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## Magnet engine: An environment-friendly approach

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### ABSTRACT

*The developing of internal combustion engines and also demand is growing for the need of Fossil fuels for vehicles. Present a lot of emissions came from the combustion engines, so humans are heading for electric vehicles. The scenario of traveling is changing rapidly with metros, electric rails, electric airplanes (solar), etc. Hence we require products with more power but also with higher efficiency. Magnetism possesses a magnificent opening for development. Bullet trains using the technology of magnetic levitation have proved to be the strong nature of electromagnetic fields. Keeping in mind the arising needs of the industry, in this project I tried to design an experiment, a system called Magnet engine, which makes use of magnet repulsion force to drive. The working principle is based on repulsion force from both permanent magnet and electromagnet. The combined repulsive forces will develop the power strokes in each cycle and generate the mechanical power. Successful implementation in this field can actively switch over internal combustion engines.*

**Keywords**— Fossil fuels, Magnetism, magnet levitation

### 1. INTRODUCTION

As all of know that the Engine is a great innovation device and which it converts one form of energy into mechanical energy. Mainly the heat engines are running in automobiles, power plants...etc. it gives the best in performance as well as a lot of emissions came from that. So I thought to change the use of fuels and replacing it by placing a Magnet.

Magnetism is a phenomenon which exists in our body, our earth as well as our universe. The virtual concept of black holes has been said to be related to strong magnetic fields. The tremendous energy within a black hole pulls matter inside it to nowhere. If magnetism can possess such potential, then tapping it the right way can create wonders shows a bright spot so current scenario it will be helpful by taking the Magnet Element. Magnet has attraction and repulsion properties, I used as pulls and push the piston then conversion takes place by reciprocating into the rotary. So it's not enough to develop power as minimum reach to low capacity Heat engines. By arranging the electromagnetic coil to the cylinder, the piston moves faster in action of TDC (Top dead center) to BDC (Bottom dead center) or vice versa .but not at all like solenoid it's quite different. So I'm combining both electromagnet field and Neodymium magnets then it may develop the max speed and torque.

The following main components present in the Equipment with their arrangements:

- 1) Electromagnetic coil wrapping on the cylinder
- 2) Neodymium magnet built on the piston head and in the cylinder head
- 3) Connecting rod and Crank,
- 4) Alternator
- 5) Voltage Controller/Regulator

#### 1.1 Electromagnetic coil wrapping on a cylinder

An electromagnetic force is one of the four fundamental interactions of nature. Electromagnetism is the physical interaction between electrically charged particles. First, the force of attraction and repulsion between electric charges is inversely proportional to the square of a distance between them. Second, magnetic poles always come in pairs, as electric charges do. Third, the current flowing in a conductor produces a magnetic field around it. Lastly, a traveling electric field will produce a magnetic field, and vice-versa. The phenomenon is using in making of the Electromagnetic coil on the cylinder. The wrapping of copper wire on the outer surface of thinness hallow cylinder(made by iron) up to the top dead center line and to bottom of the cylinder by a number of layers forming an increasing number of turns it will be best for the perfect magnetic field. While power supply to the coil, the charged particles flow through positive to negative as well poles created south on positive and negative on North. So magnet field passes south to north.

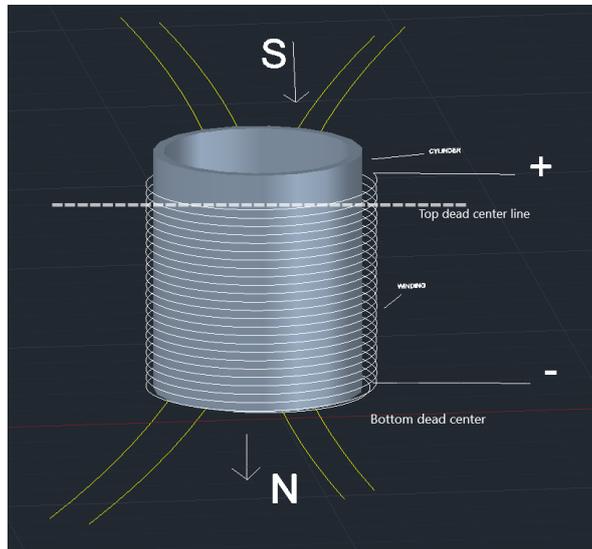


Fig. 1: Engine cylinder along with electromagnet coil

### 1.2 Neodymium Magnet built on the piston head and in the cylinder head

Neodymium is a super powerful magnet and is a chemical element atomic number 60. It is not found naturally in metallic form or unmixed with other terbium metals, and it is usually refined for general use. It is a soft silvery metal that tarnishes in air. Although neodymium is in order to as a rare earth, it is a fairly common element, no rarer than cobalt, nickel, or copper, and is widely distributed in the Earth's crust. Below given type magnet is used



Fig. 2: Neodymium Ring magnet

In this equipment, I'm using N52 ring magnets because it has high strength in attraction as well in repulsion in that series and it also already hole made on manufacturing by good thing for this equipment why because of while if this is flat disc and we making hole with drill on that, sometimes it will cause cracks or breaking, losing magnet strength of the magnet.

**Piston:** A piston is a main component is present in the engine and it reciprocates in a cylinder by the supply of external power as fuel and to take combustion then push the piston or other things to push and connected with connecting rod to crank. This helps us to convert the reciprocating into the rotary. Coming to the topic, I am taking the 100cc bike piston and in this component by arranging the Neodymium magnet on piston head with bolt fitting (small bolt head with long shank because of it has less space head-on magnet then it will they avoid magnet power reduction). The magnet South Pole face to top and North Pole bottom is attached to the piston.

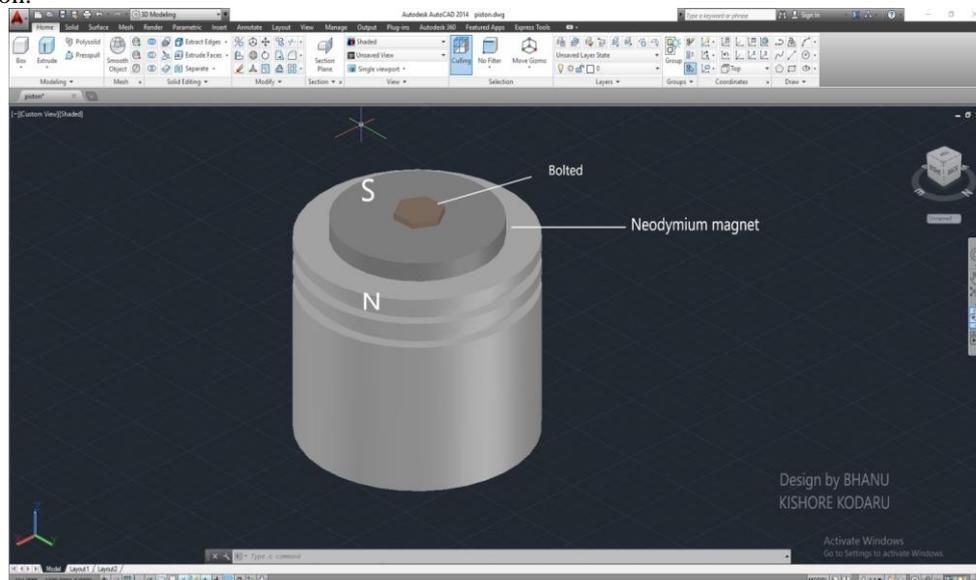
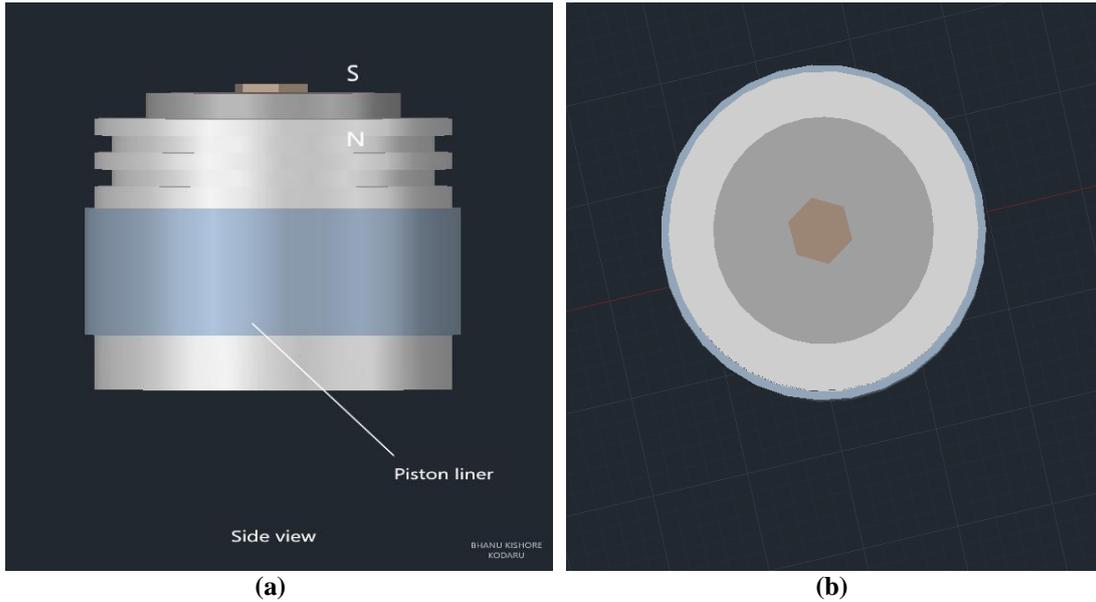


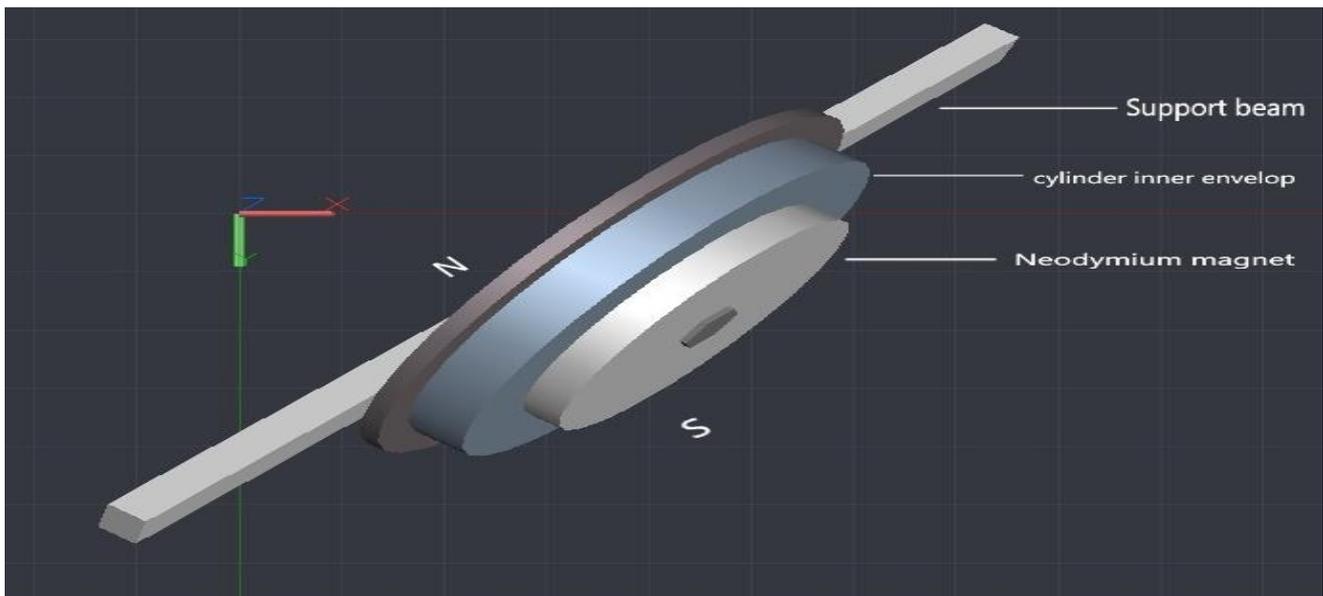
Fig. 3: 3D Front view of piston without liner

The placing/ inserting the liner (made by thin ferrous) on the outer surface of the piston and up to piston rings because of it will participate in the electromagnetic field of the cylinder. the reason behind making this type of arrangement because of heat engine pistons are made by a mixture of alloys and cast Aluminum, so it does not have magnetic property.



**Fig. 4: (a) Side view of a piston with liner (b) Top view of piston**

**Cylinder head:** coming to the cylinder head and this is placed on top of the cylinder or envelop the cylinder on top with support beam. I'm putting the magnet in the cylinder head by way of north pole face is fastened to cylinder inner envelope and south pole face is outside



**Fig. 6: 3D view of Cylinder head construction**

### 1.3 Connecting rod and Crankshaft

A connecting rod is placed in between the piston and crank and is a rigid support to them; it helps to convert the reciprocating motion into rotary motion as well rotary to reciprocating motion. It has two ends - Small End and Big End. The small end is connected to the piston with piston pin and the big end is hold by crankshaft through crankpin. The small end may have a solid or split eye but the big end is always split. The split shoulder end is assembled with a cap by clamping bolt.



**Fig. 8: Connecting rod**

Crank, in mechanics, arm secured at a right angle to a shaft with which it can rotate or oscillate. Next, to the wheel, the crank is the most important motion-transmitting device. The arm may be a bent portion of the shaft or a separate arm or disk attached to it. Attached to the end of the crank by a pivot is a rod, usually called a connecting rod (conrod). The end of the rod attached to the crank moves in a circular motion, while the other end is usually constrained to move in a linear sliding motion.



**Fig. 9: Crank with connecting rod**

The connecting rod and crankshaft, both along the joint to above piston what designed and envelop the cylinder on top with the cylinder head and assemble the jointed things to a cylinder block.

### 1.4 Alternator

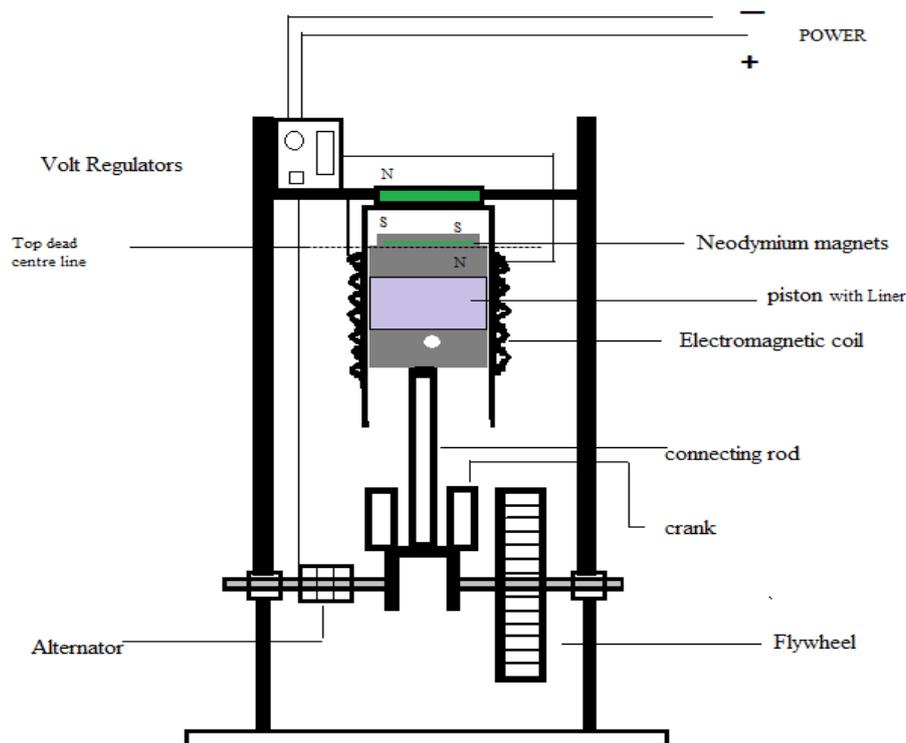
An alternator is a power generator that charges the battery in the vehicle and it converts mechanical energy to electrical energy in the form of alternating current. For reasons of cost and simplicity, most alternators use a rotating magnetic field with a stationary armature. And this is connected to the crankshaft then power output connection to rectifier and regulator.

### 1.5 Voltage Controller/Regulator

A voltage controller also called an AC voltage controller or AC regulator is an electronic module and which converts a fixed voltage, fixed frequency alternating current (AC) electrical input supply to obtain a variable voltage in output delivered to a resistive load. This varied voltage output is used for dimming street lights, varying heating temperatures in homes or industry, speed control of fans and winding machines and many other applications, in a similar fashion to an autotransformer. Voltage controller modules come under the purview of power electronics. Because they are low-maintenance and very efficient, voltage controllers have largely replaced such modules as magnetic amplifiers and saturable reactors in industrial use. This is connected to the battery and electromagnetic coil of the cylinder and then control the voltage supply to the coil, it means creating a controllable magnetic field

## 2. TOTAL CONSTRUCTION

A Magnetic Repulsion Engine consists of a cylinder, piston with connecting rod, flywheel and crankshaft arrangement, and a pair of permanent magnets. The construction of this engine is similar to that of a typical IC engine. Here, the spark plug and valves at the cylinder head are replaced by a permanent magnet. Another permanent magnet is placed at the top of the piston which can freely reciprocate along with the piston. Both the magnets are arranged in such a way that their surfaces are facing each other with like poles. Electromagnetic coil wrapped on the cylinder and Small openings are provided at the cylinder for natural air circulation.



**Fig. 10: Magnet engine construction (Source: Drawn by Bhanu Kishore Kodaru)**

### 3. TECHNICAL SPECIFICATIONS

Table 1: Components and quantities

S. no	Name of component	Quantity
1	Neodymium magnets(ring type)	2
2	Electromagnetic coil (copper best gauge wire)	As required
3	Piston	1
4	Crank, connecting rod	1
5	Hallow thin cylinder	1 (length as required)
6	Voltage controller 12v	1
7	Battery 12v	1

### 4. WORKING

The working of the magnet engine is when the piston at the BDC is provided with initial cranking effort, it will move from BDC to TDC causing 180° rotation of the crank shaft. As the magnet placed at the top of the piston and magnet fix at cylinder head are facing each other with like poles, the repulsion force will start acting on both the magnets. Minimum the distance between the magnets will cause higher repulsion force. Therefore when piston reaching the TDC while crossing the TDC line the repulsion force will repel the magnets and thus the magnetic piston will start moving to downward and on the time piston cross the line then Electromagnet field of the cylinder will initiated (by the cam mechanism to supply the power to the coil on while piston cross the line and move to down) the downwards and on TDC line to BDC therefore both repulsion of permanent magnet and electromagnetic force will cause the high repulsive force and pushes the piston from TDC to BDC causing further 180° rotation of crank shaft and thus one complete rotation of crank shaft is obtained . After piston reaches BDC the flywheel will pull the piston back towards TDC and thus cycle repeats. The engine will work on two stroke i.e. compression and power stroke. In this system, a permanent neodymium iron-boron magnet was adhered to the top surface of the piston. Hence the magnet travelled along with the piston with reciprocating motion. So there were two magnets stuck to each piston which reciprocated within the cylinder. The magnets were fixed in such a way that the pole orientation was in the same direction. For example, if the south poles of both the magnets were fixed to the piston surface, then the north poles were exposed to the atmosphere.

### 5. FUTURE SCOPE

Day by day pollution is increasing in atmosphere and humans are heading toward the use of sources of energy which are pollution free and eco-friendly. Thus the magnetic repulsive engine can be used as better alternatives. It can be used to perform various tasks and function that involve the application of force or displacement of objects. This engine is highly efficient. It has the possibility of reaching unity-over operation mode. It has the capability to replace any engine which requires fuel burning to operate. As this prototype model consists of only one electromagnetic coil, one piston and only one pole of magnet is used for running the engine, in future modification can be made to it by using two magnetic piston on both side of the fixed magnet to make use of both the poles of magnet and to achieve high power and more effective use of magnet

### 6. CONCLUSION

Hence, I have successfully designed and deeply analyzed about working facts of this equipment and to possible the combining of both Neodymium magnet and Electromagnetic coil will in the best performance. It has some conditions, factors affecting magnet power and many more. I have also learned about the difference between theoretical concept (i.e. design and working) and the actual concept of the engine. Also, I learned about various difficulties arising during the actual construction of the engine. Due to this project, I got very important information related to magnets and various magnetically. I hope that in future this engine will improve and very efficient and used in many sectors.

### 7. REFERENCES

- [1] A Textbook of Electromagnetic Fields - U.A. Bakshi, A.V. Bakshi
- [2] Theory of magnetism textbook by Kei Yosida
- [3] Slider Crank mechanism topic on chapter -5 of simple mechanisms in Theory of machines textbook by R. S. Khurmi and J. K. Gupta.
- [4] P.C. Sen, "Modern Power Electronics", 5th ed., S. Chand & Co New Delhi, India, 2012.
- [5] V. B. Bhandari, "Design of Machine Elements", 3rd ed., McGraw Hill Education Pvt, Ltd., India, 2013.
- [6] C. Sudhakar, K. Premkumar, K. Vijith, S. Balaji, "Emissionless Engine by using ElectroMagnet", IJRAET, 2013.