

## Belay Device Comparisons

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We get a lot of questions about the “strength” of belay and rappel devices, and a lot of questions about their stopping power. Unfortunately, THERE IS NO AGREED UPON STANDARD FOR TESTING BELAY DEVICES. The UIAA, the CE and the ASTM can not agree on a common method. Strength is an oddball question: With a Figure 8, you can simply pull the two eyes apart and measure the resistance. How do you do it with a belay device, especially with all the different configurations out there? What we did was pull one apart at opposing ends of the same slot and recorded the results (Jaws=20kN, Pyramid=20kN). While these results probably aren’t meaningless, they should be fairly far down your list of reasons to buy or not buy a particular device. Handling and stopping power are the more important reasons to select a device. Unfortunately, there are just too many variables involved to be able to develop a reliable and repeatable stopping power test. I can repeat the same test on two different days and get results that are off by 20%. What does not change, however, is the relative stopping power results, so I believe the results below show good comparative results, if not a good definitive ones.

Here's how we did the test:

A rope was fixed to the rafters in our warehouse and a climber weighing 160lb, wearing a harness, rigged a single strand of the rope through the device in a manner similar to rappelling. A bucket was attached to the braking rope below the climber and filled with enough bottles of beer to prevent the climber from moving down the rope. Bottles were removed one at a time until the climber started moving. The bucket and remaining bottles were then weighed to determine the amount of force required to stop the climber. I know that beer bottles are a funny unit of measure but the weights remain constant (No, we didn't drink as we tested!) and for some reason they always seem to be handy.

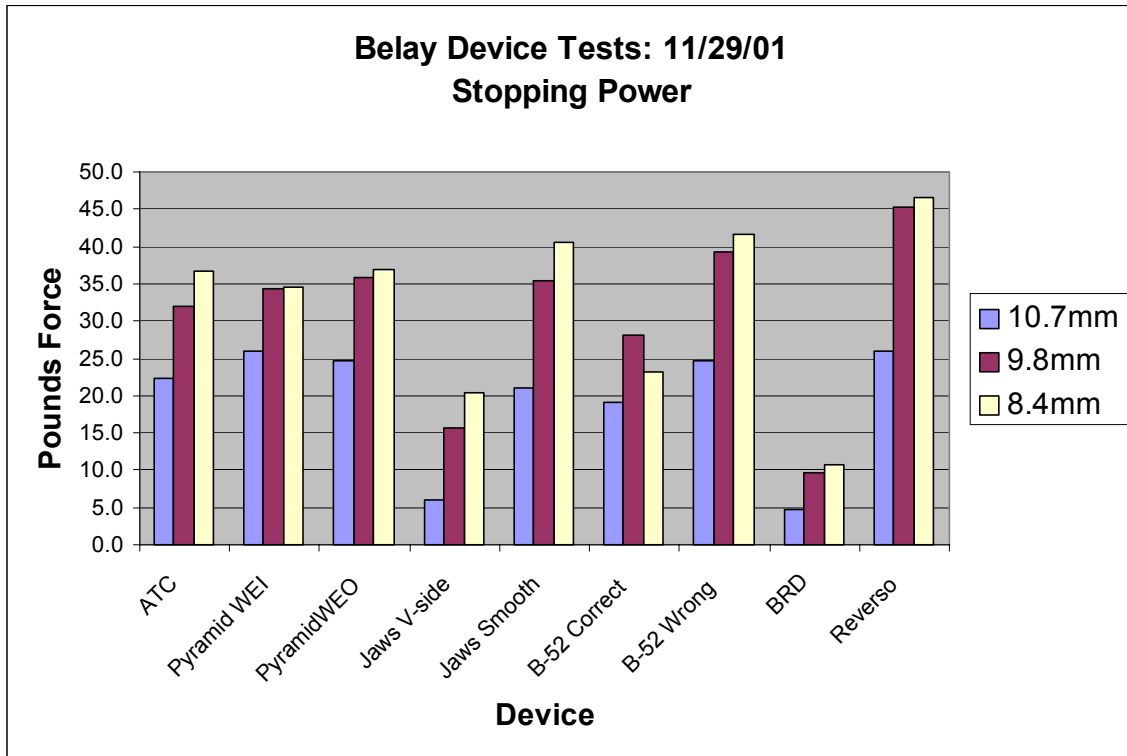
The results below compare our Jaws, oriented in both directions, the Pyramid with the Wide End In (WEI) and with the Wide End Out (WEO) and our new (available March, 2002) B-52, rigged correctly and incorrectly. An ATC, BRD and Reverso were tested as well for comparison purposes.

What these results don't show, and what I haven't been able to figure out how to calibrate, is the feel or handling of a belay device. Handling is made up of “feed” and “modulation” The “feed” of the rope is how easy it is to pay out slack when your leader calls for it. A device that doesn't feed well will jam when you try to give slack. Modulation is how much range there is between full lock-off and fully free. A device that doesn't modulate well will feel jerky when you're rappelling or will lower someone abruptly. The GriGri, for instance, is a great device but you know how easy it is to drop someone if you pull the lever just a bit too much. And when you've got the braking ropes through the V-notch side of Jaws at the start of a long rappel, it's just plain jerky and not smooth. These devices don't modulate well.

So how do you choose? You're looking for a device that stops falls easily and handles well. On the **Stopping Power Chart** below the numbers indicate the pounds force required to stop the climber. The lower the number, the easier it is to catch a fall. On the **Handling Chart** I've listed very subjective ratings for Feed and Modulation as explained above. Rather than say, “It handles well.”, or “It feeds really fast.”, or “It's grabby.”, I've put numbers on those descriptive words, 1 being unacceptable and 5 being ideal. The best all round device would be one with a low **Stopping Power** score (easy to stop a fall) and a high **Handling** score. If you're just top-roping, choose a device that stops a fall well (low score) and Modulates well for lowering. It doesn't matter as much how it feeds. For sport climbers, stopping power isn't as critical (assuming it's not off the charts) as the handling. For smooth rapelling choose a device that modulates well. Finally, look at other features: Can it be used in the Auto-block mode? (B-52 and Reverso, yes). Is the cable strong and does it stay out of the way? Does it clank and clang when you move? That's cute for a while but gets tiresome quickly. As with most difficult decisions there is no right or wrong, just a continuum of choices, each with good and bad sides. Fortunately, most Belay/Rappel devices cost less than \$25 so you can have one to match each situation if you need.

## Stopping Power

Rope Diameter	Pyramid		Jaws		B-52		ATC	BRD	Reverso
	WEI	WEO	V-side	Smooth	Correct	Wrong			
10.7mm	25.9	24.7	6.0	21.1	19.2	24.7	22.3	4.8	25.9
9.8mm	34.3	35.7	15.6	35.5	28.0	39.3	31.9	9.6	45.3
8.4mm	34.5	36.9	20.4	40.5	23.2	41.7	36.7	10.8	46.5



## Handling

	Pyramid		Jaws		B-52		ATC	BRD	Reverso
	WEI	WEO	V-side	Smooth	Correct	Wrong			
Feed	4	3	3	4	5	5	3	1	2
Modulation	4	4	2	4	5	5	3	1	2