

EFFECT OF INJECTION TIMING ON PERFORMANCE, COMBUSTION AND EMISSION CHARACTERISTICS OF DIESEL ENGINE USING CANOLA OIL AS FUEL

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ABSTRACT

Due to the increasing demand for fossil fuels and environmental threat, a number of renewable sources of energy has been studied worldwide. An attempt is made to assess the suitability of vegetable oil for diesel engine operation. In Diesel engines quality of combustion is depending on the formation fuel-air mixture. A high-quality of formation for combustion is achieved by addition of pulverized fuel drops and the air inside the cylinder. In this issue, injection parameters such as timing and period of injection, injection pressure and the number of the injection beams affect quality of combustion and mixture formation. The present paper is focused on the effect of injection timing on performance, combustion and emission characteristics of canola biodiesel and its blends with pure diesel on a 4 stroke direct injection diesel engine without any modification in the existing experimental setup. Standard injection pressure (220 bar) is maintained during the experiment. Injection timings (21° , 24° and 27° bTDC) were considered under steady state conditions at maximum load condition of the engine. The effect of varying injection timing was evaluated in terms of thermal efficiency, specific fuel consumption, carbon monoxide, hydrocarbons and oxides of nitrogen were presented graphically and concluded that the advanced injection timing increases the brake thermal efficiency and reduces unburned hydrocarbon and Nox emissions significantly.

KEYWORDS: Diesel Engine, Injection Timing, Canola Oil, Performance, Emission, Combustion Characteristics