



DESIGN, ANALYSIS AND OPTIMIZATION OF FLYWHEEL

A Project report submitted
in partial fulfillment of the requirements for award of
degree of
BACHELOR OF TECHNOLOGY
IN
MECHANICAL ENGINEERING

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CERTIFICATE

This is to certify that the thesis entitled “**DESIGN, ANALYSIS AND OPTIMIZATION OF FLYWHEEL**” being submitted by **S RAJENDRA SANTOSH KUMAR (14811A03A8)**, **M MAHESH (14811A0376)**, **U LAKSHMAN KUMAR (14811A03C5)**, **Y HARI BABU (14811A03D1)** and **R SRINIVASA RAO (14811A03A3)** in partial fulfillment of the requirement for the award of the degree of **BACHELOR OF TECHNOLOGY in MECHANICAL ENGINEERING** is a record of bonafide work done by them under my supervision during the academic year 2017-18.

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ABSTRACT

A flywheel used in machines which serves as a reservoir which stores energy all along the period when the supply of energy is more than the required energy and releases it during the period when the requirement of source is less than supply.

For example, in Internal Combustion (I.C) engines, the required energy is developed only in the power stroke which is lot more than engine load, and no energy is being produced during the suction process, compression and exhaust strokes in case of four stroke engines. The excess energy which is developed during power stroke is consumed by the flywheel and discharges it to the crank shaft at the time of other strokes in which no energy is produced, thus rotating the crank shaft at a constant speed. The flywheel is placed at one end of the crankshaft and delivers two objectives. First, through its inertia, it compensate vibration by smoothing out the power stroke as each cylinder fires. And the Second, one is the mounting surface used to nut the engine up to its load. The aim of the system is to design a flywheel for a multi cylinder petrol engine flywheel using the empirical formulas. Different designs are modelled in 3D modeling programmable software called CATIA V5.

The forces assisting on the flywheel are also considered and calculated. The capacity of the flywheel is validated by applying forces on the flywheel in analysis software ANSYS 15.

Structural study is done on the flywheel. Structural study is used to test whether flywheel withstands under working conditions are not. Analysis study is done for three materials Cast Iron, Carbon Fiber Reinforced Polymer (CFRP) and Glass Fiber Reinforced Polymer (GFRP) and on different design structures to compare the results.