

A Report on
Thermal & Static Analysis of an Automated Brake System
Using ANSYS

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CERTIFICATE

This is to certify that the project entitled “ **Thermal & Static Analysis of an Automated Brake System Using ANSYS**” is the record of the work carried out by **SRIPATHI SAI VAMSI (21815A0363), GONDESI MANI KUMAR (21815A0316), MUDUNURU BALA SAI ADITYA (21815A0327) and KURAKULA GOWTHAM (21815A0324)** students of final year B. Tech in the department of Mechanical engineering. This work is done for the partial fulfillment for the award of BACHELOR OF TECHNOLOGY during the year 2023-2024.

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ABSTRACT

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Safety aspect in automotive engineering has been considered as a number one priority in development of new vehicle. Each single system in brake system has been studied and developed in order to meet safety requirement. Instead of having air bag, good suspension systems, good handling and safe cornering, there is one most critical system in the vehicle which is the braking systems.

If there is no proper braking system in the vehicle the passenger in the vehicle is in unsafe position. Therefore, it is a must for all vehicles to have proper braking system. Due to critical system in the vehicle, many of researchers have conducted a study on brake system and its entire component. In this project, we have conducted a study on performance of normal disc brake rotor of normal passenger vehicle at different speeds when different materials are used. The study is more likely concern of Stress distribution on disc brake rotor and deformation and stresses developed on it due to different speeds.

The widely used brake rotor material is cast iron which consumes much fuel due to its high specific gravity. The aim of this project is to select the optimum material for the application of brake disc system emphasizing on the substitution of this cast iron by any other lightweight material.

The present project is aimed to study the given disc brake rotor for its stability and rigidity, for this Thermal analysis and coupled structural analysis is carried out on a given disc brake rotor to find out its deformation, stress when different materials are used. For these three different materials in each case is analyzed.

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