

# Electromagnetic Engine

Vishal Abasaheb Misal<sup>1</sup>, Umesh Dattatray Hajare<sup>2</sup> & Arshad Ashak Atar<sup>3</sup>

<sup>1</sup>Mech. Engg., <sup>2</sup>Electrical Engg., <sup>3</sup>Mech. Engg. Department

<sup>1&2</sup>Yadavrao Tasgaonkar Institute of Engineering & Technology, A/P-Chandhai, Karjat, Dist-Raigad,410201

<sup>3</sup>Yadavrao Tasgaonkar College of Engineering & Management, A/P-Chandhai, Karjat, Dist-Raigad,410201

E-mail : misalvishal1991@gmail.com<sup>1</sup>, umeshhajare7445@gmail.com<sup>2</sup>, arshad.atar2@gmail.com<sup>3</sup>

**Abstract** – In this paper we are going to describe how to design and construct an electrically operated two cylinder engine i.e. Electromagnetic Engine. Our engine is totally different from ordinary IC Engine, because of the inventory advancement in operating principles. We have changed the operating principle of IC Engine by using electromagnetic effect instead of combustion of fossil fuels. This engine works on the principle of magnetic repulsion between two magnets. This electromagnetic engine consists of two magnets, one of them is an Electromagnet and other one is a Permanent Magnet. Permanent Magnet acts as piston and Electromagnet is located at the top of the cylinder instead of spark plug and valve arrangement in IC Engines. In this way this engine does not contain any spark plug and fuel injection system. The Electromagnet is energized by a battery source of suitable voltage and the polarities of electromagnet are set in such a way that it will repel the permanent magnet i.e. piston from TDC to BDC, which will result in the rotary motion of crank shaft. When the piston is at BDC the supply of Electromagnet is discontinued, the permanent magnet which was repelled to BDC will come back to its initial position i.e. TDC. This procedure completes one revolution of crank shaft i.e. our output work. Switching of electromagnet is controlled by cam and follower arrangement. The total power supplied by battery will be just to fulfill the copper losses of winding and power required to magnetize the windings.

## I. INTRODUCTION

This project is about to design electricity operated engine construction. In this engine there is no use of fuels like diesel and petrol. So this engine is operating on pure electricity coming from a battery source.

An electromagnet is positioned on the top of the cylinder, while construction of engine is traditional. And piston is just a permanent magnet (Neodymium magnet). There is no combustion within the cylinder so design of piston and cylinder arrangement is simpler as compared to IC Engine. So the accuracy of dimensions is not a serious matter here.

Although this engine can't produce any flue gases which are harmful to the environment, because there is no combustion of fossil fuels in this engine.

## II. WORKING PRINCIPLE

This engine works on the principle of magnetic repulsion between same poles of the two different magnets. When similar poles of two magnets come in contact with each other they will repel each other with equal and opposite force. This phenomenon of repulsion is used in this engine to create motion. The Electromagnet which is placed at the top of the cylinder of the engine repels the permanent magnet placed at the place of piston in IC Engine such a way that the magnetic force produced by the electromagnet repels permanent magnet. Piston i.e. Permanent magnet is connected to the crank shaft through connecting rod. This arrangement converts the reciprocating motion of piston into the rotary motion of the crank shaft. This is our useful work.

## III. CONSTRUCTION

Construction of the electromagnet is similar to the IC Engine. It consists of one Electromagnet and one permanent magnet. Electromagnet is positioned on the top of the cylinder of engine, and permanent magnet is used as the piston in engine. Piston of the engine is connected to the crank shaft through connecting rod. Connecting rod is connected to the crank shaft by using gudgeon pin. The cam and follower arrangement is used to control the switching of electromagnets. The schematic diagram of Electromagnetic Engine is shown in fig.

1. Electromagnet: It is made of copper windings of suitable gauge. Turns of windings are kept as per magnetic field required. Consumption in wattage for electromagnet is only to fulfill its copper losses. Electromagnet will repel the piston consuming very less power.

2. Piston: It is made of a very strong Neodymium magnet.
3. Connecting rod: It is made of aluminium alloy.
4. Crank shaft: It is made of steel alloy.

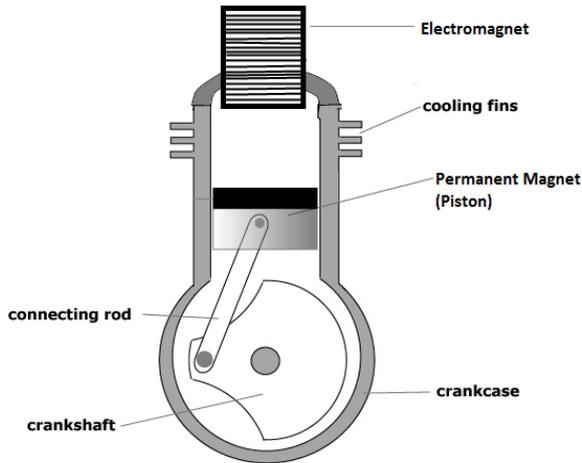


fig. Schematic Diagram of Electromagnetic Engine

5. Cam and follower: This is used here to control switching of the circuit for electromagnets.
6. Capacitors: They are here to balance the reactive power in electromagnets.
7. Switches: These are operated by cam and follower arrangement. And are normal DC circuit switches.
8. Crank case: It is made of aluminium alloy.

#### IV. CONCLUSION:

In this way we have designed an electromagnetic engine. It is different from motor, because the working principle is totally different as well as the power consumption is also very less. The only power consumed is the power consumed by electromagnet and electromagnet used here is to repel the permanent magnet. There is no extra power consumed by electromagnet to repel the permanent magnet. Movement of magnet doesn't induce back electromotive force in windings of electromagnet. And hence nothing happens similar to electric motor here. Power to be produced at shaft of the engine is much more than the power to be consumed by electromagnet to repel permanent magnet.

#### V. ACKNOWLEDGEMENT

We thank to all our professors to make us able to research on such topic.

#### VI. REFERENCE

- [1] IC engine – P.C. SHARMA
- [2] Electrical technology – B.L. Thereja
- [3] Electrical Machine Design – A.K. Sawhney
- [4] Theory Of Machine – Tata Mcgraw Hill
- [5] [www.google.com](http://www.google.com)
- [6] [www.wikipedia.com](http://www.wikipedia.com)

