Design and Fabrication of a Go kart

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***Abstract*- This paper concentrates on explaining the design and engineering aspects of making a Go Kart. This report explains objectives, assumptions and calculations made in designing a Go Kart. The primary objective is to design a safe and functional vehicle based on rigid and torsion free frame. The design is chosen such that the Kart is easy to fabricate in every possible aspect.**

Index terms- Design, Engine and Transmission, Steering, Brakes and wheels, welding, cutting and safety.

INTRODUCTION

The document approached our design by considering all possible alternatives for a system and modeling the min CAD software CATIA and subjected to analysis using ANSYS based on analysis result, the model was modified and retested and a final design was fixed. The design process of the vehicle is based on various engineering aspects depending up on

Safety and ergonomics
Market Availability
Cost of the Components
Safe Engineering Practices

Guidelines

STEERINGSYSTEM

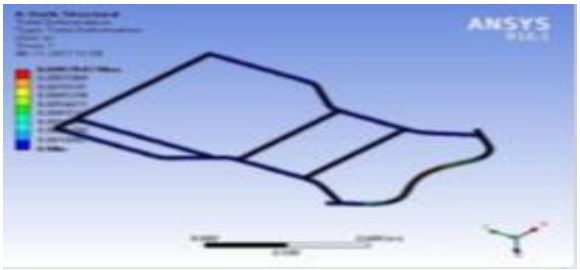
Mechanical arrangement is planned to be used this type of steering system was selected because of its simple working mechanism and a steering ratio of 1:1so to simple we have used mechanical type linkage.

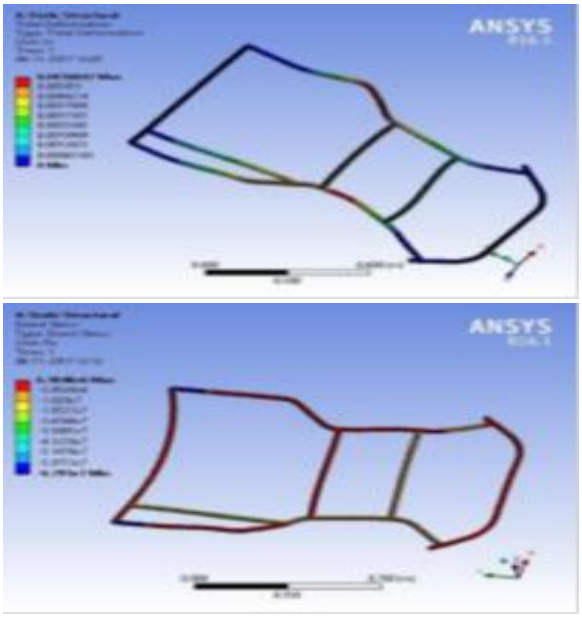
GEOMETRY	VALUES
Caster Angle	12 degrees
Camber angle	0 degrees
Combined angle	10 degrees
Scrub radius	9mm
Minimum turning radius	1.12 m
Maximum turning radius	1.09 m

BRAKINGSYSTEM

The braking system has to provide enough braking force to completely lock the wheels at the end of a specified acceleration run, it also proved to be cost effective. The braking system was designed by determining parameters necessary to produce a given deceleration, and comparing to the deceleration that a known braking system would produce.

Calculations:
Pedal effort=1980N
Disc diameter=190.5mm
Pedal ratio=6:1
Overall weight (M) =130kgs
Diameter of master cylinder (d1) =25.4mm
Diameter of caliper (d2) =30.48mm
Assumed values: Coefficient of friction between tire and road=0.7
Coefficient of friction between disc and caliper=0.4
Clamping force = (Pedal Effort * Pedal Ratio *d12) /d22 = 2851.2N
Breaking torque in disc = (CLAMPING FORCE) * μ * radius of disc = 6.34 KN/mm Deceleration = μ (road) * g = 6.867 m/sec2
Figures
Force is applied on front, side and rear portion of Go-kart and all DOF'S of front were constrained.





CONCLUSION

The purpose of this project was to fabricate a go kart based on a conceptual design which is optimized to increase the stability of the vehicle. The design is based on rule book which is affiliated to CIK-FIA. The design and fabrication of the Go-kart focuses on developing a simple, light weight and easily operated vehicle. Aspects of ergonomics, safety and reliability were incorporated into the design specifications. Analyses were conducted on all major components to optimize strength and rigidity, improve vehicle performance and to reduce complexity and manufacturing costs.

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