PROJECT REPORT ON

PERFORMANCE STUDIES WITH BIODIESEL VAPOUR INDUCTION IN A SINGLE CYLINDER DIESEL ENGINE

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ABSTRACT

Indiscriminate extraction and lavish consumption of fossil fuels have led to reduction in underground carbon-based resources. The need to exploit bio-origin-based alternative fuels to quench the world's energy thirst has long been realized. Homogenous charge compression ignition (HCCI) is a modern combustion technology which uses homogeneous charge for combustion. HCCI engines operate on the principle of having a dilute. premixed charge that reacts and burns volumetrically throughout the cylinder as it is compressed by the piston. Vapour induction is one of the approaches to achieve partial HCCI. This can be achieved vaporizing diesel/biodiesel using exhaust gas. The vapourised fuel is then mixed with the intake air.

In the present work fuel is vaporized by a heat exchanger by the exhaust gases from the engine. The work involves performance test on a single cylinder 4 stroke diesel engine, with and without vapour induction. A shell and tube heat exchanger has been designed which uses waste exhaust gases from the engine as heating media. The variables such as load and fuel flow rate through heat exchanger are varied and corresponding performance characteristics such as brake power, brake thermal efficiency, volumetric efficiency, brake specific fuel consumption and air fuel ratios are compared for engine operation before induction and after induction.

The results obtained show that there is increase in brake thermal efficiency and air fuel ratio, decrease in brake specific fuel consumption for the vaporized fuel mixtures of diesel and biodiesel blends. B20 and B40 fuels with 0.1 kg/hr flow rate have comparatively lower fuel consumption as compared to diesel. Vaporised diesel consumes 20 percent less fuel when compared with normal diesel. The charge is compression ignited because of which there is no throttling losses, which leads to high efficiencies.

Keywords: *HCCI, vapour induction, biodiesel, honge oil*