Design and Fabrication of Automotive Disk Brake System

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Abstract **- Automotive disc brake is a device by means of which artificial frictional resistance is quick applied to rotating disc, in order to stop the motion of vehicle instantly. During the braking phase, the frictional heat generated at the interface of the disc and pads can lead to high temperature. For reduce this temperature improving design modelling of an automotive disc rotor. The objective of the current study is to design a Disc, Brake pads, Piston and also Core and Cavity of Disc Brake Rotor by using Creo parametric 7.0, To manufacturing of disc brake rotor using Aluminum Metal Matrix Composites by using stir casting method. AMMC is the combination of aluminum reinforced with fly ash along with small quantity of other material like magnesium, graphite which are added in precise quantity to enhance the chemical, mechanical, thermal strength of material and testing in real time application and to investigate and analyses the temperature distribution, also analysis design of disc plate of rotor and to identify critical temperature during operation using FEA analysis.**

Index Terms **- Disc brake, Calliper, Master cylinder**

INTRODUCTION

The automotive disc brake is a device for slowing or stopping the rotation of a wheel instantly. A tandem type of master cylinder was selected so that independent to hydraulic circuit can be obtained and it can be obtained by single control from brake pedal. A two-wheeler vehicle disc rotor made of aluminum alloy and ceramic composite (including carbon and silica). These brakes offer better stopping performance than comparable drum brakes, including resistance to "brake fade" caused by the overheating of brake components, and are able to recover quickly from immersion (wet brakes are less effective).

In this automotive disc brake system advanced type caliper are used in which used two pistons in one side and other side flexible caliper used to reduce speed of vehicle, the stopping power or capacity of a friction brake depends on the area in contact and coefficient of friction of the working surfaces as well as on the actuation pressure applied. Wear occurs on the working surfaces, and the durability of a given brake (or service life between maintenance) depends on the type of friction material used for the replaceable surfaces of the brake. If drake disc is in solid body the Heat transfer rate is low. Time taken for cooling the disc is low. If brake disc is in solid body, the area of contact between Disc and Pads are more, so efficiency of brake is high. The variation in temperature between a full and ventilated disc having same material is about 65 degree at the moment1.8839 s from application of brake the obtained results are very useful for the study of the thermo-mechanical behaviour of the disc brake (stress, deformations, efficiency, and wear).

PROBLEM DEFINITION

- Before we used automotive disc brake, we are used drum brake system in two-wheeler.
- In drum brake system excessive wear and hauling happens due to this heat may produce. If we used continuously this brake system oversize of drums may occur replace the drum immediately.
- Due to above problem a control of vehicle may loosed, and accident may happen to overcome this problem we used disc brake system instead of drum brake system.
- Sometimes a loud noise or high-pitched squeal occurs when the brakes are applied. Most brake squeal is produced by vibration (resonance

instability) of the brake components, especially the pads and discs (known as force-coupled excitation). This type of squeal should not negatively affect brake stopping performance.

- Techniques include adding chamfer pads to the contact points between caliper pistons and the pads, the bonding insulators (damping material) to pad backplate, the brake shims between the brake pad and pistons, etc. All should be coated with an extremely high temperature, high solids lubricant to help reduce squeal.

CONCLUSION

Now a days automotive disc brakes are mostly used in vehicles to reduce the speed quickly.

Automotive disc brakes are huge successful for the automotive industry.

With this project we achieved a safe durable and variable design for a rotor component in a automotive disc brake system taking in consideration the forces exerted for all the components in the brake system.

We are concerned with the points of safety, we calculated forces and analysis exerted on this using material.

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