Energy From Free Wheeling Propellers

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Problem Statement:

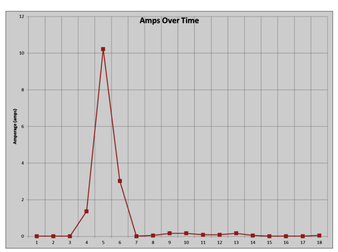
The reliability of sailing vessels is limited by insufficient energy production ability for long underway periods. Many vessels use batteries to meet energy demands however batteries do not provide capacity for extended voyages. To fulfill the extra energy requirements vessels run their motors and charge up their batteries. This motoring is noisy, inefficient, and takes away from the sailing experience.

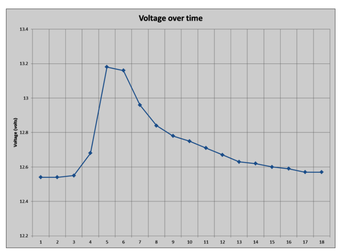
Proposed Solution:

Many sailing vessels sail with a free wheeling propeller which provides easy to capture energy. This energy will be captured via an alternator geared to the main propeller shaft.

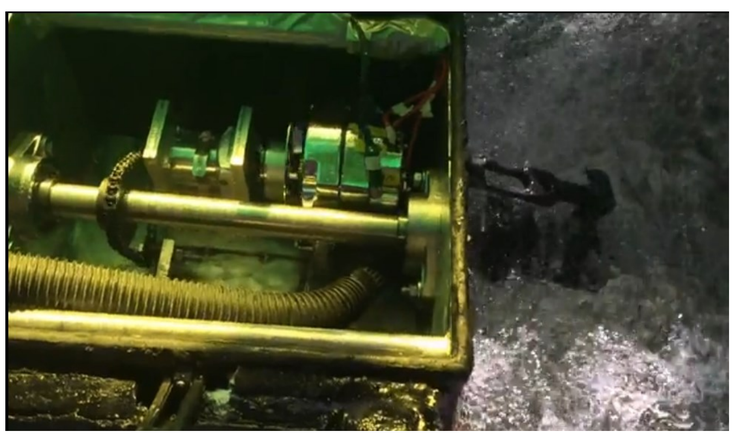
Customer Needs:

- Function without supervision from deck hands
- Fit on an average sailboat without impeding vessel operation
- Tie into main batteries
- Produce 102 Watts at 5 knots
- Run effectively for a 2-week underway voyage
- Device must be corrosion and water resistant.

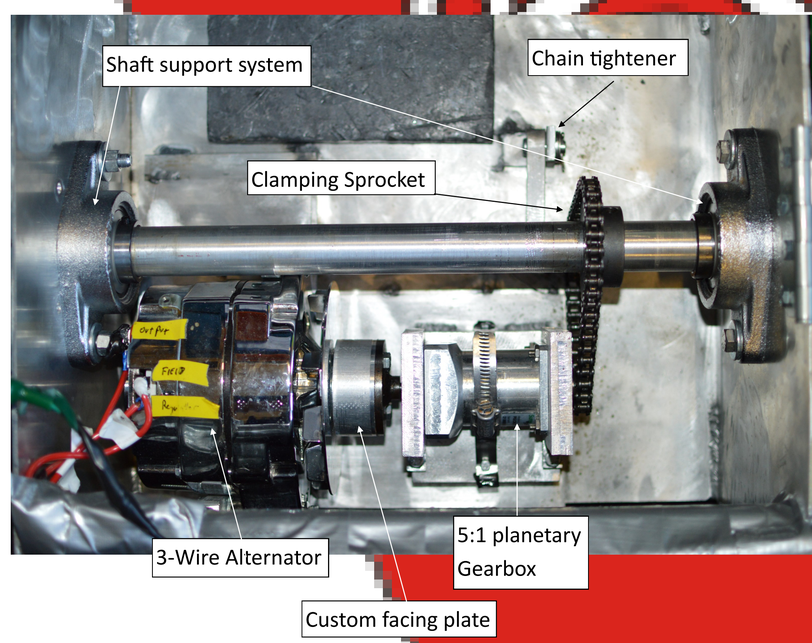




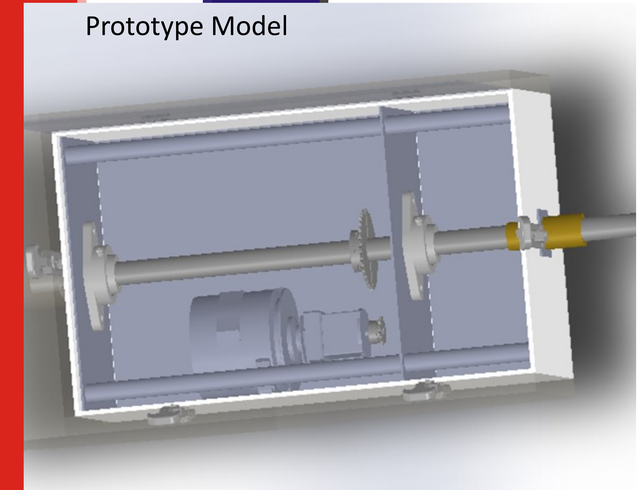
Self Excitation Voltage and Amperage Curves



Operating during water test



Prototype Model



Major Constraints:

-Bilge space limitation

-Constructing operable testing platform

- Building around an immovable shaft

Technical Summary:

A power extraction device attached to a sailing vessel's free wheeling propeller shaft. Solution utilizes a three wired alternator monitored for voltage, amperage and shaft speed. The device is optimized through a gearing system to increase RPMs into the alternator