Hogsback Kit

Presented by:

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and

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Hogsback Kit

The south side of Oregon's Mt Hood (11,235') is one of the most frequently climbed alpine routes in the world. The Hogsback is a geographic feature on the route at about 10,500' which serves as rest stop before the final summit push. Occasionally, climbers run afoul of gravity and luck and need to be rescued from the Hogsback area. Portland Mountain Rescue has developed the Hogsback Kit as a lightweight alternative to conventional two rope rescue systems for this long, low angle lowering operation. Recently, we've been experimenting with new rope technology to make our "kit" even lighter.

About the Presenters

Dave Clarke is a Captain with Gresham (Oregon) Fire and Emergency Services. He has served as the Technical Rescue Team Leader since 1995 where his duties include training Firefighters in high angle and confined space rescue. Dave also volunteers with Portland Mountain Rescue.

Rocky Henderson has been involved in mountain rescue since 1986.
He has served as a president of Portland Mountain Rescue as well as president of the Mountain Rescue Assoc.
I consider it an extreme privilege and honor to work with a team that has saved lives and given people a second chance.

Portland Mountain Rescue's
Hogsback Kit

The south side of Oregon's Mount Hood (11,239') is one of the most climbed alpine routes in the world. From a technical mountaineering perspective it is a simple, straightforward route well suited for beginning climbers. On a clear week end day in May or June hundreds of climbers will successfully summit and return home safely. Occasionally however, someone runs afoul of luck and gravity and needs to be rescued. Often, these people are at or near the "Hogsback", a ridge of snow at about 10,500' that serves as a rest stop on the way up and down.

Above the Hogsback is the technical crux of the route: the "Bergschrund", a large crevasse, and the "Pearly Gates" a steep, narrow ice and rock chute. When climbers get in trouble here they often get assisted down to the Hogsback area, either rapidly, by gravity or more slowly by their climbing partners. Over the years Portland Mountain Rescue (PMR) has performed numerous litter evacuations and body recoveries from this area. The majority of the time these rescues involve a low angle evacuation over snow. As a result, we have learned that carrying a heavy conventional two rope rescue system up the mountain is unnecessary.

PMR developed the Hogsback kit to provide a lightweight system that allows us to perform these long lowering evacuations quickly, and safely. We recognized that speed was important for these patients. Even under the best of circumstances our response time is four hours and can be much longer. By the time we reach them these patients are cold and eager to be evacuated. One key advantage of the Hogsback kit is the use of a single 600' rope. This allows long pitches and fewer anchor stations. A well trained team can bring a patient down at walking speed with only minimum down time for anchor changeovers. The end result is faster transport times to definitive care and happier rescuers since they don't have to carry unnecessary pounds of equipment up the hill.

Of course there are limitations to this kind of a system. Being lightweight, it has a lower strength rating compared with our standard high angle rescue system. Our training emphasizes this limitation and our teams are made aware of the potential to exceed our 10:1 safety factor by attempting terrain steeper than 45*. In the event of an unforeseen complication such as a crevasse extraction or a short pitch exceeding 45* the rope can be doubled and both ends can be used to provide a mainline and belay that are within the 10:1 safety factor.

What follows is the chapter of PMR's training manual that pertains to the Hogsback Kit. Other chapters refer to general safety and operational procedures so some of those considerations may appear to be missing from this handout. We encourage you and your teams to try this type of a system and let us know what you think. We can be reached at:

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18 PMR “Hogsback Kit”

Introduction

The PMR Hogsback Kit is an important tool for quickly evacuating patients off the low-angle South side of Mt. Hood. However, this kit has specific limitations that must be mastered in order to use it safely. It is designed for evacuations from slopes of maximum 45° angle.

If the Hogsback Kit is used in conditions outside the design specifications, safety factors may be diminished, resulting in a hazardous situation.

Topics

This chapter contains the following topics:

18.1 Theory and limitations

Background

Portland Mountain Rescue developed the "Hogsback Kit" in response to the relatively large number of low-angle patient evacuations performed from the Devils Kitchen down to the top of the Palmer ski lift.

Prior to the creation of the Hogsback Kit, rescuers would lug full-strength high-angle rescue gear to this area of the mountain to do relatively low-angle evacuations. This resulted in needlessly high safety factors and slowed down the rescue team's response time. PMR realized that this was actually a disservice to the patient who was usually very cold and eager to be evacuated from the field.

PMR determined that the forces could be recalculated for this specific type of rescue enabling lighter weight ropes and hardware to be used. The required 10:1 safety factor is still met while improving the speed and efficiency of the rescue operation.

Design Calculations

DANGER! The Hogsback kit was designed for low-angle evacuations using specific environmental criteria (outlined below). If the system is used outside the design parameters (such as on slopes greater than 45 degrees), or if other variables such as high-friction snow are encountered during a raise/traverse operation, then forces may exceed the required 10:1 safety factor. All general safety practices must be considered.

In calculating the requirements for the Hogsback kit, the following assumptions were made:

- Zero slope friction (similar to "boiler-plate" ice conditions)
- Maximum slope angle of 45°
- 10:1 Safety Factor requiring all equipment to support 5000 lbs
- Maximum of 500 lb load
- "Belay" normally consisting of four (4) litter attendants in contact with litter at all times

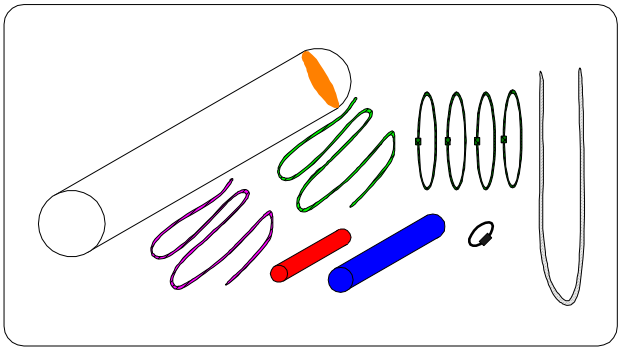
These assumptions are important to master! When operating the Hogsback kit within the specifications stated above, the system should have a 10:1 safety factor. If the kit is used on terrain or conditions outside of these specifications, the safety margin may be reduced to unacceptable levels!

18.2 Software and Hardware

The Hogsback Kit is designed with lightweight rescue equipment that is not suitable for vertical or high-angle rescue environments. All equipment was chosen based on its weight and adherence to the 10:1 safety factor given a 500 lbs load on low-angle terrain. For instance, large rescue carabiners were replaced with lightweight recreational locking carabiners; a smaller diameter rescue rope was employed; and spectra webolettes were used instead of 1” tubular webbing.

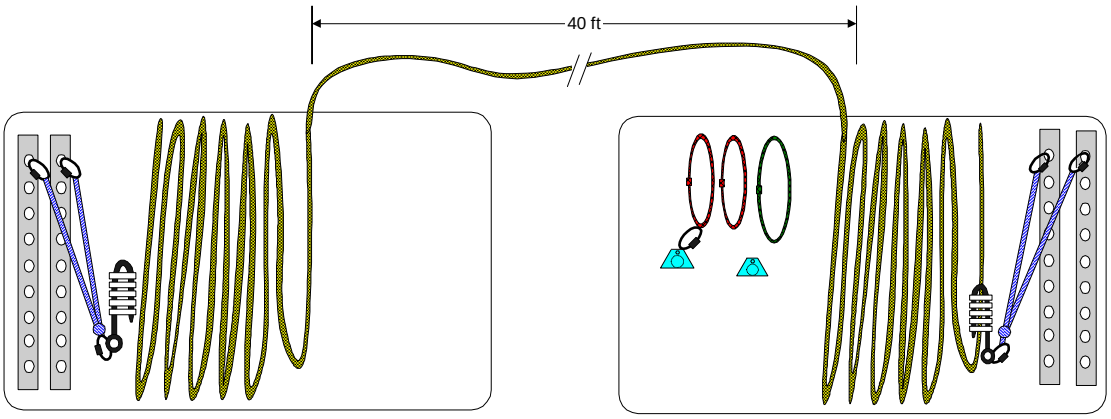
The Hogsback Kit is split between two Black Diamond rope carrying bags, so 300 feet of rescue rope and one lowering station can by carried in each rope bag, with each rope bag carried by separate rescuers.

Figure 18.1 shows the components of the Hogsback Kit.



SKED BAG:

- (1) SKED Litter
- (2) 40 ft, 9mm Tag-Line Ropes
- (4) T-Handle Prusiks
- (1) Large Locking 'Biner
- (1) Rope Litter Harness (white)
- (1) Rescue Bivy Sack
- (1) Foam Rubber Pad



ROPE BAG 2:

- (1) "Super Slacker" Rope Bag"
- (1) 280 ft of the 600ft (3/8") rope
- (2) Snow Pickets
- (3) Locking 'Biners
- (1) Web-o-let
- (1) Brake Rack

ROPE BAG 1:

- (1) "Super Slacker" Rope Bag"
- (1) 280 ft of the 600ft (3/8") rope
- (2) Snow Pickets
- (4) Locking 'Biners
- (1) Web-o-let
- (1) Brake Rack
- (2) Short Prusiks
- (1) Long Pruisk
- (2) Prusik Minding Pulleys (PMPs)

Figure 18.1. Hogsback Kit components.

18.3 Using the Hogsback Kit

The Hogsback Kit is designed to be used on terrain where a roped belay is not required and litter attendants can hold the rescue load on their own. This generally necessitates the use of at least 4 litter attendants to support and guide the litter. When used in this capacity, the full 600 ft of rope can be used to lower the patient before necessitating a switch to a new lowering system.

If low-angle terrain is encountered where a separate roped belay is required, the 600 ft rope can be doubled over, with one-half of the rope being used as the main line, and one-half of the rope used as the belay. This will result in slightly shorter than 300 ft pitches, as additional rope will be taken up between the belay and main line anchors.

The Hogsback Kit also contains recreational style Petzl Gemini pulleys for use in a raise system. The kit provides enough equipment to provide either a 2:1 or 3:1 mechanical advantage without a belay. It is thought that raise systems might be useful to pull a litter out of the Devils Kitchen and traverse over to the standard climbing route.

Required Skills

Use of the Hogsback Kit requires special training beyond PMR's standard high-angle rescue and rigging techniques. Skills that are required include:

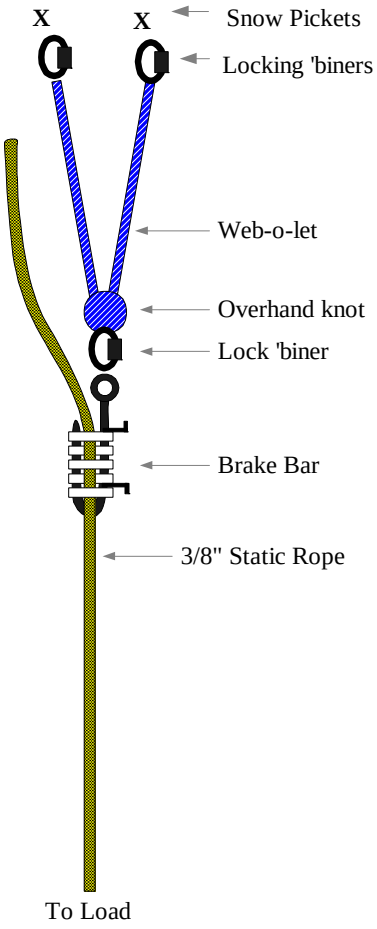
- Knowledge of the theory and limitations of the Hogsback Kit
- Skill in pacing off 300 and 600 ft pitches over varied, downhill terrain. (This is helpful in estimating where to place changeover/ lowering anchors for consecutive pitches.)

Figure 18.2 shows the basic configuration and use of the Hogsback Kit.

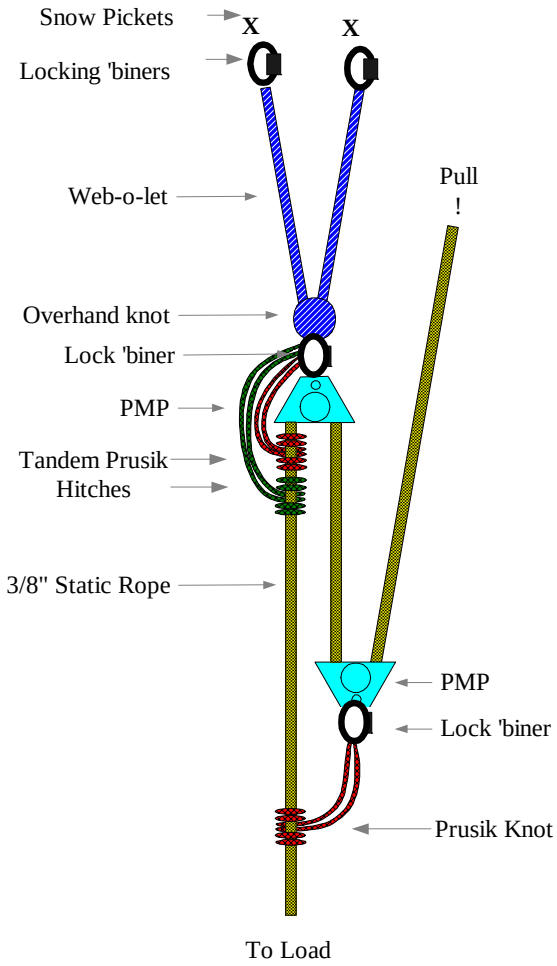
HOGS BACK LOWERING KIT

For slopes up to 45 degrees <u>only!</u>

Lowering System



Raising System



LOWERING NOTES:

- No LRH since slope angle should allow litter to be lifted for raise/lower change over.
- Thinner rope provides additional stretch/ load limiting characteristics.

RAISING NOTES:

- Two Prusiks on all rope capturing devices.
- For Hogs Back Rescue, should not need more than a 3:1 mechanical advantage.

Figure 18.2. Basic Hogsback Kit configuration and use.

18.4 Lowering Operations

Proper lowering technique:

- Rescuer is in comfortable position, able to watch and manage rescue load during lower.
- Gloves are used to protect fingers from being caught in brake bar, speed of lower is controlled by varying the spacing between brake bars.
- Easy access to radio communications is important, as it may not be possible to communicate over the 600 ft distance of the lower.
- Additional friction may be added using hyper-bars.
- The rescuer running the brake bar (or an assistant) should communicate rope left during the decent. This will allow the lower anchor station to better judge where the next anchor station must be established.

Figure 18.3. Typical lowering operation using hyperbar brake rack.

Proper belay technique:

- Attendant belay okay if there are sufficient belayers to ensure the rescue load will not move if main line is detached. This must be true for all of the terrain encountered during the lowering process.
- If attendants are acting as belayers (without anchors) they should be attached to the rescue load using the tag lines attached to their harnesses. This allows their hands to be freed of the rope for balance.
- If conditions are icy, or there are not enough belayers available, or if conditions otherwise dictate, a separate (roped) belay should be used. This can be accomplished by doubling the 600 rope, using 300 feet for the lowering main line, and 300 ft for the belay. The belay mechanism should be a standard tandem prusik belay.

Figure 18.4. Hogsback Kit belay practices.

18.5 Anchor Switchovers

The Hogsback Kit contains sufficient rigging material so that the subsequent anchor station may be setup during a lowering operation. An anchor team should take enough gear to build a full anchor station and pace off 300 feet, 600 feet, or the distance required by the given terrain to the next desired anchor station. The anchor should be in place and ready to use when the rescue load arrives.

To perform an anchor switchover:

1. Second Anchor Team sets/equalizes anchors.
2. Attendants position/stabilize litter by attaching it to second anchor or otherwise securely anchoring it.
3. Attendants instruct upper anchor station to release the load.
4. Main Line is removed from upper anchor station.
5. Main Line is threaded through lower anchor station hyperbar brake rack.
6. Rescuer running hyperbar brake rack starts next lowering pitch.

Figure 18.5. Hogsback Kit anchor switchover.

