



Slow-Pull Failure Tests

Petzl Tibloc® and both Wild Country Ropeman® versions

Slow-pull failure tests can be a good indicator of when and how failure might occur, but will not necessarily represent what happens after the initial failure occurs.

Because the slow-pull machine's hydraulic ram moves at a constant speed, if the device being tested (e.g. the Tibloc® or Ropeman®) tears the sheath off the rope, then the hydraulic ram cannot maintain tension on the device, and thus you would not observe any successive failure, such as rapid slippage of the sheath down the rope, or any possible mechanical damage to the rope's core. In other words, the actual 'outcome' of such a failure, may be worse than just a torn sheath. To observe the latter effects, either drop tests, or constantly applied tension tests would have to be conducted (stay tuned).

The Tibloc was designed for 8-11 mm cord and rope, though users seem to find a way to use the device for which it was not intended. These quick look tests were conducted only to provide an indicator of the relative differences of where catastrophic failures might occur between Petzl's Tibloc® and Wild Country's Ropeman® under similar conditions. Different rope types, and condition of rope will result in different values.

Force Required to Fail Sheath

Cord/Rope Diam. and Brand	Tibloc kN	Ropeman (old) kN	Ropeman (new) kN
5.5 mm Titan (Spectra)	2.0	2.3	2.3
5.5 mm Gemini (Spectra/Kevlar)	2.2	2.8	2.9
6 mm Mammut	3.5	2.7	3.2
7 mm Mammut	3.5	3.5	4.0
8 mm Mammut	4.9	3.4	3.9
9 mm Roco (climbing-full rope)	6.5	4.9	5.1
11 mm Edelrid (climbing)	5.3	5.0	4.7
11 mm Cancord (low stretch)	8.2	5.4	6.4

*quick look tests conducted by Rigging for Rescue® (Nov. 1999), on new materials.

- Ⓣ Petzl's Tibloc® product information sheet also provides data on the effects of fall factors 0.5 and 1.0 using an 80 kg mass on both low stretch and high stretch (climbing) Beal® ropes and cord. They indicate that a fall factor 1 will completely sever 8 mm cord; the sheath will tear on low stretch diameters greater than 9 mm, and no sheath failure will occur on high stretch cords of 9 mm and greater. For a fall factor of 0.5, high stretch ropes have no sheath failure; 8 & 9 mm low stretch cords will result in sheath failures, but 10 & 11 mm low stretch ropes will not. These are all based on drop tests. It would be of value to reproduce these tests, as well as obtain 'Constantly Applied Tension' test results to more accurately reflect what could happen in certain field use situations, such as in haul systems.