

VOLMETRIC EFFICIENCY COMPENSATION WITH SUPERCHARGING IN AN INSULATED DI DIESEL ENGINE FOR IMPROVED PERFORMANCE

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Abstract

The higher temperatures available in the Insulated engine are used for vaporizing the alcohols due to its higher latent heat of vaporization and lower cetanenumber. One of the main problems in the insulated engines is the drop in volumetric efficiency which causes the decrease in the density of air entering the cylinder because of higher wall temperatures of the insulated engine. The degree of degradation of volumetric efficiency depends on the degree of insulation. This further increases the frictional horse power due to thinning of lubricant. Therefore to improve the thermal efficiency of insulated engine, the volumetric efficiency drop is to be compensated either by supercharging. Hence the present experimental work is planned accordingly. For the purpose of supercharging the engine, an external blower which is driven by a motor is used. But in the turbocharging the exhaust gases are expended in a turbine which is further coupled to engine. Experiments are carried out in a single cylinder water cooled DI diesel engine with an air gap insulated piston, airgap insulated liner and ceramic coated cylinder head and valves. The volumetric efficiency is compensated with super charger. The insulated diesel engine with volumetric efficiency compensation gave a better performance and reduced smoke. During the experimentation in super charging and turbocharging the intake boost pressure is raised and its effect on the engine performance is studied.