

EXPERIMENTAL INVESTIGATION ON EFFECT OF INJECTOR OPENING PRESSURE ON PERFORMANCE, EMISSION AND COMBUSTION CHARACTERISTICS OF COMPRESSION IGNITION ENGINE FUELLED WITH VEGETABLE OIL –ETHANOL BLEND

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Abstract

In this study, experiments are conducted on single cylinder, constant speed, direct injection compression ignition engine to investigate effect of injector opening pressure (IOP) on performance, emission and combustion characteristics. The engine is operated with diesel and a blend BSVO-70 having 70 % straight vegetable oil (Honge oil) with 30% ethanol. During investigation, injector opening pressure is increased from 200 bar to 260 bar. It is observed that increase in injector opening pressure from the rated injector opening pressure of 200 bar to 240 bar improved the brake thermal efficiency, reduced CO, HC and smoke opacity with increased NO_x emissions. However, increase in injector opening pressure from 240 bar to 260 bar deteriorated the engine performance with increased CO, HC and smoke emissions. Improvement in peak pressure and net rate of heat released observed for blend, with increase in IOP from 200 bar to 240 bar. The optimum injector opening pressure is 240 bar with BSVO-70 based on thermal efficiency and emissions.

Keywords: Straight vegetable oil, Blend, Injector opening pressures, Brake specific fuel consumption, Oxides of Nitrogen, Smoke emissions.