

# **DESIGN, DEVELOPMENT, AND FABRICATION OF AN ELECTROMAGNETIC BREAKING SYSTEM (EBS)**

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## **ABSTRACT**

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The braking system that is widely used at this moment in time relies on frictional forces to slow down a vehicle to a stop; this requires high mechanical force which is countered with hydraulic power, in most cases brake oil. Due to friction, the components significant in making this system work require regular replacements and maintenance, which is costly. Another drawback of the conventional system is that if the brake oil leaks and the driver are not aware, they could be in a very dangerous situation.

This project aims to tackle this problem by using Electromagnetic Braking System (EBS). By using electromagnets, directing the similar poles to face each other and using the repelling forces from the similar poles to slow down the vehicle and eventually bring it to a stop. The strength of the poles of the electromagnets is controlling the electrical current supplied to them.

The EBS in this project is designed for a bicycle, research into the fundamentals of electromagnets were done as well as research into the current applications for electromagnets which ranges from doorbells to heavy machinery to EBS already in use for this day and age. Aside from that, the forces that might be acting on a bicycle under different circumstances were discussed and said forces were calculated to provide a rough idea of how much force the EBS should counter. The designs for the EBS were done with all these factors in mind, and the hardware part of the project was constructed according to the design.