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A Project Report on

Performance Study of Compression Ignition Engine Using Methyl Ester of Waste Vegetable oil as a Fuel

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Submitted in partial fulfillment of the requirement for the award of degree

Bachelor of Engineering In
MECHANICAL ENGINEERING

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ABSTRACT

Diesel fuel is the single largest source to power the vehicles both in transportation and agriculture sectors. The increasing demand on the use of fossil fuel leads to its scarcity. And also the burning of fossil fuel is associated with emissions like CO_2, CO, SO_X, NO_X and particulate matter, which are currently the dominant global source of emissions. Most appealing alternative energy sources for automobiles are those fuels which can be used with minimum modifications in existing engines. Hence it has become imperative fuels to replace conventional fossil fuels. Many types of alternative fuel sources, such as solar energy, electrical energy, hydrogen fuel cells as well as several vegetable oils have been tried Among the vegetable oils, Jatropha, pongamia, waste restaurant oil, soyabean, rapeseed, cottonseed and others have proved to be effective. Of these waste restaurant's oil shows a great promise as an alternative fuel for diesel. According to survey approx. 25 lacs liters dumped as a waste product in Bangalore city alone and in outside countries they pay to get it disposed (approx. 1.1 billion kg of waste restaurant oil are collected annually from restaurants and fast foods in united states). Hence there is a dire necessity to utilize these waste oils.

This works deals with the experimental investigations carried out in studying the performance analysis of 4 stroke Diesel Engine using methyl ester of used vegetable oil and its blends with diesel. Bio diesel (methyl ester of used vegetable oil) has been prepared by trasesterification process. Performance tests on single cylinder 4 stroke Compression Ignition engine have been conducted using pure biodiesel and its blends as fuel and performance parameters are compared by using Diesel as fuel. Various graphs like Brake Thermal Efficiency, BSFC, BSEC, fuel consumption rate and Exhaust gas temperature verses loads ranging from 0 kg to 5 kgs have been plotted. The study shows that there will be a slight improvement in brake thermal efficiency, so methyl ester of used vegetable oil can be a alternate fuel.