

Test on CRDI Diesel Engine Using Biodiesel as an Alternative Fuel

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Abstract: In this research work an experimental investigation of biodiesel blends on combustion, performance and emission characteristics of a direct injection (DI) CRDI Diesel Engine is carried out. The blends are prepared at different proportions and fuel properties such as calorific value, viscosity, flash point and fire point, cloud point, pour point of biodiesel (B), diesel (D), biodiesel-diesel (BD) blends are determined. The engine test is conducted at different speeds and loads. From the results obtained for fuel properties we can observe that the flash, fire and pour point, mechanical efficiency and thermal efficiency are decreasing by increasing the percentage of sunflower biodiesel in BBD blends. It is also observed that the performance parameters such as brake thermal efficiency (BTE) and exhaust gas temperature increases with increase in the proportion of butanol in BBD blend. However, the brake power (BP) decreases with increase in the proportion of sunflower and waste cooking oil in BBD blend. The increase of butanol in BBD blends also influences emission characteristics such as carbon monoxide (CO), hydrocarbon (HC) and oxides of nitrogen (NOx). The use of biodiesel as an alternative to petroleum diesel has become prevalent in the past two decades due to the depletion of fossil fuels. It is a renewable source of energy as edible and non-edible plants can be grown at will. But taking into consideration the ever-growing population the use of vegetable oil in excess could result in starvation.

Keywords: Diesel Engine, Butanol, Biodiesel, BBD Blends, Emission Characteristics Alternative, Edible, Non-edible, Lubrication, Mechanical Efficiency. Diesel, Ethanol, etc.

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