Human Powered Vehicle Challenge

Overview

The HPVC Team was tasked with designing and building a Human Powered Vehicle to compete in the Human Powered Vehicle Challenge (HPVC) at the ASME E-Fest held at Penn State. The vehicle needed to be designed to compete in both an endurance and sprint event, as well as to protect the rider in the event of a crash. The greatest challenge the HPVC team had to overcome was the lack of manufacturing experience when it came to fabricating custom parts as well as welding.

Objectives

The team’s main objective was to have a completed human powered vehicle that could safely compete in the HPVC at the beginning of April. The vehicle needed to meet all of the standards set forth by ASME as well.

Approach

- Met with sponsor and existing team to learn about the project
- Read the contest rules and determined project requirements
- Researched existing recumbent bike designs and relevant patents
- Began frame design in SolidWorks and completed FEA for safety requirements
- Purchased off the shelf components for the drivetrain and cockpit
- Began frame fabrication
- Put together the custom frame and off the shelf parts
- Tested the vehicle to eliminate any issues before the competition
- Competed in the 2018 HPVC

Outcomes

- Overall this project was a success
- The vehicle competed well at the HPVC and place 21rst out of over 40 teams
- There were minimal mechanical issues during the competition
- The vehicle successfully navigated all obstacles and proved to be fairly reliable