

Kyle Harlow

*To Make or To Move: Discovering a Relationship Between Motors and Generators*

Energy, especially the production of electrical energy, is immensely important to the modern world. Advances in this field could have wide implications. This experiment was designed to answer the question: Is there a relationship between the amount of energy a generator can produce and its reciprocal motor can use? The hypothesis was that there will be a relationship between the amount of energy produced by a generator and the amount of energy consumed by its reciprocal motor, and that more efficient motors will have lower differences. A 30-volt, 12-volt and 9-volt motor were tested. A circuit that eliminated as many variables as possible and could record amperage, revolutions per minute (rpm), and voltage was used to test each motor. The power used by the motor at different rpm's was recorded. Then a new circuit was designed to test the generator's power production. The data was analyzed using a variety of statistical tests such as regression correlations, corrected curve from a Probit and correlations between lines. The regression of the 30 and 12-volt motors showed that they followed power curves. Probit straightening of the curves found that the motor and the generator were related. It also showed that the two relationships were different. These both prove the hypothesis correct. This experiment shows that if the relationship between a motor and a generator is known then the consumption or production of the reciprocal motor or generator could be calculated. This would allow for much simpler testing of both.