

***ONE VIEW OF RIGGING AND
ANCHORING IN THE FIRE SERVICE***

Presented by:

Jim Kovach

One View of Rigging and Anchoring In the Fire Service

One inch tubular webbing has been a staple of mountain and cave rescue teams for years. Since much of what the fire service learned about rescue came from them, so did our use of webbing. Many in the fire service also use manufactured anchor straps. This presentation will look at how the fire service uses and perceives how these materials should be used.

About the Presenter

Jim Kovach has been a firefighter with the Fairview Park Fire Department in Ohio for 30 years. He has presented at several past NATRS and ITRS symposiums over the years on a variety of topics, including Tower Rescue, Personal Escape Rope Testing, Fall Factors, Bottom Belaying and equipment testing.

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12/31/05

Tested Rock-N-Rescue Tech Heavy Duty Anchor Sling 1.75 CAS-48

Manufactured by Bashlin Industries Inc., Grove City PA

Rated Capacities

Vertical 1200 lbs SWL, minimum breaking strength 10,000 lbf end to end

Choker 1000 lbs SWL, minimum breaking strength 8000 lbf choker

Basket 90 degrees 2400 lbs SWL, minimum breaking strength 20,000 lbf basket

Steel "O" ring 15,000 lbf

Test fixture: 8 inch x 5 ¼ inch x ¼ inch *unpadded* steel I beam with wood blocks between the flanges on each side to prevent buckling of the flanges.

Rate of pull: 39 inches per minute

Girth hitch rigged worse case, as if webbing was acting like a 2:1 on large "O" ring, and small "O" ring was being pulled.

Approximately 8 year old used anchor strap failed at webbing doubled over large "O" ring at 8010 lbf.

New anchor strap failed at webbing doubled over large "O" ring at 6985 lbf.

Girth hitch rigged in strongest configuration as if girth hitch was being pulled "in line".

New anchor strap failed at small "O" ring webbing at 9130 lbf.

Basket hitch rigged around I beam and connected to a 1 inch clevis pin with both "O" rings.

New anchor strap failed in webbing around back of I beam at 16,290 lbf.

New anchor strap failed in webbing around back of I beam at 18,430 lbf.

Approximately 8 year old used anchor strap failed in webbing around back of I beam at 16,820 lbf.

Basket hitch rigged around I beam with small "O" ring attached to a slightly used SMC aluminum locking carabiner connected to large "O" ring, and large "O" ring connected to 1 inch clevis pin.

New anchor strap webbing and aluminum carabiner failed at large "O" ring at 12,440 lbf.

Basket hitch rigged around I beam with small "O" ring attached to an old, slightly used SMC aluminum non-locking carabiner connected to large "O" ring, and large "O" ring connected to 1 inch clevis pin.

New anchor strap did not fail but the non-locking carabiner did at 12,675 lbf. (This damaged strap was later tested rigged end to end.)

New anchor strap rigged end to end and connected to large SMC heat treated carabiner at each end. Failed in webbing at small "O" ring at 11,530 lbf.

New anchor strap rigged end to end and connected at large "O" ring to SMC heat treated carabiner and small "O" ring to 1 inch clevis pin. Failed in webbing at small "O" ring at 11,060 lbf.

Previously tested anchor strap that was rigged as a basket hitch with a non-locking aluminum carabiner, and the carabiner had failed at 12,675 lbf. The anchor strap was intact but the webbing at the large "O" ring was slightly torn. Rigged end to end and connected at large "O" ring to SMC heat treated carabiner and small "O" ring to 1 inch clevis pin. Failed in webbing of large "O" ring (that was previously damaged), at 6,770 lbf.

Tested large and small "O" rings from older, used anchor straps.

Large "O" ring (5011 FC) connected to 1 inch clevis pins. Stopped test at 22,745 lbf. "O" ring was elongated but did not fail.

Small "O" ring (5030 FC 95) connected to 10 mm shackles connected to 3/8 inch chain. Chain failed at 15,150 lbf and test was stopped. Small "O" ring had elongated but did not fail.

04-26-05 Previous test of Rock-N-Rescue anchor strap.

Tested used Rock-N-Rescue Tech Heavy Duty Anchor Sling approximately 8 years old. Tested girth hitched around 8 x 8 timber, unpadding. Small "O" ring attached to 1 inch diameter clevis pin. Failed in webbing of small "O" ring at 10,120 lbf.

Choker hitch poorest configuration as if pulling back on itself:	6,985 lbf 8,010 lbf
Choker hitch as if pulled "in line":	9,130 lbf 10,120 lbf
Basket hitch:	16,290 lbf 16,820 lbf 18,430 lbf
Basket hitch with small "O" ring connected to large "O" ring:	12,440 lbf 12,675 lbf
End to end:	11,060 lbf 11,530 lbf 6,770 lbf

(2nd test of this piece, 1st test damaged the webbing at the large "O" ring)