

Rope Rescue Equipment



Personal Protective Equipment (PPE)

When thinking of PPE for rope rigging, typically what comes to mind is a helmet, gloves, eye protection, headlamp, proper footwear, appropriate clothing, a well-designed and applicable harness, and enough rigging equipment (carabiners, ascender, descender, pulleys, belay device, a few slings or webbing) to get the job done, or at least, get the user out of a jam.



Harnesses

A Class III harness fastens around the waist and thighs or lower torso and over the shoulders. This class of harness is designed for rescues where two-person loads may be encountered, and inverting may occur.



11mm Rescue Rope

7/16 (11mm) is the preferred diameter for rope access and wilderness rescue.

NFPA 1983 has bought into this size transition. In fact, the latest revisions to the standard changed the equipment designation of *Light* use to *Technical* use.

Most rope access ascending/descending hardware is tailored to 11mm rope. 11mm has a far superior handle compared to the thicker 1/2 inch version. In terms of safety margins, (based on the brand and model) on the average, 11mm has an MBS (Minimum Breaking Strength) of about 35kN.



Rope and Equipment Bags

Most rescue rope rescue teams use rope bag to store and transport rope. Many types of bags have straps for backpacking.

Rope bags protect rope from damage, assist in keeping rope from tangling, and assist in transportation and carrying of rope and other accessory rescue equipment.

When putting the rope in the bag, simply 'bird nest' it in (hand over hand, end to end placement with no organized folding or coiling of the rope).



Edge Protection

Edge protection comes in many styles, sizes, shapes and materials. It provides rope protection from sharp and aggressive edges that can quickly damage and potentially fail tensioned rope.

This is sometimes referred to as '*softening the edge*'.

Edge protection works for stationary rope as well as rope that is moving over the edge. However, a loaded stationary rope has a much greater chance of becoming damaged and should therefore always be protected from destructive edges.



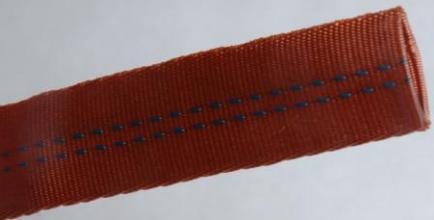
One-Inch Webbing

If there's one basic commodity for minimalist rigging gear, it's going to be an assortment of one-inch webbing.

A common length for pre-cut webbing is 15-feet. Although, several rescue teams will color code different lengths such as 6' yellow, 15' red, 20' green, and 30' black.

One-inch webbing is very strong. Pulling inline it is about 4000 lbs. MBS. When doubled, it becomes 8000 lbs. MBS.

Several pieces are easy to stow in a backpack. It is also advisable to use rope access slings and manufactured stitched dyneema loops to supplement webbing.



Stitched Rope Access Rigging Loops and Anchor Straps

Stitched loops are very versatile in locations where quick attach anchor connections are needed such as tower work and wilderness locations. Like one-inch webbing, stitched loops are easy to backpack. There are several high-quality manufacturers who produce stitched loops. Most loops are rated in the 22kN range, and some loops made with dyneema fibers can exceed that.



Anchor Straps

Commercial anchor straps come in many styles, sizes, strengths. They are usually made of nylon, with and without steel connection points.

There are several excellent manufacturers, and this product is highly regulated to guarantee they are professionally sewn to strict tolerances.

Anchor Straps are primarily used to wrap an anchor to provide connection points.

Some have built-in wear and sharp edge protection.



Anchor Plates



Anchor plates, also known as Rigging Plates, come in many styles, sizes and shapes. They all serve the same purpose of providing multiple attachment points at a given anchor location. Anchor plates assist in reducing clutter at the main anchor point as well and providing a platform for more advanced rigging functions such as changeovers from a lowering system to a raise.

When addressing wilderness locations like those typically found during a REMS deployment, smaller anchor plates are preferred for backpacking purposes. Most usually in rescue rigging we're looking for anchor plates that have a minimum breaking strength of about 36kN.

Carabiners

The term “triple action” refers to the number of movements it takes to open a carabiner. Double action, and screw type carabiners are still widely used without no abundance of adverse effects. Having said that, the triple action versions are almost impossible to open accidentally, whereas, on rare occasion, double action versions have been known to open due to rolling contact with a foreign surface such as another rope. Screw type carabiners are fine, but due diligence must be given to the gate. so that the closing end is pointing down when in use.

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Pre-rigged Mini Haul Systems

The mini haul system is often referred to as the Set-of-fours, or simply SOFs. Pre-packaged mini haul systems are enormously useful in rope access and rescue. Indeed, they've been in use for decades. Like any pre-rigged system, it is the responsibility of the end user to fully understand the application and method in rigging and re-assembling the system when needed.

This reference/nick-name "Set-of-fours is taken directly from the electrical lineman profession. Linemen have been using SOFs since the advent of electrical distribution.



The Petzl I'D

The I'D (Industrial Descender) has been available for several years now, and it has only in the past decade become accepted in the US fire service. This is a bit hard to understand because the I'D has proven beyond any doubt to be a simple and cost-effective solution for mainline descent control. Even though it introduces friction into the system, the I'D, given an adequate haul team and proper understanding of rigging physics, makes changing from a lower to a raise incredibly simple. As a rescue system belay device, the I'D comes very close to eliminating the number one cause of belay line failures – the human factor.



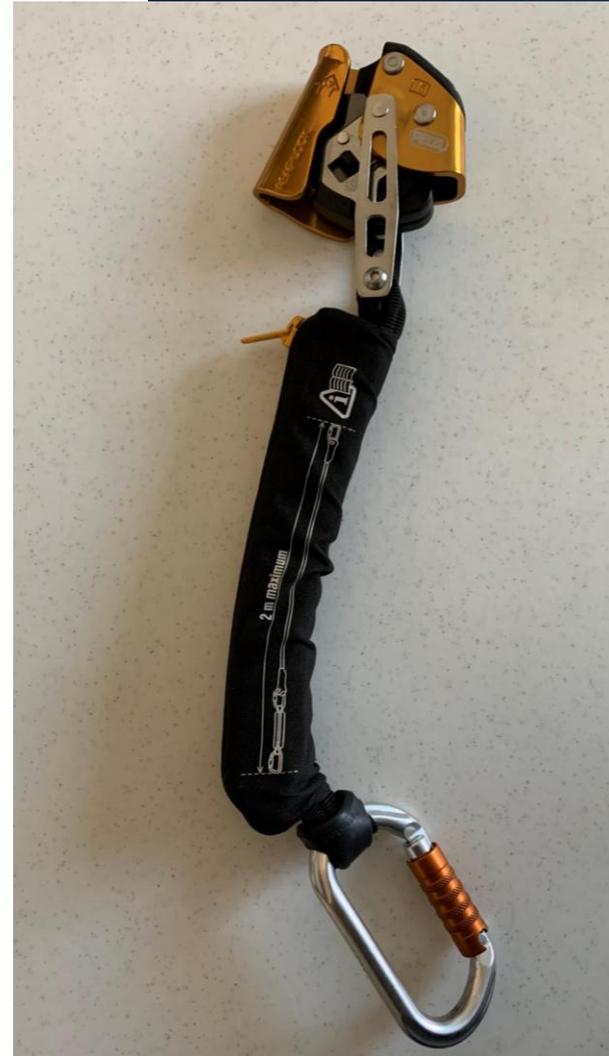
The CMC Clutch

The Clutch, manufactured by CMC, is one of the newest designs for a controlled descent device. The clutch has gained widespread popularity as a highly efficient upgrade option to the Petzl I'D. During ascending and/or progress capture applications the clutch is superior due to the internal one-way 90% efficient pulley. Hauling system efficiency has always been compromised by various devices over time. Even a 'ratchet' prusik in front of a high-quality pulley will cut efficiency by approximately 30%. Products such as the Petzl I'd and the Rig lack a true pulley and the rope must be pulled over a stationary internal drum. The I'D and Rig efficiency is almost cut in half in comparison to the 90% efficient pulley built into the Clutch.

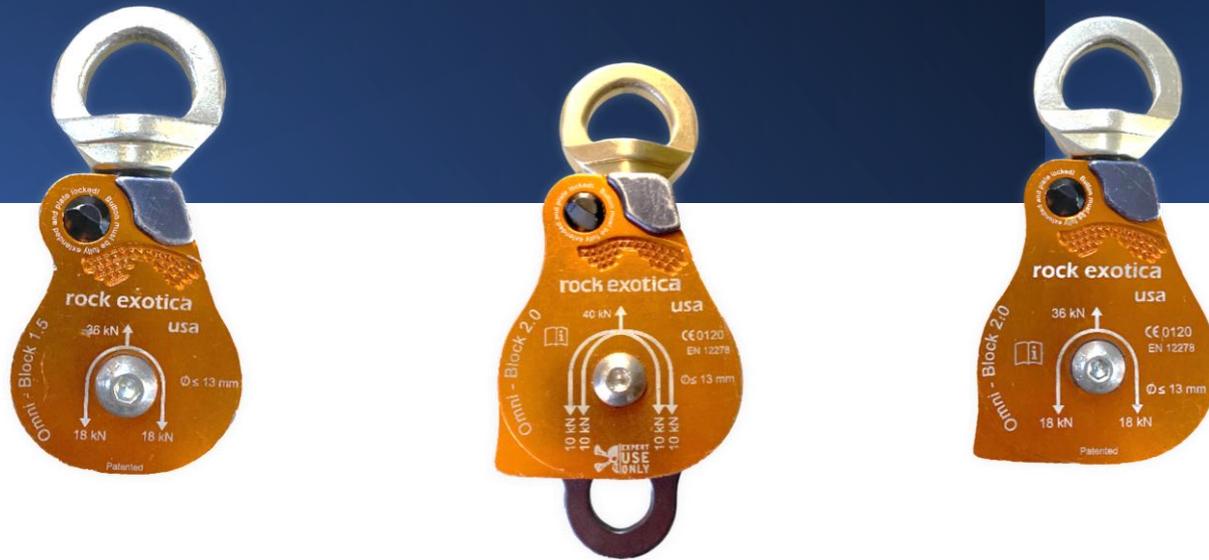


The Petzl ASAP Lock

The Petzl ASAP Lock has quickly become a favorite auto belay device for most rope access disciplines. The ASAP Lock is the smoothest device during descents. This tool is extremely effective when belaying on tensioned rope systems like the trackline of a sloping highline system. Shown in this photo is the Absorbica L57 energy absorber. It is always a mandatory requirement with any equipment to use that equipment in accordance to the Manufacturer's requirements. Petzl states: "**For an accompanied descent with two persons on a single energy absorber, use the ABSORBICA L57 or the ASAP'SORBER AXESS.**"



Rock Exotica Omni Block Pulleys



The Omni Block pulleys (36kN MBS) have become a preferred tool for rescue and rope access. What makes this pulley so attractive is the ability to insert the rope or remove it from the sheave via the slide and lock side plate. For rope access and rescue, this feature is invaluable for improved efficiency.

Petzl Rescucender

The Petzl Rescucender is a rope grab device that is one of many designs from many manufacturers that can be found on today's market. However, we prefer this model because it is extremely rope friendly and easy to use.

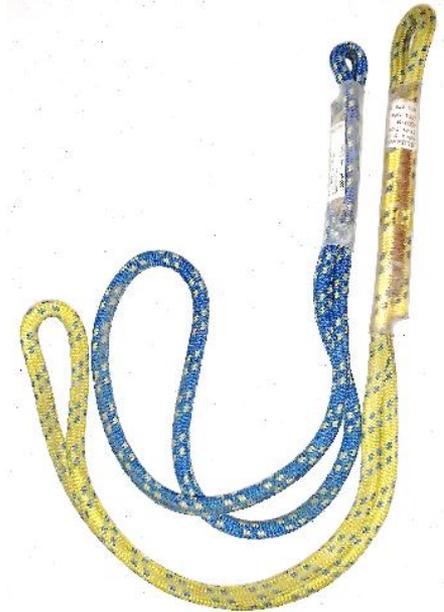
These rigging tools are used primarily as a rope grab for haul systems. They may also be used as a haul system progress capture device, as well as an ascender for climbing rope.

Note: Never use a rope grab device as a belay or fall arrest device, unless it is specifically approved by the manufacturer for fall arrest applications.



Sewn Prusik Loops

Aside from the fact that the rigging use of prusiks is somewhat of an art form, the rope rescuer is ahead of the game by using manufactured sewn prusik loops. Not only is the stitched loop more reliable and stronger than the homemade tied version, the shrink tubing around the loop is immensely beneficial in keeping the loop secure to the spine of the carabiner during those moments when the prusik and the host rope is slack or relaxed, i.e., belay line applications. Sewn prusik loops used for mainline and belay line applications should be between 7.5mm and 8mm. Most rescue rope manufacturers produce quality versions of this product.



Equipment Inspection

Here are some Key points for the inspection of rope rescue equipment.

- Perform before and after every use
- When in doubt replace it
- Soft goods: look for torn or broken stitching, cut or burned webbing
- Hard goods: smooth action with no cracks, corrosion, bends
- Refer to manufacturer's literature for exact inspection requirements, use and care
- Store in dry, clean, dark area away from chemicals

Rope Inspection

When inspecting rescue rope pay close attention to the following:

- Discoloration
- Cut fibers
- Worn sheath
- Lumps
- Glossy marks, burns
- Chemical, heat exposure
- Store in dry, clean, dark area away from chemicals