

Design for wheel to hub Alignment Tool in aid of puncture

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Aim of the Project

The project aims to revamp the group project design of the Wheel-to-Hub Alignment Tool, integrating an automatic system for aiding puncture situations, replacing manual control. This system will secure the tire for alignment with the hub, facilitating the process.

But from the group project there was some idea to work on.

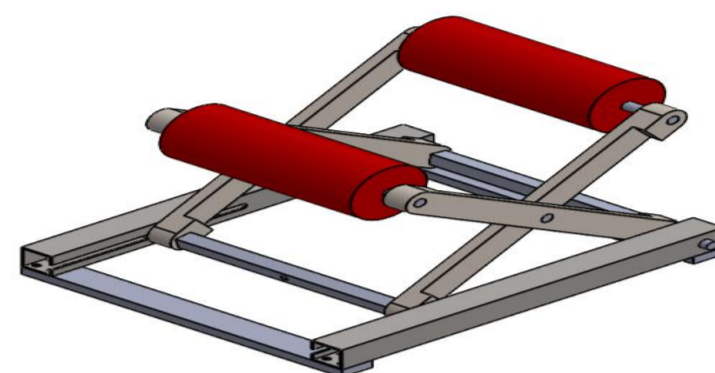


Figure 1: group project Design

While there were numerous ideas considered, the primary focus was on refining the main concept and detailing its functionality

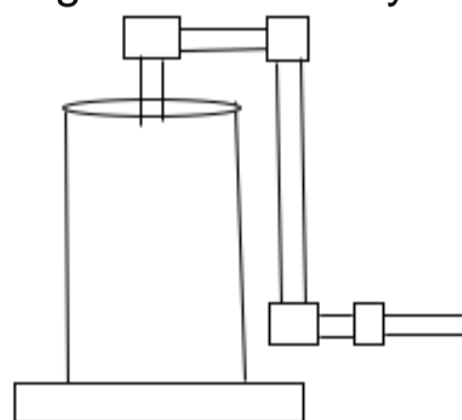


Figure 2: conceptual Design

From the conceptual design, it's evident that individuals may struggle to grasp what it actually is and how it will function. Therefore, creating 3D designs for each conceptual idea was crucial for visualizing and understanding its operational mechanism.

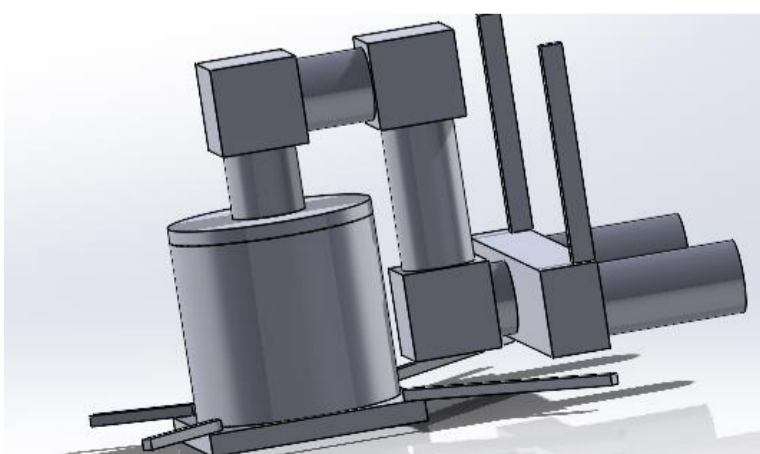


Photo of: 3d Design

Conceptual Design

The idea was to develop a design that is neither too tall to obstruct the view of the tire nor excessively heavy, surpassing the weight of the tire itself. Hence, devising an original idea isn't straightforward. Research reveals that such a product is not currently available in the market.

Materials Selection

The crucial aspect was selecting the appropriate material capable of withstanding the necessary force. This necessitated careful consideration of materials, as the selection varied depending on specific location and required specifications.

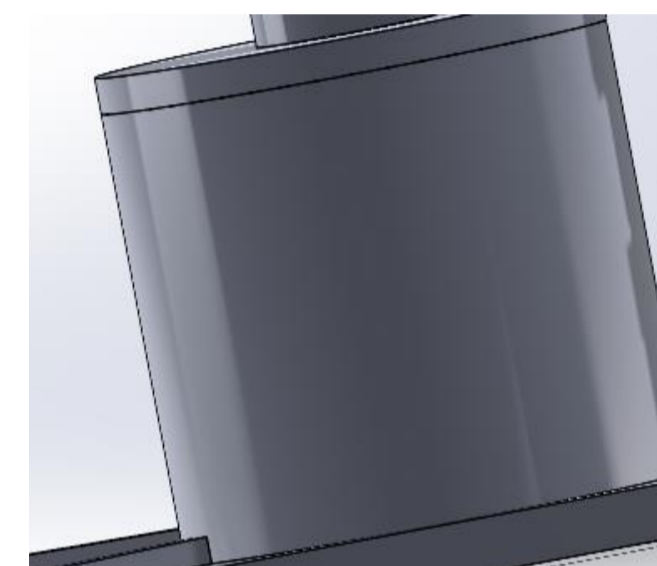


Photo of: a Cylinder

This cylinder, which will house the air suspension, requires a material that is both sturdy and somewhat Strong, but heavy..

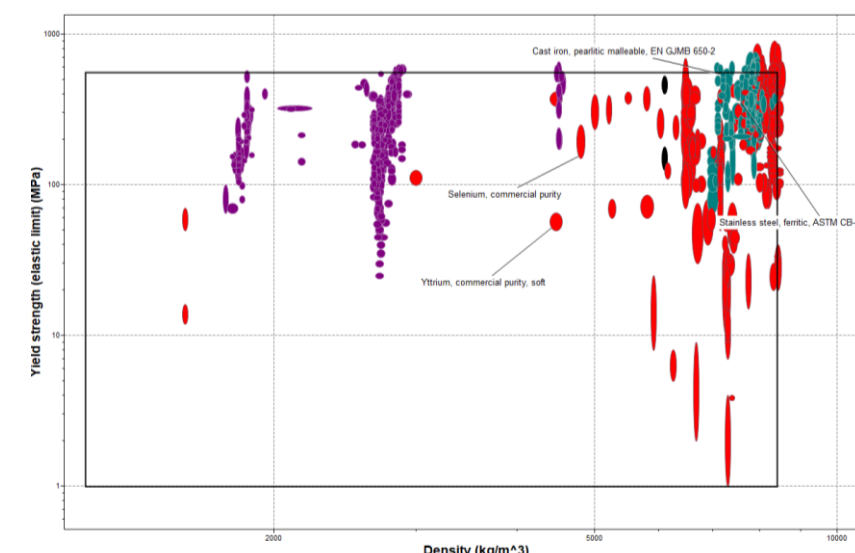


Photo of: graph for stainless steel

Apart from that, the body parts will be constructed from aluminium, except for the section where the tire will be positioned. In that area, aluminium will still be utilized, but a layer of plastic will be added on top. This plastic layer enables smooth rotation of the tire, and it offers a good balance between weight and cost.

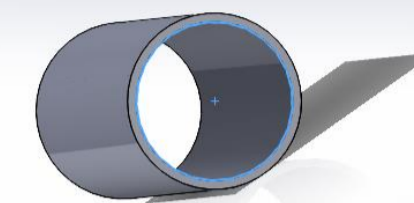


Photo of: plastic

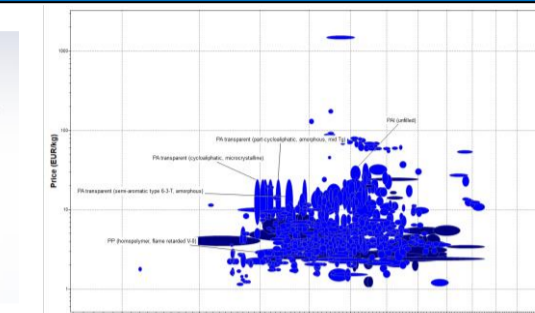


Photo of: plastic graph

The graph is about plastic Density V/S Price

Air Suspension

The suspension system that will be housed within the cylinder is an air suspension, which operates through air control to adjust its height. This type of suspension is common in cars, alongside the traditional spring suspension.



Photo of: Air suspension System

To inflate the air suspension, a 12-volt electric air pump will be employed



Castor wheel

The castor wheels will be attached to the four legs of the final project for enhanced stability and mobility.

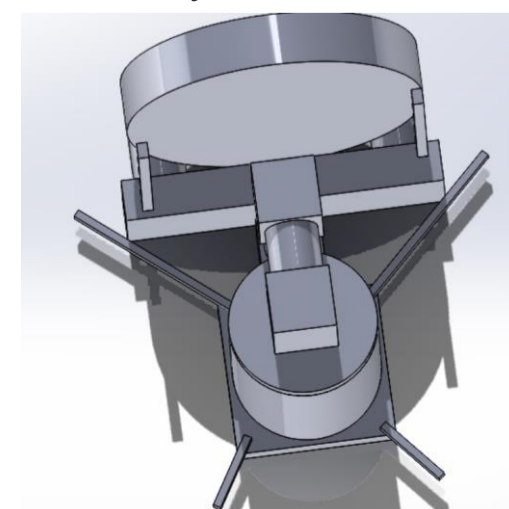


Photo of: Castor wheel