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Effect of Permanent Magnet on Fuel in 4-Stroke Engine

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Abstract – *It has been studied that magnetic field affects the performance of fuel operating in engines. This research is carried out on the basis of studies and laws proven in ancient chemistry and science. In this study we are going to enlighten the effects and uses of installing magnetic field on the flow of fuel in 4-Stroke motorcycles. The results are pretty convincing that application of permanent magnets over the fuel flow does cause the processes to change on positive notes.*

The tests were performed on fuel to study the fuel consumption, combustion and pollutant emissions. It showed that the combustion was completed more efficiently with increase in supply of oxygen by 2-4% which is quite impressive. Also the reduction in rate of fuel consumption was seen to be by 7-8% when magnet used was of magnetic field intensity of 3000 Gauss. We believe that variation in magnetic intensity might show better results over this one. This research and calculations are however carried using 3000 Gauss permanent magnet. Pollution is reduced by the lesser emissions of pollutants such as CO_2 and NO_x. Also the percentage of reduction in emissions of hydrocarbons was by 6 to 7%.

***Key Words*: Fuel Energizer, 4-Stroke engines, Permanent Magnets, Pollution Reduction.**

1. INTRODUCTION

In 21st century the drastic increase in the manufacturing and uses of vehicles has made humankind worried about the end of the non-renewable sources of energy. It is indeed an issue which in future will make us helpless and in order to cater the excess use of fuel we researched and produced results using magnetic field. Use of permanent magnets on engine fuel reduces the fuel consumption by 7 to 8%. Results show that it also causes significant reduction in emission of pollutants such as HC, CO, NO_x and CO_2 within the range of 5-10% varying for each pollutant. Fuel is a chemical compound made of molecules. These molecules may have misalignment in them due to forces of attraction in them, hence this results into improper interlocking of oxygen during combustion[2]. This incomplete combustion results in more fuel consumption and produces more pollution. This can efficiently be reduced using magnetic fields of varying intensities around the fuel flow which will cause the proper alignment of molecules and more oxygen supply during which will gradually decrease the fuel consumption and exhaust gases emissions. To carry out this study we researched and tested application and installation of magnetism on 4-stroke petrol engines of motorcycles.

Magnetic field treatment works on the principle of magnetic field interaction with hydrocarbon molecules of fuel and oxygen molecules[1]. On application of magnetism on fuel, orientation of molecules varies giving more space between molecules for oxygen to penetrate and causes energy efficient combustion. This is an economic way to deal with excess fuel consumption, air pollution and deficiency of fuel sources.

2. EXPERIMENTAL SETUP

Experiment can be studied by applying the magnets on the fuel flow pipe prior to fuel injection so that fuel is magnetized before it reaches to carburetor. The setup can be understood from the following block diagram and pictorial representation.

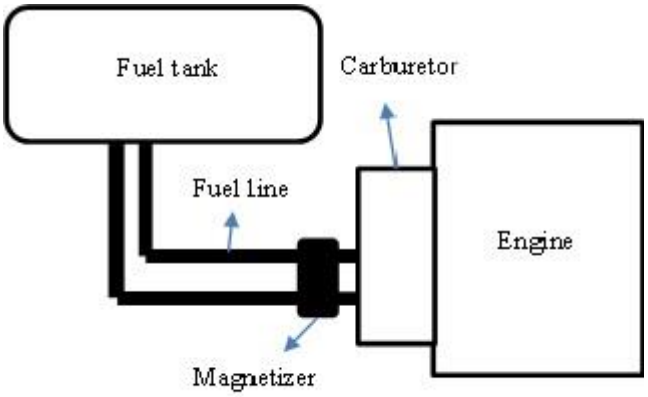


Fig -1: Block Diagram of Experimental Setup[2]

As shown above magnets can be installed on the fuel line thus inducing magnetic field over the fuel. Pair of permanent magnets with overall magnetic intensity of 3000 Gauss were installed on the fuel line using bolts to avoid the squeezing of fuel line which if not done may cause the fuel line to compress and close the fuel flow in such a strong magnetic field. Proper installation is necessary to ensure that there is appropriate flow of fuel through fuel line to carburetor without any interruption. Necessary precautions are needed to be followed while handling the magnets and their successful installation on fuel line without any damage to the system. Pictorial representation followed gives an idea of proper installation of permanent magnets over the fuel line.

Fig- 2: Installation of Magnets on fuel line

Above picture depicts the installation of magnets done on bike of make "Passion plus", which was done by us during our principle testing and calculation process.

3. WORKING PRINCIPLE

With respect to previous information provided it is clear that application of magnetic field over the fuel results into certain change in orientation of molecules which promotes energy efficient oxygen supply for complete combustion to occur.

We are aware that the molecules are bonded together due to nuclear forces of attraction between the atoms. This forces are uneven, hence they have misalignment in their structure which provides varying spaces for oxygen to penetrate for successful mixing of air and fuel leading to complete combustion. This will reduce the formation of harmful effluents like CO, NO_x, CO_2, and HC. The changes that occur inside molecules are broadly described below using Ortho and Para molecule formation and their alignment structure. This molecules are classified based on the spin of their nuclei. Hydrogen isomers are classified on same base as ortho hydrogen and Para hydrogen[3].

A] Para Hydrogen Molecule

In Para Hydrogen molecule the rotation spin of nucleus is anti-parallel i.e. the spin of one atom is opposite to other atom which makes it diamagnetic in nature. It is a general type of molecule at room temperature. It is less stable than the ortho molecules. This molecules are preferred for carrying magnetic field testing.

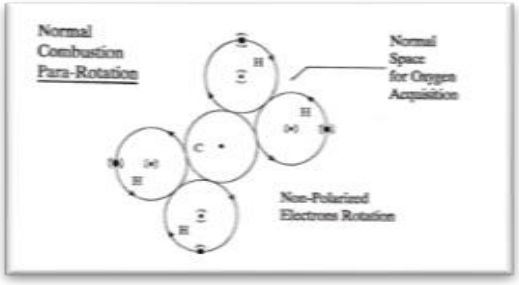


Fig-3: Para Molecule

B] Ortho Hydrogen Molecule

In Ortho molecule the spin of rotation of nucleus is parallel, contradictory to that in para hydrogen molecule. This makes molecule more uniformly aligned and provides more space for oxygen penetration. Para molecules are converted into ortho using strong magnetic field generally more than 2000 Gauss. Schematic structures are shown below representing ortho and para molecules.

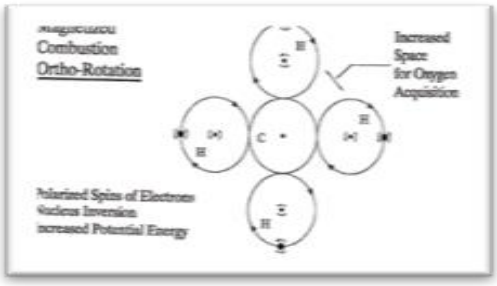


Fig-4: Ortho Molecule

4. RESULTS

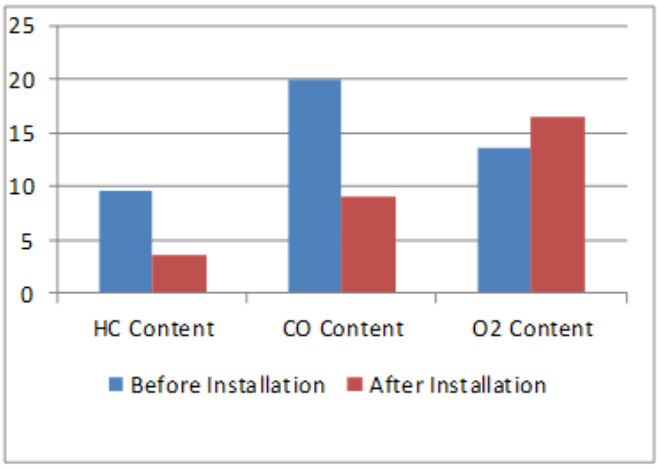
We carried testing on the 4-stoke petrol engines on motorcycles namely Hero Honda Passion Plus and TVS Victor. Magnetic field was installed on both bikes after taking readings without the field application which made it easy to study the variations and graph plotting. Magnets of 3000 Gauss were used for the testing and readings were taken using digital exhaust gas analyzer.

*** All values in %**

1] Results obtained on Hero Honda Passion Plus

	HC Content	CO Content	O_2 Content
Before Installation	9.56	20	13.56
After Installation	3.57	9.5	16.44

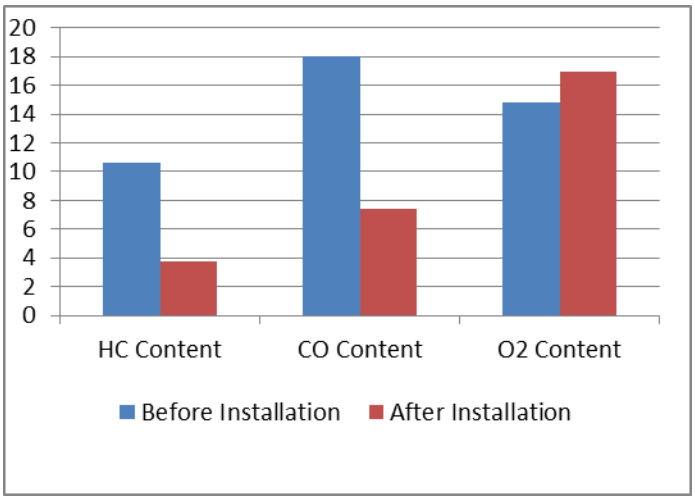
Graph plotted on above results :



2] Results obtained on TVS Victor

	HC Content	CO Content	O_2 Content
Before Installation	10.62	18.06	14.78
After Installation	3.75	7.38	16.92

Graph plotted on above results:



CONCLUSION

It is seen from the above plotted and calculated results that the application of magnetic field on fuel line affects the performance significantly.

1. The results show reduction in production of HC content by 6 & 7% in Passion and Victor respectively.

2. Similar trend was seen in the emission of CO pollutant. CO content was significantly reduced in both bikes within the range of 10-15% which can even be reduced more when varying stronger magnetic fields are applied.

3. One of the most important objective of magnetic field application over fuel line was to improve combustion by providing more quantity of oxygen in air-fuel mixture seems to have achieved in this research showing the increase in supply of oxygen by 2 to 3% which is quite significant.

Nowadays, use of vehicles has reached a new high against a deficient non-renewable energy sources. Hence, necessary steps are in need more than ever so that the future does not have to look like what it seems from now considering the current scenario. Technologies are being developed to provide an alternatives for the fuel such as electrical battery driven cars, recently this modification has been brought in trend by Tesla INC, US headed by Elon Musk, who is being addressed as a revolutionary of modern world. Despite of such modification which are quite expensive to afford we must modify the conventional ways and pay more attention fuel and energy conservation. Otherwise we have hard times ahead to face with nowhere to go.

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