

Magnetic Drive System

Sponsor: Future Force

Sponsor's Mission Statement: To create alternative means of power transmission while obtaining the highest levels of efficiency and safety.

Sponsor's Contact: Mike Tkadlec

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University of St. Thomas School of Engineering Academic Advisor: Dr. Mike Hennessey

Team Members: Tom Bergner (ME), Alex Hine (ME), Mike Zimmerman (ME), TJ Hardy (EE)

Project Mission: To improve the magnetic drive system patented by Mike Tkadlec through testing, research, and analysis, and to implement this new system into an electric vehicle to demonstrate the potential for this technology.

Major Design Requirements:

1. Increase system efficiency to greater than 93%
2. Fully enclosed the drive should not exceed 30" x 30" x 58"
3. System weight less than 1000lb
4. Maximum Vehicle Speed 15 mph
5. Acceleration of 7.0 ft/s
6. Powered by 72 V DC (9x8v batteries)
7. Travel Radius greater than 55 miles

Project Summary: The scope of this project is to test, understand, and develop a new generation prototype of a magnetic gearing system. This system will replace the original transmission of an electric vehicle. To accomplish this, we began with designing a test bed. We wanted the ability to adjust several parameters, and allow for sensors and controls. Much of the first semester was used to complete this task. We then spent January testing and finding the optimal configuration for the system. Based on our data, we designed and built a next generation prototype for implementation in the vehicle. This new prototype was built to achieve the highest levels of efficiency, while ensuring enough power to drive the vehicle.

