Printables by JOSEF PRUSA



QuickLoc Carabiner and Hook System (print-in-place + molle compatible) V2

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VIEW IN BROWSER

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Summary

Sturdy and versatile D-Ring and Hook combo system combatible with molle, paracord and any 25mm (1") wide straps.

1.52 hrs	1 pcs	0.20 mm	0.40 mm	PET	14 g	Prusa MK3/S/S+

Sports & Outdoor > Outdoor Sports

Tags: hook hanger clip buckle printinplace loop strap backpack camping molle tactical outdoors paracord carabiner backpacking mollesystem pals strapbuckle

Now updated to an improved V2 design with additional “Compact” and “Belt” variants available! See update log for details.

Summary:

Extremely versatile hook and D-ring style carabiner combo, inspired by ITW GrimLoc carabiners I have been personally using for years on my gear and backpacks. Perfect solution for one handed access and carrying of frequently used items like gloves, hats, waterbottles, bunches of paracord etc. on the side of your backpack. Or pretty much anywhere you have MOLLE/PALS webbing or 25mm wide straps for mounting.

Compared to normal springy carabiners this design provides way easier access for taking or reattaching items and can be left in the open position with everything staying in the hook securely. Easy to open and close one handed even while loaded with gear.

Tested thoroughly to ensure a sturdy construction and a reliable lock while still being easy to open with the press of the thumb button.

In addition there are also two 4mm holes for more mounting options with paracord or other cordage. With these you can create easy to use closable **hanging points at the camp for jackets, backpacks, towels, camp shover etc.**

For added versatility there are now new variations of the standard hook design. See update log at the bottom for details about the variants and the separate folders in the Files page.



And please do post a make if you decide to print and use this model :-)

Printing:

- **Material:** PETG or similar flexible and impact resistant materials recommended
  - **PLA not recommended!**
  - PETG, CPE, ABS, ASA tested and validated
  - Polycarbonate tested but might be too stiff for the spring so mileage may vary
    - might work with a separate spring design optimised for stiffer materials
  - Nylon, PP not tested but should be good candidates
- **Perimeters:** 4-5 perimeters
- **Infill:** 20%-30% Gyroid infill
- **Layer height:** Optimised for 0.2mm, thinner layers should work without issues too
- **Supports and Brim:** no
- **Orientation:** laying on either side hook slightly open (should be oriented correctly in the print files)
- **Colour change height (optional):** 1.2mm and 9.2mm

Hinge is designed with a tight tolerance so moving it for the first time will require a fair amount of force. (Improved in the V2 design)

Similarly the locking mechanism might feel a bit stiff at first but after some use it becomes easier to operate. To open the buckle place your thumb against the button on the top and your index finger inside the loop and then press the button with said thumb.

Static load tests (V1 and V2):

- test done with the standard V1 and V2 hooks
- test pieces printed with generic PETG with 4 perimeters and 25% gyroid infill
- test pieces held by a 25mm strap from the webbing slot and loaded via another 25mm strap inside the main hook



Gate opening direction, Gate closed:

10kg dumbbell, held without opening. Opened but did not break at ~30kg load.





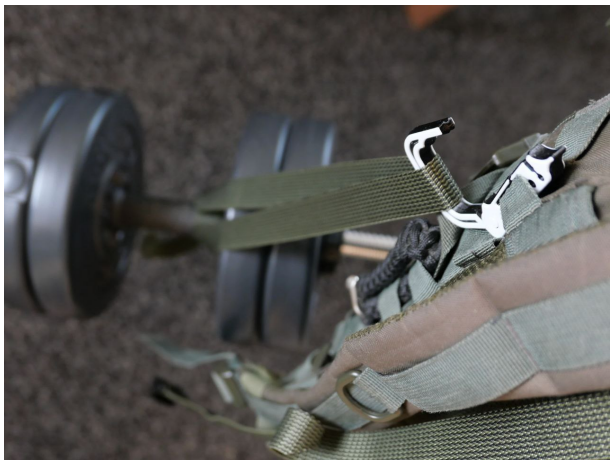
Vertical orientation, Gate closed:

10kg dumbbell held without opening. V1 opened and failed at ~35kg on luggage scale, V2 opened and failed at similar load.



Vertical orientation, Gate open:

10kg dumbbell held without damage to the hinge. V1 failed at ~25kg on luggage scale, with V2 the failure load increased to ~30kg.



Failure modes:



Quite happy with the change in failure modes for V2 version. Now it seems to not have a single weak point and instead failed in two distinct ways during testing. (pictured above)

Overall I think 30-35kg failure load is quite a good point to be in to ensure safety of the users. User should not be able to get snagged or stuck by the carabiner in any situation and realistically even small/young users mostly will weight at least 35 kg.

Update Log:

- **20.9.2024 - Added a higher tolerance version for the standard hook**
  - Based on feedback from @sethmoser added a new variant of the standard hook
    - Encountered issues while batch printing on a 0.6mm nozzle with PETG
  - Hinge tolerances increased by 0.1mm for all surfaces (0.2mm → 0.3mm)
  - Created a separate “Alternate-versions” folder for non-standard variants
  - File is named “QuickLoc-hook-V2-standard-0.3mm-tolerance.3mf”
- **19.9.2024 - V2 version available in “Belt” variant**
  - Model changes
    - Increased overall dimensions to fit the belt passtrough
    - Replaced paracord holes with a large single slot for use with belts
    - Belt hole dimension are roughly 42.5mm x 4.5mm (should fit most normal belts)
    - Increased overall thickness by 2 mm to support the frame with a larger passthrough
    - Increased base depth by 1 mm to reinforce the belt passtrough
    - Reshaped thumb button (lower profile and points away from the user slightly)
  - Model weight increased to ~22 g
  - Model print time ~2 hours with recommended settings
- **4.9.2024 - V2 version now available in “Compact” variant**
  - Weighs only ~10 grams (standard is around 14 g)
  - print time down to 1h15min (standard around 1h35min)
  - retains all standard version features in a smaller overall package
- **4.9.2024 - Updated to V2 version (general design and durability impr**ovements)
  - **Reworked latch spring geometry for increased life/ durability** and reduced risk of fatique cracks forming. Also makes the spring/locking force more consistent between different materials and over the lifetime of the carabiner.
  - Added an interal notch geometry inside the hinge to reduce the camming out force of the axle when loaded in open position.
    - Should **increase the gate open maximum load** significantly (needs verification)
    - also helps to keep the hook in the open position with a “soft lock”

- Revised some axle and hinge tolerances to reduce sticking of the mechanism when first used
- Structural improvements to the hinge design for **increased strenght and better printability**
- Paracord hole diameter increased slightly to make inserting cordage easier
- Thumb button geometry reworked slightly for easier pressing
- **Weight, overall dimesions and printing time remain the same** not to add unnecessary bulk or material
- Plans to add **additional versions** to the page (may change and ideas are welcome)
  - larger belt compatible version
  - compact/low profile version
  - large xl / heavier duty version
  - Paracord safety lock version
  - magnetic easy open version
- V2 is in the picture on the right and V1 on the left, the only major visual difference is in the spring section.



Model files

V2-Standard 2 files



quickloc-hook-v2-standard.3mf



quickloc-hook-v2-standard.stl



V2-Compact 2 files



quickloc-v2-compact.3mf



quickloc-v2-compact.stl



V2-Belt 2 files



quicklock-v2-belt.3mf



quicklock-v2-belt.stl



Alternate-versions 1 file



quickloc-hook-v2-standard-03mm-tolerance.3mf

☐ Use this version if you have issues with hinge tolerances

Legacy-versions 2 files



molle-hook-standard.3mf

for archival purposes, V2 recomended for all use cases



molle-hook-standard.stl

for archival purposes, V2 recomended for all use cases

Print files



quickloc-hook-v2-standard_02mm_petg_mk3s_1h31m.gcode

PET 0.40 mm 0.20 mm 1.52 hrs 14 g Prusa MK3/S/S+

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