Group Project Report 2401 - Lab 05

Group:

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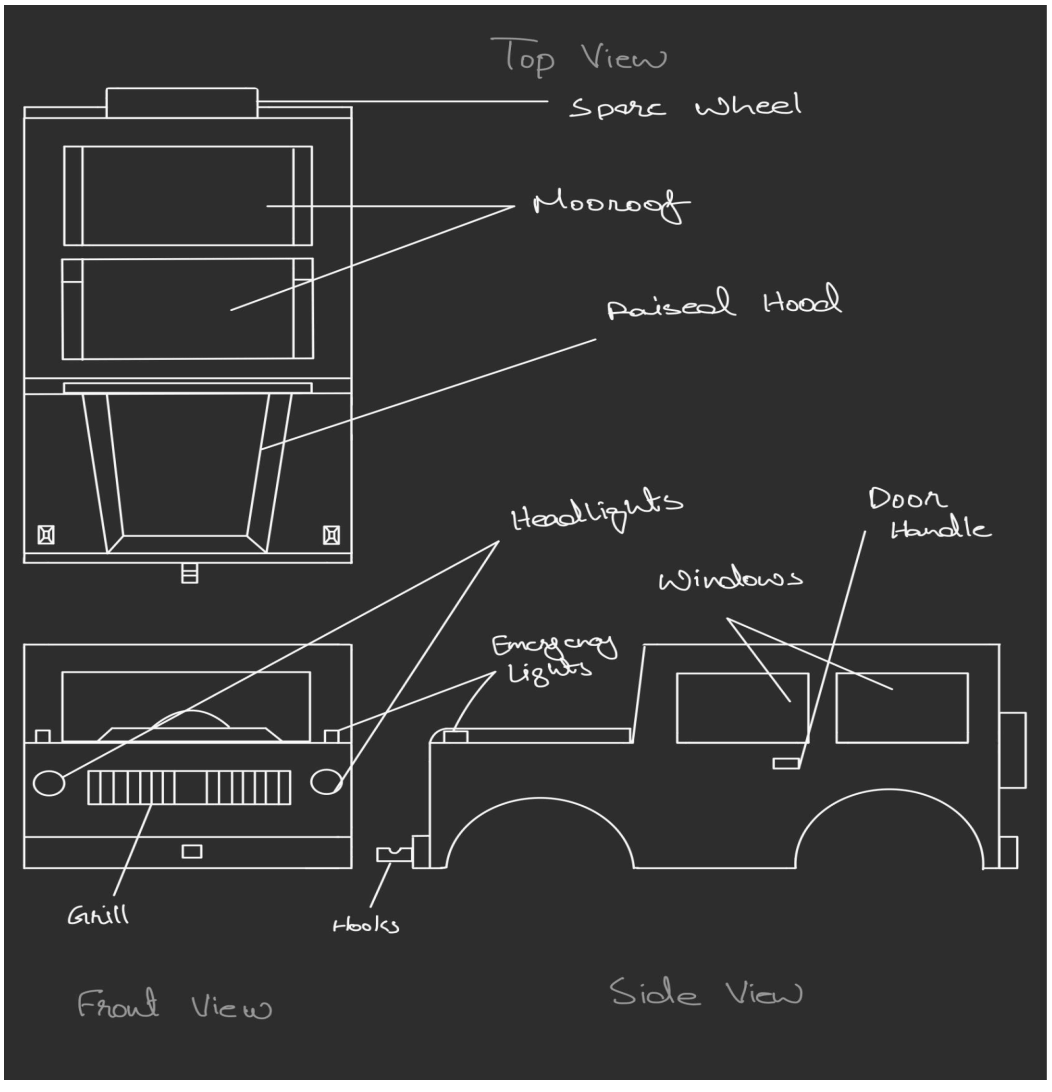
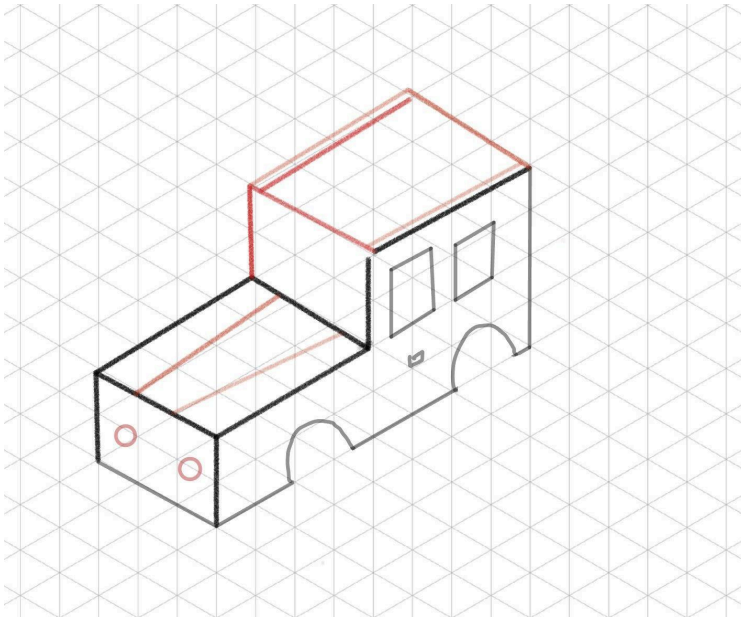
Design Concept Selection & Refinement

- Our team ultimately created a new design for the design concept.
- Because we didn't think the individual designs from the first deliverable worked well together.
- We combined the iconic Mercedes G 63 and Jeep Wrangler, two vehicles with very beautiful body styles. Members of our team spotted a chance to integrate that design with our rubber band propulsion technology.
- The car's body is made up of several different characteristics, including bumpers, tail lights, headlights, a modified bonnet, a spare tyre on the back, and a panoramic roof,etc.
- We built a custom chassis to house our rubber band propulsion system and support the vehicle.
- We created two hooks for the rubber band to become held on in order for our rubber band propulsion system to function.
- The first hook is attached to the front bumper, and from there, the rubber band is stretched from the bottom of the car, where the second hook is attached, towards the rear axle.
- Once the rubber band has been tightly attached to both hooks, we will wind the car backwards. This will cause the rubber band to circle around the car's rear axle, building tension in the rubber band that will propel the vehicle forward.
- The car will also have redesigned wheels with tyre treads carved into them for added traction.
- These modifications are intended to improve the body's balance and the performance of the rubber band propulsion system.

Hand-sketched Orthographics:

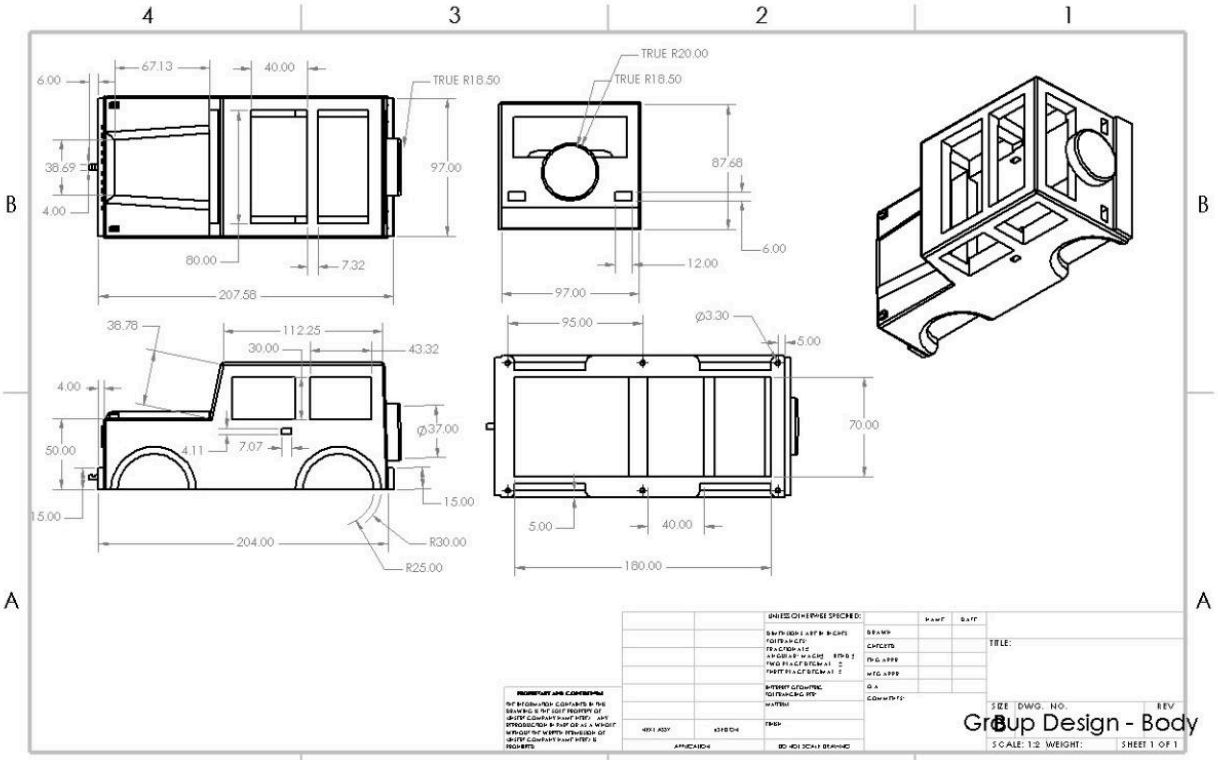


Hand-sketched Isometric:



Prototype Design SolidWorks Model

Main Body:



Description

Sleek Modular Chamber:

- This cutting-edge chamber boasts a length of 100.00 units, ensuring ample space for integration.
- Dual side panels, each of 40.00 units, complemented by a central hollow space of 80.00 units, make this design not only functional but also aesthetically striking.

Dynamic Front Interface:

- A unique 9.00 units protrusion at the front creates a futuristic look.
- The two symmetrical designs on each side, with dimensions of 7.07 and 4.11, further enhance the modern feel.

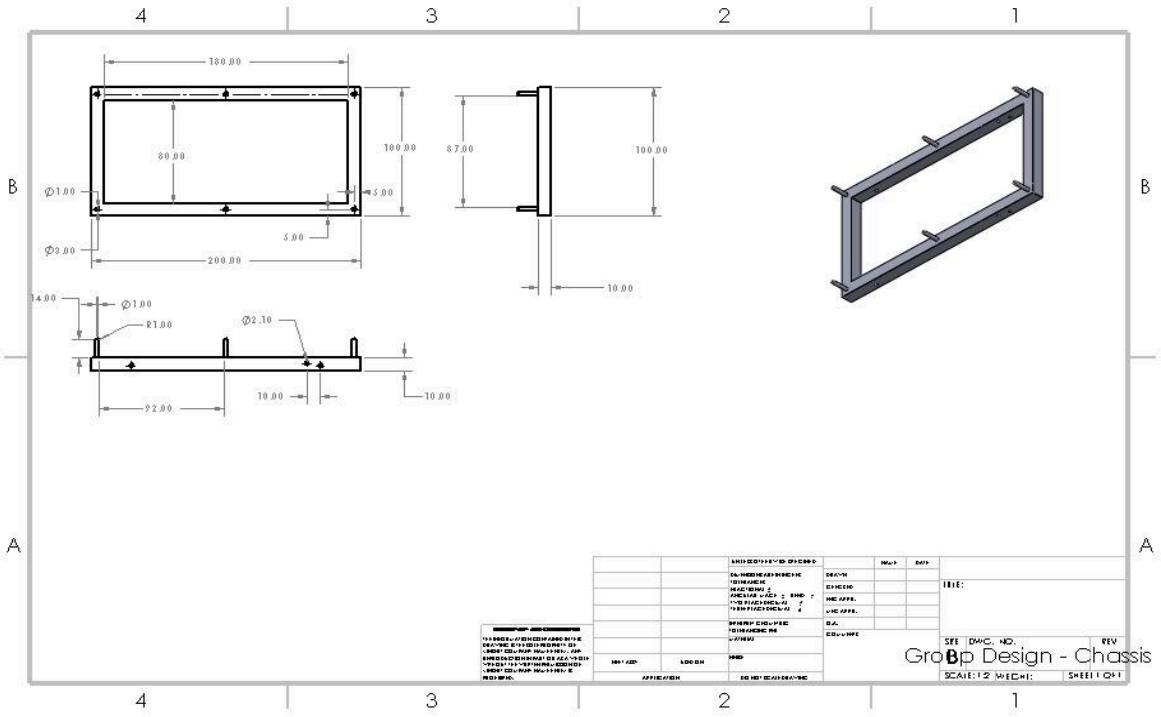
Sturdy Base with Smooth Curvature:

- The base dimensions of 204.00 units promise stability.
- Its smooth curves, like the R25.00 and R30.00, add elegance to the structure, making it stand out in any setting.

Additional Features:

- Precision cut-outs and interfaces ensure easy assembly and high functionality.
- The detailed dimensions and well-thought-out design elements, such as the specific radii and lengths, indicate meticulous planning and promise superior performance.

Chassis:



Description:

Slim Design:

- To avoid taking up extra room in the car, the chassis is thin and simple in design. It just requires the area needed to house the rubber band propulsion mechanism.

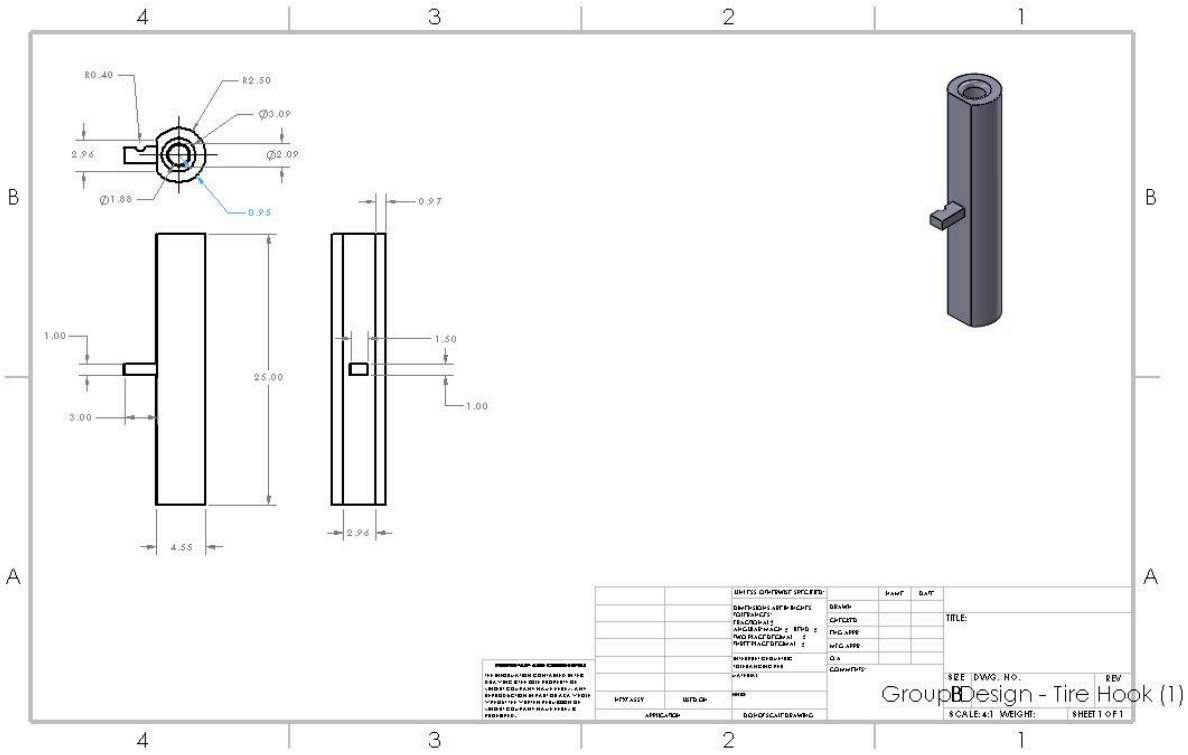
Sturdy Connection System:

- In order to ensure a proper connection between them and prevent the body from coming off with the least amount of force, our team has inserted six long pillars that go into the car body.

Axle holes:-

- We have created holes in the chassis on both the sides for the axle rods to fit in.

Rear axle Hook:

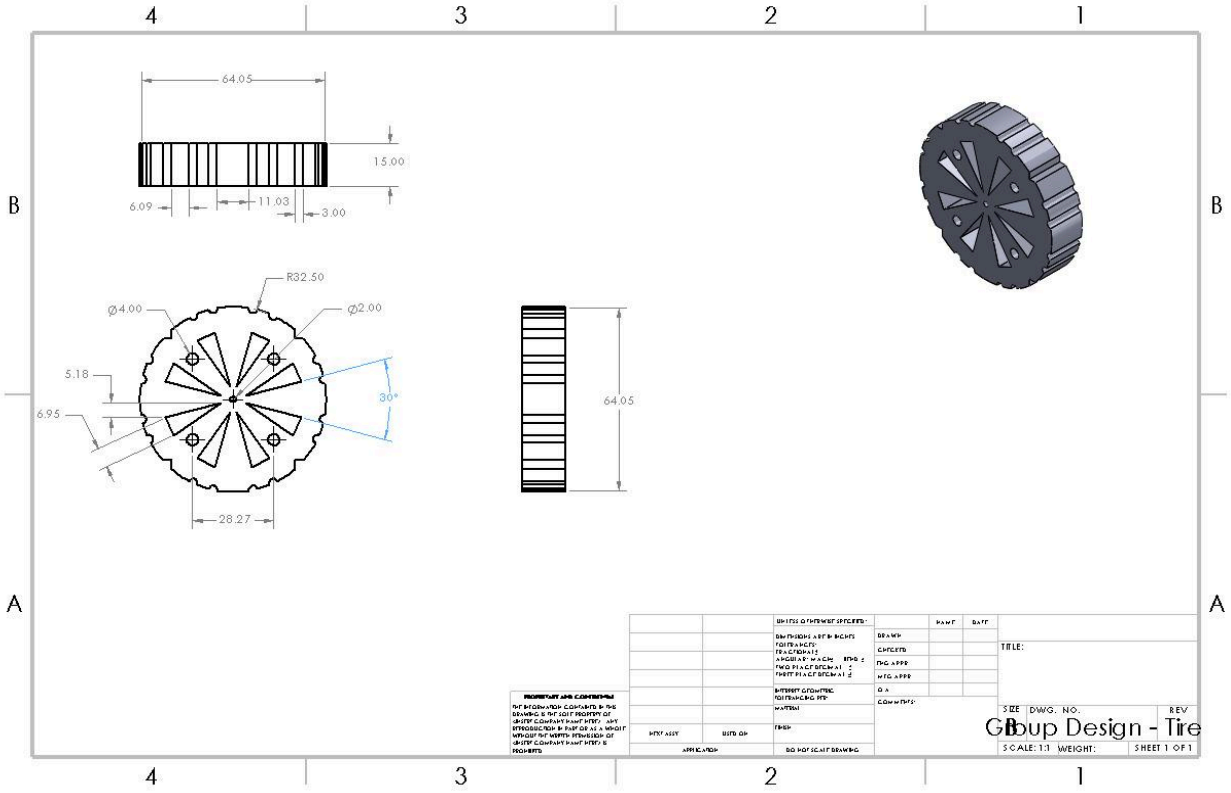


Description:

Special Design for a fixed fit on the axle as described:

- We are going to attach this on the rear wheel axle .
- It is designed to have a hole between it that becomes tight as you approach the middle.
- This is done so it does not start slipping and not pulling the rubber band.
- The hook on the circular body is placed in a certain position.
- The rubber band is going to hook up to this hook and the hook on the front bumper.
- Then when we pull the car back, the tension is going to build up and upon releasing the car will move forward.

Wheels:



Description

Innovative Core Design:

- The multi-layered core, with concentric circles ranging from dimensions of 13.86 to 19.65, showcases both complexity and precision in design.
- This intricate patterning isn't just for aesthetics; it's crafted for optimal performance and durability.

Streamlined Exterior:

- The smooth outer rim with a diameter of 65.00 units provides a sleek appearance, promising effortless motion and minimal friction.

- The true R8.81 curvature on the wheel's structure further enhances its aerodynamic properties.

Robust Connection Stem:

- The connection stem, with a dimension of 17.00 units, ensures a sturdy attachment to the main body or chassis.
- It also flaunts a perfect cylindrical cut-out of 17.62, indicating seamless design integration capability.

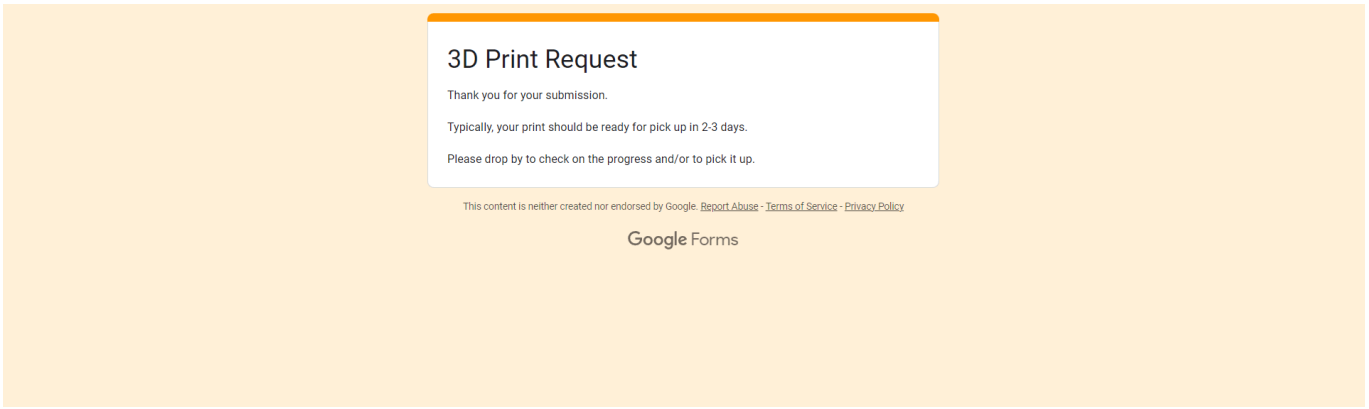
Additional Features:

- Clearly marked radii, such as TRUE R23.45 and TRUE R32.50, underscore the attention to detail in the design, ensuring optimal rotation and balance.
- The blend of geometric shapes, like circles and straight lines, gives the wheel a contemporary look, making it both functional and stylish

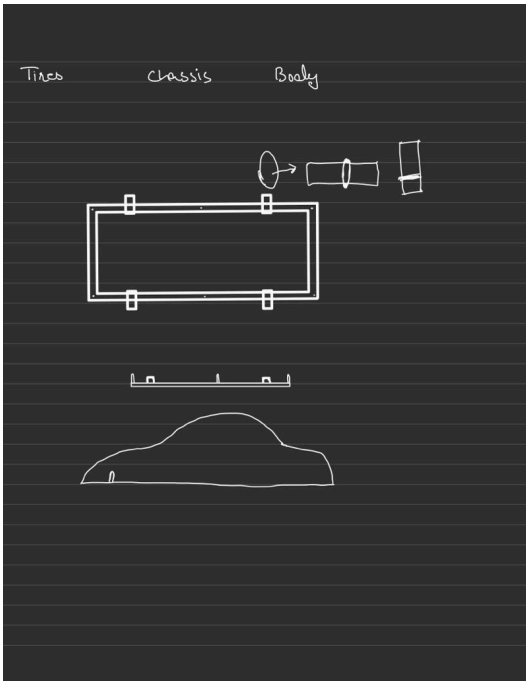
Challenges:

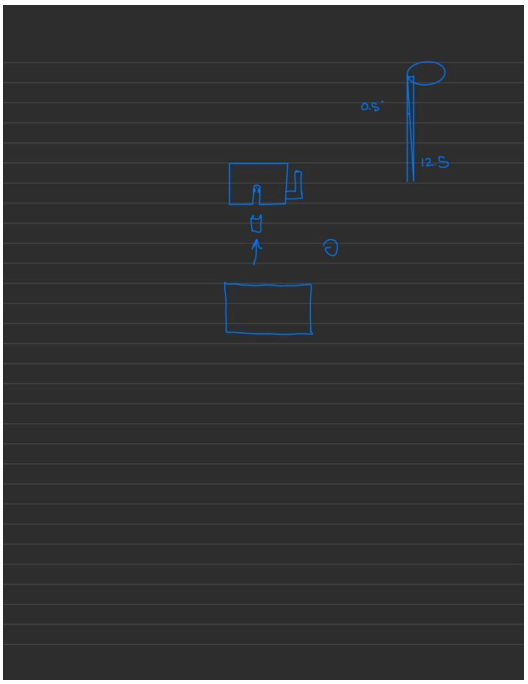
- The one we are unsure about is the way the body has been divided.
- We are going to add different ways to join the body in the final project submission.
- The tire hook design is something we are all eager to see how it performs.

Proof of Lassonde Sandbox file submission:



Rough Sketches of the design:


Tires
Chassis
Body


0.5"
12.5