STRENGTH ANALYSIS OF TWO CYLINDER CRANKSHAFT WITH 650CC OF ENGINE CAPACITY USING FINITE ELEMENT METHOD

Name of Student : Yosa Desika Wijaya
NRP : 2107 100 134
Department : Mechanical Engineering
Supervisor : Yohannes S.T.,M.Sc

Abstract

Crankshaft is a part of the engine that converts reciprocating motion of the piston into rotational motion. Crankshaft received heavy loads during operation. One of the most important function of a crankshaft as a successor of alternating pistons force into rotational force. A very important function of this rigid body makes strength analysis of the crankshaft becomes very necessary. This research was conducted by comparing the stress distribution caused by loading using finite element method against the two levels of the crankshaft speed, 3800 RPM (maximum torque) and 4500 RPM (maximum power). Then proceeded the failure of static analysis based on the stress distribution.

The results showed the biggest of von-Mises stress and shear stress occurred at engine speed 3800 RPM with a value 173.62 MPa and 95.27 MPa respectively. Based on the failure of static analysis, crankshaft with material type G 5502 / FCD 450 (JIS Standard) been declared safe against the von-Misses stress and shear stress. Based on Sodeberg method, the crankshaft is also safe against the fatigue loads because of all values of $\sigma_m$ and $\sigma_a$ are in the safe stress line area.

Keyword : crankshaft, finite element method, failure of static analysis