A PROJECT REPORT ON

"Contact Stress Analysis of Mating Spur Gears subjected to varying loads"

A project report submitted in partial fulfillment of the requirements for the award of the

Degree of

BACHELOR OF TECHNOLOGY

IN

MECHANICAL ENGINEERING

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CERTIFICATE

This is certify that the project work entitled **"Contact Stress Analysis of Mating Spur Gears subjected to varying loads"** is a bonafied record of work done by A. SHIVA KUMAR(17811A0304), J. MADHAN MOHAN(17811A0324), P. SANJAY (17811A0348) AND P SAI YESWANTH(17811A0347) in partial fulfilment of the requirement for the award of Bachelor of technology in MECHANICAL ENGINEERING by Jawaharlal Nehru technological university, Kakinada During the year 2017-2021.

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PROJECT GUIDE

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Abstract

Gear is one of the most critical components in mechanical power transmission systems. Contact stress is generally the deciding factor for the determination of the requisite gear geometry. Research on gear action has confirmed the fact that besides contact pressure, sliding velocity, viscosity of lubricant, other factors such as frictional forces, contact stresses also influence the formation of pits on the tooth surface. So thorough study of contact stresses developed between the different mating gears are mostly important for the gear design. This work focuses on design and simulation of spur gears in an automobile transmission system subjected to various loading conditions. The design of gears will be done using CATIA and the contact stresses induced at the mating points is simulated using ANSYS. The design is taken from Dassault's website where they have worked on the spur gear system employed in an automobile transmission system. The results are iterated for different loading conditions and materials. The materials chosen for analysis include S45C Carbon Steel, SUS 303 Steel, AISI 4140 Steel, Cast Iron from literature studies where von-mises stresses, deformations, fatigue life, damage and factor of safety are determined. The best material that can be employed is identified and suggested based on the results obtained.

Keywords: Contact stress analysis, Spur gear analysis, Fatigue analysis.