

EXPERIMENTAL INVESTIGATION OF FUEL CHARGING WITH MAGNETIC FIELD

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Abstract— The main aim of the project is to get more efficiency and less emission from the spark ignition engine. As we know that nowadays there was more pollution in the environment, this was due to the usage of petrol and diesel vehicles. These vehicles releases hazardous gases such carbon mono oxide, carbon di oxide, nitrous oxide etc., this was due to incomplete combustion. This incomplete combustion takes place by the improper mixing of fuel and air. This improper mixing (atomization) is takes place by the shape of the hydrocarbon molecule present in the fuel. There are two different shapes of hydrocarbon molecules, ortho and para. If it is in para shape it is difficult for the oxygen to mix with fuel but in ortho it is easy for the oxygen to combine with the fuel. This can be done by using electromagnet, as electromagnet produces magnetic field thus it is absorbed by the electrons which de-cluster hydrocarbon molecule. Then it is easy for the oxygen molecules to combine with fuel that is better atomization takes place. Therefore there occurs increase in efficiency and decrease in emission.

Keywords: Air-fuel mixing, Magnetic field, De-cluster, Efficiency, Less emission.

Manuscript received Nov 21, 2014.

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I. INTRODUCTION

Today's world is full of automobile, electrical and electronic components. The waste gas produced by these components make the atmosphere toxic because they produce gases which are toxic in nature. The toxic substances liberated during the operation of internal combustion engines are nitrogen oxide NO_x , soot, carbon monoxide CO, hydrocarbon HC and cancer producing substances. Most of the toxic substance goes to the atmosphere due to the incomplete combustion of fuel. We are in critical condition to rectify these disorders and clean the atmosphere. To do this we need to find a solution for complete combustion. Under research we come to know that there are four to five reasons for incomplete combustion. They are improper mixing of air and fuel, insufficient air supply to the flame, insufficient time to burn, cooling of the flame temperature before combustion is complete etc. Among them we took a single problem to find a solution that is improper atomization that is improper mixing of air and fuel. This improper atomization is due to the shape of the hydrocarbon molecule present in the fuel. This can be change by passing magnetic field to the fuel and this can be done by, hydrocarbon molecules have the capacity to absorb magnetic field due to this the shape of the fuel also changes. Now the air can properly mix with the fuel that is proper atomization will takes places. Therefore the emission will be less as well as the efficiency also increases due to the complete combustion. We planned to create magnetic field with the help of electromagnet. In electromagnet we can adjust the magnetic field but in permanent magnet it is not possible to adjust the magnetic field.

II. EXPERIMENTAL INVESTIGATION

The experimental setup is carried out on a TVS star sports 2011 model. The specification of the following model is given below

Engine and Transmission:

Displacement	100 cc
Cylinders	1
Max Power	7.40 bhp @ 7500 rpm
Max Torque	7.50 Nm @ 5000 rpm
Bore	51 mm
Stroke	48 mm
Valves per cylinder	2
Fuel delivery system	Carburettor
Fuel type	Petrol
Ignition	Digital CDI
Spark plug	1 per cylinder
Cooling system	Air cooled
Gear box	Manual
No of gears	4
Transmission type	Chain drive
Clutch	Wet plate
Compression	9.2:1

The iron pipe which is wound by a copper wire is placed on the inlet manifold and fuel pipe line. One of the copper wire is connected with positive terminal of the inverter and the other to the negative terminal of the inverter. The inverter is connected to the two batteries which are connected parallel. In between the inverter and winding, a voltage regulator is fixed so that it can vary the voltage. This whole setup is fixed on the TVS star sports and the readings are calculated such as the fuel consumption and emission. The capacities of the batteries, when it is connected in parallel are 12V and 15Ah. The inverter circuit which gives 155 voltages is connected to the winding.



Thus the experimental setup is fixed on the TVS star sport. Now the switch is on the current (15 Ah) and the voltage (12 V) is passed to the inverter. In the inverter the voltage will be raised to 155V. This voltage is then passed to the field winding where the voltage is converted into magnetic field. This magnetic field is then penetrated through the aluminium manifold and the fuel line. This magnetic field is then absorbed by the hydrocarbon molecule so that the para shape of the molecule will change into ortho shape. Thus the oxygen will combine with ortho shape molecule. This was due to the energy emitted by the magnetic field is absorbed by the hydrocarbon molecule and it acts as a flywheel. The flywheel stores energy in it so that the oxygen will be attracted by the hydrocarbon molecule. Now this sends to the engine cylinder where complete combustion takes place. Therefore the efficiency of the engine will increase as well as the emission such as unburned hydrocarbon and carbon monoxide will be reduced.

III. RESULTS AND DISCUSSION

Effect of magnetic field on fuel consumption and exhaust gases

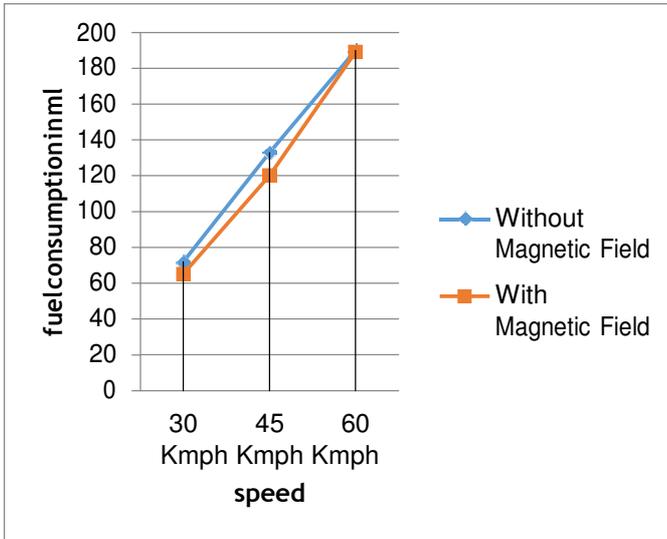


Figure no.7.1 The amount of consumed fuel with and without magnetic field

Figure represents the amount of fuel consumed with the intensity of the magnetic field for three different engine speeds. The amount of untreated fuel consumed in the engine for the three speeds were (72, 133, 190) ml, respectively. While these values decreased with the use of a magnetic field.

The percentage of the exhaust gases which measured during the operation of the engine, for three speeds, before and after magnetic treatment

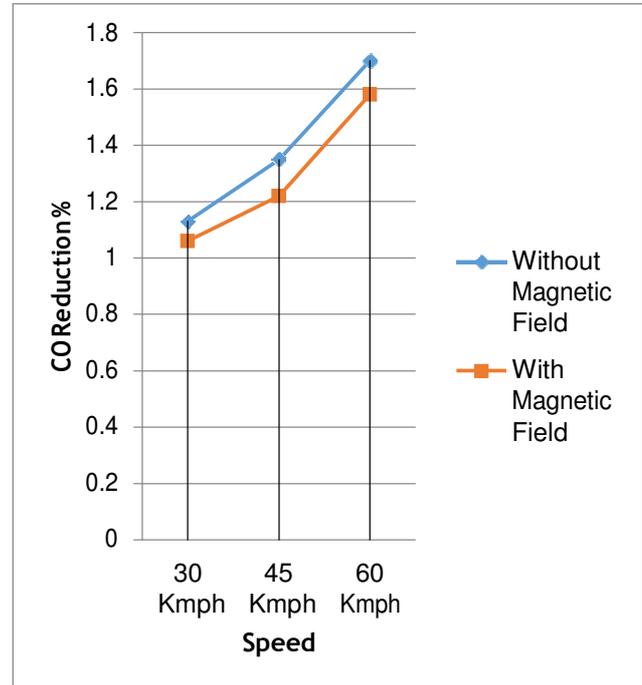
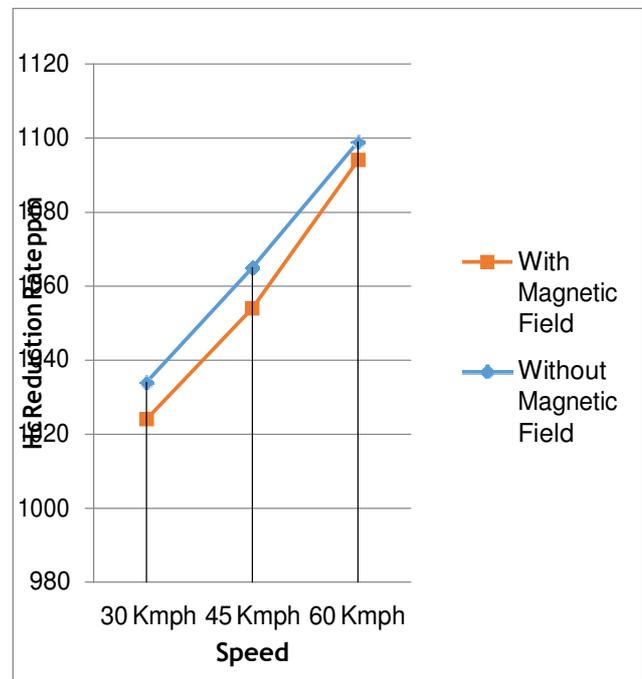


Figure no.7.2 Decrease rate of CO gas with and without magnetic field



***Figure no.7.3 Decreased rate of unburned Hydrocarbon with and without magnetic field**

IV. CONCLUSION

When fuel is exposed to a magnetic field, we find that its properties are changed. Magnetic treatment does not need energy and thus be economically feasible. Change some properties of the fuel by the magnetic field, and take advantage of some of the applications that belong to the industry and the environment. Increase the efficiency of most equipment and machinery that using hydrocarbon fuel and reduce consumption up to 11%. We can understand the mechanism of magnetization of fuel through the impacts of external magnetic field in the microscopic structure, which is the displacement and polarize the fuel molecules. Clear changes in the value of surface tension of the fuel, which used in this study and employment of these changes in the applied fields. Reduce the amount of environmental pollutants in the exhaust gases.

ACKNOWLEDGEMENT

The submitting author is responsible for obtaining agreement of all coauthors and any consent required from sponsors before submitting a paper. It is the obligation of the authors to cite relevant prior work.

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