STRESS AND THERMAL ANALYSIS ON THE PISTON HEAD USING FINITE ELEMENT ANALYSIS (FEA)

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ABSTRACT

This study on the Stress and Thermal Analysis are motivated by the problem that occur in the SI Engines. **MSC. Nastran Software** is a **Finite Element Methods Analysis** that uses to determine the stress and thermal on the piston. The analysis base on the piston head in the Spark Ignition (SI) Engines. The objective of the project is to analyze stress and thermal on the piston head and to select the best piston head surface that produces less maximum stress and thermal on the piston head. The angles in this analysis are -25 ^{o} before the Top Dead Center (TDC). The analysis only on the flat piston head.

From the result and data analysis, the best selection of the piston head surface that has less maximum stress and temperature is convex surface. The maximum stress is 1.65 x10^{8} Pa. This lower stress and temperature will give long lifecycles to the piston in S.I. Engines before failure. Therefore, it will reduce the cost of the engine maintenance due to piston failure. Finally, the study of the stress and thermal analysis has successfully full fill the objectives of this final project.

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