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A STUDY ON THE PERFORMANCE OF THE IC ENGINE

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Abstract

The internal combustion (IC) motor is a heat motor, which transforms chemical energy into mechanical energy, which is normally generated by a revolving escape shaft. The fuel's chemical energy first becomes thermal energy by combustion or air oxidation in the turbine. This thermal energy increases the temperature and pressure of the gas in the engine and then spreads high-pressure gas against the engine systems. The mechanical connections of the motor transform this expansion into a rotational shaft that is the output of the motor. On the other side, the crankshaft is attached to a power train and/or transmit mechanics' spinning energy to the intended final use. This is also the driving power of a car with engines. For a certain amount of time, recent studies centered on engine efficiency using various alternative fuels. For the monitoring of the motor output, this time span cannot be compared with the real performance for the specified car life. It is evident from the literature published that the effects on the nature, existence and performance of the use of alternate combustion fuel on IC engine components such as combustion chamber, piston, piston rings are not discussed. There is an effort to design and improve the most effective IC engine components for alternative fuels that last longer without compromising the engine's output. Any of the findings presented suggest the scope for thorough analysis of this study.

Keywords: *Alternative Fuel, Combustion chamber, Cylinder liner, Piston and Piston Rings.*

I. INTRODUCTION

IC engine (Figure 1) is an air-fuel combustion engine that creates a high-temperature and high gas pressure inside the combustion chamber. IC engine is a heat engine. The friction of this gas moves the piston over a distance and converts the chemical energy into a thermal energy used for mechanical operations. The engine size and configuration differ by function and specifications.

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Several study groups work to improve the performance of IC motors so they are used in most applications. In practice, the properties of all engines including efficiency, weight, exhaust, noise, heat and power are jeopardized[1]. If the engine's performance is high, the fuel economy will be increased and fuel usage and maintenance costs will be minimized. The CI motors play a crucial role among spark ignition (SI) and compression ignition (CI) motors, as 80 – 90% of IC motors are in operation on CI motors. These motors are the main offenders to waste and a danger to life on Earth. The engines emit NO, CO, HC, CO2, smoke, and particulate matter, which may influence the atmosphere and its living environment directly or indirectly.

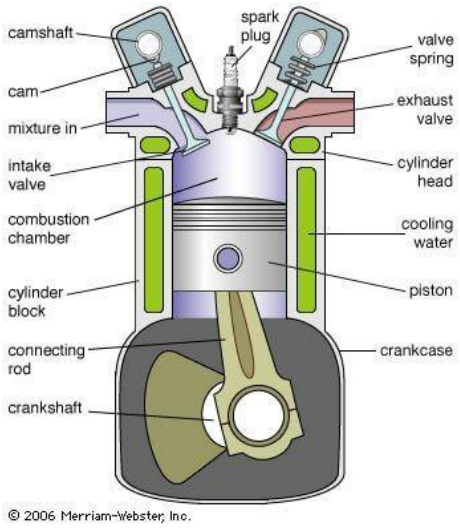

Fig. 1: IC engine[2]

In vehicles, trucks and buses, internal combustion motors are every day noticeable. The internal combustion name also applies to gas turbines and that the name is commonly reserved for internal combustion engines[3]. Like those used in daily vehicles. Essentially, there are two I.C forms. Inflammation engines, which require a spark plug and which depend on fluid compression. Spark ignition motors take a fuel combination and Compress the air, blast it with a spark plug. The piston and some of its essential components. The name 'reciprocal' is given due to the movement of the system. In the beginning of the 20th century, the internal combustion engine, the "motor" of the economy, has introduced far ranging society improvements, which have made human travel easy and inexpensive. The transformation of chemical energy into mechanical work is carried out under high pressure conditions by combustion of primarily hydrocarbon fuel. For compressing air and gasoline, a reciprocal piston-in cylinder method is used, and then this mixture is ignited. Combustion easily induces in the confined volume heavy pressure and high-temperature gases. This gas accelerates the piston easily and can be pushed into a spinning shaft.

While significant changes have been made in fuel economy and emissions, internal combustion engines remain a major cause of air pollution[4]. The dynamic interactions between turbulent flow and chemical reactions at fast but end-to-end scale make the right overall path to efficient and clean fuel combustion challenging to find. But advanced approaches have improved thermal efficiencies by more than 40 per cent, including direct injecting petrol. Catalytic converters and filters have been used to extract from exhaust most unbanned hydrocarbons and nitric oxide, origins of the notorious smog from Los Angeles.

A. Alternate Fuel:-

Owing to the huge rise in the number of vehicles, demand for oil products has increased in recent years. An active search was undertaken for alternative fuels with crude oil reserves expected to last just a few decades[5]. The loss of crude oil would have a huge influence on the transport market. Biodiesel from vegetable oils is the most promising alternative fuel to traditional among the different alternative fuels under consideration. Diesel (derived from fossil combustible; just "diesel" hereafter) for the following reasons:

1. Biodiesel can be used without modification in existing engines.
2. Biodiesel is entirely manufactured from vegetable sources; it has no Sulphur, hydrocarbons aromatic, metals or the residue of crude oil.
3. Biodiesel is a fuel oxygenated; carbon monoxide and soot levels are typically smaller than traditional petrol diesel.
4. As compared to fossil fuels, the use of biodiesel does not add to global warming, as CO2 is once again released plants cultivated for the manufacture of vegetable oil/biodiesel consumed. The balance of CO2 is then retained.
5. Biodiesel is listed as a non-flammable liquid by the industrial safety and health department.
6. Thanks to the lubrication it is more lubricating than oil diesel fuel, biodiesel can prolong the life of diesel engines.
7. Biodiesel is made from green vegetable oils and animal fats, thereby improving fuel or safety and economy.

   Many research activities have been carried out in neat and adapted from using vegetable oil. Studies found that it is feasible, though not preferable, to use vegetable oil neatly. The high viscosity of vegetable oils and low volatility impact the atomization and spray conditions of petrol, resulting in uncomplete combustion and heavy carbon deposits. The viscosity of vegetable oils is reduced by techniques such as diesel mixing, emulsion, pyrolysis and transesterification. These are the commercial method most widely used for safe and environmentally sustainable fuel processing. Compression Ignition (CI) engines were carried out with various performance, combustion and emission studies using raw vegetable oils and methyl/ethyl esters made from sunflower oil, rice bran oil, palm oil, manhua oil. This paper discusses earlier studies investigating the impact of biodiesel on the CI engine from the viewpoint of the poi.

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II. RESULT AND CONCLUSION

Compared to the engine with fuel diesel, the wear and tear of piston rings and liner are likely to be greater. This results in increased fuel consumption which can require cylinder replenishment early on postings. Needs a newer piston, piston ring, line compliant with alternate combustible fuel in the above situation

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