**Problem Statement**

Client is a 36 year old Army National Guard Combat Engineer who was injured in 2004 by a suicide bomb. Among many of his injuries, he also has a thumb amputation on his right hand which provides continuous pain and difficulty gripping with his right hand.

**NEED**

Client rides his mountain bike and needs a device to:
- Be Safe
- Assist with Grip/ Prevent hand from slipping forward
- Allow Quick Movements
- Easily attach & detach from hand & bike
- No interference with any bike controls or motion of hand
- Able to be cleaned

**Prototype Process**

In order to develop a device that would not only fulfill the requirements needs, but also fit the client best, an iterative design process was used. In order to do this, the team agreed on one basic design and then continually changed little things about the design to best satisfy the client. This was done through 3D-printed models of the device.

Changes to the design continue to be made, even to the first machined prototype shown to the side. All changes shall be reflected in the second and final machined ASA.

**Design Analysis**

While the general idea of the ASA and Sleeve have remained constant throughout the entire design process, little components of each subsection have changed. As of now, these exploded views represent the current models.

**Components**

The main components of the design are the Adaptive Support Arm (ASA) and the Sleeve. The ASA is an aluminum brace the presses against the handlebar as the user is riding in order to prevent his hand from slipping forward (his primary issue). The sleeve is a brace-like feature that simply secures the ASA to the users arm.

**Adaptive Support Arm (ASA)**

- Base
- Arm

**Sleeve**

- Top Sleeve Cover
- Top Liner
- Bottom Liner
- Elastics
- Velcro Strap
- Bottom Sleeve Cover

**Team Members**

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**Testing**

- ASA Contact to Handlebar
- "Update In Progress"
- Correct Use Full Functionality
- Client Testing

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