



Hyattsville Volunteer Fire Department Training

Rope Rescue



NFPA 1983

Defined two person load as:

One person = 300 lbs

Two person = 600 lbs

Defined ratio for safety for rope rescue as: 15:1

(example: 300lbs needs a 4500 lbs rope, and 600lbs needs 9000 lbs rope for rescue)



Rope Properties

- Determined by the material the rope is made of and way it is constructed
- Different combinations make one kind of rope more suitable than another for rescue operations



Rope Properties (Cont.)

- The rope on the Rescue Squad is Static Kernmantle Rope
- Design matches a static nylon core (kern) with an abrasion-resistant braided polyester sheath (mantle) for durability



Rope Properties (Cont.)

- Tensile or Breaking Strength
 - $7/16'' = 6,000$ lbs
 - $1/2'' = 9,000$ lbs
 - $5/8'' = 13,000$ lbs



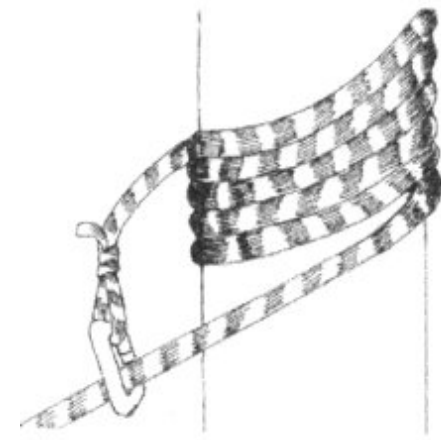
Anchor Points

- Anchor points are the points at which ropes and other elements of the rope system are secured to. Anchor points to a rope system are to what a foundation is to a building.
- Anchor points should be “bombproof”
- Anchor points can be natural such as trees or boulders as well as manmade such as the squad, structural columns, wall sections



Anchor Points (Cont.)

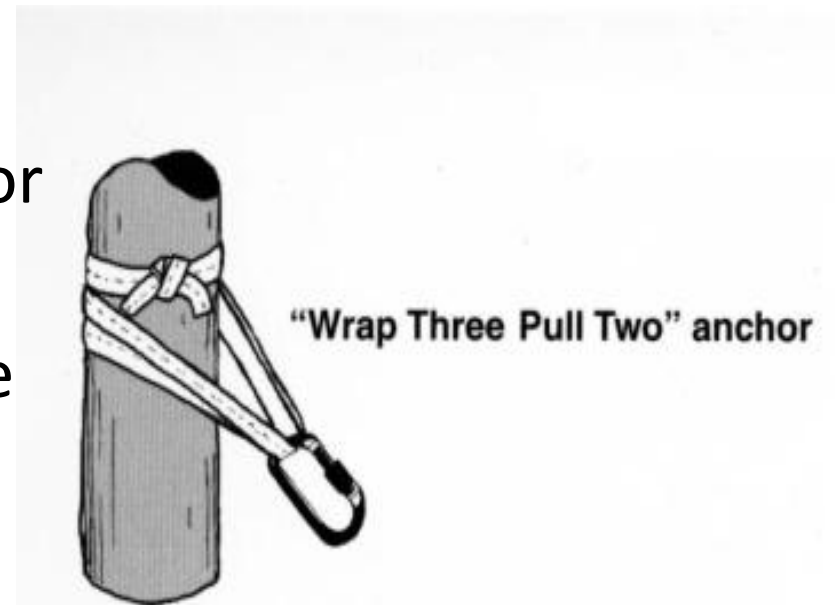
- Tensionless Hitch
 - Knot system in which a rope is wrapped around an anchor point that is at least 4 times the diameter of the rope
 - The anchor point should be wrapped a minimum of 4 times and followed up with a back up knot in case of anchor deterioration and/or slippage





Anchor Points (Cont.)

- Wrap three, Pull Two
 - Anchor point is wrapped three times with webbing or rope then tie together.
 - Two loops are pulled so the knot is resting against the anchor point





Haul Systems

- The number of pulleys plus one in a simple system gives the mechanical advantage (MA). (There are some exemptions)
- If the end of the rope is attached to the load, the MA is odd.
- If the end of the rope is attached to the anchor, the MA is even.



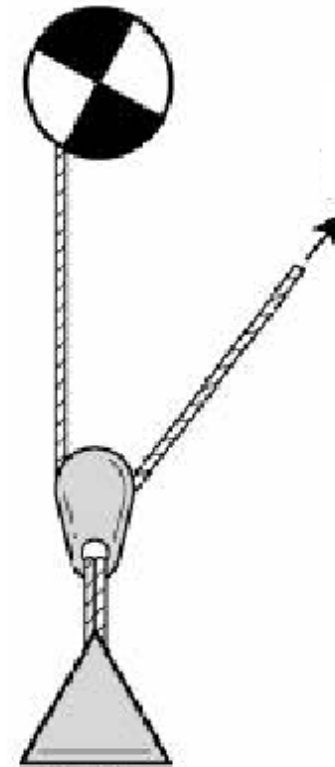
Tandem Prusiks

- The tandem triple wrap Prusiks are used as a safety and a progress capture device.
- When setting up the Tandem Prusiks, the Prusiks go on the load size. The large Prusik goes on the carabiner first, then the short one. The long one should be wrapped about 4 inches from the pulley and the short one should rest against the pulley.

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2:1

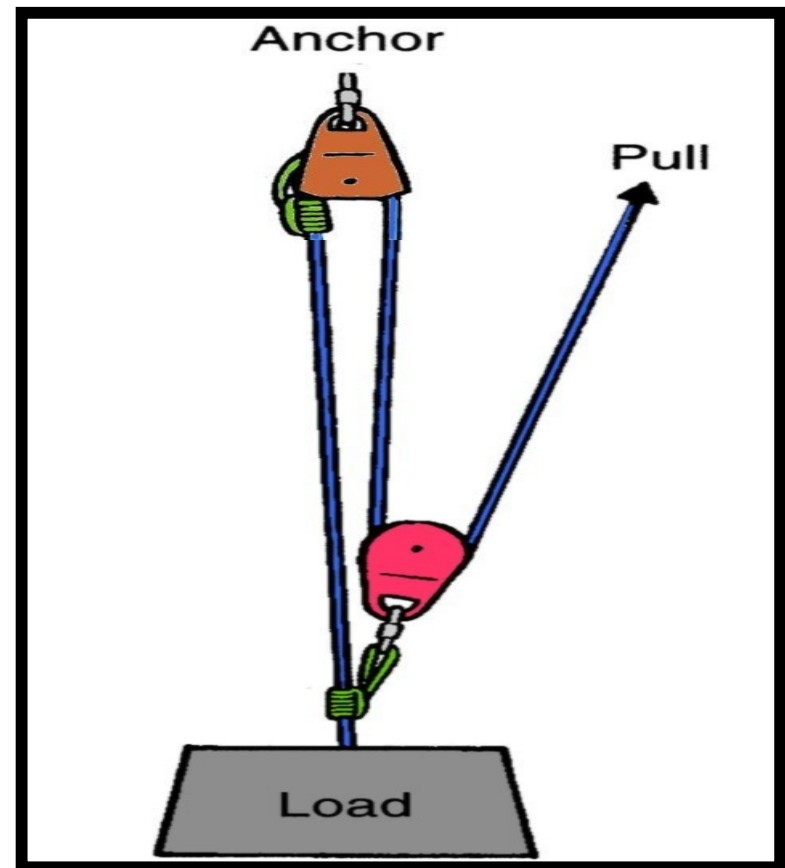
1. Establish an Anchor Point
2. Attach the end of the rope to the Anchor Point
3. Lay out the rope in the shape of a U
4. Attach a pulley to the load



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Z-Rig (Has 3:1 MA)

1. Establish an Anchor Point
2. Attach the end of the rope to the load.
3. Lay out the rope in the shape of a Z (as shown in the picture)
4. Attach Pulleys at the two bends in the rope
5. Set up a tandem Prusik system on the load side of the Pulley attached to the anchor
6. Use tandem Prusiks to attach the 2nd pulley to the 1st let of the rope (as shown in the picture)

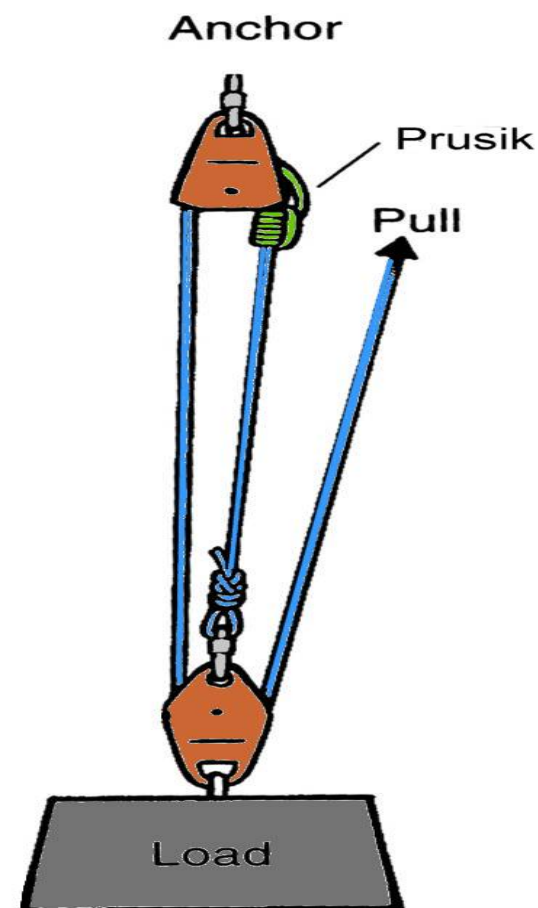


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3:1

3:1 Haul system

1. Establish an Anchor Point
2. Run rope through two pulleys
3. Tie a figure 8 on a bight at the end of the rope and attach it to a carabiner.
4. Attach one Pulley to the anchor point and the other pulley to the load
5. Attach the end of the rope to the load
6. Set up a tandem Prusik system



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4:1

1. Establish an Anchor Point
2. Attach the end of the rope to the Anchor Point
3. Establish a second hook in point (Can either be off of original anchor point or a new anchor point)
4. Attach a pulley to the load for the first moving pulley
5. Attach a second moving pulley to the load. This pulley can either be attached to the first moving pulley (as shown) or attached to another point on the load (as shown on next slide)
6. There should be Tandem Prusiks on the load side of the none moving pulley



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5:1

1. Establish an Anchor Point
2. Attach the end of the rope to the load
3. Establish a second hook in point (Can either be off of original anchor point or a new anchor point)
4. Attach pulleys to two different hook in points (as shown)
5. Attach two pulleys to the load (as shown)
6. There should be Tandem Prusiks on the load side of the none moving pulley





Yosemite Rig

- Pre-rigged located in the bag labeled “Yosemite Rig”
- Includes 4 hook in points used to connect to the four anchor points of the Stokes Basket
- Used as a litter control device
- Adjust the Prusiks to move the Stokes at different angles



Stokes Basket

- Patients should be internally lashed to protect them from ejection out of the ends of the litter.
- Always attempt to get a harness on the patient
- Use external lashing to keep the patient from thrashing about



Stokes Basket (Cont.)

- There are many different ways to tie the patient into the stokes.
- A simple weave can be used starting at the upper body and moving from tie in point to tie in point alternating sides.

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Stokes and Yosemite Rig



11/22/09

Rope Rescue