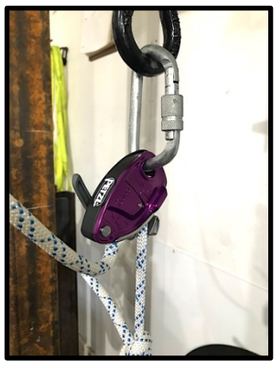
Petzl GriGri+ Testing

Date: October 23, 2019

Note: this is not a certified test and the author makes no guarantee of accuracy.
The Petzl GriGri+ is designed as a climbing belay device.

Configuration:



A new GriGri+ was connected via a carabiner to a dynamometer on the hydraulic cylinder of the break test machine. Selector knob on GriGri+ was placed in top-rope mode. Rope was threaded into GriGri+ with knotted bight anchored to the frame of the break test machine. Intent of the test was to measure the force required for various static ropes to slip through the GriGri+ device.

Ropes Tested:

- 8.3mm Imlay Canyon Fire, Polyester construction (new)
- 9mm Sterling HTP, Polyester construction (new)
- 11mm Bluewater II, Nylon construction (approximately 25 years old)

Results:

1. 8.3mm Imlay Canyon Fire: slippage occurred at 4.5 kN. Tester could not hold the rope over the brake bar firm enough by hand to keep it from slipping.
2. 9mm Sterling HTTP: slippage occurred at 7.75 kN. Tester could not hold the rope over the brake bar firm enough by hand to keep it from slipping.
3. 11mm Bluewater II: Rope did not slip so no brake hand pressure was applied. Catastrophic failure occurred of the GriGri at 10.2 kN. Rope remained intact.

How the GriGri failed:

At 10.2 kN of force the main cam pivot pin sheared off flush at the black side plate that holds the cam in place. This is a step-down pin that is a larger diameter going through the cam, then steps down to .200" where it fastens into the black side plate. Once the .200" diameter pin sheared at the plate, it allowed the cam to torque (drop down slightly) inside the body of the GriGri. This torqueing of the cam under load bent the anodized side plate outward (the opening and closing plate) and popped off the stainless plate that is attached to the anodized side plate. The stainless plate is used both as a brake bar wear plate (on the outside) and a capture device for the main cam pin (on the inside). Once the plate broke off, the whole cam and rope came out of the main body even though the carabiner was still intact and the unit was still closed and captured by the carabiner.

Photos:




Similar Devices

Tests on MadRock Safeguard:

The above tests were applied to a MadRock Safeguard device. The 8.3mm Polyester rope slipped at 4.3 kN and continued to slip. The 9mm HTP rope slipped at 8.5 kN for about 7 inches then started de-sheathing the rope. The 11mm Bluewater Nylon static rope did not slip at all and was finally pinched in two at 12 kN. The Safeguard device suffered no visible damage.

Photos: