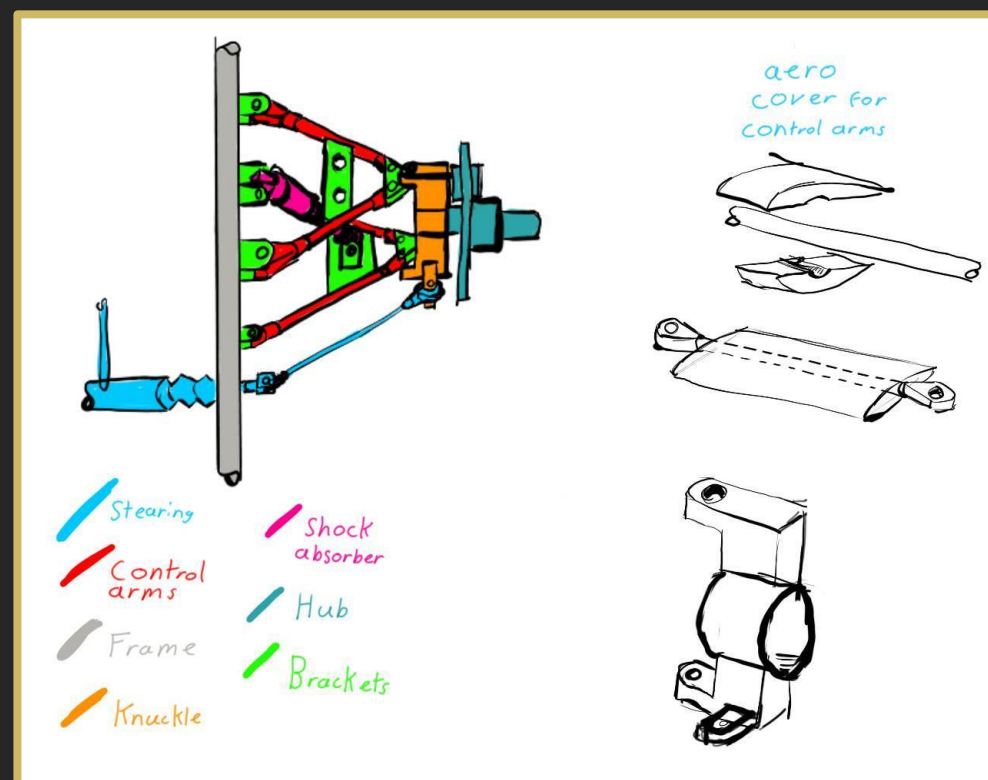


Aim of the Project

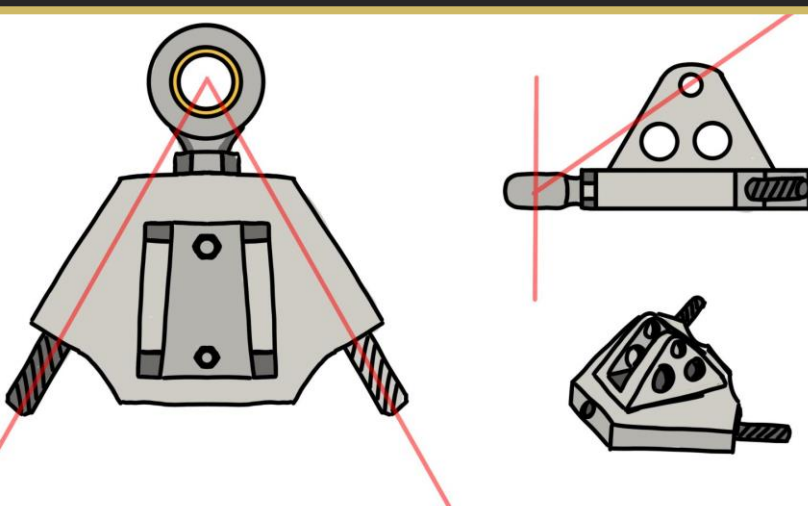
The aim of this project is to design the front and rear control arms for the Formula Student race car. This involved generating concept designs, picking the best design for the car, designing the parts in SolidWorks and conducting FEA analysis on the assembly.

Concept Sketches

Early concept sketch of the front suspension layout.

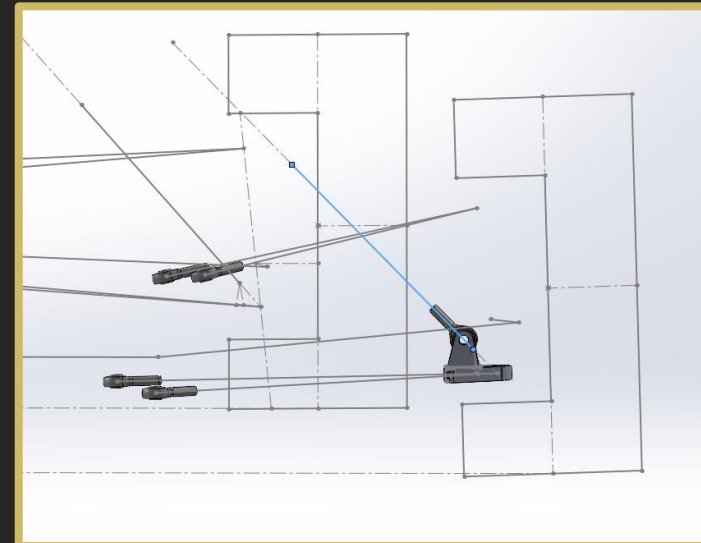


A design for a bracket that will be at the end of the control arms. The control arms are designed to thread in.

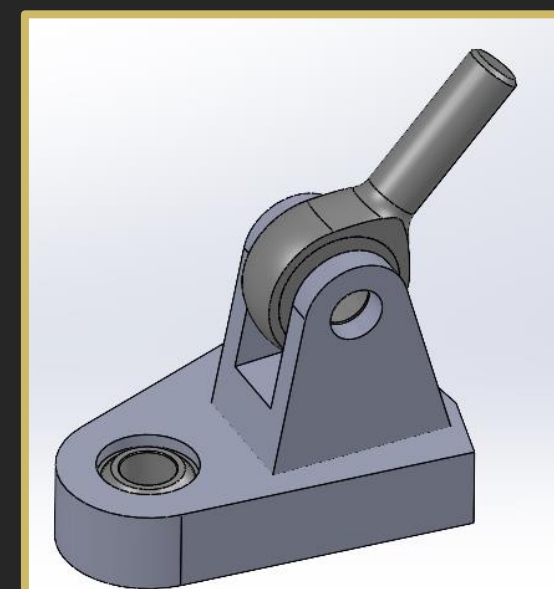


SolidWorks Design History

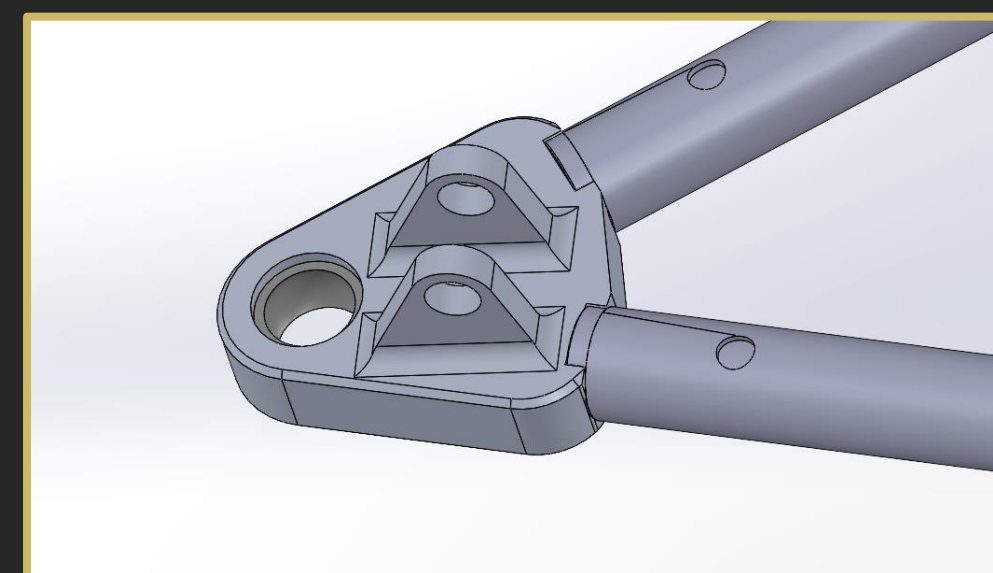
The parts must align with the suspension geometry sketch.



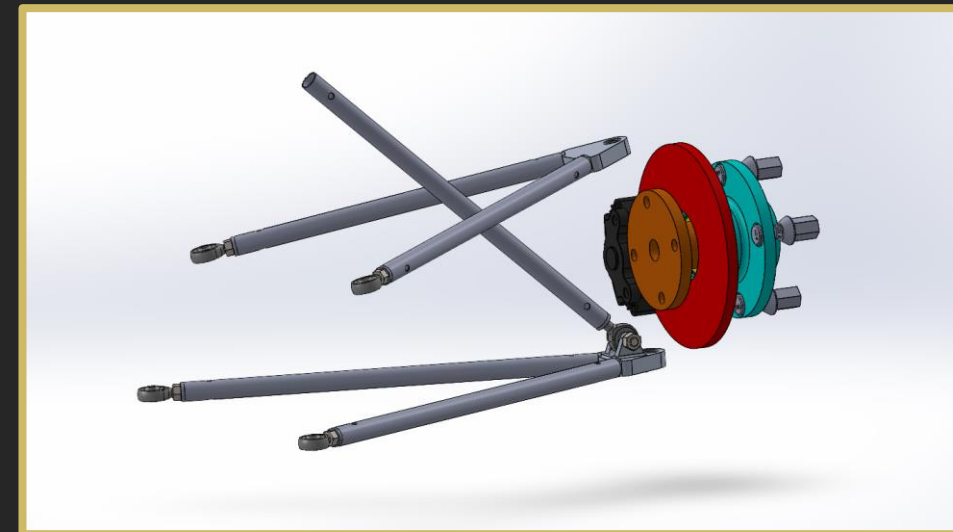
The rough shape of the suspension bracket was designed. Initially the shock absorber mounts were a separate part.



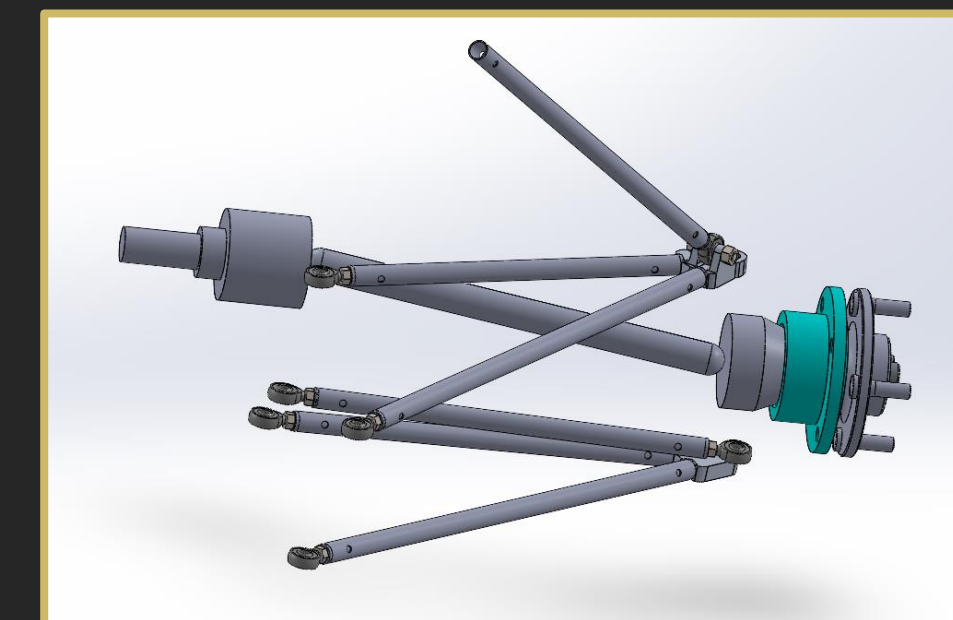
The design was further refined. The shock mounts became part of the bracket. A counter bore was added to provide more support to the control arms.



All the components were put into an assembly to check for clearances. Below is the front suspension assembly.

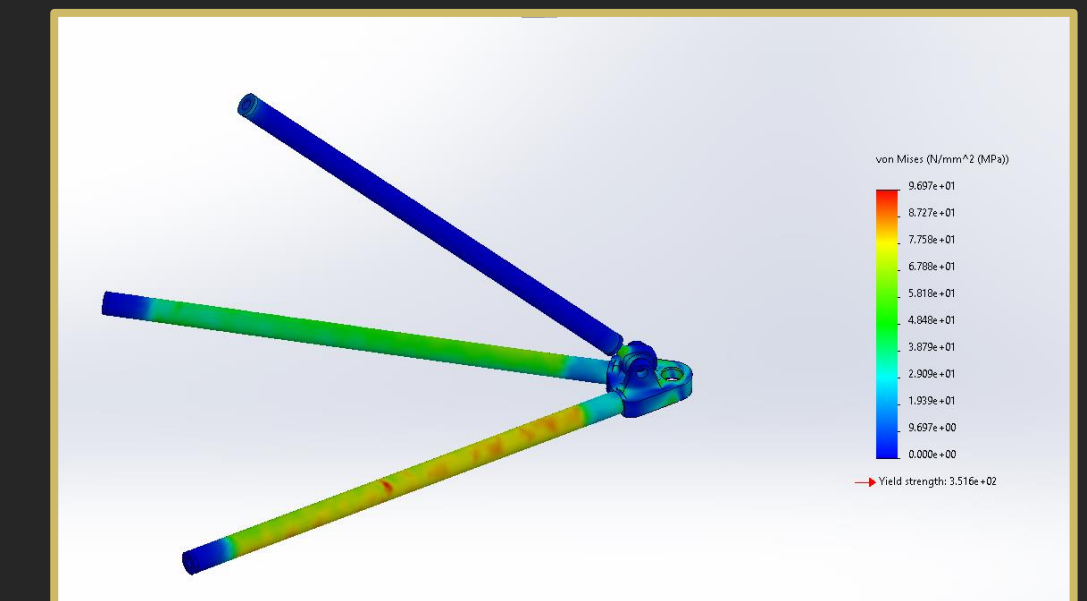


On the rear control arms the shock absorber is mounted on the upper control arm to give clearance to the drive shaft.

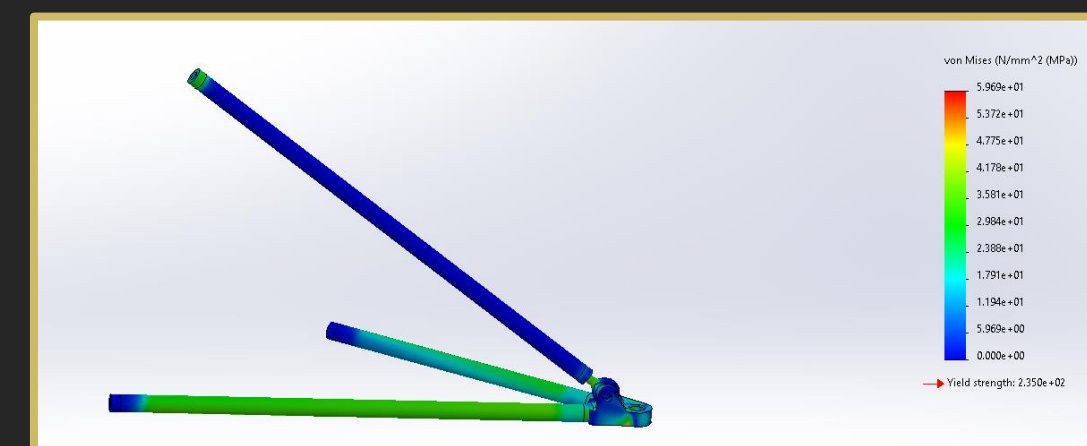


Simulations

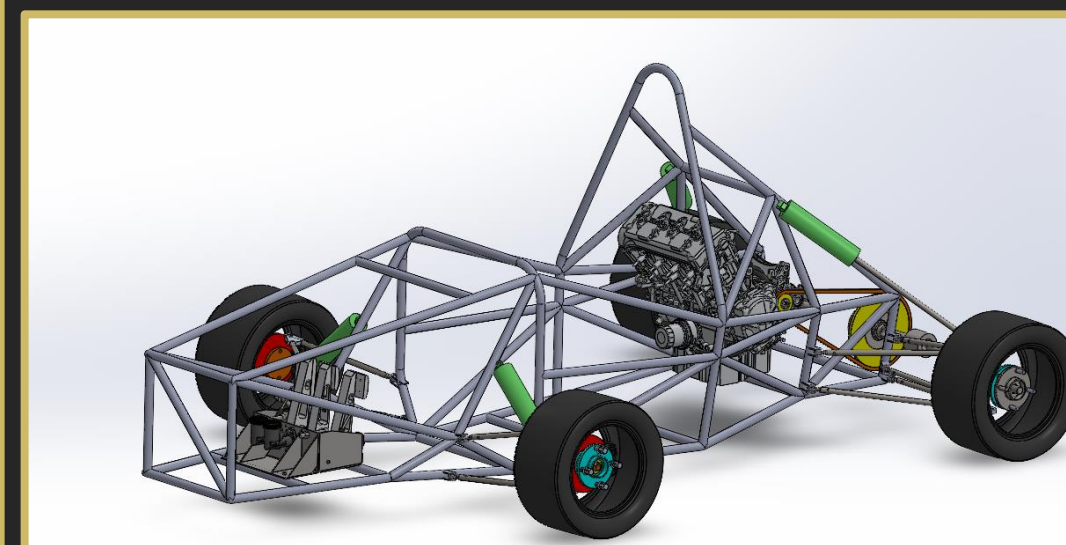
Simulations were conducted using SolidWorks. The control arms had driving forces applied. The front control arms have a FOS of 3



The rear control arms have a FOS of 4. The simulations confirmed the design will not break.



Conclusions



The completed control arms were inserted into the car assembly. The suspension mounts onto the chassis. The suspension design conforms to all completion regulations.

Acknowledgements

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