

PERFORMANCE CHARACTERISTICS OF AN ALCOHOL FUELLED INSULATED DI DIESEL ENGINE WITH NEWLY DEVELOPED LUBRICANTS WITH TEFLON BASED ADDITIVE

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Abstract

The petroleum crisis of recent years has simulated a world-wide search for alternative fuels and also emphasized the need for using petroleum fuels with utmost economy. This leads to the recognition of alcohol as a preferable replacement because these are derived from indigenous sources and are renewable. However alcohols by their nature do not make a good CI engine fuel due to its low cetane number and high latent heat of vaporization. But they have peculiar property of igniting in the high temperature combustion chambers. This tendency of alcohols is being exploited in developing the insulated engine (IE) which reduces the ignition delay and aids combustion. The engine in which the heat transfer surfaces are thermally insulated (PSZ coated cylinder head, valves and air gap liner and air gap piston) is the method being investigated for improving fuel efficiency and to reduce the emissions. The low viscosity of alcohols leads to the problem of injection and equipment wear and tear. In order to compensate this, the fuel injection pressure has been reduced to 165 bar for the experimentation. Tests are conducted on a single cylinder 4-stroke, water-cooled 3.68 KW Kirloskar C.I. engine.

For the total experiments the commercial lubricant is used. But the commercial liquid lubricants are totally inadequate to perform under this escalated thermal environment. So the frictional losses in the engine are found to be higher. In the present work new lubricants are developed from the base oil supplied by refineries. These newly developed lubricants are blended with different additives and analyzed the frictional losses to find the best oil.

Keywords: Insulated engine, alcohol and new lubricating oils.