

Steering Mechanism for Eclectic Vehicle (EV)

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Abstract

1. Constructing a Steering mechanism for Electric Vehicle (EV).
2. The objective above is achieved through design process of CAD modelling, laser and waterjet cutting, welding etc.
3. Various types of materials used. To mention some: aluminum plates, mild steel tube, wood, fiber glass and resin mix for the dashboard,.
4. The outcome is a comfortable linkage type steering.
5. Improvement on swing arm grips is required and more time for this type of project.

Introduction

This steering design is part of an electric vehicle (EV) project for Design 2 paper. This team of two is required to design and build a steering mechanism and mountings for AV and be fitted in the vehicle itself. The steering should comply with the necessary engineering standards and meet the client's requirements.

Steering mechanism is the vehicle movement control system that includes few main components which are the steering wheel, the steering column, ball joint, swing arms as shown in the figure below.

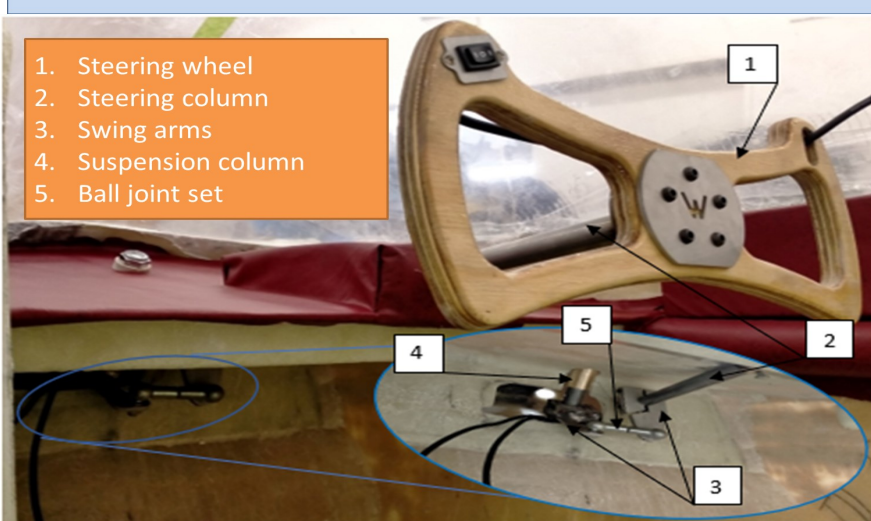


Figure 1 Steering Unit

Methods and Materials

Design process.

1. Modelling on solidworks.
2. Laser cut some parts on Medium-density fiberboard (MDFs).
3. Assemble and test.
4. After testing then cut and build out of actual materials.

Materials

1. Ball joint set.
2. Wood.
3. 22mm diameter tube.
4. Aluminum.
5. Bolts and nuts.
6. Fiberglass and resin mix.

Results



Figure 2 Steering

Conclusions

After evaluating different steering types to meet the requirements, a comfortable linkage steering mechanism is engineered to the reasonable standard for the client's satisfaction.

Future suggestions

1. If using the existing mechanism, consider spline both shafts/tubes and arms for better grips.
2. Using spring restoring on the steering.

References

- How the steering system works. (2019). How a Car Works; How a Car Works. <https://www.howacarworks.com/basics/how-the-steering-system-works>
- Learn Engineering. (2019). Counter Steering! The interesting physics behind it [YouTube Video]. In YouTube. <https://www.youtube.com/watch?v=ZpV2Bg-WX0w>
- Countersteering. (2020, September 20). Wikipedia. <https://en.wikipedia.org/wiki/Countersteering>
- ball joint - Google Search. (n.d.). Www.Google.Co.Nz. <https://www.google.co.nz/search?q=ball+joint&source=lnms&tbn=isch&sa=X&ved=2ahUKEwiEmeiMifLsAhW7zzgGHUm6CesQAUoAXoECB4QAw&biw=1600&bih=789>
- Vehicle steering system with independent steering for each wheel. (n.d.). <https://patents.google.com/patent/US5154437A/en>

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