

# EMISSIONLESS ENGINE BY USING ELECTRO MAGNET

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**ABSTRACT:** In modern science and technology there is a demand in fossil fuels. Nowadays scientists are searching for an alternative fuels. This project is one of the main power sources for the automobile engines. This project is to describe the construction and design of a V-type magnetic piston engine, which operate with the help of electromagnetic force. This mechanism is entirely different from normal IC engine mechanism. It works with electromagnetic effect and repulsion of magnetic force instead of fossil fuels.

It consists of, two permanent magnet and two electro magnet. Electro magnets are mounted on the cylinder head and the permanent magnets are mounted on the piston head. Here not using spark plug and valve arrangement. Electro magnet contains copper windings. Electro magnets are getting power supply from the battery by suitable voltage. The piston contains permanent magnet moves from TDC to BDC and BDC to TDC which will result, convert reciprocating motion into rotary motion of crank shaft. Power supply from battery to the electro magnets are controlled by micro controller with help of power splitter, timer and relay switch arrangement. The normal IC engine are producing harmful gasses, which is one the main causes of air pollution but this mechanism free from pollution and emission.

## I. INTRODUCTION:

This project is about to design the V-type magnetic piston engine. In this mechanism there is no use of fuels like petrol and diesel because mainly operating with the electromagnetic force.

The piston and cylinder arrangement is simpler to the IC engine. The two electro magnets are positioned in the top of the cylinder head which is connected with the battery. The two permanent magnets are positioned in the piston head (material used in piston is NEODYMIUM MAGNET). This combination is used for running the engine. The common crank shaft is used for both connecting rods which produce rotating motion. This mechanical force depends magnetic pistons.

This v-type magnetic piston engine can't produce any flue gasses, because there is no combustion of fossil fuels.

## II. CYCLIC PROCESS :

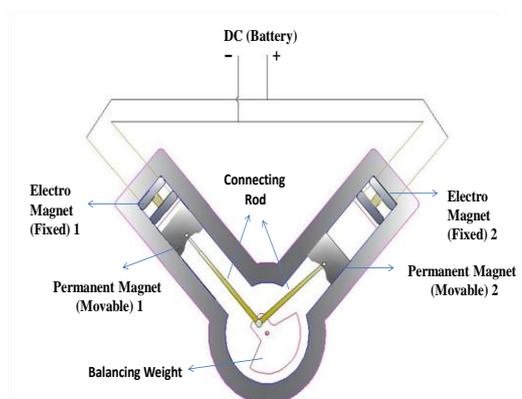
V-type magnetic piston works on a basic principle of magnet. In magnetic principle, same direction will repel each other and different direction will attract each other.

This phenomenon is used in this engine to produce rotary motion. The electro magnet, placed at the top of the cylinder head is repelling the permanent magnet placed at the piston head on the v- type magnetic piston engine. Electro magnet get energize and de-energize by the help of timer and power splitter.

When the left side of the cylinder head gets energized in between the piston and cylinder head magnetic force is produced it help to push the piston downwards, at same time right side of the cylinder head gets de-energized and the piston is move upwards. This happens continuously to produce the rotary motion. The crank shaft connected to the permanent magnet through the connecting rod. This arrangement, reciprocating motion of piston into rotary motion of crank shaft.

## III. CONSTRUCTION:

Construction of the v-type magnetic piston is similar to the normal IC engine. It consists of two electro magnet and two permanent magnet. Electro magnet positioned on the cylinder head and permanent magnet positioned on the piston head. Power splitter, Timer, Relay are used to working the engine it's controlled by the micro controller. Crank shaft are connected to the piston through connecting rod.



Fig

#### IV. COMPONENTS OF ENGINE:

- **ELECTRO MAGNET:**

It is a temporary magnet made by coiling wire around an iron core, when current flows in the coil the iron become magnet. V-type magnet piston contains two electro magnets. Power supply getting through battery.

- **PISTON:**

It is a cylindrical part. Generally made of cast iron, cast steel, aluminum alloy. Permanent magnet mounted on the piston head

- **CONNECTING ROD:**

It is made up of aluminum alloy. It is used to convert reciprocating motion of piston into rotary motion of crank shaft.

- **CRANK SHAFT:**

It is made up of steel alloy. It is the engine component which is used to rotating the wheel

- **POWER SPLITTER:**

It is used to distribute the electric power. Power splitter is directly connected with two electro magnet to energize and de-energize. Power splitter is controlled by the micro controller.

- **RELAY:**

Relay is an electrically operated switch. It controls the power supply of electro magnet.

- **TIMER:**

It is a specialized type of clock for measuring the time intervals. It is an automatic mechanism control by micro controller for activating a device at present time.

- **MICRO CONTROLLER:**

A micro controller is compact micro computer designed to govern the operation of embedded systems in motor vehicles, robots. It controls the power splitter, timer, and relay switch.

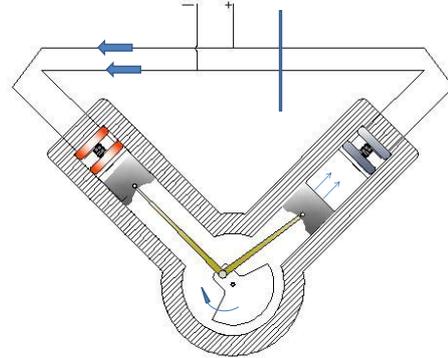
#### V. WORKING OF V-TYPE MAGNETIC PISTON:

The v-type magnetic piston engine contains electro magnet on the cylinder head and permanent magnet on the piston. In this arrangement operate the engine with help of micro controller. The engine contains two cylinders, left side cylinder and the right side cylinder. Both pistons connected to the common crank shaft.

#### VI. LEFT SIDE CYLINDER:

When starting position of left side cylinder, the piston on TDC on that time electromagnet gets energized with battery source. In between the cylinder head and piston

head repulsive force is produce. It tends to move piston TDC to BDC. Power splitter, timer and relay switch are used to energize or de-energize the particular interval of time automatically with help of micro controller

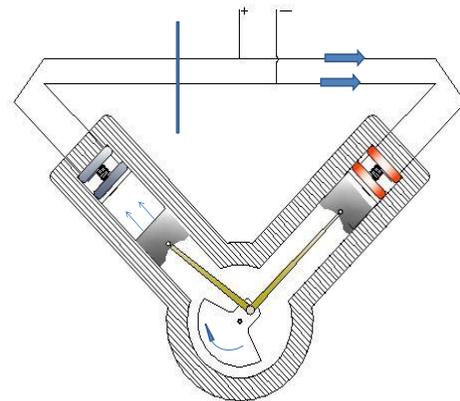


B.Fig

#### VII. RIGHT SIDE CYLINDER:

When starting position of right hand cylinder, the piston on BDC on that time electro magnet gets reenergized by disconnecting the with power source. In between the cylinder head and the piston head attraction force is produced. It tends to move the piston BDC to TDC.

This done simultaneously for each operation so the piston gets reciprocating movement. Both pistons are connected with single crank shaft through connecting rod it convert reciprocating motion into rotary motion. This motion benefit for using suitable application.



B.Fig

#### VIII. MERITS:

- This engine can't produce any flue gasses so it is not harmful to the environment.
- This engine is free from pollution.
- No fuel is required.

- No heat is produce during the operation.
- Less noise.

#### IX. DEMERITS:

- Compare to IC engine, less power is produced.
- It produces less uniform torque.

#### X. APPLICATION:

- Mobile application in automobile field.
- It is used to generating the electricity.
- It is used to make toys and accessories

#### XI. CONCLUSION:

Design and working of v-type magnetic piston engine is different from other engine. It is more economic and free from air pollution. Magnet is one of the prime power source used for many application. By the demand of fossil fuels expecting that electro magnet is main alternative fuel and it is very much useful for coming generation.



#### XII. ACKNOWLEDGMENT:

I thank professor Mis. N. Maheshwari, assistant professor mechanical and Mr. R. Hariprasath assistant professor \mechanical, for their are valuable suggestion and guiders in this project.

#### XIII. REFERENCE:

- [1] John Daniel Kraus, Keith R. Carver, Electromagnetic, McGraw-Hill, 1973.
- [2] Edward J. Rothwell, Michael J. Cloud, Electromagnetic, CRC Press, 28-Oct-2008.
- [3] Karl Erik Lonngren, Sava VasilevSavov, Randy, Fundamentals of Electromagnetics with Sciteck publications.inc.
- [4] Magnetic force calculation from Australian Magnetic Solutions ([www.magneticsolution.com.au](http://www.magneticsolution.com.au)).
- [5] Basic concept of Engine from the book 'Automotive Engine' by Srinivasan.
- [6] Basic concept of electromagnet & electromagnetism from Text Book of Physics by C.R. Dasgupta.