

Mechanical Load Ratings for The Becker Sling

All elements of this system have been tested for ultimate or working load strength with the exception of the D rings attachments on the Becker Slings. The D rings are designed to only handle the loads that might be associated with a human pulling a tag line attached to the patient or for an associated accessory. The chest portion of the sling is intended only to hold the patient in the right position over the front body sling. The chest sling therefore is not typically loaded and by itself should not place much load on the D rings.

Master Oval Link: 15,000 pounds working load. Pear Link: 13,200 pounds working load.

Prusik Loops: One half inch rescue rope has an ultimate breaking strength of 9,000 pounds. With the quadruple looping configuration of the loops giving each leg four strands of rope, but then lowering the rating by 50% due to the knot and bends around the oval and shackles, the rating of each leg would be 18,000 pounds breaking. The angle between both prusik loops, which is dependent upon the shackle configuration in the spread bar also influences the load. Therefore, the ultimate load rating for the prusik loops, depending upon configuration, would range between 18,000 – 24,000 pounds.

Shackles: Each has a working load limit of 10,000 pounds.

Aluminum Spread Bar: Independent load testing, with the upper shackles on the inner set of holes, and with an evenly divided load, had an ultimate load of 21,000 pounds before breaking. The bar was showing visible bending at 15,000 pounds, long before it ultimately broke. Testing was not done with shackles in alternate positions, as it was reasoned that those smaller patients would exhibit much lower loads.

Slings: While the slings have not undergone destructive load testing, 8 inch nylon webbing has a rating of 78,000 pounds. The sewing thread, size 554, has a breaking strength from 95-100 pounds. Calculating the number of stitches in each sling and lowering the thread rating by 50%, there still a system load capability of 124,000 - 166,000 pounds. This should hold the average large animal. The D rings have a tensile strength of 6000 pounds. The attaching Type 7 nylon webbing has a strength of 6000 pounds. Although the stitching of the Type 7 webbing to the 8 inch webbing has not undergone destructive load testing, failure of this junction would most likely be contained to a small area and not undergo complete catastrophic failure. The long snaps on the adjustable chest sling have a rating of 2,500 pounds. The chest sling uses 2 of these in a “basket” configuration, giving the total load limit of the chest sling at 5,000 pounds.

Definitions:

“Breaking strength” or “ultimate load” is that load where the equipment is expected to undergo complete failure. Actual loads should be far less. An ideal safety factor of 15:1 is considered typical for rescue.

“Working Load Limit” is that load that can be safely handled. Exceeding that load places that piece of equipment in a situation that is beyond its design considerations. Although it may be able to withstand a much higher load before breaking, the working load limit should never be exceeded.

CAUTION: This equipment should only be used in the system as designed. Using this equipment in alternate situations were it has not be tested may place unusual high loads causing a premature failure. Always read directions and work within safety limits!