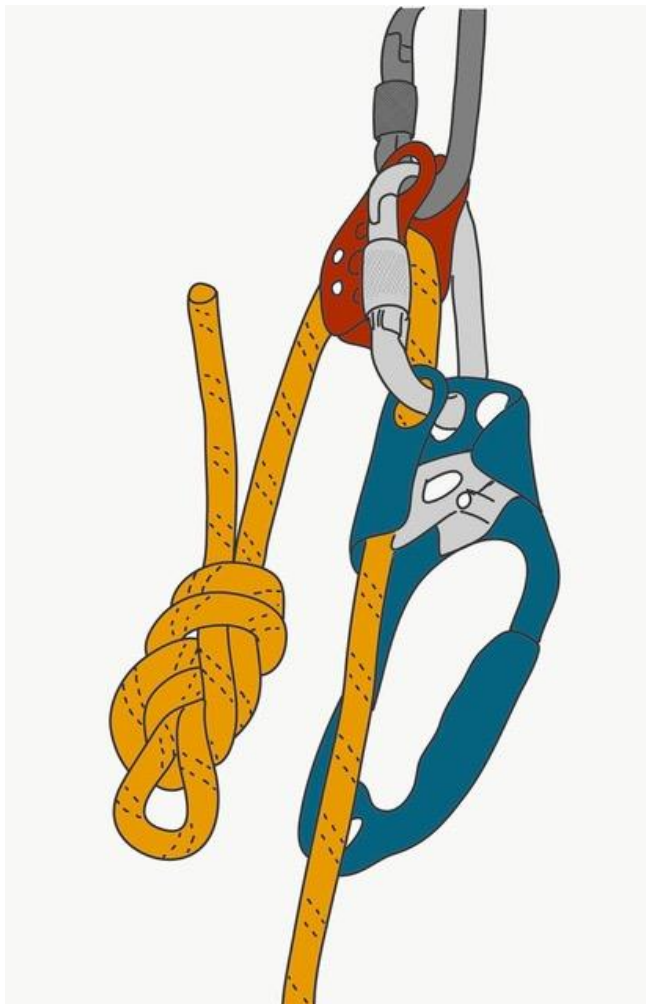




Pulley-Jammer Combo Risks

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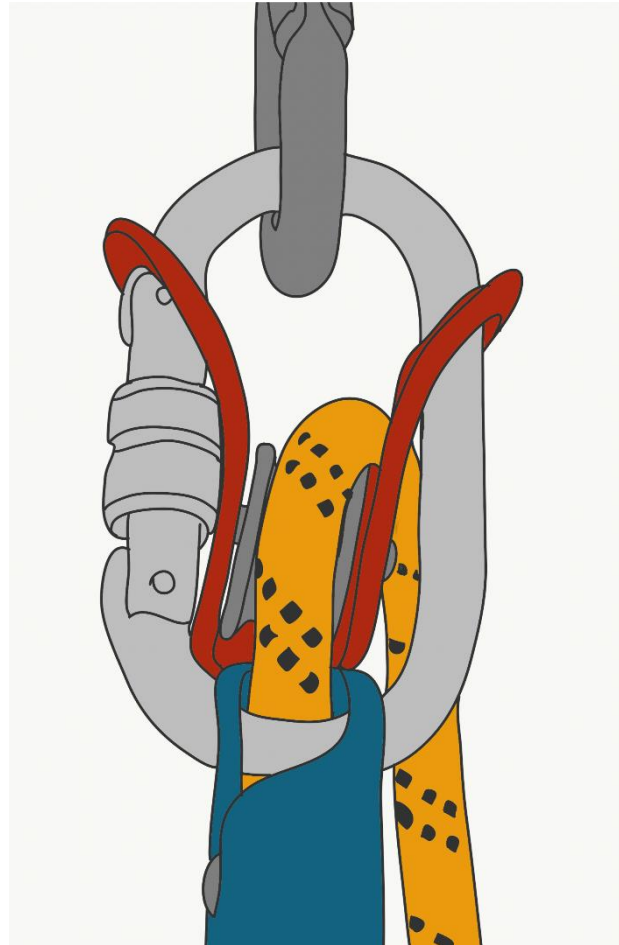
Early in 2019, the BCA conducted tests with a range of known improvised belay devices or configurations including a pulley/toothed ascender configuration as illustrated in diagram 1 (left).

A key feature of this particular system is that the toothed jamming device is located on the opposite side of the pulley to the load.

During the testing, relatively short falls (from a little over 20cm to 45cm) with a 100kg steel mass yielded high impacts ranging from 4.8kN to 6.7kN. It should be noted that toothed jamming devices damage ropes if exposed to more than 4kN, and it is commonly accepted that impacts in excess of 6kN will result in significant injuries to an individual.

Of equal concern was the significant damage caused to the pulley (see diagram 2, right). This was the result of the carabiner attached to both the ascender and pulley forcing the pulley cheeks apart. In addition, it was noted that the ascender's cam firmly wedged into the ascender and could not be released by hand, and that the rope suffered varying degrees of serious sheath damage.

The BCA is aware that the technique illustrated here **was** historically advocated by some manufactures, and features in many historic and current forms of literature as a means to belay a second when ascending a climb or ladder.



Conclusion: The BCA would urge cavers to only use devices specifically designed for this purpose in line with current manufacturer's instructions.

