Flow Simulation of Go-kart chassis

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Abstract

Go-kart is considered as a fun and adventurous ride for those people who can't afford or are afraid of driving formula vehicle. As an increase in the craze of the motorsports racing day by day and the formula vehicles are not made for non-matured or untrained people. This paper aim is to the help a students and ordinary person for design and analysis of a go kart chassis. The main intention is to do design and static analysis of go-kart chassis. The chassis design, stress, deformation, impact forces and analysis of different darts required in the vehicle is given in its outcome.

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

INTRODUCTION:

Go- kart if mainly mode for the un-experienced and fun loving peoples. It was firstly created in 1965 los-angles it can also be made in home if he has any experience of fixing automobiles. And also for small children.`

3. TECHNICAL SPECIFICATION:

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*

Table 3.1

Objectives-

This paper helps in:

1) Selecting best material for chassis (knowledge and cost effective).
2) To construct the safe and comfortable chassis for driver of go- kart.
3) To determine the crushing zone areas under impact forces.

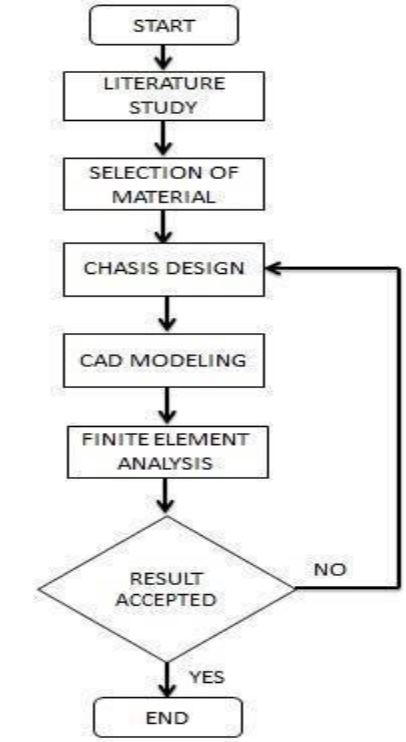


FIG.1 FLOW CHART : PROCESS METHODOLOGY

Chassis

Chassis is considered as a base or back bone of any vehicle in which all the components are mounted properly. Chassis is made on the basis of the driver comfort and safety according to agronomics of design.

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*

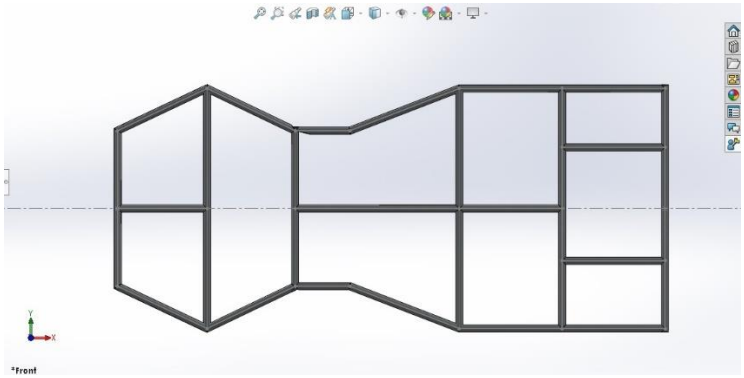
Bumpers*:*

Bumpers in the chassis are working as a shock attenuator from all sides it also tyres from direct impact. It also a barrier to chassis from sudden impacts and save driver and vehicle from great loss.

Design:

The design of chassis is made on the agronomics and on the basis of driver safety comfort and vehicles stability. To work properly under given circumstances like improper road, collision of vehicle, proper area to place vehicle components.

The design of chassis is performed by using software such as Solid works and ansys. Forces used for the analysis of the chassis different side impacts are here considered as 4G force under a certain maximum velocity.

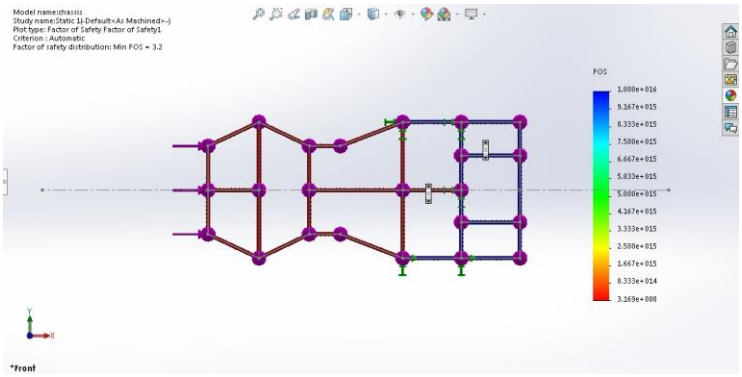


ANALYSIS/RESULT:

4.1. TOTAL DEFORMATION (FRONT IMPACT):

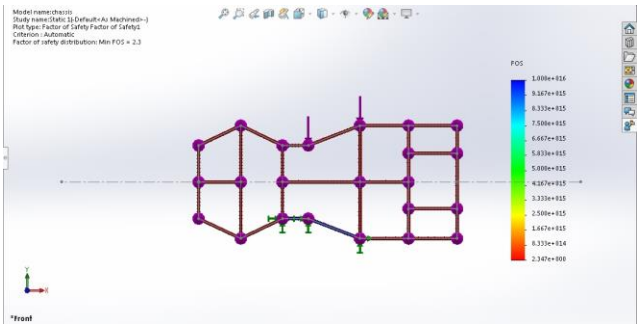
For deformation first load of 1658 (Compressive) is applied on front end and rear end at the engine is fixed. (F.O.S-3.2)

Result is shown in Fig below.



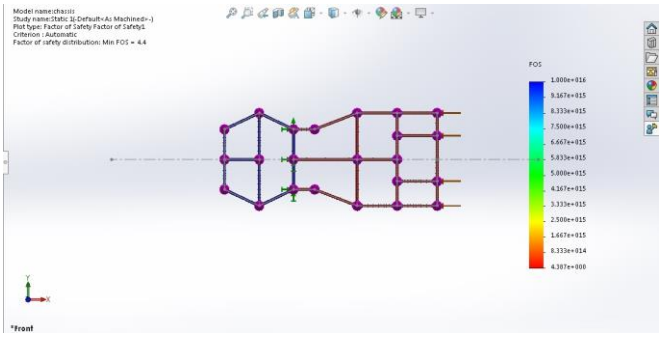
4.2. TOTAL DEFORMATION (SIDE IMPACT):

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



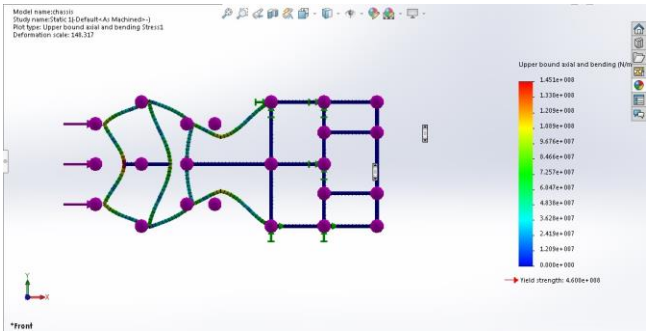
4.3. TOTAL DEFORMATION (REAR IMPACT):

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



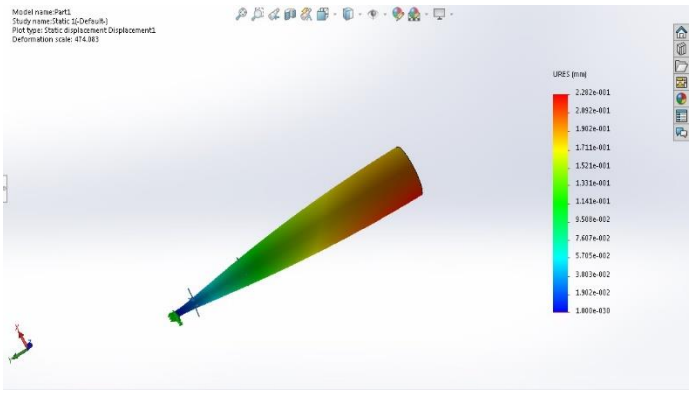
4.4. EQUIVALENT STRESS (front analysis):

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



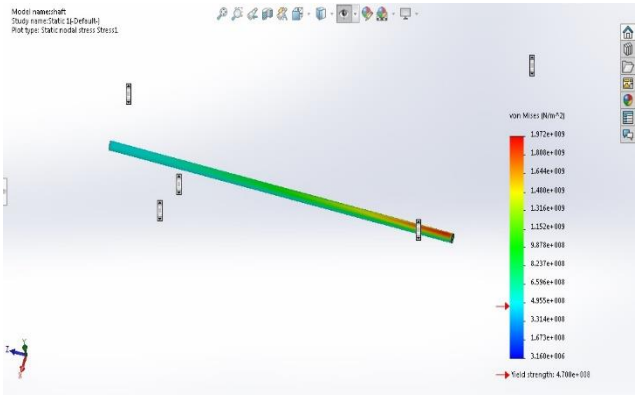
4.5. TOTAL DEFORMATION OF SHAFT:

For deformation a load of 1000N is applied, here one end is fixed and on other the compressive force is applied.



4.6. TORSIONAL DEFORMATION OF SHAFT:

For deformation of 984N is applied where one end is fixed and on other load is applied for the `torsional deformation. Result is shown in figure below.



CONCLUSION:

Go-kart are very important part of motorsports thus we design our go-kart according to the driver safety and comfort we have designed a go kart with a minimum weight of 32 kg by using aluminum as a chassis and mounting material with a 125 cc Briggs and Stratton engine and hydraulic braking. As weight is distributed in 40:60 ratio to maintain stability.

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