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EXPERIMENTAL INVESTIGATION OF EFFECT OF THE METHANOL PETROL MIXTURE IN SI ENGINE- A REVIEW

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Abstract

Now a days the price of fossil fuel increase day by day, it is main source of energy. Here alternative fuel play very important role for CI & SI engine. It reduce the dependency of fossil fuel as a primary fuel. May research has been done focusing on using alternative fuel. In this study, the effect of methanol-gasoline fuel blend (M10, M15 and M20) on the fuel consumption and exhaust emission of a spark ignition engine (SI) were investigated, experiments have been done to measure the performance and emissions of a 4-stroke S.I. Engine, one by using the commercial imported petrol, another by using the petrol-methanol blends. The engine is run at different loads and methanol blending percentages. It is found that increasing the blending percentage reduces the emitted concentration of carbon oxides and HC . However it is found that break power and break thermal efficiency are increased with increasing methanol blending percentage due to higher cylinder temperatures. The results showed that use of 15% volume of methanol blending with the petrol appears to be a good option for replacing any oxygenate additives in the gasoline, where the CO, CO2, and HC are mini mum and the fuel consumption of the blend is lower than of the commercial gasoline.

KEYWORDS:- ***Fossil fuel, energy, engines, performance, methanol blend***

INTRODUCTION

Over the past few decades the demand of petroleum energy is being increased due to which there is the rise in the cost of because of the limited sources of fossil fuels is left. Therefore, it is very important to search the alternate fuels to replace or reduce the petroleum. Alcohols are one of the suitable fuels for the SI engines. As its properties are similar to the gasoline fuel and if it is blended in small quantities then there is no need to modify the existing engine. The other impact of gasoline it`s harmful gases damaging the environment like Carbon Monoxide (CO), Carbon dioxide CO_2 and un-burnt hydro carbon UBHC are the main residual gases due to incomplete combustion of fuel. By the production of these pollutant gases there is too much disorder in human health like asthma, bronchitis, emphysema, slowing down the reflexes, vomiting sensation, dizziness, drowsiness, Cardiovascular problem, neurobehavioral disorder, pulmonary cancer, premature death etc. Such pollutant also causes major effects on plants and animal life. [1]

In environment, there are many gases present which causes pollution and also the greenhouse effect. The major share in this destruction is of transport. Transport plays major role in creating the gases like carbon monoxide, carbon dioxide and un-burnt

hydrocarbon. Many submit and political decisions are taken to reduce in the future. CO_2 Manly originates mostly petroleum and diesel oils in transport system and also some originate from other types of fossil fuel such as natural gas, Liquefied Petroleum Gas (LPG). If national and international aiming to reduce the production of carbon dioxide they have to minimize the use of fossil fuel products in commercial usages of transportation [2].

LITERATURE SURVEY

Lin Lin.et.al[3] examined the chances and difficulties for biodiesel fuel. Petroleum derivative assets are diminishing day by day. As a sustainable power source, biodiesel has been accepting expanding consideration due to the significance it gains from the rising oil cost and its natural points of interest. This audit features a portion of the points of view for the biodiesel business to flourish as an elective fuel, while examining openings and difficulties of biodiesel. This survey is partitioned in three sections. First outline is given on improvements of biodiesel in at various times, particularly for the various feed stocks and the change advances of biodiesel industry. All the more explicitly, a diagram is given on conceivable ecological and social effects related with biodiesel creation, .

Sukumar Puhan.et.al[4] talked about the impact of biodiesel unsaturated fat on burning qualities of a DI pressure start Engine. In this investigation, fundamental spotlight is put on the impact of biodiesel sub-atomic weight, structure (Cis and Trans), and the quantity of twofold securities on the diesel Engine activity qualities. Three kinds of biodiesel with various sub-atomic weight and number of twofold bond were chosen for the exploratory investigations. The biodiesels were arranged and dissected for fuel properties as indicated by the benchmarks. A consistent speed diesel Engine, which creates 4.4 kW of intensity, was run with biodiesels and its presentation was contrasted and diesel fuel. The outcomes explain that Linseed oil methyl ester with high linolenic (unsaturated fat ester) occasionally falls short for best for diesel Engine because of high oxides of nitrogen outflow and low warm effectiveness.

Venkata Ramesh Mamilla.et.al[5] Oil based commodities assets are restricted and their utilization rate is expanding extremely quick with innovative advancement since the most recent two decades. The discharges from the use of these oil based goods contaminate nature extensively. Jatropha oil is one of the sustainable power source assets which are effectively accessible in India. This examination explores the rate substitution of jatropha methyl ester mixes to diesel as fuel for vehicles and other mechanical purposes. The examination subtleties the investigation of the exhibition and emanation attributes of the jatropha methyl esters and its correlation with oil diesel. The tests were done on a 3.6 KW single chamber, direct infusion and a water cooled diesel Engine. The fills utilized were slick jatropha methyl ester, diesel and various mixes of the methyl ester with diesel. The trial result shows that 20% of the mix shows better execution with decreased contamination. The examination shows that jatropha methyl ester mixed biodiesel is a decent substitute for unadulterated diesel.

METHODOLOGY

Initially engine stared at no load by adjusting the fuel feed control to enable engine to achieve the rated speed of 1500rpm. Engine was allowed to

run until engine reached steady state, with fuel measuring unit and stop watch, the elapsed for consumption of 10cc, 20cc, and 30cc fuel was measured and averaged. Fuel consumption, rpm, exhausts temperature and power output is also measured. The engine was loaded slowly keep the speed in the acceptable range; Observation on each parameter is recorded to generate the base line data, short term performance test is also carried out on the engine; Subsequently methanol-petrol blends were used to evaluate its potential suitability as fuel with every reading, the remaining blend is taken out of engine by drain pipe and again charged with the new methanol petrol blend to take new readings.

Fig. Engine Testing Setup

RESULT AND CONCLUSION

In this study engine performance have been tested experimentally by using different blend of methanol –petrol in ratio 0%, 10%, 15%, 20% by volume at different load with maximum RPM of 3000 3 cylinder, 4 stroke, SI engine (Product code-230H). The data discussed clearly about the blending of petrol and methanol, result shows that if experiment is operated on M15 then there is lean shifting and this lean shifting result in increasing of brake power and thermal efficiency. Brake thermal efficiency and brake power increase in this experiment. Around 2500rpm the brake thermal efficiency increase and then starts decreasing. The thermal efficiency increases as the % of methanol addition increases for constant load and improvement in combustion process. The brake thermal efficiency (BTE) is based on values of BP (Break Power) and calorific value. The specific fuel consumption (SFC) decreases as the blending ratio increases and shows higher value for pure petrol at constant loads. The additives of methanol show lower specific fuel consumption as compare to pure petrol due to higher content of oxygen in methanol. SFC decrease with increase in loads and brake thermal efficiency. Using of methanol blend (M15) in engine improves the performance of engine and also it reduces harmful exhaust gases due to the higher content of oxygen in methanol.

Future Scope

It is possible that analysis of reason for the apparent accordant between various results will bring improved understanding of the requirement of ensuring that pollutant emission minimized by running engine on methanol fuels. Fuel option for reducing emission includes reformulate fuels to reduce or increase particular components in engine or use alternative fuel such as methanol.

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