VOLUME-7, ISSUE-2, FEBRUARY-2018 • PRINT ISSN No 2277 - 8160

Original Research Paper

ENGINEERING

BRAKING SYSTEM DESIGN FOR GO-KART

Satya Prakash Gupta Assistant Professor, Mechanical Engineering,IIMT Greater Noida,India

Gurudayal Kumar Assistant Professor, Mechanical Engineering,IIMT Greater Noida,India

ABSTRACT

A disc braking system is a wheel brake system which is use to provide the motion control of wheel and slows rotation of the wheel by the conversion of kinetic energy of wheel into heat energy by pushing brake pads against a brake disc with a set of calipers. This paper deals with the design analysis of the brake systems of a Go kart . We have extensively designed and carried out the design analysis regarding separate parameters of the disc brake system involved in the car. The mechanical device used in go-kart for slowing and stopping of vehicle is termed as disc brake. Here in this the various engineering aspects are being considered for evaluating different variables.

KEYWORDS : Braking System, Go-Kart, Caliper, master cylinder, disc

Introduction

Go-kart is a simple four-wheeled, small engine, single Seated racing car used mainly in United States .For proper movement of any vehicle, brakes play a very important role. The vehicle has two independent hydraulic systems and a single brake pedal actuates it. The pedal directly actuates the master cylinder. Here no cables are used for this purpose. All rigid brake pipes are mounted securely along the roll cage or along other members. The brake system design includes the single disc at the rear axle to stop the vehicle. It is mounted in the one third part position of the axle with opposing the position of drive train sprocket hence also enables the good balancing requirement. Master cylinder is used at the front near the brake pedal providing the occupant to easily accessible space

CONSIDERATIONS FOR BRAKING SYSTEM SELECTION

Discs, calipers and master cylinders which were used for considering suitable for our vehicle after market survey

Various brakes disc available in market:

Sr. No.	Vehicle name	Dia. of front brake disc	Dia. Of rear brake disc
1	Apache 180 RTR	270 mm	200 mm
2	Pulsar 200 NS	280 mm	230 mm
3	Honda active 125	190 mm	XX
4	Bajaj discover 125	200 mm	XX
5	Honda CB shine 125	240 mm	XX

Various calipers available in market:

Sr. No.	Caliper brand	No. Of pistons	Arrangement of pistons	Dia. Of Piston front
1	Apache 180 RTR	2	Single side	28.5mm
2	Pulsar 200 NS rear	2	Single side	40mm
3	Honda active 125	1	Single side	26mm
4	Bajaj discover 125	1	Single side	28mm

Components that we are using:

COMPONENTS	SPECIFICATION
Rotor	190 mm (dia) of activa 125
Master cylinder	$2.01*10^{-4}$ m^2 (area)
Brake fluid	Dot-3
Caliper	26 mm (dia)

Calculating values:

Pedal force applied by driver	1177.2N
Pedal lever ratio	6:1
Force on caliper	2869.79N
Braking torque	164.45N/m
Time taken to stop the vehicle	0.35s
Stopping distance	2.9m

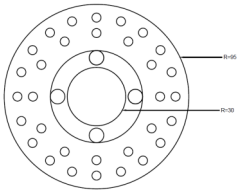

Fig-1 Rotor of disc

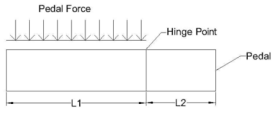

Fig-2 Brake pedal

CONCLUSION:- We calculated all the design parameters and analyzed the layout of braking system, brake disc, etc. Thus after all required test and calculation we have concluded that our design is safe for fabrication and installation of braking system in go-kart.

REFERENCES

[1] M. T. V and D. S. P. M, "Structural and Thermal Analysis of Rotor Disc of Disc Brake," International Journal of Innovative Research in Science, Engineering and Technology, vol. 2, no. 12, pp. 7741-7749, 2013.
[2] B. N and P. G, "Design and Analysis of Disc Brake Rotor for a Two wheeler," International Journal of Mechanical and Industrial Technology, vol. 1, no. 1, pp. 7-12, 2014.
[3] P. P. C. D. S. B. Jaju, "A REVIEW ON THERMAL AND CONTACT STRESS ANALYSIS OF DISC BRAKING SYTEM," International Journal of Engineering Research and General Science, vol. 2, no. 1, pp. 78-84, 2014.
[4] B. M. Belhocine A, "Temperature and Thermal Stresses of Vehicles Gray Cast Brake," Journal of Applied Research and Technology, vol. 11, pp. 675-682, 2013.
[5] D. Swapnil R. Abhang, "Design and Analysis of Disc Brake," International Journal of Engineering Trends and Technology, vol. 8, pp. 165-, 2014.
[6] H. S. Haripal Singh, "Thermal Analysis of Disc Brake Using Comsol," International Journal on Emerging Technologies, vol. 3, no. 1, pp. 84-88, 2012.
[7] Automobile Engineering by R.K Rajput
[8]. Theory of Machines, by R.S Khurmi, JK Gupta
[9]. Machine Design by R.S Khurmi, JK Gupta