**Advance Smart GPS & Electromagnetic Brake system**

**ABSTRACT**

Rising incidents of theft vehicles is an increasing concern in cities. The purpose of this project is to eliminate all possibility of theft by using ‘Advance Smart GPS System’. ‘Electromagnetic Brake Systems’ are the future of transportation safety using ‘Eddy Current Law’. Eddy current braking systems are a better alternative to the currently used friction based braking systems for instance disk and drum brakes. Electromagnetic brakes have become a wide regarded, technological advancement, in regards to the reduction of friction and heat energy produced, when braking heavy loads of matter. By Combining ‘Advance Smart GPS’ & ‘Electromagnetic Brake System’ technology can get all the stats of these two system into mobile by creating a Mobile App. These System can be controlled from Mobile app, Smart GPS System is a system in which can integrate all vehicles into one app to track data and analyze from different place regardless of vehicles location. This Smart GPS System Project is copyrighted (©) by ‘Dread Eye Studio’. This project definitively answers the question regarding elimination of theft & future proof. Further studies are needed to establish crucial for safety & preventative measures.

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**ABBREVIATIONS**

DES - Dread Eye Studio

DES MC - Dread Eye Studio Microcontroller

GSM - Global System for Mobile Communication

APN - Access Point Name

GPS - Global System for Mobile Communication

AVL - Automatic Vehicle Location

GIS - Geographic Information System

RF - Radio Frequency

AGPS - Assisted Global Positioning System

RDID - Radio Frequency Identification

DC - Direct Current

AC - Alternating Current

HTTP - Hypertext Transfer Protocol

HTML - Hypertext Markup Language

IDE - Integrated Development Environment

CSS - Cascade Style Sheet

SQL - Structure Query Language

DBMS - Database Management System

JDBC - Java Database connectivity

2D - Two Dimensional

3D - Three Dimensional

XML - Extensible Markup Language

POST - Power On Self Test

EEPROM- Electrically Erasable Programmable Read only Memory

SRAM - Static Random Access Memory

API - Application Programming Interface

**Chapter 1: Introduction**

**1. Introduction and History of Advance Smart GPS System**

**2. Introduction and History of Electromagnetic Brake system**

**Introduction:**

Enhancement in Technology a lot of new technologies are arriving in the braking systems. The principle of braking is depending on the conversion of energy that is converted kinetic energy into thermal energy form of heat. In two wheeler Disc brake and drum brake are used in existing system, both braking are contact type braking as well as the frictional resistance braking. Dude to contact type braking losses are more like the wear and tear and so on. Also maintenance is required more like lubrication, replacement of auxiliary part due to wear and tear. There are few problems in the existing braking system. Realize the importance of the new braking system that reduced common problems mentioned earlier, experiment will be conducted to study of electromagnetic braking system. In this electromagnet electrical supply converted into magnetic field which act as magnetic force on the disc to be braked. In this braking system parameter influence to the braking force which is electrical current, air gap between the disc and the electromagnet etc. These are parameter will be design in this experiment. This type of braking system is more effective than the existing braking system. And all disadvantages of the existing braking system will be minimized in the electromagnetic braking system. Electromagnetic brakes are also called as Electro Mechanical Brakes. Stop motion using electromagnetic force to apply mechanical resistance form of frication. The original name was “Electro Mechanical Brakes” but over the years the name changed to “Electromagnetic Brakes”, referring to their actuation method. Since becoming popular in the mid 20th century especially in trains and trams, the variety of application and brakes designs has increased dramatically but the basic operation remains the same. Electromagnetic brakes are the brakes working on the electric power and magnetic power. They work on the principle of electromagnetism. ‘Electromagnetic Brake Systems’ are the future of transportation safety using ‘Eddy Current Law’. Eddy current braking systems are a better alternative to the currently used friction based braking systems for instance disk and drum brakes.

**History:**

It is found that electromagnetic brakes can develop a negative power which represents nearly twice the maximum power output of a typical engine, and at least three times the braking power of an exhaust brake. These performances of electromagnetic brakes make them much more competitive candidate for alternative retardation equipments compared with other retarders. By using the electromagnetic brakes are supplementary retardation equipment, the frictions brakes can be used less frequently and therefore practically never reach high temperatures. The brake linings would last considerably longer before requiring maintenance and the potentially brake fade problem could be avoided. In research conducted by a truck manufacturer, it was proved that the electromagnetic brake assumed 80% of the duty which would otherwise have been demanded of the regular service brake. Furthermore the electromagnetic brake prevents the danger that can arise from the prolonged use of brake beyond their capability to dissipate heat. This is most likely to occur while a vehicle descending a long gradient at high speed. Ina study with a vehicle with 5 axles and weighting 40 tones powered by a powered by an engine of 310 b.h.p travelling down a gradient of 6% at a steady speed between 35 and 40 m.h.p, it can be calculated that the braking power necessary to maintain this speed ot the order of 450 hp. The brakes, therefore, would have to absorb 300 hp, meaning that each brake in the 5 axels must absorb 30 hp, that a friction brake can normally absorb with self destruction. The magnetic brake is wall suited to such conditions since it will 9 independently absorb more than 300 hp. It therefore can exceed the requirements of continuous uninterrupted braking, leaving the friction brakes cool and ready for emergency braking in total safety. The installation of an electromagnetic brake is not very difficult if there is enough space between the gearbox and the rear axle. If did not need a subsidiary cooling system. It relay on the efficiency of engine components for its use, so do exhaust and hydrokinetic brakes. The exhaust brake is an on/off device and hydrokinetic brakes have very complex control system. The electromagnetic brake control system is an electric switching system which gives it superior controllability.

**Chapter 2: Literature Review**

**1. Literature Review of Advance Smart GPS System**

**1.1. Active and Passive Tracking System**

**1.2. Type of Tracking System**

**2. Literature Review of Electromagnetic Brake System**

**Principle of Electromagnetic Brake System**

If a piece of copper wire wound around the nail bar and then connected to the electrical supply, it would create that substance to act as an electro magnet. The magnetic field that is generated in the wire, from the current is known as “Right Hand Thumb Rule”. The Strength of the magnetic field can be changed by changing both wire size and the amount of wire turns. An Electromagnet is type of temporary magnet in which magnetic field is produced by a flow of electric current. The magnetic fields disappear when the current is lost. The wire produces loops of magnetic field lines around it, the current represents the movement of bar and resulting field line direction is the direction of turning. If a wire is wound into a coil, then the field lines add up in such a way as to produce a set of field lines surround the coil in a similar way to those that surrounds as a permanent bar magnet. If further a piece of soft iron is placed inside the coil, they themselves serve as many little bar magnets in the iron, creating a strong bar magnet as long as the current is switch on.

**Working of Electromagnetic Brake System**

A soft iron core that is magnetized by passing a current through a coil of wire wound on the core. Electromagnets are used to lift heavy masses of magnetic material and to attract movable magnetic parts like iron disc and ferrous material. When electric supply given to the electromagnet then it act as a temporary magnet this magnetic field exerted the force on rotation disc in the direction of perpendicular to the disc. In an engineering sense the word electromagnet does not refer to the electromagnetic brakes and clutches, and in attractive and lifting or holding magnets and magnetic chucks.

Electromagnets may be classified into two types:

* Traction Magnets:

In which the pull is to be exerted over a distance and work is done by reducing the air gap.

* Lifting or holding magnets:

In which the material is initially placed in contact with the magnet For Examples of the latter type are magnetic chucks and circular lifting magnets.

**Design and Practical Working:**

Theoretically, it is divided into three main units are Base unit, Driving unity and Braking Unit. Base unit consist of structural foundation of base unit, driving unit consist of an electrical motor, power control and bearing. Braking unit consists of an electromagnet. Electromagnetic brakes also called as Electro Mechanical Brakes. Stop motion using electromagnetic force to apply mechanical resistance by friction. The original name was “Electro Mechanical Brakes” referring to their actuation method. Since becoming popular in the mid 20th century especially in trains and trolleys, the variety of application and brake current brakes use electromagnetic force but electromagnetic brakes ultimately depend on friction and eddy current brakes use magnetic force directly.

**Material Selection:**

Material Selection process is depending on application of where the brake is used. Generally plate is mostly used in aluminum because it is very efficient to produce eddy current in plate. Preferred to use most effective copper plate but it is not cost efficient.

**2.1. Type of Brake System**

* **Electromagnetic Brake System:**

Rising style of brake system, electromagnetic brakes use an electric motor that is included in the automobile which help the vehicle come to stop. These types of brakes are in most hybrid vehicles and use an electric motor to charge the batteries and regenerative brakes. On occasion some buses will use it as a secondary retarder brake.

* **Frictional Brake System:**

Frictional brake system is found in many automobiles. It is typically found in two forms pads and shoes. As the name implies these brakes use friction to stop the automobile from moving. They typically include a rotating device with a stationary pad and a rotating weather surface. On most band brakes the shoe will constrict and rub against the outside of the rotating drum. Alternatively on a drum brake, a rotating drum with shoes will expand and rub against the inside of the drum.

* **Hydraulic Brake System:**

A hydraulic brake system is composed of a master cylinder that is fed by a reservoir of hydraulic braking fluid. This is connected by an assortment of metal pipes and rubber fittings which are attached to the cylinders of the wheels. The wheels contain two opposite pistons which are located on the band or drum brakes which pressure to push the pistons apart forcing the brake pads into the cylinders, thus causing the wheel to stop moving.

**2.2. Signification/Scopes of Electromagnetic Brake System**

* Electromagnetic brakes satisfy all the energy requirements of braking without the use of friction. They have better heat dissipation capability to avoid problems that friction brakes faces times.
* They can also be used as supplementary retardation equipment in addition to the regular friction brakes on heavy vehicles.
* These brake component cost is less so these brakes are cheap.
* They can be used as an alternative method for the future crisis of the crude oils.

**2.3. Limitations of Electromagnetic Brake System**

* The installation of an electromagnetic brake is very difficult if there is not enough space between the gearbox and rear axle.
* It cannot use grease or oil.
* Electromagnetic brakes are good at slowing things down, not completely stopping them.

**Chapter 3: Hardware Components**

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**Chapter 5: Result Analysis \*\*\***