Alternator Conversion

By Robert Wenger, Bodi Morris, Connor Wilkinson, and Evan Lake Faculty Advisor: Dr. Kevin Kilty

Abstract

Millions of people do not have access to a sustainable source of electricity. This project will examine how to convert a used alternator into a generator as a means of developing cheap and renewable electrical power. We conducted a proof-of-concept test where an electric motor was used to rotate the alternator and produce enough electricity to charge a 12-Volt battery. This leads us to believe that it is possible to not only convert an alternator into an efficient generator, but also to produce a useful quantity of electrical power.



Alternator Testing Circuit



Lovejoy Coupling



Alternator Testing Setup



Alternator Characterization



Future Directions

Permanent Magnet Generator:

The "Permanent Magnet Generator" would make it possible to generate power from the alternator effectively without the need to charge the coils on the rotor. The traditional rotor coils would be replaced with a permanent magnetic rotor that would hypothetically behave the same as the "Optimized Generator".

Optimized Alternator:

The "Optimized Alternator" is a solution that would utilize a renewable power source, such as a solar panel that can supply 12 volts, to either charge the rotor coils of the alternator or pre-charge the battery. The alternator could then become a reliable power source when rotating at approximately 1000 RPM.