

EXPERIMENT INVESTIGATION ON EFFECT OF METHANOL- PETROL BLEND ON PERFORMANCE OF SI ENGINE TEST- A REVIEW

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Abstract-Fossil fuel is the main source for the production of energy used today. Due to the continuous rise in the cost of fossil fuel and demand of pollution free environment and clean energy is increasing. Alternative fuel has become very noticeable and has a relevant role to play for both CI & SI engines, so it is important to reduce down dependency of gasoline as a fuel. Many research and investigation have been done focusing on using alternative fuel and minimizing the effect on fuel utilization and growing engine performance.

It is known that future availability of energy resources as well as reducing carbon dioxide from fuel has increased the need of other way to replace the fuels. This investigation is done by taking commercial petrol as reference which is blended with 10%, 15% and 20% of methanol blend with petrol. Physical properties of fuel were determined for these three blends of gasoline. A three cylinder, four stroke, varying rpm, petrol MPFI engine was tested on blends contains 10%, 15%, and 20% methanol. The performance characteristics and exhaust temperature were measured. The result shows there is reduction in petrol consumption and also increase in Brake Power, Brake Thermal Efficiency, volumetric efficiency, on blending. So, we can finish from result that 15% methanol blend is mainly effective and we

can use it in further use in SI engine with little constrains on material used to continue little boost in pressure without any engine modification.

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

1. INTRODUCTION

In IC Engine, the ignition of air and powers happen inside the chamber and are utilized as the immediate rationale power . In IC Engine, the warm vitality is discharged by copying the fuel in the Engine chamber. The ignition of fuel in IC Engine is very quick however the time expected to get an appropriate air/fuel blend relies for the most part upon the idea of fuel and the technique for its presentation into the burning chamber. The burning procedure in the chamber should take as meager time as conceivable with the arrival of greatest warmth vitality during the time of activity.[1] Longer activity brings about the arrangement of stores which in mix with other ignition items may cause over the top wear and consumption of chamber, cylinder and cylinder rings. The ignition item ought not be poisonous when depleted to the climate. These necessities can be fulfilled utilizing various fluid and vaporous fills. The biodiesel from non eatable sources like Jatropa, Pongamia, Mahua, Neem and so on meets the above

Engine presentation prerequisite and in this way can offer ideal reasonable option in contrast to diesel oil in India. The test on the diesel Engine are performed and discovered that it increment the BSFC utilizing different mixes of biodiesel from different assets including diesel. The discovering shows that there is increment in the BSFC when utilizing biodiesel when contrasted with diesel for a similar force yield. This is on the grounds that that the warming estimation of biodiesel is less when contrasted with diesel.[2] It is discovered that there is no huge change in the warm effectiveness while utilizing biodiesel up to B20 however there is a slight abatement in warm proficiency when B100 was utilized which is because of the lower vitality substance of biodiesel.[3] Literature uncovered that the Engine activity on biodiesel mix with diesel produce lower vaporous discharge than diesel fuel expect NOX which increment to 2% with B20 and 10% with B100 use.[4] The target of this investigation is to create interchange fuel for IC Engine from non consumable oil source like Pongamai , Jatropha. This work provides the guidance how the biodiesel from these oils impacts the presentation of IC Engine.

2. LITERATURE REVIEW

Gaurav Dwivedi.et.al In perspective on the quick exhaustion of non-renewable energy source, the quest for elective energizes has gotten unavoidable, taking a gander at colossal interest of diesel for transportation part, hostage power age and agrarian area, the biodiesel is being seen a substitute of diesel. The point of the present work is to concentrate on the work done in the zone of generation of biodiesel from Pongamia and the portrayal of properties of different mixes of Pongamia biodiesel. The principle issue

with biodiesel is its upper thickness than diesel. The higher substance of consistency prompts arrangement of gums in the biodiesel which will influence its exhibition

Venkata Ramesh Mamilla.et.al 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.

Gerhard Knothe.et.al looked at biodiesel and inexhaustible diesel. The quest for options in contrast to oil based fills has prompted the improvement of powers from different sources, including inexhaustible feed-stocks, for example, fats and oils. A few sorts of powers can be got from these tri-acylglycerols containing feed stocks. Biodiesel is One of them, which is characterize the same as the mono-alkyl esters of vegetable oils or creature fats. Biodiesel is created by transesterifying the oil or fat with a liquor, for example, methanol under mellow conditions within the sight of a base impetus. Another sort of item that can be acquired from lipid feed stocks is a fuel whose organization mimics that of oil inferred diesel fuel.

Lin Lin.et.al 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

4. METHODOLOGY

Initially engine started 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 gradually keeping the speed in the permissible 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.3.1 Engine Testing Setup

5. SIMULATION RESULT AND DISCUSSION

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 percentage of methanol addition increases for constant load and improvement in combustion process. The brake thermal efficiency is based on values of brake power and calorificvalue.

The specific fuel consumption 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 thermalefficiency.

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 inmethanol.

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