



# CREVASSE RESCUE



## Step-by-Step Instructions



**The Mountaineers**  
**Seattle, WA**

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*This describes how a well-equipped rope team of three climbers performs a rescue of an endperson's fall into a crevasse. An endperson falling is the most likely scenario.*

## VICTIM YELLS "FALLING!"

### FIRST RESPONSE

#### 1. ROPE TEAM DROPS INTO SELF-ARREST POSITIONS

- Rope team shouts for help from other climbers in the area. Extra help quickens the rescue. These instructions assume no other help is available.
- Endperson and middleperson communicate about what happened and next few steps.

### INITIAL ANCHOR INSTALLATION

#### 2. MIDDLEPERSON ACCEPTS ALL OF THE VICTIM'S WEIGHT

- Middleperson adjusts to safest and most comfortable arrest position.
- Endperson gradually releases self-arrest, transferring victim's load to middleperson and maintains readiness to drop back into self-arrest. Holding the victim's weight usually is not difficult for the middleperson due to rope entrenchment into the side of the crevasse.
- Endperson slides harness prusik (from Texas prusik system) to self-belay while carefully approaching middleperson. Endperson also probes route for crevasses with ice axe and is ready to self-arrest, should middleperson need help.

#### 3. ENDPERSON INSTALLS INITIAL ANCHOR

- Endperson selects a spot for the initial anchor in well-consolidated snow next to the rope, about 6-9 feet on the victim's side of middleperson, conditions permitting.
- Endperson drives a picket or ice axe vertically into the snow, angled back at least 20 degrees away from the victim. Pickets are preferred, since ice axes may be needed for rescuers' safety.
- Endperson clips a single runner into the picket with a locking carabiner. If an ice axe is used, the runner can be girth-hitched to the axe. A carabiner is clipped to this runner.
- Endperson attaches a tie-off (hero) loop to the rope with a prusik knot, then clips tie-off loop to the carabiner on runner from picket or ice axe, keeping the gate up and away from the tie-off loop.
- Endperson slides prusik knot down rope towards victim to remove slack in the tie-off loop and runner. Initial anchor is now ready to accept victim's weight (Figure 1).

#### 4. MIDDLEPERSON TRANSFERS VICTIM'S WEIGHT TO INITIAL ANCHOR

- Middleperson carefully eases out of self-arrest position, transferring the victim's weight to the initial anchor.
- While middleperson gets up, endperson guards initial anchor by standing on the head of the picket or ice axe. The initial anchor alone is safeguarding three people until the main anchor is constructed. If the initial anchor begins to fail, the endperson shouts alarm and both rescuers drop into self-arrest. The initial anchor is guarded by the middle or endperson throughout the entire rescue.

#### 5. ENDPERSON BACKS UP PRUSIK KNOT IN INITIAL ANCHOR

- As soon as middleperson creates slack in the rope above the initial anchor, and while constantly guarding the initial anchor, the endperson ties a figure-8 loop in the rope above the prusik knot. The figure-8 can not pass through the prusik knot, providing a temporary back-up (Figure 2).
- Endperson attaches a rescue pulley and carabiner to the rope between the prusik knot and the figure-8 loop, just tied.
- Endperson clips the rescue pulley carabiner, with gate up and away from connection point, to the other carabiner connecting the tie-off loop and runner in the initial anchor.
- Endperson clips loop in figure-8 knot to the rescue pulley carabiner for a secure back-up (Figure 3).

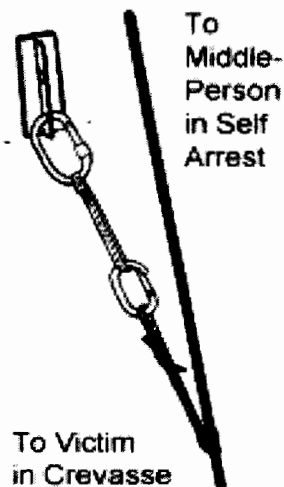


Figure 1

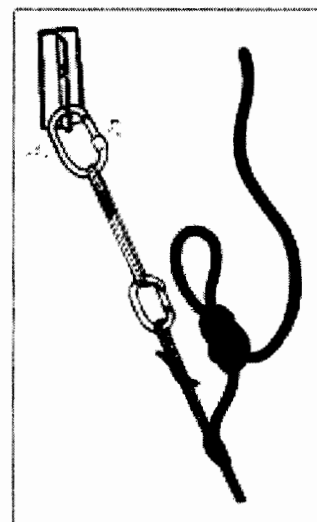


Figure 2

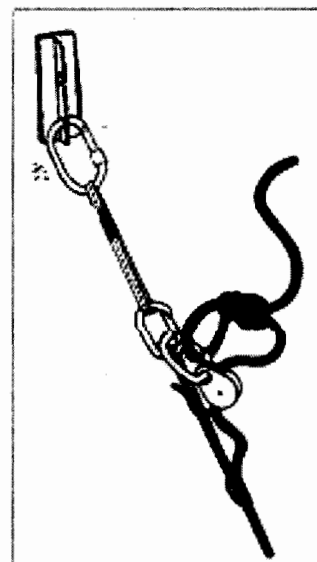


Figure 3

## MAIN ANCHOR CONSTRUCTION

*The main anchor must be strong enough to hold the full weight of the victim for long periods of time, with absolute confidence that it will not fail.*

### 6. RESCUERS DETERMINE TYPE AND LOCATION OF MAIN ANCHOR

- A. In well consolidated snow, the best anchor is a climber's "deadman" made with a picket or other large, solid object buried as deep as possible. On ice, the best anchor is at least two, well-placed, ice screws. The following steps describe making a deadman anchor.
- B. Endperson clips a carabiner, with gate up and away from connection point, to both the tie-off loop and the rescue pulley carabiner in the initial anchor. To this newly attached carabiner, the endperson clips a double runner and stretches it out across the surface of the snow toward the spot where the main anchor will be located (Figure 4).
- C. Middleperson determines exact location for main anchor, which should be behind and directly in line with the initial anchor.

### 7. MIDDLEPERSON BURIES "DEADMAN" AND COMPLETES MAIN ANCHOR

- A. Middleperson digs a deep pit in compacted snow at right angles to the rope, then digs a right angle slot in the middle of the pit leading from the pit towards the initial anchor.
- B. Middleperson attaches a runner to a deadman using a girth hitch and/or carabiner and clips a carabiner to the runner.
- C. Middleperson buries deadman in pit, using stomped snow, and extends runner through right angle slot so carabiner attached to runner protrudes above the surface of the snow.
- D. Middleperson clips carabiner from deadman runner to the runner from tie-off loop and rescue pulley that extends from the initial anchor. Both runners must be stretched as tight as possible. Retie water knots on runners to tighten runners.
- E. Review anchor connections to ensure that BOTH the main anchor runner and the initial anchor runner are clipped to BOTH the tie-off prusik and the rescue pulley carabiner. Make sure that all carabiner gates are up and away from the connection point. Main anchor is now complete (Figure 5).

### 8. MIDDLEPERSON ATTACHES SELF TO MAIN ANCHOR

- A. Middleperson girth hitches a double runner to one strand of the main anchor runner, then clips the other end of double runner to seat harness locking carabiner.
- B. Middleperson unties from climbing rope, freeing the rope for use in rescue hauling.
- C. Endperson remains tied into climbing rope throughout rescue.

## PERFORM RESCUE

*There are three rescue methods: Indirect Pull, Single Pulley, and Z-Pulley. The endperson decides which one to use after reaching the crevasse lip and assessing the situation.*

### 9. ENDPERSON APPROACHES CREVASSE LIP

- A. Rescuers pool gear so that endperson has a rescue pulley, tie-off loop, carabiners, runners, and ice axe to take to the crevasse lip. With these, all three rescue methods can be implemented.
- B. Endperson pulls slack created when middleperson untied from rope, through harness prusik then cautiously approaches crevasse lip, sliding harness prusik along rope as self-belay. If enough rope is available, the middleperson can belay the endperson to the crevasse lip.
- C. Endperson tries to establish voice contact with victim in crevasse to provide reassurance and to gain information about the victim's condition.

### 10. ENDPERSON SELECTS RESCUE METHOD TO EMPLOY -- Endperson evaluates both the victim's condition and the condition of the crevasse lip to reach this decision.

- A. If the victim is able to contribute to the rescue and has one good hand, or the rope is badly entrenched into the crevasse lip and there is enough extra rope to lower a bight, use the Single Pulley Method.
- B. If the victim is unresponsive or unable to assist, or the rope will not entrench, use the Z-Pulley.
- C. If many rescuers are available and the rope will not entrench, use the quick Indirect Pull.

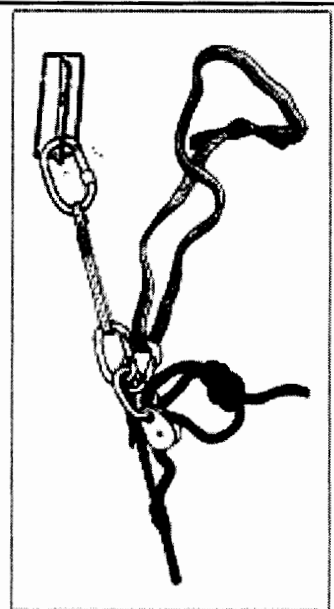


Figure 4

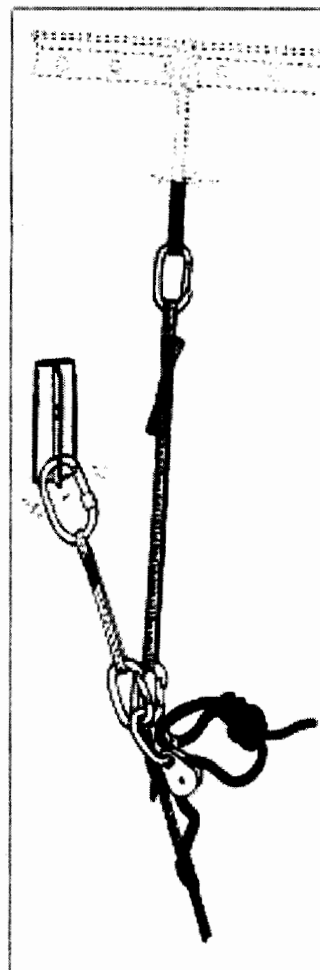


Figure 5

### 11. ENDPERSON PADS CREVASSE LIP WITH ICE AXE

- A. Endperson places ice axe directly beneath the rope to the victim at right angle to rope and as close as safely possible to the crevasse lip.
- B. Endperson makes certain that the head of the ice axe is on the downhill side, with the pick implanted, so that neither the rope to the victim nor another rescue rope will slide off the axe during hauling.
- C. Endperson anchors ice axe to prevent it from falling into crevasse.

### 12. ENDPERSON PREPARES HAULING SYSTEM FOR SELECTED RESCUE METHOD

- A. If Single Pulley method is used, endperson takes a bight of rope in the slack beyond harness prusik, attaches a rescue pulley and carabiner to this bight of rope, then lowers the rescue pulley and carabiner over the padded crevasse lip to victim. Victim clips the lowered rescue pulley and carabiner to seat harness or loop formed by Figure-8 tie-in knot.
- B. If Z-Pulley is used, endperson attaches tie-off loop with a prusik knot to the victim's rope near crevasse lip. Endperson then takes a bight of rope in the slack beyond the harness prusik and attaches a rescue pulley and carabiner to this bight of rope. Endperson clips carabiner with rescue pulley to the tie-off loop.
- C. Endperson returns to position near middleperson, sliding harness prusik as a self-belay. Once back to the anchor area, endperson ties in with a runner to the main anchor.
- D. If Indirect Pull is used, no additional preparation is necessary.

### 13. TOGETHER, ENDPERSON AND MIDDLEPERSON HAUL VICTIM FROM CREVASSE

- A. If Single Pulley method is used, the figure-8 loop at the initial anchor remains in place while rescuers haul. A piggy back system can be used for more pulling power if necessary.
- B. If Z-Pulley is used, middleperson unclips the figure-8 loop from the rescue pulley carabiner in the initial anchor and then unties this knot. Both rescuers haul on end of rope. Note that the prusik knot in tie-off loop at initial anchor is self-tending. The other tie-off loop that the endperson attached to the victim's rope near the crevasse lip (the working prusik), will be pulled closer to the rescuers as they haul. When this working prusik approaches the initial anchor, both rescuers gradually relax their hold on the rope so the self-tending prusik in the initial anchor holds the victim's weight. (The working prusik must not get too close to the initial anchor or the Z may suddenly collapse, causing all loss of mechanical advantage and necessitating resetting the Z-Pulley.) While the self-tending prusik is holding the victim's weight, the endperson slides the working prusik knot along the rope (while self-belaying), resetting it close to the crevasse lip. Endperson returns to a position near the middleperson and together they resume hauling until the victim is carefully extracted from the crevasse.
- C. If Indirect Pull is used, several rescuers haul on end of rope until victim is rescued from crevasse. This method offers no mechanical advantage, but is a quick and easy option if many rescuers are available.

## NOTES

### RESCUERS

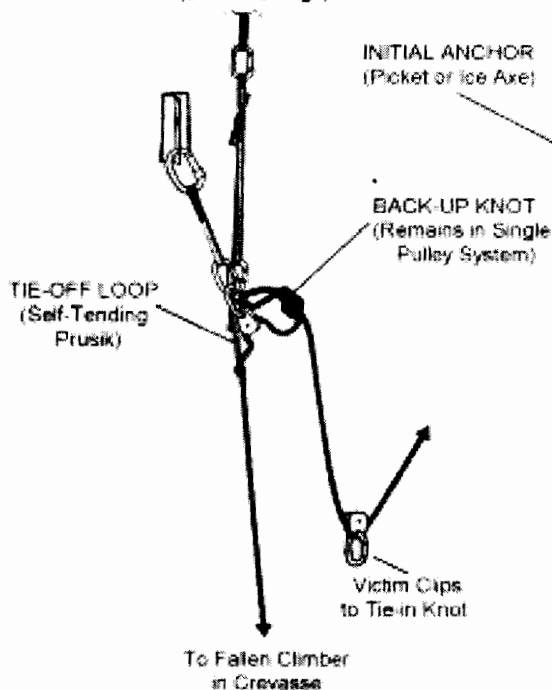
- A. Frequently a combination of methods can be used. For instance, the victim can climb or prusik most of the way out of the crevasse, then a Single Pulley can be used to get the victim over the crevasse lip, often the crux of the rescue.
- B. When hauling, rescuers can use extra prusiks as handles on the rope.
- C. With any mechanical advantage system, be especially careful as the victim approaches the lip of the crevasse during hauling. Previously the victim has been hauled straight up, but near the crevasse lip the force of the pull tends to pull the victim in, towards the crevasse wall, potentially causing serious injuries to the victim. Fatalities have occurred from overzealous hauling.

### VICTIM

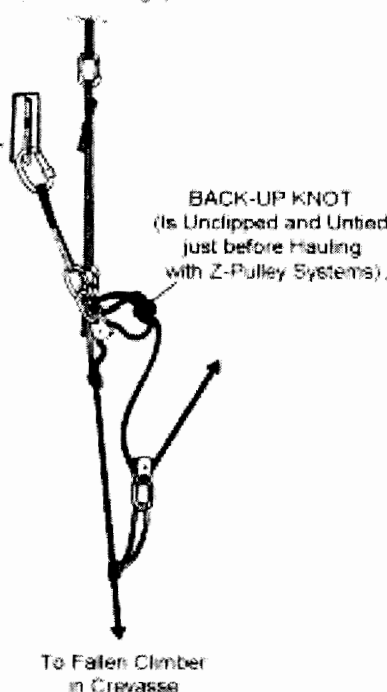
- A. During the accident, remember to yell "falling!" Spread-eagle your body to try to slow or stop your fall.
- B. Hang onto your ice axe during the fall.
- C. When you stop falling, check your climbing rope tie-in, then clip the climbing rope temporarily into the carabiner on your chest harness. The chest harness will need to be unclipped when you reach the lip of the crevasse.
- D. Tie your ice axe off out of the way.
- E. Remove your pack and clip it to the rope below your prusiks.
- F. Climb or prusik all or part way out if you are able. If climbing the side of the crevasse, remember to slide your prusiks up as you go (self-belay).
- G. If you are unable to prusik or climb, dress warmly and use your parka hood to keep falling snow out of your clothing.
- H. Do not waste energy yelling. Your rope partners are working on rescuing you safely.

## CREVASSE RESCUE

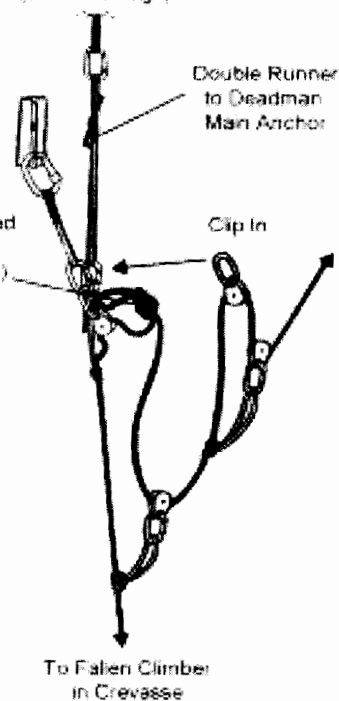
**SINGLE PULLEY SYSTEM**  
(2:1 Advantage)



**Z-PULLEY SYSTEM**  
(3:1 Advantage)



**Z X Z PULLY SYSTEM**  
(9:1 Advantage)

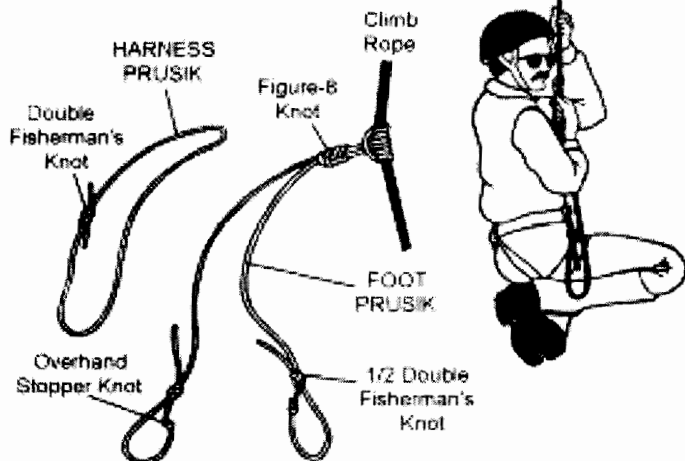


## TEXAS PRUSIK

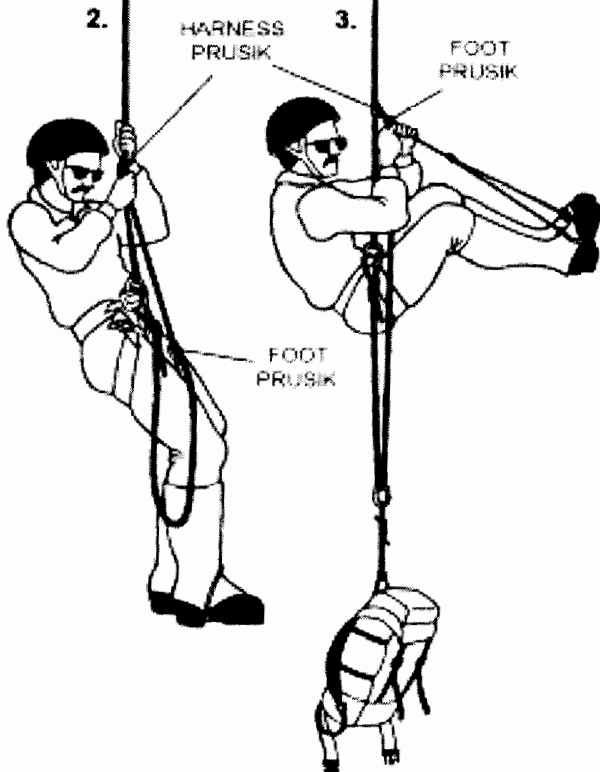
1.

### One complete cycle illustrated

- Ascend the Texas Prusik system using leg muscles. Bring both feet underneath buttocks, then stand.
- Stand tall, sliding Harness Prusik up AS YOU RISE. Keep one hand on the climbing rope ABOVE the Harness Prusik as you rise.
- Resting on the Harness Prusik, slide Foot Prusik as high as possible. It's easier than it looks! Resume position in Step 1 and repeat cycle.



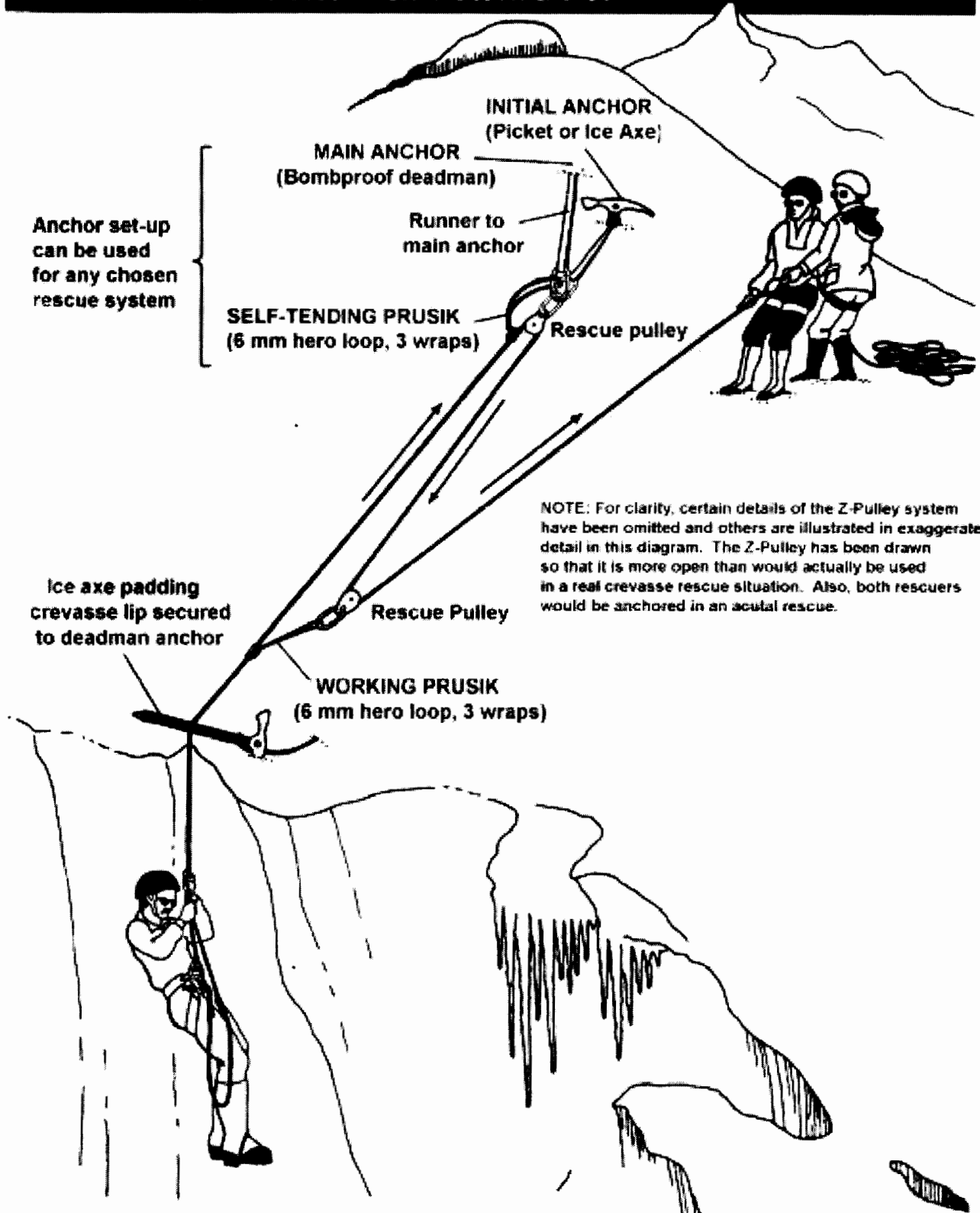
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3.

FOOT PRUSIK

# Z-PULLEY CREVASS RESCUE



1992 handout by Loren Foss and Ross Prather, with input from Dave Anthony, Dan Bean, Glenn Eades, Alan Freese, Marcia Hanson, Sam LeBarron, Dave LeBlanc, Bob Shafer, Ken Small, and Erhart Wichert. Updated 1995 by Zac & Becky Segal, 1996 by Lowell Anderson