect blend of performance and usability.



## CAT TRIKE 700

The 700 is designed to be fast and efficient. A low, aerodynamic body position and lightweight vertebrae-spaceframe puts the rider in a perfect position to generate power and speed.



## ICE-SPRINT 26

With its sporty ride, comfort and medium height seating position, the versatile Sprint is a great fit for the performance-oriented rider. Whether you are carving turns or pushing your speed, the Sprint is a trike for all seasons.

## KMX KOMPACT R

This recumbent trike is great for older kids and young adults. Features a low center of gravity and very high stability. It has a sliding boom to make easy height adjustments so it can grow with your child.



# HANDCYCLES

Handcycles are a great option for individuals with limited lower mobility.

- Provide an alternative to cycling
- Great option for individuals with limited or no leg function
- Also great for able bodied individuals for cross-training
- Good form of upper body exercise
- Increase upper body strength, cardiovascular health, and overall fitness
- Can go as fast or slow as you please

## TYPES OF HANDCYCLES

### UPRIGHT HANDCYCLES: LEGS BEND AT 90-DEGREE ANGLE



Handcycles are a great option for individuals with limited use of their legs from spinal cord injuries, amputations, multiple sclerosis, stroke, cerebral palsy and spina bifida.

### RECUMBENT HANDCYCLES: LEGS EXTEND OUT IN FRONT



### ADAPTATIONS

- One Hand Operation
- Pedal Straps
- Hand Grips
- Padding or Cushion
- Shortened Cranks

# HAND GRIP ADAPTATIONS

**QUADGRIPS** These grips are great for individuals with grip or wrist issues. If you have a grip issue, you probably know that you can push as hard as you want. However, when it comes to pulling, if you can't grip, you can't pull. Quadrigrips support the wrist in the pulling mechanism while pedaling.



**ERGONOMIC GRIPS** Help spread pressure throughout the palm. Relieves pain or numbness in the hands that handcyclists may experience when using conventional grips.

**BIKE-ON.COM C5 GRIPS** These modified gloves are for those with little to no finger function. The gloves have a short bar that extends from the palm of the glove and inserts into a connector piece attached to the cranks. The design allows the rider to release hands from attachment to shift and re-connect easily.



**ACTIVE HANDS GRIPPING AID** Gripping aids function by the tightening of a strap in the upper section, which gently pulls the hand into a fist shape, adjusting to hold items in the palm. The wrist strap is also adjustable, and the aid is padded to reduce chafing. (Active Hands Gripping Aids are also available in youth sizes, refer to pg. 29).

# UPRIGHT HANDCYCLES

Upright handcycles are great introductory cycles for individuals new to handcycles. These are great beginner handcycles due to the upright position allowing the body to adjust to using new muscles and being able to use majority of their upper body to propel.



## TRANSFER

- Position of seat allows for an easy transfer.
- Height of the seat is about the same height as a wheelchair (or standard chair)

## ADJUSTMENTS

- Footrests can be adjusted using allen and adjustable wrench
- Seat slides on rails
- No height

## ADAPTATIONS

- Pedal straps
- Hand Grips
- Shorten Cranks
- One hand operation
- C-5 Grips

## POSITIONING

- Sit in chair position with legs bent at a 90-degree angle.
- Feet behind front wheel
  - Allowing for tight turns
- Seat should be close enough to the hand pedals to fully extend arms without rolling shoulders forward.

Upright handcycles are a great option for individuals with limited leg mobility, physically challenged athletes, or individuals looking to gain upper body strength.

**PACIFIC HANDY** This unique handcycle has been engineered to provide the ideal cycling experience for athletic advancement of upper body strength and toning for athletic events. Especially valuable to triathletes and physically challenged athletes, it provides the perfect way to get in shape in a healthy outdoor environment.



**TOPEND EXCELERATOR** If you want a great way to exercise, cross-train or just have fun, the Invacare Top End Excelerator handcycle is just what you're looking for. Extremely stable and maneuverable, the Excelerator is capable of speeds up to 15 mph and can tackle hills or level terrain with equal ease. (Youth Excelerator also available, pictured below)



### **QUICKIE MACH 2**

This upright handcycle is designed for an upright rider and is capable of long-distance cruising. The Mach 2 is Smooth-cranking, easy shifting and a piece-of-cake to back up. (Youth size available)



### **TOPEND LI'L EXCELERATOR**

Sized for smaller riders, the Invacare Top End Li'l Excelerator handcycle is a great way for kids to exercise. The 7-speed hub with reversing brake means hands never have to leave the handles, making for a safer ride.



# RECUMBENT HANDCYCLES



Recumbent handcycles provide greater stability and performance. Hand crank placement allows for better body positioning increasing the ability of the rider and enabling them to ride longer distances.

## TRANSFER

### Getting on

- Come up to seat at a 60-degree angle. Put the closest leg across the seat, placing the other foot on the ground
- Place the closer hand on the seat back and the other hand on wheelchair seat (if applicable)
- Raise both legs to place feet on footrests.

### Getting off

- Angle chair against the bike at 90 degrees.
- Rider takes legs off the footrest and tucks them up close to the seat.
- Then put one hand on seat back of cycle and another on chair, then transfer.

## COMMON ADAPTATIONS

- Crank Position
- One hand operation
- Quad Grips
- Handgrips
- C-5 Grips

## POSITIONING

- Rider's legs straddle front wheel, with legs extended almost in a straight line with body, keeping slight bend in knee.
  - Allowing rider to turn bike without their legs locking, which could prevent them from turning.
- Leg positioning creates some resistance keeping body from sliding forward.
  - Too much knee bend will interfere with crank handles (pedals)
- If rider is unable to straighten legs:
  - Raise the height of the crank
  - Use bike with wider or "s" style crank arms.
  - Lower footrest slightly.

## TOP END FORCE-RX

This Handcycle is the latest competitive handcycle to join the Invacare Top End Force Handcycle series. The Force RX handcycle delivers hypersonic speed in a lightweight, adjustable and sleek aerodynamic package.



## TOP END FORCE 3

The Invacare Top End Force-3 Handcycle offer 27 speeds, tire options ranging from high-performance road tires to knobby tires, a reclining backrest and super controlled one-handed braking all in a sleek, flat, stealth black finish.

## TOPEND EXCELERATOR XLT

The Invacare Top End Excelerator-XLT handcycle is great for everyone, from the beginner to the competitive cyclist. It's a great way to exercise, cross-train or just have fun. Performance-minded handcycle riders will like all the options available to build a lean, mean racing machine tailored to their exact needs.



## TOPEND FORCE G

The Force G design offers an adjustable, trunk-powered, erect position for athletes that have a low paraplegia, amputees and competitors who can “gut” it out using abdominal, arm, shoulder and chest muscles. The Force G

Handcycle can be considered a cross trainer and is used by athletes classified as an H4 or H5. It is a great core workout and allows users to see the traffic a bit easier than the recline-only positioned handcycles.



## TOPEND EXCELERATOR XLT JR.

This recumbent handcycle built just for kids or small adults. It has the same great features as the adult size XLT which is available with 7 speeds with an easy to operate, hands-on reversing drum brake



# TRADITIONAL & NON-TRADITIONAL TANDEMS CYCLES

Standard bike setup for both front and rear.



## FRONT RIDER = THE CAPTAIN & REAR RIDER = THE STOKER

- Front rider is in control, together they power the bike.
  - Unless specially equipped, front and rear need to pedal and rest simultaneously.
- Typically, individual with the disability will be the stoker and the guide will be the captain.
- Non-Traditional Tandems are also available. Many of these tandems have the stoker sitting in the front to enjoy the view and the captain pedaling behind.

**Practice** and **good communication** are important

### BENEFITS:

- Great option for individuals with a visual impairment, cognitive deficit, or limited strength.
- Riding opportunity for people out who do not have the ability to power any kind of cycle on their own.
- Adults and children can ride together for a longer distance
- Effort and experience is shared by both riders.

### HOW TO START IN A STOPPED POSITION:

- Stoker will be in place, ready to go, with right pedal in a downstroke position.
- As the captain pushes off, they both pedal down to the bottom position.

# TRADITIONAL TANDEMS

## CO-MOTION INLINE TANDEM

This your basic bicycle built for two. The captain steers from the front seat. Great for individuals with auditory or visual impairments.



## CO-MOTION PARASCOPE

This tandem is ideal for getting your young child started cycling early yet can stick with your family as your child grows and take you places you never imagined.

## RALEIGH COMPANION

Two upright seating positions welcome you and your riding partner aboard and stable handling means a great view as you cruise the scenic back streets. Sturdy 27.5-inch wheels with flat-resistant Kenda tires roll smoothly and confidently over pavement and gravel paths, and the wide-range, 21-speed drivetrain has the spread you need to conquer every hill. Your contact points are covered with super comfortable Raleigh grips and handlebars as well as a pair of supportive high-density foam saddles.



# NON-TRADITIONAL TANDEMS



## FREEDOM CONCEPTS ADVENTURER TANDEM

The best way for some folks to enjoy a ride in the great outdoors is on a bicycle built for two. The Adventurer Tandem fits the bill. The driver steers and controls the device from the rear. The individual in front, whether visually or physically challenged, can enjoy all the benefits of cycling, including the fresh breeze on their face.

## THE DUET

The wheelchair's low center of gravity provides superior weight distribution and overall stability. The Duet wheelchair seat supports the back in a natural position and aids in passenger relaxation. Most importantly, the cyclist can easily communicate and supervise the wheelchair passenger while facing forward. It's the exhilaration of the wind brushing by your face as friends and family ride together. Once you've reached your destination the wheelchair disconnects and can be used independently.



# SIDE-BY-SIDE TANDEM

## JTB (JUST TWO BIKES, INC.)

This cycle can accommodate just about anyone wanting the wind in their face. The JTB is basically two cycles with a frame in between. Each rider can choose to pedal if they want. Only one captain steers. Both riders pedal from the recumbent position. An optional leg rest allows for one of the riders to have his or her feet up resting on the level with the seat.



**LEG CRADLES** Leg cradles can be added on to the JTB tandem to provide leg support for riders who may not be able to pedal.. Pictured below, rider on the left is using leg cradles.



# TWO-WHEEL CYCLES



**STRIDER (20", 16", 14", 12")** This is a balance bike designed for foot propulsion to teach the fundamentals of riding. When learning to ride, it is important for children to experience how leaning and steering affects the balance of the bike. Once the fundamentals of balance and steering are mastered, transitioning to a bicycle with pedals is easy.

**TREK'S 1.1** This is a great choice for road riding fun. This bike has a light aluminum frame that has a slightly higher front end and handlebars for comfort. (Trek FX 7.1 which is a hybrid cycle is also available)



## NOVARA TRANSFER

The Transfer is one of their "fully dressed" transportation bikes. The bike includes fenders, rack, dynamo-powered lights, chainguard, etc. -- normal for a bike sold in Europe but rare in the US.

# OFF-ROAD CYCLES & CHAIRS

Adaptive off-road bikes provide access to rough and rugged terrains that would normally be inaccessible such as: single-track trails, mountain bike parks, beaches, river crossings, and snow-covered terrains.

ReActive Adaptations Stinger Trike



TrailRider



Riders should have some knowledge regarding risk management factors such as greatly varying terrain, potential wilderness settings, and increased chance of rollovers and crashes.

There are many different off-road options from handcycles to all terrain wheelchairs.

**The options are limitless for off-road adventures. Outdoors for All carries off-road handcycles, recumbent trikes, full suspension mountain bikes, and all-terrain wheelchairs.**

ReActive Adaptations Bomber Handcycle



Off-road cycles can use many of the common adaptation options mentioned previously: pedal straps, padding, hand grips, etc.

# OFF-ROAD CYCLES & CHAIRS

## GRIT FREEDOM CHAIR

All-terrain wheelchair built for every type of adventure. This easy-to- push, lever-driven wheelchair comes armed with rugged mountain bike wheels, a big, sturdy front wheel that doesn't get stuck, and optional trail handles, allowing you to choose your own custom journey.



MIT-designed patented lever drive is easier to push than regular wheelchairs, and way more powerful. Riders can cruise faster than walking speed on smooth ground and the power needed to climb over hills and roll through grass, dirt, and sand.

## NATURAL-ACCESS LANDEEZ BEACH CHAIR

Each wheelchair from Natural Access provides all-terrain access for disability. This Beach wheelchair can roll on sand, gravel, and snow. Parks and recreation are available to wheelchair users with this all-terrain wheelchair.



## TRAILRIDER

Extremely versatile and reliable! The highest mountains and harshest terrain is just another day in the life for the TrailRider. Riders are typically assisted by 2-6 volunteer sherpas to climb mountains & experience the outdoors. Great for paraplegics, amputees, lower and upper extremity weakness, and really anyone who does not have the strength but wants to explore extreme terrains.



## REACTIVE ADAPTATIONS BOMBER HANDCYCLE

The Bomber has been built to withstand even the toughest tests on the trail, in the backcountry and yet stay lightweight and agile. The Bomber's rear suspension provides improved ride quality, downhill speed control and improved traction uphill. Steered using handlebars and chest steering (secondary). Legs are placed in knee trays, chest lays across chest steering and hands on cranks.



## REACTIVE ADAPTATIONS STINGER

The Stinger is a recumbent tadpole trike. It is one of its kind. This cycle has enough traction to conquer any rocky, root-filled mountain trail. What makes this cycle stand out the most is its derailleur. Mounted on the 26-inch rear wheel, the Stinger's derailleur is free from many trail collisions, an issue many tadpole off-road cycles encounter.



## **TRANSITION SCOUT (XS, S, M, L)**

The Scout is a fun, playful, and versatile trail bike that strikes a "sweet spot" with 130mm of rear wheel travel and aggressive angles.



## **TRANSITION PATROL (M, L, XL)**

An efficient well-mannered ascender that immediately switches into pure party mode on the way down. Featuring Speed Balanced Geometry to create a super slack bike that also adds front wheel traction going up and downhill. The Patrol gives you the control of a downhill bike perfectly balanced with a lively and jumpy personality for a comfortable, efficient and fun ride in any trail condition.

