

Enhancement of Tribological Behavior for Diesel Engine Piston of Solid Skirt by an Optimal Choice of Interface Material

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Abstract : Shear stresses generate frictional forces thus lead to the reduction of engine performance due to the power losses. This friction can also cause damage to the piston material. Thus, the choice of an optimal material for the piston is necessary to improve the elastohydrodynamical contacts of the piston. In this study, to achieve this objective, an elastohydrodynamical lubrication model that satisfies the best tribological behavior of the piston with the optimum choice of material is developed. Several aluminum alloys composed of different components are studied in this simulation. An application is made on the piston 60 x 120 mm Diesel engine type F8L413 currently mounted on Deutz trucks TB230 by using different aluminum alloys where alloys based on aluminum-silicon have better tribological performance.

Keywords : EHD lubricated contacts, friction, properties of materials, tribological performance

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