



LIN
HUMAN POWERED
VEHICLES

Fall Design Review

November 29, 2012

Who are we?



What is a recumbent bike?



VS



ASME HPVC West



- Competition Overview
 - Drag/Sprint
 - Utility Endurance
 - Design Report
- Event Details
 - Moffett Field, CA
 - Sponsored by San Jose State University
 - April 12th-14th

Competition



Previous Results



2009- Philadelphia, PA- 3rd Place

2010- Stafford Springs, CT- 2nd Place

2011 – Indianapolis, IN – 1st Place

2012 – Grove City, PA – 3rd Place

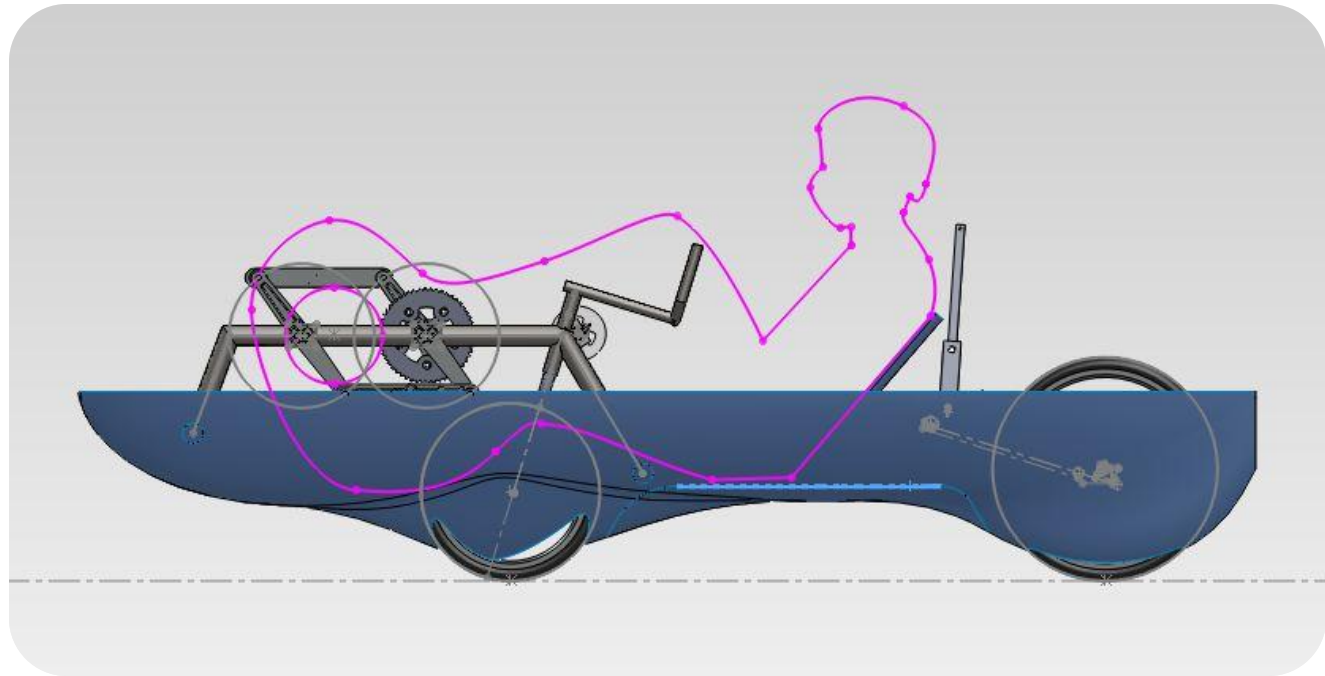
Modus Operandi



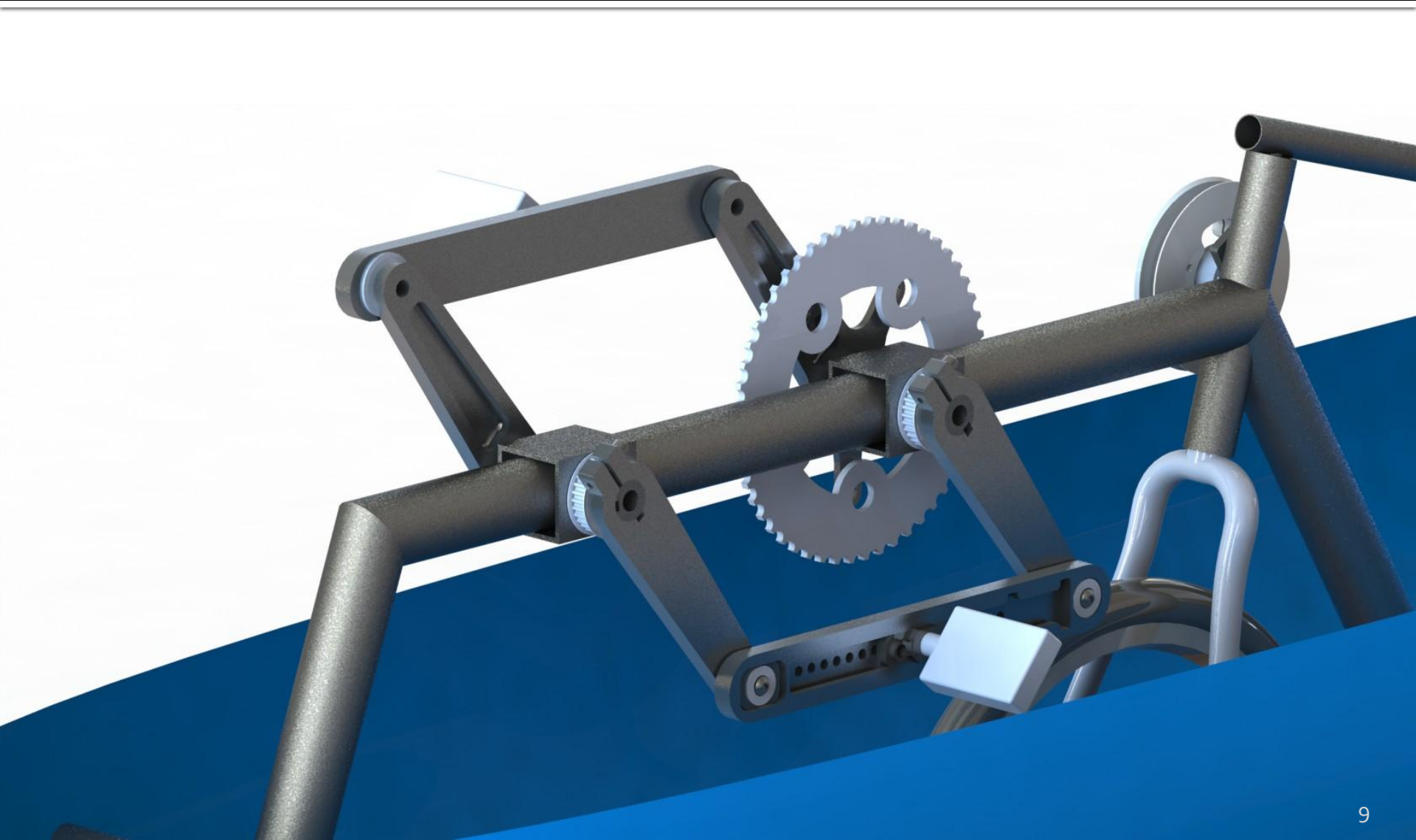
- Build it Early
- Break it Often
- Reuse the Good
- Be Ready

Systems Overview

- Slow Speed Stability System
- Fairing
- Rider Variation Compensation



Rider Variation Compensation

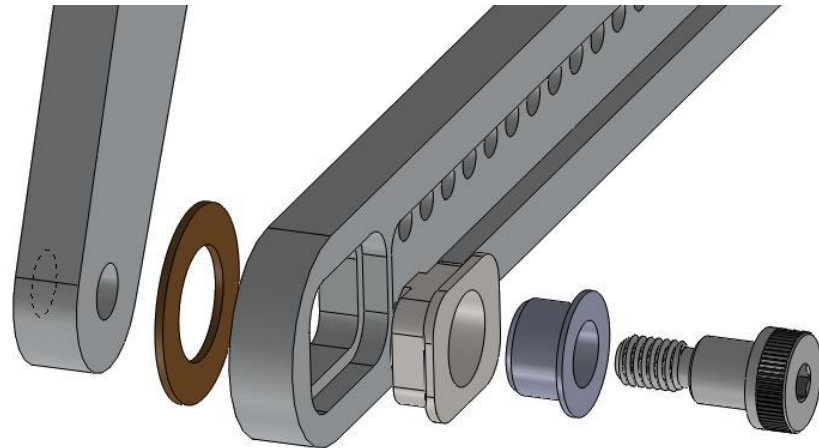
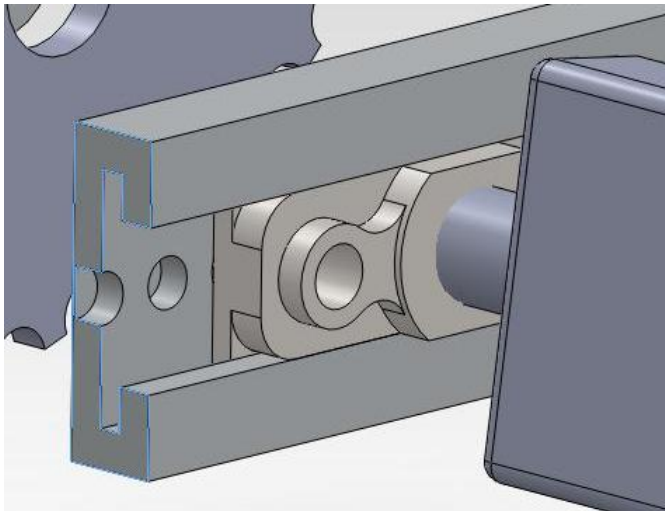


Rider Variation Compensation

- 8" of Variation
- Comparable Efficiency
- Fluid Movement
- Quick Adjustment

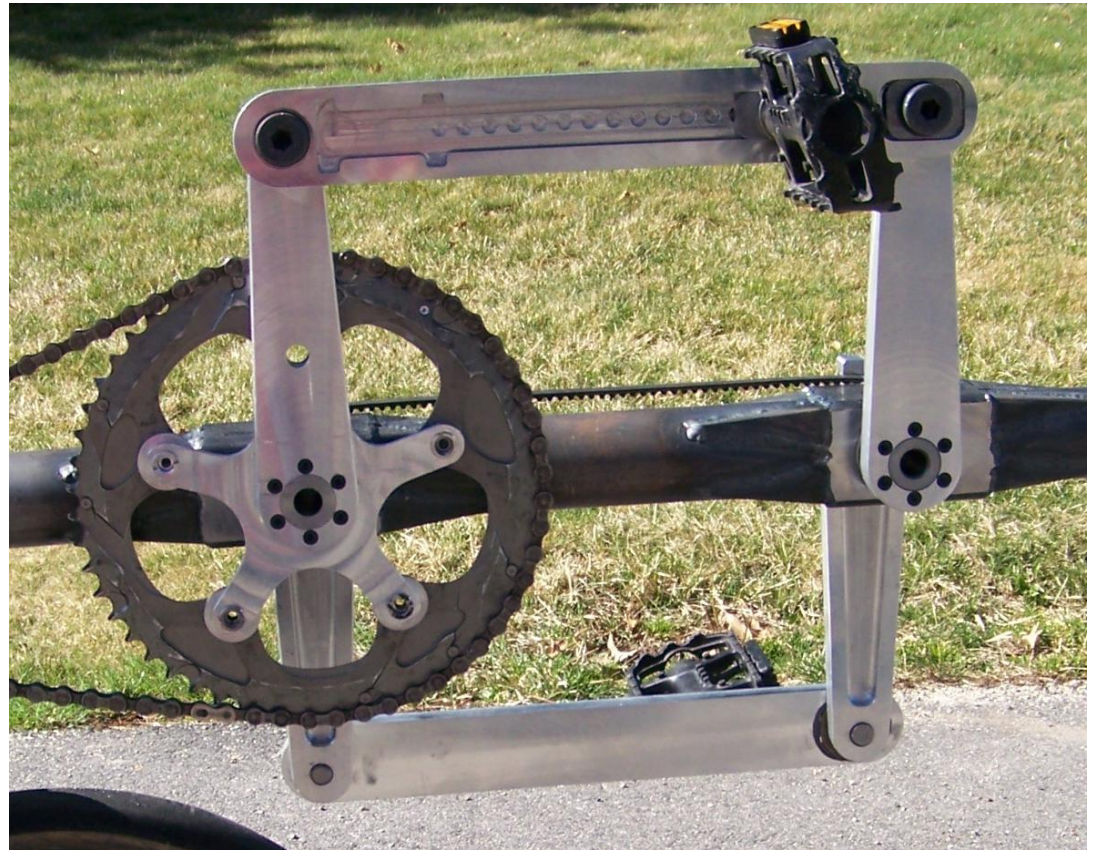


Rider Variation Compensation



Rider Variation Compensation

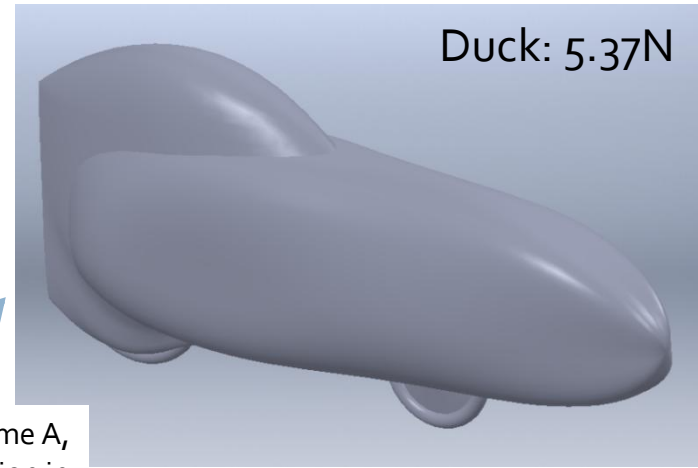
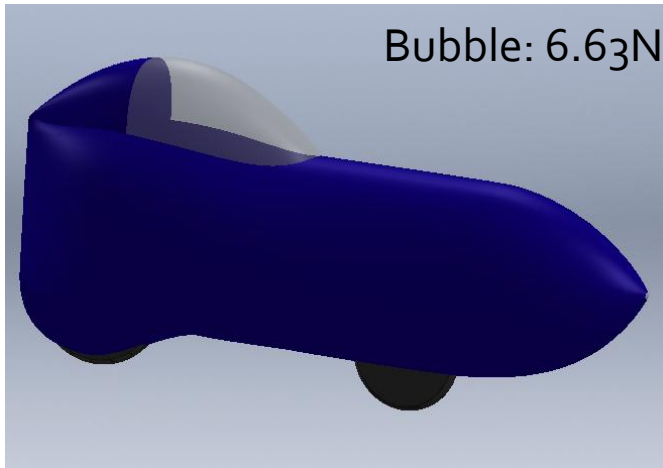
- Cut Weight
- Replace Main Bearings
- Reduce Q-Factor



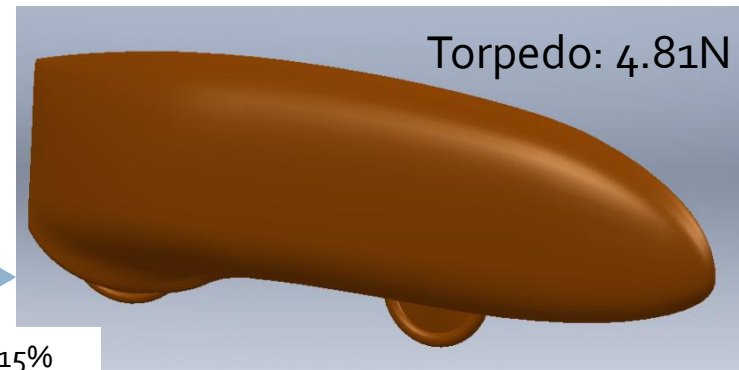
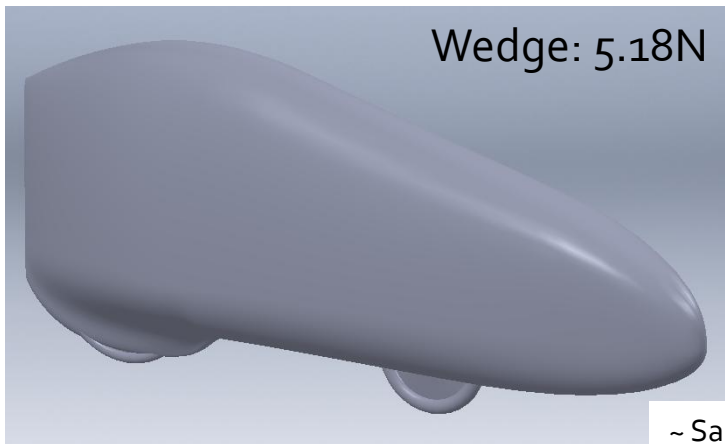
Fairing Design



Fairing Design

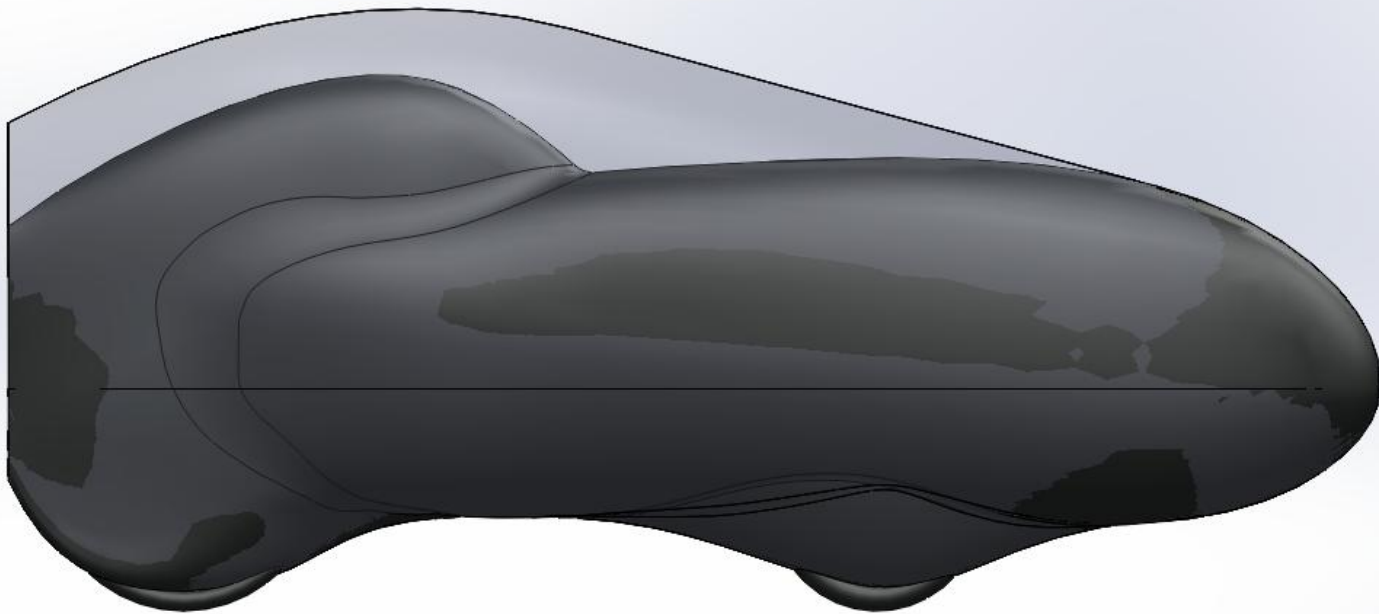


~ Same A,
reduction in
Cd

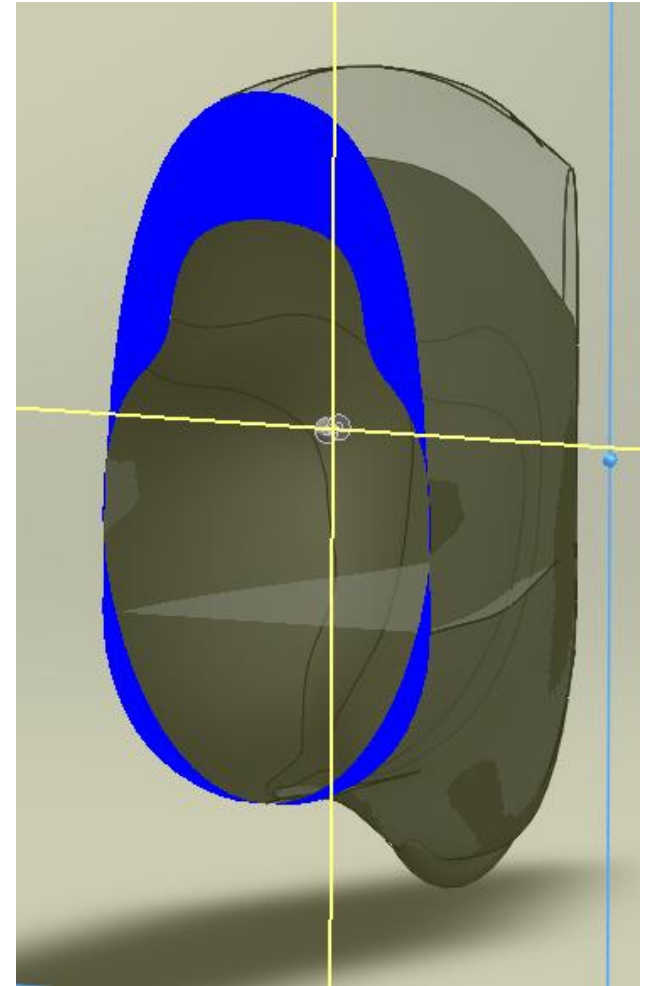
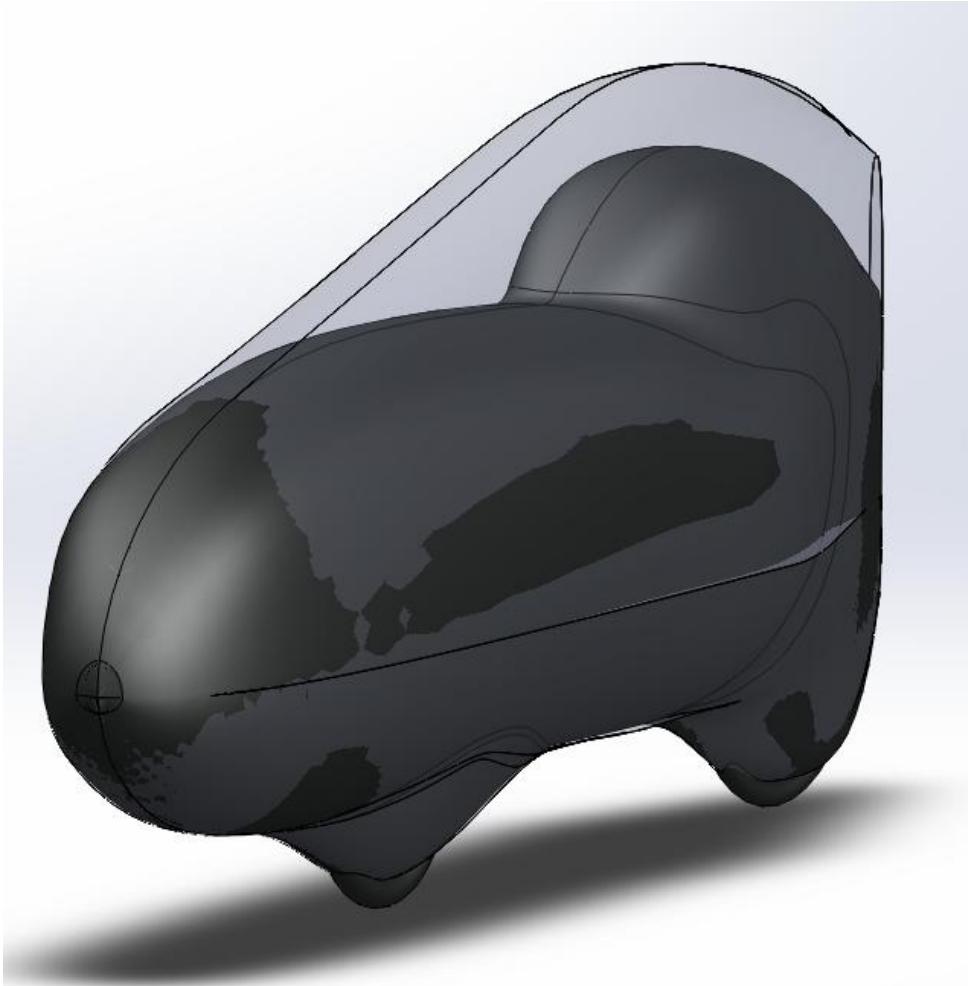


~ Same Cd, 15%
reduction in area

Fairing Design

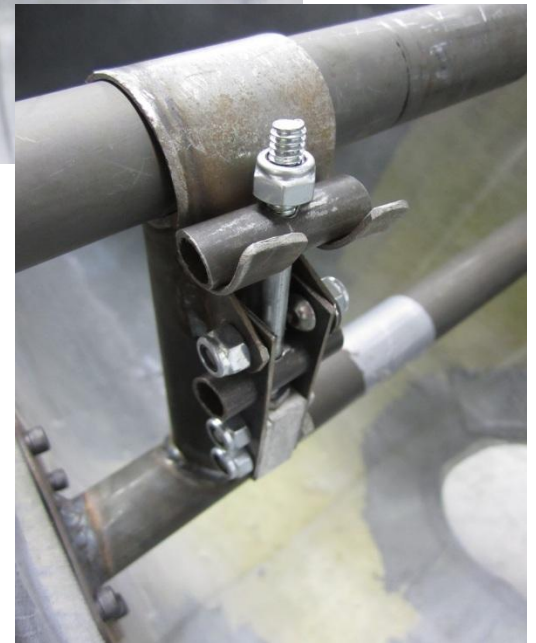
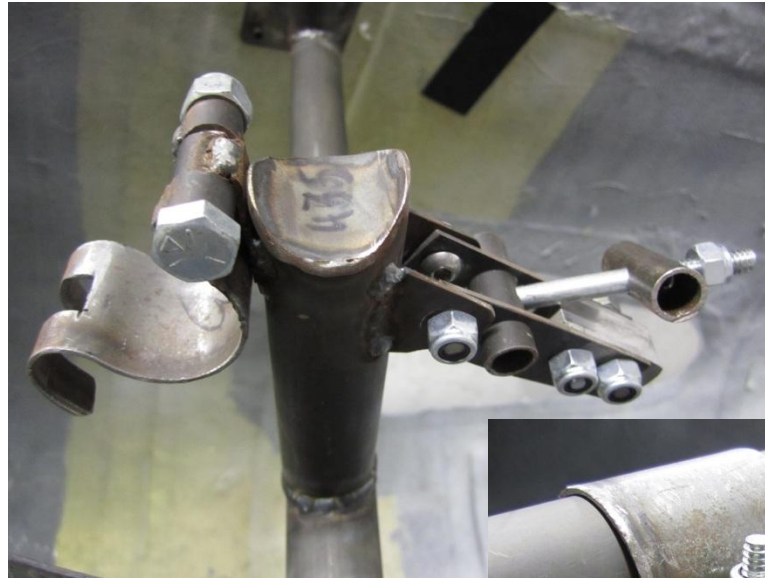


Fairing Design



Rollover Protection System

- Rules Change
 - No split
- Redesign
 - Follow the rules
 - Investigate new techniques

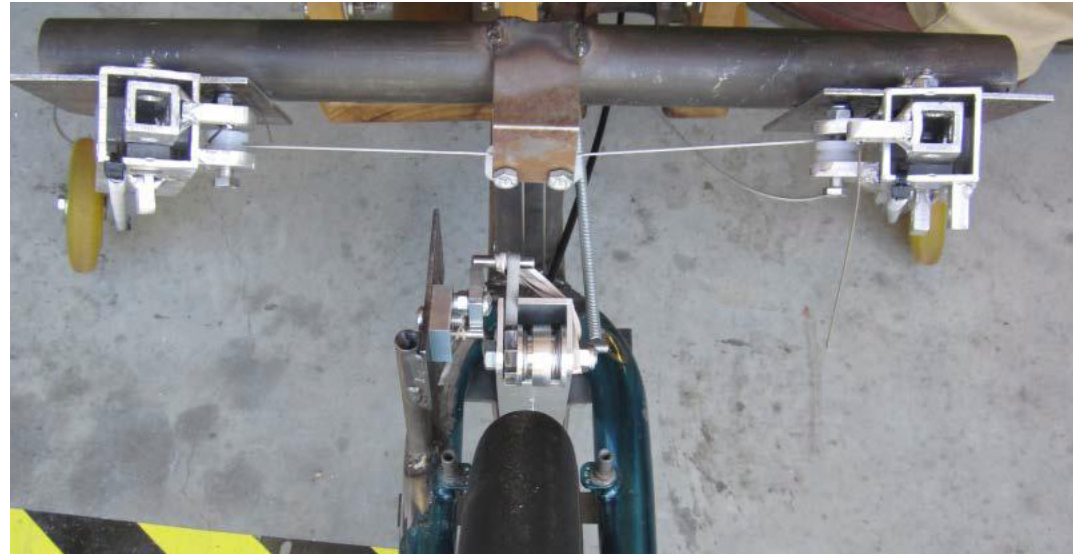


Slow Speed Stability System



Slow Speed Stability System

- Last Year
 - Telescoping design
 - Power deployment
 - Exposed cables
- This Year
 - A-frame design
 - Hand crank deployment
 - Housed cables

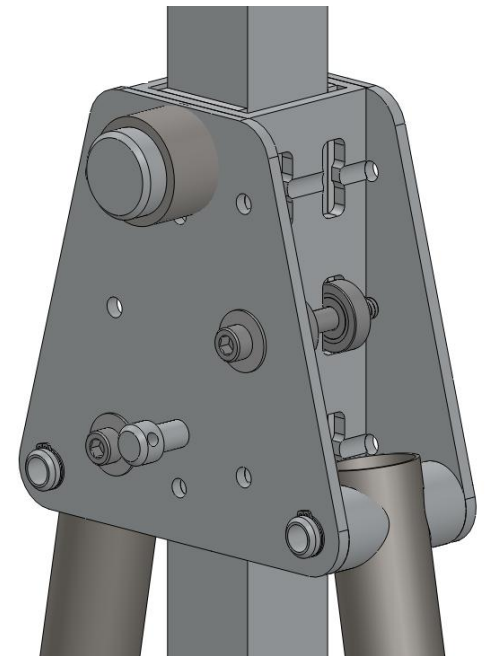
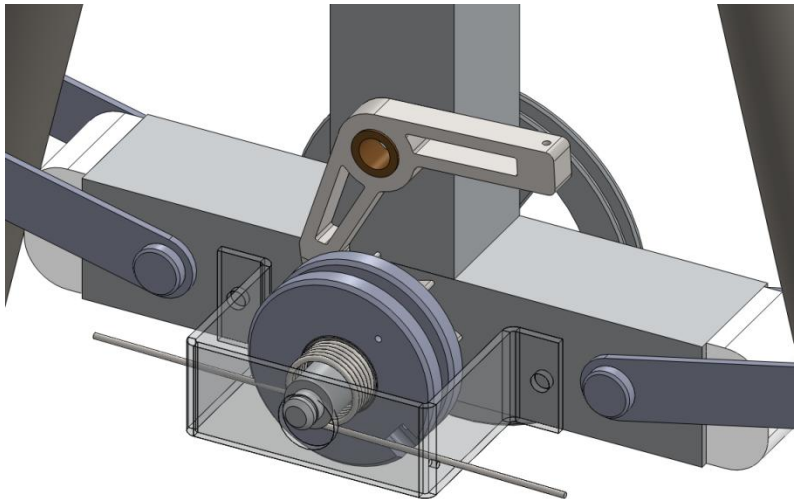
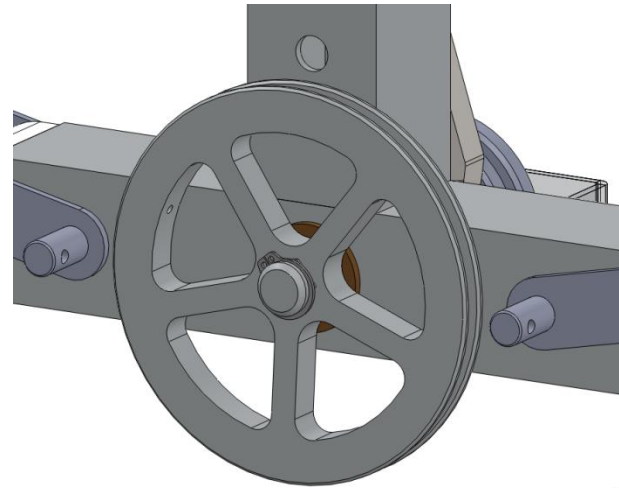


Slow Speed Stability System



Slow Speed Stability System

- Design Goals
 - Stability
 - Intuitive actuation
 - Reliability



Fairing Fabrication



Fairing Fabrication

- Last Year
 - Dowel construction
 - Cut in-house
- This Year
 - Dipole construction
 - Artisan's Asylum
 - Proper waxing



Fairing Fabrication

- Last Year
 - Four mold sections
 - Mating lip closure
- This Year
 - More mold sections
 - Attached door
 - Molded window



Seeking Advice

- Door Placement
- Landing Gear Actuation
- Window Molding
- Composite Techniques



Thank you.

If you have any questions, please come talk to us.

