

Design and Manufacturing of Reverse Electric Trike

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Abstract:- The Reverse Electric Trike with front independent suspension. The bike runs by means of a brushless electric motor which is powered 12v battery. The front side is equipped with two tyres and independent suspension systems. The power from the battery is transmitted through chain drive to the rear wheel. The trike uses mechanical disk brakes.

Keywords:- Tadpole Design, Delta Design.

I. INTRODUCTION (HEADING 1)

The Reverse Electric Trike with front independent suspension. The bike runs by means of a brushless electric motor which is powered 12v battery. The front side is equipped with two tyres and independent suspension systems. The power from the battery is transmitted through chain drive to the rear wheel. The trike uses mechanical disk brakes.

II. METHODOLOGY

- Designing is done by using Solid works
- Analysis is by using Ansys 15.0
- Runs on a electric motor which is powered by battery
- Front independent suspension system on each wheel
- The working model of the reverse electric trike is been fabricated according to the design

III. RESULTS AND DISCUSSION

The design parameters and the analysis parameters have been considered as per the required before starting with each one of these. The results thus obtained are discussed below in brief

A. Design

Solid works software is used to design. Individual parts have been designed are assembled at the end. The final assembly of design is shown below

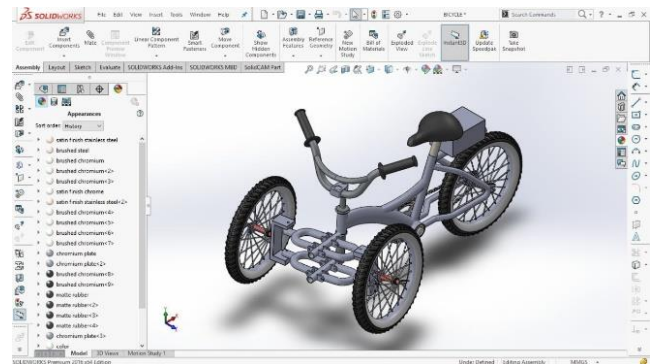


Fig 1:- Assembly of design

B. Analysis

The designed model is now converted into IGES format to analyze it. The analysis is done only for the load carrying capacity and to determine the stresses, strains and deformation induced. During analysis, the materials are assigned to each component based on the requirement. Analysis is done for different loads to determine the failure. The results of analysis have been presented below.

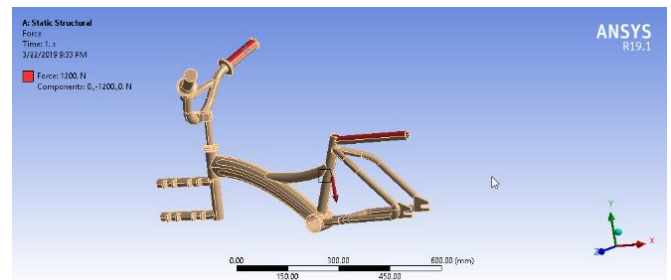


Fig 2:- Frame Analysis

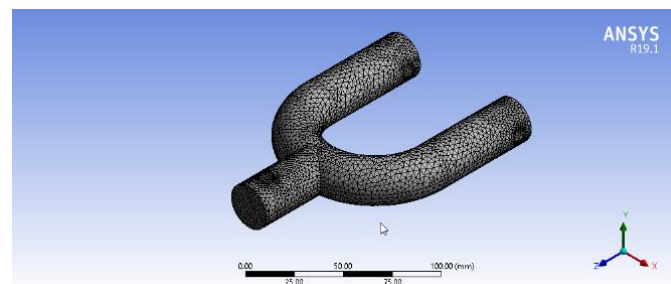


Fig 3:- Wish Bone Analysis

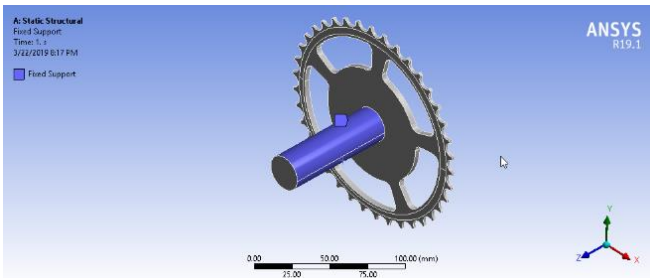


Fig 4:- Sprocket Analysis

C. Fabrication

Fabrication is done by iron square pipes and strong pipes and the process like milling, welding, lathetic are used to manufacture the c brackets, hubs, driving arms etc. The final assembled reverse electric trike looks like the given below figures .The reverse electric trike has a BLDC Motor which is of a 24 volts and is connected with a controller which controls the drive of the vehicle . The cycle also houses two batteries id 12 volts each and are connected in series to get a total output of 24v to drive the motor.



Fig 5:- Final assembled reverse electric trike



Fig 6:- BLDC Motor mounting on the cycle

D. Recommendations:

1. The suspension design and stiffness can be changed according to usage
2. The members used to weld can be changed to different materials and alloy steels
3. The motor and batteries capacities can be changed greater power and efficiencies from the vehicle.

IV. CONCLUSIONS

A. Advantages:

- Electric tricycles give the elderly, those who are not so fit, suffering illnesses or convalescing, the courage to go out and go at far distances while being fit without getting very tired.
- Electric tricycles have the potential to extend the quality cycling commuting distance that's getting to have a positive effect on your environment and your health.
- You could reach places a lot more easily that you could have otherwise reached only after half a day of strenuous hike in order to reach it
- Electric bicycles are also good for the environment because they have a lower carbon footprint compared to conventional vehicles.
- Riding an electric tricycle is considered a mild exercise. The NHS recommends that you simply ride the bicycle for two hours and half-hour hebdomadally in order that riding to figure daily could assist you accomplish this. According to research, those that ride a bicycle to figure experience a 39% lower rate of mortality

B. Disadvantages:

- High center of gravity.

V. ACKNOWLEDGMENT

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