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INVESTIGATION OF THERMAL BARRIER COATINGS ON PISTON CROWN TO IMPROVING THE SI ENGINE PERFORMANCE

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Abstract

The quest for increasing the efficiency of an internal combustion engine has been going on ever since the invention of this reliable workhorse of the automotive world. Recently, much attention has been focused on achieving this goal by reducing energy lost to the coolant during the power stroke of the cycle. Thermal barrier coatings have a significant effect in the reduction of wear and abrasion failure in reciprocating and rotary engines for transportation and stationary power. As operating temperatures are pushed higher to improve efficiency in these engines, the wear/abrasion problem becomes more challenging because lubrication in the high temperature locations becomes increasingly problematic. Yttria zirconia, Chromium oxide &Tungsten carbide coatings have applications as thermal barriers to improve the efficiency of the engines. The main aim of this investigation is to evaluate the effects of Yttria zirconia, Chromium oxide &Tungsten carbide coatings coating on petrol engines effective efficiency at different engine loads and speeds. The yttria zirconia coated piston have low thermal conductivity so thermal barrier leads to the increase in efficiency and performance. Emission test is carried for various load to calculate the level of CO%, HC ppm, CO₂, O₂%, NOx ppm.

Keywords: Thermalbarriercoating; SIengine; Engine performance; Emissions characteristics; Efficiency.

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