Tip of the Week

November 15, 2004

Knot Now...

There are two basic knots that every stack tester MUST master. They are the Clove Hitch and the Bowline ((Boh'-Lin). We sometimes pair a clove hitch with a half-hitch and call it a "Probe Knot", because this is the best way to anchor a rope to a probe for hoisting. The Bowline is used for creating a hoisting loop that can be attached to other objects when lifting, sometimes by using a carabiner.





Clove Hitch

Bowline

Practice these knots. Find a short piece of rope or cord and tie them over and over until you can tie them in your sleep. Turn off the lights and see if you can tie them in the dark...while wearing work gloves! This needs to be second-nature, not only to be safe, but to be efficient during set-up and tear-down days.

There are, of course, other knots that can be useful in the field. If you're interested in becoming a knot junkie, then learn these in your spare time.

Figure-Eight Used as a rope stopper, or on a bite to create a haul loop. The double half-hitch A sliding knot that is commonly used to tie a tarp line to a post rail. A fancier version of the double half-hitch. aught-line hitch Rolling hitch Use to tie a slider to another rope. Use this to tie two ropes together. Fisherman's Knot Climber's Overhand Knot Alternative for tying two haul ropes together.

Clove Hitch



The Clove Hitch is used to tie a line to a probe. This knot can also be used to tie a rope to a railing, and provides a quick and secure result. Although this knot is handy because of its simplicity, it should only be used in temporary situations, and never in cases where it will go unwatched for long times.

The clove hitch can jam under heavy tension, making it difficult to untie. Worse, is its tendency to untie itself when subjected to repeated strain and release. For this reason, it is not recommended for long-term motion applications, such as holding down a tarp flapping in the wind. Despite these weaknesses, the clove hitch is still ideal when temporarily tying something up.

A single clove hitch can suffer from the hitch unrolling under tension if the probe turns. If you are in a situation where the clove hitch may unroll, add a half-hitch several feet above the clove hitch with the running end to the standing end of the knot, turning it into a "Probe Knot".

To tie a single clove hitch:

- 1. Begin with a loop around the probe.
- 2. Start a second loop around the probe, making sure you cross up, over the first loop.
- Come around the probe and tuck the free end under the SECOND loop.
 Tighten it up.

On average, any knot will reduce the breaking strength of any line or rope by at least 15%. The clove hitch reduces the line breaking strength by 40%.

If you are tying to something over which you can slip a loop of rope, then there is an alternative way to tie a Clove Hitch. (See the climber's clove hitch alternative.)

Climber's Version of a Clove Hitch

Here is an alternative way to tie a clove hitch if you can slip it over one end of the object you are tying to.



- 1. Form a loop in the rope.
- 2. Form a second loop in the opposite direction to the first. Some people do this by crossing their hands over (like an X), grabbing the rope in each hand and then drawing two loops whilst uncrossing hands again.
- 3. Place the second loop over the first.
- Pass the loops over the item you are tying to.
- 5. Pull tight.

Half Hitch

Picture of a half-hitch used in a probe knot.

The half hitch is the start of a number of other hitches and is useful all by itself as a temporary attaching knot.

Probe Knot

The probe knot consists of a <u>half-hitch</u> at the top, connected to a <u>clove hitch</u> at the bottom of the probe.



Bowline



The Bowline is used to make a fixed-size loop in a line, often to either provide a clipping point for a carabiner, or to tie directly to something to be hauled. The benefits of the bowline are in its loop that will not slip, and in its ability to be easily untied after being exposed to a heavy strain. On average, any knot will reduce the breaking strength of any line or rope by at least 15%. The bowline reduces the line breaking strength by 25%.

To tie a bowline:

- 1. Begin with a small overhand loop (the direction is important the loop goes over the loaded part, i.e., attached or long end of the line.) Be sure to leave enough in the free end to form the loop.
- 2. Form the loop of desired size.
- 3. Pass the free end up through the small loop, around the standing part, and back through the small loop, this time going down.
- 4. Tighten it up.

You know you have it correct when the free end is in the inside of the loop.

A chant used by many to remember this knot is: "The rabbit comes out of the hole, round the tree, and back down the hole again", where the hole is the small loop, and the rabbit is the running end of the rope.

Tips

- Don't be afraid to use this knot to form a loop of any size in rope.
- To quickly identify if you have tied the Bowline normal or left handed, check to see that the running end exits the knot on the <u>inside</u> of the loop.
- For added security, finish the knot with a stop knot such as a Figure of Eight knot to remove any possibility of the Bowline slipping.

Figure Eight



The Figure Eight Knot (Flemish Knot, Savoy Knot) is larger, stronger and more easy to untie than an overhand knot. It does not harm your rope as much as the overhand knot does. These knots are useful in the end of a rope as a small stopper.

To tie a Figure Eight Knot:

- 1. Interlock the overhand loops.
- 2. The running part then goes through the eye of one loop and the standing part goes through the eye of the other loop.
- 3. Pull the running part and standing part tight.

Another useful form of the figure eight is to tie it on a "bight". This knot is formed from a "bight" of rope. It's very handy to just grab a bight of the rope anywhere along it and tie it off in this manner, following the general steps 1-3 described above. Add a fourth step of clipping on a carabiner. Useful for making a quick haul loop and all sorts of applications. Once loaded, however, it is somewhat difficult to untie. If you are hauling a lot of weight, use a <u>bowline</u> instead.



Double Half-Hitch



The double half-hitch is commonly used to tie a line to a post or rail, or to start or finish a lashing. This knot will slide, resulting in a tight grip on the post. The knot can slip apart under high stress loads so it should NOT be used for "mission-critical" things like tying a probe. This knot has a redeeming feature - it rarely jams! On average, any knot will reduce the breaking strength of any line or rope by at least 15%. The double half-hitch reduces the line breaking strength by 25%.

To tie a double half hitch:

- 1. After coming around the post, make an underhand loop (the loop goes under the loaded or standing part, i.e., the attached or long end of the line.)
- 2. Bring the free end up over the standing part and through the eye which you created.
- 3. Next make a second underhand loop around the standing part, and run the free end through this eye.
- 4. Tighten it up.

Superior to a <u>Clove Hitch</u> for starting and finishing a lashing as the half hitches prevent this knot from unrolling, as they have the effect of locking the knot. The Clove Hitch is easier and faster to tie, but it has a tendency to unroll, and can be difficult to tie tightly when tying off.

A better but more advanced knot for lashing is the Taught Line.



This knot is relatively easy to tie for lashing and makes adjusting the sling line length very easy, without having to re-tie the knot each time. All one has to do is release the line from any tension and then slide the knot to the desired position. It will require you to keep an eye on it, since any action of the secured object (e.g., flapping tarp) can cause the knot to start loosening up a little bit, which can eventually lead to it coming apart.

Rolling Hitch



The Rolling hitch is often used to attach one rope to a second, in such a manner that the first rope can be easily slid along the second.

The knot can be considered a <u>Clove Hitch</u> with an additional turn.

When tension is applied and the ropes form a straight line, the rolling hitch will lock onto the first rope. When the tension is released, the hitch can be loosened and slid along the first rope to a new location.

The tension must be applied on the side of the knot with the extra turn.

Use this knot if you have a guy rope with no adjuster. Create a loop on the end of a second rope which is slipped over the peg. Use a rolling hitch to attach the second rope to the guyline. Alternatively, take the guyline around the peg and tie the Rolling hitch back onto the standing part of the guyline, above the peg, thus forming an adjustable loop. This is equivalent to the <u>Tautline</u> <u>Hitch</u>.

When adjustments are complete, lock the rolling hitch into place by using a stop knot such as a <u>Figure of Eight</u> in the first rope, below the Rolling hitch, to stop it slipping.

Fisherman's Knot



The Fisherman's knot is used to tie two ropes of equal thickness together. It is used by fishermen to join fishing line, and is very effective with small diameter strings and twines.

Tie an <u>overhand knot</u>, in the running end of the first rope around the second rope. Then tie an overhand knot in the second rope, around the first rope. Note the overhand knots are tied such they lie snugly against each other when the standing ends are pulled.

One problem with this knot is that it becomes very difficult to untie after being loaded. If you are loading the knot, such as in a hauling situation, use the <u>Climber's Overhand Knot</u> instead.

Climber's Overhand Knot

The overhand knot is probably the simplest and fastest knot you can form to join two ropes together. This can be very handy in situations where speed is critical. It's also generally believed to be the least likely knot to get stuck when the ropes are pulled. Follow these steps to form an overhand knot to join two ropes:



- 1. Grab an end of each rope and form the simple pass shown above.
- 2. Pull tight, leaving a large amount of tail (ie. about 12 inches) for both ends, to account for any slippage. It shouldn't slip too greatly if the ropes are of the same diameter, but this is not something to skimp on. You should probably leave more tail than the pictures above imply.