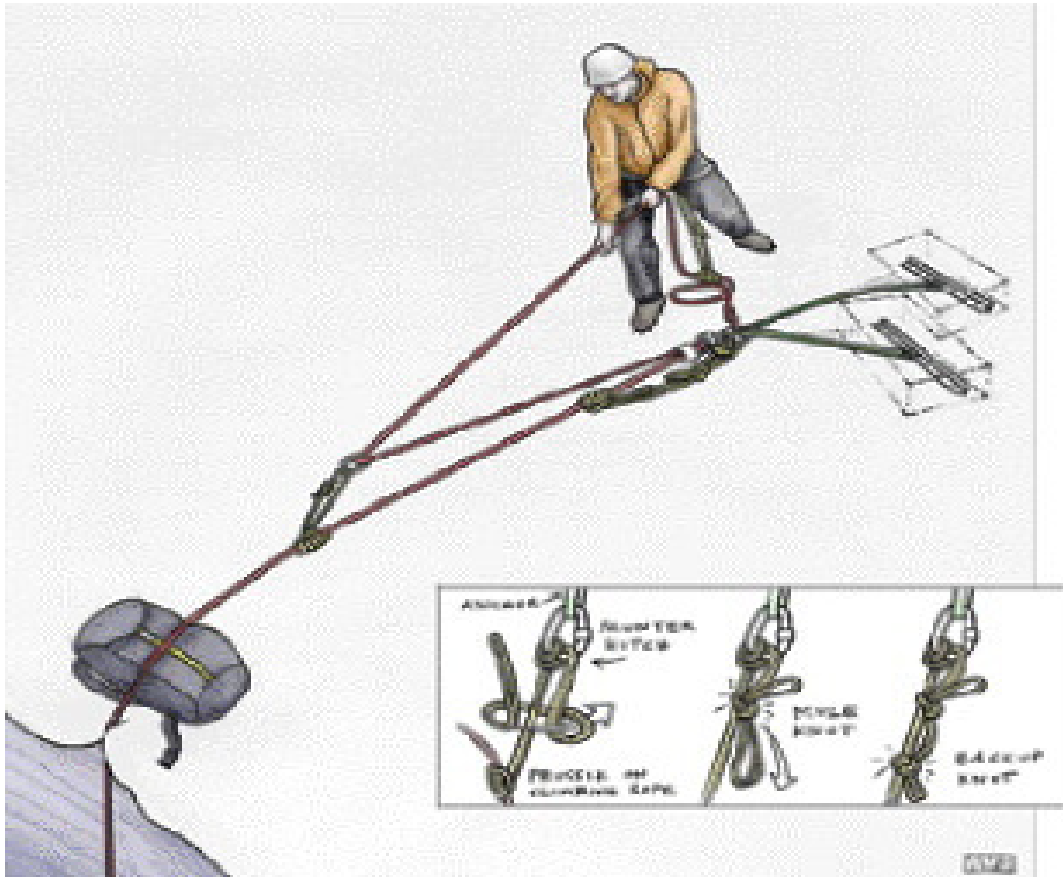


The Z pulley

Crevasse-rescue essentials every alpinist should know

By Jon Tierney



Moving quietly across the snow-covered glacier at dawn, your serenity is broken by a single shout. Your eyes widen as you watch your partner disappear in front of you -- swallowed by a collapsing snow bridge. As the rope jerks tight to your harness, you drop into self-arrest. A few heavy breaths later, it's silent once again. You hear nothing from your partner in the crevasse, but can feel his weight pulling against your harness.

What to do now? First, yell to your partner to form a plan. Is he injured? If not, he should be able to climb or prussik out on his own while you hold fast. Or, you can lower him to a snow bench or even the bottom of the crevasse if there's an easy walk or scramble out either side of the fissure. But if he's injured or not responding to your calls, or just stuck, you will have to haul him out on your own. A 3:1 pulley system, also called a "Z drag," is the quickest way to do this by yourself. (If you're traveling with a larger group, you can gang together like tug of war and man-haul him up without rigging pulleys.)

Here's what you do:

* **Build an anchor.** From the self-arrest position, build a solid anchor. This can be a picket, deadman or ice screw, or even an ice axe, pack or skis buried deadman-style, depending on the snowpack and what gear you're carrying. As you build the anchor, remember: the bigger the anchor and the deeper it is placed, the more likely it will hold. Keep the angle of pull as parallel to the surface as possible -- not upward -- by extending the clip-in points with a runner or cord and digging a *deep* trench for these slings in the direction of pull.

* **Transfer the load.** You should have a prussik hitched to your end of the rope and clipped your harness, tied before you even set foot on the glacier. With a solid anchor now established, unclip the prussik from your harness, and attach it to the main anchor point with a Munter Hitch tied off with a mule knot. Slowly transfer the load to the Munter, and back the main rope up with a Figure-8-on-a-bight.

Next, place another prussik on the free end of the rope and clip this to your harness. You are now free to move around on this end of the rope, but always keep yourself attached. With your increased mobility, double-check the anchor and consider backing it up.

Sliding the prussik along as you go for a self-belay, move to the edge of the crevasse to check on your partner (be careful not to kick snow blocks on him). If he is seriously hurt and needs immediate care, rappel the free end of the rope and administer the necessary aid. Before rappelling down, do two things: Attach a hands-free backup for your rappel to your harness (e.g. a prussik knot), and prepare the lip for your descent. Put something (a pack, axe or clothing) under the rap line near the lip to prevent it from burying itself into the snow edge.

* **Prepare the edge.** Before hauling your partner, compact the snow near the lip without knocking blocks down on your partner. Then place an ice axe, ski pole or pack under the rope near the edge to keep the rope from sawing into the snow as you haul.

* **Build the Z-pulley.** Attach a prussik, the "tractor," to your partner's rope near the lip. Clip the free end of your rope into this friction hitch with a carabiner and pulley. Now, walk back to the anchor and untie the Figure-8 backup knot (but keep the rope firmly in your hand), placing this part of the rope through a carabiner and pulley clipped to the anchor. (To prevent the top prussik from jumping through the carabiner or pulley as you haul, first run this loop of rope through a belay plate clipped to the carabiner.) You are now ready to haul on the free end of the rope, using the 3:1 Z system. Carabiners can be used in place of pulleys, but greatly increase the friction.

Using the prussik attached from you to the free end of the rope, start hauling, using your legs to dig in and pull. The best system is to pull as far as you can, reset the top prussik by sliding it tight on the victim's haul rope, reset your tractor prussik, and pull again.

As you raise your partner close to the top, clear snow away from the edge to make hauling him over the lip as easy as possible. If he gets snagged under the lip, you may need to reach over the edge and help pull him over.

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