

Effect of Permanent Magnet on Fuel Burning in S.I. Engine

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Abstract: The present work deals with the complete combustion of air fuel mixture using magnetic field. Due to inappropriate blending of fuel molecule and oxygen molecule the combustion in engine is incomplete. The number of pollutant gas emitted in large amount like CO, NO_x, HC etc. The reduction in the efficiency of the engine is due to incomplete combustion of fuel in the cylinder. This attempt is for improving the combustion efficiency of S.I. Engine by using ionization of fuel in which ionization helps to proper blending of fuel. For this experiment permanent magnet of 3500 gauss were used as magnetic fuel conditioner. In the effect of magnetic field hydrocarbon molecule align and orient for the better atomization of fuel. There is notable improvement in the mileage and reduction of vehicle emission. At varying loading condition testing is carried out.

Keywords: Permanent magnet, Combustion, ionization, 4 stroke, petrol engine.

1. Introduction

The steady depletion of global energy resources due to increase in consumption by mankind has contributed to the severe problem of exhausting all available conventional source of energy such as natural gas and oil. S.I. engine uses fuels in the form of fluid. The combustion of fuel doesn't take place until they are vaporized and mixed with air. Combustion of fuels releases pollutants such as CO, HC, NO_x and many more components in environment. Due to this an atmospheric phenomenon called smog is created by the action of sunlight on HC in the atmosphere.

Increased range of pollutants is believed to penetrate deeply into human lungs. Carbon clogs, loss of horse power and reduced mileage natural deformation are caused by HC in the engine. There are many methods like MPFI, EGR, PCV, catalytic that are used to complete and also reduction of emission.

This technology works same but in different way. For ionization of fuel permanent magnets are used of 3500 gauss. This is basically done by using the principle of magnetic field mutual action with hydrocarbon molecule of fuel and oxygen molecule. The hydrocarbon fuels are polarized by the external force of the magnetic field. Because of the magnetic effect the hydrocarbon changes their orientation and aligns them with the increased space between hydrogen.

2. Permanent magnet as fuel ionizer

Permanent magnet is used as fuel ionizer. Neodymium magnet of different size is used in this experiment. It is the permanent magnet made up of alloy of neodymium, iron and boron. There are different sizes of magnet of 3500 gauss used that are clamped on the fuel line.

3. Working principle

Permanent magnet is used as fuel ionizer. Neodymium magnet of different size is used in this experiment. It is the permanent magnet made up of alloy of neodymium, iron and boron. There are different sizes of magnet of 3500 gauss used that are clamped on the fuel line.

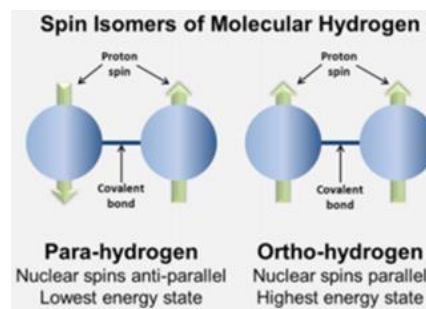


Fig. 1. Depiction of para ortho hydrogen

4. Experimental setup

The testing work has been performed on three cylinder four stroke S.I. engine with fuel petrol. This experimental setup used to study engine performance and exhaust emission using magnet at different places.

For performing this experiment, we use three-cylinder petrol engine test rig. This test rig includes fuel tank, manometer fuel measuring unit, digital speed indicator and digital temperature indicator. This setup also includes voltmeter, load indicator, oil level adjuster and fuel throttle unit. For adjusting dynamometer loading it has dynamometer loading unit. In this setup magnets are connected on fuel line and fuel is passed through the fuel line and effect of magnet on fuel line is checked. After the result we change the sizes of magnet and repeat the same procedure as mention above. Ppm analyzer is used for measuring the exhaust emission from the engine.

Table 1
Engine parameters and specifications

Engine Parameter	Specifications
Engine model	Maruti 800
No. of cylinder	3
No of stroke	4
Fuel	Petrol
Rated power	27.6KW@5000rpm
Cylinder diameter	66.5mm
Stroke length	72.0mm
Connecting rod length	114mm
Compression ratio	9.2:1
Orifice diameter	35mm
Dynamometer arm length	210mm



Fig.2. Actual engine setup

5. Conclusion

Due to magnetic effect the hydrocarbon viscosity decrease and fuel get thinner on application of magnetic field. As the fuel gets thinner this improve the atomization of fuel and results in the better mixture of complete combustion. There is significant

increase in break thermal efficiency due to reduction in fuel consumption. By using different strength of magnet better result can be obtained. The emission like CO, NO_x, HC and different pollutant is reduced. Due to proper blending of oxygen and fuel mileage is increased. Complete combustion of fuel improves the life of engine and reduces the maintenance cost.

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