BI-UNIQUE™

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BI-SKI INSTRUCTION, MAINTENANCE & PARTS MANUAL

A BI-SKI/SIT-SKI DESIGNED & BUILT IN USA BY

ENABLING TECHNOLOGIES

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I. INTRODUCTION

Imagine going through a lift line on your own, loading onto the chairlift, then carving turns down your favorite slope. The Bi-Unique ski, designed and manufactured by Enabling Technologies, is a high performance unit. It offers more features for less. Suitable for skiers of all ages, skills, and sizes, the Bi-Unique Ski weighs only 32 pounds (14.5kg). The skier sits only 7 inches (17.7cm) off the ground which provides better stability, while the hydraulic jack lifts the ski for easy self-loading. No nuts or bolts are required for adjustment. Instead, flip release pins make adjustments simple. The roll bar and push bar make for easy ski buddy assistance. It is fitted with the Glove Seat for comfort and control. The shoulder harness provides upper body support. The Bi-Unique Ski comes with a tether hook and is available in a variety of colors. For a safer journey on the chair lift, bigger and wider seat glides provide extra stability and ease at dismounting. A retention strap with carabineer help lock you to the chair lift and the integrated evacuation harness are always ready for emergency use.

Your 2005 Bi-Unique bi-ski/sit-ski incorporates the latest technology and all upgrades made to these machines since they were first built in 1991. It is the culmination of user requests and suggestions as well as our vision and experience. This manual is not intended to teach you how to ski. Learn from a qualified adaptive ski program/instructor. This manual is to assist you in understanding, maintaining and utilizing your Bi-Unique.

II. BACKGROUND

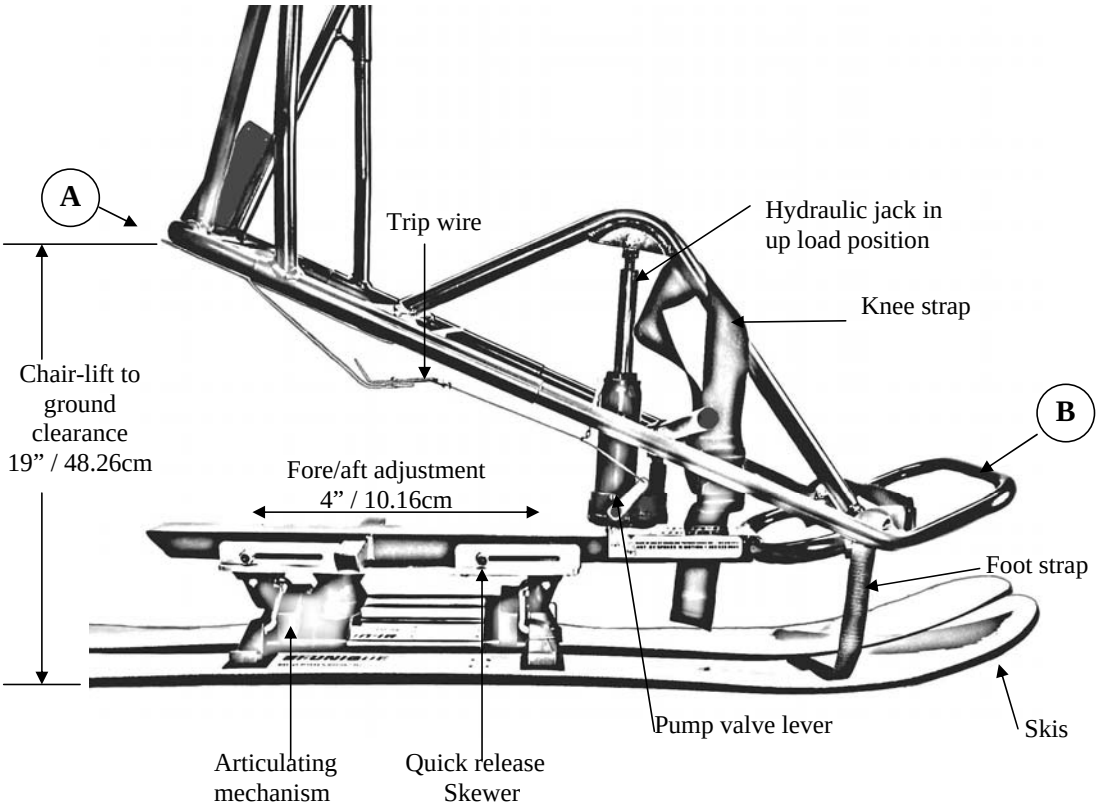
Your Bi-Unique was designed and intended to be a versatile, durable ski for ski programs and individuals. It is an easy to use, confidence building, and skiing device for all who lack the upper body strength and coordination required to mono-ski. We designed a stable, low to the ground ski that would be fun to use on beginner and intermediate groomed slopes. It had to be light yet durable, fit a broad range of skier abilities, be self-loading, easily adjustable, and quick to evacuate in emergencies. From the start, ski programs could introduce the sport of sit skiing to a broader range of handicapped persons.

Feedback from skiers and instructors has led to broader capabilities for the latest models. We have added several sizes to accommodate children through extra tall adults, higher roll bar handles to ease back pain of the ski buddy, tether strap anchors, removable and adjustable fixed outriggers, stronger frame models, more durable skis, and articulating mechanism. T- handle, t-bar lift capability, quick release skewers for rapidly adjusting your center of gravity, is among some of the innovations and upgrades. We have designed most of these items so that you can bring your Bi-Unique up to current specifications with minimal expenditures.

Future innovations include a warmer, redesigned Glove Seat, a suspension system for the Sport Version of the Bi-unique, and a joystick controlled bi-ski for high-level injury, independent skiers.

III. GENERAL DESCRIPTION

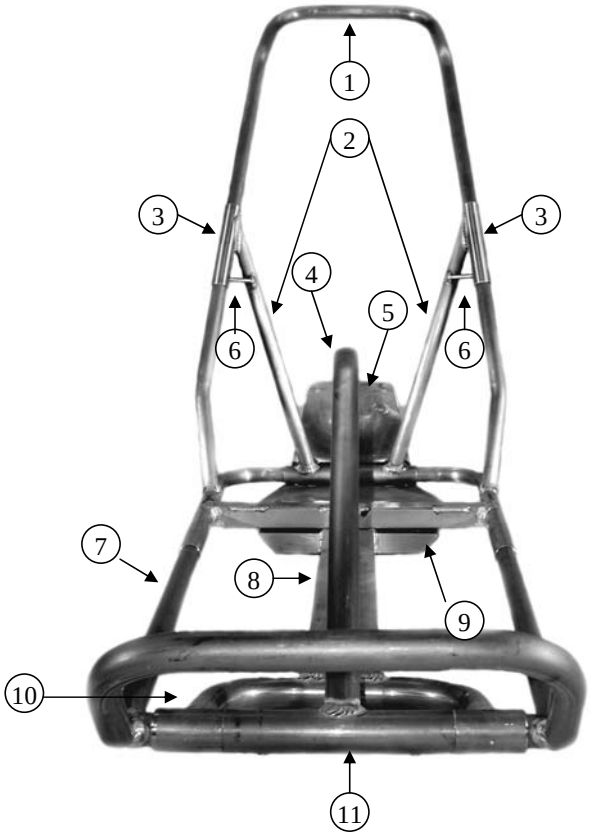
The Bi-Unique consists of the Glove Seating System incorporating our evacuation system mounted on an aircraft quality aluminum tubular chassis. This chassis mounts to an adjustable articulating mechanism. The removable skis are clipped to the feet of the mechanism. Various options can be added to extend the basic capabilities of the Bi-Unique.



Bi-unique Sizes: Measure from **A** to **B**

Kid	= 33.25" / 84.45cm
Junior	=37.5" / 95.25cm
Adult	=41.5" / 105.41cm
X-Large Adult	=46.5" / 118.11cm

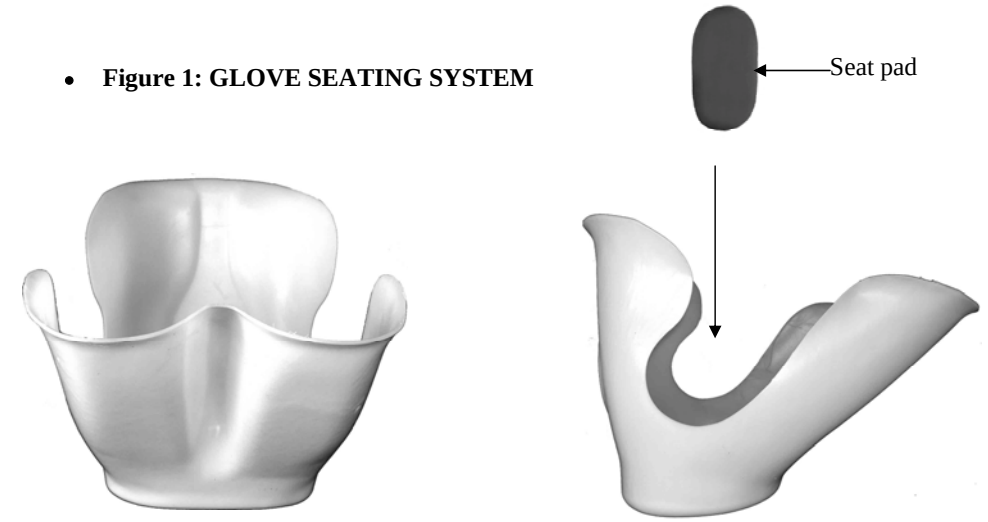
Bi-unique frame

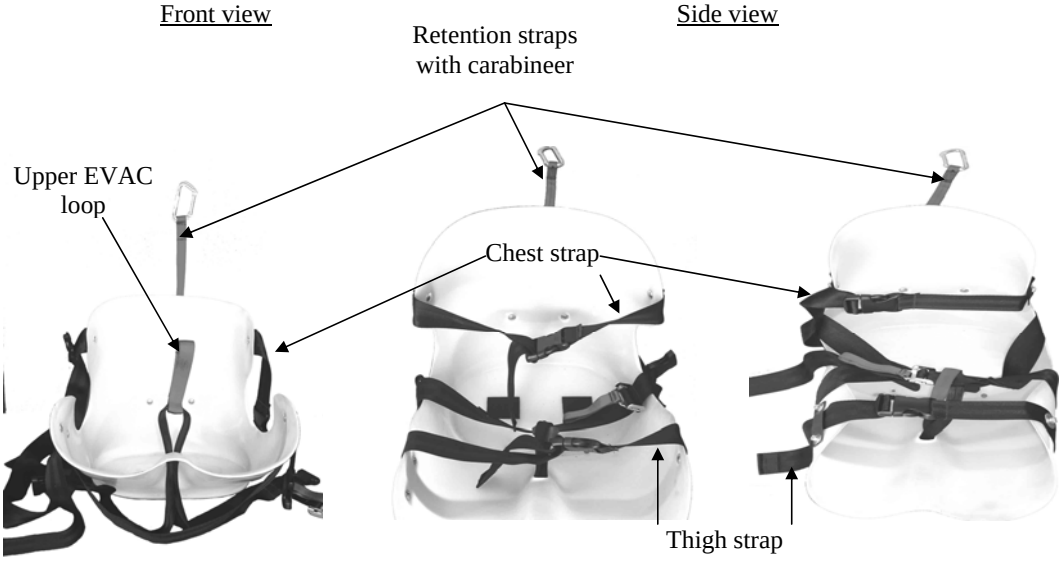


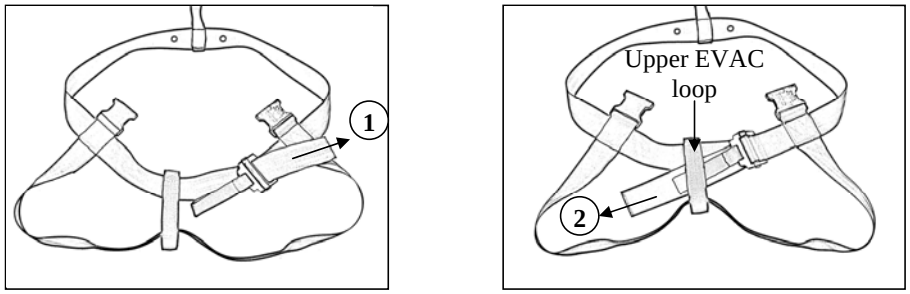
No.	Name	Materials	Qty
1	Roll bar	Alum. 6061-T6	1
2	Roll bar support	Alum. 6061-T6	2
3	Roll bar sleeves	Alum. 6061-T6	2
4	Knee rest	Alum. 6061-T6	1
5	Seat pan	Alum. 5062 H32	1
6	Tether anchor	Alum. 6061-T6	2
7	Main frame	Alum. 6061-T6	1
8	Main rail	Alum. 6061-T52	1
9	Main rail wing	Alum. 6061-T6	2
10	Foot rest rear	Alum. 6061-T6	1
11	Front hinge tubes	Alum. 6061-T6	1

IV. INDIVIDUAL COMPONENTS

- **Figure 1: GLOVE SEATING SYSTEM**







- **Figure 2: EVACUATION SYSTEM**

The Bi-Unique utilizes a time tested mountaineering evacuation harness that doubles as the seat belt and adds a retention strap with carabineer to complete the safety package. We chose to mount the evacuation harness on the outside of the Glove Seat so that both the skier and the unit could easily be evacuated. This distributes the weight that is applied during evacuation to the seat and not the skier. In an evacuation, the skier would attach the evacuation line with carabineer from the mountain rescuers to the evacuation loop on his harness and be scooped to safety.

PLEASE NOTE: The ski is bolted to the Glove Seat. The skier is strapped to the seat. The ski will simply hang from the seat during evacuation. The retention strap with carabineer provides additional protection from dropping to the ground should you be dislodged or tossed from the chair while riding up the lift. The strap should be wrapped around some part of the chairlift seat, preferably around the chairs' backrest. Making the retention strap taut minimizes the distance you could fall. Ideally, it should be tight enough to keep you in the chair.

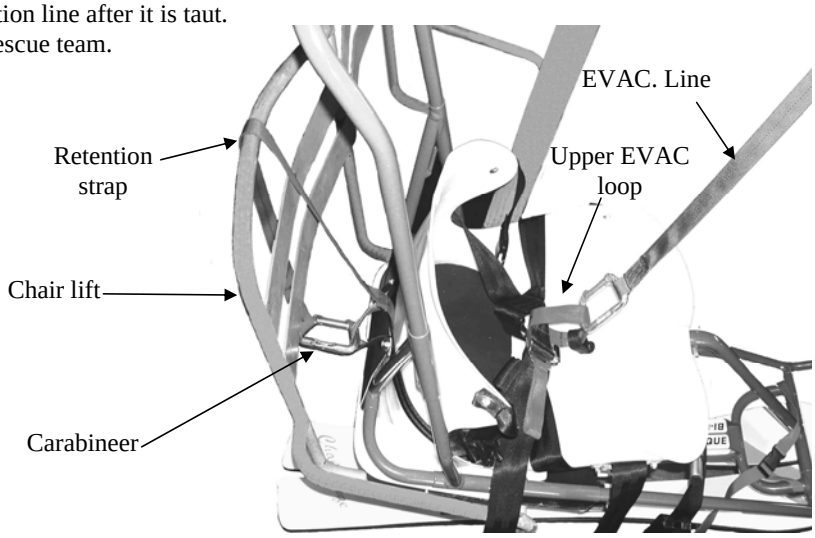
PROPER EVACUATION HARNESS USE:

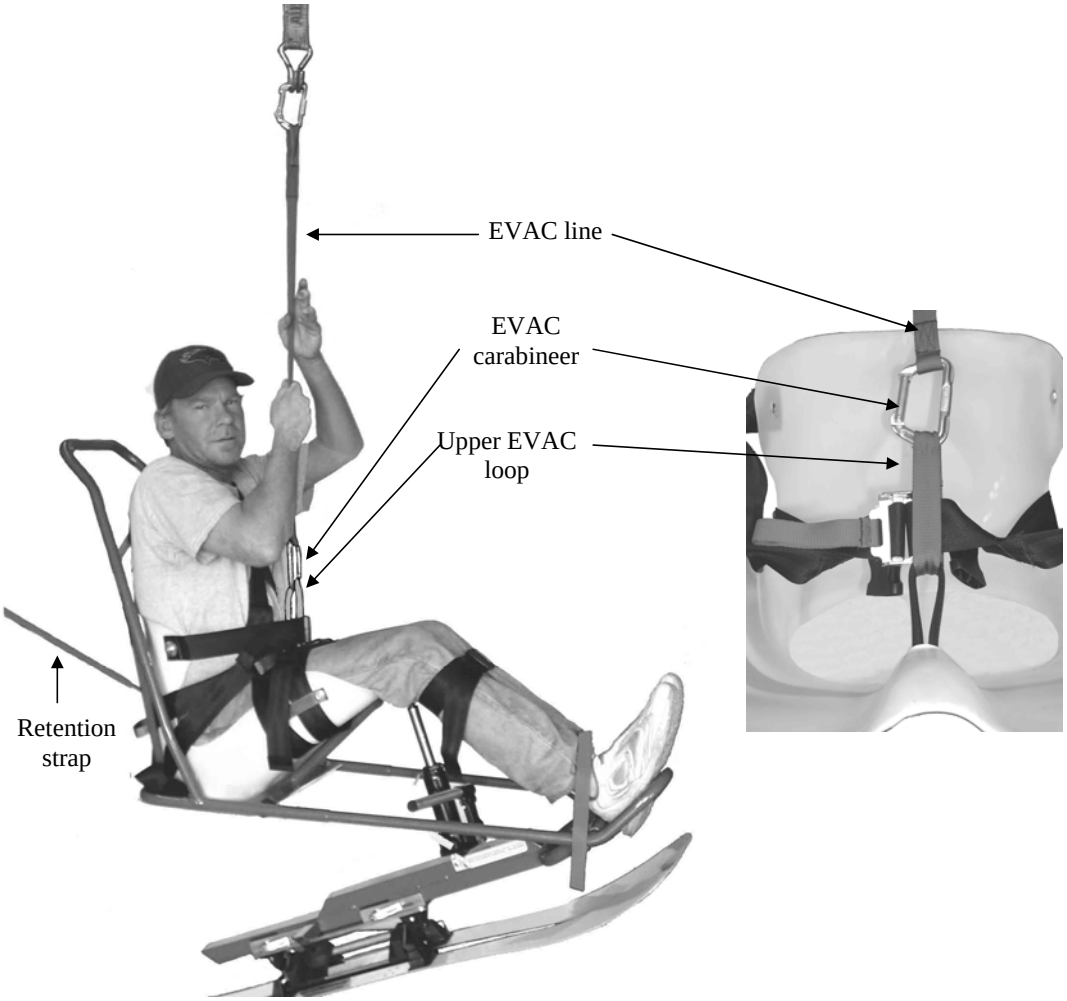
It is imperative that you properly thread the seat belt through the evacuation strap loop to maximize your evacuation system after positioning yourself in the Glove Seat.

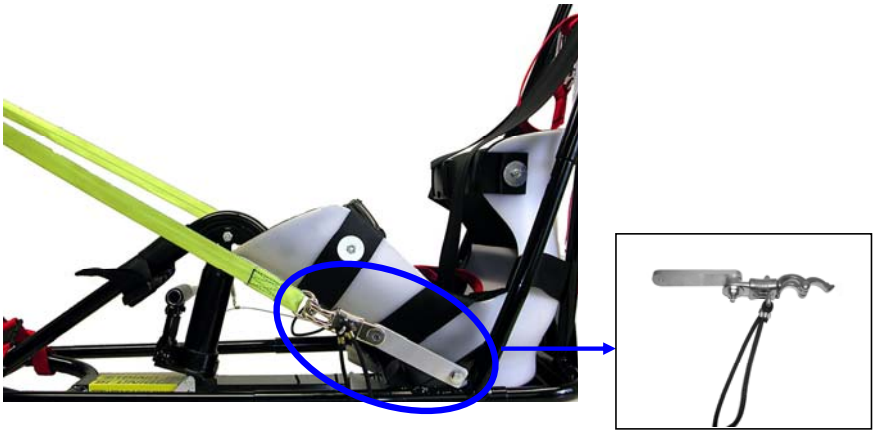
1- Pull up the evacuation harness loop between your legs as far as you can.
2-Thread the seat belt through the evacuation loop.
3-Thread the loose end through the seat belt buckle.
4-Pull tight.
5-Push your pelvis to the rear of the seat and retighten seat belt.
6-Finish buckling yourself in. You are now ready to be evacuated should the need arise.

EVACUATION PROCEDURE:

- Remain calm and hold onto the chairlift.
- Listen to instructions from the rescue team.
- Point out that you already are wearing your evacuation system.
- Show them the attachment point, the upper loop of your evacuation strap.
- Clip evacuation carabineer onto evacuation loop.
- Unhook your retention strap/ carabineer from the chairlift.
- Hold onto the evacuation line after it is taut.
- Ride down with the rescue team.







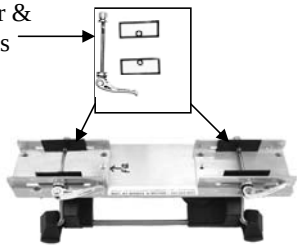
Attachment for T-Bar tow lift kit

- **Figure 3: SKI AND ARTICULATING MECHANISM**

50 ¼” / 128.27cm

TYPE #2
MEGA II

A longer sportier ski can go faster and ski more assertively

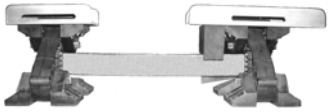


TYPE #2
Current articulating mechanism
*Superior technology
*Low maintenance
Quick release system for skis
*4” / 10cm fore/aft adjustment
*Full flexible ski mounting system

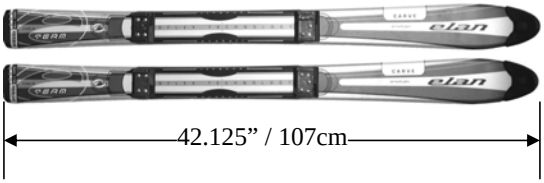
48.25” / 122.55cm

TYPE #1
Blue

Very benevolent skiing & turning characteristics



TYPE #1
Original mechanism (discontinued)
*Mechanism permanent mount to ski
*Had 8-pads/feet minimum flex.
*3”/7.6cm fore/aft adjustment



42.125” / 107cm

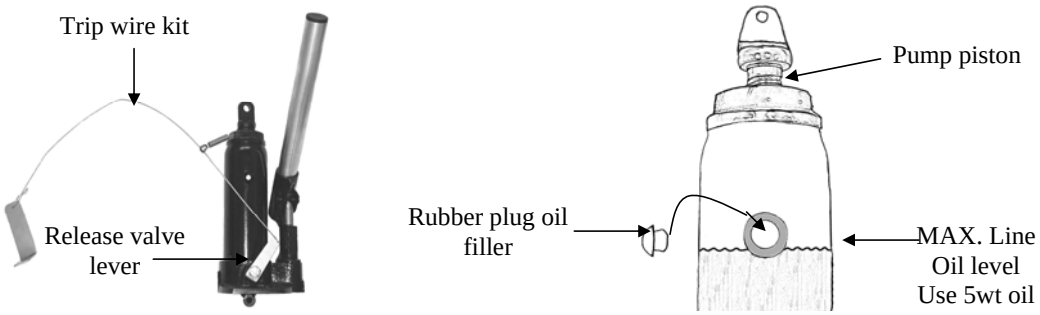
Alternative state of the art carving/shaped ski can be use

Go straight

Turn left

Turn right

- **Figure 4: HYDRAULIC PUMP**



- **Figure 5: OUTRIGGER SUPER LITE (option)**

Down/Ski position
Competition style

Down/Ski position
Standard style

Up/Push position

v. FREQUENTLY ASKED QUESTIONS

WHO CAN USE THE BI-UNIQUE?

Our experience is that nearly everybody can safely use the Bi-Unique provided that they or their ski buddy have the training, skills, physical strength and coordination to get it up and down the ski slope safely.

CAN I SKI INDEPENDENTLY?

The Bi-Unique can be skied independently by anyone with the upper body strength and coordination to utilize outriggers, that is, most paraplegic, amputees, and some low level quadriplegics. We recommend taking a certification course, and demonstrating the ability to maneuver and control the ski safely. We always recommend skiing with a buddy, no matter how expert you are.

WHO ELSE CAN USE THE BI-UNIQUE?

For those individuals that do not have the strength and coordination to ski independently a tether strap is attached to the ski, which allows the instructor/ski buddy to control the ski. A partial list of disabilities that may benefit from this ski are: multiple sclerosis, muscular dystrophy, cerebral palsy, spinal bifida, spinal cord injuries, neuromuscular diseases. These individuals can be safely transported on the lift, and ski down the slopes with the assistance of their instructor.

WHERE CAN I SKI THE BI-UNIQUE?

Your Bi-Unique was designed to be skied on the groomed beginner and intermediate slopes. We will not warranty machines used on advanced slopes, mogul fields and/or snowboard parks. The ski is designed to be chairlift compatible with the majority of chair lifts around the world. An optional kit allows for use at ski areas with T-bar lifts.

PLEASE NOTE: Facilities and disabled skiers guidelines vary at different ski areas and countries. We have adapted most of our designs to be compatible with existing technologies. It is your responsibility to find out the specific requirements of the area that you intend to ski.

WHAT SKI SHOULD I USE ON THE BI-UNIQUE?

For ski programs we recommend the specially designed **Mega II** skis. They are the most versatile and maneuverable. With the emergence of the shaped/carving skis, many independent skiers can utilize these skis to their advantage. We offer either style. It takes less than a minute to switch from one ski to another. All kids and many junior Bi-Unique skis come with short shaped skis.

PLEASE NOTE: The original Version I Blue skis are no longer in production. Many ski programs comment on the ski ability and ease of turning for beginners that these skis afforded them. We are looking at combining the best characteristics of each ski into the next generation.

WHAT OPTIONAL ACCESSORIES ARE AVAILABLE?

Ski programs have asked for most of these items to assist them with their wide range of clients.

1. **Tether Kit:**
   Consist of 2 carabineers and a 23 feet x 1-inch flat nylon webbing strap. Clip each carabineer onto the left and right tether anchors to partially control the student's moves as well as keeping them from running away.

2. **Fixed outriggers:**
   Like training wheels on a bicycle. The original version is detachable from the bi-ski with the ability to adjust the height for the skier's abilities. The new version allows for independent adjustments of the left and right sides.

3. **T-Handle:**
   Several styles available depending on your need. Quickly detachable, it provides skiers something with which to hold on. Some children use it in place of outriggers.

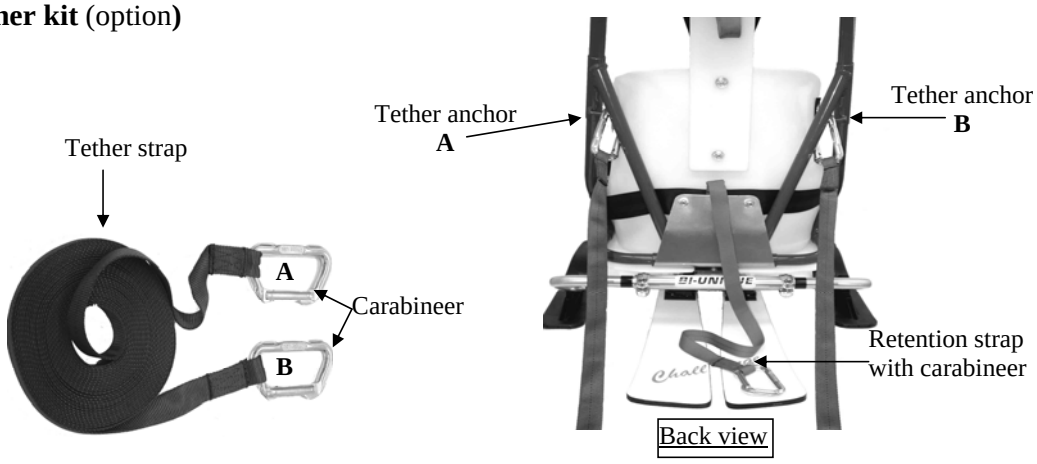
4. **High or Lo Roll Bar:**
   Independent skiers favor the low roll bar. Everyone else appreciates the high roll bar/handle because they can control the ski from a more upright position, minimizing back pain.

5. **Shoulder harness:**
   Provides upper body support and assists in pulling the skier back into the upright position after leaning forward.

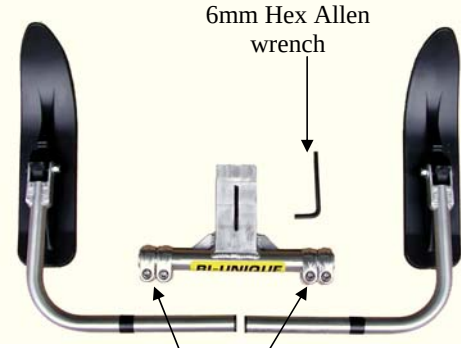
6. **Head/Neck brace:**
   Provides additional support for the head and neck by gently yet solidly holding them in place.

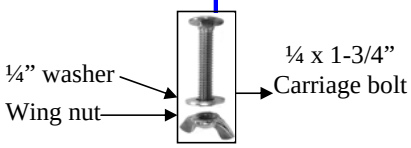
7. **T-Bar Lift kit:**
   Allow you to get up the slopes that utilize the T-bar lift systems prevalent in Europe. Consists of two quick release mechanisms mounted on the frame or Glove Seat that can be activated/released by you or your assistant when needed.

Tether kit (option**)**

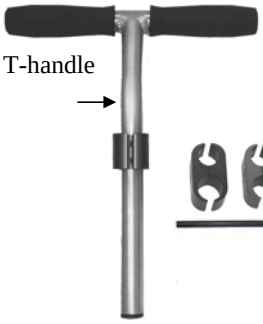


Fixed outriggers (option**)**

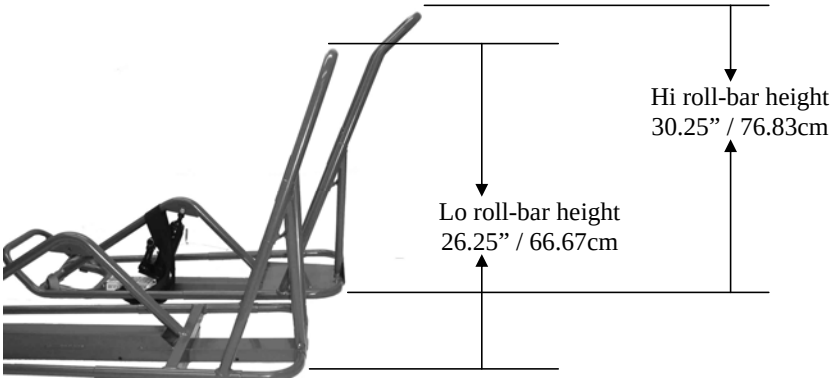




T-handle (option)



High or Low roll-bar (option)



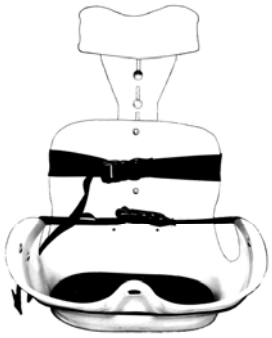
Shoulder harness (option)

X Shoulder Buckling Technique

Straight Buckling Technique

Back view shoulder strap attach

Head & Neck support (Option)



Front view

Side view

Back view

VI. GENERAL INSTRUCTIONS FOR USE

Safety is everyone's top concern. Safe equipment under the control of trained safety conscious users enhances the experience of all skiers, both able bodied and disabled.

1. General Inspection:
Check your machine for any frayed or cut webbing, leaking pump, loose or broken fasteners, cracked frame or skis. Check that skis articulate left and right by moving your chassis in both directions. Check that quick release pins are working and that the chassis slides smoothly fore and aft. Repair as needed before use. We highly recommend that you have repairs and servicing done by a trained technician or us if you do not have the skills to safely accomplish them.

2. Buckling up:
We recommend unlocking/opening all seat belts and retaining straps before getting into the unit. After transferring into the bi-ski,
1- Lean forward and position your pelvis as far to the rear of the seat as possible.
2-Straighten up and make sure your legs are evenly positioned. You may need assistance to do this.
3-Pull up the evacuation harness loop located between your thighs and feed the right end of the seat belt through this loop and then through the seat belt buckle.
4-Pull tight, wiggle to the rear of the seat and pull tight again. THIS IS THE MOST IMPORTANT PART OF BUCKLING UP! It prepares your evacuation system for instant use and properly positions you in your seat.
5-Buckle the foot, knee and thigh straps, then the chest and shoulder straps if you have them. REMEMBER THE SNUGGER YOU FIT IN YOUR SEAT AND ON THE BISKI, THE MORE CONTROL YOU WILL HAVE WHEN SKIING. Your Glove Seating System is the equivalent of a ski boot.

3. Preparing for the chairlift:
The Bi-Unique has two positions, "load" and "skiing". Get as close to the ski lift as possible in the "skiing position". That is, wait as long as possible before pumping the jack to the load position. When you are close to the chairlift, reach under your right knee and turn the pump valve forward, then pump the jack handle to the full up position. With your outriggers upright, push yourself toward the loading spot.

PLEASE NOTE: if your ski buddy is positioning/pushing you, have them lift up under the rear of the seat and then push forward to minimize putting undue strain on the frame.

4. Loading on the chair:
Bi-Unique users employ numerous techniques for loading depending on their skill levels, the rules of the ski area, and the specifics of the lift station. It is your responsibility to check out the requirements of the area you will be skiing. At the lift, inform the attendants of your needs. The lift attendants will slow down or stop the chair as necessary. It is not their job to physically assist you in getting on the chair. That is you and your ski buddy's job!!!

5. On the chairlift:
Once on the chair, the trip wire automatically pulls the pump valve lever to the rear making your ski ready for unloading. Unclip the carabineer and loop the strap around some part of the chair lift frame. You want to take as much slack out of the retention strap as possible. This keeps you from falling too far. Your retention strap protects you from falling off the chair should you lean too far forward or have sudden jolts be experienced on your ride up. Like seat belts on a car, your retention strap can only help you if you use it!!!

PLEASE NOTE: We recommend using the retention strap and carabineer provided. We recommend that you let your ski buddy buckle and release the retention strap.

6. Preparing to Unload:
Wait until you are as close as possible to the off-load ramp before:
1-Unbuckling the carabineer and releasing the retention strap.
2-Clip it back on the either the rear grabs handle or the carabineer loop provided.
3-Hold on to the chairlift. Raise the safety bar if needed.

PLEASE NOTE: This is perhaps the most dangerous part of the entire chairlift ride. After the retention strap is released **you** could fall off the chair!!! If you forget to unclip the retention strap, **you** could be dragged by the chair and dangled from the chair as it heads down the mountain.
PAY ATTENTION!

7. Unloading:
Push off the chair. Once off the chair, the chassis will smoothly settle down to the ski position. Ski away and enjoy. Again, we emphasize that you adjust your technique to your skill level and conditions of each chairlift. Some skiers unload with the lift at full speed, some at slower speed, and some request a stop.

8. Balancing your bi-ski:
Balancing your ski is the process of finding your optimal center of balance. Factors like your upper body mass, atrophied or amputated limbs affect the center of balance. Some programs have trained instructors that will balance you on the Bi-Unique before going on the slopes. We recommend that you first set up the bi-ski by centering the chassis and skiers in the top brackets of the ski mechanism. Once you are skiing the unit should smoothly respond to your movements. If the front or rear slides out you will need to shift your weight toward the end that is sliding out. After stopping, release the skewers and move the upper chassis toward the end that slid out. It may take several runs to find the correct spot.

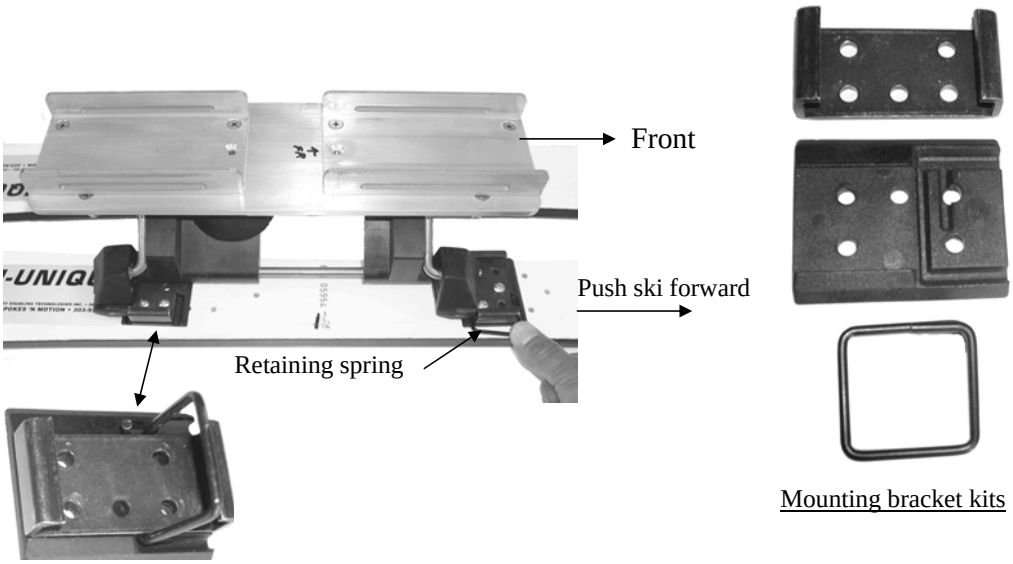
9. Fixed Outriggers:
Insert fixed outrigger assembly into rear mainframe rail, align holes, insert bolt and tighten wing nut. Use the 6 mm Allen wrench provided to adjust skis to the desired height. New individually adjustable fixed outriggers have 2 clamps per side. Adjust and tighten per your needs. We recommend that they be used in tethered training sessions. They may get in the way if you try to ski behind holding the handrail of the bi-ski.

10. Hydraulic Pump:
Flip valve handle forward. Grab pump handle and pump approximately 25-30 times or until ski doesn't move any higher. The jack has a release valve that only allows it to go up a prescribed distance. If the rear of the seat doesn't rise the full 19 inches, you probably have insufficient oil. The oil level should be to the height of the oil filler hole with the jack in the down position. Remove rubber plug, check oil level and add 5-weight hydraulic oil as needed to fill. Routine maintenance involves making sure there are no leaks and changing the oil at the end of the ski season if moisture is detected in oil. **We highly recommend storing your Bi-Unique upright**. Hanging from the ceiling or storing it upside down have been the main causes of pump oil leakage/ loss. These jacks were designed to be used in the upright position.

11. T-Handle:
Simply position T-handle in the desired location and tighten the clamp with the 3/16-inch Allen wrench provided.

12. Mounting and Changing Skis:
To Dismount: Pushdowns on the ski retaining spring and tap/push the ski forward. The ski is released.
To Mount: Line up ski brackets under and in front of front and rear feet. Press down on retaining spring and tap/slide the ski to rear until the retaining spring snaps in place. Skis are now locked in place. **We offer ski mounting bracket kits so that you can quickly change to different or spare skis.**

13. T-Bar Lift Loading and Release:
The basic process involves hooking the towrope into the quick-release hooks on both sides of your seat or frame. Push or get pushed to the loading area. Have your assistant/instructor or lift operator hook the T-bar on to your towrope. They will start the lift again and you are on your way. You are now being towed up the ski slope. If alone, use your outriggers for balance. As you near the top of the slope and approach the unload area, simply pull either release strap or the towrope will be released on one side. Gather your towrope, stow it and ski away. Should you require an assistant, the same process occurs with the exception that your instructor/assistant will hang on to the rear handle of the bi-ski and be towed up behind you. Upon reaching the unload area they will usually be the ones to activate the quick-release via an extended release strap.



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