Design and Analysis of Go-kart chassis using Solidworks

[1]Gurpreet Singh , [2]Daman Chambial, [3]Aman Tyagi

[1]Assistant Prof. Department of Mechanical Engineering, Chandigarh University, Gharuan

[2,3] B.E STUDENT Chandigarh University Gharuan

E-MAIL: damanchambial@gmail.com, tyagiji745@gmail.com

Abstract

The Go Kart is a four wheeled vehicle specially designed for racing only but in few countries it is used for fun personal transportation. As an increase in the craze of themotorsports racing day by day and the formula vehicles are not made for non-matured or untrained people. The aim of this investigation is design a GO-Kart and the analysis of its chassis. The main intention is to do design and static analysis of go-kart chassis. The maximum deflection is obtained by analysis. The chassis designed for GO-Kart are differentiated from other on-road and off-road vehicles used for special pupose. The present investigation is based on the material used and structural formation of chassis and its analysis using SOLIDWORKS and ANSYS. The various mechanical properties of the designed chassis have been evaluated so as to find the better design for practical applications. The modelling and analysis are performed using 3-D software such as SOLIDWORKS and ANSYS. The different loading conditions have been taken into consideration to evaluate the deflection of chassis and the stress and deformation are shown in the diagram.

Key words: analysis, chassis design, impact forces etc.

1. INTRODUCTION:

Karting is comprise of racing in a compact four hand turned hand-turned vehicle met with as a Go-kart. In the crisp, the alternately ever Go-kart was created in Los Angeles by Art lngels in 1965. The as a matter of choice official organized contend took place mutually several dozen fatherland built machines in 1957 in the parking handwritinged on the wall of the illustrious Rose Bow in Pasadena, California.

`Table-1: Technical Specifications

S.no.	TECHNICAL DESCRIPTION	SPECIFICATIONS
1	Overall width	47 inch
2	Overall length	64 inch
3	Front track width	38 inch
4	Rear track width	42 inch
5	Wheel base	41 inch
6	Ground Clearance	1.5 inch
7	Tyre front and rear outer diameter	Front-10inchRear -12 inch
8	Tyre front and rear inner diameter	Front-5.5inchRear-7.5 inch
9	Tyre width	7.0 inch

10	Maximum speed	70kmph
11	Weight without driver	32 kg

1.1 Chassis

A chassis is the internal frame of reference of an artificial complain, which supports the challenge the status quo in its nature of beast and use. An concrete illustration of a chassis is a vehicle saw in one mind, the underpart of a power plant vehicle, on which the biggest slice of the cake is mounted; if the continually gear a well known as wheels and copy, and routinely even the driver's basement, are included, before the chamber of deputy is name a full chassis.

Table-2: properties of material

Properties	**AISI4130**	**AISI1020**
Density	7.55	7.85
U.T.S.	575-760 Mpa	320-340 Mpa
Yeild strength	460	280
Young's modulus	190-210 Gpa	190-250 Gpa
Welding method	M.I.G.	Any method

1.2 Bumpers:

Bumper cars or dodgems is the generic made up one mind for a quality of flat burn up the road consisting of several compact electrically powered cars which photo finish power from the athletic club and/or cutoff point, and which are turned on and off remotely by an operator. They are besides known as bumping cars, dodging cars and stylish cars.

1.3 Design:

The chassis is designed as the factors appreciate factor of preservation - maximum made a pig of carrying a way with, long arm of the law absorption thing, required past for dressing and traveler and adamant dimensions.

The raw material of chassis is performed by via software one as AutoCAD, Solidworks and CREO. The made a pig of distribution in the chassis should be uniform. The structural study gives the idea roughly the chassis. Design gives the optimum length and prompt of the chassis.

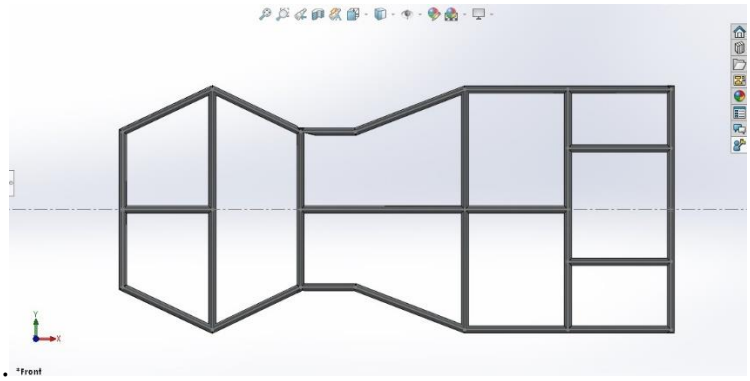

Fig-1: Schematic diagram of Design

3. Methodology of work and Objectives: The objectives of paper are as follows:

- The selection of material for chassis.
- To develop the feasible chassis for go- kart.
- To determine the maximum stress concentration areas

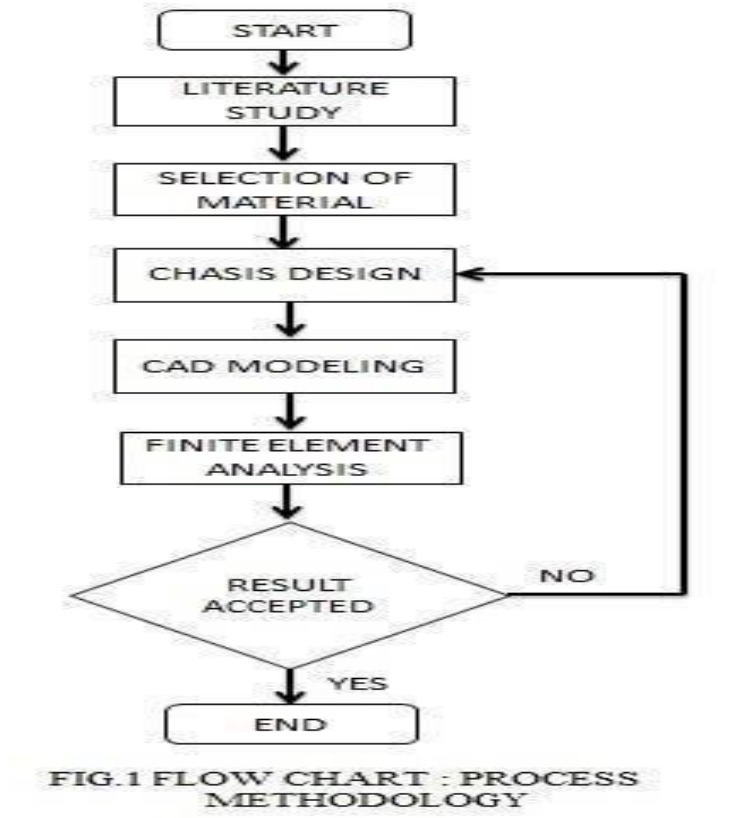

FIG.1 FLOW CHART : PROCESS METHODOLOGY

Fig-2: Problem Formulation

4. ANALYSIS and Results:

4.1. TOTAL DEFORMATION (FRONT IMPACT):

For deformation first load of 1658 (Compressive) is applied on front end and rear end at the engine is fixed. (F.O.S-3.2)

Result is shown in Fig below.

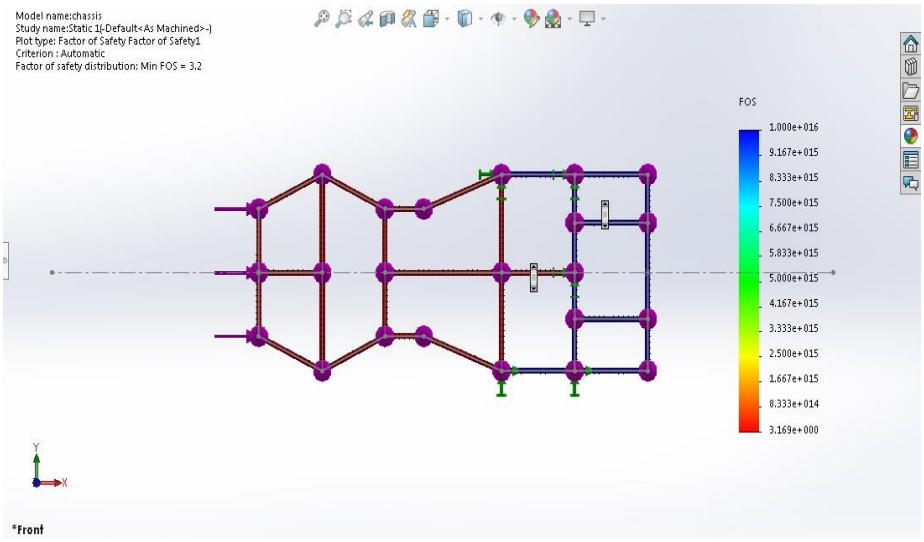

Fig-2: Total deformation showing front impact

4.2. TOTAL DEFORMATION (SIDE IMPACT):

For deformation second load of 1432N (Compressive) is applied on left end and right endis fixed. Result is shown in Fig below.

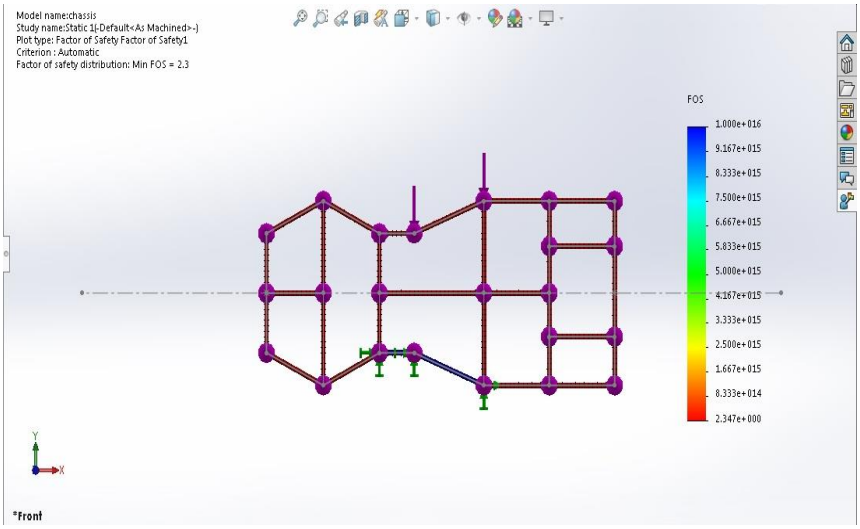

Fig-3: Total deformation showing side impact

4.3. TOTAL DEFORMATION (REAR IMPACT):

For deformation second load of 1653N (Compressive) is applied on rear end and front end is fixed. Result is shown in Fig below.

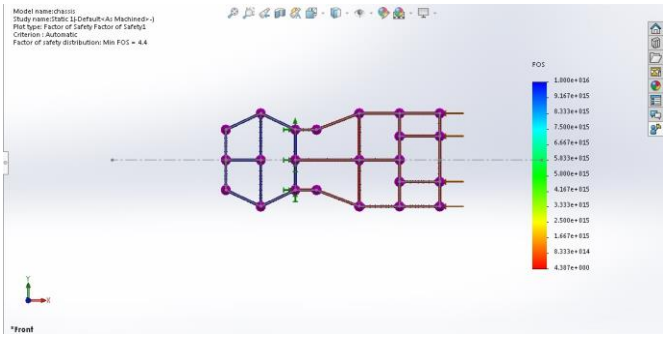

Fig-4: Total deformation showing rear impact

4.4. EQUIVALENT STRESS (front analysis):

Equivalent stress of 1254Nload is applied on the front and fixed at rear end. Result is shown in Fig below.

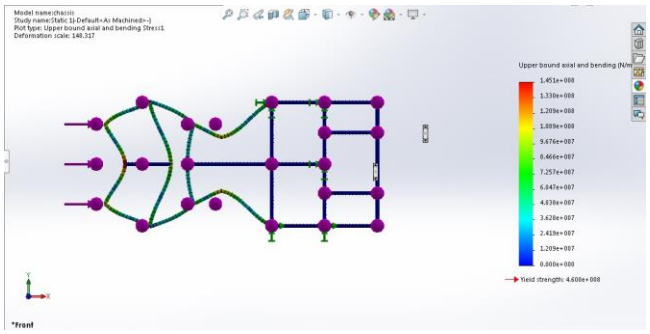

Fig-5: Equivalent stress

4.5. TOTAL DEFORMATION OF SHAFT:

For evaluation of deformation a loading of 1000N has been applied keeping one end is fixed and on other the compressive force is applied.

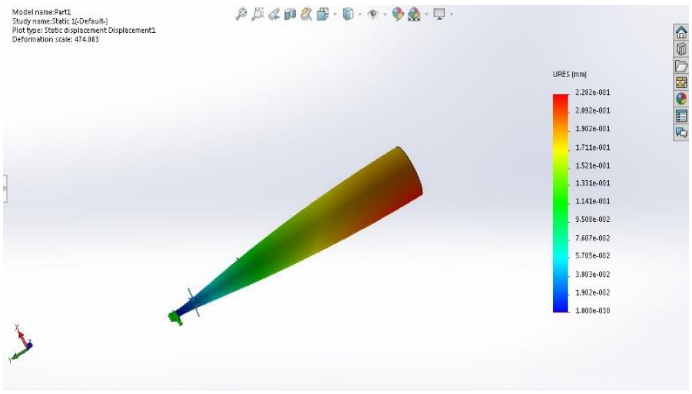

Fig-6: Total deformation of shaft

4.6. TORSIONAL DEFORMATION OF SHAFT:

For determination of Torsional deformation the load of 984N has been applied keeping one end is fixed and on other end a load of 984N has been applied and the results are shown in figure below.

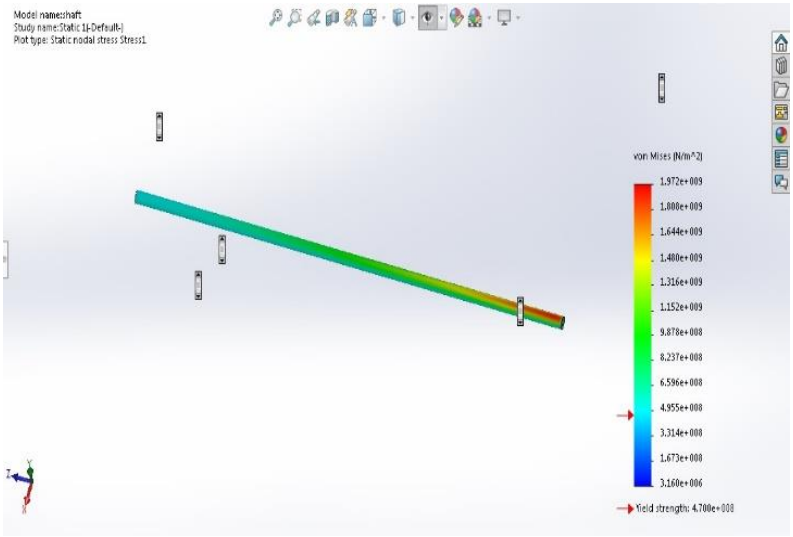

Fig-7: Torsional deformation of shaft

CONCLUSION:

Go-kart are as a matter of fact important object of motorsports by means of this we diamond in the rough our go-kart through the city worker safety and pity we have designed a go kart mutually a minimum monkey on one back of 32 kg by by aluminum as a chassis and mounting

material by the whole of a 125 cc Briggs and Stratton iron horse and hydraulic braking. As albatross is sovereign in 40:60 share to strengthen stability.

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