



Beyond Disabilities - AXOLYFT

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Strength
Without Limits

Background

Our sponsor, Steve Ferreira, — a paraplegic Olympian, motivational speaker, and CEO of Beyond Disabilities— aims to improve gym accessibility for individuals with disabilities. This project focuses on designing a modular adaptive device that empower users within traditional gym settings.



Overview / Design Specs

AXOLYFT is a modular assistive device designed to empower individuals in wheelchairs to utilize commercial gym equipment with ease.

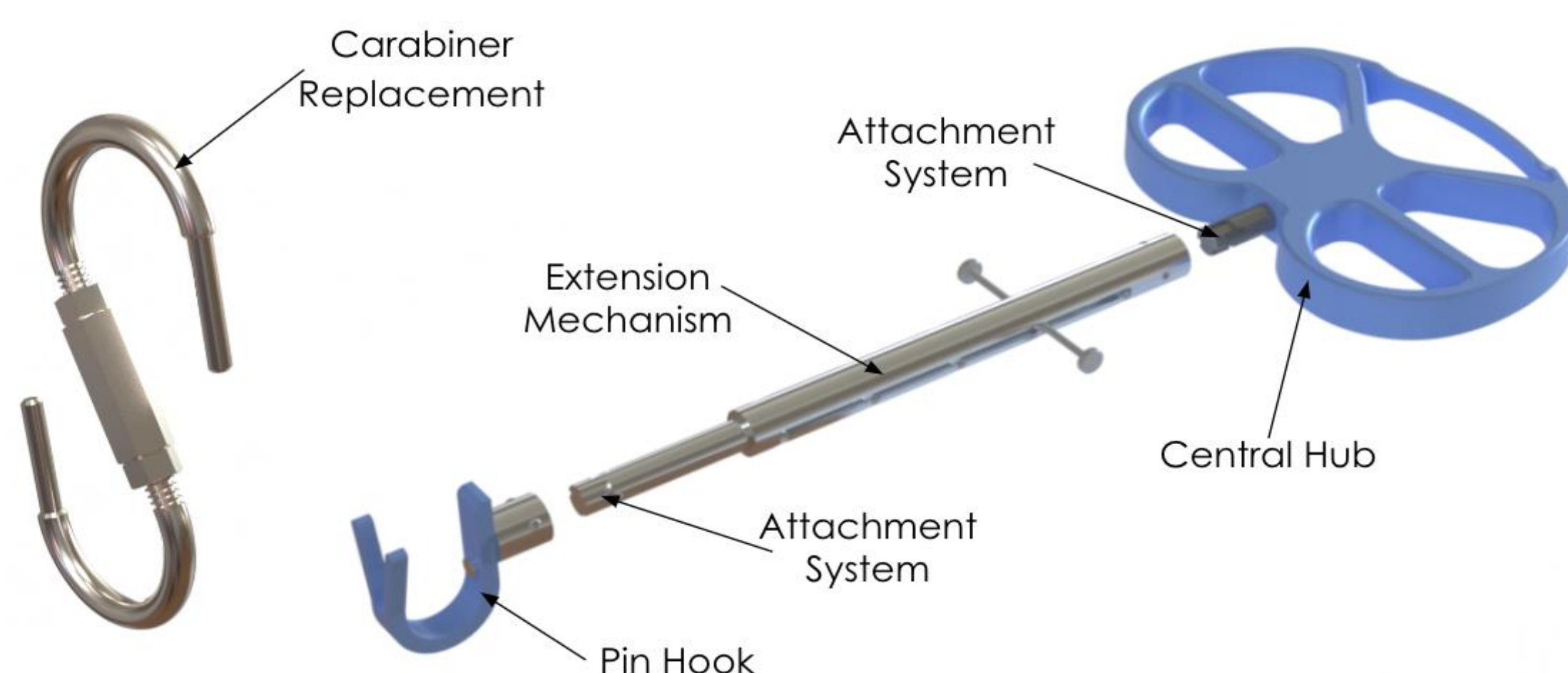
Key Problems Addressed

- Grip/hand mobility issues
- Extension/reach issues
- Carabiner clip manipulation

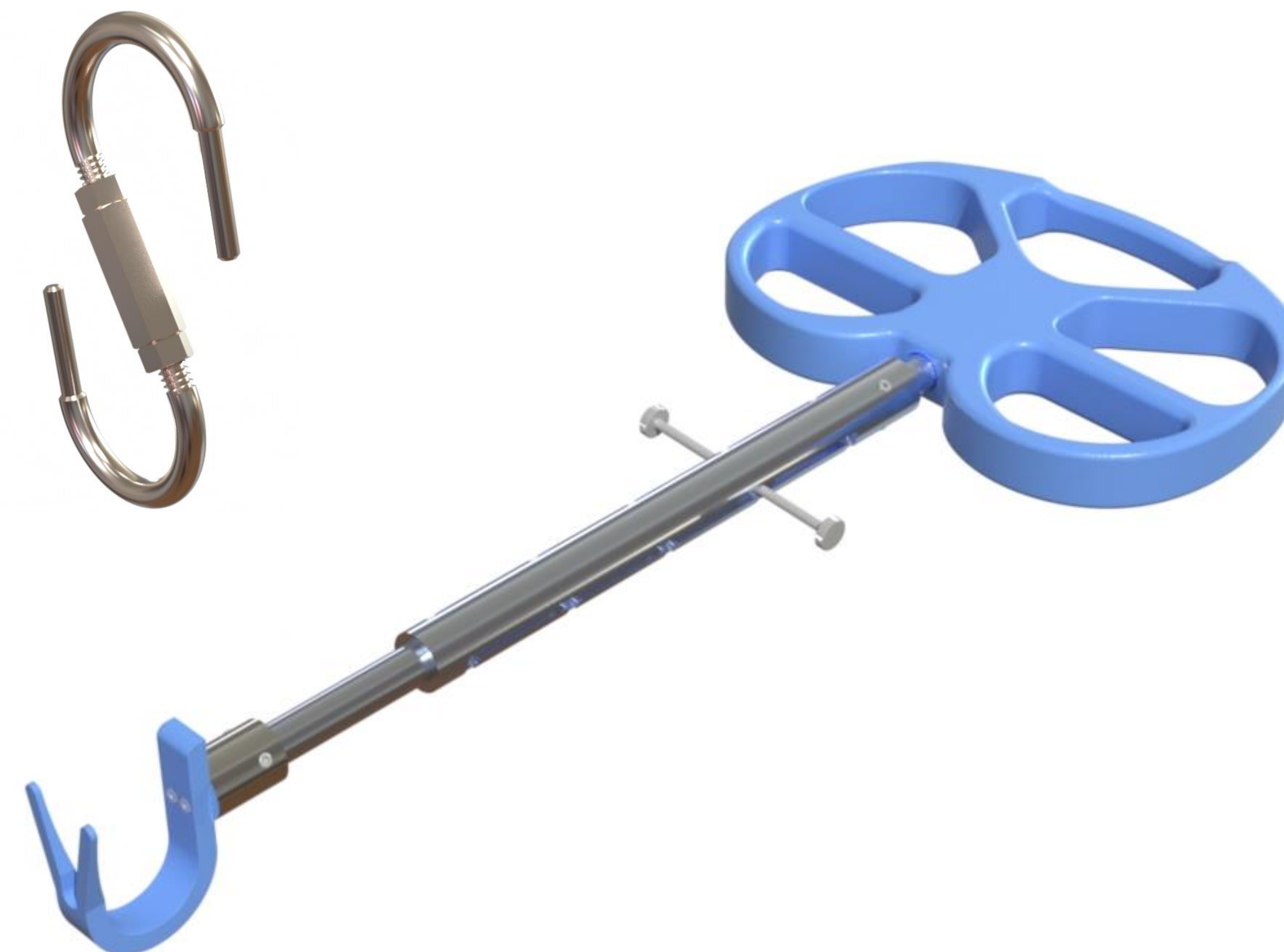
Key Specs

- Lightweight: 3.125lbs
- Durable: withstands 400lbs
- Extendable: 33in
- Affordable: \$100
- Portable: < 18" x 12" x 6"

Exploded View



AXOLYFT Adaptive Accessory



Key Components

Central Hub

- 3D printed with PET-G Carbon Fiber
- Primary base for all attachments
- Provide a secure and ergonomic grip

Extension Mechanism

- 5 different height options
- Compact length: 13in
- Extended length: 23in

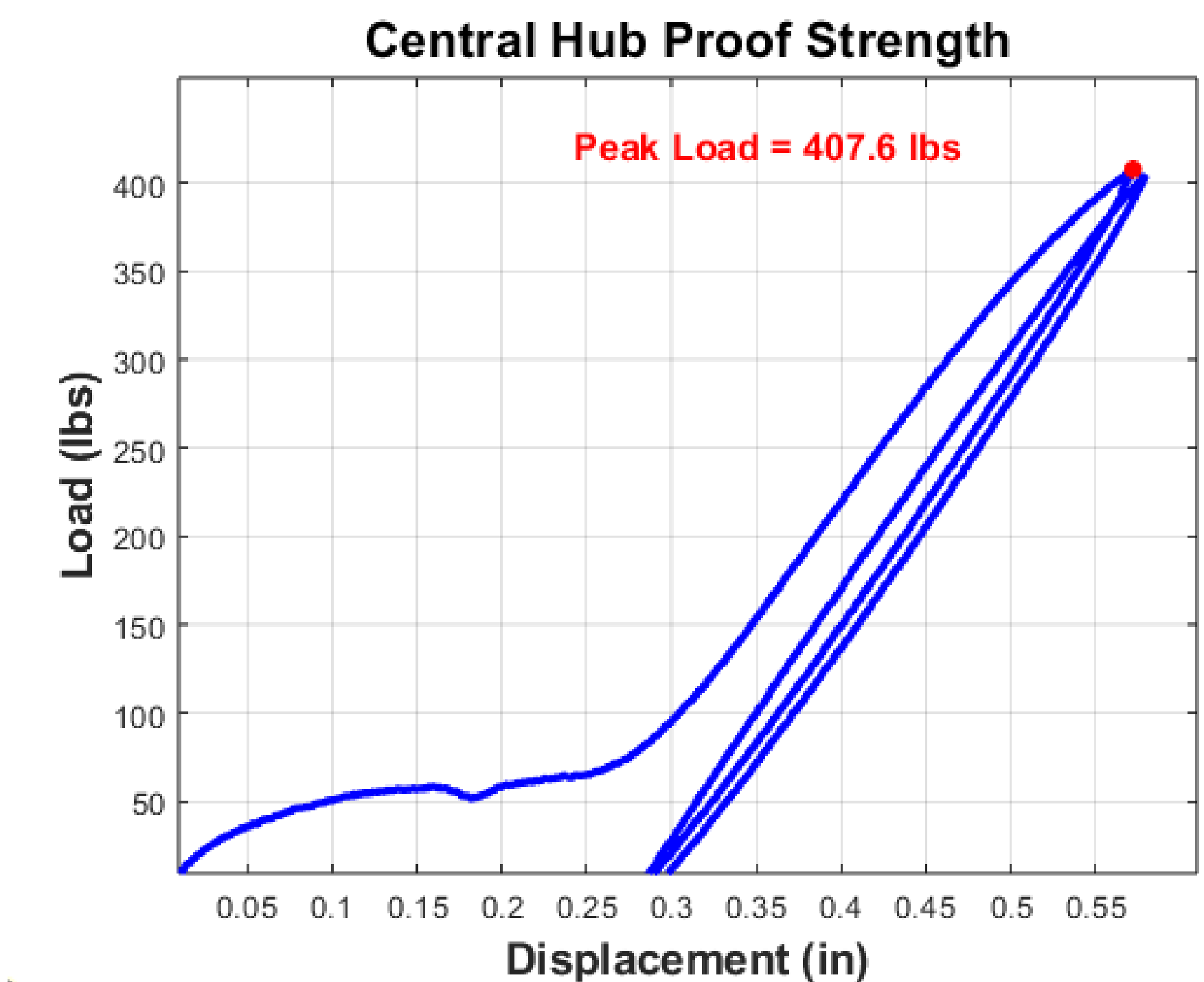
Pin Hook

- 3D printed with PET-G Carbon Fiber
- Magnet insert for stability
- Versatile attachment system

Carabiner Replacement

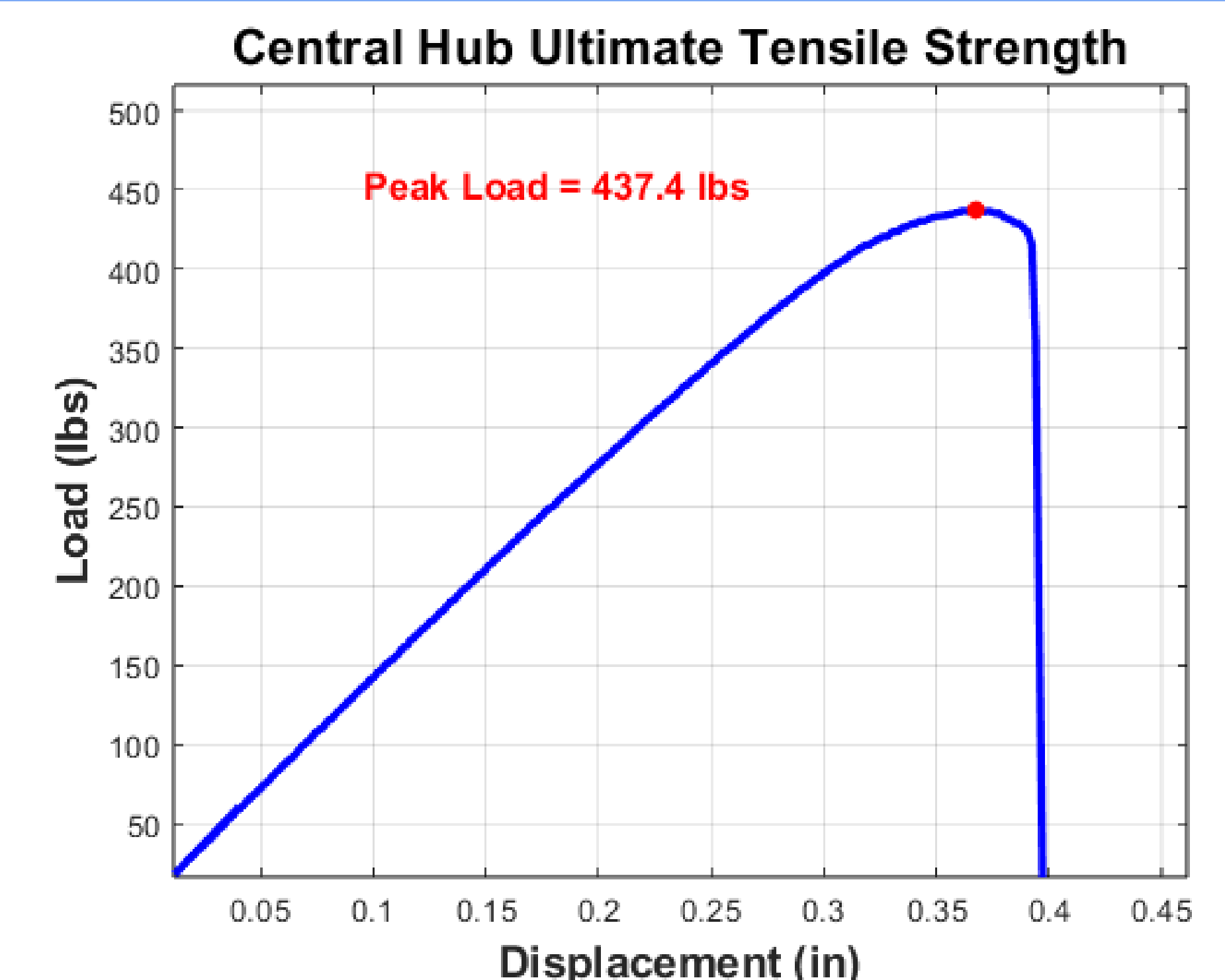
- Stainless Steel U bolts
- Zinc Coupling Nut

Central Hub Strength Test



- Assembly proof loaded to 400lbs
- Initial displacement of 0.3in
- No change after initial displacement
- Proof load before sending out

Central Hub Ultimate Tensile Test



- Assembly loaded until failure
- Failed at 437.4lbs
- Snapped at dovetail connections
- Sufficiently hits our goal of withstanding 200lbs with a safety factor of 2

Acknowledgements:

Steve Ferreira, Kirk Fields, Joyce Martinez, Devinder Grewal, Justin Fisher, Trevor Marks

Mission Statement:

At AXOLYFT, we believe fitness should be for everyone. It is our responsibility to remove barriers, foster inclusivity, and provide strength without limits!



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