Emission Analysis of Magnetic Fuel Energizer in Four Stroke SI Engine

Shubham Kalne[1], Manish Nawkar[2], Vivek Tank[3], Suraj Chorghe[4], Mr. Pankaj D. Chute[5]
Department of Mechanical Engineering
[1, 2, 3, 4]RMDSinhgad School of Engineering, Pune
[5]Assistant Professor, RMD Sinhgad School of Engineering, Pune

Abstract-*Emission of pollutant from exhaust gas has serious effect on environment. Magnetic field can be used to reduce the emission of pollutant from IC engine. Magnetic field of almost 3000 gauss can be formed with the use of neodymium magnet which can be used as magnetic fuel energizer. The analysis of magnetic fuel energizer has been done with experimental PUC testing on four stroke SI engine vehicle and comparative results are plot on the graphs for different pollutants like CO, CO2 and HC.*

Keywords- Fuel, Hydrocarbon, Magnetic Field, Pollutants.

I. INTRODUCTION

Today pollution is serious matter of concern. There are number of sources of pollution like industrial waste, urban waste, vehicles exhaust etc. Out of these exhaust from vehicle constitutes major pollution problem. Hence, it is necessary to find the ways to reduce the vehicle pollution.

Generally we use fuel like petrol, diesel, LPG etc. they are forms of hydrocarbon fuel. Pollutant from the vehicle is mainly due to incomplete combustion of fuel inside the engine and results into the exhaust of pollutant like CO, CO_2, HC, NOx etc. Hence, it necessary to achieve complete combustion to reduce the pollution from the vehicle emission.

Generally, fuels for internal combustion engine are compound of molecules. Each molecule consists of a number of atoms made up of number of nucleus and electrons, which orbit their nucleus. Magnetic movements already exist in their molecules and they therefore already have positive and negative electrical charges. However, these molecules have not been realigned, the fuel is not actively interlocked with oxygen during combustion, the fuel molecule or hydrocarbon chains must be ionized and realigned. The ionization and realignment is achieved through the application of magnetic field.

II.CONCEPT OF PARA HYDROGEN AND ORTHO HYDROGEN

Para hydrogen and ortho hydrogen are isomers of hydrogen. Generally, isomers are defined as each two or more compound with same formula but different molecular arrangement and different properties.

In Para hydrogen spin state of one atom is opposite to the other atom thus the inter-molecular force between two atoms is more; hence less space is available for oxygen to get interlock with hydrogen atoms. On the other hand ortho hydrogen atoms have same spin of rotation thus intermolecular force between two atoms is less and hence space available for oxygen to get interlock with hydrogen atom is more. [1]

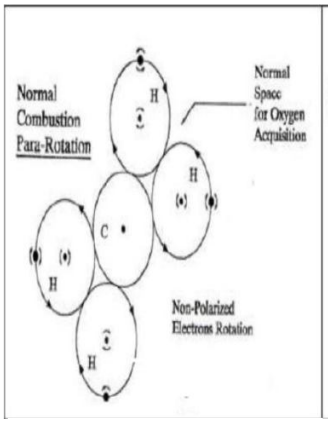

Fig 1: Para Hydrogen

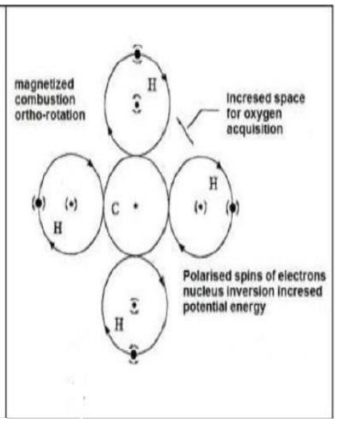

Fig 2: Ortho Hydrogen

III. EFFECT OF MAGNETIC FIELD ON HYDROGEN CONFIGURATION

Fuel mainly consists of hydrocarbon and when fuel flows through a magnetic field, such as the one created by neodymium magnet, the hydrocarbon change their orientation and molecules of hydrocarbon change their configuration. Para hydrogen in the fuel gets converted into the ortho hydrogen due to the application of magnetic field [2]. Hence the intermolecular force between the atoms of the hydrogen is reduce, thus space between two atoms is increase hence more oxygen is exposed to the hydrogen molecule to obtain better interlocking of hydrogen-oxygen molecule. As more oxygen is exposed to the hydrogen atoms combustion property may be improved and combustion efficiency will increase.

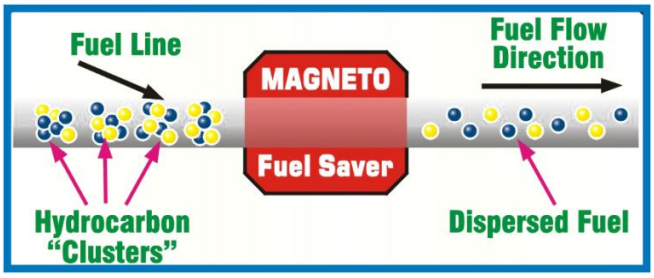

Fig 3: Effect of magnetic field on fuel molecules

IV MAGNET USED AND ITS INSTALLATION

Fig 4: Actual neodymium magnet

A neodymium magnet is type of rare earth magnet. It is permanent magnet made from alloy of neodymium, iron and boron to form Nd2Fe14B. It has tetragonal crystalline structure. It is the strongest type of permanent magnet having magnetic field of 3000 gauss. The magnetic field of 3000 gauss is enough to change the para hydrogen to ortho hydrogen.

Magnetizer Fuel Energizer (viz. Neodymium magnet) is installed on motorcycle, car or truck etc. immediately before carburetor or injector on fuel line.

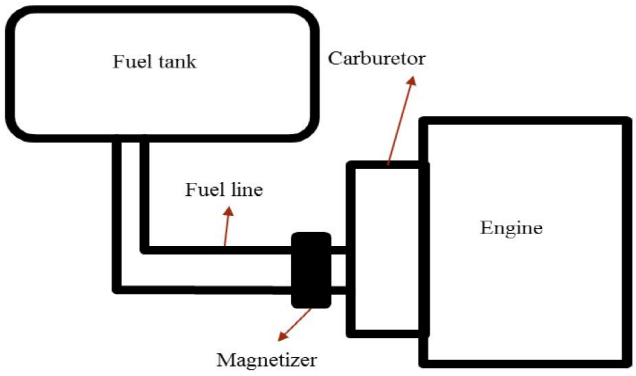

Fig 5: Position of magnet on fuel line

V. EXPERIMENTAL STUDY AND ANALYSIS

To conduct PUC on vehicle for the purpose of experimental study following steps has been carried out:-

- Perform PUC test on vehicle without application of magnetic field and record the readings
- Perform PUC test on vehicle with application of magnetic field with the help of permanent magnet and record the readings.
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Fig 6: Actual setup for experiment

We have carried out PUC test on Hero Honda Passion Plus and test specifications are given below.
Specification:

- Bike Model- Hero Honda Passion Plus (100 cc)

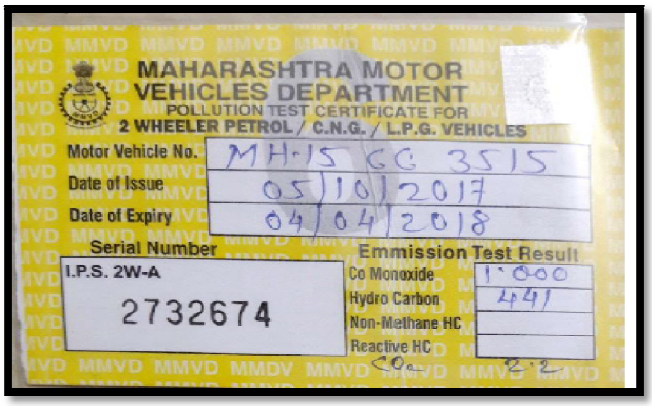


Fig 7: PUC test without application of magnetic field

Fig 8: PUC test with application of magnetic field

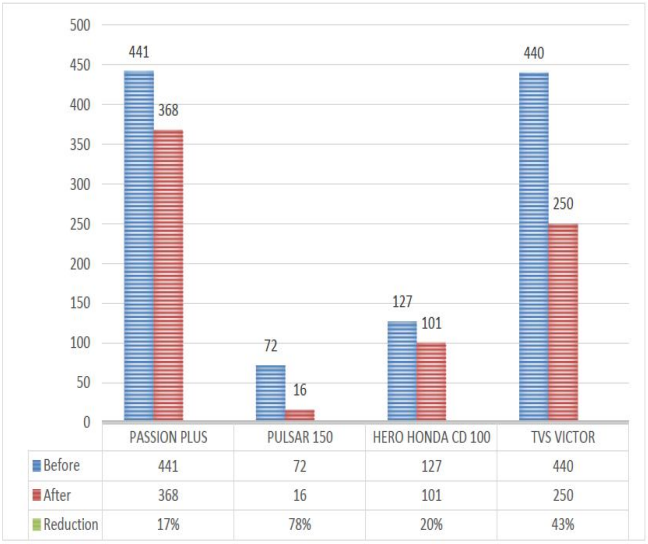
For above bike model results are expressed in tabular form as shown in table 1.

Table1: Results for PUC test on Hero Honda Passion Plus

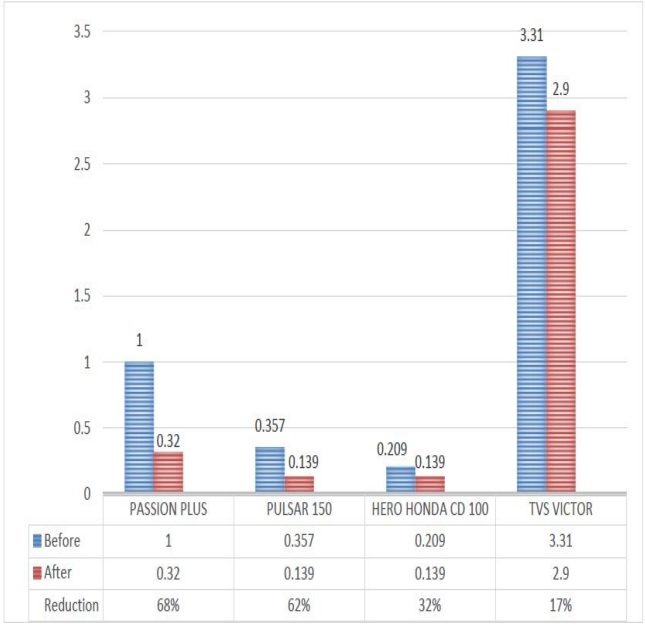
Parameters	Without Magnet	With Magnet	% Reduction in Pollutant
CO (%)	1.00	0.32	68
HC (ppm)	441	368	17
CO_2 (%)	0.22	0.2	9.09

Graphical Analysis of Experimental Result for Permanent Magnet:

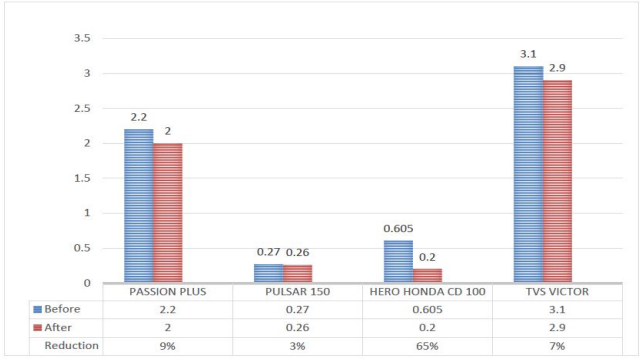
The same PUC test had been carried out on different vehicle model and their results for each pollutant are expressed in graphical format as shown below.



Graph 1: HC content with permanent magnet (ppm)



Graph 2: CO content with permanent magnet (% of volume)



Graph 3: CO_2 Content with permanent magnet (% of volume)

VI. CONCLUSION

It is clear from above experimental results that use of magnetic field on fuel line will result into the increase in combustion efficiency of fuel and hence emission of pollutants like CO, CO2 and HC can be reduced up to 36%, 10% and 28% respectively. We can use this magnetic field as fuel energizer

VII. ACKNOWLEDGMENT

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