



e-ISSN: 2278-8875

p-ISSN: 2320-3765

International Journal of Advanced Research

in Electrical, Electronics and Instrumentation Engineering

Volume 10, Issue 6, June 2021

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 7.282

9940 572 462

6381 907 438

ijareeie@gmail.com

www.ijareeie.com



A Review on Design and Analysis of EV Go-Kart

Hamza Rangwala, Abdullah Choudhary, Prof. Ganesh Lohar

Department of Mechatronics Engineering, Symbiosis Skills and Professional University, Pune, Maharashtra, India

Department of Mechatronics Engineering, Symbiosis Skills and Professional University, Pune, Maharashtra, India

Department of Mechatronics Engineering, Symbiosis Skills and Professional University, Pune, Maharashtra, India

ABSTRACT: Go - karts have consistently been thrilling, exciting, and the initial step for the youthful ones to engine dashing. They are minimal, lightweight and the ground freedom is kept as low as conceivable which helps in the corners. From Generator motors to petroleum heads, from 50cc to 350cc motors, we have made considerable progress. Over the course of the years there has been a ton of progress in the plan and drive quality. Presently a-days E-Go-karts are supplanting the petroleum heads. So considering all the above difficulties we will fabricate an electric Go-kart. Our Aim in this venture is to accomplish greatest speed, better dealing with, a decent range, and a lighter casing. The primary target is plan a casing which would be light in weight. Thinking about the above factors, one significant measure is that we likewise need to keep it in our budget. The car undercarriage fills in as a structure for supporting the body and various pieces of the car to keep it solid. Additionally, it needs to withstand the stun, turn, vibration and different anxieties caused because of unexpected breaking, speed increase, stunning street condition, outward power while cornering and powers actuated by its parts. This paper audits the plan investigation of a go kart frame. In this paper an exertion is done to study and survey the different go kart case and its primary investigation and other plan related viewpoints just as the exploration philosophies utilized by the scientists.

Keywords: EV- Go-kart design and analysis, On-shape design, Sim-scale analysis.

I. INTRODUCTION

The Go-kart is a vehicle which is compact, simple, lightweight and easy to operate. The go-kart is designed for flat track racing, so its ground clearance is very small as compared to other vehicles hence it skips the suspension. The parts of go-kart are engine, steering, axle, tires and bumpers. The engine used for go-karting is either two strokes or four stroke engines. The electric motors are also used instead of engines, known as “Eco kart”. The chassis is independent of suspension to experience thrill. Go-karting is a great outlet for those interested in racing because of its simplicity, cost and safer way to race.

II. METHODOLOGY

The material used for chassis are various grades of steel or aluminium alloys. The main component of steel is carbon which increases the hardness of material of chassis. Aluminium alloy is more expensive than steel so mainly steel is used to construct the chassis. The chassis is widely made up of AISI-1018 which is a medium carbon steel. This material was selected due to its good Combination of all of the typical traits of Steel – high tensile strength, ductility, light weight, better weldability and comparative ease of machining.

Material selection for Go-Kart Chassis dependent upon the following parameters:

- [1]Machinability
- [2]Strength of Material
- [3]Weldability
- [4]Availability
- [5]Cost



Mechanical Properties	Metric	English
Hardness, Vickers	170	170
Ultimate tensile strength	440 MPa	63800 psi
Yield strength	370 MPa	53700 psi
Modulus of Elasticity	205 GPa	29700 ksi
Bulk Modulus	140 GPa	20300 ksi
Shear Modulus	80 GPa	11600 ksi
Machinability	78%	78%

Figure 1: Material properties table

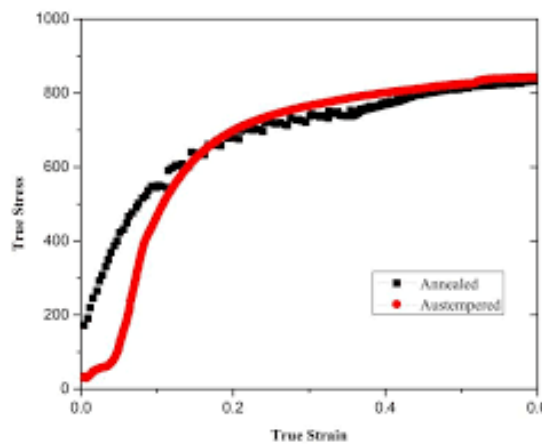


Figure 2:Material stress – strain graph

III. MODELING AND ANALYSIS

DESIGN

The chassis is designed considering factors like factor of safety - maximum load carrying capacity, The main component of the frame is divided into two major parts first the front block (cockpit) for steering and seat positions etc. and second rear block (engine compartment) for transmission and brake assembly. Force absorption capacity, required space for accessories and driver and specific dimensions. The design of chassis is performed by using software such as AutoCAD and CATIA. The load distribution in the chassis should be uniform. The structural design gives the idea about the chassis. Design gives the optimum size and shape of the chassis. The chassis design was done using the software on shape which is a cloud based open source software. The software is user friendly and has useful tools which are helpful and beneficial.



ANALYSIS

The next stage after design is analysis of chassis under various impact forces. The chassis experience loads under condition such as cornering force, torsional rigidity and overall dynamic loads applied during race. By performing analysis of, a) Front Impact b) Rear Impact c) Side Impact So, the design is analysed in CAD based upon these three one of the essential parameters of the chassis design. So, the design is analysed using Sim-Scale cloud based analysis software. The software is open source and helps in static analysis. The software is very user friendly. The driver safety can be checked and improved by analysis Meshing is probably the most important part in any of the computer simulations, because it can show drastic changes in results.

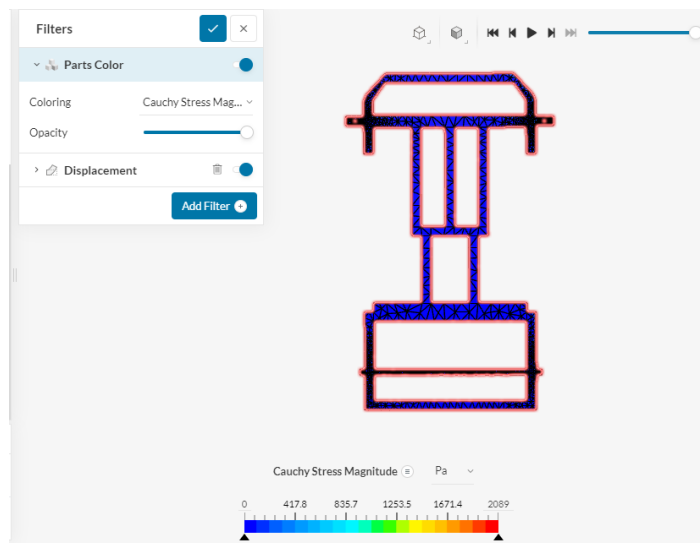


Figure 6: Analysis using Sim-scale (Stress)

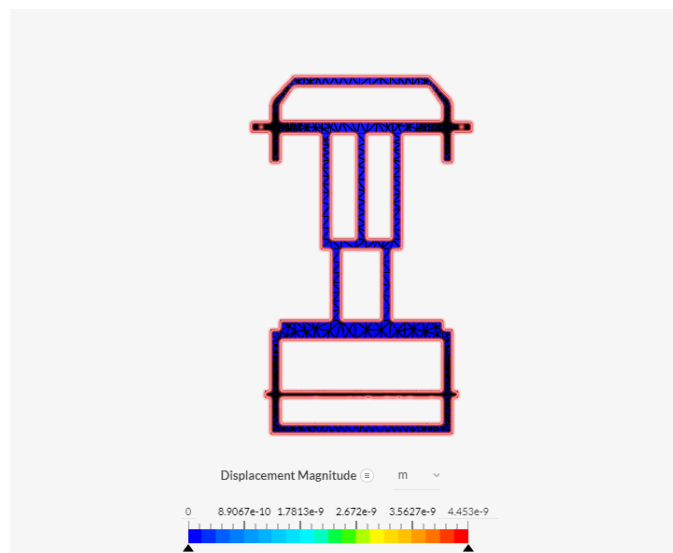


Figure 7: Analysis using Sim-scale (Displacement)

IV. RESULTS AND DISCUSSION

We successfully completed the design and analysis of the EV Go- Kart. The new design can successfully withstand the load of the driver and the shocks from the track. The chassis has passed the stress magnitude and displacement magnitude analysis.



V. CONCLUSION

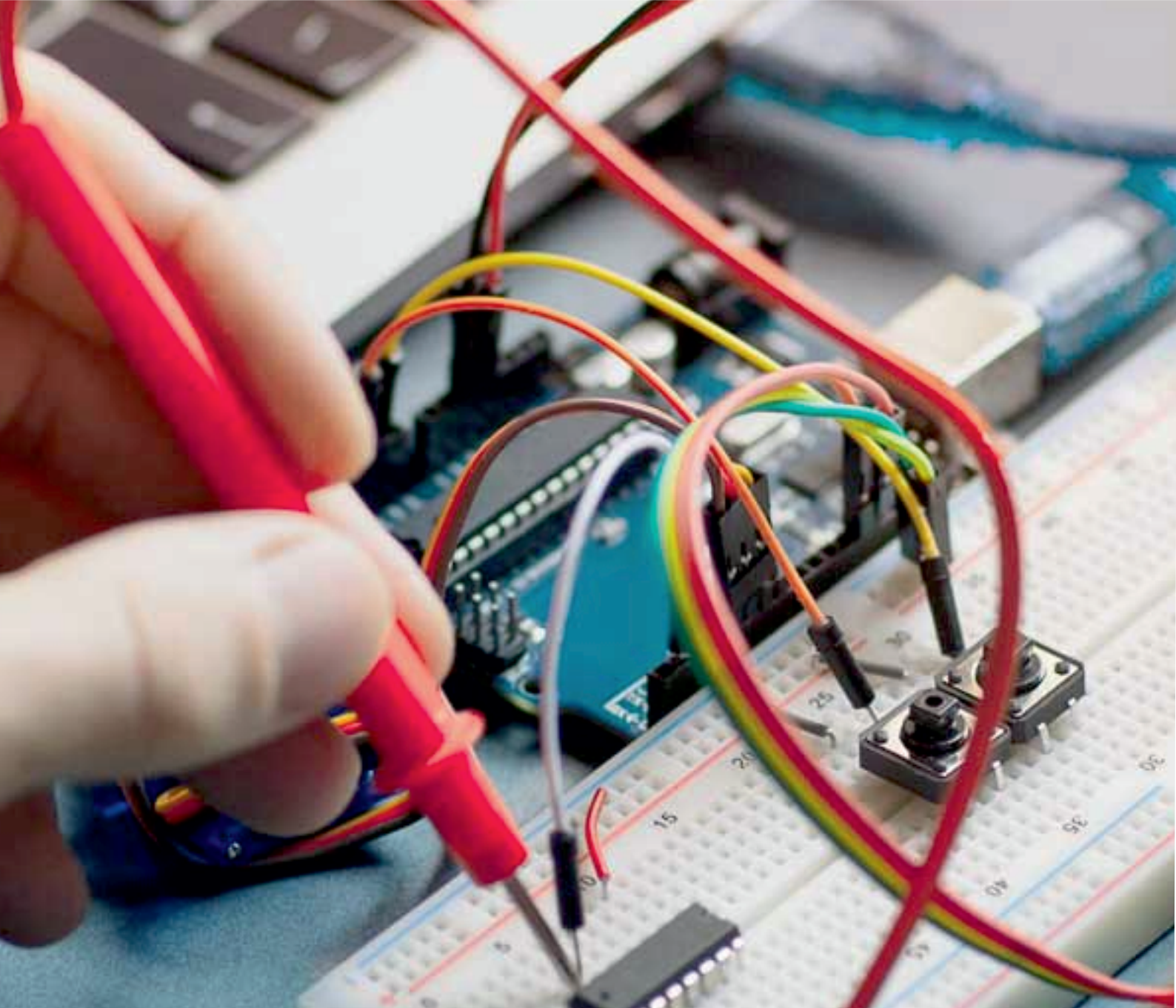
The designing of chassis for go-kart can develop many skills. In this review paper, some researchers and their research methodology with remarks is included so it can be concluded the analysis of design determines the stresses developed in the chassis which plays an important role in factor safety. From the analysis Design Engineer can predict the chassis is safe or not and also by seeing the deformation and stresses modification in the kart chassis is possible.

ACKNOWLEDGEMENTS

It's our pleasure to thank Prof. Ganesh Lohar, for providing us constant support and suggestions. His experience and advice were invaluable to our ability to make an accurate study.

REFERENCES

- [1]Shaik Himam Saheb, Govardhana Reddy& Md. Hameed, Design Report of a Go-Kart Vehicle, International Journal of Engineering Applied Sciences and Technology: 2016 Vol. 1, Issue 9, ISSN No. 2455-2143, Pages 95-102.
- [2]Rohit Rana, Mohd. Nawaz Hassan, Kartik Goswami & Prof: Nitish Kumar Saini, Design and Impact Analysis of Go-kart Chassis,International Journal of Applied Engineering Research ISSN 0973-4562 Volume 14, Number 9, 2019
- [3] Vijayan, S. N, Sendhilkumar, S. and Kiran Babu K. M., Design and Analysis of Automotive Chassis Considering Cross-Section and Material,” International Journal of Current Research, Issue, 05, pp.15697-15701, May, 2015.
- [4] Avinash Barve, Vivek Gurve, Gaurao Tapre&Arvind Totey, "DETAILED DESIGN CALCULATIONS & ANALYSIS OF GO-KART VEHICLE", International Journal of Emerging Technologies and Innovative Research (www.jetir.org), ISSN: 2349-5162, Vol.5, Issue 8, page no.259-273, August-2018.
- [5]Abhishek Bhattacharya , Bisma Mannan, Chassis of Go Kart: A Review, 2Dept. of Mechanical Engineering Sharda University, Greater Noida, Uttar Pradesh, ISSN- 2394-5125 VOL 7, ISSUE 10, 2020.
- [6] Srinivasa Reddy, N. Sharathchandra, Mustafa & P. Jayanth, 2Department of Mechanical Engineering, Guru Nanak Institute of Technology, Rangareddy, Telangana, India, Modelling and Analysis of Go-Kart Chassis, International Journal of Trend in Scientific Research and Development (IJTSRD) Volume: 3, Issue: 3 Mar-Apr 2019 e-ISSN: 2456 – 6470.



INNO SPACE
SJIF Scientific Journal Impact Factor
Impact Factor: 7.282



ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



International Journal of Advanced Research

in Electrical, Electronics and Instrumentation Engineering

 **9940 572 462**  **6381 907 438**  **ijareeie@gmail.com**



www.ijareeie.com

Scan to save the contact details