7

RAPPELLING

INTRODUCTION

Rappelling (rapping) is a technique for descending a rope using friction to control the rate of speed. It can be used as an alternative to walking around or down-climbing. In some cases, such as on free-standing pinnacles, it will be the only choice. The basic idea is to install a device on the rope and connect it to your harness, then step over the side, letting the rope take your weight and controlling the amount of friction, and thus your rate of descent, with one of your hands, called the "brake hand."

There are a number of safety measures you should take when rappelling. Rappelling is instantly unforgiving when you make a mistake. Memorize these safety precautions and take them every time—whether you think you need them or not.

CAUTIONS ABOUT RAPPELLING

- **Tie a knot in the end of the rope before throwing it down for the rappel if you cannot see or verify that the end touches the ground.** Rapping off the end of the rope is extremely dangerous, and only happens when you don't expect it. Don't get cocky—it's happened to experienced and novice climbers alike.
- **Tie in to the rappel anchor** with a personal anchor before setting up the rappel.
- **Always check four things before you rappel:** your harness is doubled back, the locker holding your rappel device is locked, the rappel setup is correct, and the rappel anchor is good.
- **ALWAYS, ALWAYS, ALWAYS test your rappel setup by weighting it before unclipping your personal anchor and trusting your full weight to the system.** This will double-check that you have set up the rappel correctly.
- **Always carry your prusiks on rappel,** preferably on the side opposite your brake hand.
- **Tie back hair, tuck in clothing, and be careful of long beards.** Move gear from your brake side to the other side of your harness while rappelling. It is easy to get dangling objects jammed in the rappel device.
- **Place the rope over the most rounded edges available on the rock on your way down.** You may encounter several edges along the way as you rappel, so keep your eyes open. Placing the rope on a sharp edge with weight applied is the worst thing you can do to a rope.
- **If you are carrying a heavy pack, hang the pack** from the back of your harness to prevent it from making you top-heavy and pulling you over backwards. Or, hang it directly from the rappel biner so that you don't feel the weight.
- **Take the rappel device off the rope as soon as possible.** Rappelling imparts a lot of heat to the rope, which is nylon.
- **Control your rate of descent.** Going too quickly heats the rope and device, and it is possible to rap off the end.

- **Buy a "static" rope if you rappel often.** A "static" rope is better suited to rappelling than is a climbing rope. It has almost no stretch.

CAUTIONS ABOUT SPECIFIC RAPPEL DEVICES

- **Figure-8 descending ring.** When rappelling using a figure-8, ensure that the rappel rope around the "waist" (or mid-section) of the figure-8 is on top of the figure-8, not underneath. If the rope is underneath, it can be caught on a ledge and cause the rope to girth hitch, locking you into place, which will require that you prusik up to reset the figure-8 (see Self-Rescue).
- **Figure-8 descending ring.** If you are a large person, over the "typical climber weight" of 176 pounds, consider using a Slot-type device. These provide more friction and stopping power than a figure-8.
- **Figure-8 descending ring.** The figure-8 leaves the rope mildly twisted after use.
- **Slot-type devices** (e.g., Black Diamond ATC, Trango Pyramid or Jaws, HB Sheriff, Blue Water AirBrake, Salewa Fangs, Sticht plate). It is possible to set up these devices incorrectly on a double rope rappel by pushing only one bight of rope into the device, allowing the other side of the rope to pull free. Climbers have been known to miss seeing this and it is believed to have caused at least one fatality in Arizona. Make sure you test the rappel setup before unclipping your personal anchor.
- **Slot-type devices with wire keeper cables.** The keeper cable can get sucked up into the rappel device while doing a double rope rappel, requiring a prusik self-rescue. The stiffer wire cables and the aluminum keepers shouldn't have a problem.

CAUTIONS ABOUT SPORT RAPPELLING

- Some people treat rappelling as a sport, or try to imitate military/police rappelling (facing downhill, fast, etc.). The rappelling we will teach in the AMC Basic School is not sport rappelling. There are major differences between the two types of rappelling. In the climbing world, we rappel gently and cautiously. Please do not rappel swiftly or use a jumping, bounding technique on the AMC ropes. The following are some differences between sport rappelling and the rappelling you will do in class.
- Sport rappelling usually involves fast descents, causing a lot of heat buildup in the friction device. Heat can melt nylon rope. Fast rappels damage ropes worse than slow rappels.
- Sport rappelling often involves bounding and jumping. This stresses the rope and causes damage to the fibers, especially when done over a long period of time. Climbing ropes are designed to take a low number of "lead" falls before they are retired to top-rope status; the bounding, jumping motion of sport rappelling hastens this process. If you want to sport rappel, use your own rope (don't climb on it) and use it for sport rappelling only. Please don't use our Club ropes.
- Sport rappelling's bounding and jumping shock-loads and stresses the anchors much more than regular rappelling. While we set "bombproof," backed-up anchors that we believe cannot fail, we do not want to continually stress-test our anchor components. We want the trees, rocks and bolts to be there for the next class and future generations of climbers. Again, if you want to sport rappel, choose a location where you are not hastening the demise of climbing anchors.
- Bounding can grind the rope over the edge, increasing the risk of cutting it under tension.
- Bounding can knock off holds on the climb, causing rockfall.

PREPARING TO SET UP A RAPPEL

Let us assume for now that there is a rope tied to a good strong anchor. We do not teach anchor setting in the Basic Climbing School, but you should at least exercise good judgment in looking at the anchor (grass is bad, trees are good) and satisfying for yourself that the anchor is good. For this discussion, assume that the anchor is already set.

Tie yourself in prior to rigging the rappel using a "personal anchor." Your personal anchor can be a sling or prusik clipped in to a locked harness biner. The other end should be clipped to the rappel anchor with a locked locking biner. The personal anchor should not be part of the rappel setup, as you will be removing it prior to rappelling.

Verify that the rope reaches the ground. Do this in one of two ways: sight-verify, or ask someone who is already down. IF you cannot verify that the rope reaches the ground, tie a knot in the end of the rope before throwing it down to prevent you from rappelling off the end of the rope.

Do not unclip your personal anchor from the rappel anchor until you have double-checked your setup (see "Preparing to Rappel" below) and load-tested the anchor. Only when you are sure you have load-tested the anchor can you safely remove the personal anchor.

SETTING UP A RAPPEL

There are many devices on the market designed for belaying/rappelling, and many ways to rig a rappel from non-rappel devices. We will teach you how to use slot-type devices, figure-8's and the Muenter hitch. This will give you a primary method and a backup technique, which you can set up with virtually no equipment (a harness, a biner and a rope) in case you drop or lose your rappel device.

As in the belay setup, the rappel setup can be made using a rappel locker on the belay loop or through the rope tie-in area. We recommend always using the belay loop, as this allows for adding a prusik or autoblock backup while on rappel.

The most commonly used rappel device is the slot-type device. It can be used for belaying and rappelling, and with either one or two ropes.

The Muenter hitch is a rope technique that allows rappelling using one carabiner; if you drop your rappel device, you can use the Muenter hitch to get out of a jam. Don't use it unless you need to, because it really twists the rope. It also has the advantage of being the same setup as the Muenter belay, so that you only need to know the one backup technique.

The figure-8 descending ring has been around for decades, has stood the test of time and is easy to use. It is a better pure rappel device than the slot-type device. Its belay setup is different from the rappel setup.

The following setups all describe a single rope rappel, but they will all work the same way with a double rope rappel. The only difference will be that the double rope will provide much more friction.

Slot-Type Device

Assume there is a single rope tied to a good strong anchor and that you will perform a right-handed rappel (fig 7-01).

1. Anchor yourself prior to rigging the rappel. Make sure the clip-in is close enough that you can reach it in order to unclip prior to starting the rappel.
2. Face the anchor, with the rappel rope on the side you wish to use for your brake hand (in this case, the right hand). Hold the slot-type device in your left hand.
3. Reach down and grab the rappel rope with your right hand. Make a bight and poke it through one of the slots on the small end of the slot-type device. Manufacturers of some slot-type devices state that you can insert the bight of rope through the large end to vary the amount of friction the device generates, but most are designed to be used through the small end. Inserting the bight in the brake-side slot will give a smoother rappel.
4. Clip the bight of rope and the keeper cable into the rappel biner on the belay loop and lock the gate.
5. The large end of the rappel biner should be away from your body and the spine should be on the brake side.
6. The rope on the right side of the slot-type device that hangs down the rappel pitch is the "brake" rope.

Muenter Hitch

Assume there is a single rope tied to a good strong anchor (fig 7-02). This setup is identical to the Muenter belay.

1. Anchor yourself prior to rigging the rappel.
2. Form a loop in the rope by folding upward.
3. Fold the loop upward toward the rope. This makes a loop in which one part has two strands and the other has one strand.
4. Clip a locker down through the loop and over the two strands. Clip the biner to the belay loop and lock the biner.
5. Make sure the large end of the biner faces away from your body.
6. Make sure the spine of the biner is on the same side as the brake rope so that the brake rope does not open the biner gate.
7. Weight the setup to make the hitch reverse away from you if necessary.

Figure-8 Descending Ring Setup (Figure-8)

Assume there is a single rope tied to a good strong anchor. This setup will allow either a right-handed or left-handed rappel (fig 7-03).

1. Anchor yourself prior to rigging the rappel.
2. Face the anchor, with the rappel rope on the side you wish to use for your brake hand (in this case, the right hand). Hold the figure-8 in your left hand with the large hole AWAY from you.
3. Reach down and grab the rappel rope with your right hand. Make a bight and poke it down through the big hole of the figure-8.
4. Pull the bight toward you, then up and over the small end. The rope will pass over the "waist" of the figure-8. The rope on the left side of the figure-8 goes up to the anchor. The rope on the right side of the figure-8 that hangs down the rappel pitch is the "brake" rope.
5. Clip the small hole of the figure-8 into a locker on the belay loop and lock the gate.
6. Make sure the large end of the biner faces away from your body.
7. Make sure the spine of the biner is on the same side as the brake rope so that the brake rope does not open the biner gate.

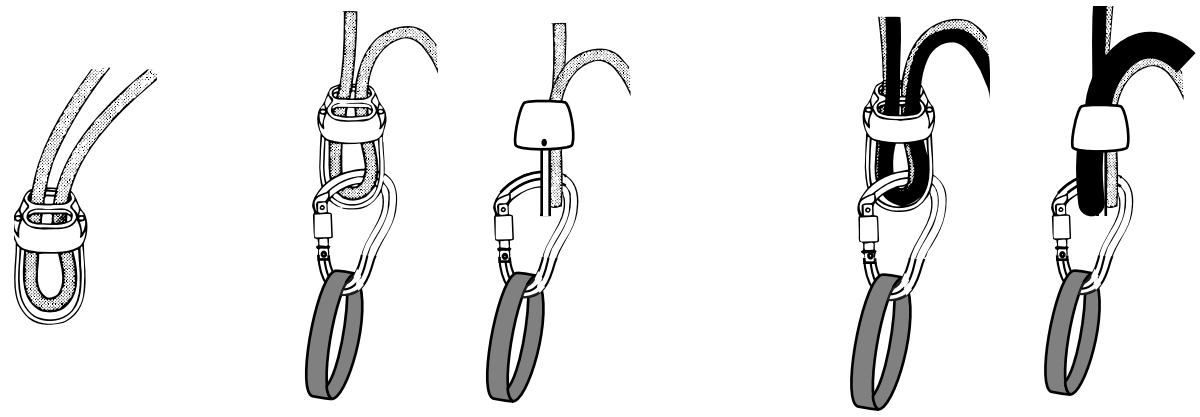


Fig 7-01a—Setting up the rappel on a slot-type device is identical to setting up the belay. Always use the belay loop for your rappel setup.

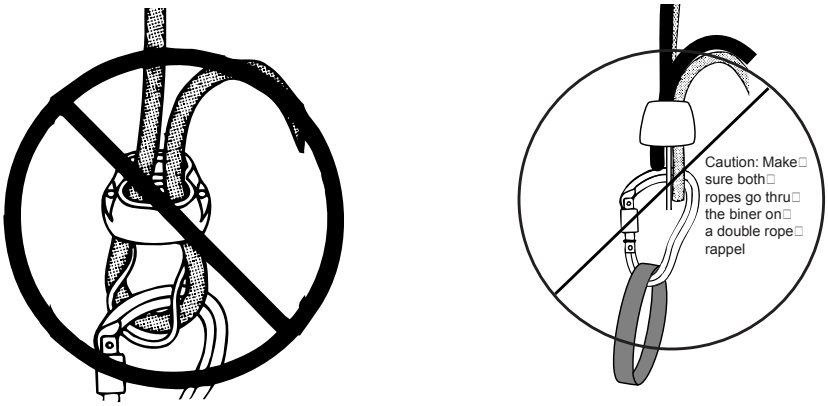


Fig 7-01b—Don't mangle the keeper cable (left). Make sure that both ropes are clipped into the rappel biner on a double rope rappel.

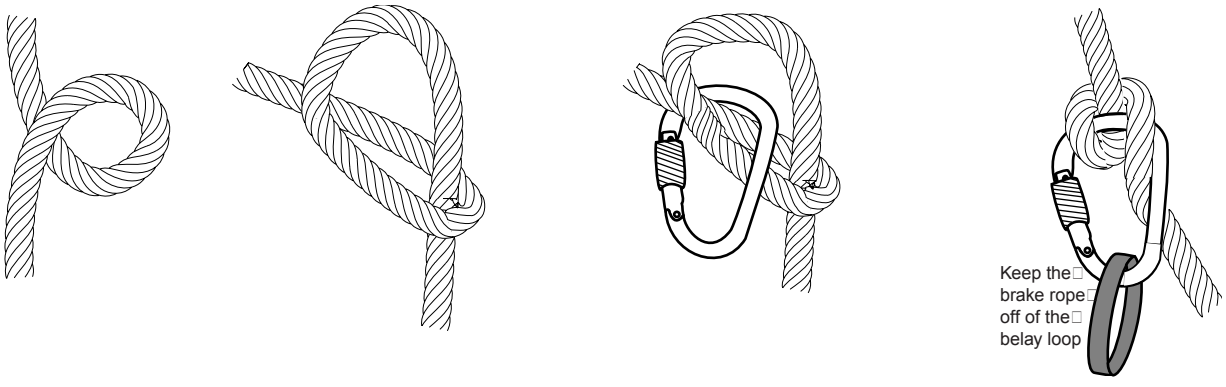


Fig 7-02—The Muenter hitch rappel is identical to the belay. The Muenter hitch kinks the rope during use. It can be used for a double rope rappel, but there is a lot of friction.

8. If you are doing a double rope rappel, and you are the last one down, clip a biner into one rope above your rappel device. Trailing this biner will keep the rope from twisting around itself and will allow you to pull the rope from below when finished (see below).

PREPARING TO RAPPEL

Make sure that you have your prusiks on your harness. Tuck in your shirt, jacket, hair, beard, or jewelry and move any gear you may have on the brake side of your harness to the non-brake side. If wearing gloves, put them on now.

1. Verify that the rope either reaches the ground or that you have tied a knot in the end of the rope(s).
2. Always check these four things before testing the setup:

- Is the anchor solid?
- Is your harness doubled-back?
- Is your harness locker locked (the one holding the rappel setup) and oriented correctly?
- Is your rappel setup correct?

3. *For slot-types:* Is the bight of rope properly through your rappel device and clipped in to your harness locker? If a double rope rappel, are both bights of rope properly through your rappel device and clipped in to your harness locker?
4. *For figure-8:* Is the figure-8 clipped into the harness locker? Is the rope on top of the "waist"?
5. *For the Muenter:* Does the hitch reverse itself properly through the harness locker?
6. Take the slack out of the load rope. Lean back gently to weight the system with your personal anchor in place, but so that the rappel setup takes the weight, not your personal anchor. Fully weight the system until you are sure the rappel setup is correct.
7. Remove your personal anchor.
8. Yell DOWN to people below you: "ON RAPPEL!" This amounts to "ROCK!" so make it loud. Let them get out of the way and then proceed. Check your rappel anchor and your setup one last time before going over the edge.

RAPPELLING TECHNIQUE

Descending

YOUR BRAKE HAND MUST NEVER LEAVE THE BRAKE ROPE.

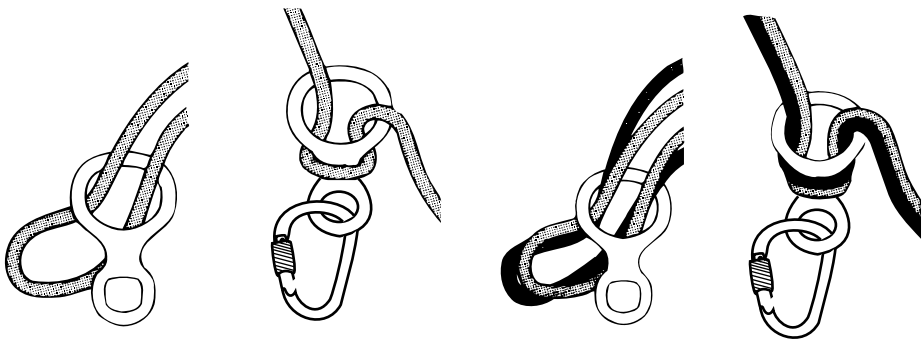
Let the brake rope slide slowly through your brake hand, but do not let it get out of control by going too fast. If you are heavy, there may be a fine line between keeping and losing control; hold the brake rope more tightly around your body (leg, butt) any time you want to stop or slow down. If you are very light, you may have to help push the rope through the rappel device; just keep control when doing so.

Keep your legs perpendicular to the rock, no matter what angle the rock is. When you walk on a sidewalk, your feet are flat and your legs align at right angles to the ground. Rappelling is the same way. The most stable position as you rappel is with your legs at a right angle to the rock. If you let your feet get too low, they slip out from under you and your face may hit the rock. As the angle of the rock steepens, you must raise your foot position with respect to your butt (fig 7-04).

Spread your feet about shoulder-width apart. If you feel as though you have to fight to keep from swinging one way or the other, don't fight it—go slowly in that direction. If you don't, and you get out of the "fall line" and then stumble or slip, you will probably pendulum into the rock. Allow yourself to gently slip down into the fall line.

Do not grab the load (anchor) rope above the rappel device with the non-brake hand, or guide hand. If you slip, you will probably bang your hand against the rock, causing bruises or abrasions. If you must touch the rope above the

Fig 7-03—Setting up the rappel on a figure-8 is different from setting up the belay. Always use the belay loop for your rappel setup. Shown are both single- and double-rope rappels



rappel device, rest your hand on the side of the rope closest to you, not in between the rope and rock.

Watch below you to see where you are going; don't walk blindly backwards. Watch above you to be sure that your rope is not lying on loose or sharp rock.

Your brake hand must not leave the brake rope until you reach the bottom of the rappel. Keep your hand at your hip, knuckles out, or tucked behind you if you need more friction. If you slip or pendulum, a natural tendency is to let go with both hands to protect yourself from a swing into the rock. Train that brake hand to stay put.

To control the braking, pull the rope across your right hip. If you need more friction along the way, pull the rope around your butt. If you pull it all the way around to the left side, you can brake with the other hand.

As you proceed down, don't bound, bounce or jerk around. You can pull rocks loose from above (onto your head), knock rocks onto your friends, stretch your climbing rope, cut the rope or fail the anchor.

As you descend, keep your shirt, hair or body parts from entering the rappel device. If the ends of the rope are stuck, free them before rappelling past that point. If you rappel below the ends, you may not be able to free the ends, and may end up stuck in mid-air.

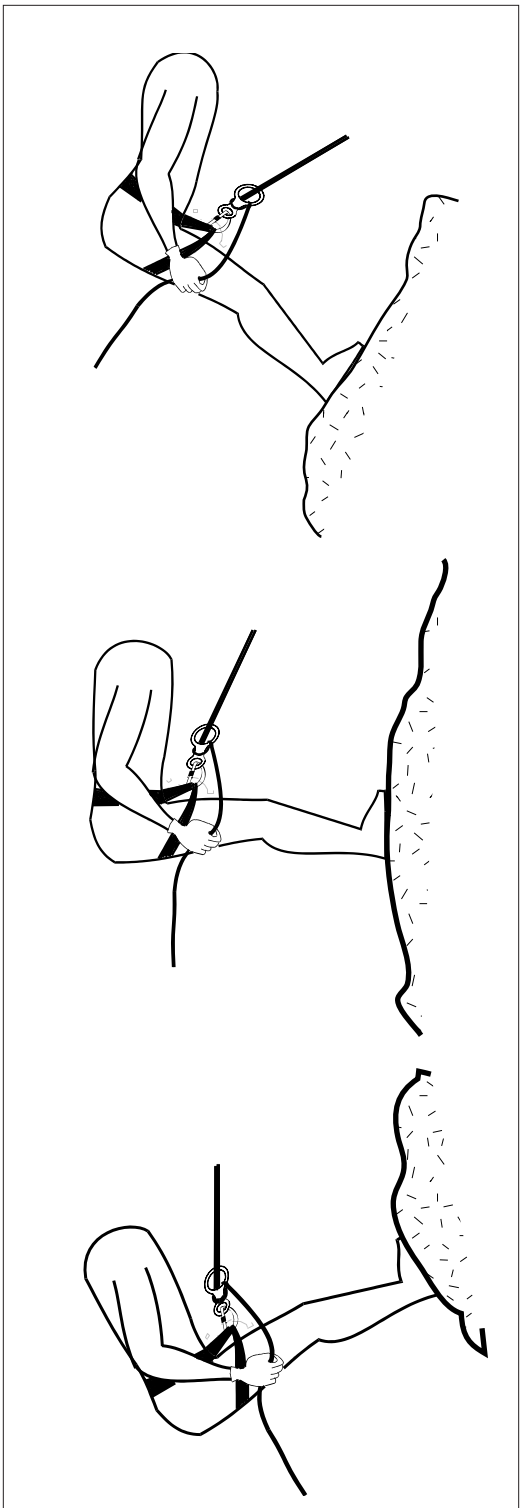


Fig 7-04—A key to efficient rappelling is to keep the legs perpendicular to the rock, no matter what the angle of the rock

Locking Off on Rappel

You may want to stop temporarily for a number of reasons. You may want to fix a snagged rope, pull a piece of pro, examine the rock or an animal, take care of an injury, or rearrange some gear that is bothering you. It will be easier if you can take some of the load off your brake hand.

- Wrap the rope around your butt and hold it with the other hand. On low-angle rappels, this provides enough friction without fear of letting go or needing a lot of strength.
- Wrap the rope around your leg a few times on less-than-vertical rock. It will allow you to do your business and then move on. However, some people find this painful.
- Have someone below give you a "bottom belay." He/she will pull the rope tight, which will be the same as you pulling tight with your brake hand, except that when it is done from below, the belayer can use both hands and is not in danger of falling. You cannot budge when someone below is belaying you.
- Add a 3' prusik as a safety backup (see discussion below about Rappelling With a Safety Backup). This is the most versatile technique and allows you to work hands-free.

Rappelling Past Overhangs

If you come to an overhang, take it easy. People have broken ankles by not keeping their feet up and consequently slamming into the rock.

1. Lower yourself until your feet are just above the lip of the overhang. Your butt should be almost horizontal with your feet. Stop and look at what is below the overhang (fig 7-04).
2. Slowly release a few inches at a time to lower your rear without moving your feet. Keep your feet at the lip (your butt will be below your feet). Keep releasing rope.
3. At a certain point, you will feel most of the weight come off of your feet. At that time, you can let your feet dangle in a sitting position and continue in a free-hanging rappel.

Finishing a Rappel

When you reach the bottom, stabilize yourself, squat, and pull three or four feet of slack through the rappel device. Remove your rappel device completely from the rope. Step well away from the base of the rock and yell upward "OFF RAPPEL!" This tells people above that they are free to rappel. Clear the area.

RETRIEVING THE ROPE

You must rappel on a double rope to be able to recover your rappel rope from below. This could be a single rope with both ends hanging down (80' rappel) or two ropes tied together (160' rappel). The last person down the rope must straighten out or untwist the ropes. This simplifies the process of pulling the ropes down. If you are using a slot-type device, it will automatically straighten the ropes. If you are using a figure-8, clip a "straightening" biner to the side of the rope you will be pulling on at the bottom. Hold onto the straightening biner as you rap down to remove the twists from the rope. When you reach the bottom, DON'T RELEASE THE STRAIGHTENING BINER. Detach the straightening biner and your rappel device from the ropes. Pull the rope that the straightening biner was clipped to.

On a double rope rappel with two ropes tied together, if the rope is being pulled from an anchor that is set back from the top edge, there may be too much friction for the rappellers to pull from below. The last person down must work the knot toward the edge so that it doesn't prevent the rope from being pulled. This can be tricky, but it means allowing one side of the rope to pull through the rappel device faster than the other until the knot is over the edge. Ask for a bottom belay until you have adjusted the rope properly.

RAPPELLING WITH A SAFETY BACKUP (AUTOBLOCK)

A safety backup can be added to the rappel in different ways. The safety backup will lock off the rappel and free both your hands. There are several reasons for doing this. You may be injured before you rappel, you may get injured while on rappel, you may need to handle windy conditions, you may need to free your hands for working with a stuck rope below or beside you, you may want to take pictures or work on some stuck pro. Some people always put on a safety backup before rappelling and some do so only when they feel it necessary. The usual safety backup is a prusik, installed in an autoblock or a prusik hitch (fig 7-05).

An "autoblock" is a prusik that is wrapped around the rope and whose ends are secured by a biner clipped into the leg loop. The key to an autoblock is to find the amount of friction that is right for your weight. If you create too much friction, you may not be able to move, or find that it is a struggle to do so. If you wrap too few times, it may slip too much. Another way to vary the friction is to girth-hitch one end of the prusik around the leg loop and the other end to a biner clipped into the leg loop, or clip both ends of the prusik into a biner clipped into the leg loop. It is important to determine what level of friction you need for your weight, so experiment before you need it.

Typically, we use a three-foot or four-foot prusik for the autoblock. It is also possible to use a short sling; 9/16-inch webbing is easier to use than one-inch webbing.

1. Set up your rappel device on the belay loop. If you have a harness with no belay loop, clip a locking biner around the waist and leg loops and add a short sling. Use this short sling the same way you would use a belay loop.
2. Clip a locking biner into your leg loop (a non-locker will do in a pinch).
3. Clip the autoblock prusik into the locker on your leg loop (or girth-hitch it to the leg loop).
4. Wrap the autoblock prusik around the brake rope three or four times. Neatness counts; make sure the wraps are neat, that the strands around the rope are all parallel and that all are touching the rope. (It doesn't matter if you wrap toward the rappel device or away from it.)
5. Clip the other end of the autoblock prusik into the locker.
6. Rappel as you normally do, placing your brake hand (right hand) on the rope below the autoblock.
7. Place your non-brake hand (left hand) on the rope just above the autoblock. This is your "autoblock hand." Slide the autoblock down the rope between your autoblock hand and your brake hand as you rappel. Do not squeeze the autoblock in your autoblock hand.
8. Brake as you normally do with the brake hand pulling the rope across your right hip.
9. You can stop and go as often as you want. When you get ready to stop, let go with your autoblock hand. Gently let go with the brake hand until the autoblock grips the rope and locks off the rappel device. Do not fully let go of the brake rope until you have verified that the autoblock has locked off.
10. To resume your rappel, grasp the rope with your brake hand and wiggle the autoblock with your autoblock hand to loosen it, sliding it back down the rope to give slack in the autoblock.
11. If you want slightly more friction, you can also use a prusik hitch in place of the autoblock wrap.

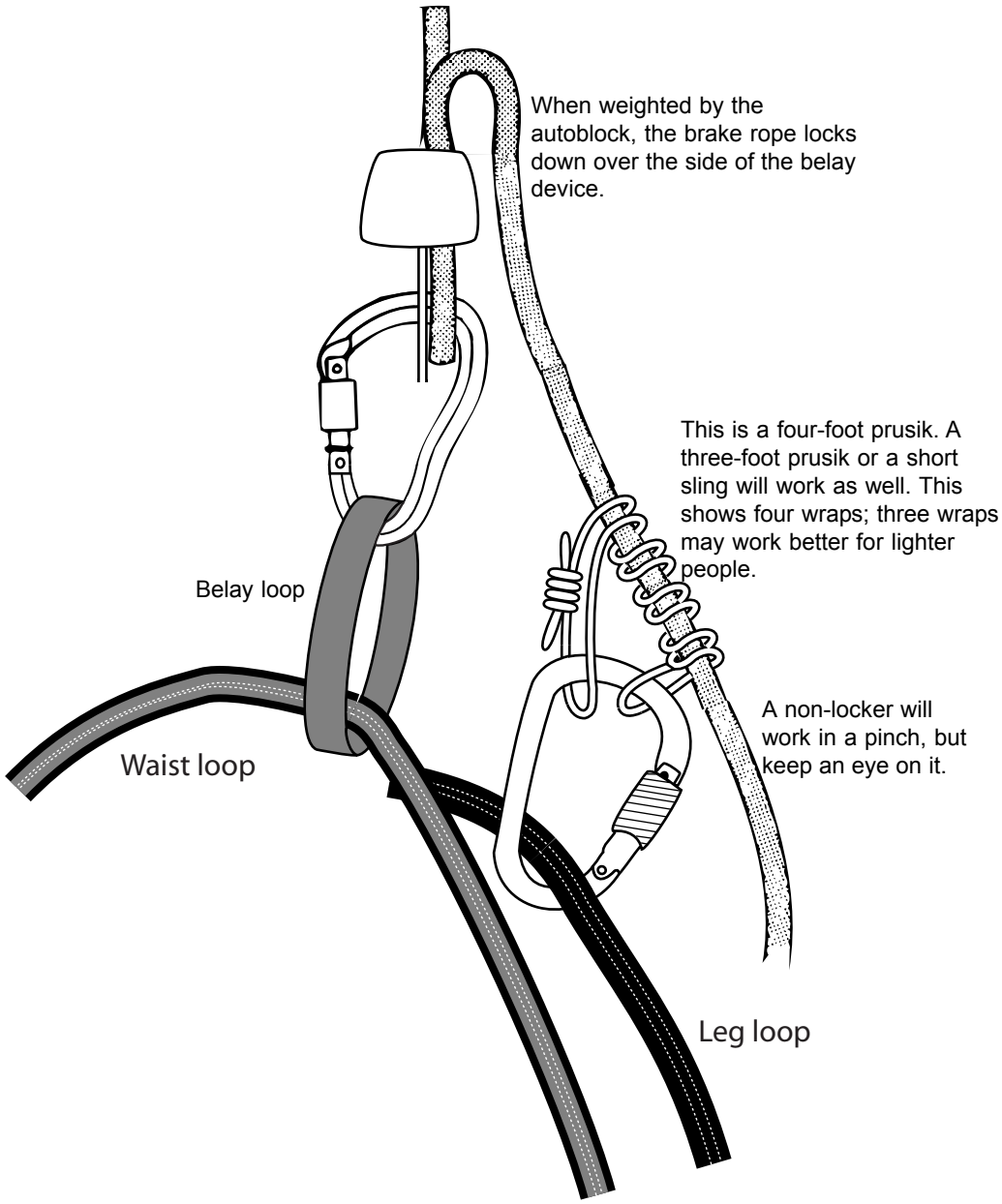


Fig 7-05—The autoblock rappel backup. You could use a prusik or a Klemheist hitch also. Place the right hand below the autoblock and the left hand above, neither one squeezing the autoblock itself.